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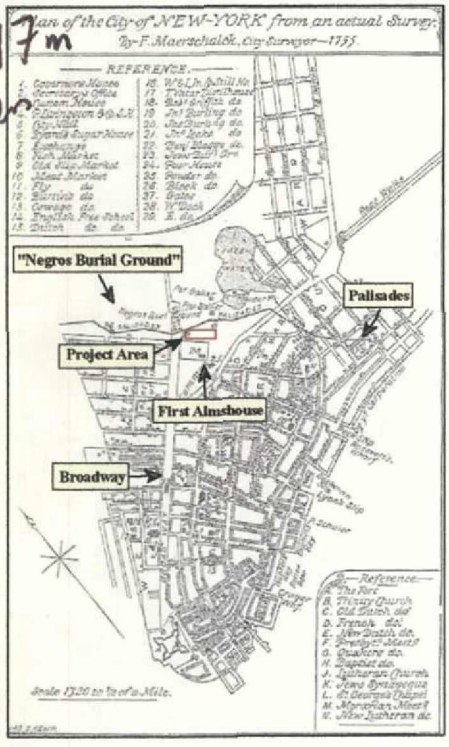
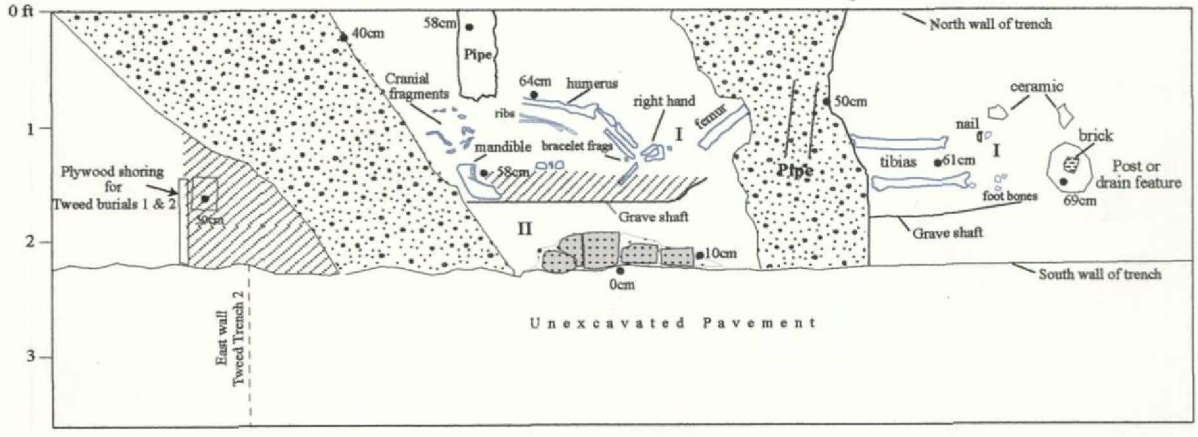
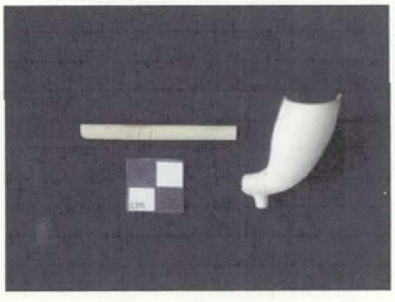


Archeological Monitoring
Con Edison Utility Trenches

Chambers Street, Manhattan
City of New York, New York County

LPC 02-1987





conEdison

Prepared For:
Consolidated Edison
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Burial drawing and artifact photo by HAA, Inc.
Historic map of Lower Manhattan by Maerschalk (1755).
Color illustration of Second Almshouse and City Hall c. 1825 from the collections of
The Museum of the City of New York.

ABSTRACT

This report presents the results of archeological monitoring conducted during the excavation of utility trenches by Consolidated Edison (Con Ed) in Chambers Street between Broadway and Elk Streets in the Borough of Manhattan, New York County. This study was conducted under the Landmarks Law of 1965 (New York City Charter Section 3020; Title 25, Chapter 3 of the New York City Administrative Code) and the 1977 City Environmental Quality Review Act (New York City Mayor's Executive Order No. 91). Con Ed was required to mitigate impacts to archeological resources identified within two utility trenches in this section of Chambers Street since it is located within the African Burial Ground and Commons Historic District regulated by the New York City Landmarks Preservation Commission (LPC). All work conducted for this project followed the guidelines outlined in the 1994 NYAC *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State* (New York Archaeological Council [NYAC] 1994).

In 2002, Hartgen Archeological Associates, Inc. (HAA, Inc.) was hired by Con Ed to monitor all excavation work associated with utility replacement within an approximately 300-ft (91.44 m) section of Chambers Street between Broadway and Elk Streets. The construction work included ground-disturbing activities that had the potential to impact significant historical resources, as this segment of the street is located within the African Burial Ground and Commons Historic District, a designated New York City historic district.

Chambers Street and the adjacent public sidewalks are characterized by high sensitivity for the presence of historic cultural resources, particularly human burials. During previous construction in this area in the 1980s, 1990s, and 2000-2001, numerous historic burials, as well as disturbed human remains, were identified beneath Chambers Street and its south sidewalk, the grounds of the Tweed Courthouse at 52 Chambers Street, and the adjacent grounds of City Hall Park.

Two trenches were hand-excavated by Con Ed in the eastbound lane of Chambers Street. Archeological monitoring of these two trenches documented ten historic burials, six in Trench 1 and four in Trench 2. None of the burials were completely intact and most were heavily disturbed by previous construction. Of the ten burials, nine were single burials and one had two individuals. Nine of the individuals were adults, and two were infants. The ten burials represent at least ten separate rows, which are oriented in three different fashions. One was buried north-south; four east-west; and five northeast-southwest. Nine of the ten burials were single interments, while one (Burial 10) was a double interment.

In addition to the intact burials, 1,879 disarticulated or disturbed human remains were identified and removed from the two trenches and 1,026 historic artifacts were collected. One heavily disturbed historic feature – a probable privy – was identified in Trench 1 and a partial brick feature was identified in Trench 2.

There remains a high potential for uncovering additional pockets of intact cultural resources in this general area. This project and other recent studies have confirmed that despite the amount of ground disturbance in the area, isolated pockets of intact human remains and other cultural features still exist. There is a particularly high potential for the presence of fragmentary human remains and intact burials just outside the impact area of this project, including several already identified and protected during this and the Tweed Courthouse project. Based on these factors, it is recommended that if any further ground disturbance is proposed for Chambers Street and its associated sidewalks in this area, further archeological testing and/or monitoring should be required.

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INTRODUCTION

This report presents the results of archeological monitoring conducted during the excavation of utility trenches by Consolidated Edison (Con Ed) in Chambers Street between Broadway and Elk Streets in the Borough of Manhattan, New York County (Map 1). This study was conducted under the Landmarks Law of 1965 (New York City Charter Section 3020; Title 25, Chapter 3 of the New York City Administrative Code) and the 1977 City Environmental Quality Review Act (New York City Mayor's Executive Order No. 91). Con Ed was required to mitigate impacts to archeological resources identified within two utility trenches in this section of Chambers Street since it is located within the African Burial Ground and Commons Historic District regulated by the New York City Landmarks Preservation Commission (LPC). All work conducted for this project followed the guidelines outlined in the LPC's *Guidelines for Archaeological Work in New York City* (LPC 2002).

PROJECT INFORMATION

In 2002, HAA, Inc. was hired by Con Ed to monitor all excavation work associated with utility replacement within an approximately 300 ft (91.44 m) section of Chambers Street between Broadway and Elk Streets. The construction work included ground-disturbing activities that had the potential to impact significant historical resources, as this segment of the street is located within the African Burial Ground and Commons Historic District (Map 2), a designated New York City historic district.

Chambers Street and the adjacent public sidewalks are characterized by high sensitivity for the presence of historic cultural resources, particularly human burials. During previous construction in this area in the 1980s, 1990s, and 2000-2001, numerous historic burials, as well as disturbed human remains, were identified beneath Chambers Street and its south sidewalk, the grounds of the Tweed Courthouse at 52 Chambers Street, and the adjacent grounds of City Hall Park.

The Con Edison utility replacement trenches were excavated primarily in the eastbound lane of Chambers Street. One small segment at the east end of the project crossed into the westbound lane. The fieldwork was carried out in May 2002, and all excavations occurred at night to avoid traffic problems during the regular workday.

As required by the LPC, due to the high potential for the presence of human remains and intact burials, Carol A. Raemsch, Ph.D., bioarcheologist, was Principal Investigator and Field Director for all of the archeological site work. The report is authored by Carol A. Raemsch.

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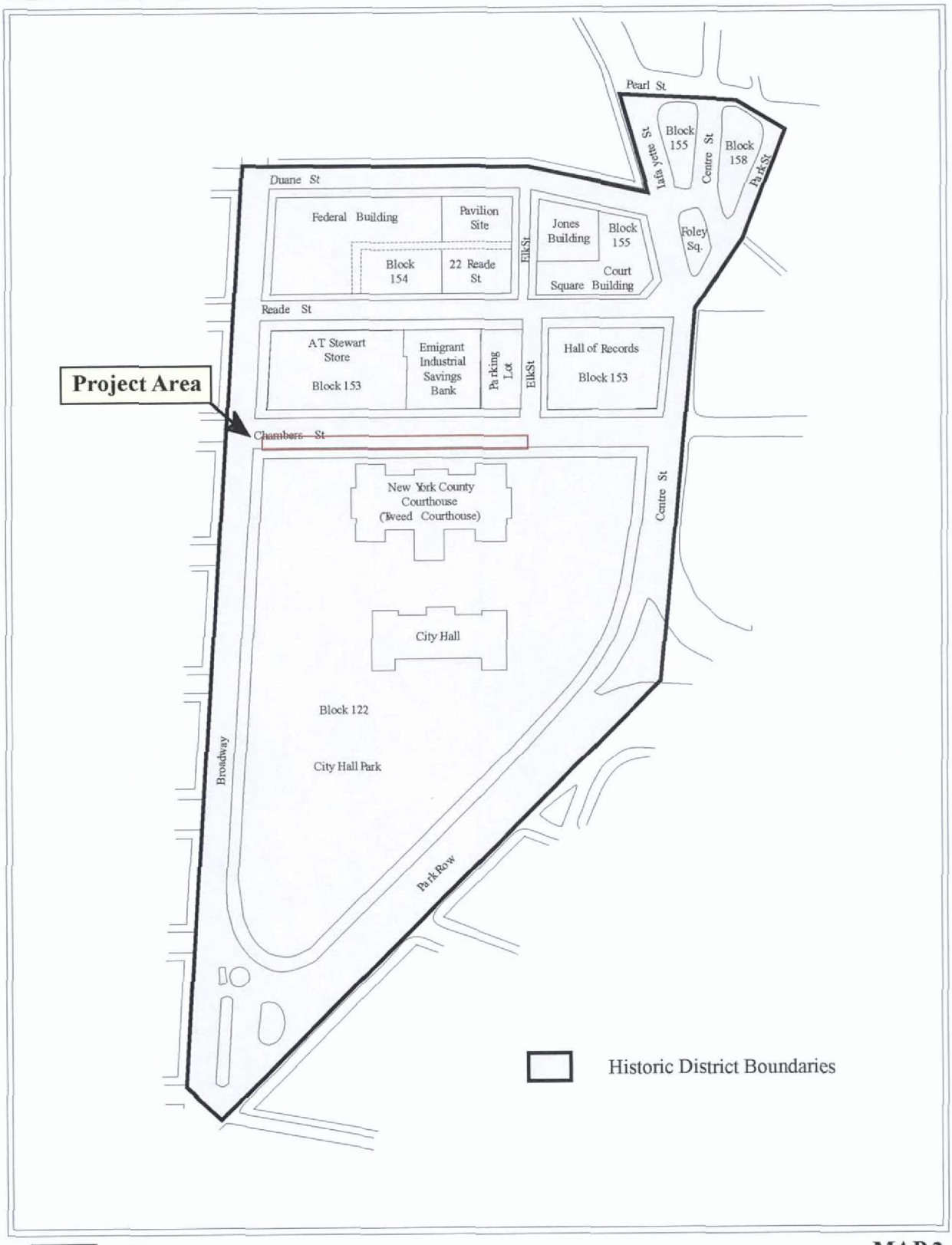
MAP 1

Location of Project Area, Chambers Street
1979 USGS *Central Park* and 1981 *Weehawken*
7.5' Topographic Quadrangles



MAP 2

2002 NYC Landmarks Preservation Commission
Boundaries of the African Burial Ground
and the Commons Historic District

ENVIRONMENTAL CONTEXT

The area of the project on Chambers Street between Broadway and Elk is located one-half mile west of the East River and one-half mile east of the Hudson River in downtown Manhattan in New York County. Manhattan is located within the Southern New England physiographic province, nearly one-third of which consists of urban land. Approximately one-quarter of this province is agricultural land including eastern Long Island, northern New Jersey, and the Connecticut River Valley. Forested areas include a mixture of oak-hickory and other hardwoods, white pine-red pine forest, and pine-oak woodlands or barrens (United States Department of the Interior, Bureau of Land Management 2002). The project area is contiguous with an urban park setting which includes flowering trees and evergreens.

Topography in the area of the project ranges from 20-30 feet (6-9 m) above mean sea level. The project area itself is characterized by level topography with an elevation of approximately 30 feet (9 m) above mean sea level. Underlying bedrock in this area consists of Middle Ordovician through Lower Cambrian age eugeosynclinal (rise-rock) thrust sheets intensely deformed with carbonate slivers along faults (Fisher et al. 1971). Riverhead soils are found in the vicinity of the proposed project area. The Riverhead soil series consists of very deep, well-drained soils formed in glacial outwash deposits primarily from granitic materials. These soils are found on outwash plains, valley trains, beaches, and water-sorted moraines. Slopes range from 0-50 percent (United States Department of Agriculture 2002).

HISTORIC CONTEXT

Previous studies (LPC 1993; Hunter Research, Inc. [Hunter]1994) have summarized the background of the historic commons area within which the current project is located. A general history of the area is summarized here followed by a more detailed history of the site area itself.

Early New York

Following Henry Hudson's arrival in 1609, the New York City area transformed primarily into a European settlement rather quickly. The first permanent settlement on Manhattan (New Amsterdam) was established by the Dutch in 1624 on the southern tip of the island. The Dutch established several settlements in New Amsterdam including isolated farms, nucleated farm villages, and large plantation-like estates (Cantwell and Wall 2001:259). By 1639, Dutch plantations lined the East River and other land purchases extended settlement to the western end of Long Island. Settlement in Queens began c. 1635, and in 1642 three villages were joined to form "Breukelen" (Homberger 1994:30). By 1643, the colony had a population of about 400-500 and had "a flour mill, two saw mills, a shed for shipbuilding, goat pens, a local midwife, a church, and a bakery" (Homberger 1994:28).

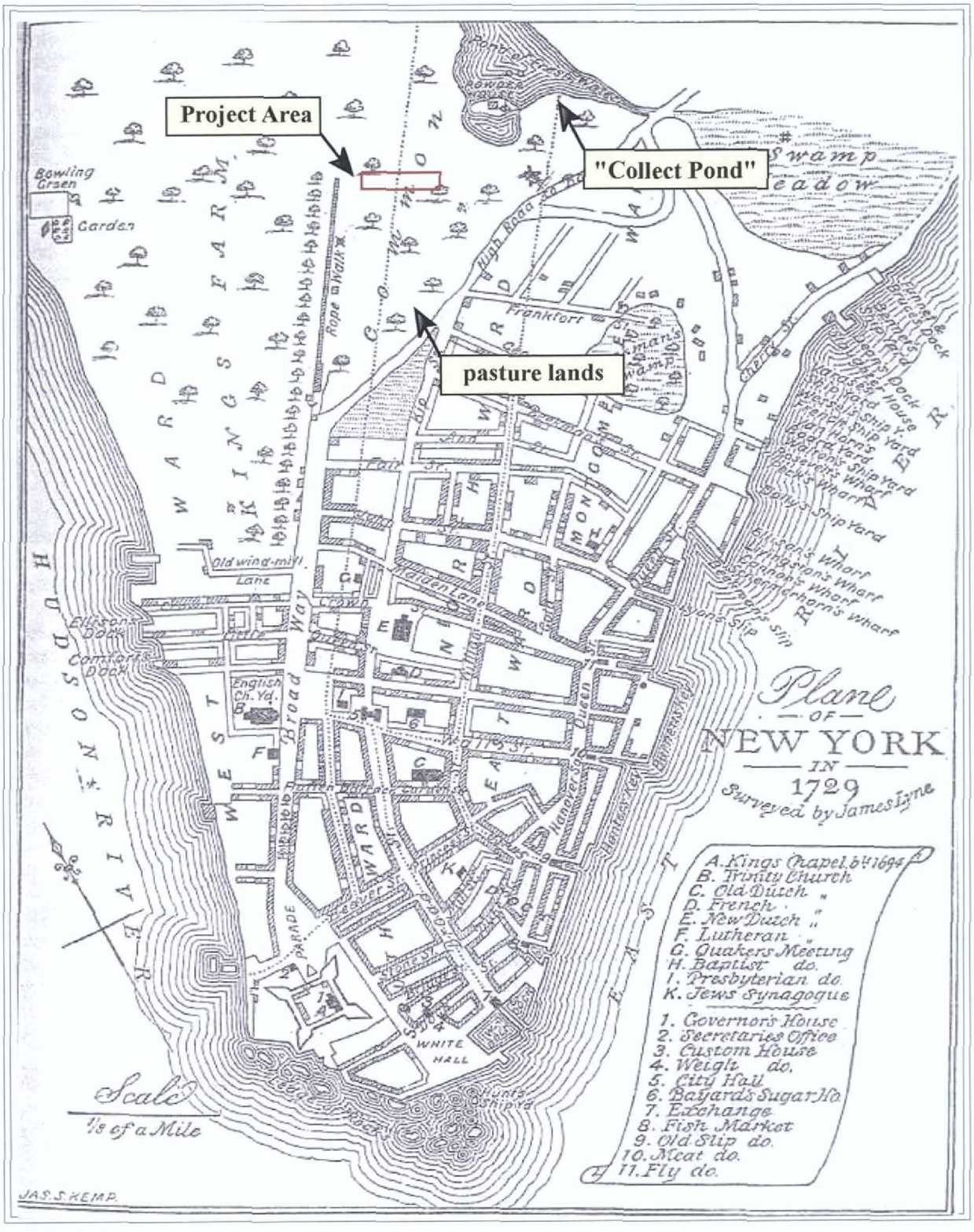
The Commons and City Hall Park

By 1660, colonial herdsmen were employed to maintain a triangular piece of pastureland near today's Chambers Street in a ravine leading east-northeast from Broadway (Map 3). The pastures were located near what was called Collect Pond (LPC 1993:5), a deep spring-fed pond that provided early New Yorkers with drinking water into the 1800s (Koeppel 2000:11). This communal pastureland encompassed the area which is now City Hall Park. The area later became known as "the Commons" where by the 1720s, various civic activities, such as executions, parades, mass meetings, and the construction of several institutions occurred. The City Hall Park portion of the commons was "one of the city's earliest gathering places where the community assembled for both celebration and protest" (LPC 1993:3).

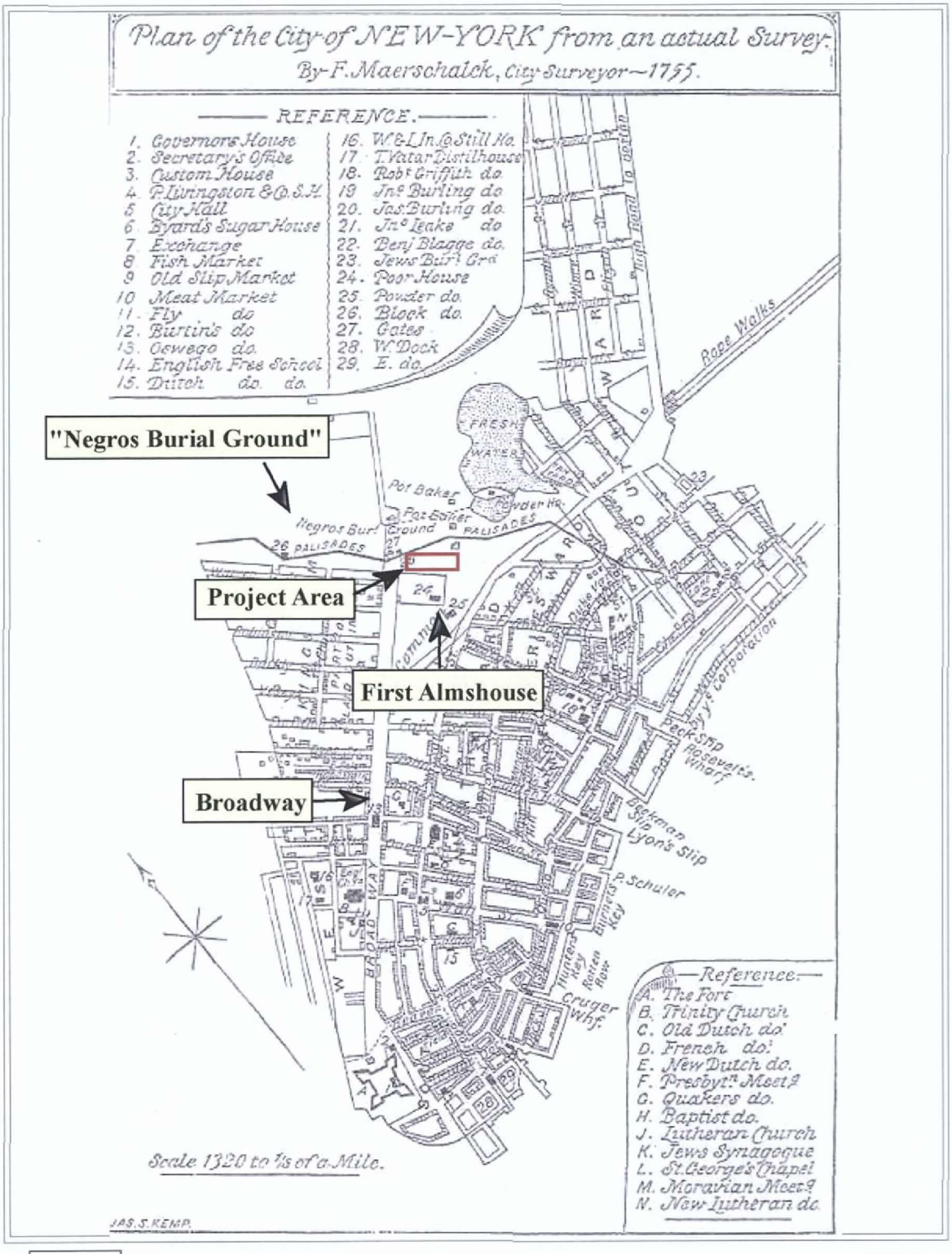
The African Burial Ground and the Commons Historic District (designated in 1993) constitutes much of the commons area. The burial ground used in the 18th century and possibly as early as the late 17th century was located in the northern segment of the commons north of the project area (Map 4). New York City's First Almshouse (1735) was built in the southern part of the commons (south of the burial ground) where City Hall stands today (Map 5). By the mid-18th century, the commons "became more firmly established as the appropriate site for the location of welfare and punitive institutions at the northern edge of the city with the construction of the "New Gaol" in 1757-1759 and the Bridewell for vagrants in 1775" (LPC 1993:3). The military used the northern commons area (the area where Tweed Courthouse now stands) to build a palisade with blockhouses and barracks in use from 1757-1790 (Maps 4, 6, and 7). The First Almshouse was demolished in 1797, and a second was built in 1796-1797 in the northern area of the commons, again in the vicinity of Tweed Courthouse (Map 8). Areas surrounding these buildings and features were used as burying grounds for these various institutions.

The exact locations of cemeteries associated with these institutions were not recorded on any surviving historic maps. However, as described in Inskeep (2000:6), the records of the New York City Common Council indicate that a small burial ground was established in 1757 "to the eastward of and adjoining to the fence of the said workhouse of the length of two boards to be enclosed and fenced in for a burial place for the poor belonging to the said workhouse." In August of 1785, the City Council designated a piece of ground behind the barracks as a burial ground for the Almshouse and Bridewell dead. In December 1785, a committee charged with finding a proper place for the burial ground suggested that it would be more economical to build "two large vaults in the back of the Almshouse garden" (Inskeep 2000:6).

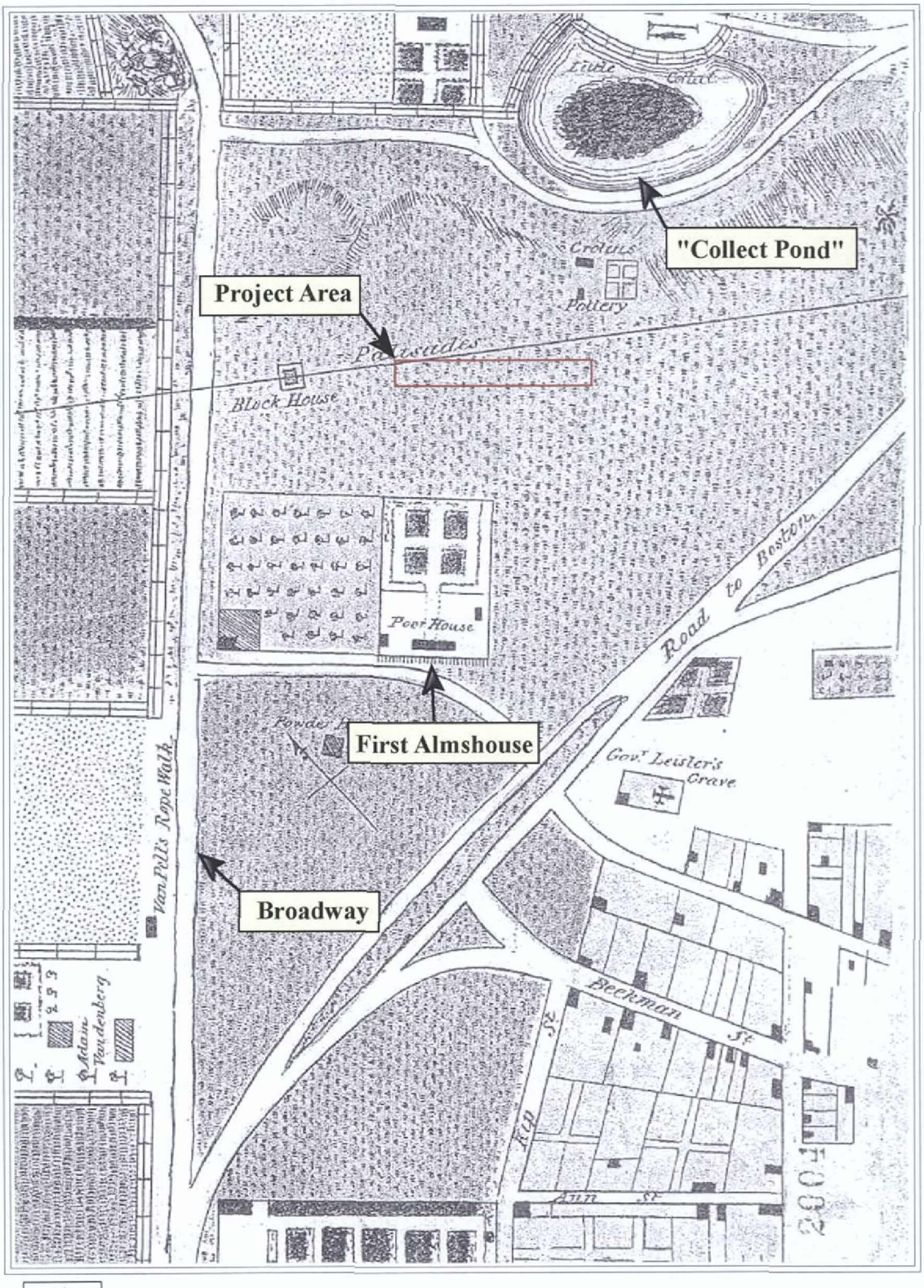
By the end of the 18th century, the commons area was transformed into the seat of local government with the building of City Hall in 1803. In addition, the area was divided into lots for the development of various buildings. Built in 1796, Chambers Street overtook a portion of the African Burial Ground, as noted in the city's Board of Alderman records, which explicitly state that "on or about 1792, in opening Chambers-street, it passed through the burying ground of the Africans" (City of New-York 1833, Document 76:391). The remainder of the burial ground was built over during the 19th century (LPC 1993:4).



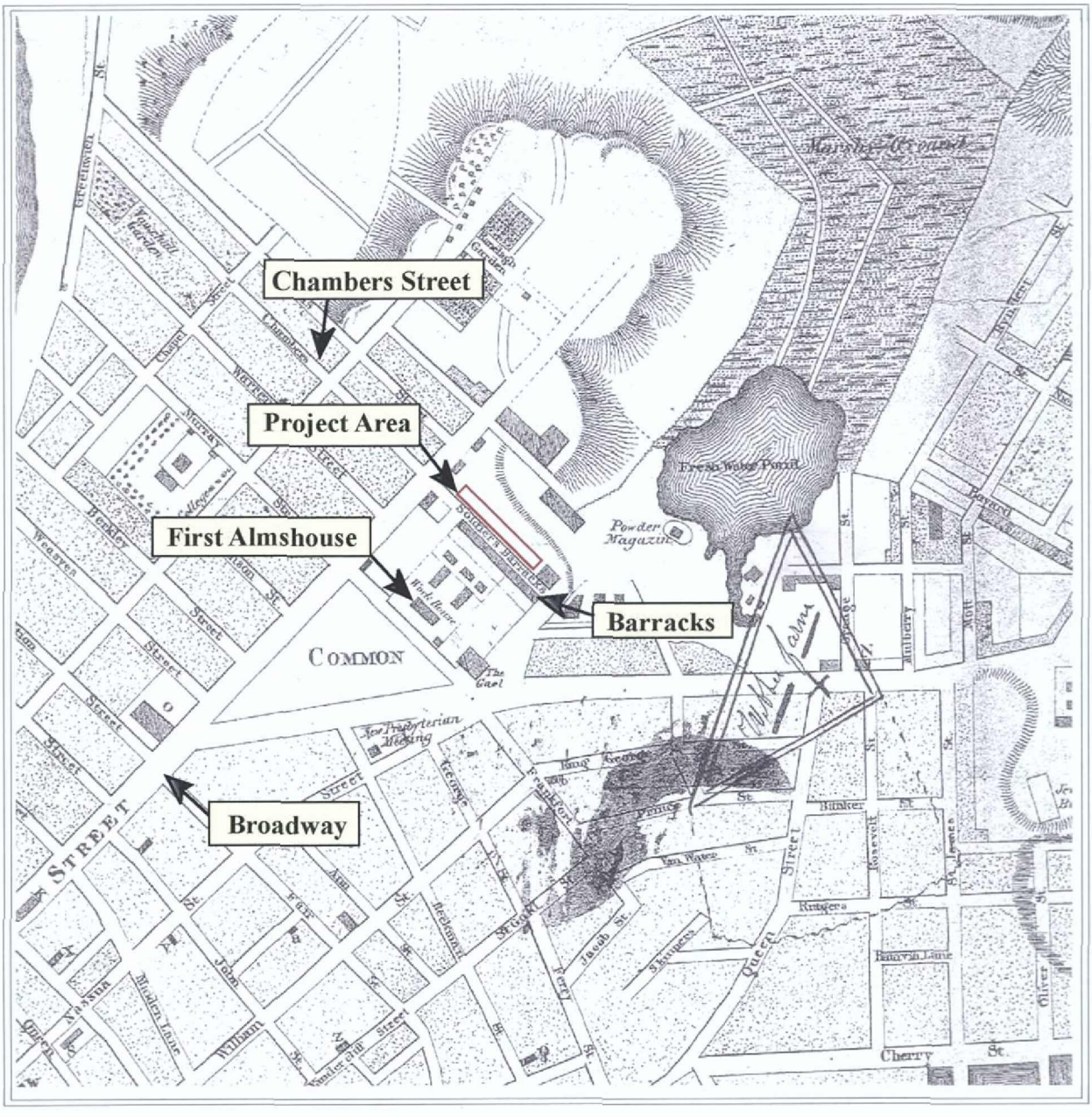
MAP 3
Lyne's *Plan of New York in 1729*



MAP 4
1755 Maerschalk
Plan of the City of New York



MAP 5
1813 Grim
Part of New York in 1742



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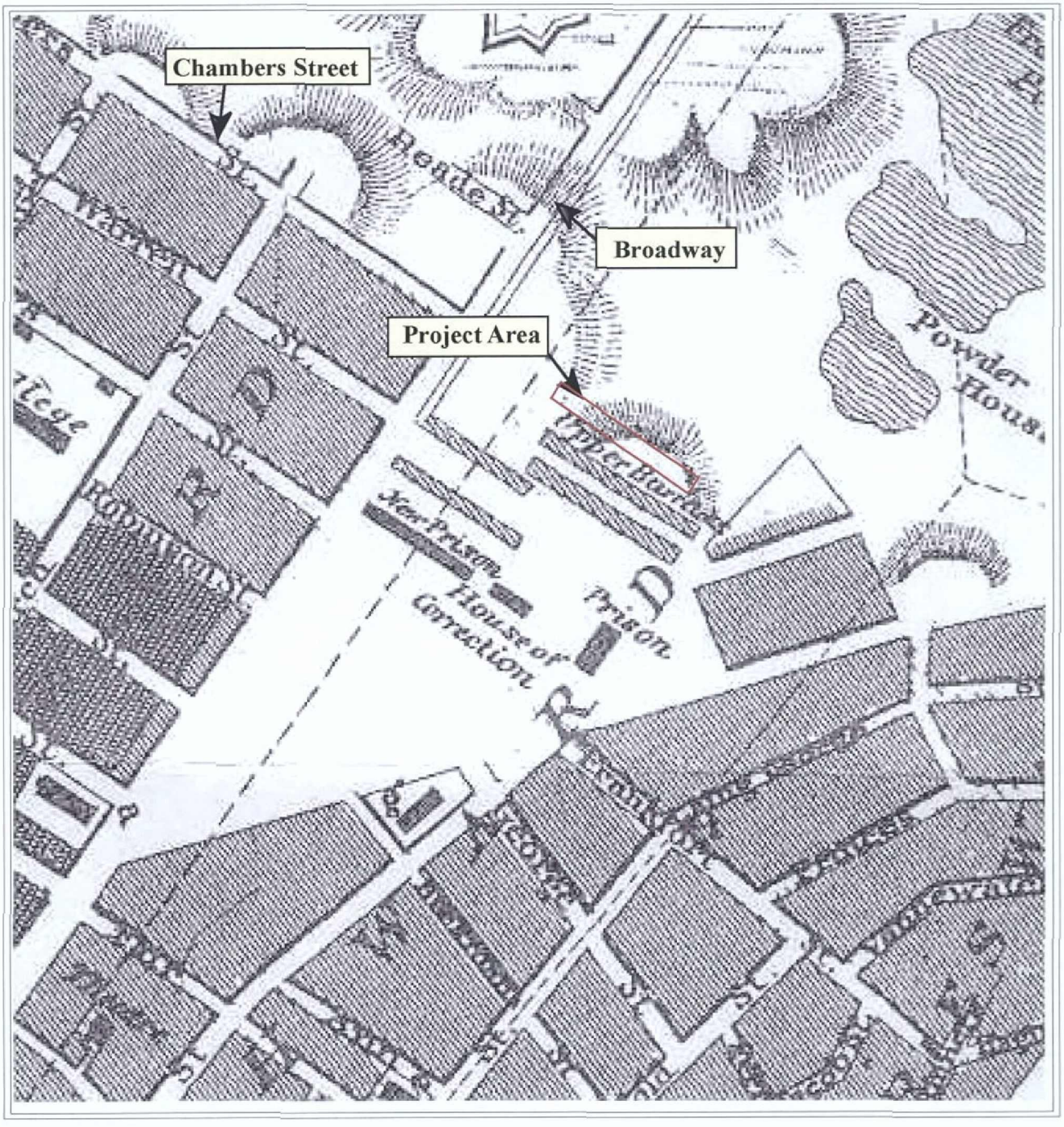
MAP 6
1776 Holland
Plan of the City of New-York



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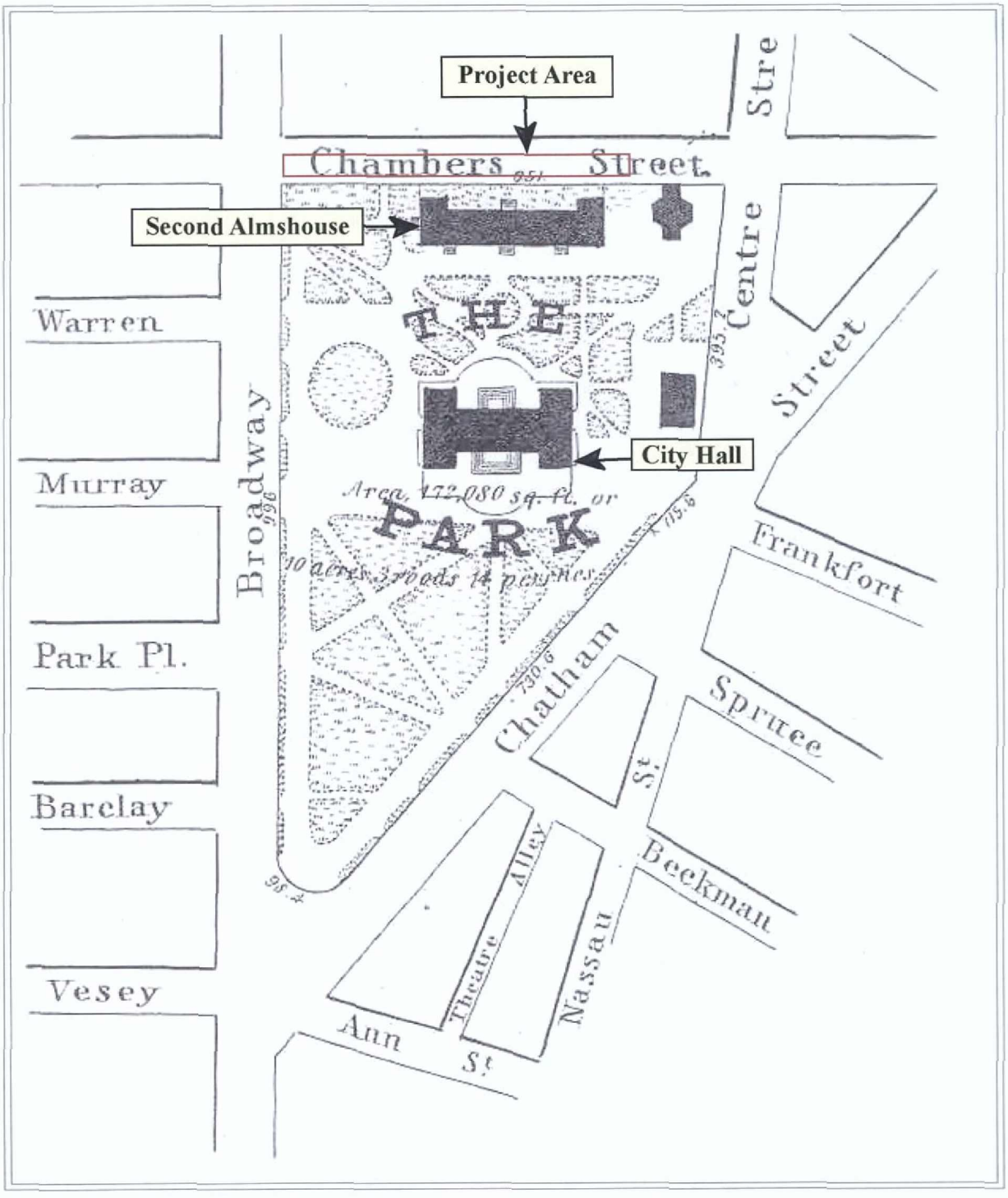
MAP 7
1782 Hills
City of New York



MAP 8
1838 Nicholson
The Second Almshouse, City Hall, and the Park

The Second Almshouse remained as such until 1816 when it became the New York Institution, a home for various cultural institutions including the Academy of Arts, the Literary and Philosophical Society, the New-York Historical Society, the New York Society Library, and John Scudder's American Museum. In 1830, the building was converted into offices and courtrooms and was later demolished in 1857, just a few years before the construction of the Tweed Courthouse. In 1830, the jail was remodeled to become the Hall of Records. This building was later demolished in 1903. Several other buildings were built in this area in the 19th century including the New York County (Tweed) Courthouse (1861-1881).

Considering this information, it is clear that this area "has undergone intense public use since the mid-seventeenth century, resulting in the overlay of many significant historic improvements and resources—both above ground and below—all of which document the changing nature of this important area long devoted to communal, public, and civic purposes" (LPC 1993:3).

PREVIOUS CULTURAL RESOURCE STUDIES IN THE VICINITY OF CHAMBERS STREET

Several previous archeological investigations were conducted within the African Burial Ground and the Commons Historic District. Since a formal sensitivity study (Hunter 1994) and various other publications (e.g., LPC 1993) have summarized previous archeological work in this area, only those investigations that overlap with the Chambers Street project area are discussed within this report.

Previous Con Ed electrical conduit trench, Chambers Street

In 1993, Con Ed excavated a backhoe trench in Chambers Street in front of Tweed Courthouse for the purpose of installing electrical lines. During this excavation, human remains were discovered. Hunter Research, Inc. (Hunter) was called in to monitor the excavations and extract human remains from the backdirt piles. No intact or partially intact burials were identified and no intact crania or long bones were recovered (Hildebrant 1994). It was estimated that about one dozen individuals — including both children and adults — were represented by the remains recovered from the Con Ed trench. No other features were identified, but 4,576 artifacts were recovered from the trench fill.

Chambers Street backhoe trench

In 1994, Barbara S. Hildebrant, M.A., conducted archeological investigations in association with a 60-foot (18.3 m) backhoe trench excavated in Chambers Street in front of Tweed Courthouse (Hildebrant 1994). The construction trench was 10 feet (3.05 m) wide and 10 feet (3.05 m) deep. Human remains were identified only in the backdirt soils. No intact or partially intact burials were identified, and no intact crania or long bones were recovered. Based on the remains identified, it was estimated that at the least, 12 individuals were represented by the remains. This estimate includes

two individuals under the age of 20 years. No other cultural features were identified during this investigation.

Tweed Courthouse to Broadway electrical conduit trench

In 1994, Barbara S. Hildebrant, M.A. conducted archeological investigations for the City Hall Park electrical conduit trench from Tweed Courthouse to Broadway (Hildebrant 1995). The 120-foot (36.6 m) trench extended from the west side of the courthouse west through the northwestern quadrant of the park to Broadway. Only one possible 18th-century feature, a segment of a wall foundation, was observed during the project. Predominantly late 18th- to early 19th-century cultural materials were identified within the fill deposits. These materials reflect the more intensive domestic and military use of the commons area in the period between c. 1750 through 1850 (Hildebrant 1995:5-2). No human remains were identified during this project.

31-52 Chambers Street utility trench

From October 1995 through June 1996, Linda Stone, M.A., conducted archeological monitoring, testing, and mitigation studies within the 31-52 Chambers Street utility trench project (Stone 1997). Excavations followed the path of the 1916 clay pipe trench with the intention of minimizing impacts to potential archeological resources. Additional work was also conducted outside of this trench. The trench began at the Surrogate's Court building at 31 Chambers Street and continued south to the northeast sidewalk of Tweed Courthouse, west to the eastern side of the Tweed driveway, south along the driveway and west again into the Tweed east door. The study identified 64 fragments of human remains. No intact burials were identified. Also identified were 931 faunal bones and 1,015 diagnostic artifacts. Three features including a footing, decomposing marble, and a brick vault were identified. The first two features were identified as part of the Second Almshouse (1796-1854). The brick features were likely part of a warehouse from the second half of the 19th century.

Chambers Street water main

In October 1998, excavations by the Department of Environmental Protection (DEP) for a water main break in Chambers Street revealed the presence of fragmentary human remains within historic fill deposits excavated from several utility trenches. Kise Straw & Kolodner Inc. (KSK) and the Public Archaeology Laboratory (PAL) were hired to recover the remains and to monitor additional DEP excavations in this area (KSK 2000). Of four trenches excavated during this work, human remains were identified only in the Elk Street Trench. The recovery effort revealed 2,108 human bones and bone fragments, all within a discrete deposit at a depth of approximately four feet below street grade. Analysis of the remains indicated that at least ten individuals were represented by the remains, which were highly fragmentary and poorly preserved. The sample included both adults and children. KSK hypothesized that the remains originated from redeposited fill from the City Hall Park area (2000:15). No intact burials or other significant intact cultural features were identified during the investigation.

City Hall Park 1999 excavations

In 1999, Parsons Engineering Science, Inc. (PES) conducted archeological investigations in City Hall Park prior to the park restoration project. The project identified over two dozen burials as shallow as six inches below the ground surface, as well as scattered fragmentary remains. Burials were found in the northwest corner of the park at Broadway and Chambers Street and in the northeast corner east of Tweed Courthouse a few yards from the subway entrance. Several ossuary-like burial pits were also identified including one containing at least a dozen infants and three with the remains of at least a dozen adults each (London 2004). The results of the artifact assemblage have not been published yet, as analysis of the materials is currently underway at Brooklyn College. However, a report of the burials has been completed by London (2004).

London (2004) reported finding at least six intact or partially intact burials, two ossuary-like burial pits, and scattered remains in at least 22 additional locations. Three intact burials were identified in the northwest quadrant of the park, including one (PES Feature 45) which was reexcavated by HAA, Inc. (Burial 26) during the 2001 investigations at Tweed Courthouse (HAA, Inc. 2003). In addition, two ossuary-like burials were identified in the northeast quadrant of the park, one of which was identified along the ~~west~~ east drive of Tweed Courthouse beneath a large tree. HAA, Inc. also identified additional remains from this feature (PES Feature 137; HAA Unit 48) in 2001. The PES study of this feature identified at least 21 individuals (18 adults and 3 children); HAA, Inc.'s study identified four individuals (HAA, Inc. 2003:122).

The second deposit of commingled remains identified by PES contained at least one male adult and the remains of 23 children, mostly under the age of five years. The partial remains of as many as 256 more individuals may be represented by the remains found in 22 other locations throughout the park during this excavation (London 2004:12).

Tweed Courthouse Restoration Project

In 2000-2001, HAA, Inc. conducted archeological monitoring, testing, and data retrieval excavations during the Tweed Courthouse restoration project (HAA, Inc. 2003). The fieldwork included the grounds of Tweed Courthouse, as well as Chambers Street and its south sidewalk from Broadway to roughly Elk Street. Twenty-eight intact, partially intact, and heavily disturbed historic burials were identified, all on the north side of the courthouse, primarily beneath Chambers Street and its south sidewalk. Of these, 23 were left in situ as per LPC regulations. Eight of the 23 were found in two trenches excavated in the eastbound lane of Chambers Street in the vicinity of the Con Ed project. In addition to the intact burials, 16,626 disarticulated or disturbed human remains were identified and removed from the north, east, and south sides of the building and Chambers Street (HAA, Inc. 2003).

The Tweed Courthouse project also identified eight significant historic features including two stone foundation walls; a brick drain; a storm sewer or well; a privy; a brick wall; a cold storage shed; and a large ossuary-like deposit of disturbed human remains. Several of the features were

determined to be associated with the former almshouse building and military barracks that once stood on the courthouse property (HAA, Inc. 2003).

Overall, this study found that there remains a high potential for uncovering intact cultural resources in the area. The extensive fieldwork carried out during the Tweed Courthouse project "confirmed that, despite the amount of ground disturbance in the area, isolated pockets of intact cultural and human remains still exist" and that "there is a particularly high potential for the presence of fragmentary human remains and intact burials including those already identified and protected ...and others that may lie outside the various boundaries of impact for the project" (HAA, Inc. 2003:209). For example, several partially intact burials were identified in the walls of construction trenches (HAA, Inc. 2003:209) in Chambers Street and along its south sidewalk in front of the courthouse where the 2003 Con Ed utility work was located.

SENSITIVITY ASSESSMENT

An archeological sensitivity assessment of the African Burial Ground and Commons Historic District, which includes the segment of Chambers Street between Broadway and Elk streets, was completed by Hunter Research, Inc. (Hunter) in 1994. In general, this area is characterized by a high sensitivity for the presence of archeological resources including historic burials. Formal review by the LPC of all ground-disturbing activity within the district is required.

While the initial designation report for the district provided basic background information concerning potential historic and archeological resources throughout the area (LPC 1993), a more extensive assessment was completed by Hunter (1994) in order to provide details regarding the location of all potential cultural resources identified through historical documents, such as historical maps and photographs, city records, institutional records; personal accounts, such as journals; and previous archeological investigations.

The Hunter (1994) study was reviewed prior to HAA, Inc.'s fieldwork in order to identify potential historic archeological resources within the immediate vicinity of the project area. This review identified numerous potential historic resources in the form of archeological features, such as historic utility trenches, building remains, palisades, and human burials. While the resources occur somewhere within the area of Chambers Street, in many cases it is unknown exactly where they are located, and for several, it is speculated that they were destroyed by construction of 19th- and 20th-century buildings, utilities, and/or the subway system.

Despite the amount of prior disturbance to this area, Chambers Street and the adjacent sidewalk are considered highly sensitive for the presence of archeological resources including both primary (or intact) burials and fragmentary remains (or secondary burials) dating from the late 18th to the early 19th century. As defined by the LPC, primary burials are "burials which have not been disturbed since interment or which have been only potentially disturbed" (LPC 2002:17). These burials "may contain remains of coffins, complete skeletons, and artifacts associated with the burial, such as shroud pins, buttons, or jewelry" (LPC 2002:17). Fragmentary remains are defined as

disarticulated bones and bone fragments (LPC 2002:17). These are also called secondary burials since the remains were either intentionally or inadvertently displaced from their original context or place of burial.

The Tweed Courthouse study by HAA, Inc. (2003) confirmed that Chambers Street contains numerous intact and partially intact primary burials, as well as large pockets of fragmentary remains. HAA, Inc.'s familiarity and recent experience in the Con Ed construction area helped to guide the construction work and pace of excavation, as the locations of previous utility trenches, intact burials, and high densities of disarticulated human remains were known beforehand.

RESEARCH DESIGN AND RESEARCH QUESTIONS

Since HAA, Inc. was required to conduct monitoring of the excavation work only, no archeological testing was completed prior to the work and no formal research design was developed for the project. Because the project area falls within the same general area as the Tweed Courthouse project, the research questions developed for HAA, Inc.'s (2003) study are repeated below, as the same questions are appropriate for this project. Due to the nature of the project (archeological monitoring rather than testing or a well-defined mitigation study), only generalized research questions were developed. These questions (with minor modifications) include:

- Are archeological resources located within the areas of impact? Specifically, are human burials located within the construction area? If so, are the burials primary, secondary, or both?
- If burials are secondarily deposited, what caused the disturbance and when? How many individuals are represented in the deposits?
- If primary burials are present, what is the range of burial forms and types? Do all burials originate from the same cemetery and time period? Are all demographic categories (i.e., adults, children, men, and women) represented by the burials?
- Are features associated with other historic uses of the property present and intact within the construction area? If so, what are they and to what time period do they date?

FIELD METHODS AND COLLECTION PROCEDURES

Methods of investigation

The LPC required archeological monitoring for the length and duration of this segment of the Con Ed construction project. Archeological monitoring is "the observation of construction activity by an archaeologist in order to identify, recover, protect and/or document archaeological information or materials" (NYAC 2002:1). Monitoring is often employed in urban settings where traffic and other logistical considerations are a factor (NYAC 2002:1). Certain segments of a project area or archeological site that are characterized by relatively low sensitivity for the presence of intact archeological resources may also be monitored.

During the Chambers Street fieldwork, monitoring was required during all excavations. Archeological monitoring involves close watch of the excavator(s), whether the work is being done by hand or machine, and observation of excavated soils and trench walls for cultural materials, archeological features, and human remains. HAA, Inc. staff archeologists were required to stop excavation work if significant cultural resources or human remains were observed (see Appendix 1 for project work scope). The archeologists were then allotted the time required to properly document and collect or protect the resources prior to continuing excavation. In areas with substantial resources, the soils were carefully excavated and screened.

Depending on the size of the area and the overall pace of the excavations, between one and four archeologists were present to monitor the excavations, and when significant resources were found, screen the soils. When significant or potentially significant resources were identified, particularly human remains or burials, HAA, Inc. directed the construction workers to stop excavation in the area, and further excavation in the area of the find was completed by HAA, Inc. staff only. Construction in the area ceased until HAA, Inc. determined that the work could resume.

LPC required that all excavation occur by hand. As excavation proceeded by construction workers, HAA, Inc. monitored the backfill for the presence of historic artifacts and fragmentary human remains. Samples of artifacts were collected from historic fill deposits, which composed most of the excavated soils. When human remains were identified in the fill, all soils from the area of the excavations were screened. Again, when intact human remains or evidence of coffins, grave shafts, or other potential features were identified, normal archeological excavation procedures were followed in order to document and collect or protect the resources.

When required, excavated soils from the utility trenches were sifted using a 0.25 inch (0.64 cm) hardware cloth and examined for cultural material. Historical artifacts from fill deposits were sampled, while all artifacts from any excavated features were collected. Collection methods for human remains are described below. The stratigraphy of each test unit or trench was recorded including soil type and depth of each stratum, and the test locations and trenches were recorded on a project map. Artifacts were collected by provenience in paper field bags. Each bag included the project name, trench or excavation unit number and level, excavator, and date in black permanent

marker. Following excavation, all field bags were numbered with red permanent marker and recorded in a field bag log.

During the fieldwork, numerous fragmentary human remains and several burial features were identified within the project area. In cases where disturbed human remains were identified, they were collected following the methods outlined below. In cases where intact burials and other archeological features were encountered, additional methods were employed to properly identify, document, and mitigate adverse effects to these resources.

Burial identification and removal of human remains

Following LPC regulations, only previously disturbed human remains were removed from the ground during the fieldwork. Intact remains (primary burials) were left in situ and protected from further disturbance according to the LPC standards (see following section). Disturbed human remains (secondary burials) refer to those remains that either have been removed from their original place of interment or that have been subject to extensive disturbance so that the burial no longer remains intact. Based on previous studies (Stone 1997; KSK 2000; HAA, Inc. 2003), it has been determined that most of the remains found in the area consist of disarticulated and/or fragmentary bones. In some cases, complete or nearly complete bones were collected and in a few cases, remains were still partially articulated and were also removed because of extensive prior disturbance.

While hundreds of secondarily deposited remains were identified throughout the construction trenches, several intact or partially intact burial features were also identified. Similar to the Tweed Courthouse project, these features were discernible in three different ways:

(1) by distinguishable grave shafts that outlined the location and extent of a burial;
(2) by decayed coffin remains in the form of relatively faint, narrow wood stains; and/or
(3) by the placement and position of a set of human remains (with no visible or remaining grave shaft or coffin remains).

The third case can occur when prior disturbances exist to the depth of the remains, thereby destroying evidence of the grave shaft and/or coffin.

As per LPC regulations, a bioarcheologist was present during all excavation and removal of human remains. Excavation was carried out either directly by the bioarcheologist or by the field crew under direct supervision of the bioarcheologist. At least one bioarcheological assistant (a field crew member trained in the identification of human remains) was present during the excavations as well.

Except in a few unique cases, each identifiable burial feature was excavated only to the point of judging whether the burial was primary or secondary. In several cases, as described below in the field results section, whether a burial was completely intact could not be determined until the remains were at least partially uncovered. Because prior disturbances either intruded into the burials

or occurred to a depth just overlying the human remains, it was difficult to assess how much if any of the human remains were still intact. The noted prior disturbance that affected most of the burials often removed any visible signs of a grave shaft or coffin outline. Due to these factors, several burials were partially or fully uncovered in order to assess the level of prior disturbance and to distinguish whether they were disturbed to an extent that warranted removal. In the few cases where grave shafts and/or coffin outlines were observed prior to the discovery of human remains, the feature was not excavated, thus preserving the burial in place. Often, however, due to prior disturbance and poor preservation, these features were not noted until after the human remains were identified.

Following LPC regulations, all disturbed human remains were removed. Human remains were collected by provenience in separate containers from artifacts. If a bone fragment was not readily identifiable in the field as human or faunal it was collected with the human remains for later sorting in the lab. As human remains were removed from the ground, they were placed in packets formed of aluminum foil and filled with soil from the context in which the remains derived. The purpose of this methodology is to store the remains in an air-tight environment similar to that in which the remains have been in situ. Plastic was not used as there is a greater potential for retaining moisture within the containers. In addition, aluminum foil is a more rigid material to use than plastic bags. The foil containers were labeled in permanent marker with the project name, project area, provenience information, the collector's initials, and the date. The abbreviation "HR" (for "human remains") was written in red permanent marker on each foil bag. Following their collection, each package of remains was labeled with a bag number. The foil packages were then stored in plastic bins to protect them from being crushed or disturbed.

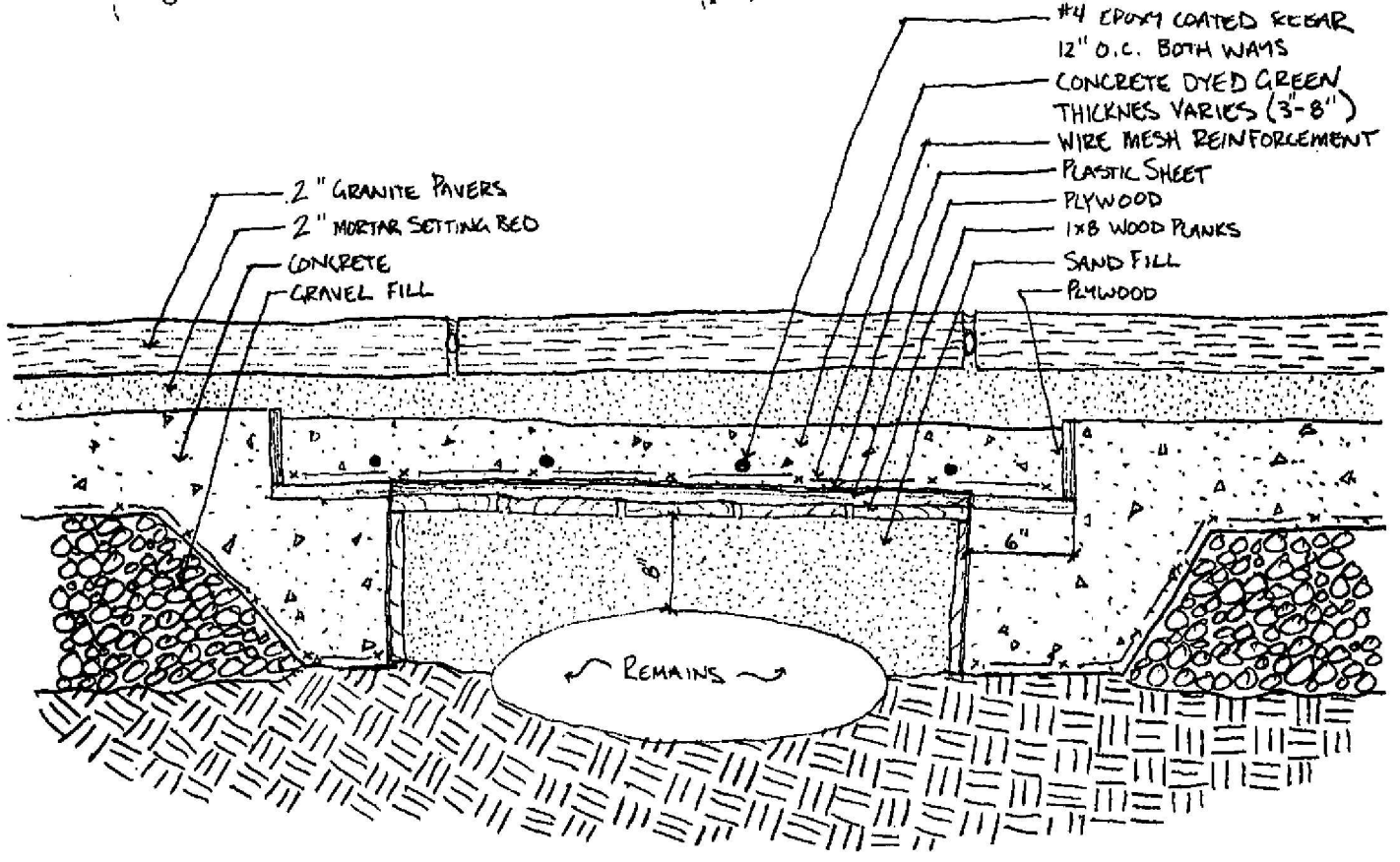
Preservation and data collection of primary burials

Intact burials were protected in place using methods recommended by the LPC and developed by conservator Gary McGowan (Appendix 2). Following several observations made during the Tweed Courthouse study (HAA, Inc. 2003:24), a few minor modifications were made to this approach and were approved by the LPC.

The methods originally outlined by McGowan and the LPC designated a 6-inch (15.24 cm) minimum coverage of a burial (top and sides) with sand and vermiculite followed by coverage with a one-inch (2.54 cm) plywood or pine box and four-inch (10.16 cm) concrete cap prior to installation of the required mortar bed and bluestone paving for finishing the sidewalk. Due to HAA, Inc.'s observation that vermiculite tends to adhere to bone (HAA, Inc. 2003:24), this material was not used.

Figure 1 illustrates the general methods employed in the protection of burials found during the excavations, as outlined for the Tweed Courthouse project (HAA, Inc. 2003:26) and followed for this project. The overall technique for burial protection included covering intact burials with 6-12 inches (20.3-30.5 cm) of clean sand, a 1-inch (2.54 cm) thick plywood box, which included a 6-12 inch (15.24-30.5 cm) buffer around the human remains, and heavy plastic sheeting. Following

Figure 1. General Burial Protection Technique, Tweed Courthouse Restoration.



SK 178b

TWEED COURTHOUSE RESTORATION (AS-BUILT SKETCH)
SECTION – SIDEWALK PAVEMENT OVER ARCHEOLOGICAL FEATURE
NOT TO SCALE 7-25-01 YGWANYC

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HARTGEN

archeological coverage of the burial, a steel plate supplied by Con Ed was placed over the burial followed by the backfilling and poured concrete.

As much data as possible were collected for each burial or partial burial that was left in place. In general, at least the size, position, and orientation of the grave could be documented, as well as the presence or absence of cultural materials, such as coffin nails, other coffin hardware, and personal items. In a few cases, information concerning the sex of the individual and the relative age were decipherable. Finally, a series of photographs of the burials and burial boxes were recorded, and several drawings and plan views of each burial were generated.

Storage of artifacts and human remains

During the 2002 fieldwork, the artifacts and human remains were stored in HAA, Inc.'s Brooklyn, New York, laboratory. Following completion of the fieldwork and approval of the work scope for conducting the analysis, the remains were cleaned, identified, and stored in archival packaging in the HAA, Inc. lab.

FIELD RESULTS

Carol A. Raemsch, Ph.D., bioarcheologist, directed the field investigations throughout the duration of the 2002 fieldwork. The field crew included Cassandra Ayott, M.A., Stephen Houk, Joseph Samalin, and John Wilkinson. Project maps, figures, and drawings included in the report were completed by Evangelia Tsesmeli, M.A. and Carol A. Raemsch.

Two trenches were hand excavated by Con Ed in the eastbound lane of Chambers Street (Photo 1). Archeological monitoring of these two trenches documented ten historic burials, six in Trench 1 and four in Trench 2. None of the burials were completely intact and most were heavily disturbed by previous construction. Of the ten burials, nine were single burials and one had two individuals. Nine of the individuals were adults, and two were infants. In addition to the intact burials, 1,879 disarticulated or disturbed human remains were identified and removed from the two trenches and 1026 historic artifacts were collected. One heavily disturbed historic feature—a probable privy—was identified in Trench 1, and a partial brick feature was identified in Trench 2. Each burial and the features are described in the general order in which they were excavated as the construction work proceeded.

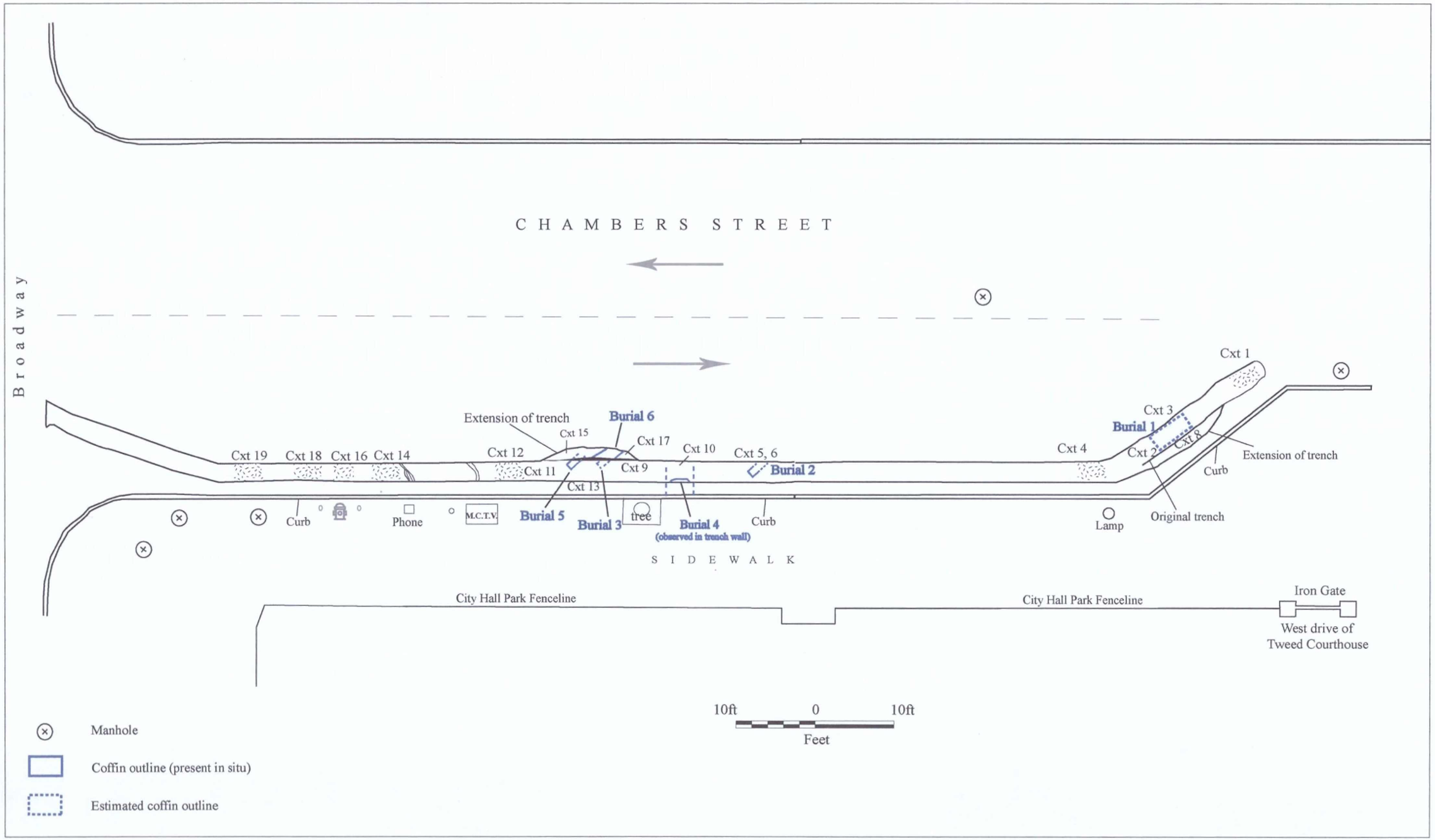
Appendix 3 includes the trench data recorded in the field including trench length, depth, and stratigraphy. Sections of the trenches containing cultural materials and/or human remains were recorded by context numbers (Appendix 4). Context (Cxt) numbers represent the location of cultural features, human remains, and/or historic artifact deposits. Most of the contexts included samples of historic artifacts from fill deposits associated with prior construction; therefore, the discussion does not include detailed information of each context recorded in the catalog. The following discussion describes the excavation of Trench 1 followed by the Trench 2 excavation.

Trench 1

The excavation of Trench 1 began approximately 3 feet (.91 m) west of the manhole aligned with the west gate of Tweed Courthouse (Map 9). The trench was excavated at a distance of 1.5 feet (.46 m) from the existing sidewalk curb in the eastbound lane of Chambers Street and was excavated from east to west. The trench was approximately 160 feet (48.77 m) in length, 3-4 feet (.91-1.22 m) wide, and no more than 4 feet (1.22 m) deep. Nearly all of the soils within the trench consisted of either brown sandy historic fill with scattered fragments of historic artifacts and disarticulated human remains or modern yellow sand fill devoid of bone and cultural material. The modern fill was interspersed throughout the trench where recent utility trenches have been excavated and filled in.

At the trench's origin, a few historic artifacts and five fragments of human bone were collected from the fill originating from prior utility trenching in this area (Cxt 1). A concrete utility duct was observed in this location. The human remains and artifacts including two fragments of late 19th- to early 20th-century ceramic and two iron nails, were identified at a depth of approximately 11.42 inches (29 cm). Owing to their context within historic fill, the artifacts are of no particular significance.

Photo 1. View east of the beginning of the trench excavations, eastbound lane of Chambers Street.



Map 9. Con Ed Chambers Street Project Map: Archeological Monitoring, Trench 1

Burial 1

For a length of 25 feet (7.62 m) west of Context 1, no features or artifacts were identified, primarily due to the presence of modern yellow sand fill in this section of the trench. At 25 feet (7.62 m) to the west, fragmentary human remains were identified by HAA, Inc. staff while monitoring Con Ed's hand excavation of the trench. Numerous disarticulated bone fragments including several well-preserved adult hand bones were identified and collected from the backfill, and a fragmentary adult femur shaft was observed at the western edge of the excavation where the Con Ed worker was stopped from digging.

In order to discern whether an intact burial might be present, the area of excavation was examined for potential intact human remains. Several articulated hand bones and a distal radius were identified on the south side of the femur (Photo 2), and fragmentary cranial bones were noted to the west at a depth of 20 inches (50.8 cm). These remains were identified immediately below the concrete street bed and a thin layer of brown silty sand fill (Photo 3). The grave fill consisted of a mottled brown to dark brown silty sand.

Given the orientation of the remains, the femur and hand bones represented the right side of the body, which was extended with the head to the southwest (Fig. 2). Compared to other burials in this area (HAA, Inc. 2003), the burial appeared to be on more of a northeast-southwest alignment. A faint grave shaft outline was also discernible adjacent to the cranial remains and overlying the femur and hand bones. The Con Ed excavation apparently destroyed a portion of the grave shaft overlying these remains; however, it was also clear that a previous disturbance cut through the burial at the distal femur, where it was broken with the lower half missing. Additional intact remains likely existed beneath the grave fill between the cranial bones and lower body, but they were not exposed as it was already obvious that the burial was partially intact. The remaining portion of the burial visible within the confines of the trench measured 38 inches (96.52 cm) in length and approximately 30 inches (76.2 cm) wide. The burial extended outside of the trench and beneath the street (Fig. 2). It is unknown whether the remainder of the burial is still intact or whether it also has been disturbed by previous construction.

The burial was that of an adult of indeterminable age and sex. No coffin remains or other cultural materials were identified in the area of the remains or grave fill. One iron nail that may have been a coffin nail and one fragment of faunal bone were identified in the fill immediately overlying the burial (Cxt 3) along with the collected hand bones and a few other fragments of human bone which may or may not have originated from this particular burial.

As per LPC policy, since the burial was partially intact, the burial was left in place and the trench moved to the south to avoid impacting the feature. Map 9 shows the location and extent of the alternate trench. A small deposit of 25 artifacts including late 19th to early 20th century ceramic, brick, shell, and faunal bone was identified in the fill excavated from this portion of the trench (Cxt 8). No additional human remains were found in the fill.

Photo 2. Hand bones and femur shaft identified in Trench 1.

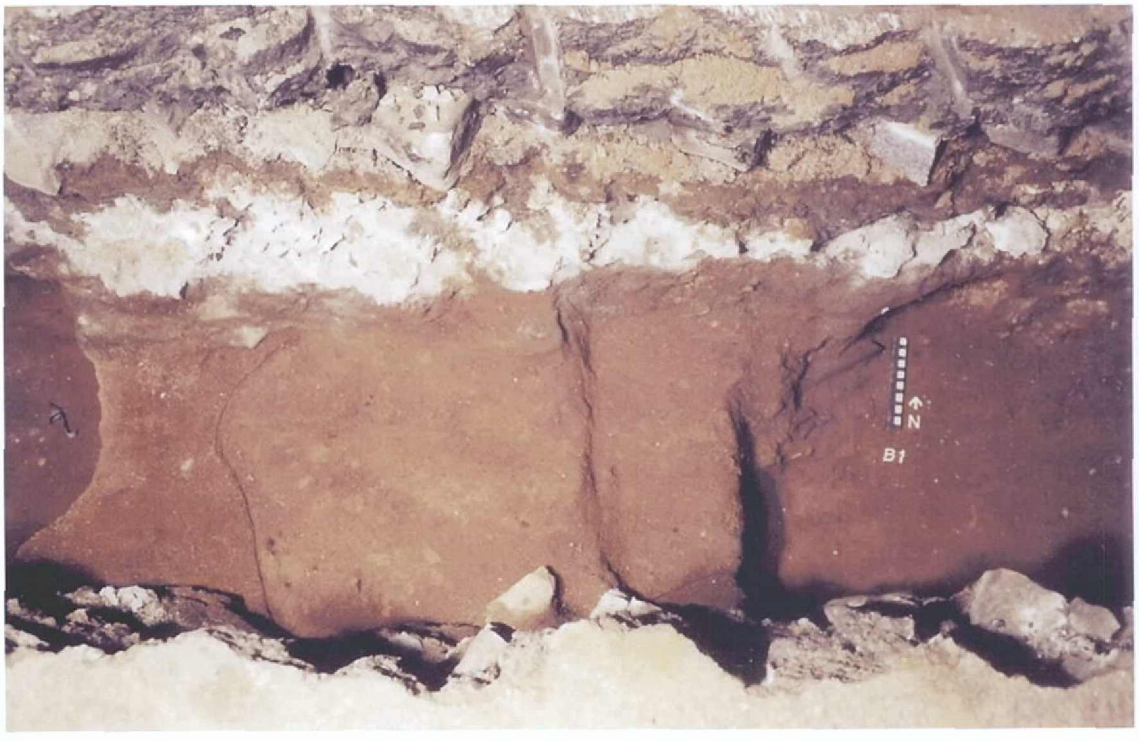
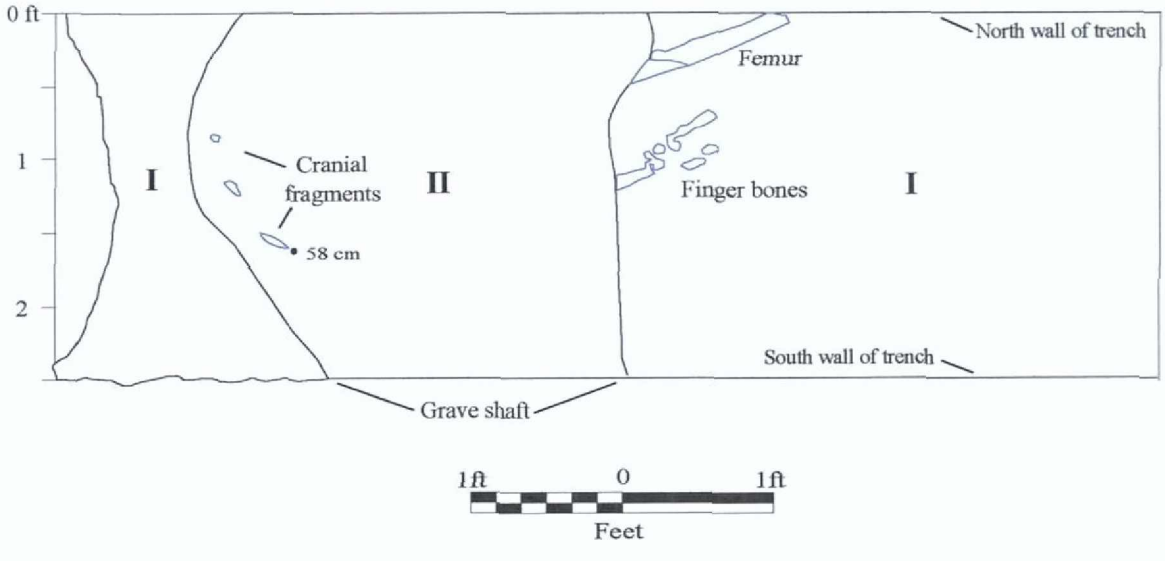


Photo 3. Burial 1 with west outline of grave shaft and human remains to the west.

Figure 2. Burial 1 Plan View, Trench 1



I Dark brown sandy fill with gravel

II Mottled brown and dark brown silty sandy grave fill

Human Remains

Prior to covering and protecting the burial, the hand bones and cranial fragments collected from the excavator's backfill were returned to the burial. Bone fragments from the fill that did not obviously belong to the burial were collected and returned to the HAA, Inc. lab. A plywood box was constructed around the grave and filled in with 12 inches (30.48 cm) of clean yellow sand and covered with a lid and plastic sheeting. Map 9 shows the location of the Burial 1 box approximately 5.5 feet (1.68 m) east of the street lamp adjacent to the Tweed west gate.

Burial 2

Approximately 50 feet (15.24 m) west of Burial 1, several cranial fragments and two adult teeth were identified in the excavator's backfill along with several historic artifacts including ceramic sherds, bottle glass, and four iron nails (Cxt 5). Inspection of the trench floor identified a partially intact and crushed adult cranium, partial right mandible, and several vertebrae and rib fragments immediately below a thin level of fill at a depth of 20 inches (50.8 cm). A small portion of the grave shaft with seven iron nails remaining was also observed (Photo 4; Fig. 3).

With the exception of the remains described above, most of the burial was destroyed by a prior disturbance, as evidenced by the modern sand fill on the north and east sides of the remains (Fig. 3). This suggests the disturbance was caused by installation of a modern utility in this location.

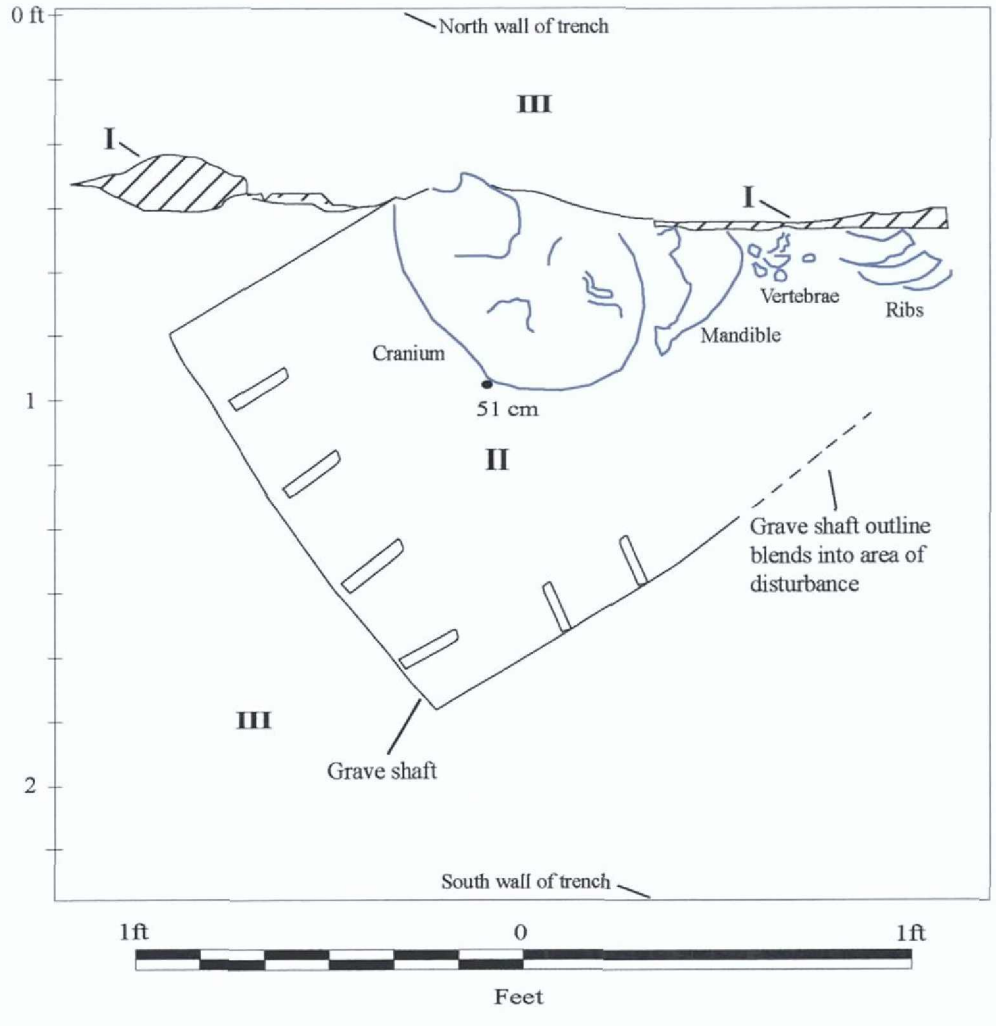
The remaining feature's full length from the head of the coffin to the area of disturbance was approximately 19 inches (4.26 cm), and the width 13 inches (33.02 cm). Similar to Burial 1, the burial appeared to be oriented on a northeast-southwest alignment with the head to the southwest. The seven nails were oriented around the head (west) and south sides of the grave shaft outline. The grave shaft outline on the south side of the burial was apparent for about 8 inches (20.32 cm) before it blended into the area of disturbance. The grave fill was a mottled brown to dark brown silty sand.

Due to the high level of disturbance to the burial feature and the very fragmentary nature of the remains, the burial was considered heavily disturbed. The remains were therefore documented and carefully removed from the trench. Upon removal, a few very small fragments (< 1cm) of decayed copper or brass were noted on the right side of the cranium and collected separately from the remains. Due to the knowledge that "stacked" burials have been found in this area (HAA, Inc. 2003), the area beneath the grave shaft was excavated in order to ensure no additional remains or burials were located in this part of the trench. This exploratory excavation revealed no further cultural materials or features.

The analysis of the remains excavated from Burial 2 indicates the burial was that of an adult male of indeterminable age. Approximately 145 disarticulated bone fragments were collected from the fill above the burial including 3 cranial fragments, 2 teeth, 30 vertebrae and 20 rib fragments, 5 long bone fragments, and 7 hand and foot bone fragments. The remains are summarized in more detail in the human remains catalog (Appendix 5). Many of these remains may originate from the

Photo 4. Fragmentary remnants of adult burial (Burial 2) showing outline of coffin's west end and crushed cranial remains. Yellow sand from modern disturbance is visible on the north side of the feature.

Figure 3. Burial 2 Plan View, Trench 1



I Yellowish brown modern sand fill
II Brown silty sandy grave fill
III Dark brown sand

Human Remains

Nails

burial itself, although due to the amount of disturbance to the historic burials in this section of Chambers Street, it is just as likely that they derive from another burial. Seven artifacts were identified in the fill on the west side of the burial (but not in the feature itself) including two tobacco pipe stems, one historic ceramic fragment, two iron nails, and three faunal bone fragments (Appendix 6).

Burial 3

Approximately 17 feet (5.18 m) west of Burial 2, a partial unfused (child's) pelvic bone was identified in the excavator's backfill (Cxt 9). Further inspection of the excavation area revealed a child's crushed long bone and a possible coffin outline at a depth of 21 inches (53.34 cm). Prior disturbance to the feature at this level obscured the feature's outline and condition; therefore, more of the feature was exposed to determine whether it consisted of an intact burial. Several poorly preserved but intact ribs and several unfused (child's) vertebrae and long bones were identified (Photo 5).

While disturbance to the grave's surface destroyed any evidence of a grave shaft, a slight line of dark soil was indicative of probable coffin remains. In addition to the disturbance to the grave's surface, a second disturbance was intrusive into the burial's west end. A round metal object—possibly a former sign post or other hardware—was identified on the west side of the ribs and vertebrae. This disturbance appears to have destroyed the head of the burial. Yellow sand fill indicative of modern disturbance was present on the burial's north side, impacting the lower end of the grave. The remaining grave feature measured 3 feet (.91 m) in length and 2.25 feet (.67 m) in width.

The burial was that of a child, buried northeast-southwest in an extended position with head to the southwest (Fig. 4). The child's age was indeterminable, as no dental remains were present, and the skeletal remains were poorly preserved. However, based on the size of the unfused pelvic bone fragment, the child was a young infant.

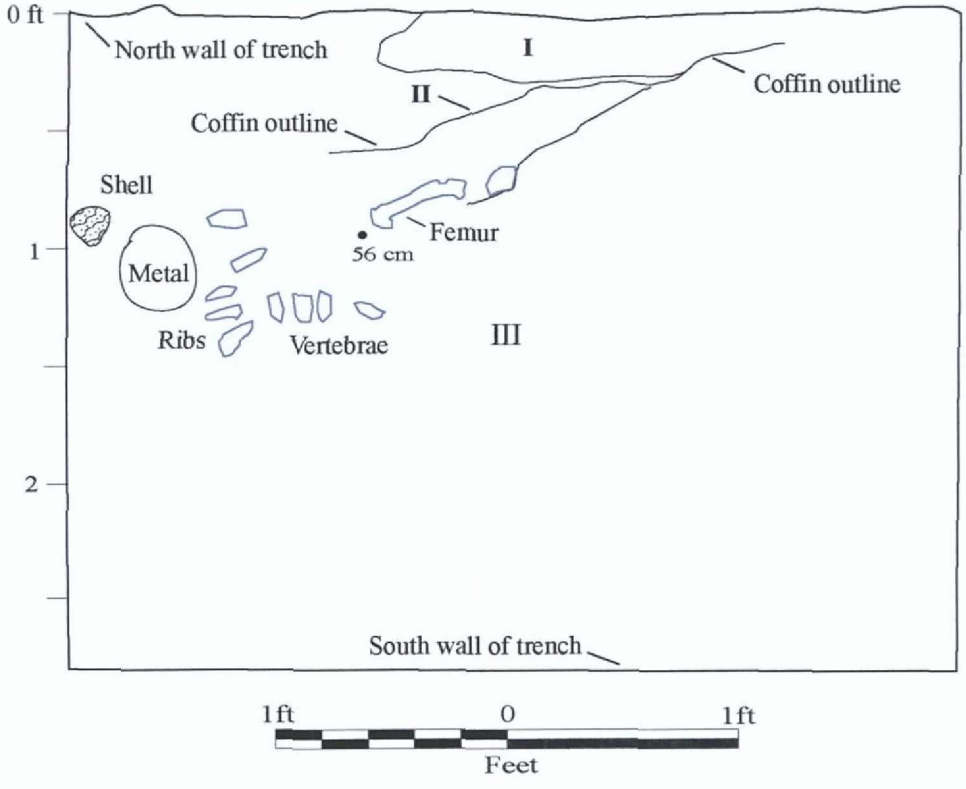
The pelvic bone was stained green on the ventral side suggesting the presence of brass or copper, perhaps a shroud pin, jewelry, or other personal ornamentation. Several shell fragments were noted in the grave fill at the west end, and one iron nail and an oyster shell fragment were collected from historic fill overlying the grave. The grave fill was a brown silty sand. No other human remains or other cultural materials were identified in the excavator's backfill.

While the burial was disturbed to the level of the remains, it was clear that it was partially intact. Due to this factor and the fragile nature of the remains, no further investigation of the burial occurred. The burial was protected with 12 inches (30.48 cm) of clean sand, a plywood box, and plastic sheeting. Due to the close proximity of this burial to Burial 5 (see below), the two burials were covered with one large box. Con Ed was also able to provide large steel plates to place over the fill and concrete covering the burial box to help demarcate the box's location.

Photo 5. Fragmentary remains of a child (Burial 3) including ribs, vertebrae, and a long bone.

Photo 6. Location of Burial 4 in the west wall of Trench 1.

Figure 4. Burial 3 Plan View, Trench 1



I	Olive yellow modern sand fill
II	Black silty sand (decayed wood)
III	Dark brown sand fill
☐	Human Remains

Burial 4

Approximately 7 feet (2.13 m) east of Burial 3 and about 10 feet (3.05 m) west of Burial 2, a fourth burial was identified in the trench. During hand excavation of the trench, a human long bone (an adult left ulna) was dislodged from the south wall (Cxt 10). Upon further inspection by HAA, Inc. intact ribs and other unidentifiable bones were observed in the wall of the trench (Photo 6) at a depth of approximately 20 inches (50.8 cm). Since further construction by Con Ed would not cause disturbance to the trench wall, the remains were left in the wall without further investigation. Based on HAA, Inc.'s observations, prior construction activity in this area had already destroyed a portion of this burial's grave shaft. The south wall of the current Con Ed trench came down on a point within the grave shaft, and soils being excavated by Con Ed just north of the remains consisted of historic brown sand fill with no human remains.

Interestingly, considering the feature's relatively narrow width and the position of the ribs in the trench wall, it appears that the burial was oriented north-south (Fig. 5). The feature was 17 inches (43.18 cm) wide with no disturbance to its east or west edges. The feature was approximately 6 inches (15.24 cm) thick from the top to bottom edges. The grave fill was characterized by a dark reddish brown, clayey silty sand, while the surrounding soils were a dark brown, sandy silt characteristic of the historic fill. No modern intrusions (as evidenced by yellow sand fill) were noted. The burial was cut through at the mid-section in the area of the rib cage.

Burial 4 was identified in the area where two north-south oriented burials were found during the Tweed Courthouse study (HAA, Inc. 2003) and would have been immediately adjacent to Tweed Burial 9. The relationship of this and other burials to the Tweed burials will be discussed further below.

Burial 5

Approximately four feet (1.2 m) west of Burial 3, 30 historic artifacts (Cxt 11) were collected from the trench fill originating from a depth of approximately 15-20 inches (38.1-50.8 cm). The sample included 9 fragments of historic ceramics, 4 iron nails, 10 faunal bone fragments, 5 shell fragments, and one fragment each of brick and mortar. In addition, 12 fragments of human bone were found. Below this deposit at about 24 inches (60 cm), potentially intact bone was observed in the trench by HAA, Inc. staff. Con Ed was stopped from further excavation and HAA, Inc.'s inspection of the area revealed small cranial fragments with a potential coffin outline adjacent to them.

In order to identify whether this was an intact burial, the feature was excavated further until a very narrow coffin outline (6 in/15.24 cm) on the north and south sides of the remains became evident. While the crushed cranial remains appeared intact, the coffin outline was not evident at the head (west end) of the grave except for one remaining iron nail that would have been the coffin's northwest corner (Fig. 6). Further inspection revealed several additional cranial fragments and one iron nail (Cxt 13) just outside the feature's west end. These remains appeared to have been dragged out of the grave feature to the southwest by a previous disturbance unrelated to the current Con Ed

Figure 5. Burial 4 Profile, South Wall, Trench 1

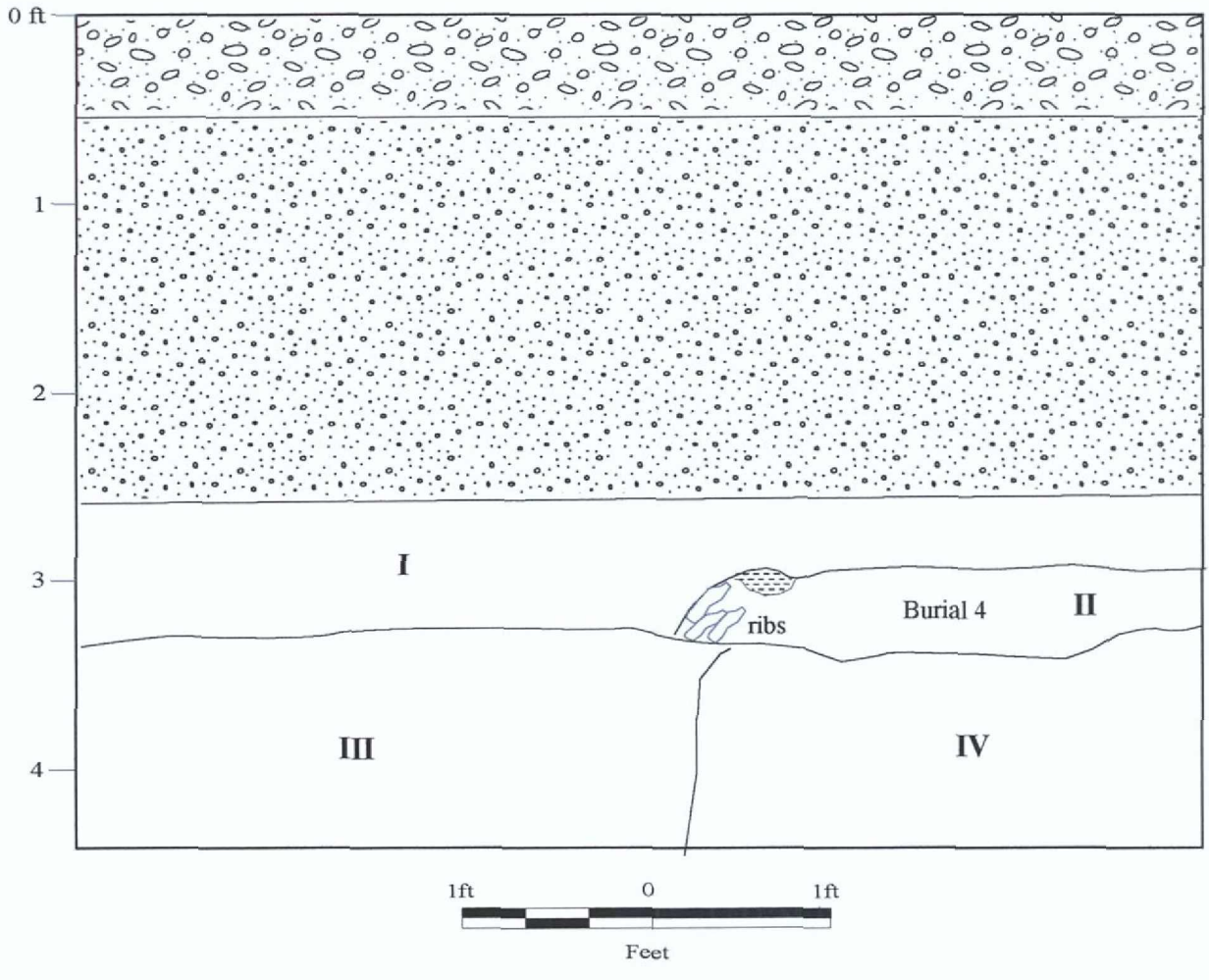
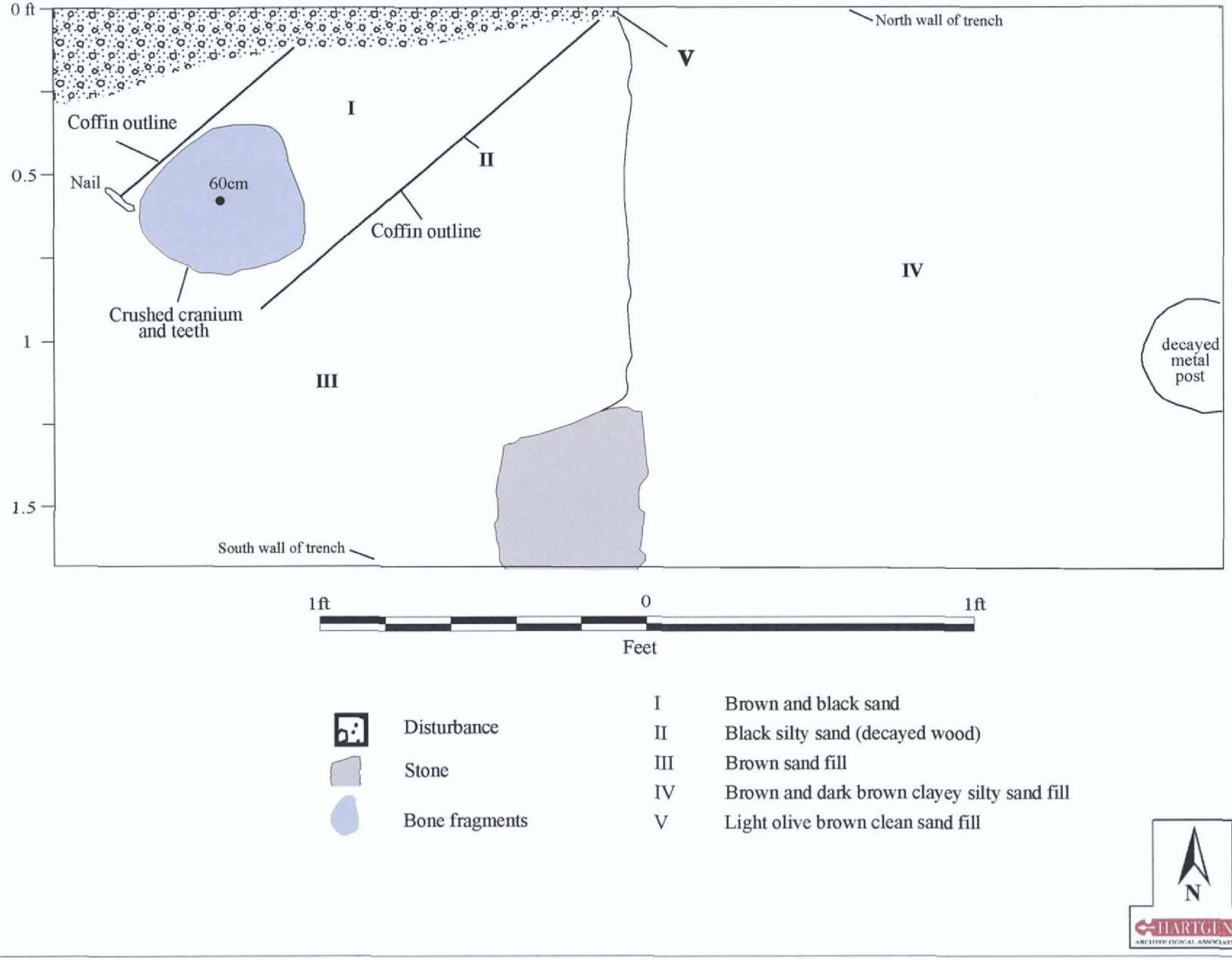


Figure 6. Burial 5 Plan View, Trench 1



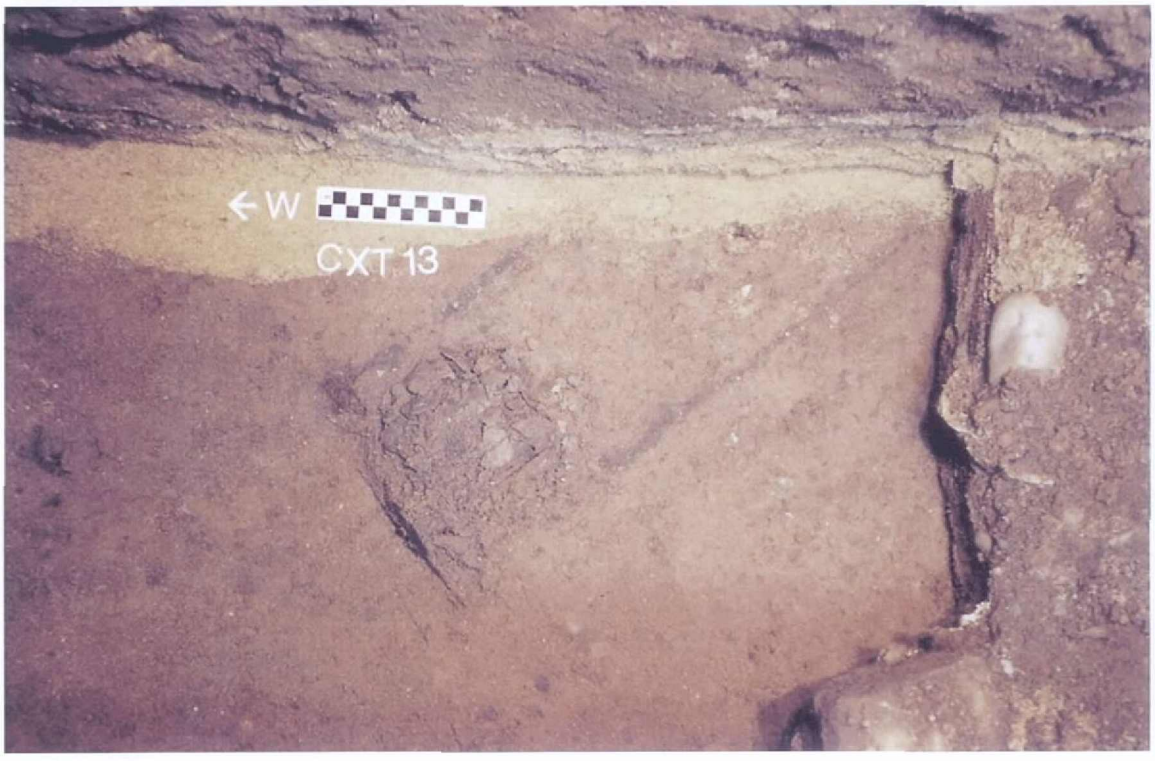


Photo 7. Burial 5, an infant burial visibly truncated at the foot of the grave by a previous disturbance, as demarcated by the yellow sand. A clear coffin outline can be observed surrounding and to the east of the cranial remains in the center of the photograph.

excavation. This was distinguishable as a previous disturbance due to the organic soil stains present beneath the misplaced cranial remains indicating long-term deposition in that position. Similar to Burials 1, 2, and 3, this burial was interred on a northeast-southwest alignment with the head to the southwest.

In addition to the disturbance at the west end of the feature, the lower (east) end was cut by a prior modern disturbance characterized by the yellow sand fill (Photo 7). Minus the two disturbances, the remaining feature was 18 inches (45 cm) in length. The grave fill was a mottled brown and black sand. One indistinguishable piece of iron that may have been coffin hardware was collected from the soils outside of the grave.

The size of the feature as well as the size of the cranial remains and the presence of two deciduous (baby) teeth with undeveloped roots indicated the burial was that of an infant. Based on

Because it was determined that the feature was partially intact, LPC policy to protect the remains in situ was followed. Cranial fragments that had been dragged out of the original grave were removed and replaced at the head of the coffin with the other remains. The burial was covered with 12 in (30.48 cm) of clean sand fill and covered with a plywood box. Due to the close proximity of Burials 3 and 5 (merely two feet), they were placed under one large box (Map 9). The box was covered with sand fill and concrete and the steel plate described above.

Burial 6

In order to accommodate the utility pipe in the area of Burials 3 and 5 the trench was rerouted to the north (Map 9). During excavation of this section of the trench, several adult hand bones were identified in the backfill. Further inspection of the excavated area revealed additional intact hand bones and a right femur at a depth of 17 inches (44 cm). In order to determine how much of the burial was intact, the feature was exposed enough to identify which elements were present. A partial grave shaft outline and decayed coffin wood was evident, and several intact arm bones and vertebrae were exposed. Given the relative size of the humerus and radius, the burial was most likely that of an adult male.

The burial extended into the north wall of the trench into unexcavated soils beneath the existing pavement. Like the other burials in this area, this one was also oriented northeast-southwest. The head (west end) of the grave was disturbed by a previous utility trench evident on the south side of the current trench (Photo 8; Fig. 7). The remaining feature was approximately 18 inches (45.72 cm) in length within the trench, although the full feature extending into the wall of the trench was likely longer. The visible portion of the feature was 2.1 feet (65 cm) in width. The burial appears to overlie Burials 3 and 5 by several inches.

Numerous (N=66) adult cranial fragments, ribs, long bone fragments, and teeth were identified in disturbed soils overlying the burial (Cxt 15); whether these remains originated from this burial or another disturbed burial in the area is unknown. No associated cultural materials were identified in the grave fill, although the fill overlying the remains contained the typical small sample (N=32) of historic artifacts including ceramics, faunal bone, iron nails, glass, and brick fragments (Cxt 15). The grave fill was a mottled brown and black silty sand.

Since this burial was partially intact, LPC policy to protect it in place was followed. The burial was covered with a plywood box and filled with 12 inches (30.48 cm) of sand. Con Ed also placed steel plates over this area of the trench containing the burial box.

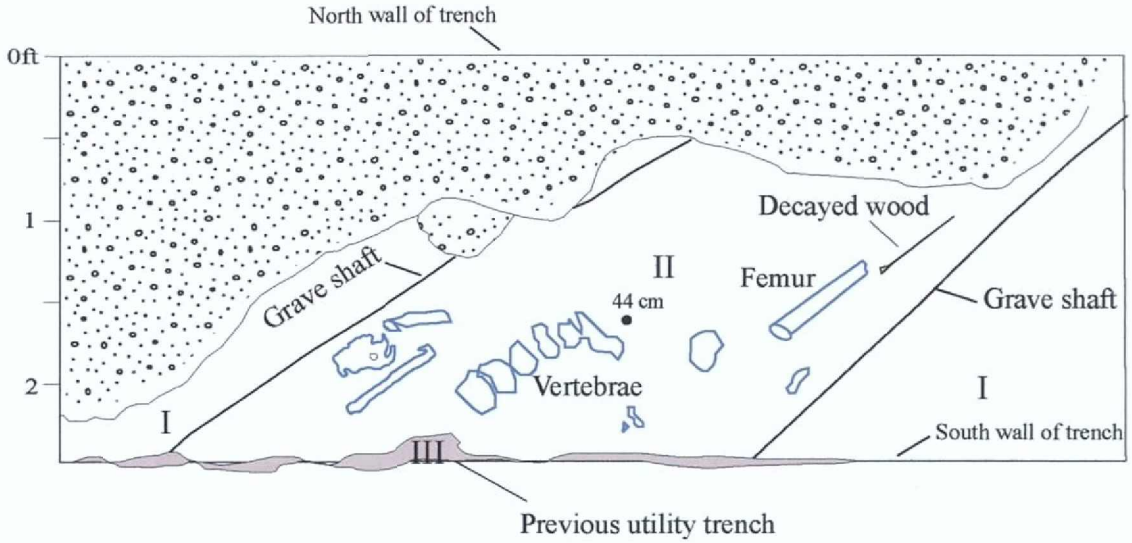
Because it was likely that more of the burial extended further north, HAA, Inc. recommended that Con Ed not attempt to extend the trench any further in this direction. Due to the circumstances, HAA, Inc. recommended that the utility pipes in this section of the trench be placed between the Burial 3/5 box and the Burial 6 box. Because of the limited space, Con Ed was able to place the pipes 2-on-2 through this section of the trench rather than four alongside of one another. This technique still allowed for a 6-inch (15.24 cm) buffer between the pipes and the burials.

Photo 8. Burial 6, an adult burial truncated at the west end by a previous disturbance as demarcated by the lighter sand below the context label. The burial continues to the west beneath unexcavated portions of the street.

West end of trench

No additional burials or fragmentary human remains were identified west of Burials 5 and 6 (Map 9). For a length of 16 feet (4.88 m) west of Burial 6, no additional cultural materials were identified. Several preexisting utilities were noted in this area including the M.C.T.V. utility pipe and wiring associated with the sidewalk telephone. Immediately west of the telephone utility, a deposit of 164 artifacts were found at a depth of 19 inches (48.2 cm). The sample (Cxt 14) included 33 fragments of historic ceramics (creamware, whiteware, pearlware, stoneware, porcelain, delft, earthenware), 7 tobacco pipe fragments, 15 bottle glass fragments, 68 faunal bone fragments, 10 shell fragments, 10 nails, and 9 bricks. Asphalt and concrete were also mixed in with the deposit. No human remains were identified.

Figure 7. Burial 6 Plan View, Trench 1



The artifacts were found in a pocket of compact mottled dark brown, clayey sand distinguishable from the surrounding brown silty sand, historic fill. The soil had very little depth and appears to be a small portion of a feature that was moved from its original context and redeposited within the fill.

Two feet to the west, two additional deposits of artifacts (Cxt 16 and Cxt 18) were identified at a depth of approximately 24 inches (61 cm). These two deposits are similar in composition to Context 14 and may be parts of the same feature. Context 16 contained 27 historic artifacts, as well as modern trash. The sample included stoneware tile, earthenware pipe, bottle glass, brick, nails, and faunal bone. Context 18 contained 137 historic artifacts including several types of earthenware (pearlware, slipware, Whieldon ware), a roofing tile, bottle and window glass, tobacco pipe fragments, nails, and faunal bone fragments (Photos 9-11). Ninety-nine of the artifacts were fragments of a single wine bottle. Due to the amount of disturbance to these three contexts little information about the feature from which they derived can be gleaned. However, a sample of the artifacts dates to the late 18th century, including the Whieldon earthenware and slipware. In addition, several samples of pearlware date from the late 18th to early 19th century (1779-1840). Considering the early dates, the feature—likely a privy based on the soil composition— may have been associated with the mid-to-late-18th-century military barracks or the late 18th-to-early-19th-century almshouse which both stood on the grounds of today's Tweed Courthouse.

Additional cultural materials consisting of a mix of historic artifacts, modern trash, and a broken ceramic sewage pipe (Cxt 19) were identified in soils west of Context 18, but these appear to derive from an area of construction disturbance east and north of the catch basin at the west end of the trench. For a distance of 28 ft (8.5 m) from Context 19 to the end of the trench, no additional cultural materials other than modern trash were observed (Map 9). This section of the trench was characterized by modern disturbance associated with numerous utilities. The trench ended at the intersection of Chambers Street with Broadway.

Summary of Trench 1

Six partially intact burials and 667 fragmentary human remains were identified in this trench. Of the six burials, one very fragmentary burial that was heavily disturbed (Burial 2) was removed. The remainder of the bone fragments collected from the trench were all from fill deposits and have no particular association with a specific burial.

Of the six burials, five were oriented on a northeast-southwest alignment and one burial observed in the south wall of the trench (Burial 4) was likely oriented north-south. Two of the burials (Burials 2 and 6) had evidence of both grave shafts and coffin remains in the form of decayed wood or nails. Two (Burials 3 and 5) had coffin remains only; and two (Burials 1 and 4) had a grave shaft.

One disturbed feature was identified in the trench and 806 historic artifacts were collected. Of these, 328 were from the feature deposit (Cxts 14, 16, and 18), and the rest were collected from fill deposits throughout the trench.

Photos 9 and 10. Examples of ceramics found in previously disturbed privy in Trench 1 (Cxt 16 and 18). Above: Chinese export porcelain; two fragments of hand-painted underglaze blue pearlware; creamware vessel base; and pearlware vessel base. Below: Several examples of slipware (top) and decorative stoneware tile (bottom).

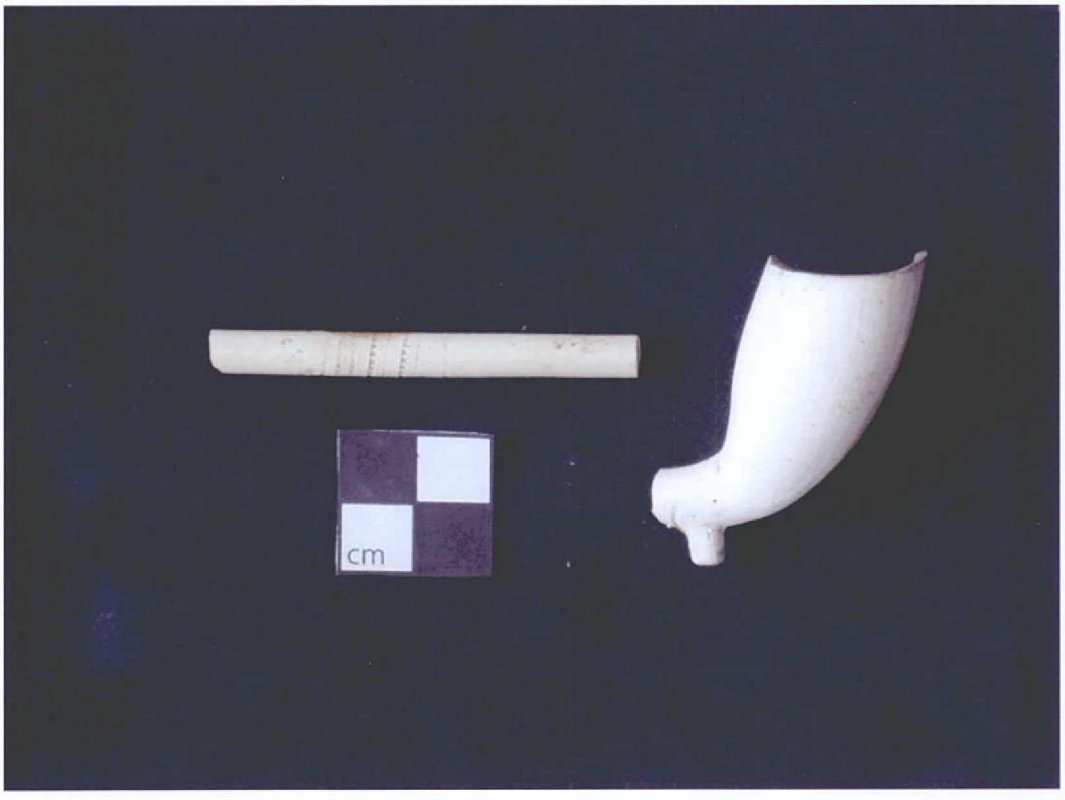


Photo 11. Tobacco pipe stem and bowl from disturbed privy deposit (Cxt 14). Stem includes embossed letters ("N. GOUD") and spiral rouletting.

Trench 2

The excavation of Trench 2 commenced adjacent to the fire hydrant located just west of Tweed Courthouse's east gate (Map 10). The trench was excavated at a distance of approximately 1.5 feet (.46 m) from the existing sidewalk curb in the eastbound lane of Chambers Street. The trench was approximately 145 feet (44.2 m) in length, 3-4 feet (.91-1.22 m) wide, and no more than 4 feet (1.22 m) deep. While excavation proceeded from east to west from the trench's origin, the trench was also extended northeast across Chambers Street to Elk Street.

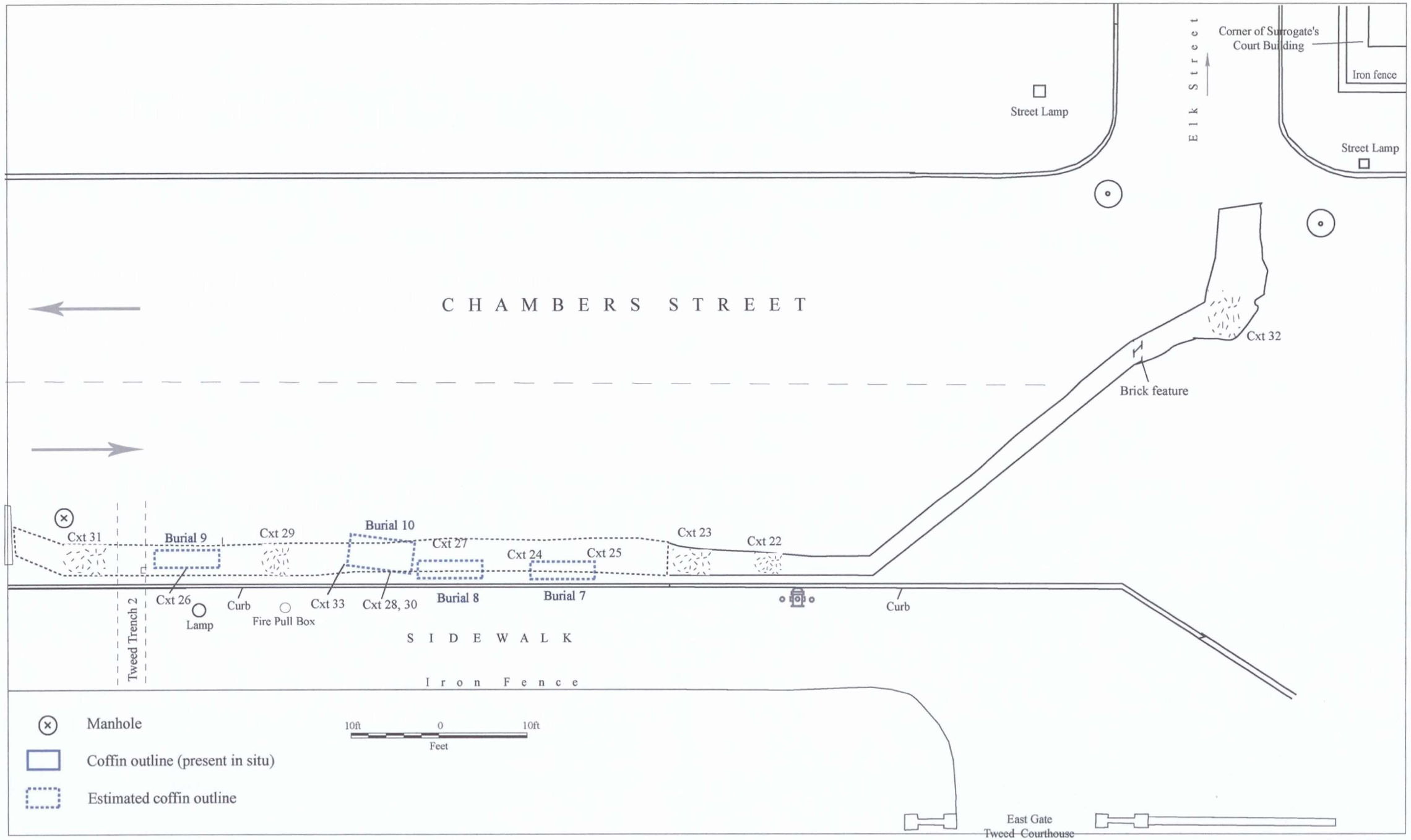
From the fire hydrant for a distance of 17 feet (5.18 m) west to Context 23 (Map 10), soils within the trench consisted primarily of modern sand fill devoid of cultural material. The north trench wall in this section was devoid of the historic Belgian brick level found in other areas of the street suggesting more recent disturbance—most likely a previous Con Ed trench. The south wall of the trench still contained the Belgian brick along the sidewalk curb line in most sections.

Contexts 23 through 25 (Map 10) consisted of a mottled dark brown and strong brown sand and silty sand fill with flecks of charcoal. Contexts 23 and 24 contained fragmentary human remains mixed with historic artifacts including ceramics, brick, glass, and shell, as well as significant amounts of gravel, large stones, and chunks of asphalt. Context 23 contained 15 fragments of human bone. Context 25 consisted of a black silty sand containing historic artifacts interspersed with modern trash.

Fragmentary human remains from Context 24 (N=281) were found immediately underlying the Belgian brick level, 18 inches (45 cm) below current grade. All were secondarily deposited remains that were fractured prior to the current excavation. The northern third of the trench in this section cut through a previous construction trench which had obviously disturbed human remains, as several large femur fragments were found embedded within the concrete matrix overlying the soil fill. Below the fill, a partial burial was identified as well.

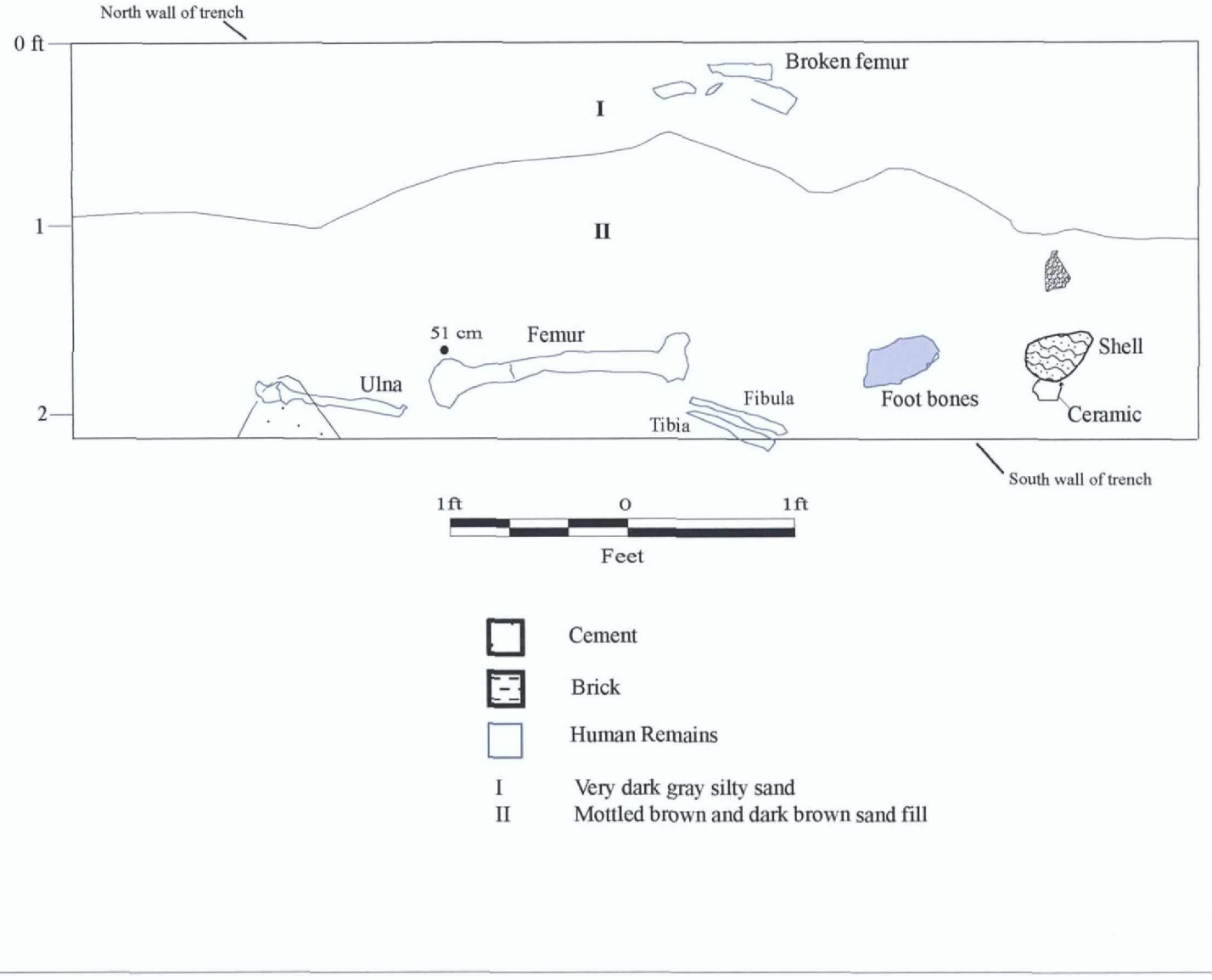
Burial 7

In the south wall of the trench adjacent to Contexts 24 and 25 (Map 10), several foot bones were retrieved from Con Ed's backfill during hand excavation of the trench, and a partially intact leg was identified immediately below the level of the street bed (Photo 12). The remains were identified at a depth of 20 inches (50.8 cm). Just north of the remains was a large area of disturbance, which contained a left femur shaft broken into several pieces (Fig. 8). Investigation of the trench floor revealed an adult right femur, as well as a partial left tibia and left fibula alongside the south wall of the trench. Because the lower leg bones were not fully intact, soils in the area of the remains were excavated further to identify whether the remains consisted of a partially intact burial. A few intact foot bones (left) were identified to the east of the leg bones, and a left ulna to the west. It also appeared that the burial extended into the south wall of the trench. No remains were evident above the level of the elbow. In contrast to the five burials in Trench 1 oriented northeast-southwest, this one was oriented east-west with the head to the west. The grave was disturbed by various construction episodes on the east, west, and north.



Map 10. Con Ed Chambers Street Project Map: Archeological Monitoring, Trench 2

Figure 8. Burial 7 Plan View, Trench 2



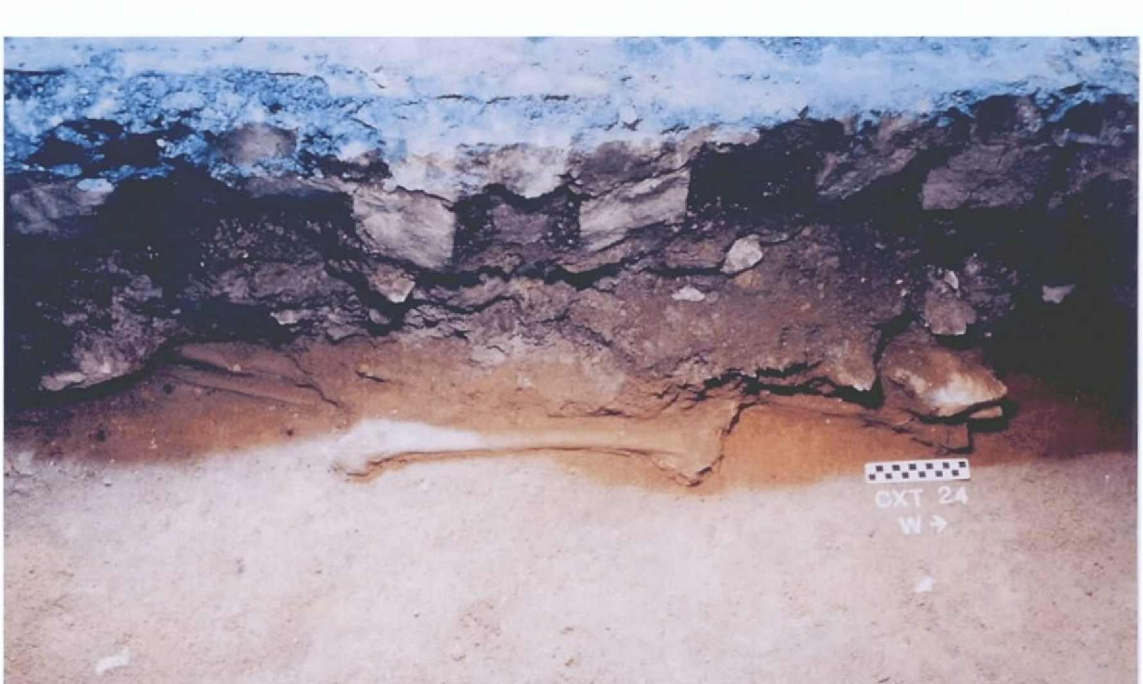


Photo 12. View south of Burial 7, a heavily disturbed adult burial. The burial had been previously impacted on the east, west, and north sides.

Possible remnants of a grave shaft were observed on the north and east sides of the remains; however, heavy disturbance to the area surrounding and overlying the remains erased most evidence of a grave shaft. No coffin outline was observed but several nails were found in the grave fill. The grave fill consisted of mottled brown and dark brown sand with flecks of charcoal and shell and a small sample of historic artifact fragments.

The size of the remaining feature was approximately 3.3 feet (1 m) in length and 10 inches (25 cm) in width. Due to the amount of disturbance to the grave and its shallow depth, the remains were removed. Analysis of the remains indicated that this was the burial of a young adult male.

Burial 8

Burial 8 was identified approximately 15 ft (4.57 m) west of Burial 7 (Map 10). An intact rib cage was identified in situ during hand excavation of the trench from east to west by Con Ed (Photo 13). No remains had been observed in the backfill during excavation of the trench to the east, and none were found in soils immediately above the discovery. The remains were identified at a depth of 24 inches (60 cm) along the south wall of the trench. Further inspection of the trench floor revealed a left humerus with articulated clavicle. Also observed in the south wall west of the remains was a cranium, which was only partially visible. Due to the location of the cranium and the identification of remains from the left side of the body, it is likely that more of the burial is intact beyond the face of the south wall and beneath the unexcavated portion of the street.

Similar to Burial 7, this grave was oriented east-west with the head to the west. The size of the remaining burial was approximately 24 inches (60 cm) in length, and approximately 16 inches (40.64 cm) of its width were visible on the trench floor (Fig. 9). No distinct grave shaft was identifiable, and no coffin remains were evident with the exception of a few nails in the grave fill. The grave fill consisted of a brown sand with flecks of charcoal and shell with samples of historic artifact fragments.

Since the burial appeared relatively intact from the rib cage and up, the remains were left intact and were not investigated any further. The visible remains were covered with 12 inches (30.48 cm) of sand and a plywood box. The south side of the box was where the burial extended into the trench wall was left open so as not to disturb the burial further.

Burial 9

During Con Ed's hand excavation of the trench 22 feet (6.71 m) west of Burial 8, fragmentary human remains were identified in the backfill. Within the trench, a potentially intact adult humerus was observed in the area of excavation at a depth of 25 inches (64 cm). Further investigation of the area surrounding the humerus revealed cranial fragments, ribs, and finger bones that appeared to be intact. However, portions of the burial were impacted by existing utilities crosscutting the Con Ed trench from south to north (Photo 14). A large portion of the burial area was excavated in order to determine the extent of the disturbance.

A utility pipe installed at the west end of the grave appears to have destroyed the uppermost thorax region of the burial (Fig. 10), as portions of the upper arms, vertebral column, and rib cage were missing. Only fragments of the cranium remained, and the mandible was displaced and overturned from its original anatomical position. Just west of the cranial remains, a second disturbance consisting of a large concrete duct bank impacted the head of the grave erasing any evidence of a grave shaft or coffin remains at this end of the feature. At the east end of the grave, the area of the upper legs was impacted by a third disturbance consisting of another concrete duct bank. A partial broken femur was identified on the west side of the disturbance, and the right and left tibias and some foot bones were still relatively intact on the east side (Fig. 10).

Photo 13. Burial 8, the north half of an adult burial truncated at the elbow by a prior disturbance. The south half of the burial appears to be underneath unexcavated portions of the trench, as a part of the cranium is visible on the edge of the trench wall in the feature's northwest corner.

Photo 14. Burial 9, an adult burial disturbed at the west end and center of the grave.

Figure 9. Burial 8 Plan View, Trench 2

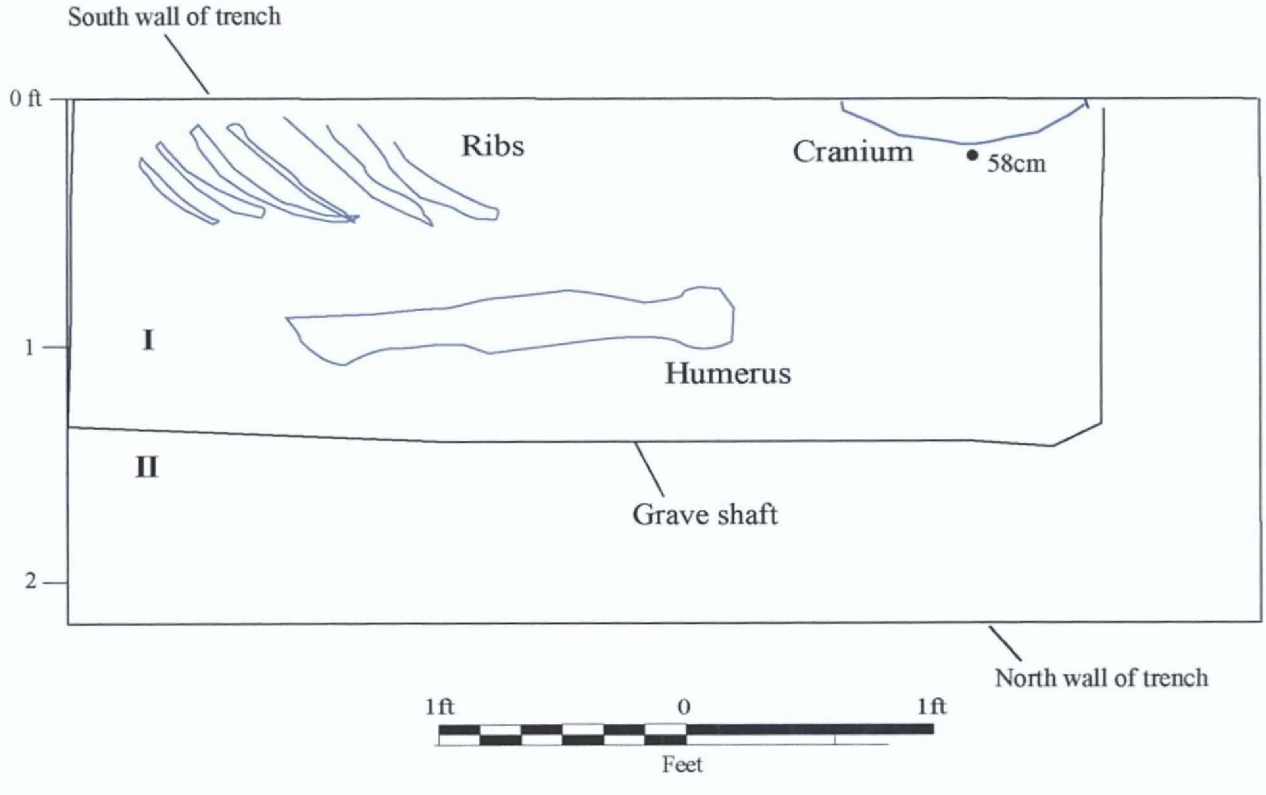
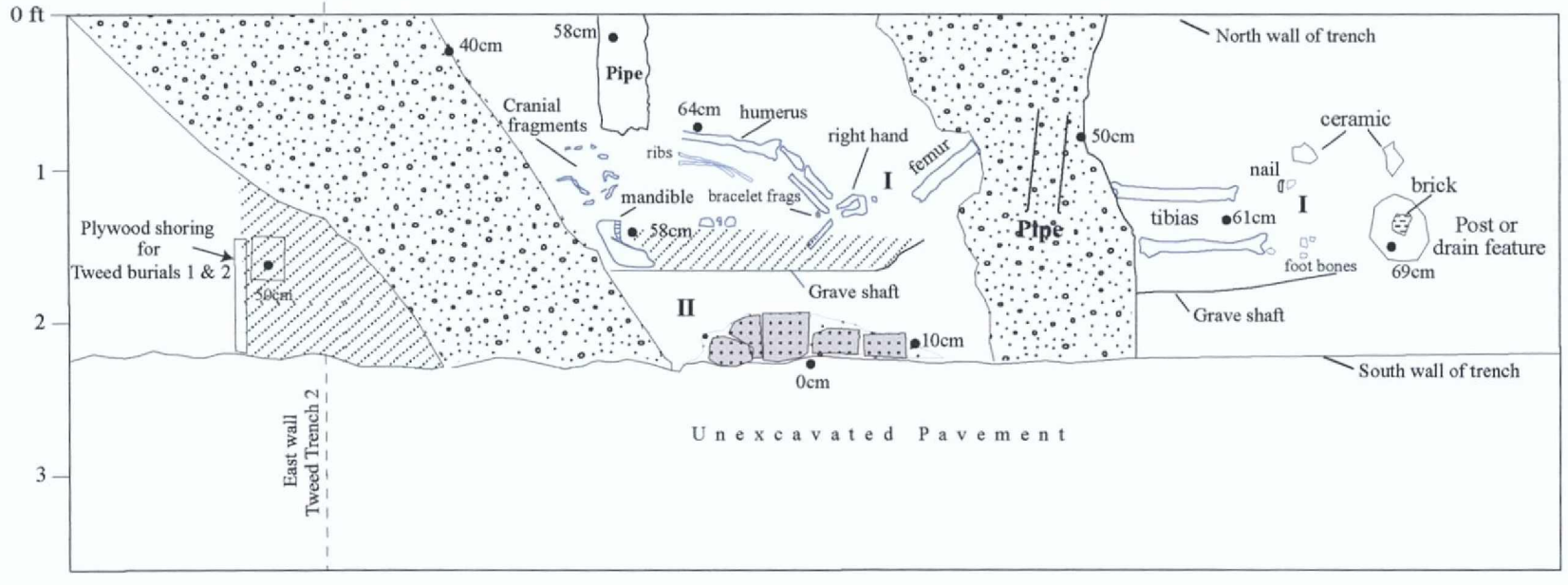


Figure 10. Burial 9 Plan View, Trench 2



Belgian brick
Concrete
Unexcavated
Human remains

1ft 0 1ft
Feet

I Mottled brown, dark brown, and strong brown silty sand
II Brown sand fill

During HAA, Inc.'s investigation of the disturbed grave, numerous fragmentary remains were identified in the fill immediately overlying the burial (Cxt 26). These remains may have originated from the several disturbances impacting this grave or from a disturbance of adjacent graves. Because their origin could not be determined with any certainty, the remains found in the fill (N=210) were collected.

Similar to the other two burials identified in this trench, Burial 9 was oriented east-west with the head to the west. The arms were crossed at the waist with the right hand over the left. A partial grave shaft outline was observed on the south side of the burial. No coffin outline was observed, although a few nails were found in the disturbed soils overlying the burial and one by the left foot. The burial fill consisted of a mottled brown, dark brown, and strong brown sand with flecks of charcoal and small fragments of historic artifacts.

During final documentation of the burial, a glass bead was visible in the area of the wrist. Upon further inspection it appeared that the individual had a copper or brass bracelet with glass beads around the left wrist, as several beads and green-tarnished metal flecks were present adjacent to the left radius.

Since several large areas of the burial were relatively intact, the decision was made to leave the burial in place, as per LPC policy. The burial was covered with 8 inches (20.32 cm) of clean sand and a plywood box. Plastic sheeting and several small steel plates were placed over the box. In order to avoid impacting other known burials in the area (HAA, Inc. 2003), the new utility pipe was placed over this burial. Several burials are known to exist in the south wall and potentially the north wall as well, leaving few options for placement of the utility.

One final note about the excavation of the trench in this area is that the Tweed Courthouse Trench 2 was identified just west of Burial 9 on the west side of the large duct bank (Fig. 10). In addition, the location of the plywood shoring protecting and demarcating Burials 1 and 2 was identified. The relationship of Burial 9 to the Tweed burials will be discussed further below.

Burial 10

This burial was identified immediately west of Burial 8 and 16 ft (4.88 m) east of Burial 9 (Map 10). The area between Burials 9 and 10 contained historic fill with the characteristic sample of historic artifacts and fragmentary human remains (N=87). Burial 10 was identified during the excavation of a relatively large pocket of secondarily deposited remains (N=215) in disturbed soils immediately west of Burial 8 (Cxt 28). Intact remains including foot bones, lower leg bones, lower arm bones, and a partial vertebral column were found in soils below the fragmentary remains at a depth of approximately 27 inches (68.6 cm) below surface. The remains were excavated enough to identify how much of the burial was still intact and how far the remains extended to the west within the trench.

Additional intact remains were identified south of the first set of remains, and it became obvious that a second individual was present. The two individuals were placed side-by-side and only inches apart (Fig. 11; Photo 15) suggesting burial in a single grave. Both individuals were buried east-west with the heads to the west. The head of the grave was previously disturbed by construction of two separate north-south utility pipe trenches.

A grave shaft outline was difficult to distinguish, as the soils were heavily mottled and the burials extended into the north and south walls of the trench beneath unexcavated portions of the street. The size of the feature visible within the trench was approximately 4.3 feet (130 cm) in length and 18 inches (45.7 cm) in width. The grave fill consisted of brown and dark brown, silty sand with shell and brick fragments. In addition to the fragmentary human remains, a sample of historic artifacts was collected from the brown silty, sandy fill overlying the burial (Cxt 28).

Again, based on the remains present in the trench and their position and orientation, it is likely that additional portions of the burials exist under unexcavated portions of the street. Due to this factor, as well as time constraints, the decision was made to place the utility above the burials. Further excavation to the north and south would likely encounter additional remains associated with these burials and potentially other undisturbed burials. Prior to installation of the utility, the burial was covered with 6-8 inches (15.24-20.32 cm) of sand, a plywood box covering both burials, plastic sheeting, and steel plates.

West and east ends of the trench

The west end of Trench 2 ended 15 feet (4.57 m) west of the Burial 9 box at a steel grate in the street. No additional burials or significant artifact deposits were identified in the rest of the trench at this end.

At the east end, the trench was extended another 49 feet (14.9 m) northeast crosscutting Chambers Street and ending in the westbound lane between two manholes at the corners of Elk Street (Map 10). Most of this section of the trench consisted of fill and recent utility work as characterized by sections of clean yellow sand. One partial feature was identified within this section of the trench. Context 32 was identified 21 feet (6.4 m) northeast of the trench's origin (adjacent to the fire hydrant). This context contained a partial brick feature and a deposit of historic artifacts (N = 56) from the surrounding fill. The artifact sample included mainly19th-century ceramics, bottle and window glass, nails, and faunal bones. One piece of 18th century slipware was also included in the deposit.

The partial brick feature was identified just below the bottom of the concrete street bed at a depth of 2 feet (.61 m). The bricks were arranged lengthwise from north to south at a slight angle (approx. 30°) and were present only in one layer. The area beneath the brick appeared hollow, suggesting it may have been some kind of storage or other container (i.e., a coal shaft). Since only a small portion of the feature was visible in the confines of the trench it is difficult to identify the feature's function and full size.

Figure 11. Burial 10 Plan View, Trench 2

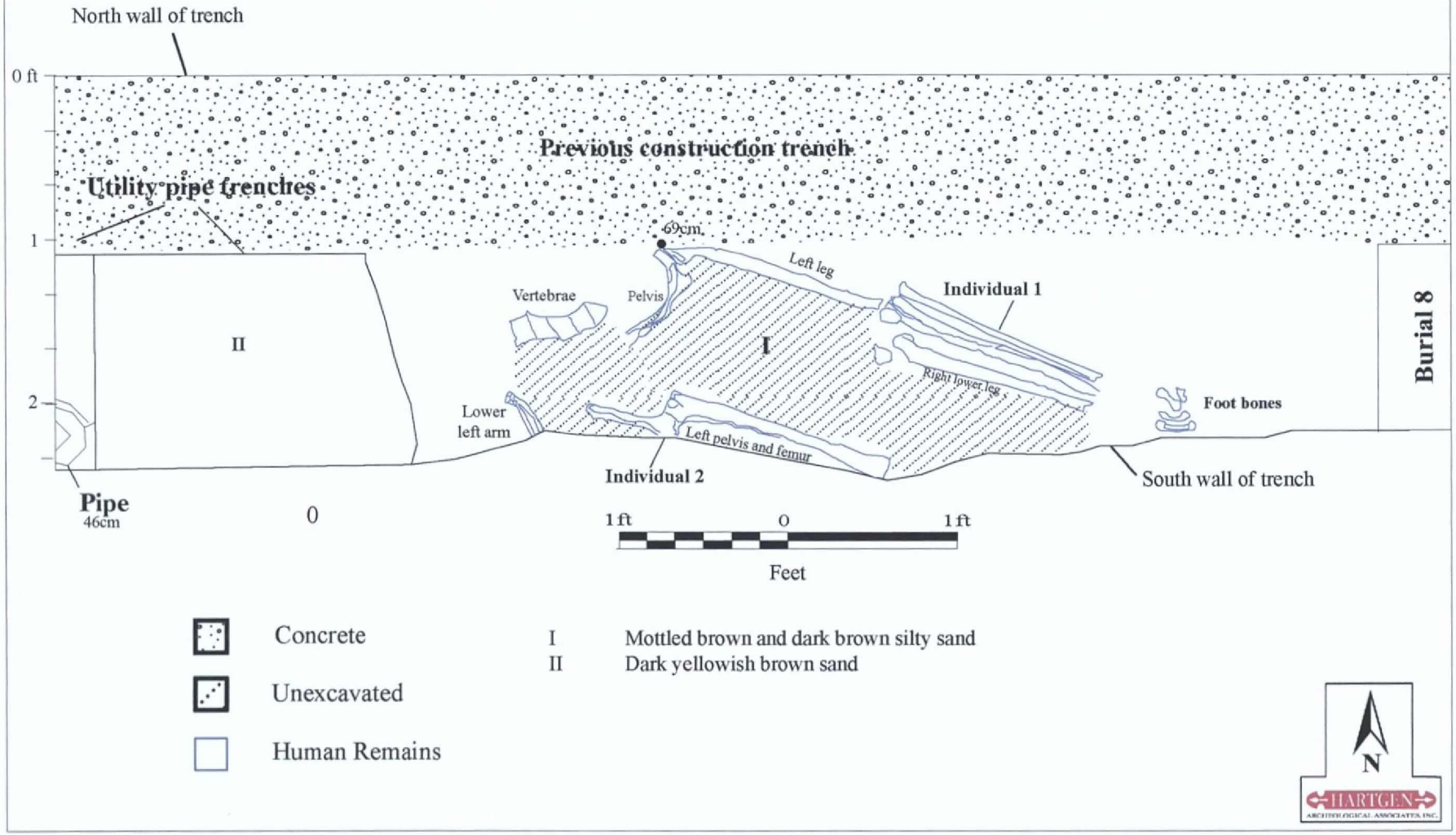


Photo 15. Burial 10, two adults buried side-by-side in a common grave. The left half of Individual 1 and portions of the right and left sides of Individual 2 are visible between the north and south walls of the trench.

Summary of the fieldwork

As outlined above, the archeological monitoring of the Con Ed utility replacement resulted in the identification of ten partially intact historic burials, over 1,800 fragmentary human remains, two partial features, and a small collection of artifacts from historic fill deposits. With the exception of the intact burials and features or remnants of them, soils throughout the project area consisted of historic and modern fill from various construction episodes.

The ten burials, which included both adults and children, were interred in three different ways: north-south, east-west, and northeast-southwest. The single north-south burial and five northeast-southwest burials were all identified in Trench 1 located west of Tweed Courthouse, while the four east-west burials were found in Trench 2, east of the Tweed central staircase.

Fragmentary, secondarily deposited human remains found in both trenches were collected and returned to the HAA, Inc. laboratory for cleaning and analysis. The next section describes the laboratory work and results of the fragmentary human remains analysis.

One disturbed feature, likely a privy, was found at the west end of Trench 1. A small portion of an unknown brick feature was found at the east end of Trench 2.

LAB METHODS

Archeological materials recovered from the project were processed according to the professional curation standards outlined in the NYAC guidelines (1994). All artifacts and human remains were cleaned and stored in archival quality (acid-free) tissue paper, plastic bags, and boxes in order to prevent any further decomposition of the remains.

The entirety of the artifact collection originated from fill deposits, which contained only artifacts removed from their original provenience. Using these artifacts to date the fill deposits is impossible given numerous episodes of excavation and filling.

Artifact Processing

The historic artifact collection was processed by the staff of the HAA, Inc. laboratory located in Brooklyn, New York. The artifact collection included samples of ceramics and glassware; building materials, such as nails, brick, and window glass; personal items, such as smoking pipes, buttons, and coins; and food refuse. The artifact collection was cleaned and processed by Michael C. Diaz. The artifacts were analyzed and catalogued by David Klinge, M.A. All provenience data and artifact information were entered into a customized MicroSoft *Excel* artifact database. Objects were assessed for material type and stability and were washed or dry-brushed accordingly. Analysis of the historic artifacts included counts, weights, and descriptors, such as material, function, manufacturing technique, decorative technique, and element. Photography of artifacts was completed by Carol A. Raemsch, Ph.D.

Human remains (by Cassandra Ayott, M.A. and Carol A. Raemsch, Ph.D.)

The analysis of human remains was completed in the osteology laboratory in Brooklyn, New York. The cataloging and analysis of human remains was completed by Cassandra Ayott, M.A. under the supervision of Carol A. Raemsch, Ph.D. Dawnie W. Steadman, Ph.D. examined and provided identification on pathological remains. Cleaning and conservation of human remains was completed by Michael C. Diaz and Cassandra Ayott. Photography of human remains was completed by Carol Raemsch.

All bone material in the collection was inspected to ensure that all human skeletal elements were separated from the rest of the collection so that there was no mixing of faunal elements. The skeletal remains were processed and analyzed using standard laboratory procedures. All human bones and bone fragments were cleaned (dry-brushed), sorted, and identified by skeletal element. When possible, fragmentary and broken remains were reassociated. In cases in which the soil adhering to the remains was somewhat damp, the remains were left to slowly dry before processing. The foil containers were left partially opened for several days to allow air to circulate and slowly dry the remains.

After cleaning, the remains were organized by bag number and provenience. Basic skeletal analyses were performed to determine the elements present, the side of the bone, and when possible the age and sex of the individual, pathology, cause of death, and ancestry. In addition, taphonomic data were recorded (see below). Due to the fragmentary nature of the remains, not all of these features were discernible for each bone and bone fragment.

All human remains data were entered into HAA, Inc.'s customized MicroSoft *Excel* human remains database. The following describes the data sheets, which are included in Appendix 7. The *Inventory of Commingled Remains* sheet was the initial site of data entry. When applicable, the following information was recorded for all human remains on the inventory sheet whether complete or fragmentary:

1. Field context (burial number) and the stratum from which the element derived (*Provenience* and *Level*);
2. Field bag number (*Bag*);
3. Class (*Class*);
4. Element (*Elmt*);
5. Subelement (*Subelm*);
6. Number of fragments present per element (*Count*);
7. Size in centimeters (*Size);*
8. Side of the element (*R,L*);
9. Specific part of the element (*Medial, Lateral, Proximal*, or *Distal*);
10. An indication of whether the bone was fragmentary (*Frag*) or intact (*Intact*); and
11. General comments or noted features (*Comments*).

The *Class*, *Element*, and *Subelement* information was retrieved from a bone coding system developed by HAA, Inc. for cataloging commingled human remains included in Appendix 5. The coding system classifies each human bone and element by a series of numbers. Human remains were divided into 21 primary classes, such as cranium, dentition, vertebrae, ribs, os coxae, foot bones, etc. In addition, a class was added for remains that were unidentifiable.

The subcategory *Element* divides the classes into specific bones, such as the frontal, parietal, occipital; cervical, thoracic, and lumbar vertebrae; and the separate diagnostic features of other bones, such as the sternal end, shaft, and acromial ends of the clavicle. A sample of the 22 classes is also divided into a *Subelement* category when applicable, such as the mastoid, petrous, auditory meatus, etc. for the temporal bone; the specific carpal or tarsal bone; specific tooth, etc. If a bone fragment was identifiable as a specific class but the specific element of the bone was unidentifiable, it was entered as "*0*." Together, the code numbers used in the *Bag*, *Class*, *Element*, and *Subelement* categories form the HAA, Inc. catalog number.

Any bone or bone fragment with observable taphonomic information was recorded on a separate sheet within the database (Appendix 7). Taphonomic data generally refers to

postdepositional influences affecting the remains. Taphonomic data was divided into two primary categories: *External Modification* and *Fracturing*. *External modification* describes four potential taphonomic features that could be observed on the remains: discoloration, exfoliation, rodent gnawing, and the growth of fungus. *Discoloration* refers to staining on the surface of the bone, such as green copper/brass staining from artifacts or soil staining. For example, there was a characteristic black spotting on many of the elements resulting from some type of chemical substance in the soil. *Exfoliation* describes the flaking nature of the outer layers of the bone as part of the decomposition process. *Rodent gnawing* describes the distinctive tooth marks left on bone surfaces by various scavengers. The presence of *Fungus* was noted as previously described. *Fracturing* was segregated into 19th- versus 20th- and 21st-century disturbance. This category notes whether the fracture occurred as a result of 19th- or 20th/21st-century construction disturbances. Comments regarding detailed observations made for these categories were added in an additional column at the end of the spreadsheet.

The commingled remains *Basic Analysis* sheet contains demographic information on any remains where age, sex, ancestry, and minimum number of individuals (MNI) could be determined. This database is organized by field bag number and lists the total number of bones present; MNI; sex and age; presence/absence of pathology; and a description of how this information was obtained (i.e., criteria used, references, etc.). Several standard references were used in gathering these data, including Bass 1987; Buikstra and Ubelaker 1994; Reichs 1986; Ubelaker 1989.

Detailed information on the few dental remains collected was entered in the *Dental characteristics* spreadsheet (Appendix 7). The following measurements were collected (in millimeters) for each complete tooth: mesial-distal, buccal-labial, and cementum enamel junction-occlusal surface (*M-D, B-L, CEJ-O*). Observations of dental attrition (occlusal tooth wear) were entered as *none, mild, moderate,* or *significant*. When present, the following dental features were also recorded: *linear enamel hypoplasias* (*LEH*), *abcesses, calculus, caries, wear, pipe stem wear, staining*, and *other*. A separate column describes the specific details of each feature.

Pathologies were noted on a separate spreadsheet and are described in detail for the site of occurrence, degree of intensity, and possible etiology.

Following analysis, the human remains were carefully wrapped in archival tissue paper and placed in archival plastic bags. A label including the HAA, Inc. collection number, the bag number, and the element(s) included was placed into each bag. All of the remains were organized into boxes, separated by bag number and temporarily stored in the HAA, Inc. Brooklyn laboratory.

ANALYSIS OF BURIAL FEATURES AND HUMAN REMAINS

As described above, ten historic burials containing 11 partial individuals were identified within the boundaries of the construction area. The burials are summarized in Table 1. The condition of the burials ranged from partially intact to heavily disturbed. Two heavily disturbed burials were removed, while eight partially intact, partially undisturbed burials were left in place. In all, 1,879 disarticulated or fragmentary human remains were also collected. This section discusses the overall characteristics and patterning of the burials and the analysis of the fragmentary human remains. The ten burials identified in this study are closely tied to those found during the Tweed Courthouse study (HAA, Inc. 2003); therefore, a comparison of the two studies is also included in a separate section below.

Organization and characteristics of burial features across the project area

This section summarizes the general organization and characteristics of burial features and their numbers, provenience, and organization across the area of the construction site.

Burial feature provenience

As discussed in the previous section, all ten burials identified during the Con Ed study were located in the eastbound lane of Chambers Street on the north side of Tweed Courthouse. All were identified within a 7.5YR dark brown or mottled 7.5YR brown and dark brown sand. Typically they were located directly below a compact mottled silty sand containing historic refuse, such as ceramic, glass, nails, and shell. Burials ranged from 20 inches/1.67 feet (50.8 cm/.51 m) to 27 inches/2.25 feet (68.9 cm/.69 m) below existing grade. One burial (Burial 10) was identified at a depth of 27 inches (68.9 cm), while the rest were 20-24 inches (50.8-60 cm) in depth.

Burial feature MNI

In all, the burials identified during the Con Ed monitoring represent 11 individuals buried in ten separate graves. Since most of the graves were partial burials and not completely excavated, it was difficult to assess age, sex, and ancestry for each individual burial. However, at least one burial (Burial 6) was a male and another (Burial 7) was likely a male. One burial (Burial 3) was that of a young child and one (Burial 5) was an infant.

Evidence of grave shafts and coffin remains

As described above, despite the extensive disturbance to the 10 burials, several still had partial grave shafts and/or coffin remains. Grave shafts were discernible based on the presence of soil stains resulting from the excavation and backfilling of the grave. Coffin remains consisted solely of decayed wood stains and nails. Coffin nails were occasionally found in situ along the outline of the feature. The presence/absence of grave shaft and coffin features related primarily to the amount of disturbance affecting the burial feature. In general, the burials were impacted by disturbances that

Table 1. Description of burials identified during Con Edison Chambers Street fieldwork

Burial No.	Trench No.	Location	Burial Type		Age		Condition	Portion(s) excavated	Protected in situ	Orientation				Grave Shaft	Coffin Outline
			Single	Multiple (number)	Adult	Child				E/W	N/S	NE/SW	Head		
1	Trench 1	Just west of Tweed west gate.	X		X		Partially intact in grave shaft (cranium, arm, hand, leg observed in situ).	Portion exposed to I.D. whether intact or not.	X			X	SW	X	
2	Trench 1	50 ft (15.24 m) west of Burial 1.	X		X (M)		Heavily disturbed.	Removed.				X	SW	X	X
3	Trench 1	17 ft (5.18 m) west of Burial 2.	X			X (infant)	Partially intact (ribs, vertebrae, long bone observed in situ).	Portion exposed to I.D. whether intact or not.	X			X	SW		X
4	Trench 1	10 ft (3.05 m) west of Burial 2.	X		X		At least partially intact (in trench wall): ribs and ulna. Cut through mid-section.	Portion exposed to I.D. whether intact or not.	X		X		S	X	
5	Trench 1	2 ft (.61 m) west of Burial 3.	X			X (infant)	Partially intact in grave shaft (cranium observed).	Unexcavated except for cranial remains.	X			X	SW		X
6	Trench 1	Trench 1 extension north of Burials 3 and 5.	X		X (M)		Partially intact in grave shaft (vertebrae, finger bones, femur observed in situ).	Portion exposed to I.D. whether intact or not.	X			X	SW	X	X
7	Trench 2	25 ft (7.61 m) west of fire hydrant west of Tweed east gate.	X		X (M)		Heavily disturbed.	Removed.		X			W		
8	Trench 2	15 ft (4.57 m) west of Burial 7.	X		X		At least partially intact (extends into trench wall): disturbed below thorax.	Portion exposed to I.D. whether intact or not.	X	X			W		

Burial No.	Trench No.	Location	Burial Type		Age		Condition	Portion(s) excavated	Protected in situ	Orientation				Grave Shaft	Coffin Outline
			Single	Multiple (number)	Adult	Child				E/W	N/S	NE/SW	Head		
9	Trench 2	22 ft (6.71 m) west of Burial 8.	X		X		Partially intact. Sections disturbed by two modern utility lines.	Completely exposed to I.D. whether intact or not.	X	X			W	**X**	
10	Trench 2	Immediately west of Burial 8; 16 ft (4.88 m) east of Burial 9.		2	X		At least partially intact: both individuals extend into the N & S trench walls.	Portion exposed to I.D. whether intact or not.	X	X			W		

swept both horizontally and vertically through the features destroying any evidence of grave shafts or coffins.

Of the 10 graves, seven had evidence of one or both of these features. Of these, two (Burials 1 and 4) exhibited evidence of a grave shaft only; two (Burials 3 and 5) had coffin remains only; and three (Burials 2, 6, and 7) had evidence of both. Burials 8, 9, and 10 had no grave shafts or coffin remains. One grave shaft (Burial 4) was observed in the trench wall while the rest of the shafts and coffin remains were observed as horizontal features.

Grave orientation and alignment

The burials identified during this study were oriented in one of three ways: east-west with the head to the west; northeast-southwest with the head to the southwest; or north-south with the head to the south. Five of six burials in Trench 1 west of the Tweed Courthouse west gate were oriented northeast-southwest and one was oriented north-south. The four burials identified in Trench 2 between the Tweed staircase and east gate of the courthouse were buried east-west.

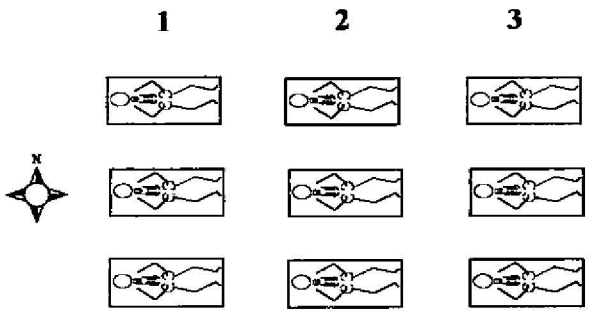
Similar to the burials identified during the Tweed Courthouse study (HAA, Inc. 2003), those identified during the Con Ed study indicate that numerous rows of graves were interred in the historic commons area. For purposes of clarity, a row is defined as a series of burials aligned side-by-side, typically extending along an east-west or north-south axis (Fig. 12). Burials interred north-south are aligned side-by-side on an east-west axis; burials interred east-west are arranged on a north-south alignment; and in the case of this study, northeast-southwest burials are placed on a northwest-southeast alignment. Nine rows are represented by the burials identified during this study.

Burial 4, the north-south oriented burial in Trench 1, is considered to represent one row of east-west aligned burials assuming others were present on one or both sides of the grave. However, because the burial is aligned head to foot with the Tweed Courthouse Burial 9 (see Map 11 on p. 83), together the burials represent at least two rows.

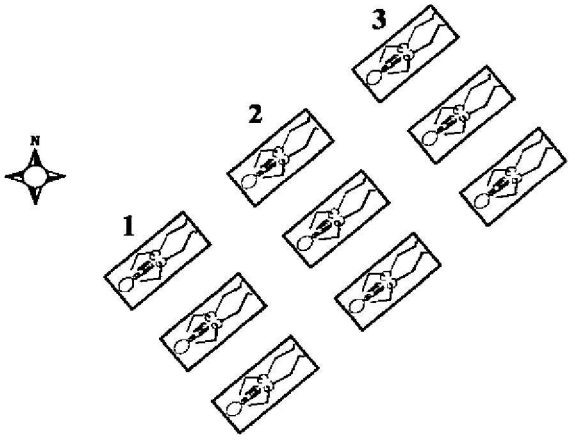
The five northeast-southwest burials in Trench 1 represent a unique pattern in this area. While the north-south oriented graves in this section of the burial ground were unique to the Tweed Courthouse study (as all other burials were east-west), the northeast-southwest burials are also considered unique as no graves identified during the Tweed Courthouse study were oriented in this fashion. Considering the placement of these graves (Burials 1-3, 5, and 6), at least four rows are represented. Burials 1 and 2 each represent one distinct row. Burials 3 and 5 appear to represent two separate but very closely-spaced rows. Burial 6 may represent a fifth row, as it overlies Burials 3 and 5 by several inches.

All four burials in Trench 2 were oriented east-west representing four rows on a north-south axis. Of these, one (Burial 9) was identified in the center of the trench and two (Burials 7 and 8) were at the trench's south edge with most of the burial extending into the south wall. Burial 10, the double burial, covered the bottom of the trench and the individual on the south extended into the trench wall.

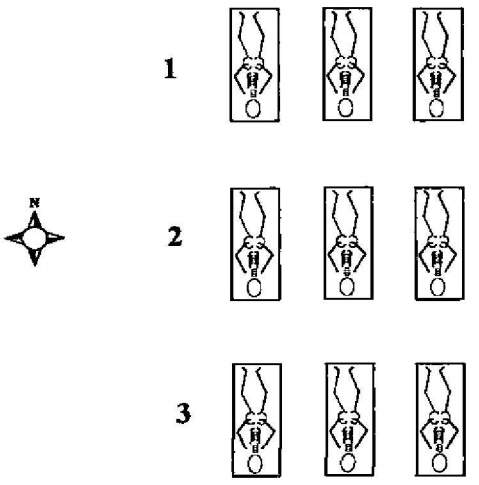
Figure 12. Possible configuration of rows of burials



A. East-west oriented graves with rows on a north-south alignment.



B. Northeast-southwest oriented graves with rows on a north-south alignment.



C. North-south oriented graves with rows on an east-west alignment.

Prior disturbance to the graves

As described above, all of the graves identified during the fieldwork were only partially intact; even those which were nearly complete (i.e., had both the head and foot of the grave) were impacted in some fashion. Most, if not all, disturbances to the graves resulted from various construction episodes from the early 19th century through the end of the 20th century. Historic documentation supports the conclusion that the area was repeatedly graded and filled during the construction of Chambers Street (1796) and its consequent renovations over two centuries. In general, the area in front of and surrounding Tweed Courthouse has been subject to extensive grading and cut and fill construction. All of the burials identified during this study, as well as the Tweed Courthouse study (HAA, Inc. 2003), were covered by Chambers Street, its associated south sidewalk, and numerous utilities. In some cases, construction trenches were the obvious cause of the disturbances, while in other cases it was difficult to distinguish specific construction trenches. Overall, the burials are very shallow in reference to the current road grade. Since the graves were most likely interred 4-6 feet (1.2-1.8 m) deep, the traditional depth for burials, their shallow depth attests to the amount of disturbance and reconstruction that has occurred throughout the area.

In addition to the partially intact burials, hundreds of secondarily deposited human remains were identified throughout the length of the two trenches. Unfortunately, it will never be known whether these remains originated from the burials documented during this and other archeological fieldwork in this area or from other disturbed graves for which no evidence remains. Most likely the remains represent a combination of both; however, it should not be assumed that the fragmentary remains found overlying or adjacent to partially intact graves are necessarily associated with those graves. Over a period of two hundred years, several dozen construction events have disturbed the burials, and it is likely that separate construction episodes destroyed and consequently relocated different parts of the same grave as the area was backfilled. Overall, the presence of hundreds of fragmentary human remains scattered throughout the area attests to the high level of disturbance of the historic burial ground(s) located in this area.

Based on this and other documentary and archeological studies of the area (Hildebrant 1994; Hunter 1994; Stone 1997; KSK 2000; HAA, Inc. 2003; London 2004), it is clear that Chambers Street and its underlying soils were affected by numerous construction activities beginning in the 17th century and continuing through the 20th century. Disturbance of the historic burial grounds dates back to the construction of Chambers Street itself (c. 1796), as well as the Upper and Second Military Barracks (1757-1790 and c. 1774) and the Second Almshouse (1797-1857). The disturbances continued during the construction of Tweed Courthouse between 1861-1881, the installation and replacement of numerous utilities in the street from the 19th through 20th century (including the current project), and the restoration of Tweed Courthouse in 2000-2001.

Results of fragmentary human remains analysis

The focus of the human remains analysis was to gather information pertaining to the general biological characteristics of individuals buried in the area of the historic commons, where possible depending on preservation and the extent of excavation required to determine whether burials were at least partially intact. Osteological (skeletal) data provide useful information regarding personal identification and are used to distinguish many of the life circumstances experienced by an individual prior to and at the time of death. Skeletal data from a community of individuals can be used as a tool for illuminating otherwise unknown aspects of a group's cultural and physical environment. The biological characteristics of pre-20th century populations normally are not known in particular, but the biological and cultural diversity of communities from different historic periods and different segments of the population can be probed in some detail through the study of human skeletal remains.

The quantity and types of demographic and pathological information extractable from human remains is limited, and thus skeletal analysis reveals only a sample of information regarding the population characteristics of a study sample. However, coupled with historical information and comparative data, skeletal data contributes to the formation of a comprehensive view of a past population's physical and cultural environment.

Normally, the study of human burials includes an analysis of distinct individuals exhumed from specific burial locations. However, as reiterated throughout this report, the sample of human remains collected from the project is composed primarily of fragmentary, disarticulated remains that were removed from their original graves and redeposited across the site area. Since most of the remains could not be reassociated to form individuals, it was only possible to perform basic analyses of the general patterns and trends represented by these individuals' remains. However, the data collected during this project can be added to that from the Tweed Courthouse project (HAA, Inc. 2003); combined, the two projects contribute new information to the literature on the history of early residents of New York City. The following sections describe the data obtained from the analysis of this sample of commingled human remains.

Summary of fragmentary human remains

In all, 1,879 fragments of human remains were collected from the Con Edison Chambers Street project area during the 2002 fieldwork. Each fragment of bone in the collection was counted as a single piece unless several fragments were mended to form one bone. Table 2 summarizes the complete sample of human remains classified by element. All pieces of human bone were included in the count regardless of whether they were very small fragments or nearly complete bones.

Of the 1,879 remains, 45.6% (N=857) were classified as "unidentifiable" because they were too small to identify as originating from a particular bone. Very small fragments or splinters of miscellaneous bones and small long bone fragments, which could not be associated with a specific long bone, compose most of this category.

Of the identifiable remains (N=1,022), the greatest number of fragments originated from the cranium (N=352) and rib (N=153), together representing 49% of the collection. The third largest category was the femur (N=106); however, 28 of these fragments were from one individual bone and another 21 were from a second bone.

Of the 352 cranial bones a little more than half (51.4%) were assigned to the unidentifiable category. These were all small fragments of the cranial vault or other fragments that could not be identified by subelement. Most of the identifiable remains were from the cranial vault (frontal, parietal, and occipital bones), and the mandible. Dental remains included 26 teeth consisting of 15 maxillary teeth, 5 mandibular teeth, and 6 fragments classified as unidentifiable.

Other than remains that are not typically found or identified in commingled contexts, i.e., the hyoid bone, the lacrimal bone, ossified tissue, etc., the least frequent remains in the collection (N<25 each) were the humerus, radius, clavicle, sternum, sacrum, patella, and fibula. Together these represent only 3.7% of the identifiable remains.

Age and sex determinations

While age and sex were assigned to fragmentary remains where these determinations were possible, constructing a demographic profile of the human remains identified during this fieldwork is not possible because of the inability to reconstruct individuals. The extensive commingling and fracturing of the remains limits demographic reconstruction of the collection, as single bones and bone fragments cannot be rematched to form individual skeletons. It is necessary to have a larger percentage of the skeleton in order to accurately assign age, sex, and ancestry. Despite the limitations, a number of remains in the collection including partial os coxae and crania were complete enough to make determinations of age and/or sex. In addition, there were a few remains of children that could be assigned to general age categories. This information is summarized in Appendix 8.

In general, ages within the sample range from infant through "older adult." The numbers summarized here represent only those remains that were complete enough to categorize as definitely adult or definitely subadult. Of the remains collected, 39 bones or bone fragments were those of children (younger than 15 years old). The remains included 8 cranial fragments representing one individual; one isolated cranial fragment; 3 hand bones from a single context (most likely representing one individual); 11 rib fragments from one context and 4 from another; 11 femur fragments from a single context; and one humerus fragment. The remains represent at least three individuals, one infant, a 10-15 year old, and one child of unknown age.

Diagnostic adult remains that were not too fragmentary and that retained the diagnostic features necessary for determination of sex, i.e., cranial remains, os coxae (pelvic bones), and long bones, were assigned to one of five categories: Male (M); Female (F); Indeterminate (I); or possible Male or possible Female (M?; F?). The features used to classify the diagnostic remains are included

Table 2. Summary of fragmentary human remains by class and element

Class	Total Count	Element	Count
CRANIUM	352	Frontal	5
		Parietal	55
		Temporal (including inner ear bones)	5
		Occipital	8
		Maxilla	4
		Palatine	0
		Zygomatic	6
		Nasal	0
		Lacrimal	0
		Sphenoid	1
		Ethmoid	0
		Mandible	25
		Other (fused bone fragments)	62
		Unidentifiable cranial fragments	181
DENTITION	26	Maxillary	15
		Mandibular	5
		Unidentifiable teeth	6
HYOID			1
VERTEBRAE	64	C1	2
		C2	1
		C3	1
		C4	1
		C5	1
		C6	1
		C7	0
		Unidentifiable cervical	4

Class	Total Count	Element	Count
VERTEBRA (con't)		T1	0
		T2	0
		T3	0
		T4	0
		T5	0
		T6	0
		T7	0
		T8	0
		T9	0
		T10	0
		T11	0
		T12	0
		Unidentifiable thoracic	3
		L1	0
		L2	0
		L3	0
		L4	0
		L5	0
		Unidentifiable lumbar	5
		Unidentifiable vertebral fragments	45
CLAVICLE			8
SCAPULA			32
STERNUM			0
RIBS	153	1st	8
		2nd	1
		3rd	0
		4th	0

Class	Total Count	Element	Count
RIBS (con't)		5th	0
		6th	0
		7th	0
		8th	0
		9th	0
		10th	0
		11th	0
		12th	0
		Unidentifiable rib fragments	144
HUMERUS			6
RADIUS			13
ULNA			32
HAND	52	Carpals	9
		Metacarpals	13
		Proximal phalanges	20
		Intermediate phalanges	4
		Distal phalanges	6
		Unidentifiable hand bone fragments	0
OS COXA			37
SACRUM			2
COCCYX			0
FEMUR			106
PATELLA			1
TIBIA			32
FIBULA			9

Class	Total Count	Element	Count
FOOT	85	Tarsals	32
		Metatarsals	20
		Proximal phalanges	16
		Intermediate phalanges	7
		Distal phalanges	3
		Unidentifiable foot bone fragments	7
OSSIFIED TISSUE			0
UNIDENTIFIABLE FRAGMENTS			857
TOTAL			1,879

in Appendix 8. Ten remains were classified as male and 6 as probable male; three were classified as female and 5 as probable female; and 32 remains were considered indeterminate.

Due to the amount of commingling and fragmentation of the remains, estimating the numbers of males and females represented and the numbers of individuals from each age category is difficult. In addition, several of the remains included in the following counts may unknowingly belong to the same individual. However, of the above numbers of adult remains, 10 were considered "young adult." This category included remains of a 15-18 year old, a 19-24 year old female, and also the remains of two males, one probable male, and one probable female. One probable male was aged as "older adult;" one probable female was aged at 30-35 years; and the remainder were simply classified as "adult." The remains collected from Burial 2 were determined to be those of a young adult male; those from Burial 7, an adult male. These two burials are included in the above counts.

Minimum Number of Individuals (MNI) estimate

The total MNI for a collection of human remains is typically a tally of the most frequent element occurring in the collection. Since there are too few diagnostic remains and too many incomplete bones in the collection, this method was not feasible. Instead, the MNI for the collection is based on remains that could be aged and/or sexed with certainty. Of the remains, six can be assigned to specific age categories: an infant; one child of unknown age; a 10-15 and 15-18 year old; a 19-24 year old female; and a 30-35 year old probable female. In addition, there are remains for one older adult (probable male). Again, while there are hundreds of remains of other adult males and females, many of the remains could originate from a single individual. Counting each bone would inflate the true number of individuals represented by the collection of remains. Considering this

information, one adult male and one adult female can be added to the MNI. The MNI for the collection is therefore nine.

Ancestry considerations

Similar to the age and sex analysis of the remains, determinations of ancestry are also difficult based on fragmentary remains and incompletely excavated burials. In order to make accurate judgements of ancestral affiliation, it is necessary to have complete or nearly complete bones and also preferable to have more than a single bone of an individual. Due to the extensive commingling and the fragmentary nature of the remains, assigning the remains in this collection to specific ancestral categories is not possible. In addition, the partially intact individuals could not accurately be assessed for possible ancestral characteristics since they were not completely excavated.

Stature

Due to the fragmentary nature of the remains collected, there was not enough data available to estimate average height among the individuals represented by these remains. Few complete long bones were present in the collection and most were classified simply as "adult."

Taphonomic analysis

As defined by Haglund and Sorg (1997:13), taphonomy is "the study of postmortem processes which affect (1) the preservation, observation, or recovery of dead organisms, (2) the reconstruction of their biology or ecology, or (3) the reconstruction of the circumstances of their death." As used in the context of this research, taphonomy is the study of the various processes affecting the condition and preservation of human remains between the time of death and the time of their discovery in the field.

Table 3 summarizes the frequency of the four main taphonomic processes affecting the remains: fracturing, discoloration, exfoliation, and erosion. In addition to this list, one bone fragment exhibited evidence of rodent gnawing. Of the four processes, fracturing due to disturbance of the burials following their original interment had the greatest impact on the remains. Twenty-five percent of the remains (N=474) exhibited evidence of postdepositional fracturing. Fractures classified as originating from earlier disturbances were those in which the point of fracture had the same coloration as the surrounding bone suggesting long-term burial. Fractures resulting from more recent disturbances including damage to the remains upon excavation, as well as damage incurred during removal or storage of the remains, are characterized by a whiter appearance at the point of fracture. Most of the recent fracturing resulted from excavation of the trenches in Chambers Street by construction workers.

The second most frequent postdepositional influence on the remains (2.9%) was discoloration, primarily a dark staining resulting from the surrounding soil matrix. A small sample of the remains exhibited black spotting from some type of foreign substance in the soil, possibly oil or tar.

Table 3. Frequency of various taphonomic agents affecting the fragmentary remains

Taphonomic observations		Frequency
Fracture	Historic	2.0%
	Recent	11.9%
	Both	6.0%
Discoloration	Dark stains	0.4%
	Black spots	1.7%
	Ashy, white	0.16%
Exfoliation		0.64%
Erosion		0.8%

Two bone fragments (one unidentifiable cranial fragment and an adult distal radius) exhibited the green-colored staining characteristic of decomposing copper or brass materials once in contact with the remains. In addition, Burial 3 — the infant burial — exhibited green staining on the pelvic bone. The presence of this attribute suggests that several individuals in this cemetery were buried with copper or brass jewelry, buttons, cuff links, or shroud pins.

Paleopathological analysis

Paleopathological analysis refers to the study of diseases that affect the human skeleton and preserved soft tissue. Human bones record many of the life events experienced by an individual, particularly disease and traumatic injury. Not all skeletal pathologies are traceable to a specific disease and not all diseases leave their mark in skeletal remains; however, based on the data stored in the remains, much can be said of the general health and disease conditions experienced on both the individual and population levels.

Similar to the above analysis, observations of bone pathology could be made only on individual elements and these data are merely a reflection of some of the very general health and disease characteristics of the sample of individuals buried in this area. While some of the remains in the sample may match up to a single individual or several individuals, there is no adequate method for identifying actual frequencies of pathology within the larger cemetery population. Therefore, the analysis of pathology in the sample includes only counts of remains exhibiting the various conditions, and interpretations of these general patterns.

Few pathologies (N=11) were observed in the remains collected during this study. All of the remains with pathologies are adult bones; none of the few fragmentary remains of children exhibited signs of pathology. Table 4 lists all identified pathologies by element and frequency. Typically, pathological skeletal conditions can be divided into at least seven main categories following the classification system used in Aufderheide and Rodriguez-Martin (1998). These categories are as follows:

- infectious disease;
- hematological disorders;
- metabolic disorders;
- joint disorders;
- fractures;
- dental diseases; and
- miscellaneous disorders.

Of the above, the remains collected during the Con Ed monitoring project exhibited evidence of four: hematological disorders; joint disorders; dental diseases; and miscellaneous disorders.

Table 4. Summary of fragmentary remains exhibiting pathology.

Disease category	Pathology	Element	Count	Total
Hematological Disorders	**Cribra orbitalia**	Frontal	1	1
Joint Disorders	**Osteoarthritis**	Metacarpal	1	4
		Proximal hand phalange	2	
		Distal foot phalange	1	
Miscellaneous Disorders	**Entheseopathy**	Humerus	1	2
		Radius	1	
		TOTAL		7

Hematological disorders

Hematological diseases are disorders of the blood, such as anemia. Two conditions reflecting anemia in human skeletal remains that are common in archeological samples are porotic hyperostosis and cribra orbitalia. Both conditions cause porosity in the bones of the cranium with the former affecting the cranial vault (frontal, parietal, and occipital bones) and the latter affecting only the orbits. Anemia is defined as a "reduction in concentration of haemoglobin and/or red blood cells below normal" (Roberts and Manchester 1995:166). Since red blood cells are formed in bone marrow, a long-term deficiency in the production of these cells ultimately affects bone structure. One bone fragment in the collection of remains from the Con Ed project (an orbital fragment) exhibited evidence of cribra orbitalia. For comparative purposes, six cases of the condition were noted in the collection of remains from the Tweed Courthouse study (HAA, Inc. 2003:145). While observed in adult remains, it is likely that the condition resulted from childhood iron deficiency, as the cranial bone changes associated with anemia seem to develop only during the childhood years (Stuart-Macadam 1985; Aufderheide and Rodriguez-Martin 1998:350).

Anemia may be caused by an iron-deficient diet, excessive blood loss resulting from an injury, chronic disease, such as cancer, and parasitic infection of the gut (Roberts and Manchester 1995:166). Most studies of past human populations have focused on the role of iron deficiency and parasitic infections in the anemic responses observed in human skeletal remains. Both poor nutrition and chronic infection leading to poor diet may lead to iron deficiency, especially during the childhood years. Parasitological studies of historic archeological sites (i.e., Reinhard 2000a, b), as well as the record of historic diseases, indicate that the parasite load was typically very high in historic urban populations. This could be expected considering the unsanitary living conditions described in the historic literature for the 17th through 18th centuries.

The presence of anemic conditions in the remains of several individuals buried in this area is reflective of the overall historical environment characterized by high disease rates, unsanitary living conditions, and dietary constraints. Since these conditions likely developed during childhood, their presence also suggests that while children were exposed to a rather harsh environment at times, they were able to survive these stresses. Unfortunately, it is not known whether the individuals exhibiting the disease were born and raised in early New York or whether they were immigrants to the area; therefore, it is unknown whether the environmental stresses they faced during childhood were experienced in this area or elsewhere.

Joint disorders

Of the range of degenerative diseases affecting human populations, degeneration of bone and joints are the only clues of advanced age recognizable in human skeletal remains (Roberts and Manchester 1995:99). As summarized by Roberts and Manchester (1995:101-103):

> Skeletal involvement in the joint diseases potentially consists of two processes: formation and destruction of bone. Formation of bone is in the form of bony outgrowths from joint surfaces called osteophytes; these

> represent the body's attempt to spread the load at the joint and compensate for the stress to which the joint is being subject... Once cartilage is destroyed and the individual continues to use the joint, the underlying bone can become very hard (sclerosis) and polished (eburnation)... If osteophyte formation is extensive a joint may become fused.

The most common joint disease is osteoarthritis, a noninflammatory disease affecting the synovial joints (Roberts and Manchester 1995:105). Osteoarthritis is a chronic, progressive condition that is both activity- and age-related. Osteoarthritis is primarily mechanical in origin but is also part of the normal aging process. The disease tends to have the greatest effect on load-bearing joints, such as the spine, hip, and knees. Osteoarthritis is observable in human remains by the typical signs of bone degeneration: osteophyte development, eburnation, and Schmorl's nodes—depressions in the vertebral bodies caused by degeneration of the interverterbral discs. Arthritis can take on several forms, including the following:

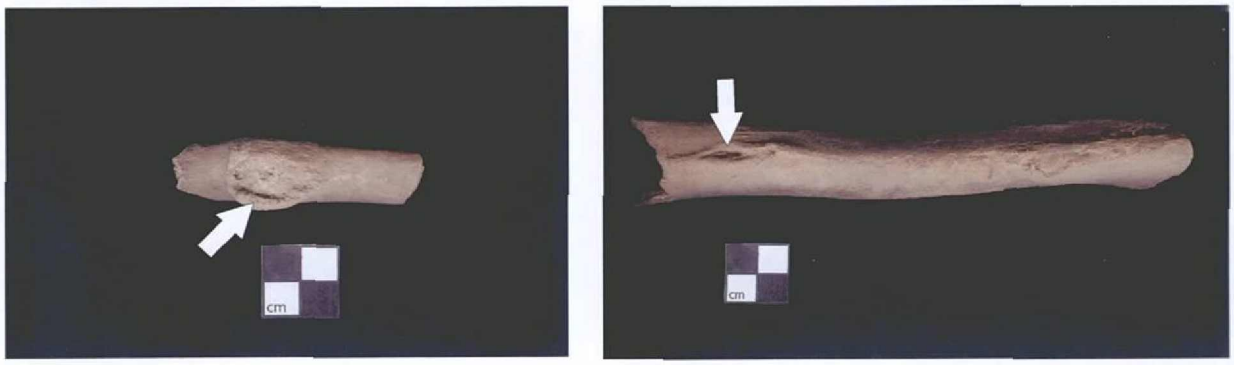
- osteoarthritis (definition above);
- septic arthrtitis (inflammatory arthritis caused by nonspecific infection);
- rheumatoid arthritis (chronic inflammatory disease of connective tissue);
- psoriatic arthritis (associated with the skin disease psoriasis);
- ankylosing spondylitis (progressive autoimmune inflammatory joint disease;
- diffuse idiopathic skeletal hyperostosis (DISH) which causes gradual and complete fusion of the spine; and
- gouty arthritis (gout) causing inflammation of and erosion of cartilage and bone (Roberts and Manchester 1995:113-123).

Of the above disorders, five fragmentary remains collected during the Con Ed study exhibited osteoarthritis. The Tweed Courthouse sample included over 72 individual examples of this condition. With the exception of one possible case of gout in the Tweed collection, no examples of the other disorders listed above were noted in the two collections. Table 4 includes the remains from the Con Ed project identified with joint disorders. Three cases of osteoarthritis were observed on hand bones (two of which were likely from the same individual), and one case was observed on a foot bone.

Little can be said about the few commingled remains in this collection exhibiting joint disorders. However, when combined with the Tweed Courthouse data, it is clear that joint disorders were common to those inhabiting the historic commons area. A large proportion of osteoarthritic conditions are shown to be occupation-related, affecting those joints exposed to repeated use and stress (i.e., from heavy manual labor and other repetitive activities). The incidence of joint disease among those buried in this area is consistent with a population of individuals who likely led a strenuous life and who with age suffered from the typical skeletal maladies of middle to older adulthood.

Miscellaneous disorders

One pathology noted in the collection that is typically classified within a "miscellaneous"category is entheseopathy. The condition is the formation of new bone at the insertion points of tendons and ligaments, usually resulting from an increase in size of the associated muscles (Roberts and Manchester 1995:110). Two entheseophytes were observed in the collection of commingled remains from the Con Ed project. One was observed on a radius at the radial tuberosity (Photo 16), and the second on a humerus at the bicipital groove (Photo 17). In addition, a second humerus observed in the field (Burial 8) also exhibited the condition at the site of the deltoid insertion. Two cases of entheseopathies observed in the Tweed Courthouse collection should be noted as well. One was observed on a humerus just below the site of the deltoid insertion, and a second at the site of the patellar ligament of a femur. Development of these entheseophytes is most likely related to occupational stress, such as that described above.



Photos 16 and 17. Two cases of entheseopathies found among the Con Ed human remains collection. Left (Photo 16): on the radial tuberosity of a left radius. Right (Photo 17): on the bicipital groove of a right humerus.

Dental diseases

Along with joint diseases, dental diseases are the most commonly observed pathologies in human skeletal remains. Dental remains "provide evidence of diet, physiological adequacy of diet, method of procuring diet, and oral hygiene" (Roberts and Manchester 1995:44). The main diseases recorded in dental remains include: caries (cavities), abscesses, attrition (occlusal wear), calculus (plaque), periodontal disease, and linear enamel hypoplasias (LEH).

Of the 26 teeth collected during this study, there was one example of LEH, six occurrences of dental calculus, and two caries. In addition, three teeth exhibited relatively no attrition; 16 had mild attrition; and 10 had moderate attrition. One tooth showed evidence of enamel wear resulting from pipe smoking.

While only two teeth from the Con Ed collection had caries, this condition was common among the Tweed Courthouse dental collection with a total of 13.1% (N=36) with one or more caries (HAA, Inc. 2003:155). Development of cavities is considered an infectious disease caused by "fermentation of food sugars, especially sucrose, in the diet by bacteria that occur on the teeth" (Roberts and Manchester 1995:46). The two teeth from the Con Ed collection with caries were molars. In the Tweed collection, caries were especially prevalent in molars with 77% of all molars exhibiting one or more carious lesions (HAA, Inc. 2003:155). Given the morphology of the molar with its deep crevices, higher frequencies of cavities are common within this tooth category.

Dental calculus is essentially mineralized dental plaque (Aufderheide and Rodriguez-Martin 1998:401). Calculus develops most frequently on teeth nearest the salivary glands — the tongue side of the lower incisors and cheek side of the upper molars (Roberts and Manchester 1995:55). Six teeth from the Con Ed collection and 79 (28.5%) of the Tweed teeth exhibited dental calculus (HAA, Inc. 2003:157). This condition was especially common in the second mandibular premolar (13.2%), the central mandibular incisor (10.5%), and the second maxillary premolar (9.2%). Dental plaque was common in this historic period before dental care was popular and was especially frequent in individuals with few resources.

One tooth in the Con Ed collection was found to have linear enamel hypoplasia, while 18 were found in the Tweed collection (HAA, Inc. 2003:157). Lineal enamel hypoplasia (LEH) involves the structure of the tooth enamel in which horizontal lines on the teeth represent episodes of stress induced by metabolic insults (Aufderheide and Rodriguez-Martin 1998:405). The defect only develops during the growth and development period, and appears as lines, pits, or grooves in the tooth enamel. The condition is usually associated with nutritional deficiency or childhood illness (Roberts and Manchester 1995:58).

Also frequent among the teeth in both collections was dental attrition or tooth wear. By definition, attrition "is a physiological process, the wearing away of tooth hard tissue as a result of tooth-to-tooth contact during mastication and swallowing" (Aufderheide and Rodriguez-Martin

1998:398). Tooth wear occurs primarily on the occlusal (top) surfaces of the tooth, but also on the incisal and proximal surfaces.

Dental attrition is difficult to evaluate in fragmentary remains, as scoring based on seriation is the best method for quantifying and understanding patterns of tooth wear. However, in order to gather at least some data on this condition, attrition of the Con Ed dental remains was scored as either nonexistent, mild, moderate, or severe. Of the teeth that were scorable for attrition (N=26), only 3 teeth exhibited no macroscopic signs of attrition. Of the 23 teeth with signs of attrition, 60.9% exhibited mild cases of the condition and the rest exhibited moderate attrition. No teeth were considered to have severe cases of attrition. In the Tweed collection, 61.4% had mild attrition, which is comparable to the Con Ed dental remains, while 22.5% had moderate and 12.3% had severe cases (HAA, Inc. 2003:157). In both collections, most of the attrition was observed on mandibular teeth.

The information extracted from the fragmentary dental remains of the Con Ed and Tweed Courthouse samples combined suggests that the dental health of the individuals represented by these fragmentary remains was an artifact of lifestyle, one lacking in oral hygiene and dental care. Dental wear, calculus buildup, and cavity prevalence all increase with age, but are also related to dietary habits and hygiene. Gritty diets, such as those including coarsely processed grains tend to increase wear, and cavity formation, and dental plaque is intensified by a diet high in carbohydrates. All of these conditions are precursors to developing periodontal disease, a disease of the soft tissues of the mouth, which may ultimately affect the bone as well. These factors all predispose an individual to abscessing and tooth loss. While assessing the occurrence of periodontal disease itself is not possible without intact dental remains, based on the condition of teeth in this sample, it is likely that a number of individuals suffered from the disease.

Conclusions regarding disease patterns exhibited in the sample

Despite the limitations imposed on this study both by the gathering of only fragmentary, commingled human remains and by the small sample of pathological remains present, the paleopathological information collected does offer some information about those buried in the commons cemetery area, especially when combined with the data obtained during the Tweed Courthouse study (HAA, Inc. 2003). While specific causes of death cannot be determined with certainty based on the human remains, the information collected during the two studies provides insight into the general health and lifestyle of the individuals buried in the historic commons area. The overall health of a number of individuals interred in this cemetery was poor, as a sample of the skeletal remains included pathologies that reflect chronic health problems, such as arthritis, dental disease, anemia, and osteoporosis. In addition, several individuals suffered from nonspecific infections that may have been acute or chronic conditions (HAA, Inc. 2003:158).

While certain diseases such as yellow fever, small pox, measles, and the like, do not leave evidence in the human skeleton, there were a number of outbreaks of these diseases throughout the time period spanning the use of the commons area and cemetery. Several years of fevers beginning in 1743 aroused concern about the unsanitary condition of the city (Koeppel 2000:23). The

observation was made that "the part of the town chiefly afflicted with the epidemical distemper these two last summers, is built upon a swamp, or most slimy ground" (Koeppel 2000:24). The high moisture content of the ground was observed in cellars, which were rarely drained (Koeppel 2000:24). Much of the infectious and intestinal disease likely originated in the city's water supply, which during the mid-18th century was from a "Tea Water" pump dug near the Fresh Water Pond just north of the commons area. Tea water was claimed to be an improvement on that obtained from public wells (Koeppel 2000:28). By 1774, every household in the city (about 3,000 total) was taking water from that source, and there was no concern at that time that the pump was just downstream from the pond's associated industries including the tanyards and slaughterhouses (Koeppel 2000:35-36). The city was notorious for its bad water and was described as having "one great inconvenience which is the want of fresh water" (Koeppel 2000:27). The water was described by travelers from other cities as hard and brackish (Koeppel 2000:27).

Considering this context, the poor health reflected in a sample of fragmentary human remains from this area is most likely reflective of the unfortunate environmental conditions of the time: unsanitary living conditions, a diet lacking in variety—which was exacerbated during the Revolutionary War—high risk of infectious disease, and deficient medical care. These conditions directly influenced rates of disease and mortality throughout 18th- and 19th-century New York. As noted by Higgs (1977:194), during the 19th century, communities allocated too few resources for maintaining their health, and this was intensified by increasing pestilence throughout the period. Maintaining good health would have been especially difficult for those in crowded, contaminated, institutionalized settings where resources were minimal.

Summary of the burial ground and associated human remains

The study of historic burials and fragmentary human remains identified during this project was limited by several factors including extensive soil disturbance, commingling of the remains, and the policy to leave intact burials in the ground. However, when combined with the results of the Tweed Courthouse study (HAA, Inc. 2003), much can be said about the organization of the burial grounds, historic and modern attitudes toward burials and human remains, the origin of soil disturbances across the site, and the potential for locating additional burials in this area.

Site stratigraphy as related to intact burials and fragmentary human remains

The archeological investigation carried out in association with the Con Ed utility replacement in the eastbound lane of Chambers Street confirmed that this area is scattered with partially intact historic burials and secondarily deposited fragmentary human remains. This study confirmed the conclusions of the Tweed Courthouse archeological study that the area is characterized by an absence of natural soil profiles resulting from extensive disturbance from numerous construction episodes (HAA, Inc. 2003:159). All areas within the two projects consisted of historic and/or modern fill in the first two strata—up to 2-3 feet (0.6-0.9 m) in depth on the courthouse grounds and below the sidewalks and up to 6 feet (1.8 m) deep in Chambers Street (HAA, Inc. 2003:158). Only small and occasional pockets of sealed historic deposits containing intact human remains are left beneath the

fill and between the many construction trenches. The remainder of soils at this level consisted of silty sand and sand containing modern and historic refuse.

The most recent disturbances (from about the last 15-20 years) consisted of a clean yellow sand fill with no or very few cultural materials. Older disturbances contained historic and/or relatively modern fill with cultural materials and fragmentary human remains. There was no particular pattern to the depth of the remains, as they were identified from immediately below the concrete street bed (18-20 in/45-50.8 cm) to three feet (.91 m) in depth in the Con Ed project area. Within the Tweed Courthouse study area, the remains were found up to 2-3 feet (0.6-0.9 m) in depth on the courthouse grounds and sidewalk areas and up to 6 feet (1.8 m) deep in Chambers Street (HAA, Inc. 2003:175). The remains were identified on the surface of soils immediately beneath the street bed, on the surface of the courthouse grounds, above and below utilities, above and below historic features, and overlying partially intact burials.

As discussed in the Tweed Courthouse report (HAA, Inc. 2003:175), considering the amount of disturbance to this area it is surprising that any burials remain intact. The location of the burials is random, and there is no dependable method for predicting where they may be located. They are only identifiable through inspection of the soils as excavation proceeds. Identifying where there definitely are *not* burials is somewhat easier, as recent construction trenches including those excavated during this and the Tweed project contain clean sand fill. There is some consistency in the areas in which burials are typically found, however, as described in the Tweed study (HAA, Inc. 2003:176):

> intact burials are typically found in 7.5YR dark brown coarse sand or silty sand often containing a very light scatter of cultural materials, especially oyster and clam shell, historic ceramics, and glass. Often there is a compact almost clayey/silty mottled sand with these cultural materials immediately overlying the feature. In cases where disturbance and fill deposits have not reached the human remains, there is evidence of a grave shaft and/or a coffin outline of decomposed wood often including coffin nails.

An important factor also observed during both studies is that if fill deposits directly overlie the human remains, it is impossible to predict their presence even when coffin hardware or disturbed human remains are found in the fill. In these cases, construction has erased all evidence of the graveshaft and coffin making it impossible to predict whether human remains are about to be found.

Organization of the burials and their relationship to the Tweed and City Hall Park burials

The investigation of burials within the limits of the two Con Ed construction trenches located in the eastbound lane of Chambers Street between Broadway and Elk revealed new data that contribute to understanding the organization of the historic cemetery or cemeteries that once covered a much larger space within the historic commons area. As summarized above, the ten partial burials identified along the length of Chambers Street during this project represent at least nine separate rows of burials, which are oriented in three different fashions. One was buried north-south; four east-west;

and five northeast-southwest. Nine of the ten burials were single interments, while one (Burial 10) was a double interment. Two burials were infants, and eight were adults.

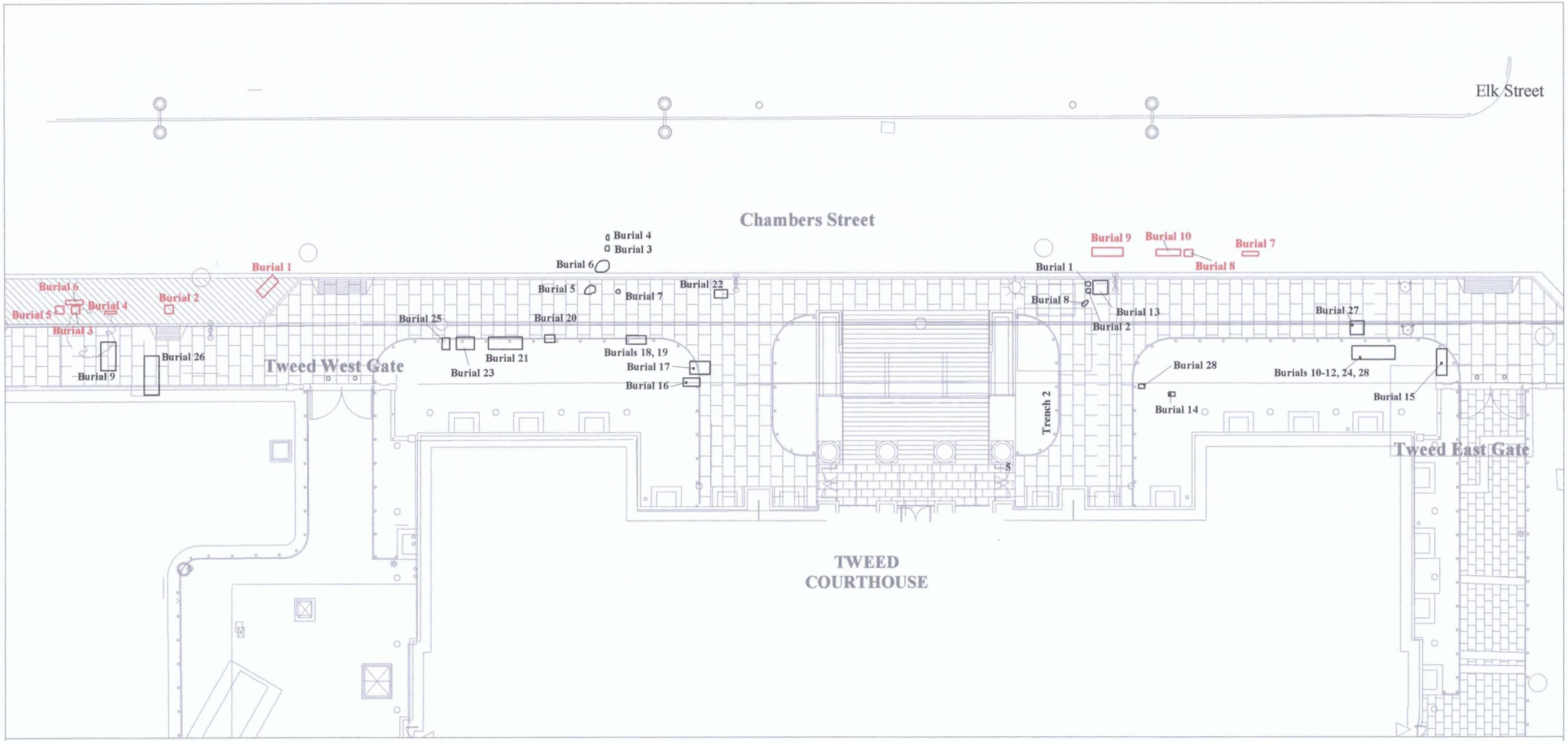
The north-south oriented burial (Burial 4) was identified in the south wall of Trench 1, west of Tweed Courthouse's west gate. This burial is located at what would have been the foot (north) of Tweed Burial 9, a north-south grave identified beneath the current sidewalk (Map 11). About 6 feet (1.8 m) southeast of these two burials is Tweed Burial 26, another north-south oriented grave. Burial 4 is an adult of indeterminable sex; Tweed Burial 9 was an adult female, and Burial 26, an adult male. The three graves are obviously part of the same cemetery or cemetery area, as they are close together and were buried in the same fashion. They are located in a discrete area at a distance of 30 to 40 feet (9.14-12.19 m) west of the courthouse gate. Together they represent three separate rows aligned on an east-west axis.

The City Hall Park study also identified three graves oriented north-south with the heads to the south (London 2004). One of the three (PES Feature 45) is equivalent to Tweed Burial 26. The other two were found in the same area, thus totaling five north-south oriented burials now identified in this area. Together, it appears that the burials would have made up three separate rows. Three graves are in a southern row aligned with Tweed Burial 26; Tweed Burial 9 represents a separate row to the north; and Con Ed Burial 4, a third row north of this one.

Five northeast-southwest burials (Burials 1, 2, 3, 5, and 6), representing four rows were identified beneath the street in Con Ed Trench 1. Burials 3, 5, and 6 were in a cluster just west of Burial 4 (Map 11). It appears from their alignment that Burials 3 and 6 would have been adjacent to each other in the same row. Burial 3 was a young infant and Burial 6, an adult male. Burial 5, a 6-12 month old infant, would have been buried one row southwest of the other two graves. Burial 3, the easternmost burial of the three, is located approximately 4 feet (1.22 m) west of Burial 4. Burials 5 and 6 are each just a few feet west (Burial 5) and northwest (Burial 6) of Burial 3.

Burial 2, a young adult male, was identified 10 feet (3.05 m) east of Burial 4. Burial 1, an adult of indeterminable age and sex, was identified 50 feet (15.24 m) east of Burial 2 just west of the courthouse's west gate along the part of the street curb that is oriented northeast-southwest (Map 11). Each of these two isolated graves represents another row of northeast-southwest burials. No other burials were identified in this area during the Tweed study. The large distance between these burials of similar orientation where Burial 1 is over 50 feet (15 m) east of the others suggests that numerous rows of northeast-southwest burials may have been located in this area.

The four remaining burials identified during this study were also found in a relatively discrete area. All four burials were oriented east-west and were found between the east side of the Tweed staircase to approximately 40 feet (12.19 m) west of its east gate. Each burial represents a separate row. The closest burial to the Tweed burials in this area was Con Ed Burial 9 (Map 11). This adult burial was just several feet north of Tweed Burials 1, 2, 8, and 13, all of which were also oriented east-west. Nine other east-west burials were found in this area beneath the sidewalk and the grassy area adjacent to the courthouse's front elevation.



Map 11. Location of Con Ed and Tweed Courthouse Burials Identified by HAA, Inc., Chambers Street

Con Ed Burials

Tweed Courthouse Burials

40 0 40 80 120 160 Feet

N

HARTGEN
ARCHEOLOGICAL ASSOCIATES, INC.

Base Map Provided by John G. Waite Associates, NYC

Con Ed Burials 7, 8, 9, and 10 were all adult burials with Burial 10 containing two adults buried side-by-side. Of the Tweed burials in this area, six were single interments (five adults, one child) and three were multiple interments containing two, three, and at least five individuals (Burials 12, 27, and 15, respectively). In all three cases, individuals within the same grave were interred simultaneously and were superimposed in various ways with heads both to the east and west. The multiple graves were located in close proximity to one another just west of the Tweed east gate, although none were buried in what would be considered the same row. The double burial identified during this project is located approximately 100 feet (30.5 m) northwest of these.

The City Hall Park study conducted by Parsons Engineering Science, Inc. (PES) in 1999 also found multiple and superimposed graves in this general area. As described by London (2004:3), "in some cases of in situ burials, exposure of one burial resulted in the exposure of one or more additional burials beneath the skeleton nearest the surface. These earlier burials were sometimes in the same orientation as the later ones, and sometimes in completely different orientations." These burials were identified south of the Tweed multiple burials in the northeast quadrant of City Hall Park.

The Con Ed and Tweed projects together documented a total of 23 separate rows of burials: 9 from the Con Ed study and 14 from Tweed. None of the burials from the two projects occur within a similar row. Of the 14 rows documented during the Tweed study, two were north-south burials and 12 were east-west. In all, there were 16 rows of east-west burials, four rows of northeast-southwest burials, and three rows of north-south burials, each found in distinct areas of Chambers Street. The data from these two projects as well as that gleaned from the City Hall Park study indicate a relatively large amount of variation in interment techniques used throughout this cemetery area.

Burial variation within historic cemeteries

In order to decipher the underlying organization and the origin of the burials identified during the Con Ed study, as well as those documented during other recent studies (HAA, Inc. 2003; London 2004), the site is placed within a larger historical framework. This framework necessarily includes a review of both patterns and variations in the internal organization of cemetery sites throughout the historic period, as well as a review of historic documentation associated with the site area itself. This review serves to identify whether the burial grounds identified during this study exhibit patterns that are similar to other historic cemetery sites. The following summary is modified from that compiled for the Tweed Courthouse report (HAA, Inc. 2003:161-163), also written by this author.

The archeological literature on historic cemeteries indicates a trend throughout the historic period that recognized diversity in interment methods under certain conditions and in certain types of cemeteries. While diversity in burial form may potentially occur within any cemetery, it is most commonly reported in nonsectarian burial grounds connected to county and municipal institutions and those associated with groups historically considered marginal in society. Nontraditional burial methods are also reported at times of unusually high mortality, such as during epidemics and in times of warfare when time and available burial space are limited.

Research of the burial grounds in the historic commons area indicates that at least a large section of the cemetery consisted of single interments organized in east-west rows. Cemeteries arranged in this fashion are typical of most historic European traditions. As summarized by Pearson (1999:6), however, some traditions varied from this pattern:

> In the medieval and early modern periods, Jewish burials were arranged either north-south with heads to the south, or west-east. Alternatively, the head might be placed towards the exit from the cemetery. Christian burials are laid west-east with their heads to the west so that they may arise on the Day of Judgement to face God in the East. Within the pagan religions of post-Roman England and Viking Scandanavia, burials are orientated broadly east-west or north-south.

Burial customs originating in the Old World were commonly carried over in New World traditions, particularly early on, so that interment patterns observed in historic cemeteries reflect traditional forms. However, inconsistencies in the system underlying the organization of historic interments have been noted in the archeological record. Differential orientation within a cemetery and multiple burials are somewhat unconventional yet not completely unique in historic cemeteries. In addition to that documented in and around the study area, other excavations have identified diversity in historic burial form and orientation. For example, excavations at the 18th-century African Burial Ground a few blocks north of Chambers Street noted that while most of the burials were oriented east-west with heads to the west, one was buried with head to the east and three graves were oriented north-south (LPC 1993:41).

In the 1609-1610 "potter's field" cemetery in historic Jamestown most graves were oriented east-west but some were buried in contorted positions or face down (Brown 2001). In a late 18th- to early 19th-century slave cemetery in Frederick County, Maryland, two of 35 burials were oriented with heads to the east rather than to the west (Burnston 1997:94-95). The 19th century county poorhouse, poor farm, and insane asylum cemetery in Chicago identified several superimposed graves in which the lower burials were oriented east-west and the overlying burials north-south (Trubitt, et al. 1999).

Multiple graves have been identified in several historic cemeteries including the early colonial cemetery in Jamestown (Brown 2001); a mid-18th-century prisoner burial ground in Quebec (Piédalue and Cybulski 1997:123); the War of 1812 cemetery at Snake Hill, Ontario (Litt, et al. 1993); the early to mid-19th century First African Baptist Church cemetery in Philadelphia (Parrington 1984:6); and the mid-19th century Hudson Poor Farm Cemetery in Hudson, Massachusetts (Bell 1993:43). Superimposed or "stacked" burials have been identified at the late 17th-18th century Dutch Reformed Church Burial Ground (Collamer & Associates, Inc. 1988) and the 19th century Albany County Almshouse cemetery site (Andrea Lain, personal communication, 2003), both in Albany, New York.

Other unique characteristics found in historic cemeteries include the identification of graves outside mapped cemetery boundaries (HAA, Inc. 2002c), and graves in isolated locations within a cemetery (Bell 1993:44; Piédalue and Cybulski 1997:123). In contrast to evenly spaced and highly organized rows of interments, groups or clusters of graves have been identified (Burnston 1997:94-95),

as well as "very densely packed" (Parrington 1984:6) and "closely spaced" graves (Piédalue and Cybulski 1997:123).

With respect to the general composition of historic cemeteries, it is not uncommon that municipal cemeteries in urban areas functioned as burial grounds for a number of institutions including poorhouses, hospitals, orphanages, and jails. Paupers, prisoners, soldiers, hospital patients, orphans, slaves, and "unknowns" were sometimes buried in a single public cemetery and often within spatially distinct areas of the cemetery (HAA, Inc. 2003:162). For example, the Albany County Almshouse cemetery was known to have been used for interment of a mixed group of Albany residents including almshouse tenants, children from the adjacent orphanage, hospital patients/autopsy cases, African Americans, and soldiers (LoRusso 1990; HAA, Inc. 1999; Lisa Anderson, personal communication, 2002; Matthew Lesniak, personal communication, 2002). Excavations at the site of the former Milwaukee County Poor Farm in Wauwatosa, Wisconsin (Richards 1997; Richards and Trubitt 1999) identified that distinct areas of the cemetery were used at different times, and that infant burials were placed in a designated section of the cemetery (Richards 1997).

In other cases, cemeteries initially designated for a specific purpose were sometimes converted for other uses. For example, the 19th century New State Street Burial Ground in Washington Park, Albany, New York, was initially a potter's field used for burial of "strangers" and persons not belonging to a particular religious group, but was later divided into distinct areas and used by various religious denominations (Raemsch and Wheeler 2000). Pearson (1999:15) also notes examples of large, urban cemeteries divided according to ethnic or religious affiliations.

Together, these examples illustrate that historic cemeteries occasionally contain a sample of graves characterized by differential burial treatment or placement and that it is not unusual to encounter wide variation in burial form and organization. Diversity in cemetery plans may be due to sociocultural factors, such as religious or ethnic tradition or for various practical reasons including limited burial space or high mortality during a short period of time. Diversity in the use of public cemeteries is related to both the desires and the particular demands of communities during certain periods of time and under certain conditions (HAA, Inc. 2003:163).

Origin and context of the burials

As discussed extensively in the Tweed Courthouse report (HAA, Inc. 2003), the data concerning the location and boundaries of cemeteries in the historic commons area are limited. There are few original sources describing the organization and boundaries of the burial grounds; however, there is enough information to piece together some hypotheses about the origin and context of the Con Ed, Tweed, and other related burials. Much of the information about the historic development of early New York City derives from the *Minutes of the Common Council* (New York City 1917). A chronology of the council's actions, as well as information from other original sources including newspaper reports, diaries, and maps was developed by I.N. Phelps Stokes (1915-1928). In addition to the information reported in Stokes' six volumes, a few historic maps indicate the location of burial grounds and other significant features of the commons area.

Despite the lack of concrete historical data pertaining to burial ground boundaries in this area and the actual dates and demographics of the burials, the strongest case for the origin of the burials identified on Chambers Street is the almshouse and bridewell burial ground. According to the records of the Common Council, a burial ground was established by the city in 1785 on the vacant ground behind the barracks. The cemetery was established specifically for burial of the almshouse and bridewell dead (Stokes 5:1203). "Behind the barracks" is believed to be its north side (LPC 1993:33), equivalent to the north side of Tweed Courthouse. The time span of the cemetery's use remains unknown. However, it is known that the city prohibited burials south of Canal Street beginning in 1813 (Booth 1859:617) suggesting the cemetery would have been inactive by that time.

In 1785, the Common Council reported that "63 men, 133 women, 50 boys, 49 girls, 2 black men, and 4 black women" were residing at the almshouse (Stokes 5:1206). The presence of children's graves, confirmed by this, the Tweed Courthouse, and the City Hall Park studies, suggests the burial grounds identified through the archeological work were used for burial of the almshouse dead. The archeological observation of rows of interments in what would be in the backyard of the barracks makes the strongest case for the hypothesis that the graves originate from the almshouse and/or other public institutions in the commons area.

The origin and context of the nine graves that vary in orientation from the rest of the typical east-west pattern remains unknown. These graves are all located west of the courthouse building, while all the east-west burials are located directly in front of the building between its northwest and northeast corners. While the boundaries of the almshouse/bridewell burial grounds are undocumented, this area west of Tweed Courthouse was most likely considered part of the vacant ground behind the barracks as well. The presence of women and children's graves in this area also supports the almshouse as the origin of the burials, although their differential orientation is puzzling. One problem in attempting to interpret these seemingly different sectors of the burial grounds is that it remains unknown how many graves once existed in the cemetery and how many were buried in one fashion versus another.

The differential orientation of graves may result from the use of different grids for different areas of the burial grounds or from differential burial based on ethnic, religious, or other reasons. The timing of the burials may also be a factor, as different burial methods may have been used at different times, i.e., the north-south and northeast-southwest graves may have originated from an earlier or later time period than the rest of the graves. Also, while there is usually a set of organizing principles in mind when planning a cemetery (Pearson 1999:12), there is no documentation concerning how this cemetery was laid out. Graves may have originated at one end of the yard and the cemetery may have continually expanded in one direction, or graves may have been added to both ends once the cemetery grew in size and space became a factor. Unfortunately, due to the amount of disturbance within the site area, the lack of artifacts associated with the graves, and lack of concrete data on these unmarked burial grounds, it is not possible to determine the origin or time period of the groups of graves with any certainty.

Based on archeological documentation of wide variation in historic public cemetery organization, there is also a possibility that not all of the burials in this area originated from these institutions, but from different sources that were not specifically documented in the historic record. As pointed out by London (2004:6), there may have been burials associated with earlier uses of the park, such as the public gallows, which was located at the upper end of City Hall Park (Wilson 1893). In addition, "in early times," the site of Tweed Courthouse was used for "hanging slaves and others guilty of heinous crimes" (Macoy 1875), and it is possible there was some type of burying ground close by. Because of the lack of documentation, other origins of the graves cannot be ruled out. As described above, there are numerous cases of unmarked burial grounds remaining unknown until they are discovered archeologically, and many methods of burial are undocumented prior to archeological discovery as well.

While it is argued here and in the Tweed study (HAA, Inc. 2003:163-166) that at least most of the cemetery is associated with the almshouse and bridewell, the historic record allows for two other possible origins of the burials. There is some documentation suggesting that burials in this area may have originated from prisoner of war executions or from the African Burial Ground. In reference to the potential for military or prisoner burials, a British Headquarters map, while poor in quality (as described by Stokes 1:363), indicates a burial ground immediately north of the Upper Barracks, equivalent to the area immediately north of the courthouse today. In addition to this map, Stokes (5:1016) noted an account by William Cunningham, a British prison marshal, describing that 2,000 prisoners of war (POWs) were held in the Gaol and Bridewell during the Revolutionary War. According to Cunningham's account, the secret execution and burial of about 275 prisoners was ordered, and the POWs were said to have been hung and buried without ceremony north of the barracks. In a diary, one eyewitness recalled visiting "ye Burying Ground & see[ing] four of ye Prisoners Buryed in one Grave" (Stokes 5:1038).

Considering this information and the data concerning the multiple graves found during the Tweed study, it is possible that these and other graves in this section are associated with the above events. However, there still are other possible explanations. These graves may also have originated from the almshouse or bridewell, and individuals who died within a relatively short time frame were buried in the same grave simply out of convenience and/or to save on time, money, and space. Since the multiple graves appear to be located at one end of the cemetery, it is also possible that by the time these individuals were buried, there was little space left for additional interments. Unfortunately, the condition of the burials limited identifications of the age and sex of those interred in this fashion. It could only be determined that the two individuals in Burial 12 were both males. If women were present in any of the burials, this would suggest almshouse/bridewell rather than military burials.

As summarized in the Tweed report (HAA, Inc. 2003:165), while the burial of a child (Burial 11) presumably from the almshouse population was identified immediately adjacent to and at the same level as a double male burial (Burial 12), it was intrusive into the burial indicating interment at a later time. The intrusion of the child grave would support the hypothesis that Burial 12 may be a military/prisoner grave, as the almshouse postdates military use of the property. However, it is not possible to determine the amount of time that lapsed between the interments of Burials 11 and 12.

Days, weeks, months, or years may have separated the two graves indicating that Burial 12 may also originate from the almshouse or bridewell. Considering the account of hundreds of prisoners being executed, if they were buried in this area, more of the burials surrounding the three multiple burials also would have been multiple or mass graves. Therefore, it is most likely that the three burials originate from the almshouse or bridewell population (HAA, Inc. 2003:165).

The question of whether graves in this area originate from the African Burial Ground remains, due in large part to limited data on cemetery boundaries in the commons area as well as the limited data available from fragmentary and unexcavated graves (HAA, Inc. 2003:165). While it has never been clearly defined, the southern boundary of the burial ground is thought to be located somewhere in the vicinity of Chambers Street. Therefore, it remains possible that graves associated with the African Burial Ground site (two blocks north) were located this far south primarily because the construction of Chambers Street is recorded as overtaking a portion of the burial ground (New York City 1917; City of New-York 1833, Document 76:391). However, the 1755 Maerschalk map (Map 4) depicts the burial ground north of the palisades, which traversed west-east close to the general alignment of Chambers Street. Unfortunately, the records are not explicit in stating what section of the burial ground was impacted by street construction. Based on the alignment of the palisades in the area in question (Map 4), if accurate, it seems most likely that the portion of the burial grounds impacted by construction was from Broadway and west where the palisades appear to be closer to the future Chambers Street (HAA, Inc. 2003:165). Also in support of this hypothesis is the 1865 Viele map depicting the ravine where the burial ground was located as falling along Chambers Street in the area west of Broadway (see Stokes 3:pl. 155b).

Other evidence supporting the hypothesis that the burials do not originate from the African Burial Ground is based on consideration of the likely property boundaries associated with the military barracks. Since the burials identified during the Tweed and Con Ed studies are in close proximity to the 1757-1790 barracks and the African Burial Ground was also used through the 1790s (potentially overtaking the area of the former palisades), it is unlikely that the latter did not extend into the rear yard of the barracks. There would likely have been a clear dividing line between the African Burial Ground and use of the area for military activity (HAA, Inc. 2003:166).

While the origin of graves in the area of Chambers Street, Tweed Courthouse, and City Hall Park cannot be determined with complete certainty, the combined information from the archeological and historic records, while limited in certain respects, has provided a foundation from which the organization and likely context of the burials identified during this research can begin to be understood.

CONCLUSIONS

Despite the constraints placed on the archeological investigation conducted during the Con Ed utility replacment, the project was successful in collecting and compiling data pertaining to the former burial grounds located in the historic commons area of downtown Manhattan. Several constraints limited the types of data that could be collected during the project including the requirement of monitoring the construction only rather than formal excavation; the LPC policy stipulating that intact burials be left in situ; and the fragmentary nature of the burials. However, despite the amount of prior construction disturbance in the area, the project did identify that numerous burials still remain intact. The locations of ten partially intact burials were identified and mapped throughout the course of the project. Conclusions regarding the origin of the burials remain speculative; however, based on the available archeological data and historic records, they most likely derive from the burial ground designated by the Common Council in 1785 for use by the First Almshouse and Bridewell.

RECOMMENDATIONS

While the Con Ed utility replacement has been completed, there remains a high potential for uncovering additional pockets of intact cultural resources in this general area. This project and other recent studies have confirmed that despite the amount of ground disturbance in the area, isolated pockets of intact human remains and other cultural features still exist. There is a particularly high potential for the presence of fragmentary human remains and intact burials just outside of the impact area of this project including several already identified and protected during this and the Tweed Courthouse project. Based on these factors, it is recommended that if any further ground disturbance is proposed for Chambers Street and its associated sidewalks in this area, further archeological testing and/or monitoring should be required.

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Appendix 1

Project workscope

Hartgen Archeological Associates, Inc.

Cultural Resource Specialists

1713 8TH AVENUE ▫ BROOKLYN, NEW YORK 11215

SCOPE OF WORK FOR ARCHEOLOGICAL MONITORING

conEdison work on Chambers Street from Broadway to Elk
located within the
African Burial Ground and Commons Historic District

May 1, 2002

Staff from Hartgen Archeological Associates, Inc. (HAA, Inc.) will conduct archeological monitoring of conEdison utility work on Chambers Street between Broadway and Elk. Due to the project's location within the African Burial Ground and Commons Historic District, archeological monitoring of all excavation in this area is required by the New York City Landmarks Preservation Commission (LPC). In addition, LPC requires that a bioarchaeologist be present on site during all work in order to identify the presence or absence of human burials and human skeletal remains within the construction area. If archeological resources, including human remains, are identified LPC requires the project sponsor (conEdison) to submit an analysis and report of the archaeological work within this area.

Based on our conversations with staff from the LPC office and the 2002 *Landmarks Preservation Commission Guidelines for Archaeological Work in New York City* the project should proceed as follows:

- Archaeological monitoring of all construction trenches to assess the presence/absence of archaeological resources, including historic artifacts, features, and human burials.
- All primary excavation work will be conducted by conEdison; HAA, Inc. will only assist in excavation if significant or delicate resources are identified.
- HAA, Inc. will ask that the excavations be conducted slowly and carefully until it can be determined whether the soils contain archeological materials, primarily human remains.
- HAA, Inc. is required to call a "stop work" order of it is determined that a primary (intact) burial has been encountered. The LPC will be notified immediately.
- If a primary burial should require protection for a period of time, HAA, Inc. will cover the burial with plastic sheeting and plywood provided by conEdison.

- If previously disturbed human remains are encountered, the archaeologists are required to slow excavation, screen the excavated soils, and recover all disturbed remains identified within the trenches.

- Following completion of the work, an end-of-field work letter will be submitted to the client and the LPC within two weeks. The letter report will outline the results of the study.

- If minimal or no archaeological resources are identified, the end-of-field work letter will serve as the final report of investigations. The letter will include a map, soil profiles, and photographs of the excavations. This work will be completed on a time and materials basis or a separate contract for the work may be requested by conEdison.

- If significant resources are identified, LPC will require that the archaeological materials be cleaned, cataloged, and analyzed, and that a more substantial report of investigations be completed by HAA, Inc. This work will be completed on a time and materials basis or a separate contract for the work may be requested by conEdison.

- If human remains are recovered from the project, the issue of final disposition of the remains will be addressed in consultation with LPC; any excavated human remains and artifacts will be conserved in the HAA, Inc. lab in Brooklyn, New York until their final disposition.

- Cost for the field work will be on an hourly basis, plus reimbursed expenses (including travel and lodging for one archaeologist from our Troy, New York office). These rates and other miscellaneous fees are included on the attached sheet.

Please call if you have any questions.

Sincerely,

Carol A. Raemsch, Ph.D.
Branch Manager

Hartgen Archeological Associates, Inc.

Cultural Resource Specialists

1713 8TH AVENUE ▫ BROOKLYN, NEW YORK 11215

June 3, 2002

Kevin Cook
Consolidated Edison
750 East 16th Street, Room 204
New York, New York 10003

Re: Work scope for analysis and report
Chambers Street Archeology

Dear Mr. Cook,

This letter provides an outline of the proposed work scope for the analysis and report of the archeological field work associated with recent work by Con Edison on Chambers Street in downtown Manhattan. As you know, this work is required by the New York City Landmarks Preservation Commission as outlined in the LPC *Guidelines for Archeological Work in New York City* (2002) and the New York Archaeological Council's (NYAC) *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections in New York State* (1994).

We would like to obtain approval of the work scope as soon as possible so that we may begin to process the collection. While measures were taken to store the human remains within a protective micro-environment at the time of removal from the ground, it is particularly important to begin processing the collection prior to any post-excavation damage to the remains, such as disintegration or fungal growth.

Analysis of human remains and artifacts

During the May 2002 field work, HAA, Inc. staff collected a total of 59 bags of artifacts and 10 containers of human remains from the work associated with the Con Ed work on Chambers Street. The collection includes complete and fragmentary human remains as well as a sample of historic artifacts. All recovered materials will be processed according to federal, state, and city-recognized curation standards (Department of Interior Guidelines [1983], New York Archaeological Council Guidelines [1994] and NYC Landmarks Preservation Commission guidelines [2002]).

Artifact analysis and cataloging

The historic artifact collection, which includes samples of ceramics, glassware, building materials such as nails, brick, and window glass, personal items, and food refuse, will be processed by our laboratory and conservation staff. The lab work will consist of entering provenience data and artifact information into our customized MicroSoft Access artifact database. Objects will be assessed as to material type and stability and will be washed or dry brushed accordingly. Items requiring conservation will be assessed on a case by case basis. Analysis of the historic artifacts will include counts, weights, and descriptors such as material, function, manufacturing technique, decorative technique, and element. Following analysis and data entry, all materials will be labeled and packaged in acid free containers. A representative sample of artifact photographs will be included in the final report.

Human remains analysis and cataloging

All bone material in the collection, both human and faunal, will be inspected to ensure that all human skeletal elements have been separated from the remainder of the collection. Identifiable human bones and bone fragments will be cleaned, sorted, and identified by skeletal element. Unidentifiable remains (i.e., small bone fragments) will be counted and stored, with no further analysis. Following analysis, all human remains will be stabilized and stored in acid-free containers. Photography of informative skeletal elements, such as those indicating sex, age, or pathology will be completed, and a representative sample of these will be used in the report.

Final report of investigations

The final archeological report will include the following components, which are outlined in the NYAC and LPC guidelines:

- Management summary, table of contents, introduction
- Historical context/summary of the history of the general project area
- Summary of previous archeological investigations in the general project area
- Description of the field methodology
- Results of the field work, including maps, profiles, photographs
- Results and discussion of the lab analysis of the artifact collection and human remains, including catalogs, tables, and photographs

Two copies of the report will be submitted to the client, and two will be provided to the LPC office.

Final disposition of the collection

Once the archeological report is reviewed and accepted by the LPC, LPC requires that the collection of human remains and artifacts resulting from this work be curated in a formal repository according to federal standards. Human remains are stored temporarily until they are reinterred in a

place that is yet to be determined by the LPC. Labor, travel, and expenses for the transfer of the collection to a repository as well as costs associated with reinterment of the human remains will be charged on a time and materials basis, as it become clear what this component of the project will involve.

Cost estimate and scheduling

Attached is an estimated cost for completing the analysis and report. The total hours spent on the collection is based on the amount of materials collected during the field work.

Regarding scheduling, we anticipate completing the project over a total of 6 weeks; however, the work most likely will not be completed over a period of 6 consecutive weeks. Given that we have a notice-to-proceed by June 15, it is estimated that a final report will be submitted no later than October 1, 2002.

Please note the acceptance portion of the proposal on the following page. Please call if you have any questions; we look forward to hearing back from you soon so that we can begin to process the collection.

Sincerely yours,

Carol A. Raemsch, Ph.D.
Project Manager, Bioarcheologist

Appendix 2

Conservation Plan Developed for City Hall Park Burial

Fax

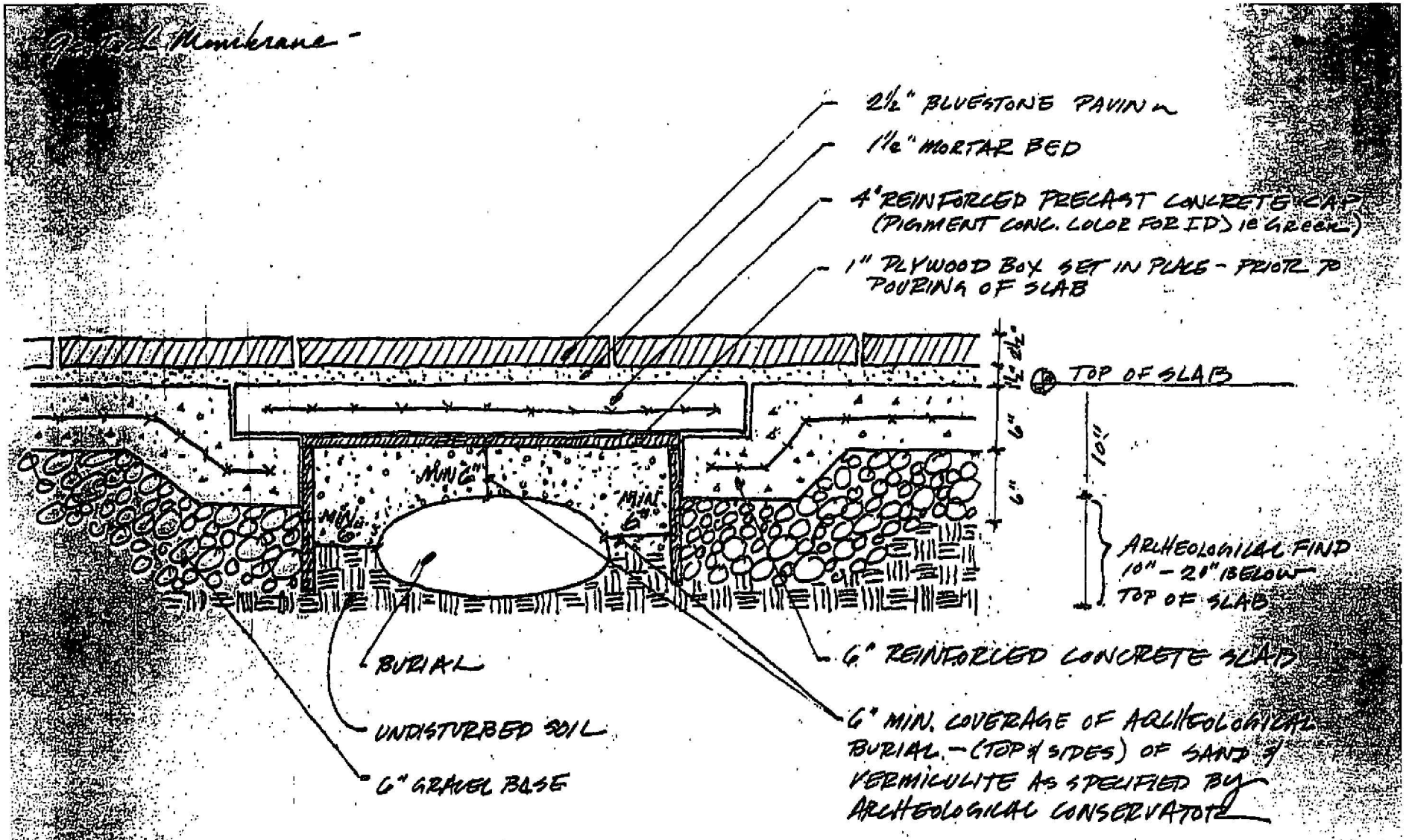
Name:	Nancy Rankin
Fax:	619-4882
From:	Amanda Sutphin, LPC
Date:	June 15, 2001
Subject:	Burial Protection Measures
Pages:	5

Comments:

As we discussed, attached please find a letter from archaeological conservator Gary McGowan outlining the measures that were taken to protect the burials found in City Hall Park as well as a schematic drafted by Kim Hoyt. Similar methods must be employed to protect burials encountered during the Tweed restoration work. Please share this information with Carol Raemsch and call me with any questions or concerns.

Amanda Sutphin

Geotextile Membrane -



NOTE THAT THIS IS A CONCEPTUAL DESIGN ONLY CONSTRUCTION DETAIL MUST BE ENGINEERED

CITY HALL PARK — PROPOSED PRECAST CONCRETE BURIAL CAP

SCALE: 1" = 1'-0"

K. Hoyt

JULY 7, 1999

Appendix 3

Trench data

General Trench Information
Con Ed Chambers Street Monitoring

Trench	Length	Width	Ave. Depth	Munsell code	Munsell color	Description	Comments
1	160 ft (48.8 m)	2-2.5 ft (60.1cm)	0-6in	n/a	n/a	Asphalt	Origin just west of Tweed Courthouse west gate, eastbound lane of Chambers Street. Termination at intersection of Chambers Street and Broadway.
			6-12in	n/a	n/a	Belgian brick cobbles	
			12-14in	10YR 4/2		Silty sand fill	
			14-20in			Concrete	
			20-24in	7.5YR 3/3, 3/4 or 10YR 5/4	Dark brown and brown Yellowish brown	Silty sand fill Sand fill	
2	145 ft (37 m)	2-2.5 ft (60.1cm)	0-6in	n/a	n/a	Asphalt	From westbound lane of Elk Street across to eastbound lane with termination at manhole just east of Tweed Courthouse staircase.
			6-12in	n/a	n/a	Belgian brick cobbles	
			12-14 in	10YR 4/2		Silty sand fill	
			14-20in	7.5YR 3/3, 3/4	Dark brown and brown	Concrete	
			20-24in	7.5YR 3/3, 3/4 or 10YR 5/4	Dark brown and brown Yellowish brown	Silty sand fill Sand fill	
Sections of trenches with no Belgian brick level							
			0-3in	n/a	n/a	Asphalt	
			3-9in	n/a	n/a	Concrete	
			9+ in	7.5YR 3/3, 3/4 or 10YR 5/4	Dark brown and brown Yellowish brown	Silty sand fill Sand fill	

Appendix 4

Context list

Context List
Con Ed Chambers Street Monitoring

Trench #	Context #	Depth	Burial	Fragmentary Human Remains	Artifacts	Fill	Comments
1	1	11in		X	X	X	Origin of trench; just east of lamppost and west of Tweed Courthouse west gate
	2	8in		X	X	X	Just west of Burial 1
	3	23in	X	X	X		Burial 1
	4	24in		X		X	West of Burial 1
	5	18in		X	X	X	9 ft. east of tree
	6	20in	X	X	X		Burial 2
	7	18in		X	X	X	West of Burial 2
	8	16in			X	X	South extension of trench to avoid Burial 2
	9	21in	X		X		Burial 3
	10	18in	X	X			Burial 4
	11	17in		X	X	X	West of Burial 3
	12	16in		X	X	X	West of Burial 5
	13	24in	X	X	X		Burial 5
	14	19in			X	X	Disturbed privy
	15	20in		X	X	X	North of Burial 3 & 5
	16	24in			X	X	Disturbed privy
	17	17in	X	X			Burial 6
	18	24in			X	X	Disturbed privy
	19	18in			X	X	Broken utility pipe
	20	19in			X	X	Immediately west of Cxt 19
	21	18in			X	X	Utility conduits
						X	
2	22	20in		X	X	X	Adjacent to fire hydrant west of Tweed Courthouse east gate
	23	19in		X	X	X	17 ft. west of fire hydrant
	24	20in	X	X	X		Burial 7
	25	22in			X	X	Small deposit of historics in black organic fill
	26	23in	X	X	X		Burial 9, adjacent to Tweed Courthouse Trench 2
	27	23in	X				Burial 8
	28	20in		X	X	X	5 ft. west of Burial 8
	29	19in		X	X	X	Between Burials 9 and 10
	30	29in	X	X			Burial 10
	31	19in		X	X	X	West of Tweed Courthouse Trench 2
	32	22in		X	X	X	Partial brick feature
	33	20in		X		X	West of Burial 10

Appendix 5

Human remains catalog

Inventory of Commingled Human Remains
Con Ed Chambers Street

Cxt	Bag	Item	Class	Elmt	Subelm	Count	Size (cm)	R	L	Med	Lat	Prox	Dist	Frag	Intact	Comments
TRENCH 1																
1	58	1	1	0		1	18.9							x		
	58	2	12	3	1	1	25.0						x		x	subadult; proximal epiphysis missing
	58	3	12	1	7	1	25.3	x							x	
	58	4	12	2	3	1	54.8		x						x	subadult; distal epiphysis missing
	58	5	12	2	5	1	44.7	x							x	subadult; distal epiphysis missing
2	59															
	60	1	1	0		1	25.6							x		
	60	2	8	0	2	1	33.4							x		
	60	3	9	4		2	41.0 -							x		
	61	1	11	3		1	103.3							x		
	61	2	11			3	6.8 - 81.0						x	x		
	61	3	10,11	2,3		3	48.5 -							x		radial and ulnae shaft fragments
	61	4	21			4	17.0 -							x		
	61	5	21			10+	0.0+							x		dirt and tiny fragments
	62	1	6	7		1	42.0							x		
	62	2	6	0		1	50.6							x		body fragment
	62	3	6	0		2	33.4 -							x		body fragments
	62	4	20	1	2	3	23.2 -	x						x		
	62	5	21			6	5.1 - 16.2							x		
	63	1	1	0		10+	0.0+							x		cranial fragments
	63	2	1	4	3	3	36.0 -							x		superior occipital fragments
	63	3	18	2		1	60.2							x		
3	64	1	13	1,4		6	17.2 -							x		
4	65	1	19	2		2	38.8 -						x	x		
	65	2	8	1	2	1	39.1	x								
	65	3	18	2		1	46.9							x		
	65	4	5	2		1	42.3		x				x	x		
5	66	1	1	0		3	7.7 - 21.0							x		
	67	1	20	3	0	1	33.7							x		proximally fragmented
	67	2	6	3		1	30.5							x		
	67	3	5	2,3		1	95.1		x				x	x		sternal end missing
	67	4	8	0	2	7	12.1 -							x		
	67	5	6	0		1	6.0							x		body fragment
	67	6	21			24	4.6 - 40.1							x		long bone fragments, rib fragments, ilium fragment
	67	7	21			10+	0.0+							x		
	68	1	11	1,2		1	72.1	x				x		x		
	68	2	6	2,3,4		5	1.7 -	x	x					x		right and left corocoid processes, body fragments
	68	3	20	2,3		5	20.4 -							x		metatarsal and phalanges fragments
	68	4	4	0	2,4	6	1.4 - 2.4							x		small process fragments

Inventory of Commingled Human Remains
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Cxt	Bag	Item	Class	Elmt	Subelm	Count	Size (cm)	R	L	Med	Lat	Prox	Dist	Frag	Intact	Comments
	68	5	8	0	1,,2	13	14.1 -							x		rib shaft fragments
	68	6	21			22	8.8 - 54.3							x		long bone fragments
	68	7	21			10+	0.0+									small unidentifiable fragments
	69	1	9	4,5,6		2	54.0 -	x					x	x		distal shaft, end only; fragments mend
	69	2	9	4		1	99.7		x					x		MNI=1
	69	3	8	0	2	13	8.1 - 50.1							x		
	69	4	12	3	1	1	31.8		x					x		proximal end missing
	69	5	4	1,8	2,3	3	6.1 - 31.2							x		
	69	6	18	2		2	41.6 -							x		
	69	7	21			10+	7.4 - 31.6							x		long bone fragments
	69	8	4	27	1	1	39.5							x		
	69	9	4	0	2	2	17.0 -							x		
6	BURIAL 2															
	71	1	4	1	1,3,4	2	23.2 -							x		spinous process missing, left articular facets missing
	71	2	4	2	1,2,3,4	1	27.8							x		mostly complete, eroded left side of spinous process
	71	3	4	3	1,2,3,4	1	46.5							x		eroded, mostly complete
	71	4	4	5	1,2,3,4	1	46.3							x		eroded, mostly complete
	71	5	4	4	1,2,3,4	1	45.6							x		eroded, mostly complete
	71	6	4	0		15	4.0 - 28.4							x		vertebral fragments, body fragments, articular fragments
	71	7	21			10+	0.0+							x		
	72	1	2	1,2	4	2	26.0 -		x						x	see dental characteristics
	72	2	6	3		1	36.5		x					x		
	72	3	1	7		1	29.6	x						x		
	72	4	4	0	4	2	15.5 -							x		
	72	5	6	0		5	4.2 - 39.5							x		body fragments
	72	6	21			6	7.5 - 30.5							x		rib fragments, cranial vault
	72	7	8	0	1,2	20	5.3 - 54.6	x	x			x		x		rib fragments, sternal end and shafts, both sides
	72	8	8	1	2	5	4.6 -53.2	x						x		
	73	1	1	12	3,4	20	3.9 - 55.2	x						x		
	73	2	2	2	10	1	16.0		x						x	see dental characteristics
	74	1	1	2		39	18.7 -	x	x					x		some fragments mend
	74	2	1	1,2,3		7	21.5 -	x	x					x		basilar, nuchal regions, some condyle/foramen magnum fragments
	74	3	1	10		1	30.6							x		greater wing fragment
	74	4	1	3	2,3	2	53.6 -	x	x					x		petrous pyramids; external auditory meatus
	74	5	1	0		145	4.3 - 23.2									vault fragments
	74	6	1	0		17	19.4 -							x		internal cranial and vault fragments
	74	7	21			10+	1.0 - 9.1							x		small cranial fragments
7	75	1	1	1,2,3,4	2,1	7	17.9 -	x	x					x		subadult
	75	2	9	4		1	39.3							x		subadult

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Cxt	Bag	Item	Class	Elmt	Subelm	Count	Size (cm)	R	L	Med	Lat	Prox	Dist	Frag	Intact	Comments
	75	3	8	0	2	1	30.9							x		subadult
	75	4	21			5	7.9 - 70.2							x		long bone fragments; adult; copper staining
	75	5	21			10	21.4 -							x		long bone fragments
10	76	1	11	3,4		2	65.5 -		x				x	x		almost complete; prox. end missing; fragments mend
11	77	1	20	2	0	1	57.5							x		shaft only
	77	2	1	1	1	1	43.6		x					x		subadult
	77	3	1	2		5	8.9 - 49.6	x	x					x		subadult and adult; MNI=2
	78	1	2	2	4	1	23.6		x						x	see dental characteristics
	78	2	21			1	44.1							x		rib fragment?
	78	3	1	2		1	34.7							x		
	78	4	16	4		2	9.8 - 51.3							x		
12	79	1	18	2		4	22.3-	x	x					x		shaft fragments
	79	2	19	2		1	40.9							x		
	79	3	8	0	2	2	16.8 -							x		
	79	4	21			1	42.8							x		long bone fragment
	80	0				0	0.0									
	81	1	13	3		1	57.8		x					x		
	81	2	8	0	2	1	47.0	x						x		subadult
	81	3	8	0	2	1	39.6							x		subadult
	81	4	21			1	60.0							x		long bone fragment
	81	5	1	2		2	35.5 -							x		
13	82	1	1	7		2	7.2 - 45.2	x						x		
15	83	1	12	3	2	1	44.4		x						x	
	83	2	12	3	2	2	5.9 - 23.1							x		
	83	3	21			1	60.9							x		long bone fragment
	83	4	8	0	2,3	1	69.8	x						x		subadult
	83	5	1	5,7		1	62.6	x						x		fused maxilla fragment and zygomatic fragment
	83	6	2	1	9	1	20.8	x							x	see dental characteristics
	83	7	21			1	33.1							x		
	83	8	6	0		1	28.9							x		superior scapula fragment
	83	9	1	4		1	40.3							x		
	83	10	1	12	4,5	1	34.1	x						x		
	83	11	16	1		1	39.5							x		epiphysis unfused; subadult
	83	12	8	0	1	1	34.3		x					x		
	83	13	9	4		1	35.8							x		distal end
	83	14	11	3		2	50.3 -50.5							x		
	83	15	9	4		2	37.2 -							x		
	83	16	16	4		10+	3.6 - 42.9							x		epiphyseal surface present; subadult
	83	17	1	2,3,4		11	4.5 - 80.3	x	x					x		

Cxt	Bag	Item	Class	Elmt	Subelm	Count	Size (cm)	R	L	Med	Lat	Prox	Dist	Frag	Intact	Comments
	83	18	8	0	2	7	19.4 -	x	x					x		subadult
	84	1	9	4		1	206.0		x				x	x		distal 2/3
	84	2	9	4,5		1	105.2	x					x	x		distal end
	84	3	10	1,2,3		4	10.8 -	x						x		fragments mend; mostly complete
	84	4	6	1,3,4,5		1	91.0	x						x		
	84	5	1	2		1	64.7							x		
	84	6	8	0	2	2	22.9 -							x		
	84	7	16	5		10+	1.0 - 32.3							x		distal end fragments
17	85	1	2	1	9	1	20.6		x						x	see dental characteristics
	85	2	2	1	4	1	23.9	x							x	see dental characteristics
	85	3	5	2,3		1	78.2		x				x	x		
	85	4	16	4		1	46.0					x		x		
	85	5	1,2	12		1	48.8		x					x		see dental characteristics
	85	6	8	1	1	1	40.6	x						x		
	85	7	8	2	1	1	57.3	x						x		
	85	8	10	1,2		2	8.5 - 54.8		x			x		x		
	85	9	21			10+	2.6 - 40.6							x		very eroded fragmented ribs, long bones
TRENCH 2																
22	86	1	12	2	3	1	51.0		x					x		ends missing
	87	1	1,13	1		3	22.9 -							x		temporal fragment, ilium
	87	2	1	2		1	81.5	x						x		
	87	3	9	1		1	67.9		x			x		x		
	87	4	21			10+	0.0+							x		
	88	1	1	12	4,6	1	72.8	x						x		
	88	2	13	2		1	71.6	x						x		
	88	3	1	7		1	52.9	x						x		
	88	4	5	3		1	72.5		x				x	x		
	88	5	1	2,4		14	20.5 -	x	x					x		parietal and occipital fragments
	88	6	1	12	3	1	36.2	x						x		
	88	7	2	1	4	1	32.0		x						x	
	88	8	16,18	4,2		3	117.8-	x	x					x		2 right femoral shaft fragments, 1 left tibial shaft fragment
	88	9	8	0	2	6	20.7 -							x		
	88	10	21			12	9.3 - 50.8							x		miscellaneous fragments--os coxae and vertebrae
	88	11	21			10+	0.0+							x		misc. small fragments
23	89	1	12	3	1	1	32.4		x						x	eroded
	89	2	8	0	1	1	33.6							x		
	89	3	21			1	46.7							x		long bone fragment
	89	4	6	1,2		1	66.8	x						x		
	89	5	8	0	2	3	40.0-51.2							x		

Cxt	Bag	Item	Class	Elmt	Subelm	Count	Size (cm)	R	L	Med	Lat	Prox	Dist	Frag	Intact	Comments
	89	6	1	2		2	43.7-44.7							x		
	89	7	21			6	20.0-35.0							x		cranial and long bone fragments
24	BURIAL 7															
	90	1	6	0		2	62.0-51.6							x		body fragments
	90	2	21			1	45.3							x		long bone fragment
	90	3	12	2	5	1	45.9	x				x		x		head missing
	90	4	12	2	2	1	43.8	x				x		x		head missing
	90	5	12	2	0	1	38.2							x		shaft only
	90	6	20	3	0	1	39.0							x		shaft only
	90	7	12	3	2	1	40.2		x				x	x		
	90	8	12	4	4	1	33.5	x					x	x		
	90	9	12	3	3	1	39.3		x				x	x		
	90	10	12	3	3	1	37.2	x					x	x		
	90	11	12	5	5	1	22.4								x	
	90	12	12	3	4	1	26.5		x				x	x		
	90	13	12	4	3	1	29.4	x							x	
	90	14	12	5	2	1	25.7								x	
	90	15	12	4	2	1	17.4	x							x	
	90	16	12	5	4	1	16.1								x	
	90	17	12	5	1	1	18.2		x			x		x		
	90	18	12	5	5	1	16.3								x	
	90	19	20	1	1	1	27.6							x		
	90	20	12	1	4	1	19.9	x							x	
	90	21	12	1	7	1	26.1	x							x	
	90	22	12	1	2	1	17.2	x							x	
	90	23	12	1	5	1	13.6	x							x	
	90	24	12	1	1	1	23.4	x							x	
	90	25	12	1	8	1	23.0	x							x	
	90	26	12	1	6	1	16.7	x							x	
	90	27	12	1	3	1	28.0	x							x	
	90	28	16	4		1	37.5							x		
	90	29	10	2,3		4	34.3 -	x					x	x		fragments mend
	90	30	11	2		4	37.5 -							x		
	90	31	11	1,2,3		4	57.4 -		x					x		frags. mend to almost complete-no dist. artic. surface
	90	32	21			1	34.6							x		long bone fragment
	90	33	21			10+	5.0 - 29.9							x		phalanx, metacarpal fragments, long bone fragments
	90	34	21			10+	0.0+							x		misc. small fragments
	91	1	18	2		1			x			x		x		
	91	2	18	0		7								x		
	91	3	21			20+								x		tibial and long bone fragments

Cxt	Bag	Item	Class	Elmt	Subelm	Count	Size (cm)	R	L	Med	Lat	Prox	Dist	Frag	Intact	Comments
	91	4	16	3,4		2		x				x		x		two fragments mend
	91	5	16	5		21		x					x	x		distal end--fragments crumbled during analysis
	91	6	21			10+								x		tiny fragments and dirt
	92	1	20	1	5	1			x						x	
	92	2	20	1	5	1			x						x	
	92	3	20	1	1	1			x					x		
	92	4	20	1	7	1			x						x	
	92	5	20	3	0	1						x		x		
	92	6	20	2	1	1			x					x		fragments mend to complete bone
	92	7	20	3	1	1			x						x	
	92	8	20	2	2	1			x			x		x		head missing
	92	9	20	3	1	1		x							x	
	92	10	20	5	1	1		x						x	x	
	92	11	20	4	0	2									x	
	92	12	20	4	0	3									x	
	92	13	20	4,5		1									x	fused intermediate and distal foot phalanges
	92	14	20	1	8	2								x	x	
	92	15	20	2	0	1							x	x		head only
	92	16	19	2,3		3			x				x	x		
	92	17	20	1	1	2			x					x		
	92	18	20	1	2	1			x					x		mostly intact
	92	19	13	1,2		3								x		
	92	20	8	0	2	1								x		
	92	21	11	3		2								x		
	92	22	21			10+								x		misc. long bone and os coxae fragments
	92	23	21			10+								x		dirt and tiny fragments
	93	1	20	2	4	1		x				x		x		head missing
	93	2	20	2	5	1		x				x		x		head missing
	93	3	19	2		1							x	x		
	93	4	20	5	1	1		x				x		x		
	93	5	20	3	0	3								x	x	two fragments mend to complete bone
	93	6	20	4	0	2									x	
	93	7	20	2,3	0	2								x		metatarsal and foot phalanges fragments
	93	8	18	2		5								x		
	93	9	21			20+								x		long bone fragments
	93	10	20	1	0	11								x		tarsal fragments
	93	11	21			20+								x		long bone fragments
	93	12	21			10+								x		dirt and tiny fragments
24	94	1	16	1		2								x		
	94	2	8	0	2	2								x		

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Cxt	Bag	Item	Class	Elmt	Subelm	Count	Size (cm)	R	L	Med	Lat	Prox	Dist	Frag	Intact	Comments
	94	3	16	4		1								x		
	94	4	8	0	1	3								x		rib heads
	94	5	10	2		1								x		
	94	6	12	3		1						x		x		
	94	7	12	2	5	1			x						x	some erosion
	94	8	12	2	4	1			x			x		x		head missing
	94	9	21			10+								x		long bone fragments
	94	10	13	1		2								x		
	94	11	11	1		1								x		
	94	12	4	0	4	2								x		
	94	13	20	1	2	1		x							x	
	94	14	6	2,6		3								x		
	94	15	4	0	2,3,4	6								x		
	94	16	21			10+								x		misc. cranial fragments
	95	1	20	1	3	1	42.9		x					x		superior portion missing
	95	2	2	2	5	1	23.2	x							x	see dental characteristics
	95	3	20	1	1	1	44.2	x						x		
	95	4	4	27	2,3,4	1	38.8							x		
	95	5	4	27	2,3	1	42.8							x		
	95	6	21			10+	4.0 - 34.7							x		vertebrae fragments, rib fragments, misc. fragments
	95	7	21			10+	0.0+							x		minute fragments
	96	1	12	3	1	1	39.1		x						x	
	96	2	12	3	1	1	27.6								x	
	96	3	20	3	0	1	25.4							x		proximal end missing
	96	4	20	3	0	1	22.8							x		proximal end missing
	96	5	19	2		1	43.8							x		
	96	6	21			1	64.2							x		long bone fragment
	96	7	12	3	1	1	45.5		x						x	
	96	8	12	3	3	1	42.7								x	
	96	9	12	3	1	2	22.8 -							x		
	96	10	20	2	4	1	25.0	x						x		ends missing
	96	11	8	0	2	1	29.9							x		
	96	12	13	4		1	30.0							x		
	96	13	14	5		1	31.7							x		
	96	14	21			22	7.9-33							x		long bones fragments, rib fragments, scapula fragments
	96	15	21			10+	0.0+							x		misc. fragments
	97	1	21			1	31.9 -							x		long bone fragments
	97	2	12	2	5	1	40.2							x		shaft only
	97	3	10	2		1	69.5		x			x		x		radial tuberosity

Cxt	Bag	Item	Class	Elmt	Subelm	Count	Size (cm)	R	L	Med	Lat	Prox	Dist	Frag	Intact	Comments
	97	4	12	3	2	1	41.7		x						x	some erosion, complete
	97	5	6	3		1	32.7		x					x		
	97	6	11	1,2,3		1	6.6 -		x			x		x		proximal 1/3
	97	7	21			10+	0.0+							x		misc. fragments
	98	1	16	4		1	130.9	x				x		x		
	98	2	18	2		1	58.5							x		
	98	3	9	5,6		1	49.7		x					x		
	98	4	8	0	2	13	13.6 -							x		
	98	5	14	3		1	42.6				x			x		
	98	6	16	1		2	28.8 -					x		x		
	98	7	1	7		1	40.6	x						x		
	98	8	4	27	1,2	2	14.7 -							x		
	98	9	4	21	4	1	31.7							x		
	98	10	4	6	1,2	1	47.8							x		
	98	11	4	21	2,3	1	36.0							x		
	98	12	1	0		2	32.0 -							x		
	98	13	21			39	8.2 - 35.9							x		long bone fragments, cranial fragments
	98	14	21			10+	0.0+							x		small misc. fragments
	99	1	16	1,2,3,4		4	40.2 -	x				x		x		
	99	2	4	0	2	1	6.3							x		
	99	3	8	0	1	1	18.8							x		
	99	4	13	2,4		1	93.0		x					x		
	99	5	5	1,2		1	82.3	x				x		x		
	99	6	21			23	4.8 - 30.3							x		
	99	7	21			10+	0.0+							x		misc. fragments and dirt
	100	1	8	0	2	5	38.5 -							x		4 of 5 appear to be subadult
	100	2	1	1	1	1	28.9		x					x		
	100	3	13	1		1	41.4							x		iliac crest fragment
	100	4	21			4	10.8 -							x		long bone fragments
	100	5	11	3		3	18.4 -							x		
	100	6	16	4		6	18.0 -		x			x	x	x		
	100	7	21			10+	0.0+							x		
	101	0				0	0.0									
26	102	1	8	0	1,2	1	62.4		x					x		
	102	2	1	4	3	1	57.6							x		
	102	3	16	4		1	113.8		x					x		
	102	4	20	1	0	1	41.9							x		
	102	5	1	2,4		7	9.6 - 53.6							x		
	102	6	21			10+	0.0+							x		cranial fragments

Cxt	Bag	Item	Class	Elmt	Subelm	Count	Size (cm)	R	L	Med	Lat	Prox	Dist	Frag	Intact	Comments
	103	1	10	1		1	55.5		x			x		x		
	103	2	16	4		1	37.5							x		
	103	3	21			1	23.0							x		
	103	4	8	1	2	1	27.0		x					x		
	103	5	2	1	5	1	23.7		x						x	see dental characteristics
	103	6	2	1	4	1	23.8	x							x	see dental characteristics
	103	7	2	1	4	1	30.4		x						x	see dental characteristics
	103	8	2	1	4	1	29.2	x							x	see dental characteristics
	103	9	20	2	3	1	57.1					x		x		
	103	10	1	2,3		6	23.0 -							x		
	103	11	8	0	2	19	7.2 - 76.4							x		
	103	12	6	2,3		3	48. - 61.8							x		
	103	13	4	0	1,2	2	42.6 -							x		
	103	14	21			62	24.0							x		long bone fragments
	103	15	21			10+	0.0+							x		
	104	1	2,1	1,5	2	1	27.8	x						x	x	alveolus fragment of maxilla, crypt for incisor; see dental
	104	2	2	2	1	1	21.6	x							x	see dental characteristics
	104	3	2	1	9	1	22.2	x							x	see dental characteristics
	104	4	1	5		1	27.2							x		
	104	5	1,2	1,5	9	2	28.9	x						x	x	see dental characteristics
	104	6	1	3	4,5	1	39.0	x						x		
	104	7	1	7		1	47.3		x					x		
	104	8	3			1	21.7							x		body fragment
	104	9	1	2,3,4		9	17.1 -							x		
	104	10	21			10+	2.0 - 47.5							x		occipital fragment, long bone fragments, rib fragments
	104	11	21			10+	0.0+							x		minute fragments
	105	1	2	1	1	1	24.5	x							x	
	105	2	2	2	5	1	23.7	x							x	
	105	3	2	1	5	1	23.0	x							x	
	105	4	1	5	1	2	21.6-48.2							x		
	105	5	4	8	1,2	1	39.3							x		
	105	6	1,2	5,1	1,10	1	34.0	x						x		
	105	7	1	4		2	30.7 -							x		
	105	8	21			8	11.2 -27.5							x		rib fragments, cranial fragments
	105	9	1	2		3	23.0 -							x		
	105	10	12	3	1	1	24.3		x			x		x		
	105	11	12	2	1	1	21.2		x				x	x		head only
	105	12	21			10+	0.0+							x		
26E	106	1	1	2		1	44.2							x		

Inventory of Commingled Human Remains
Con Ed Chambers Street

Cxt	Bag	Item	Class	Elmt	Subelm	Count	Size (cm)	R	L	Med	Lat	Prox	Dist	Frag	Intact	Comments
	106	2	1	4	3	1	31.8							x		
	106	3	21			2	35.6 -							x		long bone fragments
	106	4	21			4	17.7 -							x		long bone fragments
28	107	1	16	4		28	2.9 -	x				x		x		
	107	2	21			10+	0.0+							x		
	108	1	16	2,3,4		6	8.7 -		x			x		x		neck and proximal shaft
	108	2	8	0	2	1	75.7		x					x		
	108	3	16	1		1	44.3							x		left?
	108	4	21			10+	0.0+							x		tiny misc. fragments
	109	1	8	0	2,3	1	35.1						x	x		
	109	2	8	0	2	1	42.7							x		
	109	3	18	2		1	99.7		x					x		
	109	4	18	2		1	105.1	x				x		x		
	109	5	11	2		1	67.2	x						x		
	109	6	19	1		1	59.9	x						x		
	109	7	13	1		2	39.8 -							x		iliac crest fragments
	109	8	21			8	9.0 - 25.7							x		long bone fragments
	109	9	21			10+	0.0+							x		misc. minute fragments
	110	1	20	2	4	1	64.8		x			x		x		
	110	2	20	2	3	1	63.8	x				x		x		
	110	3	20	2	2	5	59.1	x				x		x		
	110	4	20	2		1	48.3	x				x		x		
	110	5	20	5	1	1	28.5		x						x	some erosion
	110	6	8	0	2	2	30.3 -							x		
	110	7	21			2	40.5 -							x		long bone fragments
	110	8	8	0	2	2	8.8 - 26.0							x		
	110	9	21			10+	0.0+							x		misc. minute fragments
	111	1	9	4		1	200.0	x				x		x		
	111	2	21			10+	0.0+							x		small fragments, humerus fragments
	112	1	8	0	1	1	39.7	x						x		
	112	2	8	0	1	1	30.9		x					x		
	112	3	8	0	2	1	28.3							x		
	112	4	21			2	11.7 -							x		
	113	1	12	2	5	1	52.3		x			x		x		
	113	2	11	2		1	51.4							x		
	113	3	1	1		3	18.3 -							x		
	113	4	16	5		1	45.7							x		
	113	5	21			4	21.5-42.5							x		long bone fragments
	113	6	21			10+	0.0+							x		misc. minute fragments

Cxt	Bag	Item	Class	Elmt	Subelm	Count	Size (cm)	R	L	Med	Lat	Prox	Dist	Frag	Intact	Comments
	114	1	21			12	16.4-35.3							x		tiny misc. fragments; long bone fragments
	114	2	18	2		2	32.5-42.4							x		shaft fragments
	114	3	18	2		3	12.8-97.3		x					x		
	114	4	2	1	1	1	23.6		x						x	
	114	5	13	4		2	20. -25.6							x		rim fragments
	114	6	6	4,6		3	38.6-78.4	x						x		
	114	7	21			10+	0.0+							x		tiny fragments and dirt
28	115	1	16	1		1								x		
	115	2	9	4,5		1		x					x	x		
	115	3	18	2		1		x						x		
	115	4	21			18								x		misc. long bone fragments
	115	5	13	1,2,3		6		x						x		
	115	6	4	0	1	1								x		
	115	7	4	0	2,3,4	8								x		facets and processes
	116	1	13	1,4,5,6		1	139.5		x					x		ilium complete
	116	2	21			2	7.8 - 21.6							x		misc. fragments
	116	3	21			1	28.4							x		misc. fragment
29	117	1	2	1	1	1	23.9		x						x	
	118	1	20	2	1	1	62.4	x					x	x		proximal end missing
	118	2	20	2	0	1	51.1						x	x		head only
	118	3	20	2	0	1	47.5							x		shaft only
	118	4	5	1,2		1	31.9	x				x				
	118	5	20	3	0	1	36.1							x		
	118	6	2	1	1	1	23.0	x							x	
	118	7	1	0		1	27.3							x		
	118	8	21			1	26.8							x		
	118	9	8	0	2	1	55.5							x		
	118	10	5	2,3		2	64.0 -		x					x		MNI=2
	118	11	21			11	8.8 - 45.6							x		rib and misc. fragments
	118	12	21			10+	0.0+							x		tiny fragments and dirt
30	119	1	20	3	0	2	27.7, 27.6								x	some erosion
	119	2	20	3	0	1	27.1					x		x		head missing
	119	3	20	3	0	2	13.4 -							x		fragments mend to complete bone
	119	4	20	2	4	1	72.6	x				x		x		head missing
	119	5	13	1		1	75.7							x		
	119	6	20	1	2,6	3	36.5 -	x	x					x		right talus and navicular, left navicular fragments
	119	7	21			13	5.3 - 33.1							x		misc. small fragments
	119	8	21			10+	0.0+									misc. small fragments and dirt
	120	1	13	1,2		5	21.5 -							x		

Inventory of Commingled Human Remains
Con Ed Chambers Street

Cxt	Bag	Item	Class	Elmt	Subelm	Count	Size (cm)	R	L	Med	Lat	Prox	Dist	Frag	Intact	Comments
	120	2	12	4		1	27.7								x	some erosion
	120	3	12	5		1	17.9								x	
	120	4	12	3	3	1	47.0	x							x	
	120	5	21			3	10.4 -							x		misc. tiny fragments
	120	6	21			10+	0.0+							x		misc. tiny fragments and dirt
31	121	1	9	4		1	59.2							x		
	121	2	8	0	2	1	29.3							x		
	121	3	13	1		2	28.0 -							x		
	121	4	12	2	3	1	60.0	x				x		x		head missing
	121	5	13	1		1	55.3							x		
	121	6	21			8	5.8 - 3.0							x		long bone fragments
	121	7	21			10+	0.0+							x		misc. tiny fragments and dirt
	122	1	12	2	1	1	66.2		x				x	x		proximal end missing
	122	2	1	0		1	30.3							x		vault fragment
	122	3	18	2		1	56.2							x		
	122	4	8	0	2	4	28.1 -							x		
	122	5	11	2,3,4		4	37.4-	x				x	x	x		fragments all from same bone
	122	6	21			10+	0.0+							x		small fragments and dirt
	123	1	11	2		2	34.8-							x		
	123	2	4	21	1	1	32.1							x		
	123	3	8	0	1	1	30.9							x		
	123	4	16	1		1	65.6	x						x		
	123	5	21			9	16.3 -							x		long bone fragments
	123	6	21			10+	0.0+									tiny fragments and dirt
33	125	1	20	1	2	1	62.6		x					x		mostly intact
	125	2	1	12	3	1	48.5	x						x		
	125	3	1	12		1	37.0							x		
	125	4	17	1,2		1	42.6	x							x	mild erosion
	125	5	21			2	8.0 - 72.8							x		long bone fragments
	125	6	8	0	2	1	36.3							x		
	125	7	21			10+	0.0+							x		tiny fragments and dirt

Appendix 6

Artifact catalog

Cxt	Bag #	Item #	Material	Type	Surface Decoration	Body Decoration	Color	Element	Manuf. Tech.	Count	Weight (g)
TRENCH 1											
0	1	1	Porcelain	Insulator or fuse		embossed lettering; obverse :"C.T. & E. SUBWAY CO." converse: "C (surrounded by) "PATD APRIL 14 1908"	white			1	33.8
1	2	1	Iron	Nail					machine-cut	2	20.7
	3	1	Refined earthenware	Yellowware				body		1	4.3
	3	2	Bone	Faunal						2	9.5
	3	3	Iron	Nail (spike)					unidentified	2	35.5
	4	1	Refined earthenware	Whiteware	hand-painted underglaze blue			body		1	0.5
	4	2	Refined earthenware	Creamware				body		1	0.4
	4	3	Bone (tooth)	Faunal						1	6.0
	4	4	Iron	Nail					unidentified	2	12.5
2	5	1	Glass	Bottle, modern		embossed geometric patterns and lettering; base: "CONTENTS 7 1/2 FL OZ.; side: "CLIN... BEVE... NEW YORK, NY".	clear	rim/neck/ body/base	machine-made	##	378.6
3	6	1	Iron	Nail					unidentified	1	14.6
5	7	1	Refined earthenware	Whiteware				body		1	0.7
	7	2	Glass	Bottle			green	body		1	3.4
	7	3	Stoneware	Buff-bodied, salt-glazed				body		1	7.3
	7	4	Refined earthenware	Whiteware				body		1	6.3
	7	5	Iron	Nail					unidentified	4	38.9
6	8	1	Ball clay, white	Tobacco pipe, stem						1	0.7
	8	2	Glass	Window			light yellow			1	0.6
	9	1								10	
7	10	1	Ball clay, white	Tobacco pipe, stem						1	3.6
	11	1	Coarse earthenware	Slipware	slip trailed and combed			body		1	4.9
	11	2	Iron	Nail					unidentified	1	8.9
	11	3	Bone	Faunal						##	32.9
8	12	1	Iron	Nail (spike)					machine-cut	1	43.6
	12	2	Stoneware	Buff-bodied, salt-glazed				body		1	5.9
	12	3	Refined earthenware	Creamware				body		1	1.1
	12	4	Stoneware	Buff-bodied, salt-glazed				body		1	6.4
	12	5	Brick	Brick						1	72.5
	13	1	Stoneware	Buff-bodied, salt-glazed				body		1	2.1
	13	2	Brick	Brick						1	64.2
	13	3	Shell	Oyster						1	32.3
	13	4	Bone	Faunal						17	20.6

Cxt	Bag #	Item #	Material	Type	Surface Decoration	Body Decoration	Color	Element	Manuf. Tech.	Count	Weight (g)
9	14	1	Iron	Nail					unidentified	1	7.4
	14	2	Shell	Oyster						1	3.9
11	15	1	Stoneware	Nottingham-type	hand-painted underglaze blue and brown	engine-turned etched lines and hand-etched floral motif		body		2	53.3
	15	2	Shell	Oyster						3	32.9
	15	3	Bone	Faunal						9	14.3
	15	4	Shell	Clam (bi-valve)						1	9.0
	15	5	Brick	Brick						1	107.0
	15	6	Mortar/Cement	Wall plaster						1	2.5
	15	7	Stone	Granite		cut and polished				1	12.8
	15	8	Shell	Clam (bi-valve)						1	21.6
	15	9	Refined earthenware	Redware, lead-glazed	iron oxide mottling			base		1	23.2
	15	10	Bone	Faunal						1	7.9
	15	11	Refined earthenware	Redware, lead-glazed	iron oxide mottling			base		1	9.1
	15	12	Iron	Nail					unidentified	4	13.9
	15	13	Stone	Quartz						1	1.4
	15	14	Ball clay, white	Tobacco pipe, stem						1	1.6
	15	15	Earthenware	Delftware				base/body		2	14.1
	15	16	Refined earthenware	Creamware				base		3	2.8
12	16	1	Brick	Brick						1	87.8
	16	2	Refined earthenware	Jackfield-type				body		2	19.3
	16	3	Stoneware	Buff-bodied, salt-glazed				rim		1	8.4
	16	4	Refined earthenware	Jackfield-type				body		1	1.7
	16	5	Refined earthenware	Creamware				body		3	9.2
	16	6	Refined earthenware	Whiteware	hand-painted underglaze blue, chinoserie			body		1	0.9
	16	7	Refined earthenware	Whiteware				body		1	0.6
	16	8	Iron	Nail					unidentified	4	60.1
	16	9	Bone	Faunal						3	19.6
	16	10	Ball clay, white	Tobacco pipe, bowl, stem		embossed "W" and "C" on opposite sides of heel				1	4.9
	17	1	Bone	Faunal						4	59.5
	17	2	Iron	Unidentified						3	369.9
	17	3	Mortar/Cement	Lime based mortar						1	9.3
	17	4	Coarse earthenware	Slipware	slip trailed	"pie-crust" rim		rim		1	1.9
	17	5	Earthenware	Delftware				body		1	1.0
	17	6	Wood	sample						1	7.9
	17	7	Coarse earthenware	Ceramic pipe				body		1	24.6

Cxt	Bag #	Item #	Material	Type	Surface Decoration	Body Decoration	Color	Element	Manuf. Tech.	Count	Weight (g)
	17	8	Stone	Cut stone debris						1	12.5
	17	9	Anthracite	Coal						1	7.9
	17	10	Brick	Brick						1	4.3
	17	11	Glass	Window			light green			1	2.9
	17	12	Refined earthenware	Whiteware	hand-painted underglaze blue			body		1	2.0
	17	13	Glass	Bottle			green	body		1	5.0
	17	14	Ball clay, white	Tobacco pipe, stem		Embossed lettering and design: One fragment = "R - B"; Second fragment = repeated leaf design circling stem in two bands				3	5.3
	17	15	Bone	Faunal						4	4.7
	17	16	Refined earthenware	Creamware				body/rim		10	7.1
	17	17	Shell	Unidentified						1	0.2
	17	18	Shell	Oyster						2	1.9
	17	19	Shell	Clam (bi-valve)						1	0.7
13	18	1								1	
14	19	1	brick			arrow				2	.75 (lbs
	20	1	Glass	Bottle			white			1	1.0
	20	2	Refined earthenware	Pearlware	hand-painted underglaze blue			base		1	2.7
	20	3	Brick	Brick						4	3.3
	20	4	Bone	Faunal						3	3.3
	20	5	Mortar/Cement	Lime based mortar						1	0.3
	20	6	Refined earthenware	Whiteware				body		1	0.6
	20	7								1	0.2
	20	8	Shell	Unidentified						1	0.1
	20	9	Iron	Nail					unidentified	1	31.7
	21	1	Glass	Bottle (wine)			dark green		blown-in-mold	7	490.6
	21	2	Coarse earthenware	Slipware	slip trailed			body		2	36.2
	21	3	Bone	Faunal						32	230.3
	21	4	Coarse earthenware	Ceramic pipe						1	70.3
	21	5	Shell	Oyster						3	245.7
	21	6	Stoneware	Nottingham-type	hand-painted underglaze blue	engine-turned etched lines		base		1	50.1
	21	7	Glass	Bottle				body		1	10.7
	21	8	Stoneware	Nottingham-type				handle		1	9.9
	21	9	Porcelain	Chinese export	hand-painted underglaze blue, "Canton" pattern			body		1	4.4
	21	10	Stoneware	Buff-bodied, salt-glazed				body		1	2.4
	21	11	Shell	Clam (bi-valve)						2	9.1

Cxt	Bag #	Item #	Material	Type	Surface Decoration	Body Decoration	Color	Element	Manuf. Tech.	Count	Weight (g)
	21	12	Coarse earthenware	Ceramic pipe						2	99.7
	21	13	Iron	Nail (spike)					extruded wire	1	59.0
	21	14	Ball clay, white	Tobacco pipe, bowl, stem and mouthpiece		embossed letter and spiral rouletting on one stem, "N. GOUD"				4	12.8
	21	15	Iron	Nail						3	42.0
	21	16	Coarse earthenware	Slipware	slip trailed (dot) and combed			rim/body/base		3	9.5
	21	17	Refined earthenware	Creamware				base		1	14.6
	21	18	Refined earthenware	Whiteware				body		1	1.1
	21	19	*Mortar/Cement*	Wall plaster						1	1.8
	21	20	Coarse earthenware	Ceramic pipe						1	4.6
	21	21	Refined earthenware	Rockingham				body		1	1.0
	21	22	Glass	Window			light green			1	2.8
	21	23	Earthenware	Delftware				body		1	2.4
	21	24	Refined earthenware	Pearlware	hand-painted underglaze blue			body		1	0.8
	22	1	Brick	Brick						2	.45 (lbs
	22	2	Iron	Nail (wire)					extruded wire	1	197.5
	23	1	Brick	Brick						1	428.2
	23	2	Bone	Faunal						33	250.2
	23	3	Glass	Bottle (case)			green	body		4	293.3
	23	4	Refined earthenware	Creamware	engine turned banding, red			body		1	0.1
	23	5	Shell	Oyster						4	196.2
	23	6	Refined earthenware	Creamware				body		4	8.8
	23	7	Iron	Unidentified (iron oxide)						1	11.5
	23	8	Iron	Nail					unidentified	3	39.8
	23	9	Stoneware	Buff-bodied, salt-glazed				body		2	14.2
	23	10	Mortar/Cement	Lime based mortar						1	15.2
	23	11	Ball clay, white	Tobacco pipe, stem						3	3.6
	23	12	Glass	Tableware			light yellow	rim	press molded	1	3.9
	23	13	Refined earthenware	Pearlware	hand-painted underglaze blue			body		1	0.3
	23	14	Coarse earthenware	Slipware				base		1	5.9
	23	15	Coarse earthenware	Slipware				base		1	4.3
	23	16	Porcelain	Chinese export	hand-painted, underglaze blue			body		1	0.5
	23	17	Coarse earthenware	Slipware	slip trailed			body		1	3.6
	23	18	Unidentified	Unidentified						1	2.3
	23	19	Earthenware	Delft tile						1	2.3
	23	20	Coarse earthenware	Unidentified						1	2.51
	23	21	Refined earthenware	Redware, lead glazed				rim		1	3.5
	23	22	Refined earthenware	Creamware				body		1	1.7

Cxt	Bag #	Item #	Material	Type	Surface Decoration	Body Decoration	Color	Element	Manuf. Tech.	Count	Weight (g)
	23	23	Refined earthenware	Creamware	yellow glaze			body		1	1.0
	23	24	Stoneware	Buff-bodied, salt-glazed				body		1	4.7
	23	25	Glass	Bottle (wine)			dark green	base	blown-in-mold	2	238.1
15	24	1	Ball clay, white	Tobacco pipe, stem						3	4.9
	24	2	Stone	Cut stone debris						1	20.7
	24	3	Glass	Bottle			dark green			1	6.0
	24	4	Glass	Bottle/Tableware			light green			1	1.1
	24	5	Refined earthenware	Rockingham				rim		1	11.7
	24	6	Bone	Faunal						4	31.1
	24	7	Stoneware	Buff-bodied, salt-glazed				rim		1	10.4
	24	8	Mortar/Cement	Lime based mortar						1	3.4
	24	9	Shell	Clam (bi-valve)						1	1.3
	24	10	Glass	Bottle			dark green			1	1.3
	24	11	Stoneware	Buff-bodied, salt-glazed				body		1	3.2
	24	12	Glass	Window			clear			1	2.9
	24	13	Glass	Window (plate)			clear			1	4.1
	24	14	Glass	Window			clear			2	4.8
	24	15	Refined earthenware	Redware, lead glazed		engine-turned rouletting		body		1	0.9
	24	16	Refined earthenware	Redware, unglazed				body		1	0.9
	24	17	Brick	Brick						1	2.5
	24	18	Stoneware	Buff-bodied, salt-glazed				body		1	1.8
	24	19	Glass	Tableware		press molded checking	clear	body		1	5.5
	24	20	Iron	Nail					unidentified	6	34.8
	24	21	Stoneware	White salt-glazed				rim		1	2.3
	24	22								1	
16	25	1	Iron	Unidentified						1	227.5
	25	2	Glass	Bottle (wine)				base		2	36.6
	25	3	Bone	Faunal						7	6.6
	25	4	Stoneware	Decorative tile	black glaze over slip					1	8.5
	25	5	Refined earthenware	Creamware				rim		1	1.0
	26	1	Coarse earthenware	Ceramic pipe						1	438.9
	26	2	Iron	Nail (wire)					extruded wire	4	38.8
	26	3	Brick	Brick						2	213.5
	26	4	Brick	Brick						2	2.8
	26	5	Wood	Sample						3	3.6
	26	6	Glass	Bottle			dark green	body	blown-in-mold	1	1.5

Cxt	Bag #	Item #	Material	Type	Surface Decoration	Body Decoration	Color	Element	Manuf. Tech.	Count	Weight (g)
	26	7	Stoneware	Decorative tile	black glaze over slip	embossed ridge lines on back to hold mortar, impressed letters "P IIII"		body/edge		2	29.8
18	27	1	Refined earthenware	Unidentified	underglaze blue			body		1	2.6
	27	2	Refined earthenware	Whieldon	underglaze polychrome manganese purple & green, tortoiseshell pattern			body		1	1.5
	27	3	Coarse earthenware	Ceramic pipe				body		1	21.8
	27	4	Glass	Tableware		molded diamond pattern	clear	body	press molded	1	9.5
	27	5	Refined earthenware	Pearlware	hand-painted underglaze polychrome, blue and yellow			body		2	2.2
	27	6	Glass	Bottle/Tableware			clear	body		1	0.4
	27	7	Glass	Window			clear			1	0.2
	27	8	Bone	Faunal						3	28.5
	27	9	Iron	Nail					unidentified	2	36.62
	27	10	Refined earthenware	Pearlware				base		1	2.2
	27	11	Stoneware	Buff-bodied, salt-glazed				rim		1	3.2
	27	12	Bone	Faunal (calcined)						1	0.9
	27	13	Stone	Sandstone sample						2	6.4
	27	14	Coarse earthenware	Roofing tile				edge		1	27.6
	27	15	Coarse earthenware	Slipware	slip trailed and combed			body/rim		3	7.4
	27	16	Glass	Window			light green			8	3.4
	27	17	Bone	Faunal						1	0.0
	27	18	Ball clay, white	Tobacco pipe, bowl,stem				stem and bowl		8	15.1
	27	19	Glass	Bottle (wine)				body/base		9	1.95 (lbs.
19	28	1	Lead	Slag/production debris						1	0.9
	28	2	Coarse earthenware	Ceramic pipe						2	41.7
	28	3	Glass	Window						1	12.8
	28	4	Coarse earthenware	Ceramic pipe						1	12.5
	28	5	Glass	Bottle (modern)			clear	body		1	4.0
	28	6	Refined earthenware	Pearlware	hand-painted underglaze polychrome, blue and yellow			body		1	1.1
	28	7	Stoneware	Ceramic pipe				body		1	72.8
	28	8	Stoneware	Ceramic pipe		etched, parallel lines on unglazed exterior		body		1	65.8
	28	9	Brick	Brick						1	33.7
20	29	1	Stoneware	Ceramic pipe				body		2	157.7
	29	2	Iron	Unidentified (iron oxide)						1	64.2
	29	3	Glass	Bottle (wine)			dark green	base	free blown, rough pontil	1	236.5
	29	4	Glass	Bottle		embossed lettering: "...& TOM...CK"		clear	blown-in-mold	1	5.5
	29	5	Ball clay, white	Tobacco pipe, stem				stem and bowl		1	6.3
	29	6	Refined earthenware	Whiteware	underglaze blue					1	0.5

Cxt	Bag #	Item #	Material	Type	Surface Decoration	Body Decoration	Color	Element	Manuf. Tech.	Count	Weight (g)
	29	7	Brick	Brick						1	3.6
	29	8	Glass	Bottle (modern)			green			2	3.0
21	30	1	Refined earthenware	Whiteware				body		1	5.7
	30	2	Unidentified	Unidentified						1	11.8
	30	3	Stoneware	Buff-bodied, salt-glazed				body		1	9.4
	30	4	Refined earthenware	Pearlware	transfer-printed underglaze blue			body		1	5.5
	30	5	Refined earthenware	Pearlware				body		1	9.3
	30	6	Bone	Faunal						1	6.0
	30	7	Refined earthenware	Creamware	slip trailed annular polychrome, orange and brown			body		1	4.8
	30	8	Mortar/cement	Lime based mortar						2	17.4
	30	9	Glass	Bottle (wine)			light brown	base		1	15.9
	30	10	Refined earthenware	Whiteware						1	11.4
	30	11	Refined earthenware	Whiteware (ironstone)	maker's mark			body		2	12.9
	30	12	Wood	Sample						1	21.3
	30	13	Coarse earthenware	Roofing tile						1	98.1
	30	14	Iron	Nail					machine-cut	6	70.7
	30	15	Coarse earthenware	Coarse Agate ware				body (door knob)		1	41.1
	30	16	Refined earthenware	Whiteware				body		1	1.7
	30	17	Glass	Bottle			clear	body		1	3.9
	30	18	Refined earthenware	Creamware				body		1	0.5
	30	19	Refined earthenware	Creamware				body		1	1.4
22	31	1	Iron	Nail (spike)					hand-forged	4	210.5
	31	2	Wood	Sample						2	44.3
	31	3	Stoneware	Ceramic pipe		etched, parallel lines on exterior		body		1	90.2
	31	4	Stoneware	Floor tile		embossed geometric patterns				1	47.7
	31	5	Glass	Window (plate)						1	37.6
	31	6	Stoneware	Building tile						1	83.6
	31	7	Bone	Faunal						1	27.2
	31	8	Glass	Marble					machine made	1	5.2
	31	9	Glass	Bottle			dark brown	body		1	12.1
	31	10	Porcelain	Unidentified (calcined)						1	9.5
	31	11	Procelain	Porcelaineous				body		1	6.7
	31	12	Bone	Faunal						2	0.8
	31	13	Bone	Faunal						2	1.9
	31	14	Porcelain	Hotel ware				body		1	5.5
	31	15	Brass	Threaded connector						1	4.8
	31	16	Stoneware	Floor tile						1	5.5
	31	17	Unidentified	Unidentified						1	6.9

Cxt	Bag #	Item #	Material	Type	Surface Decoration	Body Decoration	Color	Element	Manuf. Tech.	Count	Weight (g)
	31	18	Refined earthenware	Pearlware	engine turned annular banding, brown			body		1	8.9
	31	19	Unidentified	Unidentified						1	9.5
	31	20	Glass	Bottle (modern)	production marks		clear	base/body/rim		12	89.2
	31	21	Glass	Window (wire reinforced plate)						8	101.0
	31	22	Glass	Bottle (modern)						15	34.5
	31	23	Iron	Nail (wire)					extruded wire	3	68.7
	31	24	Glass	Bottle (wine)			light green/clear	body/rim		2	34.0
	31	25	Glass	Window						2	5.8
	31	26	Glass	Tableware		embossed vertical lines	clear	body/rim	press molded	3	6.7
	31	27	Refined earthenware	Redware, lead glazed		engine-turned rouletting				1	4.1
	31	28	Unidentified	Unidentified						1	11.7
	31	29	Glass	Bottle (modern)			clear	body		3	21.0
	31	30	Iron	Nail (wire)					extruded wire	2	16.3
	31	31	Glass	Bottle (modern)	yellow, machine-painted lettering: "DIX A-DEE BE[verage] BROOK[lyn]		clear	body		1	6.0
	31	32	Glass	Window						3	33.9
	31	33	Refined earthenware	Redware				body		1	12.2
	31	34	Glass	Bottle (modern)			clear	body		3	12.7
	31	35	Stoneware	Unidentified						1	27.7
	31	36	Stoneware	Buff-bodied, salt glazed				body		1	4.9
	31	37	Aliminum	Chain						1	1.5
	31	38	Porcelain	Porcelaineous				body		1	3.2
	31	39	Bone	Faunal						1	0.3
	31	40	Glass	Bottle			green	body		3	3.3
	31	41	Refined earthenware	Redware, lead glazed				body		1	1.5
	31	42	Refined earthenware	Whiteware				rim		1	0.5
	31	43	Refined earthenware	Creamware				body		2	1.3
	31	44	Glass	Bottle/Tableware			light brown	body		1	0.1
	31	45	Glass	Bottle (modern)			brown	body		1	0.5
	31	46	Glass	Window			clear			2	7.9
	31	47	Glass	Window			clear			1	0.5
	32	1	Bone	Faunal						2	56.1
	32	2	Glass	Bottle (wine)			brown	body/neck and rim	free-blown, laic	3	43.0
	32	3	Iron	Nail					unidentified	2	35.0

Cxt	Bag #	Item #	Material	Type	Surface Decoration	Body Decoration	Color	Element	Manuf. Tech.	Count	Weight (g)
	32	4	Unidentified	Unidentified						1	25.5
	32	5	Stoneware	Grey-bodied, salt glazed						1	5.0
	32	6	Refined earthenware	Redware						1	15.3
	32	7	Refined earthenware	Jackfield-type				bottle/container rim and lip		1	6.2
	32	8	Asphalt	Roofing/Road Tar						3	3.5
	32	9	Refined earthenware	Creamware				body		1	4.5
	32	10	Ball clay, white	Tobacco pipe, stem				stem		1	2.6
	32	11	Refined earthenware	Redware				body		1	2.5
	32	12	Bone	Faunal						1	4.1
	32	13	Glass	Bottle			light green	body		1	2.1
	32	14	Refined earthenware	Whiteware				body/rim		2	1.5
	32	15	Stoneware	Grey-bodied, salt glazed				body		1	2.3
	32	16	Refined earthenware	Creamware				body		1	0.7
	33	1	Glass	Window			light green			1	0.3
	33	2	Stoneware	Buff-bodied, salt glazed				rim		1	7.1
	33	3	Bone	Faunal						1	5.9
	33	4	Iron	Nail (wire)					extruded wire	1	17.8
	33	5	Refined earthenware	Whiteware				body		1	1.2
TRENCH 2											
23	34	1	Glass	Bottle (modern)				body		1	3.1
	34	2	Refined earthenware	Redware				body		1	6.9
	34	3	Refined earthenware	Redware				body		1	13.6
	34	4	Refined earthenware	Creamware	transfer-printed, black			base		1	1.4
	34	5	Stoneware	Buff-bodied, salt glazed	hand-painted underglaze blue			rim		1	80.0
	34	6	Bone	Faunal						2	64.2
	34	7	Shell	Oyster						6	174.6
24	35	1	Refined earthenware	Redware				body		1	65.0
	35	2	Refined earthenware	Redware, lead glazed				body		1	18.1
	35	3	Refined earthenware	Redware				body		9	27.0
	35	4	Refined earthenware	Redware, lead glazed				body		1	4.0
	35	5	Shell	Oyster						1	34.4
	35	6	Stoneware	Buff-bodied, salt glazed				body		1	17.7
	35	7	Refined earthenware	Whiteware (ironstone)				base		1	6.1
	35	8	Refined earthenware	Creamware				body		1	0.2
	35	9	Stoneware	Nottingham-type	hand-painted underglaz	engine-turned etched lines		body		1	4.0
	35	10	Glass	Window			light yellow			2	2.4
	35	11	Iron	Nail					machine-cut	2	27.5

Cxt	Bag #	Item #	Material	Type	Surface Decoration	Body Decoration	Color	Element	Manuf. Tech.	Count	Weight (g)
	35	12	Unidentified	Unidentified						1	8.9
	35	13	Bone	Faunal						4	10.8
	35	14	Refined earthenware	Creamware				body/base		6	13.7
	35	15	Ball clay, white	Tobacco pipe, stem				stem		1	3.3
	35	16	Porcelain	Chinese Export	hand-painted, underglaze blue			body/base		1	0.8
	35	17	Bone	Faunal						1	0.4
	35	18	Porcelain	Chinese Export	hand-painted underglaze blue			body		1	2.1
	35	19	Refined earthenware	Redware, lead glazed				body		1	1.4
	35	20	Refined earthenware	Redware, lead glazed				body		1	1.1
	35	21	Glass	Bottle (wine)			dark green	base/body	free-blown	5	161.3
	36	1	Brick	Brick						1	1.9 (lbs.
	36	2	Shell	Oyster						1	47.1
	36	3	Stoneware	White salt-glazed				base (teacup)		1	3.3
	36	4	Bone	Faunal						1	14.6
	37	1	Nail							3	
	38	1	Bone	Faunal						5	14.2
	38	2	Refined earthenware	Creamware				base		1	2.3
	38	3	Stoneware	Grey-bodied, salt glazed				base		1	3.4
	38	4	Iron	Nail (spike)					unidenitified	1	54.4
	38	5	Refined earthenware	Redware, lead glazed				base		1	16.7
25	39	1	Stoneware	White salt-glazed				rim/body/base		1	24.2
	39	2	Refined earthenware	Redware, lead glazed				body		1	8.8
	39	3	Glass	Bottle (wine)				body		2	12.6
	39	4	Bone	Faunal						1	11.0
	39	5	Iron	Nail					unidenitified	1	37.2
	39	6	Refined earthenware	Creamware		engine-turned rouletting		rim		2	3.9
	39	7	Iron	Screw						1	12.9
	39	8	Glass	Bottle			green	body		1	2.7
	39	9	Refined earthenware	Whiteware				body		1	0.4
	39	10	Glass	Bottle (modern)			clear	body		1	4.9
	39	11	Shell	Oyster						2	32.3
26	40	1	Refined earthenware	Pearlware				body		1	2.8
	40	2	Iron	Nail					unidenitified	1	8.2
	41	1								1	
	41	2	Refined earthenware	Pearlware	hand-painted underglaze blue, chinoieserie			body		1	0.8
	41	3	Refined earthenware	Creamware				body		3	0.6
	41	4	Unidentified	Unidentified						1	56.2
	41	5	Iron	Nail					unidentified	1	8.4

Cxt	Bag #	Item #	Material	Type	Surface Decoration	Body Decoration	Color	Element	Manuf. Tech.	Count	Weight (g)
	41	6	Stoneware	Grey-bodied, salt glazed				handle		1	16.8
	41	7	Stoneware	Grey-bodied, salt glazed				body		1	9.2
	41	8	Refined earthenware	Rockingham				body		1	1.8
26E	42	1	Refined earthenware	Creamware		feather edged		rim		1	14.4
	42	2	Stoneware	Grey-bodied, salt glazed	hand-painted underglaze blue			rim		1	28.0
	43	1	Brick	Brick						1	381.7
	43	2	Shell	Clam (bi-valve)						1	2.7
	43	3	Bone	Faunal						1	1.1
28	44	1	Bone	Faunal						11	39.7
	44	2	Refined earthenware	Pearlware	hand-painted underglaze blue, chinoieserie			body		1	0.6
	44	3	Bone	Faunal (tooth)						2	10.4
	44	4	Stoneware	Grey-bodied, salt glazed	hand-painted underglaze blue			body		1	3.1
	44	5	Glass	Bottle/Tableware			clear	body		1	1.5
	44	6	Glass	Window			clear			1	1.6
	45	1	Ball clay, white	Tobacco pipe, stem				stem		1	1.8
	46	1	Iron	Nail					unidentified	2	20.3
	47	1	Bone	Faunal						3	44.2
	47	2	Iron	Nail					unidentified	1	5.9
29	48	1	Bone	Faunal						3	82.6
	48	2	Iron	Nail					unidentified	4	64.4
	48	3	Iron	Nail					unidentified	2	37.7
31	49	1	Iron	Nail (wire)					extruded wire	1	13.9
	49	2	Glass	Unidentified			white			1	2.5
	49	3	Bone	Faunal						1	10.4
	49	4	Glass	Window			clear			1	2.8
	49	5	Refined earthenware	Creamware				body		1	0.3
	50	1	Porcelain	Chinese export	hand-painted underglaze blue, debased "canton" style			body		1	9.2
	50	2	Refined earthenware	Whiteware				base		1	6.5
	50	3	Earthenware	Delftware	hand-painted underglaze blue, chinoieserie			body		1	1.6
	50	4	Shell	Clam (bi-valve)						1	0.5
	50	5	Refined earthenware	Redware, lead glazed				body		1	3.3
	50	6	Bone	Faunal						2	0.4
	50	7	Refined earthenware	Creamware				body		1	0.7
32	51	1	Brick	Brick						2	4.6 (lbs.
	52	1	Brick	Brick						2	8 (lbs.)
	53	1	Glass	Lamp					red	5	102.7
	53	2	Refined earthenware	Pearlware	hand-painted underglaze blue, chinoieserie			base (teacup)		1	24.6
	53	3	Iron	Nail					unidentified	4	67.4

Cxt	Bag #	Item #	Material	Type	Surface Decoration	Body Decoration	Color	Element	Manuf. Tech.	Count	Weight (g)
	53	4	Glass	Bottle			green	body		1	18.1
	53	5	Refined earthenware	Buff-bodied, lead glazed	slip trail, brown, "worm"			body		1	16.3
	53	6	Glass	Bottle			brown	body		1	3.7
	53	7	Stoneware	Buff-bodied, salt glazed				body		1	7.6
	53	8	Unidentified	Unidentified						1	4.9
	53	9	Iron	Nail					unidentified	2	29.0
	53	10	Refined earthenware	Whiteware				body		1	21.2
	53	11	Bone	Faunal						1	4.6
	53	12	Glass	Bottle			clear	bosy		1	1.0
	53	13	Bone	Faunal						2	1.4
	53	14	Refined earthenware	Redware, lead glazed				body		1	3.3
	53	15	Refined earthenware	Whiteware				body		1	0.4
	53	16	Refined earthenware	Whiteware				body		2	5.7
	53	17	Glass	Bottle			light greeen	body		1	12.2
	53	18	Glass	Window			clear			1	0.8
	53	19	Coarse Earthenware	Slipware				body		1	2.0
	53	20	Shell	Clam (bi-valve)						1	1.5
	54	1	Stoneware	Buff-bodied, salt glazed				base		1	71.1
	54	2	Glass	Lamp			red			14	135.9
	54	3	Glass	Window (wire reinforced plate)						1	20.9
	54	4	Iron	Nail (spike)					hand-forged	2	498.5
	54	5	Stoneware	Albany sllip				body		1	27.9
	54	6	Bone	Faunal						2	8.0
	54	7	Iron	Nail						2	26.7
	55	1	Coarse Earthenware	Ceramic pipe						1	111.9
	55	2	Iron	Nail					unidentified	1	25.0
	55	3	Iron	Nail					unidentified	1	7.6
	55	4	Coarse Earthenware	Ceramic pipe						1	2.8
	55	5	Glass	Bottle			green	body		1	2.9
	55	6	Stoneware	Buff-bodied, salt glazed				body		1	5.3
	55	7	Iron	Nail					machine-cut	1	5.7
	55	8	Brick	Brick (modern construction block)						1	585.7
	55	9	Glass	Window			clear			1	0.5
	55	10	Brick	Brick						1	0.6
	55	11	Glass	Window						1	1.8
	55	12	Refined earthenware	Unidentified						1	2.1
	56	0								0	00
14	57	1	Brick							2	19 (lbs.)

Appendix 7

Data sheets

HUMAN SKELETON CODING KEY

CLASS		ELEMENT		SUBELEMENT	
1	CRANIUM	0	UNIDENTIFIABLE		
		1	FRONTAL	1	ORBIT
		2	PARIETAL		
		3	TEMPORAL	1	MASTOID
				2	PETROUS
				3	AUDITORY MEATUS
				4	MANDIBULAR FOSSA
				5	ZYGOMATIC ARCH
				6	MALLEUS
				7	INCUS
				8	STAPES
		4	OCCIPITAL	1	FORAMEN MAGNUM
				2	CONDYLE
				3	NUCHAL REGION
		5	MAXILLA	1	ALVEOLUS
				2	ZYGOMATIC PROCESS
		6	PALATINE		
		7	ZYGOMATIC		
		8	NASAL		
		9	LACRIMAL		
		10	SPHENOID		
		11	ETHMOID		
		12	MANDIBLE	1	ALVEOLUS
				2	MENTAL EMINENCE
				3	CONDYLE
				4	RAMUS
				5	CORONOID PROCESS
		13	INCA BONE		
2	DENTITION	0	UNIDENTIFIABLE		
		1	MAXILLARY	1	MEDIAL INCISOR
				2	LATERAL INCISOR
				3	UNIDENTIFIABLE INCISOR
				4	CANINE
				5	PREMOLAR 1
				6	PREMOLAR 2
				7	UNIDENTIFIABLE PREMOLAR
				8	MOLAR 1
				9	MOLAR 2
				10	MOLAR 3
				11	UNIDENTIFIABLE MOLAR
		2	MANDIBULAR	1	MEDIAL INCISOR
				2	LATERAL INCISOR
				3	UNIDENTIFIABLE INCISOR
				4	CANINE
				5	PREMOLAR 1
				6	PREMOLAR 2
				7	UNIDENTIFIABLE PREMOLAR
				8	MOLAR 1
				9	MOLAR 2
				10	MOLAR 3
				11	UNIDENTIFIABLE MOLAR
		3	SUPERNUMERARY TOOTH		
3	HYOID				
4	VERTEBRA	0	UNIDENTIFIABLE	0	UNIDENTIFIABLE
		1	C1 - ATLAS	1	BODY
		2	C2 - AXIS	2	TRANSVERSE PROCESS
		3	C3	3	SPINOUS PROCESS
		4	C4	4	ARTICULAR FACET
		5	C5		
		6	C6		
		7	C7		
		8	UNIDENTIFIABLE CERVICAL		
		9	T1		
		10	T2		
		11	T3		
		12	T4		
		13	T5		
		14	T6		
		15	T7		
		16	T8		
		17	T9		
		18	T10		
		19	T11		
		20	T12		
		21	UNIDENTIFIABLE THORACIC		

CLASS		ELEMENT		SUBELEMENT	
4	VERTEBRA (con't)	22	L1		
		23	L2		
		24	L3		
		25	L4		
		26	L5		
		27	UNIDENTIFIABLE LUMBAR		
		28	SUPERNUMERARY VERTEBRA		
5	CLAVICLE	0	UNIDENTIFIABLE		
		1	STERNAL END		
		2	SHAFT		
		3	ACROMIAL END		
6	SCAPULA	0	UNIDENTIFIABLE		
		1	ACROMIAL PROCESS/SPINE		
		2	COROCOID PROCESS		
		3	GLENOID CAVITY		
		4	MEDIAL BORDER		
		5	LATERAL BORDER		
		6	INFERIOR ANGLE		
7	STERNUM	0	UNIDENTIFIABLE		
		1	MANUBRIUM		
		2	BODY		
8	RIBS	0	UNIDENTIFIABLE	1	VERTEBRAL END
		1	1st RIB	2	SHAFT
		2	2nd RIB	3	STERNAL END
		3	3rd RIB		
		4	4th RIB		
		5	5th RIB		
		6	6th RIB		
		7	7th RIB		
		8	8th RIB		
		9	9th RIB		
		10	10th RIB		
		11	11th RIB		
		12	12th RIB		
9	HUMERUS	0	UNIDENTIFIABLE		
		1	HEAD		
		2	GREATER TUBERCLE		
		3	LESSER TUBERCLE		
		4	SHAFT		
		5	EPICONDYLE		
		6	DISTAL ARTICULAR SURFACE		
10	RADIUS	0	UNIDENTIFIABLE		
		1	HEAD		
		2	SHAFT		
		3	DISTAL ARTICULAR SURFACE		
11	ULNA	0	UNIDENTIFIABLE		
		1	OLECRANON PROCESS		
		2	CORONOID PROCESS		
		3	SHAFT		
		4	DISTAL ARTICULAR SURFACE		
12	HAND	0	UNIDENTIFIABLE		
		1	CARPAL	0	UNIDENTIFIABLE
				1	TRAPEZIUM
				2	TRIQUETRAL
				3	SCAPHOID
				4	LUNATE
				5	PISIFORM
				6	TRAPEZOID
				7	HAMATE
				8	CAPITATE
				9	SESAMOID
		2	METACARPAL	0	UNIDENTIFIABLE
				1	1st METACARPAL
				2	2nd METACARPAL
				3	3rd METACARPAL
				4	4th METACARPAL
				5	5th METACARPAL

CLASS		ELEMENT		SUBELEMENT	
12	HAND (con't)				
		3	PHALANGE, PROXIMAL	0	UNIDENTIFIABLE
				1	1st
				2	2nd
				3	3rd
				4	4th
				5	5th
		4	PHALANGE, INTERMEDIATE	0	UNIDENTIFIABLE
				1	1st
				2	2nd
				3	3rd
				4	4th
		5	PHALANGE, DISTAL	0	UNIDENTIFIABLE
				1	1st
				2	2nd
				3	3rd
				4	4th
				5	5th
		6	PHALANGE, UNIDENTIFIABLE		
		7	SUPERNUMERARY BONE		
13	OS COXA	0	UNIDENTIFIABLE		
		1	ILIUM		
		2	ISCHIUM		
		3	PUBIC BONE		
		4	ACETABULUM		
14	SACRUM	0	UNIDENTIFIABLE		
		1	SUPERIOR ARTICULAR SURFACE		
		2	BODY		
		3	WING		
		4	INFERIOR SACRUM		
		5	MEDIAN CREST		
		6	INFERIOR ARTICULAR SURFACE		
15	COCCYX				
16	FEMUR	0	UNIDENTIFIABLE		
		1	HEAD		
		2	GREATER TROCHANTER		
		3	LESSER TROCHANTER		
		4	SHAFT		
		5	CONDYLE		
17	PATELLA	0	UNIDENTIFIABLE		
		1	ARTICULAR SURFACE		
		2	APEX		
18	TIBIA	0	UNIDENTIFIABLE		
		1	CONDYLE		
		2	SHAFT		
		3	MEDIAL MALLEOLUS		
		4	DISTAL ARTICULAR SURFACE		
19	FIBULA	0	UNIDENTIFIABLE		
		1	HEAD		
		2	SHAFT		
		3	LATERAL MALLEOLUS		
19	FOOT	0	UNIDENTIFIABLE		
		1	TARSALS	0	UNIDENTIFIABLE
				1	CALCANEUS
				2	TALUS
				3	MEDIAL CUNEIFORM
				4	INTERMEDIATE CUNEIFORM
				5	LATERAL CUNEIFORM
				6	NAVICULAR
				7	CUBOID
				8	SESAMOID
		2	METATARSAL	0	UNIDENTIFIABLE
				1	1st METATARSAL
				2	2nd METATARSAL
				3	3rd METATARSAL
				4	4th METATARSAL
				5	5th METATARSAL

CLASS		ELEMENT		SUBELEMENT	
19	FOOT (con't)				
		3	PHALANGE, PROXIMAL	0	UNIDENTIFIABLE
				1	1st
				2	2nd
				3	3rd
				4	4th
				5	5th
		4	PHALANGE, INTERMEDIATE	0	UNIDENTIFIABLE
				1	1st
				2	2nd
				3	3rd
				4	4th
		5	PHALANGE, DISTAL	0	UNIDENTIFIABLE
				1	1st
				2	2nd
				3	3rd
				4	4th
				5	5th
		6	PHALANGE, UNIDENTIFIABLE		
		7	SUPERNUMERARY BONE		
21	UNIDENTIFIABLE				

INVENTORY OF COMMINGLED REMAINS

Con Ed Chambers Street - Human Remains Analysis

Bag	Cxt	Class	Elmt	Subelmt	Count	Size	R	L	Med	Lat	Prox	Dist	Frag	Intact	Comments
							☐	☐	☐	☐	☐	☐	☐	☐	

Date(s): _____ HAA, Inc. Recorder: _____

COMMINGLED REMAINS - BASIC ANALYSIS

Con Ed Chambers Street

Cxt #	Total Count	MNI	Sex	Age	Pathology	Description/Refit
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	
			M ☐ F ☐ I ☐		☐	

Date(s): ______________ HAA, Inc. Recorder: ______________

TAPHONOMY RECORDING FORM

Con Ed Chambers Street - Human Remains Analysis

					External Modification				Fracturing		
Bag	Cxt	Class	Elmt	Subelmt	Discoloration	Exfoliation	Rodent	Fungus	19th c	20th c	Description
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
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					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
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					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	
					☐	☐	☐	☐	☐	☐	

Date(s): ______________

Recorder: ______________

Appendix 8

Age and sex data

Con Ed, Chambers Street Monitoring
Sex and Age Determinations, Commingled Human Remains

Bag #	Item	Class	Sex	Age	Basis of Determinations
58	2,4,5	12	I	10-15 years	stage of hand bone development (Bass 1987)
60	misc.		I	Adult	
61	1-3	11	F?	Adult	gracile ulna
62	misc.		I	Adult	
63	misc.		I	Adult	
64	misc.		I	Adult	
65	4	5	M?	Adult	robust clavicle
66	misc.		I	Adult	
67	3	5	F?	Adult	gracile clavicle
68	misc.		I	Adult	
69	3	8	F?	Young adult	gracile ribs
71-74	misc.		M	Young ddult	Burial 2 (removed). Large mandible; incomplete root dev't of 3d molar; C2, C3 vertebral rings billowed.
75	4	21	I	Adult	
75	1	1	I	Subadult	infant: foramen magnum incomplete; humerus and ribs
76	1	11	M?	Young adult	very robust ulna
77	3	1	I	Adult	cranial bones
77	3	1	I	Subadult	immature cranial bones
78	2	21	I	Young adult	very little attrition on tooth
79	1,2	18,19	I	Young adult	
81	1	13	F?	30-35 years	age, sex: pubic bone (Krogman, 1962)
81	5	1,8	I	Subadult	gracile, immature cranial and rib fragments
82	1	1	I	Adult	
83	4,18	8	I	Subadult	Subadult---gracile, immature ribs
83		8	I	Young adult	distal end of rib unfused
84	3	10	I	15-18 years	epiphyses unfused
85	8	10	M	Young adult	very robust radius
86	12	2	I	Adult	
87	3	9	M	Adult	robust humeral head
88	1	12	M	Adult	robust mandible
89	4	6	M?	Adult	robust scapula, ribs
90-93	misc.		M	Adult	Burial 7 (removed). Robust ulna, radius, phalanges, foot bones.
94	misc.		I	Adult	
95	2	2	I	Young adult	little attrition on premolar
96	12	3	M?	Older adult	osteoarthritis; robust phalanges
97	6	11	M	Middle-aged adult	very robust ulna and radial tuberosity
98	misc.		I	Adult	

Con Ed, Chambers Street Monitoring
Sex and Age Determinations, Commingled Human Remains

Bag #	Item	Class	Sex	Age	Basis of Determinations
99	1	16	M	Adult	max femoral head diam =49.50mm (Thieme, 1957)
100	3	13	I	Adult	iliac crest
100	1	8	I	Subadult	Subadult ribs--small, gracile shafts
102	2,5	1	M	Adult	prominent nuchal crest; occipital proturberance
103	misc.		I	Adult	
104	misc.		I	Adult	
105	misc.		I	Adult	
106	misc.		I	Adult	
108	3	16	F	Adult	max femoral head diam =41.20mm (Thieme, 1957)
109	misc.		I	Adult	
110	1-5	20	M	Adult	very robust foot bones
111	1	9	M?	Adult	long humeral shaft
112	misc.		I	Adult	
113	misc.		I	Adult	
114	misc.		I	Adult	
115	misc.		I	Adult	
116	1	13	F	19-24 years	wide sciatic notch; ageing: Lovejoy & Meindl (1989)
117	1	2	I	Adult	
118	10	5	M	Adult	robust clavicle
118	10	5	F	Adult	gracile clavicle
119	misc.		I	Adult	
120	misc.		I	Adult	
121	misc.		I	Adult	
122	5	11	M?	Adult	robust ulna
123	4	16	F?	Adult	gracile femoral neck
125	misc.		I	Adult	

Appendix 9

Qualifications

Hartgen Archeological Associates, Inc.

Cultural Resource Specialists

1744 WASHINGTON AVENUE EXT. • RENSSELAER, NEW YORK 12144

KAREN S. HARTGEN, RPA

Qualifications: **36 CFR 61 Qualified Archeologist**

Education:

State University of New York at Albany
Master of Arts, Anthropology, December 1988

State University of New York at Albany
Bachelor of Arts, Anthropology, January 1970

Experience:

March 1973 to Present

President and Principal Investigator
Hartgen Archeological Associates, Inc.

I have directed the cultural resource management firm since 1973, completing over 2500 cultural resource projects in New York and New England. The firm currently has a full time staff of 25 and a trained seasonal staff of 40. We provide services in historical documentation, site file searches, field reconnaissance, archeological survey and excavation, artifact preservation, collection management, cartography, GIS, architectural history, historic structure survey, National Register nominations, Environmental Impact Evaluations as mandated under NEPA, NHPA, SHPA and SEQR. Archeological surveys include initial surveys to locate sites (Phase IA and IB), development of research designs and field methodologies to identify sites (Phase II), and subsequently data retrieval as mitigating measures (Phase III).

June 1974 to 1978

New York State Museum and Science Service
State Education Department, Albany
Assistant Highway Salvage Coordinator

Administration and coordination of the Highway Salvage Archeology Program for New York State during field seasons. Intermediary between various State agencies and cooperating institutions in the process of project evaluation and impact mitigation. Also prepared detailed financial reports for Federal reimbursement.

Professional Affiliations:

Registered Professional Archaeologist (RPA)
Adjunct Research Associate, University at Albany, SUNY

Board Member, Rensselaer County Historic Society (RCHS)
Chair, RCHS Preservation Committee
Board Member, Iroquois Indian Museum
State Plan for Historic Resources Steering Committee Member, for Office of Parks, Recreation and Historic Preservation
Town Historian, North Greenbush

American Cultural Resources Association
Archaeological Conservancy
Archaeological Institute of America
Council for Northeast Historic Archaeology
Eastern States Archeological Federation
Greenbush Historical Society
Historic Albany Foundation
The Holland Society of New York
Hudson-Mohawk Industrial Gateway
Maine Archaeological Society
Maryland Archeological Society
National Trust for Historic Preservation
The Native American Institute at Columbia-Green Community College
New Hampshire Archaeological Society
New Hampshire Preservation Alliance
New York Archaeological Council
New York State Archaeological Association
Northeastern Anthropological Association
Preservation League of New York State
Society of American Archaeology
Society of Historic Archeology
Scenic Hudson
Society for Industrial Archeology
Vermont Archaeological Society
Women's Transportation Seminar

Former President, New York State Archaeological Association (NYSAA)
Former Board Member, American Cultural Resources Association (ACRA)
Former Board Member, Cornell Cooperative Extension of Rensselaer County
Former President, New York Archaeological Council (NYAC)

Publication:

1997 Preserving Albany's Past: The Battle over the Broadway-Maiden Lane Archeological Site. *De Halve Maen*, The Holland Society of New York.

Hartgen Archeological Associates, Inc.

Cultural Resource Specialists

CAROL A. RAEMSCH, Ph.D.

QUALIFICATIONS: **36 CFR 61 qualified archeologist**

EDUCATION:

University at Albany, Albany, New York
Doctor of Philosophy, Biological Anthropology/Bioarchaeology (1995)
Master of Arts, Anthropology (1991)

Skidmore College, Saratoga Springs, New York
Bachelor of Arts, Anthropology (1988)

SPECIAL TRAINING:

Health and Safety Training for Archaeologists
Sponsored by Panamerican Consultants, Inc. and the NYS Occupational Safety and Health Training and Education Program, Albany, NY (2001)

NAGPRA's Evolving Legacy
Training course in Native American Graves Protection and Repatriation Act legislation, sponsored by the University of Nevada, Philadelphia, PA (1998)

***Historic* Preservation Law Course**
Section 106 training course jointly sponsored by the Advisory Council on Historic Preservation and the University of Nevada (1997)

Environmental Report Preparation Seminar & Environmental Compliance Training Course
Seminar and course sponsored by the Federal Energy Regulatory Commission, Office of Pipeline Regulation (1997)

EMPLOYMENT:

January 2002-present **Manager, New York City Office, Bioarcheologist**
Hartgen Archeological Associates, Inc.

Manager of New York City office of HAA, Inc. Responsible for managing and directing Phase I, II, and III field projects and archeological monitoring; report and proposal preparation. Specialized in burial excavation; identification, analysis, interpretation of human skeletal remains from archeological contexts; NAGPRA inventory; consultation concerning historic and prehistoric burial sites.

May 1998 to Dec. 2001 **Project Manager & Bioarcheologist**
Hartgen Archeological Associates, Inc.

Responsible for managing and directing Phase I, II, and III field projects, and all burial-related projects; report, proposal, and company qualifications preparation; management of company's customized artifact database. Manager of all New York State DOT and State of Connecticut cultural resource studies.

May 1996 to May 1998	**Project Director & Bioarcheologist** **Hartgen Archeological Associates, Inc.** Responsible for managing and directing Phase I and II field projects; report & proposal preparation; responsible for all burial-related projects.
July 1995 to July 1998	**Associate editor, *Northeast Anthropology*** **Institute for Archaeological Studies, University at Albany** Coordinate publication of peer-reviewed archaeological and anthropological journal. Includes review, editing, and type-setting of manuscripts.
Nov. 1993 to May 1996	**Forensic Consultant** **Self-Employed** Identification, analysis, and curation of human skeletal remains from archaeological contexts, university and museum collections, and private collections. Documentation of skeletal remains for compliance with Native American Graves Protection and Repatriation Act (NAGPRA).
Aug. 1993 to May 1996	**Lecturer** **Department of Anthropology, University at Albany** Teaching of introductory, upper-level, and graduate courses in anthropology. Advisement of undergraduate majors.
Aug. 1993 to May 1995	**Lecturer** **Department of Anthropology, Skidmore College;** **Departments of Anthropology and Continuing Education,** **State University College at Oneonta** Taught semester-length courses in anthropology. **Department of Physical Therapy, Russell Sage College** Co-taught semester-length lab course in human anatomy.
May to Aug. 1995	**Archeological Consultant** **Hartgen Archeological Associates, Inc.** Field crew member. Participation in cultural resource management field work in New York prehistoric and historic archeology.

PROFESSIONAL AFFILIATIONS:

Department of Anthropology, University at Albany (*Adjunct Assistant Professor*)
New York Archaeological Council (*Secretary; Chair, Human Remains Committee*)
New York State Archaeological Association
Society for American Archaeology
American Association of Physical Anthropologists
National Trust for Historic Preservation
Archaeological Conservancy