

HOBOKEN PRIVATELY-OWNED WATERFRONT STRUCTURES INSPECTION

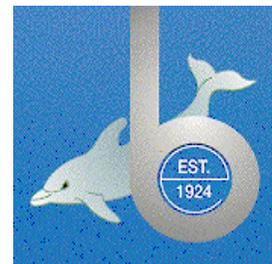
File No. BUE-1010

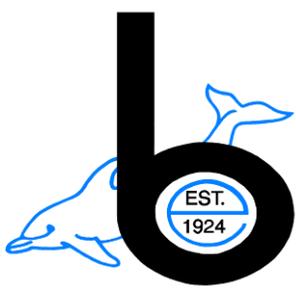


BOSWELL UNDERWATER ENGINEERING

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June 2011





June 27, 2011

Jennifer W. Maier
Director of Environmental Services
City of Hoboken
94 Washington Street
Hoboken, NJ 07030

Re: Hoboken Privately-Owned
Waterfront Structures Inspection
Our File No. BUE-1010

Dear Director Maier:

In accordance with the terms of the referenced Agreement, we are pleased to submit the final copy of the Condition Survey Report of the above referenced facilities.

This report summarizes our field survey efforts, evaluation of the structural conditions of the various elements of the facilities and recommendations for repair to preserve and/or prolong the serviceability of these facilities. Repair recommendations have been prioritized and have been individually enumerated, as practicable.

The thoroughness and accuracy of all work on this project has been ensured through independent quality control by our technical and senior management staff.

Please do not hesitate to contact this office if you should have any questions or comments.

Very truly yours,

BOSWELL UNDERWATER ENGINEERING

Michael J. Ganas, P.E.
BUE Managing Director

MJG/kc
Enclosures

EXECUTIVE SUMMARY

Boswell Underwater Engineering (BUE) performed a condition survey of privately-owned waterfront structures in the city of Hoboken from December 2010 to February, 2011. The condition survey included an inspection of the following properties:

- Stevens Institute of Technology - pedestrian pier and fishing pier.
- Maxwell Place - West Pier, a concrete-encased steel H-pile supported platform and North Pier, a pre-cast concrete pile supported pier.
- Shipyard LLC - consisting of 3 piers of varying structure type, 3 high-level platforms adjacent to the shoreline, 505 lf of timber cribbing bulkhead, and a low-level timber relieving platform. The pier types are configured as follows:
 - Pier A (northern-most pier) is roughly 782 ft long and 35 wide. The pier is composed of concrete-filled steel pipe piles supporting concrete pile caps, beams and pier deck.
 - Pier B (center pier) is approximately 738 ft long and 30 ft wide. The western 310 ft of the pier is made-up of timber pile bents; the eastern 428 of the pier is made-up of steel pipe pile bents. The pile bents support concrete pile caps, beams and pier deck.
 - Pier C (southern-most pier) is approximately 739 ft long and 40 ft wide and founded on timber pile bents supporting concrete pile caps, beams and pier deck.
- NY Waterway – comprised of concrete-filled steel pipe pile supported pier with concrete pile caps, beams and pier deck, a high-level timber pile platform, a concrete-encased steel H-pile platform, and roughly 271 lf of steel sheet pile bulkhead.
- Sovereign at Shipyard – a high level platform comprised of steel pipe piles supporting cast-in-place pile caps, and pre-cast concrete beams and deck planks.
- Toll Brothers Tea House – Approximately 1,056 lf of concrete seawall primarily supported by timber cribbing, with one area roughly 63 ft long supported by a low-level timber relieving platform, and another area roughly 226 ft long founded on a single bent of piles supporting timber decking.

The following areas were found to be in serious or critical condition and require immediate repairs or action to be taken:

- Shipyard LP - The western-most bent of Pier A at the shipyard property, which supports a pedestrian walkway adjacent to Sinatra Drive, is in critical condition due to 8 of 10 piles supporting the cap observed to have 100% section loss. The pile cap is essentially unsupported and should be repaired as soon as possible. Repair plans prepared by

Birdsall Services Group dated March 10, 2011 include reconstruction of the deteriorated portion of promenade, see Appendix B.

- Shipyard LP - The eastern 45 ft of Pier B at the shipyard property is in critical condition due to 28 missing timber piles, missing and/or broken timber pile caps, broken concrete pile caps and severely deteriorated pier deck. Barricades should be placed to restrict all access to the eastern end of the pier as soon as possible.
- Toll Brothers Tea House - The timber relieving platform from 2+17 to 2+79 at the Tea House property is in critical condition due to severely deteriorated timber piles, pile caps and deck planks. The area is currently fenced off to restrict access and should remain closed until repairs are made to the platform.
- Toll Brothers Tea House - The northeast corner of the bulkhead, Sta. 8+30 to 8+50, at the Tea House property is in critical condition due to the northern-most 6 piles supporting the seawall being severely deteriorated. The area is currently fenced off to restrict access and should remain closed until repairs are made to the piles.

STEVENS INSTITUTE OF TECHNOLOGY

Construction of the pedestrian pier was not complete at the time of inspection and no portions of the pier were open for use. All of the pier elements were installed with the exception of the southern section of pier deck planks. All of the piles, pile caps and deck planks are in good condition. The adjacent structures which will provide access to the pedestrian pier, Castle Point Park seawall and the Frank Sinatra Park seawall are in a deteriorated condition. Repairs for both of these adjacent structures are in the design phase. Until these repairs are completed the pier should remain closed.

The shoreline adjacent to the pedestrian pier is comprised of a timber cribbing bulkhead for a distance of roughly 300 lf. Voids were found in the timber cribbing bulkhead due to missing timber elements or portions of the cribbing having been removed to permit installation of the pedestrian pier pipe piles. The general condition of the timber cribbing does not affect the pier structure; however, the voids are significant enough to allow upland fill to escape and could potentially result in sinkholes in the adjacent parking area. It is recommended that the timber cribbing be repaired or the shoreline stabilized where voids were found in the timber cribbing.

PT MAXWELL

The general condition of the West Pier is satisfactory. It is recommended that a portion of exposed, severely deteriorated steel sheet pile bulkhead at the north end of the pier be repaired on a priority basis. It is recommended that the spalls observed in the pile caps and underdeck of the West Pier be repaired on a routine basis. The overall condition of the North Pier is good; there are no recommended repairs for the structure.

SHIPYARD ASSOCIATES LP

PIER A – The condition of the piles supporting Bent-2 is critical and recommended for immediate repair as described above. The general condition of the remainder of the steel H-piles supporting Pier A is poor due to severe corrosion of 275 of the 361 inspected piles. Additionally, 124 piles had voids at the tops of the concrete pile encasements that exposed the underlying steel H-pile. The condition of the concrete pile caps is satisfactory, with typically only moderate scaling noted. The overall condition of the concrete beams and underdeck is fair due to a substantial amount of spalling of the underdeck and bottoms of the beams.

PIER B – The eastern 45' of the pier is in critical condition due to severely deteriorated or missing timber piles, pile caps, concrete pile caps and concrete pier deck. No load should be permitted within this area and physical barricades restricting access should be installed as soon as possible as detailed above. The overall condition of the timber piles is fair; 150 piles have deterioration classified as severe and 70 have deterioration classified as moderate. The defects of the timber piles include completely missing piles, full or partial loss of bearing, section loss, splits and deteriorated connection hardware. The timber piles caps are generally in satisfactory condition with isolated areas identified with section loss due to rot. The overall condition of the timber bracing is poor due to many missing elements, bracing with moderate to severe section loss, splits or missing or severely corroded hardware. The concrete pier deck and beams are generally in poor condition, with widespread spalling and severely corroded reinforcing steel.

PIER C – The overall condition of the timber piles, pile caps and bracing is fair. Severe deterioration in the form of reduced bearing, section loss, splits and missing or severely corroded connection hardware was identified at 89 piles and moderate deterioration was identified at 238 piles. A total of 27 pile caps have severe section loss, and 61 have moderate section loss. The overall condition of the steel pipe piles at Pier C is poor; 185 of 207 inspected piles have severe corrosion within the tidal zone, and 95 of those piles have through holes exposing the concrete in-fill. The overall condition of the concrete pile caps, beams and underdeck is fair, showing areas of spalling with exposed, corroded reinforcing steel located throughout the pier.

RELIEVING PLATFORMS – The condition of the concrete-encased steel H-piles supporting the relieving platforms is satisfactory. Several piles are not encased and are generally in poor condition. It is likely that the piles were not necessary to support the current loading conditions that the structure is subjected to and were abandoned in place.

The timber piles at the southern platform are generally in fair condition with 14 of 52 piles rated severe due to splits, section loss or reduced bearing. The concrete beams and underdeck at the platforms are in overall fair condition, showing areas of spalling and exposed, corroded reinforcing steel throughout the structures.

TIMBER CRIBBING BULKHEAD – The overall condition of the timber cribbing is poor due to numerous voids in the cribbing, and moderate to severe section loss throughout the cribbing from marine borer attack. Loose fill was observed within the voids in the cribbing and probes up to 4 ft deep horizontally were possible. At the time of the inspection, access to the walkway supported by the cribbing was limited by roadway construction due to the October 2010 Sinatra Drive relieving platform collapse. The overall condition of the timber low-level relieving platform at the northern limits of the structure is fair with isolated elements in poor condition due to moderate to severe deterioration of the timber piles, pile caps and deck planks.

Immediate repairs are recommended for the steel piles in Bent-1 at Pier A and for the east end of Pier B as presented above. Based on the findings of the condition survey, the following repairs are recommended on a priority basis:

- Pier A - Repair severely deteriorated steel H-piles.
- Pier B – Repair concrete underdeck and beam spalls.
- Pier C – Repair steel pipe piles with severe section loss or loss of bearing.
- Timber High-Level Platform – Repair timber elements rated severe.
- Steel H-pile Platforms – Confirm that steel H-piles that were not encased are not required to support the currently imposed loads and were intentionally abandoned in place. If structure support is not adequate without abandoned piles, develop and implement repairs.
- Low-Level Timber Relieving Platform – Repair timber piles, pile caps and decking rated severe.
- Repair/replace timber cribbing bulkhead.

The following items are recommended to be repaired on a routine basis:

- Pier A – Repair underdeck and beam spalls.
- Pier B – Repair deteriorated timber piles, pile caps and bracing.
- Pier C – Repair deteriorated timber piles, pile caps and bracing.
- Pier C – Repair underdeck and beam spalls.
- Steel H-Pile Relieving Platform south of Pier A – protect exposed steel H-piles from further corrosion and repair concrete beam spalls.
- Steel H-Pile Relieving Platform north of Pier A - Repair underdeck and beam spalls.

Repair plans prepared by Birdsall Services Group dated March 10, 2011 (Appendix B) include repairs to the severely deteriorated bent at Pier A, the low-level timber relieving platform and the timber cribbing bulkhead.

NY WATERWAY

The overall condition of the steel pipe piles of the NY Waterway is fair to poor. Of 461 piles inspected, 98 are rated severe due to corrosion within the tidal zone and 80 are rated moderate. The concrete pile caps are typically in satisfactory condition with minor to moderate scaling. The concrete deck beams and underdeck are generally in fair condition, showing spalling and moderate to severe corroded reinforcing throughout the structure.

The timber piles supporting the high-level timber relieving platform are generally in fair condition. There are 32 piles with severe deterioration and 15 piles with moderate deterioration of 489 total inspected. The most common forms of deterioration of the piles is rot and hollowing of the top, resulting in loss of bearing. The timber pile caps are generally in satisfactory condition with isolated locations in poor condition due to section loss from rot. The concrete underdeck from Bents 1 to 14 is in fair condition with widespread spalling and delamination. The majority of the underdeck from Bents 15 to 29 has gunite repairs and is in satisfactory condition.

The steel H-pile platform that supports a portion Sinatra Drive and the adjacent walkway is generally in satisfactory condition, as all the piles with the exception of two have full length encasements. The two piles that are not encased are in poor condition with severe loss of section. Outboard of the walkway and beyond the guardrail is a platform section supported by three rows of steel H-piles that have not been encased. The condition of the H-piles is poor due to severe section loss.

Overall, the steel sheet pile bulkhead is in satisfactory condition with moderate loss of section. There is a hole, roughly 4 in high and 2 in wide, at one location in the sheeting. The location of the hole coincides with an area of sheeting that is exposed to water dripping from the deck above.

Based on inspection findings, the following repairs are recommended on a priority basis:

- Pier – Repair severely corroded steel pipe piles and H-piles, and piles with loss of bearing.
- High-Level Timber Platform – Repair timber piles and pile caps with deterioration rated severe.
- High-Level Steel H-Pile Platform – Repair two piles with section loss rated severe.
- Steel Sheet Pile Bulkhead – Stop water from leaking onto steel sheeting; repair hole in sheeting.

The following repairs are recommended on a routine basis:

- Pier – Repair/protect steel pipe piles with moderate corrosion.
- Pier - Repair underdeck and beam spalls.
- High-Level Timber Platform – Repair underdeck spalls.

SOVEREIGN AT SHIPYARD

The overall condition of the high-level platform at the Sovereign at Shipyard property is satisfactory. Protective coating loss and minor corrosion of the steel pipe piles was observed within the tidal zone. It is recommended that the pipe piles be protected from further corrosion within the tidal zone on a routine basis.

TOLL BROTHERS TEA HOUSE

As described above, there are two areas of the bulkhead, Sta. 2+17 to 2+79 and Sta. 8+30 to 8+50, that are in critical condition and should be repaired as soon as possible. The timber piles, pile caps and decking at the relieving platform between Sta. 2+17 and 2+79 typically show section loss rated severe due to marine borer infestation. From Sta. 8+30 to 8+50, the 6 timber piles supporting the seawall have severe marine borer infestation and section loss up to 80%, with one pile completely broken off near the mudline. At Sta. 8+30 there is visual evidence that the seawall has settled. The overall condition of the remainder of the timber cribbing is poor due to severe infestation of marine borers and section loss typically between 25% and 40%, but as great as 50% in isolated locations. The concrete seawall has signs of differential lateral movement at three locations, Sta. 5+20, Sta. 6+47 and Sta. 7+07. The condition of the face of the concrete seawall varies from satisfactory to poor, showing areas of spalling up to 12 in deep with exposed corroded reinforcing steel.

As detailed above, repairs to the timber substructure are recommended at the section of relieving platform between Sta. 2+17 and 2+79, and the severely deteriorated timber piles from Sta. 8+30 to 8+50 to be performed as soon as possible. In addition, an engineering evaluation should be performed on a priority basis to determine the cause of the differential movement of the seawall and develop appropriate repair plans. Until such time that the evaluation can be performed and repairs completed, movement of the seawall should be monitored and deck loads should be restricted to pedestrian use only. The timber cribbing should be repaired to prevent further deterioration caused by marine borers on a priority basis. The spalling at the face of the seawall should be repaired on a routine basis.

This report contains conclusions concerning the causes of the noted conditions and recommendations for the rehabilitation of structures. The repair procedures contained in the recommendation sections of the reports outline the general extent of the required rehabilitation

work. Repair recommendations do not preclude the necessity of performing further investigation and preliminary design work for the purpose of establishing the complete scope of work and final rehabilitation.

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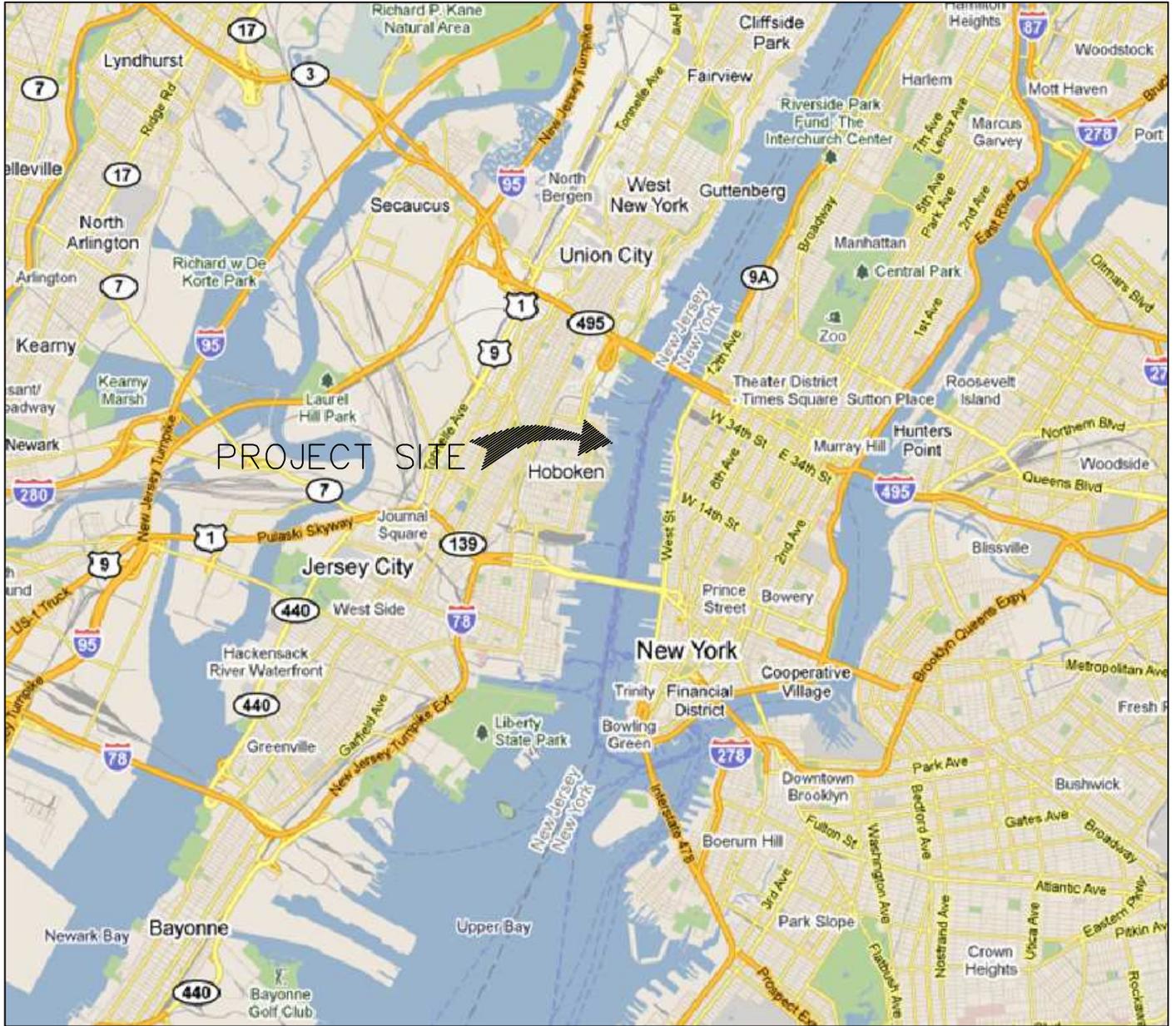
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**CITY OF HOBOKEN
CONDITION SURVEY OF PRIVATELY-OWNED
WATERFRONT STRUCTURES**

VICINITY PLAN

INSPECTED BY: JP, DC, JF DRAWN BY: JG	SCALE: N1S	DATE OF INSPECTION: FEBRUARY 2011
JOB NO. BUE 1010	DRAWING NO. 1.1	SHEET x8



BOSWELL UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS – MARINE CONSTRUCTION

CITY OF HOBOKEN
CONDITION SURVEY OF PRIVATELY-OWNED
WATERFRONT STRUCTURES

SITE PLAN

INSPECTED BY: JP, DC, JF DRAWN BY: JG	SCALE: NTS	DATE OF INSPECTION: FEBRUARY 2011
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1. SCOPE OF WORK AND INSPECTION PROCEDURE

1.1 SCOPE OF WORK

From December, 2010 to February, 2011, Boswell Underwater Engineering (BUE) performed a condition survey of privately-owned waterfront structures in Hoboken, New Jersey. The condition survey included inspections of the following properties:

- Stevens Institute of Technology – Inspection of a steel pipe pile supported pedestrian pier and a steel pipe pile supported fishing pier.
- PT Maxwell – Inspection of the West Pier, a concrete-encased steel H-pile supported high-level platform and the North pier, a pre-stressed concrete pile pier.
- Shipyard Associates LP – Inspection of three piers; for the purpose of this inspection, referred to as Piers A, B and C from north to south. Pier A is founded on steel pipe piles, Pier B is supported by timber piles, and Pier C is supported by timber piles and steel pipe piles. Inspection of three high-level platforms, two built on steel H-piles, and one built on timber piles. The inspection also included the timber cribbing bulkhead along the shoreline of the property and a section of concrete seawall supported by a low-level timber relieving platform.
- NY Waterway – Inspection of a steel pipe pile supported pier, two high-level timber pile platforms, a high-level steel H-pile supported platform and steel sheet pile bulkhead.
- Sovereign at Shipyard – Inspection of a high-level steel pipe pile supported platform.
- Toll Brothers Tea Building – Inspection of a concrete seawall founded on timber cribbing and low-level timber relieving platform.

1.2 INSPECTION PROCEDURE

The facility was inspected under the direction of a registered Professional Engineer licensed in New Jersey. The underwater inspection was performed by a three-person team, consisting of a professional engineer-diver, an engineer-diver, and an inspector-diver. All underwater inspection work was conducted utilizing surface-supplied air and a hardwire communications tether. Operations were staged from an inspection van located on the pier deck as well as a 25 ft dive boat. The inspection was performed and report prepared in accordance with the American Society of Civil Engineers' "Underwater Investigations Standard Practice Manual." The following Inspection Levels were employed for this inspection.

- Level I A close visual examination or a tactile examination using large sweeping motions of the hands where visibility is limited. Although this effort is often referred to as a "swim-by" inspection, it must be detailed enough to detect obvious major damage or deterioration caused by overstress or other severe deterioration. It should confirm the continuity of the full length of all members and detect undermining or exposure

of normally buried elements. This inspection also may include limited probing of the substructure and adjacent channel bottom.

Level II A detailed inspection that requires marine growth to be removed from portions of the structure. Cleaning is time-consuming, hence the need to base the inspection on a representative sampling of components. For piles, a 12-in.-high band should be cleaned at designated locations, generally near the low waterline, at the mudline, and midway between the low waterline and the mudline. On a rectangular pile, the marine growth removal should include at least three sides; on an octagonal pile, at least six sides; on a round pile, at least three-fourths of the perimeter. On large-diameter piles (3 ft or greater), 1-ft x 1-ft areas should be cleaned at four locations approximately equally spaced around the perimeter at each elevation. On large, solid-faced elements such as retaining structures, 1-ft x 1-ft areas should be cleaned at these three elevations. This inspection also should focus on typical areas of weakness such as attachment points and welds. It is intended to detect and identify damaged and deteriorated areas that may be hidden by surface biofouling. The thoroughness of cleaning should be governed by the tasks necessary to discern the condition of the underlying material. Removal of all biofouling staining is generally not required.

Level III A detailed inspection typically involving nondestructive or partially destructive testing, conducted to detect hidden or interior damage or to evaluate material homogeneity. Typical inspection and testing techniques include the use of ultrasonics, coring or boring, physical material sampling, and in situ hardness testing. This inspection is generally limited to key structural areas, areas that are suspect and areas that may be representative of the underwater structure.

The following types of inspection/survey activities were performed on the components of the structures:

Steel H-Piles/Concrete-Encased Steel H-Piles

A 100% Level I – visual/tactile inspection was performed on all steel H-piles and concrete-encased steel H-piles. Level II inspections were performed at 10% of all piles inspected. Additionally, micrometer or ultrasonic thickness measurements were taken at a representative number of piles in order to determine average loss of cross-sectional area.

Steel Pipe Piles

A 100% Level I visual/tactile inspection was performed on all steel pipe piles. At 10% of the steel pipe piles a Level II inspection was conducted. At roughly 5% of the steel pipe piles, a Level III inspection was performed consisting of ultrasonic thickness measurements to determine average loss of cross-sectional area.

Timber Piles

A 100% visual/tactile inspection was performed at all timber structural piles; any timber fender piles, walers and associated hardware encountered at the inspected structures were not included in this scope of work. At 10% of the timber piles, a Level II inspection was performed. Additionally, the timber piles were probed with an ice pick at representative locations to ascertain the presence and severity of marine borer intrusion and the overall softness of the wood.

Timber Cribbing

A 100% visual inspection was performed of all the timber cribbing. The timber cribbing was probed with an ice pick at regular intervals to assess the condition of the timber and the extent of marine borer intrusion, if any. Additionally, where gaps or voids were encountered within the timber cribbing, those areas were probed to determine the presence and depth of any loss of fill from behind the cribbing.

Steel Sheet Pile Bulkhead

A 100% visual/tactile inspection of the steel sheet pile bulkhead was conducted. Ultrasonic thickness measurements were taken at representative locations.

Concrete Seawall

A 100% Level I visual inspection was conducted at the concrete seawall at Castle Point.

Concrete Pile Cap and Underdeck

A 100% Level I visual inspection was conducted of the concrete pile caps and underdeck at all inspected structures.

Due to extremely poor underwater visibility, underwater photographs were not feasible. Photographs of typical and atypical above water conditions and conditions that were visible at low tide were taken and included at the end of each section of this report.

1.3 DEFINITIONS OF RECOMMENDATION CATEGORIES

1.3.1 TYPES OF INSPECTION

The inspection involves one of the following methods:

Hands-On Inspection	Close-up inspection from no further away than arm's length where the member or element can be physically touched.
Visual Inspection	The inspection from a reasonable distance of a member or element where initial determination of the condition can be made.

1.3.2 RATING CRITERIA

The following ratings criteria, as defined by Table 2-4, of the ASCE Underwater Investigations Standard Practice Manual, were utilized for this inspection:

Table 1.1
Routine Underwater Condition Assessment Ratings

<u>Rating</u>	<u>Description</u>
6 Good	No visible damage, or only minor damage is noted. Structural elements may show very minor deterioration, but no overstressing is observed. No repairs are required.
5 Satisfactory	Limited minor to moderate defects or deterioration are observed, but no overstressing is observed. No repairs are required.
4 Fair	All primary structural elements are sound, but minor to moderate defects or deterioration is observed. No repairs are required.
3 Poor	Advanced deterioration or overstressing is observed on widespread portions of the structure but does not significantly reduce the load-bearing capacity of the structure. Repairs may need to be carried out with moderate urgency.
2 Serious	Advanced deterioration, overstressing, or breakage may have significantly affected the load-bearing capacity of primary structural components. Local failures are possible and loading restrictions may be necessary. Repairs may need to be carried out on a high-priority basis with urgency.
1 Critical	Very advanced deterioration, overstressing, or breakage has resulted in localized failure(s) of primary structural components. More widespread failures are possible or likely to occur, and load restrictions should be implemented as necessary. Repairs may need to be carried out on a very high priority basis with strong urgency.

1.3.3 DESCRIPTION OF RECOMMENDED ACTIONS

Based on the findings of the routine condition assessment, the following recommendation categories as defined by Table 2.6 of the ASCE Underwater Investigations Standard Practice Manual, may be assigned:

Table 1.2
Description of Recommended Actions Options

Recommended Action	Description
Emergency Action	<p>Recommended whenever an unsafe condition is observed. If the situation is life threatening or if significant property damage or environmental damage may occur, appropriate owner representatives should be contacted immediately.</p> <p>May consist of barricading or closing all or portions of the structure, placing load restrictions, or unloading portions of a structure.</p>
Engineering Evaluation	<p>Recommended whenever significant damage or defects are encountered that require a structural investigation or evaluations to quantify the structural capacity, determine whether repairs are required, or determine which method of repair is appropriate.</p> <p>Although the scope of the routine inspections should include the structural assessment of the damage or defects on the capacity of typical structural components relative to their new condition, the engineering evaluation should consider the actual or anticipated loads that are or will be imposed on the structure.</p>
Repair Design Inspection	<p>Recommended whenever repairs are required, typically as a result of a routine inspection, but also may result from a special inspection or post-event inspection.</p>
Special Inspection	<p>Typically recommended to determine the cause or significance of atypical deterioration, usually before designing repairs.</p> <p>Special testing, analysis, monitoring, or investigation using nonstandard equipment or techniques is typically required.</p>
Develop Repair Plans	<p>Recommended when the repair design inspection has been completed and any special inspections recommended have been completed.</p> <p>Indicates that the field data may have been collected and that the structure is ready to have repair documents prepared.</p>
No Action	<p>Recommended when no further action is necessary on the structure until the next scheduled routine inspection.</p>

Four categories of recommendations for repair are identified and defined as follows:

- Immediate** Requires immediate action, including possible closing of the structure or areas affected for safety reasons until interim remedial measures, such as shoring or removal of potentially unsafe structures (or elements), can be implemented. These closings or interim remedial actions, if any, always require immediate action upon discovery.
- Priority** Conditions for which no immediate action may be required or for which immediate action has been completed, but further investigations, design and implementation of interim or long-term repairs should be undertaken on a priority basis, i.e., taking precedence over all other scheduled work.
- Safety** Conditions that present a potential hazard and which should be repaired as soon as possible.
- Routine** Conditions requiring further investigation of remedial work, which can be undertaken as part of a scheduled maintenance program, other scheduled project, or routine facility maintenance, depending on the action required.

1.3.4 INSPECTION TERMINOLOGY

The following terms may be used during inspection to describe the condition of structural members:

a. Steel Members

1. Corrosion

Minor (or Light) – A light surface rust.

Moderate – Rust that is loose and flaking with some pitting. This scaling or exfoliation can be removed with some effort by use of a scraper or chipping hammer. Element exhibits measured but no significant loss of section.

Severe – Heavy, stratified rust or rust scales with extensive pitting. Removal requires exerted effort and may require mechanical means. Significant loss of section.

2. Pack Rust – Rust collected between two interfacing surfaces, usually two steel plates. Pack rust can be minor, moderate, or severe as described above.

Pack rust can severely deform the steel members due to the expansive nature of rust.

3. Pitting – Formation of cavities due to corrosion. Minor, moderate, and severe pitting categories are used based upon depth and density of cavities.

Minor – Typically less than 1/4 inch in diameter and 1/32 inch deep.

Moderate – 1/4 inch to 1/2 inch diameter and up to 1/8 inch deep.

Severe – Greater than 1/2 inch diameter and over 1/8 inch deep.

b. Concrete Members

1. Cracking – A separation into two or more parts with a space between the fractured concrete surfaces.

Hairline – Crack width less than 1/32 inch.

Fine – Crack width between 1/32 inch and 1/16 inch.

Medium – Crack width between 1/16 inch and 1/8 inch.

Wide – Crack width greater than 1/8 inch.

The above definitions for cracks can be modified, depending on the type of structural element. Other terminology, such as map cracking, pattern cracking, etc., may be used as appropriate.

2. Efflorescence – A white deposit caused by crystallization of soluble salts brought to the surface by moisture leaching through concrete.
3. Delamination – A layered separation of the concrete. When a delaminated area of concrete is struck (sounded) with a hammer, a hollow sound will be emitted.
4. Leaching – The dissolution and washing away of the calcium hydroxide in concrete. The moisture enters the concrete through exposed cracks in the surface.
5. Spall – A roughly circular, oval, or elongated depression in the surface of a concrete element caused by separation of a portion of the surface concrete.

Small (Pop-out) – Less than 6 inches in diameter and 1 inch deep.

Medium – Between 6 inches and 12 inches in diameter and up to 2 inches deep.

Large – Over 12 inches in diameter and any depth.

6. Scaling – The gradual loss of surface mortar and aggregates.

Light Scaling – Loss of surface mortar up to 1/4 inch deep.

Medium Scaling – Loss of surface mortar between 1/4 inch and 1/2 inch deep, including loss between large aggregate.

Heavy Scaling – Loss of mortar greater than 1/2 inch in depth significantly exposing large aggregate.

7. Hollow area – An area of concrete which emits a hollow sound when struck with a hammer, indicating the existence of a fracture plane beneath the surface.
8. Honeycomb – Typically small pocket voids formed by the entrapment of air during the placement of the concrete.

c. Timber Members

1. Marine Borer Attack

Limnoria – Commonly referred to as wood gribbles, these crustaceans are tiny wood eaters that attack the timber from the outside, continually reducing the diameter of a timber pile. Severe attack will result in an hourglass shape to the pile.

Teredo – Commonly referred to as shipworms, these mollusks burrow minute holes into the timber and attack from within. Severe attack will result in a hollowing of the pile, leaving just the outer shell, and may go undetected. Teredo leave a white calcified trail that may be exposed by exterior timber deterioration.

2. Fungus Decay

Generally appears as a moist area with stain or discoloration. Fungi produce conks, which are fruiting bodies, usually fan-like in shape, and which grow horizontally from the wood. They shed spores which propagate the fungus.

Conks are a sure sign of advanced decay and they vary from a fraction of an inch to several inches in length. Sapstain fungi have small black, globular fruiting bodies which smear like soft carbon when brushed with the hand.

- a. Molds – Cottony powdery circular growths varying from white or light colors to black. Molds themselves do not cause decay but their presence is an indication that conditions favorable to growth of fungi exist.
- b. Stains – specks, spots, streaks, or patches, varying in color, which penetrate the sap wood. Sapstain is harmless to wood. It is usually a surface phenomenon and like molds, implies conditions where harmful fungi can flourish.
- c. Soft rot – attacks the wood, making it soft and spongy. Only the surface wood is affected, and thus it does not significantly weaken the member.
- d. Brown rot – feeds upon the cellulose and makes the wood dark brown and crumbly.
- e. White rot – feeds upon both the cellulose and the lignin and makes the wood white and stringy.

Brown and white rots are responsible for structural damage to wood, while the other fungi types simply provide a sign that favorable conditions exist for growth.

3. Checks – Separation of the wood fibers, normally occurring across the annual growth rings.
4. Splits – similar to checks except the separations of the wood fibers extend completely through the piece of wood.
5. Shakes – Separations along the grain, which usually occur between the annual growth rings.
6. Damage by parasites

Damage is generally inside the surface of the wood and is therefore not visible, but sagging, crushing, small holes or the accumulation of sawdust may be observed.

Parasites tunnel in and hollow out the insides of timber members for food and shelter. Some common types of parasites include:

- a. Termites – Termites are pale-colored, soft-bodied insects that feed on wood. All damage is inside the surface of the wood, hence it is not visible. The only visible signs of infestation are white mud shelter tubes or runways extending up from the earth to the wood and on the side of masonry substructures.
 - b. Carpenter ants – Carpenter ants are large, black ants that gnaw galleries in soft or decayed wood. The ants may be seen in the vicinity of the infested wood, but the accumulation of sawdust on the ground at the base of the timber is also an indicator of their presence.
 - c. Powder-post beetles – Powder-post beetles also hollow out the insides of timber members and leave the outer surface pierced with small holes about 1/16” in diameter filled with dry pulverized wood. Often a powdery wood dust is dislodged from the holes. The inside may be completely excavated.
7. Overloading – Overstressing of the timber element by continuous or impact loads in excess of their ultimate capacity. Typically evident by severe vertical cracks in the timber that cross the grain, breakage of the timber, or bulging of the timber with splitting of the wood fibers.
 8. Abrasion – Reduction of the timber surface due to continual rubbing by debris, ice, or suspended particulates in the water. When combined with Limnoria attack, abrasion may rapidly reduce the cross-sectional area of piles.
 9. Connecting Hardware Corrosion – Pins and bolts connecting timber members are subject to corrosion and may provide the weak link in a structure if they fail. Additionally, holes left in the timber due to missing hardware provide openings for marine borers to access the untreated interior of the timber.

2.0 STEVENS INSTITUTE OF TECHNOLOGY

2.1 FACILITY DESCRIPTION

The Stevens Institute of Technology pedestrian pier is a steel pipe pile supported structure with pre-cast concrete pile caps and deck planks (Photo Nos. 2.1 and 2.2). A total of 78 concrete-filled 14 in. diameter steel pipe piles support the pedestrian pier. The structure closely follows the shoreline from the south end of Castle Point Park to the northern end of the Frank Sinatra Park soccer field. The total length of the main pier structure is 830 lf. At the southern end of the pedestrian pier, a fishing pier comprised of 16 steel pipe piles supporting pre-cast concrete pile caps, laminated timber stringers and composite deck planks extends 162 ft to the east, into the Hudson River (Photo Nos. 2.3 and 2.4). Design plans of the structures were not available at the time of inspection. Drawing Nos. 2.1 and 2.2 contain a typical cross-section and pile plan, respectively, based on field measurements.

2.2 INSPECTION FINDINGS

The construction of the pier was not complete at the time of inspection. All of the piles and pile caps and a majority of the pre-cast deck planks were installed; however, the south end of the pier deck, where it meets Frank Sinatra Park, was not in place (Photo No. 2.12). The seawall at Frank Sinatra Park, which will support the west end of the pedestrian pier deck planks, is a concrete cap placed on loose stacked concrete debris and rubble. There are voids beneath the south half of the concrete cap due to displacement of the loose concrete fill below (Photo Nos. 2.13 and 2.14). At the time of this inspection, access to Frank Sinatra Park was restricted due to a collapse of the southeast corner of the platform and the overall condition of the remainder of the structure. Repairs to restore the substructure were in the design phase. The deck planks connecting the Stevens Institute of Technology pedestrian pier to Frank Sinatra Park should not be installed until repairs to the Park are complete. The north end of the pier abuts a concrete seawall at Castle Point, which is in poor condition due to section loss from severe marine borer attack of the supporting timber piles, pile caps, and decking (Photo Nos. 2.10 and 2.11). At the time of the inspection, access to the southern end of Castle Point Park was restricted by a chain link fence due to a partial collapse of the concrete seawall (Photo No. 2.9). An inspection of the collapsed portion of the Castle Point seawall was performed by BUE in 2009 and not included in this scope of work. Currently, repairs to the seawall are in the design phase, and until repairs are complete, this area should remain closed.

2.3 STEEL PIPE PILES

The overall condition of the steel pipe piles is good, with no notable defects. The protective coating is typically in place for the full exposed length of the piles. In order to install the steel pipe piles in the mid-sections of the pier (pier section oriented north to south), existing timber cribbing was partially demolished. The removal of the outbound face of the cribbing has left voids in the remaining section of cribbing which could allow upland fill to escape (Photo Nos. 2.6 and 2.7).

Additionally, the southern east-west oriented section of pier is directly adjacent to a timber cribbing bulkhead. The bottom of the timber cribbing has several missing timbers with evidence of loose and missing fill within the section of cribbing (Photo No. 2.8).

2.4 CONCRETE PILE CAPS AND DECK PLANKS

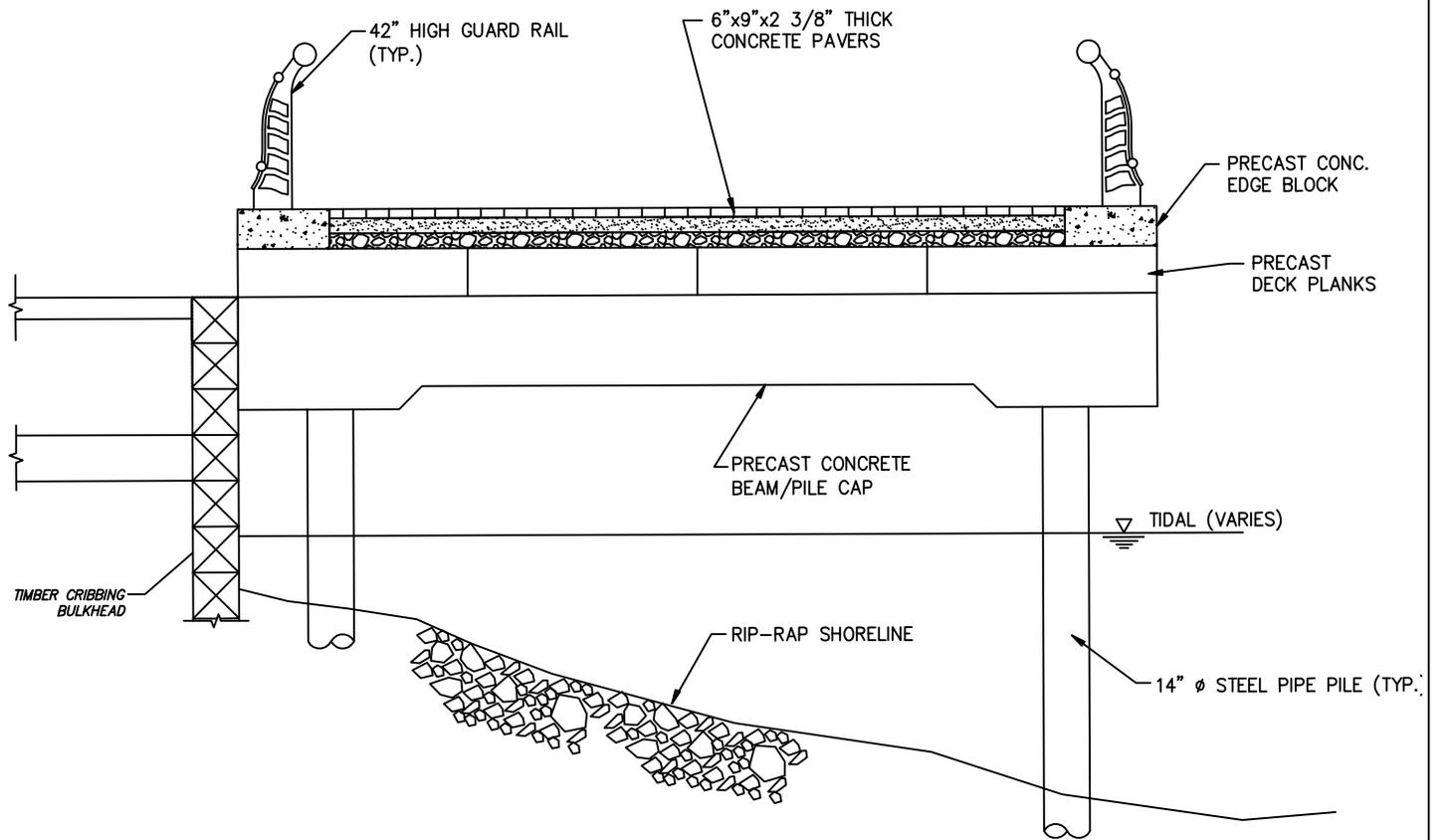
The general condition of the concrete pile caps is good (Photo No. 2.5). The installation of the deck planks at the south end of the pier was not complete at the time of this inspection. The installed deck planks, however, are in good condition.

2.5 RECOMMENDATIONS

Based on the findings of the condition survey, the following repairs and/or actions are recommended:

- No access should be permitted to the pier until repairs are made at both the north and south approaches (Castle Point Park and Frank Sinatra Park) and construction of the new pier is complete, inclusive of all deck planks, railings, and safety items.
- Repair/restore the timber cribbing and stabilize the shoreline where cribbing is deteriorated or has been partially demolished for installation of new pier pipe piles.

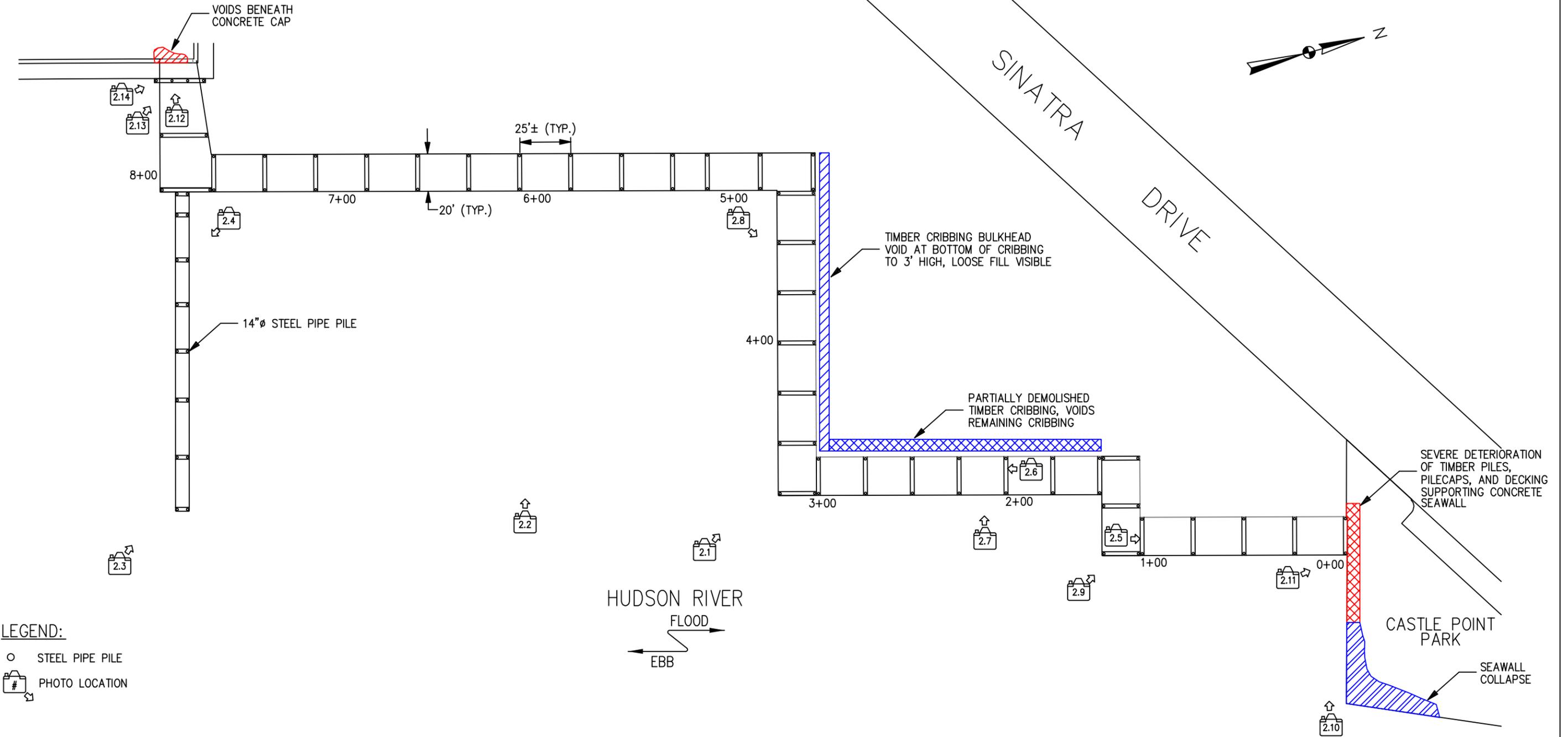
The next inspection of the pedestrian and fishing piers should occur within five years.



TYPICAL SECTION

FRANK SINATRA PARK

VOIDS BENEATH
CONCRETE CAP



LEGEND:

- STEEL PIPE PILE
- 📷 PHOTO LOCATION

HUDSON RIVER
FLOOD
EBB



UNDERWATER INSPECTION & DIVING SERVICES
HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
CONDITION SURVEY OF PRIVATELY-OWNED
WATERFRONT STRUCTURES

STEVENS INSTITUTE OF TECHNOLOGY
PEDESTRIAN PIER AND FISHING PIER PLAN

INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 10'	DATE OF INSPECTION: FEBRUARY, 2011
DRAWN BY: J.G.	JOB NO. BUE-1010	DRAWING NO. 2.2
		SHEET 14

2.7 PHOTOGRAPHS



Photo No. 2.1

Location:

Northern section of pier

Description:

General view looking north



Photo No. 2.2

Location:

Center section of pier

Description:

General view looking west



Photo No. 2.3

Location:

Fishing pier

Description:

General view looking west



Photo No. 2.4

Location:

Fishing pier

Description:

General view looking east



Photo No. 2.5

Location:

Typical pile and pile cap

Description:

General view



Photo No. 2.6

Location:

North section of pier

Description:

Timber cribbing partially removed for pile installation



Photo No. 2.7

Location:

North section of pier

Description:

Gaps in remaining
cribbing, fill visible



Photo No. 2.8

Location:

East-west oriented
pier section

Description:

Deteriorated cribbing,
voids and loose fill
visible



Photo No. 2.9

Location:

North end of pier and
Castle Point seawall

Description:

Partially collapsed



Photo No. 2.10

Location:

North end of pier

Description:

North deck plank
cantilever abuts Castle
Point seawall



Photo No. 2.11

Location:

Castle Point timber relieving platform

Description:

Severely deteriorated timbers supporting seawall



Photo No. 2.12

Location:

Southeast pier cap and Sinatra Park

Description:

General view looking west



Photo No. 2.13

Location:

Sinatra Park concrete cap

Description:

Loose stacked concrete foundation and voids beneath concrete cap



Photo No. 2.14

Location:

Sinatra Park concrete cap

Description:

Voids beneath cap, loose concrete slab

3.0 PT MAXWELL

3.1 FACILITY DESCRIPTION

The PT Maxwell waterfront property consists of two structures, the West Pier and the North Pier. The West Pier is oriented north to south adjacent to the shoreline at the southern limits of the property. The pier is approximately 378 ft long and 72 ft wide and comprised of concrete-encased steel H-piles supporting cast-in-place concrete pile caps and concrete deck (Photo Nos. 3.1 and 3.2). The pier was rehabilitated within the last three years by re-encasing existing steel H-piles with previous repairs. Waterfront development plans detailing the repair scheme dated May, 2008 are included in Appendix A of this report. The repair of the pier included the re-encasement of approximately 237 piles that were accessible for inspection. Roughly 217 piles were not repaired and were abandoned in place. The field conditions are generally consistent with the 2008 Repair Plans; however, a few variations were found in the location of repaired piles and are reflected in the plan view shown on Drawing No. 3.20. A concrete bulkhead is located at the land side of the pier. The North Pier is a pre-cast, pre-stressed concrete pile supported structure. The piles support pre-cast concrete pile caps, deck planks, and cast-in-place deck (Photo No. 3.4). The pier is oriented east to west and is 490 ft long and 65 ft wide. The pier was built at the same time as the rehabilitation of the West Pier. The North Pier replaced a deteriorated timber pier structure, and timber piles cut-off near mean low water have been left in place beneath the new pier. A steel sheet pile bulkhead is located at the land side of the pier. The concrete pier deck is primarily utilized by pedestrians, and a portion of the pier is landscaped (Photo No. 3.3). Typical sections and plan views of the West and North Piers showing pile locations, general configuration of the piers and observed conditions are depicted on Drawing Nos. 3.1 through 3.6.

3.2 INSPECTION FINDINGS

The overall condition of the West Pier is satisfactory, with isolated areas of spalling in the concrete pile caps and underdeck, and a section of exposed steel sheet pile bulkhead, roughly 30 ft long, that is severely corroded with through holes at the north end of the pier. The general condition of the North Pier is good with only minor defects observed.

3.3 WEST PIER - CONCRETE-ENCASED STEEL H-PILES

The condition of the concrete-encased steel H-piles that have been re-encased is generally good. At most locations, the fiberglass form used to construct the encasement repair has been left in place (Photo No. 3.5). There are three piles that show minor deterioration in the concrete jacket in the form of erosion of the concrete, exposing reinforcing steel, and at one location, Pile 14.2-C, the encased steel H-pile is exposed for a height of 0.5 ft near the mudline. However, there was no notable deterioration of the exposed length of pile. Additionally, minor voids in the concrete at the tops of some repairs were observed, but the voids were not deep enough to expose the steel H-pile (Photo No. 3.8).

The piles that were not re-encased have been abandoned in place and are not required to support the structure for its current loading conditions. The abandoned piles typically have wide cracks of the existing concrete-encasement, heavy concrete erosion, and moderate to severe corrosion of the reinforcing steel within the encasement, where visible (Photo No. 3.7). At locations where the underlying steel H-pile is exposed at the abandoned piles, the steel typically shows minor to moderate corrosion (Photo No. 3.6). As the abandoned piles are no longer structurally significant, ultrasonic thickness measurements were not taken where exposed steel H-pile was observed.

3.4 WEST PIER – CONCRETE PILE CAPS AND UNDERDECK

The condition of the concrete pile caps and underdeck is generally satisfactory, with fifteen (15) isolated areas of spalling found, totaling approximately 145 sf (Photo Nos. 3.9 and 3.10). Where the spalling was observed, the exposed reinforcement has minor to severe of corrosion. Additionally, there was one area found where partial timber formwork was left in place at the underdeck with spalling evident behind the formwork (Photo No. 3.11). The extent of the spalling at this location could not be determined as it was concealed by the remaining formwork.

3.5 WEST PIER – CONCRETE BULKHEAD

The concrete bulkhead located at the inland edge of the West Pier is generally in good condition. At the north end of the pier, a steel sheet pile bulkhead is exposed below the concrete bulkhead for a distance of roughly 30 ft and a maximum height of approximately 2 ft. A portion of the steel bulkhead is hidden by a horizontal timber, so that the entire steel bulkhead could not be inspected. The condition of the visible steel bulkhead is poor, showing severe corrosion and at least one through hole approximately 3 in. in diameter (Photo No. 3.12). Further deterioration of the bulkhead could allow the upland fill retained by the bulkhead to escape.

3.6 NORTH PIER

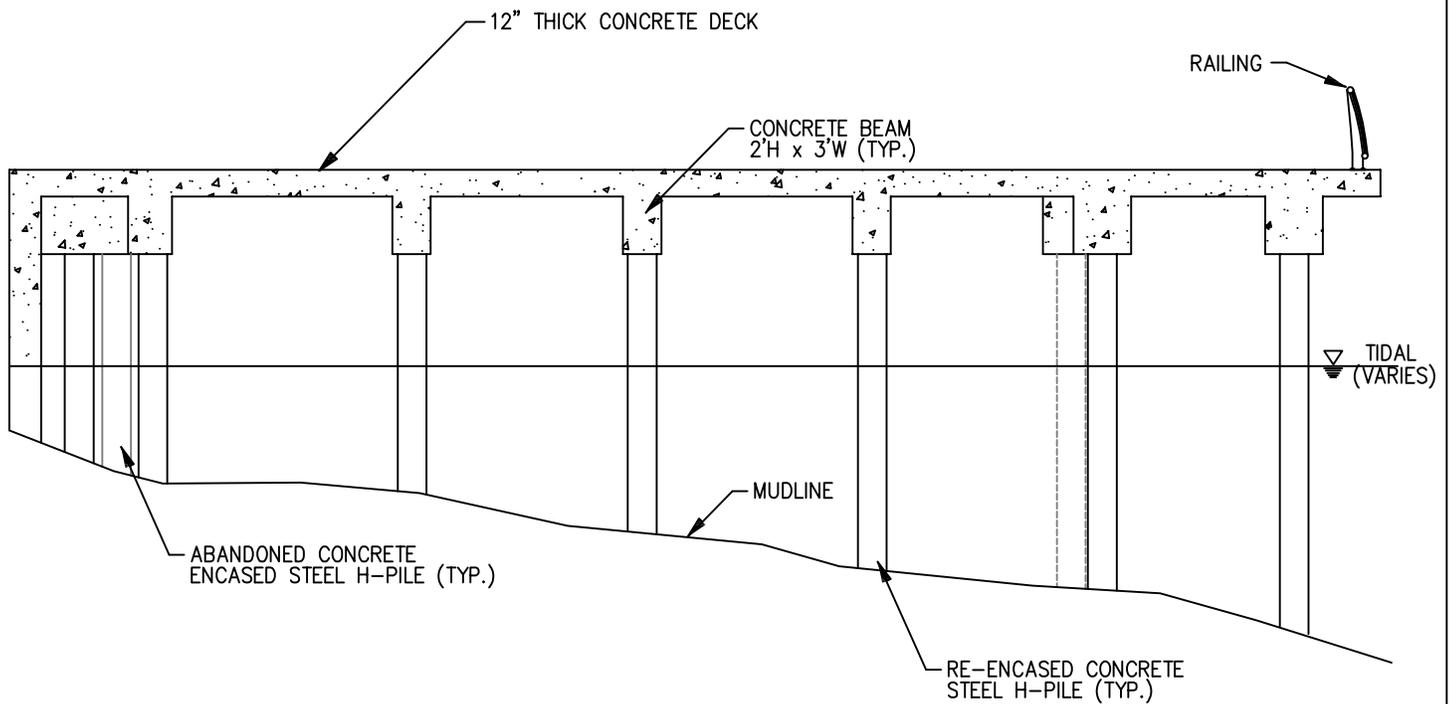
The overall condition of the North Pier is good with only minor deterioration noted. The concrete piles are generally in good condition with a few shallow spalls at isolated locations noted, typically less than 1 in. deep. One void was found at the pile cap grout socket at Pile 6B, measuring 12 in. wide and 6 in. deep (Photo No. 3.13). The condition of the pre-cast deck planks is good. A total of four spalls were found in the bottom of the deck planks, none of which contained exposed reinforcing steel (Photo No. 3.14). The steel sheet pile bulkhead at the inboard side of the North Pier also is in good condition.

3.7 RECOMMENDATIONS

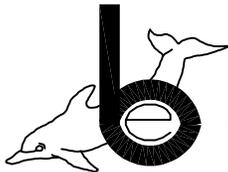
Based on the findings of the condition survey, the following repairs and/or actions are recommended:

- West Pier – repair approximately 30 lf of exposed steel sheet pile bulkhead at the north end of the pier on a routine basis.
- West Pier – repair underdeck and pile cap spalls on a routine basis.

There are no recommendations for repair or further action for the North Pier. The West Pier and North Pier should be re-inspected within five (5) years.



WEST PIER TYPICAL SECTION



BOSWELL UNDERWATER ENGINEERING

UNDERWATER INSPECTION & DIVING SERVICES
HYDROGRAPHIC SURVEYS – MARINE CONSTRUCTION

CITY OF HOBOKEN
CONDITION SURVEY OF PRIVATELY-OWNED
WATERFRONT STRUCTURES

PT MAXWELL
WEST PIER TYPICAL SECTION

INSPECTED BY: JP, DC, JF
DRAWN BY: JG

SCALE:
NTS

DATE OF INSPECTION:
FEBRUARY 2011

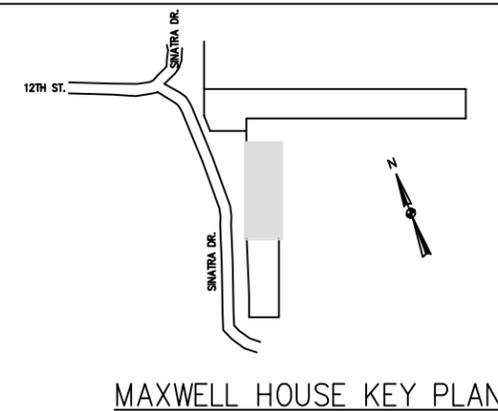
JOB NO. BUE 1010

DRAWING NO. 3.1

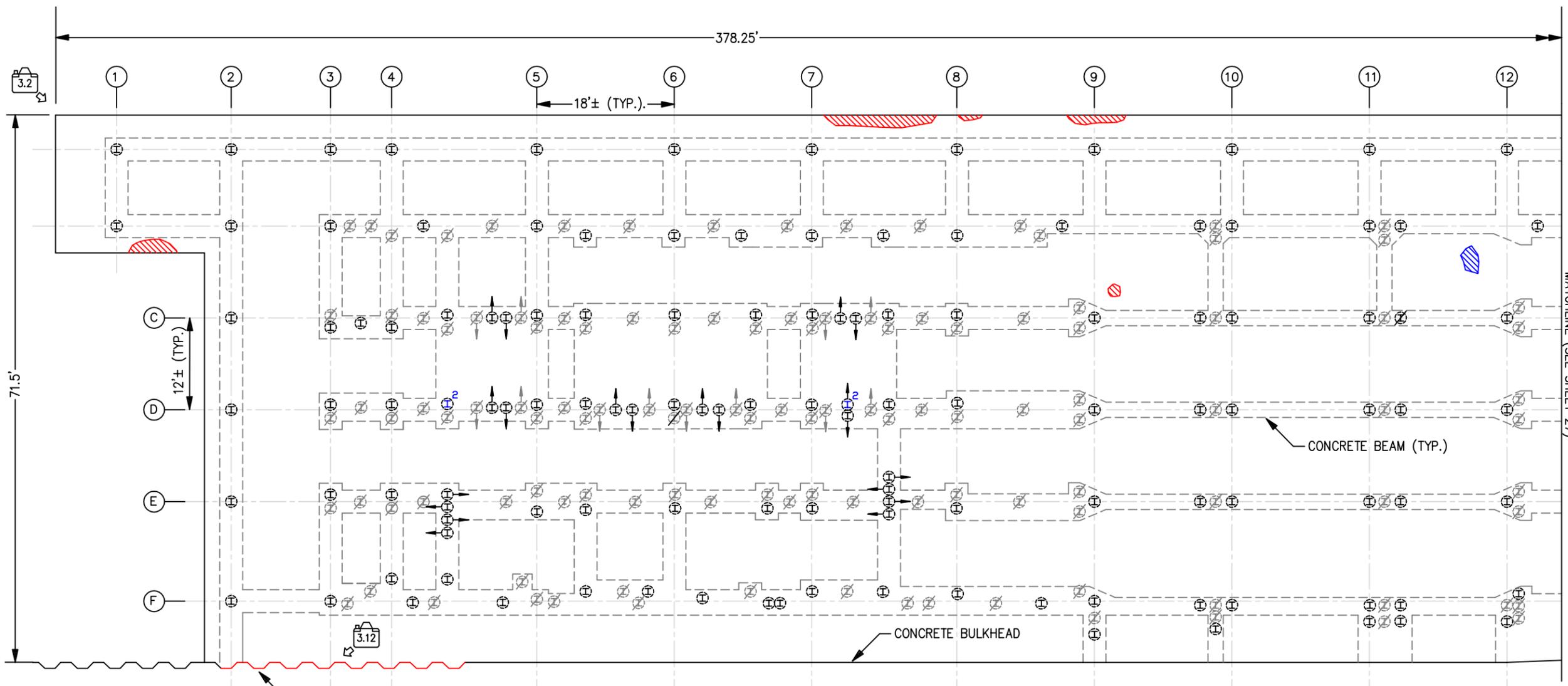
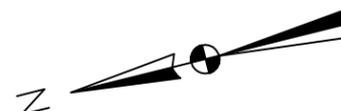
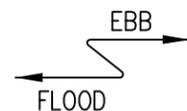
SHEET 25

LEGEND:

- ⊕ CONCRETE ENCASED STEEL H-PILE
- ⊕→ CONCRETE ENCASED STEEL BATTER H-PILE
- ⊗ ABANDONED CONCRETE ENCASED STEEL H-PILE
- ⊕² STEEL H-PILE WITH MODERATE EROSION OF CONCRETE JACKET
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL WITH EXPOSED, CORRODED REINFORCING STEEL.
- 📷 PHOTO LOCATION



HUDSON RIVER



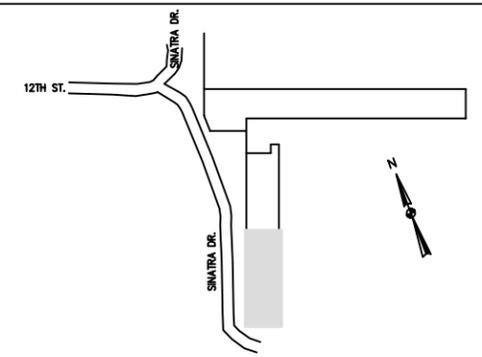
MATCHLINE (SEE SHEET 27)

BOSWELL UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN CONDITION SURVEY OF PRIVATELY-OWNED WATERFRONT STRUCTURES			
PT MAXWELL WEST PIER PLAN 1 OF 2			
INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011	
DRAWN BY: J.G.	JOB NO. BUE-1010	DRAWING NO. 3.2	SHEET 26

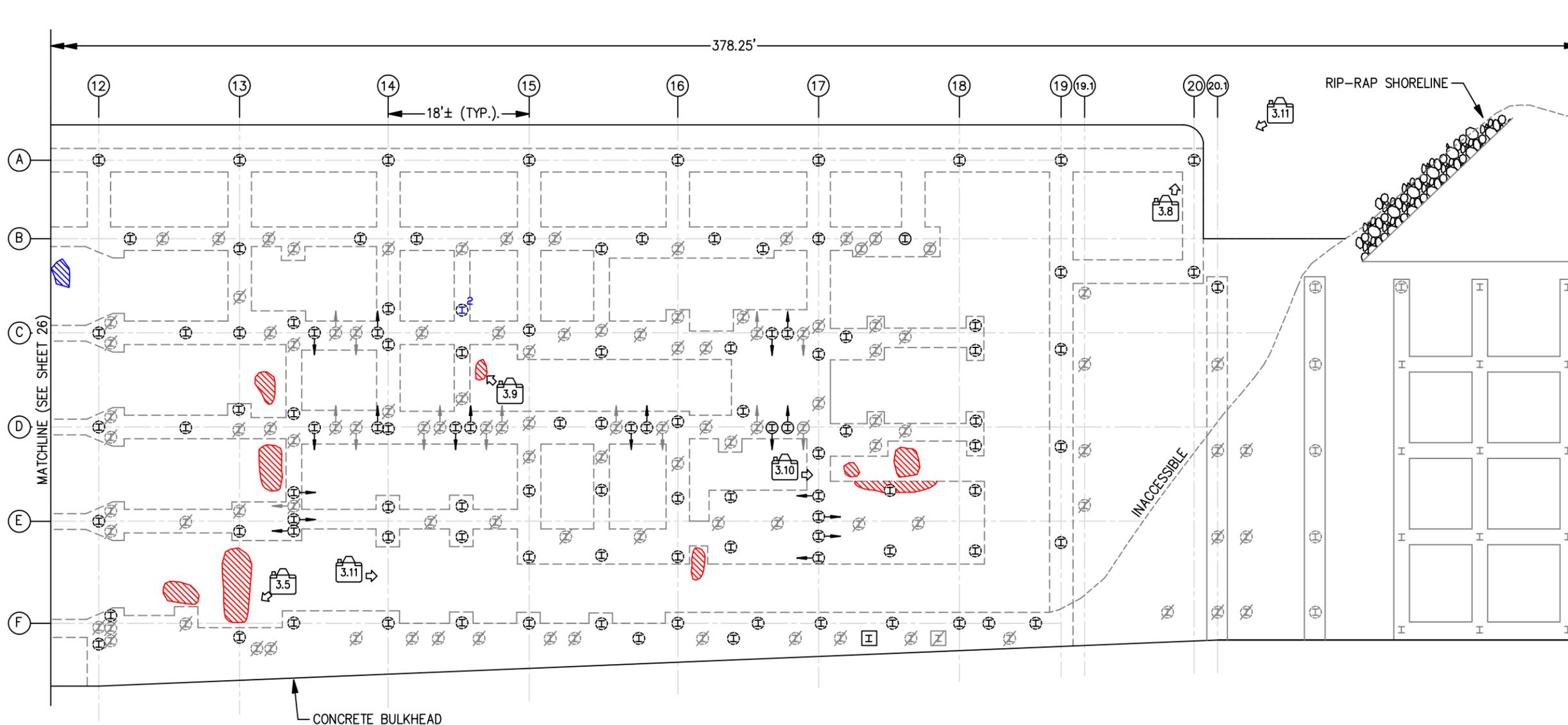
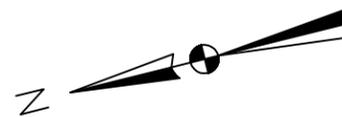
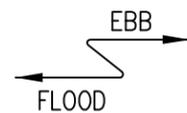
LEGEND:

- ⊕ CONCRETE ENCASED STEEL H-PILE
- ⊕→ CONCRETE ENCASED STEEL BATTER H-PILE
- ⊗ ABANDONED CONCRETE ENCASED STEEL H-PILE
- ⊕² STEEL H-PILE WITH MODERATE EROSION OF CONCRETE JACKET
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL WITH EXPOSED, CORRODED REINFORCING STEEL
- INACCESSIBLE AREA
- 📷 PHOTO LOCATION



MAXWELL HOUSE KEY PLAN

HUDSON RIVER

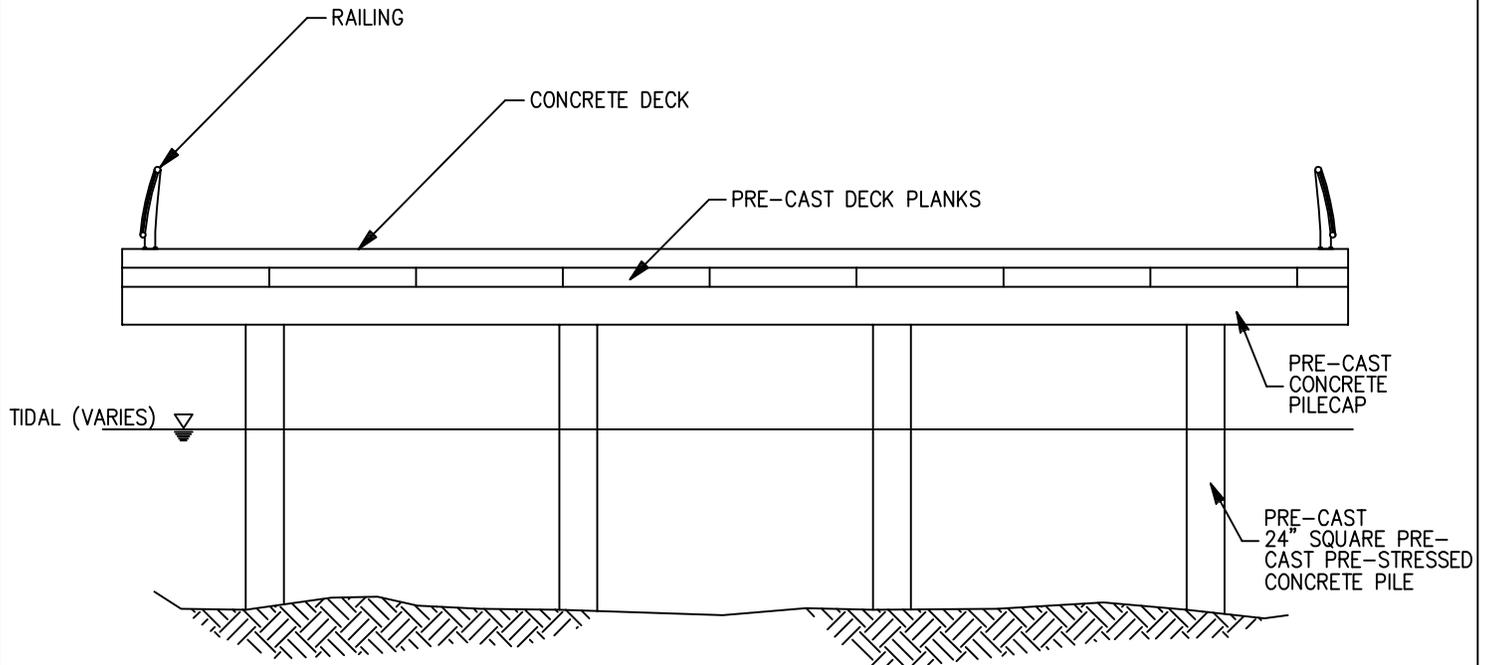


BOSWELL UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
 CONDITION SURVEY OF PRIVATELY-OWNED
 WATERFRONT STRUCTURES

PT MAXWELL
 WEST PIER PLAN 2 OF 2

INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
DRAWN BY: J.G.	JOB NO. BUE-1010	DRAWING NO. 3.3
		SHEET 27



NORTH PIER TYPICAL SECTION



CITY OF HOBOKEN
CONDITION SURVEY OF PRIVATELY-OWNED
WATERFRONT STRUCTURES

PT MAXWELL
NORTH PIER TYPICAL SECTION

INSPECTED BY: JP, DC, JF DRAWN BY: JG	SCALE: NTS	DATE OF INSPECTION: FEBRUARY 2011
JOB NO. BUE 1010	DRAWING NO. 3.4	SHEET 28

LEGEND:

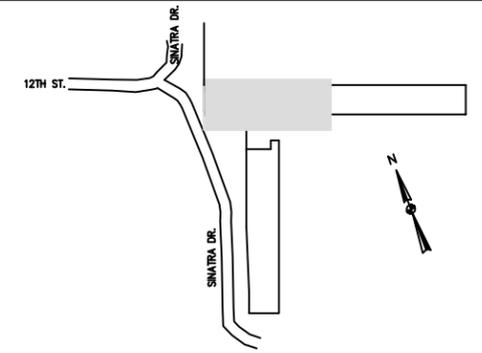
-  24" SQUARE PRE-CAST, PRE-STRESSED CONCRETE PILE
-  CONCRETE EROSION, SPALL, OR DELAMINATION
-  PHOTO LOCATION



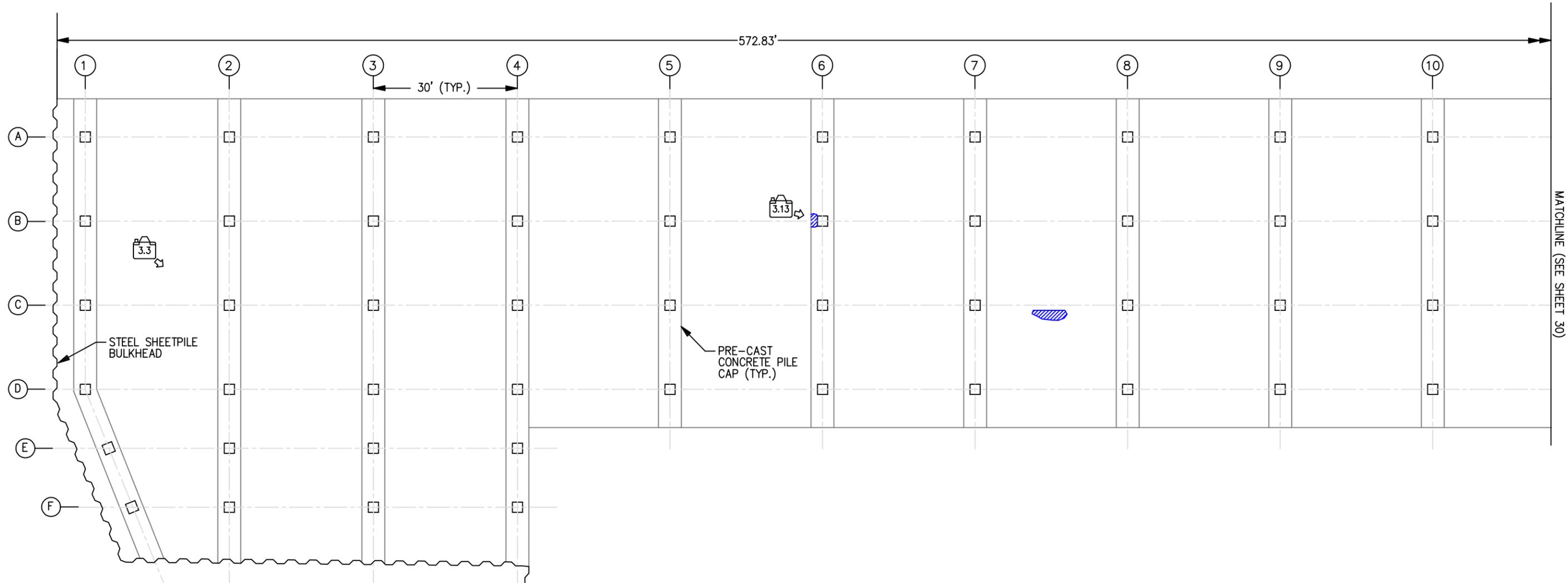
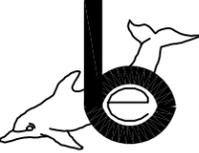
HUDSON RIVER

FLOOD

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MAXWELL HOUSE KEY PLAN

BOSWELL UNDERWATER ENGINEERING

UNDERWATER INSPECTION & DIVING SERVICES
HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
CONDITION SURVEY OF PRIVATELY-OWNED
WATERFRONT STRUCTURES

PT MAXWELL
NORTH PIER PLAN 1 OF 2

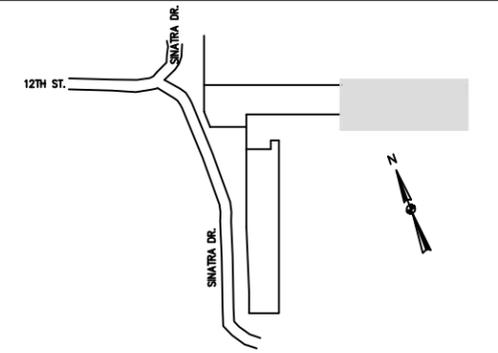
INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 20'	DATE OF INSPECTION: FEBRUARY, 2011
DRAWN BY: J.G.		
JOB NO. BUE-1010	DRAWING NO. 3.5	SHEET 29

LEGEND:

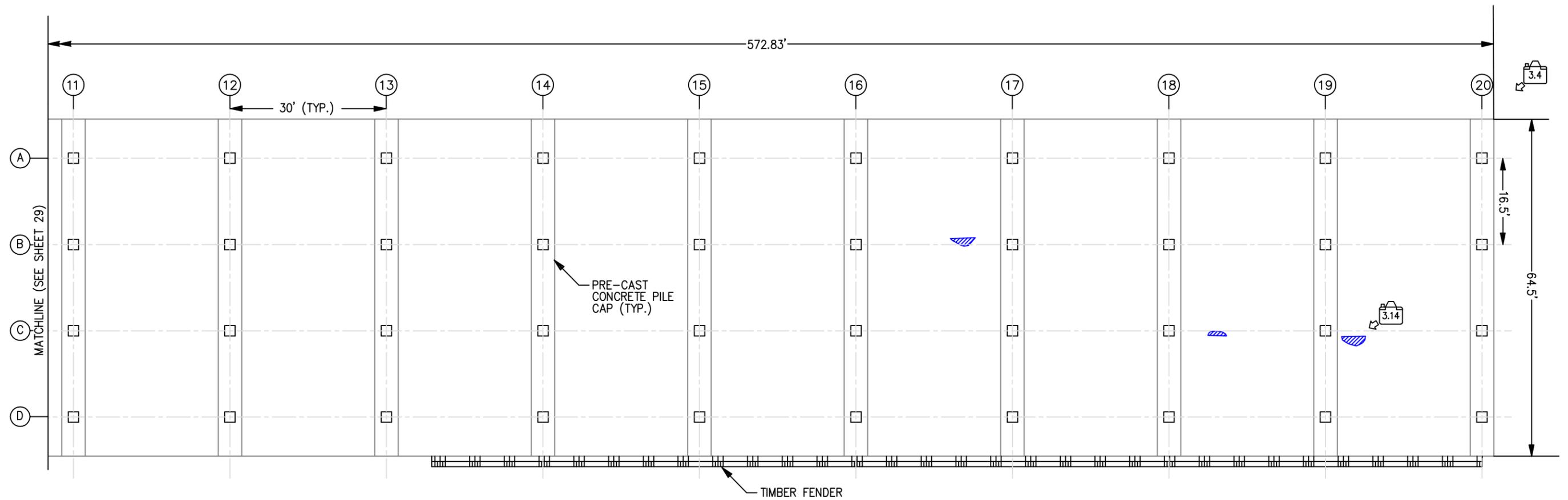
-  24" SQUARE PRE-CAST, PRE-STRESSED CONCRETE PILE
-  CONCRETE EROSION, SPALL, OR DELAMINATION
-  PHOTO LOCATION



HUDSON RIVER
 FLOOD ↑
 EBB ↓



MAXWELL HOUSE KEY PLAN




BOSWELL UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
 CONDITION SURVEY OF PRIVATELY-OWNED
 WATERFRONT STRUCTURES

PT MAXWELL
 NORTH PIER PLAN 2 OF 2

INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 20'	DATE OF INSPECTION: FEBRUARY, 2011
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JOB NO. BUE-1010	DRAWING NO. 3.6	SHEET 30
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3.9 PHOTOGRAPHS



Photo No. 3.1

Location:

West Pier

Description:

General view looking north



Photo No. 3.2

Location:

West Pier

Description:

General view looking south



Photo No. 3.3

Location:

North Pier

Description:

General view looking east



Photo No. 3.4

Location:

North Pier

Description:

General view looking west



Photo No. 3.5

Location:

West Pier, Pile 13F

Description:

Typical re-encased pile, fiberglass form left in place



Photo No. 3.6

Location:

West Pier

Description:

Typical abandoned pile, severely deteriorated encasement, steel H-pile exposed

	 <p>12/13/2010</p>		<p>Photo No. 3.7</p> <p>Location: West Pier</p> <p>Description: Typical abandoned pile, wide crack in existing encasement</p>
	 <p>12/13/2010</p>		<p>Photo No. 3.8</p> <p>Location: West Pier Pile 20A</p> <p>Description: Void at top of re-encasement</p>



Photo No. 3.9

Location:

West Pier
Bent 14 to 15
Between Pile Lines C
and D

Description:

Spall in underdeck,
exposed moderately
corroded reinforcing
steel



Photo No. 3.10

Location:

West Pier,
Bent 17 to 18,
Pile Line E

Description:

Spall at bottom of
beam with severely
corroded reinforcing
steel



Photo No. 3.11

Location:

West Pier,
Bent 14 to 15,
Pile Line E to F

Description:

Underdeck repair
formwork left in place



Photo No. 3.12

Location:

West Pier,
North End of
Bulkhead

Description:

Steel sheeting below
concrete bulkhead,
hole in sheeting

			<p>Photo No. 3.13</p> <p>Location: North Pier, Pile 6B</p> <p>Description: Void at top of pile</p>
			<p>Photo No. 3.14</p> <p>Location: North Pier</p> <p>Description: Underdeck between Bents 19 and 20, spall in deck plank</p>

4.0 SHIPYARD ASSOCIATES LP

4.1 FACILITY DESCRIPTION

The Shipyards Associate LP waterfront property has three main piers, extending from the shore towards the east. For the purpose of this inspection, the piers were referred to as Pier A at the north, Pier B in the center, and Pier C at the south.

Pier A has a concrete deck, concrete beams and pile caps, and is founded on 360 steel H-piles that have been concrete-encased (Photo No. 4.1). The pier is roughly 782 ft long and 35 ft wide. The pier has 34 bent rows spaced at approximately 22 ft-on-center. Each row typically contains ten piles, two each near the north and south end of the bent, and a center cluster containing six piles, two of which are battered. The pier is currently utilized as an access pier to a marina, and has a lawn area at the east end of the pier. The marina is comprised of floating docks located between Piers A and B. The marina floating docks and piles were not included in this scope of work. North and south of the inland portion of Pier A, the pier is flanked by high-level steel H-pile supported platforms.

Pier B consists of timber piles and pile caps supporting concrete pile caps, deck beams and pier deck (Photo No. 4.13). The pier is approximately 738 ft long and 30 ft wide and is comprised of 68 main bent rows, of eight to 11 plumb piles each, with two batter piles on the west side in each row (Photo No. 4.14). Between each main pile bent is an intermediate bent of four to five piles that are centered within the pier. The pier currently has a dog park at the west end and two boats were berthed at the south face of the pier at the time of inspection.

Pier C is roughly 739 ft long and 40 ft wide. The pier is comprised of two different construction types, the inboard 310 ft is of similar construction type of Pier B, with 32 main timber pile bents spaced roughly 10 ft on-center. Each main bent contains 12 plumb piles and two batter piles. Centered between each main bent is an intermediate bent containing ten plumb piles. Each timber bent supports a concrete pile cap, longitudinal concrete deck beams and a concrete pier deck. The outboard 429 ft of the pier is founded on 14 in. diameter pipe piles configured in 26 rows spaced approximately 17 ft on-center. Each row contains 6 plumb piles and two batter piles supporting a concrete cap. The pile caps support longitudinal concrete beams and a concrete pier deck. At the time of inspection, two boats were berthed at the pier.

The bulkhead at the shipyard property is a concrete seawall founded on timber cribbing, roughly 505 ft in length. For this inspection, the seawall was stationed from south to north, beginning with Sta. 0+00 at the southern limits of the shipyard property. The northern limit of the timber cribbing is located beneath Pier A where it terminates at a 20 ft length of concrete seawall oriented in an east-west direction. North of the concrete seawall, the bulkhead has been removed for a distance of roughly 105 ft as part of an emergency repair project due to a partial collapse of Sinatra Drive near 13th Street that occurred in October of 2010. Temporary steel H-piles and steel plates have been

placed to retain the upland fill during construction. At the northern limits of the shipyard property is a concrete seawall roughly 63 ft long supported by a low-level timber relieving platform.

Plans of the piers, platforms and bulkhead at the Shipyard LP property were not available at the time of inspection. Typical sections and plans of each structure were developed from measurements taken during the condition survey and are shown on Drawing Nos. 4.1 through 4.18. In addition to overall layout and structural configuration, the plan views depict observed conditions and significant inspection findings.

4.2 PIER A

At the easternmost row of piles, Bent-2, eight of ten piles are in critical condition. The eight steel H-piles do not have concrete repair jackets and all have 100% loss of section near the mudline, effectively leaving all but the north end of the pile cap completely unsupported. The bent row supports a concrete walkway adjacent to and east of Frank Sinatra Drive. Repair design plans prepared by Birdsell Services Group dated March 10, 2011 show this portion of platform being rebuilt with new concrete encased steel H-piles and a new concrete deck, see Appendix B.

The overall condition of the concrete-encased steel H-piles is poor, with one localized, isolated location where the pile conditions are critical as described above. A total of 277 of the 361 piles that support the pier have steel H-piles exposed below the concrete repair jackets, while 84 have full length encasements. The full length encasements were generally found in the eastern half of the pier, with five piles in each bent having full length encasement. All of the piles with steel exposed below the encasement, with the exception of two piles, have section loss classified as severe as evidenced by knife-edging of the flange edges and hour glassing of the width of the flange. At 20 locations, the corrosion is severe enough to have caused through holes in the webs of the H-pile. A summary of steel H-pile conditions is presented in Table 4.1 below.

Table 4.1
Steel H-Pile Summary of Conditions

	No. of Pier	Percent
Total Piles Inspected	361	100%
Steel H-Pile Exposed Below Concrete Repair	277	77%
Piles with Section Loss Greater than 50%	275	76%
Piles with Through Hole	20	6%
Piles with Voids At Top of Repair	124	34%

Micrometer readings were taken at representative pile locations, and based on those measurements it appears that nominal thickness for the steel H-piles is 0.54 in. One micrometer reading was taken at each flange per pile. The average remaining flange thickness is 0.2 in., corresponding to an average section loss of 63%. See Table 4.2 below for micrometer readings.

Pile	Flange 1	Flange 2	Flange 3	Flange 4	Average
5-A-east	0.11	0.13	0.25	0.20	0.17
6-C-east	0.15	0.22	0.12	0.25	0.19
7-B-bat	0.22	0.15	0.18	0.22	0.19
8-D-west	0.23	0.24	0.22	0.15	0.21
9-A-west	0.21	0.21	0.23	0.29	0.24
11-B-east	0.29	0.27	0.26	0.27	0.27
13-D-east	0.14	0.08	0.19	0.13	0.14
15-A-west	0.13	0.09	0.14	0.15	0.13
17-C-east	0.21	0.32	0.31	0.32	0.29
19-C-east	0.13	0.12	0.17	0.20	0.16
21-A-east	0.16	0.11	0.23	0.09	0.15
23-A-west	0.27	0.28	0.25	0.26	0.27
25-B-west	0.18	0.20	0.20	0.16	0.19
27-D-west	0.18	0.17	0.18	0.23	0.19
29-C-west	0.25	0.16	0.30	0.30	0.25
31-B-bat	0.12	0.14	0.22	0.31	0.20
34-F-bat	0.09	0.13	0.18	0.20	0.15
AVERAGE REMAINING FLANGE THICKNESS					0.20

At 124 locations, voids were found at the tops of the concrete encasements deep enough to expose the underlying steel H-piles (Photo Nos. 4.4 to 4.6). The condition of H-piles within the voids was typically satisfactory, with little or no section loss observed. However, the voids do expose the steel H-piles in the atmospheric zone, which is generally an area highly susceptible to corrosion.

The overall condition of the concrete pile caps is satisfactory. There is moderate scaling at the bottom edges of the caps; typically the scaling is not severe enough to expose reinforcing steel. Spalling of the north end of the pile caps with exposed, corroded reinforcing steel was found at six locations (Photo No. 4.9). The general condition of the concrete beams and underdeck is fair. There is spalling throughout the structure with exposed reinforcing steel, which varies from moderate to severe corrosion. The deterioration is generally concentrated at the bottom of the north and south longitudinal beams and along the outboard edge of the underdeck (Photo Nos. 4.7 to 4.9). The two interior longitudinal beams typically have cracking 1/4 to 1/2 in. wide or incipient spalls

along their bottom edges (Photo Nos. 4.10 to 4.12). These defects are a sign that the underlying reinforcing steel is corroding.

A typical Pier A cross-section is depicted on Drawing No. 4.1; pile plans and underdeck plans showing general configurations and observed deficiencies are shown on Drawing Nos. 4.2 through 4.5.

4.3 PIER B

The eastern 45 ft (Bents 65 to 68) of Pier B is in critical condition due to 36 missing, broken or split timber piles, severe spalling of the concrete pier deck and six locations where the transverse concrete beams are broken or missing (Photo Nos. 4.15 to 4.19). The eastern 11 ft of concrete deck is completely unsupported because all of the piles in the eastern two bents are missing, and the north half of the pier for the easternmost five rows have missing piles and broken concrete beams. No load should be permitted within this area and a permanent barrier should be installed to restrict access as soon as possible.

With the exception of the eastern portion of the pier, which is severely deteriorated, the remainder of the timber piles are in fair condition. There are 150 locations (inclusive of the 36 severe piles at the east end of the pier) where piles have section loss greater than 49 percent, severe splits, or missing connection hardware and are rated severe (Photo Nos. 4.19 to 4.21). The majority of these piles are located at the north or south end of a row and many appear to have been affected by impact damage and hollowing of the interior of the top of the pile. A total of 70 piles are rated moderate due to section loss less than 49%, splits, loss of bearing or corroded connection hardware. The remainder of the timber piles are typically in satisfactory condition with only minor deterioration noted. Marine borer intrusion in the form of Teredos was observed at 67 piles. The severity of the infestation is light, and the resultant section loss is generally less than 10 percent. However, Teredo infestation can be difficult to detect solely from a visual inspection as they attack the interior of the wood. Additionally, deterioration due to marine borer attack can progress rapidly, so the extent of marine borer intrusion should be monitored closely during future inspections.

A summary of observed pile conditions is presented in Table 4.3 below.

Table 4.3
Pier B Timber Pile Summary of Conditions

	No. of Piles	Percent
Total Piles Inspected	1,103	100%
Piles with Deterioration Rated Severe	150	14%
Piles with Deterioration Rated Moderate	70	6%

The timber pile caps are typically in satisfactory condition with isolated areas of section loss and hollowing found at ends of some caps due to rot (Photo No. 4.21). Four pile caps are rated severe and two pile caps are rated moderate due to hollowing observed at the ends of the pile caps.

The condition of the timber horizontal bracing and cross bracing is poor. The majority of the braces are loose, split or have section loss due to soft rot (Photo 4.24). At several locations the braces are missing altogether. Additionally, at the lower hardware connections, those within the tidal zone, the hardware is typically severely corroded or missing (Photo No. 4.25).

The condition of the concrete pier deck and beams from Bent 64 to the east end is critical as described above. The overall condition of the concrete underdeck and beams is poor from Bent 1 to Bent 64. There is widespread delaminations and spalling with exposed and moderately to severely corroded reinforcing steel throughout the entire structure. The entire surface of the underdeck is spalled from Bent 59 to the east end of the structure. The lower course of reinforcing steel is severely corroded with some locations where the reinforcing steel is completely corroded through. At one location, Bent 62 to 63, cracks were observed in the remaining concrete that extended to the top of the deck (Photo No. 4.27). The remainder of the concrete beams and deck also have cracks, delaminations and spalling (Photo Nos. 4.28 to 4.30).

Typical cross-sections of Pier B are shown on Drawing No. 4.6; plan views detailing observed conditions and deficiencies are shown on Drawing Nos. 4.7 through 4.10.

4.4 PIER C

The overall condition of the timber piles at Pier C is fair. Of the 737 inspected timber piles, 89 are rated severe due to section loss greater than 50%, a loss of bearing greater than 50%, splits or batter piles with missing or severely corroded hardware. A total of 238 piles are rated moderate due to section loss between 10% and 49%, loss of bearing between 10% and 49%, splits or corrosion of connecting hardware. Many piles are less than 100% bearing due to deterioration of the top of the piles from rot and/or hollowing, deterioration of the timber pile cap it supports or a combination of the two (Photo No. 4.33).

Table 4.4
Pier C Timber Pile Inspection Summary

	No. of Piles	Percent
Total Piles Inspected	737	100%
Piles with Deterioration Rated Severe	89	12%
Piles with Deterioration Rated Moderate	238	32%

Visual signs of marine borer infestation were detected at 95 percent of the timber piles inspected. While marine borer intrusion is widespread throughout the structure, the level of intrusion is typically light with little or no observed section loss. However, the rate of deterioration due to marine borer intrusion can be very rapid, and should be closely monitored during future inspections.

The condition of the timber pile caps is generally fair. There are 27 locations where section loss at the pile caps is rated severe and 61 locations where the section loss is rated moderate (Photo Nos. 4.32 and 4.34). The section loss typically occurs at the end of the pile caps in the form of hollowing due to rot, and in some locations the entire end of the pile cap is broken off.

The condition of the timber cross bracing and horizontal bracing is fair. There are four locations where the bracing is rated severe due to section loss, splits or missing hardware. At 61 locations the bracing has section loss or deteriorated hardware and is rated moderate.

The condition of the 207 concrete-filled steel pipe piles that support the eastern portion of the pier is generally poor. The piles typically have a band of corrosion 2 to 3 ft high within the tidal zone; 22 piles have section loss classified as moderate, while at 185 locations, the section loss was rated severe. At the piles with severe section loss of the steel, many have 100% section loss with concrete infill visible. At 95 of these locations erosion of the concrete within the steel pipe pile was observed. The most severe concrete deterioration was as much as 8 in. deep and exposed, corroded reinforcing steel was visible within two areas of erosion. In addition, there are 18 piles that are completely non-bearing and two piles found with reduced bearing. The total loss of bearing or reduction of bearing appears to be due to a combination of erosion of the bottom of the concrete pile cap and a very small embedment length of the top of the pile into the concrete pile cap from original construction. Table 4.6 contains a summary of steel pipe pile inspection findings.

Table 4.5
Pier C Steel Pipe Pile Inspection Summary

	No. of Piers	Percent
Total Steel Pipe Piles Inspected	207	100%
Corrosion Rated Severe	185	89%
Through Holes and Concrete Erosion Rated Severe	95	46%
0% Bearing Rated Severe	18	9%
Corrosion Rated Moderate	22	11%
50-90% Bearing Rated Moderate	2	1%

The overall condition of the concrete beams, pile caps and underdeck is fair with isolated locations in poor condition. There is delamination and spalling with moderate to severely corroded reinforcing steel throughout the structure. The concrete deterioration in the timber Bents 1 to 32 is concentrated on the bottom of the longitudinal beams, typically in the form of concrete delaminations, with isolated areas of spalling (Photo Nos. 4.40 to 4.42). From Bents 33 to 50, the spalling and delaminations occur on the bottom of the longitudinal beams (Photo No. 4.39), the underdeck (Photo Nos. 4.37 and 4.38), and the north and south ends of the pile caps. From Bents 50 to 58, the condition of the underdeck is generally poor. Spalling of the concrete affects roughly 80% of the surface of the underdeck and 50% of the beams. The majority of these spalls have exposed, severely corroded reinforcing steel. Also, in this area the concrete pile caps exhibit spalls with exposed, corroded steel (Photo No. 4.43).

Drawing No. 4.11 contains a typical cross-section of Pier C and Drawing Nos. 4.12 through 4.15 contain plan views with observed deficiencies.

4.5 RELIEVING PLATFORMS

Directly south of Pier A and adjacent to the bulkhead is a concrete-encased steel H-pile supported high-level platform (Photo No. 4.44). The platform has a concrete deck which serves as a walkway on the east side of Frank Sinatra Drive in the vicinity of Constitution Ct. cross street. The overall condition of the encased H-piles is satisfactory. A total of 25 plumb piles and three batter piles support the pier. All of the plumb piles were concrete-encased, of which, only one encasement extends into the mudline. The remainder of the piles have steel exposed below the bottom of the encasement with moderate corrosion observed. Eight encasements have moderate deterioration of the concrete repair jacket (Photo Nos. 4.45 and 4.46). The batter piles were not encased and exhibit severe corrosion. It is likely that the batter piles are abandoned in place as the platform is not subjected to significant lateral loads such as the berthing of vessels. The condition of the concrete pile caps and underdeck is satisfactory. The overall condition of concrete beams is fair with moderate to severe delaminations and spalling found at eight locations at the bottom of the beams (Photo Nos. 4.47 to 4.49).

South of the concrete-encased steel H-pile high-level platform is a timber pile supported high-level platform. The timber platform has a concrete deck which serves as a pedestrian walkway and provides access to a gangway that leads to the marina located between Piers A and B (Photo No. 4.50). The timber platform contains 36 plumb piles and 16 batter piles in three bents oriented north to south. The overall condition of the timber piles is fair. Fourteen piles have deterioration rated severe due to splits, section loss greater than 49% or less than 50% remaining bearing. One pile has bearing loss between 50% and 90%, and two piles were observed to have section loss between 10% and 49% and are rated moderate. The general condition of the timber pile caps, stringers and decking is good.

The high-level platform north of Pier A and directly adjacent to the bulkhead is supported by 41 steel H-piles, 23 of which have concrete encasements that extend into the mudline (Photo Nos. 4.51

and 4.52). The remainder of the piles have not been encased, or have partial encasements leaving portions of the steel H-pile exposed. The piles with full encasements are in satisfactory condition. The piles which only have partial encasements are generally in satisfactory condition with only minor section loss. Eight piles without encasements or with only partial encasements are rated severe due to section loss greater than 50%. Four of those piles have C-channels bolted to the webs of the pile; however, the C-channels were not installed for the full length of the pile, and the piles still have severe section loss above the C-channel repairs.

The concrete pile caps and underdeck are in fair condition, displaying isolated areas of spalling with exposed, corroded reinforcing steel. The spalled areas vary in size from 1 to 16 square feet (Photo Nos. 4.54 to 4.56).

Pile configurations and observed conditions for the high-level platforms are shown on Drawing Nos. 4.16 and 4.17.

4.6 TIMBER CRIBBING BULKHEAD

The bulkhead at the Shipyards property is primarily comprised of a concrete seawall supported by timber cribbing. Inland of the seawall is a concrete pedestrian walkway. A partial roadway collapse of Sinatra Drive occurred in October, 2010, due to deterioration of the timber substructure north of Pier A near 13th Street. The bulkhead has been removed for a distance of roughly 105 ft, and reconstruction of the bulkhead and roadway were ongoing at the time of the inspection. The timber cribbing bulkhead from Sta. 0+00 (the southern limit of the property) to Sta. 5+05 (Photo No. 4.63) is generally in serious condition. There are numerous voids and significant section loss throughout the cribbing due to deterioration of the timber elements caused by marine borer infestation (Photo Nos. 4.59, 4.61 and 4.62). The voids were typically found at the bottom of the exposed cribbing near the mudline and vary in size. Many of the voids are concentrated at locations where the transverse timber tie-backs are located. Above water deterioration and hollowing was routinely observed at the exposed ends of the transverse timbers (Photo No. 4.60). The largest void, found at Sta. 2+15 (between Piers B and C), measured 12 ft long by 2.5 ft high. Divers could typically probe horizontally between 1.5 ft to 3 ft into the voids into loose granular and rock fill; and at one location, probes up to 5 ft deep were possible. A plan view of the timber cribbing and a table summarizing the location and size of voids is included in Drawing No. 4.18.

At the time of the inspection, the pedestrian walkway adjacent to the bulkhead was fenced, although limited access was available to users of Piers A, B and C through the area. Appendix B contains design plans prepared by Birdsall Services Group dated March 10, 2011 which include the installation of a new steel sheet pile bulkhead for the full length of the deteriorated timber bulkhead.

The northernmost 60 ft of the concrete seawall at the Shipyards property is supported by a low-level timber relieving platform. Due to limited space beneath the bottom of the relieving platform, the entire platform structure was not accessible for inspection. Because the bulkhead was inaccessible, its structural configuration could not be determined. A total of 98 timber piles were inspected and

generally found to be in satisfactory condition. There were four piles rated severe that are split or show less than 50% bearing. All of the 98 inspected piles have visual signs of marine borer infestation, while 18 were observed to have section loss between 10% and 30%. The estimated section loss at the remainder of the piles is less than 10%. The condition of the timber pile caps is fair to poor; the outboard ends of the pile caps all have marine borer infestation. Five pile caps have section loss exceeding 50%. The timber decking is generally in fair condition with isolated locations in poor condition; however, marine borer intrusion was observed, and most evident at the exposed north ends of the deck planks and the outboard fascia of the concrete seawall (Photo Nos. 4.65 and 4.66). The low-level timber relieving platform is shown in plan view on Drawing No. 4.17. The March 2011 Birdsall Services Group plans include design for the replacement of the section of low-level timber cribbing.

4.7 RECOMMENDATIONS

Based on the findings of this condition survey, the following repair and/or actions are recommended:

PIER A

- Repair eight steel H-piles with 100% section loss in Bent-2 as soon as possible.
- Perform an engineering evaluation based on current loading conditions and develop repair design for deteriorated steel H-piles that do not have full length encasements on a priority basis.
- Repair underdeck, beam spalls and voids in the concrete encasements showing exposed steel H-piles on a routine basis.

Pier A should be re-inspected within three years.

PIER B

- Restrict all access to the eastern 45 ft of the pier as soon as possible.
- Repair concrete underdeck and beam spalls on a priority basis.
- Repair deteriorated timber piles, pile caps and bracing on a routine basis.

Pier B should be re-inspected within three years.

PIER C

- Repair steel pipe piles displaying severe section loss and loss of bearing on a priority basis.
- Repair deteriorated timber piles, pile caps and bracing on a routine basis.

- Repair concrete underdeck and beam spalls on a routine basis.

Pier C should be re-inspected within three years.

RELIEVING PLATFORMS

Steel H-pile platform south of Pier A:

- Protect exposed steel H-piles and repair concrete beam spalls on a routine basis.
- Re-inspect the platform within four years.

Timber platform south of Pier A:

- Repair all timber elements with severe deterioration on a priority basis.
- Re-inspect the structure within three years.

Steel H-pile platform north of Pier A:

- Confirm that the structure can be adequately supported by H-piles with full length encasements and that those piles without full length repairs are actually abandoned in place. If the structure cannot support current and anticipated load conditions, develop repairs to remaining piles on a priority basis.
- Repair concrete underdeck and beam spalls on a routine basis.
- The facility should be re-inspected within five years.

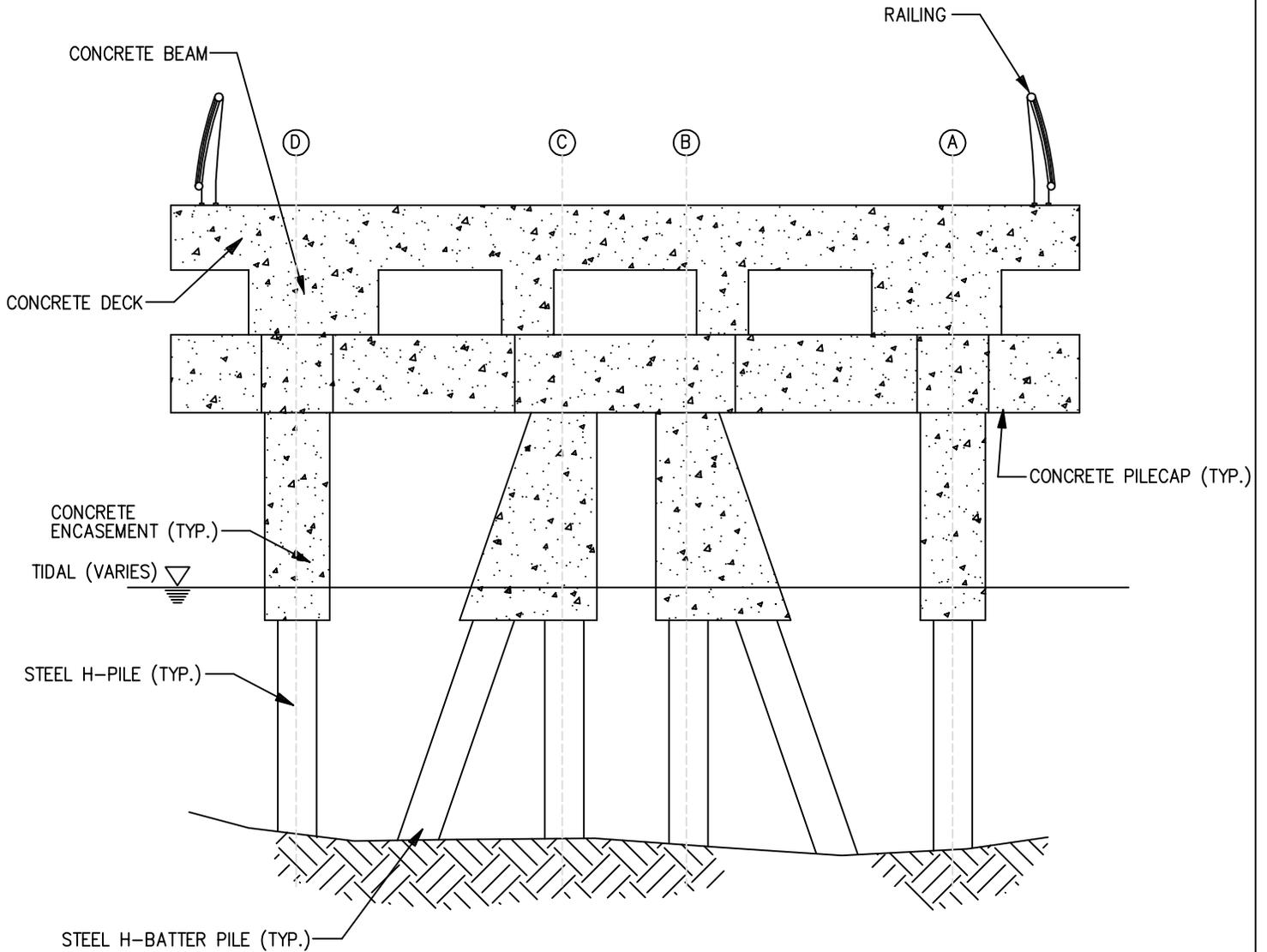
TIMBER CRIBBING BULKHEAD

- Repair/Replace timber cribbing bulkhead on a priority basis.
- Until such time that repairs can be completed, the seawall should be monitored for signs of stress and movement; and the structure should be re-inspected within one year.

Low-level timber relieving platform:

- Repair timber piles and pile caps with severe section loss or deficiencies on a priority basis.
- The next inspection of the platform should occur within three years.

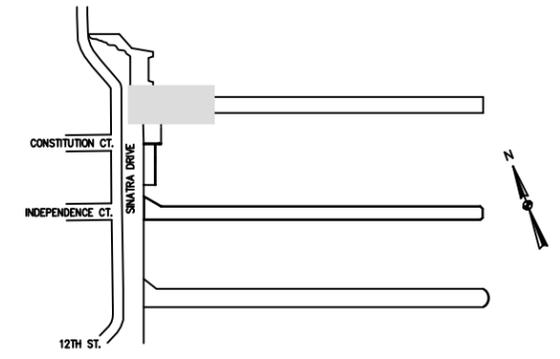
The Shipyards Promenade Stabilization Plans dated March 2011 include design of repairs or replacement of the westernmost bent at Pier A, the timber cribbing bulkhead and the low-level timber relieving platform.



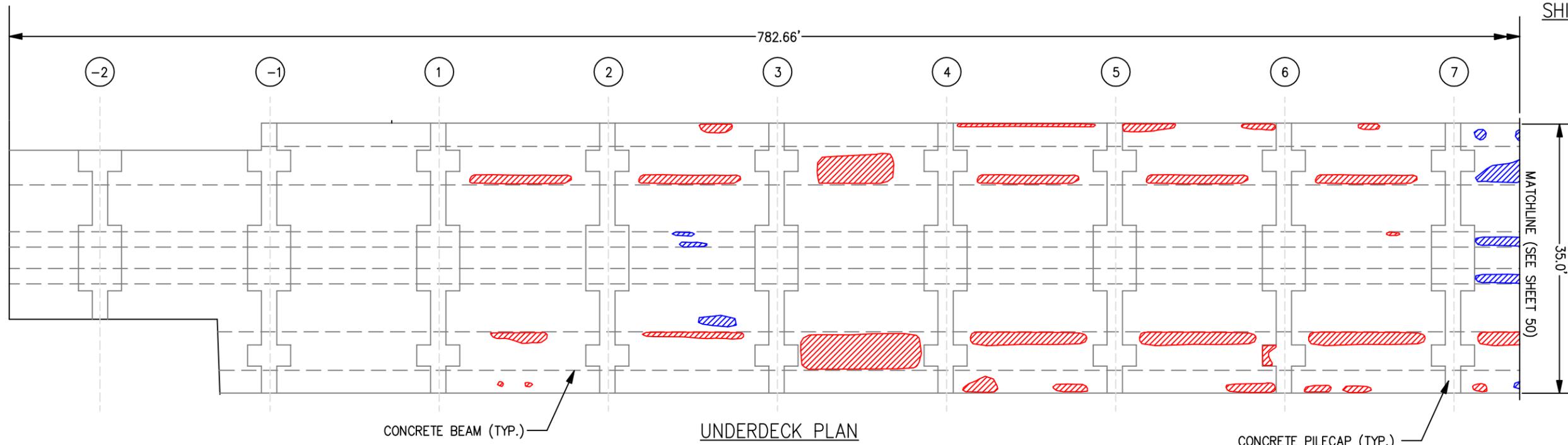
PIER A TYPICAL SECTION
VIEW LOOKING WEST

LEGEND:

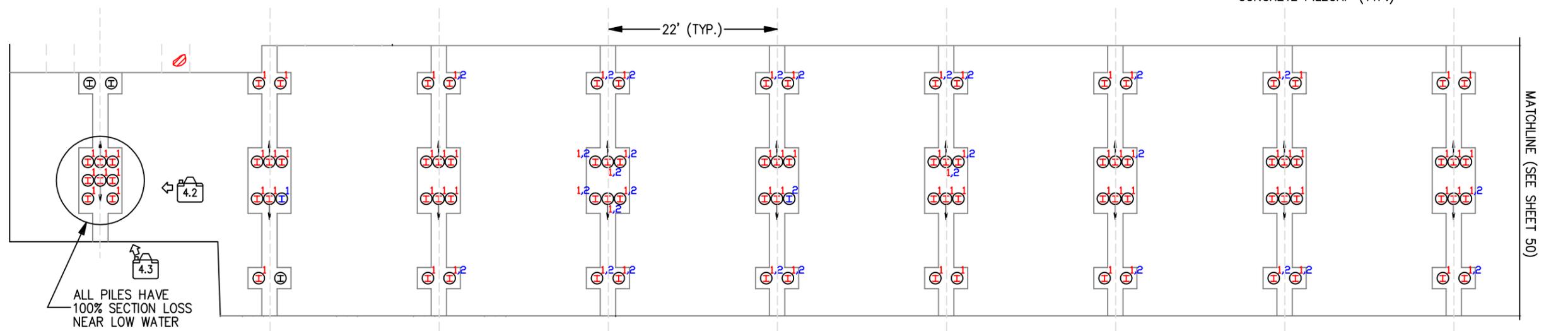
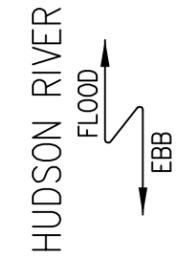
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- I STEEL BATTER H-PILE
- ⊕ STEEL H-PILE WITH CONCRETE ENCASEMENT
- ⊕¹ STEEL H-PILE WITH CONCRETE EXTENSION WITH SEVERE CORROSION
- ⊕² STEEL H-PILE WITH CONCRETE EXTENSION WITH MODERATE CORROSION
- ⊕² STEEL H-PILE WITH MODERATE EROSION OR VOIDS IN CONCRETE ENCASEMENT
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL WITH EXPOSED, CORRODED REINFORCING STEEL.
- 📷 PHOTO LOCATION



SHIPYARD KEY PLAN



UNDERDECK PLAN



PILE PLAN



UNDERWATER INSPECTION & DIVING SERVICES
HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
CONDITION SURVEY OF PRIVATELY-OWNED
WATERFRONT STRUCTURES

SHIPYARD ASSOCIATES LP
PIER A PLAN VIEW 1 OF 4

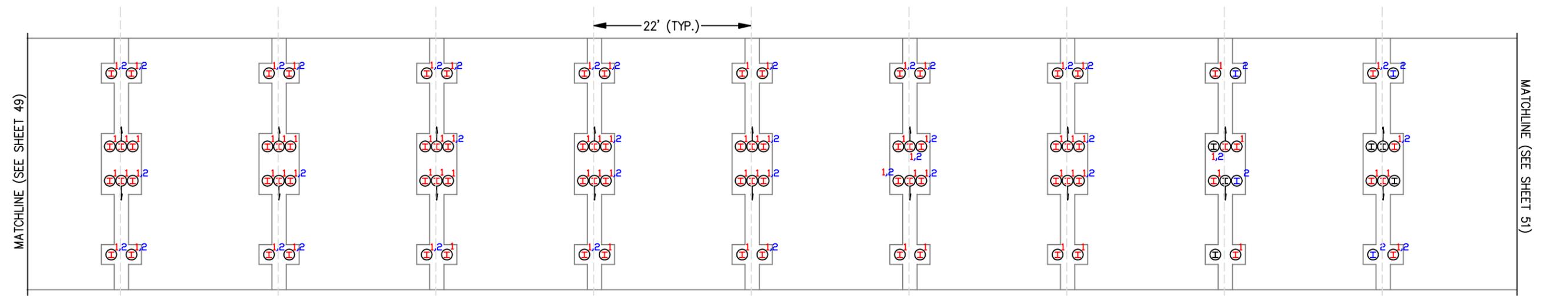
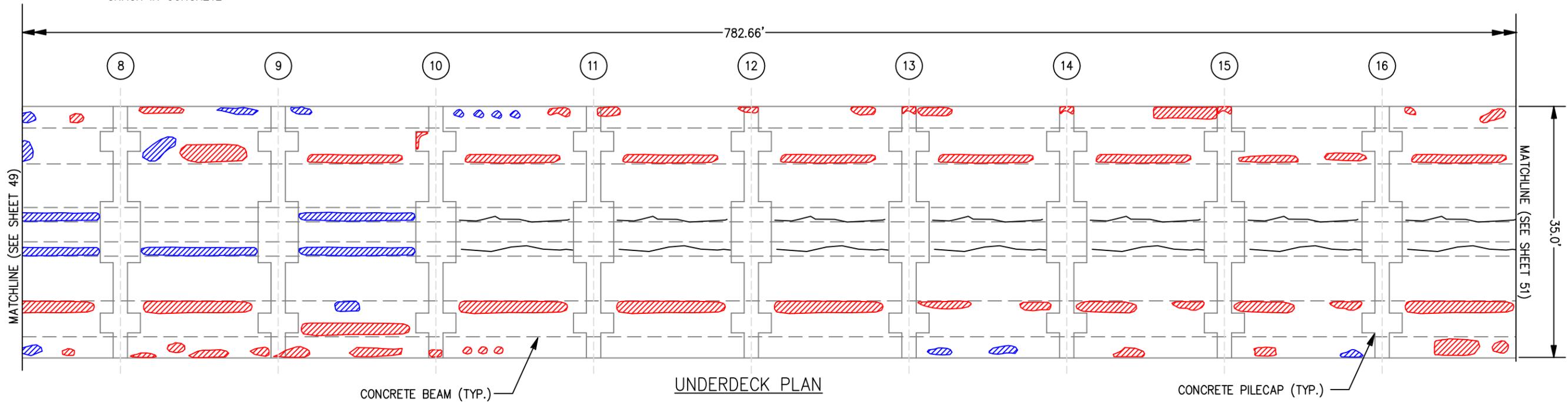
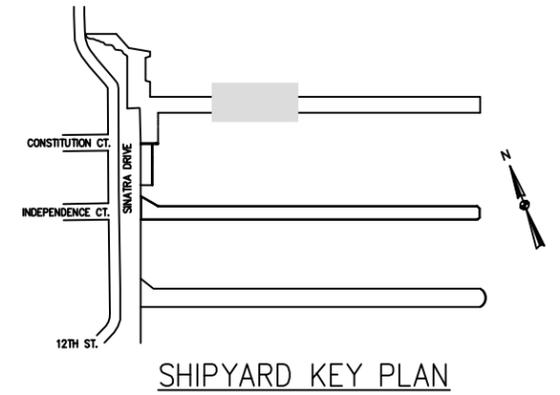
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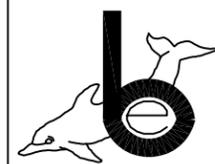
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- ↑ STEEL BATTER H-PILE
- ⊕ STEEL H-PILE WITH CONCRETE ENCASEMENT
- ⊕¹ STEEL H-PILE W/ CONCRETE EXTENSION WITH SEVERE CORROSION
- ⊕² STEEL H-PILE WITH MODERATE EROSION OR VOIDS IN CONCRETE ENCASEMENT
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL W/ EXPOSED, CORRODED REINFORCING STEEL
- ~ CRACK IN CONCRETE



HUDSON RIVER
 FLOOD ↑
 EBB ↓



PILE PLAN



BOSWELL UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
 CONDITION SURVEY OF PRIVATELY-OWNED
 WATERFRONT STRUCTURES

SHIPYARD ASSOCIATES LP
 PIER A PLAN VIEW 2 OF 4

INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
DRAWN BY: J.G.	JOB NO. BUE-1010	DRAWING NO. 4.3
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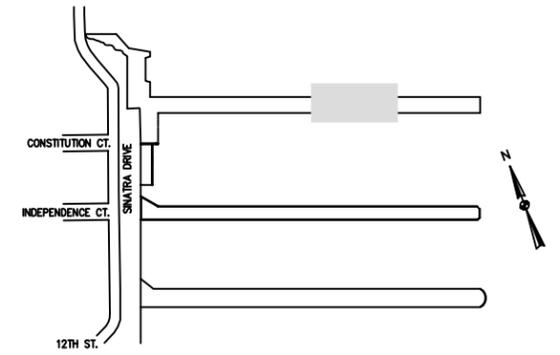
LEGEND:

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- ↑ STEEL BATTER H-PILE
- ⊕ STEEL H-PILE WITH CONCRETE ENCASEMENT
- ⊕¹ STEEL H-PILE W/ CONCRETE EXTENSION WITH SEVERE CORROSION
- ⊕² STEEL H-PILE WITH MODERATE EROSION OR VOIDS IN CONCRETE ENCASEMENT
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- ▨ CONCRETE SPALL W/ EXPOSED, CORRODED REINFORCING STEEL.

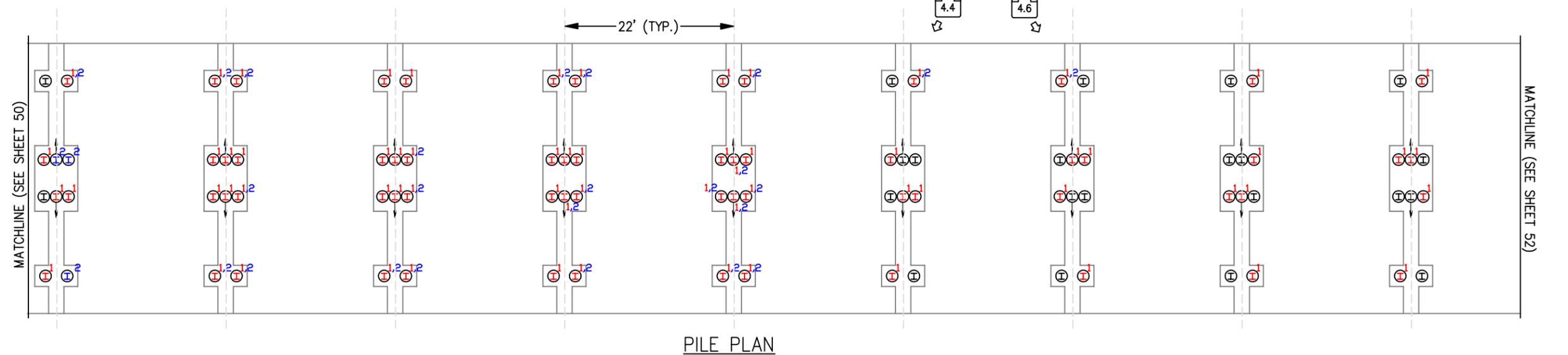
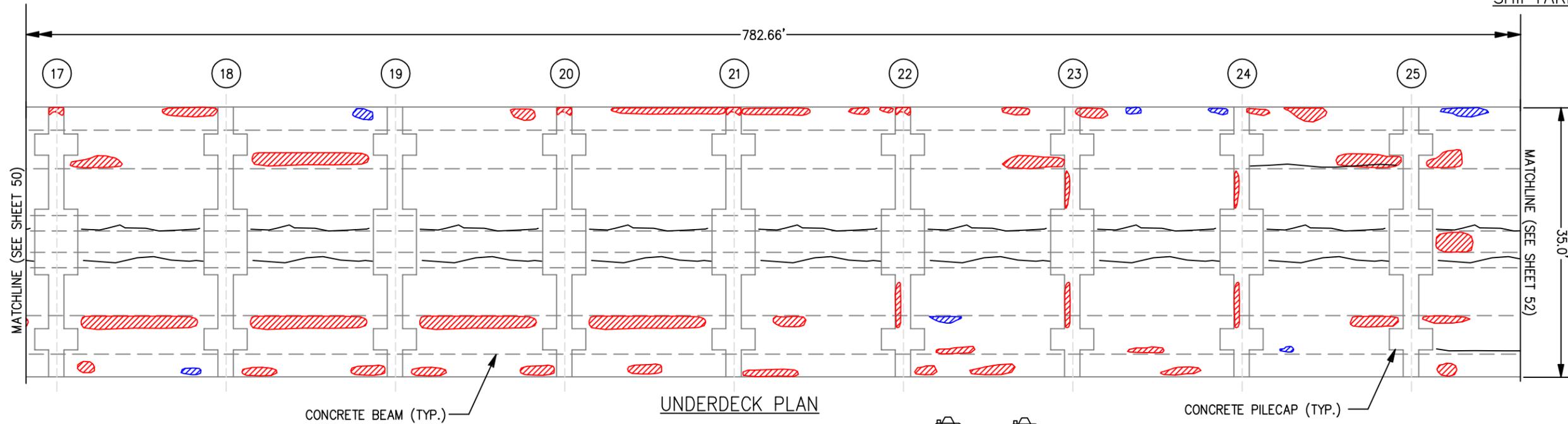
- ~ CRACK IN CONCRETE
- # PHOTO LOCATION



HUDSON RIVER
 FLOOD ↑
 EBB ↓



SHIPYARD KEY PLAN



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 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
 CONDITION SURVEY OF PRIVATELY-OWNED
 WATERFRONT STRUCTURES

SHIPYARD ASSOCIATES LP
 PIER A PLAN VIEW 3 OF 4

INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
DRAWN BY: J.G.	JOB NO. BUE-1010	DRAWING NO. 4.4
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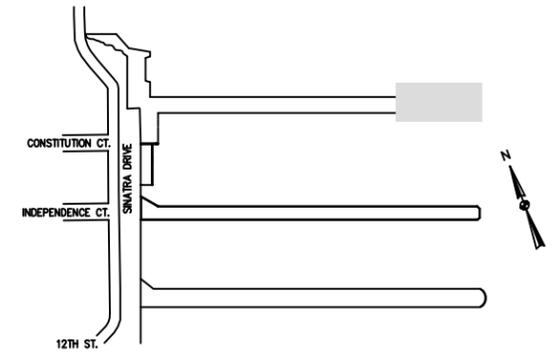
LEGEND:

- I STEEL H-PILE
- ↑ STEEL BATTER H-PILE
- ⊕ STEEL H-PILE WITH CONCRETE ENCASEMENT
- ⊕¹ STEEL H-PILE W/ CONCRETE EXTENSION WITH SEVERE CORROSION
- ⊕² STEEL H-PILE WITH MODERATE EROSION OR VOIDS IN CONCRETE ENCASEMENT
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL W/ EXPOSED, CORRODED REINFORCING STEEL.

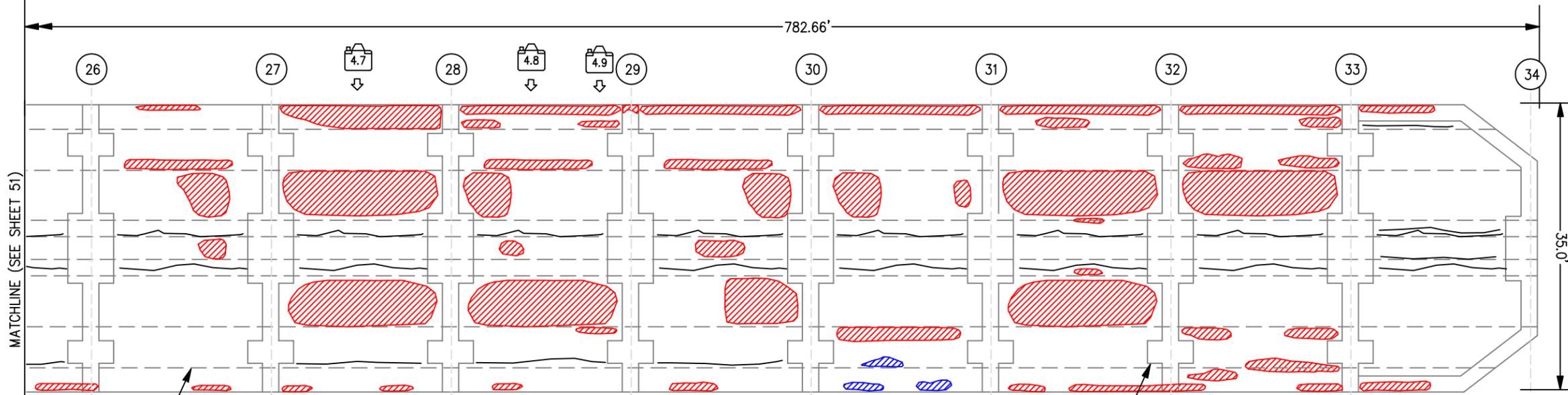
- ~ CRACK IN CONCRETE
- 📷 PHOTO LOCATION



HUDSON RIVER
 FLOOD ↑
 EBB ↓



SHIPYARD KEY PLAN

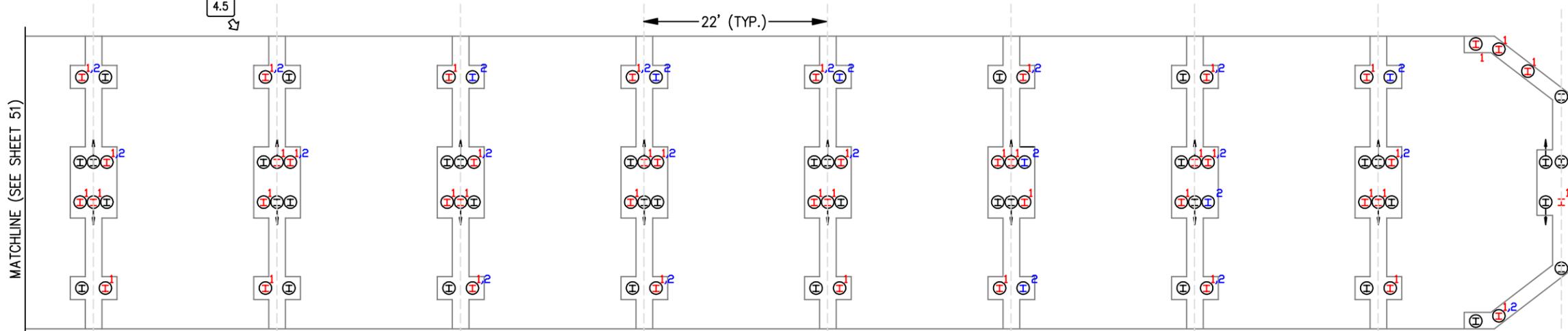


UNDERDECK PLAN

CONCRETE BEAM (TYP.)

CONCRETE PILECAP (TYP.)

📷 4.1



PILE PLAN

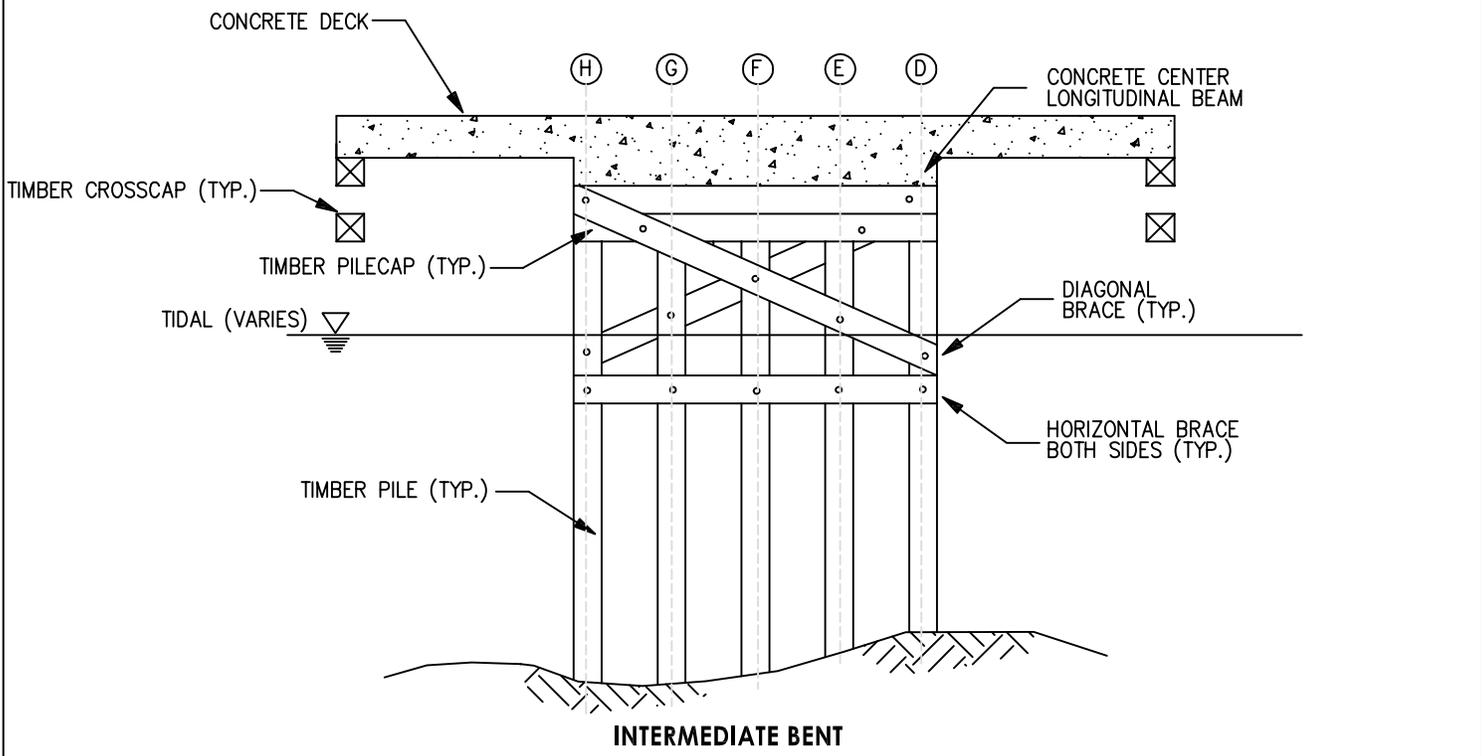
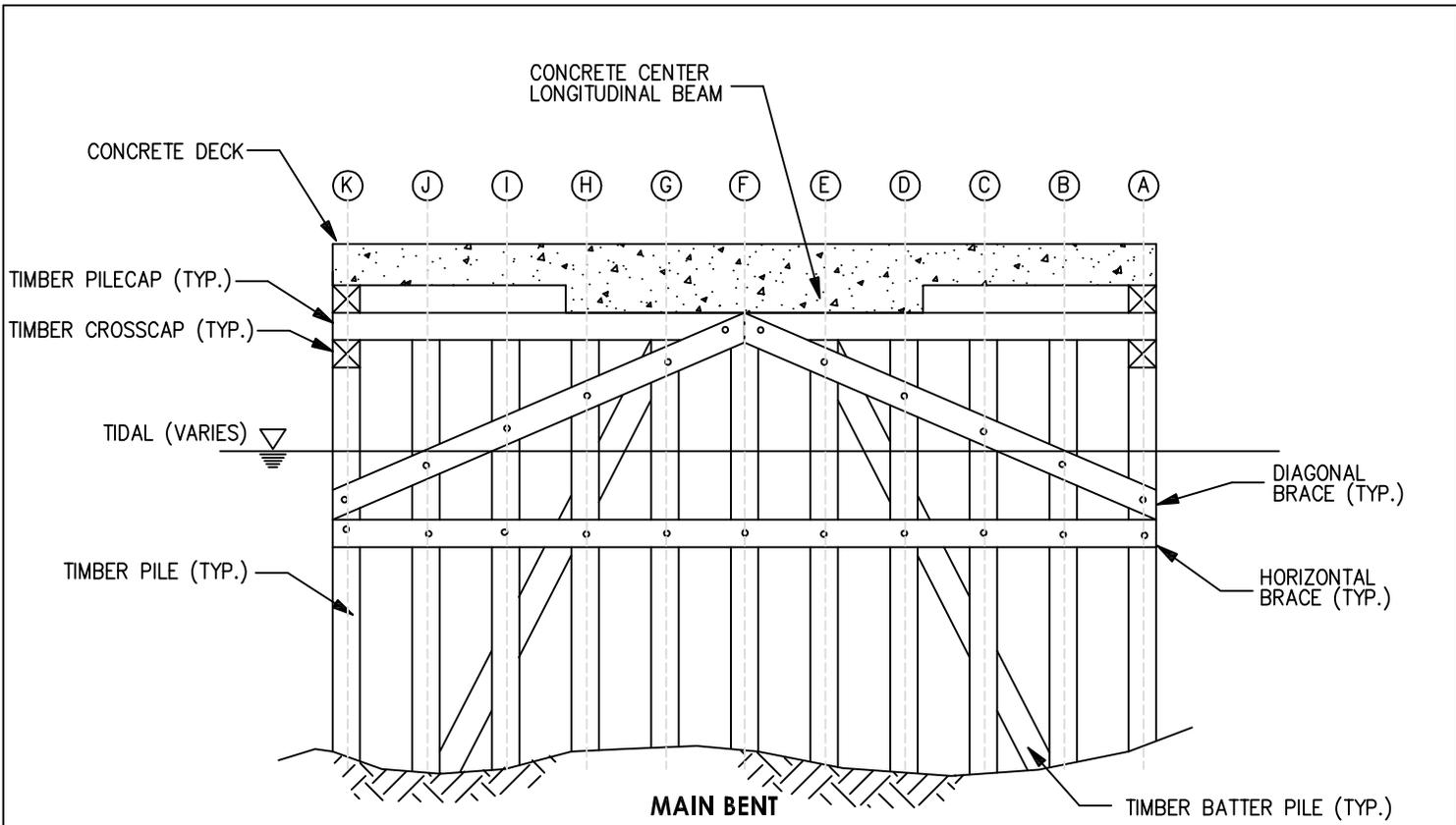


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 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
 CONDITION SURVEY OF PRIVATELY-OWNED
 WATERFRONT STRUCTURES

SHIPYARD ASSOCIATES LP
 PIER A PLAN VIEW 4 OF 4

INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
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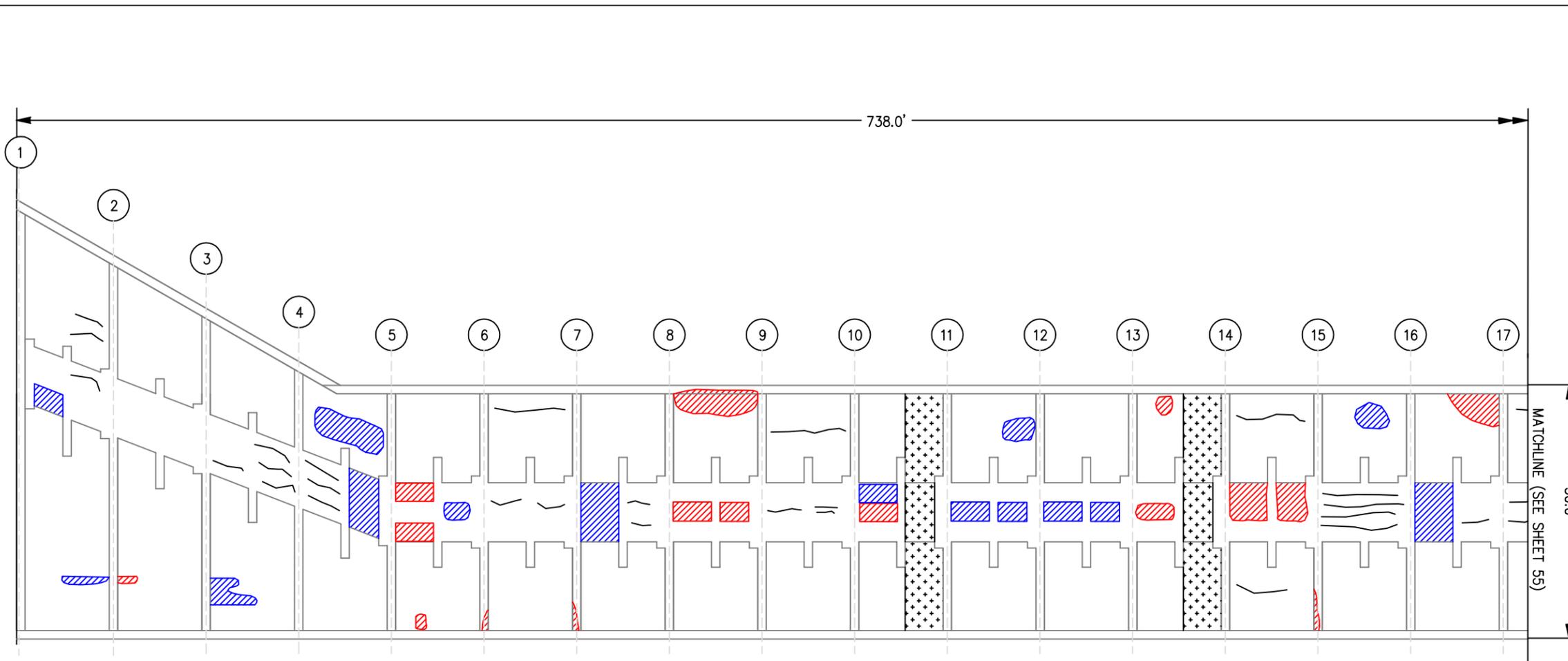


PIER B TYPICAL SECTION

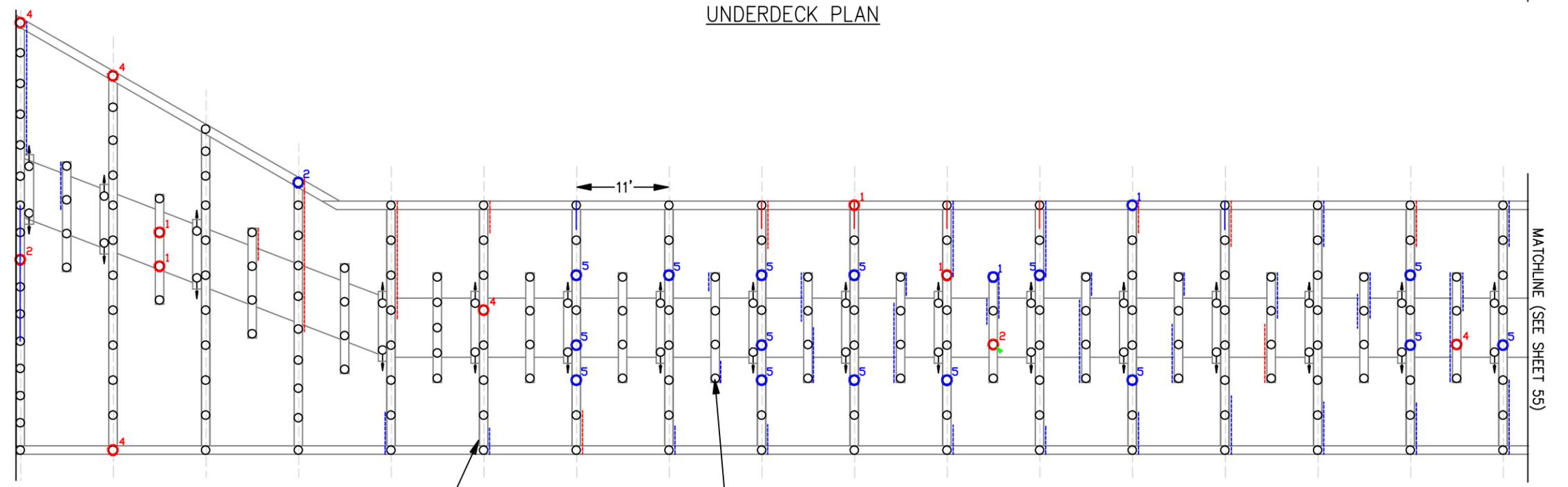
BOSWELL UNDERWATER ENGINEERING

UNDERWATER INSPECTION & DIVING SERVICES
HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

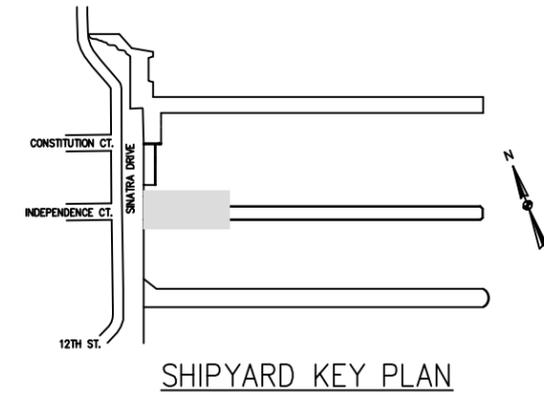
CITY OF HOBOKEN			
CONDITION SURVEY OF PRIVATELY-OWNED WATERFRONT STRUCTURES			
SHIPYARD ASSOCIATES LP			
PIER B TYPICAL SECTION			
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JOB NO. BUE 1010	DRAWING NO. - 4.6	SHEET 53	



UNDERDECK PLAN



PILE PLAN



SHIPYARD KEY PLAN



LEGEND:

- TIMBER PILE
- TIMBER BATTER PILE
- MARINE BORER ACTIVITY
- ¹ TIMBER PILE WITH LESS THAN 50% BEARING
- ² TIMBER PILE WITH SECTION LOSS GREATER THAN 49%
- ⁴ TIMBER PILE WITH SEVERE SPLIT
- ¹ TIMBER PILE WITH 50-90% BEARING
- ² TIMBER PILE WITH 10-49% SECTION LOSS
- ⁵ TIMBER PILE WITH SEVERELY CORRODED CONNECTION PLATE
- TIMBER PILECAP WITH MODERATE SECTION LOSS
- TIMBER BRACE WITH MODERATE DETERIORATION
- TIMBER PILECAP WITH SEVERE SECTION LOSS
- TIMBER PILE WITH MODERATE SPLIT
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL WITH EXPOSED, CORRODED REINFORCING STEEL.
- ▨ FORMWORK LEFT IN PLACE, UNDERDECK NOT VISIBLE.
- ~ CRACK IN CONCRETE
- # PHOTO LOCATION

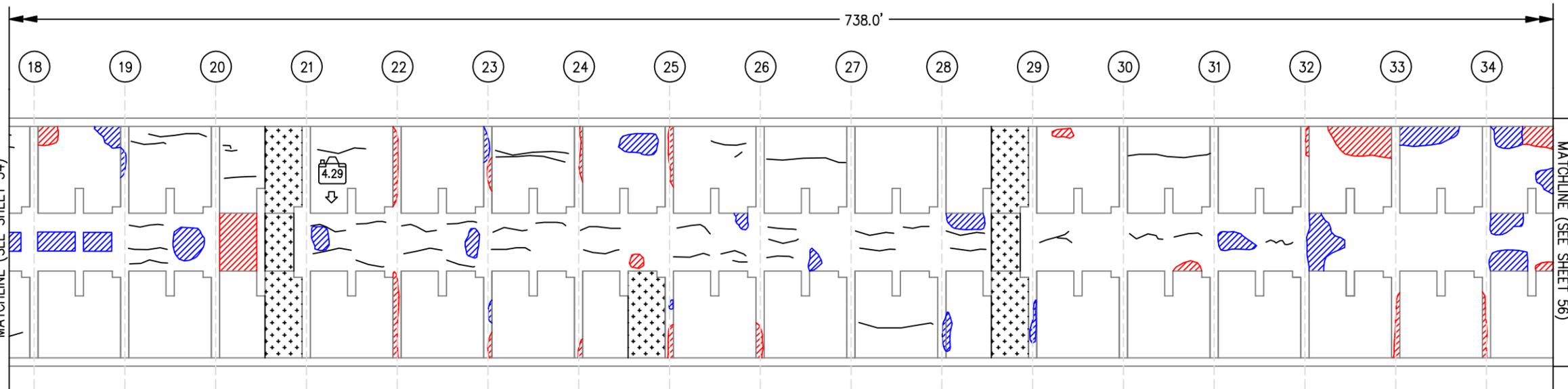


Boswell UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
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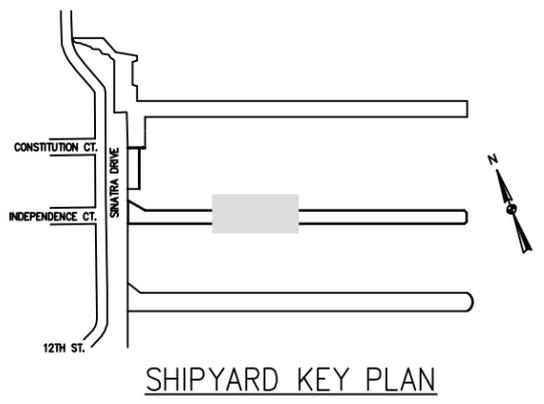
CITY OF HOBOKEN
 CONDITION SURVEY OF PRIVATELY-OWNED
 WATERFRONT STRUCTURES

SHIPYARD ASSOCIATES LP
 PIER B PLAN VIEW 1 OF 4

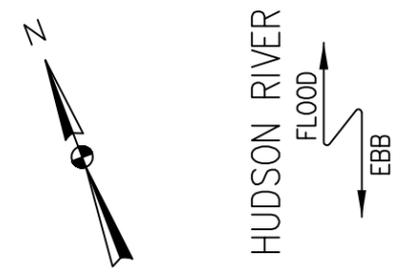
INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
DRAWN BY: J.G.	JOB NO. BUE-1010	DRAWING NO. 4.7
		SHEET 54



UNDERDECK PLAN



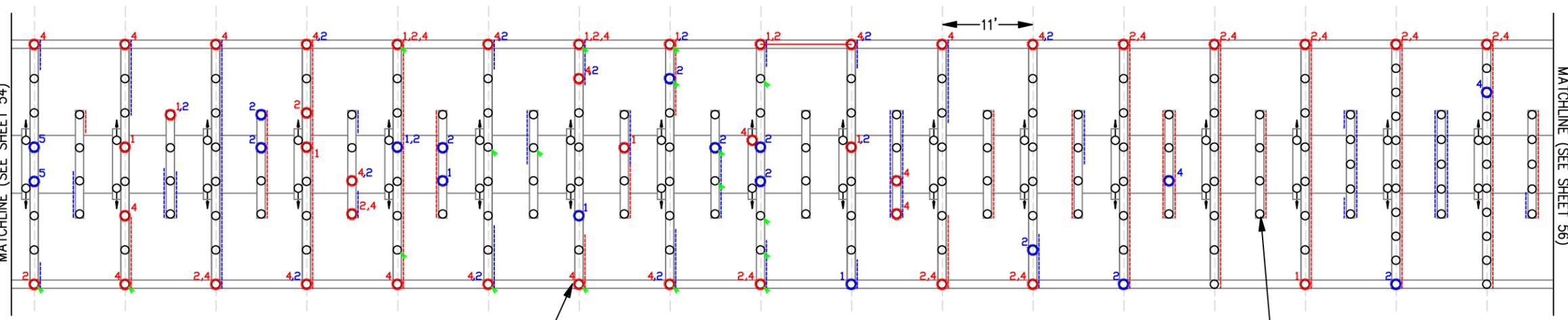
SHIPYARD KEY PLAN



HUDSON RIVER
FLOOD
EBB

LEGEND:

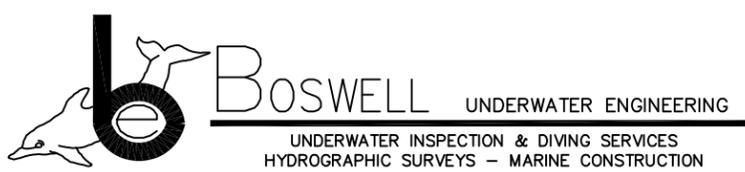
- TIMBER PILE
- ⊙ TIMBER BATTER PILE
- MARINE BORER ACTIVITY
- ¹ TIMBER PILE WITH LESS THAN 50% BEARING
- ² TIMBER PILE WITH SECTION LOSS GREATER THAN 49%
- ⁴ TIMBER PILE WITH SEVERE SPLIT
- ¹ TIMBER PILE WITH 50-90% BEARING
- ² TIMBER PILE WITH 10-49% SECTION LOSS
- ⁴ TIMBER PILE WITH MODERATE SPLIT
- ⁵ TIMBER PILE WITH SEVERELY CORRODED CONNECTION PLATE
- TIMBER BRACE WITH MODERATE DETERIORATION
- TIMBER PILECAP WITH SEVERE SECTION LOSS
- TIMBER PILE WITH MODERATE SPLIT
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL WITH EXPOSED, CORRODED REINFORCING STEEL.
- ▨ FORMWORK LEFT IN PLACE, UNDERDECK NOT VISIBLE.
- ~ CRACK IN CONCRETE
- 📷 PHOTO LOCATION



PILE PLAN

TIMBER MAIN BENT ROW (TYP.)

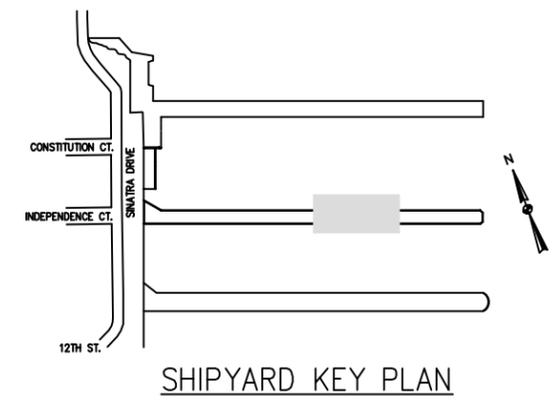
TIMBER INTERMEDIATE BENT ROW (TYP.)



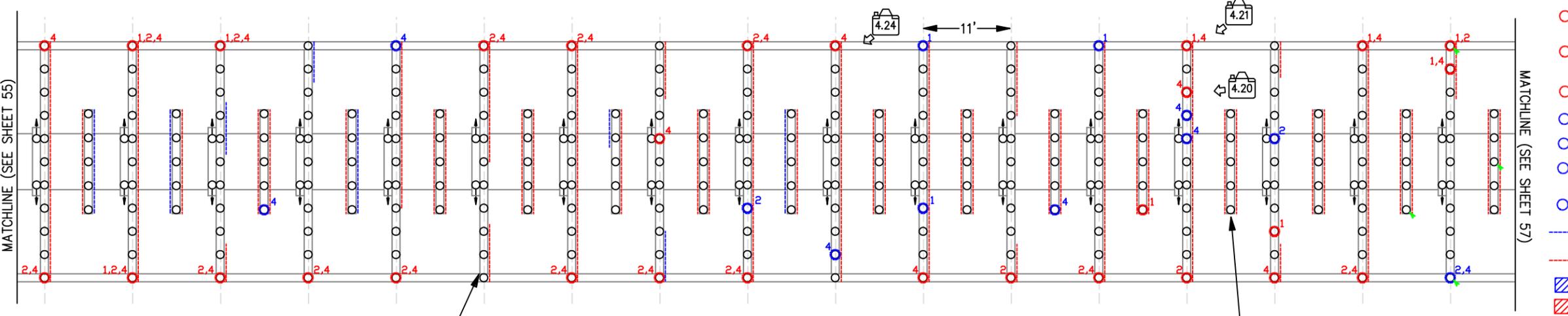
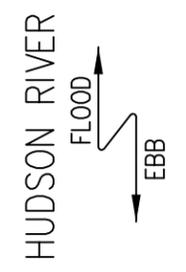
CITY OF HOBOKEN
CONDITION SURVEY OF PRIVATELY-OWNED
WATERFRONT STRUCTURES

SHIPYARD ASSOCIATES LP
PIER B PLAN VIEW 2 OF 4

INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
DRAWN BY: J.G.	JOB NO. BUE-1010	DRAWING NO. 4.8
		SHEET 55



UNDERDECK PLAN



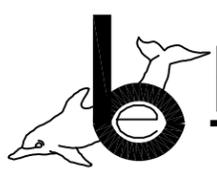
TIMBER MAIN BENT ROW (TYP.)

PILE PLAN

TIMBER INTERMEDIATE BENT ROW (TYP.)

LEGEND:

- TIMBER PILE
- ◐ TIMBER BATTER PILE
- MARINE BORER ACTIVITY
- ¹ TIMBER PILE WITH LESS THAN 50% BEARING
- ² TIMBER PILE WITH SECTION LOSS GREATER THAN 49%
- ³ TIMBER BATTER PILE WITH MISSING BOLT CONNECTION
- ⁴ TIMBER PILE WITH SEVERE SPLIT
- ¹ TIMBER PILE WITH 50-90% BEARING
- ² TIMBER PILE WITH 10-49% SECTION LOSS
- ³ TIMBER BATTER PILE WITH SEVERELY CORRODED HARDWARE
- ⁴ TIMBER PILE WITH MODERATE SPLIT
- TIMBER BRACE WITH MODERATE DETERIORATION
- - - TIMBER PILE WITH MODERATE SPLIT
- ▒ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▒ CONCRETE SPALL WITH EXPOSED, CORRODED REINFORCING STEEL.
- ~ CRACK IN CONCRETE
- 📷 # PHOTO LOCATION

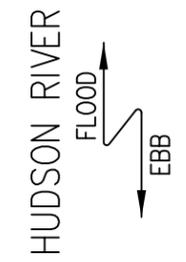
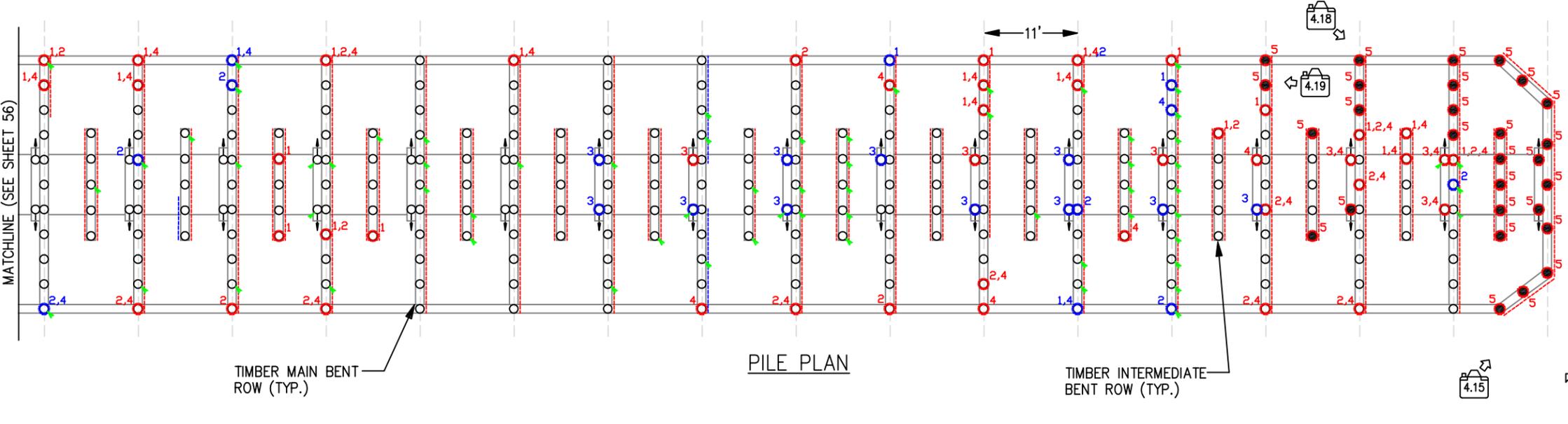
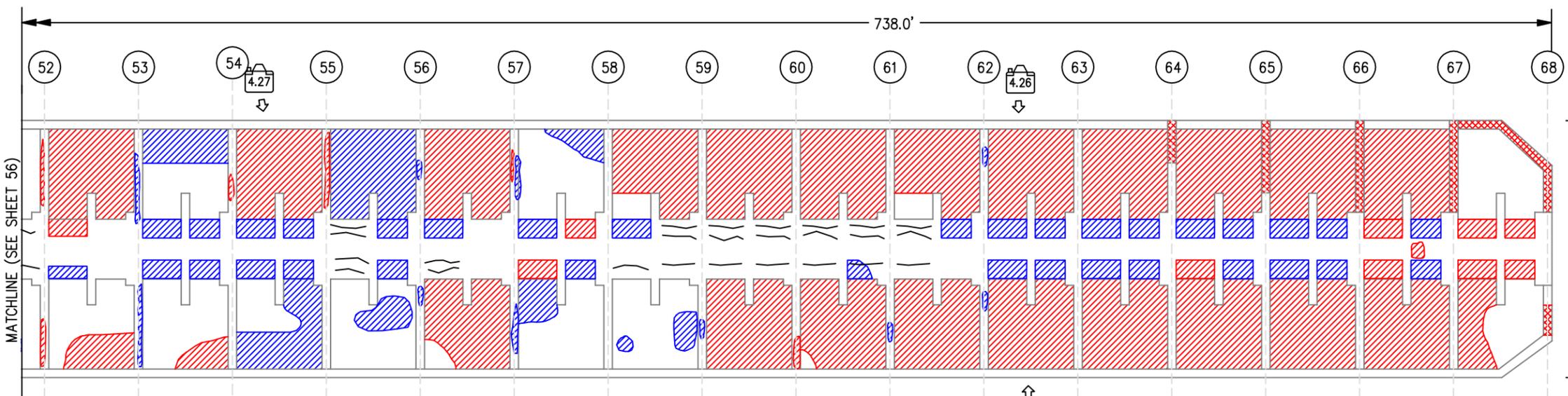
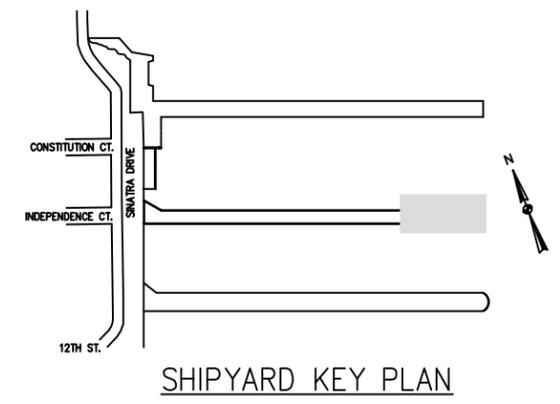


BOSWELL UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
 CONDITION SURVEY OF PRIVATELY-OWNED
 WATERFRONT STRUCTURES

SHIPYARD ASSOCIATES LP
 PIER B PLAN VIEW 3 OF 4

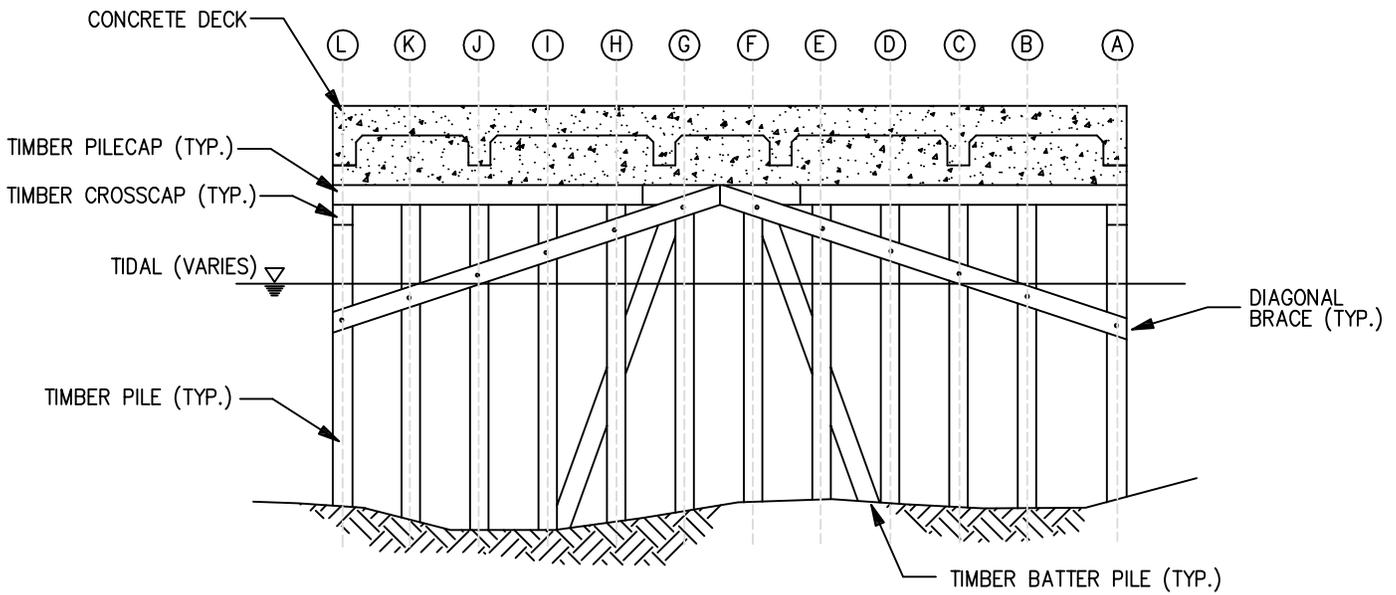
INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
DRAWN BY: J.G.	JOB NO. BUE-1010	DRAWING NO. 4.9
		SHEET 56



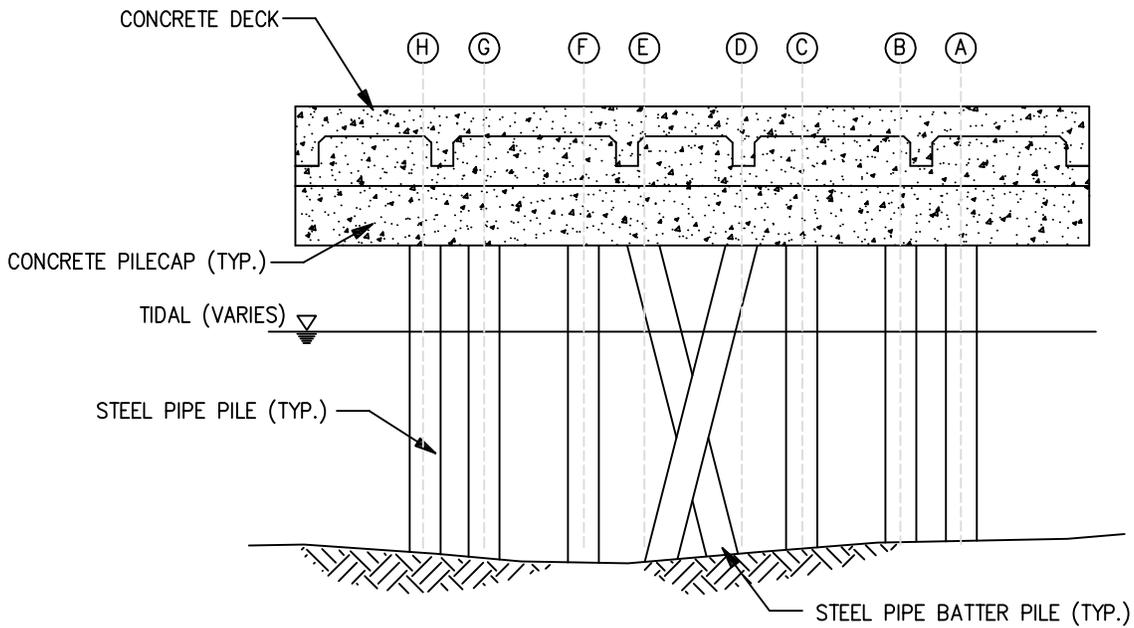
- LEGEND:**
- TIMBER PILE
 - MISSING TIMBER PILE
 - TIMBER BATTER PILE
 - MISSING TIMBER BATTER PILE
 - MARINE BORER ACTIVITY
 - ¹ TIMBER PILE WITH LESS THAN 50% BEARING
 - ² TIMBER PILE WITH SECTION LOSS GREATER THAN 49%
 - ³ TIMBER BATTER PILE WITH MISSING BOLT CONNECTION
 - ⁴ TIMBER PILE WITH SEVERE SPLIT
 - ⁵ TIMBER PILE MISSING
 - ¹ TIMBER PILE WITH 50-90% BEARING
 - ² TIMBER PILE WITH 10-49% SECTION LOSS
 - ³ TIMBER BATTER PILE WITH SEVERELY CORRODED HARDWARE
 - ⁴ TIMBER PILE WITH MODERATE SPLIT
 - TIMBER PILE WITH MODERATE SPLIT
 - ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
 - ▨ CONCRETE SPALL WITH EXPOSED, CORRODED REINFORCING STEEL.
 - ▨ CONCRETE BEAM BROKEN OR MISSING
 - ~ CRACK IN CONCRETE
 - # PHOTO LOCATION

Boswell UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN CONDITION SURVEY OF PRIVATELY-OWNED WATERFRONT STRUCTURES		
SHIPYARD ASSOCIATES LP PIER B PLAN VIEW 4 OF 4		
INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
JOB NO. BUE-1010	DRAWING NO. 4.10	SHEET 57

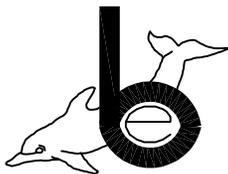


TIMBER BENT



STEEL BENT

PIER C TYPICAL SECTION



BOSWELL UNDERWATER ENGINEERING

UNDERWATER INSPECTION & DIVING SERVICES
HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
CONDITION SURVEY OF PRIVATELY-OWNED
WATERFRONT STRUCTURES

SHIPYARD ASSOCIATES LP
PIER C TYPICAL SECTION

INSPECTED BY: JP, DC, JF
DRAWN BY: JG

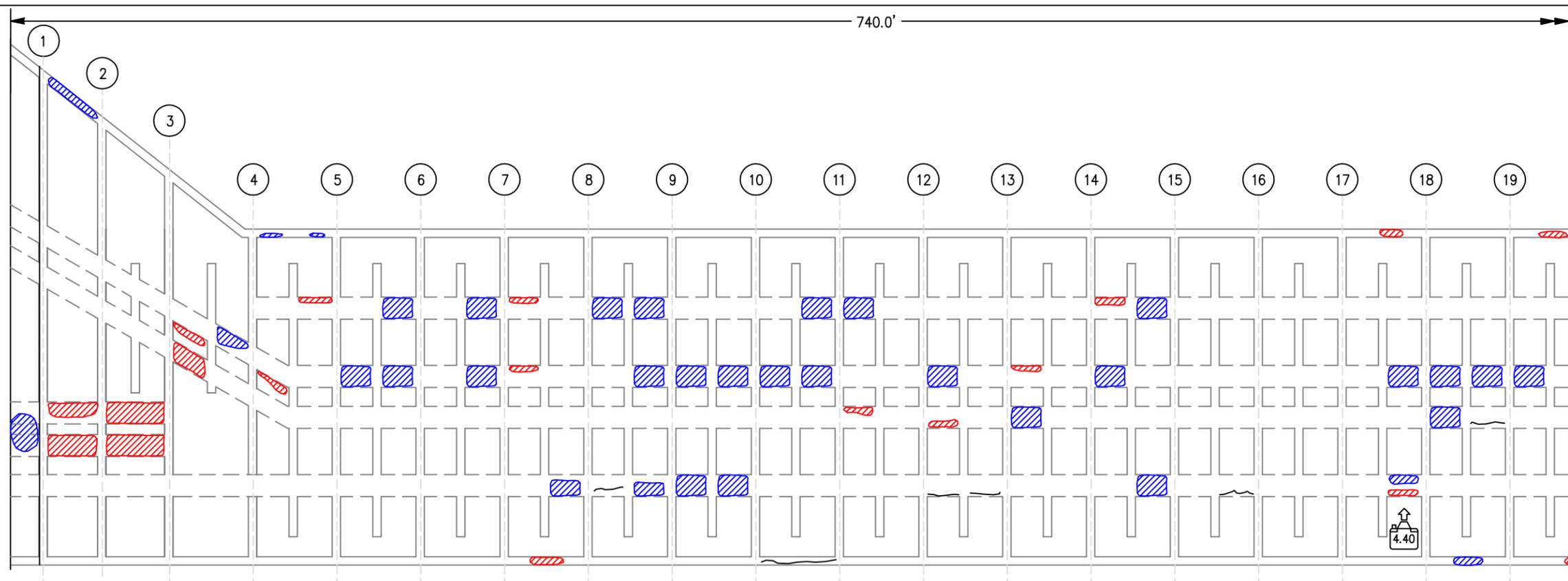
SCALE:
NTS

DATE OF INSPECTION:
FEBRUARY 2011

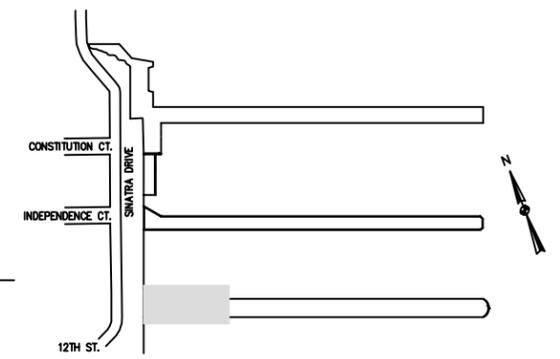
JOB NO. BUE 1010

DRAWING NO. - 4.11

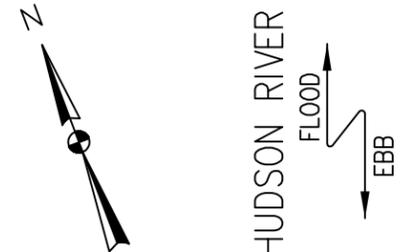
SHEET 58



UNDERDECK PLAN



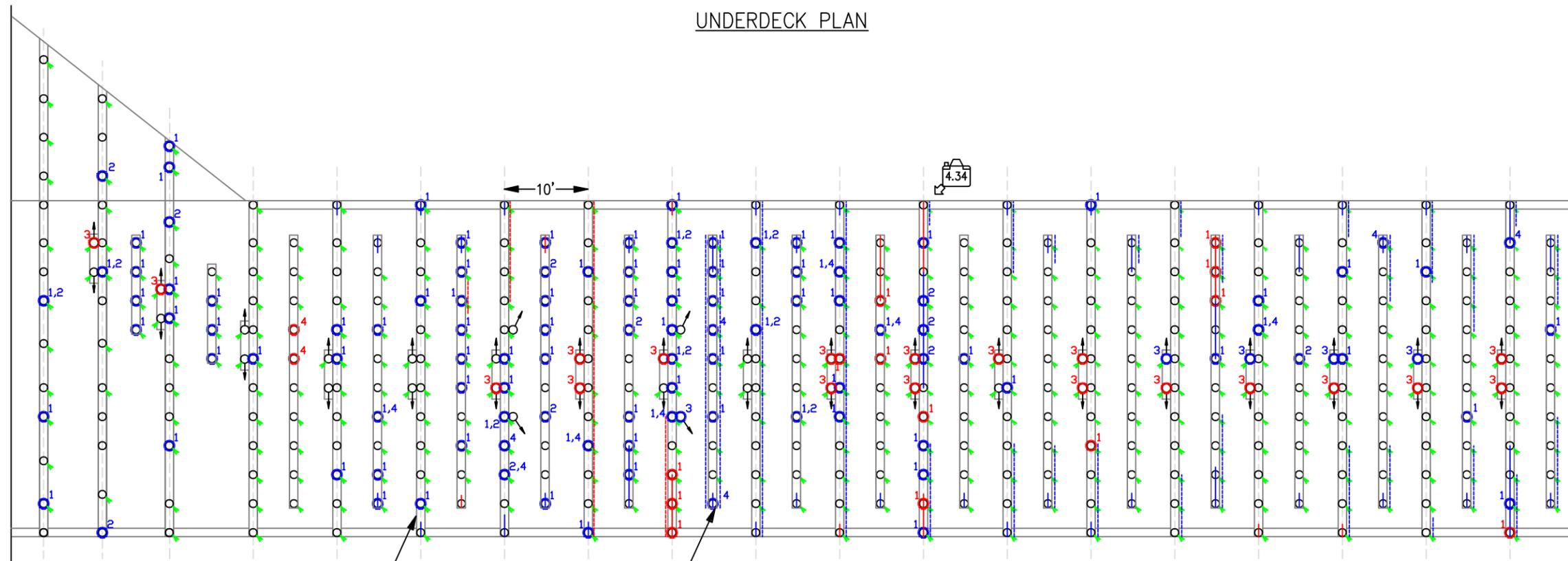
SHIPYARD KEY PLAN



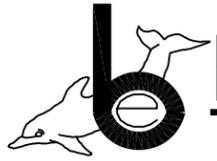
HUDSON RIVER
FLOOD
EBB

LEGEND:

- TIMBER PILE
- TIMBER BATTER PILE
- MARINE BORER ACTIVITY
- ¹ TIMBER PILE WITH LESS THAN 50% BEARING
- ³ TIMBER BATTER PILE WITH MISSING BOLT CONNECTION
- ⁴ TIMBER PILE WITH SEVERE SPLIT
- ¹ TIMBER PILE WITH 50-90% BEARING
- ² TIMBER PILE WITH 10-49% SECTION LOSS
- ³ TIMBER BATTER PILE WITH SEVERELY CORRODED HARDWARE
- ⁴ TIMBER PILE WITH MODERATE SPLIT
- TIMBER PILECAP WITH MODERATE SECTION LOSS
- TIMBER BRACE WITH MODERATE DETERIORATION
- TIMBER PILECAP WITH SEVERE SECTION LOSS
- TIMBER PILE WITH MODERATE SPLIT
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL WITH EXPOSED, CORRODED REINFORCING STEEL
- ~ CRACK IN CONCRETE
- 📷 PHOTO LOCATION



PILE PLAN



Boswell UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

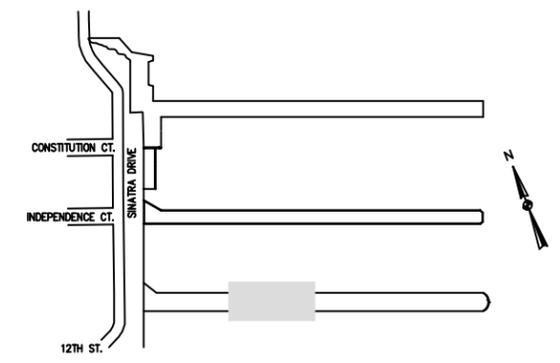
CITY OF HOBOKEN
 CONDITION SURVEY OF PRIVATELY-OWNED
 WATERFRONT STRUCTURES

SHIPYARD ASSOCIATES LP
 PIER C PLAN VIEW 1 OF 4

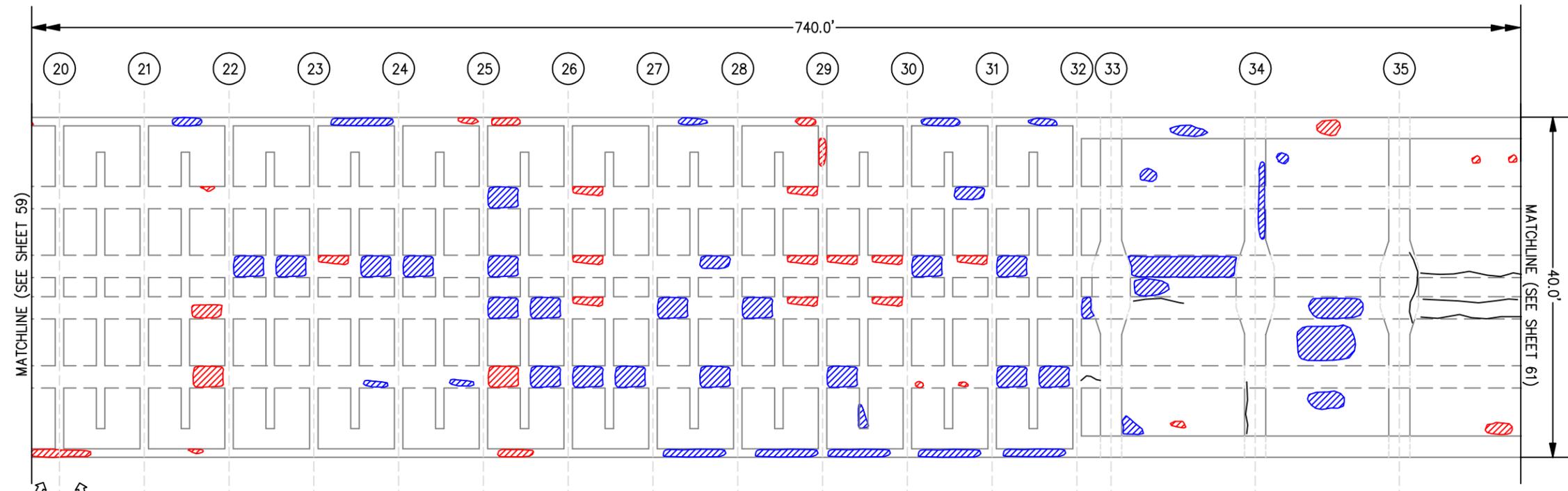
INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
DRAWN BY: J.G.	JOB NO. BUE-1010	DRAWING NO. 4.12
		SHEET 59



HUDSON RIVER
 FLOOD ↑
 EBB ↓



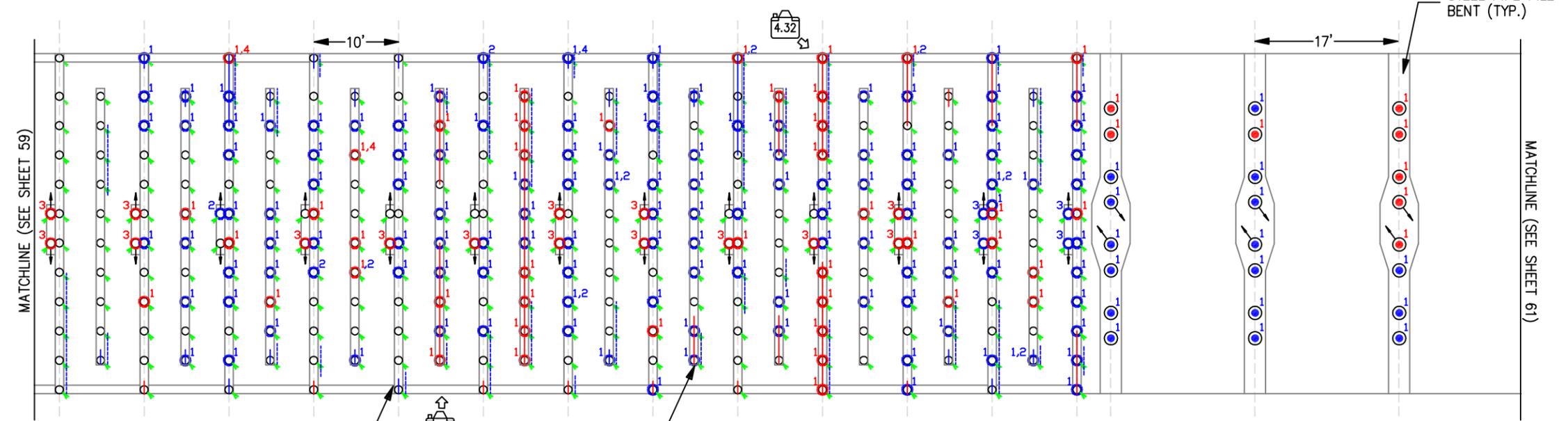
SHIPYARD KEY PLAN



UNDERDECK PLAN

LEGEND:

- TIMBER PILE
- ◐ TIMBER BATTER PILE
- STEEL PIPE PILE
- ◐ STEEL BATTER PIPE PILE
- MARINE BORER ACTIVITY
- ¹ STEEL PIPE PILE WITH SEVERE CORROSION
- ² STEEL PIPE PILE WITH MODERATE CORROSION
- ¹ TIMBER PILE WITH LESS THAN 50% BEARING
- ³ TIMBER BATTER PILE WITH MISSING BOLT CONNECTION
- ⁴ TIMBER PILE WITH SEVERE SPLIT
- ¹ TIMBER PILE WITH 50-90% BEARING
- ² TIMBER PILE WITH 10-49% SECTION LOSS
- ³ TIMBER BATTER PILE WITH SEVERELY CORRODED HARDWARE
- ⁴ TIMBER PILE WITH MODERATE SPLIT
- TIMBER PILECAP WITH MODERATE SECTION LOSS
- - - TIMBER BRACE WITH MODERATE DETERIORATION
- TIMBER PILECAP WITH SEVERE SECTION LOSS
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL WITH EXPOSED, CORRODED REINFORCING STEEL.
- ~ CRACK IN CONCRETE
- 📍 PHOTO LOCATION



PILE PLAN

Boswell UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
 CONDITION SURVEY OF PRIVATELY-OWNED
 WATERFRONT STRUCTURES

SHIPYARD ASSOCIATES LP
 PIER C PLAN VIEW 2 OF 4

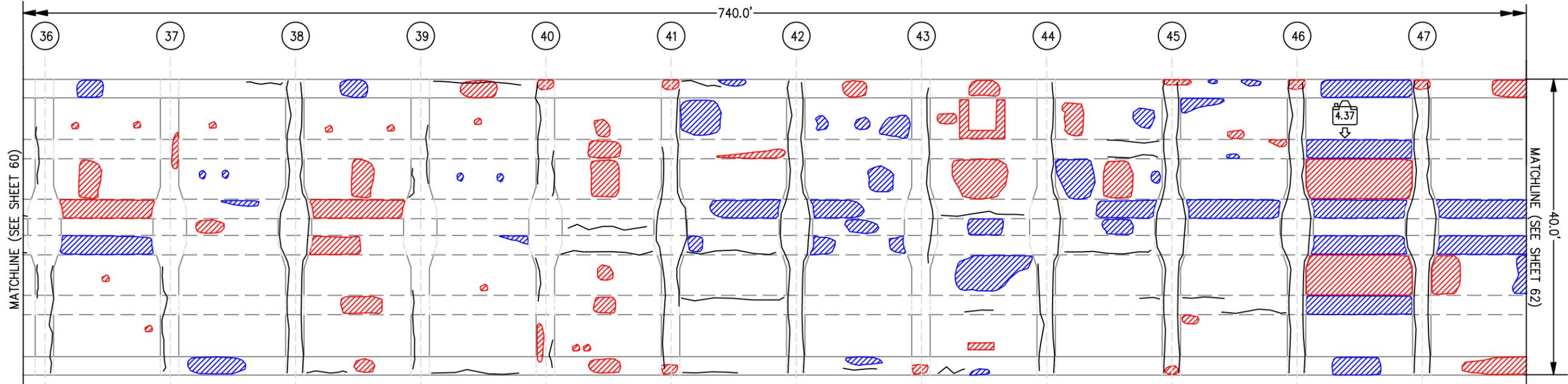
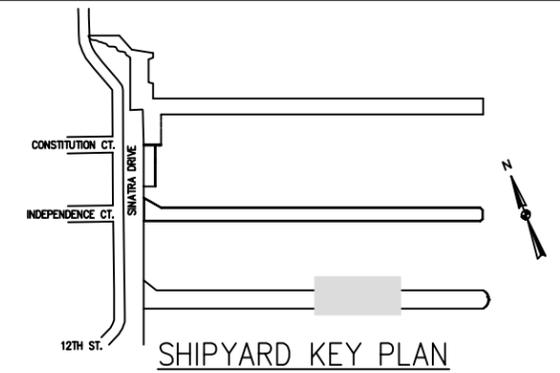
INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
DRAWN BY: J.G.	JOB NO. BUE-1010	DRAWING NO. 4.13
		SHEET 60

LEGEND:

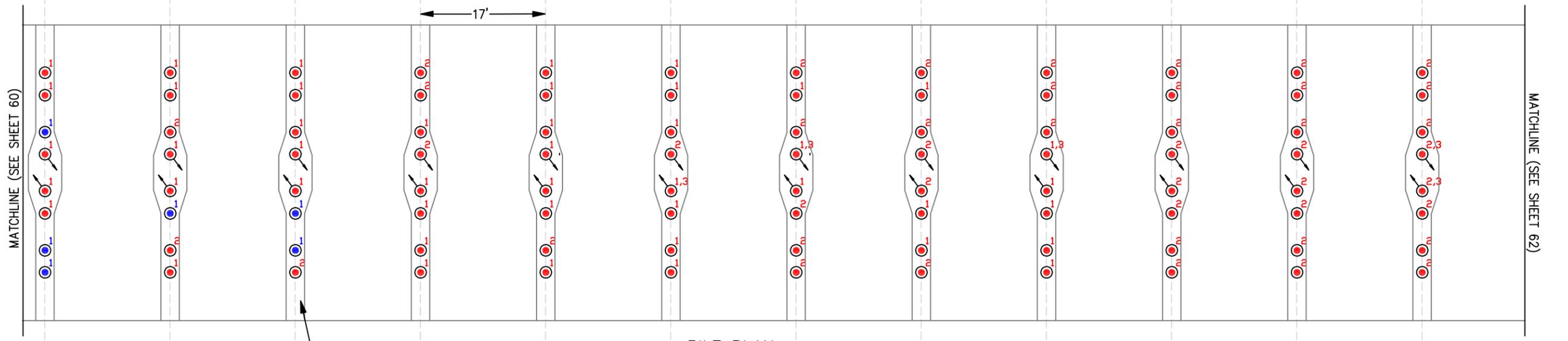
- STEEL PIPE PILE
- ⊖ STEEL BATTER PIPE PILE
- ⊙¹ STEEL PIPE PILE WITH SEVERE CORROSION
- ⊙² STEEL PIPE PILE WITH THROUGH HOLES AND EROSION OF CONCRETE JACKET
- ⊙³ STEEL PIPE PILE WITH 0% BEARING
- ⊙¹ STEEL PIPE PILE WITH MODERATE CORROSION
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL WITH EXPOSED, CORRODED REINFORCING STEEL.
- ~ CRACK IN CONCRETE
- 📷 PHOTO LOCATION



HUDSON RIVER
 FLOOD ↑
 EBB ↓



UNDERDECK PLAN



PILE PLAN

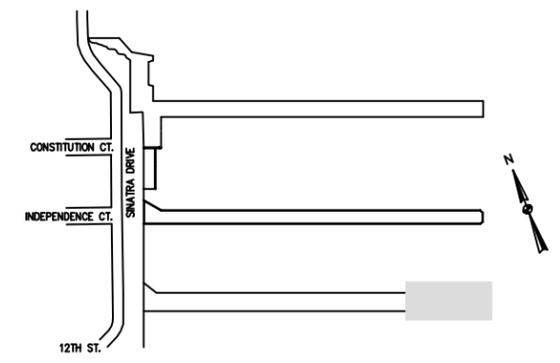
STEEL PIPE PILE BENT (TYP.)

Boswell UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

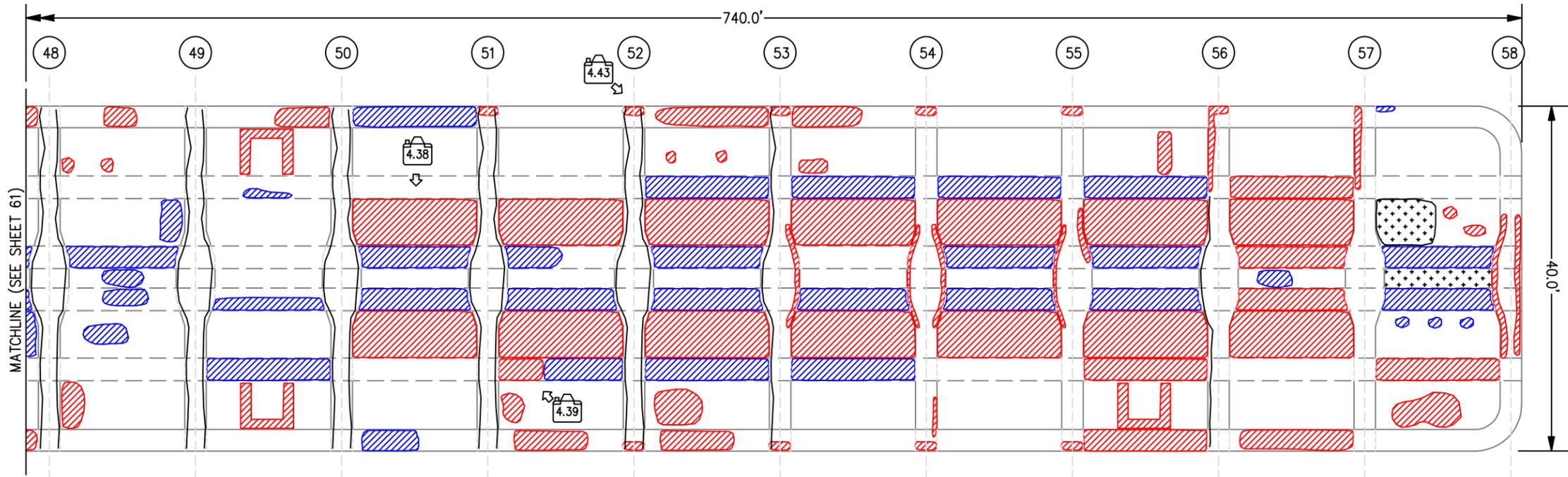
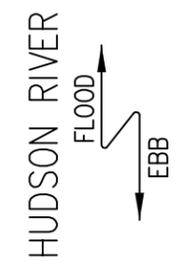
CITY OF HOBOKEN
 CONDITION SURVEY OF PRIVATELY-OWNED
 WATERFRONT STRUCTURES

SHIPYARD ASSOCIATES LP
 PIER C PLAN VIEW 3 OF 4

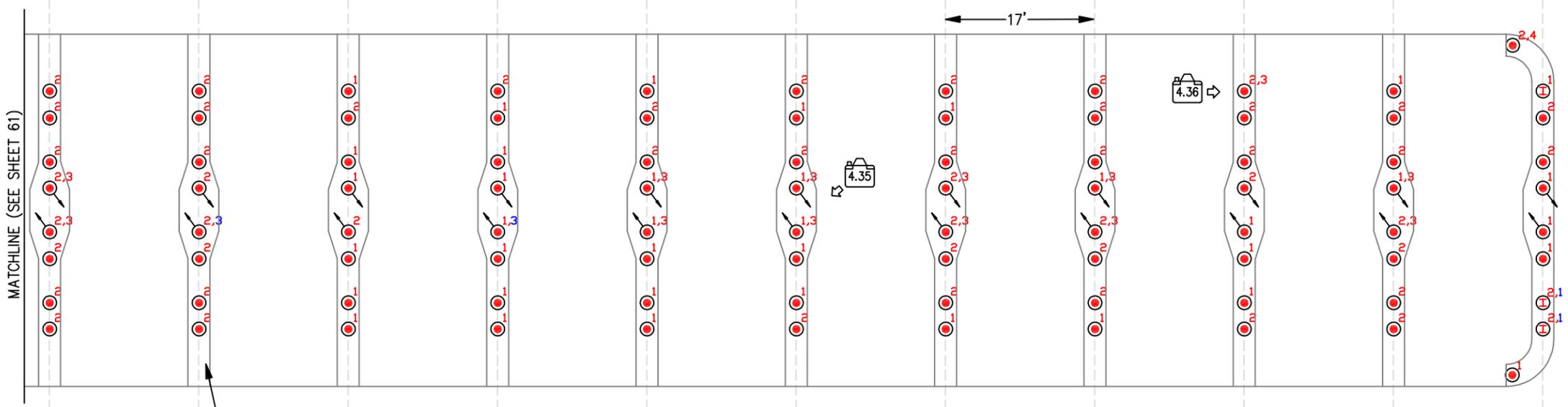
INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
JOB NO. BUE-1010	DRAWING NO. 4.14	SHEET 61



SHIPYARD KEY PLAN



UNDERDECK PLAN



PILE PLAN

STEEL PIPE PILE BENT (TYP.)

LEGEND:

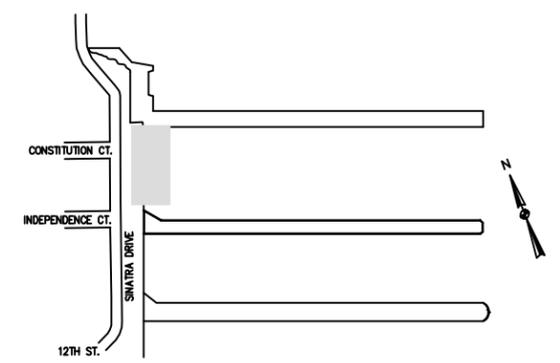
- STEEL PIPE PILE
- ←○ STEEL BATTER PIPE PILE
- I STEEL H-PILE
- ① STEEL H-PILE WITH CONCRETE EXTENSION WITH SEVERE CORROSION
- ② STEEL H-PILE WITH SEVERE EROSION OF CONCRETE JACKET
- ① STEEL PIPE PILE WITH SEVERE CORROSION
- ② STEEL PIPE PILE WITH THROUGH HOLES AND EROSION OF CONCRETE JACKET
- ③ STEEL PIPE PILE WITH 0% BEARING
- ④ STEEL PIPE PILE WITH BROKEN OR 100% SECTION LOSS
- ① STEEL PIPE PILE WITH MODERATE CORROSION
- ③ STEEL PIPE PILE WITH 50-90% BEARING
- ① STEEL H-PILE WITH CONCRETE EXTENSION WITH MODERATE CORROSION
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL WITH EXPOSED, CORRODED REINFORCING STEEL.
- ▨ FORMWORK LEFT IN PLACE, UNDERDECK NOT VISIBLE.
- ~ CRACK IN CONCRETE
- 📷 PHOTO LOCATION

Boswell UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

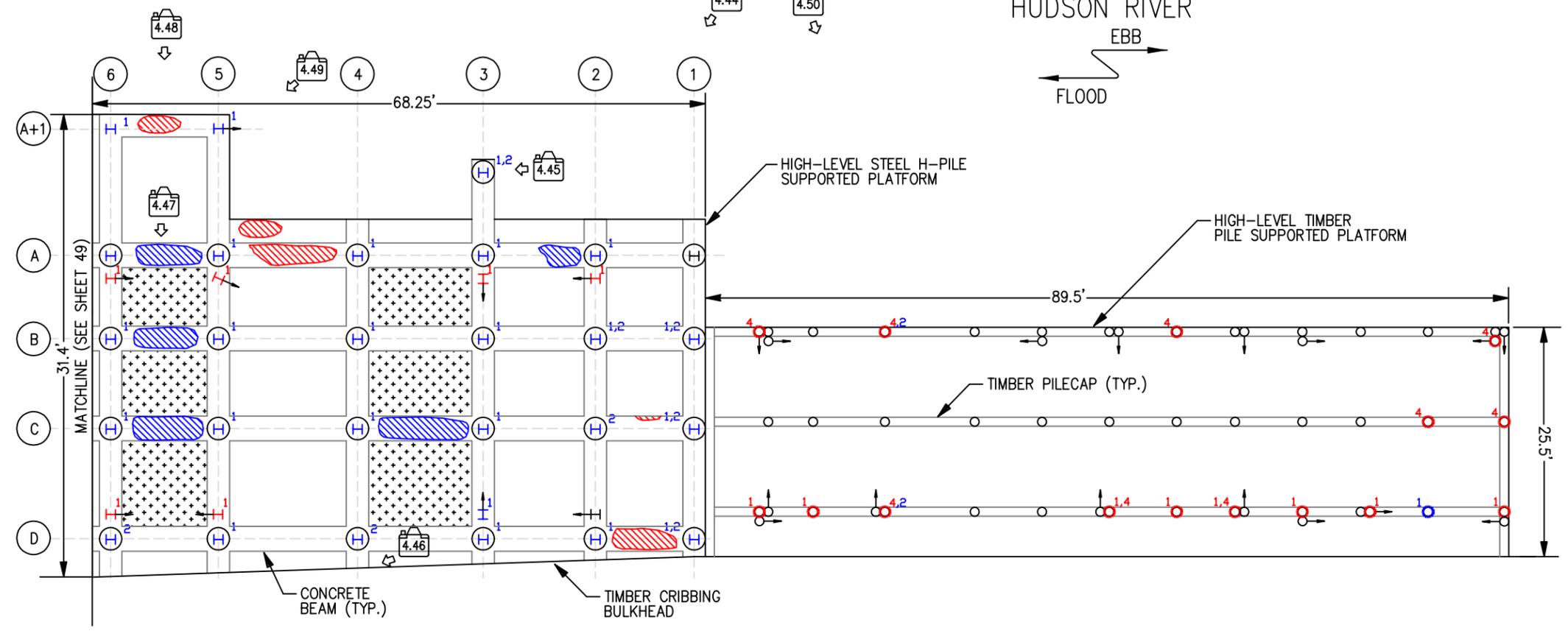
CITY OF HOBOKEN CONDITION SURVEY OF PRIVATELY-OWNED WATERFRONT STRUCTURES		
SHIPYARD ASSOCIATES LP PIER C PLAN VIEW 4 OF 4		
INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
JOB NO. BUE-1010	DRAWING NO. 4.15	SHEET 62



HUDSON RIVER
 EBB
 FLOOD



SHIPYARD KEY PLAN



LEGEND:

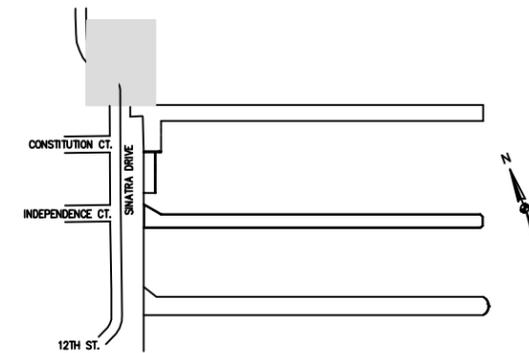
- TIMBER PILE
- ◐ TIMBER BATTER PILE
- ⊕ CONCRETE ENCASED STEEL H-PILE
- ⊕ STEEL BATTER H-PILE
- ⊕¹ STEEL H-PILE WITH CONCRETE EXTENSION WITH SEVERE CORROSION
- ¹ TIMBER PILE WITH LESS THAN 50% BEARING
- ⁴ TIMBER PILE WITH SEVERE SPLIT
- ¹ TIMBER PILE WITH 50-90% BEARING
- ² TIMBER PILE WITH 10-49% SECTION LOSS
- ⊕¹ STEEL H-PILE WITH CONCRETE EXTENSION WITH MODERATE CORROSION
- ⊕² STEEL H-PILE WITH MODERATE EROSION OF CONCRETE JACKET
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL WITH EXPOSED, CORRODED REINFORCING STEEL.
- ▨ FORMWORK LEFT IN PLACE, UNDERDECK NOT VISIBLE.
- 📷 # PHOTO LOCATION

BOSWELL UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN CONDITION SURVEY OF PRIVATELY-OWNED WATERFRONT STRUCTURES		
SHIPYARD ASSOCIATES LP HIGH-LEVEL PLATFORMS SOUTH OF PIER A		
INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
JOB NO. BUE-1010	DRAWING NO. 4.16	SHEET 63

HUDSON RIVER
EBB
FLOOD

HIGH LEVEL STEEL
H-PILE SUPPORTED
PLATFORM



SHIPYARD KEY PLAN

MATCHLINE (SEE SHEET 49)

SEAWALL REMOVED AS PART OF EMERGENCY
REPAIRS IN RESPONSE TO ROADWAY COLLAPSE
IN OCTOBER, 2010. TEMPORARY H-PILES AND
STEEL PLATES IN PLACE AT TIME OF INSPECTION.

LOW LEVEL TIMBER
RELIEVING PLATFORM

LEGEND:

- TIMBER PILE
- I STEEL H-PILE
- ⊕ CONCRETE ENCASED STEEL H-PILE
- ⊥ STEEL BATTER H-PILE
- MARINE BORER ACTIVITY
- ¹ TIMBER PILE W/ LESS THAN 50% BEARING
- ⁴ TIMBER PILE WITH SEVERE SPLIT
- ² TIMBER PILE W/ 10-49% SECTION LOSS
- ⊕¹ STEEL H-PILE W/ CONCRETE JACKET WITH SEVERE CORROSION
- TIMBER PILECAP W/ MODERATE SECTION LOSS
- TIMBER PILECAP W/ SEVERE SECTION LOSS
- ▒ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▒ CONCRETE SPALL W/ EXPOSED, CORRODED REINFORCING STEEL
- # PHOTO LOCATION



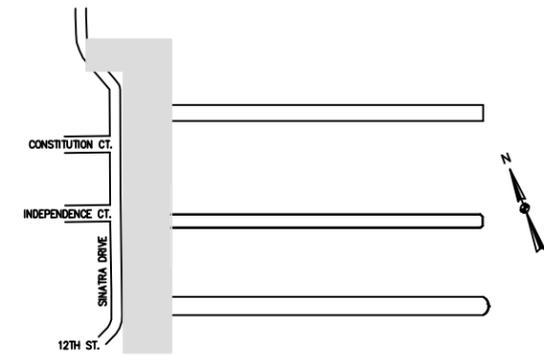
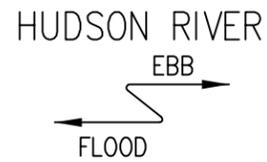
BOSWELL UNDERWATER ENGINEERING
UNDERWATER INSPECTION & DIVING SERVICES
HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
CONDITION SURVEY OF PRIVATELY-OWNED
WATERFRONT STRUCTURES

SHIPYARD ASSOCIATES LP
PLATFORMS NORTH OF PIER A

INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
JOB NO. BUE-1010	DRAWING NO. 4.17	SHEET 64

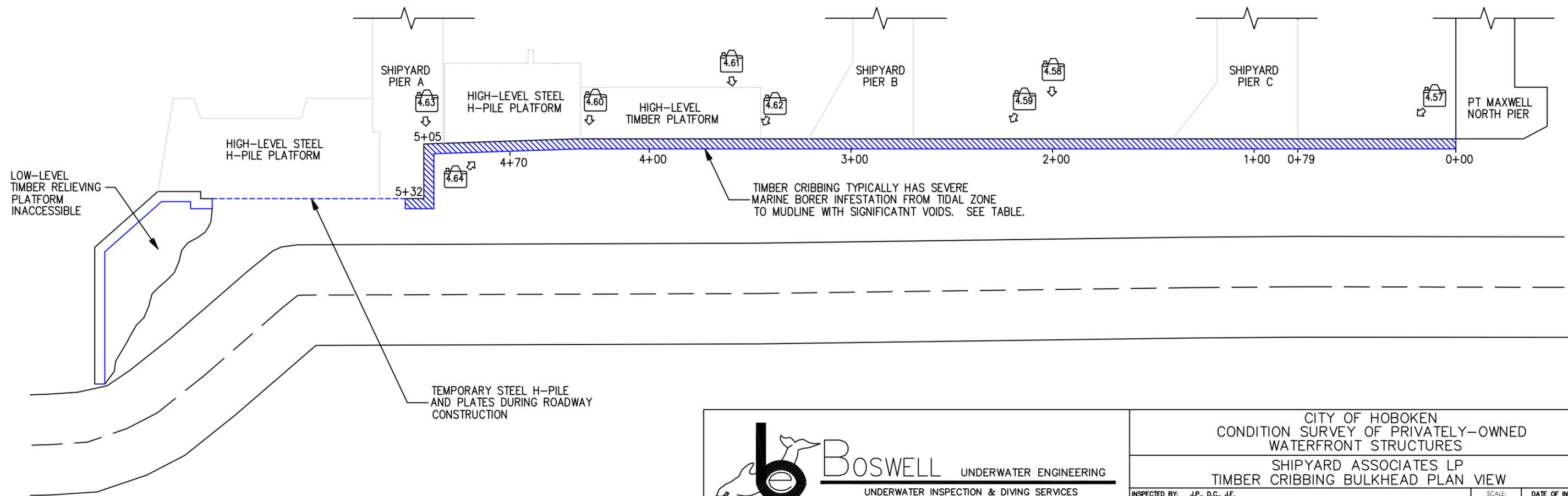
Voids in Timber Cribbing			
Sta.	Description	Sta.	Description
0+06	5'L x 0.5'H x 4'D	2+15	12'L x 2.5'H x 3'D
0+50	1.5'L x 1'H x 2.5'D	2+25	5'L x 2.5'H x 3'D
0+54	1'L x 1'H x 3.5'D	2+48	2'L x 1'H x 2'D
0+65	1.5'L x 0.5'H x 1.5'D	2+63	3.5'L x 2'H x 2'D
0+68	1'L x 0.5'H x 1'D	2+75	2.5'L x 0.5'H x 2'D
1+10	2.5'L x 1'H x 2'D	2+85	3'L x 0.5'H x 1.5'D
1+22	4'L x 1'H x 2'D	2+87	2'L x 1'H x 2.5'D
1+30	3.5'L x 2'H x 2'D	2+90	3'L x 1'H x 2.5'D
1+35	4'L x 2'H x 2'D	3+04	2'L x 1'H x 1.5'D
1+41	3.5'L x 2'H x 3'D	3+10	4'L x 1'H x 1.5'D
1+46	1'L x 1'H x 1.5'D	3+15	2.5'L x 1'H x 2'D
1+51	9'L x 2.5'H x 2.5'D	3+20	1'L x 1'H x 1.5'D
1+60	4'L x 1.5'H x 1.5'D	3+45	1'L x 1'H x 2.5'D
1+65	3'L x 1'H x 2'D	3+69	4'L x 1'H x 2.5'D
1+90	1.5'L x 1.5'H x 5'D	3+87	3'L x 1'H x 2'D
1+95	6'L x 1.5'H x 2'D	4+15	2'L x 1'H x 2.5'D
2+15	12'L x 2.5'H x 3'D	4+35	2'L x 1'H x 1.5'D



SHIPYARD KEY PLAN

LEGEND:

- CONCRETE SEAWALL FOUNDED ON TIMBER CRIBBING
- CONCRETE SEAWALL FOUNDED ON LOW-LEVEL TIMBER RELIEVING PLATFORM
- SEAWALL REMOVED - TEMPORARY STEEL SHEETING IN PLACE
- PHOTO LOCATION



BOSWELL UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN CONDITION SURVEY OF PRIVATELY-OWNED WATERFRONT STRUCTURES		
SHIPYARD ASSOCIATES LP TIMBER CRIBBING BULKHEAD PLAN VIEW		
INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
JOB NO. BUE-1010	DRAWING NO. 4.18	SHEET 65

4.9 PHOTOGRAPHS



Photo No. 4.1

Location:

Pier A

Description:

General view looking west

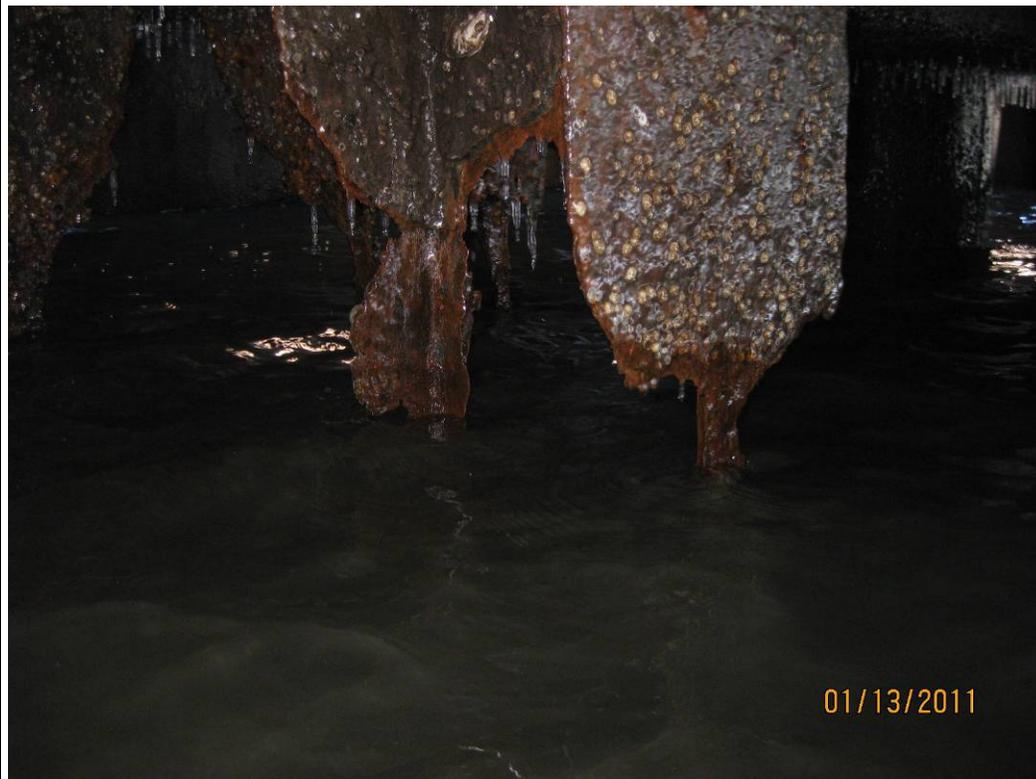


Photo No. 4.2

Location:

Pier A
Bent-1

Description:

Severely corroded steel H-pile



Photo No. 4.3

Location:

Pier A
Bent11

Description:

Severely corroded
steel H-pile



Photo No. 4.4

Location:

Pier A
Bent 22
Pile A-East

Description:

Void at top of
H-pile concrete
encasement



Photo No. 4.5

Location:

Pier A
Bent 27
Piles A-East and A-
West

Description:

Void at top of 2
H-pile concrete
encasements



Photo No. 4.6

Location:

Pier A
Bent 23
Pile A-West

Description:

Void at top of H-pile
concrete encasement
showing exposed steel
reinforcement



Photo No. 4.7

Location:

Pier A
Bent 28

Description:

Spall at underdeck exposing severely corroded reinforcing steel



Photo No. 4.8

Location:

Pier A
Bent 29

Description:

Spall at bottom edge of deck fascia with exposed corroded reinforcing steel



Photo No. 4.9

Location:

Pier A
Bent 29

Description:

Spall at end of pile cap showing exposed reinforcing steel



Photo No. 4.10

Location:

Pier A
Typical Exterior
Beam

Description:

1/4" wide crack with
rust staining along
lower side



Photo No. 4.11

Location:

Pier A
Typical Interior Beam

Description:

1/4" – 1/2" wide
cracks on vertical face
of beam



Photo No. 4.12

Location:

Pier A
Typical Interior Beam

Description:

1/4" wide crack with
rust staining on
vertical face of beam



Photo No. 4.13

Location:

Pier B

Description:

General view looking northwest



Photo No. 4.14

Location:

Pier B

Description:

General view, typical bent row



Photo No. 4.15

Location:

Pier B

Description:

East end of pier unsupported



Photo No. 4.16

Location:

Pier B

Description:

East end of pier unsupported



Photo No. 4.17

Location:

Pier B

Description:

East end of pier unsupported



Photo No. 4.18

Location:

Pier B
Bent 66

Description:

Timber piles missing; concrete pile cap broken; massive spalling of concrete underdeck showing exposed, corroded steel reinforcement



Photo No. 4.19

Location:

Pier B
Bent 65

Description:

Three (3) timber piles missing; concrete pile cap broken; massive spalling of concrete underdeck showing exposed, corroded steel reinforcement



Photo No. 4.20

Location:

Pier B
Pile 48C

Description:

Wide split at top of pile



Photo No. 4.21

Location:

Pier B
Pile 48A

Description:

Severely corroded
attachment hardware



Photo No. 4.22

Location:

Pier B
Pile 11C

Description:

Severely corroded
attachment hardware



Photo No. 4.23

Location:

Pier B
Bent 9

Description:

Rot and hollowing at
north end of timber
pile cap



Photo No. 4.24

Location:

Pier B
Bent 44

Description:

Diagonal timber
brace broken



Photo No. 4.25

Location:

Pier B
Bent 11

Description:

Corroded hardware,
missing bolt



Photo No. 4.26

Location:

Pier B
Bent 62 to 63

Description:

Spalling of concrete
underdeck with
severely corroded
reinforcing steel
exposed

	<p>Photo No. 4.27</p> <p>Location: Pier B Bent 54 to 55</p> <p>Description: Spall of concrete underdeck showing severely corroded reinforcing steel and cracks in remaining concrete</p>
	<p>Photo No. 4.28</p> <p>Location: Pier B Bent 62 to 63</p> <p>Description: Delamination at bottom of longitudinal concrete beam</p>



Photo No. 4.29

Location:

Pier B
Bent 21 to 22

Description:

Spall at bottom of longitudinal concrete beam



Photo No. 4.30

Location:

Pier B
Bent 14 to 15

Description:

Delamination at bottom of longitudinal concrete beam



Photo No. 4.31

Location:

Pier C

Description:

General view looking northwest



Photo No. 4.32

Location:

Pier C
Bent 29

Description:

Severe deterioration of timber pile cap



Photo No. 4.33

Location:

Pier C
Bent 25.5S

Description:

Severe deterioration
of timber pile cap



Photo No. 4.34

Location:

Pier C
Bent 12

Description:

Timber pile cap with
60% section loss



Photo No. 4.35

Location:

Pier C
Pile 53D

Description:

Steel pipe pile is 0% bearing



Photo No. 4.36

Location:

Pier C
Pile 56A

Description:

Steel pipe pile is 0% bearing; spalling of concrete pile cap showing exposed, corroded steel reinforcement



Photo No. 4.37

Location:

Pier C
Bent 46 to 47

Description:

Spalled concrete underdeck, severely corroded reinforcing steel



Photo No. 4.38

Location:

Pier C
Bent 50 to 51

Description:

Spalled concrete underdeck, severely corroded reinforcing steel

	<p>Photo No. 4.39</p> <p>Location: Pier C Bent 51 to 52</p> <p>Description: Southern longitudinal concrete beam spall with severely corroded reinforcing steel</p>
	<p>Photo No. 4.40</p> <p>Location: Pier C Bent 17.5 to 18</p> <p>Description: Spall at bottom of interior longitudinal concrete beam</p>



Photo No. 4.41

Location:

Pier C
Bent 20 to 21

Description:

Concrete spall at
bottom of southern
fascia beam



Photo No. 4.42

Location:

Pier C
Bent 19 to 20

Description:

Concrete delamination
at bottom of southern
fascia beam



Photo No. 4.43

Location:

Pier C
Bent 52

Description:

Spall at north end of
concrete pile cap

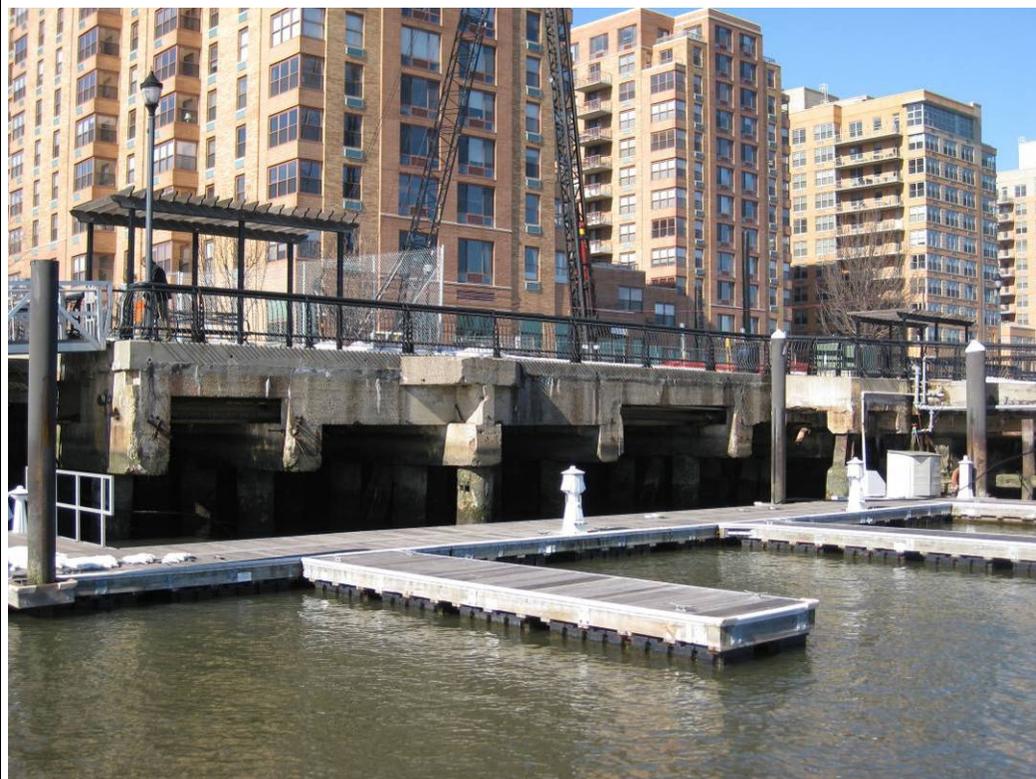


Photo No. 4.44

Location:

Steel H-pile supported
platform south of Pier
A

Description:

General view looking
west



Photo No. 4.45

Location:

Platform South of Pier A, Bent 3, Pile A+1

Description:

Void in concrete encasement with exposed steel reinforcement



Photo No. 4.46

Location:

Platform South of Pier A, Bent 4, Pile D

Description:

Erosion of concrete encasement with exposed steel reinforcement



Photo No. 4.47

Location:

Platform South of Pier A, Bent 5 to 6, Beam at A-line of Piles

Description:

Spall at bottom of concrete beam exposing corroded steel reinforcement



Photo No. 4.48

Location:

Platform South of Pier A, Bent 5 to 6, Beam at A+1 line of Piles

Description:

Spall at bottom of concrete beam, exposing corroded steel reinforcement; underdeck spalled and showing corroded steel rebar



Photo No. 4.49

Location:

Platform South of Pier A,
Bent 5, Pile A+1

Description:

Wide crack in
concrete pile cap



Photo No. 4.50

Location:

Timber Platform and
Marina Gangway
South of Pier A

Description:

General view looking
east



Photo No. 4.51

Location:

Platform North of Pier A

Description:

General view looking west



Photo No. 4.52

Location:

Platform North of Pier A

Description:

General view of pile configuration



Photo No. 4.53

Location:

Platform North of Pier
A, Pile 3A

Description:

Steel H-pile not
encased and
displaying severe
corrosion



Photo No. 4.54

Location:

Platform North of Pier
A, Pile 3B

Description:

Spall at bottom of
concrete beam,
exposing corroded
rebar



Photo No. 4.55

Location:

Platform North of
Pier A, Pile 6A

Description:

Spall at concrete
fascia beam with
exposed corroded
steel reinforcement;
corroded steel H-pile



Photo No. 4.56

Location:

Platform North of
Pier A, Bent 10 to 11,
C Line of Pier

Description:

Spall in concrete
underdeck showing
corroded steel rebar



Photo No. 4.57

Location:

Timber Cribbing
Bulkhead, Sta. 0+00
to 0+74

Description:

General view looking
northwest



Photo No. 4.58

Location:

Timber Cribbing
Bulkhead, Between
Piers B and C

Description:

General view looking
west

	<p>Photo No. 4.59</p> <p>Location: Timber Cribbing, Sta. 2+25</p> <p>Description: Severe marine borer infestation</p>
	<p>Photo No. 4.60</p> <p>Location: Timber Cribbing Sta. 4+40</p> <p>Description: Severely deteriorated transverse timbers</p>

	 <p>01/13/2011</p>		<p>Photo No. 4.61</p> <p>Location: Timber Cribbing, Sta. 3+90</p> <p>Description: General view looking north</p>
	 <p>01/13/2011</p>		<p>Photo No. 4.62</p> <p>Location: Timber Cribbing, Sta. 3+90</p> <p>Description: Close-up view of damage caused by marine borer infestation</p>



Photo No. 4.63

Location:

Timber Cribbing,
Sta. 5+05

Description:

North end of timber
cribbing



Photo No. 4.64

Location:

Timber Cribbing,
Sta. 4+90

Description:

Void behind cribbing,
loose fill visible



Photo No. 4.65

Location:

Low-Level Timber
Relieving Platform

Description:

General view of low-
level platform, outer
plank missing

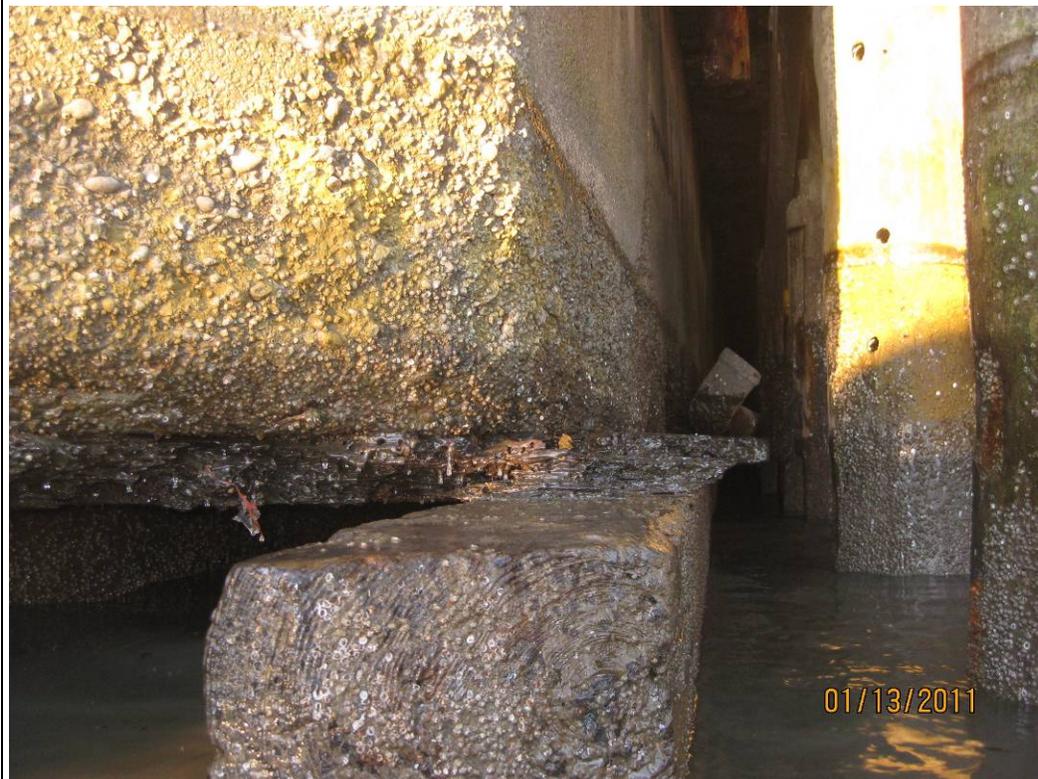


Photo No. 4.66

Location:

Low-Level Timber
Relieving Platform

Description:

Marine borer
infestation in timber
decking

5.0 NY WATERWAY

5.1 FACILITY DESCRIPTION

The main NY Waterway pier is comprised of 461 18-in. diameter concrete-filled steel pipe piles and concrete pile caps supporting longitudinal concrete deck beams and pier deck (Photo No. 5.1). Concrete fascia beams connect pile caps of adjacent bents at various locations (Photo No. 5.3). Steel frames are attached to the pier fascia at several locations; the frames no longer serve a purpose in the current pier usage, and are likely remnants of when the pier was used for industrial purposes (Photo No. 5.4). The pier is approximately 802 ft long and 40 ft wide, with 46 rows each containing 10 piles (Photo No. 5.5). North of the pier is a floating barge which serves as a docking location for ferries (Photo No. 5.2). A gangway pier extends from the main pier to the floating barge, roughly 250 ft east of the bulkhead. West of the ferry landing, the pier houses a lawn area.

Both north and south of the inland end of the main pier are timber pile supported high-level platforms. The piles support timber pile caps and a concrete deck. The platform south of the pier is comprised of 14 bents (numbered 1 to 14 from the south) oriented east to west. Each bent has between 12 and 16 piles. The platform is roughly 118 ft long and a maximum of 66 ft wide. The north platform has 15 bents (numbered 15 to 29 from the south). The number of piles per bent varies from 12 to 20. The platform is approximately 128 ft long and 88 ft wide at its widest point. The timber pile platforms and steel H-pile platforms support a pedestrian promenade at the eastern edge and Sinatra Drive. At the northern extent of the NY Waterway property is a high-level platform supported by concrete-encased steel H-piles. The bulkhead for the majority of the NY Waterway property is comprised of steel sheet pile with a concrete cap, roughly 270 ft in length. At the northern limit of the property, the bulkhead is comprised of a concrete seawall, roughly 40 ft long, founded on a low-level timber relieving platform.

Plans of the facilities at the NY Waterway property were not available at the time of inspection; typical sections and plans were developed based on field measurements and are depicted on Drawings Nos. 5.1 through 5.7.

5.2 NY WATERWAY PIER

The overall condition of the concrete-filled steel pipe piles is fair to poor. The pipe piles were once protected within the tidal zone by a concrete or grout filled jacket. Roughly half of the jackets were noted to have deterioration and many of those are completely missing. Of the 461 pipe piles, 98 have severe corrosion within the tidal zone, with 48 of those having through-holes and erosion of the concrete within the pile (Photo Nos. 5.7 and 5.8). Some areas of concrete erosion were up to 3 in. deep with exposed reinforcing steel which had varying degrees of section loss due to corrosion. Eighty (80) piles were found to have moderate corrosion within the tidal zone where the repair jacket had failed. Four piles were found to be non-bearing due to

erosion of the concrete pile cap (Photo No. 5.9). Also contributing to the cause of the non-bearing condition is what appears to be inadequate embedment of the top of the pile into the pile cap as evidenced by a shallow socket in the bottom of the pile cap (Photo No. 5.10). Below the tidal zone, the steel is typically in fair to satisfactory condition to the mudline, showing minor to moderate uniform corrosion and pitting of the surface of the steel.

In the easternmost bent, there are four steel H-piles with concrete jackets within the tidal zone. Below the jackets, the piles have severe corrosion and section loss with holes observed in the flanges and webs. Table 5.1 contains a summary of conditions of the piles inspected.

**Table 5.1
 NY Waterway Pier
 Steel Pipe Pile Inspection Summary**

	No. of Piles	Percent
Total Steel Pipe Piles	461	100%
Pipe Piles with Through Holes and Concrete Erosion	48	10%
Pipe Piles with Severe Corrosion Holes and No Concrete Erosion	50	11%
Pipe Piles with Moderate Corrosion Within Tidal Zone	80	17%
Non-Bearing Pipe Piles	4	1%
Steel H-Piles with Section Loss Rated Severe	4	1%

A sacrificial cathodic protection system has been installed to protect the steel piles. The system consists of two sacrificial anodes per bent, one on the north pile and one on the south pile in each bent. The northern five piles and southern five piles are each connected electrically by a bonding bar welded to each pile. Portions of the repair jacket were removed near mean low water to attach the bonding bar (Photo No. 5.6). At 18 locations, the bonding bar or cable was found to be broken or disconnected. Without additional testing, the effectiveness of the cathodic protection system in its current state is unknown. Additionally, cathodic protection is not effective in protection of the steel for the full height of the tidal zone, and is completely ineffective in the splash and atmospheric zones above the tidal zone. Therefore, the steel within and above the tidal zone will continue to corrode even if the cathodic protection system is functioning.

Overall, the concrete pile caps are in satisfactory condition with minor to moderate scaling at the bottom edges of the caps. At one location, the north end of the pile cap at Bent No. 28, a wide crack and spalling was observed (Photo No. 5.16). The condition appears to be the result of impact damage. The concrete longitudinal beams are in fair condition with widespread longitudinal cracks, delaminations and spalling at the bottoms of the beams caused by corrosion of the reinforcing steel (Photo Nos. 5.14 and 5.15). At isolated locations, open spalls with severely corroded reinforcing steel were found at the bottom of the beams. Much of the concrete underdeck is obstructed from inspection due to timber formwork that has been left in place (Photo No. 5.11). Where the underdeck is exposed, generally east of Bent 30, there are isolated areas of spalling with corroded reinforcing steel (Photo Nos. 5.12 and 5.13).

5.3 HIGH-LEVEL TIMBER PLATFORM

At the west end of the NY Waterway pier, the structure is flanked by a high-level timber platform on both the north and south sides. There are 14 bents south of the main pier (Photo No. 5.19) and 15 bents north of the main pier (Photo No. 5.20). The general condition of the timber piles is fair. Of 489 inspected piles, 32 piles have deterioration classified as severe and 15 have defects classified as moderate. The deterioration consists of loss of bearing, loss of cross-sectional area, and splits (Photo Nos. 5.21 to 5.23). Some attempts have been made to repair some of the deficiencies, by use of foam to fill voids, but is obviously inadequate to restore loss of cross-sectional area or bearing (Photo No. 5.24). The condition of the timber pile caps is generally satisfactory, with isolated areas in poor condition due to loss of section from rot (Photo No. 5.25). Some areas have evidence of fire damage as the exterior of the timbers are charred, specifically at Bents 12 to 14, and 25 to 27. The timber piles and pile caps with fire damage are still structurally sound and have sustained only minimal loss of section.

East of Bents 12 to 14 of the timber high-level platform and directly adjacent to the south face of the main pier is a high-level platform supported by concrete-filled steel pipe piles; there are ten plumb piles and three batter piles. The piles are in poor condition and all rated severe due to severe corrosion and section loss of the steel within the tidal zone (Photo No. 5.17). The three batter piles are all completely non-bearing. The concrete pile caps and beams within the platform section are in poor condition with widespread spalling and delamination at the bottom of the beams (Photo No. 5.18).

The underdeck in Bents 1 to 14 is generally poor with several areas of spalling and severely corroded reinforcing steel (Photo Nos. 5.26 and 5.27), as well as random areas of delaminations and minor spalls. From Bents 15 to 29, the majority of the underdeck has been repaired with a sprayed-on concrete. The area appears to be in satisfactory condition. A transverse concrete beam oriented north to south is located above the timber cross cap adjacent to the steel sheet pile bulkhead. Between Bents 7 and 8, the beam is severely spalled with exposed corroded reinforcement. The location of the spall in the beam coincides with a splice in the timber cross cap (Photo No. 5.28).

5.4 STEEL H-PILE PLATFORM

At the northern limits of NY Waterway property, directly north of Bent 29 of the high-level timber platform, is a platform section supported by steel H-piles. Bents 1 to 7 support a platform beneath Sinatra Drive and a promenade walkway. Bents 8 to 10 support a grass filled area which is blocked from public access by a railing. The piles in Bents 1 to 7 have full length concrete encasements and are in satisfactory condition, with the exception of two piles in Bent 7 which only have C-channel repairs and are severely corroded. The H-piles in Bent 8, 9 and 10 are exposed for their full length without repairs, and all have severe corrosion and section loss (Photo No. 5.34). The concrete underdeck and pile caps are in satisfactory condition.

5.5 STEEL SHEET PILE BULKHEAD

The bulkhead from the southern end of the NY Waterway property to Bent 25 of the timber relieving platform consists of a steel sheet pile bulkhead with a concrete cap (Photo No. 5.29). Overall the bulkhead is in satisfactory condition, with one isolated location in poor condition. Near Bent 21 of the timber platform, a hole, roughly 4 in. high and 2 in. wide, was found at the outer corner of one of the sheet piles (Photo No. 5.31). At this location water was observed dripping from the deck above onto the steel sheets (Photo No. 5.30), which likely contributed to the hole in the sheeting. The remainder of the sheets have moderate corrosion and pitting. The average remaining section of the steel sheets based on UT measurements at representative locations is 0.26 in. The original steel thickness is not known.

From Bent 25 to 29, the concrete bulkhead is supported by a low-level timber pile relieving platform (Photo No. 5.32). Due to minimal distance from the bottom of the platform to the mudline and very close pile spacing, access to this area was limited. The timber piles, pile caps and deck planks were observed to have visible signs of marine borer infestation and minor to moderate section loss (Photo No. 5.33). Steel pipe piles were visible, but not accessible, west of the bulkhead, beneath the platform. Based on the location of the piles, they appear to be support piles for the Sovereign Building that were driven through the deck of the relieving platform.

Northwest of the steel H-pile support platform at the northern limit of the NY Waterway property there is no bulkhead in place to retain the upland fill. West of the Bent 1 steel H-pile platform, the shoreline is made up of loose fill and debris (Photo No. 5.35). Concrete building footings founded on steel pipe piles were visible west of the inland end of the platform. Due to the fact that there is no mechanism in place to retain the fill or stabilize the shoreline in combination with the area being subject to tidal waters, general erosion of the fill is likely.

5.6 RECOMMENDATIONS

Based on the findings of the condition survey, the following repairs and/or actions are recommended:

NY WATERWAY PIER

- Repair steel pipe piles and H-piles exhibiting severe corrosion, through holes and erosion of concrete, or loss of bearing on a priority basis.
- Repairs should include steel pipe piles at smaller platform south of main pier and east of Bents 12 to 14 of the high-level timber platform.
- Repair/protect steel pipe piles showing moderate corrosion on a routine basis.
- Repair concrete underdeck and pile cap spalls and delaminations on a routine basis.

The next condition survey of the pier should be performed within three years.

HIGH-LEVEL TIMBER PLATFORMS

- Repair piles and pile caps rated severe on a priority basis.
- Repair underdeck spalls, piles and pile caps rated moderate on a routine basis.

The next condition survey of the high-level timber platforms should be performed within three years.

HIGH-LEVEL STEEL H-PILE PLATFORM

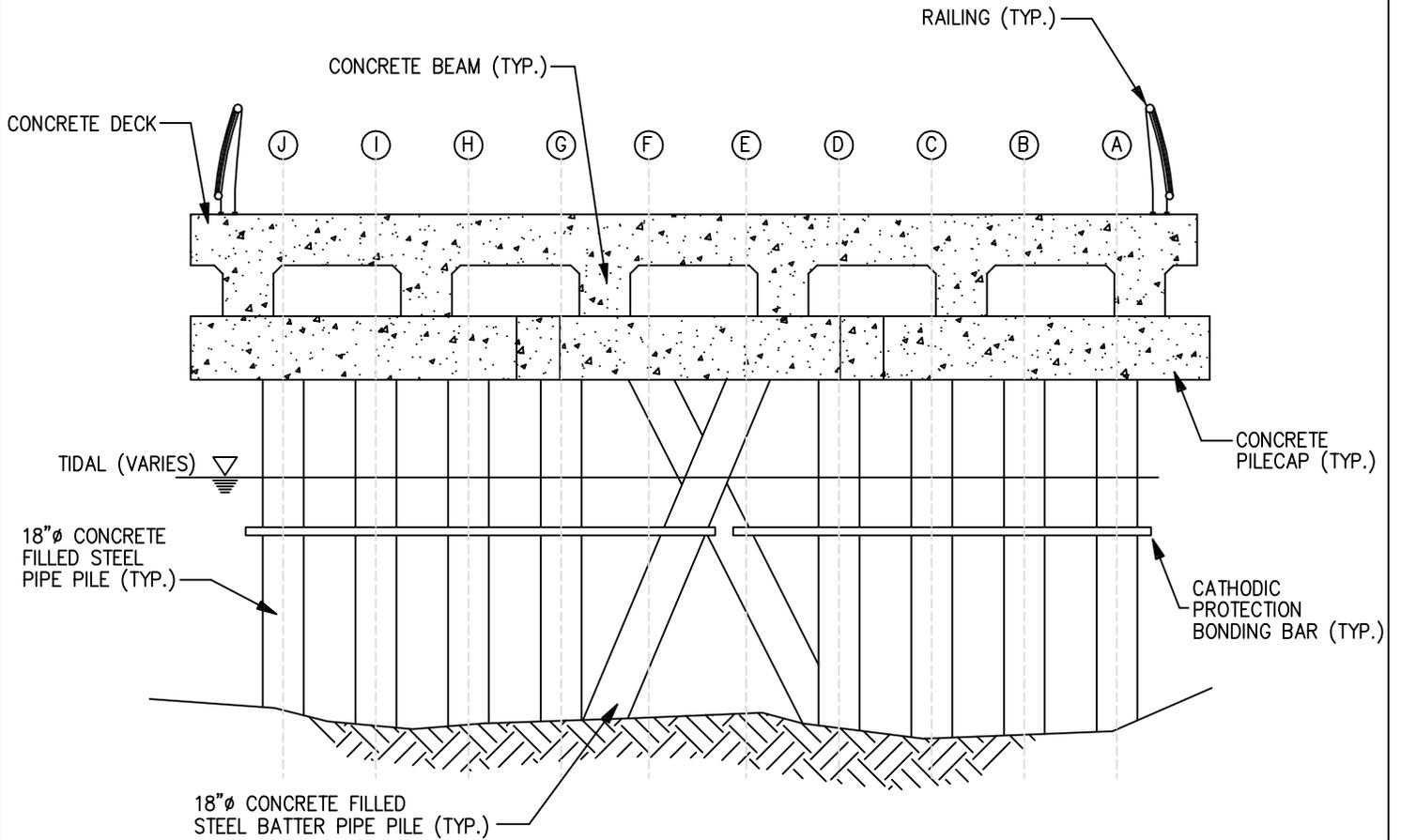
- Repair Piles 7E and 7E batter on a priority basis.

The next condition survey of the high-level steel H-pile platform should be performed in five years.

STEEL SHEET PILE BULKHEAD

- Stop leaking water on steel sheeting near Bent 21 of high-level timber platform and repair hole in sheeting on a priority basis.

The next condition survey of the steel sheet pile bulkhead should be performed within four years.



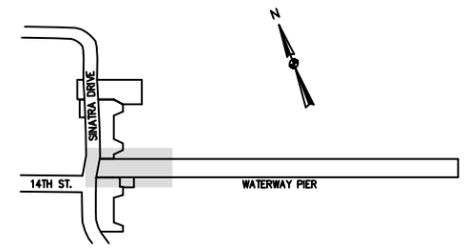
WATERWAY PIER TYPICAL SECTION
VIEW LOOKING WEST

LEGEND:

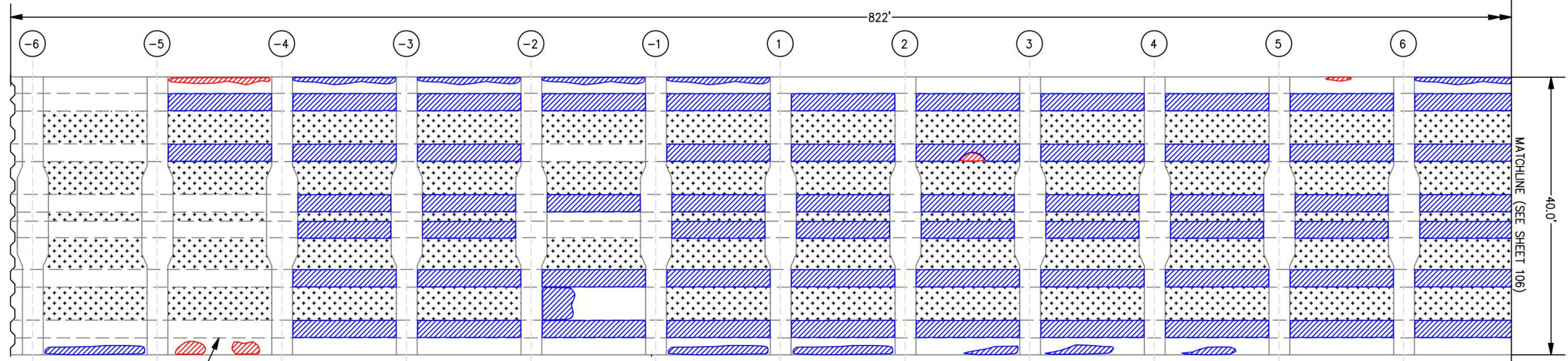
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- ◐ STEEL BATTER PIPE PILE
- ⊙² STEEL PIPE PILE W/ THROUGH HOLES AND EROSION OF CONCRETE JACKET
- ⊙³ STEEL PIPE PILE W/ DETERIORATED REPAIR JACKET AND EXPOSED STEEL
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▧ CONCRETE SPALL W/ EXPOSED, CORRODED REINFORCING STEEL
- ⊠ FORMWORK LEFT IN PLACE, UNDERDECK NOT VISIBLE.
- 📷 PHOTO LOCATION



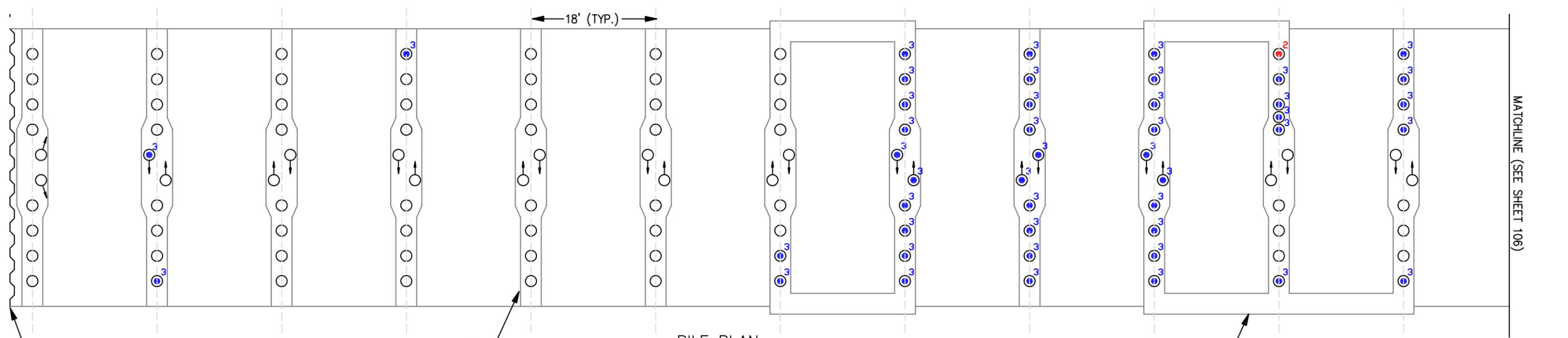
HUDSON RIVER
 FLOOD ↑
 EBB ↓



WATERWAY KEY PLAN



UNDERDECK PLAN



PILE PLAN

NOTE:

1. FASCIA BEAMS NOT SHOWN ON UNDERDECK PLAN FOR CLARITY.

Boswell UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

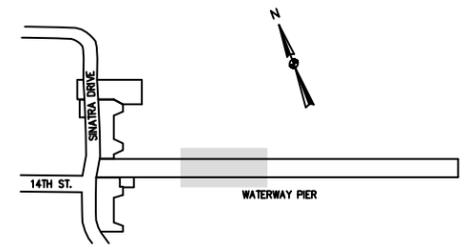
CITY OF HOBOKEN CONDITION SURVEY OF PRIVATELY-OWNED WATERFRONT STRUCTURES		
NY WATERWAY PIER PLAN VIEW 1 OF 4		
INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
JOB NO. BUE-1010	DRAWING NO. 5.2	SHEET 105

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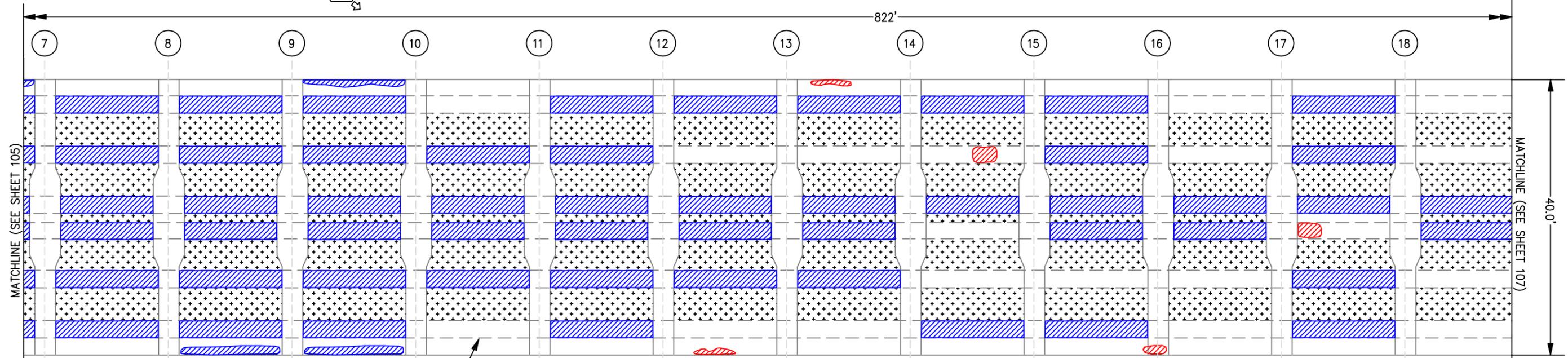
- STEEL PIPE PILE
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- ⊙³ STEEL PIPE PILE W/ MODERATE CORROSION
- ⊙³ STEEL PIPE PILE W/ DETERIORATED REPAIR JACKET AND EXPOSED STEEL
- ⊙⁴ STEEL PIPE PILE W/ BROKEN CATHODIC PROTECTION ATTACHMENT
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL W/ EXPOSED, CORRODED REINFORCING STEEL.
- ⊞ FORMWORK LEFT IN PLACE, UNDERDECK NOT VISIBLE.
- 📷 PHOTO LOCATION



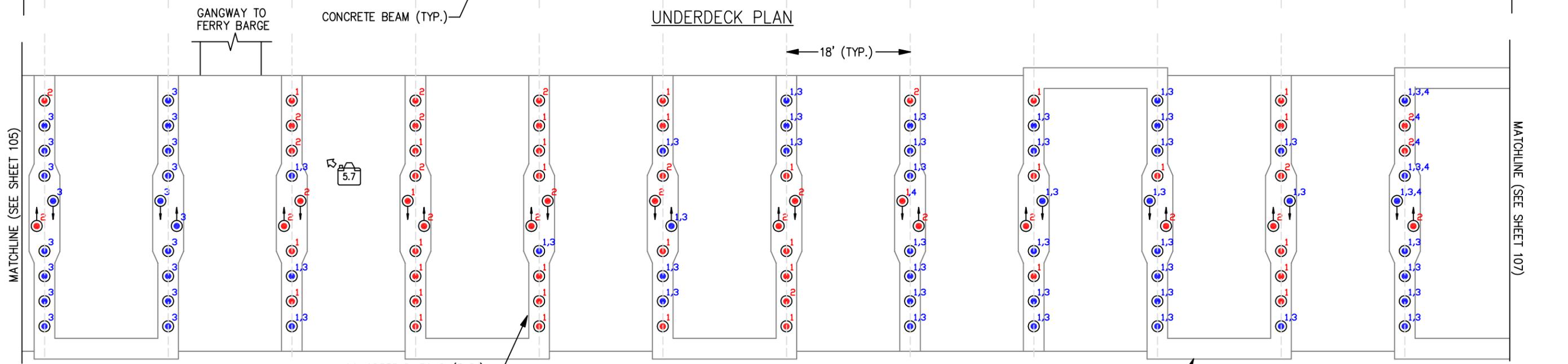
HUDSON RIVER



WATERWAY KEY PLAN



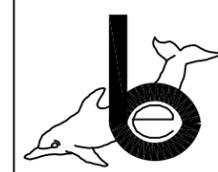
UNDERDECK PLAN



PILE PLAN

NOTE:

1. FASCIA BEAMS NOT SHOWN ON UNDERDECK PLAN FOR CLARITY.



BOSWELL UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

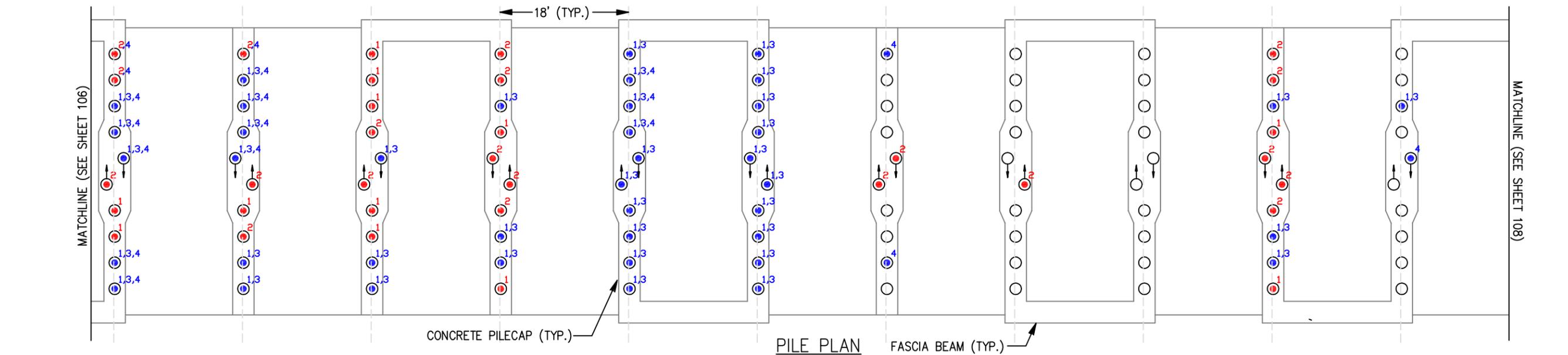
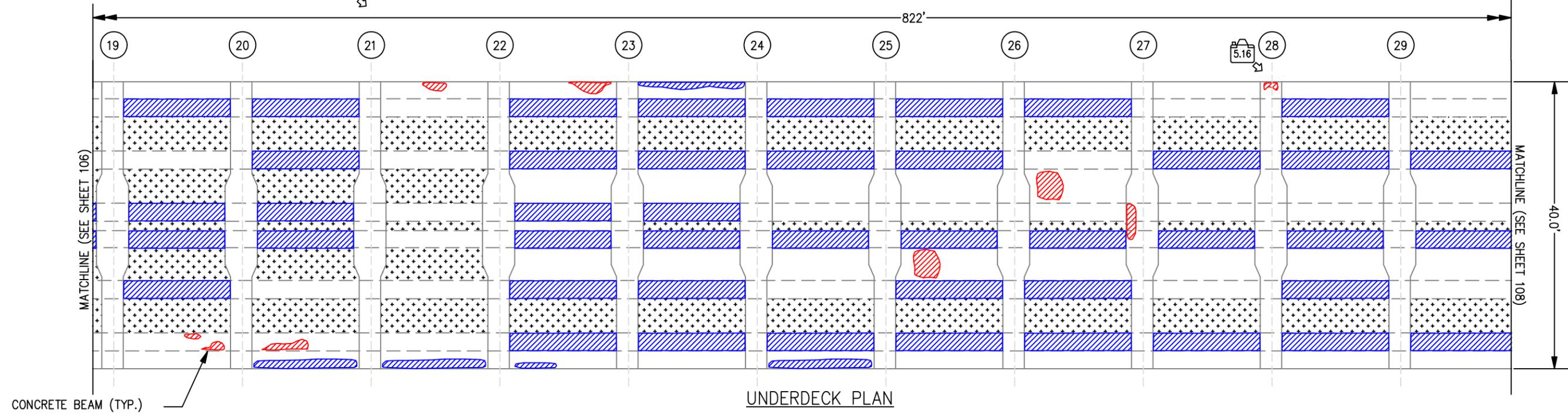
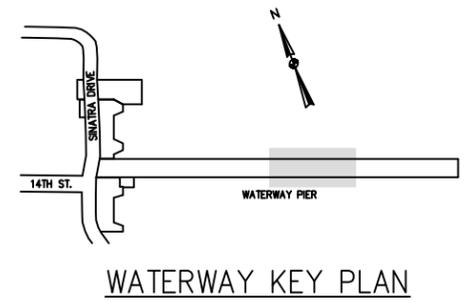
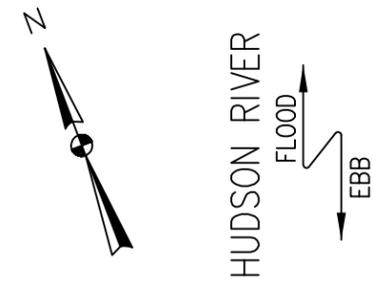
CITY OF HOBOKEN
 CONDITION SURVEY OF PRIVATELY-OWNED
 WATERFRONT STRUCTURES

NY WATERWAY
 PIER PLAN VIEW 2 OF 4

INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
DRAWN BY: J.G.	JOB NO. BUE-1010	DRAWING NO. 5.3
		SHEET 106

LEGEND:

- STEEL PIPE PILE
- ⊖ STEEL BATTER PIPE PILE
- ⊙¹ STEEL PIPE PILE W/ SEVERE CORROSION
- ⊙² STEEL PIPE PILE W/ THROUGH HOLES AND EROSION OF CONCRETE JACKET
- ⊙³ STEEL PIPE PILE W/ MODERATE CORROSION
- ⊙³ STEEL PIPE PILE W/ DETERIORATED REPAIR JACKET AND EXPOSED STEEL
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- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL W/ EXPOSED, CORRODED REINFORCING STEEL.
- ⊞ FORMWORK LEFT IN PLACE, UNDERDECK NOT VISIBLE.
- 📷 PHOTO LOCATION



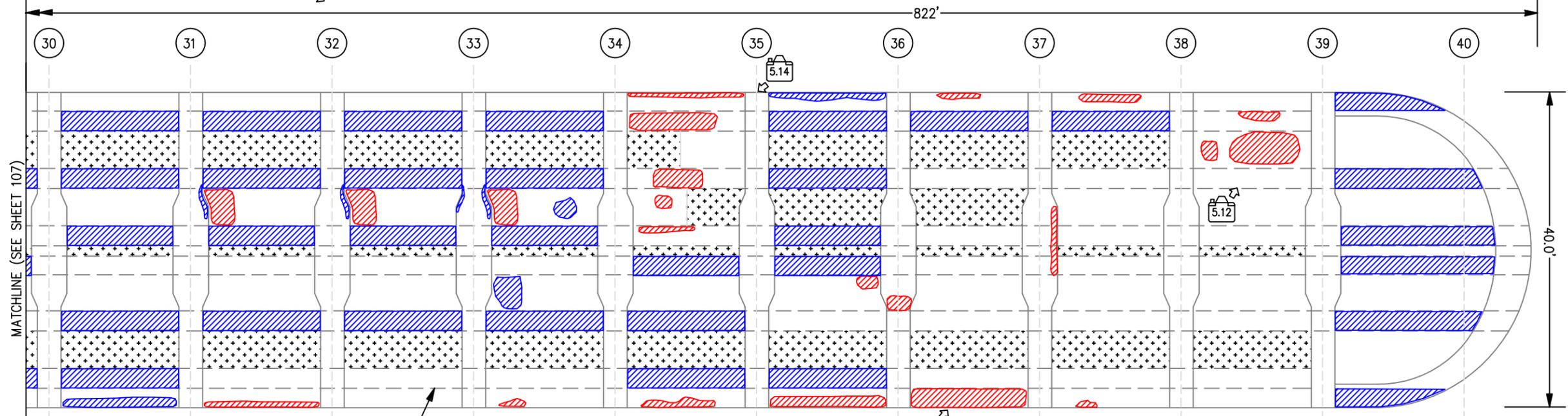
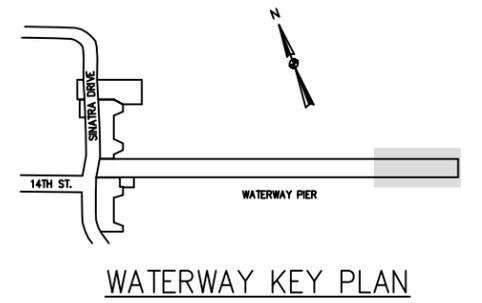
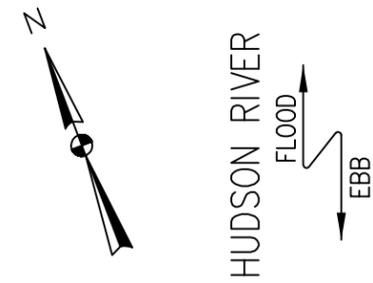
NOTE:
1. FASCIA BEAMS NOT SHOWN ON UNDERDECK PLAN FOR CLARITY.

Boswell UNDERWATER ENGINEERING
UNDERWATER INSPECTION & DIVING SERVICES
HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN CONDITION SURVEY OF PRIVATELY-OWNED WATERFRONT STRUCTURES		
NY WATERWAY PIER PLAN VIEW 3 OF 4		
INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
JOB NO. BUE-1010	DRAWING NO. 5.4	SHEET 107

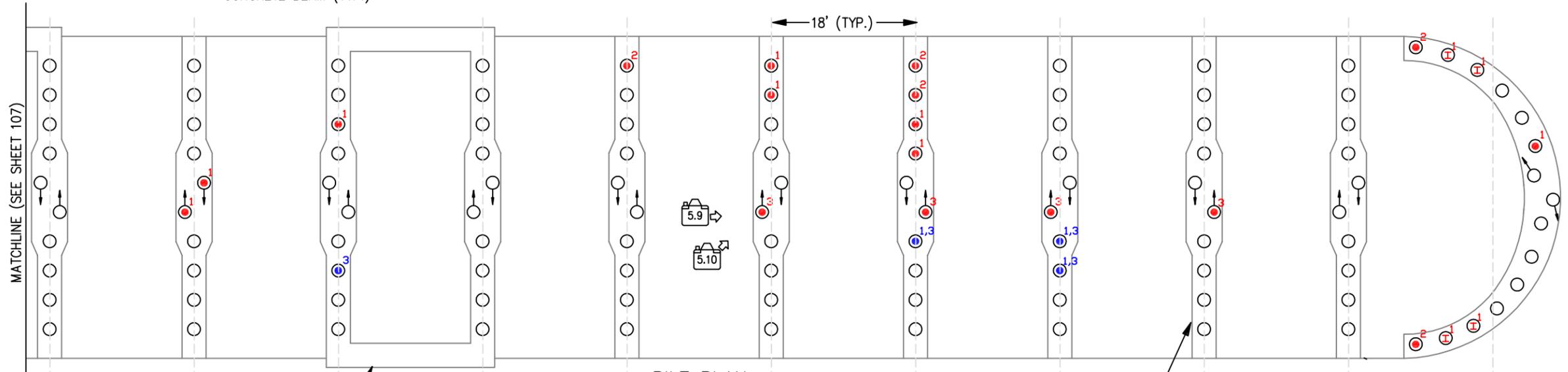
LEGEND:

- STEEL PIPE PILE
- STEEL BATTER PIPE PILE
- ① STEEL PIPE PILE W/ SEVERE CORROSION
- ② STEEL PIPE PILE W/ THROUGH HOLES AND EROSION OF CONCRETE JACKET
- ③ STEEL PIPE PILE W/ 0% BEARING
- ④ STEEL H-PILE W/ CONCRETE EXTENSION WITH SEVERE CORROSION
- ① STEEL PIPE PILE W/ MODERATE CORROSION
- ③ STEEL PIPE PILE W/ DETERIORATED REPAIR JACKET AND EXPOSED STEEL
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL W/ EXPOSED, CORRODED REINFORCING STEEL
- ▨ FORMWORK LEFT IN PLACE, UNDERDECK NOT VISIBLE.
- 📷 PHOTO LOCATION



CONCRETE BEAM (TYP.)

UNDERDECK PLAN



FASCIA BEAM (TYP.)

PILE PLAN

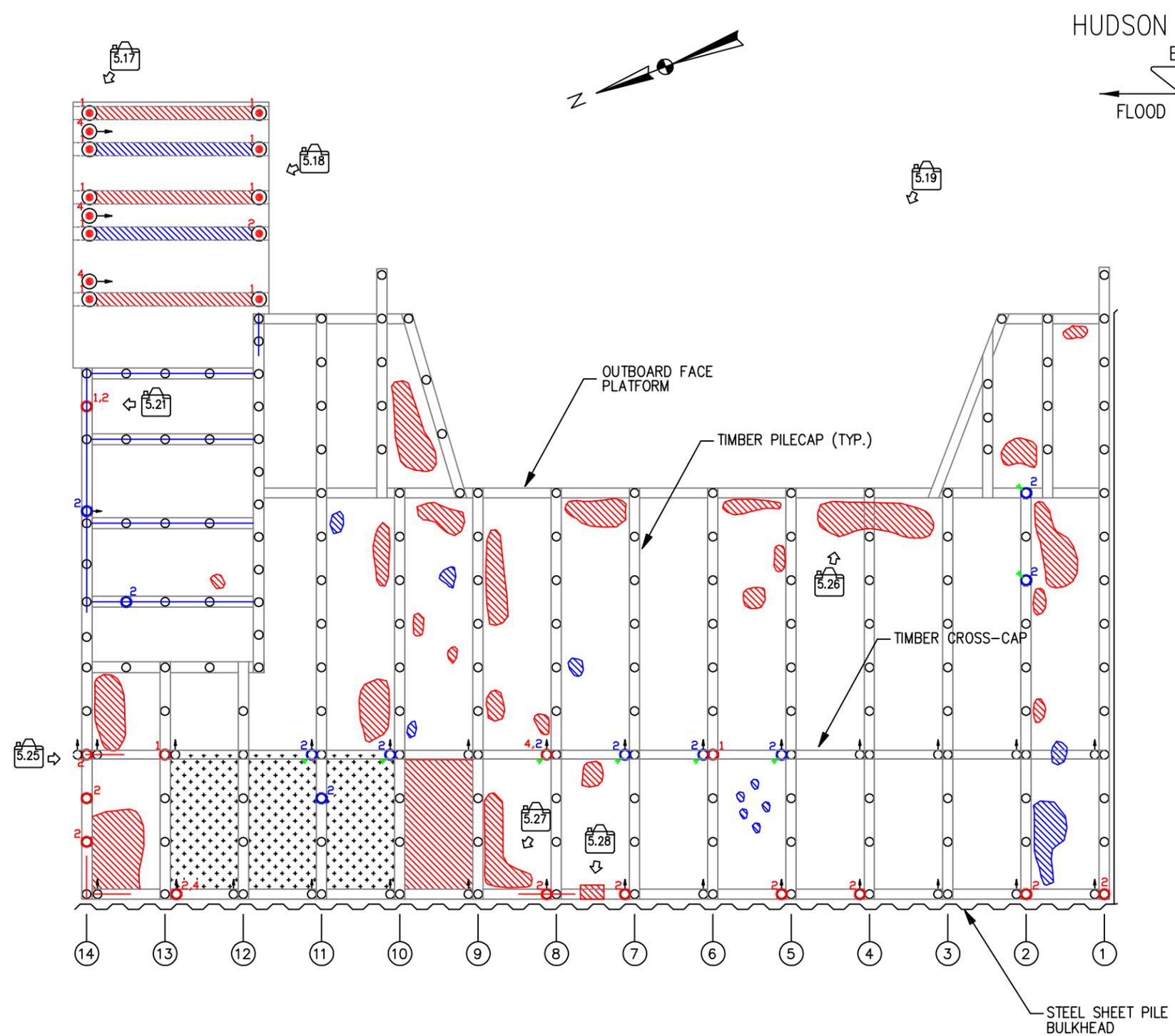
CONCRETE PILECAP (TYP.)

NOTE:

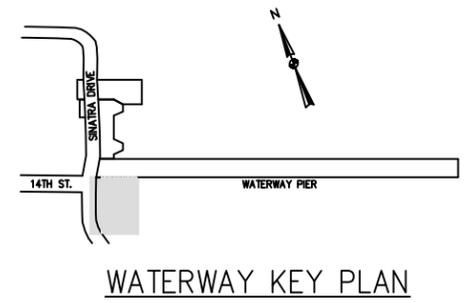
1. FASCIA BEAMS NOT SHOWN ON UNDERDECK PLAN FOR CLARITY.

BOSWELL UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN CONDITION SURVEY OF PRIVATELY-OWNED WATERFRONT STRUCTURES		
NY WATERWAY PIER PLAN VIEW 4 OF 4		
INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
JOB NO. BUE-1010	DRAWING NO. 5.5	SHEET 108



HUDSON RIVER
EBB
FLOOD

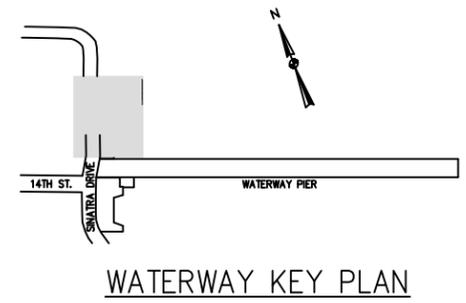
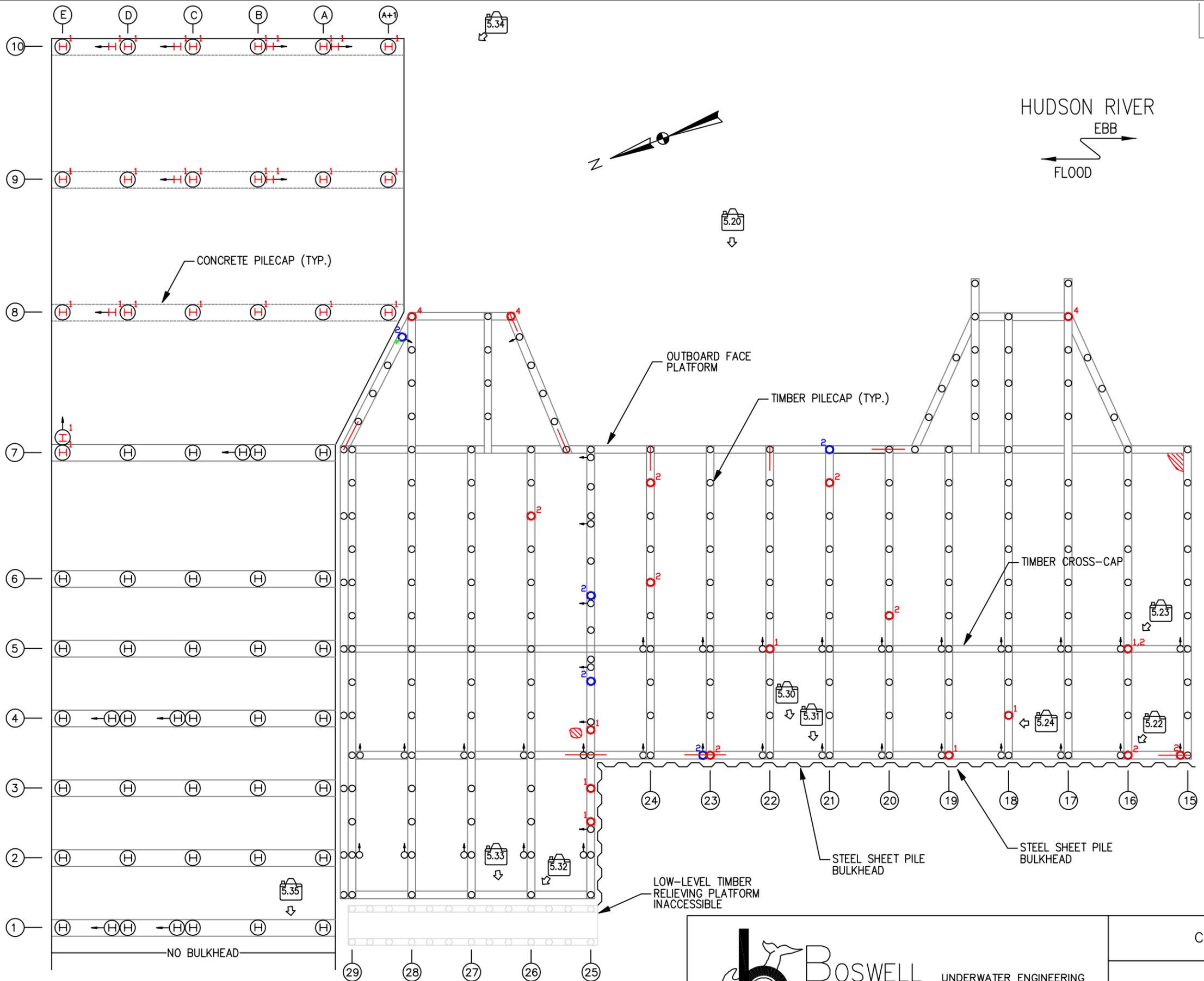


LEGEND:

- TIMBER PILE
- ◐ TIMBER BATTER PILE
- STEEL PIPE PILE
- ◐ STEEL BATTER PIPE PILE
- MARINE BORER ACTIVITY
- ① STEEL PIPE PILE W/ SEVERE CORROSION
- ② STEEL PIPE PILE W/ THROUGH HOLES AND EROSION OF CONCRETE JACKET
- ④ STEEL PIPE PILE W/ BROKEN OR 100% SECTION LOSS
- ① TIMBER PILE W/ LESS THAN 50% BEARING
- ② TIMBER PILE W/ SECTION LOSS GREATER THAN 49%
- ④ TIMBER PILE WITH SEVERE SPLIT
- ② TIMBER PILE W/ 10-49% SECTION LOSS
- TIMBER PILECAP W/ MODERATE SECTION LOSS
- TIMBER PILECAP W/ SEVERE SECTION LOSS
- ▨ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▨ CONCRETE SPALL W/ EXPOSED, CORRODED REINFORCING STEEL
- ▨ FORMWORK LEFT IN PLACE, UNDERDECK NOT VISIBLE.
- 📷 PHOTO LOCATION

BOSWELL UNDERWATER ENGINEERING
UNDERWATER INSPECTION & DIVING SERVICES
HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN CONDITION SURVEY OF PRIVATELY-OWNED WATERFRONT STRUCTURES		
NY WATERWAY PLATFORM SOUTH OF PIER PLAN VIEW		
INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
JOB NO. BUE-1010	DRAWING NO. 5.6	SHEET 109



LEGEND:

- TIMBER PILE
- ←○ TIMBER BATTER PILE
- STEEL PIPE PILE
- ←○ STEEL BATTER PIPE PILE
- I STEEL H-PILE
- I↑ STEEL BATTER H-PILE
- MARINE BORER ACTIVITY
- ⊕¹ STEEL H-PILE W/ CONCRETE EXTENSION WITH SEVERE CORROSION
- ¹ TIMBER PILE W/ LESS THAN 50% BEARING
- ² TIMBER PILE W/ SECTION LOSS GREATER THAN 49%
- ⁴ TIMBER PILE WITH SEVERE SPLIT
- ² TIMBER PILE W/ 10-49% SECTION LOSS
- TIMBER PILECAP W/ SEVERE SECTION LOSS
- ▒ CONCRETE EROSION, SPALL, OR DELAMINATION
- ▒ CONCRETE SPALL W/ EXPOSED, CORRODED REINFORCING STEEL.
- 📷 PHOTO LOCATION

BOSWELL UNDERWATER ENGINEERING
 UNDERWATER INSPECTION & DIVING SERVICES
 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
 CONDITION SURVEY OF PRIVATELY-OWNED
 WATERFRONT STRUCTURES

NY WATERWAY
 PLATFORM NORTH OF PIER PLAN VIEW

INSPECTED BY: J.P., D.C., J.F.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
DRAWN BY: J.G.	JOB NO. BUE-1010	DRAWING NO. 5.7
		SHEET 110

5.8 PHOTOGRAPHS



Photo No. 5.1

Location:

NY Waterway Pier

Description:

General view looking northeast



Photo No. 5.2

Location:

Ferry Barge

Description:

General view looking south



Photo No. 5.3

Location:

North Face of Pier
and Fascia Beams

Description:

General view looking
east



Photo No. 5.4

Location:

South Face of Pier

Description:

Abandoned steel
frame attached to
fascia



Photo No. 5.5

Location:

NY Waterway

Description:

Typical pile bent,
general view



Photo No. 5.6

Location:

NY Waterway

Description:

Typical cathodic
bonding bar
attachment, general
view



Photo No. 5.7

Location:

Pile 9C

Description:

Steel pile corroded with through hole, void 30”H x 24”W x 8”D



Photo No. 5.8

Location:

Pile 5A

Description:

Steel pile corroded through, void 18”H x 18”W x 4”D with railroad beam cast in concrete



Photo No. 5.9

Location:

Pile 35E

Description:

Non-bearing steel
pipe pile



Photo No. 5.10

Location:

Pile 35E

Description:

Pile socket in bottom
of concrete pile cap



Photo No. 5.11

Location:

NY Waterway

Description:

Timber formwork left in place at underdeck, general view



Photo No. 5.12

Location:

Underdeck
Bents 38 to 39

Description:

30 SF spall at manhole showing corroded steel rebars



Photo No. 5.13

Location:

Underdeck
Bents 36 & 37
South Face

Description:

40 SF spall with
exposed corroded
reinforcing steel



Photo No. 5.14

Location:

Bent 34 to 35
North Longitudinal
Beam

Description:

Spall with corroded
reinforcing steel at
bottom of beam



Photo No. 5.15

Location:

Bent 37 to 38
North Longitudinal
Beam

Description:

Incipient spall at
bottom of concrete
beam



Photo No. 5.16

Location:

Pile Cap, Bent 28

Description:

Spall and wide crack
at north end of
concrete pile cap



Photo No. 5.17

Location:

Steel Pipe Pile
Platform
South of Main Pier

Description:

Steel pipe pile, severe
corrosion, concrete
exposed (typical)



Photo No. 5.18

Location:

Steel Pipe Pile
Platform,
South of Main Pier

Description:

Concrete spall at
center beam showing
corroded steel
reinforcement



Photo No. 5.19

Location:

Timber High-Level Platform South of Main Pier

Description:

General view looking northwest



Photo No. 5.20

Location:

Timber High-Level Platform North of Main Pier

Description:

General view looking west

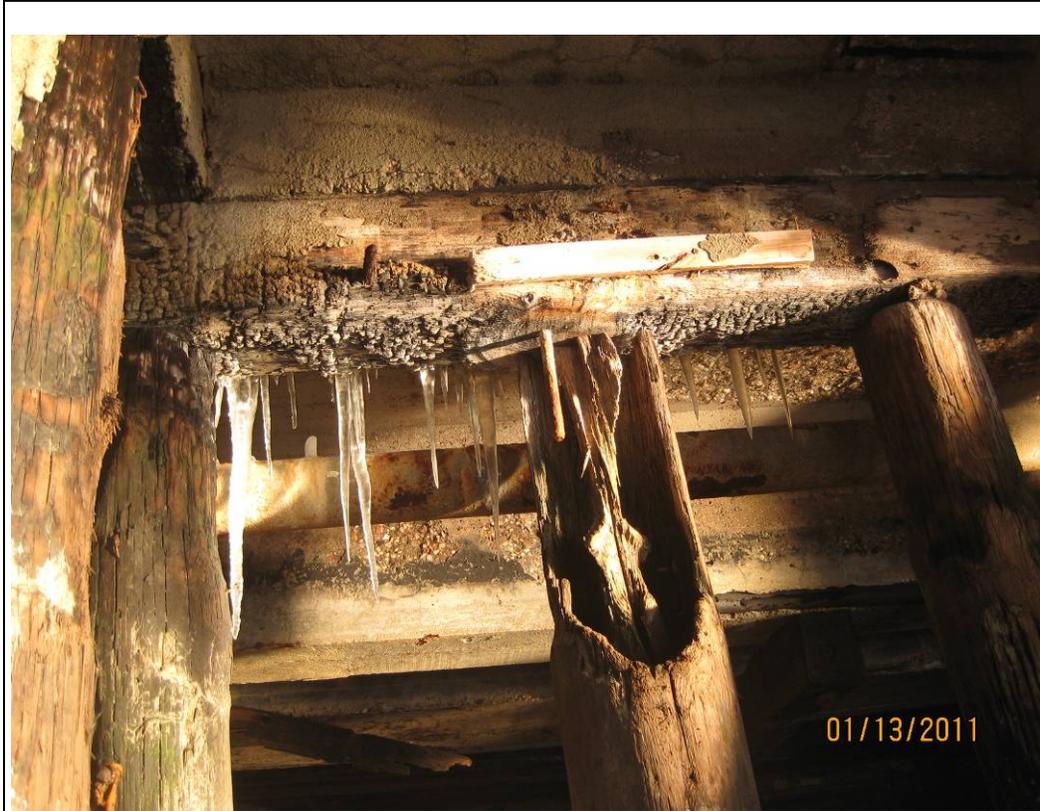


Photo No. 5.21

Location:

Pile 14B

Description:

Severe rot and hollowing at top 2.5 ft; fire damage of timber pile cap



Photo No. 5.22

Location:

Pile 16J

Description:

Top 2 ft of timber pile hollow with 0% bearing

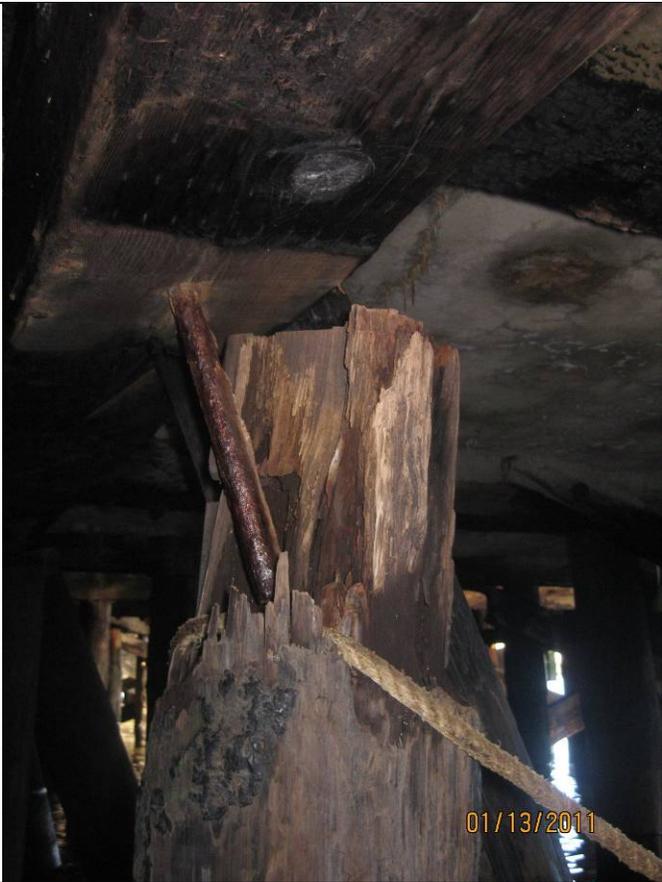
			<p>Photo No. 5.23</p> <p>Location: Pile 16G</p> <p>Description: Top 2 ft of timber pile hollowing with 0% bearing</p>
			<p>Photo No. 5.24</p> <p>Location: Pile 18I</p> <p>Description: Inadequate repair - foam sprayed to fill separation at pile that is hollow with 0% bearing</p>



Photo No. 5.25

Location:

Pile 14G

Description:

Timber pile cap split and hollow



Photo No. 5.26

Location:

Bent 4 to 5
A to B Piles

Description:

40 SF underdeck spall with exposed, corroded steel reinforcement



Photo No. 5.27

Location:

Bent 8 to 9
J Pile Line

Description:

30 SF underdeck spall
exhibiting corroded
steel reinforcement



Photo No. 5.28

Location:

Bent 7 to 8

Description:

Severe spall exposing
corroded steel
reinforcement in
concrete pile cap at
timber pile cap splice
location



Photo No. 5.29

Location:

Bent 8

Description:

General view of steel sheet pile bulkhead



Photo No. 5.30

Location:

Bent 21

Description:

Water leaking from deck onto sheet pile bulkhead

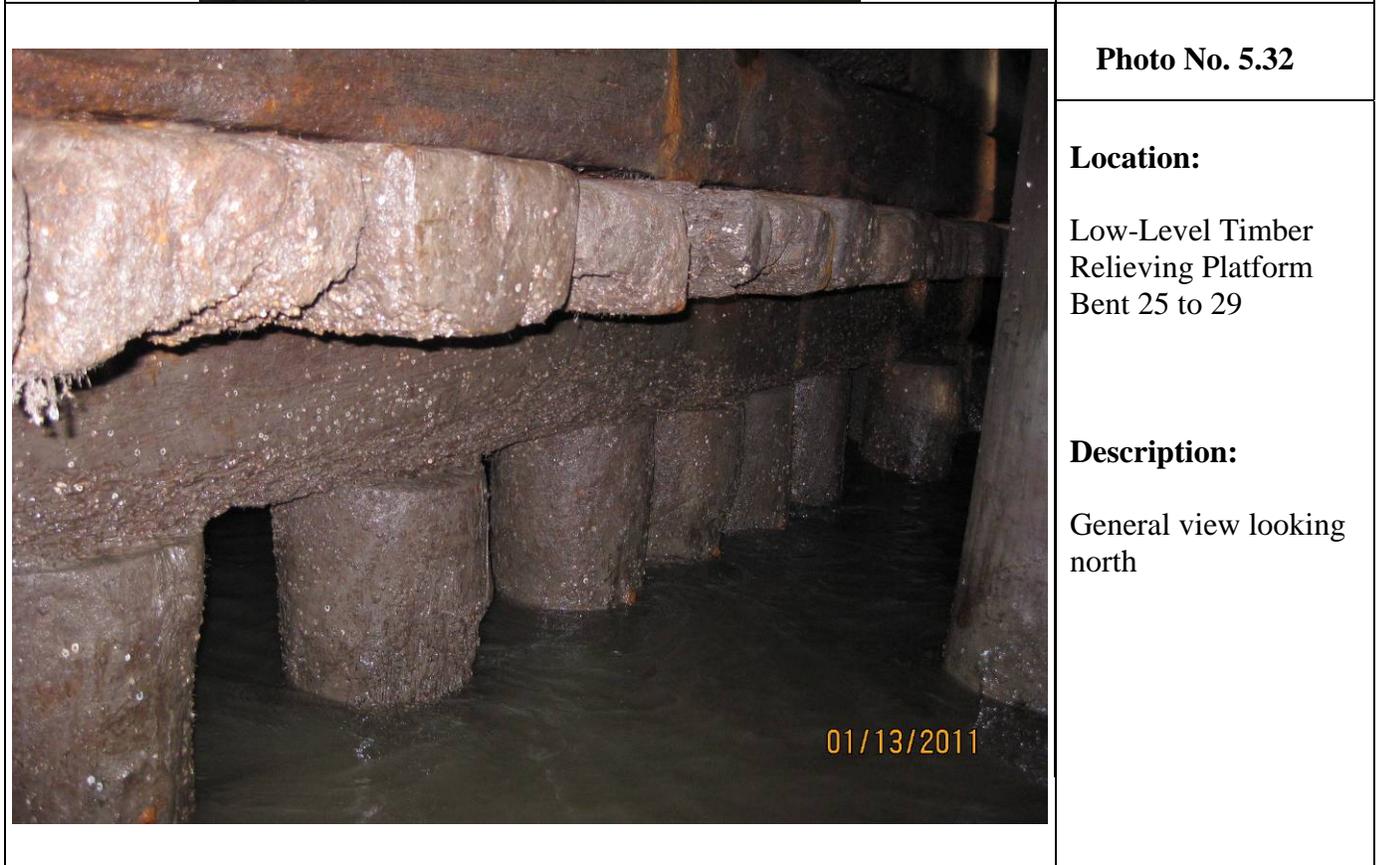
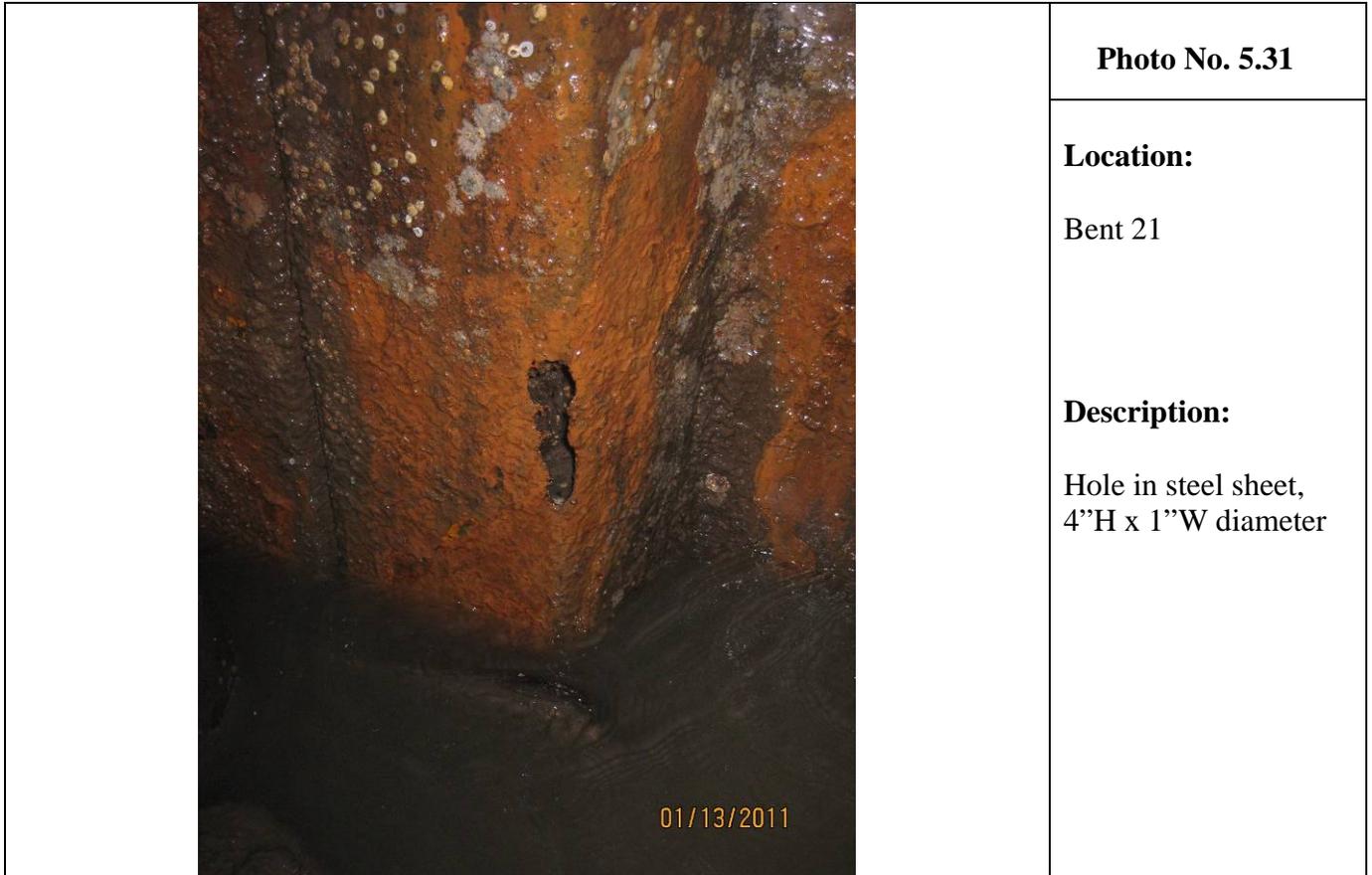




Photo No. 5.33

Location:

Low-Level Timber
Relieving Platforms
Bents 25 to 29

Description:

Marine borer
infestation of deck
planks



Photo No. 5.34

Location:

Steel H-Pile Platform
North of Timber
Platform

Description:

General view looking
west exhibiting
severely deteriorated
steel H-piles



Photo No. 5.35

Location:

Steel H-Pile Platform,
West of Bent 1

Description:

Loose fill and debris,
no bulkhead found

6.0 SOVEREIGN AT SHIPYARD

6.1 FACILITY DESCRIPTION

The waterfront structure at the Sovereign at Shipyard property is a steel pipe pile supported high-level platform. The structure was constructed over the remnants of a deteriorated concrete pier founded on steel H-piles. The new structure consists of 118 16-in. diameter steel pipe piles driven in 57 clusters of two to three piles each supporting a cast-in-place concrete pile cap. The pile caps support pre-cast concrete beams and deck planks. Demolition of the older pier was limited to only as much as was required to allow construction of the new platform (Photo No. 6.4).

Plans of the Sovereign at Shipyard platform structure were not available at the time of inspection; a plan view was developed based on field measurements taken during this condition survey and shown on Drawing No. 6.1. During the preparation of the report partial plans of the platform were made available and are included in Appendix C.

6.2 INSPECTION FINDINGS

The overall condition of the high-level platform is satisfactory. The pipe piles, pile caps, beams and deck planks are generally in satisfactory condition. The pipe piles typically exhibit coating loss and only minor to moderate corrosion within the tidal zone (Photo No. 6.5). The inland side of the roadway and promenade platform abuts the Sovereign building substructure. The bulkhead in this vicinity is located beneath the Sovereign building; see design plans in Appendix C. The Sovereign building substructure and bulkhead were not included in the scope of this inspection. However, BUE divers did note that at least one location a utility line suspended from the bottom of the floor slab appeared to have one or more missing/broken utility hangers (Photo 6.13) and recommend that the utility lines be inspected and re-supported if required.

6.3 STEEL PIPE PILES

The overall condition of the steel pipe piles is satisfactory. The steel pipe piles are 16 in. in dia. and concrete filled. The bottom elevation of the cast-in-place pile caps is within the tidal zone. The top 2 to 3 ft of the pipe piles are also within the tidal zone. Loss of protective coating and minor corrosion was found at the steel pipe piles within the tidal zone. The original pipe pile wall as indicated in the design plans is 0.375 in. The average of ultrasonic thickness measurements taken within the tidal zone is 0.345 in., equating to an average loss of section of 8%.

6.4 CONCRETE PILE CAPS, BEAMS AND DECK PLANKS

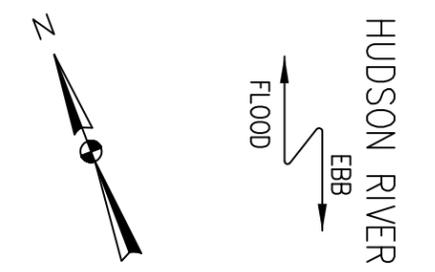
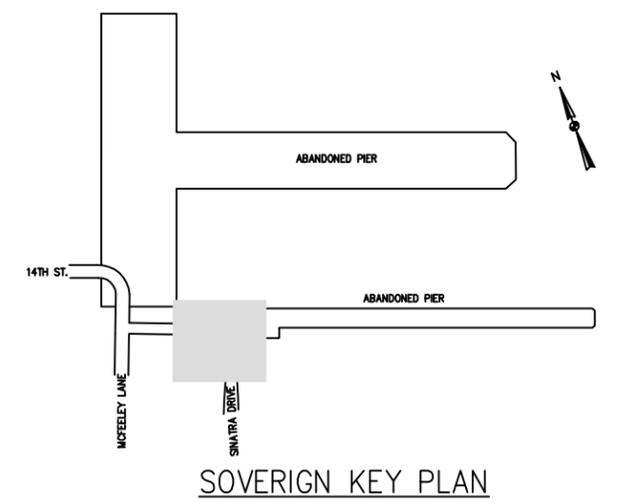
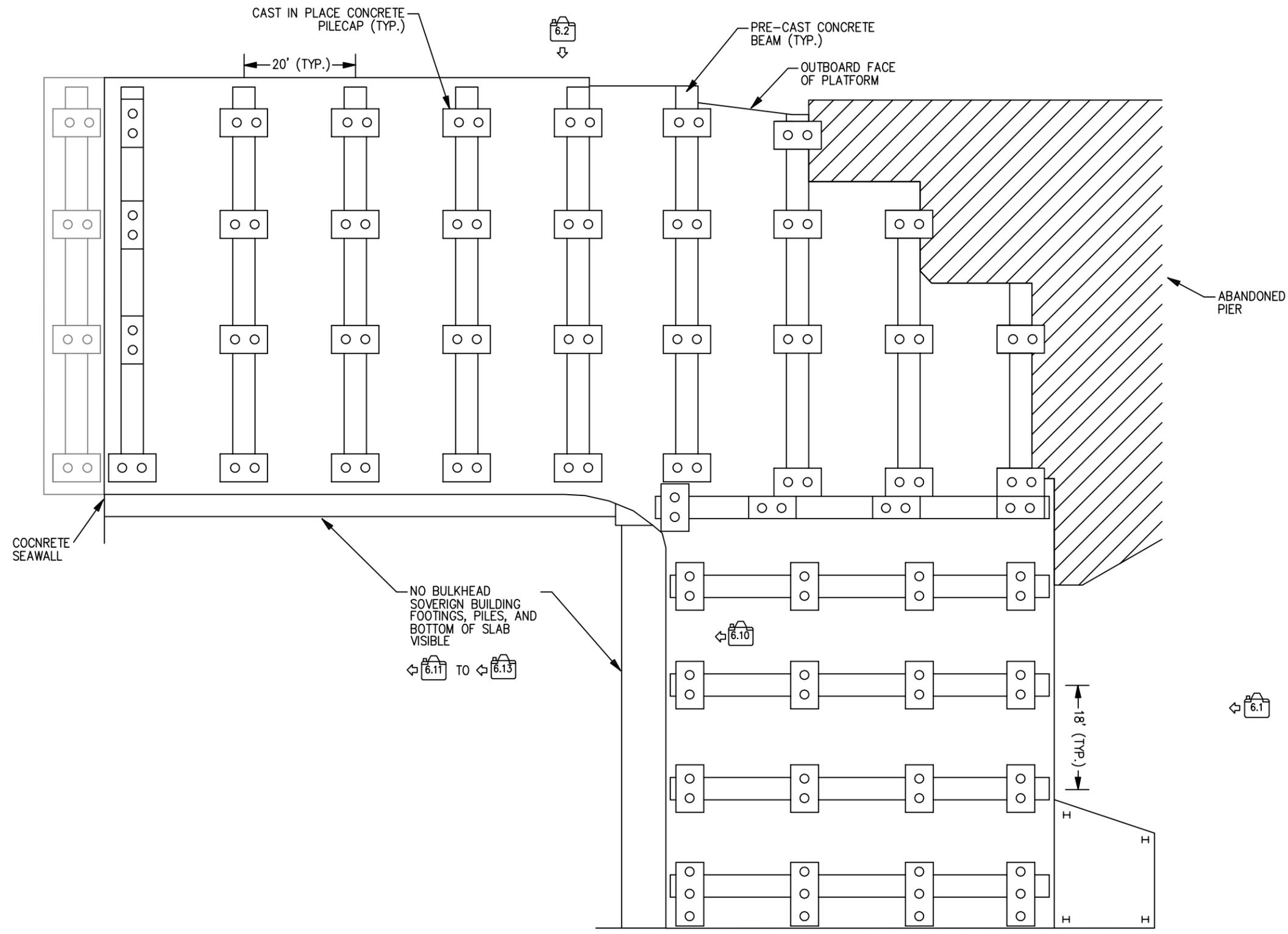
The condition of the cast-in-place pile caps is generally good. The bottom of the pile caps were not visible due to formwork that had been left in place (Photo No. 6.9); however, there were no signs of defects or erosion. The condition of the pre-cast beams and deck planks is good with no deterioration noted (Photo Nos. 6.6 and 6.7).

6.5 RECOMMENDATIONS

Based on the findings of this condition survey, the following actions and repairs are recommended:

- Steel Pipe Piles – Clean and apply protective coating to the pipe piles within the tidal zone to protect from corrosion on a routine basis.

The platform should be re-inspected within five years.



- LEGEND:**
- STEEL PIPE PILE
 - 📷 PHOTO LOCATION

- NOTE:**
1. ALL PIPE PILES HAVE RANDOM, INTERMITTANT COATING LOSS AND MINOR CORROSION WITHIN THE TIDAL ZONE.
 2. HIGH-LEVEL PIPE PILE PLATFORM WAS BUILT OVER A PARTIALLY COLLAPSED STEEL H-PILE SUPPORTED PLATFORM, NOT SHOWN FOR CLARITY.

BOSWELL UNDERWATER ENGINEERING
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 HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN CONDITION SURVEY OF PRIVATELY-OWNED WATERFRONT STRUCTURES		
SOVERIGN PROPERTY PLATFORM PLAN VIEW		
INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
JOB NO. BUE-1010	DRAWING NO. 6.1	SHEET 131

6.7 PHOTOGRAPHS



Photo No. 6.1

Location:

East Face of Platform

Description:

General view looking west



Photo No. 6.2

Location:

North Face of Platform

Description:

General view looking south



Photo No. 6.3

Location:

North Face of
Platform

Description:

View of new structure
constructed around
remnants of old
structure



Photo No. 6.4

Location:

Concrete Pile Cap

Description:

Typical view of cast-
in-place pile cap



Photo No. 6.5

Location:

Steel Pipe Piles

Description:

Typical minor to moderate corrosion within tidal zone



Photo No. 6.6

Location:

Pre-Cast Concrete Beam

Description:

General view



Photo No. 6.7

Location:

Pre-Cast Concrete
Deck Planks

Description:

General view



Photo No. 6.8

Location:

New platform
constructed around
remnants of old pier
structure

Description:

General view

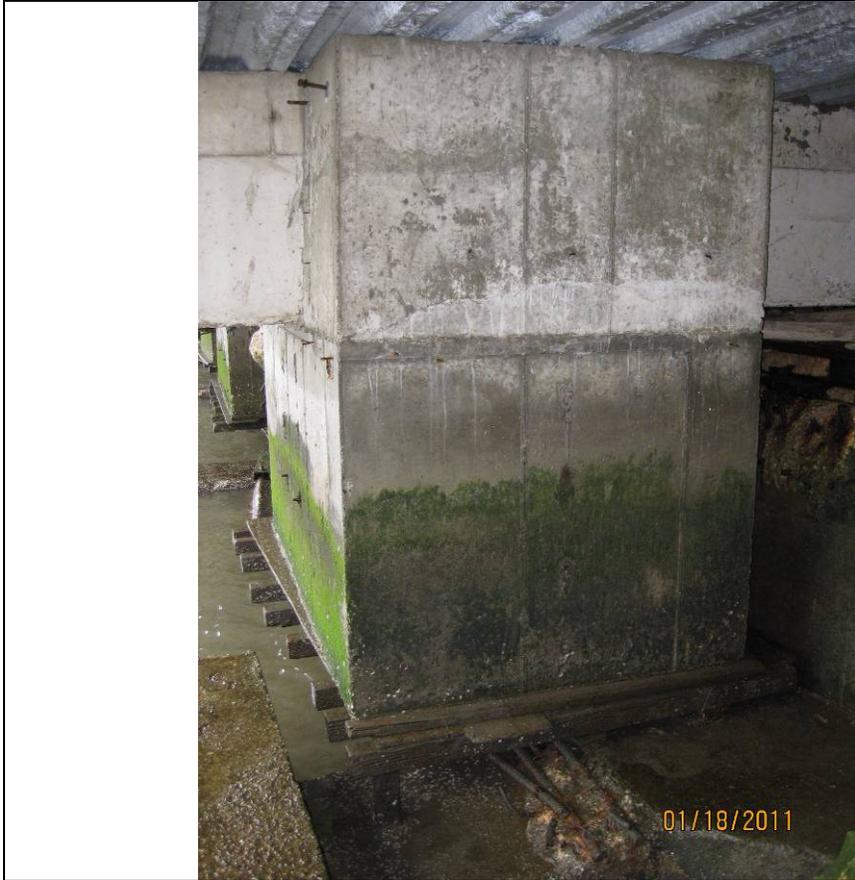


Photo No. 6.9

Location:

Concrete Pile Cap

Description:

General view, bottom formwork left in place



Photo No. 6.10

Location:

West End of Platform

Description:

Filter fabric retaining fill between new platform and pier deck of old structure



Photo No. 6.11

Location:

West of New Platform

Description:

Exposed building footing and support piles



Photo No. 6.12

Location:

West of New Platform

Description:

Building support steel pipe piles driven through old pier deck



Photo No. 6.13

Location:

West of New Platform

Description:

Fill settled beneath
building slab, utilities
no longer supported

7.0 TOLL BROTHERS TEA HOUSE

7.1 FACILITY DESCRIPTION

The waterfront structure at the Toll Brothers Tea House is predominantly comprised of timber cribbing supporting a concrete seawall. For this inspection, the seawall was stationed from Sta. 0+00 at the west end of the structure to Sta. 10+56 at the southeast corner of the structure. From Sta. 2+17 to Sta. 2+79 the structure consists of a low-level timber relieving platform supporting a concrete seawall. The relieving platform is comprised of 12 bent rows, each row having six or seven piles. From Sta. 8+30 to Sta. 10+56, the seawall is comprised of a concrete wall supported by timber decking on a single row of piles oriented north to south. The decking spans from the single row of piles toward the west to a section of timber cribbing.

Plans of the bulkhead structure at the Toll Brothers Tea House property were not available at the time of the inspection. Drawing Nos. 7.1 and 7.2 depict typical sections and a plan view of the facility based on field measurements taken during the survey, including observed conditions.

Due to observed differential settlement in the seawall at the time of the inspection, access to the pedestrian walkway was restricted from Sta. 2+17 to Sta. 8+75 by a chain link fence.

7.2 INSPECTION FINDINGS

From Sta. 0+00 to Sta. 2+17, the general condition of the seawall is fair, with severe marine borer infestation in the timber cribbing and minor to moderate erosion of the concrete seawall. The overall condition of the structure from Sta. 2+17 to 2+79 is critical due to significant section loss in the timber piles, pile caps and decking caused by marine borer biodeterioration. Additionally, the concrete seawall in this area is in poor condition due to erosion of the concrete within the tidal zone. From Sta. 2+79 to Sta. 8+30, the general condition of the seawall is poor with isolated locations that are serious, as evidenced by areas of differential movement and cracking in the seawall. The timber cribbing in this location typically has severe marine borer infestation. The concrete seawall has severe erosion within the tidal zone from Sta. 2+79 to Sta. 4+05, and moderate erosion from Sta. 4+05 to Sta. 8+30. From Sta. 8+30 to Sta. 8+50, the seawall is in critical condition due to severe deterioration of the timber piles supporting the concrete seawall. From Sta. 8+50 to Sta. 10+56, the timber substructure is satisfactory with moderate marine borer infestation. The concrete seawall from Sta. 8+30 to Sta. 8+50 is generally in fair condition with isolated areas of severe erosion exposing reinforcing steel.

7.3 CONCRETE SEAWALL

From Sta. 0+00 to Sta. 2+17, the concrete seawall is in satisfactory condition with minor to moderate erosion within the tidal zone. From Sta. 2+17 to Sta. 4+05, the overall condition of the concrete seawall is poor. The face of the concrete seawall has moderate to severe erosion and spalling, to a maximum of 12 in. deep at its base, with several areas of exposed reinforcing steel

(Photo Nos. 7.2 and 7.3). From Sta. 4+05 to Sta. 8+30, the face of the seawall typically displays minor to moderate erosion, with a few isolated areas of more severe erosion. In this area, there are three locations where differential movement and cracking were observed in the seawall, Sta. 5+20, Sta. 6+47 and Sta. 7+07 (Photo Nos. 7.4 to 7.6). It is not clear if the movement is the result of deterioration of the timber cribbing that supports the concrete seawall, or from lateral soil pressure or overloading from behind the seawall. As design plans were not available, it is not known if the seawall has a tieback system to resist lateral forces. From Sta. 8+30 to Sta. 10+56, the condition of the seawall is fair due to moderate to heavy erosion and spalling with exposed reinforcing steel and areas of delaminations within the tidal zone (Photo No. 7.7). Additionally, the seawall exhibits vertical settlement from Sta. 8+30 to Sta. 8+50 as a result of deterioration of the timber substructure (Photo No. 7.8).

7.4 TIMBER CRIBBING

The concrete seawall is supported by timber cribbing from Sta. 0+00 to Sta. 2+17 and from Sta. 2+79 to Sta. 8+30. The overall condition of the timber cribbing is poor. There is heavy to severe marine borer infestation throughout the cribbing. The estimated section loss of the cribbing members from Sta. 0+00 to Sta. 2+17 and from Sta. 2+79 to Sta. 8+30 is between 25% and 40%, with isolated locations exhibiting up to 60% section loss. The timber tie-backs, those members oriented perpendicular to the main structure, have greater section loss, generally between 50% and 70%. At Sta. 1+80, a 3 ft long void was found at the bottom of the timber cribbing. Probes up to 2.2 ft deep laterally were able to penetrate into loose fill and stone within the void.

7.5 TIMBER RELIEVING PLATFORM

The general condition of the timber low-level relieving platform is serious. The timber piles supporting the structure all display severe marine borer intrusion. A total of 22 of the 74 inspected piles are broken, or have section loss in excess of 50% (Photo No. 7.9). Many of these piles have as much as 80% section loss. The most severe conditions were found at the three most outboard piles in each row, which are directly beneath the concrete seawall. The remainder of the timber piles typically have section loss between 10% and 50% due to marine borer infestation. Ice pick penetrations between 1 in. and 3 in. deep were common in the surface of the piles indicating severe Teredo infestation and section loss that cannot be fully assessed from a visual inspection alone. The timber pile caps also have severe marine borer infestation and significant section loss. Compression of the pile caps from 1 in. to 3 in. was observed at seven of the 12 pile caps within the platform. The compression damage is an indication that general settlement of the structure has occurred. The timber decking is also susceptible to marine borer infestation, and as a result, exhibits moderate loss of section. Gaps were observed throughout the structure between the deck planks up to 1 in. wide; and in some locations, there are signs that the gaps are allowing fill to escape. From Bent 12 to the crib wall to the east, the majority of the decking is severely deteriorated or missing. Geotextile fabric is visible and retaining the fill where the deck planks have voids or are missing.

7.6 TIMBER PLATFORM STA. 8+30 TO 10+56

The condition of the timber piles supporting the timber deck planks and concrete seawall from Sta. 8+30 to Sta. 8+50 is critical. The northern six piles that comprise the single row of support piles are all in critical condition and are broken, completely non-bearing, or have section loss exceeding 50%. The pile cap in this area has severe marine borer infestation, visual signs of compression damage, and up to 50% loss of section. The corner of the structure has settled as evidenced by the pile cap relative to the waterline as shown in Photo No. 7.11.

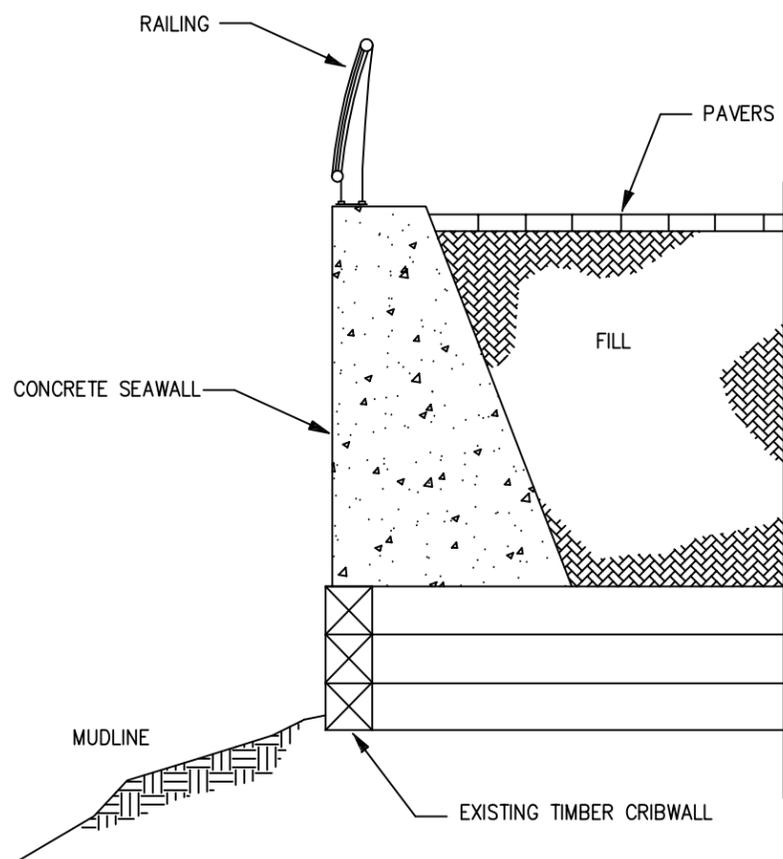
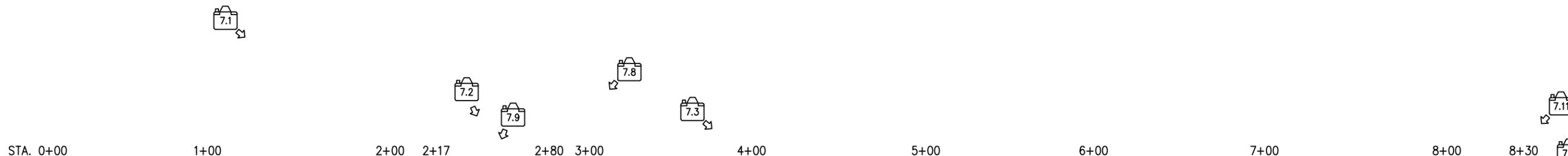
From Sta. 8+50 to Sta. 10+00, the timber substructure is in satisfactory condition with visual signs of marine borer intrusion (Photo No. 7.12); however, the resultant loss of section is generally less than 10% in the piles, pile caps and decking. South of Sta. 10+00, the timber substructure is buried beneath a sandy shoreline.

7.7 RECOMMENDATIONS

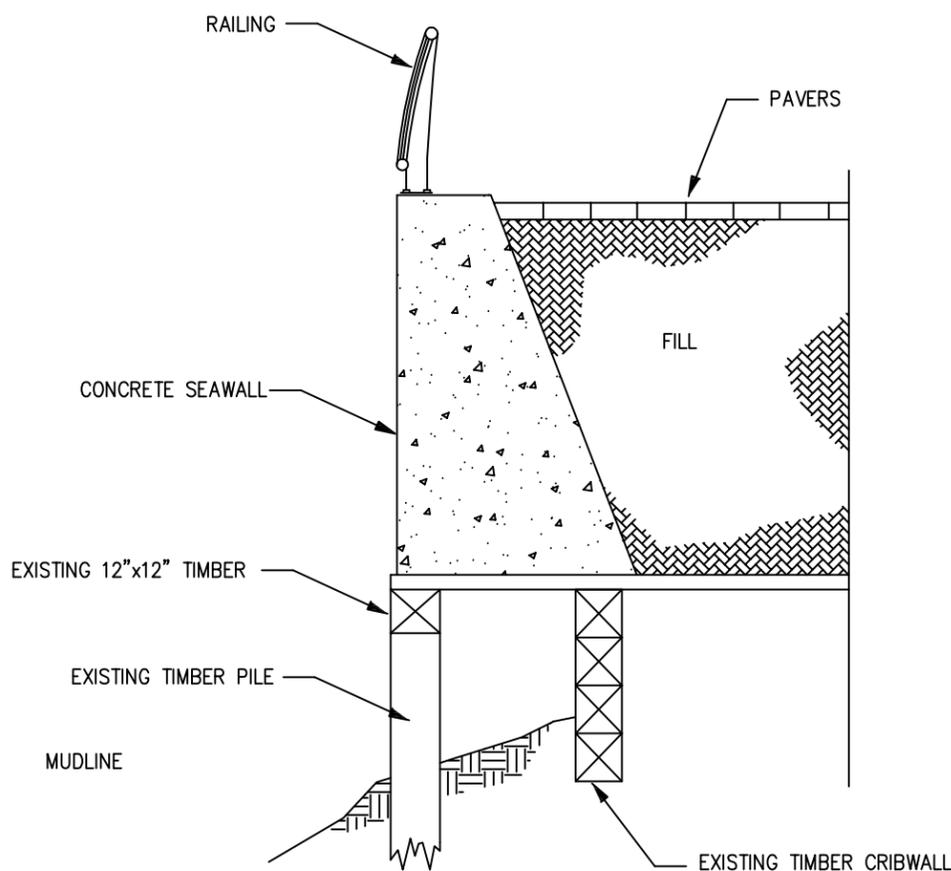
Based on the findings of this condition survey, the following repairs and/or actions are recommended:

- Relieving Platform Sta. 2+17 to Sta. 2+79 – Repair or replace severely deteriorated, broken or missing piles, pile caps and deck planks on an immediate basis.
- Timber Piles, Sta. 8+30 to Sta. 8+50 – Repair six northernmost timber piles on an immediate basis.
- Concrete Seawall – Perform engineering evaluation to determine cause of differential movement in the seawall, the presence and condition of tie-back system, if any, and appropriate repair method to stabilize seawall on a priority basis. Movement of the concrete seawall should be monitored; and until such time that engineering analysis is performed and repairs are implemented, loads should be restricted to pedestrian loads from Sta. 2+79 to Sta. 3+30..
- Timber Cribbing – Due to the widespread, advanced deterioration of the timber cribbing from marine borer infestation, repair timber cribbing to prevent further deterioration due to marine borer intrusion on a priority basis.
- Concrete Seawall – Repair concrete erosion/spalling at the face of the seawall on a routine basis.

It is recommended that access to the structure continue to be restricted until the immediate recommended repairs are completed. Based on ASCE Underwater Investigation Standard Practices Manual guidelines, the condition of the structure, and the potential rate of deterioration due to marine borers, it is recommended that the structure be re-inspected in one year.



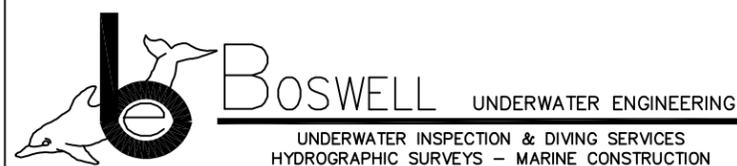
SECTION:
STA. 0+00 TO 2+17 AND STA. 2+79 TO 8+30



SECTION:
STA. 8+30 TO 10+56

LEGEND:

- TIMBER PILE
- MARINE BORER ACTIVITY
- ² TIMBER PILE W/ SECTION LOSS GREATER THAN 49%
- ⁴ TIMBER PILE WITH SEVERE SPLIT
- ⁶ TIMBER PILE BROKEN
- ¹ TIMBER PILE W/ 50-90% BEARING
- ² TIMBER PILE W/ 10-49% SECTION LOSS
- TIMBER PILECAP W/ SEVERE SECTION LOSS
- 📁# PHOTO LOCATION

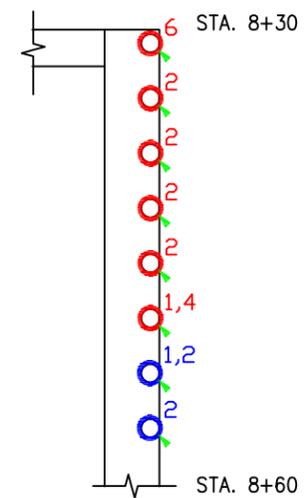
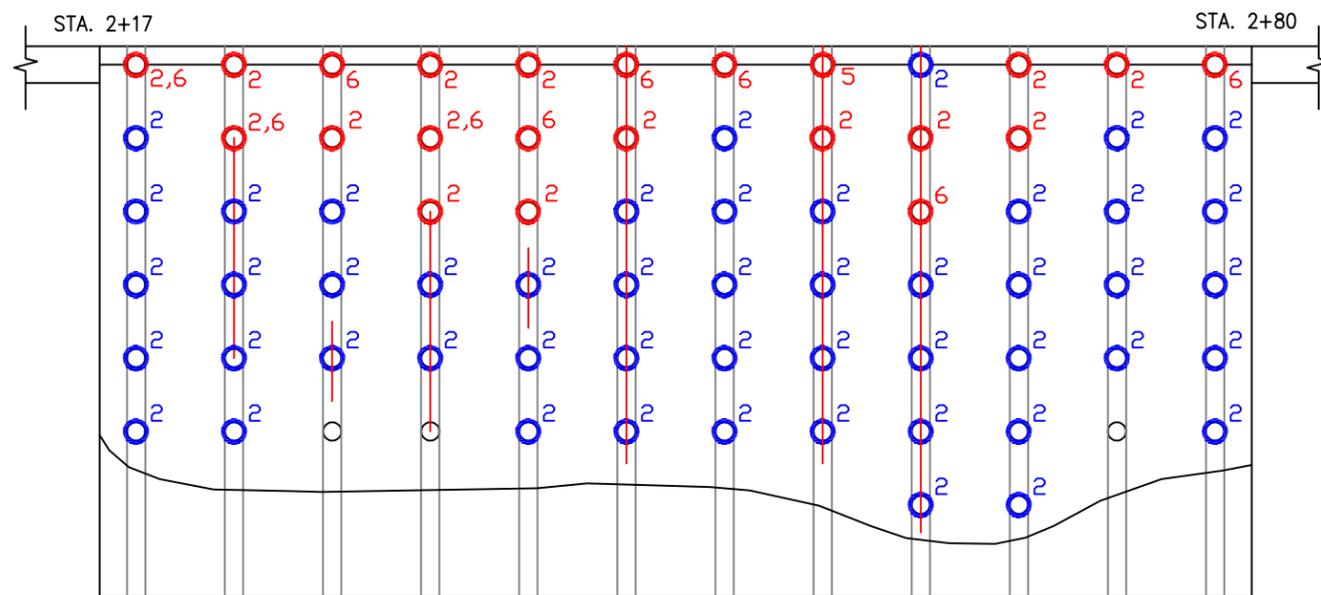


UNDERWATER INSPECTION & DIVING SERVICES
HYDROGRAPHIC SURVEYS - MARINE CONSTRUCTION

CITY OF HOBOKEN
CONDITION SURVEY OF PRIVATELY-OWNED
WATERFRONT STRUCTURES

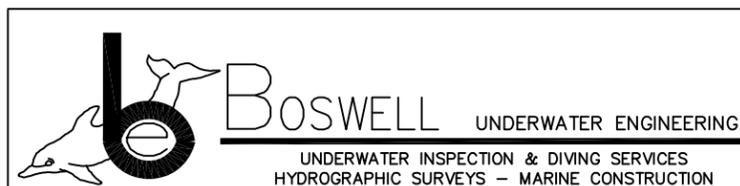
TOLL BROTHERS
TEA HOUSE PLAN VIEW

INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 15'	DATE OF INSPECTION: FEBRUARY, 2011
JOB NO. BUE-1010	DRAWING NO. 7.1	SHEET 142



LEGEND:

- TIMBER PILE
- MARINE BORER ACTIVITY
- ² TIMBER PILE W/ SECTION LOSS GREATER THAN 49%
- ⁴ TIMBER PILE WITH SEVERE SPLIT
- ⁶ TIMBER PILE BROKEN
- ¹ TIMBER PILE W/ 50-90% BEARING
- ² TIMBER PILE W/ 10-49% SECTION LOSS
- TIMBER PILECAP W/ SEVERE SECTION LOSS



CITY OF HOBOKEN
CONDITION SURVEY OF PRIVATELY-OWNED
WATERFRONT STRUCTURES

TOLL BROTHERS
TEA HOUSE PLAN VIEW

INSPECTED BY: J.P., D.C., J.F. DRAWN BY: J.G.	SCALE: 1" = 10'	DATE OF INSPECTION: FEBRUARY, 2011
JOB NO. BUE-1010	DRAWING NO. 7.2	SHEET 143

7.9 PHOTOGRAPHS



Photo No. 7.1

Location:

North Face of Seawall

Description:

General view looking southeast



Photo No. 7.2

Location:

Concrete Seawall
Sta. 2+50

Description:

Severe erosion at
bottom of seawall



Photo No. 7.3

Location:

Concrete Seawall
Sta. 3+75

Description:

Moderate to severe
erosion of seawall in
the tidal zone



Photo No. 7.4

Location:

Top of Concrete
Seawall, Sta. 5+20

Description:

Cracking at joint



Photo No. 7.5

Location:

Top of Concrete
Seawall, Sta. 6+47

Description:

Differential
movement at joint



Photo No. 7.6

Location:

Top of Concrete
Seawall, Sta. 7+07

Description:

Differential
movement at joint



Photo No7.7

Location:

Concrete Seawall,
Sta. 8+40

Description:

Erosion within tidal
zone, exposed
reinforcing steel



Photo No. 7.8

Location:

Low-Level Timber
Relieving Platform

Description:

General view



Photo No. 7.9

Location:

Timber Relieving Platform, Bent 6A

Description:

Timber pile broken, severe marine borer infestation in deck planks



Photo No. 7.10

Location:

Concrete Seawall, Sta. 8+30

Description:

Settlement at corner of seawall



Photo No. 7.11

Location:

Concrete Seawall,
Sta. 8+30 to Sta. 8+50

Description:

Settlement of seawall



Photo No. 7.12

Location:

Timber Pile Cap,
Sta. 9+00

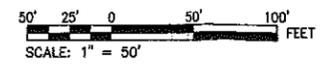
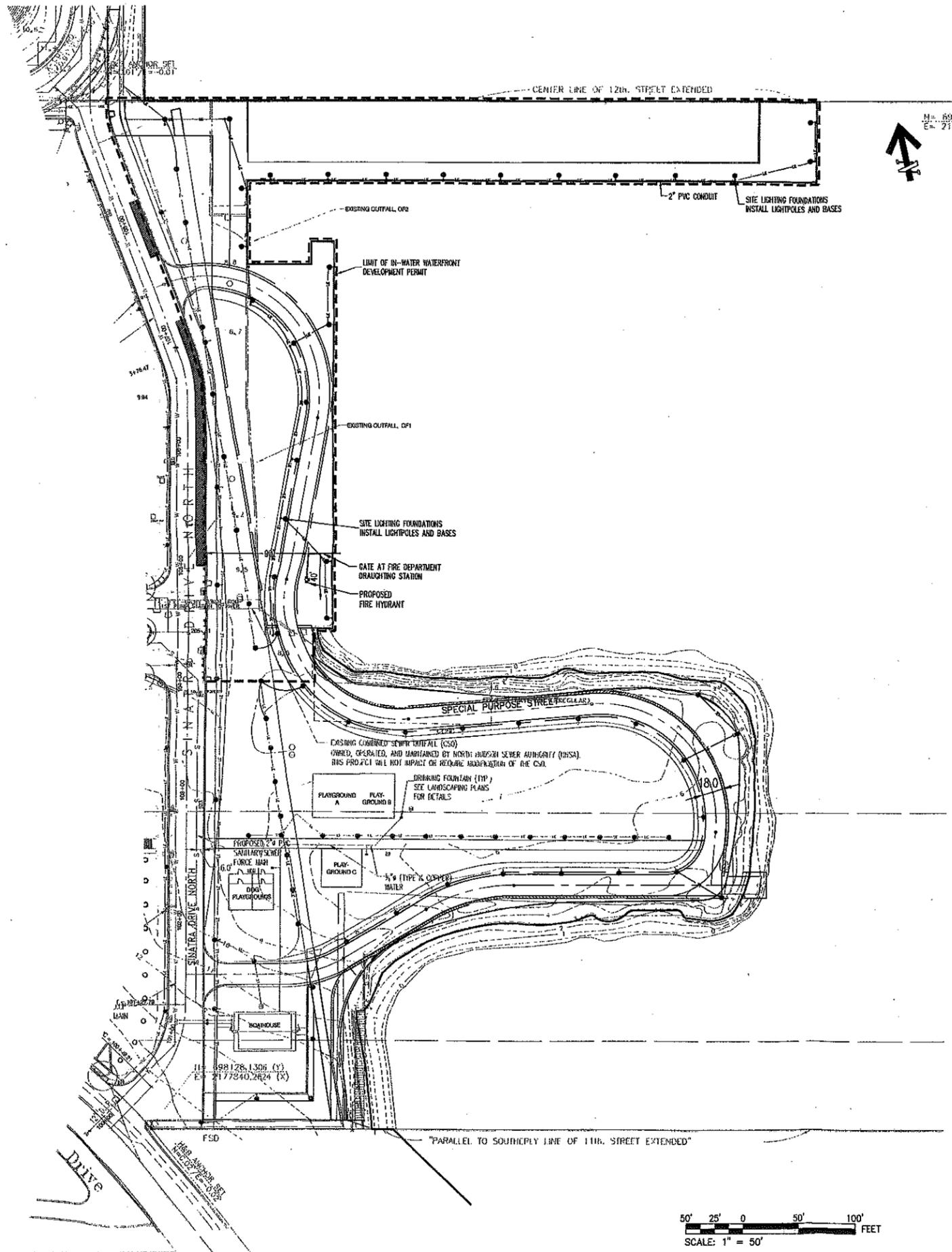
Description:

Marine borer
infestation at bottom
of pile cap

APPENDIX A
Maxwell Place On The Hudson
2008 Waterfront Development Plans

PROJECT NAME:
**MAXWELL PLACE
 ON THE HUDSON**
 1101-1125 HUDSON STREET
 HOBOKEN, NEW JERSEY

PREPARED FOR:
P.T. MAXWELL L.L.C.
 1125 HUDSON STREET
 HOBOKEN, NEW JERSEY



LEGEND

- | | | | |
|------|---|-----|---|
| —●— | EXIST. PIPE (SAN. OR STORM) | —●— | MODIFY EXISTING MANHOLE |
| —S— | PROP. SAN. MH | —●— | PIPE FITTINGS |
| —L— | PROP. SAN. LINE | —●— | LIGHT TYPE A |
| —E— | PROP. UNDERGROUND ELECTRIC | —●— | LIGHT TYPE B |
| —E— | MOVE OR REMOVAL OF EXIST. UNDERGROUND ELECTRIC | —●— | EXIST. FEATURE |
| —LE— | PROP. UNDERGROUND ELECTRIC FOR LIGHT POLE | —●— | EXIST. PIPE |
| —LE— | MOVE OR REMOVAL OF EXIST. UNDERGROUND ELECTRIC FOR LIGHT POLE | —●— | EXIST. CONTOUR |
| —T— | PROP. CONDUIT W/ TEL. | —●— | PROP. CONTOUR |
| —C— | PROP. CONDUIT W/ CTV | —●— | PROP. DRAINAGE INLET |
| —SC— | PROP. CONDUIT W/ SATELLITE CABLE | —●— | PROP. CENTERLINE OF ROAD |
| —W— | PROP. WATER LINE | —●— | PROP. DRAINAGE MANHOLE |
| —WB— | PROP. WATER CURB BOX W/ VALVE | —●— | EXIST. CURB |
| —FW— | PROP. FIRE MAIN | —●— | PROPOSED NEW OR REPLACEMENT CURB |
| —FH— | PROP. FIRE HYDRANT | —●— | DEVELOPMENT BLOCK LINE |
| —PV— | PROP. POST INDICATOR VALVE | —●— | FLUSH CURB |
| | | —●— | PROP. CENTERLINE OF ROAD |
| | | —●— | PROPOSED CONCRETE ENCASED ELECTRICAL CONDUITS |

0905-03-0001.2
 AUG 9 2008

McLaren
 STEVEN L. GROGG
 N.J. REG. NO. 31820
 email: mgmclaren@mgmclaren.com
 100 Snake Hill Road, West Nyack, NY 10994
 Tel. (945) 353-6400 Fax. (945) 353-6509

[Signature]
 05-23-08

LAND SURVEYOR:
HENDERSON AND BODWELL, L.L.P.
 154 WOODS FARM DRIVE, SOMERSET, N.J. 08873
 PATRICK L. BERRY, P.L.L.
 N.J. REG. NO. 33372

Issue:

Date:	Per:

WATERFRONT DEVELOPMENT PERMIT

**WATERFRONT WALKWAY/
 UTILITY PLAN**

Date: 5/23/08 - Scale: AS NOTED
 Revisions: Drawn by: OJT

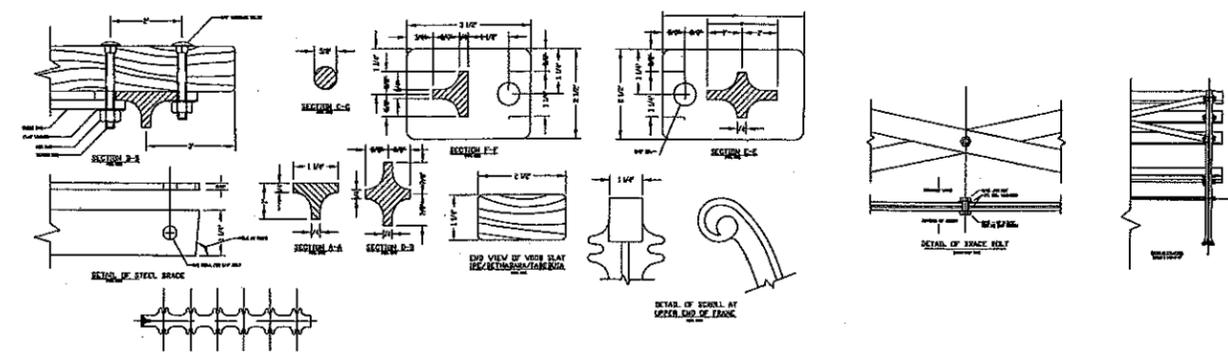
WFDP-2

Job No. DMA 99114/ MGM 99105.02

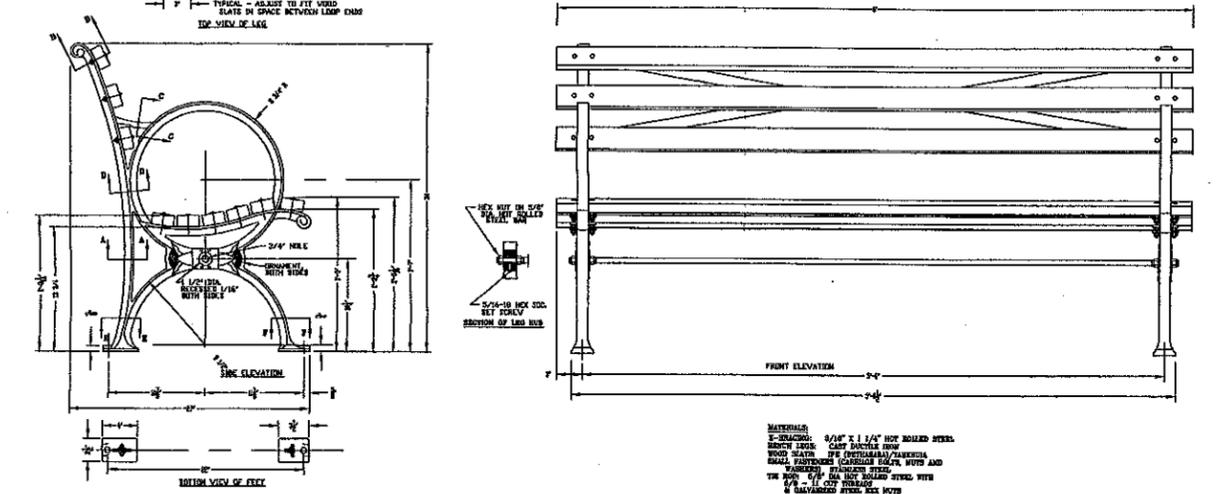
FILE NAME: C:\200805\SRV\03\01\Yield Studies\Hoboken\Development\Permit\090503\WFDP.dwg PLOT TIME: Thu, 21 Aug 2008 5:27pm LAST SAVE: Thu, 21 Aug 2008 5:10pm PLOT BY: BJC

PROJECT NAME:
**MAXWELL PLACE
 ON THE HUDSON**
 1101-1125 HUDSON STREET
 HOBOKEN, NEW JERSEY

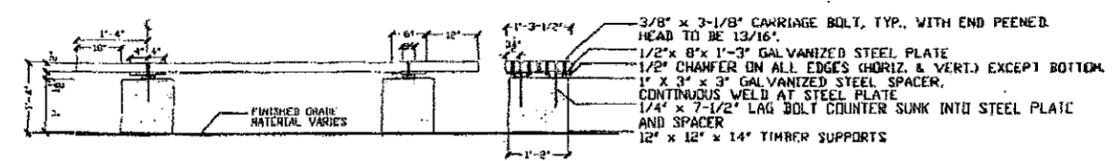
PREPARED FOR:
P.T. MAXWELL L.L.C.
 1125 HUDSON STREET
 HOBOKEN, NEW JERSEY



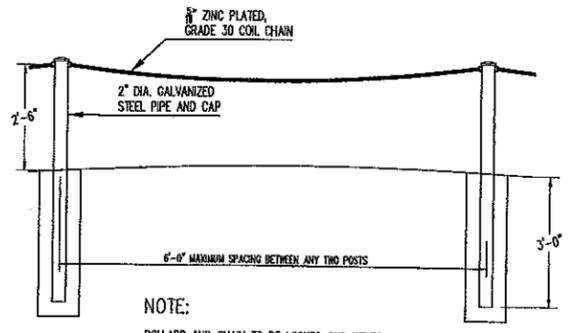
1 PARK BENCH
 WFDP-3 N.T.S.



2 *BACKLESS BENCH
 WFDP-3 N.T.S.

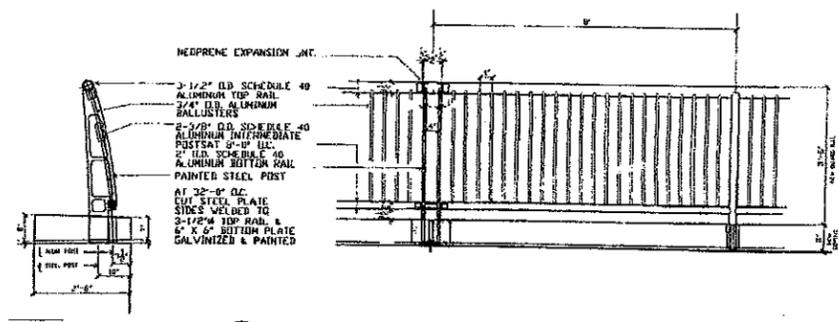


NOTE: HOT DIP GALVANIZE ENTIRE STEEL ASSEMBLY.
 ALL BOLTS SHALL BE STAINLESS STEEL
 TAMPER RESISTANT.

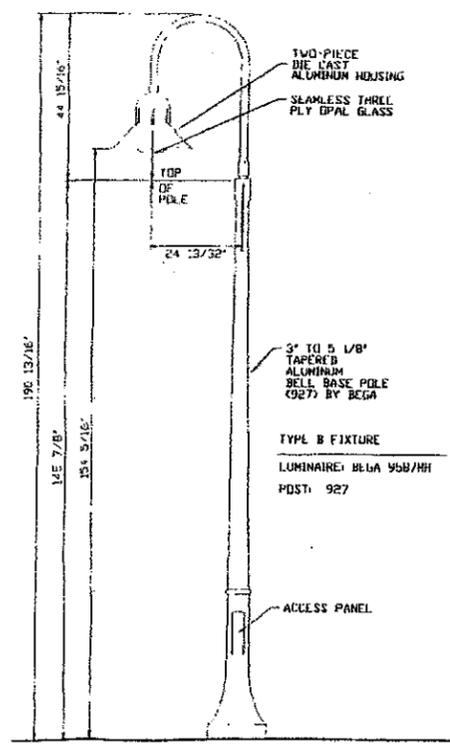


NOTE:
 BOLLARD AND CHAIN TO BE LOCKED AND KEYS
 IN COORDINATION WITH THE CITY OF HOBOKEN.
 SPACING AT EMERGENCY EGRESS AND BOAT
 LAUNCH TO BE CONFIRMED WITH CITY OF HOBOKEN
 EMERGENCY SERVICES PRIOR TO INSTALLATION.

3 BOLLARD & CHAIN FENCE
 WFDP-3 N.T.S.



4 *WATERFRONT WALKWAY RAILING DETAIL
 WFDP-3 N.T.S.



5 *LIGHT FIXTURE DETAILS
 WFDP-3 N.T.S.

Luminaire Schedule						
Project: All Projects						
Symbol	Qty	Label	Arrangement	Lumens	LLF	Description
●	43	B	SINGLE	8500	0.487	Bega 9587MH

LAMP AND LUMINAIRE SCHEDULE

TYPE: MWU CATALOG #
 LAMP CODE: B
 Bega 0587MH-70-Coro 927-Emu
 MP100/11/ME2

Decorative pole top luminaire with symmetrical distribution with
 arm. Housing of two interlocking die-cast aluminum housings. Lower housing
 provides four windows for additional top light output. Heavy gauge 0.80" spun
 aluminum shade with rolled edge, finished white inside. Arm of fabricated
 0.125" wall aluminum extrusion formed into a continuous smooth radius,
 terminating and welded into a one piece die-cast aluminum fitter, for 3" tenon,
 secured with six stainless steel hex-head screws. Diffuser shall be homogenous
 seamless three ply opal glass with screw neck with minimum 75% transmission,
 fully gasketed for weather tightness using high temperature silicone rubber
 O-ring. Lamp holder is medium base porcelain with nickel plated copper screw
 shell with 200 degree C leads, rated at 4kw. Ballast is located in base of
 pole and is 120-277 volt, to be specified. Finish being two coats of
 polyurethane over a phosphate base. Color to be Eurocoral (stainless steel) or
 black. Post shall be tapered round ball base pole. Short of extruded seamless
 aluminum alloy tubing. Ball base shall be round cast aluminum with four
 stainless steel bolts threaded into stainless steel inserts to retain pole. Flush
 access door is provided. Post supplied with 898A anchorage. EPA @100MPH -
 5.9

0905-03-0001.2
 AUG 03 2008

McLaren SEVERAL L. CROSS
 100 Snake Hill Road, West Nyack, NY 10994
 Tel: (945) 353-6400 Fax: (945) 353-6509

Handwritten signature
 65-23-08

LAND SURVEYOR:
HENDERSON AND BODWELL, L.L.P.
 20 WARDEN FARM DRIVE, SOMERSET, N.J. 08873

Issue:
 Date: _____
 Part: _____

WATERFRONT DEVELOPMENT PERMIT

WATERFRONT WALKWAY/
 DETAILS

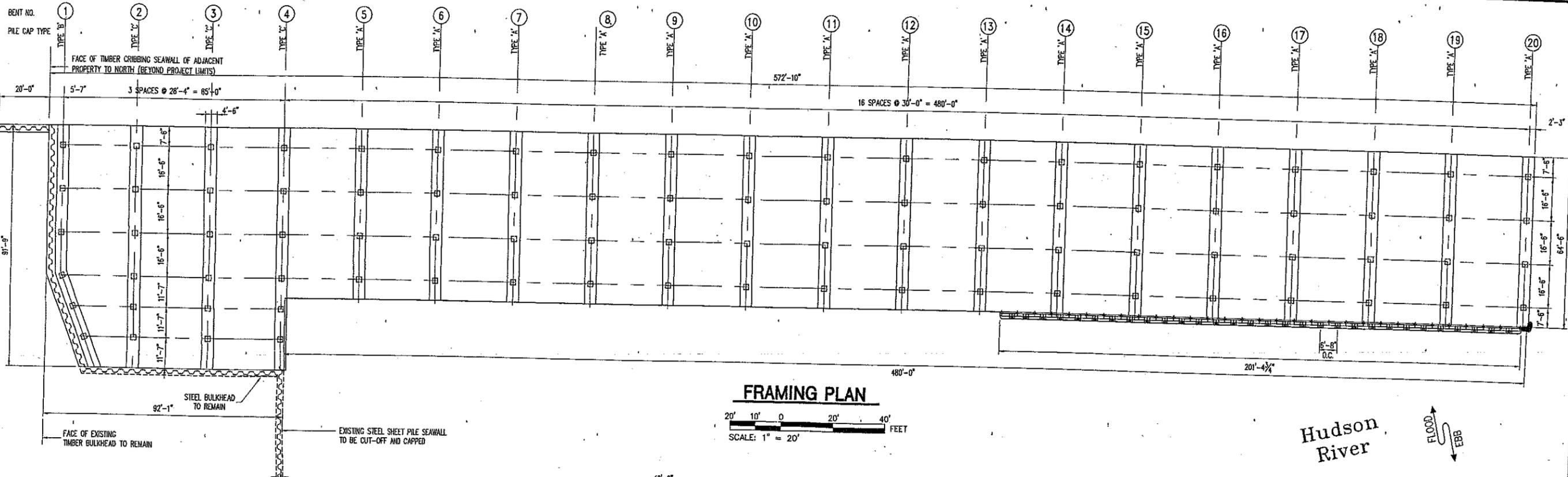
Date: 5/23/08 Scale: AS NOTED
 Revisions: Drawn by: DJT

WFDP-3

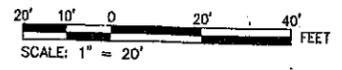
Job No. DMA 99114/ NCM 99105.02

* PER DWG. WDPP-2 "WATERFRONT DEVELOPMENT
 PERMIT PLAN DETAILS", PREPARED BY DEAN
 MARCHETTO & ASSOCIATES ARCHITECTS.

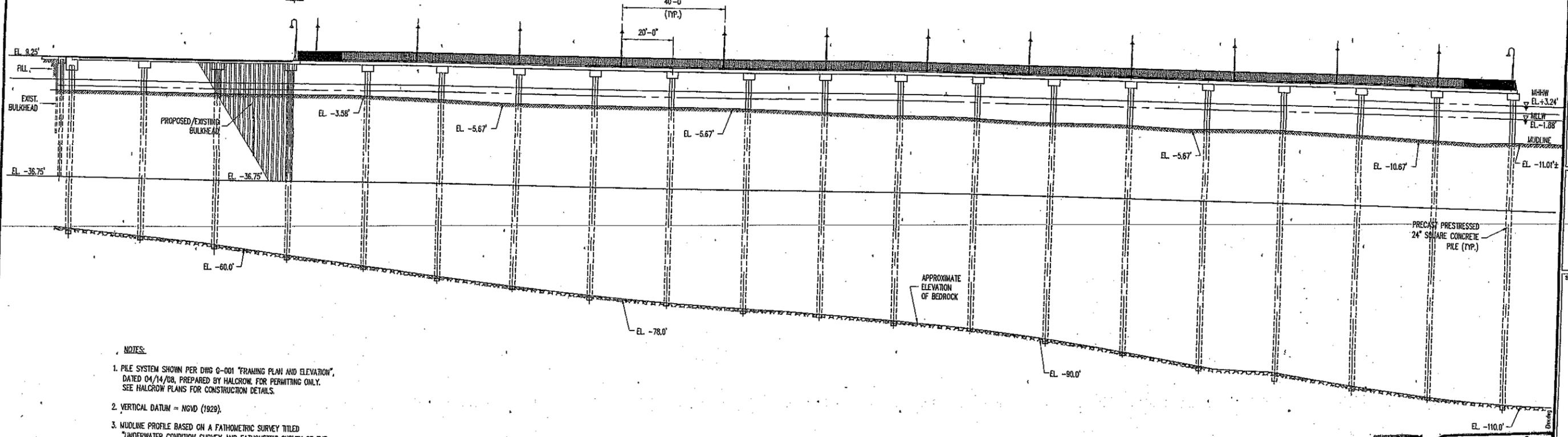
FILE NAME: C:\Users\jg\Documents\Development\Permit\090503\WFDP-3.dwg PLOT TIME: Thu, 22 May 2008 - 3:36pm LST DATE: Thu, 22 May 2008 - 10:59pm ST: 0184



FRAMING PLAN



Hudson River
 FLOOD
 EBB



ELEVATION



- NOTES:**
1. PILE SYSTEM SHOWN PER DWG G-001 "FRAMING PLAN AND ELEVATION", DATED 04/14/08, PREPARED BY HALCROW, FOR PERMITTING ONLY. SEE HALCROW PLANS FOR CONSTRUCTION DETAILS.
 2. VERTICAL DATUM = NGVD (1929).
 3. MUDLINE PROFILE BASED ON A FATHOMETRIC SURVEY TITLED "UNDERWATER CONDITION SURVEY AND FATHOMETRIC SURVEY OF THE MAXWELL HOUSE SITE".
 4. GEOTECHNICAL/BEDROCK PROFILE BASED UPON GEOTECHNICAL REPORT FOR MAXWELL HAUS MIXED USE NEIGHBORHOOD HOBOKEN, NEW JERSEY, AUGUST 2000.
 5. BERTHING FENDERS SYSTEM NOT SHOWN FOR CLARITY.

0905-03-0001-2
 AUG 06 2008

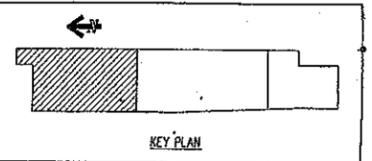
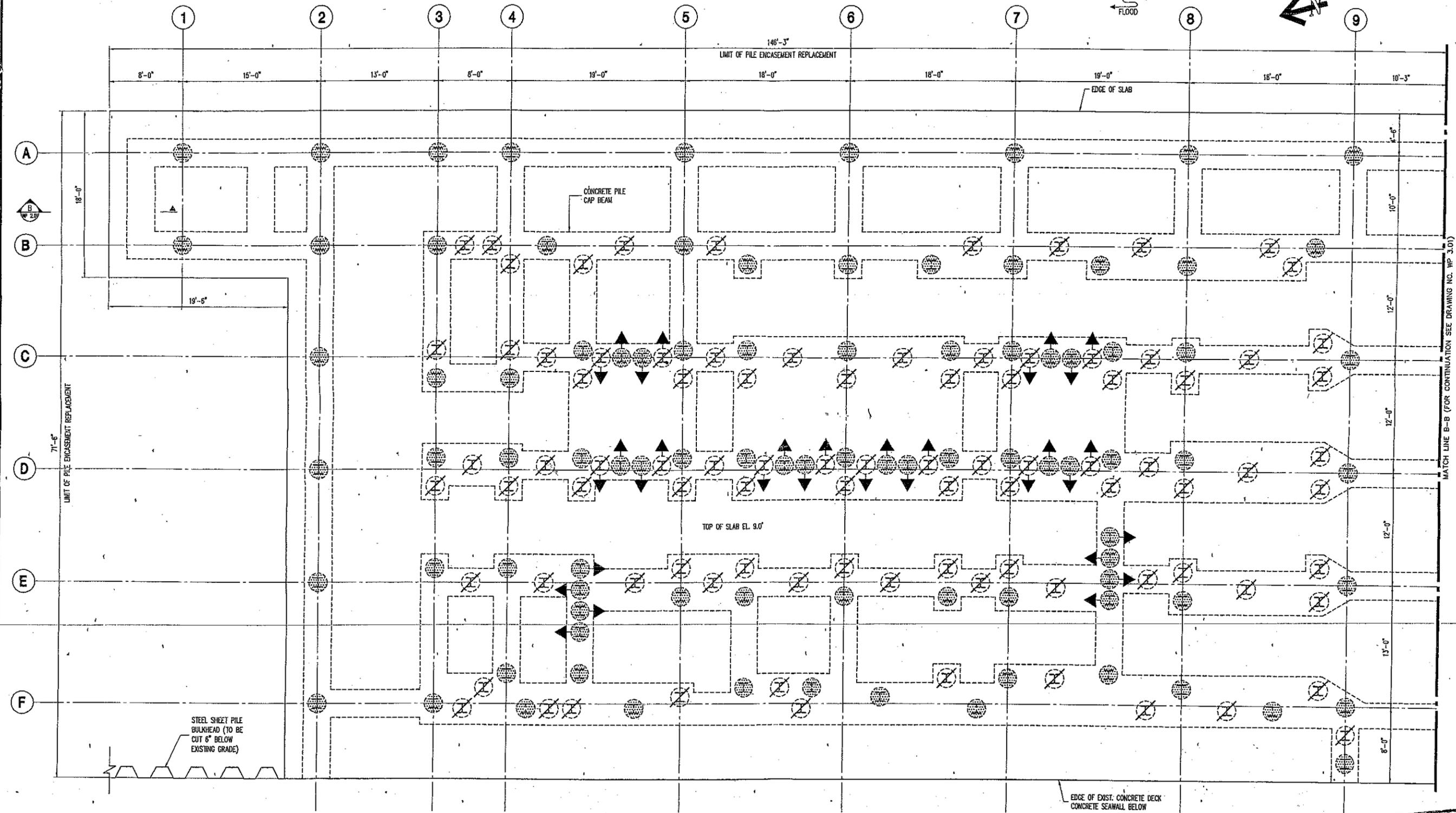
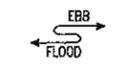
McLaren
 ENGINEERING GROUP
 E-mail: mclaren@mgmclaren.com
 100 Satis Hill Road, West Nyack, NY 10994
 Tel: (845) 393-6000 Fax: (845) 352-6609

PROJECT
MAXWELL PLACE ON THE HUDSON NORTH AND WEST PIERS
 HOBOKEN, NEW JERSEY

SHEET TITLE
NORTH PIER PLAN AND ELEVATION

PROJECT NO. 99105.05
 SCALE AS SHOWN
 DATE 05/22/08
 DRAWN BY BGM
 CHECKED BY SLG/CJM
 DRAWING NO.

Hudson River



PILE ENCASEMENT PLAN - 2
3/16" = 1'-0"

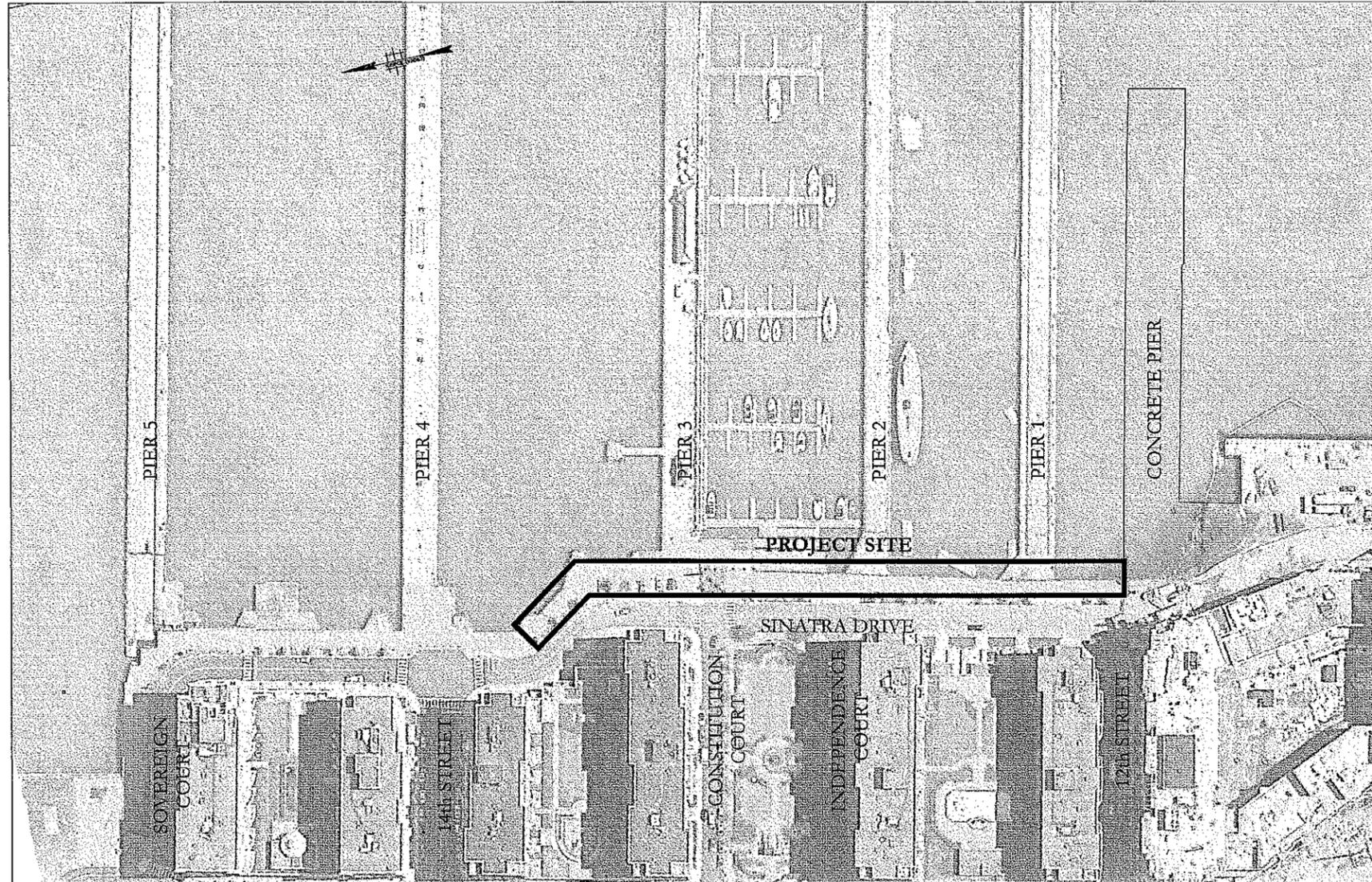
- LEGEND
- PILE TO BE RE-ENCASED
 - BATTER PILE TO BE RE-ENCASED
 - PILE TO BE ABANDONED

0905-03-0001.2
AUG 06 2008

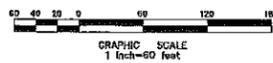
<p>McLaren ENGINEERING GROUP</p> <p>100 Snake Hill Road, West Nyack, NY 10994 Tel. (845) 353-6000 Fax. (845) 353-6005</p>	
<p>PROJECT</p> <p>MAXWELL PLACE ON THE HUDSON NORTH AND WEST PIERS</p> <p>HOBOKEN, NEW JERSEY</p>	
<p>DESIGNER</p> <p><i>Malcolm G. McLaren P.E.</i></p> <p>MALCOLM G. McLAREN P.E. No. 26476 N.J. P.E. No. 35-100</p>	
<p>SHEET TITLE</p> <p>WEST PIER PILE ENCASEMENT PLAN-2</p>	
<p>PROJECT NO.</p> <p>99105.05</p>	<p>SCALE</p> <p>AS SHOWN</p>
<p>DATE</p> <p>05/22/08</p>	<p>DRAWN BY</p> <p>BCM</p>
<p>CHECKED BY</p> <p>SLG/CMM</p>	<p>DRAWING NO.</p> <p>WFDP-S6</p>
<p>FILE NAME: G:\Projects\WFDP-S6\WFDP-S6_PileEncasement_Plan-2.dwg</p>	
<p>COPYRIGHT © 2008, M.G. McLAREN, P.C.</p>	

APPENDIX B
Shipyard Promenade Stabilization Plans

SHIPYARD PROMENADE STABILIZATION CITY OF HOBOKEN, HUDSON COUNTY, NEW JERSEY OWNER: SHIPYARD PROPERTY OWNERS ASSOCIATION, INC.



SITE OVERVIEW: NJDEP 2007 AERIAL PHOTOGRAPH
1" = 60'



NOTICE TO CONTRACTOR

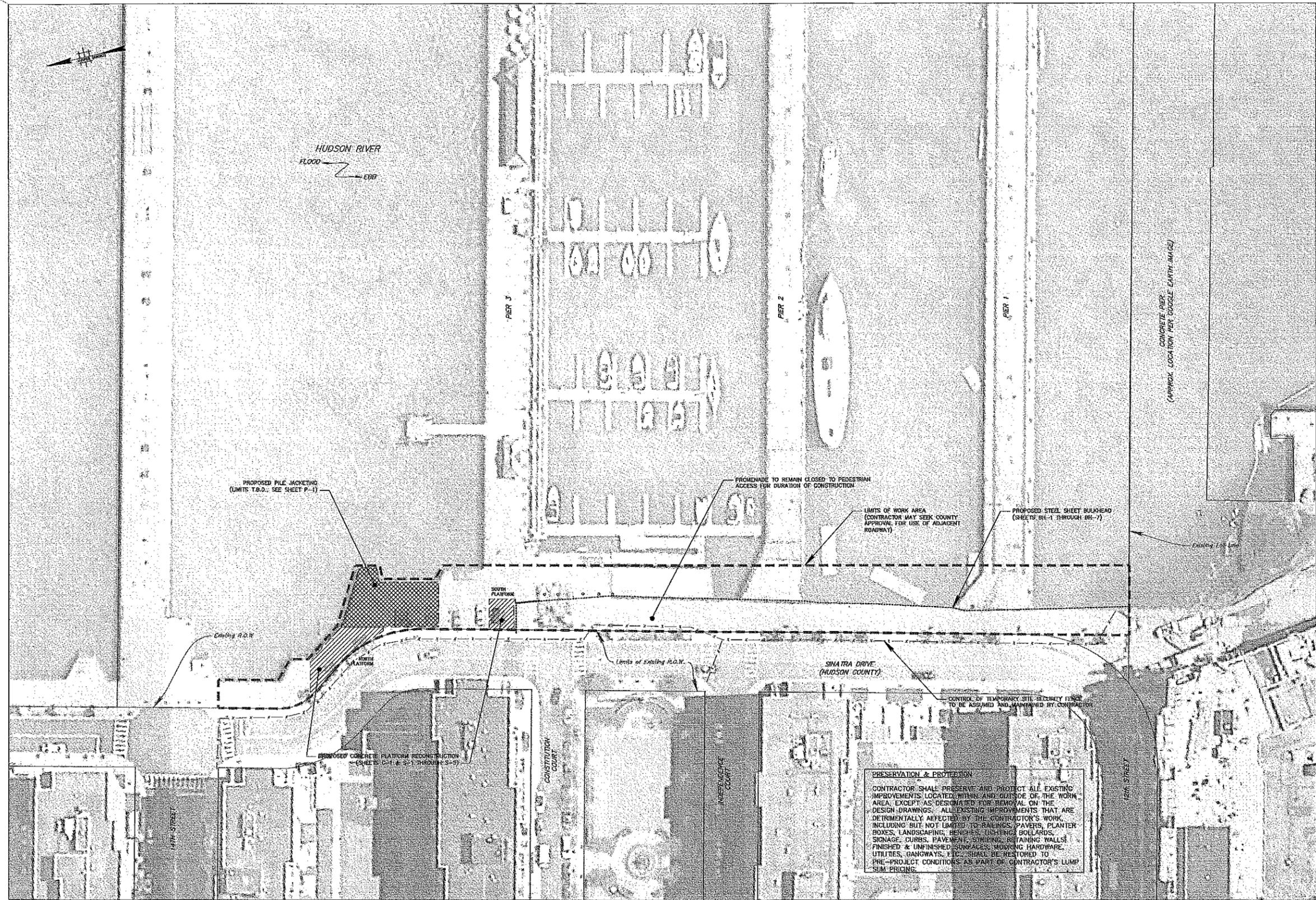
ATTENTION OF THE CONTRACTOR IS DIRECTED TO THE FACT THAT THE APPROXIMATE LOCATIONS OF KNOWN UTILITY STRUCTURES AND FACILITIES THAT MAY BE ENCOUNTERED WITHIN AND ADJACENT TO THE LIMITS OF THE WORK ARE SHOWN ON THE PLANS. THE ACCURACY AND COMPLETENESS OF THIS INFORMATION IS NOT GUARANTEED BY THE ENGINEER, AND THE CONTRACTOR IS ADVISED TO VERIFY, IN THE FIELD, ALL THE FACTS CONCERNING THE LOCATIONS OF THESE UTILITIES PRIOR TO CONSTRUCTION. FURTHER, THE CONTRACTOR SHALL NOTIFY THE ENGINEER IN WRITING PRIOR TO CONSTRUCTION, OF ANY DISCREPANCIES THAT MAY AFFECT THE PROJECT DESIGN. THE CONTRACTOR SHALL CONTACT NEW JERSEY ONE CALL (1-800-272-7600 OR LATEST NUMBER) PRIOR TO START OF CONSTRUCTION FOR UTILITY MARKOUT.



INDEX OF SHEETS

- G-1 TITLE SHEET
- G-2 OVERALL PLAN/KEY MAP
- G-3 EXISTING CONDITIONS
- BH-1 STRUCTURAL BULKHEAD PLAN
- BH-2 STRUCTURAL MONITORING PLAN
- BH-3 DEMOLITION PLAN - NORTHERN SECTION
- BH-4 DEMOLITION PLAN - SOUTHERN SECTION
- BH-5 PIER RESTORATION PLAN
- BH-6 STRUCTURAL SECTIONS & DETAILS 1 OF 2
- BH-7 STRUCTURAL SECTIONS & DETAILS 2 OF 2
- C-1 PLATFORM RECONSTRUCTION SITE SITE PLAN
- S-1 STRUCTURAL PLATFORM PLANS
- S-2 STRUCTURAL PLATFORM SECTIONS & DETAILS 1 OF 4
- S-3 STRUCTURAL PLATFORM SECTIONS & DETAILS 2 OF 4
- S-4 STRUCTURAL PLATFORM SECTIONS & DETAILS 3 OF 4
- S-5 STRUCTURAL PLATFORM SECTIONS & DETAILS 4 OF 4
- P-1 FILE JACKETING PLAN
- N-1 CONSTRUCTION NOTES

	BIRDSELL SERVICES GROUP ENGINEER & CONSULTANT BIRDSELL ENGINEERING, INC. REGISTERED PROFESSIONAL ENGINEER NEW JERSEY
ANDREW W. RAICHE, P.E. <small>REGISTERED PROFESSIONAL ENGINEER NEW JERSEY</small>	
LOT 1, BLOCK 262.1 CITY OF HOBOKEN HUDSON COUNTY NEW JERSEY	
SHIPYARD PROPERTY OWNERS ASSOCIATION, INC. HOBOKEN SHIPYARD - PROMENADE STABILIZATION SHIPYARD BULKHEAD RECONSTRUCTION TITLE SHEET	
SHEET NO. G-1 OF 5	



PRESERVATION & PROTECTION
 CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING IMPROVEMENTS LOCATED WITHIN AND OUTSIDE OF THE WORK AREA, EXCEPT AS DESIGNATED FOR REMOVAL ON THE DESIGN DRAWINGS. ALL EXISTING IMPROVEMENTS THAT ARE DETRIMENTALLY AFFECTED BY THE CONTRACTOR'S WORK, INCLUDING BUT NOT LIMITED TO: RAILINGS, PAVERS, PLANTER BOXES, LANDSCAPING, BENCHES, FISHING BOLLARDS, SIGNAGE, CURBS, PAVEMENT, STRIPING, RETAINING WALLS, FINISHED & UNFINISHED SURFACES, MOORING HARDWARE, UTILITIES, GANGWAYS, ETC., SHALL BE RESTORED TO PRE-PROJECT CONDITIONS AS PART OF CONTRACTOR'S LUMP SUM PRICING.



NO. DATE EDITION DRAWN (DATE) ISSUED (DATE)

BSS BIRDSALL SERVICES GROUP
 ENGINEERS & CONSULTANTS
 BIRDSALL ENGINEERING, INC.
 14,722 LAWRENCE
 MANHATTAN, NY 10019
 TEL: 212.692.1000
 WWW.BIRDSALL.COM

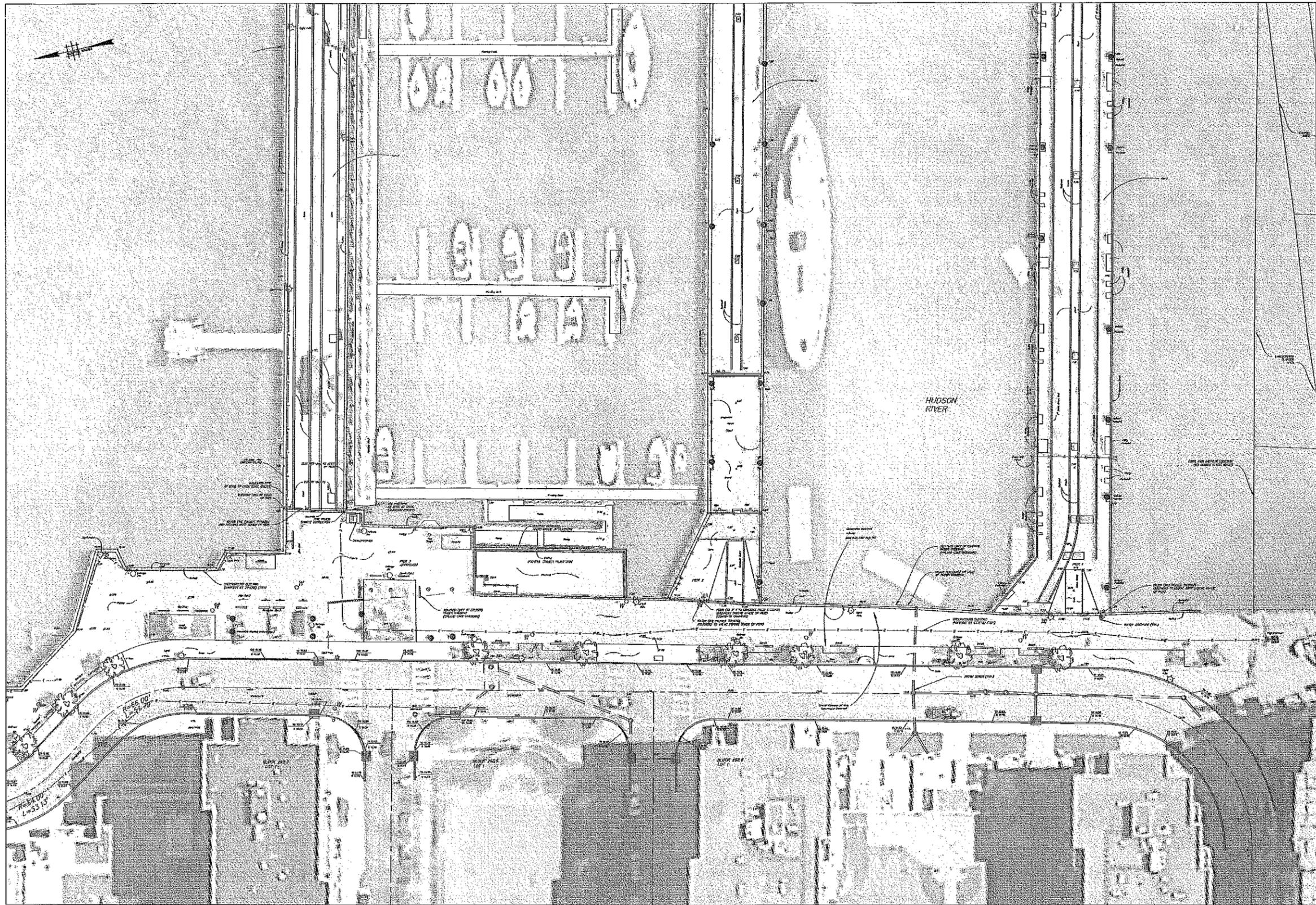
DATE
 ANDREW W. RAICHLE, P.E.
 REGISTERED PROFESSIONAL ENGINEER

LOT 1, BLOCK 282.1
 CITY OF HOBOKEN
 HUDSON COUNTY
 NEW JERSEY

SHIPYARD PROPERTY OWNERS ASSOCIATION, INC.
 HOBOKEN SHIPYARD - PROMENADE STABILIZATION
 SHIPYARD BULKHEAD RECONSTRUCTION
 OVERALL PLAN / KEY MAP

DESIGN	DATE
DESIGNED BY	DATE
CHECKED BY	DATE
DATE	DATE
SHEET NO. G-2	
OF 3	

PLOT 01 (A1) - 1/4" = 1' - 0" (1/4" = 1' - 0")
 DATE: 08/14/2018
 DRAWN BY: [Name]
 CHECKED BY: [Name]
 DATE: 08/14/2018



COORDINATE SYSTEM
 HORIZONTAL DATUM: NAD83, BASED ON OBSERVATIONS BY BIRDSELL SERVICES GROUP AND REFERRING TO NATIONAL GEODETIC MONUMENT WITH POINT ID K10490.
 VERTICAL DATUM: NGVD83, BASED ON OBSERVATIONS BY BIRDSELL SERVICES GROUP AND REFERRING TO NATIONAL GEODETIC MONUMENT WITH POINT ID K10490.

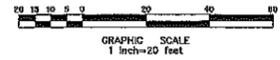
NOTES - MAP REFERENCES
 1. A PORTION OF THE TOPOGRAPHY, LOCATIONS AND OTHER EXISTING FEATURES SHOWN HEREON WAS OBTAINED FROM A PLAN ENTITLED "PRELIMINARY/FINAL MAJOR SITE PLAN, FOR 1 IMPROVEMENTS, LOT 1, BLOCK 2621, REFORMER'S SURVEY" PREPARED BY LSA ENGINEERING, INC., ASSIGNED A DRAWER NUMBER OF 311-010, AND DATED APRIL 9, 2009.
 2. THE AERIAL SHADY-TONE SHOWN HEREON IS A PORTION OF THE NAIP 2007 DATABASE AND IS SUBJECT TO THE FOLLOWING DISCLAIMER: THIS MAP WAS DEVELOPED USING NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION GEOGRAPHIC INFORMATION SYSTEM DIGITAL DATA, BUT THIS SECONDARY PRODUCT HAS NOT BEEN VERIFIED BY NAIP AND IS NOT STATE-AUTHORIZED.

NOTES - EXISTING CONDITIONS
 1. TUMBER CROSSING FOR SUBSTRUCTURE ELEMENTS AND UTILITY MARK-OUT LOCATIONS WERE FIELD-LOCATED AND MEASURED BY BIRDSELL SERVICES GROUP IN OCTOBER 2010 AND JANUARY 2011.
 2. BIRDSELL SERVICES GROUP MAKES NO GUARANTEES THAT ALL UNDERGROUND UTILITIES IN THIS AREA ARE SHOWN HEREON. THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL UNDERGROUND UTILITIES, TO INCLUDE CONTACTING THE NEW JERSEY ONE CALL SYSTEM PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES (SEE TITLE SHEET FOR FURTHER INFORMATION).

TIDE ELEVATIONS

MEAN HIGHER HIGH WATER	3.30'
MEAN HIGH WATER	3.04'
MEAN LOW WATER	1.58'
MEAN LOWER LOW WATER	0.11'
LOWEST TIDE	0.00'
MEAN LOW WATER	-1.84'
MEAN LOWER LOW WATER	-1.70'

BASED ON NOAA'S TIDE DATINGS AND BENCHMARK ELEVATION SHEET FOR STATION 851-8750 (THE BATTERY, NEW YORK).

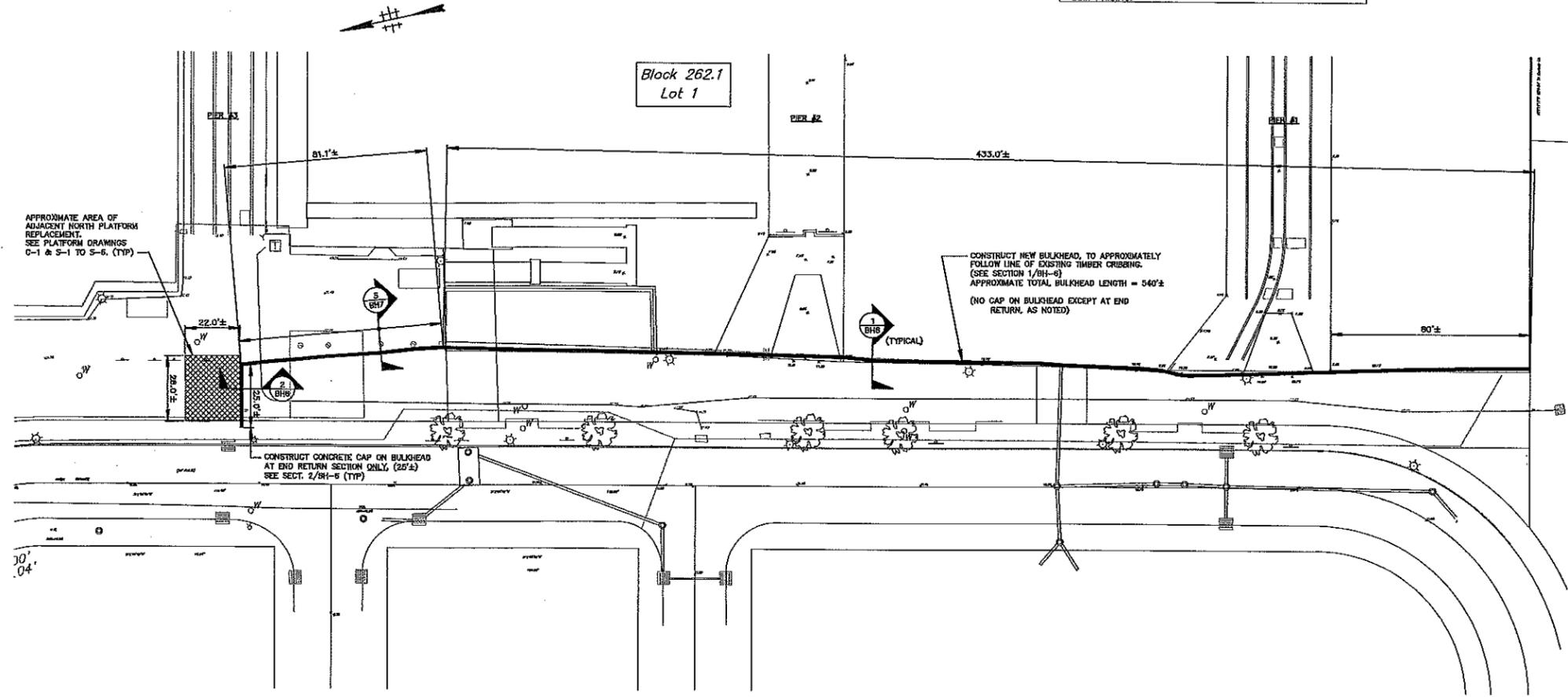


NO.	DATE	REVISION	DRAWN	CHECKED	SCALE																																		
BIRDSELL SERVICES GROUP ENGINEERS & CONSULTANTS Birdsell Engineering, Inc. 1000 West 17th Street Suite 200 Hoboken, NJ 07030 Tel: 201.348.1000 Fax: 201.348.1001 www.birdsell.com																																							
ANDREW W. RAICHE, P.E. PE Professional Engineer License No. 100000000																																							
LOT 1, BLOCK 2621 CITY OF HOBOKEN HUDSON COUNTY NEW JERSEY																																							
SHIPYARD PROPERTY OWNER'S ASSOCIATION, INC. HOBOKEN SHIPYARD - PROMENADE STABILIZATION SHIPYARD BULKHEAD RECONSTRUCTION EXISTING CONDITIONS																																							
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td colspan="2">DATE: 08/08/2010</td> <td colspan="2">PROJECT: ASSOCIATION</td> <td colspan="2">DRAWN: JRM</td> <td colspan="2">CHECKED: JRM</td> </tr> <tr> <td colspan="2">DATE: 08/08/2010</td> <td colspan="2">PROJECT: ASSOCIATION</td> <td colspan="2">DRAWN: JRM</td> <td colspan="2">CHECKED: JRM</td> </tr> <tr> <td colspan="2">DATE: 08/08/2010</td> <td colspan="2">PROJECT: ASSOCIATION</td> <td colspan="2">DRAWN: JRM</td> <td colspan="2">CHECKED: JRM</td> </tr> <tr> <td colspan="2">DATE: 08/08/2010</td> <td colspan="2">PROJECT: ASSOCIATION</td> <td colspan="2">DRAWN: JRM</td> <td colspan="2">CHECKED: JRM</td> </tr> </table>								DATE: 08/08/2010		PROJECT: ASSOCIATION		DRAWN: JRM		CHECKED: JRM		DATE: 08/08/2010		PROJECT: ASSOCIATION		DRAWN: JRM		CHECKED: JRM		DATE: 08/08/2010		PROJECT: ASSOCIATION		DRAWN: JRM		CHECKED: JRM		DATE: 08/08/2010		PROJECT: ASSOCIATION		DRAWN: JRM		CHECKED: JRM	
DATE: 08/08/2010		PROJECT: ASSOCIATION		DRAWN: JRM		CHECKED: JRM																																	
DATE: 08/08/2010		PROJECT: ASSOCIATION		DRAWN: JRM		CHECKED: JRM																																	
DATE: 08/08/2010		PROJECT: ASSOCIATION		DRAWN: JRM		CHECKED: JRM																																	
DATE: 08/08/2010		PROJECT: ASSOCIATION		DRAWN: JRM		CHECKED: JRM																																	
SHEET NO. G-3																																							



PRESERVATION & PROTECTION

CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING IMPROVEMENTS LOCATED WITHIN AND OUTSIDE OF THE WORK AREA, EXCEPT AS DESIGNATED FOR REMOVAL ON THE DESIGN DRAWINGS. ALL EXISTING IMPROVEMENTS THAT ARE DETRIMENTALLY AFFECTED BY THE CONTRACTOR'S WORK, INCLUDING BUT NOT LIMITED TO RAILINGS, PAVERS, PLANTER BOXES, LANDSCAPING, BENCHES, LIGHTING, BOLLARDS, SIGNAGE, CURBS, PAVEMENT, STRIPING, RETAINING WALLS, FINISHED & UNFINISHED SURFACES, MOORING HARDWARE, UTILITIES, GANGWAYS, ETC., SHALL BE RESTORED TO PRE-PROJECT CONDITIONS AS PART OF CONTRACTOR'S LUMP SUM PRICING.



BULKHEAD PLAN
(SCALE: 1" = 20')

TIDAL ELEVATIONS	
MEAN HIGH HIGH WATER:	3.38'
MEAN HIGH WATER:	3.04'
NAVD83 (REF)	1.08'
MEAN TIDE LEVEL:	0.77'
NGVD29 DATUM:	0.80'
MEAN LOW WATER:	-1.49'
MEAN LOW LOW WATER:	-1.70'

- NOTES:**
1. BULKHEAD PLAN IS BASED ON OVERALL PROJECT PLAN DRAWINGS G-1 THRU G-3
 2. FOR DEMOLITION PLAN, SEE DRAWINGS BH-2 & BH-3.
 3. FOR RESTORATION OF DEMOLITION AREAS, SEE DRAWING BH-5.
 4. FOR SECTIONS AND DETAILS OF NEW BULKHEADS, SEE DRAWINGS BH-6 & BH-7.
 5. FOR GENERAL NOTES ON BULKHEAD CONSTRUCTION, SEE DRAWING N-1.
 6. ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD PRIOR TO STARTING ANY WORK OR PURCHASING ANY MATERIALS.
 7. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN WITH CONSTRUCTION OF ADJACENT RECONSTRUCTION OF SINATRA DRIVE.
 8. ELEVATIONS SHOWN IN THE REFERENCE PLAN ON THIS SHEET ARE BASED ON NGVD29 DATUM.

DATE: _____
REVISION: _____
DRAWN: _____
FIELD: _____

BIRDSALL SERVICES GROUP
ENGINEERS & CONSULTANTS

BIRDSALL
ENGINEERING, INC.

1000 WEST 10TH AVENUE
SUITE 200
DENVER, CO 80202
TEL: 303.733.1100
WWW.BIRDSALL.COM

DATE: _____

RICHARD C. MALONEY, P.E.
REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF NEW JERSEY

LOT 1, BLOCK 262.1
CITY OF HOBOKEN
HUDSON COUNTY
NEW JERSEY

DATE: 01/11/11
SCALE: 1" = 20'

SHIPYARD PROPERTY OWNERS ASSOCIATION, INC.
HOBOKEN SHIPYARD - SHORELINE STABILIZATION PLAN

SHIPYARD BULKHEAD RECONSTRUCTION
STRUCTURAL BULKHEAD PLAN

Sheet No. **BH-1**

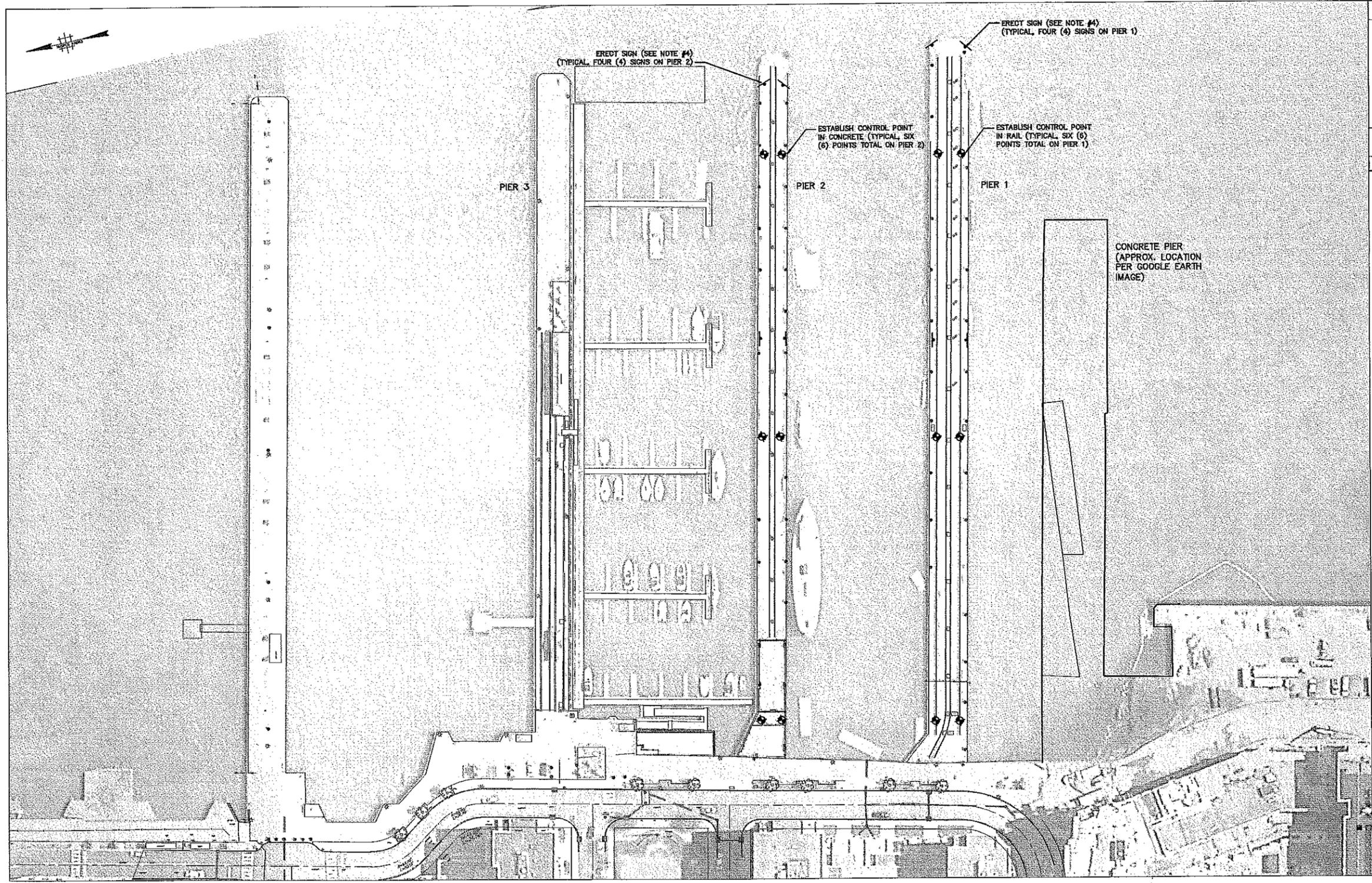
DATE: 01/11/11

SCALE: 1" = 20'

DESIGNED BY: _____
CHECKED BY: _____
DATE: 01/11/11

PROJECT NO. 11P-02





STRUCTURAL MONITORING PLAN
1" = 40'

COORDINATE SYSTEM
HORIZONTAL DATUM: NAD83, BASED ON OBSERVATIONS BY BIRDSELL SERVICES GROUP AND REFERENCING TO NATIONAL GEODETIC MONUMENT WITH POINT ID NY0495.
VERTICAL DATUM: NAVD83, BASED ON OBSERVATIONS BY BIRDSELL SERVICES GROUP AND REFERENCING TO NATIONAL GEODETIC MONUMENT WITH POINT ID NY0495.

REFER MAP REFERENCES
1. THE TOPOGRAPHY, LOCATIONS AND OTHER EXISTING FEATURES SHOWN HEREIN WERE OBTAINED FROM A PLAN ENTITLED "PRELIMINARY/TITLE MAJOR SITE PLAN, PIER 1 IMPROVEMENTS, LOT 1, BLOCK 282.1, SHIPYARD SHIPYARD, PREPARED BY LGA ENGINEERING, INC., ASSIGNED A DRAWER NUMBER OF 31-010, AND DATED APRIL 9, 2022.
2. IMAGE SOURCE: NAJN 2007 AERIAL PHOTOGRAPHY.

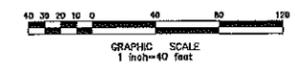
NOTES: STRUCTURAL MONITORING
1. PRIOR TO COMMENCEMENT OF DEMOLITION, CONTRACTOR SHALL ESTABLISH MONITORING POINTS AT EACH LOCATION SHOWN HEREIN. CONTRACTOR SHALL MEASURE AND RECORD HORIZONTAL POSITION AND ELEVATION OF EACH POINT DURING EACH WORK SHIFT BASED ON THE MONITORING SCHEDULE SHOWN BELOW. IF MOVEMENT OF MORE THAN ONE FIVE HUNDRETHS OF A FOOT (0.05 FT) IN ANY DIRECTION IS NOTED, CONTACT THE ENGINEER IMMEDIATELY, REMOVE PERSONNEL FROM THE PIERS, AND STOP ALL WORK.
2. MONITORING SCHEDULE POSITIONS AND ELEVATIONS OF EACH POINT ARE TO BE RECORDED AT THREE (3) TIMES DURING EACH EIGHT-HOUR WORK SHIFT AND SHALL BE EQUALLY SPACED THROUGHOUT THE WORK SHIFT.
3. PRIOR TO COMMENCEMENT OF DEMOLITION ACTIVITIES FOR EACH PIER, AND FOR THE DURATION OF DEMOLITION WORK, NO VESSELS ARE TO BE MOORED ON PIER 1 OR PIER 2. IF A VESSEL IS OBSERVED TO BE MOORED OR ATTEMPTS TO MOOR ON EITHER PIER, THE CONTRACTOR IS TO IMMEDIATELY CONTACT THE ENGINEER AND STOP ALL WORK.

4. CONTRACTOR SHALL PROVIDE STORAGE AT LOCATIONS NOTED HEREIN, PROHIBITING MOORING OF VESSELS ON PIERS DURING DEMOLITION ACTIVITIES.
5. CONTRACTOR SHALL MAINTAIN SIGNS (NOTE #4) FOR THE DURATION OF THE DEMOLITION OF PIERS AND SHALL VERIFY DAILY THAT ALL SIGNS ARE PRESENT. UPON COMPLETION OF THE DEMOLITION, THE CONTRACTOR SHALL REMOVE OR LEAVE SIGNS IN PLACE, AT THE DISCRETION OF THE OWNER. THE CONTRACTOR SHALL RECEIVE WRITTEN DETERMINATION FROM THE OWNER AS PART OF THE PROJECT CONTRACT CLOSEOUT DOCUMENTS.
6. CONTRACTOR SHALL COORDINATE WITH OWNER AND TENANTS OF PIERS TO FACILITATE VESSEL MOORING DURING DEMOLITION ACTIVITIES AND OTHER WORK.
7. OWNER AND DONOR MAKE NO WARRANTY OR REPRESENTATION AS TO THE STABILITY OF ANY PIERS, CRIBBING, OR OTHER COASTAL STRUCTURES WITHIN THE LIMIT OF WORK.

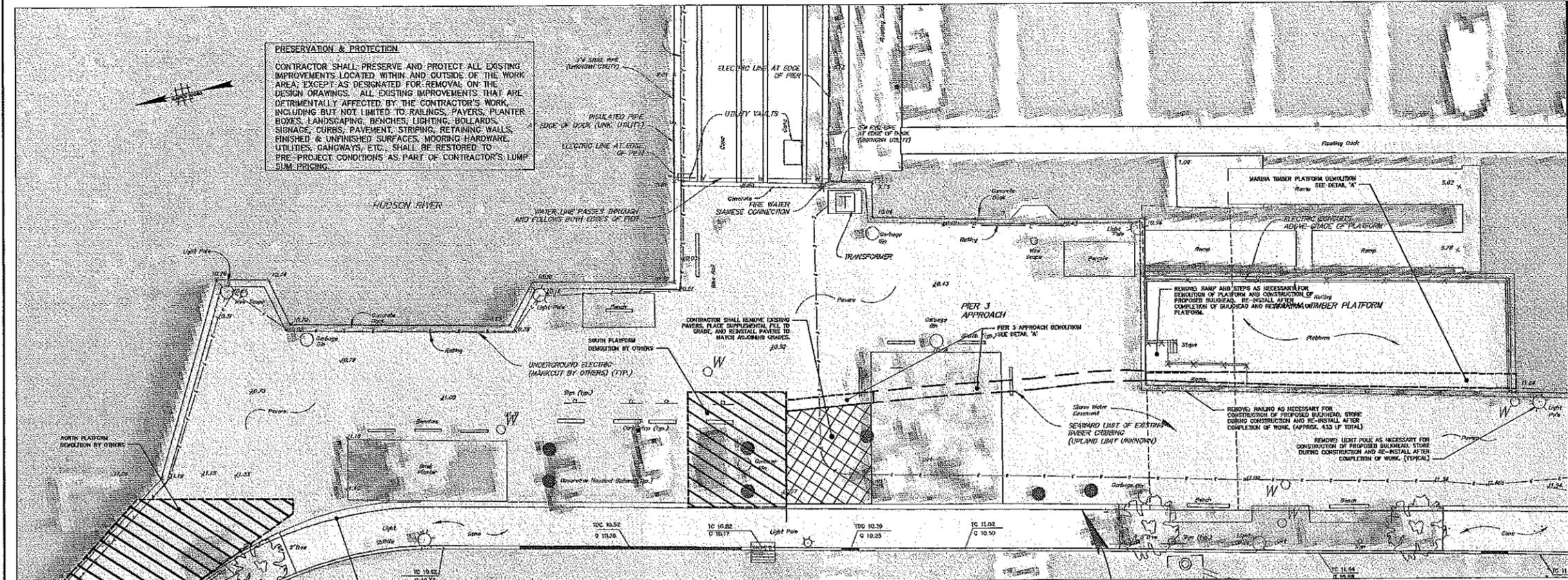
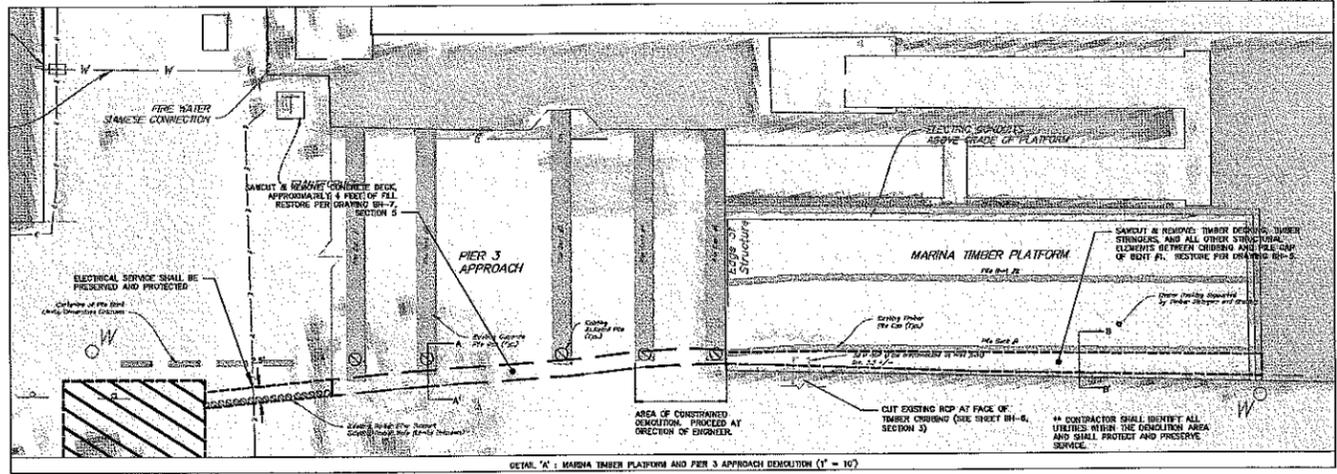
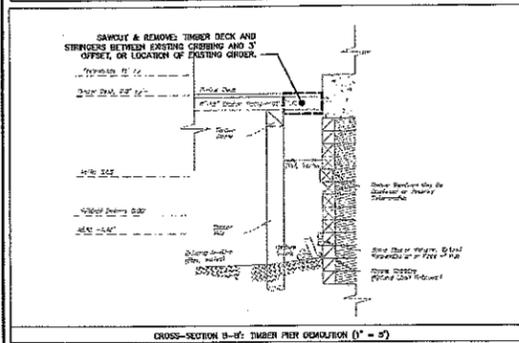
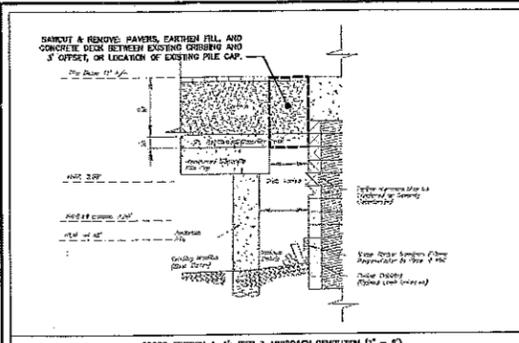
TIDAL ELEVATION

MEAN HIGHER HIGH WATER	3.40'
MEAN HIGH WATER	3.00'
MEAN TIDE LEVEL	0.00'
MEAN LOW WATER	-1.00'
MEAN LOWER LOW WATER	-1.50'

BASED ON NOAA'S TIDAL DATUMS AND BENCHMARK ELEVATION SHEET FOR STATION 851-8750 (THE BATTERY, NEW YORK).



<p>BIRDSELL SERVICES GROUP ENGINEERS & CONSULTANTS BIRDSELL ENGINEERING, INC. 1000 WEST 17TH AVENUE DENVER, CO 80202 TEL: 303.733.1111 WWW.BIRDSELLGROUP.COM</p>	<p>DATE: _____</p> <p>ANDREW W. RAICHELE, P.E. NY Professional Engineer No. 138818B</p>
<p>LOT 1, BLOCK 282.1 CITY OF HOBOKEN HUDSON COUNTY NEW JERSEY</p>	
<p>SHIPYARD PROPERTY OWNERS ASSOCIATION, INC. HOBOKEN SHIPYARD - PROMENADE STABILIZATION SHIPYARD BULKHEAD RECONSTRUCTION STRUCTURAL MONITORING PLAN</p>	
<p>DATE: 1-09-2020 SCALE: AS SHOWN BY: AS SHOWN</p> <p>Drawn: [] Checked: [] Reviewed: [] Date: [] Sheet: []</p> <p>SHEET NO. BH-2 OF 7</p>	



COORDINATE SYSTEM
 HORIZONTAL DATUM: ANSRS, BASED ON OBSERVATIONS BY BIRDSELL SERVICES GROUP AND REFERRING TO NATIONAL GEODETIC MONUMENT WITH POINT ID 470455.
 VERTICAL DATUM: NAVD83, BASED ON OBSERVATIONS BY BIRDSELL SERVICES GROUP AND REFERRING TO NATIONAL GEODETIC MONUMENT WITH POINT ID 470455.

NOTES: MAP REFERENCES

- THE TOPOGRAPHY, LOCATIONS AND OTHER EXISTING FEATURES SHOWN HEREON WERE OBTAINED FROM A PLAN ENTITLED 'PRELIMINARY/FINAL MAJOR SITE PLAN, PIER 3 IMPROVEMENTS, LOT 1, BLOCK 262, TOPOGRAPHIC SURVEY PREPARED BY LCA ENGINEERING, INC., ASSIGNED A DRAWER NUMBER OF 310-010, AND DATED APRIL 9, 2007.
- SEAWARD LIMIT OF EXISTING CRIBBING AS WELL AS THE CONFIGURATION OF PIER AND PLATFORM SUBSTRUCTURES WERE FIELD-LOCATED BY BIRDSELL SERVICES GROUP IN DECEMBER 2010 (SEE SHEETS 2 AND 3).

NOTES: DEMOLITION

- UTILITIES PENETRATIONS THROUGH THE EXISTING CRIBBING ARE INDICATED HEREON BY THE SYMBOL (U).
- THESE PENETRATIONS REPRESENT PIPES, CONDUITS, OR OTHER UTILITY ELEMENTS THAT PASS THROUGH THE FACE OF THE EXISTING CRIBBING. THE TYPE AND STATUS OF THESE UTILITIES IS UNKNOWN.
- THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL UNDERGROUND UTILITIES TO INCLUDE CONTACTING THE NEW JERSEY ONE CALL SYSTEM PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES (SEE THIS SHEET FOR FURTHER INFORMATION).
- PRIOR TO COMMENCEMENT OF CONSTRUCTION, CONTRACTOR SHALL ESTABLISH CONTROL POINTS AT VARIOUS LOCATIONS. THE ELEVATIONS AND HORIZONTAL POSITIONS OF THESE POINTS SHALL BE MONITORED DAILY FOR MOVEMENT THROUGH APPROPRIATE SURVEYING TECHNIQUES. SEE SHEET BH-2 FOR FURTHER INSTRUCTIONS.

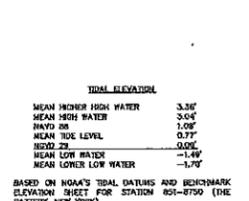
- PRIOR TO COMMENCEMENT OF AND FOR THE DURATION OF DEMOLITION, NO VESSELS ARE TO BE MOORED ON PIER 1 OR PIER 2. IF A VESSEL IS OBSERVED TO BE MOORED OR ATTEMPTS TO MOOR ON EITHER PIER, THE CONTRACTOR IS TO IMMEDIATELY CONTACT THE ENGINEER AND STOP ALL WORK.
- THE CONTRACTOR IS TO MAINTAIN ACCESS TO PIER 3 IN COORDINATION WITH OWNER. THE CONTRACTOR SHALL MAINTAIN UTILITY SERVICES TO PIER 3 WITH MINIMAL INTERRUPTIONS. ALL NECESSARY INTERRUPTIONS SHALL BE COORDINATED WITH THE PROJECT OWNER, AND THE CONTRACTOR SHALL PROVIDE THE OWNER WITH 72 HOURS' NOTICE PRIOR TO A SCHEDULED INTERRUPTION.
- OWNER/ENGINEER MAKE NO REPRESENTATION AS TO THE STABILITY AND/OR SUITABILITY OF STAGING AREAS FOR CONSTRUCTION.
- CONTRACTOR IS TO FIELD-VERIFY THE ABILITY OF ALL AREAS TO SUPPORT EQUIPMENT AND OTHER LOADS AND IS RESPONSIBLE FOR PROVIDING ALL NECESSARY MEANS OF SUPPORT.
- CONTRACTOR IS TO REMOVE ALL WASTE AT AN APPROVED DISPOSAL FACILITY. ALL DISPOSAL ITEMS SHALL BE RETAINED AND COPIES SHALL BE SUPPLIED TO THE ENGINEER.
- CONTRACTOR SHALL RESTORE ALL WORK AREAS TO PRE-CONSTRUCTION CONDITIONS.
- PROTECTION OF ADJACENT INFRASTRUCTURE, BUILDINGS, AND VEHICLES FROM DUST, DEMOLITION DEBRIS, AND VIBRATION RESULTING FROM DEMOLITION OPERATIONS IS OF THE UTMOST IMPORTANCE. CONTRACTOR SHALL PROVIDE PROTECTION BY ACCORDANCE WITH CHAPTER 53 - 'SAFETY/HAZARD BUREAU CONSTRUCTION' OF INTERNATIONAL BUILDING CODE 2006, NEW JERSEY EDITION, AS WELL AS APPLICABLE OSHA REQUIREMENTS.

- CONTRACTOR SHALL CONDUCT PRE-DEMOLITION AND POST-DEMOLITION PHOTOGRAPHY AND VIDEO OF WORK AREA AND ADJACENT INFRASTRUCTURE.
- CONTRACTOR SHALL STABILIZE THE FILL AND SURFACE INFRASTRUCTURE OF ADJACENT STRUCTURES THAT ARE EXPOSED AS A RESULT OF THE PROPOSED DEMOLITION.
- CONTRACTOR SHALL EMPLOY SAN CUTTING AND/OR OTHER METHODOLOGY TO ENSURE THE SOUNDNESS AND AESTHETIC APPEARANCE OF ADJACENT SURFACE INFRASTRUCTURE TO REMAIN.
- CONTRACTOR SHALL CAREFULLY REMOVE AND PALLETIZE EXISTING PAVEMENT, BENCHES, RAILING, BOLLARDS, TRASH CANS, LIGHT POLES AND MISCELLANEOUS APPURTENANCES FOR RE-INSTALLATION.
- CONTRACTOR SHALL EMPLOY BEST MANAGEMENT PRACTICES TO PROTECT AND PRESERVE THE HUDSON RIVER FROM DUSTY OPERATIONS AND SEDIMENT/OBSOLETE DEPOSITION. CONTRACTOR SHALL EMPLOY A 5% CURTAIN AROUND THE SEA FRONTAGE OF ALL WORK AREAS THROUGHOUT THE DURATION OF THE CONTRACT.

TOTAL ELEVATION

MEAN HIGH WATER	3.30'
MEAN HIGH WATER	3.04'
MEAN TIDE LEVEL	1.00'
MEAN TIDE LEVEL	0.77'
MEAN TIDE LEVEL	0.00'
MEAN LOW WATER	-1.49'
MEAN LOWER LOW WATER	-1.70'

BASED ON NOAA'S TIDAL DATUMS AND BENCHMARK ELEVATION SHEET FOR STATION 821-8750 (THE BATTERY, NEW YORK).



MATCH LINE: SHEET BH-4

NO.	DATE	REVISION	BY	CHKD	FILED
1					

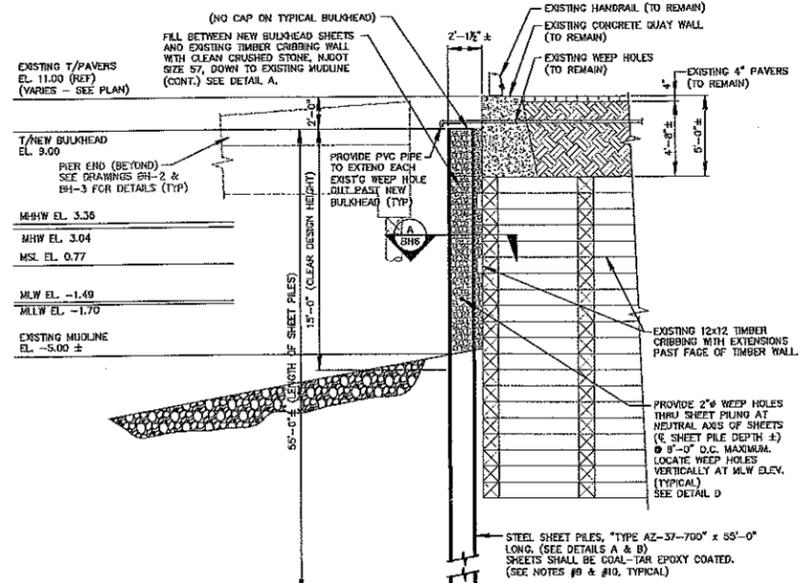
BIRDSELL SERVICES GROUP
 ENGINEERS & CONSULTANTS
 BIRDSELL SERVICES GROUP
 1000 WEST 10TH STREET
 HOBOKEN, NJ 07030
 TEL: 201-991-8800
 FAX: 201-991-8801
 WWW.BIRDSELL.COM

DATE: _____
 ANDREW W. RAICHE, P.E.
 20 Hudson Lane, Suite 100
 Hoboken, NJ 07030

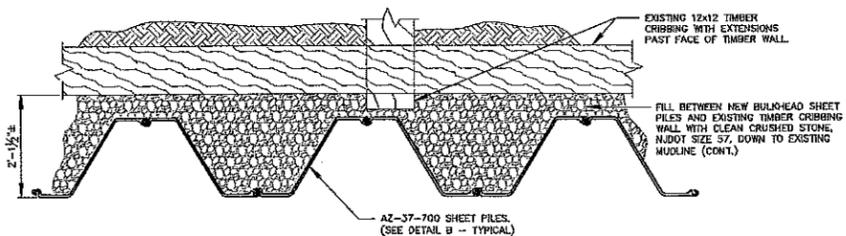
LOT 1, BLOCK 262-1
 CITY OF HOBOKEN
 HUDSON COUNTY
 NEW JERSEY

SHIPYARD PROPERTY OWNERS ASSOCIATION, INC.
 HOBOKEN SHIPYARD - PROMENADE STABILIZATION
 SHIPYARD BULKHEAD RECONSTRUCTION
 DEMOLITION PLAN - NORTHERN SECTION

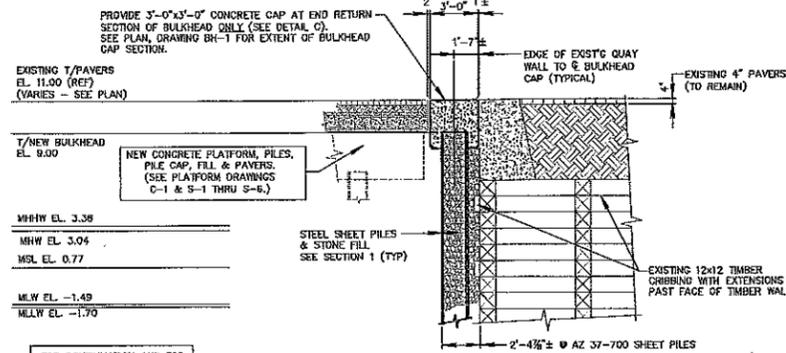
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SCALE:	AS SHOWN
BY:	AWR
CHKD:	TJR
APP'D:	AWR
DATE:	3/20/11
SHEET NO.:	BH-3
OF 7	



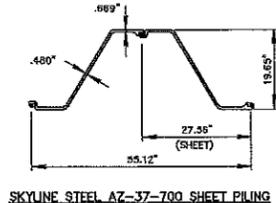
SECTION 1
TYPICAL BULKHEAD SECTION
(SCALE: 1/4" = 1'-0")



DETAIL A
PLAN VIEW AT SHEET PILE BULKHEAD
(SCALE: 3/4" = 1'-0")

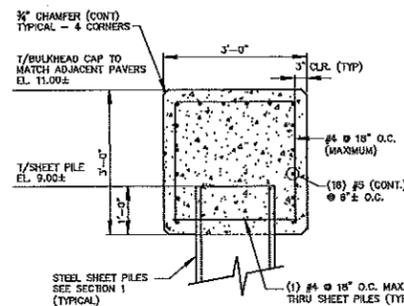


SECTION 2
END BULKHEAD SECTION - WITH CAP
(SCALE: 1/4" = 1'-0")

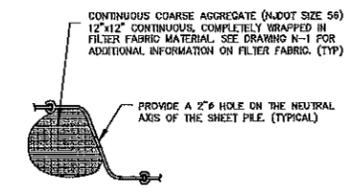


SKYLINE STEEL AZ-37-700 SHEET PILING

DETAIL B
TYPICAL SHEET PILE SECTION & PROPERTIES
(SCALE: 3/4" = 1'-0")



DETAIL C
TYPICAL CONCRETE BULKHEAD CAP
(SCALE: 3/4" = 1'-0")



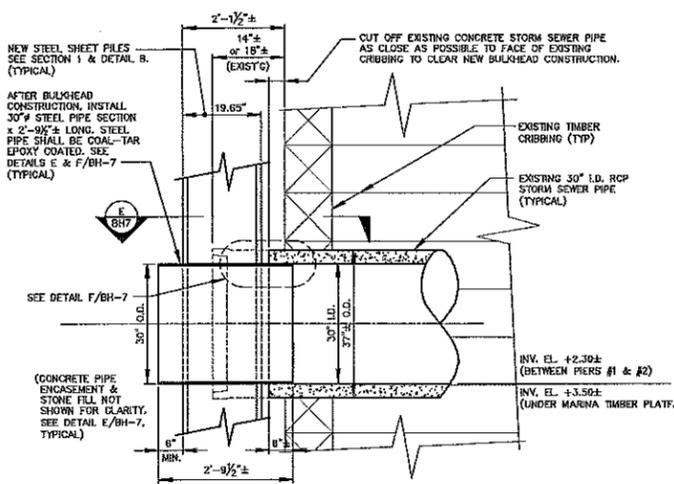
DETAIL D
TYPICAL SHEET PILE WEEP HOLE DETAIL
(NOT TO SCALE)

TIDAL ELEVATIONS	
MEAN HIGH HIGH WATER	3.36'
MEAN HIGH WATER	3.04'
NAVD83 (REF)	1.08'
MEAN TIDE LEVEL	0.77'
NGVD29 DATUM	0.00'
MEAN LOW WATER	-1.40'
MEAN LOW LOW WATER	-1.70'

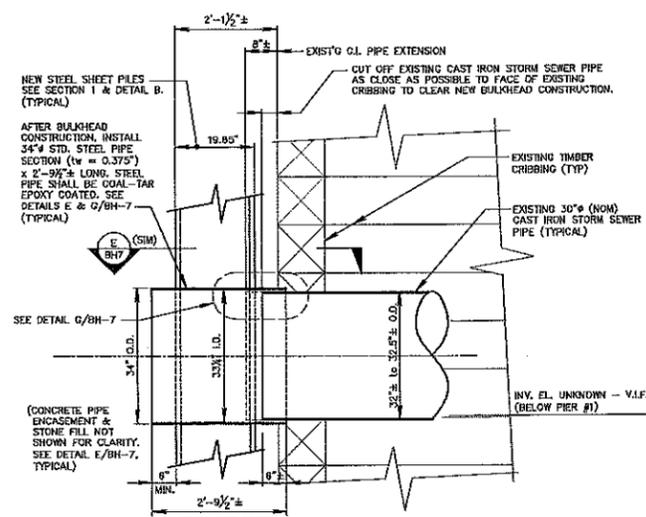
PRESERVATION & PROTECTION

CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING IMPROVEMENTS LOCATED WITHIN AND OUTSIDE OF THE WORK AREA, EXCEPT AS DESIGNATED FOR REMOVAL ON THE DESIGN DRAWINGS. ALL EXISTING IMPROVEMENTS THAT ARE DETRIMENTALLY AFFECTED BY THE CONTRACTOR'S WORK, INCLUDING BUT NOT LIMITED TO RAILINGS, PAVERS, PLANTER BOXES, LANDSCAPING, BENCHES, LIGHTING, BOLLARDS, SIGNAGE, CURBS, PAVEMENT, STRIPING, RETAINING WALLS, FINISHED & UNFINISHED SURFACES, MOORING HARDWARE, UTILITIES, GANGWAYS, ETC., SHALL BE RESTORED TO PRE-PROJECT CONDITIONS AS PART OF CONTRACTOR'S LUMP SUM PRICING.

- NOTES:**
- FOR PLAN LOCATIONS AND EXTENTS OF NEW BULKHEAD CONSTRUCTION, SEE DRAWING BH-1.
 - FOR DEMOLITION AT ADJACENT PIER AND PLATFORM CONSTRUCTION, SEE DRAWINGS BH-2 THRU BH-4.
 - FOR PLAN OF UTILITY PENETRATIONS AT BULKHEAD, SEE DRAWINGS BH-2 THROUGH BH-4.
 - FOR ADDITIONAL SECTIONS AND DETAILS, SEE DRAWING BH-7.
 - FOR GENERAL STRUCTURAL NOTES ON BULKHEAD CONSTRUCTION, SEE DRAWING N-1.
 - ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD PRIOR TO STARTING ANY WORK OR PROCURING ANY MATERIALS.
 - CONTRACTOR SHALL COORDINATE ALL WORK SHOWN WITH ADJACENT RECONSTRUCTION OF SHATRA DRIVE.
 - ELEVATIONS SHOWN ON THIS SHEET ARE REFERENCED TO NGVD29 DATUM, AS FOLLOWS:
 - A. T/PAVERS AT FINISHED SURFACE = EL. 11.00 (REF)
 - B. T/BULKHEAD = EL. 9.00
 - F. APPROXIMATE EXISTING MUDLINE = EL. -5.00 ± (CLEAR HEIGHT USED FOR BULKHEAD DESIGN = 15.00')
 - ALL STEEL SHEET PILES SHALL BE COATED WITH COAL-TAR EPOXY. SEE NOTES, SHEET N-1 FOR ADDITIONAL COATING INFORMATION.
 - SHEET PILES SHALL BE PROVIDED WITH SUFFICIENT EXTRA SACRIFICIAL LENGTH ABOVE INDICATED T/BULKHEAD ELEVATION TO ALLOW FOR DRIVING EQUIPMENT CLEARANCES AS REQUIRED. CONTRACTOR SHALL INCLUDE COSTS FOR SUCH SACRIFICIAL SHEET PILE LENGTH IN BID. NO EXTRA COSTS WILL BE COMPENSATED BY OWNER FOR EXTRA SHEET LENGTH REQUIRED FOR DRIVING CLEARANCES. (TYPICAL FOR ENTIRE LENGTH OF BULKHEAD.)



SECTION 3
CONCRETE PIPE PENETRATION AT SHEET PILES
(SCALE: 3/4" = 1'-0")



SECTION 4
CAST IRON PIPE PENETRATION AT SHEET PILES
(SCALE: 3/4" = 1'-0")

DATE: 08/14/2013
DRAWN BY: J. MALONEY
CHECKED BY: J. MALONEY
IN CHARGE: J. MALONEY
PROJECT: SHIPYARD BULKHEAD RECONSTRUCTION

BIRDSELL SERVICES GROUP
ENGINEER & CONSULTANT
BIRDSELL ENGINEERING, INC.
1000 W. 17TH ST., SUITE 200
HOUSTON, TEXAS 77058
PH: 281.462.1111
WWW.BIRDSELL.COM

LOT 1, BLOCK 2621
CITY OF HOBOKEN
HUDSON COUNTY
NEW JERSEY

RICHARD C. MALONEY, P.E.
REGISTERED PROFESSIONAL ENGINEER
STATE OF NEW JERSEY
NO. 123456789

SHIPYARD PROPERTY OWNERS ASSOCIATION, INC.
HOBOKEN SHIPYARD - SHORELINE STABILIZATION PLAN

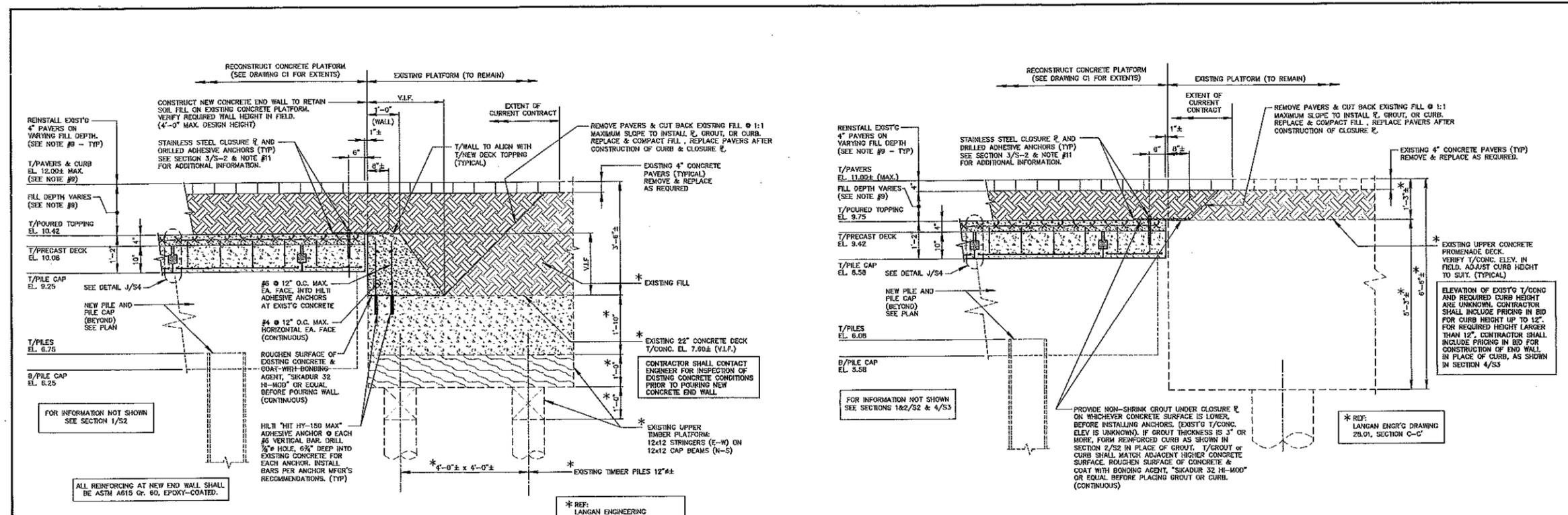
SHIPYARD BULKHEAD RECONSTRUCTION
STRUCTURAL SECTIONS & DETAILS - Sht. 1 of 2

DATE: 08/14/2013
DRAWN BY: J. MALONEY
CHECKED BY: J. MALONEY
IN CHARGE: J. MALONEY
PROJECT: SHIPYARD BULKHEAD RECONSTRUCTION

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

BH-6

OF 1

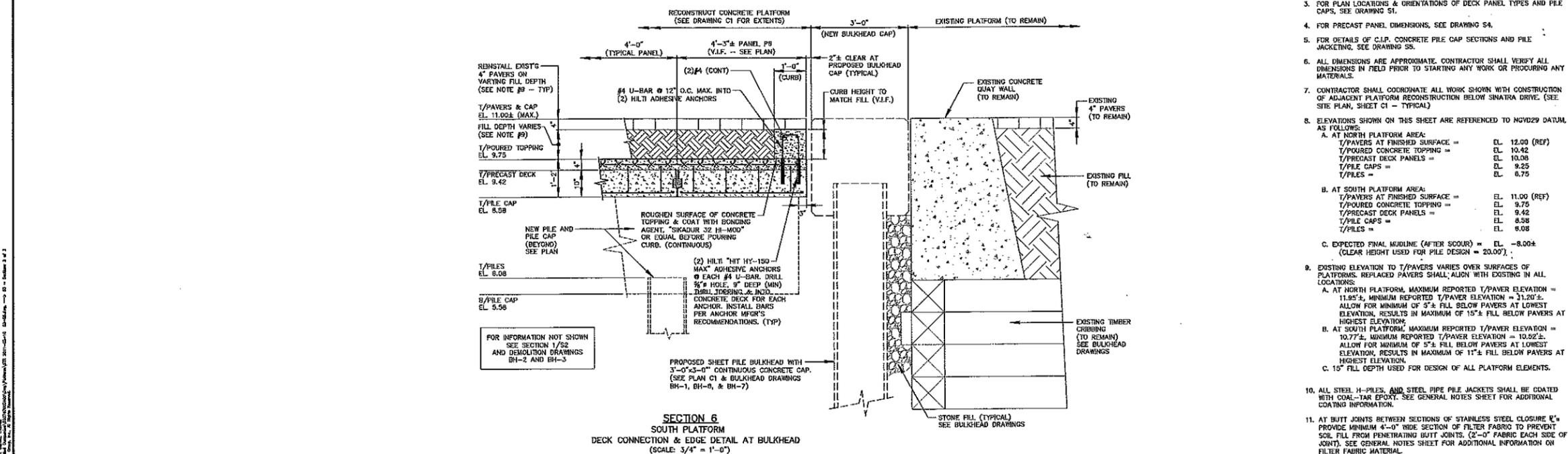


SECTION 4
NORTH PLATFORM
DECK CONNECTION & EDGE DETAIL AT EXISTING UPPER PLATFORM
(SCALE: 3/4" = 1'-0")

SECTION 5
SOUTH PLATFORM
DECK CONNECTION & EDGE DETAIL AT EXISTING PLATFORM
(SCALE: 3/4" = 1'-0")

TIDAL ELEVATIONS	
MEAN HIGH HIGH WATER:	3.38'
MEAN HIGH WATER:	3.04'
HANDS (REF.):	1.04'
MEAN TIDE LEVEL:	0.77'
HYDROG DATUM:	0.00'
MEAN LOW WATER:	-1.49'
MEAN LOW LOW WATER:	-1.73'

PRESERVATION & PROTECTION:
CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING IMPROVEMENTS LOCATED WITHIN AND OUTSIDE OF THE WORK AREA, EXCEPT AS DESIGNATED ON THE DESIGN DRAWINGS FOR REMOVAL. ALL EXISTING IMPROVEMENTS THAT ARE DETRIMENTALLY AFFECTED BY THE CONTRACTOR'S WORK, INCLUDING BUT NOT LIMITED TO RAILINGS, PAVERS, PLANTER BOXES, LANDSCAPING, BENCHES, LIGHTING, BOLLARDS, SIGNAGE, CURBS, PAVEMENT, STRIPING, RETAINING WALLS, FINISHED & UNFINISHED SURFACES, MOORING HARDWARE, UTILITIES, GANGWAYS, ETC., SHALL BE RESTORED TO PRE-CONTRACT CONDITIONS AS PART OF THE CONTRACTOR'S LUMP SUM PRICING.



SECTION 6
SOUTH PLATFORM
DECK CONNECTION & EDGE DETAIL AT BULKHEAD
(SCALE: 3/4" = 1'-0")

- NOTES:**
- FOR LOCATIONS OF NEW PLATFORM AREAS, SEE DRAWING C1.
 - FOR STRUCTURAL NOTES ON PLATFORM CONSTRUCTION, SEE GENERAL NOTES DRAWING.
 - FOR PLAN LOCATIONS & ORIENTATIONS OF DECK PANEL TYPES AND PILE CAPS, SEE DRAWING S1.
 - FOR PRECAST PANEL DIMENSIONS, SEE DRAWING S4.
 - FOR DETAILS OF C.I.P. CONCRETE PILE CAP SECTIONS AND PILE JACKETING, SEE DRAWING S5.
 - ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD PRIOR TO STARTING ANY WORK OR PROCURING ANY MATERIALS.
 - CONTRACTOR SHALL COORDINATE ALL WORK SHOWN WITH CONSTRUCTION OF ADJACENT PLATFORM RECONSTRUCTION BELOW SINATRA DRIVE. (SEE SITE PLAN, SHEET C1 - TYPICAL)
 - ELEVATIONS SHOWN ON THIS SHEET ARE REFERENCED TO NGVD29 DATUM, AS FOLLOWS:

A. AT NORTH PLATFORM AREA:	
T/PAVERS AT FINISHED SURFACE =	EL. 12.00 (REF)
T/POURED CONCRETE TOPPING =	EL. 10.42
T/PRECAST DECK PANELS =	EL. 10.08
T/PILE CAPS =	EL. 9.25
T/FILES =	EL. 6.75
B. AT SOUTH PLATFORM AREA:	
T/PAVERS AT FINISHED SURFACE =	EL. 11.00 (REF)
T/POURED CONCRETE TOPPING =	EL. 9.75
T/PRECAST DECK PANELS =	EL. 9.42
T/PILE CAPS =	EL. 8.58
T/FILES =	EL. 6.08
C. EXPECTED FINAL MUDLINE (AFTER SCOUR):	
(CLEAR HEIGHT USED FOR PILE DESIGN = 20.00')	EL. -8.00±
 - EXISTING ELEVATION TO T/PAVERS VARIES OVER SURFACES OF PLATFORMS. REPLACED PAVERS SHALL ALIGN WITH EXISTING IN ALL LOCATIONS.
 - AT NORTH PLATFORM, MAXIMUM REPORTED T/PAVER ELEVATION = 11.85±, MINIMUM REPORTED T/PAVER ELEVATION = 11.20±. ALLOW FOR MINIMUM OF 5±" FILL BELOW PAVERS AT LOWEST ELEVATION. RESULTS IN MAXIMUM OF 15±" FILL BELOW PAVERS AT HIGHEST ELEVATION.
 - AT SOUTH PLATFORM, MAXIMUM REPORTED T/PAVER ELEVATION = 10.77±, MINIMUM REPORTED T/PAVER ELEVATION = 10.52±. ALLOW FOR MINIMUM OF 5±" FILL BELOW PAVERS AT LOWEST ELEVATION. RESULTS IN MAXIMUM OF 11±" FILL BELOW PAVERS AT HIGHEST ELEVATION.
 - 15" FILL DEPTH USED FOR DESIGN OF ALL PLATFORM ELEMENTS.
 - ALL STEEL H-PILES, AND STEEL PIPE PILE JACKETS SHALL BE COATED WITH COAL-TAR EPOXY. SEE GENERAL NOTES SHEET FOR ADDITIONAL COATING INFORMATION.
 - AT BUTT JOINTS BETWEEN SECTIONS OF STAINLESS STEEL CLOSURE 'E' PROVIDE MINIMUM 4'-0" WIDE SECTION OF FILTER FABRIC TO PREVENT SOIL FILL FROM PENETRATING BUTT JOINTS. (2'-0" FABRIC EACH SIDE OF JOINT). SEE GENERAL NOTES SHEET FOR ADDITIONAL INFORMATION ON FILTER FABRIC MATERIAL.

DRAWN: C180
REVISION:
DATE:
NO.:

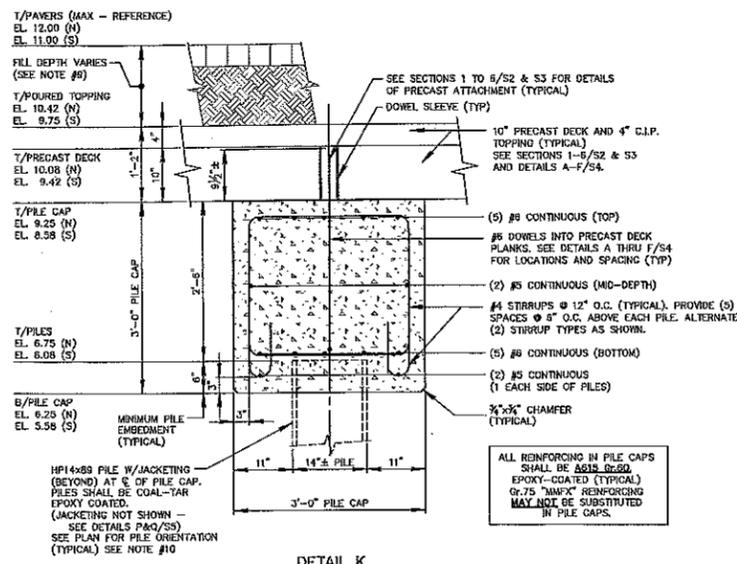
BIRDSELL SERVICES GROUP
ENGINEERS & CONSULTANTS
BIRDSELL ENGINEERING, INC.
1000 WASHINGTON STREET
NEW JERSEY 07093

RICHARD C. MALONEY, P.E.
REGISTERED PROFESSIONAL ENGINEER, STATE OF NEW JERSEY
NO. 120000000

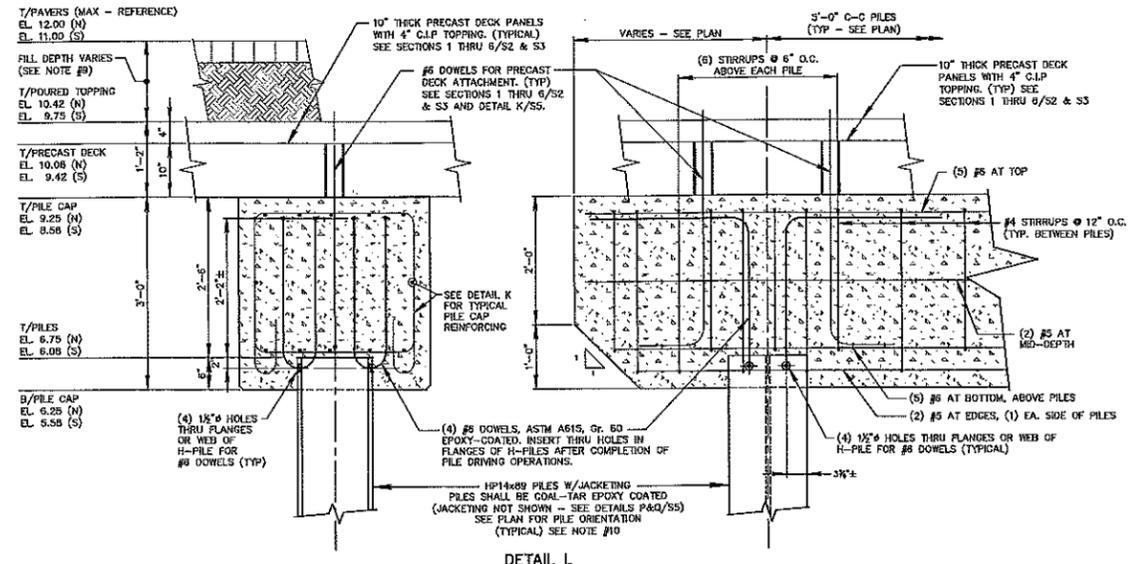
LOT 1, BLOCK 282.1
SINATRA DRIVE
CITY OF HOBOKEN
HUDSON COUNTY
NEW JERSEY

SHIPYARD PROPERTY OWNERS ASSOCIATION, INC.
SHOBYARD SHIPYARD - SHORELINE STABILIZATION PLAN
UPPER LEVEL PLATFORM RECONSTRUCTION
STRUCTURAL PLATFORM SECTIONS & DETAILS - Sht. 2 of 4

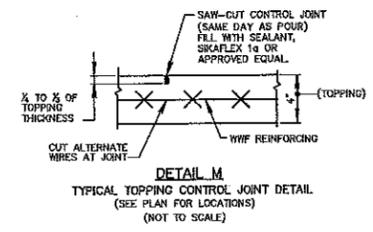
JAW
SHEET NO. 53



DETAIL K
TYPICAL CONCRETE PILE CAP DETAIL
(SCALE: 1" = 1'-0")

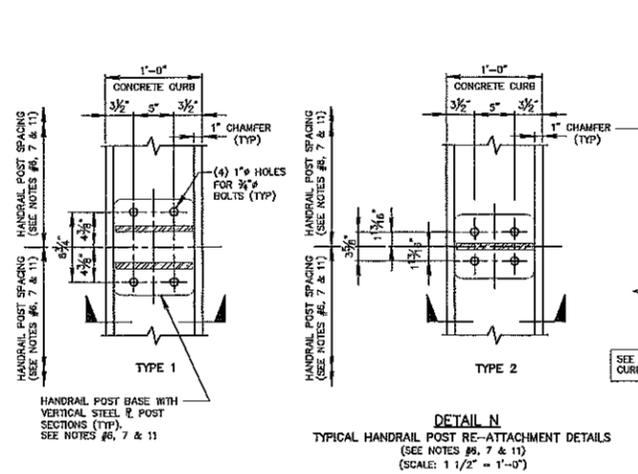


DETAIL L
TYPICAL PILE-TO-CAP CONNECTION DETAIL
(SCALE: 1" = 1'-0")

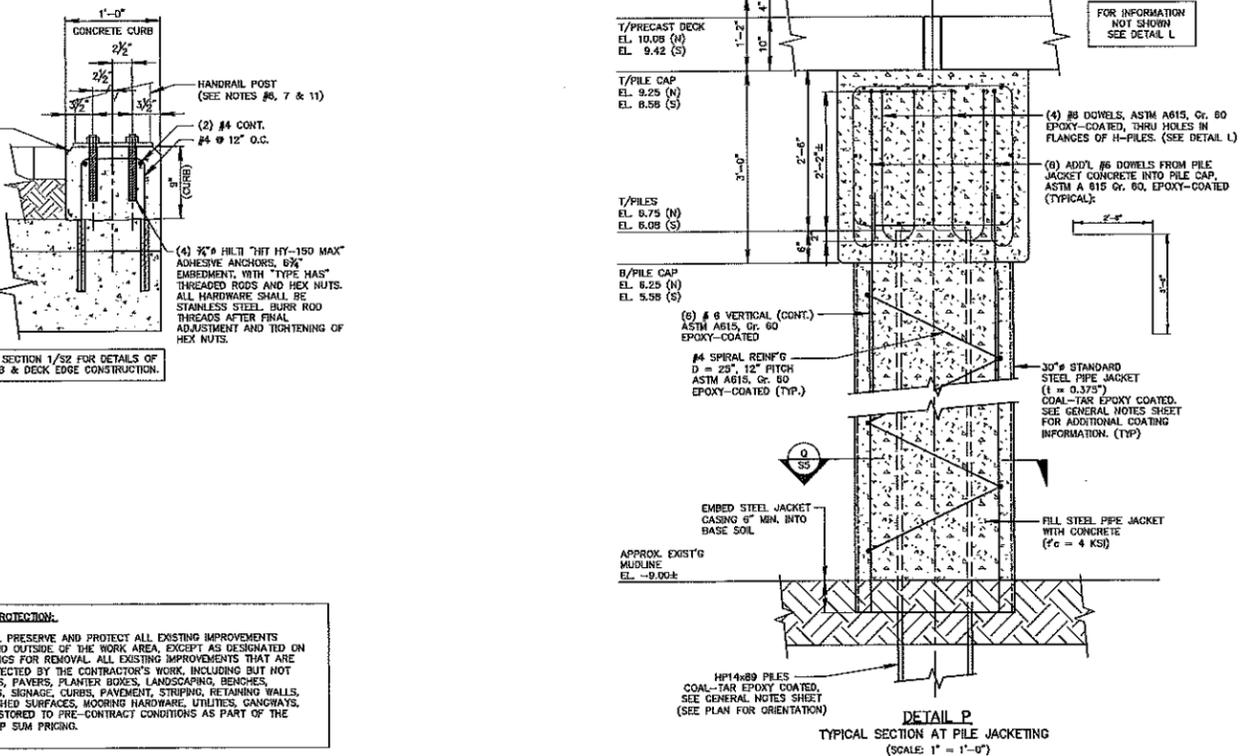


DETAIL M
TYPICAL TOPPING CONTROL JOINT DETAIL
(SEE PLAN FOR LOCATIONS)
(NOT TO SCALE)

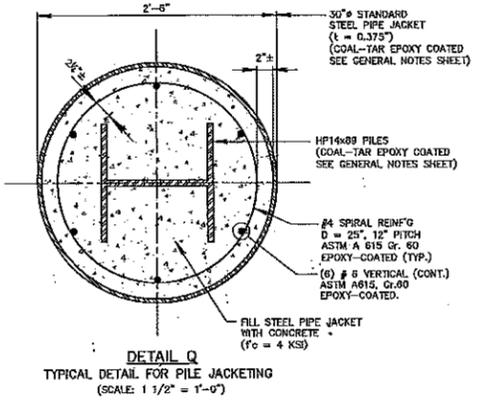
TIDAL ELEVATIONS	
MEAN HIGH HIGH WATER:	3.35'
MEAN HIGH WATER:	3.04'
NAVODDS (REF):	1.08'
MEAN TIDE LEVEL:	0.77'
NGVD29 DATUM:	0.00'
MEAN LOW WATER:	-1.49'
MEAN LOW LOW WATER:	-1.70'



DETAIL N
TYPICAL HANDRAIL POST RE-ATTACHMENT DETAILS
(SEE NOTES #6, 7 & 11)
(SCALE: 1 1/2" = 1'-0")



DETAIL P
TYPICAL SECTION AT PILE JACKETING
(SCALE: 1" = 1'-0")



DETAIL Q
TYPICAL DETAIL FOR PILE JACKETING
(SCALE: 1 1/2" = 1'-0")

PRESERVATION & PROTECTION.
CONTRACTOR SHALL PRESERVE AND PROTECT ALL EXISTING IMPROVEMENTS LOCATED WITHIN AND OUTSIDE OF THE WORK AREA, EXCEPT AS DESIGNATED ON THE DESIGN DRAWINGS FOR REMOVAL. ALL EXISTING IMPROVEMENTS THAT ARE DETRIMENTALLY AFFECTED BY THE CONTRACTOR'S WORK, INCLUDING BUT NOT LIMITED TO RAILINGS, PAVERS, PLANTER BOXES, LANDSCAPING, BENCHES, LIGHTING, BOLLARDS, SIGNAGE, CURBS, PAVEMENT, STRIPING, RETAINING WALLS, FINISHED & UNFINISHED SURFACES, MOORING HARDWARE, UTILITIES, CANNYWAYS, ETC., SHALL BE RESTORED TO PRE-CONTRACT CONDITIONS AS PART OF THE CONTRACTOR'S LUMP SUM PRICING.

- NOTES:**
- FOR LOCATIONS OF NEW PLATFORM AREAS, SEE DRAWING C1.
 - FOR STRUCTURAL NOTES ON PLATFORM CONSTRUCTION, SEE GENERAL NOTES DRAWING.
 - FOR PLAN LOCATIONS & ORIENTATIONS OF DECK PANEL TYPES AND PILE CAPS, SEE DRAWING S1.
 - FOR PRECAST PANEL DIMENSIONS, SEE DRAWING S4.
 - FOR DECK EDGE DETAILS AND PILE CAPS, SEE DRAWINGS S2 & S3.
 - ALL DIMENSIONS ARE APPROXIMATE. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN FIELD PRIOR TO STARTING ANY WORK OR PRODUCING ANY MATERIALS.
 - CONTRACTOR SHALL COORDINATE ALL WORK SHOWN WITH CONSTRUCTION OF ADJACENT PLATFORM RECONSTRUCTION BELOW SINATRA DRIVE. (SEE SITE PLAN, SHEET C1 - TYPICAL).
 - ELEVATIONS SHOWN ON THIS SHEET ARE REFERENCED TO NGVD29 DATUM, AS FOLLOWS:
 - A. AT NORTH PLATFORM AREA:
 - T/PAVERS AT FINISHED SURFACE = EL. 12.00 (REF)
 - T/POURED CONCRETE TOPPING = EL. 10.42
 - T/PRECAST DECK PANELS = EL. 10.08
 - T/PILE CAPS = EL. 9.25
 - T/PILES = EL. 6.75
 - B. AT SOUTH PLATFORM AREA:
 - T/PAVERS AT FINISHED SURFACE = EL. 11.00 (REF)
 - T/POURED CONCRETE TOPPING = EL. 9.75
 - T/PRECAST DECK PANELS = EL. 9.42
 - T/PILE CAPS = EL. 8.58
 - T/PILES = EL. 6.08
 - ELEVATIONS ON THIS SHEET ARE DENOTED THUS:
 - EL. 12.00 (N) DENOTES ELEVATION AT NORTH PLATFORM
 - EL. 11.00 (S) DENOTES ELEVATION AT SOUTH PLATFORM
 - EXPECTED FINAL MIDLINE (AFTER SCOUR) = EL. -9.00± (CLEAR HEIGHT USED FOR PILE DESIGN = 20.00')
 - EXISTING ELEVATIONS TO T/PAVERS VARIES OVER SURFACES OF PLATFORMS. REPLACED PAVERS SHALL ALIGN WITH EXISTING IN ALL LOCATIONS:
 - A. AT NORTH PLATFORM, MAXIMUM REPORTED T/PAVER ELEVATION = 11.95±, MINIMUM REPORTED T/PAVER ELEVATION = 11.20±. ALLOW FOR MINIMUM OF 5"± FILL BELOW PAVERS AT LOWEST ELEVATION. RESULTS IN MAXIMUM OF 15"± FILL BELOW PAVERS AT HIGHEST ELEVATION.
 - B. AT SOUTH PLATFORM, MAXIMUM REPORTED T/PAVER ELEVATION = 10.77±, MINIMUM REPORTED T/PAVER ELEVATION = 10.52±. ALLOW FOR MINIMUM OF 5"± FILL BELOW PAVERS AT LOWEST ELEVATION. RESULTS IN MAXIMUM OF 11"± FILL BELOW PAVERS AT HIGHEST ELEVATION.
 - C. 15" FILL DEPTH USED FOR DESIGN OF ALL PLATFORM ELEMENTS.
 - ALL STEEL H-PILES, AND STEEL PIPE PILE JACKETS SHALL BE COATED WITH COAL-TAR EPOXY. SEE GENERAL NOTES SHEET FOR ADDITIONAL COATING INFORMATION.
 - EXISTING HANDRAIL MATERIALS SHALL BE REMOVED AND STORED BY CONTRACTOR DURING DEMOLITION OPERATIONS AND RE-USED AFTER COMPLETION OF PLATFORM CONSTRUCTION. MATERIALS SHALL BE STORED AND PROTECTED OFF-SITE BY CONTRACTOR. ANY DAMAGE TO STORED MATERIALS SHALL BE REPAIRED OR REPLACED AT CONTRACTOR'S EXPENSE AS DIRECTED BY THE OWNER.

BIRDSALL SERVICES GROUP
Engineers & Constructors
BIRDSALL ENGINEERING, INC.
1000 W. 10TH STREET
HOBOKEN, NJ 07030
TEL: 201-327-1000
WWW.BIRDSALL.COM

RICHARD C. MALONEY, P.E.
REGISTERED PROFESSIONAL ENGINEER IN THE STATE OF NEW JERSEY
LICENSE NO. 24003

LOT 1, BLOCK 262.1
SINATRA DRIVE
CITY OF HOBOKEN
HUDSON COUNTY
NEW JERSEY

SHIPYARD PROPERTY OWNERS ASSOCIATION, INC.
HOBOKEN SHIPYARD - SHORELINE STABILIZATION PLAN
UPPER LEVEL PLATFORM RECONSTRUCTION
STRUCTURAL PLATFORM SECTIONS & DETAILS - Sh. 4 of 4

DATE	DESCRIPTION
08/11/11	ISSUED FOR PERMIT
08/11/11	ISSUED FOR CONSTRUCTION
08/11/11	ISSUED FOR AS-BUILT
08/11/11	ISSUED FOR RECORD

85

GENERAL NOTES

- 1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NEW JERSEY UNIFORM CONSTRUCTION CODE (NUCC), IBC 2006, WHICH IS THE ADOPTED BUILDING SUBCODE FOR THE PROJECT SITE, AND ITS REFERENCE DOCUMENT, ASCE 7-05, "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES".

STRUCTURAL SPECIAL INSPECTIONS

- 1. PROVIDE SPECIAL INSPECTIONS OF MATERIALS AND WORK IN ACCORDANCE WITH NUCC SECTION 1704, AS NOTED BELOW.
- 2. SPECIAL INSPECTORS SHALL KEEP RECORDS OF ALL INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE CODE OFFICIAL AND TO THE ENGINEER OR ARCHITECT OF RECORD. ALL DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THE DISCREPANCIES ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE CODE OFFICIAL AND TO THE ENGINEER OR ARCHITECT OF RECORD. A FINAL REPORT OF INSPECTIONS SHALL BE SUBMITTED, DOCUMENTING COMPLETION OF ALL REQUIRED SPECIAL INSPECTIONS AND CORRECTION OF ANY NOTED DISCREPANCIES.

MISCELLANEOUS STRUCTURAL STEEL

- 1. STRUCTURAL AND MISCELLANEOUS STEEL ELEMENTS SHALL CONFORM TO THE FOLLOWING REQUIREMENTS.
- 2. ALL STRUCTURAL STEEL FABRICATION AND ERECTION SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION - ALLOWABLE STRESS DESIGN", LATEST EDITION.
- 3. STRUCTURAL STEEL MATERIALS - A. ALL STRUCTURAL STEEL "W" SHAPES SHALL CONFORM TO ASTM A992.

STEEL H-PILES

- 1. ALL PILE FOUNDATION DESIGNS ARE BASED ON THE GEOTECHNICAL REPORT FOR THE PROJECT SITE, REPORT IS AS PREPARED BY PMR GROUP, A DIVISION OF BIRDSALL SERVICES GROUP, REPORT NO. 287078, DATED FEB. 16, 1998, AND SUBSEQUENT UPDATES AND ANALYSES.
- 2. ALL PILE FOUNDATION DESIGNS ARE BASED ON THE FOLLOWING ALLOWABLE PILE CAPACITIES FOR HP14x89 STEEL H-PILES, BASED ON PILE EMBEDMENT LENGTHS IN ACCORDANCE WITH THE REFERENCED GEOTECHNICAL REPORT: A. VERTICAL (AXIAL COMPRESSION) CAPACITY = 40 TONS (80 K)

STEEL SHEET PILING

- 1. STEEL SHEET PILING SHALL BE AS SUPPLIED BY SKYLINE STEEL, PARSONSPANY, NJ. (www.skylinesteel.com 856-875-9546), OR EQUAL AS APPROVED BY THE ENGINEER. SUBSTITUTION OF OTHER SHEETS MAY REQUIRE REVIEW AND/OR REDESIGN OF BULKHEAD, REDSIGN WILL BE AT CONTRACTOR'S EXPENSE.
- 2. SECTIONS FOR BULKHEAD STEEL SHEET PILING SHALL BE AS SHOWN ON THE DRAWINGS AND AS FOLLOWS: A. "SKYLINE" BULKHEAD SHEET DESIGNATION: AZ 37-700

CONCRETE

- 1. ALL CONCRETE WORK SHALL COMPLY WITH THE REQUIREMENTS OF ACI 318 AND "SPECIFICATIONS FOR CONCRETE BUILDINGS" ACI 301, LATEST EDITIONS.
- 2. ALL CONCRETE SHALL HAVE MINIMUM 28-DAY COMPRESSIVE STRENGTH OF 4,000 PSI, UNLESS OTHERWISE NOTED. CONCRETE SHALL BE AIR-ENTRAINED IN ACCORDANCE WITH ASTM STANDARDS. MAXIMUM SLUMP SHALL BE 4 INCHES. ALL CONCRETE SHALL BE NORMAL WEIGHT.
- 3. REINFORCING STEEL FOR CONCRETE SHALL BE AS FOLLOWS: A. REINFORCING FOR PRECAST CONCRETE PLATFORM DECK MAY BE EITHER OF THE FOLLOWING AT CONTRACTOR'S OPTION. CONTRACTOR SHALL INDICATE ON SHOP DRAWINGS WHICH REINFORCING OPTION IS SELECTED - (1) EPDMER, LOW-CARBON CHROMIUM REINFORCING, IN ACCORDANCE WITH ASTM A1035, GRADE 75 (Fy = 75 KSI), "MMFX-2" OR EQUAL.

STEEL PIPE PILE JACKETING

- 1. JACKETING FOR PROTECTION OF DRIVEN HP PILE SECTIONS SHALL BE STEEL PIPE PILES, OF SIZE AND WALL THICKNESS AS SHOWN IN THE DETAILS.
- 2. STEEL PIPE PILES SHALL BE IN ACCORDANCE WITH ASTM A252, GRADE 2, OR ASTM A53, GRADE B, STANDARD WEIGHT, WELDED. YIELD STRENGTH, Fy = 35 KSI MINIMUM.
- 3. PIPE JACKETS SHALL BE 30" NOMINAL SIZE STANDARD STEEL PIPE, WITH 0.375" MINIMUM WALL THICKNESS.

FILTER FABRIC

- 1. FILTER FABRIC SHALL BE PROVIDED FOR CONSTRUCTION OF PLATFORMS AND BULKHEADS AT AREAS AS SHOWN ON THE DESIGN DRAWINGS, INCLUDING BUT NOT LIMITED TO: A. BUTT JOINTS BETWEEN STAINLESS STEEL CLOSURE PLATES BETWEEN NEW AND EXISTING CONSTRUCTION.

CONCRETE CURING

- 1. PROPER CURING OF CONCRETE IS OF THE UTMOST IMPORTANCE. BEGINNING IMMEDIATELY AFTER PLACEMENT, CONCRETE SHALL BE PROTECTED FROM PREMATURE DRYING, EXCESSIVELY HOT OR COLD TEMPERATURES, AND MECHANICAL INJURY AND SHALL BE MAINTAINED WITH MINIMAL MOISTURE LOSS AT A RELATIVELY CONSTANT TEMPERATURE FOR AT LEAST 7 DAYS. THE MATERIALS AND METHODS OF CURING SHALL BE SUBJECT TO ACCEPTANCE BY THE ENGINEER. UNSATISFACTORY FINISHED CONCRETE THAT RESULTS FROM FAILURE TO FOLLOW THE SPECIFIED CURING PROCEDURES MAY BE REQUESTED BY THE OWNER OR ENGINEER TO BE REMOVED AND REPLACED. ALL COSTS ASSOCIATED WITH REMOVAL AND REPLACEMENT OF CONCRETE WORK SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.

TESTING

- 1. CONCRETE: A. MAKE 7-DAY AND 28-DAY COMPRESSION TESTS.
- 2. TEST FOR SLUMP AND AIR CONTENT OF CONCRETE PLACEMENT FROM SAME LOAD SAMPLED FOR COMPRESSION TESTS.

FIELD-INSTALLED ANCHORS AND FASTENERS

- 1. DRILLED ADHESIVE ANCHORS FOR CONCRETE CONSTRUCTION SHALL BE HILTI TYPE "117-150 HAST" ADHESIVE ANCHORS, OR EQUAL AS APPROVED BY THE ENGINEER. (HILTI: 1-800-879-8000, www.us.hilti.com)
- 2. ANCHORS SHALL BE SUPPLIED WITH HILTI TYPE "HST" THREADED ROD, WITH HEX NUT AND PLATE WASHER, UNLESS OTHERWISE NOTED ON DRAWINGS. (ALL HARDWARE SHALL BE MANUFACTURER'S STANDARD STAINLESS STEEL MATERIAL, UNLESS OTHERWISE NOTED.)

EPOXY MATERIALS FOR CONCRETE CONSTRUCTION

- 1. EPOXY MATERIAL FOR USE AS BONDING AGENT BETWEEN EXISTING AND NEW CONCRETE, OR FOR ANCHORAGE OF REINFORCING DOVELS INTO EXISTING CONCRETE SHALL BE A HIGH-MODULUS, HIGH STRENGTH EPOXY BONDING/GROUTING ADHESIVE.
- 2. EPOXY MATERIAL SHALL CONFORM TO THE REQUIREMENTS OF ASTM C-891 AND AASHTO M-229 STANDARDS.
- 3. EPOXY SHALL BE ONE OF THE FOLLOWING, AS MANUFACTURED BY SIKHA CHEMICALS CO. (1-800-933-7452, www.stokusa.com) OR EQUAL AS APPROVED BY THE ENGINEER: A. TYPICAL (D.O.N.): "SIKAUR 32, H-100"

COAL-TAR EPOXY COATING

- 1. ALL STEEL ELEMENTS, INCLUDING H-PILE SECTIONS, SHEET PILING, ACCESSORIES, AND PIPE PILE JACKETING SHALL BE COATED WITH COAL-TAR EPOXY COATING.
- 2. COAL-TAR EPOXY SHALL BE IN COMPLETE ACCORDANCE WITH THE REQUIREMENTS OF THE US ARMY CORPS OF ENGINEERS FORMULA C-200, AND STEEL STRUCTURES PAINTING COUNCIL (SSPC) STANDARD "PAINT 16".
- 3. MINIMUM (NOT AVERAGE) DRY FILM THICKNESS (DFT) OF 18 mils IS REQUIRED ON ALL COATED ELEMENTS. THICKNESS MAY BE OBTAINED IN ONE (1) OR TWO (2) COATS.

BULKHEAD DESIGN SURCHARGE LOAD - A. BULKHEAD SURCHARGE DESIGN LIVE LOAD: 250 PSF

PLATFORM DESIGN LOADS -

- A. LIVE LOADS: 1. TYPICAL PLATFORM (A) UNIFORM LIVE LOAD (NAJCC TABLE 1607.1) = 100 PSF
- B. DEAD LOADS: 1. TYPICAL PLATFORM (A) 1" PRECAST CONCRETE DECK = 125 PSF
- C. LATERAL LOADS: 1. SEISMIC LOAD (NAJCC 1613 & ASCE 7-05 CHAPTERS 11 & 12) (CONTROLS OVER WIND LOAD FOR PLATFORM DESIGN)

EARTHWORK

- 1. IMPORTED FILL AS SPECIFIED HEREIN SHALL BE CLEAN STRUCTURAL FILL CONFORMING TO SECTION 301.11 FOR THE 1-10 SOIL AGGREGATE GRADATION.
- 2. IMPORTED CRUSHED STONE AS SPECIFIED HEREIN SHALL BE CLEAN COURSE AGGREGATE CONFORMING TO INDOY SECTION 801 FOR SIZE 37 AGGREGATE GRADATION.

TIDAL ELEVATIONS table with columns for Mean High High Water, Mean High Water, Mean Low Water, Mean Low Low Water, and corresponding elevations.

Vertical strip on the right side containing project information: SHIPYARD PROPERTY OWNERS ASSOCIATION, INC. HOBOKEN SHIPYARD - SHORELINE STABILIZATION PLAN, BIRDSALL SERVICES GROUP ENGINEERS & ARCHITECTS, ANDREW W. RAICHLE, P.E., and a table of tidal elevations.

APPENDIX C
Sovereign Platform and Building
Substructure Plans

15TH STREET EXTENSION

HOBOKEN, N.J.

COUNTY OF HUDSON / SHIPYARD ASSOCIATES LP

PMK
65 JACKSON DRIVE
CRANFORD, NJ 07016

GOLDSTEIN ASSOCIATES, PLLC
31 WEST 27TH ST
NY, NY 10007

GENERAL NOTES

- THE STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE ARCHITECTURAL AND MECHANICAL DRAWINGS AND SPECIFICATIONS.
- THE LATEST EDITIONS OF THE FOLLOWING CODES SHALL APPLY:
 - INTERNATIONAL BUILDING CODE 2000.
 - REINFORCING STEEL FOR CONCRETE - ACI 308.
 - CONCRETE REINFORCING STEEL - ACI 308R.
 - REINFORCING STEEL FOR CONCRETE - ACI 308.
- IN CASE OF CONFLICT, THE MOST STRINGENT REQUIREMENTS SHALL APPLY.
- THE DESIGN OF STRUCTURAL MEMBERS ARE LIMITED TO THE FOLLOWING DEFLECTION CRITERIA:
 - THE MAXIMUM PERMISSIBLE CONTROLLED DEFLECTION OF CONCRETE ELEMENTS SHALL BE LIMITED BY SEC. 4.5.2 AND SEC. 4.5.3 OF ACI 308-R-02.
 - THE LIVE LOAD DEFLECTION OF BEAMS AND GIRDES SHALL NOT EXCEED 1/400 OF SPAN LENGTH.
 - THE WIND LOAD DEFLECTION OF TOTAL BUILDING SHALL NOT EXCEED 1/200 OF BUILDING HEIGHT WITH A UNIFORM LATERAL WIND LOAD OF 20 PSF.
 - THE WIND LOAD DEFLECTION OF PARTIAL BUILDING SHALL NOT EXCEED 1/400 OF SPAN LENGTH.
 - THE STORY DRIFT DUE TO EARTHQUAKE FORCES SHALL NOT EXCEED 0.01 IN. HEREIN A STORY HEIGHT SHALL BE LEVEL I TO LEVEL II.
 - MAXIMUM LIVE LOAD + CURTAIN WALL HEIGHT + SUPERIMPOSED DEAD LOAD DEFLECTION OF ANY SPAN SHALL NOT EXCEED 1/400 OF SPAN LENGTH.
 - ELEVATOR STRUCTURAL SUPPORTS SHALL BE DESIGNED WITHIN LIMITS OF DEFLECTION PRESCRIBED BY ASME A17.
- FIELD MEASUREMENTS SHALL BE TAKEN AT THE SITE BY THE CONTRACTOR TO VERIFY AND SUPPLEMENT ALL DIMENSIONS AND CONDITIONS APPLICABLE TO THE WORK. DIMENSIONS NOT SHOWN SHALL BE TAKEN FROM THE INFORMATION SHOWN ON PLANS SHALL BE REPORTED TO AND COORDINATED WITH THE ARCHITECT'S REPRESENTATIVE.
- BEFORE COMMENCEMENT OF ANY WORK AND/OR FABRICATION, THE CONTRACTOR SHALL SUBMIT TO THE STRUCTURAL ENGINEER FOR HIS APPROVAL CONCRETE MIX DESIGNS FOR EACH TYPE OF CONCRETE TO BE USED AND SHOP DRAWINGS FOR ALL TRADES.
- THE CONTRACTOR SHALL ADEQUATELY BRACE, SHORE, AND SUPPORT THE STRUCTURE DURING THE ENTIRE CONSTRUCTION PERIOD.
 - NON-MASONRY BEARING WALL CONSTRUCTION SHALL CONFORM TO THE FOLLOWING:
 - CONCRETE MASONRY UNITS - ASTM C-90, COMPRESSIVE STRENGTH 2500 PSI ON NET AREA - LIGHTWEIGHT AGGREGATE CONCRETE.
 - MORTAR - ASTM C-770 TYPE M, COMPRESSIVE STRENGTH 2500 PSI.
 - GRAOUT IN CONCRETE MASONRY JOINTS - 3000 PSI COMPRESSIVE STRENGTH.
 - MORTAR - ASTM C-770 TYPE M, COMPRESSIVE STRENGTH 2500 PSI.
 - GRAOUT IN CONCRETE MASONRY JOINTS - 3000 PSI COMPRESSIVE STRENGTH.
- MEMBERS WITH SIZES INDICATED ON THE DRAWINGS ARE NEW UNLESS OTHERWISE NOTED. CONCRETE APPROVAL OF THE INSPECTOR. UNAPPROVED INSTALLATION IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S SOLE EXPENSE.
 - BUILDING STABILITY
 - STRUCTURAL INTEGRITY
 - STRUCTURAL STEEL WELDS AND HIGH-STRENGTH BOLTING
 - REINFORCING STEEL PLACEMENT
- SLABS ON GRADE SHALL BE SUPPORTED BY A COMPACTED FORDS FILL AT LEAST 6 INCHES THICK. AT INTERIOR SLABS A VERTICAL CURB AT LEAST 2 INCHES THICK SHALL BE PLACED BETWEEN THE SLAB AND THE FORDS FILL. THE FORDS FILL SHALL, IN TURN, BE SUPPORTED BY EITHER CLEAN NONBRICK ORIGINAL SOIL OR COMPACTED FILL.

WARRANTY

- BY THE ACT OF SUBMITTING A BID FOR THE PROPOSED CONTRACT, THE BIDDER WARRANTS THAT:
- THE BIDDER AND ALL SUBCONTRACTORS HE INTENDS TO USE HAVE CAREFULLY AND THOROUGHLY REVIEWED THE DRAWINGS, SPECIFICATIONS AND OTHER CONSTRUCTION CONTRACT DOCUMENTS AND HAVE THEREAFTER COMPLETED AND FREE FROM AMBIGUITIES AND SUFFICIENT FOR THE CONTRACTOR TO BID, FABRICATE, AND INSTALL THE WORK ON THE FURTHER THAT:
 - NEITHER THE BIDDER NOR ANY OF HIS EMPLOYEES, AGENTS, INTENDED SUFFICIENT OR SUBCONTRACTORS HAVE RELIED UPON ANY VERBAL REPRESENTATIONS, ALLEGEDLY AUTHORIZED OR UNAUTHORIZED FROM THE OWNER, HIS EMPLOYEES OR AGENTS INCLUDING ARCHITECTS, ENGINEERS OR CONSULTANTS, IN ASSEMBLING THE BID FURTHER THAT,
 - THE BIDDER IS BASED SOLELY UPON THE CONSTRUCTION CONTRACT DOCUMENTS AND PROPERLY ISSUED WRITTEN ADDENDA AND NOT UPON ANY OTHER WRITTEN REPRESENTATION.
 - THE BIDDER ALSO WARRANTS THAT HE HAS CAREFULLY EXAMINED THE SITE OF THE WORK AND THAT FROM HIS OWN INVESTIGATIONS HE HAS SATISFIED HIMSELF AS TO THE NATURE AND LOCATION OF THE WORK AND THE CHARACTER, QUALITY, QUANTITIES OF MATERIALS AND UTILITIES TO BE ENCOUNTERED, THE KIND AND EXTENT OF EQUIPMENT AND OTHER FACILITIES NEEDED FOR THE PERFORMANCE OF THE WORK, THE GENERAL AND LOCAL CONDITIONS, AND OTHER ITEMS MIGHT AFFECT THE WORK OR ITS PERFORMANCE.

STRUCTURAL STEEL NOTES

- STRUCTURAL STEEL SHALL CONFORM TO ASTM A36, GRADE 50, UNLESS OTHERWISE NOTED HEREIN.
- FIELD CONNECTIONS SHALL BE WELDED.
- WELD CONNECTIONS SHALL BE BOLTED WITH ASTM A325 BOLTS IN ALL DISCONTINUOUS MEMBERS. BOLTS SHALL BE 3/4" DIAMETER MINIMUM. CONNECTIONS SHALL BE SLIP CRITICAL CONNECTIONS UNLESS OTHERWISE NOTED.
- WELDING SHALL BE PERFORMED BY QUALIFIED WELDERS IN ACCORDANCE WITH AWS SPECIFICATIONS LATEST EDITION AND THE BUILDING CODE.
- WELDING ELECTRODES SHALL BE ASTM A532 E-70 SERIES.
- STEEL DETAILS SHALL BE IN ACCORDANCE WITH AISC STANDARD LATEST EDITION.
- THE CONNECTIONS OF ALL MEMBERS SHALL BE DESIGNED FOR THE FULL CAPACITY OF THE MEMBERS UNLESS OTHERWISE NOTED.
- FILLET WELDS SHALL BE 1/4" MIN UNLESS OTHERWISE SHOWN.

CONTROLLED INSPECTION NOTES

- THE FOLLOWING IS A PARTIAL LIST OF WORK ITEMS REQUIRING CONTROLLED INSPECTION. THE CONTRACTOR IS OBLIGATED TO NOTIFY THE STRUCTURAL ENGINEER AT LEAST 72 HOURS BEFORE INSTALLATION OF SUCH ITEMS SO THAT PROPER INSPECTION CAN BE MADE. IN NO CASE SHALL SUCH ITEMS BE INSTALLED OR CONSTRUCTION PROCEED WITHOUT COMPLETE APPROVAL OF THE INSPECTOR. UNAPPROVED INSTALLATION IS SUBJECT TO REMOVAL AND REPLACEMENT AT THE CONTRACTOR'S SOLE EXPENSE.
- BUILDING STABILITY
 - STRUCTURAL INTEGRITY
 - STRUCTURAL STEEL WELDS AND HIGH-STRENGTH BOLTING
 - REINFORCING STEEL PLACEMENT

INDICATED LIABILITY DECLINED

GOLDSTEIN ASSOCIATES MAKES NO WARRANTY, OTHER EXPRESSED OR IMPLIED, AS TO GOLDSTEIN'S FITNESS, RECOMMENDATIONS, PLANS, SPECIFICATIONS, OR PROFESSIONAL ADVICE. GOLDSTEIN HAS UNDERTAKEN AND WILL UNDERTAKE TO PERFORM ITS SERVICES IN ACCORDANCE WITH GENERALLY ACCEPTED STANDARDS OF PRACTICE IN EFFECT AT THE TIME OF PERFORMANCE. BY UTILIZING THESE DOCUMENTS (OR HAVING OTHERS UTILIZE THEM) FOR ANY PURPOSE WHATSOEVER, THE OWNER OR DEVELOPER RECOGNIZES THAT NEITHER GOLDSTEIN NOR ANY OF GOLDSTEIN'S SUBCONSULTANTS OR SUBCONTRACTORS OWES ANY FIDUCIARY RESPONSIBILITY TO THE OWNER OR DEVELOPER.

CONCRETE NOTES

- CONCRETE TYPES
 - COLUMNS, SLABS AND BEAMS - 4000 PSI STONE CONCRETE.
 - SIROCKWALKS - 4000 PSI AIR-ENTRAINED STONE CONCRETE.
 - REINFORCED SLABS ON GRADE (OTHER THAN SIROCKWALKS) - 3000 PSI STONE CONCRETE.
 - NON-STRUCTURAL FILL - 2000 PSI LIGHTWEIGHT CONCRETE.
 - ALL OTHER CONCRETE - 4000 PSI STONE CONCRETE.
- BAR REIN. SHALL CONFORM TO ASTM A-66, GRADE 60.
- WELDED WIRE FABRIC SHALL CONFORM TO ASTM A-185 WITH A MINIMUM ULTIMATE TENSILE STRENGTH OF 10000 PSI.
- CONCRETE SHALL BE CAST HORIZONTAL UNLESS OTHERWISE SHOWN.
- REINFORCEMENT MARKED "CONT." (CONTINUOUS) SHALL BE LAPPED A SPICE LENGTH AT ALL ENDS AND CORNERS AND SHALL BE WELDED OR EXTENDED AN EQUIVALENT LENGTH AT NON-CONTINUOUS ENDS AS PER A.C.I. 4.03.5. HORIZONTAL WALL REINFORCING SHALL BE CONTINUED.
- REINFORCING SHALL BE CONTINUOUS THROUGH ALL CONSTRUCTION JOINTS UNLESS OTHERWISE SHOWN ON DRAWINGS. THE CONTRACTOR SHALL LOCATE CONSTRUCTION JOINTS AT POSSES OF HORIZONTAL BEAMS.
- REINFORCING BARS SHALL HAVE THE FOLLOWING MINIMUM CONCRETE PROTECTION:
 - CONCRETE CAST AGAINST EXISTING - 1"
 - EXPOSED TO EARTH OR WEATHER - 2"
 - SLABS AND WALLS NOT EXPOSED TO WEATHER - 1 1/2"
 - BEAMS AND GIRDES NOT EXPOSED - 1 1/2"
 - SLABS IN PARKING AREA - 2" (TOPS BARS ONLY)
- MINIMUM LENGTH OF CONCRETE FOR SPACING BETWEEN CONSTRUCTION JOINTS SHALL BE 50 FEET DURING THE 1ST, 2ND, 3RD AND 4TH YEAR AND 75 FEET DURING THE 5TH YEAR.
- THE CONTRACTOR SHALL VERIFY DIMENSIONS AND LOCATIONS OF ALL OPENINGS, PIPE, GLEVES, ANCHOR BOLTS, ETC. AS REQUIRED BY TRADES BEFORE CONCRETE IS PLACED.
- THE CONTRACTOR SHALL PROVIDE SLAB BACKSTOPS, IRON CHAIRS AND ALL ACCESSORIES REQUIRED FOR PROPER PLACEMENT OF THE MESH AND REINFORCING AS PER A.C.I. 4.03.5. STANDARD LOCATION OF CONSTRUCTION JOINTS IF REQUIRED SHALL BE SUBJECT TO THE APPROVAL OF THE ARCHITECT.
- CONCRETE MAY BE CONVEYED BY PUMPING. PUMPING METHODS SHALL COMPLY WITH REQUIREMENTS ESTABLISHED BY A.C.I. COMMITTEE 304, PLACING CONCRETE PUMPING METHODS.
- PRIOR TO PLACING CONCRETE, ALL REINFORCING SHALL BE FREE OF LOOSE FLAKES, RUST, OIL, OR OTHER CONTAMINANTS THAT WILL DESTROY, REDUCE OR IMPAIR FULL LOAD CAPACITY.

FOUNDATION NOTES

- FOUNDATIONS SHALL BE SUPPORTED ON 12" MIN DIA. 60" MIN DIA. FOR PILES IN THE WATER. CLOSED-END STEEL PIPE PILES FILLED WITH 4000PSI CONC. PILES SHALL BE EARTH ANCHORED TO THE UNDERLYING BEDROCK TO YIELD 100 TONS OF CAPACITY PER PILE. PILES MAY BE SPICED BY A HELD OR DRIVE-SLEEVE. APPROVAL OF PILES AND CONSTRUCTION PROCEDURES SHALL BE DONE BY A GEOTECHNICAL ENGINEER LICENSED IN THE STATE OF NEW YORK. PILES SHALL BE AS PER SPECIFICATIONS.
- THE CONTRACTOR SHALL VERIFY THE LOCATION OF THE EXISTING UTILITIES AND FORMATIONS PRIOR TO BEGINNING CONSTRUCTION.
- MAKE NO EXCAVATION TO THE FULL DEPTH INDICATED WHEN FREEZING TEMPERATURES MAY BE ENCOUNTERED UNLESS THE FOOTINGS OR SLABS CAN BE PLACED IMMEDIATELY AFTER THE EXCAVATION HAS BEEN COMPLETED. PROTECT THE BOTTOM OF EXCAVATION FROM FROST IF PLACING OF CONCRETE IS DELAYED. SHALL DRAINAGE PROTECTIVE FILL, REMOVE PROTECTIVE MATERIALS AND REPLACE WITH CONCRETE OR GRAVEL FILL.

SHOP DRAWING NOTES

- THE ENGINEER WILL REVIEW CONTRACTORS SHOP DRAWINGS AND RELATED DETAILS WITH RESPECT TO CONFORMANCE WITH THE STRUCTURAL DRAWINGS AND THE SPECIFICATIONS.
- BEFORE SUBMITTING A SHOP DRAWING OR ANY RELATED MATERIAL TO THE ENGINEER, CONTRACTOR SHALL REVIEW EACH SUCH SUBMISSION FOR CONFORMANCE WITH THE DESIGN METHODS, REQUIREMENTS, SEQUENCES AND OPERATIONS OF CONSTRUCTION AND SAFETY PRECAUTIONS AND PROGRAMS INCIDENTAL THEREOF, INCLUDING REPLICATION OF EXISTING FIELD CONDITIONS. ALL OF WHICH ARE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE ENGINEER WILL ASSUME THAT NO SHOP DRAWINGS OR RELATED SUBMITTALS CONSTITUTE A VARIATION FROM THE CONTRACT UNLESS CONTRACTOR ADVISES THE ENGINEER OTHERWISE VIA A WRITTEN INSTRUMENT WHICH IS ACKNOWLEDGED BY THE ENGINEER IN WRITING. IN THE EVENT THAT THE ENGINEER WILL REQUIRE MORE THAN TEN (10) WORKING DAYS TO PERFORM REVIEW THE ENGINEER WILL SO NOTIFY THE CONTRACTOR.

INDEX OF DRAWINGS

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5005	GARAGE & TOWNHOUSE COLUMN SCHEDULES
5006A	GRADE BEAM SCHEDULES
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5008	SOUTH TOWER SHEAR WALLS
5009	GARAGE & TOWNHOUSE SHEAR WALLS
5010	DETAILS I
5011	DETAILS II

NORTH TOWER PLANS

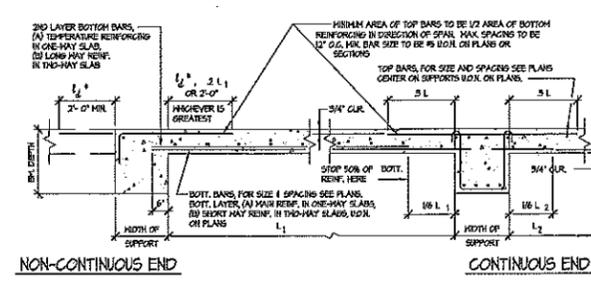
5100	NORTH TOWER FOUNDATION & DIMENSIONAL PLAN
5101	NORTH TOWER 1ST FLOOR FRAMING PLAN
5101A	NORTH TOWER 2ND FLOOR GARAGE FRAMING PLAN
5102	NORTH TOWER 2ND FLOOR FRAMING PLAN
5103	NORTH TOWER 3RD FLOOR FRAMING PLAN
5104	NORTH TOWER 4TH FLOOR FRAMING PLAN
5105	NORTH TOWER 5TH FLOOR FRAMING PLAN
5106	NORTH TOWER 6TH FLOOR FRAMING PLAN
5107	NORTH TOWER 7TH FLOOR FRAMING PLAN
5108	NORTH TOWER 8TH FLOOR FRAMING PLAN
5109	NORTH TOWER ROOF, TERRACE & BELLEMEAD ROOF FRAMING PLANS

SOUTH TOWER PLANS

5200	SOUTH TOWER FOUNDATION & DIMENSIONAL PLAN
5201	SOUTH TOWER 1ST FLOOR FRAMING PLAN
5201A	SOUTH TOWER 2ND FLOOR GARAGE FRAMING PLAN
5202	SOUTH TOWER 2ND FLOOR FRAMING PLAN
5203	SOUTH TOWER 3RD FLOOR FRAMING PLAN
5204	SOUTH TOWER 4TH FLOOR FRAMING PLAN
5205	SOUTH TOWER 5TH FLOOR FRAMING PLAN
5206	SOUTH TOWER 6TH FLOOR FRAMING PLAN
5207	SOUTH TOWER 7TH FLOOR FRAMING PLAN
5208	SOUTH TOWER ROOF, TERRACE & BELLEMEAD ROOF FRAMING PLANS

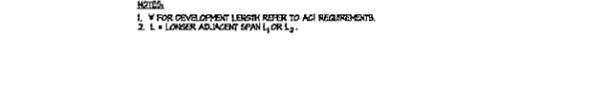
GARAGE & TOWNHOUSE PLANS

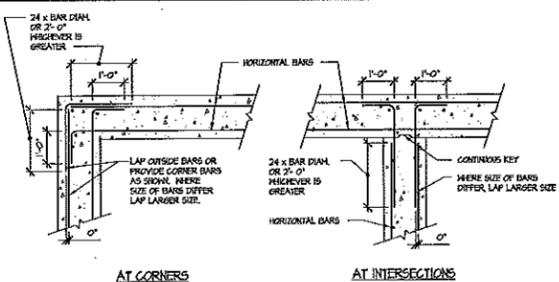
5300	GARAGE & TOWNHOUSE FOUNDATION AND DIMENSIONAL PLAN
5301	GARAGE & TOWNHOUSE 1ST FLOOR FRAMING PLANS
5302	GARAGE & TOWNHOUSE 2ND FLOOR FRAMING PLAN
5303	GARAGE & TOWNHOUSE 3RD FLOOR FRAMING PLAN
5304	GARAGE & TOWNHOUSE 4TH FLOOR FRAMING PLAN
5305	GARAGE & TOWNHOUSE ROOF, TERRACE & BELLEMEAD ROOF FRAMING PLANS
5400	NORTH TOWER, SOUTH TOWER, GARAGE & TOWNHOUSE FOUNDATION & DIMENSIONAL PLAN



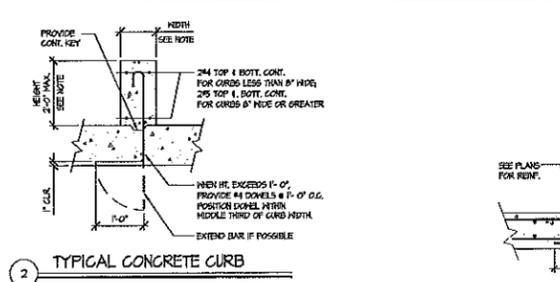
ONE-WAY SLAB TEMP. REIN. SCHEDULE

SLAB	REIN.	SLAB	REIN.
5'	14 @ 18"	4'	14 @ 12"
6'	14 @ 18"	10'	14 @ 17"
7'	14 @ 18"	8'	14 @ 15"
8'	14 @ 18"	12'	14 @ 14"

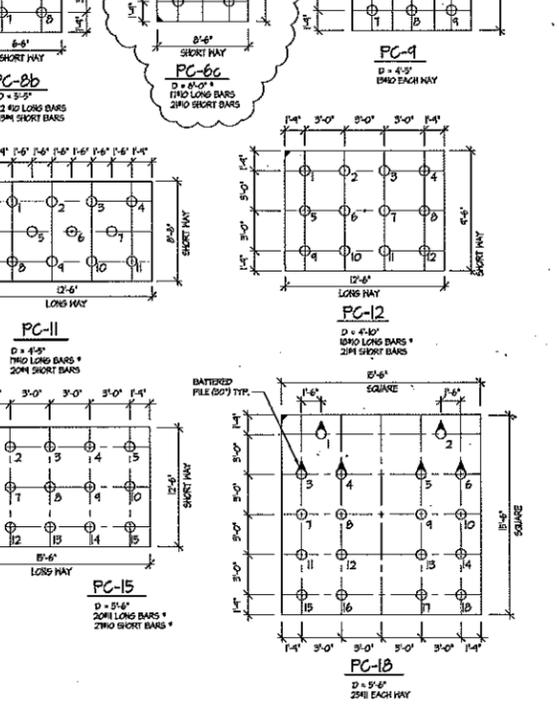
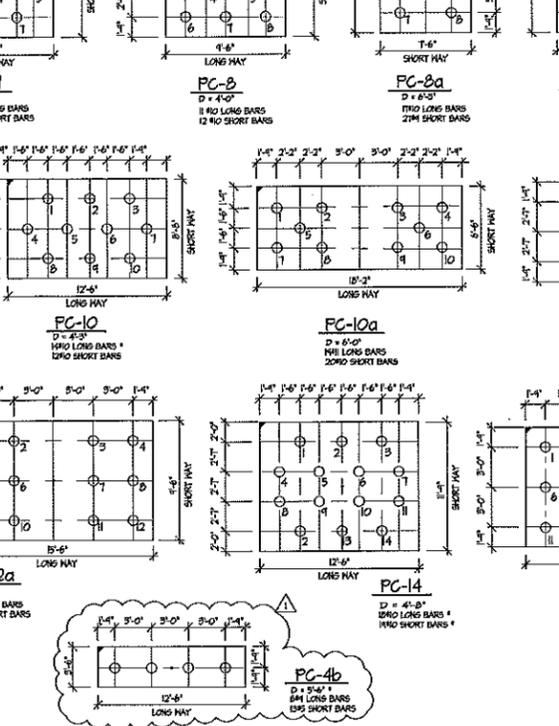
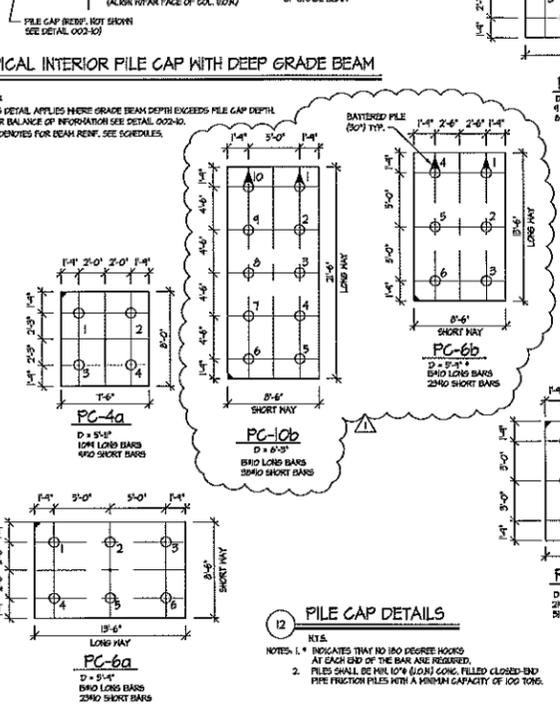
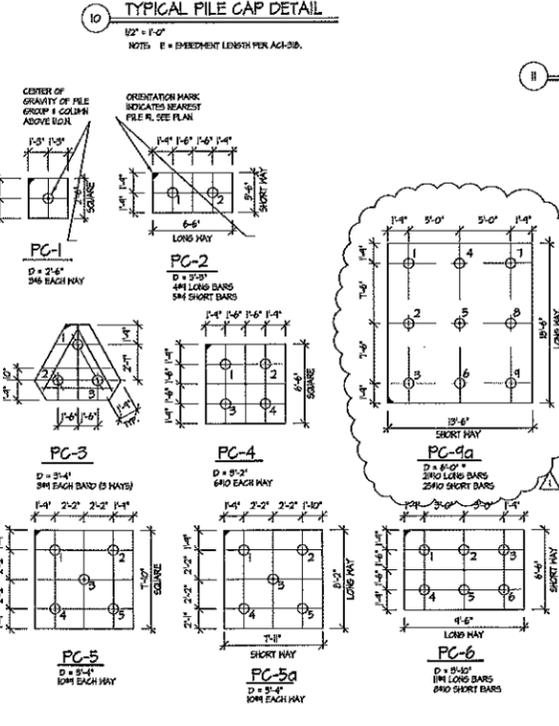
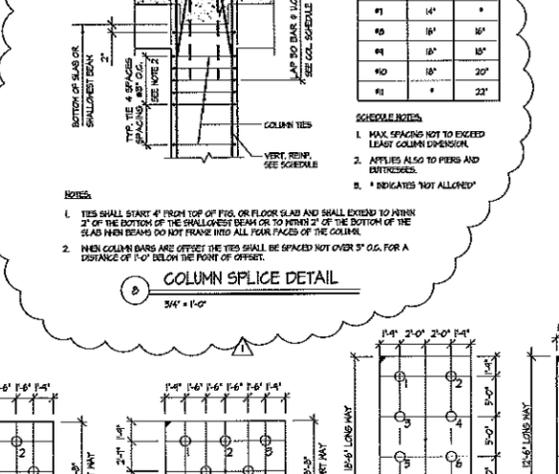
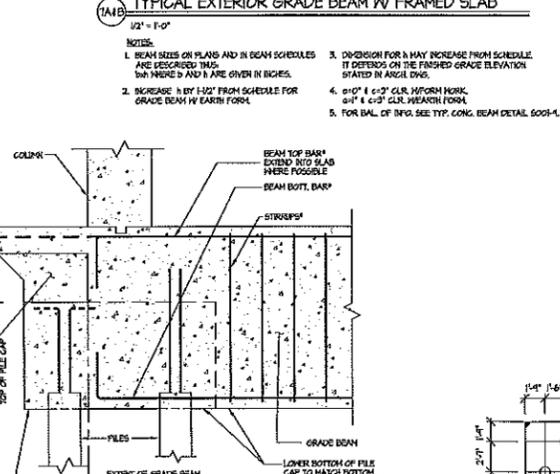
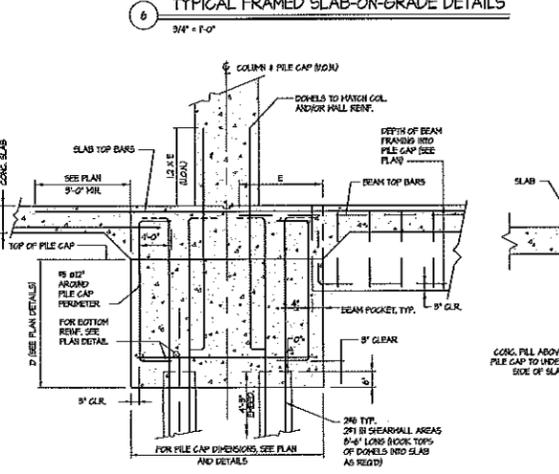
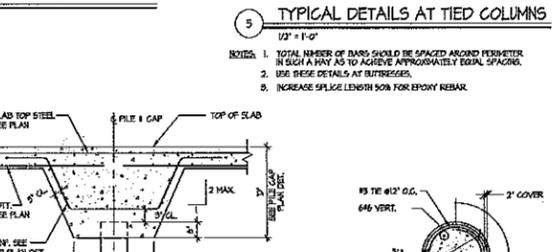
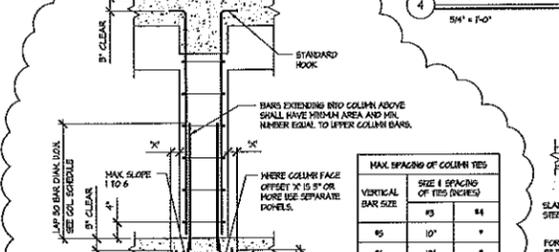
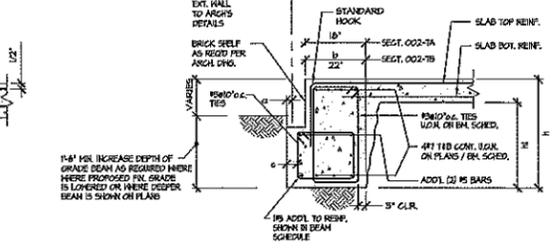
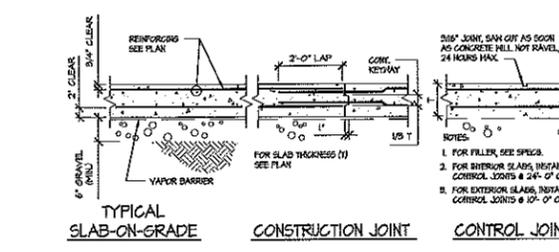
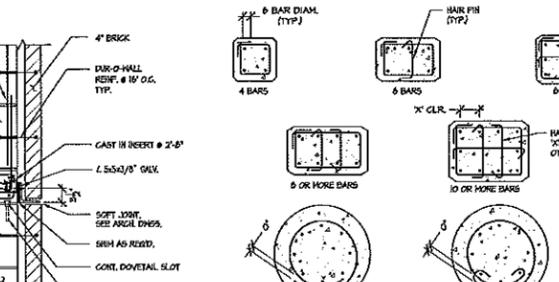
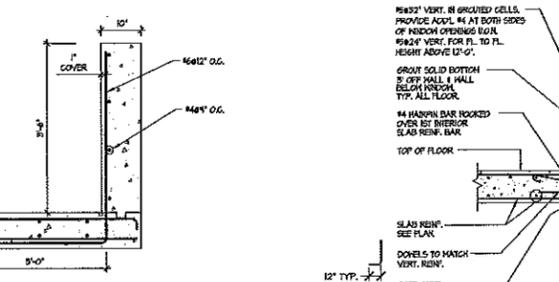




1 TYPICAL PLAN OF HORIZONTAL REINFORCING FOR CONCRETE WALLS AND GRADE BEAMS
 1/2" = 1'-0"



2 TYPICAL SECTION THRU CRASH BARRIER AT RAMP
 3/4" = 1'-0"



06/22/2004	GENERAL DESIGN REVISION
05/07/2004	ISSUED FOR BID
DATE	REVISION

SOVEREIGN
 HUDSON, NEW JERSEY

THE APPLIED DEVELOPMENT COMPANY
 HUDSON, NEW JERSEY

D+W+T TISHMAN ARCHITECTS LLP
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 Fax: 212 512 2002

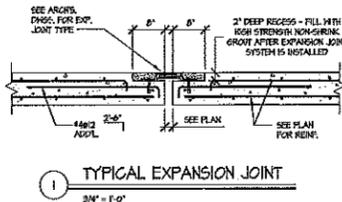
N.J. Cert. 08377

GOLDSTEIN ASSOCIATES PLLC
 consulting engineers
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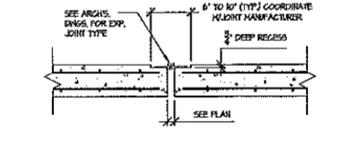
KEY PLAN
 DRAWING FILE
 TYPICAL DETAILS

Scale: AS NOTED
 Date: May 01, 2004

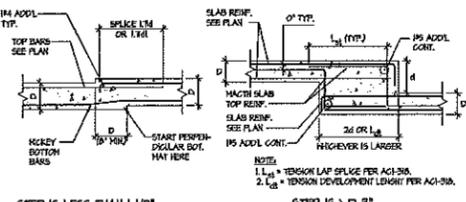
E. R. S. (Sect. 8a)
 Drawing No.: **S002**



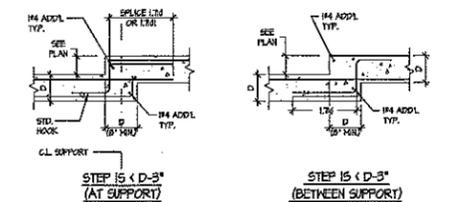
1 TYPICAL EXPANSION JOINT
3/4" x 1'-0"



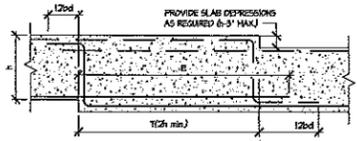
2 TYPICAL EXPANSION JOINT
DETAIL AT PARKING LEVEL SLABS
3/4" x 1'-0"



3 TYPICAL DETAILS OF STEP IN SLAB
1/2" x 1'-0"



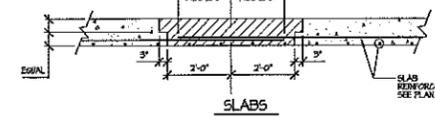
4 TYPICAL DETAIL
AT DEPRESSED SLAB
3/4" x 1'-0"



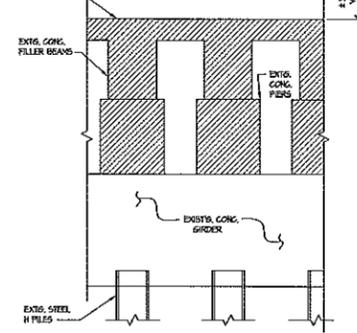
5 TYPICAL FOUR STRIP DETAILS
N.T.S.

BAR #	T
4	1'-0"
5	1'-0"
6	1'-6"
7	1'-4"
8	2'-0"
9	2'-0"
10	2'-6"
11	2'-6"

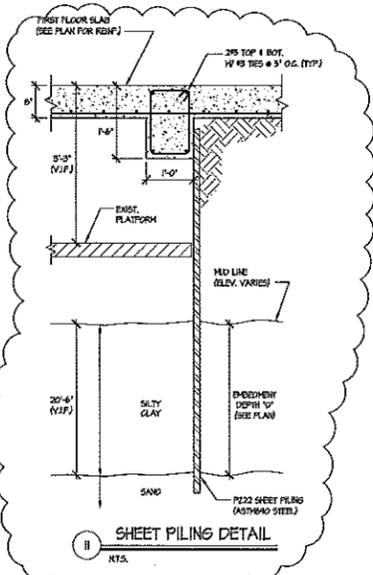
6 TYPICAL SECTION THRU
EXISTING PIER CONSTRUCTION
N.T.S.



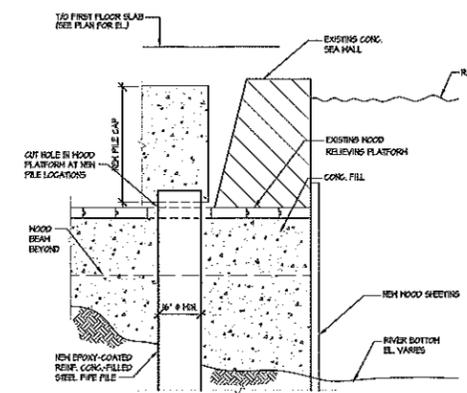
6 TYPICAL SECTION THRU
EXISTING PIER CONSTRUCTION
N.T.S.



7 TYPICAL SECTION THRU
EXISTING PIER CONSTRUCTION
N.T.S.

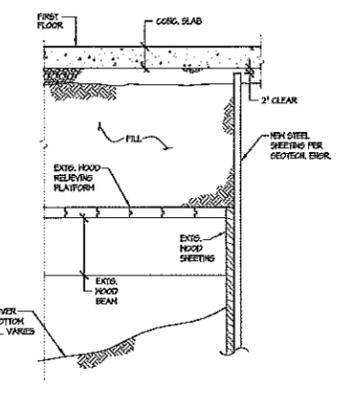


8 SHEET PILING DETAIL
N.T.S.



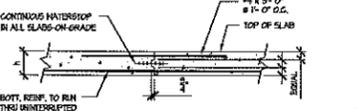
9A SECTION THROUGH RELIEVING
PLATFORM AND NEW WOOD SHEETING
N.T.S.

- FILE INSTALLATION PROCEDURES:
1. INSTALL NEW WOOD SHEETING PER GEOTECHNICAL ENGINEER.
 2. EXCAVATE AS NOTED TO TOP OF WOOD PLATFORM.
 3. CUT ROLES IN PLATFORM TO INSTALL NEW PILES.
 4. INSTALL PILES TO COMPLETE BACKFILL BELOW PLATFORM WITH CONC. FILL.
 5. BACKFILL WITH SOIL UNDER 1' AROUND NEW PILECAPS.



9B SECTION THROUGH RELIEVING
PLATFORM AND NEW STEEL SHEETING
N.T.S.

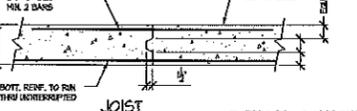
- NOTES:
1. FOR BALANCE OF INFO. SEE DETAIL 901-1A.



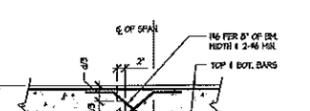
10 FRAMED SLAB
1/2 x DEPTH OF SLAB



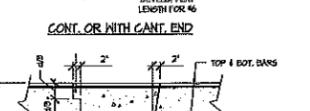
11 WALL PLAN VIEW
1 x THICKNESS OF WALL



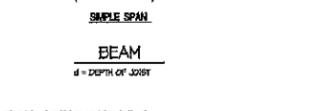
12 SIMPLE SPAN
1/2 x DEPTH OF JOIST



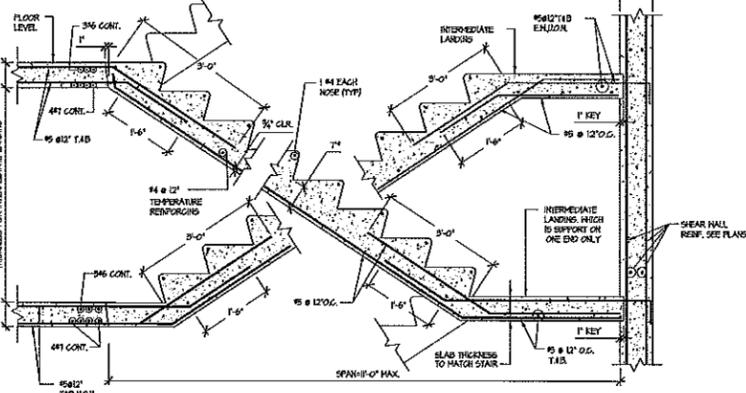
13 CONT. OR WITH CANT. END
DEVELOPMENT LENGTH FOR 4#



14 JOIST
1/2 x DEPTH OF JOIST

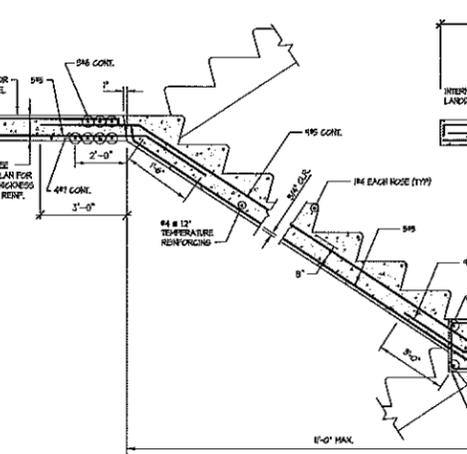


15 TYPICAL CONSTRUCTION JOINT DETAILS
3/4" x 1'-0"



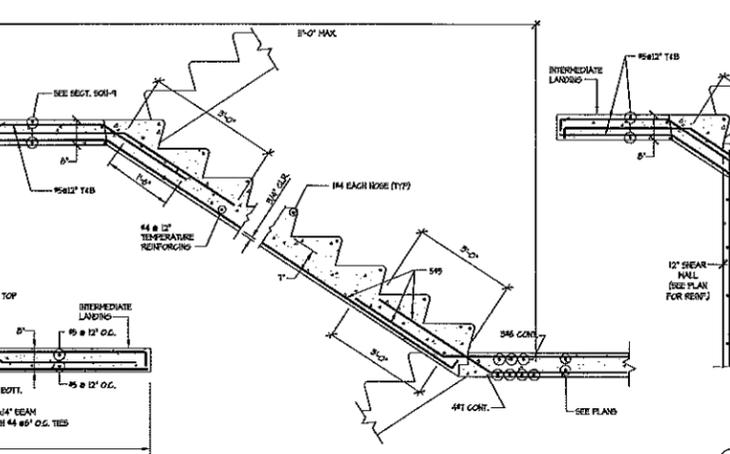
16 TYPICAL CONCRETE STAIR
3/4" x 1'-0"

- NOTES:
1. INDICATES 8\"/>



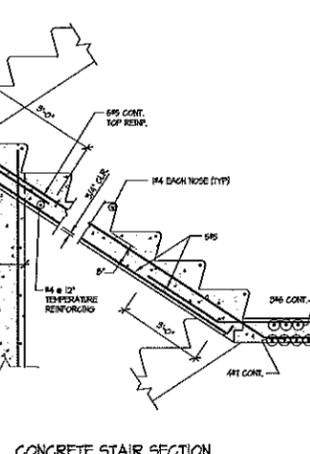
9 CONCRETE STAIR SECTION
3/4" x 1'-0"

- NOTES:
1. SEE PLANS FOR LOCATIONS.
 2. FOR BALANCE OF INFO. SEE DETAIL 901-8.



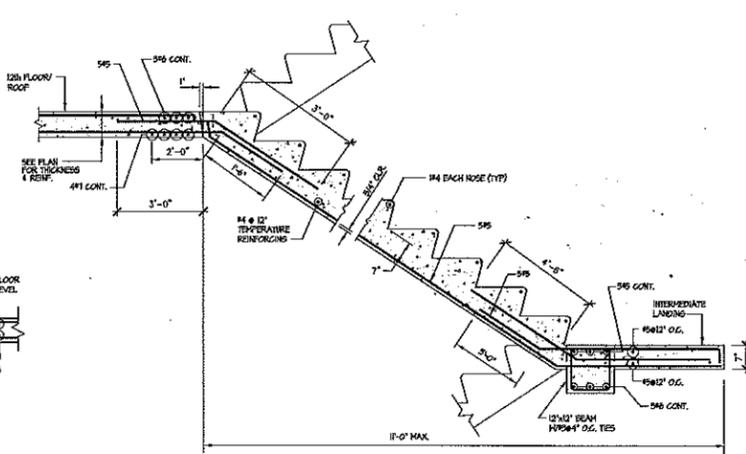
10 CONCRETE STAIR SECTION
3/4" x 1'-0"

- NOTES:
1. SEE PLANS FOR LOCATIONS.
 2. FOR BALANCE OF INFO. SEE DETAIL 901-8.



11 CONCRETE STAIR SECTION
3/4" x 1'-0"

- NOTES:
1. SEE PLANS FOR LOCATIONS.
 2. FOR BALANCE OF INFO. SEE DETAIL 901-8.



12 CONCRETE STAIR SECTION
3/4" x 1'-0"

- NOTES:
1. SEE PLANS FOR LOCATIONS.
 2. FOR BALANCE OF INFO. SEE DETAIL 901-8.

NO.	DATE	REVISION
01	08/21/2004	REV. BY SHEET PILING
02	08/21/2004	GENERAL DESIGN REVISION
03	08/21/2004	ISSUED FOR BID

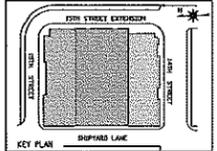
SOVEREIGN
ROCKAWAY, NEW JERSEY

THIS APPLIED DEVELOPMENT COMPANY
FORMED, MAY 2007

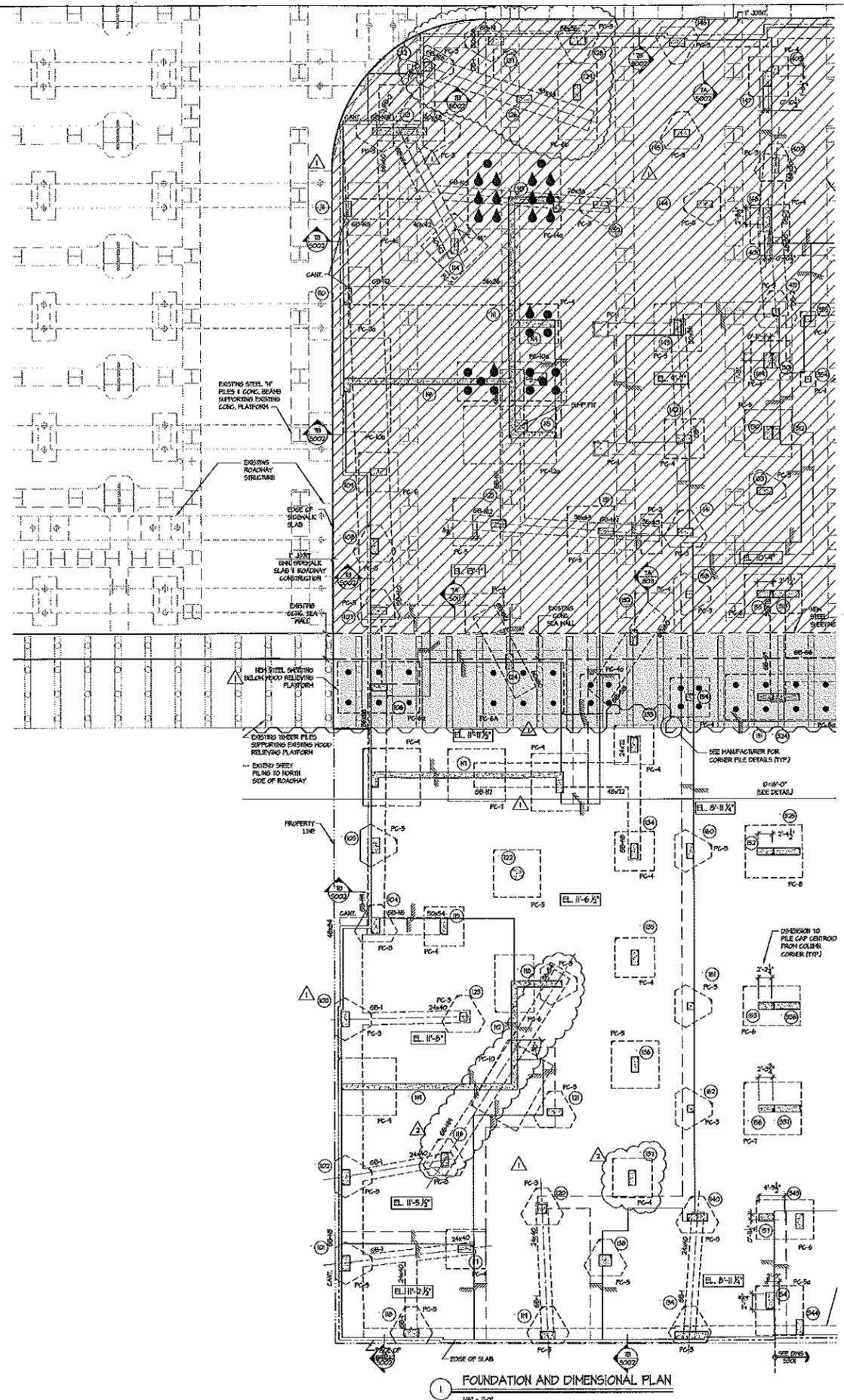
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N.A. Cmt. 08037

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TEL: 212 693 9000
FAX: 212 693 9101



Scale: AS NOTED
Date: May 07, 2004
E. E. P. Sheet No.
Drawing No. 1



1 FOUNDATION AND DIMENSIONAL PLAN
1/8" = 1'-0"

THE STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE ARCH. & MEP. DWGS & SPECS. REFER TO ARCH. DRAWINGS FOR EDGE OF SLAB LOCATIONS.

NOTES

1. TOP OF INTERIOR PILE CAP ELEVATION TO BE (2'-0") MIN. REFERENCED TO THE FIRST FLOOR SLAB ELEVATION NOTED THIS [] BOX (). SEE TYP. PILE CAP DETAILS ON 5002.
2. TOP OF PERIMETER PILE CAP ELEVATION TO BE AS PER DETAIL 5002-7.
3. FOR PILE CAP SIZE & REIN. SEE DETAIL 5002-2.
4. FOR TOP OF PILE CAP ELEVATION WHERE DEEP GRADE BEAMS ARE SUPPORTED SEE DETAIL 5002-3.
5. SEE FIRST FLOOR PLANS FOR SLAB REINFORCING.
6. --- INDICATES CENTER LINE OF PILE CAP OR GRADE BEAM.
7. CENTERLINE OF GRADE BEAM TO ALIGN WITH CENTROID OF PILE CAP & COLUMN BLOB.
8. FOR COLUMN SIZES & REIN. SEE COLUMN SCHEDULES ON 5003, 5004 AND 5005.
9. FOR BEAM REIN. SEE GRADE BEAM SCHEDULES ON 5006A.
10. [] DENOTES AREA BELOW EXIST. HOOD RELIEVING PLATFORM TO BE FILLED WITH CONCRETE FILL AFTER PILES ARE DRIVEN. SEE DETAIL 5001-1.
11. ALL NEW PILES ARE 100 TON CONCRETE FILLED STEEL PIPE PILES. [] DENOTES PILES LOCATED IN AREA WITH EXISTING TIMBER PILES. [] LOCATIONS OF EXIST. FOUNDATION PRIOR TO DRIVING NEW PILES AS MODIFICATIONS TO NEW PILE LAYOUTS (IE. ROTATE PILE CAP) MAY BE REQUIRED TO AVOID EXISTING FOUNDATION.
12. [] DENOTES PILES IN THIS AREA ARE TO BE 18" BY 8" BRIDGE DIAMETER EPOXY REINFORCED CONC. FILLED STEEL PIPE PILES. SEE DETAIL 5002-3. ALL REIN. IN PILES, PILE CAPS, AND GRADE BEAMS IN THIS AREA MUST BE EPOXY COATED.

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SOVEREIGN
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KEY PLAN

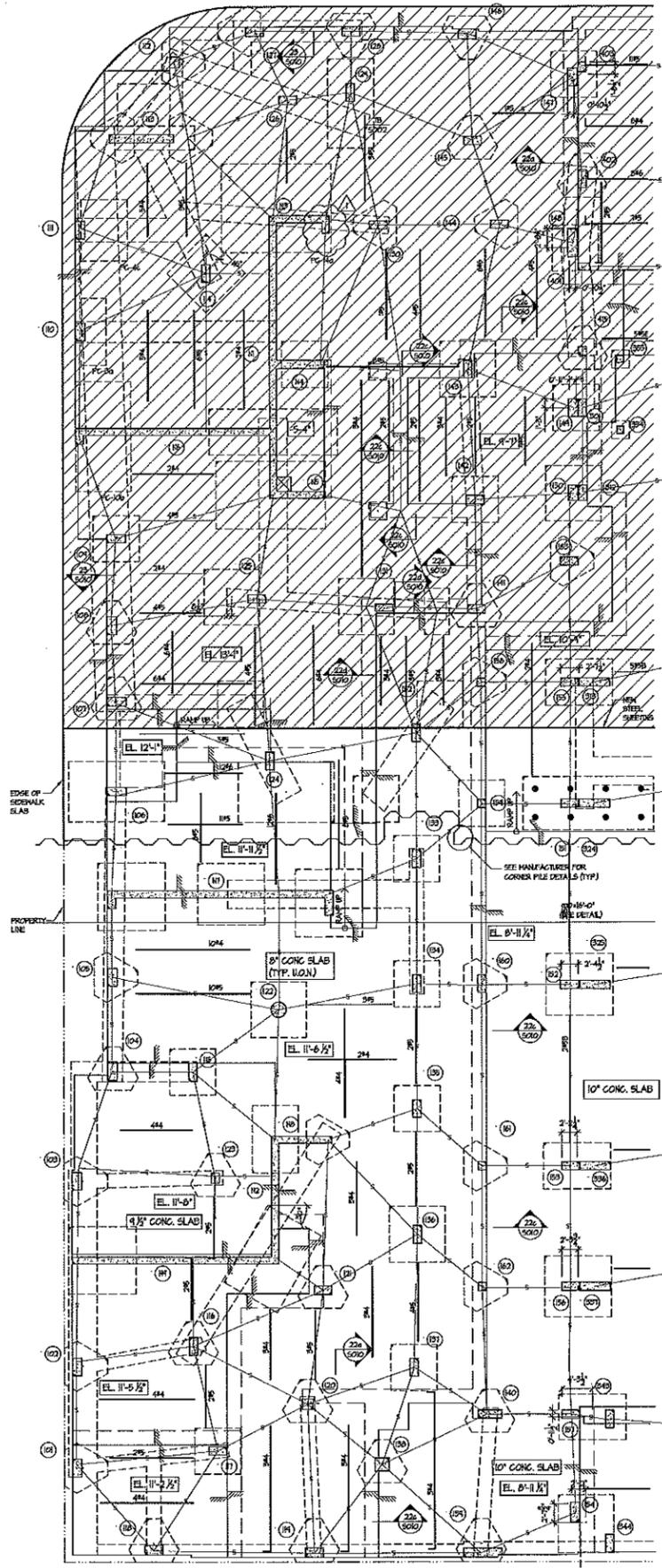
Drawing Title:
NORTH TOWER FOUNDATION AND DIMENSIONAL PLAN

Scale: AS NOTED

Date: May 07, 2004

S. U. A. Seal No.

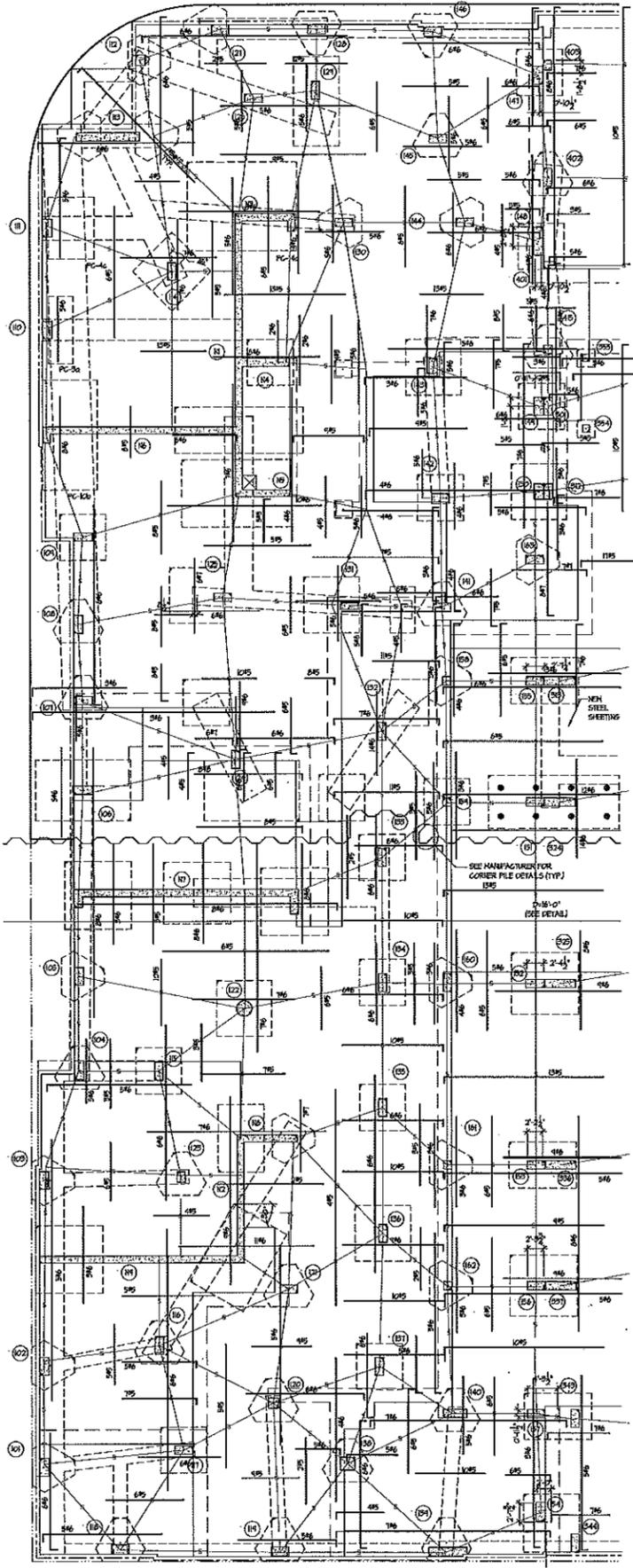
Drawing No.: **S100**



1 ADDITIONAL BOTTOM REINFORCING & DIMENSIONAL PLAN
1/8" = 1'-0"

THE STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE ARCH. & MECH. DWGS. & BESS. REFER TO ARCH. DRAWINGS FOR EDGE OF SLAB LOCATIONS.

- NOTES:
1. FOR FOUNDATION & GRADE BEAM INFORMATION SEE FOUNDATION PLANS.
 2. TYP. BOTTOM REINFORCING - #4 @ 12" O.C. EACH WAY CONTIGUOUS (MIN.), #5 @ 12" O.C. EACH WAY CONTIGUOUS IN 10" CONC. SLAB. SEE TYP. FLAT SLAB DETAILS ON SOG.
 3. PLACE NORTH-SOUTH REINFORCING IN THE OUTER - MOST LAYERS.
 4. FOR COLUMN & MIDDLE STRIPS SEE TYPICAL FLAT SLAB DETAIL OR SOG.
 5. FOR COLUMN COORDINATES SEE FOUNDATION PLANS.
 6. FOR COLUMN SIZES & REINFORCING SEE COLUMN SCHEDULES ON SOG, SO4 AND SO5.
 7. FOR BEAM REINFORCING SEE BEAM SCHEDULES ON SO6A.
 8. TOP OF SLAB ELEVATION SHOWN THROUGHOUT.
 9. ALL REINFORCING IN BALCONIES, TERRACES & OTHER AREAS OF EXPOSED CONCRETE TO BE EPDM COATED.
 10. ALL TERRACES MUST BE FITTED TO DRAIN WITH STRUCTURAL CONCRETE. SEE ARCH. DWGS. FOR PITCHES & LOCATIONS OF DRAINS. 8" SLAB MIN. REQUIRED.
 11. SEE SO1 FOR SLAB SHEET DETAILS.
 12. SEE TYP. STAIR DETAILS ON SO8 FOR AXIAL REINFORCING IN SLAB.
 13. Hatched area indicates ALL BOTTOM REINFORCING TO BE EPDM COATED IN THIS AREA.
 14. SEE TYP. DETAIL SO8-5 FOR STEP IN SLAB AT TERRACE FLOOR. SEE ARCH. FOR LOCATIONS.



2 TOP REINFORCING ONLY
1/8" = 1'-0"

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KEY PLAN

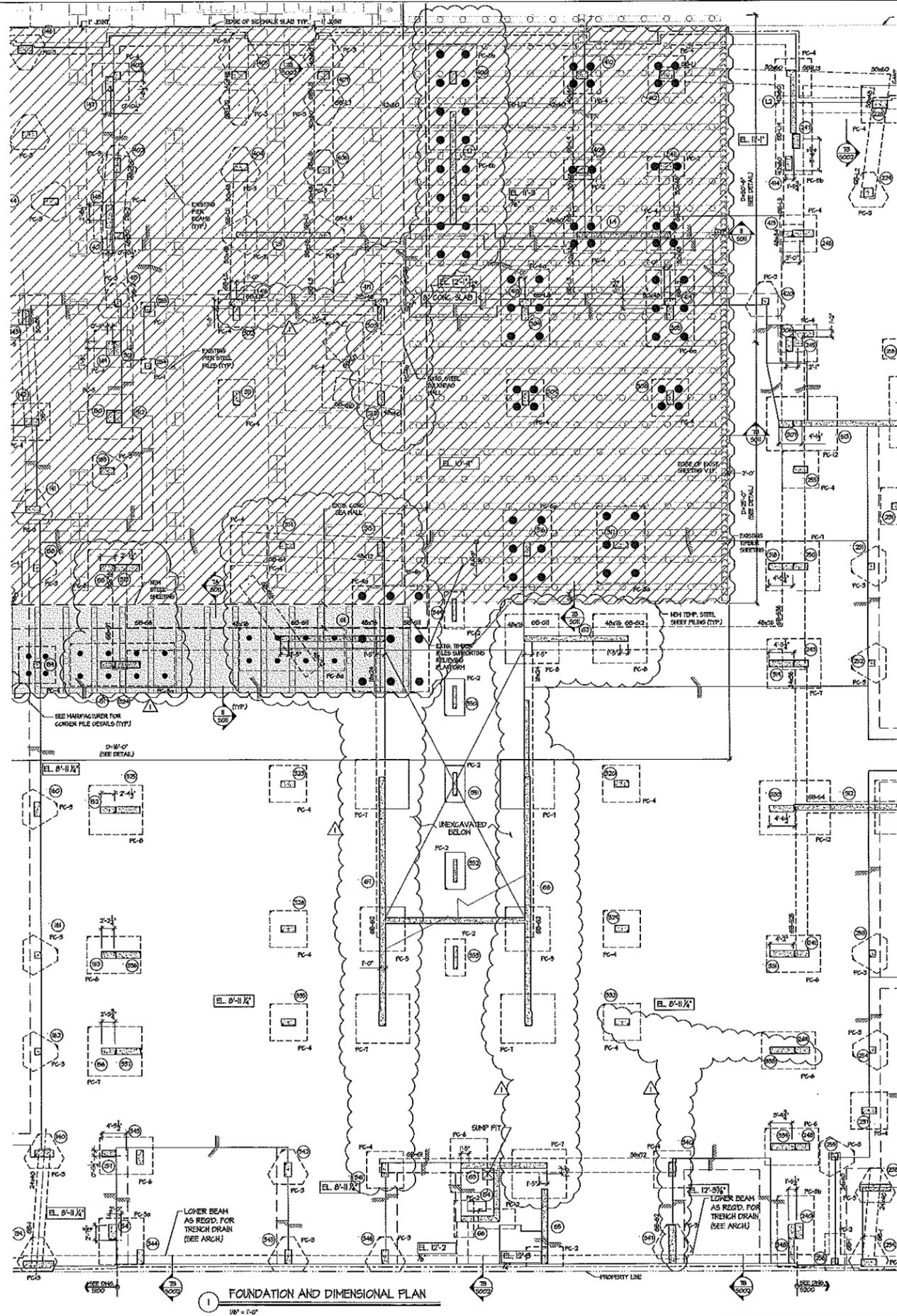
Drawing Title:
**NORTH TOWER
FIRST FLOOR
FRAMING PLANS**

Scale: AS NOTED

Date: May 01, 2004

E. C. B. Sher, P.E.

Drawing No.: **S101**



THE STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE ARCH. & MECH. SPECS. & SPEC. REFER TO ARCH. DRAWINGS FOR EDGE OF SLAB LOCATIONS.

NOTES:

1. TOP OF INTERIOR PILE CAP ELEVATION TO BE (-2'-0") WITH REFERENCE TO THE FIRST FLOOR SLAB ELEVATION NOTED THIS EL. WORK (N. 1). SEE TYP. PILE CAP DETAIL ON 5002-1.
2. TOP OF PERIMETER PILE CAP ELEVATION TO BE AS PER DETAIL 5002-1.
3. FOR PILE CAP SIZE & REIN. SEE DETAIL 5002-12.
4. FOR TOP OF PILE CAP ELEVATION WHERE DEEP GRADE BEAMS ARE SUPPORTED SEE DETAIL 5002-3.
5. SEE FIRST FLOOR PLANS FOR SLAB REINFORCING.
6. --- INDICATES CENTER LINE OF PILE CAP OR GRADE BEAM.
7. CENTERLINE OF GRADE BEAM TO ALIGN WITH CENTER OF PILE CAP & COLUMN BELOW.
8. FOR COLUMN SIZES & REIN. SEE COLUMN SCHEDULES ON 5003, 5004 AND 5005.
9. FOR BEAM REIN. SEE GRADE BEAM SCHEDULES ON 5003A.
10. [Hatched Area] INDICATES AREA BELOW EXTS. WOOD RELIEFING PLATFORM TO BE FILLED WITH CONCRETE FILL AFTER PILES ARE DRIVEN. SEE DETAIL 5011-1A. ALL REIN. IN PILES, PILE CAPS, AND GRADE BEAMS IN THIS AREA MUST BE EPOXY COATED.
11. ALL NEW PILES ARE 100 TON CONCRETE FILLED STEEL PIPE PILES. [Circle with 'X'] INDICATES PILES LOCATED IN AREA WITH EXISTING TENDER PILES. V.I.F. LOCATION OF EXTS. FOUNDATION PRIOR TO DRIVING NEW PILES AS INDICATORS TO NEW PILE LAYOUT (I.E. ROTATE PILE CAP) MUST BE REQUIRED TO AVOID EXTS. FOUNDATION.
12. [Circle with 'Z'] INDICATES PILES IN THIS AREA TO BE 14" DIA. (FRISKI DIAMETER) REINFORCED CONG. FILLED STEEL PIPE PILES. SEE DETAIL 5002-3. ALL REIN. IN PILES, PILE CAPS, AND GRADE BEAMS IN THIS AREA MUST BE EPOXY COATED.

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SOVEREIGN
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KEY PLAN

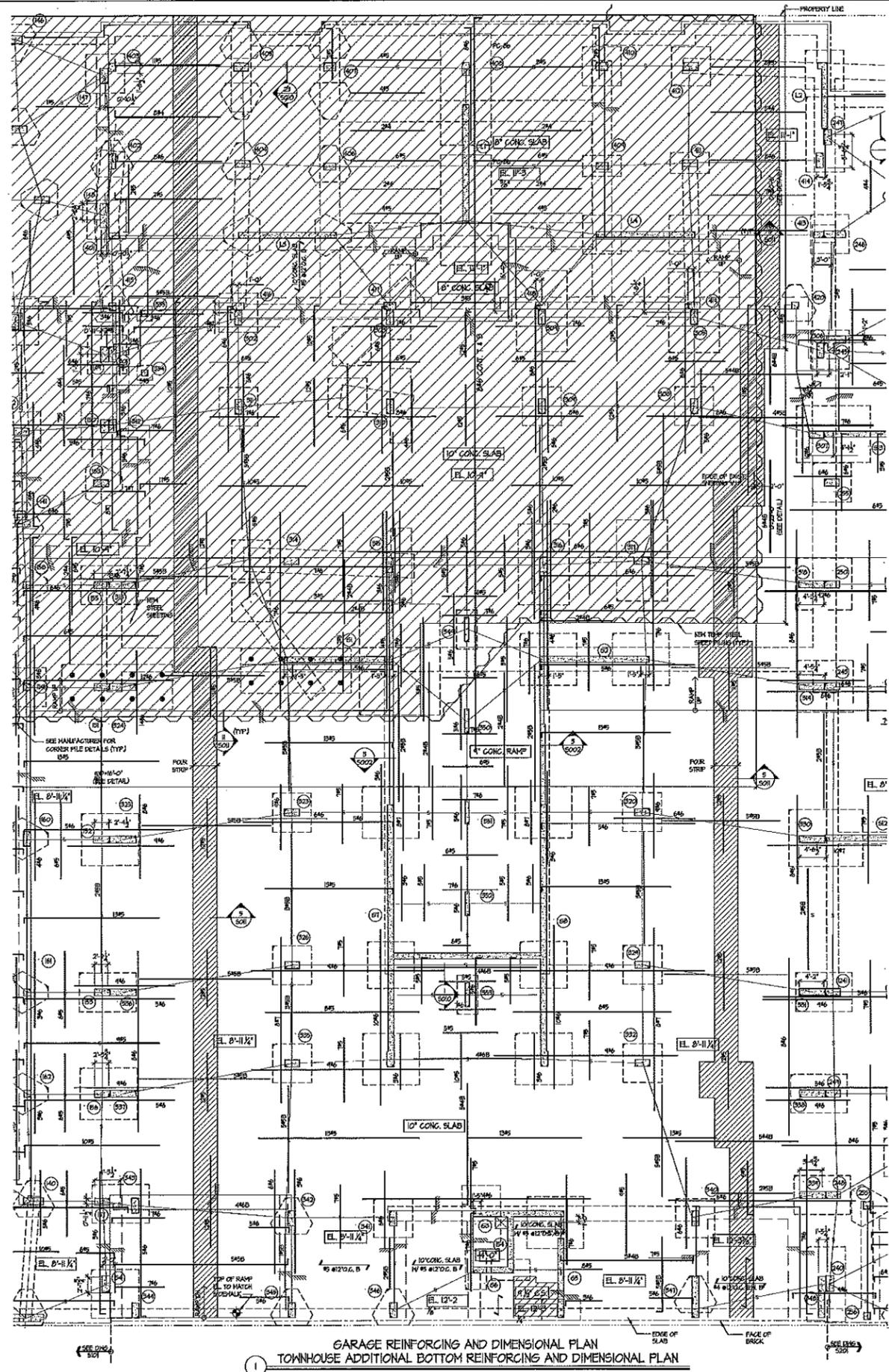
Drawing Title:
**GARAGE & TOWNHOUSE
FOUNDATION AND
DIMENSIONAL PLAN**

Scale: AS NOTED

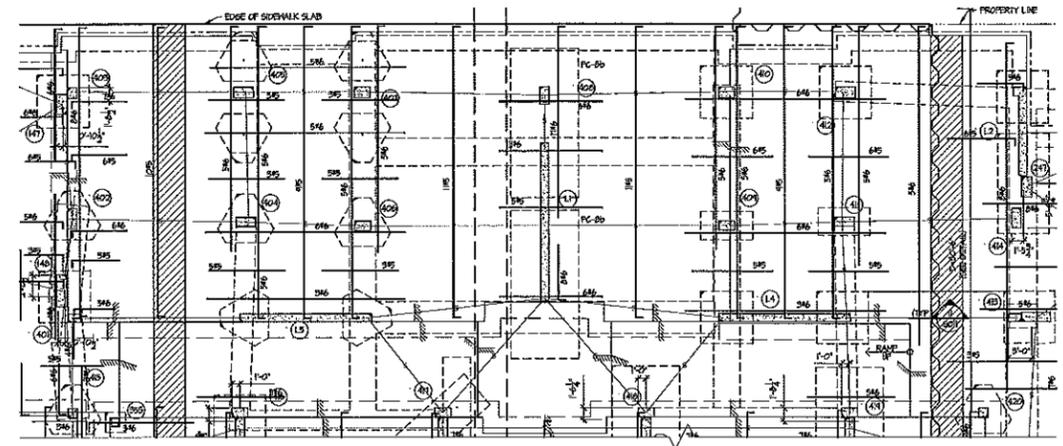
Date: May 07, 2004

D. E. E. (Seal St.)

Drawing No.: **S300**



1 GARAGE REINFORCING AND DIMENSIONAL PLAN
TOWNHOUSE ADDITIONAL BOTTOM REINFORCING AND DIMENSIONAL PLAN
1/8" = 1'-0"



2 TOWNHOUSE TOP REINFORCING ONLY
1/8" = 1'-0"

THE STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE ARCH. & MECH. DWGS & SPECS. REFER TO ARCH. DRAWINGS FOR EDGE OF SLAB LOCATIONS.

NOTES:

1. FOR FOUNDATION & GRADE BEAM INFORMATION SEE FOUNDATION PLANS.
2. TYP. BOTTOM REINFORCING - #5 @ 12" O.C. EACH WAY CONTIGUOUS IN 10" SLAB (SLOD) - #4 @ 12" O.C. EACH WAY CONTIGUOUS IN 8" & 4" SLAB (SLOD) SEE TYP. FLAT SLAB DETAILS ON SOOL.
3. PLACE NORTH-SOUTH REINFORCING IN THE OUTER - MOST LAYER.
4. FOR COLUMN & MIDDLE STRIPS SEE TYPICAL FLAT SLAB DETAIL ON SOOL.
5. FOR COLUMN COORDINATES SEE FOUNDATION PLANS.
6. FOR COLUMN SIZES & REIN. SEE COLUMN SCHEDULES ON SOO3, SOO4 AND SOO5.
7. FOR BEAM REIN. SEE GRADE BEAM SCHEDULES ON SOO6A.
8. TOP OF SLAB ELEVATION SHOWN THIS WAY.
9. COORDINATE SLAB PENETRATIONS BY PLUMBING, MECHANICAL, ELECTRICAL & SPRINKLER DWGS.
10. DENOTES ONE-WAY SLAB. SEE DETAIL SOO-1.
11. DENOTES ADDITIONAL BOTTOM REIN. IN STORAGE AREA.
12. REIN. AT BASE OF RAMP TO BE EMBEDDED INTO FIRST FLOOR SLAB.
13. SEE TYPICAL SPAR DETAILS ON SOO FOR ADDL. REIN. REQ'D. IN SLAB.
14. INDICATES BOTTOM REIN. TO BE EPOXY COATED IN THIS AREA.
15. SEE TYP. DETAIL SOO-3 FOR STEP IN SLAB AT TERRAZZO FLOOR. SEE ARCH. FOR LOCATIONS.

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KEY PLAN
Drawing Title:
**GARAGE & TOWNHOUSE
FIRST FLOOR
FRAMING PLANS**
Scale: AS NOTED
Date: May 07, 2004

D. G. E. Sheet No. :
Drawing No. : **S301**