

APPENDIX C

Preliminary Geotechnical Report 2008



SAN JUAN WATERFRONT

DRAFT

Preliminary Dredge Materials Assessment Report

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San Juan Waterfront Redevelopment

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1.0 INTRODUCTION

This Draft Preliminary Dredge Materials Assessment Report was prepared by AMEC E&E Caribe, LLP (AMEC) on behalf of Colliers TMT of Puerto Rico in order to document environmental site assessment activities conducted at the San Juan Harbor site located in San Juan Puerto Rico. The scope of work documented in this report was performed in order to provide background data to support the Environmental Impact Statement (EIS) and infrastructure design tasks associated with the proposed redevelopment of a 91.5-acre consisting of a number of parcels (defined as the “Site”), most of which are owned by the Autoridad de los Puertos (PRPA). This 91.5-acre area will be referred to as the Site throughout this document.

The work described herein was conducted in conjunction with a wider site-wide geotechnical investigation program. The results of the geotechnical investigation, including a detailed description of soil lithology, will be reported in a separate document are not described in detail here.

1.1 Objectives

The objectives of the environmental portion of subsurface investigation program are to acquire characterization data to identify the appropriate disposition of dredged material from Pier 7, Pier 8, Pier 9, Pier 10 and Piers 11 through 14 and to support such a determination. The scope of this initial investigation was to evaluate proposed areas to be dredged that could be accessed from on-shore locations. Future investigations will address off-shore locations where dredging is to be conducted.

1.2 General Site Description

The project site consists of approximately 91.5 acres of land along the waterfront on the north side of the San Antonio Channel in the Old San Juan area of San Juan, Puerto Rico, extending from Pier 6 eastward to the Navy/Frontier Pier, as shown on the enclosed Location Map (Figure 1). Portions of the site are currently utilized as docking points for barges and commercial importing/exporting activities. Other uses include light industrial and commercial activities. Several areas within the project site have been abandoned or condemned for use because of safety concerns.

Site boundaries are generally delineated by Pier 6 to the west, Fernandez Juncos Avenue on the north, by Club Nautico Marina on the east, and by San Antonio Channel on the south. The enclosed Site & Exploration Plan (Figure 2) illustrate these site boundaries and adjacent existing features.

Preliminary re-development plans within or immediately adjacent to the existing San Antonio channel include: reconstruction of existing Piers 6 and 7, removal of the existing Pier 8 and construction of a new Marina Pier, improvements to Pier 10 including infilling of the “La Coal” Fishing Facility, replacement of Piers 11-14, infilling of the Corps of Engineers Pier and Harbor Pilots Pier, and reconstruction of the Frontier Pier. Inland improvements are to include re-development of the existing PRPA property with park areas designated as; the Gateway, the East and West Cross Island Parks. Also proposed is the Ramblas, an 80-foot wide linear plaza extending from the Canal Walk northward into the existing Puerta de Tierra public housing project, and mixed use development.

2.0 SCOPE OF WORK

As stated in Section 1.1 above, the objective of the environmental portion of subsurface investigation program is to acquire characterization data to identify the appropriate disposition of dredged material from Pier 7, Pier 8, Pier 9, Pier 10 and Piers 11 through 14 and to support such a determination. The scope of this initial investigation was to evaluate proposed areas to be dredged that could be accessed from on-shore locations. Future investigations will address off-shore locations where dredging is to be conducted.

To achieve these objectives, AMEC oversaw the installation of fifteen (15) soil borings at the Site. Soil/sediment samples were collected from representative areas of the Site where dredging was to be conducted. As described above, the several of the soil borings served a dual purpose in that in addition to generating environmental data, the borings were also used to provide geotechnical data for the Site. Geotechnical analyses are described in a separate document.

In this section, a description of the sampling locations (including the rationale for selecting these locations), sampling procedures and field observations are presented. It should be noted that the explorations performed and utilized for this evaluation reveal subsurface conditions only at discrete locations across the project site and that actual conditions in other locations could vary. Furthermore, the nature and extent of any such variations would not become evident until additional explorations are performed or until construction activities have begun. If significant variations are observed at that time, we may need to modify our conclusions and recommendations contained in this report to reflect the actual site conditions.

2.1 Sampling Locations/Depths

Soil boring locations are presented in Figures 1A through 1C. The rationale for boring location selection was described in the April 2008 *Draft San Juan Waterfront Project, Sediment Characterization, Sampling and Analysis Plan (SAP)*. In summary, the dredging area has been divided into six dredging units: Pier 7; Pier 8; Pier 9 West; Pier 9 East/Pier

10; Piers 11-14; and the Navy/Frontier Pier. In the April 2008 SAP, a total of twenty-six boring locations were identified as representative of sediments within the dredging footprint: sixteen located in the marine environment and ten upland locations located at Piers 8 and 10. Sampling was conducted as follows:

- Proposed sampling of the Pier 7/8 basin included three marine locations: two along the bulkhead and one on the western portion of the basin (Figure 2). For this investigation, one location along the bulkhead (7-2) was accessible from on-shore and a composite sample collected. One sample (Pier 7 Fill) was collected from a depth interval of 9-10.5 feet below grade (approximately 1 to 2.5 feet below the mud/water interface). The second composite sample (Pier 7 Native) was collected from 14 to 35.5 feet below grade which is approximately two feet below the anticipated dredge depth.
- Sampling at Pier 8 consisted of eight upland boring locations (8-1 through 8-8). Materials to be dredged at Pier 8 were divided vertically into two strata: an upper unit containing fill and previously dredged materials and a lower strata comprised of native sediments. The lower stratum was considered a single unit for testing purposes while the upper stratum was separated into two units: Pier 8N (corresponding to the northern half of the pier and borings 8-1 through 8-4) and Pier 8S (corresponding to the southern half of the pier and borings 8-5 through 8-8). A total of three composite samples were collected: one composite sample from each of the two units from materials deemed as fill material (Pier 8N Fill and Pier 8S Fill) and one composite sample (Pier 8 N/S Native) of native materials from the entire pier (i.e. each of the eight borings). The fill/native interface was generally located in the upper 19 to 20 feet with the exception of Borings 8-1 and 8-6 where native materials were first encountered at 14 feet below grade and at Boring 8-7 where native materials were first encountered at 24 feet below grade. Total boring depth was 30.5 feet below grade or approximately two feet below the planned dredge depth.
- Pier 9 West area consists solely of two off-shore locations and will be evaluated in future investigations.
- Sampling at Pier 9 East/Pier 10 consists of two composite samples collected from two upland borings: one composite sample of the upper strata of fill material and one composite sample from a lower strata of native materials. Additionally, one marine core collected from the proposed toe trench at the north end of the basin may be installed in future investigations. Native materials were first encountered at 9 and 14 feet below grade in borings 10-2 and 10-1, respectively. Total boring depth was 40.5 feet below grade or approximately two feet below the planned dredge depth.
- Sampling at Piers 11 through 14 area consisted of four borings drilled into marine sediments through the concrete pier which overhangs the bulkhead in this area. Two

composite samples were collected – one from shallow sediments located in the upper two feet and one composite from the remainder of the boring depth. Total boring depths were 45.5 feet below grade or approximately two feet below the planned dredge depth.

- The Navy/Frontier Pier consists solely of four off-shore locations and will be evaluated in future investigations.

2.2 Soil Sampling

As described above, a total of fifteen (15) soil borings (designated 7-2, 8-1 through 8-8, 10-1, 10-2, and 11-1 through 11-4) were advanced at the Site. The borings were advanced using a truck-mounted hollow stem auger rig from October 28 to November 14, 2008. GeoCim, Inc. was subcontracted to conduct the drilling activities. Boring locations are presented in Figures 1A through 1C and boring logs are presented in Appendix A.

Soil samples were collected no greater than 5-foot intervals using a 2-inch diameter split-spoon sampler. Samples were generally collected more frequently in the upper portion of the subsurface (i.e. while still in fill materials) in order to increase the likelihood of identifying any subsurface contamination, if present. Upon retrieval, soils were visually inspected for evidence of contamination and soil samples were screened for volatile compounds with a photoionization detector (PID).

A subset of composite samples was collected as described in Section 2.1. After compositing was completed, the individual discrete samples were archived in the event the identification of potential “hotspots” within the sediment column would be useful to explain the results obtained from the composite testing. Soil/sediment samples were collected in laboratory-supplied sample jars and placed in an iced cooler immediately upon collection. The coolers were transported to the laboratory via an overnight delivery service following chain-of-custody protocols.

All soil cuttings generated during drilling were checked for obvious signs of visual and olfactory impacts and were screened periodically with a PID for any signs of elevated organic vapors. Soil cuttings that did not exhibit any signs of environmental impact were added to the soil stockpiles north of the abandoned concrete building on Pier 12. Soil cuttings that exhibited signs of environmental impact were containerized in steel drums for storage prior to waste characterization. Waste characterization was not included in the scope of work for this investigation.

2.3 Laboratory Analysis

As described above, soil and groundwater samples were collected at the Site and submitted for laboratory analysis. The laboratory analysis was conducted by CalScience Laboratories in Garden Grove, California. Laboratory analysis consisted of the following:

- Metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, selenium and silver) by USEPA Method 6010B/7471
- Organotins by Krone's Method
- Pesticides by USEPA Method 8081A
- Polycyclic aromatic hydrocarbons (PAHs), phthalates and phenols by USEPA Method 8270C
- Polychlorinated Biphenyls (PCBs) by USEPA Method 8082
- Total Ammonia by USEPA Method 350.2
- Total Organic Carbon by USEPA Method 9060
- Total Recoverable Petroleum Hydrocarbons (TRPH) by USEPA Method 418.1M
- Total solids by USEPA Method 160.3
- Total & soluble sulfides by USEPA Method 376.2

One duplicate soil sample were collected and one matrix spike/matrix spike duplicate sample was collected.

3.0 ANALYTICAL RESULTS

This section describes the results of the investigation described in Section 2.0 above. Analytical results are presented in Table 1 with complete laboratory reports included as Appendix A.

Detected compounds in soil include metals, TRPH, inorganics, organotins, pesticides, PAHs, phenols and phthalates. PCBs and dissolved sulfides were not detected. For pesticides and organotins, detections were infrequent. For pesticides only a low concentration of 4,4'-DDE was detected in one sample (1.3 ug/kg at Pier 10 Fill) and for organotins, only low levels of dibutyltin and tributyltin were detected in one sample (7.1 and 39 ug/kg respectively at Pier 11 Shallow). Detected concentrations were generally low and indicate a low level of environmental impacts at the Site and are described in detail below.

To gauge the significance of a particular concentration level, concentrations were screened against the Effects Range-Low (ERL), a reference criteria for marine sediments developed by

NOAA. The ERL is calculated from available toxicity data as the value where toxic effects may be observed in sensitive species (NOAA 2004).

3.1 Metals

Detected metals include arsenic (1.71 to 21.7 ppm), cadmium (ND to 13696 ppm), (chromium (13.1 to 29.3 ppm), copper (4.9 to 29.3 ppm), lead (1.63 to 24 ppm), mercury (ND to 0.125 ppm), nickel (0.84 to 17.4 ppm), selenium (ND to 2.18 ppm), silver (one detect of 0.637 ppm) and zinc (3.19 to 132 ppm). Metals concentrations at Pier 7 and Pier 11 are generally an order of magnitude greater in the shallow samples than the deeper composites. At Piers 8 and 10, no consistent trend with depth is observed. With the exception of arsenic, all concentrations are below the ERL.

3.2 Organics

PAHs, phenols, and phthalates were detected at the Site. Detected PAHs include: 1-methylnaphthalene, 2-methylnaphthalene, acenaphthene, acenaphthylene, anthracene, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(g,h,i)perylene, benzo(k)fluoranthene, chrysene, dibenz(a,h)anthracene, fluoranthene, fluorene, indeno(1,2,3-c,d)pyrene, N-nitrosodimethylamine, naphthalene, phenanthrene, and pyrene. With the exception of Pier 10 Fill, all detected PAH concentrations were less than 100 ug/kg. With the exception of 2-methylnaphthalene, fluorene, and naphthalene in one sample (Pier 10 Fill), all samples were below the ERL, where available.

Detected phenols include: 3/4-methyl phenol (all samples), phenol (all samples except Pier 10 Fill) and 2,4-dimethylphenol and 2 methylphenol (both detected only in Pier 10 Fill). All concentrations were less than 50 ug/kg.

Detected phthalates include bis(2-ethylhexyl) phthalate, butyl benzyl phthalate, di-n-butyl phthalate, diethyl phthalate, and dimethyl phthalate. Highest concentrations were generally observed at Pier 7 Shallow.

3.3 Petroleum Hydrocarbons

Low levels of TRPH were detected in each sample. Detected concentrations are generally low (<100 ppm with the exception of Pier 10 where the TRPH concentration in the fill sample was 940 ppm. Low levels of TPH had been detected previously at Pier 10 and are likely the result the long history of industrial operations at this location.

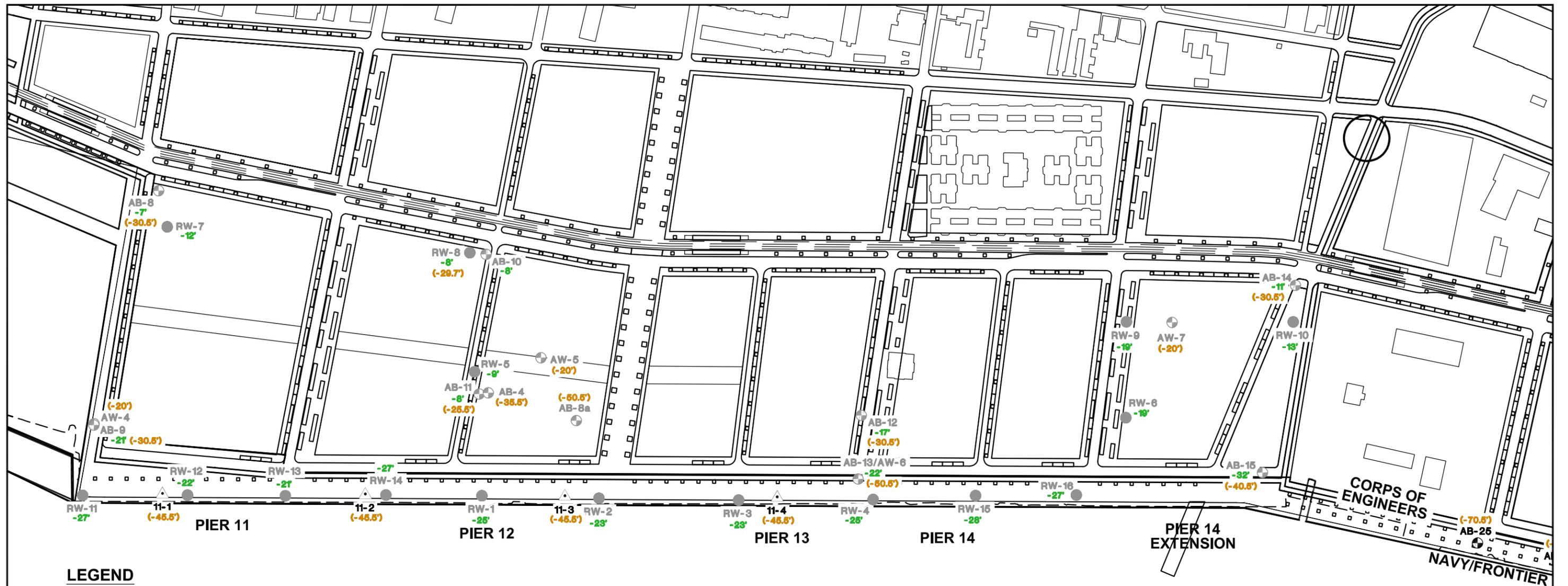
3.4 Inorganics

Sulfides, ammonia and total organic carbon were present in each sample. Total sulfide concentrations ranged for 0.14 to 3.3 mg/kg. Dissolved sulfides were not detected. Ammonia and total organic carbon concentrations ranged from 1.7 to 28 mg/kg and from 0.07 to 3.2 %, respectively. These concentrations are typical of marine sediments and will be used in the future evaluation as to the appropriate disposition of the dredged materials

4.0 SUMMARY

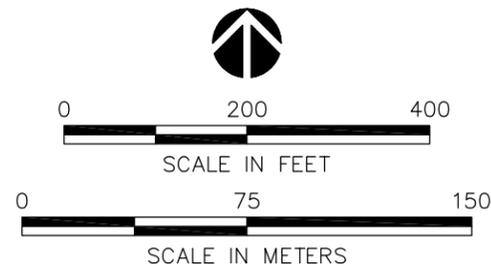
As documented in this report, AMEC has conducted a preliminary investigation to support the EIS and infrastructure design task associated with the proposed redevelopment of a 91.5-acre waterfront site primarily owned by the Autoridad de los Puertos. The objectives of the environmental portion of subsurface investigation program are to acquire characterization data to identify the appropriate disposition of dredged material from Pier 7, Pier 8, Pier 9, Pier 10 and Piers 11 through 14 and to support such a determination. The scope of this initial investigation was to evaluate proposed areas to be dredged that could be accessed from on-shore locations. Future investigations will address off-shore locations where dredging is to be conducted.

In general, environmental impacts to dredge materials at the Site appear to be minimal and results are similar to other studies conducted in the vicinity of the site. Composite samples from each of these project areas indicate only slightly elevated amounts of chemical contaminants, with most chemical concentrations below the effects range low (ERL). Evaluation of these data as well as other site data and the results of future investigations will be analyzed in accordance with the procedures presented in the April 2008 SAP to identify appropriate disposal options for the dredged materials.

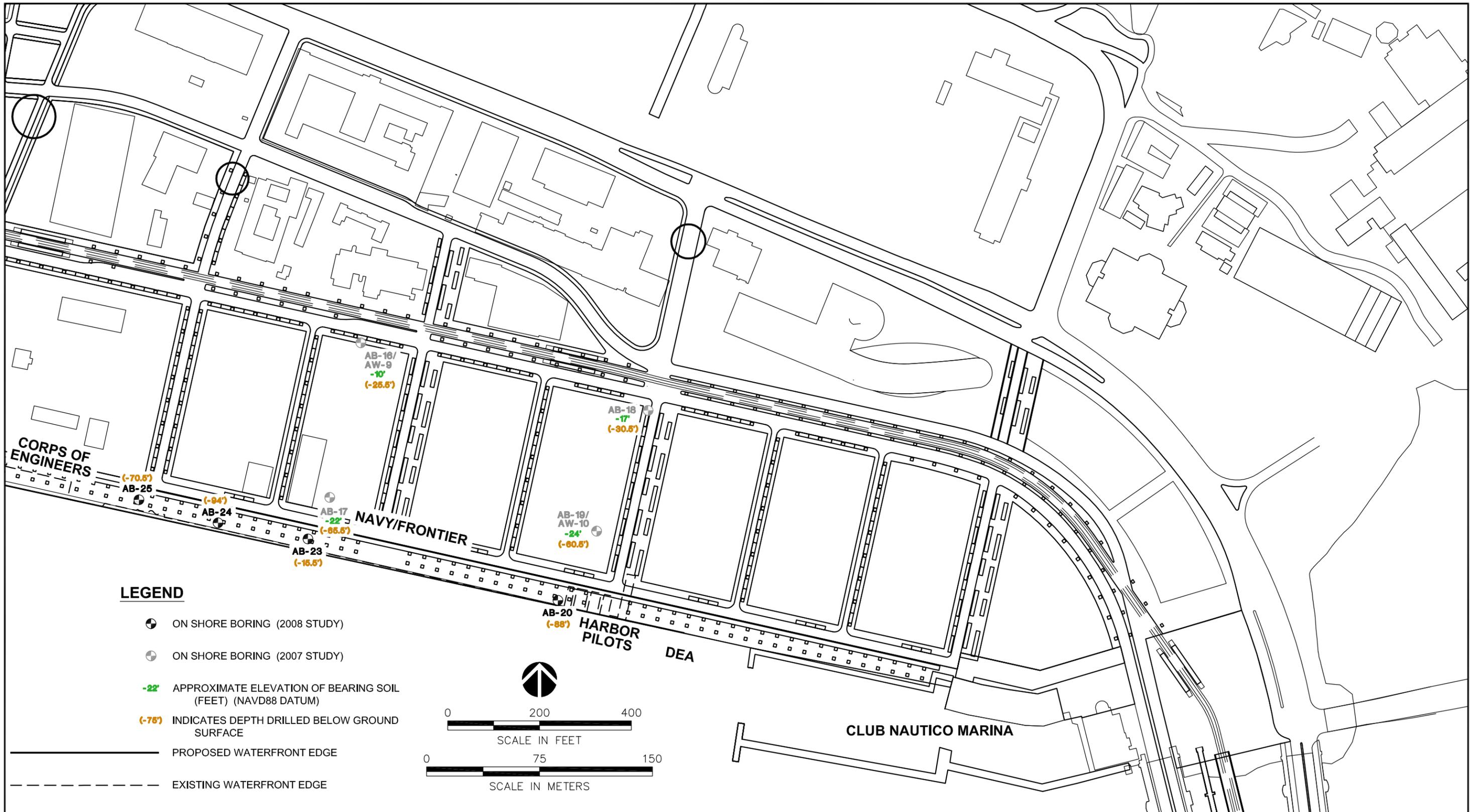


LEGEND

- ON SHORE BORING (2007 STUDY)
- ON SHORE BORING (COMPLETED BY OTHERS)
- ▲ UPLAND DREDGE SAMPLING LOCATION (2008 STUDY)
- 22' APPROXIMATE ELEVATION OF BEARING SOIL (FEET) (NAVD88 DATUM)
- (-75') INDICATES DEPTH DRILLED BELOW GROUND SURFACE
- PROPOSED WATERFRONT EDGE
- - - EXISTING WATERFRONT EDGE
- PROPOSED BULKHEAD

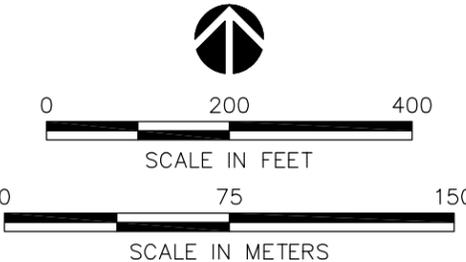


	CLIENT:		DRAWN BY: JRS		PROJECT SAN JUAN WATERFRONT PROJECT SAN JUAN, PUERTO RICO	DATE: DECEMBER 2008
	COLLIERS TMT OF PUERTO RICO		CHECKED BY: WJL			PROJECT NO: 766000005
AMEC E & E Caribe, LLP 530 AVE DE LA CONSTITUTION SAN JUAN, PUERTO RICO 00901-2304 PHONE (787) 289-7835 FAX (787) 289-8779				TITLE SITE AND EXPLORATION PLAN		REV. NO.:
						FIGURE No. FIGURE 2b



LEGEND

-  ON SHORE BORING (2008 STUDY)
-  ON SHORE BORING (2007 STUDY)
- 22' APPROXIMATE ELEVATION OF BEARING SOIL (FEET) (NAVD88 DATUM)
- (-75') INDICATES DEPTH DRILLED BELOW GROUND SURFACE
-  PROPOSED WATERFRONT EDGE
-  EXISTING WATERFRONT EDGE



	CLIENT:		DRAWN BY: JRS		PROJECT SAN JUAN WATERFRONT PROJECT SAN JUAN, PUERTO RICO	DATE: DECEMBER 2008
	COLLIERS TMT OF PUERTO RICO		CHECKED BY: WJL			PROJECT NO.: 766000005
AMEC E & E Caribe, LLP 530 AVE DE LA CONSTITUTION SAN JUAN, PUERTO RICO 00901-2304 PHONE (787) 289-7835 FAX (787) 289-8779				DATUM:	TITLE SITE AND EXPLORATION PLAN	REV. NO.:
				PROJECTION:		FIGURE No. FIGURE 2c
				SCALE: AS SHOWN		

Table 1
Summary of Analytical Results
Preliminary Dredge Area Investigation
San Juan Waterfront
San Juan, Puerto Ricp

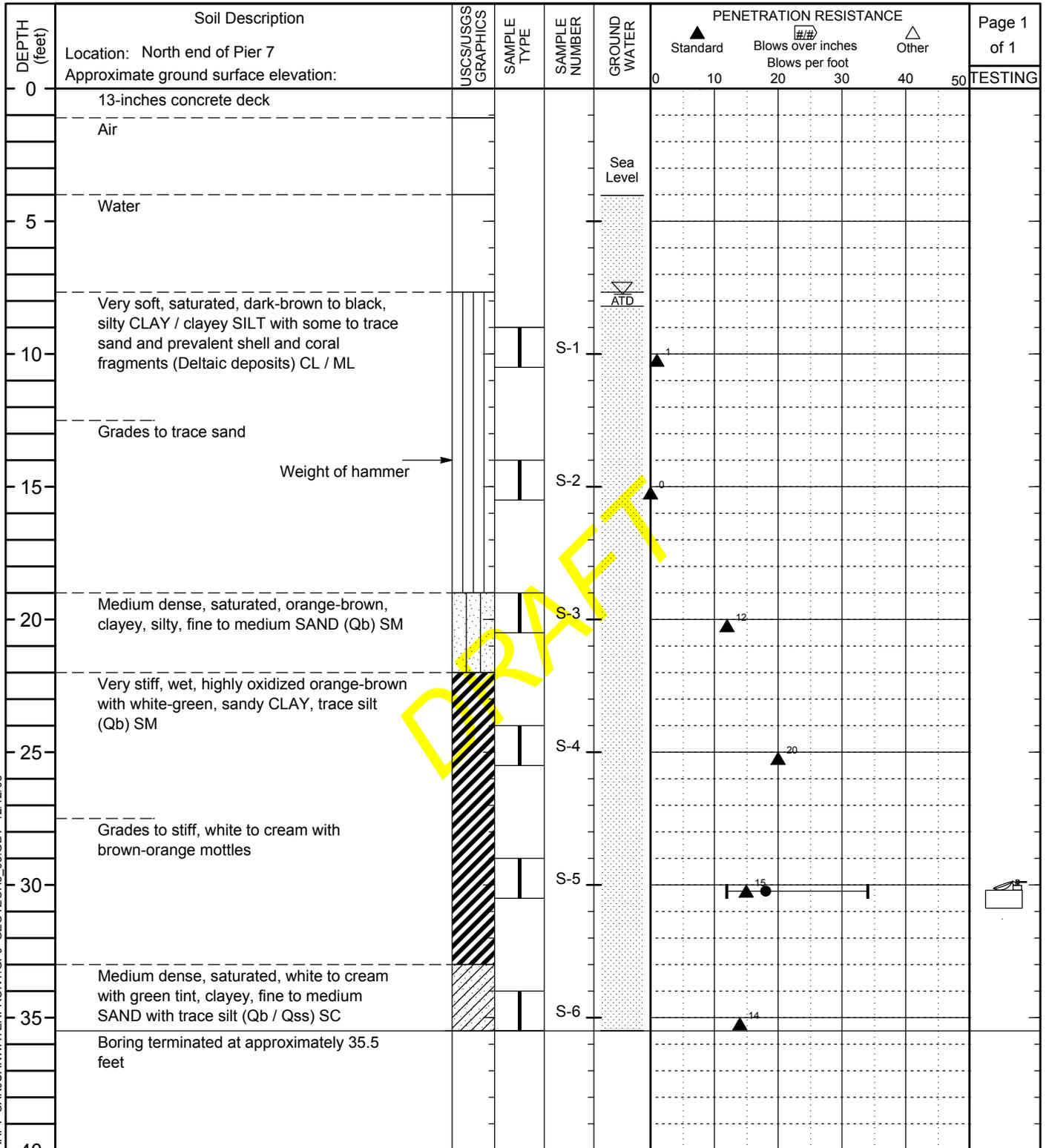
COMPOUND	Units	ERL	Pier 7 Fill	Pier 7 Native	Pier 8N Fill	Pier 8S Fill	Pier 8N/S Native	Pier 10 Fill	Pier 10 Native	Pier 8N/S Native (Dup)	Pier 11 Fill	Pier 11 Native
METALS												
Arsenic	mg/kg	8.2	21.7	5.72	12.2	8.68	15.2	5.65	12.9	15.9	4.21	1.71
Cadmium	mg/kg	1.2	0.305	-	0.287	0.272	0.387	0.696	0.308	0.322	0.217	-
Chromium	mg/kg	81	29.3	7.06	15.7	13.4	17.8	11.7	24.9	17.1	13.1	6.48
Copper	mg/kg	34	31.1	7.18	17	12.6	17	20.8	23.1	16.7	33.9	4.9
Lead	mg/kg	46.7	6.73	1.79	18.2	9.49	6.11	13.9	4.13	5.77	24	2.05
Nickel	mg/kg	20.9	17.4	1.63	10.5	10.9	9.79	7.71	8.56	10.4	6.7	0.836
Selenium	mg/kg		2.18	-	-	0.314	0.435	0.972	0.58	0.563	0.507	0.287
Silver	mg/kg	1	-	-	-	-	-	-	-	-	0.637	-
Zinc	mg/kg	150	37	5.24	29.3	19.7	24.9	41.2	21.4	25.1	132	3.19
Mercury	mg/kg	0.15	0.0684	-	0.125	0.036	0.0695	0.0345	-	0.0563	-	-
INORGANICS												
Sulfide, Total	mg/kg		NA	1.1	-	0.14	0.14	3.3	2.2	0.14	0.75	0.74
Sulfide, Dissolved	mg/kg		NA	-	-	-	-	-	-	-	-	-
Carbon, Total Organic	%		2.8	0.07	0.66	1.2	1.4	1.7	1.2	1.3	3.2	0.48
Ammonia (as N)	mg/kg		NA	1.7	19	4.7	7.5	28	23	7.2	5.6	2.1
Moisture	%		NA	NA	28	28.6	28.6	14.9	35.3	28.5	NA	NA
Solids, Total	%		46.4	80.5	65.3	71.4	71.4	85.1	64.7	71.5	80	79.2
PETROLEUM HYDROCARBONS												
TRPH	mg/kg		81	34	64	69	15	940	130	19	86	23
ORGANOTINS												
Dibutyltin	ug/kg		-	-	-	-	-	-	-	-	7.1	-
Monobutyltin	ug/kg		-	-	-	-	-	-	-	-	-	-
Tetrabutyltin	ug/kg		-	-	-	-	-	-	-	-	-	-
Tributyltin	ug/kg		-	-	-	-	-	-	-	-	39	-
PAHS												
1-Methylnaphthalene	ug/kg		4.6	-	5.7	-	-	230	9.1	-	3.8	-
2-Methylnaphthalene	ug/kg	70	8.8	-	10	3.7	3.8	370	14	3.9	8	4
Acenaphthene	ug/kg	16	-	-	-	-	-	16	-	-	2.6	-
Acenaphthylene	ug/kg	44	-	-	7	-	3.5	-	-	3.1	13	-
Anthracene	ug/kg	85.3	-	-	6	5.3	6.9	19	-	6.9	-	-
Benzo (a) Anthracene	ug/kg	261	8.8	-	44	11	15	33	-	14	33	-
Benzo (a) Pyrene	ug/kg	430	14	-	36	9.6	16	-	-	15	63	4.1
Benzo (b) Fluoranthene	ug/kg		21	-	44	10	25	-	-	25	160	-
Benzo (g,h,i) Perylene	ug/kg		7.4	-	18	2.9	8.7	17	-	8.3	-	-
Benzo (k) Fluoranthene	ug/kg		16	-	46	9.2	24	-	-	24	74	-
Chrysene	ug/kg	384	9.9	-	41	13	16	81	3.2	15	59	-
Dibenz (a,h) Anthracene	ug/kg	63.4	-	-	5.2	-	-	-	-	-	7.8	-
Fluoranthene	ug/kg	600	14	-	48	12	22	34	-	21	65	-
Fluorene	ug/kg	19	-	-	3.4	3.9	-	50	-	-	-	-
Indeno (1,2,3-c,d) Pyrene	ug/kg		8.3	-	24	3.1	11	6.6	-	10	28	-
N-Nitrosodimethylamine	ug/kg		-	-	80	65	23	9.3	-	23	-	75
Naphthalene	ug/kg	160	24	-	16	5.1	8	210	9.7	8.2	12	4.8
Phenanthrene	ug/kg	240	9.4	-	15	6.6	10	170	8.8	11	15	-
Pyrene	ug/kg	665	20	-	53	25	22	160	-	21	64	-
Phenols												
2,4,5-Trichlorophenol	ug/kg		-	-	-	-	-	-	-	-	-	-
2,4,6-Trichlorophenol	ug/kg		-	-	-	-	-	-	-	-	-	-
2,4-Dichlorophenol	ug/kg		-	-	-	-	-	-	-	-	-	-
2,4-Dimethylphenol	ug/kg		-	-	-	-	-	22	-	-	-	-
2,4-Dinitrophenol	ug/kg		-	-	-	-	-	-	-	-	-	-
2-Chlorophenol	ug/kg		-	-	-	-	-	-	-	-	-	-
2-Methylphenol	ug/kg		-	-	-	-	-	15	-	-	-	-
2-Nitrophenol	ug/kg		-	-	-	-	-	-	-	-	-	-
3/4-Methylphenol	ug/kg		15	2.6	7.5	3.9	3.7	15	4.8	4.1	7.4	3.5
4,6-Dinitro-2-Methylphenol	ug/kg		-	-	-	-	-	-	-	-	-	-
4-Chloro-3-Methylphenol	ug/kg		-	-	-	-	-	-	-	-	-	-
4-Nitrophenol	ug/kg		-	-	-	-	-	-	-	-	-	-

Table 1
Summary of Analytical Results
Preliminary Dredge Area Investigation
San Juan Waterfront
San Juan, Puerto Ricp

COMPOUND	Units	ERL	Pier 7 Fill	Pier 7 Native	Pier 8N Fill	Pier 8S Fill	Pier 8N/S Native	Pier 10 Fill	Pier 10 Native	Pier 8N/S Native (Dup)	Pier 11 Fill	Pier 11 Native
Pentachlorophenol	ug/kg		-	-	-	-	-	-	-	-	-	-
Phenol	ug/kg		47	19	26	27	22	-	25	25	24	21
Phthalates												
Bis(2-Ethylhexyl) Phthalate	ug/kg		310	76	42	91	44	-	41	58	290	160
Butyl Benzyl Phthalate	ug/kg		210	95	-	65	34	-	28	40	-	260
Di-n-Butyl Phthalate	ug/kg		400	220	180	280	200	95	190	180	160	200
Di-n-Octyl Phthalate	ug/kg		-	-	-	-	-	-	-	-	-	-
Diethyl Phthalate	ug/kg		45	9.5	13	19	14	-	16	14	10	9
Dimethyl Phthalate	ug/kg		25	-	17	18	18	-	13	17	3.5	-
PCBs												
Aroclor-1016	ug/kg	22.7	-	-	-	-	-	-	-	-	-	-
Aroclor-1221	ug/kg	22.7	-	-	-	-	-	-	-	-	-	-
Aroclor-1232	ug/kg	22.7	-	-	-	-	-	-	-	-	-	-
Aroclor-1242	ug/kg	22.7	-	-	-	-	-	-	-	-	-	-
Aroclor-1248	ug/kg	22.7	-	-	-	-	-	-	-	-	-	-
Aroclor-1254	ug/kg	22.7	-	-	-	-	-	-	-	-	-	-
Aroclor-1260	ug/kg	22.7	-	-	-	-	-	-	-	-	-	-
Aroclor-1262	ug/kg	22.7	-	-	-	-	-	-	-	-	-	-
Individual Congeners	ug/kg	22.7	-	-	-	-	-	-	-	-	-	-
Pesticides												
Aldrin	ug/kg		-	-	-	-	-	-	-	-	-	-
Alpha-BHC	ug/kg		-	-	-	-	-	-	-	-	-	-
Beta-BHC	ug/kg		-	-	-	-	-	-	-	-	-	-
Delta-BHC	ug/kg		-	-	-	-	-	-	-	-	-	-
Gamma-BHC	ug/kg		-	-	-	-	-	-	-	-	-	-
Chlordane	ug/kg	0.5	-	-	-	-	-	-	-	-	-	-
Dieldrin	ug/kg	0.08	-	-	-	-	-	-	-	-	-	-
2,4'-DDD	ug/kg	2	-	-	-	-	-	-	-	-	-	-
2,4'-DDE	ug/kg	2.2	-	-	-	-	-	-	-	-	-	-
2,4'-DDT	ug/kg	1	-	-	-	-	-	-	-	-	-	-
4,4'-DDD	ug/kg	2	-	-	-	-	-	1.3	-	-	-	-
4,4'-DDE	ug/kg	2.2	-	-	-	-	-	-	-	-	-	-
4,4'-DDT	ug/kg	1	-	-	-	-	-	-	-	-	-	-
Endosulfan I	ug/kg	0.02	-	-	-	-	-	-	-	-	-	-
Endosulfan II	ug/kg	0.02	-	-	-	-	-	-	-	-	-	-
Endosulfan Sulfate	ug/kg	0.02	-	-	-	-	-	-	-	-	-	-
Endrin	ug/kg		-	-	-	-	-	-	-	-	-	-
Endrin Aldehyde	ug/kg		-	-	-	-	-	-	-	-	-	-
Endrin Ketone	ug/kg		-	-	-	-	-	-	-	-	-	-
Heptachlor	ug/kg		-	-	-	-	-	-	-	-	-	-
Heptachlor Epoxide	ug/kg		-	-	-	-	-	-	-	-	-	-
Methoxychlor	ug/kg		-	-	-	-	-	-	-	-	-	-
Toxaphene	ug/kg		-	-	-	-	-	-	-	-	-	-
Notes:												
ERL - Effects range low, the concentration threshold below which adverse effects on sensitive species rarely be observed (NOAA, 2004).							- = Not Detected NA = Not Analyzed					

APPENDIX A

Boring Logs.



Page 1 of 1
TESTING

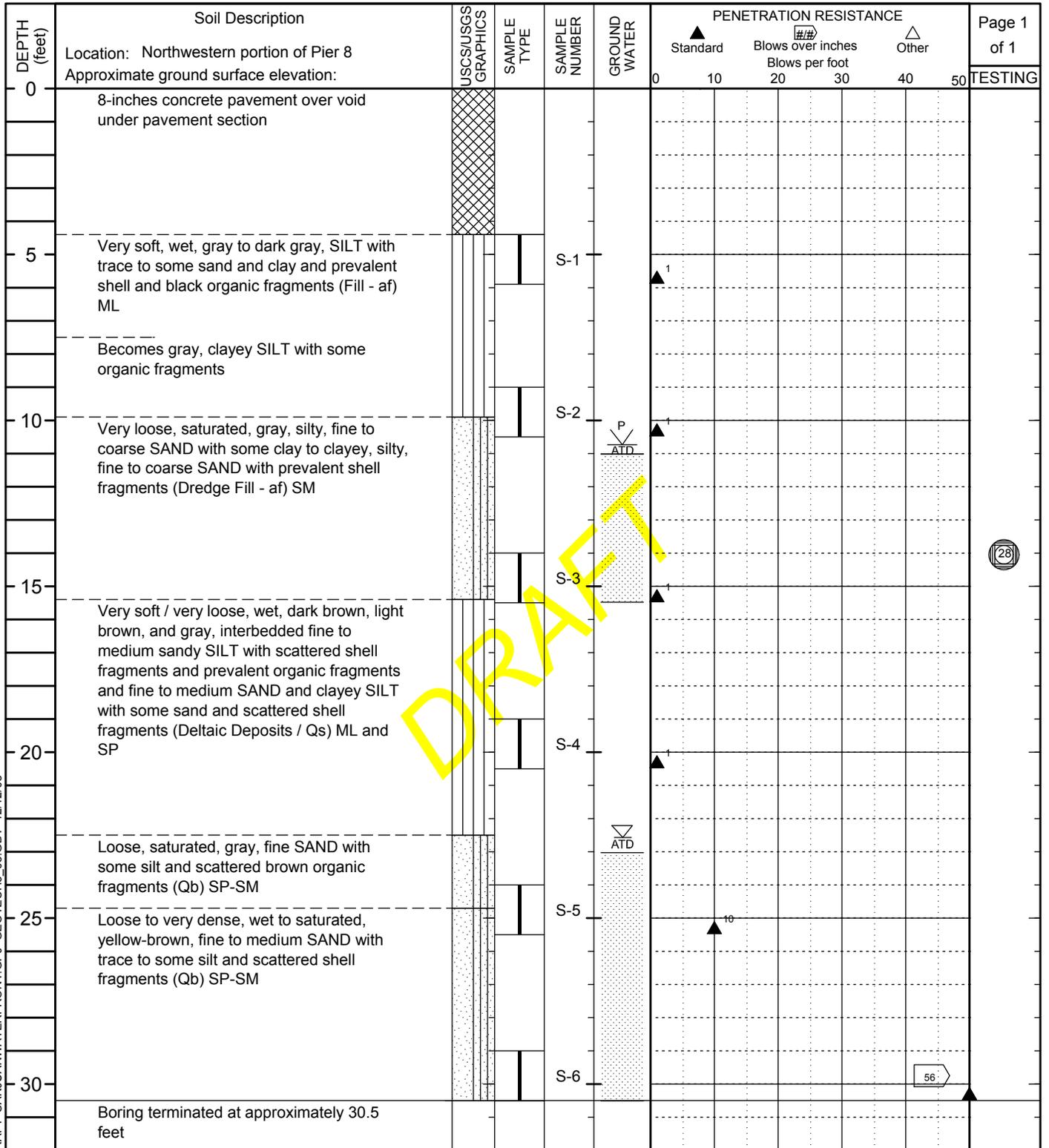
ST SOIL_ROCK_COMBO_DRAFT_SANJUANWATERFRONT.GPJ GEOTECH3_05.GDT 12/12/08

LEGEND

- 2.00-inch OD split-spoon sampler
- Groundwater level at time of drilling
- Atterberg Test (PI shown)



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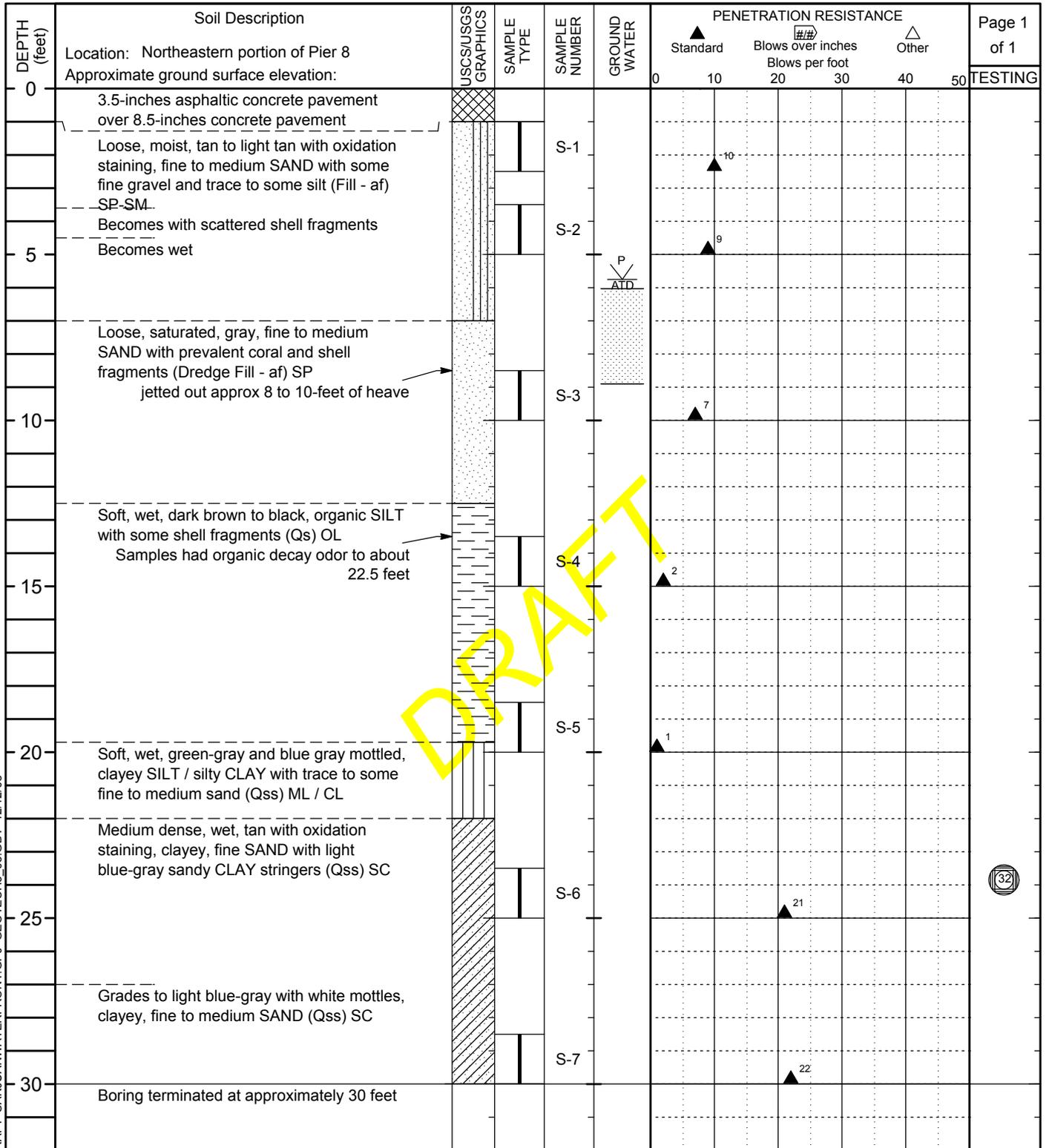
ST SOIL_ROCK_COMBO_DRAFT_SANJUANWATERFRONT.GPJ GEOTECH3_05.GDT 12/12/08

LEGEND

- 2.00-inch OD split-spoon sampler
- P Perched water level at time of drilling
- ATD Groundwater level at time of drilling
- Grain Size Analysis (% fines shown)



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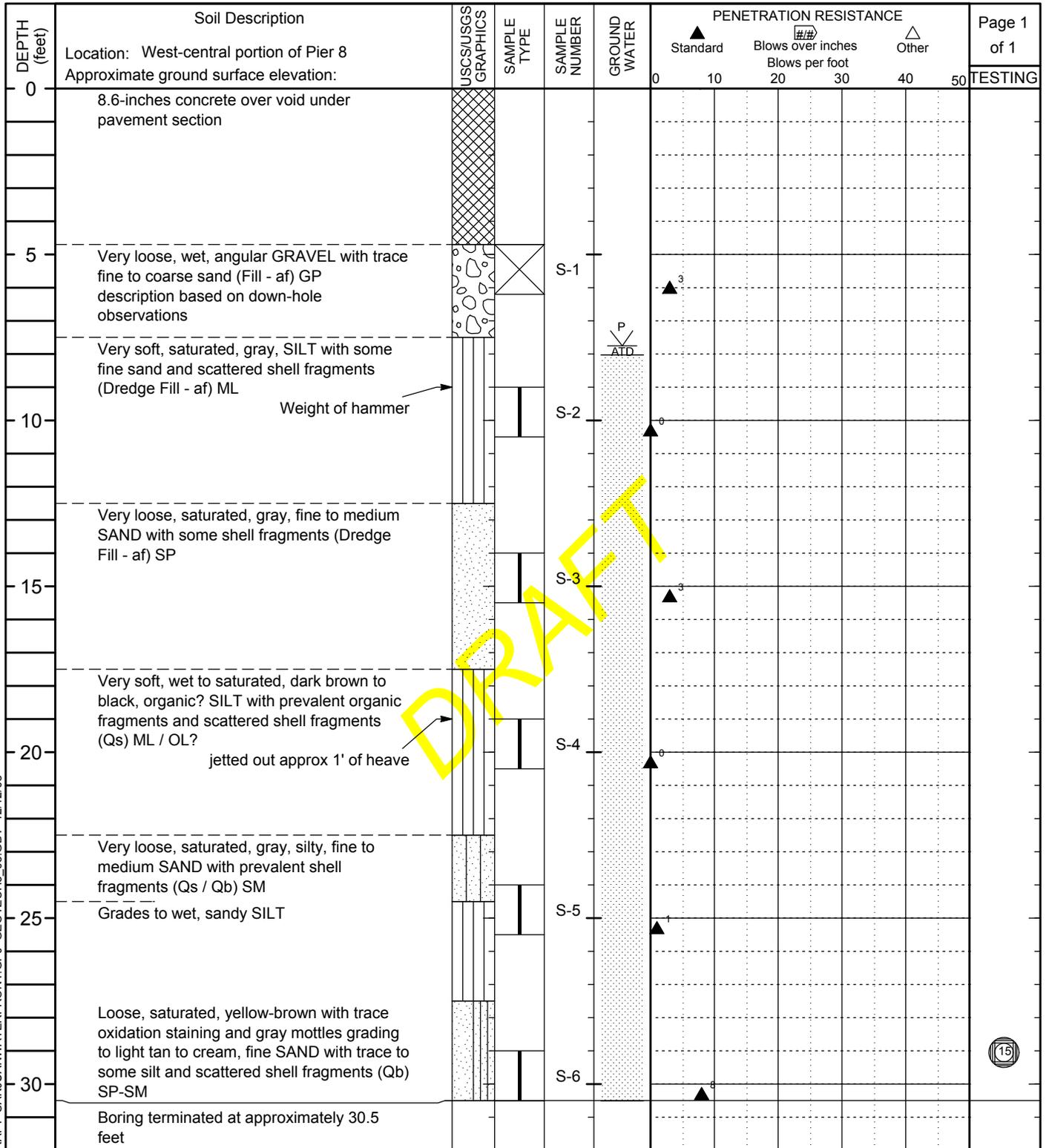
32

LEGEND

- 2.00-inch OD split-spoon sampler
- Perched water level at time of drilling
- Grain Size Analysis (% fines shown)



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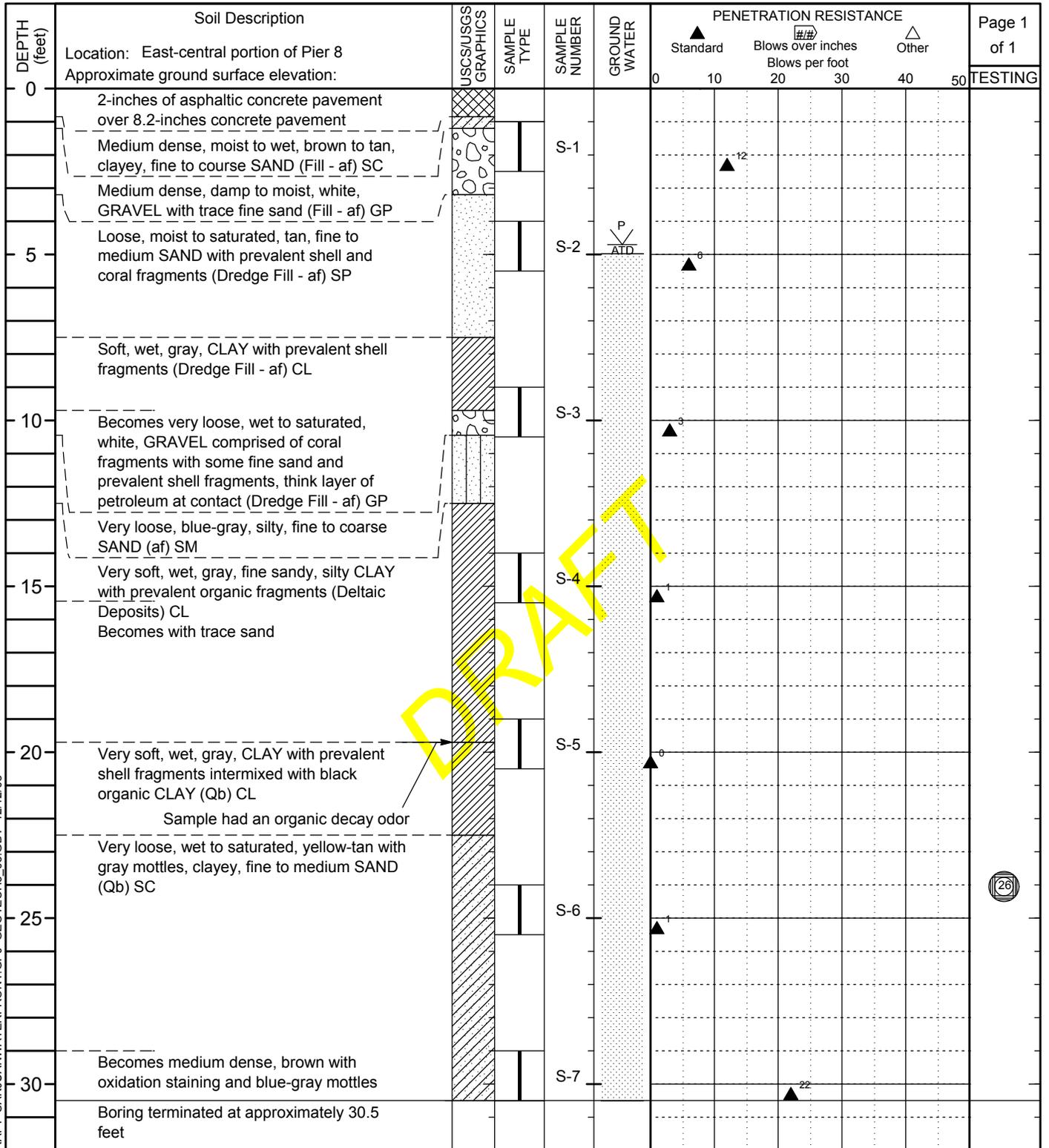
LEGEND

- No Recovery
- 2.00-inch OD split-spoon sampler
- Perched water level at time of drilling
- Grain Size Analysis (% fines shown)



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ST SOIL_ROCK_COMBO_DRAFT_SANJUANWATERFRONT.GPJ GEOTECH3_05.GDT 12/12/08

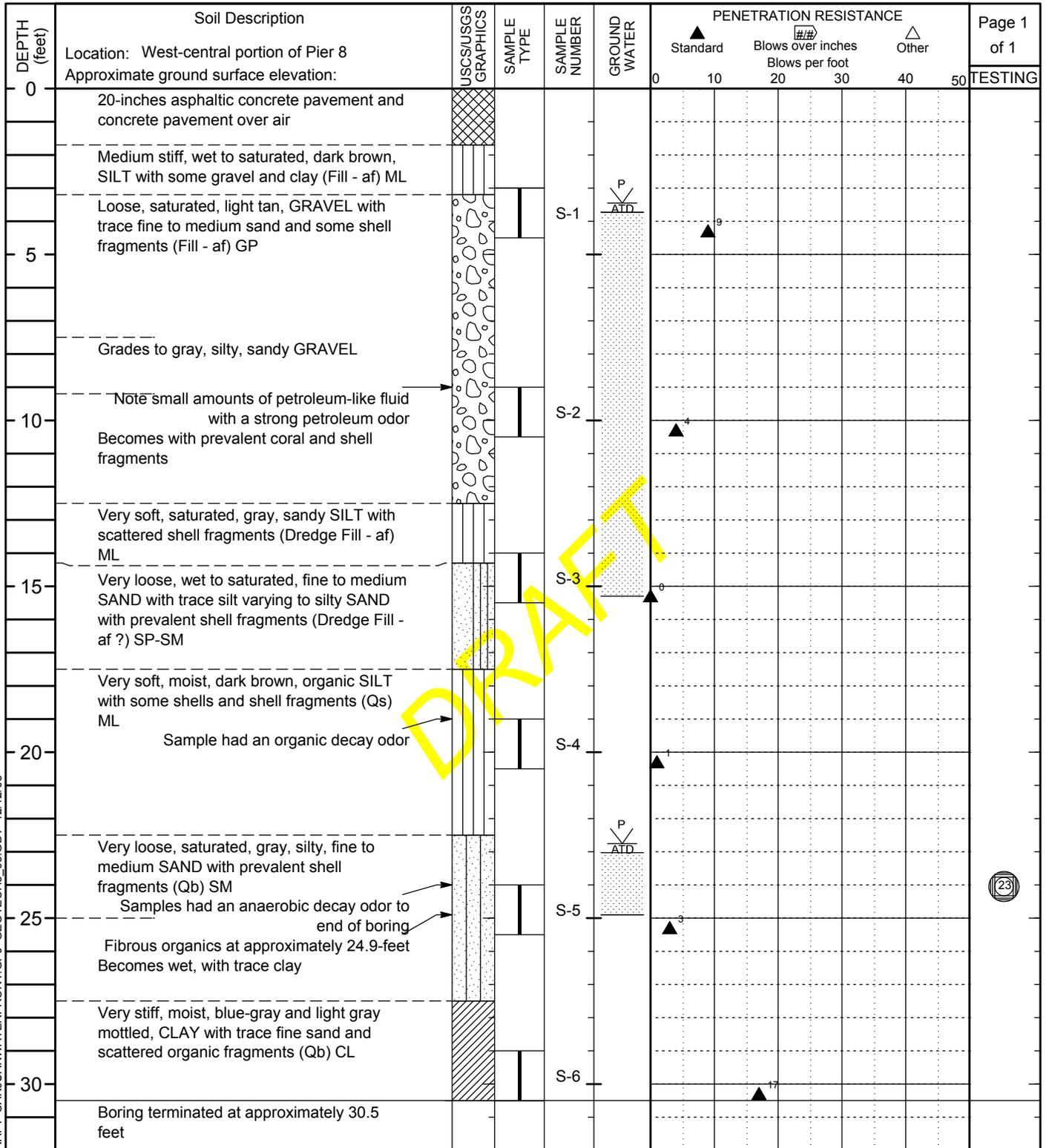
(26)

LEGEND

- 2.00-inch OD split-spoon sampler
- Perched water level at time of drilling
- Grain Size Analysis (% fines shown)



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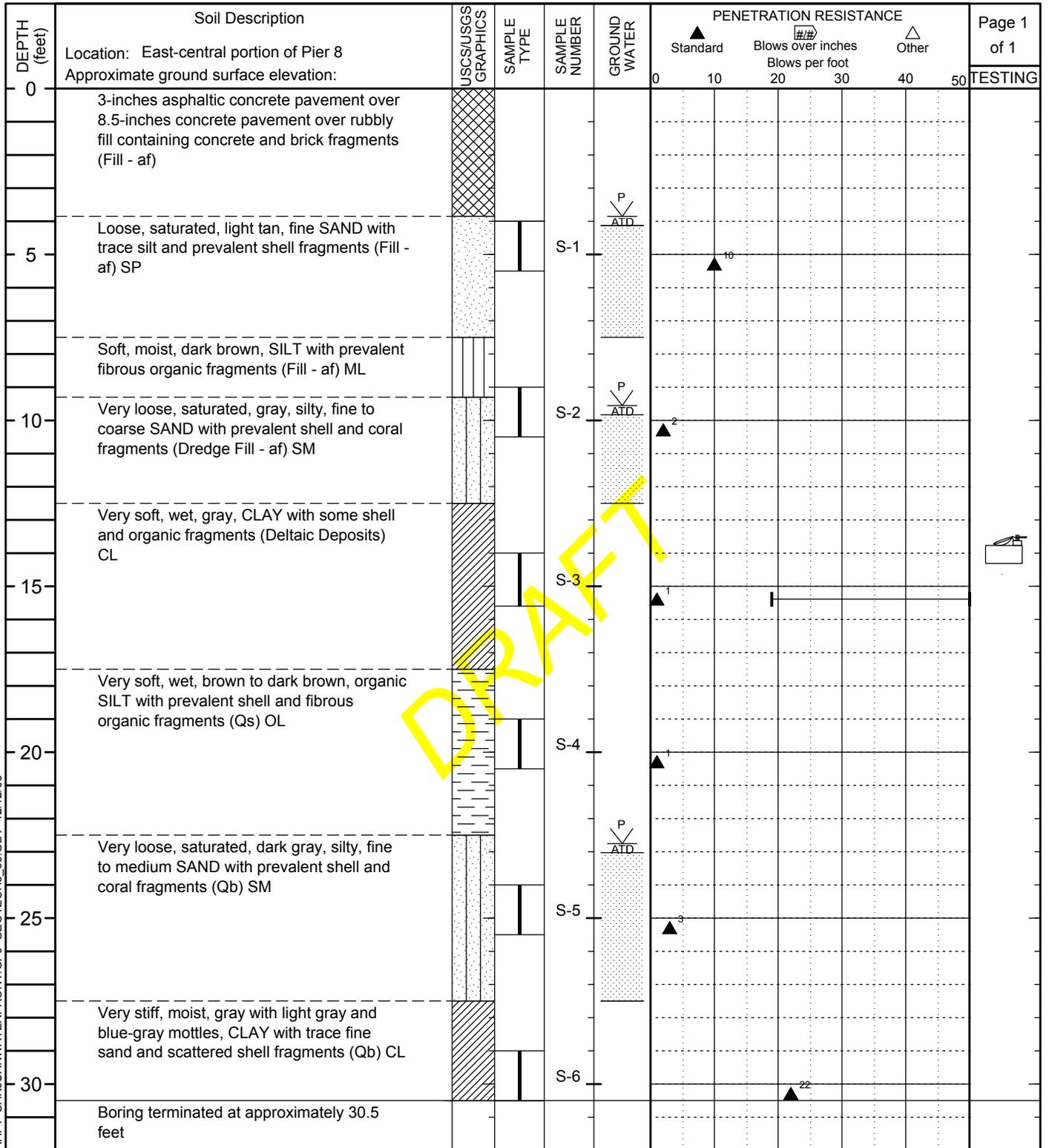
ST SOIL_ROCK_COMBO_DRAFT_SANJUANWATERFRONT.GPJ GEOTECH3_05.GDT 12/12/08

LEGEND

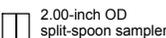
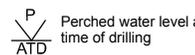
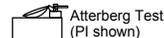
- 2.00-inch OD split-spoon sampler
- Perched water level at time of drilling
- Grain Size Analysis (% fines shown)



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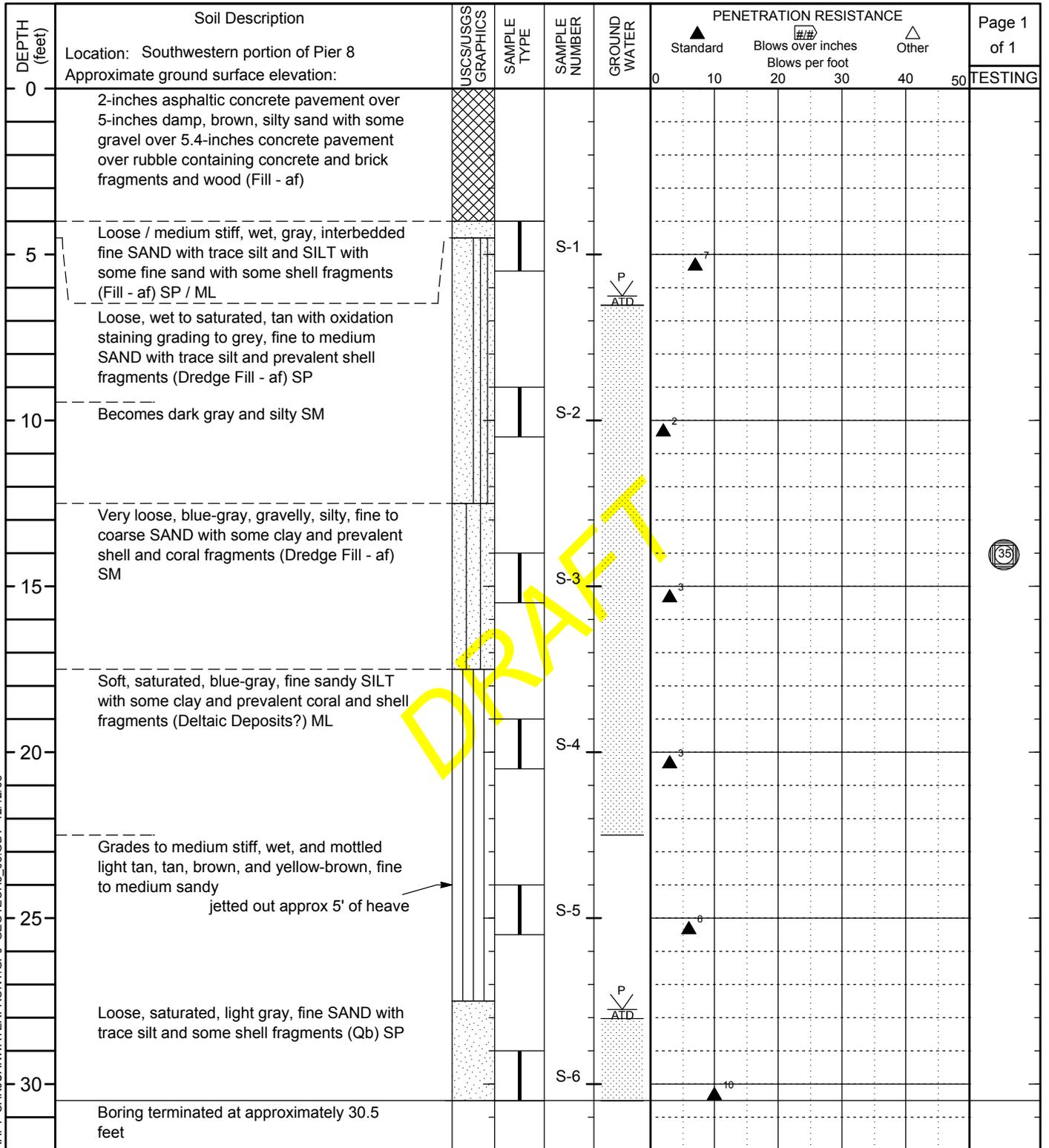


LEGEND

-  2.00-inch OD split-spoon sampler
-  Perched water level at time of drilling
-  Atterberg Test (PI shown)



ST SOIL_ROCK_COMBO_DRAFT_SANJUANWATERFRONT.GPJ GEOTECH3_05.GDT 12/12/08



ST SOIL_ROCK_COMBO_DRAFT_SANJUANWATERFRONT.GPJ GEOTECH3_05.GDT 12/12/08

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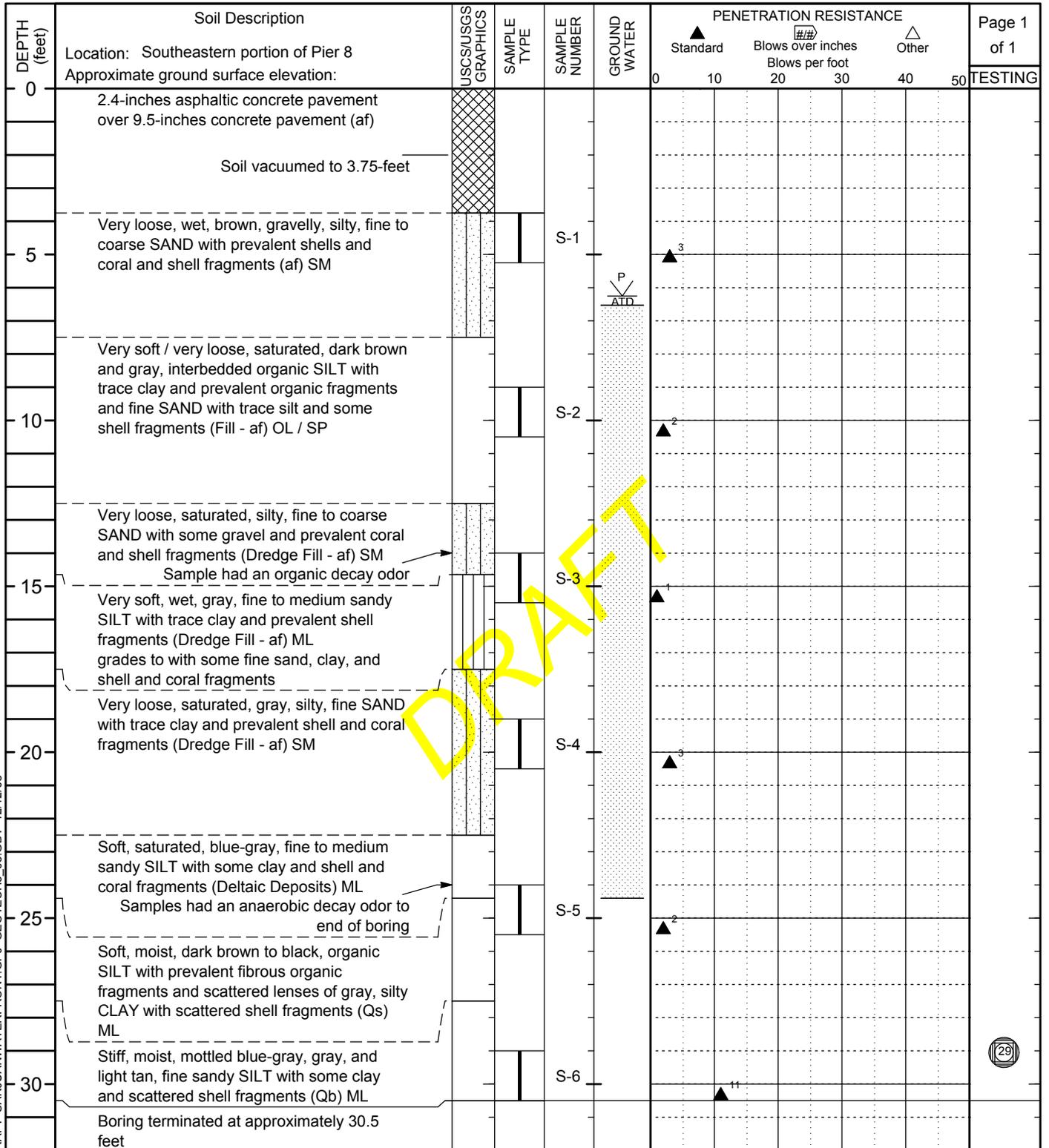


LEGEND

- 2.00-inch OD split-spoon sampler
- Perched water level at time of drilling
- Grain Size Analysis (% fines shown)



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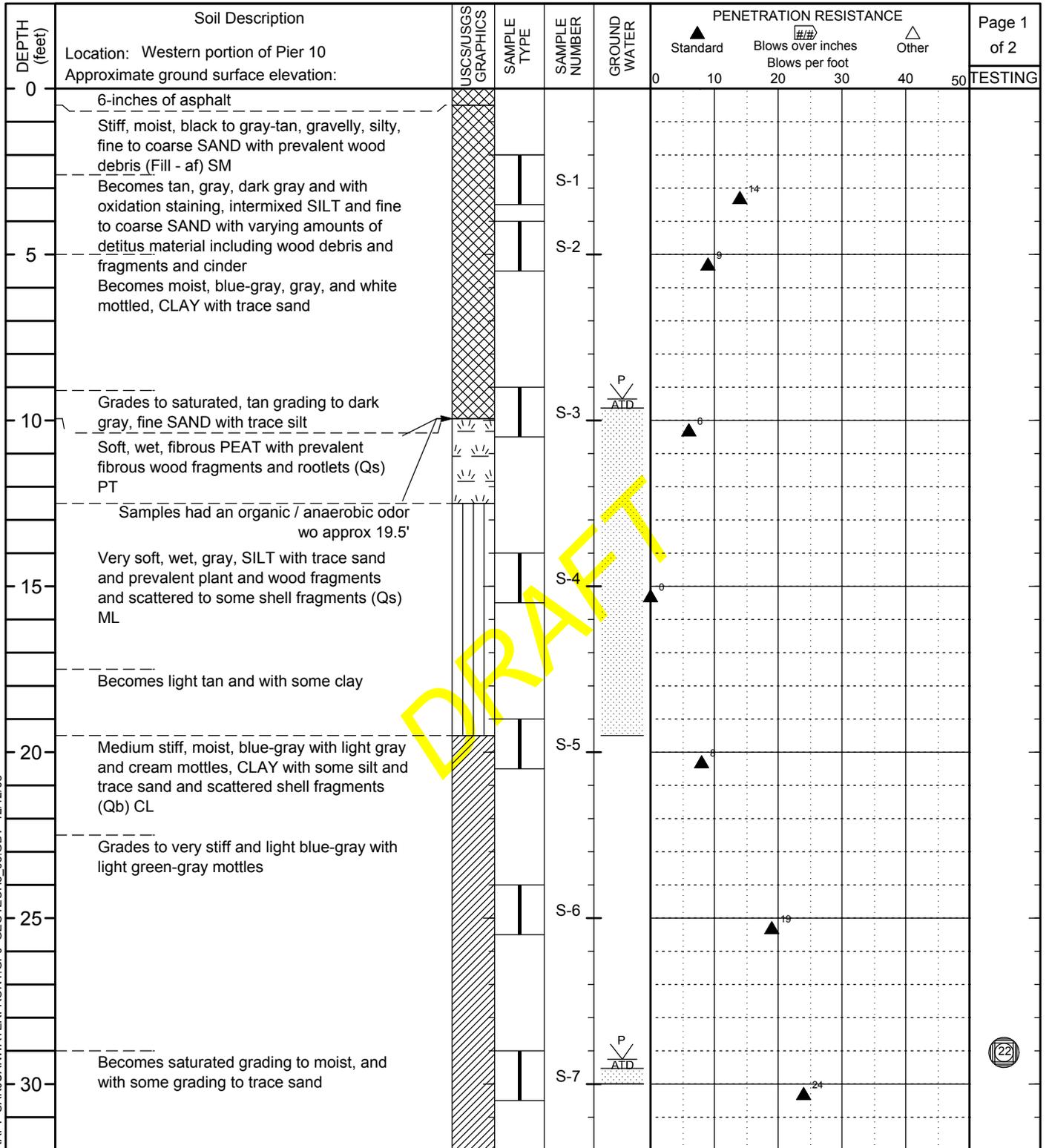
ST SOIL_ROCK_COMBO_DRAFT_SANJUANWATERFRONT.GPJ GEOTECH3_05.GDT 12/12/08

LEGEND

- 2.00-inch OD split-spoon sampler
- Perched water level at time of drilling
- Grain Size Analysis (% fines shown)



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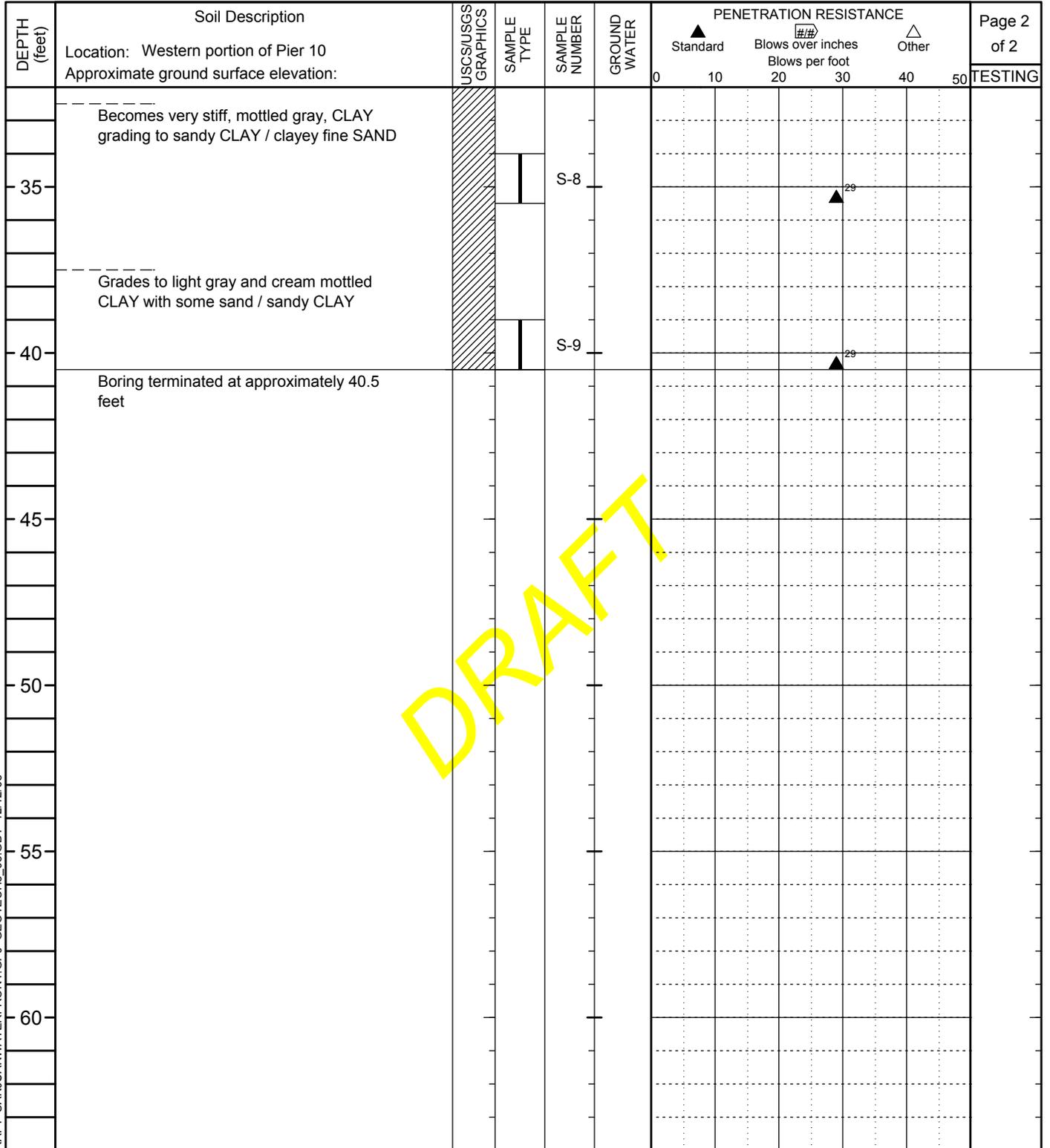
LEGEND

- 2.00-inch OD split-spoon sampler
- Perched water level at time of drilling
- Grain Size Analysis (% fines shown)

0 20 40 60 80 100

Plastic Limit MOISTURE CONTENT Liquid Limit

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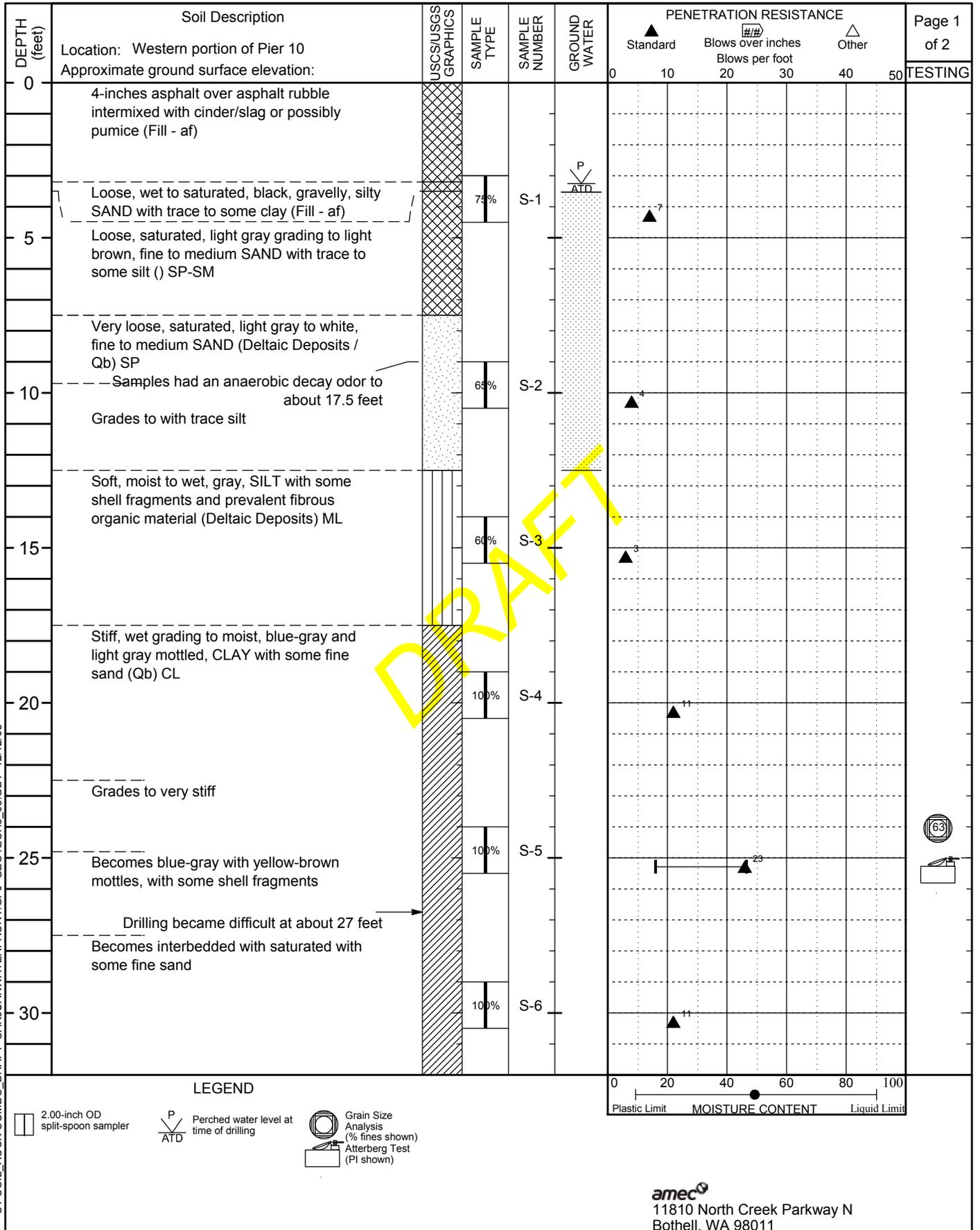
LEGEND

-  2.00-inch OD split-spoon sampler
-  Perched water level at time of drilling
-  Grain Size Analysis (% fines shown)



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DEPTH (feet)	Soil Description Location: Western portion of Pier 10 Approximate ground surface elevation:	USCS/USGS GRAPHICS	SAMPLE TYPE	SAMPLE NUMBER	GROUND WATER	PENETRATION RESISTANCE			Page 2 of 2
						Standard	Blows over inches Blows per foot	Other	
35	Medium dense, saturated, yellow-brown, clayey, fine to medium SAND (Qb) SC	[Hatched pattern]	100%	S-7	[Water table symbol]	11			TESTING
	Stiff, saturated, yellow-brown with gray mottling, fine sandy CLAY with scattered fine shell fragments (Qb) CL								
40	Grades to moist, dark yellow-brown to brown, with trace fine sand		100%	S-8		14			
	Boring terminated at approximately 40.5 feet								
45									
50									
55									
60									

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LEGEND

[Symbol] 2.00-inch OD split-spoon sampler

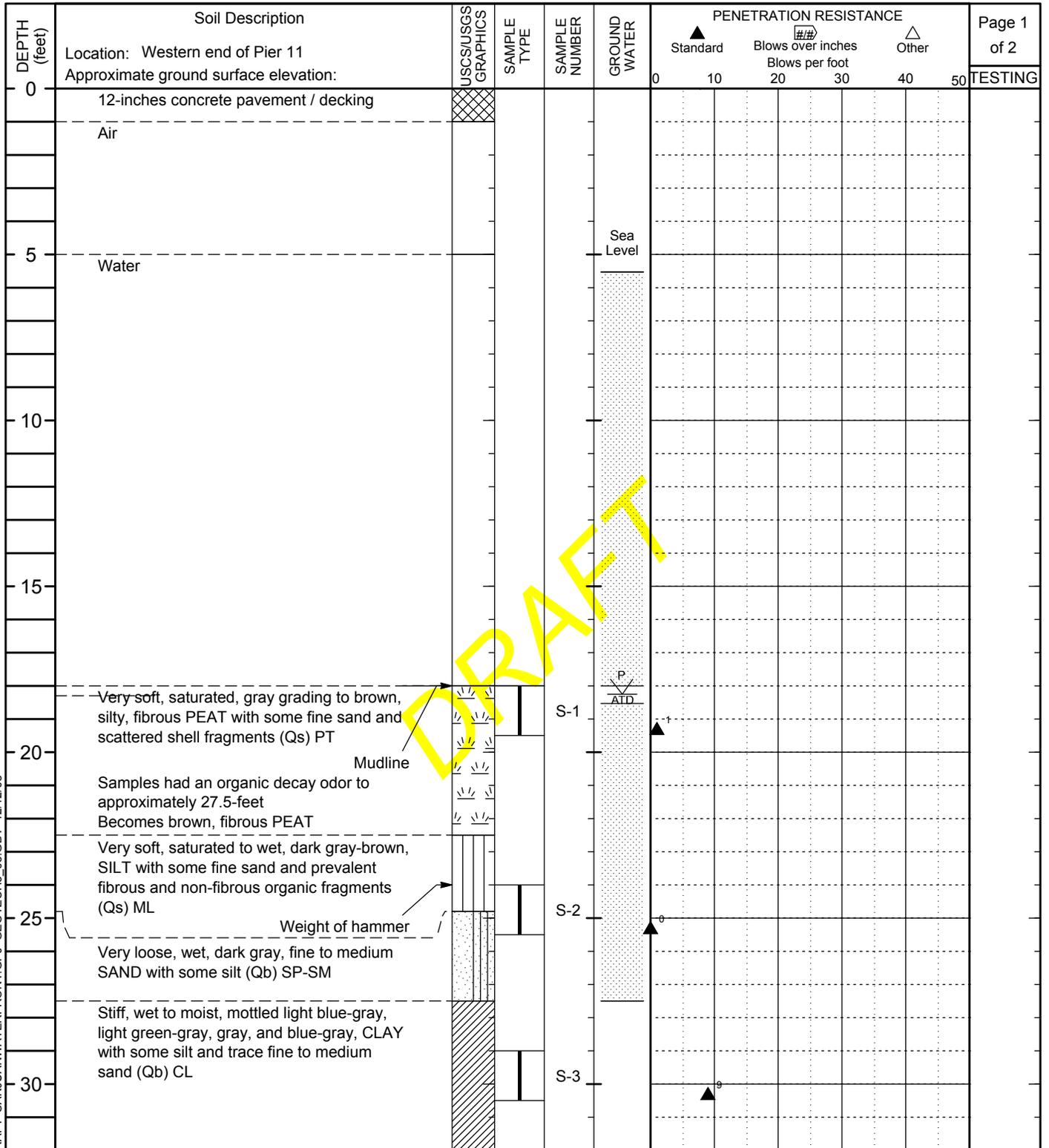
[Symbol] Perched water level at time of drilling

[Symbol] Grain Size Analysis (% fines shown) Atterberg Test (PI shown)



ST SOIL_ROCK_COMBO_DRAFT_SANJUANWATERFRONT.GPJ GEOTECH3_05.GDT 12/12/08

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LEGEND

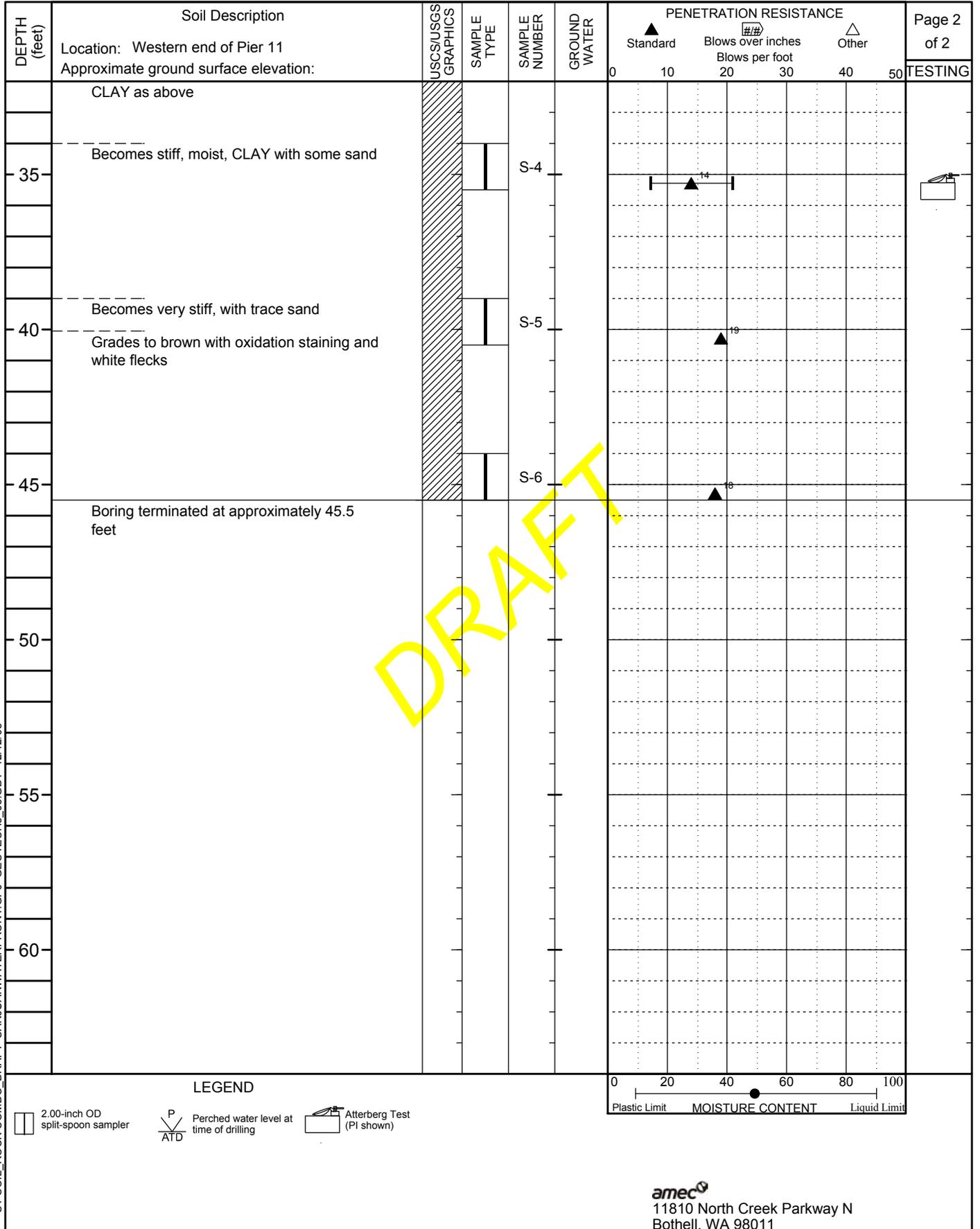
- [Vertical lines] 2.00-inch OD split-spoon sampler
- [P over ATD] Perched water level at time of drilling
- [Hammer icon] Atterberg Test (PI shown)

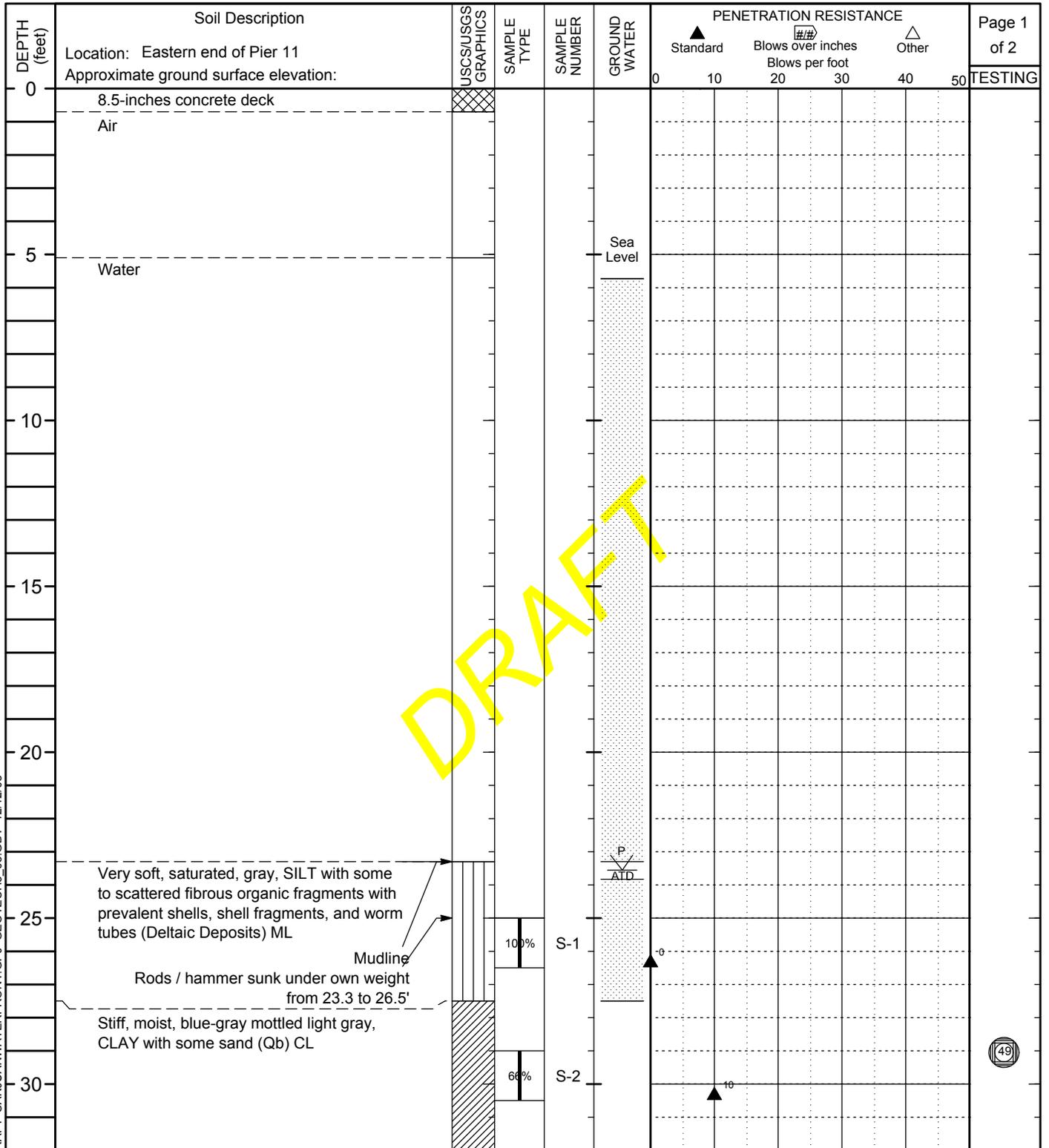


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DEPTH (feet)	Soil Description Location: Eastern end of Pier 11 Approximate ground surface elevation:	USCS/USGS GRAPHICS	SAMPLE TYPE	SAMPLE NUMBER	GROUND WATER	PENETRATION RESISTANCE			Page 2 of 2
						Standard	Blows over inches Blows per foot	Other	
	CLAY as above								TESTING
35	Becomes moist to wet, fine to medium sandy CLAY with some silt		93%	S-3		10			
40	Becomes moist, mottled light blue-gray, light green-gray, and light gray		87%	S-4		12			
45	Becomes fine to medium sandy CLAY / clayey SAND (Qb) CI / SC		100%	S-5		14			
	Boring terminated at approximately 45.5 feet								
50									
55									
60									

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LEGEND

 2.00-inch OD split-spoon sampler

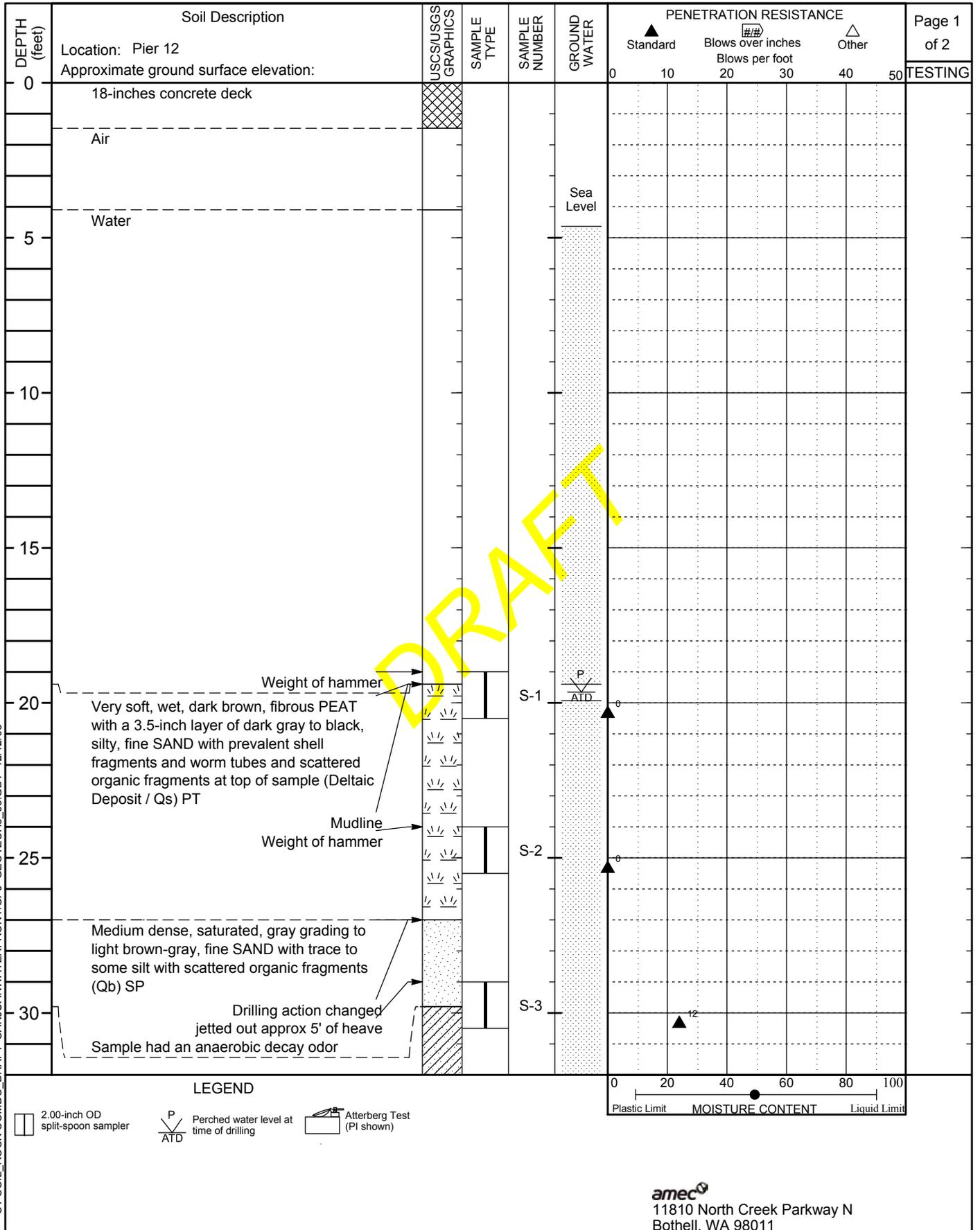
 P
ATD Perched water level at time of drilling

 Grain Size Analysis (% fines shown)

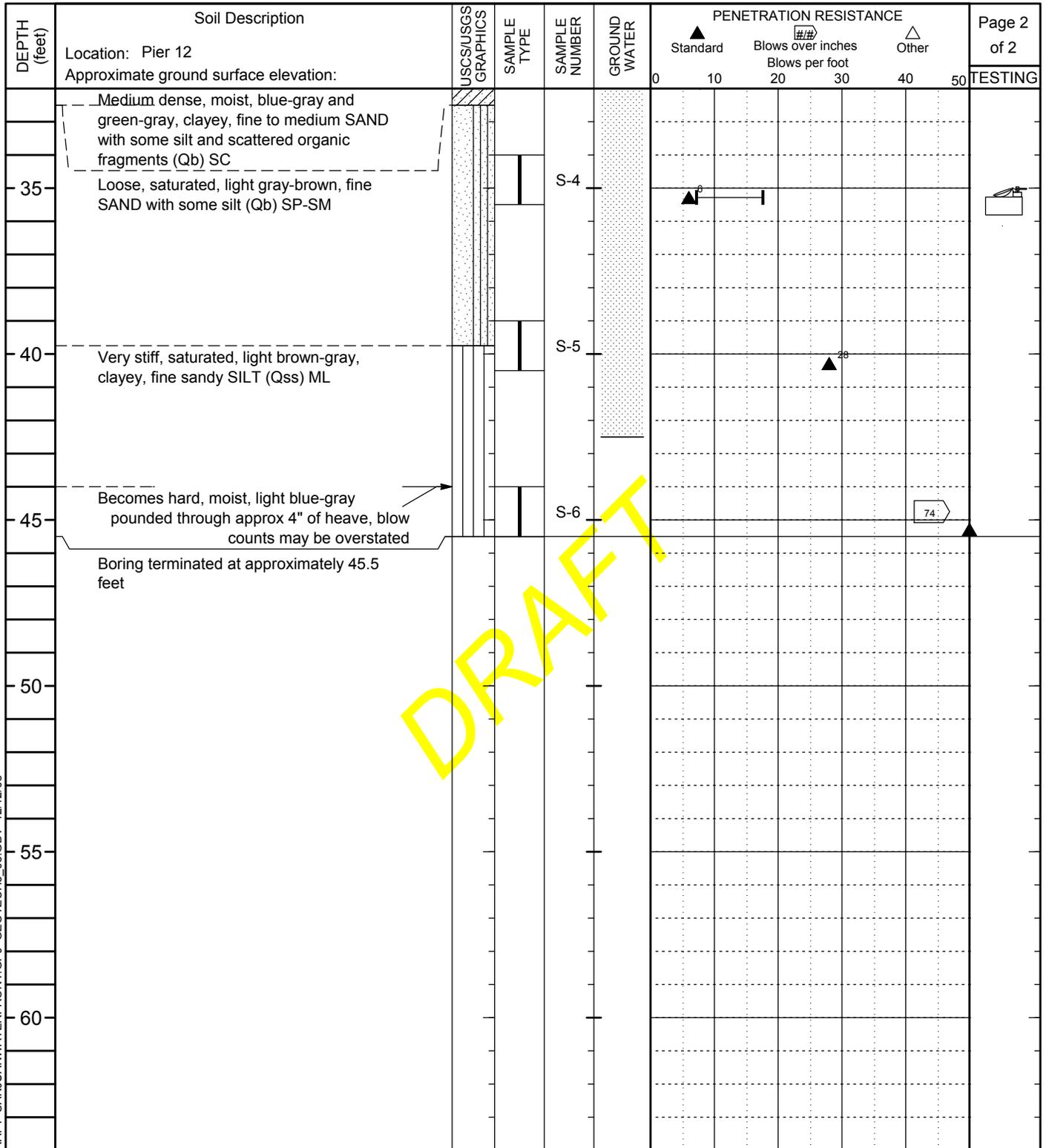


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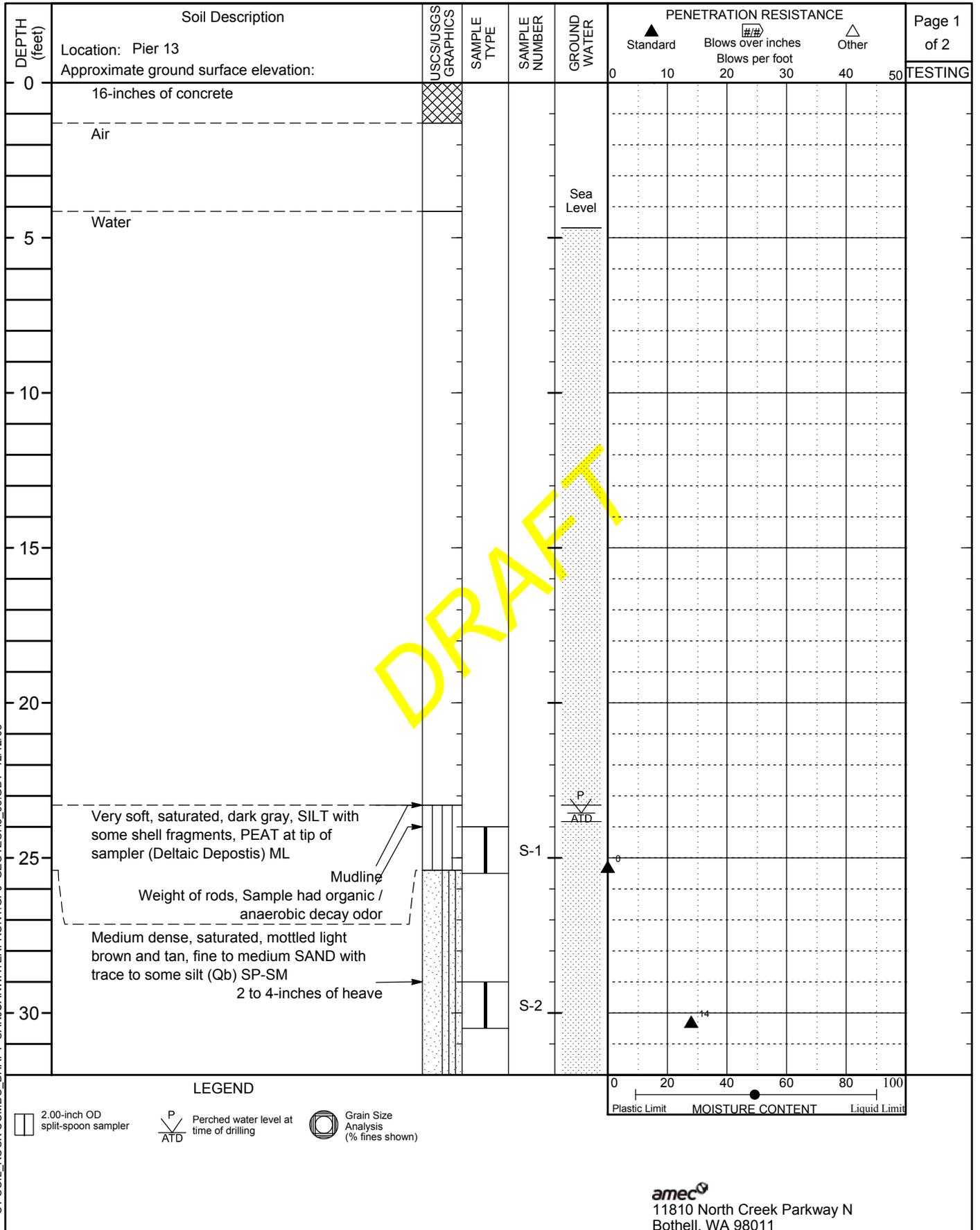
ST SOIL_ROCK_COMBO_DRAFT_SANJUANWATERFRONT.GPJ GEOTECH3_05.GDT 12/12/08

LEGEND

- 2.00-inch OD split-spoon sampler
- Perched water level at time of drilling
- Atterberg Test (PI shown)

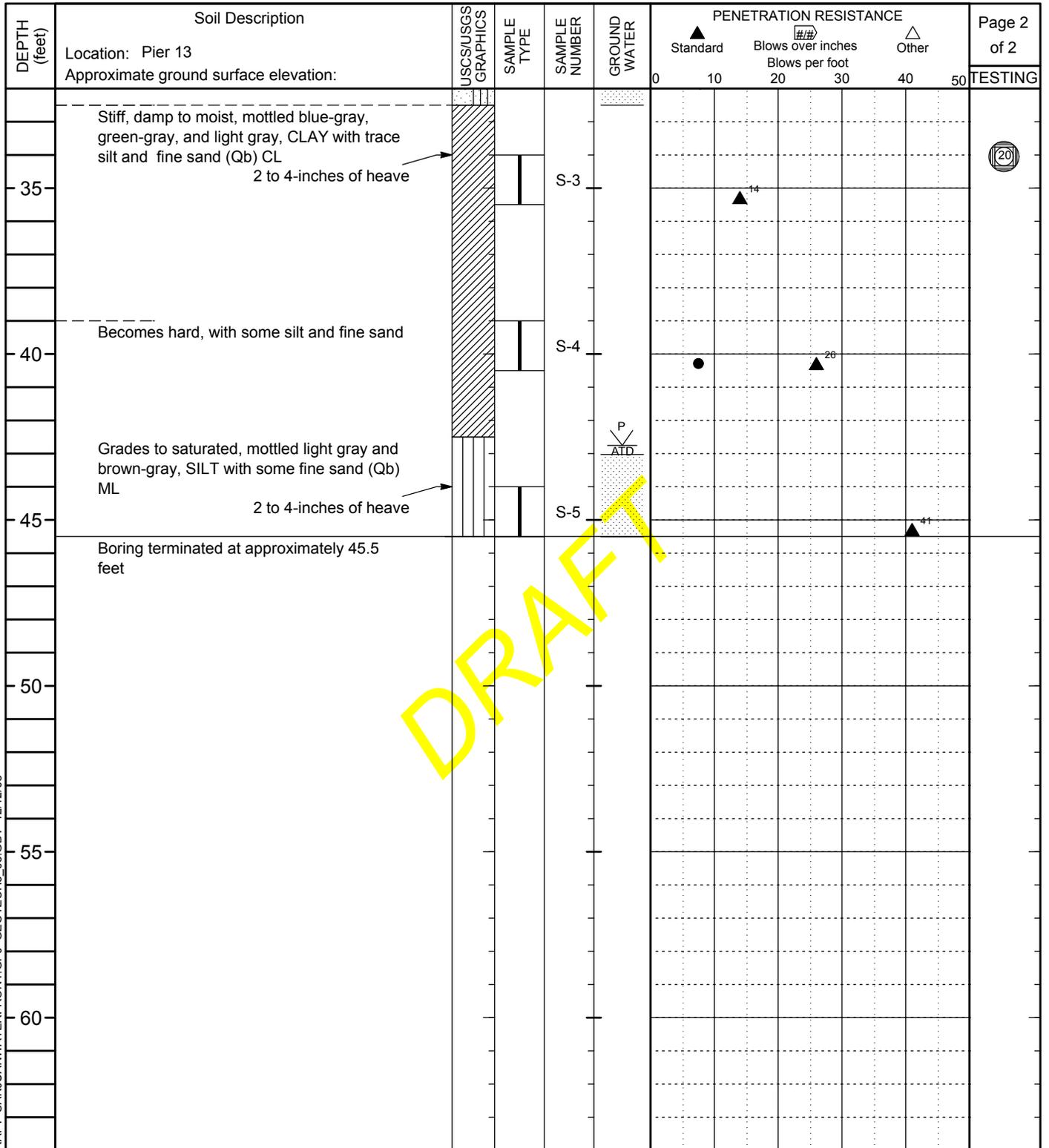


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LEGEND

- 2.00-inch OD split-spoon sampler
- Perched water level at time of drilling
- Grain Size Analysis (% fines shown)



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APPENDIX B

Laboratory Analytical Reports.

APPENDIX C

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