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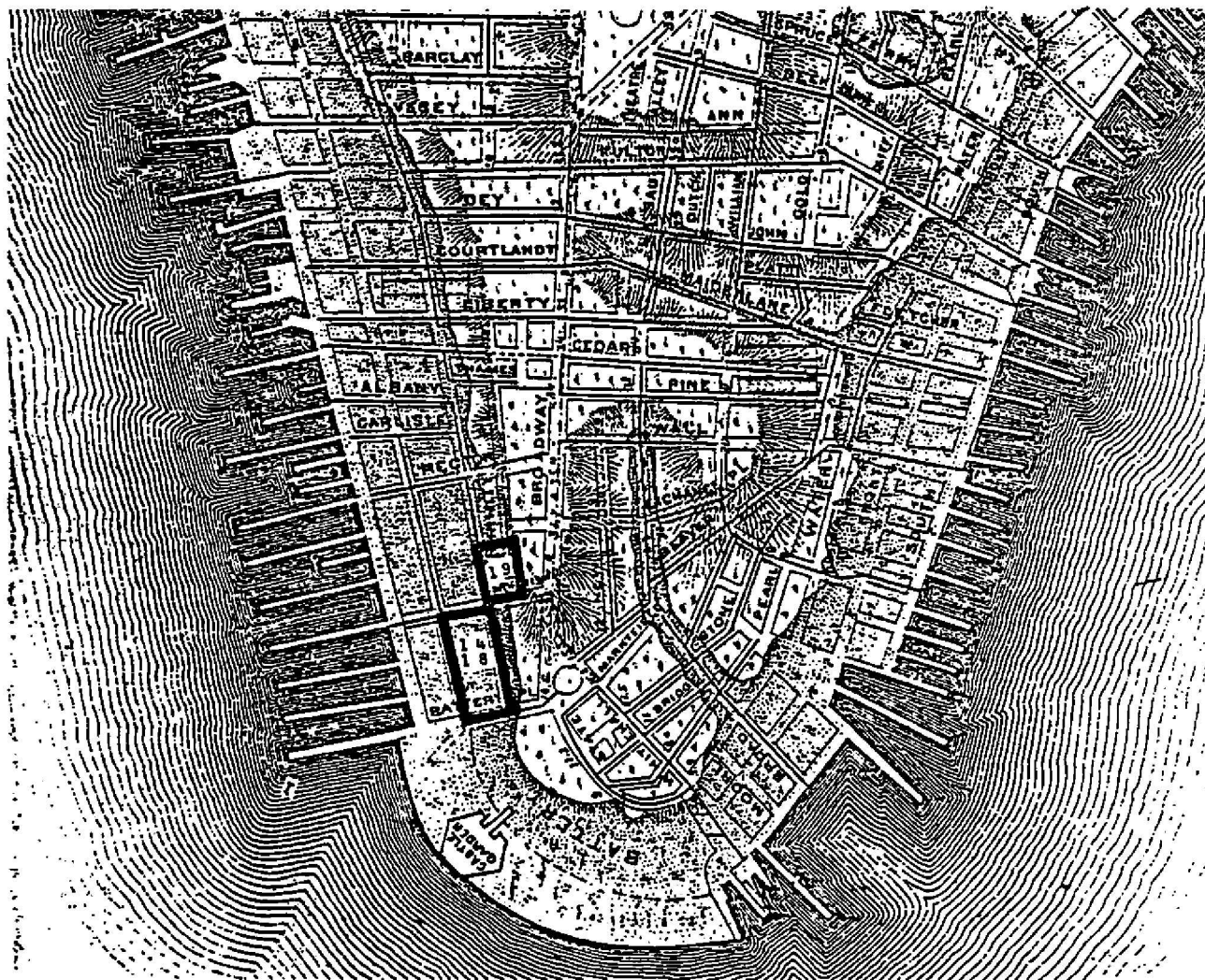
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Stage 1A Archaeological Evaluation of the Exchange Project Site, 10 Battery Place, New York City

EEA



Prepared for EEA, Inc.

Prepared by Joan H. Geismar, Ph.D.

January 22, 1987

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(all recent photos by Joan Geismar)

ACKNOWLEDGMENTS

EXECUTIVE SUMMARY

The primary focus of this Stage 1A archaeological evaluation of the Exchange Project site was the east and west side of the Brooklyn-Battery Tunnel blower building, the only portions of the project block unaffected by twentieth century development. This included subway construction in the second decade of this century and building of the tunnel complex and related subway alterations in the late-1940s. Research indicates the entire block, which is bounded by Battery Place to the south, Greenwich Street to the east, Washington Street to the west (Western Union International Plaza in the site area), and Morris Street to the north, was land under water until filling began in the last decade of the eighteenth century. Once begun, this filling occurred episodically until about 1821.

During the first decade of the nineteenth century, prominent merchants built and occupied homes along Greenwich Street in the sensitive area; however, the yards of these buildings, where meaningful domestic archaeological data would have been located, were destroyed during tunnel construction. The Washington Street side of the block, filled during the next decade, was where these merchants erected warehouses and stables (an exception to this non-residential development was a house that stood in the vicinity of the Battery Place-Washington Street corner from 1816-1824). It was also where wharves and piers were located in the course of filling and, once the block was filled, where piers alone are later documented in tax records.

During foundation excavations planned for the block, in this instance evenly-spaced holes dug to install caissons and

piles, it is possible that remnants of waterfront and landfill constructions may be encountered in previously unexcavated areas (for example, an unrecorded wharf cribbing was revealed during excavation for the blower building in 1947). By archaeologically monitoring these excavations and documenting evidence of wharves, piers, or bulkheads that remain on the southeastern and southwestern portions of the block, our knowledge of late-eighteenth and early-nineteenth-century land reclamation would be expanded. Implementation of a mutually acceptable monitoring program, which would provide a cost-effective sampling strategy, should be agreed upon by the Exchanges, PDC, the Landmarks Commission, the foundation contractors, and the archaeologist.

In addition to the project block, an area just to the northeast (bounded by Morris Street to the south, Greenwich Street to the west, Trinity Place to the east, and Edgar Street to the north) will also be developed and was considered to determine if archaeology need be a concern. At this writing, development plans are tentative, but may include the creation of a park.

Although the data are somewhat ambiguous, this part of the site was mainly land under water, but the northeastern part may have been the edge of a bluff or a beach. In addition, a palisaded fortification built by the Dutch in the seventeenth century appears to have been located here; if so, leveling thought to have occurred in the late-eighteenth century to create a commercial waterfront would undoubtedly have destroyed evidence of this fortification. It is also possible stone foundation walls that represent early fill constructions might be located in this area as might

oyster shell middens, the debris of Native American food gathering. And finally, it is more than likely wharves or piers built in the late-eighteenth century to extend Edgar Street beyond the Hudson's high water mark might be found here (in 1947, this street was rerun approximately 8 to 10 ft. north of its eighteenth-century location).

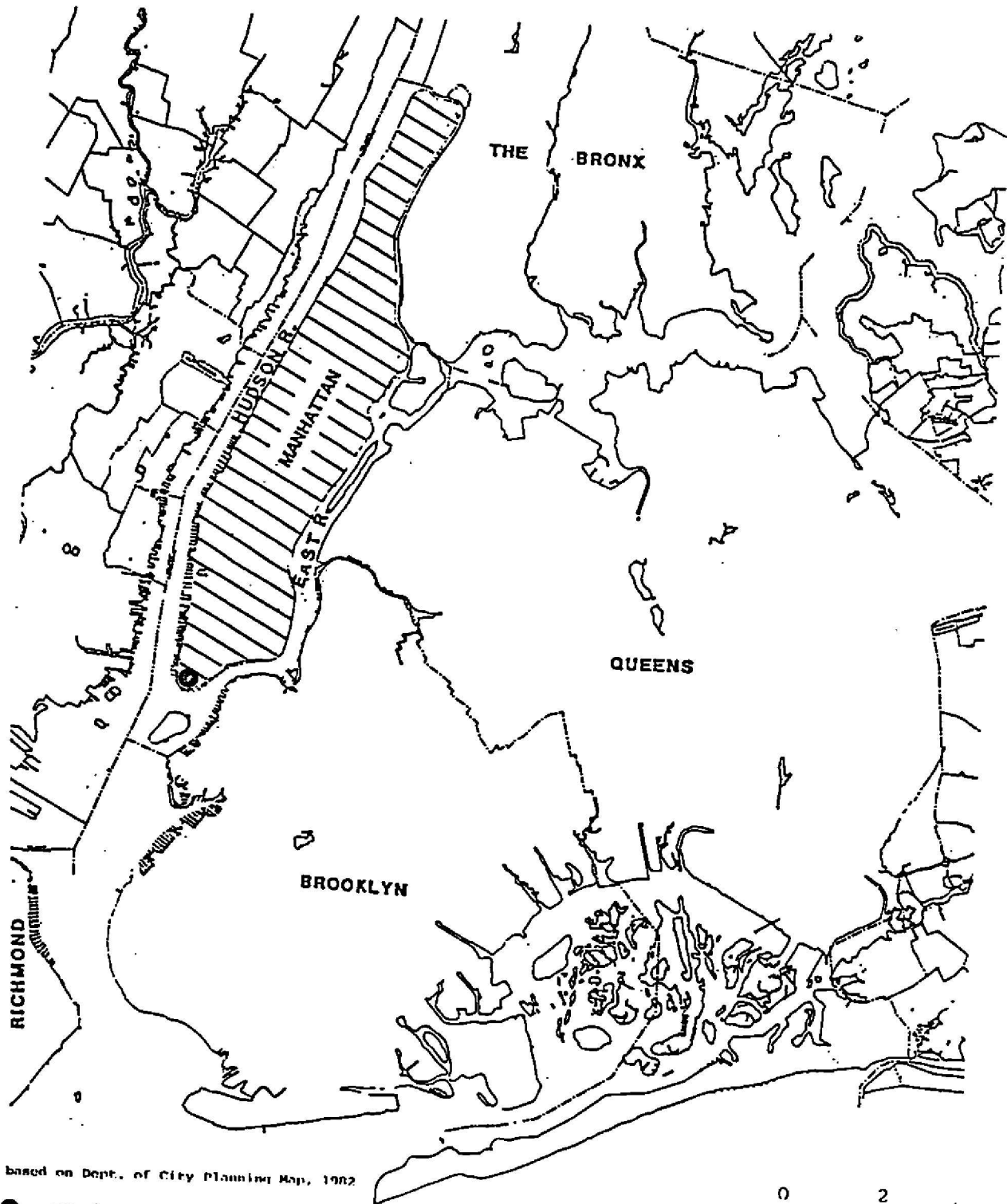
Until detailed borings are available to assess subsurface conditions, only a highly speculative evaluation can be made for this part of the site. Therefore, three borings continuously sampled to bedrock (which may be shallow in this area) are recommended. These would help determine if further documentation or field testing are necessary should development in this area include excavation (below 8 ft. where buildings stood and below grade where Edgar Street originally ran). To ensure that construction schedules will not be affected, it is recommended these borings be made well in advance of planned construction.

INTRODUCTION

This report presents a Stage 1A archaeological study for the proposed Exchange Project, 10 Battery Place, Manhattan. It was prepared for EEA, Inc., as part of an environmental review undertaken for the New York City Public Development Corporation (PDC).

Located just north of Battery Park at the southwestern tip of Manhattan (Figures 1 and 2), the project block was originally designated Block 14 in the city block-numbering system, but is now Block 18. Since the early-1820s, it has been bounded south by Battery Place, east by Greenwich Street, north by Morris Street, and west by Washington Street (now Western Union International Plaza in the project area). However, prior to land reclamation that began in the last decade of the eighteenth century, what became Greenwich and Washington Streets were the Hudson River's high and low water mark (e.g., Gilder 1936:44); therefore, the entire block was originally land under water. Subsequent filling between Washington and West Streets relegated the block to an inland position by the late-1830s (Stokes V 1926: 1764-1765), and the recent construction of Battery Park City has shifted it even further from the river.

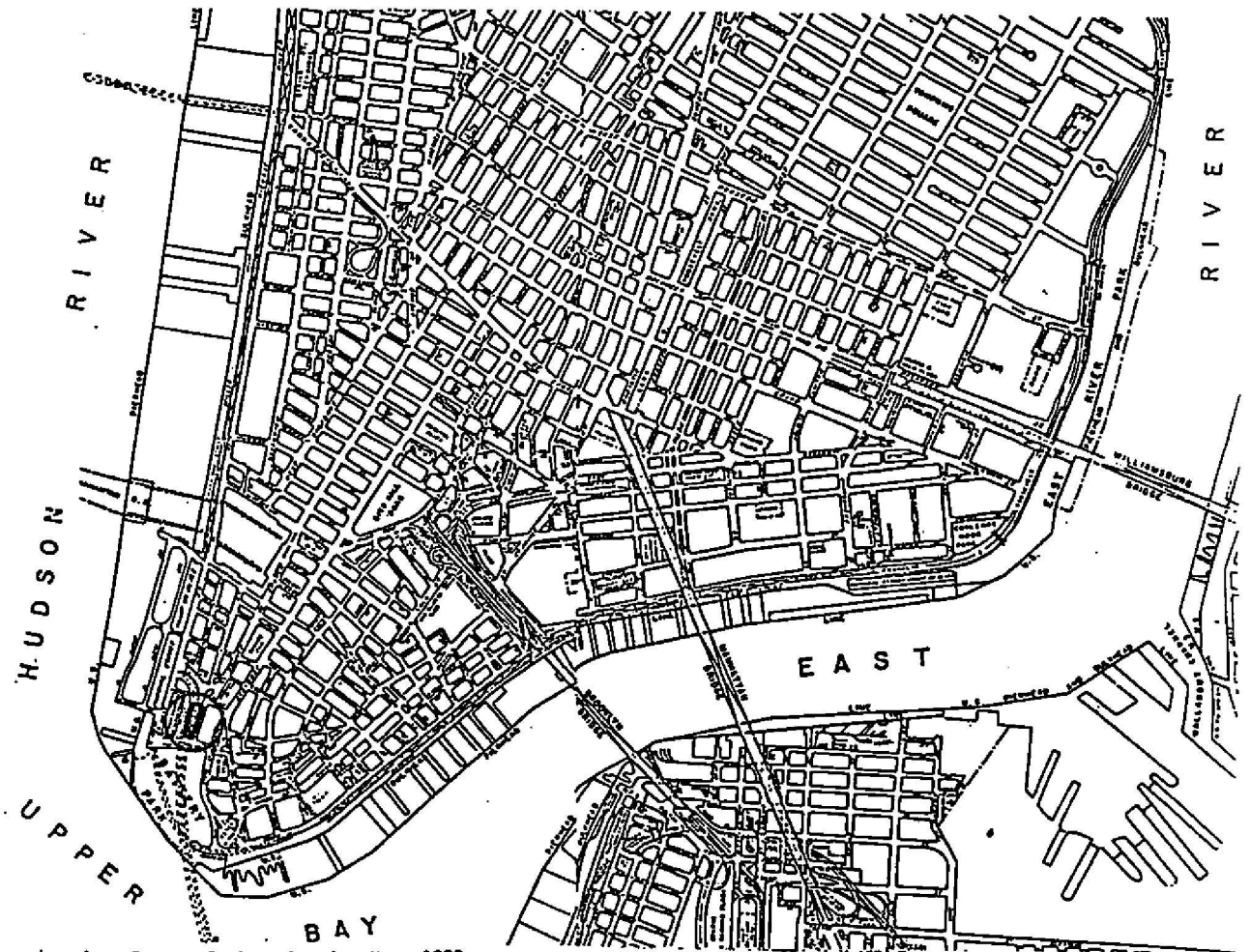
With two noteworthy exceptions, the block was excavated in 1947 to create the approach, exit, and blower building of the Brooklyn-Battery Tunnel (Figure 3 and Plates 1 and 2; in this process, the fill brought in to create the block in the late-eighteenth and early-nineteenth centuries was used in the twentieth century to extend Battery Park and LaGuardia Airport [TBTA



based on Dept. of City Planning Map, 1982

● project location, approx.

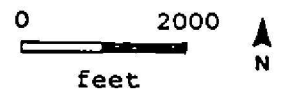
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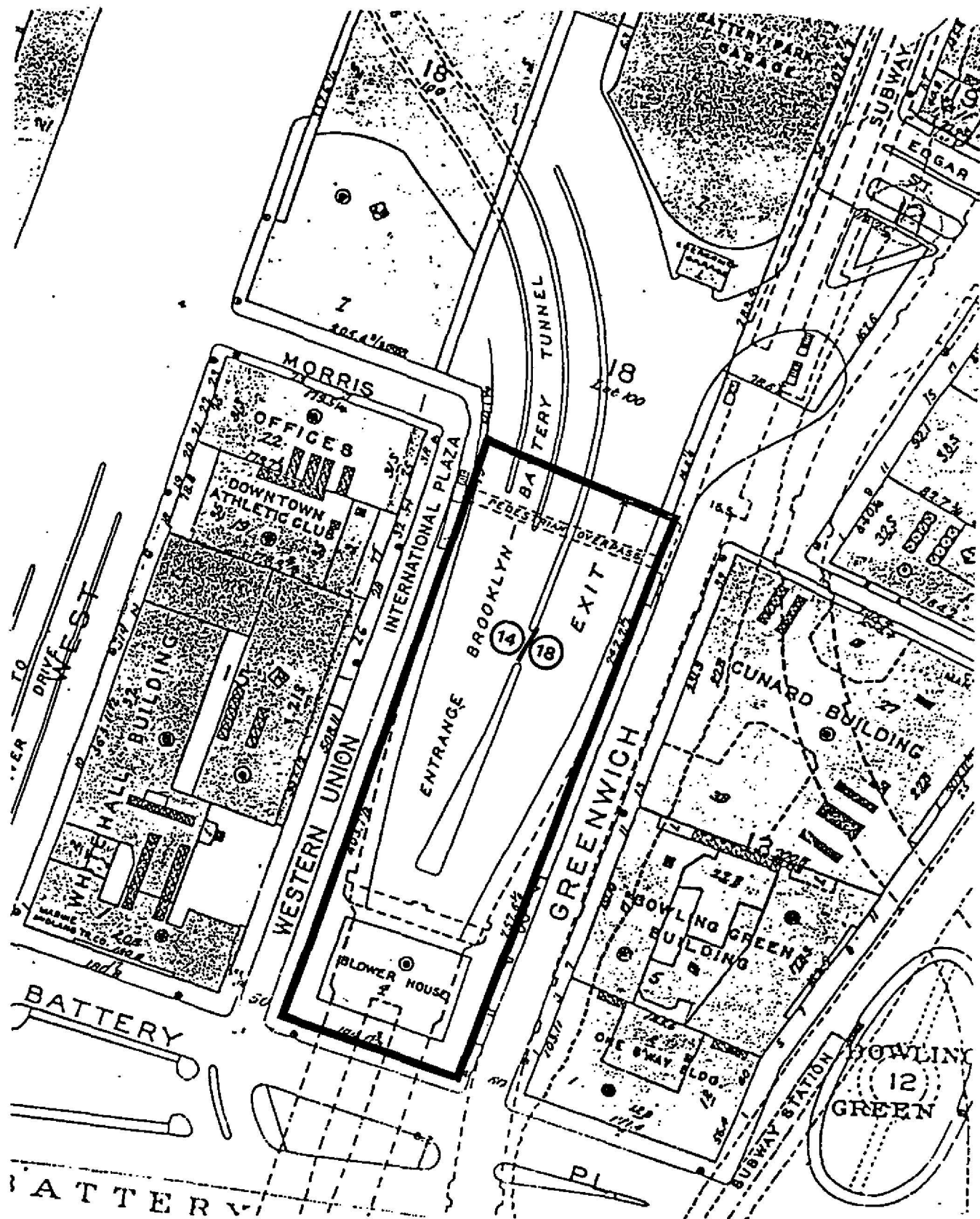


based on Dept. of City Planning Map, 1982



site block





based on 1955 Manhattan Land Book updated to 1975

project block (Block 14/18)

0 100
feet N

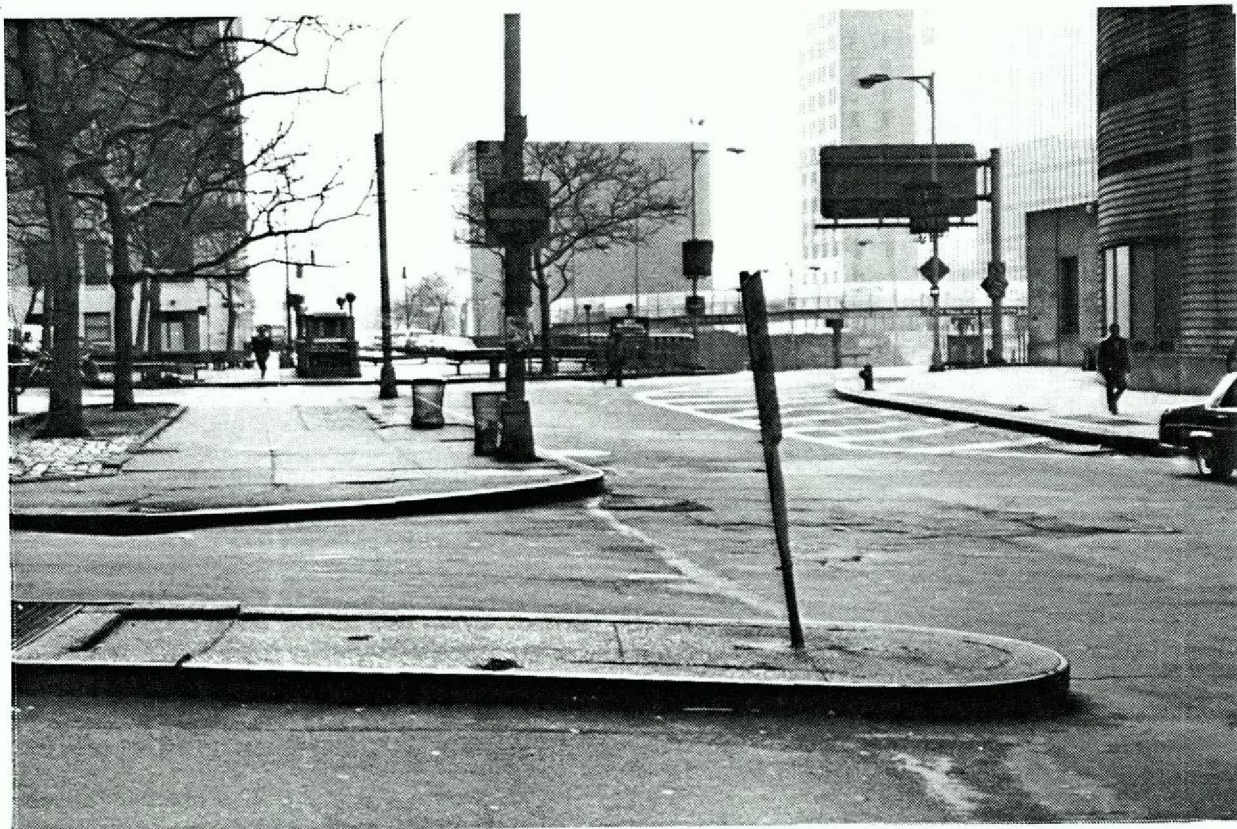


Plate 1. Looking south from Edgar Street (foreground) and Greenwich Street toward the Brooklyn-Battery Tunnel. The tunnel blower building is in the center background. A park is planned that will extend south from Edgar Street which was moved about 10 ft. north of its original 18th-century location in 1947 (12/16/86).

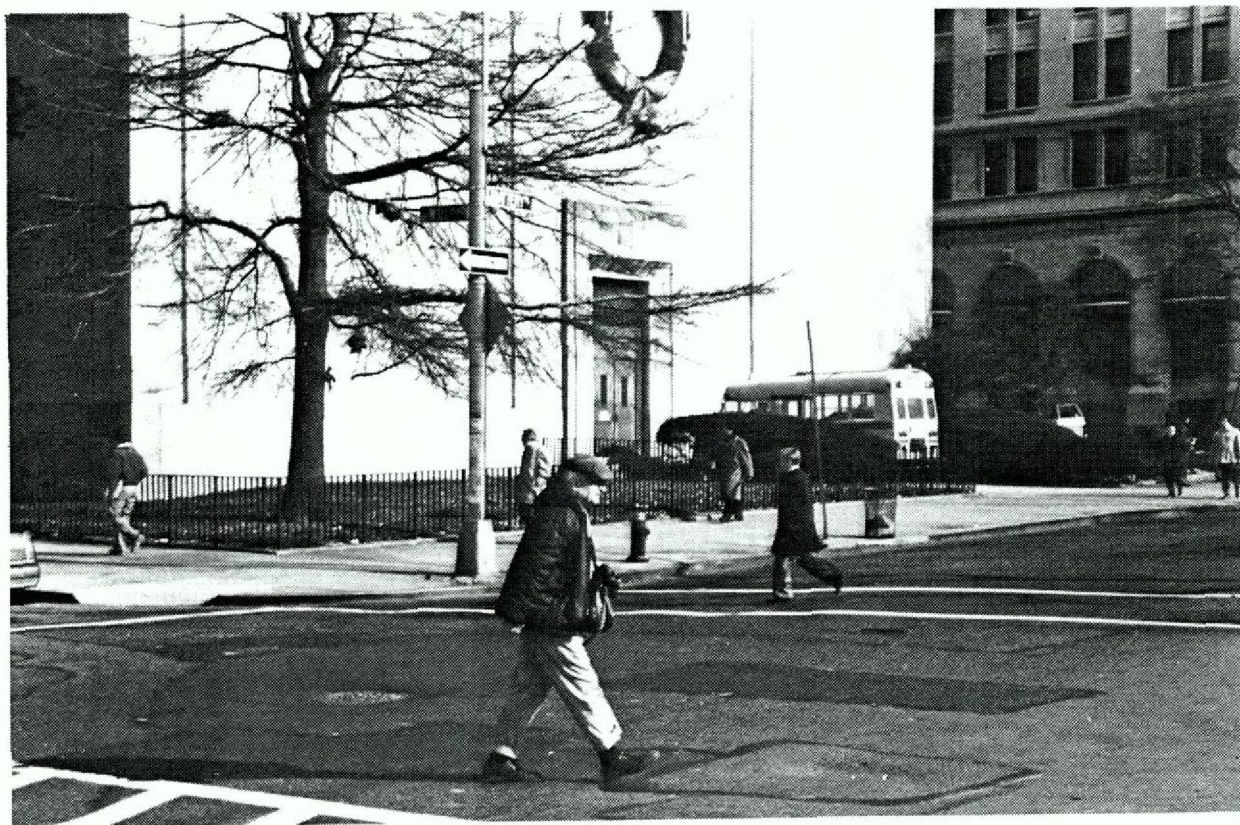


Plate 2. Battery Place facade of the tunnel blower building showing the sodded area in front. Greenwich Street is to the right and Washington Street (Western Union Plaza) is to the left. The area in front of the building was excavated when the tunnel complex was built in 1947, but the strips of land on either side of the building were not disturbed (12/16/86).

memo, October 6, 1941)). The exceptions, which comprise land strips approximately 110-ft. long by 25-ft. wide that extend north from Battery Place on the east and west sides of the tunnel blower building, were the major focus of this assessment. Based on demolition and construction photos provided by the Triborough Bridge and Tunnel Authority (TBTA) as well as subsequent research, foundations for the proposed building will extend into these areas that appear undisturbed by twentieth-century development (Plate 3). In addition to the tunnel complex, this included construction of the subway on Greenwich Street by 1918 (Hall 1945) and its renovation in the late-1940s (TBTA Contract 19).

As currently planned, the proposed development will create trading, office, and retail space in a ten-story structure extending above the tunnel plaza and a tower fronting on Battery Park. The tower, comprising trading floors and offices, will encompass the existing blower building and provide easements and accommodations for air intake and exhaust.

In addition to the building site, Block 19, now represented by a concrete island just to the northeast, was peripherally included in this assessment. Currently, a park is planned on this site that is bounded by Edgar Street to the north, Trinity Place to the east, and Greenwich Street to the west (Figure 4 and see Plates 1 and 4); in addition, the eastern foundations of an access ramp for the proposed Exchange building may be situated here. Although this part of the project site was not a major research focus, its history and development were considered to determine its potential sensitivity.

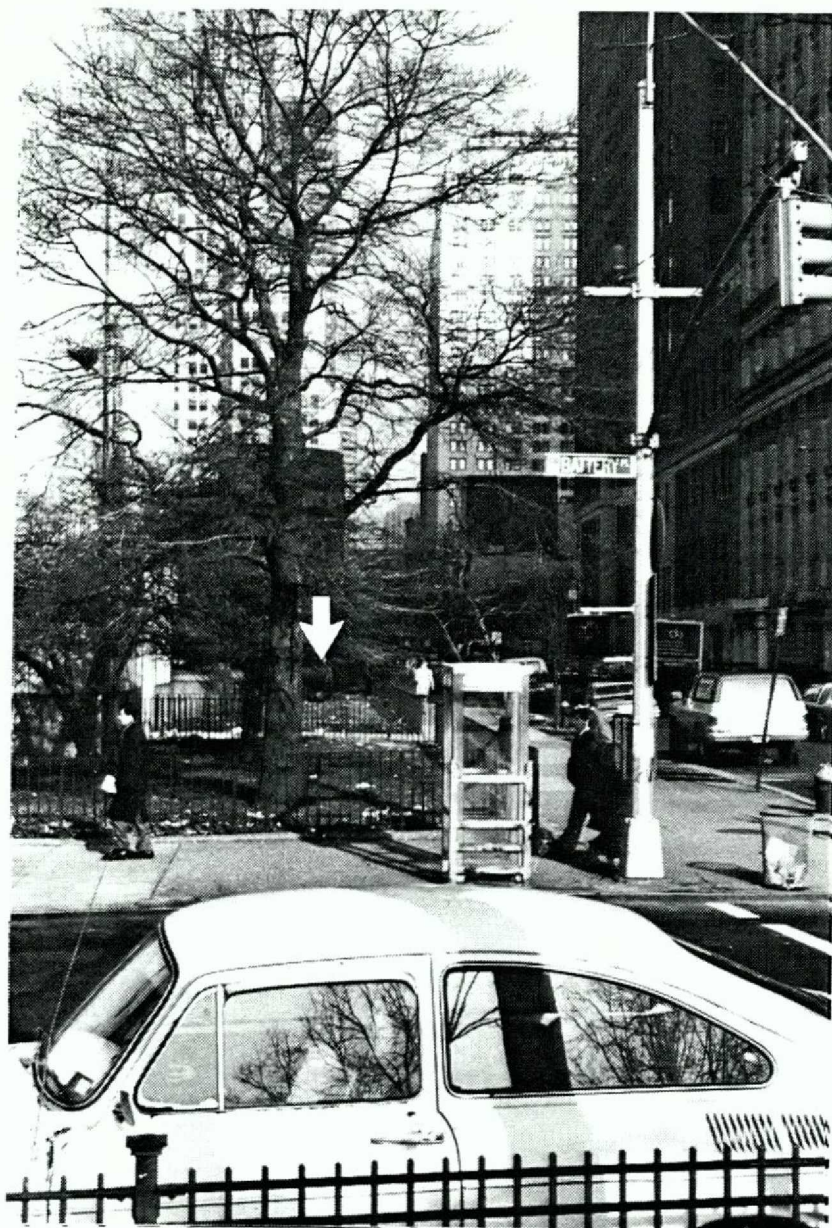
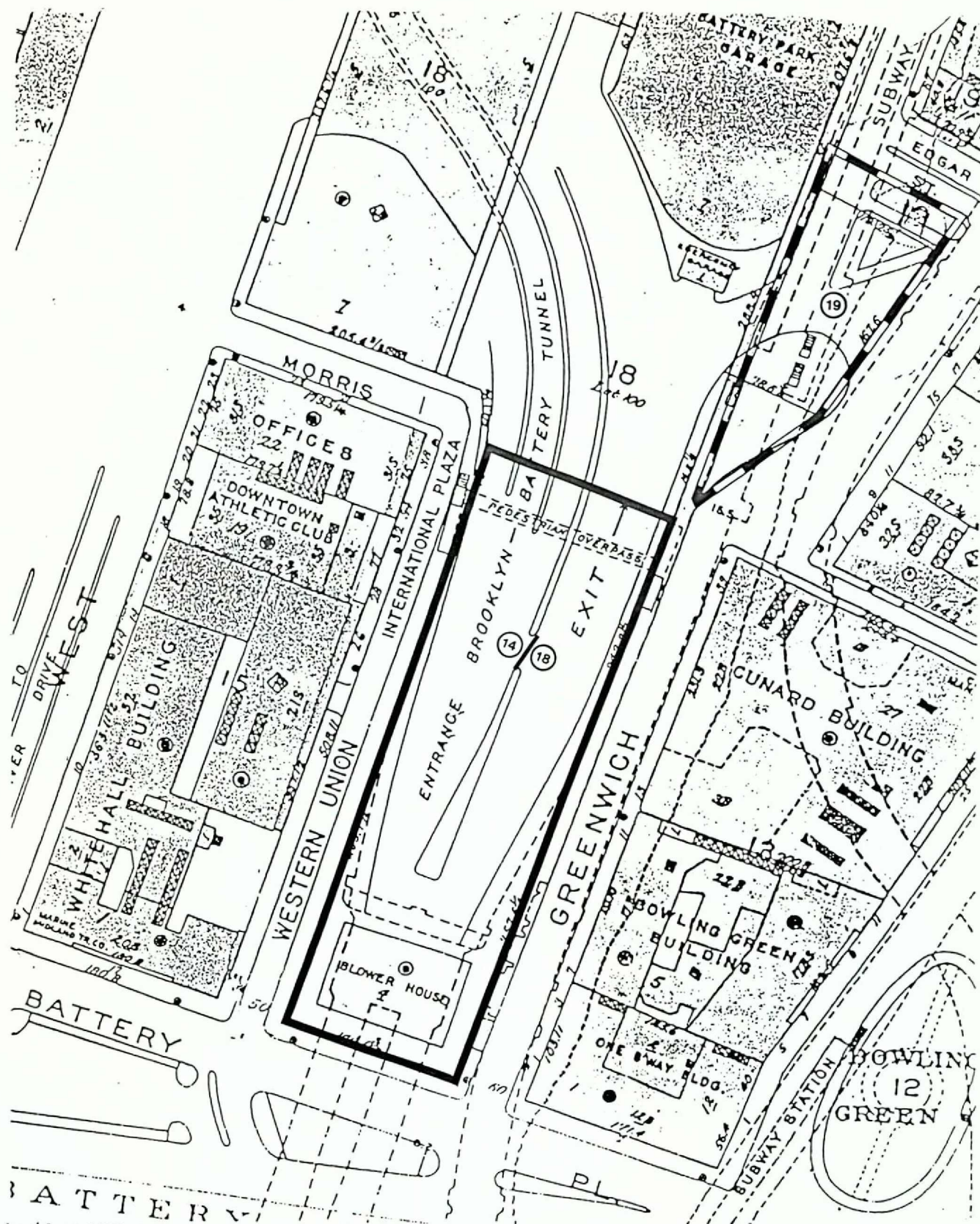


Plate 3. Looking north from Battery Place to strip of unexcavated land on the east side of the blower building on Greenwich Street. Note gratings for the IRT subway. Construction of this subway line in the second decade of this century, like that of the blower building, apparently did not drastically disturb this area. A small boat landing may have been located here prior to filling. Once filled, it became the location of elegant homes built in the early-19th century (12/16/86).



based on 1955 Manhattan Land Book updated to 1975

— project block (Block 14/18)

— proposed park (Block 19)

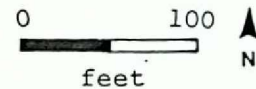




Plate 4. Composite photo looking from north (left) to south along Greenwich Street from Edgar Street to the exit from the Brooklyn-Battery Tunnel. Greewnwich Street is in the foreground and Trinity Place runs to the right of the lefthand island. The blower building is to right just beyond the photo. This view encompasses all of what was formerly Block 19 (12/16/86).

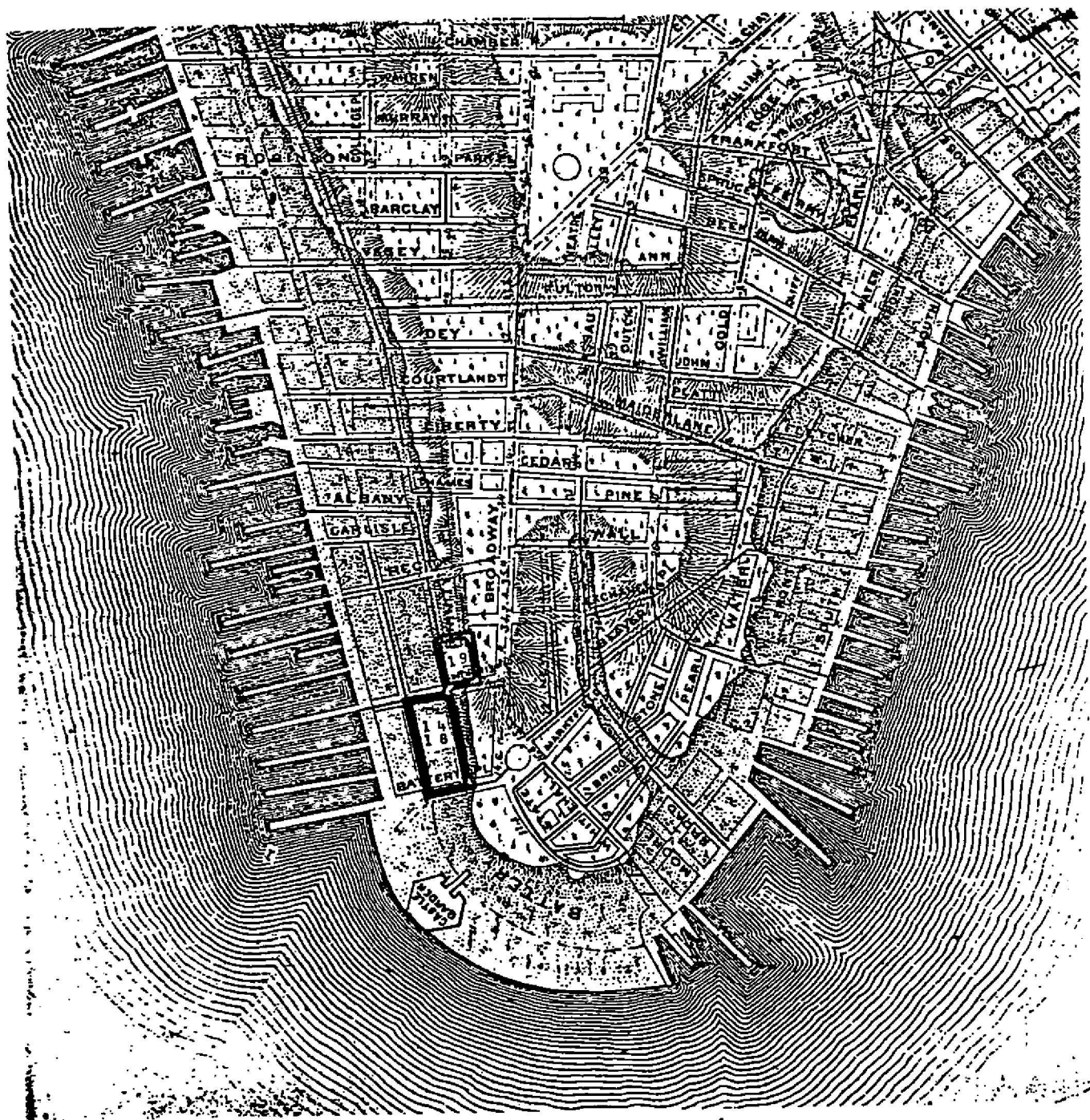
To evaluate the archaeological potential of both portions of the site, an archival and literature search was undertaken. Since the project block [Block 14/18] was totally reclaimed from the river, prehistoric sites were not a consideration in its archaeological assessment; however, the development of Block 19 just to the north where a bluff may have been leveled (e.g., Figure 5), might have preserved some evidence for Native American use (a seventeenth-century fortification known as the "Oyster Pasty mount" located somewhere in this vicinity suggests shell deposits associated with Native American populations).

In addition to map, tax, and deed data, invaluable information was found in the TBTA photos noted above. The research was also coordinated with data from relevant local archaeological investigations, among them Site 1 of the Washington Street Urban Renewal Area; this is a chronologically compatible site and the only Hudson River landfill site investigated to date (Geismar 1986a).

ARCHIVAL AND HISTORICAL RESEARCH

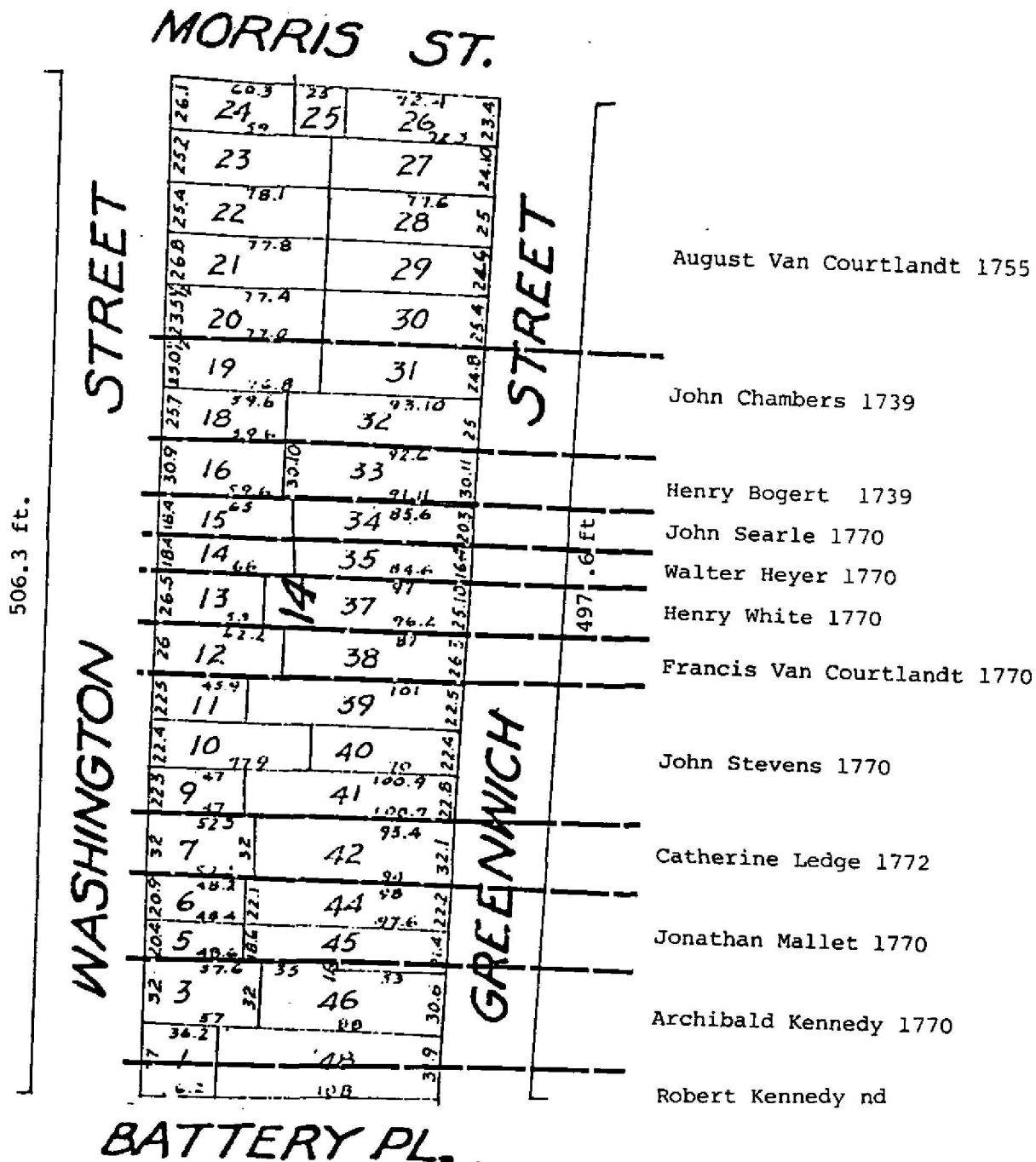
Block 14/18

Archival and historical research indicated water lot grants for the project block were issued by the city between 1739 and 1770 (Figure 6 this report) and that they were filled in several episodes (for the most part, not by the original grantees). The first, which apparently created Greenwich Street as well as its wharves and least some of its lots, occurred approximately between 1792 and 1803 (e.g., Liber of Deeds [LD] 55: 365ff; also Figures 7, 8, and 9 this report. Additional filling on this side of the block in the sensitive area was completed by



— project blocks (14/18, 19)

it should be noted that the southern part of Manhattan was developed in 1865 when this map was drawn. Therefore, the topography depicted is mainly a reconstruction and is somewhat speculative.



based on 1916 Index of Libers, Block 14, Section 1

— — — — — grant lines

dimensions as indicated

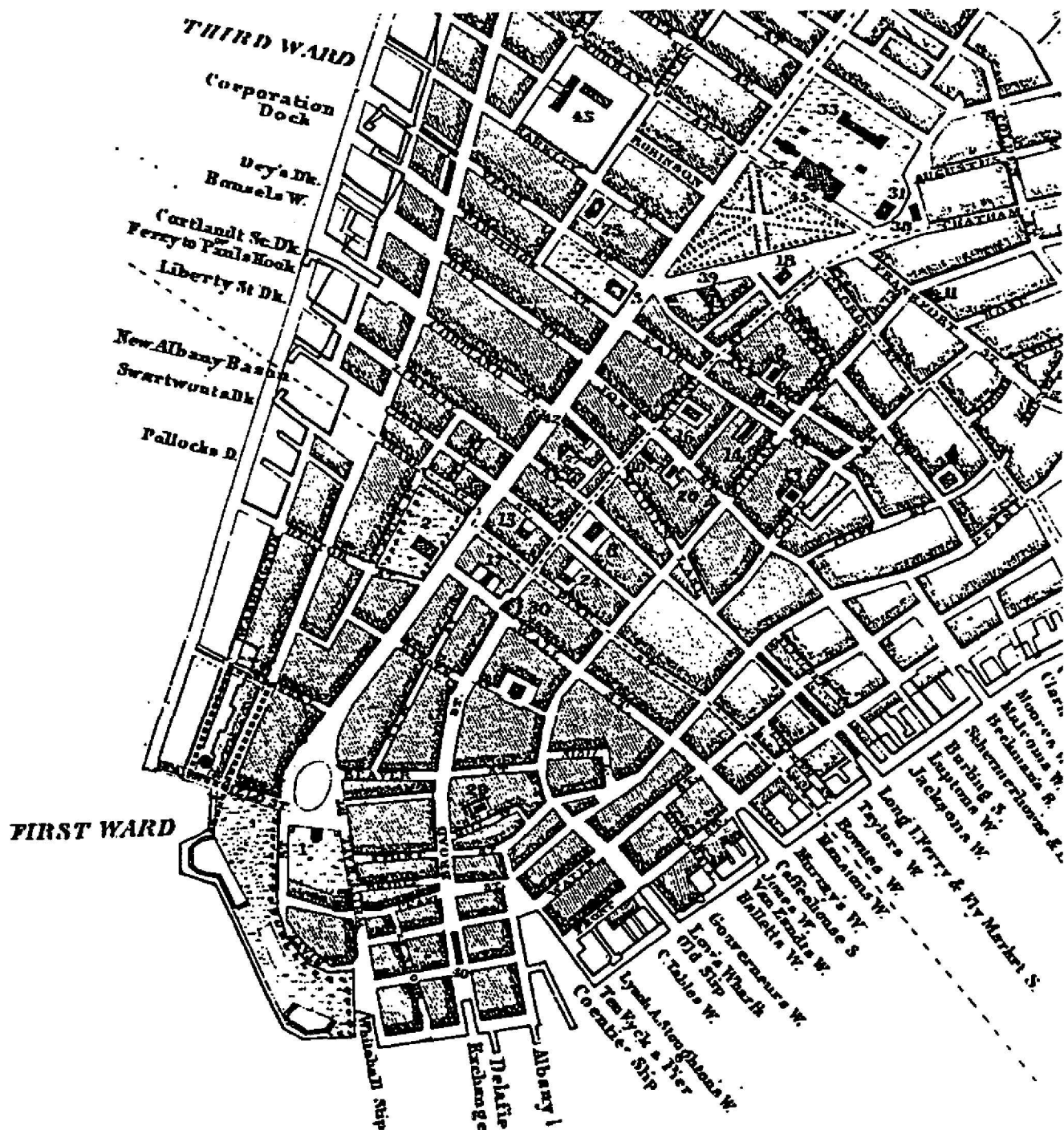
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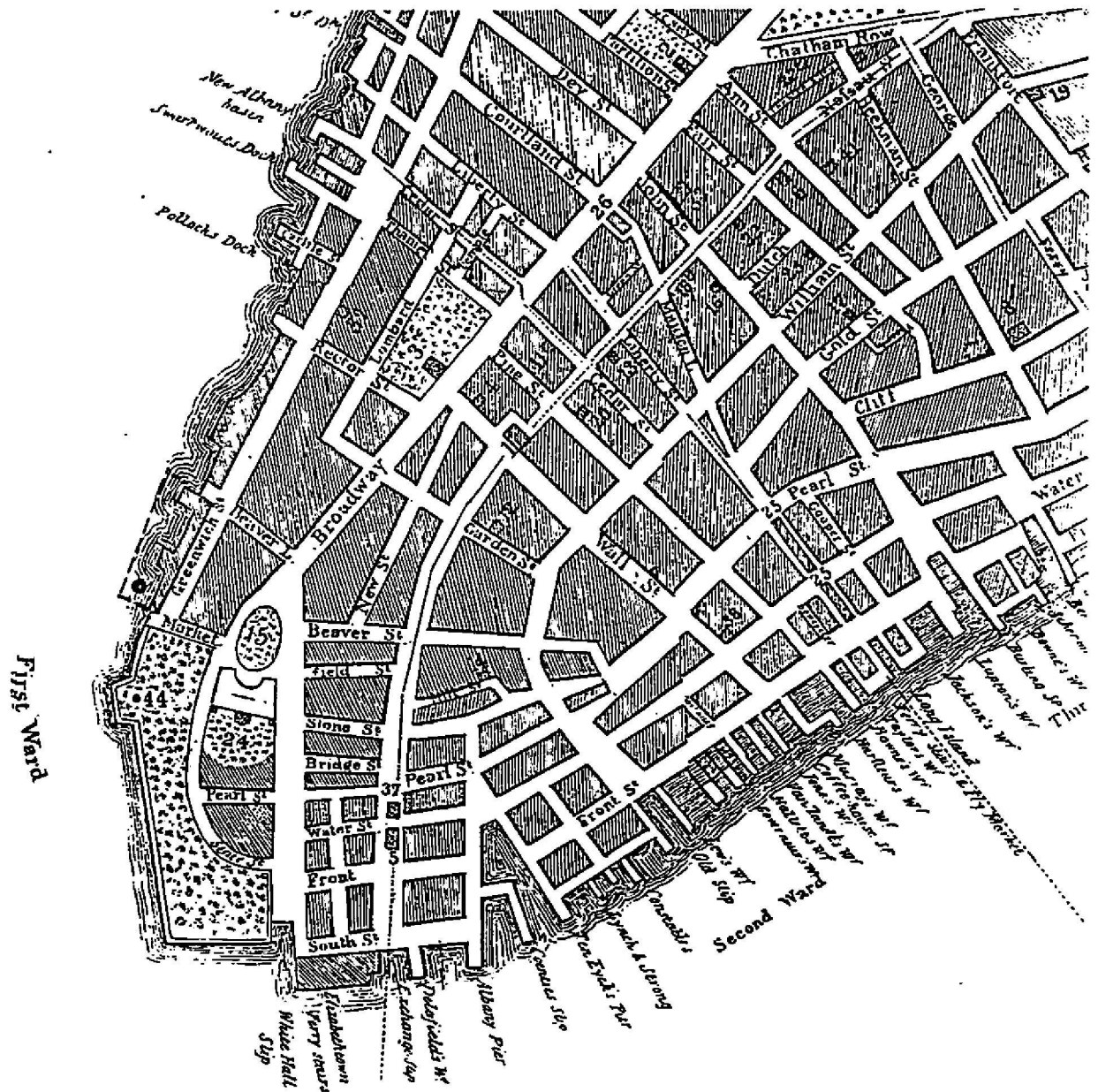


==== approx. project block location
(not yet filled)

no scale
N

an arrow indicates the approximate location of Edgar Street which is not yet run





- approx. extent of site block
(not yet filled)
- approx. location of cribbing
(wharf?) discovered in 1947
excavations (see Plate 10)

0 500
feet

N

1808 (e.g., First Ward Tax Rolls [FWTR] 1808). Subsequent filling of the Washington Street lots and the street itself was at least equally episodic. Here, by 1817 (FWTR 1817), non-residential or commercial structures such as stables and stores (warehouses) were situated adjacent to wharves and piers that extended from and perhaps created Washington Street (FWTR 1808- 1840).

Although its exact location is questionable, map data (see Figures 5 and 7) and written histories indicate a bluff once ran along the east side of what would become Greenwich Street from a point beginning about 160 ft. north of Battery Place. From here it continued north approximately to Wall Street. The initial fill for the project block may have been soil obtained when this bluff was leveled to create a viable dock area (Gilder 1936:44).

Where Greenwich and Marketfield (later Battery Place) Streets met on the Hudson River south of the bluff was apparently low-lying ground that formed a natural small-boat landing (Gilder 1936:44); this was an area that included the sensitive portion of the project block. It is here that Verrezzano is thought to have landed in 1524 followed by Henry Hudson almost 100 years later (Gilder 1936:2-3). While this may or may not be the case, it is possible that small boats or canoes were abandoned in the area prior to filling. However, any evidence of these relics would undoubtedly have been destroyed when basements were dug for the nineteenth-century dwellings constructed on Greenwich Street.

By 1808, members of New York City's merchant elite had begun to develop and live on newly filled lots situated on the west side of Greenwich Street (e.g., FWTR] 1808; NY Directories

1805-1808). Among them was Thomas Farmer (Farmer) who lived at Number 8 in 1808 (NY Directories 1808) and then, by 1809, at Number 6. This was apparently a house he built and where he lived until his death in 1822 or 1823 (his widow continued to reside here for several years).

By 1811 another prominent resident, Nehemiah Rogers, had bought a house at Number 4 Greenwich Street, just south of Farmer. Rogers, who was the youngest son of a distinguished merchant family (his elder brother, Moses, lived at 7 State Street to the southeast [Geismar 1986b]), purchased the house from his brother-in-law, Isaac Bell (LD 92:486ff; Scoville Vol. 2 1863:309). The deed records a \$30,000 sale that included "all that certain Messuage or dwelling house, stable and store [warehouse] and lot or parcel of ground" on the west side of Greenwich Street. It also included the "water lot opposite," indicating the western part of the block behind Number 4 was not yet filled.

The grandeur of the Farmer and Rogers houses is suggested by their size and outlines (see Plate 6) and by correspondence dating from 1940 when a museum meant to house relics and records from these and other local historic structures was contemplated by the New York City Tunnel Authority (now the Triborough Bridge and Tunnel Authority). One of the objects that was to be preserved was the elliptical marble staircase from Number 6 (Osborn letter, March 24, 1940), originally Farmer's residence.

Apparently, the late-eighteenth and early-nineteenth century houses built on Greenwich and State Streets were among the most elegant of their time (Osborn letter, March 24, 1940).

The only local example still standing is the landmarked Moses Rogers house, now the Shrine of the Holy Rosary, at 7 State Street. However, the Historic American Building Survey (HABS), a division of the National Park Service, documented many of the Greenwich and Washington Street buildings (e.g., HABS NY-472 to NY-475 covers Numbers 4 through 10 Greenwich Street). In addition, a genealogical search of many of the block's residents was done for the files of the Federal Hall Memorial Associates (Osborn letter, May 29, 1940). However, at this writing, this file has not been located and may be irrevocably lost.

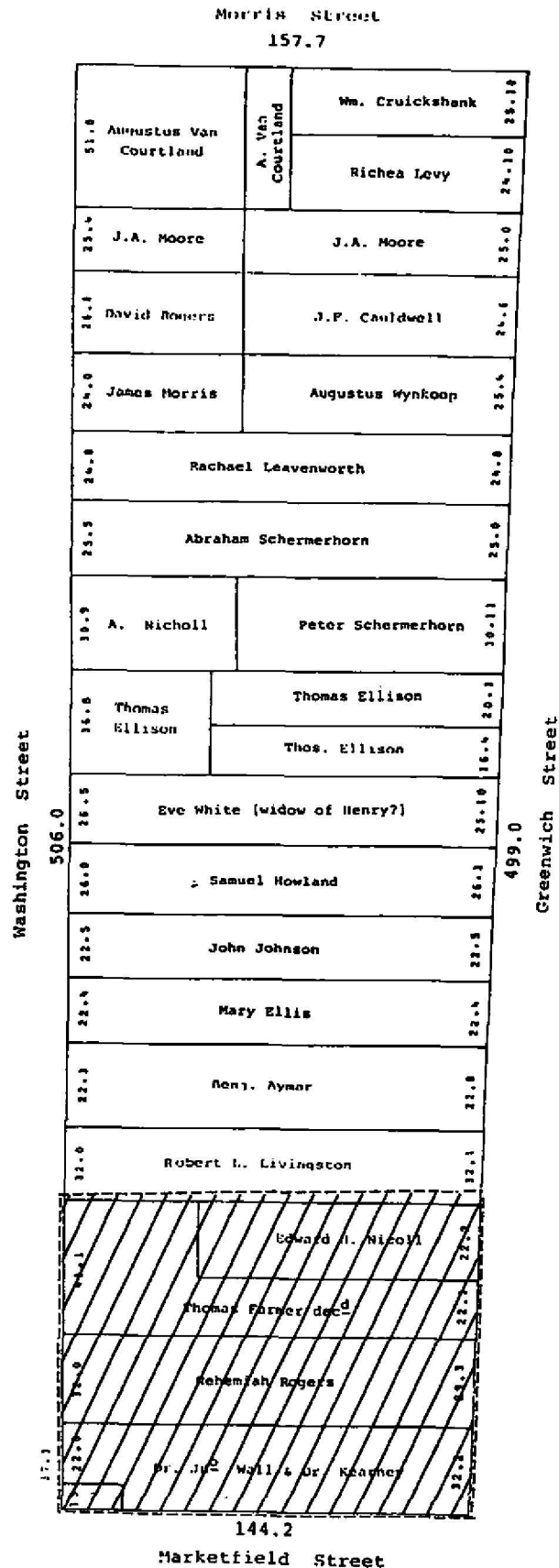
As noted in the introduction, while many prominent early-nineteenth-century merchants lived on the southern portion of Greenwich Street on the project block, when their adjoining lots to the rear on Washington Street were filled they were mainly non-residential properties (e.g., FWTR 1817-1858). Many of them were stables and warehouses belonging to Greenwich Street residents. The exception was the "house" of Isaac Brown that apparently occupied the southwest corner of Marketfield and Washington Streets as early as 1816 but may have been demolished by 1824 (FWTR 1816-1824). However, from 1816 until at least the 1850s, all other structures documented on Washington Street in the project area and well beyond were stables, warehouses, or shops. Until 1821, tax data document wharves as well as piers and unimproved lots on this part of the block, suggesting it was not yet filled to Washington Street; after 1821, however, only piers are listed, implying the block may have been filled (the Ewen shoreline maps document the block and lot owners in 1827-

1830 [see Figure 10; however, the data vary [see below and Appendix A]].

A map dating from approximately 1830 found at the TBTA administrative offices on Randall's Island indicates two piers located on Washington Street between Battery Place (still Marketfield Street on the map) and Morris Street (Burr ca. 1830). The more southerly of the two (Pier Number 2) is attributed to James Arden while the owner of Pier Number 3 just to the north is not identified. However, tax records from 1820 to at least 1830 list James Morris and Henry White as owners of these two piers. (Parenthetically, after a gale had damaged shore properties in September, 1821, "William Gibbons, Nehemiah Rogers, and Thomas Farmar, owners of water lots between Marketfield Street and lots formerly owned by James Arden," petitioned for release from repairing Washington Street in front of their lots [Minutes of the Common Council 1917 Vol. 12:15]).

Not only do the names found on maps and tax rolls vary, pier-line configurations and placement shown on contemporaneous maps also differ (e.g., Burr ca. 1830; Ewen 1827-1830; Prior and Dunning 1826 [this latter map is presented in Figure 11 this report]). And, perhaps most significantly, a crib wharf or pier uncovered and photographed during excavation for the Brooklyn-Battery tunnel in 1947 documents a wharf or pier that is not found on any map (see below and Figures 8 and 9).

By 1853, hotels had been built on both corners of Battery Place (FWTR 1853). This location must have been particularly advantageous when Castle Garden just to the south became an immi-



/// focus of archaeological evaluation of the project block



from Historic Conservation & Interpretation 1983:Figure 6

grant processing center in 1855. To accommodate the influx of immigrants that poured through this structure originally built as a fort in the early-nineteenth century, once-elegant State Street saw the construction and conversion of many buildings for transient housing (e.g., Geismar 1986b:16); presumably buildings on the project block were similarly affected.

In the following decade, the introduction of an experimental elevated railroad would portend the further demise of Greenwich Street's residential aspect. Until its demolition in 1941 (NY Times 1940), the elevated train that ran from South Ferry northward blighted Greenwich Street for more than 60 years.

By the turn of the century, some of the city's most impressive office buildings were erected along the Battery. However, although its commercial aspect increased and retail stores were found at the street level of former residences, the project block was the only one on Battery Place where new construction did not occur (Plate 5): the buildings standing by the end of the nineteenth century were those demolished in 1946 to complete construction of the Brooklyn Battery Tunnel (Plate 6).

The Battery's historian, Rodman Gilder, described the Battery Place portion of the block as it appeared in 1934, just over a decade before the buildings were demolished:

The row of four- and five-story brick buildings on Battery Place, between Washington and Greenwich Streets, has been ready for the housewreckers for a good many years...Lingering between two modern blocks, this row of old houses, with its 'one-eye' retail stores--on month-to-month leases from the H.L.D. Realty Corporation--had, in 1934, much to offer the public...(Gilder 1936:272).



Plate 5. View of Battery Place and State Street with project block, an undeveloped anachronism, indicated by an arrow. This undated photo probably was taken about 1920. Note Castle Garden in Battery Park, a structure originally built as a fort in 1812 that became an immigration center in 1855, and was the New York City Aquarium when this photo was taken (Courtesy of Amy L. Benenson).

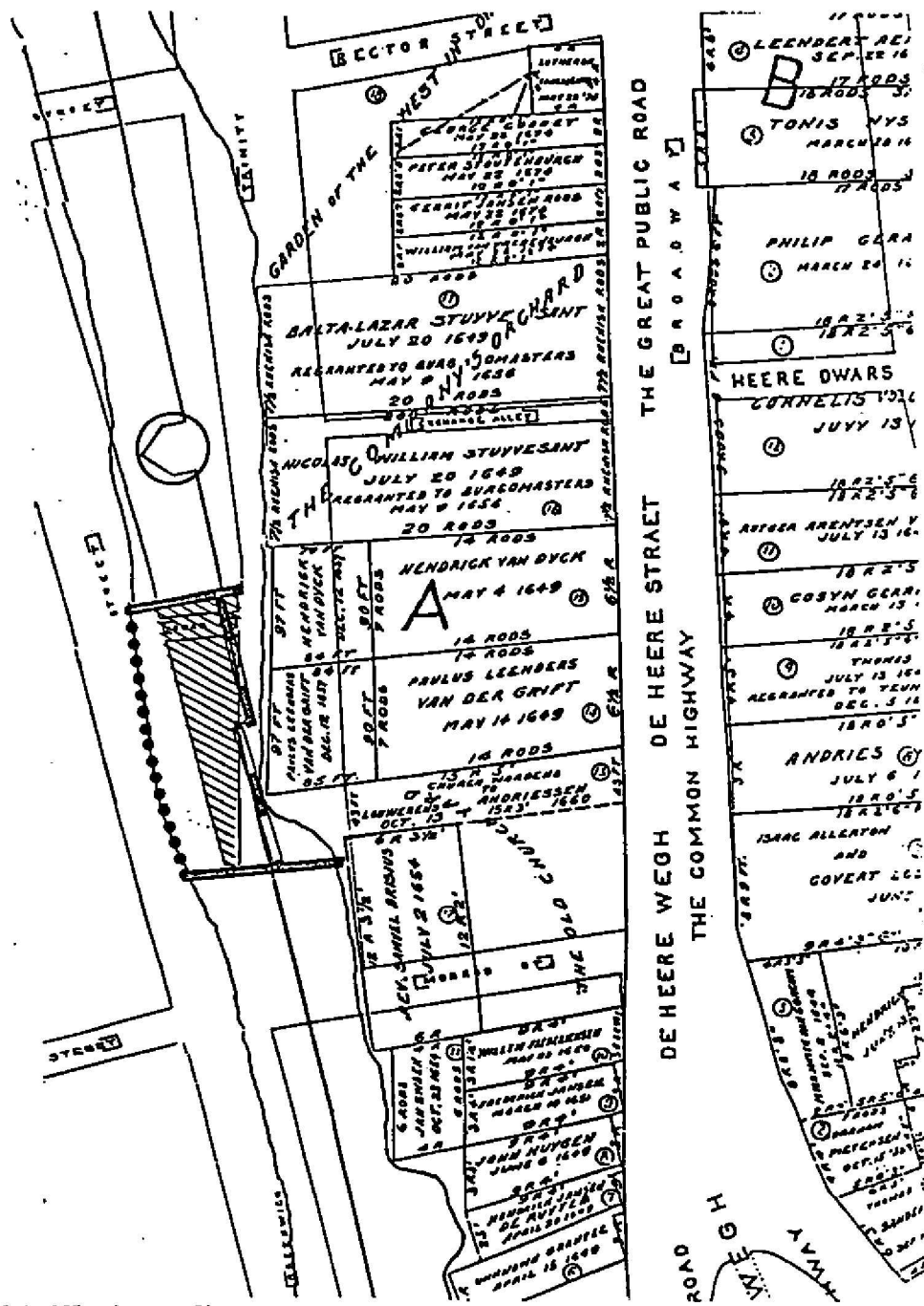
Among the goods and services then available on the block along Battery Place were a postal telegraph office, a barber, a stationery and sundries store, a tailor, a photographer, a tobacconist, a printer, and three bars and grills (Gilder 1936:273).

As early as the second decade of this century, the block had become the anachronism described above. Gilder wrote: "When the time comes for this crumbling ant-hill to vanish...it is to be hoped that in its place will rise a tower beautiful enough to be worthy of one of the finest urban sites in the world" (Gilder 1936:273). However, leveling in 1946 did not anticipate an architectural wonder but an engineering feat. As noted in the introduction the block's structures were cleared to create the Manhattan entrance and exit plaza and blower building for the Brooklyn-Battery Tunnel, the city's deepest tunnel (Thruelsen 1950; see Figure 15 and Plate 4).





Block 19

At this writing development plans include the creation of a park just northeast of the project block where Block 19 had been located. The archaeological assessment of this part of the Exchange Project site is intended to identify its potential sensitivity and determine whether a more detailed study would be necessary should construction plans include intrusive excavation.

Now merely concrete islands created to channel traffic (see Plates 1 and 4), Block 19 may originally have included the crest of a bluff or low Hudson River beachfront. Adjacent land to the east was apparently conveyed in lots during the Dutch period (Index to Libers 1916, Block 19, Section 1; see Figure 12



from Stokes II 1916:C P187; also see Figure 14 this report

-  Block 19 in area of concern
-  northern and southern limits of evaluation
-  17th-century fortification in area of concern
-  shoreline in area of concern
- Oyster Pasty Mount (bastion) circled

no scale

and Appendix B) and can often be traced in the English period through deed recitations (e.g., LD 26: 128ff). It appears that originally all but the northeastern portion of the block was land under water (Figure 13), but by 1795 Edgar Street was fully run (Cessions Book JOBW-JG), suggesting it (and perhaps part of the block) had been filled by this time. The 1797 Taylor-Roberts Plan corroborates this, showing but not naming Edgar Street; it also indicates the block filled to Greenwich Street as well as a filled shoreline beyond it to the west (Stokes I 1916:Plate 64).

Like Block 14/18, all the buildings on Block 19 were demolished by 1947 (Plate 7); at the same time, Edgar Street was moved approximately 8 to 10 ft. north of its original location and more than doubled in width (Topographic Bureau 1946:Acc.#28744; see for example Figures 13 and 18 this report). In this same year, the current street configuration and cityscape were established.

As noted earlier, in the Dutch period a portion of a palisaded fortification built prior to 1660 ran in the vicinity of Block 19. According to a 1688 account by the English, this former "curtine" and its breastworks had extended from Fort St. James (near Bowling Green and the Customs House) to the Pasty Mount (Stokes IV 1922:348). As depicted on the 1660 Costello Plan (Stokes II 1916:C Pl. 82), this fortification extended even further north and was linked to the palisade that defined the northern limit of New Amsterdam (now modern Wall Street; for example, see Figure 14).

The name "Pasty Mount," or "Oyster Pasty Mount," as this bastion was called, is perhaps a reference to oyster shell deposits left by Native Americans. In 1693, its location was vague-





Plate 6. General view of demolition area looking toward Battery Place. Buildings 2 through 10 on Greenwich Street are located on lots that are the concern of this assessment. Thomas Farmer's residence (No. 6 Greenwich Street) is indicated by an arrow, and the home of Nehemiah Rogers (No. 4) is to its right (TBTA 10/4/46).

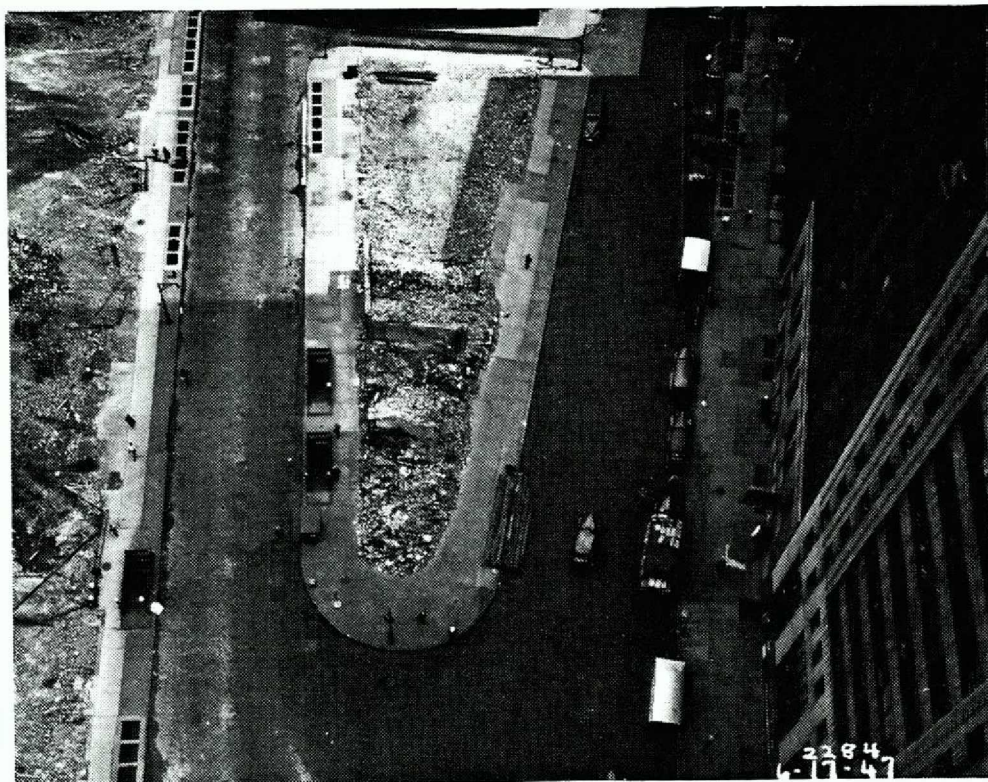


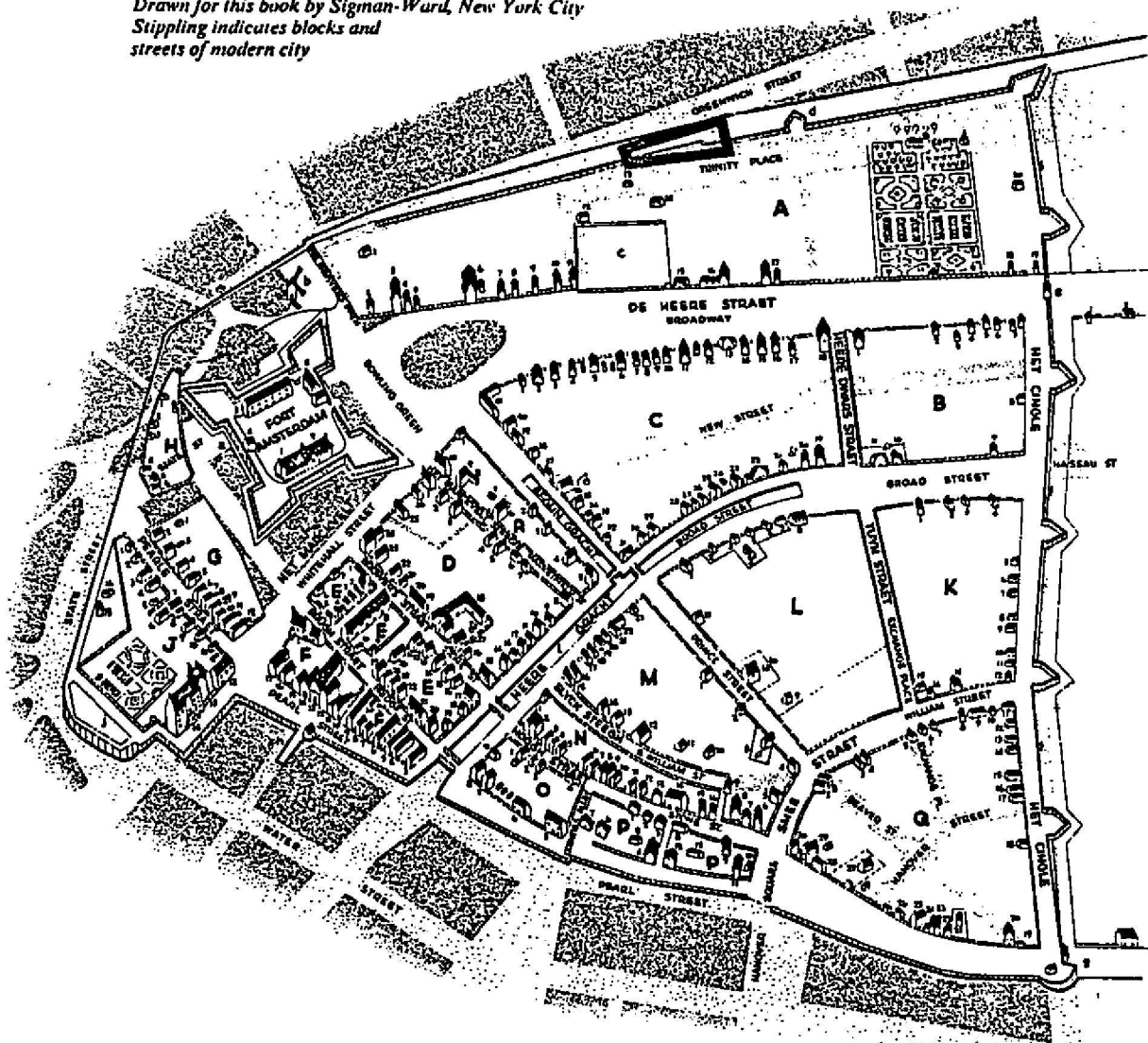
Plate 7. General view of demolition area north of Morris Street between Greenwich Street (left) and Trinity Place (right). This photo shows part of Block 19 before Edgar Street (top of photo) was relocated (TBTA 6/17/47).

ly described as facing the North River and fronting on Broadway (MCC Vol. I 1905:321). By 1751, the location and configuration of this bastion was a question. In that year, a stone wall found behind Trinity Church at a depth of 8 ft. was thought to be the breastwork of a battery; Stokes interpreted it as as a blockhouse or bastion of the old wall (Stokes III 1918:945), an interpretation he later recanted (Stokes IV 1922:628). Perhaps most tellingly, the 1797 Taylor-Roberts Plan (Stokes I 1916:Pl. 64) shows a "Pasty Mount Street" running from Broadway to Lumber Street (Trinity Place) where Exchange Alley is now located (see Stokes IV 1922:380 and Figure 12 this report).

In 1892, the discovery of a cannon at 55 Broadway again caused speculation about the location of the Oyster Pasty mount (Gilder 1936:276). The Costello plan coordinated with modern streets as shown in Kouwenhoven (Figure 14 this report) indicates its associated stockade may have crossed the eastern portion of Block 19. It is conceivable that despite development and installation of sewers and other service lines in this area, which are relatively shallow, and the building of the BMT subway on Trinity Place, remnants of this fortification might remain under fill. This is particularly true where Edgar Street was originally located, an area where little intrusive excavation has occurred. However, if the fortification ran along a bluff, leveling undoubtedly would have destroyed evidence of it.

Apparently, the water lots west of Broadway in the vicinity of what would become Block 19 were granted to heirs of Sir Peter Warren, Oliver DeLancey, and Richard Schacksburgh in

Drawn for this book by Sigman-Wurd, New York City
 Stippling indicates blocks and
 streets of modern city



from Kouwenhoven 1953:41

no scale



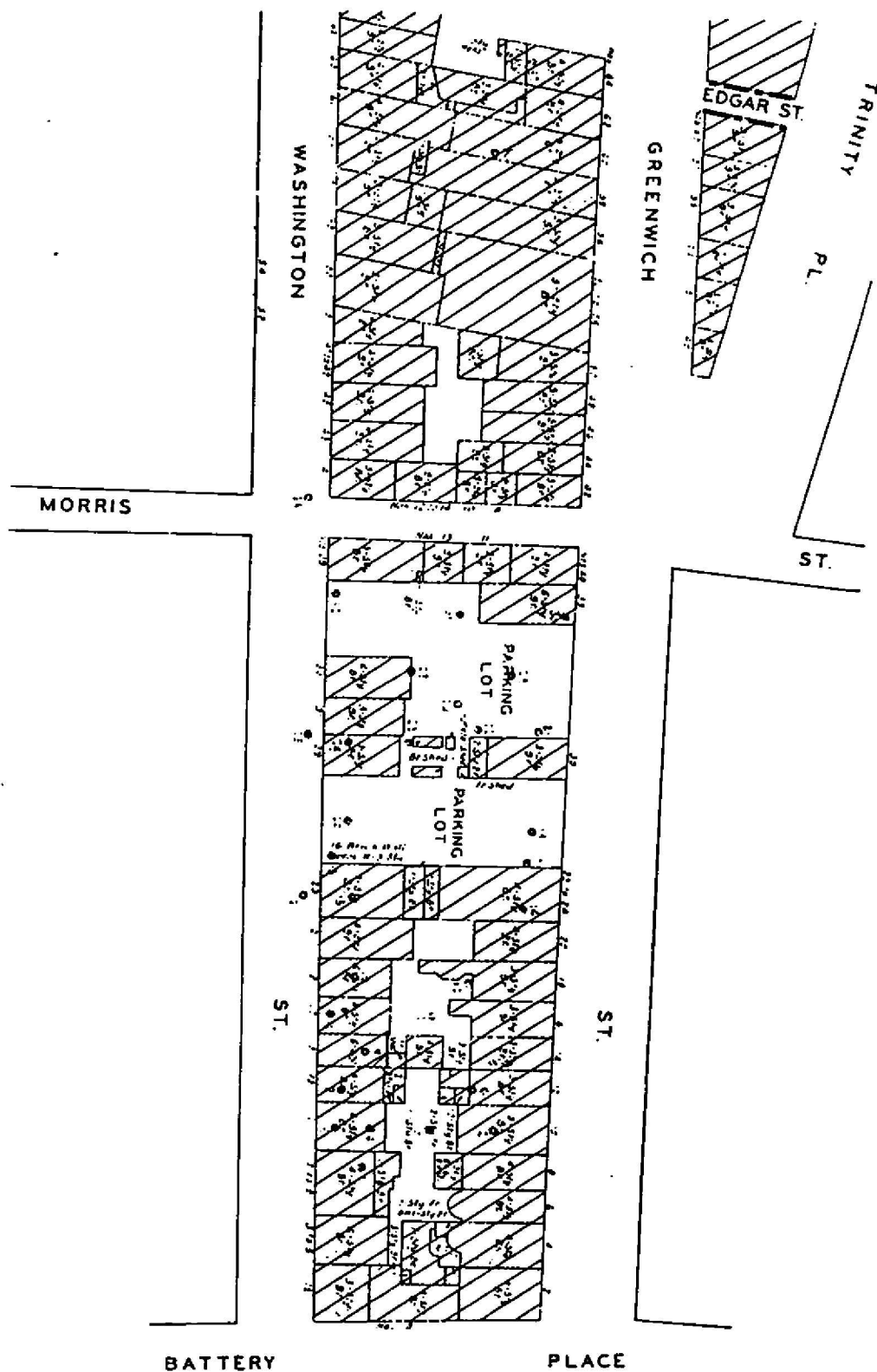
— hypothesized location of 17th-century North (Hudson) River
 fortification in relation to Block 19 (also see Figure 12)

d indicates Oyster Pasty Mount

1765 (Grants of Land Under Water C Vol. II:302-314). While information is meager, tax records indicate that by 1808, only one lot on this block was undeveloped. Among the owners was William Edgar, a prominent merchant who apparently built or acquired two tenant houses as income properties (in 1808, however, both were vacant [FWTR 1808]). Edgar, for whom Edgar Street is undoubtedly named, owned wharves and piers along Washington Street as well as other properties in the site area. In 1830, Edgar's widow, Cornelia, lived across from the project block at Number 7 Greenwich Street (NY Directories 1830), the house Edgar had built by 1822 (FWTR 1822-1827).

The 1858 tax roll, the first to list lot and building dimensions, indicates the six houses located on Greenwich Street between Edgar and Morris Streets were three to five stories high, all of them with small yards. By 1870, all the buildings on the block were five-story structures that covered lots reduced in size when Trinity Place was widened (FWTR 1858-1870). Building Department files record only two new building applications from this time, both for five-story structures. Of the two applications, only the one for 53 Greenwich Street (New Building Application 961-69) could be located. It describes a five-story, two-family brick building that covered its 25 by 32-ft. lot; a store occupied the first floor. A 9-ft. deep foundation was planned, and construction begun on October 5, 1869, was completed by December 15th of the same year.

Tax records indicate the other buildings on this block date from the same time and were undoubtedly of the same type.



/// buildings to be demolished

Br=brick, Fr=frame, Sty=story, H=height, B=basement

based on Brooklyn-Battery Tunnel Contract 19D, C1

--- original Edgar Street route

0 20 40
feet

N

As noted earlier, these buildings were demolished in 1947 in preparation for tunnel construction (see Figure 15 and Plate 7).

TWENTIETH-CENTURY DEVELOPMENT AND SITE PRESERVATION

Block 14/18

Started in 1940, halted in 1942 because of the Second World War, and resumed again late in 1945, the Brooklyn-Battery Tunnel was finally opened in 1950 (Thruelsen 1950). While early-nineteenth century buildings with long, single-family occupancies were once located on the site, excavation for the tunnel's Manhattan plaza, portal, and blower building destroyed the portions of these lots where meaningful domestic archaeological data might have been recovered. These are the backyards where privies and cisterns are located that, when filled, create an archaeological time capsule. However, an unrecorded wharf documented in photos taken during the 1947 excavations and construction (TBTA contact 8-N; see Plates 8-12 this report) suggests that invaluable information about fill components might still remain in unexcavated portions of the block.

While early-nineteenth-century maps (for example, see Figures 8 and 9) indicate that construction of wharves or piers were part of the fill process here as at other Manhattan landfill sites (e.g., Geismar 1983, 1986a), the log cribb wharf partially exposed and recorded in the south-central portion of the block in March of 1947, is not found on these maps. A construction photo from this date (Plate 10) records this "old log cribbing" and locates it approximately 60 ft. north of the Battery Place building line and, from its relation to structural beams installed for the blower building, just west of the block's north-south mid-

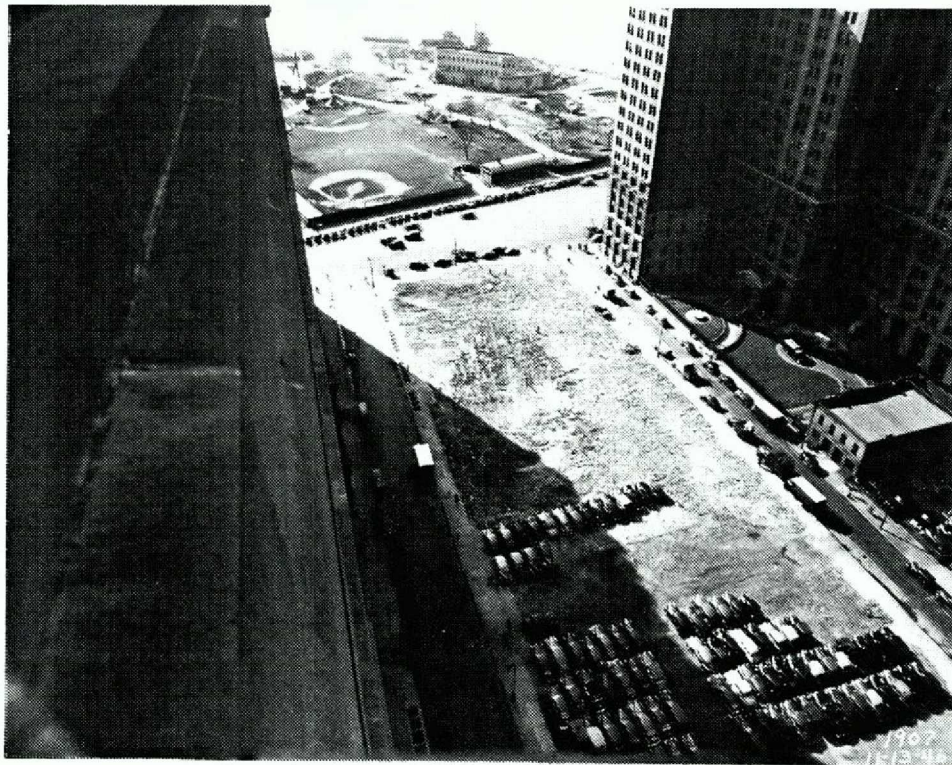


Plate 8. Project block after demolition, looking south to Battery Park. Construction activities for the tunnel can be seen in the park (TBTA 11/13/46)

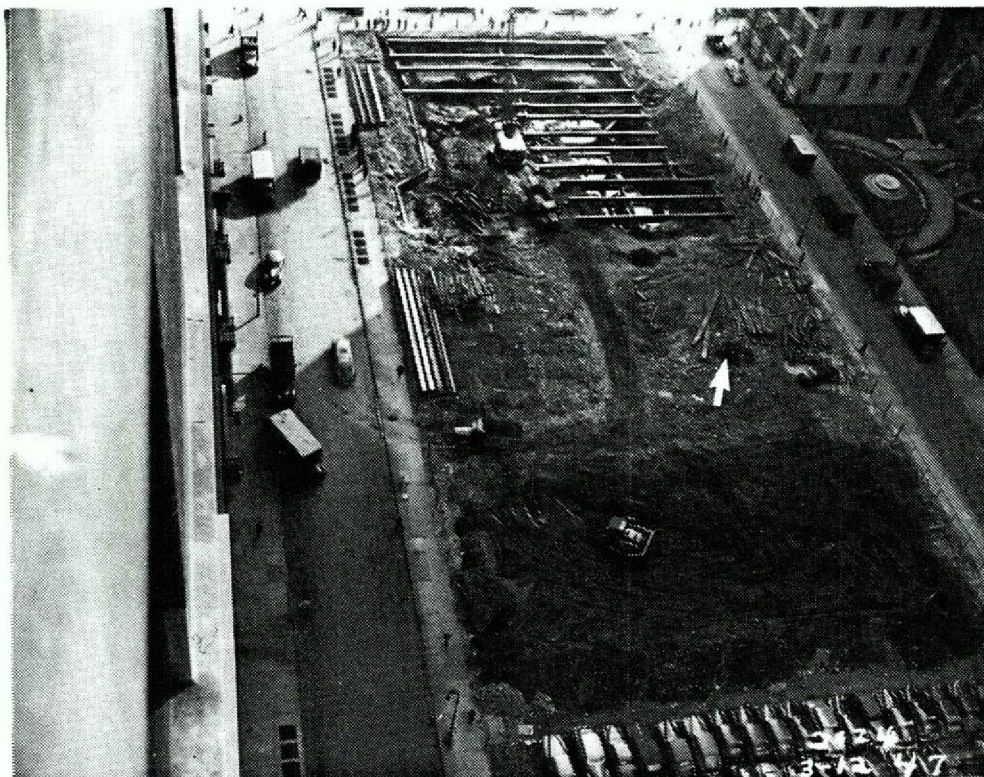


Plate 9. Looking south toward Battery Park, construction of the blower building is underway. Note logs (arrow) that may come from cribbing uncovered during construction excavations (see Plate 10) (TBTA 3/12/47).



Plate 10. Log cribbing partially exposed in the southwestern segment of the blower building site, about 60 ft. north of Battery Place (the southwestern corner of this construction is indicated by an arrow). Possibly a wharf on Thomas Farmer's water lot, it is not documented in any known record or on any known map (TBTA 3/12/47).

line. This location would put the wharf on the water lot belonging to Thomas Farmer, the owner and occupant of 6 Greenwich Street from 1808 until 1822 or 1823, the time of his death (the Farmer water lot may have been at least partially filled by 1816 when tax records document a warehouse at what would become 7 Washington Street, the back half of Farmer's water lot). However, neither the eastern or northern extent of this construction nor its depth were revealed, and an attempt to recover additional information from TBTA files was unsuccessful.

Other photos do provide some clues. For example, logs apparently removed from the cribbing, some of them notched, can be seen at ground level north of where the cribbing was exposed (Plate 11). Subsequent photos (e.g., Plate 12) also show these logs but do not indicate others added to the debris, suggesting the cribbing was an isolated find. If so, it may have been a wharf that ran parallel to an intermediate shoreline on Farmer's water lot. It is also possible this cribbing was a segment of a block-and-bridge pier or wharf--a construction incorporating discrete cribb elements or "blocks" that support a wooden plank surface or "bridge;" this could mean other segments still exist to the west beyond the blower building. Unless more of this feature or its components are found intact to the east or west, its configuration will remain speculative, as will other aspects of wharf and pier placement on the filling block.

It should be noted construction photos indicate that tunnel excavations extended to the property line on Battery Place (e.g., see Plate 12), eliminating the possibility of site preservation in this area. It should also be noted that construction

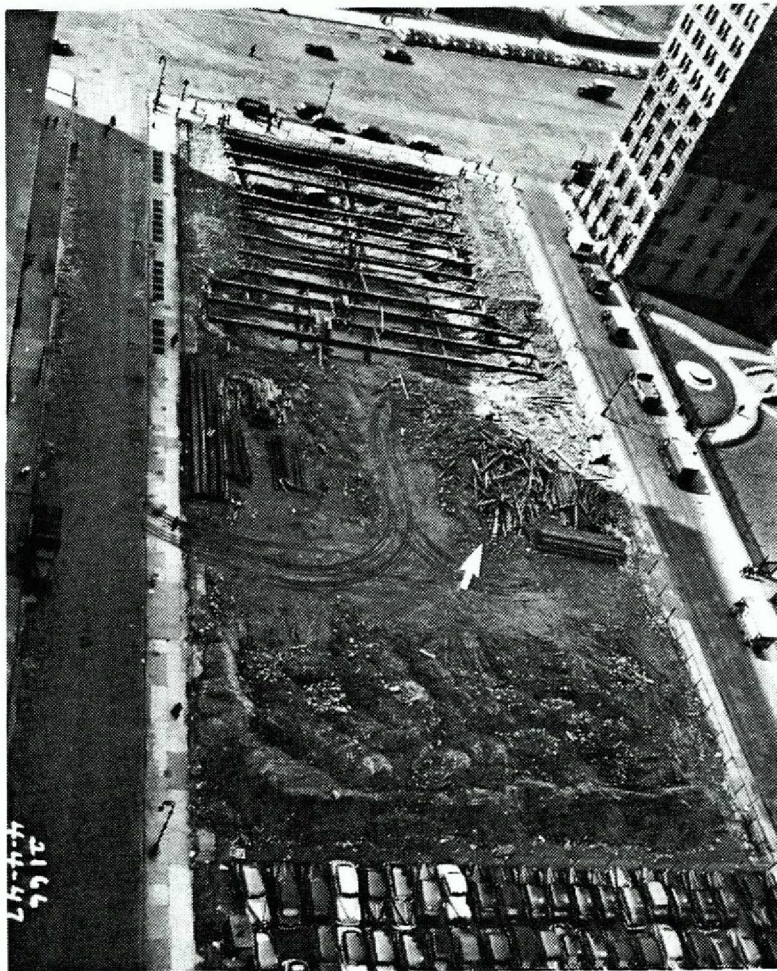


Plate 11. Progress of blower building construction, looking south toward Battery Park. Note size of log pile (arrow) noted in Plate 9 has increased (TBTA 4/4/47)

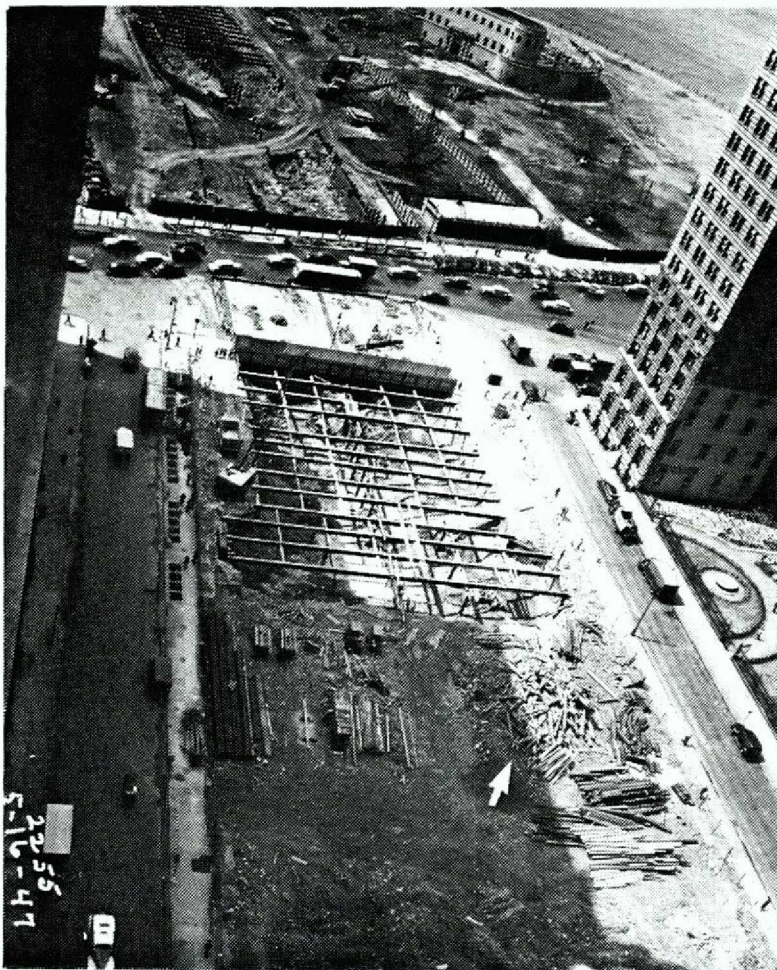


Plate 12. One month later, blower building excavation is apparently finished and log pile (arrow) appears unchanged. Note the excavations extend to the Battery Place sidewalk (TBTA 5/16/47).

of the IRT subway on Greenwich Street, a segment of the Dual subway system that opened on July 1, 1918 (Hall 1945), would not have impacted the adjacent building lots on Greenwich Street. With few exceptions, the cut-and-cover method, which was relatively non-intrusive to nearby properties, was used for the city's subway system (Miller 1941:93-94) and was apparently the method used here. Based on construction photos (TBTA contract 19), the Greenwich Street lots also appear undisturbed by subsequent subway alterations. And finally, although utility lines and sewers were installed in the sensitive area, these relatively shallow intrusions would not have affected deeply buried fill components.

Block 19

As described in the archival section, the configuration of Block 19 was altered in 1947 when Edgar Street was moved approximately 8 to 10 ft. north of its original site and widened. Beyond this, like Block 14/18, nineteenth-century structures remained standing until their demolition in 1947 (see Plate 7; also Figure 15 for the demolition plan). It is possible, however, wharves or piers that may have extended from the original shoreline might be found under basements on this block and also on the western part of Edgar Street's original route. It is also possible but more speculative that evidence for the seventeenth-century palisade or its bastions and even earlier shoreline shell middens--remnants of Native American occupation--may remain under fill.

RELATIONSHIP TO NEW YORK CITY FILL SITES

To date, eight New York City fill sites have been archaeologically investigated (Table 1); as mentioned earlier, among

Table 1. EXCHANGE PROJECT Landfill Sites Excavated in Manhattan (Geismar 1986:Table 3)

Project	Landfill Dates*	Number of Blocks From Original Shore	Types of Waterfront Constructions	Year Tested/Excavated	Sources	Remarks
64 Pearl Street	Late 17th C.	1	Stone foundation walls	1980	Rothschild 1986; Personal Communication	First east-side fill site excavated. Basement excavations Landfill structures similar in time and type to those at Hanover Sq. (see below).
7 Hanover Square	Late 17th C.*	1	Stone foundation walls	1971	Rothschild 1982	Stone foundations similar to those at 64 Pearl (see above).
Old Silp and Cruger's Wharf	1690-1800	3	Massive timber wharves (undressed logs)	1969	Huey 1984	Episodic wharf-building and landfilling. Observed wharves appear analogous to 175 Water St.
Telco Block	c. 1740-1775*	2	Cobb-crib (log) wharves; planked bulkhead	1981	Rockman et al. 1983; Wall 1986	Dates apply to episodic wharf construction. Possible that block and bridge construction was used, but speculative at present.
175 Water Street	c. 1740-1780	2	Wharf/grillage**; ship tied into planked bulkhead and stabilized with pilings	1981-1982	Geismar 1983; 672-712	Block structured c. 1754 when ship incorporated, but landfill process continued as late as 1780 or, with secondary filling, 1795.
209 Water Street	between 1775 and 1800(?)	2	Partially excavated ship	1978	Henn et al. N.D.; Brouwer 1980	Ship side and deck beams excavated. Landfill in and around hull.
Assay Site	1780s-1790s* (wharf and pier only)	3	Cobb wharf, block and bridge pier	1984	Wall and Henn 1986; Personal Communication	Time span of full fill maneuver presently unknown. Data currently being analyzed (Louis Berger & Associates, Inc.)
Barclays Bank	1694-1702*	1	Stone foundations and log cobb wharf.	1983-1984	Klein and Cohen 1986; Personal Communication	Stone foundations similar to 64 Pearl St. and 7 Hanover Sq.; Cobb wharf part of Rotten Row (Water St.)
Schermerhorn Row	1780-1810*	3	Log crib works	1977	Kardas and Larrabee 1979, 1980	Basement excavations, therefore dimensions of constructions unknown.
Site 1, Washington St. Urban Renewal Area	1797-1801 1807-1817	1 2	Log block and bridge (?) probably a pier	1984	Geismar 1986	First west side fill site investigated. Relatively rapid filling; no major fill-retaining features (large bulkhead, ship, etc located in site).

* Fill dates based mainly on historical documentation.

** Wharf/grillage is a term used to define wharfing later used as block foundations (Geismar 1983:672-712).

them is Site 1 of the Washington Street Urban Renewal Area on Manhattan's west side, a site that is not only geographically but also chronologically comparable to the Exchange Project block. With the exception of seventeenth- and eighteenth-century shallow, off-shore sites, where stone foundation walls were often used to initiate filling (see 64 Pearl Street, 7 Hanover Square, and Barclays Bank shown on Table 1), the process and method of reclaiming land included the construction of wharves and piers that were later incorporated into fill, and the building of bulkheads to structure the filling blocks (e.g., Geismar 1983, 1986a; Huey 1984; Rockman et al. 1983). At two sites, abandoned ships were used as cribbing (Geismar 1983; Henn et al. n.d.).

Fill constructions at all these sites were variations on a theme where logs were the major building material (planked bulkheads are also documented). The cribs of parallel wharves built along the shore and crib-blocks incorporated into a block-and-bridge constructions were filled with cut stones (Site 1 of the Washington Street Urban Renewal Area) or cobbles (Telco); at 175 Water Street and Old Slip, massive wharves of layered logs were documented (Geismar 1983; Huey 1984). Information about these constructions and general fill data (the kind of fill and its extent) are known solely through archaeological investigation. It is information that expands our understanding of New York City's commercial, economic, and social history.

The episodic filling documented at the Exchange site, as well as the discovery of an unmapped wharf during construction of the Brooklyn-Battery Tunnel, suggests that fill information may

still be found in the limited portions of the site that have not been excavated. Moreover, if it is obtainable, this information can be recovered in a monitored testing program coordinated with foundation excavations (see Summary and Recommendations), a method used successfully at Site 1 of the Washington Street Urban Renewal Area and other urban sites.

BORING LOG DATA

In preparation for construction of the Brooklyn-Battery Tunnel over forty years ago and more recently for the proposed Exchange Project development, subsurface conditions of the block have been explored through borings (Mueser Rutledge 1986). The most recent comprised five borings made between July 28 and August 4, 1986, by Warren George, Inc., under the supervision of Mueser Rutledge Consulting Engineers.

In this latest testing program, soil samples were recovered to bedrock at 5-ft. intervals; once bedrock was reached, rock cores were drilled (Appendix C). All borings were located on the sidewalk in the southern half of the project block (Figure 16), and logs from these borings as well as others from 1942 (generously provided by Joel Moskowitz of Mueser Rutledge) record a fill deposit of varying thickness throughout the block. A deposit ranging from a thickness of 13 1/2 to 18 1/2 ft. is indicated (Mueser Rutledge 1986:4); earlier borings that included several from yards now lost to tunnel construction indicated even greater variation (TBTA Borings 1942).

In the most recent borings, all but one (B-2) documented a 4 to 16 1/2-ft. thick layer of glacial till between the fill and



Figure 1 shows a rectangular arena with a total length of 100 feet and a width of 10 feet. The arena is divided into three sections by two vertical lines. The left section is labeled 'C' and is 40 feet wide. The middle section is labeled '40'' and is 40 feet wide. The right section is labeled '20'' and is 20 feet wide. A scale bar at the bottom indicates 0, 20, 40, 60, 80, and 100 feet.

NOTES

1. SCENARIOS FOR THIS INVESTIGATION WERE MADE BY WARREN GEORGE MC. BETWEEN JULY 28 AND AUGUST 4, 1986 UNDER THE SUPERVISION OF MURDER RUTLEDGE CONSULTING ENGINEERS.
2. 1986 BORING LOCATIONS AND ELEVATIONS WERE DETERMINED BY HOWARD F. GREENSPAN.
3. FOR SOIL SAMPLE DESCRIPTIONS, SEE BORING LOGS IN APPENDIX A.
4. ELEVATIONS ARE REFERENCED TO THE TEMPOURHOG PIDGE AND TUNNEL DATUM WHICH IS ELEVATION 200 + 265.7 FEET ABOVE MEAN SEA LEVEL. TO CONVERT TO BOROUGH PRESIDENT OF MANHATTAN DATUM, SUBTRACT 300.037.

-45-

decomposed rock or mica schist bedrock below; this till was a compact gray fine to coarse sandy silt with clay and some gravel (fill was recorded directly above bedrock in B-2; Mueser Rutledge 1986: 3-4). However, examination of soil samples made available by Joel Moskowitz of Mueser Rutledge indicated this glacial soil may be similar to deposits associated with a river environment at other fill sites, but this remains speculative.

None of the samples appear to contain wood that might suggest a wharf, pier, or bulkhead; however, the 2 1/2 in. diameter sampling spoon and the 5-ft. sampling intervals employed in testing conceivably might not document these constructions. (In addition, it should be noted that fill data from boring B-3 would not be representative of early fill since it was recovered from between the east and west tunnels, a portion of the site that was fully excavated in 1947 and either backfilled or refilled with new material.)

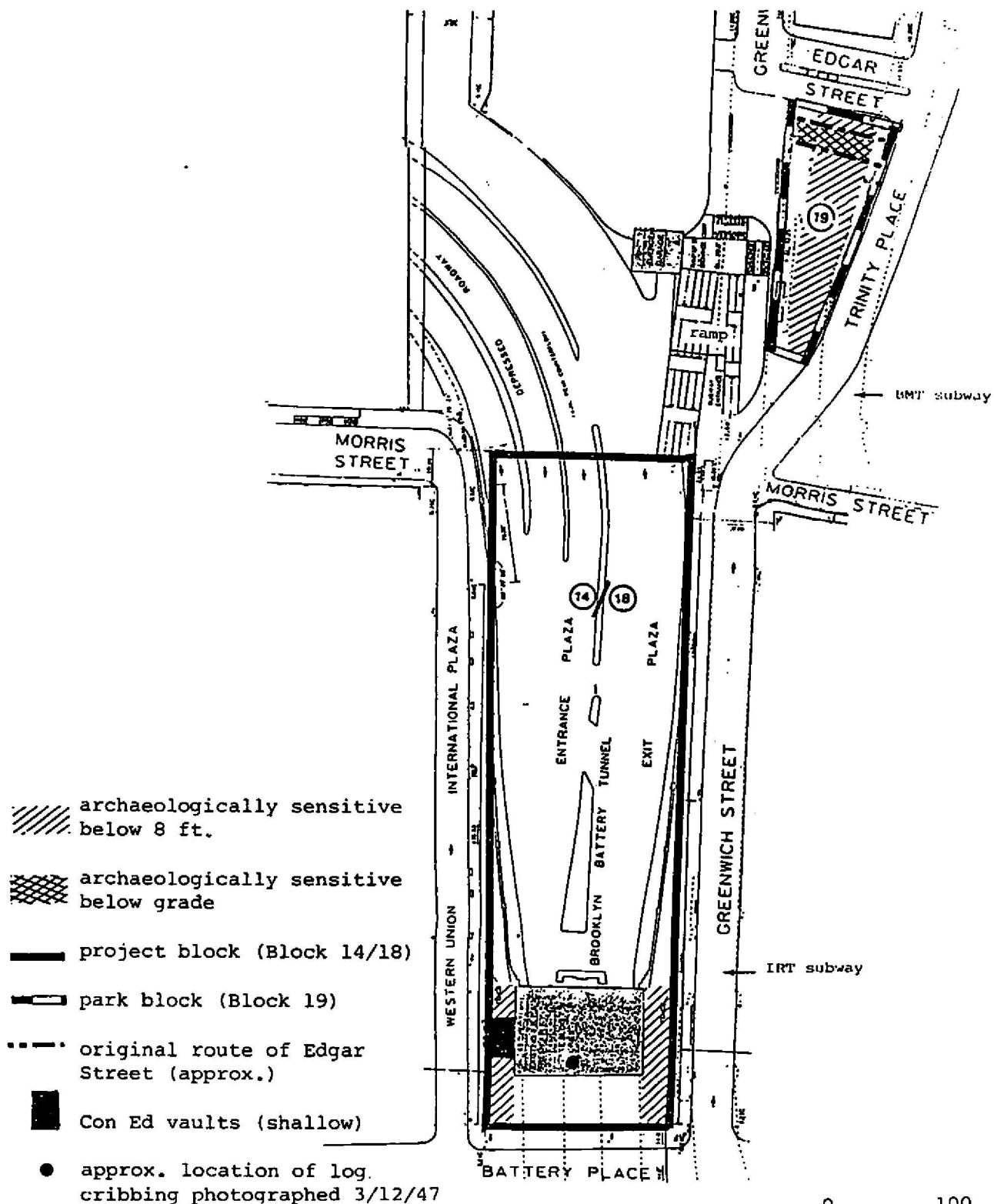
While boring log data indicate a fill situation on Block 14/18, the findings are inconclusive in regard to landfill constructions such as wharves, piers, or bulkheads--the major concern of this assessment. In addition, it should be noted that in 1939, Rock Data borings were made at three locations in the vicinity of Block 19 (Rock Data Borings 1939:Vol. 1, Sheet 2, Borings 12, 86, and 88; see Appendix D this report which includes a location map). Borings 86 and 88 suggest the filling of the block and a pre-fill river condition; however, they are not well described, and neither go beyond a depth of 28 1/2 ft. Moreover, they are not located directly in the projected area of sensitivity. No recent borings are available.

SUMMARY AND RECOMMENDATIONS

Block 14/18

The project block was severely disturbed during excavation and construction of the Brooklyn-Battery Tunnel Plaza and blower building in 1947. However, two 25 by 110 ft. strips of land bordering Greenwich Street on the east side of the blower building and Washington Street on the west side, or approximately 5,500 square ft., appear relatively undisturbed by this construction (Figure 17). Greenwich Street was where several prominent merchants built or bought homes in the first and second decades of the nineteenth century, and the block was evidently filled by 1821 when warehouses and stables were located on Washington Street (the exception was a house that apparently stood on the southwest corner of the block from 1816 to 1824). However, it is the wharves, piers, and bulkheads that initially served as shore front features and then provided the infrastructure for land-making that are the archaeological concern here, not the houses and commercial buildings that developed on the filled lots. It appears that archaeological data regarding these engineered features may still remain on the two unexcavated strips that represent the block's earliest and latest fill episodes.

Based on construction photos and archival research, it is possible that undocumented wharves and piers may illustrate the methods and means of the block's episodic fill process. Moreover, foundation excavations for the proposed building that could destroy remnants of these features may also provide a cost effective means of documenting this process through monitoring. This



based on Kevin Roche John Dinkerloo and Assoc. Maps 1986:Sheet 2
and Topographic Bureau, Manhattan Map 1946:Acc. #28744

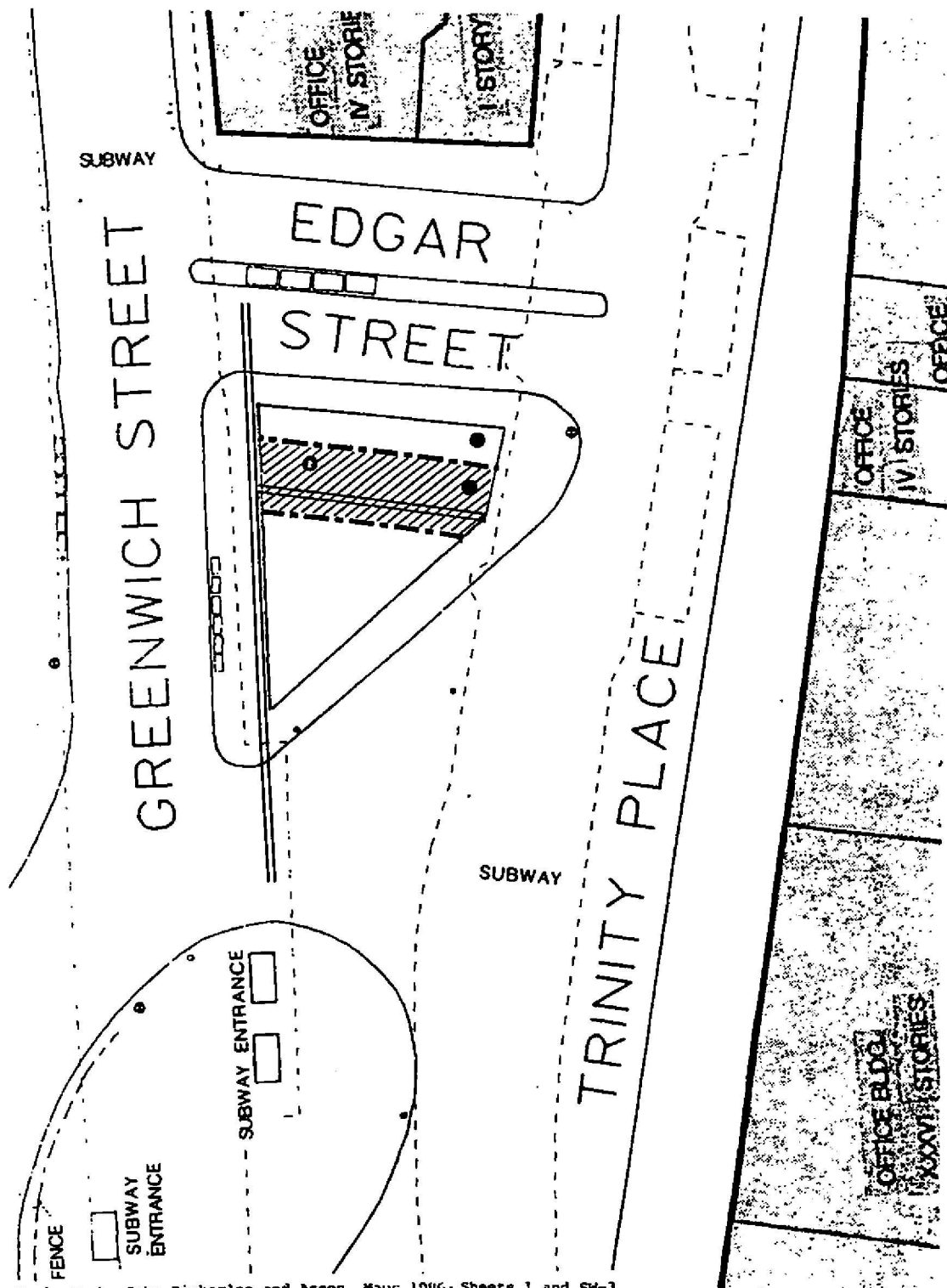
method requires an archaeologist on site to locate, photograph, describe, and, if possible, measure any shore front constructions uncovered during these excavations.

Monitoring the foundation sites, in this case caisson locations (Kinsella 1987:personal communication), would provide access to fill information in a satisfactory manner. In addition, any exploratory excavations undertaken to locate utility lines and sewers in the sensitive area should also be included in the monitoring program. Upon acceptance of this recommendation and when the foundation plans are finalized, a mutually acceptable monitoring program should be developed with the Exchanges, PDC, the Landmarks Commission, the foundation contractor, and the archaeologist.




Block 19

Prior to development, this portion of the project site was partially under water and, in the northeastern portion, perhaps either a bluff or beach. A seventeenth-century stockaded fortification built by the Dutch and linked to the Wall Street palisade may have crossed the eastern part of this block (possibly west of the subway excavations on Trinity Place), and it is conceivable that Native American shell middens (shell and garbage heaps) may be preserved under fill. Since this part of the site adjoined Dutch grants, it is also possible, if highly speculative, that seventeenth-century stone building foundations similar to those found at contemporaneous East River fill sites may be located on the western portion of the block. It is even more likely that eighteenth-century wharves and piers would be found here, particularly where Edgar Street was extended in the latter part of the century (see Figure 17 for sensitive areas).

The park tentatively planned at this writing represents a relatively non-intrusive development. However, planting mature trees could require excavations of 8 or more feet. Should intrusive excavation become an issue--that is, should excavations extend 8 or more feet below the surface where development occurred on the block (beneath nineteenth-century basements) or below grade where Edgar Street was originally located--the impact of this excavation would require careful evaluation. Therefore, as a preliminary assessment, it is recommended that borings be made with ample time for further work should it prove necessary (Figure 18 shows a location plan for these proposed borings). Based on the information from these borings and the final development plans, more intensive documentation (particularly into the elusive eighteenth century) and possibly field testing may be recommended. However, it is also possible that conditions documented in these borings may preclude archaeological sensitivity.



based on Kevin Roche John Dinkerloo and Assoc. Maps 1966: Sheets 1 and SW-3 and Topographic Bureau, Manhattan Map 1946: Acc. #28744

-  original Edgar Street route
-  approx. center line of sewers or other utilities in area of concern
-  approx. location of proposed boring

0 40
feet

NEW YORK
LANDMARKS PRESERVATION
COMMISSION

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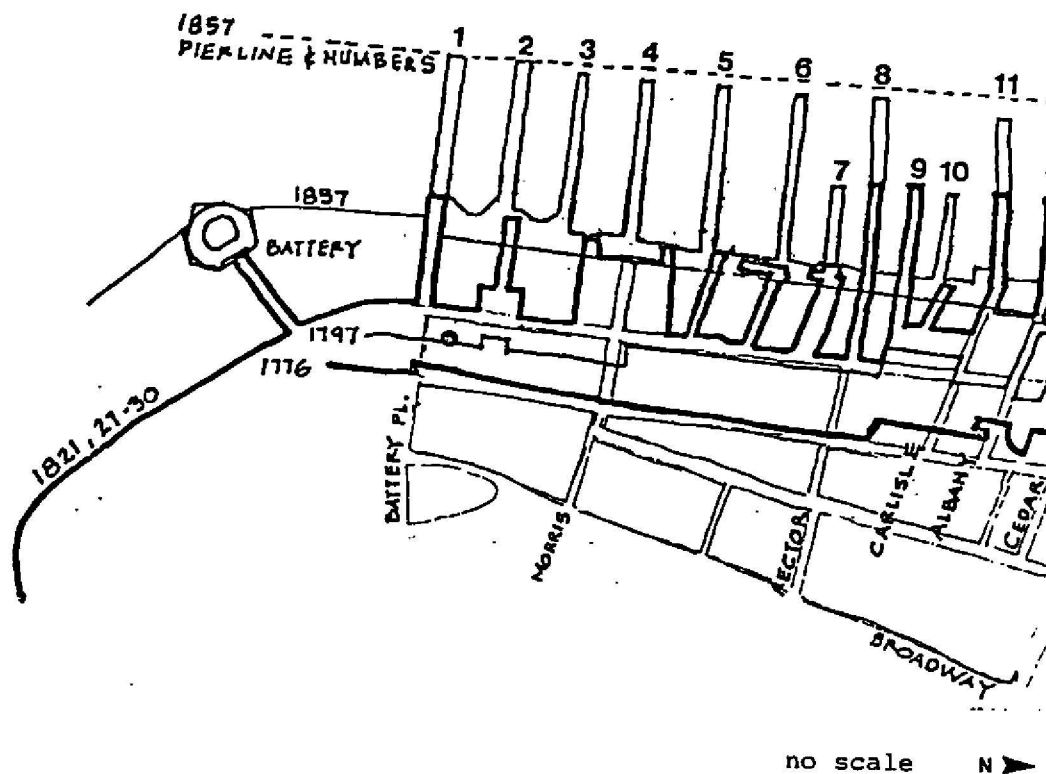
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- approx. location of cobb crib (wharf?) uncovered during 1947 excavations for the blower building and approach to the Brooklyn-Battery Tunnel.

Source: Historic Conservation & Interpretation 1983:Figure 82; based on Ratzer 1776 (1776 shoreline); Taylor and Roberts 1797 (1797 shoreline); Ewen 1827-1830 (1821-1830 shoreline); Kurth & Rosa 1857 (1857 shoreline)

Note that other maps give different configurations for intermediate shorelines (for example, see Figures 7-9)

LOT 13

1660

- Oct. 13 Deed. Nicasius de Sille and Hendrick Jansen Van der Vin, Church Wardens of this City, to Louwerens Andriessen. (Lib. A, Deeds, N. Y. Co.: 217.) Desc.: Lot W. of Heere Straat, bounded S., Churchyard, 15 r., 3 ft.; W., Shore North River, 43 ft.; N. by no. and lot of P. Leenders Vander Grift; 15 r., 5 ft.; E. by St. afsd., 43 ft. Recites measured by J. Cortelyou, September 9, 1660.

Note: This is a strip 43 Dutch ft. (39 ft., 5 ins. English) in width, taken from the N. end of the Church Yard, reducing it to a width of 150 English ft., more or less. The Map shows the Church Yard fenced of the original width.

LOT 14

1649

- May 14 Gr-br. to Paulus Leendersen Van Der Grift. Not found of record. Recited in instruments set forth below.

1667

- June 1 Conf. Governor Nicolls to Paulus Leenders Van Der Grift. (Pats. Alb. II: 73.) Recites gr-br. from Stuyvesant, of May 14, 1649. Desc.: W. side of Great Broadway to N. of Churchyard and to S. of Hendrick van Dyck's; striking in br. alongst said Broadway, 6½ r. and towards the Strand side, 7 r.; in length, 14 r.; and there being likewise an addition of ground granted May 11, 1654, by said Dutch Governor unto said Van der Grift, of 1 r., 7 ft. in length on the S. side of said lot, next to the said Churchyard, and on the N. side next to Hendrick van Dyck's, of 1 r., 6 ft.

This following conf. endorsed on the foregoing pat.: Whereas, the late Dutch Governor did grant unto said Paulus afsd. over and above what is mentioned in the within written pat., a cert. lot lying behind his other lot, cont'g on the N. side, 84 ft.; on the W. side, 97 ft.; on the S. side, 85 ft.; and on the E. side, 90 ft. as by the endorsement, on the additional gr-br., bearing date the 12th of December, 1657, doth appear; and do hereby likewise ratify and confirm, etc.

LOT 15

1649

- May 4 Gr-br. to Hendrick Van Dyck. Not found of record. Recited in confirmation set forth below:

1667

- July 22 Conf. Governor Nicolls to Hendrick Van Dyck. (Pats. Alb. II: 79.) Recites gr-br. Stuyvesant to Van Dyck, May 4, 1649. Desc.: Lot and garden W. side of Great Broadway, to the N. of Paulus Leenders Van der Grift and to the S. of the Orchard heretofore belonging to the West India Company; striking in br. alongst the said Broadway, 6½ r.; towards the Strand side, 7 r.; in length, 14 r. And there being likewise an additional grant from Stuyvesant to Van Dyck, May 11, 1654, having in length on the S. side next to Paulus Leenders, 1 r., 6 ft. and on the N. side, 1 r., 5 ft., and whereas there was also on the 12th of December, 1657, another additional grant endorsed and made to Van Dyck, of a lot lying behind his former lot, cont'g on the S. side, 84 ft., W. side 97 ft.; N. side, 79 ft. and E. side, 90 ft.; which is also confirmed, etc.

Source: Stokes II 1916:362

EXCHANGE PROJECT APPENDIX Boring Logs, July 28 to August 6, 1986
(Mueser Rutledge Consulting Engineers)

C

MUESER RUTLEDGE CONSULTING ENGINEERS

ROCK CORE DESCRIPTION CRITERIA AND ABBREVIATIONS

HARDNESS

Criteria for N Series Double Tube core barrels

	Abbreviation	Recovery	RQD
Hard-Sound	Hard	95% or greater	85% minimum
Medium Hard	MedHd	70% or greater	50% min
Intermediate	Int	50% or greater	35% min
Soft	Soft	less than 50%	less than 35%

JOINTING

	Abbreviation	Frequency of Joints
Massive	Mass	less than 1 joint in 4 feet
Blocky	Blky	1 joint every 2 to 4 feet
Moderately Jointed	MdJtd	1 joint every 1 to 2 feet
Jointed	Jtd	1 to 2 joints per foot
Closely Jointed	ClJtd	2 to 4 joints per foot
Highly Jointed,	HiJtd	More than 4 joints per foot
Broken, or	Bkn	" " " " " "
Fractured	Ftd	" " " " " "

WEATHERING

	Abbreviation
Unweathered	UnW
Unweathered Including Joints	UnWInJts
Unweathered Except Joints	UnWExJts
Slightly Weathered	SlW
Moderately Weathered	MdW
Weathered	Wtd, Wthd
Highly Weathered	HiW
Decomposed	Dec








MUESER RUTLEDGE CONSULTING ENGINEERS

ROCK CORE CLASSIFICATION ABBREVIATIONS

bkn	Broken	sa	Sand
Blky	Blocky	sch	Schist, schistose
brn	Brown	sh	Shale
cal	Calcareous or calcite	si	Silt
chl	Chlorite	SlW	Slightly Weathered
cl	Clay	snd	Sound
ClJtd	Closely Jointed	ss	Sandstone
ct	Coating on joint surface	st	Stained
cr	Crushed	SZ	Shear Zone
Dec	Decomposed	UnW	Unweathered
dk	Dark	UnWInJts	Unweathered Including J
Do	Ditto	VJ	Vertical Joint
dolomt	Dolomite, dolomitic	vn	Vein
Fe	Iron Staining on Joint Surface	Wtd, Wthd	Weathered
feld	Feldspar	Z	Zone
Ftd, frtd	Fractured		
gns	Gneiss, gneissic		
gog	Gouge		
grt	Granite, granitic		
gry	Grey		
Hard	Hard-sound		
HiJtd	Highly Jointed		
HiW	Highly Weathered		
horn	Hornblende		
HJ	Horizontal Joint		
in	Infill		
Int	Intermediate hardness		
inj	Injected		
lms	Limestone		
lt	Light		
Jtd	Jointed		
Mass	Massive		
MB	Mechanical Break		
MedHd	Medium Hard		
mic	Mica, Micaceous		
MdW	Moderately Weathered		
pkt?	Pockets		
qtz	Quartz		
Rec	Recovery		
rel	Relatively		
RQD	Rock Quality Designation		

MUESER RUTLEDGE CONSULTING ENGINEERS

ROCK CORE SKETCH SYMBOLS

	Joint	//	Parallel
	Healed Joint	X	Crossing
	Broken	F	Foliation
	Part of Core Not Recovered	S	Stratification
	Cavities or Vugs in core	U	Unfoliated or Unstratified
	Clay	MB	Mechanical Break
	Sand		

JOINT SURFACE CONDITION KEY

Surface	-	Condition
C- Curved	-	Slick -1
I- Irregular	-	Smooth -2
S- Straight	-	Rough -3

SHEET 1 OF 3

FILE NO. 6363

BORING NO. B-1

SURFACE ELEV. +9.46

PROJECT THE EXCHANGE PROJECT

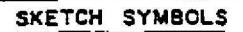
PROJECT LOCATION NEW YORK, N.Y.

RES. ENGR. G.C. BRAUN

[illegible]

Sheet 2 of 3
File No. 6363
Boring No. B-1

Location NEW YORK NY



Boring No. 3-1

Sheet 3 of 3
File No. 6363

BORING No. B-1

MUESER RUTLEDGE CONSULTING ENGINEERS

SHEET 1 OF 3
 FILE NO. 6363
 BORING NO. B-2
 SURFACE ELEV. +7.62

PROJECT THE EXCHANGE PROJECT

PROJECT LOCATION NEW YORK, N.Y.

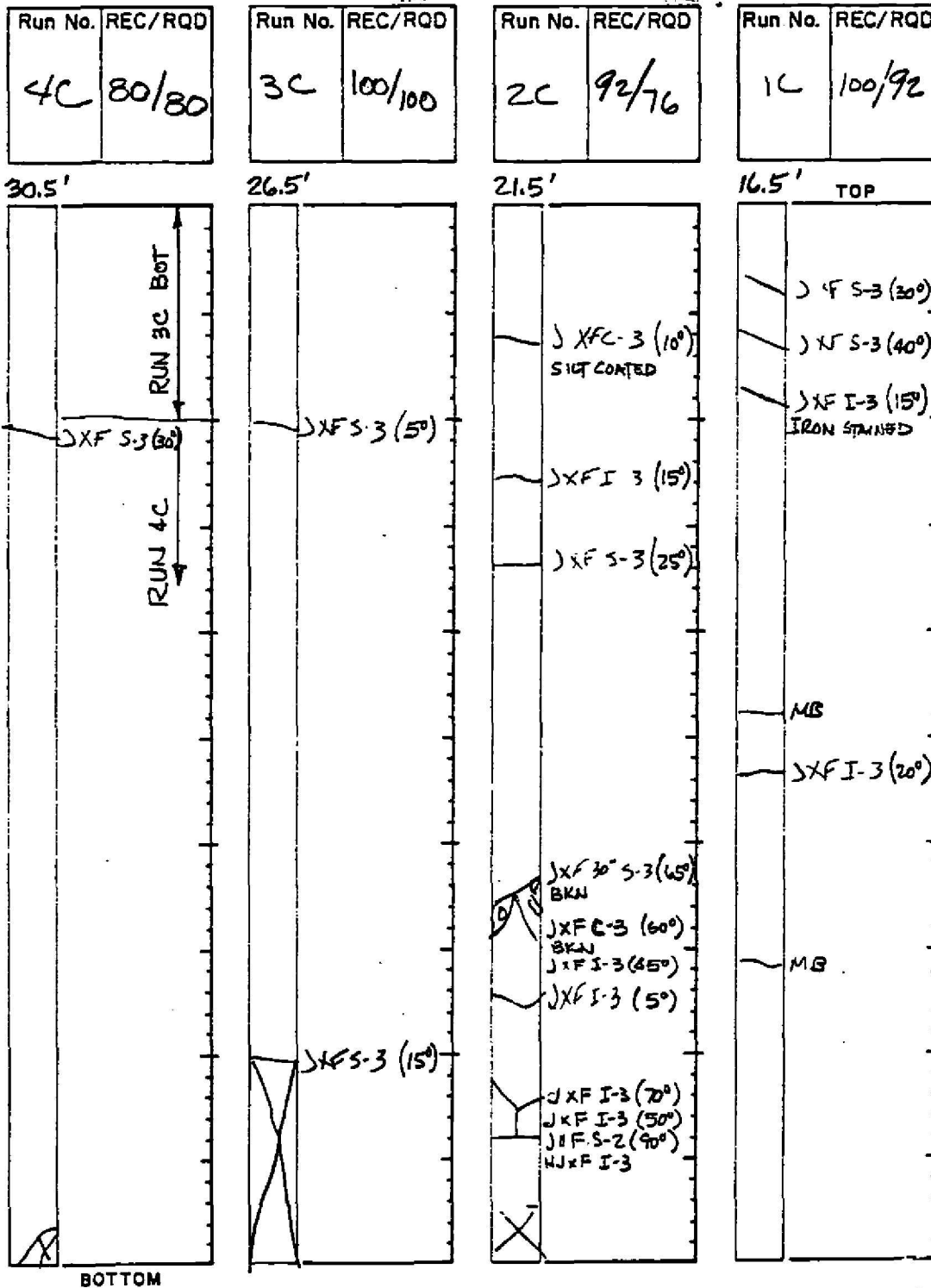
RES. ENGR. G.C. BRAUN

DAILY PROGRESS	SAMPLE			SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
	NO.	DEPTH	BLOWS/6"					
0845								4" Pavement. Orientation parallel to Greenwich St. Single scribe pointing 15°SSW.
8-4-86 Monday Sunny 80°F	1D	5.0 7.0	1-1 2-5	Red brown silty fine to medium sand, some gravel (Fill) (SM)	LOOSE TO VERY COMPACT SILTY FINE TO COARSE SAND, SOME GRAVEL (FILL)	5		4" Casing drilled to 10.3'
	2D	10.0 10.7	40- 100/2"	Red gravel, trace coarse to fine sand, silt (Fill) (GP)		10		Lost all drill water
	3D	15.0 16.1	13-21 100/1"	Gray silty micaceous medium to fine sand, some gravel (SM)		15		3" casing drilled to 16.5'.
	1C	16.5 21.5	Rec=100% RQD=92%	Gray gneissic garnet quartz mica schist, blocky to closely jointed, unweathered excluding joints		16.5	5*	*Coring time in min/ft.
	2C	21.5 26.5	Rec=92% RQD=76%	Do 1C		20	5	
	3C	26.5 31.5	Rec=100% RQD=100%	Do 1C, blocky		25	5	Core barrel jammed.
	4C	31.5 36.5	Rec=80% RQD=80%	Do 1C, blocky		30	5	Bottom 1' of run #3C recovered with run 4C.
						35	7	Bottom 1' run 4C left in hole. Could not recover End of boring @ 36.5'.
						36.5	7	
						40		
						45		
						50		
1630								

MUES RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

Sheet 2 of 3
File No. 6363
Boring No. B-2

Project THE EXCHANGE PROJECT
Location NEW YORK NY



SKETCH SYMBOLS

NOTES ORIENTED CORE SINGLE SCRIBE POINTING 150 SSW

Boring No. B-2

PROJECT THE EXCHANGE PROJECT BORING NO. B-2
 LOCATION NEW YORK, N.Y.
 BORING LOCATION CORNER OF BATTERY PLAZA & GREENWICH STREET
 SURFACE ELEVATION +7.62 DATUM BOROUGH OF MANHATTAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG: ☒ TRUCK, ☐ SKID, ☐ TRIPOD, ☐ OTHER _____
 TYPE OF FEED DURING CORING: ☐ MECHANICAL, ☐ HYDRAULIC, ☐ OTHER _____
☒ CASING UTILIZED: DIAMETER, INCHES 4", DEPTH FROM 0.0' TO 10.0'
 DIAMETER, INCHES 3", DEPTH FROM 0.0' TO 16.5'
☐ DRILLING MUD UTILIZED: DIAMETER OF ROTARY BIT, INCHES _____
 TYPE OF DRILLING MUD _____
☐ AUGER UTILIZED: TYPE AND DIAMETER, INCHES _____
 TYPE AND SIZE OF:
 DRILL RODS N, D-SAMPLER 2" O.D. SPLIT SPOON
 S-SAMPLER _____, U-SAMPLER _____
 CORE BARREL CHRISTENSEN DOUBLE TUBE, CORE BIT NX DIAMOND
 CASING HAMMER: WEIGHT, POUNDS 300, AVERAGE FALL, INCHES 24
 SAMPLER HAMMER: WEIGHT, POUNDS 140, AVERAGE FALL, INCHES 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION*
					BACK FILLED
					NO OBSERVATION DONE

* Note reliability of observation, rainfall, elevation of nearby open water, tide gauge or other factors affecting water level recorded.

☐ PIEZOMETER INSTALLED. SKETCH SHOWN ON _____
 STANDPIPE: TYPE _____, ID _____, LENGTH _____, TOP ELEV. _____
 INTAKE POINT: TYPE _____, OD _____, LENGTH _____, TIP ELEV. _____
 FILTER: MATERIAL _____, OD _____, LENGTH _____, BOT. ELEV. _____

PAY QUANTITIES

2 1/2" DIA. DRY SAMPLE BORING, LIN. FT. 16.5' NO. OF 2" SHELBY TUBE SAMPLES _____
 _____ DIA. U-SAMPLE BORING, LIN. FT. _____ NO. OF 3" UNDISTURBED SAMPLES _____
 CORE DRILLING IN ROCK, LIN. FT. 20.0' OTHER _____

BORING CONTRACTOR WARREN GEORGE, INC.
 DRILLER V. GONDOLFO HELPERS S. LUDICKY
 REMARKS ORIENTED CORE, SINGLE SCRIBE POINTING 15° SOUTH SOUTH WEST.
 RESIDENT ENGINEER GERALD C. BRAUN DATE 8-4-86

NOTES:

1. Make a separate log of each boring and each unsuccessful attempt. Keep a copy of all logs in the field.
2. In daily progress column indicate depth at beginning and end of work day, calendar date, time at beginning and end of work day and weather conditions.
3. All samples shall be numbered in consecutive order regardless of type; dry samples D, wash samples W, shelly tube samples S, fixed piston samples U. Do not assign numbers to lost samples but record blows and reasons for lack of recovery.
4. Mark each U-sample with boring number, sample number, depth, recovery and job number.
5. Record blows on sampler per six inches of penetration. Note all blows and penetrations when taken at less than six inch intervals. Indicate method by which penetration of tube sampler was obtained.
6. Indicate changes of material in strata column and list generalized strata description.
7. List under remarks the manner by which changes in material were detected, all obstructions, any loss or gain of wash water including amount, the recovery of rock core in feet and inches and per cent of run, Rock Quality Designation (RQD) in per cent and any unusual occurrences.
8. Include sample description by Unified Soil Classification System.
9. Obtain water level at the beginning of each day and at all other times when stable water conditions exist.

MUESER RUTLEDGE CONSULTING ENGINEERS

SHEET 1 OF 3
FILE NO. 6363
BORING NO. B-3
SURFACE ELEV. +6.53

PROJECT THE EXCHANGE PROJECT

PROJECT LOCATION NEW YORK, N.Y.

RES. ENGR. G.C. BRAUN

DAILY PROGRESS	SAMPLE			SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
	NO.	DEPTH	BLOWS/6"					
1230 Rain 7-30-86 Wed.							P U S H	4" Concrete 4" Casing to 19' 3" Casing to 21.5'.
1430 0700 7-31-86	1D	5.0 7.0	4-8 8-10	Brown gravelly fine to coarse sand, trace silt (Fill)(SP-SM)	MED CPT BRN TO GRV GRAVELLY F-C SAND TO F-C SAND, SM GVL. TRACE SILT (FILL)	5	28	
0930 0630	2D	10.0 12.0	12-7 7-6	Gray fine to coarse sand, some gravel, trace silt (Fill)(SP-SM)		10		Blows not recorded
	3D	15.0 17.0	11-13 9-10	Gray fine to coarse sandy silt, some gravel (ML)		15		
	4D	20.0 21.5	18-28 100	Gray micaceous fine to coarse sand, sm gravel, tr silt (SP-SM)		19.0	31 35 81 97	Hard drilling
	1C	21.5 26.5	Rec=96% RQD=28%	Gray gneissic garnet quartz mica schist, highly jointed to jointed, slightly weathered to unweathered excluding joints		20		
	2C	26.5 31.5	Rec=98% RQD=60%	White mica quartzite, closely jointed, unweathered excluding joints		21.5	5*	*Coring time in min/ft.
	3C	31.5 36.5	Rec=97% RQD=74%	Do 2C, jointed		25	3 3 5 3 6 7 7 7	
	4C	36.5 41.5	Rec=97% RQD=97%	Gray gneissic garnet quartz mica schist, closely jointed to blocky unweathered excluding joints		30	7 5	Drilling time not recorded. 31.5' - 36.5'.
1200						35		
						40	7 7	
						41.5	7	End of boring @ 41.5'.
						45		
						50		

PLEASE RETURN TO
LIBRARY
LANDMARKS PRESERVATION
COMMISSION

MUES RUTLEDGE CONSULTING ENGINEERS
ROCK CORE SKETCH

Sheet 2 of 3
 File No. 6-63
 Boring No. B-3

Project NEW YORK STATE HIGHWAY PROJECT

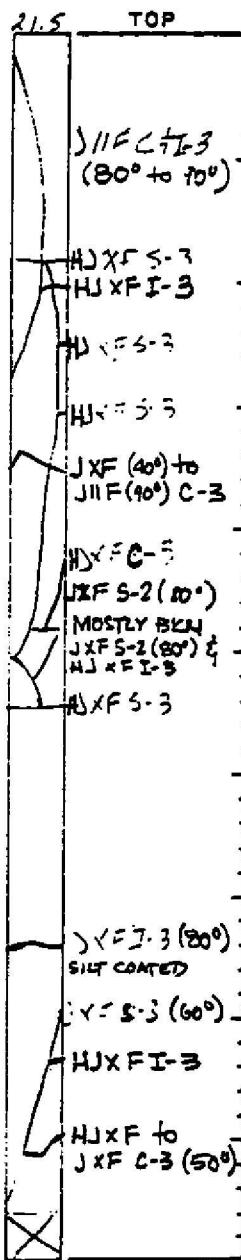
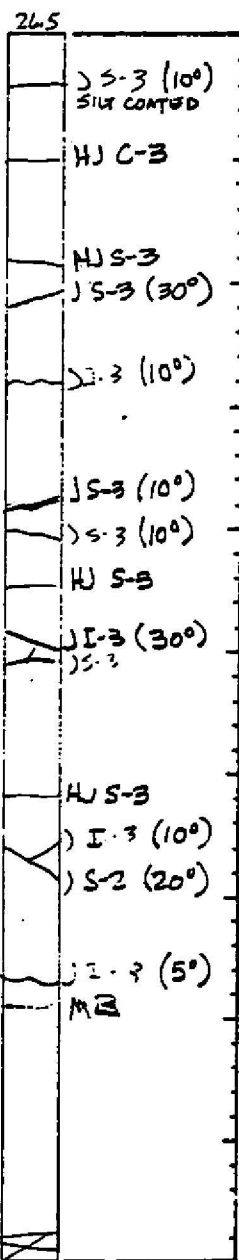
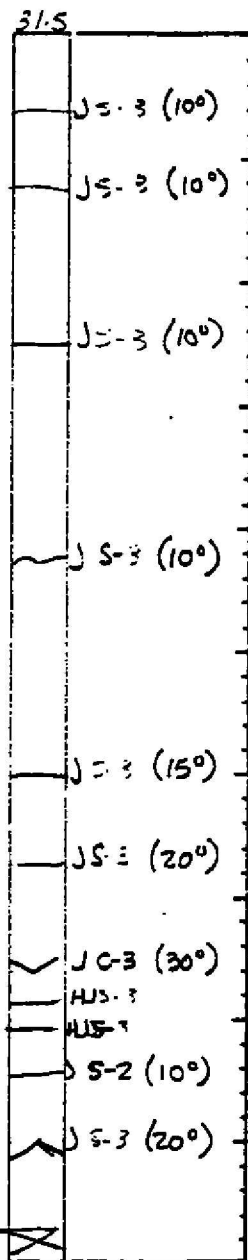
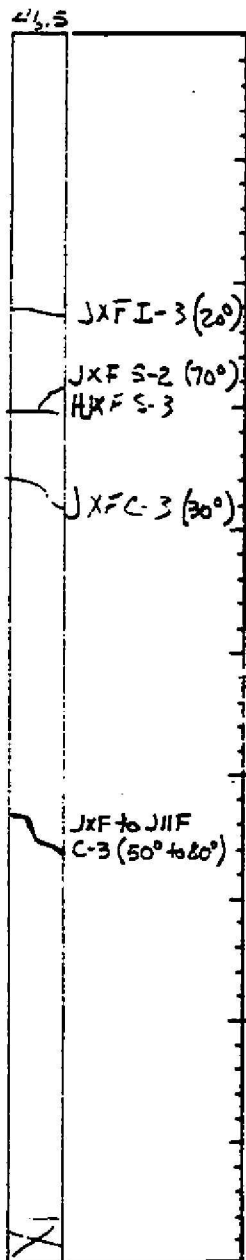
Location NEW YORK N.Y.

Run No.	REC/RQD
4C	97/91

Run No.	REC/RQD
3C	97/47

Run No.	REC/RQD
2C	98/60

Run No.	REC/RQD
1C	96/28



SKETCH SYMBOLS

ALL JOINTS
 SILT COATED &
 IRON STAINED

BOTTOM

NOTES _____

Boring No. B-3

MUESER RUTLEDGE CONSULTING ENGINEERS

Sheet 3 of 3
File No. 6363

PROJECT THE EXCHANGE PROJECT BORING NO. B-3
LOCATION NEW YORK, N.Y.
BORING LOCATION 10 FEET FROM CENTERLINE OF CURB ON SIDEWALK
SURFACE ELEVATION +6.53 DATUM BOROUGH OF MANHATTAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG: ☒ TRUCK, ☐ SKID, ☐ TRIPOD, ☐ OTHER _____
TYPE OF FEED DURING CORING: ☐ MECHANICAL, ☐ HYDRAULIC, ☐ OTHER _____
☒ CASING UTILIZED: DIAMETER, INCHES 4", DEPTH FROM 0.0' TO 19.0'
DIAMETER, INCHES 3", DEPTH FROM 0.0' TO 21.5'
☐ DRILLING MUD UTILIZED: DIAMETER OF ROTARY BIT, INCHES _____
TYPE OF DRILLING MUD _____
☐ AUGER UTILIZED: TYPE AND DIAMETER, INCHES _____
TYPE AND SIZE OF:
DRILL RODS N D-SAMPLER 2" O.D. SPLIT SPOON
S-SAMPLER _____ U-SAMPLER _____
CORE BARREL CHRISTENSEN DOUBLE TUBE CORE BIT NX DIAMOND
CASING HAMMER: WEIGHT, POUNDS 300, AVERAGE FALL, INCHES 24
SAMPLER HAMMER: WEIGHT, POUNDS 140, AVERAGE FALL, INCHES 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION*
7-31-86	0700	7'	5'	0	DUE TO RAIN READING
					UNRELIABLE
8-1-86	0630	10'	10'	0	DUE TO RAIN READING
					UNRELIABLE

* Note reliability of observation, rainfall, elevation of nearby open water, tide gauge or other factors affecting water level recorded.

☐ PIEZOMETER INSTALLED. SKETCH SHOWN ON _____
STANDPIPE: TYPE _____, ID _____, LENGTH _____, TOP ELEV. _____
INTAKE POINT: TYPE _____, OD _____, LENGTH _____, TIP ELEV. _____
FILTER: MATERIAL _____, OD _____, LENGTH _____, BOT. ELEV. _____

PAY QUANTITIES

2 1/2" DIA. DRY SAMPLE BORING, LIN. FT. 21.5' NO. OF 2" SHELBY TUBE SAMPLES _____
____ DIA. U-SAMPLE BORING, LIN. FT. _____ NO. OF 3" UNDISTURBED SAMPLES _____
CORE DRILLING IN ROCK, LIN. FT. 20.0' OTHER _____

BORING CONTRACTOR WARREN GEORGE, INC.
DRILLER M IMPARATO HELPERS J. IMPARATO

REMARKS _____
RESIDENT ENGINEER GERALD C. BRAUN DATE 8-1-86

NOTES:

1. Make a separate log of each boring and each unsuccessful attempt. Keep a copy of all logs in the field.
2. In daily progress column indicate depth at beginning and end of work day, calendar date, time at beginning and end of work day and weather conditions.
3. All samples shall be numbered in consecutive order regardless of type; dry samples D, wash samples W, shelly tube samples S, fixed piston samples U. Do not assign numbers to lost samples but record blows and reasons for lack of recovery.
4. Mark each U-sample with boring number, sample number, depth, recovery and job number.
5. Record blows on sampler per six inches of penetration. Note all blows and penetrations when taken at less than six inch intervals. Indicate method by which penetration of tube sampler was obtained.
6. Indicate changes of material in strata column and list generalized strata description.
7. List under remarks the manner by which changes in material were detected, all obstructions, any loss or gain of wash water including amount, the recovery of rock core in feet and inches and per cent of run, Rock Quality Designation (RQD) in per cent and any unusual occurrences.
8. Include sample description by Unified Soil Classification System.
9. Obtain water level at the beginning of each day and at all other times when stable water conditions exist.

MUESER RUTLEDGE CONSULTING ENGINEERS

SHEET 1 OF 3
 FILE NO. 6363
 BORING NO. B-4
 SURFACE ELEV. +5.20
 G.C. BRAUN

PROJECT THE EXCHANGE PROJECT

PROJECT LOCATION NEW YORK, N.Y.

RES. ENGR.

DAILY PROGRESS	SAMPLE			SAMPLE DESCRIPTION	STRATA	DEPTH	CASING BLOWS	REMARKS
	NO.	DEPTH	BLOWS/6"					
1000								4" Asphaltic concrete. 0-5' explored with roller bit.
7-28-86 Monday Cloudy 85°F	1D	5.0 7.0	11-7 7-7	Brown fine to coarse sand, some silt, gravel (Fill) (SM)	MEDIUM COMPACT FINE TO COARSE SAND, TRACE TO SOME SILT, GRAVEL	5		4" casing to 19' 3" casing to 30' Drilled in.
	2D	10.0 12.0	9-5 5-7	Brown fine to coarse sand, some gravel, trace silt (Fill) (SP)		10		2 Attempts. Poss. wash.
	3D	15.0 17.0	9-9 6-7	Brown gravelly fine to coarse sand, trace silt (Fill) (SP)		15		2 Attempts. wash.
	4D	20.0 22.0	29-72 50/3"	Gray fine to coarse sandy silt, some gravel, clay (ML)		18.5 20		
	1C	22.5 28.0	10/3**21* Rec=6%	Gray gneiss boulder		25	7** 5	*300 lb. Hammer Very hard drilling at 22.9'.
							2 3 2	Dirty washwater. Possible boulder.
	5D	29.0 29.8	67- 75/3"	Gray fine to coarse sandy silt, some gravel, rock fragments (ML)		30	7** 5	**Coring time in min/ft.
	2C	30.5 35.5	Rec=97% RQD=84%	Gray gneissic garnet quartz mica schist, blocky to closely jointed unweathered excluding joints		35	3 6 6	
	3C	35.5 40.5	Rec=98% RQD=86%	Do 2C		40	5 5 6 4 5	New Bit.
	4C	40.5 45.5	Rec=100% RQD=97%	Do 2C, blocky to jointed		45	4 4 5 5 5	
7-29-86 Tuesday Cloudy 75°F	5C	45.5 50.5	Rec=98% RQD=97%	Do 2C, massive		50	4 5 5 5 6	
						50.5		End of boring 50.5'.

ROCK CORE SKETCH

File No. 2567

Boring No. B-7

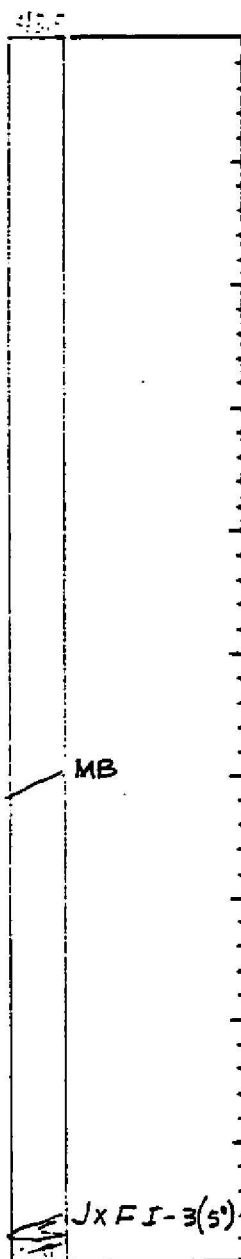
Location NEW YORK NY

Run No.	REC/RQD
5C	98/97

Run No.	REC/RQD
42	100/27

Run No.	REC/RQD
5C	98/86

Run No.	REC/RQD
62	97/84



BOTTOM

SKETCH SYMBOLS

NOTES

Boring No. B-4

Sheet 3 of 3
File No. 6363

Page No. 8-1

SHEET 1 OF 3
FILE NO. 6363
BORING NO. B-5
SURFACE ELEV. +6.49
G.C. BRAUN

PROJECT LOCATION NEW YORK, N.Y.

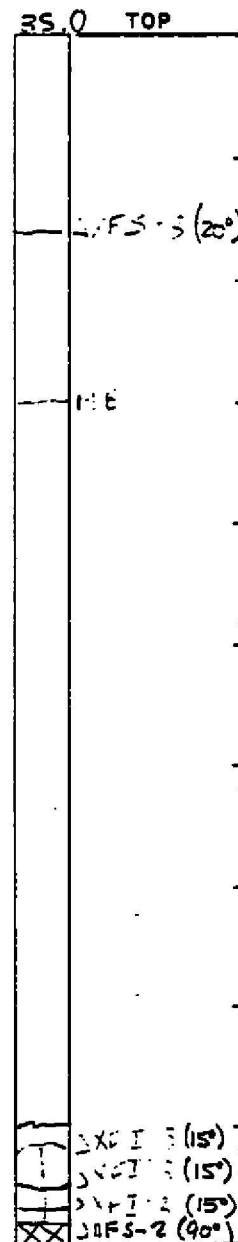
G.C. BRAUN

BORING NO. B-5

Boring No. A-5

Location NEW YORK N.Y.

Run No.	REC/RQD
1C	75/72



SKETCH SYMBOLS

NOTES _____

Boring No. 3-51

MUESER RUTLEDGE CONSULTING ENGINEERS

Sheet 3 of 3
File No. 6363

PROJECT THE EXCHANGE PROJECT BORING NO. B-5
LOCATION NEW YORK, N.Y.
BORING LOCATION 190' NORTH ALONG W.U.I. PLAZA FROM B-4
SURFACE ELEVATION +6.49 DATUM BOROUGH OF MANHATTAN

BORING EQUIPMENT AND METHODS OF STABILIZING BOREHOLE

TYPE OF BORING RIG: ☒ TRUCK, ☐ SKID, ☐ TRIPOD, ☐ OTHER _____
TYPE OF FEED DURING CORING: ☐ MECHANICAL, ☐ HYDRAULIC, ☐ OTHER _____
☒ CASING UTILIZED: DIAMETER, INCHES 4", DEPTH FROM 0.0' TO 25.0'
DIAMETER, INCHES 3", DEPTH FROM 0.0' TO 35.0'
☐ DRILLING MUD UTILIZED: DIAMETER OF ROTARY BIT, INCHES _____
TYPE OF DRILLING MUD _____
☐ AUGER UTILIZED: TYPE AND DIAMETER, INCHES _____
TYPE AND SIZE OF:
DRILL RODS N . D-SAMPLER 2" O.D. SPILT SPOON
S-SAMPLER _____ . U-SAMPLER _____
CORE BARREL DOUBLE TUBE . CORE BIT DIAMOND NX
CASING HAMMER: WEIGHT, POUNDS 300, AVERAGE FALL, INCHES 24
SAMPLER HAMMER: WEIGHT, POUNDS 140/300, AVERAGE FALL, INCHES 30

WATER LEVEL OBSERVATIONS IN BOREHOLE

DATE	TIME	DEPTH OF HOLE	DEPTH OF CASING	DEPTH TO WATER	CONDITIONS OF OBSERVATION*
7-30-86	0700	30'	30'	20'	OVERNIGHT

* Note reliability of observation, rainfall, elevation of nearby open water, tide gauge or other factors affecting water level recorded.

☐ PIEZOMETER INSTALLED. SKETCH SHOWN ON _____
STANDPIPE: TYPE _____, ID _____, LENGTH _____, TOP ELEV. _____
INTAKE POINT: TYPE _____, OD _____, LENGTH _____, TIP ELEV. _____
FILTER: MATERIAL _____, OD _____, LENGTH _____, BOT. ELEV. _____

PAY QUANTITIES

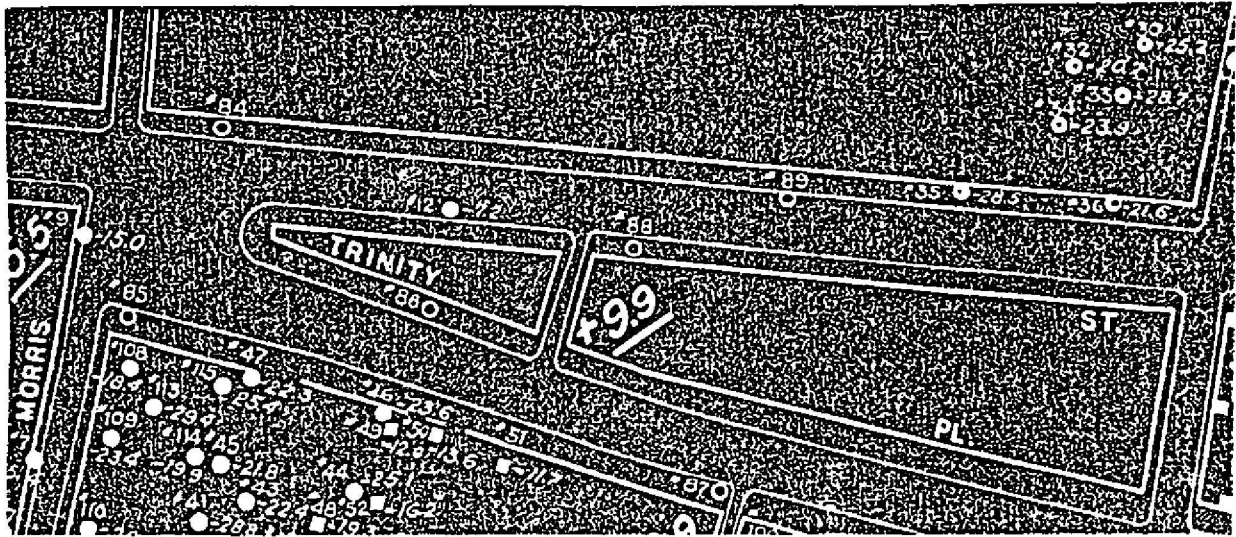
2 1/2" DIA. DRY SAMPLE BORING, LIN. FT. 35.0' NO. OF 2" SHELBY TUBE SAMPLES _____
____ DIA. U-SAMPLE BORING, LIN. FT. _____ NO. OF 3" UNDISTURBED SAMPLES _____
CORE DRILLING IN ROCK, LIN. FT. 20.0' OTHER _____

BORING CONTRACTOR WARREN GEORGE, INC.
DRILLER M. IMPARATO HELPERS J. IMPARATO

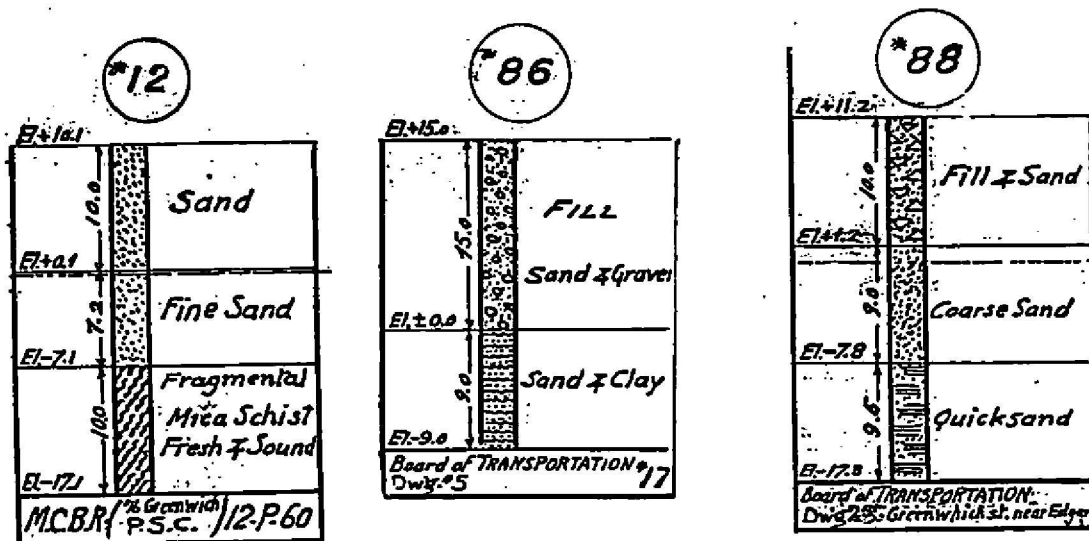
REMARKS _____
RESIDENT ENGINEER GERALD C. BRAUN DATE 7-30-86

NOTES:

1. Make a separate log of each boring and each unsuccessful attempt. Keep a copy of all logs in the field.
2. In daily progress column indicate depth at beginning and end of work day, calendar date, time at beginning and end of work day and weather conditions.
3. All samples shall be numbered in consecutive order regardless of type; dry samples D, wash samples W, shelly tube samples S, fixed piston samples U. Do not assign numbers to lost samples but record blows and reasons for lack of recovery.
4. Mark each U-sample with boring number, sample number, depth, recovery and job number.
5. Record blows on sampler per six inches of penetration. Note all blows and penetrations when taken at less than six inch intervals. Indicate method by which penetration of tube sampler was obtained.
6. Indicate changes of material in strata column and list generalized strata description.
7. List under remarks the manner by which changes in material were detected, all obstructions, any loss or gain of wash water including amount, the recovery of rock core in feet and inches and per cent of run, Rock Quality Designation (RQD) in per cent and any unusual occurrences.
8. Include sample description by Unified Soil Classification System.
9. Obtain water level at the beginning of each day and at all other times when stable water conditions exist.



Location Plan, Rock Data 1939 Vol. 1 Sheet 1

Relevant Borings

- #12 Greenwich Street south of Edgar Street (street)
- #86 Trinity Place south of Edgar Street (sidewalk)
- #88 Greenwich Street north of Edgar Street (side walk)--this boring is in vicinity of new location of Edgar Street

Note: only Boring 12 was taken near bedrock (decomposed rock at 27.2 ft. below grade)

ACKNOWLEDGMENTS

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