



**Bulkhead Documentation Report**

**Burling Slip**

**Block 74, Portions of Lots 20 and 1  
Borough of Manhattan, New York, New York**

**Prepared for:**

Lower Manhattan Development Corporation

**Prepared by:**

AKRF, Inc.

440 Park Avenue South

New York, New York 10016

**June 2, 2011**

## Management Summary

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**SHPO Project Review Number:** 06PR06595

**Involved Agencies:** Lower Manhattan Development Corporation (Lead Agency),  
US Department of Housing and Urban Development (HUD),  
Federal Highway Administration (FHWA), City of New York

**Phase of Survey:** Unanticipated Discoveries/ Data Recovery

### Locational Information

**Location:** Burling Slip (John Street) between Front and South Streets  
**Minor Civil Division:** 06101: New York, Block 74, Lots 20 and 1 (portions)  
**County:** New York County

### Survey Area

**Survey Area Length:** 240 feet  
**Survey Area Width:** 80 feet  
**Depth:** Approx. 9 feet  
**Number of Acres Surveyed:** 0.44 acres

**USGS 7.5 Minute Quadrangle Map:** Jersey City

**Archaeological Survey Overview:** Documentation of approx. 190-foot length of timber bulkhead

### Results of Archaeological Survey

**Number & Name of Sites Identified:** 1

**Report Authors:** Molly McDonald, RPA  
(Report incorporates Phase 1B Data contributed by A. Michael Pappalardo and Diane Dallal)

**Date of Report:** June 2, 2011

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**A. INTRODUCTION**

This report summarizes the archaeological discovery, documentation, and analysis of a buried timber wharf structure and adjacent landfill at Burling Slip, which is located along John Street between Front and South Streets in Lower Manhattan. The wharf was discovered in association with the Fulton Street Corridor Revitalization Project, which is being undertaken by the City of New York and the Lower Manhattan Development Corporation (LMDC).

The core components of the Fulton Street Corridor Revitalization Project include improvements to the streetscape and to the facades of buildings that contribute to the heritage and experience of the corridor, as well as the creation, expansion or improvement of open space within the project area. Included among the Project's open space improvements is the construction of Imagination Playground at Burling Slip. The wharf structure was discovered during the construction of the playground and was documented archaeologically as part of the implementation of the Unanticipated Archaeological Discoveries Plan for Burling Slip.

**B. PROJECT CONTEXT**

The *Fulton Street Corridor Revitalization Project Environmental Assessment* (EA) was completed in December 2007 in compliance with the National Environmental Policy Act (NEPA), the State Environmental Quality Review Act (SEQRA), and New York City Environmental Quality Review (CEQR). Potential effects on historic resources were considered in conformance with Section 106 of the National Historic Preservation Act of 1966 (NHPA).

As part of this environmental review process for the Project, five Areas of Potential Effect (APEs) for archaeological resources were identified (see **Figure 1**). These corresponded to five separate project elements or locations expected to result in excavation or ground disturbance: Burling Slip; DeLury Square; Titanic Memorial Park; the Pearl Street Playground; and the Streetscape Improvements. Archaeological documentary studies (Phase 1A studies) were completed for each of these APEs.

The Phase 1A Study for Burling Slip (Historical Perspectives, Inc. [HPI] 2006) concluded that the Burling Slip APE was sensitive for archaeological resources relating to late 18th and/or early 19th century waterfront development and landfilling of the site, such as wharf and slip structures. The EA determined that the proposed project had the potential to affect archaeologically sensitive locations in Burling Slip, and archaeological field testing (Phase 1B testing) was recommended.

A Programmatic Agreement (PA) for the Project between the LMDC and the New York State Historic Preservation Office (SHPO) was signed on March 23, 2008. The New York City Landmarks Preservation Commission (LPC) served as a consulting party. The PA included a commitment that LMDC and the City would complete the steps outlined in an Archaeological Testing Protocol for Burling Slip (AKRF November 2007). This Archaeological Testing Protocol, which was written in coordination with LPC and SHPO, included detailed plans for both Phase 1B archaeological testing

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in advance of construction and the treatment of any Unanticipated Discoveries made during construction.

Phase 1B field testing, consisting of a combination of deep backhoe trench excavation and hand testing, was undertaken at Burling Slip in the winter of 2008. The results of this testing were presented in a Phase 1B Archaeological Survey Report (AKRF March 2008). During the Phase 1B field testing, archaeologists encountered a brick foundation that was identified as part of an early 20th century comfort station. In addition, they encountered loose fills containing late-18th to mid-19th century artifact deposits including ceramic sherds, leather scraps, glass, shells, etc. It was concluded that these fills had been deposited when Burling Slip had been filled, and a tentative date of ca. 1850 was assigned to this filling episode. No landfill retaining structures, such as wood wharf or slip walls were encountered during the Phase 1B. It was surmised that landfill retaining structures were most likely located along the perimeter of Burling Slip, just outside of the APE. The features encountered were not considered significant and no further testing was recommended. It was acknowledged, however, that the Unanticipated Archaeological Discoveries Plan set forth in the Testing Protocol would apply in the event that archaeological resources were encountered during the construction of the proposed project.

In May 2009, the City of New York Department of Parks and Recreation (DPR) began excavation for Imagination Playground at Burling Slip. AKRF was retained by LMDC to provide the archaeologist for implementation of the Unanticipated Discoveries Plan. Oscar Urquiola (DPR) was designated as the Environmental Inspector, and Lawrence Mauro (DPR) as Project Manager for DPR.

Early in the course of construction, a timber feature was encountered. This feature was further exposed under the supervision of the archaeologist and was determined to be part of a waterfront landfill retaining structure constructed as the east<sup>1</sup> wall of the Burling Slip and the west wall of the adjacent wharf. In order to determine the character of the feature and its extent within the APE, the feature was exposed and recorded for a length of approximately 190 feet and artifacts adjacent to the feature were sampled. In close coordination with Amanda Sutphin and Arthur Bankoff of LPC and Doug Mackey of SHPO, it was determined that the segment of wharf was considered historically significant. Measures to minimize harm to the wharf feature, such as redesign of project elements, were developed by DPR. Nevertheless, it was determined that the project would have an adverse effect on the archaeological resource. Measures to further document and partially mitigate adverse effects were developed by LMDC, DPR, and the Mayor's Office in close coordination with LPC and SHPO.

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<sup>1</sup> True cardinal directions are oriented at an approximately 45 degree angle to the street grid in the vicinity of the APE. To simplify directional descriptions, true northwest is considered "north" for the purposes of this document and other cardinal directions correspond to this adjusted orientation.

**A. SUMMARY OF PHASE 1A DOCUMENTARY STUDY**

The following summary of the environmental setting and history of the Burling Slip APE was largely abstracted from the Phase 1A survey prepared by Historical Perspectives, Inc. (HPI) in 2006. The Phase 1A should be referenced for more detail. As part of the bulkhead documentation effort in 2009-2011, additional historical research undertaken to facilitate the interpretation of the field findings. The results of this additional research are presented in Chapter 4.

**ENVIRONMENTAL SETTING**

The Burling Slip APE is located within an open space known as Burling Slip, bounded by South Street to the south and Front Street to the north. John Street, historically part of Burling Slip, is a mapped street open to vehicular traffic, located along the south side of Burling Slip. The APE's dimensions are approximately 240 feet from Front Street to South Street and 80 feet from the eastern side of the Slip to John Street (**Figure 1**). It is located within City Block 74 and includes portions of Lots 20 and 1. At the time the Project was begun, the APE was paved in asphalt and used as a parking lot for municipal vehicles. A concrete median oriented north-south ran along the southern edge of the project site.

The island of Manhattan is found within a geographic bedrock region known as the Manhattan Prong of the New England (Upland) Physiographic Province. This region is composed of heavily metamorphic and sedimentary rock that dates to the Cambrian and Ordovician ages (New York State Office for Technology [NYSOFT], 2004). The bedrock slopes downward from north to south, and has been found to be approximately 100 feet below the earth's surface at the southern end of Manhattan. There are a number of deposits which overlay the bedrock region, but nearly all of Manhattan is covered by anywhere from 3 to 164 feet of glacial till. These deposits were left behind by glaciers that retreated from the area towards the end of the Pleistocene. There were four major glaciations that affected Manhattan until roughly 12,000 years ago when the Wisconsin period—the last glacial period—came to an end. The glacial movements also brought about the creation of hundreds of sand hills, or kames, some of which were nearly one hundred feet tall. These hills were contrasted by many small streams, rivers, and lakes that were fed by the glacial runoff. As temperatures increased and glacial runoff ceased, smaller water courses evolved into swamps and marshlands.

**HISTORY OF THE APE AND VICINITY**

Manhattan had a much narrower and more irregular shape in the days before landfilling created the regimented shoreline we see today. The southern tip of Manhattan, known as *Kapsee*, was a rocky point jutting out into the harbor forming a small cove that was possibly used as a canoe landing by Native Americans. As New York City expanded during the late 17th, 18th, and 19th centuries, the City of New York and private owners gradually improved the East River shoreline

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with wharves, docks, and slips. The shoreline was built increasingly further out into the East River responding to pressures for new commercial real estate, and in order to address the poor conditions of existing waterfront infrastructure. The shoreline was characterized by an almost continuous network of slips, which allowed ships to dock between wharves. Methods of constructing landfill varied according to period and location, but typically consisted of timber retaining structures containing stone and other fill materials such as sand, soil, gravel, and rubbish.

At the time of European contact, the East River shoreline in the vicinity of the APE was about one and a half blocks north of Front Street, near what is now Pearl Street. Thus the entire Burling Slip APE was under water. Water, followed by marshland, occupied the area north of the Burling Slip APE.

Burling Slip, located at the terminus of John Street, was known for periods as Lyons Slip, Rodman's Slip, and Van Clyffe Slip. The northernmost portion of Burling Slip (north of the APE) was created prior to 1692, when two wharves were constructed on either side of the 24-foot wide docking place on the property of Mrs. Van Clyffe. The Slip was maintained by the City, and by 1730, landfilling had occurred there to allow for the construction of Water Street (north of the APE) along the inner edge of the Slip.

The Montgomery Charter resulted in the granting of water lots to private individuals during the 18th century in order to improve and expand Manhattan's waterfront. In 1736, the City granted James Alexander and Archibald Kennedy a water lot on the west side of Burling Slip; and in 1737, granted Henry Van Borsom a water lot on the east side of the Slip, part of which was subsequently passed to John Riker. Another water lot along the east side of Burling Slip was granted to David Provoost in 1749; Provoost was responsible for building a wharf along the eastern edge of Burling Slip terminating roughly half way between Water and Front Streets. In 1749, a wharf had also been built along the west side of Burling Slip as far south as Front Street. Common Council minutes suggest that between 1773 and 1777, Jacob Brewerton, who then owned the water lot immediately east of Burling Slip, constructed a "wharf or street" extending between present-day Front and South Streets (within or immediately east of the APE). In 1786, a petition was filed to extend the wharf along the west side of Burling Slip to the same point.

Historic maps of the late 18th and early 19th centuries contribute conflicting evidence of the state of the slips and the flanking wharves, including the wharf that would have run along the eastern edge of the APE. The progression of wharf building and slip filling in and around the study area as depicted by historic maps is summarized on an overlay map created by HPI for the Phase 1A Study, included in this report as **Figure 2**. The 1776 Ratzer map clearly depicts no wharf construction in the immediate vicinity of the APE. The 1789 McComb map shows a long straight wharf extending along the entirety of the APE to South Street. However, the 1798 Taylor-Roberts map depicts only a small portion of wharfage along the east edge of the APE, extending roughly one-third of the way between front and south streets and aligned on a slight angle. The 1833 Hooker map shows a straight wharf extending along the entirety of the east edge of the APE and beyond, terminating well south of South Street.

The water rights to the Slip itself were retained by the City. In 1761, John Sackett was retained to fill Burling Slip as far south as Water Street (one block north of the APE). Several petitions recorded in the Common Council Minutes from 1788 to the mid-19th century request that Burling Slip be filled so that Front Street (the north edge of the APE) could be continued across it. Despite their various inconsistencies, all of the known historic maps show Burling Slip still open for the passage of vessels as far north as Water Street as late as 1832.

In 1801 the City had passed an act that encouraged proprietors of lots adjoining streets or wharves along the river to fill intermediate spaces, such as portions of slips, in return for ownership of the filled area. Owners of land adjacent to Burling Slip between present-day Front and South Streets in the early 19th century included George Codwise, George Bowne, Peter Schermerhorn, Peter Van Zandt, and others.

According to the Phase 1A, the Common Council moved to have the slip within the APE filled in early 1835. “At that time a State Commissioner presented a ‘draft of an ordinance for building a bulkhead across Burling Slip, continuing the drain to South Street, and filling up the said Slip’ (MCC 1835 8:112-113). The bulkhead was constructed on the south side of South Street to allow for its creation. The work to accomplish this was not permitted to begin until March 1 of that year (Ibid.)” (HPI 2006: 9). Historic maps (Hooker 1833; and Colton 1836) show that Burling Slip was entirely filled as far south as South Street between 1833 and 1836. The Phase 1A speculates that if the slip was not entirely filled by 1835, as delinquent assessments for the work suggest, debris from the Great Fire of 1835 (which took place in early December of that year and destroyed hundreds of buildings in lower Manhattan) may have been used in filling the slip.

Following the City’s filling of Burling Slip to South Street (including the entirety of the APE), the Phase 1A observes that based on historic map research, the APE remained vacant through the entirety of the 20th century, serving as vehicular access to South Street. The 19th century width of the slip from water lot line to water lot line was 142.1 feet at South Street and 139.1 feet at Front Street. Today, the Slip is the same approximate width from building line to building line.

## **ARCHAEOLOGICAL SENSITIVITY**

The Phase 1A Study concluded that the APE was sensitive for archaeological resources related to the filling of the APE, including wharves and/or other landfill retaining structures, and the fill within them. A Phase 1B Archaeological Field Survey was recommended to determine the presence or absence of landfill retaining structures in portions of the APE that did not appear to be occupied and previously disturbed by utilities.

## **B. SUMMARY OF PHASE 1B FIELD INVESTIGATION**

### **PHASE 1B RESEARCH DESIGN**

Based on the conclusions of the Phase 1A report for Burling Slip and the recommendations of the NYSHPO and LPC, the primary objective of the Phase 1B survey for Burling Slip was to determine the presence or absence of landfill retaining structures and landfill dating to the late 18th through mid-19th centuries. The following research topics were developed in the testing protocol and are specific to the types of potential archaeological resources that could be encountered in the APE.

Landfilling episodes have been archaeologically documented in several other locations in Lower Manhattan, New York City, and other cities in North America and Europe. In addition, archaeologists have been able to date individual landfilling episodes to specific periods of time, based both on the artifacts used in the fill and the technology used to construct the retaining devices. The Phase 1A concluded that the identification and analysis of landfill retaining structures at Burling Slip had the potential to contribute to the growing body of research on the subject. It could confirm and clarify documentary resource information concerning the

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development of Burling Slip, contribute to our knowledge of the City's development, and add to our knowledge of the strategies employed in land reclamation during the early 19th century.

Timber bulkhead construction took a range of forms dependent upon available materials and logistical considerations; clear regional patterns before ca. 1840 have not been clearly identified (HPI 2005:48). For the era prior to more standardized designs, variations in the construction of timber landfill retaining structures have been identified as sources of potentially significant information (LBA, Inc 1990). "Surviving original vernacular design components below contemporary mean low water levels could include timber construction, joinery, and filling methods, or systems of cribwork bottoms support, and could be potentially eligible for the National Register under criteria C and D" (HPI 2005:50).

A forthcoming article by the author regarding the construction of early timber wharf structures identifies several approaches to landfill retaining structure construction that appear to have been common throughout the northeast prior to the mid-19th century (McDonald 2011). The most prevalent construction method in North America employs stacked-log construction methods similar to those used to build log houses. The stacked log construction method differs from other historically documented approaches to wharf construction including timber pile construction and timber-framed construction. The stacked-log method could be used to build wharves using two distinct forms: the crib form and the reinforced wall form. In crib form examples, stacked logs were arranged to create box- or cell-like units, which in turn comprised the larger wharf structure. In reinforced wall form examples, stacked logs were arranged in a linear wall form; tie-backs were notched into the interior face of the wall and were used to anchor the wall from within. Reinforced walls could be used to form each exterior side of a wharf. While the term "cribbing" is often used as a catch-all phrase to describe landfill retaining structures, the crib form and the wall form both appear to have been relatively common in early North American wharf construction. Documentation of landfill retaining structures at Burling Slip could be used to contribute to an understanding of the use of these and other construction approaches to wharf building.

In general, the lower portions of landfill retaining structures are regarded as particularly important because they are poorly documented and tend to remain well-preserved below the water. It has been found that upper components of bulkheads and landfill retaining devices have more frequently been subject to decay or subsequent replacement (Green 1917:52). However, when preserved beneath later landfilling projects, the upper components may also yield significant data.

The material with which retaining devices were filled may also yield significant data. Archaeologists have theorized two broad categories of fill strata: primary fill and secondary fill. Primary fill, the first-deposited, and largest of the stratum, would be the landfill initially placed within the landfill retaining structures. Few artifacts are to be expected in this stratum, because through time, decaying, artifact-rich garbage would compress unevenly, settle at varying rates, and cause instability. Although the activity is poorly documented, various references suggest that clean landfill material was generally obtained from regrading and construction projects in other parts of Manhattan. Secondary fill is utilized to cover the rough and rocky primary landfill, providing a working surface for construction. It contains less rock than primary landfill, and is where most of the artifacts recovered by excavations are found. This corresponds to recorded historical observations of the filling of waterlots by their owners. Fill material used in timber bulkheads was probably varied and possibly included industrial, commercial and domestic refuse. Fill size and material often reflected the design of fill-retaining structures, and sample fill

documentation could inform our understanding of waterfront substructure designs. In addition, this fill could provide important time-markers for the study of the project area waterfront structures, shoreline development, and urban history (HPI 2005:50).

The Testing Protocol for Phase 1B testing in Burling Slip stated that the following three conditions had to be met in order for the Phase 1B survey to conclude that archaeological methods have the potential to address the above topics:

1. Archaeological features such as bulkheads or timber cribbing associated with the use and reclamation of Burling Slip must be present.
2. These features must be intact and must not have been significantly disturbed by subsequent activities that have taken place on the property.
3. The features must contain identifiable elements and/or diagnostic artifacts to indicate the period of time during which they were deposited, created, or used.

In the absence of results meeting these conditions, this survey would conclude that no historic resources will be affected by the proposed action.

#### **PHASE 1B FIELD INVESTIGATION**

In advance of initiating fieldwork at Burling Slip, a testing protocol was prepared and submitted to the LPC and the SHPO for their concurrence (both agencies concurred with the protocol). Six proposed backhoe trenches were planned, each with a length of at least 25 feet and a width of at least 5 feet. Trench locations were intended to both maximize the likelihood of encountering land filling features and avoiding known utilities including water, sewer, electric, gas, and telephone lines.

AKRF archaeologists A. Michael Pappalardo and Molly McDonald conducted Phase 1B fieldwork at Burling Slip during the month of December 2007. Initial logistical tasks consisted of enclosing the approximately 50 foot by 200 foot portion of the APE where backhoe trenching was to occur within a chain link fence, marking out all known utilities, marking out trench locations, and discussing basic safety and working procedures with the machine operator and crew. During the course of fieldwork, the actual location of individual trenches was changed to accommodate the discovery of utilities and other field information. **Figure 3** presents the location of each of the six trenches excavated, as well as the location of utilities discovered within some of the trenches.

Of the six backhoe trenches that were excavated, Trench 3 was longest, measuring 48 feet from north to south, and Trench 2 was shortest, measuring only 10 feet (this trench was abandoned due to the presence of shallow unmapped electrical lines). Trenches 1, 3, 4, 5, and 6 were each excavated to at least 5 feet below ground surface (bgs). Trenches 3, 4, and 6 were each excavated to over 8 feet below pavement. All excavation was guided by project archaeologists who would periodically enter the excavated trench to hand clear possible resources, collect artifacts, or document the progress of work. Each trench's dimensions and location is summarized in **Table 1**.

**Table 1**  
**Summary of Phase 1B Trenches**

Trench	Distance (feet) from N side of South Street	Length (feet)	Width (feet)	Closing Depth (Approx.)	Notes
Trench 1	30	25	3'9"	9'	Utility line at 3 feet oriented east west along the center of the trench
Trench 2	70	10.5	7	3.25	Discontinued at a depth of just over 3 feet after encountering electrical lines oriented north south along the center of this trench.
Trench 3	80	48	5-14	9.5	The northwest corner of a brick foundation was encountered. Several hundred domestic artifacts recovered in adjacent fills.
Trench 4	200	32	6-9	8	Fills to over 8 feet bgs. A timber below concrete
Trench 5	100	25	6.5	5	Large iron pipe at a depth of 3 feet., timber at 4 feet
Trench 6	150	25	6'	8.5	Fills to 8.5

Between 4 and 8 inches of asphalt were encountered in each backhoe trench and in most of the trenches, thick layers of concrete were encountered beneath the asphalt. Below the concrete, multiple layers of generally horizontally deposited sandy fill were encountered. Fills were relatively clean, with occasional bricks, wood, or other debris. Generally, relatively small quantities of artifacts were observed. The fills were variable from one trench to the next with some trenches containing more individual soil deposits than others. The fill deposits also varied vertically alternating between lighter sands and thinner darker deposits containing more organic material. Exposed features and stratigraphy were drawn, mapped, and photographed.

The Phase 1B field survey identified no bulkheads, wharves, piers, or other retaining structures. While some timbers were encountered at various elevations in multiple trenches, none appeared to be *in situ* as part of a crib-work system or other landfill retaining device.

One feature was encountered, a brick wall, which was found in Trench 3. The brick wall, which appeared to be of late 19th or early 20th century construction extended from roughly 9 inches bgs to roughly 2 feet 6 inches bgs and was roughly 2 feet 10 inches thick. The feature could only be partly excavated due to the location of nearby utilities and other site restrictions, and therefore, the horizontal extent (plan dimensions) of the feature could not be fully ascertained. A corner (apparently the northwest corner of the foundation wall) was exposed in the approximate center of the trench; the west wall of the structure was exposed to a length of 28 feet and the north wall was exposed to a length of roughly seven feet. The upper surface of the exposed wall was generally intact and showed no signs of demolition and excavation within the foundation and outside of it failed to recover the quantities of demolition debris typically encountered when a building has been demolished.

The Phase 1A documentary study had documented no structures built in the Burling Slip APE, and therefore, additional documentary research was undertaken as part of the Phase 1B study to elucidate the origins of the structural remnants encountered during field testing. Research revealed that in 1903, the City filed plans with the Department of Buildings and the Art Commission for a one-story brick comfort station to be built at Burling Slip near South Street (Art Commission Files June 10, 1903; *New York Times*, July 12, 1903). The specific location of the planned comfort station shown on the historic plans matched the actual location of the brick foundation encountered in the field. Historic maps and photographs, however, suggest that if the comfort station was completed, it stood for no more than two years. Photographs on file at the New York Public Library dating to 1928 and 1930 show a different building with a larger footprint, a concrete-founded, corrugated metal-clad structure located in John Street and Burling Slip, apparently overlapping with the APE. It was concluded that the brick foundation was a remnant of the ca. 1903 comfort station while the thick layers of concrete beneath the ground surface were probably associated with the ca. 1928 corrugated metal structure pictured in historic photographs.

### PHASE 1B ARTIFACT ANALYSIS

A total of 737 artifacts were collected, processed, catalogued and analyzed as part of the Phase 1B investigation. The complete Phase 1B artifact catalogue, prepared by Diane Dallal, is attached as **Appendix A**. Artifact data were organized by trench and by level or depth within each trench. The artifacts were collected as a representative sample of the observed artifact classes. Large artifacts such as bricks and wood were sampled to a lesser extent. The majority of these artifacts were spot finds collected during monitoring of the backhoe or during the hand clearing of trench walls or features.

The fragmentary nature of the artifacts suggested they were part of fill soils. Most of the artifacts were from secondary (i.e. redeposited) household refuse; all were under 10 percent complete, an identifying characteristic of secondary refuse. When Burling Slip was filled, refuse from different sources became mixed together, as can be seen by the variety of artifact manufacturing dates, which range from the 17th through the late 19th centuries. The few recovered late 19th century artifacts were recovered from the upper 2-3 feet of fill and were likely introduced during excavation associated with construction of the brick foundation. Artifacts with 17th through 18th century manufacturing dates (for example, British slip-decorated earthenware dishes [buff bodied slipwares]) that could have been made anytime between the late 17th and the late 18th centuries, were likely first discarded at other locations and then transported along with their surrounding soils to the slip. All of the ceramics were fragmentary and most vessels were only represented by one sherd.

White granite wares with printed designs were recovered from various depths across the site. These ceramics began to be imported in quantities in the early 1850s, although they were being produced as early as 1840. The Phase 1B study concluded that the presence of this ceramic type indicates that Burling Slip may have been filled sometime after 1850, a filling date more than 10 years later than suggested by documentary research presented in the Phase 1A study. A relatively large number of shoe parts were also observed and sampled across the site at depths ranging from 2 to 6 feet bgs.

The number of burned artifacts recovered during the Phase 1B investigation and the presence of many sherds of white granite ware (TPQ 1840) was considered suggestive of the use of fill from the Great Fire of 1845 or another fire, to fill in the Slip. The small size of the ceramic sherds,

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however, suggests that this is secondary mostly household refuse, and household trash is often incinerated as a matter of course.

The artifacts recovered from Burling Slip as part of the Phase 1B investigation will be discussed further in the following section as part of the complete artifact assemblage from both phases of field investigation.

### **PHASE 1B CONCLUSIONS**

Field testing concluded that wharf and landfill retaining structures were not present within the interior of Burling Slip where testing was conducted. However, based on the cartographic evidence and research conducted on the filling of slips such as Burling Slip, it was considered likely that wharf and retaining structures were present along the perimeter of the slip (immediately outside of the APE). It was concluded that such features, if present, would not be impacted by the proposed action. Fill material dating to the period during which the slip was filled, however, was encountered, and was sampled and documented. The artifactual evidence suggested that the filling of Burling Slip took place some time after 1850, although documentary and cartographic sources suggest filling took place during the late 1830s. In coordination with the LPC and SHPO, it was determined that no additional testing was required. The APE remained subject to the stipulations of the protocol for Unanticipated Discoveries of Archaeological Resources, contained within the Archaeological Testing Protocol for Burling Slip, which included detailed plans for the treatment of any Unanticipated Discoveries made during construction.

## **Chapter 3: Unanticipated Discovery & Bulkhead Documentation**

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### **A. INTRODUCTION**

Early in the course of excavation for the construction of Imagination Playground at Burling Slip, the construction team encountered a timber feature and the archaeologist was contacted. On May 26, 2009, this feature was exposed more fully under the supervision of the archaeologist, Environmental Inspector, and Project Manager, and was determined to be a wood bulkhead, apparently constructed as the east wall of what was once a portion of Burling Slip. This chapter summarizes the process of exposing and documenting the bulkhead and the physical characteristics of the timber structure. The results of supplementary historical research are presented which provides new insight into the construction history of the bulkhead. The results of the dendrochronology are then presented, followed by a description and analysis of the artifacts found at Burling Slip.

### **B. BULKHEAD EXCAVATION AND DOCUMENTATION**

In order to better understand the feature and its extent within the APE, the bulkhead was exposed for a length of roughly 190 feet. Excavation was undertaken by DPR contractors under the guidance and supervision of AKRF archaeologist Molly McDonald using a combination of backhoe and manual excavation. The archaeologist documented the bulkhead during the course of excavation through field notes, photographs, sketches, and scale drawings of the bulkhead and its components. Artifacts were sampled from the fill on both sides of the bulkhead. Frequent input and guidance was obtained from LPC and SHPO during the course of the excavation and documentation process. Arthur Bankoff and Amanda Sutphin (LPC) visited the site on May 27. Amanda Sutphin made a second site visit on May 28. The archaeologist consulted with Doug Mackey (SHPO) by telephone on May 27 and May 28.

It should be noted that bulkhead documentation revealed that almost the entire linear extent of the feature within the APE was located immediately beneath an active water line. For logistical reasons outlined in the Burling Slip Testing Protocol document, the immediate location of known utility lines was avoided during the Phase 1B field survey. Therefore, the bulkhead had not been encountered during the Phase 1B survey trenching due to its location beneath the utility.

### **DESCRIPTION OF THE BULKHEAD**

A plan view of the bulkhead in its entirety is provided as **Figure 4**. A more detailed view of this drawing, separated into two sections, is presented as **Figure 5**. Labels denoting the locations of tie-backs, piles, broken or damaged portions of the bulkhead, metal spikes, artifact pockets, and other field observations are included on Figure 5. The depth of the top of the bulkhead at various points and the locations of deep excavation areas are also shown. Photographs of the bulkhead are provided in the Photographs section of this report (see the **Photo Key** and **Photographs 1** through **12**).

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The top of the timber feature ranged in depth between 2'2" and 6' below ground surface<sup>1</sup> depending on location (the top of the feature was shallower to the south and greater to the north). Over the course of excavation, the feature was exposed to a depth varying between 4 and 8 feet below ground surface. The water level on the site (depending on tide and location within the APE) ranged from 4 to 6 feet below ground surface. It was not possible to pump or dewater the site.

The bulkhead ran in a roughly north-south orientation along the eastern edge of the Burling Slip APE (the bulkhead angled slightly, ranging from roughly 5 to 14 feet west of the east sidewalk of Burling Slip).

No clear northern or southern terminus of the bulkhead was encountered within the APE as they were apparently located beyond the excavation area. The trench containing the wall was terminated to the south at a point approximately 40 feet north of the intersection of Burling Slip and South Street. The bulkhead appeared to continue in a straight line beyond the trench limits. Excavation did not extend further to the south because no impacts were expected in the far southern portion of the project site. To the north, the trench containing the bulkhead was excavated to a point roughly 31 feet south of the intersection of Burling Slip and Front Street. As described in greater detail below, several angled timbers associated with the bulkhead seemed to suggest that the bulkhead had either a loss of integrity in this location or a changed course, veering to the west. A section of bulkhead was later encountered and documented in an excavation area a few feet north and west of the main trench (described in more detail below).

The trench containing the bulkhead was excavated to a depth of between 3 and 6 feet (generally sloping to greater depths towards the north, where the top of the bulkhead top was also deeper). At the request of Amanda Sutphin of LPC, two deep probe areas were excavated along the sides of the bulkhead to a depth of 6 to 9 feet (below the water line). The bottom of the bulkhead was not encountered. Visibility in deep probe areas was limited, due to the high water level. Brief views were afforded to approximately 2 feet below the water level (up to 9 feet below ground surface) before water filled in the trench.

Towards the northern end of the trench, the overall integrity of the bulkhead decreased and in two locations, angled timbers suggested that portions of the wall may have become dislocated from their original positions (see Photographs 5 and 6). The presence of small piles along the sides of the angled timbers, however, implied that if dislocation occurred, measures were taken to stabilize the wayward timbers. Another possible explanation was also considered: that the angled timber was part of a system for anchoring or tying the bulkhead to an earlier section of bulkhead not yet encountered.

The archaeological field documentation was considered complete when the bulkhead within the linear trench was recorded, as no further impacts along the trajectory of the bulkhead were planned. At the request of SHPO, prior to backfilling the trenches, DPR contractors placed strips of geo-textile atop the bulkhead.

As construction proceeded, however, almost a year later, on April 4, 2010, an additional segment of bulkhead was unexpectedly exposed while driving piles and excavating for the northwestern corner of the playground structure (see Photographs 9 and 10). This section of bulkhead at the north end of the APE was on a different alignment from the bulkhead exposed during the previous year's documentation. It appeared to be the southeast corner of a landfill retaining

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<sup>1</sup> Ground surface is defined as the surface of the adjacent John Street sidewalk.

structure, with its west wall located approximately 15 feet west of the previous structure, and its south wall at approximately the same point as the northern end of the previously documented bulkhead. Like the previous bulkhead, this segment was constructed of squared and stacked horizontal timbers with square notches at the ends. A wood pile reinforced the outer (west) face of the bulkhead wall. This pile was subsequently removed and a sample was taken for dendrochronology. When removed, it was revealed that the pile had a pointed end with an apparent empty dowel hole of unknown function at the pointed end (see Photograph 11). The northern segment of bulkhead was at approximately the same elevation as the adjacent end of the earlier segment. Four horizontal courses could be observed, with the fourth course disappearing from view beneath the water line.

In summary, the additional segment of bulkhead was constructed of stacked squared timbers measuring between 10 inches and 12 inches square. The structure formed a linear north-south-oriented wall. Six courses of timber were exposed at the deepest probe area. The bulkhead was reinforced on both the north and south sides by timber piles located at irregular intervals. The bulkhead was also reinforced from the east by perpendicular horizontal timbers (“tie-backs”), which had been inserted into notches (typically square notches) on the face of the wall. The east ends of the tie-backs appeared to extend outside of the APE, under the sidewalk; and were not exposed during the excavation. Two tiers of tie-backs (upper and lower) were observed. Like the piles, the tie-backs were located at irregular intervals. Large metal spikes were used in several locations to connect two courses of timber (particularly in tie-back locations) or to reinforce crude scarf joints.

A tie-back located roughly midway along the length of the main section of bulkhead, designated U. 3 (the third tie-back noted in the uppermost tier of tie-backs) was one of several sections of the bulkhead that was sketched in the field. The east face of the wall at this tie-back is shown on Figure 6 and Photograph 7. In this example, the tie-back (U.3) was a round log with the west end hewn into a square notch. The notch was asymmetrical and did not appear to be carefully executed. It was fit into the wall face between the second and third courses of horizontal logs observed, positioned beneath a square-notched squared timber in the second course of timbers. At the point of this assembly, a timber pile was driven behind the bulkhead (on the opposite, ie. western face of the bulkhead). A metal spike was observed in the top course of timber in this location, apparently used to reinforce the assembly. The spike did not appear to penetrate any of the lower timbers, however, it may originally have gone through the second course of timber. A large empty saddle notch was observed on the upper face of the top course of timber immediately south of the tie-back assembly. The original function of this saddle notch was not apparent. When a deep excavation probe was undertaken on the west side of the bulkhead in the location of this tie-back assembly, the end of a lower tie-back was observed immediately beneath tie-back U.3. The western ends of both tie-backs are shown in Photograph 8, as is the timber pile used to reinforce the wall in this location.

The physical integrity of the exposed sections of bulkhead was compromised in several locations. This was chiefly due to previous utility installations, however, some rot was also evident, particularly in the shallowest portions of the feature.

It is likely that additional courses and tiers of tie-backs continued to far greater depths; however, the excavation could not be extended deeper to ascertain the vertical extent of the structure. In June 2009, the DPR project manager, Lawrence Mauro, and the construction crew noted during subsequent driving of micropiles into the interior of Burling Slip that a timber material was being encountered at depths exceeding 20 feet below ground surface. Due to the extreme depth,

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no detailed investigation could be done to ascertain the function or details of these deep timber deposits in the interior of the former slip.

Soils surrounding the bulkhead were generally composed of loose silty sands, as documented in greater detail in the Phase 1B study. A greater number of medium-sized rocks were noted on the east side of the bulkhead than on the west. However, on the whole, neither side was observed to contain a large number of rocks. The silty soil appeared in layers of varying colors ranging from 10 YR 4/6 (dark yellowish brown) to 10YR3/3 (dark brown) to 2.5 Y 2.5/1 (black). These silt layers appeared to be relatively uniform, yet widely undulating throughout the site, apparently the product of the process of tidal action and settlement. The presence of artifacts and artifact concentrations in the soils is described in Section D, “Artifact Analysis.”

### **C. ADDITIONAL DOCUMENTARY RESEARCH ON THE BULKHEAD**

In January 2010, the author presented the preliminary results of the Burling Slip bulkhead documentation to the Metropolitan Chapter of the New York State Archaeological Association. Archaeologist Arnold Pickman, who was in attendance, pointed out that an important source of historical information had been omitted from the Phase 1A research, namely, an Archaeological Documentary Study that Pickman himself had written on behalf of the South Street Seaport Museum on Block 74, Lot 20, on the corner of John and South Streets (Pickman 1999). During the course of the documentary research for this adjacent parcel, Pickman had elucidated the construction sequence of the wharf structures in the immediate vicinity of Burling Slip. As his research was directly relevant to the history and construction of the bulkhead, AKRF reviewed Pickman’s research and supplemented it with limited additional research. The following section briefly summarizes the history of land use and wharf construction described in Pickman’s Documentary Study. This research suggests that the main section of bulkhead encountered during the Burling Slip Bulkhead Documentation was Codwise’s Wharf, built ca. 1803. The small section of bulkhead in the northern portion of the APE appears to have been the southeastern corner of Remsen’s Wharf, constructed some time between 1756 and 1803.

In 1756, John Byvanck obtained a water lot grant permitting him to fill in the eastern portion of the block northeast of the Burling Slip APE. At some point after 1756, it appears the Byvancks built a wharf that not only covered that block, but also extended a short distance south of Front Street (overlapping with the northeast corner of the APE). This wharf was known as the Bowne/Byvanck Wharf.

George Codwise, Jr., the child of a prominent New York ship owner and Revolutionary War soldier, married John Byvanck’s daughter, Mary in 1790. George Codwise became partial owner of the Bowne/Byvanck Wharf when in 1799 the executors of John Byvanck’s estate deeded to Mary Codwise a tract of land “including the wharf and buildings which it contained,” which extended 37 feet and 9 inches south of Front Street.

By 1803, Codwise also obtained partial ownership of a water lot grant that encompassed the entire block south of the Bowne/Byvanck Wharf from Front Street to South Street and beyond to the south. The Minutes of the Common Council from April 25, 1803, indicate that other individuals, Simeon and Rem Remsen and John Riker, also claimed rights to portions of the Bowne/Byvanck wharf and the adjacent water lot. George Codwise, anxious to extend the wharf further into the East River, petitioned the Remsens and Riker, claiming that they repeatedly “refused or delayed” extending the wharf along Burling Slip to the south. The Remsens and Riker were threatened to either cooperate or have their grants revoked (MCC III:270). Two

months later, the Council resolved that the water lot grant would be given solely to George and Mary Codwise on the condition that they extend Burling Slip from Front Street to South Street, to create a wider slip measuring “one hundred feet in breadth” so that “the Street on the east side of the said Slip be twenty five feet wide” (MCC III:316). The terms of the actual water lot grant made to George and Mary Codwise on July 11, 1803 required that the Codwises make by December 1, 1803 “a good sufficient & firm wharf” to the specific dimensions described therein (Grants of Land Under Water Liber E:57).

During his 1999 research, Pickman discovered a map in the collection of the New York Historical Society drawn by Rem Rensen and dated June 22, 1805. This map has been re-photographed and included in this report as **Figure 7**. This map shows “Burlings Slip” at the top of the page (west), Front Street on the right (north), and a bulkhead immediately east of Burling Slip (labeled as the wharf “newly built”) depicted in yellow. The map also shows portions of the wharfage that existed at the time of the 1803 petition (the Bowne/Byvanck Wharf), which extends a short distance south of Front Street. An irregular corner section immediately south of Front Street extending into Burling Slip, is labeled Rensen’s Wharf. It extends west of the principal Bowne/Byvanck wharf structure into the northeast corner of the APE. Neighboring Rensen’s Wharf to the east is a section called “J. Riker’s Smith Shop,” followed by stores and vacant lots owned by George Bowne and P. Schermerhorn.

The 1805 Rensen map depicts in some detail the bulkhead “lately built” that would extend the wharf south into the East River. The newly constructed bulkhead is apparently the very bulkhead documented in the field as part the Bulkhead Documentation effort. The map depicts the bulkhead extending along the eastern edge of Burling Slip a distance of 325 feet into the East River (beyond South Street) from a point 32 feet south of Front Street. The mapmaker, Rensen, appears to have been concerned with the fact that the bulkhead was not completely straight (bowing slightly westward into the slip in the middle) and did not quite meet the 100-foot width requirement specified by the Common Council. Rensen color-coded the map to illustrate the actual versus the ideal trajectory of the bulkhead. The actual face of the bulkhead is depicted in yellow. The red line depicts the 100-foot-width bulkhead line requested by the Common Council, and the green line denotes a straight line from the northern and southern terminus of the actual bulkhead (ie. the actual bulkhead if the bow were straightened). No documentary evidence was found to suggest that the bulkhead was ever straightened.

The bulkhead itself appears to be depicted on the 1805 Rem Rensen map as a wall in form. Small circles drawn along the edge of the wall may suggest that piles were used to reinforce it. No similar bulkhead had yet been built along Beekman’s Slip to the east. Therefore, the only portion of the future Codwise’s Wharf that existed at that time was the west wall (the Burling Slip bulkhead). It is clear that landfilling to create the wharf had not yet begun, since nothing was in place to retain the fill on the east or south sides. The Burling Slip bulkhead must have been able to exist as a free-standing timber wall jutting into the East River for at least two years until the rest of the wharf was built. In regards to the construction of the bulkhead, the 1805 illustration appears to be consistent with the structure encountered in the field, in that it appears to show a linear wall in form stabilized with piles. It is assumed that the tie-backs encountered in the field would have existed at this time, however, it is not clear how the tie-backs above the river sediment would be anchored prior to filling within the wharf.

Subsequent Common Council minutes of July 21, 1806 document that the ever-determined Codwise petitioned for “sinking the Bulkhead at Beekman Slip as soon as possible, which will give it time to settle previous to the filling in with earth.” Codwise notes that he “cannot fill up

his ground until [the adjacent landowner] Schermerhorn fills his - which Mr. Schermerhorn will not do until the Bulkhead is sunk as it will be washed into the River.” While Codwise had paid for the bulkhead along Burling Slip, he proposed that the City share in the cost of this bulkhead, charging the Corporation between 800 and 900 dollars towards the accomplishment of the work. The minutes note that “the Dock builders will wait for it until next May, if desired, & without Interest (MCC IV:250-251).

The filling and completion of Codwise’s Wharf, of which the Burling and Beekman Slip bulkheads formed the west and east sides (respectively) was completed by 1807, as Codwise was assessed for the land in this year. Within a few years, Codwise and Schermerhorn went on to extend their wharf further into the East River beyond South Street, as documented in subsequent Minutes. On July 29, 1811 the Common Council minutes recorded “A memorial from George Codwise junr & Peter Schermerhorn ... stating that the wharf on the East side of Burling Slip was overflowed by the tides & praying that the same might be raised” (MCC VI:662). Pickman’s research indicates that George Codwise, Jr. died on August 16, 1816 at the age of 61, surviving his father, who died in 1814 at the age of approximately 82 years, by only two years (Academy of Genealogy 1966).

## D. DENDROCHRONOLOGY

The Lamont-Doherty Earth Observatory Tree-Ring Laboratory (TRL) visited Burling Slip during on-site excavation to assist the archaeologist in selecting timber samples for analysis. Seven samples were taken from various portions of the bulkhead. Samples 1 through 4 (coded BS-1 through BS-4) were taken from the northernmost segment of the exposed bulkhead (now believed to be the southeast corner of Remsen’s Wharf) on April 4, 2010. On April 15, 2010, samples 5 through 7 (BS-5 through BS-7) were taken from a portion of bulkhead roughly midway along the length of the main segment of wharf (now believed to be Codwise’s Wharf). The collected samples were transported to TRL’s laboratory in Palisades, New York, where they were dried slowly over the course of several weeks and then sanded to a uniform surface. The results of the tree ring analysis are provided in TRL’s report (**included as Appendix C**). A brief summary is given in **Table 2** and interpretation is provided below.

Analysis of the samples revealed that all seven timbers consisted of conifer species; five samples of eastern hemlock (*Tsuga canadensis*), one sample of pitch pine (*Pinus rigida*), and one sample of eastern white pine (*Pinus strobus*). All of these species are known to have been available from local sources during the late 18th and early 19th centuries. Their likely local origin was confirmed through a comparison of their ring series to those of the Hudson Valley tree-ring master data set for each of the species. A strong match was evident in all cases, suggesting that the timber used to build Burling Slip was rafted to New York from the northern Hudson Valley.

The implications of the dendrochronology in terms of construction date and sequence are more complex. Because many of the Burling Slip bulkhead timbers were hewn square prior to bulkhead construction, the bark and outer rings (the “waney edge”) of many of the timber samples were missing, making it impossible to date the last year of the tree’s growth. Out of the seven samples, only two samples (BS-2 and BS-4) retained a clear waney edge and could be attributed a definitive felling date. The first, BS-2, was a round hemlock log, pointed at one end which had been used as a vertical pile to stabilize the northernmost segment of the bulkhead (Remsen’s Wharf). This timber began its life in 1714 and was felled in 1825. The second was BS-4, a semi-circular white pine sample that formed the third exposed horizontal course from the top in the northernmost segment of bulkhead. It commenced growing in 1631 and was felled

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in 1720. The discrepancy of over 100 years (1720 to 1825) between the felling dates of the two timbers in the northernmost segment of bulkhead suggests one of two possible scenarios. First, the white pine sample BS-7 may have been 105 years old when it was first incorporated into the bulkhead. Second, the bulkhead may have been initially constructed ca. 1720 and the timber pile BS-2 added ca. 1825 to shore or modify it. The latter scenario does not appear likely based on the documentary evidence.

Two other timbers were sampled from the northernmost section of the bulkhead. Timber BS-3 formed the course immediately above the 1720-dated timber BS-7, discussed above. This sample was a semi-circular hemlock timber which began its life in 1495. The timber had up to 230 rings with the last ring still intact dated to 1724. Because the timber did not appear to have been squared, it is likely that 1724 was a relatively accurate felling date for the sample; however, because no bark was present, it is possible that the tree continued to live beyond that date. The final sample taken from the northernmost segment of bulkhead was BS-1, the uppermost course of horizontal timber found in this location. This timber was a squared pitch-pine timber which would have begun growing in 1686. The last intact ring dated to 1793, but due to the absence of a waney edge, the actual felling date could have been later.

Three timber samples were taken from the main segment of bulkhead (Codwise's Wharf), approximately midway along the total length of the bulkhead within the APE. None of these three timbers retained a waney edge and all of the samples were hemlock. Two formed neighboring segments of the top course of the bulkhead wall: BS-5 and BS-7. The former showed minimal signs of squaring, but lacked a waney edge. It began growing in 1607 and the last surviving ring dated to 1760. The second, BS-7, was squared, began its life in 1674 and had a final surviving ring dating to 1816. One additional timber sample, BS-6, was taken from the course immediately below BS-5. It was heavily squared. It began its life in 1509 and its last ring dated to 1823. Due to the lack of waney edge found on any of the timber samples from the southern portion of the bulkhead, it is not possible to assign a construction date to this portion of the bulkhead. However, it is likely that the entire section of bulkhead was constructed sometime after 1823 based on the 1816 and 1823 rings present in BS-7 and BS-6, respectively.

**Table 2**  
**Summary of Dendrochronology Results**

Sample ID	Wharf Segment	Position	Waney Edge	First Ring	Last Ring	Species
BS-1	North/Remsen's	Horizontal, Top Course	No	1686	1793	Pitch pine
BS-2	North/Remsen's	Vertical Pile	Yes	1714	1825	Hemlock
BS-3	North/Remsen's	Horizontal, Second Course	No	1495	1724	Hemlock
BS-4	North/Remsen's	Horizontal, Third Course	Yes	1631	1720	White pine
BS-5	South/Codwise's	Horizontal, Top Course	No	1697	1760	Hemlock
BS-6	South/Codwise's	Horizontal, Second Course	No	1509	1823	Hemlock
BS-7	South/Codwise's	Horizontal, Top Course	No	1674	1816	Hemlock

In summary, the tree ring analysis clearly indicates that the timber used to build the Burling Slip bulkhead consisted of conifers felled in the northern Hudson Valley. However, the implications of the dendrochronology are more problematic in regards to a construction chronology for the bulkhead. Because many of the members used to construct the bulkhead were hewn square, the outer rings of the timbers were removed and no definitive felling date could be identified.

Documentary evidence suggests that the north section of wharf (Remsen's Wharf) was built between 1756 and 1803, and the main/southern segment of wharf (Codwise's Wharf) was built in 1803. The two wharf timbers for which dendrochronology could supply a definitive felling date (BS-2 and BS-4), both part of Remsen's Wharf, dated to 1825 and 1720, respectively. Neither of these dates appears consistent with the date range expected for the construction of the wharf, BS-4 being substantially earlier in date and BS-2 being substantially later. Of the three timber samples analyzed from Codwise's Wharf, two were clearly still growing in 1816 and 1823 respectively, one to two decades after Codwise's Wharf was built based on documentary evidence. It is likely that the upper courses of the bulkhead (from which the samples were taken), located within the tidal zone, would have been subject to rot, damage, and replacement. The range of dates reflected by the dendrochronology probably reflects ad-hoc repairs to the bulkhead using a variety of new and reused timbers. In short, the dendrochronology for Burling Slip does not appear to provide conclusive indications of the original construction date of the bulkhead.

## E. ARTIFACT ANALYSIS

### METHODOLOGY

The methodology used for the collection and processing of artifacts during the Bulkhead Documentation phase was similar to that used during the Phase 1B field investigation. Artifacts collected in the field were transported to the AKRF laboratory where they were logged in and the artifacts washed in a solution of warm water and mild detergent. Artifact processing and cataloguing was undertaken by Diane Dallal, RPA, Molly McDonald, RPA, and Elizabeth Meade, RPA. Fragile artifacts (e.g. some bone, soft shell, mortar, plaster) were dry brushed. Artifacts were dried on metal drying racks. They were subsequently repackaged in clean, 4 ml acid-free, polyethylene bags that were marked with the site name, date of recovery, and provenience in indelible ink. The bags were vented to provide ventilation and to prevent mold.

To the extent possible, recovered artifacts were identified as to material, temporal or cultural/chronological association, function, and style following the standard archaeological references. The artifact analysis included the identification of the Terminus Post Quem (TPQ) of artifacts for each context and the generation of mean beginning and end dates for each artifact when known.

A modified form of Stanley South's (1977) approach to organizing historical archaeological data was used for this project. All artifacts were categorized by group: Activities, Architectural, Clothing, Furniture, Kitchen, Personal, Tobacco and Unidentified. Artifacts were also identified by Class, (e.g. Nails, Window Glass, Unidentified, Decorative Furnishings, Container, Dishes, Ethnofaunal, Ethnobotanical, etc.). Artifacts were also categorized by material (e.g. glass, slate, Fe, Cu alloy, bone, etc.), although the term, "Ware Type" (e.g. plain whiteware, grey salt-glazed stoneware) was used with regard to ceramics. The artifacts were further identified, when possible, by Function (e.g. floor tile, chamberpot, wine/liquor bottle, wire nail, mirror, etc.) and Part (e.g. base, rim, finish, etc.). Beyond these basic groupings, artifacts were also described (e.g. decorative motifs, color, and manufacturer) under "Comments."

The complete artifact catalogue for the Phase 1B investigation is included as **Appendix A**. The complete artifact catalogue for the Bulkhead Documentation phase is included as **Appendix B**. This section briefly reviews the results of laboratory analysis specific to the Bulkhead

Documentation phase. The section then proceeds to analyze the artifacts recovered in both phases as a complete assemblage.

In keeping with the suggestion of Dr. Arthur Bankoff and Amanda Sutphin (LPC), the artifacts have been divided into those that were recovered from the east side of the Burling Slip bulkhead (which would presumably have constituted the interior of the wharf) and the west side of the bulkhead (which would have constituted the interior of the slip). At the time of the Phase 1B investigation, the location of the bulkhead was not known and therefore this approach was not originally taken. However, for the purposes of the present analysis, the Phase 1B artifacts were retrospectively categorized according to their location east or west of the bulkhead. The only artifact-producing trench excavated on the east side of the bulkhead during the Phase 1B investigation was Trench 5.

#### **SUMMARY OF ARTIFACTS RECOVERED DURING BULKHEAD DOCUMENTATION**

A total of 165 artifacts was recovered and catalogued as part of the Bulkhead Documentation phase of the project. As stated above, a complete catalogue of the artifacts recovered and processed as part of the Bulkhead Documentation phase of the project is included in **Appendix B**. Photographs showing a selection of the artifacts recovered and processed are provided as **Photographs 13** through **19**. No artifacts were collected from the top 1.5 feet below ground surface. Instead, collection during this phase focused on the soils immediately surrounding the bulkhead, both vertically and horizontally.

In general, artifacts appeared to be relatively evenly distributed throughout the fills on the site. The few exceptions to this rule are described in more detail below. Artifacts collected during Bulkhead Documentation were sampled with the conscious aim of representing both the east and west sides of the bulkhead. A small number of artifacts were also collected from “within” the bulkhead, a category that includes spikes nailed into the bulkhead or artifacts packed into the notches of the bulkhead. The small number of artifacts found within the notches were firmly packed into position, however, it is not certain if they were placed there intentionally to make the notch assembly tighter or whether they were incidentally wedged into the notches through tidal action or the filling process.

A concentrated pocket of artifacts consisting primarily of bottles was noted immediately west of the bulkhead and at an elevation just above the extant top of the bulkhead in that location. The location of this cache or pocket is illustrated on **Figure 5** and is shown on **Photograph 12**. It was referred to in the field and in the Artifact catalogue as “the brick artifact pocket north of tie-back U.2.” The pocket contained a large number of bottles, several bricks, and sheet-like chunks of a hard substance that may have been a 19th century paving material. It was clear from its jumbled orientation that the material was not in its original location, however, it is possible that it was at one time used to pave Burling Slip or a nearby street and was dislocated and discarded during a subsequent paving or construction episode. In addition to this material a large numbers of liquor and/or utility bottles were packed into the pocket. None of the bottles were whole, but many were approximately 40 to 60% intact. Approximately 50 bottle fragments from this context were sampled. It is likely that at least 40 individual bottles were represented by the fragments noted in this area in the field. Based on the physical characteristics of the bottles, all appeared to have possible manufacture dates between 1820 and 1860. In addition, a yellow brick and a red brick, a piece of roofing slate, a smoking pipe, and several ceramic fragments were recovered from within or adjacent to this artifact pocket. A puzzling piece of salt-glazed

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stoneware was included in this assemblage. The piece was curved on two surfaces and glazed on both sides. Along the edge it was embossed with "...RAN..." and a small portion of a decorative element, possibly a sheaf of wheat, remains. The shape of the stoneware suggested a seal or decorative medallion.

A second concentration of artifacts was encountered during Bulkhead Documentation. This pocket was located on and around the top of the bulkhead towards the northern portion of the APE. It was situated in the area where the bulkhead appeared to diverge in two directions: a timber oriented diagonally (at a roughly 30 degree angle to the rest of the bulkhead) suggested either a dislocated section of bulkhead or a construction feature of unknown function. This artifact concentration (also illustrated on **Figure 5**) occupied a larger area than the brick and bottle pocket described above but was more loosely concentrated and consisted entirely of ceramics. Artifacts contained in this pocket included whiteware, pearlware, and annularware dishes and cups decorated with transfer-printed and hand-painted designs. The sizes of the sherds were relatively large. Repetition of the designs on multiple vessels and vessel types within the concentrated assemblage suggests that portions of china sets were deposited in this location at the same time. It is possible that the dishes were part of a commercial shipment that was damaged in transport and discarded into the slip.

Further analysis of artifact dates, types, and distributions for both phases of the project are provided below.

### **INTERPRETATION OF ARTIFACTS FROM BOTH PHASES OF INVESTIGATION**

Following an initial review of the artifacts collected as part of the Bulkhead Documentation effort, the artifacts from the documentation phase and the earlier Phase 1B investigation have been analyzed as one complete assemblage. A combined total of 902 artifacts were recovered and catalogued. For the purposes of analysis, they have been divided into categories based on their location in relation to the bulkhead.

It should be noted that on the whole, artifacts encountered during excavation appeared to be relatively evenly distributed throughout the fill both east and west of the bulkhead. Except in limited locations (such as the concentration of ceramics along the breached portion of bulkhead and the bottle cache on the west side of the bulkhead) artifacts were not located in obvious pockets and concentrations.

It was hypothesized that artifacts found east of the bulkhead (including those recovered from Trench 5 during the Phase 1B investigation) would have originated within the wharf immediately east of Burling Slip. The date at which the wharf was constructed and filled would have been earlier than the date at which the adjacent slip was filled (ca. 1835 based on documentary sources). Thus, the fills and artifacts encountered east of the bulkhead might be earlier in date than those on the west side of the bulkhead. Additional categories were created for artifacts whose locational relationship to the bulkhead was not clear. This included artifacts recovered from back dirt during excavation. The category also included a large pocket of ceramics located immediately along the bulkhead wall in a location in which the wall appeared to be breached or damaged. Lastly, a fourth category was used in the analysis consisting of artifacts found within the bulkhead wall. This included iron spikes that were nailed into the bulkhead and objects that were wedged into the notches of the bulkhead.

*ARTIFACT DISTRIBUTION BY TERMINUS POST QUEM*

In order to test the theory that fills encountered within the wharf (on the east side of the bulkhead) would be earlier than those used to fill the slip (on the west side of the bulkhead), the artifacts were divided according to their location, and a TPQ was identified for the assemblages in each context. A summary of this analysis is presented in **Table 3**. It should be noted that the sample sizes varied widely from context to context.

**Table 3**  
**Summary of All Artifacts by Location and TPQ**

Phase	Location	Total	TPQ at Bulkhead Levels*
<b>East of Bulkhead</b>			
Phase IB	Trench 5	49	1840
Bulkhead Doc.	East of Bulkhead	39	1840
<b>Total</b>		<b>88</b>	<b>1840</b>
<b>West of Bulkhead</b>			
Phase IB	Trench 1	6	1820
Phase IB	Trench 3	660	1850
Phase IB	Trench 4	6	1840
Phase IB	Trench 6	12	1840
Bulkhead Doc.	West of Bulkhead	76	1840
<b>Total</b>		<b>760</b>	<b>1850</b>
<b>Within Bulkhead</b>			
Bulkhead Doc.	Embedded or affixed into bulkhead	8	1760
<b>Total</b>		<b>8</b>	<b>1760</b>
<b>Unknown or Undetermined</b>			
Phase IB	Sampled Back Dirt	4	1840
Bulkhead Doc.	Pocket of ceramics along damaged portion of bulkhead	42	1831
<b>Total</b>		<b>46</b>	<b>1840</b>
<b>Grand Total</b>		<b>902</b>	<b>1850</b>
<b>Note:</b> * Where Phase IB testing results included later TPQs that appeared to be located within shallower or disturbed contexts, these TPQs were removed from the analysis presented in this table.			

A comparison of the artifacts within the wharf and those found within the slip indicates no substantial distinction in artifact TPQs. The overall TPQ for artifacts on the east side of the bulkhead was 1840, while on the west side it was 1850. On the whole, the dates of were very similar and both were somewhat later than would be expected based on the expected dates of wharf construction and slip filling suggested by the documentary evidence presented in the Phase 1A study.

The collection of artifacts found wedged into the bulkhead itself had an earlier TPQ of 1670. This date resulted from the presence of a fragment of British buff-bodied slipware (manufactured from ca. 1670 to 1785) found wedged firmly into the assembly where tie-back “U.2” connected to the bulkhead wall. Because the sample size of artifacts wedged into the wall was extremely limited, the early date of this artifact is not considered strongly suggestive of a construction date for the bulkhead.

## **Burling Slip Bulkhead Documentation**

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A TPQ of 1840 was identified for the artifacts whose locational origin in relationship to the bulkhead wall was unclear. Within this category, the large concentration of ceramics found along an apparently breached or damaged portion of the bulkhead had a TPQ of 1831.

One possible explanation for the similarity in TPQs on the east and west sides of the bulkhead is that ground disturbance occurred within both the slip and the wharf after construction of the wharf and filling of the slip. Alternatively, the TPQ of 1850 for the interior of the slip may lead to the conclusion that the slip was filled slightly later than suggested by documentary sources. This theory was espoused in the Phase 1B study, which noted: “The artifactual evidence places the filling of Burling Slip at some time after 1850 although documentary and cartographic sources suggest filling took place during the 1830s.” If the slip was indeed filled in the 1850s, it is possible that artifacts in fills deposited at that time migrated to the east side of the bulkhead through apertures in the construction or damaged portions of the bulkhead. Migration might have happened during the initial filling of the slip or may have occurred gradually through tidal action. The loose silty fills within both the slip and the wharf would likely have been prone to substantial movement in the East River tides, even after the slip was filled. Given that the APE included only the westernmost edge of the wharf, it is possible that artifact migration from slip was more prevalent here than it was closer to the center of the wharf’s interior (east of the APE).

### *ARTIFACT DISTRIBUTION BY FUNCTIONAL GROUP*

In order to understand what kinds of artifacts were represented in the fill used to build the wharf and fill the slip, artifacts were analyzed by their functional group. **Table 4** presents a summary of the artifact assemblage by location (grouped again by their physical relationship to the bulkhead) and the numbers of artifacts associated with each functional group. The percentage of each functional grouping within each context and within the entire artifact assemblage is also presented.

Chapter 3: Unanticipated Discovery & Documentation of Timber Bulkhead

Table 4  
Summary of All Artifacts by Location and Functional Group

Location	Unident	Archit'l	Infra-structure	Activities	Clothing	Kitchen	Household	Personal	Furniture	Tobacco	Manufac	Poss Prehist	Total
Phase 1B, Trench 5		2		5	2	38	1			1			49
Bulk Doc Ph	2	3		2	1	28			1	2			39
<b>East of Bulkhead TOTAL</b>	<b>2</b>	<b>5</b>		<b>7</b>	<b>3</b>	<b>66</b>	<b>1</b>		<b>1</b>	<b>3</b>			<b>88</b>
Percentage	2.27%	5.68%		7.95%	3.40%	75%	1.14%		1.14%	3.40%			
Phase 1B, Trench 1		2		1		3							6
Phase 1B, Trench 3	1	64		107	47	416	6	1	11	2	1	4	660
Phase 1B, Trench 4				1	1	4							6
Phase 1B, Trench 6				3	3	6							12
Bulk Doc		7	3	4		59				2		1	76
<b>West of Bulkhead TOTAL</b>	<b>1</b>	<b>73</b>	<b>3</b>	<b>116</b>	<b>51</b>	<b>488</b>	<b>6</b>	<b>1</b>	<b>11</b>	<b>4</b>	<b>1</b>	<b>5</b>	<b>760</b>
Percentage	0.13%	9.61%	0.39%	15.26%	6.71%	64.21%	0.79%	0.13%	1.45%	0.53%	0.13%	0.66%	
Ph 1B Undetermined							4						4
Bulk Doc Undetermined		1		1		36	4						42
<b>Undetermined TOTAL</b>		<b>1</b>		<b>1</b>		<b>36</b>	<b>8</b>						<b>46</b>
Percentage		2.17%		2.17%		78.26%	17.39%						
<b>Within Bulkhead TOTAL</b>		<b>5</b>		<b>1</b>		<b>2</b>							<b>8</b>
Percentage		62.5%		12.5%		25%							
<b>Grand Total</b>	<b>3</b>	<b>84</b>	<b>3</b>	<b>125</b>	<b>54</b>	<b>592</b>	<b>15</b>	<b>1</b>	<b>12</b>	<b>7</b>	<b>1</b>	<b>5</b>	<b>902</b>
<b>% Total</b>	<b>0.33%</b>	<b>9.31%</b>	<b>0.33%</b>	<b>13.86%</b>	<b>5.99%</b>	<b>65.63%</b>	<b>1.66%</b>	<b>0.11%</b>	<b>1.33%</b>	<b>0.78%</b>	<b>0.11%</b>	<b>0.55%</b>	

## **Burling Slip Bulkhead Documentation**

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Overall, Kitchen-related artifacts were the best represented group at Burling Slip, making up 65% of the total collection. The group was also best represented in three of the four location categories devised for analysis, making up 75% of the artifacts east of the bulkhead, 64% of the artifacts on the west side of the bulkhead, and 78% of the artifacts of unknown locational association. Artifacts embedded in the bulkhead were only 25% Kitchen-related because this grouping included several spikes (categorized in the Architectural grouping) used in the construction of the feature. The majority of the Kitchen-related artifacts found at the site were fragments of dishes and cups. The bottle cache described earlier on the west side of the slip may have been deposited as part of a slightly later grading episode. While this feature contained a large number of mid-19th century bottle fragments, bottles were not found in large numbers elsewhere in the slip.

The Activities category constituted 14% of the total artifact assemblage. This grouping constituted the second largest percentage both east and west of the bulkhead (8% and 15% respectively) and was comprised largely of oyster and clam shells and various types of bones. The bones principally belonged to large mammals such as cows and pigs, and based on processing marks, the majority are believed to be food remains. A large cow mandible may also have been the byproduct of butchering though no butchering marks were noted (see Photograph 16). The shells are also believed to be food remains. Most of the shells were generally chipped and scuffed making it difficult to discern processing marks. It is interesting to note that at another recent archaeological investigation in Lower Manhattan, the Vehicular Security Center/World Trade Center Site, AKRF archaeologists found many oysters with both valves still intact in a late 18th and early 19th century wharf and landfill context. Based on their location and condition it appeared that these bivalves had not been processed as food and discarded, but rather were discovered in their natural habitat. At Burling Slip, however, no bivalves were found with both sides intact, indicating that they were deposited either as part of either primary or secondary fill episodes.

The Architectural grouping was reasonably well represented on both sides of the bulkhead, comprising 9% of the total artifact count. With the exception of Architectural materials relating to the early 20th century construction of a comfort station on the site, most of the materials in this grouping consisted of Dutch yellow bricks and red bricks. In addition, one small (2-inch by 2-inch) fragment of delft tile was recovered (see Photograph 17). The tile features a hand-painted scene in purple, apparently a hillock and a house. While the fragment is too small to ascertain its subject, it may depict a biblical scene or landscape.

Clothing was fairly well represented, making up 6% of the artifact assemblage, including 3% of the total artifacts on the east side of the bulkhead and 7% of the artifacts on the west side of the bulkhead. The majority of the clothing was made up of shoes and fragments of shoes (see Photograph 19). The shoe assemblage is addressed in greater depth in the next section.

Household items (primarily chamber pot fragments) were strongly represented only in the context of the artifacts of undetermined origin, taken both from the back-dirt during Phase 1B investigation and from the pocket of ceramics found along the damaged section of bulkhead.

Other categories included Infrastructure, represented solely by several large chunks of a possible early paving material which comprised part of the bottle cache at an elevation slightly higher than the top of the bulkhead. This hard asphalt-like material contained gravel and many tiny fragments of glass, animal hair, and other inclusions.

Four clay smoking pipe stems (Tobacco group) were recovered from the west side of the bulkhead. None of these bore designs or makers marks that would allow for precise dating. A total of 12 artifacts from the Furniture grouping were recovered; all fragments of red earthenware flowerpots.

In general, a fairly wide range of artifact types were represented at Burling Slip with a relatively even distribution throughout the site, both east and west of the bulkhead. In general, no strong difference is noticeable between the fills within the slip and those within the westernmost edge of the wharf. Overall, the artifacts best represented in the project site fills were Kitchen-related ceramics that could have been discarded by merchants or could have been domestic trash. With only a few exceptions (such as the ceramic pocket discussed earlier) the size of the ceramic sherds tended to be quite small, possibly suggesting a secondary refuse deposit. Also common in the fill were bones and shells, principally the byproducts of food processing. Lastly, Architectural elements and Clothing were well represented. Further consideration of the shoe assemblage is presented below.

#### *A CLOSER LOOK AT THE SHOE ASSEMBLAGE*

A total representative sample of 24 shoes and/or leather scraps were recovered during the Phase IB investigation, 22 of which were in Trench 3 (on the west side of the bulkhead) and 2 of which were in Trench 5 (on the east side of the bulkhead). Only one shoe fragment was recovered as part of the Bulkhead Documentation phase of investigation; this was taken from the east side of the bulkhead. Examples of the shoe assemblage are provided in Photograph 19.

Photographs of the shoe fragments recovered during the Phase 1B investigation were sent to Valentine Povinelli and Domenic A. Saguto, experts on historic shoes at Colonial Williamsburg in Virginia. The following information is abstracted from information provided by Povinelli and Saguto via email correspondence in October 2010 and April 2011.

The assemblage represented at Burling Slip included fragments (insoles, welts, vamp and quarters, split-lifts and heel bases) of shoes which based on stylistic characteristics on the whole appeared to date to the first half of the 19th century. The majority of shoes exhibited a square toe shape, a form which was introduced as early as 1817 and became dominant by 1825. Another diagnostic aspect of the shoe assemblage was a vamp-to-quarters dog-leg side-seam arrangement popularly utilized from around the 1810s through the 1840s. The majority of shoes at the site exhibited stitching channels along the perimeter of the sole and hand-applied wood pegs to hold together the stacked layers of the heel. At least one example had a sole that had been hand-pegged around the perimeter rather than stitched. According to Povinelli and Saguto, “the technique of pegging soles emerged in the United States around 1815, became the dominant method of constructing inexpensive shoes by circa 1830, and by 1850 was replaced by steam-powered machine pegging.” Therefore, the hand-pegged soles in the Burling Slip shoe assemblage most likely date to the second quarter of the 19th century.

Other aspects of the shoe assemblage that are noteworthy if less indicative of a manufacturing date include the fact that most of the shoes appear to be men’s. It was apparent that some of the examples had been built on a last (wood form) that was straight while others were built on a left or right last. According to Saguto, “Straight (non-left and right) lasts were introduced circa 1580 as an economy measure for shoemakers when the heel came into fashion. By circa 1790s, left- and right-shaped lasts are coming back into fashion. Up through most of the 1800s you’ll find both—straights for cheaper shoes and left and rights for better quality footwear.”

## **Burling Slip Bulkhead Documentation**

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Where the shoes originated and how they were disposed of is not completely clear. Several previous archaeological excavations in landfill areas in lower Manhattan have also observed the presence of shoe fragments and leather scraps in fill (Cantwell and Wall 2001:189). “Shoemaker’s Pasture” or “Shoemaker’s Land” was located in an area near John Street, covering several blocks between Maiden Lane and Ann Street, east of Broadway. According to Saguto, between 200 and 300 shoemaking firms operated in this area by the late 18th century. They later moved to “the Leather Swamp” an area above Beekman Street, near Gold Street. It is generally considered likely that detritus from the tanneries and shoe maker’s shops deposited along the waterfront accounts for the typically large volume of shoes in Lower Manhattan landfill. As Burling Slip is particularly near the shoemaking district, it is very possible that some of the leather refuse originated there.

The assemblage of shoes and shoe fragments recovered at Burling Slip appears to consist of used shoes rather than scraps that would have been the byproduct of tanning or shoemaking. Saguto notes that there was “a thriving industry in second-hand shoes, refurbishing and re-selling as well as mending.” Thus, the Burling Slip shoe assemblage may be the refuse of second-hand shoe dealers or mending cobblers rather than shoemakers per se. Saguto notes that the approximate rate of consumption for shoes in the 18th century was 2 to 4 pairs per person per annum. Given the population of Lower Manhattan in the late 18th and early 19th century, a large volume of worn-out shoes would have been discarded in some manner in the vicinity.

**A. BULKHEAD DOCUMENTATION CONCLUSIONS**

Based on the field documentation, the bulkhead wall itself was built of squared hemlock and pine timbers. It was built using stacked-log construction methods. The structure appeared to be built in a linear wall form, using tie-backs and piles to anchor and stabilize it. This landfill retaining structure appears to have been filled primarily with loose silts and sands as well as some rocks. Refuse, likely a combination of primary and secondary deposits with domestic and commercial origins was observed throughout the fills in moderate quantities.

Documentary sources suggest that the Burling Slip bulkhead documented within the APE was constructed in two phases. The first relates to the small northern segment discovered in the final days of the documentation effort. This segment appears to be the southeast corner of Remsen's Wharf, which was constructed at some point between 1756 and 1803. The main section of bulkhead, a 190-foot segment of which was documented as part of this effort, appears to be the 1803 east wall of Codwise's Wharf. The historical record suggests that the Slip itself within the APE was filled sometime after a bulkhead was built across its mouth at South Street in 1835.

The construction characteristics of the Burling Slip bulkhead (including portions of Remsen's Wharf and Codwise's Wharf) contributes to the growing body of knowledge on wharf construction techniques in the period prior to 1850. It suggests that the "crib" form so often assumed to be standard in early timber retaining structures, was not always used in favor of the reinforced wall form. The reinforced wall may, in fact, have been preferred in situations where wharf construction was forced to proceed in gradual stages due to the vicissitudes of ownership and other practical and political factors. In building the Burling Slip bulkhead wall at least a year before he had gained permission to construct the rest of the wharf, George Codwise, Jr. may have made an intentional and shrewd choice of construction techniques.

Documentary evidence suggests that Burling Slip between Front and South Streets was filled shortly after 1835, however, artifact analysis at Burling Slip suggests that the slip was not fully filled, graded, and paved before 1850. It appears that Slip filling either commenced later than the documentary record suggests, or that the filling process was completed gradually over the course of a decade or more. The distribution of artifacts throughout the APE suggests that even after the Slip was completely filled and sealed, below-grade tidal action probably continued to cause substantial movement of the silty soils. Migration of artifacts is evident within the former slip and between the former slip and the adjacent former wharf.

Lastly, the results of the dendrochronology show that the conifers used to construct both wharves grew in the Hudson Valley and would likely have been rafted to New York for use. However, the dates of the timbers identified by tree ring analysis did not assist in confirming the construction dates of the wharves. Instead, the dendrochronology suggests that the upper courses of both sections of bulkhead incorporated replacement timbers, some of which were reused and

others which were felled as late as 1825. This evidence confirms the belief that the upper portions bulkheads, near the tidal zone, were subject to rot and frequent replacement.

### **B. IMPACTS OF THE PROJECT ON THE BULKHEAD**

The construction of Imagination Playground at Burling Slip is now complete. However, subsequent to the field identification of the bulkhead (yet prior to completion of the project), planned construction elements and their potential to directly impact portions of the historic bulkhead were discussed in a conference call between DPR, LMDC, EDC, AKRF, LPC, and SHPO on June 9, 2009. Project-related ground disturbance planned in the vicinity of the bulkhead requiring excavation to depths of two feet or greater included the following: (1) the installation of water and drainage pipes and abandonment of existing water and drainage features; (2) the installation of slab foundations for the “Crow’s Nest,” one of the primary components of the playground; (3) the installation of footings for the “Listening Forest;” and (4) the installation of a slab footing for the “Whispering Fence.”

At the request of LPC and SHPO, DPR subsequently reviewed the potential for each of these project elements to impact the bulkhead and assessed the feasibility of measures to avoid or minimize direct impacts to the bulkhead. Through this process, DPR determined that while certain measures could be taken to minimize impacts to the bulkhead, direct impacts to the bulkhead could not be completely avoided (see **Figure 8**). Avoidance, minimization measures, and unavoidable direct impacts anticipated relating to the project construction items are described below.

Where the locations of new water or drainage lines would transect the bulkhead, DPR agreed to make every effort to install these lines in existing breaks in the bulkhead caused by previous utility work.

The Crow’s Nest foundation would extend 15” below ground surface, and would require clearance to a depth of 2 feet below the slab foundation. The total depth of excavation required for the Crow’s Nest feature, therefore, would be 3’ 3.” In the east/central portion of the APE, the top of the bulkhead wall is located at approximately 2’5” below ground surface. Where the Crow’s Nest foundation overlaps with the bulkhead location, direct impacts to the foundation would occur. One course of timber (the uppermost course) would be removed for a total length of 16 feet. DPR determined that this feature could not be feasibly redesigned to avoid impacts.

As designed, the “Listening Forest” fence, was to be located in the northeastern portion of the APE, which would have required the excavation of footings extending up to 4 feet below ground surface. An additional clearance of 2 feet would be required, making the total depth of excavation required for the Listening Forest 6 feet below ground surface. The top of the bulkhead in the eastern portion of the APE ranges in depth from 2’2” to 2’6” below ground surface. Therefore, as designed, the Listening Forest excavation would require the removal of up to 4 courses of timber (the uppermost courses) for a length of 16 feet. In order to minimize the impact of the Listening Forest on the historic bulkhead, DPR redesigned the foundation as an 18-inch-thick reinforced concrete slab (rather than the original 4-foot-deep footings). The reinforced slab would require a 2-foot clearance, making the total required depth of excavation 3-feet 6-inches below ground surface. The minimized direct impact of the feature on the bulkhead consisted of the removal of 1 to 2 courses of timber for a total length of 16 feet.

The “Whispering Fence,” was designed to be constructed on a slab footing that would extend up to 2 feet below ground surface. An additional clearance of 2 feet was required below the footing, making the total depth of excavation required for the Whispering Fence 4 feet below ground surface. The top of the bulkhead in the location of the Whispering Fence ranged from 2’ 6” to 3’ below ground

surface. The direct impact of the feature on the bulkhead consisted of the removal of 1 to 2 courses of timber for a length of 32 feet in order to accommodate this feature. DPR determined that this feature cannot be feasibly redesigned to avoid impacts.

In summary, DPR evaluated measures for avoiding or minimizing the impacts to the Burling Slip bulkhead. DPR identified and implemented certain avoidance and minimization measures. However, complete avoidance of direct impacts on the bulkhead was not feasible. Excavation for project elements directly impacted an estimated total of 64 linear feet of the bulkhead. One to two courses of timber were removed in these locations (depending on location).

Subsequent to these negotiations, one further area of impact was identified: a portion of the corner of the former Remsen's Wharf was inadvertently impacted while driving piles, and excavation continued in this limited area in order to construct the northeastern portion of the playground structure.

In deep test areas, the bulkhead was exposed to reveal up to 5 courses of timber (at approximately 8 feet below ground surface), and it is considered likely that the bulkhead structure extends substantially deeper. Therefore, despite the planned removal of 1 to 2 courses in the locations described above, the vast majority of the resource within the APE would remain intact.

### **C. DOCUMENTATION AND MITIGATION COMMITMENTS**

In light of the significance of the wharf structure in the context of Lower Manhattan's development history and early landfilling technology, LMDC and DPR, in consultation with LPC and SHPO, agreed that additional measures may be appropriate to mitigate the adverse affect of the project on the bulkhead.

In addition to the preparation of a documentation report, DPR and LMDC agreed to cooperate in implementing the following mitigation measures:

1. Create and install signage in or adjacent to Imagination Playground at Burling Slip which would discuss the results of the archaeological investigation of Burling Slip, explain the history and technology of landfilling, and interpret the development history of the site and its vicinity. The signage would also explain the process of archaeology and its importance in urban environments. Signage would include graphic elements and would be appropriate for both child and adult audiences. An electronic version of the signs will be posted on the DPR website. This signage is currently under preparation. A draft copy of the text and layout of the signage will be provided to SHPO and LPC for review and comment.
2. DPR would facilitate the archaeologist's collection of at least 3 additional timber samples from the portions of the wall that will be directly impacted by the project. If the quality of the samples allows, they would be dendrochronologically analyzed in attempt to date them more specifically and to identify their wood type. As described earlier in this report, seven timber samples were taken and the results of dendrochronological analysis was summarized herein and included as Appendix C.
3. Artifacts recovered from the Burling Slip APE (including those sampled during both the Phase 1B field testing and the implementation of the Unanticipated Discoveries Plan) would be properly prepared for curation and would be offered to the New York State Museum. If the New York State Museum will not accept the artifacts, every reasonable effort would be made to locate an appropriate repository in New York City or New York State to house the collection. The repository will meet the *Standards for the Curation of Archaeological*

*Collections in New York State* (1994), adopted from the Department of the Interior, National Park Service 36 CFR Part 79 and the Standards of Research Performance of the Register of Professional Archaeologists. The artifacts have now been processed and catalogued. Additional curation measures and identification of a permanent repository will be undertaken in the near future.

4. In addition, as requested by LPC and SHPO, an educational component will be included as mitigation: a tri-fold color pamphlet interpreting the history of the site, the history and technology of landfilling, and the value of urban archaeology. This pamphlet will be prepared and made available to institutions such as the South Street Seaport Museum, located immediately adjacent to the Burling Slip APE, to facilitate educational programming. An electronic version of the brochure will also be posted on the DPR website. This pamphlet is currently under preparation. A draft copy of the text and layout of the signage will be provided to SHPO and LPC for review and comment.

### **D. SUMMARY OF PARALLEL ARCHAEOLOGICAL INVESTIGATION**

Following the identification of the Burling Slip bulkhead but prior to the completion of the associated playground construction, a separate but related construction project was undertaken immediately west of the Burling Slip/Imagination Playground APE in the Fall of 2009. This was the City of New York's installation of a new sewer line oriented north-south beneath the John Street streetbed between Front and South Streets. The project site for this sewer construction fell within the historic boundaries of Burling Slip and the history of the site was consistent with that detailed in HPI's Phase 1A for Burling Slip, summarized in this report. Chrysalis Archaeological Consultants, Inc. was retained to monitor excavation for the sewer line. The results of this monitoring were presented in a recently prepared report (Chrysalis Archaeological Consultants, April 2011).

The excavation for the sewer line installation project consisted of a 240-foot-long, 15-foot-wide trench, ranging in depth from 5 to 8 feet below ground surface. The north-south oriented trench ran parallel to and approximately 15 feet east of John Street's west curb. Limited dewatering was undertaken as part of this excavation. Multiple existing utilities were observed in various portions of the trench were found to have disturbed soils in isolated locations to depths beyond the depths of excavation. No landfill retaining structures were encountered during monitoring, however, the fills and the artifacts contained within them were examined. Artifacts collected consisted of ceramics (transfer-printed whiteware, hand-painted pearlware and porcelain, and other types), animal bones (including large numbers of bull horns), pipe stems, a small quantity of shoe fragments, and other artifact classes consistent with 19th century landfill deposits in New York City. Most of the ceramics dated after 1825, and several had TPQs of 1850 suggesting that the Slip was either filled or heavily disturbed after 1850. Some artifacts of early 20th century origin, such as Bakelite, were also noted, possibly having made their way into the deeper soils in connection with utility construction. In addition to these artifacts three dislocated human bones were encountered, believed to date to the 19th century. All proper procedures for the discovery and treatment of human remains as detailed in the Unanticipated Discoveries Plan for Burling Slip were followed.

In summary, the archaeological monitoring undertaken by Chrysalis Archaeological Consultants encountered no additional bulkheads or landfill retaining structures. These findings were consistent with the conclusions of AKRF's Phase 1B study for Burling Slip, which noted that Slips in New York were typically filled by constructing a bulkhead across the mouth of the Slip

and filling the contained area with loose unconsolidated fills. The dates of artifacts identified by Chrysalis in the Slip fills were generally consistent with those encountered during AKRF's Phase 1B and Bulkhead Documentation-stage investigations in Burling Slip. They included TPQs as late as 1850 and artifact types consisting chiefly of ceramics as well as bones, shoe fragments, and other items. The Chrysalis Phase 1B report noted an apparent widespread migration of artifacts within the Slip, noting at least one instance where two dish fragments found over 200 feet apart cross-mended. This supports AKRF's observation that a high degree of post-deposition migration appears to have occurred within the Slip fills as a result of tidal action on the loose silty soils.

## **E. RECOMMENDATIONS**

The Burling Slip Bulkhead is considered to be historically significant and appears to meet the State/National Register of Historic Places criteria. It is significant under Criterion D due to the data it contains in relation to the history of wharf construction technology. A SHPO Site File Form for the bulkhead has been included in this report (see **Appendix D**) and submitted to SHPO. A Landfill Retaining Structure Field Inventory Form has also been included in Appendix D. It is recommended that if future projects anticipate further impacts to sections of the Burling Slip bulkhead (including Codwise's Wharf, Remsen's Wharf, and adjacent structures) outside of the vertical or horizontal APE for this project, additional archaeological investigation be considered in consultation with SHPO and LPC.

## References

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### Academy of Genealogy (comp.)

1966            *Descendants of John Conrad Codwise and the Ancestry of James Cowise (1772-1861)*. Ms. prepared for William Durand Grafton. Collection of the New York Public Library, Local History and Genealogy Division.

### AKRF, Inc.

2007            Archaeological Testing Protocol for Burling Slip, Block 74, Lots 20 and 1. Prepared by AKRF, Inc. for the Lower Manhattan Development Corporation.

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### Anonymous

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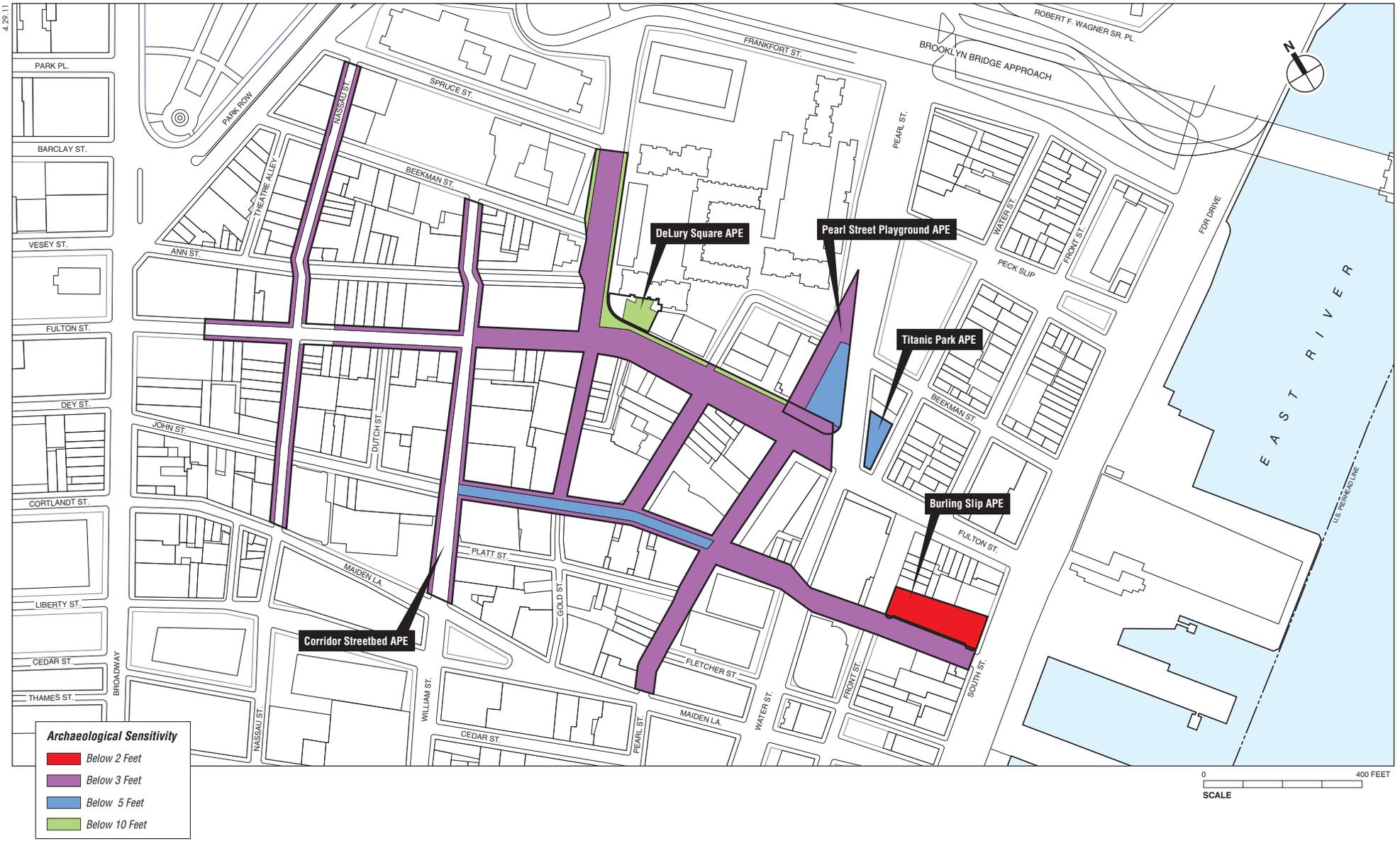
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## Burling Slip Bulkhead Documentation

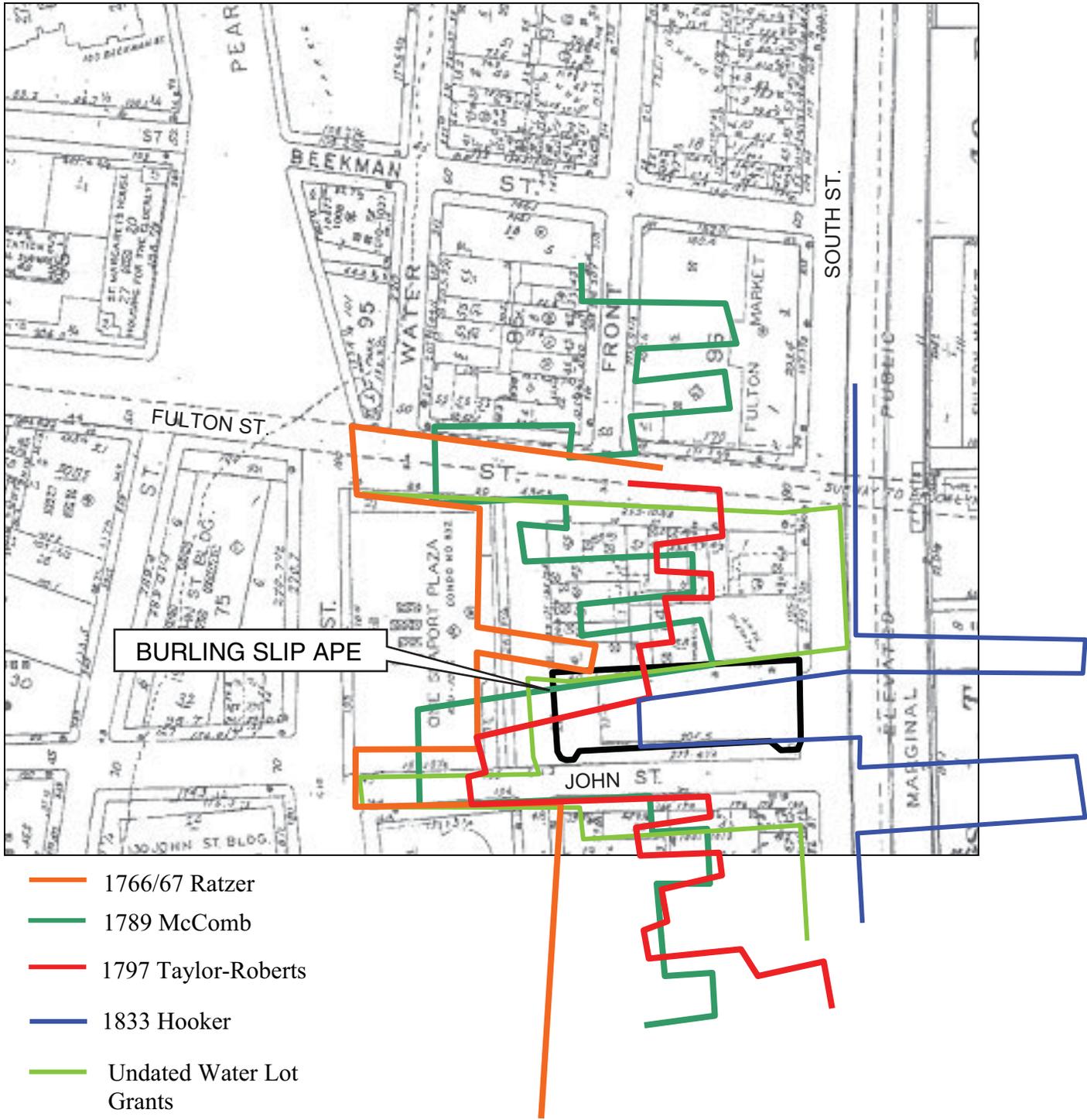
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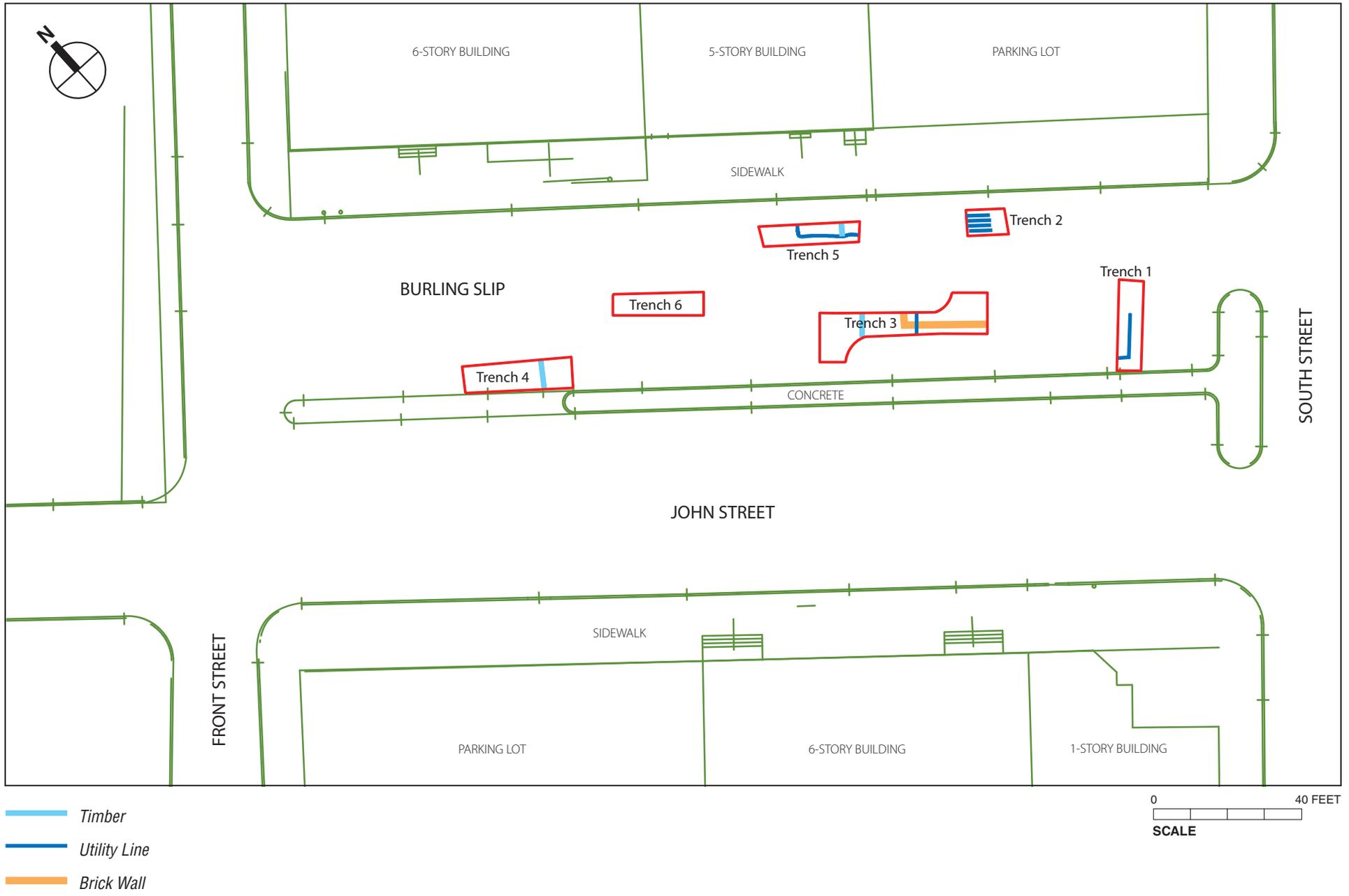


SOURCE: HPI 2006



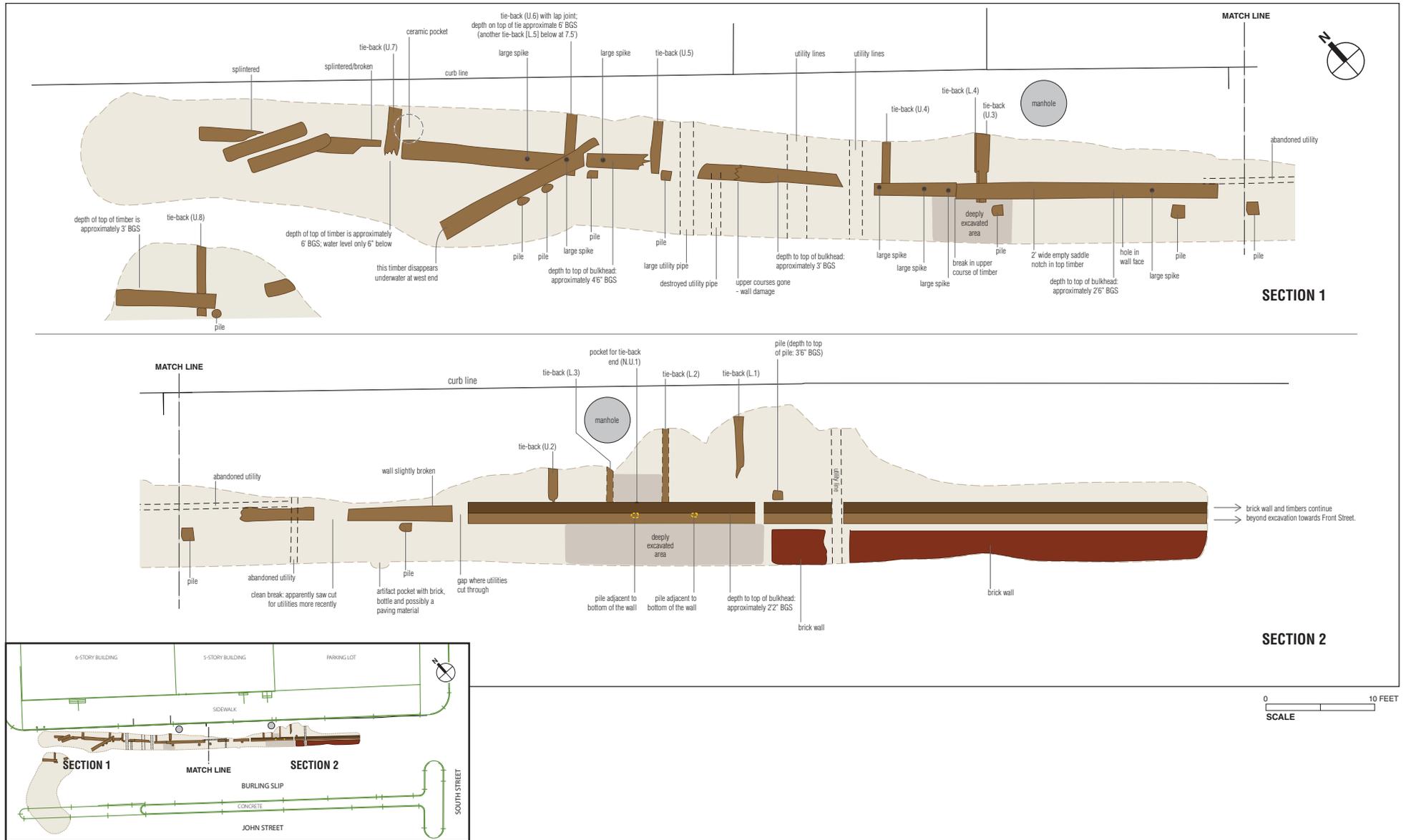
Note: All shoreline boundaries are approximate.

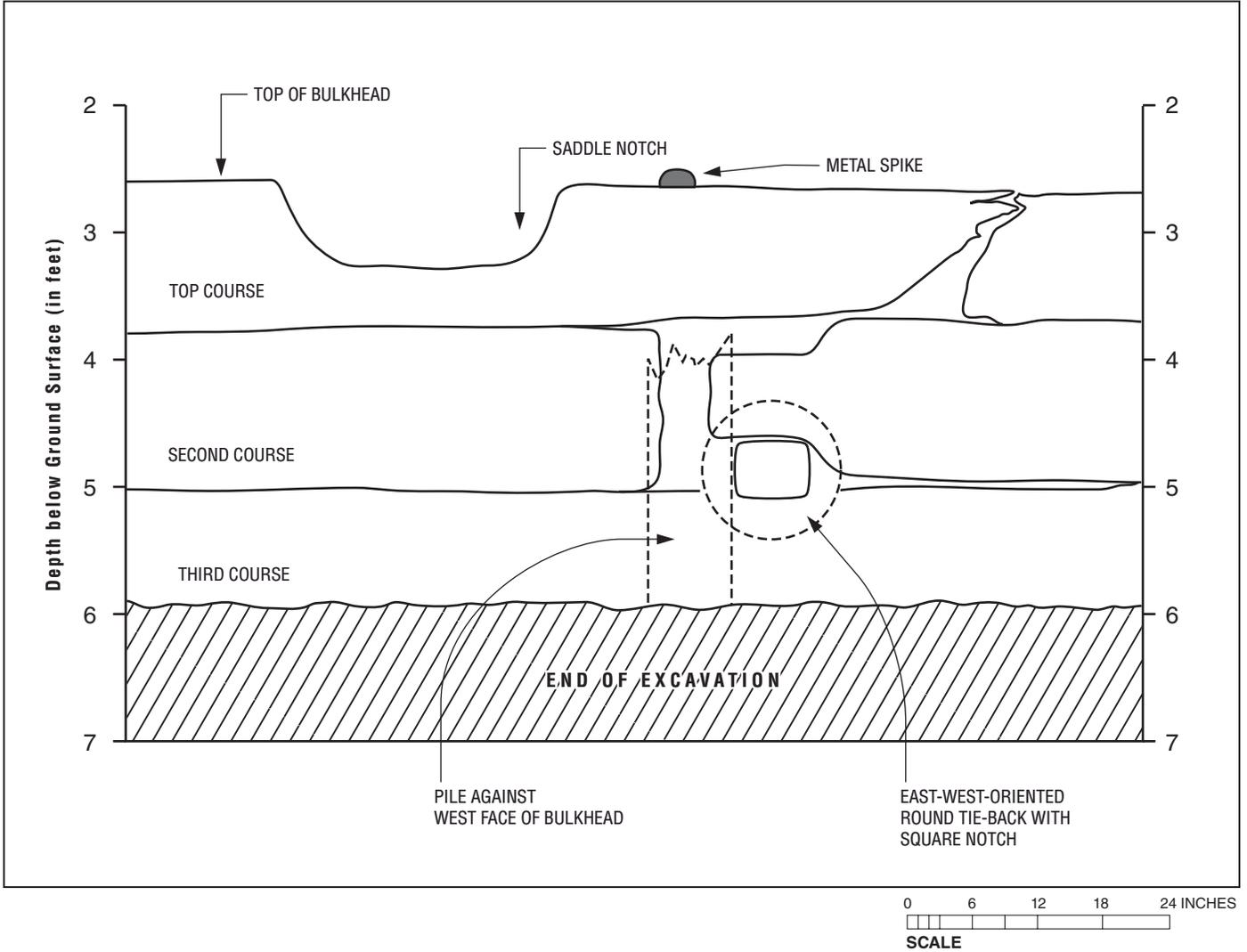
Burling Slip APE Showing Former Shoreline Locations Based on Historic Maps  
 Base Map: Sanborn, 2005  
 Figure 2



Site Plan with Phase 1B Trench Locations  
**Figure 3**

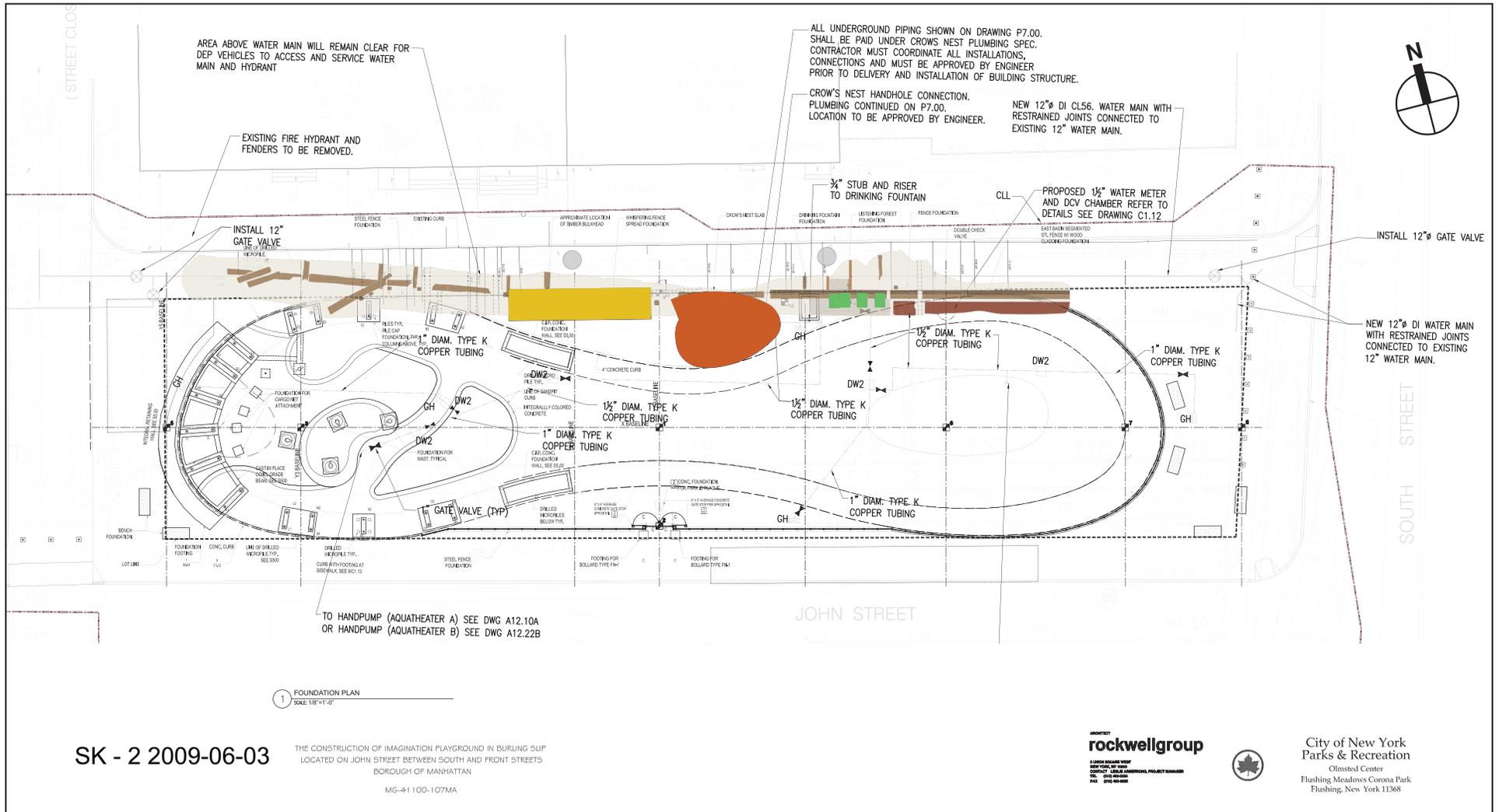






Burling Slip Bulkhead, East Face:  
at Upper Tie-Back 3 (U.3)  
Figure 6





- Whispering Fence Footings*
- Listening Forest Foundation*
- Crow's Nest Slab*

Burling Slip Bulkhead and Proposed Playground Elements  
Figure 8

# Photographs





*A view of the first exposed section of bulkhead, looking northwest towards Front Street. Note the brick foundation of the former Comfort Station closely paralleling the bulkhead* **1**



*Excavation of a deep test area along the east face of the bulkhead. Note empty mortises where tie-backs would once have connected to the wall. An extant tie-back is pictured on the left. Silty fills and medium-sized rocks characterize the fill* **2**



*A view from the upper floor of the South Street Seaport Museum, looking downwards and west on the southern half of the bulkhead* **3**

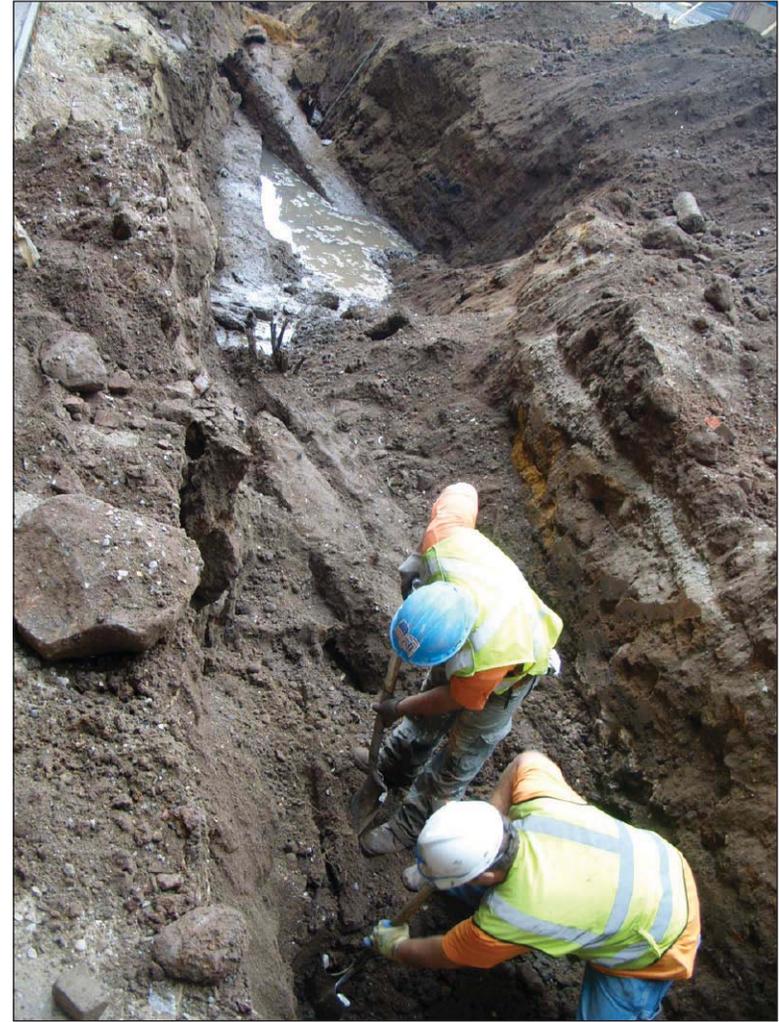


*From the upper floor of the South Street Seaport Museum, looking downwards and northwest on the northern half of the bulkhead* **4**



Looking south from the northern portion of the trench where one course of timber was oriented at an angle to the rest of the bulkhead wall. This section may represent a dislocated and subsequently shored portion of the bulkhead. Alternatively, the arrangement may have been constructed to tie the northernmost section of the wharf (Remsen's Wharf) to the new section (Codwise's Wharf)

5

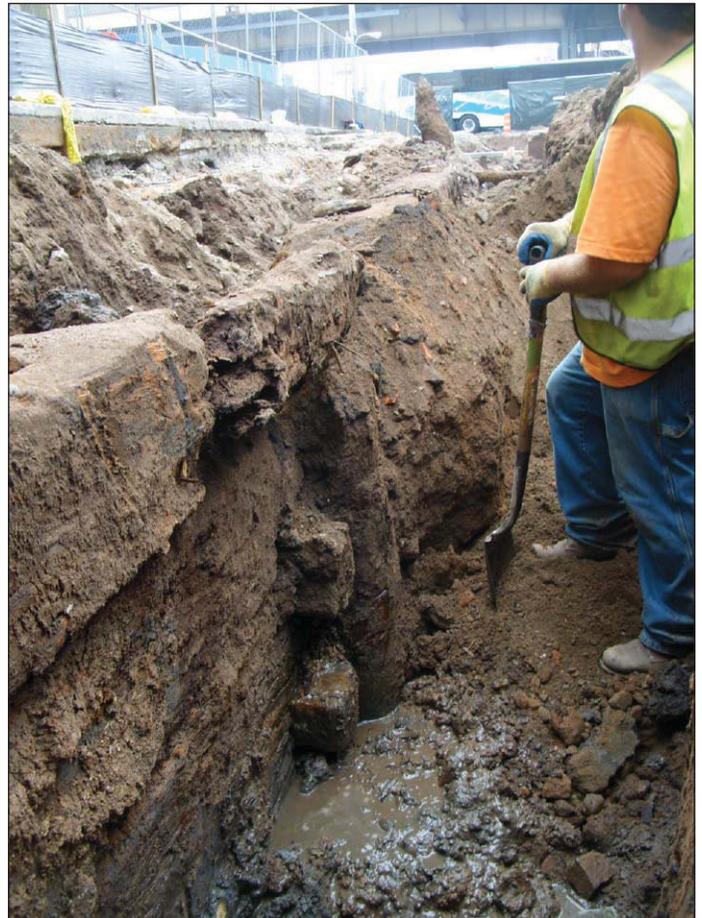


A view of the same portion of bulkhead, looking south from the northernmost portion of the trench

6



*Looking west, a close-up view of where the tie-back identified as "U.3" is notched into the east face of the bulkhead* **7**



*Looking east at the same assembly from the other (west) side of the bulkhead, this close-up view shows the square lock-notched ends of tie-backs "U.3" and "L.3." A pile (right) was used by the wharf builders to reinforce the bulkhead* **8**



*The northernmost section of bulkhead, believed to be the corner of what was Remsen's Wharf. This section of bulkhead was encountered during construction several months after the rest of the bulkhead was documented*

9



*A close-up view of what is believed to be the corner of Remsen's wharf, the northernmost section of bulkhead documented. Note the notched timbers and wood pile. The steel pile pictured was driven for the playground construction prior to excavation in this area*

10



*The wood pile used in the construction of the northern section of bulkhead is being sampled for dendrochronology. Note the pointed end of the pile and an apparent dowel hole of unknown function through the end of the timber*

11



*A pocket of bottles, bricks, and a possible paving material was encountered during excavation of the bulkhead, immediately west of the bulkhead*

12



*An example of the ceramics recovered during the Bulkhead Documentation* **13**



*A red transfer-printed plate fragment which was identified one of the Clyde Scenery series, produced by John and Job Jackson in Staffordshire, England between 1831 and 1835* **14**



A stoneware jar or crock fragment found during the Phase 1B investigation produced by Crolius of Manhattan between 1800 and 1815 **15**



The mandible of a cow, recovered from over 7 feet below ground surface in Trench 6 (on the west side of the bulkhead) during Phase 1B investigation **16**



*A fragment of delft tile depicting a scene (likely biblical or a landscape), hand-painted in purple glaze* **17**



*A glass bead recovered during the Phase 1B investigation, originally thought to be a trade bead, now believed to date to the mid-19th century* **18**



*Examples of the shoe fragments recovered during both phases of excavation* **19**

## **APPENDIX A**

**Appendix A:**

**Phase 1B Artifact Inventory**

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
1	Trench 1, Along Pipe and Wood	1-3'	Activities		Ethnafaunal zoological		oyster shell			1	
1	Trench 1, Along Pipe and Wood	1-3'	Architectural		Construction materials		terra cotta	brick		1	
1	Trench 1, Along Pipe and Wood	1-3'	Architectural		Architectural glass		glass	window pane		1	pale green
1	Trench 1, Along Pipe and Wood	1-3'	Kitchen		Dishes	Red Earthenware				1	reddish brown lead glaze on one side
1	Trench 1, Along Pipe and Wood	1-3'	Kitchen	1790-1880	Dishes	Oriental Porcelain				1	underglaze blue exterior, plain interior
1	Trench 1, Along Pipe and Wood	1-3'	Kitchen	1820-present	Dishes	Whiteware				1	undecorated
<b>Trench 1, Along Pipe and Wood Total</b>										6	
3	Inside foundation - N - Builder's trench - Level 1	1'2" below top of wall	Architectural		Construction materials		concrete			1	
3	Inside foundation - N - Builder's trench - Level 1	1'2" below top of wall	Architectural		Nails				fragmts	3	
<b>Inside foundation - N - Builder's trench - Level 1 Total</b>										4	
3	Inside foundation - N - Builder's trench - Level 2	27"	Kitchen	1840-Present	Dishes	White granite/ironstone			base	1	large vessel, worn, burned, stained
<b>Inside foundation - N - Builder's trench - Level 2 Total</b>										1	
3	Inside foundation - N - Level 1	1'4"	Activities		Ethnafaunal zoological		oyster shell			1	
3	Inside foundation - N - Level 1	1'4"	Activities		Ethnafaunal zoological		bone			1	long bone
3	Inside foundation - N - Level 1	1'4"	Architectural		Nails		Iron		frag conglom.	1	
3	Inside foundation - N - Level 1	1'4"	Household		Health & sanitation	Red or brown Stoneware		chamber pot	rim and body	2	burned

**Burling Slip – Bulkhead Documentation Report**

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Inside foundation - N - Level 1	1'4"	Kitchen	1790-1880	Dishes		Oriental Porcelain	plate or saucer	rim and caveltto	2	underglaze blue - Canton, Nanking; mends
3	Inside foundation - N - Level 1	1'4"	Kitchen	1850-present	Dishes		Hard paste Porcelain	saucer	rim	1	Gold gilded band
3	Inside foundation - N - Level 1	1'4"	Kitchen	1763-1820	Dishes or possible storage		Red-bodied Stoneware?	Unident	rim	1	engine-turned lead glazed
3	Inside foundation - N - Level 1	1'4"	Kitchen	1825-1915	Dishes		Whiteware	Unident	rim	1	blue t.p. interior; black t.p. exterior
3	Inside foundation - N - Level 1	1'4"	Kitchen	1780-1840	Dishes		Pearlware?	Unident	body	1	plain, undecorated; possibly Whiteware
<b>Inside foundation - N - Level 1 Total</b>										11	
3	Inside foundation - N - Level 2	2'	Activities		Ethnofaunal zoological		oyster shell			2	
3	Inside foundation - N - Level 2	2'	Furniture		Decorative Furnishings		Red Earthenware	flower pot	rim	1	decorated w/ band of incised lines; large vessel
3	Inside foundation - N - Level 2	2'	Kitchen		Container		glass	Unident	body	1	lt. aqua; thin but not thin like lamp glass
3	Inside foundation - N - Level 2	2'	Kitchen	1820-1900	Dishes		Whiteware?	bowl	base/body	1	burned; appears to be plain interior and two bands of dk. brown on exterior; possible mocha
3	Inside foundation - N - Level 2	2'	Kitchen	1820-present	Dishes		Whiteware		rim	1	blue t.p. floral, w/ blue dots on interior, plain exterior. Similar to an artifact outside the foundation, 36"-42" bgs (Level 4).
3	Inside foundation - N - Level 2	2'	Kitchen	1840-1915	Dishes		White granite		base/body	1	blue t.p. with floral dec. interior and plain exterior; burned
<b>Inside foundation - N - Level 2 Total</b>										7	
3	Inside foundation - N - Level 3	26"-32"	Clothing		Shoes		leather		scraps	4	
3	Inside foundation - N - Level 3	26"-32"	Kitchen		Container		glass	wine/liquor bottle	base and kick-up	4	bases mend and kick-up mends; all belong to the same bottle; devitrified; narrow bottle
3	Inside foundation - N - Level 3	26-32"	Kitchen		Container		glass	wine/liquor bottle	body	1	devitrified; possibly belongs to bottle above but does not mend
3	Inside foundation - N - Level 3	26"-32"	Kitchen		Dishes		Unident		body?	2	badly burned

Appendix A: Phase 1B Artifact Inventory

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Inside foundation - N - Level 3	26"-32"	Kitchen		Dishes	Unident			body	1	badly burned but looks like bold cobalt blue decoration on the exterior; sherd is thick like delft or Stoneware.
3	Inside foundation - N - Level 3	26"-32"	Kitchen	1820-present	Dishes	Whiteware			body	2	plain, undecorated; one has ridge
3	Inside foundation - N - Level 3	26"-32"	Kitchen		Dishes	Porcelain?			base/cavetto	1	burned
<b>Inside foundation - N - Level 3 Total</b>										15	
3	Inside foundation - N - Level 4	3'3"	Tobacco	1620	Pipe		white ball clay	smoking	stem	1	8/64" bore
<b>Inside foundation - N - Level 4 Total</b>										1	
3	Inside foundation - S - Level 1	3'2"	Activities		Manufacture		Stoneware	kiln Furniture		1	kiln pad, spacer or roll. Parts covered with glaze.
3	Inside foundation - S - Level 1	3'2"	Activities		Ethnofaunal zoological		bone		rib	1	large mammal, butchered
3	Inside foundation - S - Level 1	3'2"	Activities		Ethno-botanical		nut shell	hickory nut		1	
3	Inside foundation - S - Level 1	3'2"	Architectural		Construction related		iron	wire		1	
3	Inside foundation - S - Level 1	3'2"	Clothing		Shoe		leather		scrap	1	
<b>Inside foundation - S - Level 1 Total</b>										5	
3	Inside foundation - S - Level 2	3'-4'	Architectural	1830	Nail		Iron	machine cut nail?		1	possibly machine cut; badly corroded with pcs. brick and mortar adhering to it
3	Inside foundation - S - Level 2	3'-4'	Kitchen		Container		glass	bottle		1	olive green glass
3	Inside foundation - S - Level 2	3'-4'	Kitchen		Dishes	Porcelain		plate/saucer	base	1	feels like bisque but was probably affected by same fire that touched on other ceramics in this context; underglaze painted red strip above base on interior.
3	Inside foundation - S - Level 2	3'-4'	Kitchen		Dishes	Porcelain			body	1	plain; pinkish tinge on one side
3	Inside foundation - S - Level 2	3'-4'	Kitchen		Dishes	Burned Unidentifiable				11	includes 2 bases
3	Inside foundation - S - Level 2	3'-4'	Kitchen	1820-1915	Dishes	Whiteware				4	blue t.p.: 3 floral, 1 landscape

**Burling Slip – Bulkhead Documentation Report**

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Inside foundation - S - Level 2	3'-4'	Kitchen		Dishes	Burned Unidentifiable			cavetto	1	transfer print
3	Inside foundation - S - Level 2	3'-4'	Kitchen		Dishes	Burned Unidentifiable			rim	1	embossed leaves below rim
3	Inside foundation - S - Level 2	3'-4'	Kitchen	1840-1915	Dishes	White granite			rims	2	black t.p.
3	Inside foundation - S - Level 2	3'-4'	Kitchen	1780-1830	Dishes	Pearlware			rim/base	1	blue shell edge; indented mark on base.; scalloped edge
3	Inside foundation - S - Level 2	3'-4'	Kitchen	1763-1820	Dishes	red bodied Stoneware			body	1	clear lead glaze on one side, yellow glaze on the other; could possibly be refined Red Earthenware
3	Inside foundation - S - Level 2	3'-4'	Kitchen		Dishes	Porcelain			base	1	blue h.p. chinoiserie pattern w/pagoda
3	Inside foundation - S - Level 2	3'-4'	Household		Hygiene	Burned Unidentifiable		chamber pot		1	transfer printed rim
3	Inside foundation - S - Level 2	3'-4'	Household		Hygiene	Stoneware		chamber pot	rim/body	1	grey salt-glazed with cobalt blue decoration
<b>Inside foundation - S - Level 2 Total</b>										28	
3	Inside foundation - S - Level 3	3.5'	Architectural		Construction materials		wood			1	burned
3	Inside foundation - S - Level 3	3.5'	Architectural		Construction materials		terra cotta	brick		1	red
3	Inside foundation - S - Level 3	3.5'	Architectural	1830	Nails		Iron	machine cut		2	
3	Inside foundation - S - Level 3	3.5'	Kitchen		Containers	Burned Unidentifiable	glass	bottle	bases	3	burned glass, melted; 2 appear to be dark green, 1 is Unident color
3	Inside foundation - S - Level 3	3.5'	Kitchen		Containers	Burned Unidentifiable	glass	bottle	Unident	1	burned, melted; dark green
3	Inside foundation - S - Level 3	3.5'	Kitchen		Dishes	Burned Unidentifiable			rims, bases, bodies, etc.	45	
3	Inside foundation - S - Level 3	3.5'	Kitchen	1795-1820s	Dishes	Pearlware			body	1	u.g. h.p. polychrome, red flower, brown stem on exterior
3	Inside foundation - S - Level 3	3.5'	Kitchen	1840-1915	Dishes	White granite			body	2	green t.p. flower; this might be a 20th century revival; burned
3	Inside foundation - S - Level 3	3.5'	Kitchen		Dishes	Burned Unidentifiable			bodies, rims, bases	13	transfer prints, mostly floral

Appendix A: Phase 1B Artifact Inventory

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Inside foundation - S - Level 3	3.5'	Kitchen	1840-1915	Dishes	White granite			bodies, rims, bases	5	black transfer printed wares, florals and landscapes
3	Inside foundation - S - Level 3	3.5'	Kitchen		Dishes	Burned Unidentifiable				2	blue transfer print
3	Inside foundation - S - Level 3	3.5'	Kitchen		Dishes	Porcelain				1	Hand painted but can not tell if over or under glaze due to burning.
3	Inside foundation - S - Level 3	3.5'	Household		Hygiene	Burned Unidentifiable		chamber pot	rims	2	mend
<b>Inside foundation - S - Level 3 Total</b>										79	
3	Outside foundation - 2' - 3'	2'-3'	Activities		Ethnofaunal zoological			clam shell		1	
3	Outside foundation - 2' - 3'	2'-3'	Architectural		Construction materials		mortar	mortar		5	
3	Outside foundation - 2' - 3'	2'-3'	Clothing		Shoes		leather		sole w/heel	1	
3	Outside foundation - 2' - 3'	2'-3'	Clothing		Shoes		leather		heel	1	
3	Outside foundation - 2' - 3'	2'-3'	Clothing		Shoes		leather		scrap	1	
3	Outside foundation - 2' - 3'	2'-3'	Kitchen	1840-1915		Ironstone		Platter	rim	1	blue transfer print, floral, paneled, plain ext.
3	Outside foundation - 2' - 3'	2'-3'	Kitchen	1840-1915		White granite		plate	rim	1	blue t.p. floral interior, plain exterior
3	Outside foundation - 2' - 3'	2'-3'	Kitchen	1820-1915		Whiteware			body	1	blue t.p. floral, plain ext.
3	Outside foundation - 2' - 3'	2'-3'	Kitchen			Burned Unidentifiable		cup or mug	body	1	cobalt blue dec on exterior
3	Outside foundation - 2' - 3'	2'-3'	Kitchen	1840-1915		White granite		plate or platter		1	cobalt blue t.p. floral, plain ext., impressed floral mark on ext.
3	Outside foundation - 2' - 3'	2'-3'	Kitchen	1840-Present		White granite			body	1	blue underglaze painted
3	Outside foundation - 2' - 3'	2'-3'	Kitchen			Burned Unidentifiable			body	1	possibly black t.p.
3	Outside foundation - 2' - 3'	2'-3'	Kitchen	1670-1795	Dishes	Buff bodied slipware		pie plate	rim	1	crimped rim, trailed lines, yellow with brown lines; unglazed exterior
<b>Outside foundation - 2' - 3' Total</b>										17	
3	Outside foundation - 2' 6"-2' 9"	2' 6"	Kitchen		Tableware		bone/iron	cutlery handle	handle	1	Double hafted rounded handle with chamfered sides. Three screws hold the handle together.

**Burling Slip – Bulkhead Documentation Report**

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Activities		Ethnofaunal zoological		oyster shell			7	
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Activities		Ethnofaunal zoological		clam shell			8	some are burned
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Activities	1831	Specialized Activities		slag			1	
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Architectural	1830	Nail		Galvanized Iron? (Fe/Zinc)	nail		1	machine cut
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Architectural		Window glass		glass			1	pale green
3	Outside foundation - 2' 6"-2' 9"	2' 6" 2' 9"	Clothing		Shoes		leather			1	possible shoelace fragment
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen	1820	Dishes	Whiteware		plate	base	2	mend; ribbing near base on exterior; very badly burned
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen	1820- present	Dishes	Whiteware			body	1	dark brown glaze int. and ext.
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen	1840- present	Dishes	White granite			body	1	undecorated
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2'9"	Kitchen	1820- present	Dishes	Whiteware			body	1	brown and white stripe exterior and plain interior
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen	1675-1795	Dishes	buff-bodied slipware			body	2	clear lead glazed
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen	1820-1915	Dishes	Whiteware			rim	1	blue t.p. floral interior, plain exterior; burned
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen	1820-1915	Dishes	Whiteware			body	2	blue t.p. floral interior, plain exterior; burned
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen	1795-1820	Dishes	Pearlware			rim	2	mend; unglazed hand painted polychrome with green band below rim and red, blue and green floral decoration
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen	1795-1820	Dishes	Pearlware			body	1	mend; unglazed hand painted polychrome with green band below rim and red floral decoration.
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen	1840-1880	Dishes	Porcelain?			rim	1	burned; red t.p. with dots in relief below rim and scalloped rim; might be an earthenware
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2'9"	Kitchen		Dishes	Porcelain		cup handle?	handle	1	very badly burned

Appendix A: Phase 1B Artifact Inventory

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen		Dishes	Stoneware			Unident	1	badly burned; melted glaze covers most edges
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen		Dishes	Stoneware			body	1	burned; appears to be grey bodied Stoneware with brown salt glaze on exterior and burned interior. Cannot tell if int. is glazed or just burned.
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen		Dishes	Unident			various	5	5 sherds melted together; at least two have cobalt blue decoration.
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen		Container		glass	wine/liquor bottle		2	dk. Green; badly devitrified
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen	1820	Container		glass	soda/mineral water bottle?		1	small aqua sherd
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Kitchen		Unident		glass	Unident	Unident	1	badly devitrified; appears blue with incised lines or bands at one end that are of a different color but could be result of glass degradation. Very tiny sherd
3	Outside foundation - 2' 6"-2' 9"	2' 6"-2' 9"	Prehistoric?		Flake?		Jasper	Core		1	This may not be Prehistoric. It could be natural
	Outside foundation - 2' 6"-2' 9" Total									47	
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Activities		Ethnofaunal zoological		bone/enamel	tooth		2	fragments
3	Outside foundation - 2' 6"-4'	2' 6"-4"	Activities		Ethnofaunal zoological		bone			1	large mammal (horse or cow); pelvic bone with socket for femur; butchered
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Activities		Ethnofaunal zoological		bone		frags.	7	mammal; includes 2 rib frags and 1 scapula frag.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Activities		Ethnofaunal zoological		clam shell			14	burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Activities		Ethnofaunal zoological		oyster shell			19	burned

**Burling Slip – Bulkhead Documentation Report**

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Activities	1831	Specialized Activities		slag/ceramics			12	9 are attached to badly burned ceramics of various sorts: possible Stoneware, Porcelain and earthenwares
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Architectural		Construction materials		brick	brick		1	red; burned black
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Architectural		Nails		Iron	nail frags		2	badly corroded
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Architectural		Construction materials		wood			3	one is just bark
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Architectural		Construction materials		mortar			10	some concrete on several mortar samples
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Architectural		Construction materials		brick	brick		1	red
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Clothing		Shoes		leather		sole	1	
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Clothing		Shoes		leather		scraps	2	
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Container		glass	wine/liquor		5	Misc. Dark Green Bottle Glass
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Unident table? Glass		glass	Unident		5	clear, light green/aqua, ; badly devitrified; thin
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Container		glass	gin?		2	green, flat, badly devitrified
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Unident table glass		glass			1	dark green, ridged, thin
3	Outside foundation - 2' 6"-4'	2' 6"-4"	Kitchen	1670-1850	Dishes	Red bodied slipware			body	1	reddish brown (glaze with touch of yellow glaze)
3	Outside foundation - 2' 6"-4'	2' 6"-4"	Kitchen		Dishes	Stoneware			body	2	one is grey salt glaze but badly burned so paste is half red and half grey, the other is grey Stoneware but badly burned and might have had cobalt blue decorations
3	Outside foundation - 2' 6"-4'	2' 6"-4"	Kitchen		Dishes	Soft Paste Porcelain		saucer	rim	1	underglaze blue on both sides; circles on int., lines on ext.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Porcelain			body	1	plain white
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Porcelain			rim	1	badly burned

Appendix A: Phase 1B Artifact Inventory

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1820-1860	Dishes	Burned Unidentifiable			base	1	underglaze h.p. polychrome, green leaves, red flower, brown stem; burned or a second
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1820-1860	Dishes	Burned Unidentifiable			rim	1	underglaze h.p. polychrome, green leaf, brown thin band below rim on interior; burned.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1820-1860	Dishes	Whiteware?			rim	1	underglaze polychrom h.p., with thin brown band below rim on exterior and brown band and red flower on interior
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1820-1860	Dishes	Whiteware?			rim	1	underglaze h.p. polychrome with thick brown band, pink and blueflowers, and brown stems on interior; plain exterior.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1840-1880	Dishes	Whiteware?		platter?	rims	12	red t.p. on interior, thick sherds. Scalloped rims with white dots and flowers. Body of ware has floral decorations; 4 mend
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1840-1880	Dishes	Whiteware?			rims	9	red t.p. identical to above but much thinner; 2 mend
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1840-1880	Dishes	Whiteware?			rim	1	red t.p., very thin different design than above but too fragmentary to determine. Dec. int.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1840-1880	Dishes	White granite			body	42	red transfer print sherds, floral decorations. At least 2 patterns but all similarly colored; all dec is on interior with plain exterior, except for one sherd

**Burling Slip – Bulkhead Documentation Report**

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1840-1880	Dishes	White granite			body	1	red t.p. w/ white banner which says, "Wearied" in cursive letters. Atop the banner is an urn and a domed building is in the background. There is wheat like decoration on the obverse.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1840-Present	Dishes	Ironstone		pitcher/ewer	handle	1	plain white
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1840-Present	Dishes	Ironstone		pitcher/ewer	rim	1	plain white
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable		pitcher/ewer	handle	1	embossed; burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1820-1915	Dishes	Whiteware		plate	rim/cavetto	2	Mend; black transfer printed floral; scalloped rim, plain exterior
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable		plate/saucer	rim	1	black transfer print floral interior, plain exterior; burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1820-1915	Dishes	Whiteware		saucer	rim	1	brown t.p. interior and exterior
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			body	1	brown t.p. int., burned ext.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable		bowl/jar/mug	base	1	color looks like drab ware (white s.g. Stoneware) but paste is earthenware-like; all probably affected by burning
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			body	18	badly burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			rim	4	badly burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			rim	1	t.p.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			body	2	t.p.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			rim	1	red t.p. interior, embossed or molded on both sides; badly burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable		cup		1	cobalt blue? decoration on exterior; badly burned

Appendix A: Phase 1B Artifact Inventory

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1820-1900	Dishes	Whiteware			rim	1	blue shell edge
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			cavetto	1	t.p., probably blue but burned badly; opposite side is a drab tan color, probably caused by the fire
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			body	6	blue t.p. on interior, plain ext.; burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			rim	1	blue t.p. int., badly burned exterior
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1820-1915	Dishes	Whiteware			body	1	blue t.p. int, Unident t.p. dec. ext.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			rim	1	green shell edge, burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			body	3	green stripe on one side; burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			body	1	has some green glaze on ext. spalled ext.; burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			rim	1	some green glaze on ext.; very badly burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			knop	1	has green glaze; badly burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable		spout; tea strainer		1	green glaze int.' plain ext; burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1820-1900	Dishes	Whiteware?		bowl?	body	1	olive green and ochre with white band on ext. plain int.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1830-1940	Dishes	Yellowware			body	1	plain
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1670-1795	Dishes	Yellow slipware			body	2	plain
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1670-1795	Dishes	Yellow slipware			rim	1	plain
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1670-1795	Dishes	Yellow slipware			body	1	clear lead glaze with reddish brown combed line on int; spalled ext.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			body	20	plain white, burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			base	6	plain white, burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Burned Unidentifiable			rim	3	plain white; burned

**Burling Slip – Bulkhead Documentation Report**

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes		Burned Unidentifiable		rim	1	pinkish tinge on int., poss. Red t.p on ext.; burned
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes		Burned Unidentifiable		base	1	pinkish tinge on int., burned ext.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes		Burned Unidentifiable		body	1	pinkish tinge on int., burned ext.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes		Burned Unidentifiable		rim	2	embossed dots and floral on int., badly burned ext.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes		Burned Unidentifiable		body	3	looks like brown glze but could just be burned; incised lines around exterior
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes		Burned Unidentifiable		rim	1	same vessel as above; looks brown but could just be burned; incised lines below rim
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes		Burned Unidentifiable		base	1	Dark brown glaze.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes		Burned Unidentifiable		body	4	Dark brown glaze. Same vessel as above. Some burned.
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen	1825-1915	Dishes	Whiteware			rim	1	Purple transfer print floral with triangle and dot border below rim. Plain exterior
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Kitchen		Dishes	Unident			body	1	Purple? Transfer print; burned, discolored
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Tobacco	1710	Pipe		white ball clay	smoking	stem	1	4/64" bore
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Prehistoric?		Flake		dk grey chert			1	possible flake
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Prehistoric?		Flake		grey chert	core?		1	possibly worked
3	Outside foundation - 2' 6"-4'	2' 6"-4'	Prehistoric?		Flake		jasper	core?		1	possibly worked
<b>Outside foundation - 2' 6"-4' Total</b>										272	
3	Outside foundation - 3' 3"	3'3"	Architectural	1880	Construction Materials		terra cotta	brick		1	whole red brick with frog; writing illegible
<b>Outside foundation - 3' 3" Total</b>										1	
3	Outside foundation - 3'-6'	3'-6'	Activities		Ethno-historical zoological		bone		long bone	1	medium mammal; marrow removed
3	Outside foundation - 3'-6'	3'-6'	Activities		Ethno-historical zoological		bone		radius	1	deer?

Appendix A: Phase 1B Artifact Inventory

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Outside foundation - 3'-6'	3'-6'	Activities		Ethno-historical zoological		bone			1	possible bird femur
3	Outside foundation - 3'-6'	3'-6'	Activities		Ethno-historical zoological		oyster shell			1	
3	Outside foundation - 3'-6'	3'-6'	Clothing		Shoes		leather	shoe or slipper	sole	1	large partial sole w/ sew holes
3	Outside foundation - 3'-6'	3'-6'	Clothing		Shoes		leather	tongue and scraps	scraps	4	sew hole strips, possible tongue and other s scraps
3	Outside foundation - 3'-6'	3'-6'	Clothing		Shoes		leather	sole	sole	1	square toed sole, apx. 10 1/2" long
3	Outside foundation - 3'-6'	3'-6'	Clothing		Shoes		leather	sole	sole	1	square toed sold with sew and nail holes; apx. 11" long
3	Outside foundation - 3'-6'	3'-6'	Clothing		Shoes		leather	heel	heel	1	heel with shoe nails belonging to above shoe sole.
3	Outside foundation - 3'-6'	3'-6'	Clothing		Shoes		wood?	shoe nails	whole and frags.	26	nails to hold heel to shoe.
3	Outside foundation - 3'-6'	3'-6'	Kitchen	1820-1915	Dishes	Whiteware			body	3	cobalt blue t.p., 1 landscape, 1 Unident border design, 1 floral, possibly Pearlware
3	Outside foundation - 3'-6'	3'-6'	Kitchen	1720-1805	Dishes	Stoneware		shallow bowl?	rim	1	white, salt glazed Stoneware; scalloped rim
3	Outside foundation - 3'-6'	3'-6'	Kitchen	1840- Present	Dishes	White granite			rim	1	plain
3	Outside foundation - 3'-6'	3'-6'	Kitchen	1840- Present	Dishes	White granite			body	1	plain
3	Outside foundation - 3'-6'	3'-6'	Kitchen		Dishes	Porcelain			body	1	overglaze black hand- painted interior
3	Outside foundation - 3'-6'	3'-6'	Kitchen		Dishes	Oriental Porcelain?		bowl	bases	4	2 mend but others probably belong to the same vessel or represent another identical vessel. H.p. u.g. blue bands on the interior; exterior has blue bands with lines and squiggles; chinoiserie; very thick

**Burling Slip – Bulkhead Documentation Report**

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Outside foundation - 3'-6"	3'-6"	Kitchen		Dishes		Oriental Porcelain?		rim	1	h.p. u.g. 2 thin blue lines below rim interior, exterior painted with squiggly lines and blue band below rim, possibly same set as above Porcelain, although thinner. Brown band atop rim
3	Outside foundation - 3'-6"	3'-6"	Kitchen		Dishes		Oriental Porcelain?		body	2	bold designs, squiggles as above in thinner pottery on exterior, plain interior
3	Outside foundation - 3'-6"	3'-6"	Kitchen	1790-1880	Dishes		Oriental Porcelain		rim	2	Late o.e.p., with sloppy "Canton" border on int. and ext.
3	Outside foundation - 3'-6"	3'-6"	Personal	17th-19th c.	Personal ornamentation			Glass bead		1	Barrel shaped blue and white bead; faceted; possible trade bead
<b>Outside foundation - 3'-6' Total</b>										55	
3	Outside foundation - 4'-4' 7"	4'-4' 1"	Activities		Ethnafaunal zoological		bone		long bone frags.	2	mammal
3	Outside foundation - 4'-4' 7"	4'-4' 1"	Architectural		Construction Materials		brick	brick		1	red
3	Outside foundation - 4'-4' 7"	4'-4' 1"	Kitchen	1840-1880	Dishes		White granite		rim	1	red t.p. floral interior, plain ext.
3	Outside foundation - 4'-4' 7"	4'-4' 1"	Kitchen	1840-1880	Dishes		White granite		body	4	red t.p. floral interior, plain exterior; possibly all the same vessel as above but do not mend
3	Outside foundation - 4'-4' 7"	4'-4' 1"	Kitchen	1840-1880	Dishes		White granite		base	1	red t.p. decoration of tulips and circles interior with plain exterior; not same pattern as above
3	Outside foundation - 4'-4' 7"	4'-4' 1"	Kitchen	1775-1840	Dishes		Pearlware?		body	2	underglaze blue painted exterior
3	Outside foundation - 4'-4' 7"	4'-4' 1"	Kitchen	1820-1915	Dishes		Whiteware		body	1	fragmentary; blue transfer print interior, plain exterior
3	Outside foundation - 4'-4' 7"	4'1"-4'7"	Activities		Ethnafaunal zoological		bone			1	fragment;
3	Outside foundation - 4'-4' 7"	4'1"-4'7"	Activities		Ethnafaunal zoological		clam shell			1	
3	Outside foundation - 4'-4' 7"	4'1"-4'7"	Activities		Ethnafaunal zoological		oyster shell			1	

Appendix A: Phase 1B Artifact Inventory

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Outside foundation - 4'-4' 7"	4'1"-4'7"	Architectural		Construction materials		brick	brick		1	red
3	Outside foundation - 4'-4' 7"	4'1"-4'7"	Kitchen	1775-1840	Dishes	Pearlware			body	1	underglaze blue painted
3	Outside foundation - 4'-4' 7"	4'1"-4' 7"	Kitchen	1820-Present	Dishes	Whiteware			body	1	plain white but rust-stained
3	Outside foundation - 4'-4' 7"	4'1"-4' 7"	Clothing		Shoes		leather			1	scraps
<b>Outside foundation - 4'-4' 7" Total</b>										19	
3	Outside foundation - NW - Level 1	11"-1'4"	Activities		Ethnofaunal zoological		bone/enamel	tooth	whole	1	horse
3	Outside foundation - NW - Level 1	11"-1'4"	Architectural	1903-present	Architectural glass		glass	window pane		3	2 are very thick, more like bottle glass or perhaps safety-glass
3	Outside foundation - NW - Level 1	11"-1'4"	Kitchen	1840-present	Dishes	White granite			base	1	undecorated
<b>Outside foundation - NW - Level 1 Total</b>										5	
3	Outside foundation - NW - Level 2	1'4"-22"	Activities		Ethnofaunal zoological		oyster shell			2	
3	Outside foundation - NW - Level 2	1'4"-22"	Activities		Ethnofaunal zoological		clam shell			1	
3	Outside foundation - NW - Level 2	1'4"-22"	Architectural		Construction materials		concrete/stone			1	
3	Outside foundation - NW - Level 2	1'4"-22"	Architectural		Architectural glass		glass	window pane		1	aqua
3	Outside foundation - NW - Level 2	1'4"-22"	Architectural	1850	Nails		Iron			3	1 wire nail frag.; 2 Unident. frags.
3	Outside foundation - NW - Level 2	1'4"-22"	Kitchen		Tableware		glass	Unident		1	clear, scalloped
3	Outside foundation - NW - Level 2	1'4"-22"	Kitchen		Container		glass	bottle	frags	2	dark green
3	Outside foundation - NW - Level 2	1'4"-22"	Kitchen	1840-1915	Dishes	White granite				3	blue transfer printed
3	Outside foundation - NW - Level 2	1'4"-22"	Kitchen	1820-present	Dishes	Whiteware				1	blue u.g. h.p. circles and lines
3	Outside foundation - NW - Level 2	1'4"-22"	Kitchen	1820-1900	Dishes	Whiteware				2	2 frags melted together by glaze; black t.p.
3	Outside foundation - NW - Level 2	1'4"-22"	Kitchen	1820-Present	Dishes	Whiteware			rim	1	plain, undecorated
3	Outside foundation - NW - Level 2	1'4"-22"	Kitchen	1825-1915	Dishes	Whiteware				1	purple t.p. interior; plain exterior
3	Outside foundation - NW - Level 2	1'4"-22"	Kitchen	1840-1880	Dishes	Whiteware				1	red t.p., flovered/filled in
<b>Outside foundation - NW - Level 2 Total</b>										20	
3	Outside foundation - NW - Level 3	22"-36"	Activities	1831	Specialized Activities		slag			6	

**Burling Slip – Bulkhead Documentation Report**

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Outside foundation - NW - Level 3	22"-36"	Activities	1831	Specialized Activities		coal			1	
3	Outside foundation - NW - Level 3	22"-36"	Activities		Ethnofaunal zoological		bone		rib	1	large Mammal
3	Outside foundation - NW - Level 3	22"-36"	Activities		Ethnofaunal zoological		bone		long bone	1	small mammal, probably a rodent
3	Outside foundation - NW - Level 3	22"-36"	Activities		Ethnofaunal zoological		clam shell			3	
3	Outside foundation - NW - Level 3	22"-36"	Activities		Ethnofaunal zoological		oyster shell			2	
3	Outside foundation - NW - Level 3	22"-36"	Architectural		Construction materials		concrete			1	
3	Outside foundation - NW - Level 3	22"-36"	Architectural		Construction materials		wood			1	
3	Outside foundation - NW - Level 3	22"-36"	Architectural	1830?	Nails		Iron	nails		6	badly corroded; possibly machine cut?
3	Outside foundation - NW - Level 3	22"-36"	Architectural		Nails		Iron	washer		1	badly corroded; could be a nail frag.
3	Outside foundation - NW - Level 3	22"-36"	Furnishings	1864	Lighting Device		glass	lamp/chimney glass		3	devitrified
3	Outside foundation - NW - Level 3	22"-36"	Furnishings		Decorative Furnishings	Red Earthenware		flower pot		4	thick; one sherd decorated with incised lines but not as finely made as the sherd above on line #60.
3	Outside foundation - NW - Level 3	22"-36"	Kitchen		Dishes	Red Earthenware				1	clear lead glazed exterior; unglazed interior
3	Outside foundation - NW - Level 3	22"-36"	Kitchen	1795-1820	Dishes	Pearlware?			rim	1	underglaze polychrome painted floral, stem, leaves and possible red flower; poorly made or possibly the result of a fire, there are lumps in the paste, under the glaze.
3	Outside foundation - NW - Level 3	22"-36"	Kitchen		Dishes	Unident			body	1	burned; appears to have black u.g. painted decorations that might have once been blue.
3	Outside foundation - NW - Level 3	22"-36"	Kitchen		Dishes	Stoneware?			body	1	burned; thin; appears gray salt-glazed but paste is white; cobalt decoration with leaf pattern on ext., plain interior.

Appendix A: Phase 1B Artifact Inventory

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Outside foundation - NW - Level 3	22"-36"	Kitchen		Dishes	Unident			body	1	burned
3	Outside foundation - NW - Level 3	22"-36"	Kitchen	1820-present	Dishes	Whiteware			body	1	blue t.p. floral decoration on interior; plain exterior
3	Outside foundation - NW - Level 3	22"-26"	Kitchen	1820-present	Dishes	Whiteware			body	1	plain, undecorated;
3	Outside foundation - NW - Level 3	22"-36"	Kitchen	1820-present	Dishes	Whiteware			rim/cavetto	1	plain, undercoated; yellowish tinge
3	Outside foundation - NW - Level 3	22"-36"	Kitchen		Dishes	Unident earthenware			body	1	badly burned; glazed interior and exterior
3	Outside foundation - NW - Level 3	22"-36"	Kitchen		Dishes	Stoneware			body	1	gray s.g. exterior; brownslip interior.
3	Outside foundation - NW - Level 3	22"-36"	Kitchen		Dishes	Stoneware?			body	1	burned or mis-fired or possibly just a rock
3	Outside foundation - NW - Level 3	22"-36"	Kitchen		Container		glass	bottle	body	1	dark green
3	Outside foundation - NW - Level 3	22"-36"	Kitchen	1920?	Container		glass	bottle	neck	1	clear glass
3	Outside foundation - NW - Level 3	22"-36"	Kitchen		Container		glass	Unident	body	1	very small and badly devitrified
<b>Outside foundation - NW - Level 3 Total</b>										44	
3	Outside foundation - NW - Level 4	36"-42"	Activities	1831	Specialized Activities		coal	coal		1	burned
3	Outside foundation - NW - Level 4	36"-42"	Activities		Ethnofaunal zoological		bone		frags.	2	mammal
3	Outside foundation - NW - Level 4	36"-42"	Architectural		Construction materials		concrete			1	
3	Outside foundation - NW - Level 4	36"-42"	Architectural		Construction materials		slate			1	
3	Outside foundation - NW - Level 4	36"-42"	Architectural		Construction materials		terra cotta	brick	frag.	1	yellow brick fragment
3	Outside foundation - NW - Level 4	36"-42"	Architectural		Unident		Iron conglomerate			4	clumps of rust, iron, plaster, stones, etc.
3	Outside foundation - NW - Level 4	36"-42"	Furniture		Decorative furnishings	Red Earthenware		flowerpot	base	2	
3	Outside foundation - NW - Level 4	36"-42"	Furniture		Decorative furnishings	Red Earthenware			body	1	ribbed interior
3	Outside foundation - NW - Level 4	36"-42"	Kitchen		Container		glass	wine/liquor bottle	body sherd	1	dark green glass; devitrified
3	Outside foundation - NW - Level 4	36"-42"	Kitchen	1820-1915	Dishes	Whiteware		shallow bowl	rim	1	blue t.p., floral interior; plain exterior; mends with sherd below
3	Outside foundation - NW - Level 4	36"-42"	Kitchen	1820-1915	Dishes	Whiteware		shallow bowl	base/body	1	blue t.p., floral interior; plain exterior; mends with sherd above

**Burling Slip – Bulkhead Documentation Report**

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
3	Outside foundation - NW - Level 4	36"-42"	Kitchen	1820-1915	Dishes	Whiteware			small sherd	1	blue t.p.; with blue dots on interior, plain exterior
3	Outside foundation - NW - Level 4	36"-42"	Kitchen	1820-1915	Dishes	Whiteware			body	1	blue t.p. floral interior and exterior; burned
3	Outside foundation - NW - Level 4	36"-42"	Kitchen	1840-Present	Dishes	White granite		bowl	base/body	1	plain, undecorated
3	Outside foundation - NW - Level 4	36"-42"	Kitchen	1820-Present	Dishes	Whiteware			spall	1	plain, undecorated interior; glaze missing on exterior
3	Outside foundation - NW - Level 4	36"-42"	Kitchen	1820-Present	Dishes	Whiteware?			rims	2	badly burned
3	Outside foundation - NW - Level 4	36"-42"	Kitchen	1820-1900	Dishes	Whiteware?			body	2	possibly mocha; reddish brown with black "marbling" on exterior and black splotches on interior; paste is super white; meds.
3	Outside foundation - NW - Level 4	36"-42"	Unident		Unident		glass		thick chunk	1	badly broken; too thick for a bottle.
<b>Outside foundation - NW - Level 4 Total</b>										25	
3	Trench 3, back dirt		Activities		Ethnofaunal zoological		enamel/bone	Tooth		1	pig, lower incisor
3	Trench 3, back dirt		Clothing		Shoe		leather	Shoe sole		1	part of a sole with sew holes for stitching
3	Trench 3, back dirt		Kitchen	1840-present	Dishes	White granite			body	1	plain white
3	Trench 3, back dirt		Kitchen	1840-Present	Dishes	White granite			body	1	dark blue u.g. painted
3	Trench 3, back dirt Total									4	
3	Trench 4, back dirt		Clothing		Shoe		leather	shoe sole	sole	1	10 1/2" long; has stitching holes
<b>Trench 4, back dirt Total</b>										1	
4	Trench 4, 2'-4'	2'-4'	Activities		Ethnofaunal zoological		oyster shell			1	
4	Trench 4, 2'-4'	2'-4'	Kitchen	1840-1880	Dishes	White granite				1	red t.p. on int.
4	Trench 4, 2'-4'	2'-4'	Kitchen	1840-1880	Dishes	White granite		cup or bowl		1	red t.p. ext.
4	Trench 4, 2'-4'	2'-4'	Kitchen	1762-1820	Dishes	Creamware				1	plain
4	Trench 4, 2'-4'	2'-4'	Kitchen	1670-1850	Dishes	Red bodied slipware				1	clear reddish brown glaze with yellow lines of varying thicknesses
<b>Trench 4, 2'-4' Total</b>										5	
5	Trench 5, 44" & deeper	44" & deeper	Activities		Ethno-faunal zoological		clam shell			1	

Appendix A: Phase 1B Artifact Inventory

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
5	Trench 5, 44" & deeper	44" & deeper	Architectural	17th-early 18th c.	Construction Materials		brick	Dutch brick		1	Dutch yellow brick, 7" X 3 1/4" X 1 1/4"
5	Trench 5, 44" & deeper	44" & deeper	Architectural		Construction Materials		terra cotta	brick		1	red
5	Trench 5, 44" & deeper	44" & deeper	Clothing		Shoe		leather			1	fragment
5	Trench 5, 44" & deeper	44" & deeper	Kitchen	18th century	Container		glass	wine/liquor	base and body	2	has kick-up; dark green glass
5	Trench 5, 44" & deeper	44" & deeper	Kitchen	19th century?	Dishes	Stoneware		lg. vessel	rim	1	on ext and tan clear glaze on int.
5	Trench 5, 44" & deeper	44" & deeper	Kitchen		Dishes	Stoneware			body	1	gray salt glaze with reddish brown glaze; deeply grooved interior
5	Trench 5, 44" & deeper	44" & deeper	Kitchen		Dishes	Stoneware			body	2	buff-bodied Stoneware with reddish glaze ext and none on interior
5	Trench 5, 44" & deeper	44" & deeper	Kitchen		Dishes	Discolored Unidentifiable			body	1	blue t.p.
5	Trench 5, 44" & deeper	44" & deeper	Kitchen	1780-1840	Dishes	Pearlware			body	1	underglaze blue painted
5	Trench 5, 44" & deeper	44" & deeper	Kitchen		Dishes	Stoneware			body	1	gray salt glazed
5	Trench 5, 44" & deeper	44" & deeper	Kitchen	1670-1795	Dishes	Buff/Yellow bodied slipware			body	1	mottled dark brown and yellow glazed exterior, clear yellow glaze interior
5	Trench 5, 44" & deeper	44" & deeper	Kitchen	1795-1820s	Dishes	Pearlware		cup/small bowl	base	1	polychrome painted green leaves, yellow and blue flowers, brown stem on interior base
5	Trench 5, 44" & deeper	44" & deeper	Kitchen	1762-1820	Dishes	Creamware		plate/saucer	rim	1	green shell edge
5	Trench 5, 44" & deeper	44" & deeper	Kitchen	1820-1900	Dishes	Whiteware		plate/saucer	rim	1	blue shell edge
5	Trench 5, 44" & deeper	44" & deeper	Kitchen		Dishes	Discolored Unidentifiable			rim	1	plain
5	Trench 5, 44" & deeper	44" & deeper	Kitchen		Dishes	Discolored Unidentifiable			body	1	plain
5	Trench 5, 44" & deeper	44" & deeper	Kitchen	1840-Present	Dishes	White granite?			base	3	plain
5	Trench 5, 44" & deeper	44" & deeper	Kitchen	1840-Present	Dishes	White granite?			rim	2	plain
5	Trench 5, 44" & deeper	44" & deeper	Kitchen	1840-Present	Dishes	White granite?			body	1	plain
5	Trench 5, 44" & deeper	44" & deeper	Kitchen	1840-1915	Dishes	White granite			body	1	black t.p. floral int, plain ext

**Burling Slip – Bulkhead Documentation Report**

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
5	Trench 5, 44" & deeper	44" & deeper	Household	1762-1820	Hygiene	Creamware		chamber pot	rim	1	plain
5	Trench 5, 44" & deeper	44" & deeper	Tobacco	1680	Pipe		white ball clay	smoking	stem	1	5/64" bore
<b>Trench 5, 44" &amp; deeper Total</b>										28	
5	Trench 5, 4'	4'	Activities		Ethnofaunal zoological					4	
5	Trench 5, 4'	4'	Clothing		Shoe		leather	sole	sole	1	apx. 7" long; very narrow
5	Trench 5, 4'	4'	Kitchen		Container		glass	bottle	body	2	dark green; devitrified
5	Trench 5, 4'	4'	Kitchen		Dishes	Stoneware			body	1	grey salt-glazed ext.; brown slip interior
5	Trench 5, 4'	4'	Kitchen		Dishes	Discolored Unidentifiable			rim	1	blue shell edge; possibly Pearlware
5	Trench 5, 4'	4'	Kitchen	1780-1840	Dishes	Pearlware		bowl	base	1	underglaze blue hand painted; possibly chinoiserie
5	Trench 5, 4'	4'	Kitchen	1762-1820	Dishes	Creamware			body	1	plain
<b>Trench 5, 4' Total</b>										11	
5	Trench 5, 3'		Kitchen	1740-1850	Dishes	refined Red Earthenware			body	1	Jackfield style
5	Trench 5, 3'		Kitchen	1762-1820	Dishes	Creamware		servicing bowl	base	1	plain
5	Trench 5, 3'		Kitchen	1780-1830	Dishes	Pearlware			body	1	underglaze blue painted; some oriental designs and other floral on ext; chamfered or paneled
5	Trench 5, 3'		Kitchen	1795-1820s	Dishes	Pearlware			body	1	plain int.; polychrome painted yellow with brown hatching ext.
5	Trench 5, 3'		Kitchen	1780-1840	Dishes	Pearlware			rim	1	dark green shell edge
5	Trench 5, 3'		Kitchen	1780-1840	Dishes	Pearlware		soup bowl	rim and base	1	green shell edge, scallop edge
<b>Trench 5, 3' Total</b>										6	
5	Trench 5, back dirt		Kitchen	1762-1820	Dishes	Creamware			body	2	plain
5	Trench 5, back dirt		Kitchen	1795-1820s	Dishes	Discolored Unidentifiable			rim	2	mend; polychrome painted border, green leaves, yellow, brown and blue flowers and brown bands; probably Whiteware or Pearlware
<b>Trench 5, back dirt Total</b>										4	
6	Trench 6, back dirt	2'-4'	Kitchen	1840-1915	Dishes	White granite			body	1	brown transfer print int., floral patter, plain ext. Appears to be different pattern from those below

Appendix A: Phase 1B Artifact Inventory

Trench	Location	Depth	Group	Artifact TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
<b>Trench 6, back dirt Total</b>										1	
6	Trench 6, 4'	4'	Clothing		Unident		leather		Scraps	3	2 large flat leather scraps and one smaller folded over piece. 5 X 1 3/4"; 6 1/4 X 3 1/4"; 9 X 4 3/4"
6	Trench 6, 4'	4'	Kitchen	1840-1915	Dishes	White granite			body	4	brown transfer printed on one side, plain on other; probably from the same vessel, floral and landscape design; one sherd is paneled
6	Trench 6, 4'	4'	Kitchen	1820-1915	Dishes	Whiteware			body	1	blue transfer print floral int., plain ext.
<b>Trench 6, 4' Total</b>										8	
6	Trench 6, 7' 3"	7' 3"	Activities		Ethnafaunal zoological		oyster shell			1	
6	Trench 6, 7' 3"	7' 3"	Activities		Ethnafaunal zoological		bone	long bone		1	Large bird?
6	Trench 6, 7' 3"	7' 3"	Activities		Ethnafaunal zoological		bone/enamel	mandible		1	cow mandible with molars in place
<b>Trench 6, 7' 3" Total</b>										3	
	Back dirt		Kitchen	1800-1815	Storage	Stoneware		storage jar or crock	rim, body, handle	1	marked: C.CROL/MANUFACT/ MANHATTAN-W/NEW-YORK. Gray salt glazed Stoneware exterior, brown slipped interior. Blue and brown splotches on front of vessel.
	Back dirt		Kitchen		Dishes	Stoneware				1	buff-bodied, burned
	Back dirt		Kitchen	1840-1915	Dishes	White granite		plate	base	1	brown transfer print floral pattern on interior, plain ext.
	Back dirt		Kitchen	1795-1820s	Dishes	Pearlware		bowl	base	1	underglaze hand painted polychrome; blue line and blue flowers with ochre leaves.
<b>Back dirt Total</b>										4	
<b>Grand Total</b>										<b>737</b>	

## **APPENDIX B**

**Appendix B:**

**Bulkhead Documentation Artifact Inventory**

Location	Depth	Group	TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
<b>WEST OF BULKHEAD</b>										
West of Bulkhead in vicinity of Tie-Back N.L.1	Approx. 3' 6' bgs.	Architectural	17th-early 18th c.	Construction Materials		Yellow Brick	Brick	Whole; Fragment	2	Whole brick: 3" wide, 1" tall, 6.5" long. Broken brick: 1" tall, 3" wide, 4" long. Bricks have red clay inclusions; and traces of mortar on faces.
<b>Context Total</b>									<b>2</b>	
West of bulkhead, near N.U.4	Approx. 3-5' bgs	Activities		Ethnafaunal zoological		Bone		frag	1	Unident long bone with kerf mark (evidence of butchering)
West of bulkhead, near N.U.4	Approx. 3-5' bgs	Architectural		Construction Materials		Iron and wood		Composite	1	
West of bulkhead, near N.U.4	Approx. 3-5' bgs	Kitchen	Ca. 1830s-1860s	Containers		Glass	Wine/liquor bottle	Base frag	1	Dark brown, round bottle push-up base
<b>Context Total</b>									<b>3</b>	
Sample from Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Kitchen		Dishes	Stoneware		Unident	Rim Fragment	1	Salt-glazed stoneware, glazed on both sides. Curved on two surfaces. Along edge embossed with "...RAN..." A small portion of a decorative element remains.
Sample from Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Kitchen	1840s-1860s	Containers		Glass	Wine/Liquor/Utility bottles	Neck, Body, and Base	6	3 bases; 1 neck; and 2 body fragments.
Sample from Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	(Infrastructure ?)		(Roads?)		(Tar, wood chips, sand)	(Paving material?)	Fragments	3	
Sample from Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Tobacco		Pipe		White ball clay	Smoking	Stem	1	4/64" Bore
<b>Context Total</b>									<b>11</b>	

**Burling Slip – Bulkhead Documentation Report**

Location	Depth	Group	TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
West of bulkhead between N.U.2 and N.U.4	Between 2' 6" and 4' 6" bgs.	Activities		Ethnofaunal zoological		Clam shells			2	
West of bulkhead between N.U.2 and N.U.4	Between 2' 6" and 4' 6" bgs.	Kitchen		Unident		Glass		body	1	Light green glass
West of bulkhead between N.U.2 and N.U.4	Between 2' 6" and 4' 6" bgs.	Kitchen	1800-1830s	Dishes	Whiteware		Plate	Rim frag	1	Hand-painted green shell-edge; may have a gray finish, but this may be due to staining
<b>Context Total</b>									<b>4</b>	
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Kitchen	1840-1850s	Containers		Glass	Wine/Liquor/Utility bottle	Neck/finish	1	Dark olive green hand-blown bottle
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Kitchen	1840s-1860s	Containers		Glass	Wine/Liquor/Utility bottle	Neck/finish and base	2	Dark olive green, tall, moderately slender neck with applied finish. Base with push-up and push-up rod/ pontile scar.
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Architectural	17th-early 18th c	Construction Materials		Yellow Brick	Brick	Whole	1	Whole brick: 3.5" wide, 1.5" tall, 7" long. Traces of mortar on at least 4 faces.
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Architectural		Construction Materials		Red Brick	Brick	Large Fragment	1	Broken large irregular brick: 1.5" tall, 4.25" wide; 4.5" long (but broken length). No mortar traces. Color is orange, except for ashy color in center portions. Possible fire brick?
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs					Flint?		Fragment	1	Long nodule of black chert with small area exhibiting recent breakage
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Kitchen	1840s-1860s	Containers		Glass	Wine/Liquor/Utility bottle	Base and body fragments	7	Dark olive green; bases with push-up and push-up rod/ pontile scar.
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Kitchen	1840-1850	Containers		Glass	Wine/Liquor/Utility bottles	Neck/finishes and bases	35	15 bases; 8 neck/ finishes; 12 body fragments. All dark olive green glass cylindrical bottles with push-up. Bases have open pontil marks. Necks have applied finishes. Some are squatty form and appear free blown, others elongated and appear dip-molded. One finish retains cork fragment.

**Appendix B: Bulkhead Documentation Artifact Inventory**

Location	Depth	Group	TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Kitchen	1820-1850	Containers		Glass	Liquor bottle	Base	1	Olive-green flask with embossed pattern barely visible on lower body. Snap molded with pontil scar.
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Kitchen		Containers		Glass	Bottle	Neck	1	Aqua glass
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Activities		Ethnafaunal zoological		oyster shell			1	
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Architectural		Construction materials		Slate	Possible roofing material	Fragment	1	
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Architectural		Construction materials		Mortar	Possible roofing material	Fragment	1	Containing lime and sand
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Kitchen		Dishes	Whiteware		Unident	Fragment	1	Undecorated
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Kitchen	1670-1785	Dishes	British Buff-bodied Slipware		Unident	Body fragment	1	
West of bulkhead in or near Brick Artifact Pocket north of N.U.2	Approx. 2' bgs	Tobacco		Pipe		White ball clay	Smoking	Stem	1	5/64" Bore
<b>Context Total</b>									<b>56</b>	
<b>WEST OF BULKHEAD TOTAL</b>									<b>76</b>	
<b>EAST OF BULKHEAD</b>										
Back-dirt near N.U.3 (probably east side),	unknown	Architectural	Ca. 1750-1830	Construction Materials		Delft Tile		Fragment	1	Approx. 2"x2" fragment. Hand-painted scene in purple: a hillock with possible house. Possibly biblical or landscape scene.
<b>Context Total</b>									<b>1</b>	
Back dirt from east side of bulkhead near Pile N.1.	unknown	Activities		Ethnafaunal zoological		Bone			1	Unident long bone
<b>Context Total</b>									<b>1</b>	
Along east side of bulkhead near Pile N. 1	Approx. 4' bgs	Kitchen		Dishes	Whiteware ?		Unident	Frag	1	Hand-painted with black floral? pattern
Along east side of bulkhead near Pile N. 1	Approx. 4' bgs	Architectural		Construction Materials		Terra cotta	Brick	Frag	1	Yellow brick
Along east side of bulkhead near Pile N. 1	Approx. 4' bgs	Tobacco		Pipe		White ball clay	Smoking	Stem	1	4/64" Bore

**Burling Slip – Bulkhead Documentation Report**

Location	Depth	Group	TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
Along east side of bulkhead near Pile N. 1	Approx. 4' bgs	Kitchen		Unident	Buff-bodied stoneware ?		Unident	Frag	1	Hand-painted with brown stripes
Along east side of bulkhead near Pile N. 1	Approx. 4' bgs	Unident?		Unident?	Redware		Unident	Frag	1	Large fragment of partially brown-glazed redware with long parallel impressions
Along east side of bulkhead near Pile N. 1	Approx. 4' bgs	Clothing		Shoe?		Leather		Scrap	1	
Along east side of bulkhead near Pile N. 1	Approx. 4' bgs	Furnishings	ca. 1820-ca. 1920	Lighting Equipment		Carbon	Carbon Arc Lamp Rod	Whole	1	2.5" long, 3/8" diameter
Along east side of bulkhead near Pile N. 1	Approx. 4' bgs	Kitchen		Containers?	Redware?		Unident	Fragment	1	Brown lead glaze on interior and exterior
<b>Context Total</b>									<b>8</b>	
Top of east end of tie-back N.L.4 in Deep Test Area 2	7.5 feet bgs	Kitchen		Dishes		Annularware	Bowl or mug	Base frag	1	Hand-painted light brown and dark brown lines
<b>Context Total</b>									<b>1</b>	
East of bulkhead, near tie-back N.U.2	Approx. 3' 6" bgs	Kitchen		Dishes	Stoneware		Unident	Fragment	1	Gray stoneware with a brown glaze on one side and a clear glaze on the other
East of bulkhead, near tie-back N.U.2	Approx. 3' 6" bgs	Kitchen		Dishes	Whiteware		Dish	Fragment	1	Undecorated
East of bulkhead, near tie-back N.U.2	Approx. 3' 6" bgs	Tobacco		Pipe		White ball clay	Smoking	Stem	1	4/64" Bore
East of bulkhead, near tie-back N.U.2	Approx. 3' 6" bgs	Unident		Unident		Flint/chert		Fragment	1	Black chert with white coating
<b>Context Total</b>									<b>4</b>	
East of bulkhead between N.U.2 and N.U.4	Between 2'6" and 4' 6" bgs.	Kitchen		Dishes	Buff-bodied stoneware		Unident	Fragment	1	Interior has a reddish brown glaze and parallel line impressions, exterior has a clear glaze
East of bulkhead between N.U.2 and N.U.4	Between 2'6" and 4' 6" bgs.	Architectural		Construction Materials		Slate	Possible roofing material	Fragment	1	
East of bulkhead between N.U.2 and N.U.4	Between 2'6" and 4' 6" bgs.	Architectural		Construction Materials		Mortar	Mortar	Fragment	1	Lime and sand
East of bulkhead between N.U.2 and N.U.4	Between 2'6" and 4' 6" bgs.	Kitchen		Dishes	Whiteware		Unident	Fragments	2	One may be a rim frag
East of bulkhead between N.U.2 and N.U.4	Between 2'6" and 4' 6" bgs.	Kitchen		Dishes	Stoneware		Unident	Fragment	1	Gray stoneware with a brown glaze on one side and a clear glaze on the other

**Appendix B: Bulkhead Documentation Artifact Inventory**

Location	Depth	Group	TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
East of bulkhead between N.U.2 and N.U.4	Between 2' 6" and 4' 6" bgs.	Kitchen		Dishes	Whiteware		Unident	Fragment	1	Blue transfer print on one side
East of bulkhead between N.U.2 and N.U.4	Between 2' 6" and 4' 6" bgs.	Kitchen		Dishes	Whiteware		Unident	Frag	1	Dark blue transfer print on both sides
East of bulkhead between N.U.2 and N.U.4	Between 2' 6" and 4' 6" bgs.	Kitchen	1840-1860s	Containers		Glass	Wine/Liquor/Utility bottle	Base	1	Dark olive green hand-blown bottle with push-up rod/ pontile scar
East of bulkhead between N.U.2 and N.U.4	Between 2' 6" and 4' 6" bgs.	Kitchen		Dishes	Whiteware		Unident	Body fragment	1	Undecorated
East of bulkhead between N.U.2 and N.U.4	Between 2' 6" and 4' 6" bgs.	Kitchen	1840s-1860s	Containers		Glass	Wine/Liquor/Utility bottles	Neck, Body, and Base	12	8 body fragments; 2 neck fragments; 2 base fragments
East of bulkhead between N.U.2 and N.U.4	Between 2' 6" and 4' 6" bgs.	Kitchen		Dishes	Stoneware		Unident	Body Fragment	1	Salt-glazed stoneware, glazed on both sides.
East of bulkhead between N.U.2 and N.U.4	Between 2' 6" and 4' 6" bgs.	Kitchen		Dishes	Whiteware		Unident	Body fragment	1	Undecorated
<b>Context Total</b>									<b>24</b>	
<b>EAST OF BULKHEAD TOTAL</b>									<b>39</b>	
<b>UNDETERMINED</b>										
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1800-1830s	Dishes	Whiteware		Plate	Rim frags.	2	Hand-painted blue shell-edge with neo-classical design
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1800-1830s	Dishes	Whiteware		Plate	Rim and base frags.	2	Hand-painted blue shell-edge; one frag. Has a portion of a decorator's mark.
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1800-1830s	Dishes	Whiteware		Plate	Rim frag.	1	Hand-painted blue shell-edge with minimal impressions
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1820s-1830s	Dishes	Whiteware		Plate	Rim Frag.	1	Hand-painted blue shell-edge with cord and herringbone embossing
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1800-1830s	Dishes	Whiteware		Plate	Rim frags.	2	Hand-painted green shell-edge with neo-classical design
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1800-1830s	Dishes	Whiteware		Plate	Rim frags.	1	Hand-painted green shell-edge
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Household	1820-1900	Health & sanitation	Whiteware		Chamber Pot	Rim Frags	4	

**Burling Slip – Bulkhead Documentation Report**

Location	Depth	Group	TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1820-1900	Dishes	Whiteware		Bowl	Base frags	6	Several large fragments may have been parts of chamberpots
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1820-1900	Dishes	Whiteware		Plate	Base Frags	2	
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1820-1900	Dishes	Whiteware		unident	Body Frags	2	mends
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1815-1915	Dishes	Whiteware or Ironstone		Unident	Rim frags	2	Blue transfer print; mends
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1815-1915	Dishes	Whiteware or Ironstone		Unident	Rim frags	3	Black transfer print; possible maker's mark or double-sided pattern on one fragment
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1815-1915	Dishes	Whiteware or Ironstone		Unident	Rim frags	1	Black transfer print and embossed edge
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1825-1915	Dishes	Whiteware or Ironstone		Bowl	Rim frags	2	Red transfer print
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1831-1835	Dishes	Whiteware or Ironstone		Plate	Base frag	1	Red transfer print, floral with castle and landscape; maker's mark: "Clyde Scenery, Jacksons Warranted." (Produced by John and Job Jackson, Staffordshire)
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1795-1825	Dishes	Pearlware		Bowls	Base/rim frags	2	Underglaze hand-painted polychrome (yellow, green, purple, brown)floral/leaves motif; decorator's mark on underside of base (three dots)
P Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1795-1825	Dishes	Pearlware		Bowls	Base/rim frag	1	Underglaze hand-painted polychrome (green) leaf motif
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1775-1840	Dishes	Pearlware		Bowls	Base frag	1	Underglaze hand-painted with blue leaves
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1775-1840	Dishes	Pearlware		Bowls	Base frag	1	Underglaze hand-painted with red and blue leaves and a blue border around base
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1775-1840	Dishes	Pearlware		Unident	Body frag	1	Underglaze hand-painted polychrome pearlware with red and blue leaf pattern

Appendix B: Bulkhead Documentation Artifact Inventory

Location	Depth	Group	TPQ	Class	Ware Type	Material	Function	Parts	Total	Remarks
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1763-1820	Dishes	Red-bodied stoneware		Unident	Frag	1	Brown lead-glazed interior with three yellow concentric circles and unglazed exterior
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Kitchen	1815-1900	Dishes	Annularware		Unident	Rim frag.	1	Hand-painted with green, brown, and tan bands, parallel impressions in the green band near the rim.
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Activities		Ethnafaunal zoological		oyster shell			1	
Pocket of Ceramics in east wall of trench near N.U.6	approx. 6' bgs	Architectural		Construction materials		Slate fragment	Possible roofing material		1	
<b>Context Total</b>									<b>42</b>	
<b>UNDETERMINED TOTAL</b>									<b>42</b>	
<b>WITHIN BULKHEAD</b>										
Spike from lap joint of "Timber 6"	(unknown)	Architectural		Spike		Iron		frag	1	
<b>Context Total</b>									<b>1</b>	
From Top of Wall near N.U.4	Approx. 2' 8" bgs	Kitchen		Containers or dishes	Whiteware		Possibly a pitcher	Spout frag?	1	Dark blue transfer print with floral motif; print is on exterior and interior
From Top of Wall near N.U.4	Approx. 2' 8" bgs	Activities		Ethnafaunal zoological		Bone		Fragment	1	Butchered horse or cow rib bone,
<b>Context Total</b>									<b>2</b>	
Within mortise for tie-back N.U. 2	4' 3" bgs	Architectural		Construction Materials		Metal	Unident	Fragment	1	Large (5"x2"x3") chunk of wrought iron within mortise for tie-back; possibly a fastener assoc with tie-back
Within mortise for tie-back N.U.2	4' 3" bgs	Architectural		Construction Materials		Wood	Unident	Fragment	2	Fragments of wood encrusted with iron, found in close association with iron fragments in mortise for tie-back
Within mortise for tie-back N.U.2	4' 3" bgs	Kitchen	1670-1785	Dishes	British Buff-bodied Slipware		Unident	Fragment	1	
Within mortise for tie-back N.U.2	4' 3" bgs	Architectural		Construction Materials		Metal	Unident	Fragment	1	Large (6"x4"x4") chunk of wrought iron within mortise for tie-back; possibly a fastener assoc with tie-back
<b>Context Total</b>									<b>5</b>	
<b>WITHIN BULKHEAD TOTAL</b>									<b>8</b>	
<b>BULKHEAD DOCUMENTATION ARTIFACTS GRAND TOTAL</b>									<b>165</b>	

## **APPENDIX C**

**Tree-Ring Dating Results for**  
**Burling Slip Timbers**  
**Lower Manhattan, New York City**

**By**

**Edward R. Cook**

**and**

**Dario Martin Benito**

## Introduction

In April 2010, members of the Lamont-Doherty Earth Observatory Tree-Ring Laboratory (TRL) accompanied Molly McDonald, Senior Archaeologist and Architectural Historian, AKRF, on a visit to the newly excavated Burling Slip site near the South Street Seaport Museum in Lower Manhattan. This site was being prepared for the construction of the Burling Slip Imagination Playground. During the initial excavation phase a substantial number of wharf pilings and timbers were encountered, which were thought to have possibly been part of the original Burling Slip prior to it being buried in landfill. Because of the potential historical significance of the timbers, Molly McDonald contacted the TRL on behalf of AKRF to determine the feasibility of dating some of the timbers using tree-ring dating techniques. The April visit proved highly successful and some major timbers were sampled. Subsequently, additional ones were collected and a total of seven (7) samples were brought to the TRL for analysis. The results of those analyses are reported on here.

## Tree-Ring Analysis Results

The seven samples collected at Burling Slip were slowly dried prior to analysis. Slow drying was necessary to avoid rapid shrinking, splitting, and cracking that could impair the tree-ring analysis of the samples. Due to the waterlogged nature of the samples, this process took several weeks to complete. After the samples were sufficiently dried, they were carefully sanded with progressively finer grits to reveal the fine details of the annual tree rings. This process revealed that all seven samples were from locally available conifer species: eastern hemlock (*Tsuga canadensis*; 5 samples), pitch pine (*Pinus rigida*; 1), and eastern white pine (*Pinus strobus*; 1). Only hemlock provided multiple samples for comparison, which generally improves the likelihood of dating archaeological tree-ring samples of unknown site origin. However, this case we were also able to produce tree-ring dates for the two pine species as well.

**Figure 1** shows photographs of the seven sanded conifer samples. Please refer to **Table 1** for identifying the samples in the photographs. The photos reveal one of the problems in interpreting the outer-ring dates of these tree-ring samples. Ideally, we want to date the year in which the trees were felled for use in the construction of the Burling Slip because the felling date would probably not precede construction by more than 1-2 years. But to do so with certainty requires that the bark (or waney) edge (+BE) of the sample be present. The photographs indicate that three of the samples were heavily squared off (BS1, BS6, BS7) prior to use. In that case, only by chance might there still be a waney edge present at one of the corners of the timbers. The other four samples all show signs of curvature that is indicative of the outer surface of a tree. Yet because of the long period of submersion, only two samples had unequivocal waney edges (BS2 and BS4). This limits the precise dating of the Burling Slip and in fact has revealed a conundrum. More samples would have better constrained the results reported on here.

After the samples were sanded to a high polish, the tree rings along two radii of each sample were carefully measured to  $\pm 0.001$ mm precision and dated with available tree-ring dating masters for the appropriate species. The defacto standard computer program used in tree-ring research for doing this was program COFECHA (Holmes, 1983). This work was conducted by TRL post-doctoral fellow Dario Martin Benito. **Table 1** provides the tree-ring dating results. All of the samples had at least 100 annual rings in them, which is often regarded as the desirable minimum for achieving cross dating for tree species in the eastern United States.

The dating results are presented here with minimal archaeological interpretation on our part because that is not our field of expertise. The strongest evidence for a felling date prior to construction can be found in the eastern hemlock samples: 1825 for BS2 (+BE), followed closely by 1823 for BS6 (-BE) and 1816 for BS7 (-BE). The latter two are likely to be the same as BS2 because of lost outer rings. The pitch pine sample BS1 may also be from the 1825 felling period because its outer date (1793) and squared off form could have resulted in that many rings being lost. Some of the other dates are harder to explain and interpret however. For example, hemlock samples BS3 and BS5 have much earlier outer dates (1724 and 1760, respectively) that are inconsistent with an 1825 felling period date and neither shows strong evidence of being squared off. The white pine sample BS4 also has a waney edge, yet dates to 1720. Do these earlier dates suggest an earlier period of construction or reuse of timbers? These results point in either of those directions, but the number of samples is too limited to draw any firmer conclusions beyond this level of speculation.

To emphasize the strength of the tree-ring dates reported here for eastern hemlock, a comparison is shown between the Burling Slip hemlock master (mean of the five series) and a northern Hudson Valley eastern hemlock chronology based on living trees and independent archaeological samples. The Spearman rank correlation between the two series ( $r=0.58$ ) is highly significant ( $p<<0.001$ ) with an overlap of 317 years and a t-statistic of 12.5. This extremely strong match suggests that the origin of the hemlock logs used in the Burling Slip was from the northern Hudson Valley and the logs were most likely floated down to New York City. The two other Burling Slip timbers (pitch pine and white pine – not shown) also dated against northern Hudson Valley tree-ring masters of the same species, which essentially verifies this interpretation of the most likely origin of the wood recovered from the Burling Slip excavation.

## Reference

Holmes, R.L. 1983. Computer assisted quality control in tree-ring dating and measurement. *Tree-Ring Bulletin* 43:69-78.

**Table 1.** Dendrochronological dating results for all samples taken from the excavated wharf at Burling Slip site, New York City. For WANNEY, +BE means the bark edge was present or thought to be recovered at the time of sampling; -BE means that the bark edge was not recovered or was completely missing on the timber. All correlations are Spearman rank correlations of each radius (**Correl1** and **Correl2**) series against the master chronology of their species. **Correl** is for the mean of the two radii. See **Figure 1** for photographs of these samples and **Figure 2** for a summary plot of the dating results for the five eastern hemlock samples.

Sample	Species	Number of rings	Waney	First ring	Last ring	Correl1	Correl2	Correl
BS1	Pitch pine	73-108	-BE / squared	1686	1793	0.418	0.282	0.350
BS2	Hemlock	112-112	+BE	1714	1825	0.62	0.571	0.595
BS3	Hemlock	205-230	-BE	1495	1724	0.608	0.606	0.607
BS4	White pine	84-89	+BE	1631	1720	0.48	0.416	0.448
BS5	Hemlock	150-154	-BE	1607	1760	0.574	0.521	0.547
BS6	Hemlock	301-305	-BE / squared	1509	1823	0.538	0.554	0.546
BS7	Hemlock	120-127	-BE / squared	1674	1816	0.485	0.394	0.439



BS1



BS2



BS3



BS4



BS5

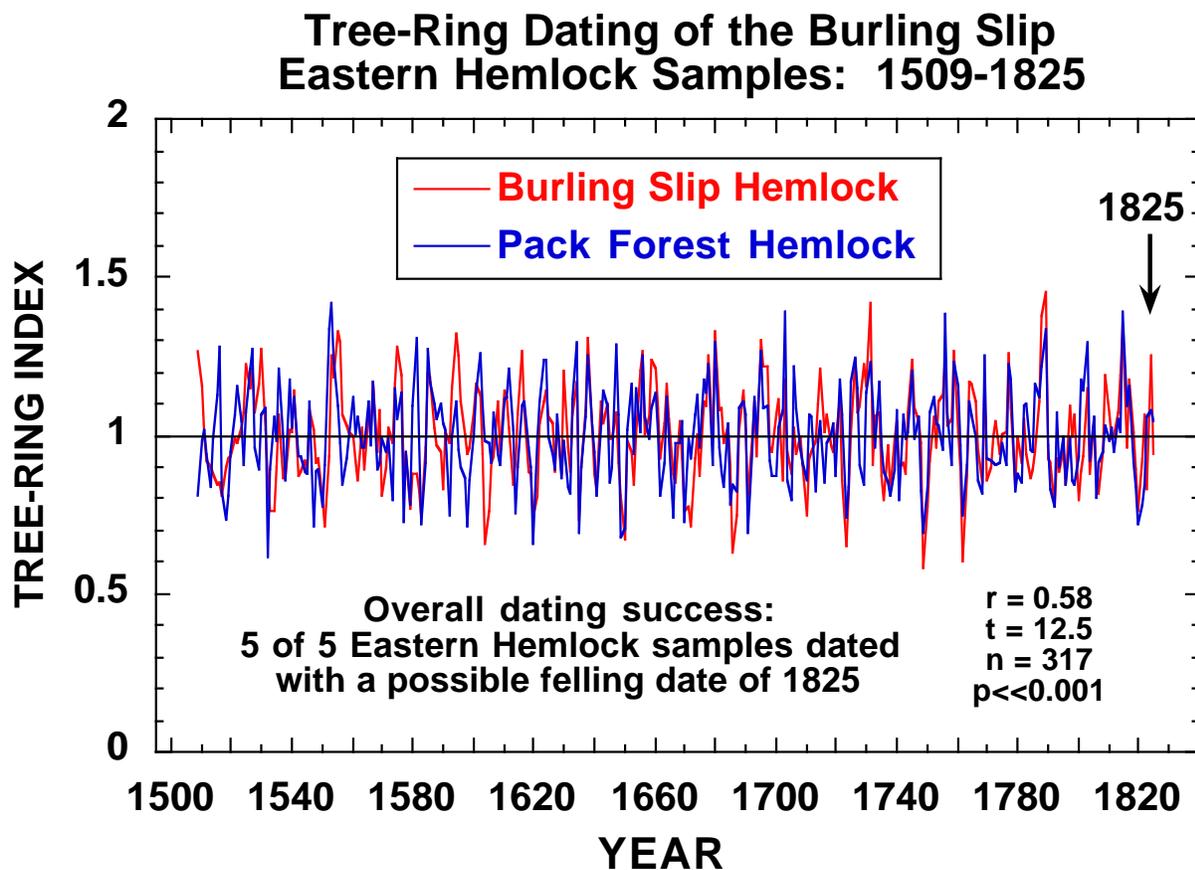


BS6



BS7

**Figure 1.** Photographs of the seven Burling Slip wood samples dated by tree-ring analysis. Refer to **Table 1** for the wood species and dates of the samples.



**Figure 2.** Comparison of the cross-dated eastern hemlock master chronology for the Burling Slip against a northern Hudson Valley eastern hemlock chronology based on living trees and independent archaeological samples. The Spearman rank correlation between the series ( $r=0.58$ ) is highly significant ( $p \ll 0.001$ ) with an overlap of 317 years and a t-statistic of 12.5. This extremely strong match suggests that the origin of the hemlock logs used in the Burling Slip was from the northern Hudson Valley and the logs were most likely floated down to New York City. The two other Burling Slip timbers (pitch pine and white pine – not shown) also dated against northern Hudson Valley tree-ring masters of the same species, which essentially verifies this interpretation of the origin of the wood.

## **APPENDIX D**



**NEW YORK STATE HISTORIC ARCHAEOLOGICAL SITE INVENTORY FORM**

NYS OFFICE OF PARKS, RECREATION & HISTORIC PRESERVATION

(518) 237-8643

For Office Use Only: Site Identifier: \_\_\_\_\_

Project Identifier: \_\_\_\_\_

Your Name: Molly R. McDonald, RPA

Date: May 2, 2011

Address: 440 Park Avenue South, 7th Floor, NY, NY 10016

Phone: 646.388.9810

Organization: AKRF, Inc. on behalf of the Lower Manhattan Development Corporation and the City of New York

1. SITE IDENTIFIER(S): Burling Slip (John Street) between Front and South Streets, Block 74, Lots 20 and 1 (portions)

2. COUNTY: New York

One of the following:

City: New York

Township: \_\_\_\_\_

Incorporated Village: \_\_\_\_\_

Unincorporated Village or Hamlet: \_\_\_\_\_

3. PRESENT OWNER: New York City Economic Development Corporation

ADDRESS: 110 William Street, New York, NY 10038

4. SITE DESCRIPTION (check all appropriate categories):

*STRUCTURE/SITE*

- Superstructure:  complete     partial     collapsed     not evident  
Foundation:  above     below     ground level     not evident  
 Structural subdivisions apparent  
 Only surface traces visible  
 Buried traces detected

List construction materials (be as specific as possible): Timber bulkheads (comprising walls of former wharves) constructed of hemlock, white pine, and pitch pine timber (chiefly squared). Iron spikes used in some locations.

*GROUNDS*

Current Conditions: Urban Streetbed

- Under cultivation     Sustaining erosion     Woodland     Upland  
 Never cultivated     Previously cultivated     Floodplain     Pastureland

Soil Drainage:  excellent     good     fair     poor

Distance to nearest water from structure (approx.): 100 feet (feature is in historically inundated location)

Elevation: Top of feature varies from approximately 0 to 2 feet above mean high water.

5. SITE INVESTIGATION (append additional sheets, if necessary):

SURFACE: Date(s): N/A

Collection: \_\_\_\_\_

Site map (submit with form\*)

SUBSURFACE: Date(s): May 2009 to April 2010

Testing: Shovel: \_\_\_\_\_ Coring: \_\_\_\_\_ Other: Trenches (Backhoe and Manual Excavation)

Unit Size: Approx. 200 feet long, 10 feet wide, 2 to 9 feet deep.

INVESTIGATOR: Molly McDonald, RPA

MANUSCRIPT OR PUBLISHED REPORT (S) (REFERENCE FULLY):

Bulkhead Documentation Report, Burling Slip. Report Prepared by AKRF, Inc., Submitted to the Lower Manhattan Development Corporation. May 2, 2011

PRESENT REPOSITORY OF MATERIALS: AKRF Lab, pending identification of permanent repository

6. **SITE INVENTORY (APPEND ADDITIONAL SHEETS, IF NECESSARY):**  
*a. Date constructed or occupation period:* North segment, 1756-1803; South segment, ca. 1803  
*b. Previous owners, if known:* Rem Remsen; George Codwise, Jr.  
*c. Modifications, if known:* Likely modified during second quarter of 19th century
7. **SITE DOCUMENTATION (APPEND ADDITIONAL SHEETS, IF NECESSARY):**  
*a. Historic map references:* 1805 Rem Remsen Map (on file at New York Historical Society)  
*b. Representation in existing photography:* (see Attachment)  
*c. Primary and secondary source of documentation (reference fully):* See Phase 1A Report, Phase 1B Report, and Bulkhead Documentation Report.  
*d. Persons with memory of site:* N/A
8. **List of material remains other than those used in construction (be as specific as possible in identifying object and material):** Timber bulkhead; historic-period artifacts in fill with overall TPQ of 1840-1850 (variety of ceramics, animal bone, shoe fragments, bottles, bricks, shells, personal items, smoking pipes, delft tile fragment, possible paving material).
- If prehistoric materials are evident, check here  and fill out prehistoric site form.**
9. **Map References: Map or maps showing exact location and extent of site must accompany this form and be identified by source and date. Keep this submission to 8½" x 11", if possible:**  
USGS 71/2 Minute Series Quad. Name: Jersey City (see Figure 1, attached)  
For Office Use Only--UTM Coordinates:
10. **Photography (optional for environmental impact survey): Please submit a 5"x7" black and white print(s) showing the current state of the site. Provide a label for the print(s) on a separate sheet. (See attachment)**

**LANDFILL RETAINING STRUCTURE FIELD INVENTORY FORM**

Unique Site Number: \_\_\_\_\_ Date Received by SHPO: \_\_\_\_\_

**GENERAL INFORMATION**

Investigator Molly R. McDonald, RPA Affiliation AKRF, Inc. Date May 2, 2011  
Street Address Burling Slip (John Street) btw. Front & South Streets Block/Lot Block 74, Lots 20 and 1 Town/Municipality New York (Manhattan)  
GPS Coordinates (if known) \_\_\_\_\_  
Project Fulton Street Corridor Revitalization Project Client/Institution Lower Manhattan Development Corporation and City of New York  
Name of Feature Burling Slip Bulkhead/ Codwise's Wharf Date of structure, if known ca. 1803 OPRHP Review Number 06PR06595

Structure was examined *in situ*  Dislocated/Disturbed Portions of Structure Examined

Was entire extent of structure exposed? Vertical: Yes  No  Horizontal: Yes  No   
Length of portion examined Approx 190 ft Height of portion examined 2 to 9 ft Depth from current ground surface to top of feature 2 to 6 ft  
Depth from current ground surface to Mean High Water 4 ft and Mean Low Water 6 ft

Elevation of top of feature relative to Mean Sea Level: Approx. 0-4 ft Did dewatering occur? Yes  No  Timber samples taken? Yes  No   
Present Repository of Materials Recovered: AKRF, Inc. Lab., 440 Park Ave South, NY, NY 10016 Long-Term Repository (if known): Not known

**1. PRIMARY STRUCTURAL MATERIAL**

Wood Wood Type (Oak, Pine, etc.), if known: Hemlock  
Shape of Wood Members: Round  Squared  Half-round  Planks  Bark Present   
Tooling of Wood Members: Hewn  Milled  Circular Saw  Undetermined  None  Other \_\_\_\_\_  
Typical Diameter/Width of Members (indicate member type/s): 12 to 14 inches Typical Length: 6 to 10 feet

Stone Stone Type, if known: \_\_\_\_\_ Courses: Regular  Irregular   
Shape: Fieldstone  Rough-cut  Ashlar  Other \_\_\_\_\_  
Finish: Quarry  Smooth  Tooled  Other \_\_\_\_\_  
Average Dimension of Stones: Height \_\_\_\_\_ Length \_\_\_\_\_ Width \_\_\_\_\_

Metal Metal Type, if known: \_\_\_\_\_  
Shape of Metal Members: \_\_\_\_\_  
Typical Dimensions of Members: \_\_\_\_\_

Concrete Poured  Reinforced  Concrete Block  Other \_\_\_\_\_  
If Concrete Block, Average Dimensions: \_\_\_\_\_  
Atypical Composition, Color, or Finish, if applicable \_\_\_\_\_

Other Material \_\_\_\_\_

**2. FILL MATERIAL**

Can Fill Retained within Structure be distinguished from External or Adjacent Fill? Yes  No

Fill Material Retained within Structure was Examined (If yes, complete this section)

Are Fill Soils Stratified? No  Yes ; If yes, number of soil levels: (Soil levels and colors were present but appeared to be result of natural settling of sediments rather than stratified episodes of filling).

Level 1: Depths: \_\_\_\_\_ Soil Color/s \_\_\_\_\_ Soil Types \_\_\_\_\_  
Level 2: Depths: \_\_\_\_\_ Soil Color/s \_\_\_\_\_ Soil Types \_\_\_\_\_  
(Expand as needed)

Are Rocks/Stones a Major Component of Fill? Yes  No  Estimated Percentage of Rock to Soil Fill: Approx. 20%  
Describe rock/stone type and Average Dimensions: Jagged schist, approx. 10 to 15 inches diameter

Other Materials Present in Fill: Wood  Sand  Gravel  Coral  Other \_\_\_\_\_

Artifact Types Represented: Ceramics  Glass  Shell  Leather  Bone  Wood  Other \_\_\_\_\_

Fill Materials Adjacent to (Outside of) Landfill Retaining Structure were Examined (If yes, complete this section)

Location of External Fill Materials in Relation to Landfill Retaining Structure: \_\_\_\_\_

Are Soils Stratified? No  Yes ; If yes, number of soil levels: (Soil levels and colors were present but appeared to be result of natural settling of sediments)

Level 1: Depths: \_\_\_\_\_ Soil Color/s \_\_\_\_\_ Soil Types \_\_\_\_\_  
Level 2: Depths: \_\_\_\_\_ Soil Color/s \_\_\_\_\_ Soil Types \_\_\_\_\_

Are Rocks/Stones a Major Component?  Yes  No Estimated Percentage of Rock to Soil Fill: Negligible  
Describe rock/stone type and average Dimensions: N/A

Other Materials Present in Fill:  Wood  Sand  Gravel  Coral  Other \_\_\_\_\_

Artifact Types Represented:  Ceramics  Glass  Shell  Leather  Bone  Wood  Other \_\_\_\_\_

**3. STRUCTURE FORM**

Is the structure form known?  Yes  No If "No," Explain: \_\_\_\_\_

Wall

Crib

If structure is a wall or crib form, are the following features present:

Piles along:  Interior Face  Exterior Face  Another Location \_\_\_\_\_

Tie-backs (One end anchored in fill)  Cross-Ties (Both ends anchored in structures)  Unknown

Diagonal Braces:  Interior  Exterior

If tie-backs, cross-ties, or braces, are present, are they placed at regular intervals?  Yes  No  
Approximate distance (horizontal) between tie-backs/cross-ties and/or braces: 10 to 20 feet

If multiple tiers of ties are visible: Number of tiers: 2 Distance (vertical) between tiers: Min. 10 inches

Placement of tiers:  In-line with tier above/below  Off-set  Variable

Grillage

Are courses of timber aligned perpendicular to each other?  Yes  No \_\_\_\_\_

Is gravel or stone present between tiers?  Yes  No \_\_\_\_\_

Are fasteners, joints, or piles present?  Yes  No If yes, describe: \_\_\_\_\_

Ship/Vessel \_\_\_\_\_

Other: \_\_\_\_\_

**4. STRUCTURE TYPE**

Is the structure form known?  Yes  No If "No," Explain: \_\_\_\_\_

Continuous Linear Shoreline

Structure Forms Shoreline of:  Canal  Sea  River  Other \_\_\_\_\_

Wharf

Wharf Configuration, if known:  Block-and-Bridge  Parallel Structural Units  Other \_\_\_\_\_

Slip

Structure Forms:  Fabric of Original Slip  Barrier at Slip Mouth Installed when Slip Filled

Other \_\_\_\_\_

**5. VERNACULAR CONSTRUCTION METHOD**

Stacked Log Construction

Is the structure made up of stacked logs/timbers?  Yes  No Number of courses visible: 6

Are courses reinforced with:  Wood Pegs/Dowels  Metal Spikes  Vertical Lock Bars  
Describe: \_\_\_\_\_

Is corner of structure visible?  Yes  No Is corner notching present?  Yes  No  
Type of corner notching, if applicable: \_\_\_\_\_

Are notches reinforced with:  Wood pegs or dowels  Metal spikes  
Other features and joints observed (Describe joint/notch types in each location, if applicable):

Scarf joints (tie timbers together in the same alignment) Simple lap scarfs reinforced with metal spikes

Tie-backs/Cross-Ties Notched into Wall Variable square and lap notches, some lock notches, many reinforced with metal spikes  
Are scarf joints and tie-back/cross-tie ends part of the same assembly? No

Diagonal Braces \_\_\_\_\_

Other \_\_\_\_\_

Timber-Frame Construction (not common in United States)

Does the structure have the following:  A frame consisting of sills/plates and posts  Mortise and tenon joints  
Describe structure: \_\_\_\_\_

Pile Construction

Type of Pile Construction:

Closely spaced vertical piles creating a solid linear wall

Piles supporting superstructure  
Describe placement of piles and any braces present: \_\_\_\_\_  
Describe superstructure: \_\_\_\_\_

Other: \_\_\_\_\_

Plank Construction:  Vertical Planks  Horizontal Planks

Planks are :  Nailed/Spiked  Rabbeted (set into groove)  Other: \_\_\_\_\_ to  Piles  Wood Plates  Other  
Describe: \_\_\_\_\_

Masonry: If the structure is built of stone or other masonry, please use a separate sheet to describe the construction of the wall.

**6. MAPS AND PHOTOGRAPHY**

Please attach map or maps on 8 1/2 x11" paper showing location and extent of Landfill Retaining Structure documented. Include source and date.  
Please attach photographs or good-quality prints of the landfill retaining structure. Provide caption noting location and direction of view.  
Please attach plan and profile drawings of Landfill Retaining Structure feature, if possible.

**LANDFILL RETAINING STRUCTURE FIELD INVENTORY FORM**

Unique Site Number: \_\_\_\_\_ Date Received by SHPO: \_\_\_\_\_

**GENERAL INFORMATION**

Investigator Molly R. McDonald, RPA Affiliation AKRF, Inc. Date May 2, 2011  
Street Address Burling Slip (John Street) btw. Front & South Streets Block/Lot Block 74, Lots 20 and 1 Town/Municipality New York (Manhattan)  
GPS Coordinates (if known) \_\_\_\_\_  
Project Fulton Street Corridor Revitalization Project Client/Institution Lower Manhattan Development Corporation and City of New York  
Name of Feature Burling Slip Bulkhead/ Remsen's Wharf Date of Feature, if known 1756-1803 OPRHP Review Number 06PR06595

Structure was examined *in situ*  Dislocated/Disturbed Portions of Structure Examined

Was entire extent of structure exposed? Vertical: Yes  No  Horizontal: Yes  No

Length of portion examined Approx 10 feet Height of portion examined 3.5 ft Depth from current ground surface to top of feature 3 ft  
Depth from current ground surface to Mean High Water 4 ft and Mean Low Water 6 ft

Elevation of top of feature relative to Mean Sea Level: Approx. 3 ft above Did dewatering occur?  Yes  No Timber samples taken?  Yes  No  
Present Repository of Materials Recovered: AKRF, Inc. Lab., 440 Park Ave South, NY, NY 10016 Long-Term Repository (if known): Not known

**1. PRIMARY STRUCTURAL MATERIAL**

Wood Wood Type (Oak, Pine, etc.), if known: Hemlock, White Pine, Pitch Pine  
Shape of Wood Members:  Round  Squared  Half-round  Planks  Bark Present  
Tooling of Wood Members:  Hewn  Milled  Circular Saw  Undetermined  None  Other \_\_\_\_\_  
Typical Diameter/Width of Members (indicate member type/s): 12 to 14 inches Typical Length: Unknown

Stone Stone Type, if known: \_\_\_\_\_ Courses:  Regular  Irregular  
Shape:  Fieldstone  Rough-cut  Ashlar  Other \_\_\_\_\_  
Finish:  Quarry  Smooth  Tooled \_\_\_\_\_  Other \_\_\_\_\_  
Average Dimension of Stones: Height \_\_\_\_\_ Length \_\_\_\_\_ Width \_\_\_\_\_

Metal Metal Type, if known: \_\_\_\_\_  
Shape of Metal Members: \_\_\_\_\_  
Typical Dimensions of Members: \_\_\_\_\_

Concrete  Poured  Reinforced  Concrete Block  Other \_\_\_\_\_  
If Concrete Block, Average Dimensions: \_\_\_\_\_  
Atypical Composition, Color, or Finish, if applicable \_\_\_\_\_

Other Material \_\_\_\_\_

**2. FILL MATERIAL**

Can Fill Retained within Structure be distinguished from External or Adjacent Fill?  Yes  No

**Fill Material Retained within Structure was Examined** (If yes, complete this section)

Are Fill Soils Stratified?  No  Yes; If yes, number of soil levels: (Soil levels and colors were present but appeared to be result of natural settling of sediments rather than stratified episodes of filling)

Level 1: Depths: \_\_\_\_\_ Soil Color/s \_\_\_\_\_ Soil Types \_\_\_\_\_  
Level 2: Depths: \_\_\_\_\_ Soil Color/s \_\_\_\_\_ Soil Types \_\_\_\_\_  
(Expand as needed)

Are Rocks/Stones a Major Component of Fill? Yes  No  Estimated Percentage of Rock to Soil Fill: Unknown  
Describe rock/stone type and Average Dimensions: \_\_\_\_\_

Other Materials Present in Fill:  Wood  Sand  Gravel  Coral  Other \_\_\_\_\_

Artifact Types Represented:  Ceramics  Glass  Shell  Leather  Bone  Wood  Other (Note: Artifacts were not collected in specific association with this wharf; rather adjoining Codwise's Wharf was more thoroughly sampled)

**Fill Materials Adjacent to (Outside of) Landfill Retaining Structure were Examined** (If yes, complete this section)

Location of External Fill Materials in Relation to Landfill Retaining Structure: \_\_\_\_\_

Are Soils Stratified?  No  Yes; If yes, number of soil levels: (Soil levels and colors were present but appeared to be result of natural settling of sediments)  
Level 1: Depths: \_\_\_\_\_ Soil Color/s \_\_\_\_\_ Soil Types \_\_\_\_\_

Level 2: Depths: \_\_\_\_\_ Soil Color/s \_\_\_\_\_ Soil Types \_\_\_\_\_

Are Rocks/Stones a Major Component?  Yes  No Estimated Percentage of Rock to Soil Fill: Negligible

Describe rock/stone type and average Dimensions: N/A

Other Materials Present in Fill:  Wood  Sand  Gravel  Coral  Other \_\_\_\_\_

Artifact Types Represented:  Ceramics  Glass  Shell  Leather  Bone  Wood  Other \_\_\_\_\_

**3. STRUCTURE FORM**

Is the structure form known?  Yes  No If "No," Explain: Only the corner was exposed. It could not be determined if wharf was crib or wall

Wall

Crib

If structure is a wall or crib form, are the following features present:

Piles along:  Interior Face  Exterior Face  Another Location \_\_\_\_\_

Tie-backs (One end anchored in fill)  Cross-Ties (Both ends anchored in structures)  Unknown (Corner included tie-back or cross-tie)

Diagonal Braces:  Interior  Exterior

If tie-backs, cross-ties, or braces, are present, are they placed at regular intervals?  Yes  No  
Approximate distance (horizontal) between tie-backs/cross-ties and/or braces: Unknown

If multiple tiers of ties are visible: Number of tiers: \_\_\_\_\_ Distance (vertical) between tiers: (Unknown)

Placement of tiers:  In-line with tier above/below  Off-set  Variable

Grillage

Are courses of timber aligned perpendicular to each other?  Yes  No \_\_\_\_\_

Is gravel or stone present between tiers?  Yes  No \_\_\_\_\_

Are fasteners, joints, or piles present?  Yes  No If yes, describe: \_\_\_\_\_

Ship/Vessel \_\_\_\_\_

Other: \_\_\_\_\_

**4. STRUCTURE TYPE**

Is the structure form known?  Yes  No If "No," Explain: \_\_\_\_\_

Continuous Linear Shoreline

Structure Forms Shoreline of:  Canal  Sea  River  Other \_\_\_\_\_

Wharf

Wharf Configuration, if known:  Block-and-Bridge  Parallel Structural Units  Other \_\_\_\_\_

Slip

Structure Forms:  Fabric of Original Slip  Barrier at Slip Mouth Installed when Slip Filled

Other \_\_\_\_\_

**5. VERNACULAR CONSTRUCTION METHOD**

Stacked Log Construction

Is the structure made up of stacked logs/timbers?  Yes  No Number of courses visible: 4

Are courses reinforced with:  Wood Pegs/Dowels  Metal Spikes  Vertical Lock Bars  
Describe: No fasteners observed other than notches and piles

Is corner of structure visible?  Yes  No Is corner notching present?  Yes  No  
Type of corner notching, if applicable: Square lock notch

Are notches reinforced with:  Wood pegs or dowels  Metal spikes  
Other features and joints observed (Describe joint/notch types in each location, if applicable):

Scarf joints (tie timbers together in the same alignment) \_\_\_\_\_

Tie-backs/Cross-Ties Notched into Wall \_\_\_\_\_

Are scarf joints and tie-back/cross-tie ends part of the same assembly? \_\_\_\_\_

Diagonal Braces \_\_\_\_\_

Other \_\_\_\_\_

Timber-Frame Construction (not common in United States)

Does the structure have the following:  A frame consisting of sills/plates and posts  Mortise and tenon joints  
Describe structure: \_\_\_\_\_

Pile Construction

Type of Pile Construction:

Closely spaced vertical piles creating a solid linear wall

Piles supporting superstructure  
Describe placement of piles and any braces present: \_\_\_\_\_  
Describe superstructure: \_\_\_\_\_

Other: \_\_\_\_\_

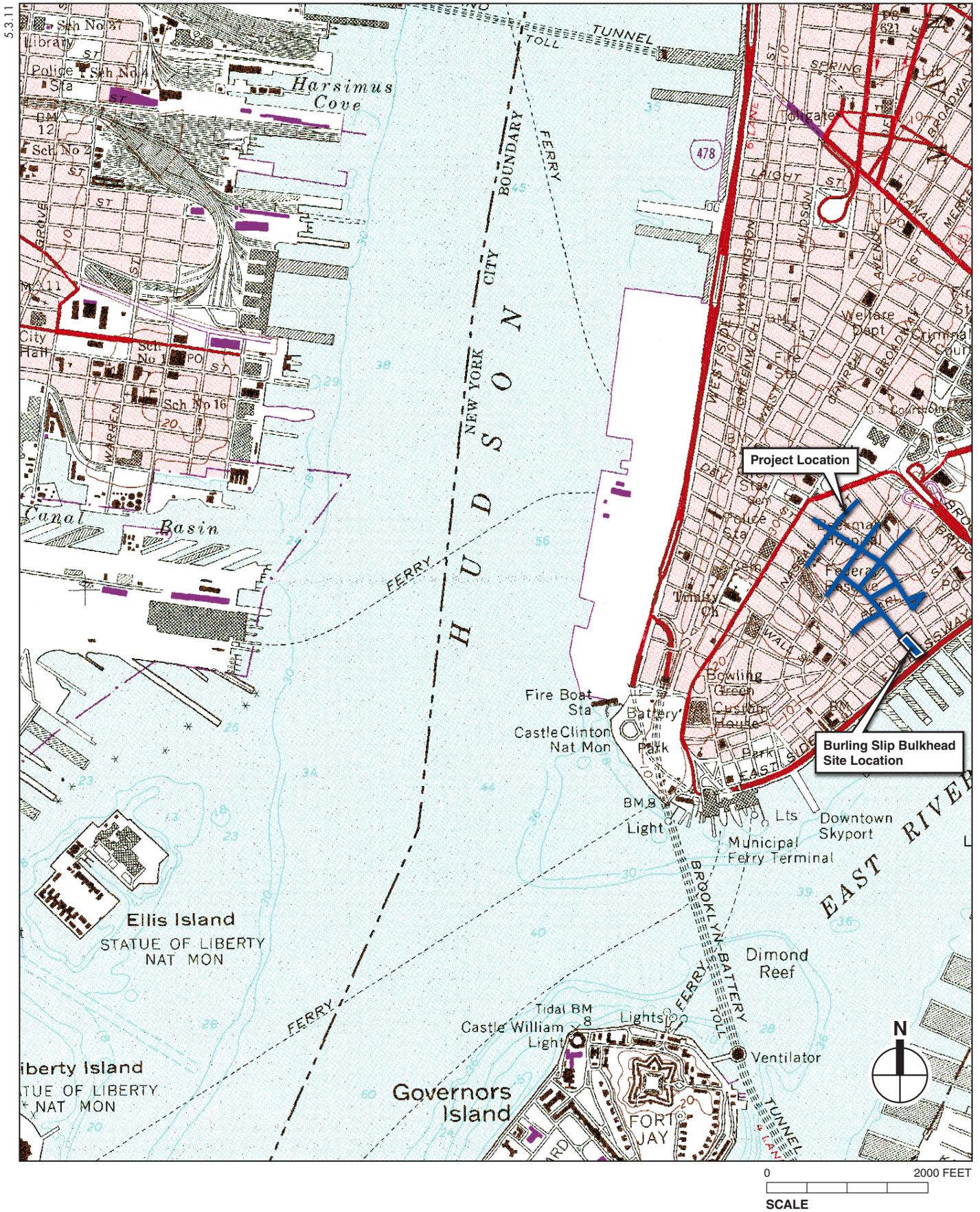
Plank Construction:  Vertical Planks  Horizontal Planks

Planks are:  Nailed/Spiked  Rabbeted (set into groove)  Other: \_\_\_\_\_ to  Piles  Wood Plates  Other  
Describe: \_\_\_\_\_

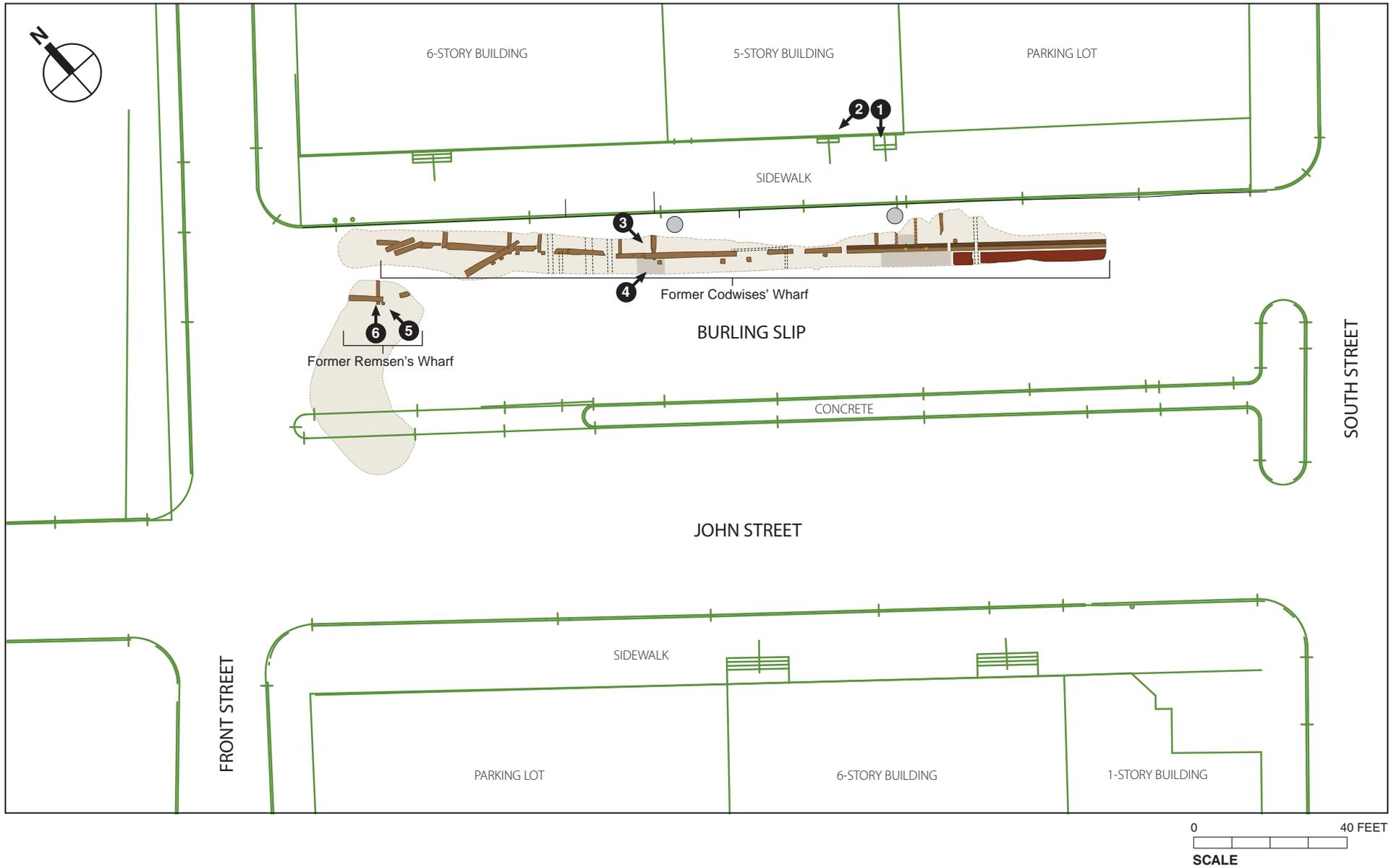
Masonry: If the structure is built of stone or other masonry, please use a separate sheet to describe the construction of the wall.

**6. MAPS AND PHOTOGRAPHY**

Please attach map or maps on 8 1/2 x 11" paper showing location and extent of Landfill Retaining Structure documented. Include source and date.  
Please attach photographs or good-quality prints of the landfill retaining structure. Provide caption noting location and direction of view.  
Please attach plan and profile drawings of Landfill Retaining Structure feature, if possible.



Project and Site Location  
 USGS Jersey City Quadrangle  
 Figure 1





A view from the upper floor of the South Street Seaport Museum, looking downwards and west on the southern half of the bulkhead 1



From the upper floor of the South Street Seaport Museum, looking downwards and northwest on the northern half of the bulkhead 2



Looking west, a close-up view of where the tie-back identified as "U.3" is notched into the east face of the bulkhead **3**



Looking east at the same assembly from the other (west) side of the bulkhead, this close-up view shows the square lock-notched ends of tie-backs "U.3" and "L.3." A pile (right) was used by the wharf builders to reinforce the bulkhead **4**



*The northernmost section of bulkhead, believed to be the corner of what was Remsen's Wharf. This section of bulkhead was encountered during construction several months after the rest of the bulkhead was documented*

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*A close-up view of what is believed to be the corner of Remsen's wharf, the northernmost section of bulkhead documented. Note the notched timbers and wood pile. The steel pile pictured was driven for the playground construction prior to excavation in this area*

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