

MICROFILMED  
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**GEOLOGY OF THE SITE**  
THE STRUCTURE SITE IS LOCATED ON THE GLACIATED MODERATELY DISSECTED PORTION OF THE MISSISSIPPI VALLEY PLAIN, IN AN AREA WHERE SHALLOW GLACIAL-DERIVED SOILS OVERLIE SHALE BEDROCK, OF MISSISSIPPIAN AGE.

**EXPLORATION**  
THE EXPLORATION CONSISTED OF TWO DRIVE SAMPLE-CORE BORINGS AND SIX DRIVE ROD PENETRATION TESTS, MADE BETWEEN SEPTEMBER 18 AND 25, 1968.

**INVESTIGATIONAL FINDINGS**  
THE BORINGS DISCLOSED THAT SLOPING BEDROCK SURFACE, ENCOUNTERED AT 10-FOOT DEPTH, ELEVATION 952 FEET, IN THE REAR PORTION OF THE STRUCTURE SITE, AND AT 10-FOOT DEPTH, ELEVATION 948 FEET, IN THE FORWARD PORTION OF THE STRUCTURE SITE, IS OVERLAIN BY STIFF AND VERY STIFF CLAYS. THE BORINGS WERE TERMINATED AT 35 AND 40-FOOT DEPTHS, ELEVATIONS 923 TO 922 FEET, AFTER PENETRATING 25 AND 30 FEET BELOW BEDROCK SURFACE.

ROD SOUNDINGS ENCOUNTERED INCREASING PENETRATION RESISTANCE WITH INCREASE IN DEPTH AND WERE TERMINATED DUE TO REFUSAL OR NEAR-REFUSAL TO PENETRATION AT 8 TO 12-FOOT DEPTHS, ELEVATIONS 953 TO 946 FEET, CONSIDERED TO BE ON BEDROCK SURFACE, AS REVEALED BY THE BORINGS.

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

THE PILES WILL BE FOUNDED IN BEDROCK AND IF IT IS THE INTENTION TO FOUND THE ABUTMENTS ON BEDROCK, IT IS CONSIDERED ADVISABLE THAT THE OPEN EXCAVATIONS BE INSPECTED IN THE FIELD, IN ORDER TO INSURE THAT THE EXCAVATIONS HAVE BEEN EXTENDED TO ROCK THROUGHOUT THE ENTIRE FOUNDED AREA. IT IS FURTHER SUGGESTED THAT THE AREA OF THE FOOTING CONTACT NOT BE SUBJECT TO PROLONGED ATMOSPHERIC EXPOSURE, AND THAT THE EXCAVATION BE WELL DRAINED AT ALL TIMES.

UNCONFINED COMPRESSION TESTS ON SIMILAR SHALE BEDROCK INDICATES A CRUSHING STRENGTH ON THE ORDER OF 100 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
- 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.
- 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.
- V 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.

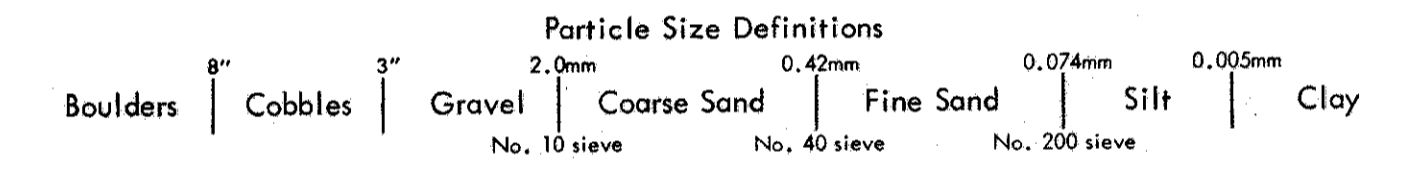
**Drive Sample Borings - Drive-Press Sample Borings**

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.



**LOG OF BORING**

Date Started 9-24-68 Date Completed 9-24-68 Boring No. B-4  
 Sampler Type SS Dia. 1 3/8" Casing Length \_\_\_\_\_ Dia \_\_\_\_\_  
 Station & Offset 16+15, 30' Lt. (1st Pier) Surface Elev. 962.4' Water Elev. \_\_\_\_\_

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics											SHTL Class.	
							% Agg.	% C.S.	% F.S.	% Silt	% Clay	LL	PI	WC	Visual	Class.	Class.		Class.
962.4	0																		
957.4	2																		
	4																		
	6	18/26			Brownish-Gray Gravelly Clay	1	14	3	6	29	48	37	12	21					A-6a
	8																		
952.4	10				TOP OF WEATHERED ROCK														
951.8	12	50*			Brownish-Gray Weathered Shale	2	26	4	3	32	35	34	12	13					Visual
	14	(0.6')	4.0	0.4	TOP OF ROCK														
	16																		
	18		4.9	0.1															
	20																		
	22		5.0	0.0															
	24																		
	26				Shale, dark-gray, very platy, few clay shale stringers, silty in part. Core Loss 6%.														
	28		5.0	0.0															
	30																		
	32																		
	34		3.7	1.3															
	36																		
	38		5.0	0.0															
922.4	40				BOTTOM OF BORING														

**LOG OF BORING**

Date Started 9-25-68 Date Completed 9-25-68 Boring No. B-9  
 Sampler Type SS Dia. 1 3/8" Casing Length \_\_\_\_\_ Dia \_\_\_\_\_  
 Station & Offset 18+64, 41' Rt. (4th Pier) Surface Elev. 957.8' Water Elev. \_\_\_\_\_

Elev.	Depth	Std. Pen. (N)	Rec. ft.	Loss ft.	Description	Sample No.	Physical Characteristics											SHTL Class.		
							% Agg.	% C.S.	% F.S.	% Silt	% Clay	LL	PI	WC	Visual	Class.	Class.		Class.	
957.8	0																			
	2																			
	4																			
952.8	6	10/11			Brown Silt and Clay	1	12	2	6	36	44	36	14	14						A-6a
	8																			
947.8	10				TOP OF WEATHERED ROCK															
	12	50*			Brownish-Gray Weathered Clay Shale	2	28	4	4	26	38	37	13	15						Visual
	14	(0.6')	1.0	1.4																
943.8	16		1.0	0.5	TOP OF ROCK															
	18		3.9	1.1																
	20																			
	22																			
	24		4.8	0.2	Shale, weathered, gray, brown, at top of unit, dark-gray, somewhat silty, clay shale seen at 19.5' feet. Core Loss 10%.															
	26																			
	28		4.4	0.6																
	30																			
	32																			
	34		5.0	0.0																
922.8					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.

**OHIO DEPARTMENT OF HIGHWAYS  
TESTING LABORATORY**  
1620 WEST BROAD STREET, COLUMBUS 23, OHIO

**STRUCTURE FOUNDATION INVESTIGATION**  
BRIDGE NO. CUY-480-2020  
UNDER TURNEY ROAD  
SEC. CUY-480-19-43

CHECKED BY L.N.L.	REVIEWED BY R.D.R.	DATE 10/15/68
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