

5090
Ser 1142E/Alameda/HAS

29 AUG 1986

California Regional Water Quality Control Board
San Francisco Bay Region
Attn: G. Fulton
1111 Jackson Street, Room 6040
Oakland, CA 94607

Gentlemen:

In response to your letter File No. 2199.9080A (GRF) of August 4, 1986 to the Commanding Officer of the Alameda Naval Air Station (NAS), and as discussed in a phone conversation with Ms. Gloria Fulton of your staff on August 27, 1986, we unfortunately will not be able to submit by August 30, 1986 a proposal to address ponding at the Alameda NAS West Beach Landfill. At present, we are seeking from the construction contractor a written commitment as to when an as-built construction drawing showing final elevations and contours will be submitted to the Government. Based upon verbal discussions with the contractor, it is anticipated that the drawing can be submitted to the Government in about one month. As it would take our design consultant, Harding Lawson Associates (HLA), the same amount of time to prepare (by subconsultant) and to submit such a drawing, it was determined that the contractor should prepare the drawing. As the drawing is critical in our evaluation of potential ponding at the site, our proposal to address the ponding issue cannot be developed until after receipt of the drawing. We will make every effort to furnish you our proposal as soon as possible.

The results of HLA's field and laboratory testing for the 20,000 cubic yards of cover recently placed at the landfill are provided as enclosure (1). Drawings C-1, C-3, and C-7 which you requested are provided as enclosures (2), (3) and (4).

Your previous correspondence requested that a revised closure plan for the site be submitted by October 1, 1986. We cannot meet the 1 October date for the following reasons: as-built construction drawings have not yet been provided by the contractor to the Government, funding uncertainties must still be resolved, and a detailed proposal regarding placement of additional cover at the site (including the wetland/landfill interface) must still be developed.

In our past correspondence and conversations with Ms. Fulton, we have discussed the possibility of utilizing clamshell dredged materials as cover at the site. We are currently investigating the technical feasibility of utilizing clamshelled materials from an upcoming military construction project which is described in enclosure (5). The results of the geotechnical and chemical testing of samples taken from the area to be dredged in this project are provided as enclosures (6) and (7).

5990

Ser 1142E/Alameda/NAS

29 AUG 1986

Questions regarding this matter may be directed to Louise T. Lew in our San Bruno office at (415) 877-7497.

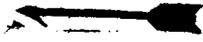
Sincerely,

ALEX E. DONG
HEAD, WEST CENTRAL ENVIRONMENTAL SECTION

Encl:

- (1) Harding Lawson Associates ltr of 19 August 1986
- (2) Drawing C-1, P-183, Solid Waste Disposal System, Naval Air Station, Alameda (NAVFAC Drawing No. 6164530)
- (3) Drawing C-3, P-183, Solid Waste Disposal System, Naval Air Station, Alameda (NAVFAC Drawing No. 6161497)
- (4) Drawing C-7, P-183, Solid Waste Disposal System, Naval Air Station, Alameda (NAVFAC Drawing No. 6161501)
- (5) Dredging Project, P-012, Naval Supply Center, Oakland
- (6) EAL Corporation, Results of Elutriate Testing dtd 9 March 1984
- (7) Harding Lawson Associates, Supplemental Geotechnical Engineering Services Report dtd 16 October 1985

Copy to: (w/ encl (1) only)
NAS Alameda

Blind copy to: (w/o encls)
ROICC San Francisco Bay
09A2A.13
051
405
203
243
102
114
1142
1142E 



August 19, 1986

2176,060.01

Commanding Officer
Western Division
Naval Facilities Engineering Command
P.O. Box 727
San Bruno, California 94066

Attention: Mr. Fred Paat
Code 405.1

Gentlemen:

Report
Results of Field and Laboratory Testing
Solid Waste Disposal System (P183)
Naval Air Station Alameda, California

This letter presents the results of field and laboratory testing we performed on recently compacted fill at the Alameda Naval Air Station Landfill. During July 1986, Contri Construction Company of Reno, Nevada, spread and compacted approximately 20,000 cubic yards of fill. They imported this fill during the early part of 1986 from a construction site along the east side of Webster Street in Alameda.

A sample of the proposed fill was submitted to our laboratory by Contri Construction. It was tested and found to be satisfactory as reported in our letter dated January 7, 1986. A copy of this letter is attached.

The scope of this assignment was to determine the thickness, compaction, percent passing the No. 200 sieve, and the approximate limits of the new fill. In addition, samples from two locations were to be remolded in the laboratory to their in situ moisture and density conditions and permeability tests performed.

On July 10, 1986 our field engineers performed tests at 11 locations. These locations and the approximate fill limits are shown on Plate 1. The field tests included field density and determination of fill thickness. In the laboratory the percent passing the 200 sieve was determined on 9 of the 11 samples. The results of the tests are shown on the attached table.

August 19, 1986
2176,060.01
Mr. Fred Paat
Western Division
Naval Facilities Engineering Command
Page 2

Based on the field and laboratory tests it appears that the majority of the field compaction and gradation and some of the fill thicknesses are unsatisfactory. The two permeability tests results also are higher than required.

If you have any questions, please call us.

Yours very truly,

HARDING LAWSON ASSOCIATES

Lyle E. Lewis

Lyle E. Lewis
Principal Engineer



Attachments: Plate 1
Letter dated January 7, 1986
Soil Tests Table

cc: OICC/ROICC, San Francisco Bay Area
P.O. Box 23300
Oakland, California 94623
Attention: Lt. Brown



January 7, 1986

2176,060.01

Commanding Officer, Western Division
 Naval Facilities Engineering Command
 P.O. Box 727
 San Bruno, California 94066

Attention: Mr. Fred Paat, Code 405.1

Gentlemen:

Report
 Results of Laboratory Testing
 Solid Waste Disposal System (P-183)
 Naval Air Station
 Alameda, California

This letter presents the results of laboratory tests performed on two samples of proposed fill to be used for cover at the P-183 project (land-fill) at the Alameda Naval Air Station. Both samples were submitted by Contri Construction Company of Reno, Nevada. The first sample was obtained from a pit in Livermore, California. The second sample was obtained from a large stockpile east of Webster Street in Alameda, California. Our December 10, 1985 letter reported the results of tests on a sample from a different part of the Webster Street stockpile.

Compaction curves were performed (ASTM D1557-78) to determine the maximum dry densities. Samples were then compacted to 90 percent of the maximum dry density and permeability tests performed. The permeability tests were performed using backpressure saturation and the falling head test method. The coefficients of permeability are as follows:

<u>Source</u>	<u>Dry Density (pcf)</u>	<u>Moisture Content (%)</u>	<u>Coefficient of Permeability (cm/sec)</u>
Livermore Pit	103	19.6	2.8×10^{-6}
Webster Street	92	27.8	8.1×10^{-8}

January 7, 1986
2176,060.01
Commanding Officer, Western Division
Naval Facilities Engineering Command
Mr. Fred Paat
Page 2

Harding Lawson Associates

Based on the results of the tests, the proposed material from Webster Street meets the specifications for impermeable cover at the landfill when compacted to at least 90 percent at 5 percent above the optimum moisture content. The Livermore sample does not meet the specifications. However, if compacted to a slightly higher density, the coefficient of permeability probably will be satisfactory.

Yours very truly,

HARDING LAWSON ASSOCIATES

Lyle E. Lewis

Lyle E. Lewis,
Civil Engineer - 16360

LEL/bt

3 copies submitted

cc: ROICC
Building 796, Oakland Army Base
P.O. Box 23300
Oakland, California 94623

Attention: Mr. Wilfred Uclusen

Table

No.	Soil Type	Moisture Content (%)	Dry Density (pcf)	Relative(1) Compaction (%)	Passing(2) No. 200 Sieve (%)	Permeability(3) (cm/sec)	Thickness(4) (Inches)
1	Sandy Clay	11.2	95.3	--	51.3		13
2	Clayey Sand	10.2	107.3	83	30.0		13
3	Clayey Sand	10.5	102.4	83	43.6	2.5 x 10 ⁻⁶	12
4	Clayey Sand	10.9	105.0	83	31.9		12
5	Clayey Sand	12.8	104.1	--	37.5		9
6	Clayey Sand	10.5	113.8	88	27.5		18
7	Clayey Sand	13.1	99.0	80	40.0		8
8	Clayey Sand	17.9	100.3	84	43.4	2.0 x 10 ⁻⁶	6
9	Clayey Sand	12.0	97.8	82	42.7		4
10	Sandy Clay	18.8	92.5	86	71.7		12
11	Clayey Sand	9.5	123.8	97	45.8		13

Required Values

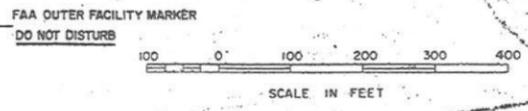
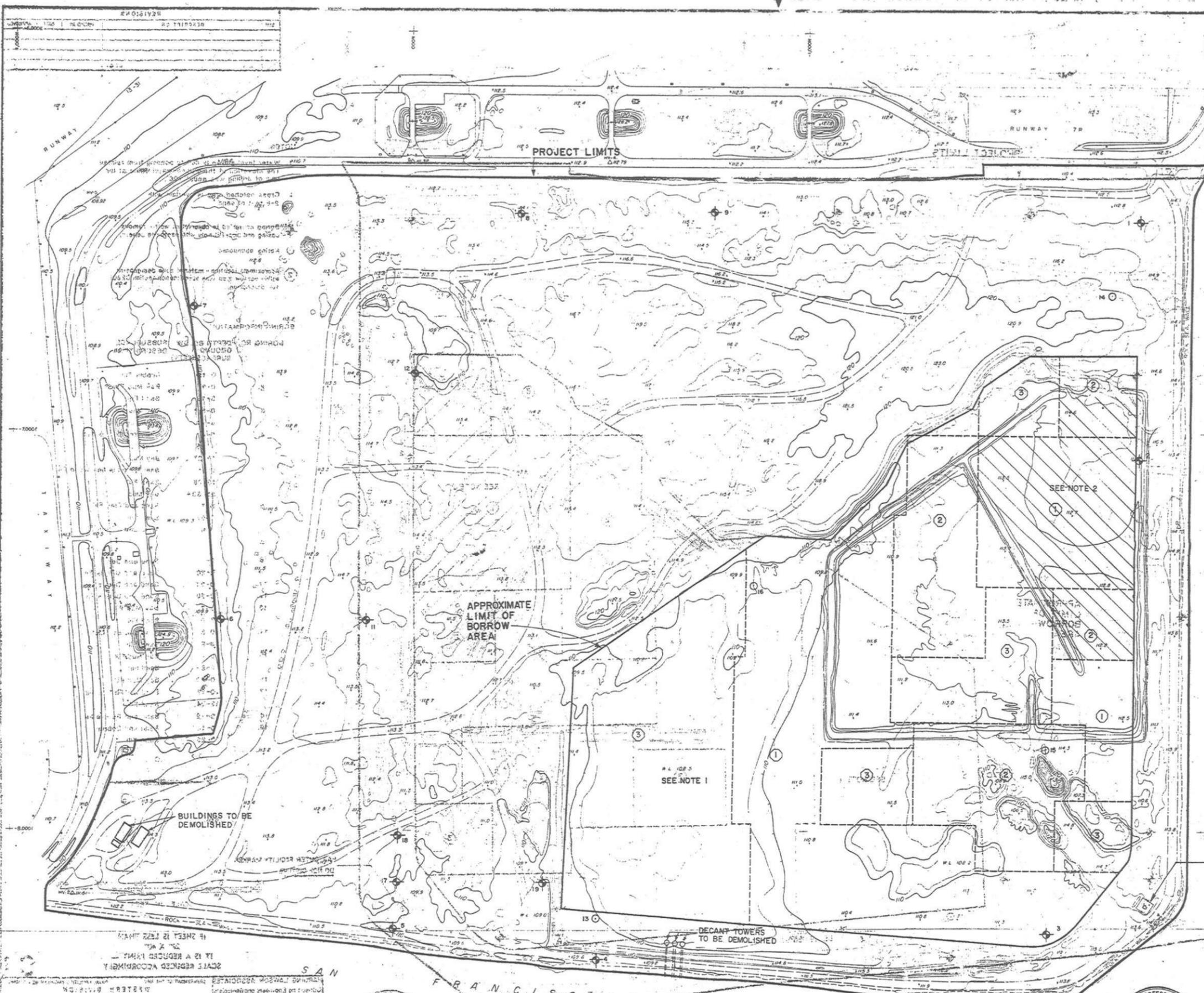
- (1) 90%
- (2) >50% passing the No. 200 sieve (Zone 1 Type Soil)
- (3) 1 x 10⁻⁶ cm/sec or less
- (4) 12 inches

REVISIONS			
NO.	DESCRIPTION	PREP BY	DATE

- NOTES:
- Water level shown is due to ponding from rainfall. The elevation of the ground-water table at the time of drilling was about 106'.
 - Cross hatched area is overlain with 2-5 feet of sand.
 - Boring converted to observation well - remove casing and backfill hole with bentonite pellets.
 - Boring abandoned
 - Approximate location - material zone designation within borrow area (see specification section 02201 for description).

BORING INFORMATION

BORING NO.	DEPTH BELOW GROUND SURFACE (FEET)	SUBSURFACE DESCRIPTION
1.	0-15	Rubble Fill
2.	0-3	Bay Mud Fill
3.	3-10	Sand Fill
4.	0-5	Bay Mud Fill
5.	5-11	Clay and Sand
6.	0-4	Sand and Debris Fill
7.	4-16	Sand Fill
8.	16-27+	Bay Mud
9.	0-13	Sand, Rubble and Wood Fill
10.	13-25	Sand Fill
11.	25-30+	Bay Mud
12.	0-7	Sand and Clay Fill
13.	7-27	Sand Fill
14.	0-4	Sand and Debris Fill
15.	4-18	Sand Fill
16.	0-15	Sand and Debris Fill
17.	0-20	Sand and Debris Fill
18.	5-21	Sand and Debris Fill
19.	5-20	Sand and Debris Fill
20.	0-7	Bay Mud Fill
21.	7-9	Sand Fill
22.	0-3	Sand and Bay Mud
23.	3-9	Sand Fill
24.	0-2	Bay Mud Fill
25.	2-9+	Sand Fill
26.	0-10	Bay Mud Fill
27.	0-12	Sand and Refuse Fill
28.	12-24	Sand Fill
29.	0-12	Sand and Refuse Fill
30.	0-12	Sand and Debris Fill
31.	12-25	Sand Fill



ALAMEDA NAVAL AIR STATION
 WESTERN ENGINEERING AND GEOLGISTS
 CONSULTING ENGINEERS AND GEOLOGISTS
 2/5/82
 80091



WESTERN ENGINEERING COMMAND
 WESTERN DIVISION
 SAN BRUNO, CALIFORNIA
 ALAMEDA NAS ALAMEDA, CALIFORNIA
 P 183
 SOLID WASTE DISPOSAL SYSTEM
 BORROW AREA AND EXISTING SITE PLAN

DATE: 2/5/82
 DRAWN BY: J.L.W.
 CHECKED BY: W.F.F.
 SUBMITTED BY: W.F.F.
 APPROVED BY: W.F.F.

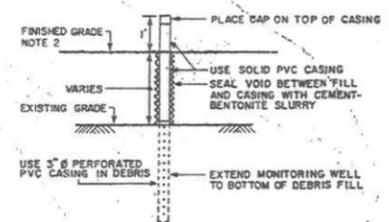
PROJECT NO. 80091
 SHEET NO. 2 OF 10

C1

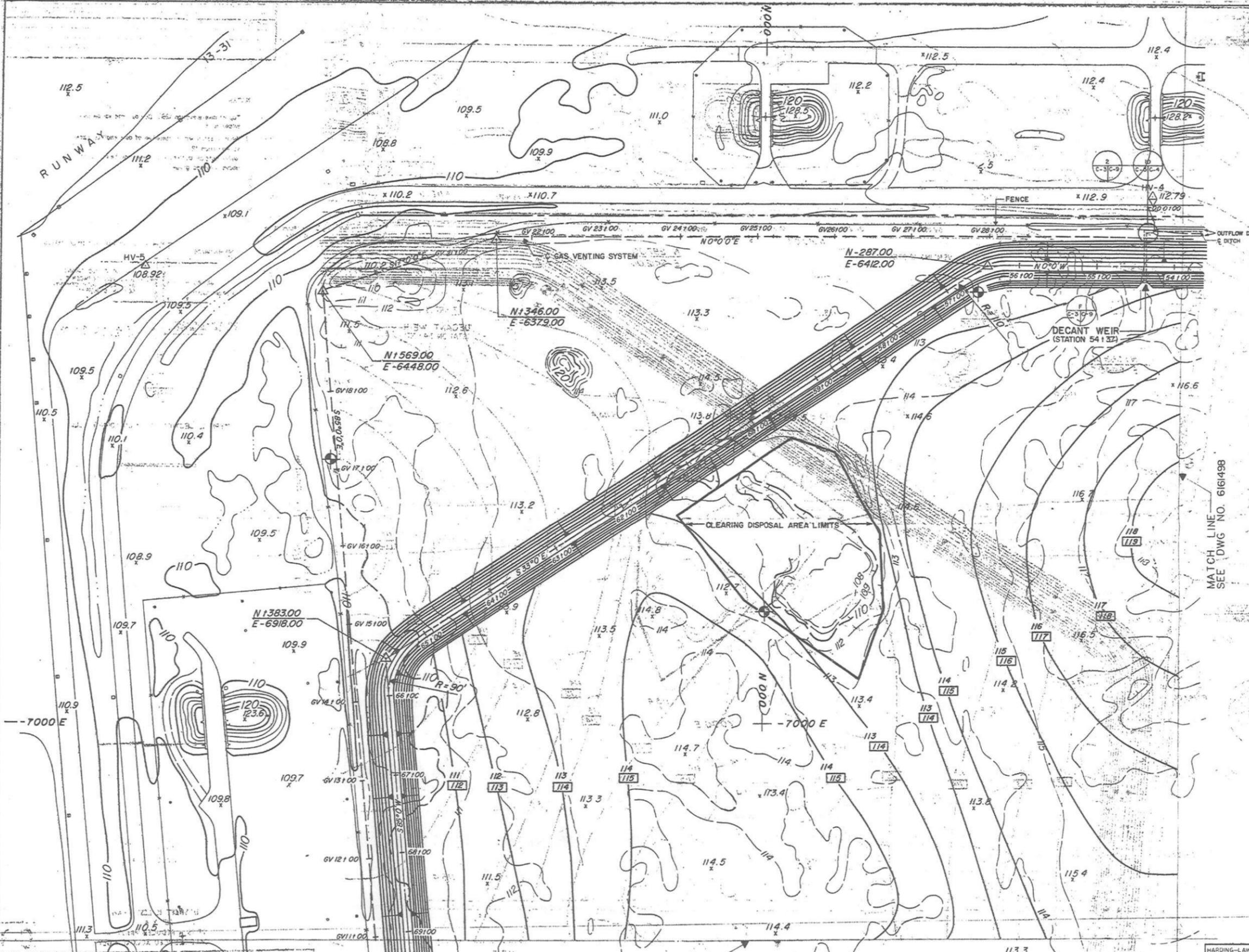
NO.	DESCRIPTION	DATE	APPROVED

NOTES:

1. Top of dike elevation 126'. Contour interval on dike slopes is 2'.
2. Wells located within centerline of dike shall be raised to elevation 125'. Wells outside centerline of dike shall be raised to 1' above finished grade.



TYPICAL SECTION NEW MONITORING WELL



MATCH LINE NO. 6161498
SEE DWG NO. 6161499

IF SHEET IS LESS THAN 28" X 40"
IT IS A REDUCED PRINT —
SCALE REDUCED ACCORDINGLY

C3

TOPOGRAPHY Prepared by
HARRISON-JENSEN-WALKER ASSOCIATES
MAPPING AND FORESTRY SERVICES
DUBLIN, CALIFORNIA

NOTE: This map was photogrammetrically prepared using aerial photography dated March 1979. Horizontal and vertical control was established by Tucker & Associates based on the California Coordinate System Zone 3 and Station 5074.100, 5074.100.



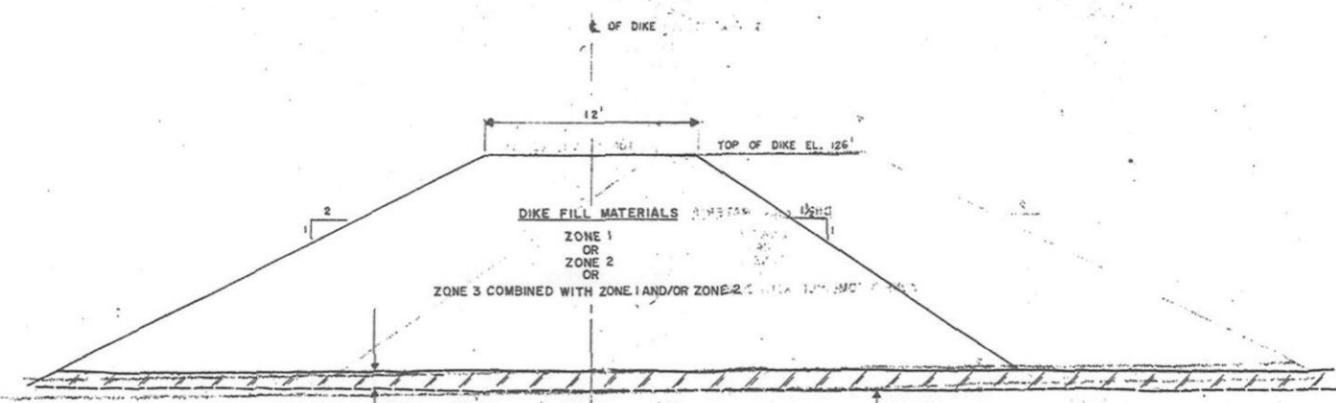
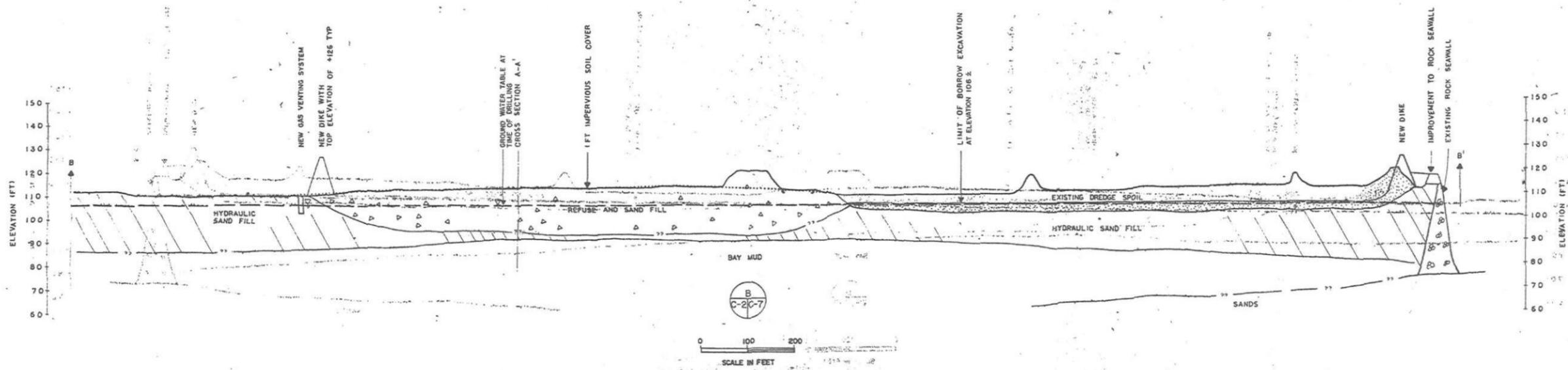
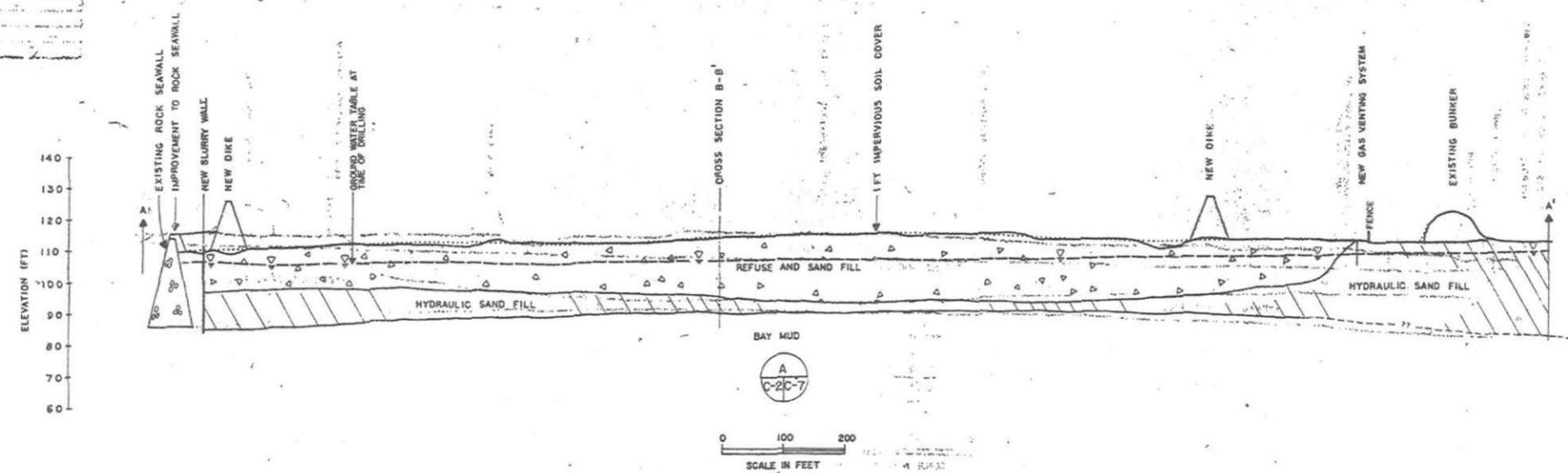
This map was enlarged from the original 1:5000 scale map scale 1:1000, contour interval 1'

MATCH LINE
SEE DWG NO. 6161499



HARRISON-JENSEN-WALKER ASSOCIATES Consulting Engineers and Geologists		DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND WESTERN DIVISION SAN BRUNO, CALIFORNIA	
DESIGN WFF DR	CHK WFF	ALAMEDA NAS ALAMEDA, CALIFORNIA P 183	
SUPV JLW	CH ENGR JCD	SOLID WASTE DISPOSAL SYSTEM PLAN - N.E. QUADRANT	
DATE 2/5/82	DATE 2/5/82	SIZE F	CODE IDENT. NO. 80091
BY WFF	DATE 2/5/82	NAVAC DRAWING NO. 6161497	CONSTR. CONTR. NO. M2474-80-C-9054
SATISFACTORY TO	DATE	SCALE AS-SHOWN	SHEET 12 OF 10

REVISIONS				
NO.	DESCRIPTION	PREP'D BY	DATE	APPROVED



IF SHEET IS LESS THAN
28" X 40"
IT IS A REDUCED PRINT —
SCALE REDUCED ACCORDINGLY

C-7

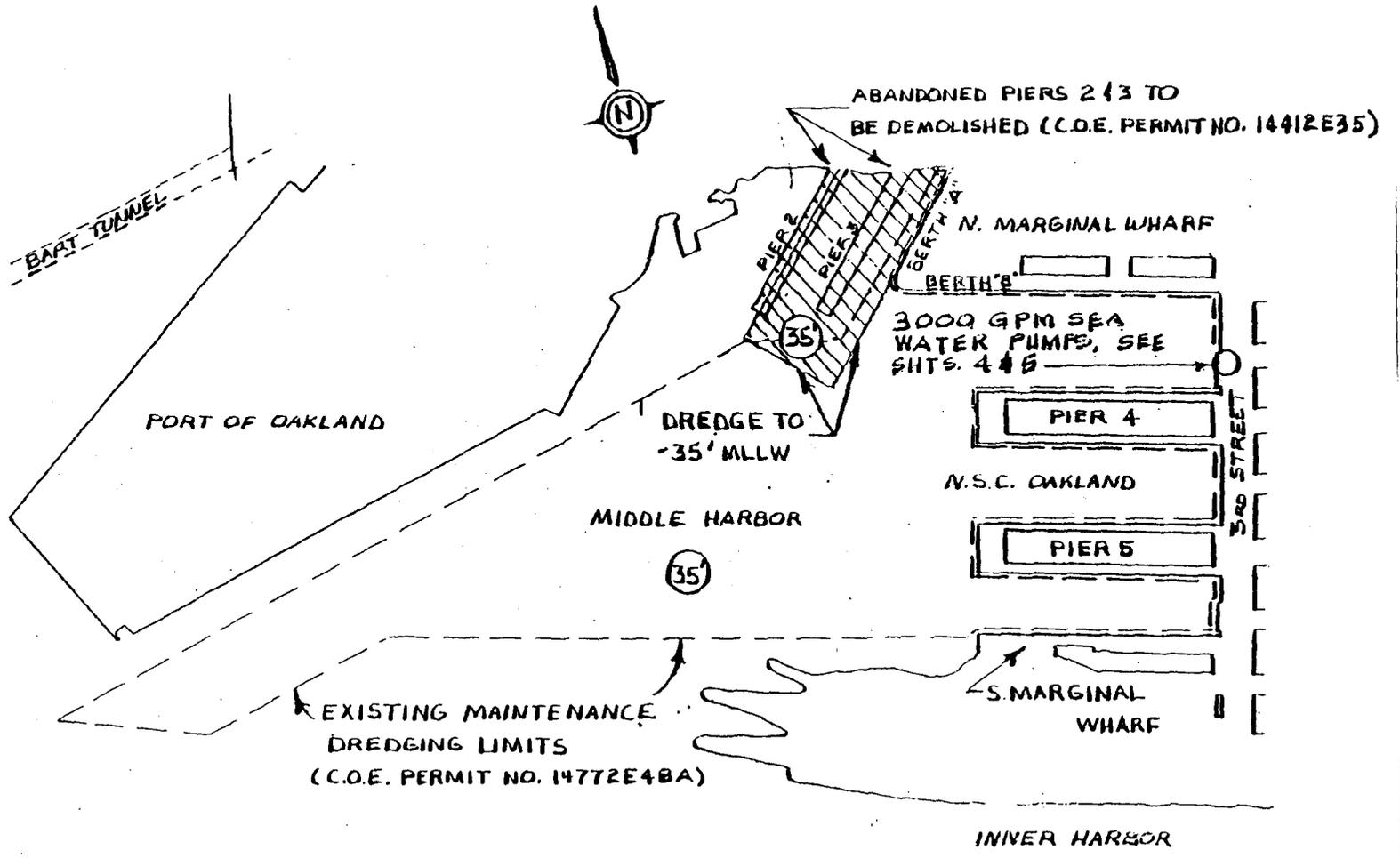
HARDING-LAWSON ASSOCIATES Consulting Engineers and Geologists		DEPARTMENT OF THE NAVY NAVFACILITIES ENGINEERING COMMAND WESTERN DIVISION SAN BRUNO, CALIFORNIA	
DESIGN: WFR DR. TL CHK: WFP	SUPV: JLW CH ENGR: JCD	ALAMEDA - NAS ALAMEDA, CALIFORNIA P183 SOLID WASTE DISPOSAL SYSTEM CROSS SECTIONS	
SUBMITTED BY: <i>[Signature]</i> Associate 2/5/82		SIZE: CODE IDENT NO: 6161501	
DATE: 7-18-73		CONST. CONTR. NO. 462474-80 -C- 9054	
SATISFACTORY TO: _____		SCALE: AS SHOWN	



14008 11

PURPOSE: DREDGE FOR BERTHING NAVAL VESSELS
 DATUM: MLLW = 0.00'
 ADJACENT PROPERTY OWNERS:
 ① N/A
 ②

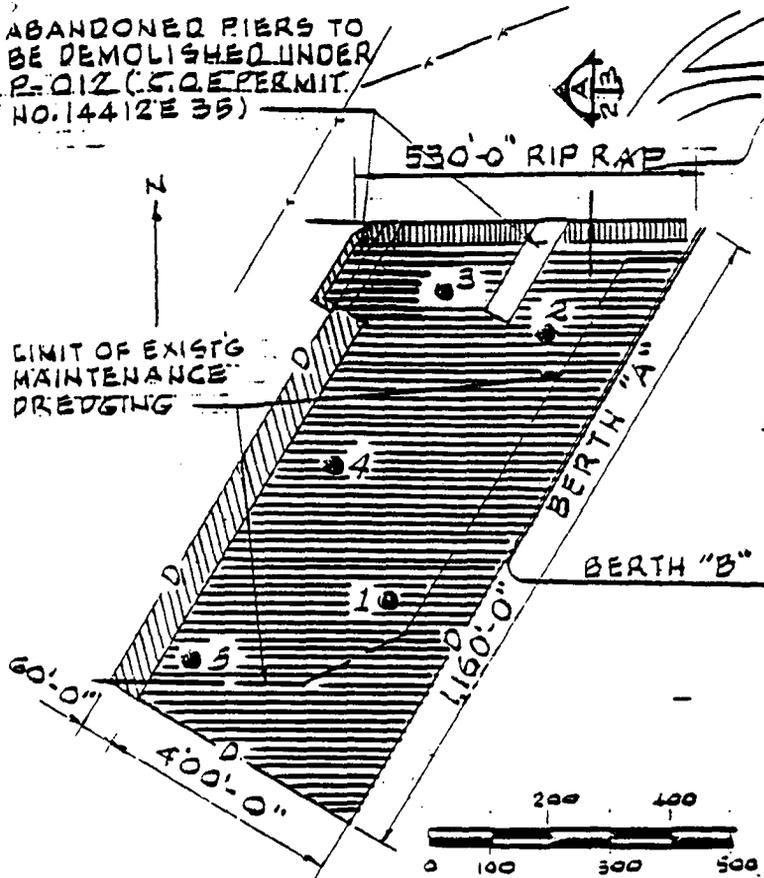
IN BERTH 'A', NORTH MARGINAL WHARF
 AT U.S. NAVAL SUPPLY CENTER, OAKLAND
 COUNTY OF ALAMEDA STATE CA



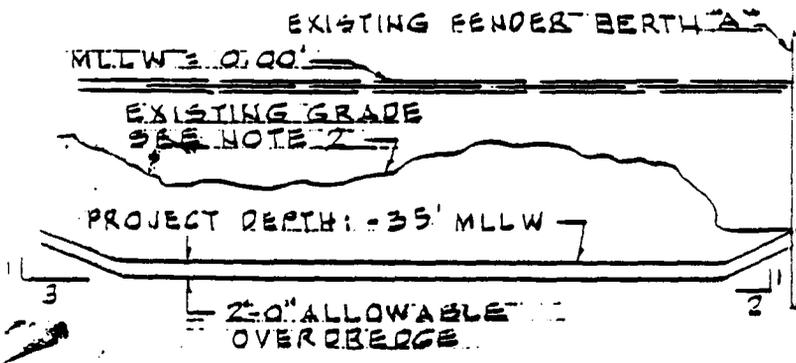
SITE PLAN
 SCALE: N.T.S.

Enclosure 5

ABANDONED PIERS TO BE DEMOLISHED UNDER P-012 (S.O.E. PERMIT NO. 14412E 35)



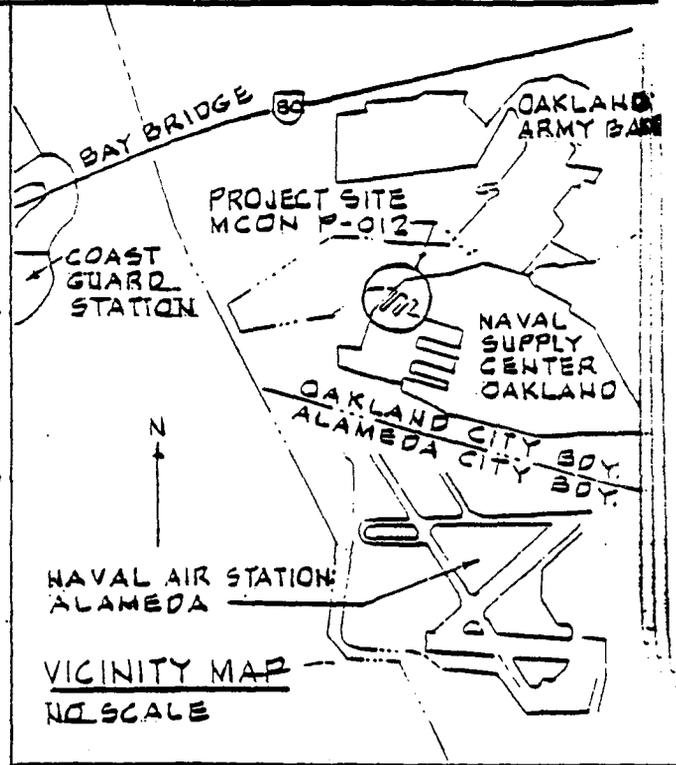
DREDGING PLAN MCON P-012
SCALE: 1" = 300'-0"



TYPICAL DREDGE SECTION
NO SCALE

PURPOSE: DREDGE FOR BERTHING NAVAL VESSELS
DATUM: MLLW = 0.00'
ADJACENT PROPERTY OWNERS:

- ① N/A
- ②



- DREDGE TO -35 FT. MLLW
- 15' TO -25' EXISTG. DREDGE TO -35' MLLW @ 3:1 SLOPE
- RESET EXISTING RIP RAP 20,000 SQ. FT.
- DREDGING LIMIT
- CORE SAMPLE LOCATION

NOTES:

1. DREDGE APPROXIMATELY 300,000 CY
2. EXISTING DEPTHS WITHIN PROPOSED DREDGING LIMIT RANGE FROM -12 TO -30 MLLW.

IN BERTH 'A', NORTH MARGINAL WHARF AT U.S. NAVAL SUPPLY CENTER, OAKLAND COUNTY OF ALAMEDA STATE CA.

EAL Corporation



2030 Wright Avenue
Richmond, California 94804
(415) 235-2633
(TWX) 910-382-8132

ANALYSIS REPORT

HARDING LAWSON ASSOC.
2430 STANWELL DR. SUITE 16
CONCORD, CA 94520
ATTENTION:TOM CUNDEY

DATE: 3-9-84
Samples Received: 2-8-84
EAL W.O. No. 48-5800
Purchase Order No.

ELUTRIATES WITH ALCATRAZ DISPOSAL SITE WATER

Analysis	Units	BORING 1	BORING 2	BORING 3	BORING 4
		1287-6-1	1287-6-2	1287-6-3	1287-6-4
Cadmium	MG/L	<0.005	<0.005	<0.005	<0.005
Lead	MG/L	<0.02	<0.02	<0.02	<0.02
Mercury	MG/L	<0.0005	<0.0005	<0.0005	<0.0005
Oil And Grease	MG/L	<5	<5	<5	<5
Petroleum Hydrocarbons	MG/L	<5	<5	<5	<5
Chlorinated Pesticides	MG/L	<0.001	<0.001	<0.001	<0.001
Polychlorin. Biphenyls	MG/L	<0.001	<0.001	<0.001	<0.001

HARDING ASSOC.

MAR 12 1984

EAL Corporation



2030 Wright Avenue
 Richmond, California 94804
 (415) 235-2633
 (TWX) 910-382-8132

Report to HARDING LAWSON ASSOC.

REPRODUCED AT GOVERNMENT EXPENSE

Analysis	Units	ELUTRIATE WITH ALCATRAZ DISPOSAL SITE WATER		ALCATRAZ DISPOSAL SITE WATER	
		BORING 5 1287-6-5		1287-6-8	1287-6-9
Depth	Ft (MLLW)	----	-30	-40	
Lead	MG/L	<0.005	<0.005	<0.005	
Cadmium	MG/L	<0.02	<0.02	<0.02	
Mercury	MG/L	<0.0005	<0.0005	<0.0005	
Oil And Grease	MG/L	<5	<5	<5	
Petroleum Hydrocarbons	MG/L	<5	<5	<5	
Chlorinated Pesticides	MG/L	<0.001	<0.001	<0.001	
Polychlorinated Biphenyls	MG/L	<0.001	<0.001	<0.001	

EAL Corporation



2030 Wright Avenue
 Richmond, California 94804
 (415) 235-2833
 (TWX) 910-382-8132

Report to HARDING LAWSON ASSOC.

ALCATRAZ DISPOSAL SITE WATER

Analysis	Units	1287-6-9	1287-6-10	1287-6-11
Depth	Ft (MLLW)	-50	-60	-70
Lead	MG/L	<0.005	<0.005	<0.005
Cadmium	MG/L	<0.02	<0.02	<0.02
Mercury	MG/L	<0.0005	<0.0005	<0.0005
Oil And Grease	MG/L	<5	<5	<5
Petroleum Hydrocarbons	MG/L	<5	<5	<5
Organic Pesticides	MG/L	<0.001	<0.001	<0.001
Polychlorinated Biphenyls	MG/L	<0.001	<0.001	<0.001

PARTICLE SIZE DISTRIBUTION

SAMPLE I.D.	EAL I.D.	UNITS	>62u(SAND)	2-62u(SILT)	<2u(CLAY)
BORING 1	1287-6-1	%	43	24	33

George E. Dunstan
 George E. Dunstan
 Program Manager

REPRODUCED BY GOVERNMENT EMPLOYEES



October 16, 1985

8015,011.03

Koepf and Lange, Incorporated
971 Dewing Avenue
Lafayette, California 94549

Attention: Mr. A. H. Koepf

Gentlemen:

Supplemental Geotechnical Engineering Services
Navy Project P-012
Naval Supply Center
Oakland, California

INTRODUCTION

This letter report summarizes supplemental services performed by Harding Lawson Associates (HLA) relative to drilling, sampling, and laboratory testing for dredging of the north marginal wharf (Berth A) at the Naval Supply Center, Oakland, California. The project area is shown on the Site Plan, Plate 1. HLA was contracted by Koepf and Lange, Incorporated to perform services for the Naval Facilities Engineering Command (NAVFAC) under Contract No. N62474-83-C-2414.

HLA previously performed geotechnical services on this project, the results of which were presented in a letter report dated August 21, 1984. The present study is meant to supplement the results of the earlier study. These results will be included in an application for a dredging permit that NAVFAC is preparing.

SCOPE OF SERVICES

The scope of our services as described in the contract document and subsequently revised in a letter from Koepf and Lange dated August 29, 1985 is summarized below:

1. Drill and sample the soils at two locations approximately -40 feet Mean Lower Low Water (MLLW). These borings should be drilled as close as possible to Borings 2 and 4 of our previous investigation (see Plate 1).

Engineers
Geologists &
Geophysicists

2430 Stanwell Dr.
Suite 110
Concord, CA 94520

Telephone
415/687-9660

Alaska
California
Colorado

Hawaii
Illinois
Nevada

Texas
Washington
Saudi Arabia

2. Provide particle size analyses, moisture content, and Atterberg limits testing at samples from both borings.

FIELD OPERATIONS

The offshore investigation consisted of two borings which were drilled approximately 30 feet below mudline. The borings were drilled and sampled using a CME 55 drill rig mounted on a 10- by 15-foot barge. This drilling equipment is owned and operated by Datum Exploration. Drilling and positioning of the barge were performed under the supervision of HLA.

The barge was positioned near Borings 2 and 4 by using sightings with land monuments and by taping the distance to Berth A. The locations of Borings 2A and 4A are shown on Plate 1. Upon arrival at the borehole location, four spuds were lowered below mudline to stabilize the barge during drilling. Drilling operations commenced by taking Osterberg samples until refusal was encountered. The drillers then extended a 4-inch casing into the mud and used rotary-wash drilling operations to extend the borings to below -40 MLLW. California Modified samples with a 2.0-inch O.D. were taken at generally 5-foot intervals to the bottom of the borehole. Water level measurements were taken at each sample interval in order to correct the sample depths for the tidal variations.

The Osterberg sampler uses tubes that have an O.D. of 3.0 inches and an inside diameter (I.D.) of 2.87 inches and take samples of 33 inches in length. The California Modified samples have an O.D. of 2.5 inches and an I.D. of 2.0 inches and takes a sample that is 18 inches long. The sampler was driven with a 140-pound hammer falling 30 inches.

Logs of borings were recorded during the investigation by our field engineer. The boring logs are presented on Plates 2 and 3. The information provided on the boring logs includes the stratigraphy of soils encountered, the depth of each sample below mudline corrected for tidal variation, the blow counts corrected to standard N-values*, and the results of the laboratory tests in the manner shown on the Key to Test Data, Plate 4.

* Standard penetration N-values are defined as the number of blows of a 140-pound hammer falling 30 inches required to advance a standard sampler (2 inches O.D. and 1.5 inches I.D.) the final 12 inches of an 18-inch drive. The standard hammer driving mechanism utilizes a cathead-drum, rope, and pulley system.

October 16, 1985
8015, 011.03
Mr. A. H. Koepf
Koepf and Lange, Incorporated
Page 3

Harding Lawson Associates

REPRODUCED AT GOVERNMENT EXPENSE

All samples were reexamined to confirm field classification and prepared for testing. Laboratory testing consisted of Atterberg limits, particle size analyses, and moisture density measurements.

SITE CONDITIONS

Site conditions consisted of very soft silts and clays to a depth of approximately 12 feet below mudline underlain by a fine-grained sand to the bottom of the borings. The water depth varied between 15 and 20 feet during the drilling operations at the boreholes.

SUMMARY

As requested under Contract N6474-83-C-2414, we have performed the drilling and sampling at Borings 2A and 4A. The moisture contents, gradation analyses, and Atterberg Limits are presented on the attached Plates.

We appreciate the opportunity to be of service to Koepf and Lange and the U.S. Navy. If you have any questions, please call.

Yours very truly,

HARDING LAWSON ASSOCIATES


Stephen J. Osborne
Civil Engineer - 29555


Claude Corvino
Civil Engineer - 31072

SJD/CC/sk

6 copies submitted

Attachments: Plates 1 through 7

CME 55 Rotary Wash

Equipment Mounted on Barge

Mudline Elevation -18.5' MLLW* Date 9/3/85

Laboratory Tests	Blows/foot	Moisture Content (%)	Dry Density (pcf)	Core Recov. % /RQD	Drilling Rate (min/ft)	Depth (ft)	Sample
Liquid Limit=134% Plasticity Index=79%	174	29				0	
Liquid Limit=97% Plasticity Index=57%						5	
#200=9%	46	21	99			15	
#200=8%	58	31	92			20	
						25	
						30	
						35	
						40	

DARK GREY CLAYEY SILT (MH)
very soft, saturated,
trace of organics,
odor of hydrocarbons at 5 feet

LIGHT BROWN TO GREY SAND (SP-SM)
medium dense, fine grained,
saturated

becoming dense at 28 feet

Bottom of Boring at 31.2 feet
below Mudline

74

*MLLW indicates Mean Lower Low Water

Note: The sample depths were corrected
for tidal variation during drilling



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LOG OF BORING 2A
North Marginal Wharf
Oakland, California

PLATE
2

CME 55 Rotary Wash
Mounted on Barge

Equipment Mudline
Elevation -14.9' MLLW Date 9/4/85

Laboratory Tests	Blows/foot	Moisture Content (%)	Dry Density (pcf)	Core Recov. %/RQD	Drilling Rate (min/ft)	Depth (ft)	Sample
Liquid Limit=112% Plasticity Index=67%		157	31			0	DARK GREY CLAYEY SILT (MH) very soft, trace of organics odor of hydrocarbons, saturated
						5	
Liquid Limit=98% Plasticity Index=60%		104	39			10	DARK GREY SILTY CLAY (CH) very soft, trace of organics, saturated
#200=8%		31	87			15	
#200=12%	31	38	87			20	LIGHT BROWN TO GREY SAND (SP-SM) loose to medium dense, fine grained, saturated; some pockets of dark grey clayey silt to 14 feet depth below mud line
#200=5%	39	20	100			25	LIGHT BROWN SAND (SP-SM) medium dense, fine grained, saturated
#200=17%		35	41			30	

Bottom of Boring at 27 feet below Mudline

Note: The sample depths were corrected for tidal variation during drilling



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LOG OF BORING 4A
North Marginal Wharf
Oakland, California

PLATE

3

MAJOR DIVISIONS					TYPICAL NAMES
COARSE - GRAINED SOILS MORE THAN HALF IS LARGER THAN NO. 200 SIEVE	GRAVELS MORE THAN HALF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE SIZE	CLEAN GRAVELS WITH LITTLE OR NO FINES	GW		WELL-GRADED GRAVELS, GRAVEL-SAND MIXTURES
			GP		POORLY GRADED GRAVELS, GRAVEL-SAND MIXTURES
		GRAVELS WITH OVER 12% FINES	GM		SILTY GRAVELS, POORLY GRADED GRAVEL-SAND-SILT MIXTURES
			GC		CLAYEY GRAVELS, POORLY GRADED GRAVEL-SAND-CLAY MIXTURES
	SANDS MORE THAN HALF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE SIZE	CLEAN SANDS WITH LITTLE OR NO FINES	SW		WELL-GRADED SANDS, GRAVELLY SANDS
			SP		POORLY GRADED SANDS, GRAVELLY SANDS
		SANDS WITH OVER 12% FINES	SM		SILTY SANDS, POORLY GRADED SAND-SILT MIXTURES
			SC		CLAYEY SANDS, POORLY GRADED SAND-CLAY MIXTURES
FINE - GRAINED SOILS MORE THAN HALF IS SMALLER THAN NO. 200 SIEVE	SILTS AND CLAYS LIQUID LIMIT 50% OR LESS	ML		INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS, OR CLAYEY SILTS WITH SLIGHT PLASTICITY	
		CL		INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS	
		OL		ORGANIC CLAYS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY	
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50%	MH		INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOILS, ELASTIC SILTS	
		CH		INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS	
		OH		ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS	
HIGHLY ORGANIC SOILS		PT		PEAT AND OTHER HIGHLY ORGANIC SOILS	

UNIFIED SOIL CLASSIFICATION SYSTEM

Perm	—	Permeability	Shear Strength (psf)	↓	Confining Pressure	
Consol	—	Consolidation	TxUU	3200	(2600)	— Unconsolidated Undrained Triaxial Shear (field moisture or saturated)
L	—	Liquid Limit (%)	(FM) or (S)			
P	—	Plastic Index (%)	TxCU	3200	(2600)	— Consolidated Undrained Triaxial Shear (with or without pore pressure measurement)
G _s	—	Specific Gravity	(P)			
M _s	—	Particle Size Analysis	TxCD	3200	(2600)	— Consolidated Drained Triaxial Shear
	—	"Undisturbed" Sample	SSCU	3200	(2600)	— Simple Shear Consolidated Undrained (with or without pore pressure measurement)
	—	Bulk or Classification Sample	(P)			
			SSCD	3200	(2600)	— Simple Shear Consolidated Drained
			DSCD	2700	(2000)	— Consolidated Drained Direct Shear
			UC	470		— Unconfined Compression
			LVS	700		— Laboratory Vane Shear

KEY TO TEST DATA

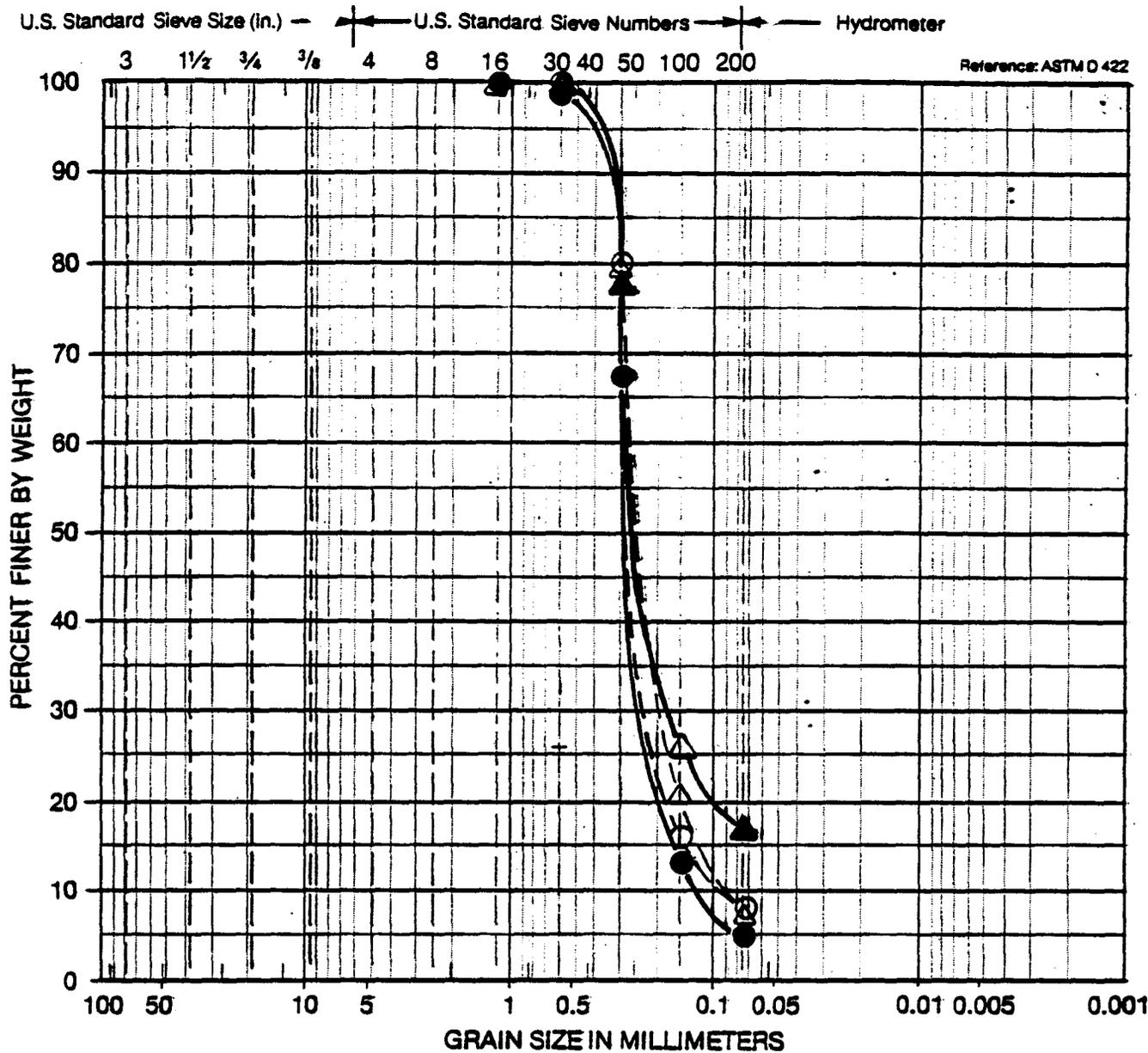


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UNIFIED SOIL SYMBOLS & KEY TO TEST DATA
North Marginal Wharf
Oakland, California

PLATE

4



Reference: ASTM D 422

COBBLES	COARSE	FINE	COARSE	MEDIUM	FINE	SILT OR CLAY
	GRAVEL		SAND			

Symbol	Sample Source	Classification
○	4A at 13.3 feet, MLLW	Grey-Silty Sand (SP-SM)
△	4A at 18.2 feet, MLLW	Grey Silty Sand (SP-SM)
●	4A at 22.2 feet, MLLW	Grey Silty Sand (SP-SM)
▲	4A at 25.5 feet, MLLW	Grey Silty Sand (SM)



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Particle Size Analysis
North Marginal Wharf
Oakland, California

PLATE

6

DRAWN
AC

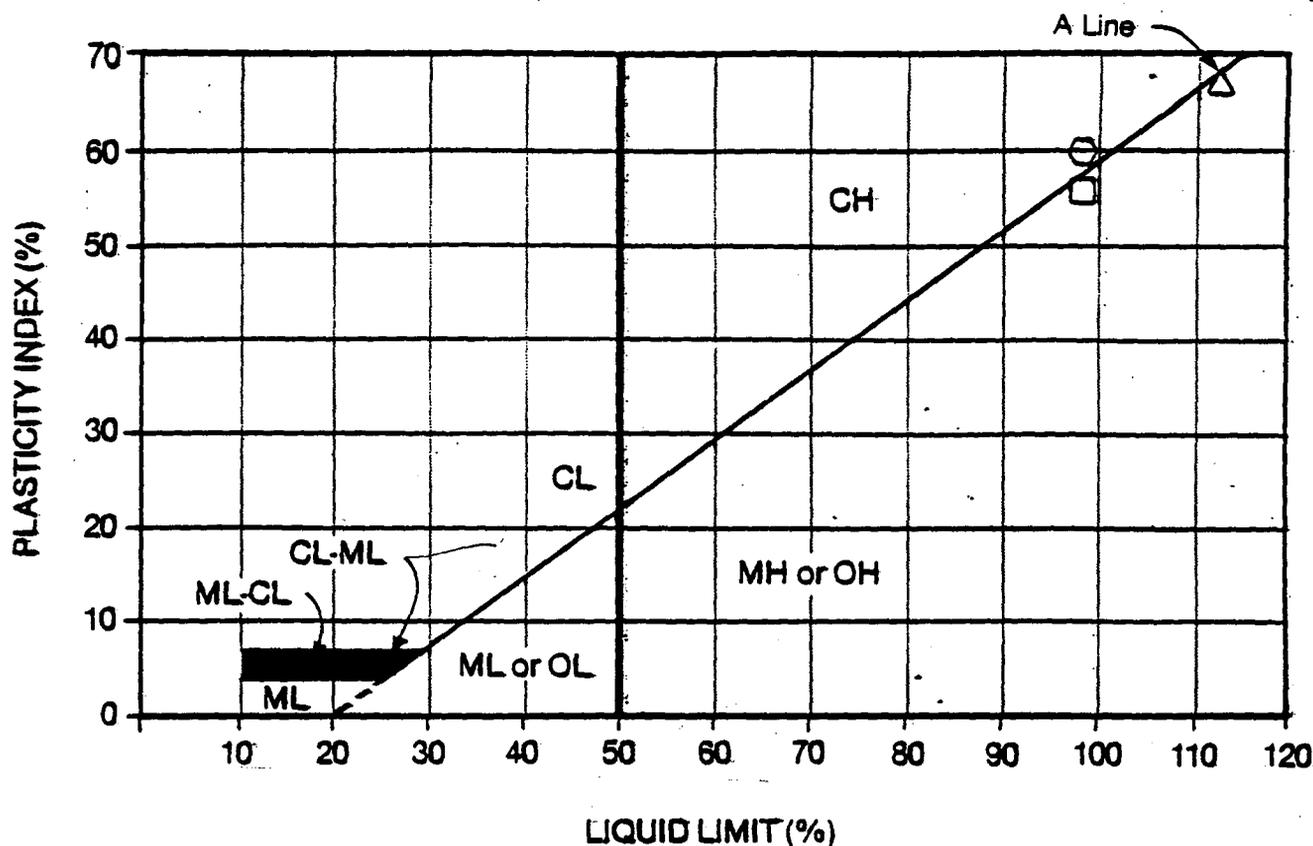
JOB NUMBER
8015,011.03

APPROVED
SSD

DATE
10/85

REVISED

DATE



Symbol	Source	Classification	Natural M.C. (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
○	Boring 2A, 0-3'	Dark Grey Clayey Silt(MH)		134	79	
□	Boring 2A, 4½-7'	Dark Grey Clayey Silt(MH)		97	57	
△	Boring 4A, 0-3'	Dark Grey Clayey Silt(MH)		112	67	
○	Boring 4A, 9½-11½'	Dark Grey Silty Clay(CH)		98	60	



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Plasticity Chart
North Marginal Wharf
Oakland, California

PLATE

7

DRAWN
AC

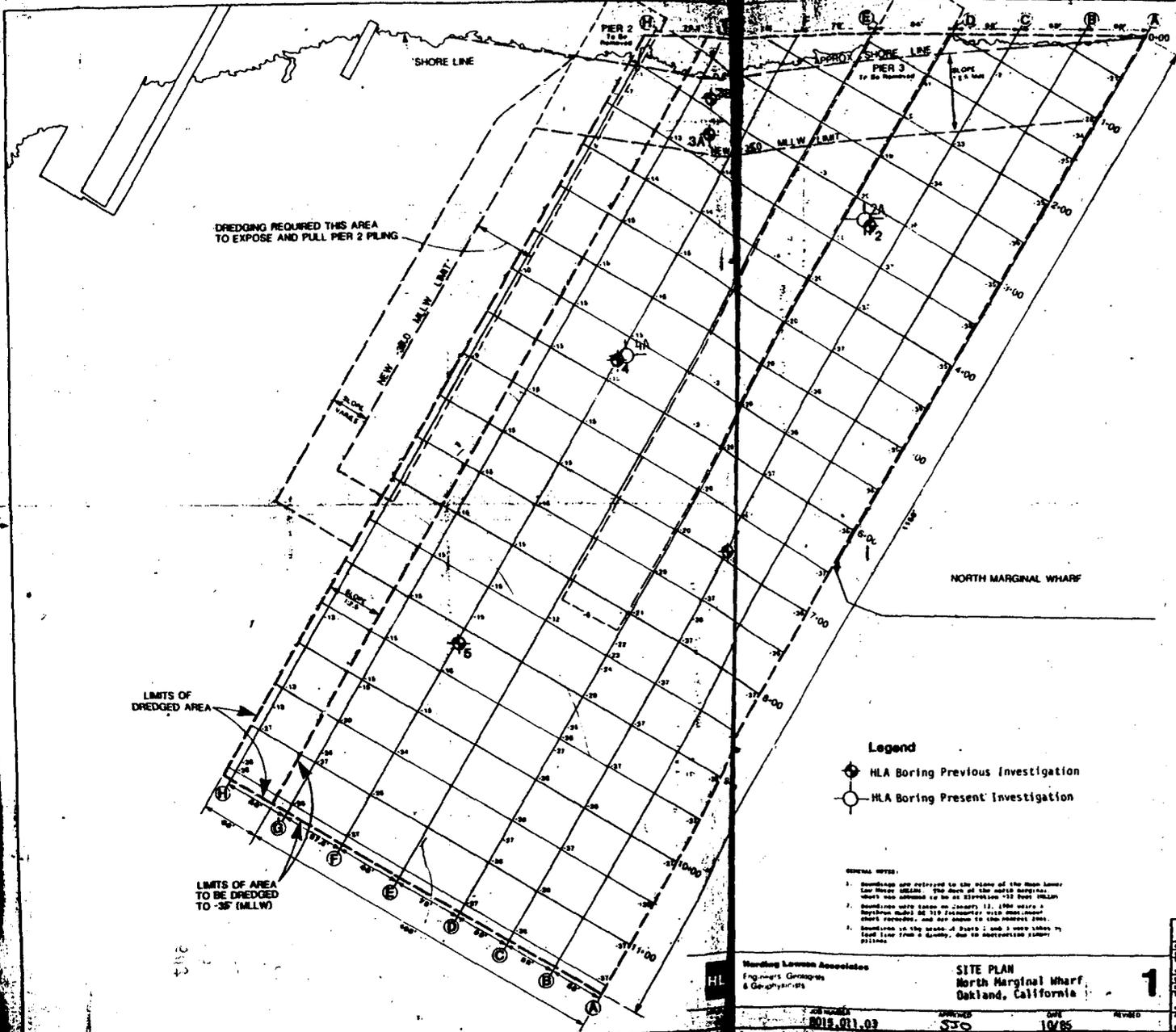
JOB NUMBER
8015.011.03

APPROVED
SJS

DATE
10/85

REVISED

DATE



DREDGING REQUIRED THIS AREA TO EXPOSE AND PULL PER 2 PILING

LIMITS OF DREDGED AREA

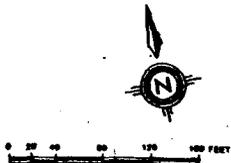
LIMITS OF AREA TO BE DREDGED TO -35' (MLLW)

Legend

- ⊕ HLA Boring Previous Investigation
- HLA Boring Present Investigation

GENERAL NOTES:

1. Soundings are referred to the plane of the Mean Lower Low Water (MLLW). The date of the soundings, when not otherwise noted, is at or near low tide.
2. Soundings were taken on January 12, 1966 using a Raytheon Model 80 210 fathometer with 1000-pound shot recovered, and are shown to the nearest 0.01.
3. Soundings in the space of Sheet 2 and 3 were taken 74 feet from a datum, due to construction level change.



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SITE PLAN
North Marginal Wharf
Oakland, California

1

DATE: 015.011.03
SHEET: 330
DATE: 10/65
REVISION: 1

NAVY SUPPLY CENTER, OAKLAND, CALIFORNIA	
WHARF UTILITIES (P-012)	
HYDROGRAPHIC SURVEY-02870	
FORM NO. 1	REVISION 1
F 80091	DATE: 10/65

C12

REPRODUCED AT GOVERNMENT EXPENSE

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