REPORT OF
GEOTECHNICAL EXPLORATION
SHIPYARD - PHASE I BULKHEAD
JACKSONVILLE, FLORIDA
E&A PROJECT NO. 01-1346

Ellis & Associates inc.

REPORT OF
GEOTECHNICAL EXPLORATION
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JACKSONVILLE, FLORIDA
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for

TRI-LEGACY DEVELOPMENT

by

Ellis & Associates, Inc.
7064 Davis Creek Road
Jacksonville, Florida 32256

November 9, 2001

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Ellis & Associates inc.

November 9, 2001

Tri-Legacy Development
P.O. Box 41064
Jacksonville, Florida 32202

Attention: Mr. W. Hamilton Taylor

Subject: Report of Geotechnical Explorations
Shipyard-Phase I Bulkhead
Jacksonville, Florida
E&A Project No. 01-1346

Dear Mr. Taylor:

Ellis & Associates, Inc. (E&A) has completed a geotechnical exploration for the subject project as authorized by Eng. Andy Zarka, P.E. with BHR, Inc., on September 6, 2001, and was performed in accordance with our proposal dated June 29, 2001. The exploration was performed to determine the subsurface conditions along the proposed bulkhead alignment and to provided design recommendations for the proposed construction.

We appreciate this opportunity to be of service as your geotechnical consultant on this phase of the project and look forward to providing the materials testing and observation that will be required during the construction phase. If you have any questions or if we may be of any further service, please contact us.

Very truly yours,
ELLIS & ASSOCIATES, INC.

Antoinette (Tina) D. Meskel, P.E.
Sr. Project Engineer
Registered, Florida No. 56999

N. Oweis

Nemer (Nick) Y. Abdulla Oweis, P.E.
Sr. Geotechnical Engineer
Registered, Florida No. 44755

cc: Eng. Andy Zarka, P.E.- BHR, Inc.
Eng. Lake Ray, III - Harbor Engineering

Distributions: 1 Copy - Tri-Legacy Development
2 Copies - Harbor Engineering
3 Copies - BHR, Inc.

Ellis & Associates inc.

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1.0 PROJECT INFORMATION

1.1 Site Location and Description

The project site is located just south of the Hart Expressway and west of Metropolitan Park along the northern bank of the St. Johns River at the shipyard area (750 East Bay Street), in Jacksonville, Florida. The subject project area is located between Hogan Creek to the west and Pier No. 7 to the east, thus incorporating existing Piers 5, 6 and 7. Historical information indicates that the area has been used for industrial activities from the late 1800's to 1992. The areas of the project originally consisted of salt marshes and tidal flats, which have been filled to construct the existing river front facilities.

The topography of the ground surface adjacent to the existing bulkhead is generally relatively level. The ground surface is generally covered with grass and concrete pavement. Voids have occurred adjacent to the existing bulkhead deadman anchors and/or concrete crib. The bulkheads consist of steel sheet and concrete piles and appeared to be in poor condition at the time of our field exploration. Pier No. 6 is located between the proposed bulkhead areas within the Phase I portion of the project. The adjacent land to the north is currently relatively level and is developed with one-story structures and pavement and parking areas.

1.2 Project Description

Project information has been provided to us in discussions with Eng. Andy Zarka, P.E. with BHR, Inc., and Eng. Lake Ray, III, Eng. Kumran Marashi, P.E., and Eng. John Hutchins, P.E. with Harbor Engineering, Inc. We have been provided with a set of drawings titled Map Showing Boundary and Topographic Survey Of Shipyard (Sheet Nos. 1-8) for the subject site prepared by BHR, dated May 4, 2001 and other relevant information. These plans show the boundary limits of the site, layout of the existing construction, the existing roadways adjacent to the site, and site topographic information.

Based on the provided information, it is our understanding the project will consist of installing steel sheet pile walls adjacent the existing steel sheet and concrete bulkhead walls. It is understood the proposed sheet pile walls will be installed approximately one foot in front of the existing walls (waterside). We understand that flowable fill may be placed between the existing and proposed wall. It is our understanding the sheet piles could have section lengths of 50 to 60 feet and that pre-cast/pre-stressed concrete displacement piles may be used to provide anchor support to the walls. It is assumed that the river at the bulkhead would be dredged to El. –10.

If actual project information varies from these conditions, then the recommendations in this report may need to be re-evaluated. Any changes in these conditions should be provided so the need for re-evaluation of our recommendations can be assessed.

2.0 FIELD EXPLORATION

A field exploration was performed during the period of September 17 to 28, 2001. A digitized copy of the plan provided to us, which shows the approximate boring locations, is included as the Field Exploration Plan, Figure 2. The approximate boring locations were determined in the field by our personnel using taped measurements from existing controls, and should be considered accurate only to the degree implied by the method of measurement used.

To explore the subsurface conditions along the existing/proposed bulkhead alignment, we located and performed 10 Standard Penetration Test (SPT) borings. Five SPT borings were drilled adjacent to the bulkhead on the landside to depths of approximately 50 to 75 feet below the existing ground surface, and five SPT borings were drilled waterside to depths varying between 50 and 60 feet below the mudline. The borings were performed in general accordance with the methodology outlined in ASTM D 1586. Split-spoon soil samples recovered during performance of the borings were visually classified in the field and representative portions of the samples were transported to our laboratory for further evaluation.

3.0 LABORATORY TESTING

3.1 Index Testing

Representative soil samples obtained from the SPT borings were visually classified in general accordance with the Unified Soil Classification System (USC). Quantitative laboratory testing was performed on selected samples of the soils encountered during the field exploration to better define the composition of the soils encountered and to provide data for correlation to their anticipated strength characteristics. The laboratory testing determined the Atterberg limits, organic material, percent fines and natural moisture contents of the selected soil samples. The results of the laboratory testing are shown on the Summary of Laboratory Test Data included in Appendix B. Also, these results are shown on the Log of Boring records included in Appendix A and on the Generalized Subsurface Profiles (Figures 3 to 5) at the respective depths from which the tested samples were recovered.

3.2 Corrosion Testing

In addition, a selected soil sample was tested for corrosion properties. The tests performed included pH, electrical resistivity, and chloride and sulfate content. The results of the corrosion property tests are discussed in Section 5, and shown on Table 2.

4.0 GENERAL SUBSURFACE CONDITIONS

4.1 General Soil Profile

Graphical presentation of the generalized subsurface conditions is presented on Figures 3 to 5. Detailed boring records are included in Appendix A. When reviewing these records it should be

understood that the soil conditions will vary between the boring locations. The following discussion summarizes the general soil conditions encountered.

The results of the borings indicated relatively variable subsurface soil conditions. The waterside borings were performed in 6 to 14 feet of water (approximately El. -5 to –12) at the time of drilling depending on tide fluctuation. Below the mudline, approximately 11- to 29-foot thick layer of very soft organic silt (OL) and very loose silty fine sand with many organic materials (PT) were encountered to approximately El. –23 to -36. Below this soil zone, very loose to very dense fine sand (SP), fine sand with silt (SP-SM), fine sand with clay (SP-SC), silty fine sand (SM), clayey fine sand (SC), and very soft to firm sandy clay and clay (CH) were encountered to approximately El. –50 to -56. Loose to dense fine sand with clay (SP-SC) and clayey fine sand (SC) containing limestone fragments and phosphate nodules, locally referred to as Marl, then were encountered to the boring termination depths of 50 and 60 feet below mudline (El. –54 to –65).

The landside borings were performed through 6 to 27 feet of fill soils above the organic stratum. Concrete and asphalt pavement and topsoil were encountered to depths of approximately 0.5 feet. These materials were underlain by intermittent layers of very loose to dense fine sand (SP), fine sand with silt (SP-SM), silty fine sand (SM), clayey fine sand (SC) to approximately El. –6 to –26. This zone also contained layers of wood, roots and construction rubble. Soft to stiff organic silt and other soils with organic materials were encountered to approximately El. –11 to –32. Below this soil zone, inter-layered loose to dense fine sand, fine sand with silt, fine sand with clay, clayey to very clayey fine sand and soft to firm clay and sandy clay were encountered to approximately El. –43 to -60. Borings B2, and B9 were terminated in this soil zone at approximately El. -45 and –45, respectively. Clayey fine sand containing limestone fragments and phosphate nodules (Marl) were then encountered to approximately El. –45 to –68 (boring termination depths).

4.2 Groundwater Level

The groundwater level was encountered at each of the landside borings and recorded, at the time of drilling, at depths varying from 2.5 to 6.0 feet below the existing ground surface. As previously mentioned, the water depth varied between 6 and 14 feet at the waterside boring locations at the time of our exploration. However, it should be anticipated the groundwater level will fluctuate due to seasonal climatic variations, tidal fluctuations, surface water runoff patterns, construction operations, and other interrelated factors. The depth to the groundwater level at each boring location is noted on the Generalized Subsurface Profiles and on the Log of Boring records.

5.0 DESIGN RECOMMENDATIONS

5.1 General

Our geotechnical engineering evaluation of the site and subsurface conditions at the property with respect to the planned construction and our recommendations for construction of the bulkhead walls are based on (1) our site observations, (2) the field and laboratory test data obtained, and (3) our understanding of the project information and structural conditions as presented in this report.

If the structural conditions are incorrect, please contact us so that we can review our recommendations. Also, the discovery of any site or subsurface conditions during construction, which deviate from the data obtained during this geotechnical exploration should also be reported to us for our evaluation.

The recommendations presented in the subsequent sections of this report present design and construction techniques, which are appropriate for the planned construction. We recommend that we be provided the opportunity to review final design specifications to verify that our recommendations have been properly interpreted and implemented.

5.2 Bulkhead Design Parameters

5.2.1 Selection of Engineering Properties

Our review of the results of the SPT borings conducted at the proposed bulkhead indicated the following general soil profile:

Elevation, feet (MLW)	Description
Landside Only, -5 to -10	Very loose to medium dense fine sand (SP), fine sand with silt (SP-SM), silty fine sand (SM), clayey fine sand (SC) (Fill Soils)
-10 to -30	Soft to stiff organic silt (OL) and other soils with organic materials (PT)
-30 to -55	Very loose to very dense fine sand (SP), fine sand with silt (SP-SM), fine sand with clay (SP-SC), silty fine sand (SM), clayey fine sand (SC), and very soft to firm sandy clay and clay (CH)
-55 to -65	Loose to dense fine sand with clay (SP-SC) and clayey fine sand (SC) (Marl)

The above soil profile is outlined in general terms only. However, based on the relatively variable subsurface soil conditions encountered at the boring locations, soil parameters required for design of the proposed bulkhead walls were prepared in sections of relatively similar soil characteristics along the proposed wall alignment as shown on Plate 1. The parameters are based on empirical correlations between N-values and various soil properties. In each case, N-values were averaged over the zone of interest. Included are typical soil unit weight, angle of internal friction, cohesion, and the angle of wall friction.

5.2.2 Construction Considerations

It should be anticipated that debris may be encountered at the site which may impede the sheet pile driving operations. The contractor should be made aware that difficult driving conditions may be encountered during the proposed sheet pile installation. Also, if the existing bulkhead and it's associated anchors/cribs are not removed prior to driving the sheet piles, the voids behind the existing

bulkhead should be filled with compacted structural fill. Raveled soils should be over-excavated and re-compacted. Fine sand or FDOT 57 stone can be used to fill the space between the existing and proposed bulkhead. As an alternative, flowable fill may be used to fill the voids behind the existing bulkhead and the space between the existing and proposed bulkhead walls.

5.3 Bulkhead Pile Anchor Design Recommendations

5.4.1 Uplift Capacity

As previously mentioned, we understand 18-inch square displacement piles may be used as anchors to tie back the proposed bulkhead. Based on the results of our analysis, 18-inch diameter square precast/prestressed concrete piles, properly placed to bear in the medium dense to dense clayey fine sands (Marl) encountered at the boring locations between elevations of approximately El. -50 to El. -60 would provide allowable tensile capacities on the order of 30 to 70 tons with a safety factor of 2. Figures 1 through 6 included in Appendix D present allowable uplift pile capacities as a function of pile embedment depth for each section of proposed wall shown on Plate 1. It should be noted that the presented capacities were determined for vertical piles. Once a final design batter angle has been determined for the piles, we would be pleased to review the provided information.

5.4.2 Lateral Load Analysis

Lateral loads acting on the foundation may be resisted by the lateral resistance of the piles. The main criteria of assessing the allowable load per pile are to satisfy both the allowable bending moment in the pile and the allowable deflection of the pile group, depending on the soil conditions within a depth equal to approximately 20 times the pile diameter. The following soil parameters should be used for lateral analysis:

Elevation	Saturated Unit Weight, γ_s (pcf)	Internal Friction Angle, φ (degrees)	Soil Modules, k (pci)	Cohesion, C (psf)	Soil Strain Parameter, E_{50}
Landside, 6 to -10	115	35	125	--	--
-10 to -30	85	0	5	100	--
-30 to -55	120	32	25	--	0.02
-55 to -65	120	58	50	--	--

5.4 Environmental Classification

Corrosion series tests were performed on soil samples obtained at the boring locations. The samples were tested to evaluate the environmental classification for the proposed wall. Based on the test results and classification procedures, the soils encountered are considered moderately aggressive for

concrete and steel. The environmental classification was based on the procedures presented in the FDOT Structures Design Manual, Chapter 7. Test results are included in Appendix B.

6.0 Pile Anchor Construction Considerations

6.1 Installation Criteria

The actual in-place length of the driven piles should be determined in the field by the use of wave equation analysis. The wave equation analysis considers the energy of the driving system and the weight and stiffness of the pile element, which is considered essential in achieving the proper penetration of the bearing strata by the pile and thus a satisfactory pile foundation system.

Care should be exercised to avoid damaging any nearby structures during pile driving operations. We recommend monitoring the vibrations generated by the pile driving operations. Pile driving should cease if deemed detrimental to adjacent structures and Ellis & Associates, Inc. should be contacted immediately. Predrilling through the existing bulkhead and concrete deadman/crib would be required to install the piles.

6.2 Hammer Selection

To help reduce over-driving, we recommend that the final driving criteria be carefully specified with respect to the pile type, pile size, and hammer size. The pile driving hammer should therefore be properly selected with relation to the size, weight, and type of pile specified. The ratio of an air or steam hammer ram to the weight of the pile should not be less than one-half and should preferably be on the order of 0.67 to 1.0. We recommend that the pile driving equipment be approved by the geotechnical engineer.

6.3 Quality Control

An engineering technician (1) familiar with the installation of driven piles into subsurface soil conditions similar to those at this site and (2) acting under the direction and supervision of the geotechnical engineer should witness the installation of the production piles. His duties should include, but not be limited to, the following:

1. Keep an accurate record of pile installation and driving procedures.
2. Verify that all piles are installed to the proper driving resistance and to a depth indicative of the piles bearing in the desired bearing formation.
3. Confirm that the pile driving equipment is operating properly.
4. Inspect the piles prior to installation for defects and confirm that the piles are not damaged during installation.

If the installation of the piles cannot be witnessed by a qualified engineering technician, we recommend as a minimum construction control measure that all pile driving records be reviewed by the geotechnical engineer prior to the superstructure construction.

6.4 Pile Load Test Considerations

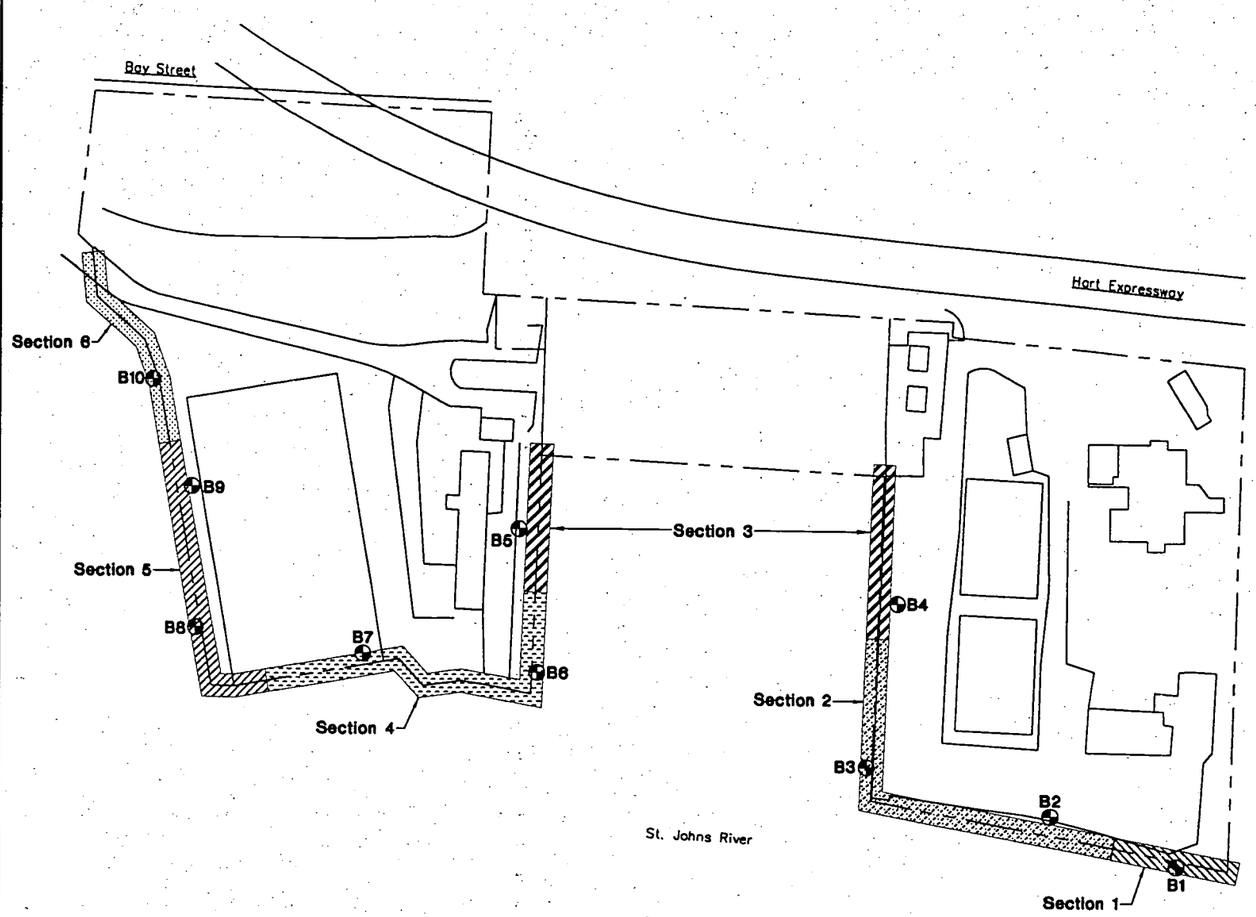
We recommend that at least six dynamic pile load tests (one at each section) be performed using the Pile Driving analyzer (PDA). The PDA data will be used to evaluate: hammer-driving system performance, pile stresses during driving, pile structural integrity and calculation of pile static compression bearing capacity. The dynamic results will then be used in wave equation analysis to establish an optimum driving criteria to be employed in driving the production piles. Prior to test pile driving, hammer specifications should be made available to us to assess pile driving system suitability.

7.0 REPORT LIMITATIONS

Our geotechnical exploration has been performed, our findings obtained, and our recommendations prepared in accordance with generally accepted geotechnical engineering principles and practices. Ellis & Associates is not responsible for any independent conclusions, interpretation, opinions or recommendations made by others based on the data contained in this report.

Petroleum odor was noted during visual classification of soil samples as indicated on the soil profiles (Figures 3 through 5) and the individual boring logs. These statements are strictly for the information of our client. We recommend that the procedures used for construction activities at this site be in compliance with the Consent Order agreement already in place for the facility.

This report does not reflect any variations which may occur adjacent to or between soil borings. The discovery of any site or subsurface condition during construction which deviate from the data obtained during this geotechnical exploration should be reported to us for our evaluation. Also, in the event of any change to the structural conditions or the location of the bulkhead walls, please contact us so that we can review our recommendations. We recommend that we be provided the opportunity to review the final design specifications to verify that our recommendations have been properly interpreted and implemented.



Bulkhead Wall Design Sections

Graphical Scale

0' 200' 400'

Reference:
Site plan provided by Bessent, Hammock & Ruckman, Inc.
(Last Dated May 4, 2001)

LEGEND

Approximate Location of Standard Penetration Test (SPT) Boring

Boring No.	Bulkhead Design Section	Soil Type	Approximate Elevation	Total Unit Weight (pcf)	Effective Unit Weight (pcf)	Internal Friction Angle (degrees)	Cohesion (psf)	Friction Angle Between Sheet Pile and Wall
B1	1	OL	-11.2 to -28	85	23	0	100	0
		SC	-28 to -41	105	43	29	0	14
		CH	-41 to -56	125	63	30	1,500	12
		SC	-56 to -62	120	58	33	0	14
B2 B3	2	OL, PT, SM	-4.5 to -33	85	23	0	100	0
		SP	-33 to -41	120	58	35	0	17
		CH	-41 to -52	115	53	0	1,300	12
		SC	-52 to -55	105	43	29	0	14
B4 B5	3	OL, PT	-5 to -12	85	73	0	100	0
		SP	-12 to -17	120	58	33	0	17
		SM, SC	-17 to -27	110	48	30	0	14
		OH, CH, SC	-27 to -42	115	53	0	1,200	13
		SC, SM	-42 to -54	105	43	30	0	13
		SC	-54 to -65	120	58	34	0	14
B6 B7	4	OL, SM	-4 to -32	85	23	0	100	0
		CH	-32 to -42	120	58	8	1,400	14
		SP	-42 to -46	125	63	34	0	17
		SP-SC, SC	-46 to -60	110	48	31	0	13
		SC	-60 to -68	120	58	33	0	14
B8 B9	5	OL, PT, SM, SC	-8 to -24	85	23	0	100	0
		SP, SP-SC, SM	-24 to -43	120	58	33	0	16
		CH	-43 to -54	120	58	0	1,400	12
		SC	-54 to -60	120	58	33	0	14
B10	6	OL	-6 to -36	85	23	0	100	0
		SC	-36 to -44	105	43	30	0	14
		CH	-44 to -50	110	48	0	500	12
		SC	-50 to -60	120	58	33	0	14

Notes: 1) Active earth pressure should be modeled using a unit weight of 115 pcf and an angle of internal friction of 35°.

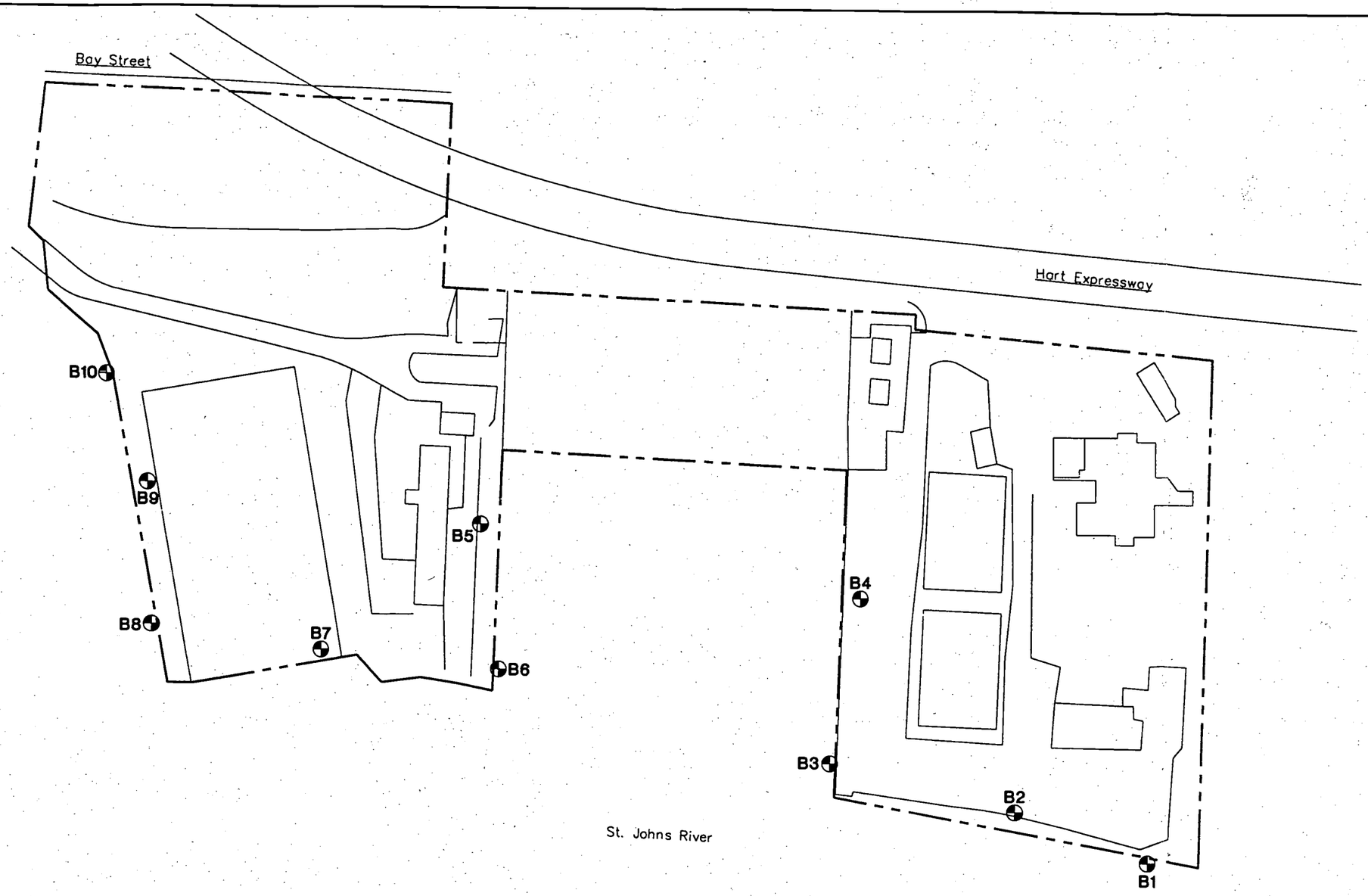
2) Surcharge loading, if any, near the bulkhead should be included in the calculation.

Bulkhead Wall Design Sections
Shipyard - Phase I Bulkhead
Jacksonville, Florida

Ellis & Associates Inc.
GEOTECHNICAL ENGINEERING & ENVIRONMENTAL SERVICES
CONSTRUCTION MATERIALS ENGINEERING AND TESTING

DATE: 11/7/01 | PROJ. NO: 01-1346 | Plate 1

011346p



FIELD EXPLORATION PLAN

Graphical Scale

0' 150' 300'

Reference:
Site plan provided by Bessent, Hammock & Ruckman, Inc.
(Last Dated May 4, 2001)

LEGEND

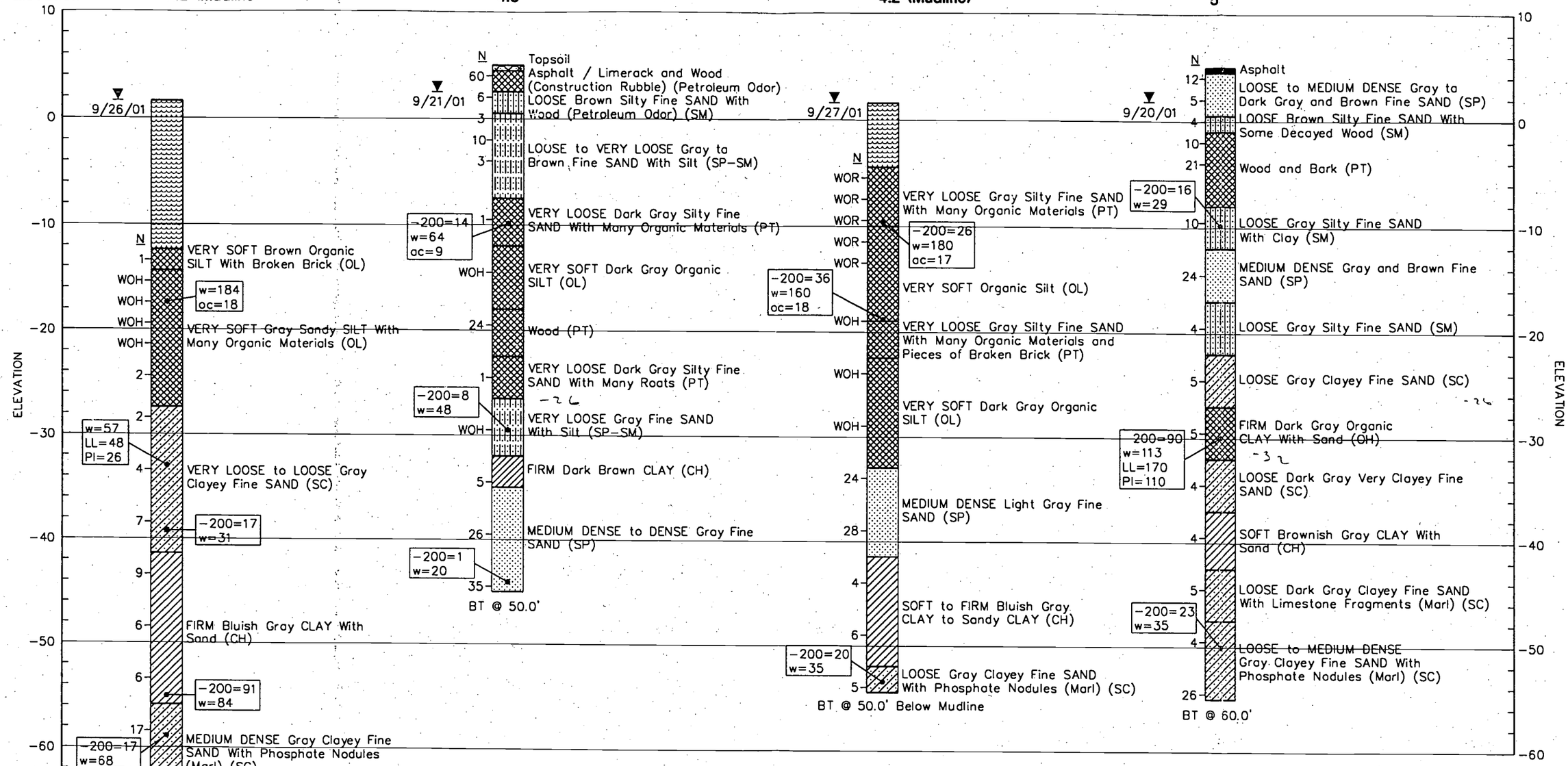
Approximate Location of Standard Penetration Test (SPT) Boring

011346s

Field Exploration Plan
Shipyard - Phase I Bulkhead
Jacksonville, Florida

Ellis & Associates Inc.
GEOTECHNICAL ENGINEERING ■ ENVIRONMENTAL SERVICES
CONSTRUCTION MATERIALS ENGINEERING AND TESTING

DATE: 11/7/01 | PROJ. NO: 01-1346 | Figure 2



LEGEND

- Water
- Fine SAND (SP)
- Fine SAND With Silt (SP-SM)
- Organic SILT, Sandy SILT With Many Organic Materials (OL), Silty Fine SAND With Many Roots and Organic Materials (PT), (Construction Rubble – Limerock and Bark), Wood (PT)
- Silty Fine SAND (SM)
- Clayey Fine SAND, Clayey Fine SAND With Phosphate Nodules and Limestone Fragments (Marl) (SC)
- CLAY, Sandy CLAY (CH)
- BT — Boring Terminated

- N — Standard Penetration Resistance, Blows/Foot
- ▼ — Groundwater Level at Time of Drilling
- WOH — Hammer Dropped by the Static Weight of Hammer and Rods Only
- WOR — Rod Dropped by Static Weight of the Rod Only
- SP — Unified Soil Classification System
- -200 — Percent Passing No. 200 U.S. Standard Sieve
- w — Natural Moisture Content (%)
- oc — Organic Content (%)
- LL — Liquid Limit
- PI — Plasticity Index

Note:
Elevation of the ground surface and mudline at each boring location was interpolated from the provided plan, and should be considered accurate only to the degree implied by the method used to locate the borings.

Generalized Subsurface Profiles
Shipyard - Phase I Bulkhead
Jacksanville, Florida

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GEOTECHNICAL ENGINEERING & ENVIRONMENTAL SERVICES
CONSTRUCTION MATERIALS ENGINEERING AND TESTING

DATE: 11/7/01 | PROJ. NO: 01-1346 | Figure 3

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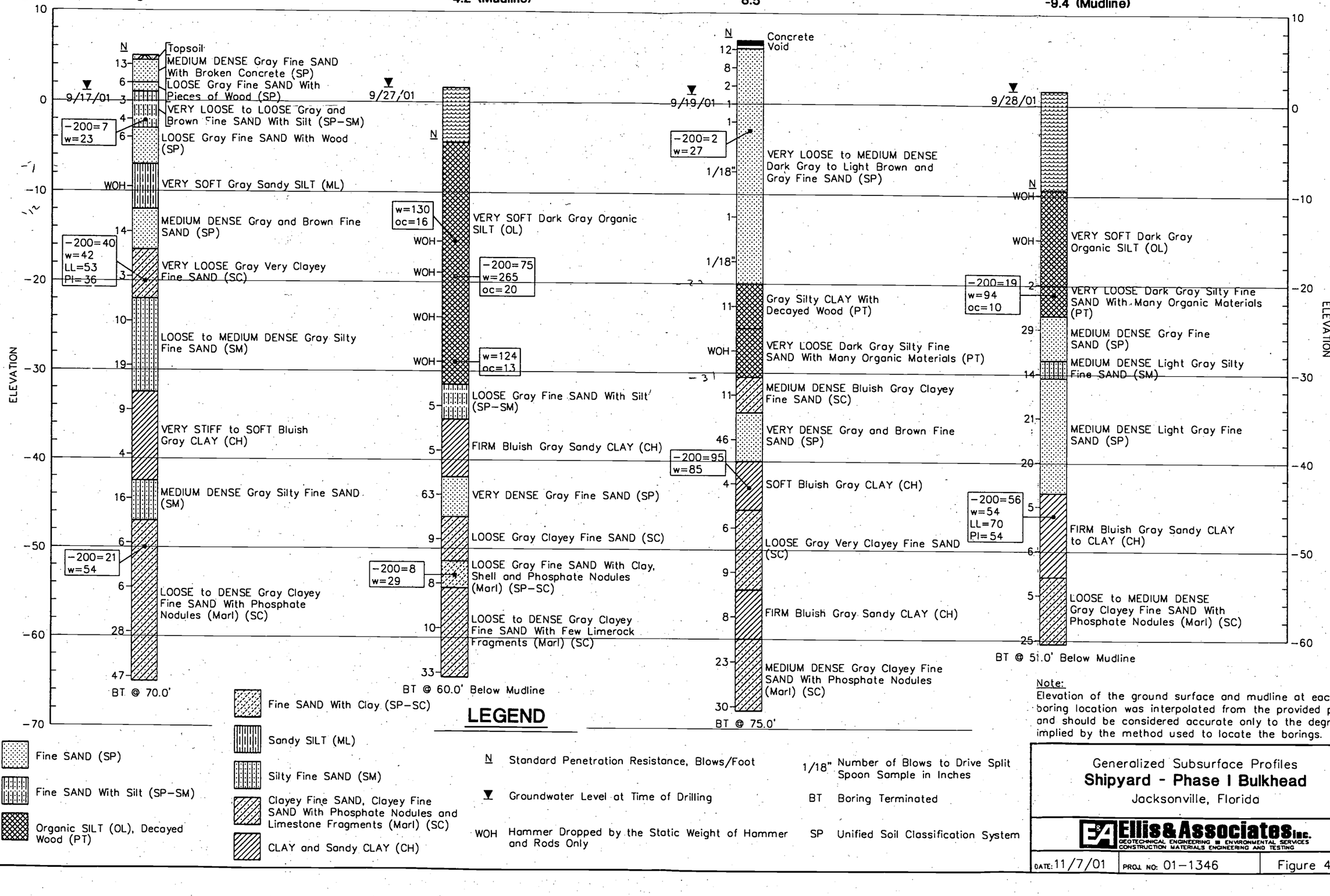

Note:
Elevation of the ground surface and mudline at each boring location was interpolated from the provided plan, and should be considered accurate only to the degree implied by the method used to locate the borings.

Generalized Subsurface Profiles
Shipyard - Phase I Bulkhead
Jacksonville, Florida

Ellis & Associates Inc.
GEOTECHNICAL ENGINEERING ■ ENVIRONMENTAL SERVICES
CONSTRUCTION MATERIALS ENGINEERING AND TESTING

DATE: 11/7/01 | PROJ. NO: 01-1346 | Figure 4

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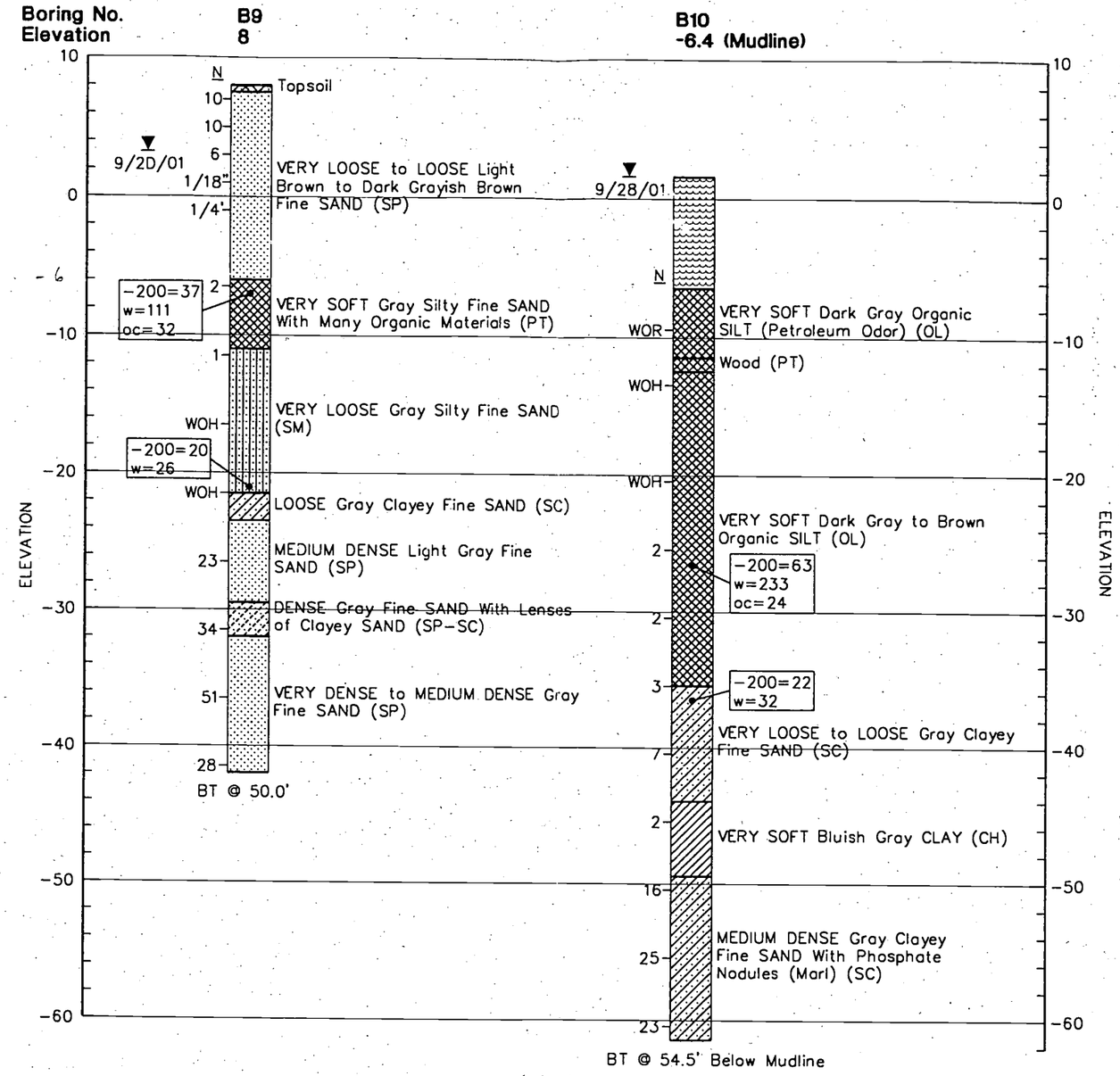

LEGEND

- Fine SAND (SP)
- Fine SAND With Fine Lenses of Clayey SAND (SP-SC)
- Organic SILT (OL), Silty Fine SAND With Many Organic Materials, Wood (PT)
- CLAY (CH)
- Water
- Silty Fine SAND (SM)
- Clayey Fine SAND, Clayey Fine SAND With Phosphate Nodules and Limestone Fragments (Marl) (SC)
- BT Boring Terminated

- N Standard Penetration Resistance, Blows/Foot
- ▼ Groundwater Level at Time of Drilling
- WOH Hammer Dropped by the Static Weight of Hammer and Rods Only
- SP Unified Soil Classification System
- 1/18" Number of Blows to Drive Split Spoon Sample in Inches or Feet
- -200 Percent Passing No. 200 U.S. Standard Sieve
- w Natural Moisture Content (%)
- oc Organic Content (%)

Note:
Elevation of the ground surface and mudline at each boring location was interpolated from the provided plan, and should be considered accurate only to the degree implied by the method used to locate the borings.

Generalized Subsurface Profiles
Shipyard - Phase I Bulkhead
Jacksonville, Florida

Ellis & Associates Inc.
GEOTECHNICAL ENGINEERING ■ ENVIRONMENTAL SERVICES
CONSTRUCTION MATERIALS ENGINEERING AND TESTING

DATE: 11/7/01 | PROJ. NO: 01-1346 | Figure 5

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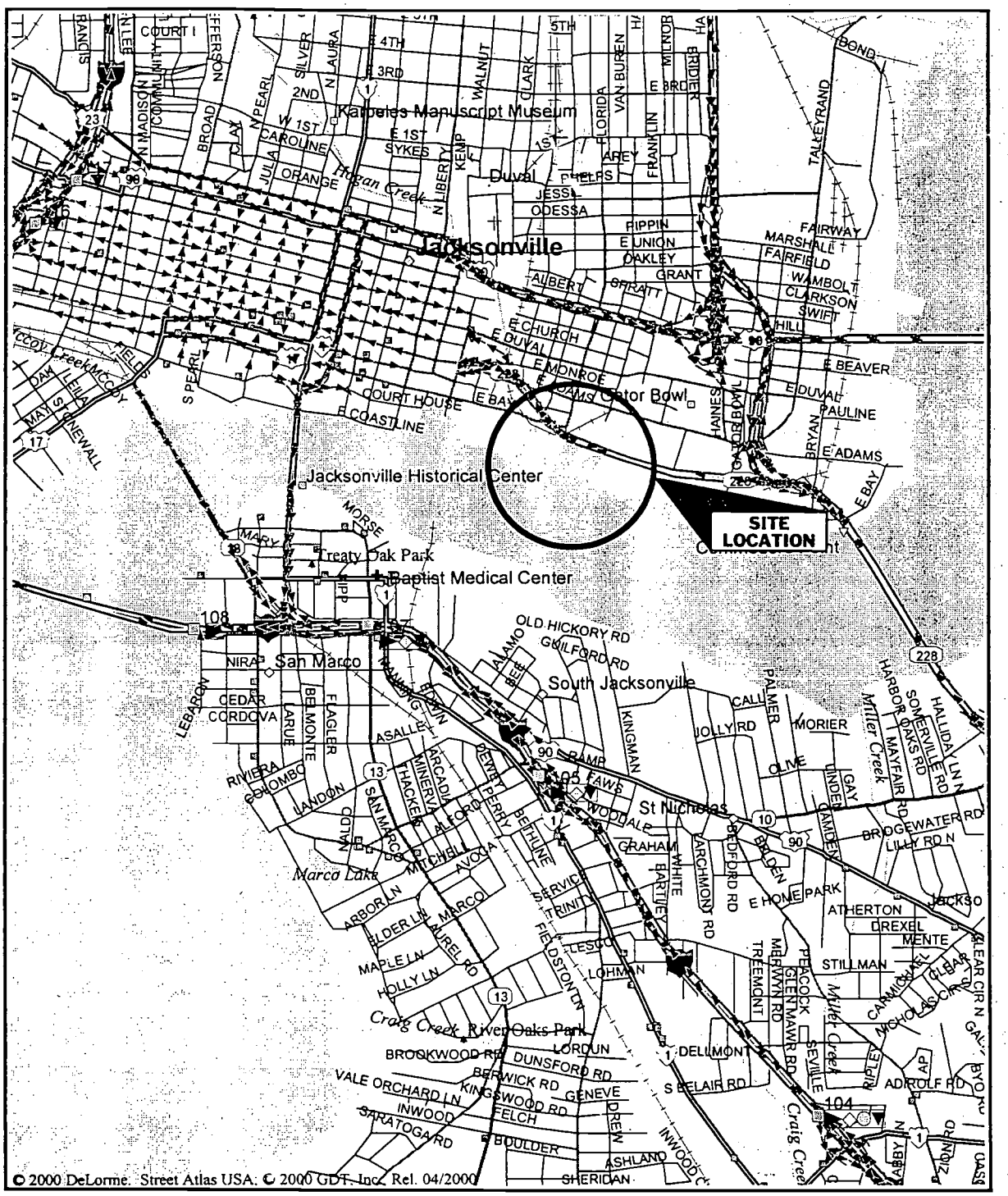
FIGURES



Reference:
DELORME Street Atlas USA
Dated 2000
Scale: 1" = .5 miles

Site Location Plan
Shipyard - Phase I Bulkhead
Jacksonville, Florida

Ellis & Associates Inc.
GEOTECHNICAL ENGINEERING ■ ENVIRONMENTAL SERVICES
CONSTRUCTION MATERIALS ENGINEERING AND TESTING

DATE: 11/8/01	PROJ. NO: 01-1346	Figure 1

011346v

APPENDIX A

SOIL BORING LOGS

Ellis & Associates Inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B1
Sheet 1 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Drill Rig: BK 51
Driller: D. Collier
Boring Location: See Field Exploration Plan
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/26/01
Boring Begun: 9/26/01
Boring Completed: 9/26/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	0		Water			
1	15		VERY SOFT Brown Organic SILT With Broken Brick (OL)	1		
2			VERY SOFT Gray Sandy SILT With Many Organic Materials (OL)	WOH		
3	20			WOH	17.8	
4				WOH		
5				WOH		
6	25					

PLASTIC LIMIT ○ | MOISTURE + CONTENT (%) | LIQUID LIMIT ◇

0 100 200

SHEAR STRENGTH KSF

- ⊙ Pocket Penetrometer Undisturbed Sample
- ◐ Pocket Penetrometer Disturbed Sample
- ▼ Torvane
- ● Unconfined Compression
- ⊠ Triaxial Compression

0 1 2

Ellis & Associates Inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B1
Sheet 2 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51 Driller: D. Collier
Drill Rod: AW Drill Mud: Super Gel-X
Casing Size: BW Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/26/01
Boring Begun: 9/26/01 Boring Completed: 9/26/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
6	25		VERY SOFT Gray Sandy SILT With Many Organic Materials (OL)	2		
7	30		VERY LOOSE to LOOSE Gray Clayey Fine SAND (SC)	2		
8	35			4		
9	40			7		17
10	45		FIRM Bluish Gray CLAY With Sand (CH)	9		
11	50			6		

PLASTIC LIMIT ○ MOISTURE + CONTENT (%) ◇ LIQUID LIMIT
0 100 200

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
◆ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

Ellis & Associates inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B1
Sheet 3 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51 Driller: D. Collier
Drill Rod: AW Drill Mud: Super Gel-X
Casing Size: BW Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/26/01 Boring Begun: 9/26/01 Boring Completed: 9/26/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	50		FIRM Bluish Gray CLAY With Sand (CH)	6		
12	55			6		90.5
			MEDIUM DENSE Gray Clayey Fine SAND With Black Phosphate Nodules (Marl) (SC)			
13	60			17		16.5
	65			20		
14			Boring Terminated At 66'			
	70					
	75					

PLASTIC LIMIT ○ | MOISTURE + CONTENT (%) | LIQUID LIMIT ◇

0 100 200

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
● Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression

0 1 2

Ellis & Associates Inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B2
Sheet 1 of 2

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51 Driller: S. Hall
Drill Rod: AW Drill Mud: Super Gel-X
Casing Size: BW Length of Casing:
Groundwater Depth: 2.5' Time: Drilling Date: 9/21/01
Boring Begun: 9/21/01 Boring Completed: 9/21/01

Surface Elevation: 4.5'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	0		Topsoil			
1			Asphalt / Limerock and Wood (Construction Rubble) (Petroleum Odor)	60		
2			LOOSE Brown Silty Fine SAND With Wood (Petroleum Odor) (SM)	6		
3	5		VERY LOOSE Gray Fine SAND With Silt (SP-SM)	3		
4			LOOSE to VERY LOOSE Brown Fine SAND With Silt (SP-SM)	10		
5	10			3		
6	15		VERY LOOSE Dark Gray Silty Fine SAND With Many Organic Materials (PT)	1	8.8	14.1
7	20		VERY SOFT Dark Gray Organic SILT (OL)	WOH		
8	25		Wood (PT)	24		

PLASTIC LIMIT ○ MOISTURE + CONTENT (%) ◇ LIQUID LIMIT
0 40 80

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
◆ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

Ellis & Associates Inc.

Project No.: 01-1346
Boring No.: B2
Sheet 2 of 2

LOG OF BORING

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51 Driller: S. Hall
Drill Rod: AW Drill Mud: Super Gel-X
Casing Size: BW Length of Casing:
Groundwater Depth: 2.5' Time: Drilling Date: 9/21/01
Boring Begun: 9/21/01 Boring Completed: 9/21/01

Surface Elevation: 4.5'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	25		Wood (PT)			
9	30		VERY LOOSE Dark Gray Silty Fine SAND With Many Roots (PT)	1		
10	35		VERY LOOSE Gray Fine SAND With Silt (SP-SM)	WOH		
11	40		FIRM Dark Brown CLAY (CH)	5		
12	45		MEDIUM DENSE to DENSE Gray Fine SAND (SP)	26		
13	50		Boring Terminated At 50'	35		1

PLASTIC LIMIT ○ MOISTURE + CONTENT (%) 0 40 80 ◇ LIQUID LIMIT

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
⊙ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

Ellis & Associates inc.

Project No.: 01-1346
Boring No.: B3
Sheet 1 of 3

LOG OF BORING

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 81 Driller: D. Collier
Drill Rod: AW Drill Mud: Super Gel-X
Casing Size: BW Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/27/01
Boring Begun: 9/27/01 Boring Completed: 9/27/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	0		Water			
	5					
1			VERY LOOSE Gray Silty Fine SAND With Many Organic Materials (PT)	WOR		
2	10			WOR		
3			VERY SOFT Gray Organic SILT (OL)	WOR	17	26
4				WOR		
5	15			WOR		
6	20			WOH		
			VERY LOOSE Gray Silty Fine SAND With Many Organic Materials and Pieces of Broken Brick (PT)			
7	25		VERY SOFT Dark Gray Organic SILT (OL)	WOH		

PLASTIC LIMIT ○ | MOISTURE + CONTENT (%) | LIQUID LIMIT ◇

0 100 200

SHEAR STRENGTH KSF

⊙ Pocket Penetrometer Undisturbed Sample
⊗ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression

0 1 2

Ellis & Associates Inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B3
Sheet 2 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Drill Rig: BK 81
Driller: D. Collier
Boring Location: See Field Exploration Plan
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/27/01
Boring Begun: 9/27/01
Boring Completed: 9/27/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
7	25		VERY SOFT Dark Gray Organic SILT (OL)	WOH		
8	30			WOH	18	36
9	35		MEDIUM DENSE Light Gray Fine SAND (SP)	24		
10	40			28		
			SOFT Bluish Gray CLAY (CH)			
11	45			4		
			FIRM Bluish Gray Sandy CLAY (CH)			
12	50			6		

PLASTIC LIMIT ○ | MOISTURE + CONTENT (%) | LIQUID LIMIT ◇

0 100 200

SHEAR STRENGTH KSF

0 1 2

- ⊙ Pocket Penetrometer Undisturbed Sample
- ⊗ Pocket Penetrometer Disturbed Sample
- ▼ Torvane
- ● Unconfined Compression
- ⊠ Triaxial Compression

Ellis & Associates Inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B3
Sheet 3 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Drill Rig: BK 81
Driller: D. Collier
Boring Location: See Field Exploration Plan
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/27/01
Boring Begun: 9/27/01
Boring Completed: 9/27/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
12	50		FIRM Bluish Gray Sandy CLAY (CH)	6		
13	55		LOOSE Gray Clayey Fine SAND With Phosphate Nodules (Marl) (SC)	5		20
			Boring Terminated At 56'			
	60					
	65					
	70					
	75					

PLASTIC LIMIT ○ — MOISTURE + CONTENT (%) — LIQUID LIMIT ◇ (0, 100, 200)

SHEAR STRENGTH KSF (0, 1, 2)
⊙ Pocket Penetrometer Undisturbed Sample
● Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression

Ellis & Associates Inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B4
Sheet 1 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51 Driller: S. Hall
Drill Rod: AW Drill Mud: Super Gel-X
Casing Size: BW Length of Casing:
Groundwater Depth: 3.2' Time: Drilling Date: 9/20/01
Boring Begun: 9/20/01 Boring Completed: 9/20/01

Surface Elevation: 5.0'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	0		Asphalt			
1			MEDIUM DENSE Gray and Dark Gray Fine SAND (SP)	12		
2			LOOSE Brown Fine SAND (SP)	5		
3	5		LOOSE Brown Silty Fine SAND With Some Decayed Wood (SM)	4		
4			Wood and Bark (PT)	10		
5	10			21		
6	15		LOOSE Gray Silty Fine SAND With Clay (SM)	10		16
7	20		MEDIUM DENSE Gray and Brown Fine SAND (SP)	24		
8	25		LOOSE Gray Silty Fine SAND (SM)	4		

PLASTIC LIMIT ○ MOISTURE + CONTENT (%) ◇ LIQUID LIMIT
0 100 200

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
⊗ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

Ellis & Associates inc.

Project No.: 01-1346
Boring No.: B4
Sheet 2 of 3

LOG OF BORING

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51 Driller: S. Hall
Drill Rod: AW Drill Mud: Super Gel-X
Casing Size: BW Length of Casing:
Groundwater Depth: 3.2' Time: Drilling Date: 9/20/01
Boring Begun: 9/20/01 Boring Completed: 9/20/01

Surface Elevation: 5.0'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	25		LOOSE Gray Silty Fine SAND (SM)			
9	30		LOOSE Gray Clayey Fine SAND (SC)	5		
10	35		FIRM Dark Gray Organic CLAY With Sand (OH)	5		89.9
11	40		LOOSE Dark Gray Very Clayey Fine SAND (SC)	4		
12	45		SOFT Brownish Gray CLAY With Sand (CH)	4		
13	50		LOOSE Dark Gray Clayey Fine SAND With Limestone Fragments (Marl) (SC)	5		

PLASTIC LIMIT ○ — MOISTURE + CONTENT (%) — LIQUID LIMIT ◇
0 100 200

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
◉ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

Ellis & Associates Inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B4
Sheet 3 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51
Driller: S. Hall
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: 3.2' Time: Drilling Date: 9/20/01
Boring Begun: 9/20/01
Boring Completed: 9/20/01

Surface Elevation: 5.0'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	50		LOOSE Dark Gray Clayey Fine SAND With Limestone Fragments (Marl) (SC)			
14	55		LOOSE to MEDIUM DENSE Gray Clayey Fine SAND With Phosphate Nodules (Marl) (SC)	4		23.4
15	60			26		
			Boring Terminated At 60'			
	65					
	70					
	75					

PLASTIC LIMIT ○ — MOISTURE + CONTENT (%) — LIQUID LIMIT ◇ (0, 100, 200)

SHEAR STRENGTH KSF (0, 1, 2)
⊙ Pocket Penetrometer Undisturbed Sample
⊛ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression

Ellis & Associates inc.

Project No.: 01-1346
Boring No.: B5
Sheet 1 of 3

LOG OF BORING

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51 Driller: S. Hall
Drill Rod: AW Drill Mud: Super Gel-X
Casing Size: BW Length of Casing:
Groundwater Depth: 3.9' Time: Drilling Date: 9/17/01
Boring Begun: 9/17/01 Boring Completed: 9/17/01

Surface Elevation: 5.0'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	0		Topsoil			
1			MEDIUM DENSE Gray Fine SAND With Broken Concrete (SP)	13		
2			LOOSE Gray Fine SAND With Pieces of Wood (SP)	6		
3	5		VERY LOOSE to LOOSE Gray and Brown Fine SAND With Silt (SP-SM)	3		
4				4		7.4
5			LOOSE Gray Fine SAND With Wood (SP)	6		
	10					
			VERY SOFT Gray Sandy SILT (ML)			
6				WOH		
	15					
			MEDIUM DENSE Gray and Brown Fine SAND (SP)			
7				14		
	20					
			VERY LOOSE Gray Very Clayey Fine SAND (SC)			
8				3		39.6
	25					

PLASTIC LIMIT ○ MOISTURE + CONTENT (%) ◇ LIQUID LIMIT
0 20 40 60

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
⊗ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

Ellis & Associates inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B5
Sheet 2 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51
Driller: S. Hall
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: 3.9' Time: Drilling Date: 9/17/01
Boring Begun: 9/17/01
Boring Completed: 9/17/01

Surface Elevation: 5.0'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	25		VERY LOOSE Gray Very Clayey Fine SAND (SC)			39.6
9	30		LOOSE to MEDIUM DENSE Gray Silty Fine SAND (SM)	10		
10	35			19		
11	40		STIFF to SOFT Bluish Gray CLAY (CH)	9		
12	45			4		
13	50		MEDIUM DENSE Gray Silty Fine SAND (SM)	16		

PLASTIC LIMIT ○ MOISTURE + CONTENT (%) ◇ LIQUID LIMIT
0 20 40 60

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
◉ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

Ellis & Associates Inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B5
Sheet 3 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51
Driller: S. Hall
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: 3.9' Time: Drilling Date: 9/17/01
Boring Begun: 9/17/01
Boring Completed: 9/17/01

Surface Elevation: 5.0'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	50		MEDIUM DENSE Gray Silty Fine SAND (SM)			
14	55		LOOSE to DENSE Gray Clayey Fine SAND With Phosphate Nodules (Marl) (SC)	6		21.1
15	60			6		
16	65			28		
17	70		Boring Terminated At 70'	47		
	75					

PLASTIC LIMIT ○ — MOISTURE + CONTENT (%) — LIQUID LIMIT ◇

0 20 40 60

SHEAR STRENGTH KSF

- ⊙ Pocket Penetrometer Undisturbed Sample
- ◈ Pocket Penetrometer Disturbed Sample
- ▼ Torvane
- ● Unconfined Compression
- ⊠ Triaxial Compression

0 1 2

Ellis & Associates inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B6
Sheet 1 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51
Driller: S. Hall
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/277/01
Boring Begun: 9/27/01
Boring Completed: 9/27/01

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE	PLASTIC LIMIT ○ / MOISTURE + CONTENT (%) / LIQUID LIMIT ◇	SHEAR STRENGTH KSF
	0		Surface Elevation: 0.8'				0 100 200 300	0 1 2
			Water					
	5							
1			VERY SOFT Dark Gray Organic SILT (OL)	WOR	15.6		+	
	10							
2								
	15			WOH				
3	20			WOH	19.7	74.5	+	
4	25			WOH				

Shear Strength KSF: ○ Pocket Penetrometer Undisturbed Sample; ● Pocket Penetrometer Disturbed Sample; ▼ Torvane; ● Unconfined Compression; ⊠ Triaxial Compression

Ellis & Associates inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B6
Sheet 2 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Drill Rig: BK 51
Driller: S. Hall
Boring Location: See Field Exploration Plan
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/27/01
Boring Begun: 9/27/01
Boring Compieted: 9/27/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
4	25		VERY SOFT Dark Gray Organic SILT (OL)	WOH		
5	30			WOH	13.3	
			LOOSE Gray Fine SAND With Silt (SP-SM)			
6	35			5		
			FIRM Bluish Gray Sandy CLAY (CH)			
7	40			5		
			VERY DENSE Gray Fine SAND (SP)			
8	45			63		
			LOOSE Gray Clayey Fine SAND (SC)			
9	50			9		

PLASTIC LIMIT ○ — MOISTURE + CONTENT (%) — LIQUID LIMIT ◇
0 100 200 300

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
● Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

Ellis & Associates Inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B6
Sheet 3 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Drill Rig: BK 51
Driller: S. Hall
Boring Location: See Field Exploration Plan
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/277/01
Boring Begun: 9/27/01
Boring Completed: 9/27/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
9	50		LOOSE Gray Clayey Fine SAND (SC)	9		
10	55		LOOSE Gray Fine SAND With Clay, Shell and Phosphate Nodules (Marl) (SP-SC)	8		7.7
11	60		LOOSE to MEDIUM DENSE Gray Clayey Fine SAND With Few Limestone Fragments (Marl) (SC)	10		
12	65			33		
			Boring Terminated At 66'			
	70					
	75					

PLASTIC LIMIT ○ — MOISTURE + CONTENT (%) — LIQUID LIMIT ◇
0 100 200 300

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
◆ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

Ellis & Associates Inc.

Project No.: 01-1346
Boring No.: B7
Sheet 1 of 3

LOG OF BORING

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Drill Rig: BK 51
Driller: S. Hall
Boring Location: See Field Exploration Plan
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: 6.0' Time: Drilling Date: 9/19/01
Boring Begun: 9/19/01
Boring Completed: 9/19/01

Surface Elevation: 8.5'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	0		Concrete			
1				12		
			MEDIUM DENSE Dark Gray Fine SAND (SP)			
2				8		
			LOOSE to VERY LOOSE Light Brown Fine SAND (SP)			
3	5			2		
4				1		
5			VERY LOOSE Light Brown Fine SAND (SP)	1		1.9
	10					
			VERY LOOSE Gray Fine SAND (SP)			
6				1/18"		
	15					
7				1		
	20					
			VERY LOOSE Dark Gray and Gray Fine SAND (SP)			
8				1/18"		
	25					

PLASTIC LIMIT ○ | MOISTURE + CONTENT (%) | LIQUID LIMIT ◇

0 50 100

SHEAR STRENGTH KSF

⊙ Pocket Penetrometer Undisturbed Sample
⊗ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression

0 1 2

Ellis & Associates inc.

Project No.: 01-1346
Boring No.: B7
Sheet 2 of 3

LOG OF BORING

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51
Driller: S. Hall
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: 6.0' Time: Drilling Date: 9/19/01
Boring Begun: 9/19/01
Boring Completed: 9/19/01

Surface Elevation: 8.5'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	25		VERY LOOSE Dark Gray and Gray Fine SAND (SP)			
9	30		Gray Silty CLAY With Decayed Wood (PT)	11		
10	35		VERY LOOSE Dark Gray Silty Fine SAND With Many Organic Materials (PT)	WOH		
11	40		MEDIUM DENSE Bluish Gray Clayey Fine SAND (SC)	11		
12	45		VERY DENSE Gray and Brown Fine SAND (SP)	46		
13	50		SOFT Bluish Gray CLAY (CH)	4		94.6

PLASTIC LIMIT ○ MOISTURE + CONTENT (%) ◇ LIQUID LIMIT
0 50 100

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
● Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

Ellis & Associates inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B7
Sheet 3 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51
Driller: S. Hall
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: 6.0' Time: Drilling Date: 9/19/01
Boring Begun: 9/19/01
Boring Completed: 9/19/01

Surface Elevation: 8.5'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	50		SOFT Bluish Gray CLAY (CH)			94.6
14	55		LOOSE Gray Very Clayey Fine SAND (SC)	6		
15	60			9		
			FIRM Bluish Gray Sandy CLAY (CH)			
16	65			8		
			MEDIUM DENSE Gray Clayey Fine SAND With Phosphate Nodules (Marl) (SC)			
17	70			23		
18	75		Boring Terminated At 75'	30		

PLASTIC LIMIT ○ | MOISTURE + CONTENT (%) | LIQUID LIMIT ◇

0 50 100

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
⊗ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression

0 1 2

Ellis & Associates inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B8
Sheet 1 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 81
Driller: D. Collier
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/28/01
Boring Begun: 9/28/01
Boring Completed: 9/28/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	0		Water			
1	5		VERY SOFT Dark Gray Organic SILT (OL)	WOH		
2						
3	10					
4	15			WOH		
5						
6	20		Dark Gray Silty Fine SAND With Many Organic Materials (PT)	2	10	19
	25					

PLASTIC LIMIT ○ | MOISTURE + CONTENT (%) | LIQUID LIMIT ◇

0 50 100

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
◆ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression

0 1 2

Ellis & Associates Inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B8
Sheet 2 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Drill Rig: BK 81
Driller: D. Collier
Boring Location: See Field Exploration Plan
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/28/01
Boring Begun: 9/28/01
Boring Completed: 9/28/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
7	25		MEDIUM DENSE Gray Fine SAND (SP)	29		
8	30		MEDIUM DENSE Light Gray Silty Fine SAND (SM)	14		
9	35		MEDIUM DENSE Light Gray Fine SAND (SP)	21		
10	40			20		
11	45		FIRM Bluish Gray Sandy CLAY (CH)	5		56
	50					

PLASTIC LIMIT ○ MOISTURE + CONTENT (%) LIQUID LIMIT ◇

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
◐ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression

Ellis & Associates inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B8
Sheet 3 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 81 Driller: D. Collier
Drill Rod: AW Drill Mud: Super Gel-X
Casing Size: BW Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/28/01
Boring Begun: 9/28/01 Boring Completed: 9/28/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	50		FIRM Bluish Gray Sandy CLAY (CH)			
12			FIRM Gray CLAY (CH)	6		
	55		Light Organic Materials MEDIUM DENSE Gray Clayey Fine SAND With Phosphate Nodules (Marl) (SC)			
13				5		
	60					
14				25		
			Boring Terminated At 62'			
	65					
	70					
	75					

PLASTIC LIMIT ○ MOISTURE + CONTENT (%) ◇ LIQUID LIMIT
0 50 100

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
⊙ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

Ellis & Associates inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B9
Sheet 1 of 2

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: ATV
Driller: D. Smith
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: 4.8' Time: Drilling Date: 9/20/01
Boring Begun: 9/20/01
Boring Completed: 9/20/01

Surface Elevation: 8.0'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOUT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	0		Topsoil			
1			LOOSE Light Brown Fine SAND (SP)	10		
2			LOOSE Dark Grayish Brown Fine SAND (SP)	10		
3	5		LOOSE to VERY LOOSE Light Brown Fine SAND (SP)	6		
4				1/18"		
5				1/4'		
6	15		VERY LOOSE Gray Silty Fine SAND With Many Organic Materials (PT)	2	32.3	37.1
7	20		VERY LOOSE Gray Silty Fine SAND (SM)	1		
8	25			WOH		

PLASTIC LIMIT ○ — MOISTURE + CONTENT (%) — LIQUID LIMIT ◇
0 50 100 150

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
● Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

Ellis & Associates inc.

Project No.: 01-1346
Boring No.: B9
Sheet 2 of 2

LOG OF BORING

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Drill Rig: ATV
Driller: D. Smith
Boring Location: See Field Exploration Plan
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: 4.8' Time: Drilling Date: 9/20/01
Boring Begun: 9/20/01
Boring Completed: 9/20/01

Surface Elevation: 8.0'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE	PLASTIC LIMIT ○ / MOISTURE + CONTENT (%) / LIQUID LIMIT ◇ (0 50 100 150)	SHEAR STRENGTH KSF (0 1 2)
	25		VERY LOOSE Gray Silty Fine SAND (SM)					
9	30		LOOSE Gray Clayey Fine SAND (SC)	WOH		19.6	+	
			MEDIUM DENSE Light Gray Fine SAND (SP)					
10	35			23				
			DENSE Gray Fine SAND With Lenses of Clayey SAND (SP-SC)					
11	40			34				
			VERY DENSE to MEDIUM DENSE Gray Fine SAND (SP)					
12	45			51				
13	50		Boring Terminated At 50'	28				

SHEAR STRENGTH KSF
○ Pocket Penetrometer Undisturbed Sample
● Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression

Ellis & Associates inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B10
Sheet 1 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51
Driller: S. Hall
Drill Rod: AW
Drill Mud: Super Gel-X
Casing Size: BW
Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/28/01
Boring Begun: 9/28/01
Boring Completed: 9/28/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	0		Water			
	5					
	10		VERY SOFT Dark Gray Organic SILT (Petroleum Odor) (OL)			
1				WOR		
			Wood (PT)			
2	15		VERY SOFT Dark Gray Organic SILT (OL)	WOH		
3						
	20					
4				WOH		
	25					

PLASTIC LIMIT ○ — MOISTURE + CONTENT (%) — LIQUID LIMIT ◇
0 100 200 300

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
◉ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression
0 1 2

Ellis & Associates inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B10
Sheet 2 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51 Driller: S. Hall
Drill Rod: AW Drill Mud: Super Gel-X
Casing Size: BW Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/28/01
Boring Begun: 9/28/01 Boring Completed: 9/28/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE
	25		VERY SOFT Dark Gray Organic SILT (OL)			
5			VERY SOFT Brown Organic SILT (OL)	2	33.7	62.6
	30					
6				2		
	35					
7			VERY LOOSE to LOOSE Gray Clayey Fine SAND (SC)	3		21.5
	40					
8				7		
	45					
9			VERY SOFT Bluish Gray CLAY (CH)	2		
	50					

PLASTIC LIMIT ○ | MOISTURE + CONTENT (%) | LIQUID LIMIT ◇

0 100 200 300

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
◐ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression

0 1 2

Ellis & Associates inc.

LOG OF BORING

Project No.: 01-1346
Boring No.: B10
Sheet 3 of 3

Project: Shipyard - Phase I Bulkhead
Client: TriLegacy
Boring Location: See Field Exploration Plan
Drill Rig: BK 51 Driller: S. Hall
Drill Rod: AW Drill Mud: Super Gel-X
Casing Size: BW Length of Casing:
Groundwater Depth: ____ Time: Drilling Date: 9/28/01
Boring Begun: 9/28/01 Boring Completed: 9/28/01

Surface Elevation: 0.8'

SAMPLE NO.	DEPTH, FEET	SAMPLE TYPE	DESCRIPTION	BLOWS PER FOOT	PERCENT ORGANIC MATERIAL	PERCENT PASSING NO. 200 SIEVE	PLASTIC LIMIT ○ / MOISTURE + CONTENT (%) / LIQUID LIMIT ◇	SHEAR STRENGTH KSF
	50		VERY SOFT Bluish Gray CLAY (CH)				0 100 200 300	0 1 2
10			MEDIUM DENSE Gray Clayey Fine SAND With Phosphate Nodules (Marl) (SC)	16				
	55							
11				25				
	60							
12				23				
			Boring Terminated At 63'					
	65							
	70							
	75							

SHEAR STRENGTH KSF
⊙ Pocket Penetrometer Undisturbed Sample
◉ Pocket Penetrometer Disturbed Sample
▼ Torvane
● Unconfined Compression
⊠ Triaxial Compression

FIELD EXPLORATION PROCEDURES

Standard Penetration Test (SPT) Borings

The Standard Penetration Test (SPT) borings were made in general accordance with the latest revision of ASTM D 1586, "Penetration Test and Split-Barrel Sampling of Soils". The borings were advanced by rotary (or "wash-n-chop") drilling techniques. At 2 1/2 to 5 foot intervals, a split-barrel sampler inserted to the borehole bottom and driven 18 inches into the soil using a 140 pound hammer falling on the average 30 inches per hammer blow. The number of hammer blows for the final 12 inches of penetration is termed the "penetration resistance, blow count, or N-value". This value is an index to several in-place geotechnical properties of the material tested, such as relative density and Young's Modulus.

After driving the sampler 18 inches (or less if in hard rock-like material), the sampler was retrieved from the borehole and representative samples of the material within the split-barrel were containerized and sealed. After completing the drilling operations, the samples for each boring were transported to our laboratory where they were examined by our engineer in order to verify the driller's field classification. The retrieved samples will be kept in our facility for a period of six (6) months unless directed otherwise.

APPENDIX B

LABORATORY DATA

Ellis & Associates Inc.
GEOTECHNICAL ENGINEERING ■ ENVIRONMENTAL SERVICES
CONSTRUCTION MATERIALS ENGINEERING AND TESTING

SUMMARY OF LABORATORY TEST RESULTS

Project: Shipyard - Phase I
Client: TriLegacy Group, LLC
Project No.: 01-1346

Boring/ Sample No.	Sample Depth (ft.)	Organic Content %	Fines Content %	Natural Moisture Content %	Atterberg Limits			Pocket Pen. (tsf)
					Liquid Limit %	Plastic Limit %	Plasticity Index	
B1/3	19	18		184				
B1/8	35			57	48	22	26	
B1/9	40		17	31				
B1/12	55		90	84				
B1/13	60		16	68				
B2/6	15	9	14	64				
B2/10	35		8	48				
B2/13	50		1	20				
B3/3	12	17	26	180				
B3/8	30	18	36	160				
B3/13	55		20	35				
B4/6	15		16	29				
B4/10	35		90	113	170	60	110	
B4/14	55		23	35				
B4/15	60		15	39				
B5/4	7		7	23				
B5/8	25		40	42	53	17	36	
B5/14	55		21	54				
B6/1	8	16		130				
B6/3	20	20	75	265				
B6/5	30	13		124				
B6/10	55		8	29				
B7/5	9		2	27				
B7/13	50		95	85				
B8/6	21	10	19	94				
B8/11	46		56	53	70	16	54	
B9/6	15	32	37	111				
B9/9	29		20	26				
B10/5	27	34	63	233				
B10/7	37		22	32				

CORROSION SERIES TEST RESULTS

Shipyard – Phase I
Jacksonville, Florida
E&A Project No. 01-1346

Boring/ Sample	Approximate test depth below existing grade (feet)	Soil Stratum	Chlorides (mg/Kg)	Resistivity (ohm-cm)	Sulfates (mg/Kg)	pH
B2/4	7.0	SP-SM	30U	6,000	54	7.3
B5/9	30.0	SM	32I	2,000	81	7.2
B6/4	25.0*	SP-SM	1,400	160	180	7.4
B7/10	35.0*	PT	82	830	9.0U	7.8
B8/14	61.0*	SC	32I	2,100	120	7.6

* Depth Below Mudline

(1) (U) = Compound was analyzed for but not detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

(2) (I) = Analyte detected; value is between the Method Detection Level (MDL) and the Practical Quantitation Level (PQL).

LABORATORY TEST PROCEDURES

Percent Fines Content

The percent fines or material passing the No. 200 mesh sieve of the sample tested was determined in general accordance with the latest revision of ASTM D 1140. The percent fines are the soil particles in the silt and clay size range.

Natural Moisture Content

The water content of the sample tested was determined in general accordance with the latest revision of ASTM D 2216. The water content is defined as the ratio of "pore" or "free" water in a given mass of material to the mass of solid material particles.

Organic Loss on Ignition (Percent Organics)

The organic loss on ignition or percent organic material in the sample tested was determined in general accordance with ASTM D 2974. The percent organics is the material, expressed as a percentage, which is burned off in a muffle furnace at 445±10 degrees Celcius.

Atterberg Limits

The Atterberg Limits consist of the Liquid Limit (LL) and the Plastic Limit (PL). The LL and PL were determined in general accordance with the latest revision of ASTM D 4318. The LL is the water content of the material denoting the boundary between the liquid and plastic states. The PL is the water content denoting the boundary between the plastic and semi-solid states. The Plasticity Index (PI) is the range of water content over which a soil behaves plastically and is denoted numerically by the difference between the LL and the PL. The water content of the sample tested was determined in general accordance with the latest revision of ASTM D 2216. The water content is defined as the ratio of "pore" or "free" water in a given mass of material to the mass of solid material particles.

Ellis & Associates Inc.
GEOTECHNICAL ENGINEERING ■ ENVIRONMENTAL SERVICES
CONSTRUCTION MATERIALS ENGINEERING AND TESTING

KEY TO SOIL CLASSIFICATION

Description of Compactness or Consistency in Relation To Standard Penetration Resistance

COARSE GRAINED SOILS (Sands and Gravels)	
N-Value	**Compactness**
0 - 3	Very Loose
4 - 10	Loose
11 - 30	Medium Dense
31 - 50	Dense
51 and Greater	Very Dense

FINE GRAINED SOILS (Silts and Clays)	
N-Value	**Compactness**
0 - 1	Very Soft
2 - 4	Soft
5 - 8	Firm
9 - 15	Stiff
16 - 30	Very Stiff
31 and Greater	Hard

DESCRIPTION OF SOIL COMPOSITION**

(Unified Soil Classification System)

MAJOR DIVISION		Group Symbol	LABORATORY CLASSIFICATION CRITERIA		SOIL DESCRIPTION
			FINER THAN 200 SIEVE %	SUPPLEMENTARY REQUIREMENTS	
Coarse grained (over 50% by weight coarser than No. 200 sieve)	Gravelly soils (over half of coarse fraction larger than No. 4)	GW	0 - 5*	D_{60}/D_{10} greater than 4, $D_{30}^2/(D_{60} \times D_{10})$ between 1 & 3	Well graded gravels, sandy gravels
		GP	0 - 5*	Not meeting above gradation for GW	Gap graded or uniform gravels, sandy gravels
		GM	12 or more*	PI less than 4 or below A-line	Silty gravels, silty sandy gravels
		GC	12 or more*	PI over 7 above A-line	Clayey gravels, clayey sandy gravels
	Sandy soils (over half of coarse fraction finer than No. 4)	SW	0 - 5*	D_{60}/D_{10} greater than 6, $D_{30}^2/(D_{60} \times D_{10})$ between 1 & 3	Well graded sands, gravelly sands
		SP	0 - 5*	Not meeting above gradation requirements	Gap graded or uniform sands, gravelly sands
		SM	12 or more*	PI less than 4 or below A-line	Silty sands, silty gravelly sands
		SC	12 or more*	PI over 7 and above A-line	Clayey sands, clayey gravelly sands
Fine grained (over 50% by weight finer than No. 200 sieve)	Low compressibility (liquid limit less than 50)	ML	Plasticity chart		Silts, very fine sands, silty or clayey fine sands, micaceous silts
		CL	Plasticity chart		Low plasticity clays, sandy or silty clays
		OL	Plasticity chart, organic odor or color		Organic silts and clays of low plasticity
	High compressibility (liquid limit more than 50)	MH	Plasticity chart		Micaceous silts, diatomaceous silts, volcanic ash
		CH	Plasticity chart		Highly plastic clays and sandy clays
		OH	Plasticity chart, organic odor or color		Organic silts and clays of high plasticity
Soils with fibrous organic matter		Pt	Fibrous organic matter; will char, burn or glow		Peat, sandy peats, and clayey peat

* For soils having 5 to 12 percent passing the No. 200 sieve, use a dual symbol such as GW-GC.

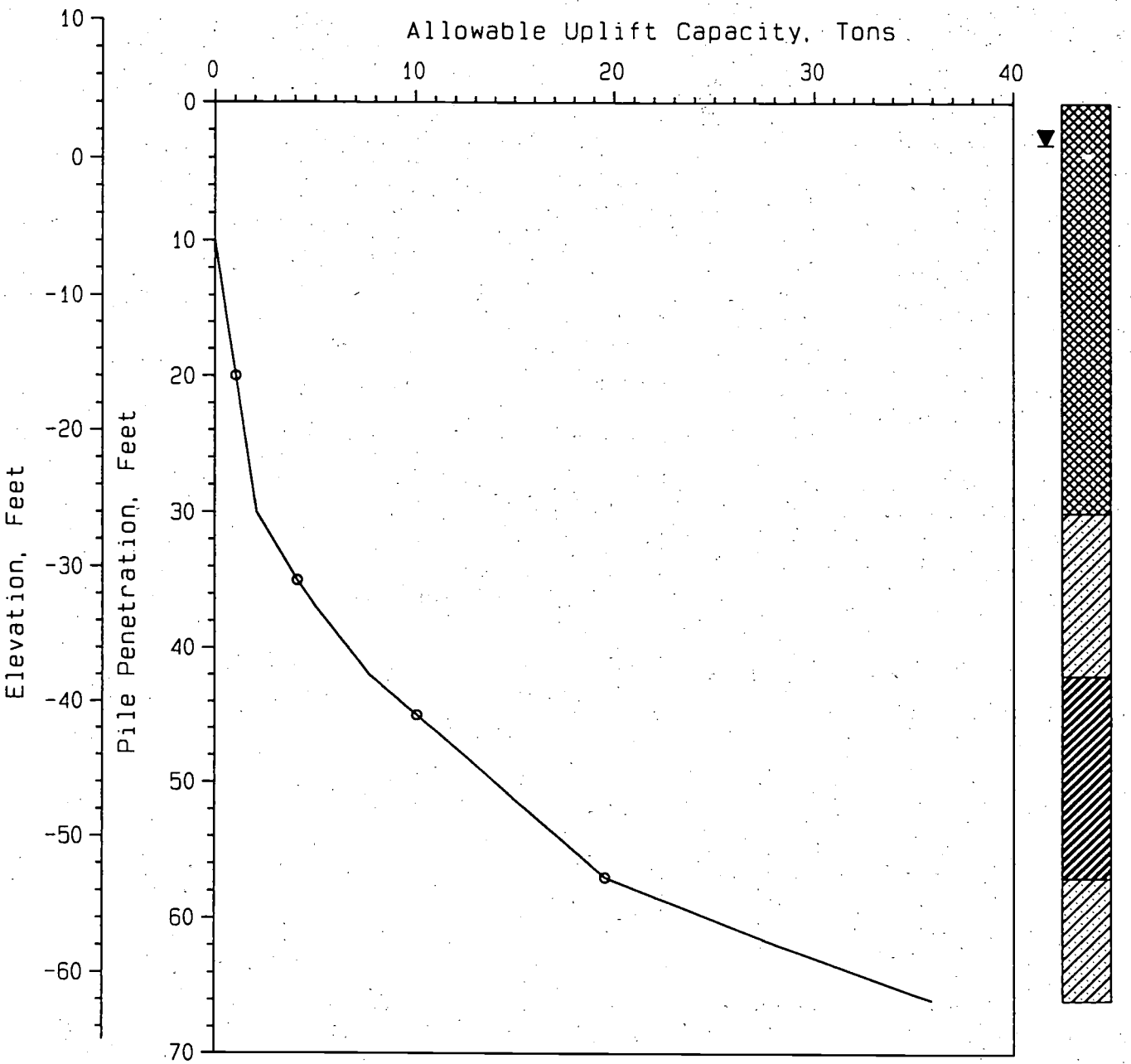
** Standard Classification of Soils for Engineering Purposes (ASTM D 2487)

SAND DESCRIPTION MODIFIERS	
Modifier	**Fines Content**
With	5% to 12%
(No Modifier)	13% to 30%
Very	31% to 50%

ORGANIC MATERIAL MODIFIERS	
Modifier	**Organic Content**
Trace	1% to 2%
Few	2% to 4%
Some	4% to 8%
Many	>8%

APPENDIX C

BULKHEAD ANCHOR PILE
UPLIFT CAPACITY CURVES



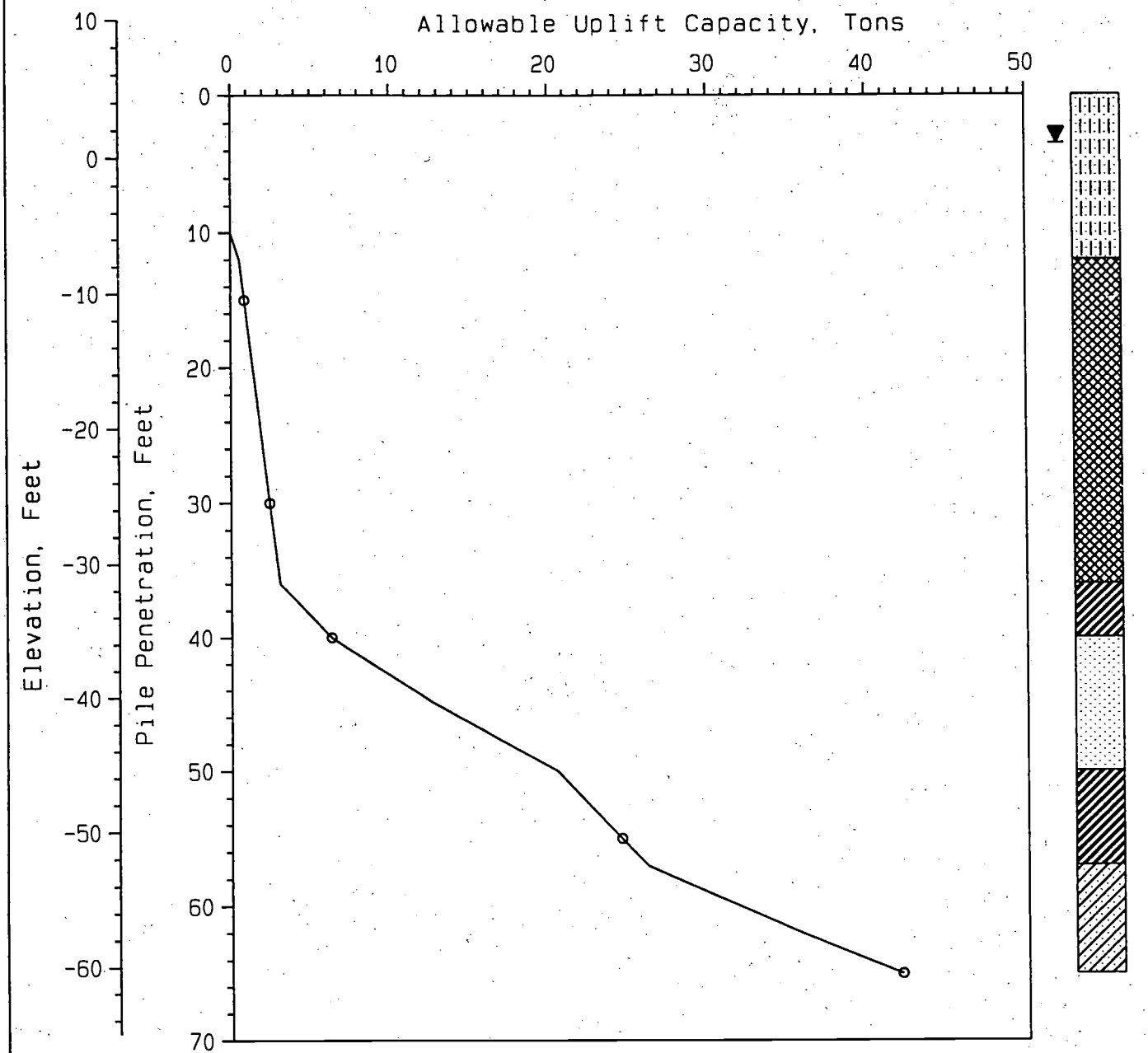
Note: Safety Factor of 2.0 included in allowable capacity.

LEGEND

18-Inch Square PC/PS Concrete Pile

STATIC PILE CAPACITY ANALYSIS

Section 1 (See Plate 1)
Shipyard-Phase I Bulkhead
Jacksonville, Florida
Figure 1, Appendix D



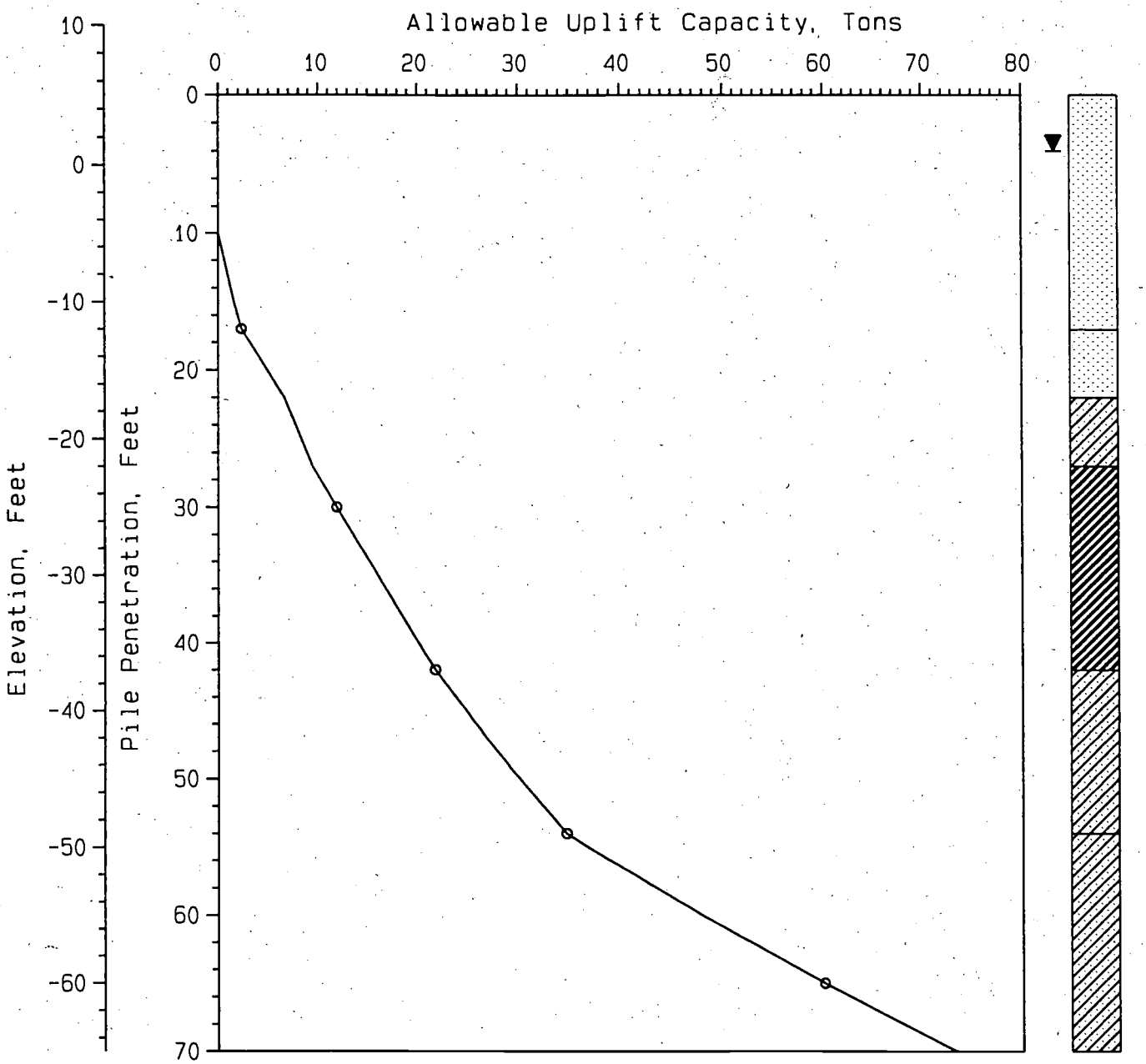
Note: Safety Factor of 2.0 included in allowable capacity.

LEGEND

18-Inch Square PC/PS Concrete Pile

STATIC PILE CAPACITY ANALYSIS

Section 2 (See Plate 1)
Shipyard-Phase I Bulkhead
Jacksonville, Florida
Figure 2, Appendix D



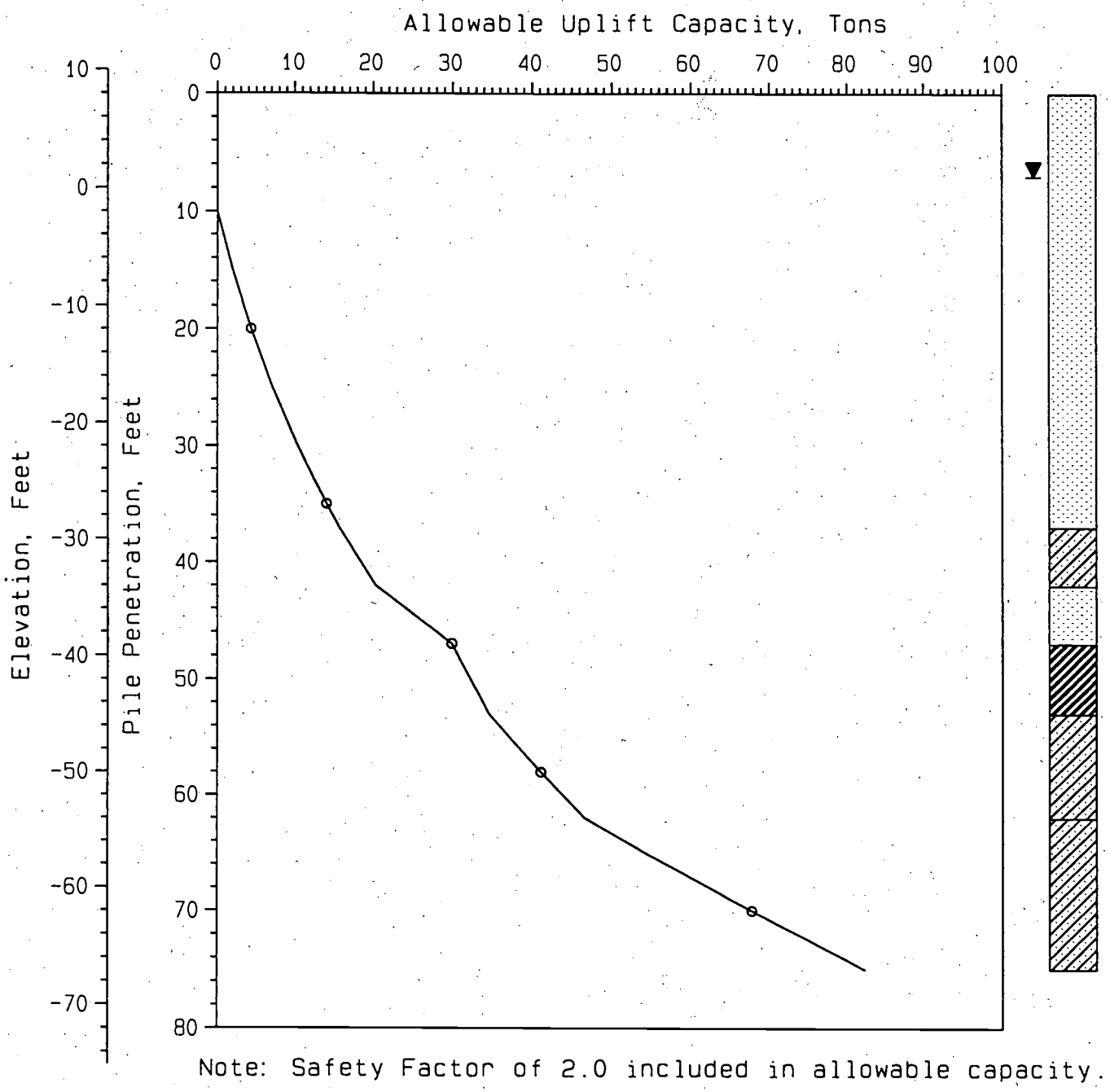
Note: Safety Factor of 2.0 included in allowable capacity.

LEGEND

18-Inch Square PC/PS Concrete Pile

STATIC PILE CAPACITY ANALYSIS

Section 3 (See Plate 1)
Shipyard-Phase I Bulkhead
Jacksonville, Florida
Figure 3, Appendix D



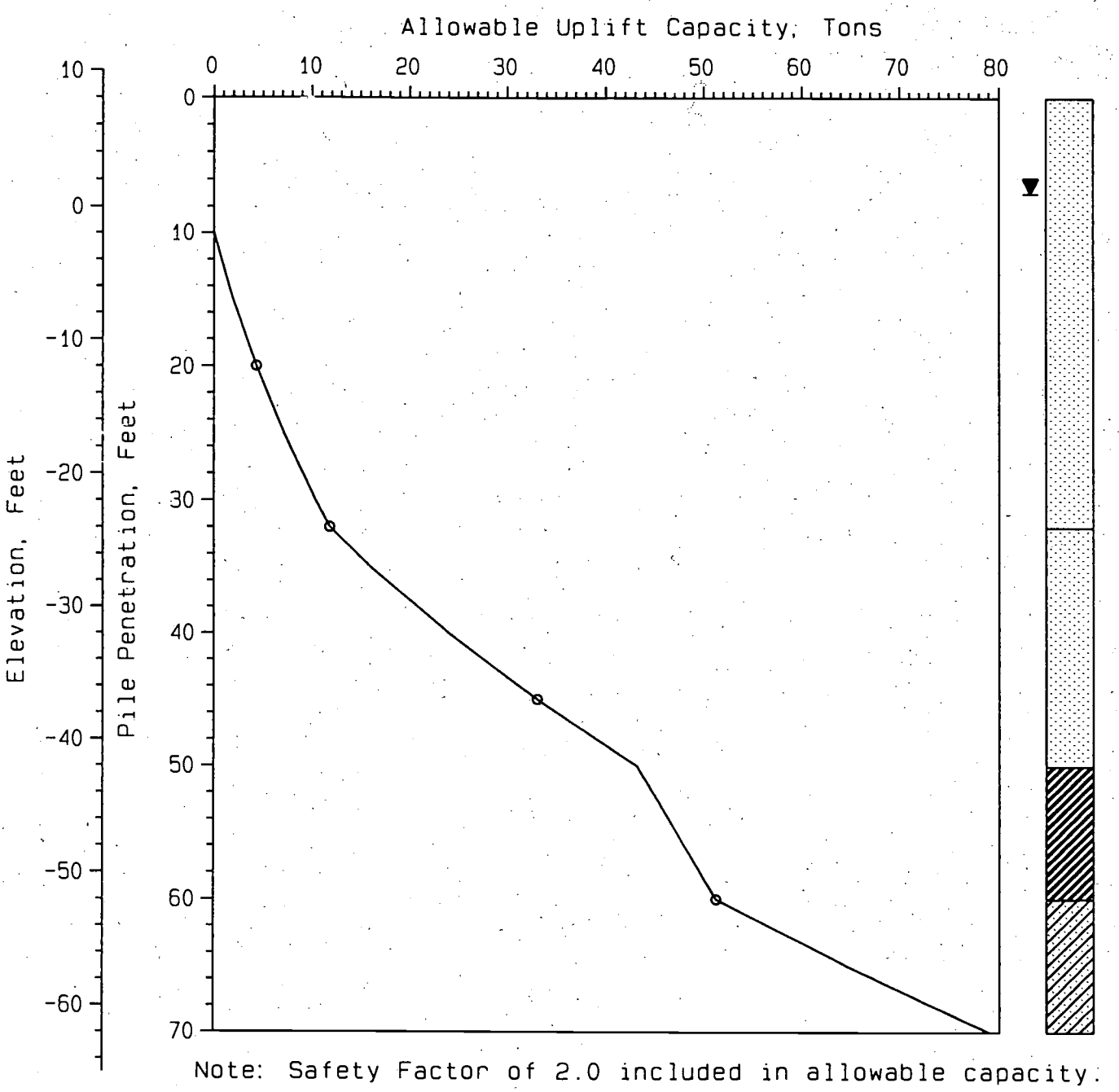
Note: Safety Factor of 2.0 included in allowable capacity.

LEGEND

18-Inch Square PC/PS Concrete Pile

STATIC PILE CAPACITY ANALYSIS

Section 4 (See Plate 1)
Shipyard-Phase I Bulkhead
Jacksonville, Florida
Figure 4, Appendix D



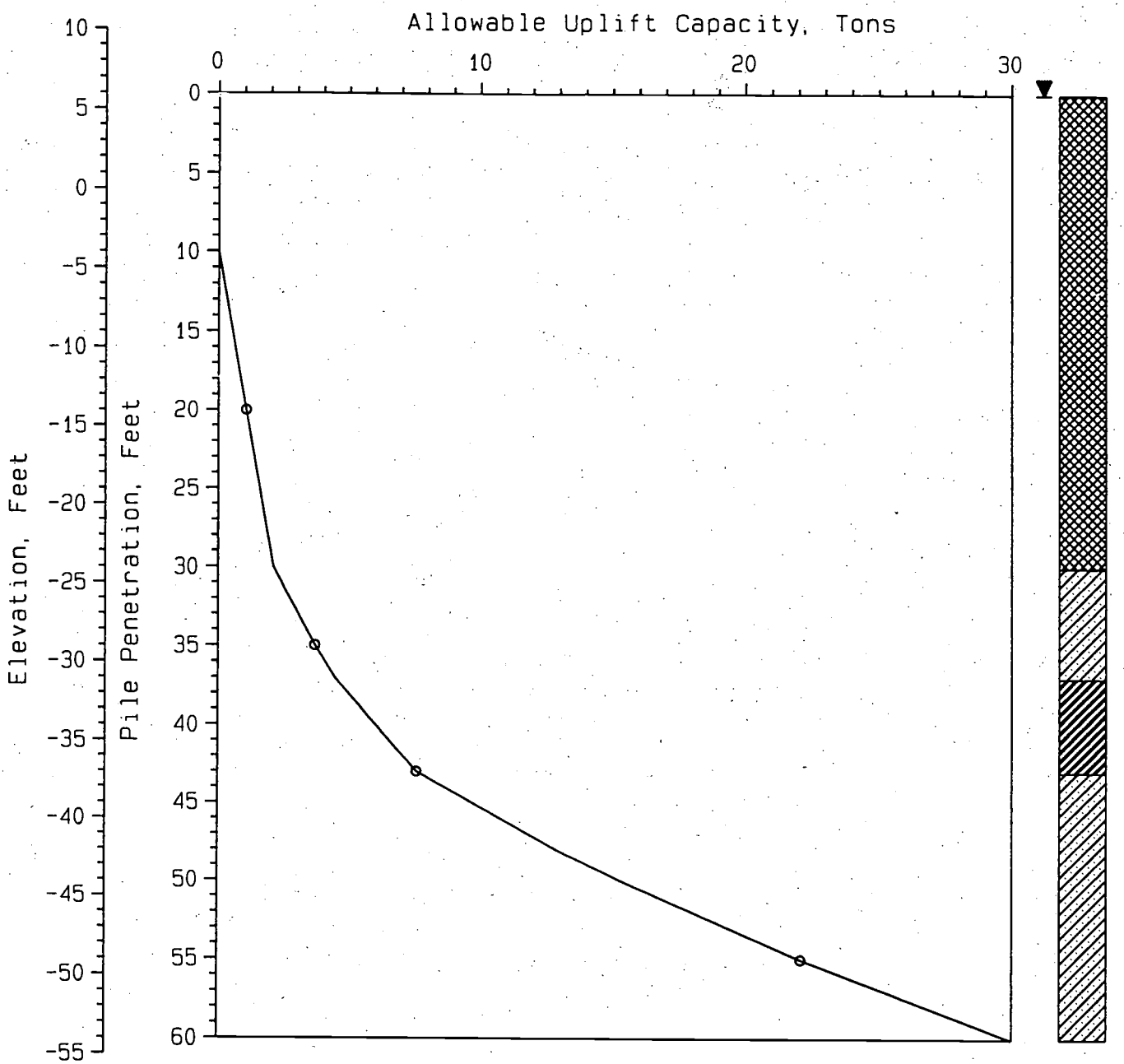
Note: Safety Factor of 2.0 included in allowable capacity.

LEGEND

18-Inch Square PC/PS Concrete Pile

STATIC PILE CAPACITY ANALYSIS

Section 5 (See Plate 1)
Shipyard-Phase I Bulkhead
Jacksonville, Florida
Figure 5, Appendix D



Note: Safety Factor of 2.0 included in allowable capacity.

LEGEND

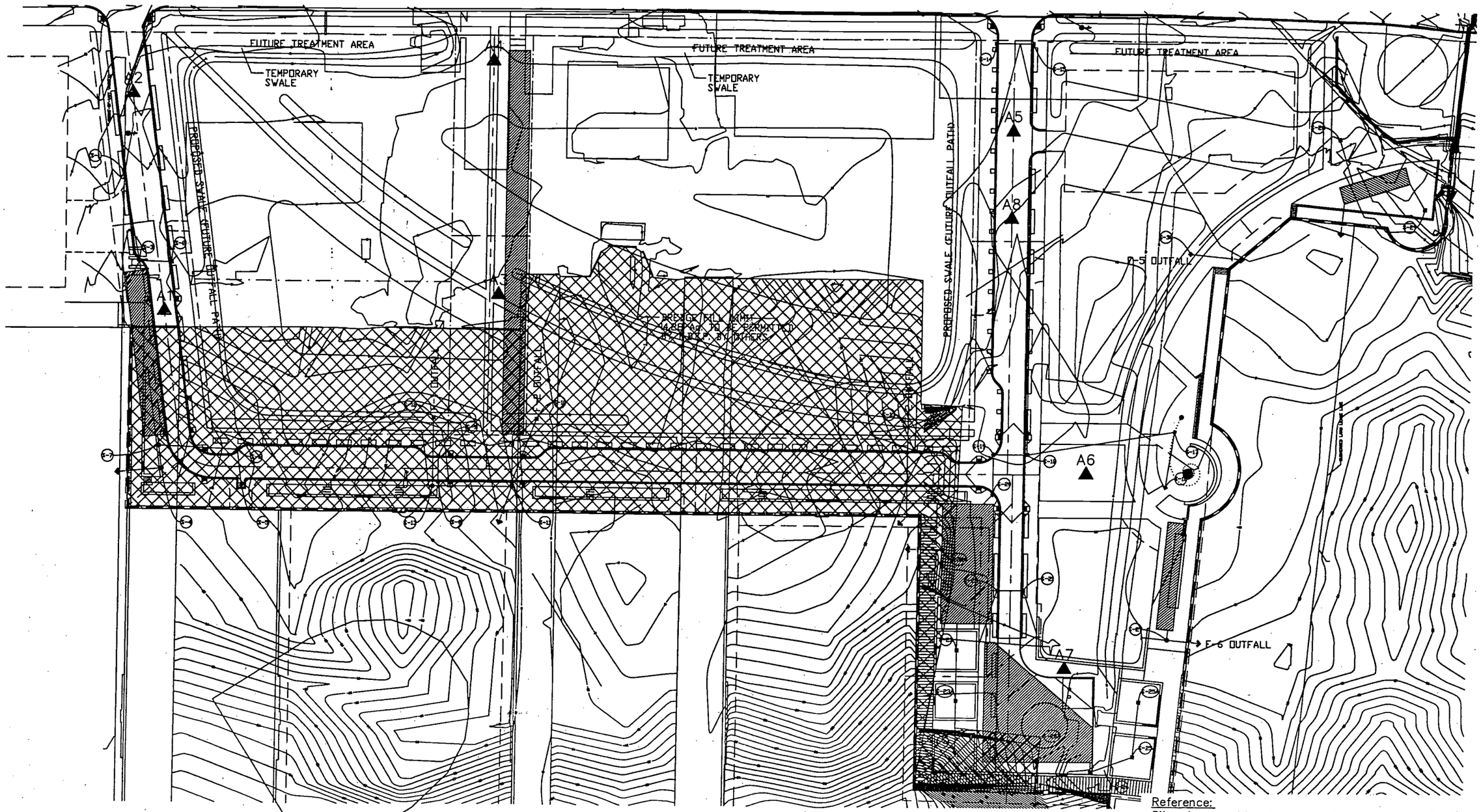
18-Inch Square PC/PS Concrete Pile

STATIC PILE CAPACITY ANALYSIS

Section 6 (See Plate 1)
Shipyard-Phase I Bulkhead
Jacksonville, Florida
Figure 6, Appendix D

ADDITIONAL GEOTECHNICAL BORINGS FOR WEST SIDE OF SHIPYARDS

EAST BAY STREET



ST. JOHNS RIVER

Reference:
Site plan provided by Bessent, Hammock & Ruckman, Inc. (Last Dated 2/11/02)

FIELD EXPLORATION PLAN

Graphical Scale
0' 100' 200'

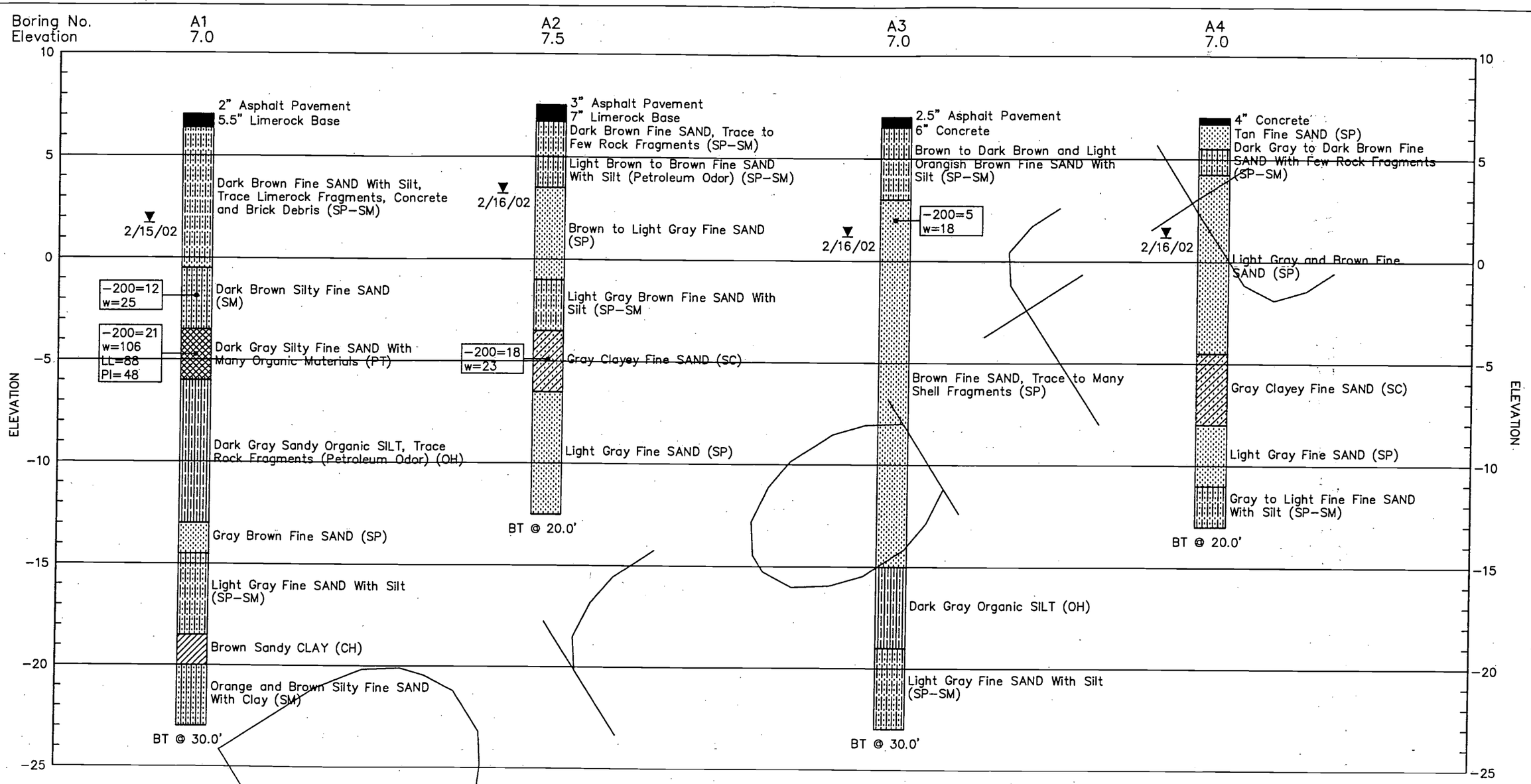
LEGEND

▲ Approximate Location of Auger Boring

Field Exploration Plan
Shipyard Bulkhead – Phase II
Jacksonville, Florida

Ellis & Associates Inc.
GEOTECHNICAL ENGINEERING ENVIRONMENTAL SERVICES
CONSTRUCTION MATERIALS ENGINEERING AND TESTING

DATE: 4/4/02 | PROJ NO: 01-1346a | Figure 3



LEGEND

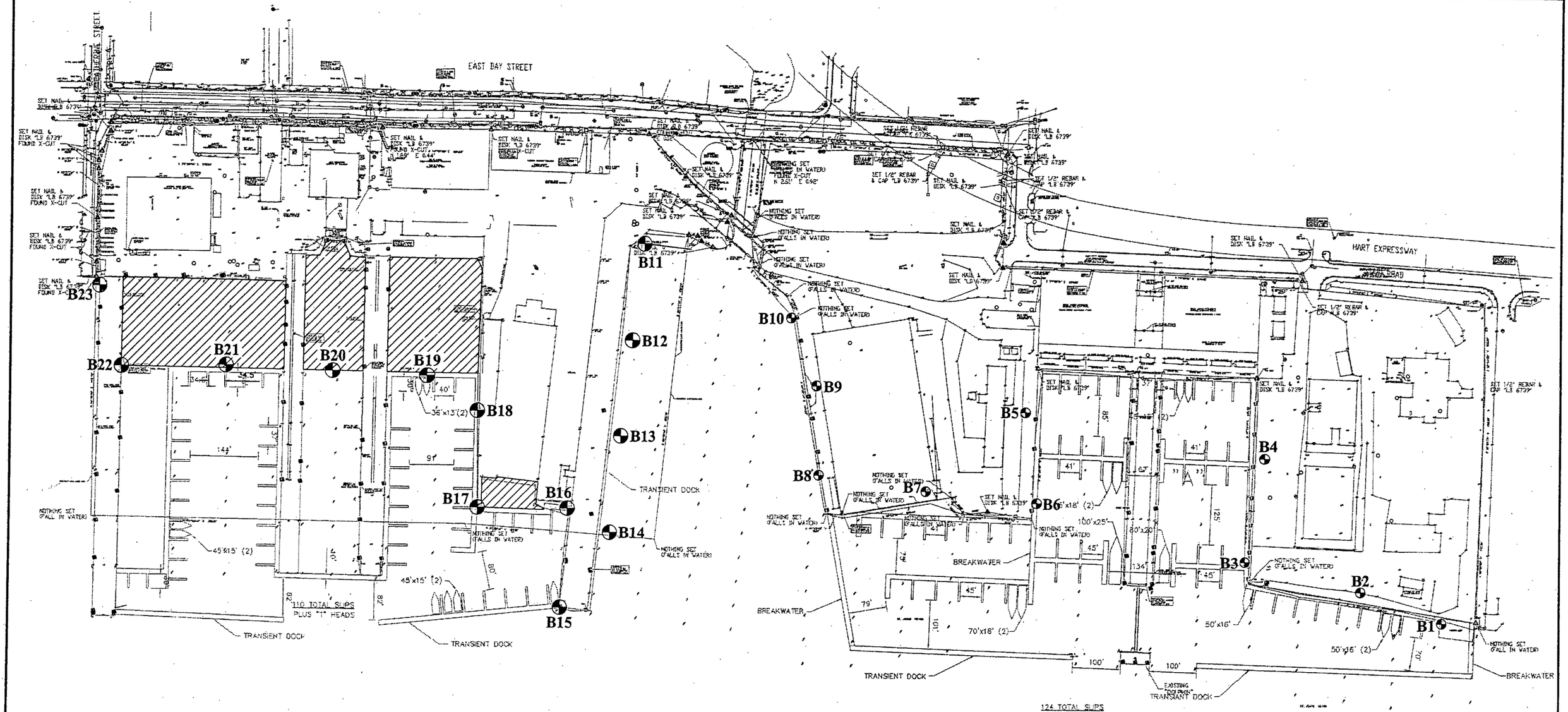
- Asphalt Pavement and Limerock Base
- Fine SAND (SP)
- Fine SAND With Silt (SP–SM)
- Clayey Fine SAND (SC)
- Organic SILT With Sand (OH)
- Silty Fine SAND With Many Organic Materials (PT)
- CLAY (CH)
- Silty Fine SAND (SM)
- ▼ Groundwater Level at Time of Drilling
- SP Unified Soil Classification System
- N Standard Penetration Resistance, Blows/Foot
- -200 Percent Passing No. 200 U.S. Standard Sieve
- w Natural Moisture Content (%)
- LL Liquid Limit
- PI Plasticity Index
- BT Boring Terminated

Note:
Auger surface elevation was estimated from the provided plans and should be considered approximate.

Generalized Subsurface Profiles
Shipyard Bulkhead – Phase II
Jacksonville, Florida

Ellis & Associates Inc.
GEOTECHNICAL ENGINEERING ENVIRONMENTAL SERVICES
CONSTRUCTION MATERIALS ENGINEERING AND TESTING

DATE: 4/11/02 | PROJ. NO: 01–1346a | Figure 4



FIELD EXPLORATION PLAN

Graphical Scale

0' 200' 400'

DRAFT

LEGEND

B11-B23	Standard Penetration Test Borings (Phase 2 Bulkhead)
B1-B10	Standard Penetration Test Borings (Previously Performed for Phase I Bulkhead)
	Areas to be Filled

Field Exploration Plan

Shipyard Bulkhead (Phase II)

Jacksonville, Florida

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DATE: 2/14/02 | PROJ. NO: 01-1346a | Figure 1

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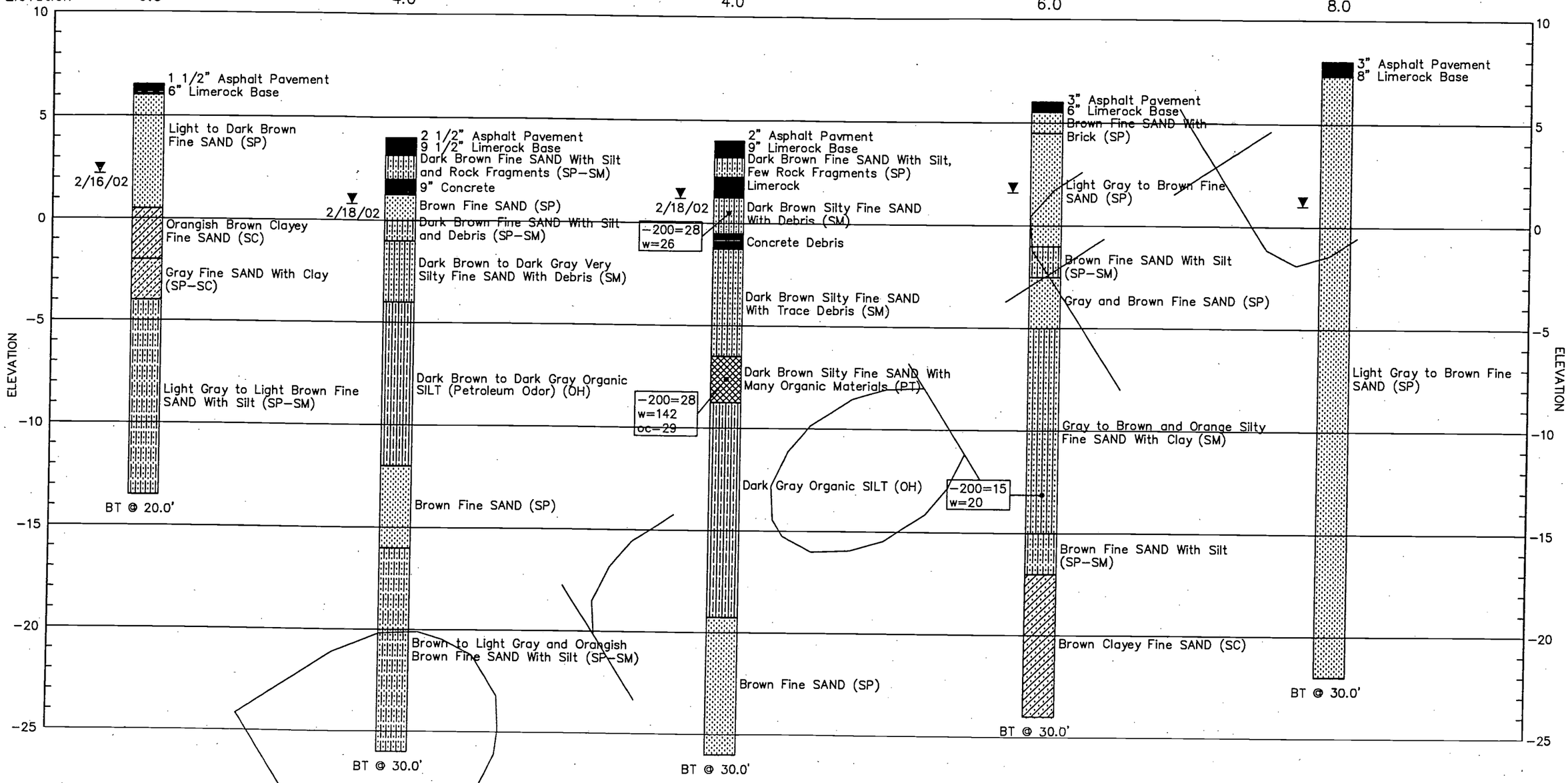
Boring No.	A5	A6	A7	A8	A9
Elevation	6.5	4.0	4.0	6.0	8.0



LEGEND

- Asphalt, Limerock and Concrete
- Fine SAND (SP)
- Fine SAND With Silt (SP−SM)
- Clayey Fine SAND (SC)
- Organic SILT With Sand (OH)
- Silty Fine SAND With Many Organic Materials (PT)
- CLAY (CH)
- Silty Fine SAND (SM)

N Standard Penetration Resistance, Blows/Foot

▼ Groundwater Level at Time of Drilling

SP Unified Soil Classification System

BT Boring Terminated

−200 Percent Passing No. 200 U.S. Standard Sieve

w Natural Moisture Content (%)

oc Organic Content (%)

Note:
Auger surface elevation was estimated from the provided plans and should be considered approximate.

Generalized Subsurface Profiles
Shipyard Bulkhead – Phase II
Jacksonville, Florida

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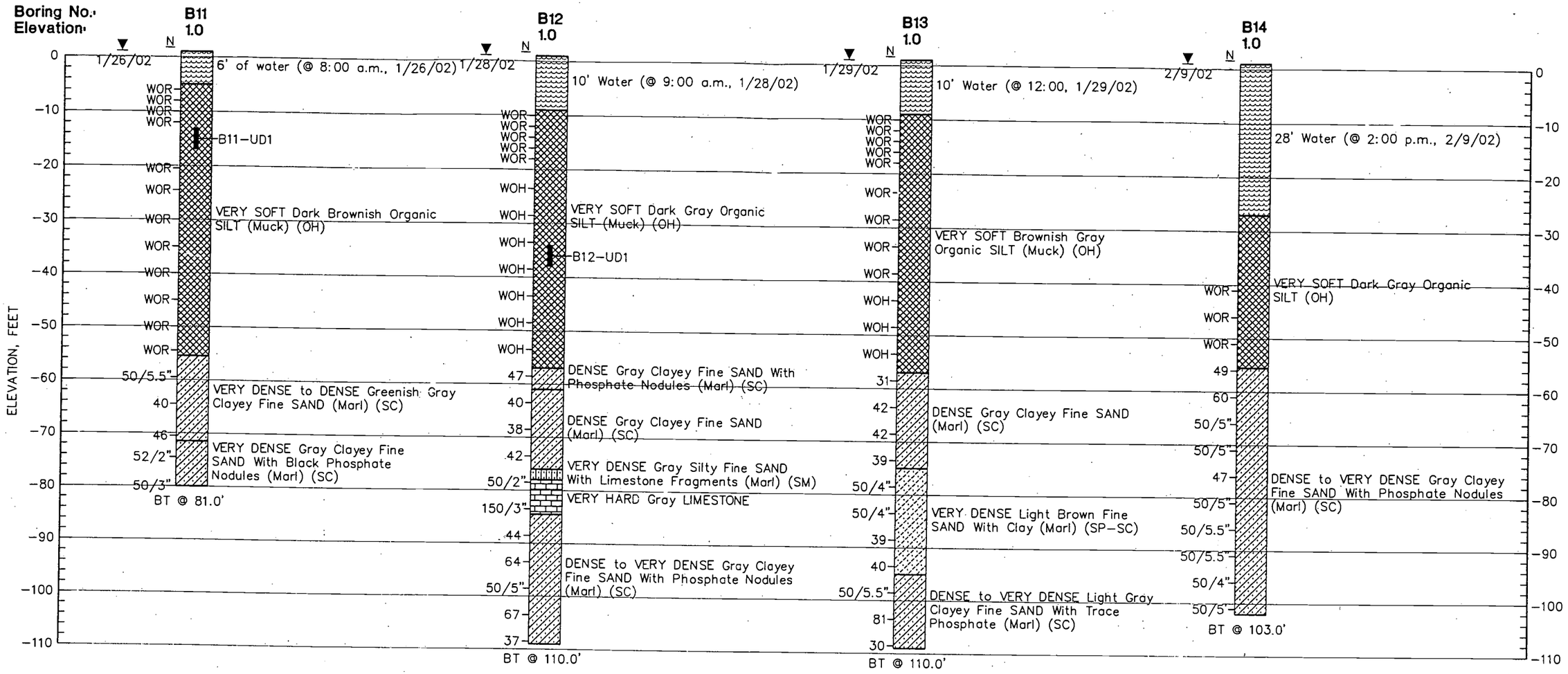
CONSTRUCTION MATERIALS ENGINEERING AND TESTING

DATE: 4/11/02 | PROJ. NO: 01−1346a | Figure 5



GENERALIZED SUBSURFACE PROFILES

LEGEND

- Water
- Organic SILT (Muck) (OH)
- Fine SAND (SP)
- Fine SAND With Clay (SP–SC)
- Silty Fine SAND (SM)
- Clayey Fine SAND (SC)
- Limestone
- Relatively Undisturbed Sample "Shelby Tube"

N Standard Penetration Resistance, Blows/Foot

50/5" Number of Blows to Drive Split Spoon Sample in Inches

WOH Hammer Dropped by the Static Weight of Hammer and Rods Only

WOR Rod Dropped by Static Weight of Rods Only

SP Unified Soil Classification System

▼ Groundwater Level at Time of Drilling

BT Boring Terminated

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Generalized Subsurface Profiles
Shipyard Bulkhead (Phase II)
Jacksonville, Florida

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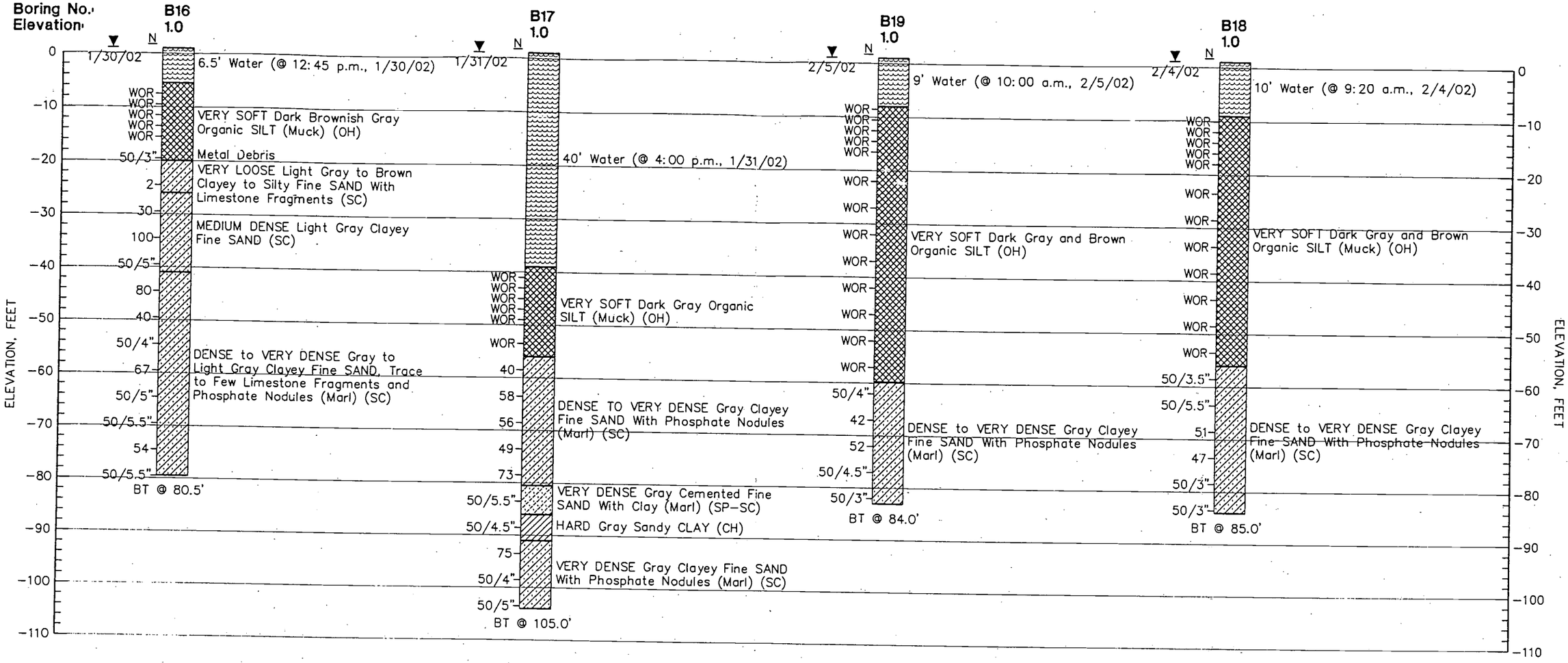

GENERALIZED SUBSURFACE PROFILES

LEGEND

- Water
- Organic SILT (Muck) (OH)
- Clayey Fine SAND (SC)
- Sandy CLAY (CH)

N Standard Penetration Resistance, Blows/Foot

▼ Groundwater Level at Time of Drilling

WOH Hammer Dropped by the Static Weight of Hammer and Rods Only

WOR Rod Dropped by Static Weight of the Rod Only

SP Unified Soil Classification System

50/5" Number of Blows to Drive Split Spoon Sample in Inches

BT Boring Terminated

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Generalized Subsurface Profiles
Shipyard Bulkhead (Phase II)
Jacksonville, Florida

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DATE: 2/14/02 | PROJ. NO: 01-1346a | Figure 3

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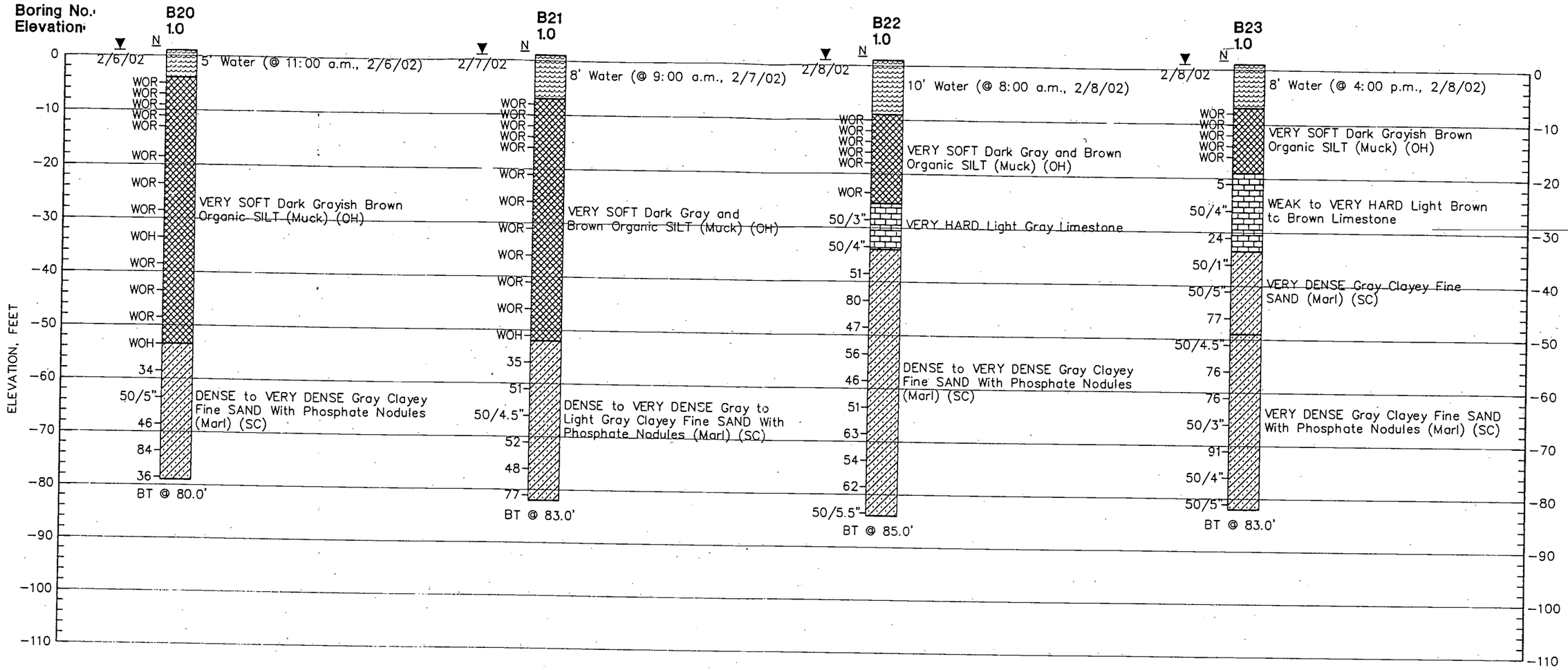

GENERALIZED SUBSURFACE PROFILES

LEGEND

- Water
- Organic SILT (Muck) (OH)
- Clayey Fine SAND (SC)
- Sandy CLAY (CH)
- Limestone

N Standard Penetration Resistance, Blows/Foot

▼ Groundwater Level at Time of Drilling

WOH Hammer Dropped by the Static Weight of Hammer and Rods Only

WOR Rod Dropped by Static Weight of the Rod Only

SP Unified Soil Classification System

50/5" Number of Blows to Drive Split Spoon Sample in Inches

BT Boring Terminated

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Generalized Subsurface Profiles
Shipyard Bulkhead (Phase II)
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