

GEOLOGY OF THE SITE

The structure site is located on the glaciated Lake Plain region, in an area where thin glacial derived soils overlie shale bedrock, of the Chagrin formation.

EXPLORATION

The exploration consisted of two drive sample-core borings, made on May 11 and 12, 1965, and five drive rod penetration tests, made on April 21, 1965.

INVESTIGATIONAL DISCLOSURES

The borings disclosed that gradually sloping bedrock surface, occurring at 10-foot depth, elevation 624 feet in the rear area, and 15-foot depth, elevation 618 feet, in the forward area, is overlain by stiff clay and dense silt. The borings were terminated at 20-foot depth, elevations 614 and 613 feet, 5 and 10 feet below bedrock surface.

Rod soundings encountered rapid increase in penetration resistance with increase in depth and were terminated upon encounter with refusal to penetration at 10 to 15-foot depths, elevations 622 to 619 feet, considered to be on or slightly above bedrock surface, as disclosed by the borings.

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

If it is the intention to found the pier substructure units 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 founding area. It is further suggested that the area of the footing contact not be subjected to prolonged atmospheric exposure, and that the excavation be kept drained at all times, due particularly to the fact that while this shale bedrock is generally firm in place, it is susceptible to disintegration upon exposure to the atmosphere and water.

Unconfined compression tests on similar shale bedrock indicate 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.

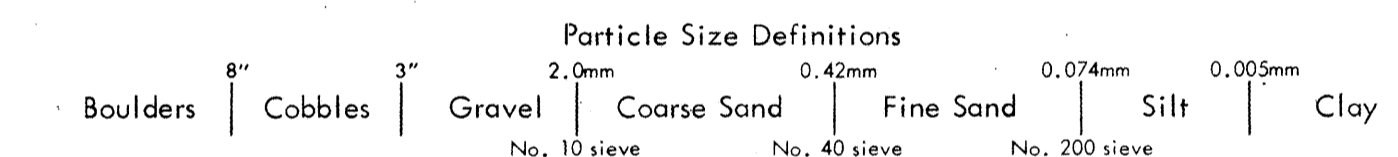
Drive Sample Borings - Drive-Press Sample Borings

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 5-11-65 Sampler Type BB Dia. 1 3/8" Water Elev. _____
 Date Completed 5-11-65 Casing Length _____ Dia. _____
 Boring No. B-1 Station & Offset 240+20, 40' Lt (REAR ABUTMENT) Surface Elev. 633.5'

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.	
633.5	0															
631.0	2	7/11			Brownish-Gray Silty Clay	1	0	3	12	38	47	37	18	27		
628.5	4															
626.0	6	10/11			Mottled Brownish-Gray Sandy Silt	2	9	9	11	43	28	27	9	15		
623.5	8	50* (0.7')			Gray Silt with Shale Fragments	3	17	4	5	46	28	27	9	12		
	10				TOP OF ROCK											
	12		4.5	0.5	Shale, gray, fissile, medium-firm, jointed with few thin clay seams, broken. Core loss 5%.											
	14															
	16															
	18		5.0	0.0												
613.5	20				BOTTOM OF BORING											

LOG OF BORING

Date Started 5-12-65 Sampler Type BB Dia. 1 3/8" Water Elev. _____
 Date Completed 5-12-65 Casing Length _____ Dia. _____
 Boring No. B-8 Station & Offset 243+04, 39' Rt (FORWARD PIER) Surface Elev. 633.0'

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.	
633.0	0															
630.5	2	6/10			Brown Silty Clay	1	0	3	14	34	49	37	20	32		
628.0	4															
625.5	6	10/13			Brown and Gray Gravelly Sandy Silt	2	15	19	13	30	23	25	10	16		
623.0	8	16/18			Grayish-Brown Sandy Gravelly Silt	3	19	8	8	38	27	24	8	24		
622.0	10	18/20			Gray Sandy Silt with Stone Fragments	4	15	8	10	41	26	21	6	10		
	12															
	14		1.0	4.0	Gray clayey silt and shale fragments.											
618.0	16				TOP OF ROCK											
	18		5.0	0.0	Shale, gray, fissile, slightly argillaceous, medium-firm, jointed and broken. No core loss.											
613.0	20				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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OVER LAKELAND FREEWAY (SR 2)
SEC. LAK-91-3.84

CHECKED BY R.H.P. REVIEWED BY R.D.R. DATE 6/10/65