WATERFRONT & COMMERCIAL REAL ESTATE DIVISION

LOS ANGELES WAREHOUSE NO. 1

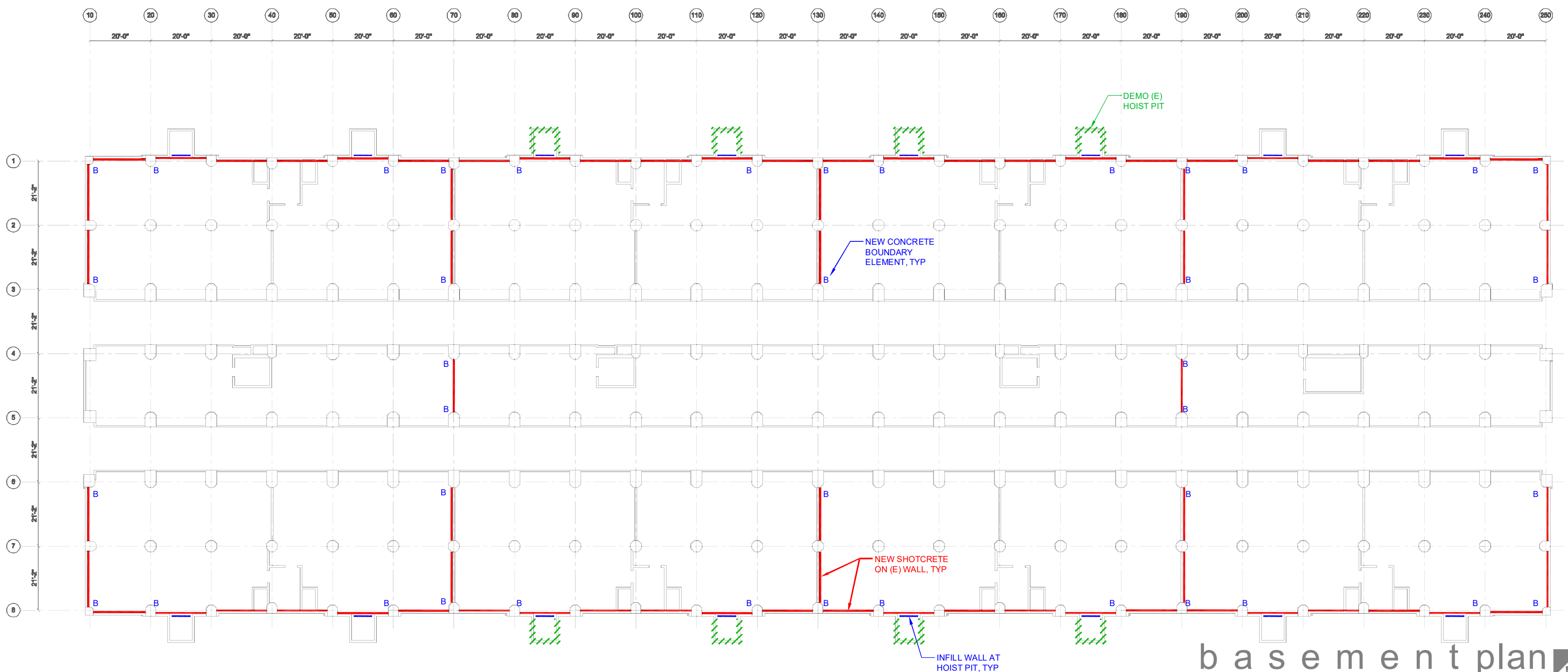
REDEVELOPMENT AND ADAPTIVE RE-USE OPPORTUNITY

REQUEST FOR INTEREST

DUE DILLIGENCE DOCUMENTS

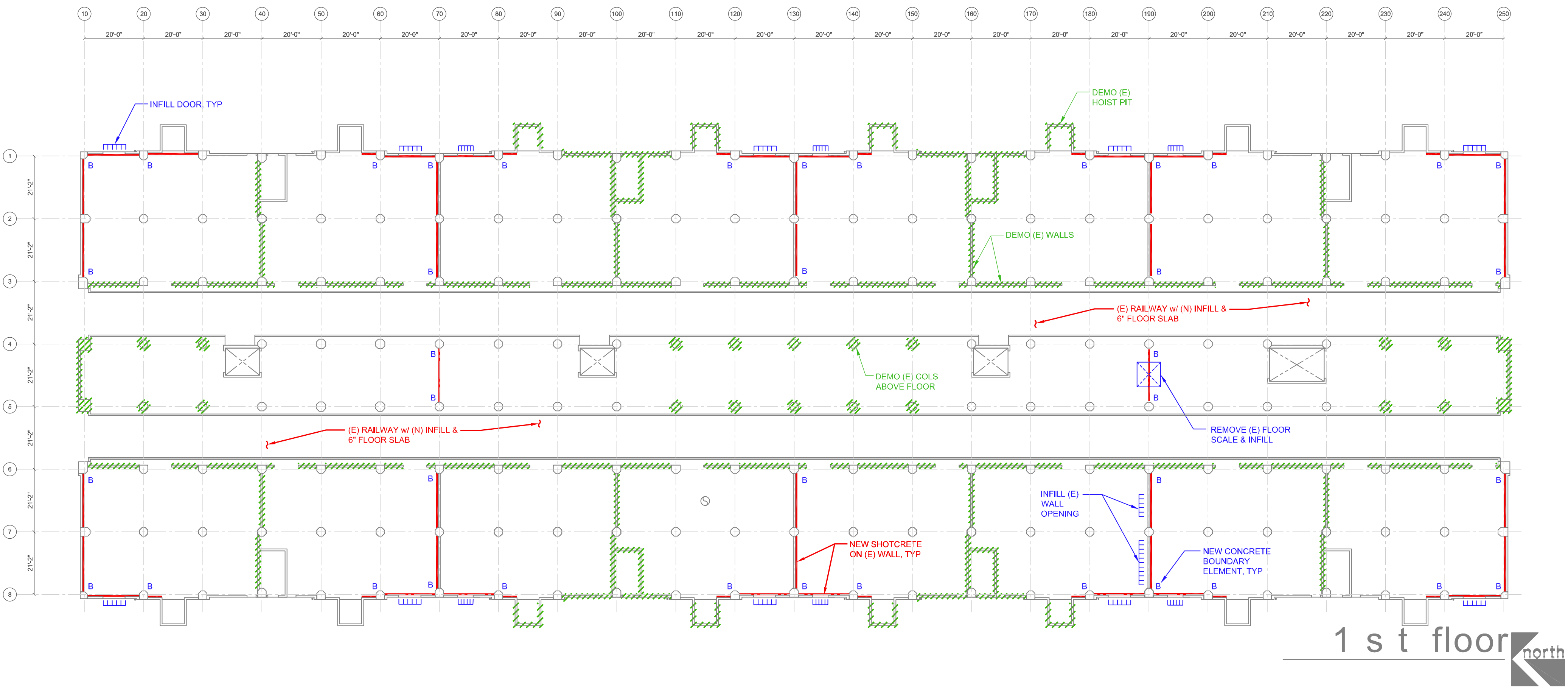
CONTENTS

ARCHITECTURAL ELEVATION DRAWINGS

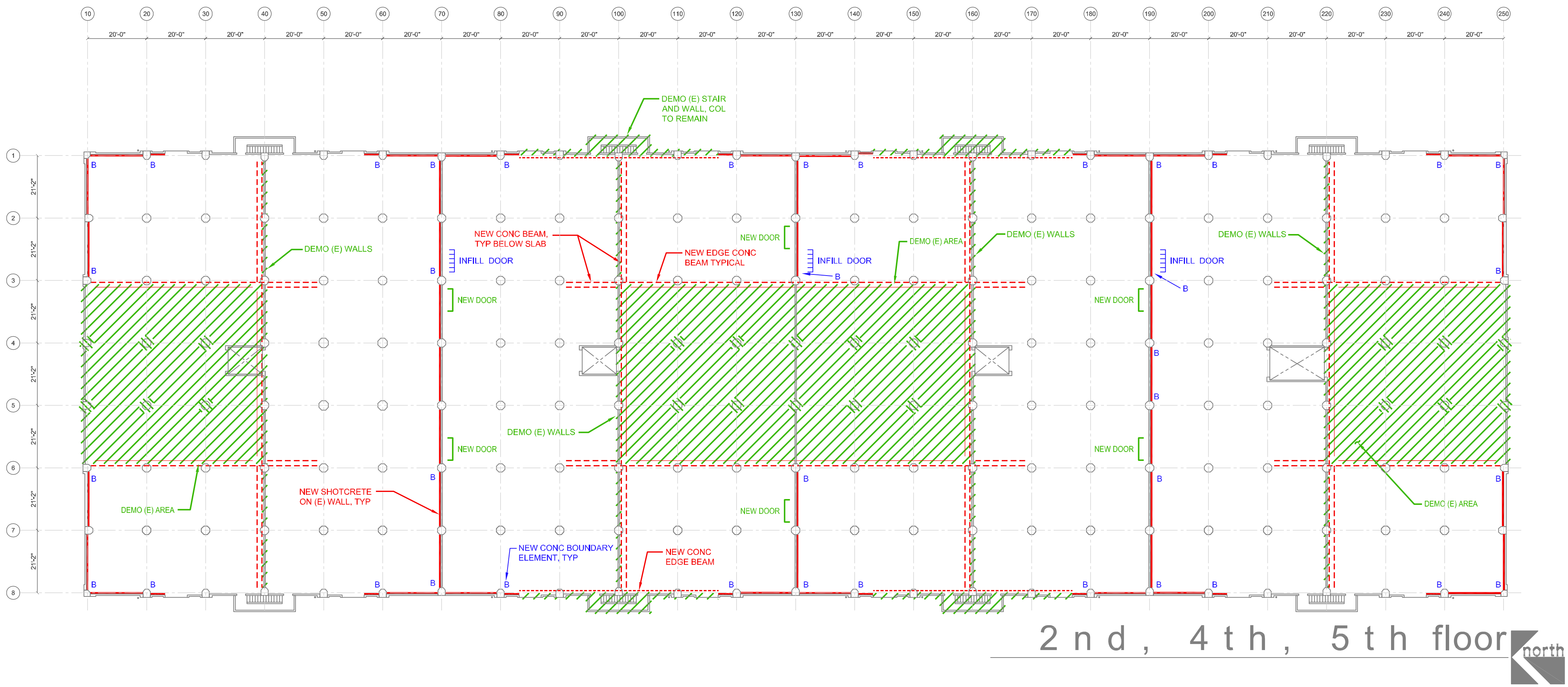


b a s e m e n t plan

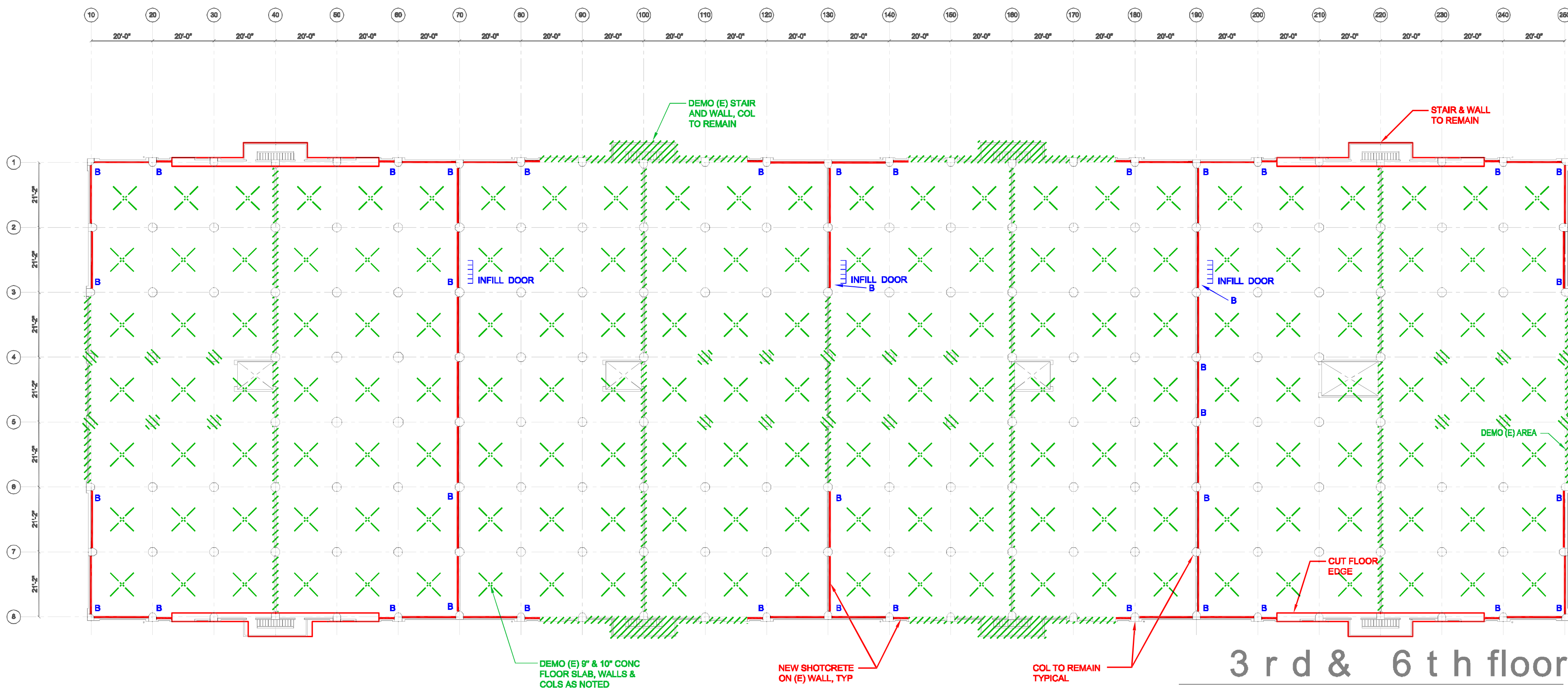
north


INFILL DOOR, TYP
DEMO (E) HOIST PIT
DEMO (E) WALLS
(E) RAILWAY w/ (N) INFILL & 6" FLOOR SLAB
DEMO (E) COLS ABOVE FLOOR
REMOVE (E) FLOOR SCALE & INFILL
(E) RAILWAY w/ (N) INFILL & 6" FLOOR SLAB
INFILL (E) WALL OPENING
NEW SHOTCRETE ON (E) WALL, TYP
NEW CONCRETE BOUNDARY ELEMENT, TYP

1 s t floor

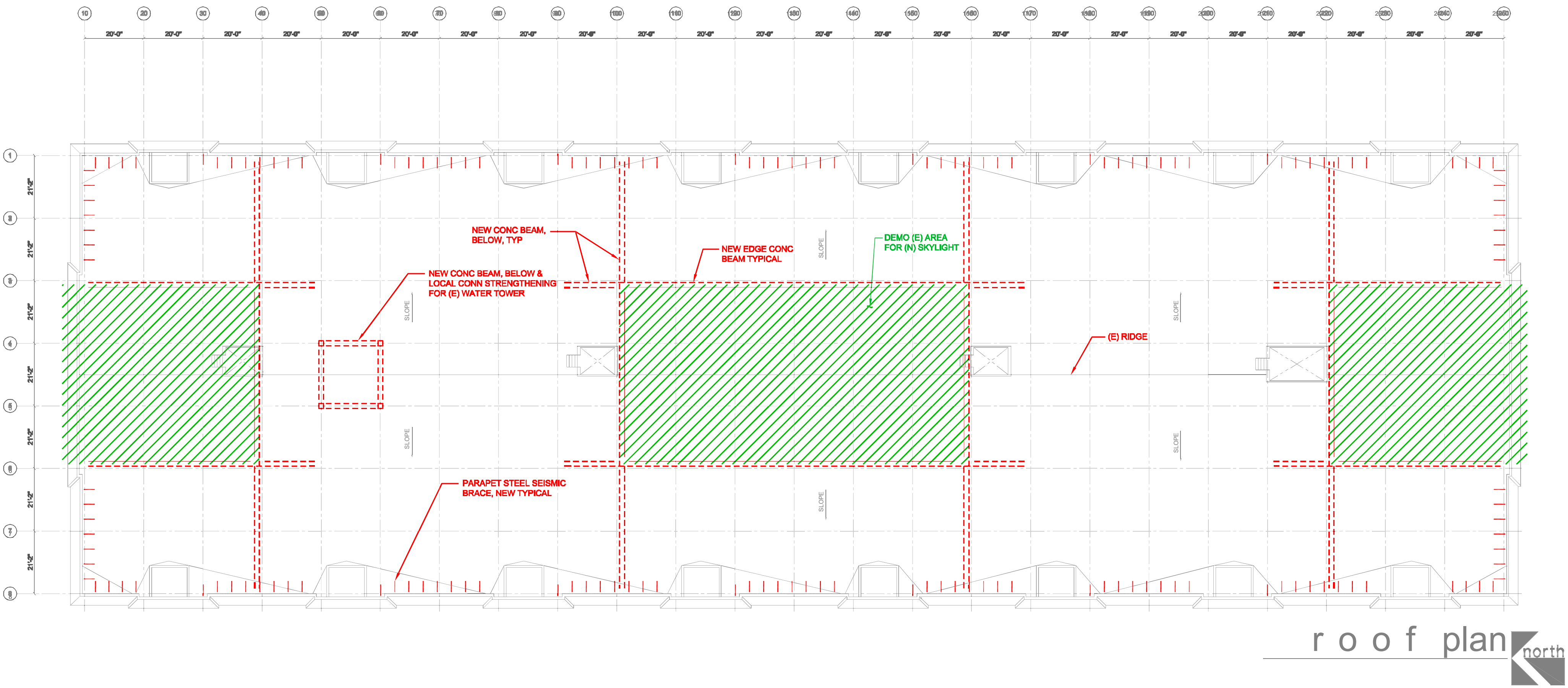


2nd, 4th, 5th floor

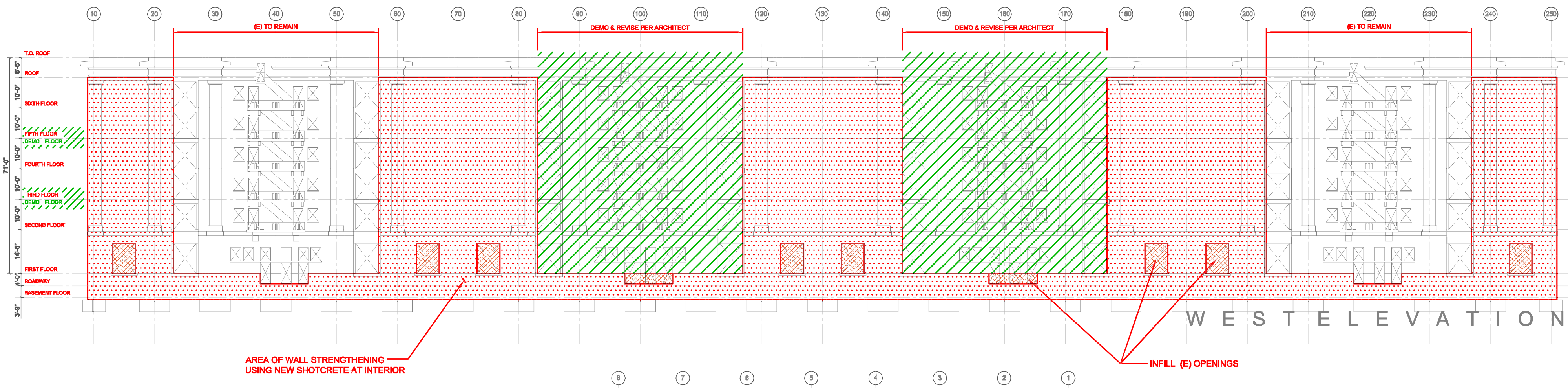


3 r d & 6 t h floor

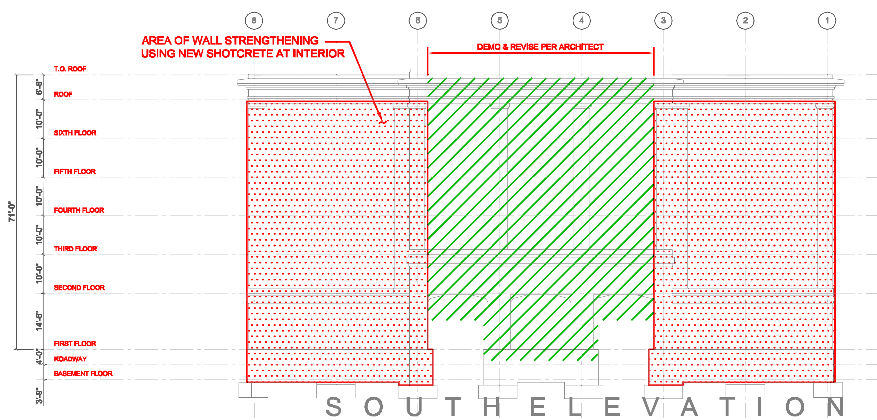
north


NEW CONC BEAM, BELOW, TYP
NEW CONC BEAM, BELOW & LOCAL CONN STRENGTHENING FOR (E) WATER TOWER
NEW EDGE CONC BEAM TYPICAL
DEMO (E) AREA FOR (N) SKYLIGHT
(E) RIDGE
PARAPET STEEL SEISMIC BRACE, NEW TYPICAL
SLOPE
north

r o o f plan

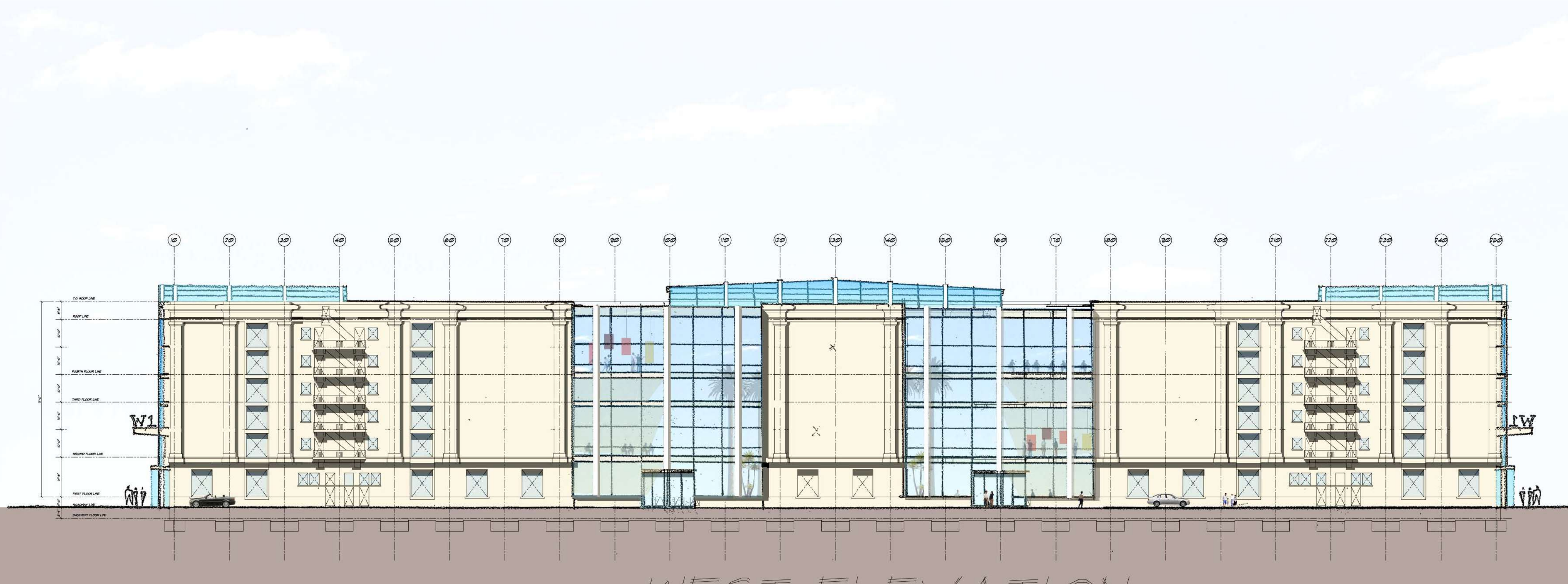


W E S T E L E V A T I O N

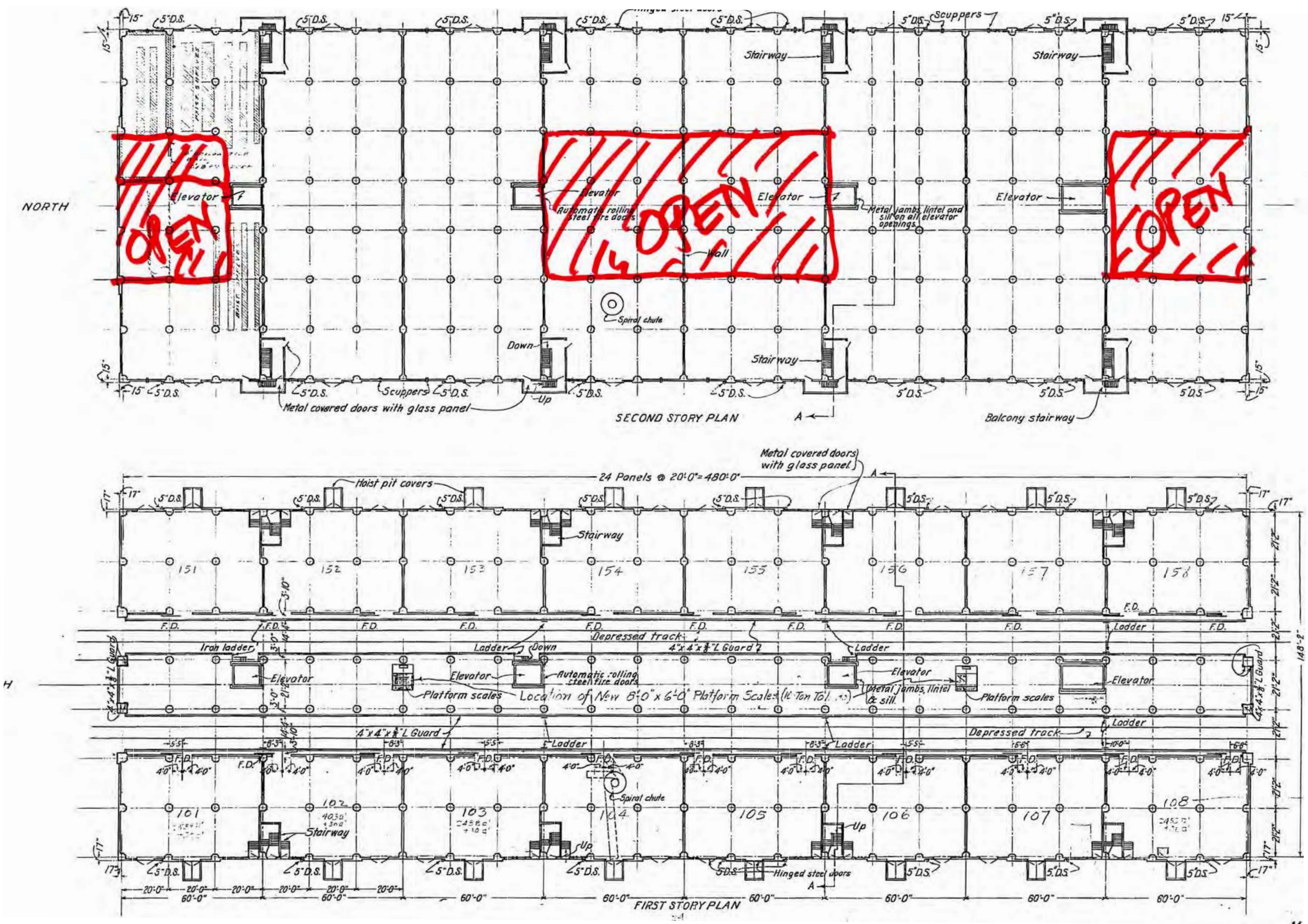


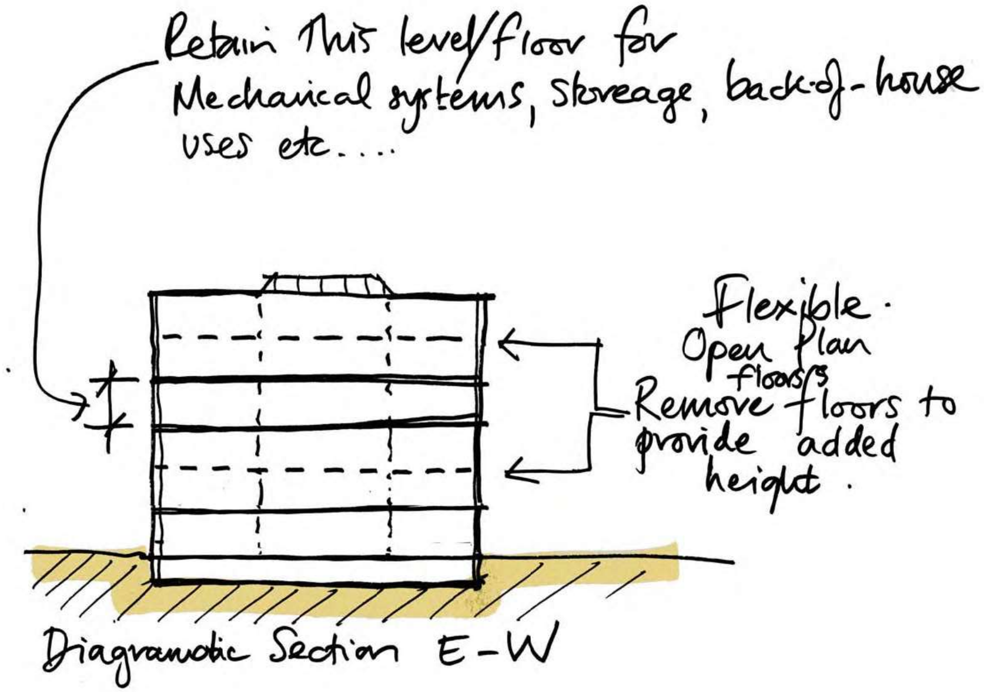
S O U T H E L E V A T I O N

e l e v a t i o n s



WEST ELEVATION


NORTH
OPEN
OPEN
OPEN
Stairway
Elevator
Automatic rolling steel fire doors
Metal jambs, lintel and sill on all elevator openings
Spiral chute
Scuppers
Metal covered doors with glass panel
Balcony stairway
SECOND STORY PLAN
Metal covered doors with glass panel
24 Panels @ 20'-0" = 480'-0"
Hoist pit covers
Depressed track
Iron ladder
Platform scales
Location of New 8'-0" x 6'-0" Platform Scales
Hinged steel doors
FIRST STORY PLAN


Retain this level/floor for Mechanical systems, storeage, back-of-house uses etc....
Flexible. Open plan floors
Remove floors to provide added height.
Diagramatic Section E-W

PRELIMINARY GEOTECHNICAL INVESTIGATION
WAREHOUSE NO. 1 SEISMIC RETROFIT

APPENDIX 4-1 - WAREHOUSE ONE PRELIMINARY GEOTECHINICAL REPORT

A Report Prepared for:

Wilson & Company
200 South Los Robles Avenue, Suite 420
Pasadena, CA 91101

PRELIMINARY GEOTECHNICAL INVESTIGATION
WAREHOUSE NO. 1 SEISMIC RETROFIT
SAN PEDRO, CALIFORNIA

Project No. 2007-005.01

by

Saroj Weeraratne
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Santa Ana, CA 92705-8509

June 6, 2007

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1.0 INTRODUCTION

This report summarizes the results of Diaz•Yourman & Associates' (DYA) preliminary geotechnical services for the proposed seismic retrofit of Warehouse No. 1 in the Port of Los Angeles (POLA), California. The work was performed for Wilson & Company, in accordance with an agreement dated April 25, 2007.

Warehouse No. 1 is a 90-year-old, 6-story high reinforced concrete building with a footprint of approximately 80,000 square feet. Warehouse No. 1 is located on Pier 1 in the POLA as shown on the Vicinity Map, Figure 1. The building is located approximately 35 feet north and 150 feet west of existing perimeter rock dikes. The warehouse is considered a historic building and is supported on piles. It is intended to seismically retrofit the building in accordance with U.S. Federal Emergency Management Agency (FEMA; 2000) Manual 356, for historic buildings instead of retrofitting the structure to current building code criteria.

The purpose of DYA's investigation was to provide geotechnical input for the planning of the seismic retrofit. The scope of our services reported herein consisted of reviewing data, performing a limited field investigation, limited laboratory testing, preliminary engineering analyses, and preparing this report.

Prior to final design, a design-level geotechnical investigation should be performed.

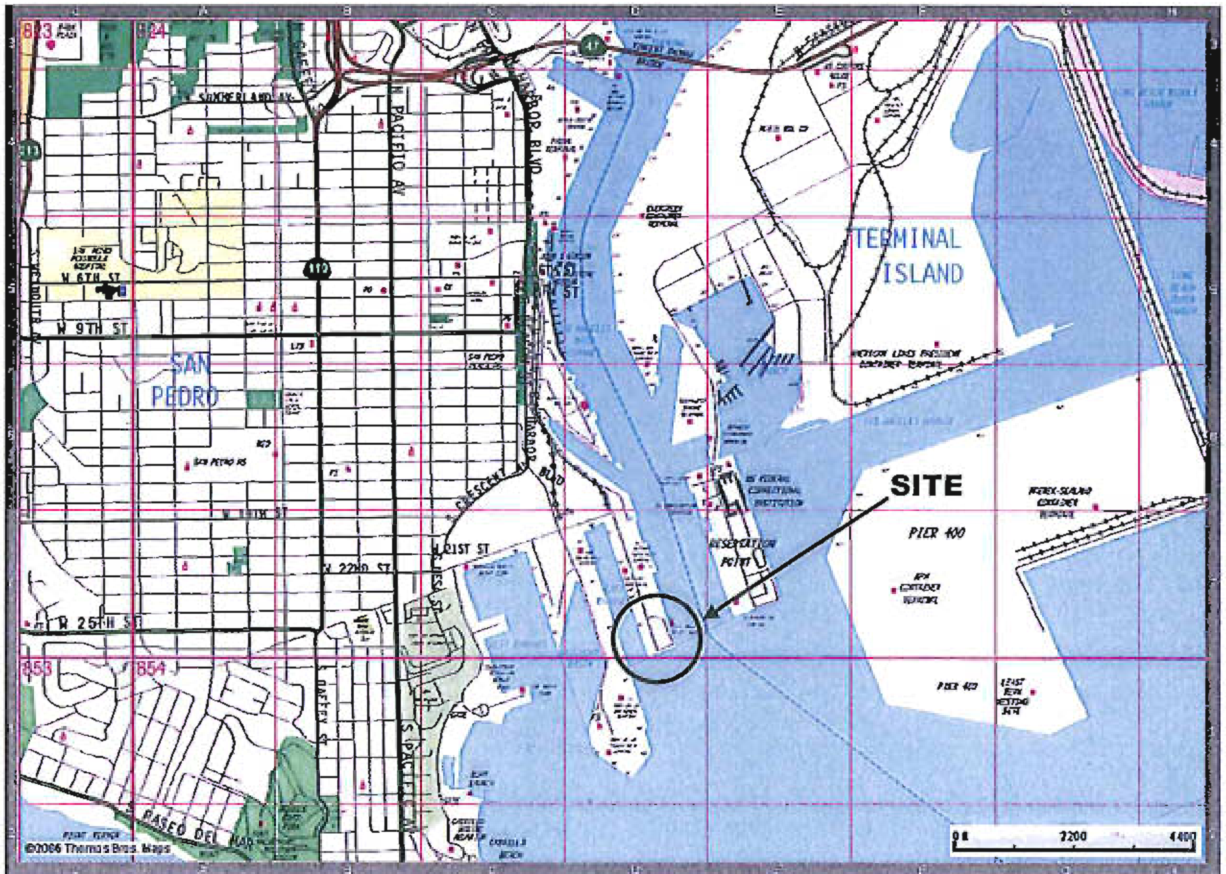


Figure 1 - VICINITY MAP

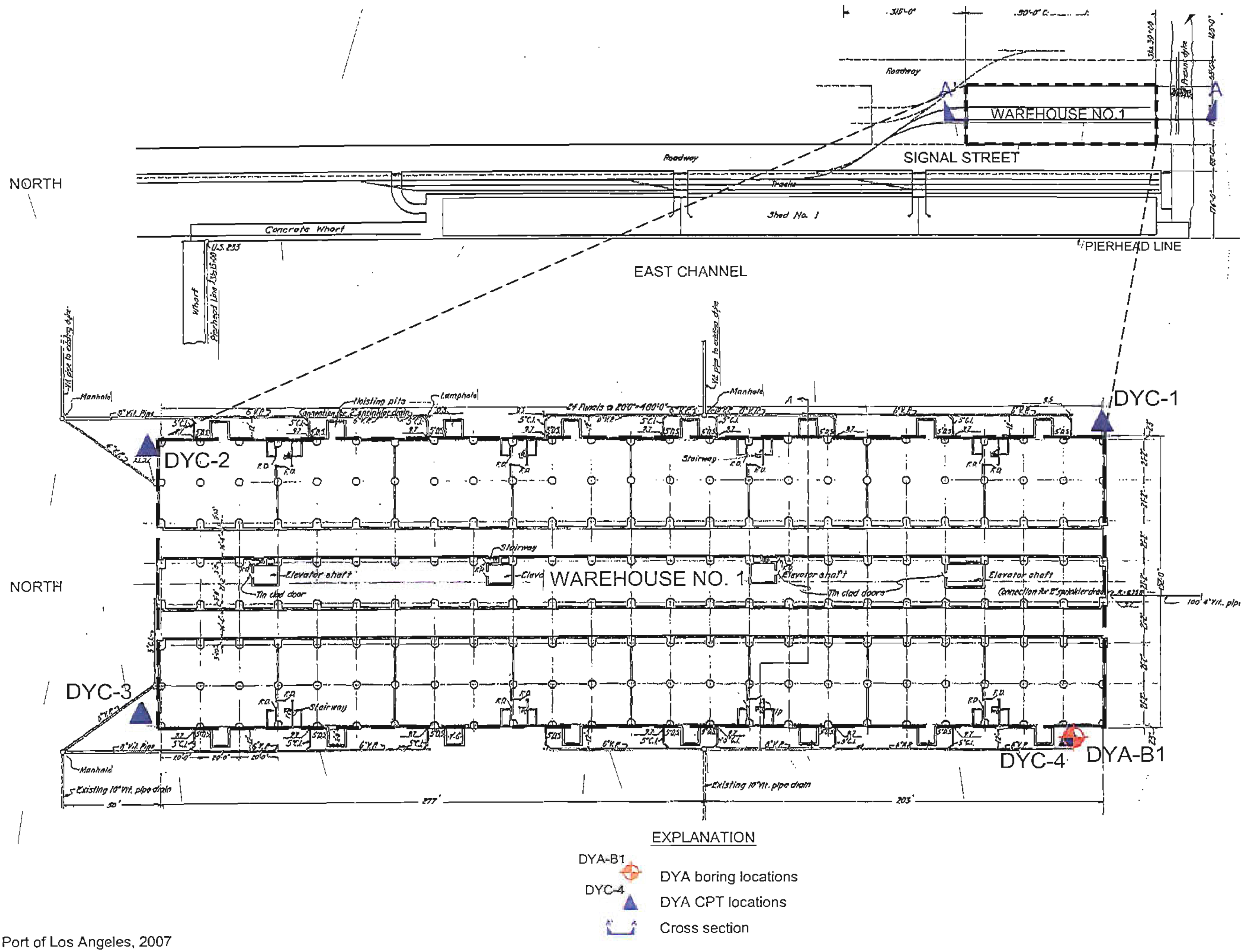
K:\DATAFLS\PROJECTS\2007\2007-005.01\REPORT\10 DRAFT REPORT.DOC

2.0 DATA REVIEW, FIELD INVESTIGATION, AND LABORATORY TESTING

As-built drawings for the Warehouse No.1 were reviewed (provided by POLA) and are attached in Appendix A. However, no geotechnical reports were available for the site or project vicinity for review at the time of our investigation. Also, no information was available on the construction of Pier 1. A list of the documents reviewed is presented in the bibliography (Section 7.0).

DYA's field investigation for the warehouse building consisted of drilling one boring and performing four cone penetration tests (CPT). The boring and CPT depths were selected to extend to the depth of significant influence of the proposed structure loads and to investigate liquefaction potential. The depths of the boring and CPTs were between approximately 59 and 86.5 feet. The approximate boring and CPT locations are shown on Figure 2. Additional details regarding the field investigation are presented in Appendix B.

DYA's laboratory testing program was developed to evaluate and aid in soil classification and the selection of engineering parameters. DYA selected soil samples to be tested and the tests to be performed on the soil samples. Geotechnical laboratory testing was performed by AP Engineering, Inc., a City of Los Angeles Department of Building and Safety (LADB&S) certified laboratory. We have reviewed and concur with the test results, and accept full responsibility for their use in our analysis. Geotechnical laboratory data are summarized on the boring logs and presented in Appendix C.



by Port of Los Angeles, 2007

3.0 SITE CONDITIONS

3.1 SURFACE CONDITIONS

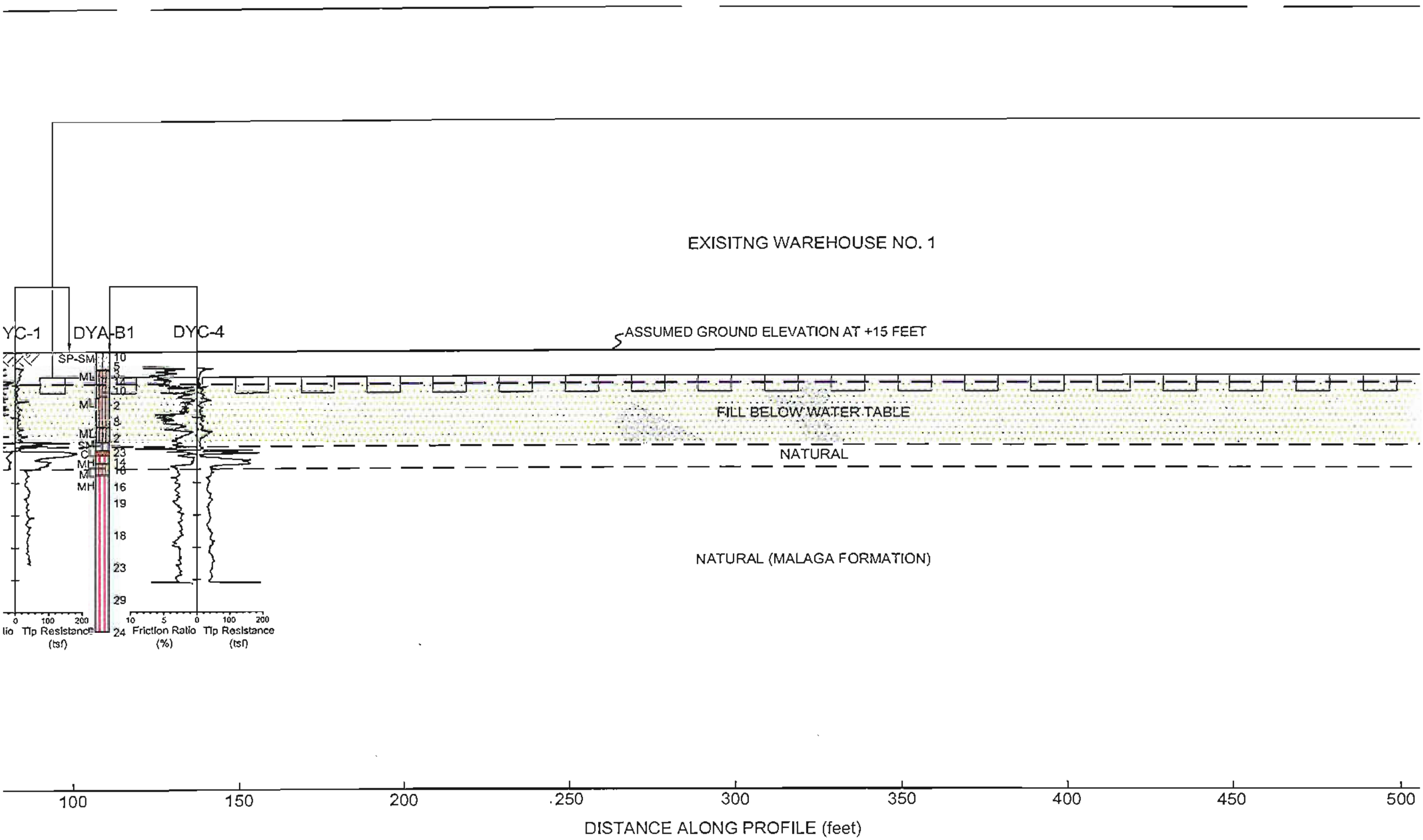
At the time of our field investigation, the area surrounding the warehouse was relatively level with an assumed surface elevation near 15 feet mean lower low water (MLLW) and paved with asphalt concrete (AC). A perimeter rock dike was located approximately 35 feet south of the warehouse. The geometry of the rock dike was not available. Based on our experience with perimeter rock dikes at San Pedro Bay sites and preconstruction bathemetric maps (U.S. Coast and Geodetic Survey, 1907/1908), the geometry of the rock dike was assumed with the sea floor near elevation -16 feet MLLW. Figure 3 presents Cross Section A-A' through the assumed perimeter rock dike and Warehouse No. 1. The location of the Cross Section A-A' is shown on Figure 2. The perimeter rock dike cross section was assumed for our preliminary analysis and was not based on site-specific historical or current data.

Based on the drawings reviewed, Warehouse No. 1 is a reinforced concrete building constructed around 1915 and was supported on numerous piles. However, the pile material type (timber, concrete, or steel), pile size, and pile length are not known. Based on the scale in drawing M.D. No.1 Warehouse No.1 Pile Diagram [see Appendix A]), the piles are circular with a diameter of approximately 16 inches. Also, as noted on drawing, the piles for the outside stairwell (not the building) were noted as 24 feet long. We did not see any notes regarding the length of the foundation piles. However, it is probable that the piles consisted of timber (concrete piles were relatively rare in 1915) and were approximately 28 feet long to tip in the Malaga mudstone. The current condition of the piles is unknown. Because of the age of the piles and their location within a tidal zone, we judge that it is unlikely that the full cross sections of the piles are currently intact. Therefore, for the purposes of this preliminary investigation and to be conservative, the piles were assumed to have deteriorated such that the Warehouse No.1 is supported by the pile caps acting as shallow foundation. At this stage, it is beyond the scope of our services to investigate the size and length of the piles and the integrity of the piles.

3.2 SUBSURFACE CONDITIONS

In general, the subsurface consisted of hydraulic fill overlying natural formational materials, as shown on Figure 3. The hydraulic fill comprised of sands with silts (SP, SM) and very soft to soft non-plastic sandy silts (ML) up to an approximate depth of 28 feet below existing ground surface (bgs). In the hydraulic fill, the CPT tip resistances were less than approximately 30 tons per square foot (tsf); the average standard penetration test (SPT) blow counts ranged from 2 to 14 blows per foot (bpf). Therefore, the fill was considered potentially liquefiable. Because the fill was likely placed using hydraulic methods, the fill will be considered as uncertified by LADB&S. Below the hydraulic fill, harbor bottom natural sediments were approximately 6 feet thick and comprised of inter-bedded layers of silty sand, lean clay, and elastic silt. Below the harbor bottom sediments was firm to very hard weathered Malaga siltstone, as shown on Figure 3.

Groundwater was encountered at depths near elevation 5 feet MLLW during field investigation, approximately 10 feet bgs; the groundwater was tidally influenced.



see Figure 2.
raphic description.
graphic column is based on ASTM D2487 and D2488.
raphic column is an equivalent uncorrected SPT blow count per foot.
oximate and may vary from that shown.
etry is assumed and not based on factual data. The geometry should be verified.
f assumed deterioration.

4.0 GEOLOGIC/SEISMIC HAZARDS AND DESIGN

4.1 GROUND SHAKING

The site, like most of Southern California, will be subject to strong ground shaking during major earthquakes. FEMA 356 refers to several ground shaking levels for Damage Control and Building Performance Levels (i.e., Collapse Prevention Performance Level, Life Safety Performance Level, Immediate Occupancy Performance Level, and Operational Performance Level; FEMA, 356, Chapter 1.4). A ground shaking level corresponding to Life Safety Performance Level having probability of exceedance of 10 percent in 50 years was considered for the preliminary analysis. This ground shaking level is the same as the code level earthquake (CLE) required by California Geological Survey (CGS; formerly California Division of Mines and Geology [CDMG]) Special Publication 117 (CGS, 1997) for buildings. Seismic design can be performed in accordance with the criteria listed in Table 1.

Table 1 SEISMIC DESIGN CRITERIA

CHARACTERISTIC	CRITERIA
Alquist-Priolo Special Study Zone Act	Site outside special study zones
California Building Code (CBC) Seismic Zone Factor (z)	0.4
CBC Soil Profile	S_D[1]
CBC Seismic Source Type/Distance (km)	B /< 2 km
CBC Near Source Factors, Na and Nv	1.3 and 1.6
California Seismic Hazards Mapping Act, Liquefaction Zone	Site within liquefaction zone
California Seismic Hazards Mapping Act, Landslide Zone	Site outside landslide zone
Peak Ground Acceleration,[2] g	0.52

Notes:
1 The site is classified as S_F. However, after ground improvement site can be characterized as S_D in accordance with CBC.
2 Earth Mechanics, Inc. (2007), 10 percent probability of exceedance in 50 years.

The site-specific design ARS curve recommended in Port-Wide ground motion study report (EMI, 2006) can be used for the seismic design of the warehouse structure. The acceleration response spectrum is presented in Table 2 and on Figure 4. The ARS curve corresponds to a firm ground condition assuming ground improvement at the site.

Table 2 - ACCELERATION SPECTRUM COORDINATES (ARS)

T (sec)	SPECTRAL ACCELERATION (g)
0.01	0.512
0.02	0.512
0.03	0.512
0.05	0.690
0.075	0.831
0.1	0.931
0.12	0.990
0.15	1.061
0.17	1.101
0.2	1.154
0.24	1.151
0.3	1.147
0.4	1.055
0.5	0.983
0.75	0.763
1.0	0.637
1.5	0.462
2.0	0.338
3.0	0.194
4.0	0.128

4.2 LIQUEFACTION

The potential for soil liquefaction at the site was initially evaluated using procedures suggested by Seed et al. (2003) that summarized recent advances in the liquefaction engineering topics based on a recent database. This approach meets the requirements of CGS Special Publication 117 (1997) and provides a more rigorous evaluation than the procedures outlined in the Southern California Earthquake Center (1999) guidelines. The critical SPT N-values and CPT tip resistances below which soil liquefaction is likely to occur were calculated for the CLE. Based on the analyses, loose to medium-dense sands and silts below the groundwater will liquefy during or after the design earthquake. However, the Malaga formation materials were assumed to not be liquefiable because of their age and fabric. Our analysis indicates that the site may experience approximately 4 inches of liquefaction induced settlements under the CLE event. Liquefaction induced differential settlement of 3 inches should be assumed. The differential settlement should be assumed to act on adjacent foundations (pile caps) located approximately 30 feet apart.

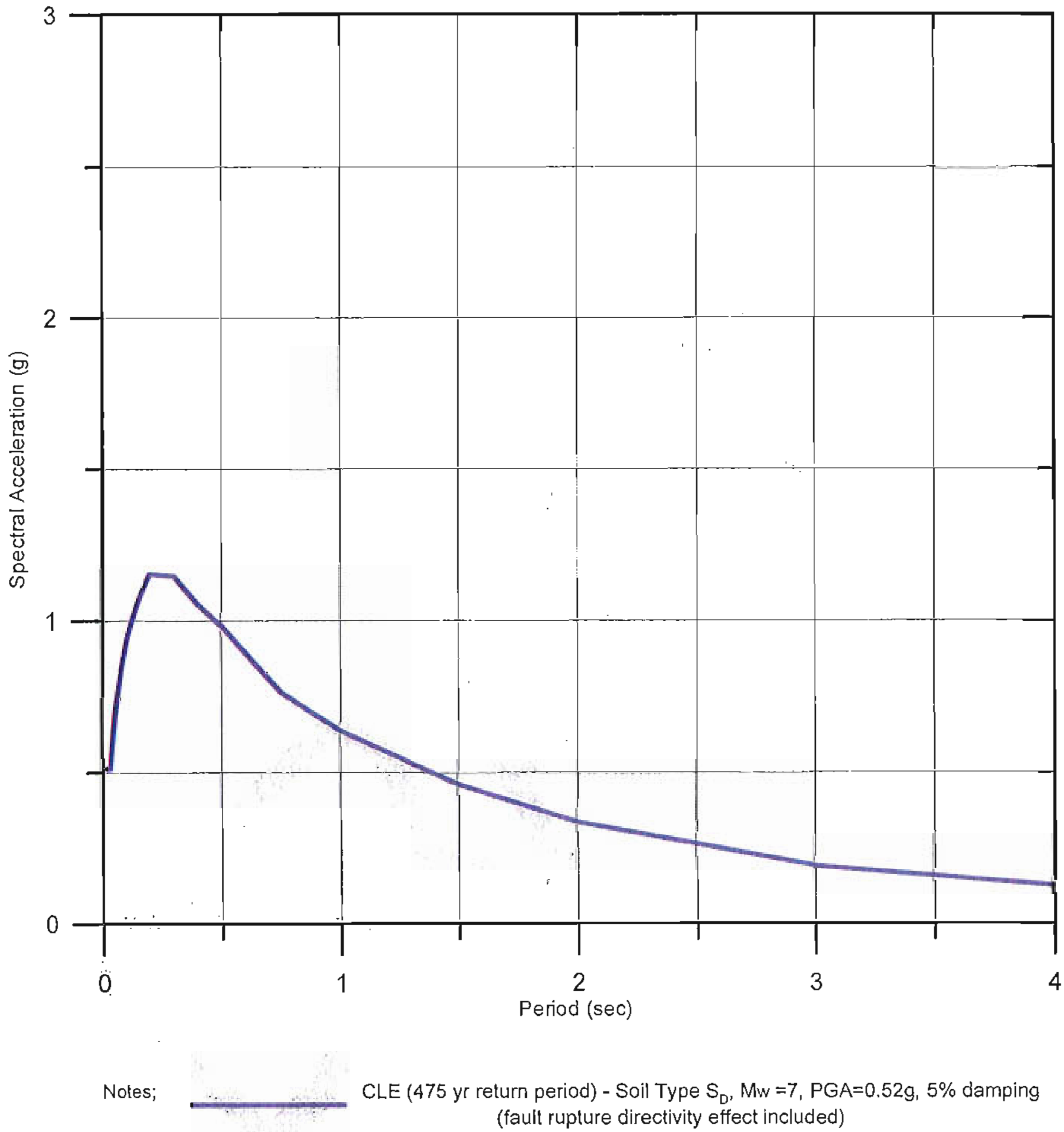


Figure 4 - ACCELERATION RESPONSE SPECTRUM (ARS)

The consequences of liquefaction will likely consist of settlement and differential settlement, and possible lateral movement near the southern perimeter rock dike slope. The lateral spreading could be greater than 2 feet and could extend to beneath the warehouse. Other potential manifestations of liquefaction include random lateral displacement, ground cracking, fissure openings, and sand boiling. Liquefaction mitigation is discussed in Section 5.2 and Section 5.3..

5.0 DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

For this preliminary investigation, the existing piles were assumed to have deteriorated to the point where the existing piles effectively do not exist. Therefore, the primary geotechnical considerations for the seismic retrofit of the warehouse building are the relatively loose sands and silts below the groundwater level that are potentially liquefiable from seismic shaking. Unless mitigated, liquefaction will cause settlement and differential settlement of the building and lateral deformation. Thus, ground improvement and/or structural retrofit to reduce the effects of liquefaction are required. To help mitigate the effects of liquefaction, we judge that a compaction grouting program under and surrounding the warehouse is the preferred retrofit scheme. If a future investigation can prove that the existing piles are intact, then the liquefaction induced effects would be reduced; however, some liquefaction mitigation may still be required. An additional geotechnical investigation should be performed to evaluate the piles, the effects of liquefaction, and determine the perimeter dike geometry to provide design -level recommendations.

5.1 SLOPE STABILITY

The stability of perimeter rock dike slope was evaluated for static, pseudo-static, and CLE conditions using the computer program GSTABL7 (Gregory Geotechnical Software, 2003). The simplified Janbu method was used to calculate the slope stability factor of safety (FS) for both circular and irregular (block) failure modes. Cross Section A-A' (Figure 3) for the perimeter rock dike was analyzed. The slope stability analysis was performed assuming the existing piles do not exist and an assumed rock dike geometry. The calculated FS for the assumed existing slope for static conditions was greater than 1.5. However, under the pseudo-static (0.15g) and CLE event **(0.52g) conditions,** the calculated FS were less than 1, indicating the rock dike may experience **lateral movement b**ecause of earthquake shaking.

A preliminary Newmark type deformation analysis was performed as part of the slope stability analysis. The slope deformations were estimated to be of the order of several feet under pseudo static and CLE earthquake conditions. The critical failure surface extended under the warehouse. To mitigate the effects of the adjacent slope, ground improvement to reduce liquefaction or a deep foundation system is required. The deep foundation system could consist of providing evidence that the existing piles are intact or a new foundation system. These options are discussed in Section 5.3 and Section 5.4.

5.2 BUILDING FOUNDATIONS

The warehouse was assumed to be supported on shallow foundations (existing pile caps) approximately 5 feet deep and approximately 10-foot square. Bearing capacity analysis indicates the pile caps have a static allowable bearing capacity of 12,500 pounds per square foot (psf) with a factor of safety (FS) of at least 3 against shear failure. Because of the uncertified fill, the LADB&S limits the lateral resistance to an equivalent fluid pressure of 100 pounds per cubic foot (pcf) along the grade beams and other foundation elements to resist lateral loads.

The building was constructed in the early 1900s and was used as a warehouse until the mid-1960s. We understand the building has not been used in its full capacity since then. We also do not anticipate any increase in the building loads in future. Therefore, no further static settlements are anticipated under the building loads.

During ground shaking, the shallow foundations (pile caps) will be subject to potential bearing failures (FS less than 1) and vertical movements. Therefore, a seismic retrofit program should be implemented as described in Section 5.3.

5.3 GROUND IMPROVEMENT/FOUNDATION ALTERNATIVES

The warehouse will probably require seismic geotechnical retrofitting of the shallow foundation (pile caps) and floor slab systems if the warehouse is subject to the FEMA 356 Rehabilitation Guidelines and/or if required by LADB&S. The retrofit will likely include mitigating the seismic settlement and potential lateral spreading.

The ground improvement/foundation alternatives considered include: compaction piles, compaction grouting, deep soil mixing, jet grouting, vibro systems, and mini piles. Table 3 lists the advantages and disadvantages of the various ground improvement alternatives considered for this project. Based on the site conditions, and the locations of the proposed structure, we judge that compaction grouting would be the most appropriate ground improvement/foundation alternative. The ground improvement/foundation alternatives are listed in general order of geotechnical preference with the preferred alternative listed first.

Table 3 - GROUND IMPROVEMENT/FOUNDATION ALTERNATIVES

ALTERNATIVE	ADVANTAGES	DISADVANTAGES
Compaction Grouting	Effective in the liquefiable layers. Suitable in vibration sensitive areas. Least expensive.	Does not improve drainage characteristics. Limited approval by LADB&S.
Mini Piles	Structural elements added for firm support.	Limited resistance to lateral loads. LADB&S does not allow for vertical support in uncertified fill. Not approved by LADB&S. Limited number of specialty contractors.
Jet Grouting	Effective in the liquefiable layers. Suitable in vibration sensitive areas.	Does not improve drainage characteristics. Not approval by LADB&S. Significant spoils generated. More expensive than compaction grouting. Requires specialty contractor.
Deep Soil Mixing	Effective in the liquefiable layers. Suitable in vibration sensitive areas.	Very difficult inside the warehouse. Not approval by LADB&S. Requires specialty contractor.
Stone Columns, Rammed Aggregate Piers Vibratory Systems		Not feasible because of potential damage to the existing structure.

For preliminary design, assume that the compaction grouting columns will be spaced approximately five feet apart and extend to natural soils, approximately 25 to 30 feet deep. The compaction grouting pattern should extend 10 feet outside the building footprint except for the southern boundary where the compaction grouting should extend approximately 25 feet outside the building footprint. We estimate that the construction cost will be approximately $1,500 per compaction grout column.

5.4 FURTHER INVESTIGATION

The ground improvement/foundation seismic mitigation program can be minimized if a field investigation program is performed to evaluate the integrity of the piles and confirms that the piles are intact. Also, the geometry of the southern perimeter rock dike should be determined, either based on review of drawings (if they can be located) or by a field investigation. If the findings of the additional field investigation prove that the piles are intact, then the liquefaction induced settlements would not likely affect the proposed foundation system. Confirmation of the extent and geometry of the southern perimeter rock dike could reduce the estimated lateral spreading and affects on Warehouse No. 1. Therefore, the design-level geotechnical investigation should include the following:

- The geometry of the rock dike should be verified using drawings and/or field investigation.
- Additional borings and/or CPTs, including inside the building, to evaluate the ground conditions inside the building.
- A field investigation program to verify the whether the piles are intact and if intact, the size, length, and type of the piles.
- If piles are intact, analyze the affects of liquefaction on the piles including the effect of the adjacent perimeter rock dike lateral deformation.

6.0 LIMITATIONS

This report has been prepared for this project in accordance with generally accepted geotechnical engineering practices common to the local area. No other warranty, expressed or implied, is made.

The analyses and recommendations contained in this report are based on the literature review, field investigation, and laboratory testing conducted in the area. The results of the field investigation indicate subsurface conditions only at the specific locations and times, and only to the depths penetrated. They do not necessarily reflect strata variations that may exist between such locations. Although subsurface conditions have been explored as part of the investigation, we have not conducted chemical laboratory testing on samples collected or evaluated the site with respect to the presence or potential presence of contaminated soil or groundwater conditions.

The validity of our recommendations is based in part on assumptions about the stratigraphy. Observations during construction can help confirm such assumptions. If subsurface conditions different from those described are noted during construction, recommendations in this report must be reevaluated. DYA should be retained to observe earthwork construction in order to help confirm that our assumptions and recommendations are valid or to modify them accordingly. In accordance with LADB&S and CBC Appendix Chapter 33 Section 3317, DYA cannot assume responsibility or liability for the adequacy of recommendations if we do not observe construction.

This report is intended for use only for the project described. In the event that any changes in the nature, design, or location of the facilities are planned, the conclusions and recommendations contained in this report should not be considered valid unless the changes are reviewed and conclusions of this report modified or verified in writing by DYA. We are not responsible for any claims, damage, or liability associated with the interpretation of subsurface data or reuse of the subsurface data or engineering analyses without our express written authorization.

Further, the City of Los Angeles Building Code required the Geotechnical Engineer of Record to observe ground improvement.

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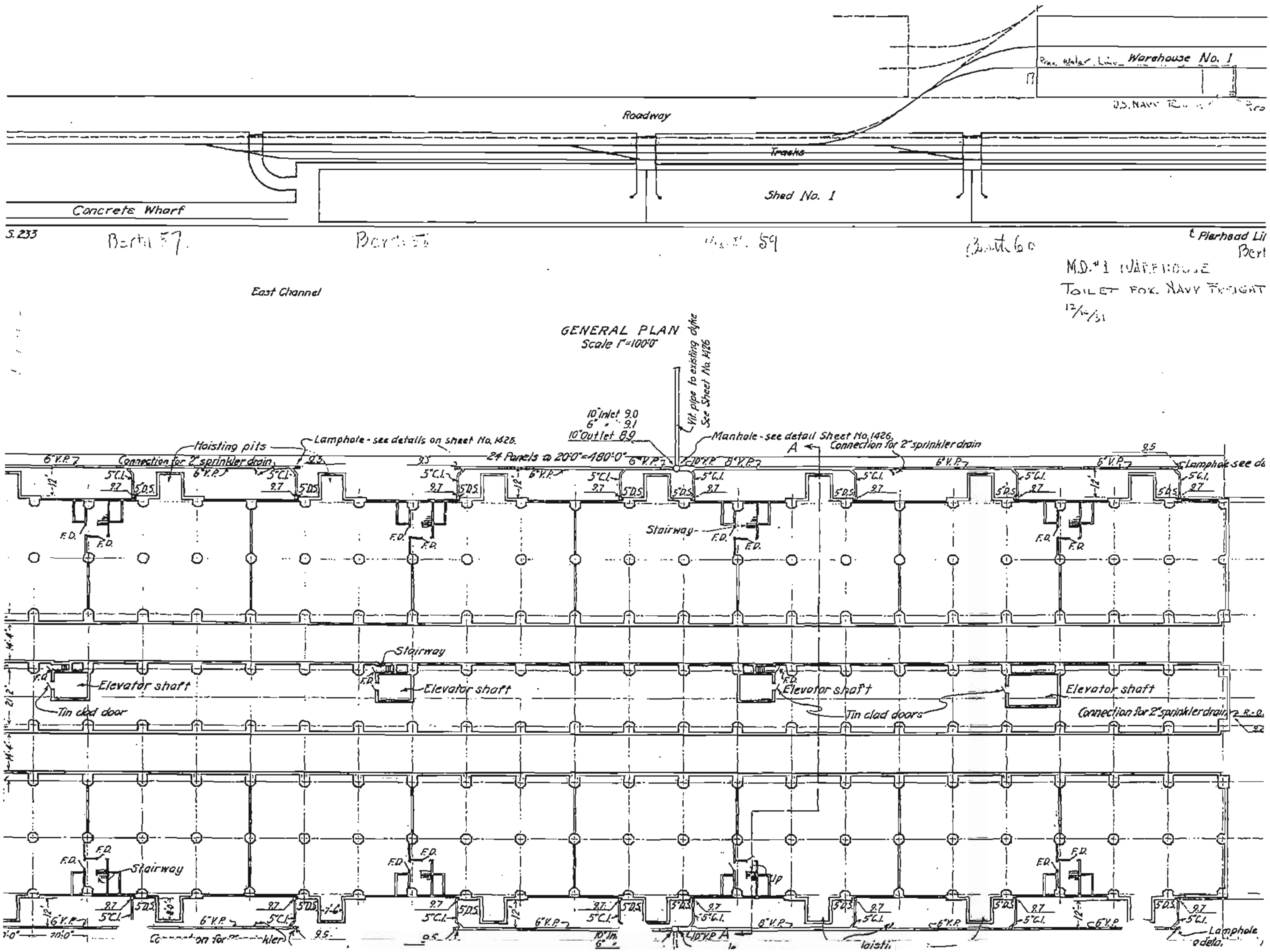
APPENDIX A
PROJECT DATA

APPENDIX A - PROJECT DATA

This appendix contains the as-built drawings related to warehouse building. These drawings were provided by POLA.


Warehouse No. 1
Roadway
Tracks
Shed No. 1
Concrete Wharf
S.233
Berth 57
Berth 59
Berth 60
Pierhead Li
East Channel
M.D. #1 WAREHOUSE
TOILET FOR NAVY FREIGHT
12/14/31
GENERAL PLAN
Scale 1"=100'0"
Vit. pipe to existing dyke
See Sheet No. 1426
10" Inlet 9.0
6" " 9.1
10" Outlet 8.9
Manhole - see detail Sheet No. 1426
Connection for 2" sprinkler drain
Hoisting pits
Lamphole - see details on sheet No. 1426
24 Panels @ 20'0" = 480'0"
6" V.P.
8" V.P.
5" C.I.
5" D.S.
9.7
9.5
12'
F.D.
Stairway
Elevator shaft
Tin clad door
Tin clad doors
14'4"
21'2"
20'0"
Up

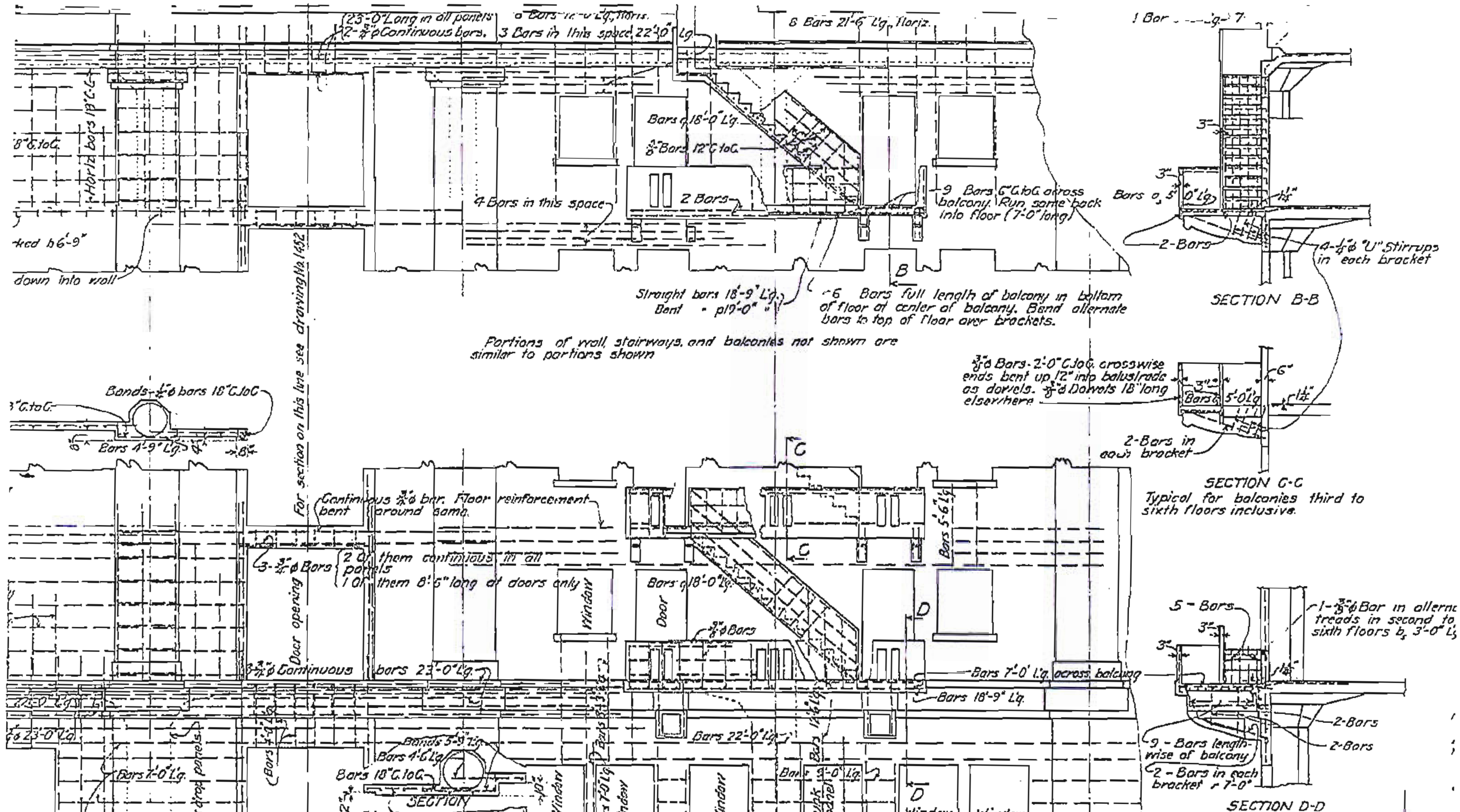
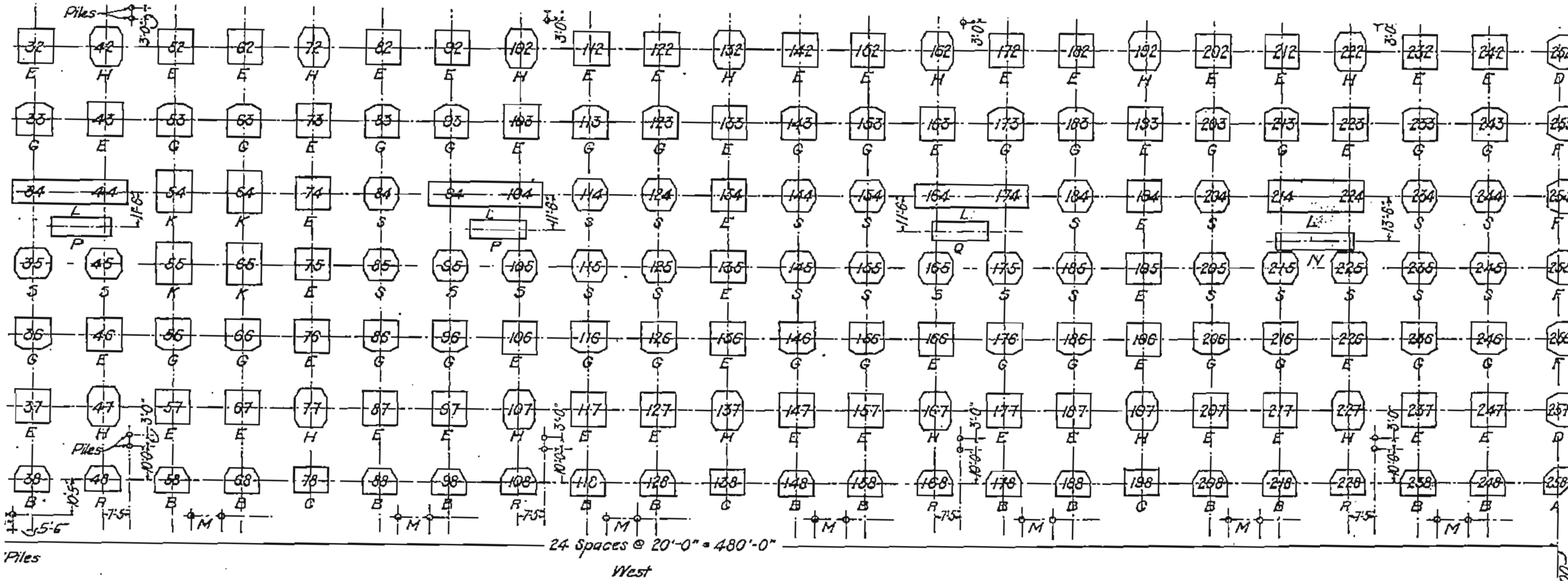


TABLE OF BARS FOR PLAIN PANELS

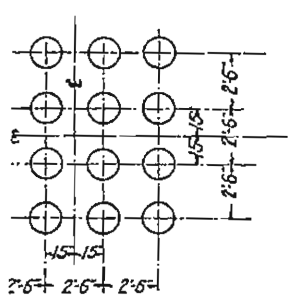
BASEMENT			
2 - Bars	⅜"ø	22'-0" Lg.	Hor.
16 - "	⅜"ø	21'-0"	"
24 - "	½"ø	10'-0"	Vert.
1st STORY			
6 - Bars	⅜"ø	23'-0" Lg.	above doors
12 - "	½"ø	22'-0"	" "
16 - "	"	16'-0"	Vert.
7 - "	"	12'-3"	between "
14 - "	"	7'-0"	Hor. side of doors
8 - "	"	6'-0"	Vert. over "
2nd 3rd 4th & 5th STORIES EACH			
6 - Bars	⅜"ø	23'-0" Lg.	Hor.
12 - "	½"ø	22'-0"	"
24 - "	"	11'-6"	Vert.
6th STORY			



West

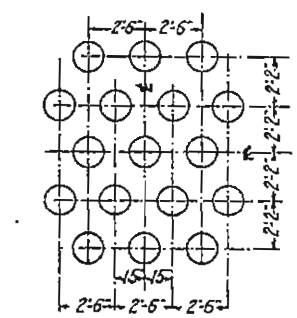
FOUNDATION PLAN

Scale 1" = 20'-0"



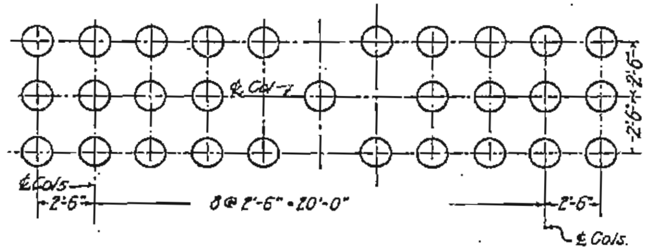
FOR 52 FOOTINGS-E

Scale 1/4" = 1'-0"



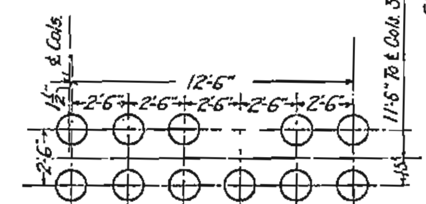
PILES FOR 14 FOOTINGS-H

Scale 1/4" = 1'-0"



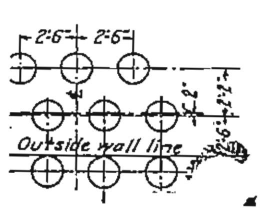
PILES FOR 4 COMBINED FOOTINGS-L

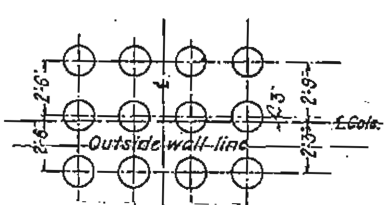
Scale: 1/4" = 1'-0"

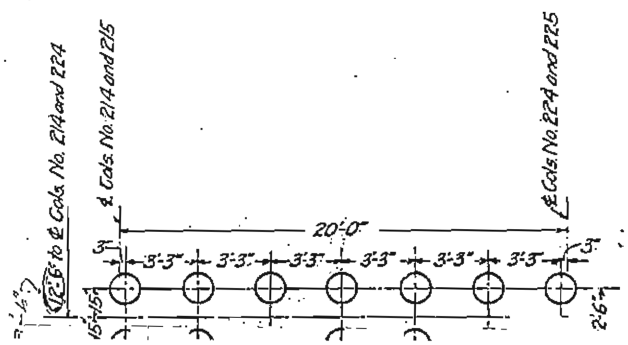


PILES FOR 1 FOOTING-Q
PILES FOR 2 FOOTINGS-P OPPOSITE

Scale: 1/4" = 1'-0"







APPENDIX B
FIELD INVESTIGATION

APPENDIX B - FIELD INVESTIGATION

The field investigation for the proposed project consisted of drilling one boring (DYA-B1) and performing four cone penetration tests (CPTs; DYC-1 through DYC-4). The depths of the boring and CPTs were between approximately 59 and 86.5 feet. The approximate boring and CPT locations are shown on Figure 2.

Boring B-1 was drilled by Gregg Drilling on June 5, 2007, with a truck-mounted Versa Drill (V-100) drill rig using rotary wash drilling techniques. Our field engineer observed the drilling operations and collected drive samples for visual examination and subsequent laboratory testing. Drive samples were collected with a 2.4-inch-inside-diameter (3.0-inch-outside-diameter) modified California split-barrel sample lined with brass tubes and a standard split-spoon penetrometer with dimensions in accordance with ASTM 3550 and 1586, respectively. Both samplers were driven with a 140-pound hammer falling 30 inches. An automatic trip device was used to lift the hammer. The blows required to drive the modified California sampler were converted to equivalent standard penetration test (SPT) N-values by multiplying by 0.65 (N = 0.65 x modified California blows per foot). Field unconfined compression strengths were obtained using a pocket penetrometer.

Soils encountered in the borings were classified in general accordance with the ASTM Soil Classification System (ASTM D2487 and 2488), which is summarized on Plate B1. The boring log is presented on Plates B2 through B4 and was prepared from visual examination of the samples, cuttings obtained during drilling operations, and results of laboratory tests.

The boring was backfilled with soil bentonite cement grout.

The CPTs were advanced by Gregg InSitu May 5, 2007, with a truck-mounted rig. The CPT was advanced in general accordance with ASTM D 5778 using an electronic cone penetrometer. The results of the CPT are contained in this appendix.

The boring and CPT locations were identified in the field by measuring from known locations using a measuring wheel and using a hand-held differential global positioning system (gps) unit with an estimated 6-foot horizontal accuracy.

SOIL CLASSIFICATION SYSTEM-ASTM D2487

MAJOR DIVISIONS			SYMBOLS GRAPH	SYMBOLS LETTER	TYPICAL DESCRIPTIONS
COARSE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE-GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		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 SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

"Push" Sampler

Split Barrel "Drive" Sampler With Liner

Standard Penetration Test (SPT) Sampler

Bag Sample

Concrete/Rock Core

Groundwater Surface

NP = Nonplastic
EI = Expansion Index Test
SG = Specific Gravity
SE = Sand Equivalent
UC = Unconfined Comp.
CD = Consol. Drained Triaxial.
CU = Consol. Undrained Triaxial.
UU = Undrained, Unconsol. Triaxial.
RV = R-Value
CA = Chemical Analysis
DS = Direct Shear
CN = Consolidation
CP = Collapse Potential
SA = Grain size; HD = Hydrometer
MD = Compaction Test
CBR = California Bearing Ratio
[PID] Reading in ppm above background

SPT "N" = Uncorrected equivalent blow count for last foot of driving (set to 100 for driving refusal)
= 0.65 x modified California blows per foot

KEY TO LOG OF BORINGS

Warehouse No. 1 Seismic Retrofit
Project No. 2007-005.01

PLATE **B1**

BORING LOCATION:	See Figure 2	ELEVATION AND DATUM (feet):	15 MSL
LATITUDE:	33° 43' 13.5" N	LONGITUDE:	118° 16' 20.1" W
DRILLING EQUIPMENT:	Versa Drill V-100	DRILLING METHOD:	Rotary Wash
BORING DIAMETER (inches):	5	BORING DEPTH (feet):	86.5
DATE STARTED:	5/4/07	DATE COMPLETED:	5/4/07
SPT HAMMER DROP:	30 inches WT: 140 lbs	DRIVE HAMMER DROP:	30 inches WT: 140 lbs
LOGGED BY: NWO	CHECKED BY: TK	DRIVE SAMPLER DIAMETER (inches)	ID: 2.4 OD: 3

Elevation (feet)	Depth (feet)	Blows per 6 Inches	SPT N Blows per Foot	Field Unc. Comp. Str. (tsf)	DESCRIPTION	Dry Density (pcf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Percent Passing #200 Sieve	Other Tests [PID]
					ASPHALT CONCRETE (AC): 6 inches						
		5 8 7	10		POORLY GRADED SAND with SILT (SP-SM): light yellowish brown, moist, loose to medium dense, fine- to coarse-grained sand, little sea shell fragments	90	4				CA
		4 6 2	5		loose, fine- to medium-grained sand	92	22				
10	5	2 3 2	3		very loose					5	SA
					SANDY SILT (ML): dark brown, moist, soft, nonplastic, trace sea shell fragments, micaceous	90	29	NP	NP		DS
		0 12 2	14		∇ wet, firm						
5	10	2 7 8	10			67	59			57	SA CN
0	15	1 1 1	2		SILT with SAND (ML): dark olive brown, wet, very soft to soft, nonplastic, fine-grained sand, trace sea shell fragments, trace micaceous						
-5	20	3 5 7	8		firm	60	70	NP	NP	74	SA DS
					SANDY SILT (ML): dark olive brown, wet, very soft to soft, low plasticity, fine-grained sand, trace clayey material, trace micaceous						
-10	25	2 1 1	2								
					SILTY SAND (SM): dark gray, wet, medium dense, fine-grained sand, micaceous						DS CN

LOG OF BORING DYA-B1

Page 1 of 3

Warehouse No. 1 Seismic Retrofit

Project No. 2007-005.01

PLATE

B2

Template: DYLG1-2006; Prj ID: 2007-005.01.GPJ

Elevation (feet)	Depth (feet)	Sampler	Symbol	Blows per 6 Inches	SPT N Blows per Foot	Field Unc. Comp. Str. (tsf)	DESCRIPTION	Dry Density (pcf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Percent Passing #200 Sieve	Other Tests [PID]
				50 18 17	23		LEAN CLAY (CL): dark olive brown, wet, hard, medium plasticity, trace sea shell fragments, trace mica	97 96	27 25	NP	NP	16	SA
				8 10 11	14	3	ELASTIC SILT (MH): dark greenish gray, wet, firm, high plasticity, trace micaceous	61	58	69	19	100	
-20	35			7 8 10	18		SILT with SAND (ML): dark olive brown, wet, hard, low plasticity, fine-grained sand, trace micaceous						
							ELASTIC SILT (MH): dark greenish gray, wet, hard, high plasticity, micaceous - MALAGA FORMATION						
-25	40			6 10 14	16	3.5	dark olive brown, trace micaceous	56	67	66	19	100	
-30	45			6 9 10	19	4	dark greenish gray, trace clayey material, trace micaceous						
-35	50												
-40	55			6 12 16	18	4		59	58	68	21	100	
-45	60												
-50	65			7 11 12	23	4							

Elevation (feet)	Depth (feet)	Sampler	Symbol	Blows per 6 Inches	SPT N Blows per Foot	Field Unc. Comp. Str. (tsf)	DESCRIPTION	Dry Density (pcf)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Percent Passing #200 Sieve	Other Tests [PID]
-60	75			11 20 25	29	>4.5		63	54	64	20	100	
-65	80												
-70	85			7 11 13	24	4	olive brown						
							Bottom of boring at 86.5 feet. Groundwater encountered at 7 feet. Boring backfilled with cement slurry and grout mix. Surface patched with cold set asphalt.						
-75	90												
-80	95												
-85	100												
-90	105												

LOG OF BORING DYA-B1

Warehouse No. 1 Seismic Retrofit

Project No. 2007-005.01

PLATE

B4

GREGG IN SITU, INC.

GEOTECHNICAL AND ENVIRONMENTAL INVESTIGATION SERVICES

May 7, 2007

Diaz Yourman & Associates
Attn: Nils Orliczky
1616 E. 17th St.
Santa Ana, California 92705

Subject: CPT Site Investigation
POLA Warehouse 1
Los Angeles, California
GREGG Project Number: 07-080SH

Dear Mr. Orliczky:

The following report presents the results of GREGG Drilling & Testing's Cone Penetration Test investigation for the above referenced site. The following testing services were performed:

1	Cone Penetration Tests	(CPTU)	☒
2	Pore Pressure Dissipation Tests	(PPD)	☐
3	Seismic Cone Penetration Tests	(SCPTU)	☐
4	Resistivity Cone Penetration Tests	(RCPTU)	☐
5	UVIF Cone Penetration Tests	(UVIFCPTU)	☐
6	Groundwater Sampling	(GWS)	☐
7	Soil Sampling	(SS)	☐
8	Vapor Sampling	(VS)	☐
9	Vane Shear Testing	(VST)	☐
10	SPT Energy Calibration	(SPTE)	☐

A list of reference papers providing additional background on the specific tests conducted is provided in the bibliography following the text of the report. If you would like a copy of any of these publications or should you have any questions or comments regarding the contents of this report, please do not hesitate to contact our office at (562) 427-6899.

Sincerely,
GREGG Drilling & Testing, Inc.

Peter Robertson
Technical Operations

2726 Walnut Ave • Signal Hill, California 90755 • (562) 427-6899 • FAX (562) 427-3314
OTHER OFFICES: SAN FRANCISCO • HOUSTON • SOUTH CAROLINA
www.greggdrilling.com

Cone Penetration Test Sounding Summary

-Table 1-

CPT Sounding Identification	Date	Termination Depth (Feet)	Depth of Groundwater Samples (Feet)	Depth of Soil Samples (Feet)	Depth of Pore Pressure Dissipation Tests (Feet)
CPT-01	5/04/07	65	-	-	-
CPT-02	5/04/07	59	-	-	-
CPT-03	5/04/07	67	-	-	-
CPT-04	5/04/07	71	-	-	-

Cone Penetration Testing Procedure (CPT)

Gregg Drilling & Testing, Inc. carries out all Cone Penetration Tests (CPT) using an integrated electronic cone system, *Figure CPT*. The soundings were conducted using a 20 ton capacity cone with a tip area of 15 cm^2 and a friction sleeve area of 225 cm^2. The cone is designed with an equal end area friction sleeve and a tip end area ratio of 0.85.

The cone takes measurements of cone bearing (q_c), sleeve friction (f_s) and penetration pore water pressure (u_2) at 5-cm intervals during penetration to provide a nearly continuous hydrogeologic log. CPT data reduction and interpretation is performed in real time facilitating on-site decision making. The above mentioned parameters are stored on disk for further analysis and reference. All CPT soundings are performed in accordance with revised (2002) ASTM standards (D 5778-95).

The cone also contains a porous filter element located directly behind the cone tip (u_2), *Figure CPT*. It consists of porous plastic and is 5.0mm thick. The filter element is used to obtain penetration pore pressure as the cone is advanced as well as Pore Pressure Dissipation Tests (PPDT's) during appropriate pauses in penetration. It should be noted that prior to penetration, the element is fully saturated with silicon oil under vacuum pressure to ensure accurate and fast dissipation.

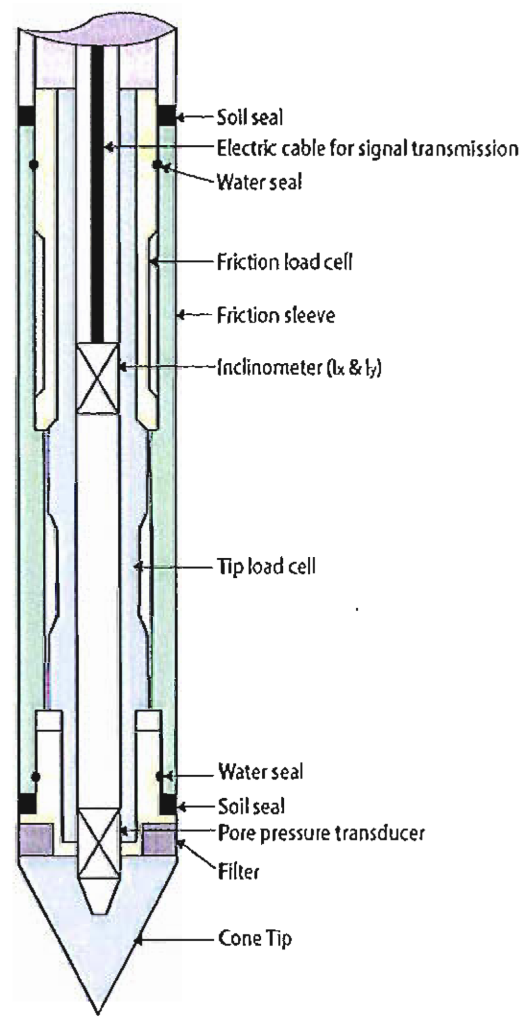


Figure CPT

When the soundings are complete, the test holes are grouted using a Gregg In Situ support rig. The grouting procedures generally consist of pushing a hollow CPT rod with a "knock out" plug to the termination depth of the test hole. Grout is then pumped under pressure as the tremie pipe is pulled from the hole. Disruption or further contamination to the site is therefore minimized.

GREGG

Cone Penetration Test Data & Interpretation

Soil behavior type and stratigraphic interpretation is based on relationships between cone bearing (q_c), sleeve friction (f_s), and pore water pressure (u_2). The friction ratio (R_f) is a calculated parameter defined by $100f_s/q_c$ and is used to infer soil behavior type. Generally:

Cohesive soils (clays)

- High friction ratio (R_f) due to small cone bearing (q_c)
- Generate large excess pore water pressures (u_2)

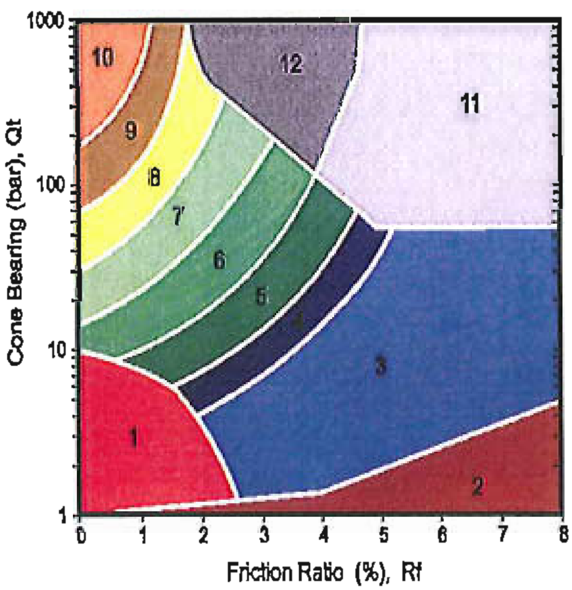
Cohesionless soils (sands)

- Low friction ratio (R_f) due to large cone bearing (q_c)
- Generate very little excess pore water pressures (u_2)

A complete set of baseline readings are taken prior to and at the completion of each sounding to determine temperature shifts and any zero load offsets. Corrections for temperature shifts and zero load offsets can be extremely important, especially when the recorded loads are relatively small. In sandy soils, however, these corrections are generally negligible.

The cone penetration test data collected from your site is presented in graphical form in Appendix CPT. The data includes CPT logs of measured soil parameters, computer calculations of interpreted soil behavior types (SBT), and additional geotechnical parameters. A summary of locations and depths is available in Table 1. Note that all penetration depths referenced in the data are with respect to the existing ground surface.

Soil interpretation for this project was conducted using recent correlations developed by Robertson et al, 1990, *Figure SBT*. Note that it is not always possible to clearly identify a soil type based solely on q_c, f_s, and u_2. In these situations, experience, judgment, and an assessment of the pore pressure dissipation data should be used to infer the soil behavior type.



ZONE	Qt/N	SBT
1	2	Sensitive, fine grained
2	1	Organic materials
3	1	Clay
4	1.5	Silty clay to clay
5	2	Clayey silt to silty clay
6	2.5	Sandy silt to clayey silt
7	3	Silty sand to sandy silt
8	4	Sand to silty sand
9	5	Sand
10	6	Gravely sand to sand
11	1	Very stiff fine grained*
12	2	Sand to clayey sand*

*over consolidated or cemented

Figure SBT

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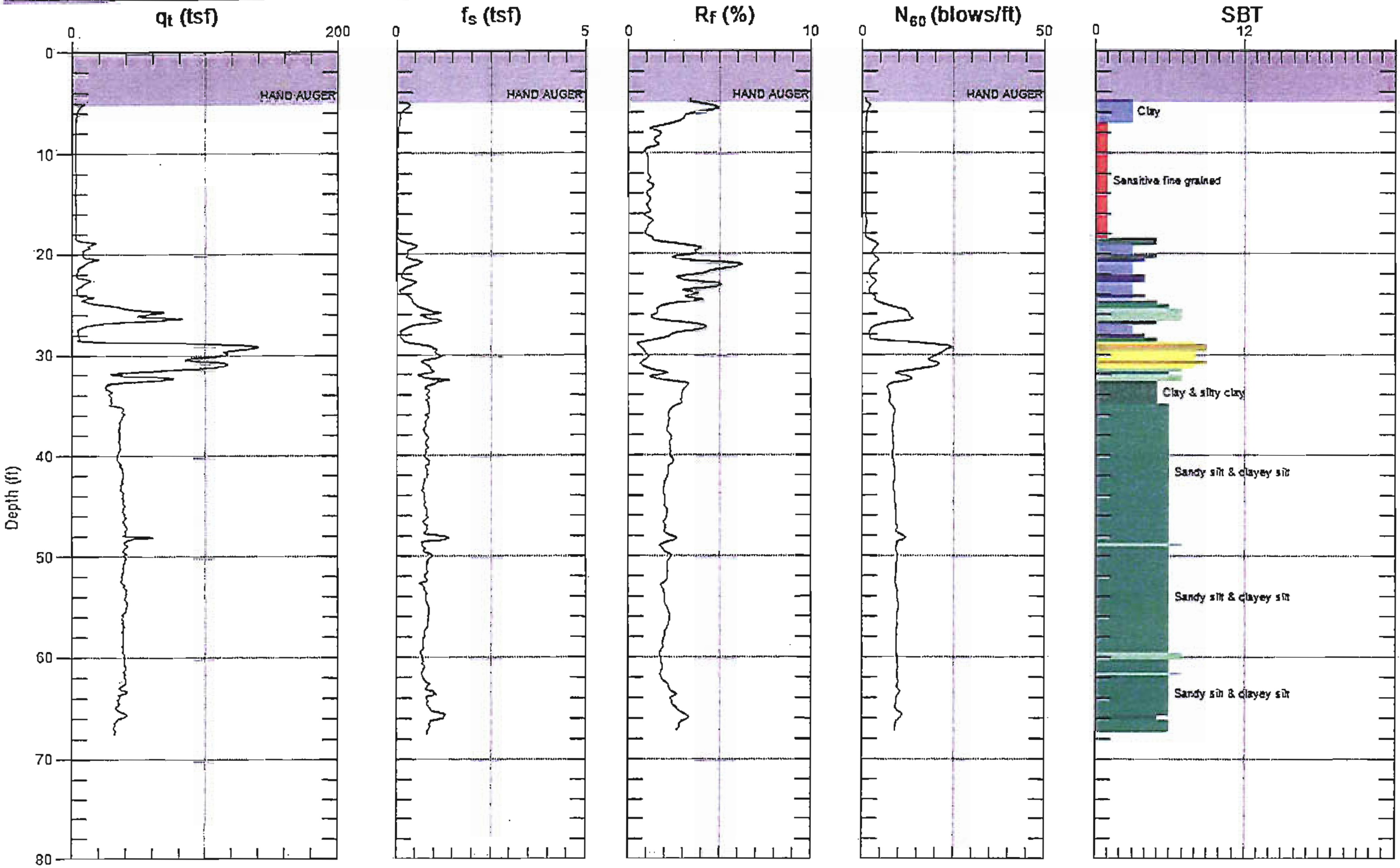
Copies of ASTM Standards are available through www.astm.org

DIAZ YOURMAN

Site: POLA WAREHOUSE 1
Sounding: CPT-03

Engineer: N.ORLICZKY
Date: 5/4/2007 11:29



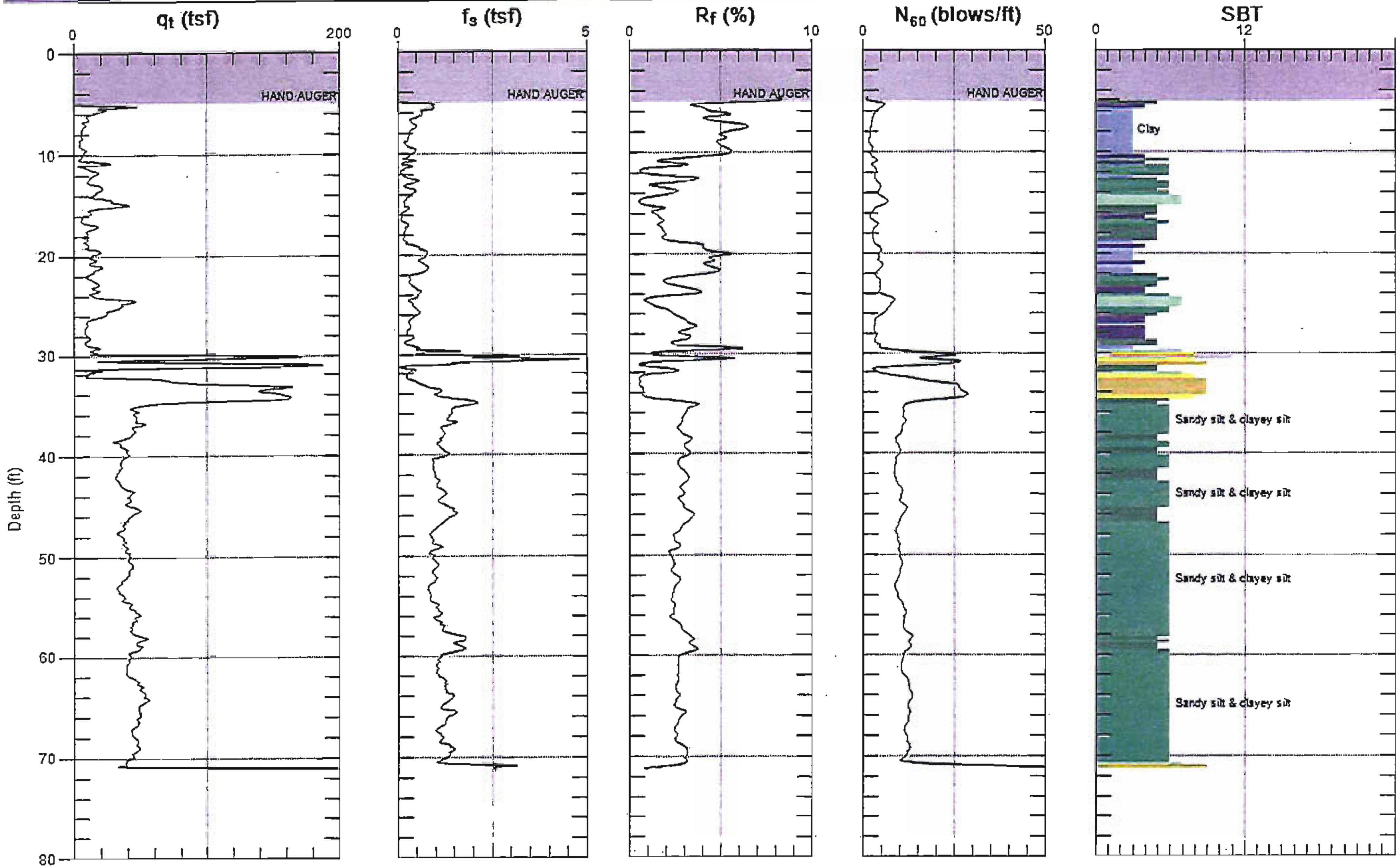
Max. Depth: 67.585 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

DIAZ YOURMAN

Site: POLA WAREHOUSE 1
Sounding: CPT-04

Engineer: N.ORLICZKY
Date: 5/4/2007 08:52



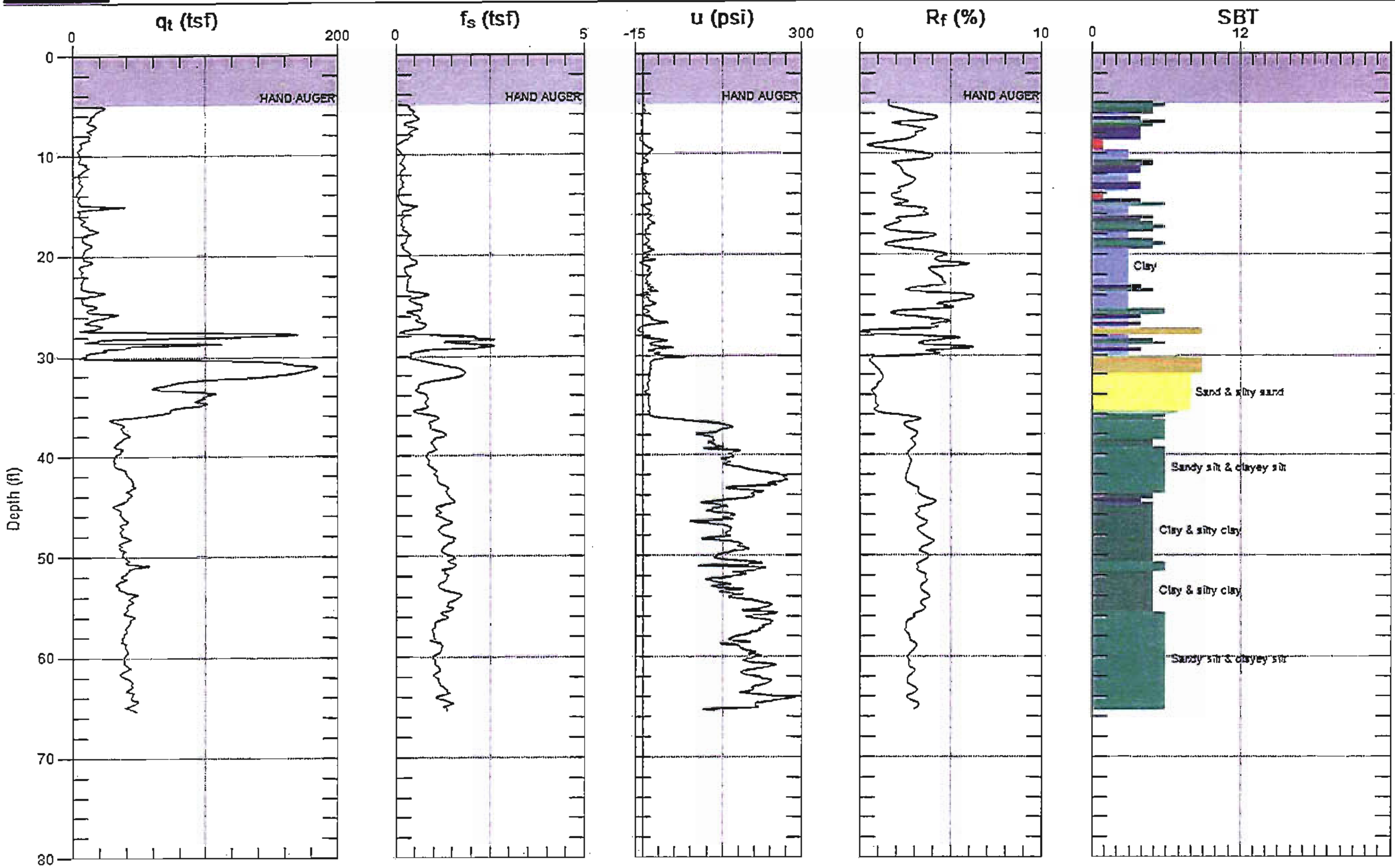
Max. Depth: 71.358 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG DIAZ YOURMAN

Site: POLA WAREHOUSE 1
Sounding: CPT-01

Engineer: N.ORLICZKY
Date: 5/4/2007 12:56

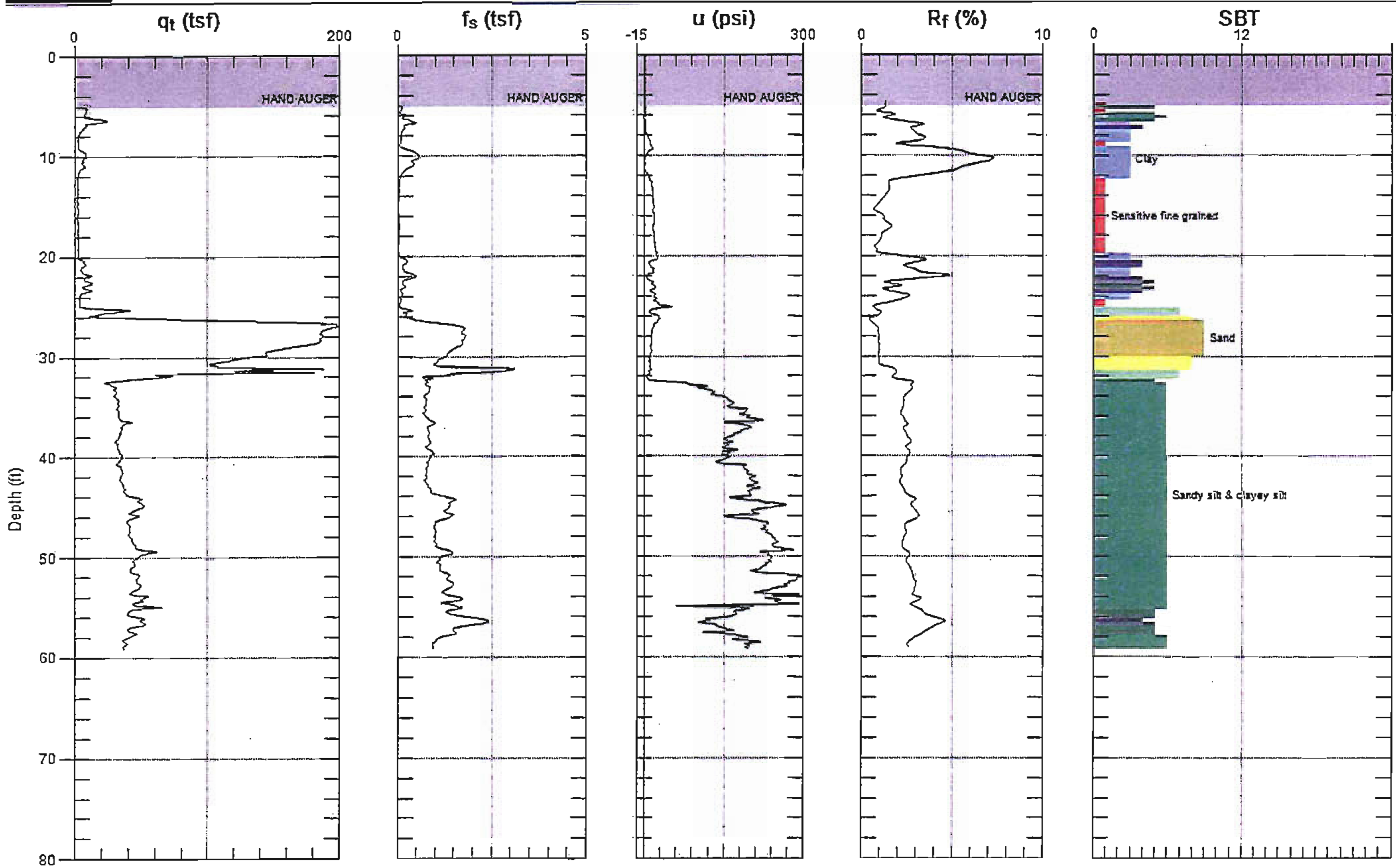


Max. Depth: 65.453 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

GREGG **DIAZ YOURMAN**

Site: POLA WAREHOUSE 1 | Engineer: N.ORLICZKY
Sounding: CPT-02 | Date: 5/4/2007 10:42



Max. Depth: 59.219 (ft)
Avg. Interval: 0.328 (ft)

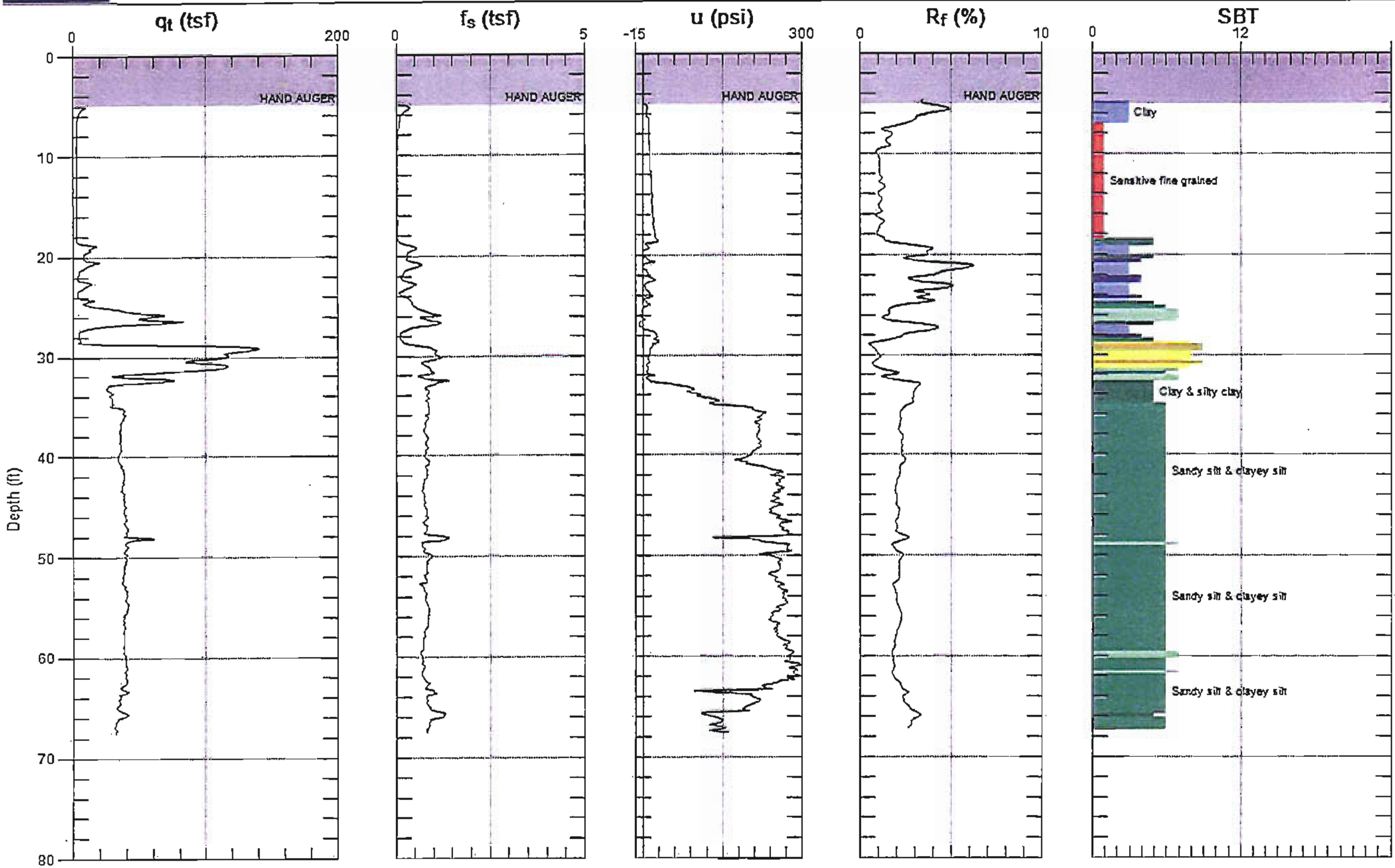
SBT: Soil Behavior Type (Robertson 1990)

GREGG

DIAZ YOURMAN

Site: POLA WAREHOUSE 1
Sounding: CPT-03

Engineer: N.ORLICZKY
Date: 5/4/2007 11:29



Max. Depth: 67.585 (ft)
Avg. Interval: 0.328 (ft)

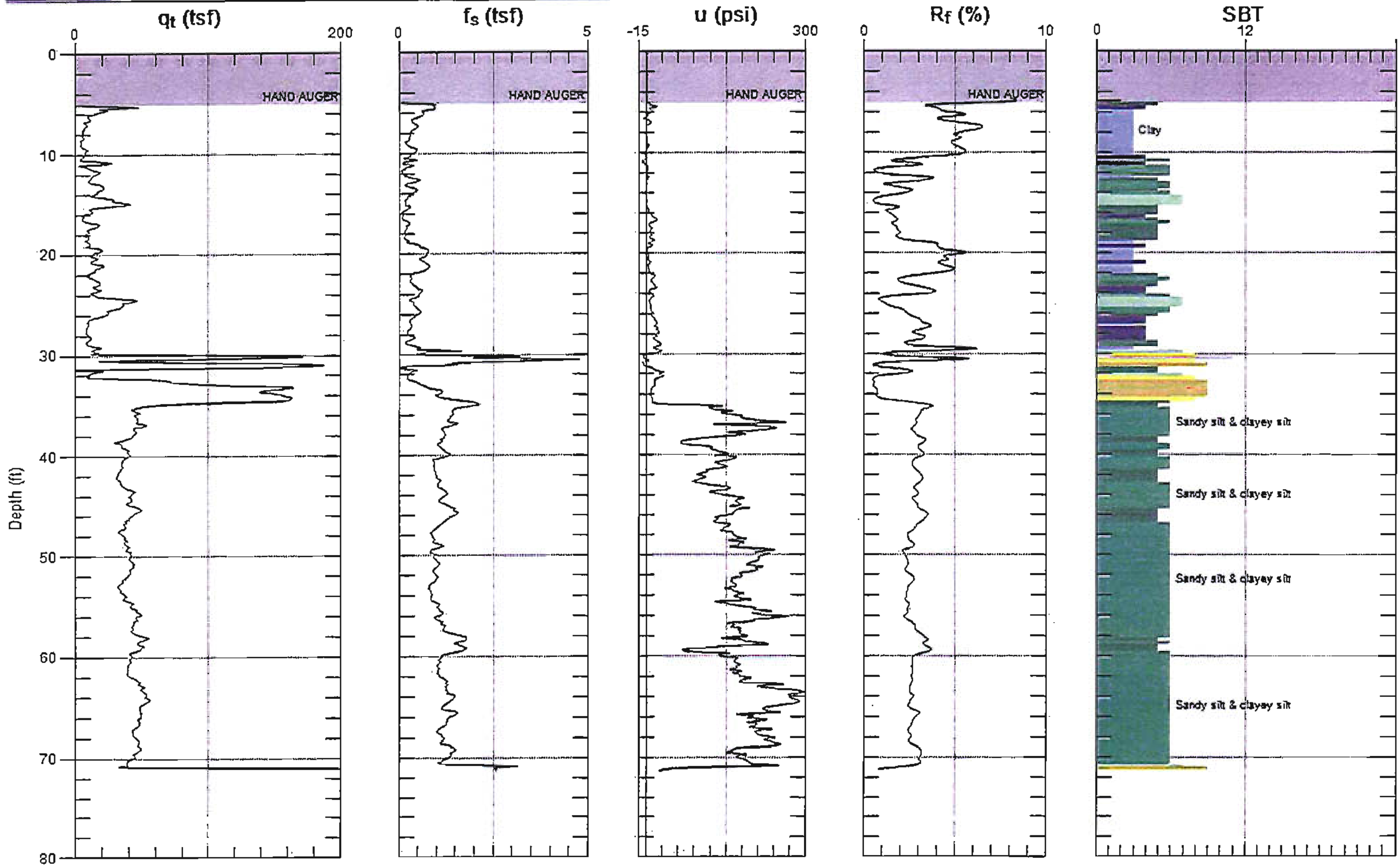
SBT: Soil Behavior Type (Robertson 1990)

GREGG

DIAZ YOURMAN

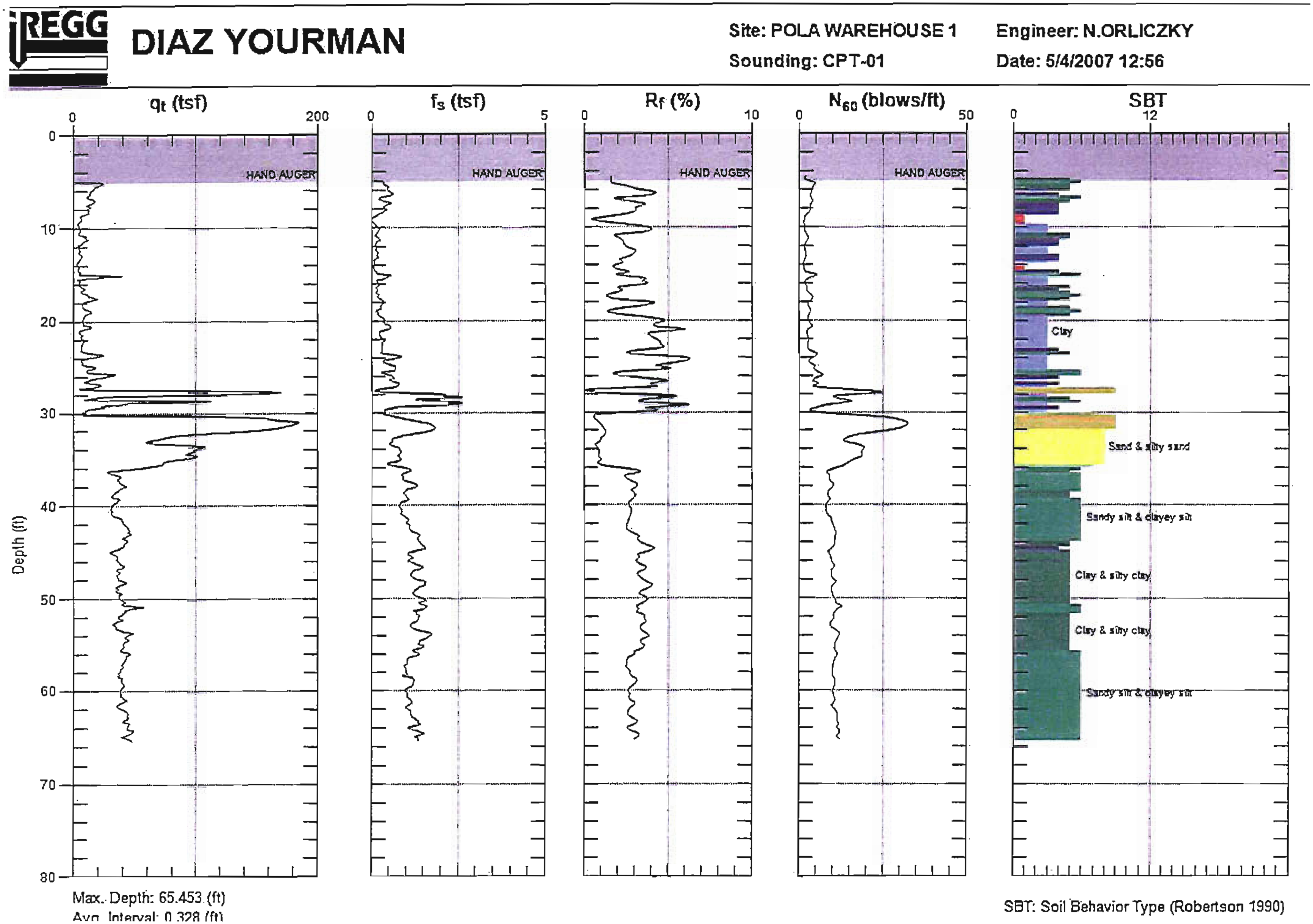
Site: POLA WAREHOUSE 1
Sounding: CPT-04

Engineer: N.ORLICZKY
Date: 5/4/2007 08:52



Max. Depth: 71.358 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

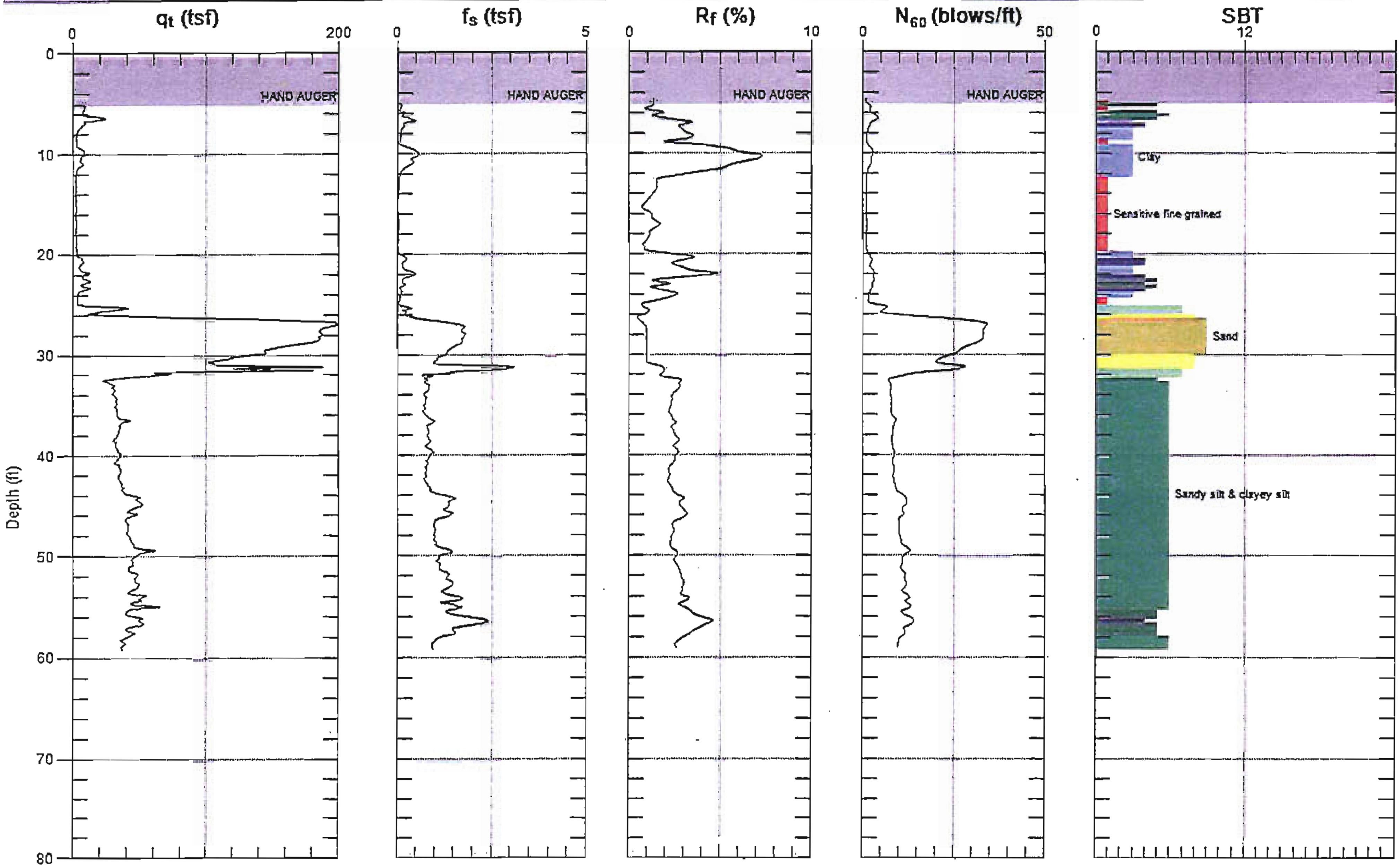


GREGG
DIAZ YOURMAN
Site: POLA WAREHOUSE 1
Sounding: CPT-01
Engineer: N.ORLICZKY
Date: 5/4/2007 12:56
qt (tsf)
fs (tsf)
Rf (%)
N60 (blows/ft)
SBT
HAND AUGER
Clay
Sand & silty sand
Sandy silt & clayey silt
Clay & silty clay
Depth (ft)
Max. Depth: 65.453 (ft)
Avg. Interval: 0.328 (ft)
SBT: Soil Behavior Type (Robertson 1990)

DIAZ YOURMAN

Site: POLA WAREHOUSE 1
Sounding: CPT-02

Engineer: N.ORLICZKY
Date: 5/4/2007 10:42



Max. Depth: 59.219 (ft)
Avg. Interval: 0.328 (ft)

SBT: Soil Behavior Type (Robertson 1990)

APPENDIX C

LABORATORY TESTING

APPENDIX C - LABORATORY TESTING

Diaz•Yourman & Associates (DYA) selected the soil samples to be tested and the tests to be performed on the selected samples. Laboratory testing was performed by AP Engineering, Inc., a City of Los Angeles certified testing laboratory. Laboratory data are summarized on the boring logs in Appendix B and presented on Plates C1 through C10. DYA has reviewed and concurs with the test results listed in Table C1 and accepts full responsibility for their use in our analysis. A summary of the geotechnical laboratory testing is presented in Table C2.

Table C1 - LABORATORY TESTING SUMMARY

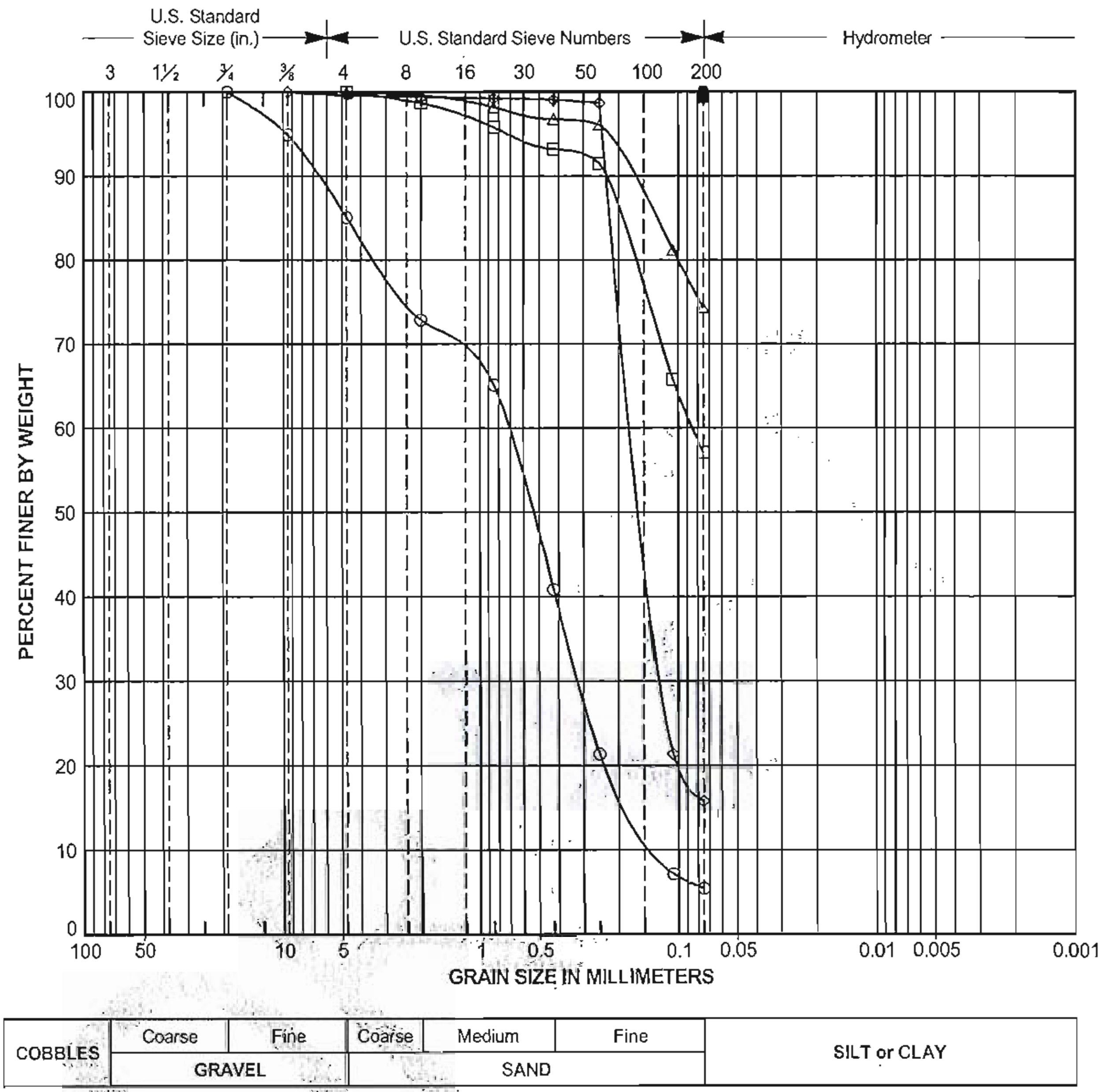
TEST NAME	PROCEDURE	PURPOSE	LOCATION
Percent Passing the No. 200 Sieve	ASTM D1140-92	Classification, index properties	Boring Logs
Moisture Content, Dry Density	ASTM D2216-92	Classification, index properties	Boring Logs
Grain-Size Distribution	ASTM D422-63	Classification, index properties	Plate C1
Atterberg Limits	ASTM D-4318-93	Expansion potential, classification, index properties	Plate C2
Consolidation	ASTM D2435-90	Settlement	Plates C3 and C4
Direct Shear	ASTM D3080-90	Shear strength	Plates C5 through C10
pH	CTM 532	Corrosion potential	Table C2
Resistivity	CTM 532	Corrosion potential	Table C2
Soluble Sulfates	CTM 417-B	Corrosion potential	Table C2
Soluble Chlorides	CTM 422	Corrosion potential	Table C2

Notes:
- ASTM = American Society for Testing and Materials
- CTM = Caltrans Test Method

Table C2 - CORROSION POTENTIAL TEST RESULTS

Boring No.	B-1
Depth (feet)	0 to 5
pH	10.2
Water Soluble Sulfate Content (ppm)	17
Water Soluble Chloride Content (ppm)	132
Minimum Resistivity (ohms-cm)	3,600

Note:
- ppm = parts per million



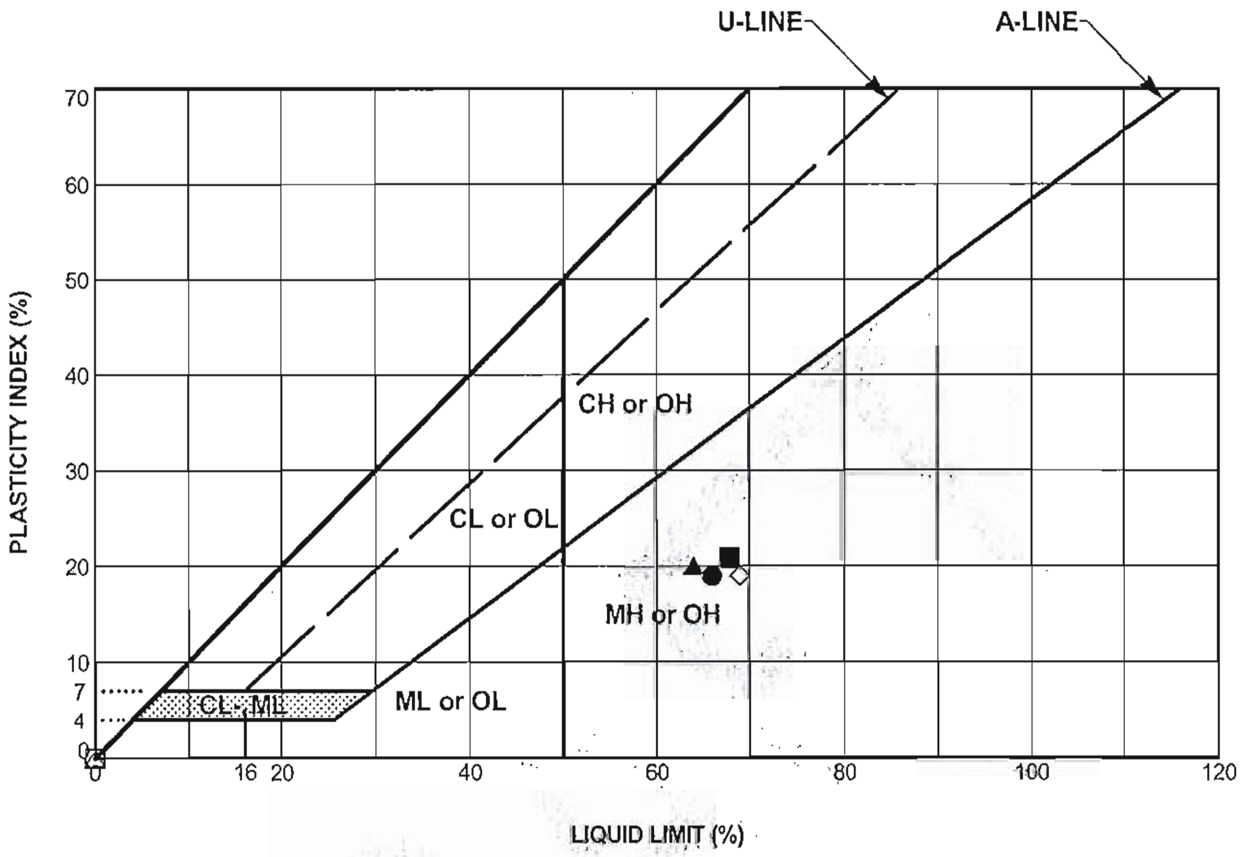
Laboratory Testing by: AP Engineering and Testing, Inc.

Symbol	Source	Depth (feet)	Classification	Natural M. C. (%)	Liquid Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
⊙	DYA-B1	4.7	POORLY GRADED SAND WITH SILT (SP-SM)				5
□	DYA-B1	10.0	SANDY SILT (ML)	59			57
△	DYA-B1	20.0	SILT WITH SAND (ML)	70	NP	NP	74
◇	DYA-B1	30.0	SILTY SAND (SM)	27	NP	NP	16
●	DYA-B1	33.0	ELASTIC SILT (MH)	58	69	19	100
■	DYA-B1	40.0	ELASTIC SILT (MH)	67	66	19	100
▲	DYA-B1	55.0	ELASTIC SILT (MH)	58	68	21	100
◆	DYA-B1	75.0	ELASTIC SILT (MH)	54	64	20	100

PARTICLE SIZE ANALYSIS

Warehouse No. 1 Seismic Retrofit
Project No. 2007-005.01

PLATE
C1



Laboratory Testing by: AP Engineering and Testing, Inc.

Symbol	Source	Depth (feet)	Classification	Natural M. C. (%)	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	% Passing #200 Sieve
⊙	DYA-B1	6.0	SANDY SILT (ML)	29	NP	NP	NP	
□	DYA-B1	20.0	SILT WITH SAND (ML)	70	NP	NP	NP	74
△	DYA-B1	30.0	SILTY SAND (SM)	27	NP	NP	NP	16
◇	DYA-B1	33.0	ELASTIC SILT (MH)	58	69	50	19	100
●	DYA-B1	40.0	ELASTIC SILT (MH)	67	66	47	19	100
■	DYA-B1	55.0	ELASTIC SILT (MH)	58	68	47	21	100
▲	DYA-B1	75.0	ELASTIC SILT (MH)	54	64	44	20	100

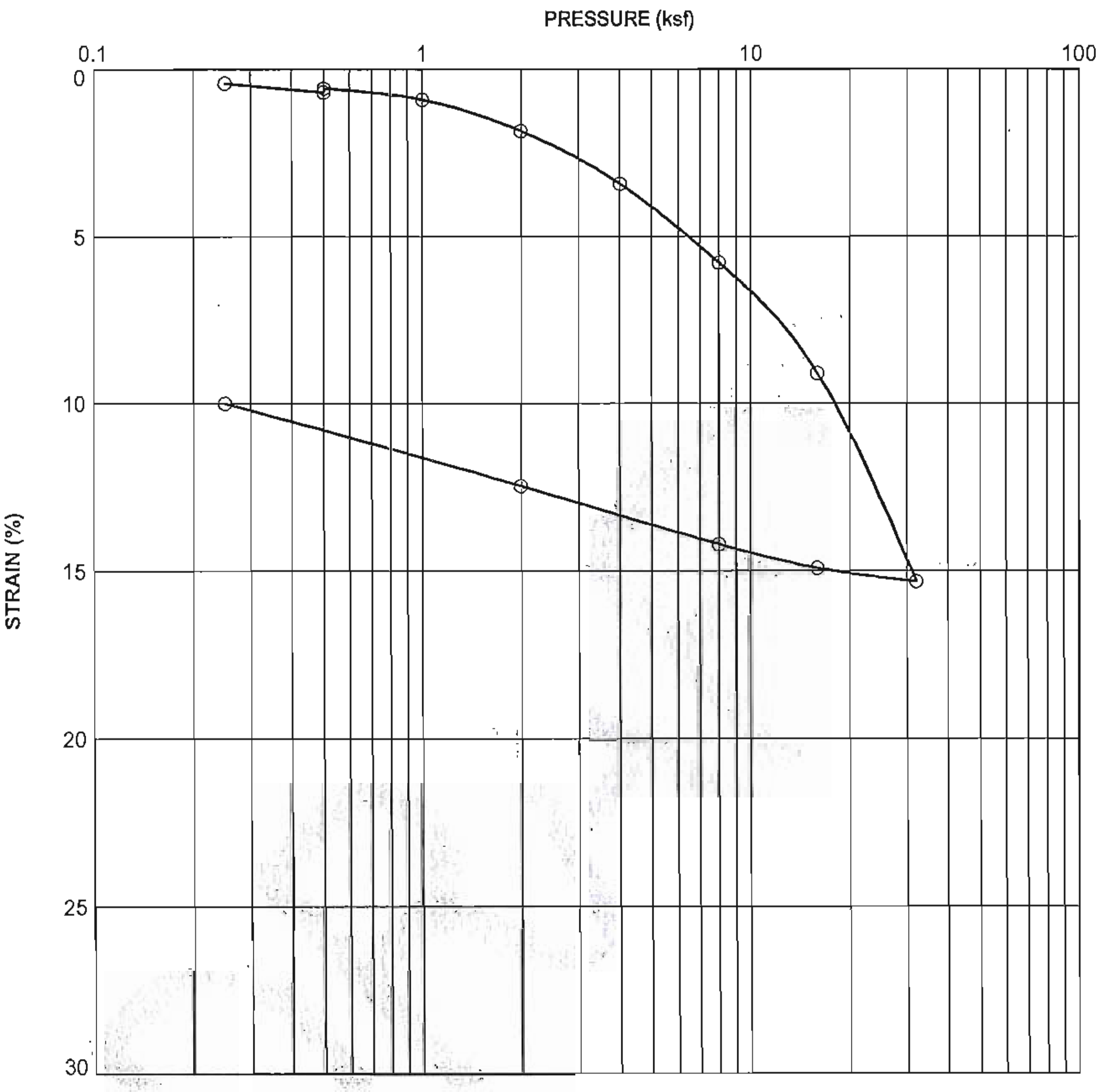
PLASTICITY CHART

Warehouse No. 1 Seismic Retrofit

Project No. 2007-005.01

PLATE

C2



Source: DYA-B1 Depth (ft): 10.0	Sample Type: Tube+Ziploc		
Classification: SANDY SILT (ML)	LL:	PI:	Specific Gravity: 2.7
Sample Diameter (inches): 2.4	Water Added: 0.5		

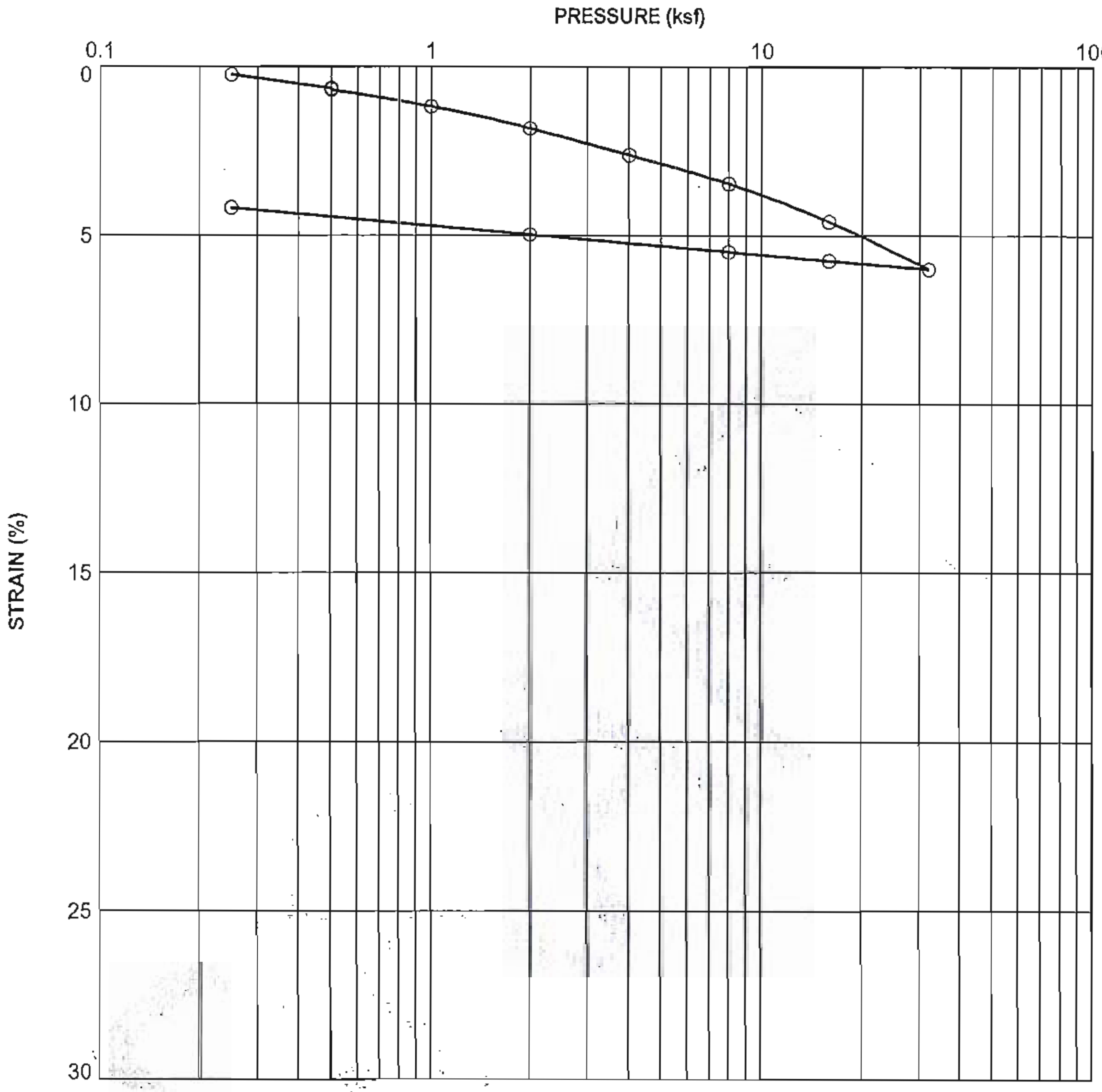
Laboratory Testing by: AP Engineering and Testing, Inc. Test Method: ASTM D2435

Test Stage	Moisture Content (%)	Dry Density (pcf)	Saturation (%)	Void Ratio
Before	59	67	105	1.511
After	69	75	148	1.260

CONSOLIDATION TEST PLOT

Warehouse No. 1 Seismic Retrofit
Project No. 2007-005.01

PLATE
C3



Source: DYA-B1 Depth (ft): 30.0	Sample Type: Tube+Ziploc		
Classification: SILTY SAND (SM)	LL: NP	PI: NP	Specific Gravity: 2.7
Sample Diameter (inches): 2.4	Water Added: 0.5		

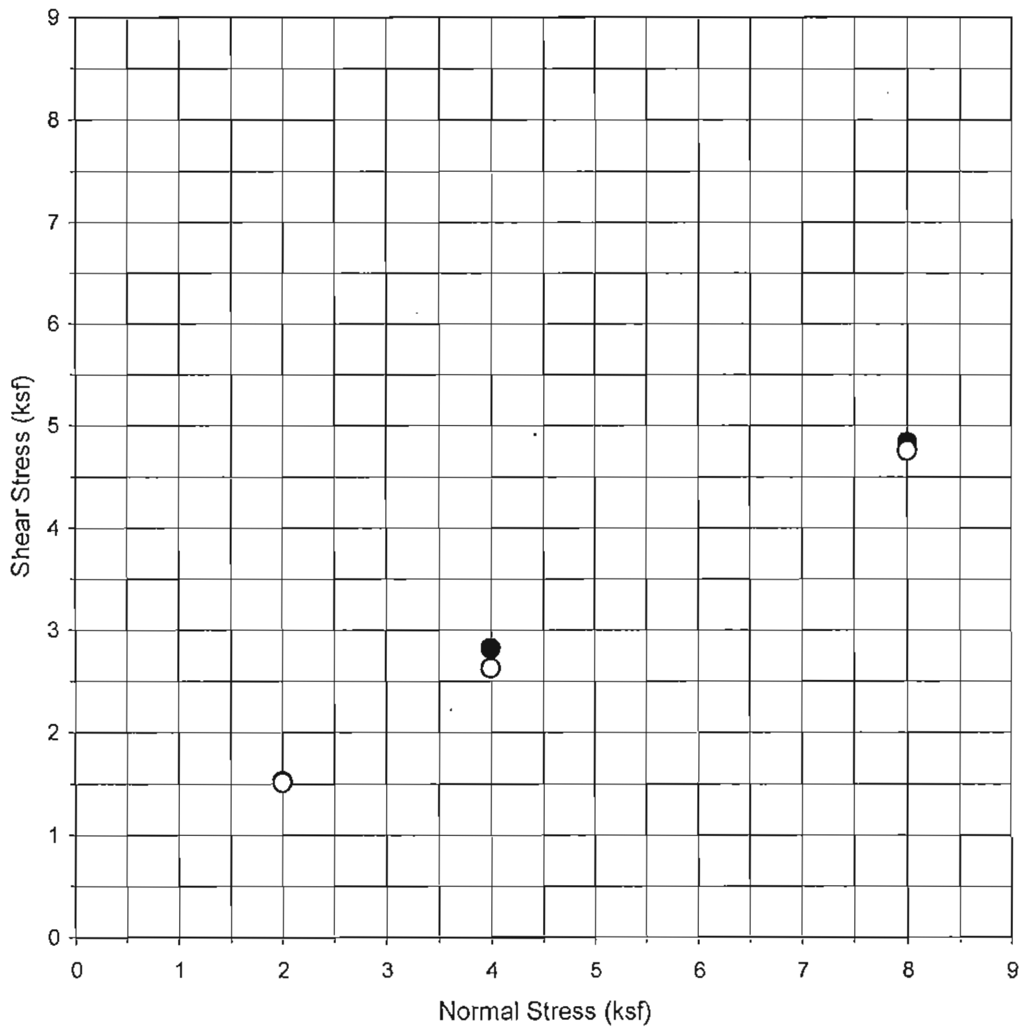
Laboratory Testing by: AP Engineering and Testing, Inc. Test Method: ASTM D2435

Test Stage	Moisture Content (%)	Dry Density (pcf)	Saturation (%)	Void Ratio
Before	27	97	99	0.737
After	27	101	108	0.665

CONSOLIDATION TEST PLOT

Warehouse No. 1 Seismic Retrofit
Project No. 2007-005.01

PLATE
C4



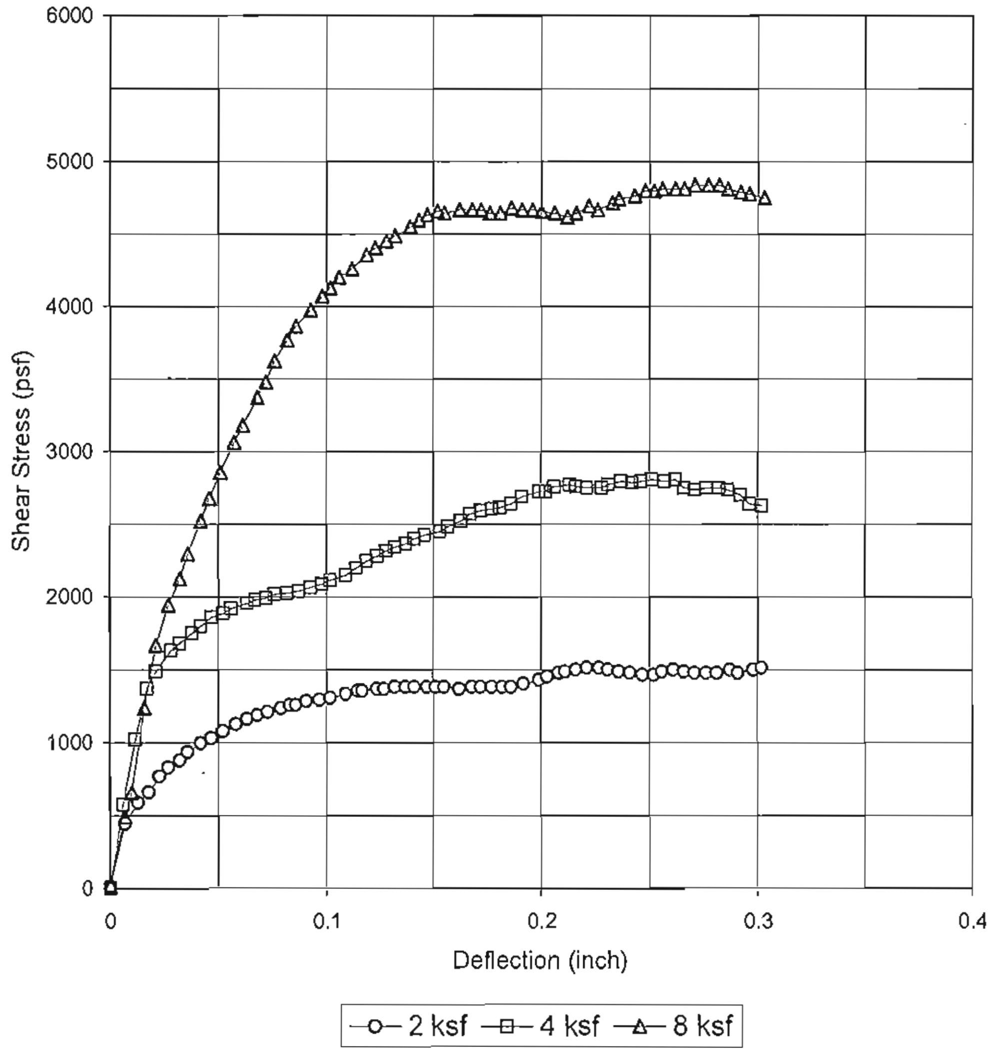
Project Name:	:	Warehouse No. 1 Seismic Retrofit
Project No.	:	2007-005.01
Boring No.	:	B-1
Sample No.	:	7
Depth (ft)	:	20
Sample Type	:	Tube
Soil Type	:	Organic Silt with fine sand layer
Test Condition	:	Saturated
Initial Dry Density	:	60.39 pcf
Moisture Content (before)	:	70.25 %
Moisture Content (after)	:	54.71 %
Shear Rate (in/min)	:	0.0653

Normal Stress (ksf)	Shear Stress Peak (ksf)	Shear Stress Ultimate (ksf)
2	1.524	1.512
4	2.820	2.628
8	4.836	4.752

AP ENGINEERING AND TESTING, INC.

DIRECT SHEAR
TEST RESULTS
(ASTM D 3080)

May-07 Figure No.

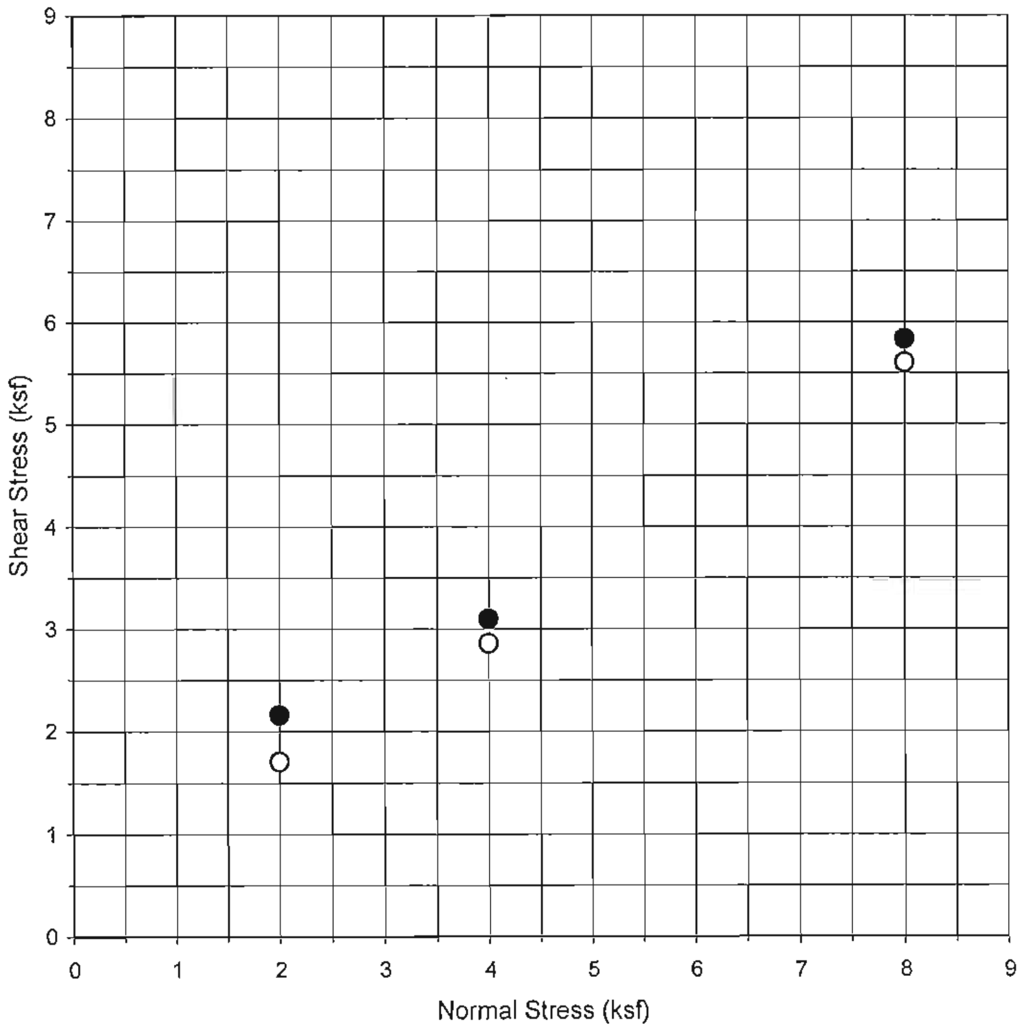


Project Name:	:	Warehouse No. 1 Seismic Retrofit	
Project No.	:	2007-005.01	
Boring No.	:	B-1	
Sample No.	:	7	
Depth (ft)	:	20	
Sample Type	:	Tube	
Soil Type	:	Organic Silt with fine sand layer	
Test Condition	:	Saturated	
Initial Dry Density	:	60.4	pcf
Moisture Content (before)	:	70.2	%
Moisture Content (after)	:	54.7	%

AP ENGINEERING AND TESTING, INC.

DIRECT SHEAR
TEST RESULTS
(ASTM D 3080)

May-07 Figure No.



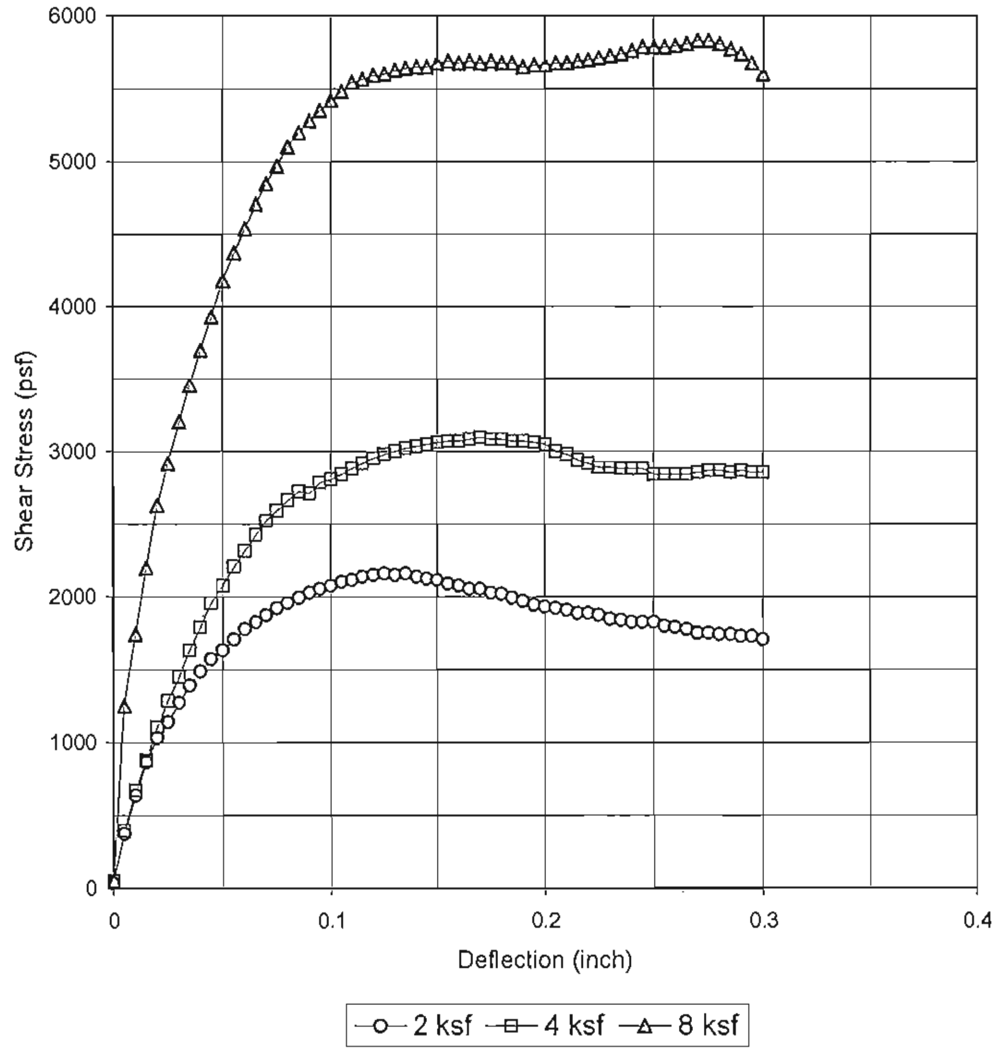
Project Name:	:	Warehouse No. 1 Seismic Retrofit
Project No.	:	2007-005.01
Boring No.	:	B-1
Sample No.	:	3A
Depth (ft)	:	5
Sample Type	:	Tube
Soil Type	:	Silty Sand w/shell
Test Condition	:	Saturated
Initial Dry Density	:	89.79 pcf
Moisture Content (before)	:	29.09 %
Moisture Content (after)	:	30.93 %
Shear Rate (in/min)	:	0.0653

Normal Stress (ksf)	Shear Stress Peak (ksf)	Shear Stress Ultimate (ksf)
2	2.160	1.704
4	3.096	2.856
8	5.831	5.603

AP ENGINEERING AND TESTING, INC.

DIRECT SHEAR
TEST RESULTS
(ASTM D 3080)

May-07 Figure No.



Project Name:	:	Warehouse No. 1 Seismic Retrofit	
Project No.	:	2007-005.01	
Boring No.	:	B-1	
Sample No.	:	3A	
Depth (ft)	:	5	
Sample Type	:	Tube	
Soil Type	:	Silty Sand w/shell	
Test Condition	:	Saturated	
Initial Dry Density	:	89.8	pcf
Moisture Content (before)	:	29.1	%
Moisture Content (after)	:	30.9	%

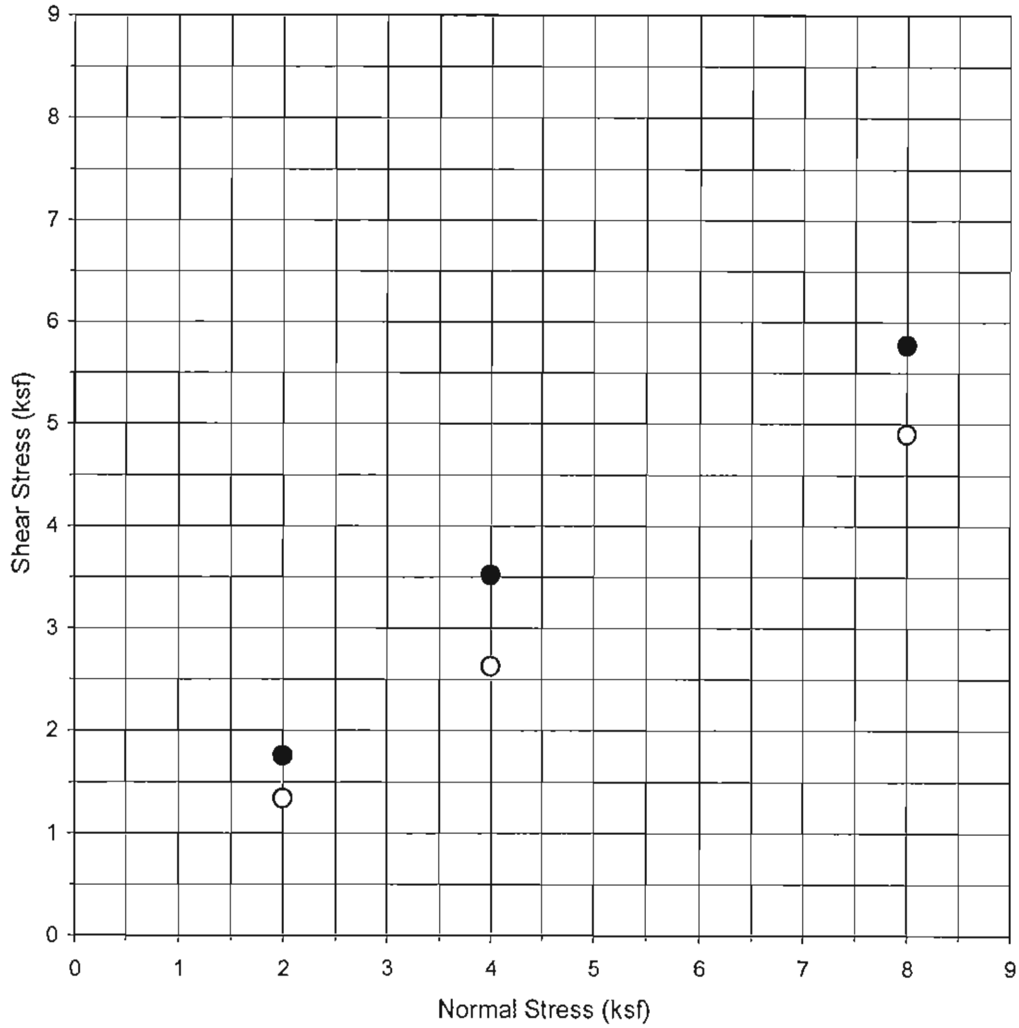
AP ENGINEERING AND TESTING, INC.

DIRECT SHEAR

TEST RESULTS

(ASTM D 3080)

May-07 Figure No.



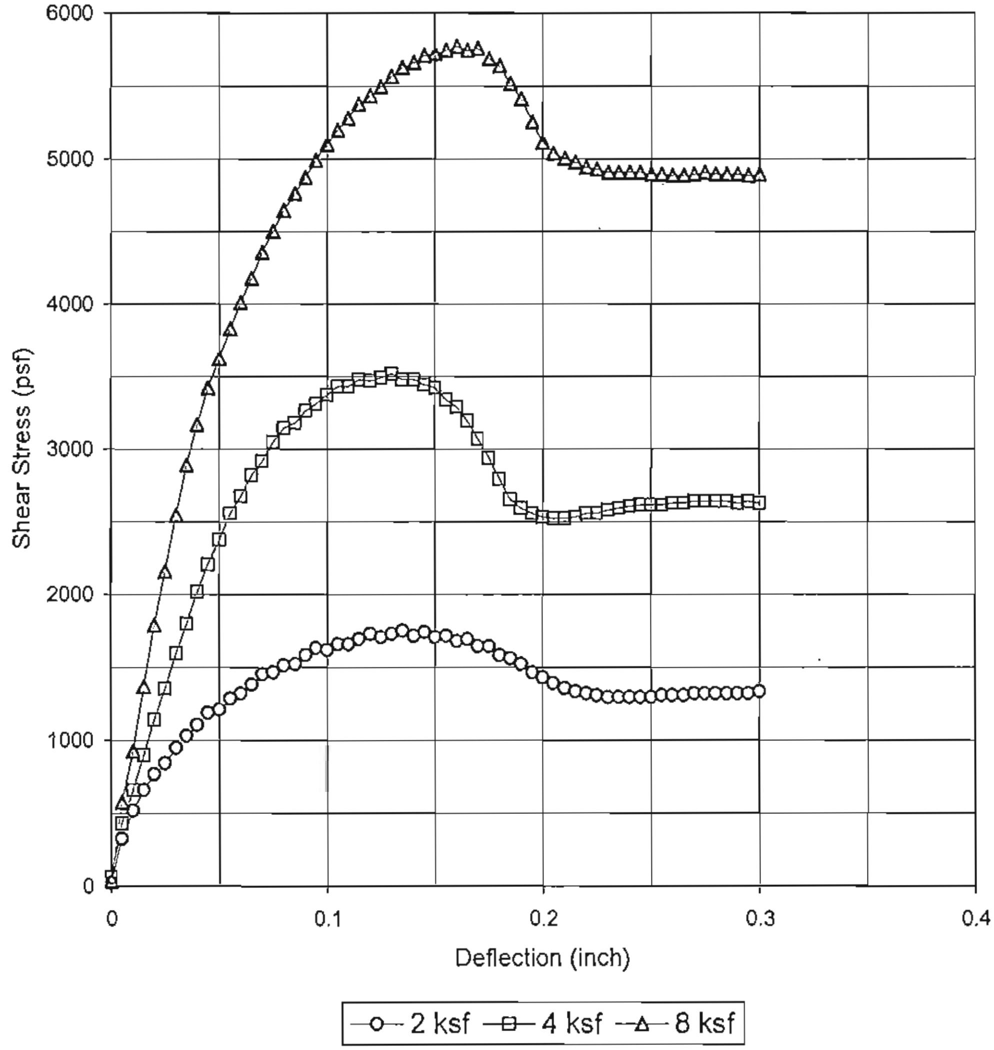
Project Name:	:	Warehouse No. 1 Seismic Retrofit
Project No.	:	2007-005.01
Boring No.	:	B-1
Sample No.	:	9B
Depth (ft)	:	30.5
Sample Type	:	Tube
Soil Type	:	Silty Sand
Test Condition	:	Saturated
Initial Dry Density	:	95.54 pcf
Moisture Content (before)	:	25.43 %
Moisture Content (after)	:	29.68 %
Shear Rate (in/min)	:	0.0653

Normal Stress (ksf)	Shear Stress Peak (ksf)	Shear Stress Ultimate (ksf)
2	1.752	1.332
4	3.516	2.628
8	5.771	4.896

AP ENGINEERING AND TESTING, INC

DIRECT SHEAR
TEST RESULTS
(ASTM D 3080)

May-07 Figure No.



Project Name:	:	Warehouse No. 1 Seismic Retrofit	
Project No.	:	2007-005.01	
Boring No.	:	B-1	
Sample No.	:	9B	
Depth (ft)	:	30.5	
Sample Type	:	Tube	
Soil Type	:	Silty Sand	
Test Condition	:	Saturated	
Initial Dry Density	:	95.5	pcf
Moisture Content (before)	:	25.4	%
Moisture Content (after)	:	29.7	%

AP ENGINEERING AND TESTING, INC.

DIRECT SHEAR

TEST RESULTS
(ASTM D 3080)

May-07 Figure No.

DISTRIBUTION

3 copies: Mr. Mark E. Peterson
Wilson & Company
200 South Los Robles Avenue, Suite 420
Pasadena, CA 91101

QUALITY CONTROL REVIEWER

V. R. Nadeswaran, P.E., G.E.
Principal

AMY/SW:cfp

K:\datafls\PROJECTS\2007\2007-005.01\Report\10 Draft Report.doc

APPENDIX 4-2 - WAREHOUSE ONE STRUCTURAL REPORT

miyamoto.

September 7, 2007

Mr. Mark Peterson
Wilson & Co
701 B Street, Suite 1220
San Deigo, CA 92101
Via Email: Mark.E.Peterson@wilsonco.com

Subject: **Port of Los Angeles Warehouse No 1 Renovation Feasibility Study**
Los Angeles, CA
(MI Project Number: LA0500028)

Dear Mr. Peterson:

We have prepared a schematic set of drawings and a detailed list of items for your use to estimate the cost of structural work to renovate Warehouse No 1. This scheme was developed in concert with Vaughan Davies at EDAW, and is primarily for an occupancy change from storage to office use. The structural strengthening measures noted are to meet FEMA 356 requirements for basic life safety.

The following items are structural cost items described in detail here, and shown in schematic form on the attached plans and elevations. Please refer to both in order to obtain a complete picture of the proposed structural renovation work.

1. Extensive demolition of existing concrete elements is proposed. Based on field visits there does not appear to be finish materials that would contain hazardous materials, however this would need to be verified at a future date. Any abatement required is likely to be minor in scope.
2. Demolition of existing concrete floor slabs, columns, and walls as noted on the plans. Existing floors are rated for heavy loads, and demolition will not require special care to avoid damage to existing finishes or floors.
3. Soil improvements and additional geotechnical/foundation investigation is required. Refer to the "Preliminary Geotechnical Investigation Warehouse No. 1 Seismic Retrofit" report prepared by Diaz Yourman & Associates, Dated June 6, 2007. Specifically refer to section 5.3 of this report. The favored solution for ground improvement is compaction grouting, and it is suggested this be included in the cost estimate at this time.
4. Infill of existing doors and openings is noted on the schematic plans. Where this is noted assume 3000 psi normal weight concrete of the same thickness as the existing walls, which is 8" thick at the basement and first floor, and 6" thick at the upper floors, with 2 lbs/sq.ft. of reinforcement and perimeter epoxied rebar dowels at 18" on center.
5. There are two existing railways running through the building. The westmost railway has been infilled and topped with a slab at the first floor level. It is proposed to infill the eastmost railway with compacted fill, and a new 6" concrete floor slab.
6. New steel braces are required at the perimeter of the roof. Assume approximately 80 lbs of round steel pipe per brace with epoxy anchors to the parapet and roof slab.
7. For information on the new skylights over the new atriums, please refer to the architect.

700 South Flower Street, Suite 1010 Los Angeles, CA 90017 t 213.362.7778 f 213.362.7783
Sacramento / Los Angeles / Orange County / San Francisco Bay Area / San Diego / Tokyo

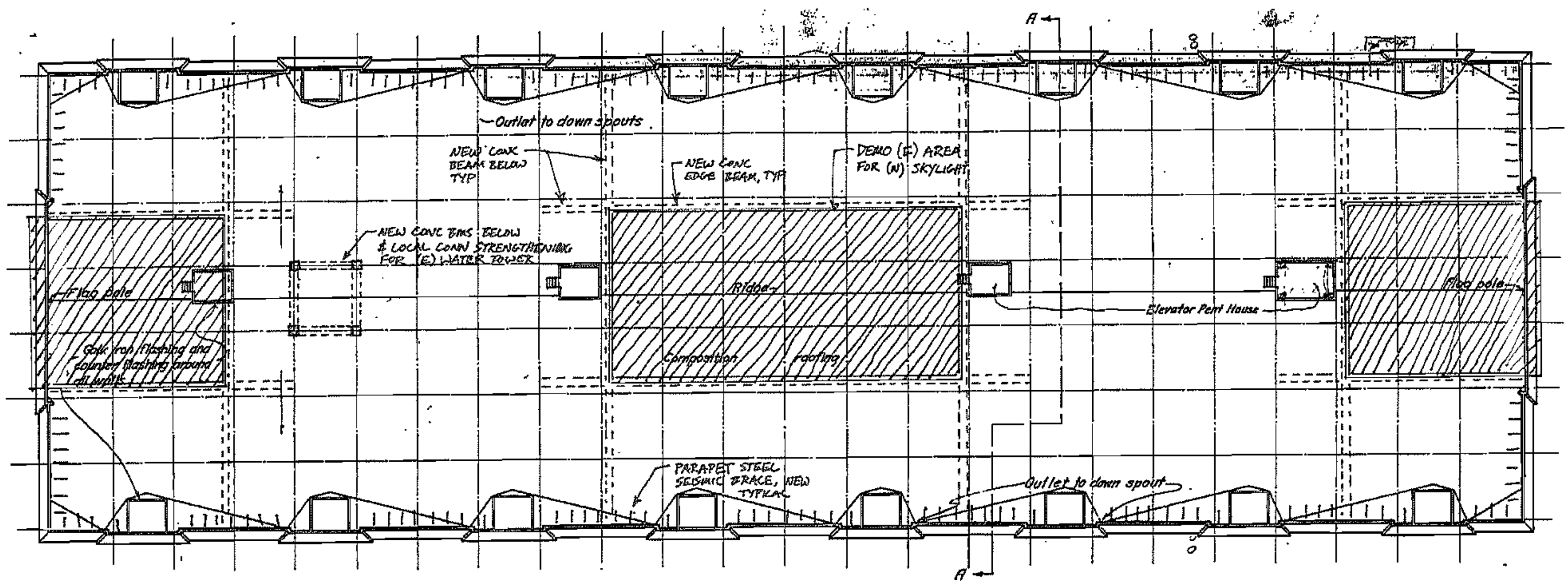
miyamoto.

8. At the areas of exterior wall demolition, the plan is to replace it with new exterior glass curtain walls. Assume 4 lbs/sq.ft of structural steel frame support in addition to the new glass system. Please refer to the architect for additional information.
9. New stairs and elevator modifications are not shown on these plans, please refer to the architect for additional information.
10. New concrete edge beams, and beams below slab are noted on the plans to support loads and seismic upgrade requirements. Assume approximately 12"x12" normal weight concrete 3000 psi beams with 12 lbs/ft of reinforcing steel. These beams will be doweled into the existing slab with approximately 4 epoxy bars per foot of length.
11. New pneumatically applied concrete referred to as "shotcrete" will be applied against existing walls as shown on the plans. This concrete may be assumed as normal weight 4000 psi concrete. At the basement and first floors, assume 8" thick applied shotcrete with 4 lbs/sq.ft. of reinforcement. At the second, third, and fourth floors, assume 6" thick applied shotcrete with 3 lbs/sq.ft. of reinforcement. At the fifth and sixth floors, assume 4" thick applied shotcrete with 2 lbs/sq.ft. of reinforcement. New shotcrete walls will be doweled into the existing walls with approximately 1 epoxied rebar per sq.ft. of existing wall. Rebar dowels at the top and bottom of each shotcrete wall will be cored through the floors at about 9" on center.
12. New vertical concrete boundary elements are required at the edges and intersections of strengthened walls. These are heavily reinforced column-like elements with horizontal ties doweled into the existing walls at approximately 4" on center along the height. Assume an additional 6"x24" to the shotcrete thickness, with an average of 30 lbs/ft of reinforcing steel.
13. Repair of existing exterior concrete damage due to weathering will be required. Please refer to the architect for an approximate estimate on the work to be performed. It is anticipated that approximately 15% of the parapets and remaining general exterior wall area will require some level of repair. Due to the extensive corrosion and spalling of the existing exterior stairs, assume at least 50% replacement of the remaining concrete stairs.
14. To meet FEMA 356 standards for the final design, additional material testing and investigation will be required, however this would be part of the design cost and may not be desired to be incorporated into the renovation cost at this point.

Very truly yours,
Miyamoto International, Inc.

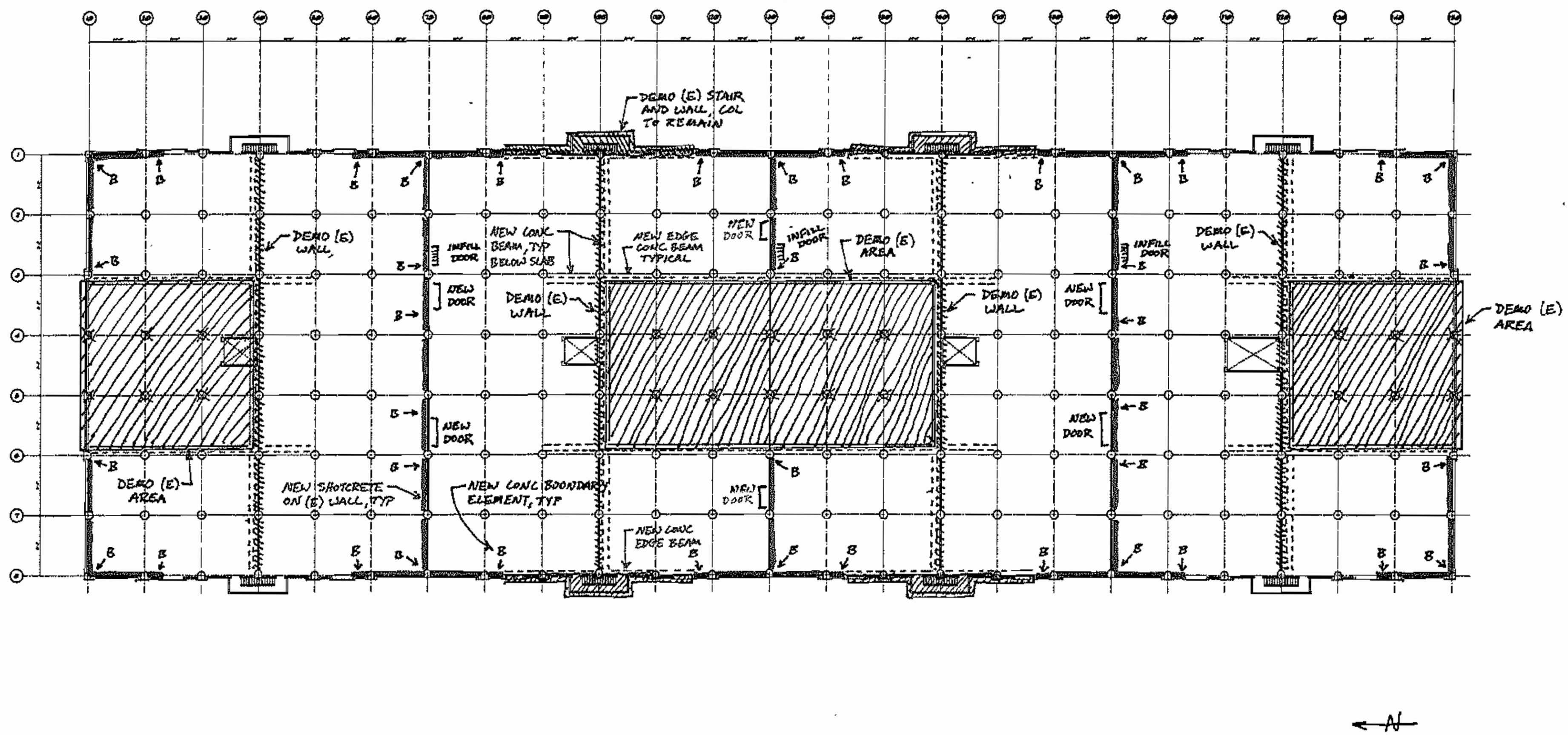
Josh Gebelein, M.S., P.E.
Project Manager

JG/ah
I:\2005\LA0500028 Waterfront Red Car Line Expansion Study\Engr\POLA Warehouse No1 Cost Estimate Information.doc

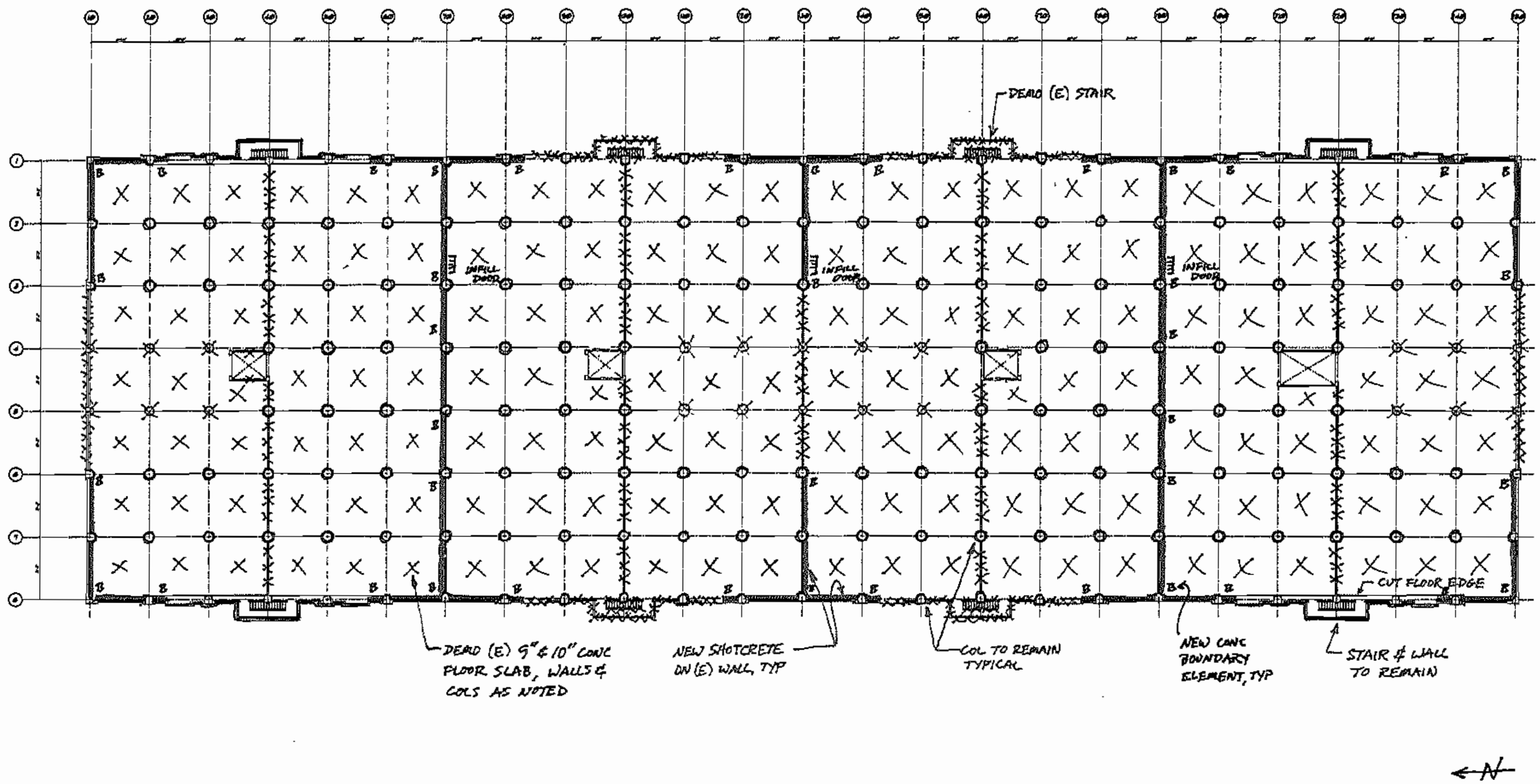

Outlet to down spouts
NEW CONC BEAM BELOW TYP
NEW CONC EDGE BEAM, TYP
DEMO (E) AREA FOR (N) SKYLIGHT
NEW CONC BMS BELOW & LOCAL CONN STRENGTHENING FOR (E) WATER TOWER
Flag pole
Ridge
Composition roofing
Elevator Pent House
Flag pole
PARAPET STEEL SEISMIC BRACE, NEW TYPICAL
Outlet to down spout
A
A
N

ROOF PLAN

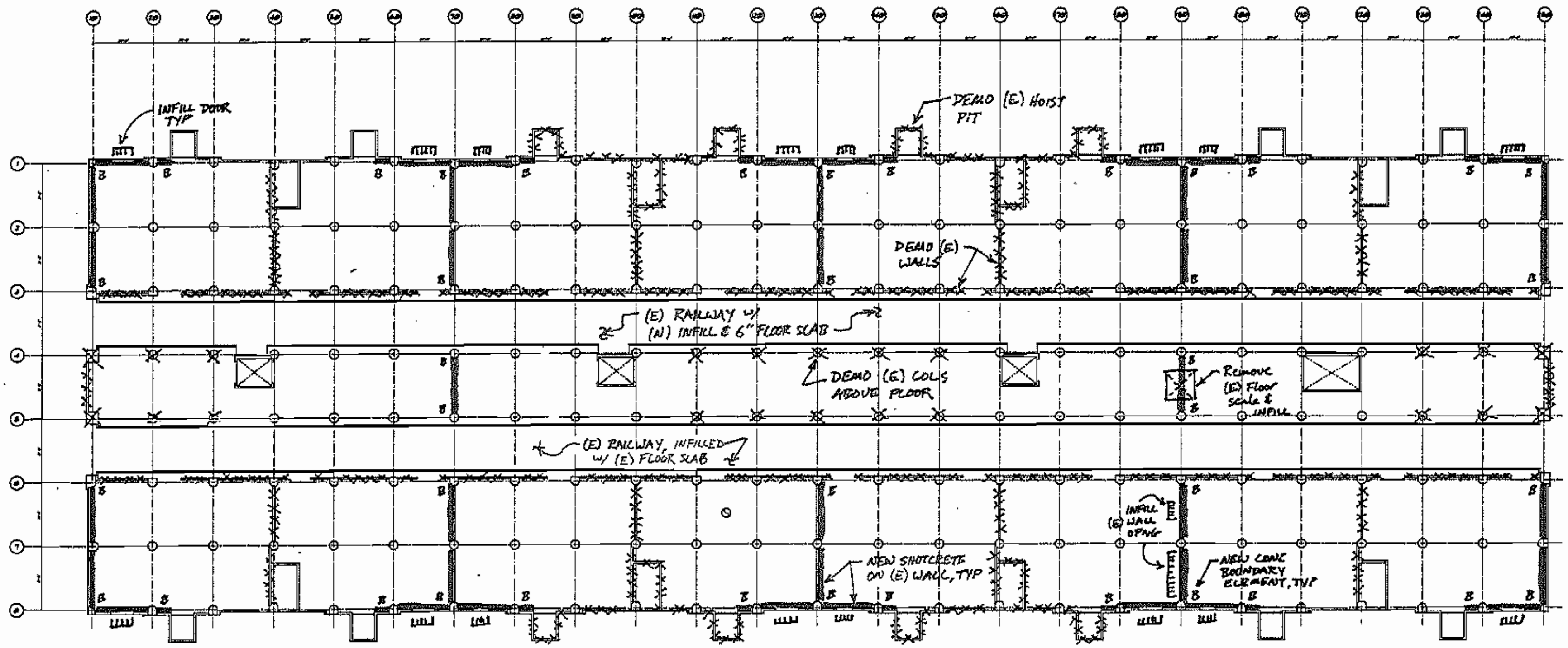
2ND, 4TH & 5TH FLOORS



3rd & 6th FLOORS

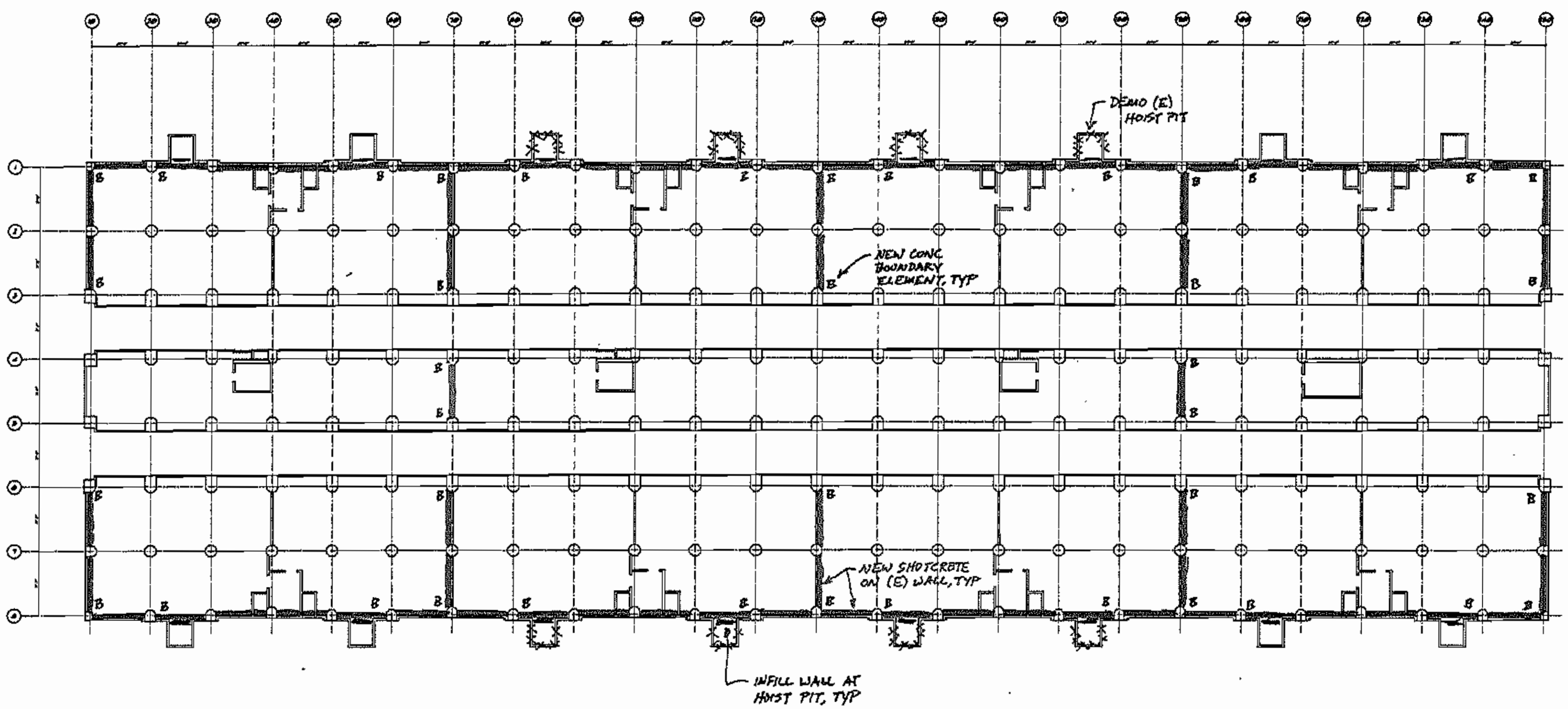


FIRST FLOOR



INFILL DOOR TYP
DEMO (E) HOIST PIT
DEMO (E) WALLS
(E) RAILWAY w/ (N) INFILL & 6" FLOOR SLAB
DEMO (E) COLS ABOVE FLOOR
Remove (E) Floor scale & infill
(E) RAILWAY, INFILLED w/ (E) FLOOR SLAB
INFILL (E) WALL OPNG
NEW SHOTCRETE ON (E) WALL, TYP
NEW CONC BOUNDARY ELEMENT, TYP
N

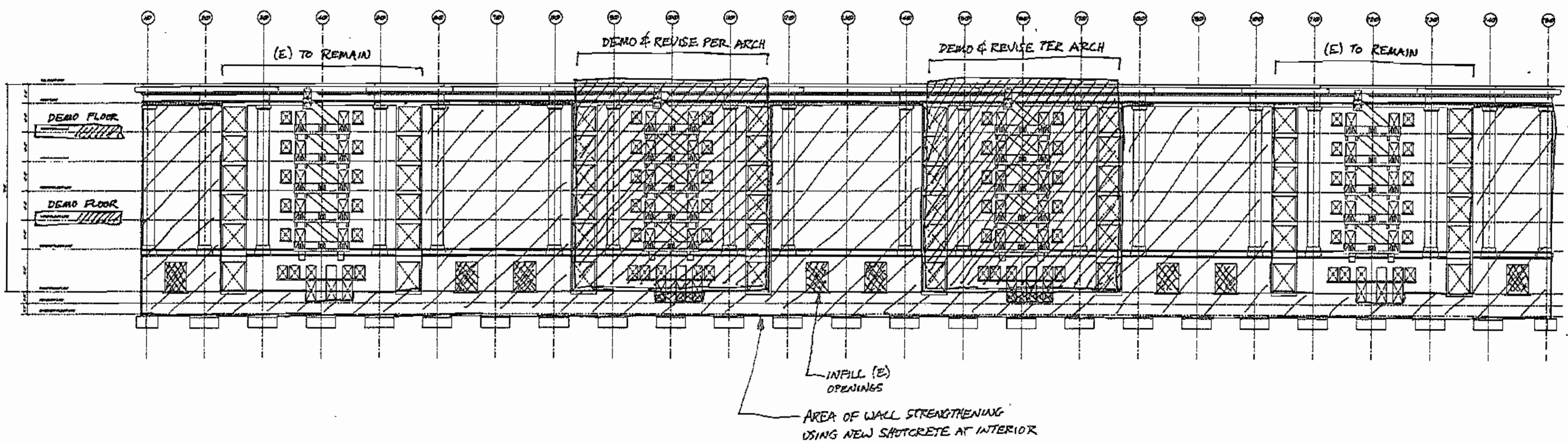
BASEMENT



DEMO (E) HOIST PIT
NEW CONC. BOUNDARY ELEMENT, TYP
NEW SHOTCRETE ON (E) WALL, TYP
INFILL WALL AT HOIST PIT, TYP
N

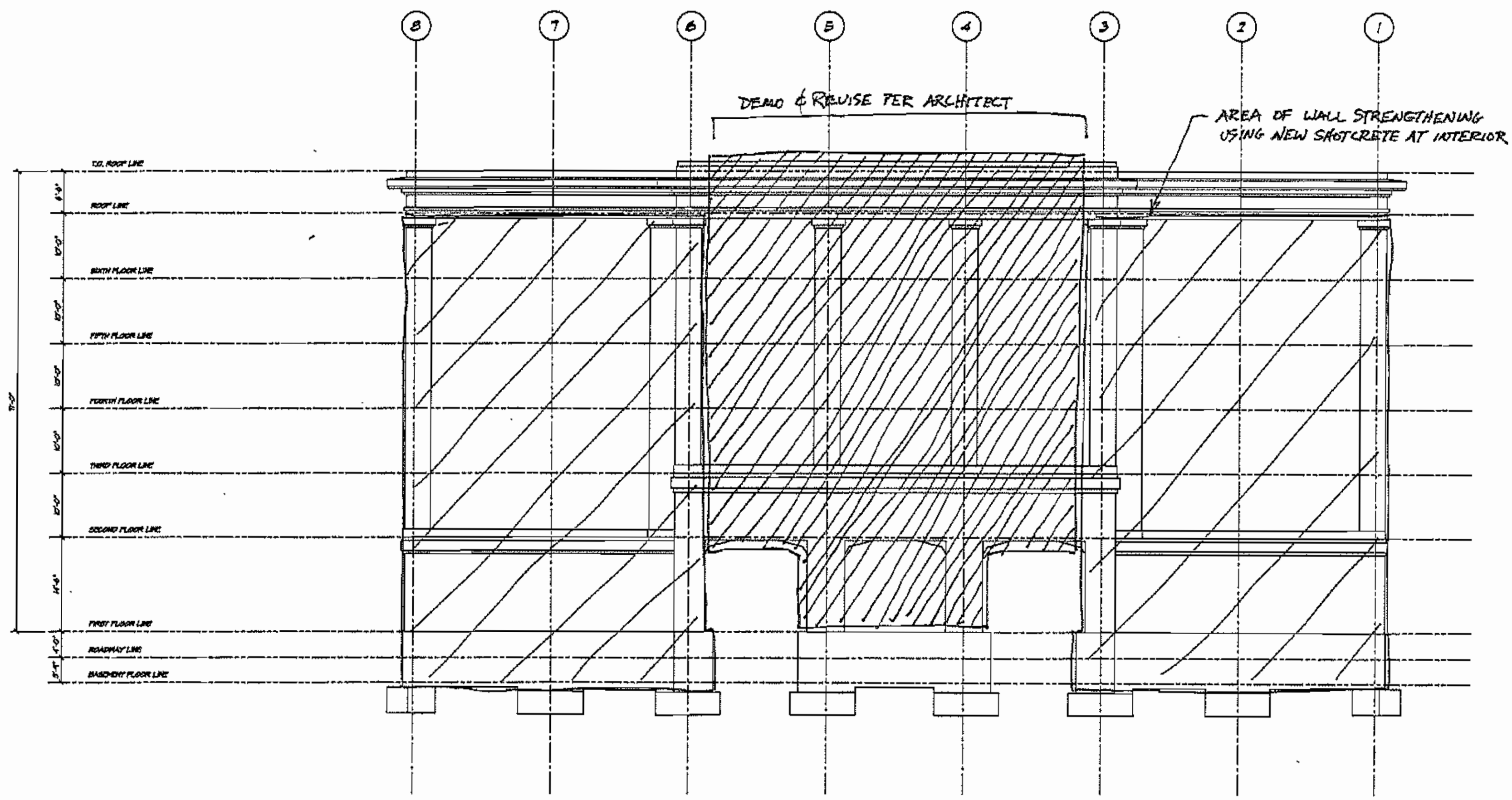
WEST ELEVATION

(EAST ELEV SIMILAR)



SOUTH ELEVATION

(NORTH ELEV SIMILAR)



APPENDIX 4-3 - WAREHOUSE ONE CAPITAL COST ESTIMATE

PROJECT SUMMARY

ELEMENT	TOTAL COST	$/SF AREA
A. TOTAL BUILDING COST	$6,637,871	$13.00
C. TOTAL SITEWORK COST	$14,000,305	$167.87

TOTAL PROJECT COST	**$20,638,176**	

GENERAL SUMMARY

ELEMENT		**TOTAL COST**	**$/SF AREA**
A. SUBSTRUCTURE		$954,134	$1.87
B. SHELL		$3,816,165	$7.47
NET DIRECT BUILDING COST		$4,770,299	$9.34
GENERAL CONDITIONS, OH&P,	15.0%	$715,545	$1.40
SUBTOTAL		$5,485,844	$10.74
DESIGN CONTINGENCY,	10.0%	$548,584	$1.07
SUBTOTAL		$6,034,428	$11.82
ESCALATION TO MIDPOINT OF CONSTRUCTION, 4/2010	10.0%	$603,443	$1.18
TOTAL BUILDING COST		**$6,637,871**	**$13.00**

GROSS FLOOR AREA: 510,720 SF

COST PER SQUARE FOOT: $13.00

DETAIL SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
A20 BASEMENT CONSTRUCTION		$954,134	$1.87
B20 EXTERIOR ENCLOSURE		$3,816,165	$7.47
NET DIRECT BUILDING COST		$4,770,299	$9.34
GENERAL CONDITIONS, OH&P,	15.0%	$715,545	$1.40
SUBTOTAL		$5,485,844	$10.74
DESIGN CONTINGENCY,	10.0%	$548,584	$1.07
SUBTOTAL		$6,034,428	$11.82
ESCALATION TO MIDPOINT OF CONSTRUCTION, 4/2010	10.0%	$603,443	$1.18
TOTAL BUILDING COST		**$6,637,871**	**$13.00**

GROSS FLOOR AREA: 510,720 SF

COST PER SQUARE FOOT: $13.00

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
A - SUBSTRUCTURE				
A20 BASEMENT CONSTRUCTION				
A2020 Basement Walls				
Drill dowels - infill walls	160	EA	25.00	$4,000
Set dowels - infill walls	160	EA	30.00	$4,800
Reinforcing steel - infill walls	396	LBS	1.80	$713
Forms - infill walls	748	SF	11.00	$8,228
Place, finish & cure concrete - infill walls	5	CY	300.00	$1,500
Sack exposed surfaces - infill walls	350	SF	1.25	$438
Surface prep for shotcrete (sandblast)	19,066	SF	1.40	$26,692
Apply and finish 8" shotcrete to walls	544	CY	730.00	$397,120
Drill and set #4 dowels - 8" shotcrete	19,066	EA	20.00	$381,320
Drill and set #4 vert. dowels - 8" shotcrete	1,006	EA	30.00	$30,180
Reinforcing steel - 8" shotcrete	76,264	LBS	1.30	$99,143
A20 BASEMENT CONSTRUCTION				**$954,134**
A - SUBSTRUCTURE				**$954,134**
B - SHELL				
B20 EXTERIOR ENCLOSURE				
B2010 Walls and Slab				
Infill Walls				
Drill dowels - infill walls	22,026	EA	25.00	$550,650
Set dowels - infill walls	22,026	EA	30.00	$660,780
Reinforcing steel - infill walls	69,360	LBS	1.80	$124,848
Formwork - infill walls	21,830	SF	11.00	$240,130
Place, finish and cure concrete - infill walls	116	CY	300.00	$34,800
Sack exposed surfaces - infill walls	19,748	SF	1.25	$24,685
Patch concrete floor slab	25	CY	500.00	$12,375
Surface prep for shotcrete (sandblast)	23,308	SF	1.40	$32,631
Apply and finish shotcrete - 6"	496	CY	550.00	$272,800
Drill and set #4 dowels - 6" shotcrete	23,308	EA	20.00	$466,160
Drill and set #4 vert dowels - 6" shotcrete	3,381	EA	30.00	$101,430
Reinforcing steel - 6" shotcrete	69,923	LBS	1.30	$90,900
Surface prep for shotcrete (sandblast)	15,962	SF	1.40	$22,347
Apply shotcrete - 4"	224	CY	410.00	$91,840
Drill #4 dowels - 4" shotcrete	15,962	EA	20.00	$319,240
Drill #4 vert dowels - 4" shotcrete	2,277	EA	30.00	$68,310
Reinforcing steel - 4" shotcrete	47,885	LBS	1.30	$62,251
Apply shotcrete - at columns 6"	119	CY	550.00	$65,450
Formwork - at columns	2,966	SF	10.00	$29,660
Drill and set #4 dowels - at columns	16,492	EA	20.00	$329,840
Reinforcing steel - at columns	81,008	LBS	1.30	$105,310
Structural and Misc. Steel				
Steel frame support for curtain wall	10,648	LBS	4.00	$42,592
Channel frames at new doors	3,624	LBS	4.00	$14,496
Strengthen local connections ALLOWANCE	4	EA	1,000.00	$4,000
Seismic braces at exist parapet wall	12,160	LBS	4.00	$48,640
B20 EXTERIOR ENCLOSURE				**$3,816,165**
B - SHELL				$3,816,165

GENERAL SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
F. SPECIAL CONSTRUCTION AND DEMOLITION		$10,061,304	$120.64
NET DIRECT BUILDING COST		$10,061,304	$120.64
GENERAL CONDITIONS, OH&P,	15.0%	$1,509,196	$18.10
SUBTOTAL		$11,570,500	$138.74
DESIGN CONTINGENCY,	10.0%	$1,157,050	$13.87
SUBTOTAL		$12,727,550	$152.61
ESCALATION TO MIDPOINT OF CONSTRUCTION, 4/2010	10.0%	$1,272,755	$15.26
TOTAL BUILDING COST		**$14,000,305**	**$167.87**

GROSS FLOOR AREA: 83,400 SF

COST PER SQUARE FOOT: $167.87

DETAIL SUMMARY

ELEMENT		TOTAL COST	$/SF AREA
G10 SITE PREPARATION		$10,061,304	$120.64
NET DIRECT BUILDING COST		$10,061,304	$120.64
GENERAL CONDITIONS, OH&P,	15.0%	$1,509,196	$18.10
SUBTOTAL		$11,570,500	$138.74
DESIGN CONTINGENCY,	10.0%	$1,157,050	$13.87
SUBTOTAL		$12,727,550	$152.61
ESCALATION TO MIDPOINT OF CONSTRUCTION, 4/2010	10.0%	$1,272,755	$15.26
TOTAL BUILDING COST		**$14,000,305**	**$167.87**

GROSS FLOOR AREA: 83,400 SF

COST PER SQUARE FOOT: $167.87

DESCRIPTION	QUANTITY	UNIT	UNIT RATE	ESTIMATED COST
G - SITEWORK				
G10 SITE PREPARATION				
G1020 Building Demolition				
Remove hoist pit steel doors and frames	8	PR	400.00	$3,200
Remove hoist pit steel covers and frames	8	EA	800.00	$6,400
Remove steel doors and frames	32	PR	200.00	$6,400
Remove sliding steel doors and frames	2	EA	500.00	$1,000
Remove metal covered steel doors with glass panels - 10'	16	PR	400.00	$6,400
Sawcut hoist pits concrete slab and walls	120	LF	20.00	$2,400
Break and remove hoist pits concrete slab and walls	1,011	CF	12.50	$12,638
Remove 10 ton platform scales	2	EA	500.00	$1,000
Remove railroad tracks	960	LF	2.00	$1,920
Chip and remove grout pockets	643	CF	5.00	$3,215
Sawcut, break and remove concrete columns				
Sawcut concrete	5,160	LF	6.00	$30,960
Break and remove concrete	12,156	CF	7.00	$85,092
Chip and remove concrete	195	CF	5.00	$975
Sawcut, break and remove concrete walls				
Sawcut concrete	16,508	LF	15.00	$247,620
Break and remove concrete - interior 6"	23,399	CF	10.00	$233,990
Break and remove concrete - exterior 8"	4,434	CF	20.00	$88,680
Chip and remove concrete	742	CF	5.00	$3,710
Wall bracing	53,416	SF	0.12	$6,410
Concrete floor slab and stairs, w/ landings				
Sawcut concrete	7,872	LF	20.00	$157,440
Break and remove concrete	152,861	CF	12.00	$1,834,332
Shore floor slab sections	199,197	SF	2.00	$398,394
Sawcut, break and remove concrete for new door openings	6	EA	1,200.00	$7,200
Elevator penthouse structure at roof				
Perimeter walls	400	SF	8.00	$3,200
Steel doors and frames	1	EA	200.00	$200
Floor framing and supports w/ concrete slab	100	SF	6.00	$600
Roof framing w/ sheathing and roofing	144	SF	5.00	$720
Remove flagpoles	2	EA	500.00	$1,000
Remove roofing	15,071	SF	0.25	$3,768
Remove elevator, hoistway and machinery	1	LS	37,540.00	$37,540
Sawcut AC paving	4,208	LF	2.00	$8,416
Break and remove AC paving	2,104	SF	3.00	$6,312
Patch AC paving - 8"	2,104	SF	4.00	$8,416
Sawcut concrete floor slab	24,912	LF	3.00	$74,736
Break and remove concrete floor slab	12,456	SF	5.00	$62,280
Drill and set dowels - #4	24,912	EA	45.00	$1,121,040
Place, finish and cure concrete	254	CY	300.00	$76,200
G1030 Soil Stabilization				
Allowance for Mobilization and Demobilization	1	LS	50,000.00	$50,000
Compaction grouting columns	109,200	LF	50.00	$5,460,000
Provide 6"O steel casing	300	LF	25.00	$7,500
G10 SITE PREPARATION				$10,061,304
G - SITEWORK				**$10,061,304**

STRUCTURAL FEASIBILITY STUDY

Port of Los Angeles
Warehouse No. 1 Renovation - Structural Feasibility Study
2500 Signal Street, San Pedro, CA

December 18, 2007
LA0500028

miyamoto.

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Table of Contents

List of Tables & Figures

Executive Summary

Warehouse No. 1, a landmark building at the Port of Los Angeles built in 1917, is a six story-plus-basement, 500,000 square foot reinforced concrete structure. The primary goal of the renovation of Warehouse No. 1 is to create a new, usable space with an occupancy and functionality other than the current heavy storage use. This project will provide new useable space to the Port and extend the life of this historic building.

This report provides an evaluation of the structural system of the building for an occupancy change from heavy storage to office use. An architectural renovation concept was developed and may be found in Appendix A, and associated structural modifications may be found in Appendix B.

The existing building was investigated visually by Miyamoto International, plans and historic documents were reviewed. A geotechnical investigation was performed and material samples taken and tested.

Materials samples of concrete and steel reinforcement from areas throughout the structure were obtained and tested, the results may be found in Appendix D. The material types and strengths found are consistent with the as built drawings, and are of good quality for the period of construction.

Significant deterioration of the exterior stairs was observed and falling debris pose a hazard to passersby. This is partially addressed by chain link canopies installed over ground floor exits. Other areas of deterioration were observed, such as cornices near the roof and parapet features. This too, could pose a falling hazard to passersby. In general, the remainder of the building is in good condition for its age and exposure to the marine environment.

Any significant structural modifications to this structure will require foundation improvements. The existing pile foundations are not likely to meet current code requirements. A compaction grouting scheme is proposed for this feasibility study.

Warehouse No. 1 is situated in an area of high seismic risk. The structural evaluation for this renovation feasibility study was based on meeting the goals of the Basic Safety Objective (BSO) rehabilitation developed by the Federal Emergency Management Agency (FEMA) in FEMA 356. It is anticipated that the conclusions of this study will remain comparable and valid with the 2007 California Building Code requirements, which will be in effect January 2008 for renovations of existing buildings.

Structural analysis, calculations and modeling were performed to determine the necessary structural modifications necessary for the proposed renovation.

Based on the findings in this report it appears structurally feasible to renovate Warehouse No. 1 for office-type occupancy with the architectural scheme proposed.

The cost estimate for the proposed structural modifications and foundation improvements is $20,638,176. This estimate does not include non-structural modifications or the evaluation and upgrading of rooftop structures. The complete cost estimate may be found in Appendix C.

In the preparation of this report, Miyamoto International, Inc. has exercised the usual and customary professional care ordinarily exercised by members of the engineering profession under similar circumstances in the locality of the project. In addition, Miyamoto International, Inc. makes no warranties, express or implied in connection with this report.

Josh Gebelein, M.S., P.E. Project Manager	Ken Wong, M.S., S.E. Principal

Introduction

This report presents Miyamoto International's findings resulting from a renovation feasibility study of Warehouse No. 1 located at 2500 Signal Street, San Pedro, California. Warehouse No. 1 is a landmark building at the Port of Los Angeles built in 1917. It is listed in the National Register of Historic Places with the US Department of the Interior.

The scope of this report is an initial evaluation of the structural system of the building for occupancy change from heavy storage to office use. A schematic set of drawings and description of work for the structural modifications is provided in Appendix B.

An architectural renovation concept was developed by EDAW/AECOM in conjunction with Miyamoto and Wilson Co., and reviewed by the Port of Los Angeles. See Appendix A for a look at this concept.

The findings contained in this report are based on an exhaustive review of the constructed condition of the building, as built plans, geotechnical data, and material sampling and testing. The structural evaluation of the proposed renovations was performed to the standards of FEMA 356. Modifications associated with architectural, mechanical, electrical, plumbing, etc. are beyond the scope of this report.

Description of Structure

General Information

The subject structure is located on man made fill in the Los Angeles Harbor at the southern end of the East Channel. The structure was constructed from 1915 to 1917. This six story plus basement, approximately 500,000 square foot structure is rectangular in shape with plan dimensions of 480 feet in the North-South direction by 152 feet in the East-West direction. The building has a 7'-9" tall basement level extending roughly 5 feet below grade, the first floor is 14'-6" tall, and the remaining floors are 10'-0" tall. The overall building roof level is approximately 68 feet above adjacent grade, and the basement level is approximately at sea level. A very large water tower is located on the Northern portion of the roof, and a light framed harbor station and antennas have been installed at the Southeast corner of the roof.

Figure 1 – Aerial Photo of Building Site

Structural System

The existing building consists of 8-inch thick reinforced concrete walls around the perimeter and interior at the basement and first floor, and 6-inch thick at the upper floors. The floors are constructed of 9 and 10-inch thick reinforced concrete two-way slabs, the roof is constructed of 6 and 7-inch thick slabs. Gravity columns are evenly spaced at 20'x21'-2" modules with slab drop panels, and range in size from 20" diameter at the upper floors to 48" diameter at the lower floors. Walls are evenly spaced at 60 feet on center along the North-South length of the building, and the perimeter. Columns are cast monolithically with the walls. The foundation is composed of approximately 192 pile caps under columns and walls with an average of 12 driven piles per pile cap, the specific pile material and design information is unknown at the time of this report. Based on available documentation and similar construction the existing piles may consist of 16-inch diameter driven redwood piles, and are likely driven roughly 28 feet to firm bedrock through loose sediments and man-made fill. There are no separation or expansion joints in the structure. The lateral force resisting system is composed of the concrete shear walls noted. The exterior wall has large loading door openings, and door/windows openings at regular intervals along the East and West walls. These openings are regularly spaced horizontally, and are stacked vertically in a manner which effectively separates adjacent shear walls. Floor openings occur at the elevators and stairs, but are minor in comparison with the overall size of the floor.

Reference Plans

Plans for the building dated September 10, 1915 "M.D. No. 1 – Warehouse No. 1" created by the City of Los Angeles Harbor Department, were made available by the client and reviewed in this study. The historical information and documentation developed for the National Parks Service was also provided.

Observations

Ken Wong of Miyamoto International visited the project site on April 5, 2007 to observe the exterior of the structure, and Josh Gebelein of Miyamoto International visited the building on June 5, 2007 for full interior and exterior observation of the structure. The site survey included visual observation from the roof, an interior walk of the basement, ground floor, half of the above ground floors, and an exterior walk of the structure.

Site Observation Findings

Overall Site

From visual observations only, based on observed crack patterns in the walls of the structure, the building has settled and/or spread at the Northmost and Southmost ends in a classic "hog back". Without surveying equipment the amount of settlement or spreading can not be quantified, however for the size of this building, the type of soil in the area, and age of the structure, differential settlement or movement is expected. The movements are gradual across the building, and are not easily perceptible.

The ground water levels were observable in both a test pit in the basement near the center of the building, and in an exterior pit on the West side of the building. In both cases standing water approximately 2 feet below the basement floor level were observed. It is assumed that the ground water levels fluctuate slowly based on the adjacent sea level tidal motion.

Material Deterioration

The interior of the building exhibits only minor deterioration of concrete. Floor slabs have regular cracks running East-West evenly spaced at approximately 40 feet on center, which appear to be at locations of cold joints. Typical deterioration of floors consists of minor spalling at cold joints, primarily at the ceiling of first floor. Wear and tear from equipment may also be found, but no significant structural damage was observed.

The interior face of the perimeter concrete walls exhibits evidence of minor water intrusion at sporadic locations on the upper floors. This generally consists of water stains and some laitance, very little rusting was observed and the resultant structural damage is expected to be minor.

The exterior concrete stairs have degraded to an extreme extent. Chain link canopies have been erected to catch falling concrete debris from the stairs, and a considerable amount of material debris was observed. Much of the concrete railings are deteriorated and falling from the building, significant rusting of reinforcement was observed on all stairs. The structural integrity of the stairs is assumed to be significantly reduced, and the railings are clearly unsafe.

In general the rest of the exterior of the concrete walls are in good condition, with minor spalling at occasional locations with exposed and corroded reinforcement steel. A few architectural cornices are spalling from the building near the roof line, and at the parapet. A few locations of spalling were observed on the inside face of the roof parapet. This deterioration is not structurally significant, but a potential falling debris hazard exists.

Figure 2 – Floor Crack at Ceiling of First Floor

Figure 3 – Water Damage at Exterior Wall on Second Floor

Figure 4 – Exterior Stair Deterioration

Figure 5 – Exterior Stair Deterioration

Figure 6 – Exterior Stair Deterioration

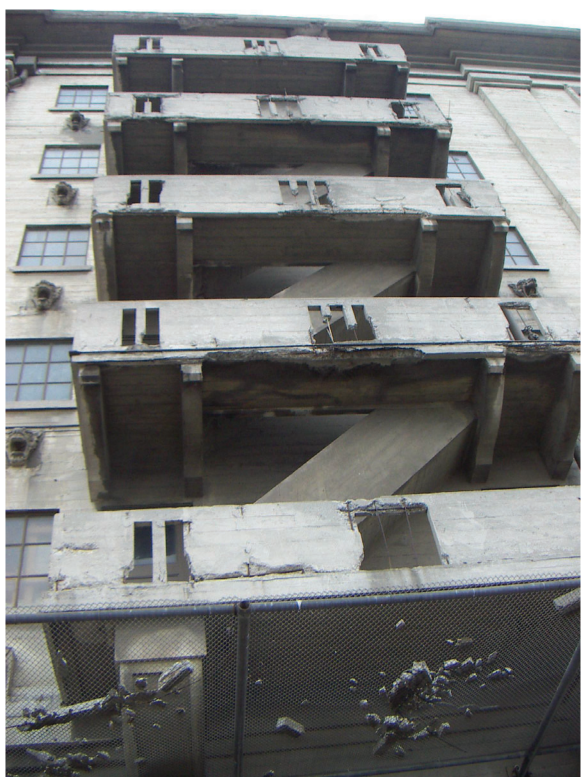

Figure 7 – Exterior Stair Deterioration

Figure 8 – Roof Parapet Deterioration

Figure 9 – Northwest Corner Deterioration & Historical Plaque

Owner Modifications

At the first floor, nearly every interior wall has been modified from the original plans with a large doorway cut into each wall. Most of these have since been infilled back to a solid wall condition. Two bays of wall have been completely removed at the first floor near the Southwest corner, and a portion of the floor above exhibits cracking due to the removal of the supporting wall.

The Western railway pit has been infilled up to the level of the first floor and topped with concrete. This is indistinguishable from the original construction, and may be a design change not shown on the plans, or is an old modification.

A roof opening was cut to allow a new stair to be installed allowing access to from the 6th floor to the roof near the Southeast corner of the building.

Several CMU infill walls are installed along the elevator shafts on all the upper floors and some bathroom areas, and a clay block infill wall is installed at the Northern bays of the Second floor.

At all upper floors, a continuous hallway has been created by cutting doorways into the interior concrete cross walls down the center of the building immediately East of the elevator locations.

Figure 10 – Infilled Door Opening at First Floor

Figure 11 – Wall Openings at First Floor

Figure 12 – Infilled West Railway at First Floor

Figure 13 – Roof Opening at Southeast Corner for Stair

Figure 14 – CMU Infill Wall at Second Floor Restroom

Figure 15 – Hallway Doorways At Upper Floor

Roof Structures

A very large water tank sits on the roof near the North end of the building, rising approximately 100 feet above the roof line. The tank is constructed of riveted steel plates with built up truss legs and tie rod bracing, and appears to be anchored directly over structural columns below. It is not known by Miyamoto if the water tank currently contains water or is in working order. The structure appears to be in good condition and well maintained. No drawings for this structure were made available for this report. Based on its construction would appear to be more than 75 years old, and may date to the original period of construction.

Small 10 feet by 15 feet equipment penthouse structures have been added on to the original elevator penthouse locations. The construction appears to consist of light gauge metal, with stucco finish. Spreader beams above the roof have been placed to support the equipment loads.

A harbor office of what appears to be timber construction on a raised steel platform has been installed on the Southeast corner of the building roof, along with a small equipment penthouse. These structures appear to be engineered to be supported directly onto the structural columns below. A small stair penthouse adjacent to the roof top office appears to be constructed of wood framing.

Figure 16 – Water Tank on Roof

Figure 17 – Water Tank Base on Roof

Figure 18 – Equipment Building on Roof

Figure 19 – Equipment Building on Roof

Figure 20 – Harbor Office on Roof

Figure 21 – Harbor Office and Equipment Penthouse on Roof

Figure 22 – Harbor Office Base on Roof

Figure 23 – Stair Penthouse on Roof

Site Geology & Seismicity

Subsurface Conditions

A geotechnical investigation was performed by Diaz Yourman & Associates in June 2007, with findings published in "Preliminary Geotechnical Investigation – Warehouse No. 1 Seismic Retrofit" (Project No. 2007-005.01) dated June 6, 2007.

This report notes that the subsurface materials consist of hydraulic man made fill of sand and silt up to a depth of about 28 feet. Underlying this fill is a natural formation of firm to very hard siltstone. The man made fill is saturated and tidally influenced, and is considered liquefiable in a seismic event.

Site Seismicity

The site is located near several active faults that are capable of producing moderate to large magnitude earthquakes. Table 1 lists the major active faults affecting the site. The closest major active fault to the project site is the Palos Verdes fault which is approximately 1.9 km away.

The Maximum Credible Earthquake (MCE) refers to the largest earthquake that can be expected to occur along a given fault or fault zone. The maximum magnitude of an earthquake for a fault is based on the length of the fault, its width (i.e., depth into the earth's crust), and to some extent the type of fault, such as thrust, normal or strike slip.

Major Active Faults	MCE Magnitude (Mw)	Distance to Site (km)	Recurrence Interval (years)
Palos Verdes	7.1	1.9	650
Compton Thrust	6.8	8.1	676
Newport-Inglewood (onshore segment)	6.9	12.3	1006
Elysian Park	6.7	29.6	549
Whittier	6.8	37.6	641

Table 1 – Major Active Earthquake Fault Affecting the Site

Seismic Fault Rupture

The property site is not located within a known fault rupture zone as delineated under the Alquist-Priolo Earthquake Fault Zoning Act. From a review of the California Department of Mines and Geology Alquist-Priolo fault trace maps for the region, the site is not located within a designated special study zone and therefore the potential for ground surface rupture due to seismic faulting is very low.

Seismic Hazard Level

The project site is located in an area of high seismic risk. This risk is quantified in a probabilistic manner due to the uncertainty of timing and magnitude of future seismic events. Structural analyses for this project are based on potential seismic hazard levels predicted by the USGS for the specific site and geology based on historic data and extensive research. For example, the Basic Safety Earthquake 2 (BSE-2) is defined by FEMA 356 as a seismic event with a 2% probability of exceedance in 50 years. The Basic Safety Earthquake 1 (BSE-1) is defined as the smaller of the seismic event with a 5% probability of exceedance in 50 years, or 2/3 the BSE-2.

For engineering calculations and design, the level of shaking that a building will experience is may be described using the Spectral Response Acceleration. The Spectral Response Acceleration describes the acceleration, and thus the force that will be experienced at a given site over a range of response periods.

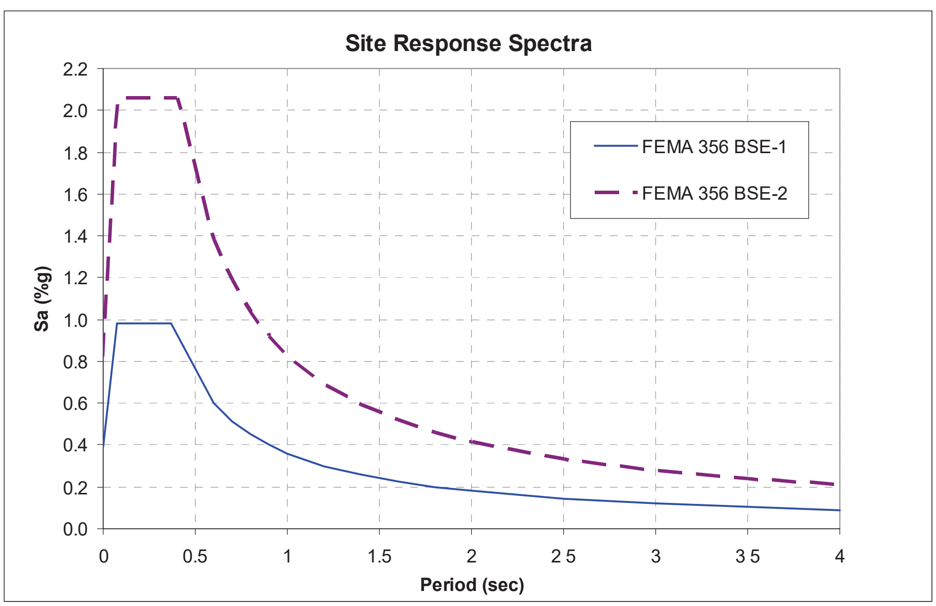

Figure 24 – Site Response Spectra

Historical Seismicity

This structure has experienced many seismic events throughout its lifetime of use. Information on seismic damage from these events was not available for this report, however it is assumed from the site observations that past damage, if any, was minor and easily repaired.

Notable seismic events:

On March 11, 1933 the Long Beach earthquake struck with a magnitude 6.3 and an epicenter 30 km from the site. This event may have generated a local peak ground acceleration of 0.10 g, which would impose a seismic force on the structure of roughly 20% considered for this study. There were approximately a dozen aftershocks with a magnitude greater than 5.0 near this site following the main shock.

On November 14, 1941 the Los Angeles Basin earthquake struck with a magnitude 5.4 and an epicenter 7 km from the site. This event may have generated a local peak ground acceleration of 0.16 g, which would impose a seismic force on the structure of roughly 35% considered for this study.

Historical data was obtained from the USGS database, and estimates of local peak ground accelerations determined using Boore, Joyner and Fumal Spectra.

Liquefaction

Soil liquefaction is the process by which saturated, unconsolidated soil or sand is converted into a state of suspension. In the case of seismically induced liquefaction, as occurred during the 1989 Loma Prieta Earthquake, sand boils and sudden loss of soil load carrying capacity can result in drastic and irregular settlement. For locations where liquefaction is likely to occur, a variety of factors must be considered including soil type, water table depth, and historic soil conditions.

Figure 4 represents a map produced by the California Geological Survey of the liquefaction zones in the area surrounding the subject site. The project site lies in the San Pedro Quadrangle.

Based on this map and the geotechnical report for this project, there is a high risk of liquefaction susceptibility at this site.

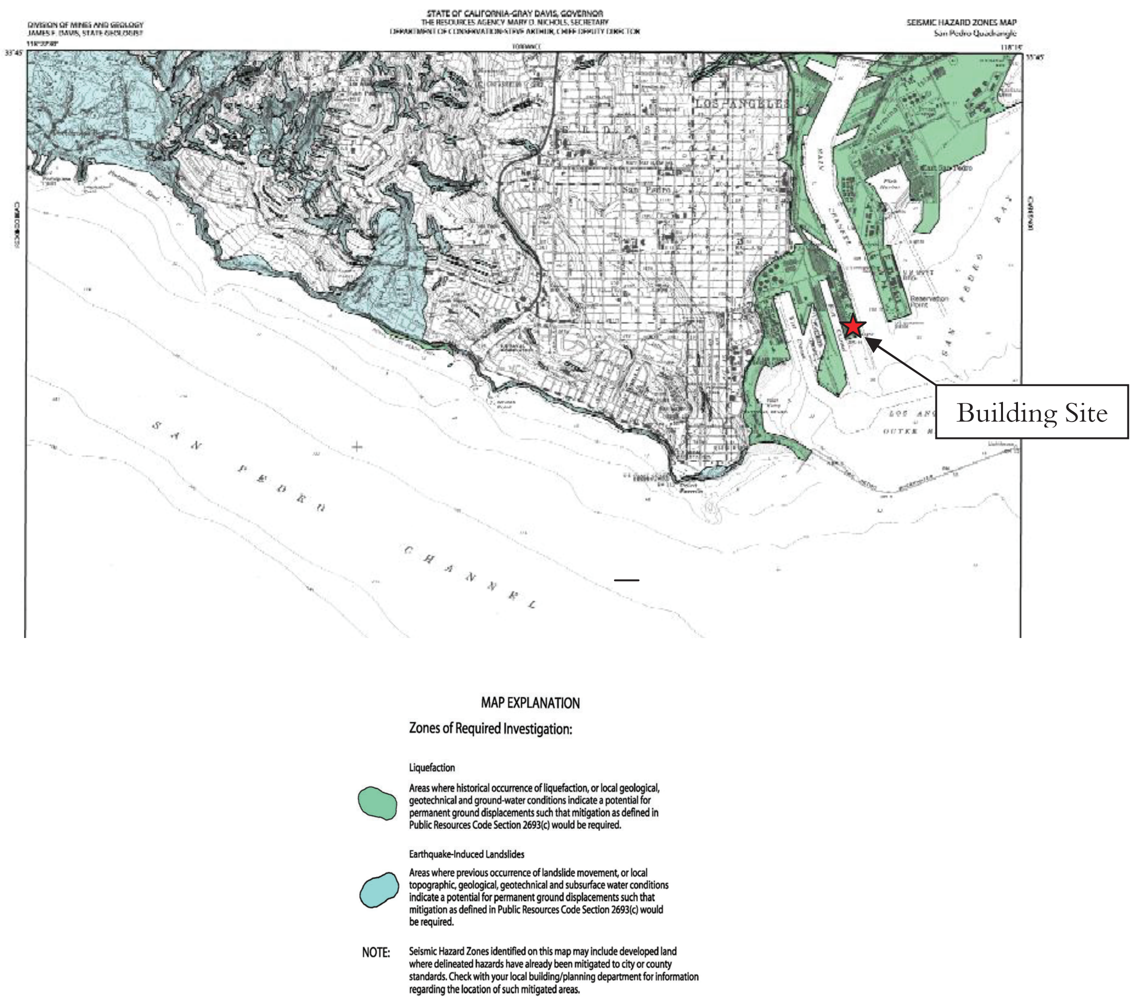

Figure 25 – Liquefaction Zones in the San Pedro Quadrangle
(www.conservation.ca.gov/cgs/shzp)

Renovation Concept

The primary goal of the renovation of Warehouse No. 1 is to create a new, usable space with an occupancy and functionality other than heavy storage. The potential uses considered in this study are office space and/or public museum space. A renovation concept was developed by EDAW/AECOM in conjunction with Miyamoto and Wilson Co., and reviewed by the Port of Los Angeles; see Appendix A for a detailed look at this concept.

There are many Architectural issues that the proposed renovation concept addresses. The existing floor to floor story height of 10 feet is low for the potential occupancy change and the amount of exterior windows and interior natural light is limited. The number of interior walls restricts the flow of occupants throughout the building, and the existing stairs and elevators are clearly not up to current standards.

The proposed renovation will require structural modifications. For the structural impact of the proposed renovation, and to improve the overall seismic safety of the building, there are important alterations and remediation issues that must be addressed:

- Foundation improvements due to possible deterioration of piles
- Remediation of deteriorated concrete features and restoration of historic façade
- Removal of exterior wall for increased views and natural light
- Removal of interior walls for flow of occupants
- Remaining walls to be strengthened
- Removal of floor slab at the third and sixth floor to increase story height
- Removal of portions of the first, second, fourth floors and roof for atriums, elevators and stairwells.
- Evaluation and upgrade of the rooftop water tower, equipment and harbor office

Foundation Improvements

Based on available documentation and similar construction for the time period, it is probable that the existing piles consist of 16-inch diameter driven redwood piles, and driven roughly 28 feet to firm bedrock through loose sediments and man-made fill. Direct investigation of the integrity of the piles was not performed for this study, as they are not accessible without significant excavation and destructive investigation. Due to the age of the piles and their location within a tidal zone, it is the opinion of Miyamoto and the Geotechnical Engineer that until proven by investigation, it is unlikely that the full cross sections of the piles are intact. Even if the existing piles have not deteriorated, they are not likely meet current code requirements for renovation of the building.

The ground the building rests on is highly liquefiable during a seismic event. Without adequate support from piles, the building could be damaged by future ground settlement or ground failure during a significant seismic event.

A proposed solution for use in the renovation scheme is to use compaction grouting of the soft soils below the building. The preliminary scheme by the Geotechnical Engineer would use compaction grouting columns approximately 25 to 30 feet deep spaced at five feet on center throughout the building and extending ten feet outside the building footprint, except for the southern end of the building where it would extend 25 feet beyond the building footprint. Compaction grouting will provide the required vertical bearing capacity, and mitigate settlement and seismic ground failures.

For more information, refer to the report by Diaz Yourman & Associates in June 2007, "Preliminary Geotechnical Investigation – Warehouse No. 1 Seismic Retrofit" (Project No. 2007-005.01) dated June 6, 2007.

Evaluation Criteria

The structural evaluation for this renovation feasibility study was based on meeting the goals of the Basic Safety Objective (BSO) rehabilitation developed by the Federal Emergency Management Agency (FEMA) as FEMA 356, "Prestandard and Commentary for the Seismic Rehabilitation of Buildings." The BSO is achieved by designing the renovated structure to meet the Life Safety (LS) Performance objective at BSE-1, and meet Collapse Prevention (CP) Performance objectives at BSE-2.

The seismic demands of BSE-1 and BSE-2 are discussed and shown in the "Site Geology & Seismicity" chapter of this report. The Collapse Prevention performance criterion is defined as the post-earthquake damage state that includes damage to structural components such that the structure continues to support gravity loads but retains no margin against collapse. After an earthquake a structure designed to the collapse prevention performance criterion may not be practical to repair and is not safe for occupancy, since aftershock activity could induce collapse. The Life Safety performance criterion is defined as building performance that includes damage to both structural and non-structural components during a design earthquake, such that: (a) partial or total structural collapse does not occur, and (b) damage to nonstructural components is non-life threatening.

FEMA 356 directs the designer to incorporate the requirements of the current material standards. At the time of this feasibility study the current material standards of 2001 California Building Code (CBC) were used. It is important to note that future renovation work for this project will likely be subject to the requirements of the 2007 CBC (or later edition). Due to the nature of the relationship of the 2007 CBC with FEMA 356, the conclusions of this study are anticipated to remain comparable and valid.

Material Investigation Results

Material sampling and testing was performed by Twining Laboratories in April 2007, the results were published in "Report of Field Investigation and Materials Testing – Port of Los Angeles Warehouse No. 1" (Project No. 070212.1) dated June 14, 2007, see Appendix D for the full report. Materials samples consisted of concrete and steel reinforcement from areas throughout the structure. The quantity of samples taken do not meet the requirements for FEMA 356, however enough samples were obtained and tested to provide preliminary data for this study.

The material data knowledge factor used for this study was 1.0, which assumes that all required testing will be performed prior to finalizing the renovation design. From the testing performed, the lower bound expected concrete strength is 3000 psi, and reinforcement is consistent with Grade 40 Intermediate with a lower bound yield strength of 40000 psi. Existing reinforcement is plain round bars, with a few locations of twisted square bar. Lower bound strength for new concrete and reinforcement is the specified strength, 4000 psi and 60000 psi respectively. Lower bound strengths are used for checking force controlled elements.

For checking deformation controlled elements, expected strengths for existing concrete and reinforcement in this study are taken as 4500 psi and 50000 psi, and for new material, 6000 psi and 70000 psi respectively.

The effect of plain bars and the use of actual lap splice lengths shown on the as built plans are incorporated into the renovation recommendations and evaluations of existing reinforced concrete member capacity.

Structural Analysis

A Systematic Rehabilitation Method was used per FEMA 356 to determine the structural modification requirements for the renovated scheme. Both a Linear Static Procedure (LSP) and a Linear Dynamic Procedure (LDP) was performed using a three dimensional finite element model in ETABS version 9. Additional hand calculations were performed for element checks. Detailed calculations and modeling results are available upon request.

Highlights of the structural analysis technical requirements, assumptions and findings:

1. The building has rigid floor diaphragms.
2. Accidental 5% eccentricity of mass, and actual torsion was analyzed. No additional amplification required.
3. Foundations were modeled as fixed. Soil-structure interaction will decrease the spectral accelerations by lengthening the fundamental period, and should be considered in future studies. Overturning was checked and found to be adequate.
4. P-delta effects are included in the analysis, but effects are minimal. The stability coefficient is determined to be acceptable.
5. Multi-directional effects are considered at wall intersections using 100% + 30% load combination of seismic forces.
6. No structural irregularities exist currently, or would exist with the proposed renovation scheme.
7. It is acceptable to perform both LSP and LDP for this structure, all requirements are met for the conditions allowing their use.
8. Checks of member capacities are determined using ACI 318-95 with strength reduction factors of 1.0.
9. Flexural strength of rehabilitated walls are based on the capacity of only the new reinforcement. The shear strength of existing walls with reinforcement spaced at less than 18 inches on center is considered to be fully effective.
10. For walls with "L" or "T" shapes, the benefit of wall returns of existing construction is excluded as new boundary elements are designed to resist flexural and overturning demands.
11. It is assumed that compressive axial loads are carried primarily by the existing columns.
12. It is assumed that soil remediation is performed to obtain a type SD soil, which is conservative for the determination of the seismic demands over type SE soil.
13. The demolition of the third and sixth floors, partial demolition of all raised floor slabs for new atriums, partial demolition of existing walls, and the change in occupancy from heavy storage to office space results in significantly lighter loads

on the foundation, structural elements, and less seismic mass. Existing columns are be capable spanning of the longer floor to floor heights with the aid of glass fiber composite wrapping at noncompliant lap splice locations of vertical rebar. Exterior and interior walls that are not strengthened will require a portion of the slab at the removed areas to remain and be designed for out of plane seismic support.

14. The existing parapets have inadequate reinforcement lap splice lengths at the roof level; new bracing supports will be required on the parapet for most of the roof perimeter.

15. The existing concrete column elements incorporated in the walls have inadequate lap splice length to be considered as wall boundary elements in tension, therefore new boundary elements will be required to meet the current code requirements of ACI 318. Existing walls will be strengthened with shotcrete and can be reinforced to meet the seismic demands.

16. It has been assumed that the existing piles are not capable of resisting uplift forces due to the possibility of deterioration as well as lack of positive attachment in the as built details. To this effect the proposed option is to modify the foundation to perform as a monolithic unit during a seismic event. The existing basement level is open and continuous, providing adequate room to install a new perimeter grade beam element linking strengthened shear walls together at their base. This will allow the existing piles caps to act as spread footings on grout compacted modified soil, and uplift resisted by dead loads.

Structural Modifications for Proposed Renovation

The structural modification measures below are necessary to meet the requirements noted in this report for the proposed renovation scheme of Warehouse No 1. These items are structural cost items described in detail here, and shown in schematic form on the attached plans and elevations in Appendix B. Please refer to both in order to obtain a complete picture of the proposed structural renovation work.

1. Extensive demolition of existing concrete elements is proposed. Based on field visits there do not appear to be finish materials that would contain hazardous materials, however this would need to be verified at a future date. Any abatement required is likely to be minor in scope.
2. Demolition of existing concrete floor slabs, columns, and walls as noted on the plans. Existing floors are rated for heavy loads, and demolition will not require special care to avoid damage to existing finishes or floors.

3. Soil improvements and additional geotechnical/foundation investigation are required. Refer to the "Preliminary Geotechnical Investigation Warehouse No. 1 Seismic Retrofit" report prepared by Diaz Yourman & Associates, Dated June 6, 2007, specifically section 5.3. The favored solution for ground improvement is compaction grouting.
4. Infill of existing doors and openings is noted on the schematic plans consisting of 3000 psi normal weight concrete of the same thickness as the existing walls, which is 8" thick at the basement and first floor, and 6" thick at the upper floors, with 2 lbs/sq.ft. of reinforcement and perimeter epoxied rebar dowels at 18" on center.
5. New steel braces are required at the perimeter of the roof to brace the existing concrete parapet consisting of approximately 80 lbs of round steel pipe per brace with epoxy anchors to the parapet and roof slab.
6. New concrete edge beams, and beams below slab are noted on the plans to support loads and seismic upgrade requirements consisting of approximately 12"x12" normal weight concrete 3000 psi beams with 12 lbs/ft of reinforcing steel. These beams will be doweled into the existing slab with approximately 4 epoxy bars per foot of length.
7. New pneumatically applied concrete referred to as "shotcrete" will be applied against existing walls as shown on the plans. This concrete would consist of normal weight 4000 psi concrete. At the basement and first floors, approximately 8" thick applied shotcrete with 4 lbs/sq.ft. of reinforcement. At the second, third, and fourth floors, 6" thick applied shotcrete with 3 lbs/sq.ft. of reinforcement. At the fifth and sixth floors, 4" thick applied shotcrete with 2 lbs/sq.ft. of reinforcement. New shotcrete walls will be doweled into the existing walls with approximately 1 epoxied rebar per sq.ft. of existing wall. Rebar dowels at the top and bottom of each shotcrete wall will be cored through the floors at about 9" on center.
8. New vertical concrete boundary elements are required at the edges and intersections of strengthened walls. These are heavily reinforced column-like elements with horizontal ties doweled into the existing walls at approximately 4" on center along the height, approximately an additional 6"x24" to the shotcrete thickness, with an average of 30 lbs/ft of reinforcing steel.
9. Repair of existing exterior concrete damage due to weathering will be required. Please refer to the architect for an approximate estimate on the work to be performed. It is anticipated that approximately 15% of the parapets and remaining general exterior wall area will require some level of repair. Due to the extensive corrosion and spalling of the existing exterior stairs, assume at least 50% replacement of the remaining concrete stairs.
10. To meet FEMA 356 standards for the final design, additional material testing and investigation will be required, however this would be part of the design cost and may not be desired to be incorporated into the renovation cost at this point.

11. Glass fiber composite wrapping at noncompliant lap splice locations of vertical rebar at interior columns where existing floor slab and drop panels are removed.

Additional nonstructural considerations for the proposed renovation include:

1. There is one existing railway running through the building. It is proposed to infill the eastmost railway with compacted fill, and install a new 6" concrete floor slab at the first floor level.
2. New skylights over the new atriums and will involve a small amount of new structural steel or concrete supports.
3. At the areas of exterior wall demolition, new exterior glass curtain walls are proposed. This would require approximately 4 lbs/sq.ft of structural steel frame support in addition to the new glass system.
4. New stairs and elevator modifications are not shown on these plans, and will involve a small amount of new structural steel supports.
5. Evaluation and upgrade of the rooftop water tank, equipment and harbor office.

Costs and modifications associated with architectural, mechanical, electrical, plumbing, etc. are beyond the scope of this report.

Conclusion

Based on the findings outlined in this report it appears structurally feasible to renovate Warehouse No. 1 for office-type occupancy with the architectural scheme proposed. This project will provide new useable space to the Port and extend the life of this historic building.

See Appendix B for the Conceptual Cost Estimate provided by O'Connor Construction Management dated November 29, 2007, which is based on the information provided in this report. This estimate covers structural modifications for the proposed renovation scheme, and does not include evaluation and upgrading of rooftop structures.

The conceptual cost estimate for the proposed structural modifications and foundation improvements is $20,638,176.

Appendix A: Architectural Renovation Concept

Appendix B: Structural Renovation Concept

Appendix C: Conceptual Cost Estimate

Appendix D: Materials Testing

HISTORIC RESOURCES EVALUATION REPORT

Final

PORT OF LOS ANGELES MUNICIPAL PIER NO. 1

Historic Resources Evaluation Report

Prepared for
Port of Los Angeles

February 2011

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Cover Image: Aerial view of completed Municipal Pier No. 1 showing Warehouse No. 1 (right), Municipal Shed No. 1 (Transit Shed Berths 58-6) (left) and the Pan American Petroleum Co. in the background, October 17, 1925. Source: POLA.

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HISTORIC RESOURCES EVALUATION

Port of Los Angeles Municipal Pier No. 1

1. Introduction

The Los Angeles Harbor Department (LAHD) has contracted with ESA to perform a historic resources survey and evaluation of Municipal Pier No. 1 (see Figure 1, Location Map). The Port of Los Angeles (POLA) is planning to implement the City Dock project, which would make a number of alterations and improvements to the sheds at Berths 57-60, as well as to Municipal Pier No 1 which supports these sheds.

Previous studies[1] of the site suggested that, in addition to the sheds at Berths 57-60, Municipal Pier No. 1 supports these structures, may also be eligible for listing in the National Register of Historic Places (NRHP) either individually, or as a potential historic district. The LAHD requested that ESA provide a conclusive evaluation of the eligibility of Municipal Pier No. 1 for the LAHD City Dock project.

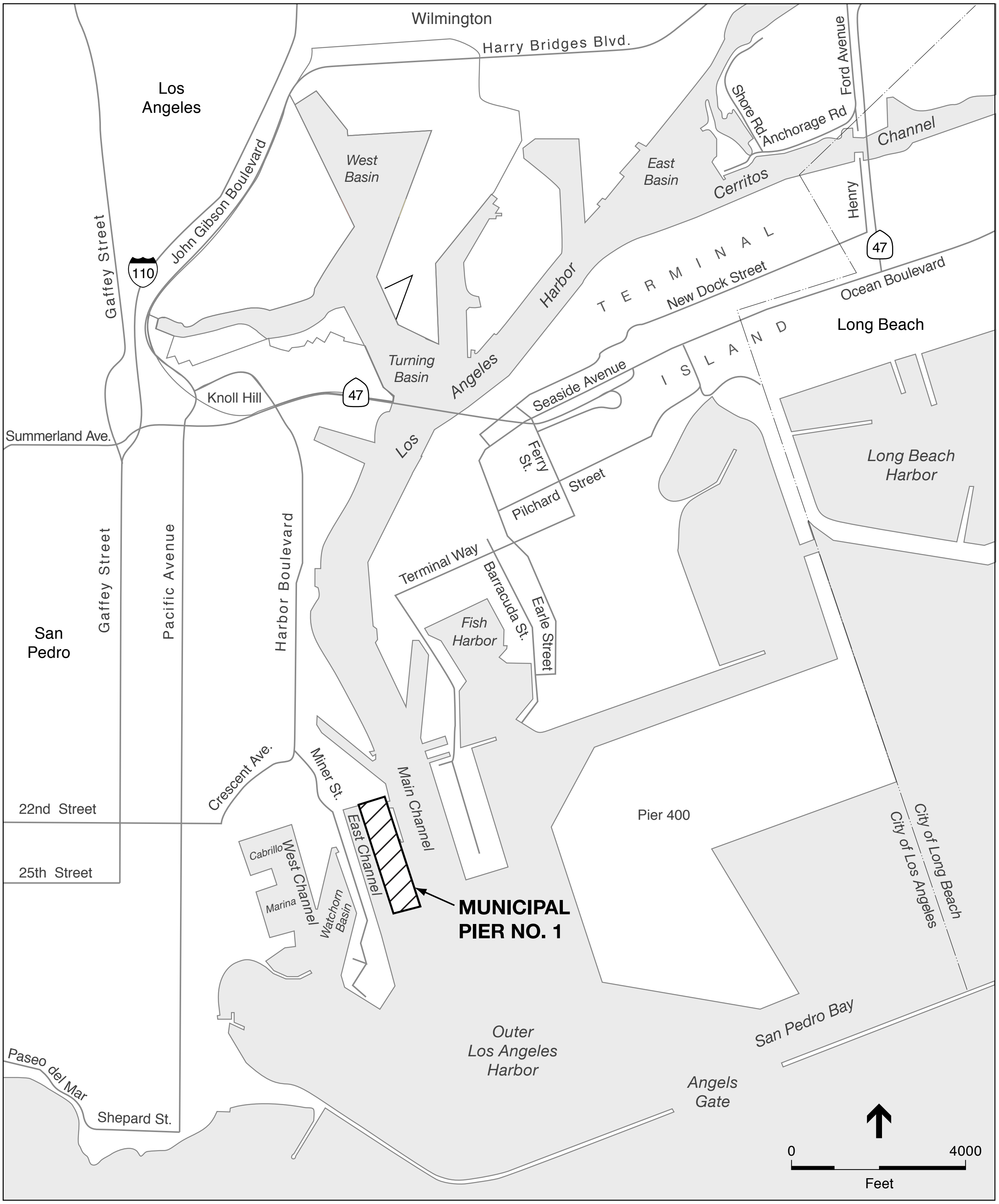
This report documents ESA's methods and findings of an intensive architectural survey and evaluation of Municipal Pier No. 1. Efforts included performing a review of previous studies; conducting additional archival research; surveying Municipal Pier No. 1; and applying the eligibility criteria for listing in the NRHP, CRHR, and City of Los Angeles Landmark criteria. All survey and evaluation work was conducted by ESA's senior preservation specialist, Brad Brewster, who meets the Secretary of Interior's professional qualification standards for both architectural history and preservation planning. Mr. Brewster supervised additional research conducted by Candace Ehringer, Registered Professional Archaeologist. Mr. Brewster and Ms. Ehringer have more than 25 years of combined experience working on cultural resources studies.

1.1 Methods

Previous Study Findings

ESA reviewed previous inventories and evaluations of the Signal Street properties at the Port of Los Angeles, including those by San Buenaventura Research Associates in the late 1990s, and ICF Jones & Stokes in 2000 and 2008.

1 ICF Jones & Stokes, *Final Architectural Survey and Evaluation of Signal Street Properties Port of Los Angeles, Los Angeles, California,* 2008.



SOURCE: POLA; ESA, 2011

Historic Resources Evaluation Report for Port of Los Angeles - Municipal Pier No. 1 . 201278.14

Figure 1
Location Map

In the late 1990s, San Buenaventura Research Associates under subcontract for Fugro West, Inc. prepared for the POLA Environmental Management Division Phase I and Phase II of a Cultural Resources Reconnaissance Survey of 7,500 Acres of land and water for the Port of Los Angeles. The purpose of the phased reconnaissance survey was to identify “potentially” eligible historic resources located on the POLA property and make recommendations of eligibility for the NRHP and for designation as City of Los Angeles Historic Cultural Monuments for individual buildings, and “potential” historic districts at the Port. As part of the Phase II report, San Buenaventura Research Associates proposed a historic district encompassing the entire Pier One area south of 22nd Street. As recommended, the potential historic district includes but may not be limited to transit shed structures at Berths 57-60, Municipal Warehouse No. 1, the U.S. Immigration Station, the former Pan American Petroleum Company site (Berth 70, Westway building), and the Municipal Fish Market. Recommended potential districts, such as “Pier One,” were not formally defined and documented in the report (Fugro West, Inc. 1997).

In 1999, the large, concrete, 6-story Warehouse No. 1, completed in 1917 and located at the southern end of Municipal Pier No. 1, was surveyed and evaluated by Jones & Stokes. This massive structure was identified as a property eligible for listing in the National Register of Historic Places (Jones & Stokes, 1999). Warehouse No. 1 was subsequently nominated to, and listed in, the Register in the following year.

In 2008, ICF Jones & Stokes surveyed and evaluated six properties located on or near Signal Street, which are either located on, or immediately adjacent to, Municipal Pier No. 1. These are the Transit Shed Berths 58-60, Immigration Station (Canetti’s Restaurant, 309 E. 22nd Street), Transit Shed Berth 57, Pan American Petroleum Company Marine Loading Station Facility – Berth 70 (Westway Terminal Building), 264 and 270 E 22nd Street, and Pan-Am Terminal Facility – Berth 56 (California Fish and Game Building). ICF Jones & Stokes found that all six properties appear to be eligible for listing in the NRHP and the CRHR, as well as appear eligible for listing as Los Angeles Historic –Cultural Monuments (ICF Jones & Stokes, 2008).

Although Municipal Pier No. 1 itself was not surveyed and evaluated at an intensive level by Jones & Stokes in 2008, they inferred that the Pier has potential historical significance because it was an integral part of the Port during the early half of the 20th Century, and the basic layout and facilities at the Pier have changed little since the late 1920s. They also inferred that Municipal Pier No.1 was eligible as part of a potential historic district, with multiple other contributing structures, upon future intensive-level survey and evaluation.

1.2 Archival Research

Archival research for the current evaluation of Municipal Pier No. 1 was conducted at POLA, the Los Angeles Public Library, various online sources, and the South Central Coastal Information Center (SCCIC) at the California State University at Fullerton.

1.3 Fieldwork

On December 10, 2010, Mr. Brewster conducted an intensive field survey of Municipal Pier No. 1. As part of this survey, Mr. Brewster took photographs and prepared descriptions of the Pier and associated structures atop the Pier. These descriptions are provided in Section 5, below, as well as in California Department of Parks and Recreation (DPR) Forms 523A and B, located in Appendix B. With 17 years of experience surveying and evaluating historic resources throughout the West Coast, Mr. Brewster meets the Secretary of the Interior's qualifications for architectural history.

1.4 Area of Potential Effects (APE)

The Area of Potential Effects (APE) was delineated as the entire Municipal Pier No. 1 south of 22nd Street. The APE map is shown in Figure 2 below. The APE includes the geographic areas within which the undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist, including all ground-disturbing activities, staging areas, and construction zones. As such, the APE includes not only the Pier structure itself, but also the sheds and warehouses which are located atop the structure.

2. Regulatory Context and Significance Criteria

2.1 Federal Regulations

To establish the significance of a property, the National Register of Historic Places (National Register) criteria for evaluation set forth in 36 CFR Part 60.4 must be applied. The following criteria are designed to guide the states, federal agencies, and the Secretary of the Interior in evaluating potential entries for the National Register. The quality of significance in American history, architecture, archaeology, and culture is present in districts, sites, buildings, structures, and objects that possess at least one of the following:

A. that are associated with events that have made a significant contribution to the broad patterns of our history; or

B. that are associated with the lives of persons significant in our past; or

C. that embody the distinctive characteristics of a type, period, or method of construction or that represent the work of a master or that possess high artistic values or that represent a significant and distinguishable entity whose components may lack individual distinction; or

D. that have yielded, or may be likely to yield, information important in prehistory or history.

The question of integrity is another factor that must be addressed when determining the eligibility of a resource for listing in the National Register. The Secretary of the Interior describes integrity as "the ability of a property to convey its significance." A property must retain certain intact physical features in order to convey its significance under one or more of the NRHP criteria.

APE Boundary

SOURCE: Google Earth, 2011

Historic Resources Evaluation Report for Port of Los Angeles - Municipal Pier No. 1 . 206278.14

Figure 2
APE Map

Integrity is judged on seven aspects; location, design, setting, workmanship, materials, feeling, and association. If a particular resource meets one of these criteria and retains sufficient integrity to convey its historic significance, it is considered as an eligible “historic property” for listing in the National Register. Additionally, unless exceptionally significant, a property must be at least 50 years old to be eligible for listing.

Section 106

Section 106 of the National Historic Preservation Act (NHPA) of 1966 requires that a federal agency with direct or indirect jurisdiction over a proposed federal or federally-assisted undertaking, or issuing licenses or permits, must consider the effect of the proposed undertaking on historic properties. An historic site or property may include a prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register maintained by the U.S. Secretary of the Interior. Federal agencies must also allow the Advisory Council on Historic Preservation (ACHP) to comment on the proposed undertaking and its potential effects on historic properties.

The implementing regulations for Section 106 of the NHPA (36 CFR 800) require consultation with the State Historic Preservation Officer (SHPO), the ACHP, federally recognized Indian tribes and other Native Americans, and interested members of the public throughout the compliance process. The four principal steps are:

- initiate the Section 106 process (36 CFR 800.3);
- identify historic properties, resources eligible for inclusion in the NRHP (36 CFR Section 800.4);
- assess the effects of the undertaking on historic properties within the area of potential effect (36 CFR 800.5); and
- resolve adverse effects (36 CFR 800.6).

Adverse effects on historic properties are often resolved through preparation of a memorandum of agreement or programmatic agreement developed in consultation between the federal agency, the SHPO, Indian tribes, and interested members of the public. The ACHP is also invited to participate. The agreement describes stipulations to mitigate adverse effects on historic properties or listing in the National Register of Historic Places (36 CFR §60).

Significance Criteria under NHPA

A significant impact would occur if a proposed action results in an adverse effect to a property that is listed in or eligible for inclusion in the National Register. The specific Criteria of Effect and Adverse Effect, as defined in 36 CFR 800.9, used to evaluate an undertaking’s effect on a historic property, are as follows:

- An undertaking has an effect on a historic property when it may alter the characteristics of the property that qualify the property for inclusion in the National Register. For the purpose of determining effect, alteration to features of the property's location, setting, or use may be relevant depending on a property's significant characteristics and should be considered.

- An undertaking is considered to have an adverse effect when the effect on a historic property may diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association. Adverse effects on historic properties include, but are not limited to:

  (1) Physical destruction, damage, or alteration of all or part of the property;

  (2) Isolation of the property from or alteration of the character of the property's setting when that character contributes to the property's qualification for the National Register;

  (3) Introduction of visual, audible, or atmospheric elements that are out of character with the property or alter its setting;

  (4) Neglect of a property resulting in its deterioration or destruction; and

  (5) Transfer, lease, or sale of the property.

2.2 State Regulations

The State implements the NHPA through its statewide comprehensive cultural resources surveys and preservation programs. The California Office of Historic Preservation (OHP), as an office of the California Department of Parks and Recreation, implements the policies of the NHPA on a statewide level. The OHP also maintains the California Historic Resources Inventory. The State Historic Preservation Officer (SHPO) is an appointed official who implements historic preservation programs within the State's jurisdictions.

California Register of Historical Resources

The CRHR includes resources that are listed in or formally determined eligible for listing in the NRHP and some resources designated as California State Landmarks and Points of Historical Interest (PRC Section 5024.1, 14 California Code of Regulations [CCR] Section 4850). Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the CRHR and are presumed to be significant resources for purposes of CEQA unless a preponderance of evidence indicates otherwise (State CEQA Guidelines Section 15064.5[a][2]). The eligibility criteria for listing in the CRHR are similar to those for NRHP listing but focus on the importance of the resources to California history and heritage. A cultural resource may be eligible for listing in the CRHR if it (see 14 CCR Section 4852):

(1) is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

(2) is associated with the lives of persons important in our past;

(3) embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

(4) has yielded, or may be likely to yield, information important in prehistory or history.

In addition to meeting one of the four criteria listed above, a resource eligible for listing in the California Register must retain historic integrity, and is typically fifty years old or older, except where it can be demonstrated that sufficient time has passed to understand the historical importance of the resource.

Significance Criteria under CEQA

The California Environmental Quality Act (CEQA) specifically addresses the protection of historic resources. Based on the Appendix G of the CEQA Guidelines, a project would have a significant impact on historic resources if it would, "result in a substantial adverse change in the significance of a historical resource that is either listed or eligible for listing on the National Register of Historic Places, the California Register of Historic Resources or a local register of historic resources."

2.3 Local Regulations

The Los Angeles Municipal and Administrative Codes address the preservation of historic and cultural monuments, and Preservation Zones. A list of historical and cultural monuments has been compiled and is maintained by the Cultural Heritage Commission, a board of five persons appointed by the Mayor and approved by the City Council. It is the responsibility of the Cultural Heritage Commission to oversee and approve the establishment of Preservation zones (LA Municipal Code Sec. 12.20.3) and to preserve monuments when such action is not in conflict with the public health, safety, and general welfare (LA Administrative Code Sec. 22.128).

According to Section 22.130 of the Los Angeles Municipal Code, a historical or cultural monument is "any site (including significant trees or other plant life located thereon), building or structure of particular historic or cultural significance to the City of Los Angeles, such as historic structures or sites in which the broad cultural, economic or social history of the nation, State or community is reflected or exemplified, or which are identified with historic personages or with important events in the main currents of national, State or local history or which embody the distinguishing characteristics of an architectural type specimen, inherently valuable for a study of a period, style or method of construction, or a notable work of a master builder, designer, or architect whose individual genius influenced his age."

According to Section 22.171 of the Los Angeles Municipal Code, 'The [Historic Preservation] Commission shall take all steps necessary to preserve Monuments not in conflict with the public health, safety and general welfare, powers and duties of the City of Los Angeles, or its several boards, officers or departments. These steps may include assistance in the creation of civic citizens' committees; assistance in the establishment of a private fund for the acquisition or restoration of designated Monuments; and recommendation that a Monument be acquired by a governmental agency where private acquisition is not feasible."

3. Historical Setting – Port of Los Angeles

The following historical setting has been adapted, in part, from the intensive-level surveys of the Port of Los Angeles prepared by Jones & Stokes in 2008, as well the reconnaissance-level surveys by San Buenaventura Research Associates from 1992 to 1996. Additional historical information developed by ESA has been inserted into the historic setting where appropriate.

3.1 Early History

The Port of Los Angeles is located approximately 20 miles from downtown Los Angeles, at the southernmost point in Los Angeles County. Due to its location on the Pacific Ocean, the surrounding area historically served as a port facility to varying degrees. Commonly referred to as San Pedro, the port is located within the boundaries of three historic ranchos: Rancho San Pedro, Rancho Los Palos Verdes, and Rancho Los Cerrios. These ranchos, conferred by Governor Pedro Fages to three veterans of the 1769 Portola expedition, possessed combined acreage equaling almost 84,000 acres (Beck and Haase 1974). Owners of the rancho lands earned a living through the raising of cattle and participation in the hide and tallow trade, and by 1830, San Pedro was considered a leading hide center on the west coast (Rawls and Bean 1993; Queenan 1986).

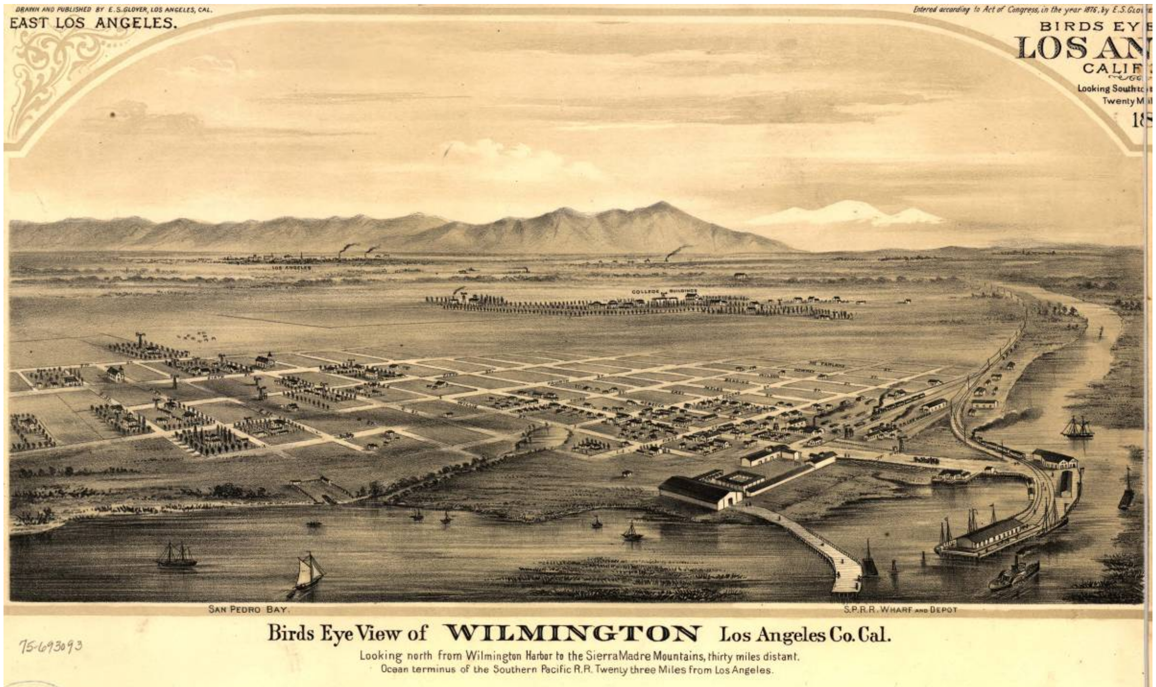
Following the annexation of California by the United States and the subsequent Gold Rush, an influx of new settlers descended upon the San Pedro area. While some residents realized the area's potential as a port area, the region was underused as a port during this period. Cattle and sheep ranching continued to dominate the economy, with one of the largest sheep operations in California, Flint, Bixby & Company, establishing the largest portion of its operation in San Pedro (Queenan 1986; Beck and Hasse 1974).

3.2 Commercial Shipping, 1857–1897

One of the earliest residents of the area, Phineas Banning, realized the potential of the area as a commercial shipping port, and in 1857, he constructed new docks to take advantage of the increasing trade coming in and out of Los Angeles. Two primary routes to the southwest gold fields, the Gila River Trail and the Old Spanish Trail, ended in Los Angeles. Banning shuttled materials on smaller boats from his base in Wilmington to and from a second location on the Rancho San Pedro waterfront.

Banning also realized the importance of rail transportation between his operation on the bay and the growing city of Los Angeles. In 1869, Banning and his investors organized the Los Angeles & San Pedro Railroad (LA&SP), marking the beginning of a period of fierce rail competition in the San Pedro and Los Angeles area. Banning's LA&SP was the first route to establish a reliable means of moving cargo from the ships coming into San Pedro Harbor to the City of Los Angeles.

Although the LA&SP was the first short line in southern California, by 1872 it had been purchased by the Southern Pacific Railroad (SPRR). In an attempt to break the stranglehold that the SPRR had on shipping in the area, Senator John P. Jones from Nevada established the Los Angeles and



SOURCE: POLA

Figure 3
Library of Congress Map of Wilmington, Los Angeles County, CA, 1877

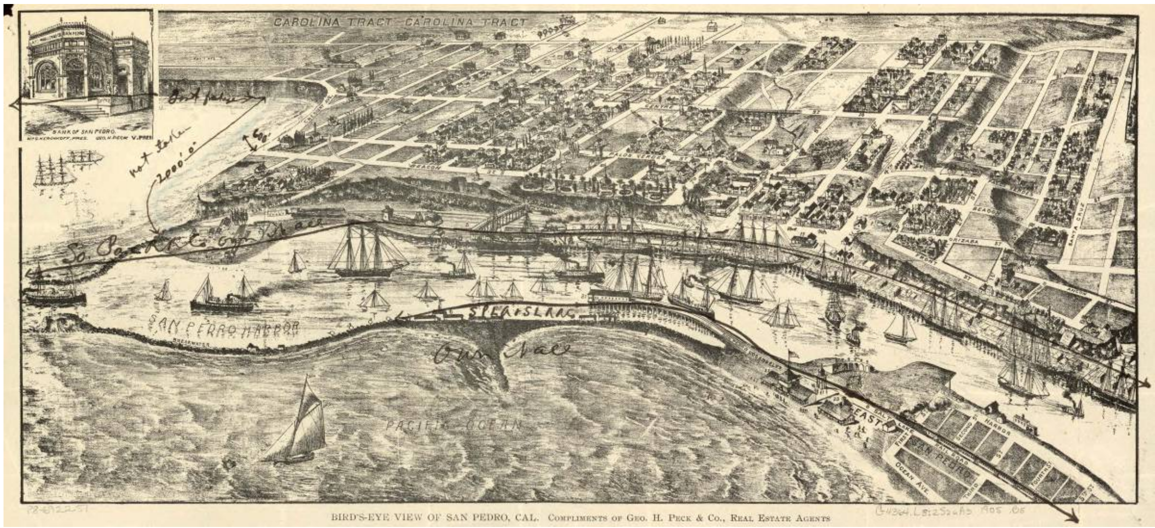
Independence Railroad (LA&I) a year before the SPRR's acquisition of the LA&SP. However, like the LA&SP, the LA&I soon was part of the SPRR system (Queenan, 1986).

Due in part to the improved transportation to and from the harbor, Los Angeles experienced rapid growth during the late nineteenth century. From a population in 1880 of 11,000, the city grew to 50,000 by 1890 and to 102,000 by the turn of the century (Matson, 1920). The increased population brought with it the need for more construction and living supplies, much of which came from ships destined for San Pedro shores.

3.3 San Pedro Bay and the Founding of Port of Los Angeles, 1897–1913

Growing commerce in Los Angeles eventually required the formal establishment of a shipping port. The federal government agreed to assist the City of Los Angeles by establishing its official harbor in San Pedro after several studies recommended it over other sites, including a Santa Monica site pursued by Collis Huntington, an influential member of the "Big Four" railroad barons. Following an extensive battle with Huntington, the San Pedro Harbor site won authorization from Congress in March 1897.

In 1906, in preparation for the opening of the Panama Canal, the City of Los Angeles extended its boundaries to coastal tidewaters when it annexed San Pedro. The Port of Los Angeles and the Los Angeles Harbor Commission were officially created in December 1907, and numerous



SOURCE: POLA

Figure 4
Library of Congress Map of San Pedro, CA, circa 1905

harbor improvements followed, including the completion of the 2.11-mile breakwater, the broadening and dredging of the main channel, the completion of the first major wharf by the SPRR, construction of the Angel's Gate lighthouse, and the construction of the first municipal pier and wholesale fish market. The construction of the breakwater was a "monumental engineering feat" requiring crane operators to place large boulders in precise locations 40 to 50 feet below the surface of the water. Both Wilmington and San Pedro were part of the City of Los Angeles by 1909, and because of this citywide growth, the Port of Los Angeles became the world's largest lumber importer by 1913 (Marquez and de Turenne, 2007; Matson 1920).

A 9-mile outer breakwater was completed in 1913, splitting the harbor into Inner and Outer Harbors. The Inner Harbor was known as Wilmington Harbor and the Outer Harbor was known as San Pedro Bay. The same year, dredging and filling of Mormon Island (Inner Harbor) allowed for its conversion from swamp land to land suitable for wharves and sheds (Marquez and de Turenne, 2007.) The first industries to use these new facilities were boatbuilding companies.

The opening of the Panama Canal in August 1914 decreased the amount of time spent by ships traveling between eastern and western U.S. ports, and promised to open up new trade opportunities worldwide. In preparation for this new trade, the City of Los Angeles completed one of many large municipal terminals in the harbor. However, the outbreak of World War I that same year temporarily stalled the movement toward expanded worldwide trade (Queenan, 1986).

3.4 Wartime Changes, 1914 – 1950

The principal use of the port changed again when England declared war on Germany. At the onset of World War I, the U.S. Navy took possession of a portion of the harbor for a training and submarine base in order to establish a significant presence on the Pacific coast. During the war, the Port was one of the chief sources of employment for residents of the area, with shipbuilding enterprises turning out vessels by the dozens for the war effort. The Port of Long Beach, established only two years before the onset of the war, offered the only southern California competition to the Port of Los Angeles in terms of shipping or shipbuilding.

Despite the previous use of the Port for the shipment of goods, it was not until 1915 that the Port of Los Angeles began constructing its first warehouse. Warehouse No. 1, located on 60 acres, was six stories in height, with a total storage capacity of 500,000 square feet. Warehouse No. 1 opened on March 6, 1917 to great fanfare, with over 10,000 people in attendance. The completion of this building symbolized the Port's transition to a significant seaport able to handle deep sea ships of varied cargo (Marquez and de Turenne, 2007; Queenan, 1986).

In 1917, Terminal Island was dredged and filled. Boatbuilding companies moved their facilities from Mormon Island to Terminal Island. Oil terminals and petroleum facilities took their place on Mormon Island (Marquez and de Turenne, 2007).

Between 1917 and 1930, distributors constructed a large number of new wharves, warehouses and sheds, indicating a significant increase in trade at the Port. In the 1920s, over 25 million tons of cargo passed through the port (Marquez and de Turenne, 2007).

Transportation systems improvements also encouraged the growth of the import and export trade in the harbor area. By 1917, a vast railroad network existed around the harbor and Los Angeles, which facilitated the efficient movement of goods throughout the country. Los Angeles had an advantage over the Port of San Francisco in that it did not have the Sierra Nevada posing an impediment to cargo shipments en route to the east coast (San Buenaventura Research Associates, 1992).

During the period following the end of World War I in 1918, the Port was increasingly used for importing lumber and other types of raw materials. Similar to the prewar period, the vast majority of inbound cargo to the Port consisted of lumber to satisfy the rapid growth of the Los Angeles area. Exceptional levels of new construction of houses and factories necessitated the importation of lumber on a large scale (Matson, 1920). Comparatively, the biggest export product passing through the Port during the postwar years was crude oil.

Following the end of the war, many trade restrictions were lifted, and the Port provided for the transportation of a wide variety of products. Although lumber and crude oil were the biggest commodities to pass through the Port at the time, Los Angeles featured almost all types of industry. Soon after the war's end, many different types of commerce and business activities developed in the area. Although existing harbor facilities continued to be used for products such as oil, lumber, ships, and fish, new facilities were developed to handle products such as cotton, borax, citrus crops, and steel. In 1923, the City of Los Angeles passed a harbor improvement bond measure, resulting in the construction of additional wharves to meet the demands of increased imports and exports. In order to streamline the railroad portion of shipping in the harbor, the various railroad companies serving the Port consolidated operations by 1929 under the title the Harbor Belt Line Railroad (Queenan, 1986; San Buenaventura Research Associates, 1992).

Harbor traffic slowed during the Depression years and the harbor witnessed a sharp decline in international trade. The Harbor Commission continued to make improvements, however, including a new breakwater extension, completed by 1937, and the construction of new cargo and passenger terminals. The federal government's Works Progress Administration (WPA) helped the Port finance improvements, including passenger and freight terminals and wharf (Queenan, 1986).

As one of the major American ports closest to the fighting in the Pacific Ocean, San Pedro experienced new life and distinction during World War II. Ship and aircraft production facilities in the harbor area worked day and night between 1941 and 1945 to manufacture more than 15 million tons of war equipment. In addition, hundreds of thousands of personnel passed through the Port when departing for and returning from combat.

The LAHD launched a broad restoration program following the war, as many facilities in the harbor required maintenance which had been delayed during the war years. During this time, the LAHD improved several of its buildings and removed many temporary wartime buildings (Queenan, 1986).

3.5 Containerization: 1950 to Present

With the rise of containerization following the end of World War II, methods of shipping changed dramatically. Prior to this new method, cargo loading was labor intensive, with individual pieces of cargo, drums, boxes, bags or crates, loaded into ships. Cargo was brought to the dock by truck or train and the individual pieces of cargo were unloaded into transit sheds, sorted and organized, and then moved to the wharf for loading as individual packages into the ship's cargo holds by either ship-based or shore-based cranes where it was then stowed. Alternatively, longshoremen would place the individual pieces of cargo in cargo nets that were hoisted into the ship where the individual pieces of cargo were unloaded and stowed. Some efficiency was achieved by placing several individual containers (e.g., drums, bags, or boxes) on a pallet and then loading the pallet into the cargo hold.

Containerization ships appropriate cargo in standard sized, sealable steel boxes, typically 20 or 40 feet long. Special trailers transport these boxes to and from the port by trucks or rail. An empty container is delivered by truck to a location (manufacture, warehouse, or other enterprise), is loaded with cargo and sealed, then transported by truck or train to the port, where shore-based cranes lift the container from the trailer and place it in the ship's cargo hold or on the ship's deck. After the container is delivered to the destination port, the process was repeated in reverse. This consolidation of cargo in standard-sized containers improves the overall efficiency of transport and allows greater integration of transport by truck, train, and ship.

The adaptation of the maritime industry to containerization involved not only the creation of new ships, truck trailers, rail cars, and cargo cranes designed and built specifically to handle the standard cargo containers, but also the construction of new port facilities. As the loading and unloading of ships and the associated handling was the most time consuming aspect of moving cargo through the Port, under the old loading methods, cargo terminals were designed to maximize the “surface area” of the terminal by providing as much berthing space as possible, with little backland (transit sheds) to service each wharf.

The containerization method required large-volume terminals, with extensive backlands, and internal roadways to service each wharf. The increased backlands reflected the need for storage of trailers and containers awaiting a ship’s arrival, area needed for the loading and unloading of containers onto ships, and area needed to process the containers into and out of the terminal by truck or train. With the increased efficiency, the limiting factor of transferring of cargo became the organization and optimization of storage of containers awaiting shipment, movement to and from the wharf, and cargo flow into and out of the terminal via road or rail. This meant that ports had to either develop new terminals to meet the needs of the new geometry required by containerization or redevelop older terminals. In addition, with containerization, the weight of cargo “packages” (i.e., containers) increased dramatically, requiring much larger cranes and a corresponding move from timber to concrete wharves.

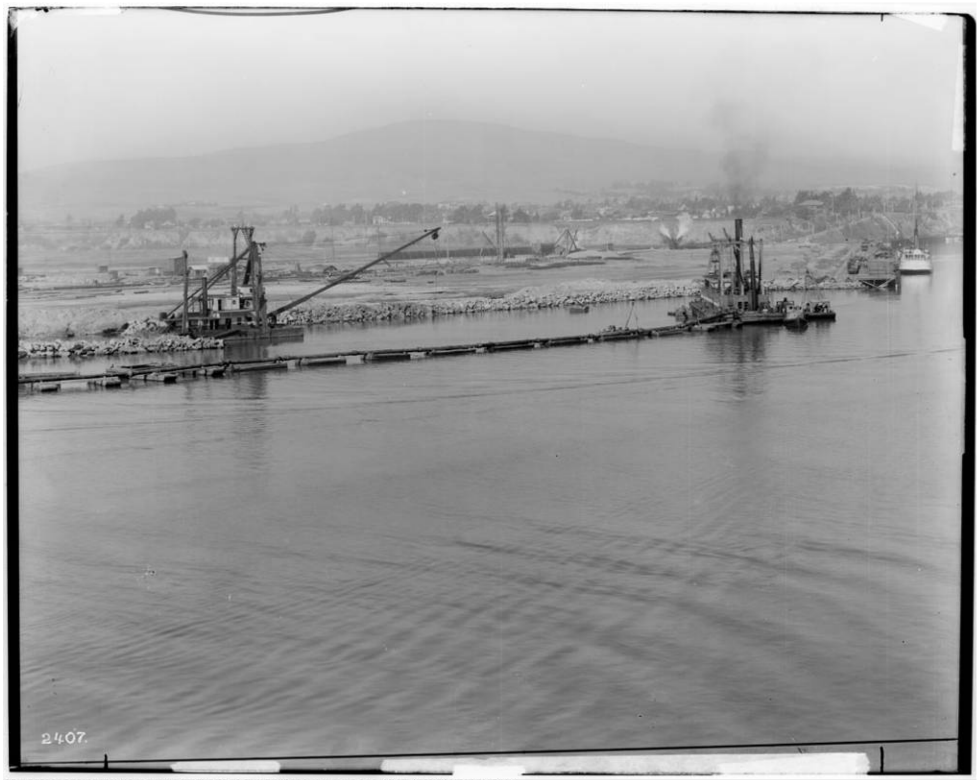
Major improvements to the Port in the 1970s included the deepening of the main channel to accommodate the larger container vessels entering the bay, the purchase of land to expand terminals, and the replacement of older wharves that could not bear the increased weight of newer containers.

Worldwide shipments through the Port increased during the latter half of the 20th century as ocean-going vessels grew to sizes no longer able to negotiate the Panama Canal. Using a “land-bridge” system, shippers wishing to pass materials from the Pacific Ocean to the Atlantic Ocean employed the more efficient practice of unloading at the Port of Los Angeles, moving materials cross country via truck or train, and loading materials onto ships on the east coast.

The following provides a historical context focused on Municipal Pier No. 1.

4. Historical Context – Municipal Pier No. 1

In anticipation of increased shipping due to the construction of the Panama Canal, to be completed in 1914, the Los Angeles Board of Harbor Commissioners initiated several improvements at the Port of Los Angeles in the early 1910s to capture a greater portion of the increased shipping traffic in the Pacific. Improvements to the Outer harbor included the construction of the massive Municipal Pier No. 1. Work on the Pier began with the filling of the Huntington Concession (also called the “Huntington Fill”) during the spring of 1912. Over 60 acres were in-filled with materials taken from dredging the adjacent channel to a new depth of 35 feet (Marquez and De Turenne, 2007; Board of Harbor Commissioners, 1912-1913; LAT, February 6, 1912). According to the Los Angeles Times, this area provided the best opportunity for deep water wharfage at the Port (LAT, March 26, 1911). The Board of Harbor Commissioners Report for 1912-1913 called the construction of Municipal Pier No. 1 as, “one of the best pieces of wharf construction in the country,” and also noted that, “This will be the finest wharf construction that can be built, and is designed for the deep sea commerce of the great ocean lines that will come through the Panama Canal from Europe, or engage in trans-Pacific trade. Figure 5 shows the dredging and fill operations circa 1913.

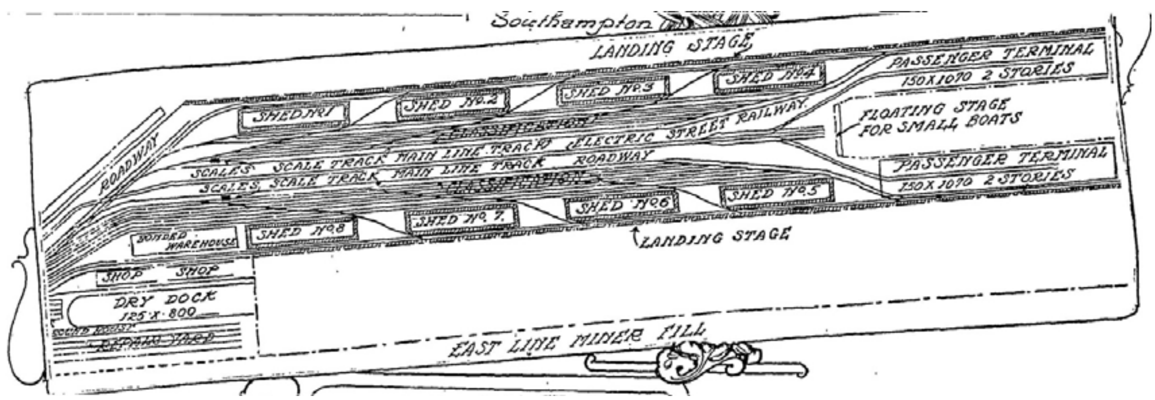


SOURCE: USC Digital Archive

Figure 5
Dredgers at Work on the
"Huntington Fill," circa 1913

The successful construction of the adjacent Miner Fill with a reinforced concrete pier (as opposed to a traditional timber pier) provided the model for the construction methods used at Municipal Pier No. 1 (LAT, March 26, 1911). Although he was met with some opposition from City Engineer Homer Hamlin, Harbor Commission board member T.E. Gibbon promoted concrete over timber construction. Gibbon believed that timber construction was obsolete and concrete structures were the wave of the future, especially where oil was involved. Concrete construction helped prevent fires, and given that the Port of Los Angeles was predicted to be one of the largest oil ports in the country, was preferred (LAT, February 6, 1912). This same article compared the Port's project with existing concrete piers in other major ports around the world, including those in Hamburg, Germany, Southampton, England, and Antwerp Belgium; a clear attempt to position the Port of Los Angeles in an international perspective, and exemplifying the enthusiasm for capturing a larger share of the increased world trade resulting from the anticipated opening of the Canal.

The layout of Municipal Pier No. 1 was proposed by Consulting Engineer E.P. Goodrich of New York and prepared by City Engineer Homer Hamlin and Harbor Engineer Vincent (LAT, October 19, 1912). Plans included a 12-foot-high concrete sheet piling retaining wall (bulkhead). The interior was to be filled with dredged materials and raised to a height of 16 feet above the low-water level. The area was surrounded by 40 feet of docking space placed on concrete pilings.[2] The dock would include modern traveling cranes, 16 railroad tracks, and a roadway wide enough to accommodate an electric railway, as well as provide almost 2 miles of wharfage (LAT, February 6, 1912). The construction contract, in the amount of $444,777 was awarded to Snare & Triest in December 1912 (LAT, December 20, 1912). See Figure 6 showing the original layout of the pier.



SOURCE: Los Angeles Times, February 6, 1912

Figure 6
Preliminary Site Plans for Municipal Pier No. 1.

Municipal Pier No. 1, located between the Main Channel and East Channel, was completed in 1914. At that time, the Pier was about 2,520 feet long and 650 feet wide. The pier could be extended an additional 1400 feet into the harbor if increased shipping traffic necessitated additional wharfage (LAT, December 6, 1914). Over 1200 concrete piles and 1100 sheet piles were used in construction. The dock was paved in asphalt by subcontractor Barber Asphalt Company (LAT, May 31, 1914). Dredging of the Main Channel and East Channel to a depth of 35 feet was conducted by the Standard American Company in 1915 (LAT, January 26, 1913; Board of Harbor Commissioners, 1913-1915).

A June 20, 1914 Los Angeles Times article called Municipal Pier No. 1 “the finest reinforced concrete wharf in the world” and praised the work of the Standard American Dredging Company (LAT, June 20, 1914). The article also noted that, “Within a short time the city will have sufficient wharves to accommodate a great volume or traffic, and others will be built as rapidly as they are needed.” Figure 7, below, shows a newly completed Municipal Pier No. 1 circa 1914, prior to the construction of sheds or warehouses.

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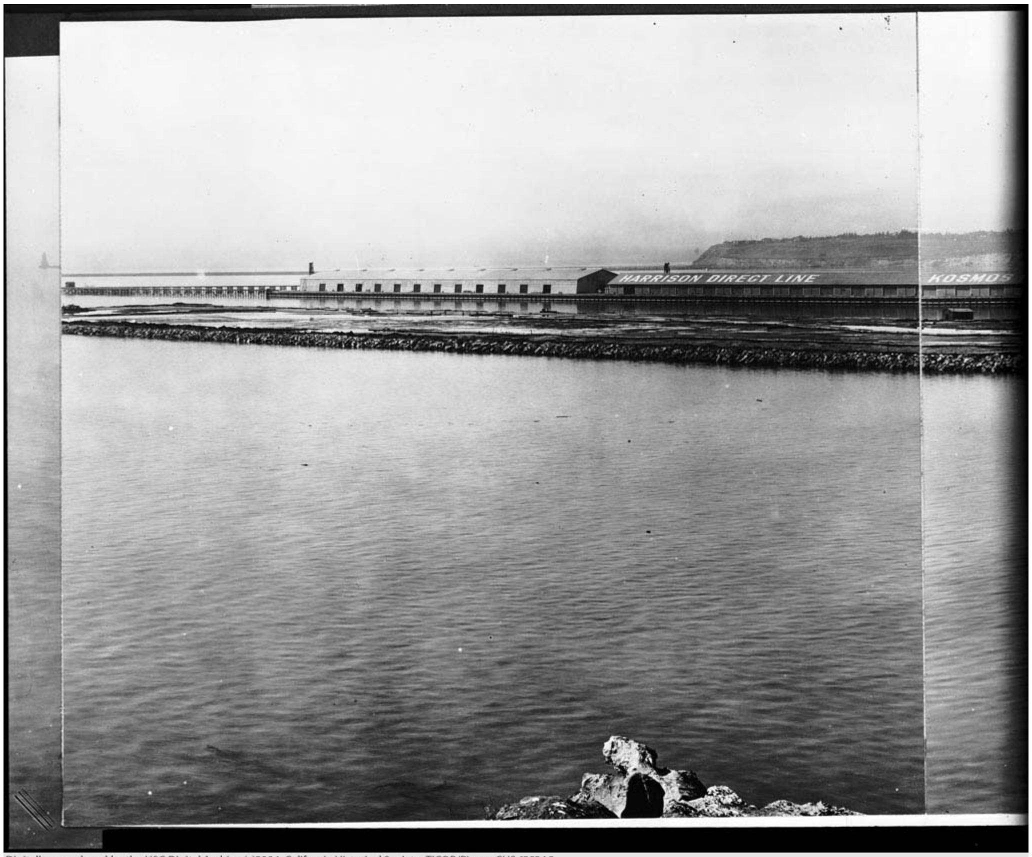
[2] The concrete pile construction was not completed without difficulties, however. According to the 1912-1913 Port of Los Angeles Board of Harbor Commissioners Annual Report, “Difficulty was encountered in the construction of the reinforced concrete wharf along the west side of Municipal Pier No. 1 through the failure of the first piles manufactured for the wharf. In accordance with the specifications prepared by E. P. Goodrich, consulting engineer, of New York, a waterproofing compound was used in making the piles, but at the end of the 30 days when the piles were allowed to cure under the specifications, they cracked and crumbled when lifted. Other piles were then made without the waterproofing, and they have proven satisfactory when cured 30 days. The construction of the wharf is now going forward without delay.”

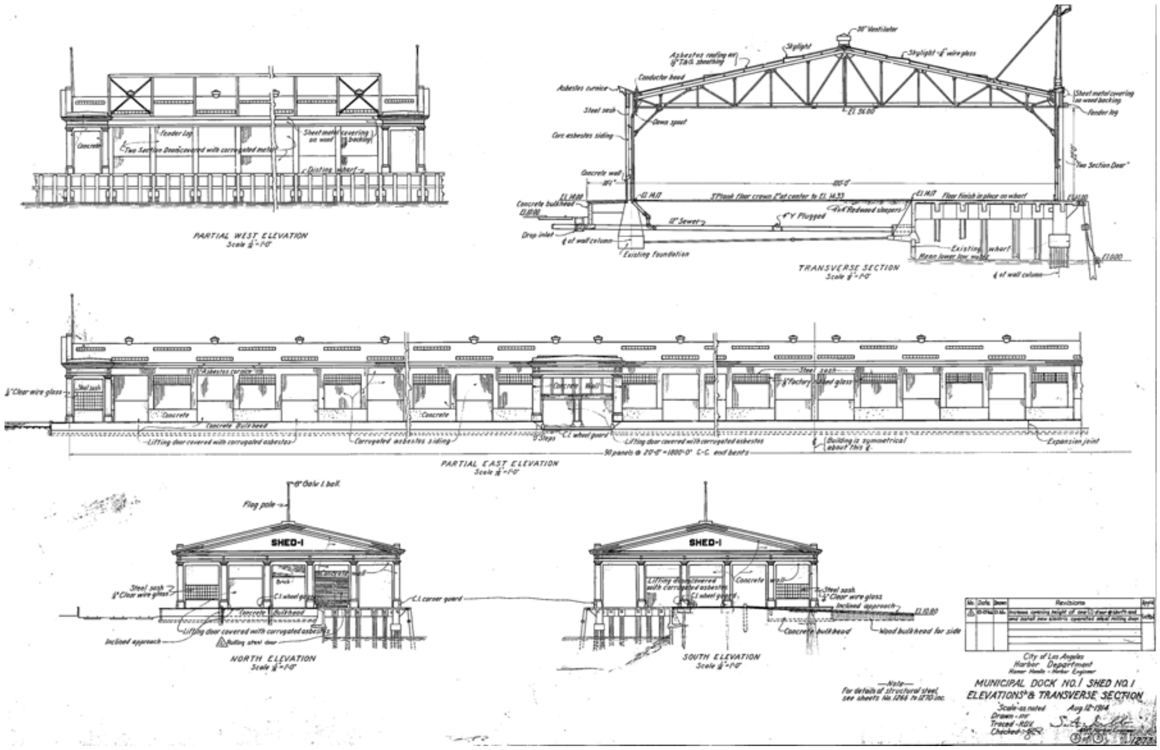


SOURCE: USC Digital Archive

Figure 7
Newly Completed Municipal Pier No.1 looking Southwest across the Main Channel, circa 1914 (Miner Fill and associated sheds located in background)

Harbor Commission President Woodman was quoted in a Los Angeles Times article of December 6, 1914, as stating, “The progress in the harbor at the present time is most satisfactory. All the slow and difficult operations, such as dredging, filling, and bulkheading have been attended to, and the dock itself is as complete as could be desired. From now on until the probably distant time when the growth of shipping shall have made additional docks on other city frontage necessary, the development of the Outer Harbor will be simple. Los Angeles is now fully ready to go ahead with wharves, sheds and warehouses as fast as they are needed” (LAT, December 6, 1914).

Los Angeles Municipal Shed No. 1 (Berths 58-60) was constructed on site by 1915 (LAT, May 31, 1914; Board of Harbor Commissioners, 1913-1915). The shed, a one-story steel-frame building, measured 1800 feet long by 100 feet wide. The shed was constructed for, and operated by, the American-Hawaiian Steamship Company (see Figure 8). A portion of the Municipal Pier No. 1 structure can be seen supporting Shed No. 1 in Figure 8.



SOURCE: POLA

Figure 8
Plans for Municipal Transit Shed No. 1 (Berth 58-60), 1914

Additional transit sheds and other structures were added to the dock over the next several years, including Municipal Warehouse No. 1, a massive, six-story concrete warehouse, which was completed in 1917 (Board of Harbor Commissioners, 1913-1915; Marquez and De Turenne, 2007). See discussion of Municipal Warehouse No. 1, below. The Los Angeles Times article from 1914, anticipating the construction of Warehouse No. 1, claimed that the structure will be the "largest west of Chicago," and noted that together with adjacent Municipal Shed No.1, "the port is expected to meet all shipping requirements for the present" (LAT, December 6, 1914).

Figure 9 shows an aerial view of Municipal Pier No. 1 with completed warehouses and sheds.

Municipal Warehouse No. 1

Municipal Warehouse No. 1 is a large, six-story structure containing 500,000 square feet in its 475 by 150-foot rectangular plan (see Figure 10 on page 20). The building was designed in 1915 by Peter Ficker, then an employee of the Harbor Engineers office.[3] It was constructed with steel reinforced, poured-in place concrete, and has a flat roof with a short parapet wall with an unornamented cornice. The building is characterized by vertical elements on all elevations,

[3] Peter Ficker also designed Municipal Transit Shed No. 1.

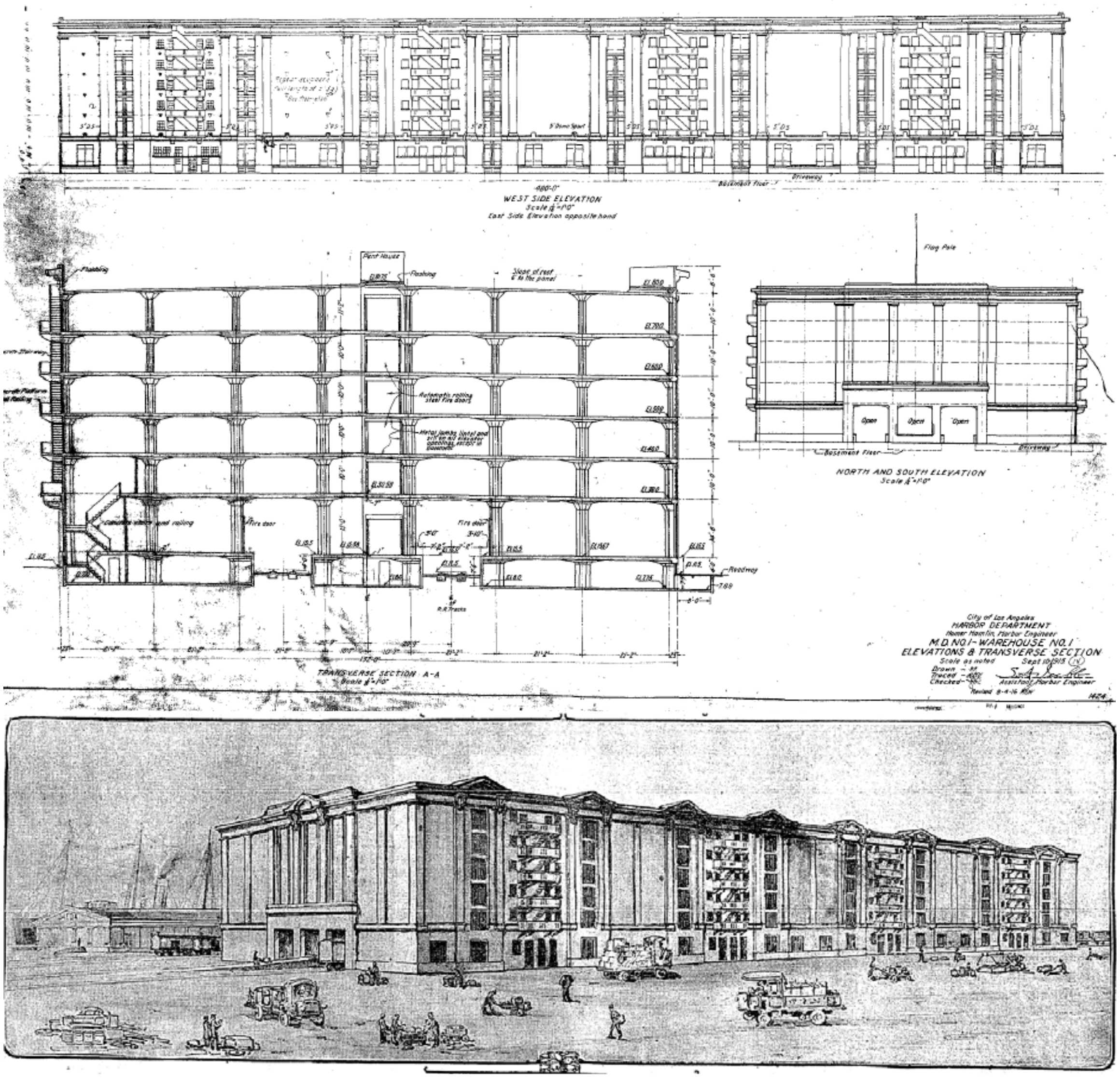
SOURCE: LAPL Photo Database

Figure 9
Aerial View of Completed Municipal Pier No. 1 showing Warehouse No. 1 (right), Municipal Shed No. 1 (Transit Shed Berths 57-60) (left) and the Pan American Petroleum Co. in the background, October 17, 1925

including full-height engaged pilasters, projecting concrete fire-escape stairways, steel loading bay doors at each floor level, and cast-concrete gargoyle drain spouts at each floor level. The building sits at the southeastern end of Municipal Pier No. 1 adjacent to Berths 59-60, located between Signal Street to the west, the Main Ship Channel on the east and the Outer Harbor to the south. Completed in 1917, Warehouse No.1 served as the Port's only bonded warehouse. International trade required a bonded location for the temporary storage of goods that would go through customs. The bonded portion of a warehouse was also used for particularly valuable goods. During the era of break-bulk cargo handling, warehousing at the port terminals was important for efficient commerce, and Warehouse No.1 served a leading role in warehousing at the Port of Los Angeles from 1917 through the 1950s (Jones & Stokes, 1999).

Transit Sheds 57-60

Transit Shed at Berth 57 was constructed in 1923, immediately north of Municipal Shed No 1. (Sheds at Berths 58-60). The one-story shed, 93 feet wide by 500 feet long, was erected by the James A. Lynch Construction Company under contract with the Port of Los Angeles at a cost of approximately $200,000.



SOURCE: POLA

Figure 10
Plans and Drawings for Municipal Warehouse No. 1, 1917

Plans on file with the Port of Los Angeles indicate that a timber wharf extension had been planned along the western edge of the all-concrete pier adjacent to Transit Sheds 57-60 as early as 1924 (Port of Los Angeles, 1924). However, these plans were abandoned in favor of an all-concrete wharf, which was constructed nearly 14 years later in July, 1938. This effort widened the pier by another 30 feet and provided new trackage for railcars loading and unloading goods at Berths 57-60.

The Pan American Petroleum Company Marine Loading Station Facility at Berth 70, including the Westway Terminal Building, was also constructed in 1923.

Summary

Municipal Pier No. 1 became an integral part of the Port during the early half of the 20th Century as several private industries, local and federal government established buildings in the area. Portions of the Pier were also used for US naval functions during World War II. The basic layout and facilities at the Pier have changed little since the late 1920s beyond additions to the tank farms on the east side of the Pier (Los Angeles Board of Harbor Commissioner Annual Report 1924-25). Other minor changes to the Pier itself which occurred within the last 20 years include of newer timber fender piles along the western edge, and a floating dock for a water taxi service constructed on the southern end.

As noted in Jones & Stokes' National Register Nomination form for Municipal Warehouse No. 1. "The process of transshipment dictated the order in which the Harbor Commission funded construction activities: dredging of the ship channel, construction of [Municipal] Pier 1 and associated wharves, transit sheds, and rail lines, and construction of the massive, bonded warehouse. With these facilities in place, the Port of Los Angeles entered into international commerce, and by 1923 had surpassed all the other west coast ports in tonnage and value of cargo" (Jones & Stokes, 1999).

5. Description and Evaluation of Municipal Pier No. 1

5.1 Description

Municipal Pier No. 1 consists of a continuous, earthen-fill pier, with a concrete perimeter wall (bulkhead) extending south from 22nd Street along Signal Street. The Pier is approximately 2,600 feet long (measured from 22nd Street) and about 600 feet wide, or about 36 acres in size. The Pier is approximately 16 feet above the low-water level. Signal Street runs north-south down the approximate center of the Pier, providing vehicular access to the sheds and warehouses on the Pier. Photos of the structure are provided in Appendix A, and period plans and drawings can be found in Appendix C.

The entire eastern edge of the Pier is comprised of sloped, rip-rap edge oriented at a 45-degree angle to the water. A sloped rip-rap edge can also be found on the majority of the southern end of the Pier, for a length of approximately 530 feet. The remaining 70 feet of the southern end is comprised of concrete pilings and decking. The western edge of the Pier is comprised entirely of concrete pilings, formed in two distinct, parallel, rows. The landward row of concrete pilings is about 40 feet wide and 2,520 feet long, and dates to the Pier's original construction in 1912-1914. Lengthwise, the reinforced concrete piles are spaced about 15 feet apart, and are seven rows deep. Each piling row is spaced approximately 5.5 to 6 feet apart. The pilings, which are roughly octagonal in plan, range in length from 50 to 60 feet in length, and support a board-formed concrete deck of the same width and length (40 feet by 2,520 feet). The landward row of pilings is only visible from the southern edge of the Pier, where the rows of pilings are exposed.

Located immediately west from, and attached to, this first landward row of pilings is a second row of seaward pilings which are about 30 feet wide and 2,520 feet long, and were constructed during the Pier's westward expansion in 1938. Lengthwise, the reinforced concrete piles are spaced about 15 feet apart, and are five rows deep. Each piling row is spaced approximately 5.5 feet apart. The reinforced concrete pilings are generally square in plan, and range in length from about 62 to 78 feet. Steel-wrapped cross-bracing piles set at an approximate 45 degree angle are visible beneath the deck. These pilings support a reinforced, board-formed, concrete deck of the same width and length (30 feet by 2,520 feet). The fendering system along the western edge consists of newer timber piles attached to the outer (westernmost) row of concrete pilings.

The majority of the decking on Municipal Pier No. 1 is primarily asphalt over earth fill, while smaller portions along the western edge of the Pier are asphalt over concrete decking. Smaller amounts of all-concrete decking are also visible, such as along loading ramps leading to Warehouse No. 1, and between the sheds at Berths 57 and 58. Three rows of railroad tracks are embedded in the Pier and are located between Signal Street and the Sheds at Berths 57-60. Curving side tracks can also be found leading to the northern end of Warehouse No. 1, and to the tank farm located along the Pier's northeastern edge. Two rows of railroad tracks can also be found along the western edge of the Pier where the concrete pile-supported wharf is located adjacent to Sheds 57-60. Wood bullrails are located along the westernmost edge of the Pier, interspersed with iron cleats located at regular intervals. A floating wooden dock and ramp for the water taxi service is located on the southeastern end of the Pier.

The majority of the pier appears to be in original condition, although some spalling and exposure of the reinforcement steel is visible on the pilings at the southernmost end of the structure (and especially within the first row of concrete pilings). Newer concrete and asphalt overlays are visible on the pier decking, some of which obscures the original railroad tracks in various locations.

Numerous structures are located on Municipal Pier No. 1. Six of these structures were previously recommended eligible for listing in the NRHP and CRHR, and are briefly described in the section below. The following is an evaluation of the historical significance of Municipal Pier No. 1. Although the Municipal Fish Market is located on the northeast corner of Municipal Pier No. 1, it has separate historical associations from this structure, and is not described below.

5.2 Evaluation

Municipal Pier No. 1 is representative of the Los Angeles Harbor's massive expansion effort in anticipation of the completion of the Panama Canal in 1914, resulting in vastly increased shipping capacity at the Port, and allowing Los Angeles to compete with other world cities for international shipping traffic. As a facility that has been in continuous use since its construction, Municipal Pier No. 1 is an excellent representation of the growth and development of the Port of Los Angeles during the planning and the completion of the Panama Canal. Completion of the massive, earth-fill pier allowed the construction of Warehouse No. 1, Municipal Shed No. 1 (Transit Sheds at Berths 58-60), as well as Transit Shed at Berth 57 to follow in rapid succession as part of a overall plan for port expansion envisioned by harbor commissioners in the 1910s. The local press extolled the initial proposal to construct the Pier in 1912, and as chronicled its completion in 1914, thereby expressing the enthusiasm of the era to capture a larger share of the increased world trade resulting from the opening of the Canal, and by comparing the Pier with other major piers in ports around the world in an attempt to position the Port of Los Angeles in an international perspective. During the early half of the 20th Century, Municipal Pier No. 1 became an integral part of the Port as several private industries, local and federal government established buildings in the area. Portions of the pier were also used for U.S. naval functions during World War II. The basic layout of the Pier has changed little since the late 1930s. Therefore, Municipal Pier No. 1, inclusive of the entire 36-acre earth-filled pier plus the concrete pile-supported structure along its western edge, appears to meet **NRHP Criterion A** for its association with events that have made a significant contribution to the broad patterns of our history. For similar reasons, Municipal Pier No. 1 appears to meet the criteria for listing in the **CRHR under Criterion 1**, as well as the City of Los Angeles CHC Criterion as a historic structure that exemplifies the broad cultural, political, economic or social history of the nation, state, and community of Los Angeles.

Although not an example of the first use of an earth-fill pier with a reinforced concrete perimeter wall (bulkhead) and a reinforced concrete pile-supported wharf at the Port of Los Angeles, Municipal Pier No 1. was one of the earliest examples to employ this method of construction in favor of timber construction, which had been the standard method at this time. The successful construction of the adjacent Miner Fill with a reinforced concrete pier provided the model for the construction method of Municipal Pier No. 1. Although this construction method initially met with some opposition from City Engineer Hamlin, Harbor Commission Board members prevailed and promoted reinforced concrete and earth-fill over timber construction. Commissioners believed that concrete structures were the wave of the future, and would help prevent fires given that the Port of Los Angeles was predicted to be one of the largest oil ports in the country. In addition, the reinforced concrete wharf pilings and decking constructed along the western edge of the Pier in 1912 are some of the earliest of such structures found at the Port. Timber pile-supported wharves, by comparison, were built throughout the Port well into the 1940s, and were generally phased out by the 1950s as all-concrete pier construction became favored. Therefore, Municipal Pier No. 1 appears to meet **NRHP Criterion C** because it embodies the distinctive characteristics of a method of construction (early use of and earth-fill pier with a reinforced concrete perimeter wall). For similar reasons, Municipal Pier No. 1 appears to meet the criteria for listing in the **CRHR under Criterion 3**, as well as the City of Los Angeles CHC Criterion as a historic structure that is inherently valuable for a study of a period, style, or method of construction.

Municipal Pier No. 1 does not appear to be significantly associated with the lives of persons significant in our past (NRHP/CRHR B/3), or is likely to yield information important in prehistory or history (NRHP/CRHR D/4).

5.3 Period of Significance

The historic significance of Municipal Pier No. 1 relates to the role that the Port facilities played in expanding the commercial and economic success of Los Angeles, which anticipated and coincided with the opening of the Panama Canal in 1914, the emergence of Los Angeles as an "international" city in the early 1920s, and ending with the initiation of containerization in the 1950s. Therefore, the period of significance for Municipal Pier No. 1 is from 1912 (beginning of pier construction) to 1950 (beginning of containerization).

6. Previously-Identified Historical Resources on or Near Municipal Pier No. 1

A number of buildings and structures located on or near Municipal Pier No. 1 at the Port of Los Angeles were previously evaluated by ICF Jones & Stokes in 1999 and 2008, and were identified as historical resources under federal, state, and local criteria (see Table 1). One facility, Warehouse No. 1, was ultimately listed in the NRHP. Brief statements of each property's historical significance under federal, state, and local criteria are provided below, excerpted from the 1999 and 2008 Jones & Stokes reports.

TABLE 1
PREVIOUSLY-IDENTIFIED HISTORICAL RESOURCES ON MUNICIPAL PIER NO. 1

Name	Date	Historical Status
Warehouse No. 1	1917	Listed in the NRHP/CRHR
Transit Shed Berths 58-60 (Municipal Shed No. 1)	1914	Individually eligible for listing in the NRHP/CRHR
Transit Shed Berth 57	1923	Individually eligible for listing in the NRHP/CRHR
Pan American Petroleum Company Marine Loading Station Facility at Berth 70 (Westway Terminal Building)	1923	Individually eligible for listing in the NRHP/CRHR
Pan-Am Terminal Facility at Berth 56 (California Fish and Game Building)	1930, moved c. 1940	Individually eligible for listing in the NRHP/CRHR
Immigration Station (Canetti's Restaurant, 309 E. 22nd Street)	1921	Individually eligible for listing in the NRHP/CRHR

SOURCE: Jones & Stokes, 1999, and ICF Jones & Stokes, 2008.

Warehouse No. 1

The following is an excerpt of the Statement of Significance from the National Register Nomination form completed for Warehouse No. 1 by Jones & Stokes in 1999.

> Completed in 1917, Warehouse No.1 served as the Port's only bonded warehouse, a function that was critical to the Los Angeles' entry into international trade markets. During the era of break-bulk cargo handling, warehousing at the port terminals played a critical role in achieving economically efficient commerce. Warehouse No.1 served a leading role in warehousing at the Port of Los Angeles from 1917 through the early 1960s when cargo containerization revolutionized cargo handling by nearly eliminating the need for warehousing. Warehouse No.1 continues to serve in its original capacity, and remains a prominent visual landmark for ships entering the deep water channel and for residents and visitors of San Pedro. This building was recommended as eligible for individual listing in

> the NRHP by the US Army Corp of Engineers (Roberts, 1978; Schwartz, 1983), and appears to remain eligible under Criterion A (events), for its close association with the rise to international prominence of the modern port. Since no exceptionally important events or trends are related to the period of 1950-1965, the period of significance is that period of break-bulk cargo transshipment between 1917 and 1950 (Jones & Stokes, 1999).

Transit Shed Berths 58-60

Since their completion in 1914, Transit Shed Berths 58-60 have served as a symbol of the Los Angeles Harbor's expansion period during the build up and completion of the Panama Canal in 1914, which resulted in increased shipping traffic at the port. As a facility that has been in continuous use since its construction, the subject property is an excellent representation of the growth and development of the Port of Los Angeles during the planning and the completion of the Panama Canal. Therefore, Transit Shed Berths 58-60 appears to meet **NRHP Criterion A**. In addition, Transit Shed Berths 58-60 appears significant under **NRHP Criterion C** as an excellent example of neo-classical ornamentation, indicating the importance assigned to architectural design for utilitarian buildings used for Port commerce in the Outer Harbor before the dredging of the Main Channel. For similar reasons, Jones & Stokes found Transit Shed Berths 58-60 to meet the criteria for listing in the **CRHR under Criterion 1** and **Criterion 3**, and appears to meet City of Los Angeles Cultural Heritage Commission (CHC) Criterion as a historic structure that exemplifies the broad cultural, political, economic or social history of the nation, state, and community of Los Angeles (ICF Jones & Stokes, 2008).

Transit Shed Berth 57

Built in 1923, the Transit Shed at Berth 57 is representative of the general growth of the Port of Los Angeles, specifically the Outer Harbor area during the early 1920s. The shed served as a symbol of the Los Angeles Harbor's dramatic growth during the post World War I period, which was largely stimulated by an increase in worldwide commerce and the 1920s oil boom. Expansion at the Port included the development of several berths and oil shipping facilities such as the Transit Shed at Berth 57. Consequently, when considered as part of the larger Outer Harbor area, Transit Shed at Berth 57 is indicative of a period of tremendous growth and progress at the port in the early 20th century and appears to meet the criteria for listing in the **NRHP under Criterion A** individually, and as a possible contributor to a potential Pier No. 1 historic district. For similar reasons, Jones & Stokes found Transit Shed Berth 57 to meet the criteria for listing in the **CRHR under Criterion 1**, and appears to meet City of Los Angeles Cultural Heritage Commission (CHC) Criterion as a historic structure that exemplifies the broad cultural, political, economic or social history of the nation, state, and community of Los Angeles (ICF Jones & Stokes, 2008).

Pan American Petroleum Company Marine Loading Station Facility – Berth 70 (Westway Terminal Building)

Constructed in 1923, the Pan American Petroleum Company Marine Loading Station Facility – Berth 70 (Westway Terminal Building) appears to meet **NRHP Criterion A**. The building gains significance for its contribution to the broad patterns of local history through its association with development of the oil industry in Los Angeles, the early days of oil shipping from the Port of Los Angeles, and as an example of the rise and fall of Pan American Petroleum Company; one the Nation's top oil producers in the 1920s. For similar reasons, Jones & Stokes found the Westway Terminal Building appears to meet the criteria for listing in the **CRHR under Criterion 1**, and appears to meet City of Los Angeles Cultural Heritage Commission (CHC) Criterion as a historic structure that exemplifies the broad cultural, political, economic or social history of the nation, state, and community of Los Angeles (ICF Jones & Stokes, 2008).

Pan-Am Terminal Facility – Berth 56 (California Fish and Game Building)

Built circa 1930 and moved to its current location in 1940, the Pan Am Terminal Facility at Berth 56 (California Fish and Game Building) appears eligible under **NRHP Criterion A**, for its association with Pan Am and its China Clipper pioneering flight service which expanded passenger travel service at the Port of Los Angeles in the years prior to World War II. As a Pan Am ticket office, the building played a key role in the development of aviation transportation heritage of the Southern California region through it association with Pan-Am revolutionizing long distance and transoceanic seaplane flights from Los Angles to the Far East. The structure marks the site of the first Pan Am China Clipper flights from Los Angeles to the Antipodes Islands and New Zealand. For similar reasons, Jones & Stokes found the California Fish and Game Building appears to meet the criteria for listing in the **CRHR under Criterion 1**, and appears to meet City of Los Angeles Cultural Heritage Commission (CHC) Criterion as a historic structure that exemplifies the broad cultural, political, economic or social history of the nation, state, and community of Los Angeles (ICF Jones & Stokes, 2008).

Immigration Station (Canetti's Restaurant, 309 E. 22nd Street)

Constructed in 1921, the former United States Immigration Station appears eligible for the **NRHP under Criteria A** for its association with the Federal Government activities at the Port, as the only extant building designed and used for civilian federal purposes, as well as an excellent representation of the continued use of Port facilities in Cannetti's Restaurant which has become an important part of the Port's cultural heritage. The restaurant, a local institution, has served the Port and surrounding community for well over 50 years, thereby becoming an integral piece of the Port's historic fabric. For similar reasons, Jones & Stokes found the Immigration Station appears to meet the criteria for listing in the **CRHR under Criterion 1**, and appears to meet City of Los Angeles Cultural Heritage Commission (CHC) Criterion as a historic structure that exemplifies the broad cultural, political, economic or social history of the nation, state, and community of Los Angeles (ICF Jones & Stokes, 2008).

7. Evaluation of Municipal Pier No. 1 and Associated Structures as a Potential Historic District

Municipal Pier No. 1, as well as associated structures Warehouse No. 1, Municipal Shed No. 1 (Sheds at Berths 58-50) and the Shed at Berth 57, were designed by City Engineer Homer Hamlin and built as part of a master plan by the Harbor Commission in the 1910s to capture increasing international ship traffic in the Pacific in anticipation of the opening of the Panama Canal; an historic event in worldwide shipping. The planning and construction of these facilities occurred during a time of great expansion of the Port of Los Angeles, while their immense size and Neo-Classical detailing of utilitarian structures reflected the optimism and enthusiasm of the era when the City of Los Angeles as a whole was striving to become a major player on the world stage. The very existence of Warehouse No. 1 Municipal Shed No. 1 (Shed at Berths 58-50) and the Shed at Berth 57 would not be possible without the massive earth-filled and concrete pier that underpins their structures and allows them to function as originally designed and connects them by rail and road to the City at large. With a common function, design, and history, Municipal Pier No. 1 and its associated structures appear to meet **NRHP Criterion A as a potential historic district** for their association with events that have made significant contribution to the broad patterns of our history. For similar reasons, Municipal Pier No. 1 and its associated structures appear to meet the criteria for listing in the **CRHR under Criterion 1 as a potential historic district**, as well as the City of Los Angeles CHC Criterion as a potential historic district that exemplifies the broad cultural, political, economic or social history of the nation, state, and community of Los Angeles.

Due to the early use of reinforced concrete construction at the Port of Los Angeles, which reflected both the permanence and the importance of the facility, Municipal Pier No. 1, and associated structures also appear to meet **NRHP Criterion C as a potential historic district** because they embody the distinctive characteristics of a method of construction. Additionally, Warehouse No. 1 and Municipal Shed No. 1 (Transit Shed at Berths 58-60) are excellent examples of neo-classical ornamentation, indicating the importance assigned to architectural design for utilitarian buildings used for Port commerce. For similar reasons, Municipal Pier No. 1 and its associated structures appears to meet the criteria for listing in the **CRHR under Criterion 3 as a potential historic district**, as well as the City of Los Angeles CHC Criterion as a historic structure that is inherently valuable for a study of a period, style, or method of construction.

As structures intimately tied to the early 20th Century history of Municipal Pier No. 1 and identified as potential historical resources in prior studies, the Pan American Petroleum Company Marine Loading Station Facility at Berth 70 (Westway Terminal Building), the Pan-Am Terminal Facility at Berth 56 (California Fish and Game Building), and the Immigration Station (Canetti's Restaurant, 309 E. 22nd Street) also contribute to the historical significance of a potential Municipal Pier No. 1 historic district. As such, contributors to a potential Municipal Pier No. 1 historic district would include; 1) the entire Municipal Pier No. 1 south of 22nd Street, 2) Warehouse No. 1, 3) Shed at Berths 58-60, 4) Shed at Berth 57, 5) the Pan American Petroleum Company Marine Loading Station Facility at Berth 70 (Westway Terminal Building), 6) the Pan-Am Terminal Facility at Berth 56 (California Fish and Game Building), and 7) the Immigration Station (Canetti's Restaurant).

Non-contributors to the potential Municipal Pier No. 1 historic district would include the tank farm and loading docks on the northeastern end of the pier. Although some of the tanks date to the 1920s, many have been removed, and many new facilities have been constructed within the past 50 years which have degraded the overall integrity of the facility and reduced its ability to convey direct historic associations with Municipal Pier No. 1.

Table 2, below, and Figure 11 on the following page, identify the potential Municipal Pier No. 1 historic district and contributing resources.

TABLE 2
CONTRIBUTORS AND NON-CONTRIBUTORS TO THE POTENTIAL MUNICIPAL PIER NO. 1 HISTORIC DISTRICT

Potential Contributors	Potential Non-Contributors
Municipal Pier No. 1 (from 22nd Street south to the end of Signal Street)	Tank farm and loading docks (northeastern end of the pier)
Warehouse No. 1	Water Taxi docks and trailer buildings
Shed at Berths 58-60	
Shed at Berth 57	
Pan American Petroleum Company Marine Loading Station Facility at Berth 70 (Westway Terminal Building)	
Pan-Am Terminal Facility at Berth 56 (California Fish and Game Building)	
Immigration Station (Canetti's Restaurant at 309 E. 22nd Street)	

Although the Municipal Fish Market is located on the northeast corner of Municipal Pier No. 1, it has historical associations that are distinct from this structure, and is therefore located outside of the potential historic district.

8. Conclusions

Based on an intensive-level survey and evaluation of Municipal Pier No. 1, this facility appears to be individually eligible for listing in the NRHP and CRHR under Criteria A/1 and C/3. The facility also meets the City of Los Angeles CHC Criterion as a historic structure that exemplifies the broad cultural, political, economic or social history of the nation, state, and community of Los Angeles, and as a historic structure that is inherently valuable for a study of a period, style, or method of construction.

Based on this recommendation, as well as the review and incorporation of prior evaluations of the buildings and structures located on or near this facility, Municipal Pier No. 1 is also recommended eligible for listing in the NRHP/CRHR and local register as a potential historic district. Contributors to the potential historic district would include Warehouse No. 1, the Shed at Berths 58-60, the Shed at Berth 57, the Pan American Petroleum Company Marine Loading Station Facility at Berth 70 (Westway Terminal Building), the Pan-Am Terminal Facility at Berth 56 (California Fish and

SOURCE: Google Earth, 2011

Figure 11
Historic District Map

Game Building), and the Immigration Station (Canetti's Restaurant). In summary, these structures appear eligible for listing as contributors to a potential historic district under NRHP/CRHR criteria A/1 for their association with events that have made significant contribution to the broad patterns of our history.

The potential Municipal Pier No. 1 historic district also meets the City of Los Angeles CHC Criterion because it exemplifies the broad cultural, political, economic or social history of the nation, state, and community of Los Angeles. Municipal Pier No. 1 as an entire engineering structure, as well as Municipal Shed No. 1 (Transit Shed at Berths 58-60) additionally appear eligible for listing as contributors to a potential historic district under NRHP/CRHR criteria C/3 because they embody the distinctive characteristics of a type, period, or method of construction (Municipal Pier No. 1 for the early use of reinforced concrete construction, and Municipal Shed No. 1 for the excellent use of neo-classical ornamentation applied to a utilitarian building).

As a result of prior evaluations, the following buildings have been recommended individually eligible for listing in the NRHP, CRHR, and the City of Los Angeles CHC: the Shed at Berths 58-60, the Pan American Petroleum Company Marine Loading Station Facility at Berth 70 (Westway Terminal Building), the Pan-Am Terminal Facility at Berth 56 (California Fish and Game Building), and the Immigration Station (Canetti's Restaurant).

Warehouse No. 1 is currently listed in the NRHP as an individual resource, and is recommended as a contributor to a potential Municipal Pier No. 1 historic district, as described above.

9. Recommendations

Specific recommendations regarding the treatment of identified historical resources are typically provided after Port review of the draft conclusions of this report, as well as after receipt of project plans which may identify demolition of, or substantial alterations to, identified historical resources. The Port's proposed City Dock. No. 1 project, which would rehabilitate and reuse the Transit Shed Berths 57-60 for use as a marine research center, and which may require extensive retrofit or replacement of the concrete pile-supported pier which partially supports these sheds, is currently being designed and is not yet fully developed. Regardless, the typical treatment method for the avoidance of significant impacts to historical resources is the application of the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings* (NPS, 1995).

The proposed transit shed rehabilitation project would likely be subject to the Secretary of the Interior's Standards for *Rehabilitation* (other treatments that would likely not apply include preserving, restoring, and reconstructing). The National Park Service defines *Rehabilitation* as, "the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values."

Some of the most important recommendations contained within the *Standards for Rehabilitation* state that, 1) the historic character of a property shall be retained and preserved, and the removal of historic materials or alteration of features and spaces that characterize a property shall be avoided, and 2) new additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment. More specific guidance will be provided in a subsequent report following Port review of the initial conclusions of this report, and after receipt of project plans.

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_____ "Rush Work Or Forfeit Bond" January 26, 1913.

_____ "Wharf Ready In One Month" May 31, 1914.

_____ "Great Harbor Realized Here" June 20, 1914.

_____ "Harbor Commissioners O.K. Warehouse Plans" December 6, 1914.

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Plans and Drawings

City of Los Angeles Harbor Department, Homer Hamlin, Harbor Engineer, *Municipal Pier No. 1 – Warehouse No. 1, Elevations and Transverse Section*, September 10, 1915. (Drawing No. 1424)

City of Los Angeles, Bureau of Harbor Improvement, City of Los Angeles Harbor Department, *Outer Harbor Wharf General Plan*, August 1912. (Drawing No. 1169)

City of Los Angeles Harbor Department, J.W. Ludlow, Harbor Engineer, *Wharf at Berths 57-60, Plan of Proposed Extension*, June 30, 1924. (Drawing No. 5784).

City of Los Angeles, Bureau of Harbor Improvement, *Outer Harbor Wharf, Plan and Section of Typical Panel for 40-Foot Warf*. May, 1912. (Drawing No. 1170)

City of Los Angeles, Bureau of Harbor Improvement, Homer Hamlin, Harbor Engineer, *Outer Harbor Wharf Typical Panel*, May 1913 (Drawing No. 1170-B)

City of Los Angeles Harbor Department, Office of the Harbor Engineer, Wharf at Berths 57 to 60, Typical Section and Plan, July 7, 1938. (Drawing No. 11685-5)

City of Los Angeles Harbor Department, City of Los Angeles Harbor Department, Municipal Dock No. 1 Shed No. 1, Elevations & Transverse Section, August 12, 1914.

The Port of Los Angeles Engineering Division, *Warehouse at Berth 57, Building Layout Plan*, no date.

The Port of Los Angeles Engineering Division, *Warehouse at Berth 58-60, Building Layout Plan*, no date.

APPENDIX A
Photos

Photos – Municipal Pier No. 1
ESA, December 9, 2010


PORT OF LOS ANGELES
BERTH 60 - 59 - 58
PORT OF LOS ANGELES
5
MPH


US

APPENDIX B
Site Record Forms

***Resource Name or #:** Port of Los Angeles Municipal Pier No. 1

P1. Other Identifier:

***P2. Location:** ☐ **Not for Publication** ■ **Unrestricted** ***a. County:** Los Angeles

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

***b. USGS 7.5' Quad:** San Pedro **Date:** 1964/1981 **T** ;5S **R** 13W; **¼ of ¼ of Sec** 19**;** M.D. **B.M.**

c. Address: Signal Street at 22nd Street City: San Pedro Zip: 90731

d. UTM: Zone: 11 ; mE/ mN (G.P.S.)

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate) Elevation:

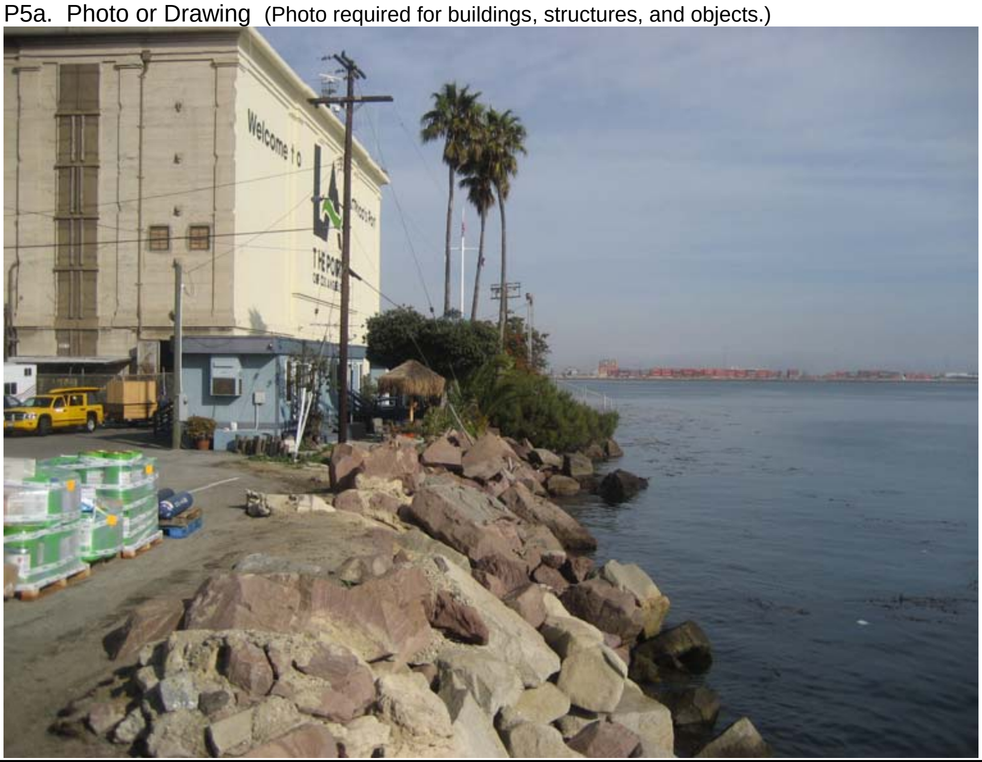
***P3a. Description:** (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

Municipal Pier No. 1 consists of a continuous, earthen-fill pier, with a concrete perimeter wall (bulkhead) extending south from 22nd Street along Signal Street at the Port of Los Angeles in San Pedro, California. The pier is approximately 2,600 feet long (measured from 22nd Street) and about 600 feet wide. The Pier is approximately 16 feet above the low-water level. Signal Street runs north-south down the approximate center of the pier providing vehicular access to the sheds and warehouses on the pier. Photos of the structure are provided in Appendix A. The entire eastern edge of the pier is comprised of sloped, rip-rap edge oriented at a 45-degree angle to the water. A sloped rip-rap edge can also be found on the majority of the southern end of the pier, for a length of approximately 530 feet. The remaining 70 feet of the southern end is comprised of concrete pilings and decking. The western edge of the pier is comprised entirely of concrete pilings, formed in two distinct, parallel, rows. The first row of concrete pilings is about 40 feet wide and 2,520 feet long, and dates to the pier's original construction in 1912-1914. Lengthwise, the reinforced concrete piles are spaced about 15 feet apart, and are seven rows deep. Each piling row is spaced approximately 5.5 to 6 feet apart. The pilings, which are roughly octagonal in plan, range in length from 50 to 60 feet in length, and support a board-formed concrete deck of the same width and length (40 feet by 2,520 feet). The first row of pilings is only visible from the southern edge of the pier, where the rows of pilings are exposed. (see Continuation Sheet)

***P3b. Resource Attributes:** (List attributes and codes) AH13: Wharf

***P4. Resources Present:** ☐Building ■Structure ☐Object ☐Site ☐District ■Element of District ☐Other (Isolates, etc.)

P5a. Photo or Drawing (Photo required for buildings, structures, and objects.)



P5b. Description of Photo: (View, date, accession #)
Southern end of pier looking east 12/9/10

***P6. Date Constructed/Age and Sources:** ■Historic ☐Prehistoric ☐Both
1914 (F)

***P7. Owner and Address:**
Los Angeles Harbor Department
425 S. Palos Verdes Street
San Pedro, CA 90731

***P8. Recorded by:** (Name, affiliation, and address)
Brad Brewster, ESA
225 Bush Street, Suite 1700
San Francisco, CA 94104

***P9. Date Recorded:** 12/9/10

***P10. Survey Type:** (Describe)
Intensive

***P11. Report Citation:** (Cite survey report and other sources, or enter "none.") ESA, *Historic Resources Evaluation Report for Port of Los Angeles Municipal Pier No. 1*, January, 2011

***Attachments:** ☐NONE ☐Location Map ☐Sketch Map ☐Continuation Sheet ■Building, Structure, and Object Record ☐Archaeological Record ☐District Record ☐Linear Feature Record ☐Milling Station Record ☐Rock Art Record ☐Artifact Record ☐Photograph Record ☐ Other (List):

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary #
HRI#
Trinomial

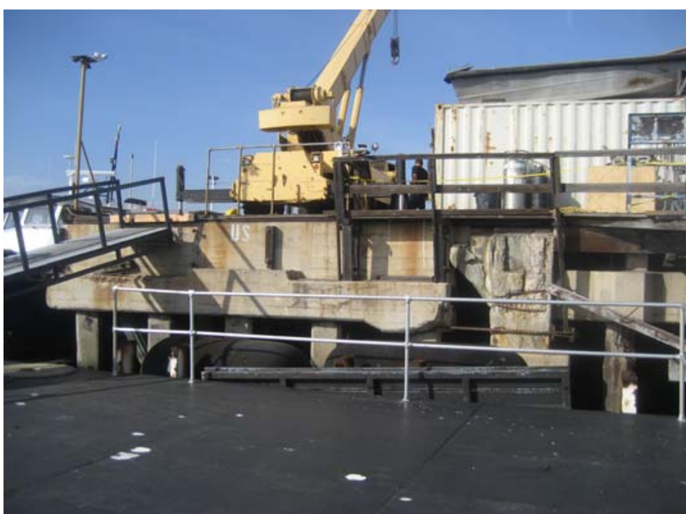
***Resource Name or #** (Assigned by recorder) Port of Los Angeles Municipal Pier No. 1

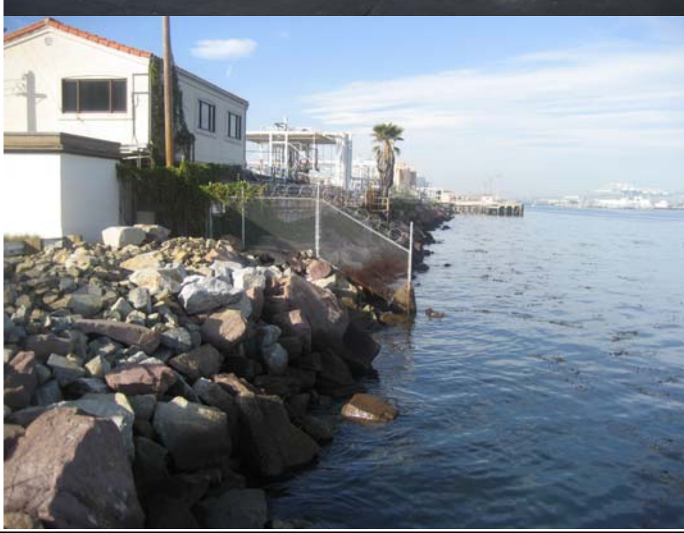
***Recorded by:** Brad Brewster, ESA ***Date:** 1/20/11 ■ Continuation ☐ Update

P3a. Description (continued)

Located immediately west from, and attached to, this first row of pilings is a second row of pilings which are about 30 feet wide and 2,520 feet long, and were constructed during the pier's westward expansion in 1938. Lengthwise, the reinforced concrete piles are spaced about 15 feet apart, and are five rows deep. Each piling row is spaced approximately 5.5 feet apart. The reinforced concrete pilings are generally square in plan, and range in length from about 62 to 78 feet. Steel-wrapped cross-bracing piles set at an approximate 45 degree angle are visible beneath the deck. These pilings support a reinforced, board-formed, concrete deck of the same width and length (30 feet by 2,520 feet). The fendering system along the western edge consists of newer timber piles attached to the outer (westernmost) row of concrete pilings.

The majority of the decking on Municipal Pier No. 1 is primarily asphalt over earth fill, while smaller portions along the western edge of the pier are asphalt over concrete decking. Smaller amounts of all-concrete decking are also visible, such as along loading ramps leading to Warehouse No. 1, and between the sheds at Berths 57 and 58. Three rows of railroad tracks are embedded in the pier located between Signal Street and Sheds at Berths 57-60. Curving side tracks can also be found leading to the northern end of Warehouse No. 1, and to the tank farm located along the pier's northeastern edge. Two rows of railroad tracks can also be found along the western edge of the pier where the concrete pile-supported wharf is located adjacent to Sheds 57-60. Wood bullrails are located along the westernmost edge of the pier, interspersed with iron cleats located at regular intervals. A floating wooden dock and ramp for the water taxi service is located on the southeastern end of the pier. The majority of the pier appears to be in original condition, although some spalling and exposure of the reinforcement steel is visible on the pilings at the southernmost end of the structure (and especially within the first row of concrete pilings). Newer concrete and asphalt overlays are visible on the pier decking, some of which obscures the original railroad tracks in various locations.






BUILDING, STRUCTURE, AND OBJECT RECORD

***NRHP Status Code** 3B

***Resource Name or #** (Assigned by recorder) Port of Los Angeles Municipal Pier No. 1

B1. Historic Name: Municipal Pier No. 1
B2. Common Name: Pier 1.
B3. Original Use: Shipping Pier B4. Present Use: same
***B5. Architectural Style:** utilitarian/industrial
***B6. Construction History:** (Construction date, alterations, and date of alterations)

Completed in 1914, concrete wharf extension along western edge in 1938. Numerous buildings on top of pier added and removed.

***B7. Moved?** ■No ☐Yes ☐Unknown **Date:** **Original Location:**
***B8. Related Features:**

Municipal Shed No. 1 (Transit Shed at Berths 58-60 [1915]), Municipal Warehouse No. 1 (1917), Transit Shed at Berth 57 [1923], Immigration Station (Canetti's Restaurant, 309 E. 22nd Street [1921]), Pan American Petroleum Company Marine Loading Station Facility at Berth 70 (Westway Terminal Building [1923]), and Pan-Am Terminal Facility at Berth 56 (California Fish and Game Building [1930]).

B9a. Architect: Homer Hamlin, Harbor Engineer b. Builder: Snare & Triest
***B10. Significance: Theme:** International Shipping **Area:** Los Angeles
Period of Significance: 1912-1950 **Property Type:** Wharf **Applicable Criteria:** A and C
(Discuss importance in terms of historical or architectural context as defined by theme, period, and geographic scope. Also address integrity.)

Individual Evaluation.

Municipal Pier No. 1 is representative of the Los Angeles Harbor's massive expansion effort in anticipation of the completion of the Panama Canal in 1914, resulting in vastly increased shipping capacity at the port, and allowing Los Angeles to compete with other world cities for international shipping traffic. As a facility that has been in continuous use since its construction, Municipal Pier No. 1 is an excellent representation of the growth and development of the Port of Los Angeles during the planning and the completion of the Panama Canal. Completion of the massive, earth-fill pier allowed the construction of Warehouse No. 1, Municipal Shed No. 1 (Transit Sheds at Berths 58-60), as well as Transit Shed at Berth 57 to follow in rapid succession as part of a overall plan for port expansion envisioned by harbor commissioners in the 1910s. The local press extolled the initial proposal to construct the pier in 1912, as chronicled its completion in 1914, thereby expressing the enthusiasm of the era to capture a larger share of the increased world trade resulting from the opening of the Canal, and by comparing the pier with other major piers in ports around the world in an attempt to position the Port of Los Angeles in an international perspective. During the early half of the 20th Century, Municipal Pier No. 1 became an integral part of the Port as several private industries, local and federal government established buildings in the area. Portions of the pier were also used for US naval functions during World War II.
(See Continuation Sheet)

B11. Additional Resource Attributes: (List attributes and codes)

***B12. References:**

See Continuation Sheet

B13. Remarks:

***B14. Evaluator:** Brad Brewster, ESA

***Date of Evaluation:** January 20, 2011

(This space reserved for official comments.)

(Sketch Map with north arrow required.)

B10. Significance (continued)

The basic layout of the pier has changed little since the late 1930s. Therefore, Municipal Pier No. 1 appears to meet NRHP Criterion A for its association with events that have made significant contribution to the broad patterns of our history. For similar reasons, Municipal Pier No. 1 appears to meet the criteria for listing in the CRHR under Criterion 1, as well as the City of Los Angeles CHC Criterion as a historic structure that exemplifies the broad cultural, political, economic or social history of the nation, state, and community of Los Angeles.

Although not an example of the first use of a reinforced concrete pier at the Port of Los Angeles, Municipal Pier No 1. was one of the earliest examples to employ this method of construction in favor of timber construction. The successful construction of the adjacent Miner fill with a reinforced concrete pier provided the model for the construction method of Municipal Pier No. 1. Although this construction method initially met with some opposition from City Engineer Hamlin, harbor commission board members prevailed and promoted reinforced concrete over timber construction. Commissioners believed that concrete structures were the wave of the future, and would help prevent fires given that the Port of Los Angeles was predicted to be one of the largest oil ports in the country. In addition, the reinforced concrete wharf pilings and decking constructed along the western edge of the pier in 1912 are some of the earliest of such structures found at the Port. Timber pile-supported wharves, by comparison, were built throughout the Port well into the 1940s, and were generally phased out by the 1950s as all-concrete pier construction became favored. Therefore, Municipal Pier No. 1 appears to meet NRHP Criterion C because it embodies the distinctive characteristics of a method of construction (early use of reinforced concrete pier construction). For similar reasons, Municipal Pier No. 1 appears to meet the criteria for listing in the CRHR under Criterion 3, as well as the City of Los Angeles CHC Criterion as a historic structure that is inherently valuable for a study of a period, style, or method of construction.

Municipal Pier No. 1 does not appear to be significantly associated with the lives of persons significant in our past (NRHP/CRHR B/3), or is likely to yield information important in prehistory or history (NRHP/CRHR D/4).

<u>Period of Significance</u>: The historic significance of Municipal Pier No. 1 relates to the role that the Port facilities played in expanding the commercial and economic success of Los Angeles, which anticipated and coincided with the opening of the Panama Canal in 1914, the emergence of Los Angeles as an "international" city in the early 1920s, and ending with the initiation of containerization in the 1950s. Therefore, the period of significance for Municipal Pier No. 1 is from 1912 (beginning of pier construction) to 1950 (beginning of containerization).

<u>Integrity</u>: With few alterations within the last 45 years, Municipal Pier No. 1 retains integrity of location, design, setting, materials, workmanship, feeling, and association.

<u>District Evaluation</u>:

In addition to being individually eligible for listing in the NRHP and CRHR, Municipal Pier No. 1 was evaluated as a potential contributor to a potential *Port of Los Angeles Municipal Pier No. 1 Historic District.* Six structures located on top of, and supported by, Municipal Pier No. 1 were previously evaluated by Jones & Stokes in 1999 and 2008, and were found to be individually eligible for listing in the NRHP and CRHR. These are; Municipal Shed No. 1 (Transit Shed at Berths 58-60 [1915]), Municipal Warehouse No. 1 (1917), Transit Shed at Berth 57 [1923], Immigration Station (Canetti's Restaurant, 309 E. 22nd Street [1921]), Pan American Petroleum Company Marine Loading Station Facility at Berth 70 (Westway Terminal Building [1923]), and Pan-Am Terminal Facility at Berth 56 (California Fish and Game Building [1930]). Warehouse No. 1 was listed in the NRHP and CRHR in 2000.

Municipal Pier No. 1, as well as associated structures Warehouse No. 1, Municipal Shed No. 1 (Sheds at Berths 58-50) and the Shed at Berth 57, were designed by the Harbor Engineering Office and built as part of a master plan by Harbor Commission in the 1910s to capture increasing ship traffic in the Pacific in anticipation of the opening of the Panama Canal; an historic event in worldwide shipping. The planning and construction of these facilities occurred during a time of great expansion of the Port of Los Angeles, while their immense size and Neo-Classical detailing of utilitarian structures reflected the optimism and enthusiasm of the era when the City of Los Angeles as a whole was striving to become a major player on the world stage. The very existence of Warehouse No. 1 Municipal Shed No. 1 (Sheds at Berths 58-50) and the Shed at Berth 57 would not be possible without the massive earth-filled and concrete pier that underpins their structures and allows them to function as originally designed and connects them by rail and road to the City at large. With a common function, design, and history, Municipal Pier No. 1 and its associated structures appear to meet NRHP Criterion A as a potential historic district for their association with events that have made significant contribution to the broad patterns of our history. For similar reasons, Municipal Pier No. 1 and its associated structures appear to meet the criteria for listing in the CRHR under Criterion 1 as a potential historic district, as well as the City of Los Angeles CHC Criterion as a potential historic district that exemplifies the broad cultural, political, economic or social history of the nation, state, and community of Los Angeles.

***Resource Name or #** (Assigned by recorder) Port of Los Angeles Municipal Pier No. 1

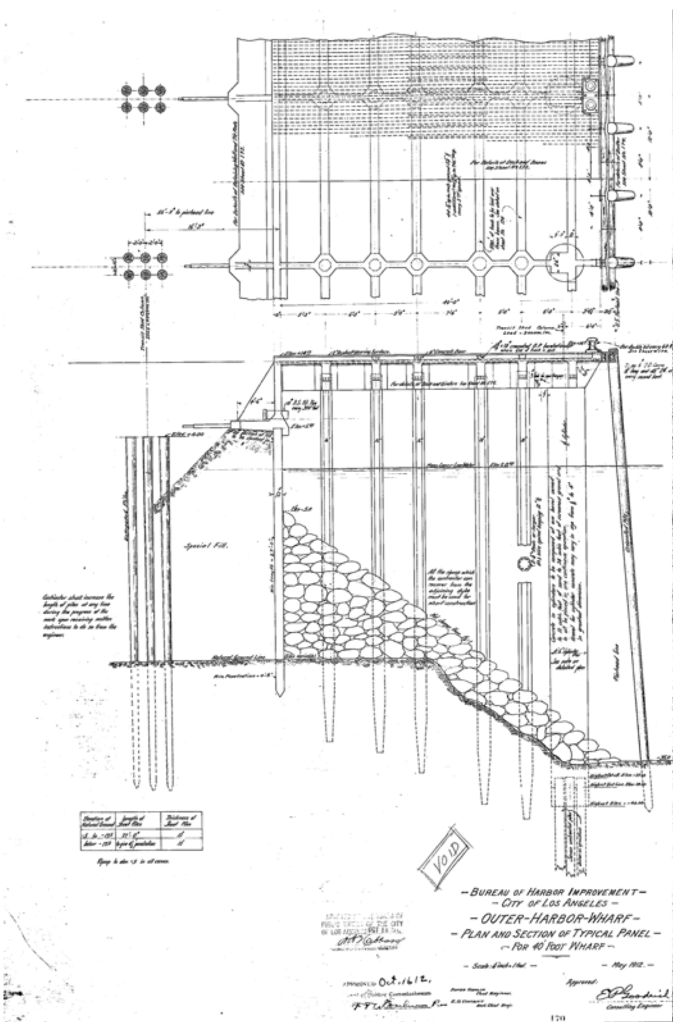
***Recorded by:** Brad Brewster, ESA ***Date:** 1/20/11 ■ Continuation ☐ Update

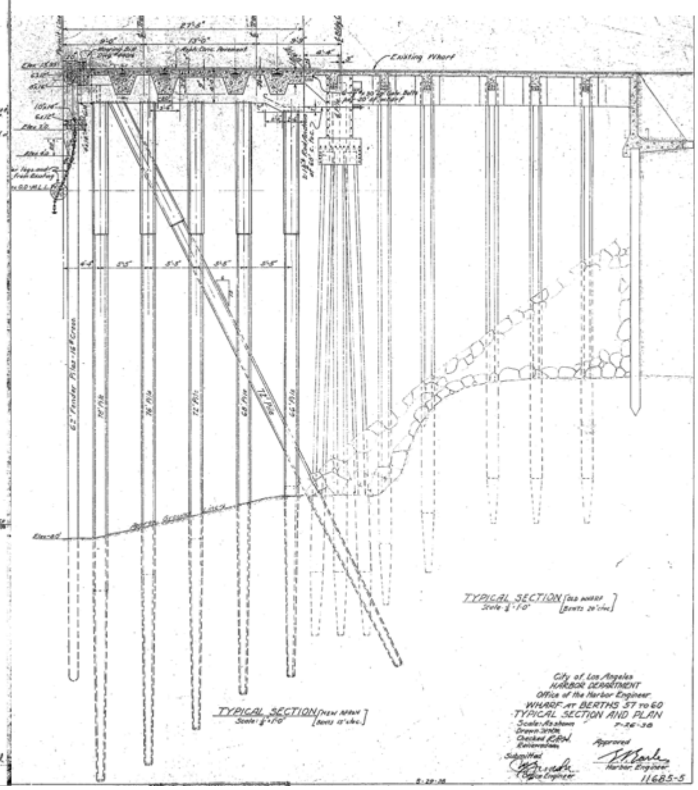
B10. Significance (continued)

Due to the early use of reinforced concrete construction at the Port of Los Angeles, which reflected both the permanence and the importance of the facility, Municipal Pier No. 1, and associated structures also appear to meet NRHP Criterion C as a potential historic district because they embody the distinctive characteristics of a method of construction. Additionally, Warehouse No. 1 and Municipal Shed No. 1 (Transit Sheds at Berths 58-60) are excellent examples of neo-classical ornamentation, indicating the importance assigned to architectural design for utilitarian buildings used for Port commerce. For similar reasons, Municipal Pier No. 1 and its associated structures appears to meet the criteria for listing in the CRHR under Criterion 3, as well as the City of Los Angeles CHC Criterion as a historic structure that is inherently valuable for a study of a period, style, or method of construction.

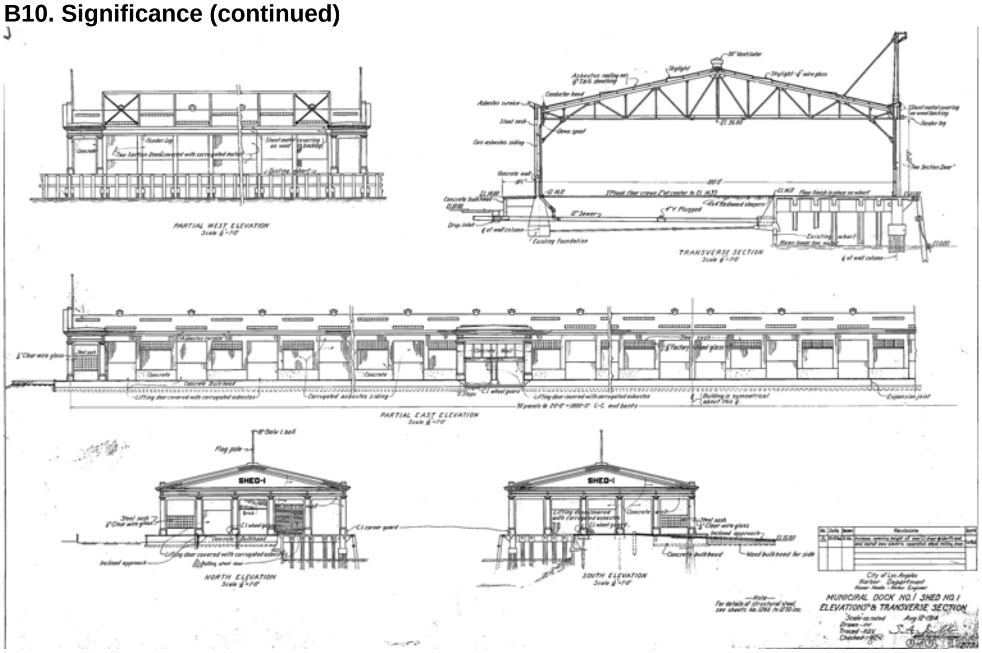
As structures intimately tied to the early 20th Century history of Municipal Pier No. 1 and identified as potential historical resources in prior studies, the Pan American Petroleum Company Marine Loading Station Facility at Berth 70 (Westway Terminal Building), the Pan-Am Terminal Facility at Berth 56 (California Fish and Game Building), and the Immigration Station (Canetti's Restaurant, 309 E. 22nd Street) also contribute to the historical significance of a potential Municipal Pier No. 1 historic district. As such, contributors to a potential Municipal Pier No. 1 historic district would include; 1) the entire Municipal Pier No. 1 south of 22nd Street, 2) Warehouse No. 1, 3) Shed at Berths 58-60, 4) Shed at Berth 57, 5) the Pan American Petroleum Company Marine Loading Station Facility at Berth 70 (Westway Terminal Building), 6) the Pan-Am Terminal Facility at Berth 56 (California Fish and Game Building), and 7) the Immigration Station (Canetti's Restaurant).

Non-contributors to the potential Municipal Pier No. 1 historic district would include the tank farm and loading docks on the northeastern end of the pier. Although some of the tanks date to the 1920s, many have been removed, and many new facilities have been constructed within the past 45 years which have degraded the overall integrity of the facility and reduced its ability to convey direct historic associations with Municipal Pier No. 1.





B10. Significance (continued)



<u>References</u>:

Beck, W., and Y. D. Haase, Historical Atlas of California, University of Oklahoma Press, Norman, OK, 1974.

Fugro West, Inc. Final Phase II Cultural Resources Reconnaissance Survey of 7,500 Acres of Land and Water for the Port of Los Angeles, City of Los Angeles, California. Prepared for the Port of Los Angeles Environmental Management Division. Prepared by San Buenaventura Research Associates under subcontract for Fugro West, Inc. Ventura, California, 1997.

ICF Jones & Stokes, Final Architectural Survey and Evaluation of Signal Street Properties, Port of Los Angeles, Los Angeles, California, Prepared for the Los Angeles Harbor Department, December, 2008.

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LAT (Los Angeles Times)
_____ "Los Angeles Harbor Development Great" March 26, 1911.
_____ "Make Way Far Ships Says Harbor Board: February 6, 1912.
_____ "Opens Bids For Municipal Dock" October 19, 1912.
_____ "Board Awards Wharf Contract" December 20, 1912.
_____ "Rush Work Or Forfeit Bond" January 26, 1913.
_____ "Wharf Ready In One Month" May 31, 1914.
_____ "Great Harbor Realized Here" June 20, 1914.
_____ "Harbor Commissioners O.K. Warehouse Plans" December 6, 1914.

Marquez, Ernest and Veronique de Turenne, Port of Los Angeles: An Illustrated History from 1850 to 1945, Angel City Press, Santa Monica, CA, 2007.

Matson, C. H. (ed.), Handbook of World Trade: Los Angeles, U.S.A., World Commerce Bureau, Los Angeles, CA, 1920.

Queenan, C. F., Long Beach and Los Angeles: A Tale of Two Ports, Windsor Publications, Northridge, CA, 1986.

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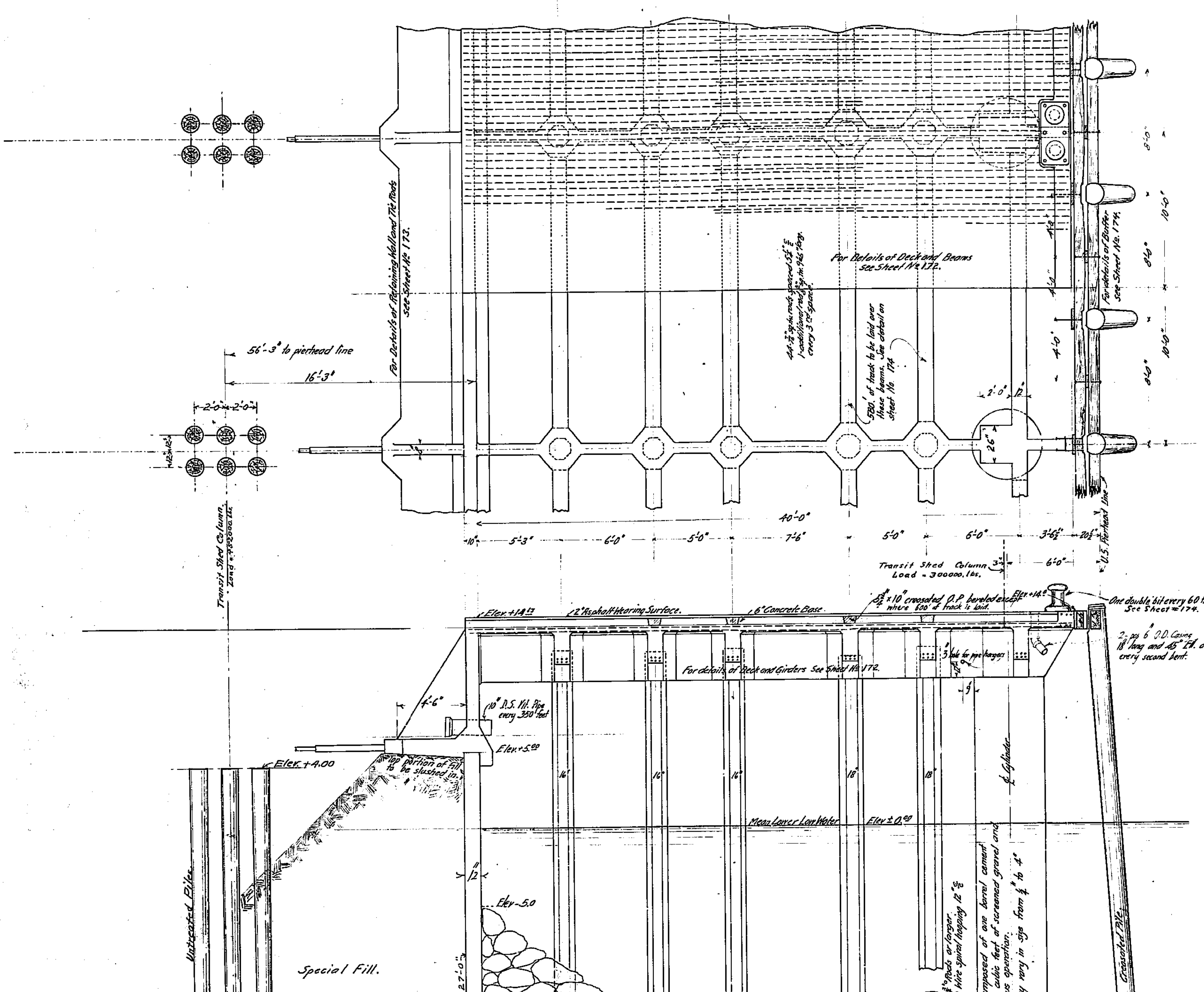
APPENDIX C
Plans and Drawings



Contractor shall increase the length of piles at any time during the progress of the work upon receiving written instructions to do so from the engineer.

Elevation of Natural Ground	Length of Sheet Piles	Thickness of Sheet Piles
-5 to -17.5	27'-0"	12"
below -17.5	to give 4½' penetration	12"

Riprap to elev. -5 in all cases.

VOID

— BUREAU OF HARBOR IMPROVEMENT —
— CITY OF LOS ANGELES —

— OUTER-HARBOR-WHARF —

— PLAN AND SECTION OF TYPICAL PANEL. —
— FOR 40' FOOT WHARF —

— Scale: ¼ inch = 1 foot. — — May 1912. —

ADOPTED BY THE BOARD OF PUBLIC WORKS OF THE CITY OF LOS ANGELES OCT 18 1912
SECRETARY

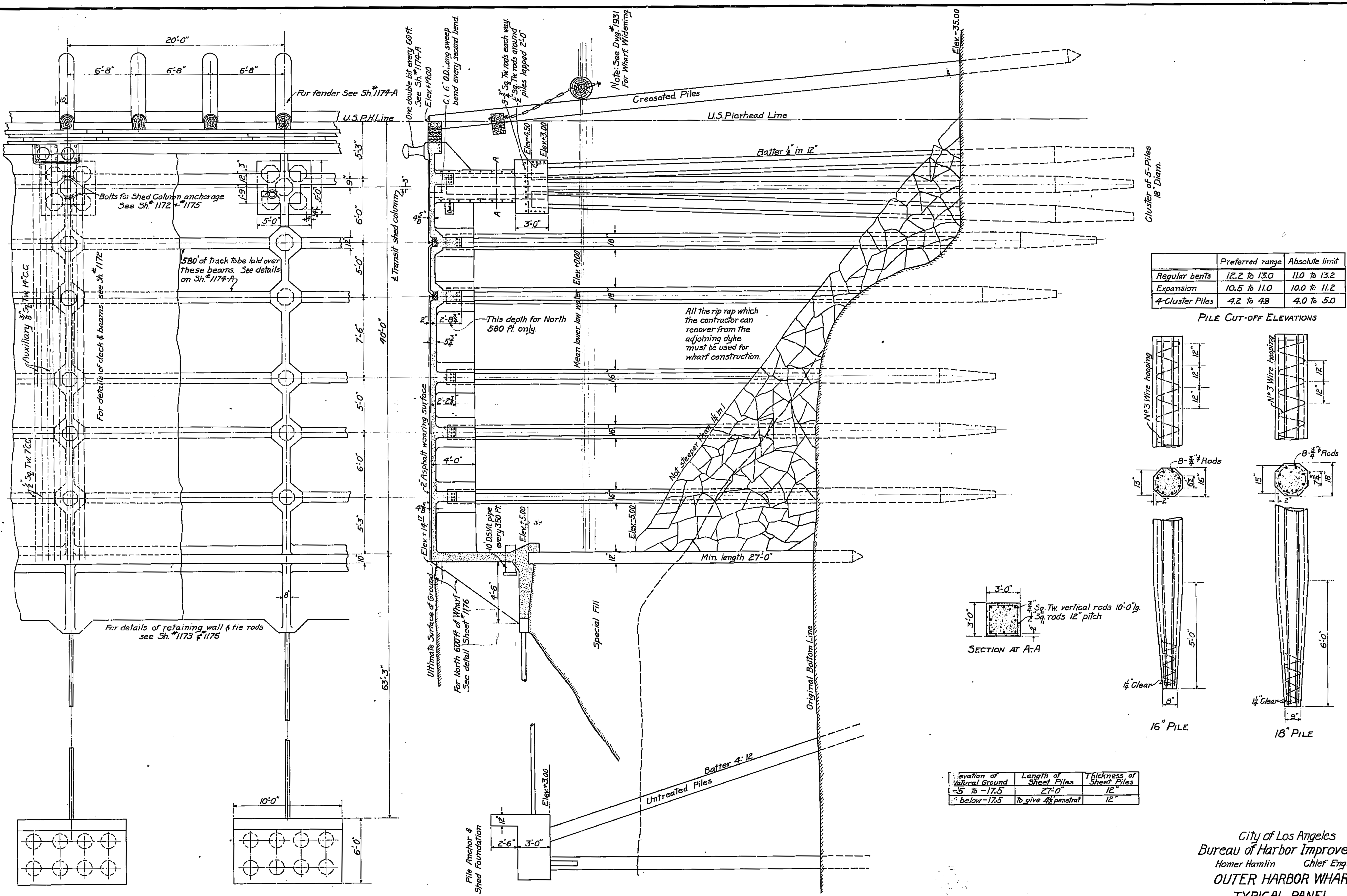
APPROVED Oct. 16 12.
Board of Harbor Commissioners
F T W... Pres

Homer Hamlin, Chief Engineer.
E. R. Vincent, Asst. Chief Engr.

Approved:
E P Goodrich
Consulting Engineer

170

1170



	Preferred range	Absolute limit
Regular bents	12.2 to 13.0	11.0 to 13.2
Expansion	10.5 to 11.0	10.0 to 11.2
4-Cluster Piles	4.2 to 4.8	4.0 to 5.0

Pile Cut-off Elevations

Elevation of Natural Ground	Length of Sheet Piles	Thickness of Sheet Piles
-5 to -17.5	27'-0"	12"
below -17.5	to give 4 1/2' penetrat	12"

City of Los Angeles
Bureau of Harbor Improvement
Homer Hamlin Chief Engr.

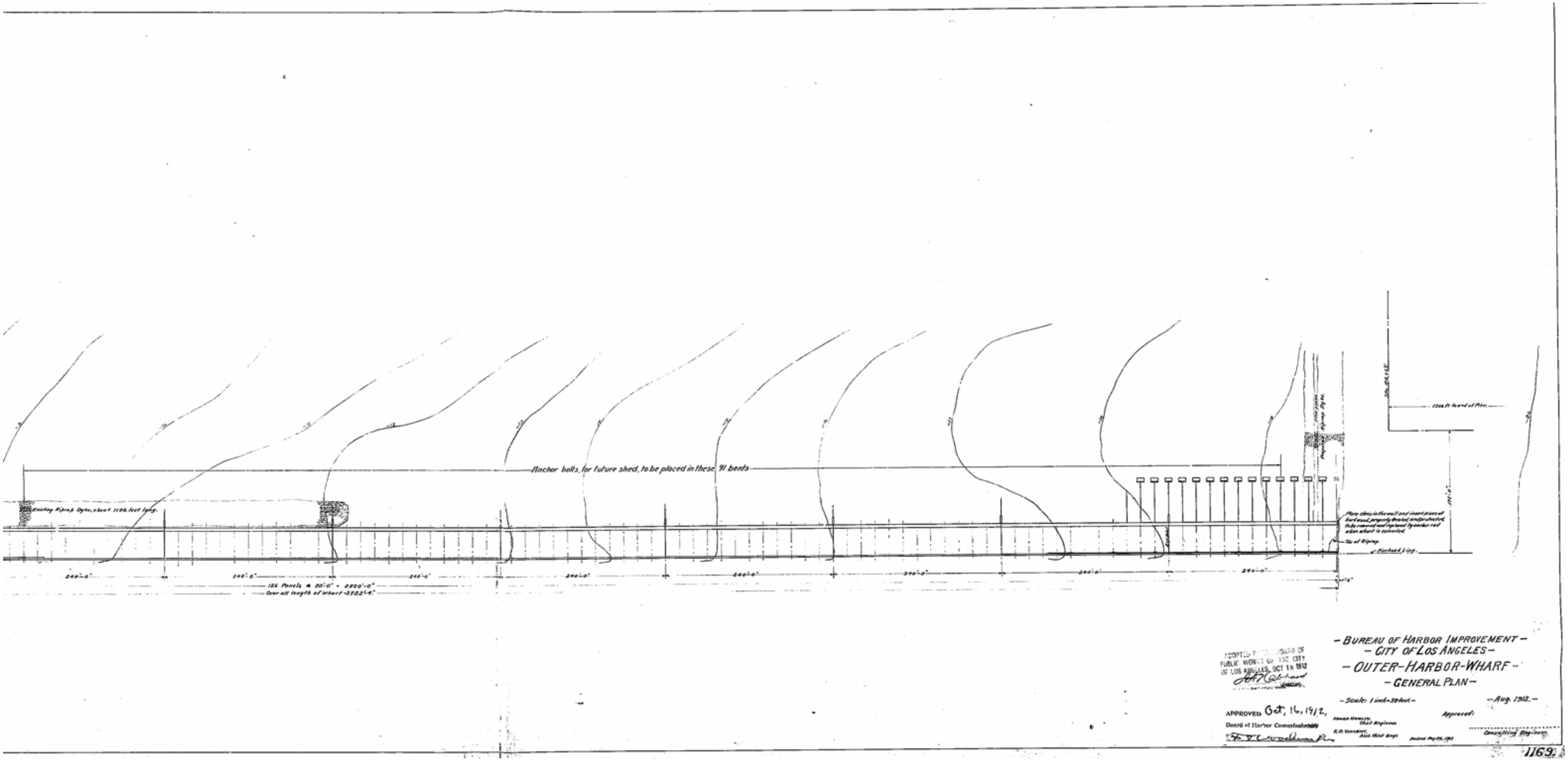
OUTER HARBOR WHARF
TYPICAL PANEL

Scale 1/4" = 1'-0" May-3-13.

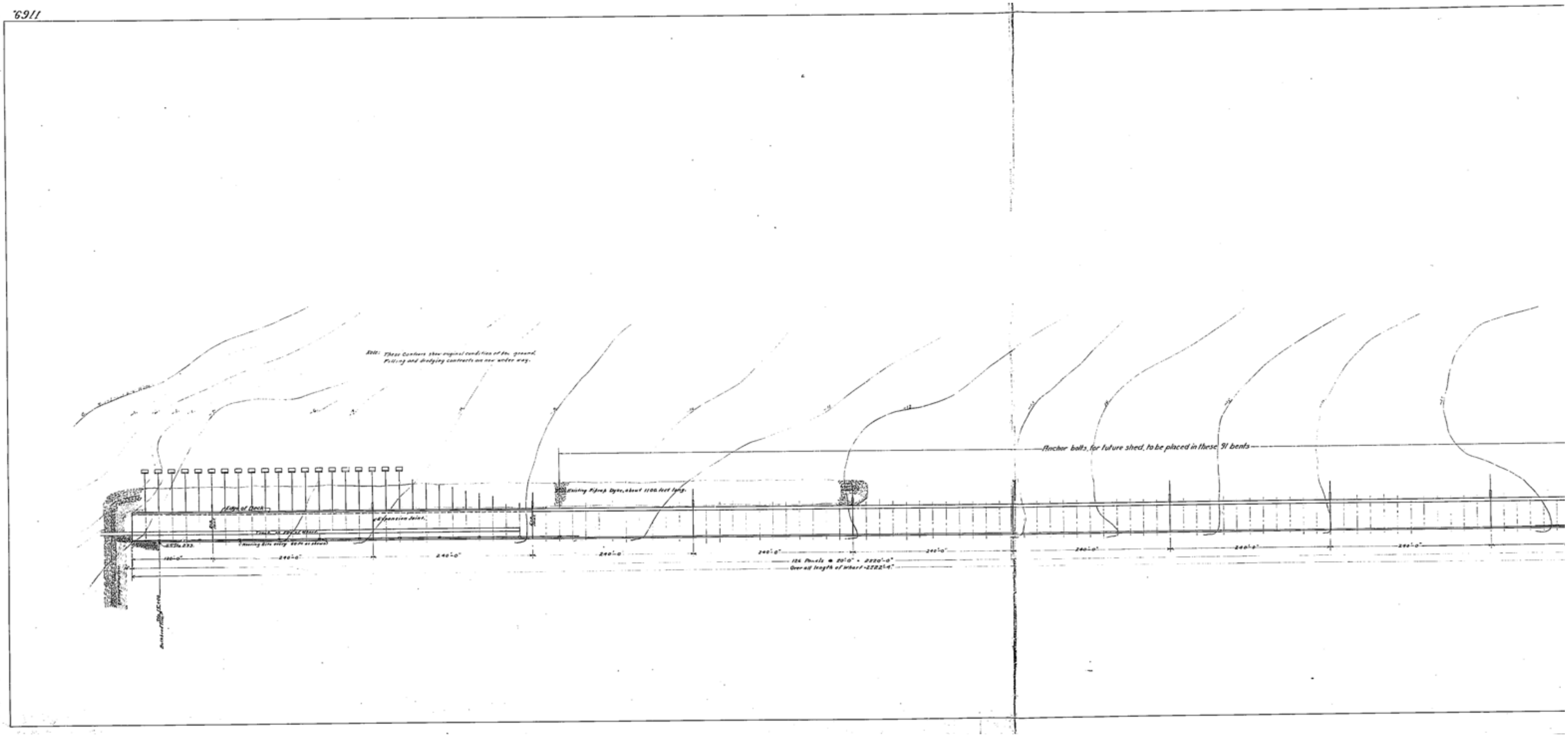
Dr.-H.S.
Tr.-H.S.
Ch.-J.W.L.

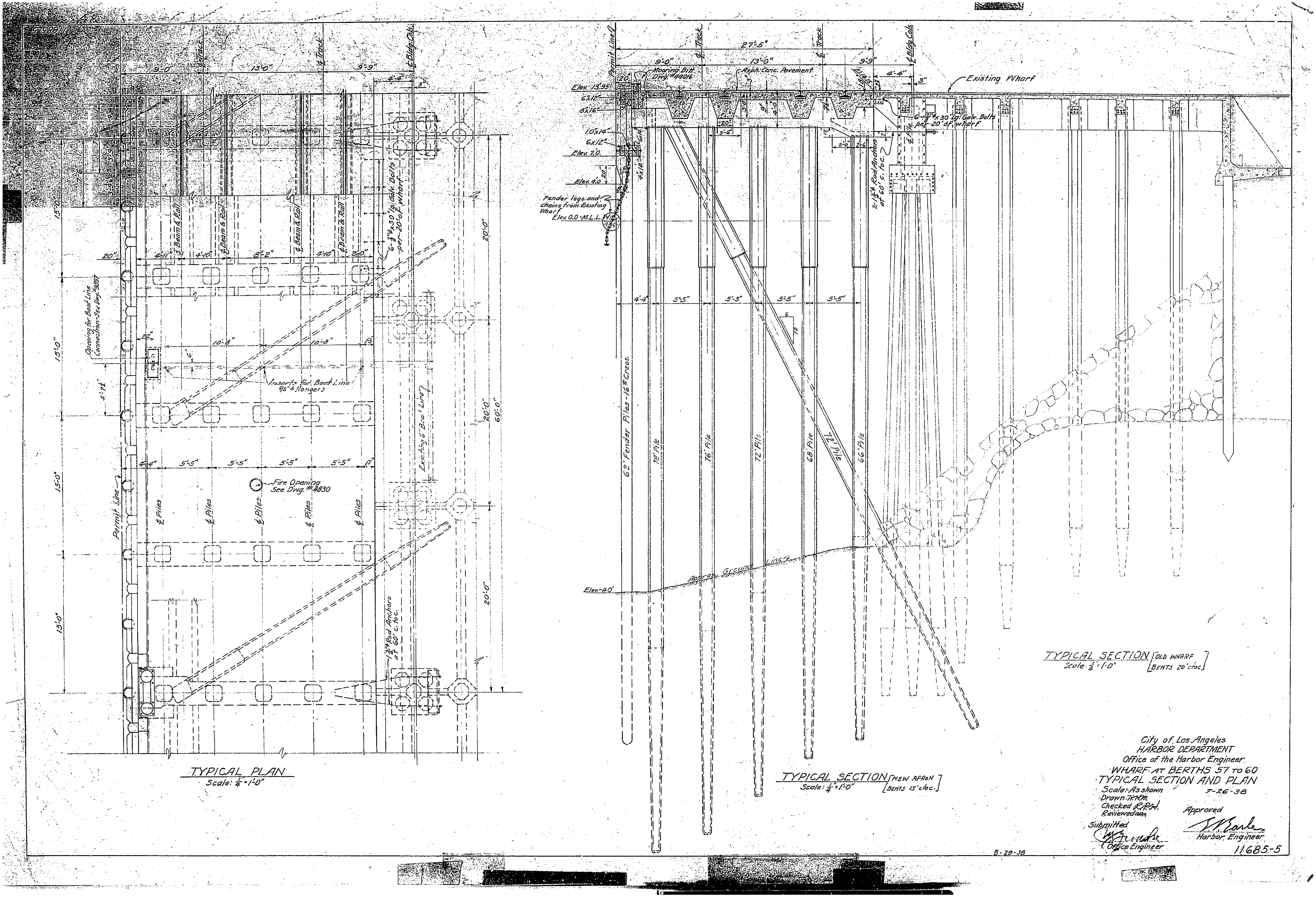
S. A. Jubb
Asst. Chf. Engr.

Retraced Nov. 19-1926 P.M.S. Revised May 27-1913

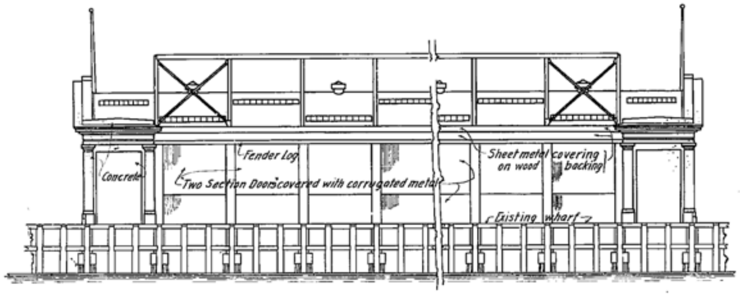


Anchor bolts, for future shed, to be placed in these 91 bents
126 Panels @ 20'-0" = 2520'-0"
Over all length of wharf = 2522'-4"
240'-0"
ADOPTED BY THE BOARD OF PUBLIC WORKS OF THE CITY OF LOS ANGELES, OCT 18 1912
APPROVED Oct, 16, 1912,
Board of Harbor Commissioners
- BUREAU OF HARBOR IMPROVEMENT -
- CITY OF LOS ANGELES -
- OUTER-HARBOR-WHARF -
- GENERAL PLAN -
- Scale: 1 inch = 50 feet -
- Aug. 1912. -
Approved:
Consulting Engineer.
1169

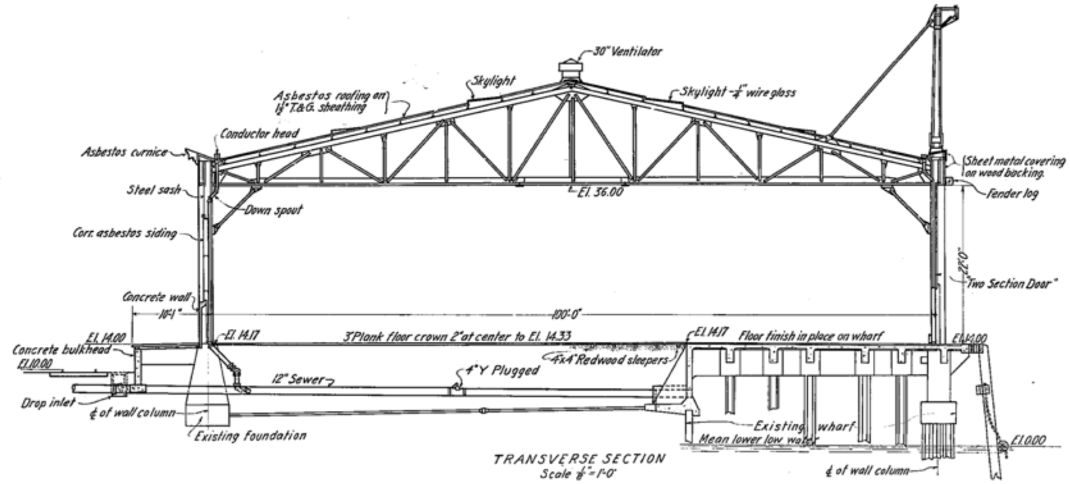
Note: These Contours show original condition of the ground. Filling and dredging contracts are now under way.
Edge of Deck
Expansion Joint.
Mooring Bits every 60 Ft as shown
Existing Riprap Dyke, about 1100 feet long.
Anchor bolts, for future shed, to be placed in these 91 bents
120'-0"
240'-0"
240'-0"
240'-0"
240'-0"
240'-0"
240'-0"
240'-0"
240'-0"
240'-0"
126 Panels @ 20'-0" = 2220'-0"
Over all length of Wharf - 2222'-4"


TYPICAL PLAN
Scale: 1/4"=1'-0"
TYPICAL SECTION [NEW APRON BENTS 15' c to c.]
Scale: 1/4"=1'-0"
TYPICAL SECTION [OLD WHARF BENTS 20' c to c]
Scale: 1/4"=1'-0"
Existing Wharf
Mooring Bitt Drwg. #4016
Asph. Conc. Pavement
Permit Line
Fender logs and Chains from Existing Wharf
Elev. 13.95
Elev. 7.0
Elev. 4.0
Elev. 0.0 M.L.L.W.
Elev. -4.0
Apron Ground Line
62' Fender Piles - 16# Creos.
78' Pile
76' Pile
72' Pile
68' Pile
66' Pile
72' Pile
6-3/4"x30" Lg. Galv. Bolts per 20' of wharf
2-1 3/4" Rod Anchors at 60' c. to c.
Opening for Boat Line Connection - See Drwg. #3857
Inserts for Boat Line 9/16" ø Hangers
Fire Opening See Drwg. #4830
Existing 6" Boa(t) Line
Beam & Rail
℄ Piles
℄ Track
℄ Bldg. Cols.
City of Los Angeles
HARBOR DEPARTMENT
Office of the Harbor Engineer
WHARF AT BERTHS 57 TO 60
TYPICAL SECTION AND PLAN
Scale: As shown
Drawn: H.H.M.
Checked R.R.H.
Reviewed: a.a.m.
7-26-38
Submitted
Office Engineer
Approved
Harbor Engineer
8-29-38
11685-5

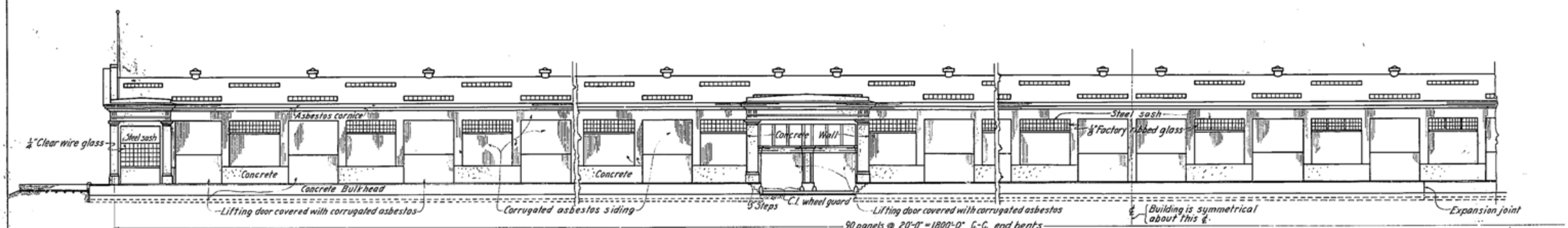
1273



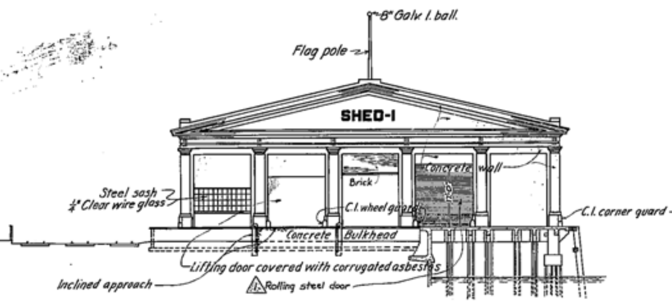
PARTIAL WEST ELEVATION
Scale 1/16" = 1'-0"



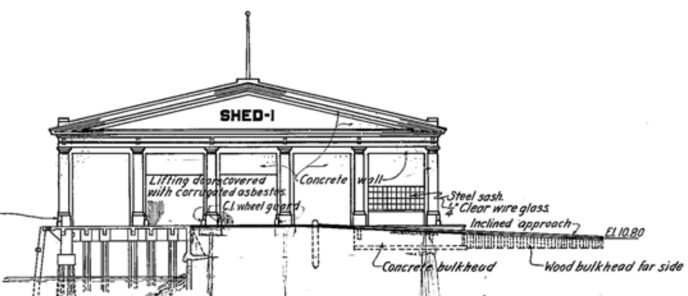
TRANSVERSE SECTION
Scale 1/8" = 1'-0"



PARTIAL EAST ELEVATION
Scale 1/16" = 1'-0"



NORTH ELEVATION
Scale 1/16" = 1'-0"



SOUTH ELEVATION
Scale 1/16" = 1'-0"

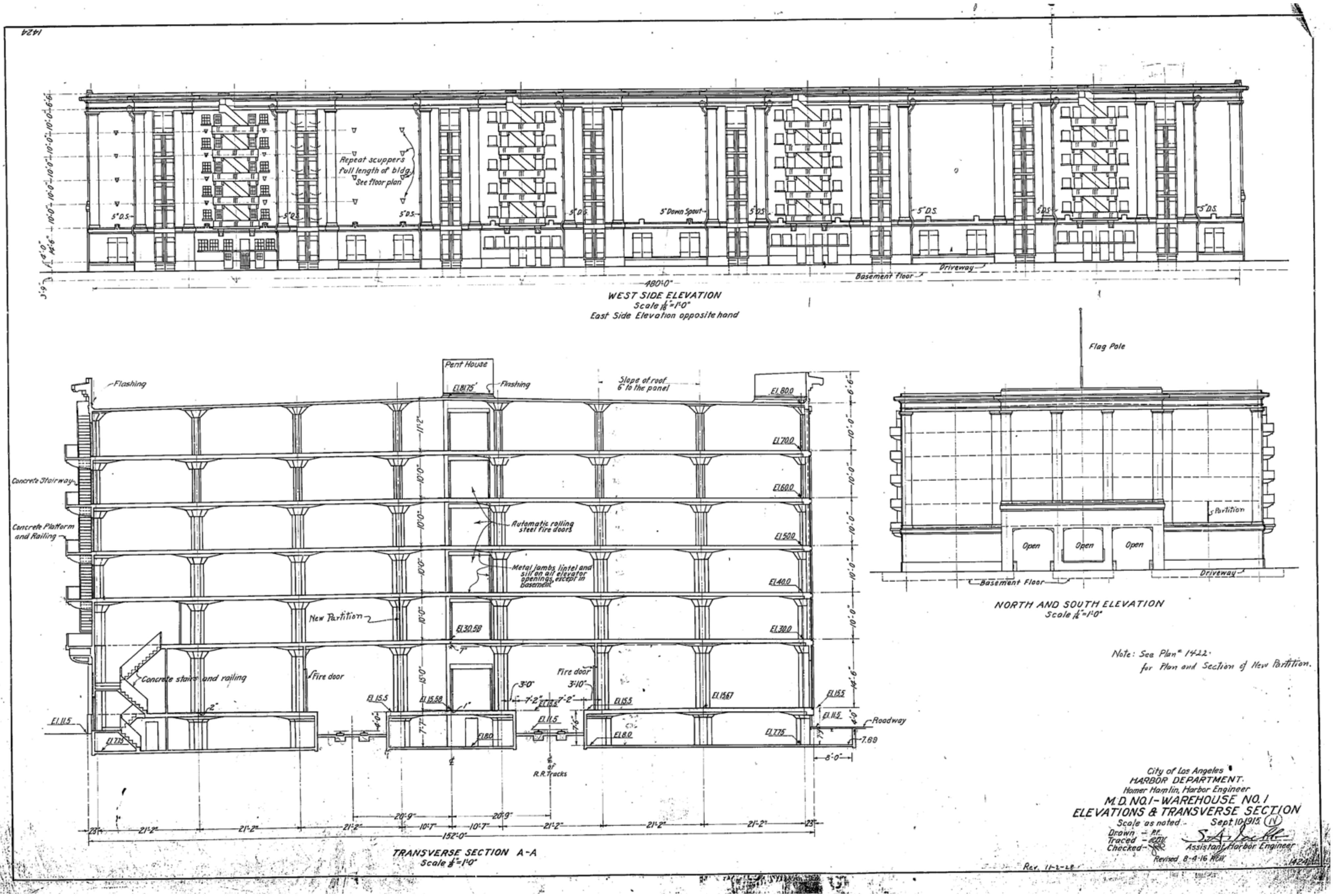
—Note—
For details of structural steel, see sheets No. 1266 to 1270 inc.

No.	Date	Drawn	Revisions	Appd.
1	10-10-44	D.Mc.	Increase opening height of one (1) door @ North end and install new electric operated steel rolling door.	

City of Los Angeles
Harbor Department
Homer Hamlin - Harbor Engineer

MUNICIPAL DOCK NO. 1 SHED NO. 1
ELEVATIONS & TRANSVERSE SECTION

Scale as noted   Aug. 12-1914
Drawn - RF
Traced - RDV
Checked -
Asst. Harbor Engineer
3 of 7
1273


1424
Repeat scuppers full length of bldg. See floor plan
5" D.S.
5" Down Spout
Basement floor
Driveway
480'-0"
WEST SIDE ELEVATION
Scale 1/16"=1'-0"
East Side Elevation opposite hand
Pent House
Flashing
Slope of roof 6" to the panel
El. 81.75
El. 80.0
El. 70.0
El. 60.0
El. 50.0
El. 40.0
El. 30.0
El. 30.58
El. 15.5
El. 15.58
El. 15.67
El. 15.5
El. 11.5
El. 8.0
El. 7.75
7.69
Concrete Stairway
Concrete Platform and Railing
Automatic rolling steel fire doors
Metal jambs, lintel and sill on all elevator openings, except in Basement
New Partition
Concrete stairs and railing
Fire door
Roadway
R.R. Tracks
21'-2"
20'-9"
10'-7"
152'-0"
TRANSVERSE SECTION A-A
Scale 1/8"=1'-0"
Flag Pole
Partition
Open
Basement Floor
Driveway
NORTH AND SOUTH ELEVATION
Scale 1/16"=1'-0"
Note: See Plan # 1422 for Plan and Section of New Partition.
City of Los Angeles
HARBOR DEPARTMENT
Homer Hamlin, Harbor Engineer
M.D. NO. 1 - WAREHOUSE NO. 1
ELEVATIONS & TRANSVERSE SECTION
Scale as noted
Sept 10 1915
Drawn
Traced
Checked
Assistant Harbor Engineer
Revised 8-4-16
Rev. 11-2-28
1424

REPORT OF
FIELD INVESTIGATION AND MATERIALS TESTING

TWINING
LABORATORIES
OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806 / 562.426.3355 *phone* / 562.426.6424 *fax* / www.twininglabs.com

Project No.: 070212.1
June 14, 2007

Miyamoto International, Inc.
700 South Flower Street, Suite 1010
Los Angeles, CA 90017-4112
Attn: Ken Wong

Received
JUN 1 5 2007
Miyamoto International

Subject: **Report of Field Investigation and Materials Testing**
Port of Los Angeles Warehouse No. 1

Dear Mr. Wong:

INTRODUCTION AND BACKGROUND INFORMATION

As requested and described in the letter prepared by Miyamoto International, Inc. (Miyamoto) dated March 8, 2006 Twining Laboratories of Southern California, Inc. (TLSC) has performed the following Field Investigation and Materials Testing Program.

SCOPE OF WORK

The following services were performed as part of our investigation:

- Site visit in order to conduct initial site walks and make necessary arrangements with client/operations for coordinating access to the site and scheduling of work;
- Obtaining 75 core samples at locations designated by Miyamoto. Specifically, the following was sampled:
    - 54 approximately 3" diameter cores from structural walls; and
    - 21 approximately 3" diameter cores from concrete columns.
- Obtaining 3 reinforcement samples at locations designated by Miyamoto;
- In place hardness testing of three vertical bars in columns;
- Laboratory testing of cores for compression strength;
- Laboratory testing of reinforcement samples for yield, ultimate strength, hardness, chemical composition and carbon equivalent;
- Laboratory testing of shavings for chemical composition and carbon equivalent;
- Analysis of hardness testing;
- Repairs of all sampled and tested locations; and

- Preparation of this letter report with test results.

FIELD INVESTIGATION AND TESTING

Sampling was performed at locations as approved by the engineer, Miyamoto and descriptions of the work performed are summarized below.

Coring

On April 9 through 12, 2007, under the observation of Twining Laboratories, coring was performed by P.M.C Incorporated. Per the Structural Engineer, Miyamoto, a total of 75 cores were taken 54 cores from various walls and 21 cores from various columns. Prior to coring, the location was surveyed using a pachometer and the reinforcement was located. After the reinforcement was located the core sample location was marked to minimize the potential of damaging in-place reinforcing steel. The coring device was mounted horizontally by small drilled in anchors ("red heads"). As allowed by ASTM C42, a 3 inch diameter core bit was used to yield a 2.72 nominal diameter sample. Once cut the cores were prepared for transport and storage by wiping water from their surfaces and placing them in water tight bags immediately after drilling. Photographs of the coring operation are presented as attachments to this report.

Reinforcing Steel Extractions

Under the observation of TLSC, chipping was performed by PMC at 3 locations. In order to minimize chipping, the reinforcement was first located with a pachometer. Once exposed by chipping the bars were cut with a hand saw and immediately tagged by a representative of TLSC.

In-Place Reinforcing Steel Testing

TLSC performed a series of in-place hardness tests on a total of three vertical column reinforcing bars. In-place hardness testing was performed using a handheld Krautkramer Branson Hardness Tester MIC 10. Also, shavings were taken from the three bars for chemical analysis.

LABORATORY TESTING

Laboratory Testing of Concrete Cores

The samples were delivered to our Long Beach laboratory for testing. As prescribed in ASTM C42 the samples were cured after the last introduction of water for a minimum of five days in sealed plastic bags. Our laboratory determined the compressive strength to the nearest 10 pounds per square inch., as describe in ASTM C39. The results of the laboratory testing are summarized in Table 1 and presented in Appendix A. Please note Sample W39 was damaged during transportation and therefore was not tested.

Table 1
Core Testing Summary

Core #	Member Type	Location	Floor	Core Diameter (in.)	Core Length, (in.)	Max Load (lbf)	Corrected Compressive Strength (psi)
W1	Wall	G-H/1	1	2.72	4.02	24738	4090
W2	Wall	F-G/4	1	2.72	4.63	22077	3720
W3	Wall	F/14-15	1	2.72	4.54	25699	4290
W4	Wall	H/21-22	1	2.72	4.35	21944	3660
W5	Wall	D/24-25	1	2.72	3.68	32521	5260
W6	Wall	A-B/19	1	2.72	4.31	23074	3850
W7	Wall	A/12-13	1	2.72	4.29	26474	4420
W8	Wall	C/7-8	1	2.72	4.89	28520	4910
W9	Wall	B-C/4	1	2.72	4.85	15348	2640
W10	Wall	A/3-4	2	2.72	4.20	23951	3960
W11	Wall	A-B/7	2	2.72	4.95	21779	3750
W12	Wall	C/15-16	2	2.72	4.82	18871	3250
W13	Wall	D/20-21	2	2.72	4.46	19913	3320
W14	Wall	B-C/25	2	2.72	4.46	18580	3100
W15	Wall	F/22-23	2	2.72	5.03	17686	3040
W16	Wall	H/13-14	2	2.72	4.94	25792	4440
W17	Wall	F/7-8	2	2.72	4.76	21850	3760
W18	Wall	F-G/4	2	2.72	5.01	20310	3500
W19	Wall	C/2-3	3	2.72	5.01	17222	2960
W20	Wall	A/9-10	3	2.72	4.95	20605	3550
W21	Wall	B-C/13	3	2.72	5.09	18955	3260
W22	Wall	A-B/19	3	2.72	5.14	22870	3940
W23	Wall	C/23-24	3	2.72	5.06	18163	3130
W24	Wall	E/22-23	3	2.72	4.80	17887	3080
W25	Wall	F-G/16	3	2.72	4.88	19815	3410
W26	Wall	E/8-9	3	2.72	4.95	21459	3690
W27	Wall	F-G/4	3	2.72	4.87	19971	3440
W28	Wall	B-C/4	4	2.72	4.97	21396	3680
W29	Wall	B-C/10	4	2.72	4.81	22640	3900
W30	Wall	B-C/16	4	2.72	4.96	19822	3410
W31	Wall	B-C/22	4	2.72	4.95	22223	3830
W32	Wall	B-C/25	4	2.72	4.88	24252	4170
W33	Wall	F-G/22	4	2.72	4.83	18765	3230
W34	Wall	F-G/16	4	2.72	4.96	19090	3290
W35	Wall	F-G/10	4	2.72	5.04	32541	5600
W36	Wall	F-G/4	4	2.72	4.92	18524	3200
W37	Wall	C/2-3	5	2.72	4.24	26048	4300
W38	Wall	C/8-9	5	2.72	5.15	20963	3610
W39	Core Damaged During Transportation – Not Tested						
W40	Wall	C/20-21	5	2.72	4.98	21798	3750
W41	Wall	B-C/25	5	2.72	3.84	29085	4760

TWINING LABORATORIES OF SOUTHERN CALIFORNIA

Table 1
Core Testing Summary (continued)

Core #	Member Type	Location	Floor	Core Diameter (in.)	Core Length, (in.)	Max Load (lbf)	Corrected Compressive Strength (psi)
W42	Wall	F/23-24	5	2.72	3.26	16017	2540
W43	Wall	F/19-20	5	2.72	5.03	15939	2740
W44	Wall	F/12-13	5	2.72	4.91	16794	2790
W45	Wall	F-G/7	5	2.72	4.87	23386	4030
W46	Wall	H/1-2	5	2.72	4.84	23943	4120
W47	Wall	B-C/7	6	2.72	4.74	24326	4100
W48	Wall	B-C/19	6	2.72	4.74	27472	4630
W49	Wall	B-C/25	6	2.72	4.64	25035	4310
W50	Wall	F-G/16	6	2.72	4.74	18230	3140
W51	Wall	F-G/13	6	2.72	4.90	19061	3280
W52	Wall	F-G/10	6	2.72	4.10	22522	3720
W53	Wall	F-G/4	6	2.72	4.87	23090	3970
W54	Wall	F-G/1	6	2.72	4.94	23940	4120
C1	Column	B/4	1	2.72	4.98	24639	4240
C2	Column	G/7	1	2.72	5.03	26890	4630
C3	Column	G/16	1	2.72	4.83	21364	3680
C4	Column	G22	1	2.72	4.94	27114	4670
C5	Column	B/13	2	2.72	4.57	19704	3290
C6	Column	E/4	2	2.72	4.58	18583	3100
C7	Column	F/20	2	2.72	4.83	25989	4470
C8	Column	C/22	2	2.72	4.96	24927	4290
C9	Column	C/4	3	2.72	5.13	24784	4270
C10	Column	C/19	3	2.72	4.69	24221	4090
C11	Column	F/16	3	2.72	4.22	21762	3670
C12	Column	F/4	3	2.72	4.17	19899	3290
C13	Column	C/7	4	2.72	4.25	24761	4090
C14	Column	C/22	4	2.72	5.22	16693	2870
C15	Column	G/19	4	2.72	5.00	18682	3220
C16	Column	G/7	4	2.72	4.95	23910	4120
C17	Column	C/4	5	2.72	4.05	20363	3360
C18	Column	C/19	5	2.72	7.74	20300	3420
C19	Column	F/19	5	2.72	4.13	27256	4520
C20	Column	F/4	6	2.72	5.33	21954	3780
C21	Column	C/4	6	2.72	4.45	15492	2590

Ave. Compressive Strength of Wall Cores (psi)	3729
Standard Deviation of Wall Cores	637
Ave. Compressive Strength of Col. Cores (psi)	3793
Standard Deviation of Column Cores	608

Reinforcing Steel Mechanical Testing

Mechanical testing of the reinforcing steel was performed in accordance with the latest version of ASTM E 8. Also, all samples were tested for hardness using a handheld Krautkrammer Branson Hardness Tester MIC 10. Results are summarized in Table 2. Load v. Time plots are provided in Appendix C. Criteria for estimation of tensile and yield strengths is presented in Appendix D.

Table 2
Reinforcing Steel Test Result Summary

Sample Information					Hardness			Mechanical Properties		
Sample No.	Member Type	Floor	Location	Bar Size	Brinell	Approx. Tensile Strength (psi)	Approx. Yield Strength (psi)	Yield Strength (psi)	Tensile Strength (psi)	Elongation in 1" (%)
RS1	Wall	1	F-G/1	#5 plain	169	n/a	n/a	48670	71419	19.8
RS2	Wall	2	F/G/7	#4 plain	152	n/a	n/a	51347	71400	17.3
RS2	Wall	3	F-G/3	#4 plain	161	n/a	n/a	47923	69300	20.4
NDR1	Column	1	G/16	#8 plain	160	69066	48166	n/a	n/a	n/a
NDR2	Column	2	C/7	#8 plain	154	65107	45405	n/a	n/a	n/a
NDR3	Column	3	B/13	#8 plain	158	67747	47245	n/a	n/a	n/a

Reinforcing Steel Chemical Composition and Carbon Equivalent Testing

Chemical analysis and carbon and sulfur combustion were performed per the latest revisions of SOP 2.02 and 7.00, respectively. Results are summarized in Table 3 and presented in Appendix B.

Table 3
Reinforcing Steel Chemical Composition and Carbon Equivalent Summary

Sample Information					Chemical Composition and Carbon Equivalent				
Sample No.	Member Type	Floor	Location	Sample Type	Carbon (%)	Manganese (%)	Phosphorus (%)	Sulfur (%)	Carbon Equivalent (%)
RS1	Wall	1	F-G/1	Bar	.26	.54	.006	.056	.35
RS2	Wall	2	F/G/7	Bar	.22	.40	.007	.054	.29
RS2	Wall	3	F-G/3	Bar	.27	.43	.007	.51	.35
NDR1	Column	1	G/16	Bar Shaving	.17	.33	.010	.047	.23
NDR2	Column	2	C/7	Bar Shaving	.29	.29	.002	.049	.34
NDR3	Column	3	B/13	Bar Shaving	.33	.33	.010	.053	.39

REPAIRS

All sample locations were repaired with a non-shrink grout that, based on information provided by the manufacturer, has a minimum compressive strength of 6000 psi at 28 days. The sides of the core holes were roughened and cleaned prior to grouting. Also, all extracted reinforcement was repaired by splicing in equivalent reinforcement by means of mechanical couplers. All repairs were observed by a representative of TLSC.

LIMITATIONS

It should be understood that due to the limited nature of our field investigation, conditions not observed and described in this report may be present. Additional field investigations and laboratory testing can be performed upon request.

This document is intended to be used only in its entirety. No portion of the document, by itself, is designed to completely represent any aspect of the project described herein. Twining Laboratories should be contacted if the reader requires additional information or has questions regarding the content or completeness of this document.

We have endeavored to perform our evaluation using the degree of care and skill ordinarily exercised under similar circumstances by engineering professionals with experience in this area. No other warranty, either expressed or implied, is made as to the conclusions contained in this report.

CLOSURE

Twining Laboratories appreciates the opportunity to be of service on this project. If you have any questions regarding this letter or if we can be of further service, please do not hesitate to contact the undersigned.

Respectfully submitted,
Twining Laboratories of Southern California, Inc.

Randall R. Slane
Field Engineering Manager

Linas Vitkus, R.C.E. 63163
Senior Project Engineer

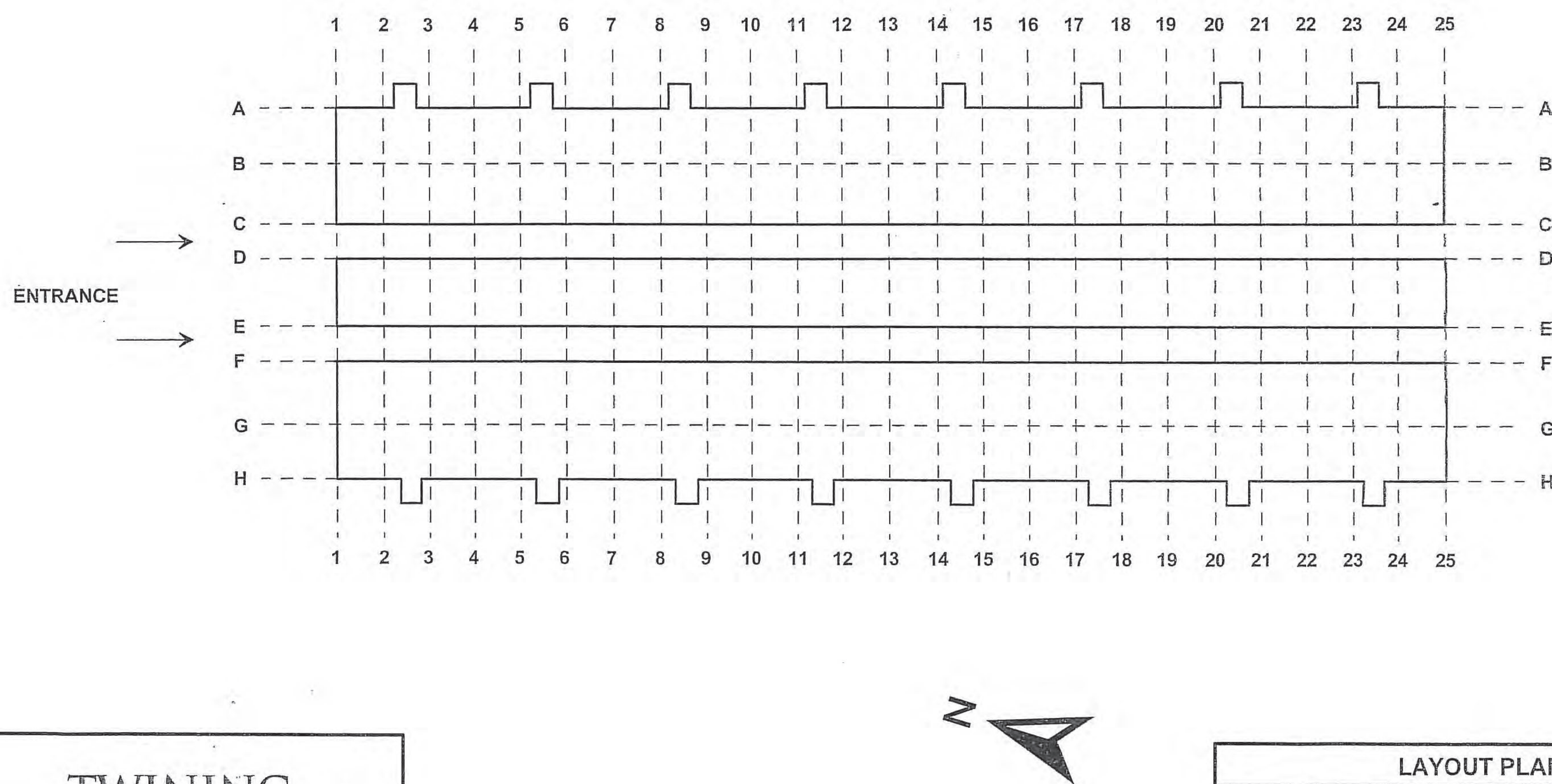
REGISTERED PROFESSIONAL ENGINEER
LINAS VITKUS
No. 63163
Exp. 6/30/08
CIVIL
STATE OF CALIFORNIA

RS/LV/rs

Attachments:
Layout Plan
Appendix A – Concrete Compression Testing Laboratory Reports
Appendix B – Chemical Analysis and Carbon Equivalent Testing Laboratory Reports
Appendix C – Reinforcing Steel Load vs. Time Plots
Appendix D – Criteria for Estimation of Reinforcing Bar Tensile and Yield Strength Using Non-Destructive Testing

Distribution: (4) Ken Wong, Miyamoto International, Inc.

Site Plan



TWINING LABORATORIES OF SOUTHERN CALIFORNIA

Reference: Drawing based on City of Los Angeles, Harbor Department, M.D. NO. 1 - WAREHOUSE NO. 1 BASEMENT & GENERAL PLAN, dated 9/10/1915

LAYOUT PLAN

Warehouse No. 1
Port of Los Angeles, California

PROJECT NO.	REPORT DATE	FIGURE 1
070212.1	MAY 2007	

Appendix A
Concrete Compression Testing Laboratory Reports

TWINING
LABORATORIES
OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
www.twininglabs.com

Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070072004
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 5/7/2007
Mix: N/A
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	5/12/2007	5/12/2007	5/12/2007
Specimen #:	1-1	2-3	3-2
Cust Spec #:	W7	W6	C4
Age (Days):	5 Day	5 Day	5 Day
Dims (in):	2.72X4.29	2.72X4.31	2.72X4.94
Area (sq. in):	5.81	5.81	5.81
L/D or hp/tp:	1.58	1.58	1.82
Total Load (lbf):	26474	23074	27114
Comp Str (psi):	4556	3971	4666
Corr Factor:	0.97	0.97	1.00
Corr Str (psi):	4420	3850	4670

Average 5 Day Strength: 4313

Testing: ASTM C42
Specimen Shape: Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTMC42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

6-11-07
Date

TWINING
LABORATORIES
OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
www.twininglabs.com

Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068012
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	W1	W2	W3	W4
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X4.02	2.72X4.63	2.72X4.54	2.72X4.35
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.48	1.70	1.67	1.60
Total Load (lbf):	24738	22077	25699	21944
Comp Str (psi):	4257	3799	4423	3776
Corr Factor:	0.96	0.98	0.97	0.97
Corr Str (psi):	4090 ✓	3720 ✓	4290 ✓	3660 ✓

Average 11 Day Strength: 3940

Testing: ASTM C42 **Specimen Shape:** Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04(MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

[signature]

6-11-07
Date

TWINING LABORATORIES OF SOUTHERN CALIFORNIA

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Ph: 562.426.3355 Fax: 562.426.6424
www.twininglabs.com

Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068013
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007
Specimen #:	1-1	4-4
Cust Spec #:	W5	W8
Age (Days):	11 Day	11 Day
Dims (in):	2.72X3.68	2.72X4.89
Area (sq. in):	5.81	5.81
L/D or hp/tp:	1.35	1.80
Total Load (lbf):	32521	28520
Comp Str (psi):	5597	4908
Corr Factor:	0.94	1.00
Corr Str (psi):	5260	4910

Average 11 Day Strength: 5085

Testing: ASTM C42
Specimen Shape: Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTMC42-04(MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

6-11-07
Date

TWINING LABORATORIES OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
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Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068014
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	W9	W10	W11	W12
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X4.85	2.72X4.20	2.72X4.95	2.72X4.82
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.78	1.54	1.82	1.77
Total Load (lbf):	15348	23951	21779	18871
Comp Str (psi):	2641	4122	3748	3248
Corr Factor:	1.00	0.96	1.00	1.00
Corr Str (psi):	2640	3960	3750	3250

Average 11 Day Strength: 3400

Testing: ASTM C42
Specimen Shape: Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTMC42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

6-11-07
Date

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3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
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Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068015
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	W13	W14	W15	W16
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X4.46	2.72X4.46	2.72X5.03	2.72X4.94
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.64	1.64	1.85	1.82
Total Load (lbf):	19913	18580	17686	25792
Comp Str (psi):	3427	3198	3044	4439
Corr Factor:	0.97	0.97	1.00	1.00
Corr Str (psi):	3320	3100	3040	4440

Average 11 Day Strength: 3475

Testing: ASTM C42

Specimen Shape: Cores

Compliance:

RANDY SLANE - FILE COPY	1	*MIYAMOTO INTERNATIONAL INC*	4	*PORT OF LOS ANGELES*	1
WILSON & COMPANY	1				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

[signature]

6-11-07
Date

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Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/14/2007
Lab Number: 1-11-070068016
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Date Cast: 4/12/2007
Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	W17	W18	W19	W20
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X4.76	2.72X5.01	2.72X5.01	2.72X4.95
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.75	1.84	1.84	1.82
Total Load (lbf):	21850	20310	17222	20605
Comp Str (psi):	3760	3495	2964	3546
Corr Factor:	0.98	1.00	1.00	1.00
Corr Str (psi):	3690 ✓	3500 ✓	2960 ✓	3550 ✓

Average 11 Day Strength: 3425

Testing: ASTM C42 **Specimen Shape:** Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

6-11-07
Date

TWINING LABORATORIES OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
www.twininglabs.com

Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068017
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	W21	W22	W23	W24
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X5.09	2.72X5.14	2.72X5.06	2.72X4.80
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.87	1.89	1.86	1.76
Total Load (lbf):	18955	22870	18163	17887
Comp Str (psi):	3262	3936	3126	3078
Corr Factor:	1.00	1.00	1.00	1.00
Corr Str (psi):	3260 ✓	3940 ✓	3130 ✓	3080 ✓

Average 11 Day Strength: 3352

Testing: ASTM C42 **Specimen Shape:** Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

[signature] 6-11-07
Date

TWINING
LABORATORIES
OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
www.twininglabs.com

Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068018
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	W25	W26	W27	W28
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X4.88	2.72X4.95	2.72X4.87	2.72X4.97
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.79	1.82	1.79	1.83
Total Load (lbf):	19815	21459	19971	21396
Comp Str (psi):	3410	3693	3437	3682
Corr Factor:	1.00	1.00	1.00	1.00
Corr Str (psi):	3410	3690	3440	3680

Average 11 Day Strength: 3555

Testing: ASTM C42

Specimen Shape: Cores

Compliance:

RANDY SLANE - FILE COPY 1 *MIYAMOTO INTERNATIONAL INC* 4 *PORT OF LOS ANGELES* 1
WILSON & COMPANY 1

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

6-11-07
Date

TWINING LABORATORIES OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
www.twininglabs.com

Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068019
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	W29	W30	W31	W32
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X4.81	2.72X4.96	2.72X4.95	2.72X4.88
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.77	1.82	1.82	1.79
Total Load (lbf):	22640	19822	22223	24252
Comp Str (psi):	3896	3411	3825	4174
Corr Factor:	1.00	1.00	1.00	1.00
Corr Str (psi):	3900 ✓	3410 ✓	3830 ✓	4170 ✓

Average 11 Day Strength: 3828

Testing: ASTM C42 **Specimen Shape:** Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

[signature] 6-11-07
Date

TWINING LABORATORIES
OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
www.twininglabs.com

Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/14/2007
Lab Number: 1-11-070068020
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Date Cast: 4/12/2007
Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	W33	W34	W35	W36
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X4.83	2.72X4.96	2.72X5.04	2.72X4.92
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.78	1.82	1.85	1.81
Total Load (lbf):	18765	19090	32541	18524
Comp Str (psi):	3229	3285	5600	3188
Corr Factor:	1.00	1.00	1.00	1.00
Corr Str (psi):	3230 ✓	3290 ✓	5600 ✓	3190 ✓

Average 11 Day Strength: 3828

Testing: ASTM C42
Specimen Shape: Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

[signature]

6-11-07
Date

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OF SOUTHERN CALIFORNIA

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Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068021
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE

Test Date:	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	4-4
Cust Spec #:	W37	W38	W40
Age (Days):	11 Day	11 Day	11 Day
Dims (in):	2.72X4.24	2.72X5.15	2.72X4.98
Area (sq. in):	5.81	5.81	5.81
L/D or hp/tp:	1.56	1.89	1.83
Total Load (lbf):	26048	20963	21798
Comp Str (psi):	4483	3608	3751
Corr Factor:	0.96	1.00	1.00
Corr Str (psi):	4300 ✓	3610 ✓	3750 ✓

Average 11 Day Strength: 3887

Testing: ASTM C42
Specimen Shape: Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

[signature] 6-11-07
Date

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OF SOUTHERN CALIFORNIA

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Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068022
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLSS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	W41	W42	W43	W44
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X3.84	2.72X3.26	2.72X5.03	2.72X4.91
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.41	1.20	1.85	1.81
Total Load (lbf):	29085	16017	15939	16236
Comp Str (psi):	5005	2756	2743	2794
Corr Factor:	0.95	0.92	1.00	1.00
Corr Str (psi):	4760 ✓	2540 ✓	2740 ✓	2790 ✓

Average 11 Day Strength: 3208

Testing: ASTM C42 **Specimen Shape:** Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SAELED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

Randall R Slane [signature] 6-11-07
Date

TWINING LABORATORIES OF SOUTHERN CALIFORNIA

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Ph: 562.426.3355 Fax: 562.426.6424
www.twininglabs.com

Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068023
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/23/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	W45	W46	W47	W48
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X4.87	2.72X4.84	2.72X4.74	2.72X4.74
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.79	1.78	1.74	1.74
Total Load (lbf):	23386	23943	24326	27472
Comp Str (psi):	4025	4121	4186	4728
Corr Factor:	1.00	1.00	0.98	0.98
Corr Str (psi):	4030 ✓	4120 ✓	4100 ✓	4630 ✓

Average 11 Day Strength: 4220

Testing: ASTM C42 **Specimen Shape:** Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

[signature] 6-11-07
Date

TWINING LABORATORIES OF SOUTHERN CALIFORNIA

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Ph: 562.426.3355 Fax: 562.426.6424
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Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/14/2007
Lab Number: 1-11-070068024
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Date Cast: 4/12/2007
Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	W49	W50	W51	W52
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X4.64	2.72X4.74	2.72X4.90	2.72X4.10
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.71	1.74	1.80	1.51
Total Load (lbf):	25035	18230	19061	22522
Comp Str (psi):	4308	3137	3280	3876
Corr Factor:	0.98	0.98	1.00	0.96
Corr Str (psi):	4220	3070	3280	3720

Average 11 Day Strength: 3572

Testing: ASTM C42 **Specimen Shape:** Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

6-11-07
Date

TWINING LABORATORIES OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
www.twininglabs.com

Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068025
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007
Specimen #:	1-1	2-2
Cust Spec #:	W53	W54
Age (Days):	11 Day	11 Day
Dims (in):	2.72X4.87	2.72X4.94
Area (sq. in):	5.81	5.81
L/D or hp/tp:	1.79	1.82
Total Load (lbf):	23090	23940
Comp Str (psi):	3974	4120
Corr Factor:	1.00	1.00
Corr Str (psi):	3970	4120

Average 11 Day Strength: 4045

Testing: ASTM C42
Specimen Shape: Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

[signature] 6-11-07
Date

TWINING LABORATORIES OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
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Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068026
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-2	2-3	4-1
Cust Spec #:	C2	C3	C1
Age (Days):	11 Day	11 Day	11 Day
Dims (in):	2.72X5.03	2.72X4.83	2.72X4.98
Area (sq. in):	5.81	5.81	5.81
L/D or hp/tp:	1.85	1.78	1.83
Total Load (lbf):	26890	21364	24639
Comp Str (psi):	4628	3677	4240
Corr Factor:	1.00	1.00	1.00
Corr Str (psi):	4630 ✓	3680 ✓	4240 ✓

Average 11 Day Strength: 4183

Testing: ASTM C42 **Specimen Shape:** Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

[signature]

6-11-07
Date

TWINING
LABORATORIES
OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
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Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068036
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	C5	C6	C7	C8
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X4.57	2.72X4.58	2.72X4.83	2.72X4.96
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.68	1.68	1.78	1.82
otal Load (lbf):	19704	18583	25989	24927
Comp Str (psi):	3391	3198	4473	4290
Corr Factor:	0.97	0.97	1.00	1.00
Corr Str (psi):	3290	3100	4470	4290

Average 11 Day Strength: 3788

Testing: ASTM C42 **Specimen Shape:** Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

6-11-07
Date

TWINING LABORATORIES
OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
www.twininglabs.com

Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068037
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	C9	C10	C11	C12
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X5.13	2.72X4.69	2.72X4.72	2.72X4.17
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.89	1.72	1.74	1.53
Total Load (lbf):	24784	24221	21762	19899
Comp Str (psi):	4265	4168	3745	3425
Corr Factor:	1.00	0.98	0.98	0.96
Corr Str (psi):	4270	4090	3670	3290

Average 11 Day Strength: 3830

Testing: ASTM C42 **Specimen Shape:** Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS **Date Cored:** 4/12/07

6-11-07
Date

TWINING LABORATORIES OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
www.twininglabs.com

Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068038
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	C13	C14	C15	C16
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X4.25	2.72X5.22	2.72X5.00	2.72X4.95
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.56	1.92	1.84	1.82
Total Load (lbf):	24761	16693	18682	23910
Comp Str (psi):	4261	2873	3215	4115
Corr Factor:	0.96	1.00	1.00	1.00
Corr Str (psi):	4090✓	2870✓	3220✓	4120✓

Average 11 Day Strength: 3575

Testing: ASTM C42

Specimen Shape: Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

6-11-07
Date

TWINING LABORATORIES OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
www.twininglabs.com

Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068039
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007	4/23/2007	4/23/2007	4/23/2007
Specimen #:	1-1	2-2	3-3	4-4
Cust Spec #:	C17	C18	C19	C20
Age (Days):	11 Day	11 Day	11 Day	11 Day
Dims (in):	2.72X4.05	2.72X4.74	2.72X4.13	2.72X0.00
Area (sq. in):	5.81	5.81	5.81	5.81
L/D or hp/tp:	1.49	1.74	1.52	.00
Total Load (lbf):	20363	20300	27356	21954
Comp Str (psi):	3504	3494	4708	3778
Corr Factor:	0.96	0.98	0.96	1.00
Corr Str (psi):	3360	3420	4520	3780

Average 11 Day Strength: 3770

Testing: ASTM C42
Specimen Shape: Cores

Compliance:

RANDY SLANE - FILE COPY 1 *MIYAMOTO INTERNATIONAL INC* 4 *PORT OF LOS ANGELES* 1
WILSON & COMPANY 1

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS

Date Cored: 4/12/07

6-11-07
Date

TWINING
LABORATORIES
OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806
Ph: 562.426.3355 Fax: 562.426.6424
www.twininglabs.com

Compression Test On Concrete

Customer: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA. 90017

Print Date: 06/13/2007
Lab Number: 1-11-070068040
Project No: 070212.1
Permit No:
OSHPD:
DSA AP #:
DSA File #:

Project: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA.

Architect
WILSON & COMPANY
Engineer

Contractor
MIYAMOTO INTERNATIONAL INC
SubContractor

Client's Customer: MIYAMOTO INTERNATIONAL INC

Sampled From: VARIOUS COLUMNS AND WALLS (SEE PLAN FOR PLOT)

	Specified	Measured
Slump (in):		N/A
Air Content (%):		N/A
Density (pcf):		N/A
Ambient Temp (F):		N/A
Concrete Temp (F):		N/A

Received On: 4/16/2007
Mix: N/I
Spec Str. (Psi): N/I @ Days
Spec Str. (Psi): 0 @ 0 Days

Specimen By: PMC, INC.
Delivered By: R. SLANE-TLSC

Test Date:	4/23/2007
Specimen #:	1-1
Cust Spec #:	C21
Age (Days):	11 Day
Dims (in):	2.72X4.45
Area (sq. in):	5.81
L/D or hp/tp:	1.64
Total Load (lbf):	15492
Comp Str (psi):	2666
Corr Factor:	0.97
Corr Str (psi):	2590

Average 11 Day Strength: 2590

Testing: ASTM C42 **Specimen Shape:** Cores

Compliance:

RANDY SLANE - FILE COPY	*1*	*MIYAMOTO INTERNATIONAL INC*	*4*	*PORT OF LOS ANGELES*	*1*
WILSON & COMPANY	*1*				

Comments:

ASTM C42-04 (MINIMUM 5 DAYS IN SEALED PLASTIC BAG)

Curing: SEE COMMENTS **Date Cored:** 4/12/07

6-11-07
Date

Appendix B
Chemical Analysis and Carbon Equivalent Testing Laboratory Reports

STORK®
Materials Technology

Stork Materials Testing & Inspection

Material Testing and Non-Destructive Testing

Contact: Tim McNair
Twining Laboratories Of So. Ca
3310 Airport Way

Long Beach, CA 90806

15062 Bolsa Chica
Huntington Beach, CA 92649
USA

Telephone :(714) 892-1961
Telefax :(714) 892-8159
Website :www.storksmti.com

Date: 5/16/2007 **P.O. No.:** Verbal/Tim McNair **W/O No.:** TWI004-05-09-45247-4

TEST CERTIFICATE

P/N	RS-1
Job Name:	Port Of L.A. Whare House #1
Description:	Rebar
Shipper No.:	5082007
Job No.:	070212.1

CARBON STEEL+CE

Element		Result %	Min %	Max %
C	=	0.26	0.00	NS
Mn	=	0.54	0.00	NS
P	=	0.006	0.000	NS
S	=	0.056	0.000	NS
Si	=	0.06	0.00	NS
Cr	=	0.01	0.00	NS
Ni	=	0.03	0.00	NS
Mo	<	0.01	0.00	NS
Cu	=	0.14	0.00	NS
V	<	0.01	0.00	NS
Ti	<	0.01	0.00	NS
Carbon Equivalent	=	0.35	0.00	NS
Fe	=	Balance	Balance	Balance

Chemical Analysis was performed by ICP per SOP 17.00, Revision 4
Carbon and Sulfur by Combustion per SOP 7.00, Revision 2

FOR INFORMATION ONLY

Respectfully submitted

Kelly Nguyen
Senior Quality Administrator

Accredited Nadcap Materials Testing Laboratory

A2LA ACCREDITED

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Material Testing and Non-Destructive Testing

Contact: Tim McNair
Twining Laboratories Of So. Ca
3310 Airport Way

Long Beach, CA 90806

15062 Bolsa Chica
Huntington Beach, CA 92649
USA

Telephone :(714) 892-1961
Telefax :(714) 892-8159
Website :www.storksmti.com

Date: 5/16/2007 **P.O. No.:** Verbal/Tim McNair **W/O No.:** TWI004-05-09-45247-5

TEST CERTIFICATE

P/N	RS-2
Job Name:	Port Of L.A. Whare House #1
Description:	Rebar
Shipper No.:	5082007
Job No.:	070212.1

CARBON STEEL+CE

Element		Result %	Min %	Max %
C	=	0.22	0.00	NS
Mn	=	0.40	0.00	NS
P	=	0.007	0.000	NS
S	=	0.054	0.000	NS
Si	=	0.05	0.00	NS
Cr	<	0.01	0.00	NS
Ni	=	0.02	0.00	NS
Mo	<	0.01	0.00	NS
Cu	=	0.09	0.00	NS
V	<	0.01	0.00	NS
Ti	<	0.01	0.00	NS
Carbon Equivalent	=	0.29	0.00	NS
Fe	=	Balance	Balance	Balance

Chemical Analysis was performed by ICP per SOP 17.00, Revision 4
Carbon and Sulfur by Combustion per SOP 7.00, Revision 2

FOR INFORMATION ONLY

Respectfully submitted

Kelly Nguyen
Senior Quality Administrator

Accredited Nadcap Materials Testing Laboratory A2LA ACCREDITED

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15062 Bolsa Chica
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Telefax :(714) 892-8159
Website :www.storksmti.com

Contact: Tim McNair
Twining Laboratories Of So. Ca
3310 Airport Way

Long Beach, CA 90806

Date: 5/16/2007 **P.O. No.:** Verbal/Tim McNair **W/O No.:** TWI004-05-09-45247-6

TEST CERTIFICATE

P/N	RS-3
Job Name:	Port Of L.A. Whare House #1
Description:	Rebar
Shipper No.:	5082007
Job No.:	070212.1

CARBON STEEL+CE

Element		Result %	Min %	Max %
C	=	0.27	0.00	NS
Mn	=	0.43	0.00	NS
P	=	0.007	0.000	NS
S	=	0.051	0.000	NS
Si	=	0.05	0.00	NS
Cr	<	0.01	0.00	NS
Ni	=	0.02	0.00	NS
Mo	<	0.01	0.00	NS
Cu	=	0.12	0.00	NS
V	<	0.01	0.00	NS
Ti	<	0.01	0.00	NS
Carbon Equivalent	=	0.35	0.00	NS
Fe	=	Balance	Balance	Balance

Chemical Analysis was performed by ICP per SOP 17.00, Revision 4
Carbon and Sulfur by Combustion per SOP 7.00, Revision 2

FOR INFORMATION ONLY

Respectfully submitted

Kelly Nguyen
Senior Quality Administrator

Accredited Nadcap Materials Testing Laboratory   A2LA ACCREDITED

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Telefax :(714) 892-8159
Website :www.storksmti.com

Date: 5/16/2007 **P.O. No.:** Verbal/Tim McNair **W/O No.:** TWI004-05-09-45247-1

TEST CERTIFICATE

P/N	NDR-1
Job Name:	Port Of L.A. Whare House #1
Description:	Rebar Shavings
Shipper No.:	5082007
Job No.:	070212.1

CARBON STEEL+CE

Element		Result %	Min %	Max %
C	=	0.17	0.00	NS
Mn	=	0.33	0.00	NS
P	<	0.010	0.000	NS
S	=	0.047	0.000	NS
Si	=	0.27	0.00	NS
Cr	<	0.01	0.00	NS
Ni	=	0.02	0.00	NS
Mo	<	0.01	0.00	NS
Cu	=	0.10	0.00	NS
V	=	0.01	0.00	NS
Ti	=	0.01	0.00	NS
Carbon Equivalent	=	0.23	0.00	NS
Fe	=	Balance	Balance	Balance

Chemical Analysis was performed by ICP per SOP 17.00, Revision 4
Carbon and Sulfur by Combustion per SOP 7.00, Revision 2

FOR INFORMATION ONLY

Respectfully submitted

Kelly Nguyen
Senior Quality Administrator

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Materials Technology

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Material Testing and Non-Destructive Testing

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Date: 5/16/2007 **P.O. No.:** Verbal/Tim McNair **W/O No.:** TWI004-05-09-45247-2

TEST CERTIFICATE

P/N	NDR-2
Job Name:	Port Of L.A. Whare House #1
Description:	Rebar Shavings
Shipper No.:	5082007
Job No.:	070212.1

CARBON STEEL+CE

Element		Result %	Min %	Max %
C	=	0.29	0.00	NS
Mn	=	0.29	0.00	NS
P	=	0.002	0.000	NS
S	=	0.049	0.000	NS
Si	=	0.64	0.00	NS
Cr	<	0.01	0.00	NS
Ni	=	0.02	0.00	NS
Mo	<	0.01	0.00	NS
Cu	=	0.09	0.00	NS
V	=	0.01	0.00	NS
Ti	=	0.03	0.00	NS
Carbon Equivalent	=	0.34	0.00	NS
Fe	=	Balance	Balance	Balance

Chemical Analysis was performed by ICP per SOP 17.00, Revision 4
Carbon and Sulfur by Combustion per SOP 7.00, Revision 2

FOR INFORMATION ONLY

Respectfully submitted

Kelly Nguyen
Senior Quality Administrator

Accredited Nadcap Materials Testing Laboratory

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Long Beach, CA 90806

15062 Bolsa Chica
Huntington Beach, CA 92649
USA

Telephone :(714) 892-1961
Telefax :(714) 892-8159
Website :www.storksmti.com

Date: 5/16/2007 **P.O. No.:** Verbal/Tim McNair **W/O No.:** TWI004-05-09-45247-3

TEST CERTIFICATE

P/N	NDR-3
Job Name:	Port Of L.A. Whare House #1
Description:	Rebar Shavings
Shipper No.:	5082007
Job No.:	070212.1

CARBON STEEL+CE

Element		Result %	Min %	Max %
C	=	0.33	0.00	NS
Mn	=	0.33	0.00	NS
P	<	0.010	0.000	NS
S	=	0.053	0.000	NS
Si	=	0.38	0.00	NS
Cr	<	0.01	0.00	NS
Ni	=	0.03	0.00	NS
Mo	<	0.01	0.00	NS
Cu	=	0.09	0.00	NS
V	=	0.01	0.00	NS
Ti	=	0.02	0.00	NS
Carbon Equivalent	=	0.39	0.00	NS
Fe	=	Balance	Balance	Balance

Chemical Analysis was performed by ICP per SOP 17.00, Revision 4
Carbon and Sulfur by Combustion per SOP 7.00, Revision 2

FOR INFORMATION ONLY

Respectfully submitted

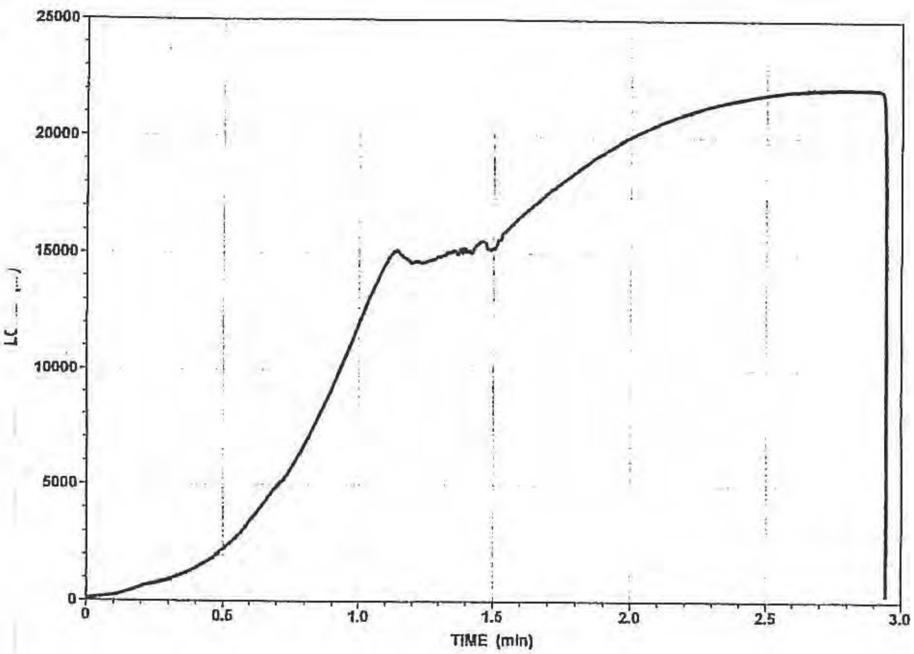
Kelly Nguyen
Senior Quality Administrator

Accredited Nadcap Materials Testing Laboratory
ACCREDITED

Appendix C
Reinforcing Steel Load vs. Time Plots

TWINING LABORATORIES
3310 AIRPORT WAY
LONG BEACH, CA 90806

Specimen #:	1
OPERATOR:	T.MCNAIR
JOB NAME:	PORT OF LA WAREHOUSE #1
JOB #:	070212.1
ID #:	RS-1
Geometry:	Area
Gage Length:	8.0000 in
Area:	0.3100 sq in



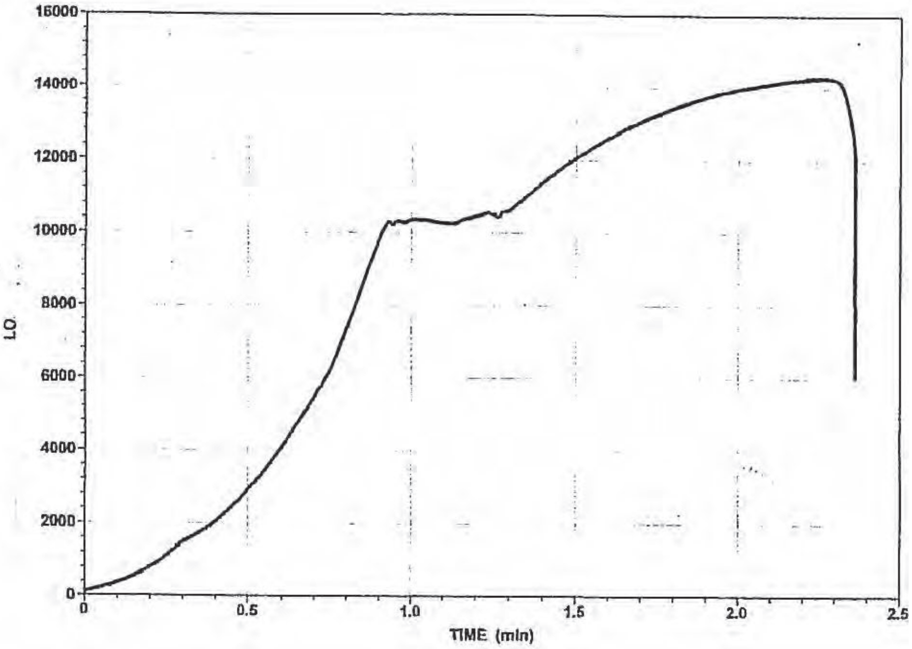
Date: 05/11/07

Time: 12:29:08
Elapsed: 00:02:57

Peak Load	22140 lb
Peak Stress	71419 psi
Man. Elong. @ Break	19.81 %
Yield-Halt of Force	48670 psi
Y/T Ratio	NA

TWINING LABORATORIES
3310 AIRPORT WAY
LONG BEACH, CA 90806

Specimen #:	1
OPERATOR:	T. MCNAIR
JOB NAME:	PORT OF LA WAREHOUSE #1
JOB #:	070212.1
ID#:	RS-2
Geometry:	Area
Gage Length:	8.0000 in
Area:	0.2000 sq in



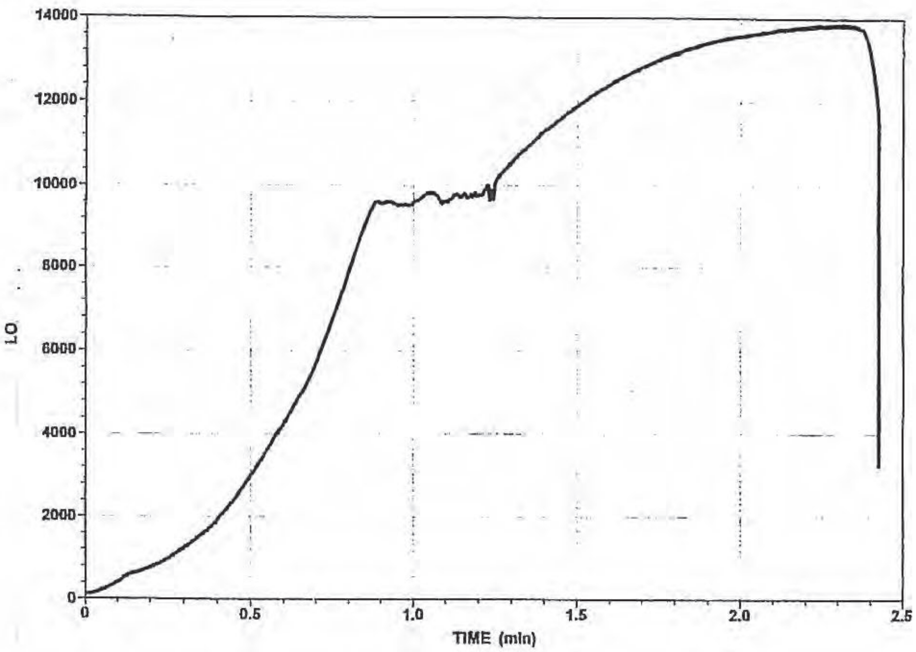
Date: 05/11/07

Time: 12:50:50
Elapsed: 00:02:22

Peak Load	14280 lb
Peak Stress	71400 psi
Man. Elong. @ Break	17.29 %
Yield-Halt of Force	51347 psi
Y/T Ratio	NA

TWINING LABORATORIES
3310 AIRPORT WAY
LONG BEACH, CA 90806

Specimen #:	1
OPERATOR:	T. MCNAIR
JOB NAME:	PORT OF LA WAREHOUSE #1
JOB #:	070212.1
ID#:	RS-3
Geometry:	Area
Gage Length:	8.0000 in
Area:	0.2000 sq in



Date: 05/11/07

Time: 12:45:25
Elapsed: 00:02:26

Peak Load	13860 lb
Peak Stress	69300 psi
Man. Elong. @ Break	20.40 %
Yield-Halt of Force	47923 psi
Y/T Ratio	NA

Appendix D
Criteria for Estimation of Reinforcing Bar Tensile and Yield Strength Using Non-Destructive Testing

TWINING LABORATORIES OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806 / 562.426.3355 *phone* / 562.426.6424 *fax* / www.twininglabs.com

Criteria for Port of Los Angeles Warehouse No. 1 Estimation of Reinforcing Bar Tensile and Yield Strength Using Non-Destructive Testing

Testing Purpose

Perform chemical composition and Brinell hardness tests on exposed in-situ reinforcing bars and correlate to tensile testing performed on extracted reinforcing steel coupons.

Testing Procedure

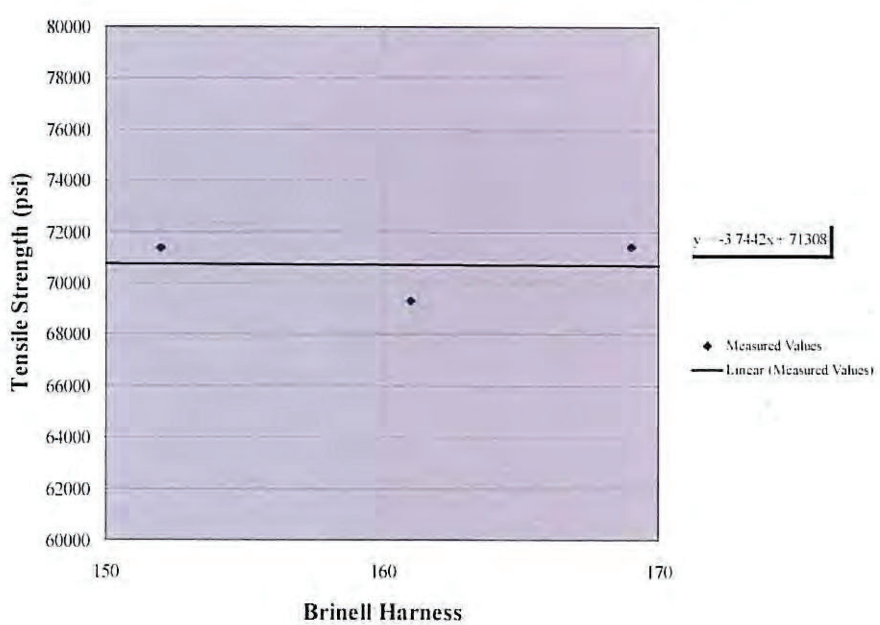
The approximate tensile strength shall be determined by strength to hardness curves as recommended by ASTM A370 and approved by the reviewing authority. These curves shall be developed by correlating data from hardness and tensile testing directly on the same sample and plotting one against the other.

The approximate yield strength shall be determined using yield to tensile strength ratios derived from recorded tests of yield and tensile strengths from the same sample and with all samples of the same vintage and classification. The yield to tensile strength ratios shall be approved by the reviewing authority.

Tensile Test Results and Corresponding Curve

Sample No.	Yield Strength (psi)	Tensile Strength (psi)	Yield to Tensile Ratio	Brinell Hardness
RS1	48,670	71,419	0.68	169
RS2	51,347	71,400	0.72	152
RS3	47,923	69,300	0.69	161
NDR1	48,166	69,066	0.70	160
NDR2	45,405	65,107	0.70	154
NDR3	47,245	67,747	0.70	158
Average				

Brinell Hardness and Tensile Strength Test Results



TWINING
LABORATORIES
OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806 / 562.426.3355 *phone* / 562.426.6424 *fax* / www.twininglabs.com

Test on Reinforcing Steel

CUSTOMER: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA 90017

DATE: May 31, 2007
JOB NO.: 070212.1
LAB NO.: 1-97-070069503

Received
JUN 2 : 2007
Miyamoto International

JOB NAME: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA

CONTRACTOR: MIYAMOTO INTERNATIONAL **ARCHITECT:**

ENGINEER: **SUBCONTRACTOR:**

SAMPLED BY: RRS-TLSC
SAMPLED AT: JOBSITE
DELIVERED BY: TLSC **ON:** 5/7/2007
DATE TESTED: 5/11/07
SPECIFICATION: ASTM A370 **TESTED BY:** T. MACIAS

GRADE	SIZE	ID NUMBER	HEAT NO.	WEIGHT (LBS.)	AREA SQ.IN.	YIELD STR(PSI)	TENSILE STR(PSI)	ELON % IN	G.L. IN.
--	5	RS-1	----	----	.31	48670	71419	19.8	8
--	4	RS-2	----	----	.20	51347	71400	17.29	8
--	4	RS-3	----	----	.20	47923	69300	20.4	8

COMPLIANCE: Information Purposes Only
REMARKS: Need hardness, Chemical Analysis and Carbon Equivalent.

DISTRIBUTIONS:
WILSON & COMPANY, 1
MIYAMOTO INTERNATIONAL INC., 4
RANDY SLANE – FILE COPY
PORT OF LOS ANGELES, 1

Dexter Quidilla for
Paul Soltis, RCE, GE Senior Engineer

RB-1-97-070069503/DC

TWINING LABORATORIES OF SOUTHERN CALIFORNIA

3310 Airport Way, Long Beach, CA 90806 / 562.426.3355 *phone* / 562.426.6424 *fax* / www.twininglabs.com

TEST REPORT ON REBAR

DATE: June 5, 2007

JOB NO.: 070212.1
LAB NO.: 1-97-070069505

CUSTOMER: MIYAMOTO INTERNATIONAL INC
700 SOUTH FLOWER STREET SUITE 100
LOS ANGELES, CA 90017

JOB NAME: PORT OF LOS ANGELES - WHAREHOUSE NO 1
SAN PEDRO, CA

CONTRACTOR:

ARCHITECT:

SUBCONTRACTOR:

ENGINEER: MIYAMOTO INTERNATIONAL INC.

SAMPLED BY: TLSC
SAMPLED AT: JOBSITE
DATE SAMPLED: 04/09/2007
DELIVERED BY: TLSC
RECEIVED ON: 05/07/2007

SPECIFICATION:
Others: Rebar

SIZE	TYPE/ GRADE/CLASS	DESCRIPTION	SAMPLE NO.	ROCKWELL HARDNESS (1)	(2)	(3)	(4)	(5)	(6)	(AVG)	P/F
# 5	----	Rebar Rockwell B	----	B86	B83	B89				B86	--
		Brinell		169	159	180				169	--
# 4	----	Rebar Rockwell B	----	B80	B86	B75				B80	--
		Brinell		150	169	137				152	--
# 4	----	Rebar Rockwell B	----	B92	B73	B82				B82	--
		Brinell		195	132	156				161	--

COMPLIANCE: Information purposes only per Randy Slane.

DISTRIBUTION:
Wilson & Company, 1
Miyamoto International Inc., 4
Port of Los Angeles, 1
Randy Slane – File Copy

Rebar1-97-070069505/dc

Paul Saltis RCE, GE Senior Engineer