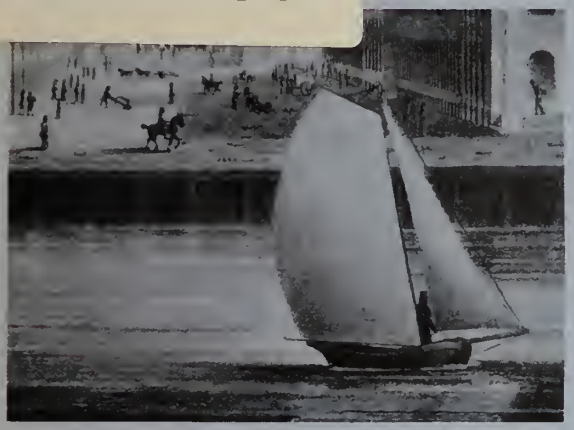
L·O·N·G W·H·A·R·F:

Archaeological Testing of Parcel D-10



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ARCHAEOLOGICAL TESTING AT
PARCEL D-10

Submitted by the

MUSEUM OF AFRO AMERICAN HISTORY

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ABSTRACT

The testing program undertaken by the Museum of Afro American History has confirmed that significant archaeological remains of Long Wharf exist within the bounds of Parcel D-10. Two test trenches uncovered intact portions of the 1763 section of Long Wharf at 12 ft. below surface. The archaeologists retrieved 391 artifacts, faunal and floral remains,and samples, many of which predate the American Revolution. It is probable that a portion of the original wharf exists in the easternmost 10 ft. of Parcel D-10. The boring results indicate that 1826 portions of Long Wharf are located at seven ft. below surface under what was Commerce Street.

Long Wharf was the focal point of Boston's harbor activity during the eighteenth century. The remains are significant because they can provide information on:

1. colonial wharf building technology
2. early Boston foodways
3. colonial crafts such as pottery making, glass manufacture and ship building
4. colonial and federal trade

The remains can also provide information on Long Wharf's change from servicing international and coastal trade to servicing the fishing industry and to warehousing.

The Museum of Afro American History recommends that archaeologists be allowed to record the wharf structures uncovered during construction excavation and sample the material remains.

INTRODUCTION

Parcel D-10 in Boston, Massachusetts is soon to be developed by Marketplace Center Associates (Map 1). The Massachusetts Historical Commission determined in the Spring of 1982 that Parcel D-10 had a high potential for containing significant archaeological materials and should be investigated. James F. Sullivan of Marketplace Center Associates made a grant to the Massachusetts Historical Commission to cover the costs of the investigation. The parcel is presently owned by the Boston Redevelopment Authority.

The purpose of this project was to determine the integrity and archaeological significance of archaeological remains on Parcel D-10. This task was limited by the existing parking lots operations and utilities. Historical research and on-site borings were combined to minimize site disturbance and to predict locations of archaeological remains. The borings and the trench excavations all occurred during September 1982.

PROJECT LOCATION

Parcel D-10 is located in Boston, Massachusetts and is bordered by State Street on the south, Commercial Street on the west, and the Central Artery on the North and East (Map 2). The parcel contains two operating parking lots, the "Walkway to the Sea" (the restored cobblestone remnant of South Market Street), and a maintenance building associated with Quincy Market. The almost triangular shape of the lot is due to the right-of-way of the Central Artery.

RESEARCH

METHODOLOGY

Map examination was the first and most informative aspect of the background research in Parcel D-10. Historical maps of many kinds were collected to provide a picture of the slow encroachment of wharves into the harbor from the west and south as well as the subsequent larger scale land filling operation in 1852. Few maps for the seventeenth and eighteenth centuries provide more than an outline of the Parcel D-10 area. The most useful maps focus closely on particular lots with great accuracy and detail and are located among the collection of plans drawn for the Registry of Deeds (Map 16). Late nineteenth century atlases and insurance surveys covered the city block by block and detail building structures. City maps dating from mid-century, notably those by McIntyre and by Slatter and Callan, also include building outlines and document a period of great change in the land mass in the Parcel D-10 area. Historic reconstructions compiled by Samuel C. Clough on deposit at the Massachusetts Historical Society contain a wealth of data on ownership from 1640 to the late nineteenth century (Maps 9 & 12).

When the map information had been collected, four maps were chosen to be redrawn on mylar sheets at a scale of 20 ft. = 1 in.[1] These were the 1852 "plan of City Wharf"

[1]Prepared by Herb Heidt, Mapworks, Newton, MA.

(Maps 4 & 16), the 1867 Sanborn Insurance Map (Map 5), the 1899 Sanborn Insurance Map (Map 6), and the 1964 Boston Redevelopment Authority Map (Map 7). These maps (called overlays) could be placed on top of the existing base maps to determine the conjunction of historic structures and utilities, parking lot features, and previous borings. They also enabled us to choose boring placements which would avoid foundation walls and penetrate buried archaeological remains (see Boring Procedures for further details).

Additional visual information on Parcel D-10 came from prints and photographs. Panoramas of the city and views of the waterfront and of specific blocks and buildings were located. Although rare for this area, they did provide more detailed information on the building types that covered the site and helped to determine the type of subsurface pattern the site would have.

Documentary sources provided data necessary to identify and interpret the sequence of structures located by the maps. Secondary sources on the city's history provided both a context for study and some details on the important wharves and buildings in the area. Primary sources were consulted for site specific information. The changes in area businesses were charted from information in directories, almanacs, and the Direct Tax of 1798. A title search on a sample property illustrated ownership over time as well as the limits of the individual's property. The voluminous records of the Proprietors of the

Long Wharf were sampled and the minutes of their meetings, both in the original and in abstract, provided insight into their plans and motivations. Another view of these sites and their developers was provided by records of Boston's town and selectmen meetings and municipal histories. These dealt frequently with the extent to which obligations were met and nuisances avoided by the Proprietors.

The following is a summary of the documentary and visual record which outlines the history of the filling and use of Parcel D-10 from the construction of Long Wharf in 1711 through the final filling in the 1850s. The information provided a basis for judgemental placement of test borings and a framework within which to analyze the materials uncovered from the ground.

HISTORICAL BACKGROUND

The history of Parcel D-10 illustrates the development of Boston's waterfront and its growth and change through time. As shown on Map 8, Parcel D-10 was under water when the town was founded in 1630. The area west of Parcel D-10 was quickly developed during the seventeenth century and contained important town buildings, the market, and the town house. The town cove was developed in 1641 "for the purpose of building wharves and warehouses" (Whitehill 1968:11). Town merchants also built wharves out into the harbor in a process called "wharfing out" (Maps 9 & 10). The earliest major wharf project

was known as the Sea Wall, Barricado, or Outwharves. Begun in 1673, the Barricado was conceived as protection for the harbor during the Third Anglo-Dutch War. It extended across the harbor for more than 2,000 ft., from Captain Samuel Scarlet's wharf on the north to the Boston Sconce or South Battery on the south. Individual investors received portions of the area on which to build and the Barricado was armed. It was never fully utilized and fell almost immediately into disrepair. This was primarily because no Dutch attack occurred and because accessibility to both the Barricado and the inner harbor was difficult. Only a few portions of it survived into the eighteenth century as the "island wharfs" (Whitehill 1968: 19-20).

The development of Parcel D-10 did not begin until the early eighteenth century. To facilitate analysis the parcel has been divided into three parts: Long Wharf, The Channel, and City Wharf. Long Wharf, the southern part of Parcel D-10, reached its maximum size in the parcel at 146 ft. north of the intersection of State and Commercial Streets. The Channel, the area which was open water until 1852, is the area north from Long Wharf to 274 ft. north of the intersection of State and Commercial Streets. City Wharf is the northern part of the parcel.

Long Wharf

In 1707, Henry Deering suggested the construction of a wharf to extend from the bottom of King Street (now State

Street) to the Barricado (Map 10). It was argued that not only would accessibility and defense be vastly improved by this new wharf, but also that the town, in a period of continued expansion, would increase its available wharfage and warehouse space. In 1710 a group headed by Oliver Noyes came forward to provide the capital required and the plan for Long Wharf was accepted by the town (BRC 10:152).[2] The Boston Pier or Long Wharf extended east from the end of King Street through the commonly held flats to the Barricado. Encroachment from neighboring wharves was prohibited by a 60 foot privilege to the north and south. The investors or Proprietors were required to include a 30 foot extension of King Street, to allow the town's inhabitants to dock on one side, and to provide a gap in the length to allow boats to pass (BRC 8:66, 67). The wharf extended 24 feet to the north of the extension to accommodate warehouses, for a total width of 54 feet. Little information on construction methods are available, but many sources describe the initial build as including the debris from the 1711 fire that burned the area from School Street to Dock Square (Winslow 1881:II, 504). Shortly after the wharf was completed the Proprietors agreed to divide the northerly 24 ft. into individually owned wharf lots for the construction of warehouses. For each share in

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[2]BRC refers to the 39 volumes of records published by the Boston Records Commissioners between 1876 and 1909. It will be followed by volume and page numbers.

the wharf, the owner received a warehouse lot of 40 ft. in length and 20 ft. in width in the westerly division, and another lot 24½ ft. by 20 ft. in the easterly division. They continued to hold in common the thirty foot passage to the south, a four foot passage to the north of the warehouses, as well as the end of the wharf (SCD 25:48).[3] Proprietors could sell the stores they built on the wharf separate from their interest or shares in the commonly held portions of Long Wharf.

The Proprietors' early records show that the group regulated many aspects of wharf activity. The owners were required to be

> subject to the rules and regulations for the management and improvement of the whole wharf or pier and upholding the same in good order and repair and in such manner and methods as are already or shall further be agreed on by the major part of the proprietors and entered in their book. (SCD 25:48)

Initially, these rules included maintenance of both the four foot section behind and the thirty foot public way before the warehouses. Further, not only were the plan dimensions of the warehouses predetermined, but also the height (21½ feet stud) and roof pitch (5 feet), as well as the requirement for dormer windows. These tall narrow warehouses can be seen in Bonner's well-known map of the town in 1722, as well as Revere's view of 1768 (Map 10, Fig. 1). These views

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[3]Suffolk County Registry of Deeds, book; page.

show that, in spite of prohibitions against it, Proprietors built on their eastern division lots before it was sanctioned by the group. The Proprietors strove to limit the use of the structures to merchant activities. The first activity to be specified as unacceptable was sailmaking in 1722, followed by the ominous presence of a billiard table in 1738. Concern over fires was high, understandable in a city of frame structures. Renters and storeowners were discouraged from living on the wharf because this was seen as a fire hazard. However, the Proprietors also had trouble obtaining watchmen and realized the benefit of a resident and paid the troublesome Mr. Moberly £5 (Proprietors Minutes, Vol. I, passim).

Almost from the beginning, individual shareholders and the Proprietors as a body went beyond the limitations of their agreements with the town. During the two year construction period the Proprietors extended the wharf beyond the Barricado and well past low water mark to ensure accessibility by ocean-going vessels. By 1731 shareholders had made "several additions on the north side . . . for which in our [the town] opinion they have no authority in the grant of flats" (BRC 12:26). The Proprietors also neglected their maintenance responsibilities. By 1734 the end of Long Wharf was decaying because, in the opinion of the town, "the foundation . . . was not at first faithfully laid, and performed." There were complaints that the common way was not "unencumbered" and that the Proprietors "constantly demand and exact

wharfage" on the south side of the wharf "though they belong to our own inhabitants" (BRC 12:144-145). These indictments failed to curtail the activities of the Proprietors and their privileges were soon expanded. In 1765 the Proprietors petitioned for a northern expansion of 20 ft. throughout the length of the wharf saying they would build "an additional building to each store . . . of undoubtable service to the town" (BRC 18:89-90).

After the middle of the eighteenth century the fortunes of Long Wharf declined with those of the port of Boston. The port was eclipsed by the trowth of New York and Philadelphia to the south and its citizens suffered as taxes increased while trade diminished. More and more often the Proprietors turned their income toward expenses and repair rather than distribute it among themselves. Repairs became increasingly more necessary and expensive and the Proprietors found it difficult to gather their number to act to preserve their investment. In addition to their approved northward widening, the Proprietors rebuilt the wharf's east end at this time, as well as making storm repairs accounting for substantial debts requiring shareholder assessments. Their records indicate that crib construction continued to be employed. In 1772, the Proprietors incorporated, thereby clearly outlining the rights and responsibilities of shareholders. Delinquent Proprietors, who refused to pay rates levied, might find their share on the auction block to raise necessary funds (Proprietors Minutes, Vol. 1, passim).

During this time period Boston was the center of colonial dissatisfaction with crown policies. In 1768 British troops were stationed in the town. On March 5, 1770 the Boston Massacre took place on King Street (now State Street) a few blocks west of Long Wharf. The Boston Port Bill was passed by the House of Commons in 1774 in response to the Boston Tea Party. This act prohibited the loading or unloading of ships in any part of Boston Harbor. Military stores and food and fuel cleared through the customs officer (who was moved to Salem) were excepted. The act took effect on June 1, 1774. The port remained closed until the British withdrew from Boston on March 17, 1776. During the almost two year period, commerce all but ceased in Boston, with the exception of the coastal trade and the importation of the growing numbers of British troops and their supplies. Long Wharf was in the center of these activities as the primary docking point of the British troops. From Long Wharf the attack on Breed's Hill and Bunker Hill was launched on June 17, 1775 (Morris 1976:90-103; Warden 1970).

The shifting fortunes of the port of Boston brought changes in the use to which the warehouses were put by their owners and occupants. Through the eighteenth century Long Wharf warehouses were valuable to their owners, in many cases remaining in the hands of the same family in much the same way that corporation shares did. But after the war the wharf deteriorated and many owners ceased to use their Long Wharf

property as their basis of operation, turning them into rental properties. By 1798 only 3 of the 14 Long Wharf stores in Parcel D-10 were owner occupied. In addition, it is difficult to determine from extant records of this period the quality of maintenance and the extent to which the warehouses were rebuilt. The Hales Map of 1814 indicates that stores 17-25, included in the eastern section of Parcel D-10, were by then constructed of brick (Map 14).

Although the importance of the port of Boston diminished with the growth of New York to the south, its citizens continued to associate together to improve the waterfront and to maintain the importance of Long Wharf in the maritime economy. The Broad Street Associates turned first to the confusion of wharves to the south of Long Wharf early in the nineteenth century. They filled the area and laid out Broad and India Streets following the line of the new shore. India Wharf (1803) and Central Wharf (1819) pushed into the harbor and uniform brick warehouses and a Custom House were constructed to accommodate the wealth generated by the China Trade (Map 14). These large and modern facilities attracted the majority of commission and general merchants away from Long Wharf.

In the 1820s the City of Boston undertook a major construction project northwest of Long Wharf, the Fanueil Hall market development. Commercial Street became the eastern extent of the shoreline and was connected to State Street by

the taking of stores 9, 10 and 11 on Long Wharf (Map 15). The Proprietors, responding to the development of the area, petitioned and received their third extension to the north. The total addition measured 78 ft. from the then current northern boundary of the stores, and extended from store #12 at the corner of Commercial Avenue east through store #34. The Wharfinger, Elijah Loring, oversaw the construction and pro-rated the costs among the storeowners. Costs included pile driving, ranging from 39 piles at store #12 to 99 piles at #17, as well as breaking up earlier construction. Stores 17 through 24 were charged for "digging and removing stones of old sea wall," while stores 25 through 34 bore the expense of "digging and removing old boxing plank" (Proprietors Receipts/Accounts, June 1825). This expansion allowed store-owners to build an additional 20 ft. to the north, and in fact, the Proprietors required that this be completed within a year so that "the line may be full, uniform, and regular" (Proprietors Minutes, 13 April 1825). With this addition, Long Wharf reached its maximum size in Parcel D-10.

It was during this antebellum period that the old age of Long Wharf became a hindrance to the Proprietors. The economy of the port improved after the War of 1812 while in-land railroad development, the pre-eminence of the clipper-ships and the establishment of the Liverpool packet meant that waterfront improvements continued. Still more new and exceptionally fitted-out wharves competed with and hurt the

corporation (Map 17). Like the rest of the nation they suffered during the Depression which began in 1837. At the same time, one author suggests, the Wharfinger during this period mismanaged the pier (Forbes 1915:52). By the mid-1840s, fewer than 20% of the city's commission merchants and 10% of the ship-owning general merchants were located on Long Wharf. Perhaps due to the proximity of the provisioning center at Faneuil Hall Market, Long Wharf became a center for three quarters of dealers in salt and pickled fish, as well as the location of the salt house and fish inspectors. It also attracted the city's flour dealers.

After a special meeting to determine how best to "prevent the declension of its value" in 1844, the Proprietors came up with a plan to improve their facilities, including rebuilding stores on the east end of the wharf, deepening the channels on either side, and leasing the whole to a manager for development (Proprietors Minutes, Vol. 3, passim). At the same time they chose to sell their rights to the 50 ft. dock area north of their wharf to just east of Commercial Avenue to Josiah Quincy, explicitly for the filling (Proprietors Records, Miscellaneous Deeds). This meant that stores #12 through 34 were no longer wharves, but part of a newly developed commercial land area (Map 5). At the same time, the areas which had been held by the corporation, the passages to the north and south of the individually held stores, were turned over to the city for public ways. The Quincy

deed explains that the 88 ft. area behind these stores would be maintained as a public way, Commerce Street. Negotiations were taken up with the Proprietors of the adjacent Central Wharf and Wet Dock Company to fill in a section of the slip they shared before the Custom House and to construct the State Street Block on the south side of State Street from Gridley J. F. Bryant designs. In 1868 the Proprietors granted a 65 ft. extension of State Street to the city in a "deed of dedication." From the time of these last filling episodes the concerns of the Long Wharf Corporation no longer relate to Parcel D-10.

At the southern end of Parcel D-10 the Long Wharf stores remained. It appears from twentieth century photographs (Fig. 5 & 6) that the stores on State Street maintained their nineteenth century form, except for the addition of stories and face lifts, until their demolition in 1971. On the remaining 78 ft. of Long Wharf north of the stores, Commerce Street was built 58 ft. wide. North of Commerce Street a commercial block was constructed on the remainder of Long Wharf and portions of the filled channel. These were demolished in 1971.

The Channel

The Channel portion of Parcel D-10 starts approximately 146 feet north of the intersection of State and Commercial Streets and ends approximately 274 feet north of the same intersection (Map 4). This area was part of the flats,

which were any area between the low and high tide marks. Until the 1820s this area was harbor which ships passed through to reach western portions of Long Wharf, David Spears Wharf and Greene's Wharf (Map 14).

At this time, the City of Boston began a massive rebuilding of the city's market area, bringing order to the area northwest of Long Wharf. The town dock had been filled but the area was a warren of woodsheds and privately held wharves insufficient to accommodate the provisioning of the growing city. The Mayor, Josiah Quincy, devised a plan beginning with the filling of a large area before Fanuiel Hall for the construction of a new granite market house, and adjacent warehouses to the north and south. The western bound of the development area was marked by Merchants Row, and land extended east to the end of Eustis and David Spears Wharves (Map 15). The city acquired the property to the north of State Street and Long Wharf from the Proprietors, as well as other area land, wharf and dock owners. They then laid out new streets roughly parallel to the street and wharf: Chatham, South Market, North Market and Clinton. Commercial Street at the water's edge formed the eastern boundary connecting to State Street. The city constructed City Wharf, the northern boundary of the channel in 1831.

The Channel was divided into four functions after this date (from south to north): docking area for Long Wharf (35 ft.); a common passage 30 ft. wide for City Wharf and

Long Wharf; a docking area for City Wharf (35 ft.) and a narrow strip of flats (ca. 27 ft. wide at Commercial Street) (Map 16). Proprietors of Long Wharf and City Wharf were responsible for dredging the common passage so that boats would have the necessary clearance. By 1852 this area was filled for further commercial development. By the 1860s a commercial block was constructed on 100 ft. of the channel and part of Long Wharf between Commerce and South Market Streets (Map 5). The style of architecture employed was the Palazzo version of Boston's Granite Style. Constructed of brick, the buildings were faced with hammered granite employing structural elements rather than ornament for visual interest. Granite post and lintel construction on the first floor allowed large plate glass windows to display the merchandise of the stores' proprietors. Belt courses and a large cornice tied together the repeating windows in the five story structures, topped by a gable roof lit by dormer windows (Bryant, 1972:passim).

City Wharf

The northernmost portion of Parcel D-10 was part of the Channel until the 1820s. Once the new Fanuiel Hall or Quincy Market was completed, the City Council considered the disposition of the flats that lay on the opposite or east side of Commercial Street. As Quincy notes in his Municipal History:

> There were at this time active influence without door at work to induce the City Council to make a sale of these wharf and dockage rights. Capitalists see early and clearly the value of choice locations of business and investment (1852:244).

The location was considered by the designated committee to be so convenient to the city's most active business area that the rights should be retained by the city until its value could be determined. At an expense of $18,856.75, a new City Wharf was constructed (Map 16). It added substantially to the made land within Parcel D-10 as Map 5 illustrates. The wharf was subsequently leased in 1832 in an agreement which called for an annual rent of $10,000 for 20 years, as well as the construction of ten brick stores, all of which reverted to the city in fee simple in 1852. A packet office was constructed on the south side of the wharf. Flour merchants occupied much of the space in the stores, probably because of the proximity to Quincy Market. The wharf generated a substantial income of over $15,000 in the twenty year period; but even though its worth increased vastly to an estimated $400,000, the arrangement was not extended. After the Channel was filled in in the 1850s, the stores and packet office were torn down and a new commercial building was constructed between South Market and Clinton Streets (Fig. 3), similar in style to the buildings just south of it.

Parcel D-10: 1855-1979

After 1855 Parcel D-10 was part of the warehouse district around Quincy Market. The changes made in the buildings

involved, usually, the additions of interior partitions, the raising of roof lines, and maintenance. In the 1950s the Central Artery was built and Parcel D-10 acquired its present shape. In the late 1960s urban renewal, by the Boston Redevelopment Authority, resulted in the demolition of all the standing structures on Parcel D-10.

CHRONOLOGY

1630	Boston settled by Europeans
1673	Third Anglo-Dutch War - Barricado constructed
1711	Fire that destroyed area from School Street to Dock Square
1711	Original Long Wharf constructed. (Approximately 24 ft. on Parcel D-10)
1734	Wharf in decay
1765	Northern expansion of Long Wharf 20 ft., wharf and stores
1768	British troops arrive
1774	Boston Port Bill - Port of Boston closed
1775	British Occupation
1776	British Evacuation
1826	Northern expansion of Long Wharf 78 ft. (stores - 20 ft.) City Wharf constructed
1852	Channel filled Commercial blocks constructed
1971	Demolition of all buildings on D-10 site
1976	Quincy Market rehabilitation Waterfront Park opened

RESEARCH DESIGN

The archaeological site examination of Parcel D-10 provides a unique opportunity to study the history of Boston's waterfront. Unlike many urban archaeological sites which have been investigated, this site represents primarily commercial and business activity rather than domestic or industrial activity. Urban sites differ from rural sites because they have a higher intensity of activity. Urban sites also have greater rates of disturbance from continual building and moving and land altering activities.

Urban sites usually are formed as the result of three processes; Parcel D-10 has the potential to demonstrate all three.

1. Day-to-day activities produce gradual deposition. At Parcel D-10 slow accumulation resulted from commercial activities on Long Wharf and later City Wharf. To what extent is this deposition visible on the harbor floor? Is there any evidence of cargo slippage or sunk vessels? Can the changing activity types be distinguished among layers? To what extent was the harbor used as a general dumping area for the city? Specifically, did Quincy Market dump any refuse from its provisions trade? Can more familiar domestic refuse be distinguished from commercial? Is there evidence that the harbor was periodically dredged to allow access to the inner portions of the wharves?

2. Construction and destruction of buildings produce site specific features. As the parcel area was filled, the resulting wharves and land were developed with commercial buildings. To what extent does this building type produce archaeological features? Is there daily accumulation of refuse on a retail/storage site?

3. Leveling and filling alter topography. At least five successive filling sequences contributed to the formation of Parcel D-10: 1) shoring Long Wharf's cribbing with the rubbish from the ruins of a 1710 fire (Winsor II, 405); 2) the northward wharfing out of Long Wharf; 3) the construction of Quincy Market on made land; 4) the construction of City Wharf; and 4) the filling of the area for the construction of Atlantic Avenue. Can these successive fills be differentiated? How did wharf construction vary over time? Were buildings added directly onto existing wharves or were special filling techniques employed?

The last research question concerns methodology. What is the best and most efficient method(s) of testing an urban site with physical restrictions (utility lines, proximity to major tourist atrraction), deep fill, and possible wet deposits? The Museum selected two methods to use during the site examination: borings and test trenches.

TESTING PROGRAM: BORINGS

METHODOLOGY AND PROCEDURES

The Museum of Afro American History selected a two-part testing strategy for Parcel D-10. Part One was a test boring program designed to obtain information on the sequence of deposits, on possible obstructions, on wet deposits and on the location of the remains of wharf and building features. Part Two was the excavation of test trenches to locate features and deposits.

Sampling strategies are normally designed to provide maximum data recovery with a minimal amount of testing. Discussions of the various strategies which can be employed usually emphasize random sampling schemes and are essentially concerned with ideal almost pristine situations (i.e. Redman 1974, Muller 1976). Conducting archaeology in the center of a major metropolis, in this case Boston, necessitates the consideration of a wide spectrum of factors which depart from the commonplace. In the case of Parcel D-10 these factors included avoidance of utilities, maintenance of traffic flow in a functioning parking lot, and educating the public while assuring their safety. All of these things contribute to development of a working, practical, and scientifically sound testing strategy.

Part One of the testing strategy, test borings, was designed to maximize coverage of Parcel D-10 while minimizing disturbance. This method has been used in other urban testing situations in New York City (Rothschild & Rockman 1981), Providence, Rhode Island (Rubertone and Gallagher 1981), and St. Augustine, Florida (Deaghan 1981). However, while the test borings mentioned above were auger borings, the D-10 borings interspersed solid core samples (Split spoon samples).

The area available for sampling was restricted by a number of utility lines (Map 3), a maintenance building, and parking lot apparatus. It was decided to sample the remaining area based on the documentary evidence, especially the historic map information. The overlay maps described under Research Methodology showed where obstructions, such as walls, might be avoided. Boring locations were first selected with a particular feature, building or historic question, as its purpose. For instance, borings numbered 1, 12 & 14 along State Street were located to test for remains of Long Wharf (circa 1711). These locations are termed "judgmental." In the rest of the area, with no known particular features, borings were located every 60 feet. These locations are termed "systematic." All of these boring locations were then put into priority categories for consultation with the developer. The priority categories were:

Priority 1.--Judgmental locations which were not near utilities and which were not in driving lanes.

Priority 2.--Systematic locations which were not near utilities and which were not in driving lanes.

Priority 3.--Judgmental locations which ran the risk of disrupting the operation of the parking lot.

The final boring locations were selected in a meeting with the developer (Maps 4 & 7). A total of 15 borings were drilled and 9 were priority 1 borings. Two priority 2 borings were done. When the boring process began it became clear that the parking lot plan (i.e. spaces and lanes) did not correspond to the plan which was used to select boring locations. Consequently some locations were abandoned and four additional locations were chosen based on field conditions and obstructions encountered during drilling. All the borings were compared with borings taken in March of 1982 by the Guild Drilling Co., Inc.

The test borings were taken by the Bay State Boring Company with a Mobile B-40L drill rig which employed both a 5 3/4 inch diameter auger and a two foot long, 2 inch diameter split spoon or core. The auger drilled to five feet below surface (the length of one auger attachment). At this point a two foot spoon or core was pounded into the ground from five to seven feet to obtain a solid sample. After this sample was obtained, a second auger section was drilled from five to ten feet and the spoon sample was repeated from ten to twelve feet.

This was usually the procedure on each boring, although consecutive spoon samples were taken in some cases, and augers were used more often in the case of an obstruction. During the auger intervals the dirt churned out of the hole was watched for changes in soil coloration and content and for artifacts. Artifacts were bagged and labelled. When a spoon sample was retrieved it was examined, described, and usually the entire sample was bagged. When it became clear that the five to seven foot intervals in most boring samples were construction debris of brick and mortar these samples were not saved.

When below ground obstructions were encountered, such as brick, or more often granite foundation stones, attempts were made to drill through them. If this met with failure then the location of the boring was altered by a few feet. In all but two cases, obstructions were able to be by-passed. In those instances when obstructions forced abandonment of a boring location, efforts were made to choose a similar location, thereby ensuring the integrity of our sample.

RESULTS (Appendix I)

With the exception of borings 2, 3, and 6, the first 9½ feet of each boring were very similar. A gravel fill level from 0-5 feet was probably put down after the 1968 demolition. This was followed by varying degrees of rubble fill to usually 9½ feet below surface. This was apparently

the cellar depth of the buildings destroyed in 1968. The cellars were filled with rubble from the demolition.

"Long Wharf" Borings (1, 2, 12, 13, 14, 16)

A total of 6 of the 15 borings were chosen for the purpose of locating Long Wharf. Borings were located within wharf buildings and on the 1826 wharf deck (Map 4). Boring 1 was located next to State Street at the southernmost portion of the parcel. Boring 1 hit concrete at 10 feet below surface. The spoon sample from 10-12 feet brought up 10 inches of concrete followed by 12 inches of solid wood. Below the wood the auger brought up gray harbor muck with a great deal of wood fragments. This continued to about 15½ feet. From 15½ feet to 17 feet below surface was gray harbor clay with a great quantity of shell.

Borings 12, 13 and 14 were also located along the State Street boundary. Borings 13 and 14, west of boring 1, both hit obstructions. Boring 13 hit an obstruction at 8 feet, probably a building wall. Boring 14 hit a granite foundation at 10½ feet. Above the foundation from 5-10 feet coal ash and cinder were found instead of rubble debris. Boring 12, east of boring 1, brought up a leather fragment between 10-12 feet. Below this level was the harbor muck, mixed with some brick fragments, to 16 feet.

Boring 16 was located north of boring 12. Granite chunks or a granite foundation were found at 9½ feet. Below the granite was harbor clay.

Boring 2 contained gravel fill to approximately 5 feet below surface. From 5 to 6 feet rubbles was encountered. Muck, shell, and traces of brick and iron were found from 6 to 7 feet. The gray clay was then encountered. This stratigraphy is similar to Guild borings B-103A and B113 in the same vicinity. Up until 1852 when the area between Long Wharf and City Wharf was filled in the northernmost portion of Long Wharf was decking with no buildings (Map 4). A portion of this area then became Commerce Street. It is therefore possible that certain portions of Long Wharf decking were not destroyed by later construction.

"Channel" Borings (3, 4, 8, 10, 15)

Five test borings were placed within the area which constituted the channel between City and Long Wharves. By 1866 this channel had been filled and buildings were constructed on the made land. Borings 3, 4, 8, 10 and 15 were all placed in this area (Map 4). Boring 3 hit an obstruction at 6 feet. The original location of boring 10 (Map 4) was obstructed at two feet below surface, and therefore was moved two feet to the north. Here the gravel fill and light building debris was followed by harbor clay about twelve feet below surface. Boring 4 came down on top of a pile at about 13.5 feet, retrieving a two foot core of solid wood, as well as an additional 33½ inches of solid wood. This wood was overlayed by over 4 feet of dense rubble; concrete, brick and wood. This was covered by five feet of dry gray/green

sand with some fragments of wood, brick and mortar. This suggests that this may well be a support pile driven to support a post-1852 building.

In both borings 8 and 15, evidence of the post-1866 buildings was clearly visible. Boring 15 was unable to break through what may be a concrete floor at 9½ feet. Concrete was visible on the drill bit. The same floor may have been encountered in boring 8. Here rubble was discovered at about 9 feet, with a foundation from 10½ to 12½ feet, at which point it was broken through. Below this was the harbor clay.

"City Wharf" Borings (6, 7, 11)

Four boring locations were chosen to drill through City Wharf. Unfortunately it was in the vicinity of City Wharf that the coring machine experienced the greatest degree of difficulty in completing its task. Only three of the four borings were actually done.

Borings 7 and 11 were located in order to sample the stores on the wharf and a section of decking on the wharf. Both exhibited the general site stratigraphy of gravel fill to 5 feet, rubble at approximately 12 feet, and harbor clay below 12 feet.

Borings 5 and 6 were located in the cobblestone "Walkway to the Sea" because it had been a street since 1852 and no utilities were shown under it (Map 3). Boring 6 was expected to hit the packet office on City Wharf. After the cobblestones were removed the auger drilled 2.5 feet and

broke a bit. A new bit was used but could not break through the obstruction. The boring crew felt that either there was a very thick concrete base to the "Walkway to the Sea" or that unmapped utilities exist under the old road. Boring 5 was cancelled because of this uncertainty.

CONCLUSION

The results of the borings were compared with the Guild borings. The conclusions are:

1. Boring 1 contained a foot of wood suggesting the existence of wharf remains at 11 feet below surface. Guild boring B101 also contained a great deal of wood (Appendix I).

2. Boring 2 was the only boring which did not have a thick rubble level (suggesting a filled cellar). Guild borings 113 and 103A had similar stratigraphy. This may signal that the decking portion of Long Wharf remains undisturbed under the utilities for the now defunct Commerce Street.

3. The two commercial buildings constructed between Commerce and Clinton Streets seem to have destroyed City Wharf above 12 feet. The portion of City Wharf under the "Walkway to the Sea"is obstructed, but may be intact under the obstruction.

4. The channel below 12 feet does not seem to be disturbed. However, the harbor clay retrieved from borings 10 and 8 contained only organic material.

TESTING PROGRAM: TRENCH EXCAVATION

METHODOLOGY AND PROCEDURES

Trench placement was limited by existing utilities and parking lot operations. The boring results showed that the trenches would have to be a minimum of 10 ft. deep to get below the 1971 demolition debris. Trench 1 was placed at the south end of Parcel D-10 starting at the location of boring 1 and moving northward. (Trench 2 was to be placed to intersect City Wharf.) Boring 1 had intersected wood which was believed to be associated with Long Wharf (Map 4). Trench 1 was placed so that it would not intersect building walls and might intersect the first expansion of the wharf. When Trench 1 confirmed this, it was decided that the further investigation of Long Wharf was a high priority. Trench 2 was intended as a northward extension of Trench 1, but was moved 13 ft. eastward to avoid unstable walls. It was placed where building 18 on Long Wharf had been located.

Because this excavation was conducted in an urban area with very high pedestrian traffic, an information flier was produced and handed out to persons stopping to observe the excavations. The filer, "This is Archaeology?", is reproduced in the Appendix.

RESULTS

Trench 1

Trench 1 was located 10 ft. north of the southern boundary of Parcel D-10 and was 9 by 26 ft. at the surface. The top four feet of the trench was characterized by consolidated fills comprised of compact sands and gravels (Fig. 7).

Below the four foot level lay a thick compact level of rubble and debris from the 1971 demolition of the State Street buildings. A looser rubble layer followed to just over 6 feet below surface (b.s.). A foot thick level of greenish clay was then followed by a loose wood and brick rubble level. This level bottomed on a concrete floor at nine feet four inches b.s. This was the cellar floor of building 17. The floor was cleaned and photographed. An architectural feature was discovered in association with the floor consisting of the cast iron support or pier for a lolly column (Fig. 8). The concrete floor, which measured one foot thick, was broken up with a large jack hammer attached to the machine's bucket. Below the concrete floor was a brick support for the pier. When the concrete floor was cleared away a highly organic layer of muck was discovered. This level had the highest artifact content, predominantly eighteenth century debris. The concrete floor had sealed these lower levels, so there was little intrusive recent twentieth century demolition debris. The western portion of the trench was disturbed by the brick pier and a ledge of concrete 2.75 ft. wide was left on the east side. The area excavated below 10 ft. was approximately 4.25 by 11 ft.

At approximately eleven feet from the surface the first of several large logs (A) was encountered. It was located in the southern wall of the trench running east/west (Figs. 9 & 10). Shortly thereafter, another log (B) was

discovered, again running east/west approximately nine feet north of the first log. A somewhat smaller log (C) between A and B was torn out by the backhoe. It was most visible in the east and west wall profiles of the trench. Perpendicular to logs A-C was log D which intersected beams B and C (Figs. 10 & 11). Also perpendicular were logs E and F which seemed to have overlain log B but were displaced and mangled by the backhoe (Fig. 12). Most of these logs were only partially uncovered so that a minimum amount of measurements could be taken. They were:

Log A - probably pierced by Boring 1 - ca. 12 in. in diameter.

Log B - ca. 10 in. in diameter

Log C - ca. 8 in. in diameter

Log D - ca. 18 in. in diameter
12½ ft. in length (Fig. 13)

Log E - ca. 18 in. in diameter

Log F - ca. 15 in. in diameter

A section of Log D was taken and samples were submitted to Dr. Elso Barghoorn at Harvard University. Dr. Barghoorn identified the samples as Atlantic white cedar. When samples of the organic muck was wet screened, cedar bark was found. This suggests that the logs were not finished when they were used.

In the southern portion of the trench, between logs A and B, and approximately three feet below them, the machinery encountered what looked like a log flooring. The logs

ran east/west and were glimpsed briefly as the bucket pushed water and mud aside. The machine operator, Arthur Standish, said it felt like a "corduroy road" or logs laid side by side. He reported that he had encountered a similar feature while excavating the foundation of the Marriott Hotel which is further east on Long Wharf. Excavation was halted at approximately 15 ft. b.s.

Below 11 ft. b.s. water was a problem and hindered visibility and hand excavation. A few artifacts were found in situ, but most could not be seen. A large number of small shells were also encountered. In order to sample the content of the muck a portion of each bucket load brought up by the backhoe was placed in a plastic garbage bag. These were labelled with their approximate depth and location. Five samples from 12 to 15 ft. b.s. were taken. They were each wet screened in an effort to recover artifacts and faunal and floral material. From 11 ft. b.s. to 13 ft. b.s. the wet organic and gray clay muck contained the highest number of manmade objects. In general the deeper samples contained more gray clay and less decayed muck and the clay became stiffer.

A total of 138 artifacts, flora, fauna and samples[4] were collected from trench 1 (excluding shells which are discussed below). Eleven ceramic fragments were found, five

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[4]Certain categories of objects were sampled either because of their size or number. They include: brick, wood, mortar, plaster, concrete, slate, linoleum, tar, coal and charcoal.

utilitarian and five refined. The utilitarian fragments consist of one piece of unglazed earthenware, four pieces of lead glazed red earthenware (one burned or a waster), and one piece of buff bodied combed slipware. It is impossible to differentiate British from American red earthenwares during the Colonial Period unless there are distinctive designs or markings. Barton has dubbed these "Anglo-american wares" (Barton 1981). Boston had earthenware potteries from 1665, and Charlestown was a center of earthenware production in the eighteenth century (Watkins 1968:19-20, 24-38). The fragment of buff bodied combed slipware was found just below log A. It has a notched edge and was probably part of a pie plate. It was made in Staffordshire, England between 1700-1770, probably after midcentury (Hume 1969:134-135).

The refined ceramic tablewares found in trench 1 consist of four fragments of Staffordshire white salt-glazed stoneware and one fragment of thin bodied buff earthenware. White saltglazed stoneware was manufactured in England between 1720 and 1770 (Hume 1968:114-115; Lewis 1969:61). One fragment appears to be a portion of a tea bowl rim. The other fragments are very small and thin, probably fragments from a tea service. The piece of thin bodied buff earthenware may be Whieldon, manufactured in England 1750-1775 (Hume 1968:123-124).

There were seven fragments of a free blown glass bottles found in trench 1. Six fragments were of light green glass from a wine bottle including pieces of a base and a neck. The form and base measurement of the bottle resembles late eighteenth century examples (Hume 1968: 67-68); Wilson 1972: 9). The other light green fragment may be a piece of a case bottle. These are probably pieces of imported glass, although the first Boston area glassworks in Braintree was in production from 1750-1768 (Wilson 1972: 47-48).

Eighteen clay tobacco pipe fragments (seventeen stem and one bowl) were found in trench. Fifteen of the seventeen stem fragments have bore diameters of 5/64th of an inch which date from 1710 to 1750 and two have bore diameters of 4/64th which date from 1750 to 1780 (Hume 1968:298). Two small fragments of leather and three plastic fragments were also found.

Structural materials include four fragments of window glass, two fragments of slate, three treenails (treenails or trunnels are cylindrical pins of hardwood used in ship and wharf construction) and two fragments of brick tile. Samples of mortar, wood, charcoal, coal and brick were taken. Three pieces of flint, probably used as ship's ballast, were discovered. A wooden keg stopper or bung was also found.

Floral (18) and faunal (15) remains were found, some in a remarkable state of preservation. The floral remains include 5 seeds (4 cherry and 1 peach pit (?), a pine cone and twigs (Martin and Barkley 1973: 108 & 166). The faunal remains

are two fish vertabrae, one cow (bos) astragalus, one tarso-metatarsus of a small bird, one femur of a small mammal, one (squirrel?) skull, one cow? (bos) mandible, two large mammal teeth and six unidentified bones (von den Driesch 1976; Olsen 1964).

When the soil samples from trench 1 were processed, a large number of shells (Molluscan remains) were found in the deposits. Specimens which had the umbo or "hinge" (for bivalves) or the spire (for snails) were collected and submitted to Dr. Russell J. Barber, Institute for Conservation Archaeology, Peabody Museum, Harvard University. His report, "Analysis of Molluscan Remains from Parcel D-10, Boston Harbor" is summarized here and appended in its entirety (Appendix III). The 231 specimens are identified as belonging to two snail species (24) and seven bivalve species (207) (Appendix III, Table 1). The environmental tolerance of these species was identified (Appendix III, Table 2), and then analyzed in conjunction with the vertical distribution information (Appendix III, Table 1). This analysis indicates that in the prehistoric and early historic periods the Parcel D-10 portion of Boston Harbor included hard intertidal (rocky?) substrates and mudflats (13.5 to 15 ft. b.s.). At the same time the distribution of two bivalve species suggests that adjacent mudflats were being filled and dredged. This would correlate with the progressive wharfing out northeast

and southeast of Long Wharf, as well as the 1711 construction of Long Wharf. The analysis also indicates that the sediment load increased, thereby driving out certain species. Size distribution analysis was done for one species in the assemblage, Mya arenaria (soft shell clam) (Appendix III, Table 3). It indicates that in the 13.5 to 13.9 ft. b.s. sample there seems to have been catastrophic mortality of certain shell fish. This would also correlate to wharf construction.

Analysis of the remains found in trench 1 indicate they date predominantly to the middle to late eighteenth century, suggesting that this portion of the wharf was constructed around that date. The upper soil samples (10.5 to 13 ft. b.s.) contained 95% of the manmade artifacts (excluding construction related items). The lower samples (13.5 to 15 ft. b.s.) contained mainly shells, some structural debris and organic remains such as twigs. This suggests that the upper levels date to the 1763 expansion and that the lower levels pre-date this expansion. The level and role of the "cordoroy road" remains unclear and would have to be examined during further excavations.

Trench 2

Trench 2 was placed 13 feet east of trench 1 and 33 feet north of the parcel's southern boundary (State Street) (Maps 4 & 7). This location was chosen to find later extensions of Long Wharf. The trench was moved eastward for safety reasons.

The initial nine and a half feet of trench 2 was comprised of unconsolidated fills similar to those found in trench 1 (Figure 14), primarily gravel to 3 ft. b.s. and rubble to 8.75 ft. b.s. At 6 ft. 10 in. b.s. the trench excavation uncovered what appears to have been the east foundation wall of building #18. This was a substantial wall consisting of two two-brick thick walls. Between the two walls were dry laid granite blocks 23 in. square, set on 8-12 in. of stone chips. The brick walls bottomed on the concrete floor 8.75 ft. b.s. The fill material directly associated with the architectural remains consisted primarily of building debris.

The granite stones were left in situ as an east retaining wall and only the floor to the west of the wall was removed, an area approximately 8 by 15 ft. The northern portion of the floor was broken, probably during the 1971 demolition. The floor itself proved to be different from that uncovered in trench 1. A two inch layer of concrete was followed by two courses of brick and then a four inch layer of concrete. Below the floor (10 ft. b.s.) was a 1.5 ft. layer of loose gravel accompanied by some large stones. This type of fill was not found beneath the floor exposed in trench 1.

At 11.5 ft. b.s. the highly organic, gray muck fill found in trench 1 was uncovered. Like trench 1 it contained a concentration of artifacts. Several wooden beams and

finished timbers were found. Figure 15 illustrates the features at a depth of about 12 feet. Three planks (G,H,I) running east-west formed a platform. They were 13 in. (G), 10½ in. (H) and 11½ in. (I) in width and sit on piles. Three piles were visible below plank I. Perpendicular to this platform were two planks (J, K) 15 in. in width with their northernmost extension approximately that of the platform. The platform and planks J and K abutt, but are not joined. Three small logs (L,M.N) which ran east-west were destroyed by the machine. Logs L and M were approximately 5 in. in diameter and log N could not be adequately measured.

North of the platform the construction differed. The granite wall continues below the level of planks J and K (11 ft. 7 in. b.s.). West of the wall and north of the platform were large uncut fragments of granite suggesting this area was filled with stone. Excavation had to be halted at this point because of unstable walls.

Artifacts and other remains were recovered in two ways. Fill from just below the concrete floor was inspected as it was brought to the surface. Fill north and south of the platform was wet-screened in the trench. As in trench 1 as the excavation went deeper the clay displaced the organic muck. Most of the artifacts were recovered from just below the concrete floor and from under and around the platform (planks G,H,I).

A total of 253 artifacts, samples, and floral and faunal remains were recovered from trench 2. There are 16 ceramic fragments consisting of two redware, four buff earthenware, four stone ware, and two semi-porcelain fragments. One redware piece has a black lead glaze inside and out and is probably a portion of a small bowl. The other is a small unglazed fragment. Boston and Charlestown had redware potteries from the mid-seventeenth century and these could have been made there or have been imported from England (Watkins 1969: 19-20). Two buff bodied earthenware fragments are everted rim sherds of Staffordshire slipware mugs, ca. 1700-1750 (Hume 1968:134). One has a brown dot on its exterior. Two fragments of buff bodied Staffordshire slipware pie plates (ca. 1700 to 1775) were also found. One fragment of English brown salt-glazed stoneware (ca. 1690-1775) is in the collection, as well as a small (ca. 1 in. diameter) white salt-glazed object resembling a cup (ca. 1720-1770) (Hume 1968:114-115 ; Lewis 1969:61). The other three fragments may be examples of Charlestown stoneware. The Parker pottery located in Charlestown was the first Boston area pottery to produce stoneware ca. 1742 (Watkins 1969:34-36) and Charlestown continued to be a center of stoneware manufacture in the nineteenth century. Two of the pieces are part of the base and body of a pot. The two pieces of semi-porcelain are portions of the rim and base of a small plate made post-1820.

Numerous bottle glass fragments (125) were found in trench 2. Brown or amber free blown bottle glass fragments (113) were identified as 21 base fragments, 10 neck fragments, and 82 body fragments. Light green free blown bottle glass fragments (12) were identified as two base fragments, two neck fragments, and eight body fragments. These bottles were wine or spirits bottles. The forms and base measurements of the bottles resemble late eighteenth century English examples (Hume 1968:67-68; Wilson 1972:9). They could possibly be early American glasshouse products as the first glasshouse in the Boston area was in Braintree ca. 1750-1768 (Wilson 1972: 47-48). The base of a clear free blown tumbler or flip dates to before 1840. There is also one piece of unidentified glass.

Only two white clay tobacco pipe fragments were found in trench 2, one a bowl fragment and one a 5/64 stem fragment (ca. 1710-1750) (Hume 1968:298). A lead musketball (ca. 80mm.) which appears to have been fired was recovered. Three small fragments of leather, two pieces of iron, and two pieces of plastic were found. Structural remains include one nail, one wire, window glass fragments (30), a porcelain insulator fragment, other utilitarian porcelain (2), a sewer pipe fragment, linoleum (12) and a fragment of rubber. Samples of brick, plaster, slate, tar, granite, charcoal, coal, mortar and wood were retrieved. The wood sample included bark shavings, probably poplar or birch. These types of wood would have been used for shingles (Dr. Barghoorn, personal communication). One unidentifiable bone and two cherry pits were found. Twelve pieces of flint were also found.

CONCLUSIONS

Trench 1 was placed to intersect the earliest (1711) portion of Long Wharf at 24 ft. north of the south boundary of Parcel D-10. The excavation uncovered a cedar log construction which resembles a crib construction. Logs A, B, and D may have formed three sides of a crib. The crib would have been sunk at the outside walls of the wharf and log B intersects with the projected north wall of the 1711 wharf (Fig. 17, Map 4). However, although most of the artifacts from trench 1 date to the eighteenth century, they post date the 1711 construction date. Records of the Long Wharf proprietors and of the Boston selectmen indicate that the wharf deteriorated during the 1730s and that when the wharf was widened in 1763 old portions of the wharf may have been dismantled and replaced. Trench 1 apparently contained the 1763 expansion. An assortment of "domestic" artifacts and remains (pottery, wine bottles, bone) and remains relating to the wharf itself (treenails) were found. The comparatively large number of white clay tobacco pipe stems (18) may relate to the wharf construction, i.e. deposited by workmen. Of interest is the identification of the logs as cedar, specifically Atlantic White Cedar (Chaeaecyparis thyoides) (Barghoorn, personal communication). It is durable, has high quality and does not rot easily. "It grows in a narrow coastal belt 50 to 130 miles wide from southern Maine to northern Florda and westward through southern Mississippi" (Little 1959:1).

Trench 2 was placed northeast of trench 1 to intersect the northernmost extension of the 1763 wharf (Map 4). A different type of construction from trench 1 was found south of plank G consisting of planks set on piles. Planks J and K appear to have borne the east wall of building #18, and this construction may relate more to store construction than wharf construction. Pile driving is mentioned in the Long Wharf Proprietor's records in 1825. The records also mention "digging and removing old boxing plank" charged to stores 25 through 34 (Proprietors Receipts/Accounts, June 1825). Is the construction in trench 2 "boxing plank"? North of plank G the the small area excavated contained slabs of rock and no visible timber construction. This coincides with the recorded location of the "old sea wall" removed in 1825 during the wharf expansion (Map 4). The expense of removing the stones of the old sea wall were charged to stores 17 through 24 (Proprietors Receipts/Accounts, June 1825). Could these be remnants of the old sea wall which was probably constructed in 1763?

More artifacts were found in trench 2 than in trench 1, especially wine bottle fragments. The dateable artifacts consist of eighteenth century items such as English slipwares and stonewares, the wine bottles (1760-1840), the semi-porcelain (mid-nineteenth century), and linoleum and plastic fragments (twentieth century). Clearly the area has been disturbed, but the predominance of eighteenth century ceramics suggests the initial construction is 1763, possibly disturbed 1826.

The birch or poplar bark shavings suggest shingling for the stores.

A review of other waterfront excavations in New England shows similarities to construction techniques found at Long Wharf. At both Charlestown, Massachusetts and Strawberry Banke, New Hampshire, crib construction has been found (Pendry et al. 1982:88; Harrington n.d.:16). At Newburyport, Massachusetts, corduroy cribwork ballasted with granite fieldstone was found in a post-1800 wharf portion of Gunnison's Wharf (Faulkner 1978:36). In Charlestown, a wharf constructed of horizontal planking on piles was discovered at a pre-1836 wharf. Four other kinds of pre-1835 construction were also found at these sites, suggesting there were no set methods or chronologies in wharf construction. However, Andrea Heintzelman-Muego of DeLeuw, Cather and Parsons is in the process of compiling eastern seaboard findings into a chronology including those sites mentioned above, and sites in Salem, Massachusetts; New London, Connecticut; New York City, New York; and Alexandria, Virginia (personal communication, Andrea Heintzelman-Muego).

SIGNIFICANCE

Boston, Massachusetts was the largest colonial American port until 1756 and was surpassed by only New York and Philadelphia during the rest of the eighteenth century. Long Wharf was the hub of Boston's maritime trade, handling much of the international and coastal trade for the town of Boston. The wharf served not only private merchants but also the public. A portion of Long Wharf exist east of Atlantic Avenue (and is listed on the National Register of Historic Places), but it dates to the reconstruction and expansion of the wharf in 1857. All above ground remnants of the eighteenth century Long Wharf disappeared between 1868 to 1870. The archaeological testing in Parcel D-10 has uncovered a portion of "Lost Boston": eighteenth century Long Wharf is intact 7 to 12 feet below surface in Parcel D-10. These remains are significant because:

1. Long Wharf was the busiest and one of the largest wharves in New England in the eighteenth century.

2. The remains of Long Wharf are an example of the maritime activities of eighteenth century Boston.

3. The remains shed light on eighteenth century wharf construction and appearance, of which little is known.

4. The artifacts and faunal and floral remains in and around the wharf are very well preserved because they are in wet clay below sea level. Organic remains such as leather, bone and seeds, which often deteriorate on New England sites, are in an excellent state of preservation here.

5. The artifacts represent a time capsule of eighteenth century Boston including, locally made pottery, leather goods, items related to shipping, food remains which might indicate diet, and imported goods such as glass.

6. This is only the third archaeological site which has been tested in Boston. The Bostonian Hotel site contained seventeenth and eighteenth century components, and the African Meeting House site is primarily nineteenth century. The Long Wharf site is only the second eighteenth century archaeological site found within the antebellum bounds of Boston.

7. Very few wharf sites have been found on New England waterfront archaeological excavations.

8. Below the historic period remains (13.5 ft. and below) exist natural historic information on the pre-1711 flora and fauna of Boston Harbor which may provide information on early species and species adaptation.

RECOMMENDATIONS

We suggest that an archaeological team monitor the excavation for the foundation of the new building. This would entail the archaeologists and the excavation contractor coordinate their efforts. The archaeologists would:

1. Monitor the excavation to ensure that no archaeological features are destroyed before mapping.

2. Evaluate any wharf or fill features. If they have been almost wholly destroyed they will be mapped and then excavation may proceed.

3. Excavate, with the help of machinery, any features (such as the 1824 Long Wharf decking) which are not significantly disturbed, and recover artifacts and other remains.

At this point the primary significant information to be retrieved relates to types and methods of wharf construction and filling. Artifacts recovery will depend on the degree of disturbance. Late nineteenth century buildings and features are not of primary significance.

The Museum's archaeological staff suggests the following guidelines concerning the material remains recovered from Long Wharf:

1. Long term conservation of the artifacts, particularly those which are apt to deteriorate (e.g., glass bottles, leather, bone) be undertaken immediately.

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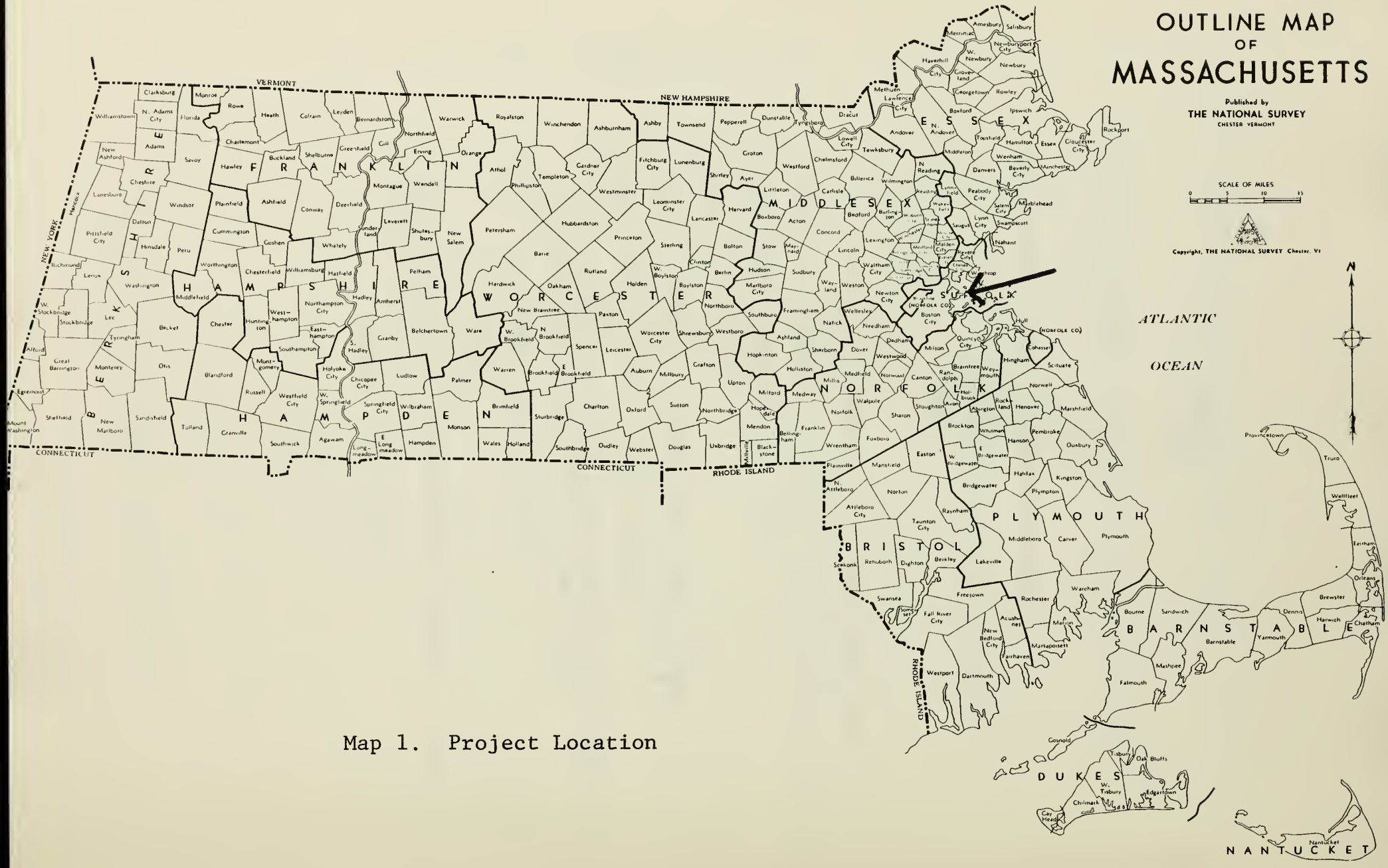
A. A. Will Co.

MAPS

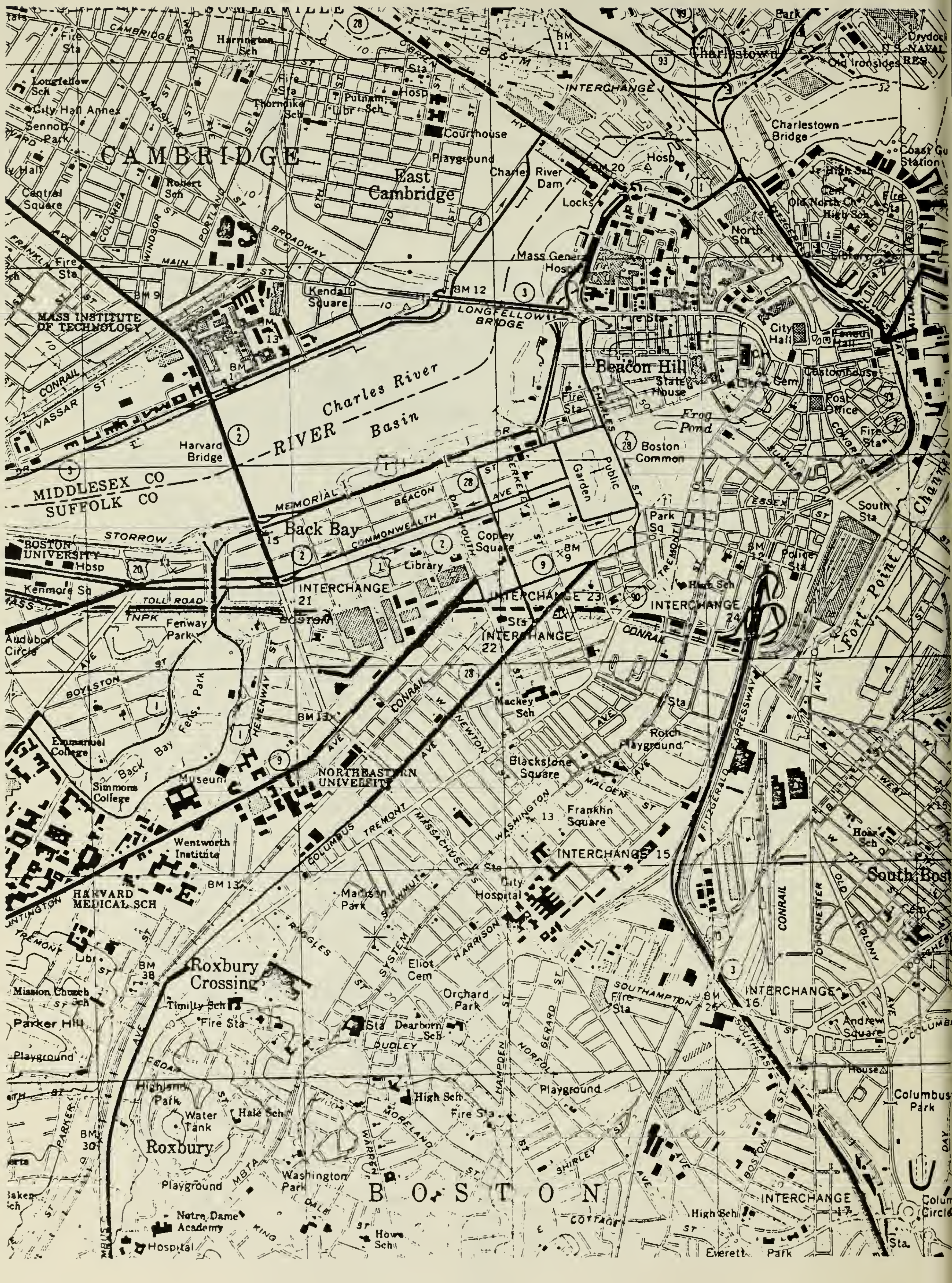
1	Project Location
2	Site Location
3	1982 Parcel D-10: Topographic Plan
4	1852 Overlay with Boring and Trench Locations
5	1867 Overlay
6	1899 Overlay
7	1964 Overlay with Boring and Trench Locations
8	Location of Boston's Original Shoreline near Parcel D-10
9	Clough Map of Boston, ca. 1643
10	Bonner Map of 1722
11A	Detail of Bonner Map of 1722 - Benes 1980:51
11B	Burgis View of 1769 - Benes 1980:51
12	Clough's Atlas 1798: Property Owners of the Town of Boston (with some 1900 street lines)
13	Detail of Clough Atlas of 1798
14	Hale's Map of 1814
15	Ground Plan of the Market House erected in 1826. Quincy 1852
16	Plan of City Wharf - SCD 636:End

MAP 1

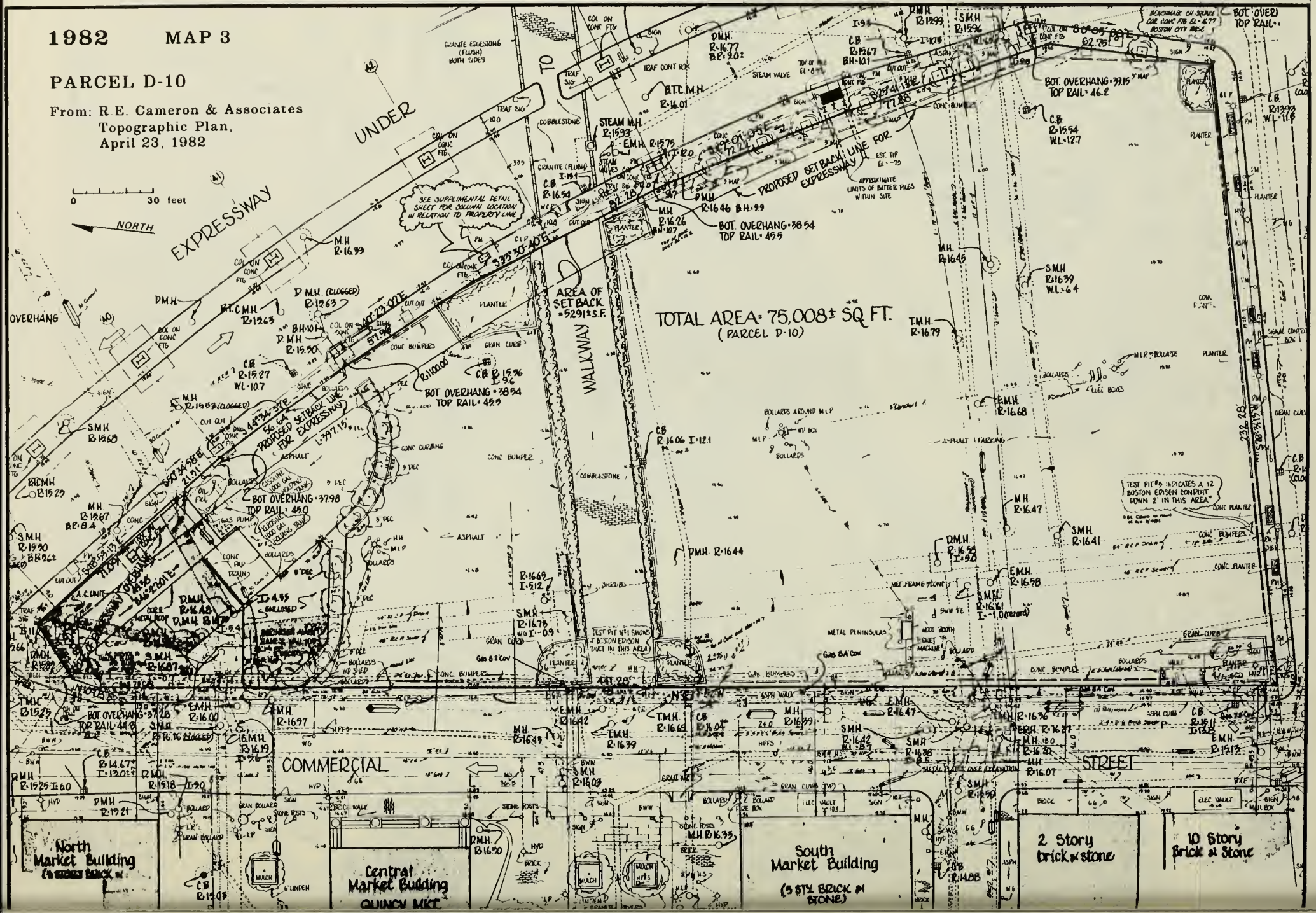


Map 1. Project Location

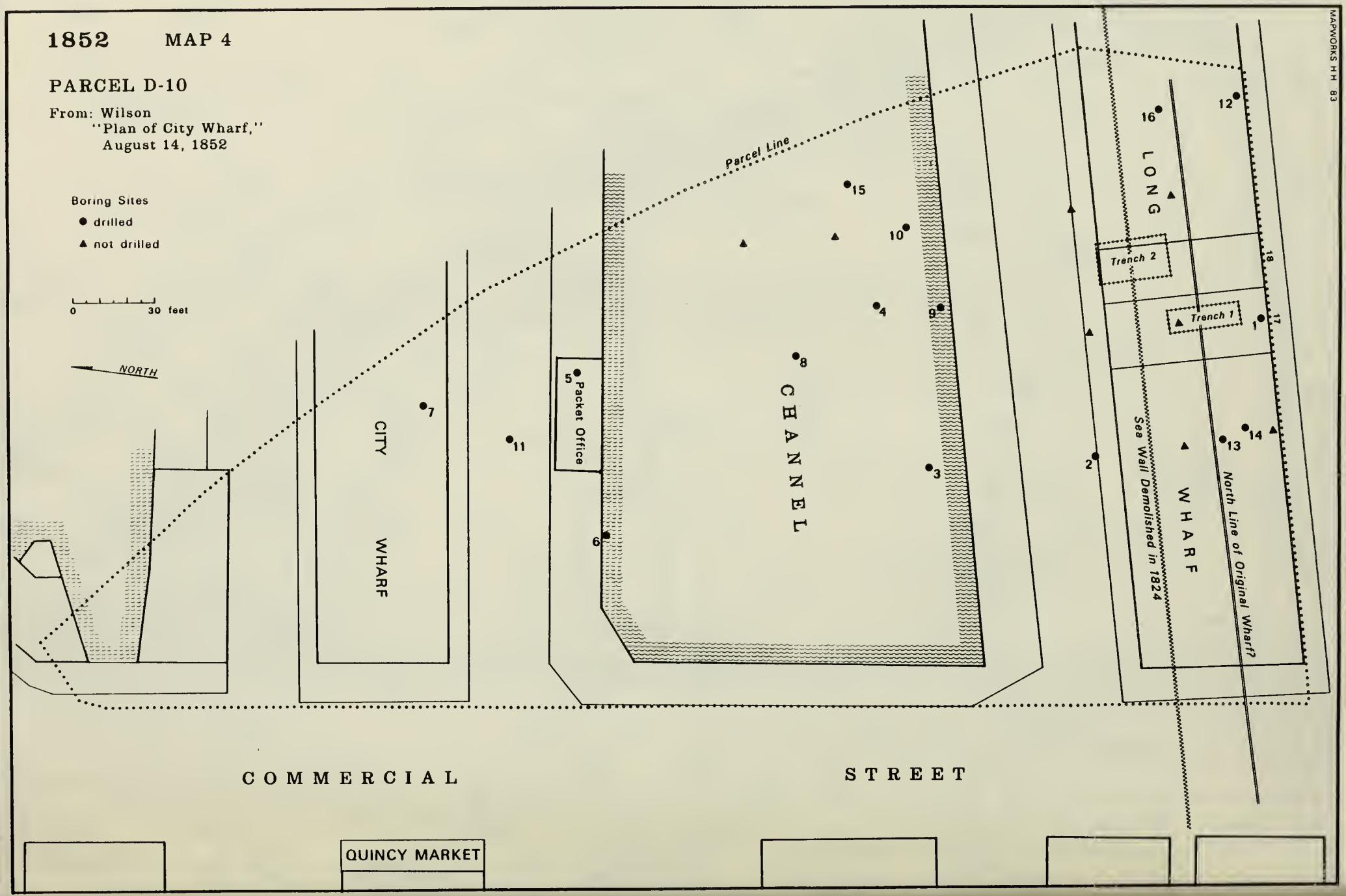
MAP 2


CAMBRIDGE
East Cambridge
Charlestown
Charlestown Bridge
Old Ironsides
U.S. NAVAL RES
Coast Guard Station
Old North Ch
Harrington Sch
Longfellow Sch
City Hall Annex
Sennott Park
Central Square
Robert Sch
Thorndike Sch
Putnam Sch
Courthouse
Playground
Charles River Dam
Locks
INTERCHANGE
Mass Gen Hosp
North Sta
Kendall Square
LONGFELLOW BRIDGE
MASS INSTITUTE OF TECHNOLOGY
Beacon Hill
State House
City Hall
Faneuil Hall
Customhouse
Post Office
Fire Sta
Charles River
RIVER
Basin
Harvard Bridge
Frog Pond
Boston Common
Public Garden
MIDDLESEX CO
SUFFOLK CO
MEMORIAL
STORROW
BEACON
COMMONWEALTH
Back Bay
BOSTON UNIVERSITY
Hosp
Kenmore Sq
Copley Square
Library
Park Sq
South Sta
Fort Point Channel
INTERCHANGE 21
INTERCHANGE 22
INTERCHANGE 23
INTERCHANGE 24
TOLL ROAD
TNPK
Fenway Park
Audubon Circle
BOYLSTON
Back Bay Fens Park
FENWAY
CONRAIL
Mackey Sch
Rotch Playground
Blackstone Square
NORTHEASTERN UNIVERSITY
Museum
Emmanuel College
Simmons College
Wentworth Institute
Franklin Square
INTERCHANGE 15
City Hospital
FITZGERALD EXPRESSWAY
HARVARD MEDICAL SCH
Madison Park
Roxbury Crossing
Mission Church
Parker Hill
Playground
Timilty Sch
Eliot Cem
Orchard Park
Dearborn Sch
DUDLEY
INTERCHANGE 16
Andrew Square
South Boston
Highland Park
Water Tank
Hale Sch
High Sch
Roxbury
Washington Park
BOSTON
Notre Dame Academy
Hospital
Columbus Park
INTERCHANGE 17
High Sch
Everett
Park

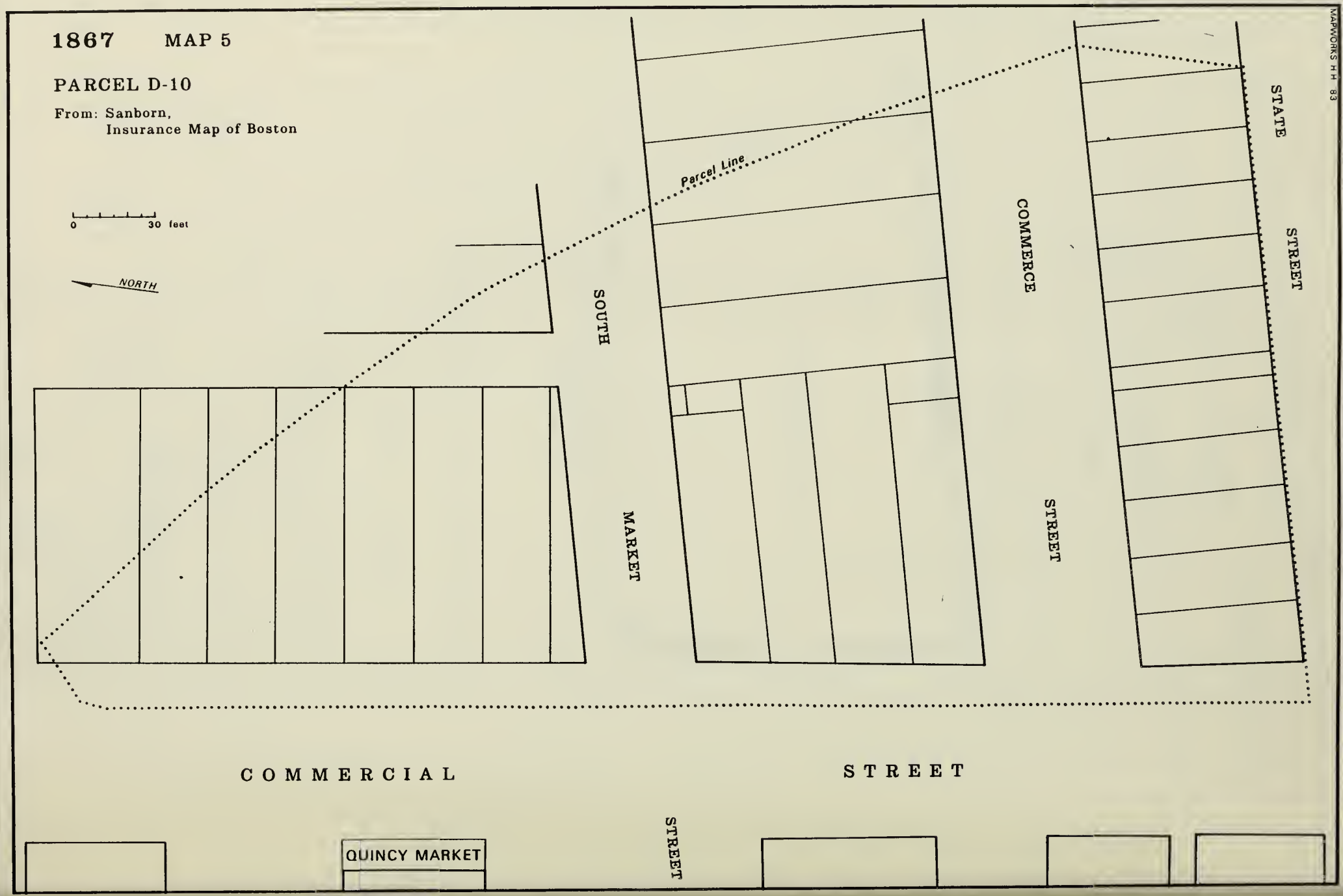
MAP 3


1982 MAP 3
PARCEL D-10
From: R.E. Cameron & Associates
Topographic Plan,
April 23, 1982
0 30 feet
NORTH
EXPRESSWAY
UNDER
TO
WALKWAY
AREA OF SET BACK = 52912 S.F.
TOTAL AREA: 75,008± SQ FT.
(PARCEL D-10)
PROPOSED SET BACK LINE FOR EXPRESSWAY
APPROXIMATE LIMITS OF BATTER PILES WITHIN SITE
SEE SUPPLEMENTAL DETAIL SHEET FOR COLUMN LOCATION IN RELATION TO PROPERTY LINE
BOT. OVERHANG · 39.15 TOP RAIL · 46.2
BOT OVERHANG · 38.54 TOP RAIL · 45.5
BOT OVERHANG · 37.98 TOP RAIL · 44.9
BOT OVERHANG · 37.28 TOP RAIL · 44.8
TEST PIT #3 INDICATES A 12 BOSTON EDISON CONDUIT DOWN 2' IN THIS AREA
TEST PIT #1 SHOWS 1 BOSTON EDISON DUCT IN THIS AREA
COMMERCIAL STREET
North Market Building
Central Market Building
QUINCY MKT
South Market Building
(5 STY BRICK & STONE)
2 Story brick & stone
10 Story Brick & Stone

MAP 4


1852 MAP 4
PARCEL D-10
From: Wilson
"Plan of City Wharf,"
August 14, 1852
Boring Sites
drilled
not drilled
0
30 feet
NORTH
Parcel Line
CITY WHARF
Packet Office
CHANNEL
LONG WHARF
Trench 2
Trench 1
Sea Wall Demolished in 1824
North Line of Original Wharf?
COMMERCIAL STREET
QUINCY MARKET
MAPWORKS HH 83

MAP 5

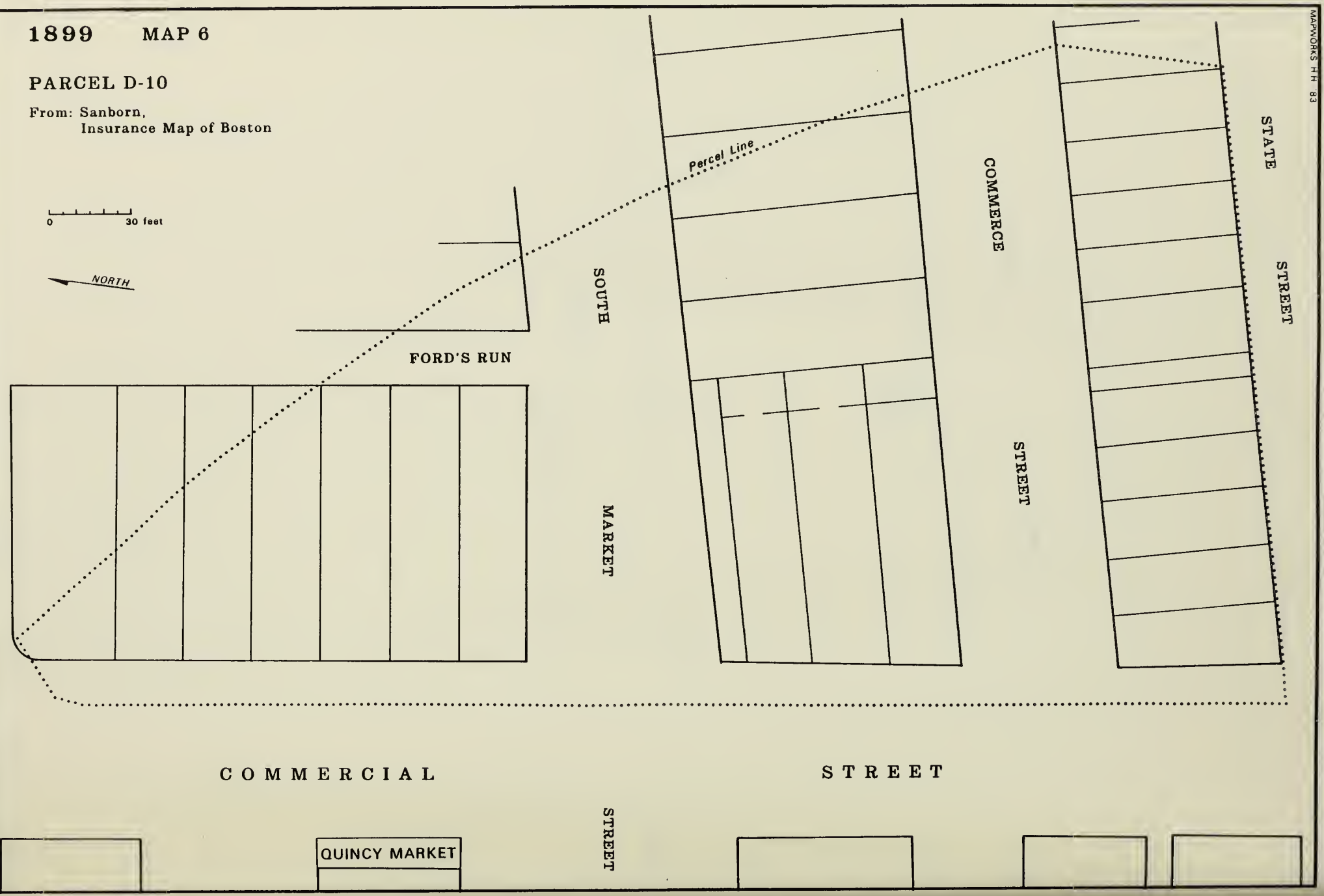

1867 MAP 5
PARCEL D-10
From: Sanborn,
Insurance Map of Boston
0
30 feet
NORTH
Parcel Line
SOUTH
MARKET
STREET
COMMERCE
STREET
STATE
STREET
COMMERCIAL
STREET
QUINCY MARKET
STREET
MAPWORKS H H 83

MAP 6

1899 MAP 6

PARCEL D-10

From: Sanborn,
Insurance Map of Boston

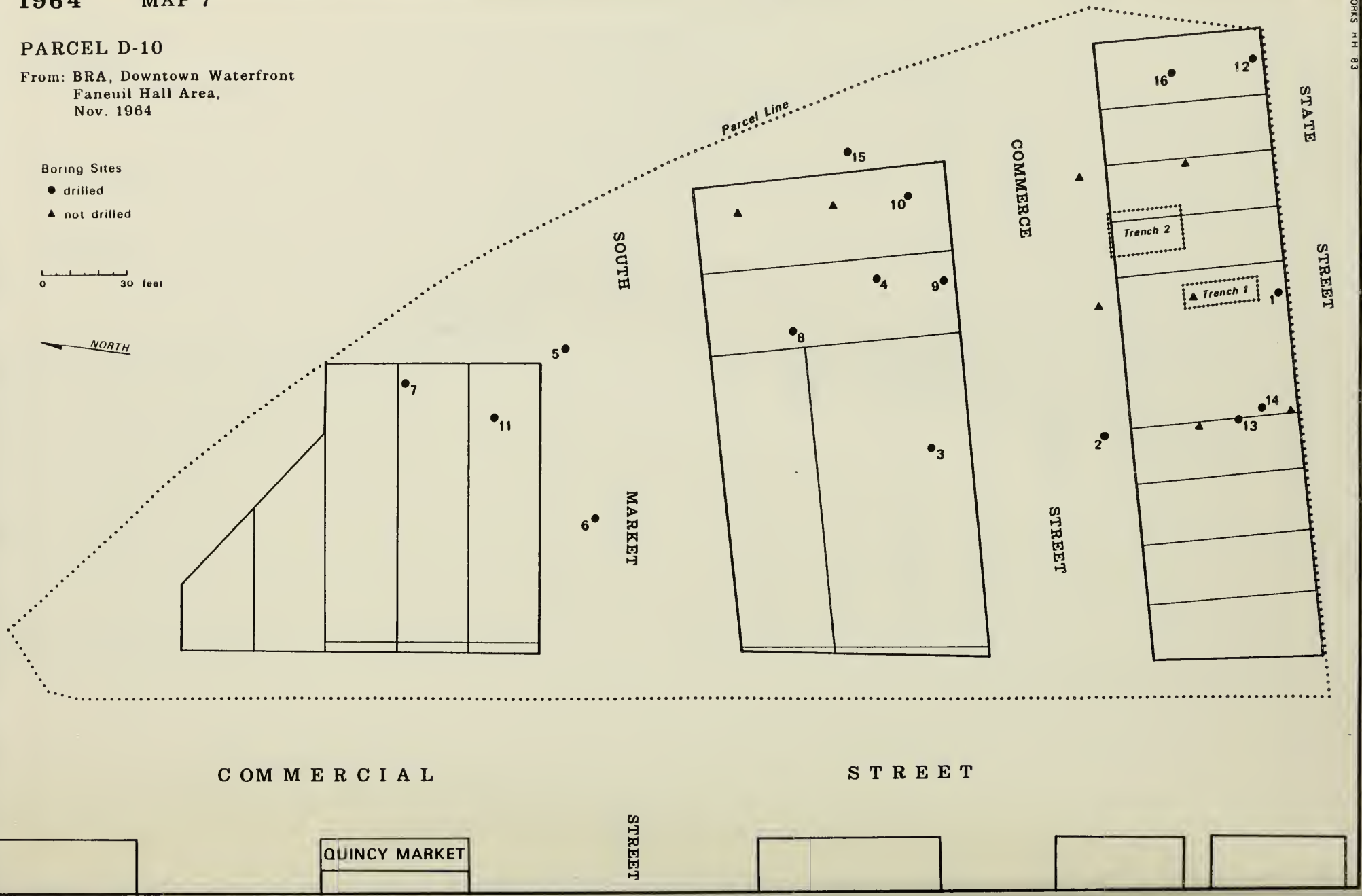


MAP 7

1964 MAP 7

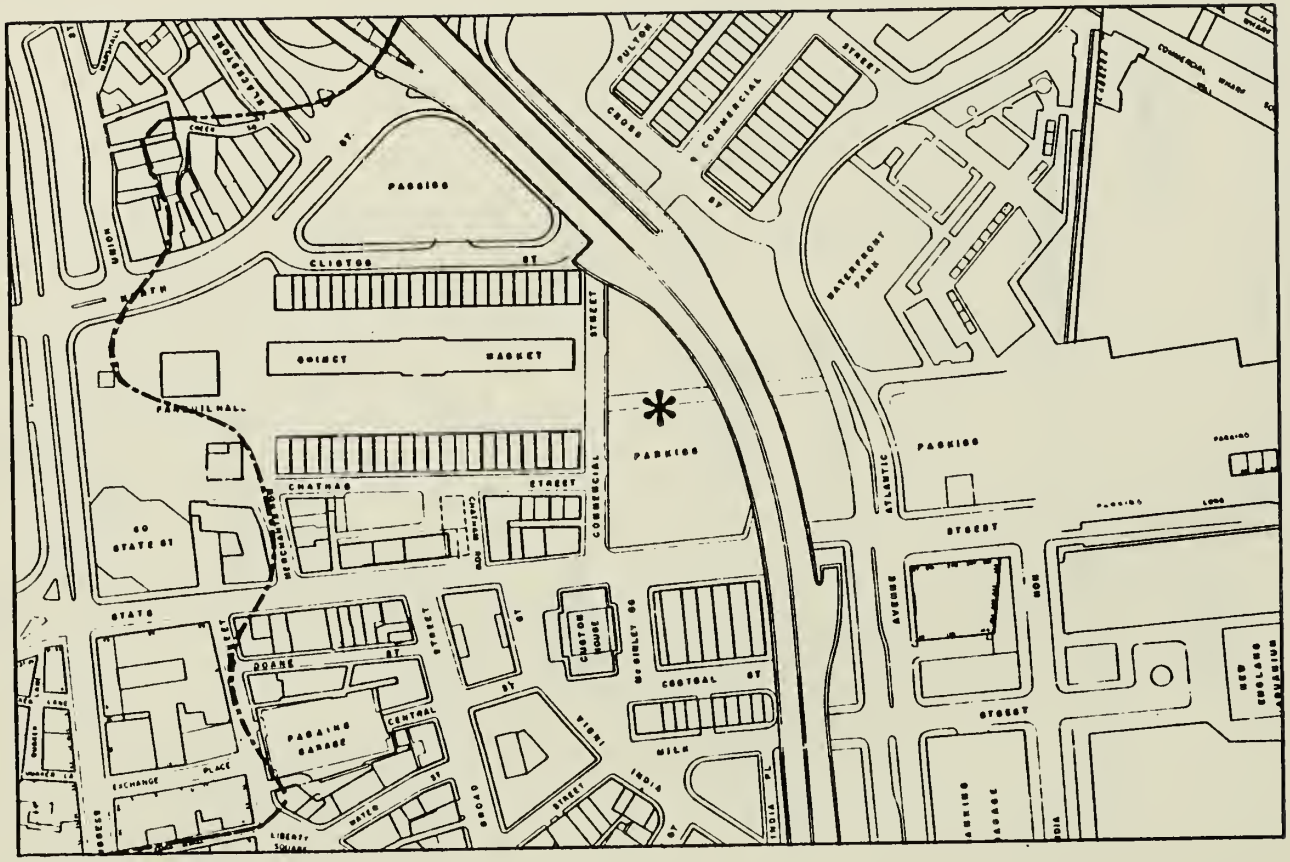
PARCEL D-10

From: BRA, Downtown Waterfront
Faneuil Hall Area,
Nov. 1964



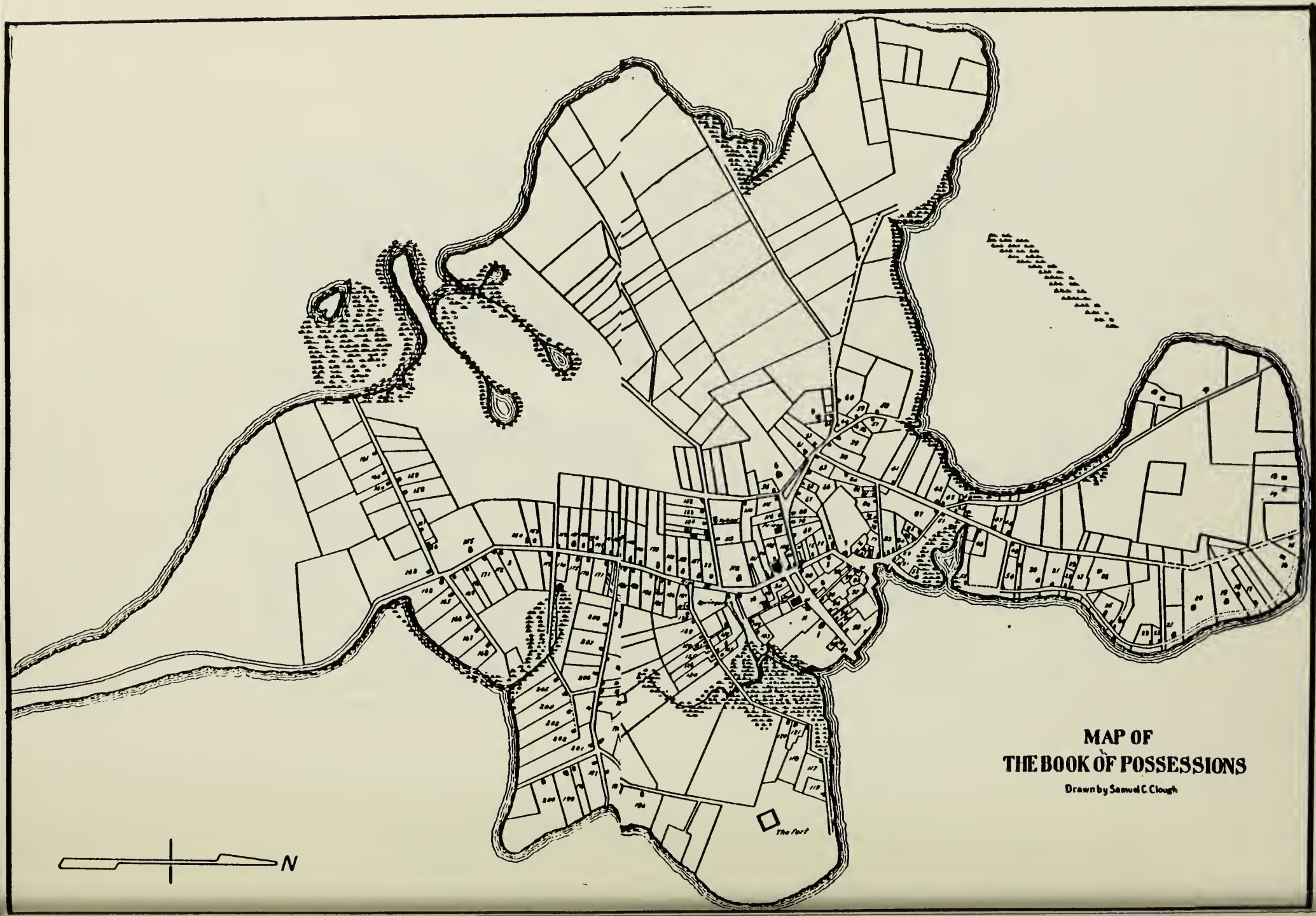
MAPWORKS H H 83

Map 8

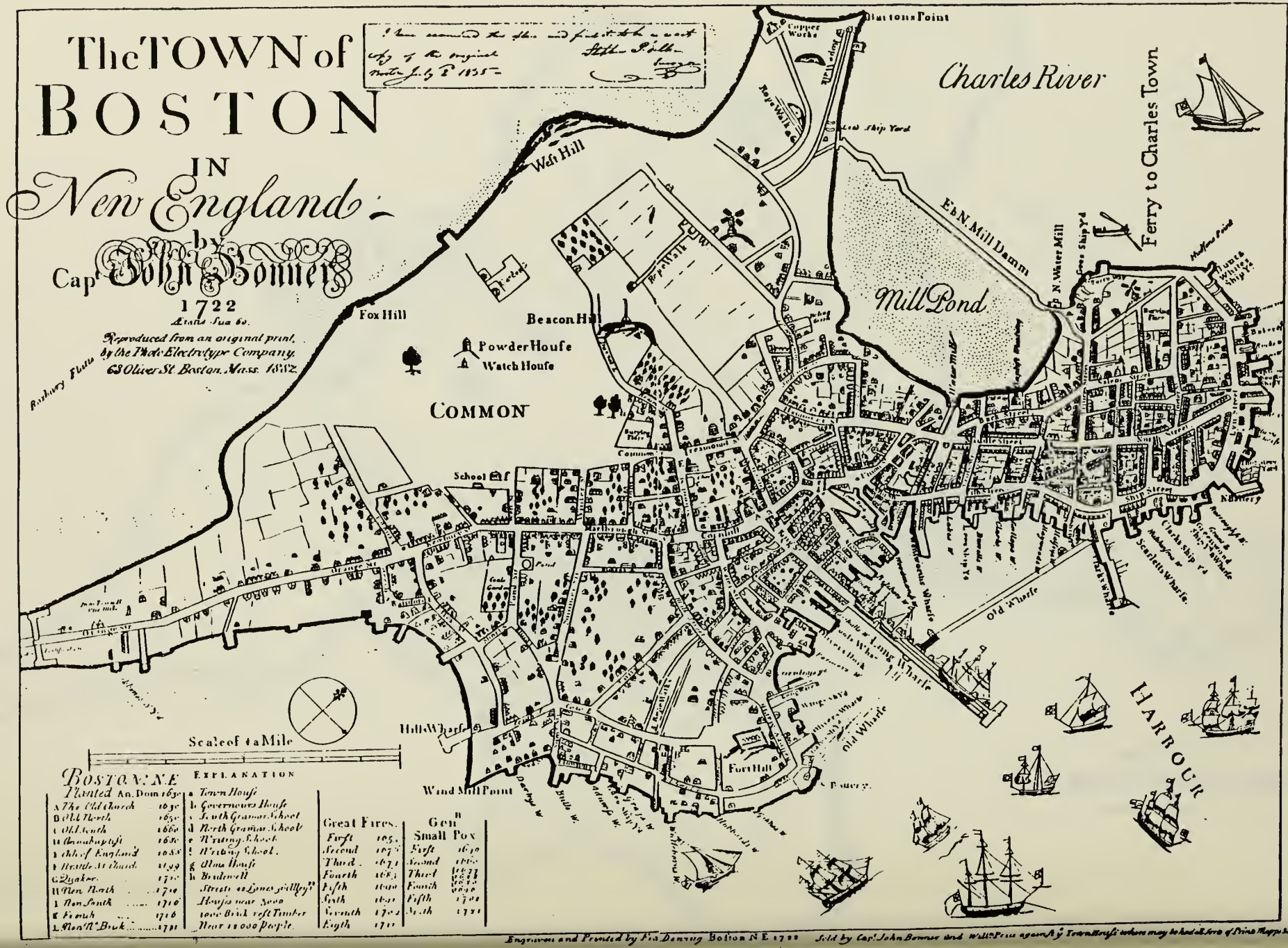


Original shore line — - — -

Map 9

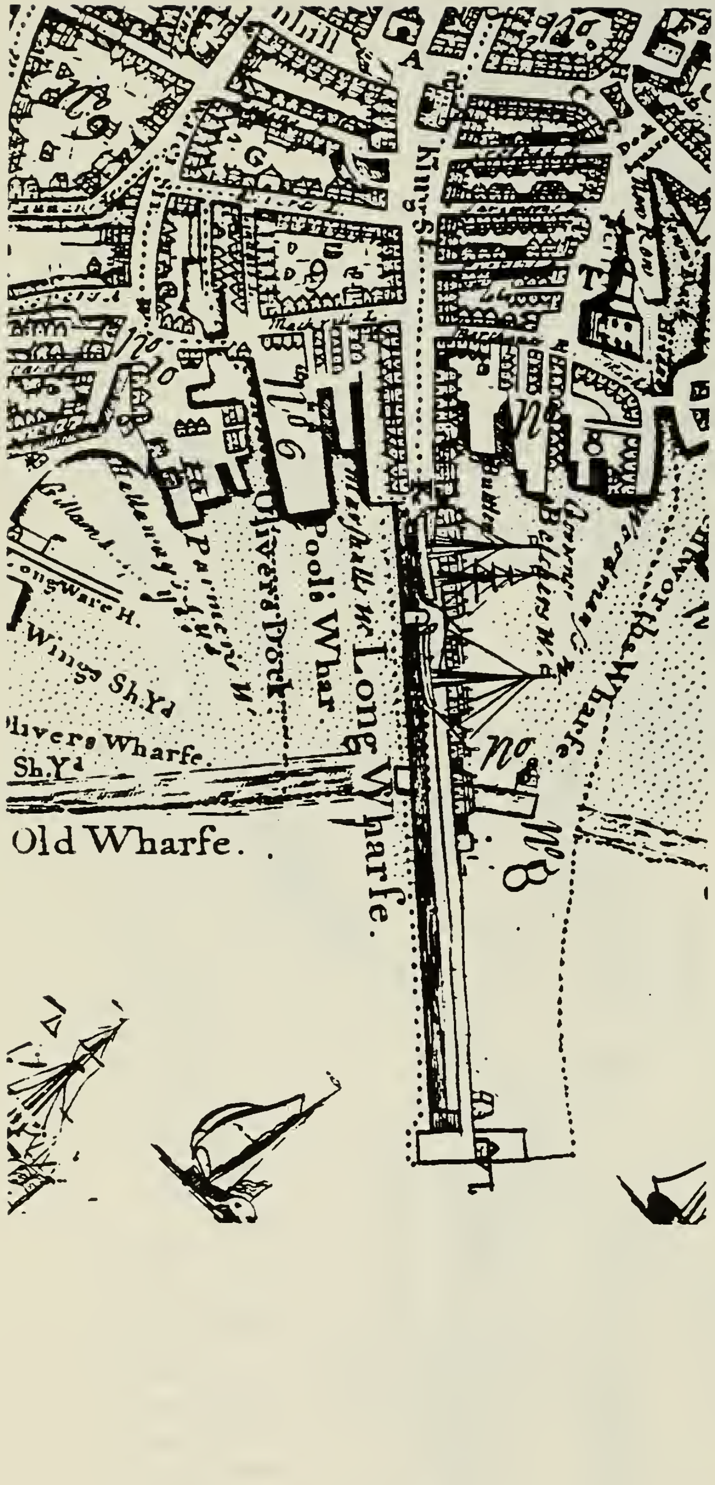

MAP OF
THE BOOK OF POSSESSIONS
Drawn by Samuel C. Clough
The Fort
N

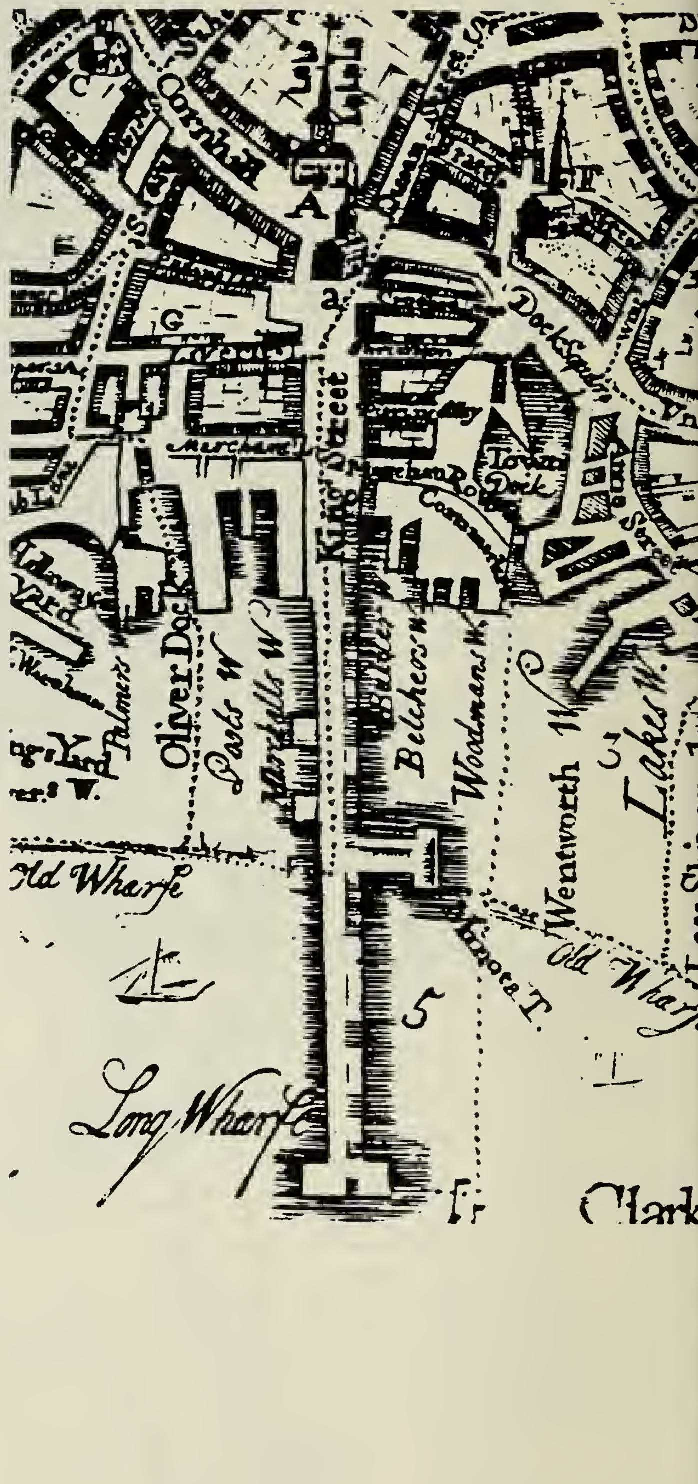
Map 10



Engraved and Printed by Fra Dewing Boston N E 1722 Sold by Capt John Bonner and Will Price again ye Town House where may be had all sorts of Prints Maps &c

Maps 11A & 11B


King St
Pools Whar
Olivers Dock
Long Wharfe.
Wings Sh.Yd
Olivers Wharfe
Sh.Yd
Old Wharfe.


Cornhill
Dock Square
King Street
Merchants Row
Town Dock
Oliver Dock
Palmers W.
Belchers W.
Woodmans W.
Wentworth W.
Lakes W.
Old Wharfe
Long Wharfe
Clark

Map 12

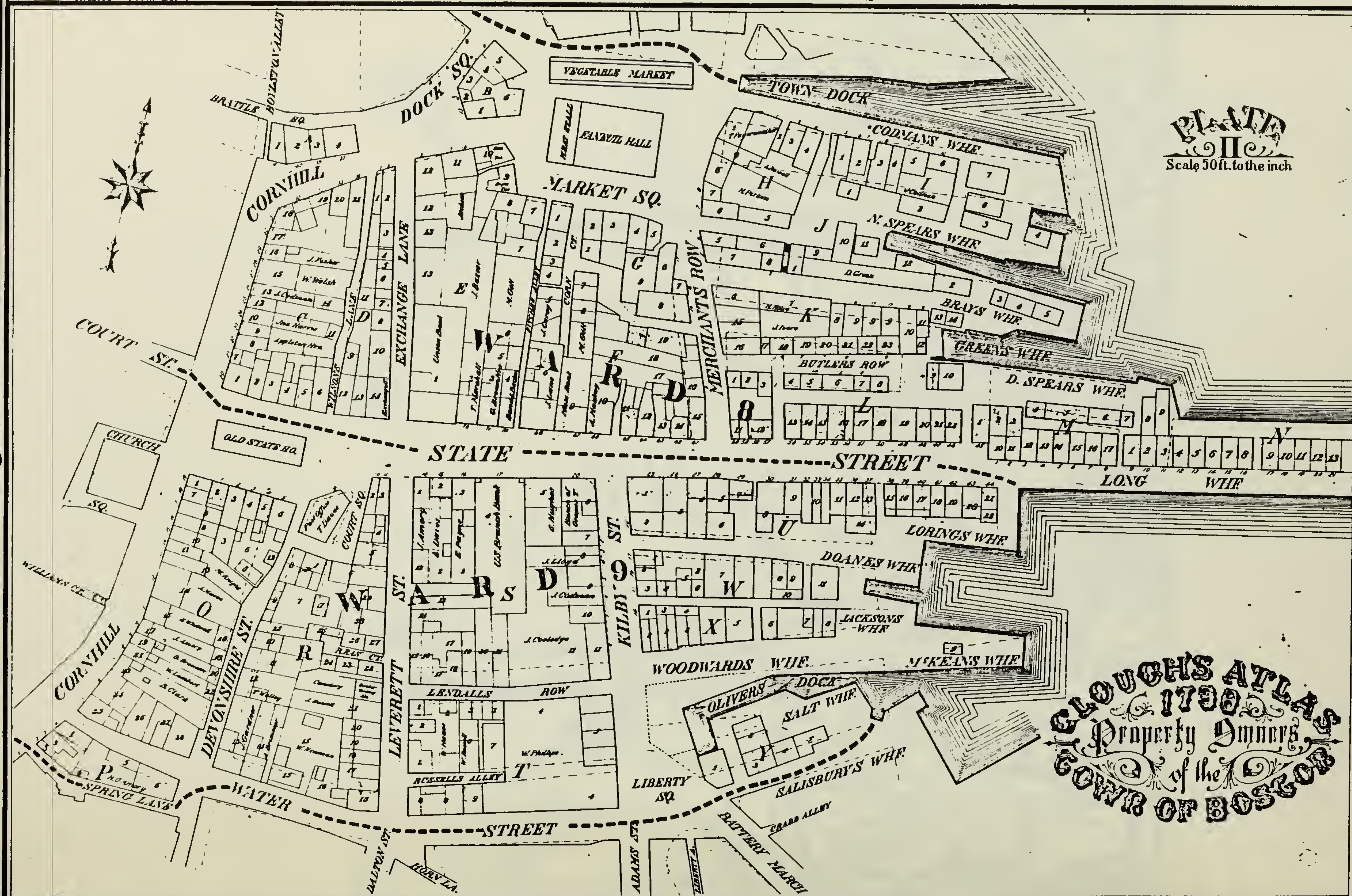
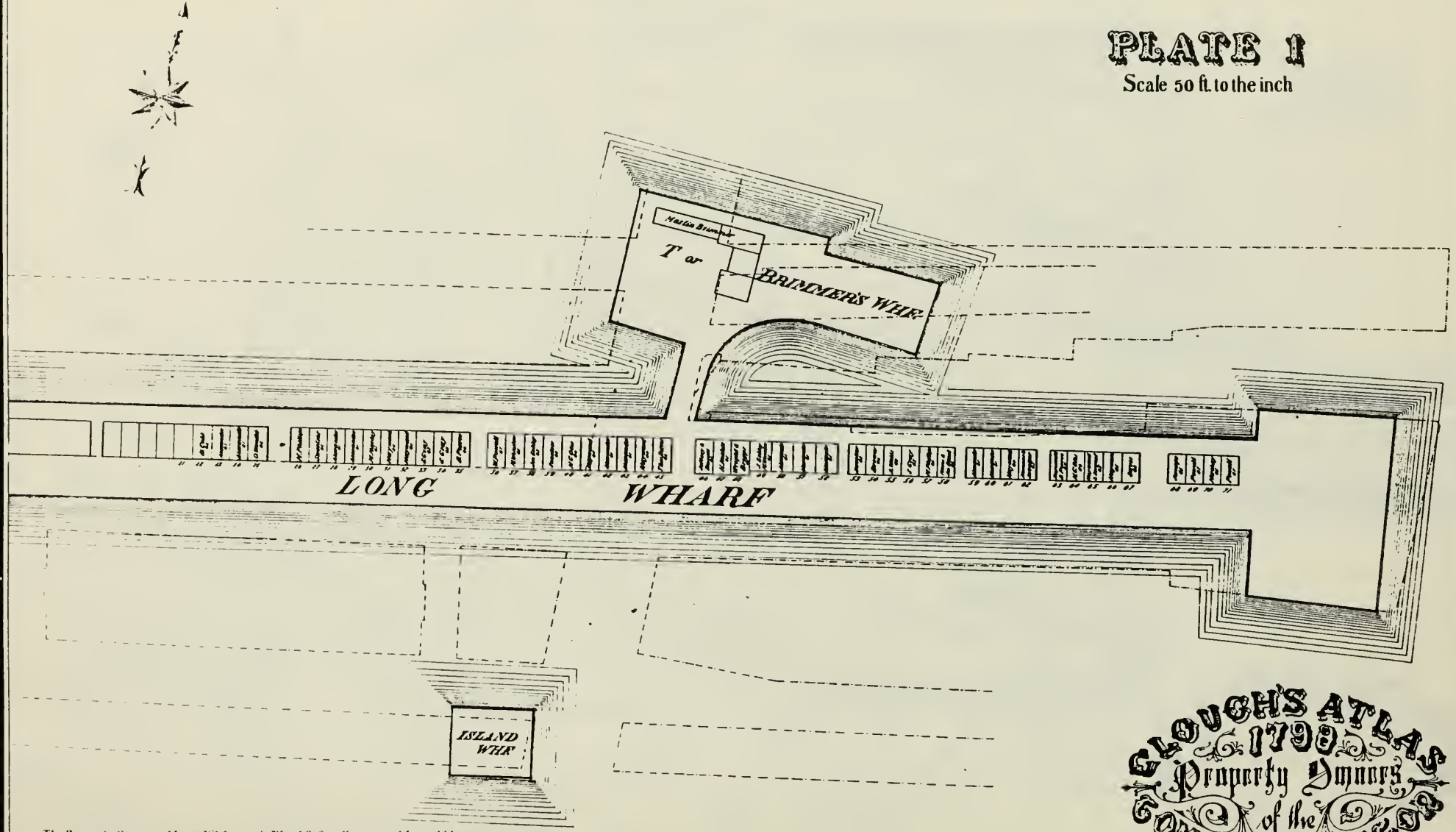


PLATE II
Scale 50 ft. to the inch
CLOUGH'S ATLAS 1798
Property Owners of the
TOWN OF BOSTON
STATE STREET
WATER STREET
CORNHILL
COURT ST.
CHURCH SQ.
OLD STATE HO.
DOCK SQ.
BRATTLE SQ.
BOYLSTON ALLEY
VEGETABLE MARKET
FANEUIL HALL
MARKET SQ.
TOWN DOCK
CODMANS WHF
N. SPEARS WHF
BRAYS WHF
GREENS WHF
D. SPEARS WHF
LONG WHF
BUTLERS ROW
MERCHANTS ROW
EXCHANGE LANE
WILSONS LANE
CORN CT.
LORINGS WHF
DOANES WHF
JACKSONS WHF
McKEANS WHF
WOODWARDS WHF
OLIVERS DOCK
SALT WHF
SALISBURY'S WHF
LIBERTY SQ.
BATTERY MARCH
CRABB ALLEY
LIBERTY A.
ADAMS ST.
DALTON ST.
HORN LA.
KILBY ST.
LEVERETT ST.
LENDALLS ROW
RUSSELLS ALLEY
DEVONSHIRE ST.
COURT SQ.
SPRING LANE
WILLIAMS CT.
WARD 8
WARD 9
WARDS

Map 13

PLATE 1

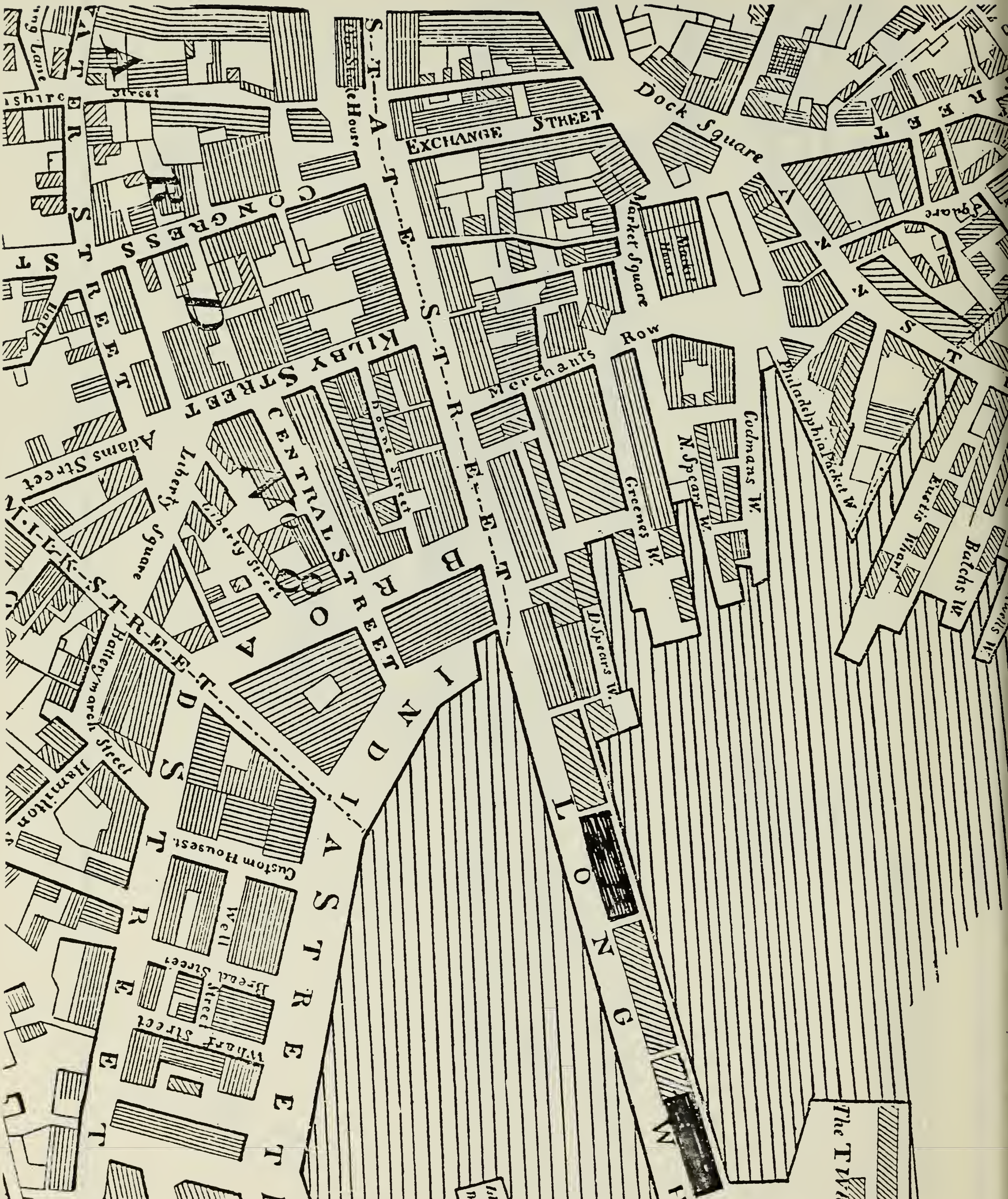
Scale 50 ft. to the inch



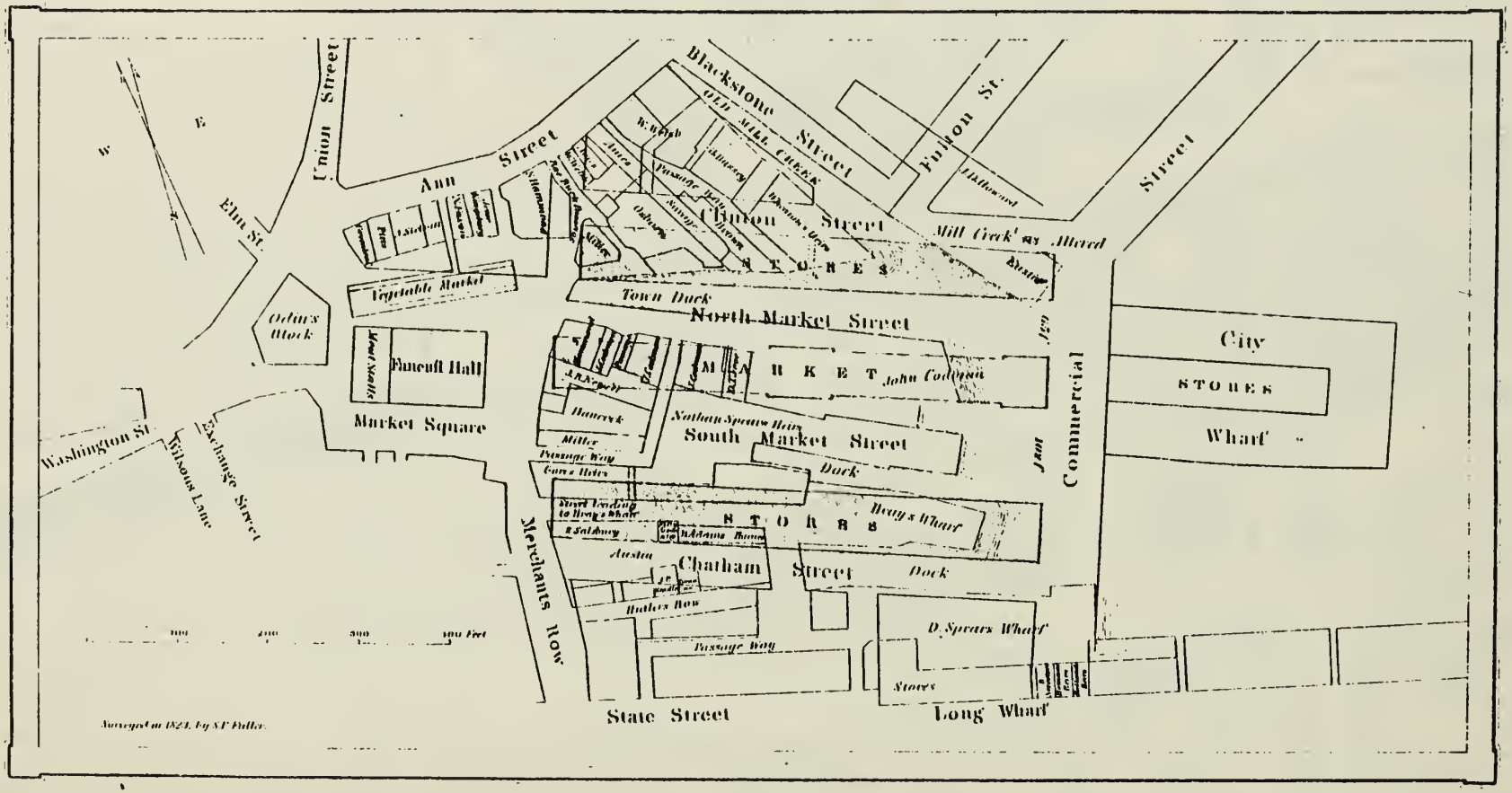
The Property Owners of Long Whf. were in Ward 8. Small nos. on whf. are bldg nos. those in properties refer to page nos in Record Comm'rs Report 22. In Clough's Blue-Book of Boston 1798 may be found the occupants and their business.
Solid black lines outline 1798, dot and dash — street lines of 1900
Public highway, Brick buildings, Wooden buildings

CLOUGH'S ATLAS
1798
Property Owners
of the
TOWN OF BOSTON

Map 14


Dock Square
EXCHANGE STREET
STATE STREET
CONGRESS STREET
KILBY STREET
Merchants Row
Market Square
CENTRAL STREET
Doane Street
Adams Street
Liberty Square
Liberty Street
MILK STREET
BROAD STREET
INDIA STREET
Batterymarch Street
Hamilton
Custom Houses
Well
Bread Street
Wharf Street
LONG WH
D.Spears W.
Greenes W.
N.Spears W.
Codmans W.
Philadelphia Packet W.
Eustis Wharf
Balchs W.
The T Wharf
Island Wharf

Map 15



GROUND PLAN OF THE MARKET HOUSE, ERECTED IN 1826, AND OF THE SPACE INCLUDED IN THE IMPROVEMENT.

Map 16

Henry H. Wilson C.E.

PLAN OF

CITY WHARF

Area of Wharf and Flats that may be built upon 50,778 Square feet.

Area of Docks ——— 36,233 Square feet.

E.S. Cresbrough, City Engineer. Aug. 14. 1852.

Scale 40 feet to an inch.

FIGURES

Figure 1

Figure 2

Figure 3

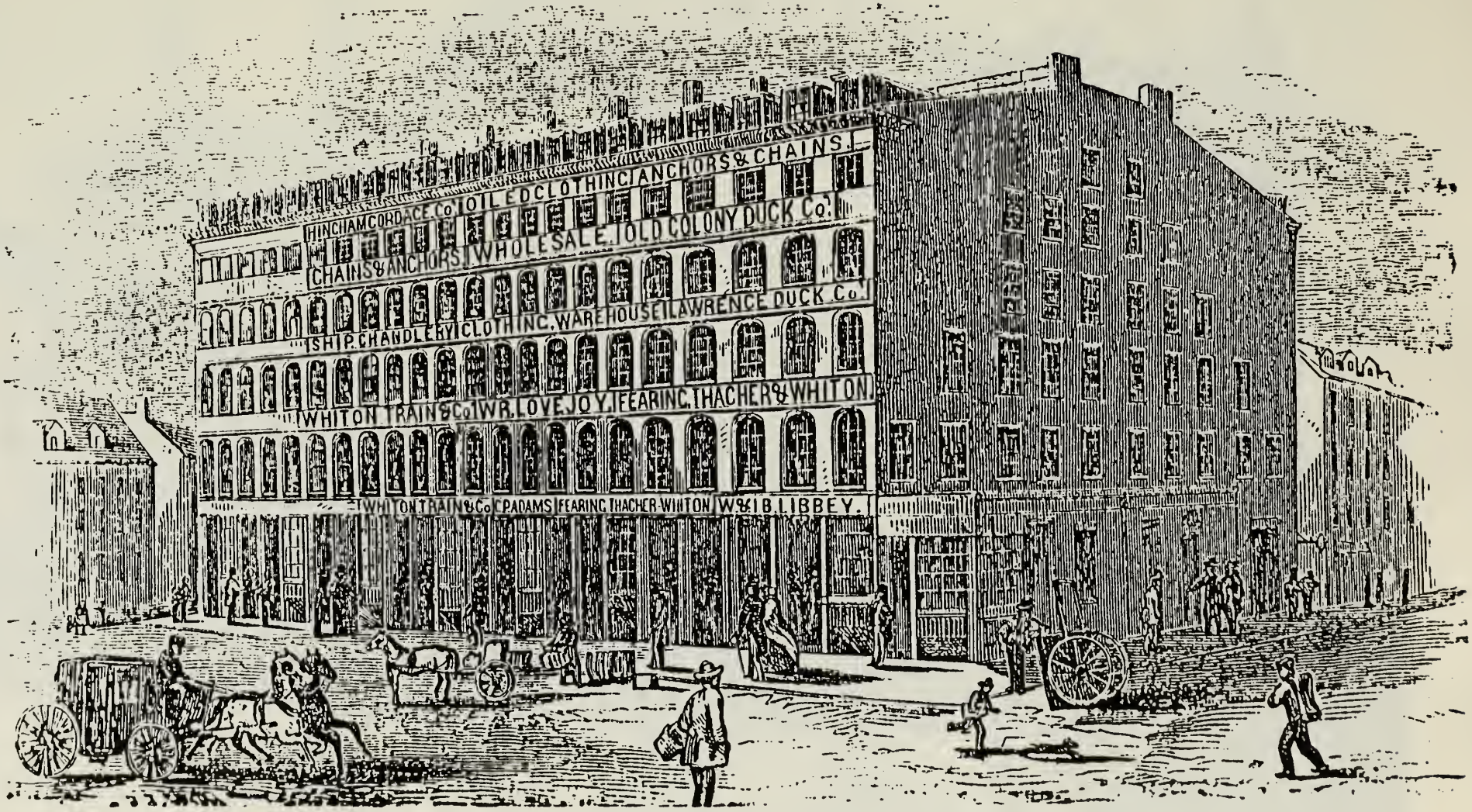

HINGHAM CORDAGE Co
OILED CLOTHING
ANCHORS & CHAINS.
CHAINS & ANCHORS
WHOLESALE
OLD COLONY DUCK Co.
SHIP CHANDLERY
CLOTHING
WAREHOUSE
LAWRENCE DUCK Co.
WHITON TRAIN & Co
WR. LOVEJOY.
FEARING, THACHER & WHITON.
WHITON TRAIN & Co
C. PADAMS
FEARING THACHER
WHITON
W & I B. LIBBEY.

Figure 4


TENTS AWNINGS

Figure 5

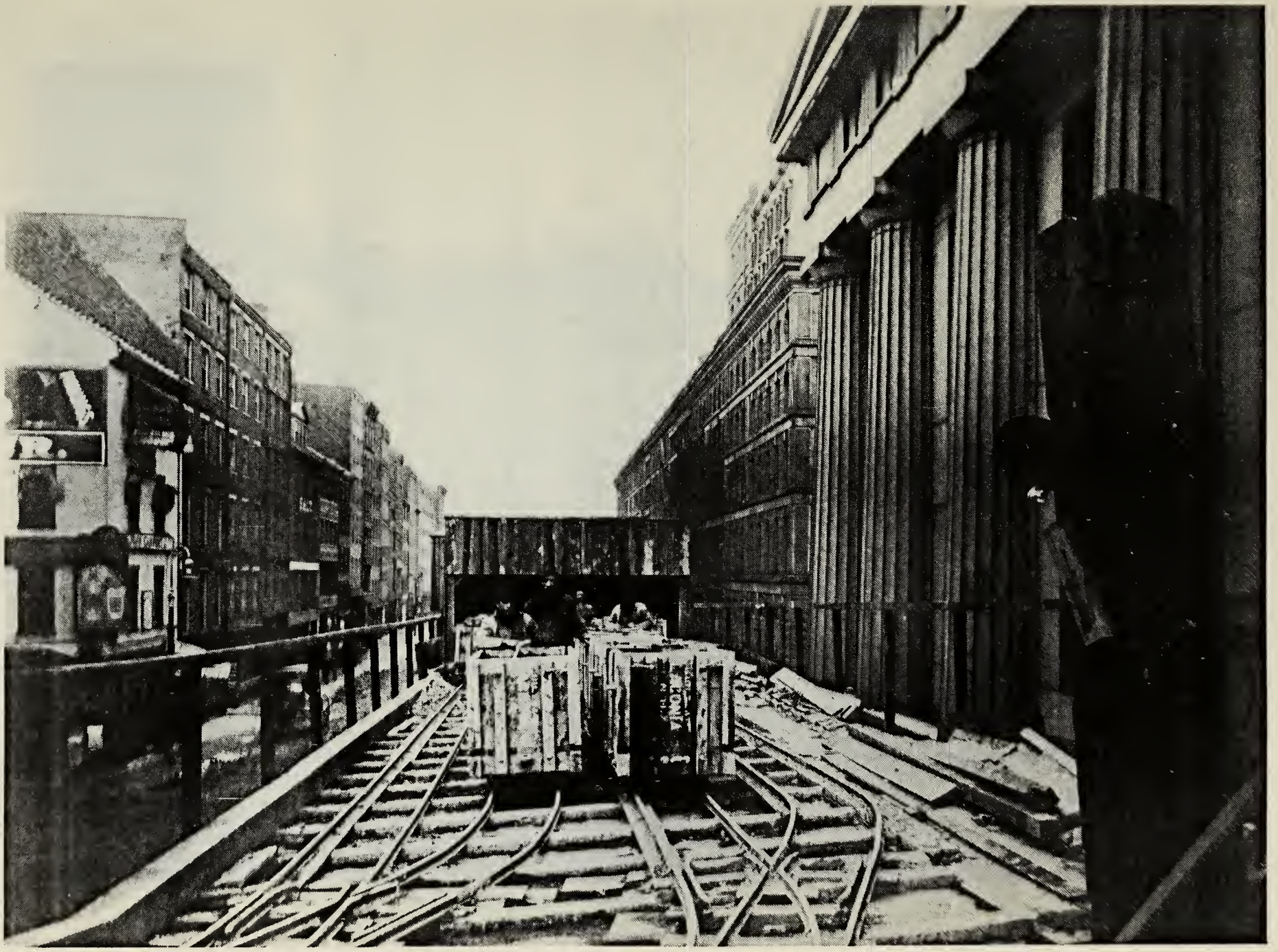


Figure 6


FORD

Figure 7. East Profile of Trench 1
(2 ft. from SE corner)

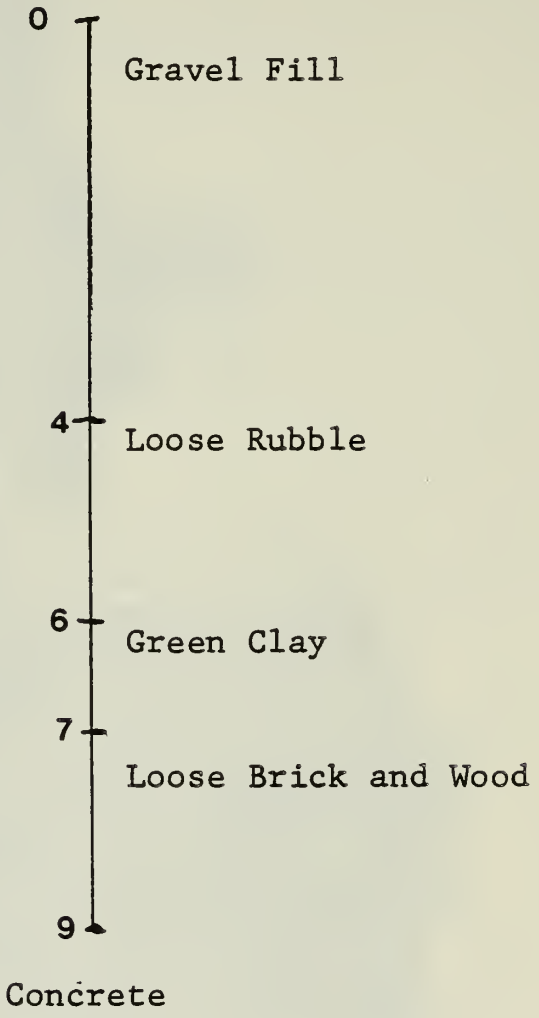


Figure 8

Figure 9

FIGURE 10. PLAN OF TRENCH 1

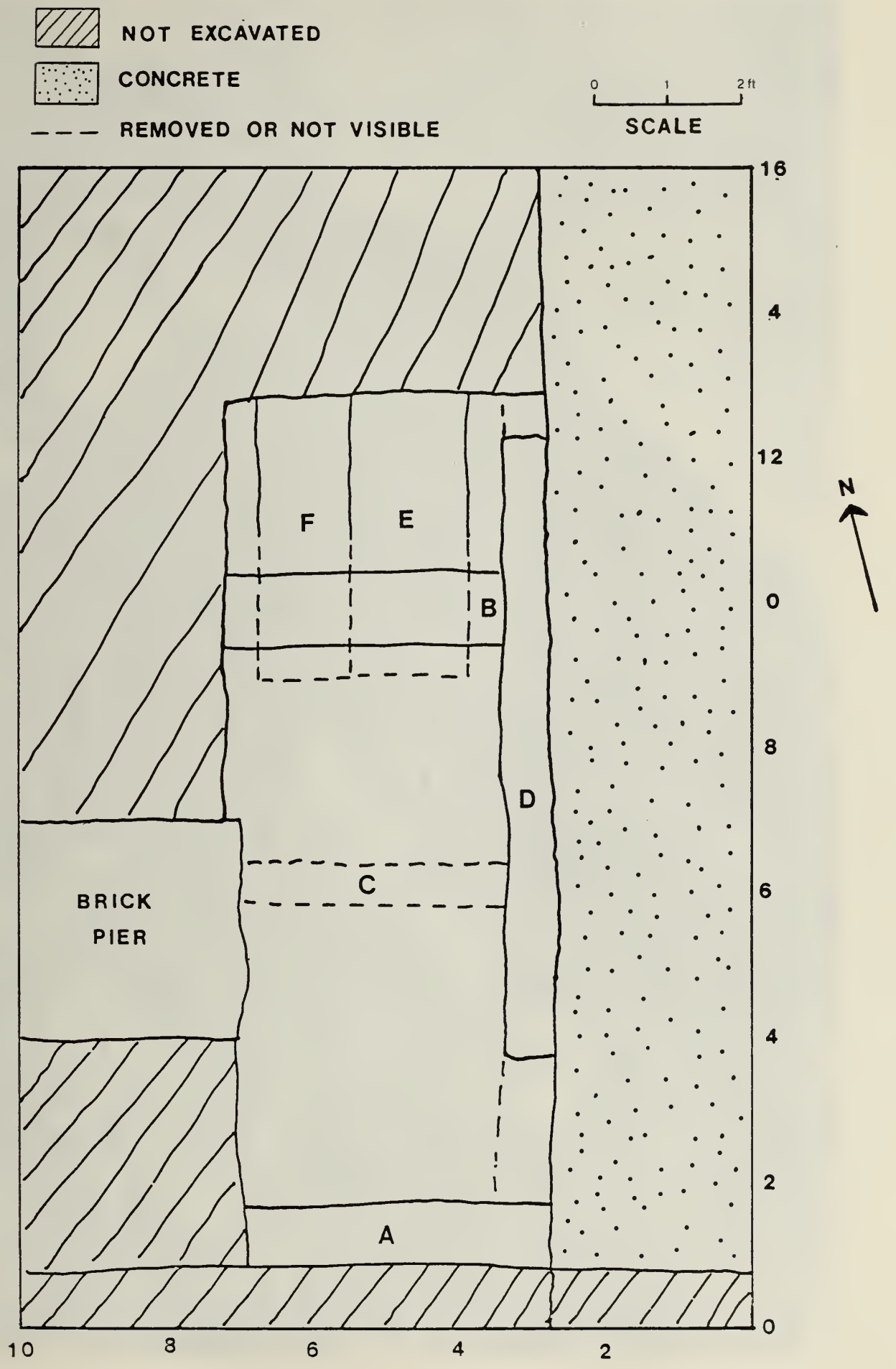


Figure 11

Figure 12

CM

FIGURE 13


NO
PARKING

Figure 14. West Profile of Trench 2
(8 ft. from SW corner)

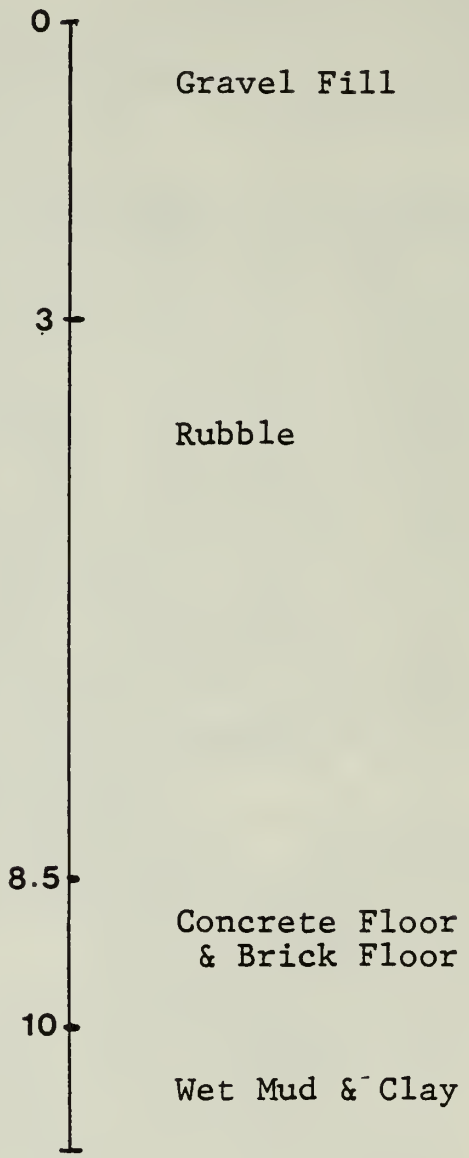
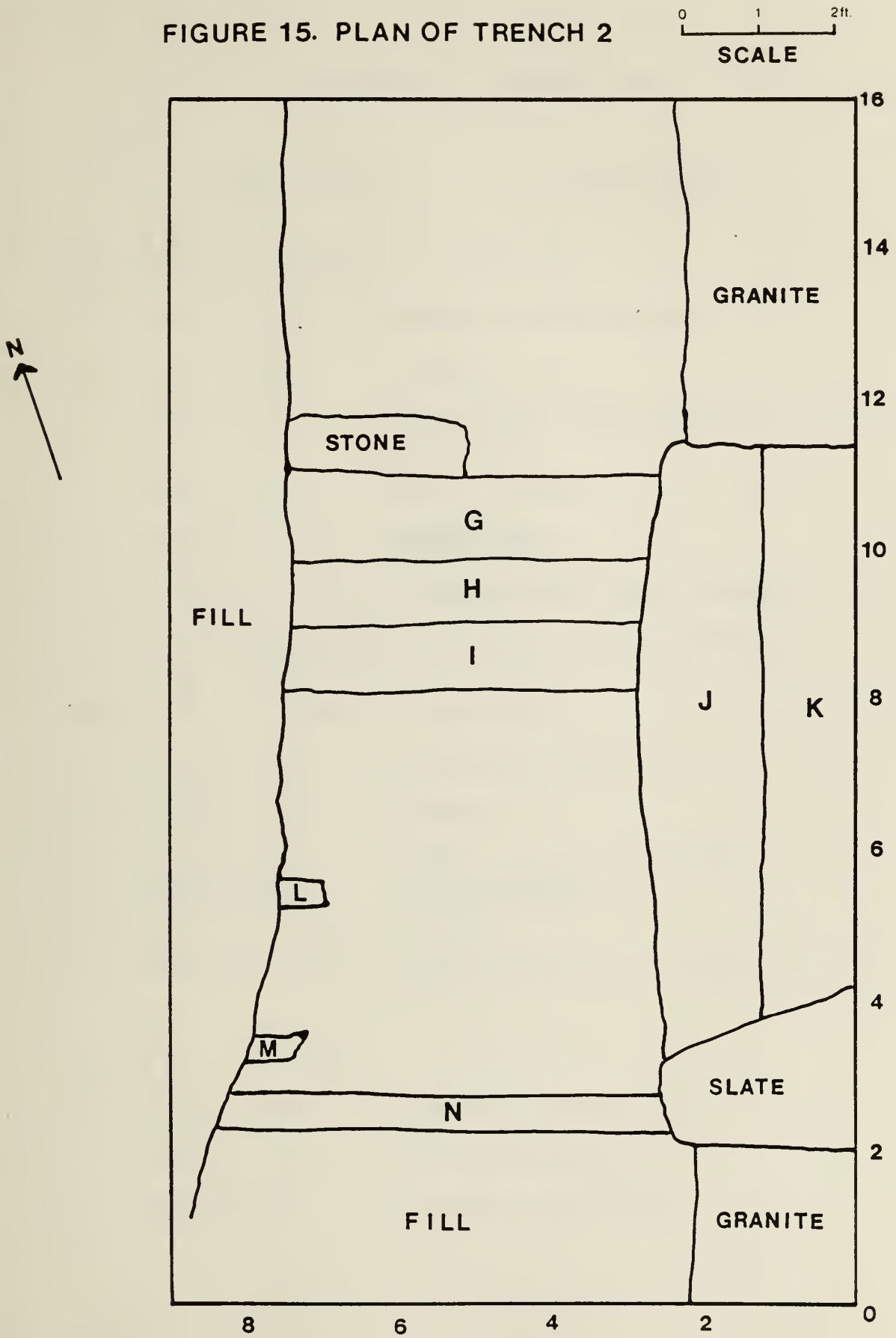


FIGURE 15. PLAN OF TRENCH 2



APPENDICES

APPENDIX I: BORING LOGS

(A) Auger (S) Split Spoon

Boring #1	9/8/82	7:45 a.m.
	0-5 ft. (A)	Gravel and brown soil
	5-7 ft. (S)	Rubble
	7-10 ft. (A)	Gray clay, wood fragments & brick fragments
	10-11 ft. (S)	10 in. cement
	11-12 ft. (S)	Wood
	12-15.5 ft. (A)	Gray mud with wood fragments
	15.5-17 ft. (S)	Gray clay with many shells
Boring #2	9/8/82	9:45 a.m.
	0-5 ft. (A)	Gravel and brown soil
	5-6 ft. (S)	Rubble
	6-7 ft. (S) 7-10 ft. (A) 10-12 ft. (S)	Shell, traces of brick, iron fragments in gray clay
	12-15 ft. (A)	Gray clay with many small shells and some peat
Boring #3	9/8/82	12:50 p.m.
	0-5 ft. (A)	Sand and gravel fill
	5-6 ft. (S)	Brick and mortar
	Obstruction	Probably brick wall

Boring #4 9/8/82 10:45 a.m.

0-5 ft. (A)	Brown sand and gravel fill
5-7 ft. (S)	Wood, brick, mortar and gray-brown silt
7-10 ft. (A)	Dry sand and small gravel. Shell at 10 ft.
10-12 ft. (S)	Rubble (brick & concrete) fill
12-13.5 ft. (S)	Concrete, brick & wood obstruction
13.5-16.5 ft.	Wood (33½" - probably a pile)
16.5-18 ft.	Gray clay and silt, many shells

Boring #6 9/10/82 6:30 a.m.

0-2½ ft.	Sand
Obstruction	Heavy concrete (?) broke 2 teeth of bit

Boring #7 9/9/82 6:30 a.m.

0-3 ft. (A)	Brown sand and gravel
3-5 ft. (A) 5-7 ft. (S) 7-8.5 ft. (A)	Brick rubble
8.5-10 ft. (A)	Wood - water 10 ft.
10-13 ft. (S)	Empty - probably blockage
13-14 ft. (S)	Gray clay mixed with brick and wood debris, then shell

Boring #8 9/9/82 12:22 p.m.

0-5 ft. (A) 5-7 ft. (S) 7-9 ft. (A)	Sand & gray green clay Clay fill
9-10.5 (A)	Brick, glass, mortar rubble
10.5-12.5 (S)	Foundation
12.5-14.5 (S)	Empty sample
14.5-16.5 (S)	Gray clay and silt mud

Boring #10 9/9/82 9:11 a.m.

(Two sites for this boring to the north and east hit a granite obstruction at 2 feet)

0-5 ft. (A)	Gravel and sand fill with pieces of granite
5-7 ft. (S) 7-10 ft. (A) 10-12 ft. (S)	Mortar and gray sand with nail fragments
12-14 ft. (S)	Gray clay with shell and wood

Boring #12 9/9/82 11:05 a.m.

0-5 ft. (A)	Gravel and sand fill
5-7 ft. (S) 7-10 ft. (A)	Brick rubble and mortar mixed with gray clay
10-12 ft. (S)	Brick, mortar, wood, a leather fragments mixed with clay
12-14 ft. (S)	Gray clay with brick fragments
14-16 ft. (S)	Gray clay with brown muck, shell, brick and tar

Boring #13 9/10/82 10:10 a.m.

0-5 ft. (A)	Gravel and sand fill
5-7 ft. (S)	Black ash/Gravel (6") Concrete (9") Brick, mortar and wood (9")
7-9.5 ft. (A)	Brick rubble
Obstruction	Probably brick foundation

Boring #14 9/10/82 8:35 a.m.

0-5 ft. (A)	Dark brown sand with some pebbles
5-7 ft. (S) 7-10 ft. (A)	Coal ash and black cinder
10-10.5 ft. (S)	Granite, concrete & mortar
Obstruction	Granite foundation

Boring #15 9/10/82 11:07 a.m.

0-5 ft. (A)	Gravel and sand fill
5-5.75 ft. (S)	Sand & oil soaked gravel
5.75-7 ft. (S)	Concrete
7-9.5 ft. (A)	
Obstruction	Probably concrete floor

Boring #16 9/10/82 12:15 p.m.

0-5 ft. (A)	Brown sand and gravel
5-7 ft. (S)	Rubble, brick, granite chunks and mortar
7-10 ft. (A)	Rubble
10-11.5 ft. (S)	
11.5-13 (S)	Granite chunks and tar
13-15 ft. (A)	
15-17 ft. (S)	Empty
17-19 ft. (S)	Gray clay with many shells, wood (and fish vertabra)

APPENDIX II: RECOVERED MATERIAL REMAINS

Trench 1

Box 1 - 12' below surface

Artifacts:	One black bead
	One White clay tobacco pipe stem (5/64) fragment
	One wood keg plug
Flora & Fauna:	One burned bone fragment
Samples:	Three brick fragments
	One mortar fragment
	One piece of charcoal

Box 2 - South of Log B - 12-13' below surface

Artifacts:	Two fragments of plain lead glazed earthenware
	Two window glass fragments
	One fragment blue plastic
	Five white clay tobacco pipe stem fragments (1-5/64, 2-4/64)
	One white clay tobacco pipe bowl fragment
	Wood
Flora & Fauna:	One bone (fish vertabra)
	One seed - Cherry
Samples:	Seven brick fragments
	Four small pieces of coal
	One piece of slate

Trench 1 - Cont.

Box 3 - North of Log B - 12-13' below surface

Artifacts: One fragment red earthenware - burned (may be a small waster fragment)

One light green case bottle body fragment

One wooden trunnel

One piece of flint

One piece of thin gray slate cut in a circle

Flora & Fauna: One fish vertabra

One bos (cow) astragalus

Four unidentified bone fragments

One seed - Cherry

Samples: Seven brick fragments

One piece of mortar

Five wood fragments

Box 4 - 13.5-13.9' below surface

Artifacts: One window glass fragment

One white clay tobacco pipe stem fragment (5/64th)

One leather fragment)

Flora & Fauna: One tarsometatarsus of a small bird

One seed - peach pit (?)

Samples: Three brick fragments

Two stones

Box 5 - 13.9-15' below surface

Trench 1 - Cont.

Flora & Fauna: One pine cone
One reed
One seed - Cherry
One unidentified femur

Samples: Three brick fragments
One charcoal piece

Bag 14A - Backdirt ca. 10.5-12' below surface

Artifacts: One unglazed red bodied earthenware
Two dark green bottle glass fragments
Six white clay tobacco pipe stem fragments (5/64)
One leather fragment
Two brick tile fragments
One chunk of flint

Flora & Fauna: One tooth
Three shells
One seed - Cherry

Samples: One brick fragment
One piece of charcoal
Two pieces of coal

Bag 15 - Wood and Brick (above concrete floor)

Artifacts: One fragment of plastic

Samples: One brick fragment
One piece mortar
One piece wood
One piece charcoal

Trench 1 - Cont.

Bag 16 - South Wall of Trench below Log A

Artifact: One fragment of buff earthenware pottery with slip decoration and pie plate edge

Bag 17 - Ca. 11-12' below surface

Artifacts: Four fragments of Staffordshire white salt-glazed stoneware. 1720-1760

One fragment refined buff-bodied earthenware (Whieldon?)

One fragment window glass

Four fragments of a dark green bottle

Four white clay tobacco pipe stem fragments

One trunnel

One fragment of Ivory or shell

Flora & Fauna: One tooth

One (squirrel?) skull

One unidentified bone

Sample: One brick fragment

Bag 18 - Backdirt ca. 13' below surface

Artifact: One piece of thick blue plastic

Bag 19 - 12' 3" below surface

No remains

Bag 20 - 13.5-13.9' below surface - backdirt

Artifacts: Ribbed red earthenware fragment with black glaze

One fragment of flint

Trench 1 - Cont.

Samples: Three pieces of wood

One piece of coal

Bag 21 - 11.5' below surface

Flora & Fauna: One (cow?) mandible

Bag 22 - 13.9-15' below surface

Artifacts: One wooden trunnel

One unidentified wood object

Trench 2

Bag 1 - Fill on cement floor

Artifact: One wire fragment

Bag 2 - Fill directly below cement and brick floor

Artifacts: One fragment domestic stoneware

Two fragments of a semi-porcelain small plate

One fragment of a porcelain insulator

One fragment utilitarian porcelain

One base and one neck of freeblown light green glass bottle

Thirty-eight fragments of brown/amber freeblown bottle glass

One unidentified nail

One wire fragment

One piece blue plastic

Three pieces of flint

Trench 2 - Cont.

Flora & Fauna: One oyster shell

Samples: Two pieces plaster

One piece wood

One piece charcoal

One piece coal

Eight pieces linoleum

One unidentifiable mass (rubber or plastic?)

Bag 3 - Fill below brick and cement floor

Artifacts: One window glass fragment

Four brown freeblown glass bottle fragments

Bag 4 - South of platform 12.5' below surface

Artifacts: One fragment lead glazed red earthenware

One fragment brown dotted buff earthenware mug rim - English

One fragment buff bodied earthenware with dark and light brown combing - pie plate rim - English

One fragment thin red earthenware

One fragment English brown saltglaze stoneware 1690-1775

One fragment window glass

Four light green freeblown bottle glass fragments

Eleven brown freeblown glass fragments

One unidentified glass fragment

One white clay tobacco pipe stem fragment

Two leather fragments

One musketball (.80 caliber has been fired - may not be accurate)

One fragment of wax(?)

Trench 2 - Cont.

Flora & Fauna: Two shells

One seed - Cherry

Samples: One brick fragment

One piece of slate

One blob tar

Bag 5 - North of platform - approximately 12.5' below surface

Artifacts: Two fragments window glass

Three fragments brown freeblown bottle glass

Bag 6 - On top of platform

Artifacts: One fragment ceramic sewer pipe(?)

Two fragments window glass

Eight fragments brown freeblown bottle glass

One white clay tobacco pipe bowl fragment

Flora & Faunda: One unidentifiable bone

One poplar or birch bark fragment

Sample: One brick fragment

Bag 7 - Fill between floor & platform

Artifacts: Two fragments domestic stoneware

Eight fragments brown freeblown bottle glass

One clear freeblown glass tumbler base with pontil mark

Bag 8 - On top of platform

Artifacts: One fragment buff earthenware with combed slipping

Three fragments brown freeblown bottle glass

Four chunks of flint

Trench 2 - Cont.

Bag 9 - Fill below platform

Artifacts: Five brown freeblown bottle glass fragments

Four wooden objects

Flora & Fauna: Two pits

Bag 10 - Fill around G, H and platform

Artifacts: One fragment unglazed redware

One buff earthenware cup rim

One fragment Staffordshire white salt-glazed stoneware (1720-1760)

One fragment domestic stoneware

One fragment utilitarian porcelain

Three pieces of window glass

Six pieces freeblown light green bottle glass

Seventeen pieces freeblown brown bottle glass

Five chunks of flint

One piece of plastic

One piece of green linoleum

One piece of brown linoleum

Samples: Three charcoal fragments

Bag 11 - Fill around G, H and platform

Artifact: One leather fragment

Bag 12 - Fill around G, H and platform

Artifacts: One glass fragment

One piece wooden lath(?)

One wooden peg

Two wood shavings

Trench 2 - Cont.

Flora & Fauna: One seed - Cherry

Bag 13 - Fill north of platform - plaster & mortar

Artifacts: Seven window glass fragments

Fifteen bottle glass fragments

Two pieces iron

One piece of rubber

One piece of linoleum

Flora & Fauna: One wood twig

Samples: Three mortar fragments

Two charcoal fragments

Two granite fragments

Bag 14 - South of platform

Artifact: One bottle glass fragment

APPENDIX III:

ANALYSIS OF MOLLUSCAN REMAINS FROM PARCEL D-10, BOSTON HARBOR

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October 25, 2983

INTRODUCTION

This document reports the identification and analysis of molluscan remains recovered during archaeological excavations at Parcel D-10 in downtown Boston, Massachusetts. The specimens were collected and submitted for analysis by Beth Bower, Archaeologist for the Museum of Afro American History and director of the archaeological work at this location.

The specimens studied were sorted from soils removed from Trench 1. The uppermost deposits from which shells were extracted lay at 12 feet below surface and dated to the second half of the eighteenth century. The deepest deposits lay at 15 feet below surface and apparently pre-dated European presence in Boston. The 1711 construction of the wharf corresponds to the deposits at 13.9 feet below surface and a bit higher.

It is assumed that all of the shells recovered and analyzed came to their sites of discovery through natural processes rather than human intervention. That is, the creatures whose shells were found are believed to have lived and died near where the shells were found, not to have been collected at one spot and consumed at another, with the shells discarded at a third spot. The nature of the assemblage--with a predominance of small individuals of species not normally eaten by human beings--supports this assumption.

Because of this assumption, the primary goal of this analysis has been the documentation of the changing environment of the harbor bottom. In large part, the change has been the result of recent human modification of nearby areas.

IDENTIFICATIONS

Table 1 summarizes the molluscan remains per each depth unit. (Table 2 gives common names.) To be counted in Table 1, a shell needed to include the umbo or "hinge" (for bivalves) or spire (for snails). If this criterion were not in force, fragmentation would inflate certain species counts more than others. For snails, the numbers in Table 1 are minimum numbers of individuals; for bivalves, the numbers equal about twice the minimum numbers of individuals.

All of the species identified are presently found in the vicinity of Boston Harbor, and no range extensions are necessary. All are marine species that could have lived in Boston Harbor.

ENVIRONMENTAL TOLERANCE

Table 2 outlines the environmental tolerances of the species identified in the assemblage. When coupled with the vertical distribution information in Table 1, several patterns emerge.

First, two species requiring intertidal, hard substrates (Littorina obtusata and Mytilus edulis) occur in the

lower levels but not in the upper. This suggests that intertidal rocks may have been removed or covered sometime around the construction of the wharf.

Second, at about the same time, there appears to have been filling or dredging of adjacent mudflats. One mudflat species (Cumingia tellinoides) appears in both early levels but in no later levels. Another mudflat species (Mya arenaria) continues through all levels but in continually decreasing densities.

Finally, the presence of Mulinia lateralis only in the lower levels suggests that the sediment load increased after wharf construction. Alternatively, wharf construction may have altered currents in such a way that the quiet water needed by this species no longer was available.

Throughout the entire sequence, subtidal bottom dwellers requiring mud substrates abounded, indicating a continuity of this environment from earliest times until filling.

SIZE DISTRIBUTION

Table 3 presents data on size distribution of Mya arenaria from the assemblage. The size of the chondrophore, the spoon-like projection on the left valve of shells of this species, has been shown to have a very high correlation with the clam's overall size and, by inference, its age (Nelson 1975). This table, therefore, provides a rough mortality table for clams in different levels. It should be remembered,

however, that breakage affects small shells inordinately, skewing the measurable sample; also, already small samples were made even smaller by the exclusion of right valves (with no chondrophores) and valves with broken chondrophores.

Shipman (1981) and others have discussed the typical mortality distribution for catastrophic death assemblages (where a catastrophe produces an assemblage with the same characteristics as a living population--many young and gradually decreasing numbers in other categories with increasing age) and for attritional death assemblages (where a population gradually dies from natural causes, creating an assemblage which mirrors typical ages at death--many young and old, but relatively few in the intermediate category).

The size distributions from the upper levels, though based on small populations, suggest attritional death. The distribution from the 13.5-13.9 ft. depth, on the other hand, is more difficult to interpret. It fits the basic catastrophic death assemblage, but the intermediate age category is considerably too high and the old category may be a bit underrepresented. This probably indicates a mixture of a catastrophic death assemblage (created by wharf construction?) with a preceding or succeeding attritional death assemblage.

The final and deepest assemblage fits no known model of death frequencies. It is either a truncated distribution where the larger individuals have been removed (perhaps by

predators?) or an inflated distribution where smaller individuals have been concentrated (perhaps by currents?). Neither of these explanations is particularly attractive, since bottom-feeding predators are infrequently so selective as implied, and since there are no indications of the concentration of other small bivalves in this level. The proper explanation remains unclear.

SUMMARY

Based on the analysis given above, the following conclusions seem warranted. In the prehistoric period and early historic period, this portion of the Boston Harbor included hard, intertidal (rocky?) substrates and mudflats. About the time of the construction of the wharf (1711-1763), the sediment load of the water increased, and the hard, intertidal surfaces were either destroyed or covered. At the same time, the amount of mudflats reduced considerably. This period also seems to have seen catastrophic mortality of certain shellfish, perhaps as a result of wharf construction. Throughout the period represented, subtidal and mud substrates continued to support shellfish.

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Depth Below Surface	*Littorina obtusata**	*Nassarius trivittatus**	*Mytilus edulis*	*Mya arenaria*	*Cumingia tellinoides*	*Mulinia lateralis*	*Nucula proxima*	*Macoma balthica*	*Macoma* sp.
12 feet	--	2	--	2	--	--	10	--	--
12 - 13 feet	--	6	--	17	--	--	10	2	--
13.5 - 13.9 feet	2	11	2	23	4	37	1	7	27
13.9 - 15 feet	--	3	9	54	1	--	1	--	--

Table 1. Numbers of shells per species and depth. Snails are marked with an (*); all other species are bivalves. All soil samples from which these were sorted measured approximately 25 liters except for the 12 - 13 ft. sample, which measured approximately 50 liters.

Species	Common Name	Environmental Tolerance
Littorina obtusata	round periwinkle	intertidal, hard substrate, among rockweeds
Nassarius trivittatus	--	subtidal, shallow water, mud substrate
Mytilus edulis	blue mussel	intertidal or subtidal (rarely, shallow water), hard substrate
Mya arenaria	soft shell clam	intertidal or (less commonly) subtidal, mud substrate, especially mudflats
Cumingia tellinoides	--	intertidal or subtidal, mud burrower, especially mudflats
Mulinia lateralis	dwarf surf clam	subtidal, shallow and quiet water with low sediment load, sand or mud substrate
Nucula proxima	nut clam	subtidal, shallow water, sand or mud substrate
Macoma balthica	--	subtidal, bays or inlets, shallow water, mud or sandy mud substrate
Macoma sp.	--	subtidal, bays or inlets, shallow water, soft substrates

Table 2. Species present and environmental tolerances.

Depth, Below Surface	Chondrophore Length, mm. 0 - 5	5 - 10	10 - 15	over 15
12 feet	1	1	--	--
12 - 13 feet	4	4	1	--
13.5 - 13.9 feet	7	4	6	--
13.9 - 15 feet	14	3	--	--

Table 3. Size distribution, Mya arenaria.

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May, 1984

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