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GEOLOGY OF THE SITE

THE STRUCTURE SITE IS LOCATED ON THE BURIED VALLEY OF MILL CREEK, IN AN AREA WHERE LACUSTRINE, DEEP ALLUVIUM, AND GLACIAL-DERIVED SOILS OVERLIE SANDSTONE BEDROCK, OF THE PENNSYLVANIAN AGE.

EXPLORATION

THE EXPLORATION CONSISTED OF TWO DRIVE SAMPLE BORINGS AND NINE DRIVE ROD PENETRATION TESTS, MADE BETWEEN APRIL 17 AND 25, 1968.

INVESTIGATIONAL FINDINGS

BORINGS ENCOUNTERED UNSTRATIFIED LOOSE TO VERY DENSE SANDY SILTS AND GRAVELS AND SANDS WITH SCATTERED INTERVALS OF BOULDERS. THE BORINGS WERE TERMINATED AT 46 AND 50-FOOT DEPTHS, ELEVATIONS 812 AND 799 FEET, AFTER PENETRATING IN EXCESS OF 25 FEET OF MATERIAL REQUIRING IN EXCESS OF 30 BLOWS PER FOOT IN THE STANDARD PENETRATION TEST.

ROD SOUNDINGS ENCOUNTERED GENERALLY GRADUAL RESISTANCE TO PENETRATION WITH INCREASE IN DEPTH WITH ERRATIC INTERVALS, INDICATIVE OF GRAVELLY ZONES, AND WERE TERMINATED UPON ENCOUNTER WITH REFUSAL TO PENETRATION AT 16 TO 38-FOOT DEPTHS, ELEVATIONS 844 TO 833 FEET, CONSIDERED TO BE ON GRAVELS, AS REVEALED BY THE BORINGS.

FREE WATER WAS OBSERVED IN ROD SOUNDING HOLES NUMBERS 15 AND 17 AT ELEVATIONS 836 AND 834 FEET.

NO TEST PENETRATED TO BEDROCK SURFACE.

- 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
- Top of Rock

LEGEND

- Horizontal Bar on Boring Log Indicates the Depth the Sample Was Taken.
- 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.
- Indicates Final Measurement of Penetration, in Inches.
- Indicates Free Water Elevation.
- Indicates Static Water Elevation.

SYMBOLS OF ROCK TYPES

- Coal
- Weathered Indurated Clay
- Indurated Clay
- Weathered Shale
- Shale
- Boulders
- Weathered Sandstone
- Sandstone
- Leached Dolomite
- Dolomite
- Leached Limestone

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.

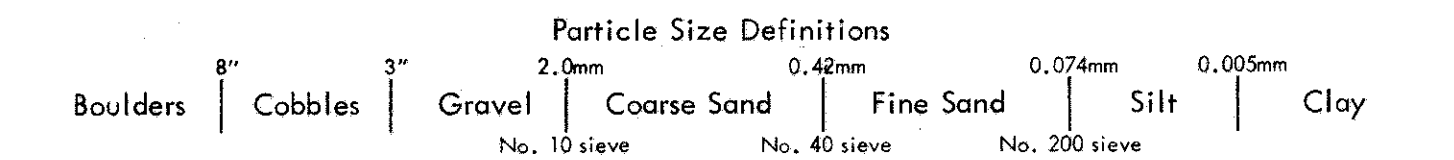
Drive Sample Borings - Drive-Press Sample Borings

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 4-24-68 Sampler Type SS Dia 1 3/8" Water Elev. _____
 Date Completed 4-25-68 Casing Length _____ Dia _____
 Boring No. B-7 Station & Offset 1154+94.73' Lt. (2nd Pier) Surface Elev. 862.1'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics							SHTL Class.			
							% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.		
862.1	0																
857.1	2																
	4																
	6	3/4			Brown Silty Sand	1	10	6	13	35	36	28	8	17	A-4a		
852.1	10	2/3			Brown and Gray Silty Gravelly Silt	2	33	11	16	16	24	29	9	23	A-4a		
849.6	12																
847.1	14	2/1			Brown Silty Sand	3	0	19	24	22	35	27	10	25	A-4a		
844.6	16	3/3			Gray Silty Sandy Gravel	4	48	6	13	14	19	29	9	18	A-2-d		
842.1	18	15/48			Brown Silty Sand	5	12	24	33	19	12	NP	NP	20	A-3a		
839.6	20	17/18			Brown Silty Sandy Gravel with Boulders	6	V	I	S	U	A	L	-	-	12	-	
837.1	22	15/22			Brown Silty Sandy Gravel with Boulders	7	58	13	12	-17	-	NP	NP	14	A-1-b		
834.6	24	28/36			Brown Silty Sand	8	0	1	21	68	10	NP	NP	22	A-4b		
832.1	26	15/45			Brownish-Gray Gravelly Silty Sand	9	19	7	19	32	23	20	5	16	A-4a		
827.1	28	24/46			Gray Silty Sand	10	0	1	48	42	9	NP	NP	22	A-4a		
822.1	30																
817.1	32																
812.1	34																
	36	32/64			Gray Silty Sand	11	0	2	84	-14	-	NP	NP	18	A-3a		
	38																
	40	50* (0.6')			Gray Gravelly Sand	12	33	27	31	-9	-	NP	NP	9	A-1-b		
	42																
	44																
	46	50* (0.7')			Gray Silty Sand	13	3	5	77	-15	-	NP	NP	18	A-3a		
	48																
	50				BOTTOM OF BORING												

LOG OF BORING

Date Started 4-22-68 Sampler Type SS Dia 1 3/8" Water Elev. _____
 Date Completed 4-23-68 Casing Length _____ Dia _____
 Boring No. B-15 Station & Offset 1157+94.73' Rt. (Forward Pier) Surface Elev. 845.3'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics							SHTL Class.			
							% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.		W.C.		
845.3	0																
	2																
	4																
840.3	6	1/3			Brown Silty Sandy Gravel	1	48	15	19	-18	-	NP	NP	14	A-1-b		
	8																
835.3	10	10/12			Brown Silty Sandy Gravel	2	52	16	16	-16	-	NP	NP	12	A-1-b		
832.8	12																
830.3	14	13/20			Brown Silty Sand	3	0	1	1	84	14	NP	NP	24	A-4b		
827.8	16	12/20			Brown Silty Sand	4	11	2	11	65	11	NP	NP	21	A-4b		
825.3	18	18/20			Brown Silty Sand	5	0	1	21	66	12	NP	NP	20	A-4b		
822.8	20	16/22			Brown Silty Sand	6	0	0	36	52	12	NP	NP	20	A-4b		
820.3	22	17/21			Brown Silty Sand	7	0	0	23	64	13	NP	NP	24	A-4b		
817.8	24	19/30			Brown Silty Sand	8	0	0	9	80	11	NP	NP	24	A-4b		
815.3	26	19/24			Brown Silty Sand	9	0	0	14	75	11	NP	NP	24	A-4b		
810.3	28	15/22			Gray Silty Sand	10	0	0	5	83	12	NP	NP	23	A-4b		
	30																
	32																
	34																
	36	19/29			Gray Silty Sand	11	0	1	45	46	8	NP	NP	19	A-4a		
	38																
	40	20/29			Gray Silty Sand	12	0	0	11	78	11	NP	NP	19	A-4b		
	42																
	44																
	46																
800.3	48	21/27			Gray Silty Sand	13	0	1	37	53	9	NP	NP	18	A-4b		
799.3	50				BOTTOM OF BORING												

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.

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STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. CUY-80-2140
OVER PENNA.RR, N&W RR. AND MILL CREEK SEC.

CHECKED BY L.N.L. REVIEWED BY R.D.R. DATE 5/15/68