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GEOLOGY OF THE SITE

THE STRUCTURE SITE IS LOCATED ON A PORTION OF THE GLACIATED LAKE PLAIN, IN AN AREA WHERE SHALLOW GLACIAL TILL OVERLIES SHALE BEDROCK, OF DEVONIAN AGE.

EXPLORATION

THE EXPLORATION CONSISTED OF TWO DRIVE SAMPLE-CORE BORINGS AND THREE DRIVE ROD PENETRATION TESTS, MADE BETWEEN JANUARY 31 AND FEBRUARY 22, 1968.

INVESTIGATIONAL FINDINGS

BORINGS DISCLOSED MEDIUM-DENSE TO VERY DENSE SILTS, SANDS, AND GRAVELS, AND VERY STIFF CLAYS TO BEDROCK SURFACE, ENCOUNTERED AT 38 TO 40-FOOT DEPTHS, ELEVATIONS 722 AND 719 FEET. THE BORINGS WERE TERMINATED AT 45-FOOT DEPTH, ELEVATIONS 715 TO 714 FEET, AFTER PENETRATING 5 TO 7 FEET OF BEDROCK.

THE ROD SOUNDINGS ENCOUNTERED RAPID INCREASE IN PENETRATION RESISTANCE WITH INCREASING DEPTH, AND WERE TERMINATED DUE TO REFUSAL OR NEAR-REFUSAL TO PENETRATION AT 26 TO 28-FOOT DEPTHS, ELEVATIONS 733 TO 732 FEET, CONSIDERED TO BE IN THE VERY DENSE MATERIAL ABOVE BEDROCK SURFACE, AS REVEALED BY THE BORINGS.

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

LEGEND

- 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
- 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.

SYMBOLS OF ROCK TYPES

- Coal
- Weathered Indurated Clay
- Indurated Clay
- Weathered Shale
- Shale
- 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 1-31-68 — Sampler Type SS — Dia. 1 3/8" — Water Elev. —
Date Completed 2-2-68 — Casing: Length 20' — Dia. 3 1/2"
Boring No. B-4 — Station & Offset 10+37, 20' Rt. (Rear Pier) — Surface Elev. 759.0'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
759.0	0														
	2														
	4														
754.0	6	3/3			Brown Sandy Silt	1	2	8	20	49	21	NP	NP	25	A-4a
	8														
749.0	10														
		6/9			Gray Silty Sand	2	10	4	59	9	18	20	3	14	A-3a
	12														
	14														
744.0	16	8/11			Gray Sandy Silt	3	10	6	11	25	48	27	9	16	A-4a
	18														
739.0	20														
		10/16			Gray Sandy Clay	4	11	5	11	25	48	31	13	14	A-6a
736.5	22														
	24	9/14			Gray Gravelly Clay	5	25	5	9	20	41	30	11	15	A-6a
734.0	26	17/27			Gray Sandy Silt	6	6	8	12	33	41	24	6	11	A-4a
731.5	28	50/*			Gray Gravelly Sandy Silt	7	18	10	21	30	21	NP	NP	15	A-4a
729.0	30	50*			Gray Sandy Gravelly Silt	8	30	15	12	20	23	22	6	10	A-4a
	32	(0.4')													
726.5	34	50*			Gray Sandy Gravelly Silt	9	29	15	10	26	20	21	4	11	A-4a
724.0	36	(0.4') 50*			Gray Sandy Gravelly Silt	10	29	13	11	19	28	27	10	11	A-4a
721.5	38	(0.8')													
719.0	40	50* (0.3')			No Sample Recovered-Gray Sandy Gravelly Silt (Driller's Description)		V		I		S		U	A	L
					TOP OF ROCK										
	42														
	44		5.0	0.0	Shale, dark-gray, firm, carbonaceous, fissile, broken and jointed. No Core Loss.										
714.0					BOTTOM OF BORING										

*Refusal

LOG OF BORING

Date Started 2-5-68 — Sampler Type SS — Dia. 1 3/8" — Water Elev. —
Date Completed 2-6-68 — Casing: Length 20' — Dia. 3 1/2"
Boring No. B-9 — Station & Offset 13+06, 20' Lt. (Forward Abutment) — Surface Elev. 759.8'

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	% Agg.	% C.S.	% F.S.	% Silt	% Clay	L.L.	P.I.	W.C.	SHTL Class.
759.8	0														
	2														
	4														
754.8	6	3/3			Brownish-Gray Sandy Silt	1	0	4	29	43	24	NP	NP	29	A-4a
	8														
749.8	10														
		5/9			Gray Clayey Silt	2	0	0	3	41	56	33	9	17	A-4a
	12														
	14														
744.8	16	7/10			Gray Silty Sandy Gravel	3	44	7	9	16	24	-	-	19	-
742.3	18	7/12			Gray Sandy Silt	4	9	8	14	25	44	28	9	15	A-4a
739.8	20	6/9			Gray Sandy Silt	5	12	7	12	23	46	29	9	16	A-4a
737.3	22														
	24	8/12			Gray Sandy Clay	6	6	6	13	34	41	26	13	14	A-6a
734.8	26	10/13			Gray Sandy Silt	7	9	11	14	30	36	23	8	12	A-4a
732.3	28	50*			Gray Gravelly Sandy Silt	8	21	18	15	23	23	22	5	12	A-4a
729.8	30	(0.4') 50*			Gray Silty Gravelly Sand	9	26	20	14	21	19	24	5	8	A-4a
727.3	32	(0.6')													
	34	50* (0.6')			Gray Silty Sandy Gravel	10	31	17	13	16	23	19	4	14	A-4a
724.8	36	50*			Gray Gravelly Sandy Silt	11	29	16	14	16	25	26	8	10	A-4a
722.3		(0.8')			TOP OF ROCK										
	38		2.2	0.3	Shale, dark-gray, hard, carbonaceous, fissile, broken and jointed. Core loss 25.										
	40														
	42														
	44		5.0	0.0											
714.8					BOTTOM OF BORING										

*Refusal

Particle Size Definitions

Boulders	Cobbles	Gravel	Coarse Sand	Fine Sand	Silt	Clay
8"	3"	2.0mm (No. 10 sieve)	0.42mm (No. 40 sieve)	0.074mm (No. 200 sieve)	0.005mm	

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-80-0614
UNDER MASTICK ROAD
SEC. CUY-80-4.84

CHECKED BY	REVIEWED BY	DATE
L.N.L.	R.D.R.	3/4/6