TE - 118
600 - 4 - 66

23
37

CUYAHOGA COUNTY
CUY-480-21.40
1
4

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 PENNSILVANIAN AGE.

EXPLORATION

THE EXPLORATION CONSISTED OF TWO DRIVE SAMPLE BORINGS AND NINE DRIVE ROD PENETRATION TESTS, MADE BETWEEN APRIL 10 AND 23, 1968.

INVESTIGATIONAL FINDINGS

BORINGS ENCOUNTERED UNSTRATIFIED LOOSE TO VERY DENSE SANDY SILTS AND GRAVELS AND SANDS. THE BORINGS WERE TERMINATED AT 45 AND 55-FOOT DEPTHS, ELEVATIONS 802 AND 798 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 GENERALLY PENETRATED TO GREATER DEPTHS THAN THE DRIVE SAMPLE BORINGS AND ENCOUNTERED GENERALLY LOW RESISTANCE TO PENETRATION WITH INCREASE IN DEPTH WITH ERRATIC INTERVALS, INDICATIVE OF GRAVELLY ZONES, AND WERE TERMINATED UPON ENCOUNTER WITH REFUSAL TO PENETRATION, AT 36 TO 110-FOOT DEPTHS, ELEVATIONS 817 TO 738 FEET, CONSIDERED TO BE ON GRAVELS, AS REVEALED BY THE BORINGS AND THE GEOLOGY OF THE AREA.

FREE WATER WAS OBSERVED IN THE ROD SOUNDING HOLES BETWEEN ELEVATIONS 839 AND 833 FEET.

NO TEST PENETRATED TO BEDROCK SURFACE.

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
- Boulders
- Weathered Sandstone
- Sandstone

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.

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

LOG OF BORING

Date Started 4-16-68 — Sampler Type SS — Dia. 1 3/8" — Water Elev. —
Date Completed 4-17-68 — Casing: Length 45' — Dia. 3 1/2"
Boring No. B-1 — Station & Offset 1160+41, 85' Lt. (Rear Abutment) — Surface Elev. 847.7'

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.
847.7	0														
	2														
	4														
842.7	6	8/10			Brownish-Gray Silty Sandy Gravel	1	45	8	23	15	9	NP	NP	21	A-1-b
	8														
837.7	10	10/14			Brown Sand	2	0	7	90	- 3	-	NP	NP	24	A-3
835.2	12														
	14	20/24			Brown Silty Gravelly Sand	3	28	21	38	-13	-	NP	NP	11	A-3a
832.7	16	18/30			Brown Silty Gravelly Sand	4	40	18	31	-11	-	NP	NP	12	A-1-b
830.2	18	28/20			Brown Sandy Gravel	5	51	17	22	-10	-	NP	NP	6	A-1-b
827.7	20	50*			Brown Silty Sandy Gravel	6	53	18	18	-11	-	NP	NP	10	A-1-a
825.2	22	(0.7')													
	24	17/29			Brown Silty Sand	7	0	11	76	-13	-	NP	NP	17	A-3a
822.7	26	50*			Brown Silty Gravelly Sand	8	30	27	28	-15	-	NP	NP	10	A-1-b
	28	(0.6')													
817.7	30	50*			Brown Silty Gravelly Sand	9	22	36	30	-12	-	NP	NP	15	A-1-b
	32	(0.7')													
	34														
812.7	36	50*			Brown Silty Sandy Gravel	10	46	14	27	-13	-	NP	NP	8	A-1-b
	38	(0.7')													
807.7	40	50*			Brown Gravelly Sand	11	22	15	53	-10	-	NP	NP	14	A-3
	42	(0.8')													
	44														
802.7					BOTTOM OF BORING										
802.2		50/*			Brown Silty Sandy Gravel	12	42	18	25	-15	-	NP	NP	10	A-1-b

*Refusal

LOG OF BORING

Date Started 4-18-68 — Sampler Type SS — Dia. 1 3/8" — Water Elev. —
Date Completed 4-23-68 — Casing: Length 55' — Dia. 3 1/2"
Boring No. B-16 — Station & Offset 1162+89, 72' Rt. (Forward Abutment) — Surface Elev. 853.8'

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.
853.8	0														
	2														
	4														
848.8	6	3/2			Brown Sandy Silt	1	0	1	19	47	33	NP	NP	23	A-4a
846.3	8	3/3			Brown Sandy Silt	2	10	3	19	38	30	NP	NP	21	A-4a
843.8	10	8/8			Brown Silty Sandy Gravel	3	62	13	12	-13	-	NP	NP	13	A-1-a
841.3	12														
	14	9/11			Brown Silty Sandy Gravel	4	50	13	19	-18	-	NP	NP	15	A-1-b
838.8	16	3/3			Brown Sand	5	0	8	85	- 7	-	NP	NP	18	A-3
836.3	18	3/4			Brown Silty Sand	6	0	8	81	-11	-	NP	NP	14	A-3a
833.8	20	1/1			Brown Sand	7	0	17	82	- 1	-	NP	NP	25	A-3
	22														
	24														
828.8	26	14/21			Brown Silty Sandy Gravel	8	54	14	19	-13	-	NP	NP	11	A-1-b
	28														
823.8	30	21/27			Brown Sand	9	0	1	89	-10	-	NP	NP	20	A-3
	32														
	34														
818.8	36	50*			Brown Sand	10	0	4	88	- 8	-	NP	NP	18	A-3
	38	(0.8')													
813.8	40	50*			Brown Silty Sand	11	0	3	84	-13	-	NP	NP	18	A-3a
	42	(0.8')													
	44														
808.8	46	50/*			Brown Silty Sand	12	0	4	82	-14	-	NP	NP	20	A-3a
	48														
803.8	50	50*			Brown Silty Sand	13	0	20	60	-20	-	NP	NP	13	A-3a
	52	(0.6')													
	54														
798.8					BOTTOM OF BORING										
798.3		49/*			Brownish-Gray Sand	14	0	16	79	- 5	-	NP	NP	20	A-3

*Refusal

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-80-2154
IR 80 & RAMP B-OBS OVER
SR 14 (BROADWAY AVE.)
SEC.

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