STRUCTURE GEOTECHNICAL REPORT

SN 003-0062
Existing SN: 003-0034

IL 143 over Shoal Creek
FAP Route 793
Section (40,112)BR-1
Bond County
D-98-108-05
PTB #169/035

Prepared By: Sarah L. Wiszkon, P.E.
Geotechnical Investigations Engineer
IDOT, Region 5, District 8
Geotechnical Unit
(618) 346-3309

Checked By: EAG

Date: April 1, 2015
Revised: July 29, 2015
Revised: August 31, 2015

Prepared For: Benjamin A. Nebel, P.E., S.E.
Hutchison Engineering, Inc.
Jacksonville, IL
(217) 245-7164

Attachments

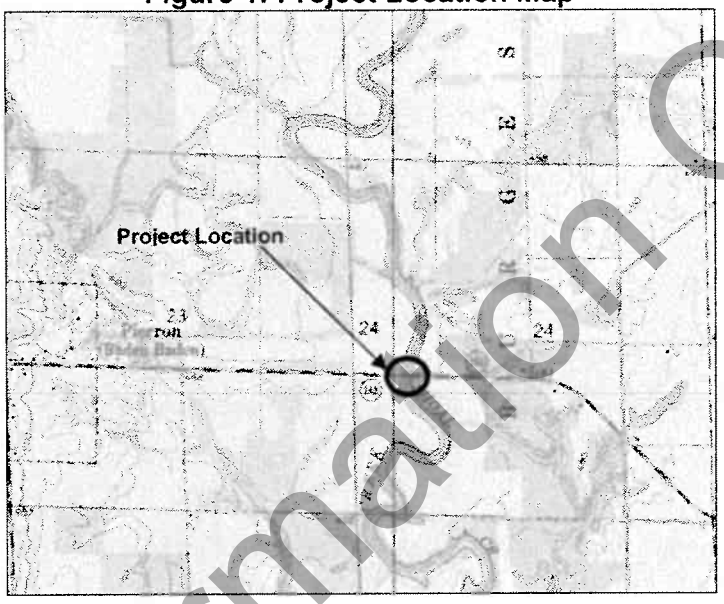
- Preliminary TS&L Plans
- Soil Profile
- Soil Boring Logs
- Drilled Shaft Analysis
- Pile Analysis

This report has been prepared based on a preliminary TS&L received April 9, 2015 and a preliminary plan and profile sheet dated September 26, 2014. Contact the author if there are any questions regarding this report of if there are modifications to structure location, size, geometry, or vertical alignment.

Project Description

This project consists of the complete replacement of existing structure 003-0034 with proposed structure 003-0062. The structure is located at the intersection of FAP 793 (IL 143) over Shoal Creek at Station 389+69.5 in Bond County. Specifically, the structure is located in the southwest quadrant of Section 24, Township 4 North, Range 4 West, 3rd Principal Meridian. The location of the structure is 5.2 miles east of the Madison County Line. See Figure 1 for the Project Location Map.

Figure 1: Project Location Map



Existing and Proposed Structure Information

The existing structure consists of a 22-span reinforced concrete deck bridge with steel beams on concrete pile bent abutments, concrete pile bent piers, and solid wall concrete piers with pile supported footings. The existing structure is 1129'-8.875" back-to-back abutments and 32'-6" out-to-out deck. It was originally constructed in 1934 as FA 793, Section 112-BR, reconstructed in 1972, and beam repaired in 2011. The existing structure has been programmed for total replacement due to the severe deteriorated conditions of both the superstructure and the substructure.

The proposed structure will consist of a 9-span composite plate girder beam bridge on stub abutments and eight solid wall piers on pile supported footings. The planned length is 1352'-0" back-to-back abutments and 35'-2" out-to-out deck. The proposed structure station is 385+04.50, while the proposed stationing for the substructure units is as follows:

- W. Abut – Station 378+32
- Pier 1 – Station 379+62
- Pier 2 – Station 381+17
- Pier 3 – Station 382+72
- Pier 4 – Station 384+27
- Pier 5 – Station 385+82
- Pier 6 – Station 387+37
- Pier 7 – Station 388+92
- Pier 8 – Station 390+47
- East Abut – Station 391+72

The proposed axial and lateral loads for each substructure unit, as provided by Hutchison Engineering, are as follows:

Substructure Unit	*Axial Load (kips)*	*Lateral Load (kips)*
East & West Abutments	1,300	65
Piers 1, 2, 3, 4, & 6	2,600	110
Piers 5, 7, & 8	3,700	165

Soils Investigation

Area Geology

The proposed structure lies in the Springfield Plain physiographic province of Illinois and the Tills Plains Section of the Central Lowlands Province of the United States. The location consists of surficial materials from the Cahokia Formation. Bedrock is generally limestone, sandstone, shale, and underclay of the Modesto Formation, formed during the Pennsylvanian period. There is one coal layer in the Modesto Formation – the No. 8 Coal.

Based on a review of the Bond County Soil Survey, the primary soil type at the proposed structure is the Wakeland Silt Loam. This soil has 0 – 2 percent slopes and is frequently flooded and somewhat poorly drained, and consists of alluvium formed on flood plains.

Subsurface Profile

Twenty-two boring logs were conducted by IDOT from April through June of 1971. The locations of the borings are as follows:

Location	***Station***	***Offset (ft)***
W Abut	379+88.20	13.0 Right
1 Bent #2	380+48.10	21.0 Right
2 Bent #3	380+97.72	22.7 Right
3 Bent #4	381+49.12	19.0 Right
4 Bent #5	382+00.49	19.5 Right
5 Bent #6	382+51.69	20.0 Right
6 Bent #7	383+03.07	21.0 Right
7 Bent #8	383+61.37	22.0 Right
8 Bent #9	384+00.73	20.0 Right
9 Bent #10	384+58.00	22.0 Right
10 Bent #11	385+08.63	21.5 Right
11 Bent #12	385+59.91	21.0 Right
12 Bent #13	386+13.35	21.3 Right
13 Bent #14	386+64.63	22.0 Right
14 Bent #15	387+15.01	21.0 Right
15 Bent #16	387+66.46	21.0 Right
16 Bent #17	388+16.89	21.0 Right
17 Bent #18	388+69.23	19.5 Right
18 Pier #1	389+00.40	21.3 Right
19 Pier #2	390+39.66	20.7 Left
20 Bent #19	390+74.09	22.9 Left
E Abut	391+33.00	10.0 Left

Two borings were conducted by TSi for IDOT in October 2014. Boring B-1 was taken at Station 389+14, 26.0 feet Right, and Boring B-2 was taken at Station 390+20, 26.0 feet right.

These borings describe a soil profile of intermingling layers of clay, clay loam, clay till, loam, sandy clay, silt, silty clay, and silty sandy clay over sand and gravel, which overlies intermingling layers of clay, clay till, silt, silty sandy clay, silty clay, and silty clay loam. Sand was encountered in each boring between Elev. 441.7 and Elev. 417.1 (these elevations are the upper and lower bounds for all borings). A relatively thin (less than 4 feet) layer of sand overlies bedrock at borings West Abut, Bent 4, Bent 5, Bent 14, Bent 15, and B-2. Weathered shale was encountered at the following elevations:

- W. Abut – Elev. 404.4
- Bent #2 – Elev. 402.0
- Bent #3 – Elev. 402.1
- Bent #4 – Elev. 403.0
- Bent #5 – Elev. 399.2
- Bent #6 – Elev. 403.0
- Bent #7 – Elev. 393.4
- Bent #8 – Elev. 387.7
- Bent #14 – Elev. 389.1
- Bent #15 – Elev. 390.7
- B-1 – Elev. 394.5
- B-2 – Elev. 391.5
- Bent #19 – Elev. 391.6

Competent bedrock was encountered at Elev. 390.5 at B-1 (shale) and at Elev. 391.0 at B-2 (shale over limestone). Groundwater elevations varied between Elev. 429.0 and Elev. 449.6.

Geotechnical Evaluation

Liquefaction

The peak seismic ground acceleration (A_s) for the project location is 0.093. . Based on AGMU Memo 10.1 (Liquefaction Analysis), areas within Seismic Performance Zone 2 with an A_s less than 0.15 do not require a liquefaction analysis.

Mining Activity

According to the Illinois State Geological Survey's collection of County Coal Mine Maps and Directories, there has been no recorded mining activity in the effective area of the project.

Scour

According to the Horner & Shifrin Hydraulic Report dated January 2011, the proposed structure is subject to 10 feet of scour at Piers 1 through 7 (Right Overbank) at the 100-year event level and 14 feet of scour at the 500-year event level, while 7 feet of scour is expected at Pier 8 (Left Overbank) at the 100-year event level and 5 feet of scour at the 500-year event levels. Abutment scour depths were not calculated due to the tendency of equations to be overly conservative. The structure does not overtop through the 500-year frequency.

The Design Scour Table provides the appropriate elevations at each of the substructure units. Note that the scour elevation at each of the abutments is at the bottom of the abutment cap. Assuming that the Class A4 riprap is an appropriate scour countermeasure, the abutment piles do not need to be designed for scour.

The proposed scour depths for Piers 1 and 5 can be reduced by 20%, as per Section 2.3.6.3.2 of the Bridge Manual.

Design Scour Elevation (feet)										
	W. Abut	*Pier 1*	*Pier 2*	*Pier 3*	*Pier 4*	*Pier 5*	*Pier 6*	*Pier 7*	*Pier 8*	*E Abut*
Q_{100}	458.0	447.5	443.5	442.5	443.0	446.7	446.8	445.0	449.0	457.4
Q_{500}	458.0	443.5	439.5	438.5	439.0	444.7	442.5	441.0	451.0	457.4
Design	458.0	447.5	443.5	445.5	443.0	446.7	446.8	445.0	445.0	457.4
Check	458.0	443.4	439.5	438.5	439.0	444.7	442.5	441.0	445.0	457.4

Seismic

The area is within the Seismic Performance Zone 2. The site's soil profile is most accurately described as Soil Site Class D. The Design Spectral Acceleration at 1 second is 0.24 g and 0.55 g at 0.2 seconds.

Settlement

Approximately 2.3 feet of additional embankment is to be added to the East Abutment bridge cone, while 2.9 feet of additional embankment is to be added at the West Abutment bridge cones. Our calculations, utilizing split spoon boring data available at the site, estimate the settlement to be on the order of 0.40 inches at the abutments. As a result, the effect of downdrag does not need to be accounted for in the substructure design.

Slope Stability

Based on information obtained from the borings and recommendations from the IDOT Geotechnical Manual, slope stability calculations have been performed using the computer program Slide. The Factors of Safety (FOS) are acceptable for the side slopes with FOS values ranging from 2.491 for the static analysis to 1.767 for the seismic analysis for the east end of the structure (3:1 H:V slopes) and FOS values ranging from 3.513 for the static analysis to 2.644 for the seismic analysis for the west end of the structure (2.5:1 H:V slopes). The use of 2:1 (H:V) end slopes results in acceptable Factors of Safety ranging from 4.863 for the static analysis to 3.735 for the seismic analysis.

Design Recommendations

The following top of rock elevations should be used for the drilled shaft and pile recommendations.

- West Abutment – 404.4 ft
- Pier 1 – 404.4 ft
- Pier 2 – 402.1 ft
- Pier 3 – 403.0 ft
- Pier 4 – 387.4 ft
- Pier 5 – 389.0 ft
- Pier 6 – 390.7 ft
- Pier 7 – 396.4 ft
- Pier 8 – 395.4 ft
- East Abutment – 400.1 ft

Spread Footings

Spread footings are not feasible at the structure, due to low soil strengths and relative densities.

Drilled Shafts

It appears that drilled shaft substructures should be feasible for all substructure locations given the preliminary axial loads provided by Hutchison Engineering, Inc.

With the soil conditions present, it appears that drilled shafts set in rock are a suitable pile type to be used at all substructures.

Drilled Shaft Design Table – West Abutment

Diameter (ft)	*Tip Elevation (ft)*	*Factored Resistance Available (kips)*	*Mode of Resistance*
3.0	401.40	177.93	Side
4.0	401.40	237.24	Side
5.0	401.40	296.55	Side

Drilled Shaft Design Table – Pier 1

Diameter (ft)	*Tip Elevation (ft)*	*Factored Resistance Available (kips)*	*Mode of Resistance*
3.0	397.35	444.83	Side
4.0	398.60	474.48	Side
5.0	399.85	444.83	Side

Drilled Shaft Design Table – Pier 2

Diameter (ft)	*Tip Elevation (ft)*	*Factored Resistance Available (kips)*	*Mode of Resistance*
3.0	388.35	517.32	Side
4.0	390.85	452.52	Side
5.0	390.85	565.65	Side

Drilled Shaft Design Table – Pier 3

Diameter (ft)	*Tip Elevation (ft)*	*Factored Resistance Available (kips)*	*Mode of Resistance*
3.0	393.00	489.89	Side
4.0	394.25	534.56	Side
5.0	395.50	519.93	Side

Drilled Shaft Design Table – Pier 4

Diameter (ft)	*Tip Elevation (ft)*	*Factored Resistance Available (kips)*	*Mode of Resistance*
3.0	379.90	459.85	Side
4.0	381.15	494.51	Side
5.0	382.40	469.86	Side

Drilled Shaft Design Table – Pier 5

Diameter (ft)	*Tip Elevation (ft)*	*Factored Resistance Available (kips)*	*Mode of Resistance*
3.0	384.00	281.92	Side
4.0	384.00	375.89	Side
5.0	385.25	321.59	Side

Drilled Shaft Design Table – Pier 6

Diameter (ft)	*Tip Elevation (ft)*	*Factored Resistance Available (kips)*	*Mode of Resistance*
3.0	383.20	459.85	Side
4.0	384.45	494.51	Side
5.0	385.70	469.86	Side

Drilled Shaft Design Table – Pier 7

Diameter (ft)	*Tip Elevation (ft)*	*Factored Resistance Available (kips)*	*Mode of Resistance*
3.0	391.40	355.86	Side
4.0	392.65	355.86	Side
5.0	393.90	296.55	Side

Drilled Shaft Design Table – Pier 8

Diameter (ft)	*Tip Elevation (ft)*	*Factored Resistance Available (kips)*	*Mode of Resistance*
3.0	387.90	311.96	Side
4.0	389.15	346.62	Side
5.0	390.40	346.62	Side

Drilled Shaft Design Table – East Abutment

Diameter (ft)	*Tip Elevation (ft)*	*Factored Resistance Available (kips)*	*Mode of Resistance*
3.0	396.35	155.98	Side
4.0	396.35	207.97	Side
5.0	397.60	173.31	Side

Piles

It appears that pile-supported substructures should be feasible for all substructure locations given the preliminary axial loads provided by Hutchison Engineering, Inc. With the soil conditions present, it appears that end-bearing steel H-piles are a suitable pile type to be used at all substructures. Metal shell piles were not considered as the majority of pile strength comes from end-bearing resistance.

Design Capacity Limitations

No geotechnical losses due to scour were taken into account in the design of the abutment piles because the end slopes have effective scour countermeasures. According to our analyses, scour appears to be applicable to the pier locations without pile supported footings. Geotechnical losses due to scour range from 4 to 5 kips at Piers 3 and 5, and 3 kips at Pier 6.

The pile design tables assume two rows of piles for the abutment locations, three rows of piles at the pier locations; and pile cutoff elevations one foot into the footing or abutment cap.

Pile Design Table – West Abutment

Est. Pile Length (ft)	HP 10x42 *Max Length: 56.1*		HP 12x53 *Max Length: 56.0*		HP 12x63 *Max Length: 57.5*		HP 14x73 *Max Length: 56.9*		HP 14x89 *Max Length: 58.9*		HP 14x117 *Max Length: 62.3*	
	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)
33	123	68	147	81	151	83	179	98	182	100	189	104
38	146	80	183	100	186	100	221	121	225	124	231	127
43	141	78	173	97	177	98	216	119	219	120	225	124
48	171	94	213	117	215	118	263	144	266	146	273	150
53	260	143	311	171	320	176	379	209	390	215	409	225
Max	335	185	418	230	497	274	578	317	705	387	929	510

Pile Design Table – Pier 1

Est. Pile Length (ft)	HP 12x53 *Max Length: 53.8*		HP 12x63 *Max Length: 55.3*		HP 14x73 *Max Length: 54.7*		HP 14x89 *Max Length: 56.7*		HP 14x117 *Max Length:60.1*	
	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)
38	137	75	139	76	169	93	171	94	175	97
41	161	89	163	90	199	110	202	111	207	114
44	182	100	184	101	224	123	227	125	233	128
47	202	111	204	112	249	137	252	139	259	143
50	290	160	299	165	354	195	365	201	383	211
53	381	209	385	212	467	257	475	261	559	307
Max	418	230	497	275	578	317	705	387	929	510

Pile Design Table – Pier 2

Est. Pile Length (ft)	HP 12x53 *Max Length:57.3*		HP 12x63 *Max Length:58.7*		HP 14x73 *Max Length:58.2*		HP 14x89 *Max Length:60.2*		HP 14x117 *Max Length:63.6*	
	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)
44	157	86	159	87	190	104	193	106	198	109
47	154	85	155	85	189	104	191	105	196	108
51	165	91	167	92	201	111	204	112	208	115
54	239	132	245	135	290	159	296	163	307	169
57	405	223	410	225	504	277	512	281	525	289
Max	418	231	497	272	578	318	705	387	929	511

Pile Design Table – Pier 3

Est. Pile Length (ft)	HP 12x53 *Max Length:56.6*		HP 12x63 *Max Length:58.1*		HP 14x73 *Max Length:57.6*		HP 14x89 *Max Length:59.6*		HP 14x117 *Max Length:63.0*	
	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)
51	162	85	163	85	198	104	201	105	206	108
52	182	96	185	97	222	117	226	119	233	123
53	203	107	206	109	246	130	251	133	259	137
54	223	118	228	121	270	143	276	147	286	152
55	330	177	335	179	401	215	408	219	420	226
56	389	210	393	212	481	259	488	263	502	271
Max	418	226	497	270	578	314	705	384	929	508

Pile Design Table – Pier 4

Est. Pile Length (ft)	HP 12x53 *Max Length:69.5*		HP 12x63 *Max Length:71.1*		HP 14x73 *Max Length:70.5*		HP 14x89 *Max Length:72.5*		HP 14x117 *Max Length:75.9*	
	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)
45	192	105	194	106	234	129	237	131	243	134
50	212	116	214	118	257	141	260	143	266	146
55	243	134	245	135	295	162	299	164	306	168
60	274	151	276	152	333	183	337	185	345	190
65	276	152	279	153	331	182	335	184	342	188
70			444	245	548	301	556	306	571	314
Max	418	229	497	275	578	317	705	387	929	510

Pile Design Table – Pier 5

Est. Pile Length (ft)	HP 12x53 *Max Length:63.1*		HP 12x63 *Max Length:64.6*		HP 14x73 *Max Length:64.0*		HP 14x89 *Max Length:66.0*		HP 14x117 *Max Length:69.4*	
	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)
50	228	121	230	123	277	148	281	150	288	154
54	240	128	242	129	291	155	294	157	301	161
58	267	143	269	145	324	174	328	176	336	180
62	365	197	370	199	446	241	453	245	466	251
64			469	254	577	313	585	317	601	326
Max	418	227	497	271	578	313	705	382	929	505

Pile Design Table – Pier 6

Est. Pile Length (ft)	HP 12x53 *Max Length:65.6*		HP 12x63 *Max Length:67.1*		HP 14x73 *Max Length:66.6*		HP 14x89 *Max Length:68.6*		HP 14x117 *Max Length:72.0*	
	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)
48	158	84	160	85	196	105	199	106	204	109
52	164	88	166	89	200	107	202	108	207	111
56	166	89	168	89	199	106	202	108	206	110
60	229	123	232	126	276	149	281	151	288	155
64	333	181	340	185	404	219	411	223	423	229
66			442	240	544	296	552	300	568	309
Max	418	227	497	270	578	316	705	385	929	508

Pile Design Table – Pier 7

Est. Pile Length (ft)	HP 12x53 *Max Length:51.7*		HP 12x63 *Max Length:53.2*		HP 14x73 *Max Length:52.6*		HP 14x89 *Max Length:54.6*		HP 14x117 *Max Length:58.0*	
	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)
48	208	114	210	115	251	138	254	140	260	143
49	252	139	257	141	305	168	310	171	319	175
50	296	163	303	167	359	197	366	201	377	207
51	386	212	390	214	475	261	482	265	496	272
52			439	242	542	298	550	302	565	311
Max	418	231	497	275	578	317	705	387	929	510

Pile Design Table – Pier 8

Est. Pile Length (ft)	HP 12x53 *Max Length:53.9*		HP 12x63 *Max Length:55.4*		HP 14x73 *Max Length:54.9*		HP 14x89 *Max Length:56.9*		HP 14x117 *Max Length:60.3*	
	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)
51	203	112	209	115	247	136	253	139	263	144
52	305	168	311	171	369	203	376	206	387	213
53	369	203	375	206	453	246	460	253	473	260
54			425	234	525	286	533	293	547	301
55			475	261			592	325	608	334
Max	418	228	497	272	578	318	705	387	929	510

Pile Design Table – East Abutment

Est. Pile Length (ft)	HP 10x42 *Max Length: 61.1*		HP 12x53 *Max Length: 60.9*		HP 12x63 *Max Length: 62.5*		HP 14x73 *Max Length: 61.9*		HP 14x89 *Max Length: 64.0*		HP 14x117 *Max Length: 67.4*	
	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)	R_N (kips)	R_F (kips)
44	106	58	134	74	135	74	167	92	169	93	174	96
49	124	68	154	85	155	85	186	104	191	105	196	108
54	135	74	166	91	167	92	201	110	203	112	208	114
58	210	116	252	138	258	142	305	168	311	171	322	177
59	249	138	307	169	314	173	372	205	379	208	390	215
60	290	159	366	201	371	204	453	249	461	253	473	260
Max	335	184	418	229	497	274	578	316	705	389	929	512

Test Piles

Due to the varying depth to bedrock between the substructure units, we recommend that 4 test piles be driven, one each at Pier 3, Pier 4, Pier 7, and East Abutment, if piles are chosen as the substructure type.

Metal Shoes

No conditions exist which would require metal shoes to be installed on any of the piles at this site.

Lateral Loading

The factored lateral loading for all the substructure units is anticipated to exceed 3 kips per pile. However, the maximum exposed height of the piles at the substructure units is 1 foot, therefore, no lateral analysis should be necessary.

Construction Considerations

The structure will be closed for construction and stage construction will not be utilized. Therefore, temporary retention will not be necessary.

If Shoal Creek is experiencing flooding that overtops the top of bank elevation of 455.0 ft, cofferdams may be required to pour the footings in dry conditions; if pile supported footings are the chosen foundation type.

The 2' x 2' box culvert at Station 378+30.4 should be removed before constructing the foundation for the West Abutment.

BENCH MARK

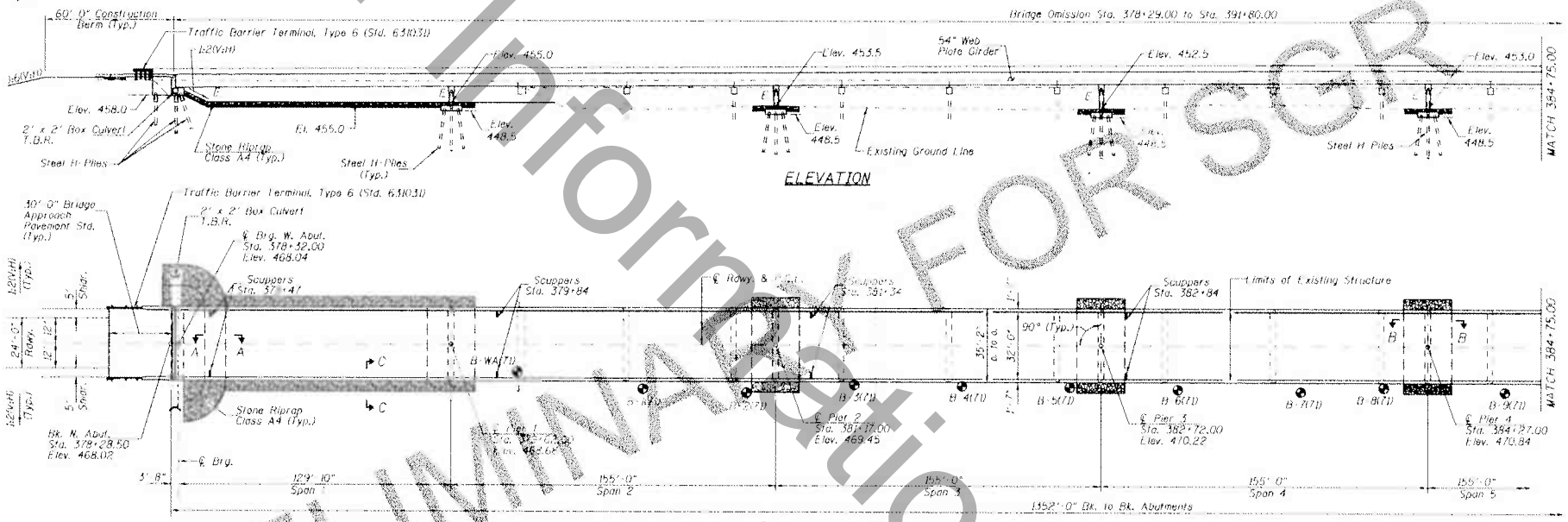
BM #22 - Chiseled "L" on north side of west abutment seat. Sta. 379+96.4, 17.2' Lt., Elev. = 461.48

EXISTING STRUCTURES

SN 003-0034 Originally built as SBI 127A, Section 112B in 1934. It was rebuilt and widened in 1972 as FAP 793, Section 112BR. The existing structure consists of 22 spans with 21 simple span RC deck on steel W-beam units (19 west, 2 east of main span) and a single span steel thru plate girder with steel floor beams and RC deck superstructure. The existing substructure consists of concrete stub abutments on concrete piles, concrete pile bent piers on concrete piles (19) and two solid wall concrete piers on concrete pile supported footings. The structure is 1129'-9" bk. to bk. of abutments and 32°-6" out to out of deck with no skew. The existing structure is to be removed and replaced.

The roadway will be closed during construction. Traffic will be detoured during construction.

Salvage: None.



WATERWAY INFORMATION

Drainage Area = 0.64 Sq. Miles Low Grade Elev. 465.00 ℄ Sta. 384+49.60

Flood	Q Yrs.	Q C.F.S.	Opening Sq. Ft. Exist.	Opening Sq. Ft. Prop.	Nat. H.W.E.	Head Ft. Exist.	Head Ft. Prop.	Headwater El. Exist.	Headwater El. Prop.
	10	21,100	6,007	7,458	458.92	1.81	1.49	460.74	460.41
Design	50	30,500	7,369	8,911	459.86	2.20	1.60	462.06	461.66
Base	100	34,300	7,711	9,428	460.20	2.33	1.91	462.53	462.11
Overtopping									
Max. Calc.	500	43,200	8,054	10,441	460.93	2.67	2.13	463.60	463.06

DESIGN STRESSES

FIELD UNITS

f'c = 3,500 psi
fy = 60,000 psi (Reinforcement)
fy = 50,000 psi (M270 Grade 50W)

HIGHWAY CLASSIFICATION

F.A.P. Rte. 793 - (Il. Rte. 143)
Functional Class: Minor Arterial
ADT: 1,700 (2017); 2,200 (2037)
ADTT: 11%
Design Speed: 55 m.p.h.
Posted Speed: 55 m.p.h.
2-Way Traffic
Directional Distribution: 50:50

DESIGN SPECIFICATIONS

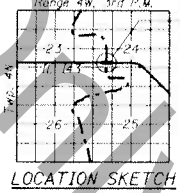
2014 AASHTO LRFD Bridge Design Specifications, 7th Edition with Interims

LOADING HL-93

Allow 50#/sq. ft. for future wearing surface.

SEISMIC DATA

Seismic Performance Zone (SPZ) = 4
Design Spectral Acceleration at 1.0 sec. (S_{D1}) = 0.10g
Design Spectral Acceleration at 0.2 sec. (S_{DS}) = 0.52g
Soil Site Class = D



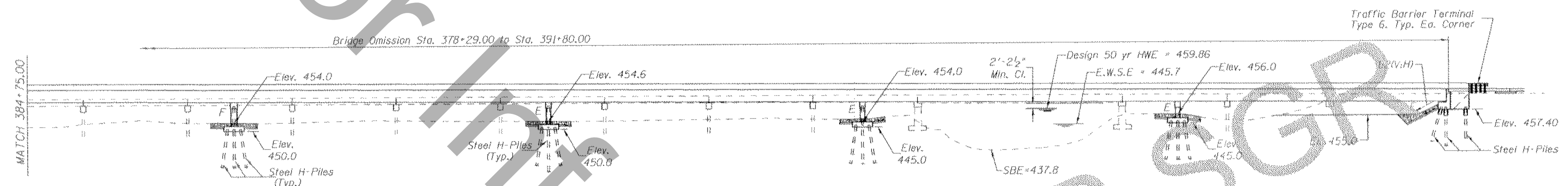
LOCATION SKETCH

GENERAL PLAN

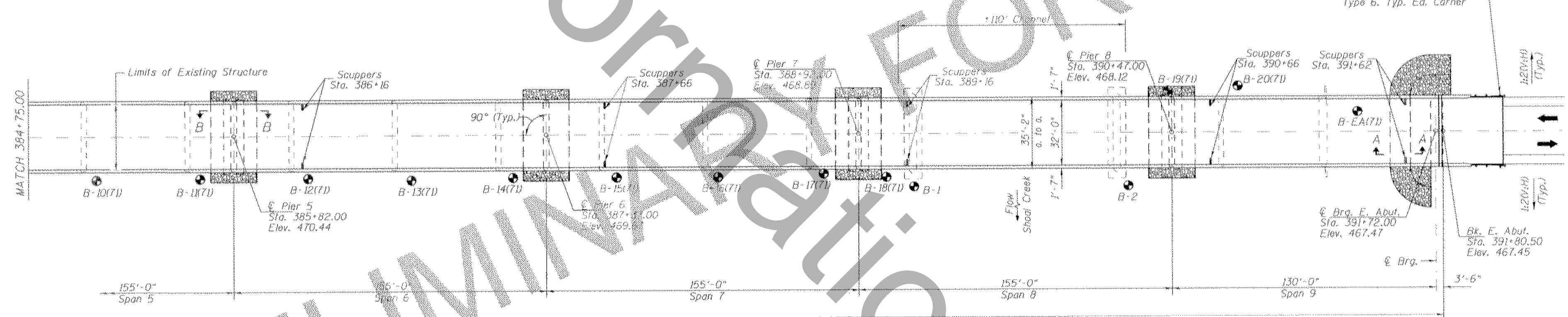
ILL. RTE. 143 OVER SHOAL CREEK
F.A.P. ROUTE 793
SECTION (40, 112) BR-1
BOND COUNTY
STATION 385+04.50
STR. NO. 003-0062

Hutchison Engineering, Inc. Jacksonville, Peoria & Shorewood, Illinois	USER NAME =	DESIGNED - BAN	REVISED -	STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION
	PLOT SCALE = NONE	CHECKED - JOH	REVISED -	
	PLOT DATE =	DRAWN - TAC	REVISED -	TYPE, SIZE & LOCATION
		CHECKED - BAN	REVISED -	SHEET NO. 1 OF 3 SHEETS

F.A.P. RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
793	(40,112) BR-1	BOND	-	-
		CONTRACT NO. 76967		
		ILLINOIS FED. AID PROJECT		



ELEVATION



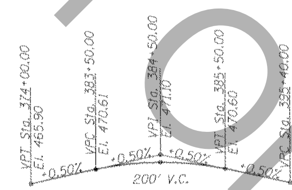
PLAN

Boring Locations

N

DESIGN SCOUR ELEVATION TABLE

	Design Scour Elevations (ft.)									
	W. Abut.	Pier 1	Pier 2	Pier 3	Pier 4	Pier 5	Pier 6	Pier 7	Pier 8	E. Abut.
Q100	458.0	445.0	443.7	442.5	443.0	444.0	444.2	444.3	448.7	457.4
Q500	458.0	441.0	439.7	438.5	439.0	440.0	440.2	440.3	450.7	457.4



PROFILE GRADE

GENERAL PLAN
ILL. RTE. 143 OVER SHOAL CREEK
F.A.P. ROUTE 793
SECTION (40, 112) BR-1
BOND COUNTY
STATION 385+04.50
STR. NO. 003-0062

Hutchison Engineering, Inc.
Jacksonville, Peoria & Shorewood, Illinois

USER NAME =	DESIGNED - BAN	REVISED -
PLOT SCALE = NONE	CHECKED - JOH	REVISED -
PLOT DATE =	DRAWN - TAC	REVISED -
	CHECKED - BAN	REVISED -

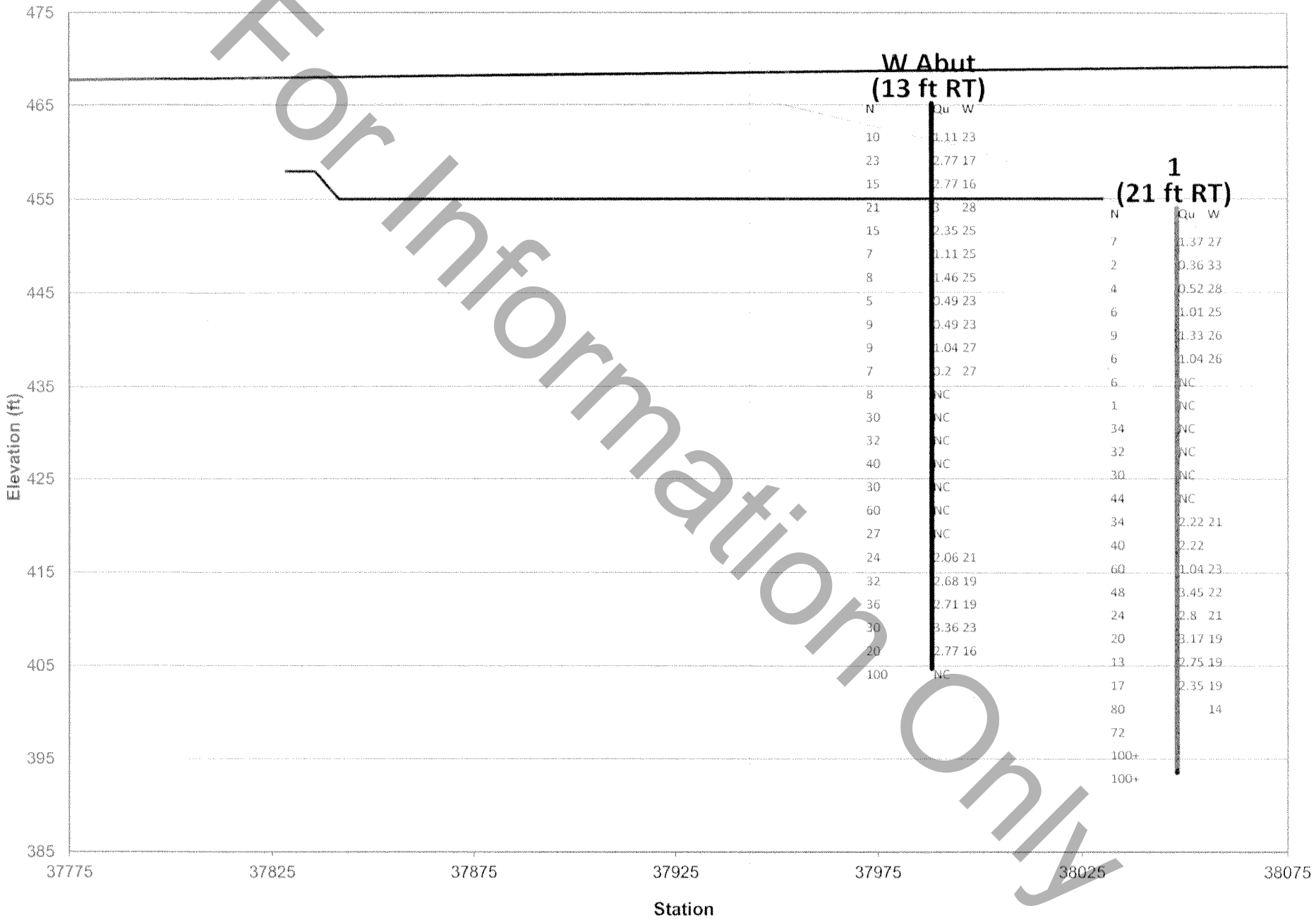
STATE OF ILLINOIS
DEPARTMENT OF TRANSPORTATION

TYPE, SIZE & LOCATION

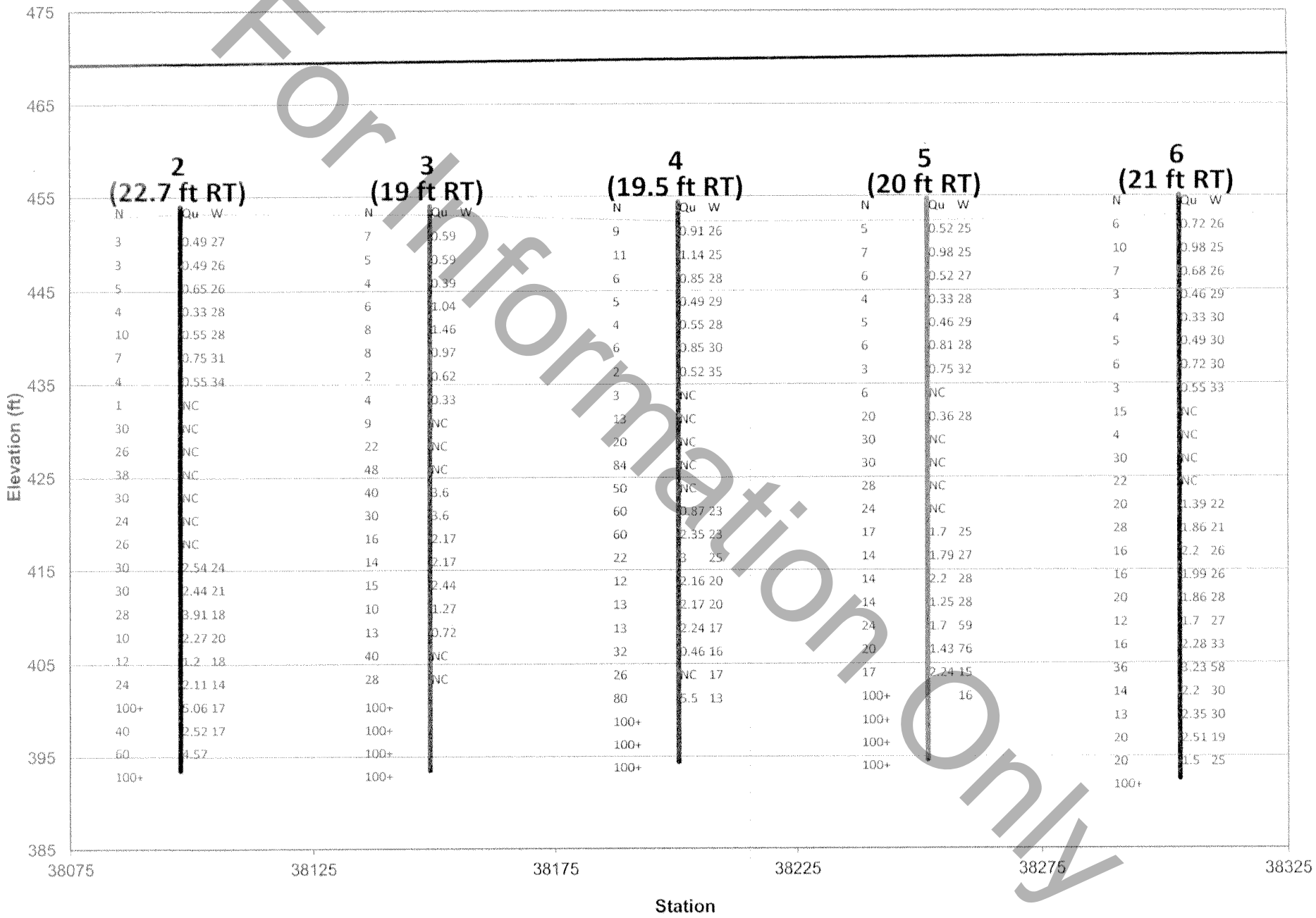
SHEET NO. 2 OF 3 SHEETS

RTE.	SECTION	COUNTY	TOTAL SHEETS	SHEET NO.
-	(40,112) BR-1	Bond	-	-
		CONTRACT NO. 76967		
	ILLINOIS FED. AID PROJECT			

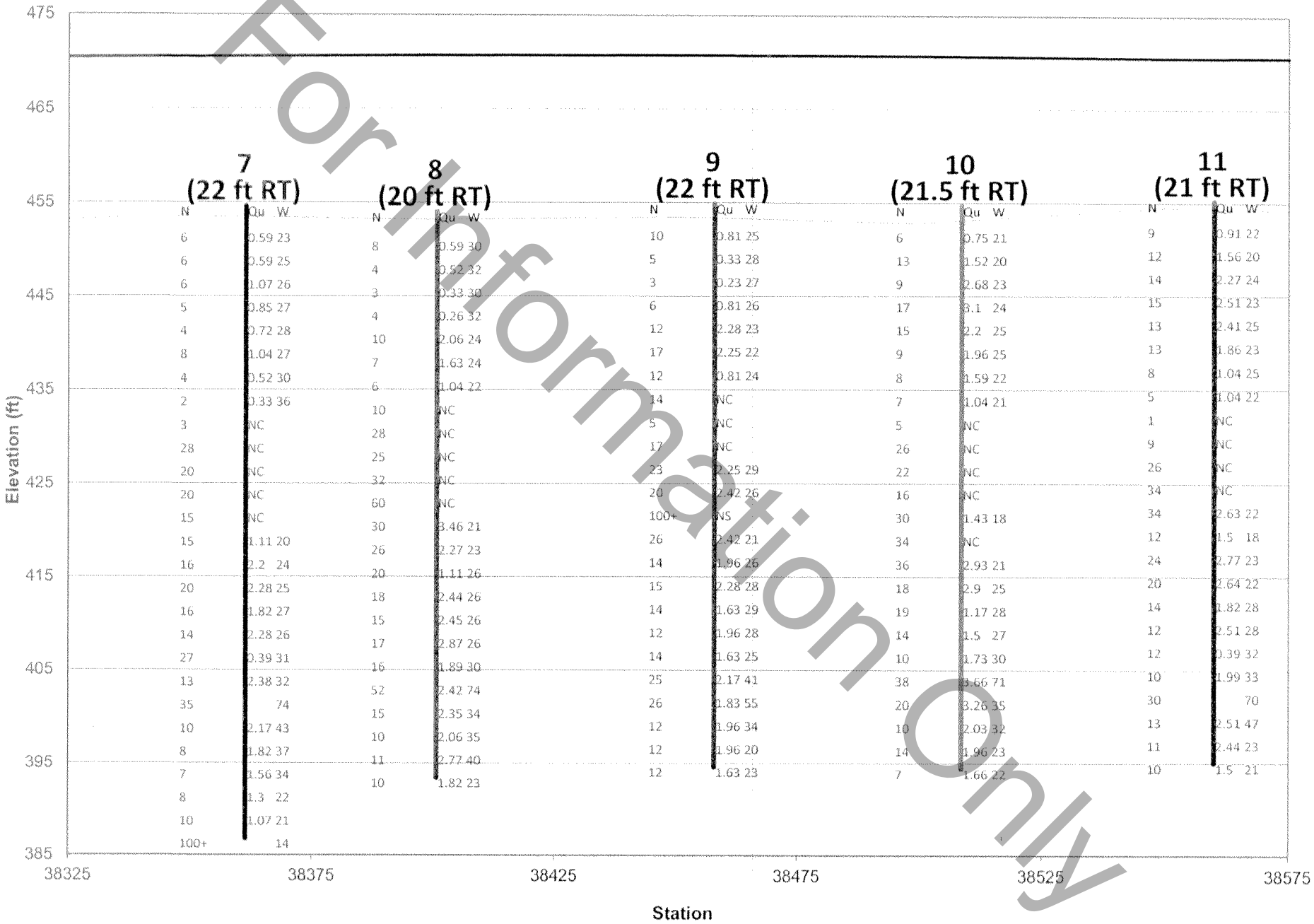
IL 143 over Shoal Creek - SN 003-0034 (E) / 003-0062 (P)



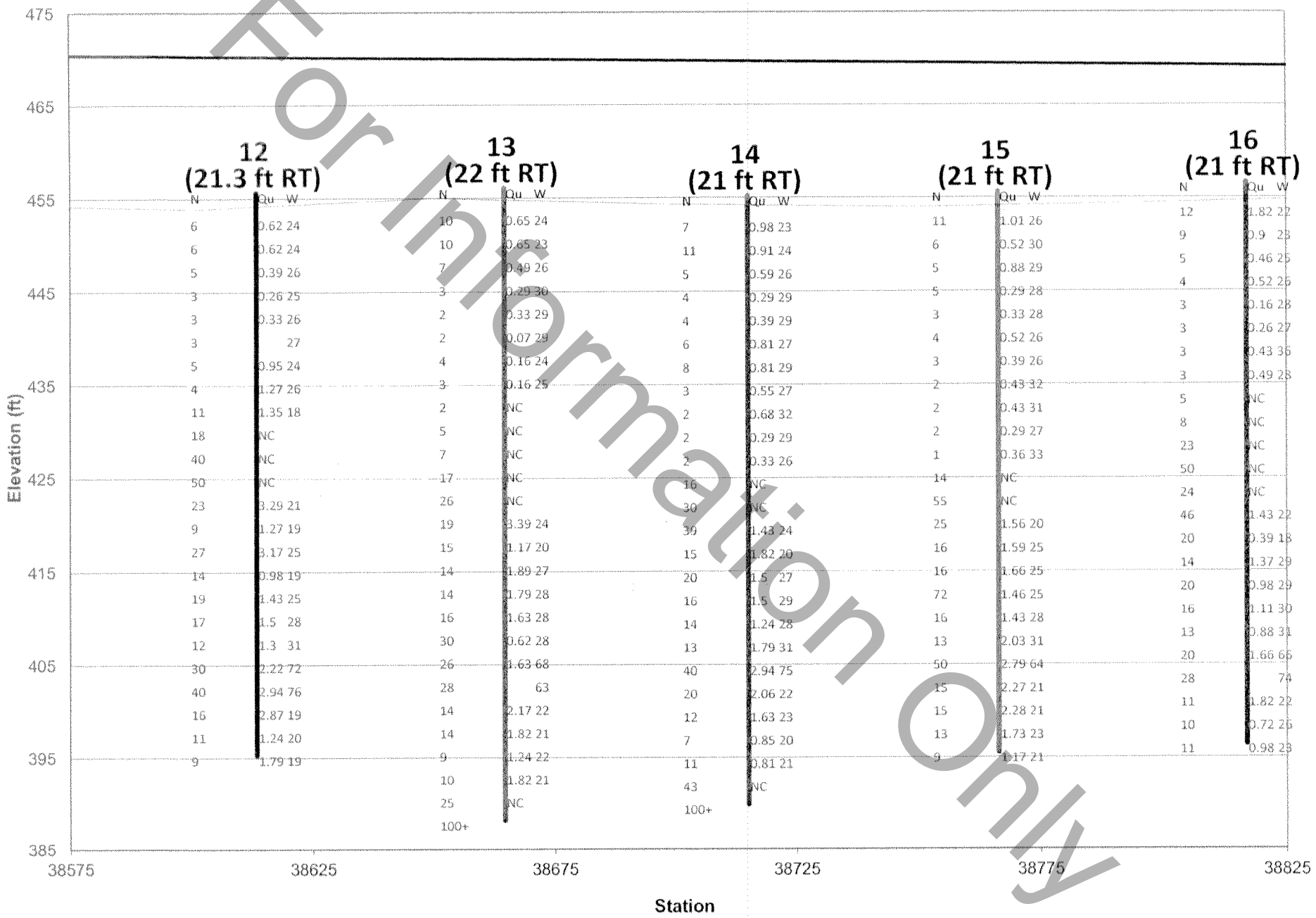
IL 143 over Shoal Creek - SN 003-0034 (E) / 003-0062 (P)



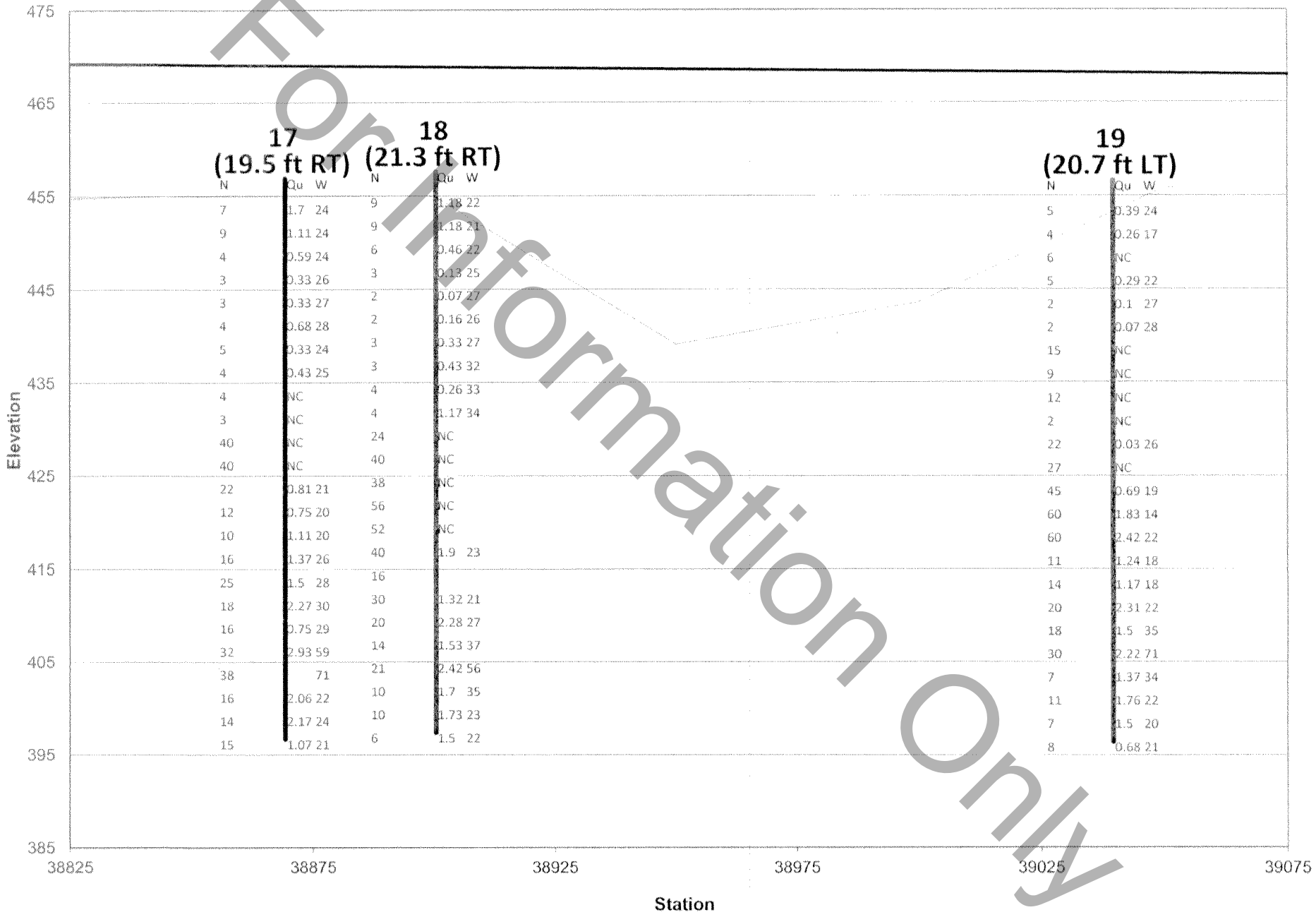
IL 143 over Shoal Creek - SN 003-0034 (E) / 003-0062 (P)



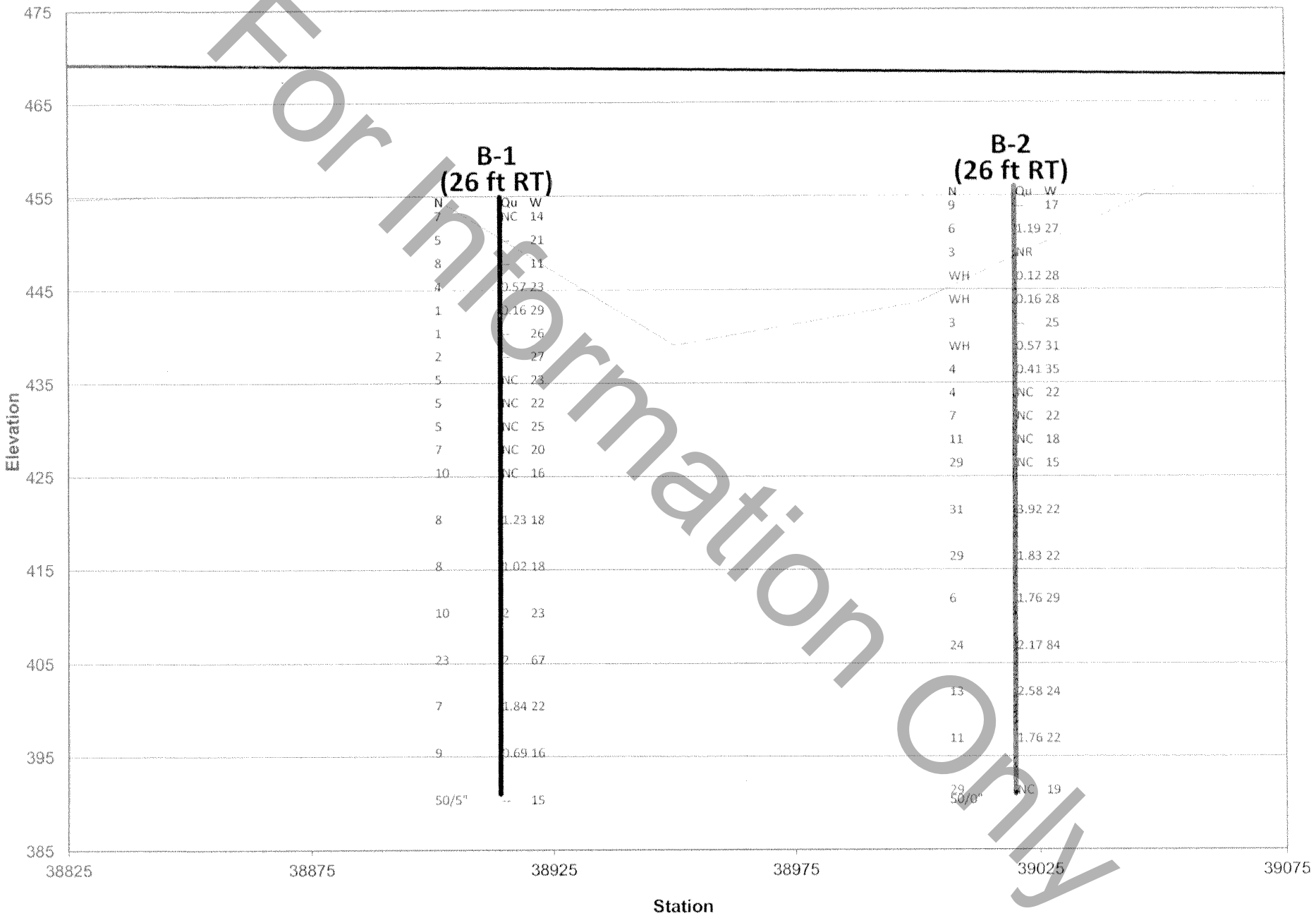
IL 143 over Shoal Creek - SN 003-0034 (E) / 003-0062 (P)



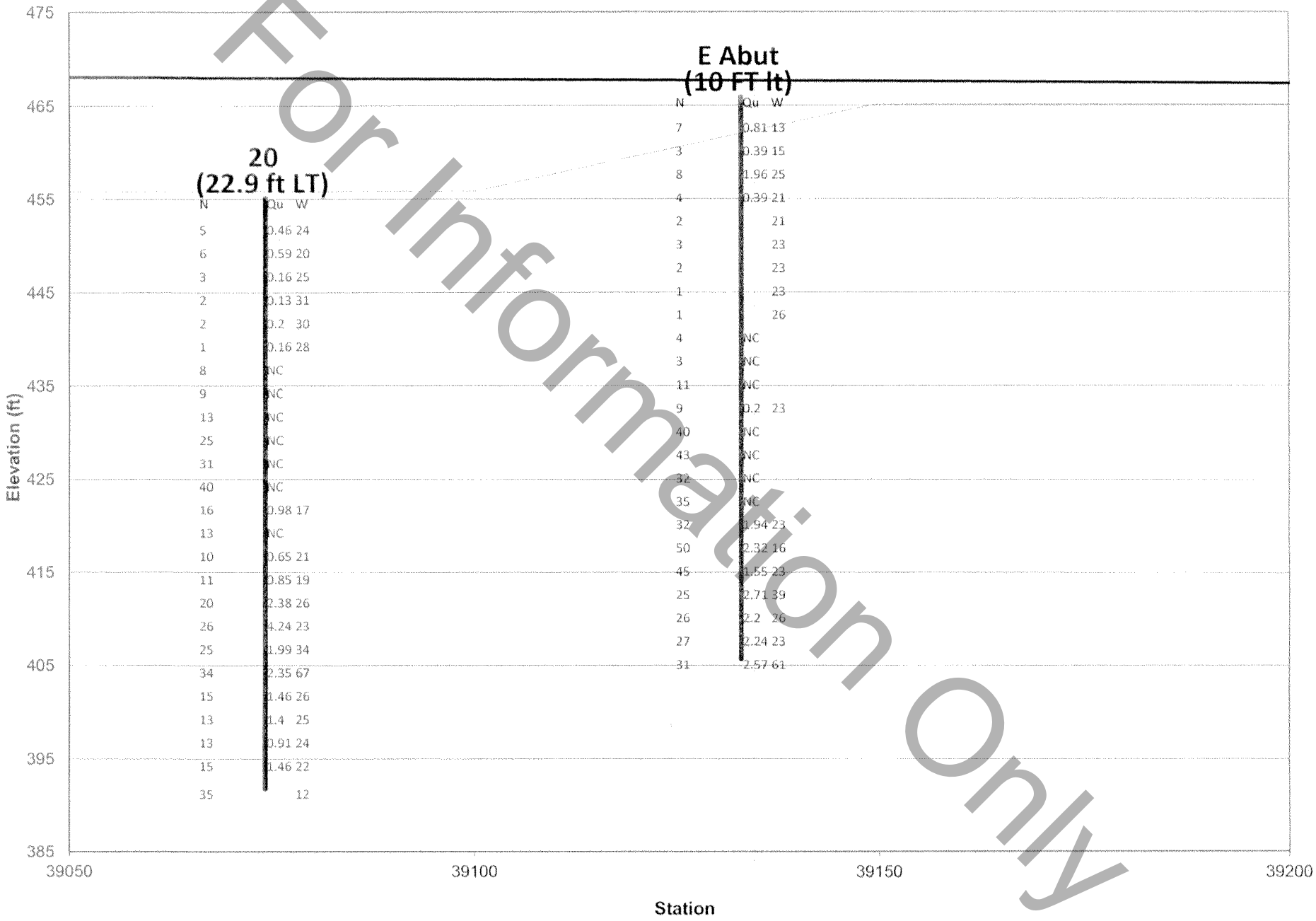
IL 143 over Shoal Creek - SN 003-0034 (E) / 003-0062 (P)



IL 143 over Shoal Creek - SN 003-0034 (E) / 003-0062 (P)



IL 143 over Shoal Creek - SN 003-0034 (E) / 003-0062 (P)



Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 3/5/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. W. Abut
Station 379+88.2
Offset 13.00ft Right
Ground Surface Elev. 465.2 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 449.0 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown Silty CLAY
	10	1.11 B	23	
-5				
	23	2.77 E	17	
	15	2.77 S	16	
-10				
	21	3.00 S	28	
453.5				
				Brown and Gray Slightly Silty CLAY
	15	2.35 S	25	
451.0				
-15				Gray Slightly Silty CLAY
449.0 ▼	7	1.11 B	25	
				Gray and Brown Slightly Silty CLAY
	8	1.46 B	25	
446.0				
-20				Gray and Brown Silty Slightly Sandy CLAY
				Gray and Brown Silty Slightly Sandy CLAY *(continued)*
	5	0.49 B	23	
	9	0.49 B	23	
-25				
	9	1.04 B	27	
438.5				
				Gray Slightly Silty CLAY
	7	0.20 B	27	
436.0				
-30				Gray Medium SAND
	8	NC		
	30	NC		
-35				
	32	NC		
	40	NC		
-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

SOIL BORING LOG

Date 3/5/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. W. Abut
Station 379+88.2
Offset 13.00ft Right
Ground Surface Elev. 465.2 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 449.0 ft
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray Medium SAND *(continued)*		30	NC	
		60	NC	
	-45			
419.0		27	NC	
Gray Clayey SILT		24	2.06 B	21
	-50			
413.7		32	2.68 B	19
Gray-Green Silty CLAY		36	2.71 B	19
	-55			
408.5		30	3.36 B	23
Gray Silt Sand TILL				
406.2		20	2.77 S	16
Gray Coarse SAND	-60			
(continued)				
Gray Coarse SAND *(continued)*				
404.4		100	NC	
Gray Weathered SHALE				
403.9				
End of Boring				
NOTE: Value in "Blows" column is equal to the N-value.				
	-65			
	-70			
	-75			
	-80			

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

SOIL BORING LOG

Date 4/19/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 1 Bent #2
Station 380+48.1
Offset 21.00ft Right
Ground Surface Elev. 454.0 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 449.6 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Gray CLAY
	7	1.37 B	27	
449.6				
-5				Gray Silty CLAY
	2	0.36 B	33	
	4	0.52 B	28	
-10				
	6	1.01 B	25	
442.0				
				Gray and Brown Silty CLAY
	9	1.33 B	26	
-15				
	6	1.04 B	26	
436.1				
	6	NC		Gray Medium SAND
-20				
				Gray Medium SAND *(continued)*
	1	NC		
	34	NC		
-25				
	32	NC		
427.0				
				Gray Coarse SAND
	30	NC		
424.5				
-30				
				Gray Fine SAND with Coarse Gravel
	44	NC		
422.0				
				Gray SILT
	34	2.22 S	21	
-35				
	40	2.22 E		
	60	1.04 S	23	
-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

SOIL BORING LOG

Date 4/19/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 1 Bent #2
Station 380+48.1
Offset 21.00ft Right
Ground Surface Elev. 454.0 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 449.6 ft ▼
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray SILT *(continued)* (Thixotropic)		48	3.45 S	22
		24	2.80 S	21
409.5	-45			
Gray Clayey SILT		20	3.17 S	19
407.0				
Blue Gray Silty CLAY		13	2.75 S	19
	-50			
		17	2.35 S	19
402.0				
Gray Weathered SHALE		80		14
	-55			
		72		
		100+		
	-60			
Gray Weathered SHALE *(continued)*		100+		
392.6				
End of Boring				
NOTE: Value in "Blows" column is equal to the N-value.				
	-65			
	-70			
	-75			
	-80			

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

SOIL BORING LOG

Date 4/26/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 2 Bent #3
Station 380+97.72
Offset 22.70ft Right
Ground Surface Elev. 454.0 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 449.6 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown and Gray Slightly Silty CLAY
	3	0.49 E	27	
-5				
	3	0.49 B	26	
	5	0.65 B	26	
-10				
	4	0.33 B	28	
	10	0.55 B	28	
-15				
	7	0.75 B	31	
437.1				
				Gray Silty CLAY
	4	0.55 B	34	
434.5				
-20				Gray Fine SAND
				Gray Fine SAND *(continued)*
	1	NC		
	30	NC		
-25				
	26	NC		
427.1				
				Gray Fine SAND and GRAVEL
	38	NC		
-30				
	30	NC		
	24	NC		
-35				
	26	NC		
417.1				
				Gray SILT
	30	2.54 S	24	
-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

SOIL BORING LOG

Date 4/26/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 2 Bent #3
Station 380+97.72
Offset 22.70ft Right
Ground Surface Elev. 454.0 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 449.6 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	30	2.44 S	21	Gray SILT *(continued)* (Thixotropic)
412.1				
				Gray-Green Silty CLAY
	28	3.91 S	18	
-45				
	10	2.27 B	20	
407.1				
				Gray Green Silty Sandy CLAY
	12	1.20 B	18	
-50				
	24	2.11 S	14	
402.1				
				Gray Weathered SHALE
	100+	5.06 S	17	
-55				
	40	2.52 S	17	
	60	4.57 S		
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	100+			Gray Weathered SHALE *(continued)*
392.6				
				End of Boring
				NOTE: Value in "Blows" column is equal to the N-value.
-65				
-70				
-75				
-80				

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

SOIL BORING LOG

Date 4/28/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 3 Bent #4
Station 381+49.12
Offset 19.00ft Right
Ground Surface Elev. 454.0 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 447.2 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray Slightly Silty CLAY			
	7	0.59 E	25
449.5			
-5			
Brown and Gray Silty CLAY	5	0.59 B	27
▼			
	4	0.39 B	28
-10			
	6	1.04 B	28
	8	1.46 B	27
-15			
	8	0.97 S	30
437.0			
Gray Silty CLAY	2	0.62 B	35
434.5			
Gray Sandy Gravelly CLAY			
-20			
Gray Sandy Gravelly CLAY *(continued)*	4	0.33 B	25
432.0			
Gray Coarse SAND and GRAVEL	9	NC	
-25			
	22	NC	
	48	NC	
424.5			
-30			
Gray SILT	40	3.60 E	25
(Thixotropic)	30	3.60 S	21
420.0			
Gray Silty CLAY			
-35			
	16	2.17 B	22
	14	2.17 B	20
-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

SOIL BORING LOG

Date 4/28/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 3 Bent #4
Station 381+49.12
Offset 19.00ft Right
Ground Surface Elev. 454.0 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 447.2 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	15	2.44 B	18	Gray Silty CLAY *(continued)*
412.0				
	10	1.27 B	18	Gray Silty Slightly Sandy CLAY
-45				
	13	0.72 B	21	
407.0				
	40	NC		Gray Medium SAND
-50				
	28	NC	17	
403.0				
				Gray Weathered SHALE
402.0				
				Dark Gray Weathered SHALE
	100+			
399.5				
-55				
				Gray Weathered SHALE
	100+			
	100+			
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	100+			Gray Weathered SHALE *(continued)*
392.7				
				End of Boring
				NOTE: Value in "Blows" column is equal to the N-value.
-65				
-70				
-75				
-80				

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

SOIL BORING LOG

Date 5/3/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 4 Bent #5
Station 382+00.49
Offset 19.50ft Right
Ground Surface Elev. 454.4 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 447.7 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown and Tan SILT
	9	0.91 B	26	
-5				
	11	1.14 B	25	
447.7 ▼				
				Brown Slightly Silty CLAY
	6	0.85 B	28	
-10				
	5	0.49 B	29	
442.7				
				Brown and Gray Silty Slightly Sandy CLAY
	4	0.55 B	28	
-15				
	6	0.85 B	30	
437.7				
				Gray CLAY
	2	0.52 B	35	
435.2				
-20				Gray Coarse SAND
	3	NC		Gray Coarse SAND *(continued)*
	13	NC		
430.2				
-25				Gray Coarse SAND and GRAVEL
	20	NC		
	84	NC		
-30				
	50	NC		
422.7				
	60	0.87 S	23	Gray SILT
				(Thixotropic)
-35				
	60	2.35 S	23	
				(Thixotropic)
	22	3.00 S	25	
415.2				
-40				Gray Silty CLAY

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

SOIL BORING LOG

Date 5/3/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 4 Bent #5
Station 382+00.49
Offset 19.50ft Right
Ground Surface Elev. 454.4 ft

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

Groundwater Elev.:
First Encounter 447.7 ft ▼
Upon Completion ____ ft
After ____ Hrs. ____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	12	2.16 B	20	Gray Silty CLAY *(continued)*
	13	2.17 B	20	
-45	13	2.24 B	17	
407.7				Gray Sandy SILT
405.2	32	0.46 B	16	Gray Coarse SAND and GRAVEL
-50	26	NC	17	
402.7				Dark Gray and Black Weathered SHALE
400.2	80	5.50 S	13	Gray Coarse SAND
-55				
399.2	100+			Gray Weathered SHALE
	100+			
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	100+			Gray Weathered SHALE *(continued)*
393.2				End of Boring
				NOTE: Value in "Blows" column is equal to the N-value.
-65				
-70				
-75				
-80				

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

SOIL BORING LOG

Date 5/4/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 5 Bent #6
Station 382+51.69
Offset 20.00ft Right
Ground Surface Elev. 454.6 ft

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

Groundwater Elev.:
First Encounter 445.5 ft
Upon Completion ____ ft
After ____ Hrs. ____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown and Tan Clayey SILT
	5	0.52 B	25	
-5				
	7	0.98 B	25	
	6	0.52 B	27	
▼ -10				
	4	0.33 B	28	
443.0				
				Brown and Gray Silty Slightly Sandy CLAY
	5	0.46 B	29	
-15				
	6	0.81 B	28	
438.0				
				Gray Silty CLAY
	3	0.75 B	32	
435.5				
-20				Gray Coarse SAND and GRAVEL

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	6	NC		Gray Coarse SAND and GRAVEL *(continued)*
433.0				
				Gray Sandy Silty CLAY
	20	0.36 B	28	
430.5				
-25				Gray Coarse SAND and GRAVEL
	30	NC		
	30	NC		
-30				
	28	NC		
	24	NC		
420.5				
-35				Gray Clayey SILT
	17	1.70 B	25	
	14	1.79 S	27	
-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

SOIL BORING LOG

Date 5/4/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 5 Bent #6
Station 382+51.69
Offset 20.00ft Right
Ground Surface Elev. 454.6 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 445.5 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	14	2.20 B	28	Gray Clayey SILT *(continued)*
	14	1.25 B	28	
410.5				
-45				Dark Brown SILT (with Organics)
	24	1.70 S	59	
	20	1.43 S	76	
405.5				
-50				Gray Silty Sandy CLAY
	17	2.24 B	15	
403.0				
				Gray Weathered SHALE
	100+		16	
-55				
	100+			
	100+			
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	100+			Gray Weathered SHALE *(continued)*
393.5				
				End of Boring
				NOTE: Value in "Blows" column is equal to the N-value.
-65				
-70				
-75				
-80				

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)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 4/5/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 6 Bent #7
Station 383+03.07
Offset 21.00ft Right
Ground Surface Elev. 455.0 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 445.9 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown and Tan Clayey SILT
	6	0.72 B	26	
-5				
	10	0.98 B	25	
	7	0.68 B	26	
-10				
	3	0.46 B	29	
	4	0.33 B	30	
-15				
	5	0.49 B	30	
437.4				
	6	0.72 B	30	Gray Silty CLAY
-20				
	3	0.55 B	33	Gray Silty CLAY *(continued)*
433.4				
				Gray Coarse SAND and GRAVEL
	15	NC		
-25				
	4	NC		
	30	NC		
-30				
	22	NC		
422.4				
	20	1.39 S	22	Gray SILT
-35				
	28	1.86 S	21	(Thixotropic)
	16	2.20 B	26	
-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

SOIL BORING LOG

Date 4/5/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 6 Bent #7
Station 383+03.07
Offset 21.00ft Right
Ground Surface Elev. 455.0 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 445.9 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	16	1.99 B	26	Gray SILT *(continued)*
413.4				
	20	1.86 B	28	Gray Slightly Clayey SILT
-45				
	12	1.70 B	27	
408.4				
	16	2.28 B	33	Gray Silty CLAY
405.9				
-50				Dark Brown SILT (with much Organic matter)
	36	3.23 S	58	
403.4				
	14	2.20 B	30	Dark Gray Slightly Clayey SILT
-55				
	13	2.35 B	30	
	20	2.51 B	19	
-60				
	20	1.50 B	25	Dark Gray Slightly Clayey SILT *(continued)*
393.4				
	100+			Gray Weathered SHALE
391.4				
-65				End of Boring
-70				NOTE: Value in "Blows" column is equal to the N-value.
-75				
-80				

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

SOIL BORING LOG

Date 5/17/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 7 Bent #8
Station 383+61.37
Offset 22.00ft Right
Ground Surface Elev. 454.6 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 445.3 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown and Tan SILT			
	6	0.59 B	23
-5			
	6	0.59 B	25
	6	1.07 B	26
▼ -10			
	5	0.85 B	27
	4	0.72 B	28
440.2			
-15			
Brown and Tan Clayey SILT	8	1.04 B	27
437.7			
Gray Slightly Silty CLAY	4	0.52 B	30
-20			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray Slightly Silty CLAY *(continued)*	2	0.33 B	36
432.7			
Gray Coarse SAND	3	NC	
-25			
	28	NC	
	20	NC	
▼ -30			
	20	NC	
	15	NC	
420.2			
-35			
Gray Clayey SILT	15	1.11 B	20
	16	2.20 B	24
-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

SOIL BORING LOG

Date 5/17/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 7 Bent #8
Station 383+61.37
Offset 22.00ft Right
Ground Surface Elev. 454.6 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 445.3 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	20	2.28 S	25	Gray Clayey SILT *(continued)*
	16	1.82 S	27	
-45	14	2.28 B	26	
	27	0.39 B	31	
-50	13	2.38 S	32	
403.3				Dark Brown SILT (Highly Organic with much Plant Material)
	35		74	
400.2				Dark Brown SILT
-55	10	2.17 B	43	
397.7				Dark Gray SILT
	8	1.82 B	37	
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	7	1.56 B	34	Dark Gray SILT *(continued)*
	8	1.30 B	22	
390.2				
-65				Gray Sandy SILT
	10	1.07 B	21	
387.7				Gray Weathered SHALE
	100+		14	
385.8				End of Boring
-70				
-75				NOTE: Value in "Blows" column is equal to the N-value.
-80				

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

SOIL BORING LOG

Date 5/18/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 8 Bent #9
Station 384+00.73
Offset 20.00ft Right
Ground Surface Elev. 454.0 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 446.9 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Soil Description
				Dark Brown and Gray Silty CLAY
	8	0.59 B	30	
-5				
	4	0.52 B	32	
				▼
	3	0.33 B	30	
-10				
	4	0.26 B	32	
442.0				
				Brown and Gray Clayey SILT
	10	2.06 B	24	
-15				
	7	1.63 B	24	
437.0				
				Brown and Gray SILT
	6	1.04 B	22	
-20				
433.4				Brown and Gray SILT *(continued)*
	10	NC		Gray Medium SAND
	28	NC		
429.5				
-25				Gray Coarse SAND and GRAVEL
	25	NC		
	32	NC		
-30				
	60	NC		
422.0				
	30	3.46 S	21	Gray SILT (Thixotropic)
-35				
	26	2.27 S	23	(Thixotropic)
416.5				
	20	1.11 S	26	Gray Clayey SILT
-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

SOIL BORING LOG

Date 5/18/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 8 Bent #9
Station 384+00.73
Offset 20.00ft Right
Ground Surface Elev. 454.0 ft

Surface Water Elev. ft
Stream Bed Elev. ft
Groundwater Elev.:
First Encounter 446.9 ft ▼
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray Clayey SILT *(continued)*				
		18	2.44 B	26
		15	2.45 S	26
	-45			
		17	2.87 B	26
		16	1.89 B	30
404.9				
Dark Brown SILT (Highly Organic, much Plant Material)	-50			
		52	2.42 S	74
401.5				
Dark Brown Clayey SILT		15	2.35 B	34
	-55			
		10	2.06 B	35
		11	2.77 B	40
	-60			
Dark Brown Clayey SILT *(continued)*				
392.4		10	1.82 B	23
End of Boring				
NOTE: Value in "Blows" column is equal to the N-value.	-65			
	-70			
	-75			
	-80			

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

SOIL BORING LOG

Date 5/17/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 9 Bent #10
Station 384+58
Offset 22.00ft Right
Ground Surface Elev. 454.9 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 447.6 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown Clayey SILT
	10	0.81 S	25	
-5				
	5	0.33 S	28	
447.9				
				Brown and Gray Silty CLAY
	3	0.23 B	27	
-10				
	6	0.81 B	26	
442.9				
				Brown and Gray Clay TILL
	12	2.28 B	23	
-15				
	17	2.25 S	22	
	12	0.81 S	24	
435.4				
-20				Gray Silty SAND
				Gray Silty SAND *(continued)*
	14	NC		
	5	NC		
430.4				
-25				Gray Medium to Coarse SAND (with Gravel)
	17	NC		
427.9				
				Gray Clay TILL
	23	2.25 S	29	
-30				
	20	2.42 S	26	
422.9				
				Gray Clayey SILT (Large Gravel)
	100+	NS		
-35				
	26	2.42 S	21	
417.9				
				Gray Silty CLAY
	14	1.96 B	26	
-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

SOIL BORING LOG

Date 5/17/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 9 Bent #10
Station 384+58
Offset 22.00ft Right
Ground Surface Elev. 454.9 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 447.6 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Gray Silty CLAY *(continued)*
	15	2.28 B	28	
	14	1.63 S	29	
-45				
	12	1.96 S	28	
407.9				
				Gray SILT
	14	1.63 S	25	
-50				
	25	2.17 S	41	
402.9				
				Brown SILT (Organic)
	26	1.83 S	55	
400.4				
-55				
				Brown and Gray CLAY
	12	1.96 B	34	
397.9				
				Gray Silty CLAY
	12	1.96 B	20	
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Gray Silty CLAY *(continued)*
393.6	12	1.63 B	23	
				End of Boring
				NOTE: Value in "Blows" column is equal to the N-value.
-65				
-70				
-75				
-80				

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

SOIL BORING LOG

Date 5/19/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 10 Bent #11
Station 385+08.63
Offset 21.50ft Right
Ground Surface Elev. 454.7 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 440.4 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown Clayey SILT			
	6	0.75 B	21
-5			
	13	1.52 S	20
447.7			
Brown and Tan CLAY			
	9	2.68 S	23
-10			
	17	3.10 S	24
	15	2.20 S	25
440.4 ▼			
Gray Tan Silty CLAY			
-15			
	9	1.96 B	25
437.7			
Gray and Brown Sandy SILT			
	8	1.59 S	22
435.2			
Gray Clayey Medium SAND			
-20			
Gray Clayey Medium SAND *(continued)*			
	7	1.04 B	21
432.7			
Gray Coarse SAND			
	5	NC	
-25			
	26	NC	
427.7			
Gray Coarse SAND and GRAVEL			
	22	NC	
-30			
	16	NC	
422.7			
Gray Sandy SILT			
	30	1.43 S	18
420.2			
Gray Coarse SAND			
-35			
	34	NC	
417.7			
Gray SILT			
	36	2.93 S	21
415.2			
Gray Clayey SILT			
-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

SOIL BORING LOG

Date 5/19/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 10 Bent #11
Station 385+08.63
Offset 21.50ft Right
Ground Surface Elev. 454.7 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 440.4 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	18	2.90 B	25	Gray Clayey SILT *(continued)*
412.7				
	19	1.17 B	28	Gray CLAY
-45				
	14	1.50 B	27	
407.7				
	10	1.73 B	30	Gray Clayey SILT
405.2				
-50				
	38	3.66 S	71	Dark Brown SILT (Highly Organic with much Plant Material)
402.7				
	20	3.26 B	35	Gray Clayey SILT
-55				
	10	2.03 B	32	
	14	1.96 B	23	
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	7	1.66 B	22	Gray Clayey SILT *(continued)*
393.4				
				End of Boring
				NOTE: Value in "Blows" column is equal to the N-value.
-65				
-70				
-75				
-80				

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

SOIL BORING LOG

Date 5/20/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 11 Bent #12
Station 385+59.91
Offset 21.00ft Right
Ground Surface Elev. 455.2 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 433.5 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown and Tan SILT
	9	0.91 S	22	
-5				
	12	1.56 S	20	
448.2				
				Brown Silty CLAY
	14	2.27 B	24	
-10				
	15	2.51 S	23	
443.2				
				Brown and Gray Silty CLAY
	13	2.41 S	25	
-15				
	13	1.86 S	23	
438.2				
				Brown and Gray Silty CLAY (with abundant pellets of Limonite)
	8	1.04 S	25	
-20				
				Brown and Gray Silty CLAY (with abundant pellets of Limonite) *(continued)*
	5	1.04 S	22	
433.5 ▼				
				Gray Medium SAND
	1	NC		
430.7				
-25				
				Gray Coarse SAND and Fine GRAVEL
	9	NC		
	26	NC		
425.7				
-30				
				Gray Coarse SAND and Coarse GRAVEL
	34	NC		
423.2				
				Gray SILT (Thixotropic)
	34	2.63 S	22	
420.7				
-35				
				Gray Slightly Clayey SILT
	12	1.50 B	18	
418.2				
				Gray SILT (Thixotropic)
	24	2.77 S	23	
-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

SOIL BORING LOG

Date 5/20/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 11 Bent #12
Station 385+59.91
Offset 21.00ft Right
Ground Surface Elev. 455.2 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 433.5 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray SILT *(continued)* (Thixotropic)	20	2.64 S	22
413.2			
Gray Clayey SILT	14	1.82 S	28
-45			
	12	2.51 B	28
408.2			
Gray Silty CLAY	12	0.39 B	32
-50			
	10	1.99 B	33
403.2			
Dark Brown SILT (Highly Organic with much Plant Material)	30		70
400.7			
-55			
Dark Gray Slightly Clayey SILT	13	2.51 S	47
398.2			
Gray Slightly Clayey SILT	11	2.44 B	23
395.7			
Gray Slightly Clayey Sandy SILT -60			
Gray Slightly Clayey Sandy SILT *(continued)*	10	1.50 B	21
394.0			
End of Boring			
NOTE: Value in "Blows" column is equal to the N-value.			
-65			
-70			
-75			
-80			

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

SOIL BORING LOG

Date 5/21/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 12 Bent #13
Station 386+13.35
Offset 21.30ft Right
Ground Surface Elev. 455.7 ft

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

Groundwater Elev.:
First Encounter 443.8 ft ▼
Upon Completion ____ ft
After ____ Hrs. ____ ft

DEPTH (ft)		BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
	Brown Silty CLAY			
		6	0.62 E	24
451.2				
-5	Brown and Tan Clayey SILT			
		6	0.62 B	24
		5	0.39 B	26
-10				
		3	0.26 B	25
	▼			
		3	0.33 B	26
441.2				
-15	Brown Very Sandy CLAY			
		3		27
438.7				
	Brown and Gray Sandy Clayey SILT			
		5	0.95 B	24
436.2				
-20	Gray CLAY			
	Gray CLAY *(continued)*			
		4	1.27 B	26
433.7				
	Gray Slightly Clayey SILT			
		11	1.35 S	18
431.2				
-25	Gray Coarse SAND and Fine GRAVEL			
		18	NC	
		40	NC	
-30				
		50	NC	
422.8				
	Gray SILT	23	3.29 S	21
421.2				
-35	Gray Silty CLAY (Till) (with small Pebbles)			
		9	1.27 B	19
418.7				
	Gray SILT (Thixotropic)			
		27	3.17 S	25
416.2				
-40	Gray CLAY			

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

SOIL BORING LOG

Date 5/21/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 12 Bent #13
Station 386+13.35
Offset 21.30ft Right
Ground Surface Elev. 455.7 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 443.8 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray CLAY *(continued)*			
(with small Pebbles)	14	0.98 B	19
	19	1.43 B	25
411.2			
Gray Silty CLAY	17	1.50 B	28
408.7			
Gray Clayey SILT	12	1.30 S	31
406.2			
Dark Brown SILT (Highly Organic, much Plant Material)	30	2.22 S	72
	40	2.94 S	76
401.2			
Gray Clayey SILT	16	2.87 B	19
	11	1.24 B	20
-60			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray Clayey SILT *(continued)*			
394.3	9	1.79 B	19
End of Boring			
NOTE: Value in "Blows" column is equal to the N-value.			
-65			
-70			
-75			
-80			

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

SOIL BORING LOG

Date 6/7/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 13 Bent #14
Station 386+64.63
Offset 22.00ft Right
Ground Surface Elev. 456.1 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 444.2 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown SILT
	10	0.65 E	24	
-5				
450.1	10	0.65 S	23	
				Brown Silty Sandy CLAY
	7	0.49 S	26	
-10				
	3	0.29 B	30	
▼				
	2	0.33 B	29	
-15				
	2	0.07 B	29	
	4	0.16 B	24	
436.6				Gray Clayey SAND
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Gray Clayey SAND *(continued)*
	3	0.16 S	25	
434.1				Gray Medium SAND
	2	NC		
431.6				Gray Coarse SAND
-25				
	5	NC		
	7	NC		
426.6				Gray Coarse SAND and Fine GRAVEL
-30				
	17	NC		
424.1				Gray Coarse SAND and Coarse GRAVEL
	26	NC		
421.6				Gray SILT (Thixotropic)
-35				
	19	3.39 S	24	
419.1				Gray Silty CLAY (with Pebbles) (Till)
	15	1.17 B	20	
-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

SOIL BORING LOG

Date 6/7/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 13 Bent #14
Station 386+64.63
Offset 22.00ft Right
Ground Surface Elev. 456.1 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 444.2 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Soil Description
				Gray Silty CLAY (with Pebbles) (Till) *(continued)*
	14	1.89 B	27	
	14	1.79 B	28	
-45				
	16	1.63 B	28	
409.1				Gray Clayey SILT
	30	0.62 B	28	
406.6				Dark Brown SILT (Highly Organic) (Wood Stems)
-50				
	26	1.63 S	68	
	28		63	
401.6				Gray CLAY
-55				
	14	2.17 B	22	
399.1				Gray Silty CLAY
	14	1.82 S	21	
396.6				Gray Silty Sandy CLAY
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Soil Description
				Gray Silty Sandy CLAY *(continued)*
	9	1.24 B	22	
	10	1.82 B	21	
391.6				
-65				Gray Coarse SAND and Coarse GRAVEL
	25	NC		
389.1				Gray Weathered SHALE
	100+		16	
387.2				End of Boring
-70				NOTE: Value in "Blows" column is equal to the N-value.
-75				
-80				

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

SOIL BORING LOG

Date 6/8/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 14 Bent #15
Station 387+15.01
Offset 21.00ft Right
Ground Surface Elev. 455.2 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 443.4 ft ▼
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown Clayey SILT				
		7	0.98 B	23
	-5			
		11	0.91 B	24
		5	0.59 B	26
	445.7			
Brown and Tan Silty CLAY	-10			
▼		4	0.29 B	29
		4	0.39 B	29
	440.7			
Brown and Gray Silty CLAY	-15			
		6	0.81 B	27
		8	0.81 B	29
	435.7			
Gray Clayey Medium SAND	-20			

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray Clayey Medium SAND *(continued)*		3	0.55 B	27
	433.2			
Gray Sandy CLAY		2	0.68 B	32
	430.7			
	-25			
Gray Clayey Medium SAND		2	0.29 B	29
	428.2			
Gray Silty Sandy CLAY		2	0.33 B	26
	424.9			
	-30			
Gray Coarse SAND and Coarse GRAVEL		16	NC	
	423.2			
Gray and Brown Medium GRAVEL		30	NC	
	420.7			
	-35			
Gray SILT (Thixotropic)		39	1.43 S	24
	417.4			
Gray Slightly Silty CLAY (Till) (with small Pebbles)		15	1.82 B	20
	-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

SOIL BORING LOG

Date 6/8/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 14 Bent #15
Station 387+15.01
Offset 21.00ft Right
Ground Surface Elev. 455.2 ft

Surface Water Elev. ft
Stream Bed Elev. ft
Groundwater Elev.:
First Encounter 443.4 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	20	1.50 S	27	Gray Slightly Silty CLAY (Till) (with small Pebbles) *(continued)*
413.2				
				Gray Slightly Silty CLAY
	16	1.50 S	29	
-45				
	14	1.24 B	28	
	13	1.79 B	31	
405.7				
-50				
				Dark Brown SILT (Highly Organic wth Plant Stems)
	40	2.94 S	75	
403.2				
				Gray Slightly Silty CLAY
	20	2.06 B	22	
400.7				
-55				
				Gray Silty CLAY
	12	1.63 B	23	
398.2				
				Gray Sandy Silty CLAY
	7	0.85 B	20	
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	11	0.81 B	21	Gray Sandy Silty CLAY *(continued)*
392.7				
	43	NC		Gray Coarse SAND and GRAVEL
390.7				
-65				
	100+			Gray Weathered SHALE
388.9				
				End of Boring
				NOTE: Value in "Blows" column is equal to the N-value.
-70				
-75				
-80				

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

SOIL BORING LOG

Date 6/10/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389-70

BORING NO. 15 Bent #16
Station 387+66.46
Offset 21.00ft Right
Ground Surface Elev. 455.6 ft

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

Groundwater Elev.:
First Encounter 429.0 ft
Upon Completion ____ ft
After ____ Hrs. ____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Dark Brown CLAY
	11	1.01 S	26	
-5				
	6	0.52 E	30	
448.7				
				Gray and Brown Slightly Silty CLAY
	5	0.88 B	29	
-10				
	5	0.29 B	28	
	3	0.33 B	28	
-15				
	4	0.52 B	26	
438.7				
				Gray Silty CLAY
	3	0.39 B	26	
436.2				
-20				Gray Silty Sandy CLAY
	2	0.43 B	32	Gray Silty Sandy CLAY *(continued)*
	2	0.43 B	31	
431.2				
-25				Gray Clayey Sandy SILT
	2	0.29 B	27	
428.0				
	1	0.36 B	33	Gray Sandy CLAY
426.2				
-30				Gray Coarse SAND and Coarse GRAVEL
	14	NC		
	55	NC		
421.2				
-35				Gray SILT
	25	1.56 B	20	
418.7				
				Gray Slightly Silty CLAY
	16	1.59 B	25	
-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

SOIL BORING LOG

Date 6/10/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389-70

BORING NO. 15 Bent #16
Station 387+66.46
Offset 21.00ft Right
Ground Surface Elev. 455.6 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 429.0 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	16	1.66 S	25	Gray Slightly Silty CLAY *(continued)*
413.7				
	72	1.46 S	25	Gray SILT
410.5 -45				
	16	1.43 B	28	Gray CLAY
	13	2.03 B	31	
406.2 -50				
	50	2.79 S	64	Dark Brown SILT (Highly Organic with Plant Stems)
403.7				
	15	2.27 B	21	Gray Slightly Silty CLAY
-55				
	15	2.28 B	21	
	13	1.73 B	23	
396.2				Gray Silty Sandy CLAY
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	9	1.17 B	21	Gray Silty Sandy CLAY *(continued)*
394.5				
				End of Boring
				NOTE: Value in "Blows" column is equal to the N-value.
-65				
-70				
-75				
-80				

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

SOIL BORING LOG

Date 6/11/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 16 Bent #17
Station 388+16.89
Offset 21.00ft Right
Ground Surface Elev. 456.6 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 442.4 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown Clayey SILT
	12	1.82 S	22	
-5				
	9	0.90 S	23	
449.6				
				Brown Silty CLAY
	5	0.46 B	25	
-10				
	4	0.52 B	26	
				(Thixotropic)
	3	0.16 B	28	
442.4 ▼				
				Brown and Tan Sandy Silty CLAY
-15				
	3	0.26 B	27	
				(Thixotropic)
438.9				
	3	0.43 B	36	Gray Sandy Silty CLAY
				(Thixotropic)
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Gray Sandy Silty CLAY *(continued)*
	3	0.49 B	28	
434.6				
				Gray Medium SAND
	5	NC		
432.1				
-25				
				Gray Coarse SAND and Coarse GRAVEL
	8	NC		
	23	NC		
-30				
	50	NC		
	24	NC		
422.1				
-35				
				Gray SILT
	46	1.43 S	22	
				(Thixotropic)
419.6				
	20	0.39 B	18	Gray CLAY (Till) (with small Pebbles)
417.1				
-40				Gray Slightly Silty CLAY

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

SOIL BORING LOG

Date 6/11/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 16 Bent #17
Station 388+16.89
Offset 21.00ft Right
Ground Surface Elev. 456.6 ft

Surface Water Elev. ft
Stream Bed Elev. ft
Groundwater Elev.:
First Encounter 442.4 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray Slightly Silty CLAY *(continued)*			
	14	1.37 B	29
	20	0.98 S	29
-45			
	16	1.11 B	30
	13	0.88 B	31
406.4 -50			
Dark Brown SILT (Highly Organic with Plant Stems)	20	1.66 S	66
	28		74
402.1 -55			
Gray Slightly Silty CLAY	11	1.82 B	22
	10	0.72 B	26
397.1 -60			
Gray Silty CLAY			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray Silty CLAY *(continued)*			
395.4	11	0.98 B	23
End of Boring			
NOTE: Value in "Blows" column is equal to the N-value.			
-65			
-70			
-75			
-80			

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

SOIL BORING LOG

Date 6/21/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 17 Bent #18
Station 388+69.23
Offset 19.50ft Right
Ground Surface Elev. 456.9 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 444.9 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown Silty CLAY			
	7	1.70 S	24
452.4			
-5			
Brown Clayey SILT	9	1.11 S	24
	4	0.59 B	24
-10			
	3	0.33 B	26
444.9 ▼			
Brown Silty Sandy CLAY (Thixotropic)	3	0.33 B	27
442.4			
-15			
Brown Silty CLAY (Thixotropic)	4	0.68 B	28
439.2			
Gray Silty Sandy CLAY (Thixotropic)	5	0.33 B	24
437.4			
Gray Clayey SAND			
-20			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray Clayey SAND *(continued)*	4	0.43 B	25
434.9			
Gray Medium SAND and Coarse GRAVEL	4	NC	
432.4			
-25			
Gray Coarse SAND and Coarse GRAVEL	3	NC	
	40	NC	
-30			
	40	NC	
424.9			
Gray SILT	22	0.81 B	21
422.4			
-35			
Gray Slightly Silty CLAY (Till) (with small Pebbles)	12	0.75 B	20
	10	1.11 B	20
-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

SOIL BORING LOG

Date 6/21/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 17 Bent #18
Station 388+69.23
Offset 19.50ft Right
Ground Surface Elev. 456.9 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 444.9 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray Slightly Silty CLAY (Till) (with small Pebbles) *(continued)*	16	1.37 S	26
	25	1.50 B	28
412.4			
-45			
Gray Silty CLAY	18	2.27 B	30
	16	0.75 B	29
407.4			
-50			
Dark Brown SILT (Highly Organic with Plant Stems)	32	2.93 S	59
	38		71
402.4			
-55			
Gray CLAY	16	2.06 B	22
	14	2.17 B	24
397.4			
Gray Silty Sandy CLAY			
-60			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Gray Silty Sandy CLAY *(continued)*	15	1.07 B	21
395.7			
End of Boring			
NOTE: Value in "Blows" column is equal to the N-value.			
-65			
-70			
-75			
-80			

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

SOIL BORING LOG

Date 6/22/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 18 Pier #1
Station 389+00.4
Offset 21.30ft Right
Ground Surface Elev. 457.6 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 446.6 ft
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown Silty CLAY				
		9	1.18 E	22
453.1	-5			
Brown SILT		9	1.18 S	21
		6	0.46 B	22
448.1	-10			
Brown Silty CLAY		3	0.13 B	25
(Thixotropic)		2	0.07 B	27
443.1	-15			
Brown Sandy Silty CLAY (Thixotropic)		2	0.16 B	26
440.6				
Gray Sandy Silty CLAY (some Organics)		3	0.33 B	27
	-20			
Gray Sandy Silty CLAY (some Organics) *(continued)*		3	0.43 B	32
435.6				
Gray Clayey SAND		4	0.26 B	33
432.4	-25			
Gray CLAY (with some Organics)		4	1.17 B	34
430.6				
Gray Coarse SAND		24	NC	
428.1	-30			
Gray Coarse SAND and Coarse GRAVEL		40	NC	
		38	NC	
	-35			
		56	NC	
		52	NC	
418.1				
Gray SILT	-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

SOIL BORING LOG

Date 6/22/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 18 Pier #1
Station 389+00.4
Offset 21.30ft Right
Ground Surface Elev. 457.6 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 446.6 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	40	1.90 S	23	Gray SILT *(continued)* (Thixotropic)
	16			
-45				
	30	1.32 S	21	(Thixotropic)
410.6				
	20	2.28 B	27	Gray Clayey SILT
-50				
	14	1.53 B	37	
405.6				
	21	2.42 S	56	Dark Brown SILT (Highly Organic with Wood Stems)
403.1				
-55				
	10	1.70 B	35	Gray Silty CLAY
400.6				
	10	1.73 B	23	Gray Silty Sandy CLAY
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	6	1.50 B	22	Gray Silty Sandy CLAY *(continued)*
396.4				End of Boring
				NOTE: Value in "Blows" column is equal to the N-value.
-65				
-70				
-75				
-80				

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

SOIL BORING LOG

Date 10/6/14

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY JAS (TSi)

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE 140# Automatic

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. B-1
Station 389+14
Offset 26.00ft Right
Ground Surface Elev. 455.0 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 437.0 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown (Moist, Medium Stiff) Silty CLAY with Trace Gravel
454.0				
	4			
	3	NC	14	Brown (Moist, Loose) Fine Sandy LOAM
	4			See Gradation @ 2 ft
452.0				
	2			Brown (Moist, Medium Stiff) LOAM
	3	--	21	A-4(3)
-5	2			See Class @ 5 ft
				Limestone Pieces
	4			
	4	--	11	
	4			
				Soft
	2			
	2	0.57	23	
-10	2	B		
				Very Soft
	WH			
	WH	0.16	29	
	1	B		
				Gray
	WH			
	WH	--	26	
-15	1			
	WH			
438.0				
	1			
	1	--	27	
				Gray (Moist, Very Loose) SAND
				See Gradation @ 20 ft
	1			Gray & Brown, Loose
	2	NC	23	
-20	3			

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Gray (Moist, Very Loose) SAND *(continued)*
	2			
	2	NC	22	
	3			
	3			
	3	NC	25	
-25	2			
429.5				
	2			Gray (Moist, Loose) Sandy LOAM
428.0				
	3	NC	20	Gray (Moist, Medium Dense)
	4			SAND with Trace Wood Pieces
				See Gradation @ 30 ft
	3			Trace Gravel
	5	NC	16	
-30	5			
423.0				
				Gray (Moist, Stiff) Silty Clay LOAM with Trace Limestone Pieces and Gravel
	5			
	4	1.23	18	
-35	4	B		
	2			
	4	1.02	18	
-40	4	S		

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

SOIL BORING LOG

Date 10/6/14

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY JAS (TSi)

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE 140# Automatic

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. B-1
Station 389+14
Offset 26.00ft Right
Ground Surface Elev. 455.0 ft

Surface Water Elev. ft
Stream Bed Elev. ft
Groundwater Elev.:
First Encounter 437.0 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
				Gray (Moist, Stiff) Silty Clay LOAM with Trace Limestone Pieces and Gravel *(continued)*
	2			
410.5				
-45	5 5	2.00 S	23	Gray (Moist, Stiff) Silty CLAY
408.0				
	7			Gray to Brown (Moist, Very Stiff) Silty Clay LOAM with Organics A-7-5(21) See Class @ 50 ft
-50	9 14	2.00 S	67	
403.0				
	4			Gray (Moist, Medium Stiff) Silty CLAY
-55	3 4	1.84 S	22	
398.0				
	4			Gray (Moist, Stiff) Clay LOAM with Trace Gravel
-60	4 5	0.69 B	16	

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Description
394.5				Gray Weathered SHALE
	50/5"	--	15	
390.5				Borehole continued with rock coring.
-65				
-70				
-75				
-80				

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

ROCK CORE LOG

Date 10/6/14

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY JAS (TSi)

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond CORING METHOD

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

CORING BARREL TYPE & SIZE

Core Diameter 2 in
Top of Rock Elev. 390.50 ft
Begin Core Elev. 390.50 ft

BORING NO. B-1
Station 389+14
Offset 26.00ft Right
Ground Surface Elev. 455.0 ft

	DEPTH (ft)	CORE (#)	RECOVERY (%)	R.Q.D. (%)	CORE TIME (min/ft)	STRENGTH (tsf)
390.50 Gray, Soft to Moderately Hard, Slightly Weathered, Thin to Thick Bedded, Finely Grained SHALE	-65	1	100	92	1	
		1	100	92	1	
		1	100	92	1	
		1	100	92	1	
		1	100	92	1	
	-70	2	100	85	1	
		2	100	85	1	
		2	100	85	1	
		2	100	85	1	
		2	100	85	1	
380.50 END OF BORING AND ROCK CORE	-75					
	-80					

Color pictures of the cores
Cores will be stored for examination until Yes
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

SOIL BORING LOG

Date 10/7/14

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY JP (TSi)

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE 140# Automatic

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. B-2
Station 390+20
Offset 26.00ft Right
Ground Surface Elev. 456.0 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 437.5 ft
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material Description
	4			Brown Clay LOAM with Trace Weathered Limestone Pieces
	4 5	--	17	A-6(6)
				See Class @ 1.5 ft
453.0				
	3			Brown Silty Clay LOAM
-5	3 3	1.19	27	A-4(6)
				See Class @ 5 ft
	2			
	2 1	NR		
	WH			
-10	WH WH	0.12	28	
	WH			
	WH WH	0.16	28	
443.0				
	WH			Brown LOAM
-15	1 2	--	25	A-4(1)
				See Class @ 15 ft
440.5				
	WH			Gray Silty CLAY
	WH WH	0.57	31	
	WH			
-20	1 3	0.41	35	

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material Description
435.5				Gray Silty CLAY *(continued)*
	WH			Gray SAND
	1 3	NC	22	See Gradation @ 25 ft
				Rotary Wash
	2			
	3 4	NC	22	Trace Fine Gravel
-25				
	3			
	3 8	NC	18	Gray Silty Clay Parting
428.0				
	8			Gray Fine to Coarse SAND with Fine to Medium Gravel
	13 16	NC	15	See Gradation @ 30 ft
-30				
424.5				
	10			Gray SILT
	15 16	3.92	22	
-35				
	14			
	17 12	1.83	22	
-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

SOIL BORING LOG

Date 6/23/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 19 Pier #2
Station 390+39.66
Offset 20.70ft Left
Ground Surface Elev. 456.6 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 442.4 ft
Upon Completion ft
After Hrs. ft

	DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)
Brown Silty CLAY				
		5	0.39 B	24
452.1	-5			
Brown Sandy SILT		4	0.26 S	17
448.9				
Brown Medium SAND		6	NC	
447.1	-10			
Brown Sandy CLAY		5	0.29 B	22
		2	0.10 B	27
442.4 ▼	-15			
Brown and Gray Sandy CLAY		2	0.07 B	28
439.6				
Brown Coarse SAND		15	NC	
	-20			
Brown Coarse SAND *(continued)*		9	NC	
		12	NC	
432.1	-25			
Brown Coarse SAND and Fine GRAVEL		2	NC	
429.6				
Gray Sandy Silty CLAY		22	0.03 B	26
428.4				
Gray Coarse SAND and Fine to Medium GRAVEL		27	NC	
424.6	-30			
Gray Very Sandy SILT		45	0.69 S	19
422.1				
Gray Sandy SILT (with Coarse Gravel embedded) (Thixotropic)	-35	60	1.83 S	14
419.6				
Gray SILT (Thixotropic)		60	2.42 S	22
417.1				
Gray Silty CLAY	-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)

Illinois Department of Transportation
Division of Highways
Illinois Department of Transportation

SOIL BORING LOG

Date 6/23/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 19 Pier #2
Station 390+39.66
Offset 20.70ft Left
Ground Surface Elev. 456.6 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 442.4 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	11	1.24 B	18	Gray Silty CLAY *(continued)* (with Pebbles) (Organic) (Till)
	14	1.17 B	18	
-45				
	20	2.31 B	22	
409.6				
	18	1.50 B	35	Gray Clayey SILT
407.1				
-50				
	30	2.22 S	71	Dark Brown SILT (Highly Organic with Plant Stems)
404.6				
	7	1.37 B	34	Gray Silty CLAY
402.1				
-55				
	11	1.76 B	22	Gray Slightly Silty CLAY
	7	1.50 B	20	
397.1				
-60				Gray Silty Sandy CLAY

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	8	0.68 B	21	Gray Silty Sandy CLAY *(continued)*
395.4				
				End of Boring
				NOTE: Value in "Blows" column is equal to the N-value.
-65				
-70				
-75				
-80				

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

SOIL BORING LOG

Date 6/24/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 20 Bent #19
Station 390+74.09
Offset 22.90ft Left
Ground Surface Elev. 455.1 ft

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

Groundwater Elev.:
First Encounter 438.3 ft ▼
Upon Completion ____ ft
After ____ Hrs. ____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown SILT
	5	0.46 B	24	
450.6				
-5				Brown Clayey SILT
	6	0.59 B	20	
448.1				
				Brown Sandy CLAY
	3	0.16 B	25	
445.6				
-10				Brown Silty Slightly Sandy CLAY
	2	0.13 B	31	(Thixotropic)
				(Thixotropic)
	2	0.20 B	30	
440.6				
-15				Brown Sandy CLAY
	1	0.16 B	28	(Thixotropic)
438.3 ▼				
				Brown Medium SAND
	8	NC		
-20				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown Medium SAND *(continued)*
	9	NC		
	13	NC		
430.6				
-25				Gray Fine SAND and Medium GRAVEL
	25	NC		
	31	NC		
425.6				
-30				Gray Medium SAND and Medium GRAVEL
	40	NC		
423.1				
				Gray Slightly Silty CLAY (Till) (with Pebbles)
	16	0.98 B	17	
420.6				
-35				Gray Coarse SAND and Fine GRAVEL
	13	NC		
418.1				
				Gray Slightly Silty CLAY (Till) (with Pebbles)
	10	0.65 B	21	
-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

SOIL BORING LOG

Date 6/24/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY C. Hoffman

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. 20 Bent #19
Station 390+74.09
Offset 22.90ft Left
Ground Surface Elev. 455.1 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 438.3 ft ▼
Upon Completion ft
After ____ Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Gray Slightly Silty CLAY (Till) (with Pebbles) *(continued)*
	11	0.85 B	19	
413.1				
	20	2.38 B	26	
-45				
	26	4.24 B	23	
	25	1.99 B	34	
405.6				
-50				
				Dark Brown SILT (Highly Organic with Plant Stems)
	34	2.35 S	67	
403.1				
				Gray Silty CLAY
	15	1.46 B	26	
-55				
	13	1.40 B	25	
	13	0.91 B	24	
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Gray Silty CLAY *(continued)*
	15	1.46 B	22	
391.6				
391.3	35		12	Gray Weathered SHALE
				End of Boring
-65				
				NOTE: Value in "Blows" column is equal to the N-value.
-70				
-75				
-80				

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

SOIL BORING LOG

Date 2/26/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY J. King

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. E. Abut
Station 391+33
Offset 10.00ft Left
Ground Surface Elev. 465.9 ft

Surface Water Elev. ft
Stream Bed Elev. ft

Groundwater Elev.:
First Encounter 449.2 ft ▼
Upon Completion ft
After Hrs. ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
				Brown Sandy SILT (Fill) (with Fine Gravel)
	7	0.81 S	13	
-5				
	3	0.39 S	15	
459.2				
				Brown and Gray CLAY
	8	1.96 B	25	
456.7				
				Brown SILT
-10	4	0.39 S	21	
454.2				
				Brown Sandy SILT
	2		21	
-15				
	3		23	
▼				
	2		23	
-20				
				Brown Sandy SILT *(continued)*
	1		23	
	1		26	
441.7				
-25				Brown Fine Silty SAND
	4	NC		
	3	NC		
436.6				
-30				Brown and Gray Medium SAND (with Gravel)
	11	NC		
434.2				
				Gray Sandy CLAY
	9	0.20 B	23	
431.6				
-35				SAND and GRAVEL
	40	NC		
	43	NC		
-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

SOIL BORING LOG

Date 2/26/71

ROUTE FAP 793 (FA 149) DESCRIPTION IL 143 over Shoal Creek LOGGED BY J. King

SECTION 112BR LOCATION NW 1/4, SW 1/4, SEC. 24, TWP. 4N, RNG. 4W, 3 PM

COUNTY Bond DRILLING METHOD Hollow Stem Auger HAMMER TYPE Unknown

STRUCT. NO. 003-0034 (E) / 003-0062 (P)
Station 389+70

BORING NO. E. Abut
Station 391+33
Offset 10.00ft Left
Ground Surface Elev. 465.9 ft

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

Groundwater Elev.:
First Encounter 449.2 ft
Upon Completion ____ ft
After ____ Hrs. ____ ft

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	32	NC		SAND and GRAVEL *(continued)*
	35	NC		
422.2				
-45	32	1.94 S	23	Gray Silty CLAY
419.2				
	50	2.32 S	16	Gray Sandy Silty CLAY
416.6				
-50	45	1.55 S	23	Gray Silty CLAY
	25	2.71 S	39	
-55	26	2.20 S	26	
	27	2.24 S	23	
406.7				Brown Clayey SILT
-60				

DEPTH (ft)	BLOWS (/6")	UCS Qu (tsf)	MOIST (%)	Material
	31	2.57 d	61	Brown Clayey SILT *(continued)* (with Wood)
404.7				End of Boring
-65				NOTE: Value in "Blows" column is equal to the N-value.
-70				
-75				
-80				

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)

COHESIVE SOIL SETTLEMENT ESTIMATE

I D O T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT — Modified on 12/9/14

LOCATION AND BORING USED ========== W Abut, W. Abut
TYPE OF SURCHARGE ========== 1 (1=2:1 bridge cone, 2=continuous embank., 3=rectangular surch.)
DEPTH TO WATER TABLE (below top of existing embankment) = 16.2 FT

NEW EMBANKMENT:
- NEW EMBANKMENT FILL UNIT WEIGHT ========== 120 PCF
- NEW EMBANKMENT FILL HEIGHT ========== 2.84 FT
- PROPOSED WIDTH AT TOP ========== 35.17 FT
- PROPOSED WIDTH AT BOTTOM ========== 52 FT (which is a 3.0:1 slope)

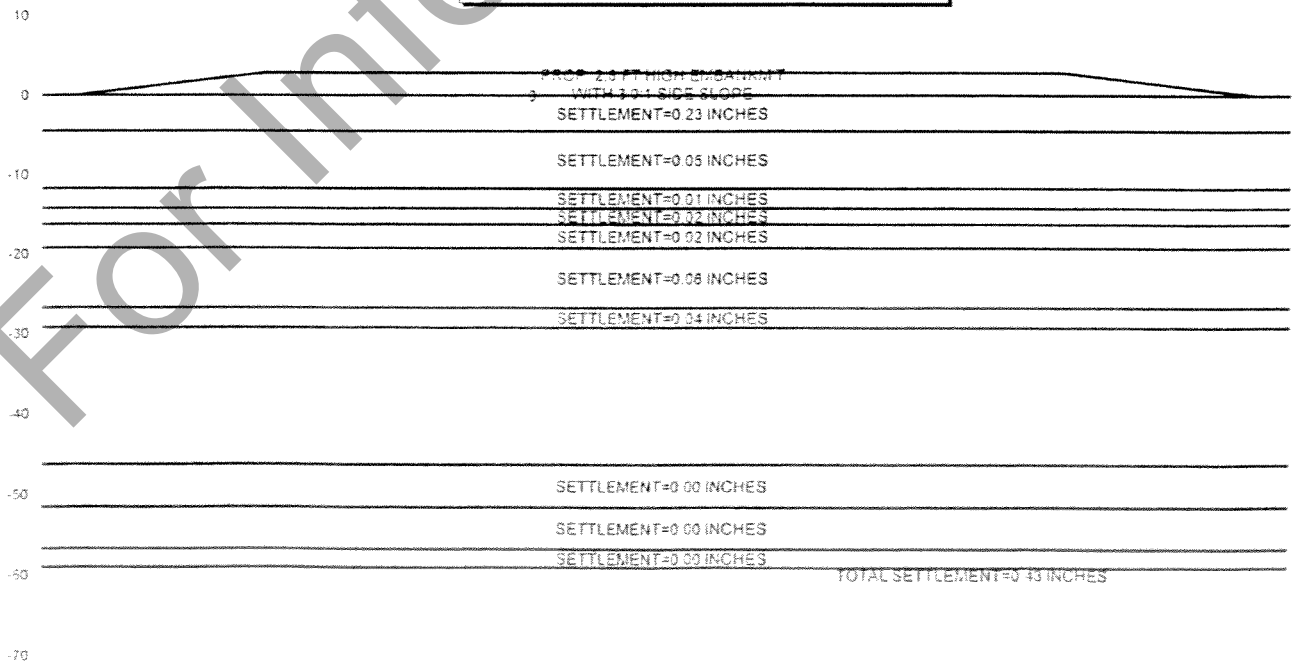
EXISTING EMBANKMENT (IF ANY):
- EXISTING EMBANKMENT UNIT WEIGHT ========== PCF
- EXISTING EMBANKMENT HEIGHT ========== FT
- EXISTING WIDTH AT TOP ========== FT
- EXISTING WIDTH AT BASE ========== FT (which is a 0.0:1 slope)

ASSUMPTIONS:
Soil Deposit is Normally Consolidated
Cohesive Layers are Saturated
Soils have a Low Sensitivity
Liquid Limit (LL)=Moist. Content (MC%)
Initial Void Ratio (Eo)=2.7*(MC%)/100
Comp. Index (Cc)=0.009*(LL-10)
Neglecting Granular & Secondary Settlem't

LAYER THICK (FT)	*TOTAL UNIT WT. (PCF)*	*UNCONF. COMP. STRENGTH (Qu) (TSF)*	*MOIST. CONTENT (%)*	*EXISTING PRESSURE (KSF)*	*PRESSURE INCREASE (KSF)*	*INITIAL VOID RATIO*	*COMPRESSION INDEX (Cc)*	*Qu CORRECTION FACTOR*	*LAYER SETTLEMENT (IN.)*
4.5	120	1.11	23	0.270	0.300	0.621	0.117	0.183	**0.23**
7.2	120	2.85	20	0.972	0.233	0.549	0.093	0.100	**0.05**
2.5	120	2.35	25	1.554	0.204	0.675	0.135	0.100	**0.01**
2.0	120	1.11	25	1.824	0.193	0.675	0.135	0.183	**0.02**
3.0	120	1.46	25	2.030	0.183	0.675	0.135	0.145	**0.02**
7.5	120	0.67	24	2.333	0.162	0.657	0.129	0.280	**0.06**
2.5	120	0.20	27	2.621	0.146	0.729	0.153	0.700	**0.04**
17.0	120	0.00		3.182	0.120			1.000	**Granular**
5.3	120	2.37	20	3.825	0.098	0.540	0.090	0.100	**0.00**
5.2	120	3.04	21	4.127	0.090	0.567	0.099	0.100	**0.00**
2.3	120	2.77	16	4.343	0.085	0.432	0.054	0.100	**0.00**

TOTAL SETTLEMENT UNDER CENTER OF BRIDGE CONE = 0.43 IN.

EMBANKMENT AND SOIL PROFILE



COHESIVE SOIL SETTLEMENT ESTIMATE

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT — Modified on 12/9/14

LOCATION AND BORING USED ========== E. Abut / E. Abut
TYPE OF SURCHARGE ========== 1 (1=2:1 bridge cone, 2=continuous embank., 3=rectangular surch.)
DEPTH TO WATER TABLE (below top of existing embankment) == 16.7 FT

NEW EMBANKMENT:
- NEW EMBANKMENT FILL UNIT WEIGHT ========== 120 PCF
- NEW EMBANKMENT FILL HEIGHT ========== 2.33 FT
- PROPOSED WIDTH AT TOP ========== 35.17 FT
- PROPOSED WIDTH AT BOTTOM ========== 49 FT (which is a 3.0:1 slope)

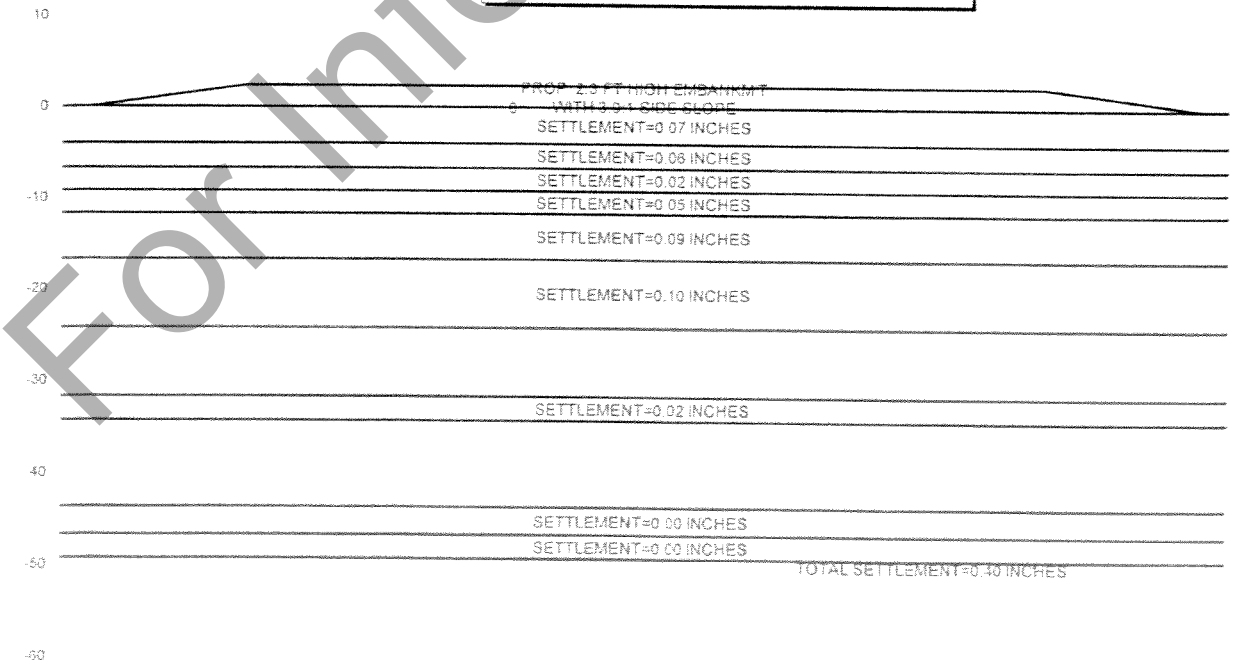
EXISTING EMBANKMENT (IF ANY):
- EXISTING EMBANKMENT UNIT WEIGHT ========== PCF
- EXISTING EMBANKMENT HEIGHT ========== FT
- EXISTING WIDTH AT TOP ========== FT
- EXISTING WIDTH AT BASE ========== FT (which is a 0.0:1 slope)

ASSUMPTIONS:
Soil Deposit is Normally Consolidated
Cohesive Layers are Saturated
Soils have a Low Sensitivity
Liquid Limit (LL)=Moist. Content (MC%)
Initial Void Ratio (Eo)=2.7*(MC%)/100
Comp. Index (Cc)=0.009*(LL-10)
Neglecting Granular & Secondary Settlem't

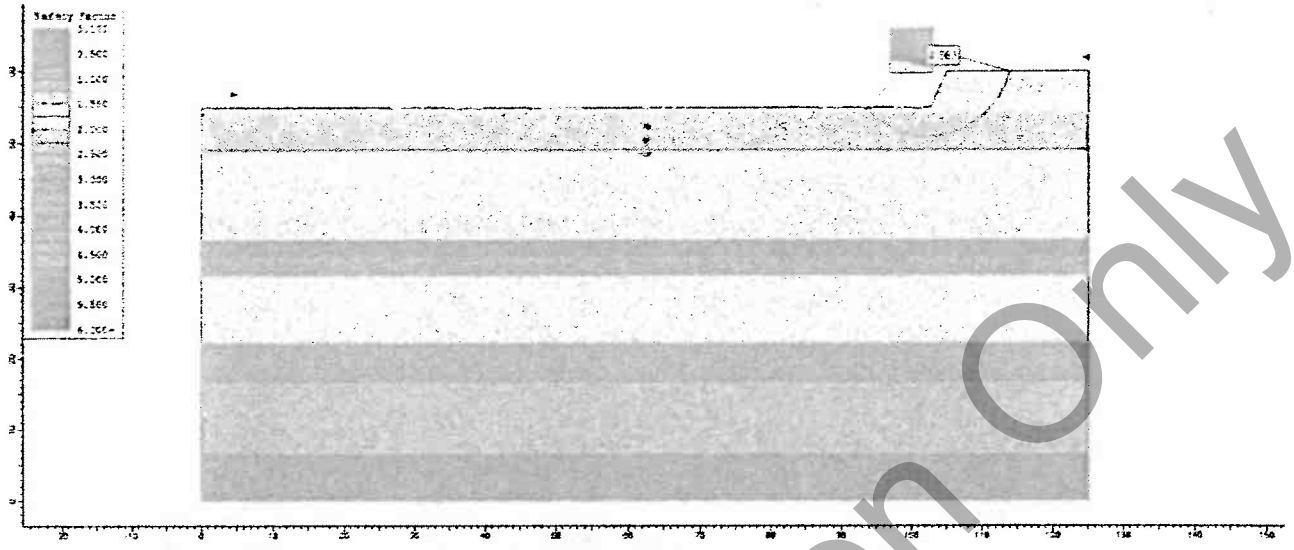
LAYER THICK (FT)	*TOTAL UNIT WT. (PCF)*	*UNCONF. COMP. STRENGTH (Qu) (TSF)*	*MOIST. CONTENT (%)*	*EXISTING PRESSURE (KSF)*	*PRESSURE INCREASE (KSF)*	*INITIAL VOID RATIO*	*COMPRESSION INDEX (Cc)*	*Qu CORRECTION FACTOR*	*LAYER SETTLEMENT (IN.)*
4.0	120	0.81	13	0.240	0.243	0.351	0.027	0.239	**0.07**
2.7	120	0.39	15	0.642	0.203	0.405	0.045	0.445	**0.06**
2.5	120	1.96	25	0.954	0.184	0.675	0.135	0.113	**0.02**
2.5	120	0.39	21	1.254	0.171	0.567	0.099	0.445	**0.05**
5.0	120	0.30	22	1.704	0.156	0.594	0.108	0.550	**0.09**
7.5	120	0.30	24	2.220	0.135	0.648	0.126	0.550	**0.10**
7.5	120	0.00		2.652	0.115			1.000	**Granular**
2.6	120	0.20	23	2.943	0.103	0.621	0.117	0.700	**0.02**
9.4	120	0.00		3.288	0.092			1.000	**Granular**
3.0	120	1.94	23	3.646	0.082	0.621	0.117	0.114	**0.00**
2.6	120	2.32	16	3.807	0.078	0.432	0.054	0.100	**0.00**

TOTAL SETTLEMENT UNDER CENTER OF BRIDGE CONE = 0.40 IN.

EMBANKMENT AND SOIL PROFILE



SLOPE STABILITY – END SLOPES (STATIC)



Analysis Methods Used: Bishop Simplified, Janbu Simplified
Circular Surface Type
Grid Search
Number of Slices: 25
Tolerance: 0.005
Maximum Number of Iterations: 50

Materials Properties (from top to bottom in above graphic)

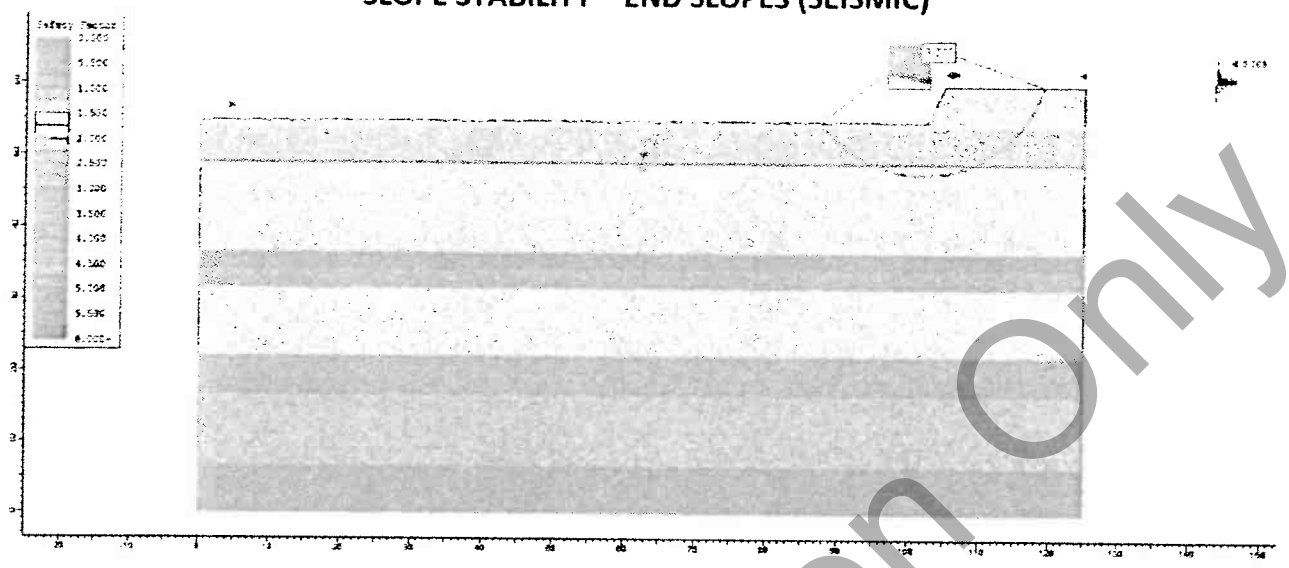
Material	Strength Type	Unsaturated Unit Weight (lb/ft^3)	Saturated Unit Weight (lb/ft^3)	Cohesion (psf)	Friction Angle (deg)	Water Surface
1	Mohr-Coulomb	120	125	390	0	Above
2				1960	0	
3				390	0	
4				0	27.5	
5				0	27.5	Below
6				0	29.5	
7				0	30.5	
8				200	0	
9				0	37.5	
10				1940	0	
11				2320	0	
12				2175	0	
13				2570	0	

Water Table: 449.2 feet (49.1 on above graphic)

Search Grid

96.891	59.614
102.978	59.614
102.978	65.701
96.891	65.701

SLOPE STABILITY – END SLOPES (SEISMIC)



Analysis Methods Used: Bishop Simplified, Janbu Simplified
Circular Surface Type
Grid Search
Number of Slices: 25
Tolerance: 0.005
Maximum Number of Iterations: 50

Seismic Load Coefficient (Horizontal): 0.088

Materials Properties (from top to bottom in above graphic)

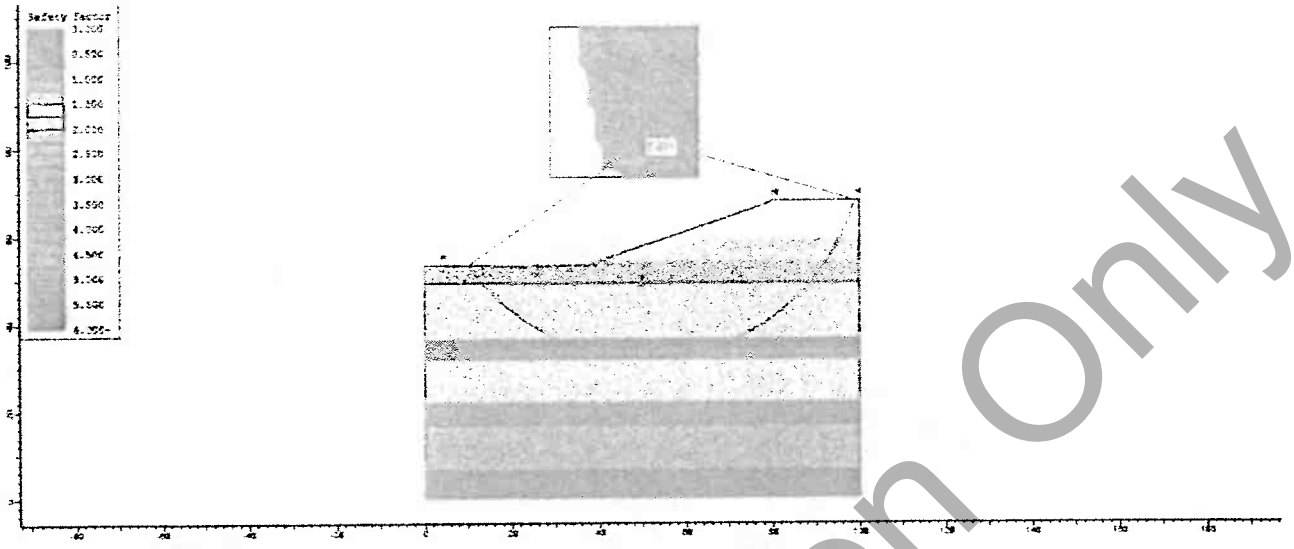
Material	Strength Type	Unsaturated Unit Weight (lb/ft^3)	Saturated Unit Weight (lb/ft^3)	Cohesion (psf)	Friction Angle (deg)	Water Surface
1	Mohr-Coulomb	120	125	390	0	Above
2				1960	0	
3				390	0	
4				0	27.5	
5				0	27.5	Below
6				0	29.5	
7				0	30.5	
8				200	0	
9				0	37.5	
10				1940	0	
11				2320	0	
12				2175	0	
13				2570	0	

Water Table: 449.2 feet (49.1 on above graphic)

Search Grid

96.891	59.614
102.978	59.614
102.978	65.701
96.891	65.701

SLOPE STABILITY – 3:1 SIDE SLOPES – EAST END (STATIC)



Analysis Methods Used: Bishop Simplified, Janbu Simplified
Circular Surface Type
Grid Search
Number of Slices: 25
Tolerance: 0.005
Maximum Number of Iterations: 50

Materials Properties (from top to bottom in above graphic)

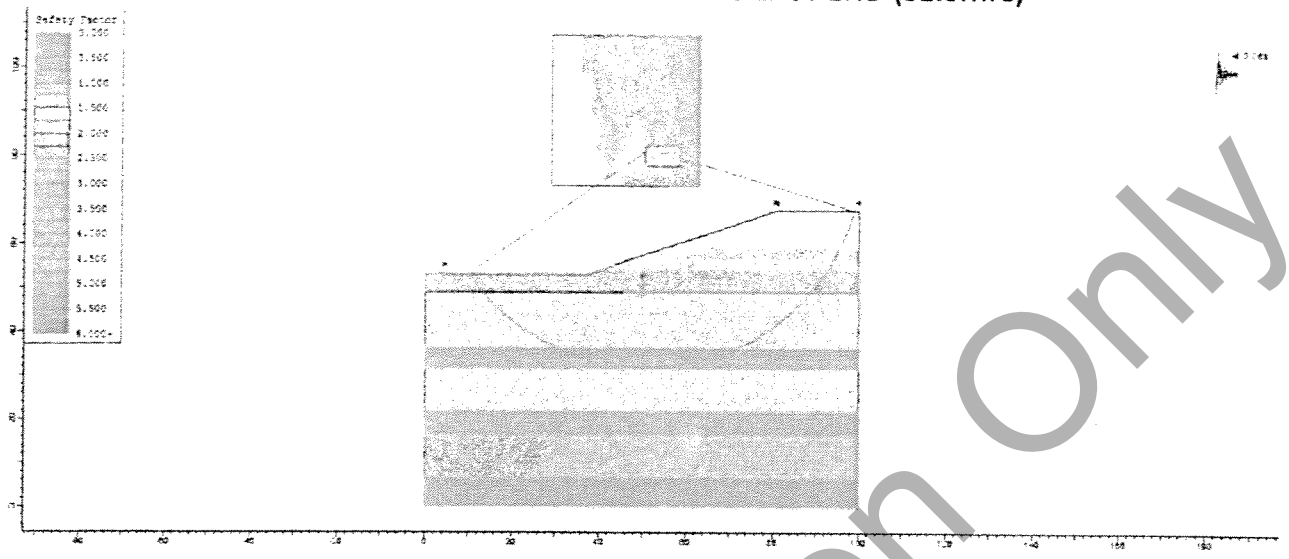
Material	Strength Type	Unsaturated Unit Weight (lb/ft^3)	Saturated Unit Weight (lb/ft^3)	Cohesion (psf)	Friction Angle (deg)	Water Surface
1a – Fill	Mohr-Coulomb	120	125	1000	0	Above
1				600	0	
2				1960	0	
3				390	0	
4				0	28.5	
5				0	28.5	Below
6				0	29.5	
7				0	30.5	
8				200	0	
9				0	37.5	
10				1940	0	
11				2320	0	
12				2175	0	
13				2570	0	

Water Table: 449.2 feet (49.1 on above graphic)

Search Grid

29.017	73.128
62.970	73.128
62.970	107.081
29.017	107.081

SLOPE STABILITY – 3:1 SIDE SLOPES EAST END (SEISMIC)



Analysis Methods Used: Bishop Simplified, Janbu Simplified
Circular Surface Type
Grid Search
Number of Slices: 25
Tolerance: 0.005
Maximum Number of Iterations: 50

Seismic Load Coefficient (Horizontal): 0.088

Materials Properties (from top to bottom in above graphic)

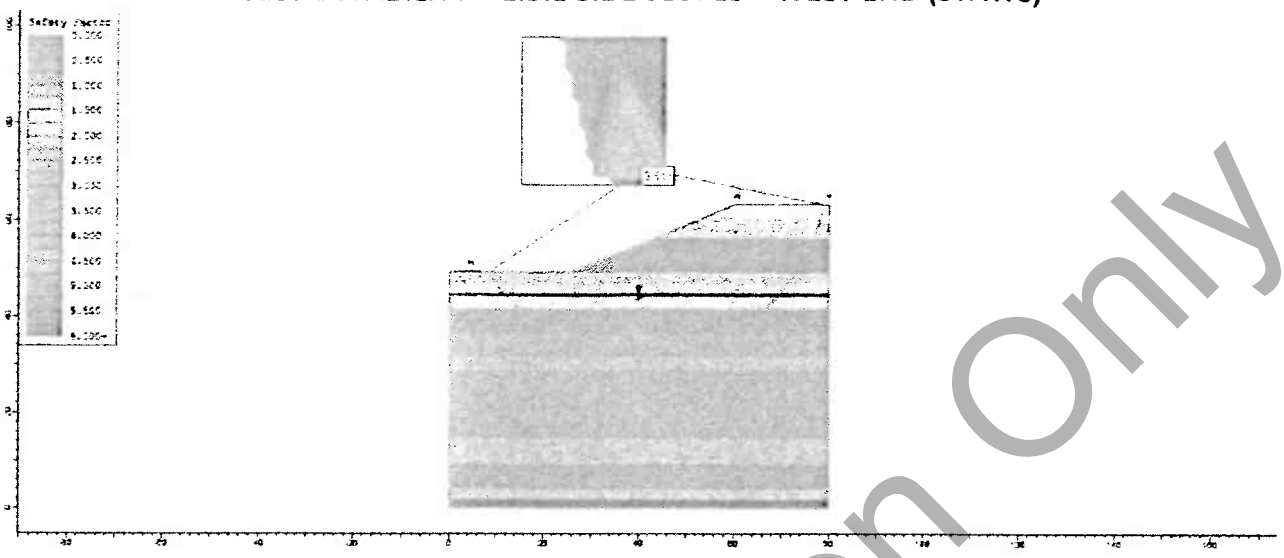
Material	Strength Type	Unsaturated Unit Weight (lb/ft^3)	Saturated Unit Weight (lb/ft^3)	Cohesion (psf)	Friction Angle (deg)	Water Surface
1a – Fill	Mohr-Coulomb	120	125	1000	0	Above
1				600	0	
2				1960	0	
3				390	0	
4				0	28.5	
5				0	28.5	Below
6				0	29.5	
7				0	30.5	
8				200	0	
9				0	37.5	
10				1940	0	
11				2320	0	
12				2175	0	
13				2570	0	

Water Table: 449.2 feet (49.1 on above graphic)

Search Grid

29.017	73.128
62.970	73.128
62.970	107.081
29.017	107.081

SLOPE STABILITY – 2.5:1 SIDE SLOPES – WEST END (STATIC)



Analysis Methods Used: Bishop Simplified, Janbu Simplified
Circular Surface Type
Grid Search
Number of Slices: 25
Tolerance: 0.005
Maximum Number of Iterations: 50

Materials Properties (from top to bottom in above graphic)

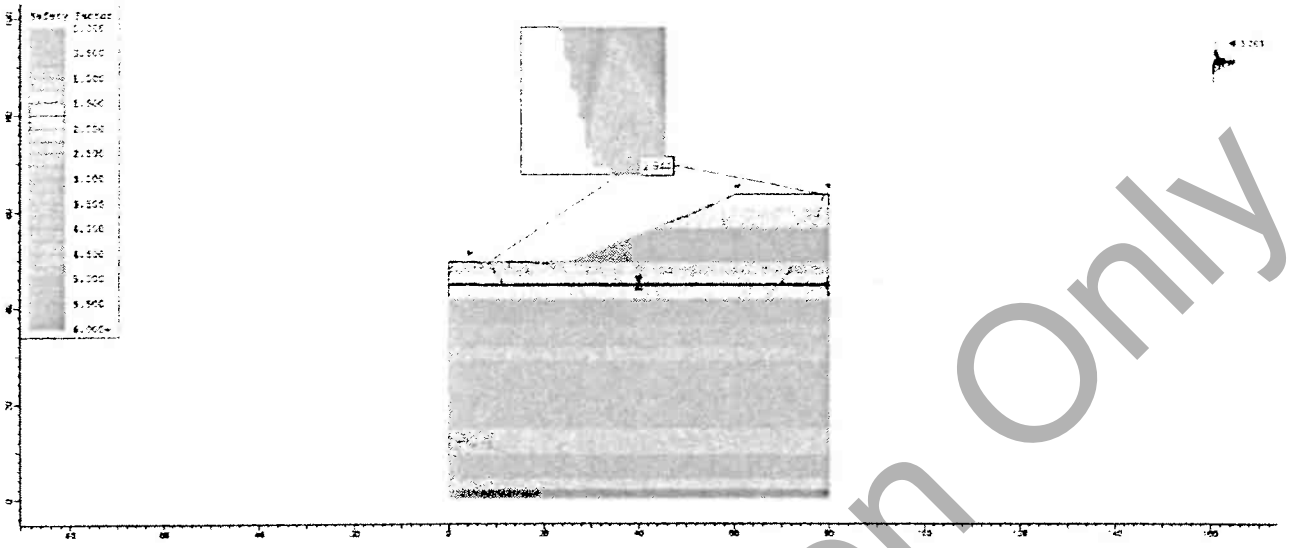
Material	Strength Type	Unsaturated Unit Weight (lb/ft^3)	Saturated Unit Weight (lb/ft^3)	Cohesion (psf)	Friction Angle (deg)	Water Surface
Fill	Mohr-Coulomb	120	125	1000	0	Above
1				1110	0	
2				2846.7	0	
3				2350	0	
4				1110	0	
5				1460	0	Below
6				490	0	
7				1040	0	
8				200	0	
9				0	32	
10				0	36.9	
11				2370	0	
12				3035	0	
13				2700	0	
14				0	50	

Water Table: 449.0 feet (44.6 on above graphic)

Search Grid

15.108	67.391
45.422	67.391
45.422	97.705
15.108	97.705

SLOPE STABILITY – 2.5:1 SIDE SLOPES – WEST END (SEISMIC)



Analysis Methods Used: Bishop Simplified, Janbu Simplified
Circular Surface Type
Grid Search
Number of Slices: 25
Tolerance: 0.005
Maximum Number of Iterations: 50

Seismic Load Coefficient (Horizontal): 0.088

Materials Properties (from top to bottom in above graphic)

Material	Strength Type	Unsaturated Unit Weight (lb/ft^3)	Saturated Unit Weight (lb/ft^3)	Cohesion (psf)	Friction Angle (deg)	Water Surface
Fill	Mohr-Coulomb	120	125	1000	0	Above
1				1110	0	
2				2846.7	0	
3				2350	0	
4				1110	0	
5				1460	0	Below
6				490	0	
7				1040	0	
8				200	0	
9				0	32	
10				0	36.9	
11				2370	0	
12				3035	0	
13				2700	0	
14				0	50	

Water Table: 449.0 feet (44.6 on above graphic)

Search Grid

15.108	67.391
45.422	67.391
45.422	97.705
15.108	97.705

DRILLED SHAFT AXIAL CAPACITY---- ROCK

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT Modified on 2/07/2012

SHAFT DIAMETER IN ROCK====== 3.00 FT.
LRFD or ALLOWABLE STRESS ===: LRFD
ESTIMATED TOP OF ROCK ELEV = 404.40 FT.

NOTE: 1 *"THE LAYER THICKNESSES INPUT SHOULD BE NO LARGER THAN 18 inches (thus adjacent layers will often have identical data to allow program interpolation)"*

NOTE: 2 *The "IDOT Joint Spacing & Condition Ranking" below should be made in conjuction with AASHTO LRFD Table 10.4.6.4-1 ... ... where "5" is best and "1" is worst*

Socket Depth (FT)	Tip Elev. (FT)	Layer Thick. (FT)	Unconf. Comp. Streng. (KSF)	RQD (%)	Joint Type (open or closed)	Em/Ei (Ratio)	Alpha E reduct.	Cumlative Factored Side Resist. (KIPS)	IDOT Joint Spacing & Condition Ranking (1,2,3,4,5)	Rock Type (A,B,C)	RMR Rating aprox.	m Coef.	s Coef.	Factored End Bear. in Layer (KIPS)	2 x Dia. Factored End Bearing (KIPS)	Controling Mode of Resistance (Side,End)	Controling Factored Resistance (KIPS)
0.50	403.90	0.50	0.0	0	open	0.05	0.450	0.00	1	B					6.03	End	6.03
1.75	402.65	1.25	150.0	92	open	0.45	0.770	88.97	1	B	32	0.04	0.00	6.03	6.03	Side	**88.97**
3.00	401.40	1.25	150.0	92	open	0.45	0.770	177.93	1	B	32	0.04	0.00	6.03	6.03	Side	**177.93**
4.25	400.15	1.25	150.0	92	open	0.45	0.770	266.90	1	B	32	0.04	0.00	6.03	6.03	Side	**266.90**
5.50	398.90	1.25	150.0	92	open	0.45	0.770	355.86	1	B	32	0.04	0.00	6.03	6.03	Side	**355.86**
6.75	397.65	1.25	150.0	92	open	0.45	0.770	444.83	1	B	32	0.04	0.00	6.03	5.02	Side	**444.83**
8.00	396.40	1.25	150.0	92	open	0.45	0.770	533.79	1	B	32	0.04	0.00	6.03	3.77	Side	**533.79**
9.25	395.15	1.25	150.0	92	open	0.45	0.770	622.76	1	B	32	0.04	0.00	6.03	2.51	Side	**622.76**
10.50	393.90	1.25	150.0	92	open	0.45	0.770	711.72	1	B	32	0.04	0.00	6.03	1.26	Side	**711.72**
11.75	392.65	1.25	150.0	92	open	0.45	0.770	800.69	1	B	32	0.04	0.00	6.03	0.00	Side	**800.69**

DRILLED SHAFT AXIAL CAPACITY---- ROCK

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT — Modified on 2/07/2010

SHAFT DIAMETER IN ROCK====== 3.00 FT
LRFD or ALLOWABLE STRESS ===: LRFD
ESTIMATED TOP OF ROCK ELEV. = 404.10 FT

NOTE: 1 "THE LAYER THICKNESSES INPUT SHOULD BE NO LARGER THAN 18 inches (thus adjacent layers will often have identical data to allow program interpolation)"

NOTE: 2 The "IDOT Joint Spacing & Condition Ranking" below should be made in conjuction with AASHTO LRFD Table 10.4.6.4-1 . . . . where "5" is best and "1" is worst

Socket Depth (FT)	Tip Elev. (FT)	Layer Thick. (FT)	Unconf. Comp. Streng. (KSF)	RQD (%)	Joint Type (open or closed)	Em/Ei (Ratio)	Alpha E reduct.	Cumlative Factored Side Resist. (KIPS)	IDOT Joint Spacing & Condition Ranking (1,2,3,4,5)	Rock Type (A,B,C)	RMR Rating aprox.	m Coef.	s Coef.	Factored End Bear. in Layer (KIPS)	2 x Dia. Factored End Bearing (KIPS)	Controling Mode of Resistance (Side,End)	Controling Factored Resistance (KIPS)
0.50	403.60	0.50	0.0	0	open	0.05	0.450	0.00	1	B				6.03	6.03	End	**6.03**
1.75	402.35	1.25	150.0	92	open	0.45	0.770	88.97	1	B	32	0.04	0.00	6.03	6.03	Side	**88.97**
3.00	401.10	1.25	150.0	92	open	0.45	0.770	177.93	1	B	32	0.04	0.00	6.03	6.03	Side	**177.93**
4.25	399.85	1.25	150.0	92	open	0.45	0.770	266.90	1	B	32	0.04	0.00	6.03	6.03	Side	**266.90**
5.50	398.60	1.25	150.0	92	open	0.45	0.770	355.86	1	B	32	0.04	0.00	6.03	6.03	Side	**355.86**
6.75	397.35	1.25	150.0	92	open	0.45	0.770	444.83	1	B	32	0.04	0.00	6.03	5.02	Side	**444.83**
8.00	396.10	1.25	150.0	92	open	0.45	0.770	533.79	1	B	32	0.04	0.00	6.03	3.77	Side	**533.79**
9.25	394.85	1.25	150.0	92	open	0.45	0.770	622.76	1	B	32	0.04	0.00	6.03	2.51	Side	**622.76**
10.50	393.60	1.25	150.0	92	open	0.45	0.770	711.72	1	B	32	0.04	0.00	6.03	1.26	Side	**711.72**
11.75	392.35	1.25	150.0	92	open	0.45	0.770	800.69	1	B	32	0.04	0.00	6.03	0.00	Side	**800.69**

DRILLED SHAFT AXIAL CAPACITY---- ROCK

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT — Modified on 2/07/2010

SHAFT DIAMETER IN ROCK====== 3.00 FT
LRFD or ALLOWABLE STRESS ==== LRFD
ESTIMATED TOP OF ROCK ELEV. = 402.10 FT

NOTE. 1 *"THE LAYER THICKNESSES INPUT SHOULD BE NO LARGER THAN 18 inches (thus adjacent layers will often have identical data to allow program interpolation)"*

NOTE. 2 *The "IDOT Joint Spacing & Condition Ranking" below should be made in conjuction with AASHTO LRFD Table 10.4.6.4-1 where "5" is best and "1" is worst.*

Socket Depth (FT)	Tip Elev. (FT)	Layer Thick. (FT)	Unconf. Comp. Streng. (KSF)	RQD (%)	Joint Type (open or closed)	Em/Ei (Ratio)	Alpha E reduct.	Cumlative Factored Side Resist. (KIPS)	IDOT Joint Spacing & Condition Ranking (1,2,3,4,5)	Rock Type (A,B,C)	RMR Rating aprox.	m Coef.	s Coef.	Factored End Bear. in Layer (KIPS)	2 x Dia. Factored End Bearing (KIPS)	Controlling Mode of Resistance (Side,End)	Controling Factored Resistance (KIPS)
1.25	400.85	1.25	8.1	0	open	0.05	0.450	12.08	1	B				0.07	0.07	Side	**12.08**
2.50	399.60	1.25	8.1	0	open	0.05	0.450	24.16	1	B	14	0.01	0.00	0.07	1.06	Side	**24.16**
3.75	398.35	1.25	8.1	0	open	0.05	0.450	36.25	1	B	14	0.01	0.00	0.07	2.20	Side	**36.25**
5.00	397.10	1.25	8.1	0	open	0.05	0.450	48.33	1	B	14	0.01	0.00	0.07	3.34	Side	**48.33**
6.25	395.85	1.25	8.1	0	open	0.05	0.450	60.41	1	B	14	0.01	0.00	0.07	4.79	Side	**60.41**
7.50	394.60	1.25	8.1	0	open	0.05	0.450	72.49	1	B	14	0.01	0.00	0.07	6.03	Side	**72.49**
8.75	393.35	1.25	150.0	92	open	0.45	0.770	161.46	1	B	32	0.04	0.00	6.03	6.03	Side	**161.46**
10.00	392.10	1.25	150.0	92	open	0.45	0.770	250.42	1	B	32	0.04	0.00	6.03	5.02	Side	**250.42**
11.25	390.85	1.25	150.0	92	open	0.45	0.770	339.39	1	B	32	0.04	0.00	6.03	3.77	Side	**339.39**
12.50	389.60	1.25	150.0	92	open	0.45	0.770	428.35	1	B	32	0.04	0.00	6.03	2.51	Side	**428.35**
13.75	388.35	1.25	150.0	92	open	0.45	0.770	517.32	1	B	32	0.04	0.00	6.03	1.26	Side	**517.32**
15.00	387.10	1.25	150.0	92	open	0.45	0.770	606.29	1	B	32	0.04	0.00	6.03	0.00	Side	**606.29**

DRILLED SHAFT AXIAL CAPACITY---- ROCK

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT — Modified on 2/07/2011

SHAFT DIAMETER IN ROCK====== 3.00 FT.
LRFD or ALLOWABLE STRESS ===: LRFD
ESTIMATED TOP OF ROCK ELEV = 403.00 FT.

NOTE: 1 *"THE LAYER THICKNESSES INPUT SHOULD BE NO LARGER THAN 18 inches (thus adjacent layers will often have identical data to allow program interpolation)"*

NOTE: 2 *The "IDOT Joint Spacing & Condition Ranking" below should be made in conjuction with AASHTO LRFD Table 10.4.6.4-1 . . . where "5" is best and "1" is worst*

Socket Depth (FT)	Tip Elev. (FT)	Layer Thick. (FT)	Unconf. Comp. Streng. (KSF)	RQD (%)	Joint Type (open or closed)	Em/EI (Ratio)	Alpha E reduct.	Cumlative Factored Side Resist. (KIPS)	IDOT Joint Spacing & Condition Ranking (1,2,3,4,5)	Rock Type (A,B,C)	RMR Rating aprox.	m Coef.	s Coef.	Factored End Bear. in Layer (KIPS)	2 x Dia. Factored End Bearing (KIPS)	Controling Mode of Resistance (Side,End)	Controling Factored Resistance (KIPS)
1.25	401.75	1.25	150.0	0	open	0.05	0.450	51.99	1	B							
2.50	400.50	1.25	150.0	0	open	0.05	0.450	103.99	1	B	15	0.01	0.00	1.24	2.04	Side	**103.99**
3.75	399.25	1.25	150.0	0	open	0.05	0.450	155.98	1	B	15	0.01	0.00	1.24	3.03	Side	**155.98**
5.00	398.00	1.25	150.0	0	open	0.05	0.450	207.97	1	B	15	0.01	0.00	1.24	4.03	Side	**207.97**
6.25	396.75	1.25	150.0	0	open	0.05	0.450	259.96	1	B	15	0.01	0.00	1.24	5.03	Side	**259.96**
7.50	395.50	1.25	150.0	0	open	0.05	0.450	311.96	1	B	15	0.01	0.00	1.24	5.02	Side	**311.96**
8.75	394.25	1.25	150.0	92	open	0.45	0.770	400.92	1	B	32	0.04	0.00	6.03	3.77	Side	**400.92**
10.00	393.00	1.25	150.0	92	open	0.45	0.770	489.89	1	B	32	0.04	0.00	6.03	2.51	Side	**489.89**
11.25	391.75	1.25	150.0	92	open	0.45	0.770	578.85	1	B	32	0.04	0.00	6.03	1.26	Side	**578.85**
12.50	390.50	1.25	150.0	92	open	0.45	0.770	667.82	1	B	32	0.04	0.00	6.03	0.00	Side	**667.82**

DRILLED SHAFT AXIAL CAPACITY---- ROCK

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT Modified on 2/07/2013

SHAFT DIAMETER IN ROCK====== 3.00 FT.
LRFD or ALLOWABLE STRESS ===: LRFD
ESTIMATED TOP OF ROCK ELEV. = 387.40 FT

NOTE: 1 *"THE LAYER THICKNESSES INPUT SHOULD BE NO LARGER THAN 18 inches (thus adjacent layers will often have identical data to allow program interpolation)"*

NOTE: 2 *The "IDOT Joint Spacing & Condition Ranking" below should be made in conjuction with AASHTO LRFD Table 10.4.6.4-1 . . . . where "5" is best and "1" is worst*

Socket Depth (FT)	Tip Elev. (FT)	Layer Thick. (FT)	Unconf. Comp. Streng. (KSF)	RQD (%)	Joint Type (open or closed)	Em/Ei (Ratio)	Alpha E reduct.	Cumlative Factored Side Resist. (KIPS)	IDOT Joint Spacing & Condition Ranking (1,2,3,4,5)	Rock Type (A,B,C)	RMR Rating aprox.	m Coef.	s Coef.	Factored End Bear. in Layer (KIPS)	2 x Dia. Factored End Bearing (KIPS)	Controlling Mode of Resistance (Side,End)	Controling Factored Resistance (KIPS)
1.25	386.15	1.25	150.0	0	open	0.05	0.450	51.99	1	B					5.03	Side	**51.99**
2.50	384.90	1.25	150.0	0	open	0.05	0.450	103.99	1	B	15	0.01	0.00	1.24	6.03	Side	**103.99**
3.75	383.65	1.25	150.0	92	open	0.45	0.770	192.95	1	B	32	0.04	0.00	6.03	6.03	Side	**192.95**
5.00	382.40	1.25	150.0	92	open	0.45	0.770	281.92	1	B	32	0.04	0.00	6.03	6.03	Side	**281.92**
6.25	381.15	1.25	150.0	92	open	0.45	0.770	370.88	1	B	32	0.04	0.00	6.03	5.02	Side	**370.88**
7.50	379.90	1.25	150.0	92	open	0.45	0.770	459.85	1	B	32	0.04	0.00	6.03	3.77	Side	**459.85**
8.75	378.65	1.25	150.0	92	open	0.45	0.770	548.81	1	B	32	0.04	0.00	6.03	2.51	Side	**548.81**
10.00	377.40	1.25	150.0	92	open	0.45	0.770	637.78	1	B	32	0.04	0.00	6.03	1.26	Side	**637.78**
11.25	376.15	1.25	150.0	92	open	0.45	0.770	726.74	1	B	32	0.04	0.00	6.03	0.00	Side	**726.74**

DRILLED SHAFT AXIAL CAPACITY---- ROCK

I.D.O.T. BBS, FOUNDATIONS AND GEOTECHNICAL UNIT — Modified on 2/07/2012

SHAFT DIAMETER IN ROCK====== 3.00 FT
LRFD or ALLOWABLE STRESS === LRFD
ESTIMATED TOP OF ROCK ELEV = 389.00 FT

NOTE: 1 "THE LAYER THICKNESSES INPUT SHOULD BE NO LARGER THAN 18 inches (thus adjacent layers will often have identical data to allow program interpolation)"

NOTE 2 The "IDOT Joint Spacing & Condition Ranking" below should be made in conjuction with AASHTO LRFD Table 10.4.6.4-1 . . . where "5" is best and "1" is worst

Socket Depth (FT)	Tip Elev. (FT)	Layer Thick. (FT)	Unconf. Comp. Streng. (KSF)	RQD (%)	Joint Type (open or closed)	Em/Ei (Ratio)	Alpha E reduct.	Cumlative Factored Side Resist. (KIPS)	IDOT Joint Spacing & Condition Ranking (1,2,3,4,5)	Rock Type (A,B,C)	RMR Rating aprox.	m Coef.	s Coef.	Factored End Bear. in Layer (KIPS)	2 x Dia. Factored End Bearing (KIPS)	Controling Mode of Resistance (Side,End)	Controling Factored Resistance (KIPS)
1.25	387.75	1.25	150.0	0	open	0.05	0.450	51.99	1	B					6.03	Side	**51.99**
2.50	386.50	1.25	150.0	0	open	0.05	0.450	103.99	1	B	15	0.01	0.00	1.24	6.03	Side	**103.99**
3.75	385.25	1.25	150.0	92	open	0.45	0.770	192.95	1	B	32	0.04	0.00	6.03	6.03	Side	**192.95**
5.00	384.00	1.25	150.0	92	open	0.45	0.770	281.92	1	B	32	0.04	0.00	6.03	6.03	Side	**281.92**
6.25	382.75	1.25	150.0	92	open	0.45	0.770	370.88	1	B	32	0.04	0.00	6.03	5.02	Side	**370.88**
7.50	381.50	1.25	150.0	92	open	0.45	0.770	459.85	1	B	32	0.04	0.00	6.03	3.77	Side	**459.85**
8.75	380.25	1.25	150.0	92	open	0.45	0.770	548.81	1	B	32	0.04	0.00	6.03	2.51	Side	**548.81**
10.00	379.00	1.25	150.0	92	open	0.45	0.770	637.78	1	B	32	0.04	0.00	6.03	1.26	Side	**637.78**
11.25	377.75	1.25	150.0	92	open	0.45	0.770	726.74	1	B	32	0.04	0.00	6.03	0.00	Side	**726.74**

DRILLED SHAFT AXIAL CAPACITY---- ROCK

I.D.O.T. BBS, FOUNDATIONS AND GEOTECHNICAL UNIT — Modified on 2/07/2010

SHAFT DIAMETER IN ROCK====== 3.00 FT
LRFD or ALLOWABLE STRESS ===: LRFD
ESTIMATED TOP OF ROCK ELEV. = 390.70 FT

NOTE: 1 *"THE LAYER THICKNESSES INPUT SHOULD BE NO LARGER THAN 18 inches (thus adjacent layers will often have identical data to allow program interpolation)"*

NOTE: 2 *The "IDOT Joint Spacing & Condition Ranking" below should be made in conjuction with AASHTO LRFD Table 10.4.6.4-1 ..... where "5" is best and "1" is worst*

Socket Depth (FT)	Tip Elev. (FT)	Layer Thick. (FT)	Unconf. Comp. Streng. (KSF)	RQD (%)	Joint Type (open or closed)	Em/Ei (Ratio)	Alpha E reduct.	Cumlative Factored Side Resist. (KIPS)	IDOT Joint Spacing & Condition Ranking (1,2,3,4,5)	Rock Type (A,B,C)	RMR Rating aprox.	m Coef.	s Coef.	Factored End Bear. in Layer (KIPS)	2 x Dia. Factored End Bearing (KIPS)	Controling Mode of Resistance (Side,End)	Controling Factored Resistance (KIPS)
1.25	389.45	1.25	150.0	0	open	0.05	0.450	51.99	1	B					6.03	Side	**51.99**
2.50	388.20	1.25	150.0	0	open	0.05	0.450	103.99	1	B	15	0.01	0.00	1.24	6.03	Side	**103.99**
3.75	386.95	1.25	150.0	92	open	0.45	0.770	192.95	1	B	32	0.04	0.00	6.03	6.03	Side	**192.95**
5.00	385.70	1.25	150.0	92	open	0.45	0.770	281.92	1	B	32	0.04	0.00	6.03	6.03	Side	**281.92**
6.25	384.45	1.25	150.0	92	open	0.45	0.770	370.88	1	B	32	0.04	0.00	6.03	5.02	Side	**370.88**
7.50	383.20	1.25	150.0	92	open	0.45	0.770	459.85	1	B	32	0.04	0.00	6.03	3.77	Side	**459.85**
8.75	381.95	1.25	150.0	92	open	0.45	0.770	548.81	1	B	32	0.04	0.00	6.03	2.51	Side	**548.81**
10.00	380.70	1.25	150.0	92	open	0.45	0.770	637.78	1	B	32	0.04	0.00	6.03	1.26	Side	**637.78**
11.25	379.45	1.25	150.0	92	open	0.45	0.770	726.74	1	B	32	0.04	0.00	6.03	0.00	Side	**726.74**

DRILLED SHAFT AXIAL CAPACITY---- ROCK

I.D.O.T. BBS, FOUNDATIONS AND GEOTECHNICAL UNIT — Modified on 2/07/2012

SHAFT DIAMETER IN ROCK====== 3.00 FT
LRFD or ALLOWABLE STRESS ===: LRFD
ESTIMATED TOP OF ROCK ELEV. = 396.40 FT

NOTE: 1.) *"THE LAYER THICKNESSES INPUT SHOULD BE NO LARGER THAN 18 inches (thus adjacent layers will often have identical data to allow program interpolation)"*

NOTE 2.) *The "IDOT Joint Spacing & Condition Ranking" below should be made in conjuction with AASHTO LRFD Table 10.4.6.4-1 . . . where "5" is best and "1" is worst*

Socket Depth (FT)	Tip Elev. (FT)	Layer Thick. (FT)	Unconf. Comp. Streng. (KSF)	RQD (%)	Joint Type (open or closed)	Em/Ei (Ratio)	Alpha E reduct.	Cumlative Factored Side Resist. (KIPS)	IDOT Joint Spacing & Condition Ranking (1,2,3,4,5)	Rock Type (A,B,C)	RMR Rating aprox.	m Coef.	s Coef.	Factored End Bear. in Layer (KIPS)	2 x Dia. Factored End Bearing (KIPS)	Controling Mode of Resistance (Side,End)	Controling Factored Resistance (KIPS)
1.25	395.15	1.25	150.0	92	open	0.45	0.770	88.97	1	B							
2.50	393.90	1.25	150.0	92	open	0.45	0.770	177.93	1	B	32	0.04	0.00	6.03	6.03	Side	**177.93**
3.75	392.65	1.25	150.0	92	open	0.45	0.770	266.90	1	B	32	0.04	0.00	6.03	6.03	Side	**266.90**
5.00	391.40	1.25	150.0	92	open	0.45	0.770	355.86	1	B	32	0.04	0.00	6.03	6.03	Side	**355.86**
6.25	390.15	1.25	150.0	92	open	0.45	0.770	444.83	1	B	32	0.04	0.00	6.03	5.02	Side	**444.83**
7.50	388.90	1.25	150.0	92	open	0.45	0.770	533.79	1	B	32	0.04	0.00	6.03	3.77	Side	**533.79**
8.75	387.65	1.25	150.0	92	open	0.45	0.770	622.76	1	B	32	0.04	0.00	6.03	2.51	Side	**622.76**
10.00	386.40	1.25	150.0	92	open	0.45	0.770	711.72	1	B	32	0.04	0.00	6.03	1.26	Side	**711.72**
11.25	385.15	1.25	150.0	92	open	0.45	0.770	800.69	1	B	32	0.04	0.00	6.03	0.00	Side	**800.69**

DRILLED SHAFT AXIAL CAPACITY---- ROCK

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT — Modified on 2/07/2010

SHAFT DIAMETER IN ROCK====== 3.00 FT.
LRFD or ALLOWABLE STRESS ===: LRFD
ESTIMATED TOP OF ROCK ELEV. = 395.40 FT

NOTE: 1 "THE LAYER THICKNESSES INPUT SHOULD BE NO LARGER THAN 18 inches (thus adjacent layers will often have identical data to allow program interpolation)"

NOTE: 2 The "IDOT Joint Spacing & Condition Ranking" below should be made in conjuction with AASHTO LRFD Table 10.4.6.4-1 . . . where "5" is best and "1" is worst

Socket Depth (FT)	Tip Elev. (FT)	Layer Thick. (FT)	Unconf. Comp. Streng. (KSF)	RQD (%)	Joint Type (open or closed)	Em/Ei (Ratio)	Alpha E reduct.	Cumlative Factored Side Resist. (KIPS)	IDOT Joint Spacing & Condition Ranking (1,2,3,4,5)	Rock Type (A,B,C)	RMR Rating aprox.	m Coef.	s Coef.	Factored End Bear. in Layer (KIPS)	2 x Dia. Factored End Bearing (KIPS)	Controling Mode of Resistance (Side,End)	Controlling Factored Resistance (KIPS)
1.25	394.15	1.25	150.0	12	open	0.05	0.450	51.99	1	B							
2.50	392.90	1.25	150.0	12	open	0.05	0.450	103.99	1	B	15	0.01	0.00	1.24	1.24	Side	51.99
3.75	391.65	1.25	150.0	12	open	0.05	0.450	155.98	1	B	15	0.01	0.00	1.24	2.04	Side	103.99
5.00	390.40	1.25	150.0	12	open	0.05	0.450	207.97	1	B	15	0.01	0.00	1.24	3.03	Side	155.98
6.25	389.15	1.25	150.0	12	open	0.05	0.450	259.96	1	B	15	0.01	0.00	1.24	4.03	Side	207.97
7.50	387.90	1.25	150.0	12	open	0.05	0.450	311.96	1	B	15	0.01	0.00	1.24	4.02	Side	259.96
8.75	386.65	1.25	150.0	66	open	0.10	0.550	375.50	1	B	25	0.04	0.00	6.03	3.77	Side	311.96
10.00	385.40	1.25	150.0	66	open	0.10	0.550	439.05	1	B	25	0.04	0.00	6.03	2.51	Side	375.50
11.25	384.15	1.25	150.0	66	open	0.10	0.550	502.60	1	B	25	0.04	0.00	6.03	1.26	Side	439.05
															0.00	Side	502.60

DRILLED SHAFT AXIAL CAPACITY---- ROCK

I D O T BBS FOUNDATIONS AND GEOTECHNICAL UNIT Modified on 2/07/2010

SHAFT DIAMETER IN ROCK====== 3.00 FT
LRFD or ALLOWABLE STRESS ===: LRFD
ESTIMATED TOP OF ROCK ELEV = 400.10 FT

NOTE: 1 *"THE LAYER THICKNESSES INPUT SHOULD BE NO LARGER THAN 18 inches (thus adjacent layers will often have identical data to allow program interpolation)"*

NOTE: 2 *The "IDOT Joint Spacing & Condition Ranking" below should be made in conjuction with AASHTO LRFD Table 10.4.6.4-1 ... where "5" is best and "1" is worst*

Socket Depth (FT)	Tip Elev. (FT)	Layer Thick. (FT)	Unconf. Comp. Streng. (KSF)	RQD (%)	Joint Type (open or closed)	Em/Ei (Ratio)	Alpha E reduct.	Cumlative Factored Side Resist. (KIPS)	IDOT Joint Spacing & Condition Ranking (1,2,3,4,5)	Rock Type (A,B,C)	RMR Rating aprox.	m Coef.	s Coef.	Factored End Bear. in Layer (KIPS)	2 x Dia. Factored End Bearing (KIPS)	Controling Mode of Resistance (Side,End)	Controling Factored Resistance (KIPS)
1.25	398.85	1.25	150.0	12	open	0.05	0.450	51.99	1	B					1.24	Side	**51.99**
2.50	397.60	1.25	150.0	12	open	0.05	0.450	103.99	1	B	15	0.01	0.00	1.24	1.24	Side	**103.99**
3.75	396.35	1.25	150.0	12	open	0.05	0.450	155.98	1	B	15	0.01	0.00	1.24	1.24	Side	**155.98**
5.00	395.10	1.25	150.0	12	open	0.05	0.450	207.97	1	B	15	0.01	0.00	1.24	1.24	Side	**207.97**
6.25	393.85	1.25	150.0	12	open	0.05	0.450	259.96	1	B	15	0.01	0.00	1.24	1.03	Side	**259.96**
7.50	392.60	1.25	150.0	12	open	0.05	0.450	311.96	1	B	15	0.01	0.00	1.24	0.77	Side	**311.96**
8.75	391.35	1.25	150.0	12	open	0.05	0.450	363.95	1	B	15	0.01	0.00	1.24	0.52	Side	**363.95**
10.00	390.10	1.25	150.0	12	open	0.05	0.450	415.94	1	B	15	0.01	0.00	1.24	0.26	Side	**415.94**
11.25	388.85	1.25	150.0	12	open	0.05	0.450	467.94	1	B	15	0.01	0.00	1.24	0.00	Side	**467.94**

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

IDOT BBS FOUNDATIONS AND GEOTECHNICAL UNIT — Modified 10/15/2015

SUBSTRUCTURE========== W Abut
REFERENCE BORING ========== W Abut
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV. ========== 459.00 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 458.00 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD None
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ========== ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 1300 Kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 35.17 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE = 2
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 147.87 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 55.45 KIPS

PILE TYPE AND SIZE ========== Steel HP 12 X 53
Plugged Pile Perimeter========== 3.957 FT. Unplugged Pile Perimeter========== 5.800 FT.
Plugged Pile End Bearing Area========== 0.983 SQFT. Unplugged Pile End Bearing Area===== 0.108 SQFT.

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Reqd Bearing of Pile	Maximum Nominal Reqd Bearing of Bore	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
418 KIPS	418 KIPS	230 KIPS	56 FT.

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED			NOMINAL UNPLUGD			NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
					SIDE RESIST. (KIPS)	END BRG. RESIST. (KIPS)	TOTAL RESIST. (KIPS)	SIDE RESIST. (KIPS)	END BRG RESIST. (KIPS)	TOTAL RESIST. (KIPS)					
455.70	2.30	2.77	15		13.2		54.5	19.3		***23.8***	24	0	0	13	3
453.50	2.20	3.00	21		13.4	41.3	58.9	19.5	4.5	***42.4***	42	0	0	23	6
451.00	2.50	2.35	15		12.8	32.4	***54.7***	18.7	3.5	59.2	55	0	0	30	8
449.00	2.00	1.11	7		8.1	15.3	***55.6***	9.0	1.7	68.7	66	0	0	36	10
446.00	3.00	1.46	8		11.2	20.1	***63.5***	16.4	2.2	83.7	63	0	0	35	13
443.20	2.80	0.49	5		4.3	6.8	***67.7***	6.2	0.7	89.9	68	0	0	37	16
440.70	2.50	0.49	9		3.8	6.8	***79.1***	5.5	0.7	96.3	79	0	0	44	18
438.50	2.20	1.04	9		8.4	14.3	***73.9***	9.4	1.6	104.3	74	0	0	41	21
436.00	2.50	0.20	7		1.6	2.8	***92.4***	2.4	0.3	108.6	92	0	0	51	23
433.20	2.80		8	Medium Sand	1.6	19.6	147.9	2.4	2.1	***116.8***	117	0	0	64	26
430.70	2.50		30	Medium Sand	5.7	73.5	159.5	9.3	8.0	***125.7***	126	0	0	69	28
428.20	2.50		32	Medium Sand	6.2	78.4	184.3	9.1	8.6	***136.9***	137	0	0	75	31
425.70	2.50		40	Medium Sand	9.0	98.0	168.8	13.1	10.7	***147.4***	147	0	0	81	33
423.20	2.50		30	Medium Sand	5.7	73.5	247.9	9.3	8.0	***163.7***	164	0	0	90	36
420.70	2.50		50	Medium Sand	18.9	147.0	186.0	27.7	16.1	***182.5***	183	0	0	100	38
419.00	1.70		27	Medium Sand	3.4	66.1	***151.6***	4.9	7.2	183.3	152	0	0	83	40
415.70	3.30	2.08	24		15.5	28.4	***175.7***	22.7	3.1	206.9	176	0	0	97	43
413.70	2.00	2.88	32		11.2	36.9	***187.3***	16.4	4.0	223.4	187	0	0	103	45
410.70	3.00	2.71	36		16.9	37.3	***213.2***	24.8	4.1	249.1	213	0	0	117	48
408.50	2.20	3.38	30		14.5	46.3	***219.6***	21.2	5.1	259.4	220	0	0	121	51
406.20	2.30	2.77	20		13.2	38.2	439.8	19.3	4.2	***311.4***	311	0	0	171	53
404.40	1.80		100	Clean Coarse Sand	33.3	245.0	350.4	48.7	26.8	***346.7***	347	0	0	191	55
403.90	0.50			Shale	24.7	122.5	***375.1***	36.1	13.4	382.8	375	0	0	206	55.1
402.90	1.00			Shale	49.4	122.5	***424.5***	72.3	13.4	455.1	425	0	0	234	55.1
401.90	1.00			Shale	49.4	122.5	***474.0***	72.3	13.4	527.3	474	0	0	261	57.1
400.90	1.00			Shale	49.4	122.5	***523.4***	72.3	13.4	599.6	523	0	0	288	58.2
399.90	1.00			Shale	49.4	122.5	***572.8***	72.3	13.4	671.8	573	0	0	315	59.2
398.90	1.00			Shale	49.4	122.5	***622.2***	72.3	13.4	744.1	622	0	0	343	60.1
397.90	1.00			Shale	49.4	122.5	***671.6***	72.3	13.4	816.3	672	0	0	370	61.1
396.90	1.00			Shale	49.4	122.5	***721.0***	72.3	13.4	888.6	721	0	0	397	62.1
395.90	1.00			Shale	49.4	122.5	***770.4***	72.3	13.4	960.8	770	0	0	424	63.1
394.90	1.00			Shale		122.5			13.4						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I.D.O.T. BBS, FOUNDATIONS AND GEOTECHNICAL UNIT — Modified 10/18/2011

SUBSTRUCTURE========== Pier 1
REFERENCE BORING ========== W Abut
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV. ========== 449.50 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 448.50 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD Scour
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ======== 447.50 ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 2600 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 35.17 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE : 3
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 197.15 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 73.93 KIPS

PILE TYPE AND SIZE ========== Steel HP 12 X 53
Plugged Pile Penmeter========== 3.967 FT. Unplugged Pile Perimeter========== 5.800 FT.
Plugged Pile End Bearing Area========== 0.983 SQFT. Unplugged Pile End Bearing Area===== 0.108 SQFT

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req'd Bearing of Bore	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
418 KIPS	418 KIPS	230 KIPS	55 FT

BOT. OF LAYER ELEV (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
446.50	2.00	3.60	21		12.1		44.5	17.7		***21.3***	21	0	0	12	3
444.00	2.50	2.35	15		12.8	32.4	40.2	18.7	3.5	***38.2***	38	0	0	21	6
442.50	2.00	1.11	7		6.1	15.3	51.2	9.0	1.7	***47.6***	48	0	0	28	8
439.00	3.00	1.45	8		11.2	20.1	***49.1***	16.4	2.2	62.6	49	0	0	27	11
436.20	2.80	0.59	5		4.3	6.8	***53.3***	6.2	0.7	69.8	53	0	0	29	13
433.70	2.50	0.49	9		3.8	6.8	***64.7***	5.5	0.7	75.2	65	0	0	36	16
431.50	2.20	1.04	9		6.4	14.3	***59.5***	9.4	1.6	83.3	60	0	0	33	18
429.00	2.50	0.20	7		1.6	2.8	***78.0***	2.4	0.3	87.5	78	0	0	43	21
426.20	2.80		8	Medium Sand	1.6	19.6	133.5	2.4	2.1	***95.8***	96	0	0	53	23
423.70	2.50		30	Medium Sand	5.7	73.5	144.1	8.3	8.0	***104.6***	105	0	0	58	26
421.20	2.50		32	Medium Sand	5.2	78.4	169.9	9.1	8.6	***115.9***	116	0	0	64	28
418.70	2.50		40	Medium Sand	9.0	98.0	154.4	13.1	10.7	***126.3***	126	0	0	69	31
416.20	2.50		30	Medium Sand	5.7	73.5	233.5	8.3	8.0	***142.6***	143	0	0	78	33
413.70	2.50		60	Medium Sand	18.9	147.0	171.6	27.7	16.1	***161.5***	161	0	0	89	36
412.00	1.70		27	Medium Sand	3.4	66.1	***137.2***	4.9	7.2	182.2	137	0	0	75	38
408.70	3.30	2.05	24		15.5	28.4	***151.3***	22.7	3.1	185.9	161	0	0	89	41
406.70	2.00	2.68	32		11.2	35.9	***172.9***	16.4	4.0	202.3	173	0	0	95	43
403.70	3.00	2.71	36		16.9	37.3	***193.8***	24.8	4.1	228.1	199	0	0	109	46
401.50	2.20	3.36	30		14.5	46.3	***205.2***	21.2	5.1	248.4	205	0	0	113	48
399.20	2.30	2.77	20		13.2	38.2	425.2	19.3	4.2	***290.3***	290	0	0	160	50
397.40	1.80		100	Clean Coarse Sand	33.3	245.0	336.0	48.7	26.8	***325.6***	326	0	0	179	52
396.90	0.50			Shale	24.7	122.5	***360.7***	36.1	13.4	361.8	361	0	0	198	52.6
395.90	1.00			Shale	49.4	122.5	***410.1***	72.3	13.4	434.0	410	0	0	226	53.6
394.90	1.00			Shale	49.4	122.5	***459.5***	72.3	13.4	506.3	456	0	0	250	54.6
393.90	1.00			Shale	49.4	122.5	***509.0***	72.3	13.4	578.5	509	0	0	280	55.6
392.90	1.00			Shale	49.4	122.5	***558.4***	72.3	13.4	650.8	578	0	0	317	56.6
391.90	1.00			Shale	49.4	122.5	***607.8***	72.3	13.4	723.0	629	0	0	344	57.6
390.90	1.00			Shale	49.4	122.5	***657.2***	72.3	13.4	795.3	657	0	0	358	58.6
389.90	1.00			Shale	49.4	122.5	***706.5***	72.3	13.4	867.5	706	0	0	385	59.6
388.90	1.00			Shale	49.4	122.5	***756.0***	72.3	13.4	939.8	756	0	0	446	60.6
387.90	1.00			Shale		122.5			13.4						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I.D.O.T. BBS, FOUNDATIONS AND GEOTECHNICAL UNIT

Modified 10/18/2011

SUBSTRUCTURE========== Pier 2
REFERENCE BORING ========== 2 Bent #3
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV. ========== 449.50 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 448.50 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD Scour
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ======== 443.50 ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 2600 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 35.17 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE : 3
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 197.15 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 73.93 KIPS

PILE TYPE AND SIZE ========== Steel HP 12 X 53
Plugged Pile Perimeter========== 3.967 FT. Unplugged Pile Perimeter========== 5.500 FT
Plugged Pile End Bearing Area========== 0.983 SQFT. Unplugged Pile End Bearing Area====== 0.108 SQFT.

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Reqd Bearing of Pile	Maximum Nominal Reqd Bearing of Boring	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
418 KIPS	418 KIPS	230 KIPS	57 FT

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED			NOMINAL UNPLUG'D			NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
					SIDE RESIST. (KIPS)	END BRG. RESIST. (KIPS)	TOTAL RESIST. (KIPS)	SIDE RESIST. (KIPS)	END BRG. RESIST. (KIPS)	TOTAL RESIST. (KIPS)					
442.50	6.00	0.49	3		9.1		15.9	13.3		***14.1***	14	0	0	8	7
440.00	2.50	0.49	3		3.8	8.8	21.9	5.5	0.7	***19.8***	20	0	0	11	10
437.50	2.50	0.65	5		4.9	9.0	***22.3***	7.2	1.0	26.5	22	0	0	12	12
435.00	2.50	0.33	4		2.6	4.5	***28.0***	3.8	0.5	30.7	28	0	0	15	15
432.50	2.50	0.55	10		4.2	7.6	***35.0***	6.2	0.8	37.2	35	0	0	19	17
430.10	2.40	0.75	7		5.3	10.3	***37.5***	7.8	1.1	44.8	38	0	0	21	19
427.50	2.60	0.55	4		4.4	7.8	***36.8***	6.4	0.8	50.5	37	0	0	20	22
425.00	2.50		1	Fine Sand	0.2	2.4	108.0	0.2	0.3	***58.5***	59	0	0	32	25
422.50	2.50		30	Fine Sand	5.1	73.5	103.3	7.5	8.0	***64.9***	65	0	0	36	27
420.10	2.40		25	Fine Sand	4.2	53.7	137.0	6.2	7.0	***74.4***	74	0	0	41	29
417.50	2.60		38	Sandy Gravel	13.0	93.1	130.4	19.0	10.2	***91.2***	91	0	0	50	32
415.00	2.50		30	Sandy Gravel	8.0	73.5	123.6	11.8	8.0	***101.2***	101	0	0	56	35
412.50	2.50		24	Sandy Gravel	5.7	58.8	134.2	8.3	6.4	***110.0***	110	0	0	61	37
410.10	2.40		26	Sandy Gravel	6.1	53.7	***111.8***	8.9	7.0	115.8	112	0	0	61	39
407.50	2.60	2.64	30		14.0	15.0	***124.2***	20.5	3.8	136.1	124	0	0	68	42
405.10	2.40	2.44	33		12.6	33.6	157.1	18.4	3.7	***156.8***	157	0	0	86	44
402.50	2.60	3.91	25		19.2	53.9	***153.7***	28.1	5.9	182.4	154	0	0	85	47
400.10	2.40	2.27	10		12.0	31.3	***151.0***	17.6	3.4	198.4	151	0	0	83	49
397.50	2.60	1.20	12		8.5	16.5	***172.0***	12.4	1.8	212.1	172	0	0	95	52
395.10	2.40	2.11	24		11.5	29.1	276.9	16.8	3.2	***239.1***	239	0	0	132	54
394.10	1.00			Shale	49.4	122.5	326.3	72.3	13.4	***311.4***	311	0	0	171	55.4
393.10	1.00			Shale	49.4	122.5	***375.7***	72.3	13.4	383.6	376	0	0	207	56.4
392.10	1.00			Shale	49.4	122.5	***425.1***	72.3	13.4	455.9	426	0	0	234	57.4
391.10	1.00			Shale	49.4	122.5	***474.5***	72.3	13.4	528.1	476	0	0	261	58.4
390.10	1.00			Shale	49.4	122.5	***523.9***	72.3	13.4	600.4	504	0	0	277	59.4
389.10	1.00			Shale	49.4	122.5	***573.3***	72.3	13.4	672.6	565	0	0	311	60.4
388.10	1.00			Shale	49.4	122.5	***622.7***	72.3	13.4	744.9	623	0	0	343	61.4
387.10	1.00			Shale	49.4	122.5	***672.2***	72.3	13.4	817.1	672	0	0	370	62.4
386.10	1.00			Shale	49.4	122.5	***721.6***	72.3	13.4	889.4	722	0	0	397	63.4
385.10	1.00			Shale	49.4	122.5	***771.0***	72.3	13.4	961.6	771	0	0	424	64.4
384.10	1.00			Shale	49.4	122.5	***820.4***	72.3	13.4	1033.9	820	0	0	451	65.4
383.10	1.00			Shale		122.5			13.4						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

IDOT BBS FOUNDATIONS AND GEOTECHNICAL UNIT

Modified 10/18/2013

SUBSTRUCTURE========== Pier 3
REFERENCE BORING ========== B Bent #6
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV ========== 449 50 ft
GROUND SURFACE ELEV AGAINST PILE DURING DR 448 50 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD Scour
BOTTOM ELEV OF SCOUR, LIQUEF , or DD ======== 442 50 ft
TOP ELEV OF LIQUEF (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 2600 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 35 17 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE : 3
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 197 15 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 73 93 KIPS

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req'd Bearing of Boring	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
418 KIPS	418 KIPS	225 KIPS	58 FT

PILE TYPE AND SIZE ========== Steel HP 12 X 53
Plugged Pile Perimeter========== 3.967 FT. Unplugged Pile Perimeter========== 5.800 FT.
Plugged Pile End Bearing Area========== 0.983 SQFT. Unplugged Pile End Bearing Area===== 0.108 SQFT

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
443.60	4.90	0.52	5		7.9		21.4	11.5		***13.0***	13	4	0	3	5
441.10	2.50	0.98	7		6.9	13.5	***22.0***	10.1	1.5	22.4	22	4	0	8	8
438.60	2.50	0.52	6		4.0	7.2	***23.3***	5.9	0.8	28.0	23	4	0	9	11
436.00	3.60	0.33	4		2.7	4.5	***27.9***	4.0	0.5	32.2	28	4	0	11	14
433.50	2.50	0.46	5		3.6	6.3	***36.3***	5.2	0.7	37.9	36	4	0	16	16
431.00	2.50	0.61	6		5.9	11.2	***41.4***	8.7	1.2	46.5	41	4	0	18	19
428.50	2.50	0.75	8		5.5	10.3	***51.3***	8.1	1.1	55.1	51	4	0	24	21
426.00	2.50		6	Sandy Gravel	1.4	14.7	***42.9***	2.0	1.6	56.0	43	4	0	19	24
423.50	2.50	0.36	20		2.9	5.0	114.3	4.2	0.5	***67.7***	68	4	0	33	25
421.10	2.40		30	Sandy Gravel	7.6	73.5	121.9	11.2	8.0	***78.9***	79	4	0	39	28
418.60	2.50		30	Sandy Gravel	8.0	73.5	125.0	11.8	8.0	***90.0***	90	4	0	45	31
416.10	2.50		28	Sandy Gravel	7.1	68.6	122.3	10.4	7.5	***99.2***	99	4	0	50	33
413.50	2.60		24	Sandy Gravel	5.9	58.8	***92.8***	8.6	6.4	104.0	93	4	0	47	36
411.10	2.40	1.70	17		10.0	23.4	***104.0***	14.6	2.6	118.7	104	4	0	53	38
408.60	2.50	1.79	14		10.7	24.7	***120.4***	15.7	2.7	135.0	120	4	0	62	41
406.10	2.50	2.20	14		12.3	30.3	***119.6***	17.9	3.3	151.5	120	4	0	61	43
403.50	2.60	1.25	14		8.7	17.2	***134.5***	12.7	1.9	164.9	134	4	0	70	46
401.00	2.50	1.20	24		10.4	23.4	***141.1***	15.2	2.6	179.7	141	4	0	73	49
398.50	2.50	1.43	20		9.2	19.7	***151.5***	13.5	2.2	194.4	162	4	0	85	51
396.00	2.50	2.24	17		12.4	30.9	266.6	18.2	3.4	***222.6***	223	4	0	118	54
395.00	1.00			Shale	49.4	122.5	315.0	72.3	13.4	***294.9***	295	4	0	158	54.5
394.00	1.00			Shale	49.4	122.5	***364.4***	72.3	13.4	367.1	364	4	0	196	55.5
393.00	1.00			Shale	49.4	122.5	***413.8***	72.3	13.4	439.4	414	4	0	223	56.5
392.00	1.00			Shale	49.4	122.5	***463.2***	72.3	13.4	511.6	463	4	0	270	57.5
391.00	1.00			Shale	49.4	122.5	***512.6***	72.3	13.4	583.9	513	4	0	274	58.5
390.00	1.00			Shale	49.4	122.5	***562.1***	72.3	13.4	656.1	562	4	0	318	59.5
389.00	1.00			Shale	49.4	122.5	***611.5***	72.3	13.4	728.4	611	4	0	342	60.5
388.00	1.00			Shale	49.4	122.5	***660.9***	72.3	13.4	800.6	661	4	0	369	61.5
387.00	1.00			Shale	49.4	122.5	***710.3***	72.3	13.4	872.9	710	4	0	374	62.5
386.00	1.00			Shale	49.4	122.5	***759.7***	72.3	13.4	945.1	760	4	0	414	63.5
385.00	1.00			Shale		122.5			13.4						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I.D.O.T. BBS, FOUNDATIONS AND GEOTECHNICAL UNIT

Modified 10/18/2011

SUBSTRUCTURE========== Pier 4
REFERENCE BORING ========== B Bent #9
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV. ========== 449.50 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 448.50 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD Scour
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ======== 443.00 ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 2600 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 35.17 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE ! 3
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 197.15 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 73.93 KIPS

PILE TYPE AND SIZE ========== Steel HP 12 X 63
Plugged Pile Perimeter========== 3.967 FT Unplugged Pile Perimeter========== 5.800 FT.
Plugged Pile End Bearing Area========== 0.983 SQFT. Unplugged Pile End Bearing Area====== 0.108 SQFT.

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req'd Bearing of Bore	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
418 KIPS	418 KIPS	230 KIPS	70 FT

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
442.50	6.50	0.59	8		10.8		17.9	15.8		***16.5***	17	0	0	9	7
440.00	2.50	0.52	4		4.0	7.2	***19.3***	5.9	0.8	22.1	19	0	0	11	10
437.50	2.50	0.33	3		2.6	4.5	***21.0***	3.8	0.5	25.8	21	0	0	12	12
435.00	2.50	0.26	4		2.1	3.6	47.9	3.1	0.4	***31.6***	32	0	0	17	15
432.50	2.50	2.06	19		11.8	28.4	53.7	17.2	3.1	***48.2***	48	0	0	26	17
430.00	2.50	1.63	7		10.1	22.5	***55.7***	14.8	2.5	62.0	56	0	0	31	20
426.40	3.60	1.04	6		10.5	14.3	***76.3***	15.3	1.6	78.5	76	0	0	42	23
424.90	1.50		10	Medium Sand	1.1	24.5	121.5	1.6	2.7	***84.9***	85	0	0	47	25
422.50	2.40		28	Medium Sand	5.0	68.6	119.1	7.3	7.5	***91.3***	91	0	0	50	27
420.00	2.50		25	Sandy Gravel	6.0	61.2	142.2	8.7	6.7	***101.9***	102	0	0	56	30
417.50	2.50		32	Sandy Gravel	8.9	78.4	219.8	13.1	8.6	***122.5***	122	0	0	67	32
415.00	2.50		50	Sandy Gravel	32.4	147.0	***152.9***	47.4	16.1	159.0	153	0	0	84	35
412.50	2.50	3.46	30		16.8	47.7	***153.3***	24.6	5.2	181.9	153	0	0	84	37
409.50	3.00	2.27	26		15.0	31.3	***152.4***	22.0	3.4	202.1	152	0	0	84	40
407.00	2.50	1.11	30		7.7	15.3	***178.3***	11.2	1.7	215.3	178	0	0	98	43
404.50	2.50	2.44	18		13.1	33.5	***191.6***	19.2	3.7	234.5	192	0	0	105	45
402.00	2.50	2.45	15		13.2	33.8	***210.6***	19.3	3.7	254.4	211	0	0	116	48
399.50	2.50	2.87	17		14.7	39.6	***211.8***	21.5	4.3	274.4	212	0	0	116	50
397.90	1.60	1.89	16		9.1	26.0	***226.2***	13.4	2.9	285.8	226	0	0	124	52
394.50	3.40	2.42	52		17.8	33.6	***243.0***	26.0	3.6	311.5	243	0	0	134	55
392.00	2.50	2.38	15		12.9	32.4	***251.8***	18.7	3.5	329.8	252	0	0	139	58
389.50	2.50	2.05	10		11.8	28.4	***273.8***	17.2	3.1	348.1	274	0	0	151	60
387.00	2.50	2.80	11		14.4	38.6	***274.5***	21.1	4.2	367.8	274	0	0	151	63
385.40	1.60	1.80	10		9.3	24.8	***274.5***	13.6	2.7	377.1	274	0	0	151	64
382.90	2.50	1.30	8		8.8	17.9	***279.9***	12.6	2.0	389.4	280	0	0	154	67
380.40	2.50	1.07	10		7.4	14.7	***395.1***	10.9	1.6	412.0	395	0	0	217	69
379.40	1.00			Shale	49.4	122.5	***444.5***	72.3	13.4	484.3	445	0	0	244	70
378.40	1.00			Shale	49.4	122.5	***493.9***	72.3	13.4	556.5	494	0	0	272	71
377.40	1.00			Shale	49.4	122.5	***543.3***	72.3	13.4	628.8	543	0	0	299	72
376.40	1.00			Shale	49.4	122.5	***592.8***	72.3	13.4	701.0	593	0	0	326	73
375.40	1.00			Shale	49.4	122.5	***642.2***	72.3	13.4	773.3	642	0	0	353	73
374.40	1.00			Shale	49.4	122.5	***691.6***	72.3	13.4	845.5	692	0	0	380	74
373.40	1.00			Shale	49.4	122.5	***741.0***	72.3	13.4	917.8	741	0	0	408	75
372.40	1.00			Shale		122.5			13.4						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

IDOT BBS FOUNDATIONS AND GEOTECHNICAL UNIT

Modified 10/18/2011

SUBSTRUCTURE========== Pier 5
REFERENCE BORING ========== 11 Bent #12
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV ========== 451.00 ft
GROUND SURFACE ELEV AGAINST PILE DURING DR 450.00 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef , DD Scour
BOTTOM ELEV OF SCOUR LIQUEF , or DD ======== 446.70 ft
TOP ELEV OF LIQUEF (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 3700 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 35.17 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE = 3
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 280.57 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 105.21 KIPS

PILE TYPE AND SIZE ========== Steel HP 12 X 53
Plugged Pile Perimeter========== 3.967 FT. Unplugged Pile Perimeter========== 5.800 FT
Plugged Pile End Bearing Area========== 0.983 SQFT Unplugged Pile End Bearing Area====== 0.108 SQFT.

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req'd Bearing of Boring	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
418 KIPS	418 KIPS	226 KIPS	54 FT

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF COMPR. STRENGTH (TSF)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
448.20	1.80	1.56	12		7.1		38.3	10.3		***13.7***	14	4	0	4	3
445.70	2.50	2.27	14		12.5	31.3	54.2	18.3	3.4	***32.4***	32	4	0	14	5
443.20	2.50	2.51	15		13.4	34.6	66.2	19.6	3.8	***51.8***	52	4	0	25	8
440.70	2.50	2.41	13		13.0	33.2	71.6	19.1	3.6	***70.1***	70	4	0	35	10
438.20	2.50	1.96	13		11.0	25.8	***71.4***	16.1	2.8	84.9	71	4	0	35	13
435.70	2.50	1.04	8		7.3	14.3	***78.6***	10.6	1.6	95.6	79	4	0	39	15
433.50	2.20	1.04	5		6.4	14.3	***73.1***	9.4	1.5	103.6	73	4	0	36	18
430.70	2.80		1	Medium Sand	0.2	2.4	***92.9***	0.3	0.3	106.1	93	4	0	47	20
428.20	2.50		9	Sandy Gravel	2.1	22.0	136.7	3.0	2.4	***113.7***	114	4	0	59	23
425.70	2.50		25	Sandy Gravel	6.3	63.7	162.6	9.2	7.0	***125.0***	125	4	0	65	25
423.20	2.50		34	Sandy Gravel	10.0	83.3	***125.5***	14.6	9.1	134.5	126	4	0	65	28
420.70	2.50	2.83	34		13.8	36.2	***123.8***	20.2	4.0	153.1	124	4	0	64	30
418.20	2.50	1.50	12		9.5	20.7	***150.8***	13.9	2.3	168.9	151	4	0	79	33
415.70	2.50	2.77	24		14.3	38.2	***153.4***	21.0	4.2	189.7	163	4	0	86	35
413.20	2.50	2.64	20		13.9	36.4	***166.0***	20.3	4.0	208.7	166	4	0	87	38
410.70	2.50	1.82	14		10.9	25.1	***156.3***	15.9	2.7	225.5	186	4	0	98	40
408.20	2.50	2.51	12		13.4	34.6	***170.5***	19.6	3.8	242.0	171	4	0	90	43
405.70	2.50	0.39	12		3.1	5.4	***195.6***	4.5	0.8	248.9	196	4	0	104	45
403.20	2.50	1.99	10		11.5	27.4	***214.2***	16.8	3.0	268.5	214	4	0	114	48
400.70	2.50	2.60	30		13.4	34.5	***227.7***	19.5	3.8	286.1	228	4	0	121	50
398.20	2.50	2.51	13		13.4	34.6	***240.1***	19.6	3.8	305.6	240	4	0	128	53
395.70	2.50	2.44	11		13.1	33.6	***240.3***	19.2	3.7	323.4	240	4	0	128	55
394.00	1.70	1.50	10		8.5	20.7	***251.2***	9.5	2.3	333.3	251	4	0	134	57
391.50	2.50	1.82	10		10.9	25.1	***298.2***	15.9	2.7	353.2	298	4	0	160	60
389.00	2.50		35	Sandy Gravel	8.0	61.2	***365.4***	8.7	8.7	368.6	365	4	0	197	62
388.00	1.00			Shale	49.4	122.5	***414.8***	72.3	13.4	440.9	415	4	0	224	63
387.00	1.00			Shale	49.4	122.5	***464.2***	72.3	13.4	513.1	464	4	0	251	64
386.00	1.00			Shale	49.4	122.5	***513.7***	72.3	13.4	585.4	514	4	0	279	65
385.00	1.00			Shale	49.4	122.5	***563.1***	72.3	13.4	657.6	563	4	0	306	66
384.00	1.00			Shale	49.4	122.5	***612.5***	72.3	13.4	729.9	613	4	0	333	67
383.00	1.00			Shale	49.4	122.5	***661.9***	72.3	13.4	802.1	662	4	0	360	68
382.00	1.00			Shale	49.4	122.5	***711.3***	72.3	13.4	874.4	711	4	0	387	69
381.00	1.00			Shale	49.4	122.5	***760.7***	72.3	13.4	946.6	761	4	0	415	70
380.00	1.00			Shale		122.5			13.4						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I D O T BBS FOUNDATIONS AND GEOTECHNICAL UNIT

Modified 10/18/2011

SUBSTRUCTURE========== Pier 6
REFERENCE BORING ========== 14 Bent #15
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV ========== 451.00 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 450.00 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD Scour
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ======== 446.80 ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 2600 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 35.17 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE = 3
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 197.15 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 73.93 KIPS

PILE TYPE AND SIZE ========== Steel HP 12 X 53
Plugged Pile Penmeter========== 3.967 FT. Unplugged Pile Perimeter========== 5.800 FT.
Plugged Pile End Bearing Area========== 0.983 SQFT. Unplugged Pile End Bearing Area===== 0.108 SQFT.

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req'd Bearing of Soil	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length of Boring
418 KIPS	418 KIPS	227 KIPS	66 FT

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED			NOMINAL UNPLUG'D			NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
					SIDE RESIST. (KIPS)	END BRG. RESIST. (KIPS)	TOTAL RESIST. (KIPS)	SIDE RESIST. (KIPS)	END BRG. RESIST. (KIPS)	TOTAL RESIST. (KIPS)					
448.20	1.80	0.98	7		5.0		17.5	7.3		***8.7***	9	3	0	2	3
445.70	2.50	0.91	11		6.5	12.5	19.6	9.5	1.4	***17.7***	18	3	0	7	5
442.70	3.00	0.59	5		5.4	8.1	***20.9***	7.9	0.9	25.2	21	3	0	9	8
440.20	2.50	0.29	4		2.3	4.0	***24.6***	3.4	0.4	28.7	25	3	0	11	11
437.70	2.50	0.39	4		3.1	5.4	***33.5***	4.5	0.6	33.8	33	3	0	16	13
435.20	2.50	0.81	8		5.9	11.2	***39.4***	8.7	1.2	42.6	39	3	0	19	16
432.70	2.50	0.81	8		5.9	11.2	***41.7***	8.7	1.2	50.7	42	3	0	20	18
430.20	2.50	0.55	3		4.2	7.6	***47.7***	6.2	0.8	57.1	48	3	0	24	21
427.70	2.50	0.68	2		5.1	9.4	***47.4***	7.4	1.0	64.0	47	3	0	23	23
425.20	2.50	0.29	2		2.3	4.0	***50.3***	3.4	0.4	67.4	50	3	0	25	26
421.90	3.30	0.33	2		3.5	4.5	***88.4***	5.1	0.5	***76.3***	76	3	0	39	29
420.20	1.70		15	Sandy Gravel	2.5	39.2	125.3	3.7	4.3	***83.7***	84	3	0	43	31
417.70	2.50		30	Sandy Gravel	8.0	73.5	***79.4***	11.6	8.0	89.5	79	3	0	41	33
414.40	3.30	1.43	39		12.2	19.7	***97.0***	17.8	2.2	107.9	97	3	0	51	37
412.40	2.00	1.82	15		8.7	25.1	***101.3***	12.7	2.7	120.1	101	3	0	53	39
410.20	2.20	1.50	20		8.4	20.7	***109.8***	12.3	2.3	132.4	110	3	0	58	41
407.70	2.50	1.50	16		9.5	20.7	***115.6***	13.9	2.3	145.9	116	3	0	61	43
405.20	2.50	1.24	14		8.3	17.1	***131.5***	12.2	1.9	158.9	132	3	0	70	46
402.70	2.50	1.79	13		10.7	24.7	***158.1***	15.7	2.7	176.4	158	3	0	84	48
400.20	2.50	2.94	40		15.0	49.5	***150.9***	21.9	4.4	196.9	151	3	0	86	51
397.70	2.50	2.06	20		11.9	28.4	***166.8***	17.2	3.1	213.5	167	3	0	89	53
395.20	2.50	1.83	12		10.1	22.5	***166.1***	14.8	2.5	227.0	166	3	0	89	56
392.70	2.50	0.85	7		6.2	11.7	***171.7***	9.0	1.3	236.0	172	3	0	92	58
389.70	3.00	0.81	11		7.1	11.2	273.0	10.4	1.2	***256.7***	257	3	0	138	61
387.70	2.00		43	Sandy Gravel	13.3	105.3	303.5	19.5	11.5	***278.1***	278	3	0	150	63
386.70	1.00			Shale	49.4	122.5	352.9	72.3	13.4	***350.3***	350	3	0	190	64.3
385.70	1.00			Shale	49.4	122.5	***402.3***	72.3	13.4	422.6	402	3	0	219	65.3
384.70	1.00			Shale	49.4	122.5	***451.7***	72.3	13.4	494.8	452	3	0	246	66.3
383.70	1.00			Shale	49.4	122.5	***501.2***	72.3	13.4	567.1	501	3	0	273	67.3
382.70	1.00			Shale	49.4	122.5	***550.6***	72.3	13.4	639.3	551	3	0	300	68.3
381.70	1.00			Shale	49.4	122.5	***600.0***	72.3	13.4	711.6	600	3	0	327	69.3
380.70	1.00			Shale	49.4	122.5	***649.4***	72.3	13.4	783.8	649	3	0	354	70.3
379.70	1.00			Shale	49.4	122.5	***698.8***	72.3	13.4	856.1	699	3	0	382	71.3
378.70	1.00			Shale	49.4	122.5	***748.2***	72.3	13.4	928.3	748	3	0	409	72.3
377.70	1.00			Shale		122.5			13.4						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT

Modified 10/18/2011

SUBSTRUCTURE========== Pier 7
REFERENCE BORING ========== 18 Pier #1
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV ========== 446.00 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 446.00 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD Scour
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ======== 445.00 ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 3700 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 35.17 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE = 3
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 280.57 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 105.21 KIPS

PILE TYPE AND SIZE ========== Steel HP 12 X 53
Plugged Pile Penmeter========== 3.967 FT. Unplugged Pile Penmeter========== 5.800 FT.
Plugged Pile End Bearing Area========== 0.983 SQFT. Unplugged Pile End Bearing Area===== 0.108 SQFT

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req'd Bearing of Boring	Maximum Factored Resistance Available in Boring	Maximum Pile Drivable Length in Boring
418 KIPS	418 KIPS	230 KIPS	53 FT

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
443.10	1.90	0.07	2		0.4		2.6	0.6		***0.9***	1	0	0	0	3
440.60	2.50	0.16	2		1.3	2.2	6.3	1.9	0.2	***3.1***	3	0	0	2	5
438.10	2.50	0.33	3		2.6	4.5	10.3	3.8	0.6	***7.1***	7	0	0	4	8
435.60	2.50	0.43	3		3.4	5.9	***11.3***	4.9	0.6	11.7	11	0	0	6	10
432.40	3.20	0.25	4		2.7	3.5	26.6	3.9	0.4	***17.0***	17	0	0	9	14
430.60	1.80	1.17	4		5.7	16.1	75.0	8.4	1.5	***30.1***	30	0	0	17	15
428.10	2.50		24	Clean Coarse Sand	4.8	58.8	118.9	7.0	6.4	***41.3***	41	0	0	23	18
425.60	2.50		40	Sandy Gravel	13.9	98.0	127.9	20.3	10.7	***51.1***	51	0	0	34	20
423.10	2.50		38	Sandy Gravel	12.5	93.1	184.5	18.3	10.2	***84.2***	84	0	0	46	23
420.60	2.50		56	Sandy Gravel	28.7	137.2	203.4	42.0	15.0	***125.1***	125	0	0	69	25
418.10	2.50		52	Sandy Gravel	25.0	127.4	***127.3***	36.6	13.9	150.6	127	0	0	70	28
415.60	2.50	1.90	40		11.2	26.2	***134.3***	16.3	2.9	166.5	134	0	0	74	30
413.10	2.50	1.60	18		10.0	22.0	***140.4***	14.6	2.4	180.7	140	0	0	77	33
410.60	2.50	1.32	30		8.7	18.2	***152.3***	12.8	2.0	194.9	162	0	0	89	35
408.10	2.50	2.28	20		12.6	31.4	***164.6***	18.4	3.4	212.1	165	0	0	91	38
405.60	2.50	1.53	14		9.7	21.1	***185.5***	14.1	2.3	227.6	187	0	0	103	40
403.10	2.50	2.42	21		13.1	33.3	***189.7***	19.1	3.6	245.8	190	0	0	104	43
400.60	2.50	1.70	10		10.4	23.4	***200.4***	15.2	2.6	260.8	200	0	0	110	45
398.10	2.50	1.73	10		10.5	23.8	***207.8***	15.4	2.6	275.9	208	0	0	114	48
396.40	1.70	1.50	6		6.5	20.7	316.1	9.5	2.3	***296.5***	296	0	0	163	50
395.40	1.00			Shale	49.4	122.5	***365.5***	72.3	13.4	368.7	366	0	0	201	50.6
394.40	1.00			Shale	49.4	122.5	***414.9***	72.3	13.4	441.0	415	0	0	228	51.6
393.40	1.00			Shale	49.4	122.5	***464.3***	72.3	13.4	513.2	464	0	0	255	52.6
392.40	1.00			Shale	49.4	122.5	***513.7***	72.3	13.4	585.5	514	0	0	283	53.6
391.40	1.00			Shale	49.4	122.5	***563.2***	72.3	13.4	657.7	563	0	0	310	54.6
390.40	1.00			Shale	49.4	122.5	***612.6***	72.3	13.4	730.0	613	0	0	337	55.6
389.40	1.00			Shale	49.4	122.5	***662.0***	72.3	13.4	802.2	662	0	0	364	56.6
388.40	1.00			Shale	49.4	122.5	***711.4***	72.3	13.4	874.5	711	0	0	391	57.6
387.40	1.00			Shale	49.4	122.5	***760.8***	72.3	13.4	946.7	761	0	0	418	58.6
386.40	1.00			Shale		122.5			13.4						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I D O T BBS FOUNDATIONS AND GEOTECHNICAL UNIT

Modified 10/18/2011

SUBSTRUCTURE========== Pier 8
REFERENCE BORING ========== 19 Pier #2
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV ========== 446.00 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 445.00 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD Scour
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ======== 449.00 ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 3700 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 35.17 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE : 3
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 280.57 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 105.21 KIPS

PILE TYPE AND SIZE ========== Steel HP 12 X 53
Plugged Pile Perimeter========== 3.967 FT Unplugged Pile Perimeter========== 5.800 FT
Plugged Pile End Bearing Area========== 0.983 SQFT. Unplugged Pile End Bearing Area===== 0.108 SQFT

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req'd Bearing of Boring	Maximum Factored Resistance Available in Boring	Maximum Pile Drivable Length in Boring
418 KIPS	418 KIPS	230 KIPS	55 FT

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
444.90	0.10	0.29	5		0.1		1.5	0.1		***0.3***	0	0	0	0	1
442.40	2.50	0.10	2		0.8	1.4	1.9	1.2	0.2	***1.5***	1	0	0	1	4
439.60	2.80	0.07	2		0.7	1.0	30.6	1.0	0.1	***5.5***	5	0	0	3	6
437.10	2.50		15	Clean Coarse Sand	3.0	29.0	26.6	4.3	3.2	***9.0***	9	0	0	5	9
434.60	2.50		9	Clean Coarse Sand	1.8	22.0	35.7	2.6	2.4	***12.5***	12	0	0	7	11
432.10	2.50		12	Clean Coarse Sand	2.4	29.4	13.6	3.5	3.2	***13.2***	13	0	0	7	14
429.60	2.50		2	Sandy Gravel	0.5	4.9	***9.6***	0.7	0.5	13.4	10	0	0	5	16
428.40	1.20	0.03	22		0.1	0.4	75.4	0.2	0.0	***20.8***	21	0	0	11	18
424.60	3.80		27	Sandy Gravel	10.2	66.1	***24.8***	14.9	7.2	29.0	25	0	0	14	21
422.10	2.50	0.39	45		3.1	5.4	47.7	4.5	0.6	***35.7***	36	0	0	20	24
419.60	2.50	1.83	60		10.9	25.2	66.8	15.9	2.8	***52.5***	52	0	0	29	26
417.10	2.50	2.42	60		13.1	33.3	***53.6***	19.1	3.6	69.8	64	0	0	35	29
414.60	2.50	1.24	11		8.3	17.1	***70.9***	12.2	1.9	81.9	71	0	0	39	31
412.10	2.50	1.17	14		9.0	16.1	***94.6***	11.7	1.8	95.3	95	0	0	52	34
409.60	2.50	2.31	20		12.7	11.8	***96.1***	18.5	3.5	112.6	96	0	0	53	36
407.10	2.50	1.50	18		9.5	20.7	***115.8***	13.9	2.3	127.6	116	0	0	64	39
404.60	2.50	2.22	30		12.3	30.5	***116.2***	18.0	3.3	144.4	116	0	0	64	41
402.10	2.50	1.37	7		9.0	18.3	***130.5***	13.1	2.1	158.0	131	0	0	72	44
399.60	2.50	1.76	11		10.6	24.3	***137.6***	15.5	2.7	173.2	138	0	0	76	46
397.10	2.50	1.50	7		9.5	20.7	***135.8***	13.9	2.3	185.9	136	0	0	75	49
395.40	1.70	0.66	8		3.5	9.4	252.4	5.1	1.0	***203.3***	203	0	0	112	51
394.40	1.00			Shale	49.4	122.5	301.8	72.3	13.4	***275.6***	275	0	0	152	51.6
393.40	1.00			Shale	49.4	122.5	351.2	72.3	13.4	***347.8***	348	0	0	191	52.6
392.40	1.00			Shale	49.4	122.5	***400.6***	72.3	13.4	420.1	401	0	0	220	53.6
391.40	1.00			Shale	49.4	122.5	***450.0***	72.3	13.4	492.3	492	0	0	270	54.6
390.40	1.00			Shale	49.4	122.5	***499.5***	72.3	13.4	564.6	565	0	0	310	55.6
389.40	1.00			Shale	49.4	122.5	***548.9***	72.3	13.4	636.9	637	0	0	350	56.6
388.40	1.00			Shale	49.4	122.5	***598.3***	72.3	13.4	709.1	709	0	0	389	57.6
387.40	1.00			Shale	49.4	122.5	***647.7***	72.3	13.4	781.4	781	0	0	429	58.6
386.40	1.00			Shale	49.4	122.5	***697.1***	72.3	13.4	853.6	854	0	0	469	59.6
385.40	1.00			Shale	49.4	122.5	***746.5***	72.3	13.4	925.9	926	0	0	509	60.6
384.40	1.00			Shale		122.5			13.4						

IDOT STATIC METHOD OF ESTIMATING PILE LENGTH

I.D.O.T. BBS FOUNDATIONS AND GEOTECHNICAL UNIT

Modified 10/18/2011

SUBSTRUCTURE========== E Abut
REFERENCE BORING ========== E Abut
LRFD or ASD or SEISMIC ========== LRFD
PILE CUTOFF ELEV. ========== 458.40 ft
GROUND SURFACE ELEV. AGAINST PILE DURING DR 457.40 ft
GEOTECHNICAL LOSS TYPE (None, Scour, Liquef., DD None
BOTTOM ELEV. OF SCOUR, LIQUEF., or DD ========== ft
TOP ELEV. OF LIQUEF. (so layers above apply DD) ========== ft

TOTAL FACTORED SUBSTRUCTURE LOAD ======== 1300 kips
TOTAL LENGTH OF SUBSTRUCTURE (along skew)=== 35.17 ft
NUMBER OF ROWS OF PILES PER SUBSTRUCTURE : 2
Approx. Factored Loading Applied per pile at 8 ft. Cts ===== 147.87 KIPS
Approx. Factored Loading Applied per pile at 3 ft. Cts ===== 55.45 KIPS

PILE TYPE AND SIZE ========== Steel HP 12 X 53
Plugged Pile Perimeter========== 3.987 FT. Unplugged Pile Perimeter========== 5.800 FT.
Plugged Pile End Bearing Area========== 0.983 SQFT Unplugged Pile End Bearing Area===== 0.108 SQFT.

MAX. REQUIRED BEARING & RESISTANCE for Selected Pile, Soil Profile, & Losses

Maximum Nominal Req'd Bearing of Pile	Maximum Nominal Req'd Bearing of Boring	Maximum Factored Resistance Available in Boring	Maximum Pile Driveable Length in Boring
418 KIPS	418 KIPS	230 KIPS	61 FT.

BOT. OF LAYER ELEV. (FT.)	LAYER THICK. (FT.)	UNCONF. COMPR. STRENGTH (TSF.)	S.P.T. N VALUE (BLOWS)	GRANULAR OR ROCK LAYER DESCRIPTION	NOMINAL PLUGGED SIDE RESIST. (KIPS)	NOMINAL PLUGGED END BRG. RESIST. (KIPS)	NOMINAL PLUGGED TOTAL RESIST. (KIPS)	NOMINAL UNPLUG'D SIDE RESIST. (KIPS)	NOMINAL UNPLUG'D END BRG. RESIST. (KIPS)	NOMINAL UNPLUG'D TOTAL RESIST. (KIPS)	NOMINAL REQ'D BEARING (KIPS)	FACTORED GEOTECH. LOSS FROM SCOUR or DD (KIPS)	FACTORED GEOTECH. LOSS LOAD FROM DD (KIPS)	FACTORED RESISTANCE AVAILABLE (KIPS)	ESTIMATED PILE LENGTH (FT.)
458.70	0.70	1.98	8		3.2		8.8	4.7		***5.3***	5	0	0	3	2
454.20	2.50	0.09	4		3.1	5.4	***9.1***	4.5	0.8	9.5	9	0	0	5	4
451.70	2.50		2	Very Fine Silty Sand	0.3	2.8	12.1	0.5	0.3	***10.2***	10	0	0	6	7
449.20	2.50		3	Very Fine Silty Sand	0.5	5.5	10.7	0.7	0.6	***10.7***	11	0	0	6	9
446.70	2.50		2	Very Fine Silty Sand	0.3	3.7	***9.2***	0.5	0.4	10.9	9	0	0	5	12
444.20	2.50		1	Very Fine Silty Sand	0.2	1.8	***9.3***	0.2	0.2	11.2	9	0	0	5	14
441.70	2.50		1	Very Fine Silty Sand	0.2	1.8	15.0	0.2	0.2	***12.0***	12	0	0	7	17
439.20	2.50		4	Very Fine Silty Sand	0.6	7.3	13.8	0.9	0.8	***12.7***	13	0	0	7	19
436.60	2.60		3	Very Fine Silty Sand	0.5	5.5	35.7	0.7	0.6	***15.8***	16	0	0	9	22
434.20	2.40		11	Medium Sand	1.9	26.9	***13.4***	2.8	2.9	15.9	13	0	0	7	24
431.60	2.60	0.20	9		1.7	2.8	110.4	2.5	0.3	***28.8***	29	0	0	16	27
429.10	2.50		40	Sandy Gravel	13.9	98.0	131.6	20.3	10.7	***49.9***	50	0	0	27	29
426.60	2.50		43	Sandy Gravel	16.7	105.3	121.3	24.4	11.5	***71.4***	71	0	0	39	32
424.10	2.50		32	Sandy Gravel	8.9	78.4	137.6	13.1	9.6	***85.2***	85	0	0	47	34
422.20	1.90		35	Sandy Gravel	8.1	85.7	***86.8***	11.8	9.4	90.5	87	0	0	48	36
419.20	3.00	1.94	32		13.6	26.7	***105.5***	19.9	2.9	111.0	105	0	0	58	39
416.60	2.60	7.32	50		13.2	32.0	***108.1***	19.3	3.5	129.1	108	0	0	59	42
414.10	2.50	1.55	45		9.8	21.4	***133.8***	14.3	2.3	145.1	134	0	0	74	44
411.60	2.50	2.71	35		14.1	37.3	***140.9***	20.6	4.1	165.0	141	0	0	77	47
409.10	2.50	2.20	28		12.3	30.3	***153.7***	17.9	3.3	183.0	154	0	0	85	49
406.70	2.40	2.24	27		11.9	30.9	***170.2***	17.4	3.4	200.9	170	0	0	94	52
404.70	2.00	2.57	31		10.9	35.4	***185.8***	15.9	3.9	215.2	186	0	0	91	54
402.40	2.30	1.46	15		8.6	20.1	***174.4***	12.6	2.2	227.8	174	0	0	96	56
400.10	2.30	1.48	15		8.6	20.1	285.4	12.6	2.2	***251.6***	252	0	0	138	58
399.10	1.00			Shale	49.4	122.5	334.8	72.3	13.4	***323.8***	324	0	0	178	59.3
398.10	1.00			Shale	49.4	122.5	***384.2***	72.3	13.4	396.1	384	0	0	211	60.3
397.10	1.00			Shale	49.4	122.5	***433.6***	72.3	13.4	468.3	434	0	0	238	61.3
396.10	1.00			Shale	49.4	122.5	***483.0***	72.3	13.4	540.6	483	0	0	264	62.3
395.10	1.00			Shale	49.4	122.5	***532.5***	72.3	13.4	612.8	532	0	0	293	63.3
394.10	1.00			Shale	49.4	122.5	***581.9***	72.3	13.4	685.1	582	0	0	320	64.3
393.10	1.00			Shale	49.4	122.5	***631.3***	72.3	13.4	757.3	631	0	0	347	65.3
392.10	1.00			Shale	49.4	122.5	***680.7***	72.3	13.4	829.6	681	0	0	374	66.3
391.10	1.00			Shale	49.4	122.5	***730.1***	72.3	13.4	901.8	730	0	0	402	67.3
390.10	1.00			Shale	49.4	122.5	***779.5***	72.3	13.4	974.1	780	0	0	429	68.3
389.10	1.00			Shale		122.5			13.4						

Hutchison Engineering, Inc.

Since 1945
Jacksonville • Shorewood • Peoria

To: Files Job No. 3515

From: Jim Hamilton

Subject: FAP 793 (IL 143) over Shoal Creek
Bond County
SN 003-0062
P-98-011-13
PTB 169/035

SUBSTRUCTURE LOADING
SGR REPORT

Based on the approved BCR and the approved Hydraulic Report, the existing bridge carrying IL 143 over Shoal Creek will be replaced with a new structure. Traffic will be detoured during the construction. The estimated structure length is 1352'-0" back to back abutments and 35'-2" out to out deck with 0 degree skew. The superstructure will be a nine span continuous steel plate girder (54" web) and 8" slab with spans of 130'-155'-155'-155'-155'-155'-155'-155'-130'. The design loading is HL-93 with 50 psf for future wearing surface. Bridge length and span lengths are subject to refinement during the final TSL preparation.

The substructure loadings are factored using LRFD. Maximum load factors are applied. The estimated dead load of the abutments, piers and approach slab are included in the calculated loadings.

The abutments are pile supported stub abutments. Piers 1, 2, 3, 4 and 6 are encased pile bent piers, and piers 5, 7 and 8 are solid wall piers with cap and pile supported footing.

Abutments	Piers 1-4 & 6	Piers 5, 7 & 8
Str I	Str I	Str I
P = 1,300k	P = 2,600k	P = 3,700k
V = 65k	V = 110k	V = 165k
	Str III	Str III
	P = 1,850k	P = 2,950k
	V = 105k	V = 230k
	Str IV	Str IV
	P = 2,425k	P = 3,550k
	V = 95k	V = 180k

1801 West Lafayette Ave. • P.O. Box 820 • Jacksonville, Illinois 62651-0820
Phone: (217) 245-7164 • FAX: (217) 243-0468
www.hutchisoneng.com • info@hutchisoneng.com