TE - 118
600 - 4 - 66

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27

CUYAHOGA COUNTY
CUY-480-22.16

GEOLOGY OF THE SITE

THE STRUCTURE SITE IS LOCATED ON THE GLACIATED MODERATELY DISSECTED PORTION OF THE MISSISSIPPI VALLEY PLAIN, IN AN AREA WHERE MODERATELY DEEP MAN-MADE FILL AND SHALLOW GLACIAL-DERIVED SOILS OVERLIE SANDSTONE BEDROCK, OF MISSISSIPPIAN AGE.

EXPLORATION

THE EXPLORATION CONSISTED OF TWO DRIVE SAMPLE-CORE BORINGS, MADE ON NOVEMBER 19 AND 20 AND DECEMBER 3, 1968.

INVESTIGATIONAL FINDINGS

THE BORINGS DISCLOSED THAT GENTLY SLOPING BEDROCK SURFACE, ENCOUNTERED AT 26-FOOT DEPTH, ELEVATION 861 FEET, IN THE FORWARD PORTION OF THE STRUCTURE SITE, AND AT 28-FOOT DEPTH, ELEVATION 858 FEET, IN THE REAR PORTION OF THE STRUCTURE SITE, IS OVERLAIN BY VERY STIFF CLAYS AND DENSE TO VERY DENSE GRAVELS AND SILTS. THE BORINGS WERE TERMINATED AT 35 AND 37-FOOT DEPTHS, ELEVATIONS 852 TO 849 FEET, AFTER PENETRATING 9 AND 10 FEET BELOW BEDROCK SURFACE.

UNCONFINED COMPRESSION TESTS ON SIMILAR SANDSTONE BEDROCK INDICATE A CRUSHING STRENGTH ON THE ORDER OF 150 TONS PER SQUARE FOOT.

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

Coal

Weathered Indurated Clay

Indurated Clay

Weathered Shale

Shale

LEGEND

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

Weathered Sandstone

Sandstone

Leached Dolomite

Dolomite

Leached Limestone

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.

Particle Size Definitions

Boulders	Cobbles	Gravel	Coarse Sand	Fine Sand	Silt	Clay
12"	3"	2.0mm (No. 10 sieve)	0.42mm (No. 40 sieve)	0.074mm (No. 200 sieve)	0.005mm	

LOG OF BORING

Date Started 12-3-68
Date Completed 12-3-68
Boring No. B-2
Sampler Type SS Dia 1 3/8"
Casing: Length 25.5' Dia 3 1/2"
Station & Offset 41+03, 42' Rt. (Rear Abutment)
Water Elev. —
Surface Elev. 886.0'

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.
886.0	0														
	2														
	4														
881.0	6	2/4			Brown Gravelly Sandy Silt	1	-	-	-	-	-	-	-	19	Visual
876.0	10	11/15			Brown Sandy Gravel	2	-	-	-	-	-	-	-	12	Visual
871.0	14	11/11			Gray Sandy Gravelly Silt	3	36	11	13	26	14	NP	NP	14	A-4a
	18														
866.0	20	13/27			Gray Sandy Gravelly Clay	4	27	6	15	20	32	30	13	13	A-6a
863.5	22	25/25			Gray Gravelly Sandy Silt	5	19	9	18	30	24	20	6	19	A-4a
861.0	24	50/*			Gray Silty Gravelly Sand	6	21	11	45	23	-	NP	NP	13	A-3a
858.5	26				TOP OF ROCK										
	28		2.6	1.9	Sandstone, light-gray, medium-firm to firm, argillaceous, carbonaceous, micaceous, coarse-grained, thin to medium-bedded. Core Loss 41%.										
	30														
	32		1.6	3.4											
	34														
849.0	36		1.5	0.5	BOTTOM OF BORING										

*Refusal

LOG OF BORING

Date Started 11-19-68
Date Completed 11-20-68
Boring No. B-3
Sampler Type SS Dia. 1 3/8"
Casing: Length 22' Dia. 3 1/2"
Station & Offset 41+62, 44' Lt. (Forward Abutment)
Water Elev. —
Surface Elev. 886.5'

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.
886.5	0														
	2														
	4														
881.5	6	25/25			Brown Sandy Gravel	1	-	-	-	-	-	-	-	13	
876.5	10	10/12			Gray Sandy Gravel (Wash Sample)	2	-	-	-	-	-	-	-	24	
871.5	14														
	16	15/25			Gray Silty Clay	3	-	-	-	-	-	25	7	12	A-4a
	18														
866.5	20	17/17			Gray Sandy Gravelly Silt	4	23	7	9	24	37	27	8	17	A-4a
864.0	22														
	24	50* (0.8')			Gray Sandy Gravelly Silt	5	25	8	17	23	27	20	6	13	A-4a
861.5	26	50/* (0.2')			No Sample Recovered, TOP OF ROCK										
	28		4.1	0.9											
	30				Sandstone, light-gray, firm, micaceous, conglomeratic, coarse-grained. Core Loss 2%.										
	32														
	34		4.8	0.2											
851.5					BOTTOM OF BORING										

*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
1620 WEST BROAD STREET, COLUMBUS 23, OHIO

STRUCTURE FOUNDATION INVESTIGATION
BRIDGE NO. CUY-480-
LEE ROAD OVER MILL CREEK
SEC. CUY-480-22.16

CHECKED BY	REVIEWED BY	DATE
L.N.L.	R.D.R.	12/18/68

NOV 3 1970