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June 2004
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Prepared for:

Extended Management
Company, Inc.
Newark, New Jersey

**Addendum Phase IA Archaeological
Documentary Study
3-7 Wooster Street
Borough of Manhattan, New York City,
New York**

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Prepared by:

URS

Florence, New Jersey

**ADDENDUM PHASE IA ARCHAEOLOGICAL
DOCUMENTARY STUDY
3-7 WOOSTER STREET
BOROUGH OF MANHATTAN, NEW YORK CITY, NEW YORK**

Prepared for:

**EXTENDED MANAGEMENT COMPANY, INC.
28 CLINTON STREET
NEWARK, NEW JERSEY**

Prepared by:

**Ingrid Wuebber
and
Edward M. Morin, RPA – Principal Investigator**

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June 2004

ABSTRACT

This report details the findings of an addendum Phase IA archaeological assessment URS Corporation (URS) conducted for Extended Management Company, Inc. Work was initiated in response to a letter from the New York City Landmarks Preservation Commission (LPC) requesting revisions to a previously conducted Phase IA study of the project area. The purpose of this study was to provide additional background research in order to adequately address the concerns of the LPC.

Previous studies of both prehistoric and Contact period settlement patterns within the region have indicated that the preferred locations for long-term occupation were elevated and well-drained areas within 150 to 1,000 feet of freshwater sources. However, early historic maps and soil borings indicated that the project area was originally located in a marsh or swampy area in the vicinity of a stream that ran between the Collect Pond and the Hudson River. Although the project area was undoubtedly utilized for procurement purposes (i.e., exploitation of plants, ducks, geese, shore birds, etc.), such activities usually leave behind very little archaeological evidence. In addition, subsequent industrial development would have altered the landscape and impacted any potential prehistoric resources. Therefore, the potential for locating intact prehistoric cultural deposits is low, and no further work is recommended.

The historical background research indicated that the rear portion of the project area once served as backyard areas for three brick houses. The houses located at Nos. 5 and 7 Wooster Street may have been constructed as early as 1828, while the house at No. 3 Wooster Street was built sometime between 1841 and 1844. It appears that the backyards of Nos. 5 and 7 and the remaining backyard to No. 3 were relatively undeveloped until the early 1870s, when a number of additions were built onto the original structures. All three houses were razed between 1934 and 1955. There is a low potential for historic archaeological resources in what was once the backyard area of No. 3 Wooster Street due to the construction of a one-story addition and because the remainder of the backyard is currently under an existing building. Therefore, no additional work is recommended. However, there is a moderate to high potential for a variety of features associated with the occupation of Nos. 5 and 7 Wooster Street. The two extensions to the rear of No. 7 Wooster Street contain shallow basements (four to five feet deep), while an approximately 160-square-foot area to the rear of No. 5 Wooster Street appears to have remained undeveloped, along with a 21-x-20-foot area below one of the additions that did not contain a basement. Therefore, a Stage IB archaeological investigation is recommended in order to determine the absence/presence of potential intact cultural resources in what were once the backyard areas of Nos. 5 and 7 Wooster Street.

TABLE OF CONTENTS

Abstract.....	i
List of Figures.....	iii
I. INTRODUCTION AND PROJECT DESCRIPTION.....	1.1
II. METHODS	2.1
III. PREHISTORIC AND HISTORIC BACKGROUND	3.1
Prehistoric Period.....	3.1
Historic Period	3.4
IV. CONCLUSIONS AND RECOMMENDATIONS.....	4.1
REFERENCES	R.1
Appendix A: Soil Borings Report	
Appendix B: Resumes of Key Personnel	

LIST OF FIGURES

Figure		Page
1	Project Area Location Map.....	1.2
2	Location of Project Area in 1859.....	3.2
3	Boring Location Plan	3.3
4	Nos. 3–7 Wooster Street in the 1850s.....	3.5
5	Nos. 3–7 Wooster Street in 1911	3.6
6	Nos. 3–7 Wooster Street in 1922	3.7
7	Nos. 3–7 Wooster Street in 1955	3.10

I. INTRODUCTION AND PROJECT DESCRIPTION

URS Corporation (URS) conducted an addendum Phase IA archaeological assessment for the 3–7 Wooster Street construction project (Figure 1). A letter dated June 4, 2004 to Rory Levy, City Environmental Quality Review (CEQR) Examiner, Board of Standards and Appeal, from Amanda Sutphin of the New York City Landmarks Preservation Commission (LPC) stated that revisions needed to be made to a report entitled *Phase IA Archaeological Documentary Study at 3–7 Wooster Street, Borough of Manhattan, New York, New York*, prepared by Tracker Archaeology Services, Inc. (Tracker 2001). The requested revisions consisted of 1) providing additional information as to why the project area does not have the potential to contain historic shaft features; 2) conducting research of the tax assessment and conveyance records to determine when the lots were first developed and in turn determine the likelihood that privies and cisterns were located in the project area; 3) research the New York City Department of Environmental Protection (NYCDEP) records to learn when the structures were connected to public water and sewer lines to determine the likelihood that privies and cisterns were present; 4) provide additional information as to why the project site has a “higher than average potential for encountering prehistoric sites below any historic fill” and to provide examples of significant prehistoric sites found in similar, densely developed urban areas; 5) utilize more primary resources than secondary to bolster research and conclusions; and 6) provide the information from the borings conducted at the site.

The purpose of the study was to conduct additional background research in order to adequately address the concerns of LPC outlined above. This work was conducted in accordance with the National Historic Preservation Act of 1966, as amended, and the Advisory Council on Historic Preservation’s “Protection of Historic and Cultural Properties” (36 CFR 800). This work was also conducted pursuant to the New York State guidelines for such projects, and pursuant to the guidelines established by the LPC for Stage IA archaeological work in New York City, dated April 12, 2002. In addition, the study was performed under the guidelines of the CEQR (Executive Order No. 91 of 1977). The cultural resources specialists who performed this work satisfy the qualifications specified in 36 CFR 61, Appendix A.

Edward Morin, Principal Investigator for the project, is certified with the Register of Professional Archaeologists (RPA). Historian Ingrid Wuebber conducted the background research. Lynda Bass and Scott Hood prepared the graphics for the report, and Paul Elwork edited the text for style and consistency.

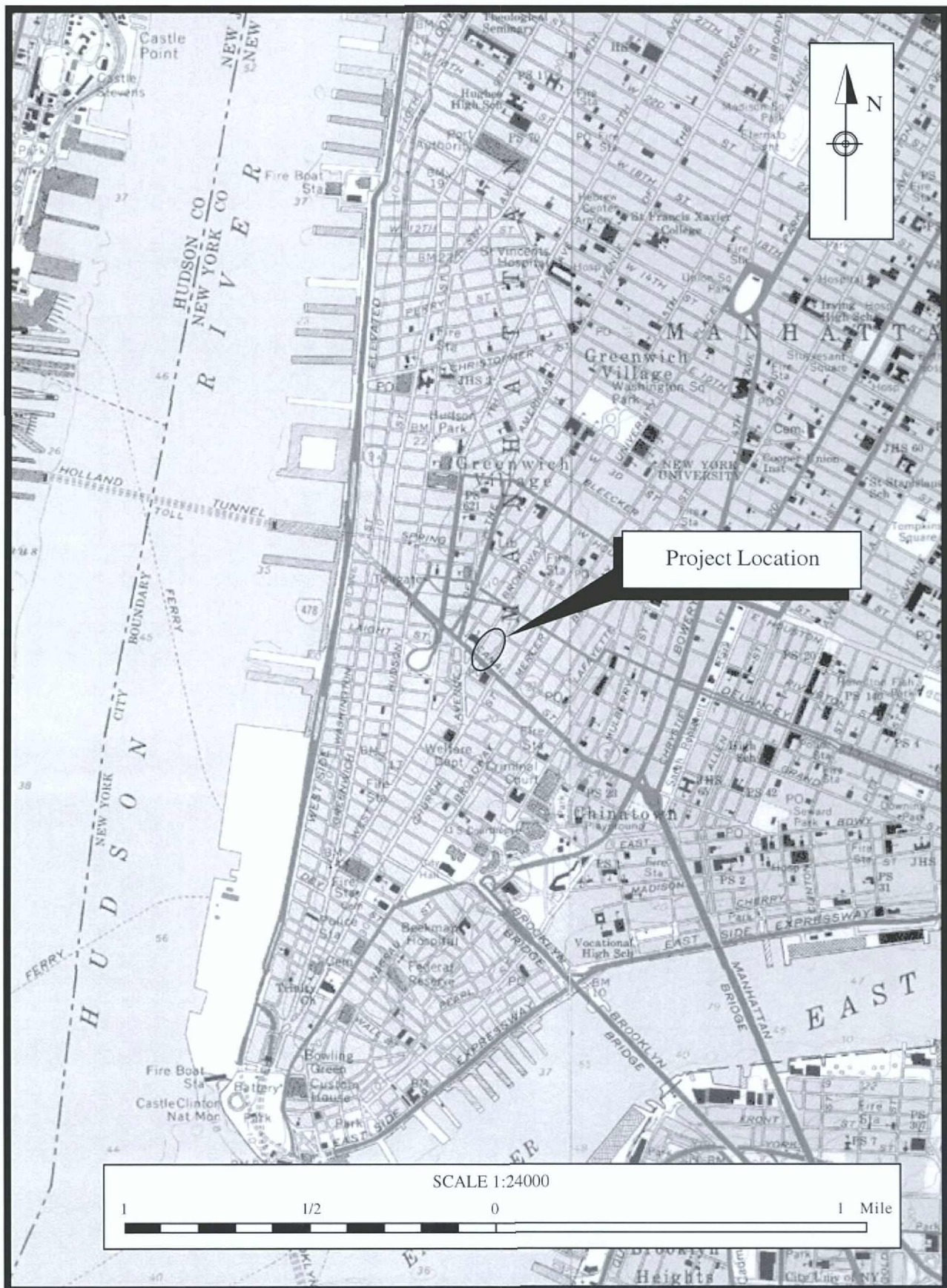


Figure 1 Project Area Location Map (Source: Portion of 7.5 Min. Topographic Map, Jersey City, New Jersey and Brooklyn, New York Quadrangles, Maptech 1981).

II. METHODS

Historical research involved an extensive examination of historical maps, tax assessments, building department records, boring logs from the site, and public utilities installation records. A table of conveyance records was included in the Phase IA archaeological documentary study (Cammisa 2001:13–17). Historical maps were photographed at the New York Public Library. Tax assessments and buildings department records were consulted at the New York City Municipal Archives. The Bureau of Water and Sewer Operations provided information regarding early sewer construction in Wooster Street.

III. PREHISTORIC AND HISTORIC BACKGROUND

PREHISTORIC PERIOD

Archaeological traces of settlement in the greater New York City area extend back to the Paleoindian period, circa 11,000 to 10,000 B.P. (Cantwell and Wall 2001:40ff). Settlement continued throughout the ensuing Archaic and Woodland periods, accompanied by a steady increase in population. By the time of the Middle Archaic, people systematically exploited the coastal resources of Manhattan. The Middle Archaic sites found in the lower Hudson Valley area are, for the most part, shell middens whose compact nature and waterfront location protected many from destruction during eighteenth- and nineteenth-century development (Cantwell and Wall 2001:54). Many of the Late Archaic sites in the area are also shell middens (Cantwell and Wall 2001:57), although intact Archaic sites of any period are scarce in New York City. The available evidence suggests that people had established seasonal rounds by the Late Archaic (Cantwell and Wall 2001:59). Large groups occupied base camps during the summer; groups split up during other seasons to visit smaller hunting, fishing, or plant procurement stations. Sites were usually located in elevated and well-drained areas near freshwater ponds, tidal inlets, coves, and bays. This pattern continued throughout the ensuing Transitional and Early and Middle Woodland periods. Agriculture became established in the Northeast during the Late Woodland period (after 1000 A.D.), but the timing of the subsistence switch by coastal peoples from complete dependence on hunting and gathering to mixed foraging and agriculture is a matter of debate among archaeologists. By the time of European settlement in the early seventeenth century, native people kept well-established fields in which they grew the triad of corn, beans, and squash, along with some other domesticated plants.

Pre-European sites within the New York City environs are not common, as subsequent development has obliterated them. A search of the archaeological site files has indicated that no known prehistoric sites have been recorded within a one-mile radius of the project area. In addition, the New York City Landmarks Preservation Commission did not identify the area as being sensitive for prehistoric cultural resources (LPC 1982), most likely due to the fact that the project area was at one time located in a marsh or swamp. Cartographic and historical research indicated that the project area was once part of a 70-acre swamp known as Lispernard's Meadow (Figure 2; see Figures 3, 4 and 5 in Cammisa 2001; Van Rensselaer 1909: 75). The meadow was fed from an unnamed stream that ran from the Collect Pond and emptied into the Hudson River. When the tides were high, the marsh would flood and make it impossible to pass through to the north without a boat (Harlow 1931:6). Soil borings conducted within the project area provide additional supporting evidence that the site was once part of a low-lying marsh (Figure 3; Appendix A). A black peat and organic silt deposit with some fine sand, that averaged 7.5 feet thick, was encountered between 12.5 to 25 feet below the current grade (C.E. Boss Co. 2000). This layer was covered by fill material that ranged in depth between 12 to 25 feet, which was deposited as part of the land-reclaiming process.

Prehistoric and Contact period settlement patterns within the region have indicated that the preferred locations for processing sites, camps, and more permanent/long-term occupations were

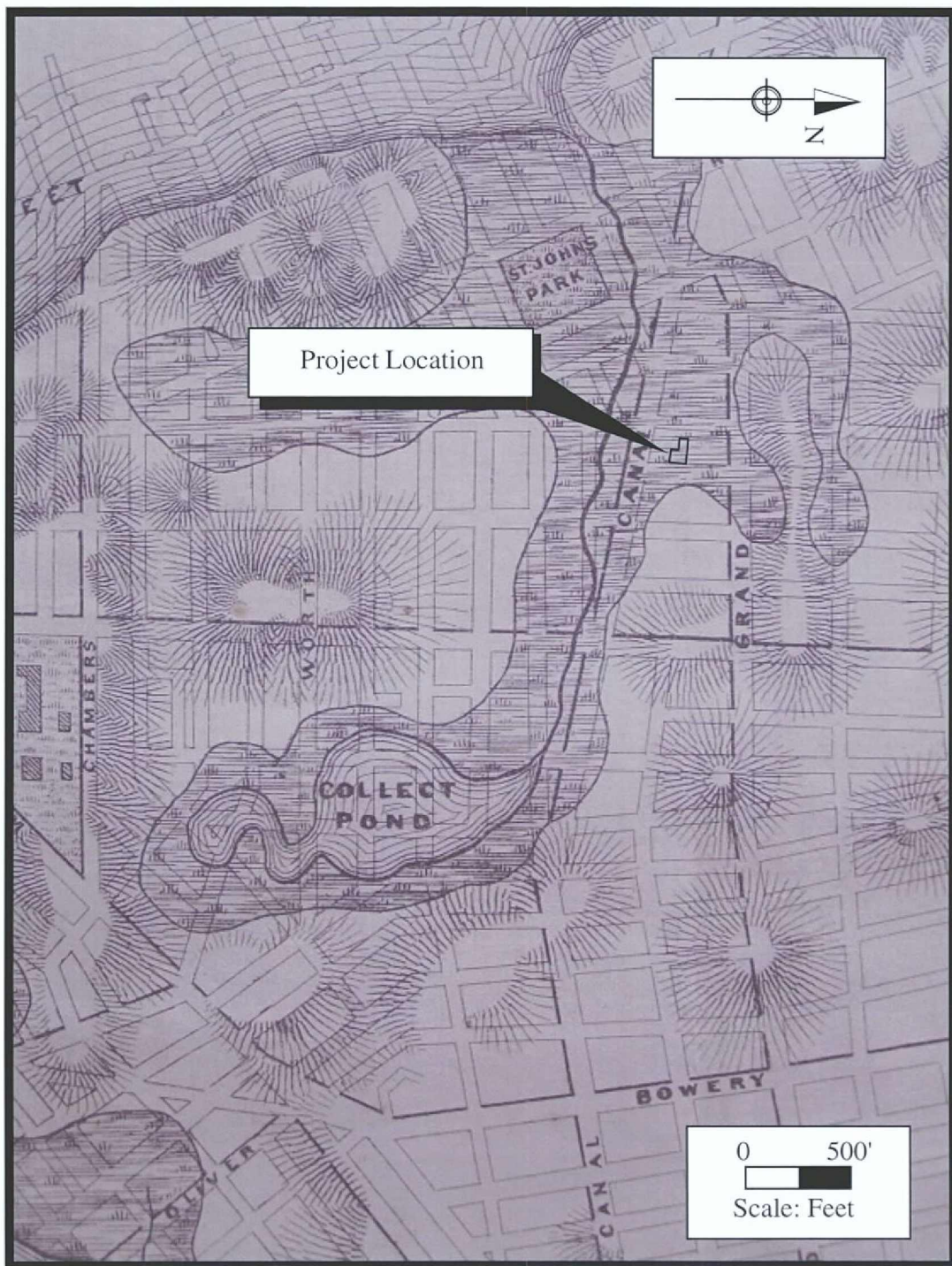


Figure 2 Location of Project Area in 1859 (Source: Viele 1859).

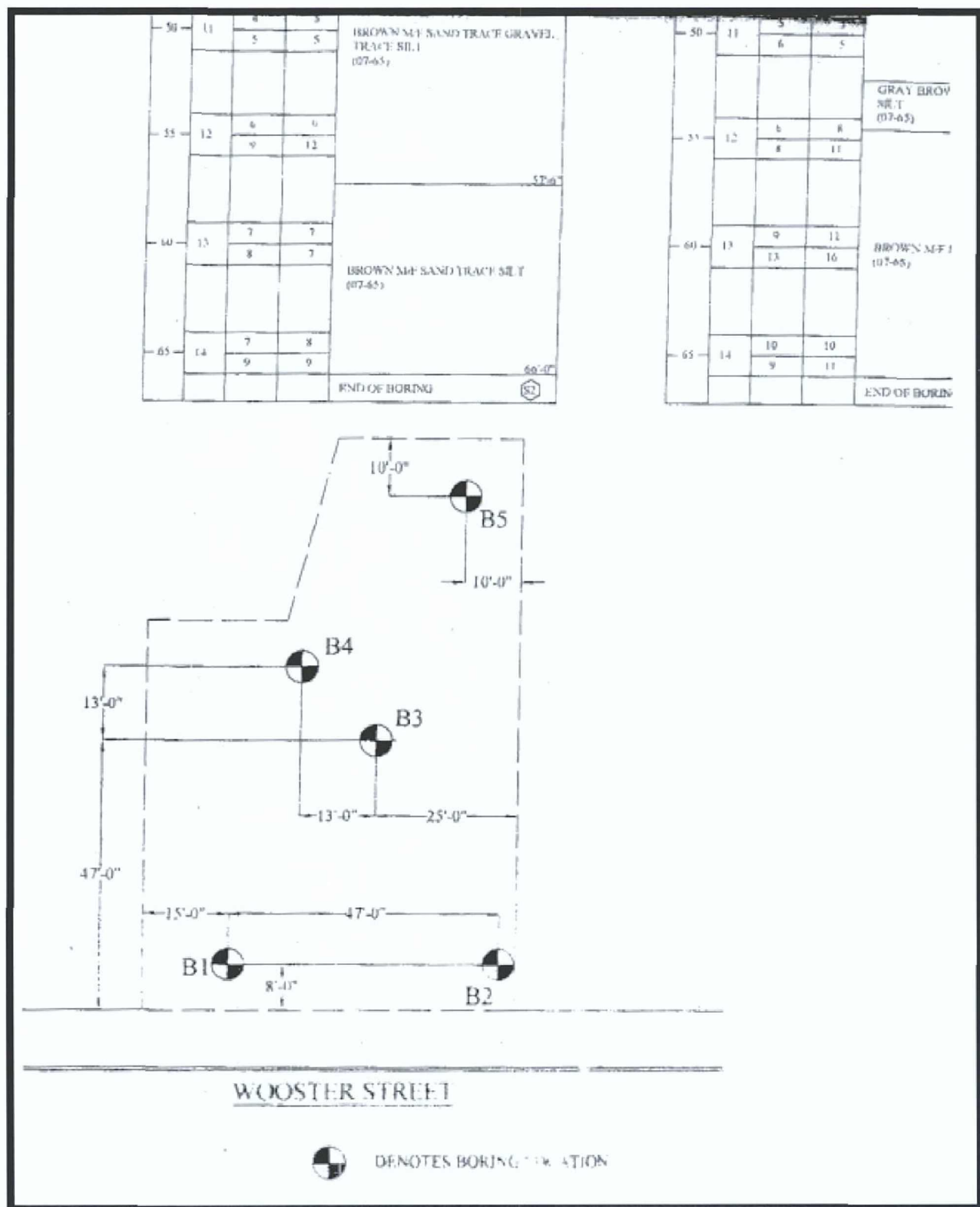


Figure 3 Boring Location Plan (Source: C. E. Boss Co., Inc., 2000).

sheltered, elevated, and well-drained areas close to wetlands and freshwater sources. These sites would have been located on the numerous hills and ridges surrounding Lispernard's Meadows and, in the case of the project area, on an east/west oriented ridge situated approximately 250 feet to the north (see Figure 2). This type of setting would have been very desirable and utilized for both long and short-term habitation. The potential for archaeological evidence would be high, as long as subsequent historical development did not alter the landscape and impact any potential cultural resources. Although the project area would have provided an abundance of natural resources—including small game, fish, shellfish, and a large variety of plants and tuberous grasses—it would not have been conducive toward long-term settlement. Such procurement sites tend to produce very negligible archaeological deposits. Therefore, the potential for locating intact prehistoric cultural deposits within the project area is low.

HISTORIC PERIOD

In 1828, Jacob Cram bought the lots at Nos. 3, 5, and 7 Wooster Street (New York Deed Liber 240, page 84). Tax records indicate that these lots were probably vacant before 1828, when they were valued at \$800 apiece. By 1830, five of Jacob Cram's lots included structures that raised their value to \$3,000 (New York, Record of Assessments, 8th Ward, 1825:46; 1830:14). In the next few years, he expanded his holdings between Canal and Grand Streets to include 10 lots on the west side of Wooster Street (i.e., Nos. 5–23) and five adjoining lots fronting on Laurens Street (now West Broadway). Cram's Wooster Street properties steadily increased in value. In 1836, the presence of a distillery was noted on his Wooster Street lots. Sometime between 1841 and 1844, a structure was built at No. 3 Wooster Street (New York, Record of Assessments, 8th Ward, 1836:14; 1841:12; 1844:13). Jacob Cram's 1850 tax assessment described each of his roughly 21-x-100-foot Wooster Street lots (Nos. 3–23) as a "house & lot" valued at \$5,800–\$6,000 (New York, Record of Assessments, 8th Ward, 1850:15).

Maps published in the 1850s suggest that Jacob Cram built 11 identical brick structures along the west side of Wooster Street. Each structure was built to the width of the lot and to a depth of 44 feet. The remaining 56 feet behind each structure was left as open ground (Dripps 1852; Perris 1857-62) (Figure 4). Tax records and maps described these structures as four stories high, but a later real estate transaction described them as three-story brick stores with attics (New York, Record of Assessments, 8th Ward, 1861:23; New York Times, January 18, 1871, "Real Estate Transactions") (Figure 5). Maps also indicate that all three structures had basements (Figure 6).

Jacob Cram was a well-known merchant of his day and was sometimes referred to as "the millionaire brewer." Like many other successful New York merchants, he was born and raised in New England. After a mercantile apprenticeship in Boston, he moved to New York in 1816. Jacob Cram built a fortune based on New York and Chicago real estate. He died in 1869, at the age of 87, leaving behind a million-dollar estate (New York Times, July 8, 1869, "Obituary"; New York Times, August 5, 1869, "The Late Jacob Cram's Will"; New York Times, June 8, 1884, "An Old Journalist Dead").

Jacob Cram's will stipulated that his New York real estate be sold within three years of his death. Accordingly, on January 18, 1871, a large crowd turned out for the auction of his properties

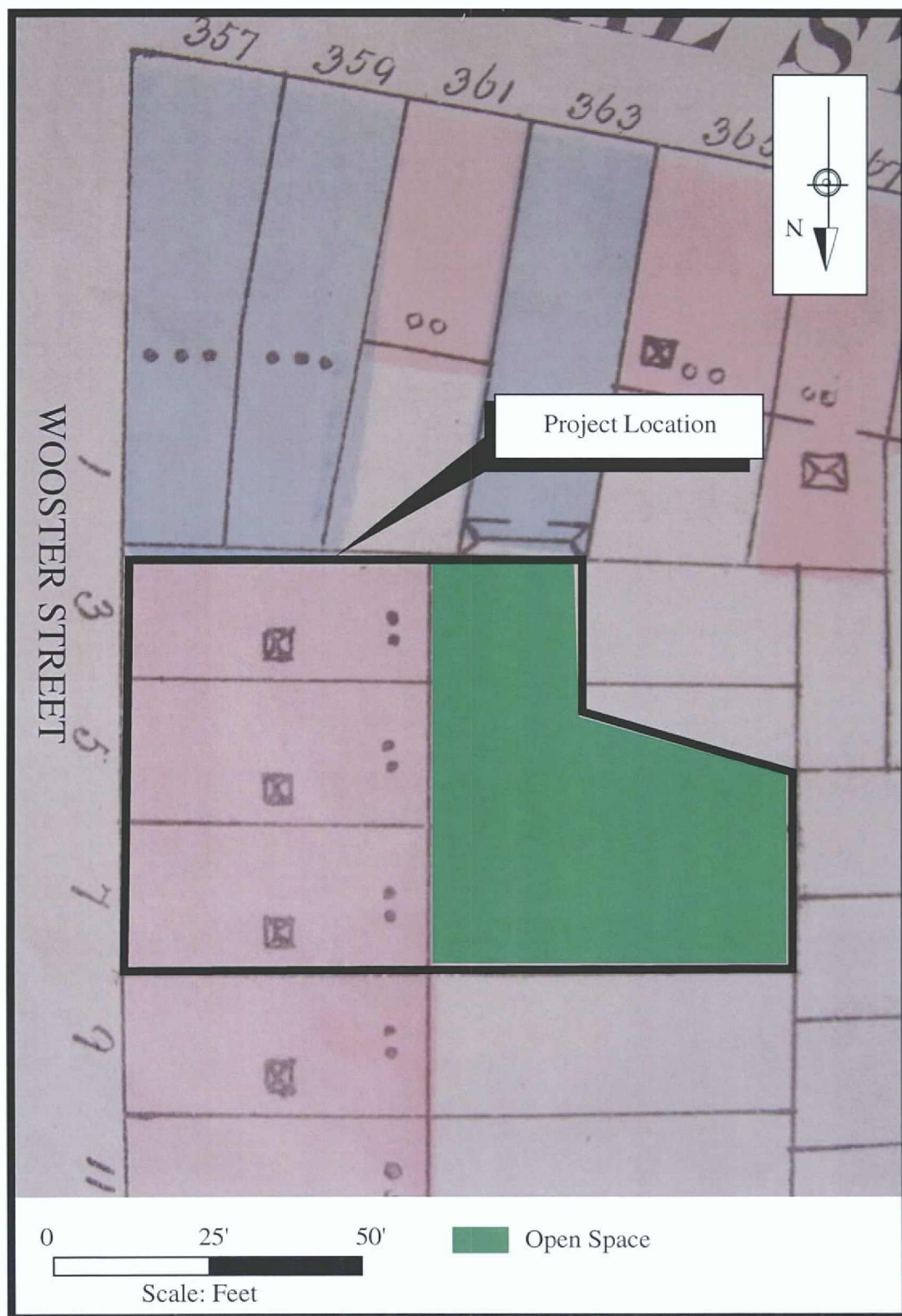


Figure 4 Nos. 3-7 Wooster Street in the 1850s (Source: Perris 1857- 62).

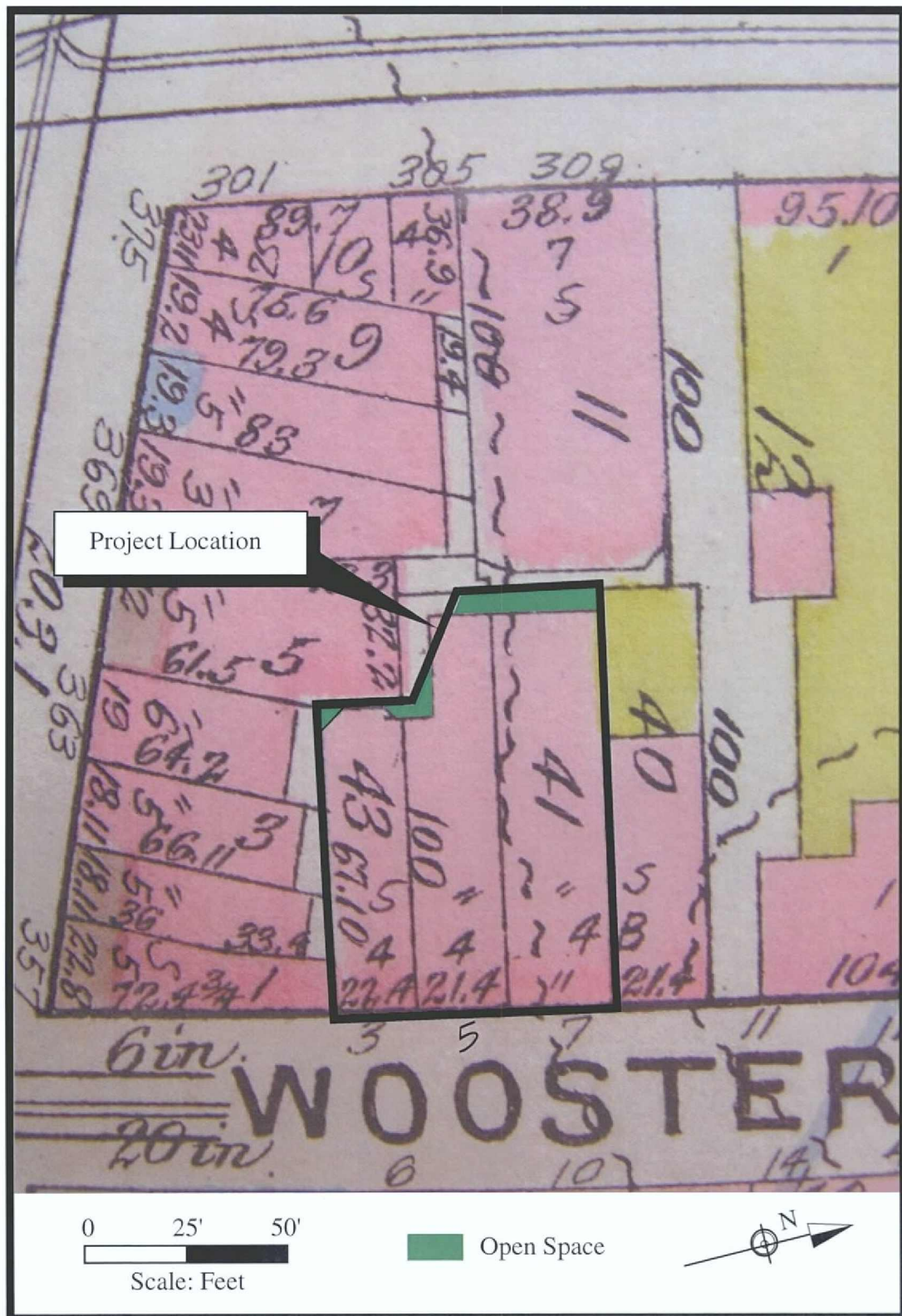


Figure 5 Nos. 3-7 Wooster Street in 1911 (Source: Bromley 1911).

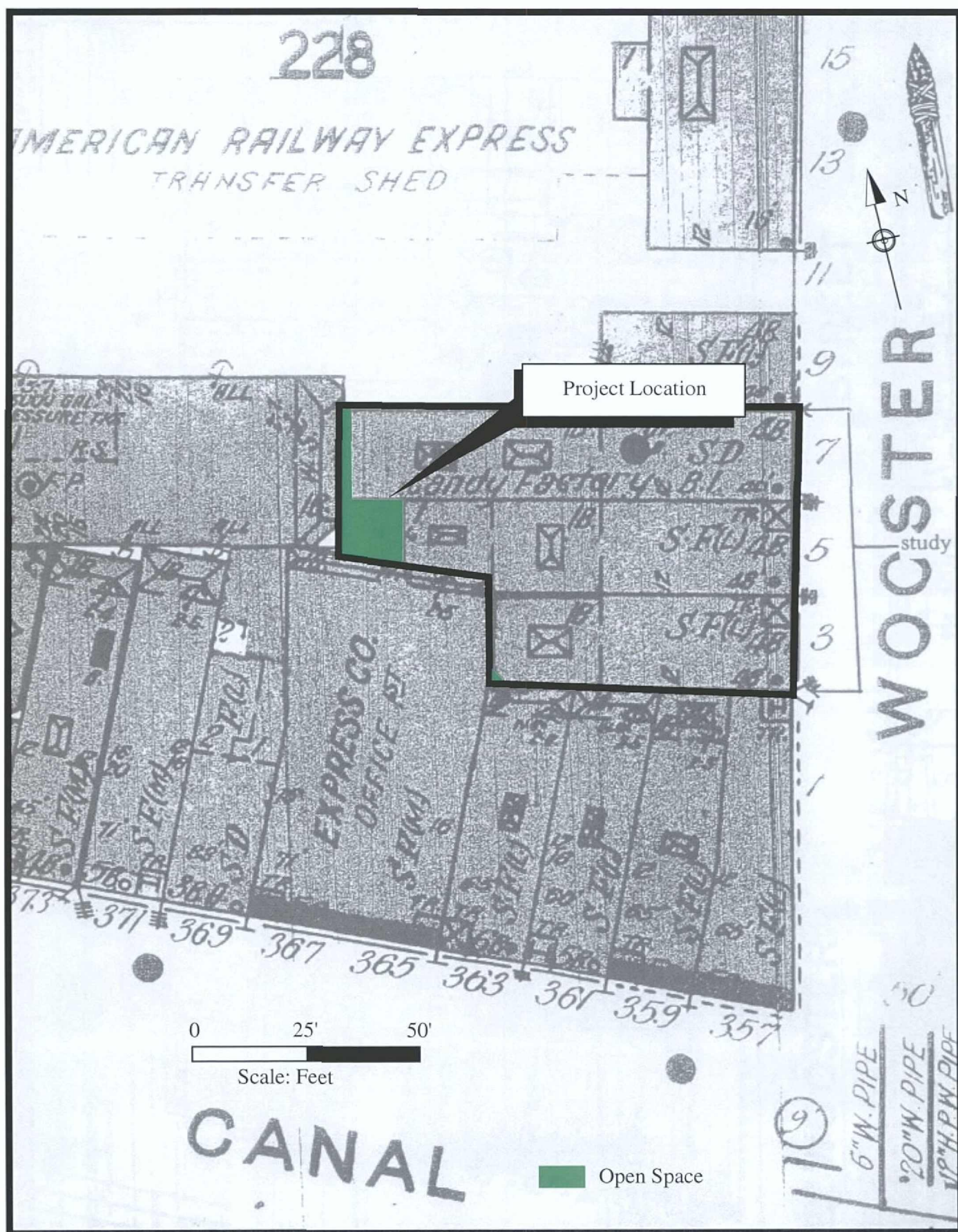


Figure 6 Nos. 3-7 Wooster Street in 1922 (Source: 1922 Sanborn Map, used as Figure 14 in Cammisa 2001).

located along Broadway, Fourth Avenue, Wooster Street, Laurens Street (now West Broadway), and Canal Street. The auction brought in \$1,161,900. The most valuable lots were five four-story stores on the corner of Broadway and 21st Street. These were sold for \$600,000 to an agent, or so it was rumored, for Boss Tweed (New York Times, January 18, 1871, "Real Estate Transactions").

The proceeds were split four ways. Jacob's son Henry A. Cram, a New York attorney, inherited his share outright. Another son, George, was killed only a few weeks after his father died while fighting in the Civil War. George's share was put into a trust for his children living in Connecticut. Jacob's daughter Mrs. Mason, of Philadelphia, inherited a quarter share of the estate. The final share was put into trust for his daughter Laura Virginia, the wife of General James Watson Webb (New York Times, January 18, 1871, "Real Estate Transactions").

Candy stores occupied most of the 11 brick buildings on the west side of Wooster Street between Canal and Grand Streets. These properties sold for \$20,050 to \$27,500 each. Frederick W. Pachtmann bought No. 3 Wooster Street for \$27,500. Michael Coleman, acting as an agent for Jacob Cram's daughter Laura and her husband General Webb, bought No. 5 Wooster Street for \$22,500. Ernest Greenleaf, apparently also acting as an agent for the Webbs, bought No. 7 Wooster Street for \$21,000. With annual rents on these properties netting between \$1,800 and \$2,000, they were sound investments (New York Times, January 18, 1871, "Real Estate Transactions").

Frederick W. Pachtmann, the purchaser of No. 3 Wooster Street, owned a jewelry store around the corner on Canal Street. Samuel Cohen bought No. 3 Wooster Street from the estate of Frederick W. Pachtmann in 1889. Following Laura Webb's death in 1890, Cohen bought Nos. 5 and 7 Wooster Street, as well (New York Deed Libers 2277:9; 2310:182-183; New York Times, June 11, 1877, "Burglary in Canal Street").

Samuel Cohen owned Nos. 3-7 Wooster Street for about 36 years. A candy factory was located at No. 7 Wooster Street. It was also the home of two families (New York Deed Liber 2310:182-185; Sanborn 1905, see figure 13 in Cammisa 2001). The firm of Goldberg & Block rented No. 5 Wooster Street for a cloak-making company. They went bankrupt in 1902. Goldstein and Goldfarb manufactured leather goods at No. 5 until 1904, when they too went bankrupt (New York Times, September 26, 1902, "Business Troubles"; New York Times, May, 1904, "Business Troubles"). A fire at No. 5 Wooster Street in December 1905 caused \$3,500 worth of damage to the goods of Solomon Shapiro and other renters (New York Times, December 11, 1905, "Yesterday's Fires"). By 1910, No. 5 had become the home of a candy factory run by Morris Weill (New York Times, February 28, 1910, "He Found The Roll Of Cash").

The New York Department of Buildings has records dating back to 1866. Alterations to the Wooster Street stores occurred after Jacob Cram's death. In June 1873, Laura Webb hired architect M. Coleman and builder T. Kirman to build a brick extension onto No. 7 Wooster Street. The extension was the width of the lot, 21 feet, and 40 feet deep. It was two stories high with a stone foundation five feet deep to accommodate a basement. Total cost was \$5,500. An inspector with the Buildings Department reported that the job took two weeks to complete and included the removal of partition walls in the main building, probably to create workshop space

on the second and third floors (New York, Buildings Department, Alterations Docket, 1873, Plan No. 664). A one-story extension was built onto the rear of No. 7 in 1893. It measured the width of the lot and 14 feet in depth. Its foundation was four feet deep (New York, Buildings Department, Alterations Docket, 1893, Plan No. 320).

Frederick W. Pachtmann also invested in improvements, paying \$4,000 for a one-story brick extension onto No. 3 Wooster Street in March 1874. Architect, F. Bloodgood, and builder, James Hardly, built the addition to the width of the lot and a 24-foot depth. The foundation was eight feet deep to accommodate a basement (New York, Buildings Department, Alterations Docket, 1874, Plan No. 77).

Historical maps indicate that an addition was built onto No. 5 Wooster Street in this same period (see Figure 5) (Robinson 1885; Sanborn 1894, see figures 11 & 12 in Cammisa 2001). Unfortunately, the Buildings Department no longer has copies of the Block and Lot files for Nos. 3–7 Wooster Street. A search of microfilmed records did not turn up a reference to the construction of an addition onto No. 5 Wooster Street. Samuel Cohen, the owner of Nos. 3–7 Wooster Street in 1890, submitted plans to the Buildings Department to have No. 5 altered from 3½ stories to four stories. Architect J. H. Whitenack and builder J. Odell Whitenack carried out the alterations in 1890, at a cost of \$3,600. The same alteration was carried out at No. 3 Wooster Street at a cost of \$2,500 (New York, Buildings Department, Alteration Docket, 1890, Plan Nos. 14 and 1030).

The extension put onto No. 3 Wooster Street left only a small corner at the back of the lot open. Further, the main building and the extension had basements. The depth of the stone foundation of the rear extension was eight feet (New York, Buildings Department, Alterations Docket, 1874, Plan No. 77) (see Figures 5 and 6). The extensions put onto No. 7 Wooster Street also eliminated nearly all of the available open space on the lot except for a thin strip, approximately one to two feet wide. Basements were located in the main building as well as the extensions.

The main building of No. 5 Wooster Street was probably built around 1830. Like its neighbors, it included a basement. An extension, approximately 24 feet deep, was built onto the rear of No. 5 sometime before 1885 (Robinson 1885). According to Sanborn maps, this extension had a basement (see Figure 6). Sometime before 1894, another extension, approximately 20 feet deep, was added onto the rear of No. 5. This one-story extension does not appear to have been built with a basement. An area of about 160 square feet remained open in the rear of the lot.

In 1926, Nos. 3–7 Wooster Street became the property of the A. Kimball Company. No. 7 Wooster Street was classified as a four-story tenement without an elevator or an old-law walk-up. This classification referred to apartment buildings built before 1901 either with or without stores on the ground floor. Nos. 3 and 5 Wooster Street were classified as miscellaneous loft buildings (New York, Annual Record of Assessed Valuation, Volume 4, 1930:118; 1940–1941:138; 1950–1951:134). Sometime between 1934 and 1955, the buildings at Nos. 3–7 Wooster Street were razed (Bromley 1934; Bromley 1955) (Figure 7).

IV. CONCLUSIONS AND RECOMMENDATIONS

Previous studies of both prehistoric and Contact period settlement patterns within the region have indicated that the preferred locations for long-term occupations were elevated and well-drained areas within 150 to 1,000 feet of freshwater sources. However, early historic maps and soil borings indicated that the project area was originally located in a marsh or swampy area in the vicinity of a stream that ran between the Collect Pond and the Hudson River. Although the project area was undoubtedly utilized for procurement purposes (i.e., exploitation of plants, ducks, geese, shore birds, etc.), such activities usually leave behind very little archaeological evidence. In addition, subsequent industrial development would have altered the landscape and impacted any potential prehistoric resources. Therefore, the potential for locating intact prehistoric cultural deposits is low, and no further work is recommended.

The historical background research indicated that the rear portion of the project area once served as backyard areas for three brick houses. Each house was located on a 21-x-100-foot lot and measured 21 x 44 feet. The houses located at Nos. 5 and 7 Wooster Street may have been constructed as early as 1828, while the house at No. 3 Wooster Street was built sometime between 1841 and 1844. Early tax maps indicate that the structures were four stories high, but a later real estate transaction describes them as three stories with an attic. Sometime between 1860 and 1880, the lot at No. 3 was reduced in length to 68 feet. However, it appears that the backyards of Nos. 5 and 7 and the remaining backyard to No. 3 were relatively undeveloped until the early 1870s. In 1873, and again in 1893, two additions were built onto the existing structure of No. 7 Wooster Street. Both additions included basements (or crawl spaces) of five and four feet respectively, and eliminated nearly all of the open space on the lot except for a thin strip, approximately one to two feet wide. In 1874, the remaining yard area to No. 3 Wooster Street was covered by an addition with an eight-foot-deep basement. Two additions were also built onto the original structure of No. 5 Wooster Street. The first addition was added sometime before 1885, measured 21 x 24 feet, and included a basement of unknown depth. The second one-story addition was added between 1885 and 1894, and did not appear to have a basement. An area of about 160 square feet remained open in the rear of the lot. All three buildings were razed between 1934 and 1955. It appears that the project area was left vacant until the 1970s, when it was utilized as a parking lot.

There is a low potential for historic archaeological resources in what was once the backyard area of No. 3 Wooster Street, due to the one-story extension with an eight-foot basement that was added onto the original structure. In addition, the remainder of the backyard is now under an existing building. No further work is recommended on this lot. However, there is a moderate to high potential for a variety of features associated with the occupation of the lots at Nos. 5 and 7 Wooster Street. The types of archaeological features that could be present and provide valuable information are deep shafts (privies, wells, and cisterns), traces of landscaping, and sheet midden scatter (yard trash). Prior studies in the region have demonstrated that deep shafts are generally located within a few feet of the rear lot boundary. Shaft contents have generally provided the best archaeological contexts for the understanding of household dietary patterns and various other aspects of household composition, social and economic status, life cycle, etc. Even though documentation indicated that the city water and sewer system was constructed in the

neighborhood between 1842 and 1856, no evidence was found regarding the date of the property's connection to either system (Burrows and Wallace 1999: 625–628; NYCDEP, Water and Sewer Permitting 1914). Consequently, wells and privies may have been in use well beyond the construction date of both systems. In general, middens (yard deposits) and traces of landscaping are somewhat limited in their ability to provide information on the topics listed above; however, they can provide information regarding the use of yard space. Although the two extensions that covered the backyard area at No. 7 Wooster Street contained four- to five-foot basements, the lower remnants of deep shaft features could still be intact and contain cultural material. In addition, an approximately 160-square-foot area to the rear of No. 5 Wooster Street appears to have remained undeveloped, along with a 21-x-20-foot section below one of the additions that did not contain a basement. Therefore, a Stage IB archaeological investigation is recommended in order to determine the absence/presence of potential intact cultural resources in what were once the backyard areas of Nos. 5 and 7 Wooster Street. Unfortunately, a building permit was inadvertently issued prior to a review of the initial Phase IA study that had recommended archaeological monitoring during construction (Cammisa 2001). By the time this oversight was identified and construction ordered to cease, a 13-foot-deep basement was excavated within the boundary of the project area. The construction of the basement effectively removed any evidence of potential archaeological resources.

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1865 Sanitary and Topographical Map of the City of New York, Island of Manhattan.

Appendix A: Soil Borings Report

Education:

M.S./1980/Rensselaer Polytechnic Institute, Troy, New York
Archaeology.

M.A./1978/St. Louis University, St. Louis, Missouri
American Studies.

B.A./1975/Westfield State College, Westfield, Massachusetts
History.

Professional:

Register of Professional Archaeologists (RPA Certification)

Society for Historical Archaeology

Society for Industrial Archaeology

Council for Northeast Historical Archaeology, Board Member-Executive Vice Chair

Professional Archaeologists of New York City

Experience:

Mr. Morin has over 25 years of experience in conducting and supervising archaeological investigations. He has directed archaeological and historical assessments, National Register evaluations, and archaeological data recovery efforts. Prior to joining URS, Mr. Morin served as Staff Archeologist with the National Park Service, Denver Service Center, Applied Archeology Center, Senior Archaeologist for Louis Berger & Associates, Inc. and Staff Historic Archaeologist for American Resources Group, LTD. in Carbondale, Illinois. In those positions, his responsibilities included conducting and contracting archaeological investigations at historic and industrial sites within the Northeast, Mid Atlantic States and the Midwest (Illinois, Missouri and Arkansas); budgeting and design of research; direction of fieldwork, laboratory analysis, and report preparation; and project management. Mr. Morin's particular expertise is in the area of historic archaeology, but he has conducted a number of survey investigations of prehistoric sites.

The following are examples of project experience:

1999 to Present * Senior Archaeologist, URS Corporation

Phase I Cultural Resources Investigation, Route 34/Amboy and Morristown Roads Intersection, Old Bridge Township, Middlesex County, New Jersey. Principal Investigator a Phase I archaeological and architectural survey for the proposed intersection improvements along Route 34, Mile Posts 24.7-24.8, in the vicinity of Amboy and Morristown Roads. Conducted for the New Jersey Department of Transportation.

Phase I Cultural Resources Investigation, Proposed Drainage Improvements to Route 9 and Jake Brown Road, Old Bridge Township, Middlesex, New Jersey. Principal Investigator a Phase I archaeological and architectural survey for the proposed drainage improvements along the U.S. Route 9 northbound jughandle, a portion of Jake Brown

Road, and the jughandle infield. Conducted for the New Jersey Department of Transportation.

Phase I/II Cultural Resources Investigation, I-195 Hamilton Noise Barriers, Hamilton Township, Mercer County, New Jersey. Principal Investigator for a Phase I/II archaeological and architectural survey for the proposed construction of a noise barrier along either side of a 1.1-mile section of Interstate 195 for the proposed construction of a noise barrier. Conducted for the New Jersey Department of Transportation.

Archaeological Construction Monitoring for the Replacement of Bridges BR 526 and BR 527 at Betts Mill Pond, Millsboro, Sussex County, Delaware. Principal Investigator for archaeological construction monitoring of the area of potential effects associated with the proposed replacement of two bridges. Identified and recorded the remains of a brick foundation and structural feature associated with an early 19th century gristmill. Conducted for the Delaware Department of Transportation.

Phase I Cultural Resources Investigation, U.S. Route 9 and Tilton Road, Northfield, Atlantic County, New Jersey. Principal Investigator a Phase I archaeological and architectural survey for the proposed improvements to the intersection of U. S. Route 9 and Tilton, Road. Conducted for the New Jersey Department of Transportation.

Phase IA Documentary Study, East Side Access Ventilation Shaft, 38th Street, New York, New York. Principal Investigator for the documentary, cartographic and photographic research of a proposed site for a ventilation shaft in a 25 x 100-foot lot. The purpose of the study was to provide information on the nature, location, and extent of intact and original soil surfaces within the project area and the depth of 20th-century fills above these surfaces. This information was needed in order to determine if proposed construction activities will extend to a depth that will encounter the historic and/or prehistoric surfaces that may contain archaeological resources. Conducted for the MTA New York City Transit/Long Island Railroad.

Phase I Archeological Investigations for the Proposed Multiple-Use Pathway, Gateway National Recreation Area, Sandy Hook Unit, Monmouth County, New Jersey. Principal Investigator for archaeological investigations along 13 selected sections of a proposed 5,470-foot long multiple purpose pathway. Conducted for the Denver Service Center, National Park Service.

Phase I Archeological Investigations within the Gateway National Recreation Area at the Jacob Riis Bathhouse, Breezy Point, New York. Principal Investigator for archaeological investigations conducted in support of the proposed development within the courtyard of the bathhouse. Conducted for the Denver Service Center, National Park Service.

Phase I Cultural Resources Investigation, Route 72 Between MP 21.69 and MP 22.99, Stafford Township, Ocean County, New Jersey. Principal Investigator a Phase I archaeological and architectural survey for the proposed improvements to a 1.3-mile section of New Jersey Route 72, between the Garden State Parkway and the U.S. Route 9 eastbound exit ramp. Conducted for the New Jersey Department of Transportation.

Cultural Resources Assessment, 1440 Story Avenue, Bronx, New York. Principal Investigator for the documentary, cartographic and photographic research of a 12-acre site proposed for a warehouse complex. The study provided information on the potential for the presence of archaeological resources within the site. Conducted for the MTA New York City Transit

Supplemental Archaeological Data Recovery Investigations at the Historic Brickworks Component of 36AL480 in Leetsdale, Allegheny County, Pennsylvania. Principal Investigator for Phase III supplemental investigations of the remains of the late 19th century Harmony Brickworks. Conducted for the U.S. Army Corps of Engineers, Pittsburgh District.

Phase I Archeological Testing at the Visitors Center and Building 101, Jamaica Bay Wildlife Refuge, Gateway National Recreation Area. Principal Investigator for conducting archaeological investigations in support of proposed development at these two sites. Conducted for the Denver Service Center, National Park Service.

Stage IB Archaeological Field Investigations 101-117 Worth Street, New York, New York. Principal Investigator for Phase IB archaeological investigations of mid 19th to mid 20th century foundation remains and yard areas. Conducted for Allee King Rosen and Fleming, Inc., New York, New York.

Archaeological Data Recovery, New Jersey Route 18, Section 2A, Middlesex County, New Jersey. Principal Investigator for Phase III archaeological investigations of a late 17th to late 19th century village along the Raritan River. Responsible for the excavation of three of the thirteen house lots. Conducted for the New Jersey Department of Transportation.

Open-End Contract for Cultural Resources, Archeology Sites, Statewide, Delaware. Principal Investigator responsible for investigating historic resources on a three year Open-End Contract for Cultural Resources, Archeology Sites, Statewide, Delaware. Conducted for the Delaware Department of Transportation.

Woodrow Wilson Bridge Improvement Project Virginia/Maryland/Washington, DC. Principal Investigator responsible for all aspects of investigating historic archaeological resources associated with this \$2-billion bridge replacement, which carries I-95 over the Potomac River. The project involved URS managing all cultural resource efforts implemented under the Memorandum of Agreement. Work also included Design Review Working Group created to implement the MOA, and Section 106 and 4(f) coordination with the Virginia, Maryland and Washington, D.C. SHPOs, National Park Service, and Federal Highway Administration on cultural resource issues. Conducted for the Federal Highway Administration.

Lancaster Pike and Brackenville Road Improvements, New Castle County, Delaware. Principal Investigator for a Phase I cultural resources study of the area of potential effect associated with proposed intersection and roadway improvements. Conducted for the Delaware Department of Transportation.

Phase II Archaeological Testing and Determination of Eligibility Documentation for Submittal to The Keeper of the National Register of Historic Places, Virginia Shipbuilding Corporation Site (44AX78), Alexandria, Virginia. Principal Investigator for Phase II archaeological investigations of the remains of the Virginia Shipbuilding Corporation that was constructed in 1918 in an effort to support and enlarge the United States merchant fleet during World War I. Conducted for the Federal Highway Administration, Virginia Department of Transportation and the National Park Service.

State Route 9 Road Improvements, New Castle County, Delaware. Principal Investigator for a Phase I cultural resources survey of the area of the area of potential effect associated with proposed intersection and roadway improvements. Conducted for the Delaware Department of Transportation.

Archaeological Monitoring for the Dry-Laid Stonewall Stabilization/Restoration Project, Chesapeake and Ohio Canal National Historical Park, Georgetown, District of Columbia. Principal Investigator, for the recordation and evaluation of structural remains and deposits associated with the restoration of the towpath stone retaining wall between 33rd and 34th Streets. Conducted for the National Capital Region of the National Park Service.

Phase I Archaeological Investigations, Route 71, Monmouth University, Monmouth County, New Jersey. Principal Investigator for Phase I archaeological investigations of a pedestrian walkway across Route 71 at Monmouth University. Conducted for the New Jersey Department of Transportation.

Route 27 Environmental Screening, Somerset and Middlesex Counties, New Brunswick, New Jersey. Principal Investigator for environmental screening along Route 27 in Somerset and Middlesex Counties, New Jersey. Conducted for the New Jersey Department of Transportation.

Cultural Resource Reconnaissance Survey of the Proposed Hillsborough Motor Vehicle Inspection Station, Somerset County, New Jersey. Principal Investigator for an historical and archaeological field reconnaissance survey to identify and evaluate the potential for any significant cultural resources within the construction area of a proposed inspection station. Conducted for the New Jersey Department of Transportation.

Reconstruction of the Stone Street Historic District, New York, New York. Principal Investigator for archaeological monitoring of Stone Street reconstruction. Provided the oversight and inspection of an archaeological contractor providing monitoring services associated with the installation of a water main and catch basins. Provided review of resulting archaeological report. Conducted for the New York City Landmarks Preservation Commission.

Cultural Resource Survey of the Proposed Freehold Motor Vehicle Inspection Station, Monmouth County, New Jersey. Principal Investigator for an archaeological survey as part of a Categorical Exclusion Document for a proposed motor vehicle inspection station. Conducted for the New Jersey Department of Transportation.

Archaeological Overview and Assessment of the Chesapeake Ohio Canal National Historical Park. Principal Investigator for providing archival, literature and collections research for developing an overview and assessment of the prehistoric and historic archaeological resources located within the C&O Canal park. This information will be summarized and evaluated, addressing topics regarding the nature, distribution, and significance of the prehistoric and historic resources. Recommendations will also be generated for future research involving site prediction, sampling bias in the existing record and National Register evaluations. Conducted for the National Capital Region, National Park Service

1991 to 1998 * Staff Archaeologist, National Park Service, Denver Service Center, Applied Archaeology Center.

Various Archaeological Assessment and Testing Programs at Gettysburg National Military, Gettysburg, Pennsylvania. Principal Investigator, for the determination of construction impacts to archaeological resources associated with nineteenth century farmsteads battle field related activities.

Archaeological Investigations of Outer Line Drive and PA Route 252 Intersection, Valley Forge National Historical Park, Chester County, Pennsylvania. Principal Investigator for the determination of construction impacts to archaeological resources associated with a nineteenth century farmstead.

Archaeological Testing at the Delaware Aqueduct, Upper Delaware Scenic and Recreational River, Minisink Ford, New York and Lackawaxen, Pennsylvania. Principal Investigator for the determination of construction impacts to potential archaeological resources associated with the aqueduct and Delaware and Hudson Canal.

Archaeological Assessment for Phase I Development at Windber/Scalp Level Coal Heritage Project, Borough of Scalp Level, Cambria County, Pennsylvania. Principal Investigator for testing the foundation of a circa 1910 house foundation and yard that was occupied by a former coal mine supervisor.

1988 To 1991 * Senior Archaeologist, The Cultural Resource Group Louis Berger & Associates, Inc., East Orange, New Jersey.

Phase I/II Archaeological and Historical Investigation of the Proposed NJ Route 129 Realignment Between Broad Street and US Route 1, Trenton, New Jersey, for DKM Properties Corp., Lawrenceville, New Jersey. Principal Investigator for the recordation and evaluation of a basin associated with industries along the D & R Canal.

Archaeological Data Recovery of the I-95 Completion Project, Philadelphia, Pennsylvania for the Pennsylvania Department of Transportation. Principal Investigator for the mitigation of mid-eighteenth to nineteenth century wharves, domestic deposits and structural remains. Conducted for the Pennsylvania Department of Transportation, Engineering District 6-0 and the Federal Highway Administration.

1986 to 1988 * Archaeologist, Louis Berger & Associates, Inc.

Archaeological and Historic American Engineering Record Data Recovery at Two Locks on the Delaware and Raritan Canal, Mercer County, New Jersey. Principal Investigator for the mitigation of mid-nineteenth to early twentieth century canal and structural remains. Conducted for the New Jersey Department of Transportation.

Archaeological Data Recovery Program of the East Creek Mill Site, Cape May County. Principal Investigator for the mitigation of structural remains of a mid-nineteenth to early twentieth century sawmill. Conducted for the New Jersey Department of Transportation.

Cultural Resource Reconnaissance of the Azalea Farm Development, Shrewsbury, New Jersey. Principal Investigator for the testing of potential archaeological sites. Conducted for Blackpoint Construction Company, Inc., Red Bank, New Jersey.

Archaeological Data Recovery Program of the Hamlin Historic Archaeological Site, Warren County, New Jersey. Principal Investigator for the mitigation of the structural remains of a late eighteenth to early-nineteenth century rural farmstead. Conducted for the New Jersey Department of Transportation.

Documentary and Literature Search for the Proposed Sanitary Landfill Site 1A, Rockaway Township, Morris County, New Jersey. Principal Investigator for the evaluation of the potential for cultural resources. Conducted for Rockaway Township, New Jersey.

1985 – 1986 * Field Supervisor, Louis Berger & Associates, Inc.

Route 92, Mercer, Middlesex and Somerset Counties, Technical Environmental Study. Historical Archaeologist for the evaluation of nineteenth to early twentieth century farmsteads. Conducted for the Federal Highway Administration and the New Jersey Department of Transportation.

Archaeological Assessment of Droyer's Point Development, Jersey City, New Jersey. Field Supervisor for the evaluation of the potential for cultural resources. Conducted for Department of Housing and Economic Development, Jersey City.

Phase II Archaeological Investigation of the Washington Street Urban Renewal Area, Site, New York, New York. Field Supervisor for the testing of nineteenth century industrial and commercial remains. Conducted for Shearson Lehman/American Express.

1984-1985 *Crew Chief, Louis Berger & Associates, Inc.

Phase III Mitigation of Barclays Bank, 100 Water Street. Crew Chief for the testing of late seventeenth to early nineteenth century domestic deposits and structural remains. Conducted for the London and Leeds Corporation, London, England

1983-1984 *Crew Member, Louis Berger & Associates, Inc.

Phase II Archaeological Investigation of Barclays Bank, 100 Water Street. Testing of late seventeenth to early nineteenth century domestic deposits and structural remains. Conducted for the London and Leeds Corporation, London, England

Phase III Mitigation at Carney Rose/Thomas Tindall Farmstead Site, Trenton, New Jersey. Data recovery of seventeenth to early nineteenth century domestic deposits and structural remains associated with a farmhouse. Conducted for the New Jersey Department of Transportation.

1980-1983 * Historic Archaeologist, American Resources Group, Ltd., Carbondale, Illinois. Responsibilities included site survey and identification; supervision of field crews; laboratory analysis, and report preparation. Dealt with both prehistoric and historic resources, however, main concentration was on historic resources.

Phase II Archaeological Investigations of the Green Site, Randolph County, Illinois. Principal Investigator for the testing and evaluation of a mid-nineteenth century horse powered sawmill and gristmill site.

Phase I Cultural Resources Survey and Assessment of Residual Lands at Union Electric Company's Callaway Nuclear Power Plant Survey, Callaway County, Missouri. Project Historical Archaeologist, for the identification and evaluation of nineteenth to mid-twentieth century deposits and structural remains.

Phase II Archaeological Survey in Northfield, Sparta, Illinois. Project Historical Archaeologist for the historic archaeological research and analysis.

Phase I Archaeological Survey of the Eden Field, Burning Star Mine #3, Randolph County, Illinois. Project Historical Archaeologist, for the identification and evaluation of nineteenth to mid-twentieth century deposits and structural remains.

Phase I Archaeological Survey of the Northfield and Eastfield, Burning Star Mine #3, Randolph County, Illinois. Project Historical Archaeologist, for the identification and evaluation of nineteenth to mid-twentieth century deposits and structural remains.

Phase I Archaeological Survey of the Eastfield and Westfield Burning Star Mine #5, Jackson County, Illinois. Project Historical Archaeologist, for the identification and evaluation of nineteenth to mid-twentieth century deposits and structural remains.

Phase I Archaeological Survey and Assessment of the Sanitary Landfill Area, Callaway Nuclear Power Plant, Callaway County, Missouri. Project Historical Archaeologist, for the identification and evaluation of nineteenth to mid-twentieth century deposits and structural remains.

1980 * Project Director, Macon County Conservation District, Decatur, Illinois. Supervised and taught an archaeological field school at the Prairie Homestead Site, a circa 1840 standing structure for Youth Conservation Corp participants.

- Phase I Archaeological Survey of the Kerr-McGee Coal Mine, Galatia, Illinois.* Crew member. Conducted by the Center for Archaeological Investigations, Southern Illinois University, Carbondale Indiana for the Kerr-McGee Coal Company.
- 1979 – 1980 *Phase III Archaeological Investigations of the Stadt Huys Site, 85 Broad Street, New York, New York.* Crew Chief for archaeological data recovery of block prior to construction of an office building. Project involved excavation of 17th century Dutch occupation and some late 18th and early 19th century residential lots in Lower Manhattan. Responsible for supervising archaeological field crew during excavation. Conducted for Turner Construction Company, New York, New York.
- 1979 *Phase II Archaeological Investigations at the Hoboken Hollow Site, Troy, New York.* Crew member. Field school on mid-nineteenth century worker housing. Conducted by Rensselaer Polytechnic Institute, Department of Anthropology and Sociology, Troy, New York..
- Phase II Archaeological Investigation of the Creekside Grove Site, Cheektowaga, New York.* Crew member. Conducted by Rensselaer Polytechnic Institute, Department of Anthropology and Sociology, Troy, New York.
- Hoboken Hollow Site, Troy, New York.* Historic researcher. Conducted archival research on mid-nineteenth century worker housing for Rensselaer Polytechnic Institute, Department of Anthropology and Sociology, Troy, New York.
- Ruscher Brewery Project, Troy, New York.* Historic researcher. Conducted archival research on mid-nineteenth century brewery for a National Register of Historic Places Nomination proposal for Rensselaer Polytechnic Institute, Department of Anthropology and Sociology, Troy, New York.
- Historic Sites Bureau, New York State Office of Parks and Recreation Division for Historic Preservation, Peebles Island, Waterford, New York..* Volunteer. Identifying and cataloguing nineteenth century ceramics, glass and metal.
- 1978 *Phase I Archaeological Survey of the Watervliet Arsenal, Watervliet, New York.* Crew member. Conducted by Rensselaer Polytechnic Institute, Department of Anthropology and Sociology, Troy New York.
- Phase I Archaeological Investigation of a Revolutionary War Armory, Russell, Massachusetts.* Crew member. Field school on a Revolutionary War armory site conducted by Westfield State College, Department of History, Westfield, Massachusetts.
- 1975 *Phase I Archaeological Investigation of the Ashley Site, Westfield, Massachusetts.* Crew member. Field school on a circa 1850s farmstead conducted by Westfield State College, Department of History, Westfield, Massachusetts.

Education:

B.A., Archaeology, Douglass College, Rutgers University, 1979.

Professional:

Society for Industrial Archaeology
New Jersey Archaeological Society
National Genealogical Society

Experience:

Ms. Wuebber has over 20 years experience researching, analyzing, and writing contextual and site-specific histories for industrial, military, transportation, commercial, and residential properties in the Northeast, Mid-Atlantic, Southeast, and Midwest.

1999 to Present *Research Historian,
URS Corporation, Florence, New Jersey.

Phase IA Documentary Study, East Side Access Ventilation Shaft, 38th Street, New York, New York. Conducted documentary, cartographic and photographic research of a proposed site for a ventilation shaft in a 25 x 100-foot lot. The purpose of the study is to provide information on the nature, location, and extent of intact and original soil surfaces within the project area and the depth of 20th-century fills above these surfaces. This information is needed in order to determine if proposed construction activities will extend to a depth that will encounter the historic and/or prehistoric surfaces that may contain archaeological resources. Conducted for the MTA New York City Transit/Long Island Railroad.

Cultural Resources Assessment, 1440 Story Avenue, Bronx, New York. Conducted documentary, cartographic and photographic research of a 12-acre site proposed for a warehouse complex. The study provided information on the potential for the presence of archaeological resources with in the site. Conducted for the MTA New York City Transit.

Phase IB Archaeological Field Investigations 101-117 Worth Street, New York, New York. Conducted documentary, cartographic and photographic research Principal Investigator for a Phase IB archaeological investigations of mid 19th to mid 20th century foundation remains and yard areas.. The Phase IB investigation consisted of both machine-excavated test trenches and hand-excavated test units, as well as monitoring of construction activities within a 150 x 260-foot site in lower Manhattan. The test trenches were utilized to determine the presence or absence of early intact surfaces, foundations, and/or shaft features within the project area. Test units were then used to further investigate potential intact surfaces and features encountered during trench excavation. The archaeological monitoring of construction activities afforded a wider exposure of the project area than otherwise provided by the excavation of test units and test trenches. The investigation identified two sections of intact stonewalls associated respectively with the

Broadway Tabernacle Church (1835 – 1857) and a late-nineteenth-century commercial building, along with the truncated remains of a mid-nineteenth-century well and a buried Holocene surface. Conducted for AKRF, New York, New York

U.S. 130, Craft's Creel Bridge, Burlington County, New Jersey. Conducted intensive documentary, cartographic, and photographic research. For the New Jersey Department of Transportation.

Route 21 Cultural Resources Mitigation, Passaic County, New Jersey. Researched and wrote walking tour brochure for an ethnically diverse industrial neighborhood in Passaic. For the New Jersey Department of Transportation

Phase I Archaeological and Historic Architectural Survey of a section of State Route 9, New Castle County, Delaware. Conducted documentary, cartographic, and photographic research. For the Delaware Department of Transportation.

King of Prussia Inn, S.R. 0202, Section 400, King of Prussia, Montgomery County, Pennsylvania. Conducted documentary, cartographic, and photographic research for the ca.1719-1952 King of Prussia Inn. For the Pennsylvania Department of Transportation.

Phase I/II Archaeological Surveys for Proposed the Route 54 Truck Climbing Lanes between Boyd and Elysburg in Northumberland County, Pennsylvania. Conducted general background research on the Route 54 project corridor and site specific historic research on three areas selected for Phase II excavation. For the Pennsylvania Department of Transportation, District 3.

Phase I Investigation for Proposed Electric Generating Facility in Cass Township, Muskingum County, Ohio. Compiled archaeological and historical background data and wrote historical context for the project area. For the Dominion Resources, Inc. and Consolidated Natural Gas (DRI-CNG).

1983 to 1999 Louis Berger. Projects include:

Georgetown Incinerator Site, Square 1189, Washington, D.C. Intensive historical research for the eastern half of a block located along the historic waterfront area. For Millennium Partners of Washington, D.C., Inc.

Edison National Historic Site, West Orange, New Jersey. Ethnographic overview and assessment for the Thomas Edison National Historic Site. For the U.S. National Park Service.

Randolph BRF 0241(29) Project, Bridge Number 42, Vermont Route 12, Town of Randolph, Orange County, Vermont. Phase I archaeological and historical investigations of industrial sites in the village of Randolph, Vermont. For the Vermont Agency of Transportation.

Philadelphia, Pennsylvania, Metropolitan Detention Center. Intensive historical investigation of half a city block in Center City, Philadelphia. For the U.S. Department of Justice, Federal Bureau of Prisons.

New Jersey Route 21(2N), City of Newark, Essex County, New Jersey. Phase II historical investigations for Route 21(2N) bridge replacement and roadway improvements. For the New Jersey Department of Transportation.

Rowland's Mills (28Hu475), New Jersey Route 31 Dualization, Readington Township, Hunterdon County, New Jersey. Phase II archaeological and historical investigations of a nineteenth-century milling community. For the New Jersey Department of Transportation.

East Creek Sawmill Site (28CM20), Cape May County, New Jersey. Phase II historical and archaeological study. Conducted historical research to identify property ownership and develop historical context for interpretation of mill remains dated circa 1782 to 1913. For the Federal Highway Administration and the New Jersey Department of Transportation.

Survey and Evaluation of Historical and Archaeological Resources at the Former United States Coast Guard Station, City of Gloucester, Camden County, New Jersey. Phase I and II investigations of a former Coast Guard Station and U.S. Immigration Detention Center. For the U.S. Coast Guard Maintenance and Logistics Command Atlantic, Governors Island.

Appendix B: Resumes of Key Personnel

Client

SAM GARAGE, LLC/DEAHL REALTY CORP.
744 BROAD STREET – SUITE 1801
NEWARK, NJ 07102

SUBSURFACE INVESTIGATION

Project

3, 7 WOOSTER STREET
NEW YORK, NEW YORK

C.E. BOSS CO. INC.

3319 MERRITT AVENUE
BRONX, N.Y. 10475
718 994 3200
FAX 994 5406

Date

AUGUST 2000
RPT 00190

INDEX

Summary.....	1
Introduction.....	2
Site Description.....	3
Structural Data.....	4
Subsurface Exploration.....	5
Groundwater.....	6
Soil Stratigraphy.....	8
Foundation Analysis and Recommendations.....	10
1. Summary of Subsurface Conditions	
2. Allowable Bearing Capacity	
3. Recommended Foundation	
4. Basement Slab on Grade Construction	
5. Surface Slab on Grade Sidewalk and Pavement Construction	
6. Backfill Considerations	
7. Dewatering	
8. Storm and Sanitary Drainage	
9. Soil Constants for Design Purposes	
10. Settlement Estimates	
11. Seismic Considerations	
12. Lot Line Construction	
Appendix.....	17
Terms Relating To Visual Identification of Soils and Rock	
Dwg B1 - Boring Location/Site Plan, Boring Logs B1 to B5	

SUMMARY

During August 2000, a subsurface investigation was performed by the firm at the site for the New Building located at 3, 7 Wooster Street, New York, NY.

1. Summary of Subsurface Conditions

Based on a review of the boring logs and inspection of soil samples the subsurface conditions are summarized as follows:

- a) The site is underlain with a deep fill stratum placed over a compressible organic layer that is followed by sandy soils of medium compact consistency.
- b) An average soil profile from existing grade would be:
 - 1. 0 to 12.0'; Rubble Fill, NYC 11-65; 0 bearing capacity.
 - 2. 12.0 to 23.5'; Granular and Silty Fill, NYC 11-65; 0 bearing capacity.
 - 3. 23.5 to 33'; Peat and Black Organic Silt some Fine Sand, NYC 11-65; 0 TSF bearing capacity.
 - 4. 33 to 42'; Fine Sand and to some Silt, NYC 08-65; 1.0 TSF bearing capacity.
 - 5. 42' to 52'; Fine Sand little Silt, NYC 08-65; 1.0 TSF bearing capacity.
 - 6. 52' to 66'+; Medium to Fine Sand little to trace Silt trace to no Gravel, NYC 07-65; 2.0 TSF bearing capacity.
- c) Groundwater was noted at 10.5' below existing grade.

2. Allowable Bearing Capacity

Considering maximum bottom of footing elevation at 10.5'+/- below existing grade, immediately above the water table, the soil stratum is a fill material with **0 allowable bearing capacity.**

3. Recommended Foundation

Considering maximum loading conditions and allowable bearing capacities, the firm recommends supporting the structure on a **pile foundation.**

The following is applicable:

- | | |
|---------------------------------|--------------------------------|
| a) Type Pile: | Timber friction pile, ASTM D25 |
| b) Pile Size: | 8" tip diameter, minimum |
| c) Pile Capacity: | 30 tons |
| d) Load Test Required: | No |
| e) Estimated Aver. Pile Length: | 60'+/- from existing grade |
| f) Minimum Pile Length: | 55'+/- from existing grade |
| g) Pile Negative Skin Friction: | 5 +/- kips |

SUMMARY CONTINUED

It is the firm's opinion that the above is probably the most cost effective pile solution. In consideration of the fragile condition of adjacent buildings, pile driving is accepted by the NYC Building Code. However, if pile driving is considered the following is recommended:

1. For your protection, a complete pre-construction survey should be preformed. Our report includes photographs of all adjacent buildings illustrating any pre-existing damage.
2. Seismic monitoring during all pile driving.
3. Pre-drilling of all piles to the depth of existing adjacent footings to minimize vibrations.

If the driving of piles is not acceptable adjacent to the buildings, alternate pile installations may be implemented. The use of drilled in pipe which are then extracted as concrete is injected creating a friction pile is one such method.

For additional pile information contact Jet Drive Contracting Corp., Rick Rivara at 516 763 2829 or Urban Foundation/Engineering, LLC, Tony Mazo at 718 478 3021.

INTRODUCTION

The firm was authorized by the client to perform a Subsurface Investigation for the new building located at 3,7 Wooster Street, New York, N. Y.

The scope of work as reported herein includes the following:

1. Performance of a field exploration program consisting of five (5) Test Borings.
2. Performance of a field site inspection of existing structures and conditions including adjacent and surrounding property.
3. Visual inspection, testing and classification of soil and rock samples recovered from the test borings to determine the physical properties of the strata encountered.
4. Provide an evaluation of the field data with pertinent conclusions and recommendations as to the type of foundation best suited for this project.
5. Provide soil design criteria as required and recommendations to deal with unique site conditions that may exist.

SITE DESCRIPTION

The site for the new structure is located 72' +/- north of the northwest corner of Canal Street and Wooster Street, N.Y.C. The site encompasses approximately 5,600 sf, and is currently used as an asphalt paved parking lot.

Along the south and west perimeter of the site, four, five-story residential buildings were noted. These buildings have brick masonry exteriors and ledgestone foundation walls are assumed. Access to the buildings was not permitted and no inspection was performed.

STRUCTURAL DATA

As noted by the project Architect, Anthony Moralishvili, a seven story steel framed structure with a full basement is planned.

The new 5,600 sf +/- footprint structure is to have concrete basement walls, and poured concrete floor slabs.

SUBSURFACE EXPLORATION

Five (5) 3.25 inch exploratory borings (Nos. B1 through B 5) were performed at locations designated by the architect and shown on the Boring Drawing B-1 found in the Appendix. Borings were performed in general accordance with the NYC Building Code Section 27-662 through 27-667, Soil Investigations.

Casing was advanced by rotary drilling and soil samples were taken at five foot intervals to the termination of each boring. Soil samples were taken by means of a split spoon sampler, having a two inch outside diameter. Standard Penetration Tests (SPT's) were performed and the number of blows required to drive the split spoon sampler a distance of 6" was recorded for a total of 24" of penetration using 140 lb hammer freely falling from a height of 30 inches. Representative portions of the soil samples were preserved in jars and returned to the laboratory.

Borings were drilled to a depth of 66' below grade.

GROUNDWATER

Groundwater was encountered at a depth from 10 to 12'-6" below grade in all borings. It is the firm's opinion that the groundwater level is not subject to tidal fluctuations and would not be greatly affected by seasonal variations in rainfall.

Perched water occurs when surface runoff is prevented from draining to the watertable by an impervious soil stratum. Soil samples collected below the impervious stratum but above the true watertable are dry. Perched water was not observed.

SOIL STRATIGRAPHY

All soil samples recovered from the test borings were visually identified in accordance with the American Society of Engineering Classification System described by Donald M. Burmeister in ASTM Special Technical Publication 479 and the samples were classified in accordance with the Unified Classification System and the NYC Building Code, section 27-675 to 27-679. Outlines are presented in the Appendix. The description of strata that follows is based on the visual identification of the samples by a licensed professional engineer as well as physical testing as required.

Stratum 1.- Granular Fill (NYC 11-65)

The initial stratum is fill material, to a maximum depth of 25'-0" below grade, placed over an organic peat stratum as reclaimed land. The top 13'+/-, of this material is medium compact rubble fill. The bottom 12'+/- is silty sand the material has no appreciable bearing capacity.

Stratum 2.- Black Peat and Organic Silt, some Fine Sand (NYC 11-65)

This highly compressible stratum located from 12'-6" to 25'-0" below existing grade is an average of 7.5 feet thick. This material has no appreciable bearing capacity.

Stratum 3.- Gray/Brown Fine Sand little to some Silt (NYC 08-65)

These strata immediately follow the peat stratum noted above and extend to an average depth of 53'-0" below grade.

SOIL STRATIGRAPHY CONTINUED

The material is loose to medium compact sand with varying silt concentrations. Average SPT N values through these strata vary from 7.8 blows/foot where more silt was noted to 11.2. Bearing capacity is estimated at 1.5 tsf.

Stratum 4.- Gray Brown M/F Sand, little to trace Silt, little to no Gravel (NYC 07-65)

These strata extend from 53'-0" to the maximum boring depth of 66'-0" below grade. The material is considered to be medium compact with average N values of 17.9 blows/foot. Bearing capacity is estimated at 2.0 tsf.

FOUNDATION ANALYSIS AND RECOMMENDATIONS

1. Summary of Subsurface Conditions

Based on a review of the boring logs and inspection of soil samples the subsurface conditions are summarized as follows:

- a) The site is underlain with a deep fill stratum placed over a compressible organic layer that is followed by sandy soils of medium compact consistency.
- b) An average soil profile from existing grade would be:
 - 1. 0 to 12.0'; Rubble Fill, NYC 11-65; 0 bearing capacity.
 - 2. 12.0 to 23.5'; Granular and Silty Fill, NYC 11-65; 0 bearing capacity.
 - 3. 23.5 to 33'; Peat and Black Organic Silt some Fine Sand, NYC 11-65; 0 TSF bearing capacity.
 - 4. 33 to 42'; Fine Sand and to some Silt, NYC 08-65; 1.0 TSF bearing capacity.
 - 5. 42' to 52'; Fine Sand little Silt, NYC 08-65; 1.0 TSF bearing capacity.
 - 6. 52' to 66'+; Medium to Fine Sand little to trace Silt trace to no Gravel, NYC 07-65; 2.0 TSF bearing capacity.
- 3. Groundwater was noted at 10.5' below existing grade.

FOUNDATION ANALYSIS AND RECOMMENDATIONS CONTINUED

2. Allowable Bearing Capacity

Considering maximum bottom of footing elevation at 10.5' +/- below existing grade, immediately above the water table, the soil stratum is a fill material with **0 allowable bearing capacity.**

3. Recommended Foundation

Considering maximum loading conditions and allowable bearing capacities, the firm recommends supporting the structure on a **pile foundation.**

The following is applicable:

- | | |
|---------------------------------|--------------------------------|
| a) Type Pile: | Timber friction pile, ASTM D25 |
| b) Pile Size: | 8" tip diameter, minimum |
| c) Pile Capacity: | 30 tons |
| d) Load Test Required: | No |
| e) Estimated Aver. Pile Length: | 60' +/- from existing grade |
| f) Minimum Pile Length: | 55' +/- from existing grade |

It is the firm's opinion that the above is probably the most cost effective pile solution. In consideration of the fragile condition of adjacent buildings, pile driving is accepted by the NYC Building Code. However, if pile driving is considered the following is recommended:

FOUNDATION ANALYSIS AND RECOMMENDATIONS CONTINUED

2. For your protection, a complete pre-construction survey should be preformed.
Our report includes photographs of all adjacent buildings illustrating any pre-existing damage.
3. Seismic monitoring during all pile driving.
4. Pre-drilling of all piles to the depth of existing adjacent footings to minimize vibrations.

Alternatives to pile driving

1. Pile Jetting – This vibration free procedure “jets” water at high pressure into the ground causing the soil to flow the surface and allows the pile to fall into the newly created hole. This procedure is not recommended for the following reasons:
 5. Pile jetting is not acceptable within the zone of influence of adjacent footings. The zone of influence in this case is the soil located within a 22.5 degree angle extending from the bottom of the adjacent footing. If this soil is disturbed, the undermining and settlement of the existing adjacent footing will result.
 6. Pile jetting is generally utilized in marine areas where water is easily accessible and in great supply. To provide enough water for this project would prove too costly.

FOUNDATION ANALYSIS AND RECOMMENDATIONS CONTINUED

2. Helical Piles – This vibration free method spins flighted pipes into the ground and is generally used where pile driving rig access is not possible. These piles have a significantly lower load capacity in comparison with a conventional timber pile, which would result in an increase in the number of required piles and a significant cost increase. This method would be an acceptable alternative to pile driving.
3. Mini Piles – This system, also vibration free, is probably the best and most cost effective alternative to pile driving. Casing is spun to the required depth and then extracted while injecting the hole with grout.

For additional pile information contact Jet Drive Contracting Corp., Rick Rivara at 516 763 2829 or America Pile Inc., James Capolla at 718 241 3900.

4. Basement Slab on Grade Construction

Subgrade soils are compressible and incapable of supporting basement slab on grade construction for the structure. The writer recommends a framed slab or concrete plank.

In addition, considering the high watertable observed at 10.5+/-' below grade, waterproofing as well as sump pump construction should be considered.

5. Surface Slab on Grade Sidewalk and Pavement Construction

FOUNDATION ANALYSIS AND RECOMMENDATIONS CONTINUED

The initial soil strata are capable of adequately supporting surface slab on grade sidewalk and pavement construction. The writer recommends the following construction procedure:

- a) Strip topsoil and any organic loam soil.
- b) Proof roll surface removing any spongy areas.
- c) Backfill granular soil to grade as required. Clean granular material should be installed in 1' lifts and compacted to 95% of ASTM D1557 maximum density.
- d) Install 6" of porous fill (crushed stone, gravel, recycled concrete, etc.) and vapor barrier, if required, for concrete slab on grade.
- e) Install concrete slab or asphalt pavement as required.

6. Backfill Considerations

All fill material above the watertable would be acceptable for general backfill after removal of particles greater than 8".

For backfill immediately beneath sidewalk and pavement construction, a granular soil with maximum size of 4" and less than 10% passing a #200 sieve is recommended.

7. Dewatering

Because of the high watertable observed at 10.5' +/- below existing grade, some dewatering should be anticipated.

8. Storm and Sanitary Drainage

If onsite collection of storm runoff is considered, percolation of the fill stratum above the perched water table is acceptable and is estimated at approximately 2.0 minutes per inch.

FOUNDATION ANALYSIS AND RECOMMENDATIONS CONTINUED

For a percolation rate of 2 minutes/inch the NYC Building Code R.S. 16, section P113.10, Table RS16-23A permits an effluent allowance rate of seepage of 4.3 gallons per sf of effective absorptive area per day.

9. Soil Constants for Design Purposes

Soil constants necessary for foundation wall design are as follows:

Dense Fill Stratum

a) Unit weight = 120 pcf b) $K_a = 0.271$ c) $K_p = 3.69$

10. Settlement Estimates

Settlement in sands is rapid, occurring almost entirely during construction and initial loading. When maximum pile cap width is 3.0' +/- and the pile depth is 55' +/- below grade, total estimated settlement is calculated to be 0.62 inches.

Maximum differential settlement is estimated to be 75 % of total settlement or 0.46 inches.

All of the above is within acceptable limits.

11. Seismic Considerations

NYC Local Law 17 is utilized. It is necessary to determine a site "S" type based on the soil profile as noted in Table 23J, Site Coefficients. From the boring average N values, the Sand bearing strata is determined to be Medium Compact. (N is between 10 and 30) and the depth to rock exceeds 100 feet. Based on the above, the soil profile conforms to type S2 with a corresponding S factor of 1.2.

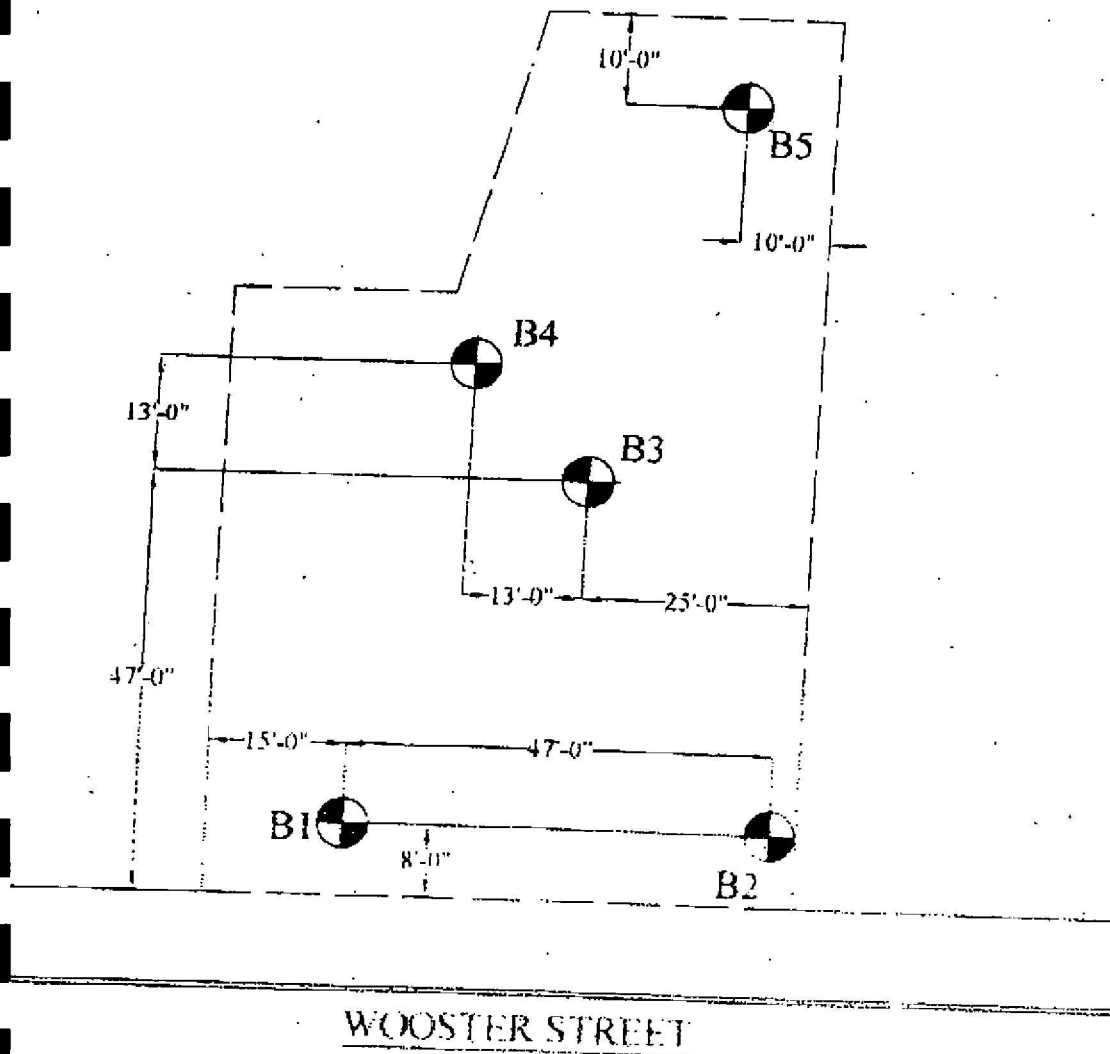
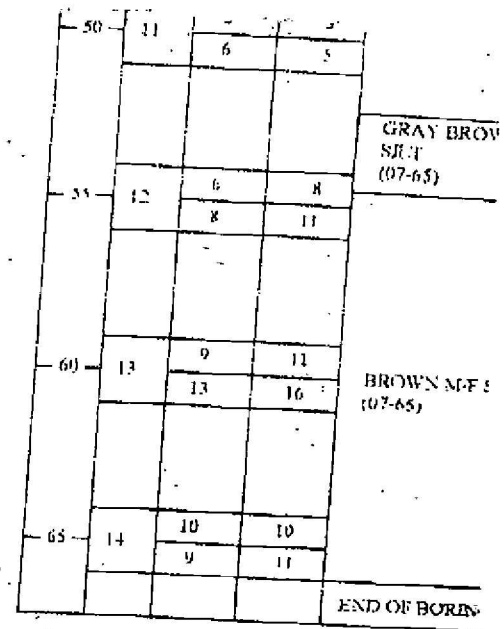
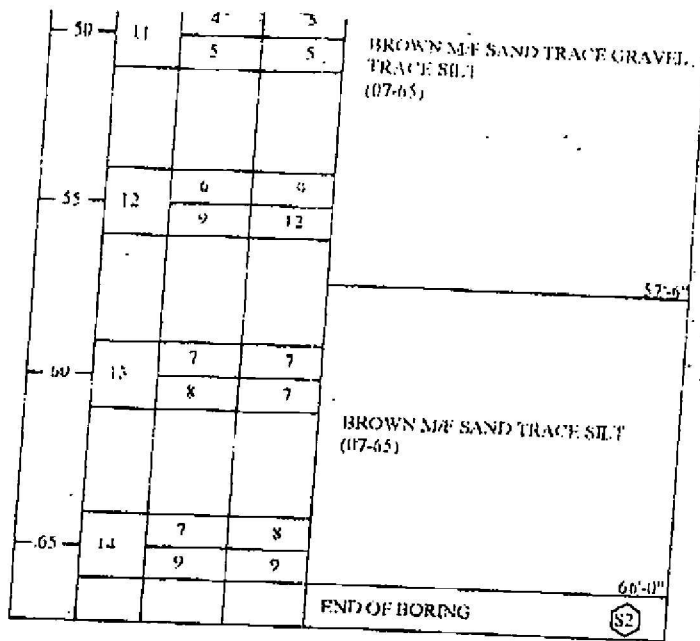
FOUNDATION ANALYSIS AND RECOMMENDATIONS CONTINUED

Considering the N values of Medium to Fine and Fine Sand below the watertable, the soil profile was evaluated for potential for liquefaction as per section 2312(d)3. The soil profile was noted to conform to Category C where **liquefaction is considered unlikely.**

12. Lot Line Construction

Since access to adjacent buildings located on the south and west property lines was denied, basement and footing depths are unknown. An investigation during construction should be performed to evaluate the necessity and possibility, given the fragile condition of these buildings, of underpinning.

APPENDIX



DENOTES BORING LOCATION

BORING LOCATION PLAN