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# **GOWANUS CANAL BULKHEAD AND CRIBBING DOCUMENTATION at CARROLL GARDENS, 365 BOND STREET and 400 CARROLL STREET BROOKLYN, KINGS COUNTY, NEW YORK**

*Prepared For:*

**Lightstone Group, LLC  
460 Park Avenue, 13<sup>th</sup> Floor  
New York, New York 10022**

*For Review By:*

**City of New York  
Landmarks Preservation Commission  
1 Centre Street, 9N  
New York, New York 10007  
09DCP015K**

*And*

**New York State Office of Parks Recreation and Historic Preservation  
Peebles Island  
Delaware Ave  
Cohoes, New York 12047**

*Prepared By:*

**Michael Audin, RPA  
Langan Engineering, Environmental, Surveying, and  
Landscape Architecture, D.P.C.  
River Drive Center 1  
Elmwood Park, New Jersey 07407  
NJ Certificate of Authorization No.: 24GA27996400**

**LANGAN**

**17 April 2013  
100287501**

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## **1.0 INTRODUCTION**

Langan Engineering, Environmental, Surveying, and Landscape Architecture, D.P.C. (Langan) was retained by Lightstone Group, LLC to conduct an archaeological field investigation to document the Gowanus Canal bulkhead and cribbing at the 365 Bond Street and 400 Carroll Street properties. Proposed site re-development for these properties will require that the bulkhead be reinforced, resulting in some disturbance.

The archaeological field investigation documentation is required to satisfy the New York City Landmarks Preservation Commission (LPC) requirement in the 6 February 2009 letter from the Department of City Planning, City of New York. The letter is for the Notice of Completion of the Final Environmental Impact Statement (FEIS) for 365 Bond Street to mitigate the adverse impacts to the bulkhead wall under the City Environmental Quality Review (CEQR). All work will be conducted in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation, New York State Historic Preservation Act of 1980, section 14.09, CEQR and LPC Guidelines for Archaeological Work in New York City (2002).

## **2.0 PROJECT SITE**

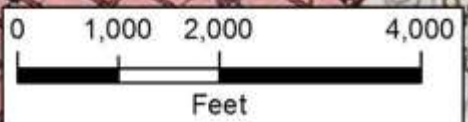
The project site is located in Brooklyn, New York (Figure 1). The 363-365 Bond Street property is bounded by the Gowanus Canal to the east, 1st street to the north, Bond Street to the west and 2nd street to the south. The property is occupied by light industrial/commercial buildings and a large vacant lot used for trailer storage (Figure 2).

The Carroll Street property is bounded by the Gowanus Canal to the east, Carroll Street to the north, Bond Street to the west and 1st Street to the south. The property contains a three-story brick building, a building constructed from former oil tanks and a light industrial/commercial building.

On 22 August 2012 Langan conducted a geotechnical due diligence assessment which included the completion of two test pits to assess the condition of the bulkhead wall and cribbing system. The two locations excavated in that geotechnical due diligence are that same areas that were excavated for this documentation. Each area is approximately 10 feet by 12 feet in size and begins at the bulkhead wall along the Gowanus Canal (Figure 3) and extends into the properties.



**Notes:**  
 Topographic basemap is provided through Langan's Esri ArcGIS software licensing and ArcGIS online © 2011 National Geographic Society, I-cubed.



River Drive Center I  
 810 River Drive  
 Elmsford Park, NY 10523  
 P: 201.794.0900 F: 201.794.0386  
 www.langan.com

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Project		<b>SITE LOCATION MAP</b>	
		<b>Bulkhead and Cribbing Documentation</b>	
KINGS COUNTY		BROOKLYN	
		NEW YORK	
Project No.	Date	Scale	Figure
100287502	4/1/2013	1"=2000'	1

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### Legend

Site Boundary

Map Reference: Microsoft Bing GIS Aerial Imagery (2011)



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Project

## 2011 AERIAL PHOTOGRAPH Bulkhead and Cribbing Documentation

KINGS COUNTY

BROOKLYN

NEW YORK

Project No.  
100287502

Date  
4/1/2013

Scale  
1"=2000'

Figure  
2

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River Drive Center 1  
619 River Drive  
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P: 201.794.6900 F: 201.794.0368  
www.langan.com

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## EXCAVATION LOCATIONS

### Bulkhead and Cribbing Documentation

KINGS COUNTY BROOKLYN NEW YORK

Project No.	Date	Scale	Figure
100287501	4/1/2013	1" = 100'	3

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### **3.0 PREVIOUS INVESTIGATIONS**

Several previous investigations included assessment of one or both of the properties in the project site. In 2009, a Phase IA Cultural Resource Assessment identified the 400 Carroll Street property (block 452, lot 15) as being sensitive for nineteenth-century bulkhead deposits. The report did not consider the 365 Bond Street property (block 458, lot 1) as being sensitive for nineteenth century bulkhead deposits. The LPC concurred with this assessment in a letter dated 27 April 2009, which was included in the Phase IA report.

In 2010, a Preliminary Bulkhead Study and Side Scan Sonar report was completed by John Milner Associates and Dolan Research. This report described the history and types of bulkheads in the Gowanus Canal. The side scan sonar identified submerged targets that were potentially historic shipwrecks.

In December 2011 a second study called the Archaeological Sensitivity Study, Gowanus Canal, Brooklyn Borough, City of New York, Kings County, New York was conducted by Hunter Research for the 365 Bond Street and 400 Carroll Street properties. The study concluded that both of the properties possess historic canal bulkhead sensitivity.

On 22 August 2012 Langan conducted a geotechnical due diligence assessment consisting of completion of two test pits to assess the condition of the bulkhead wall, cribbing system and subsurface soil conditions. This is the first known subsurface investigation of the bulkhead and cribbing systems on these two properties. An archaeologist monitored the test pit excavations to ensure that the bulkhead and cribbing system was not impacted by the excavation. The archaeologist observed the condition of the bulkhead and cribbing. During these observations plan view sketches were created and photographs were taken.

The due diligence assessment exposed the top of the cribbing system on the 365 Bond Street and 400 Carroll Street parcels of the subject property, allowing for limited documentation of the cribbing system as well as a preliminary identification of the cribbing type on both properties. Following the Gowanus Canal Preliminary Bulkhead Study, Brooklyn, Kings County, New York by Douglas McVarish the 365 Bond Street property has a cribbing system similar to Structure Type 2 (Timber Crib Bulkhead With Mass Concrete For Upper 3 To 5 Feet) with fender piles possible added later, according to observations and the bulkhead study. It is also possible that a Structure Type 5 (Fender Piles along Bulkhead Face) with concrete was added at a later date when the use of the property changed.

The 400 Carroll Street property most likely has the Structure Type 5 (Fender Piles along Bulkhead Face) cribbing according to the observations and the bulkhead study. The plan view sketches and photographs are provided in Section 5.0 by property. Based on the observations made during our initial archeological due diligence investigation a more extensive excavation will be needed to sufficiently document the bulkhead and cribbing system to an appropriate depth (approximately 4 – 5 feet below surface).

#### **4.0 METHODOLOGY**

Prior to any initiation of excavation activities tide tables for the area were reviewed to determine the most appropriate time to conduct the excavation and documentation. Langan archaeologists determined that a low tide at approximately 1pm would be an appropriate to allow time for excavation as the tide receded. Documentation would be conducted immediately following the excavation to allow for approximately two hours of documentation time.

The archaeological excavation to expose the bulkhead and cribbing consisted of a combination of small machine and hand excavations in the two areas previously excavated during the due diligence investigation, to ensure no utilities are encountered. Due to the tide changes, only one site was excavated and documented at a time.

Excavation began with a small backhoe or Bobcat excavator to minimize the potential to impact the cribbing and bulkhead. Hand excavation was used to clear off the top layer of timbers after the excavation was completed to a depth of approximately 2 feet below surface. Once the top layers of bulkhead wall and cribbing timbers were uncovered, machine excavation continued with an archaeological monitor to a depth of approximately 6 feet below surface.

In sensitive areas or areas where engineering of the bulkhead and cribbing was demonstrated hand excavation was conducted. Wood cribbing was rinsed off with hand sprayers where possible to better observe the construction methods. The excavation and back dirt piles were observed for artifacts.

Measurements were taken and scaled drawings, both profile and plan views, were created using the English system of measurement. The exposed bulkhead wall and cribbing was then photographic-documented using a digital camera. A north arrow, yard stick and a photo board were used in the photographic-documentation. Close-ups of construction details were included in the photo documentation. Once the documentation was completed, the excavations were backfilled and returned as close to original condition as possible. As no artifacts were recovered during the excavation or documentation, no photographs of artifacts are included in the documentation.



## **5.0 DOCUMENTATION**

Documentation began on 25 January 2013 and was completed on 29 January 2013. The 400 Carroll Street property was documented on the 25<sup>th</sup>. The 365 Bond Street property could not be documented until January 29<sup>th</sup> because of vehicles blocking the access to the excavation site. The 400 Carroll Street property is documented first followed by the 365 Bond Street property.

The proposed bulkhead structure will consist of a tied-back, interlocking, steel sheet pile wall installed to extend below the Canal mud line; the exposed exterior face of the new bulkhead will need to be fitted with a wooden boat fender system designed to mimic the existing bulkhead timber conditions. This new bulkhead will be constructed on the water ward side the existing wooden bulkhead. The existing bulkhead wall will not be demolished, but will require that holes be drilled through it to allow for the installation of the tiebacks.

### **5.1 400 Carroll Street Property**

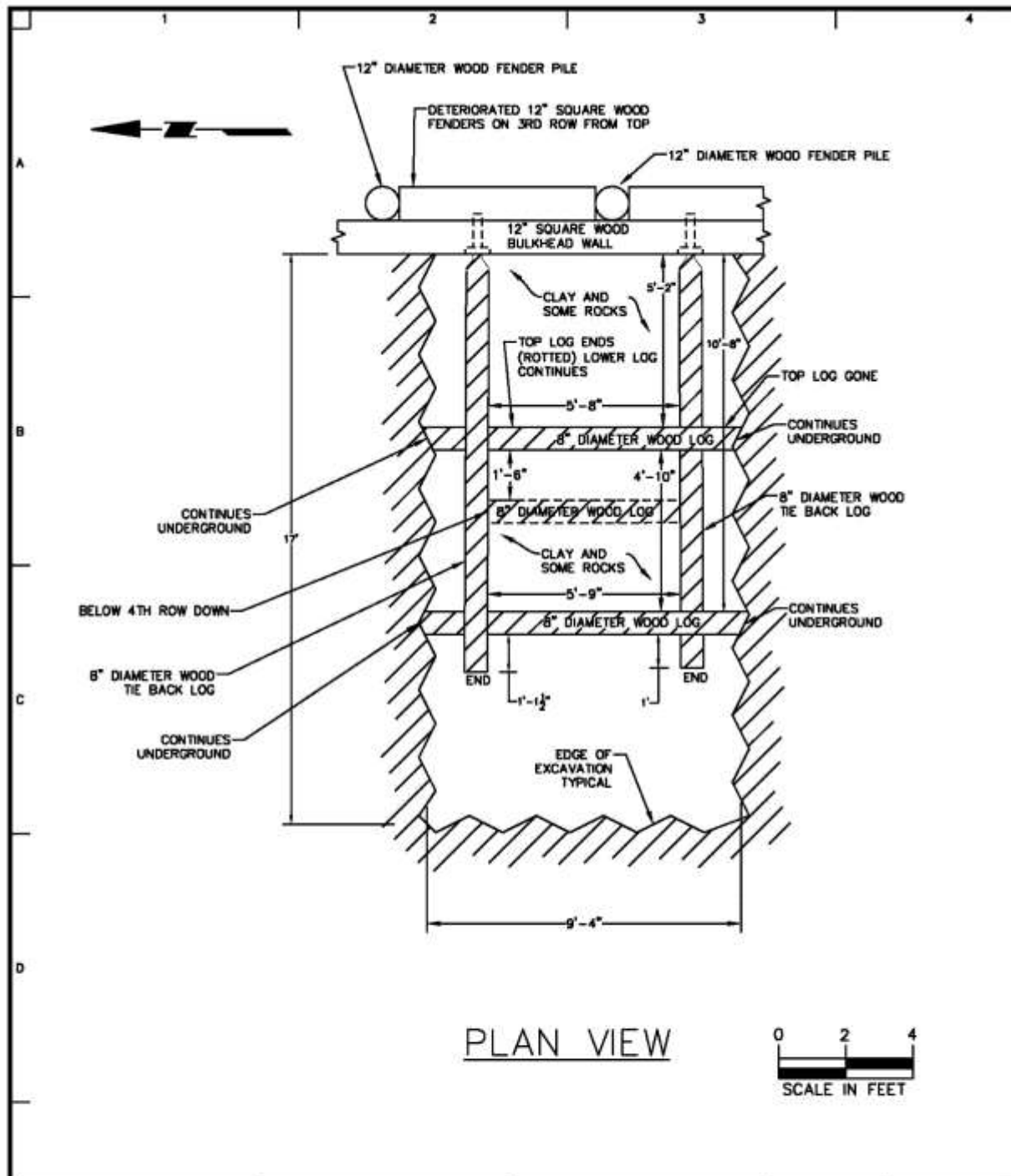
The Carroll Street property has the more intact bulkhead wall and cribbing of the two properties. The Carroll Street bulkhead retains a better state of preservation, although, the top of the bulkhead has begun to deteriorate (Photo 1). The ends of the tie back timbers that used to go through the bulkhead wall and could be seen on the water ward side of the bulkhead wall were not evident in the top row of timbers and only partially present in the second row of timbers (Photos 2 and 3).

As excavation progressed the top timbers of the cribbing system were also deteriorating and were a much smaller diameter than originally (Photo 1, 4 through 7). Regardless, the cribbing maintained its placement under the surface and it seems that little has disturbed it over the past 100+ years. Close ups of the timber joints (Photo 8) and the hand hewed tie back timbers illustrate how the cribbing was constructed and integrated with the bulkhead wall. The measured drawings illustrate how the bulkhead and cribbing was constructed.

The cribbing system at 400 Carroll Street property resembles most closely the style originally suggested in the geotechnical due diligence memo, Structure Type 5 (Fender Piles along Bulkhead Face) (Figure 4) described in the *Gowanus Canal Preliminary Bulkhead Study, Brooklyn, Kings County, New York* by Douglas McVarish. Noticeable differences include a center timber, parallel to the bulkhead wall, in the cribbing structure much higher in the structure than indicated in this style. In addition the center timber seems to shift landward as seen in photographs 5 and 6.



Photo 1 – Plan view of the 400 Carroll Street cribbing and interior of bulkhead wall, facing east.  
Photograph taken by Michael Audin, 1/25/2013.

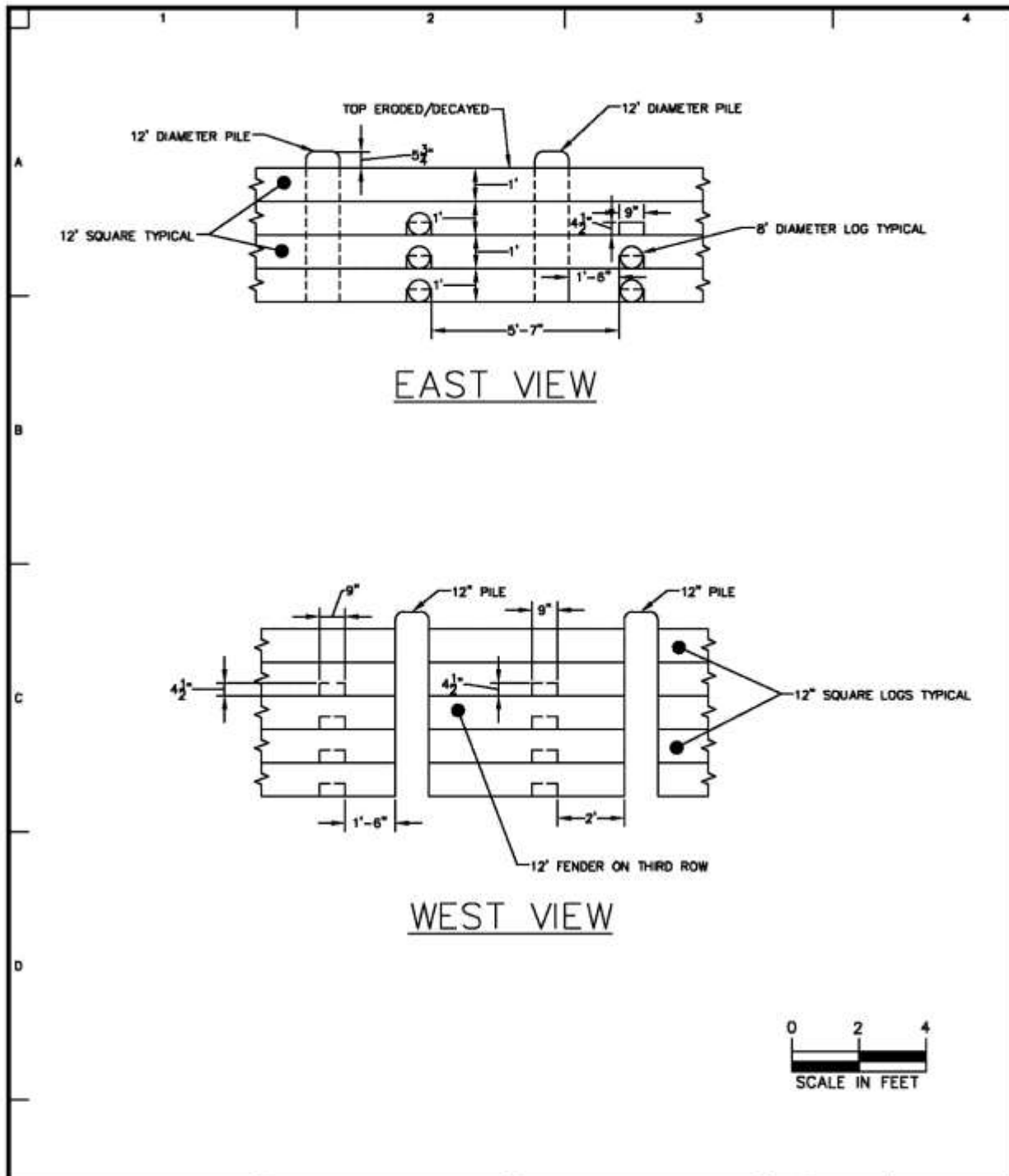


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**Photo 2 – View of the Canal face of the bulkhead wall at 400 Carroll Street, facing southwest.  
Photograph taken by Michael Audin 1/25/2013.**



**Photo 3 – Close up of landward side of bulkhead wall, facing east.  
Photograph taken by Michael Audin 1/25/2013.**







**Photo 4 – Plan view of the 400 Carroll Street cribbing and interior of bulkhead wall, facing north.  
Photograph taken by Michael Audin, 1/25/2013.**



**Photo 5 – Plan view of the 400 Carroll Street cribbing and interior of bulkhead wall, facing south.  
Photograph taken by Michael Audin, 1/25/2013.**





**Photo 6 – View of central timbers of cribbing, facing east, notice joint in second row of one timber ending and another beginning. Photograph taken by Michael Audin, 1/25/2013.**



**Photo 7 – View of west end of cribbing structure near end of tie back timbers, facing west. Photograph taken by Michael Audin 1/25/2013.**





Photo 8 – Close up of end of tie back timbers at west end of cribbing, facing north.  
Photograph taken Michael Audin 1/25/2013.





**Photo 9 – Close up of tie back timbers tapered to fit into the bulkhead wall, facing southeast.  
Photograph taken Michael Audin 1/25/2013.**

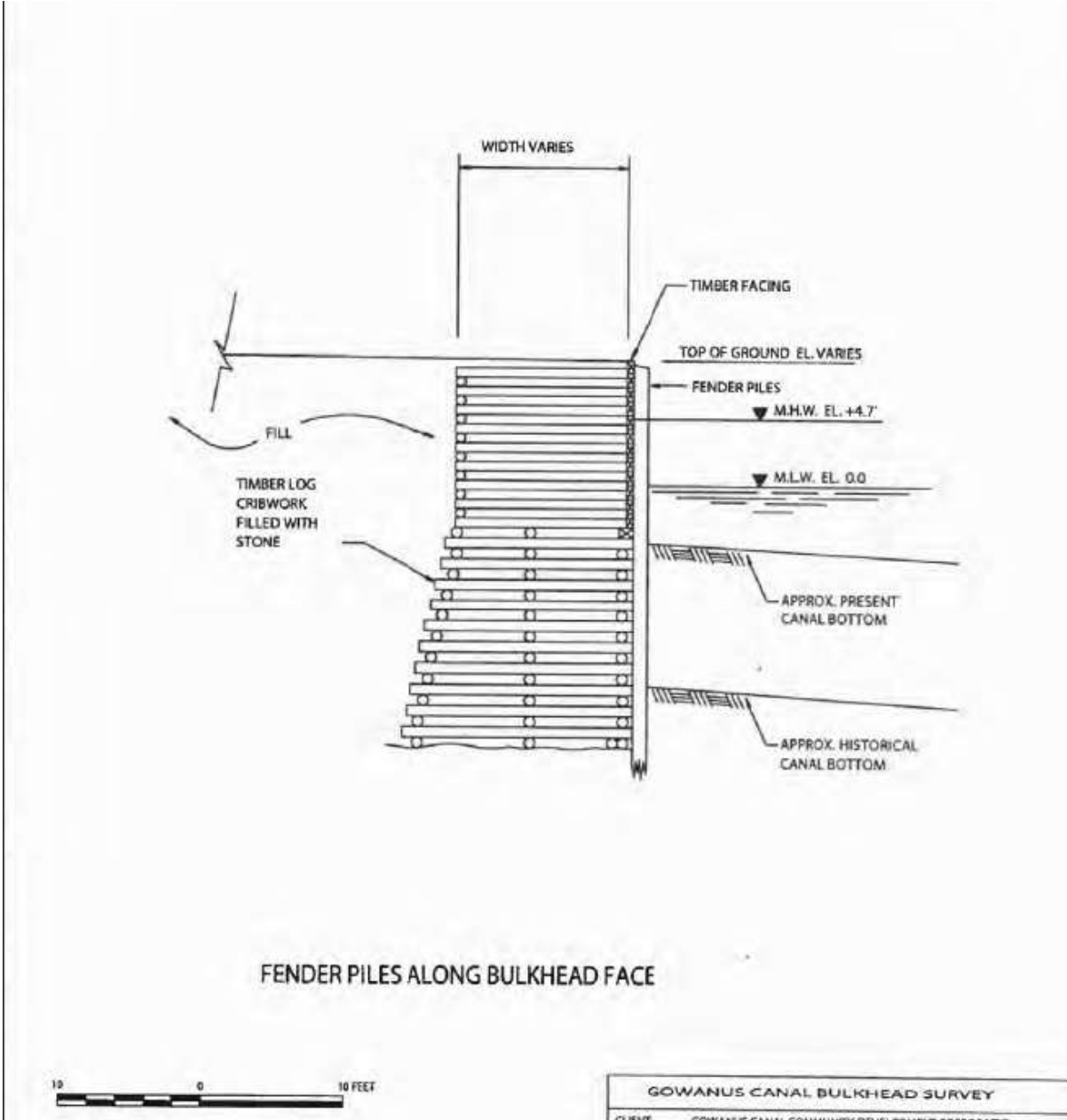


Figure 4 – Structure type 5 as described in *Gowanus Canal Preliminary Bulkhead Study* (McVarish 2010).

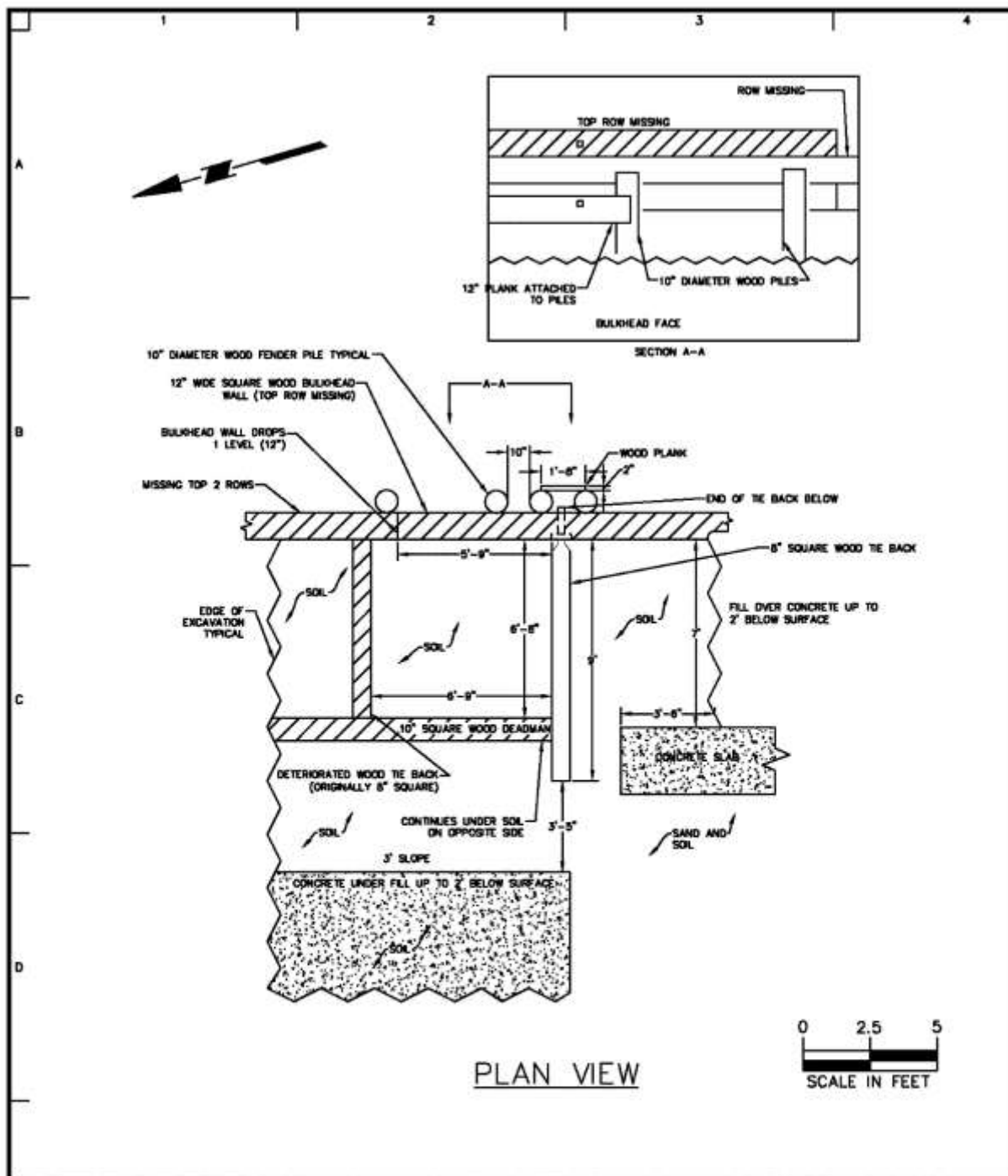
## **5.2 365 Bond Street Property**

Access to the bulkhead wall at 365 Bond Street was much more difficult than at 400 Carroll Street. The bulkhead and cribbing was covered by three plus foot thick concrete slabs that were most likely placed to convert the property in to a parking area for tractor trailer truck, several trailers were present on the property. The top of the timber bulkhead wall and cribbing was located under approximately a foot of soil under the concrete slab.

The bulkhead wall and timber cribbing has more advanced decay throughout the bulkhead wall and cribbing (Photos 10 & 11). A gap in the bulkhead wall can be seen in one of the lower rows of timbers (Photo12). The upper layer(s) of timber bulkhead wall and cribbing seem to have been replaced at some point, as indicated by the square timbers that are more crudely constructed on top as compared to the lower round timbers (Photos 13 through 16). In addition, concrete up to three feet thick was observed to the west of the bulkhead wall suggesting that this cribbing was repaired and concrete place on top of it as was possibly suggested in the due diligence memo.

The timber cribbing and bulkhead wall most likely began as Structure Type 1 (Timber Crib Bulkhead, Figure 5) and was later converted to Structure Type 2 (Timber Crib Bulkhead With Mass Concrete For Upper 3 To 5 Feet, Figure 6) when it was repaired. This would account for the higher level of rot in the round timbers below the square timbers. The irregular spaced fender piles might have been added later to shore up the bulkhead wall and prevent it from collapsing into the canal.





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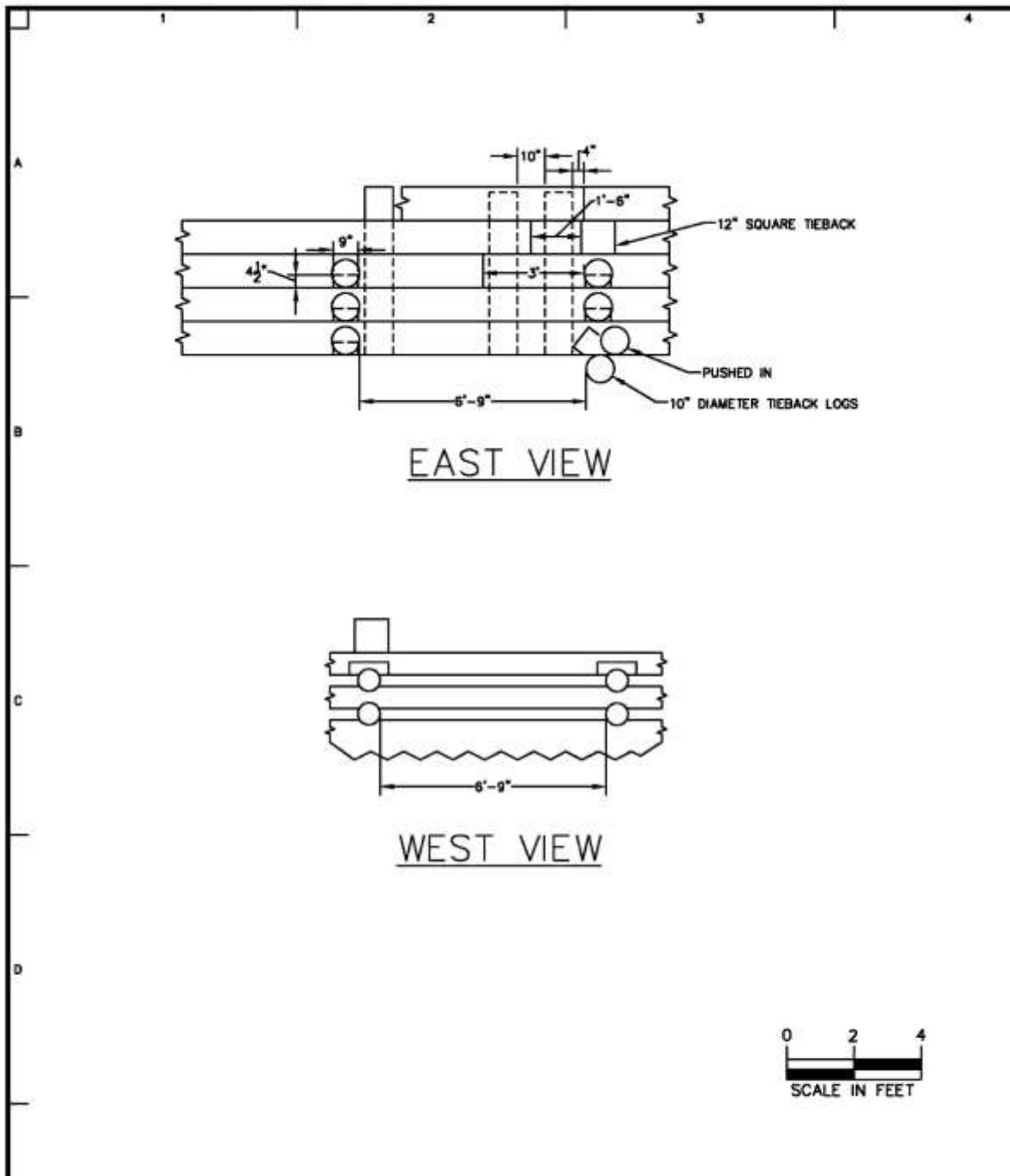
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**Photo 10 – Plan view of the bulkhead wall and cribbing at 365 Bond Street, facing southeast.  
Photograph taken by Michael Audin 1/29/2013.**



**Photo 11 – View of landward side of bulkhead wall at 365 Bond Street, facing southeast.  
Photograph taken by Michael Audin 1/29/2013.**



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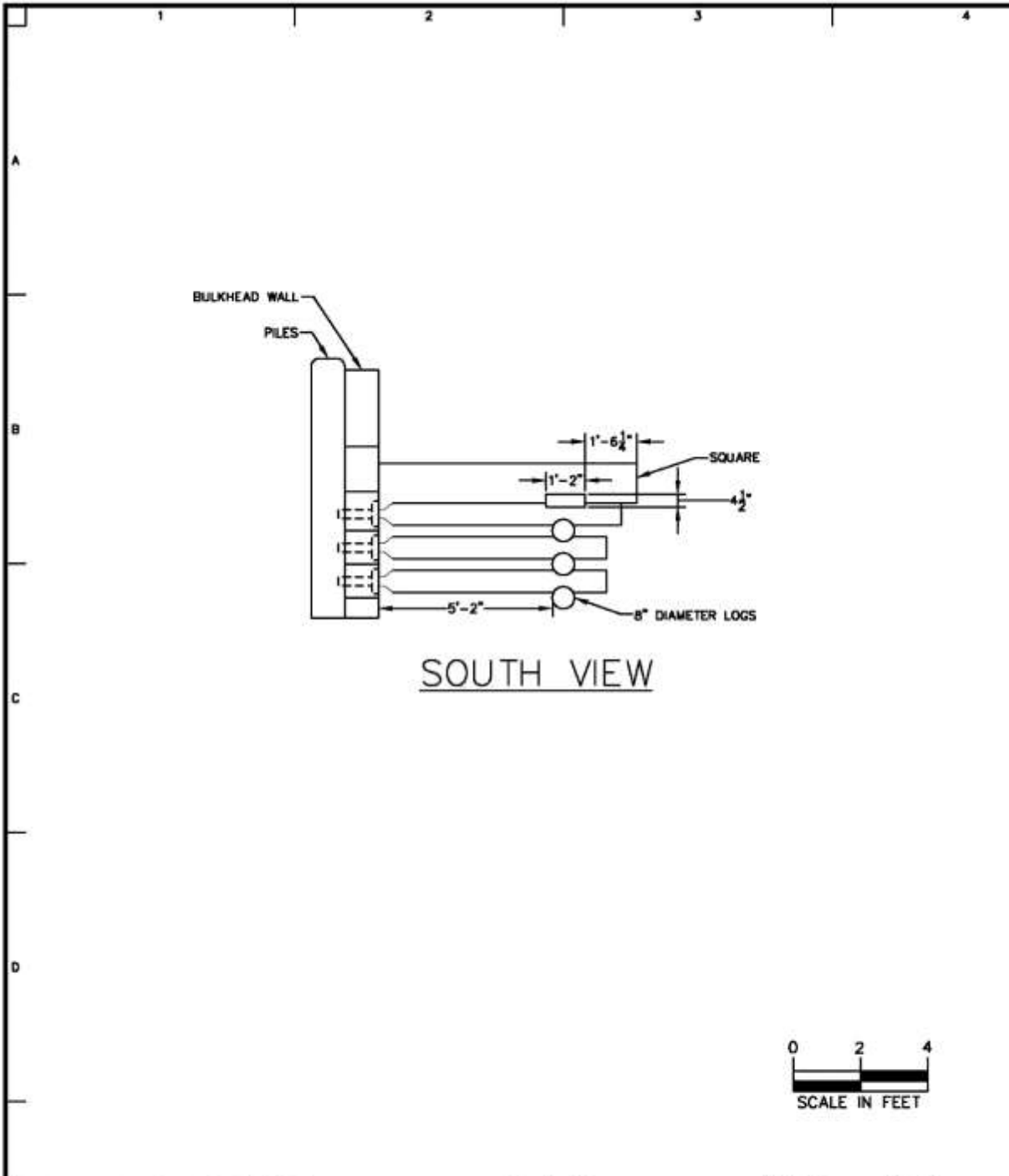




**Photo 12 – Close up of landward side of bulkhead wall, facing southeast. Notice gaps from deterioration. Photograph taken by Michael Audin 1/29/2013.**



**Photo 13 – Close up of tie back timbers taper cut to fit into bulkhead wall slots, facing south. Photograph taken by Michael Audin 1/29/2013.**



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**Photo 14 – View of the south wall of cribbing, facing southwest. Notice the top timbers are square and lower timbers are round with 3rd row of round timbers pushed out. Photograph taken by Michael Audin 1/29/2013.**



**Photo 15 – View of North wall of cribbing, facing northeast. Photograph taken by Michael Audin 1/29/2013.**





**Photo 16 – View of west side of cribbing near landward end of tie back timbers, facing northwest.  
Photograph taken by Michael Audin 1/29/2013.**



**Photo 17 – View of notch cut for top square timbers of cribbing most likely more recent than the round timbers below, facing south. Photograph taken by Michael Audin 1/29/2013.**

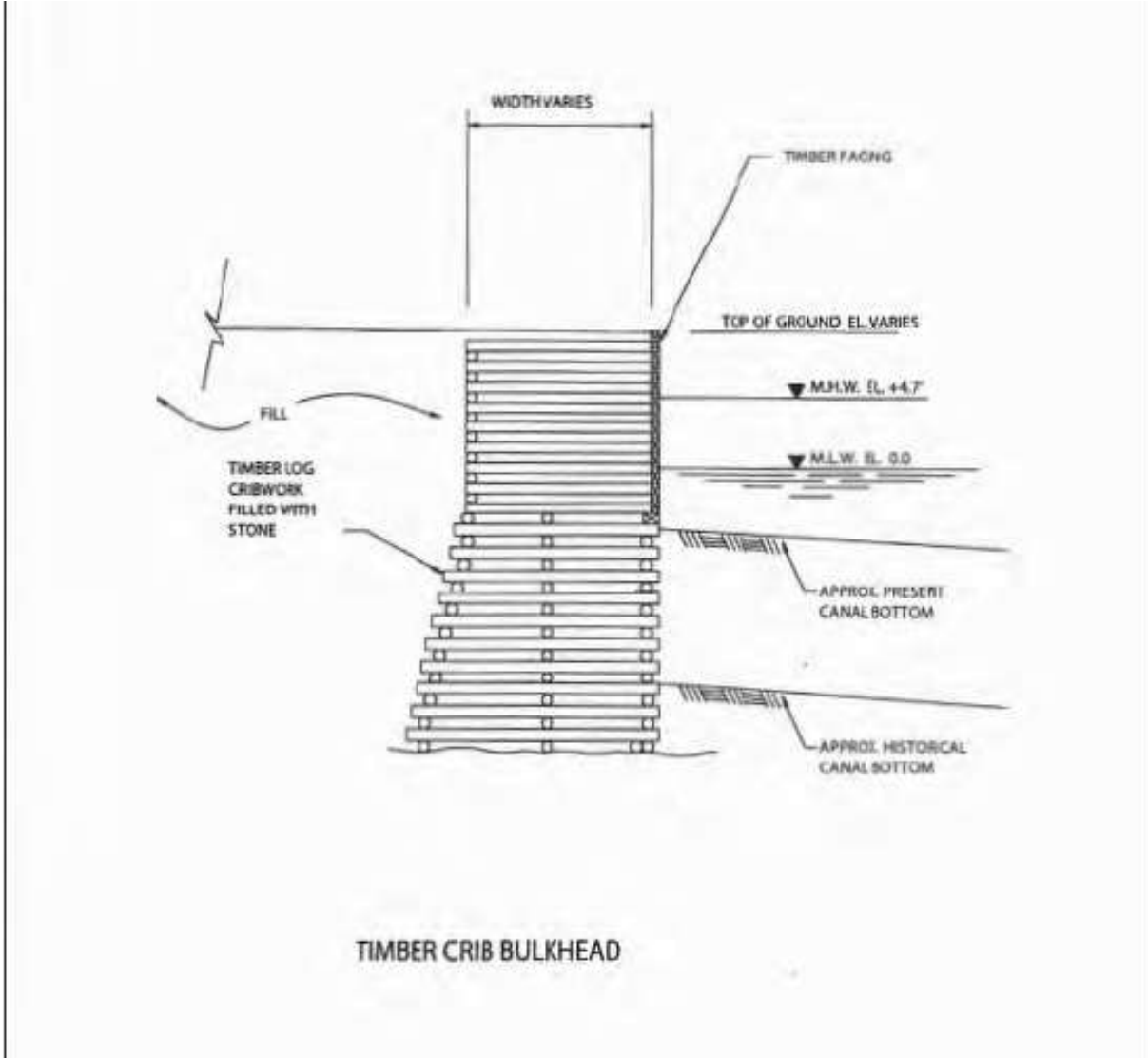
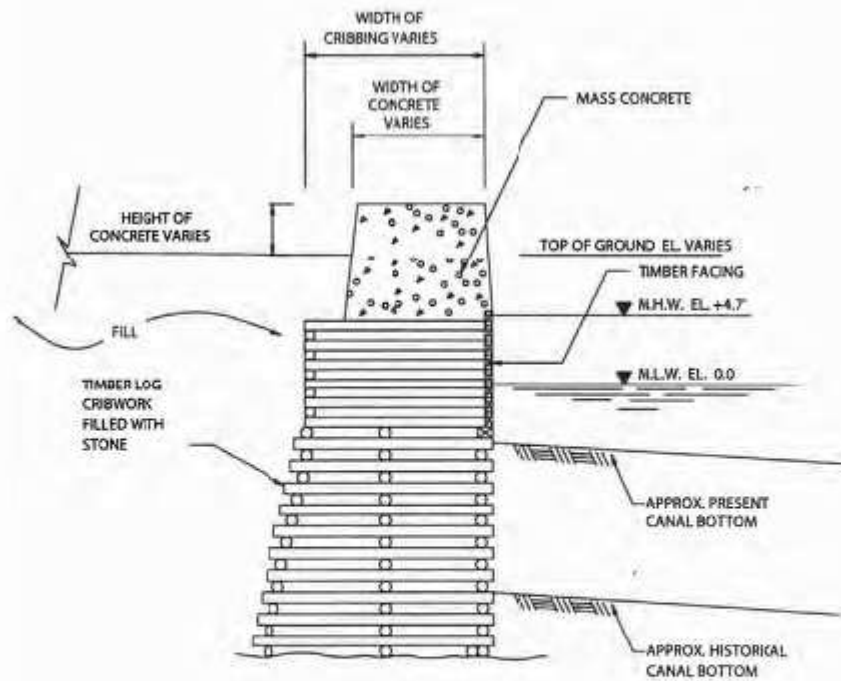


Figure 5 – Structure Type 1 as described in *Gowanus Canal Preliminary Bulkhead Study* (McVarish 2010).



TIMBER CRIB BULKHEAD WITH MASS CONCRETE  
FOR UPPER 3 TO 5 FEET

Figure 6 – Structure Type 2 as described in *Gowanus Canal Preliminary Bulkhead Study* (McVarish 2010).



## **6.0 CONCLUSION**

The Gowanus Canal has existed for over 150 years and has gone through several updates and redevelopments along its alignment. Previous studies have suggested that there are several different types of bulkhead walls and cribbing along the canal. These different types of walls and cribbing can be potentially dated by their configuration. Older cribbing tends to consist of wood tie backs and all wood bulkheads and cribbing. Newer and redeveloped bulkhead walls seem to have repaired timbers, concrete on tops of the original walls and metal tie backs. Fender systems may also be a part of the dating system, although, these could have also been added later.

The investigation into the bulkhead walls and cribbing systems at 400 Carroll Street and 365 Bond Street illustrates two of the different bulkhead wall and cribbing systems used. The bulkhead wall and cribbing located at 400 Carroll Street seems to be an older system that has been maintained over time. That could be from good maintenance or from lighter weight being placed on top of it resulting in less pressure from the soil behind it.

The bulkhead wall and cribbing system at 365 Bond Street may originally be the same age or older than at 400 Carroll Street. However, this bulkhead wall and cribbing underwent much greater pressure from the weight placed on top of it and the soil pressing into the bulkhead wall. The additional piles in front of the bulkhead may be the result of shoring up the wall as it attempted to fall into the canal. The square timbers on top of the round timbers most likely indicate a redevelopment or repair of the original bulkhead wall so it could support additional weight. The concrete placed on top of the bulkhead wall and cribbing is also a possible indication of repair/reuse of the property.

The archaeological excavation revealed that these two properties demonstrate two different configurations of bulkhead walls and cribbing. The Milner/Dolan research study indicates that there are approximately 13 different bulkhead/cribbing structures in the Gowanus Canal. Even then this archaeological excavation has found that the structures encountered on these two properties have slight variation from those in the Milner/Dolan research study. In order to more completely understand how many different types of cribbing were used in the construction of the Gowanus Canal, additional investigations on different properties along the canal would need to be undertaken so that styles and dates could be more thoroughly compared and determined.

## 7.0 REFERENCES

Bing

2011 Aerial Photograph

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2009 *Phase IA Cultural Resource Assessment, Gowanus Canal; Corridor Rezoning Project, Gowanus, Brooklyn, New York* prepared for New York City Department of City Planning by the Louis Berger Groups, Inc. and Historical Perspectives, Inc.

Lee, James, Patrick Harshbarger and Richard Hunter

2011 *Archaeological Sensitivity Study, Gowanus Canal, Brooklyn Borough, City of New York, Kings County, New York* prepared for the U.S. Environmental Protection Agency by Hunter Research under contract with CH2M Hill.

McVarish, Douglas C.

2010 *Gowanus Canal Preliminary Bulkhead Study, Brooklyn, Kings County, New York* prepared for HDR, Inc. and the United States Environmental Protection Agency by John Milner Associates.

United States Geological Survey

1954 Topographic Map, Brooklyn Quadrangle, PR 1995

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# **APPENDIX A**

## **RESUMES**



**MICHAEL AUDIN, RPA**  
**Archaeologist / Cultural Resource Specialist**

**Field Crew Management**  
**Phase I, II and III Excavation**  
**Human Remains/Burial Excavation**  
**Site Preparation and Survey**  
**Historic Research**  
**Photographer**  
**Laboratory Analysis**  
**Field Illustration**  
**Report Writing and Editing**  
**Historic American Building Surveys**

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**EDUCATION**

Hunter College: M.A. Anthropology  
William Paterson University: B.A. Anthropology  
Archaeological Field School: Lenape Meadows, Somerset  
County Parks Commission, New Jersey

**YEARS EXPERIENCE:** 10

**SUMMARY QUALIFICATIONS**

Mr. Audin is a Registered Professional Archaeologist (RPA) that exceeds the *Secretary of the Interior Professional Standards* and has been reviewed by several State Historic Preservation Offices as a Principal Investigator. He has over 10 years of professional experience (over 7 years in management positions) in Cultural Resource Management. Responsibilities include coordination and implementation of archaeological and historical tasks associated with projects requiring cultural and historic assessments as part of permit and regulatory review. Office tasks include communication with State Historic Preservation Offices and other regulatory offices, budgeting, proposal writing, field testing strategy and planning, hiring of field technicians, report writing, GIS mapping, production and editing. Field tasks include all aspects of Phase I, II and III archaeological and historical investigations including field supervision, excavation, monitoring, photographer, prehistoric and historic site assessments, site survey, field illustration, field documentation, planning, preliminary architectural evaluations and level III Historic American Building Surveys.

In addition Mr. Audin has 3 years of experience as a land surveyor and 10 years business management experience prior to coming to cultural resources.

**RELEVANT EXPERIENCE**

**NJ Transit, Phase IA Investigation, Train Station Upgrades, Elizabeth, NJ**

Principal Investigator for Phase IA Investigation. Evaluation of handicap and other facility upgrades for NJ TRANSIT train station. Conducted research, site reconnaissance, writing and preparation of report, edited and produced letter report for submission NJ SHPO.

**NJ Transit, Phase IA Investigation, Train Station Upgrades, Perth Amboy, NJ**

Principal Investigator for Phase IA Investigation. Evaluation of handicap and other facility upgrades for NJ TRANSIT train station. Conducted research, site reconnaissance, writing and preparation of report, edited and produced letter report for submission NJ SHPO.

**Federal Emergency Management Administration (FEMA), Environmental and Historic Preservation, Albany, New York**

Environmental and Historic Preservation Specialist for recovery efforts from Hurricane Irene and Tropical Storm Lee. Conducted reviews of FEMA funded projects for federal law and executive order compliance, archaeological monitoring for Individual Assistance housing mission, conducted site visits, liaison with New York State Historic Preservation Office for protected data and made

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FEMA determinations for National Register eligibility of historic sites.

**NJ Transit, Phase IA Supplemental Investigation, Market St Garage, Paterson, NJ**

Principal Investigator for Phase IA Supplemental Investigation. Re-evaluation of historic Locomotive Factory industrial site for NJ TRANIT. Conducted research, site reconnaissance, writing and preparation of report, edited and produced letter report for submission NJ SHPO.

**Old St. Patrick's Cathedral Wall Restoration Project, Archaeological Monitoring, New York**

Principal Investigator for and archeological monitor for Landmarks Preservation Commission permit for brick wall stabilization around the northern part of a historic cemetery in New York City. Conducted limited research, removed headstones for storage and reset at end of project, monitored for human remains during backhoe excavation for new concrete supports, supervision of archaeological assistants, determined method of avoidance or removal of human remains encountered and eventual reburial, report writing and preparation.

**SCCC, Archaeological Monitoring, Site 28Hd44, Kearny, New Jersey**

Principal Investigator for archaeological monitoring for NJDEP and USEPA Superfund site. Monitored for prehistoric artifacts during construction of slurry wall as part of Remedial Action Work Plan in the Hackensack Meadowlands. Registered new prehistoric archaeological site 28-Hd-44. Designed and implemented new innovative field methods to recover archaeological resources, writing and preparation of report, edited and produced report for submission.

**Tomjack Creek, Phase IA, Smithfield Township, Pennsylvania**

Principal Investigator for prehistoric/historic site investigation for a US Army Corps of Engineers Permit for a wetland mitigation site as part of the Tennessee Gas Line Company Northeast Upgrade Project. Conducted research, site reconnaissance, writing and preparation of report, edited and produced report for submission.

**Van Auken Creek, Phase IA, Clinton Township, Pennsylvania**

Principal Investigator for prehistoric/historic site investigation for a US Army Corps of Engineers Permit for a wetland mitigation site as part of the Tennessee Gas Line Company Northeast Supply Diversification Project. Conducted research, site reconnaissance, writing and preparation of report, edited and produced report for submission.

**Renaissance Plaza Project, Phase I, Egg Harbor City, New Jersey**

Principal Investigator for prehistoric/historic site investigation for NJ Pinelands Commission. Conducted research, conducted subsurface field testing for historic features, writing and preparation of report, edited and produced report for submission.

**Alpha Water Works Upgrades Project, Phase II, Site 28Wa673, Alpha, New Jersey**

Principal Investigator for prehistoric/historic site investigation for NJDEP Environmental Infrastructure Trust funding program. Conducted research, excavation of shovel test pits and units, laboratory analysis of artifacts, writing, preparation, editing and producing report for submission.

**State University of New York, Ulster Campus, Phase I, Marbletown, New York**

Principal Investigator for prehistoric/historic site investigation for NYS SEQR reviewed project. Conducted research, assessed prehistoric/historic archaeological potential, field testing, writing and preparation of report, edited and produced report for submission.

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**NJ Transit, Phase III Data Recovery Investigation, Market St Garage, Site 28Pa, Paterson, NJ**

Principal Investigator for unanticipated historic structure uncovered during excavation for a drainage pipe. Field work consisted of the excavation and documentation of a historic industrial feature partially exposed during excavation work. Recommended preservation in place with appropriate fill materials and submitted a technical memo to NJDEP SHPO.

**EZ Automotive Services, Phase IA & IB, Robbinsville, New Jersey**

Principal Investigator for prehistoric/historic site investigation for NJDEP. Conducted research, assessed prehistoric/historic archaeological potential, conducted field testing, writing and preparation of reports, edited and produced report for submission.

**Old St. Patrick's Cathedral Wall Restoration Project, Archaeological Monitoring, New York**

Principal Investigator for and archeological monitor for Landmarks Preservation Commission permit for brick wall stabilization around the southern part of a historic cemetery in New York City. Conducted limited research, monitoring for human remains during backhoe excavation for new concrete supports, supervision of one archaeological assistant, determined method of avoidance or removal of human remains encountered and eventual reburial, report writing and preparation.

**Pennsauken Country Club Water Reuse Project, Phase I, Pennsauken, New Jersey**

Principal Investigator for prehistoric/historic site investigation for NJDEP Environmental Infrastructure Trust funding program. Conducted research, preparation of site, excavation of shovel test pits, laboratory analysis of artifacts, writing, preparation, editing and producing report for submission.

**NYS Route 440 Pole Relocation Project, Phase IA & IB, Staten Island, New York**

Principal Investigator for prehistoric/historic site investigation for Department of Transportation NEPA documentation and Section 106 reviewed project. Conducted research, assessed prehistoric/historic archaeological potential, conducted field testing, writing and preparation of reports, edited and produced report for submission.

**World Trade Center, Phase III, Potential Human Remains Recovery, Staten Island, New York**

Field crew for recovery of potential human remains for the New York City Office of the Chief Medical Examiner. Conducted materials screening for human remains and artifacts relating to the 2001 attacks on the World Trade Center.

**SCCC, Phase IB Cultural Resource Investigation, Kearny, New Jersey**

Principal Investigator for historic investigations for NJDEP and USEPA Superfund site. Conducted additional research proving the Jersey City Water Works was located outside of the project area and conducted backhoe trenching for historic drainage features related to the Hackensack Meadowlands, writing and preparation of report, edited and produced report for submission.

**Access to Regional Core (ARC), 3-D Laser Scanning, New York, New York**

Field crew for documentation of historic and non-historic buildings for Section 106. Conducted 3-D laser scanning of all buildings in the project area. Collected field data of varying resolutions for buildings in project area, historic buildings were recorded at higher resolution.

**Jersey City Walkway and DMAVA Park, Phase IA, Jersey City, New Jersey**

Principal Investigator for prehistoric/historic site investigation for NJDEP and Section 106. Conducted research, assessed prehistoric/historic archaeological potential, monitored geotechnical sub surface investigation for archaeological remains, writing and preparation of report, edited and



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produced report for submission.

**Route 33 Interchange Improvements, Phase I, Palmer Township, Pennsylvania**

Principal Investigator for prehistoric/historic site investigation for Pennsylvania Department of Transportation and Section 106 reviewed project. Conducted research, site excavation of shovel test pits, laboratory analysis of artifacts, writing and preparation of report, and editing report for submission.

**USDA, Health-Based Plant Genomics Facility, Phase IB, Cornell University, Ithaca, New York**

Co-Principal Investigator for prehistoric/historic site investigation as part of a Section 106 Assessment for the addition to the Plant Genomics Laboratory Building site. Conducted research, excavation of shovel test pits, laboratory analysis of artifacts, writing and preparation of report, edited and produced report for submission.

**SCCC, Phase IA Cultural Resource Investigation, Kearny, New Jersey**

Principal Investigator for prehistoric/historic site investigation for NJDEP and USEPA Superfund site. Conducted research, assessed prehistoric/historic archaeological potential, writing and preparation of report, edited and produced report for submission.

**GAC Adsorption Plant, Phase I, Pennsauken, New Jersey**

Principal Investigator for prehistoric/historic site investigation for NJDEP Environmental Infrastructure Trust funding program. Conducted research, preparation of site, excavation of shovel test pits, laboratory analysis of artifacts, writing and preparation of report, edited and produced report for submission.

**Penn Regional Business Center III, Phase I, Smithfield, Pennsylvania**

Principal Investigator for prehistoric/historic site investigation for Pennsylvania Funding Grant Application. Conducted research, preparation of site, excavation of shovel test pits, laboratory analysis of artifacts, writing and preparation of report, edited and produced report for submission.

**Montauk Theater, Level III HABS and Architectural Salvage Plan, Passaic, New Jersey**

Principal Investigator for EO215 compliance for NJ Schools Development Authority. Conducted level III Historic American Building Survey (HABS) including photographic documentation and an architectural Salvage Plan of the Montauk Theater to mitigate the proposed demolition of this building. The HABS and Salvage Plan were requested by the NJ HPO to satisfy the EO215 review.

**Former Koppers Superfund Site, Additional Phase IB, Sites 7NCE187, 188 & 189, Newport, Delaware**

Crew chief and OSHA Site Safety Officer for prehistoric/historic site investigation for EPA compliance for superfund site during three month phase IB auger testing conducted by 13 archaeologists. Teamed with John Milner and Associates. Work included over 1,700 phase IB augers in a tidal marsh. Additional work included field tech training, and safety oversight.

**Dredge Stockpile Site, Phase I, Harmony, New Jersey**

Field director, research coordinator, lab director and photographer for prehistoric/historic site investigation for Section 106 review of stockpile site for dredge materials from FEMA. Field duties include preparation of site, excavation of 32 shovel test pits and site survey. Post field work included laboratory analysis of artifacts, writing of sections of report and prepared, edited and produced report for submission.

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**Lowes, Phase I, Mansfield, Pennsylvania**

Field director, research coordinator, lab director and photographer for prehistoric site investigation for review for big box retail store. Field duties include site preparation, excavation 60 shovel test pits of site and survey. Post field work included laboratory analysis of artifacts, writing of sections of report and prepared, edited and produced report for submission.

**Former Jacobs Aircraft Engine Factory, HABS, Lower Pottsgrove, Pennsylvania**

Complier/photographer for NPDES permit compliance. Conducted low level Historic American Building Survey (HABS) including photographic documenting of the former Jacobs Aircraft Engine Factory and Administrative Building to mitigate the proposed demolition of these buildings. The photographic documentation was requested by PHMC to satisfy the NPDES permit review.

**Queensboro Plaza, Phase I, Long Island City, New York**

Field director, research coordinator, lab director and photographer for historic site investigation for cultural resources section 106 for a NEPA assessment and LPC review for bike path in the Queensboro Plaza. Includes an archaeological assessment, field testing and architectural evaluation of the current property. Field work included site preparation, the excavation of a two meter by two meter test pit and site survey. Post field work included laboratory analysis of artifacts, writing of sections of report and prepared, edited and produced report for submission.

**Lowes, Phase IB, Montgomery, New York**

Field director, research coordinator, lab director and photographer for prehistoric/historic site investigation for SEQRA review for retail store. Field work included the preparation of site, excavation of 60 shovel test pits and site survey. Post field work included laboratory analysis of artifacts, writing of sections of report, prepared, edited and produced report for submission.

**Green Brook Trail, Application for Project Authorization/Preliminary Assessment, Plainfield, Green Brook, and North Plainfield, New Jersey**

Principal Investigator for New Jersey Historic Preservation Act and Freshwater Wetland Permit compliance. Completed and submitted an Application for Project Authorization for Green Brook Park and Washington Park Historic District for a multi-use recreational trail. Additionally, completed a preliminary archaeological assessment for the proposed seven-mile trail, including research, analysis, and report writing.

**Public School #3, Archaeological Monitoring, West New York, New Jersey**

Archaeological Monitor/researcher for NJ Executive Order 215 Compliance for 1 day of archaeological monitoring for human remains and research on school site that found headstone during excavation. Post field activities included report writing for submission to state.

**Former Koppers Superfund Site, Phase IB and II, Sites 7NCE124, 133, 134, 135, 137, 138, 139, 140, & 143, Newport, Delaware**

Crew chief and OSHA Site Safety Officer for EPA compliance for superfund site during six month phase IB and II field excavations conducted by 20 archaeologists, teamed with John Milner and Associates. Work included setting of testing grid and field testing of over 3000 phase IB auguring and STP units and over 180 phase II units. Additional work included lab work, field tech training, and safety oversight.

**Bronx River Park, Phase IA, Bronx, New York**

Research coordinator, researcher and report production for New York City Landmarks Preservation

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Commission Compliance. Assessed park land for prehistoric and historic archaeological potential.

**USDA, Health-Based Plant Genomics Facility, Cornell University, Ithaca, NY.**

Research coordinator, researcher and report production for archaeological resources Section 106 Assessment as part of a NEPA Screening on the Plant Genomics Laboratory Building site.

**Weeksville Village, Phase IB testing, Brooklyn, New York**

Archaeological Monitor for SEQRA review for village cultural center. Performed 1 day of field duties, with Joan Geismar. Work included monitoring of back hoe trenching for foundations and artifact deposits associated with the Huntely Houses.

**Edgewater Colony, Phase II, Edgewater, New Jersey**

Field director and lab director for or EIT storm water improvements loan consisting of the preparation of a Phase II prehistoric/historic site investigation. Included the direction of two field technicians excavating a total of 8 standard test units, photographer and the coordination of lab work. Other post-field responsibilities include writing sections, preparation and production of the final report for submittal to New Jersey DEP Municipal Finance and Technical Services.

**Portion of the Northeast Business Park, Phase IA, Washington Township, New Jersey**

Research coordinator, researcher, and report production for New Jersey Wetlands Permit. Assessed site for prehistoric and historic archaeological sensitivity.

**Creighton Farm Bridge Crossing, Phase I, Willistown, Pennsylvania**

Field director, research coordinator, lab director, photographer and report preparation for Army Corps of Engineers Permit. Post field work included laboratory analysis of artifacts, assisting with the writing, prepared, edited and produced report.

**Camp Laughing Water, Phase I, New Hanover and Upper Fredrick, Pennsylvania**

Field director, research coordinator, lab director, photographer and report preparation for Army Corps of Engineers Permit. Post field work included laboratory analysis of artifacts, assisting with the writing, prepared, edited and produced report.

**Camp Hidden Falls, Phase I, Delaware and Lehman Townships, Pennsylvania**

Field director, research coordinator, lab director, photographer and report preparation for Army Corps of Engineers Permit. Post field work included laboratory analysis of artifacts, assisting with the writing, prepared, edited and produced report.

**Select Sires, Phase I, Eaton, Pennsylvania**

Field director, research coordinator, lab director, photographer and report preparation for Pennsylvania section 105 Permit. Post field work included laboratory analysis of artifacts, assisting with the writing, prepared, edited and produced report.

**Tournament World, Phase IB, Montgomery, New York**

Field director, research coordinator, lab director, and photographer for SEQRA review. Field assessment for prehistoric and historic archaeological sites. Post-field work included laboratory analysis of artifacts, assisting with the writing, prepared, edited and produced report.

**Former Old First Presbyterian Church Cemetery, Phase III Data Recovery, Newark, New Jersey**

**MICHAEL AUDIN, RPA**  
**Archaeologist / Cultural Resource Specialist**

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Project Manager/Field Director

Responsibilities included:

- Over sight of all field activities for 2.2 acre cemetery excavation
- Preparation and implementation of a comprehensive field plan for the locating human remains and associated artifacts
- Hiring and managing a field staff of 35
- Directing and coordinating sub contractor with field staff of 30
- Directing and coordinating 4 backhoes on site to move overburden and back fill site
- Over sight of cataloging all burials and artifacts
- Laboratory analysis of artifacts
- Writing, coordinating and editing of final report

**Circulations Improvement Project, Phase IA and IB, Newark, New Jersey**

Field director, research coordinator, photographer and lab director for NJ Executive Order 215 Compliance. Phase I background investigation and Phase IB field testing. Work included coordinating conducting research, conducting photographic pedestrian survey site, and conducting field testing. Post field work included laboratory analysis of artifacts and preparation of the final reports. Report preparation included writing sections of the report, preparation and production of final report for submittal.

**Edgewater Colony, Phase IB, Edgewater, New Jersey**

Field director, research coordinator, and photographer for Environmental Infrastructure Trust Financing Program (EIT). Preparation of a Phase IB prehistoric/historic site investigation. Included the direction of three field technicians digging a total of 139 standard test pits, project coordination with the principal investigator, photographer and the coordination of lab work. Other post-field responsibilities include assisting with the writing, preparation and production of the final report.

**Former Central Railroad Terminal, Archaeological Monitoring, Newark, New Jersey**

Crew Chief/Project Coordinator Application for project authorization compliance of 6 week archaeological monitoring during demolition of former railroad terminal for SHPO resolution on application for project authorization. Monitor for human remains associated with the Old First Presbyterian Church cemetery, identifying, excavating, cataloging and turn over to mortician for reburial. Post field work included lab analysis of artifacts.

**Regional Biocontainment Laboratory – Newark Center, University of Medicine and Dentistry of New Jersey, Newark, New Jersey** – Researcher and report writer for cultural resources section of Environmental Assessment in accordance with the requirements of NEPA for the construction of a new Regional Biocontainment Laboratory under a grant from the National Institutes of Health.

**USDA, Health-Based Plant Genomics Facility, Phase IA, Cornell University, Ithaca, New York**

Researcher and site inspector for cultural resources section of a Section 106 Assessment as part of a NEPA Screening on the Plant Genomics Laboratory Building site. Includes an archaeological assessment and architectural evaluation of the current facility and property.

**Newark Downtown Core Redevelopment and Circulations Improvement Plan, Newark, New Jersey**

Responsibilities included:

- Preparing a multi-phased strategy for investigating, testing and mitigating the project area



## **MICHAEL AUDIN, RPA**

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- Conducting preliminary research regarding various aspects of the project area, including possible intact remains within the former First Presbyterian Church cemetery
- Supervising research
- Conducting field photo reconnaissance and preliminary visual assessment of all properties potentially eligible for listing on the State and National Register of Historic Places that may be impacted by the proposed project
- Contributing to the Application for Project Authorization regarding the proposed demolition of five historic structures located within the Four Corners Historic District

### **NJSCC School Development Program, New Jersey**

Crew Chief, researcher, photographer and report writing and production for NJ Executive Order 215 Compliance and NJSCC Guidelines. Participated in the development and redevelopment of 20 new and existing school sites located throughout New Jersey. Responsibilities included:

- Conducting and overseeing background research at the New Jersey Historic Preservation Office, the New Jersey State Museum and local archives
- Conducting field photo reconnaissance and preliminary visual assessment of all properties potentially eligible for listing on the State and National Register of Historic Places that may be impacted by the proposed project
- Preparation and assistance in writing of the Cultural and Historical Resource Assessment section of Environmental Assessment and Environmental Impact Statement Reports and Phase IA background investigations
- Overseeing report production and preparing maps and figures
- Producing for internal departments/clients memos, letters and other documentation outlining potential issues and possible recommendations.

### **Pen Del Development, Phase IB and II, Site 28BU590, Pemberton, New Jersey**

Field/Laboratory Technician of a Phase I & II prehistoric site investigation/excavation. Field responsibilities also included photographer and mapping excavation locations using GPS equipment. Laboratory Technician responsibilities included; cleaning, cataloging and photographing all artifacts. Other post-field responsibilities included assisting with the preparation and production of the final cultural resource report for submittal to New Jersey HPO.

### **Field School, Lenape Meadows, Phase II, Basking Ridge, New Jersey**

Field and Laboratory Technician for phase II prehistoric excavation. Field work included daily preparation of site, field excavations, documentation of artifact finds, field crew management and the closing up the site for the winter. Laboratory work included cleaning, identifying, cataloging and photographic documentation of all artifacts.

### **Lithics Identification Project, William Paterson University, New Jersey**

Volunteer. Conducted laboratory analysis, identification and cataloging, of over 5,000 stone fragments from the Walkkill River basin in Northern New Jersey, submitted to Dr. Janet Pollak. Research included identifying and cataloging human produced stone flakes and tools vs. naturally altered stone.

### **SELECTED PUBLICATIONS**

*Phase IA Cultural Resource Survey, Standard Chlorine Chemical Company Site, Interim Response Action Workplan, Town of Kearny, Hudson County, New Jersey.* Michael Audin, RPA, Principal Investigator, 2009. MS on file at NJSHPO, Trenton, NJ.

## **MICHAEL AUDIN, RPA**

### **Archaeologist / Cultural Resource Specialist**

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*Phase I Cultural Resource Investigation GAC Adsorption Plant, Pennsauken, Camden County, New Jersey.* Michael Audin, RPA, Principal Investigator, 2009. MS on file at NJSHPO, Trenton, NJ.

*Historic American Building Survey for the Montauk Theater, Passaic, Passaic County, New Jersey.* Michael Audin, RPA, Principal Investigator, 2009. Submitted to the NJ HPO, Trenton, NJ.

*Phase I Archaeological Investigation Montgomery Towne Square, Montgomery, Orange County, New York.* Ludomir Lozny Principal Investigator, Michael Audin, and Sarah Hlubik, 2007. MS on file at OPRHP, Pebbles Island, NY.

*Phase II Archaeological Investigation of the Edgewater Colony, Edgewater, Bergen County, New Jersey.* Ludomir Lozny PI, Michael Audin, and Sarah Hlubik, 2007. MS on file at NJSHPO, Trenton, NJ.

*Phase I Archaeological Survey Camp Hidden Falls, Lehman Township, Pike County, Pennsylvania.* Ludomir Lozny PI, Michael Audin, and Erol Kavountzis, 2006. Ms on file at PHMC, Harrisburg, Pa.

*Phase I Archaeological Investigation Eaton, Wyoming County, Pennsylvania.* Ludomir Lozny PI, Michael Audin, and Erol Kavountzis, 2006. Ms on file at PHMC, Harrisburg, Pa.

*Phase III Cemetery Excavation, Old First Presbyterian Church, Newark Downtown Core Redevelopment, Newark, Essex County, New Jersey.* Michael Audin, Erol Kavountzis, and Sarah Hlubik, 2005. Manuscript on file at NJSHPO, Trenton NJ.

## **PRESENTATIONS**

2011 "New Jersey's Iron Coffins" presented at the Archaeological Society of New Jersey Meeting.

2009 "The Montauk Theater: Last of the Seven Passaic Theaters" presented to a William Paterson University Class on Material Culture.

2007 "Excavations at the Old First Presbyterian Cemetery in Newark, NJ" presented to William Paterson University's Anthropology Club.

## **SUMMARY OF PROFESSIONAL ACTIVITIES**

Mr. Audin is the author or co-author of over sixty (60) cultural resource reports in New Jersey, New York and Pennsylvania.

## **PROFESSIONAL DEVELOPMENT**

Historic Preservation Research Course, Drew University, February 2005

OSHA 40 Hour Certified HAZWOPER Training (December, 2005) and refreshers

OSHA Site Supervisor Certified (June, 2007) and refreshers (current to 2013)

OSHA 10 Hour Construction Certified for New York City 2012

NJSHPO Cultural Resources Best Practices Workshop, October 2006

Introduction to ArcGIS I, November 2006

Preservation Planning in the Highlands, Drew University, March 2007

Section 106 Essentials Class with ACHP, July 2007

Pennsylvania Department of Transportation, Cultural Resource Handbook Class, April 2010

Federal Communication Commission Training, Washington D.C., June 2011

## **MICHAEL AUDIN, RPA**

### **Archaeologist / Cultural Resource Specialist**

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#### **PROFESSIONAL AFFILIATIONS**

Archaeological Society of New Jersey  
Council for Northeast Historical Archaeology  
Eastern States Archaeological Federation  
Lambda Alpha National Collegiate Honors Society for Anthropology  
Middle Atlantic Archaeological Conference  
National Trust for Historic Preservation  
New York State Archaeological Association (Lifetime Member)  
Register of Professional Archaeologists  
Society of American Archaeology  
Society for Historical Archaeology  
Society for Industrial Archaeology  
The Society for Pennsylvania Archaeology

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**APPENDIX B**

**COMMUNICATION WITH LPC AND SHPO**



15 November 2012

Ms. Amanda Sutphin  
City of New York  
Landmarks Preservation Commission  
1 Centre Street, 9N  
New York, NY 10007

**Re: Gowanus Canal Bulkhead and Cribbing  
Archeological Field Investigation  
Scope of Work  
Carroll Gardens Proposed Redevelopment  
Brooklyn, Kings County, New York  
Langan Project No.: 100287501**

Dear Ms. Sutphin:

Langan Engineering and Environmental Services, Inc. PC (Langan) has been retained by Lightstone Group, LLC. to conduct an archaeological field investigation to document the Gowanus Canal bulkhead and cribbing at the 363, 365 Bond Street and 400 Carroll Street properties. A new development is proposed for these properties and the bulkhead will need to be reinforced to allow for the development. According to the December 2011 *Archaeological Sensitivity Study, Gowanus Canal, Brooklyn Borough, City of New York, Kings County, New York* by Hunter Research the 363 and 365 Bond Street and 400 Carroll Street properties possess historic canal bulkhead sensitivity. As such, we have designed a scope of work for the investigation and are requesting your review and approval of the scope of work (Attachment B).

The archaeological field investigation is required to satisfy the New York City Landmarks Preservation Commission (LPC) requirement in the 6 February 2009 letter from the Department of City Planning, City of New York. The letter is for the Notice of Completion of the Final Environmental Impact Statement (FEIS) for 363-365 Bond Street to mitigate the adverse impacts to the bulkhead wall under the City Environmental Quality Review (CEQR). The FEIS indicates the new bulkhead structure will need to consist of a tied-back, interlocking, steel sheet pile wall installed to extend below the Canal mud line; the exposed exterior face of the new bulkhead will need to be fitted with a wooden boat fender system designed to mimic the existing bulkhead timber conditions. This new bulkhead will be constructed on the water ward side the existing wooden bulkhead. The existing bulkhead wall will not be demolished but will require that holes be drilled through it to allow for the installation of the tiebacks. The above-mentioned bulkhead restoration scheme has been conceptually accepted by the involved City and State agencies and is being considered a necessary part of the environmental remediation requirements of the United States Environmental Protection Agency (USEPA) for the canal.

On 22 August 2012 Langan conducted a geotechnical due diligence assessment consisting of completion of three test pits to assess the condition of the bulkhead wall, cribbing system and subsurface soil conditions. An archaeologist monitored these test pit excavations to ensure that the bulkhead and cribbing system was not impacted by the excavation and view the condition of the bulkhead and cribbing. From these observations plan view sketches were created and photographs were taken.

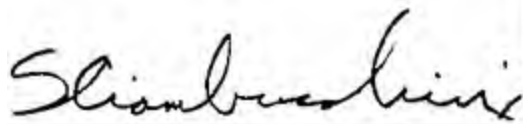
The due diligence assessment exposed the top of the cribbing system on the 365 Bond Street and 400 Carroll Street parcels of the subject property, allowing for limited documentation of the cribbing system as well as a preliminary identification of the cribbing type on both properties. Following the *Gowanus Canal Preliminary Bulkhead Study, Brooklyn, Kings County, New York* by Douglas McVarish the 363-365 Bond Street property has a cribbing system similar to Structure Type 2 (Timber Crib Bulkhead With Mass Concrete For Upper 3 To 5 Feet) with fender piles possible added later, according to observations and the bulkhead study. It is also possible that a Structure Type 5 (Fender Piles along Bulkhead Face) with concrete was added at a later date when the use of the property changed.

The 400 Carroll Street property most likely has the Structure Type 5 (Fender Piles along Bulkhead Face) cribbing according to the observations and the bulkhead study. The plan view sketches and photographs are provided in Attachment A. Based on the observations made during our initial archeological due diligence investigation a more extensive excavation will be needed to sufficiently document the bulkhead and cribbing system to an appropriate depth (approximately 3 – 5 feet below surface).

Sincerely,



Michael Audin, RPA  
Principal Archaeologist



Steven Ciambuschini, P.G., L.E.P.  
Senior Associate/Vice President

Enclosures: Attachment A – Photographs and Sketches  
Attachment B – Proposed scope of work



**Photo 1 – View of southwest corner of 365 Bond Street looking northeast.**



**Photo 2 – Location of test pit excavation location on 365 Bond Street, looking north.**





**Photo 3 – View of trackhoe moving debris piles from excavation site at 365 Bond St. looking southeast.**



**Photo 4 – View of concrete slab found approximately 2 feet below surface at 365 Bond Street.**





**Photo 5 – View of trackhoe at 400 Carroll St excavation site, looking southwest.**



**Photo 6 – View of excavation at 400 Carroll St with first portion of cribbing exposed.**



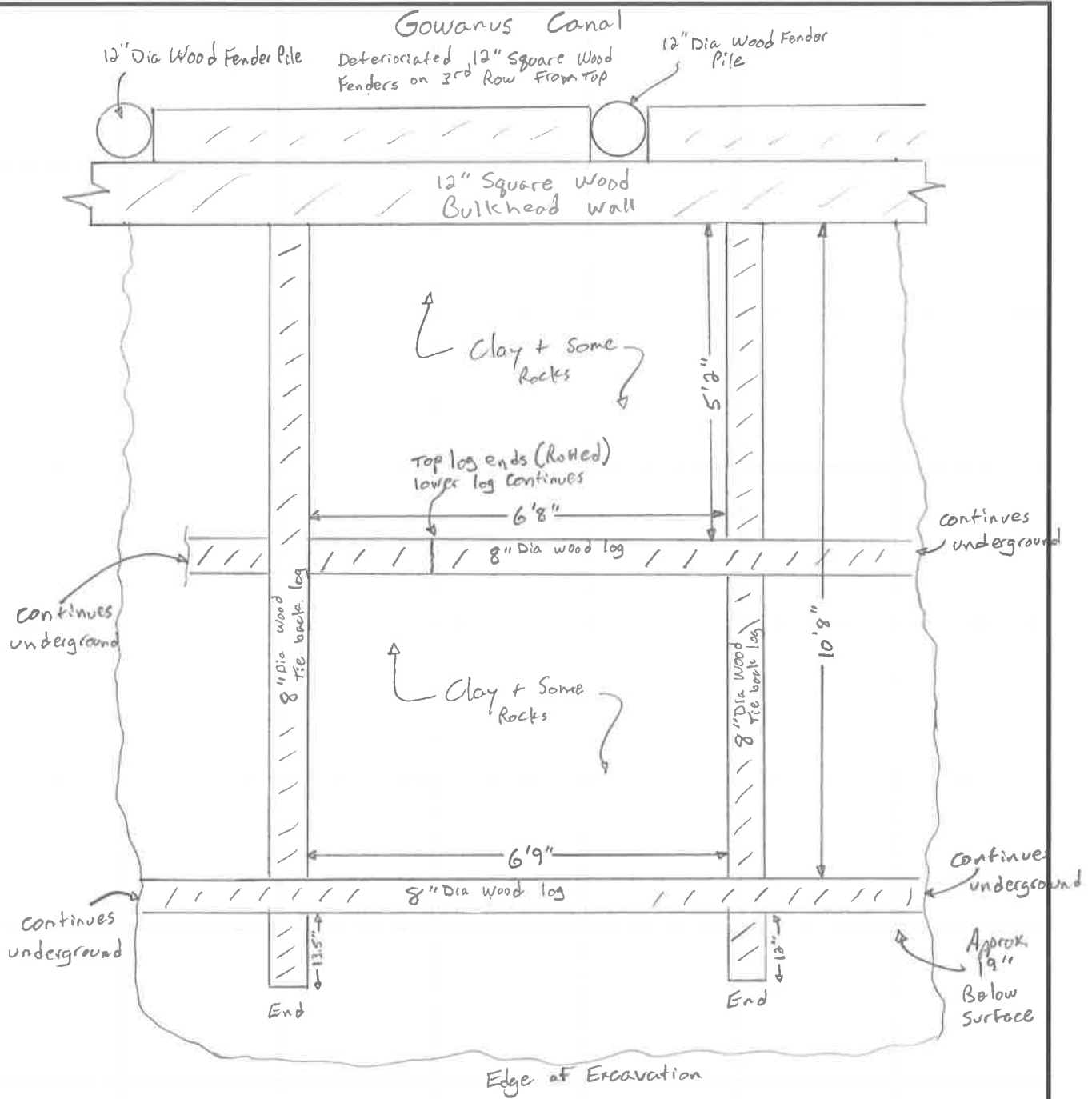


**Photo 7 – View of cribbing system at 400 Carroll St. looking southeast.**



**Photo 8 – View of additional layers of cribbing at 400 Carroll Street.**





400 Carroll St.

Bulkhead Sketch

Plan View    = 6"

400 Carroll St., Brooklyn, New York

BY M/A DATE 8/22/12

PROJ. NO. 100287501

CKD. DATE

SHEET OF



## **DRAFT**

### **Scope of Work for Gowanus Canal Bulkhead and Cribbing Archaeological Investigation and Documentation Carroll Gardens Project Brooklyn, Kings County, New York November 9, 2012**

The archaeological field investigation to document the Gowanus Canal bulkhead and cribbing at the 363, 365 Bond Street and 400 Carroll Street is based on the New York City Landmarks Preservation Commission (LPC) requirement in the 6 February 2009 letter from the Department of City Planning, City of New York. The letter is for the Notice of Completion of the Final Environmental Impact Statement (FEIS) for 363-365 Bond Street to mitigate the adverse impacts to the bulkhead wall under the City Environmental Quality Review (CEQR). The FEIS indicates the new bulkhead structure will need to consist of a tied-back, interlocking, steel sheet pile wall installed to extend below the Canal mud line; the exposed exterior face of the new bulkhead will need to be fitted with a wooden boat fender system designed to mimic the existing bulkhead timber conditions. This new bulkhead will be constructed on the water ward side the existing wooden bulkhead. The existing bulkhead wall will not be demolished but will require that holes be drilled through it to allow for the installation of the tiebacks. In addition, the December 2011 *Archaeological Sensitivity Study, Gowanus Canal* by Hunter Research indicates that 363-365 Bond Street and 400 Carroll Street both possess canal bulkhead sensitivity.

The primary goal of the archaeological field investigation is to expose and document a section of the bulkhead and cribbing system on the 365 Bond Street and 400 Carroll Street properties to mitigate the adverse impacts to the bulkhead for the tiebacks of the new sheet pile wall. All work will be conducted in accordance with the Secretary of the Interior's Standards and Guidelines for Archaeology and Historic Preservation, New York State Historic Preservation Act of 1980, section 14.09 and LPC Guidelines for Archaeological Work in New York City (2002). Michael Audin, RPA will serve as the project's principal investigator and project manager and will conduct the fieldwork with an archaeological assistant. All personnel meet the Secretary of the Interior criteria for Archaeological Survey.

#### *Scope of Work for Archaeological Field Investigation*

The field archaeological testing would consist of a combination of machine and hand excavations in the same two areas previously excavated during the due diligence investigation to ensure no utilities are encountered. Because of the tide changes only one site can be excavated and documented at a time. Limited dewatering or additional days may be required to complete thorough documentation.

Prior to fieldwork:

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#### Fieldwork:

- Fieldwork will be conducted in the same two locations as the preliminary due diligence investigation (Figure 1).
- Fieldwork would begin with excavation by a small backhoe or Bobcat excavator to minimize the potential to impact the cribbing and bulkhead.
- Excavate to a depth of approximately 3 to 5 feet below surface.
- Limited dewatering system may be installed.
- Hand excavation would supplement the machine excavation in sensitive areas. Wood cribbing may be rinsed off with hand sprayers to better determine cribbing construction and improve documentation.
- The excavations will be recorded on a standard feature forms and scaled drawings of profiles and plan views will be provided. All scaled drawings will use the English system of measurement.
- All excavations, bulkhead walls and cribbing will be photographed using a digital camera with a photo board.
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- A field journal will be kept to record all field activities.
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- Any and all artifacts found will be bagged and labeled accordingly; a field bag log will be kept on site.
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- The excavations will be backfilled upon completion of hand excavations and returned as close to original condition as possible.

#### After fieldwork:

- An Archaeological Filed Investigation report will be prepared to summarize the field work, present findings, and make recommendations. If any unique archaeological features are found, the report will also present recommendations for any additional archaeological work. The field report will contain photographs (both overall and close-up of interesting features), measured drawing (both plan and profile views) and any comparative drawings or photographs from other sources to better illustrate the bulkhead wall and cribbing construction.
- All field documentation and collected artifacts (if any) will be curated at Langan for the duration of the project and report writing. Subsequently, if any artifacts are recovered and are of informational value they will need to be prepared for curation and sent to the New York State Museum (or other appropriate repository) for permanent curation with copies of all field forms and documentation. If the artifacts recovered are not of informational value they will be offered to an appropriate local repository in consultation of the client and LPC.



Map Reference: Microsoft Bing GIS Aerial Imagery (2011)



# **ARCHAEOLOGICAL EXCAVATION LOCATIONS GOWANUS PROJECT BROOKLYN**

KINGS COUNTY

NEW YORK

NEW JERSEY PENNSYLVANIA NEW YORK CONNECTICUT FLORIDA NEVADA

Project No.  
**100287501**

Date  
**11/9/12**

Scale  
**1" = 200'**

Figure No.  
**1**

Path: X:\E:\data\501\Arch\GIS\ArchMap\_documents\Cultural Resources\Arch Invest Loc.mxd

15 November 2012

Mr. Doug Mackey  
New York State Office of Parks Recreation and Historic Preservation  
Peebles Island  
Delaware Ave  
Cohoes, NY 12047

**Re: Gowanus Canal Bulkhead and Cribbing  
Archeological Field Investigation  
Scope of Work  
Carroll Gardens Proposed Redevelopment  
Brooklyn, Kings County, New York  
Langan Project No.: 100287501  
Project Review #: 08PR02257**

Dear Mr. Mackey:

Langan Engineering and Environmental Services, Inc. PC (Langan) has been retained by Lightstone Group, LLC. to conduct an archaeological field investigation to document the Gowanus Canal bulkhead and cribbing at the 363, 365 Bond Street and 400 Carroll Street properties. A new development is proposed for these properties and the bulkhead will need to be reinforced to allow for the development. According to the December 2011 *Archaeological Sensitivity Study, Gowanus Canal, Brooklyn Borough, City of New York, Kings County, New York* by Hunter Research the 363 and 365 Bond Street and 400 Carroll Street properties possess historic canal bulkhead sensitivity. As such, we have designed a scope of work for the investigation and are requesting your review and approval of the scope of work (Attachment B).

The archaeological field investigation is required to satisfy the New York City Landmarks Preservation Commission (LPC) requirement in the 6 February 2009 letter from the Department of City Planning, City of New York. The letter is for the Notice of Completion of the Final Environmental Impact Statement (FEIS) for 363-365 Bond Street to mitigate the adverse impacts to the bulkhead wall under the City Environmental Quality Review (CEQR). The FEIS indicates the new bulkhead structure will need to consist of a tied-back, interlocking, steel sheet pile wall installed to extend below the Canal mud line; the exposed exterior face of the new bulkhead will need to be fitted with a wooden boat fender system designed to mimic the existing bulkhead timber conditions. This new bulkhead will be constructed on the water ward side the existing wooden bulkhead. The existing bulkhead wall will not be demolished but will require that holes be drilled through it to allow for the installation of the tiebacks. The above-mentioned bulkhead restoration scheme has been conceptually accepted by the involved City and State agencies and is being considered a necessary part of the environmental remediation requirements of the United States Environmental Protection Agency (USEPA) for the canal.

On 22 August 2012 Langan conducted a geotechnical due diligence assessment consisting of completion of three test pits to assess the condition of the bulkhead wall, cribbing system and subsurface soil conditions. An archaeologist monitored these test pit excavations to ensure that the bulkhead and cribbing system was not impacted by the excavation and view the condition of the bulkhead and cribbing. From these observations plan view sketches were created and photographs were taken.

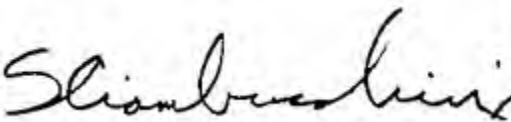
The due diligence assessment exposed the top of the cribbing system on the 365 Bond Street and 400 Carroll Street parcels of the subject property, allowing for limited documentation of the cribbing system as well as a preliminary identification of the cribbing type on both properties. Following the *Gowanus Canal Preliminary Bulkhead Study, Brooklyn, Kings County, New York* by Douglas McVarish the 363-365 Bond Street property has a cribbing system similar to Structure Type 2 (Timber Crib Bulkhead With Mass Concrete For Upper 3 To 5 Feet) with fender piles possible added later, according to observations and the bulkhead study. It is also possible that a Structure Type 5 (Fender Piles along Bulkhead Face) with concrete was added at a later date when the use of the property changed.

The 400 Carroll Street property most likely has the Structure Type 5 (Fender Piles along Bulkhead Face) cribbing according to the observations and the bulkhead study. The plan view sketches and photographs are provided in Attachment A. Based on the observations made during our initial archeological due diligence investigation a more extensive excavation will be needed to sufficiently document the bulkhead and cribbing system to an appropriate depth (approximately 3 – 5 feet below surface).

Sincerely,



Michael Audin, RPA  
Principal Archaeologist



Steven Ciambuschini, P.G., L.E.P.  
Senior Associate/Vice President

Enclosures: Attachment A – Photographs and Sketches  
Attachment B – Proposed scope of work





**Photo 1 – View of southwest corner of 365 Bond Street looking northeast.**



**Photo 2 – Location of test pit excavation location on 365 Bond Street, looking north.**





**Photo 3 – View of trackhoe moving debris piles from excavation site at 365 Bond St. looking southeast.**



**Photo 4 – View of concrete slab found approximately 2 feet below surface at 365 Bond Street.**





**Photo 5 – View of trackhoe at 400 Carroll St excavation site, looking southwest.**



**Photo 6 – View of excavation at 400 Carroll St with first portion of cribbing exposed.**





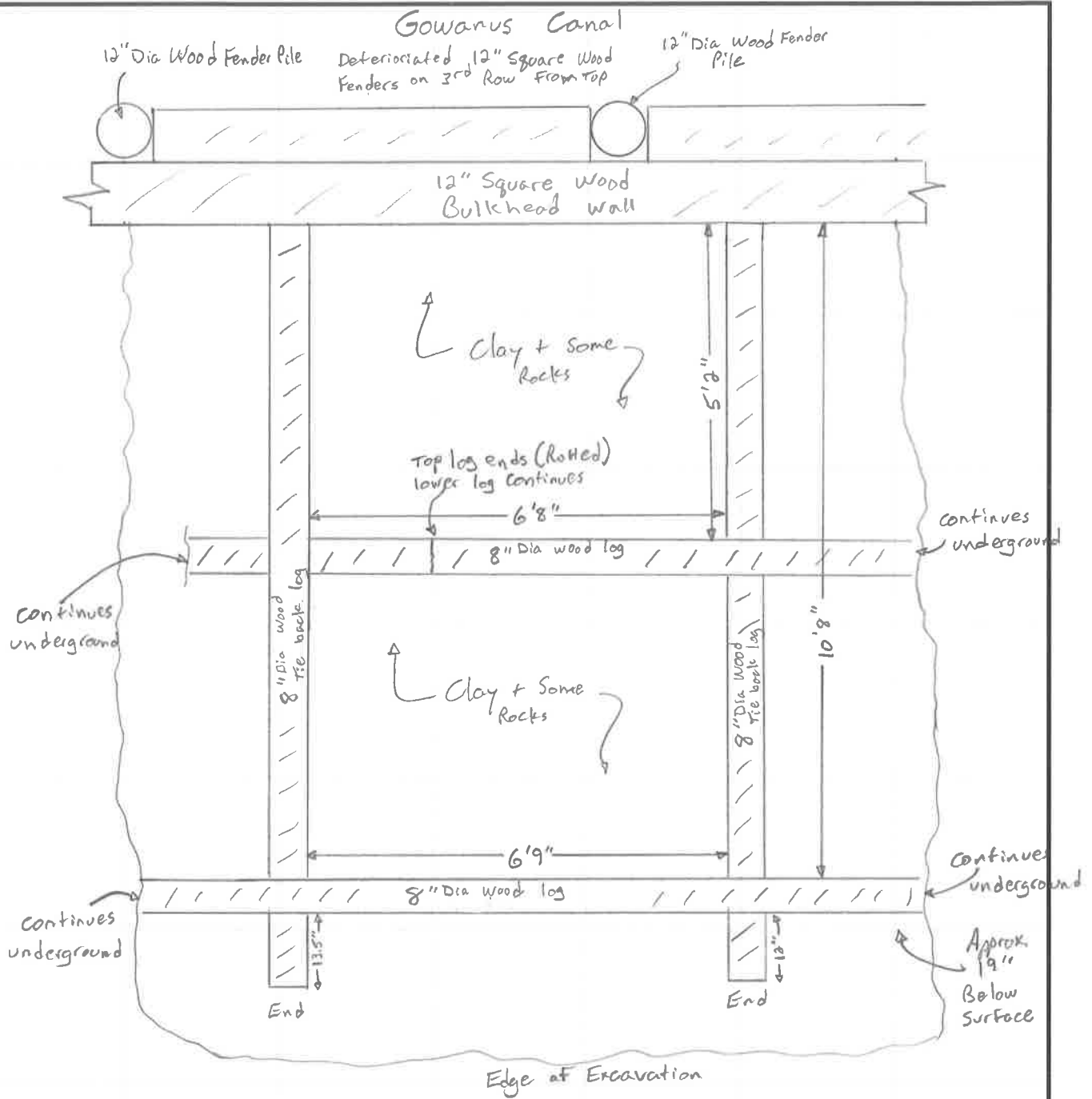
**Photo 7 – View of cribbing system at 400 Carroll St. looking southeast.**



**Photo 8 – View of additional layers of cribbing at 400 Carroll Street.**







400 Carroll St.

Bulkhead Sketch

Plan View    = 6"

400 Carroll St., Brooklyn, New York

BY M/A DATE 8/22/12

PROJ. NO. 100287501

CKD. DATE

SHEET OF

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River Drive Center 1  
 619 River Drive  
 Elmwood Park, NJ 07407  
 P: 201.794.6900 F: 201.794.0366  
 www.langan.com

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## ARCHAEOLOGY

**Project number:** DEPARTMENT OF CITY PLANNING / 09DCP015K  
**Project:** GOWANUS CANAL CORRIDOR REZONING  
**Date received:** 11/16/2012

### **Comments:**

The LPC is in receipt of the, " Draft Scope of Work for Gowanus Canal Bulkhead and Cribbing Archaeological Investigation and Documentation Carroll Gardens Project, Brooklyn, New York," prepared by Langan Engineering and dated November 9, 2012. The scope is appropriate. Please alert the Commission when the work is scheduled.



11/20/2012

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SIGNATURE  
Amanda Sutphin, Director of Archaeology

DATE

**File Name:** 25155\_FSO\_ALS\_11202012.doc