



# sanitation

**DENNIS DIGGINS**

Deputy Commissioner

**Solid Waste Management**  
125 Worth Street, Room 726  
New York, NY 10013  
Telephone (646) 885-4684  
Fax (212) 788-3906

December 4, 2014

By E-mail and Priority Mail

Mr. Kenneth B. Brezner, P.E., Regional Materials Management Engineer  
NYS Department of Environmental Conservation, Region 2  
47-40 21st Street  
Long Island City, NY 11101-5407

RE: Southwest Brooklyn Converted Marine Transfer Station  
NYSDEC Permit No. 2-6106-00002/00022 (Permit)  
Bulkhead Inspection Report

Dear Mr. Brezner:

Enclosed in compliance with Special Condition 24 of the Permit for the Southwest Brooklyn Converted Marine Transfer Station (MTS), are two hard copies of the November 22, 2014 Bulkhead Inspection Report (Bulkhead Report) performed by Ocean and Coastal Consultants Engineering, P.C. Note that the Bulkhead Report contains such information as is available on the fill level of the cofferdams. Additional information will be obtained and reported on the sand fill levels when the concrete covering the cofferdam structures is removed during MTS demolition activities. A CD containing the Bulkhead Report is also provided.

The Bulkhead Report will be posted on the Department of Sanitation website.

Please contact me with any questions at (212) 437-4508 or [sdolinar@dny.nyc.gov](mailto:sdolinar@dny.nyc.gov).

Sincerely,

Sarah Dolinar  
SWM Director of Environmental Review

Enclosures : 2 hard copies and 1 CD  
cc: V. Arnold, DSNY  
J. Cuervo, DDC  
D. Menz, LiRo  
K. Keane, HDR

[www.nyc.gov/sanitation](http://www.nyc.gov/sanitation)

KEEP NYC CLEAN  REDUCE, REUSE, RECYCLE  DON'T LITTER

 printed on paper with no less than 30% post consumer Recycled material

Greeley and Hansen LLC  
1700 Market Street, Suite 2130  
Philadelphia, PA 19103

Attn: Kathleen B. Callow, P.E.

ADDRESS Ocean and Coastal Consultants Engi-  
neering, P.C.  
35 Corporate Drive, Ste 1200  
Trumbull, CT 06611  
TEL 203 268 5007  
FAX 203 268 8821  
www.ocean-coastal.com  
DATE 11/22/14  
PAGE 1/17  
REF SW Brooklyn MTS Bulkhead Inspection  
PROJECT NO 214091

## **Southwest Brooklyn Converted Marine Transfer Station Bulkhead Investigation Report**

Dear Ms. Callow,

At the request of Greeley and Hansen LLC (G-H), Ocean and Coastal Consultants Engineering, P.C. (OCC) performed an above and below water investigation of three bulkheads at the site of the proposed Southwest Brooklyn Converted Marine Transfer Station, located in Brooklyn, New York. The inspection was performed on Monday October 27, 2014, by a three-person dive team using surface supplied commercial diving equipment. The purpose of the inspection was to perform a 100% Level I investigation on each of the three bulkheads at the site: the West Bulkhead (Approximately 189 LF), the North Bulkhead (Approximately 426 LF), and the East Bulkhead (Approximately 144 LF). The level of sand fill within the bulkheads' cellular cofferdams was also to be determined. The investigation was performed in general accordance with ASCE Underwater Investigation Practice Manual No. 101 and in accordance with OSHA requirements. The bulkheads were given an overall Condition Assessment Rating (CAR), as was each section of bulkhead inspected as part of this investigation (Appendix C). A structural analysis was not included in this scope of work.

### **Description of Bulkheads**

The North, East, and West Bulkheads (Photograph 1) form a square peninsula along the shoreline (Sketch 2). The West Bulkhead extends from the shoreline to the west for approximately 189 LF, and is composed of Z-shape steel sheet piles

for the eastern 164 LF (Photograph 2). The western 25 LF of the West Bulkhead is constructed of steel sheet piles forming cellular cofferdams. To the west of the West Bulkhead, the cellular cofferdams continue along the North Pier (Photograph 3).

The North Bulkhead is located along the offshore face of the facility and is parallel to the waterway (Photograph 4). The bulkhead intersects the northeast end of the North Pier and extends south for approximately 426 LF. The northern section of the North bulkhead is constructed of steel sheet piles forming cellular cofferdams (approximately 75 LF), which then transitions to Z-shape steel sheet piles to the south. The steel sheet pile portion of the North Bulkhead is tied back with a series of steel anchor rods, which are attached to an external double channel wale. The steel sheet piles were reported installed as overshooting for the cellular cofferdams that were once the shoreline retaining structure at this site.

The East Bulkhead intersects the North Bulkhead along the south end and creates a corner returning inshore to the east for approximately 144 LF (Photograph 5). This section of bulkhead is composed of Z-shaped steel sheet piles with an external double channel wale, which is secured with a series of steel anchor rods. The steel sheet piles were reported installed as overshooting for the cellular cofferdams that were once the shoreline retaining structure at this site.

The steel anchor rod tie-backs for both the North and East Bulkheads presumably connect to a deadman system located inshore of the bulkhead. However, details of the inshore portions of the tie-back system are not known.

A fender system is located along the offshore face of the North and East Bulkheads. The fender system consists of 6x12 fender planks, timber fender piles, and three levels of 12x12 chocks and wales. A rubber fender is located at the top of the fender system between the top wale and the steel sheet pile

bulkhead. Restraining chains run between the steel sheet pile bulkhead and the fender piles.

The fender paneling is only 12 to 20 inches from the bulkhead, and the timber wales are continuous. Inspection ports were cut in the fender panels, at approximately 100 foot intervals, to allow for the inspection of the bulkhead behind it.

### **Observed Conditions**

The bulkhead sections are in overall **Fair** condition with widespread moderate to heavy corrosion of the steel in the tidal/splash zone, and minor coating loss with surface corrosion to isolated areas of the below water steel sheet piles. Though the site is protected from direct ocean swells by Coney Island, it is open to the southwest, across Lower New York Bay. Wind generated waves up to two (2) feet were consistent throughout the inspection.

#### West Bulkhead

Overall, the West Bulkhead is in **Fair** condition due to moderate to heavy corrosion and coating failure located within the splash and tidal zone of the steel sheet piles, and isolated coating loss and surface corrosion observed underwater (Photograph 6). The cellular cofferdams located at the western extent of the bulkhead have been repaired with an epoxy coating along the entire exposed face of the steel sheets. No access hatches for the cofferdams were exposed, so the sand levels could not be verified. No evidence of sand loss (e.g. sinkholes) was observed above or below water. Additionally, a steel pile cap section located at the western edge of the Z-shape steel sheet pile bulkhead is missing (Photograph 7).

#### North Bulkhead

The North Bulkhead is in **Fair** condition due to moderate to heavy corrosion and coating failure located within the splash and tidal zone of the steel sheet piles and

steel anchor tie-backs (Photographs 8 and 9). Below mean low water, the steel sheet piles were observed to have isolated areas of failed coating and surface corrosion, however the coating is brittle and easily removed (Photographs 10). Located at station 2+80 along the bulkhead, a section of the steel sheet piles have been cut out, presumably to allow for a steel drainage pipe. The opening is approximately 24 inches wide by 20 inches high, with exposed granular fill. A section of the original cellular cofferdam is visible through this opening. No access hatches for the cellular cofferdams inshore of the existing bulkhead were exposed, so the sand levels could not be verified. The areas where the access hatches would presumably be located appear to have been paved over. No evidence of sand loss (e.g. sinkholes) was observed above or below water.

#### East Bulkhead

Overall, the East Bulkhead is in **Fair** condition due to moderate to heavy corrosion and coating failure located within the splash and tidal zone of the steel sheet piles and of the steel anchor tie-backs (Photograph 11). Below mean low water, the steel sheet piles have isolated areas of failed coating and surface corrosion. The external double channel wale has 100 percent coating loss with heavy corrosion (Photograph 12). No access hatches for the cellular cofferdams inshore of existing the bulkhead were exposed, so the sand levels could not be verified. The areas where the access hatches would presumably be located appear to have been paved over. No evidence of sand loss (e.g. sinkholes) was observed above or below water.

#### Fender System

Inspection of the fender system was outside the scope of work for this investigation, however it is clearly in **Serious** condition. Severe deterioration due to marine borer activity was observed below water on the timber fender piles and planking. Above water, moderate deterioration due to rot, and missing timber planks were observed (Photographs 13 and 14).

**Repair Recommendations**

Ocean and Coastal Consultants has developed recommendations for repairs in order to maintain the structural integrity and service life of the three bulkheads.

- Remove the timber fender system located along the North and East Bulkheads to reduce the dead load on the steel sheet piles. It is our understanding that the existing fender system is scheduled to be replaced pursuant to the U.S. Army Corps of Engineer's permit issued for the construction of the MTS (NAN-2008-0927). That would adequately address this recommendation.
- Clean and recoat all steel sheet piles from MLW to top of pile at each of the three bulkheads. It is our understanding that the entire length of the North Bulkhead is scheduled to be encased pursuant to the U.S. Army Corps of Engineer's permit issued for the construction of the MTS (NAN-2008-0927). That would adequately address this recommendation for that section of bulkhead.
- Clean and recoat the double channel tie-back wale along the North and East Bulkheads. It is our understanding that the entire length of the North Bulkhead is scheduled to be encased in concrete pursuant to the U.S. Army Corps of Engineer's permit issued for the construction of the MTS (NAN-2008-0927). That would adequately address this recommendation for that section of bulkhead.
- Clean and recoat the exposed portions of the steel anchor tie-backs and associated hardware along the North and East Bulkheads. It is our understanding that the entire length of the North Bulkhead is scheduled to be encased pursuant to the U.S. Army Corps of Engineer's permit issued for the construction of the MTS (NAN-2008-0927). That would adequately address this recommendation for that section of bulkhead.
- Install a bulk anode cathodic protection system along each of the three bulkheads. It is our understanding that an impressed cathodic protection system is scheduled to be installed along the North and East Bulkheads

pursuant to the U.S. Army Corps of Engineer's permit issued for the construction of the MTS (NAN-2008-0927). That would adequately address this recommendation for those sections of bulkhead.

- Expose the access hatches of the cellular cofferdams and inspect the sand levels. It is our understanding that the sand levels in the cellular cofferdams will be inspected once demolition of the paved surface has been completed, pursuant to the U.S. Army Corps of Engineer's permit issued for the construction of the MTS (NAN-2008-0927). That would adequately address this recommendation

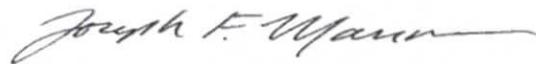
If you have any questions regarding this report, or if OCC can be of any further service on this project, please feel free to contact Joseph Acosta or myself at any time.

Very truly yours,

**OCEAN AND COASTAL CONSULTANTS ENGINEERING, P.C.**



Anthony Tedeschi  
Engineer – Dive Supervisor

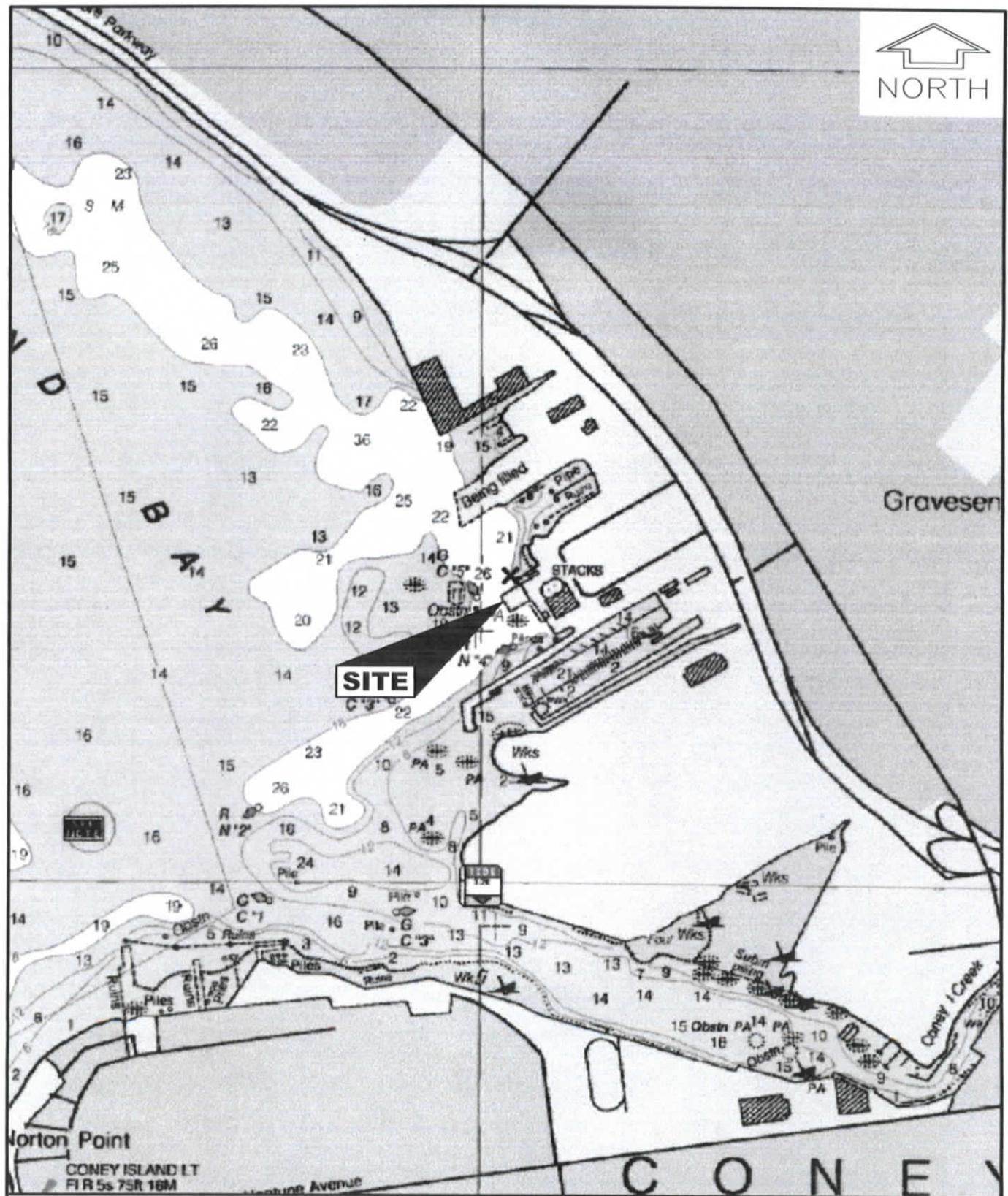


Joseph F. Marrone, PE  
Project Director

Enclosures: Appendix A – Figure Set  
Appendix B – Photographs  
Appendix C – Rating Systems

# **APPENDIX A**

## **FIGURE SET**



S:\Projects\2014\OCC\_214091\03\_Projct\_LFiles\CAD\Task 2\Sx01.dwg Sk-01 Rey T. Buzeta Mon, 10 Nov 2014 - 8:00am



Visit us at [www.ocean-coastal.com](http://www.ocean-coastal.com)  
A New York State Registered Company

DESIGNED BY: ANTS    DRAWN BY: REBU    CHECKED BY: JOAC

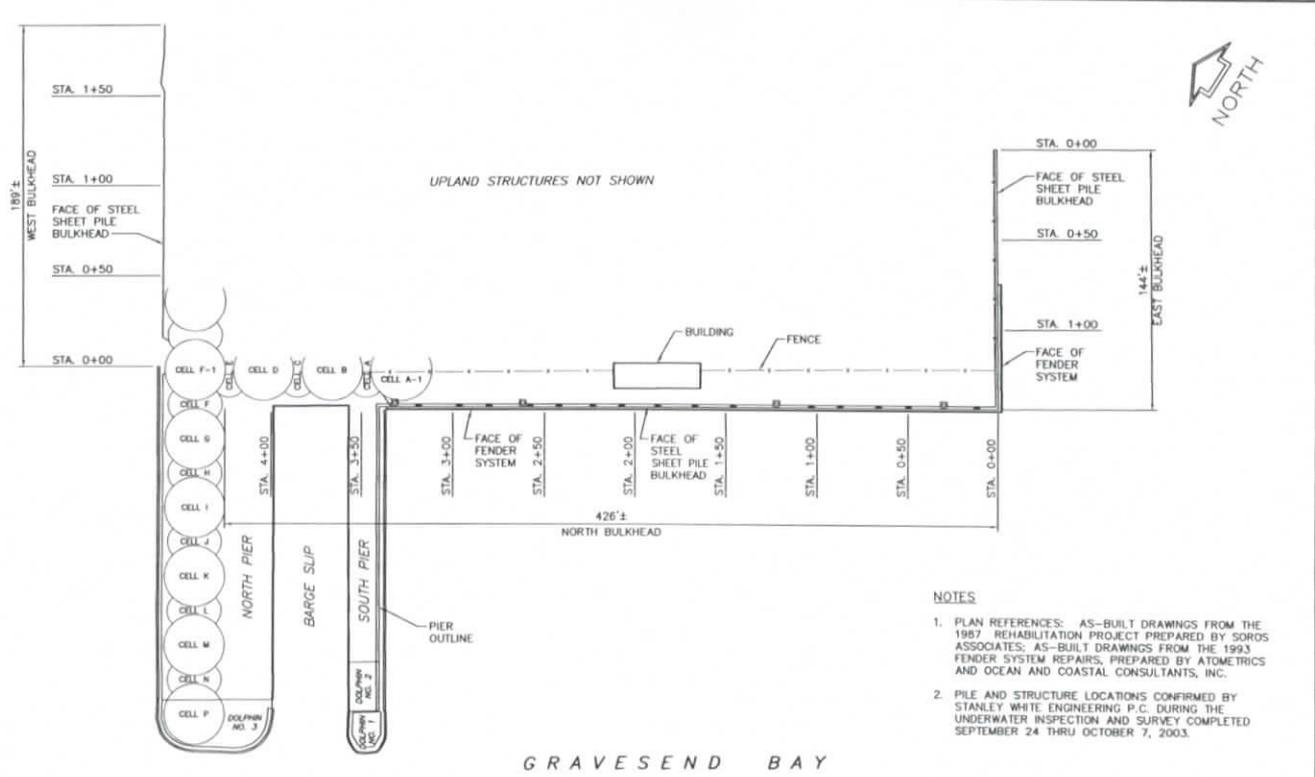
SOUTH WEST BROOKLYN  
MARINE TRANSFER STATION

VICINITY MAP

SCALE  
N.T.S.  
DATE  
10/30/14

REVISION  
SKETCH NO.  
SK-01

S:\OCC\Projects\2014\OCC-2\4001\3-D\Project\_Files\CAD\Draw 3\0602.dwg SK-02 Rev 1, Burzio Mod, 10 Nov 2014 = 7.50pm



UPLAND STRUCTURES NOT SHOWN

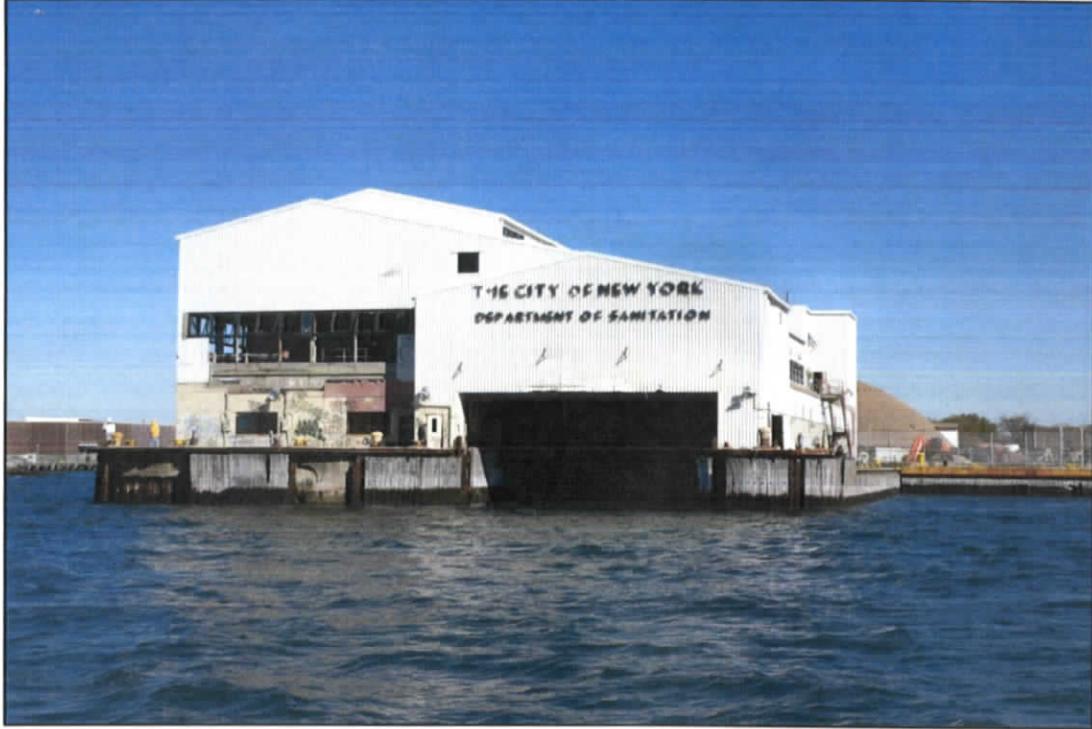
- NOTES**
1. PLAN REFERENCES: AS-BUILT DRAWINGS FROM THE 1987 REHABILITATION PROJECT PREPARED BY SOROS ASSOCIATES; AS-BUILT DRAWINGS FROM THE 1993 FENDER SYSTEM REPAIRS, PREPARED BY ATOMETRICS AND OCEAN AND COASTAL CONSULTANTS, INC.
  2. PILE AND STRUCTURE LOCATIONS CONFIRMED BY STANLEY WHITE ENGINEERING P.C. DURING THE UNDERWATER INSPECTION AND SURVEY COMPLETED SEPTEMBER 24 THRU OCTOBER 7, 2003.

GRAVESEND BAY

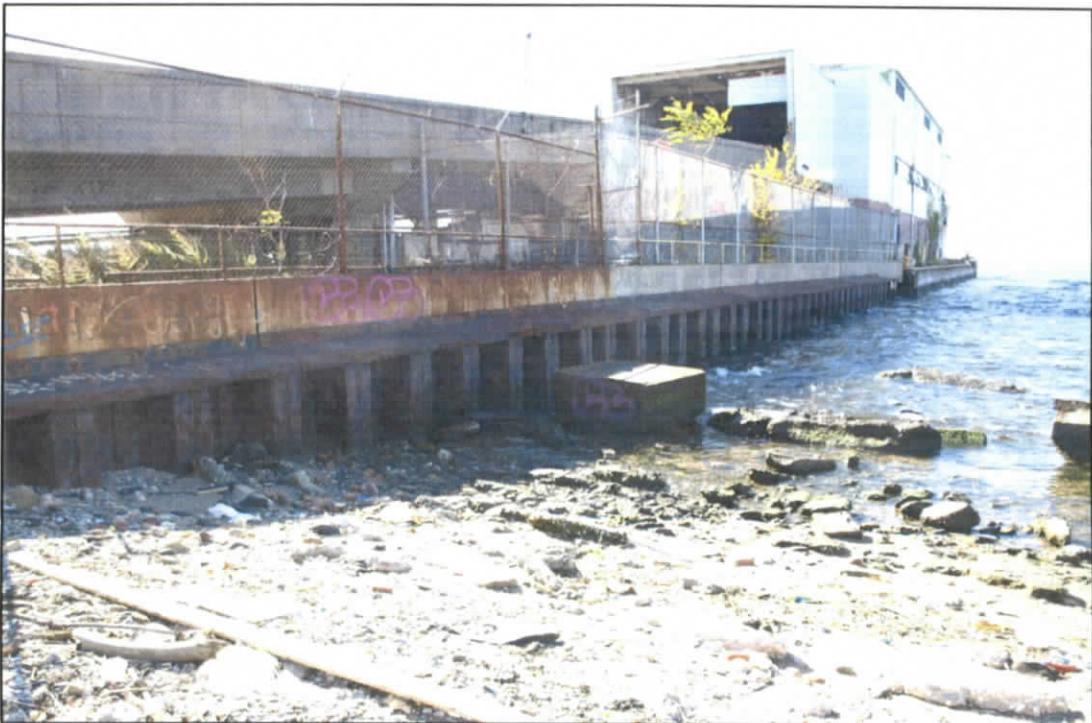
 <small>Visit us at <a href="http://www.ocean-coastal.com">www.ocean-coastal.com</a></small> <small>A New York State Registered Company</small>	SOUTH WEST BROOKLYN MARINE TRANSFER STATION	SCALE 1"=50'-0" DATE 10/28/14
	EXISTING GENERAL PLAN	SKETCH NO. SK-02
DESIGNED BY: <small>AMT</small>	DRAWN BY: <small>MEM</small>	CHECKED BY: <small>JMC</small>

## **APPENDIX B**

# **PHOTOGRAPHS**



**Photograph 1: Southwest Brooklyn Marine Transfer Station**



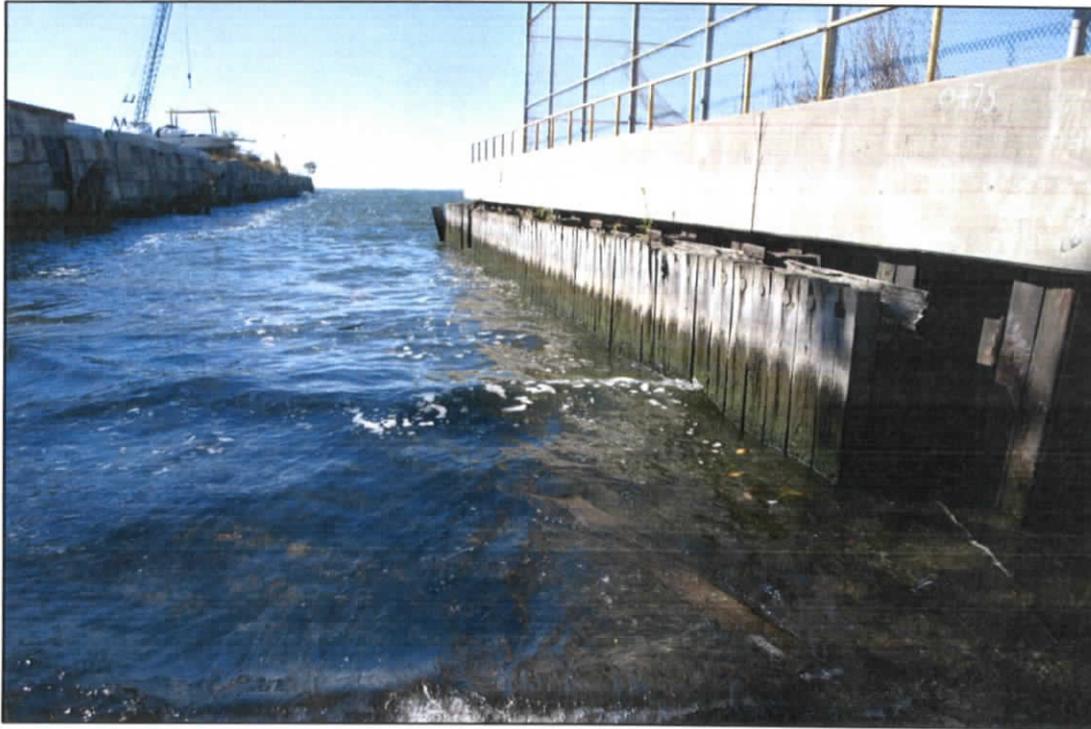
**Photograph 2: Overview of the West Bulkhead (Looking southwest)**



**Photograph 3: West Bulkhead - Steel sheet pile cellular cofferdam**



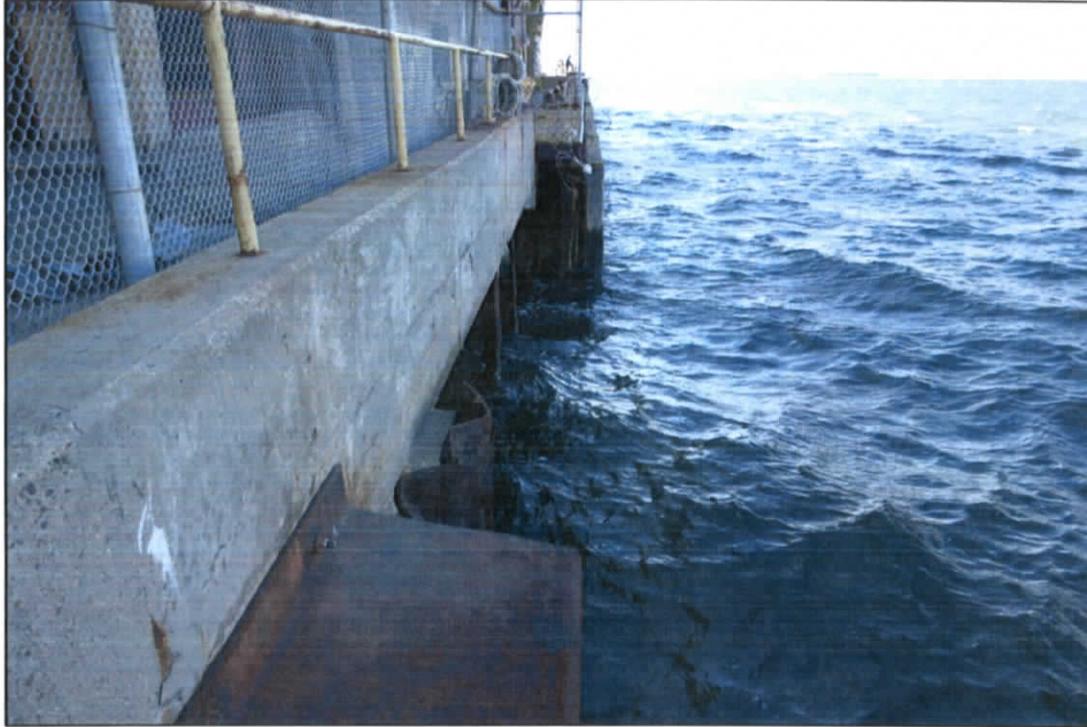
**Photograph 4: Overview of the North Bulkhead (Looking east)**



Photograph 5: Overview of East Bulkhead (Looking northwest)



Photograph 6: West Bulkhead - Typical coating failure and moderate corrosion in the splash/tidal zone



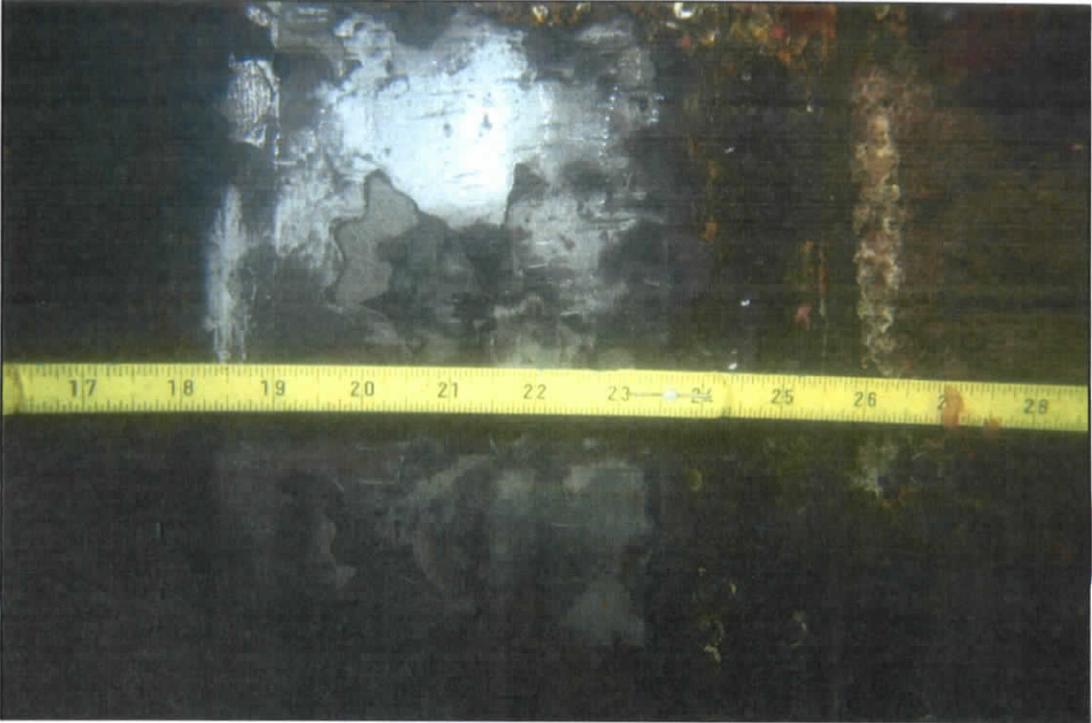
**Photograph 7: West Bulkhead - Missing steel pile cap (Looking west)**



**Photograph 8: North Bulkhead - Typical coating failure with moderate corrosion of steel sheet pile in splash/tidal zone**



**Photograph 9: North Bulkhead - Typical moderate corrosion to steel anchor rod and hardware**



**Photograph 10: North Bulkhead - Typical steel behind brittle coating**



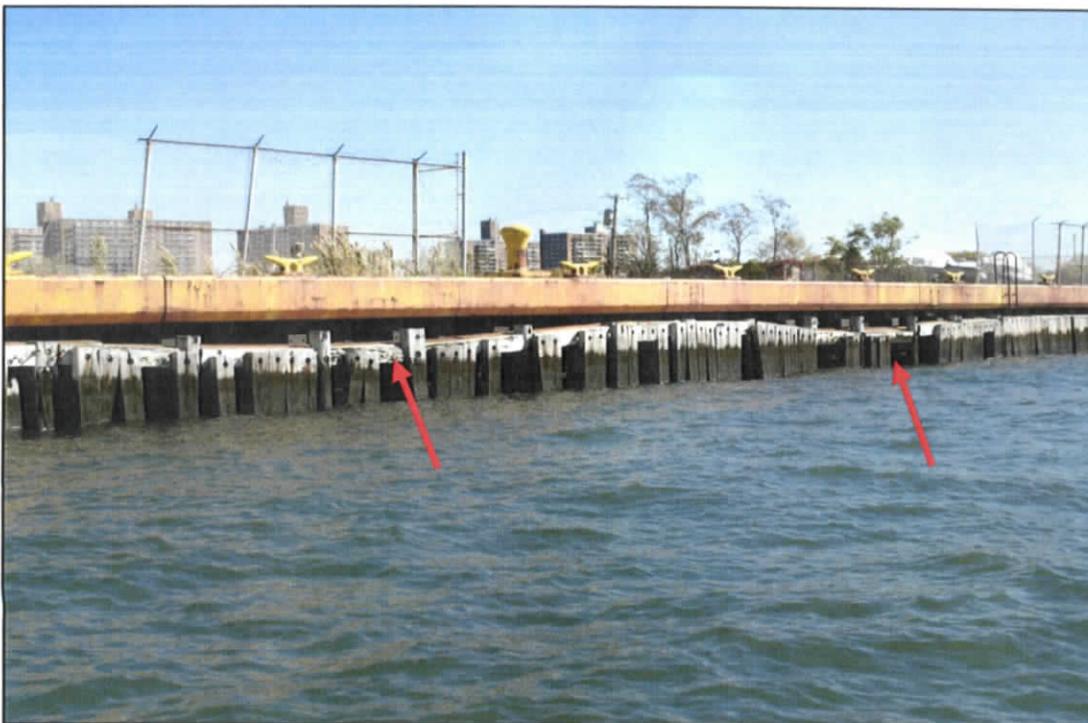
**Photograph 11: East Bulkhead – Typical coating failure with moderate corrosion of steel sheet pile in splash/tidal zone**



**Photograph 12: East Bulkhead - Typical heavy corrosion of the external steel double channel wale**



**Photograph 13: East Bulkhead - Heavy rot of the upper timber horizontal wale**



**Photograph 14: West Bulkhead - Failed timber sections of the fender system**

## **APPENDIX C**

# **CONDITION ASSESSMENT RATING (CAR)**

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

**Routine Condition Assessment Ratings as provided in the American Society of Civil Engineers (ASCE) Underwater Investigations Manual.**