

installed according to the manufacturer's requirements. Flooring suppliers should be consulted relative to acceptable vapor retarder systems for use with their products.

We recommend that contraction joints be installed in floor slabs to accommodate shrinkage in the concrete as it cures. Contraction joints are typically installed at 10 to 15 foot spacing, but should be determined by the structural engineer with consideration to slab thickness and other factors. We recommend that floor slabs be wet-cured for a period of at least 7 days after casting as a measure to reduce the potential for curling of the concrete and excessive drying/shrinkage. We further recommend that consideration be given to using curing paper installed over the cast-in-place concrete and that the curing paper remain in place as long as possible to improve the quality of the completed floor. In lieu of curing paper, a quality-curing compound should be utilized; however, care must be taken to prevent scuffing of the compound from the floor.

#### **4.5 Foundation Drainage**

We recommend that peripheral exterior and interior foundation drains be provided at footing grade for the structure. Additionally, we recommend that several sub-slab underdrain lines be placed below the on-grade parking slab. An underdrain line should be provided at elevator pit areas as well. The foundation drains should be placed at least 4.5 feet from freezing temperatures (unless subgrade insulation is utilized) and should consist of 4-inch diameter rigid underdrain pipe having perforations of  $\frac{1}{4}$  to  $\frac{1}{2}$  inches. We recommend that at least 6 inches of crushed stone bedding be provided around the foundation drains and that the stone be wrapped with a geotextile filter fabric having an apparent opening size of at least 70. The foundation drainage system must have a positive gravity outlet. Exterior foundation backfill should be sealed with a surficial layer of clayey or loamy soil in areas that are not to be paved or occupied by entrance slabs to reduce direct surface water infiltration into the backfill. Roof drains should be routed in separate non-perforated pipes, also placed below the frost depth.

#### **4.6 Excavation Work**

An erosion control system should be provided prior to excavation activity at the site to protect adjacent drainageways. We recommend that site preparation begin with the removal of existing utilities, pavement, topsoil and surficial soils containing organics and existing fills beneath the proposed building addition. As much vegetation/pavement should remain in other areas to help lessen the potential for erosion.

Excavation work will generally encounter granular fill overlying glacial till consisting of silt and sand with varying amounts of gravel and clay and cobbles. The fine-grained glacial till can undergo strength loss when subjected to construction traffic and excavation activities.

Care must be exercised during construction to limit disturbance of the bearing soils during excavation work. While it is common to use excavation equipment with ripping and digger buckets, we recommended that consideration be given to using a smooth-edged bucket for final excavation and finish grading of subgrades in the fine-grained soils to help limit subgrade disturbance. Construction equipment should not operate directly on the native subgrade soils. As discussed in section 4.2, footing subgrades should be protected with concrete mud mats. Should the foundation subgrade become soft or difficult to work, the subgrade should be over-excavated and backfilled with concrete. We recommend that a working mat consisting of  $\frac{3}{4}$  inch crushed stone be placed beneath the entire building footprint (except foundation areas) to provide a stable working surface and to protect the native soil subgrade. A geotextile fabric should be used on the subgrade soils to separate the crushed stone from the fine-grained subgrade soil. Consideration should be given to pumping concrete for foundations and the slab-on-grade level in order to limit heavy vehicle traffic on the crushed stone and native soils.

The contractor should anticipate the need for dewatering in excavations. Ditching with gravity drainage and sumping and pumping should be adequate. Controlling the water levels to at least 1-foot below subgrade elevation will reduce disturbance of the subgrade soils and provide a more stable working surface during construction.

Based on the existing grades shown on Sheet 1 and anticipated excavation depths ranging from about 15 to 30 feet below existing grades for the on-grade parking level. Deeper cuts are anticipated for foundations. We anticipate that a combination of braced and open excavations may be utilized. Excavations should be sloped or properly shored to prevent undermining of existing foundations and adjacent pavement as well as sloughing and caving of the excavation sidewalls during construction. Temporary unsupported soil excavations should be cut to a slope of  $1 \frac{1}{2}$  H on 1V or flatter. Temporary slopes should be protected from erosion placing diversion berms at the head of the slope and covering the slope with plastic sheeting. All excavations should be consistent with the OSHA trenching regulations.

#### **4.7 Backfill and Compaction**

The on-site fill soils and native glacial till are frost susceptible and not well-drained. Consequently, these soils are not suitable for reuse as foundation or basement/retaining wall backfill. Backfill placed adjacent to all foundations, both inside and outside, should be compacted select fill. At least 4.5 feet (horizontal measure) of Select Fill should be placed against foundation/retaining walls that are exposed to freezing temperatures. In areas not subjected to freezing temperatures, at least 2.0 feet (horizontal measure) of Select Fill should be placed behind basement/retaining walls and should connect to the foundation drain system to avoid the build-up of hydrostatic pressures behind the walls. Select Fill and Crushed Stone used beneath structures and against concrete walls should meet the following gradation requirements.

Sieve Size	Percent Finer By Weight	
	Select Fill	Crushed Stone
4 inch	100	---
3 inch	90 - 100	---
1 inch	---	100
3/4 inch	---	90 - 100
3/8 inch	---	20 - 55
1/4 inch	25 - 90	---
#4	---	0 - 10
#8	---	0 - 8
#40	0 - 30	---
#200	0 - 5	---

Sub-slab fill and any fill placed below structures should be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. Foundation backfill should be compacted to at least 95 percent beneath paved areas, entrance slabs and adjacent sidewalk areas. Backfill against basement/retaining walls should be compacted to between 92 to 95 percent of ASTM D-1557 using hand operated equipment to help limit lateral earth pressures. Over-compaction of wall backfill and the use of heavy compaction equipment behind basement walls will induce additional lateral stresses on the wall.

#### **4.8 Pedestrian Tunnel**

We understand that concept plans call for a 10± foot wide subsurface tunnel structure between the proposed Women and Infants building addition and the existing Leon L. Bean Wing of the existing Hospital which is located about 150 LF southeast of the proposed easterly addition corner. The tunnel will be situated beneath the existing

Emergency Room entrance and parking area. The existing parking area is at approximately elevation 128 feet. A concrete retaining wall exists along the northerly side of the existing parking area that separates the parking area and Crescent Street, which is about elevation 118 feet in this area. We understand the pedestrian tunnel will have a finish floor grade approximately 10 to 15 feet below existing pavement grade in order to access the basement of the Leon L. Bean Wing and proposed lower level (FFE=115.0) of the parking garage portion of the addition.

Borings B-4, B-107 and B-104 were made in the area of the tunnel. Borings B-4 and B-107 were made near the westerly end of the tunnel. These borings encountered 1 to 5± feet of loose granular fill overlying dense to very dense native gray glacial till. Boring B-104 was made near the easterly end of the proposed tunnel. This boring encountered about 14 feet of medium dense to dense brown silty sand with some gravel (glacial till fill) overlying native dense brown glacial till.

Groundwater observation piezometers were installed at Borings B-104 and B-107. Based on readings made to date, groundwater appears to be at depths of about 3.5 and 12.5 feet below the ground surface at these borings, respectively. The reason for the shallow groundwater readings at Boring B-104 is not known at this time, particularly since weep-holes are evident at the base of the adjacent retaining wall structure.

We anticipate that a braced excavation will be made to construct the tunnel structure. Groundwater will need to be controlled to at least 12 inches below subgrade elevation. We recommend that the tunnel base be over-excavated by at least 18 inches to allow 18 inches of a compacted crushed stone drainage layer wrapped with geotextile fabric. Perforated underdrain lines are needed within the crushed stone layer along the proposed tunnel wall lines. The underdrains must have a positive gravity outlet. Additionally, rigid insulation should be considered for the walls and roof to help reduce thermal conductivity, which can cause condensation on the interior walls. The tunnel should be backfilled with select fill up to bottom of pavement subbase gravel. Consideration should be given to providing a water barrier membrane for the structure.

#### **4.9 Asphalt Pavements**

Proposed traffic loading information was not made available to us at the time of this report; thus, we have provided the following proposed pavement sections based on our experience with similar facilities and certain geotechnical assumptions.

We offer the following new pavement sections for consideration:

<b>FLEXIBLE (ASPHALT) PAVEMENTS</b>			
	<b>Standard</b>	<b>Heavy</b>	<b>Maine DOT Standard</b>
Wearing Course	1%"	1%"	9.5mm Hot Mix Asphalt
Binder Course	1 1/2"	2%"	12.5mm Hot Mix Asphalt
Crushed Base	4"	6"	703.06 Base Aggregate Type A Crushed
Granular Subbase	12"	15"	703.06 <b>Subbase</b> Aggregate Type D

We have assumed that some paved areas will have only passenger vehicle loading (standard duty) while other areas will have delivery truck traffic (heavy duty). All pavement sections need to be placed on properly prepared subgrades. Design should be reviewed prior to actual construction once actual loading information is available (provided by others).

Since the native soils are frost susceptible, some frost heaving and distress of pavements must be anticipated unless all frost susceptible soils are removed to a depth of at least 4.5 feet below the pavement surface.

The recommended pavement structure does not account for support of construction equipment or temporary haul roads. Consequently, the site contractor should consider some contingency for use of geotextile fabrics and possibly deeper gravel or crushed stone sections to preclude adverse impacts to subgrades soils (as needed).

#### **4.10 Weather Conditions**

If foundation construction takes place during cold weather, subgrades, foundations, and floor slabs must be protected during freezing conditions. Concrete must not be placed on frozen soil and once placed, the concrete and soil beneath the structure must be protected from freezing. Further, the native fine-grained soils are moisture sensitive and as such subgrades will be susceptible to disturbance during wet weather and freeze/thaw cycles.

Consequently, site-work and construction activities should take appropriate measures to protect exposed subgrades from moisture, freezing temperatures and construction activity.

#### **4.11 Additional Evaluation and Geotechnical Design Review**

This project requires deep excavations needed adjacent to the existing structure and paved areas. As such, supplemental geotechnical engineering work and on site observations by S. W. COLE ENGINEERING, INC. will be needed during design and construction. It will be important that the structural engineer and contractor consider layout of foundations and excavations relative to shoring and underpinning requirements, to protect adjacent structures and roadways.

We recommend that periodic water level reading be made at the piezometers in order to develop a record of groundwater levels. Additionally, we recommend that field permeability testing at existing piezometers be done to evaluate the permeability of the glacial till.

It is strongly recommended that S. W. COLE ENGINEERING, INC. be provided the opportunity to review the site work and foundation design drawings to confirm that our assessment of the subsurface soil and groundwater conditions and recommendations have been appropriately interpreted.

**5.0 CLOSURE**

It is important that a S. W. COLE ENGINEERING, INC. representative should be on-site during construction to observe excavation work and subgrade soils. This is to observe compliance with the geotechnical engineering recommendations and to allow design changes in the even that subsurface conditions are found to differ from those anticipated prior to the start of construction.

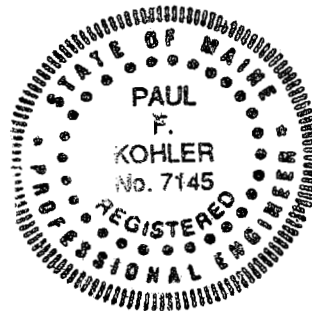
Further, a quality assurance-testing program should be implemented during construction, to observe compliance with the design concepts, specifications, and recommendations. S. W. COLE ENGINEERING, INC. is available to provide field and laboratory testing services for construction.

Sincerely,

**S. W. COLE ENGINEERING, INC.**



Paul F. Kohler, P. E.  
Vice President



CC: John Thomsen – Simpson, Gumpertz & Heger, Inc.  
Tom Lam – TRO/The Ritchie Organization

PFK/cah

**Attachment A**  
**Limitations**

This report has been prepared for the exclusive use of Maine Medical Center for specific application to the Proposed Medical Office Building and Parking Garage for the Women and Infants Facility on Charles Street in Portland, Maine. S. W. COLE ENGINEERING, INC. has endeavored to conduct the work in accordance with generally accepted soil and foundation engineering practices. No other warranty, expressed or implied, is made.

The soil profiles described in the report are intended to convey general trends in subsurface conditions. The boundaries between strata are approximate and are based upon interpretation of exploration data and samples.

The analyses performed during this investigation and recommendations presented in this report are based in part upon the data obtained from subsurface explorations made at the site. Variations in subsurface conditions may occur between explorations and may not become evident until construction. If variations in subsurface conditions become evident after submission of this report, it will be necessary to evaluate their nature and to review the recommendations of this report.

Observations have been made during exploration work to assess site groundwater levels. Fluctuations in water levels will occur due to variations in rainfall, temperature, and other factors.

Recommendations contained in this report are based substantially upon information provided by others regarding the proposed project. In the event that any changes are made in the design, nature, or location of the proposed project, S. W. COLE ENGINEERING, INC. should review such changes as they relate to analyses associated with this report. Recommendations contained in this report shall not be considered valid unless S. W. COLE ENGINEERING, INC reviews the changes.





# BORING LOG

BORING NO.: **B-101**  
 SHEET: 1 OF 2  
 PROJECT NO.: 01-0304.1  
 DATE START: 1/29/2002  
 DATE FINISH: 2/5/2002  
 ELEVATION: 140±  
 SWC REP.: KBG

PROJECT/ CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER  
 LOCATION: CHARLES STREET PORTLAND, MAINE  
 DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

CASING: TYPE HW SIZE I.D. 4" HAMMER WT. 140 lbs HAMMER FALL 30"  
 SAMPLER: SS  
 CORE BARREL: 1 3/8"

WATER LEVEL INFORMATION  
Soils appeared wet to saturated below 10' +/-

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									2'	BROWN SANDY TOPSOIL
	S-1	24"	10"	3.0'	5	6	4	4	4.0'	BROWN GRAVELLY SAND SOME SILT (FILL) -MEDIUM DENSE-
	S-2	24"	20"	7.0'	20	21	15	28	9.5'	BROWN GRAVELLY SAND TRACE SILT WITH FREQUENT COBBLES (FILL) -DENSE-
OPEN HOLE	S-3	24"	20"	12.0'	42	26	41	47	13.0'	BROWN SILTY SAND SOME GRAVEL (TILL) -VERY DENSE-
	S-4	24"	24"	17.0'	8	9	14	14	31.5'	GRAY SILTY SAND SOME GRAVEL TRACE CLAY (TILL) -MEDIUM DENSE-
	S-5	24"	24"	22.0'	11	13	18	19		-DENSE-
	S-6	24"	24"	27.0'	15	16	19	23		
	S-7	24"	24"	32.0'	6	6	18	12		
	S-8	24"	24"	34.0'	11	10	18	24		GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) -MEDIUM DENSE TO DENSE ~
	S-9	24"	24"	37.0'	6	9	19	14		-MEDIUM DENSE-

SAMPLES: \_\_\_\_\_ SOIL CLASSIFIED BY: \_\_\_\_\_ REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

D = SPLIT SPOON  
 C = 3" SHELBY TUBE  
 U = 3.5" SHELBY TUBE

DRILLER - VISUALLY  
 SOIL TECH. - VISUALLY  
 LABORATORY TEST

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

(2)  
 BORING NO.: **101**  
 B-101



# BORING LOG

BORING NO.: **B-101**  
 SHEET: **2 OF 2**  
 PROJECT NO.: **01-0304.1**  
 DATE START: **1/29/2002**  
 DATE FINISH: **2/5/2002**  
 ELEVATION: **140±**  
 SWC REP.: **KBG**

PROJECT/CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER  
 LOCATION: CHARLES STREET PORTLAND, MAINE  
 DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

CASING: TYPE HW SIZE I.D. 4" HAMMER WT. 140 lbs HAMMER FALL 30"  
 SAMPLER: SS  
 CORE BARREL: \_\_\_\_\_

WATER LEVEL INFORMATION  
 Soils appeared wet to saturated below 10' +/-

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-10	24"	24"	42.0'	6	10	14	16		GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) -DENSE-
	S-11	24"	10"	47.0'	10	14	19	19		
	S-12	24"	24"	52.0'	16	19	23	20		
	S-13	22"	22"	56.8'	7	12	15	50/3"	56.8'	
									58.0'	PROBABLE BOULDER
	S-14	24"	24"	62.0'	15	11	13	18	62.0'	-MEDIUM DENSE-
										BOTTOM OF EXPLORATION AT 62' NOT REFUSAL

SAMPLES:  SPLIT SPOON  DRILLER - VISUALLY SOIL TECH. - VISUALLY LABORATORY TEST  
 C = 3" SHELBY TUBE  
 U = 3.5" SHELBY TUBE

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT  
 STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-101**



# BORING LOG

BORING NO.: **B-102**

SHEET: 1 OF 2

PROJECT NO.: 01-0304.1

DATE START: 1/30/2002

DATE FINISH: 1/30/2002

ELEVATION: 140±

SWC REP.: KBG

**WATER LEVEL INFORMATION**

Soils appeared wet to saturated below 10' +/-

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER  
 LOCATION: CHARLES STREET PORTLAND, MAINE  
 DRILLING CO.: GREAT WORKS TEST BORING INC. DRILLER: DAVE

CASING: TYPE HW SIZE I.D. 4" HAMMER WT. 4" HAMMER FALL  
 SAMPLER: SS 1 3/8" 140 lbs 30"  
 CORE BARREL:

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
CASING									0.2'	ASPHALT PAVEMENT
	S-1			3.0'	AUGER CUTTINGS					BROWN GRAVELLY SAND SOME SILT (FILL) ~ MEDIUM DENSE ~  W=5.0%
	S-2	6"	6"	5.5'	22	25/0"			9.0'	
OPEN HOLE	S-3	24"	24"	12.0'	15	20	23	27		BROWN SILTY SAND SOME GRAVEL (TILL) W=11.2% -DENSE-
	S-4	24"	0"	17.0'	10	11	13	14	15.0'	GRAY SILT AND SAND TRACE TO SOME GRAVEL TRACE CLAY (TILL) -MEDIUM DENSE-  - DENSE ~ W=9.0%
	S-5	24"	17"	22.0'	14	12	22	21		
	S-6	24"	15"	27.0'	38	24	28	30		~ VERY DENSE ~
	S-7	24"	13"	32.0'	13	18	27	30		W=12.0%
	S-8	24"	24"	34.0'	10	12	18	21		~ DENSE ~ W=9.2%
	S-9	24"	18"	37.0'	9	23	21	32	39.0'	

SAMPLES: SOIL CLASSIFIED BY:  
 D = SPLIT SPOON  
 C = 3" SHELBY TUBE  
 U = 3.5" SHELBY TUBE

DRILLER - VISUALLY  
 SOIL TECH. - VISUALLY  
 LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.



# BORING LQG

BORING NO.: **8-102**

SHEET: **2 OF 2**

PROJECT NO.: **01-0304.1**

DATE START: **1/30/2002**

DATE FINISH: **1/30/2002**

ELEVATION: **140±**

SWC RE?.: **KBG**

**WATER LEVEL INFORMATION**

Soils appeared wet to saturated below 10' +/-

PROJECT/ CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER

LOCATION: CHARLES STREET PORTLAND, MAINE

DRILLING CO.: GREAT WORKS TEST BORING INC. DRILLER: DAVE

TYPE      SIZE I.D.    HAMMER WT.    HAMMER FALL

CASING:      HW              4"

SAMPLER:      SS              1 3/8"          140lbs          30"

CORE BARREL: \_\_\_\_\_

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-10	24"	20"	42.0'	6	7	11	14	44.0'	GRAY SILT AND SAND SOME GRAVEL SOME CLAY (TILL) -MEDIUM DENSE- W=22.3%
	S-11	24"	22"	47.0'	7	12	24	28		
	S-12	24"	12"	52.0'	13	18	23	31	58.0'	GRAY SILT AND SAND TRACE TO SOME GRAVEL TRACE CLAY (TILL) -DENSE- W=11.6%
	S-13	24"	4"	57.0'	9	13	19	21		
	S-14	24"	24"	62.0'	7	12	11	17	62.5'	CLAYEY SANDY SILT SOME GRAVEL (TILL) -MEDIUM DENSE- W=23.8%
	S-15	24"	24"	72.0'	14	19	23	38	72.0'	GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) -DENSE- W=10.0%
										BOTTOM OF EXPLORATION AT 72' NOT REFUSAL

SAMPLES:

SOIL CLASSIFIED BY:

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

D = SPLIT SPOON  
C = 3" SHELBY TUBE  
U = 3.5" SHELBY TUBE

<input type="checkbox"/>
<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/>

DRILLER - VISUALLY  
SOIL TECH. - VISUALLY  
LABORATORY TEST

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

5

BORING NO.: **B-102**



# BORING LOG

BORING NO.: B-103  
 SHEET: 1 OF 2  
 PROJECT NO.: 01-0304.1  
 DATE START: 1/31/2002  
 DATE FINISH: 113112002  
 ELEVATION: 138±  
 SWC REP.: KBG

PROJECT / CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER  
 LOCATION: CHARLES STREET PORTLAND, MAINE  
 DRILLING CO.: GREATWORKS TEST BORING INC. DRILLER: DONNY

CASING: HW 4"  
 SAMPLER: SS 1 3/8" 140 lbs 3 0  
 CORE BARREL: \_\_\_\_\_

**WATER LEVEL INFORMATION**

Soils appeared wet to saturated below 9' +/-

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
CASING									1'	ASPHALT PAVEMENT
	S-1	24"	12"	3.0'	6	6	4	4	1.0'	BROWN/BLACK SILTY SAND SOME GRAVEL TRACE ASH AND BRICK (FILL) ~MEDIUM DENSE~
	S-2	24"	16"	7.0'	19	31	35	34	9.0'	BROWN GRAVELLY SAND SOME SILT (FILL) -VERY DENSE-
OPEN HOLE	S-3	18"	18"	11.5'	10	50	42		12.0'	BROWN SILTY SAND SOME GRAVEL (TILL) ~VERY DENSE~
	S-4	24"	24"	17.0'	16	23	29	30		GRAY SILT AND SAND TRACE TO SOME GRAVEL TRACE CLAY (TILL) -VERY DENSE-
	S-5	24"	24"	22.0'	8	38	15	15		
	S-6	24"	24"	27.0'	5	8	9	15		-MEDIUM DENSE-
	S-7	24"	24"	32.0'	15	16	20	25		-DENSE-
	S-8	24"	24"	34.0'	25	20	16	20	35.0'	
	S-9	24"	24"	37.0'	12	17	14	20	38.0'	GRAY SILT AND SAND TRACE GRAVEL WITH CLAYEY SILT SEAMS -DENSE-

SAMPLES: \_\_\_\_\_ SOIL CLASSIFIED BY: \_\_\_\_\_  
 DRILLER - VISUALLY  
 SOIL TECH. - VISUALLY  
 LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-103**





# BORING LOG

BORING NO.: **B-104**  
 SHEET: **1 OF 2**  
 PROJECT NO.: **01-0304.1**  
 DATE START: **1/31/2002**  
 DATE FINISH: **1/31/2002**  
 ELEVATION: **129%**  
 SWC REP.: **KBG**

PROJECT/ CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER  
 LOCATION: CHARLES STREET PORTLAND, MAINE  
 DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

WATER LEVEL INFORMATION

Piezometer installed

CASING: TYPE HW SIZE I.D. 4" HAMMER WT. 140 lbs HAMMER FALL 30"  
 SAMPLER: SS SIZE I.D. 1 3/8" HAMMER WT. 140 lbs HAMMER FALL 30"  
 CORE BARREL: \_\_\_\_\_

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
CASING									3'	ASPHALT PAVEMENT
	S-1	24"	14"	3.0'	1	13	13	2	1.0'	BROWN GRAVELLY SAND SOME SILT (FILL)
	S-2	24"	16"	7.0'	10	15	7	6		BROWN SILTY SAND SOME GRAVEL (GLACIAL TILL FILL OR REWORKED NATIVE TILL) ~ MEDIUM DENSE ~
	S-3	24"	9"	12.0'	13	22	17	17		~ DENSE ~ W=9.9%
	S-4	24"	17"	17.0'	12	20	19	19	14.0'	~ DENSE ~ BROWN SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) W=9.7%
OPEN HOLE	S-5	24"	7"	22.0'	15	19	26	23		~ VERY DENSE ~
	S-6	24"	21"	24.0'	19	25	26	31		
	S-7	24"	24"	27.0'	14	27	27	23		
	S-8	24"	24"	32.0'	10	15	22	26	33.0'	~ DENSE ~
	S-9	24"	24"	37.0'	10	26	44	59 1/5"		GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) -VERY DENSE-

SAMPLES: D = SPLIT SPOON  
C = 3" SHELBY TUBE  
U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY: \_\_\_\_\_  
 DRILLER - VISUALLY  
 SOIL TECH. -VISUALLY  
 LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-104**



# BORING LOG

BORING NO **B-104**  
 SHEET **2 OF 2**  
 PROJECT NO **01-0304 1**  
 DATE START **1/31/2002**  
 DATE FINISH: **1/31/2002**  
 ELEVATION **129±**  
 SWC REP.: **KBG**  
 WATER LEVEL INFORMATION  
 Piezometer installed

PROJECT/ CLIENT. **PROPOSED WOMAN & INFANT MED BLDG/MAINE MEDICAL CENTER**

LOCATION **CHARLES STREET PORTLAND, MAINE**  
 DRILLING CO **GREAT WORKS TEST BORING INC** DRILLER **DAVE**

CASING: **H/M 4"**  
 SAMPLER: **SS 1 3/8" 140 lbs 30"**  
 CORE BARREL:

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	
	S-10	24"	24"	42.0'	13	21	22	32	
									49.0'
	S-11	24"	24"	47.0'	18	19	19	42	
									52.0'
	S-12	24"	24"	52.0'	29	27	35	50/5"	52.0'

**STRATA & TEST DATA**

GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL)  
-DENSE-

---

GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY  
WITH SAND SEAMS (TILL)  
-VERY DENSE-

BOTTOM OF EXPLORATION AT 52'  
NOT REFUSAL

BOTTOM OF PIEZOMETER SET @ 25'  
5' SCREEN

SAMPLES SOIL CLASSIFIED BY:  
 D = SPLIT SPOON  
 C = 3" SHELBY TUBE  
 U = 3.5" SHELBY TUBE

DRILLER - VISUALLY  
 SOIL TECH. - VISUALLY  
 LABORATORY TEST

REMARKS: OCCasional COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-104**





# BORING LOG

BORING NO.: **B-105**  
 SHEET: 1 OF 2  
 PROJECT NO.: 01-0304.1  
 DATE START: 2/4/2002  
 DATE FINISH: 2/4/2002  
 ELEVATION: 138±

PROJECT/ CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER  
 LOCATION: CHARLES STREET PORTLAND, MAINE  
 DRILLING CO.: GREAT WORKS TEST BORING INC. DRILLER: DAVE

SWC REP.: KBG  
 WATER LEVEL INFORMATION  
 Piezometer installed

CASING: TYPE HW SIZE I.D. 4" HAMMER WT. 140 lbs HAMMER FALL 30"  
 SAMPLER: SS  
 CORE BARREL:

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
CASING									3'	ASPHALT PAVEMENT
	S-1	24"	10"	3.0'	9	11	39	24/3"		VN A\ AI SOME SIL AND C )
	S-2	11"	6"	6.0'	22	50/5"				-DENSE- W=7.3%
									9.0'	
OPEN HOLE	S-3	24"	24"	12.0'	12	23	31	29	13.0'	BROWN SILTY SAND SOME GRAVEL (FILL) -VERY DENSE-
	S-4	24"	0"	17.0'	20	20	26	29		GRAY SAND AND SILT TRACE TO SOME GRAVEL SOME CLAY (TILL) -DENSE-
	S-5	24"	24"	22.0'	10	12	14	23		
	S-6	24"	24"	27.0'	16	28	14	19		
	S-7	24"	24"	32.0'	12	18	21	21		W=10.0%
	S-8	24"	24"	34.0'	34	29	28	27	35'	-VERY DENSE-
	S-9	24"	24"	37.0'	10	10	11	14	39.0'	GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY WITH OCCASIONAL SAND SEAMS AND CLAYEY SILT SEAMS -MEDIUM DENSE-

SAMPLES: SOIL CLASSIFIED BY: REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

D = SPLIT SPOON  
 C = 3 SHELBY TUBE  
 U = 3.5" SHELBY TUBE

DRILLER - VISUALLY  
 SOIL TECH. - VISUALLY  
 LABORATORY TEST

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

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BORING NO.: **B-105**



# BORING LOG

BORING NO.: B-105  
 SHEET: 2 OF 2  
 PROJECT NO.: 01-0304.1  
 DATE START: 2/4/2002  
 DATE FINISH: 2/4/2002  
 ELEVATION: 138±

PROJECT/ CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER  
 LOCATION: CHARLES STREET PORTLAND, MAINE  
 DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

CASING: TYPE HW SIZE I.D. 4" HAMMER WT. 140 lbs HAMMER FALL 30"  
 SAMPLER: TYPE SS SIZE I.D. 1 3/8" HAMMER WT. 140 lbs HAMMER FALL 30"  
 CORE BARREL: \_\_\_\_\_

SWC REP.: KBG  
 WATER LEVEL INFORMATION  
Piezometer installed

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-10	24"	0"	42.0'	20	28	40	41		GRAY SILTY SAND TRACE GRAVEL TRACE CLAY ~VERY DENSE~
	S-11	24"	24"	47.0'	10	10	16	29		W=10.5% -MEDIUM DENSE-
	S-12	24"	6"	52.0'	13	21	26	31		-DENSE-
	S-13	24"	24"	57.0'	8	10	12	23		-MEDIUM DENSE-
	S-14	24"	24"	62.0'	12	9	13	18		
	S-15	24"	24"	72.0'	26	36	48	50/4"	72.0'	~VERY DENSE~
BOTTOM OF EXPLORATION AT 72' NOT REFUSAL  BOTTOM OF PIEZOMETER SET @ 35' 5' OF SCREEN  2 COMPOSITE SAMPLES COLLECTED FOR SHEAR ANALYSIS COMPOSITE A: S-5,6 AND 7; COMPOSITE B: S-8,9 AND 11										

SAMPLES: D = SPLIT SPOON  
 C = 3" SHELBY TUBE  
 U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:  DRILLER - VISUALLY  
 SOIL TECH. - VISUALLY  
 LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-105**



# BORING LOG

BORING NO.: **B-106**  
 SHEET: 1 OF 2  
 PROJECT NO.: 01-0304.1  
 DATE START: 2/5/2002  
 DATE FINISH: 2/5/2002  
 ELEVATION: 137±  
 SWC REP.: KBG

PROJECT/ CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER  
 LOCATION: CHARLES STREET PORTLAND, MAINE  
 DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

CASING: TYPE HW SIZE I.D. 4" HAMMER WT. 140lbs HAMMER FALL 30"  
 SAMPLER: SS SIZE I.D. 1 3/8" HAMMER WT. 140lbs HAMMER FALL 30"  
 CORE BARREL: \_\_\_\_\_

WATER LEVEL INFORMATION  
 Soils appeared wet to saturated below 10' +/-

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	
									.3'
	S-1	24"	10"	3.0'	7	3	4	8	8.5'
	S-2	24"	10"	7.0'	11	20	31	34	
									13.0'
	S-3	24"	24"	12.0'	15	21	30	46	
									13.0'
	S-4	24"	9"	17.0'	13	27	34	34	
									13.0'
	S-5	24"	24"	22.0'	13	16	21	27	
									13.0'
	S-6	24"	24"	27.0'	8	15	18	23	
									13.0'
	S-7	24"	24"	32.0'	10	13	22	30	
									13.0'
	S-8	24"	10"	34.0'	32	41	51	46	
									13.0'
	S-9	24"	24"	37.0'	8	10	11	25	

STRATA & TEST DATA	
0.3' - 8.5'	<p>† T PAVEMENT</p> <p>BROWN GRAVELLY SAND, SOME SILT (FILL)          - LOOSE BECOMMING...</p> <p>...VERY DENSE~</p>
8.5' - 13.0'	<p>BROWN/GRAY SILTY SAND SOME GRAVEL (TILL)          ~VERY DENSE~</p>
13.0' - 37.0'	<p>GRAY SILT AND SAND          TRACE TO SOME GRAVEL TRACE CLAY (TILL)          ~VERY DENSE~</p> <p>-DENSE-</p> <p>~VERY DENSE~</p> <p>-MEDIUM DENSE-</p>

SAMPLES: \_\_\_\_\_ SOIL CLASSIFIED BY: \_\_\_\_\_  
 D = SPLIT SPOON  
 C = 3" SHELBY TUBE  
 U = 3.5" SHELBY TUBE

DRILLER - VISUALLY  
 SOIL TECH. - VISUALLY  
 LABORATORY TEST

AND THE TRANSITION MAY BE GRADUAL.

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BORING NO.: **B-106**



# BORING LOG

BORING NO.: B-106  
 SHEET: 2 OF 2  
 PROJECT NO.: 01-0304.1  
 DATE START: 2/5/2002  
 DATE FINISH: 2/5/2002  
 ELEVATION: 137±  
 SWC REP.: KBG

PROJECT/ CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER  
 LOCATION: CHARLES STREET PORTLAND, MAINE  
 DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: DAVE

CASING: TYPE HW SIZE I.D. 4" HAMMER WT. 140 lbs HAMMER FALL 30"  
 SAMPLER: TYPE SS SIZE I.D. 1 3/8" HAMMER WT. 140 lbs HAMMER FALL 30"  
 CORE BARREL: \_\_\_\_\_

WATER LEVEL INFORMATION  
 Soils appeared **wet** to saturated below 10' +/-

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-10	24"	2"	42.0'	14	18	21	29		GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL)  -DENSE-
	S-11	24"	21"	47.0'	10	9	8	21	51.0'	
	S-12	24"	24"	52.0'	26	9	11	14	53.0'	GRAY SILTY CLAY TRACE SANDTRACE GRAVEL (TILL) w = 39.3' -VERY STIFF~ q <sub>p</sub> = 4-5 KSF
	S-13	24"	24"	57.0'	10	21	27	23		GRAY SILT AND SAND SOME CLAY TRACE GRAVEL (TILL) -DENSE-
	S-14	24"	24"	62.0'	18	35	22	27	62.0'	~VERY DENSE~
										BOTTOM OF EXPLORATION AT 62' NOT REFUSAL

SAMPLES: \_\_\_\_\_ SOIL CLASSIFIED BY: \_\_\_\_\_ REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

D = SPLIT SPOON  
 C = 3" SHELBY TUBE  
 U = 3.5" SHELBY TUBE



DRILLER - VISUALLY  
 SOIL TECH. - VISUALLY  
 LABORATORY TEST

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.



# BORING LOG

BORING NO.: 5-107  
 SHEET: 1 OF 2  
 PROJECT NO.: 01-0304.1  
 DATE START: 2/6/2002  
 DATE FINISH: 2/6/2002  
 ELEVATION: 130±  
 SWC REP: KBG

PROJECT/ CLIENT: PROPOSED WOMAN & INFANT MED. BLDG./MAINE MEDICAL CENTER  
 LOCATION: CHARLES STREET PORTLAND, MAINE  
 DRILLING CO. : GREAT WORKS TEST BORING INC. DRILLER: WAYNE

CASING: TYPE HW SIZE I.D. 4" HAMMER WT. 30" HAMMER FALL  
 SAMPLER: SS 1 3/8" 140 lbs 30"  
 CORE BARREL: \_\_\_\_\_

WATER LEVEL INFORMATION  
 Piezometer installed \_\_\_\_\_

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
CASING									1'	ASPHALT PAVEMENT
	S-1	24"	10"	3.0'	13	6	4	10	1.0'	BROWN GRAVELLY SAND SOME SILT (FILL) ~LOOSE~
									5.2'	BROWN/BLACK SILTY SAND SOME GRAVEL TRACE BRICK (FILL)
	S-2	24"	22"	7.0'	9	12	22	26		GRAY SAND AND SILT TRACE TO SOME GRAVEL TRACE CLAY (TILL) -DENSE- W=10.1%
OPEN HOLE	S-3	24"	22"	12.0'	16	18	28	41		-VERY DENSE-
	S-4	24"	23"	17.0'	16	22	35	46		
	S-5	24"	24"	22.0'	9	14	17	20		-DENSE-
	S-6	24"	24"	27.0'	15	21	28	29		W=9.7%
	S-7	24"	24"	29.0'	31	19	18	27		
	S-8	24"	24"	32.0'	20	16	26	31		
	S-9	24"	17"	37.0'	18	39	42	35		-VERY DENSE-
									40.0'	

SAMPLES: SOIL CLASSIFIED BY:  
 D = SPLIT SPOON  DRILLER - VISUALLY  
 C = 3" SHELBY TUBE  SOIL TECH. -VISUALLY  
 U = 3.5" SHELBY TUBE  LABORATORY TEST

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT  
 STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.  
 BORING NO.: **B-107**



# BORING LOG

BORING NO B-107  
 SHEET 2 OF 2  
 PROJECT NO 01-0304 1  
 DATE START 2/6/2002

PROJECT/ CLIENT PROPOSED WOMAN & INFANT MED BLDG /MAINE MEDICAL CENTER

LOCATION CHARLES STREET PORTLAND MAINE  
 DRILLING CO GREAT WORKS TEST BORING INC DRILLER WAYNE

DATE FINISH 2/6/2002  
 ELEVATION 130±

CASING: TYPE HW SIZE I.D. 4" HAMMER WT. 140 lbs HAMMER FALL 3 0  
 SAMPLER: SS SIZE 1 3/8"  
 CORE BARREL:

SWC REP.: KBG  
 WATER LEVEL INFORMATION  
 Piezometer installed

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-10	24"	24"	42.0'	29	27	29	20	43.0'	GRAY SILTY CLAY TRACE SAND TRACE GRAVEL (TILL) ~VERY STIFF~ q <sub>p</sub> = 4 KSF W=30.9%
	S-11	24"	24"	47.0'	12	14	15	25		GRAY SILT AND SAND TRACE GRAVEL TRACE CLAY (TILL) ~MEDIUM DENSE~  ~VERY DENSE~
	S-12	24"	24"	52.0'	19	30	27	29		
	S-13	24"	24"	57.0'	18	36	35	42		
	S-14	24"	16"	62.0'	25	30	40	76	62.0'	
										BOTTOM OF EXPLORATION AT 62' NOT REFUSAL
										BOTTOM OF PIEZOMETER SET @ 35' 5' SCREEN

SOIL CLASSIFIED BY:

REMARKS: OCCASIONAL COBBLE ENCOUNTERED THROUGHOUT

D = SPLIT SPOON  
 C = 3" SHELBY TUBE  
 U = 3.5" SHELBY TUBE



DRILLER - VISUALLY  
 SOIL TECH. - VISUALLY  
 LABORATORY TEST

STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

## KEY TO THE NOTES & SYMBOLS

### Test Boring and Test Pit Explorations

All stratification lines represent the approximate boundary between soil types and the transition may be gradual.

#### **Key to Symbols Used:**

w	water content, percent (dry weight basis)
$q_u$	unconfined compressive strength, kips/sq. ft. - based on laboratory unconfined compressive test
$S_v$	field vane shear strength, kips/sq. ft.
$L_v$	lab vane shear strength, kips/sq. ft.
$q_p$	unconfined compressive strength, kips/sq. ft. based on pocket penetrometer test
O	organic content, percent (dry weight basis)
$W_L$ -	liquid limit - Atterberg test
$W_P$ -	plastic limit - Atterberg test
WOH -	advance by weight of hammer
WOM -	advance by weight of man
WOR -	advance by weight of rods
HYD -	advance by force of hydraulic piston on drill
RQD -	Rock Quality Designator - an index of the quality of a rock mass. RQD is computed from recovered core samples.
$\gamma_T$ -	total soil weight
$\gamma_B$ -	buoyant soil weight

#### **Description of Proportions:**

0 to 5% TRACE  
5 to 12% SOME  
12 to 35% "Y"  
35+% AND

**REFUSAL: Test Boring Explorations** - Refusal depth indicates that depth at which, in the drill foreman's opinion, sufficient resistance to the advance of the casing, auger, probe rod or sampler was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

**REFUSAL: Test Pit Explorations** - Refusal depth indicates that depth at which sufficient resistance to the advance of the backhoe bucket was encountered to render further advance impossible or impracticable by the procedures and equipment being used.

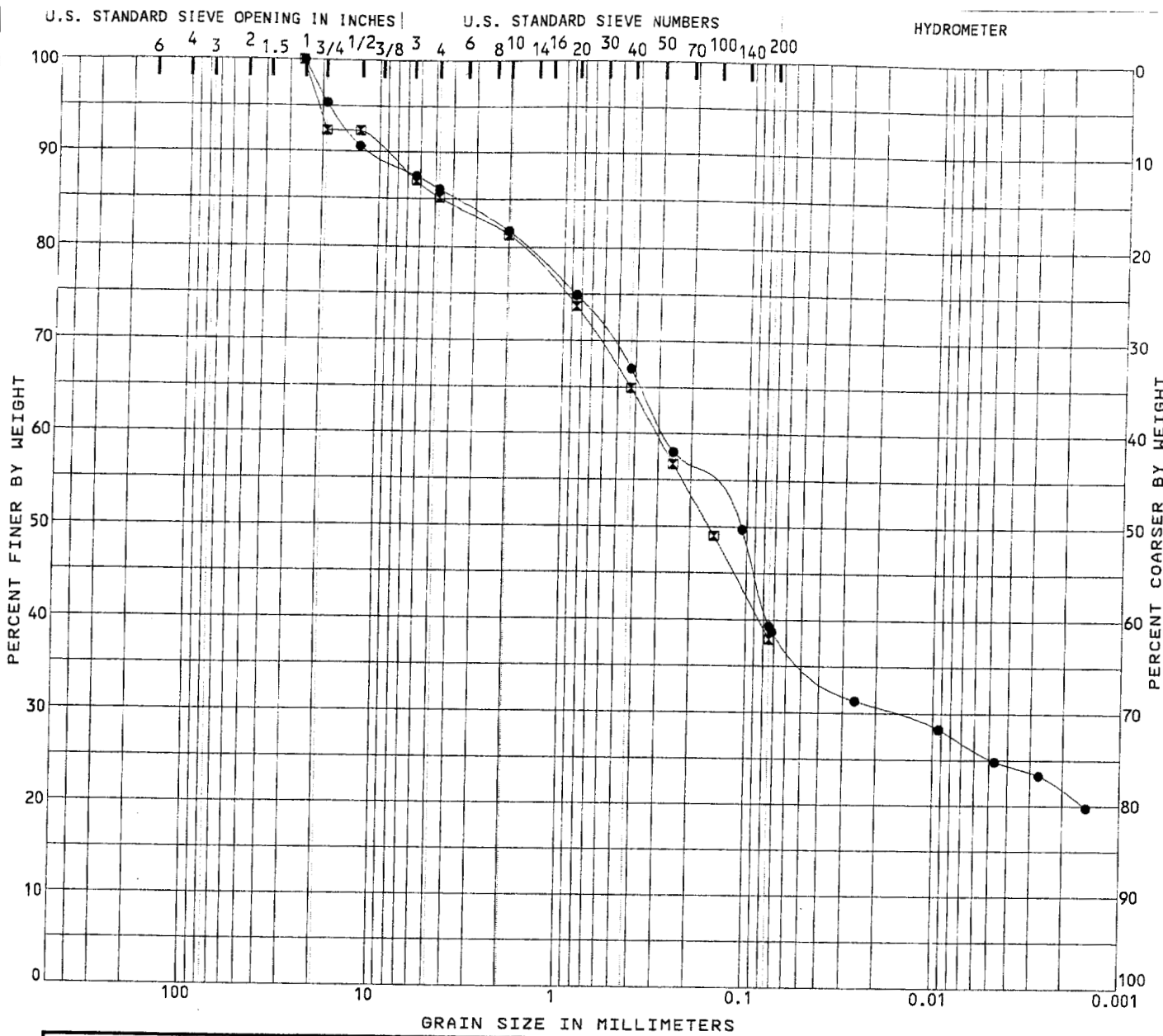
Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through a weathered or disintegrated zone of the bedrock.









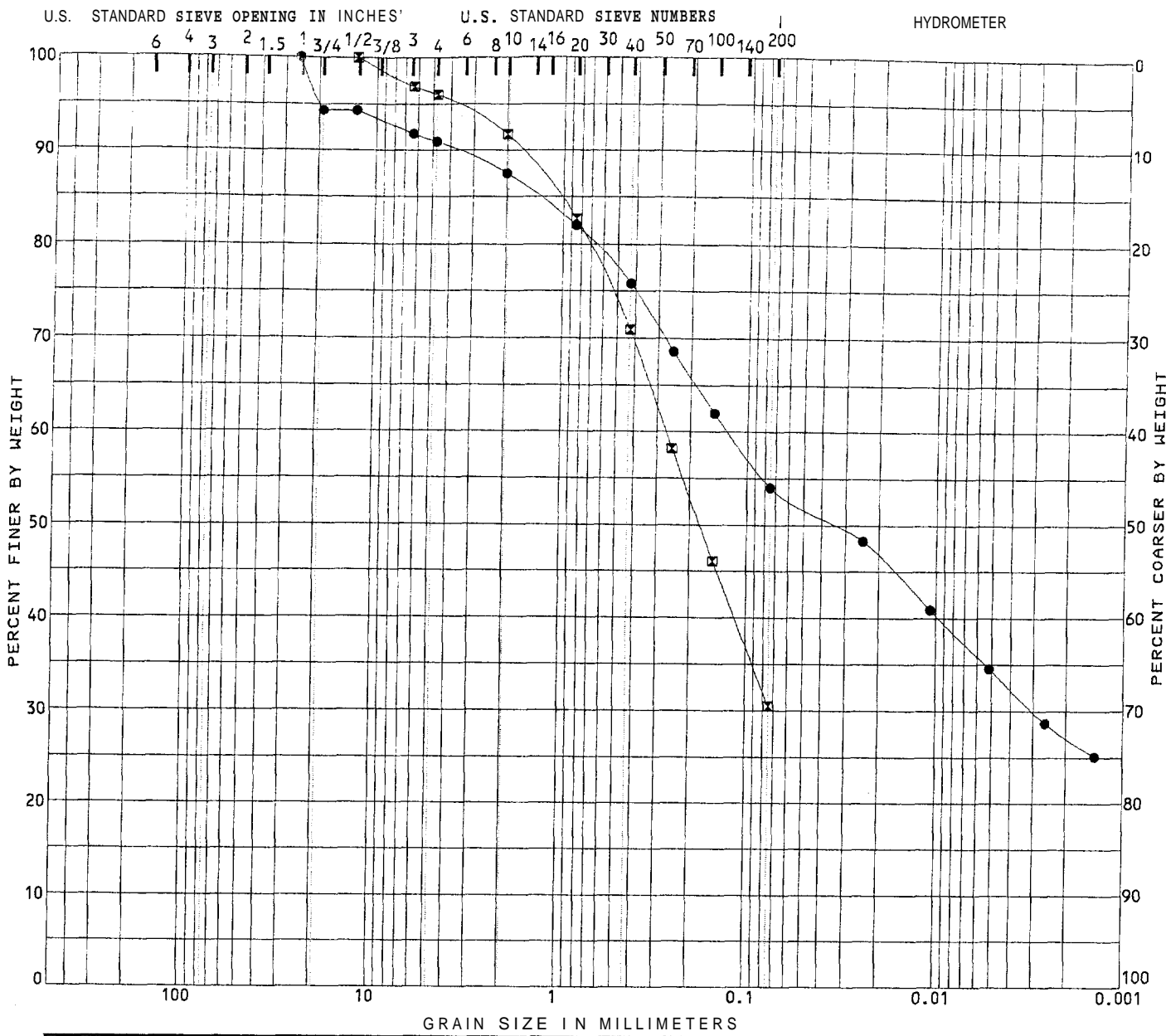


COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	WC%	LL	PL	PI	Cc	Cu
● B-105, S-5,6 & 7	SAND and SILT with some gravel, some clay	10.6	18	13	5		
⊗ B-105, S-7 30-32'	SAND and SILT with some gravel, trace clay	10.0					

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-105, S-5,6 & 7	25.00	0.28	0.017		14.0	46.7	17.8	21.5
⊗ B-105, S-7 30-32'	25.40	0.31			14.9	47.2	37.9	

<b>S.W. COI F</b> <b>ENGINEERING, INC.</b>	Project	Me.Med.Ctr./Women's & Infants Add.	Location	Portland, Maine
	SWC Job No.	01-0304.1	Sheet No.	20
	Date	March 14, 2002	<b>GRADATION CURVES</b>	



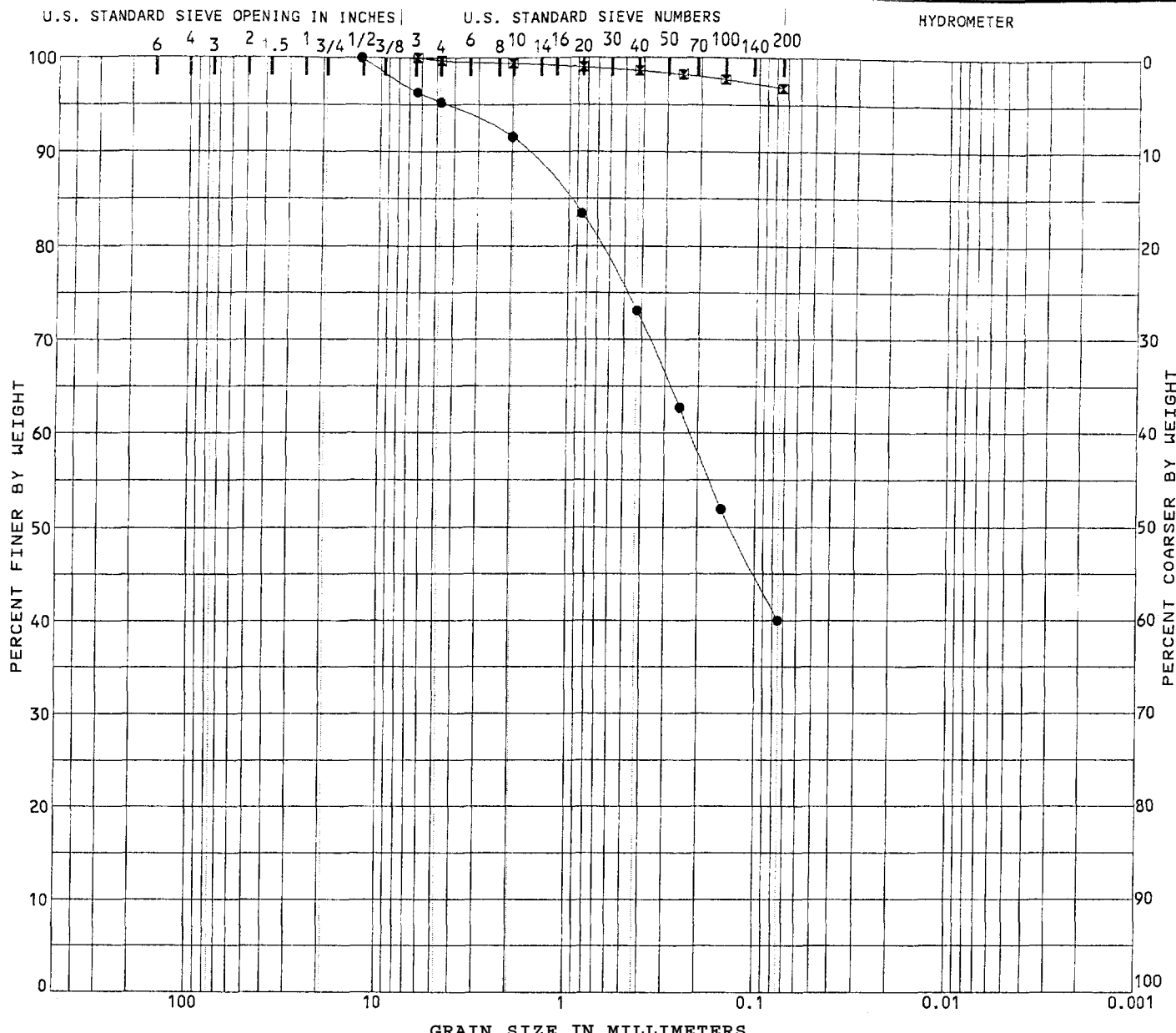
COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	WC%	LL	PL	PI	Cc	Cu
B-105, S-11 45-47'	Silty SAND with trace gravel, trace clay	10.5					

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
B-105, S-11 45-47'	12.70	0.27			4.0	65.5	30.5	

<b>S.W.COLE</b> ENGINEERING, INC.	Project <b>Me.Med.Ctr./Women's &amp; Infants Add.</b>	Location <b>Portland, Maine</b>
	SWC Job No. <b>01-0304.1</b>	Sheet No. <b>21</b>
	Date <b>March 14, 2002</b>	<b>GRADATION CURVES</b>





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	WC%	LL	PL	PI	Cc	Cu
● B-107, S-6 25-27'	SAND and SILT with trace gravel, trace clay	9.7					
☒ B-107, S-10 40-42'	silty CLAY with trace sand, trace gravel	30.9					

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-107, S-6 25-27'	12.70	0.22			4.8	55.2	40.0	
☒ B-107, S-10 40-42'	6.35				0.3	2.9	96.8	

<b>S.W.COLE</b> ENGINEERING, INC.	Project	Me.Med.Ctr./Women's & Infants Add.	Location	Portland, Maine
	SWC Job No.	01-0304.1	SheetNo.	23
	Date	March 12,2002	<b>GRADATION CURVES</b>	

















**APPENDIX A**

**1965 EXPLORATIONS (#1 THROUGH #11)  
FOR EXISTING HOSPITAL STRUCTURES  
(made by others)**

**APPENDIX B**

**2001 EXPLORATIONS (B-1 THROUGH B-5)  
MADE FOR PRELIMINARY INVESTIGATION OF THE  
WOMEN AND INFANTS M.O.B. AND PARKING STRUCTURE  
(BY S. W. COLE ENGINEERING, INC—#01-0304)**



# BORING LOG

BORING NO.: **B-1**  
 SHEET: 1 OF 1  
 PROJECT NO.: 01-0304 S  
 DATE START: 5/17/2001  
 DATE FINISH: 5/17/2001  
 ELEVATION: 138.0'+/-  
 SWC REP.: KBG

PROJECT / CLIENT: **PROPOSED MEDICAL OFFICE BUILDING / MAINE MEDICAL CENTER**  
 LOCATION: **CHARLES STREET PORTLAND, MAINE**  
 DRILLING FIRM: **GREAT WORKS TEST BORINGS** DRILLER: **DON**

WATER LEVEL INFORMATION  
 NO FREE WATER OBSERVED

CASING: TYPE HSA SIZE I.D. 4 1/4" HAMMER WT. HAMMER FALL  
 SAMPLER: SS I 3/8" 140 LB 30"  
 CORE BARREL:

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-1	24"	8"	2.0'	6	7	9	6	2'	ASPHALT PAVEMENT
									3.0'	-MEDIUM DENSE- BROWN GRAVELLY SAND, SOME SILT, BRICK FRAGMENTS (FILL) -MEDIUM DENSE TO DENSE- BROWN GRAVELLY SAND W/TRACE GRAVEL (FILL)
	S-2	24"	16"	7.0'	10	16	21	36	10.0'	-VERY DENSE- GRAY SAND AND SILT W/TRACE GRAVEL (TILL)
	S-3	24"	1"	12.0'	39	35	36	41		w=9.2%
	S-4	24"	20"	17.0'	18	37	22	19		-MEDIUM DENSE- w=9.6%
	S-5	24"	23"	22.0'	8	7	11	12		-DENSE- w=10.4%
	S-6	24"	3"	27.0'	14	15	19	22		w=8.9%
	S-7	24"	20"	32.0'	16	12	15	25		w=9.6%
	S-8	24"	24"	37.0'	12	9	17	19		
	S-9	24"	24"	39.0'	8	19	36	30	39.0'	
BOTTOM OF EXPLORATION AT 39.0' (NO REFUSAL)										

SAMPLES: SOIL CLASSIFIED BY:  
 D = SPLIT SPOON  
 C = 3" SHELBY TUBE  
 U = 3.5" SHELBY TUBE

X	DRILLER - VISUALLY
X	SOIL TECH. - VISUALLY
X	LABORATORY TEST

REMARKS:  
 STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

2

BORING NO.: **B-1**





# BORING LOG

BORING NO.: **B-2**  
 SHEET: **1 OF 1**  
 PROJECT NO.: **01-0304 S**  
 DATE START: **5/17/2001**  
 DATE FINISH: **5/17/2001**  
 ELEVATION: **140.0'+/-**  
 SWC REP.: **KBG**

WATER LEVEL INFORMATION  
 SOILS MOIST BELOW **15.0'**

PROJECT / CLIENT: **PROPOSED MEDICAL OFFICE BUILDING / MAINE MEDICAL CENTER**  
 LOCATION: **CHARLES STREET PORTLAND, MAINE**  
 DRILLING FIRM: **GREAT WORKS TEST BORINGS** DRILLER: **DON**

CASING: TYPE **HSA** SIZE I.D. **4 1/4"** HAMMER WT. **140 LB** HAMMER FALL **30"**  
 SAMPLER: **SS** SIZE I.D. **1 3/8"** HAMMER WT. **140 LB** HAMMER FALL **30"**  
 CORE BARREL:

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-1	24"	18"	2.0'	4	5	3	3	0.3'	TOPSOIL AND ORGANICS
									4.5'	-LOOSE- BROWN SAND W/SOME GRAVEL, TRACE SILT (FILL)
	S-2	24"	21"	7.0'	36	25	23	31	10.5'	-DENSE- BROWN GRAVELLY SAND W/SOME SILT (FILL)
	S-3	24"	24"	12.0'	29	27	26	52		-VERY DENSE- GRAY SAND AND SILT W/TRACE GRAVEL (TILL)
	S-4	24"	24"	17.0'	5	8	15	23		-MEDIUM DENSE-
	S-5	24"	20"	22.0'	23	21	28	29		-VERY DENSE-
	S-6	24"	22"	27.0'	10	17	25	28		-DENSE-
	S-7	6"	0	30.5'	23	50/0			30.5'	BOTTOM OF EXPLORATION AT 30.5' REFUSAL (PROBABLE BEDROCK)

NOTE :  
 PIEZOMETER SET AT 30.5' WITH 5' SCREEN.  
 WATER DEPTH MEASURED TO BE 10' ON 6/13/01

SAMPLES: SOIL CLASSIFIED BY:  
 D = SPLIT SPOON  
 C = 3" SHELBY TUBE  
 U = 3.5" SHELBY TUBE  
 DRILLER - VISUALLY  
 SOIL TECH. - VISUALLY  
 LABORATORY TEST

AND THE TRANSITION MAY BE GRADUAL.



# BORING LOG

BORING NO.: B-3  
 SHEET: 1 OF 1  
 PROJECT NO.: 01-0304 S  
 DATE START: 5/18/2001  
 DATE FINISH: 5/18/2001  
 ELEVATION: 135.0'+/-  
 SWC REP.: KBG

PROJECT / CLIENT: PROPOSED MEDICAL OFFICE BUILDING / MAINE MEDICAL CENTER  
 LOCATION: CHARLES STREET PORTLAND, MAINE  
 DRILLING FIRM: GREAT WORKS TEST BORINGS DRILLER: DON

CASING: TYPE HSA SIZE I.D. 4 1/4" HAMMER WT. 140 LB HAMMER FALL 30"  
 SAMPLER: SS SIZE I.D. 1 3/8" HAMMER WT. 140 LB HAMMER FALL 30"  
 CORE BARREL: \_\_\_\_\_

WATER LEVEL INFORMATION  
 SOILS MOIST BELOW 24.0'

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-1	24"	8"	2.0'	14	10	11	8	.2'	ASPHALT PAVEMENT -MEDIUM DENSE- DARK BROWN GRAVELLY SILTY SAND W/BRICK FRAGMENTS (FILL)
									5.0'	
	S-2	24"	18"	7.0'	15	27	40	32	6.5'	BROWN SAND W/TRACE SILT (FILL) -DENSE- GRAY SAND AND SILT W/TRACE GRAVEL (TILL) ~DENSE TO VERY DENSE~
	S-3	24"	24"	12.0'	12	22	37	36		
		24"	0	17.0'	21	48	37	44		
		24"	0	22.0'	8	7	11	12		-MEDIUM DENSE-
	S-4	24"	15"	27.0'	8	13	17	23		
	S-5	24"	9"	29.0'	22	33	34	41		~VERY DENSE~
	S-6	24"	1"	32.0'	19	41	38	37		
	S-7	24"	24"	37.0'	9	16	19	25		
	S-8	24"	24"	39.0'	19	28	27	42	39.0'	

BOTTOM OF EXPLORATION AT 39.0' (NO REFUSAL)

SAMPLES: D = SPLIT SPOON  
 C = 3 SHELBY TUBE  
 U = 3.5" SHELBY TUBE

SOIL CLASSIFIED BY:

<input type="checkbox"/>	DRILLER - VISUALLY
<input checked="" type="checkbox"/>	SOIL TECH. - VISUALLY
<input checked="" type="checkbox"/>	LABORATORY TEST

REMARKS: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-3**



# BORING LOG

BORING NO.: B-4  
 SHEET: 1 OF 1  
 PROJECT NO.: 01-0304 S  
 DATE START: 5/17/2001  
 DATE FINISH: 5/17/2001  
 ELEVATION: 129.5'+/-  
 SWC REP.: KBG  
 WATER LEVEL INFORMATION  
 NO FREE WATER OBSERVED

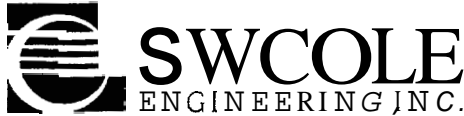
PROJECT / CLIENT: PROPOSED MEDICAL OFFICE BUILDING / MAINE MEDICAL CENTER  
 LOCATION: CHARLES STREET PORTLAND, MAINE  
 DRILLING FIRM: GREAT WORKS TEST BORINGS DRILLER: DON

CASING: TYPE HSA SIZE I.D. 4 1/4" HAMMER WT. 140 LB HAMMER FALL 30"  
 SAMPLER: SS  
 CORE BARREL:

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-1	24"	12"	2.0'	5	5	2	5	.2' 1.0'	ASPHALT PAVEMENT BROWN GRAVELLY SAND W/TRACE SILT (FILL) GRAY SAND AND SILT W/TRACE GRAVEL (TILL) -VERY DENSE-
	S-2	18"	18"	5.5'	53	32	56			
	S-3	18"	16"	10.5'	26	24	58			
	S-4	24"	17"	16.0'	6	16	20	26		-DENSE-
	S-5	24"	24"	21.0'	4	18	19	23		
									24.0'	BOTTOM OF EXPLORATION AT 24.0' REFUSAL (PROBABLE BEDROCK)

SAMPLES:  SOIL CLASSIFIED BY:   
 DR = SPLIT SPOON  DRILLER - VISUALLY  
 IC = 3" SHELBY TUBE  SOIL TECH. - VISUALLY  
 U = 3.5 SHELBY TUBE  LABORATORY TEST

REMARKS: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.



# BORING LOG

BORING NO.: **B-5**  
 SHEET: 1 OF 1  
 PROJECT NO.: 01-0304 S  
 DATE START: 5/18/2001  
 DATE FINISH: 5/18/2001  
 ELEVATION: 125.5'+/-  
 SWC REP.: KBG

PROJECT/ CLIENT: **PROPOSED MEDICAL OFFICE BUILDING / MAINE MEDICAL CENTER**  
 LOCATION: **CHARLES STREET PORTLAND, MAINE**  
 DRILLING FIRM: **GREAT WORKS TEST BORINGS** DRILLER: **DON**

CASING: TYPE HSA SIZE I.D. 4 1/4" HAMMER WT. HAMMER FALL  
 SAMPLER: SS 1 3/8" 140 LB 30"  
 CORE BARREL:

WATER LEVEL INFORMATION  
 SOILS MOIST BELOW 14.0'  
 SOILS SATURATED BELOW 24.5'

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
									5'	ASPHALT PAVEMENT
	S-1	24"	10"	2.0'	9	13	19	20	3.5'	-DENSE- BROWN SAND AND GRAVEL W/SOME SILT (FILL) w=9.2%
									8.0'	-VERY DENSE- BROWNISH GRAY GRAVELLY SANDY SILT (FILL) w=7.0%
	S-2	14"	11"	7.0'	21	36	50/2"			-VERY DENSE- BROWNISH GRAY SAND AND SILT W/SOME GRAVEL (TILL) w=9.3%
										w=13.8%
	S-3	24"	18"	12.0'	15	32	37	38	24.5'	-MEDIUM DENSE- BROWNISH GRAY SANDY CLAY W/SOME GRAVEL w=34.1%
									28.0'	-MEDIUM DENSE/STIFF- GRAY SAND AND SILT W/TRACE GRAVEL (TILL)
	S-4	24"	21"	17.0'	10	17	13	12		-DENSE- w=14.0%
	S-5	24"	24"	22.0'	6	18	17	16	37.0'	
	S-6	24"	6"	27.0'	2	8	9	5		
		24"	0	32.0'	12	21	29	21		
	S-7	24"	24"	37.0'	11	14	14	29		
										BOTTOM OF EXPLORATION AT 37.0' (NO REFUSAL)

SAMPLES: D = SPLIT SPOON C = 3" SHELBY TUBE U = 3.5 SHELBY TUBE	SOIL CLASSIFIED BY: <table border="1"> <tr><td></td></tr> <tr><td>X</td></tr> <tr><td>X</td></tr> </table> DRILLER - VISUALLY SOIL TECH. - VISUALLY LABORATORY TEST		X	X	REMARKS: STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.	6
X						
X						
			BORING NO.: <b>B-5</b>			



**APPENDIX C**

**2002 EXPLORATION (B-108)  
MADE FOR PROPOSED PARKING GARAGE  
(BY S. W. COLE ENGINEERING, INC. #02-0067)**



# BORING LOG

BORING NO.: B-108  
 SHEET: 1 OF 3  
 PROJECT NO.: 02-0067S  
 DATE START: 2/8/2002  
 DATE FINISH: 2/11/2002  
 ELEVATION: 120.0 +/-  
 SWC REP.: KGB  
 WATER LEVEL INFORMATION  
 PIEZOMETER INSTALLED

PROJECT / CLIENT: PROPOSED PARKING GARAGE / MAINE MEDICAL CENTER  
 LOCATION: CRESCENT KONGRESS STREETS - PORTLAND, ME  
 DRILLING FIRM: GREAT WORKS TEST BORING INC. DRILLER: WAYNE

CASING: TYPE HW SIZE 1.D. 4" HAMMER WT. 140 LB HAMMER FALL 30"  
 SAMPLER: SS SIZE 1.D. 1 3/8" HAMMER WT. 140 LB HAMMER FALL 30"  
 CORE BARREL: \_\_\_\_\_

CASING BLOWS PER FOOT CASING	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	BOT	0-6	6-12	12	18-24		
	S-1	2"	2"	1.1'	50/2"					ASPHALT PAVEMENT
									4.0'	BROWN GRAVELLY SAND SOME SILT (FILL)
	S-2	24"	18"	7.0'	5	7	6	6		BROWN SAND SOME SILT TRACE GRAVEL (FILL) -MEDIUM DENSE- W=6.8%
	S-3	24"	18"	12.0'	9	7	9	14	13.5'	
									15.0'	PROBABLE REINFORCED CONCRETE FOOTING
	S-4	24"	16"	17.0'	16	36	15	22		BROWN SILTY SAND SOME GRAVEL TRACE CLAY (TILL) ~VERY DENSE~
OPEN HOLE	S-5	24"	0	22.0'	31	28	34	30		
	S-6	24"	22"	27.0'	10	20	24	32		-DENSE-
	S-7	24"	24"	32.0'	7	9	13	16	33.0'	W=10.8% ~MEDIUM DENSE~
	S-8	24"	20"	37.0'	6	7	8	9	38.0'	GRAY SILT AND SAND SOME CLAY TRACE GRAVEL (TILL) -MEDIUM DENSE-

SAMPLES: SOIL CLASSIFIED BY:  
 S = SPLIT SPOON  
 S = 3" SHELBY TUBE  
 J = 3.5" SHELBY TUBE  
 [ ] DRILLER - VISUALLY  
 [X] SOIL TECH. - VISUALLY  
 [X] LABORATORY TEST

REMARKS: OCCASIONAL COBBLES THROUGHOUT  
 STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.  
 BORING NO.: **B-108**



# BORING LOG

BORING NO.: **8-108**  
 SHEET: **2 OF 3**  
 PROJECT NO.: **02-0067 S**  
 DATE START: **2/8/2002**  
 DATE FINISH: **2/11/2002**  
 ELEVATION: **120.0 +/-**  
 SWC REP.: **KGB**

PROJECT / CLIENT: **PROPOSED PARKING GARAGE / MAINE MEDICAL CENTER**  
 LOCATION: **CRESCENT/CONGRESS STREETS • PORTLAND, ME**  
 DRILLING FIRM: **GREAT WORKS TEST BORING INC.** DRILLER: **WAYNE**

WATER LEVEL INFORMATION  
 PIEZOMETER INSTALLED

CASING: TYPE **HW** SIZE I.D. **4"** HAMMER WT. **140 LB** HAMMER FALL **30"**  
 SAMPLER: TYPE **SS** SIZE I.D. **1 3/8"** HAMMER WT. **140 LB** HAMMER FALL **30"**

CORE BARREL: \_\_\_\_\_

CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24	
	S-9	24"	10"	42.0'	17	25	32	25	
	S-10	24"	24"	47.0'	17	14	17	17	
	S-11	24"	24"	52.0'	11	16	24	31	
	S-12	24"	24"	57.0'	16	34	37	44	
	S-13	21"	17"	61.8'	11	25	41	50/3"	
	S-14	24"	24"	67.0'	12	19	22	32	
	S-15	24"	24"	72.0'	12	25	26	30	
	S-16	24"	24"	77.0'	11	16	18	22	

**STRATA & TEST DATA**

-DENSE-

GRAY SAND AND SILT  
TRACE TO SOME GRAVEL TRACE CLAY (TILL)

-DENSE-

-VERY DENSE-  
W=10.1%

-DENSE-

-VERY DENSE-

-DENSE-

SAMPLES:

SOIL CLASSIFIED BY:

REMARKS: OCCASIONAL COBBLES THROUGHOUT

U = 3.5" SHELBY TUBE

X
X

LABORATORY TEST

AND THE TRANSITION MAY BE GRADUAL.

BORING NO.: **B-108**





# BORING LOG

BORING NO.: **B-108**  
 SHEET: 3 OF 3  
 PROJECT NO.: 02-0067 S  
 DATE START: 2/8/2002  
 DATE FINISH: 2/11/2002  
 ELEVATION: 120.0 +/-  
 SWC REP.: KGB

PROJECT / CLIENT: **PROPOSED PARKING GARAGE / MAINE MEDICAL CENTER**  
 LOCATION: **CRESCENTKONGRESS STREETS - PORTLAND, ME**  
 DRILLING FIRM: **GREAT WORKS TEST BORING INC.** DRILLER: **WAYNE**

CASING: TYPE HW SIZE I.D. 4  
 SAMPLER: SS 1 3/8" 140 LB 30"  
 CORE BARREL:

WATER LEVEL INFORMATION  
 PIEZOMETER INSTALLED

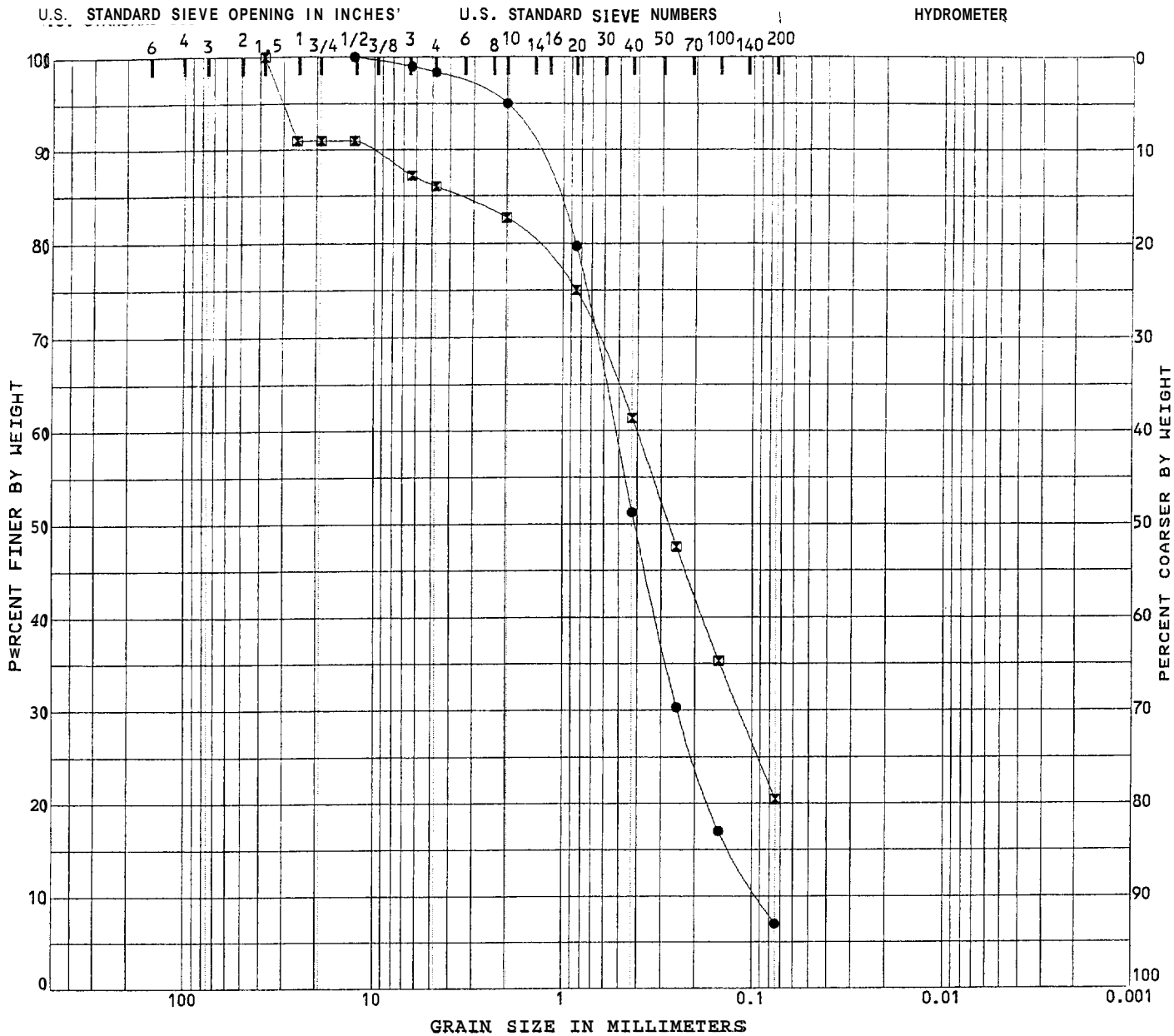
CASING BLOWS PER FOOT	SAMPLE				SAMPLER BLOWS PER 6"				DEPTH	STRATA & TEST DATA
	NO.	PEN.	REC.	DEPTH @ BOT	0-6	6-12	12-18	18-24		
	S-17	24"	24"	82.0'	10	14	19	22		GRAY SAND AND SILT TRACE TO SOME GRAVEL TRACE CLAY (TILL)  -DENSE-
	S-18	24"	24"	87.0'	12	18	13	24		
	S-19	24"	24"	92.0'	15	16	18	24		
	S-20	24"	22"	102.0'	16	27	37	45	102.0'	-VERY DENSE- BOTTOM OF EXPLORATION AT 102.0' - NOT REFUSAL

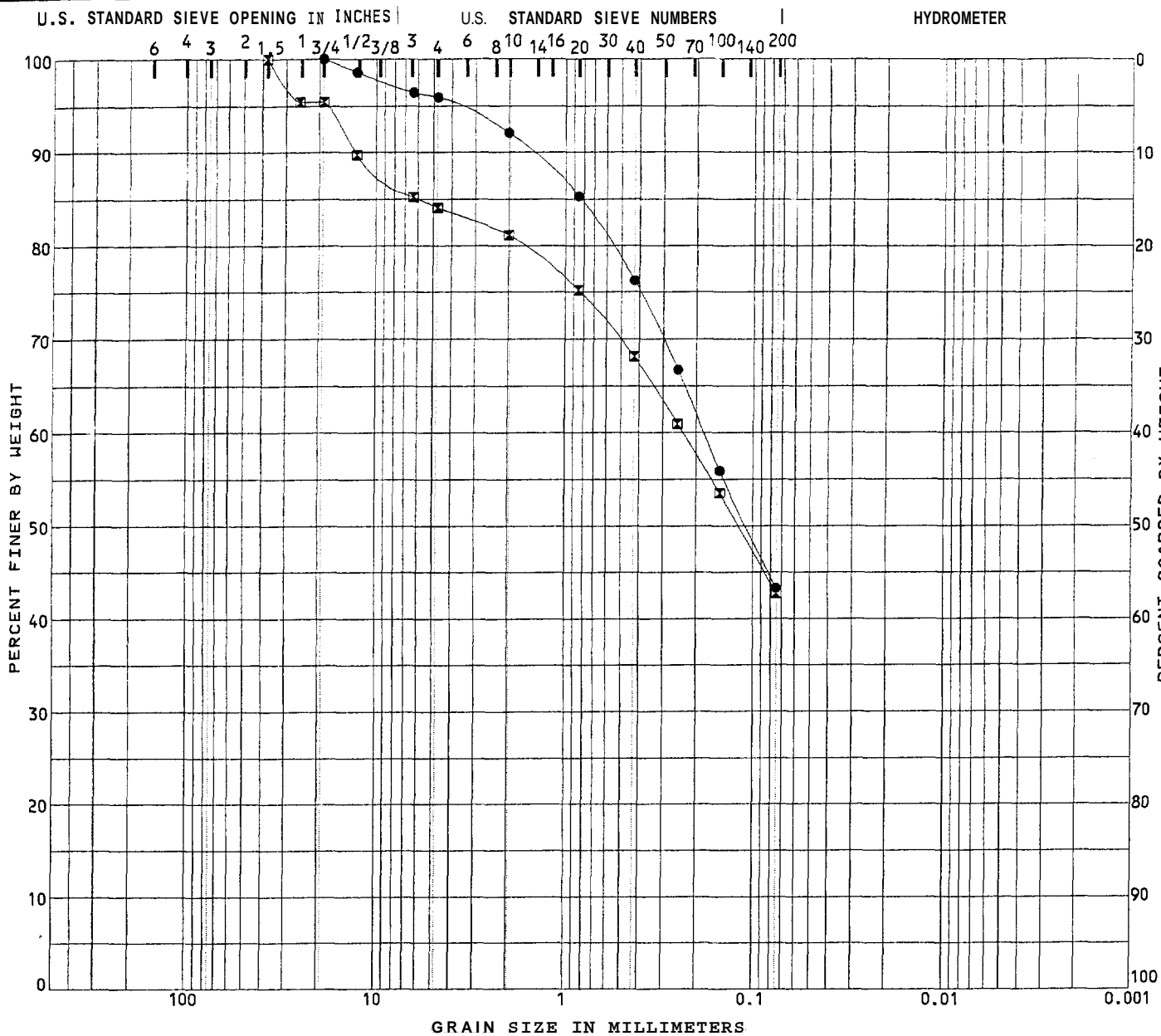
NOTE: THREE PIEZOMETERS INSTALLED  
 B108A AT 100'  
 5' SCREEN  
 BENONITE SEAL 91'-93'  
 B108B AT 65'  
 5' SCREEN  
 BENONITE SEALS 66'-67' AND 57'-58'  
 B108C AT 30'  
 5' SCREEN  
 BENONITE SEALS 31'-32' AND 20'-23'

SAMPLES: SOIL CLASSIFIED BY: DRILLER - VISUALLY  
 D = SPLIT SPOON  SOIL TECH. - VISUALLY  
 C = 3" SHELBY TUBE  LABORATORY TEST  
 U = 3.5" SHELBY TUBE

REMARKS: OCCASIONAL COBBLES THROUGHOUT  
 STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.

(4)  
BORING NO.: **B-108**





COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification	Classification	WC%	LL	PL	PI	Cc	Cu
● B-108, S-12 50-57'	SAND and SILT with trace gravel	10.1					
☒ B-108, S-20 100-102'	Gravelly SILT and SAND	8.9					

Specimen Identification	D100	D60	D30	D10	%Gravel	%Sand	%Silt	%Clay
● B-108, S-12 50-57'	19.00	0.18			4.1	52.6	43.3	
☒ B-108, S-20 100-102'	37.50	0.23			15.9	41.4	42.7	

<b>S.W.COLE</b> ENGINEERING, INC.	Project <b>Maine Medical Center/Parking Garage</b>	Location <b>Portland, Maine</b>
	SWC Job No. <b>02-0067</b>	Sheet No. <b>7</b>
	Date <b>February 25, 2002</b>	<b>GRADATION CURVES</b>