GEOTECHNICAL ENGINEERING SERVICES
PROPOSED PEARL PLACE
PHASE 1 DEVELOPMENT
210 PEARL STREET
PORTLAND, MAINE

04-1212 **July 7, 2006**

Prepared for:

AVESTA Housing
Attention: Jay Waterman
307 Cumberland Avenue
Portland, ME 04101

Prepared by:

S.W.COLE ENGINEERING, INC.
286 Portland Road
Gray, Maine 04039

TABLE OF CONTENTS

04-1212

July 7, 2006

AVESTA Housing
Attention: Jay Waterman
307 Cumberland Avenue
Portland, ME 04101

Subject: Geotechnical Engineering Services
Proposed Pearl Place Phase 1 Development
210 Pearl Street
Portland, Maine

Dear Jay,

In accordance with our Agreement dated December 16, 2004, we have completed a subsurface investigation and geotechnical evaluation for the current Phase 1 Pearl Place Development in Portland, Maine. This report summarizes our findings and recommendations relative to foundations and earthwork associated with the proposed building construction. The contents of this report are subject to the limitations set forth in Attachment A.

It should be noted that S. W. COLE ENGINEERING, INC. completed geotechnical reports for previous development concepts on the Pearl Place site. This report supersedes our previous reports.

1.0 INTRODUCTION

1.1 Scope of Work

The purpose of our work was to provide design phase geotechnical recommendations relative to foundations and earthwork associated with proposed Buildings 1 and 2. Our scope of work has included several phases of exploration work, an evaluation of the subsurface findings relative to the proposed construction, attendance at project design meetings and preparation of this report.

1.2 Proposed Construction

Based on information provided by your project team, we understand that Building 1 is proposed as a 3-story, wood-framed building situated along Oxford Street with a walk-out basement level on the downslope (north) side of the building. We understand the basement level will be used for parking and enclosed community space. Similarly, we understand that Building 2 will be a 5-story, wood-framed building situated along Pearl Street. We understand the northern two-thirds of Building 2 have a basement level cut into the existing terrain of the site with walk-out access on the west side. Building 1 is proposed with a basement floor elevation of 18'-9" and a first floor elevation of 29'-9". Building 2 is proposed with a basement floor elevation of 18'-9" and a first floor elevation of 29'-3". Proposed and existing site features are shown on the Exploration Location Plan attached as Sheet 1.

2.0 EXPLORATION AND TESTING

2.1 Exploration Work

S. W. COLE ENGINEERING, INC. has completed several phases of explorations on the site. In December 2004, test borings B-101 through B-104 were made at the site for a preliminary investigation of the then proposed Conceptual Master Plan of the development. In September 2005, eight test pits (TP-1 through TP-8) were made for the then proposed Phase 1 Development. On March 31, 2006, S. W. COLE ENGINEERING, INC. completed test borings B-105 and B-107 to supplement the previous test borings and provide information for the currently proposed Building 1 & 2 Development. S. W. COLE ENGINEERING INC. located the explorations at the site based on taped measurements from existing site features.

The approximate locations of the explorations are shown on the "Exploration Location Plan" attached as Sheet 1. Logs of explorations are attached as Sheets 2 through 18. The elevations shown on the logs were estimated based on topographic information shown on Sheet 1. A key to the notes and symbols used on the logs is attached as Sheet 19.

2.2 Testing

The test borings were made using cased wash-boring drilling techniques. Soil samples were obtained within the test borings at intervals of 2, 5, 10 and 20 feet using split

spoon and Standard Penetration Test (SPT) methods. Field Vane Shear Tests (VST) were made where softer cohesive soil deposits were encountered in order to assess in-situ soil strength properties. The results of SPT and VST tests are noted on the logs. Thin-walled Shelby Tube soil samples were obtained in boring B-104 where softer compressible cohesive soil deposits were encountered.

Laboratory testing was performed on selected samples recovered from the explorations. Moisture content test results are noted on the logs. Gradation and consolidation test results are attached as Appendix A. The ash encountered at the site was sampled and analytical testing for heavy metals was completed. The results of the analytical testing performed on the ash are included in the VRAP report prepared by S. W. COLE ENGINEERING, INC.

3.0 SITE AND SUBSURFACE CONDITIONS

3.1 Site Conditions

At the time of the exploration work, a single-story warehouse structure existed in the central portion of the site adjacent to the westerly property line. The areas to the north and east of the existing building are relatively level and covered with bituminous asphalt pavement. The southerly side of the site slopes up towards Oxford Street. The slope is grass covered. Within proposed Building 1 the existing slope transitions from about elevation 15 to 27 feet at a slope of about 1V:2.5H. Within proposed Building 2 the existing slope transitions from about elevation 18 to 28 feet at a slope of about 1V:4H. Existing site conditions are shown on Sheet G-1.

3.2 Subsurface Conditions

Seven test borings and eight test pits have been completed at the site through several phases of planning for the Pearl Place Development. In general, the explorations within the proposed Building 1 and 2 area of the site encountered a surficial layer of fill overlying a 6 to 12 inch thick layer of ash overlying either stiff clay or wet to saturated loose silt and sand with clay overlying dense glacial till soils. The explorations in the northerly portion of the site encountered a soil profile generally consisting of fill overlying soft glaciomarine clays overlying loose outwash sands overlying dense glacial till at depth. In general, the fill soils across the site contain concrete, brick and granite slabs and transition from south to north being about 5 feet thick adjacent to Oxford Street, about 10 feet thick within the central portion of the site, and approaching 12 to 14 feet in

thickness in the northern portion of the site. Refer to the attached logs for more detail of the subsurface findings at the exploration locations.

3.3 Groundwater Conditions

Along Oxford Street, the explorations generally encountered saturated soils at a depth of about 10 feet below the ground surface. At the bottom of the slope transitioning down from Oxford Street, groundwater was observed to be about 7 to 8 feet below the ground surface. It should be anticipated that the groundwater level will fluctuate seasonally, during periods of heavy precipitation and snowmelt and may be influenced by tidal fluctuations in the lower elevations of the site.

4.0 EVALUATIONS AND RECOMMENDATIONS

4.1 General Findings

Based on the subsurface findings and our understanding of the proposed construction, we provided recommendations and assisted in evaluation of foundations options including 1) pile-supported foundations, 2) conventional spread footing foundations improving ground conditions using geo-piers, and 3) spreading footing foundations improving ground conditions by overexcavation of unsuitable fill soils and replacement with compacted controlled fills. Through evaluation of alternatives by the design team, owner and owner's representative, the pile option was eliminated due to cost and the geo-pier option was eliminated due to constructability. At the conclusion of the evaluation of foundation alternatives, option 3 (spread footings with overexcavation and replacement of unsuitable fills) was selected as the preferred alternative, and as such, the pile and geo-pier foundation options are not developed further in this report.

As discussed, we anticipate that it would be feasible to blend and crush concrete, bricks and granite slabs within the existing fills to be overexcavated with concrete from demolition of the existing warehouse structure on the site for reuse as structural backfill for the overexcavated areas beneath the buildings. Additionally, we anticipate that it may be feasible to crush and reuse existing pavements and gravels beneath the pavements as well as likely beneath the existing building slab to be demolished. In our opinion, this recycling concept would require the use of a mobile crusher on the site to provide the best economy.

4.2 Site and Subgrade Preparation

As discussed, we recommend consideration of a spread footing option. This will require overexcavation and removal of unsuitable soils beneath footings to exposed undisturbed stiff silty clay or dense glacial till (undisturbed stable native soils) encountered at depths of ranging from about 5 to 10 feet below existing grades. The overexcavation would need to extend at least 0.5-feet outward from the edge of footings for each foot of overexcavation depth. The overexcavated area would need to be backfilled with compacted gravel borrow consisting of imported 6-inch minus sand and gravel and/or 6-inch minus crushed concrete, brick, pavements and relic granite slabs from demolition on-site. The backfill should be placed in 1 foot lifts compacted to 95 percent of ASTM D-1557, except that the bottom 2 feet of backfill may be placed as one lift as necessary to get above groundwater. General overexcavation details are shown on the attached Sheet 20. In all cases, the footings should be overexcavated by at least 1-foot and backfilled with compacted gravel borrow. S. W. COLE ENGINEERING, INC. must be onsite to observe overexcavation and subgrade preparation activities.

Excavations must be properly shored and/or sloped consistent with OSHA trenching regulations to prevent sloughing and caving of the sidewalls during construction. Excavations must not undermine adjacent sidewalks, roadways and utilities. Considering the depth of overexcavation needed, we anticipate that shoring will be needed along Oxford and Pearl Streets for excavation support. The contractor should be required to submit a shoring plan for review by the project team prior to beginning excavations along Oxford and Pearl Streets. The shoring plan should be based upon test pits made by the contractor to assess depths of overexcavation to remove unsuitable soils beneath the building footprints. Parking should not be allowed on the street adjacent to braced excavation unless the shoring contractor has specifically included the surcharge weight due to traffic loading in the design.

As presented herein, a 6 to 12 inch thick ash layer was encountered beneath the fill soil on the site. The ash soil will need to be segregated and buried beneath the proposed parking lot on-site according to the VRAP plan.

The contractor should anticipate the need for dewatering in excavations. Ditching with gravity drainage and sumping and pumping should be adequate. Considering the urban setting of this site, we recommend that dewatered water be recharged on-site.

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.

4.3 Foundations

The design-freezing index for the Portland area is approximately 1,250-Fahrenheit degree-days, which corresponds to a frost penetration depth on the order of 4.5 feet. To protect spread footings and foundation underdrains from freezing temperatures, perimeter footings should be cast at least 4.5 feet below exterior finish grades. According to the 2003 International Building Code, utilizing standard penetration numbers obtained at the borings and construction of the subgrade improvements recommended herein, we interpret the subsurface conditions for Buildings 1 and 2 to correspond to a Seismic Soil Site Class D. For footings bearing on properly prepared subgrades and backfilled with compacted structural fill, we recommend the following geotechnical parameters for design consideration:

Recommended Geotechnical Parameters For Spread Footings	
Net Allowable Bearing Capacity	3.0 ksf or less
Base Friction Factor	0.4
Anticipated Settlement	1-inch or less

4.3.1 Foundation and Basement Walls

We recommend that clean, free draining, compacted structural fill be provided adjacent to foundation and basement walls to promote drainage and prevent build-up of moisture. At least 2 feet, lateral distance, of structural fill should be provided against interior walls and at least 4 feet, lateral distance, should be provided against exterior walls. We recommend the following geotechnical parameters for foundation and basement walls backfilled with Structural Fill.

Recommended Geotechnical Parameters For Basement Walls	
Total Unit Weight of Backfill	130 pcf
Internal Friction Angle	30 degrees
Passive Lateral Earth Pressure Coeff.	3.0
At-Rest Lateral Earth Pressure Coeff.	0.5 (level backslope)
Surcharge Lateral Earth Pressure Coeff.	0.5

Further, we recommend that the perimeter frost walls be damp-proofed and insulated on the interior side using a 2-inch thickness of rigid insulation to help reduce heat loss through the concrete. Likewise, the basement walls should be insulated and damp-proofed on the exterior sides using a 2-inch thickness of rigid insulation.

4.4 Foundation Drainage

We recommend that foundation drains be provided along the exterior perimeter of the structures and a sub-slab underdrain should be provided near the centerline of each proposed structure. Underdrains should consist of 4-inch diameter rigid underdrain pipe having perforations of ¼ to ½ inches enveloped in at least 6 inches of crushed stone bedding and wrapped with the non-woven geotextile fabric. 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. All adjacent paved and grassed areas should be sloped to promote drainage away from the building periphery. Roof drains should be routed in separate non-perforated pipes, with outlets placed below the frost depth.

4.5 On-Grade Floor Slabs

We anticipate that surface loads on the slabs-on-grade within the proposed buildings will be on the order of 50 psf or less. Concrete slab-on-grade floors in heated areas may be designed using a subgrade reaction modulus of 150 pci (pounds per cubic inch) provided that the slabs are underlain by at least 12 inches of compacted Structural Fill. We recommend that basement floor slabs be underlain with at least 12 inches of crushed stone overlying a non-woven geotextile fabric.

We recommend that design consider a 15-mil vapor retarder installed beneath interior floor slabs in areas covered with moisture sensitive flooring. The vapor retarder should have a permeance that is less than the floor covering being applied on the slab and should be 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 control joints be installed in floor slabs to accommodate shrinkage in the concrete as it cures. Control 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 compound over the cast-in-place concrete after the wet cure period.

4.6 Entrance and Parking Slabs

Entrance slabs should be designed to reduce the effects of differential frost action. We recommend that exterior concrete approach slabs be underlain with Structural Fill extending at least 4.5 feet below the top of slab. The Structural Fill should extend beneath the entire length and width of entrance slabs. The thickness of Structural Fill below entrance slabs should transition up to adjacent sidewalk or pavement subgrade at a 1V to 3H slope or flatter. This is to help avoid abrupt, differential frost heaving. The Structural Fill should be hydraulically connected to the foundation drainage system. This frost transition zone of structural fill beneath entrance slabs is illustrated on Sheet 20.

Parking garage slabs beneath Building 1 should be underlain with Structural Fill extending to a depth of 4.5 feet below finished grades. This depth of Structural Fill is to help reduce the potential for adverse frost heave that may reduce overhead clearance in the parking garage area. The Structural Fill must be hydraulically connected to the perimeter underdrains for positive drainage relief. Alternatively, the parking garage slabs may be underlain with 12-inches of Structural Fill overlying a 2-inch thick layer of high-load foundation insulation overlying at least 6 inches of Structural Fill that is hydraulically connected to the perimeter underdrains.

4.7 Backfill and Compaction

The on-site soils are generally frost susceptible and not suitable for reuse as foundation or wall backfill. As presented here, we anticipate that concrete, brick and granite slab rubble in the soils to be overexcavated from beneath the building footprints could be blended and crushed with concrete from the building demolition to create a gravel borrow for backfill of the overexcavation area beneath the buildings.

Gravel Borrow: For backfill of the overexcavated area beneath the building, up to the bottom of footings and to within 1-foot beneath on-grade floor slabs, we recommend clean 6-inch minus sand and gravel or crushed and recycled 6-inch minus concrete, brick, pavement and gravel from on-site sources meeting the gradation requirements for MDOT Standard Specification 703.20 Gravel Borrow.

Structural Fill: We recommend that Structural Fill be utilized for interior and exterior foundation backfill and as base material below on-grade floor slabs, entrance slabs basement level exterior parking. Structural fill should be clean sand and gravel meeting the following gradation:

Structural Fill	
Sieve Size	**Percent Finer by Weight**
4 inch	100
3 inch	90 to 100
¼ inch	25 to 90
No. 40	0 to 30
No. 200	0 to 5

3/4-inch Crushed Stone: Crushed stone used for drainage aggregate around foundation underdrains should meet the requirements of MDOT Standard Specification 703.22 Type C Underdrain Stone.

Soil Compaction: Fills should be placed in horizontal lifts and be compacted such that the desired density is achieved throughout the lift thickness with 3 to 5 passes of the compaction equipment. We recommend that the loose lift thickness for soil fills not exceed 12 inches, expect as noted herein for the bottom lift of fill in the overexcavated building areas.

Fill placed beneath footing and slabs should be compacted to at least 95 percent of its maximum dry density as determined by ASTM D-1557. Backfill placed against basement and 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 against unsupported portions of the wall. Over-compaction of wall backfill and the use

of heavy compaction equipment behind retaining walls will induce additional lateral stresses on the wall.

4.8 Weather Conditions

If foundation construction takes place during cold weather, subgrades, foundations, and floor slabs must be protected during freezing conditions. Fill and 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 existing soils are moisture sensitive and 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.

4.9 Construction Observation and Testing

It is important that S. W. COLE ENGINEERING, INC. be on-site during construction to observe excavation, overexcavation and subgrade preparation work. This is to observe compliance with the construction documents and to allow design changes in the event that subsurface conditions are found to differ from those anticipated prior to the start of construction.

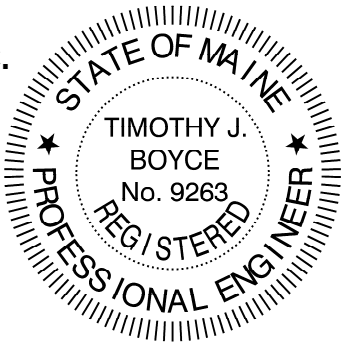
A quality assurance testing program should be implemented during construction to observe compliance with the design concepts, specifications, and recommendations. S. W. COLE ENGINEERING, INC. is available to provide field and laboratory testing services for soil, concrete, masonry, steel and asphalt construction materials.

5.0 CLOSURE

We trust this report meets your current needs. We look forward to working with you during construction of Phase 1 and future phases of this development.

Sincerely,

S. W. COLE ENGINEERING, INC.



Timothy J. Boyce, P.E.
Senior Geotechnical Engineer

TJB:tjb/pfb

C: Pandika Pleqi / Winton Scott Architects
Jim Fortin / Becker Structural Engineers
Will Haskell / Gorrill-Palmer Consulting Engineers

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ATTACHMENT A
Limitations

This report has been prepared for the exclusive use of AVESTA Housing for specific application to the proposed Phase 1 Development of Pearl Place at 210 Pearl 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.

S. W. COLE ENGINEERING, INC.'s scope of work has not included the investigation, detection, or prevention of any Biological Pollutants at the project site or in any existing or proposed structure at the site. The term "Biological Pollutants" includes, but is not limited to, molds, fungi, spores, bacteria, and viruses, and the byproducts of any such biological organisms.

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 the changes are reviewed by S. W. COLE ENGINEERING, INC.

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-101**
SHEET: 1 OF 2
PROJECT NO.: 04-1212

PROJECT / CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

DATE START: 12/28/2004
DATE FINISH: 12/28/2004
ELEVATION: 27' +/-
SWC REP.: A. SIMMONS

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN.	300 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN.	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED @ 10 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
										BROWN SILTY SAND TRACE GRAVEL (FILL)
	1D	24"	12"	2.0'	5	5	5	6		~ LOOSE TO MEDIUM DENSE ~
									3.0'	w = 18.2%
										BROWN SILTY CLAY q_P = 9 KSF
										~ VERY STIFF BECOMING. . .
	2D	24"	24"	7.0'	4	5	5	5		w = 26.9% q_P = 5 KSF
										. . . MEDIUM ~
									11.0'	q_P = 0.5 KSF
	3D	24"	24"	12.0'	1	1	6	2		GRAY SANDY SILT SOME GRAVEL (GLACIAL TILL)
										~ LOOSE ~
									15.0'	
	4D	24"	14"	17.0'	11	15	15	16		GRAY SAND AND SILT TRACE GRAVEL (GLACIAL TILL)
										w = 8.5%
	5D	24"	11"	22.0'	17	22	22	23		~ MEDIUM DENSE TO DENSE ~
	6D	24"	16"	32.0'	5	9	13	17		
										(CONTINUED)

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

SOIL CLASSIFIED BY:
[ ] 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.

BORING NO.: **B-101**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-101**
SHEET: 2 OF 2
PROJECT NO.: 04-1212

PROJECT / CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

DATE START: 12/28/2004
DATE FINISH: 12/28/2004
ELEVATION: 27' +/-
SWC REP.: A. SIMMONS

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN.	300 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN.	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED @ 10 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	7D	24"	20"	42.0'	18	31	31	34		GRAY SILTY SAND AND GRAVEL (GLACIAL TILL) ~ VERY DENSE ~
									50.0'	
	8D	17"	14"	51.4'	15	25	50/5"			GRAY SILTY SAND AND GRAVEL (GLACIAL TILL) WITH COBBLES AND BOULDERS w = 9.1% ~ VERY DENSE ~
	9D	24"	0"	72.0'	30	33	38	43	72.0'	
										BOTTOM OF EXPLORATION @ 72.0 FEET

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

SOIL CLASSIFIED BY:
[ ] 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.

BORING NO.: **B-101**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-102**
SHEET: 1 OF 2
PROJECT NO.: 04-1212

PROJECT / CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

DATE START: 12/28/2004
DATE FINISH: 12/29/2004
ELEVATION: 27' +/-
SWC REP.: A. SIMMONS

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN.	300 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN.	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED @ 10 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	1D	24"	12"	2.0'	5	3	4	5		SILTY SAND SOME GRAVEL WITH BRICKS (FILL)
										~ LOOSE ~
	2D	24"	12"	7.0'	2	3	1	1		w = 16.3%
									9.0'	
									11.0'	BROWN SILTY CLAY q_P = 2.0 KSF ~ MEDIUM ~
	3D	24"	20"	12.0'	3	3	16	6	11.8'	BROWN SILTY FINE SAND ~ MEDIUM DENSE ~
	4D	24"	10"	17.0'	21	28	29	7		GRAY SILTY GRAVELLY SAND (GLACIAL TILL) WITH COBBLES ~ DENSE ~
	5D	24"	18"	22.0'	2	3	6	5		W = 10.8% ~ LOOSE ~
	6D	24"	14"	32.0'	12	19	18	26		~ DENSE ~
										(CONTINUED)

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

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[X] LABORATORY TEST

REMARKS:
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BORING NO.: **B-102**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-102**
SHEET: 2 OF 2
PROJECT NO.: 04-1212

PROJECT / CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET PORTLAND, MAINE
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CASING:	HW	4.0 IN.	300 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN.	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED @ 10 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	7D	24"	18"	42.0'	9	13	13	15		~ MEDIUM DENSE ~
										GRAY SILTY GRAVELLY SAND (GLACIAL TILL) WITH COBBLES
	8D	17"	17"	51.5'	16	31	50/5"			~ VERY DENSE ~
									77.0'	
									78.0'	PROBABLE WEATHERED BEDROCK
										REFUSAL @ 78.0 FEET (PROBABLE BEDROCK)

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

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

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

BORING NO.: **B-102**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-103**
SHEET: 1 OF 3
PROJECT NO.: 04-1212

PROJECT / CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

DATE START: 12/27/2004
DATE FINISH: 12/27/2004
ELEVATION:
SWC REP.: A. SIMMONS

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN.	300 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN.	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED @ 6.5 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									3"	BITUMINOUS ASPHALT PAVEMENT
	1D	24"	12"	7.0'	3	2	1	3		BROWN SAND SOME SILT SOME GRAVEL (FILL) ~ LOOSE ~ w = 13.2 %
	2D	24"	10"	12.0'	6	6	5	3	11.0'	GRAY SILT AND FINE SAND SOME CLAY TRANSITIONING TO. . . ~ LOOSE ~ w = 11.0%
	3D	24"	24"	17.0'	1/24"				18.0'	GRAY SILT AND CLAY SOME SAND SOME GRAVEL
	4D	24"	10"	22.0'	2	5	7	7		GRAY SILTY SAND AND GRAVEL SOME CLAY (GLACIAL TILL) TRANSITIONING TO. . . ~ MEDIUM DENSE ~
	5D	24"	10"	27.0'	3	3	7	8		w = 10.3% GRAY SILTY SAND AND GRAVEL (GLACIAL TILL) ~ LOOSE ~
	6D	24"	10"	32.0'	2	3	6	12		

(CONTINUED)

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

SOIL CLASSIFIED BY:
[ ] 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.

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-103**
SHEET: 2 OF 3
PROJECT NO.: 04-1212

PROJECT / CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

DATE START: 12/27/2004
DATE FINISH: 12/27/2004
ELEVATION:
SWC REP.: A. SIMMONS

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN.	300 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN.	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED @ 6.5 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	7D	24"	9"	42.0'	2	4	5	5		GRAY SILTY SAND AND GRAVEL (GLACIAL TILL)
										~ LOOSE ~
									50.0'	
	8D	23"	4"	52.0'	20	31	44	50/5"		GRAY SILTY SAND AND GRAVEL (GLACIAL TILL) WITH COBBLES AND BOULDERS
										~ VERY DENSE ~
	9D	24"	12"	62.0'	12	28	36	50		
	10D	24"	24"	72.0'	11	14	22	43		w = 8.7% ~ DENSE ~
										(CONTINUED)

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

SOIL CLASSIFIED BY:
[ ] 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.

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-103**
SHEET: 3 OF 3
PROJECT NO.: 04-1212

PROJECT / CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

DATE START: 12/27/2004
DATE FINISH: 12/27/2004
ELEVATION:
SWC REP.: A. SIMMONS

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN.	300 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN.	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED @ 6.5 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	11D	23"	23"	91.9'	13	20	33	50/5"		GRAY SILTY SAND AND GRAVEL (GLACIAL TILL) WITH COBBLES AND BOULDERS ~ VERY DENSE ~
									114.5'	
									115.0'	PROBABLE WEATHERED BEDROCK
										REFUSAL @ 115.0 FEET (PROBABLE BEDROCK)

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

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

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

BORING NO.: **B-103**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-104**
SHEET: 1 OF 3
PROJECT NO.: 04-1212

PROJECT / CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

DATE START: 12/29/2004
DATE FINISH: 12/29/2004
ELEVATION:
SWC REP.: A. SIMMONS

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN.	300 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN.	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED @ 6.5 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									2"	BITUMINOUS ASPHAULT PAVEMENT
										w = 3.9%
	1D	24"	14"	3.0'	9	9	6	4		BROWN GRAVELLY SAND SOME SILT (FILL) WITH BRICKS
										~ LOOSE TO MEDIUM DENSE ~
	2D	24"	12"	7.0'	3	2	3	2		
									11.5'	
	3D	24"	14"	12.0'	6	7	7	5		
									14.5'	GRAY SILT AND FINE SAND ~ MEDIUM DENSE ~
	4D	24"	24"	17.0'	WOR					GRAY SILTY CLAY q_P = 0.5 KSF
										~ SOFT TO MEDIUM ~
										q_U = 0.57 KSF
	1C	24"	24"	22.0'	HYD. SAMPLE					w = 39.2%
	Sv (3.5x7)			22.7'	52/8					Sv = 0.56/0.09 KSF
	Sv (3.5x7)			23.4'	51/9					Sv = 0.55/0.10 KSF
	Sv (3.5x7)			25.7'	44/6					Sv = 0.48/0.07 KSF
	Sv (3.5x7)			26.4'	50/5					Sv = 0.54/0.05 KSF
									31.5'	
	5D	24"	24"	32.0'	1	1	1	4		
									33.0'	GRAY SANDY SILTY CLAY SOME GRAVEL ~ MEDIUM ~
	6D	24"	11"	37.0'	4	4	8	11		GRAY GRAVELLY SAND AND SILT (GLACIAL TILL) ~ MEDIUM DENSE ~
										(CONTINUED)

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

SOIL CLASSIFIED BY:
[ ] 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.

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-104**
SHEET: 2 OF 3
PROJECT NO.: 04-1212

PROJECT / CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

DATE START: 12/29/2004
DATE FINISH: 12/29/2004
ELEVATION:
SWC REP.: A. SIMMONS

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN.	300 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN.	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED @ 6.5 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	7D	24"	10"	42.0'	11	22	25	31		w = 8.2% GRAY SILTY GRAVELLY SAND (GLACIAL TILL) WITH COBBLES ~ DENSE ~
	8D	24"	16"	52.0'	9	23	25	27		
	9D	24"	6"	72.0'	25	38	48	50		~ VERY DENSE ~

(CONTINUED)

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

SOIL CLASSIFIED BY:
[ ] 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.

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-104**
SHEET: 3 OF 3
PROJECT NO.: 04-1212

PROJECT / CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

DATE START: 12/29/2004
DATE FINISH: 12/29/2004
ELEVATION:
SWC REP.: A. SIMMONS

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN.	300 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN.	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS APPEARED SATURATED @ 6.5 FEET

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
	10D	0"	0"	90.0'	SEE NOTE					GRAY SILTY GRAVELLY SAND (GLACIAL TILL) WITH COBBLES ~ DENSE TO VERY DENSE ~ NOTE: A SPLIT SPOON SAMPLE WAS ATTEMPTED AT A DEPTH OF 90 TO 92 FEET, HOWEVER, THE EXPLORATION HAD CAVED AT A DEPTH OF 87 FEET. THE DRILLING TOOLS WERE ADVANCED TO REFUSAL (PROBABLE BEDROCK) WITHOUT FURTHER SAMPLING.
									115'	GRAY SILTY GRAVELLY SAND (GLACIAL TILL) WITH COBBLES
									116'	PROBABLE WEATHERED BEDROCK
										REFUSAL @ 116 FEET (PROBABLE BEDROCK)

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

SOIL CLASSIFIED BY:
[ ] 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.

BORING NO.: **B-104**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-105**
SHEET: 1 OF 1
PROJECT NO.: 04-1212

PROJECT / CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

DATE START: 3/31/2006
DATE FINISH: 3/31/2006
ELEVATION: 13' +/-
SWC REP.: TJB

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN.	300 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN.	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
GROUNDWATER @ 8 FEET +/-

CASING BLOWS PER FOOT	SAMPLE NO.	PEN.	REC.	DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									4.5"	BITUMINOUS PAVEMENT
	1D	24"	11"	2.5'	7	8	6	10	3.0'	GRAY BLACK SILTY SAND (FILL) ~ MEDIUM DENSE ~
	2D	24"	6"	4.5'	10	11	20	18		BROWN GRAVELLY SAND (FILL) ~ MEDIUM DENSE TO LOOSE ~
	3D	24"	13"	7.0'	5	4	4	3	8.7'	
	4D	24"	9"	9.0'	5	4	3	3	10.0'	GRAY GRAVELLY SAND TRACE SILT (FILL) ~ LOOSE ~
	5D	24"	10"	12.0'	17	18	25	50/5"		GRAY GRAVELLY SILT AND SAND (GLACIAL TILL) ~ DENSE TO VERY DENSE ~
	6D	24"	11"	17.0'	18	30	24	45		
	7D	10"	6"	20.8'	40	50/4"			20.8'	REFUSAL @ 20.8' (PROBABLE BOULDER)

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

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

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

BORING NO.: **B-105**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-106**
SHEET: 1 OF 1
PROJECT NO.: 04-1212

PROJECT / CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

DATE START: 3/31/2006
DATE FINISH: 3/31/2006
ELEVATION: 15' +/-
SWC REP.: TJB

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN.	300 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN.	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
SOILS SATURATED FROM GROUND SURFACE

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									1.0' +/-	GRASS AND TOPSOIL
	1D	24"	2"	7.0'	23	37	15	15	9.0'	GRAY GRAVELLY SILTY SAND WITH COBBLES & BOULDERS (FILL) ~LOOSE ~ NOTE: BLOWCOUNT OVERSTATED, ROCK IN SHOE
	2D	24"	9"	12.0'	9	10	11	13	14.0'	GRAY GRAVELLY SILT AND SAND (GLACIAL TILL) ~ MEDIUM DENSE ~
	3D	24"	15"	17.0'	15	19	26	33		GRAY GRAVELLY SILTY SAND (GLACIAL TILL) ~ DENSE TO VERY DENSE ~
	4D	24"	15"	22.0'	37	30	34	48	22.0'	BOTTOM OF EXPLORATION @ 22.0'

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

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

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

BORING NO.: **B-106**

S.W.COLE ENGINEERING, INC.

BORING LOG

BORING NO.: **B-107**
SHEET: 1 OF 1
PROJECT NO.: 04-1212

PROJECT / CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET PORTLAND, MAINE
DRILLING CO. : GREAT WORKS TEST BORINGS, INC. DRILLER: JEFF LEE

DATE START: 3/31/2006
DATE FINISH: 3/31/2006
ELEVATION: 17' +/-
SWC REP.: TJB

	TYPE	SIZE I.D.	HAMMER WT.	HAMMER FALL
CASING:	HW	4.0 IN.	300 LB.	30 IN.
SAMPLER:	SS	1 3/8 IN.	140 LB.	30 IN.
CORE BARREL:				

WATER LEVEL INFORMATION
GROUNDWATER @ 8 FEET +/-

CASING BLOWS PER FOOT	SAMPLE NO.	SAMPLE PEN.	SAMPLE REC.	SAMPLE DEPTH @ BOT	SAMPLER BLOWS PER 6" 0-6	6-12	12-18	18-24	DEPTH	STRATA & TEST DATA
									1.0' +/-	GRASS AND TOPSOIL
	1D	24"	3"	7.0'	3	1	5	5	9.0'	BROWN CLAY AND TAN SAND WITH BRICKS AND GRANITE SLABS (FILL) ~ VERY LOOSE TO LOOSE ~
	2D	24"	7"	12.0'	15	13	10	12		GRAY GRAVELLY SILT AND SAND (GLACIAL TILL) ~ MEDIUM DENSE TO VERY DENSE ~
	3D	24"	2"	17.0'	12	25	29	31		
	4D	24"	15"	22.0'	11	22	31	32	22.0'	BOTTOM OF EXPLORATION @ 22.0'

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

SOIL CLASSIFIED BY:
[ ] DRILLER - VISUALLY
[X] SOIL TECH. - VISUALLY
[ ] LABORATORY TEST

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

BORING NO.: **B-107**

S.W.COLE ENGINEERING, INC.

TEST PIT LOGS

PROJECT/CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET, PORTLAND, MAINE
PROJECT NO. 04-1212

TEST PIT TP-1

DATE: 9/29/2005 SURFACE ELEVATION: 23' +/- LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		10"	DARK BROWN TOPSOIL	
			BROWN SILT AND SAND SOME GRAVEL (FILL) WITH SOME COBBLES AND MANY BRICKS	
		3.8'	~ LOOSE ~	
S-1	4.0'	4.4'	GRAY ASH	
			BROWN SILTY CLAY	qp = 7.5 KSF
		7.0'	~ STIFF ~	
			GRAY CLAYEY SILTY SAND SOME GRAVEL WITH FINE SAND SEAMS	
		9.0'	~ LOOSE ~	
			GRAY GRAVELLY CLAYEY SILTY SAND ~ LOOSE ~	
		12.0'		
S-2	14.0'		GRAY GRAVELLY SILTY SAND SOME CLAY	
		14.5'	~ DENSE ~	

COMPLETION DEPTH: 14.5 FEET DEPTH TO WATER: NO FREE WATER
SOILS SATURATED @ 9.0 FEET

TEST PIT TP-2

DATE: 9/27/2005 SURFACE ELEVATION: 26' +/- LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		3"	DARK BROWN TOPSOIL	
			BROWN SILT AND SAND SOME GRAVEL (FILL) WITH SOME COBBLES AND MANY BRICKS ~ LOOSE ~ (RELIC BRICK FOUNDATIONS, WALLS, AND GRANITE FOUNDATIONS)	
		4.5'		
S-1	4.5'	5.0'	GRAY ASH	
			GRAY-BROWN SILTY CLAY ~ VERY STIFF ~	
		6.5'		

COMPLETION DEPTH: 6.5 FEET DEPTH TO WATER: NO FREE WATER

S.W.COLE ENGINEERING, INC.

TEST PIT LOGS

PROJECT/CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET, PORTLAND, MAINE
PROJECT NO. 04-1212

TEST PIT TP-3

DATE: 9/27/2005 SURFACE ELEVATION: 27' +/- LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		3"	DARK BROWN TOPSOIL	
			BROWN GRAVELLY SILT AND SAND (FILL) WITH SOME COBBLES AND MANY BRICKS ~ LOOSE ~ (RELIC BRICK FOUNDATIONS AND BRICK MANHOLE STRUCTURES)	
		4.8'		
		5.2'	GRAY ASH	
		5.4'	BROWN SILT WITH ROOTS (RELIC TOPSOIL)	
			BROWN FINE SAND WITH GRAY SILT SEAMS	
		7.0'		

COMPLETION DEPTH: 7.0 FEET DEPTH TO WATER: NO FREE WATER

TEST PIT TP-4

DATE: 9/27/2005 SURFACE ELEVATION: 27' +/- LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		4"	DARK BROWN TOPSOIL	
			BROWN SILT AND SAND SOME GRAVEL (FILL) WITH SOME COBBLES AND MANY BRICKS ~ LOOSE ~	
		6.0'		

COMPLETION DEPTH: 6.0 FEET DEPTH TO WATER: NO FREE WATER

S.W.COLE ENGINEERING, INC.

TEST PIT LOGS

PROJECT/CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET, PORTLAND, MAINE
PROJECT NO. 04-1212

TEST PIT TP-5

DATE: 9/27/2005 SURFACE ELEVATION: 15'+/- LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		1.0'	DARK BROWN TOPSOIL	
			GRAY SANDY CLAYEY SILT TRACE GRAVEL WITH FREQUENT BROWN FINE SAND SEAMS	
		4.0'	~ LOOSE ~	
			GRAY CLAYEY GRAVELLY SANDY SILT	
		7.0'	~ LOOSE ~	
S-1	8.0'		GRAY CLAYEY GRAVELLY SANDY SILT SOME COBBLES ~ MEDIUM ~	
		11.0'		
		12.0'	GRAY GRAVELLY SANDY SILT SOME CLAY SOME COBBLES ~ LOOSE ~	

COMPLETION DEPTH: 12.0' FEET DEPTH TO WATER: SEEPAGE @ 7 FEET

TEST PIT TP-6

DATE: 9/27/2005 SURFACE ELEVATION: 20'+/- LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		2"	DARK BROWN TOPSOIL	
		1.2'	BROWN SANDY SILT SOME BRICK (FILL)	
			BROWN SILTY CLAY ~ VERY STIFF ~	qp = 7 KSF
		3.0'		

COMPLETION DEPTH: 3.0 FEET DEPTH TO WATER: NO FREE WATER

S.W.COLE ENGINEERING, INC.

TEST PIT LOGS

PROJECT/CLIENT: PROPOSED PEARL PLACE DEVELOPMENT / AVESTA HOUSING
LOCATION: 210 PEARL STREET, PORTLAND, MAINE
PROJECT NO. 04-1212

TEST PIT TP-7

DATE: 9/27/2005 SURFACE ELEVATION: 15' +/- LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		6"	DARK BROWN TOPSOIL	
		3.0'	GRAY CLAYEY GRAVELLY SANDY SILT WITH BROWN FINE SAND SEAMS ~ LOOSE ~	
		7.0'	GRAY CLAYEY SANDY GRAVELLY SILT TRACE COBBLES ~ LOOSE ~	
S-1	8.0'	10.0'	GRAY GRAVELLY SILTY SAND SOME CLAY ~ DENSE ~	

COMPLETION DEPTH: 10 FEET DEPTH TO WATER: SOILS APPEARED SATURATED
NO FREE WATER

TEST PIT TP-8

DATE: 9/27/2005 SURFACE ELEVATION: 16' +/- LOCATION: SEE SHEET 1

SAMPLE NO.	SAMPLE DEPTH	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
		3"	DARK BROWN TOPSOIL	
		1.5'	BROWN GRAVELLY SAND SOME SILT (FILL)	
		2.5'	GRAY GRAVELLY CLAYEY SAND AND SILT ~ MEDIUM DENSE ~	
		6.5	GRAY CLAYEY GRAVELLY SAND AND SILT WITH FREQUENT COBBLES ~ MEDIUM DENSE ~	

COMPLETION DEPTH: 6.5 FEET DEPTH TO WATER: SOILS APPEARED MOIST TO WET
NO FREE WATER

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.
γ_T	-	total soil weight
γ_B	-	buoyant soil weight

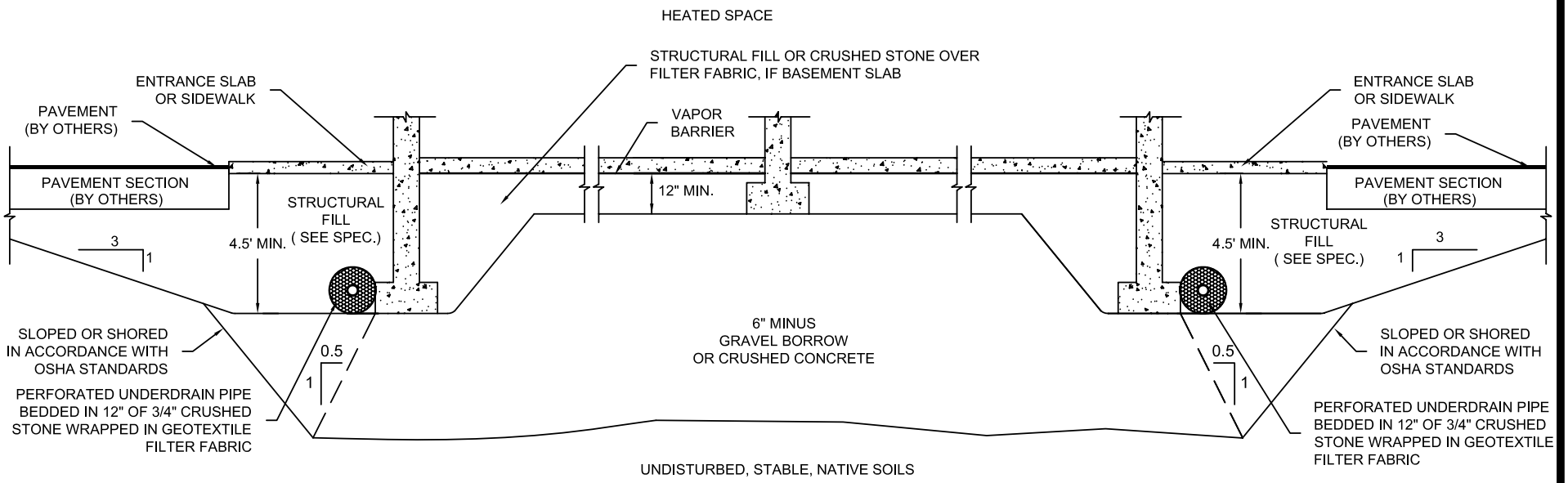
Description of Proportions:

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.



NOTE :

SEE REPORT FOR DETAILED UNDERDRAIN, WATERPROOFING AND INSULATION RECOMMENDATIONS NOT SHOWN ON THIS SHEET.

S.W.COLE ENGINEERING, INC.

AVESTA HOUSING

OVEREXCAVATION AND BACKFILL DETAIL

Proposed Pearl Place Development (Phase 1)
210 Pearl Street
Portland, Maine

Job No. 04-1212 S
Date : 07/07/06

Scale Not to Scale
Sheet 20

APPENDIX A

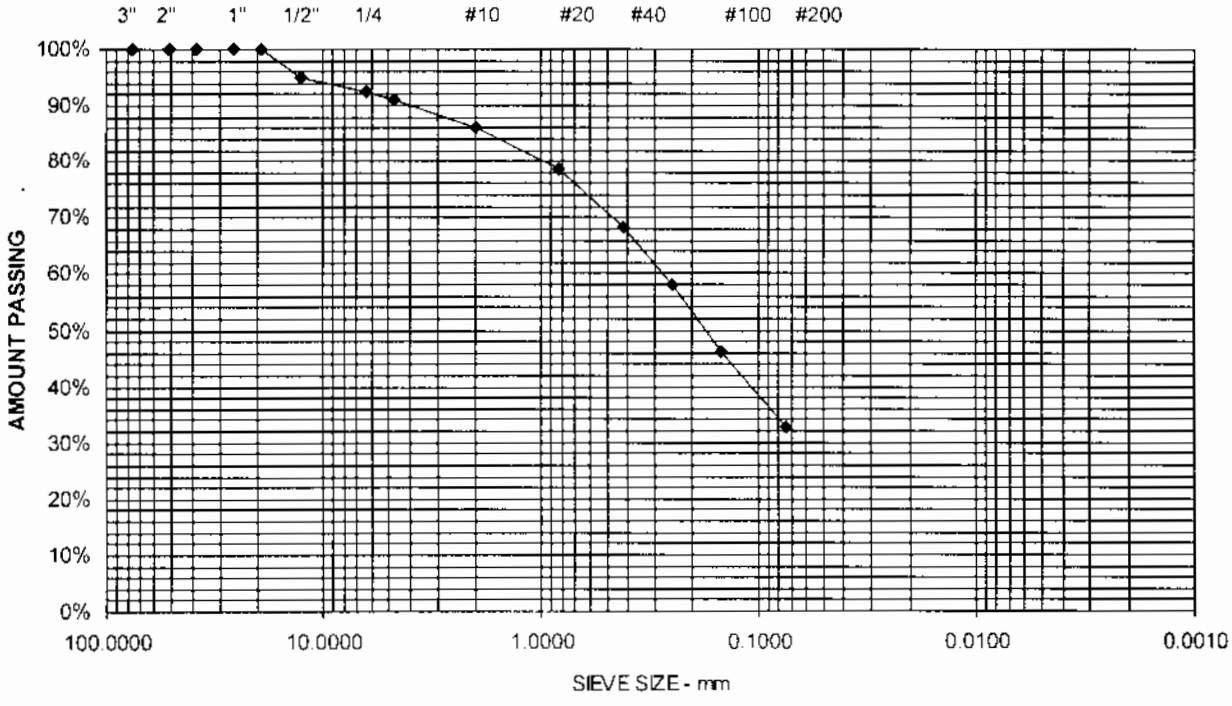
S.W.COLE ENGINEERING, INC.

Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND - LANCASTER STREET - PROPOSED 6 UNITS AND PARKING DECK - GEOTECHNICAL ENGINEERING SERVICES	Project Number	04-1212
Client	AVESTA HOUSING	Lab ID	4205G
Exploration	**TP-1 S-2**	Date Received	10/4/2005
Material Source	**14'**	Date Complete	10/10/2005
		Tested By	MICHAEL BISSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	95	
6.3 mm	1/4"	93	
4.75 mm	No. 4	91	8.9% Gravel
2.00 mm	No. 10	86	
850 um	No. 20	79	
425 um	No. 40	68	58.3% Sand
250 um	No. 60	58	
150 um	No. 100	46	
75 um	No. 200	32.8	32.8% Fines



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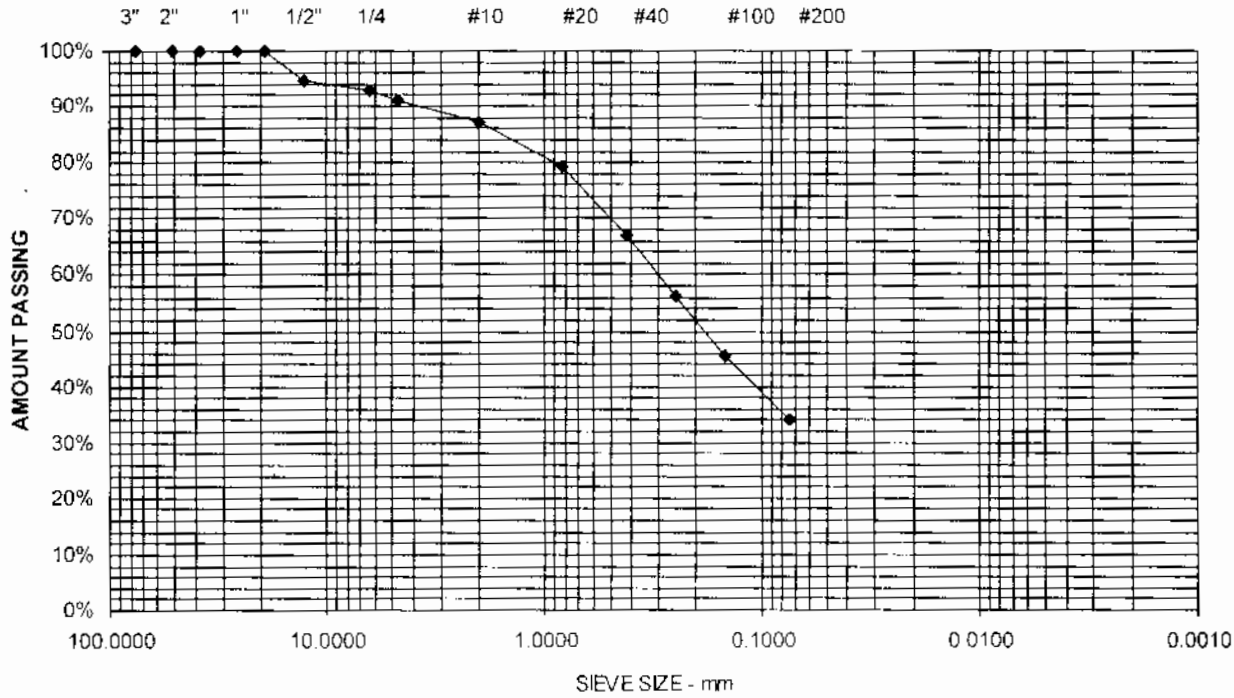
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND - LANCASTER STREET - PROPOSED 6 UNITS AND PARKING DECK - GEOTECHNICAL ENGINEERING SERVICES	Project Number	04-1212
Client	AVESTA HOUSING	Lab ID	4207G
Exploration	TP-5 S-1	Date Received	10/4/2005
Material Source	8'	Date Complete	10/10/2005
		Tested By	KATIE GUSTAFSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	95	
6.3 mm	1/4"	93	
4.75 mm	No. 4	91	8.9% Gravel
2.00 mm	No. 10	87	
850 um	No. 20	79	
425 um	No. 40	67	56.8% Sand
250 um	No. 60	56	
150 um	No. 100	46	
75 um	No. 200	34.2	34.2% Fines



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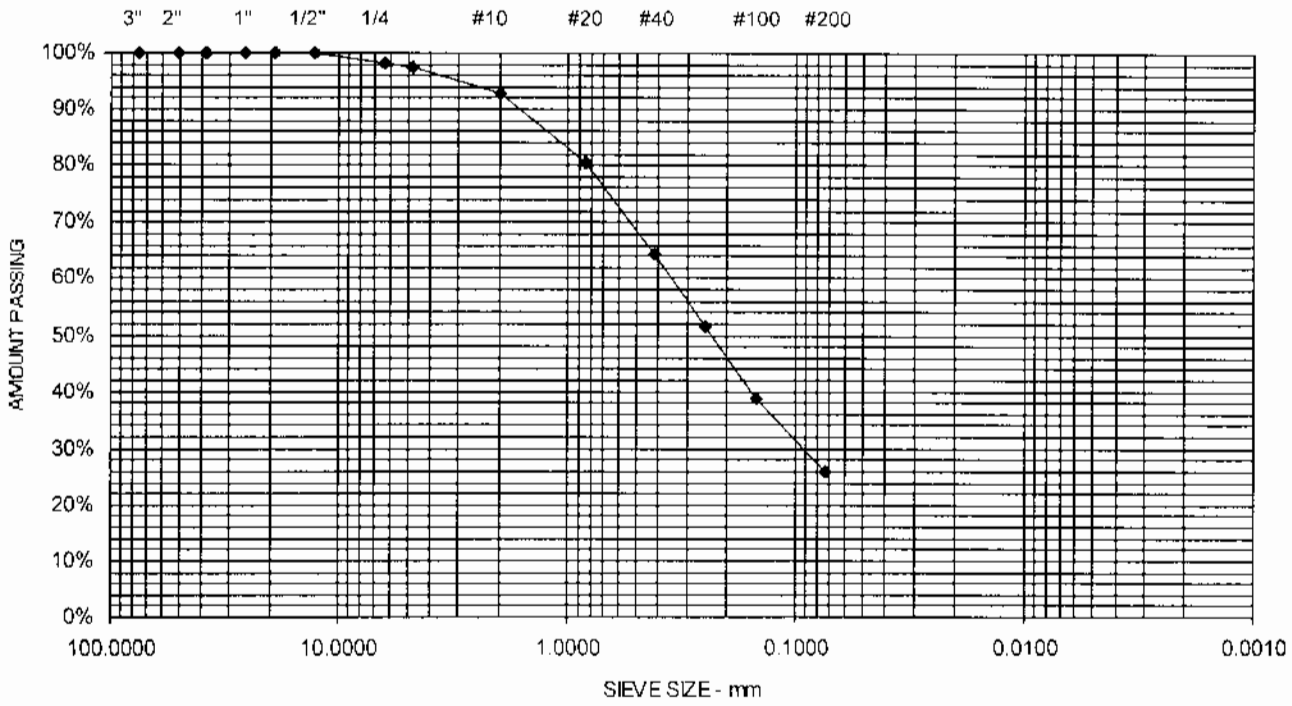
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND - LANCASTER STREET - PROPOSED 6 UNITS AND PARKING DECK - GEOTECHNICAL ENGINEERING SERVICES	Project Number	04-1212
Client	AVESTA HOUSING	Lab ID	3001G
Exploration	**B-101 1D**	Date Received	1/28/2005
Material Source	**0-2'**	Date Complete	2/1/2005
		Tested By	KATIE GUSTAFSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	100	
6.3 mm	1/4"	98	
4.75 mm	No. 4	98	2.4% Gravel
2.00 mm	No. 10	93	
850 um	No. 20	80	
425 um	No. 40	64	71.7% Sand
250 um	No. 60	51	
150 um	No. 100	39	
75 um	No. 200	26.0	26% Fines



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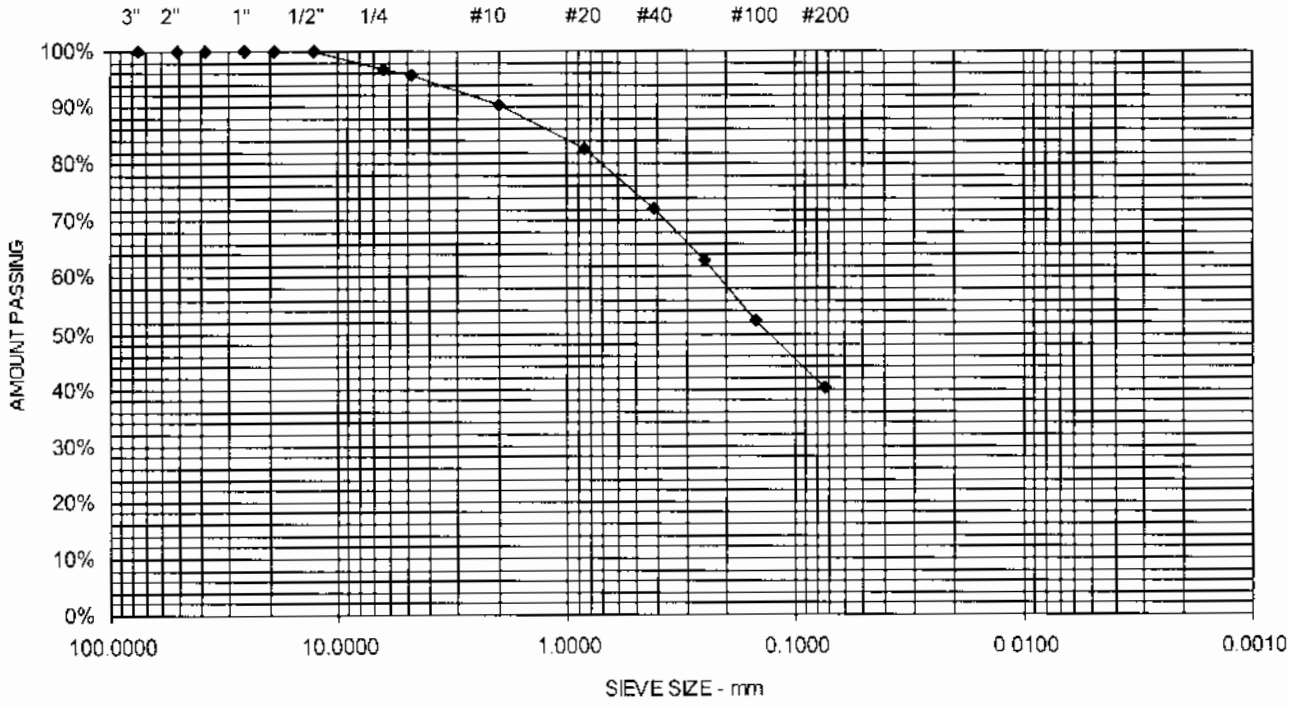
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND - LANCASTER STREET - PROPOSED 6 UNITS AND PARKING DECK - GEOTECHNICAL ENGINEERING SERVICES	Project Number	04-1212
Client	AVESTA HOUSING	Lab ID	3003G
Exploration	**B-101 5D**	Date Received	1/28/2005
Material Source	**20'-22'**	Date Complete	2/1/2005
		Tested By	KATIE GUSTAFSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	100	
6.3 mm	1/4"	97	
4.75 mm	No. 4	96	4.3% Gravel
2.00 mm	No. 10	90	
850 um	No. 20	82	
425 um	No. 40	72	55.5% Sand
250 um	No. 60	63	
150 um	No. 100	52	
75 um	No. 200	40.2	40.2% Fines



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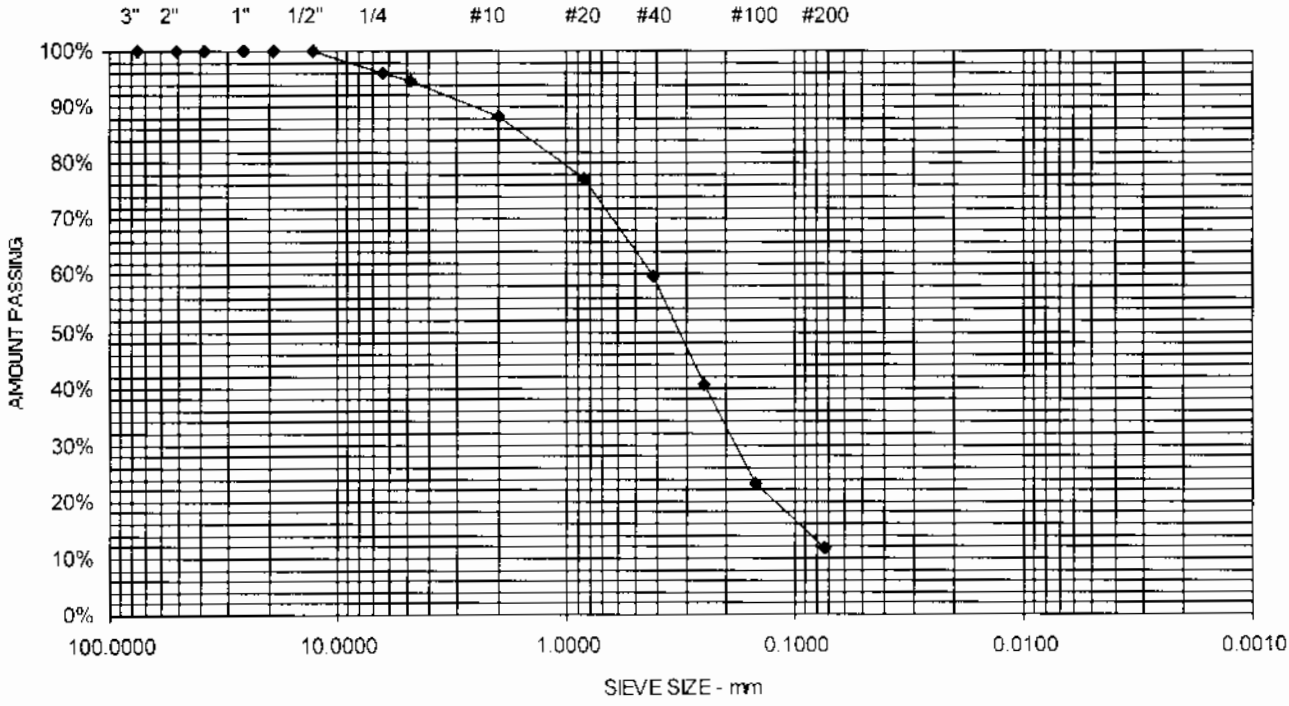
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND - LANCASTER STREET - PROPOSED 6 UNITS AND PARKING DECK - GEOTECHNICAL ENGINEERING SERVICES	Project Number	04-1212
Client	AVESTA HOUSING	Lab ID	3005G
Exploration	**B-102 2D**	Date Received	1/28/2005
Material Source	**5'-7'**	Date Complete	2/1/2005
		Tested By	KATIE GUSTAFSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	100	
6.3 mm	1/4"	96	
4.75 mm	No. 4	95	5.4% Gravel
2.00 mm	No. 10	88	
850 um	No. 20	77	
425 um	No. 40	60	82.8% Sand
250 um	No. 60	41	
150 um	No. 100	23	
75 um	No. 200	11.8	11.8% Fines



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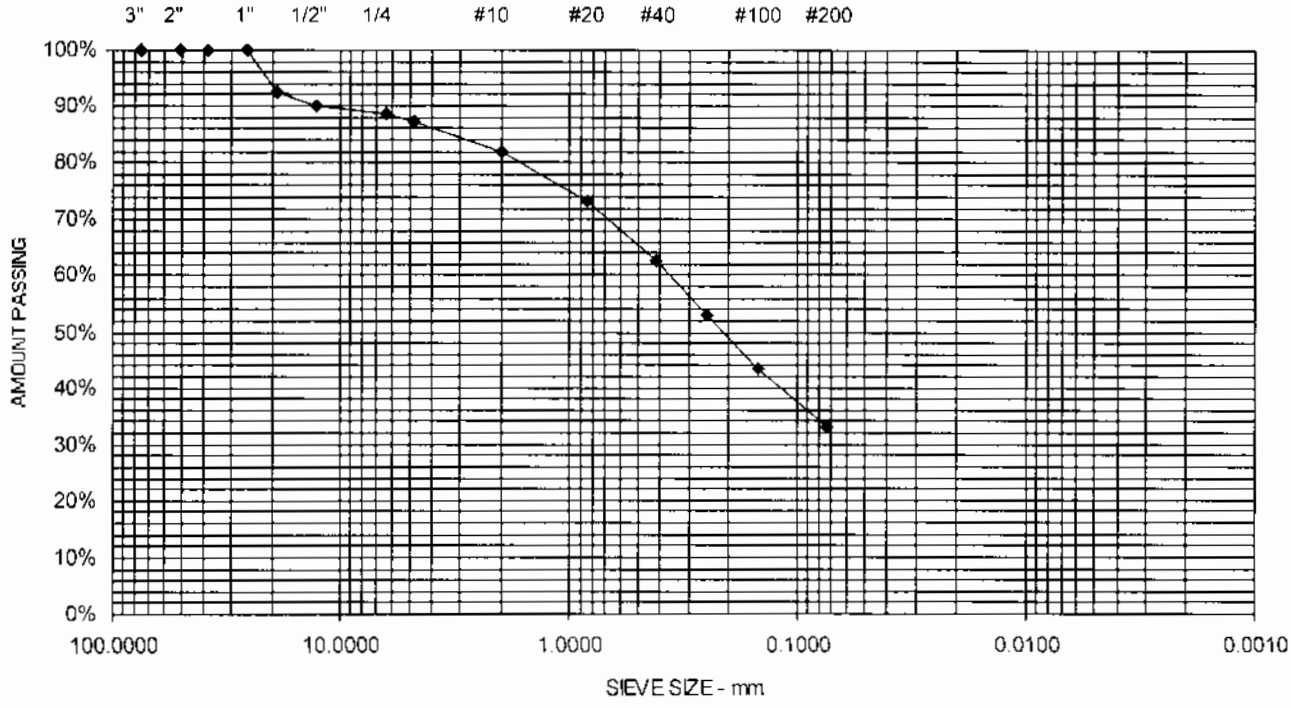
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND - LANCASTER STREET - PROPOSED 6 UNITS AND PARKING DECK - GEOTECHNICAL ENGINEERING SERVICES	Project Number	04-1212
Client	AVESTA HOUSING	Lab ID	3006G
Exploration	B-102 5D	Date Received	1/28/2005
Material Source	20'-22'	Date Complete	2/1/2005
		Tested By	KATIE GUSTAFSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	92	
12.5 mm	1/2"	90	
6.3 mm	1/4"	89	
4.75 mm	No. 4	87	12.7% Gravel
2.00 mm	No. 10	82	
850 um	No. 20	73	
425 um	No. 40	63	54.3% Sand
250 um	No. 60	53	
150 um	No. 100	43	
75 um	No. 200	33.0	33% Fines



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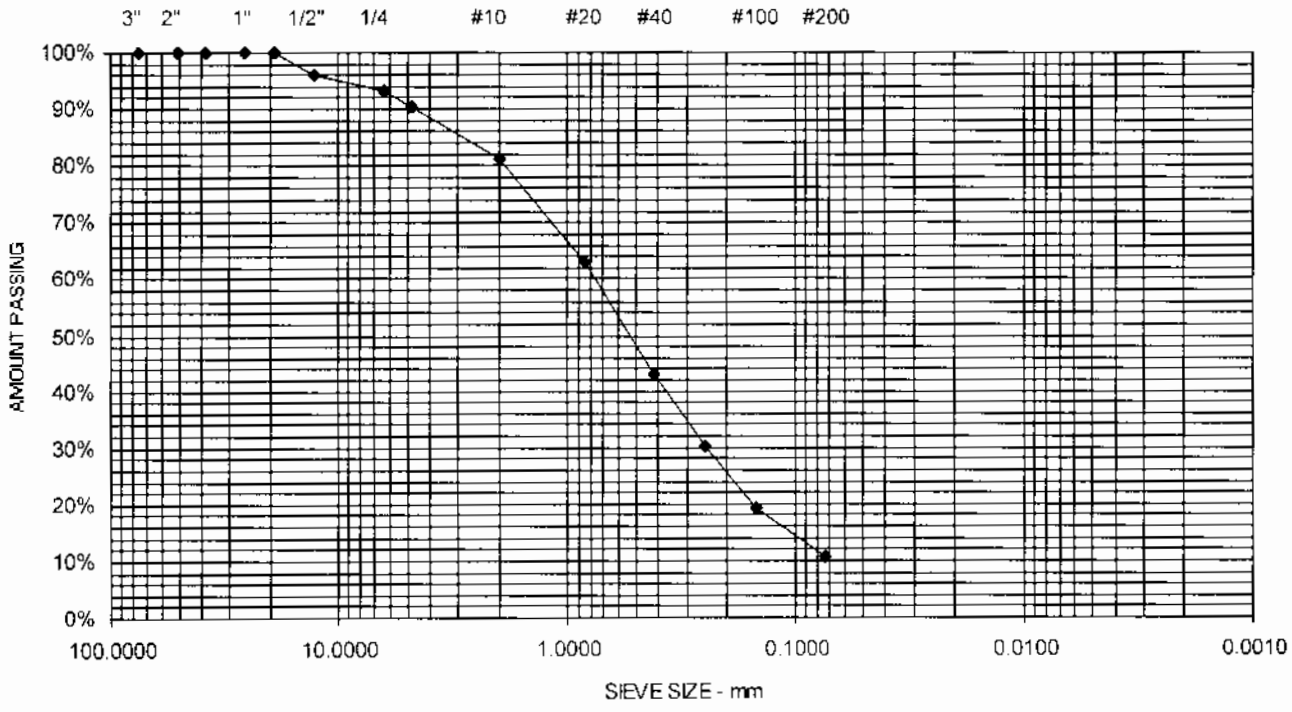
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND - LANCASTER STREET - PROPOSED 6 UNITS AND PARKING DECK - GEOTECHNICAL ENGINEERING SERVICES	Project Number	04-1212
Client	AVESTA HOUSING	Lab ID	3007G
Exploration	B-103 1D	Date Received	1/28/2005
Material Source	5'-7'	Date Complete	2/1/2005
		Tested By	KATIE GUSTAFSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	100	
19.0 mm	3/4"	100	
12.5 mm	1/2"	96	
6.3 mm	1/4"	93	
4.75 mm	No. 4	90	9.6% Gravel
2.00 mm	No. 10	81	
850 um	No. 20	63	
425 um	No. 40	43	79.8% Sand
250 um	No. 60	30	
150 um	No. 100	19	
75 um	No. 200	10.7	10.7% Fines



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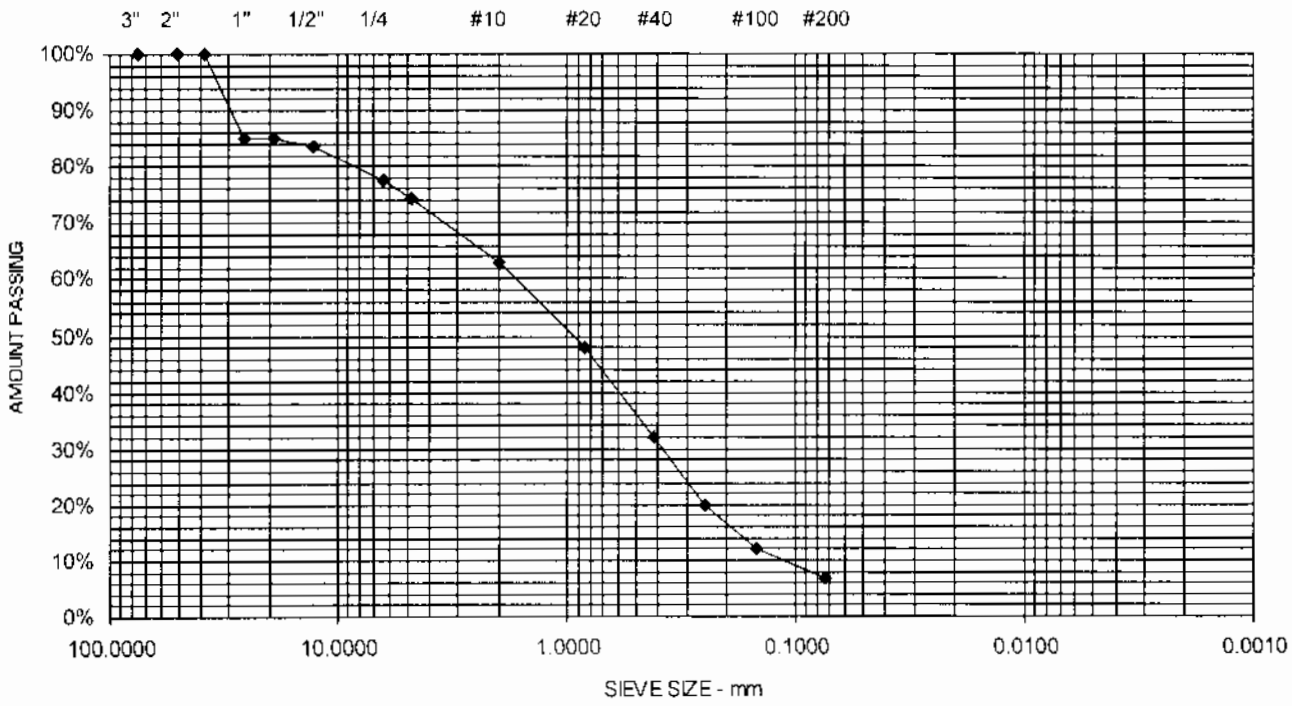
Report of Gradation

ASTM C-117 & C-136

Project Name	PORTLAND - LANCASTER STREET - PROPOSED 6 UNITS AND PARKING DECK - GEOTECHNICAL ENGINEERING SERVICES	Project Number	04-1212
Client	AVESTA HOUSING	Lab ID	3011G
Exploration	B-104 1D	Date Received	1/28/2005
Material Source	1'-3'	Date Complete	2/1/2005
		Tested By	KATIE GUSTAFSON

STANDARD DESIGNATION (mm/µm)	SIEVE SIZE	AMOUNT PASSING (%)	
150 mm	6"	100	
125 mm	5"	100	
100 mm	4"	100	
75 mm	3"	100	
50 mm	2"	100	
38.1 mm	1-1/2"	100	
25.0 mm	1"	85	
19.0 mm	3/4"	85	
12.5 mm	1/2"	84	
6.3 mm	1/4"	78	
4.75 mm	No. 4	74	25.8% Gravel
2.00 mm	No. 10	63	
850 um	No. 20	48	
425 um	No. 40	32	67.6% Sand
250 um	No. 60	20	
150 um	No. 100	12	
75 um	No. 200	6.7	6.7% Fines



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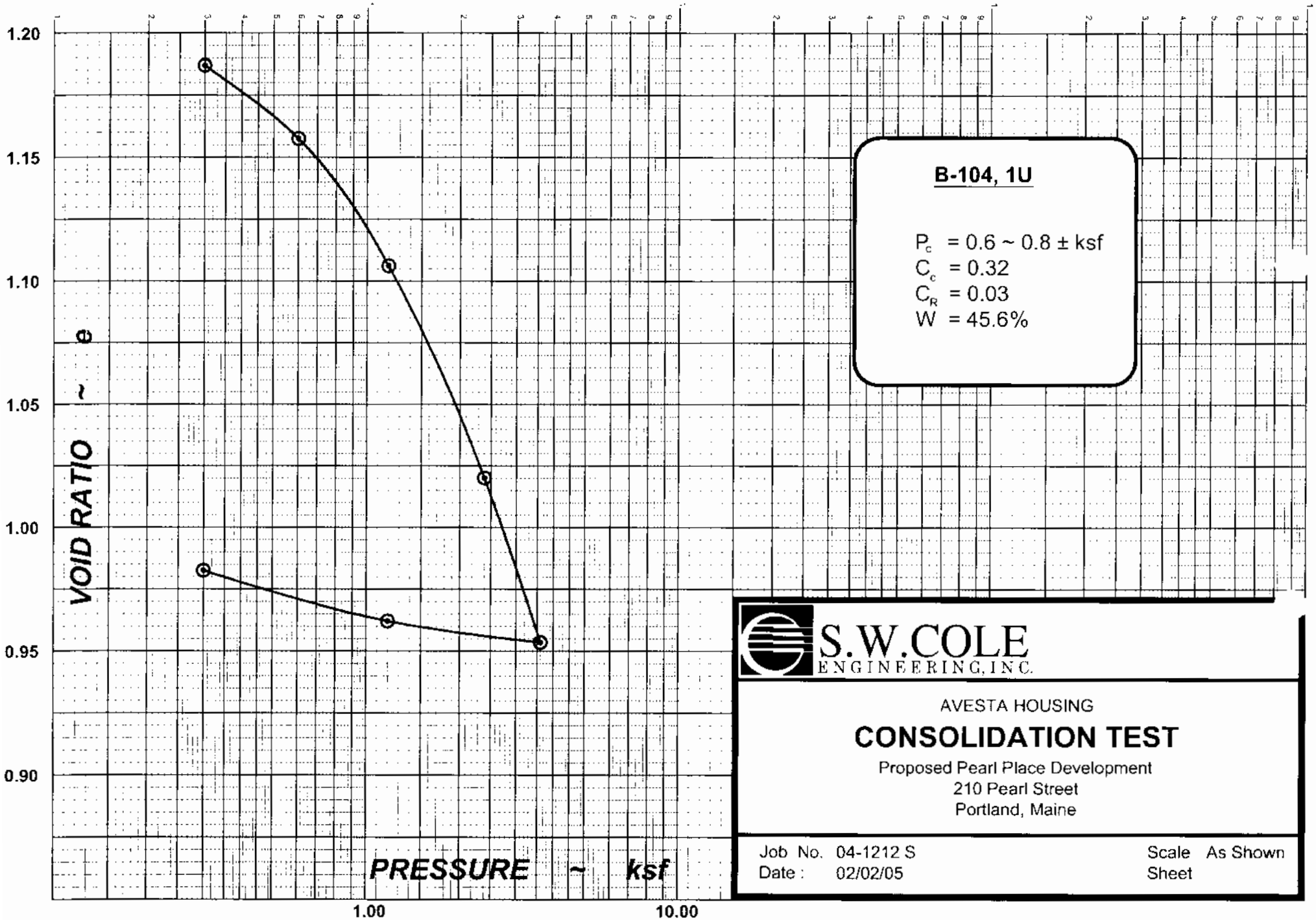

B-104, 1U

P_c = 0.6 ~ 0.8 ± ksf
C_c = 0.32
C_R = 0.03
W = 45.6%

S.W.COLE ENGINEERING, INC.

AVESTA HOUSING

CONSOLIDATION TEST

Proposed Pearl Place Development
210 Pearl Street
Portland, Maine

Job No. 04-1212 S
Date : 02/02/05

Scale As Shown
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