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City of New York  
Department of Environmental Protection  
Bureau of Sewers  
Division of Sewer Design  
Capital Project No. SE - 544 (HD387)  
For the Rehabilitation and Construction of  
Combined Sewers, Outfalls, Regulators  
and Appurtenances in:  
South Street  
From Wall Street to Approx. 100' North of Dover Street

and

Capital Project No. WM - 1 and WM - 6  
For the Installation of Water Mains and  
Appurtenances in: South Street  
From Wall Street to Approx. 100' North of Dover Street

Borough of Manhattan

ARCHAEOLOGICAL SURVEY

by

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Diana Dalla

For the Center for Building Conservation  
171 John Street  
New York, New York 10038

21 September 1983

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## Introduction

This project was undertaken (in response to city, state and federal  
legislation designed to protect archaeological and historic resources.

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The construction and rehabilitation of combined sewers, water mains, regulators, outfalls, appurtenances, etc. in South Street between Wall Street and a point approximately 100' north of Dover Street, (necessitated  
that prior to construction an archaeologist, approved by the New York  
City Landmarks Preservation Commission, perform an archaeological survey to: 1) evaluate the archaeological and historical significance of the proposed project area, 2) determine the possibility of the destruction of those resources, and 3) make recommendations for field testing, if necessary, to further establish the presence and nature of such resources.

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To serve this purpose, Woodward-Clyde Consultants, Inc. engaged the Center for Building Conservation. The documentary research was done by Diane Dallal; Nan Rothschild, ~~was~~ the principal investigator, was responsible for consultations with the project engineers and established the recommendations for field testing with consultation by Diana Rockman.

The area under construction falls within the South Street Seaport  
Historic District (1972), the South Street Seaport Extension (1977) and the Schermerhorn Row Historic District (1970).<sup>7</sup> Only the section of the project area that is south of Fletcher Street, including Wall Street, is not within the boundaries of an historic district.

According to the United States Department of Interior, the Seaport

District is "a significant archaeological resource." (National Register of Historic Places Directory.) This significance relates primarily to the 19th century period, when the Seaport was the nation's leading commercial port. A number of the buildings from this period survive along South Street, and landfill structures, portions of old piers and wharves, and artifactual materials that are associated with this period survive beneath existing sidewalks, streets, parking lots, and other waterfront land within the project area.

The first section of this report will summarize the history of the project area. The second section will describe the proposed construction and the archaeological resources likely to be present within the project area. The third section will summarize recommendations for field testing.



## Section I: South Street Seaport History

Pearl Street was the original shoreline of Manhattan Island and all land east of it is composed of successive waves of land filling and wharf building. Thus, the project area is composed of made land. South Street, beginning at Whitehall Street and extending along the Waterfront to Corlears Street, was built under "the obligations required by the Grants of Land Under Water," and was the waterfront bulkhead street, built seventy feet wide. (History of Old Streets, Vol. II, p. 46)

"Grants of Land Under Water" were originally offered to the proprietors of the upland areas along the high water line and date from ca. 1687 until 1835. The Dongan Charter of 1686 gave the City of New York the right to begin the land filling process. The Montgomerie Charter (1730) extended grants of land up to 400' beyond the low water mark.

When the city selected an area of waterfront to be improved, the owner of the land along the shore was given the privilege of extending his property. If he accepted, he was obligated to fill in the area of the grant from the high water mark to the bulkhead or dock. The owner of the grant paid an upset price as well as a nominal sum of money, and the land created by the fill became taxable real estate. If the owner of a water grant refused the privilege, it was auctioned off to the highest bidder.

The first water grant in the South Street Seaport Historic District was made to John Cannon for the area that now encompasses 209-211 Water Street. This was granted in 1719. Cannon was required to build a wharf or street at its outer margin. This came to be known as the Queen Street Wharf, and later was known as Water Street. This area is two blocks west of the project area.

On April 7, 1795, the Common Council decided that "a wide and spacious street along the front of this city would tend much of its ornament convenience and safety" (Minutes of the Common Council 1784-1832, II:138-39), and decreed that the street was to be seventy feet wide. This is the street that became South Street. South Street, however, had, previous to this decree, been sporadically filled in places to provide deep-water wharfage for large ships. Wharves and ships jutted out into the river, and as the spaces between wharves filled with silt and garbage, the city, instead of dredging them, dumped in fill, paved the surface, and extended the piers further into the water. ~~Thus were added first Water Street, then Front Street and finally South Street. Along the Hudson River, a similar~~ landfilling process created Washington and West Streets.

A book available at the New York City Topographic Bureau summarizes this process:

..... water grants with obligations were given by the City of New York, such as the building of bulkheads or docks, also the slips laid out by the City, the construction of all or such portion of the street that within the lines of the grants, the filling in and grading of the property granted, the building of all bulkheads, paving and keeping in good repair the pavements of the street ... created under the terms of the grants, the payment of the real estate tax of the land created, etc. (History of Old Streets, Vol. II, p. 46)

Maps in the New York Public Library and New York University, Department of Anthropology, document the landfill process. In 1797, the Taylor Roberts Plan of New York of 1797 shows that landfill had, in some locations, reached Front Street by the turn of the century, but South Street was not yet in existence. A map of the city surveyed by J. Hills in 1782 and (republished in 1876) shows South Street beginning on top of 18th century land-fill. South Street was in its present day position by 1804.

(National Register of Historic Places, South Street Extension, p. 2, 1977)

Maps included with this report as Figures 1 through 4 document the land-filling process in lower Manhattan between 1729 and 1808.

In 1793, John Drayton toured the United States and wrote of the City, "the greater part of its wharves are built upon the East River and there, the trade of the city is principally carried on. It is "..... crowded with stores and shops: the most of which are in the retail line, though many of them are in the wholesale business ... " (Stokes, p. 1297) On January 12, 1801, the Common Council adopted a recommendation that proprietors of lots on South Street between Whitehall Street and the Fly Market (Maiden Lane) be required to build fifteen piers before 1802. These piers were considered of the first importance to the,

commercial interests of this city, more especially as the corporations have carved the permanent line within that space to have been completed and thereby have deprived the shipping of the accomodation they heretofore had at the Old Piers. (Stokes, p. 1382)

The exact dimension of each pier was to be 180 feet long and 30 feet wide. They were to be formed by three "blocks of butments of 30 feet each and three bridges of the same size." (Ibid.)

In the first decade of the 19th century, South Street was occupied primarily by merchants and ship-owners. A line of warehouses, or "counting-houses," built four and five stories high lined the waterfront facing the East River. The slips and lanes leading up to Front and Water Streets were occupied by wholesale grocers, commission merchants, saloons, and iron merchants. Pearl Street was the headquarters of the wholesale dry-goods merchants. New York City's commercial life centered along South Street.

The Embargo Act of President Jefferson which forbade American

shipping to leave U.S. ports was a blow to the mercantile establishment. In addition, England's Navy blockaded the major U.S. ports and New York's commerce was further impeded. The period between 1806 and 1815 was particularly difficult due to these stringent restrictions laid upon commerce.

The first act of peacetime was the opening of American ports to foreign trade. (Stokes, 1909) The period of depression immediately following the War of 1812 gave way to prosperity. In addition to being the chief port in the country for the entrance of foreign trade, New York City also became the center of a vast amount of coastal trade.

It was said that "on the opening of the Erie Canal in 1825, New York was at the peak of its surge of growth. During that year, 500 new merchant houses opened ... more than 3,000 new buildings went up and 1300 ships sailed in the East River to dock at South Street piers." (Bixby, p. 10) The completion of the canal placed the trade of the West in the hands of New York and gave a powerful thrust to the growth of New York City.

~~Early in the 19th century, South Street became a major port for the first international passenger ships to maintain regularly scheduled departure and arrival dates. Prior to 1818, the idea of a fixed sailing date for a vessel was inconceivable. However, when the "James Monroe" set sail on the advertised day of departure, it set a precedent and marked the beginning of scheduled liner service. (Bixby, p.7) In 1818, packets began to leave New York for Liverpool in accordance with a regular schedule. The "Black Ball Line" began sailing from South Street, just south of Peck Slip, near present day Pier 17. (Rosebrock)~~

The 1840-1850 period was the "midpoint of a period of phenomenal growth for this largest of cities and ports; tonnage through the port increased more than 360% while exports rose by more than 400%."

(Bixby, p. 5) Trade was the most important business. Foreign and domestic shipping was localized at the piers, slips, and wharves of the East River.

Almost without exception, wharves were built of wood. Between the wharves and the buildings, the East River was a forest of masts and rigging. To the north, wharves in the vicinity of Peck Slip were utilized by smaller craft such as sloops and schooners, which were engaged in New England trade. (Stokes, p. 1909) As one approached the Battery, ships were of the larger classes that engaged in foreign trade. According to Stokes "their bowsprits (were) overhanging South Street and threatening to invade the walls of the warehouses.

In addition to the nautical advantages of New York as a harbor and an inland route for commerce, the City lay within the "cotton triangle." Southern cotton was in demand in England and Europe. South Street merchants cannily developed trade relations with Southern planters, and merchants imported woolens and machinery from England to sell in the United States. "Ships sailed to southern ports and picked up cotton," then sailed to Great Britain. (Bixby, p. 9) Occasionally, rum from West Indian ports was added cargo for ships returning to N.Y." (Ibid.)

After perhaps nearly a century of use, an 1872 description of the wharves of New York City depicts them as being "wretched, half decayed and dirty but ere long they are to be replaced with a system of magnificent stone and iron piers." (McCabe, p. 836) The same author further stated that the East River waterfront was the terminus of the ferry lines to Brooklyn, Long Island and Hunter's point. East River craft consisted almost entirely of sailing vessels.

In 1883, businesses concerned with shipping, including ship carvers,



sail makers, chandlers, and commission merchants continued to maintain locations on and near South Street. In addition, the Cotton Depot was on South Street, just north of Burling Slip (Shaw, 1982), and there were a number of iron and brass foundaries on South Street.

~~During the later part of the 19th century, hotels began to emerge along South Street. This development was paralleled by the growth of cottage industries along Front Street. (Stewart, 1981) By 1893, roughly one-half of the stores along the East River waterfront between Beekman Street and Peck Slip were occupied by fish distributors, a type of business activity which would remain prevalent in the area throughout the 20th century.~~

Nineteenth century photographs and engravings record the heavy shipping traffic which characterized South Street's great period as a port. By the end of the century, this period was ended. Although South Street seemed able to handle the proliferation of steam-powered ships, the wider channel and slower currents of the Hudson River made it "easier for the large liners and freighters to maneuver." (Brouwer, p. 14) ~~Increased use of Hudson River port facilities diminished use of the docks and wharves along South Street, thus ending the maritime heyday of South Street.~~

Section II: Proposed Construction and Archaeological and Historic Resources in the Project Area.

Plans for the proposed construction\* describe extensive work within the project area. Running south to north, this construction will extend from Wall Street to approximately 100' north of Dover Street. From west to east, construction will extend from areas beneath the sidewalks directly west of South Street to, in places, as far as approximately 25' east of South Street. Where there are outfalls, the construction will extend further east, to the Manhattan shoreline of the East River. Where South Street intersects streets running east to west, construction will extend as far as approximately 15' west into these streets (Wall, Fletcher, John, Fulton, Beekman, Peck Slip and Dover Streets). Construction in connection with water mains and sewers will be to depths of down to approximately 15' below grade. Where there are to be chambers, regulators and appurtenances, etc., construction will be to depths of down to approximately 25' below grade. (See Appendix for detailed description of proposed construction.)

Much of the proposed construction in the project area will be within areas that have already been disturbed by earlier construction in connection with the installation of previous utility services. In these areas the proposed construction will have little or no impact on archaeological or historic resources. However, in certain locations the proposed construction will be within areas where made land dates from the 18th and 19th centuries and contains resources associated with the historic periods

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\* Sheets 1 through 39 and 2A through 9A, by George W. Cowan, Engineer-in-Charge, In House Design; signed by Joseph T. McGough, Commissioner, New York City Department of Environmental Protection, 10-10-82

described in Section I of this report. The ~~three types of resources that~~  
~~will be affected are:~~

II.1 Landfill, dating from late 18th to late 19th centuries,  
which is likely to contain artifactual material that is of  
great value in documenting past ways of life. The material  
and fill can also provide information on when and how the  
fill was deposited. A recent study  
describes the land under South Street at Schermerhorn Row as  
consisting of "massive amounts of fill" that were "brought  
from varied dumping places where refuse had accumulated for  
years." (Kardas and Larrabee, 1980, p. 19) Landfill in  
other contexts has also included dredged materials and soil  
brought from sterile contexts. The fill may contain within  
it earlier ground surfaces, with materials on them discarded as  
people lived there. The fill may also contain ships important  
for cultural and technological reasons. As early as July 1786,  
mention was made of a "sunken hull of a vessel in Beekman's Slip  
which cannot be removed." (Stokes Vol. V, 1915, p. 1211)  
Recent excavations at 175, 207 and 209 Water Street have con-  
firmed the existence of sunken vessels used as crib works for  
retaining landfill. (Harris, 1980, p. 13-14)

II.2 Docks, wharves, and slips are known to have existed all along  
the project area, dating from at least two waterfronts, one  
on the South Street shoreline and one at Fulton Street.  
De Creve Couer, first French Consul General, who visited New  
York shortly before the Revolutionary War, stated, "I do not

think there are any cities on this continent, where the art of construction wharves has been pushed to a further extent. I have seen them made in 40' of water. This is done with the trunks of pines attached which they gradually sink, fill with stones and cover the surfaces with earth." (Beard, 1970, p. 15) There are great gaps in our knowledge of these structures.

II.3 ~~Landfill retaining structures, such as cribbing, or filled-~~  
~~in docks, are the third kind of resource.~~ These structures are likely to be found at the interface between early streets and later streets, such as South Street and the area identified on plans for the proposed project as "Marginal Street." This is another technological area for which only limited information exists.

Summarizing the significance of these resources, the Department of Interior concluded, in 1977, that:

The remains known to be in the landfill deposits are archaeologically significant because they reveal the material remains of earlier days, presenting a chronicle of change for one of the oldest neighborhoods in New York City. Since the South Street Seaport long served as a principal port for a widespread commercial network, detailed analysis of these material remains can also provide information on local, national and international economic patterns during specific period in time. (National Register of Historic Places, South Street Seaport Extension, 1977, p. 8).

There are three situations in which the proposed construction will have potential impact on the types of resource identified above. They are as follows:

II.4 ~~The new 12" water main being installed under the sidewalk~~

was long?

3 blocks/sidewalk  
Hetcher  
to  
Beekman

has the potential for disturbing landfill and earlier ground surfaces on the following blocks. On sheet 4 (see attached plans), from the curb at Maiden Lane (at the southern edge of the block) running north to the ConEd vault, and then along the entire stretch of sidewalk from Fletcher Street to John Street. On sheet 5, the entire sidewalk from John Street to Fulton Street. On sheet 6, the entire sidewalk from Fulton Street to Beekman Street. On sheets 7 and 8, the entire sidewalk from Beekman Street to Peck Slip. On several of these blocks there are existing gas or electric lines close to the area where the water main will be installed. However, because the water main is usually deeper than the other lines; because the blocks contain small, mostly early 19th century buildings; because the knowledge of existing utility locations is often approximate; and because sidewalk areas have in several instances provided intact, important archaeological deposits; artifactual materials documenting past ways of life may exist here.

II.5 The 48" water main is going through two areas where there do not appear to be existing utilities and where docks, wharves, slips and landfill retaining structures, as well as associated fill deposits, may exist. On sheet 2, a 25' section of this water main runs at a southwest to northeast angle from about 70' east of the curb corner to about 55' east of the curb. The other area is where this 48" water main is located on sheet 8. The watermain and a 72" sewer turn east and run parallel to the curb 80' to 95' east of the building line.

what street?



11' deep. The existing 30" water main is only 4' deep. Buried wharves, docks, etc. may all exist here.

II.6 The third sensitive location (see sheet 4) lies at the location of the sewage regulator and a 6'4" by 6'0" F.T.R.C. combined sewer where they empty into the East River. This area may contain landfill retaining structure, docks, wharves and landfill of different periods. The same types of resources as the above are likely to be present at the location on sheet 9, where the sewage regulator that the 72" and the 48" sewers feed into, empties into the river. *where?*

These locations are marked in pink on the attached plans.

Section III: Recommendations for Testing to Further Establish the Presense and Nature of Archaeological and Historic Resources in the Project Area.

Because the archaeological and historic resources described in Section II of this report may exist within the project area, and because the proposed construction will have potential impact on these resources, it is recommended that a field testing program be undertaken.

Two different archaeological approaches for field testing are recommended: one for the sidewalk areas (see II.4), and the other for the areas under South Street (II.5 & II.6). Both would begin with backhoe trenches and proceed as follows:

III.1 In the areas under South Street, where docks, wharves, slips and other structural remains may be encountered, photographic recording, mapping and descriptive notes would document these structures adequately, should they be encountered with trenching. Trenches here should be excavated to the depth to which they will be disturbed during construction. This may be accomplished as construction proceeds, as the delays involved for recording would be small. Eight to ten trenches are recommended in areas marked in pink on the attached plans.

not clear if this is during construction or just prior

III.2 The areas under the sidewalk should be examined with backhoe trenches, shallow ones placed perpendicular to the building line. The profiles here would be cleaned off and, if features (such as pits) or old living surfaces appear, one or two test units would be excavated until it was clear that the landfill had been reached. In a few places, samples of

the land fill would be excavated. This testing cannot be done while water main construction is in process but must be done prior to construction. Eight to ten trenches would have been recommended, but because of the completed work on most of the Schermerhorn Row block and partial excavation to its south, four to six trenches with a maximum of eight to twelve test units are recommended in areas marked in pink on the attached plans.

#### Appendix: Proposed Construction

Existing utility lines are below ground in most of the project area. An extensive survey of the WPA Maps: "Subsurface Conditions Battery Park Manhattan for the Department of Water Supply, Gas and Electricity, 1931, (with Sewers updated to 1971)," reveals the depths of many utilities. However, many utility lines do not appear on these maps. For example, a 24" steam line running through South Street in a south to north direction from Wall Street to Fulton Street is not listed on this, or other, subsurface maps. In this instance, it is assumed that the trench for the 24" steam line was as wide as it was deep and observed that it intersects the proposed construction at many points.

A deep 96" x 60" and 96" x 72" intercepting sewer, lies at a depth of approximately 30' below the length of South Street. Much of the proposed new construction will be within its boundaries, the most outstanding example of this being a new 20" water main which runs the entire length of the site in a south to north direction.

It should be emphasized that utility lines are not always where they are said to be, and contractors are often asked to make field <sup>e</sup>varifications of information on plans for new construction.

According to subsurface maps and information supplied by the project engineers several facts generally hold true for existing utilities in the project area. To summarize:

1. Gas lines are 2-3 feet below street level.
2. Electric lines (except oilostatic), are 2 feet below street level.
3. Water mains are generally 3-4 feet below street level.
4. Telephone lines are approximately 4 feet below street level.

5. Sewers are at an invert elevation of minus 4-5 feet.
6. Oilostatic lines (electric) are between 3 to 4 feet below street level.

The following information is organized according to the sheet numbers of plans for the proposed construction.

Sheet 2

Plan: ~~South Street between Wall Street and Pine Street~~

- Proposed Construction:
1. 12" water main
  2. 20" water main
  3. 48" water main
  4. 48" circular sewer to be rehabilitated

A segment of the proposed 12" water main lies at a distance of 48" from the corner of the building line of the block on the south side of Wall Street. This block is bounded by Wall Street on the North, South Street on the East, Front Street on the West. The 12" main runs in a south to north direction along South Street for a distance of 36', abruptly turning west and running in an east to west direction for a distance of 46'. At a point in Wall Street, 28' west of the South Street turning point mentioned above, the 12" pipe turns north once again, running in a south to north direction through Wall Street. This 12" water main continues below the curb/sidewalk area parallel and east of 120 South Street, lying at a distance of 7' from the building line. It will lie at a depth of 4' below street level.

Another branch of the new 12" proposed water main will run south to north for 47 feet and is perpendicular to the main which runs east of 12 South Street. This new branching occurs 35' from the corner of the building line



at 120 South Street.

The proposed new 20" water main originates approximately 30' east of the building line at the southern corner of Wall and South Streets. It runs in a south to north direction for a distance of approximately 43', where it branches off in two directions. At this point, one 36' portion of the line turns west into Wall Street, while the other gradually swings east for a distance of approximately 26', then turns north and running parallel with the other lines in South Street. It will lie approximately 7' below the street.

A proposed 48" water main originates at about 36' west of the Marginal Street and runs south to north in South Street at a depth of 11' below street level, for 120' where it turns diagonally northwest approximately 75'. At this point it begins to run south to north through South Street, lying at a distance of 30' from the building line of 120 South Street.

The existing 48" circular sewer (approximately -4.0 invert elevation), runs west to east through Wall Street before it swings north to run along South Street in a south to north direction. This sewer is approximately 18' east of the building line of 120 South Street.

### Sheet 3

Plan: ~~South Street between Pine Street and Maiden Lane~~

- Proposed Construction:
1. 12" water main
  2. 20" water main
  3. 48" circular sewer to be rehabilitated
  4. 48" water main

The proposed new 12" water main continues to parallel South Street in a south to north direction continuing into and through Pine Street and along Maiden Lane — still at 7' east of the building line.

The 48" water main will flow uninterrupted through South Street, lying approximately 28' from the building line of 180 Maiden Lane. The 48" circular sewer that is to be rehabilitated lies adjacent to all of the above.

The 20" water line within the deep 96" x 60" sewer continues uninterrupted in its flow towards Maiden lane. It is approximately 12' from the above-mentioned 48" water main.

New construction intersects pre-existing gas, electric, sewage and water lines. It also intersects a 30' deep intercepting sewer 96" x 60". The erection of a 41 story building (180 Maiden Lane), as well as the 34 story 120 South Street, indicates major disturbances to the project area of South Street between Pine and Maiden Lane.

Sheet 4

Plan: South Street between Maiden Land and John Street

Proposed Construction:

1. 12" water main
2. 20" water main
3. 48" water main
4. Chambers #1, #2, & #3
5. Sewage Regulator
6. 30" Sewer
7. 6' x 6' Sewer

The proposed new 12" water main continues along its south to north direction, 7' from the building line at 180 Maiden Lane and 80-86 South Street. At a point 20' from the block bounded by South Street on the east, Maiden Lane on the south and Fletcher Street on the north, the new 12" water main dips east approximately 3' into South Street to avoid electrical utilities. At the south side of the block bounded by Fletcher and John Streets, the 12" main continues on its regular path. A branch of the new 12" water main runs in an east to west direction from a point approximately

17' south of the corner of 180 Maiden Lane connecting with the new 48" water main approximately 24' away and perpendicular to it.

The new 20" water main continues along South Street in a south to north direction and is 45' from the building line at 180 Maiden Lane and 46' from the building line of 80 South Street.

The new 48" water main continues to run north to south in South Street between Maiden Lane and John Street.

The rehabilitation of the existing 48" circular sewer includes the building of Chamber #1, whose point of intersection lies 38' from 191 Maiden Lane and Chamber #2 lying approximately 48' from that same corner. The proposed chambers are connected by a 4' wide by 4' 6" high F.T.R.C. combined sewer approximately 20' long and runs from northwest to southeast. When the sewer leaves Chamber #2, running west to east, it becomes a 6' wide by 6' high F.T.R.C. combined sewer, 42' long, until it reaches the Sewage Regulator (invert elevation -12') which is 24' long and 29' wide at its widest point.

A 6' x 6' F.T.R.C. combined sewer outfall exits the sewer regulator and empties into the East River a distance of 88' from the Regulator.

The proposed Chamber #3 crosses or intersects the 20" water main which is close to or within a 96" x 60" existing intercepting sewer. Chamber #3 is perpendicular to that portion of the 20" water which is at the bottom of Maiden Lane.

It is also proposed that a 30" D.I.P.D.W.F. sewer 7' long, connect Chamber #3 (12' long by 8' wide) to the Sewage Regulator.

Sheet 5

Plan: South Street between John Street and Fulton Street

- Proposed Construction:
1. 12" water main
  2. 20" water main
  3. 6' x 6' F.T.R.C. combined sewer
  4. Chamber #4
  5. 30" diameter P.C.C.P. combined sewer
  6. 48" circular sewer to be rehabilitated
  7. 48" water main and new 36' main added

As on the previous sheets, the new 12" water main continues below the sidewalk; however, on this sheet, it is 5' from the building line in a south to north direction from John Street north towards Fulton Street.

A proposed 20" water main branch attached to an old 16" water main in the same trench runs from west to east beginning in the middle of John Street and is approximately 32' away from the building line at 87 South Street. The 20" branch main is approximately 36' long when it meets with the proposed 20" water main which has continued from its location on the Sheet 4 in a south to north direction towards Fulton Street. This 20" water line is always within the outside limits of the existing 30' deep 96" x 72" sewer.

A new 6' x 6' F.T.R.C. combined sewer will be constructed within the same trench as the pre-existing 48" circular sewer. This sewer, too, continues in its south to north direction towards Fulton Street. The 6' x 6' sewer lies at a distance of approximately 16' east of the building line of 87 South Street and near the corner of John Street.

The proposed Chamber #4 will be erected for the most part within the existing 48" x 60" F.T.R.C. sewer which runs west to east in John Street and is attached to the pre-existing 48" circular sewer on a south to north direction along South Street and adjacent to the proposed 48" water main.

The existing 48" circular sewer, which continues west to east from

John Street stops abruptly east of 91 South Street, where there is a man hole.

The 30" diag. P.C.C.P. combination sewer will also be built within the existing 48" circular sewer discussed above. This 30" sewer begins at a point approximately 13' west of the curb of the northern side of John Street and approximately 16' east of this same point. It runs in a south to north direction until it abruptly ends east of 91 South Street.

The new 48" water main continues in its south to north direction towards Fulton Street.

#### Sheet 6

Plan: South Street between Fulton and Beekman Street

Proposed Construction: 1. 12" water main  
2. Chamber 5  
3. 66" diag. P.C.C.P. combined sewer  
4. 20" water main

The proposed new 12" water main continues beneath the South Street sidewalk running in a south to north direction through Fulton Street and under the sidewalk on the east side of the Fulton Market Stores on its way to Beekman Street.

Chamber #5 (invert elevation -4.3) will be built within the existing 48" circular sewer which runs in a west to east direction through the center of Fulton, curving north and then lying adjacent to the new 48" water main which is less than 2' to the east. A 66" diag. P.C.C.P. sewer will be constructed within the existing 48" sewer beginning at a point 50' north of the corner bounded by Fulton on the South and Beekman on the North. It ends approximately 130' from its originating point.

The new 48" main continues on its south to north path parallel with



the existing sewer and the 20" water main within the bounds of the existing 96" x 72" intercepting sewer.

Existing oilostatic electric lines intersect proposed construction at various points. These generally lie from 3'-4' below the surface.

Sheet 7

Plan: South Street between Beekman Street and Peck Slip

Proposed Construction:

1. 12" water main
2. Chamber #6
3. 48" circular sewer to be removed
4. 72" diag. P.C.C.P. combined sewer
5. 48" water main
6. 20" water main

The new 12" proposed water main continues to run in a south to north direction, 4' below street level, parallel to South Street and beneath Beekman Street from 104 to 115 Fulton Street.

Chamber #6 will be constructed in South Street approximately 14' from the northern curb of Beekman Street. It will be constructed as part of the new 72" diag. P.C.C.P. combined sewer, which is itself part of the pre-existing 48" circular sewer running north along South Street. Chamber # 6 will begin approximately 1' below street level and end approximately 9' below street level. The 72" P.C.C.P. sewer will lie approximately 2' below street level and end approximately 9' below street level. Both are impacted by the existing 48" sewer which lies from approximately 3' below the street to 7' below the street. It is not known how deep the trench is.

The 72" sewer is approximately 41' north of the center line of Beekman Street and is a total of approximately 215' long.

The new 48" water main lies 6' to 11' below street level adjacent to

the existing sewer and is only about 2' away also running north to south while the 20" water main is 22' from the proposed water main but within the outer limits of the existing 96" x 72" intercepting sewer.

With the exception of the 12" water main proposed to go below the sidewalks of 104-105 South Street as well as 13' to the south of 104 South Street, all other utility lines lie in the path of previously constructed utility lines.

#### Sheet 8

Plan: South Street between Beekman Street and Peck Slip

Proposed Construction:

1. 12" water main
2. 8" water main
3. 72" diag. P.C.C.P.
4. 48" water main
5. Chambers 7, 8, & 9
6. 20" water main

The 12" water main running south to north beneath the sidewalk continues from just east of 119 South Street. At a point approximately 54' north of the building line of 119 South Street adjoining Pecks Slip, this 12" main turns sharply to the east for 24', then turns north again where after 8' reconnects to an existing 12" water main, approximately 4' below the surface of the street.

A new 8" water main, approximately 32' north of the building line of 119 South Street runs into Peck Slip and is attached to an existing 6" water main, 4' below street level. This main runs 15' in a west to east direction, perpendicular to the new 12" main. It intersect and connects with a new 12" water main.

A 72" diag. P.C.C.P. combined sewer runs in a south to north direction along South Street adjacent to the existing 48" sewer and connects to

Chamber 7. This hexagonally shaped chamber is approximately 38' in a diagonal direction from the corner of Peck Slip and 119 South Street. The 72" sewer exits from Chamber 7 directly east for a length of 57', then runs north toward Dover Street.

At the northern exit of Chamber 7, approximately 9' below street level, a new 48" diag. P.C.C.P. sewer will be constructed. This sewer runs toward the northwest for a distance of 14' until it connects to Chamber 8, which is 10' x 12'. This chamber will be located within the existing sewer that runs west to east in Peck Slip.

A proposed 48" water main continues from its location on sheet 7 at approximately 32' east of the building lines on the west side of South Street to a point on line with the corner of South Street and Peck Slip, turns northeast for 70', then runs adjacent and parallel to the new 72" sewer and continues north to Dover Street.

The 20" water main continues north from its location on sheet 7 toward Dover Street.

#### Sheet 9

Plan: South Street between Peck Slip and Dover Street

- Proposed Construction:
1. 48" circular sewer to be rehabilitated
  2. 20" water main
  3. 48" water main
  4. modification of existing chamber at 5' x 5' sewer
  5. 72" Diag. P.C.C.P. sewer
  6. Chambers 10 & 11
  7. 12' x 6' combined overflow sewer
  9. 30" P.C.C.P. D.W.F. sewer

The existing 48" sewer, which is to be rehabilitated, runs the length of the block approximately 22' from the building line of buildings on the

west side of South Street. Several new sewer lines will intersect the 48" sewer, including two new 20" water mains. This line continues north until, at a point 120' from that same building line it turns directly east and runs to the point where it empties into the East River. 10' from the building line at 160 South Street, a new 20" water main runs east for 38', southeast for 28', then east again for 32'. Eventually this main connects with the proposed 48" water main.

2' 6" from the new 20" water main and adjacent to it, an existing 5' 0" x 5' 0" combined sewer runs east, then north, finally emptying in the existing 48" sewer that is being rehabilitated.

An existing chamber connects the 5' x 5' sewer with the 48" sewer, and the modifications of this chamber will begin 13' below street level. 46' north of this chamber, the 20" water main noted above enters the 48" sewer from the west. One of its branches will extend to the north at a depth of 3' below street level for 58', to the point where proposed construction ends.

This 20" main is 54' east of the building line of 153 South Street and is within the limits of the existing 96" x 72" intercept sewer. It continues to Dover Street.

The 48" water main also continues in a south to north direction at a distance of 82' from the building line of 153 South Street. Within this water main, a pre-existing 30" water main (4' below street level) that had been within the same trench suddenly turns west then north at a distance of 7' from the proposed 48" main. It later turns west and continues on to run north toward Dover Street.

The proposed 72" P.C.C.P. sewer, fed by the 5' x 5' sewer continues 90' from that same building line adjacent to the other major new lines in South Street until it turns eastward and connects with a sewage regulator, 2' -

15' below the street level. The new 72" sewer empties in at an approximately depth of 5' x 11' below the street and 31' long x 35' wide at its outside measurements. Chamber 10 is within this section of sewer.

A combined 12' 0" x 6' 0" combined overflow sewer runs from the regulator to the East River.

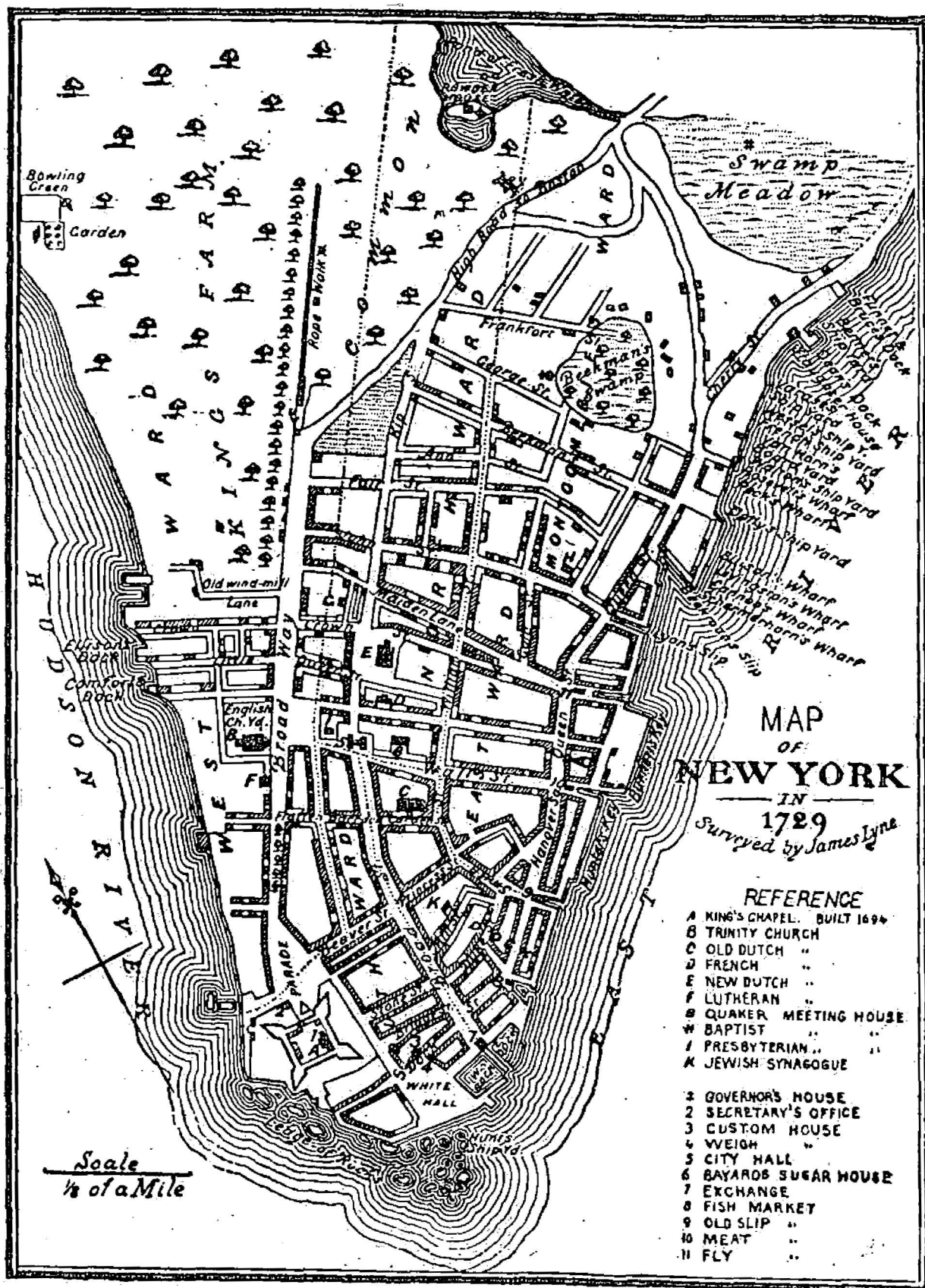
The proposed Chamber # 11 (8' x 10') is within the outside boundaries of the 96" x 72" intercepting sewer, which is 30' deep in South Street. From that chamber, running northeast, a new 30" P.C.C.P. D.W.F. sewer (15'-18' below street level crossing the 48" water main, runs until it meets a 30" D.I.P.D.W.F.

A portion of the Sewage Regulator extends to the area identified as "Marginal Street" and is free of existing utility lines.

Some structures of historic significance once located in the project area are identified below.

1. Piers and bulkheads, noted on plans (Sheet 2,
2. City wharf # 15, former location of Wall Street ferry.
3. Burling Slip under John Street.
4. Fulton Ferry House directly in front of 92 - 93 South Street. The first wood structure was replaced by a cast iron building in 1863.
5. Wooden docks, built after 1817.
6. Peck Slip or Williamsburg Ferry, at the foot of Peck Slip dating 1841.
7. 92-93 South Street, the McKinley Hotel (1868-1872), a steamboat hotel, later became the Fulton Ferry Hotel.
8. The first fish market (1822) on the block defined by Fulton Beekman, South and Front Streets.

9. 108-113 South Street, six 4-story buildings built in 1818-19 for Ebenezer Stevens and Peter Schermerhorn.
10. 114-15 South Street, two 5-story buildings from 1840 for commission merchants.
11. 116-19 South Street, Meyers Hotel and Boarding House, "a better class of waterfront hotel, sporting a magnificent bar and Meyer's own beer" (Fletcher 1983: 37). Diamond Jim Brady and Annie Oakley were reported to have been guests (Rosebrock 1974).



A MAP OF THE CITY IN 1729.

Figure 1: A Map of the City in 1729, surveyed by James Lyne



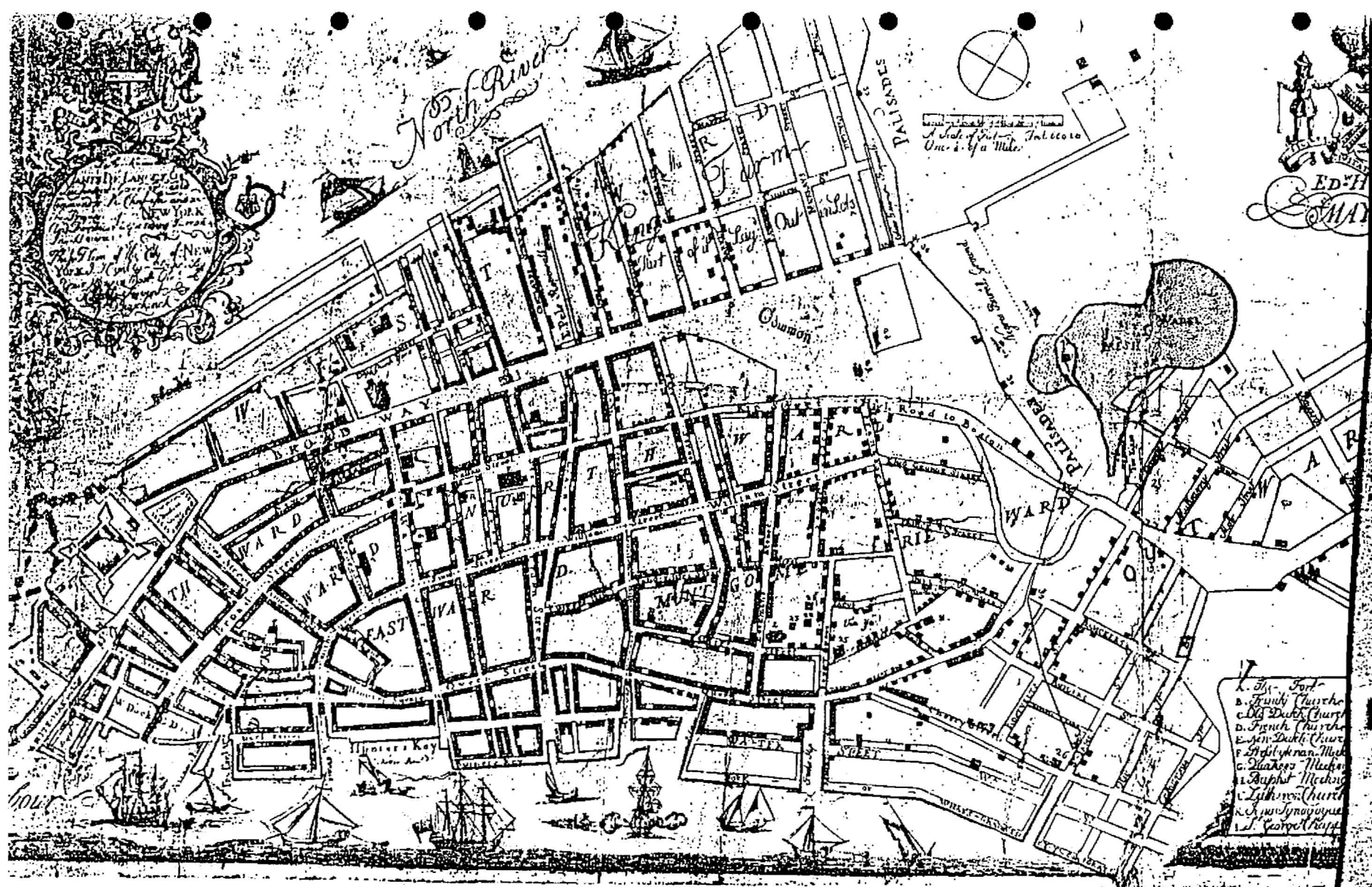


Figure 2: Maerschlack or Duyckinck Plan, 1754





Figure 4: Longworth Plan, 1808



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