

GEOLOGY OF THE SITE

THE STRUCTURE SITE IS LOCATED ON THE HIGHLAND AREA OF THE GLACIATED MISSISSIPPI VALLEY PLAIN, IN AN AREA WHERE MODERATELY DEEP GLACIAL-DERIVED SOILS OVERLIE SHALE BEDROCK OF THE BEDFORD FORMATION, MISSISSIPPIAN AGE.

EXPLORATION

THE EXPLORATION CONSISTED OF TWO DRIVE SAMPLER-CORE BORINGS, MADE ON AUGUST 13 AND 14, 1969, AND THREE DRIVE ROD PENETRATION TESTS, MADE BETWEEN SEPTEMBER 26 AND 29, 1969.

INVESTIGATIONAL FINDINGS

BORINGS DISCLOSED LOOSE TO DENSE SANDY SILTS AND SOME BOULDERS OVERLIEING SLOPING BEDROCK SURFACE, ENCOUNTERED IN BORING B-1 AT 24-FOOT DEPTH, ELEVATION 725 FEET, AND IN BORING B-7 AT 25-FOOT DEPTH, ELEVATION 730 FEET. THE BORINGS WERE TERMINATED AT 30 AND 40-FOOT DEPTHS, ELEVATIONS 719 AND 718 FEET, AFTER PENETRATING 6 AND 12 FEET OF BEDROCK.

THE ROD SOUNDINGS ENCOUNTERED GRADUALLY INCREASING RESISTANCE TO PENETRATION WITH INCREASING DEPTH, AND WERE TERMINATED DUE TO REFUSAL TO PENETRATION AT 30 TO 40-FOOT DEPTHS, ELEVATIONS 715 TO 693 FEET, CONSIDERED TO BE ON BEDROCK SURFACE, AS REVEALED BY THE BORINGS AND THE GEOLOGY OF THE AREA.

FREE WATER WAS NOT ENCOUNTERED IN ANY OF THE ROD SOUNDING HOLES.

IF IT IS THE INTENTION TO FOUND 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 FOOTING AREA. IT IS FURTHER SUGGESTED THAT THE AREA OF THE FOOTING CONTACT NOT BE SUBJECTED TO PROLONGED ATMOSPHERIC EXPOSURE, AND THAT THE EXCAVATION BE WELL DRAINED AT ALL TIMES.

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 Siltstone, Mudstone, or Claystone
- Siltstone, Mudstone, or Claystone
- Weathered Shale
- Shale
- Boulders 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.

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 8-14-69 Sampler Type SS Dia. 1 3/8" Water Elev. _____
 Date Completed 8-14-69 Casing Length _____ Dia. _____
 Boring No. B-1 Station & Offset 856+21, (4th Floor) Surface Elev. 749.0'

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				
749.0	0																	
744.0	6	4/3			Gray Gravelly Sandy Silt	1	17	8	14	31	30	26	9	18				A-4a
739.0	10	3/2			Brown Silty Sand	2	13	26	23	18	20	25	9	17				A-4a
734.0	16	6/7			Gray Sandy Silt	3	6	6	15	37	36	22	8	20				A-4a
729.0	20	6/8			Gray Sandy Silt	4	10	14	17	35	24	20	7	17				A-4a
725.0	24				TOP OF ROCK													
724.0	26		2.6	2.2	Shale, black, medium-firm to firm, carbonaceous, argillaceous, pyritiferous in part, slightly fissile, thin-bedded, jointed, slightly broken. Core Loss 445.													
719.0	30				BOTTOM OF BORING													

LOG OF BORING

Date Started 8-13-69 Sampler Type SS Dia. 1 3/8" Water Elev. _____
 Date Completed 8-14-69 Casing Length _____ Dia. _____
 Boring No. B-7 Station & Offset 867+30, 193' Rt. (7th Floor) Surface Elev. 758.0'

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				
758.0	0																	
753.0	6	4/5			Brown Sandy Silt	1	0	1	31	42	26	23	7	22				A-4a
748.0	10	9/11			Gray Clayey Silt	2	0	3	10	48	39	22	8	20				A-4a
743.0	16	23/25			Brown Sandy Silt	3	3	4	17	43	33	19	6	14				A-4a
738.0	20	25/15			Gray Silt	4	0	1	25	61	23	HP	HP	23				A-4b
733.0	26	50/4			No Sample Recovered - Cobbles (Driller's Dec.)	5	1	2	8	8	8	8	8	8				
729.5	28				TOP OF ROCK													
728.0	30																	
715.0	34				Shale, black, firm, carbonaceous, argillaceous, siliceous, pyritiferous in part, slightly fissile, thin-bedded, jointed. No Core Loss.													
					BOTTOM OF BORING													

H.N.T.B. BR #36A

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 plans governing construction of the project.

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