TRIENNIAL INSPECTION

OF PIER 3 NORTH

ALONG DELAWARE RIVER

PHILADELPHIA, PENNSYLVANIA

October 2022

Prepared For:
Pier 3 Condominium Association
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I. EXECUTIVE SUMMARY

W.J Castle, P.E. & Associates, P.C. (CASTLE) was retained by the Condominium Association at Pier 3 in order to perform the routine triennial inspection of Pier 3 and be in compliance with the requirements of Title 4 of The Philadelphia Building Construction and Occupancy Code (The Philadelphia Code), Sub-Code: PM, Section PM- 304.9. Pier 3 is located along the Delaware River in Philadelphia, PA. The former industrial pier is approximately 185' wide x 545' long (average) and is comprised of a timber pile supported low deck structure with a concrete seawall. The south side of the pier was widened approximately 15 feet in year 1954 to result in a total pier width of 200 feet. There are eight (8) wharf drops around the perimeter of the original pier, which have been spanned over by steel beams and a concrete deck.

The scope of this Triennial Inspection included assessment and structural evaluation of the various elements of the Pier, including assigning condition assessment ratings based on field observations and structural knowledge. The underwater inspection was performed utilizing a qualified dive team with over 6 months of pier inspection experience utilizing Level I & II inspection procedures (see page 6). In addition to the underwater inspection, the team completed sonar imaging of the Pier. The summary of key deficiencies is included in the main text of this report. This report includes the assessment of the structural conditions, as well as basic repair recommendations.

As per the requirements in Title 4 of The Philadelphia Building Construction and Occupancy Code (The Philadelphia Code), Sub-Code: PM, Section PM- 304.9, the overall condition of Pier 3 is **Safe with a Repair & Maintenance Program**:

- Seawall: The seawall is in overall Fair condition due to the abrasion, wide edge spalling at cracks, and voids, primarily in the lower 4.0' of the seawall. The east end of the seawall has a visible slight bowing.

- Wharf drops: The concrete walls of the wharf drops are in fair condition, due to similar but less advanced deterioration as seen in the seawall throughout. The concrete deck at Wharf Drops 1 & 3 are in poor condition due to areas of exposed and deteriorated concrete with exposed and deteriorated reinforcement. Repairs are recommended and need to be carried out with moderate urgency. The deck in Pier 4 was found to be in satisfactory condition due to minor areas of exposed and deteriorated concrete located primarily in the deck soffit. The deck in Wharf Drop 2 was found to be in good condition. The steel beams are in satisfactory condition, with areas of minor paint failure and corrosion.

- Timber Low Deck Structure: The timber elements are typically in satisfactory condition, with random locations in fair to poor condition. All timber elements, including piles, caps, clamps, decking and skirt boards, exhibit moderate deterioration and weathering typical of timber of this age and exposed to these conditions. Other defects include: broken or missing piles, splits, leaning piles, deteriorated hardware and non-bearing conditions.

- Channel bottom: The channel bottom was found to have a significant drop-off towards the east, as is common with many Philadelphia waterfront piers of similar construction. No signs of localized scour or undermining of piles were observed. The east side of the pier extends towards the main channel of the Delaware River, which accounts for the deeper water documented at this location.

RECOMMENDATIONS:

Accordingly, we recommend the following remaining repairs (maintenance program), preventative maintenance work, and additional investigations are considered in order to continue the safe usage of the Pier in the future:

High Priority Repairs (immediate repair required):

- Wharf drops: Remove stay in place (SIP) panels and repair/replace the concrete deck at all areas with advanced deterioration in Wharf Drops 1 & 3.

Medium Priority Repairs (within 1 year as funding allows):

- Seawall: patch deep voids and cracks with wide edge spalling along the seawall that create a potential path for loss of fill.

Budgetary Repairs (schedule as funding allows):

- Repair and replace deteriorated and missing timber low deck structure components including: broken, missing, split, and non-bearing piles, deteriorated and missing hardware, missing and dislodged skirt boards, and deteriorated timber clamps and pile caps. We recommend $50,000 be set aside each year for these repairs.

Additional Investigations:

- Continue to perform Triennial Inspections as per the City Ordinance within 3 years.

II. ASSET DESCRIPTION

The Residences at Pier 3 are constructed on Pier 3 North, which is located along the west bank of the Delaware River in Philadelphia, Pennsylvania and just south of the Ben Franklin Bridge. See the site map on the following page. There is a marina along the north face of the Pier. The pier was originally used for industrial cargo purposes, designed to handle the loading, unloading and storage of cargo from deep draft vessels. According to the available drawings, the Pier was constructed by the City of Philadelphia's Department of Wharves, Docks and Ferries circa 1922. The Pier was later converted into residential waterfront condominiums (circa 1988), and it is reported to be one of the first housing developments on the Philadelphia waterfront. Pier 3 is a timber low-deck structure that extends east-west into the Delaware River. The original pier is approximately 185' wide x 545' long (average). The south side of the pier was widened approximately 15' in year 1954 to result in a total pier width of 200'.

The pier is supported on approximately 104 timber pile bents that extend full width through the structure, with additional partial length "pony bents" (including under the columns that support the superstructure). See Appendix A - Drawings for layout. The timber pile bents and pony bents span in the north-south direction and are spaced at approximately 5' on center. The full width bents are supported by timber plumb piles (varying from 45 to 62 per bent) and timber battered piles (varying from 0 to 5). The piles vary from 12" to 14" diameter (construction conditions – not due to section loss) while the batter piles were found to be approximately 10" in diameter. The piles in each bent are "shouldered" connected to each other with timber clamps at the top. This forms the timber bent layout. Per the previous report, there are 6"x12" clamp boards around the exterior, and 3" x 12" timber clamp boards along the interior of the structure. The clamps are connected with (2 to 3) 1" diameter bolts at each pile. The clamped piles are topped with timber pile caps above, 6"x16" at the exterior and 10"x 12" at the interior. The timber decking boards span east-west between each of the bents, resting on the top of the timber pile cap. The pile caps support one layer of 6" thick timber decking. The deck is approximately 3' above the local Mean Lower Low Waterline (MLLW). The local tidal swing is approximately 6' high. The underside of the deck is exposed during typical low tides, and submerged during high tide. There is an approximately 9' high concrete seawall around the perimeter of the pier that rests on the timber deck. The function of the seawall is to retain the earth fill in the center of the pier and above the timber deck. There are typically 3 timber boards below the concrete seawall that form an 18" high skirt around the pier perimeter. The skirt is an aesthetic detail that also provides some protection to the exterior piles from impact damage due to ice, debris, etc.

In addition to the original timber low deck structure configuration, there are 8 wharf drops around the perimeter of the original pier, 4 on each of the north and south faces. The wharf drops along the south face are no longer visible due to the widening of the pier circa 1954. The wharf drops would have been used originally for access during the handling of cargo, and are often spanned over with new superstructure when industrial piers are converted to different usage. The wharf drops are framed with steel W18 beams that span east-west and are framed into the concrete sidewalls. The beams support a reinforced concrete deck with stay-in-place forms. Wharf Drop 2 has a second set of stringers running perpendicular and on top of the W18 beams. The stay in place forms are resting on these upper stringers that support the concrete deck.

There are multiple residential dwellings on top of the pier structure. The center of the lower level is garage parking for the residents, and the center of the building above is an open-air corridor. The units are located along the north and south faces of the pier, with walkout exterior balconies on the Pier at the lower level.

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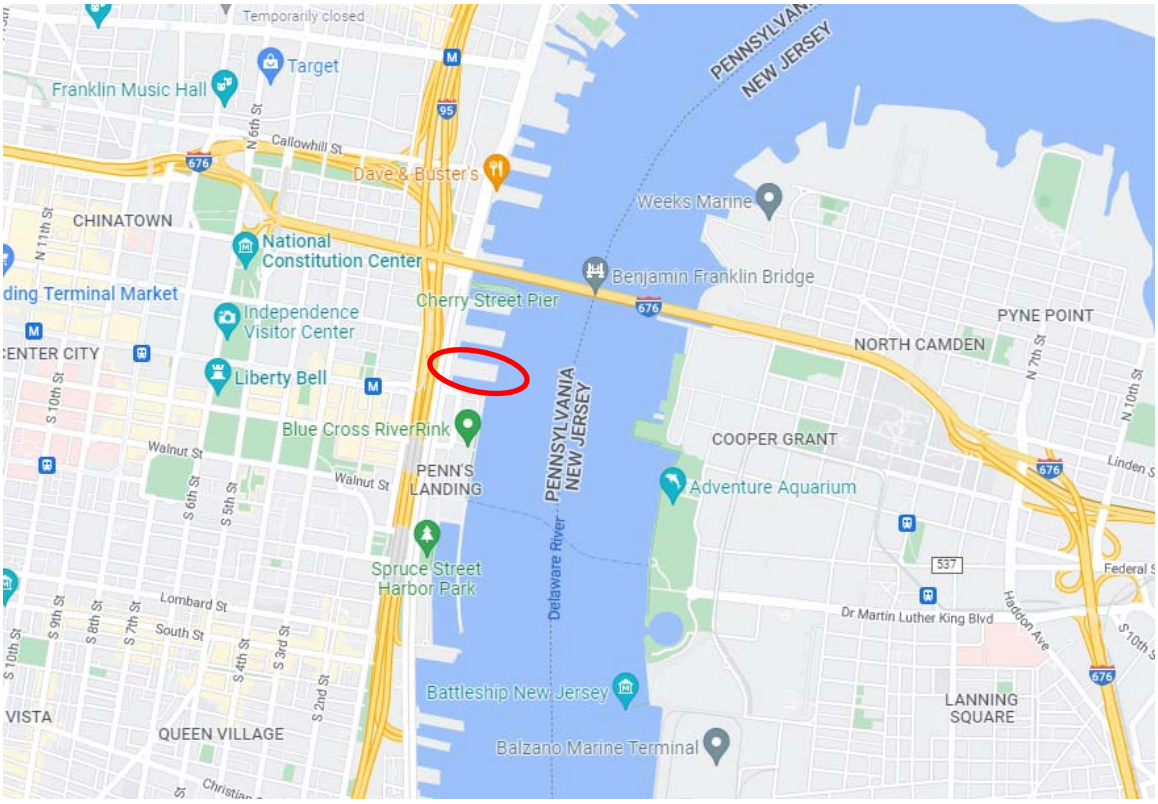

Figure 1: Location Map of Pier 3 (via Google Maps).

Figure 2: Aerial View of Pier 3 (via Google Earth).

III. INSPECTION PROCEDURE

A. GENERAL

The City of Philadelphia Code requires that waterfront structures are inspected on a three year (triennial) basis. The primary purpose of this type of routine inspection cycle is to assess the overall condition of the waterfront asset, determine and document the appropriate condition rating, to identify any priority safety concerns, and to provide general guidance about less urgent repair recommendations and maintenance programming. As the Philadelphia Code does not provide detailed instruction on best practices for underwater inspection methodology, Castle personnel used guidance from the following sources, as well as best industry practices:

- ASCE "Underwater Investigations Standard Practices" Manual No. 101 (primary guidance);
- FHWA approved NHI (National Highway Institute) class 130091 – Underwater Bridge Inspection;
- PennDOT's Bridge Safety Inspector Certification Course.

These resources provide defect definitions for conditions such as good, satisfactory, fair, poor, severe, etc. See Appendix E for condition definitions based on standard FHWA definitions. These terms have been used throughout this report to better convey the level of deterioration at each element. In addition, an overall pier assessment (Safe, Safe with a Repair Plan, and Unsafe) has also been provided in order to meet code requirements.

Due to the limitations of underwater inspection (such as poor to no visibility, obstructed view due to marine growth, difficult access conditions, etc.), it is understood that a complete assessment of all in-water components for a routine inspection is impractical. Therefore, the general industry standard is to define several levels of detail that may be obtained during an inspection. The ASCE definitions are:

- Level I – visual or tactile inspection of underwater components without the removal of marine growth.

- Level II – partial marine growth removal of a statistically representative sample – typically 10% of all components.

- Level III – non-destructive or partially destructive testing of a statistically representative sample – typically 5% of components.

Routine inspections typically consist of a Level II effort. Level III may be required when the routine inspection or previously available information indicates an issue of concern. The scope of this inspection was to perform a routine Level I and Level II inspection. Given the presence of numerous timber elements, the inspection also included recording awl penetrations into the various timber elements to better assess the level of deterioration, which is standard practice for a Level II inspection.

It should also be noted that the entire underwater portion of a structure is not necessarily inspected during a routine inspection. Only the visible, accessible, and un-obscured portions of a structure may be observed and recorded during a routine inspection. Inspectors may use engineering knowledge to pick a randomized sample of structural elements to focus on in order to gain a representative idea of the condition of the entire structure. It is generally understood that additional damage or deterioration may exist at portions of the structure that are not

accessible or visible, and that the routine inspection provides a general overview of the conditions of the underwater portions of the Pier. Additionally, this report and the findings herein represent the conditions observed at the time of the inspection only. Conditions may change over time and due to other events (such as storms or impact damage).

Summary of Inspection Levels					
		Detectable Defects			
Level	**Purpose**	**Steel**	**Concrete**	**Wood**	**Composite**
I	To confirm as-built conditions and detect severe damage	Extensive corrosion & holes. Severe mechanical damage	Major spalling & cracking. Severe reinforcement corrosion. Broken piles.	Major loss of section. Broken piles and bracing. Severe abrasion or marine borer attack.	Permanent deformation. Broken piles. Major cracking or mechanical damage.
II	To detect surface defects normally obscured by marine growth	Moderate mechanical damage. Corrosion, pitting, and loss of section.	Surface cracking, spalling & erosion. Rust staining. Exposed reinforcing steel or pre-stressing strands.	External pile damage caused by marine borers. Splintering piles. Loss of bolts and fasteners. Rot or insect infestation.	Cracking. Delamination. Material degradation.
III	To detect hidden or interior damage, evaluate loss of cross sectional area, or evaluate material homogeneity	Thickness of material. Electrical potentials for cathodic protection.	Location of reinforcing steel. Beginning of corrosion of reinforcing steel. Internal voids. Change in material strength.	Internal damage caused by marine borers (internal voids). Decrease in material strength.	N/A

B. EQUIPMENT

The underwater inspection was performed utilizing a qualified dive team under the guidance of a Licensed Pennsylvania Engineer Team Leader, including an engineer-diver and ADCI certified and FHWA trained commercial diver(s), and a boat operator. All operations are governed by the OSHA regulations for Commercial Diving-29 CFR Part 1910 Subpart T. All diving is performed with constant, direct communication between the engineer and the diver, or with an engineer performing the diving directly. The diver utilized standard hand tools, lights, measuring tools and cameras to document the condition below the pier. A PE was able to review photos of areas of concern directly throughout the inspection. Diving operations were staged from our 17' aluminum dive boat. Poor visibility, typical of the Delaware River at this location, limited the clarity of underwater photographs.

C. INSPECTION DETAILS

Diving operations took place over the course of several days (October 11, October 12, October 13) due tide conditions. The inspection was performed primarily during periods of low tide to maximize the amount of the structure exposed. The weather was generally 65˚F and sunny over the course of the inspection, with rain on the final day of inspections. The time of slack low tides were based on the tide gauge located at Philadelphia Municipal Pier 11, which is just upstream from the site. Tidal swings in this location are typically in the range of 6' high. Diving operations were typically conducted during the hours immediately before and after slack low tide on each day.

Diving operations were primarily staged from our 17' aluminum dive boat, which was able to move around the perimeter of the pier as required for access. Additional access for topside inspection was gained via the marina walkways at the north face of the pier.

The underwater inspection was initiated at the northeast corner (outshore, north face) of the pier. Bents and piles were numbered in accordance with the previous (2019) report, starting inshore at Bent 1. Note that an alternative numbering scheme is used along the east (outshore) nose (as per the previous reports, the pile immediately north of the steel armor at the southeast corner was designated as Pile 1'). The diving proceeded from north to south along the east face, east to west along the south face, and east to west along the north face. There is a marina with walkways and multiple pleasure crafts on the north side of the pier. There is heavy siltation in this area, particularly between the edge of the walkway and the face of the pier. There is significant siltation build-up, preventing safe access for diving from this side of the pier along most of the length. It should be noted that this area has continued to silt heavily over recent years. During the 2016 underwater inspection, the team was able to access from the northeast end to Bent 41. During the 2019 inspection, the team was able to access Bent 63. During this cycle, the team was able to safely access Bent 66 from the north face. It is likely that this access will continue to be diminished in future cycles. See the sonar images in Appendix B, which show the silty buildup.

D. INSPECTION APPROACH

Due to the limited time of the inspection and the large size of the pier, the inspection was focused on the outboard elements of the pier, similar to what was done in previous cycles. The exterior elements of piers of similar configuration typically exhibit the most damage and deficiencies, as they are more exposed to the sun, ice and debris flows, and other potential impacts. More than 300 piles, 232 pile caps, and accessible hardware were inspected throughout the pier over the course of this inspection including interior and exterior piles. All exterior piles along the East side were inspected for deterioration and scouring activities. The inspection was performed in accordance with ASCE "Underwater Investigation Standard Practice Manual No. 101 & 103, and The City of Philadelphia L&I current specifications for pier inspection under the direct experience of a Licensed Pennsylvania Engineer.

The inspection included all elements of the pier, such as clamps, cap, deck planks, hardware, etc. Concrete elements were struck with a hammer to determine deterioration levels and delamination. Steel elements were cleaned as needed to determine section loss. Timber elements were probed with an awl to determine overall decay and deterioration, in addition to looking for signs of splits, breaks, misalignment and non-bearing conditions. Special attention was paid to defects that could result in loss of fill, scour, and structural instability.

The staffing for the inspection was as follows:

TITLE	NAME
Project Manager Team Leader	William Castle, PE, SE Certified Commercial Diver
Engineer-Diver	Austin Goldstein
Commercial Diver(s)	Mike Antinore Scott Blankenship
Sonar Engineer	Greg DiCamillo, PE
Project Engineers	Richard Parisi, PE

IV. INSPECTION FINDINGS

The following report section includes a summary of the defect findings at each of the elements inspected. See Appendices A and C for additional detailed field notes and drawings.

A. SEAWALL

The concrete seawall at Pier 3N was visually plumb along the upriver and downriver faces of the pier. The outshore face of the pier was observed to have a slight bow at the upriver end. This condition was also reported in the 2016 and 2019 inspections. On the upriver and outshore seawalls, advanced deterioration in the form of deep erosion pockets and spalling were observed at the bottom 4'-0" of the seawall (**Photos 2, 3, 5 & 6**). Full height vertical and diagonal cracks with approximate widths of 1/8" to ¼" were observed at several locations on the upriver, downriver, and outshore faces. Typically, construction joints in the seawall exhibited greater erosion, especially at the bottom of the seawall.

The upriver seawall exhibits significantly greater deterioration (**Photos 2, 5 & 6**). Several sections of the seawall have recently been repaired on the outshore and upriver faces of the pier (**Photos 1 & 3**). Repaired sections were typically found to be intact. The bottom 4'-0" of the un-repaired seawall was typically observed to have 1" deep general erosion with localized deeper erosion pockets. The deeper erosion pockets at the bottom of the seawall were most prominent at approximately 3-5 ft. inshore and outshore of each of the four (4) wharf drops (**Photo 5**). Spalling with 8" to 15" loss of section and rounding of edges was also observed at the inshore and outshore corners of seawall at each wharf drop. There were four (4) full height cracks with spalling at the edges up to 76" W x 12" D (**Photos 2 & 6**). There are two spalls between wharf drops 2 & 3 measuring up to 4' H X 10" D (**Photo 6**). The bottom 4" of the seawall exhibited deep erosion at a few locations, exposing the top of the timber low decking. Localized areas near the top of the seawall exhibited efflorescence.

The south face of the pier seawall is in fair condition. There is a typical condition of spalling measuring up to 21" H x 48" W x 6" D with patches generally at the top of the seawall (**Photos 4 & 7**).

On the outshore face of the pier, multiple sections of the original concrete have recently been repaired. There is abrasion in the lower 4' of the seawall, and deeper erosion just above the timber deck (**Photo 3**).

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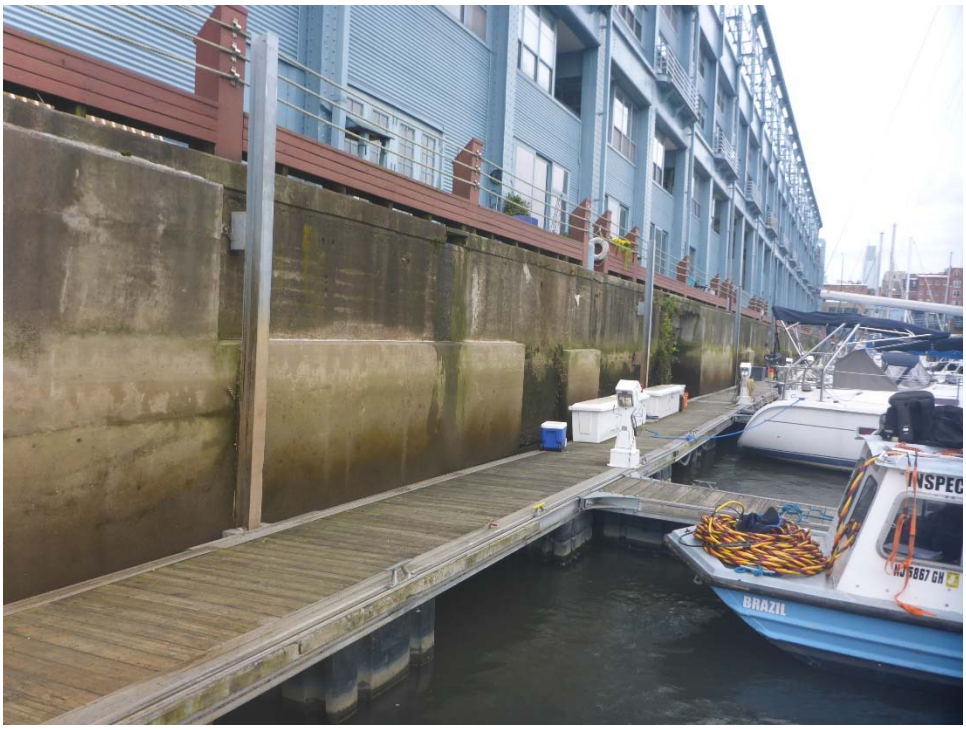

Photo 1: North face of pier, looking southwest towards WD 4. The seawall is in generally satisfactory condition, with hairline map cracking and light efflorescence throughout. Random areas of the seawall have been repaired.

Photo 2: Upper east corner of WD 4, looking south. Full height crack up to 12" deep with significant erosion and spalling at the edges with adjacent hollow area in concrete up to 76" wide. Note heavy vegetation growth. There is ½" to 1" of typical spalling along the top of the wall and moderate abrasion in the lower 4.0'.

Photo 3: Typical section of east face of pier, looking northwest. The seawall is in generally satisfactory condition with random areas of repairs. Note abrasion in the lower 4' of the seawall, and erosion just above the timber deck.

Photo 4: Typical section of south face of pier, east end, looking north. The seawall is in generally satisfactory condition. Note abrasion in lower 4' of the seawall.

Photo 5: North face, spalling at the west corner of WD 3 measuring 48” H x 8” D with exposed and deteriorated deck. Similar deterioration was observed at each corner of the northern WDs.

Photo 6: Typical spalling at joint measuring up to 56” H x 4” D approximately 10’ west of WD 3.

Photo 7: South face. Typical spalling with patch at top of seawall.

B. WHARF DROPS

There are eight (8) wharf drops around the perimeter of the original pier, four (4) on each of the north and south faces. The four (4) wharf drops on the south side of the pier are no longer exposed to the sun due to a 15' pier extension. No significant defects were found in the southeastern wharf drop (Wharf Drop 5). It is assumed that the remaining southern wharf drops are in similar condition due to their protection from outside elements. The originally open access areas are spanned over with five (5) steel W18 beams, stay-in-place (SIP) forms, and a concrete deck. Wharf Drop 2 has a second set of stringers running perpendicular and on top of the W18 beams. The stay in place forms are resting on these upper stringers that support the concrete deck (**Photos 8 & 9**). The beam ends are embedded into the concrete sidewalls of the wharf drops. Bearings, if they exist, are fully encased into the concrete and inaccessible for inspection. Plans for the wharf drop construction were unavailable. There are timber cross members at the low waterline.

1. Concrete Walls:
   The sidewalls (seawall) of the wharf drop exhibit minor to moderate abrasion in the lower 4' (tidal zone), similar to the seawall perimeter, and map cracking near the top (**Photos 8 & 9**). The worst abrasion is typically located just above the timber decking and at the corners, which are generally rounded.

   The interior face of the wharf drop is a sloped concrete wall. Typically, these interior walls exhibit abrasion similar to the sidewalls.

Photo 8: WD1, looking south. General layout of wharf drop. Note the steel beams spanning above and the sloped concrete back wall. Note the typical moderate abrasion that continues along the concrete walls.

2. Steel Beams & Concrete Deck

The steel beams are in satisfactory condition. Most deterioration is limited to the ends of the beams where some paint failure and minor corrosion is observed in various beams (**Photo 9**). Most of the beams have timber/plywood formwork left in place along the face of the concrete wall where they are embedded. The timber appears to be holding moisture and further increasing the rate of deterioration at the beam ends (**Photo 9**).

The exterior beam at Wharf Drop 4 is bent upward most likely due to an impact (**Photo 10**).

The concrete deck in Wharf Drops 1 & 3 was found to be in poor condition. There are failed sections of the SIP forms with exposed concrete and exposed layers of reinforcing with 100% section loss (**Photos 11 to 13**). The deck in Pier 4 is in satisfactory condition with deteriorated SIP forms and concrete at the soffit. The deck in Wharf Drop 2 is in good condition.

See table on the following pages for specific conditions by locations.

Photo 9: WD2, looking southwest. General layout of wharf drop 2. Note the SIP forms for the concrete deck and remnants of formwork that remain in place around the beam ends. Note that the stringers above the W18 beams are located in WD 2 only.

Photo 10: WD4, first beam from opening, looking south. Bottom flange was apparently struck previously. Note the deterioration in the SIP forms at the deck soffit.

Photo 11: WD 3, east end of Beam 2 from the opening, south side of the beam, looking up. Area of 100% section loss measuring 3' L x 1'W x 9" D to the SIP forms with exposed and deteriorating concrete deck with two layers of exposed reinforcing with up to 100% section loss in the first layer and minor section loss to the second layer. Similar conditions exist on the west end.

Photo 12: WD 1, Bays 1 & 2 from the opening, looking west. SIP forms have areas of 100% section loss around the perimeters and are bowing downwards.

Photo 13: WD 1, northwest corner of bay 1, area of exposed and soft concrete with exposed reinforcing with up to 100% section loss.

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WD #	Deck	West End	East End	Beams
1	Soffit	The stay in place sheeting exhibits random areas of moderate section loss.	The stay in place sheeting exhibits random areas of moderate section loss.	The ends of the beams have wood forms in place. Beams exhibit paint failure and minor corrosion at the ends.
	Bay 1	The stay in place sheeting exhibits areas of 100% section loss around the perimeter of the bay. The southwest corner of the deck is exposed with areas of soft concrete extending above Beam 2. Concrete deck reinforcing is exposed with section loss. The center of the sheeting has failed.	The stay in place sheeting exhibits areas of 100% section loss around the perimeter of the bay. The southeast corner of the deck is exposed with areas of soft concrete. The center of the sheeting has failed.	
	Bay 2	The stay in place sheeting exhibits areas of 100% section loss around the perimeter of the bay and random areas throughout. The northwest corner of the deck is exposed with areas of soft concrete extending above Beam 2. Concrete deck reinforcing is exposed with severe section loss. The center of the sheeting is bowed.	The stay in place sheeting exhibits areas of 100% section loss around the perimeter of the bay and random areas throughout. The northwest corner of the deck is exposed with areas of soft concrete. Concrete deck reinforcing is exposed with section loss. The center of the sheeting is bowed.	
	Interior	Appears in good condition.	Appears in good condition.	
2	Soffit	Appears in good condition.	Appears in good condition.	WD 2 has stringers above the main beams. The stringers have paint failure and minor corrosion at the opening of the WD. The ends of the beams have wood forms in place. Beams exhibit paint failure and minor corrosion at the ends.
	Bay 1	Appears in good condition.	Appears in good condition.	
	Bay 2	Appears in good condition.	Appears in good condition.	
	Interior	Appears in good condition.	Appears in good condition.	

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WD #	Deck	West End	East End	Beams
3	Soffit	The stay in place sheeting has random areas of section loss throughout.	The stay in place sheeting has random areas of section loss throughout.	The ends of the beams have wood forms in place. Beams exhibit paint failure and minor corrosion at the ends.
	Bay 1	The stay in place sheeting exhibits areas of 100% section loss around the perimeter of the bay with exposed concrete deck. There is an area of soft concrete extending above Beam 2 . There is an area above the beam with full penetration across the top flange (loss of bearing).	The stay in place sheeting exhibits areas of 100% section loss around the perimeter of the bay. The southeast corner of the deck is exposed with spalling measuring 3' L x 1' W x 9" D and areas of soft concrete extending above Beam 2 . Two layers of deck reinforcing are exposed, the first layer has exposed bars with areas of 100% section loss, the second has 2 exposed bars with minor section loss.	
	Bay 2	The stay in place sheeting exhibits areas of 100% section loss around the perimeter of the bay. The northwest corner of the deck is exposed with spalling measuring 3' L x 1.5' W x 10" D and areas of soft concrete extending above Beam 2 . There is an area above the beam with full penetration across the top flange (loss of bearing). Two layers of deck reinforcing are exposed, the first layer has 4 exposed bars with areas of 100% section loss, the second has 2 exposed bars with minor section loss.	The stay in place sheeting exhibits areas of 100% section loss around the perimeter of the bay. The northeast corner of the deck is exposed with spalling measuring 3' L x 1' W x 9" D and areas of soft concrete extending above Beam 2 . Two layers of deck reinforcing are exposed, the first layer has exposed bars with areas of 100% section loss, the second has 2 exposed bars with minor section loss.	
	Interior	Appears in good condition.	Appears in good condition.	

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WD #	Deck	West End	East End	Beams
4	Soffit	The stay in place sheeting has random areas of 100% section loss throughout. There is edge spalling in the concrete deck along the outside face.	The stay in place sheeting has random areas of 100% section loss throughout. There is edge spalling in the concrete deck along the outside face.	The bottom flange at center of the exterior Beam 1 is deformed. The ends of the beams have wood forms in place. Beams exhibit paint failure and minor corrosion at the ends.
	Bay 1	Appears in good condition.	Appears in good condition.	
	Bay 2	Appears in good condition.	Appears in good condition.	
	Interior	Appears in good condition.	Appears in good condition.	

C. TIMBER LOW DECK STRUCTURE

1. Piles:

The timber piles are typically in satisfactory condition, intact and primarily bearing with minor deterioration and natural defects. The pile spacing along the bents varies throughout, between 2'-6" to 4'-3" on center. The bents are typically spaced at 5'-0" on center, with pony bents spaced at 2'-6" where installed. The timber piles also vary in size, and were typically found to be between 12" to 16" diameter. Based on the inspection approach used during this cycle, more than 300 piles were directly inspected (**Photo 14**).

Typically, the piles were found to be relatively plumb and bearing with minor checks and splits (typical of timber elements), but no significant splits or section loss. The piles exhibit minor decay and weathering with awl penetrations up to ¾" deep throughout the length of the pile (**Photo 15**).

There are also battered (diagonal) piles throughout the pier. These are purposefully installed on the diagonal and designed to help resist lateral loads. The battered piles are connected to the side of the timber pile caps and exhibit similar typical conditions to the plumb piles.

Types of defects observed beyond the typical conditions are noted below, including any areas of concern where there are multiple adjacent defects.

- Broken/missing piles. Piles exhibit advanced deterioration (thru-splits, crushing, decay, etc.) and are no longer functioning for load transfer. Piles (typically at the top) may be fully missing/broken off. Most of the missing or broken piles were found on the south and east faces of the pier. The most exterior piles (Piles A and B) are typically more exposed to impact damage, by either ice, debris, or vessels. Note that no broken/missing piles were found at the interior. A total of 11 broken/missing piles were identified. (**Photo 16**).

- Split piles. Some of the piles exhibit significant splitting, beyond the typical minor splitting associated with timber elements. Deep or thru-splits can reduce the load bearing capacity of a pile. Splits were typically found at the top of the pile (1' to 4' high), and often in line with the shoulder. Exterior piles are typically more susceptible to splitting than interior piles, due to effects of impact and ice damage. A total of 5 split piles were identified. (**Photo 18**).

- Non-bearing piles. Some of the piles were found to be fully or partially non-bearing. Typically, there are gaps (vertically and/or laterally) between the shoulder of the pile and the clamps/cap. Note that this is also a common construction condition observed in timber piles due to cutting techniques utilized at the time of installation. The connection is designed to rely on contact with the hardware, rather than bearing on the shoulder. The diver also looked for bent hardware, particularly at the exterior, which can be a sign that the non-bearing is causing an overstressing condition in the hardware. Note that the interior piles often exhibited large gaps (up to 7" high) between the shoulder and clamp, but appear to be directly bearing on the cap and are functioning as intended (20 piles identified) (**Photos 14 & 15**).

- Piles installed out-of-plumb. Some of the vertical piles were found to be out-of-plumb. Note that this is an as-built construction condition due to installation rather than a deficiency. In deeper areas (such as the outshore face), leaning may occur due to loss of

embedment from scour. No signs of leaning due to scour were observed. A total of 4 leaning piles were observed.

See Appendix C - Field Note Tables and Appendix A - Drawings for defect information by location.

2. Caps, Clamps & Hardware

The timber caps and clamp elements were typically found to be in satisfactory condition, intact and bearing with minor deterioration and natural defects. The timber elements exhibit minor decay and weathering, with awl penetrations up to ½" deep throughout. The timber elements typically exhibit the worst conditions on the ends. A total of 1 locations of split caps or clamps were located throughout the pier. (**Photo 17**).

As noted above, some of the piles exhibit gaps (up to 7") between the pile shoulder and the clamp. Interior piles exhibit larger gaps, but are bearing at the cap. See conditions and locations above.

The visible portions of the connecting hardware are typically in satisfactory condition with minor corrosion and section loss (10% to 20%). The hardware is typically intact and tight. There were no significant visible signs of overstressing, such as exposed bent hardware. There are random areas of heavy section loss, missing hardware elements and loose hardware.

3. Timber Low Deck

The timber low deck is constructed primarily of 6"x12" timber planking that spans between bent caps in the east/west direction. The timber decking is in fair condition overall, with moderate decay and weathering typical (**Photo 14**). The boards typically exhibit up to 1" penetration with an awl.

There are typically narrow gaps between the edges of the deteriorated deck boards with isolated areas of up to 1" (**Photo 19**). There was no indications of loss of fill from the gaps. Available drawings indicate that there is only one layer of timber decking. Timber low deck structures are often constructed with two layers, spanning in opposite directions, which makes them less susceptible to loss of fill due to deterioration or gaps. There were no signs of widespread sagging or broken deck boards.

4. Skirt boards

The timber skirt boards (non-structural elements) are typically in fair condition, and exhibit moderate deterioration and splitting throughout. Random skirt boards are loose or missing. From the outshore end of the south face of the pier for approximately 20 ft along the south face the skirt board is missing with exposed exterior piles. Approximately 30ft of skirt board is broken or missing on the north face (**Photo 20**). Note that the timber low deck structure in these areas is more exposed to impact damage, ice and debris. The skirt board was generally found to be in good condition along the outshore face of the pier.

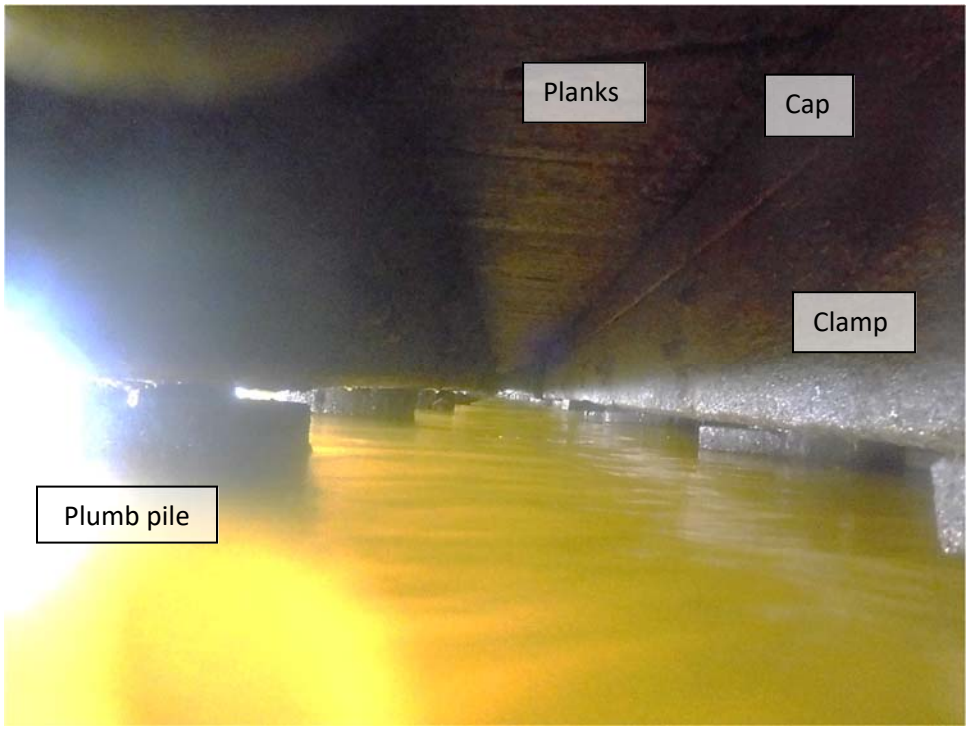


Photo 14: Bay between Bents 1'/2', looking south. Typical layout of timber low deck elements.

Photo 15: Outshore pile, East face. Typical maximum awl penetration into pile.

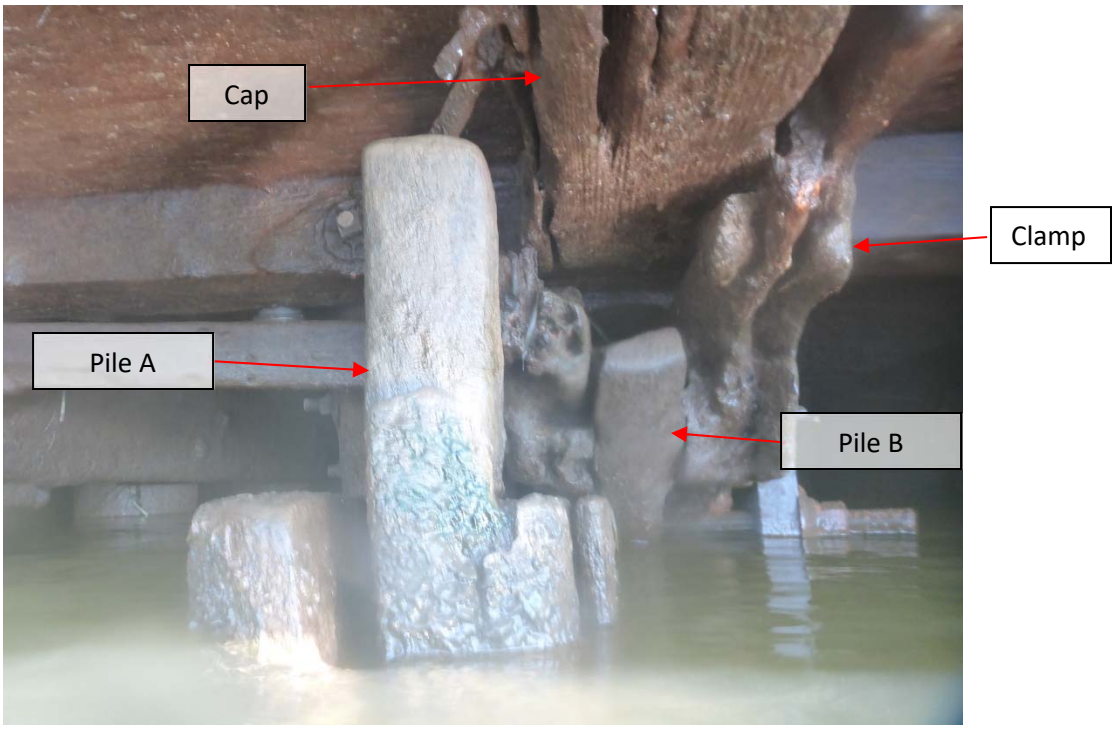


Photo 16: Bent 80S. Pile A and B are broken.

Photo 17: Bent 81S. Timber clamp and cap have deterioration up to 50%

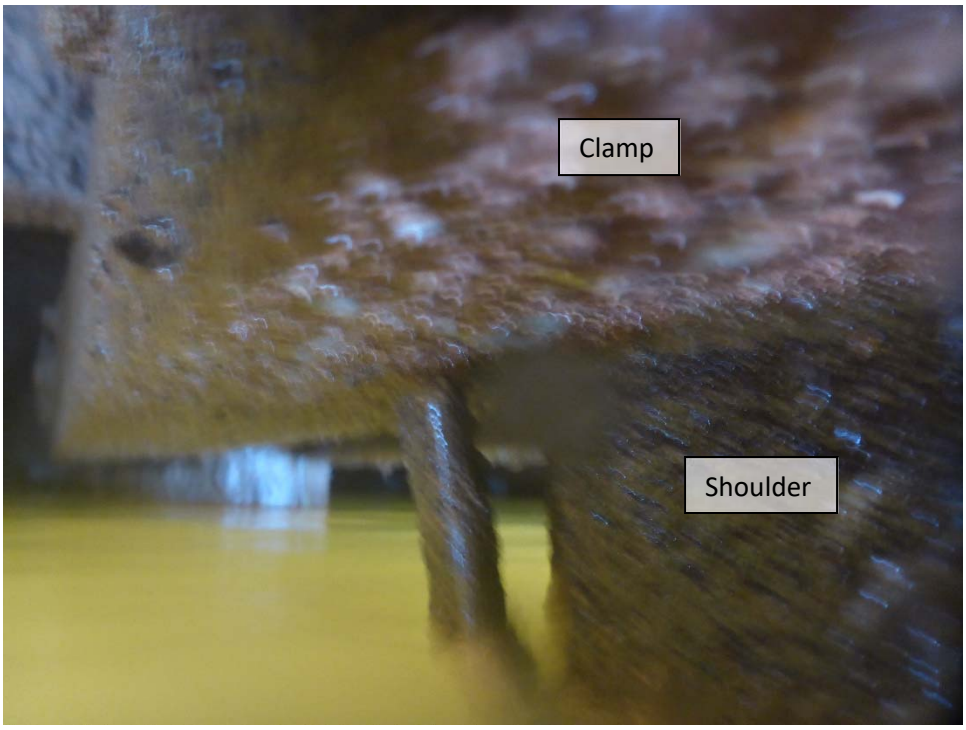


Photo 18: Bent 69S Pile A. Minor split at pile shoulder.

Photo 19: B/W bents 95S & 96S at Pile E. Gaps in timber deck up to 1" wide with no active loss of fill.

Photo 20: Typical broken skirt board on the north face.

D. SONAR IMAGING & CHANNEL BOTTOM

1. Approach

In addition to the traditional underwater inspection, Castle performed sonar imaging of Pier 3 on July 8, 2022. The imaging was completed in advance of the underwater inspection to identify any specific areas of concern to focus on during the inspection and to provide imaging of the submerged portions of the structure. This information was used in combination with the previous underwater inspection to guide the dive operations and fully assess all conditions.

The imaging was performed using a Kongsberg MS1000 scanning sonar head from a work boat with a three-person crew. The imaging is collected by a rotating sonar head that is pole mounted to the boat and moved along the perimeter of the pier. The sonar engineer documents the range and location of each scan taken while in the field. The MS 1000 can scan at multiple frequencies and ranges. The frequency and range are changed by the engineer as needed to collect detailed and wide-view data of the surfaces. Because the system collects data with a rotating head projecting a fan beam onto surroundings surfaces, some data can be obscured by shadowing created from nearby objects. For example, at timber low deck structures, the interior piles are typically obscured; the second row of piles may be partially visible in areas, and the top of the outer row of piles are often partially hidden in the shadow of the seawall or skirt boards. Piles may be only partially visible in the imaging, but may be fully intact along the length.

After completion of the data collection, the images are processed in the MS 1000 operating software. A CAD technician overlays and compiles the multiple scans to develop the complete mosaic of the imaging. Finally, topside images are incorporated for orientation purposes.

Note that the inshore portions of the north face were generally inaccessible for imaging due to the heavy siltation and the location of the marina dock system. There are limited structures at the south and east faces, which allow for full length imaging. Imaging is performed at periods of high tide.

2. Findings

The sonar imaging at Pier 3 (see Appendix B) provides a distinctive map of the channel bottom around the south face, east nose and a portion of the north face. This image can be utilized to monitor and analyze scour conditions at the Pier. The main channel of the Delaware River is dredged, and the outshore noses of piers along the waterfront are often susceptible to scouring. The images of the south face (sheets 3 & 4) show a shallow, stable channel bottom profile at the inshore portions of the pier, in the range of 4’ to 11’ deep at low tide. The channel bottom drops significantly starting before wharf drop 5, to depths up to 40’ at low tide along the east face. This is typical of similarly constructed piers along the Delaware River. The channel ranges from approximately 32’ to 40’ deep at low tide along the east face. There is a heavy buildup of miscellaneous channel bottom debris (timber, man-made, etc.) along the nose. The north face exhibits a similar channel bottom profile as the south face with the exception that the channel bottom drop off is much closer to the east end of the pier, at about wharf drop 4.

There were no specific large obstructions or other areas of concern observed in the imaging. The visible portions of the piles are generally seen to be intact with no undermining found.

E. TOPSIDE INSPECTION

1. Findings

   The concrete apron on the north face of the pier was not available for inspection. Several cracks up to 1/8" wide were observed in the concrete deck on the south side of the pier (**Photo 21**). The southeast corner of the pier has several cracks in the deck measuring up to 1/8" wide (**Photo 22**). The timber low deck structure was inspected thoroughly in this area to ensure the stability of the concrete deck. No evidence of loss of fill through the low deck or a deficiency in the piles were found in this area during the underwater inspection was found.

Photo21: South side of the pier, looking southeast. Typical cracking up to 1/8" W.

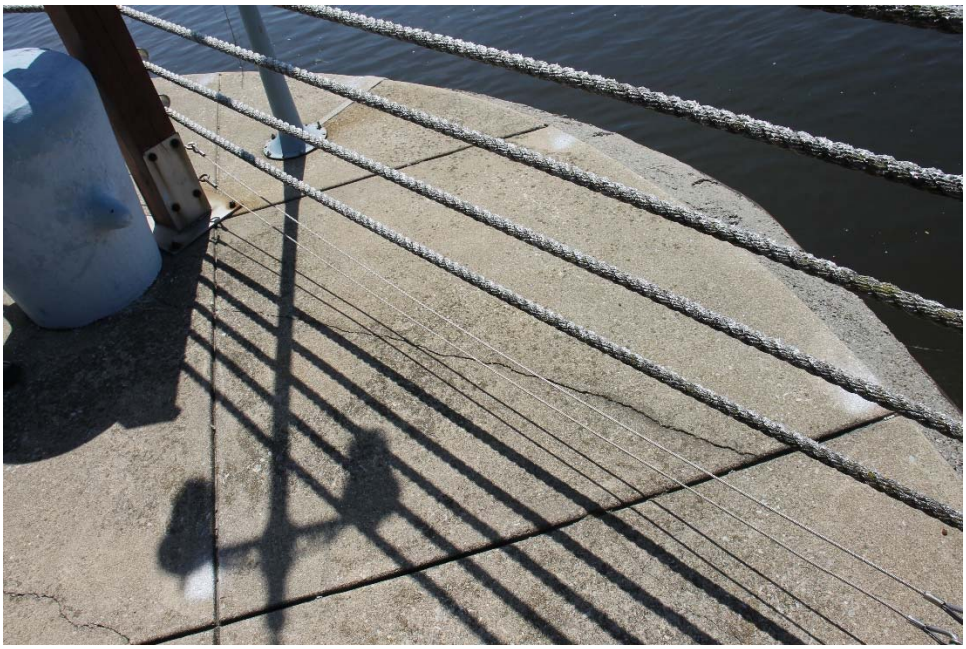


Photo 22: Southeast corner looking east. Localized cracking up to 1/8” W.

V. CONCLUSIONS

As per the requirements in Title 4 of The Philadelphia Building Construction and Occupancy Code (The Philadelphia Code), Sub-Code: PM, Section PM- 304.9, the overall condition of Pier 5 is **Safe with a Repair & Maintenance Program** due to the following defect conditions and evaluations:

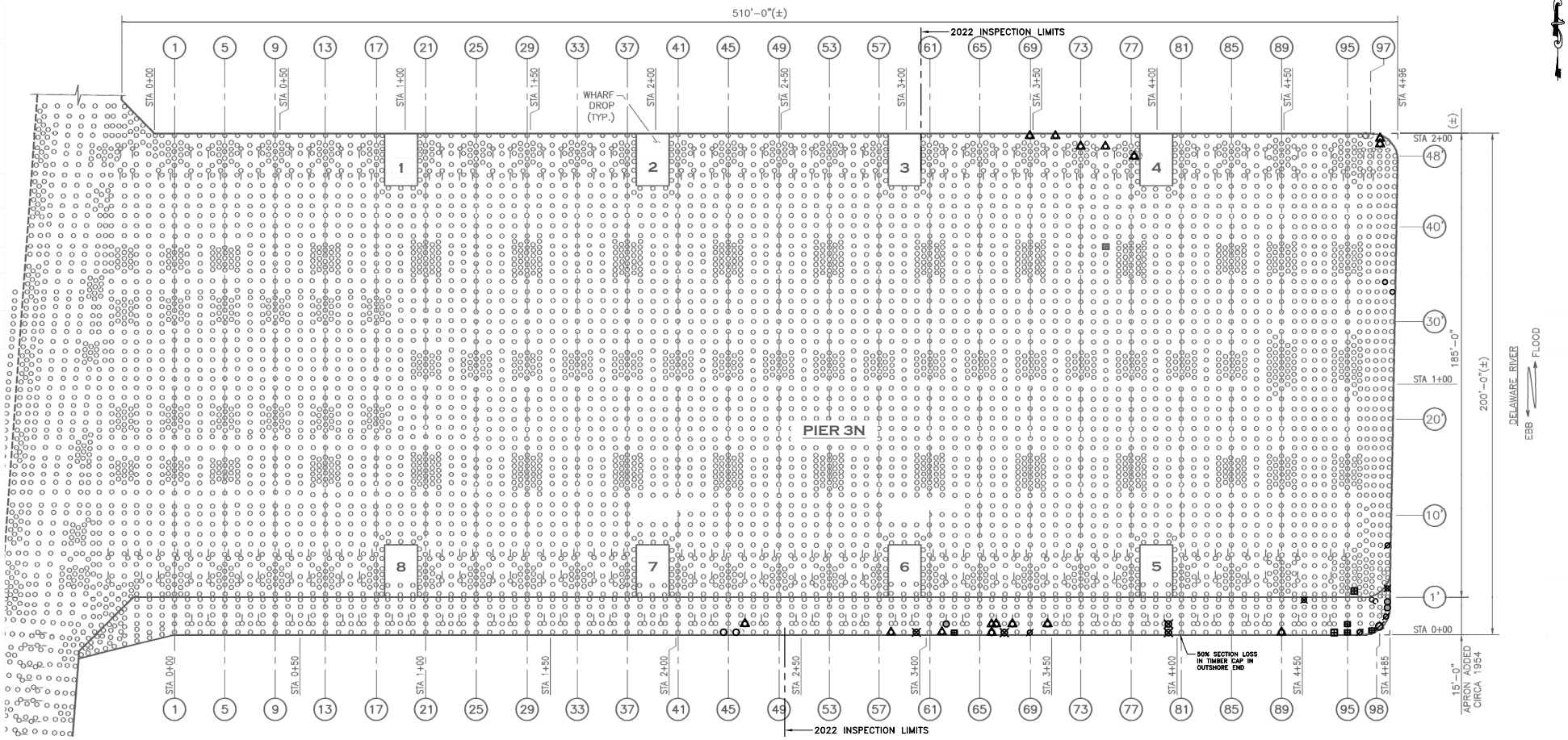
- Seawall: The seawall is in overall fair condition due to the widespread abrasion, wide edge spalling at cracks, and deep voids, primarily in the lower 4' of the northern seawall. These conditions present a potential path for loss of fill via the seawall, which could lead to additional voids and loss of structural integrity. However, no noticeable loss of fill from these locations was observed during the inspection. There were no signs of rotation or settlement in the seawall, nor were there any signs of distress in the adjacent elements. The east face of the seawall was found to be bowing as indicated in the previous (2019) inspection.

- Wharf drops: No significant defects were found in the southeast wharf drop (Wharf Drop 5). The southern wharf drops are protected by a 15' pier extension, and the remaining wharf drops are assumed to be in similar condition. The concrete walls of the wharf drops are in overall fair condition, due to similar but less advanced deterioration as seen in the seawall throughout. The deck is in poor condition in Wharf Drops 1 & 3 due to random areas of deteriorated SIP forms and exposed and deteriorated concrete with two layers of exposed reinforcing. This is an unsafe condition and requires a high priority repair. *Note that this repair is currently under contract for repair.* The deck in Wharf Drop 4 is in satisfactory condition due to the exposed and deteriorated concrete In the deck soffit. The deck in Wharf Drop 2 is in good condition. The steel beams vary from fair (exterior) to satisfactory (interior) condition, with areas of minor corrosion at the ends and impact damage to the exterior beam in Wharf Drop 4. The remaining timber formwork around the beam ends is not a structural defect in itself, but was observed to be holding moisture and contributing to the deterioration at the beam ends.

- Timber Low Deck Structure: The timber elements are typically in satisfactory condition, with random locations in fair condition. All timber elements, including piles, caps, clamps, decking and skirt boards, exhibit moderate deterioration and weathering typical of timber of this age and exposed to these conditions. Other defects include: broken or missing piles, splits, leaning piles, deteriorated hardware and non-bearing conditions. The non-bearing conditions and gaps between the pile shoulder/clamp at the tenon are typically considered to be construction conditions due to the available methods for cutting piles at the time of construction.

- Channel bottom: the channel bottom was found to have a significant drop-off towards the east, as is common with many Philadelphia waterfront piers of similar construction. No signs of localized scour or undermining of piles were observed. No overstressing or settlements was found to indicate an active scour problem at the pier.

APPENDIX A:
DRAWINGS



PLAN VIEW

SCALE: 1" = 20'-0"

LEGEND:

- ○ – EXISTING TIMBER PLUMB PILE
- ○— – EXISTING BATTERED PILE
- ⊂⊃ – LEANING PILE
- Ø – SPLIT PILE
- ⊠ – BROKEN PILE
- △ – NON–BEARING PILE
- ● – MISSING PILE
- ⊞ – CHECKED PILE

GENERAL NOTES:

1. THE UNDERWATER INSPECTION WAS COMPLETED BY OCTOBER 13, 2022 BY W.J. CASTLE, P.E. & ASSOCIATES, P.C.
2. PILE LAYOUT AND OVERALL DIMENSIONS WERE TAKEN FROM THE PREVIOUS REPORT.

DATE	NO.	REVISIONS	BY

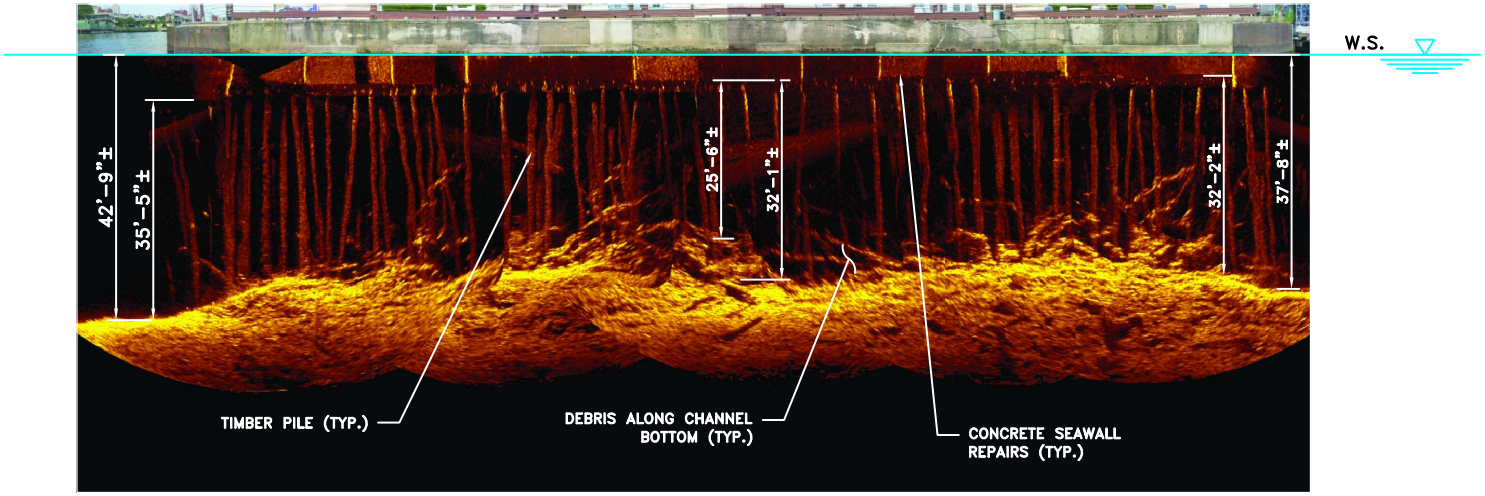
SITE PLAN

UNDERWATER INSPECTION OF
PIER 3
ALONG DELAWARE RIVER
PHILADELPHIA, PENNSYLVANIA

W.J. Castle PE & Associates
Consulting Engineers
1345 ROUTE 38 WEST
HAINESPORT, NJ 08036

SCALE	DRAWN BY	CHECKED BY	JOB NO.	DATE	DRAWING No.
AS SHOWN	CD	AG	10-2631-22	11/30/22	1 OF 1

APPENDIX B:
SONAR IMAGES



NOTES:

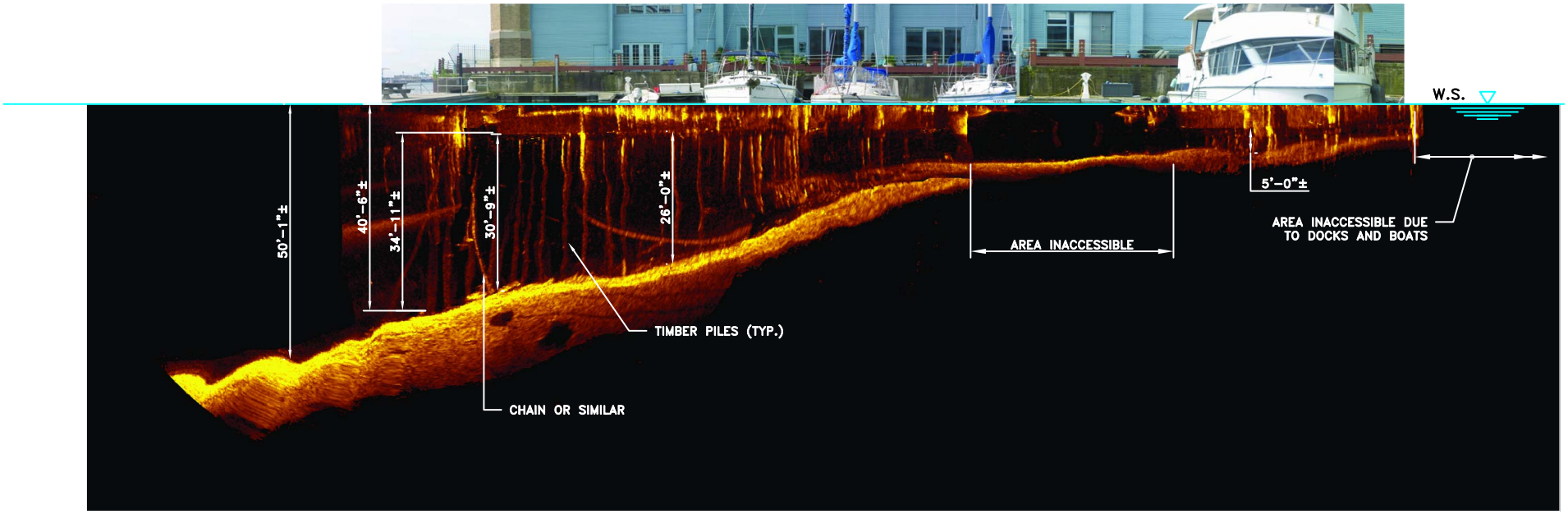
1. THE SURVEY WAS PERFORMED JULY 8, 2022 BY W.J. CASTLE, P.E. & ASSOCIATES, P.C.

20' 0 20' 40'

2022 SONAR IMAGING EAST FACE

PIER 3N OVER DELAWARE RIVER
PHILADELPHIA, PENNSYLVANIA

W.J. Castle PE & Associates
Consulting Engineers
1345 ROUTE 38 WEST
HAINESPORT, NJ 08036



NOTES:

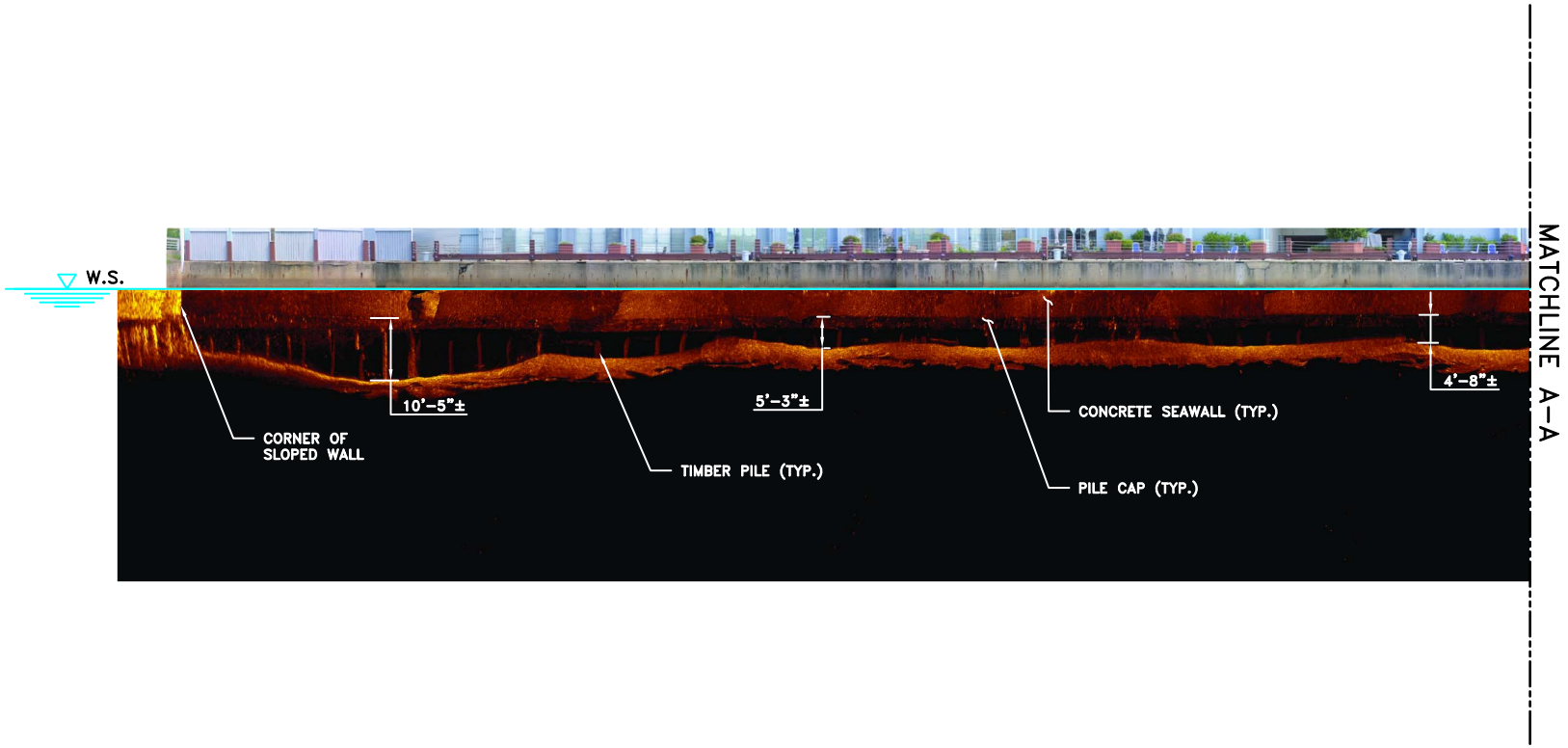
1. THE SURVEY WAS PERFORMED JULY 8, 2022 BY W.J. CASTLE, P.E. & ASSOCIATES, P.C.

20' 0 20' 40'

2022 SONAR IMAGING NORTH FACE

PIER 3N OVER DELAWARE RIVER
PHILADELPHIA, PENNSYLVANIA

W.J. Castle PE & Associates
Consulting Engineers
1345 ROUTE 38 WEST
HAINESPORT, NJ 08036



NOTES:

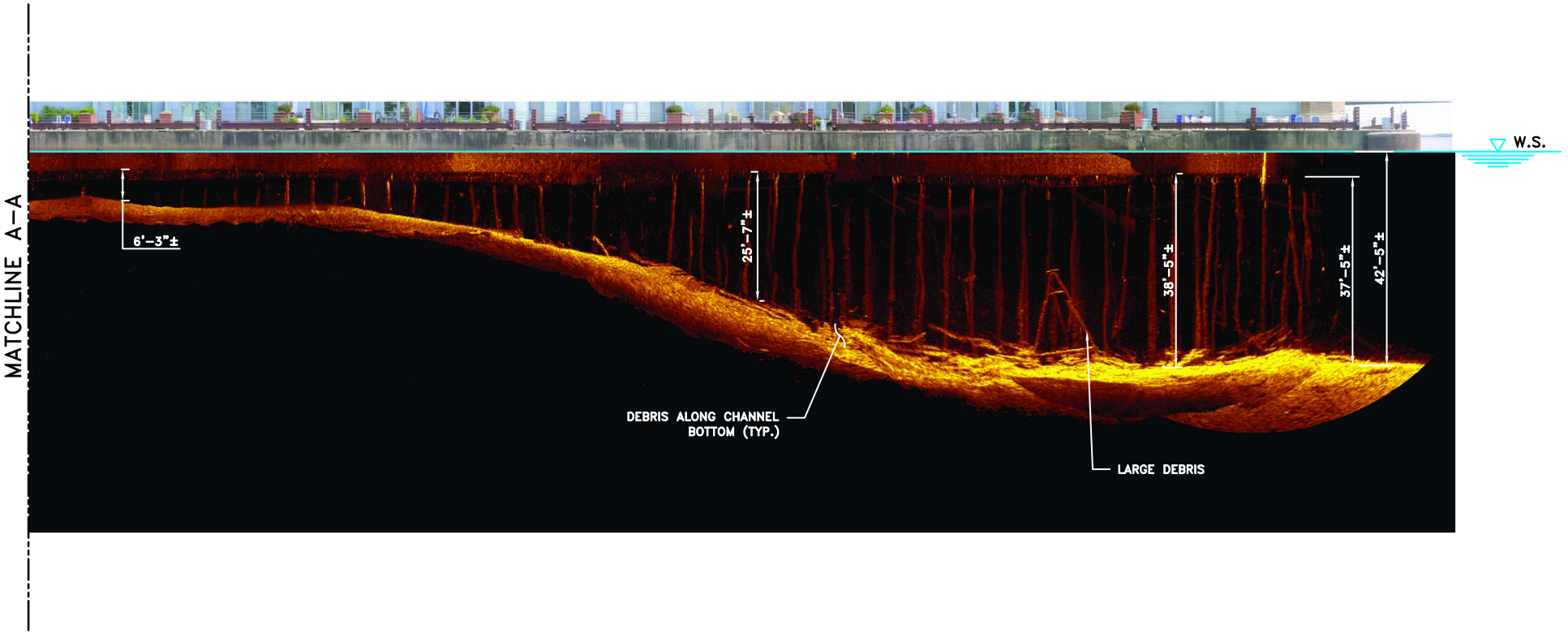
1. THE SURVEY WAS PERFORMED JULY 8, 2022 BY W.J. CASTLE, P.E. & ASSOCIATES, P.C.

20' 0 20' 40'

2022 SONAR IMAGING SOUTH FACE

PIER 3N OVER DELAWARE RIVER
PHILADELPHIA, PENNSYLVANIA

W.J. Castle PE & Associates
Consulting Engineers
1345 ROUTE 38 WEST
HAINESPORT, NJ 08036



NOTES:

1. THE SURVEY WAS PERFORMED JULY 8, 2022 BY W.J. CASTLE, P.E. & ASSOCIATES, P.C.

20' 0 20' 40'

2022 SONAR IMAGING SOUTH FACE

PIER 3N OVER DELAWARE RIVER
PHILADELPHIA, PENNSYLVANIA

W.J. Castle PE & Associates
Consulting Engineers
1345 ROUTE 38 WEST
HAINESPORT, NJ 08036

APPENDIX C:
FIELD NOTE TABLE

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 50-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 51-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 52-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 53-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 54-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 55-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 56-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 57-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 58-S	Pile A	Pile is non-bearing.	
	Piles (interior)	Diver inspected the bay between Bents 58-S/59-S to Pile G. All piles found to be typical, with any additional defects of note listed below.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 59-S	Pile A	Pile in typical condition.	
	Piles (interior)	Diver inspected the bay between Bents 58-S/59-S to Pile G. All piles found to be typical, with any additional defects of note listed below.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 60-S	Pile A	Pile is broken.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 61-S	Pile A	Pile is broken and sistered. Sister pile is in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 62-S	Pile A	Pile is non bearing.	Pile 62A was inspected to the channel bottom to a depth of 11'.
	Pile B	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 63-S	Pile A	Pile is checking.	
	Pile B	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 64-S	Pile A	Pile is split and sistered. Sister pile is in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 65-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 66-S	Pile A	Pile is non-bearing.	
	Pile B	Pile is non-bearing.	
	Pile C	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 67-S	Pile A	Pile is broken.	Pile 67A was inspected to the channel bottom to a depth of 16'.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 68-S	Pile A	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 69-S	Pile A	Pile has minor split.	
	Piles (interior)	Diver inspected the bay between Bents 69-S/70-S to Pile F. All piles found to be typical, with any additional defects of note listed below.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 70-S	Pile A	Pile in typical condition.	
	Piles (interior)	Diver inspected the bay between Bents 69-S/70-S to Pile F. All piles found to be typical, with any additional defects of note listed below.	
	Batter Pile	Pile is non-bearing.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 71-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 72-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 73-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 74-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 75-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 76-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 77-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 78-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 79-S	Pile A	Pile in typical condition.	Pile 79A was inspected to the channel bottom.
	Piles (interior)	Diver inspected the bay between Bents 79-S/80-S to Pile G. All piles found to be typical, with any additional defects of note listed below.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 80-S	Pile A	Pile is broken.	
	Pile B	Pile is broken.	
	Piles (interior)	Diver inspected the bay between Bents 79-S/80-S to Pile G. All piles found to be typical, with any additional defects of note listed below.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 81-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Timber cap exhibits 50% section loss at the outshore end.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 82-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 83-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 84-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 85-S	Pile A	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 86-S	Pile A	Pile in typical condition.	
	Piles (interior)	Diver inspected the bay between Bents 86-S/87-S to Pile F. All piles found to be typical, with any additional defects of note listed below.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 87-S	Pile A	Pile in typical condition.	
	Piles (interior)	Diver inspected the bay between Bents 86-S/87-S to Pile F. All piles found to be typical, with any additional defects of note listed below.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 88-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 89-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 90-S	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 91-S	Pile A	Pile in typical condition.	
	Piles (interior)	Diver inspected the bay between Bents 91-S/92-S to Pile P. All piles found to be typical unless specified below, with any additional defects of note listed below.	
	Pile E	Pile is broken at the tenon.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 92-S	Pile A	Pile in typical condition.	
	Piles (interior)	Diver inspected the bay between Bents 91-S/92-S to Pile P. All piles found to be typical, with any additional defects of note listed below.	
	Pile P	Pile is partially bearing.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 93-S	Pile A	Pile is partially bearing.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 94-S	Pile A	Pile is checking.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 95-S	Pile A	Pile is checking.	Pile 95A was inspected to the channel bottom.
	Pile B	Pile is checking.	
	Pile C	Pile is partially bearing.	
	Pile D	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 96-S	Pile A	Pile has minor split.	Pile 96A was inspected to the channel bottom.
	Piles (interior)	Diver inspected the bay between Bents 96-S/97-S to Pile E. All piles found to be typical unless specified below, with any additional defects of note listed below.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 97-S	Pile A	Pile is checking.	
	Piles (interior)	Diver inspected the bay between Bents 91-S/92-S to Pile P. All piles found to be typical unless specified below, with any additional defects of note listed below.	
	Pile C	Pile is partially bearing.	
	Pile E	Pile is leaning towards the O/S.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 98-S	Pile A	Pile has minor split.	Pile 98A and 98B were inspected to the channel bottom to a max depth of 34'. Pile located between Pile 98B and 99A is checking. Pile was inspected to the channel bottom.
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 99-S	Pile A	Pile has minor split.	Pile 99A was insepcted to the channel bottom.
	Pile B	Pile is missing.	
	Pile C	Pile is missing.	
	Pile D	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 1'	Pile A	Pile in typical condition.	Corner pile after the steel plate on the D/R & O/S (SE) corner of the pier. Piles 1'-46' are piles on the O/S most bent of the pier.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 2'	Pile A	Pile is broken.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 3'	Pile A	Pile in typical condition.	Pile 3'A was inspected to the channel bottom.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 4'	Pile A	Pile in typical condition.	Pile 4'A was inspected to the channel bottom to a max depth of 31'.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 5'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 6'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 7'	Pile A	Pile is split at the inshore shoulder.	Pile 7'A was inspected to the channel bottom.
	Pile B	Pile is partially bearing.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 8'	Pile A	Pile in typical condition.	Pile 8'A was inspected to the channel bottom.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 9'	Pile A	Pile in typical condition.	Pile 9'A was inspected to the channel bottom.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 10'	Pile A	Pile in typical condition.	Pile 10'A was inspected to the channel bottom to a max depth of 28'.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 11'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 12'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 13'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 14'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 15'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 16'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 17'	Pile A	Pile is partially bearing.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 18'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 19'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 20'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 21'	Pile A	Pile in typical condition.	Pile 21'A was inspected to the channel bottom.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 22'	Pile A	Pile in typical condition.	Pile 22'A was inspected to the channel bottom to a max depth of 26'.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 23'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 24'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 25'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 26'	Pile A	Pile is partially bearing.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 27'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 28'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 29'	Pile A	Pile in typical condition.	Pile 29'A was inspected to the channel bottom.
	Pile B	Pile is partially bearing.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 30'	Pile A	Pile in typical condition.	Pile 30'A was inspected to the channel bottom.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 31'	Pile A	Pile in typical condition.	Pile 31'A was inspected to the channel bottom.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 32'	Pile A	Pile in typical condition.	Pile 32'A was inspected to the channel bottom to a max depth of 26'.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 33'	Pile A	Pile is missing.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 34'	Pile A	Pile in typical condition.	
	Pile B	Pile is missing.	
	Pile C	Pile is sistered. Sister pile in good condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 35'	Pile A	Pile in typical condition.	Pile 35'A was inspected to the channel bottom.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 36'	Pile A	Pile in typical condition.	Pile 36'A was inspected to the channel bottom.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 37'	Pile A	Pile in typical condition.	Pile 37'A was inspected to the channel bottom.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 38'	Pile A	Pile in typical condition.	Pile 38'A was inspected to the channel bottom to a max depth of 27'.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 39'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 40'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 41'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 42'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 43'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 44'	Pile A	Pile in typical condition.	Pile 44'A was inspected to the channel bottom.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 45'	Pile A	Pile in typical condition.	Pile 45'A was inspected to the channel bottom.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 46'	Pile A	Pile in typical condition.	Pile 46'A was inspected to the channel bottom to a max depth of 30'.
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 47'	Pile A	Pile is partially bearing.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 48'	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware is missing.	
Bent 99-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 98-N	Pile A	Pile is non-bearing.	
	Pile B	Pile is non-bearing.	
	Pile C	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 97-N	Pile A	Pile is leaning south.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 96-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Pile C	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Pony Bent 95-96N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 95-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Pony Bent 94-95N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 94-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 93-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 92-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 91-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 90-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Pony Bent 89-90N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 89-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Pony Bent 88-89N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 88-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 87-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 86-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Pony Bent 85-86N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 85-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Pony Bent 84-85N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 84-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 83-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 82-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Pony Bent 81-82N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 81-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 80-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 79'-N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 79''-N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 79'''-N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 78-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Pile C	Pile in typical condition.	
	Pile D	Pile is leaning.	
	Pile E	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 77-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Pony Bent 76-77N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 76-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 75-N	Pile A	Pile in typical condition.	
	Pile B	Pile is non-bearing.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 74-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Pony Bent 73-74N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 73-N	Pile A	Pile in typical condition.	
	Pile B	Pile is non-bearing.	
	Pile C	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Pony Bent 72-73N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 72-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 71-N	Pile A	Pile is non-bearing.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 70-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Pony Bent 69-70N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 69-N	Pile A	Pile is non-bearing.	
	Pile B	Pile in typical condition.	
	Batter pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Pony Bent 68-69N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 68-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Bent 67-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 66-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamps in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Pony Bent 66-65N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 65-N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamps in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Pony Bent 65-64N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 64-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Batter Pile	Pile in typical condition.	
	Timber Clamp	Clamps in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 63-N	Pile A	Pile in typical condition.	
	Pile B	Pile in typical condition.	
	Timber Clamp	Clamps in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 62-N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamps in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

Inspection of Pier 3 North

STRUCTURE DESIGNATION		PIER 3 NORTH	
BENT	**STRUCTURAL COMPONENT**	**CONDITION DESCRIPTION**	**ADDITIONAL COMMENTS**
Pony Bent 62-61N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamp in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 61-N	Pile A	Pile in typical condition.	
	Timber Clamp	Clamps in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	
Bent 60-N	Pile A	Pile in typical condition.	Remaining pile bents on the North face were inaccessible due to heavy siltation.
	Timber Clamp	Clamps in typical condition.	
	Timber Cap	Cap in typical condition.	
	Low Deck	Deck in typical condition.	
	Hardware	Hardware in typical condition.	

APPENDIX D:

CITY OF PHILADELPHIA ORDINANCE

SECTION PM-314 PIERS AND OTHER WATERFRONT STRUCTURES

PM-314.0 General. In order to confirm and maintain the structural integrity of their structures, the owners of piers, bulkheads, wharves, docks, and other structures that have structural elements partly or totally below water along the shorelines of the Delaware River, Schuylkill River, or estuaries shall inspect and submit a structural assessment report to the code official on a triennial basis with the first report due no later than January 1, 2003. Subsequent reports will be due every three years thereafter. The structural assessment report shall be subject to the provisions of Sections PM-314.1 through PM-314.7. 363.2

Exceptions:

1. The reporting requirement shall not apply to pipelines, bridges, dams, utility towers, tram towers, and water and wastewater discharge and intake structures.

2. The reporting requirement shall not apply to vacant piers and other waterfront structures provided:

   2.1 A barrier to human occupancy is maintained at all points of access from the on-shore side of the pier or other waterfront structure.

   2.2 The owner files an "Affidavit of Vacant Pier" with the code official.

   2.3 The owner maintains a vacant property license.

   2.4 The pier or other waterfront structure is posted on all sides, in a visible and conspicuous manner, with "Danger-No Trespassing" signs.

3. The reporting requirement shall not apply to bulkheads in Fairmount Park. 363.3

4. The reporting requirements shall not apply to bulkheads along public rights-of-way regulated by other entities. 363.4

PM-314.1 Minimum qualification of inspection personnel: The personnel involved in the inspection of piers and other waterfront structures shall possess the following qualifications:

1. **Project engineer:** A professional engineer registered in the Commonwealth of Pennsylvania shall be designated as the project engineer and shall prepare the structural assessment report. The project engineer shall have at least five years' experience in the field of marine structure construction and design techniques with specific verifiable knowledge of relieving platforms, high water structures, and cellular structure.

2. **Team leader:** All underwater inspections shall be led by and under the direction of a team leader who shall be a professional engineer registered in the Commonwealth of Pennsylvania. The team leader shall have at least three years' experience in the field of marine structure construction and design techniques. The team leader shall also be a qualified diver or shall use a video monitor to assess and record the divers' inspections.

3. **Divers:** Underwater inspections shall be performed by divers who are graduates of a commercial diving school. Divers shall have completed at least 80 hours of instruction specifically related to structural inspections or shall have at least six months verifiable wharf builder experience in the Delaware bay, river, or estuary.

PM-314.2 Inspections: The inspections required by this Section shall be classified as follows:

1. **Routine inspections:** Routine inspections shall be performed and a structural assessment report prepared at least once every three years as set forth in Section PM-314.0. The inspections shall include:

1.1 **Topside inspections:** Topside inspection of the above-water portions of the pier or other waterfront structure.

1.2 **Underwater inspections:** Underwater inspection by personnel qualified to perform such inspections, of those portions of the pier or other waterfront structure that cannot be inspected above water.

2. **Post-event inspection:** A post-event inspection shall be performed, and a structural assessment report submitted, following a damage-causing event such as impact by vessel, major flood, ice flow, or similar event.

PM-314.2.1. Previous inspections: Prior to performing a routine or post-event inspection of a pier or waterfront structure, the Project Engineer shall review previous reports, inspections, and evidence of repairs made in the past three (3) year period, including confirmation that all areas previously determined to require remediation in less than three (3) years (as noted in any previous report) have been addressed. The results shall be included in the structural assessment report.363.5

PM-314.3 Structural assessment rating: 363.6 A rating system conforming to the following criteria shall be used in the structural assessment report to describe the overall condition of the pier or other waterfront structure:

1. **Safe -** No visible damage or only minor to moderate defects or deterioration observed, but no overstressing observed. Structural elements may show very minor deterioration, but no overstressing observed. No repairs are required.

2. **Safe with a Repair and Maintenance Program -** All primary structural elements are sound but minor to moderate defects or deterioration observed. Areas of moderate to advanced deterioration may be present but do not significantly reduce the load-bearing capacity of the structure. Repairs are recommended and may need to be carried out with moderate urgency.

3. **Unsafe -** 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. The structure, or a portion thereof, must be posted with maximum permitted live load certificate(s) and the use restricted or portions barricaded until repairs are completed. Where widespread failure is possible, all occupancy must cease immediately and the structure barricaded and posted. The pier or other waterfront structure, or a portion thereof, must remain closed until repairs are completed and the structure deemed Safe.

PM-314.4 Structural assessment report: Structural assessment reports shall be sealed by the project engineer. Each report shall consist of the following Sections:

1. **Introduction -** The introduction to the report shall include:

1.1 Description of the facility including use (function) and loading conditions.

1.2 Scope of work including any limitations affecting inspections dictated by the owner or site conditions.

1.3 Description of the inspection including equipment, test methods date, time, weather, stage of tide, and the names and qualifications of the survey party.

2. **Existing conditions -** The existing conditions section of the report shall include the following. Data and results shall be documented by drawings/sketches and pictures and shall be reported in a factual manner without comment or analysis.

2.1 Results of topside and underwater inspections.

2.2 Special testing accomplished in the field.

2.3 Results of laboratory testing.

3. **Evaluation -** Evaluate the structure based upon the existing conditions, previous inspections, current use (function), and loading conditions. The overall structural assessment rating pursuant to Section PM-314.3 shall be included in this Section. 363.7

4. **Recommendations -** The report shall contain:

4.1 Recommendations for repairs or replacement including any temporary measures that must be taken before completion of the repairs. 363.8

4.2 Restrictions of use, and required posting(s) of live load certificate(s).

PM-314.4.1 Summary report. 363.9 The Project Engineer shall also submit a summary of the written report to the code official in a form determined by the code official. The code official may by regulation impose a processing fee, not to exceed one hundred dollars ($100), that must be paid upon submission of the summary of the written report.

PM-314.4.2 Submission period. 363.10 Structural assessment reports and summary reports shall be submitted to the code official within sixty days of physical inspection.

PM-314.5 Unsafe Conditions. 363.11

1. Upon discovery of any Unsafe condition, the Project Engineer shall immediately notify the owner of the pier or other waterfront structure by electronic mail or by fax; and shall, within 12 hours of discovery, notify the code official in writing in an electronic format determined by the code official.

2. Within twenty-four (24) hours of being notified of an Unsafe condition by a Project Engineer, the owner of a pier or other waterfront structure shall take any actions necessary as recommended by the Project Engineer to protect public safety, such as posting, restricting occupancy or closing the structure.

3. The owner shall designate a professional engineer to develop a remediation plan, detailing the extent of the required repairs and temporary measures to ensure public safety. The engineer shall provide periodic structural observations prior to the remediation work and throughout the repair process as required by the Building Code and shall inform the Department if oversight responsibilities are terminated by the owner.

4. Within ten (10) days of the issuance of a building permit to repair an Unsafe condition, the owner of a pier or other waterfront structure shall commence work to correct the condition and work shall continue without interruption until the Unsafe condition has been corrected.

5. Upon completion of the repairs, the designated professional engineer shall reinspect the structure and submit a sealed statement to the Department that the structure has been made Safe.

PM-314.5.1 Posting and restricted occupancy: Where an Unsafe condition is reported, the following actions shall be taken based upon the recommendations of the Project Engineer, as detailed in the structural assessment report:

1. **Post Maximum Permitted Live Load Certification -** Live load certification signs, approved by the code official, shall be conspicuously posted.

2. **Barriers -** Install barriers and post approved signage to prevent access to specific areas identified by the Project Engineer.

3. **Restrict Occupancy -** Immediately cease operation of any pier or other waterfront structure, or portion thereof, determined by the Project Engineer to be in unsafe condition. Post "Danger - No Trespassing" signs on all sides including the on-shore and out-shore sides. Install a barrier to prevent access to the pier or other waterfront structure, or portion thereof, from all points of access.

PM-314.6 Conditions That Are Safe with a Repair and Maintenance Program: 363.12 The owner of the pier or waterfront structure is responsible for ensuring that the conditions described in the report as Safe with a Repair and Maintenance Program are repaired and the actions identified by the Project Engineer are completed within the time frame designated by the Project Engineer or by such time necessary to prevent a condition from becoming an Unsafe condition, whichever is sooner.

PM-314.7 Appeals: 363.13 The owner of the pier or other waterfront structure may appeal the findings set forth in the Project Engineer's report to the Board of Building Standards. Such appeal must be filed within thirty (30) days of the receipt or filing of the report, and a second Project Engineer's report shall be submitted within thirty (30) days of filing the appeal. The filing and pendency of such an appeal shall stay the requirement for making repairs as set forth in Section PM-314.5, but not the requirement for taking actions necessary to protect public safety as set forth in Section PM-314.5.1.

1. Upon consideration of any such appeal, the Board shall issue a recommendation to the Commissioner either to grant the appeal; deny the appeal; or grant the appeal with such proposed modifications to the Project Engineer's findings as the Board deems consistent with the intent of this Section. The Commissioner thereafter shall make the final determination on the appeal.

2. The owner of the pier or other waterfront structure may appeal the determination of the Commissioner to the Board of License and Inspection Review, pursuant to the procedures set forth in Section A-803.1 of The Administrative Code.

APPENDIX E:
CONDITION DEFINITIONS

APPENDIX E – CONDITION DEFINITIONS

The condition definitions listed below have been utilized for the purpose of this report. Note that the definitions are based on the definitions that were developed by the FHWA for bridge inspections, but have been adapted within this report to generally categorize defect deficiencies at waterfront structures.

Excellent Condition

Very Good Condition – No problems noted.

Good Condition – Some minor problems.

Satisfactory Condition – Structural elements show some minor deterioration.

Fair Condition – All primary structural elements are sound but may have minor section loss, cracking, spalling or scour.

Poor Condition – Advanced section loss, deterioration, spalling or scour.

Serious Condition – Loss of section, deterioration, spalling or scour have seriously affected primary structural components. Local failures are possible. Fatigue cracks in steel or shear cracks in concrete may be present.

Critical Condition – Advanced deterioration of primary structural elements. Fatigue cracks in steel or shear cracks in concrete may be present or scour may have removed substructure support. Unless closely monitored it may be necessary to close the structure until corrective action is taken.

"Imminent" Failure Condition – Major deterioration or section loss present in critical structural components or obvious vertical or horizontal movement affecting structure stability. structure is closed to live load but corrective action may put back in light service.

Failed Condition – Out of service-beyond corrective action.