



• *Geotechnical Engineering* • *Field & Lab Testing* • *Scientific & Environmental Consulting*

04-0238

April 1, 2004

Hardy Pond Construction  
Attention: Bob Goudreau  
1039 Riverside Street, Suite 11  
Portland, Maine 04103

Subject: Preliminary Geotechnical Engineering Services  
Limited Investigation  
Bearing Capacity Assessment  
Proposed Second Tee Business Park  
1039 Riverside Street  
Portland, Maine

Dear Mr. Goudreau:

As requested, S. W. COLE ENGINEERING, INC. has observed a subsurface investigation for the proposed Second Tee Business Park located at 1039 Riverside Street in Portland, Maine. The purpose of our work was to observe the subsurface conditions at the site and provide a preliminary assessment of allowable soil bearing capacity. The contents of this report are subject to the limitations set forth in Attachment A.

### **PROPOSED CONSTRUCTION**

We understand that a new business park is proposed on a 16-acre parcel of land at 1039 Riverside Street in Portland, Maine. The parcel will be developed for 10 structures measuring from 6,000 to 25,000 square feet. The structures will be one story metal buildings with finish floor grades within 1 to 2 feet of existing grade and light floor loading.

### **EXPLORATION AND TESTING**

As requested, we observed four test pits made at the site on March 26, 2004. The explorations were selected and located in the field by Hardy Pond Construction. The approximate locations of the explorations are shown on the "Exploration Location Sketch" attached as Sheet 1.



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Logs of the explorations, based on our observations and laboratory testing are attached as Sheets 2 and 3. A key to the notes and symbols used on the logs is attached as Sheet 4.

Laboratory testing was performed on selected samples recovered from the explorations. One grain size analysis was performed and the results are presented on Sheets 5 and 6.

### **SUBSURFACE CONDITIONS**

Test Pits TP-1 through TP-4 generally encountered 0.5 to 1.0 feet of dark brown sandy silt with organics overlying 4 to 6 feet of brown silty fine to medium sand. The silty sand overlies gray silty sand with silt and clay layers. Test Pits TP-1 through TP-3 were terminated in the gray silty sand at a depth of 8.5, 8.0 and 6.0 feet, respectively. Test Pit TP-4 encountered gray silty clay at a depth of 7 feet and was terminated at 8.0 feet.

Groundwater was observed in the explorations at depths of about 4 to 4.5 feet at the time of the fieldwork. The soils were generally wet below the ground surface. Long-term groundwater information is not available.

### **EVALUATIONS AND RECOMMENDATIONS**

Based on our observations and shallow groundwater conditions encountered, we recommend that the footings be placed on 8 inches of crushed stone over a geotextile fabric placed on the undisturbed native silt sand. We further recommend that a smooth edged bucket be utilized to excavate to subgrade in order to reduce disturbance of the bearing soils. Footings should be placed at a depth of at least 4.5 feet below exterior finish grade to provide frost protection. Based on the findings at the widely spaced test pits, we recommend that preliminary foundation design consider a net allowable bearing contact pressure not exceeding 2.5 ksf. All footings should be at least 24 inches in width.

Groundwater will be encountered during excavation work. Sumping and pumping dewatering techniques should be adequate to control groundwater below footing subgrade elevation. Controlling the water levels to a at least one foot below subgrade elevations will help stabilize the subgrade and provide a more suitable working surface during construction.

Our services have been limited by the client to widely spaced test pits and providing a preliminary assessment of allowable soil bearing capacity at those locations. Other services were specifically not requested by the client. We recommend that additional explorations



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including test pits and/or test borings be made specific to each structure proposed at the site. This is to determine if soil conditions are consistent with those found at these explorations.

S. W. COLE ENGINEERING, INC. should be on-site to observe subgrades prior to fill or concrete placement in the event that subsurface conditions are found to differ from those anticipated. S. W. COLE ENGINEERING, INC. is available to provide field and laboratory testing of soils, concrete, asphalt, masonry, spray-applied fire-proofing and structural steel.

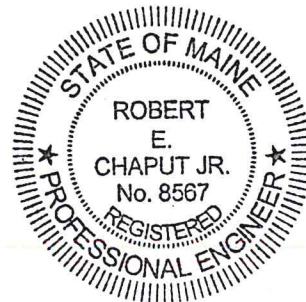
### CLOSING

It has been a pleasure to be of assistance to you with this phase of your project. If you have any questions or if we may be of further assistance, please do not hesitate to contact us.

Sincerely,

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

Robert E. Chaput, Jr., P.E.  
Vice President



REC:kml

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*BCHAPUT@SWCOLT.COM*

## **ATTACHMENT A**

### **Limitations**

This report has been prepared for the exclusive use of Hardy Pond Construction for specific application to the Proposed Second Tee Business Park at 1039 Riverside Street in Portland, Maine as described herein. Our services were limited by Hardy Pond Construction to an assessment of soil bearing capacity only and a deeper soils investigation to evaluate settlement and other geotechnical considerations was specifically excluded by Hardy Pond Construction. Hardy Pond Construction has agreed to protect and hold harmless S.W.COLE ENGINEERING, INC. from any and all claims, including third-party claims, for damages or consequential damages due to underlying soil conditions including but not limited to post-construction settlement. 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. 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.

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.

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.

Schedule B



HARDY POND CONSTRUCTION  
EXPLORATION LOCATION SKETCH  
PROPOSED SECOND TEE BUSINESS PARK  
1039 RIVERSIDE STREET, PORTLAND, MAINE

Sheet 1

Job No. 04-0238  
Date: 04/01/04

LEGEND  
TEST PIT LOCATION

- NEW PIPE OR NEW PILING
- EXISTING PIPE
- WATER VALVE
- PROPOSED
- MANHOLE
- WATER MAIN
- SEWER MAIN
- STORM SEWER
- UNDERGROUND ELECTRIC
- UNDERGROUND GAS
- UNDERGROUND TELEPHONE
- UNDERGROUND CABLE
- UNDERGROUND FIBER OPTIC
- EXISTING BUILDING
- PROPOSED LOT ANCHOR
- LIMITED CONCRETE ELEMENT (PROPOSED CURB)
- COMMON ELEMENT
- LOT NUMBER
- SHARED LINE BETWEEN ELEMENTS
- POSSIBLE BUILDING EXPANSION
- EXISTING LOT BOUNDARY

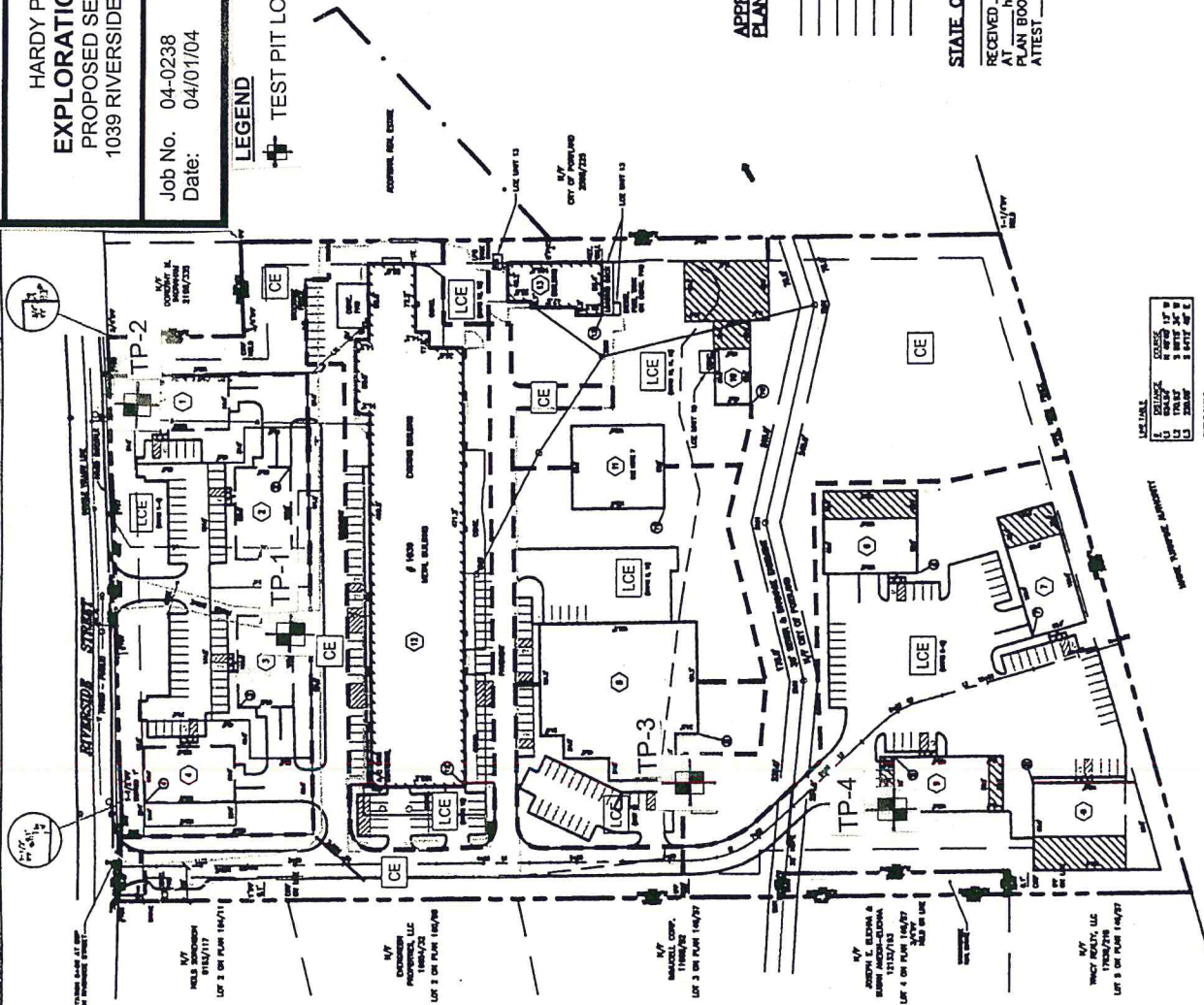
APPROVAL—CITY OF PORTLAND  
PLANNING AUTHORITY

STATE OF MAINE  
RECEIVED \_\_\_\_\_ COUNTY SS REGISTRY OF DEEDS  
AT \_\_\_\_\_ m \_\_\_\_\_ AND RECORDED IN  
PLAN BOOK \_\_\_\_\_ PAGE \_\_\_\_\_ REGISTER  
ATTEST \_\_\_\_\_

CONDOMINIUM PLAN

RECORD RE: BUSINESS PARK CONDOMINIUM  
1039 RIVERSIDE STREET, PORTLAND, MAINE  
1039 RIVERSIDE LLC  
1039 RIVERSIDE STREET, PORTLAND, ME 04102  
OWEN HASKELL, INC.

BOOK	103	PAGE	1
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LABELL

1	WALKWAY	100	100	100
2	WALKWAY	100	100	100
3	WALKWAY	100	100	100
4	WALKWAY	100	100	100
5	WALKWAY	100	100	100
6	WALKWAY	100	100	100
7	WALKWAY	100	100	100
8	WALKWAY	100	100	100
9	WALKWAY	100	100	100
10	WALKWAY	100	100	100
11	WALKWAY	100	100	100
12	WALKWAY	100	100	100
13	WALKWAY	100	100	100
14	WALKWAY	100	100	100
15	WALKWAY	100	100	100
16	WALKWAY	100	100	100
17	WALKWAY	100	100	100
18	WALKWAY	100	100	100
19	WALKWAY	100	100	100
20	WALKWAY	100	100	100

SCALE: 1" = 40'

STATION AND OFFSET

LINE	STATION	OFFSET
1	1+00.00	0.00
1	1+05.00	0.00
1	1+10.00	0.00
1	1+15.00	0.00
1	1+20.00	0.00
1	1+25.00	0.00
1	1+30.00	0.00
1	1+35.00	0.00
1	1+40.00	0.00
1	1+45.00	0.00
1	1+50.00	0.00
1	1+55.00	0.00
1	1+60.00	0.00
1	1+65.00	0.00
1	1+70.00	0.00
1	1+75.00	0.00
1	1+80.00	0.00
1	1+85.00	0.00
1	1+90.00	0.00
1	1+95.00	0.00
1	2+00.00	0.00

NOTES

1. ALL UTILITIES SHOWN ARE BASED ON THE RECORD DRAWINGS AND FIELD SURVEY. THE LOCATION AND DEPTH OF UTILITIES SHOULD BE VERIFIED BY FIELD SURVEY BEFORE CONSTRUCTION.
2. THE TEST PITS SHOWN ARE FOR THE PURPOSE OF VERIFYING THE LOCATION AND DEPTH OF UTILITIES.
3. THE UTILITY LOCATIONS SHOWN ARE BASED ON THE RECORD DRAWINGS AND FIELD SURVEY. THE LOCATION AND DEPTH OF UTILITIES SHOULD BE VERIFIED BY FIELD SURVEY BEFORE CONSTRUCTION.
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PLAN REFERENCES

1. RECORD DRAWINGS OF THE SITE, 1997, BY S.W. COLE ENGINEERING, INC.
2. RECORD DRAWINGS OF THE SITE, 1997, BY S.W. COLE ENGINEERING, INC.
3. RECORD DRAWINGS OF THE SITE, 1997, BY S.W. COLE ENGINEERING, INC.
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10. RECORD DRAWINGS OF THE SITE, 1997, BY S.W. COLE ENGINEERING, INC.

UTILITY NOTES

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**TEST PIT LOGS**

PROJECT/CLIENT: PROPOSED SECOND TEE BUSINESS PARK / HARDY POND CONSTRUCTION  
 LOCATION: 1039 RIVERSIDE STREET, PORTLAND, MAINE  
 BACKHOE FIRM: HARDY POND CONSTRUCTION OPERATOR: BOB GOUDREAU

PROJECT NO.: 04-0238  
 SWC REP.: TJG

<b>TEST PIT <u>TP-1</u></b>			
DATE: <u>3/26/2004</u>		SURFACE ELEVATION: <u>NOT AVAIL.</u>	LOCATION: <u>SEE SHEET 1</u>
SAMPLE NO.	DEPTH	STRATUM DESCRIPTION	TEST RESULTS
	1.0'	DARK BROWN SANDY SILT, TRACE GRAVEL WITH ORGANICS	
	6.0'	LIGHT BROWN SILTY FINE TO MEDIUM SAND	
S-1	7'	GRAY SILTY FINE SAND WITH SILT AND CLAY LAYERS	
	8.5'	BOTTOM OF EXPLORATIN AT 8.5'	
COMPLETION DEPTH: <u>8.5'</u>		DEPTH TO WATER: <u>4'</u>	

<b>TEST PIT <u>TP-2</u></b>			
DATE: <u>3/26/2004</u>		SURFACE ELEVATION: <u>NOT AVAIL.</u>	LOCATION: <u>SEE SHEET 1</u>
SAMPLE NO.	DEPTH	STRATUM DESCRIPTION	TEST RESULTS
	1.0'	DARK BROWN SANDY SILT WITH ORGANICS	
	5.0'	LIGHT BROWN SILTY FINE TO MEDIUM SAND	
S-2	4'	GRAY SILTY FINE SAND WITH SILT AND CLAY LAYERS	
	8.0'	BOTTOM OF EXPLORATOIN AT 8'	
COMPLETION DEPTH: <u>8'</u>		DEPTH TO WATER: <u>4.5'</u>	



**TEST PIT LOGS**

PROJECT/CLIENT: PROPOSED SECOND TEE BUSINESS PARK / HARDY POND CONSTRUCTION  
 LOCATION: 1039 RIVERSIDE STREET, PORTLAND, MAINE  
 BACKHOE FIRM: HARDY POND CONSTRUCTION OPERATOR: BOB GOUDREAU

PROJECT NO.: 04-0238  
 SWC REP.: TJG

<b>TEST PIT <u>TP-3</u></b>			
DATE: <u>3/26/2004</u>		SURFACE ELEVATION: <u>NOT AVAIL.</u>	LOCATION: <u>SEE SHEET 1</u>
SAMPLE NO.	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
	0.5'	BROWN SAND AND GRAVEL, TRACE COBBLES	
	4.5'	ORANGE/BROWN SILTY FINE TO MEDIUM SAND	
S-3	5.5'	GRAY FINE SAND WITH SILT AND CLAY LAYERS	
	6.0'	BOTTOM OF EXPLORATION AT 6'	
COMPLETION DEPTH: <u>6'</u>		DEPTH TO WATER: <u>4'</u>	

<b>TEST PIT <u>TP-4</u></b>			
DATE: <u>3/26/2004</u>		SURFACE ELEVATION: <u>NOT AVAIL.</u>	LOCATION: <u>SEE SHEET 1</u>
SAMPLE NO.	DEPTH (FT)	STRATUM DESCRIPTION	TEST RESULTS
	8"	DARK BROWN SANDY SILT WITH ORGANICS	
	3.5'	LIGHT BROWN FINE SANDY SILT	
	6.5'	BROWN SILTY SAND	
	7.0'	GRAY SILTY FINE SAND WITH SILT AND CLAY LAYERS	
S-4	7.5'	GRAY SILTY CLAY	
	8.0'	BOTTOM OF EXPLORATION AT 8'	
COMPLETION DEPTH: <u>8'</u>		DEPTH TO WATER: <u>NO FREE WATER OBSERVED</u>	



## **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 <sub>u</sub>	-	unconfined compressive strength, kips/sq. ft. - based on laboratory unconfined compressive test
S <sub>v</sub>	-	field vane shear strength, kips/sq. ft.
L <sub>v</sub>	-	lab vane shear strength, kips/sq. ft.
q <sub>p</sub>	-	unconfined compressive strength, kips/sq. ft. based on pocket penetrometer test
O	-	organic content, percent (dry weight basis)
W <sub>L</sub>	-	liquid limit - Atterberg test
W <sub>P</sub>	-	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 <sub>T</sub>	-	total soil weight
γ <sub>B</sub>	-	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.

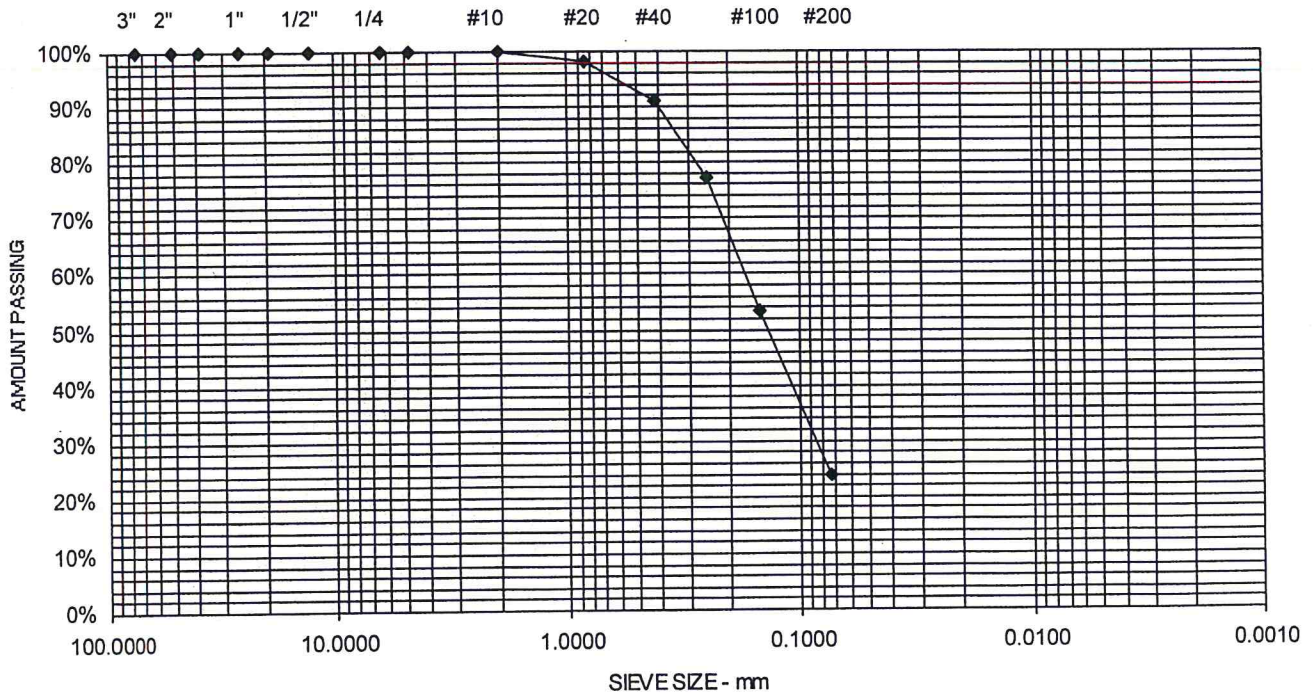
Although refusal may indicate the encountering of the bedrock surface, it may indicate the striking of large cobbles, boulders, very dense or cemented soil, or other buried natural or man-made objects or it may indicate the encountering of a harder zone after penetrating a considerable depth through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



Project Name **HARDYPOND PORTLAND RIVERSIDE COMMERCIAL SUBDIVISION**  
 SSI  
 Client **HARDYPOND CONSTRUCTION INC**  
 Exploration **TP-2,S-2,4.0'**  
 Material Source

Project Number **04-0238**  
 Lab ID **984A**  
 Date Received **3/26/2004**  
 Date Completed **3/29/2004**  
 Tested By **RYAN BRAGG**

<u>SIEVE OPENING (mm)</u>	<u>SIEVE SIZE</u>	<u>AMOUNT PASSING (%)</u>	
152.4	6"	100	
127	5"	100	
101.6	4"	100	
76.1	3"	100	
50.8	2"	100	
38.1	1-1/2"	100	
25.7	1"	100	
19	3/4"	100	
12.7	1/2"	100	
6.35	1/4"	100	
4.76	No. 4	100	0% Gravel
2	No. 10	100	
0.841	No. 20	98	
0.42	No. 40	91	76.3% Sand
0.25	No. 60	77	
0.149	No. 100	53	
0.074	No. 200	23.7	23.7% Fines



Project Name **HARDYPOND PORTLAND RIVERSIDE COMMERCIAL SUBDIVISION**  
 SSI  
 Client **HARDYPOND CONSTRUCTION INC**  
 Exploration **TP-3,S-3,5.5'**  
 Material Source

Project Number **04-0238**  
 Lab ID **985A**  
 Date Received **3/26/2004**  
 Date Completed **3/29/2004**  
 Tested By **RYAN BRAGG**

<u>SIEVE OPENING (mm)</u>	<u>SIEVE SIZE</u>	<u>AMOUNT PASSING (%)</u>	
152.4	6"	100	
127	5"	100	
101.6	4"	100	
76.1	3"	100	
50.8	2"	100	
38.1	1-1/2"	100	
25.7	1"	100	
19	3/4"	100	
12.7	1/2"	100	
6.35	1/4"	100	
4.76	No. 4	100	0% Gravel
2	No. 10	100	
0.841	No. 20	94	
0.42	No. 40	64	84.5% Sand
0.25	No. 60	35	
0.149	No. 100	23	
0.074	No. 200	15.5	15.5% Fines

