

**GEOLOGY OF THE SITE**

THE STRUCTURE SITE IS LOCATED ON THE VALLEY WALL OF MILL CREEK, IN AN AREA WHERE DEEP LACUSTRINE AND GLACIAL DEPOSITS OVERLIE SANDSTONE BEDROCK, OF MISSISSIPPIAN AGE.

**EXPLORATION**

THE EXPLORATION CONSISTED OF TWO DRIVE SAMPLE BORINGS AND FOUR DRIVE ROD PENETRATION TESTS, MADE BETWEEN APRIL 23 AND MAY 1, 1968.

**INVESTIGATIONAL FINDINGS**

BORINGS DISCLOSED STIFF TO VERY STIFF CLAYS AND DENSE TO VERY DENSE SANDS, SILTS, GRAVELS AND BOULDERS TO 60 TO 75-FOOT DEPTHS, ELEVATIONS 842 TO 831 FEET, WHERE THE BORINGS WERE TERMINATED AFTER PENETRATING AT LEAST 30 FEET OF MATERIAL REQUIRING IN EXCESS OF 30 BLOWS PER FOOT IN THE STANDARD PENETRATION TEST.

THE ROD SOUNDINGS ENCOUNTERED INCREASING RESISTANCE TO PENETRATION WITH INCREASING DEPTH AND WERE TERMINATED DUE TO NEAR-REFUSAL TO PENETRATION AT 15 TO 28-FOOT DEPTHS, ELEVATIONS 887 TO 877 FEET CONSIDERED TO BE IN DENSE SILTS, AS REVEALED BY THE BORINGS.

NO FREE WATER WAS OBSERVED IN ANY OF THE ROD SOUNDING HOLES.

NO TEST PENETRATED TO BEDROCK.

- ⊕ Auger Boring Location - Plan View.
- ⊙ Press and / or Drive Sample and / or Core Boring Location - Plan View.
- Drive Rod Penetration Resistance Sounding Location - Plan View.
- ▬ Capped Pile
- ▬ Footing
- ▬ Footing on Pile
- TR Top of Rock

**LEGEND**

- H Horizontal Bar on Boring Log Indicates the Depth the Sample Was Taken.
- X/Y Figures Beside the Boring Log in Profile Indicate the Number of Blows for Standard Penetration Test.  
X = Number of Blows for First 6 inches.  
Y = Number of Blows for Second 6 inches.
- Drive Rod Penetration Resistance Sounding Log - Profile
- Casing
- Resistance "R" < 10,000 lbs.
- Resistance "R" > 10,000 lbs.
- Z Indicates Final Measurement of Penetration, in Inches.
- W — Indicates Free Water Elevation.
- ▽ — Indicates Static Water Elevation.

**GENERAL INFORMATION**

**Drive Rod Penetration Sounding Tests**

Drive rod penetration resistance tests constitute driving a 1.315-inch diameter steel rod, with a 45° cone point, into the ground, using a 122-pound drop-hammer with a free fall of five feet. At one or two-foot depth intervals, a measurement is taken to determine the amount of penetration achieved in three hammer drops. This reading is converted to an empirical value for capacity "R", in thousands of pounds (which is a measure of both the point resistance and frictional resistance on the rod), by using charts prepared by the Ohio Department of Highways, Bureau of Bridges, on the basis of correlation study of rod penetration with past performance of pile driving. For interpretation, a graph is prepared by plotting the value "R" against the depth at which the reading was taken, and connecting the plotted points. The curve so obtained reflects the density of subsurface materials in a manner that can be readily compared with data from similar tests at other locations on the structure site. From this comparison, the overall uniformity of subsurface condition may be evaluated.

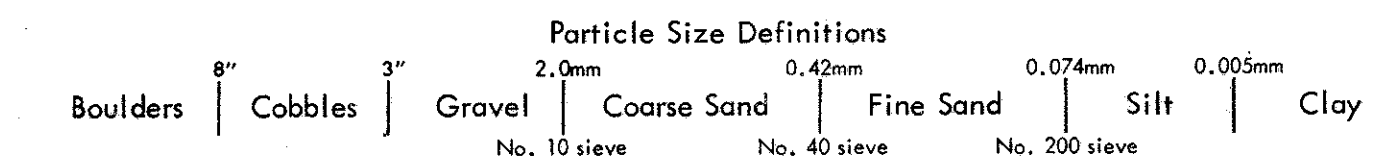
**Drive Sample Borings - Drive-Press Sample Borings**

Drive sample borings are made by means of a rotary-type drill rig, employing a 2" O.D., 1-3/8" I.D. sampler, at 2-1/2 and / or 5-foot depth intervals, driven by means of a 140 - pound drop-hammer with a free fall of 30 inches. The number of blows required to drive the sampler 12 inches is considered the standard penetration test.

Drive-press sample borings are made by means of a rotary-type drill rig, employing a 2" O.D., 1-3/8" I.D. drive sampler, and 3" O.D. thin-wall press sampler. The press sampler is advanced by continuous uniform pressure, applied by the drill rig.

The boring log sheets show a graphic plot of the information obtained, including depth and elevation of the sample, number of blows for the standard penetration tests in two 6-inch increments, depth of press samples, field sample number, sample description - based on laboratory tests and the Casagrande AC classification system - and gradation, plasticity, and moisture content determinations. Results of strength and consolidation testing, if performed, appear on separate enclosures.

At depths where materials are bouldery or gravelly to the extent that the sampler can not be driven, a wash sample is procured for visual classification, in order to determine the general character of the material. These samples are not considered sufficiently representative to warrant laboratory testing.



**LOG OF BORING**  
 Date Started 4-30-68 Sampler Type SS Dia. 1 3/8" Water Elev. \_\_\_\_\_  
 Date Completed 5-1-68 Casing Length \_\_\_\_\_ Dia. \_\_\_\_\_  
 Boring No. B-1 Station & Offset 67+78, 20' Rt. (Rear Abutment) Surface Elev. 906.2'

Elev.	Depth	Std. Pen. (N)	Loss	Description	Sample No.	Physical Characteristics										SHTL Class.		
						% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.					
906.2	0																	
901.2	5	9/14		Brownish-Gray Sandy Silt	1	10	6	12	28	44	28	9	15	A-4a				
896.2	10	7/12		Gray Silty Clay	2	0	3	7	14	76	40	18	20	A-6b				
891.2	15	9/16		Gray Silty Clay	3	0	0	1	13	86	45	18	24	A-7-6				
886.2	20	13/23		Gray Clayey Silt	4	0	2	6	24	68	30	9	22	A-4a				
881.2	25	4/6		Gray Silty Clay	5	0	0	0	9	91	44	18	21	A-7-6				
876.2	30	4/6		Gray Silty Clay	6	0	0	0	9	91	44	18	32	A-7-6				
873.7	32	5/7		Gray Silt and Clay	7	0	0	1	17	82	37	13	27	A-6a				
871.2	34	4/7		Gray Silt and Clay	8	0	1	1	13	85	37	12	32	A-6a				
868.7	36	5/8		Gray Silt and Clay	9	0	0	0	11	89	40	14	34	A-6a				
866.2	40	7/11		Gray Silt and Clay	10	0	1	2	26	71	31	11	28	A-6a				
863.7	44	26/44		Gray Silty Gravelly Sand	11	31	15	22	13	19	NP	NP	12	A-2-4				
861.2	46	22/35		Gray Silty Gravelly Sand	12	22	23	19	17	19	22	3	11	A-4a				
858.7	48	50* (0.7')		Gray Sandy Silt	13	0	4	25	49	22	NP	NP	17	A-4a				
856.2	50	24/37		Gray Silt	14	0	2	5	46	47	26	6	16	A-4a				
851.2	54	50* (0.6')		Gray Gravelly Sandy Silt	15	21	12	15	28	24	NP	NP	14	A-4a				
846.2	60	50* (0.4')		Brown Silty Gravelly Sand with Boulders	16	33	23	20	24	-	NP	NP	6	A-1-b				
841.2	64	50* (0.4')		Gray Silty Sand	17	7	40	30	23	-	NP	NP	15	A-3a				
836.2	70	50*		Gray Gravelly Sandy Silt	18	24	14	19	22	21	21	4	14	A-4a				
831.2	74	50*		Brown Gravelly Sandy Silt	19	19	12	20	20	NP	NP	12	A-4a					

**SYMBOLS OF ROCK TYPES**

- Coal
- ▨ Weathered Indurated Clay
- ▩ Indurated Clay
- ▧ Weathered Shale
- ▦ Shale
- Boulders

**LOG OF BORING**  
 Date Started 4-25-68 Sampler Type SS Dia. 1 3/8" Water Elev. \_\_\_\_\_  
 Date Completed 4-30-68 Casing Length \_\_\_\_\_ Dia. \_\_\_\_\_  
 Boring No. B-8 Station & Offset 70+43, 10' Lt. (Forward Abutment) Surface Elev. 902.7'

Elev.	Depth	Std. Pen. (N)	Loss	Description	Sample No.	Physical Characteristics										SHTL Class.		
						% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.					
902.7	0																	
897.7	5	5/9		Brownish-Gray Sandy Clay	1	4	5	13	35	43	30	11	22	A-6a				
892.7	10	11/17		Brown Sandy Silt	2	8	9	15	31	37	25	8	14	A-4a				
887.7	15	15/26		Brown Gravelly Sandy Silt	3	22	9	21	27	21	20	5	15	A-4a				
882.7	20	15/28		Gray Silt	4	0	5	12	38	45	28	5	15	A-4a				
877.7	25	5/8		Gray Silty Clay	5	0	3	1	15	81	42	18	33	A-7-6				
872.7	30	7/11		Gray Clayey Silt	6	0	1	1	24	74	34	10	31	A-4a				
870.2	32	32/50		Gray Silt	7	0	0	1	43	56	27	6	23	A-4a				
867.7	34	22/40		Brownish-Gray Sandy Silt	8	9	5	19	48	19	NP	NP	19	A-4a				
865.2	36	50* (0.4')		Brown Silty Gravelly Sand	9	25	21	18	19	17	24	7	14	A-4a				
860.2	42	29/29		Brown Silty Sandy Gravel	10	36	11	16	29	18	24	3	13	A-4a				
857.7	44	15/21		Brownish-Gray Gravelly Sandy Silt	11	25	14	19	22	20	22	3	14	A-4a				
855.2	46	13/16		Brownish-Gray Silty Sand	12	14	23	24	21	18	NP	NP	15	A-4a				
852.7	48	16/21		Brown Sandy Silt	13	7	14	29	33	17	NP	NP	21	A-4a				
847.7	54	17/24		Brown Gravelly Sandy Silt	14	18	20	22	22	18	22	3	15	A-4a				
842.7	58	50*		Gray Weathered Shale (Boulders)	15	V	I	8	U	A	L	18	-					
837.7	62	50* (0.4')		Gray Gravelly Sandy Silt, with Boulders	16	V	I	8	U	A	L	9	-					

NOTE: Information shown by this subsurface investigation was obtained solely for the use in establishing design controls for the project. The State of Ohio does not guarantee the accuracy of this data and it is not to be construed as a part of the plans governing construction of the project.

**OHIO DEPARTMENT OF HIGHWAYS TESTING LABORATORY**  
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**STRUCTURE FOUNDATION INVESTIGATION**  
 BRIDGE NO. CUY-80-LANE OBS (E.B.), OVER RELOCATED Mc CRACKEN ROAD SEC.

CHECKED BY L.N.L. REVIEWED BY G.P.H. DATE 5/23/68