

REPORT ON  
SOIL INVESTIGATIONS AND  
FOUNDATION DESIGN STUDIES  
PROPOSED BELMONT HIGH SCHOOL  
BELMONT, MASSACHUSETTS

~~OFFICE~~ COPY

for  
Korslund, LeNormand and Quann, Architects  
Norwood, Massachusetts

by  
Haley & Aldrich, Inc.  
Consulting Soil Engineers  
Cambridge, Massachusetts

File No. 68-1969

July 1968

# HALEY & ALDRICH, INC.



CONSULTING SOIL ENGINEERS • 238 MAIN STREET • CAMBRIDGE, MASSACHUSETTS 02142

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30 July 1968  
File No. 68-1969

Korslund, LeNormand and Quann, Inc.  
20 Vernon Street  
Norwood, Massachusetts 02062

Attention: Mr. Vincent Iannone

Subject: Belmont High School  
Belmont, Massachusetts

Gentlemen:

In accordance with your request we have studied the sub-soil conditions at the subject site and have made analyses to determine the most economical and satisfactory foundation treatment for the proposed structure.

Analyses of the test boring information, laboratory test data and site history indicate that it is feasible to support the proposed school building on shallow foundation members bearing on the surface of the clay except in two critical areas.

The southern section of the library wing and the cafeteria are located above what originally was the extent of the clay pit excavation. Consequently the depth of fill in this area is deep and the stiff yellow clay crust that would normally provide adequate bearing capacity has been stripped off exposing a medium to soft clay.

The southern portion of the field house and the southern third of the science wing would require additional fill to bring the ground surface to the elevation of the proposed ground floor as apposed to a required excavation elsewhere. Underlying this portion of the building test borings and laboratory tests indicate a much softer and more compressible stratum of clay. These conditions, combined with the fact that the surface of the clay is still settling under the weight of the fill placed during 1958 to construct the practice football field, yield a situation that could produce severe settlements within the life of the building.

Within these areas which, together comprise a substantial portion of the building, shallow foundations are not feasible and piles will be required.

The most economical foundation scheme initially would therefore be to construct the building partly on shallow foundations supported on top of the clay and partly on a pile foundation bearing below the clay. Settlement analyses indicate that a long term differential settlement of approximately 2 in. will occur at the joint between the pile supported and the non pile supported sections of the building. Constant maintenance would be required at this joint for the life of the structure.

To eliminate the problems inherent in such a foundation scheme not only with maintenance, but with design and construction as well, it is recommended that the column loads throughout the structure be supported by pile foundation members bearing in the glacial till or on the underlying rock.

One pile in each of the pile groups along the southern exterior wall of the proposed building may be battered toward the pond to insure the stability of the structure against a lateral soil failure.

It is recommended that the ground floor slab be designed and constructed as a slab-on-grade within the limits indicated in Figure 4. A summary of foundation design and construction recommendations is presented in Sections IV and V of the report.

Thank you for inviting us to undertake this work. If you have questions or require additional information, please do not hesitate to contact us.

Sincerely yours,  
HALEY & ALDRICH, INC.

David E. Thompson

James F. Haley

DET/ah  
Enclosures

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## I. INTRODUCTION

### 1-01. GENERAL

This report presents the results of subsurface investigations and foundation design studies for the proposed Belmont High School, Belmont, Massachusetts. The project locus is shown on Figure 1, and the approximate location of the school on the site is shown on Figure 2.

The proposed facility is to be constructed primarily as a steel frame structure with the ground floor level at El. 22 throughout the building with the exception of a small section of the field house area.

### 1-02. SCOPE OF WORK

Professional services performed by Haley & Aldrich consisted primarily of the following:

- 1) Supervision and part time inspection of test borings and machine excavated test pits to provide data upon which foundation design recommendations could be based,
- 2) sufficient laboratory testing of soils recovered from explorations to assist in classification and to determine engineering properties of the soils encountered, and,
- 3) an analysis of problems relating to the soil mechanics and economic aspects of foundation design and construction.

### 1-03. MISCELLANEOUS

Preliminary information regarding type of construction and estimated building loads was provided by the structural engineer.

## II. SITE CONDITIONS

### 2-01. GENERAL

The site for the proposed Belmont High School is south of the Boston and Maine Railroad easement and north of Clay Pit Pond in Belmont, Massachusetts. The subject area covers what is presently a lawn and field area north of Clay Pit Pond, as shown on Figure 2.

The existing ground surface slopes upward in a northerly direction from approximately El. 11.5 at the shore of the pond to El. 27 at the rear of the proposed structure. Surface vegetation consists primarily of grass and a variety of small trees.

### 2-02. SITE HISTORY

Information obtained from the office of the Belmont Town Engineer indicates that the original extent of Clay Pit Pond, prior to the site being used as a dump, was as shown on Figure 2. During the period from 1933 to 1958 the subject site was utilized as a dump where waste materials were burned and used as fill. A portion of the original Clay Pit Pond was filled and the ground surface elevation was raised from 3 to 10 ft. during this period. In 1958 dumping was discontinued, however, fill was placed at the west end of the site to create a practice football field. Ground surface elevations were raised at this time from 2 to 5 ft. within this area.

### 2-03. SUBSURFACE EXPLORATIONS

Subsurface soil conditions across the site are summarized by two "Soil Profiles" shown on Figure 3. Twenty standard 2½-inch diameter drive sample borings to refusal, two 2½-inch diameter drive sample borings to refusal with observation wells installed, four 4-inch diameter drive sample borings to refusal with 3-inch undisturbed piston samples and three 2½-inch diameter drive sample borings to the surface of the clay were conducted during the period 17 May to 27 June 1968 by Northeast Test Boring Company, Inc. at the locations shown on Figure 2.

Nine machine excavated test pits were dug on 24 June 1968 by J. Sliney Co., Inc. to determine as accurately as possible the depth and quality of the fill and to obtain large samples of the soil encountered to permit visual classification. Test pit logs are attached as Appendix C.

### 2-04. SUBSURFACE SOIL CONDITIONS

The soils encountered consist primarily of a layer of topsoil approximately 1 ft. thick underlain by 4 to 17 ft. of

burnt dump material. Test pits and boring samples indicate that the dump material is composed primarily of ashes, glass, steel, and other miscellaneous burnt materials. No boulders or large obstructions were encountered during the boring and test pit program although there are indications of boulders within the existing practice football area. A stratum of silty fine SAND underlies the fill within the southern half of the proposed structure. This stratum grades into a clay with depth and was found to be 5.5 ft. in thickness at B-115. The silty fine sand or fill is underlain by a stratum of silty gray CLAY from 34 to 62 ft. in thickness. Generally the upper 10± ft. is yellow in color and has become desiccated by exposure during geologic history. The yellow clay crust varies from stiff to very stiff in consistency. Within the limits of the original clay pit the stiff yellow clay crust is not present. The silty gray CLAY underlying the crust varies from a very soft sensitive material at the western end of the site and under the proposed field house to a medium to soft overconsolidated clay with fine sand lenses at the eastern end of the site and under the auditorium area. Underlying the clay a stratum of very compact silty fine SAND occurs in thicknesses up to 29 ft. concentrated largely below the proposed science wing. Refusal was generally met in a very compact gray coarse to fine SAND with some coarse to fine gravel and a silty clay matrix (Glacial Till). The average refusal depth below El. 22.0 is 66.5 ft.

#### 2-05. GROUNDWATER CONDITIONS

At the time the test borings were made, groundwater levels were observed by the drill crew from 2.5 to 11 ft. below the ground surface. Test pit excavations indicated groundwater at depths of 7.5 to 9.0 ft. with pit elevations between 26.5 and 28.0.

Observations wells at borings 101 and 117 indicate a groundwater table at El. 20± ft. and El. 12± ft. respectively. It appears that the groundwater toward the north edge of the site is controlled by the surface of the relatively impermeable clay crust causing rain water to flow at the surface of the clay through the fill and old topsoil.

### III. LABORATORY SOIL TESTING PROGRAM

#### 3-01. GENERAL

Undisturbed piston samples of the clay were recovered from Borings 109, 110, 115 and 123. The samples were tested in the laboratory to determine the shear strength, natural water content, Atterberg limits and consolidation characteristics of the clay.

A summary of the laboratory test data is included in Table I. Included in Appendix D are the void ratio vs. pressure curves determined from the consolidation tests.

## IV. FOUNDATION DESIGN STUDIES

### 4-01. GENERAL

The principal objective of this investigation was to determine the most suitable type of foundation for the proposed structure. A satisfactory foundation for any structure must satisfy the following general requirements:

1. The foundation including the underlying soil and rock must be adequately safe against a structural failure, for example, in a supporting pile or in the soil immediately underlying a spread footing, which could result in a sudden and perhaps catastrophic failure.
2. During the life of the structure, the foundation must not settle differentially by an amount sufficient to damage the structure or impair its useful function.
3. The foundation must be feasible both technically and economically, and practical to build.

This section summarizes foundation analyses and design recommendations.

### 4-02. PROPOSED STRUCTURE

The proposed high school will be a two story steel frame building occupying approximately 160,000 sq. ft. No basement will be provided. The general layout of the building under consideration is shown on Figure 2.

### 4-03. BEARING CAPACITY AND SETTLEMENT

The miscellaneous dump materials which cover the site to a depth of approximately 10 ft. are not considered to be suitable for support of spread footing foundations, mats or short piles for the proposed structure. The underlying stiff yellow clay is capable of supporting loads on the order of those anticipated however, settlements that would occur within the life of the structure due to consolidation of the underlying clay would be excessive along the southern edge of the building.

### 4-04. FOUNDATION TYPE

Since soils which occur at "shallow" depths are unsuitable for support of spread footings and short piles, we recommend that the structure be founded on long piles which are driven to bear in hardpan or on rock which underlie the site.

We believe, however, that the ground floor slab may be designed and constructed as an earth-supported slab-on-grade within the areas indicated on Figure 4. The line denoting the transition between the slab-on-grade construction and the structural slab may be adjusted to the north to facilitate design, however no adjustment should be made to the south. Where uplift reactions are required untreated timber piles driven into the clay may prove to be more economical than the standard production piles depending on the reactions required.

#### 4-05. FOUNDATION DESIGN CRITERIA

The following specific criteria for piles and other aspects of foundation design are recommended:

1. Support the column loads including the structural slab portion of the ground floor on concrete filled steel piles driven to bear in the glacial till or on rock. It would appear that several types of piles could be economically used, as follows:

Type A	Light wall pipe piles
Type B	Armco Hel-Cor Piles
Type C	Raymond Step Taper Piles
Type D	Union Monotube Piles

When final foundation loads for the entire structure have been calculated, a final study should be made to determine the most economical type of pile.

Allowable loads on pipe piles should be selected in accordance with the provisions of the Boston Building Code assuming that the pipes are filled with 4000 psi concrete and that 0.125 inch is deducted from the pipe wall thickness to allow for corrosion.

2. The estimated range in pile length varies from 55 to 75 ft., based on logs of test borings. The average pile length is estimated to be 65 ft. below El. 22.
3. Carry all excavations within the slab-on-grade area to a depth of 12 inches below the elevation of the underside of ground floor slab.
4. Compact the dump fill by one of the following methods:
  - a) A minimum of four (4) coverages with one of the rear wheel assemblies of a fully loaded ten-wheel truck.
  - b) A minimum of four (4) coverages with the wheels of a rubber-tired roller having a minimum of

four wheels abreast, and weighted to a total load not less than 70,000 pounds.

- c) A minimum of four (4) coverages with one tread of a crawler type tractor with a total weight, including blade and equipment, of not less than 30,000 pounds and operated at its top speed.
  - d) A minimum of four (4) coverages with a vibratory compactor approved by the Engineer.
5. Provide a minimum of 12 inches of well-graded bank-run sand and gravel below all earth supported ground floor slabs. Granular fill should meet the following gradation specification:

<u>Sieve Size</u>	<u>Percent Finer By Weight</u>
6"	100
#4	30-95
#40	5-50
#200	0-8

Compact the granular fill to at least 93 percent of the maximum density according to ASTM Test Designation D1557, Method D by one of the methods outlined in paragraph 4.

Compacted granular fill should be placed and compacted in layers not exceeding 10 inches in thickness measured before compaction and should not be placed on a frozen surface, or on snow or ice, nor should it be placed when the air temperature is less than 28°F.

- 6. Carry the bottom of exterior grade beams to a minimum depth of 4 ft. below the lowest adjacent ground surface exposed to natural freezing to protect the structure from damage by frost action.
- 7. Provide reinforcing between the slab-on-grade and walls to eliminate the development of small settlements of the slab relative to the wall.
- 8. Provide an underdrain around the northern wall of the structure. Although the permanent groundwater level is expected to be below El. 22, we believe that construction of a drain to collect whatever seepage and surface water infiltration develops, is desirable. Use 6-inch diameter extra strength clay



pipe conforming to ASTM specification 6211-61T. Locate the pipe adjacent to pile caps at the approximate elevation of the caps and use a 6-inch minimum thickness of coarse filter material around the pipe meeting the following gradation requirements:

<u>Sieve Size</u>	<u>Percent Finer by Weight</u>
5/8"	100
1/2"	85-100
3/8"	15-45
#4	0-15
#8	0-5

9. Include one pile load test carried to twice design load for the heaviest loaded pile type.
10. Fill that is to be placed within the building area to provide for access roads, walkways or other such surfaces should be placed as soon as possible during the construction period and the pavement or other surfacing material should be placed as late as possible in order to allow as much settlement as possible to occur prior to surfacing.

## V. CONSTRUCTION CONSIDERATIONS

### 5-01. EXCAVATION AND PILE DRIVING

Information obtained on the history of the proposed site indicates that in 1933 a row of trees existed diagonally across the site of the proposed field house. At this time the ground surface was at elevation 18 to 24 within this area. The trees numbered approximately 65 and varied in size from 6-inch Poplars to 36-inch Elms. If these trees were not removed by the stump some difficulty may arise in site excavation.

There are indications that some large boulders and foundation blocks were used in filling the existing practice football field. These obstructions could also yield a problem with site excavation and pile driving.

### 5-02. DEWATERING

Excavations are anticipated to be limited to areas generally above the water table. Therefore no lateral support or dewatering problems should develop.

### 5-03. CEMENT

Type 2 cement is normally considered adequate for foundation, grade beam, and exterior wall construction in soils such as those encountered at the subject site. However, considering the magnitude of the project and the costs involved an evaluation may be warranted to establish the desirability of using Type 5 sulfate resistant cement.

### 5-04. INSPECTION

Full-time inspection of the following phases of foundation construction is recommended:

1. Compaction of existing fill and placement of engineered compacted backfill below the ground floor slab. The inspector will check for areas of unsuitable materials and supervise their removal. He will inspect the quality, placement and compaction of compacted granular fill.
2. Pile Driving: The inspector will check all work in connection with the piles and make an accurate record of the material and the principal dimensions of each pile, the number of blows per minute, the number of blows per inch for the last six inches of driving,

together with the grades at point and cut-off. Inspection personnel must be qualified by training and experience in these phases of foundation construction and earthwork.

TABLE

SUMMARY OF LABORATORY TEST RESULTS

BORING & SAMPLE NUMBER	DESCRIPTION	DEPTH (FEET)	TEST NO.	NATURAL WATER CONTENT %	ATTERBERG LIMITS		UNIT WEIGHT LB./CU.FT.	UNCONFINED COMPRESSIVE STRENGTH PSF	UNCONFINED TEST STRAIN %	CONSOLIDATION MAX. PAST PRESSURE TON/SQ. FT.	C <sub>c</sub>	OTHER TESTS T.V.
					LL	PL						
109-U1	Soft gray CLAY	25-27	C1	35.0	39.2	21.4				5.0		*T.V. = 0.3
		25.2										
		25.4										
109-U2	Soft gray silty CLAY	35-37	C2	40.2	40.4	23.9				2.2		T.V. = 0.2
		35.3										
		35.5										
109-U3	Soft gray silty CLAY	45-47	C3	44.3	30.8	19.0				1.2		T.V. = 0.25
		45.4										
		45.7										
109-U4	SILT up to 55.9' Clayey SILT 55.9' - 56.1' Silty CLAY 56.1 -	55-57	C4	20.6	40.8	22.1				2.9		T.V. = 0.23
		55.6										
		56.0										
		56.2										
115-U1	Gray silty CLAY	25-27	C5	41.0	47.4	26.0				3.25		T.V. = 0.54
		25.3										
115-U2	Gray silty CLAY	35-37	C6	39.4	42.6	26.2				3.4		T.V. = 0.53
		35.2										
		35.3										

Belmont High School  
Belmont, Massachusetts

File No. 68-1969  
Sheet 2 of 2

SUMMARY OF LABORATORY TEST RESULTS

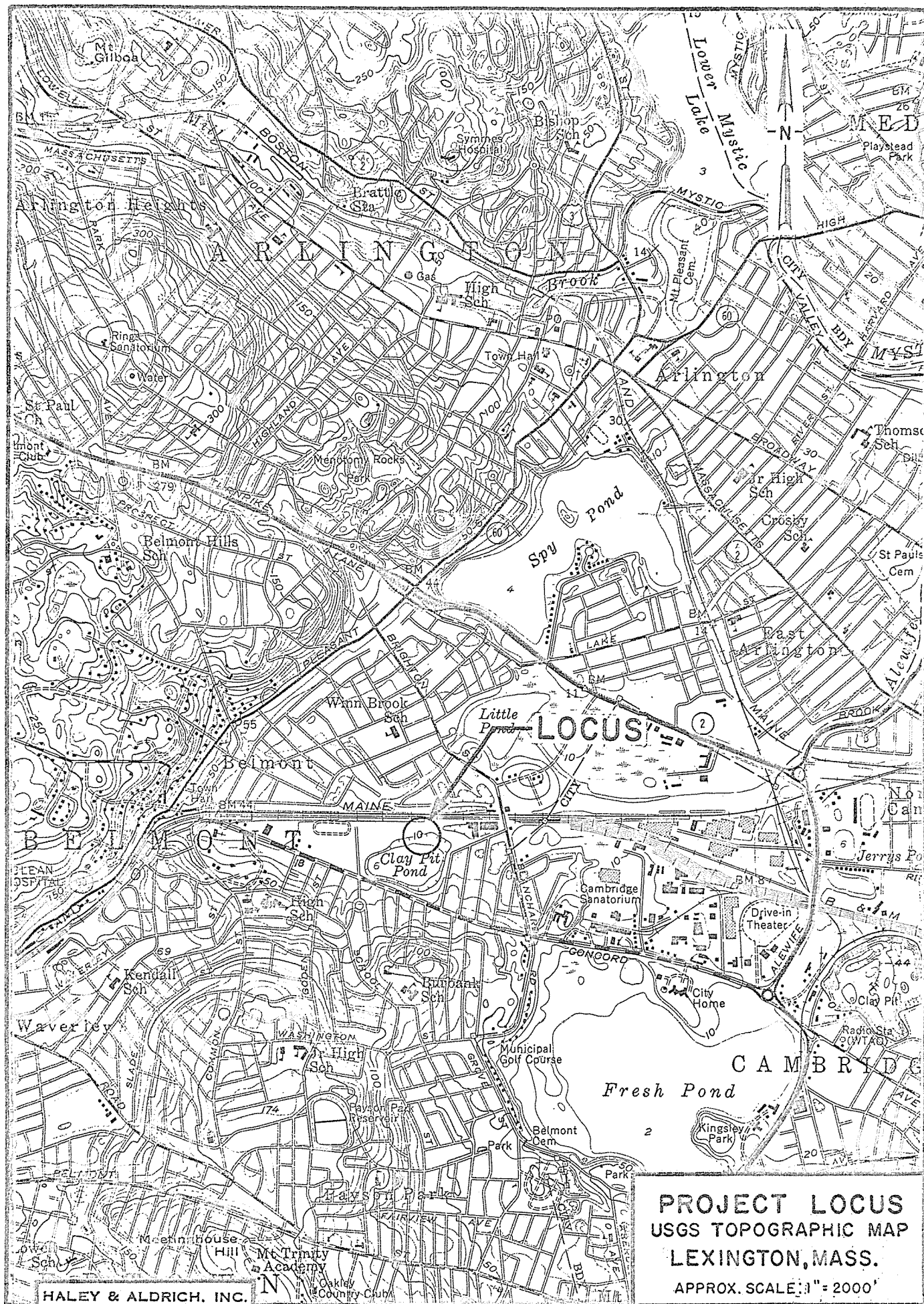
BORING & SAMPLE NUMBER	DESCRIPTION	DEPTH (FEET)	TEST NO.	NATURAL WATER CONTENT %	ATTERBERG LIMITS		UNIT WEIGHT LB/CU.FT.	UNCONFINED TEST COMPRESSIVE STRENGTH PSF.	CONSOLIDATION		OTHER TESTS
					LL	PL			MAX. PAST PRESSURE TON/SQ. FT.	Cc	
115-U3	Gray CLAY up to 45.5' Gray CLAY with occasional stones from 45.5'	45-47		39.5							T. V. =
		45.2									0.07
		45.4									PP =
		45.5									1.7
		45.7									T. V. =
		46.1	C7	26.5	42.0	19.4			4.2		0.65

\* Torvane Shear Strength  
\*\* Pocket Penetrometer Failure Strength



FIGURES





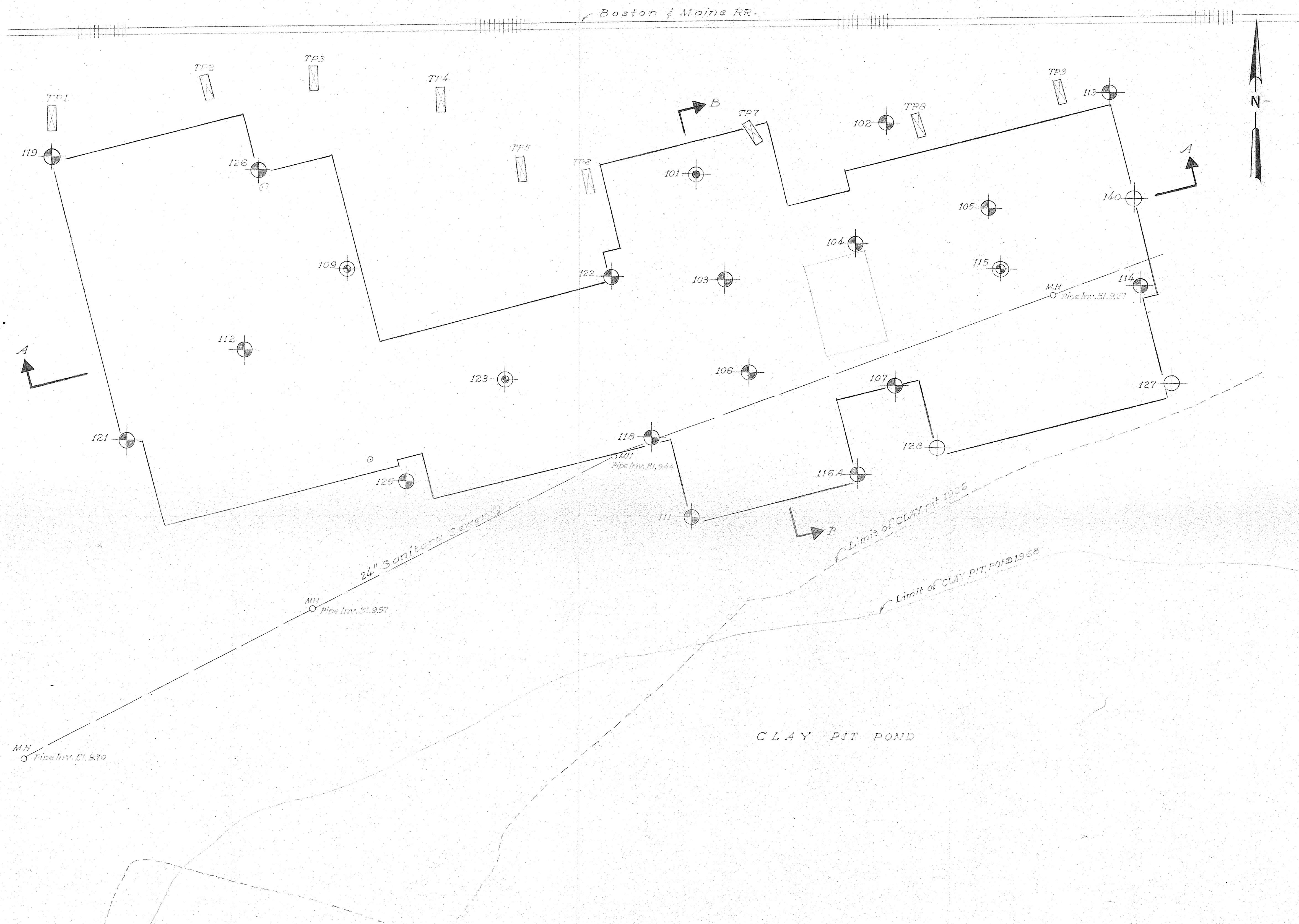
HALEY & ALDRICH, INC.  
CONSULTING SOIL ENGINEERS

**PROJECT LOCUS**  
USGS TOPOGRAPHIC MAP  
LEXINGTON, MASS.

APPROX. SCALE: 1" = 2000'

FIGURE 1





**LEGEND**

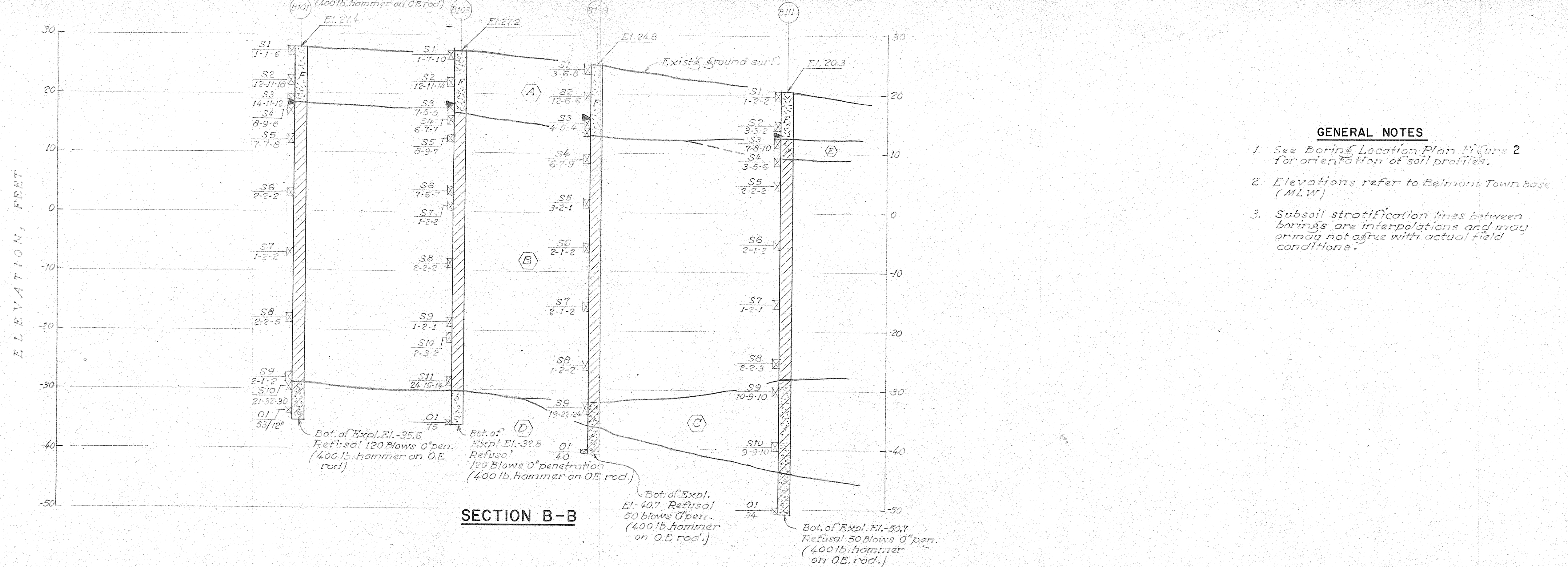
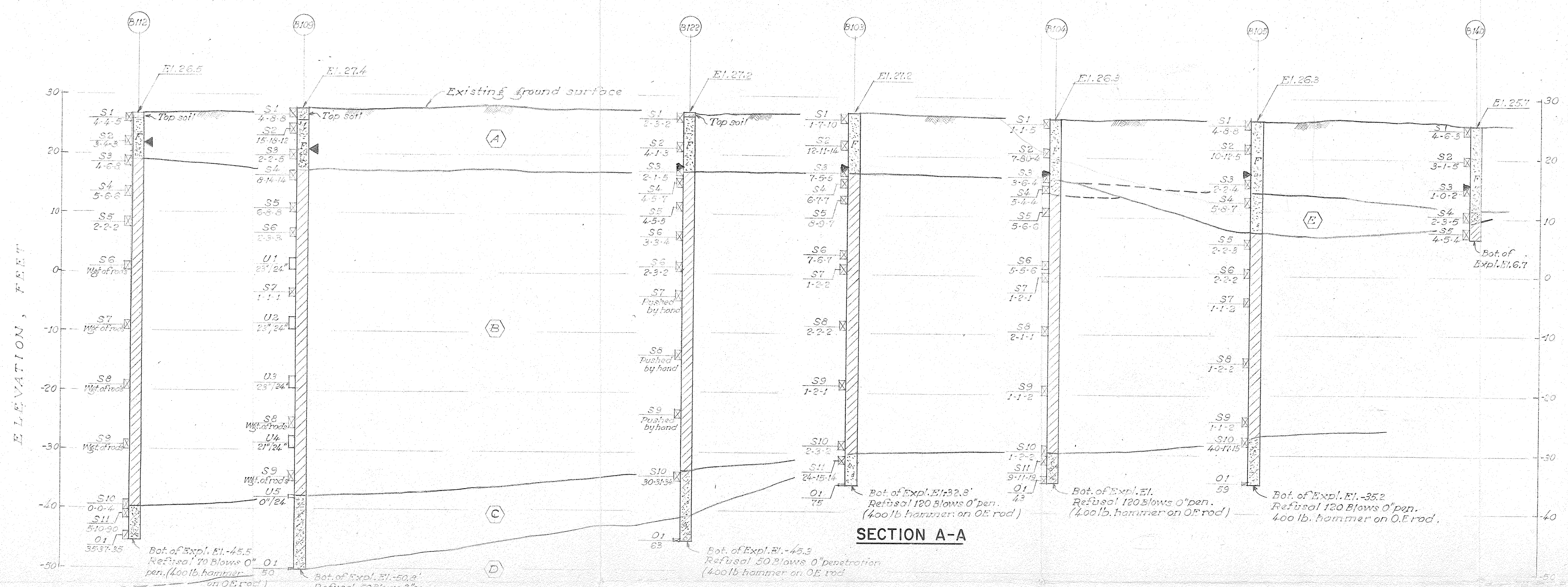
- 103 2 1/2" drive sample borings to refusal.
- ⊙ 115 4" drive sample borings with 3" undisturbed piston samples to refusal.
- ⊙ 101 2 1/2" drive sample boring to refusal with permanent observation well installed.
- ⊙ 2 1/2" drive sample borings to the surface of the clay.
- ▭ TP1 Machine excavated test pits.

**NOTES**

1. Plan of land and boring locations by Town Engineer, Belmont, Mass.
2. Building location by Korslund, LeNormond and Quam, Inc.
3. Record high elevation of CLAY PIT POND E1.19.73 recorded August 19, 1955.

FILE NO. 68-1969





- LEGEND**
- Boring number
  - El. 26.5 Ground Surface Elevation
  - Observed water level in borings
  - Location of 2 inch O.D. split spoon sample, driven with 140 lb. hammer, 30-inch drop; numbers indicate blows per 6-in. unless noted.
  - Location of 1 inch diam. open-end pipe sample, driven with a 400 lb. hammer; numbers indicate blows per 6-in. unless noted.
  - Location of 3-inch diam. stationary piston sample. Sample recovery 23 out of 24" pressed.
  - No recovery.

- GENERAL SOIL CLASSIFICATION**
- A Predominantly burnt rubbish material, with some layers of sand or gravel, contains sand, cliners, ash, steel and a small amount of wood.
  - B Stiff to very soft clay with some fine sand lenses. The stratum becomes more sensitive to the west and has a stiff to medium crust.
  - C Compact to very compact silty grey fine sand, some clay.
  - D Very compact grey coarse to fine sand some coarse to fine gravel with a clay matrix (Glacial Till)
  - E Medium compact silty fine sand with a trace of clay

- GRAPHIC SOIL SYMBOLS**
- Granular FILL
  - Peat or organic SILT
  - SAND
  - CLAY
  - GRAVEL
  - BOULDER
  - BEDROCK
- NOTE**
- Where a combination of soil type occurs, heaviest symbol indicates the major soil component.
- Example:
- Silty CLAY
  - Clayey SILT

- GENERAL NOTES**
- See Boring Location Plan Figure 2 for orientation of soil profiles.
  - Elevations refer to Belmont Town base (M.L.W.)
  - Subsoil stratification lines between borings are interpolations and may not agree with actual field conditions.

- ABBREVIATIONS**
- | DENSITY OR CONSISTENCY | COLOR       |
|------------------------|-------------|
| lse. - loose           | br. - brown |
| med. - medium          | bk. - black |
| comp. - compact        | gr. - gray  |
| stf. - stiff           | dk. - dark  |
| hd. - hard             |             |
- 
- | SOIL COMPONENTS          | MISCELLANEOUS |
|--------------------------|---------------|
| cl. - clay or clayey     | c. - coarse   |
| sl. - silt or silty      | m. - medium   |
| sa. - sand or sandy      | f. - fine     |
| gr. - gravel or gravelly | v. - very     |
| blcr. - boulder          | tr. - trace   |
| pt. - peat or peaty      | lt. - little  |
| org. - organic           | wd. - wood    |

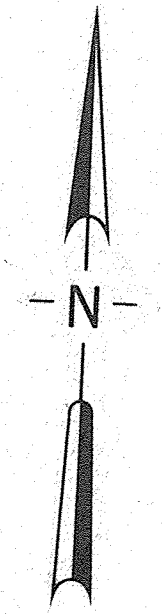
BELMONT HIGH SCHOOL  
BELMONT, MASS.

**SOIL PROFILES**

SCALE: 1"=10' HOR. & VERT. JULY 1968



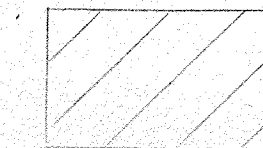
Boston & Maine RR.



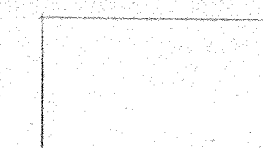
NOTES

1. Plan of land and boring locations by Town Engineer, Belmont, Mass.
2. Building location by Korslund, LeNormand & Quann, Inc.
3. Record high elevation of CLAY PIT POND El. 19.13 recorded 19 August 1955.

LEGEND



Area within which an earth supported ground floor slab @ El. 22 is recommended.



Area within which a structural slab is recommended.

BELMONT HIGH SCHOOL  
 BELMONT, MASS.  
**AREAS OF  
 GROUND FLOOR SLAB TYPES**

SCALE: 1" = 40'

JULY 1968



APPENDIX A

Boring Logs, Northeast Test Boring Co., Inc.

NORTHEAST TEST BORING CO., INC.  
156 Essex Street, Weymouth, Massachusetts

Korslund, LeNormand & Quinn, Inc.  
20 Vernon Street  
Norwood, Massachusetts

Belmont, Massachusetts  
Proposed High School  
Concord Avenue

Hole No. B-101

Elev. 27.4

Water - 9.5' after 1/2 hr.

Well Point - 10'

Depth of Samples	Blows per 6"	
	0"-6"	6"-12" 12"-18"
0"-1.5'	1	1 6
5'-6.5'	12	11 18
8'-9.5'	14	11 12
10'-11.5'	Well Point 8	9 8
15'-16.5'	7	7 8

0.0'	Mixed Fill
8.0'	(Burnt dump material)
9.5'	Mixed Fill
	Stiff, brown-gray Clay
	(quite plastic)
23.5'	Soft, gray Clay
	with layers of silty Sand
	(very plastic)
56.5'	Very compact, gray Sand, and Gravel, some Cobbles trace of Silt
63.0'	Bottom of hole 63' Refusal 120 blows 0"

53 (400# Hammer for 12")

Boring conducted on 5-22-68.

Boring Foreman

P. Manning

NORTHEAST TEST BORING CO., INC.  
 156 Essex Street, Weymouth, Massachusetts

Korslund, LeNormand & Quann, Inc.  
 20 Vernon Street  
 Norwood, Massachusetts

Belmont, Massachusetts  
 Proposed High School  
 Concord Avenue

Depth of Samples	Hole No. B-102 Elev. 27.4 Water - 9.25' after ¼ hr.	Blows per 6"		
		0"-6"	6"-12"	12"-18"
0"-1.5'	0.0'	2	4	3
4.5'-6'		3	12	8
8'-9.5'		1	1	3
11'-12.5'	10.0'	3	4	5
13.5'				
15'-16.5'		6	6	5
21'-22.5'		3	4	4
23'-24.5'	23.0'	2	2	1
30'-31.5'		1	2	2
40'-41.5'		1	1	2
50'-51.5'		1	2	3
52'-53.5'	52.0'	12	11	14
60'-60.5'	55.0'	58	(400# H.)	
	60.5'	Bottom of hole 60.5' Refusal 120 blows 0"		

Boring conducted on 5-26-68. Boring Foreman P. Manning

NORTHEAST TEST BORING CO., INC.  
156 Essex Street, Weymouth, Massachusetts

Korslund, LeNormand & Quann, Inc.  
20 Vernon Street  
Norwood, Massachusetts

Belmont, Massachusetts  
Proposed High School  
Concord Avenue

Hole No. B-103  
Elev. 27.2  
Water - 9' after  $\frac{1}{4}$  hr.

Depth of Samples	Description	Blows per 6"	
		0"-6"	6"-12" 12"-18"
0"-1.5'	Mixed Fill	1	7 10
4.5'-6'	(appears to be burnt dump material)	12	11 14
9'-10.5'	Stiff & very stiff, brown Clay	7	5 5
11'-12.5'		6	7 7
14'-15.5'	(quite plastic)	8	9 7
23'-24.5'	Soft, gray Clay, trace of silty Sand	7	6 7
25'-27'		1	2 2
35'-36.5'	(very plastic)	2	2 2
45'-46.5'		1	2 1
55'-56.5'	Compact, to very compact silty, gray Sand & Gravel tr. of Cobbles & Boulders	2	3 2
57.5'-59'		24	15 14
62.5'-63'		75	(400# Hammer)

Bottom of hole 63'  
Refusal  
120 blows 0"

Boring conducted on 5-23-68. Boring Foreman P. Manning



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 Concord Avenue.

Hole No. B-104  
 Elev. 26.3  
 Water -

Depth of Samples	0.0'	Blows per 6"	Blows per 6"	
			6"-12"	12"-18"
0"-1.5'		1	1	5
5'-6.5'		7	80	4
9'-10.5'	10.5'	3	6	4
11'-12.5'	13.0'	5	4	4
15'-16.5'		5	6	6
24'-25.5'	26.0'	5	5	6
26'-27.5'		1	2	1
35'-36.5'		2	1	1
45'-46.5'		1	1	2
55'-56.5'	56.5'	1	2	2
56.5'-59'		9	11	19
60'-61.5'	61.5'	43	(400# H.)	

Bottom of hole 61.5'  
 Refusal  
 120 blows 0"

Boring conducted on 5-26-68. Boring Foreman P. Manning



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Hole No. B-105

Elev. 26.3

Water - 9' after ½ hr.

Depth of Samples	Blows per 6"		
	0"-6"	6"-12"	12"-18"
0"-1.5'	4	8	8
4'-5.5'	10	12	5
10'-11.5'	2	2	4
13'-14.5'	5	8	7
20'-21.5'	2	2	3
25'-26.5'	2	2	2
30'-31.5'	1	1	2
40'-41.5'	1	2	2
50'-51.5'	1	1	2
53.5'-55'	40	17	15
61'-61.5'	59 (400# H.)		

Bottom of hole 61.5'

Refusal

120 blows 0"

Boring conducted on 5-25-68

Boring Foreman P. Manning

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Hole No. B-106  
 Elev. 24.8  
 Water - 9' after ½ hr.

Depth of Samples	Description	Blows per 6"		
		0"-6"	6"-12"	12"-18"
0"-1.5'	Mixed Fill	3	6	8
4.5'-6'	(appears to be burnt dump material)	12	6	6
9'-10.5'	Medium, Mixed Fill	4	5	4
10.5'-12'		6	7	9
15'-16.5'	Stiff, brown Clay (some plasticity)	6	7	6
22.5'-24'		3	2	1
30'-31.5'	Soft, Gray Clay	2	1	2
40'-41.5'	with thin layers of silty Sand	2	1	2
50'-51.5'	(very plastic)	1	2	2
57.0'	Compact, silty, Gray Sand	19	22	24
61.0'	Very compact, silty, Gray Sand, trace of Gravel and Clay	40	(400# Hammer)	
65.5'	Bottom of hole 65.5' Refusal 50 blows 0" 400# Hammer			

Boring conducted on 5-23-68.

Borin. Foreman P. Manning

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Hole No. B-107  
 Elev. 23.0  
 Water - 9' after 1 hr.

Depth of Samples	0.0'	1.5'	17.0'	24.0'	43.0'	57.5'	60.0'	Blows per 6"		
								0"-6"	6"-12"	12"-18"
0"-1.5'								2	3	7
4'-5.5'								4	5	3
7'-8.5'								21	7	5
15'-16.5'								10	8	5
17'-18.5'								4	7	6
24'-25.5'								2	1	1
35'-36.5'								1	2	1
45'-46.5'								2	3	2
55'-56.5'								3	4	3
57.5'-59'								51	32	42
59'-60'								129	145	
Bottom of hole 60'										
Refusal										
274 blows 12"										

Boring conducted on 5-17-68.

Boring Foreman P. Manning

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Hole No. B-108  
 Elev. 22.4  
 Water - 7' after  $\frac{1}{2}$  hr.

Depth of Samples		Blows per 6"		
		0"-6"	6"-12"	12"-18"
0"-1'	Top Soil	4	4	12
1.5'-3'	Stiff, brown Clay, some silty Sand	6	8	10
5'-6.5'		6	6	7
8'-9.5'		5	5	7
11'-12.5'	Medium, Gray Clay, trace of Sand	3	3	2
15'-16.5'		Pushed by Hand		
25'-26.5'	Very soft, Gray Clay	Pushed by weight of Rods		
	trace of silty	Pushed by weight of Rods		
35'-36.5'		Pushed by weight of Rods		
45'-46.5'	Sand	Pushed by weight of Rods		
53'-54.5'		35	37	45
57'-58'	Very compact, gray Sand and Gravel	10	85	

Bottom of hole 58'  
 Refusal  
 60 blows 0"  
 400# Hammer

Boring conducted on 6-5-68 Boring Foreman P. Manning

REMARKS: Water Table probably is wash water because no water was detected as stiff clay was encountered at 1 foot.

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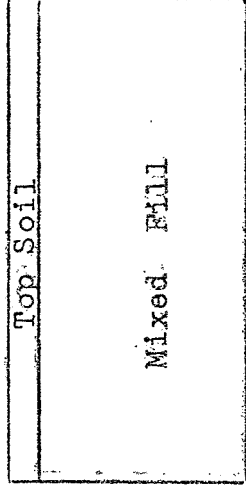
Belmont, Massachusetts  
 Proposed High School  
 Concord Avenue

Hole No. B-109 (ORIGINAL SITE)

Elev. 18.5

Water - 5' after ¼ hr.

Depth of Samples	Blows per 6"	Blows per 6"	Blows per 6"
0"-1.5'	4	4	6
4'-5.5'	8	4	5
8'-9.5'	4	5	9



REMARKS: Hole started thinking it was a drive sample hole. Discovered it was a piston hole and stopped. Hole later deleted.

Boring Conducted on 6-4-68. Boring Foreman P. Manning

Hole No. B-113 (Original Site)

Elev. 30.37

Water - None

Depth of Samples	Blows per 6"	Blows per 6"	Blows per 6"
0.0'	0"-6"	6"-12"	12"-18"
8.0'	Had bucket - loader clear decayed leaves etc.		

Bottom of hole 8'

Boring conducted on 6-1-68 Boring Foreman P. Manning

Hole No. B-119 (Original Site)

Elev. 28.8

Water - None

Depth of Samples	Blows per 6"	Blows per 6"	Blows per 6"
0.0'	0"-6"	6"-12"	12"-18"
8.0'	Had bucket - loader clear decayed leaves etc.		

Bottom of hole 8'

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Hole No. B-109  
 Elev. 27.4  
 Water - 7' after 1/2 hr.

Depth of Samples	0.0'	Blows per 6"	0"-6"	6"-12"	12"-18"
0"-1.5'	0.0'		4	8	8
2.5'-4'	2.0'		15	18	12
7'-8.5'	7.5'		2	2	5
10.5'-12'	10.5'		8	14	14
16'-17.5'	19.5'		6	8	8
20'-21.5'	23.5'		2	3	3
25'-27'		PISTON #1		Rec. 23"	
30'-31.5'		1	1	1	1
35'-37'		PISTON #2		Rec. 23"	
45'-47'		PISTON #3		Rec. 23"	
52'-53.5'		Pushed by weight of Rods			
55'-57'		PISTON #4		Rec. 21"	
61'-62.5'		Pushed by weight of Rods			
65'-65.5'	65.5'	PISTON #5		Rec. 0"	
		(see remarks)			
78'-78.25'	78.0'	Compact, silty, Gray Sand and Gravel			
	78.25'	Till			
		Bottom of hole 78.25'			
		Refusal			
		50 (400# Hammer)			

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Hole No. B-110  
Elev. 22.8  
Water - 7' after 1/2 hr.

Depth of Samples	Soil Description	Blows per 6"	6"-12"	12"-18"
0"-1.5'	Top Soil	3	5	7
2'-3.5'	Very stiff, brown and yellow Clay, trace of silty Sand	14	13	14
5.5'-7'		9	10	11
10.5'-12'	Medium, to soft, gray Clay, trace of silty Sand	3	3	3
15'-17'	(some plasticity)	PISTON #1	Rec. 23"	
20'-21.5'		1	1	1
25'-27'	Very soft, gray Clay	PISTON #2	Rec. 23"	
30'-31.5'		Pushed by weight of Rods (No Sample)		
35'-37'		PISTON #3	Rec. 23"	
40'-41.5'	trace of silty Sand	Pushed by weight of Rods		
45'-47'	(very plastic)	PISTON #4	Rec. 19"	
50'-51.5'		Pushed by weight of Rods		
55'-57'		PISTON #5	Rec. 19"	
62'-63.5'	Moist, medium, fine, gray Sand, some Silt	12	14	15
70'-71.5'	Very compact, silty, gray Sand & Gravel, trace of Clay	19	22	27 (400# H.)
79'-79.5'	Bottom of Hole 79.5' Refusal	62	(400# Hammer)	

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Hole No. B-111  
 Elev. 20.3  
 Water - 7' after 1/2 hr.

Depth of Samples	Soil Description	Blows per 6"		
		0"-6"	6"-12"	12"-18"
0'-1.5'	Top Soil	1	2	2
5'-6.5'	Loose, Mixed Fill (appears to be burnt dump material)	3	3	2
8'-9.5'	Medium, silty, gray Sand	7	8	10
11'-12.5'	Medium, brown clay, some silty Sand (some plasticity)	3	5	6
15'-16.5'		2	2	2
25'-26.5'	Soft, gray Clay,	2	1	2
35'-36.5'	trace of Sand			
45'-46.5'	(very plastic)	1	2	1
50'-51.5'		2	2	3
59'-60.0'	Medium, silty, gray Sand, some Clay	10	9	10
70'-71'	Very compact, silty, gray Sand, some Clay	9	9	10
71.0'	Bottom of hole 71' Refusal 50 blows 0" 400# Hammer	34 (400# Hammer)		

Boring Conducted on 6-19-68 Boring Foreman P. Manning



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Hole No. B-112  
Elev. 26.5  
Water - 5' after ½ hr.

Depth of Samples	Blows per 6"	
	0"-6" 6"-12"	12"-18"
0'-0'	4	4
0"-1.5'	4	5
4'-5.5'	3	3
7.5'-9'	4	8
12.5'-14'	5	6
17.0'	2	2
17.5'-19'	2	2
25'-26.5'	Pushed by weight of Rods	
35'-36.5'	Pushed by weight of Rods	
45'-46.5'	Pushed by weight of Rods	
55'-56.5'	Pushed by weight of Rods	
65'-66.5'	0	4
66.5'-68'	5	10
70.5'-72'	35	37
72.0'	35	35

Top Soil  
Loose, Mixed Fill  
Stiff, yellow Clay  
trace of silty  
Sand  
Soft, to very soft,  
gray Clay,  
trace of silty Sand  
(very plastic)  
Very compact, silty, gray  
Sand, some Clay, trace  
of Gravel and Silt

Bottom of hole 72'  
Refusal  
70 blows 0"  
300# Hammer

(300# H.)

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 Concord Avenue

Hole No. B-113  
 Elev. 27.3  
 Water - 11' after  $\frac{1}{2}$  hr.

Depth of Samples	0.0'	Top Soil	Blows per 6"		
			0"-6"	6"-12"	12"-18"
0"-1.5'	0.75'	Loose, Mixed Fill	9	6	6
4"-5.5'		(appears to be a great deal of burnt dump material)			
9"-10.5'	11.0'	Loose, black Organic Silt	4	9	3
11.5'-13'	13.0'	some Mixed Fill	3	4	3
13.5'-15'	18.0'	Stiff, blue-brown Clay and silty Sand	4	5	5
20'-21.5'		Medium, brown Clay, trace of Sand (very plastic)	3	2	3
25'-26.5'	24.5'		1	2	1
30'-31.5'		Very soft, gray Clay, trace of Sand (in thin layers)	1	0	1
40'-41.5'		(very plastic)	1	1	0
50'-51.5'	50.0'		1	2	1
60'-61.5'		Soft, gray Clay, trace of Sand (in thin layers)	1	2	2
63'-64.5'	63.0'	(very plastic)			
		Moist, compact, fine, gray Sand, trace of Silt	12	14	16
78'-78.5'	71.0'	Very compact, silty, gray Sand and Gravel			
	78.5'				

49 (400# Hammer)

Bottom of hole 78.5'  
 Refusal

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Hole No. B-1114  
 Elev. 22.4  
 Water - 9.5' after ¼ hr.

Depth of Samples	0.0'	Blows per 6"	0"-6"	6"-12"	12"-18"
5'-6.5'		4	2	8	
9'-10.5'		2	5	1	
11.5'-13'	Loose, Mixed Fill	3	3	4	
16.5'-18'	Moist, gray Silt, trace of fine Sand	4	6	6	
20'-21.5'	Stiff, gray Clay, trace of Sand (plastic)	2	2	2	
25'-26.5'	Soft, gray Clay	2	3	2	
35'-36.5'	with thin layers of silty Sand	1	2	2	
45'-46.5'	( very plastic )	1	2	2	
56'-57.5'		2	2	2	
66'-67.5'	Compact, gray Sand, trace of Gravel	10	14	19	
69.5'-70.5'	Very compact, Sand and Gravel, some Clay	30	61	(400# Hammer)	

Bottom of hole 70.5'

Refusal  
 50 blows 0"  
 400# Hammer

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Hole No. B-115  
Elev. 24.1  
Water - 10' after ½ hr.

Depth of Samples	Blows per 6"		
	0"-6"	6"-12"	12"-18"
0"-1.5'	6	4	3
5'-6.5'	2	2	3
8.5'-10'	4	6	6
10.5'-12'	3	2	2
15.5'-17'	24	12	8
20.5'-22'	3	3	4
25'-27'	PISTON 1	1	Rec. 24"
30'-31.5'	2	3	3
35'-37'	PISTON 2	2	Rec. 24"
40'-41.5'	3	4	4
45'-47'	PISTON 3	3	Rec. 24"
50'-51.5'	8	9	8
54'-55.5'	30	27	32
63.75'-64'	50 (400# Hammer)		

Bottom of hole 64'

Refusal  
50 blows 3"  
400# Hammer

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Hole No. B-116 (Original Site)  
Elev. 15.7  
Water - 5' after  $\frac{1}{4}$  hr.

Depth of Samples	Blows per 6"		
	0"-6"	6"-12"	12"-18"
0"-1.5'	4	8	8
4'-5.5'	10	6	4
9'-10.5'	4	3	3
15'-16.5'	2	2	3
20.0'			
21'-22.5'	2	4	3
24'-25.5'	3	3	6
27.0'			
29'-30.5'	3	4	3
32.0'			
32'-33.5'	8	9	10
43.5'-45'	10	9	10
45.0'			

Bottom of hole 45'

REMARKS: Hole stopped by Engineer - moved to new location.

Boring conducted 6-10-68 Boring Foreman P. Manning

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Hole No. B-116 (New Location)  
 Elev. 19.3  
 Water - 7.5' after ½ hr.

Depth of Samples	Blows per 6"	
	0"-6"	6"-12" 12"-18"
0"-1.5'	3	3
1.0'		5
5.5'-7'	3	4
7'-8.5'	3	4
9'-10.5'	5	6
12'-13.5'	6	5
15.5'	1	2
25'-26.5'	2	1
35'-36.5'	1	1
44'-45.5'	8	9
50'-51.5'	6	7
55'-56.5'	7	7
64.5'-65.5'	75	75 (400# Hammer)

Bottom of hole 65.5'  
 Refusal  
 50 blows 0"  
 400# Hammer

Boring conducted on 6-15-68. Boring Foreman P. Manning

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Hole No. B-117  
Elev. 19.2  
Water - 4.5' after ½ hr.  
Well Points - 20'

Depth of Samples	0.0'	Blows per 6"	0"-6"	6"-12"	12"-18"
0"-1.5'	0.0'	5	6	18	
4'-5.5'	1.5'	1	1	1	1
10'-11.5'	4.0'	30	25	14	
15'-16.5'	5.5'	2	3	2	
20'-21.5'	12.0'	2	1	2	
25'-26.5'		1	2	1	
30'-31.5'		1	2	1	
33'-34.5'	32.5'	4	8	7	
37.5'-39'	37.0'	40	4	5	
40'-41.5'	39.0'	5	5	6	
50'-51.5'	48.0'	10	10	8	
55'-56.5'	53.5'	4	5	4	
60'-61.5'	59.0'	12	18	21	
65'-66.5'	69.0'	15	22	25	
70'-71.5'		12	11	25	
80'-81.5'		11	12	11	

Top Soil and Fill  
Medium, brown Sand, and  
Gravel (Fill)

Very loose, Mixed Fill

Compact, Mixed Fill  
and  
(Burnt dump material)

Very loose, Mixed Fill

Well Point

and

(Burnt dump material)

Medium, Mixed Fill,  
some Clay mixed  
Gray Clay with 6" Strata  
of Sand and Gravel

Stiff, gray Clay

(quite plastic)

Wet, fine, gray Sand,  
trace of Silt  
(running Sand)

Medium, gray Clay  
(very plastic)

Moist, compact, fine,

gray Sand, trace  
of Silt

Very stiff, gray Clay,

traces of fine

Sand

(quite plastic)

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Hole No. B-118  
 Elev. 23.4  
 Water - 7.5' after ½ hr.

Depth of Samples	Blows per 6"		
	0"-6"	6"-12"	12"-18"
0.0'			
0"-15.1'	4	6	4
5.5'-7.1'	1	0	2
8.5'-10.1'	5	4	4
15'-16.5'	5	5	4
20'-21.5'	2	1	2
30'-31.5'	1	1	2
40'-41.5'	1	1	1
50'-51.5'	2	3	3
60'-61.5'	2	2	1
65'-66.1'	75	75	
67'-68.1'	81	(400# Hammer)	

Bottom of hole 68'  
 Refusal  
 50 blows 0"  
 400# Hammer

Boring conducted on 6-19-68

Boring Foreman P. Manning



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Hole No. B-119  
Elev. 27.5  
Water - None

Depth of Samples	Blows per 6"		
	0"-6"	6"-12"	12"-18"
3.5'-5'	3	4	2
5'-6'	1	1	8
6'-7.5'	6	10	8
10'-11.5'	4	5	8
17'-18.5'	4	2	1
20.5'-22'	Weight of Hammer		
30'-31.5'	Weight of Rods		
42'-43.5'	Weight of Rods		
55'-56.5'	Weight of Rods		
66'-67.5'	Weight of Rods		
69'-70.5'	Weight of Rods		
66.0'	12	15	20
69.0'	(No sample recovered)		
70.5'	42	56	80

Bottom of hole 70.5'  
Refusal  
100 blows, 0"  
250# Hammer

Loose, Mixed Fill  
Top soil, trace of fill  
Silty Sand and Clay  
Stiff, brown Clay,  
trace of Sand  
(quite plastic)  
Medium, to soft, brown  
and gray Clay  
Very soft, gray  
Clay  
trace of Sand from  
57' to 66'  
(very plastic)  
Gray Sand & Clay, trace  
of Gravel  
Very compact, gray Sand &  
Gravel, some Clay

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Hole No. B-120  
Elev. 19.9  
Water - 8.5' after 1 hr.

Depth of Samples	Blows per 6"		
	0"-6"	6"-12"	12"-18"
0"-1.5'	2	8	6
4.5'-6'	7	7	5
8.5'-10'	2	3	1
14'-15.5'	2	2	3
19'-20.5'	1	2	3
24.5'-26'	3	8	9
29'-30.5'	12	14	8
34'-35.5'	3	4	4
40'-41.5'	6	6	5
45'-46.5'	9	10	10
55'-56.5'	12	11	11
65'-66.5'	10	12	11
70'-71.5'	33	50	45
75'-76.5'	19	21	7
80'-81.5'	47	45	42

0.0'

Medium, to very loose,

Mixed Fill

(appears to be a Great  
deal of burnt material)

Stiff, Gray Clay & Bricks  
(quite plastic)

Medium, gray Clay  
(very plastic)

Medium, silty, gray Sand,  
some Clay

Wet, medium, silty,  
gray Sand,

traces of Clay

Moist, very compact, fine,  
gray Sand and Gravel,  
trace of Clay

Compact, fine, gray Sand  
and Clay  
(some plasticity)

Moist, very compact, fine,

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 Norwood, Massachusetts

Belmont, Massachusetts  
 Proposed High School  
 Concord Avenue

Hole No. B-121  
 Elev. 22.8  
 Water - None

Depth of Samples	Blows per 6"		
	0"-5"	6"-12"	12"-18"
0"-1.5'	4	6	8
3'-4.5'	9	8	6
6'-7.5'	6	7	7
10'-11.5'	5	5	4
15'-16.5'	1	1	1
20'-21.5'	1	0	1
30'-31.5'			
40'-41.5'			
50'-51.5'			
60'-61.5'			
64.5'-66'			
71'-72'			

0.0'	Top Soil
0.75'	Mixed Fill (mostly Sand)
4.0'	Stiff, brown Clay, some silty Sand (some plasticity)
13.5'	Very soft, gray Clay, slight trace of Sand
	(very plastic)
64.5'	Very compact, silty, gray Sand and Gravel
72.0'	Bottom of hole 72'

Refusal  
 50 blows 0"  
 400# Hammer

27 25 24  
 58 (400# Hammer)

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Hole No. B-122  
Elev. 27.2  
Water - 9.75' after 1/2 hr.

Depth of Samples	Blows per 6"		
	0"-6"	6"-12"	12"-18"
0.0'	TOP SOIL		
0"-1.5'	2	3	2
5'-6.5'	4	1	3
9'-10.5'	2	1	5
11'-12.5'	4	5	7
15'-16.5'	4	5	5
19.0'	3	3	4
24.5'	2	3	2
28.5'	Pushed by Hand		
40'-41.5'	Pushed by Hand		
50'-51.5'	Pushed by Hand		
60.5'-62'	30	31	34
72'-72.5'	63 (400# Hammer)		

Bottom of hole 72.5'  
Refusal  
50 blows 0"  
400# Hammer

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Concord Avenue

Hole No. B-123

Elev. 24.9

Water - 5.5' after ½ hr.

Depth of Samples	Blows per 6"	
	6"-12"	12"-18"
0.0'		
0"-1.5'	4	4
5'-6.5'	2	1
11'-12.5'	2	5
15'-16.5'	8	8
20'-21.5'	3	3
25'-27'	PISTON 1	Rec. 24"
30'-31.5'	2	2
38'-40'	PISTON 2	Rec. 22"
40'-41.5'	1	1
45'-46'	PISTON 3	(See Note)
46'-47.5'	10	5
51'-52.5'	5	5
59'-60.5'	5	6
75.0'		
76.5'-77'		
77.0'		

Cemented, silty, gray  
Sand, some gravel

85 (400# Hammer)

Bottom of hole 77'  
Refusal  
86 blows 6"

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Hole No. B-124  
Elev. 19.4  
Water - 8.5' after ½ hr.

Depth of Samples	Blows per 6"	Blows per 6"	
		0"-6"	6"-12" 12"-18"
0"-1.5'	1	2	5
4'-5.5'	4	1	6
9'-10.5'	8	7	8
14'-15.5'	1	3	4
16'-17.5'	6	5	5
22'-23.5'	3	3	4
25'-26.5'	3	3	4
30'-31.5'	3	2	3
32'-33.5'	4	3	4
40'-41.5'	4	4	2
45'-46.5'	5	5	8
50'-51.5'	18	23	21
55'-56.5'	7	13	18
58'-59.5'	31	29	34
66.5'-68'	18	28	20
71'-72.5'	10	14	15
76'-76.5'	130		

Bottom of hole 76.5'

Refusal

130 blows 6"

0.0'  
Loose, Mixed Fill  
(appears to be a great deal of burnt material)  
14.0'  
Loose, Mixed Fill, some Clay  
16.0'  
Stiff, yellow Clay (quite plastic)  
21.0'  
Medium, Gray Clay (quite plastic)  
32.0'  
Medium, gray Clay with Sand layers (quite plastic)  
43.0'  
Stiff, Gray Clay, trace of Sand (quite plastic)  
49.0'  
Wet, compact, fine, Gray Sand, trace of Silt and Clay  
58.0'  
Very compact, fine, Gray Sand, and Gravel, trace of Silt  
66.5'  
Hard, Gray Clay, trace of Sand (some plasticity)  
71.0'  
Medium fine, Gray Sand some Silt and Clay  
72.5'  
Very compact, gray Sand, Gravel, Cobbles and Clay  
76.5'

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Hole No. B-125  
 Elev. 19.5  
 Water - 2' after ¼ hr.

Depth of Samples	Soil Description	Blows per 6"		
		0"-6"	6"-12"	12"-18"
0"-1.5'	Top Soil			
3'-4.5'	Fill, some Clay	3	5	6
		2	4	6
9'-10.5'	Medium, brown Clay, some silty Sand	5	5	4
14'-15.5'	Soft, Gray Clay, trace of Sand	2	3	2
18.5'	(very plastic)			
20'-21.5'				Pushed by Hand
30'-31.5'	Very soft, Gray Clay, trace of Sand			Pushed by Hand
40'-41.5'	throughout			Pushed by Hand
50'-51.5'	(very plastic)			Pushed by Hand
59.5'				
60'-61.5'	Compact, to very compact, silty, gray Sand, some Gravel, trace of Clay	12	15	18
66'-66.5'				59 (400# Hammer)
	Bottom of hole 66.5' Refusal 50 blows 0" 400# Hammer			

Boring conducted on 6-21-68

Boring Foreman P. Manning



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 Concord Avenue

Hole No. B-126

Elev. 27.6

Water - 5.5' after 1/2 hr.

Depth of Samples	Blows per 6"		
	0"-6"	6"-12"	12"-18"
0"-1.5'	3	5	8
4'-5.5'	9	4	2
6'-7.5'	6	8	8
10'-11.5'	6	8	8
15'-16.5'	7	7	8
20'-21.5'	2	1	1

0.0'	Top Soil
0.5'	Fill (mostly Sand and Gravel)
6.0'	Stiff, brown Clay, some silty Sand
19.0'	(some plasticity)
30'-31.5'	Very soft, Gray Clay,
40'-41.5'	traces of Sand
50'-51.5'	throughout
60'-61.5'	(very plastic)
68.0'	Compact, fine, gray Sand and Gravel, some Clay
76.0'	Very compact, silty, gray Sand & Gravel, some Clay
79.0'	Bottom of hole 79'

Pushed by Hand

Pushed by Hand

Pushed by Hand

Pushed by Hand

10 18 20

85 (400# Hammer)

Bottom of hole 79'  
 Refusal

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Hole No. B-127  
 Elev. 21.8  
 Water - 8.5' after ½ hr.

Depth of Samples	Blows per 6"		
	0"-6"	6"-12"	12"-18"
0.0'	4	3	4
0"-1.5'	Top Soil		
4.5'-6'	3	1	2
9.5'-11'	2	3	2
14.0'	Loose, Mixed Fill (Burnt dump material)		
14.5'-16'	6	4	3
17.0'	Clay, some Sand and Wood		
20.5'-22'	2	3	2
22.0'	Medium, gray Clay, trace of Sand (quite plastic)		

Bottom of hole 22'

Hole No. B-128  
 Elev. 21.0  
 Water - 8.5' after ½ hr.

Depth of Samples	Blows per 6"		
	0"-6"	6"-12"	12"-18"
0.0'	3	4	4
0"-1.5'	Top Soil		
4.5'-6'	2	4	3
11.0'	Loose, Mixed Fill		
10'-11.5'	12	7	3
14.5'-16'	4	3	3
18.5'-20'	2	3	2
20.0'	Medium, blue Clay, trace of Sand (quite plastic)		

Bottom of hole 20'

Borings conducted on 6-6-68. Boring Foreman P. Manning

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 Concord, Avenue

Hole No. B-1140  
 Elev. 25.7  
 Water - 10' after 1/2 hr.

Depth of Samples	Blows per 6"		
	0"-6"	6"-12"	12"-18"
0"-1.5'	4	6	3
5'-6.5'	3	1	5
10'-11.5'	1	0	2
14.5'-16'	2	3	5
17.5'-19'	4	5	4

0.0'  
 14.0'  
 16.0'  
 19.0'

Loose, Mixed Fill  
 (appears to be burnt  
 dump material)  
 Silty Sand and Clay, trace  
 of Fill  
 Gray Clay & silty Sand  
 (some plasticity)

Bottom of hole 19'

Boring conducted on 6-24-68 Boring Foreman P. Manning



APPENDIX B

Boxing Logs, Haley & Aldrich, Inc.



# TEST BORING REPORT

HOLE NO. B109

PROJECT: Belmont High School  
CLIENT: Korslund, LeNormand & Quann  
CONTRACTOR: Northeast Test Boring Co.

FILE NO. 68-1969  
SHEET NO. 1 of 3  
LOCATION: 10yd. Line - Old Field  
ELEVATION: 27.4  
DATE START: 28 May 1968  
DATE FINISH: 28 May 1968  
DRILLER: Paul Manning  
INSPECTOR: Gary Brierley

GROUNDWATER			DEPTH TO:			CASING	SAMPLER	CORE BARREL
DATE	TIME	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE:			
28 May	8:00	7'	0	10'	SIZE I.D.:	4"	S-S+U	
					HAMMER WT.:	400#	140#	
					HAMMER FALL:	30"	20"	

SCALE IN FEET	STRATA CHANGE	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS	
0-5 7.5 10 15 20 25 30	0.5		4	S1	0.0	LOAM	
			8		1.5	Medium compact, brown, loamy FILL, some sand with bricks	
			15	S2	2.5	Compact, brown, trash FILL, lots of glass, few stones	
			18		4.0		
			12				
			8			5.0	No Recovery
			15			7.0	Loose, brown, trash FILL, very silty with glass
			12				
			2	S3	8.5	Yellow clay in tip - dessicated	
			2				
			5				
			8	S4	10.5	Very stiff, yellow, plastic, dessicated CLAY, some silt, looks varved in one portion	
			14		12.0		
			14				
	6	S5	16.0	Stiff, yellow-gray, plastic, dessicated CLAY, little silt, occasional layer of fine sand End of Yellow Clay			
	8		17.5				
	8						
	2	S6	20.0	Medium stiff, gray, varved clay, 1/8" layer of each, occasional thick layer of clay, no dessication			
	3		21.5				
	3						
				U1	25.0	Very good tube, 23" recovery	
					27.0		

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SUMMARY
2-4	VERY LOOSE	0-2	VERY SOFT	S — SPLIT SPOON	OVERBURDEN: 78 ft.
4-10	LOOSE	2-4	SOFT	T — THIN WALL TUBE	ROCK: None
10-30	MEDIUM COMPACT	4-8	MEDIUM STIFF	U — UNDISTURBED PISTON	SAMPLES: 14
30-50	COMPACT	8-15	STIFF	O — OPEN END ROD	
50+	VERY COMPACT	15-30	VERY STIFF	W — WASH SAMPLE	HOLE NO. B109

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SCALE IN FEET	STRATA CHANGE	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
30			1	S7	30.0	Very soft, gray, CLAY, little silt Silt occurs in layers, occasionally goes to fine sand, highly plastic
			1		31.5	
35				U2	35.0	Good tube 22" recovery
					37.0	
40			0		40.0	No Recovery Clay may have been disturbed by washing
			0		41.5	
45				U3	45.0	Good tube 23" recovery (Soil washed with sludge bucket)
50			0	S8	52.0	Soft, gray, plastic, CLAY and SILT, with 8" seam of silt and fine sand
			0			
55				U4	55.0	Fair tube - may be sludge on top, difficult to pull into ground
60			0	S9	61.0	Very soft, gray, very plastic CLAY, some silt
			0			
65						

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SUMMARY
0-4	VERY LOOSE	0-2	VERY SOFT	S _____ SPLIT SPOON	OVERBURDEN: <u>78 ft.</u>
4-10	LOOSE	2-4	SOFT	T _____ THIN WALL TUBE	ROCK: <u>None</u>
10-30	MEDIUM COMPACT	4-8	MEDIUM STIFF	U _____ UNDISTURBED PISTON	SAMPLES: <u>14</u>
30-50	COMPACT	8-15	STIFF	O _____ OPEN END ROD	
50+	VERY COMPACT	15-30	VERY STIFF	W _____ WASH SAMPLE	HOLE NO. <u>B109</u>

SCALE IN FEET	STRATA CHANGE	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
65			10	U5	65.0	No Recovery
			9		65.5	Sampler stopped at 65.5'
			12		67.0	No Recovery
			5	*		
			4			
			4			
			5			
			6			
70			5			*Blows shown are with 400# hammer falling 30" on open end rod
			7			
			6			
			11			
			16			
			17			
			15			Very dense, sandy CLAY and SILT
			24			
			17			
			17			
75			35			
			19			
			20			
			10			
			12			
			15			
78.0			50			
						Bottom of Exploration
80						50 blows on open end rod with 3" penetration

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SUMMARY
0-4	VERY LOOSE	0-2	VERY SOFT	S — SPLIT SPOON	OVERBURDEN: <u>78 ft.</u>
4-10	LOOSE	2-4	SOFT	T — THIN WALL TUBE	ROCK: <u>None</u>
10-30	MEDIUM COMPACT	4-8	MEDIUM STIFF	U — UNDISTURBED PISTON	SAMPLES: <u>14</u>
30-50	COMPACT	8-15	STIFF	O — OPEN END ROD	
50+	VERY COMPACT	15-30	VERY STIFF	W — WASH SAMPLE	HOLE NO B109



HALEY & ALDRICH, INC.  
CONSULTING SOIL ENGINEERS

# TEST BORING REPORT

HOLE NO. B115

PROJECT: Belmont High School  
CLIENT: Korslund, LeNormand & Quann  
CONTRACTOR: Northeast Test Boring Co.

FILE NO. 68-1969  
SHEET NO. 1 of 2

LOCATION:  
ELEVATION: 24.1  
DATE START: 12 June 1968  
DATE FINISH: 14 June 1968  
DRILLER: Paul Manning  
INSPECTOR: H. Steinberg

GROUNDWATER			DEPTH TO:			CASING	SAMPLER	CORE BARREL
DATE	TIME	WATER	BOTTOM OF CASING	BOTTOM OF HOLE	TYPE:			
14 June	1200	10'	20'	64'		4.0	S.S.	
					SIZE I.D.:	4"	1-3/8"	"
					HAMMER WT.:	300#	140#	
					HAMMER FALL:	24"	30"	

SCALE IN FEET	STRATA CHANGE	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS			
5			6	S1	0.0	Loose, brown-black TOPSOIL with cinders and grass  -FILL-			
			4		1.5				
			3						
			10	10.5		2	S2	5.0	Very loose, red-brown TOPSOIL with pieces of glass  -FILL-
						2		6.5	
						3			
15	15.5					4	S3	8.5	Loose to medium compact, black cinders
						6		10.0	
						6			
			20	20.5		3	S4	10.5	Very loose, black, silty, medium to fine SAND
						2		12.0	
						2			
25	25.5					24	S5	15.5	Medium compact to compact, gray, medium to fine gravelly SAND, little clay
						12		17.0	
						8			
			30	30.5		3	S6	20.5	Medium stiff, gray CLAY, little silt
						3		22.0	
						4			
							U1	25.0	(Tube pressed 24")
								27.0	

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SUMMARY
0-4	VERY LOOSE	0-2	VERY SOFT	S — SPLIT SPOON	OVERBURDEN: 64 ft.
4-10	LOOSE	2-4	SOFT	T — THIN WALL TUBE	ROCK: None
10-30	MEDIUM COMPACT	4-8	MEDIUM STIFF	U — UNDISTURBED PISTON	SAMPLES: 14
30-50	COMPACT	8-15	STIFF	O — OPEN END ROD	

3 A FORM 1/4

SCALE IN FEET	STRATA CHANGE	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
35			2 3 3	S7	30.0 31.5	Soft to medium stiff, gray CLAY interbedded with layers of silty fine sand
				U2	35.0 37.0	(Tube pressed 24") Soft to medium stiff, gray CLAY interbedded with layers of silty fine sand
40						
			3 4 4	S8	40.0 41.5	(Tube pressed 24") Soft to medium stiff, gray CLAY interbedded with layers of silty fine sand
45						
				U3	45.0 47.0	(Tube pressed 24")
50	50.0					
			8 9 8	S9	50.0 51.5	Medium compact, gray, silty fine SAND, trace clay
55	54.0		30 27 32	S10	54.0 55.5	Very compact, gray, gravelly coarse SAND, trace clay
60						
65						
			* 50	OE1	63.7	Very compact, gray, gravelly coarse SAND, trace clay *50 blows with 400# hammer yielded 3" of penetration
					64.0	

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SUMMARY
0-4	VERY LOOSE	0-2	VERY SOFT	S — SPLIT SPOON	OVERBURDEN: 64 ft.
4-16	LOOSE	2-4	SOFT	T — THIN WALL TUBE	ROCK: None
10-30	MEDIUM COMPACT	4-8	MEDIUM STIFF	U — UNDISTURBED PISTON	SAMPLES: 14
30-50	COMPACT	8-15	STIFF	O — OPEN END ROD	
50+	VERY COMPACT	15-30	VERY STIFF	W — WASH SAMPLE	HOLE NO. B115

JAN 11 1968  
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# TEST BORING REPORT

HOLE NO. B123

PROJECT: Belmont High School

FILE NO. 68-1969

CLIENT: Korslund, LeNormand & Quann

SHEET NO. 1 of 2

CONTRACTOR: Northeast Test Boring Co.

LOCATION: \_\_\_\_\_

GROUNDWATER

DEPTH TO:

CASING

SAMPLER

CORE BARREL

DATE	TIME	WATER	BOTTOM OF CASING	BOTTOM OF HOLE

TYPE:	CASING	SAMPLER	CORE BARREL
	4.0	S.S.	
SIZE I.D.:	4.0	1-3/8"	"
HAMMER WT.:	300#	140#	
HAMMER FALL:	24"	30"	

ELEVATION: 24.9

DATE START: 14 June 1968

DATE FINISH: 15 June 1968

DRILLER: Paul Manning

INSPECTOR: H. Steinberg

SCALE IN FEET	STRATA CHANGE	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
5			4	S1	0.0	Loose, brown topsoil, with grass -FILL-
			3		1.5	
			4			
10			2	S2	5.0	Very loose, dark gray-black coarse sand, little gravel
			1		6.5	
			1			
15			2	S3	11.0	Medium stiff, gray CLAY, trace fine sand
			4		12.5	
			5			
20			8	S4	15.0	Stiff, yellow-gray silty CLAY, trace fine sand
			8		16.5	
			8			
25			3	S5	20.0	Medium stiff, gray silty CLAY
			3		21.5	
			3			
30				U1	25.0	Medium stiff, gray silty CLAY
					27.0	

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SUMMARY
0-4	VERY LOOSE	0-2	VERY SOFT	S — SPLIT SPOON	OVERBURDEN: _____
4-10	LOOSE	2-4	SOFT	T — THIN WALL TUBE	ROCK: _____
10-30	MEDIUM COMPACT	4-8	MEDIUM STIFF	U — UNDISTURBED PISTON	SAMPLES: _____
30-50	COMPACT	8-15	STIFF	O — OPEN END ROD	
50+	VERY COMPACT	15-30	VERY STIFF	W — WASH SAMPLE	

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HOLE NO. B123

SCALE IN FEET	STRATA CHANGE	CASING BLOWS PER FOOT	SAMPLER BLOWS PER 6 INCHES	SAMPLE NUMBER	SAMPLE DEPTH RANGE	FIELD CLASSIFICATION AND REMARKS
35			2	S6	30.0	Medium stiff, gray silty CLAY
			2		31.5	
			2			
						35'-37' U-II Lock ring broke, tube lost
						Remainder of the boring was not inspected.

BLOWS/FT.	DENSITY	BLOWS/FT.	CONSISTENCY	SAMPLE IDENTIFICATION	SUMMARY
0-4	VERY LOOSE	0-2	VERY SOFT	S — SPLIT SPOON	OVERBURDEN: _____
4-10	LOOSE	2-4	SOFT	T — THIN WALL TUBE	ROCK: _____
10-30	MEDIUM COMPACT	4-8	MEDIUM STIFF	U — UNDISTURBED PISTON	SAMPLES: _____
30-50	COMPACT	8-15	STIFF	O — OPEN END ROD	
50+	VERY COMPACT	15-30	VERY STIFF	W — WASH SAMPLE	

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APPENDIX C

Logs of Machine Excavated Test Pits

# REPORT OF FOUNDATION & BORROW INVESTIGATION

Project PROPOSED BELMONT HIGH SCHOOL TP No. 1  
BELMONT, MASSACHUSETTS File No. 68-1969  
 Client KORSLUND, LE NORMAND & QUANN Date 24 June 1968  
 Contractor JOHN J. SLINEY CO., INC. Location See Plan  
 Type of Exploration 3/4 CU. YD INTERNATIONAL BACKHOE Elevation 28.0

MEASUREMENTS		SAMPLES		DESCRIPTION OF MATERIALS [ CONSISTENCY OR DENSITY, COLOR, TYPE ]	SOIL CLASS	REMARKS AND FIELD TEST DATA
SCALE 1" = 2'	DEPTH Ft.	NUMBER	DEPTH FEET			
0	0.7			Dark brown, silty-loamy SAND, trace black roots and gravel		Original ground surface at 4.0'      Stratum grades to predominately clay with increasing depth
	1.2			Yellow-brown silty, medium to fine SAND, little gravel		
2				Gray, intermixed CINDERS and ASH with miscellaneous fill (metal, glass and burnt debris)		
	4.0			Black, loamy-silty SAND, trace roots and fine gravel		
	4.5			Yellow-brown fine sandy SILT (very slightly plastic Loess?)		
	5.0			Yellow-brown silty, medium to fine SAND, trace gravel and clay (matrix very slightly plastic)		
6	6.0			Yellow-gray clayey SAND, trace fine gravel		
	6.5					
8				Bottom of Exploration		


DIMENSIONS OF TEST PIT 8' x 7.5' x 2.5' VOL. REPRESENTED 150 cu. ft  
 BOULDERS: 3"-8" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 8"-18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 Over 18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 No Boulders

WATER TABLE

DEPTH \* \_\_\_\_\_ FT

\* NOT ENCOUNTERED

J. T. Humphrey  
 Inspector

  
 HALEY & ALDRICH, INC.

H8A FORM NOV 65 24



# REPORT OF FOUNDATION & BORROW INVESTIGATION

Project PROPOSED BELMONT HIGH SCHOOL TP No. 2  
BELMONT, MASSACHUSETTS File No. 68-1969  
 Client KORSLUND, LE NORMAND & QUANN Date 24 June 1968  
 Contractor JOHN J. SLINEY CO., INC. Location See Plan  
 Type of Exploration 3/8 CU. YD. INTERNATIONAL BACKHOE Elevation 28.0

MEASUREMENTS		SAMPLES		DESCRIPTION OF MATERIALS [ CONSISTENCY OR DENSITY, COLOR, TYPE ]	SOIL CLASS	REMARKS AND FIELD TEST DATA
SCALE 1" = 2'	DEPTH Ft.	NUMBER	DEPTH FEET			
0	0.3			TOPSOIL		
				Dark brown, loamy-sandy SILT and BRICK with roots, gravel, clay		
2	2.5			Black organic SAND, roots (local pocket)		
	3.0			Yellow-brown, silty, medium to fine SAND, trace fine gravel		
	3.5			Dark brown, plastic silty fine SAND		
4	3.8			Gray CINDERS and ASH with miscellaneous fill (bottles, metal....)		
	5.5			Dark brown to black, peaty SAND (plastic) (original ground surface 5.5')		
6	6.2			Yellow-brown plastic clayey SAND, trace fine gravel grading to sandy CLAY		
	7.5			Gray, silty CLAY, trace sand		*Ground water entering pit at 7.5' at a medium rate
8	8.0			Bottom of Exploration		

DIMENSIONS OF TEST PIT 8' x 7.5' x 2.5' VOL. REPRESENTED 150 cu. ft  
 BOULDERS: 3"-8" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 8"-18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 Over 18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 No Boulders

**WATER TABLE**

DEPTH \* FT

NOT ENCOUNTERED

J. T. Humphrey  
 Inspector

  
 HALLEY & ALDRICH, INC.

# REPORT OF FOUNDATION & BORROW INVESTIGATION

Project PROPOSED BELMONT HIGH SCHOOL TP No. 3  
BELMONT, MASSACHUSETTS File No. 68-1969  
 Client KORSLUND, LE NORMAND & QUANN Date 24 June 1968  
 Contractor JOHN J. SLINEY CO., INC. Location See Plan  
 Type of Exploration 3/8 CU. YD. INTERNATIONAL BACKHOE Elevation 27.5

MEASUREMENTS		SAMPLES		DESCRIPTION OF MATERIALS [ CONSISTENCY OR DENSITY, COLOR, TYPE ]	SOIL CLASS	REMARKS AND FIELD TEST DATA
SCALE 1" = 2'	DEPTH Ft.	NUMBER	DEPTH FEET			
0						
2		*B1	0.0 to 4.0	Dark brown, loamy-sandy SILT with intermixed glass, trash, metal, brick, gravel, cinders, ash, cobbles, trace of wood		
4	4.0			Gray CINDERS and ASH and metal		
	5.5					
6	5.7			Black, sandy LOAM (original topsoil)		
	7.5			Dark brown, silty medium to fine SAND, trace gravel, (matrix gets slightly plastic with increasing depth)		
8	8.0			Yellow-brown silty CLAY, trace sand		*Bag Sample #1
				Bottom of Exploration		

DIMENSIONS OF TEST PIT 8' x 2.5' x 8' VOL. REPRESENTED 160 cu. ft.  
 BOULDERS: 3"-8" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 8"-18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 Over 18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 No Boulders

**WATER TABLE**  
 DEPTH 7.5 FT  
 NOT ENCOUNTERED

J. T. Humphrey  
 Inspector

D.S. [Signature]  
 HALEY & ALDRICH, INC.

H8A FORM 24  
 NOV 65



# REPORT OF FOUNDATION & BORROW INVESTIGATION

Project PROPOSED BELMONT HIGH SCHOOL TP No. 4  
BELMONT, MASSACHUSETTS File No. 68-1969  
 Client KORSLUND, LE NORMAND & QUANN Date 24 June 1968  
 Contractor JOHN J. SLINEY CO., INC. Location See Plan  
 Type of Exploration 3/8 CU. YD. INTERNATIONAL BACKHOE Elevation 27.5

MEASUREMENTS		SAMPLES		DESCRIPTION OF MATERIALS [CONSISTENCY OR DENSITY, COLOR, TYPE]	SOIL CLASS	REMARKS AND FIELD TEST DATA
SCALE 1" = 2'	DEPTH Ft.	NUMBER	DEPTH FEET			
0	0.5			Dark brown, loamy-sandy SILT with glass, trash, roots, metal		Bag Sample #1
	1.2			Yellow-brown, silty, medium to fine SAND, little gravel		
2		B1	1.2 to 4.5	Dark brown, loamy-silty SAND, little gravel, trace glass, brick, wood, trash and cobbles		
	4.5			Gray CINDERS and ASH with metal, trash, sand, gravel		
6	6.5			Dark gray brown, plastic sandy SILT, trace gravel (very slightly organic) (original ground surface 6.5')		
	7.5			Yellow-brown, silty CLAY, trace sand		
8	8.2					
				Bottom of Exploration		

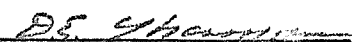
DIMENSIONS OF TEST PIT 7' x 2.5' x 8.2' VOL. REPRESENTED 144 cu. ft  
 BOULDERS: 3"-8" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 8"-18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 Over 18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 No Boulders

**WATER TABLE**

DEPTH \* \_\_\_\_\_ FT

\* NOT ENCOUNTERED

J. T. Humphrey  
 Inspector

  
 HALEY & ALDRICH, INC.

H8A FORM 24  
 NOV 65

# REPORT OF FOUNDATION & BORROW INVESTIGATION

Project PROPOSED BELMONT HIGH SCHOOL TP No. 5  
BELMONT, MASSACHUSETTS File No. 68-1969  
 Client KORSLUND, LE NORMAND & QUANN Date 24 June 1968  
 Contractor JOHN J. SLINEY CO., INC. Location See Plan  
 Type of Exploration 3/8 CU. YD. INTERNATIONAL BACKHOE Elevation 26.5

MEASUREMENTS		SAMPLES		DESCRIPTION OF MATERIALS [CONSISTENCY OR DENSITY, COLOR, TYPE]	SOIL CLASS	REMARKS AND FIELD TEST DATA
SCALE 1" = 2'	DEPTH Ft.	NUMBER	DEPTH FEET			
0	0.3			TOPSOIL		*Clay wet a 7.5 but no evidence of water entering pit after 1/4 hr.  Bag Sample #1
	1.0			Yellow-brown, coarse to fine SAND, little coarse to fine gravel and silt, trace cobbles		
2				Dark brown, silty-loamy medium to fine SAND, little medium to fine gravel, trace cobbles		
	2.5					
4				Gray CINDERS and ASH with miscellaneous trash fill (metal, brick, glass, trace wood)		
	5.0			Dark grayish-black SILT, SAND, CINDERS, GRAVEL, CLAY and TAR PAPER (burnt rubbish) (very difficult to excavate)		
6						
	6.5	Bl	6.5 to 7.5	Dark brown gray, slightly organic, plastic silty SAND, trace gravel (original ground)		
	7.5			*Olive-gray silty CLAY, trace sand		
8						
	8.0			Bottom of Exploration		

DIMENSIONS OF TEST PIT 7' x 2.5' x 8' VOL. REPRESENTED 140 cu. ft.  
 BOULDERS: 3"-8" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 8"-18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 Over 18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 No Boulders

**WATER TABLE**

DEPTH \* FT

NOT ENCOUNTERED

J. T. Humphrey  
Inspector

D.E. Humphrey  
HALEY & ALDRICH, INC.

H&A FORM 24  
NOV 65

# REPORT OF FOUNDATION & BORROW INVESTIGATION

Project PROPOSED BELMONT HIGH SCHOOL TP No. 6  
BELMONT, MASSACHUSETTS File No. 68-1969  
 Client KORSLUND, LE NORMAND & QUANN Date 24 June 1968  
 Contractor JOHN J. SLINEY CO., INC. Location See Plan  
 Type of Exploration 3/8 CU. YD. INTERNATIONAL BACKHOE Elevation 26.5

MEASUREMENTS		SAMPLES		DESCRIPTION OF MATERIALS [ CONSISTENCY OR DENSITY, COLOR, TYPE ]	SOIL CLASS	REMARKS AND FIELD TEST DATA
SCALE 1" = 2'	DEPTH Ft.	NUMBER	DEPTH FEET			
0			0.0	Gray CINDERS and ASH with metal, trash, glass, wood...		Bag Sample #1
2		Bl	to			
			4.3			
4	4.3			Olive-brown, very slightly plastic silty SAND, trace gravel		
	5.3			Gray CINDERS and ASH and trash		
6	6.0			Dark gray SILT, SAND, GRAVEL, ASPHALT PAPER, glass cinders....(very dense)		
8	7.8			Dark gray black silty SAND, trace gravel (very slightly organic and very slightly plastic) (original ground)		
	9.0			Blue-gray silty-sandy CLAY		
10	9.5			Bottom of Exploration		

DIMENSIONS OF TEST PIT 8' x 3' x 9.5' VOL. REPRESENTED 228 cu. ft  
 BOULDERS: 3"-8" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 8"-18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 Over 18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 No Boulders

WATER TABLE

DEPTH 9.0 FT

NOT ENCOUNTERED

J. T. Humphrey  
 Inspector

  
 HALEY & ALDRICH, INC.

H8A FORM 24 NOV 65

# REPORT OF FOUNDATION & BORROW INVESTIGATION

Project PROPOSED BELMONT HIGH SCHOOL TP No. 7  
BELMONT, MASSACHUSETTS File No. 68-1969  
 Client KORSLUND, LE NORMAND & QUANN Date 24 June 1968  
 Contractor JOHN J. SLINEY CO., INC. Location See Plan  
 Type of Exploration 3/8 CU. YD. INTERNATIONAL Elevation 27.0  
BACKHOE

MEASUREMENTS		SAMPLES		DESCRIPTION OF MATERIALS [ CONSISTENCY OR DENSITY, COLOR, TYPE ]	SOIL CLASS	REMARKS AND FIELD TEST DATA
SCALE 1" = 2'	DEPTH Ft.	NUMBER	DEPTH FEET			
	0			Rust-brown CINDERS and MIS-CELLANEOUS FILL(metalbrick, trash)		
	1.0					
	2			GRAY CINDERS and ASH with metal, brick, glass.....		
	3.5					
	4			Brownish-gray silty fine SAND and metal, ash, trash..... (matrix very slightly plastic)		
	4.8					
	6			Brownish-gray SILT, SAND, CINDERS, ASH, METAL, GRAVEL COBBLES, etc.		
	6.7					
	7.5			Dark black gray very slightly organic and plastic, fine sandy SILT, trace gravel		
	8			Black, soft, plastic, organic, sandy SILT, trace gravel		
	9.5					
10	10.0			Olive-gray, soft, highly plastic very slightly organic, sandy CLAY		

Bottom of Exploration

DIMENSIONS OF TEST PIT 8' x 2.5' x 10' VOL. REPRESENTED 200 cu. ft  
 BOULDERS: 3"-8" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 8"-18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 Over 18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 No Boulders

<b>WATER TABLE</b> DEPTH <u>9.5</u> FT NOT ENCOUNTERED
--

J. T. Humphrey  
 Inspector

  
 HALEY & ALDRICH, INC.

H&A FORM NOV 65 24

# REPORT OF FOUNDATION & BORROW INVESTIGATION

Project PROPOSED BELMONT HIGH SCHOOL TP No. 8  
BELMONT, MASSACHUSETTS File No. 68-1969  
 Client KORSLUND, LE NORMAND & QUANN Date 24 June 1968  
 Contractor JOHN J. SLINEY CO., INC. Location See Plan  
 Type of Exploration 3/8 CU. YD. INTERNATIONAL BACKHOE Elevation 27.0

MEASUREMENTS		SAMPLES		DESCRIPTION OF MATERIALS [ CONSISTENCY OR DENSITY, COLOR, TYPE ]	SOIL CLASS	REMARKS AND FIELD TEST DATA
SCALE 1" = 2'	DEPTH Ft.	NUMBER	DEPTH FEET			
0				Intermixed ASH, SILT, TRASH, METAL and GLASS etc.		
2						
6	5.0				Dark brown SILT, SANDS, CIN- DERS, TRASH (very dense)	
6	6.0			Black CINDERS, ASH, METAL, trash, glass, wood, sand, silt, etc.		
8				MISCELLANEOUS FILL		Hole caved at 9.0' due to water
9.0				Bottom of Exploration		
10						

DIMENSIONS OF TEST PIT 8' x 9' x 3' VOL. REPRESENTED 216 cu. ft  
 BOULDERS: 3"-8" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 8"-18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 Over 18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.  
 No Boulders

<b>WATER TABLE</b>
DEPTH <u>8.5</u> FT
NOT ENCOUNTERED

J. T. Humphrey  
 Inspector

  
 HALEY & ALDRICH, INC.

H&A FORM 24  
 NOV 65

# REPORT OF FOUNDATION & BORROW INVESTIGATION

Project PROPOSED BELMONT HIGH SCHOOL TP No. 9  
BELMONT, MASSACHUSETTS File No. 68-1969  
 Client KORSLUND, LE NORMAND & QUANN Date 24 June 1968  
 Contractor JOHN J. SLINEY CO., INC. Location See Plan  
 Type of Exploration 3/8 CU. YD. INTERNATIONAL BACKHOE Elevation 27.0

MEASUREMENTS		SAMPLES		DESCRIPTION OF MATERIALS [ CONSISTENCY OR DENSITY, COLOR, TYPE ]	SOIL CLASS	REMARKS AND FIELD TEST DATA
SCALE 1" = 2'	DEPTH Ft.	NUMBER	DEPTH FEET			
0	0.4			Brown loamy TOPSOIL		
				Brown, silty SAND and GRAVEL (gravel is crushed rock fragments)		
2	1.7					
				Rust-brown to gray CINDERS, ASH, metal, gravel, etc.		
4						
	5.0					
6	6.0			Dark brown, silty SAND, ASH, CINDERS, metal (very dense and well compact)		
				Bottom of Exploration		
8						

DIMENSIONS OF TEST PIT 6' x 2.5' x 6' VOL. REPRESENTED 90 cu. ft

BOULDERS: 3"-8" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.

8"-18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.

Over 18" Diam: No. \_\_\_\_\_ Vol. \_\_\_\_\_ cu. ft.

No Boulders

**WATER TABLE**

DEPTH \* \_\_\_\_\_ FT

\* NOT ENCOUNTERED

J. T. Humphrey  
Inspector

Haley & Aldrich, Inc.

H&A FORM 24 NOV 65



APPENDIX D  
Consolidation Test Results



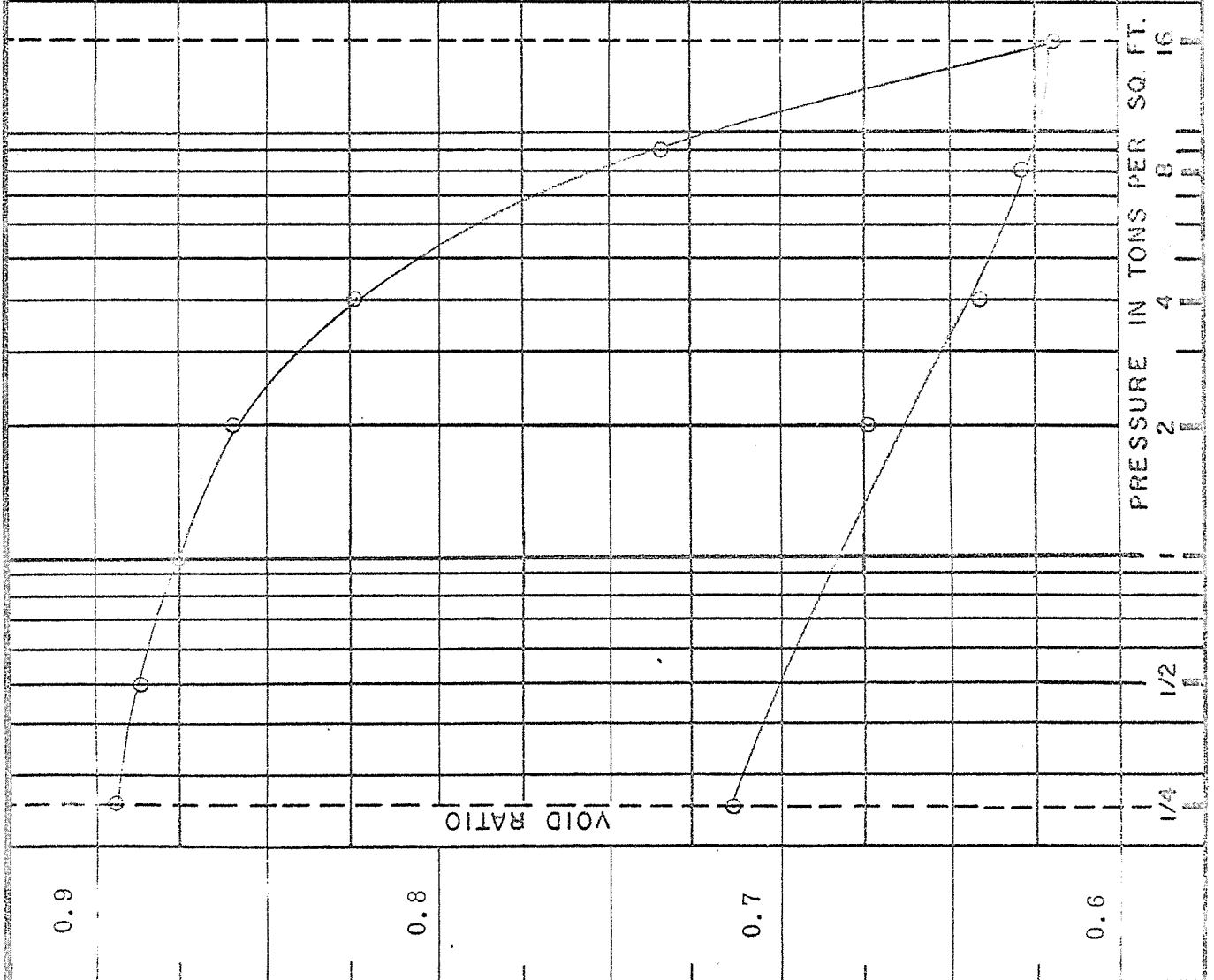
SOIL DESCRIPTION <u>Gray CLAY</u>	
BORING <u>109</u> SAMPLE <u>U1</u>	DEPTH <u>25.4'</u>
WATER CONTENT	
NATURAL	<u>35.3</u>
AFTER TEST	<u>29.3</u>
ATTERBERG LIMITS	
LIQUID LIMIT	<u>39.2</u>
PLASTIC LIMIT	<u>21.4</u>
NATURAL WATER CONTENT	<u>35.0</u>
HEIGHT OF SOIL SOLIDS <u>0.5237"</u>	
INITIAL VOID RATIO <u>0.9095</u>	

Belmont High School

CONSOLIDATION TEST

NO. C 1

FILE NO. 68-1969 DATE June 1968







SOIL DESCRIPTION Gray silty CLAY

BORING 109 SAMPLE U3 DEPTH 45.7'

WATER CONTENT  
NATURAL 38.8  
AFTER TEST 25.8

ATTERBERG LIMITS  
LIQUID LIMIT 30.8  
PLASTIC LIMIT 19.0  
NATURAL WATER CONTENT 39.5

HEIGHT OF SOIL SOLIDS 0.5046

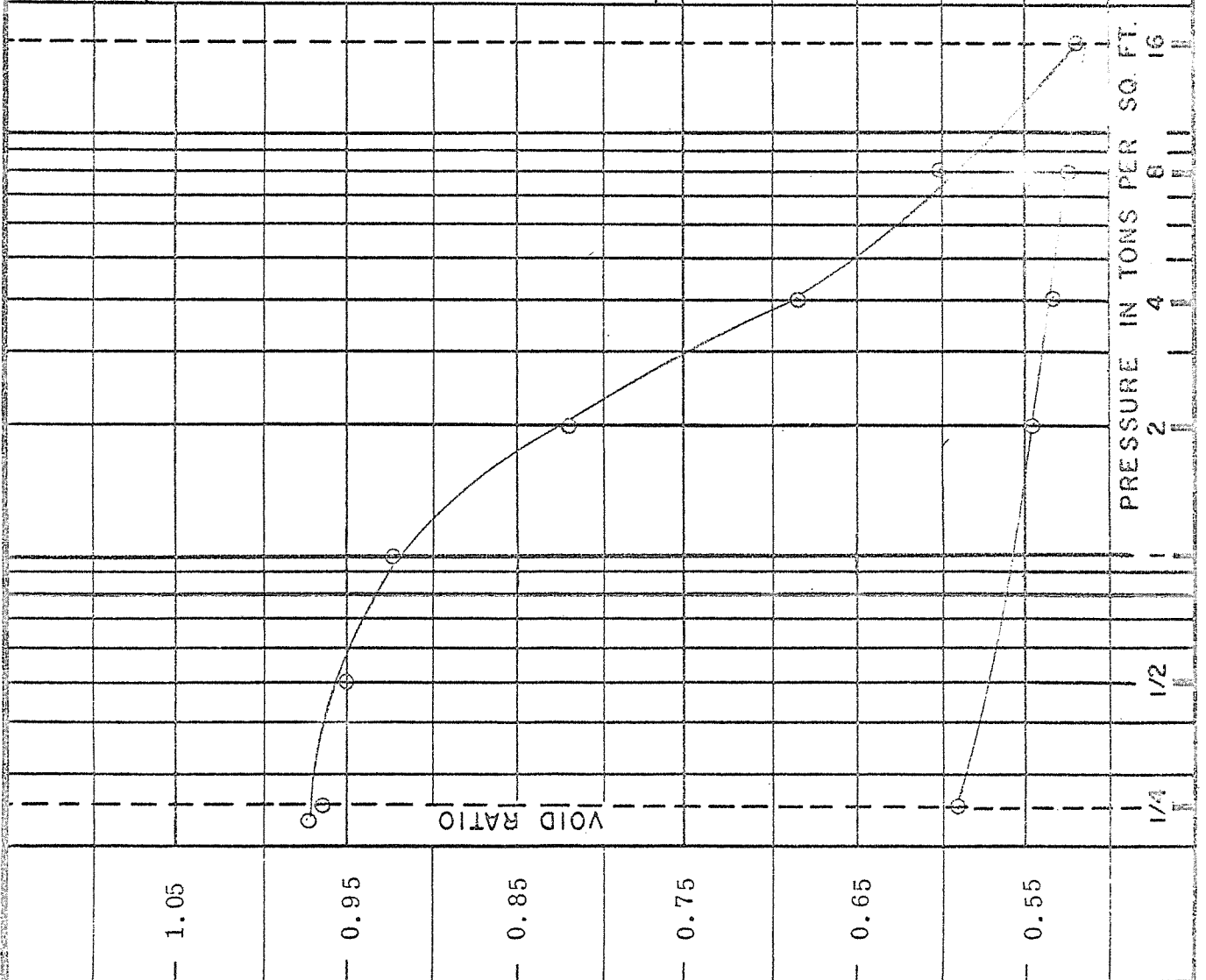
INITIAL VOID RATIO 0.9817

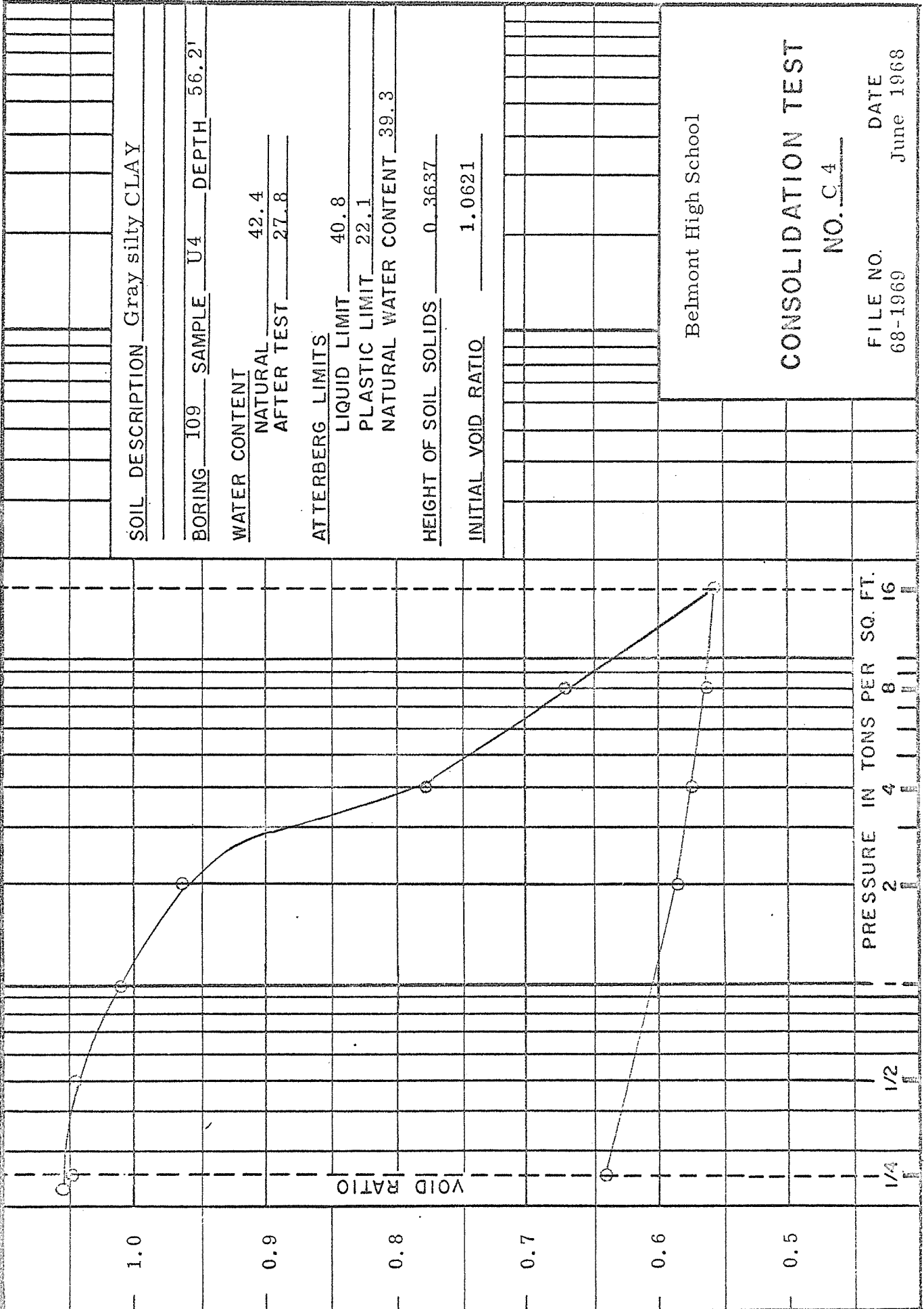
Belmont High School

### CONSOLIDATION TEST

NO. C 3

FILE NO. 68-1969 DATE June 1968





SOIL DESCRIPTION Gray silty CLAY

BORING 109 SAMPLE U4 DEPTH 56.2'

WATER CONTENT  
 NATURAL 42.4  
 AFTER TEST 27.8

ATTERBERG LIMITS  
 LIQUID LIMIT 40.8  
 PLASTIC LIMIT 22.1  
 NATURAL WATER CONTENT 39.3

HEIGHT OF SOIL SOLIDS 0.3637

INITIAL VOID RATIO 1.0621

Belmont High School

CONSOLIDATION TEST

NO. C.4

FILE NO. 68-1969 DATE June 1968






SOIL DESCRIPTION Gray CLAY

BORING 115 SAMPLE J-3 DEPTH 46.1'

WATER CONTENT  
 NATURAL 28.2  
 AFTER TEST 24.3

ATTERBERG LIMITS  
 LIQUID LIMIT 42.0  
 PLASTIC LIMIT 19.4  
 NATURAL WATER CONTENT 26.5

HEIGHT OF SOIL SOLIDS 0.5850"

INITIAL VOID RATIO 0.7094


Belmont High School

CONSOLIDATION TEST

NO. C7

FILE NO. \_\_\_\_\_ DATE \_\_\_\_\_  
68-1969 June 1968

