Project: Pier A Structural Repairs Project – Phase II
General Contractor Services –
Request for Proposals ("RFP")

Date: August 15, 2023

Addendum #4
# of Pages: 112

A) REVISIONS TO RFP:

1) The following revised drawings are hereby formally incorporated into the RFP's Exhibit B – *Pier A Structural Repairs – Phase II Project Drawings and Specifications*. These revised drawings replace and supersede all prior versions issued with the RFP.

Drawing GN-2: General Notes Sheet – Attachment #1
Drawing S-1: Apron Piles and Pier Stems Repair Plan – Attachment #2a
Drawing S-9: Pile and Seel Repair Details – Attachment #2b

2) As a reference point supporting the Project Scope of Work, an inspection report – appended hereto as Attachment #3 – dated November 30, 2020 that was prepared by Urban Engineers of New York, D.P.C. (the "2020 Inspection Report") is hereby formally incorporated into the RFP as Exhibit J – *Pier A Underwater Inspection for Phase 2 to 5 Supportive Maintenances*.

B) BPCA'S RESPONSE TO SUBSTANTIVE QUESTIONS:

The following responses are provided to substantive questions received by Battery Park City Authority ("BPCA") by 5:00 p.m. E.S.T. on August 7, 2023, in connection with this RFP. The Responses are provided in bold, italicized print immediately following the Questions. Please note that all capitalized terms shall have the same definitions as provided in the RFP.

1. Are we allowed to access under the pier to view the work?
   Prospective Proposers are not permitted to access the area under the pier. Please refer to Exhibit J – Pier A Underwater Inspection for Phase 2 to 5 Supportive Maintenances for information regarding under-Pier conditions. The selected Proposer will be provided with pre-construction access to the Work area for inspection, and any minor updates to the Scope of Work determined to be required will be noted and verified at that time.
2. Are any of the proposed construction activities for bid subject to or restricted by moratorium? If so, please clarify.
   Yes; no in-water construction work will take place between November 1st and April 30th. Permits from the NYS Department of Environmental Conservation, the Army Corps of Engineers and the NYC Department of Small Business Services ("NYC SBS") are required for in-water work.
3. Is there access to the work area from land?
   Yes, the Project Site will be accessible from land, and the selected Proposer will be provided access as needed. Note that construction fencing associated with the South Battery Park City Resiliency Project ("SBPCR Project") will be installed at Pier A Plaza and other Pier A-related maintenance and construction work may be occurring concurrently. As a result, contractor coordination will be required.
4. Can equipment and materials be staged on pier or upland? If so, please indicate where.
   Any Project-related equipment and materials will need to be stored on the pedestrian promenade that surrounds the perimeter of Pier A, and not on Pier A Plaza. Coordination of equipment and material storage may need to be coordinated with other Pier A contractors.
5. Is there opportunity to visit the site prior to bid, between Aug 2st *[sic]* and August 11th?

Two (2) Project Site walk-throughs were held on July 24th and August 3rd, respectively. Prospective Proposers are welcome to visit the publicly accessible areas of the Project Site on their own as well.

6. We respectfully request an extension to the RFI deadline.
   Please see Addendum #2 for an extension of the questions submission due date.
7. Can a barge or barges be staged at Pier A for the duration of work, without need to shift locations due to other vessel activity or operations?
   See waterfront construction permit rules and regulations of the NYC SBS: https://nyc-business.nyc.gov/nycbusiness/description/waterfront-construction-work-permits. Note that the selected Proposer will not be allowed to tie off a barge at Pier A, and that the selected Proposer would be responsible for determining whether barge access in the surrounding waters is permissible.
8. Are there photos, inspection reports, or condition surveys of the existing deficiencies available for review/reference?
   Please refer to the 2020 Inspection Report – which, as noted in Section A – REVISIONS TO RFP (above), is appended hereto as Exhibit J.
9. Can we access underdeck prior to bid?
   See response to Question #1.
10. What exactly is the cause or nature of the "previously failed repairs"?
    See response to Question #8.
11. Due to the location and volume of repairs, we strongly recommend the use of shotcrete to perform the repairs listed below. Please confirm shotcrete is acceptable to perform the listed repair bid items, where conditions allow:
    Item 4 Type 1 Spall Repairs
    Item 5 Type 2 Spall Repairs
    Item 8 Pier Stem Void Repairs
    Item 9 Pier A Edge Void Repairs
    Item 10 Replace Failed Concrete Repairs
    Item 12 Breakwater Void Repairs
    Item 13 Breakwater Spall Repairs
    Item 14 Breakwater Undermining Repairs
    Following Contract execution, the selected Proposer may submit a Request for Information (RFI) regarding the use of any such alternate repair materials/methods.
12. Please confirm all labor on the job is prevailing wage?
    Confirmed.
13. Please clarify if the project is exempt of sales and use tax on permanent materials?
    For purposes of Sections 1115 and 1116 of the New York State Tax Law, BPCA qualifies as an exempt governmental entity.
14. Please clarify if Steel Fascia Repairs are included in this bid. If so, please identify locations & provide dimensions. Drawings show a repair detail, however there does not appear to be a Bid Item pertaining to these repairs. Also, Scope of Services in Exhibit A does not indicate descaling or recoating of steel channel fascia.
    As noted in Section A – REVISIONS TO RFP (above), the relevant revised Drawings are appended as Attachments #1, #2a and #2b. Also, please refer to Specification Section 09 90 00 – Painting & Coating.
15. Please clarify the Iron Girder Repair details on sheet S-9 correspond to bid Item 11 Girder Flange Repair. If so, please identify where on sheets S-4 through S-7 they are located and what the dimensions are.
    See the Legend item "Knife Edging of Girders" in Drawings S-4, S-5, S-6, and S-7.

16. Are there any restrictions on work hours? Nights? Weekends?
    Night and weekend work is allowed with a BPCA permit. Note that some of the Work is also water tide-dependent, and the selected Proposer will need to consider that when devising its Work schedule.
17. Is the Contractor responsible for any inspection(s)?
    No.
18. Are we required to submit a letter from our surety with the proposal (bid), as indicated below?
    D. Payment and Performance Bonds: A payment bond and a performance bond will both be required for this Project. Please provide a letter from your surety(ies) stating that you are able to provide both such bonds, as required in the Standard Form of Contract (Exhibit D).
    Yes.

By signing the line below, I am acknowledging that all pages of this Addendum #4 have been received, reviewed and understood, and will be incorporated into the Proposal submitted. This document must be attached to the Proposal for consideration.

_____	_____	_____
Print Name (Above)	Signature (Above)	Date (Above)

Number of pages received:_____ <fill in>

Distributed to: All prospective Proposers

[NO FURTHER TEXT ON THIS PAGE]

ATTACHMENT #1
REVISED GENERAL NOTES DRAWING GN-2

(ATTACHED)

TIMBER

1. SHIMS: CLEAR SELECT STRUCTURAL WHITE OAK HEARTWOOD, EDGE SAWN (I.E. GRAIN TO BE ROUGHLY PERPENDICULAR TO THE BEARING FACES OF THE SHIM), U.N.O.

2. OTHER TIMBER: SELECT STRUCTURAL MARINE GRADE SOUTHERN PINE THAT IS ROUGH CUT, U.N.O.

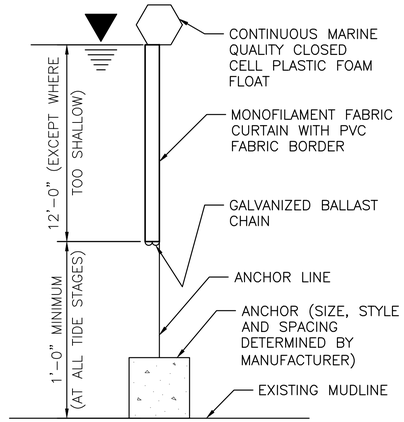
3. LEAD HOLES FOR LAG SCREW SHALL BE BORED AS FOLLOWS:
   A. THE CLEARANCE HOLE FOR THE SHANK SHALL HAVE THE SAME DIAMETER AS THE SHANK, AND THE SAME DEPTH OF PENETRATION AS THE LENGTH OF UNTHREADED SHANK. THE DRILL BIT LENGTH SHALL BE ⅛" LESS IN LENGTH AS IS REQUIRED TO ACCOMMODATE SHANK DEPTH.
   B. THE LEAD HOLE FOR THE THREADED PORTION SHALL HAVE A DIAMETER EQUAL TO 70% OF THE SHANK DIAMETER.
   C. THIS EQUIPMENT SHALL BE EXPOSED TO THE FIELD ENGINEER FOR REVIEW PRIOR TO DAILY USE.

4. THE THREADED PORTION OF THE LAG SCREW SHALL BE INSERTED IN ITS LEAD HOLE BY TURNING WITH A WRENCH OR BY ROTATING EQUIPMENT, NOT BY DRIVING WITH A HAMMER.

5. SOAP OR OTHER LUBRICANT SHALL BE USED ON THE LAG SCREWS OR IN THE LEAD HOLES TO FACILITATE INSERTION AND PREVENT DAMAGE TO THE LAG SCREW.

PROTECTIVE PILE WRAP SYSTEM

1. USE DENSO PRODUCT SEASHIELD SERIES 70, OR APPROVED EQUAL.
2. MATERIALS SHALL CONSIST OF DENSYL PETROLATUM COMPOUND, DENSO MARINE PILING PETROLATUM TAPE, DENSO GLASS OUTERWRAP 70, AND DENSO POLY-WRAP, OR APPROVED EQUALS.
3. INSTALL ALL PRODUCTS ACCORDING TO MANUFACTURER'S RECOMMENDED PROCEDURES.
4. REMOVE EXISTING PROTRUSIONS FROM PILES PRIOR TO INSTALLATION.
5. THOROUGHLY CLEAN ALL PILES PRIOR TO INSTALLATION. PILE MUST BE FREE FROM ALL NAILS, BOLTS, SPLINTERS, MARINE GROWTH, OR OTHER FOREIGN OBJECTS THAT COULD CAUSE DAMAGE TO MATERIALS.
6. PLUG AND FILL ALL HOLES AND SURFACE DEFECTS WITH DENSYL MASTIC PETROLATUM COMPOUND.
7. INSTALL IN SEQUENCE THE DENSO MARINE PILING PETROLATUM TAPE, DENSO GLASS OUTERWRAP 70, AND DENSO POLY-WRAP ACCORDING TO MANUFACTURER'S PROCEDURES.



TURBIDITY CURTAIN DETAIL
N.T.S.

EROSION & SEDIMENT CONTROL NOTES:

1. A FLOATING TURBIDITY CURTAIN SHALL BE PLACED TO ENCOMPASS AREAS WHERE SEDIMENT MAY BE GENERATED AS A RESULT OF PROJECT WORK. A TURBIDITY CURTAIN MUST BE IN PLACE FOR ACTIVITIES THAT MAY GENERATE TURBIDITY, INCLUDING: PILE INSTALLATION OR EXTRACTION, PLACING CONCRETE UNDERWATER, DREDGING OR UNDERWATER DEBRIS REMOVAL, AND DEMOLITION.

2. THE CURTAIN HEIGHT SHALL NOT EXCEED 12 FT, AND SHALL BE SHORT ENOUGH TO MAINTAIN A 1 FT GAP BETWEEN ITS BOTTOM AND THE MUDLINE AT MEAN LOW WATER.

3. UNLESS NOTED OTHERWISE, THE TURBIDITY CURTAIN SHALL BE A TRITON TYPE III PERMABLE SILT AND TURBIDITY BARRIER, OR APPROVED EQUIVALENT. WHERE NO TIDAL FLUCTUATION OR CURRENT EXISTS, A TYPE II BARRIER MAY BE USED. SUBMIT PROPOSED BARRIER SPECIFICATIONS, ALONG WITH THE MANUFACTURER'S RECOMMENDED CONDITIONS FOR USE.

4. 8"ø EROSION CONTROL SEDIMENT LOGS SHALL BE PLACED ALONG THE WATER'S EDGE IN ALL AREAS WHERE SEDIMENT OR RUNOFF MAY ENTER THE WATER, THROUGHOUT THE DURATION OF THE PROJECT, TO PREVENT THE DISCHARGE OF SEDIMENTS INTO THE WATER.

5. ATTACH BUOYS WITH NAVIGATION LIGHTS WHERE REQUIRED BY THE COAST GUARD.

ADDENDUM-3

NEW YORK STATE OF OPPORTUNITY | Battery Park City Authority
BATTERY PARK CITY AUTHORITY
200 LIBERTY STREET, 24TH FLOOR, NEW YORK, NY 10281
T: 212.417.2000

Urban Engineers of New York, D.P.C.
One Penn Plaza, Suite 4125
New York, NY 10119
o. 212.736.9100

SEAL

BY:

DATE:

REV	DATE	DESCRIPTION	BY	CKD	APP'D
1	11/16/22	EDIT PILE WRAP SYSTEM NOTE	AK	JCH	MGW
0	11/11/21	100% DESIGN SUBMISSION	AK	SMM	MGW

NEW YORK, NY
BATTERY PARK CITY AUTHORITY
PIER A REHABILITATION
GENERAL NOTES

SCALE: AS NOTED
DESIGN BY: AK
APPROVED BY: MGW
DRAWN BY: FYC
CHECKED BY: SMM
DATE: 11/11/21
PROJECT NO.: 2020200179.001
SHEET NUMBER: GN-2
SHT. NO.: SHT 2 OF 14
DRAWING FILE NO.: GN-1 GEN... .DWG
REV. NO.: 0

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DATE PRINTED:11/11/2021 8:22:38 AM

100% DESIGN SUBMISSION

ATTACHMENT #2
REVISED STRUCTURAL DRAWINGS

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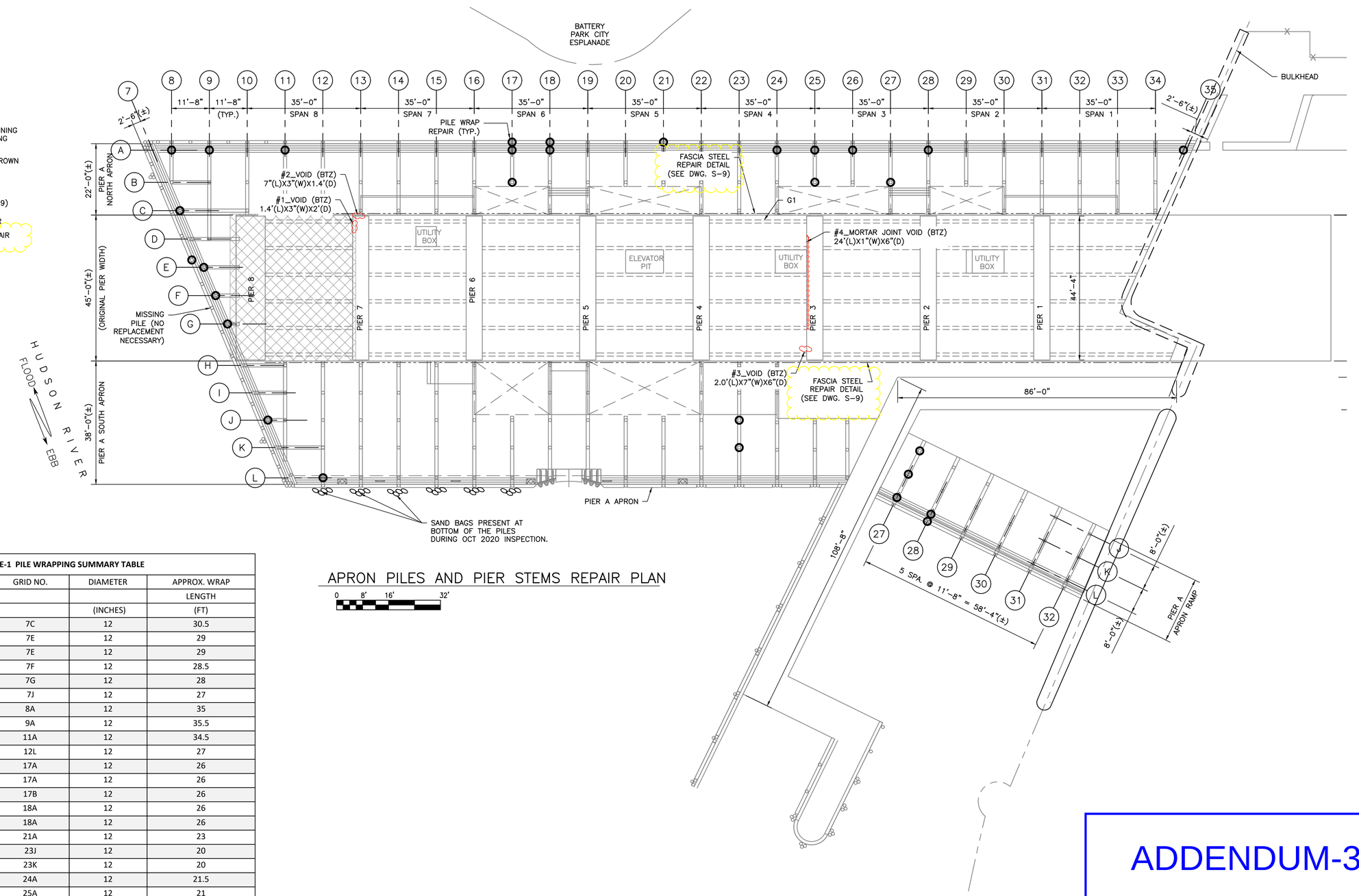
ATTACHMENT #2A
REVISED DRAWING S-1: APRON PILES AND PIER STEMS REPAIR PLAN

(ATTACHED)

N

LEGEND:

- VOIDS & UNDERMINING CONCRETE SPALLING
- CRACK LINE AT CROWN OF JACK ARCH CONCRETE DECK
- AREA PREVIOUSLY REPAIRED IN (2019)
- PILE WRAP REPAIR
- FASCIA STEEL REPAIR



APRON PILES AND PIER STEMS REPAIR PLAN

0 8' 16' 32'

TABLE-1 PILE WRAPPING SUMMARY TABLE

REPAIR NO.	ELEMENT	GRID NO.	DIAMETER (INCHES)	APPROX. WRAP LENGTH (FT)
1	PILE	7C	12	30.5
2	FENDER PILE	7E	12	29
3	PILE	7E	12	29
4	PILE	7F	12	28.5
5	PILE	7G	12	28
6	PILE	7J	12	27
7	PILE	8A	12	35
8	PILE	9A	12	35.5
9	PILE	11A	12	34.5
10	PILE	12L	12	27
11	FENDER PILE	17A	12	26
12	PILE	17A	12	26
13	PILE	17B	12	26
14	FENDER PILE	18A	12	26
15	PILE	18A	12	26
16	FENDER PILE	21A	12	23
17	PILE	23J	12	20
18	PILE	23K	12	20
19	PILE	24A	12	21.5
20	PILE	25A	12	21
21	PILE	25B	12	21
22	PILE	26A	12	21
23	PILE	27B	12	21
24	PILE	27J	12	13.5
25	PILE	27K	12	13.5
26	PILE	27L	12	13.5
27	PILE	28A	12	21
28	FENDER PILE	28L	12	13.5
29	PILE	28L	12	13.5
30	PILE	35A	12	13.5

TABLE-2 VOIDS AND JOINTS CONCRETE SPALL LOCATION

ID NO.	TYPE OF DEFECT	LOCATION	SIZE LENGTH (FT)	SIZE WIDTH (FT)	SIZE DEPTH (FT)	REMARK
1	VOID	PIER STEM-7	1.4	0.25	2	NORTH-WEST CORNER, WEST FACE, NEAR THE MUD-LINE
2	VOID	PIER STEM-7	0.6	0.25	1.4	NORTH-WEST CORNER, NORTH FACE NEAR THE MUD-LINE
3	VOID	PIER STEM-3	2	0.6	0.5	5FT FROM SOUTH-WEST CORNER, WEST FACE, NEAR THE MUD-LINE
4	MORTAR JOINT VOID	PIER STEM-3	24	0.085	0.5	HORIZONTAL JOINT BETWEEN CONCRETE BLOCKS COURSE 2 & 3

NOTES:

1. SEE GN-1 & GN-2 FOR GENERAL NOTES.
2. PILE WRAP REPAIRS AS INDICATED AND SEE THE PILE WRAPPING REPAIR DETAIL ON SHEET S-9.
3. PIER STEM REPAIRS AS INDICATED AND SEE THE PIER STEM REPAIR DETAIL ON SHEET S-8.
4. FASCIA STEEL REPAIRS AS INDICATED AND SEE FASCIA STEEL REPAIR DETAIL ON SHEET S-9.

ADDENDUM-3

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BATTERY PARK CITY AUTHORITY
200 LIBERTY STREET, 24TH FLOOR,
NEW YORK, NY 10281
T: 212.417.2000

Urban Engineers of New York, D.P.C.
One Penn Plaza, Suite 4125
New York, NY 10119
o. 212.736.9100

URBAN ENGINEERS

SEAL

BY:

DATE:

REV	DATE	DESCRIPTION	BY	CKD	APD
1	11/16/22	ADD FASCIA STEEL REPAIR LOCATIONS	AK	JCH	MGW
0	11/11/21	100% DESIGN SUBMISSION	AK	SMM	MGW

NEW YORK, NY
BATTERY PARK CITY AUTHORITY
PIER A REHABILITATION

APRON PILES AND PIER STEMS REPAIR PLAN

SCALE: AS NOTED
DATE: 11/11/21
DESIGN BY: AK
APPROVED BY: MGW
DRAWN BY: FYC
CHECKED BY: SMM
PROJECT NO. 2020200179.001
SHEET NUMBER S-1
SHT. NO.: SHT 1 OF 14
DRAWING FILE NO.: S-1 APRO... .DWG
REV. NO.: 0

100% DESIGN SUBMISSION
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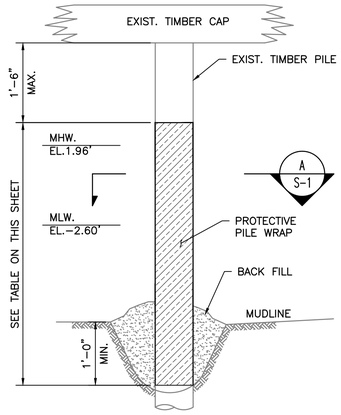
Y:\PHL\MARINE\PROJECTS\ON-GOING\2020 PROJECTS\2020200179.001 - BPCA PIER A\WORK\DRAWINGS\WORKING DRAWINGS\CURRENT\S-1 APRON PILE REPAIR PLAN & DETAILS.DWG

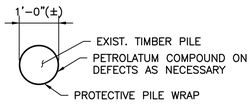
ATTACHMENT #2B
REVISED DRAWING S-9: PILE AND STEEL REPAIR DETAILS

(ATTACHED)



TYPICAL TIMBER PILE WRAP DETAIL

N.T.S.

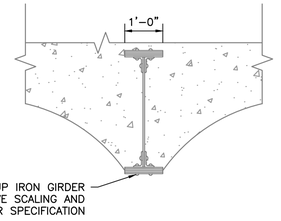


A S-9 S-1 TYPICAL TIMBER PILE WRAP SECTION

0 1' 2'

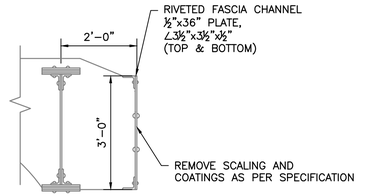
PILE REPAIR NOTES:

1. SEE GN-1 & GN-2 FOR GENERAL NOTES.
2. REFER TO SHEET S-1 FOR PILE REPAIR LOCATION AND WRAPPING LENGTH.
3. PILE WRAP REPAIRS AS INDICATED AND ACCORDING TO NOTES ON GN-2.



EXISTING IRON GIRDERS REPAIR DETAIL

N.T.S.



EXISTING FASCIA STEEL COMPONENTS REPAIR DETAIL

N.T.S.

STEEL REPAIR NOTES:

1. FOR GENERAL NOTES SEE SHEET GN-1 & GN-2.
2. REFER TO SHEET GA-2, S-4 TO S-7 FOR REPAIR MEMBERS LOCATIONS.
3. ALL THE EXISTING STEEL MEMBERS TO BE REPAIRED BY CLEANING AND MINIMUM THREE COATINGS, PRIMER, INTERMEDIATE COAT AND TOP COAT.
4. PAINTING SYSTEM OF SURFACE PREPARATION AND COATINGS MUST BE DONE ACCORDING TO TECHNICAL SPECIFICATION "SECTION 099000 PAINTING AND COATING"
5. DOWNSPOUT ON FASCIA L-ANGLE HAVE TO EXTEND TO DISCHARGE TO THE SEA.

ADDENDUM-3

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200 LIBERTY STREET, 24TH FLOOR,
NEW YORK, NY 10281
T: 212.417.2000

Urban Engineers of New York, D.P.C.
One Penn Plaza, Suite 4125
New York, NY 10119
o. 212.736.9100

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BY:

DATE:

REV	DATE	DESCRIPTION	BY	CKD	APP'D
1	01/31/22	REMOVED OPTIONS & UPDATE NOTES	AK	SMM	MGW
0	11/11/21	100% DESIGN SUBMISSION	AK	SMM	MGW

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PIER A REHABILITATION

PILE AND STEEL REPAIR DETAILS

SCALE: AS NOTED
DATE: 11/11/21
PROJECT NO: 2020200179.001
SHEET NUMBER: S-9
SHT. NO.: SHT 2 OF 14
DRAWING FILE NO.: S-7 CONC... .DWG
REV. NO.: 0

DESIGN BY: AK
APPROVED BY: MGW
DRAWN BY: FYC
CHECKED BY: SMM

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ATTACHMENT #3
ADDED RFP EXHIBIT:
EXHIBIT J: PIER A UNDERWATER INSPECTION FOR PHASE 2 TO 5 SUPPORTIVE MAINTENANCES

(ATTACHED)

Pier A Underwater Inspection for Phase 2 to 5 Supportive Maintenances

For

Battery Park City Authority
November 30, 2020

Prepared For:
Battery Park City Authority
200 Liberty Street, 24th Floor
New York, NY 10281

Prepared By:
Urban Engineers
of New York, D.P.C.
One Penn Plaza, Suite 4125
New York, NY 10119

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3 SUMMARY OF EXISTING CONDITIONS RECOMMENDATIONS
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1 INTRODUCTION

1.1 Purpose and Scope

Battery Park City Authority (BPCA) engaged Urban Engineers of New York, D.P.C. (Urban) to inspect and provide a rehabilitation design of historic Pier A substructure. Urban teamed with Marine Infrastructure Engineering Solutions P.C. (MEIS) to assist with the underwater and above water investigation. The inspection focused on the underside of the deck; the apron piles; portions of the apron support elements; the northern breakwater; and above water defects as highlighted in the Phase 2 through Phase 5 recommended repair as found in the 2016 Pier A condition inspection report performed by McLaren Engineering Group.

In 2018-2019, BPCA completed the Phase 1 priority repairs that were recommended in the 2016 report. These repairs consisted of repairs to the Relieving Platform as well as repairs to the piers and underside of the deck between Piers 7 and 8, (Span 8). Other portions of Pier A were noted as being in satisfactory or fair conditions in the 2016 Routine Inspection Report and were recommended to be repaired on a phased basis. The report recommended the additional repairs to be complete in Phases 2-5. The current investigation evaluated these previous report findings, including existing defects and documented any changes or new defects to develop the design requirements for the Phase 2-5 maintenance repairs.

1.2 General Description of Structure

Pier A was originally built in the late nineteenth century and served as the headquarters of the New York City Board of Dock Commissioners and Harbor Police. The pier was expand at the end of the nineteenth century. Pier A continued to serve the city until 1992, when the pier was vacated and allowed to fall into disrepair. There were many inspections and evaluations of the pier house supporting structure throughout the end of the twentieth century and into the early twenty-first century.

In the original design, the inner timber column footing pads for the pier house were sitting directly on the jack arches and the outer concrete column footing strips were sitting on iron girders. After a 2010 intensive renovation, the original load distribution changed by upgrading the timber columns to steel columns and installing post-tension slabs to support the new column loads. The post-tension slabs run parallel to, and on top of, the iron girders and relieve the load on the existing concrete jack arches.

The northern breakwater is located on the southern inshore end of the pier and provides protection to the south-east corner of Pier A.

The pier apron is constructed of timber piles and framing and supports a concrete decking which provided a public walkway and restaurant seating area. Please see the attached drawing.

1.3 METHOD OF INVESTIGATION

During October 2020, with the support of Urban's personnel, MEIS performed and above and underwater investigation and took detailed measurements of defective areas previously noted in the 2016 McLaren Routine Inspection Report.

The MEIS team was led by a registered Professional Engineer in the State of New York, with support from two additional engineers trained in underwater inspection. A diving support truck parked on the East apron deck while the divers assessed the underside of Pier A. Inspectors took measurements of concrete spalls and cracks under the jack arch concrete and deterioration of the iron beams that are exposed. They also visually inspected the underside of the apron deck timber structure, North breakwater wall surfaces, and bulkhead wall.

During two days in the third week of October, the team performed underwater inspections for the high priority areas of Phase 2. This was generally areas under the North, South, and West side of perimeter apron. They further inspected above water length of piles and under deck by boat at low tide. After review of tidal conditions, the crew resumed inspections for two days in the fourth week of October. These included above water investigation for Phases 3, 4 and 5, measuring the previous defects as indicated in the 2016 investigation report and recording any additional defects found.

2 2016 ROUTINE INSPECTION REPORT & 2020 INSPECTION FINDINGS

Following the 2016 report repair recommendation by McLaren, the relieving platform and end span of under deck (span-8) were rehabilitated as part of the Phase 1 plan in 2018-2019. Therefore, those areas are not discussed in this report. These 2020 recommendations were guided by NYCEDC, Waterfront Facilities Maintenance Management System Inspection Guidelines manual.

2.1 Pier A Rating and Recommendation

Apron

All of the perimeter piles along the Pier Apron were inspected. Interior piles were inspected if there were noted deficiencies in the 2016 report or if there were issues noted with adjacent perimeter piles. Based on findings, there are new recommendations to rehabilitate some advanced and severely damaged piles.

All timber pile caps were visually inspected and most of them are in satisfactory condition. A few locations show signs of splitting but they are likely due to excessive force during hardware installation and not affecting the main structure. All timber joists are in satisfactory condition except in one location, where the additional sister joist has split, however this has been rehabilitated in phase 1. The bottom of concrete deck metal formwork is still in good

condition, with no change from the 2016 findings.

Piers

As per the 2016 priority inspection, the piers are satisfactory. Minor chamfer spalls were observed in three locations at Pier-2 and 4. Pier-3 and 7 had small openings, which appear to be original to the structure and are causing no stress or deterioration. The north-west corner of pier-7 was found to be in moderate condition, where there is undermining of the bottom of the concrete block foundation. It is believed that the concrete blocks are supported by piles, but these were not exposed. The 2016 report recommended to monitor this location and place sand bags around the south side of pier-7 for to deter future undermining at this location.

Iron Girders

The bottom of iron girders are in poor condition, exhibiting advanced corrosion. The bottom flange rivets have 30% in section loss without bearing loss of rivet head. The web and top flange of the girders are covered by the concrete jack arches and were not inspected.

Concrete Jack Arches

The concrete jack arches within Spans 1-7 are in poor condition and exhibit moderate cracking and moderate concrete spalling. The jack arches in Span 8 were repaired as part of the Phase I repairs.

Pier Fascia

The pier deck perimeter concrete block is covered with a fascia that consists of a built-up channel-shaped iron section. This fascia is fixed on to the concrete block and that block is attached to the outer encasing girders (G1 & G6). Because of exposure to the weather, the outer fascia plates are corroded and the bottom of the concrete block is in fair condition, with moderate chamfer spalling.

Bulkhead

Approximately 85% of the bulkhead structure is in satisfactory condition, the remaining 15% is classified as fair condition, where there are missing mortar joints, have already been repointed and 90%-100% of the mortar is intact. This will require monitoring during future routine inspection.

Northern Breakwater

Overall, the northern breakwater structure is in fair condition. Medium and wide transverse cracks are developing on the side surface and on top of the walkway slab along the breakwater. Voids were found on the bottom of north breakwater near the mudline. The maximum size was approximately 1’-0” H x 3’-0” D.

The scope for our services only included the northern breakwater which is adjacent and parallel to the Pier A. Additional voids and crack lines were found compared to the 2016 inspection findings. We recommend that further inspection of the entire breakwater structure be considered so that any necessary design and construction could be completed simultaneously with the remainder of the pier. We anticipate one additional day of a diving would be

required to inspect the remaining area of the breakwater structure.

The following table provides a comparison of the condition ratings and repair recommendations of the 2016 and 2020 inspections.

		2016 Recommended Action		2020 Recommendation	
Sr. No.	Structure	Condition	Action Type	Condition	Action Type
	Phase -2				
I.	Pier A, Apron	Satisfactory	Routine	Satisfactory	Routine
	1) Fender Piles			Satisfactory	Routine
	2) Piles			Fair	Priority
II.	Pier A Main Structure				
	1) Piers	Satisfactory	Routine	Fair (Pier-7 NW corner undermining)	Priority
	2) Jack Arch Concrete, Span-7	Fair	Priority	Poor (more defects in outer bays)	Priority
	3) End Diaphragm Wall , Span-7	Fair	Priority	Poor (concrete spalling in all the bays)	Priority
III.	Pier A Iron Beam Bottom Flange, Span-7	Poor	Priority	Poor (developing corrosion, G1,G2, G5, G6)	Priority
IV.	Fascia Bay and Cladding, Span-7	Fair	Priority	Satisfactory	Priority
	1) Fascia Plate			Fair	Priority
	2) Concrete Fill			Poor (bottom chamfer spalling at south side)	Priority
V.	Bulkhead, Concrete Structure	Fair	Routine	Satisfactory (Repointing between the blocks with 90-100% mortar intact) (The void between masonry block and concrete foundation under north apron.	Routine
VI.	Breakwater, Concrete Structure	Fair	Routine	Poor (increasing no. of Voids and cracks)	Priority

		2016 Recommended Action		2020 Recommendation	
Sr. No.	Structure	Condition	Action Type	Condition	Action Type
	Phase -3				
I.	Pier A Main Structure				
	1) Jack Arch Concrete, Span-5 & 6	Fair	Priority	Poor (progressive cracking in span-6, bay 1 west)	Priority
	2) End Diaphragm Wall	Fair	Priority	Poor (concrete spalling in all the bays)	Priority
II.	Pier A Iron Beam Bottom Flange Span-5 & 6	Poor	Priority	Poor (more defects, concrete spalling in both span G2.	Priority
III.	Fascia Bay and Cladding, Span-5 & 6				
	1) Fascia Plate	Fair	Priority	Fair	Priority
	2) Concrete Fill			Poor (bottom chamfer spalling at both spans south side and span-6 north side)	Priority

		2016 Recommended Action		2020 Recommendation	
Sr. No.	Structure	Condition	Action Type	Condition	Action Type
	Phase -4				
I.	Pier A Concrete structure				
	1) Jack Arch Concrete, Span-3 & 4	Fair	Priority	Poor	Priority
	2) End Diaphragm Wall	Fair	Priority	Poor (new concrete spalling in middle bays)	Priority
II.	Pier A Iron Beam Bottom Flange Span-3 & 4	Poor	Priority	Poor (more concrete spalling in span-3, near bottom of the girders)	Priority
III.	Fascia Bay and Cladding, Span-3 & 4				
	1) Fascia Plate	Fair	Priority	Fair	Priority
	2) Concrete Fill			Fair (In span-4 bottom chamfer spalling are less than 2016 marked, span-3 are the same)	Priority

		2016 Recommended Action		2020 Recommendation	
Sr. No.	Structure	Condition	Action Type	Condition	Action Type
	Phase -5				
I.	Pier A Concrete structure				
	1) Jack Arch Concrete, Span-1 & 2	Fair	Priority	Poor (In span-2 new crack line found in East side of utility box and middle bay)	Priority
	2) End Diaphragm Wall	Fair	Priority	Poor (new concrete spalling on top of the Pier A in both span)	Priority
II.	Pier A Iron Beam Bottom Flange Span-1 & 2	Poor	Priority	Poor (more concrete spalling in both span G5 and G1&2 East corner	Priority
III.	Fascia Bay and Cladding, Span-1 & 2				
	1) Fascia Plate	Fair	Priority	Fair	Priority
	2) Concrete Fill			Poor (bottom chamfer spalling at both spans south side and span-1 north side)	Priority

3 SUMMARY OF EXISTING CONDITIONS RECOMMENDATIONS

3.1 Timber Structure

About half of the overall timber structure are in satisfactory condition. In the south pier apron, two piles exhibit moderate section loss which require priority repair action. Two fender piles are missing in west and north-west pier aprons. If these piles were purposefully removed at the time of renovation and reinforced with adjacent piles, there is no action required. All the timber pile caps and joists are in good condition however routine inspection is recommended. The Pier A south side has longitudinal and transverse bracing members installed between the piles. These members are in fair condition, with priority level repairs recommended near south fender rack. Please see appendix C1 for detail of defected member photographs.

This 2020 inspection relies on the previous inspection's recommended priority pile locations so not all of the piles were inspected. Marine borer damage was found on 30% of the piles that were inspected and will likely affect more in the years to come, therefore a long term schedule for repairs is recommended to prolong the life of these piles. There were no Marine borer damage noted in the piles in the 2016 routine inspection so it is recommended to check all piles at interior grid lines within the routine inspection period. Depending on those findings a decision should be made for the for the most effective and cost effective way to protect the piles.

Figure 1_ Pier A Apron Timber structure

Table 1 _ Inspected Piles Condition

		General Condition				
Element	Number of Inspected Pile	No. of Good Pile	Satisfactory Pile	Fair Pile	Poor Pile	Remarks
Fender Pile	60	-	40	20		
Apron Pile	93	-	65	26	2 (moderate section loss at Grid-18L & 23J)	-

3.2 Concrete Structure

The main stem of the granite block supporting the substructure piers are in approximately 85% satisfactory condition. The Top of the stems have end diaphragm walls from the jack arch concrete deck and the concrete spalling was found to be larger than the previous inspection. We recommend to provide patching with polymer concrete and maintenance to rejuvenate the full bearing area for the diaphragm walls which supports the transverse end of the arch deck. This repair will have a very tight schedule because of the clear working overhead space requirement and work progress is dependent on the elevation of the tide.

Each span has five bays of jack arch concrete deck. A total of thirty five bays of jack arch concrete are included in Phase 2 to 5. Each span has two exterior bays and three interior bays. The thickness of the deck at the crown of the arch is about 15 inches and does not contain reinforcement. and column footing pads are directly sitting on the deck. The consequence of this concentrated load and combined with an unreinforced deck appears to be over stressing and most of the longitudinal crack lines are found in the crown of arch concrete. When compared with 2016 report, there are two additional longitudinal cracks in span-4, where each additional longitudinal crack in span 2, 4 and 7. Transverse cracks were found in four of the bays. The locations are Span-1 Bay 1, Span-4 Bay 3 & 5 and Span-5 Bay 1. If compare with 2016 report, there were no transverse cracks in Span-2 Bay 4 & 5, Span-3 Bay 5. Our recommendation for the cracking line is to use polymer sealant concrete, which will prevent water infiltration from the crack lines and progressive spalling from adjacent concrete. Spalling of the Arch bottom of girder encasement concrete was found in many locations especially in outer girders, G1&6. Our recommendation for maintenance in this area is to remove the loose and weakened surface and then patch with polymer concrete and coat the surface. Please see appendix E2 for detail of defected area photographs.

3.3 Metal Structure Element

3.3.1 Iron Built-up Plate Girder

The iron girders consists of built-up plate girders encased in concrete, which is part of the jack arch deck. The bottoms of iron girder flanges are exposed to the air and tidal water and are in poor condition. This corrosion has caused adjacent concrete spalls and cracks. The corresponding top girder flanges are encased in concrete and can not be inspected. The inner girders, G3 & G4 have additional plates on the bottom of the flange. Please see the below sketches extracted from 2008 deck evaluation report. Our recommendation for maintenance of the iron girder bottom flanges is to remove the corrosion and rusted surfaces with sandblasting and then painting with an appropriate marine coating. Please see appendix E2 for detail of defected area photographs - 85 to 90.

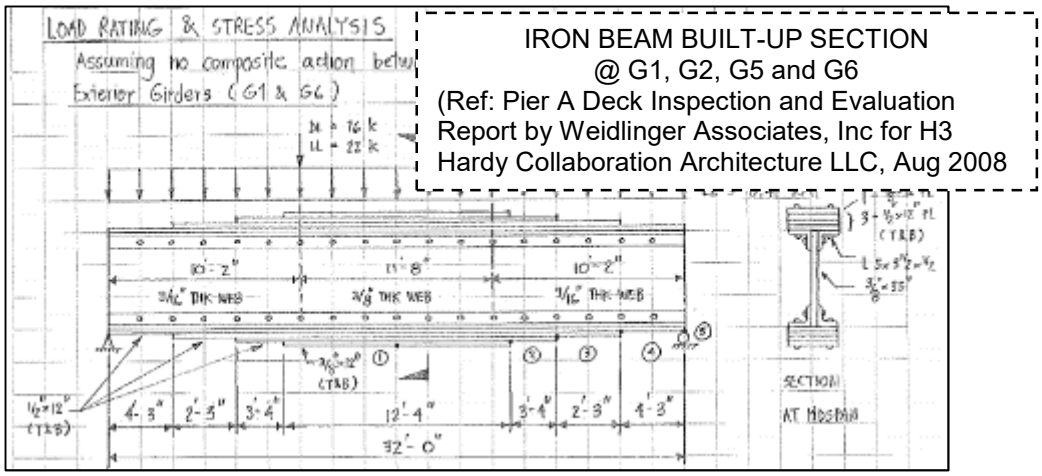


Figure 2_ Inner Iron Girders section

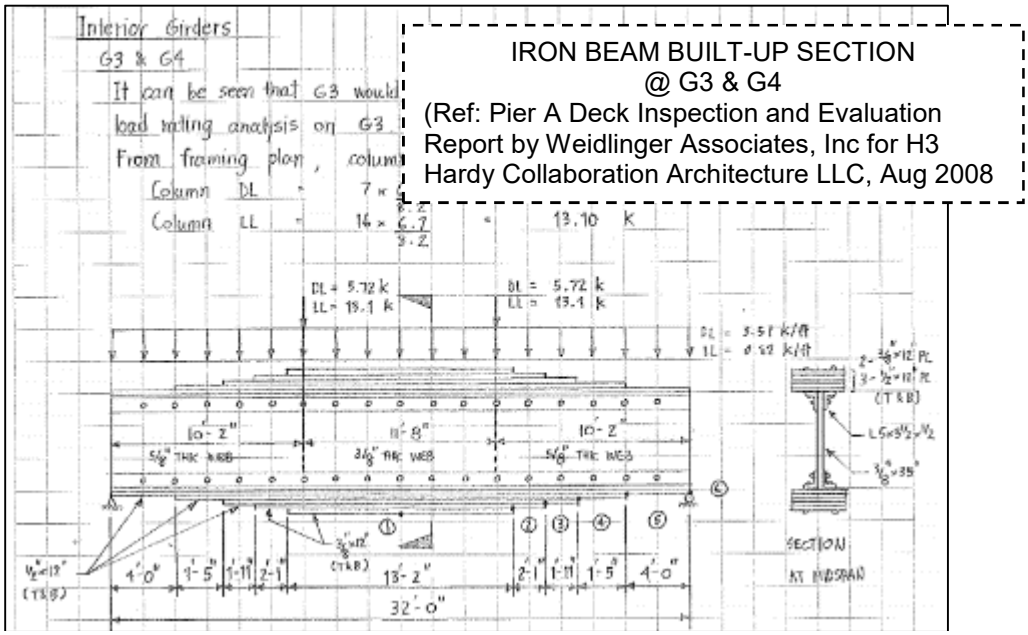


Figure 3_ Inner Iron Girders section

3.3.2 Fascia Built-up Channel

The paint on the pier perimeter fascia channel is peeling off, rusted and in fair condition. The channel is built-up with 3/8”x36” plates and two L3 ½ x L3 ½ x ½ “ angles. They are connected to the adjacent concrete block with two rivets at equal spacing. This corrosion is purely ascetic and not a structural issue. The recommendation is to clean and repaint the surface.

Figure 4_ Inner Iron Girders section

3.4 North Breakwater

The north breakwater structure has several cracks and voids, and is in fair condition. The elevation of the breakwater is the same as the deck and is connected between the south pier walkway. The walls are constructed with concrete and one layer of masonry block. These blocks are sitting on the concrete foundation which is supported by piles. This inspection references station 0+00 as the north east corner and measuring from right to left direction of seaside surface until end of west breakwater. There are four voids in the north breakwater and concrete joints exhibit spalling between blocks. Moderate undermining was found in between the breakwater bottom and concrete foundation at the mudline. The voids location are indicated in attached drawing. We recommend repairing all breakwater voids at the same time for cost-efficiency and implementing more protective action on the existing structure.

REFERENCE DOCUMENTS:

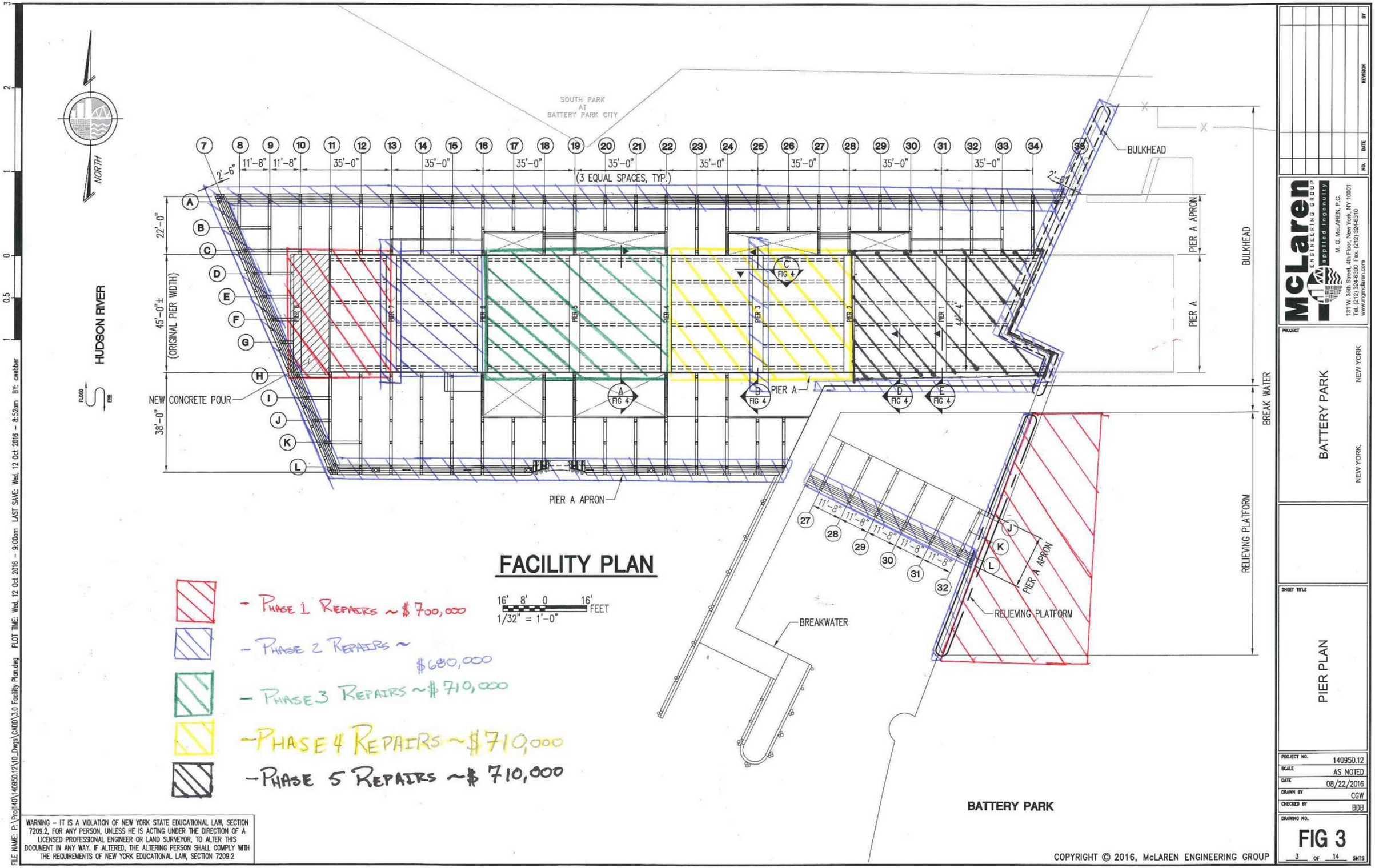
1) *PIER A DECK INSPECTION & EVALUATION REPORT, AUG 2008, PREPARED BY WEIDLINGER ASSOCIATES, INC FOR H3 HARDY COLLABORATION ARCHITECTURE LLC.*
2) *2009-2010 POST TENSIONED SLAB CONSTRUCTION PHOTOS*

Appendix A Location Map

&

Proposed Phases Plan by BPCA

PIER – A LOCATION MAP



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PROJECT
BATTERY PARK
NEW YORK, NEW YORK

SHEET TITLE
PIER PLAN

PROJECT NO.	140950.12
SCALE	AS NOTED
DATE	08/22/2016
DRAWN BY	CGW
CHECKED BY	BDB
DRAWING NO.	FIG 3
	3 OF 14 SHTS

FILE NAME: P:\Proj\140\140950.12\10_Dwgs\CAD\3.0 Facility Plan.dwg PLOT TIME: Wed, 12 Oct 2016 – 9:00am LAST SAVE: Wed, 12 Oct 2016 – 8:52am BY: cwebber

Appendix B Existing Drawings and

Previous Inspection Documents from BPCA

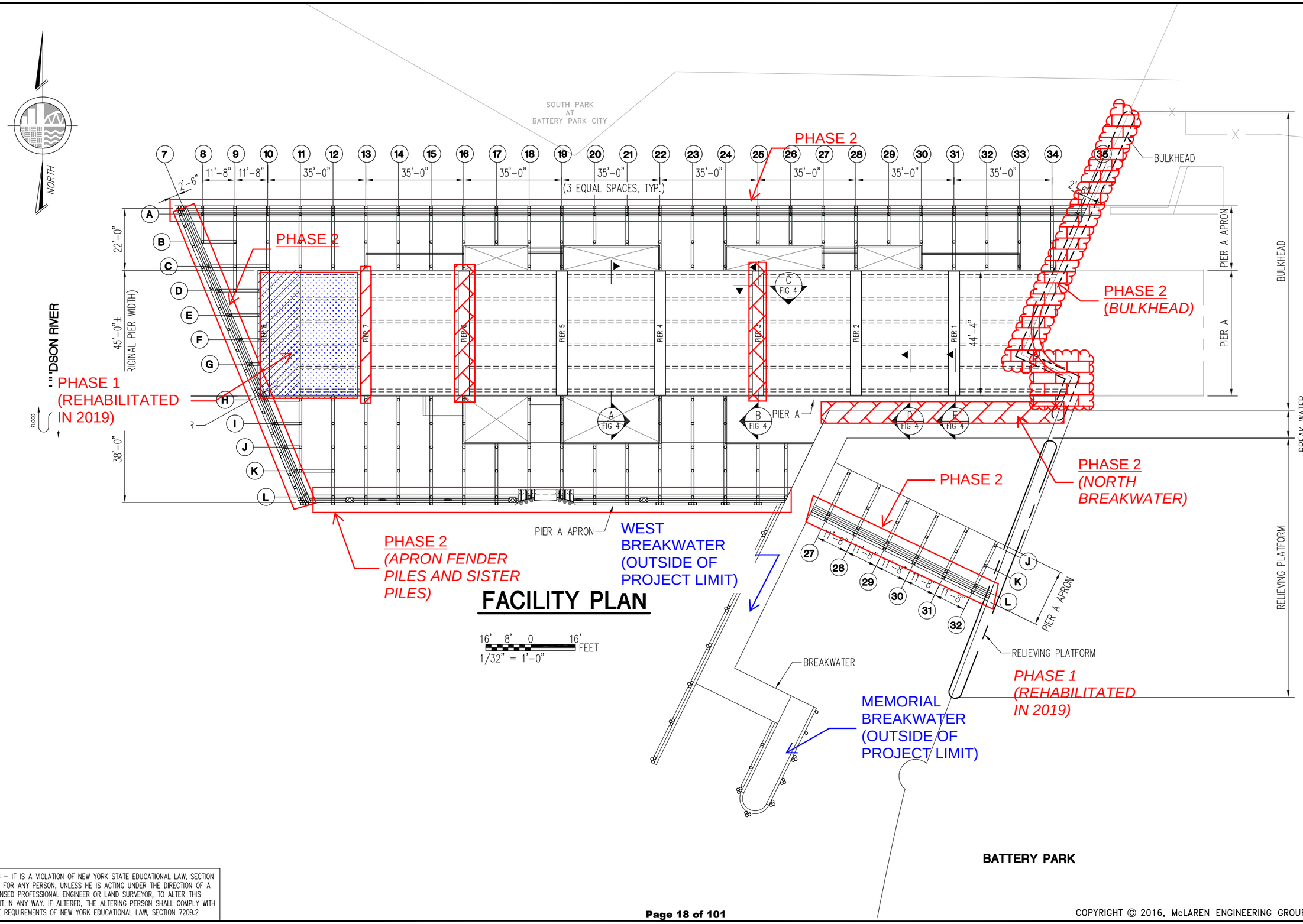

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FIG 3
3 OF 14 SHTS

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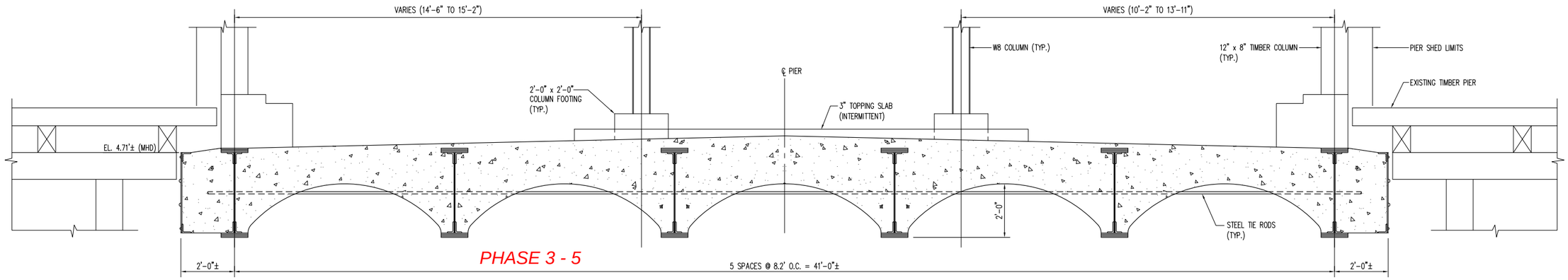
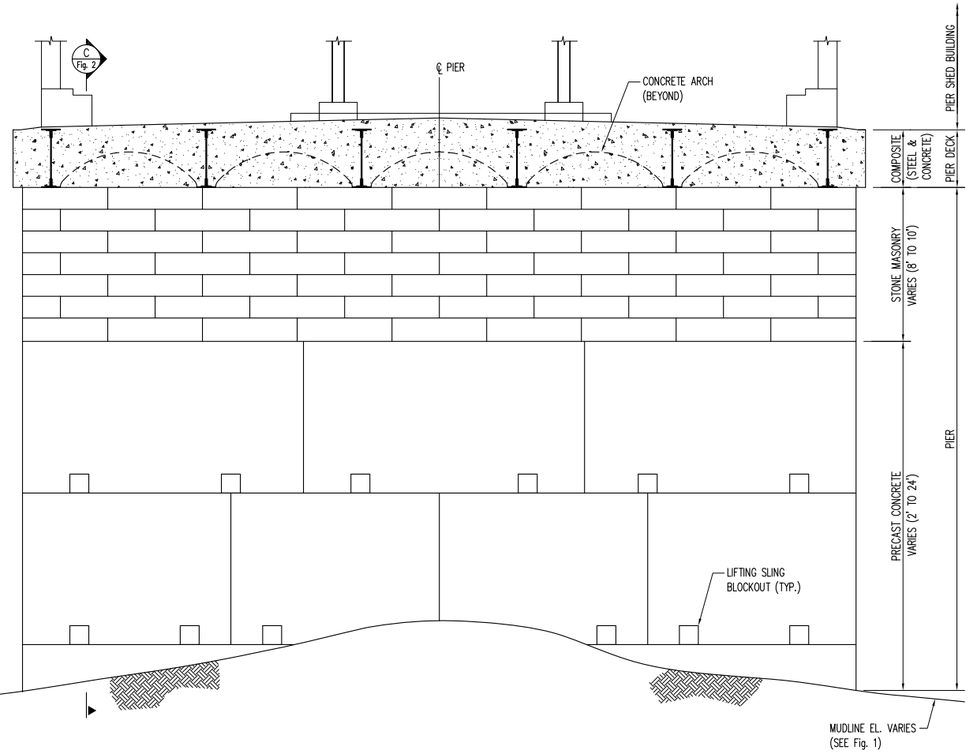


A SECTION THRU PIER DECK (AT MID-SPAN)

FIG 4

2' 1' 0 2' FEET

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



B SECTION THRU PIER DECK (AT PIER)

FIG 4

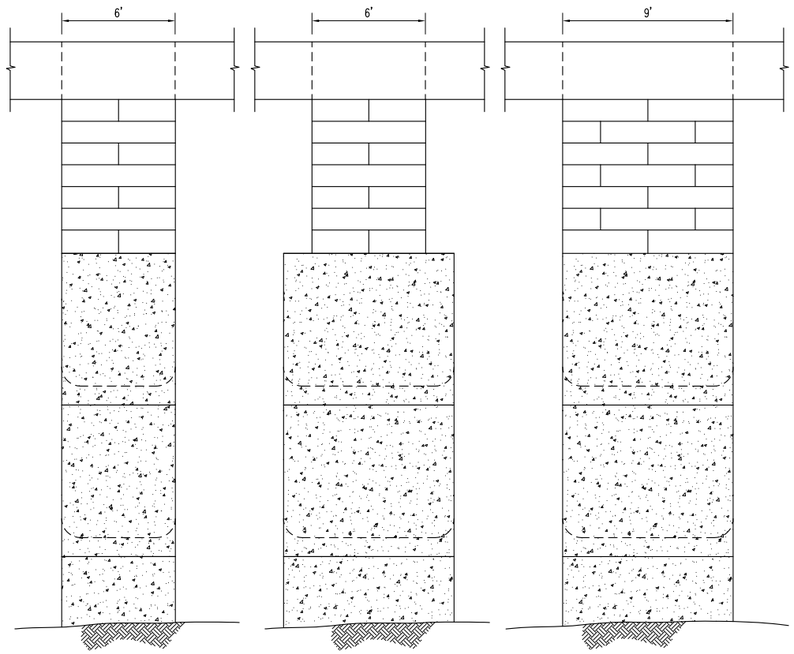
4' 2' 0 4' FEET

SCALE: 1/8" = 1'-0"

NOTE:
EXISTING BUILT-UP BEAM DETAILS FROM SIDNEY M. JOHNSON ASSOCIATES CONSULTING

PHASE 2

PHASE 2



PIERS 1 THRU 5

ONLY PIER 4

PIERS 6 AND 7

PIER 8

C SECTION

FIG 4

4' 2' 0 4' FEET

SCALE: 1/8" = 1'-0"

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PIER A SECTIONS

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FIG 4

4 OF 14 SHTS

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SPAN -3
PHASE 4

SPAN -2
PHASE 5

SPAN -1
PHASE 5

BULKHEAD
PHASE 2

1.5" FLANGE WIDTH LOSS

20"Lx8"Hx6"D EXPOSED WEB

5"D CHAMFER SPALL

1.5" LOSS OF FLANGE WIDTH

2'Lx8"Hx6"D

⅛" MAX W CRACK

3'Lx6"Hx6"D EXPOSED WEB

10"D CHAMFER SPALL

10"D CHAMFER SPALL

20"Lx3"Hx2"D

3" FLANGE WIDTH LOSS

3'Lx8"Hx2"D

SHALLOW POP-OUT SPALLS (TYP.)

CHAMFER SPALL 15"Hx3"D

PIER 2

24"Lx6"Hx6"D

CHAMFER SPALL 2.5'Lx6"Hx6"D

5'Lx8"Hx6"D EXPOSED WEB

6"ø x6"D EXPOSED WEB

TRANSVERSE CRACKS EVERY 3'-4'

FAILED REPAIR

1" LOSS OF FLANGE WIDTH

UTILITY BOX 7'-0"

7'-0"

EDGE VOID 10"Wx7"D

TYPICAL CRACK W/ EFFLORESCENCE

DELAMINATED SECTION

9'-0"

9'-0"

UTILITY BOX

12"Lx8"Hx3"D

SHALLOW POP-OUT SPALL 30"Lx6"Wx½"D EXPOSED STEEL (TYP.)

12"Lx6"Hx2"D

CHAMFER SPALL 12"Lx4"Hx3"D

HAIRLINE TRANSVERSE CRACKS EVERY 3'-4'

CHAMFER SPALL 12"Lx4"Hx3"D

18"Lx4"Hx3"D EXPOSED STEEL

FAILED REPAIR 15" MAX PENETRATION W/ EXPOSED STEEL

18"Lx5"Hx2"D

PIER 1

5'Lx6"Hx4"D

MODERATE CORROSION

6'Lx5"Hx3"D

TRANSVERSE HAIRLINE CRACKS EVERY 3'-4'

5'Lx5"Hx5"D

4" LOSS OF GIRDER WIDTH

4'Lx8"Hx4"D

8"Hx4"D

3'Lx8"Hx2"D W/ RUST STAINING

3'Lx8"Hx2½"D W/ RUST STAINING

⅛" CRACK

CRACK WITH EFFLORESCENCE (TYP.)

44'-4"

18"Lx8"Hx4"D

9'Lx4"Hx5"D

5"Hx3"D

BULKHEAD
PHASE 2

SPALL, EXPOSED WEB

LARGE SPALL, FULL LENGTH UP TO (1) FOOT DEEP (TYP.)

BREAKWATER
PHASE 2

NORTH

PIER PART PLAN A

N.T.S.

CRACK
SPALL
DELAMINATION
KNIFE EDGING OF GIRDERS

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FIG 6
6 OF 14 SHTS

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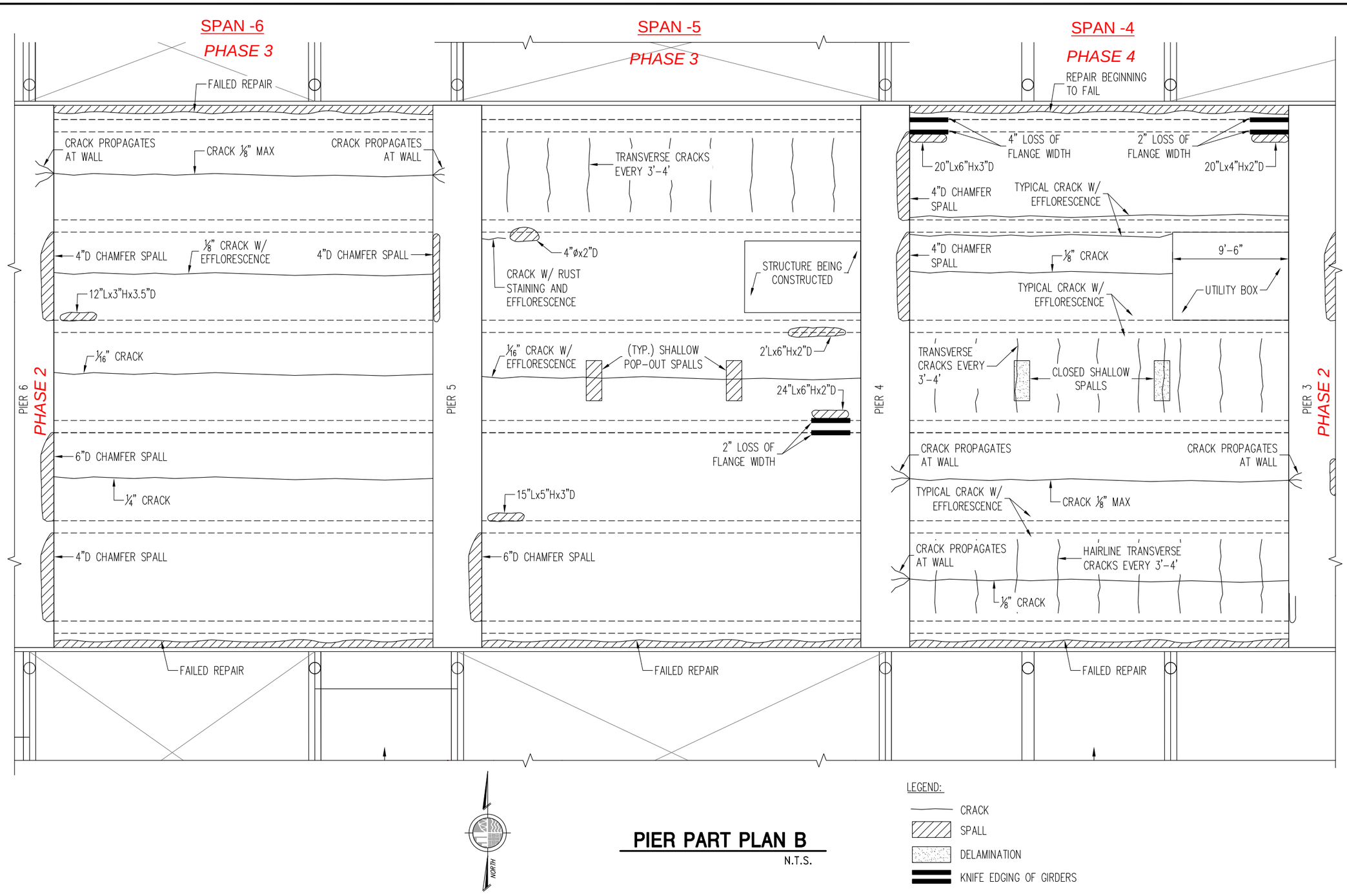

PIER PART PLAN B

N.T.S.

LEGEND:

- CRACK
- SPALL
- DELAMINATION
- KNIFE EDGING OF GIRDERS

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PART PLAN B

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FIG 7

7 OF 14 SHTS

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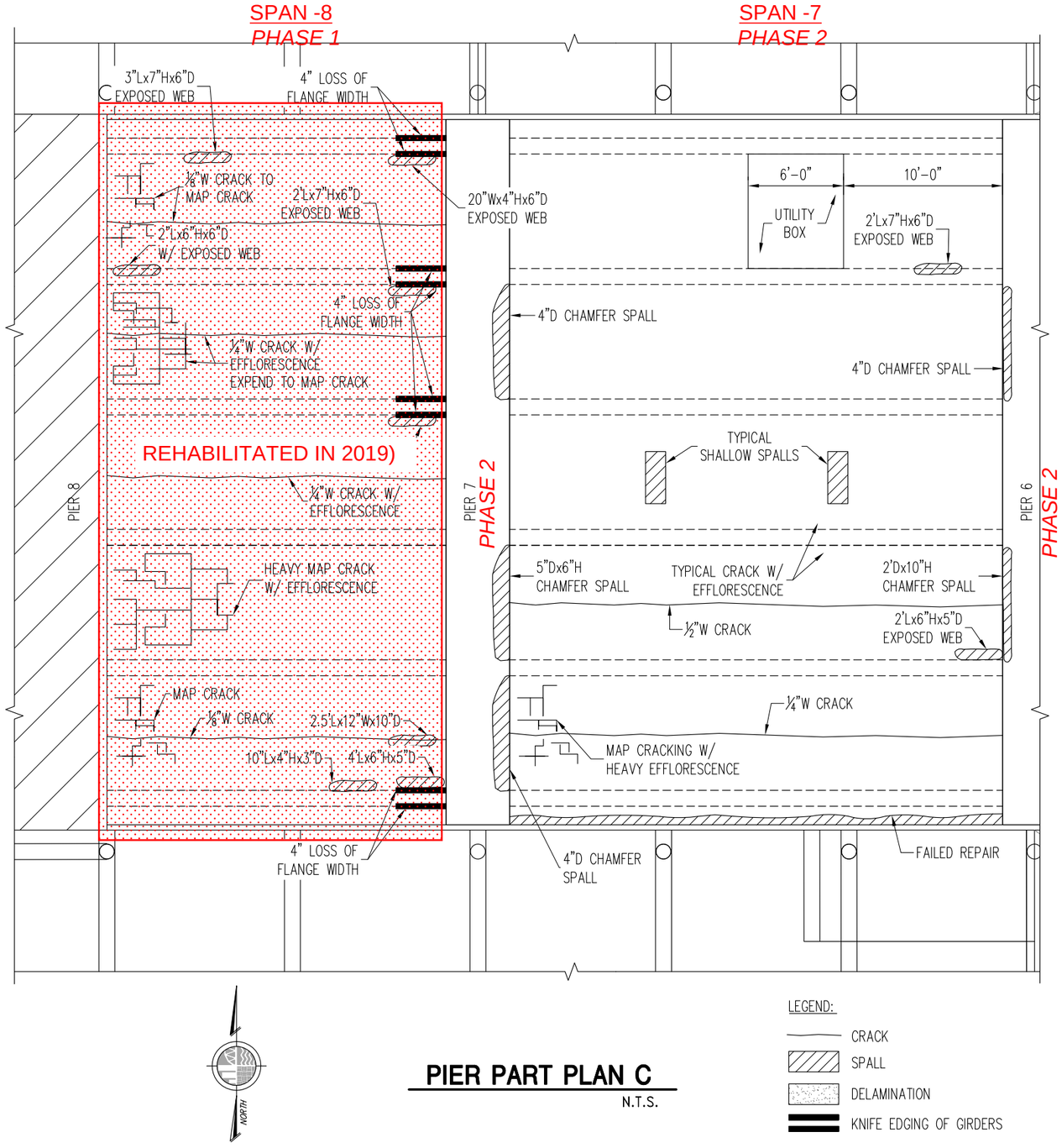

PIER PART PLAN C

N.T.S.

LEGEND:

- CRACK
- SPALL
- DELAMINATION
- KNIFE EDGING OF GIRDERS

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M. G. McLAREN, P.C.
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PART PLAN C

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FIG 8

8 OF 14 SHTS

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BATTERY PARK CITY AUTHORITY

PIER A & ADJACENT BULKHEAD, BREAKWATER AND LOW-LEVEL PLATFORMS ROUTINE CONDITION INSPECTION

NOVEMBER 2016

McLaren ENGINEERING GROUP applied ingenuity

PIER A

DECK INSPECTION
&
EVALUATION REPORT

August 2008

Prepared by

Weidlinger Associates, Inc.

for

H3 Hardy Collaboration Architecture LLC

Appendix C

Under Water Inspection Area, Plan and Sections, Photographs & Notes

Appendix C1 Pile & Pile Cap and Bracing

1. Summary from inspected poor condition piles

No.	Grid No.	Description	Repaired requirement
1	(7 btw F&G)	Fender pile was missed in the location	Routine
2	7L	SW corner cluster - SE dolphin pile missing copper cap abrasion, splitting top 6"	Routine
3	9A	Fender Pile, Trace limnoria, Minor peeling in tidal zone 1/4"D.	Priority
4	9C	Pile Abrasion in tidal zone	Priority
5	11A	Mechanical gouge with trace of marine borer (limnoria), 6' above mudline NE side 2'H x 10"W x 1"D	Priority
6	17A	3/4"D Peeling in upper tidal zone	Routine
7	17B	Shallow shake in tidal zone	Routine
8	18L	Pile and brace connection was loose and lost.	Priority
9	23J	Active of marine borer (Torredo) on pile; visible section loss - 10% maximum; gauging on north side of pile, starts at 2 FT below water surface, 2.5 F H x 0.6 F W x 1.25 N D; Bottom comp - soft slope at base; probe of 4F+ into mudline. Ragworms photographed on pile surface next to calcified	Priority
10	23K	At 23, the bracing underneath the pier is no longer present east of 21; 21 is good; MN peeling intermittent on pile face, .25 N; localized deformity on pile at mid-pile;	Priority
11	27B	Likely old timber post	
12	27L	Minor peeling, trace of marine borer (Terredo); minor gauge 2.5’ L x 4” W x 0.75” D on north face of pile	Priority
13	28	Pile section loss, Marine borer (Trredor) Water surface to mudline	Priority
14-34	Various	Tracing marine borer (Limnoria)	Priority
	30	**Total No. of priority repaired required pile**	

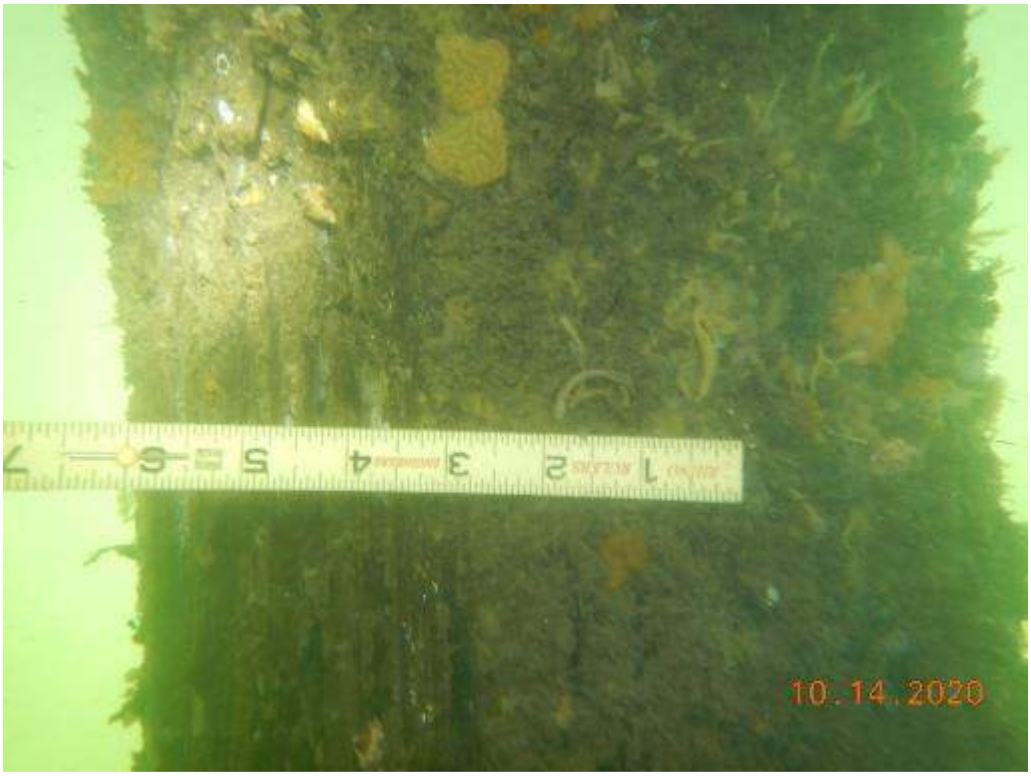
2. Summary from inspected pile caps and bracings

No.	Grid No.	Description	Future Inspection
1	8A	Bearing gap at the top of the pile, 50% bearing	Routine
2	12A	Damage to the bottom 30% of cap from North end to pile; repaired with sister boards were connected in place.	Routine
3	B (Btw. 8&9)	Check on east end of cap ½" max, 25' long	Good
4	19B	Full length crack in both sister boards on cap, ¼" wide max;	Routine
5	30C	Partial bearing, east side 80-90%	Routine
6	19L	Loose diagonal brace Bent 21-22, disconnected at 21	Routine

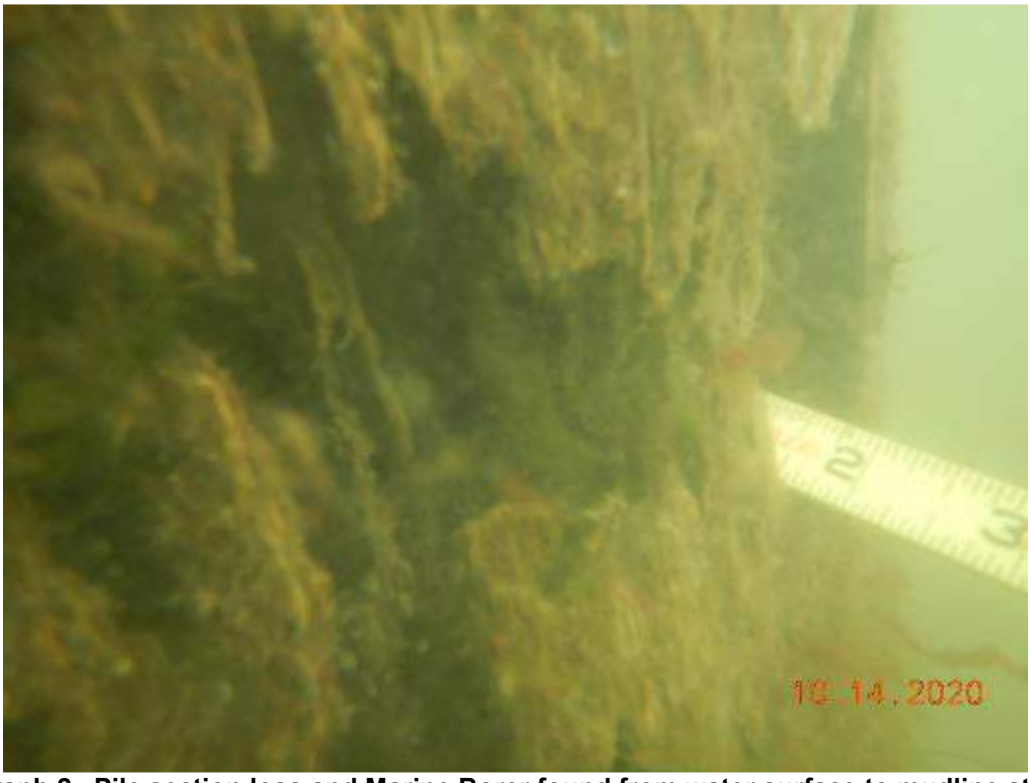
3. South Apron Pier Fender Panel

No.	Grid No.	Description	Remarks
1	Btw 18 &19	Ferry landing fender rack was serious condition and not allow to use ship berthing. Two marine fenders were missed and loose Buffer rails	Routine Inspection is required and Before structure repaired not allow to use for ship landing. Priority repaired, to fix the adjacent bracings

Appendix C1-1 Photographs



Photograph 1. Pile 10% section loss and Marine Borer found from water surface to mudline at Grid 23J



Photograph 2. Pile section loss and Marine Borer found from water surface to mudline at Grid 28

Photograph 3. Fender Pile was missed in Grid 7 between Grid F & G

Photograph 4. Pile Abrasion at Grid - 9C

Photograph 5. Pile peeling off at Grid - 17A

Photograph 6. Pile Shimming at Grid – 17B

Photograph 7. Pile Cap Bearing Loss at Grid – 8A

Photograph 8. Repaired Pile Cap with Corroded Bolts at Grid – 12A

Photograph 9. Repaired Pile Cap with Rusted Bolts at Grid – B (Between Grid 18 & 19)

Photograph 10. Pile Cap with Rusted Bolts at Grid – 19B

Photograph 11. Pile Cap Bearing Loss at Grid – 19B

Photograph 12. Timber Bracing connection loose at Grid – 19L

Photograph 13. Deteriorating Fender Panel and Lost Fenders

Photograph 14. Deteriorating Fender Support Bracings

Appendix C2 Piers

Supporting Piers Field Notes

No.	Grid No.	Description	Repaired Requirement
1	Pier-3	3 courses of masonry above the base of the concrete; Void in west face of pier 3 in course 2 located 5' north of the southwest corner 2 F H X 7 N W X 6 N D ; Looks like a deliberate cut-out, very uniform (photo); mortar mostly intact besides at low water between courses 2 and 3 - 60% missing; .75 N high by 6N deep VOD at horizontal joint between courses 2 and 3 over 60% of length. All other pointing 90% intact; missing mortar at horizontal joint between courses 2 and 3 on east face for full length of pier	Routine
2	Pier-6	Holes are present extending through the width of the pier, continuous on the pier face intended for construction. Photo taken at the south west corner (photo); piles on Bent 16 between FS and Pier 6 MN; Masonry MN; Pointing (mortar) intact; >10% missing; ND along west side; Fire protection system piping found between rows 16 and 17 south side of pier	Routine
3	Pier-7	Northwest corner Undermining: West Face = 1.4'L x 0.3'H x 2.0'D ML Comp is silt, sand, rock and debris. Northwest corner Undermining: North Face = 0.6'L x 0.2'H x 1.4'D Horiz. Penetration. Open hole thru pier at top of bottom course of concrete block, 1'W x 2'H with a curved taper from top to bottom to a horiz.. passageway 1'W x <1'H. There are 6 points (2 per block) across the length of the pier. 2 courses of concrete block at bottom with 3 courses masonry above. No additional passageways noted. Mortar mostly intact with 5-10% max missing mortar in lower tidal zone.	Priority

Appendix C2-1 Piers Photographs

Photograph 15. Pier-3 Mechanical cut on Pier Stem

Photograph 16. Pier-6 Open Cut on Pier Stem

Photograph 17. Pier-7 North Face

Photograph 18. Pier-7 West Face

Photograph 19. Pier-7 Undermining NW Corner West Face (1.4'Lx0.3'Hx2.0'D)

Photograph 20. Pier-7 Undermining NW Corner North Face (0.6'Lx0.2'Hx1.4''D)

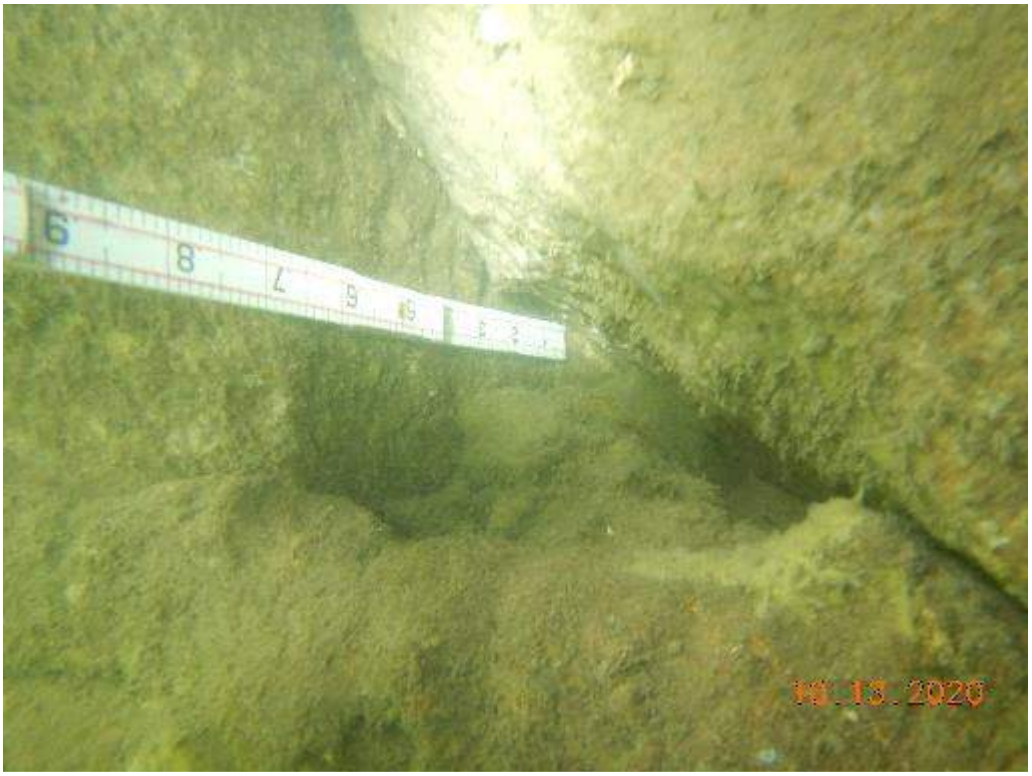
Photograph 21. Pier-7 Horizontal Passageway (1'W x <1'H)

Appendix C3 Bulkhead Inspection

Bulkhead Inspection Field Notes

No.	Grid No.	Description	Repaired Requirement
1	35A	Masonry to ML, 7 courses exposed from top to ML. Mortar loss <10% below water near mudline, repairs visible in tidal zone extending above water 100% intact above water extending to visual limit to south (9:30 AM on 10/13/2020). Mortar intact full ht from bent 35 to north.	Routine
2		Mortar 100% intact above and below water from SE corner to north. Mortar joints typically 0.5" to 0.75" in height. Construction changes at northern pier fascia where pier meets north apron.	Routine
3		North Pier Fascia to Northern limit of inspection at bulkhead/riprap slope: Mortar joints vary in height fom 0.05'H to 0.3'H. Blocks are uniform in size Course 5 = 1.9'H. Course 6 = 1.5'H. Course 7 = 2.0'H., mortar joints vary due to irregular edges. Broken blocks occur intermittently and are visible at MLW (bottom of 4th course from top). Vertical joints 0.3'W with failing mortar within. Horizontal joints get wider at 5th course extending down (below MLW). 7 courses exposed for height of wall. Vertical joints of courses 5-7 (alternating spacing ranges from 2' to 6'L, average =4') and horizontal joints 5/6 and 6/7. Joints have 25% mortar loss, 0.2' to 0.3' wide x 0.3' to 0.4' D (average measurements) for a length of 60'L extending from the north pier fascia. Isolated defect: Under pier bottom joint of course 7 = even with ML joint loss is 0.2'H x 1'D for 10'L under north apron. Isolated areas where penetrations in joints exceed 1'D.	Routine

Appendix C3-1 Bulkhead Photographs



Photograph 22. Bulkhead Joint Loss ~ 10 Ft (1'D x 0.2'H) under North Apron

Photograph 23. Bulkhead North End

Photograph 24. Bulkhead North

Photograph 25. Bulkhead Under the North Apron

Photograph 26. Bulkhead Adjacent to the North Apron

Photograph 27. Bulkhead North End

Photograph 28. Bulkhead North End

Photograph 29. Bulkhead North End

Photograph 30. Bulkhead North End

Appendix C4 Breakwater Inspection

1. Summary Voids and Joints Concrete Spall Location from Field Notes

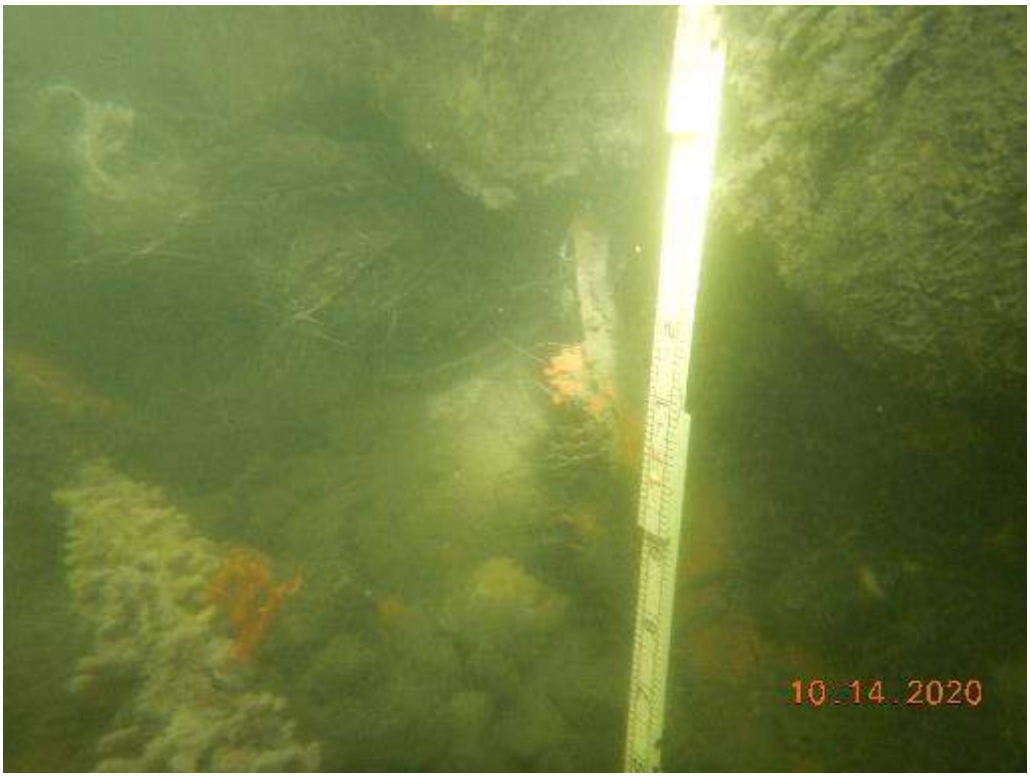
No.	Grid No.	Station	Length (Ft)	Width (Ft)	Depth (Ft)	Repaired Requirement	Remark
	North Breakwater						
1	Void	0+05	5	0.67	1.0	Priority	At Mud Line
2	Void	0+14	2	0.5	0.5	Priority	
3	Void	0+56.5	5	1.5	2	Priority	
4	Undermining	0+56.5	30	1.5	2	Priority	Open joint between one concrete block and the next below it; open spalled joint
	West Breakwater						
5	Void	0+91	15	0.5	6	Priority	
6	Void	1+38	5	3	2.2	Priority	Large void at joint
7	Void	1+60	3	15	1.5	Priority	
8	Void	1+65	5	3	3.5	Priority	
9	Void	1+80	5	1.5	3	Priority	At vertical joint in bulkhead
10	Void	1+86	12	3	1.33	Priority	
11	Deterioration	0+91	8.5	1	1	Priority	

2. Summary of Crack Lines from Breakwater Side Surface

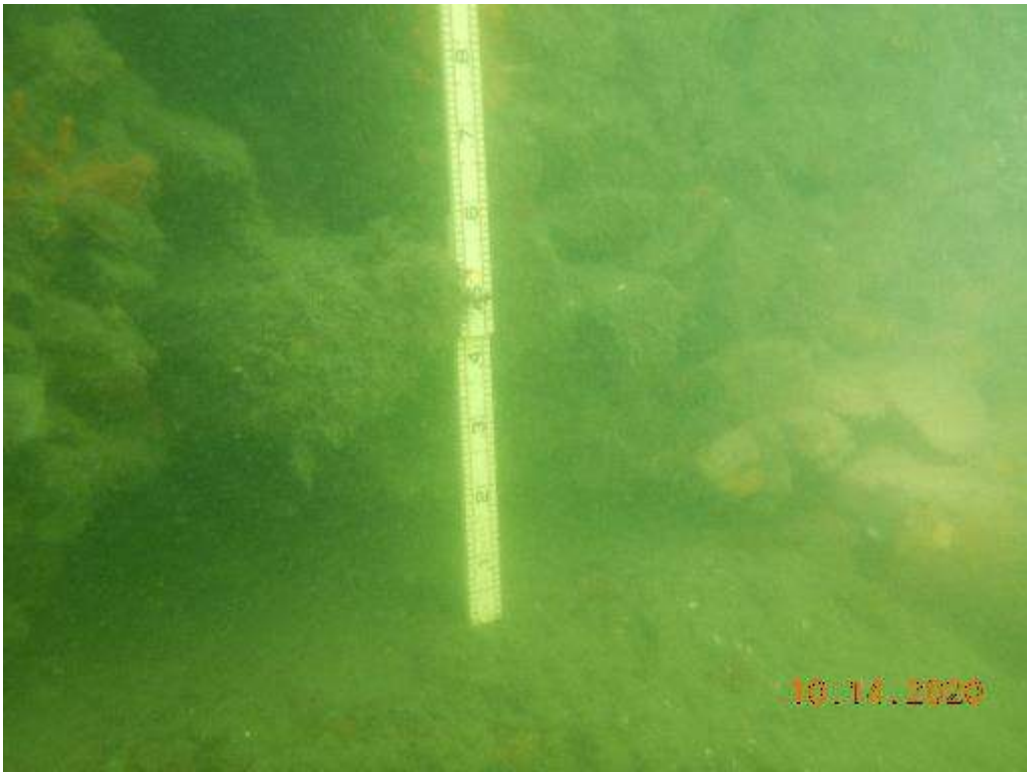
No.	Location	Number of Crack	Total Length (Ft)	Repaired Requirement	Remark
	North Breakwater				
1	North surface	9	71	Priority	Max. crack width=1/4” Min. crack width=1/8”
2	South surface	21	115	Priority	Max. crack width=1/4” Min. crack width=1/32”

Notes: North Breakwater inspection is under Phase-2. West Breakwater and Memorial Breakwater are outside of Project Limit. Future inspection is required for repair work.

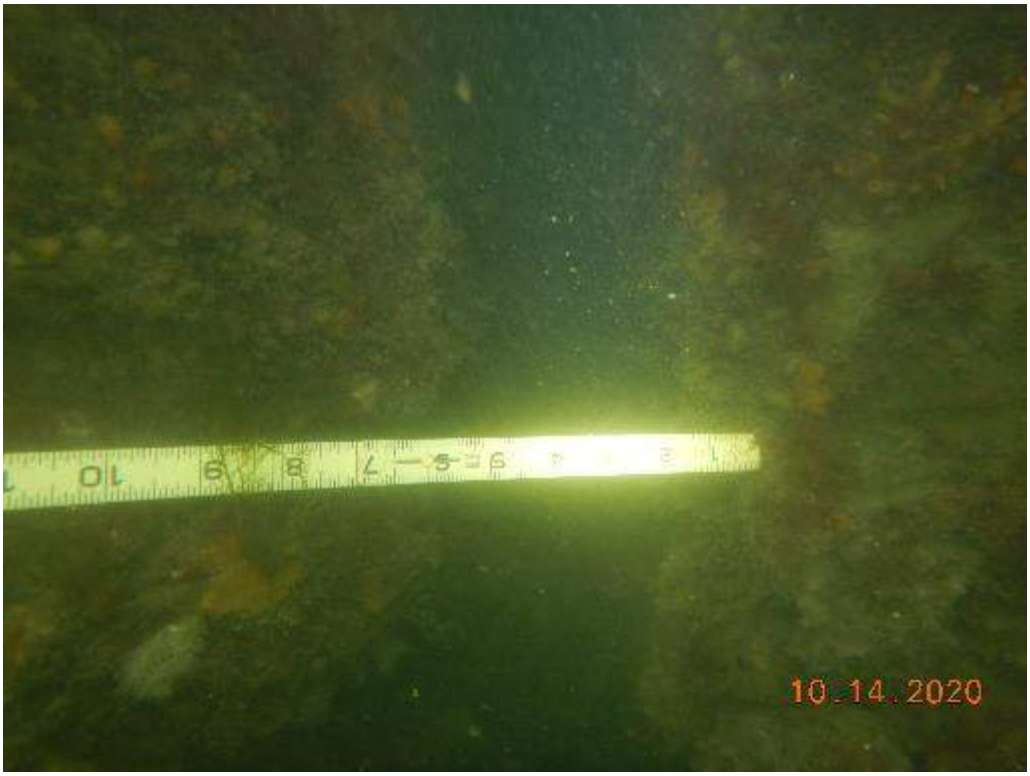
Appendix C4-1 Breakwater Inspection Photos



Photograph 31. (30' L x 1.5' W x 2' D) Under Minding at Station 0+56.5, North Breakwater

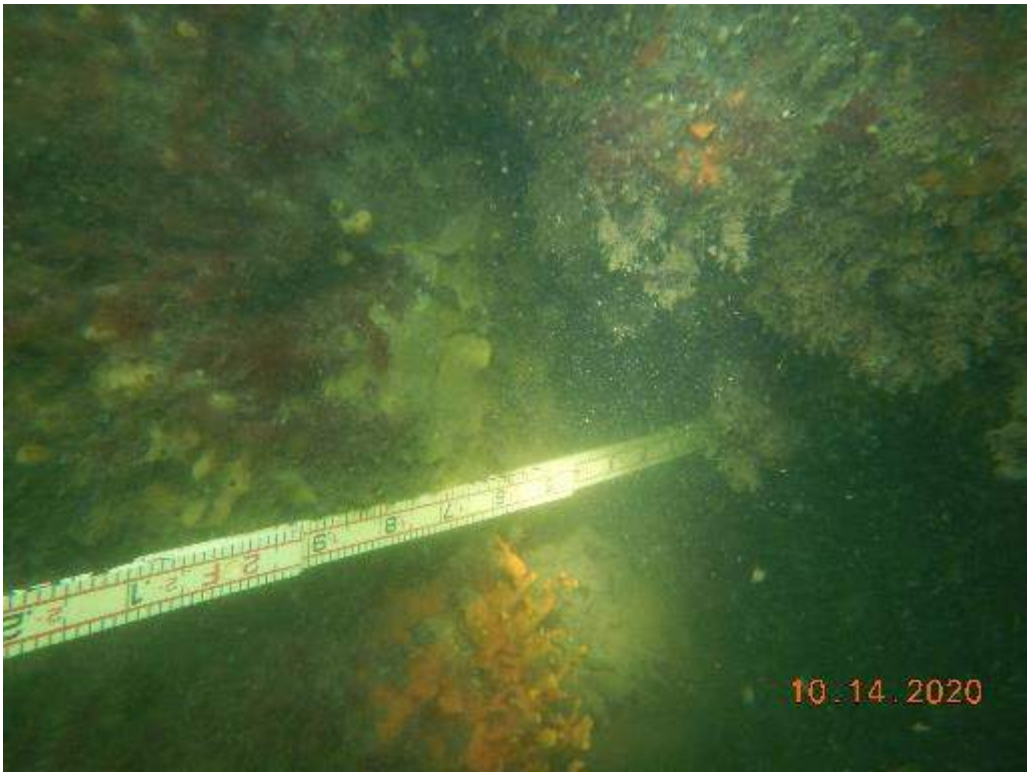


Photograph 32. Void at the Base of Breakwater at Station 0+91, West Breakwater



Photograph 33. (15' L x 6" W x 6' D) Transverse Void under Water at Station 0+91, West Breakwater

Photograph 34. Transverse Void above Water Level at Station 0+91, West Breakwater



Photograph 35. (5'L x 3'W x 2.2'D) Void under water at Station 1+38, West Breakwater

Photograph 36. Breakwater wall concrete crack, South Surface, North Breakwater

Photograph 37. Concrete crack lines on South Surface, North Breakwater

Photograph 38. Concrete crack lines on South Surface, North Breakwater

Photograph 39. Concrete crack lines on South Surface, North Breakwater

Photograph 40. Concrete crack lines on South Surface, North Breakwater

Photograph 41. Concrete crack lines on North Surface, North Breakwater

Photograph 42. Concrete crack lines on North Surface, North Breakwater

Photograph 43. Voids between Blocks Wall on West Surface, West Breakwater

Photograph 44. Tilted Blocks on West Surface, West Breakwater

Photograph 45. Concrete crack lines on East Surface, West Breakwater

Photograph 46. Fender Piles near West Breakwater (Routine inspection required)

Photograph 47. Voids between Blocks Wall on South West Surface, Memorial Breakwater

Photograph 48. Voids between Blocks Wall on South Surface, Memorial Breakwater

Photograph 49. Concrete Spalling at North East Corner, Memorial Breakwater

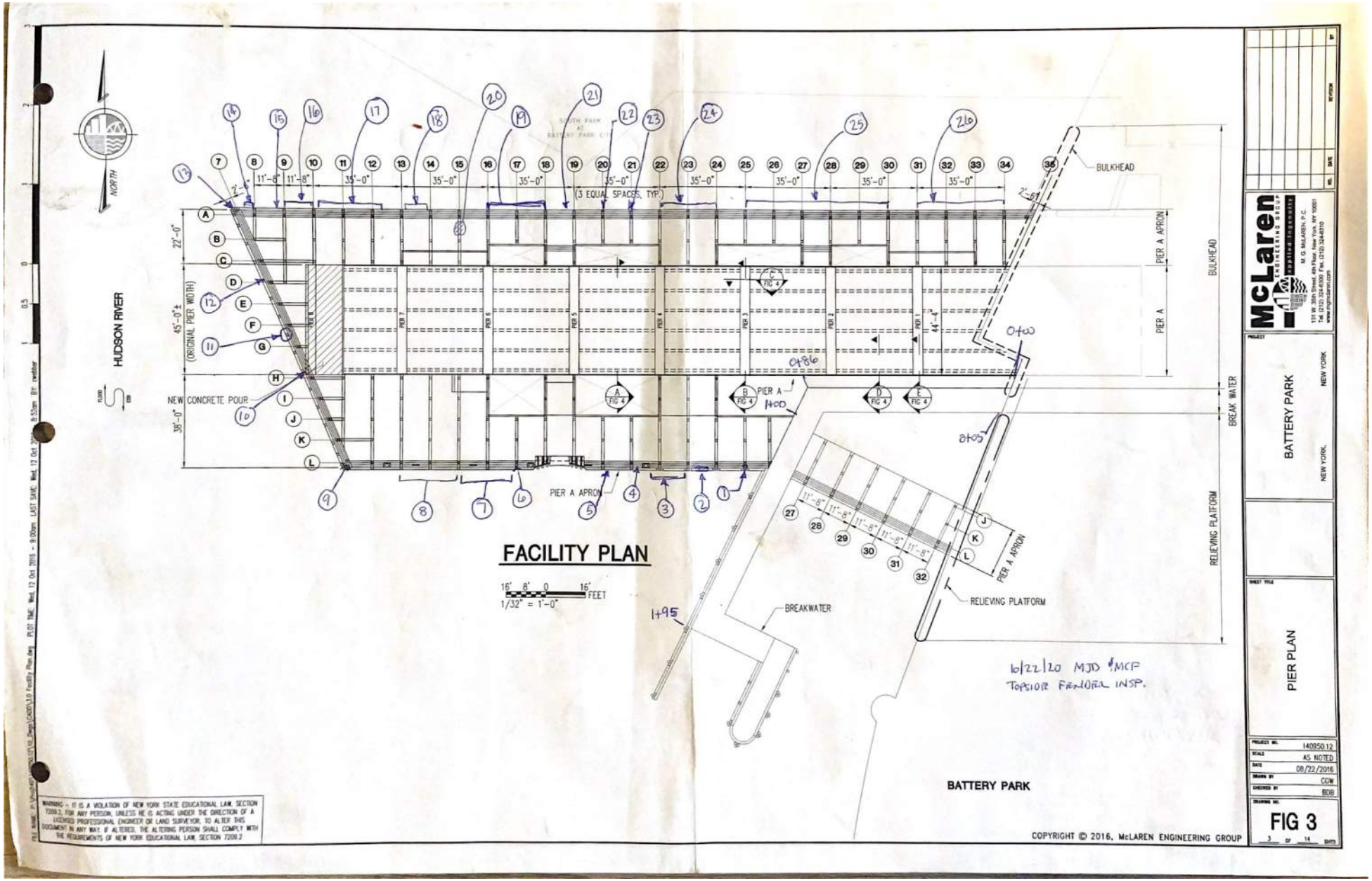
Photograph 50. Concrete crack lines on Walkway Slab every 5-10 ft, North Breakwater

Photograph 51. 0.6” Crack Width on Walkway Slab, North Breakwater

Photograph 52. Concrete crack lines on Walkway Slab every 5-10 ft, West Breakwater

Appendix D Top Side Inspection

On Pier-A Apron

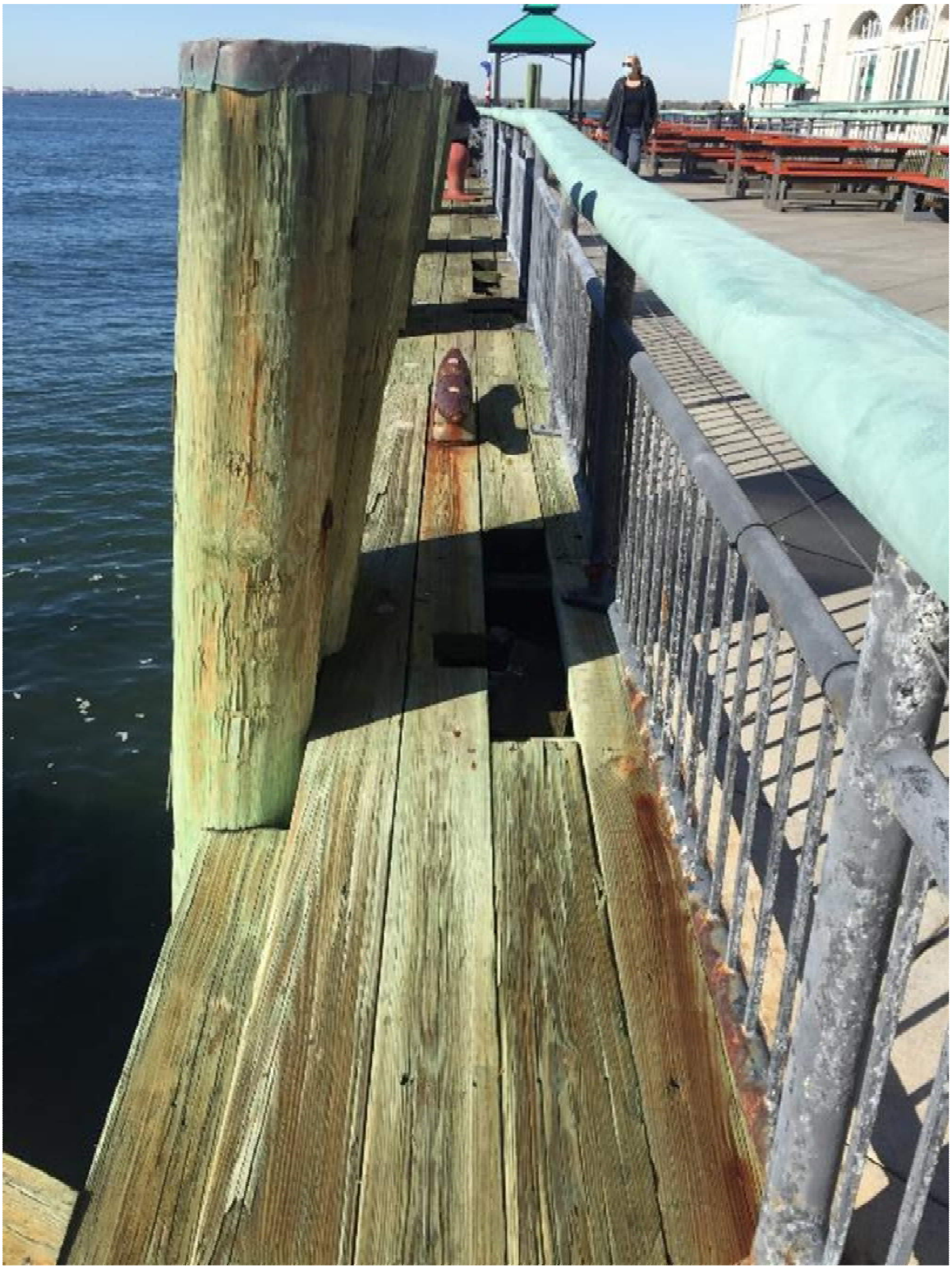

NORTH
HUDSON RIVER
(3 EQUAL SPACES, TYP.)
BULKHEAD
PIER A APRON
PIER A
BREAK WATER
RELIEVING PLATFORM
NEW CONCRETE POUR
(ORIGINAL PIER WIDTH)
PIER A APRON
BREAKWATER
RELIEVING PLATFORM
BATTERY PARK
FACILITY PLAN
16' 8' 0 16' FEET
1/32" = 1'-0"
6/22/20 MJD & MCF
TOPSIDE FENDER INSP.
COPYRIGHT © 2016, McLAREN ENGINEERING GROUP
BATTERY PARK
NEW YORK
PIER PLAN
140950.12
AS NOTED
08/22/2016
CDW
BDB
FIG 3

Summary of Top Side Opening

Mark-up ID	Area of Opening (Sq-Ft)	Description	Remarks
1	5	Opening in fender wall	
2	8	-	
3	4	4 Openings	
4	2	-	
5	1	-	
6	1	-	
7	20	Missing/ loose plank	
8	4	4 Openings	
9	1	At corner	
10	1	Likely old timber post	
11	-	Missing fender piles chocks missing	
12	1	-	
13	5	-	
14	2	2 Openings	
15	4	-	
16	4	4 Openings	
17	3	6 Openings	
18	2	3 Openings	
19	12	5 Openings	
20	4	Concrete spall on walkway pavement	Photo-2
21	2	2 Openings	
22	5	Loose plank.	
23	7	Loose and missing plank	
24	8	8 Openings	
25	11	11 Openings	
26	7	7 Openings	
	120	**Total area square feet of opening on plank**	

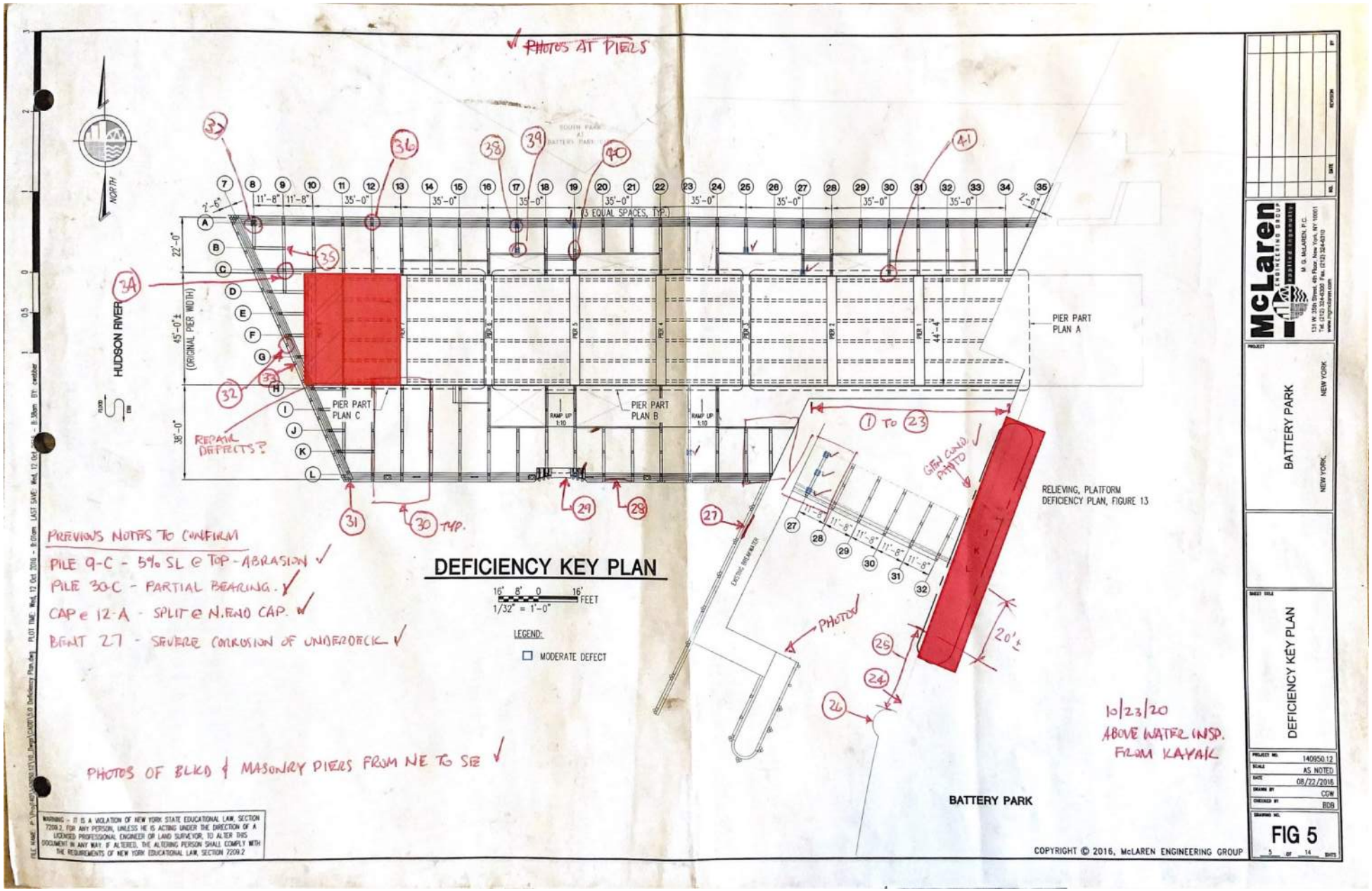
Photograph 53. Top Side Openings in Pier-A North Apron

Photograph 54. Concrete spall on walkway pavement



Photograph 55. Top Side Openings in Pier-A South Apron

Appendix E Above Water Inspection


PHOTOS AT PIERS
NORTH
HUDSON RIVER
PIER PART PLAN A
PIER PART PLAN C
PIER PART PLAN B
RAMP UP 1:10
RAMP UP 1:10
(3 EQUAL SPACES, TYP.)
45'-0"± (ORIGINAL PIER WIDTH)
38'-0"
REPAIR DEFECTS?
30 TYP.
1 TO 23
OPEN CELL PHOTO
RELIEVING PLATFORM DEFICIENCY PLAN, FIGURE 13
EXISTING BREAKWATER
PHOTOS
20'±
PREVIOUS NOTES TO CONFIRM
PILE 9-C - 5% SL @ TOP - ABRASION
PILE 30-C - PARTIAL BEARING.
CAP @ 12-A - SPLIT @ N. END CAP.
BENT 27 - SEVERE CORROSION OF UNDERDECK
DEFICIENCY KEY PLAN
16' 8' 0 16' FEET
1/32" = 1'-0"
LEGEND:
MODERATE DEFECT
10/23/20
ABOVE WATER INSP. FROM KAYAK
PHOTOS OF BLKD & MASONRY PIERS FROM NE TO SE
BATTERY PARK
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McLaren ENGINEERING GROUP
BATTERY PARK
NEW YORK
NEW YORK
DEFICIENCY KEY PLAN
140950.12
AS NOTED
08/22/2016
CDW
RDB
FIG 5
5 OF 14

Photograph 56. Pier-A South Elevation View

Photograph 57. Pier-A West Elevation View

Photograph 58. Pier-A North Elevation View (Landside)

Photograph 59. Pier-A North Elevation View (Seaside)

Appendix E1 Relieving Platform Seawall

Inspection Notes and Photos

Relieving Platform Seawall Above Water Inspection field Notes

Mark-up ID	Area (Sq-Ft)	Description	Remarks
24	40	Missing granite blocks in upper courses.	Beside of project limit (Photo-5)
25	-	Missing mortar between courses 2-4; (3 horizontal + vertical) 50% 0.75” - 1.5” deep, 3” - 6” deep, 20 ft south of apron extending south	Project Area (Photo-1-4)
26	-	Missing granite block and spalled concrete core	Beside of project limit (Marisol Sculptor Stone Label for American Merchant Mariners’ Memorial, That stone behave as cantilever action and there has no reinforcements from concrete cap beam. Sonner or later adjacent granite stone wall and concrete cap beam will fall to the water.) If that is under BPCA property immediately repaired are required for protection of adjacent seawall. Photos – 6&7

Photograph 60. Relieving Platform Seawall

Photograph 61. Relieving Platform Seawall under Ramp

Photograph 62. Relieving Platform Seawall between Ramp and Breakwater

Photograph 63. Relieving Platform Seawall Concrete Cap Beam

Photograph 64. Relieving Platform Seawall Outside of Project Limit

Photograph 65. Relieving Platform Seawall Outside of project limit

Photograph 66. Seawall concrete cap displacement outside of project limit

Photograph 66. Seawall concrete cap displacement outside of project limit

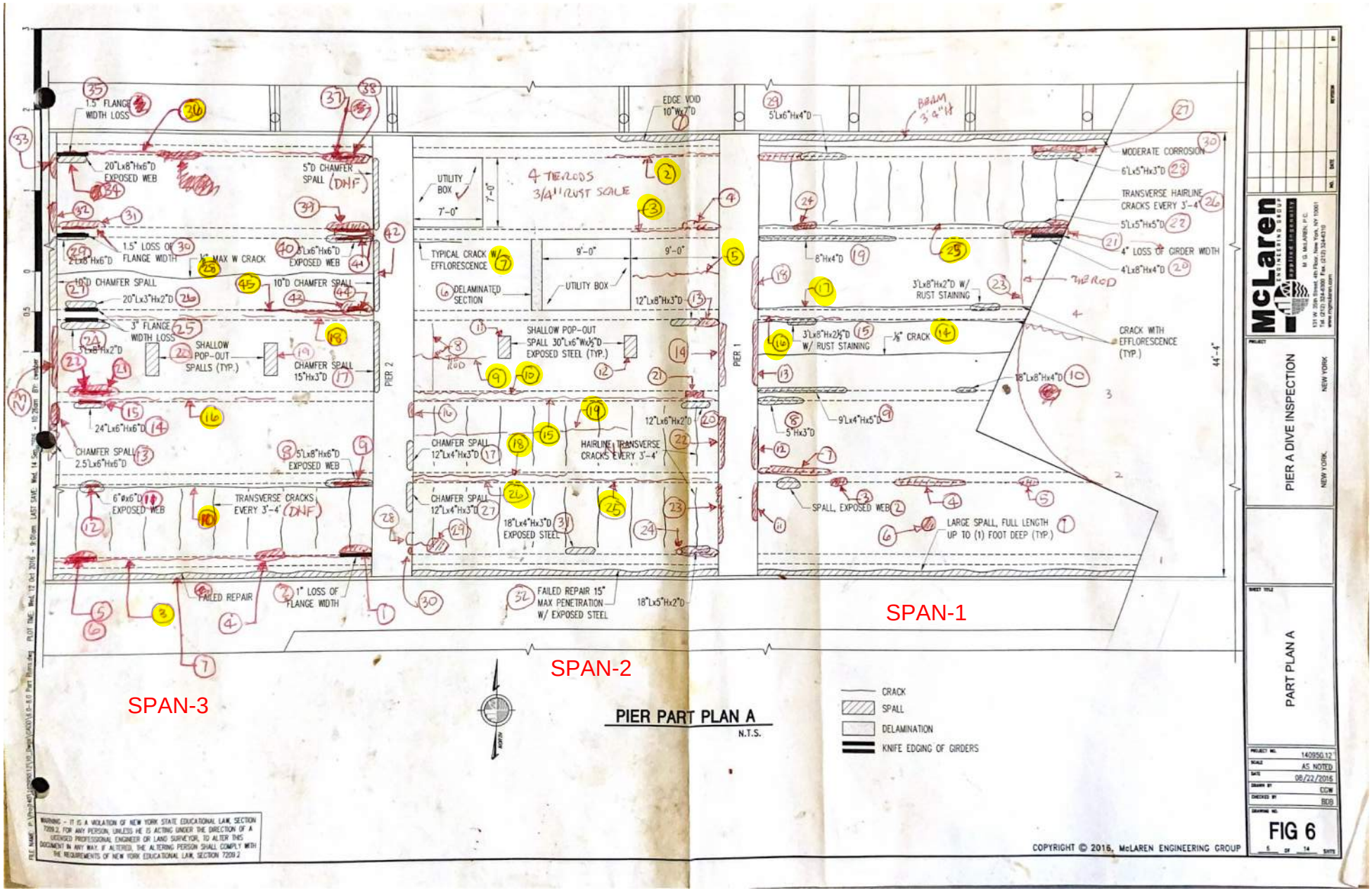
Appendix E2 Jack Arch Concrete under Deck Inspection

Table 1. Summary of Defect under the deck

Span No.	2020 Defect	Longitudinal Crack line at Crown of Arch Concrete Deck	Remarks
1	Number of Total defect 26, between Bulkhead and Pier-1	One crack line in middle bay (Bay-3)	(Bay-1) has less number of transverse crack lines than 2016 findings.
2	Number of Total defect 32, between Pier-1 and Pier-2	Two crack lines in (Bay-2) , (Bay-3) & (Bay-4)	No transverse crack lines in (Bay-4&5) from 2016 findings. Found three new longitudinal crack lines in 2020.
3	Number of Total defect 45, between Pier-2 and Pier-3	One crack line in middle bay (Bay-2)	No transverse crack lines in Bay-5 from 2016 findings.
4	Number of Total defect 23, between Pier-3 and Pier-4	Four crack lines in (Bay-2), (Bay-3), (Bay-4), (Bay-5)	Found one new longitudinal crack line in (Bay-3)
5	Number of Total defect 25, between Pier-4 and Pier-5	One crack lines in middle bay (Bay-3)	
6	Number of Total defect 33, between Pier-5 and Pier-6	Four crack lines in middle bay (Bay-1), (Bay-2), (Bay-3) & (Bay-4)	
7	Number of Total defect 33, between Pier-6 and Pier-7	Four crack lines in middle bay (Bay-2), (Bay-3), (Bay-4) &(Bay-5)	Found two new longitudinal crack lines in (Bay-2&3)

Table 2. Comparison of longitudinal crack lines before and after post-tensioned slab renovated

Span No.	2008 finding from Weidlinger Asso. (No. of Bay)	2020 findings (No. of Bay)	Remarks
1	0	1	+1
2	1	3	+2
3	2	1	-1
4	2	4	+2
5	1	1	0
6	3	4	+1
7	3	4	+1


SPAN-1
SPAN-2
SPAN-3
PIER 1
PIER 2
PIER PART PLAN A
N.T.S.
CRACK
SPALL
DELAMINATION
KNIFE EDGING OF GIRDERS
EDGE VOID 10"Wx7"D
5'Lx6"Hx4"D
MODERATE CORROSION
6'Lx5"Hx3"D
TRANSVERSE HAIRLINE CRACKS EVERY 3'-4"
5'Lx5"Hx5"D
4" LOSS OF GIRDER WIDTH
4'Lx8"Hx4"D
#2 ROD
CRACK WITH EFFLORESCENCE (TYP.)
18"Lx8"Hx4"D
9'Lx4"Hx5"D
5"Hx3"D
SPALL, EXPOSED WEB
LARGE SPALL, FULL LENGTH UP TO (1) FOOT DEEP (TYP.)
3'Lx8"Hx2"D W/ RUST STAINING
8"Hx4"D
3'Lx8"Hx2½"D W/ RUST STAINING
½" CRACK
4 TIE RODS 3/4" RUST SCALE
UTILITY BOX
7'-0"
9'-0"
TYPICAL CRACK W/ EFFLORESCENCE
DELAMINATED SECTION
12"Lx8"Hx3"D
SHALLOW POP-OUT SPALL 30"Lx6"Wx½"D EXPOSED STEEL (TYP.)
12"Lx6"Hx2"D
CHAMFER SPALL 12"Lx4"Hx3"D
HAIRLINE TRANSVERSE CRACKS EVERY 3'-4"
18"Lx4"Hx3"D EXPOSED STEEL
18"Lx5"Hx2"D
FAILED REPAIR 15" MAX PENETRATION W/ EXPOSED STEEL
1" LOSS OF FLANGE WIDTH
FAILED REPAIR
6"Øx6"D EXPOSED WEB
TRANSVERSE CRACKS EVERY 3'-4" (DNF)
5'Lx8"Hx6"D EXPOSED WEB
CHAMFER SPALL 2.5'Lx6"Hx6"D
24"Lx6"Hx6"D
CHAMFER SPALL 15"Hx3"D
SHALLOW POP-OUT SPALLS (TYP.)
3"Lx8"Hx2"D
3" FLANGE WIDTH LOSS
10"D CHAMFER SPALL
20"Lx3"Hx2"D
1.5" LOSS OF FLANGE WIDTH
½" MAX W CRACK
5'Lx6"Hx6"D EXPOSED WEB
5"D CHAMFER SPALL (DNF)
20"Lx8"Hx6"D EXPOSED WEB
1.5" FLANGE WIDTH LOSS
McLaren ENGINEERING GROUP
PIER A DIVE INSPECTION
NEW YORK
NEW YORK
PART PLAN A
PROJECT NO. 140950.12
SCALE AS NOTED
DATE 08/22/2016
DRAWN BY CCW
CHECKED BY BDB
FIG 6
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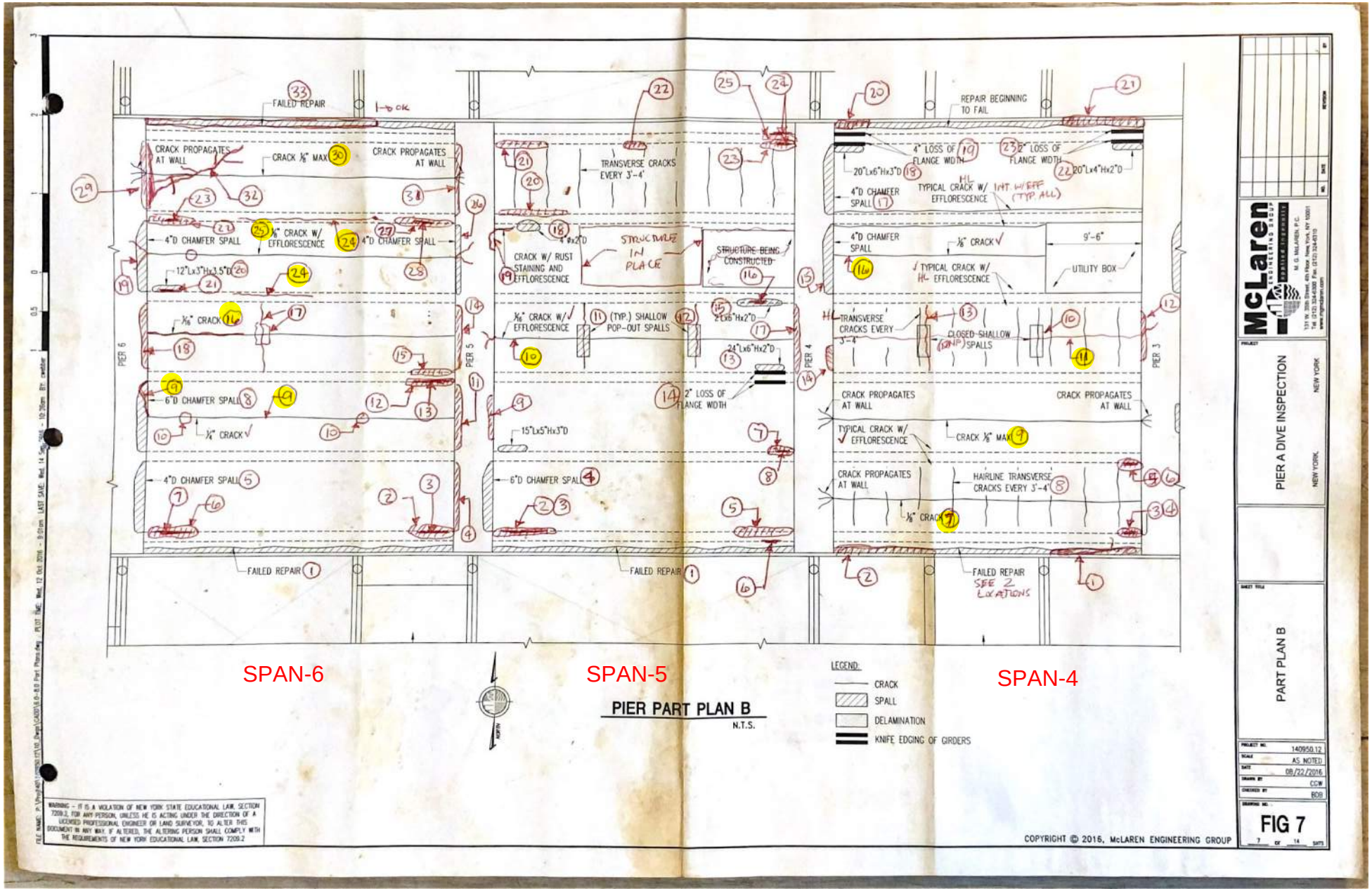
FAILED REPAIR
CRACK PROPAGATES AT WALL
CRACK ⅛" MAX
4"D CHAMFER SPALL
12"Lx3"Hx3.5"D
⅛" CRACK W/ EFFLORESCENCE
⅛" CRACK
6"D CHAMFER SPALL
¼" CRACK
PIER 6
TRANSVERSE CRACKS EVERY 3'-4'
4"Dx2"D
CRACK W/ RUST STAINING AND EFFLORESCENCE
STRUCTURE IN PLACE
STRUCTURE BEING CONSTRUCTED
⅛" CRACK W/ EFFLORESCENCE
(TYP.) SHALLOW POP-OUT SPALLS
2"Lx6"Hx2"D
24"Lx6"Hx2"D
15"Lx5"Hx3"D
6"D CHAMFER SPALL
PIER 5
2" LOSS OF FLANGE WIDTH
REPAIR BEGINNING TO FAIL
4" LOSS OF FLANGE WIDTH
2" LOSS OF FLANGE WIDTH
20"Lx6"Hx3"D
20"Lx4"Hx2"D
4"D CHAMFER SPALL
TYPICAL CRACK W/ EFFLORESCENCE
INT. W/EFF (TYP. ALL)
9'-6"
UTILITY BOX
TRANSVERSE CRACKS EVERY 3'-4'
CLOSED SHALLOW (TYP) SPALLS
PIER 4
PIER 3
CRACK PROPAGATES AT WALL
CRACK ⅛" MAX
HAIRLINE TRANSVERSE CRACKS EVERY 3'-4'
SEE 2 LOCATIONS
SPAN-6
SPAN-5
SPAN-4
PIER PART PLAN B
N.T.S.
LEGEND:
CRACK
SPALL
DELAMINATION
KNIFE EDGING OF GIRDERS
McLaren ENGINEERING GROUP
PIER A DIVE INSPECTION
NEW YORK
PART PLAN B
140950.12
AS NOTED
08/22/2016
CCW
BDB
FIG 7
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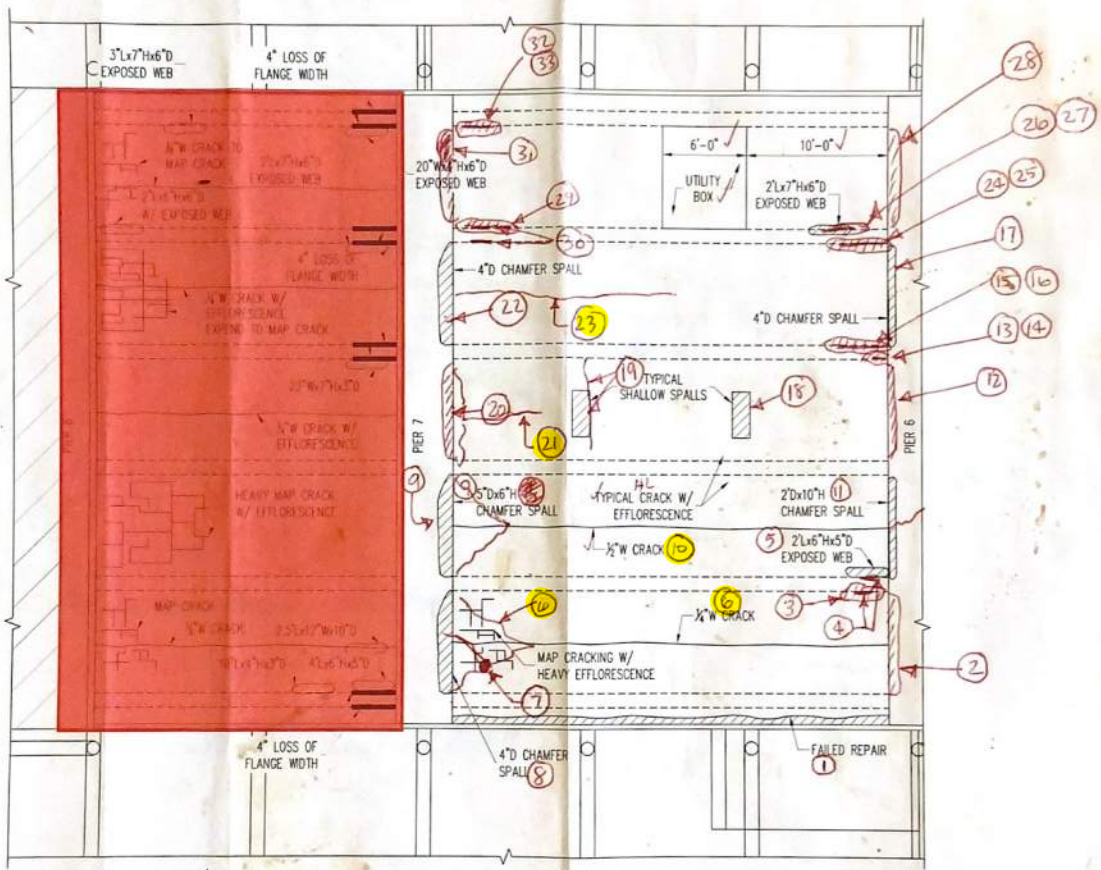

PIER PART PLAN C
N.T.S.

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M. G. McLAREN, P.C.
131 W. 35th Street, 4th Floor, New York, NY 10001
Tel. (212) 324-8300 Fax. (212) 324-8310

PIER A DIVE INSPECTION
NEW YORK
NEW YORK

PART PLAN C

PROJECT NO.	140950.12
SCALE	AS NOTED
DATE	08/22/2016
DRAWN BY	CGW
CHECKED BY	BOB

FIG 8

Appendix E2-1 Jack Arch Concrete under Deck

Inspection Photographs

Photograph 67. Span-1,#1, G6, Edge Beam Concrete Spalling

Photograph 68. Span-1,#11, Arch Transverse wall Concrete Spalling on Pier-1@Bay(5)

Photograph 69. Span-1,#17, G3 Bottom of the Iron Flange Efflorescence

Photograph 70. Span-1,#18, Concrete Spalling at Bay (2) on Pier-1

Photograph 71. Span-1,#21, Deteriorated Iron Beam & adjacent Concrete Spalling @ G2

Photograph 72. Span-1,#23, Deteriorated Tie Rod

Photograph 73. Span-1,#24, Arch concrete partially opening

Photograph 74. Span-3,#10, Concrete Cracking along the Iron Beam Bottom @ G5 Bay (5)

Photograph 75. Span-3,#19, Exposing Deteriorated reinforcement from Concrete arch

Photograph 76. Span-3,#28, Longitudinal Crack line at Bay (2)

Photograph 77. Span-4,#9, Longitudinal Crack line at Bay (4)

Photograph 78. Span-4, Concrete Cracks & Iron Beam Bottom flange Deterioration

Photograph 79. Span-6, #27 Concrete Spalling from Iron Beam Web (G2) and Deterioration

Photograph 80. Span-6, #10 Repaired Wooden Plug of Hole, expanded cracks surrounded

Photograph 81. Span-6, #30 Longitudinal Crack line at Bay (5)

Photograph 82. Span-6, #9 _ Arch Crown Crack width 4/16" in 10/22/2020 at Bay (4)

Photograph 83. Span-7, #2 _ End Diaphragm Wall Bearing loss Pier-6 at Bay (4)

Photograph 84. Span-7, #11 _ Arch Crown Longitudinal Crack at Bay (4)

Photograph 85. Span-7, View from G-1 , Pier-7

Photograph 86. Span-7, View from G1, Pier-6

Photograph 87. Span-6, View from G1, Pier-6

Photograph 88. Span-5, View from G1, Pier-5

Photograph 89. Span-4, View from G1, Pier-3

Photograph 90. Span-3, View from G1, Pier-3

Photograph 91. Span-1, View from G1 to Bulkhead