

GEOLOGY OF THE SITE

The structure site is located on the relatively flat portion of the Mississippian Valley Plain, where moderately deep glacial-derived soils and lake deposits overlie shale and sandstone bedrock, of Mississippian age.

EXPLORATION

The exploration consisted of two drive sample-core borings, and six drive rod penetration tests made on May 20 and 25, 1965.

INVESTIGATIONAL DISCOVERIES

The borings disclosed that gradually sloping bedrock surface is overlain by dense and extremely dense gravels and silts, stiff gravelly sandy clays and boulders. The borings encountered bedrock surface at 23 and 29-foot depths, elevation 762 feet in the forward area, and elevation 758 feet in the rear area. The borings were terminated 11 and 12 feet below bedrock surface, elevations 750 and 746 feet.

Rod soundings encountered gradual increase in penetration resistance with increase in depth and were terminated at 17 and 25-foot depths, elevations 769 and 764 feet, upon encounter with water through refusal to penetration, considered to be above bedrock surface in extremely dense silt containing shale fragments and boulders, as revealed by the borings.

No free water was observed in any of the rod sounding holes.

- 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

- SYMBOLS OF ROCK TYPES**
- Coal
 - Weathered Indurated Clay
 - Indurated Clay
 - Weathered Shale
 - Shale
 - Boulders and/or Cobbles

- 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.
 - Indicates Static Water Elevation.

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.

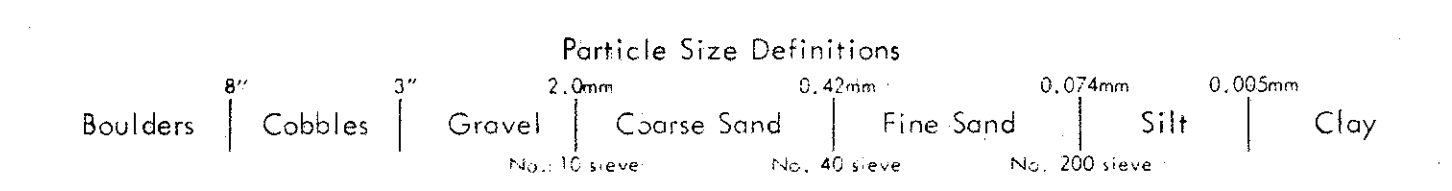
Drive Sample Borings - Drive-Press Sample Borings

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 5-24-65 Date Completed 5-25-65 Boring No. B-1 Station & Offset 531+30, 70' Rt (REAR ABUTMENT) Surface Elev. 786.1'

Sampler Type SS Dia. 1 3/8" Casing Length 15' Dia. 3 1/2" 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	L.L.	P.I.		W.C.		
786.1	0																
783.6	2	1/2			Dark-Brown Gravelly Sandy Silt, Trace of Organic	1	18	14	24	26	18			16			
781.1	4	2/7			Mottled Brown and Gray Gravelly Clay	2	V	I	S	U	A	L	31	11	22		
778.6	6	9/11			Brown Sandy Silt	3	9	6	12	37	36	28	9	22			
776.1	8	20/22			Brown Sandy Clay	4	10	5	6	32	47	30	12	18			
773.6	10	14/21			Brown and Gray Silt and Clay	5	7	3	8	34	48	33	14	17			
771.1	12	24/30			Gray Sandy Silt	6	10	7	9	39	35	24	6	17			
768.6	14	66/*			Gray Gravelly Sandy Silt	7	16	10	10	44	20	26	8	13			
766.1	16				Shale, boulders and clastic silt												
761.1	20	50* (0.2')				Gray Broken Weathered Shale Fragments	8	V	I	S	U	A	L	28			
757.5	24		3.0	2.0	TOP OF ROCK												
	26				Sandstone, gray, firm, fine-grained with few shale seams, broken. Core loss 4%.												
	28		4.8	0.2													
749.1	30				Shale, gray to dark gray, firm, carbonaceous, argillaceous, broken. Core loss 10%.												
746.1	32		4.5	0.5													
	34				BOTTOM OF BORING												

LOG OF BORING

Date Started 5-20-65 Date Completed 5-21-65 Boring No. B-6 Station & Offset 534+30, 105' Lt (FORWARD ABUTMENT) Surface Elev. 784.8'

Sampler Type SS Dia. 1 3/8" Casing Length 10' Dia. 3 1/2" 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	L.L.	P.I.		W.C.		
784.8	0																
782.3	2	9/9			Brown Sandy Gravelly Silt	1	25	8	10	31	26	26	9	18			
779.8	4	8/10			Brown Silty Sand	2	0	11	52	25	12	NP	NP	20			
777.3	6	10/14			Gray Gravelly Clay	3	22	6	9	31	32	26	12	16			
774.8	8	13/15			Gray Gravelly Clay	4	15	6	9	19	51	26	11	18			
772.3	10	17/19			Gray Sandy Silt	5	11	6	8	36	39	27	8	15			
769.8	12	15/18			Gray Gravelly Silt	6	16	6	9	39	30	24	8	13			
767.3	14	16/26			Gray Sandy Gravelly Silt	7	26	7	8	41	18	19	5	13			
764.8	16	9/14			Grayish-Red Clayey Silt with Stone Fragments	8	34	3	3	34	26	26	9	13			
762.2	18		3.2	1.8	TOP OF ROCK												
	20				Sandstone, gray, fine-grained, firm with shale seams (max. 0.5' thick). No core loss.												
	22																
	24																
	26																
	28		5.0	0.0													
754.8	30																
	32		4.8	0.2	Shale, dark gray, carbonaceous, calcareous in top 1.0', fissile, medium-firm. Core loss 4%.												
749.8	34				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-IR80-09
OVER C.C. & ST. LOUIS RAILROAD
SEC. CUY-IR80-8.54

CHECKED BY R.H.P.	REVIEWED BY R.D.R.	DATE 6/23/65
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