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STAGE I-B FIELD MONITORING
TEST BORING, ELECTRIC LINE AND OVERHEAD SUPPORT LOCATIONS
BROOKLYN NAVY YARD COGENERATION PROJECT
BOROUGH OF BROOKLYN, KINGS COUNTY, NEW YORK

SEORA - K

Prepared by
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for
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1377 Motor Parkway
Islandia, New York 11788

June 1996

of Brooklyn Navy Yard

B2024?

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TABLE OF CONTENTS

INTRODUCTION AND BACKGROUND.....	1
MONITORING STRATEGY AND METHODS.....	6
FIELD MONITORING.....	8
METHOD.....	8
RESULTS.....	11
CONCLUSIONS.....	18
REFERENCES CITED.....	26
APPENDIX - TEST BORING LOGS	

FIGURES

1 - Location of Project Area.....	2
2 - Original Route of Proposed Conduit and Steam Line.....	3
3 - Revised Electrical Conduit and Steam Line Route.....	4
4 - Construction Routes With Areas of Historic Concern....	7
5 - Locations of 1995 Soil Borings.....	10

PHOTODOCUMENTATION

1 - Construction in vicinity of Dry Dock 2.....	14
2 - Conduit trench along Perry Avenue.....	14
3 - Detail of conduit trench wall showing rubble.....	15
4 - Detail of conduit trench wall with track remnants....	15
5 - Conduit trench showing sections of track remnants....	16
6 - Conduit trench showing steel I-beams.....	16
7 - Conduit trench showing I-beam in profile.....	17
8 - Conduit trench showing stratification.....	17
9 - Overhead steam line base Chauncey Ave/Second St.....	19
10 - Overhead steam line support base Second Street.....	19
11 - Overhead steam line support base Second Street.....	20
12 - Overhead steam line support base Craneway.....	20
13 - Overhead steam line support base Craneway.....	21
14 - Overhead steam line support base Craneway.....	21
15 - Conduit route Plymouth and Little Street.....	23
16 - Conduit route south side of Plymouth Street.....	23
17 - Plymouth Street excavation and utility lines.....	24
18 - Conduit near Hudson Street intersection.....	24
19 - Conduit on Plymouth Street with utilities.....	25

INTRODUCTION AND BACKGROUND

In 1993, a Stage I-A cultural resources survey, comprising a documentary study and an assessment of potential impact to cultural resources (Geismar and Oberon 1993a), was submitted to the New York City Landmarks Preservation Commission (LPC) and the New York State Office of Parks, Recreation and Historic Preservation (OPRHP). This study considered locations of planned construction in and immediately adjacent to the former Brooklyn Navy Yard associated with completion of the proposed Brooklyn Navy Yard cogeneration facility.

Because of its location on Wallabout Bay (Figure 1), where a Native American presence is possible and early Dutch settlement is known to have occurred, the former Navy Yard was considered archaeologically sensitive by the LPC. The Navy Yard, which so long played a key role in naval history and development, itself constitutes a significant cultural resource. Consequently, potential impacts were assessed where subsurface disturbance or above-ground construction will occur.

Another dimension is added to the potential for impact to buried cultural resources by the interment of unknown numbers of American Revolutionary War prisoners on the shores of Wallabout Bay after their deaths on British prison ships anchored nearby. Many of the skeletons were subsequently washed from their shallow graves and haphazardly redeposited by the tides although thousands of bodies were later reinterred, first on nearby Hudson Avenue and then in Fort Green Park. Much of Wallabout Bay was filled to expand the Navy Yard during the nineteenth century and the potential for the presence of as-yet-undiscovered human remains beneath this fill must be considered high.

Another focus of concern noted in the 1993 study was for potential project impact to cultural resources identified as the "Monument Lot," where the above-mentioned remains of a large number of Revolutionary War prisoners recovered from nearby beaches were reinterred in 1808. This site was located in the vicinity of proposed underground construction originally proposed along Hudson Avenue (Figure 2).

Revised plans for construction of the northwesternmost segment of the electrical conduit avoid the intersection of Hudson Avenue and York Street in favor of a route that passes through the southwest portion of the Red Hook Water Pollution Control Plant and along Plymouth Street, crossing Hudson Avenue just southeast of the existing Con Edison Electrical Interconnect (Figure 3). This reconfiguration eliminated the likelihood of impact to the former Monument Lot. However, natural soils

FIGURE 1 - PROJECT LOCATION

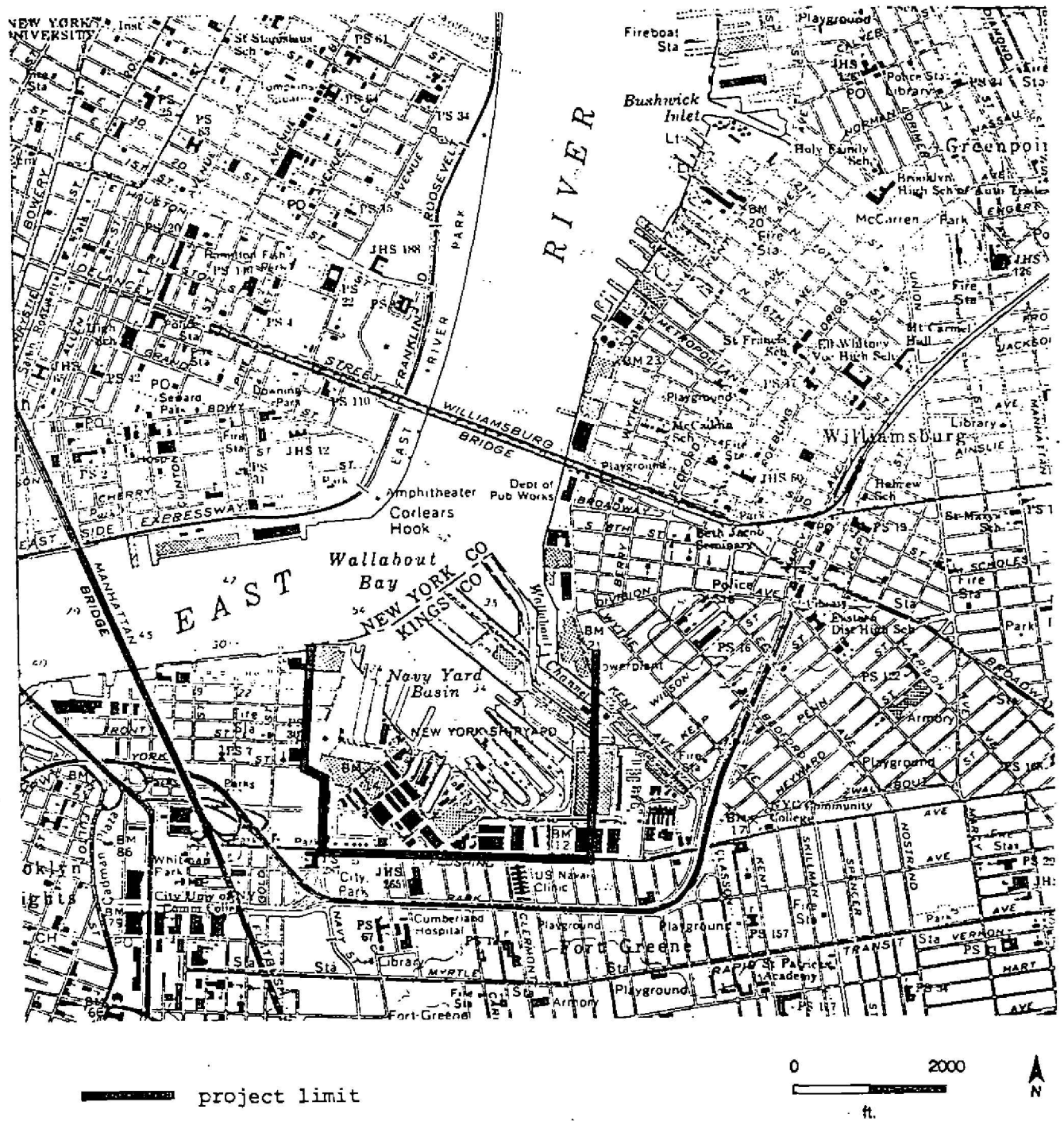


FIGURE 2 - PROPOSED UTILITY LINE PLAN 1992

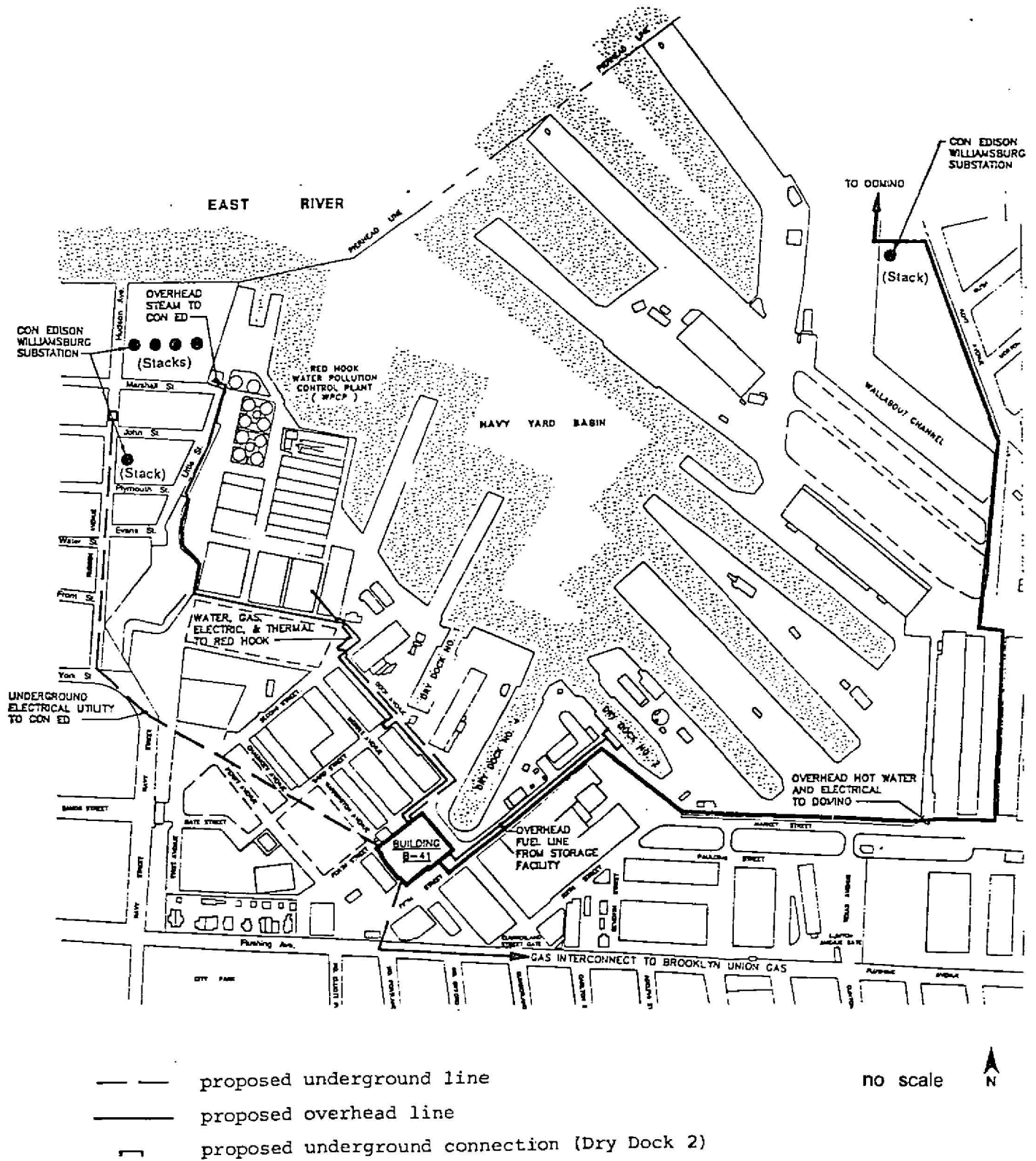
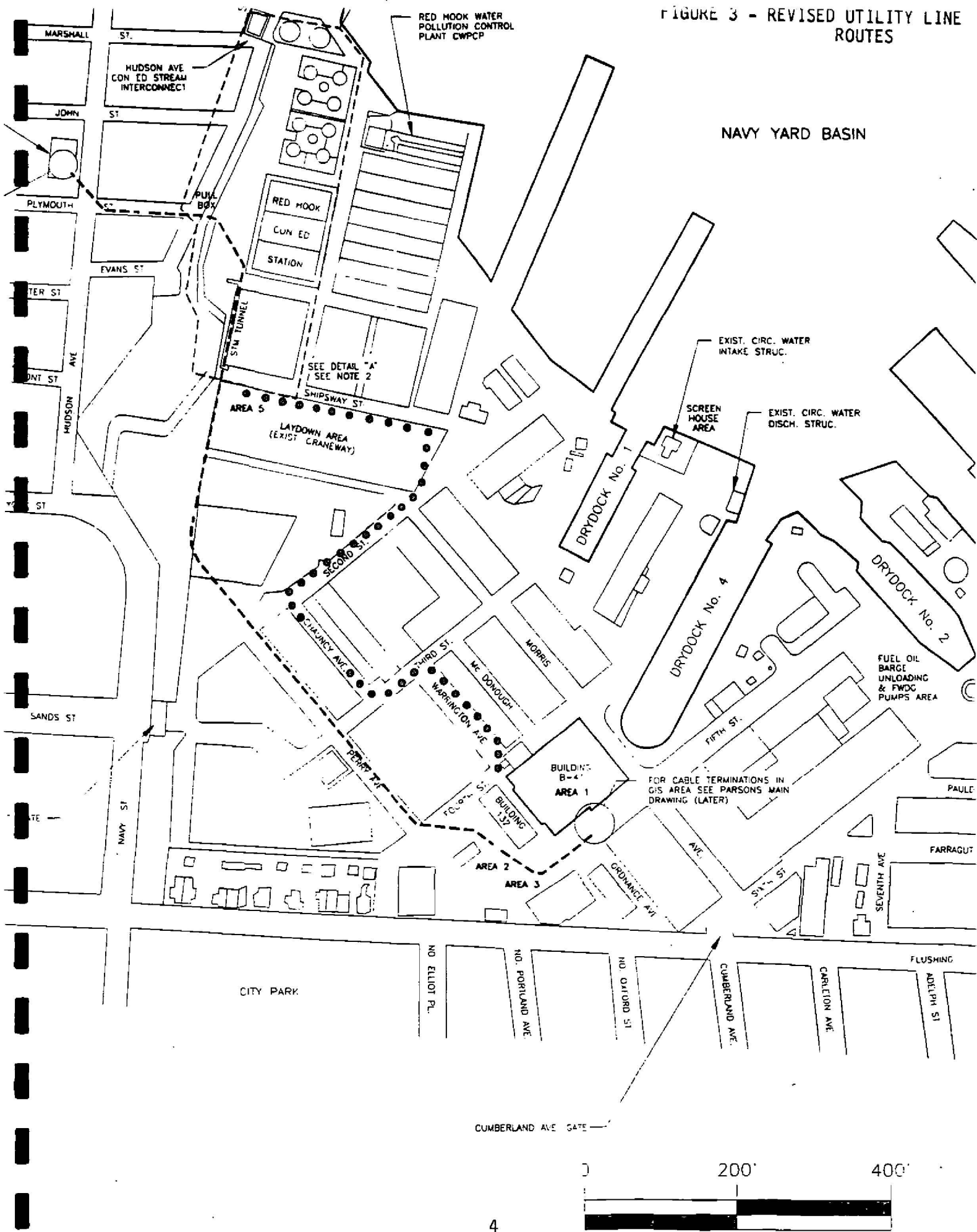


FIGURE 3 - REVISED UTILITY LINE ROUTES



anywhere in this elevated area west of the former Navy Yard have the potential to contain cultural remains associated with the Native American occupation of the region and/or with the earliest Dutch settlement. Consequently there is a possibility for impact to cultural remains beneath Plymouth Street should construction extend beneath introduced fill or previously disturbed natural soils.

Although the low-lying, salty and marshy character of the Wallabout Bay shore would not have been very attractive for Native American settlement, the possibility was noted that indigenous groups ventured here to procure the plants and animals found in this environmental setting. The potential for the remains of small, briefly-occupied camps and shell heaps was therefore considered moderate for those portions of the project area that formed the shoreline of Wallabout Bay prior to establishment of the Navy Yard and subsequent filling. The higher ground to the west, encompassing what is now the area adjacent to Hudson Avenue, would have been more suitable for longer-term Native American occupation.

Comprehensive documentary research indicated that no structures dating from the early period of local Dutch or British settlement were known to stand within the limits of project impact.

The area west of Fourth Street constitutes the oldest portion of the Navy Yard and is where the potential for construction impact to significant cultural resources was assessed to be the greatest. The Stage I-A study identified the sites of several former Navy Yard structures in this area, including Buildings 23, 13 and 15 (Geismar and Oberon 1993a:34-36). Because this portion of the former installation includes the eighteenth century shoreline of Wallabout Bay and adjacent salt marshes, the fill here is likely to be shallower and consequently the potential is greatest for construction impact to any unknown interment sites or redeposited Revolutionary War human remains. The shore and the adjacent higher ground to the west might also be the site of any Native American occupation that occurred within the project impact area.

An additional locus of potential cultural resource impact was identified along the original planned underground electric line construction route on Hudson Avenue, near the site of the aforementioned Monument Lot, but as mentioned above, the rerouting of the electrical conduit has eliminated this area as a topic of concern.

MONITORING STRATEGY AND METHODS

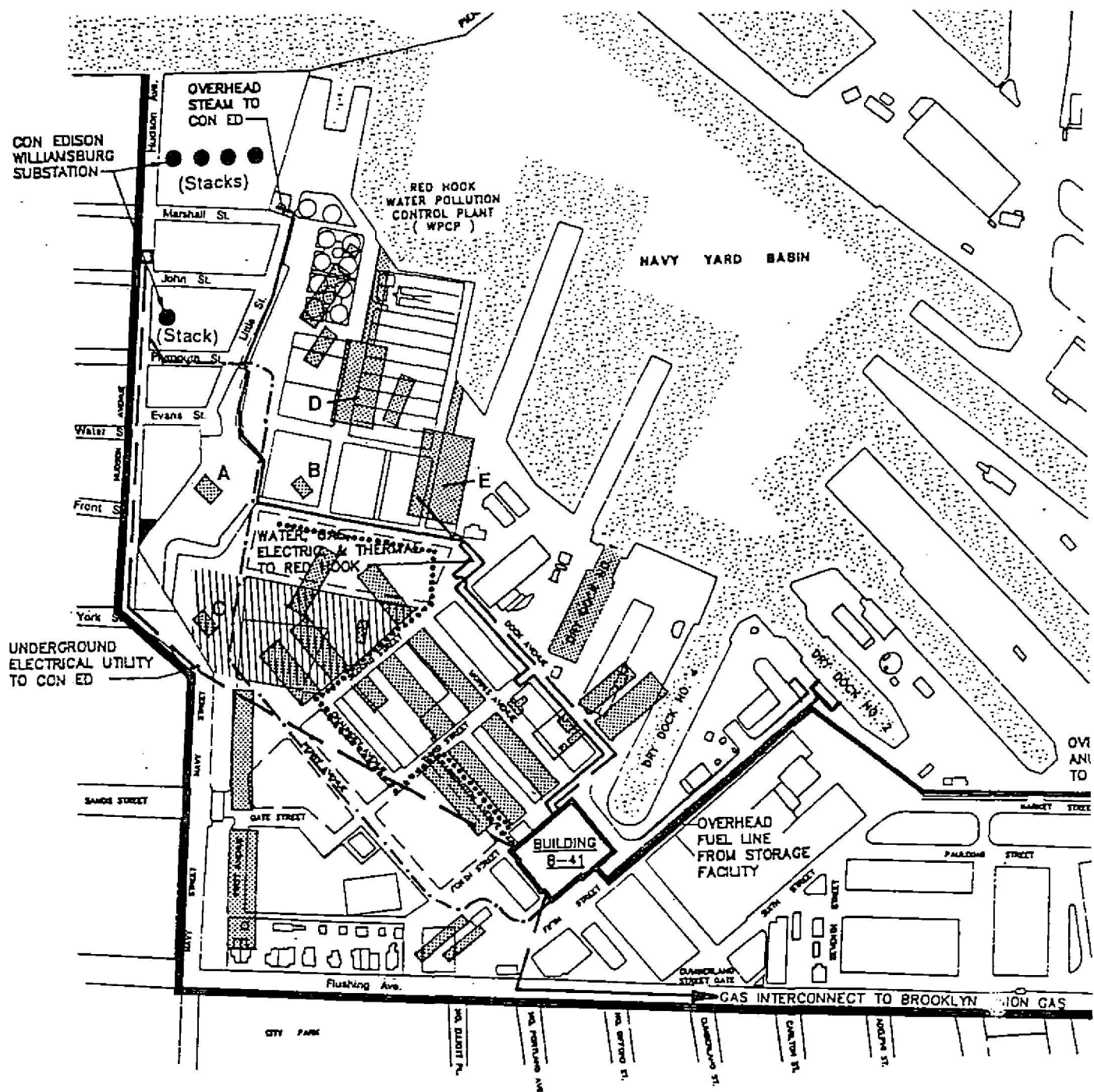
Project plans call for installing a pipeline above ground between Building 41 and Dry Dock 2 to the northeast, construction of a fuel oil storage tank area just southeast of Dry Dock 2 and the installation of an above-ground pipeline between Building 41 and the west end of Shipways Street to the northwest and an underground electrical line between Building 41 and the Con Edison Hudson Avenue Interconnect Station.

In 1994, archaeological field monitoring was carried out in conjunction with a series of test borings and installation of monitoring wells to evaluate possible soil and ground water contamination around Building 41 and along the routes of proposed pipeline construction. After consultation with the New York City Landmarks Preservation Commission (LPC), further monitoring was carried out by Stephen Oberon, one of the authors, in the area of proposed fuel oil storage tank and associated construction in the immediate vicinity of Dry Dock 2. Located just north of Market Street in the southeast portion of the former New York (Brooklyn) Navy Yard, the dry dock was built in 1890. At that time, it was the largest wooden facility of its kind. Its exterior was covered with concrete in 1902 (Geismar and Oberon 1993a:43). The results of the 1994 monitoring were presented in a report submitted in March 1995 (Geismar and Oberon 1995).

Revised plans for conducting test borings along the route of the proposed underground electrical conduit involved subsurface impact to locations along Perry Avenue and First Avenue in the western portion of the former Navy Yard. As noted in the Stage I-A assessment study (Geismar and Oberon 1993a), the potential for impact to buried cultural material was found to be greatest west and northwest of Building 41.

The revised route of test borings and electrical conduit construction will exit the south corner of Building 41 and proceed northwest along Perry Avenue and across the present NYC Department of Transportation Impound Lot northwest of Third Street (Figure 3), thus avoiding the potential for impact to the sites formerly occupied by Building 23 (southwest of Building 41) and Building 13 (between Perry and Chauncey avenues northwest of Third Street) noted in the Stage I-A report (Geismar and Oberon 1993b:35-36,38; see Figure 4). However, the potential would still exist for impact to intact buried structural remains associated with Building 15. In addition, the segment of the conduit between Second Street and the Red Hook Water Pollution Control Plant would pass through the former site of Building 4, as well as near the northwest corner of an unnamed structure depicted on Dripps' 1850 map (Geismar and Oberon 1993:25; see Figure 4). It should be noted that burials were encountered when Building 4 was enlarged in 1939 (Geismar and Oberon 1993a:42). ✓

FIGURE 4 - CURRENT ROUTE OF UNDERGROUND AND OVERHEAD CONSTRUCTION AND ROUTE FORMERLY PROPOSED COORDINATED WITH 1850 DEVELOPMENT (DRIPPS 1850) AND OTHER AREAS OF CONCERN



- project limit, western part
- 1850's buildings
- current proposed overhead lines
- current proposed underground lines
- former proposed overhead lines
- former proposed underground lines
- former location of Bldg No. 4

- A Commandant's house
- B Lyceum
- C guard house
- D ship house
- E ship house
- ▼ Monument Lot

0 450
ft.

N

Plymouth Street, where electrical conduit will be installed, had at least been laid out by 1834, at which time it and adjacent streets were depicted and named on a map of the area (Martin 1834). This map does not document any structures on either side of Plymouth Street, although buildings are noted in the Navy Yard and elsewhere in the vicinity.

Based on this information, test borings west of B-41, in the former vicinity of B-4, and along Plymouth Street were archaeologically monitored in order to determine if this activity would impact cultural remains; if so, any such resources would have been investigated in a scientific manner prior to the continuation of ground disturbing activities. Of particular concern were areas where natural soils might be encountered. Since the proposed electrical conduit followed the path of most of the test borings, monitoring would be focused where test borings extended through the fill into natural soils. Once these locations were identified, monitoring of excavation was proposed in all areas where natural soil would be penetrated by the electrical conduit.

Construction of the above-ground pipeline between Building 41 and the west end of Shipways Street was previously assessed as likely to cause only minimal impact to existing streets and no impact to existing buildings (Geismar and Oberon 1995: 3). However, the revised specifications of the proposed construction include a series of pits for the placement of supports for the overhead pipeline to be excavated along Chauncey Avenue, Second Street, and in the Craneway south of Shipways Street. Since these pits would involve substantially greater subsurface impact in a potentially sensitive area than test borings, these excavations were also monitored.

FIELD MONITORING

METHOD

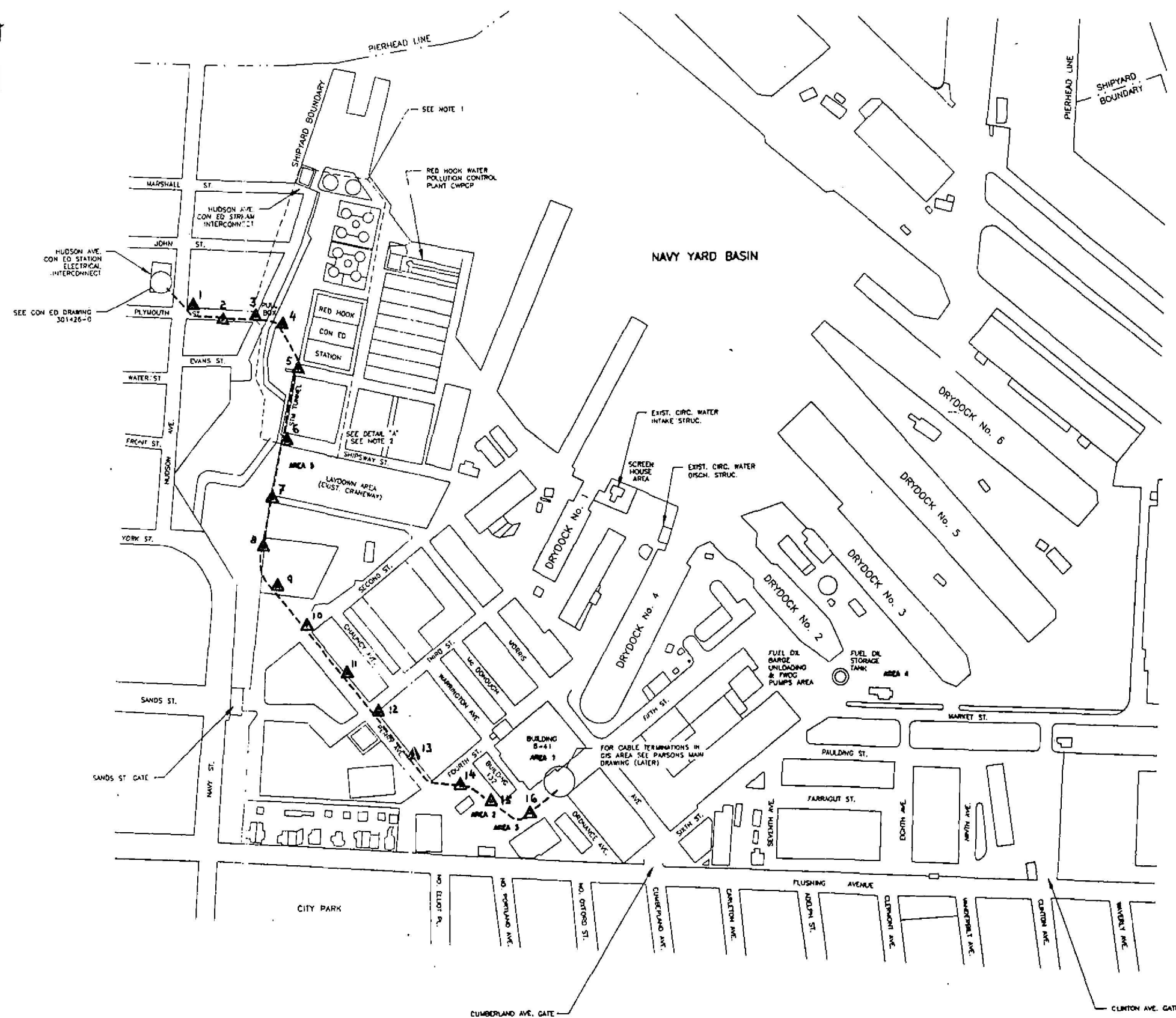
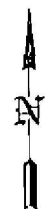
The potential for impact to cultural resources from this subsurface disturbance ranged from high to nil, based on the model of cultural resource sensitivity in and around the former Navy Yard developed in the Stage I-A study. As noted previously, the western and northwestern portions of the study area were considered most likely to contain extant cultural remains pertaining to the early history of the Navy Yard and the preceding British, Dutch, and Native American presence in the area. This included the area encompassed by First Avenue, the area northwest of Second Street including the Craneway, the site of the Red Hook Water Pollution Control

Plant, and the higher elevation north and west of Little Street (Geismar and Oberon 1993a). The same document noted that a potential exists for impact to human remains buried in what was the western portion of Wallabout Bay if sampling or other subsurface disturbance extended beneath the fill on which the Navy Yard was built. For this reason, all test boring locations west of Fourth Street (Nos. 1-13; see Figure 5) were archaeologically monitored. Split spoon samples were manually and visually examined for evidence that natural soils had been penetrated. Where natural soils were suspected, the samples were washed over 1/8-inch (3.12-millimeter) hardware cloth, and then manually examined for traces of human bone.

Data from the archaeological monitoring of previous boring and monitor well installation carried out in 1993 adjacent to Building 41 on the southeast (Fifth Street) and southwest (adjacent to Building 132) (Geismar and Oberon 1993b), had indicated that disturbance associated with construction of the electrical conduit and overhead line in these areas would be restricted to fill. It was therefore considered unlikely that subsurface construction would affect potential culture bearing soils. For this reason, test borings and construction of the electrical conduit and overhead line supports east of Fourth Street were not monitored. Though previous archaeological monitoring of test borings in the vicinity of Shipways Street and the Craneway had produced no traces of human remains, the additional subsurface disturbance associated with construction of overhead steam line supports was considered to have a moderate potential for impact to this class of cultural resource. Excavation in this area was therefore also monitored.

As noted above, each soil core was carefully examined to ascertain whether there would be impact on natural strata. Where this occurred, core contents were trowelled, subjected to close visual and manual examination, and flushed through 1/8-inch (3.12-millimeter) hardware cloth to permit recovery of any fragments of cultural material, particularly human remains.

Had any human bone been recovered, soil borings in that area would have ceased at once and appropriate LPC and OPRHP personnel notified. The various depths of fill and the type of material encountered in the soil cores were recorded in a log. Based on the soil boring monitoring and the model of cultural resource sensitivity referred to previously, construction segments where impact was not clearly shown to be restricted to fill were also monitored. This report incorporates the findings of these two monitoring components. Along with the two previous reports, it will be submitted to LPC and OPRHP for review. The results of subsequent monitoring necessitated by any additional subsurface impact



EXPLANATION

----- ELECTRICAL LINE ROUTE

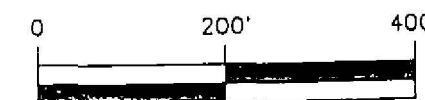


FIGURE 5 SITE MAP
AND PROPOSED SOIL BORING
LOCATIONS

Prepared For:
BROOKLYN NAVY YARD, BROOKLYN, N.Y.

ROUX ROUX ASSOCIATES INC Environmental Consulting & Management	Compiled by: H.G.	Date: 12/94	FIGURE
	Prepared by: G.M.	Scale: SHOWN	
	Project Mgr: J.D.B.	Revision: 0	
	File No: X1134008	Project: X-11.34	

to potentially sensitive portions of the former Navy Yard will be appended to this document or will be submitted independently to both agencies for review.

RESULTS

The thirteen test borings west and northwest of Fourth Street shown in Figure 5 were executed between 13 and 18 April 1995. These soil borings were drilled in six-inch vertical intervals; an auger was used to penetrate concrete and other paving, then replaced by a split-spoon. Based on the potential for encountering buried cultural resources in this portion of the project impact area, all split-spoon samples were examined as they were retrieved from the boring holes. All samples were subject to the visual and manual examination discussed previously. Where potential natural soils were encountered, samples were also water-screened through hardware cloth as described in the previous section.

The three remaining soil borings (B-14, B-15 and B-16) were placed immediately southeast of Building 41, southeast of Building 132, and southwest of Building 132, respectively. Since previous archaeological soil boring monitoring of sampling in this area (Geismar and Oberon 1993b, 1994) indicated that impact would not extend beneath the fill, these three soil borings were therefore not monitored.

Most of the borings did not extend below fill that dates from the construction of the Navy Yard and the residential area that developed along Plymouth Street during the nineteenth and twentieth centuries. The composition of this fill is detailed in the accompanying soil boring logs. Cultural material recovered from the borings consisted of small fragments of brick, coal, wood, and glazed ceramic (mostly white earthenware, some pearlware). This material represents secondary deposition dating either to the filling of the Wallabout or to the construction and repair of the structures and streets along the sampling route. As such, it may be seen to have been dislocated from its primary context. Even if its origin could be determined, the sparseness of this material and its association with recently manufactured items indicate that its cultural integrity has been compromised. The cultural material recovered from this fill may therefore be considered not significant from a cultural resources perspective.

As stated previously, natural soils in the western portion of the former Navy Yard have the potential for containing human remains associated with the interment and subsequent inadvertent redeposition of American Revolutionary War prisoners. Natural soils in the elevated area west of the Navy Yard have the potential for containing cultural remains

pertaining to Native American occupation of the area and/or its earliest period of European settlement. For this reason, examination of the test boring samples focused on identifying natural soils that formerly constituted the floor of the bay or the former shoreline.

Potential natural soils were noted only in test borings B-6, B-7 and B-8, located along First Street southeast of the Red Hook Water Pollution Control Plant (Figure 5). No trace of human bone or bone of any kind was noted in the recovered drilling core samples. No evidence of natural soils was identified in samples retrieved from drilling along Plymouth Street.

Excavation for installation of the electrical conduit followed the path of the test borings in most places and was monitored by Stephen Oberon during June and September of 1995. The excavation along most of this route did not exceed five feet (1.5 meters) in depth and was observed to be clearly restricted to fill. Thick concrete supports for crane tracks and other World War II-era constructions were found to extend beneath the proposed impact area of the conduit installation along some parts of Perry Avenue and First Avenue. The lower portions of these pre-existing structural supports, and the soil in which they are anchored, were not penetrated by this excavation.

In other construction segments, the entire conduit excavation was in construction debris composed mostly of bricks, building stone, steel beams, glass, nails, wooden beams and moldings, steel rods, cobbles, and chunks of concrete and bituminous pavement. Construction along Plymouth Street involved the exposure and displacement of abandoned utility lines in addition to brick, individual cobbles, rubble stone, pieces of asphalt, concrete, and iron pipe sections. Deeper excavation at the Little Street and Hudson Avenue ends of this conduit segment were monitored by Stephen Oberon. Impact in the intervening portion consisted solely of removing the existing pavement and hand-digging a path for the conduit that provided a clearance of roughly one foot (30 centimeters) as it snaked around existing utilities. Excavation in no part of this construction segment extended beneath the disturbance associated with existing and abandoned utilities (Harry Gregory, 1995 personal communication). A sample of the material removed in hand-digging the conduit trench was set aside to be examined by Stephen Oberon, who noted its character as described above.

Since monitoring test borings B-6, B-7, and B-8 suggested the possibility that natural soils would be penetrated, excavation of the deeper portion of this conduit construction segment along First Avenue was observed with particular care. Material

from the portion of the construction trench beneath the dense construction debris immediately below the surface was trowelled or screened through hardware mesh as described. Three soil strata were encountered: the upper level of debris just mentioned; a stratum of sand containing almost no trace of organic material; and, in the bottom of the southern portion of the trench along the west side of First Avenue, blue-grey clay.

The lack of organic material in the sand layer may reflect the exposure of deep natural strata after the removal of upper soils or possibly the introduction of a sand fill to support Navy Yard construction. The blue-grey clay, normally associated with deep deposits, was in this case found to contain pockets of coarse brown sand and what appeared to be tiny brick fragments, indicating it was most likely fill, quite possibly obtained from a nearby source.

The butchered remains of large mammals, comprising long bones and ribs, were the only bones of any kind encountered in the First Avenue trench. They were recovered in a context of nineteenth century fill from the location on First Avenue where a manhole is to be installed, just north of test boring B-9.

Building debris found during excavation of the conduit trench comprised bricks, building stones, disarticulated boards, and sections of brick, concrete, and bituminous pavement, some containing steel reinforcing rods and steel beams. What appear to represent the truncated remains of concrete walls and foundations, along with supports for crane tracks, sometimes with the track still embedded in the concrete, were encountered at various points in the conduit excavation, as illustrated in photos 2-8. These structural remains extended to depths greater than 15 feet (4.5 meters) beneath First Avenue. Neither the truncated foundations nor the track remnants and associated concrete bases, both apparently dating from the World War II era of Navy Yard construction, were considered potentially significant cultural resources.

Several vitreous clay sewer pipes of assorted dimensions were exposed in the conduit excavation. Some were encased in concrete, others in brick. Most appeared to be in situ, although the structures they served have long been demolished. These pipes probably functioned as drains and steam lines; larger-diameter pipes of this type, such as one encountered near the intersection of First Avenue and Morris Avenue just north of test boring B-6, appear to have carried fresh or waste water from the area west of the Navy Yard eastward. These pipes were also not considered significant cultural remains.



PHOTO 1 - Construction in vicinity of Dry Dock 2, located off the photograph to the left (view to ENE)



PHOTO 2 - Conduit trench along south side of Perry Avenue northwest of Third Street (view to SE)



PHOTO 3 - Detail of conduit trench wall northwest of Third Street showing concrete and brick rubble and bituminous pavement in profile (view to NE)



PHOTO 4 - Detail of conduit trench wall northwest of Third Street showing track remnants at left and concrete support base extending to right (view to N)



PHOTO 5 - Conduit trench along former course of Perr Avenue northwest of Third Street, now NYS impound lot, showing three sections of tra remnants (view to NW)



PHOTO 6 - Conduit trench excavation northwest of Third Street showing parts of three steel I-beams exposed (view to SW)



PHOTO 7 - Profile of one steel I-beam surrounded by concrete rubble
(view to N)



PHOTO 8 - Conduit trench along west side of First Avenue near
manhole location showing previous road surface or slab
of concrete with large aggregate and steel reinforcement
(view to N)

Excavation of supports for the overhead steam line that will connect Building 41 with the Red Hook Water Pollution Control Plant was monitored along Chauncey Avenue, Second Street, and in the Craneway south of Shipyard Street. Excavation east of Third Street, where the support bases are to be located within only a few feet of standing structures, was considered less likely to extend beneath fill or to have the potential for causing impact to extant cultural remains. This segment was therefore not monitored.

As may be seen in photos 9-14, most of the excavation in this area was quite shallow and spatially confined. However, since this portion of the former Navy Yard is considered to have a high potential for containing buried cultural resources, and because the small pits were dug relatively close to one another along the route of the steam line, archaeological monitoring was considered appropriate for this western portion of the steam line construction component.

Some in-place structural remains were noted, as shown in the accompanying photos 9, 12, 13 and 14. These consist of manholes lined with concrete, concrete-lined conduits whose function was not determined, concrete retaining walls apparently related to demolished structures, wooden support posts, and steel components apparently related to former activities in the Craneway. Excavation of the support bases removed concrete, brick, wood and asphalt rubble as well as associated debris, such as steel reenforcing bars, similar to those encountered during excavation of the electrical conduit. None of these remains appear to date from the early periods of the Navy Yard and none were considered significant cultural resources. No portion of the excavation for steam line support bases was found to extend beneath fill, nor did it impact cultural resources. The pits excavated along the eastern portion of Chauncey Avenue quickly filled with water and were not photodocumented. The pits dug along Second Street and in the Craneways area were photodocumented (photos 9-14).

CONCLUSIONS

Archaeological monitoring was carried out for soil cores recovered from test borings drilled within and adjacent to the former Brooklyn Navy Yard: along Perry Avenue to Third Street, northwest in what was formerly the continuation of Perry Street to First Avenue (currently occupied by the New York City Department of Transportation Impound Lot), along First Street to the present Red Hook Water Pollution Control Plant, and along the easternmost block of Plymouth Street. Observation of soil samples from these test borings indicated that the entire area sampled was limited to soils introduced



PHOTO 9 - Overhead steam line support at intersection of Chauncey Avenue and Second Street showing impact to concrete paving and structural supports (view to SE)



PHOTO 10 - Overhead line support base excavation near north end of Second Street (view to N)



PHOTO 11 - Overhead steam line support excavation near north end of Second Street (view to SW)



PHOTO 12 - Overhead steam line support excavation at east end of former Craneway location (view to N)



PHOTO 13 - Overhead line support excavation in former Craneway showing extent of impact and material encountered (view to N)



PHOTO 14 - Overhead line support excavation in former Craneway showing avoidance of concrete utility structure; edge of adjacent excavation visible at upper left (view to NNE)

during the filling of this part of the Wallabout in the nineteenth century or in conjunction with construction and repair of present or former structures and roadways. All sample soils were devoid of human remains. These soil sampling activities constituted no impact to cultural resources pertaining to any period of human occupation or use of the area.

Construction of the underground electrical line to the Con Edison Interconnect Station was also monitored. Again, no human bone was encountered. Although a variety of cultural material and structural remains was noted in construction in the former Navy Yard, none that retained any archaeological integrity was found to represent more than a small portion of the building, crane platform or other structure with which it was once associated, or to pre-date World War II-era Navy Yard construction. Impact beneath Plymouth Street was restricted to soils that had previously been disturbed by utility installation. Excavation for electrical conduit both within the former Navy Yard and along Plymouth Street entailed no impact to potentially significant cultural resources pertaining to any period of human occupation or use of the area.

Excavation for overhead steam line supports was monitored for possible impact to natural soils or potentially significant structural remains. It was found that all disturbance was confined to fill and no potentially significant structural remains were encountered. Construction of the steam line support bases also had no impact on cultural resources.

Notwithstanding these findings, there continues to be a potential for impact to unknown human remains below the fill and to cultural material pertaining to Native American and early European occupations of the area in locations not directly monitored by this and preceding efforts. We recommend that any further sampling or construction excavation that has the potential to extend below the fill in any portion of the Navy Yard be archaeologically monitored, with further field investigation performed where necessary. Any additional investigation should be appended to this document and submitted to LPC and OPRHP for review.



PHOTO 15 - Conduit installation route at intersection of Plymouth Street and Little Street (view to W)



PHOTO 16 - Conduit route along south side of Plymouth Street (view to W)

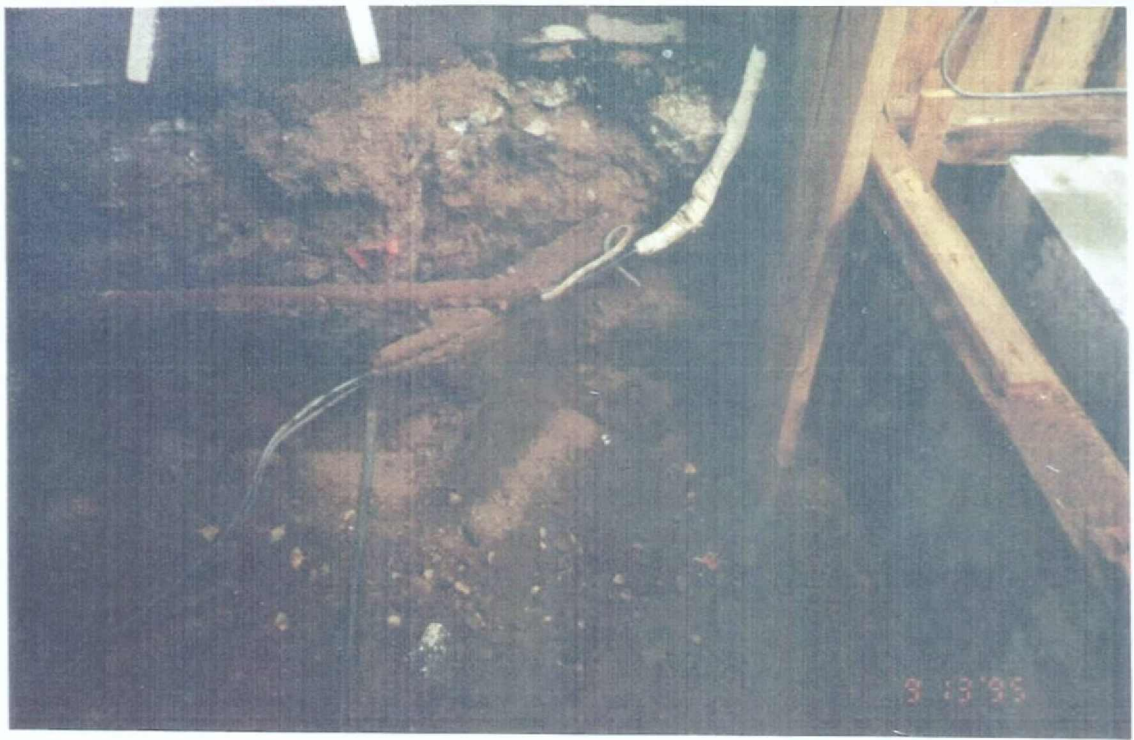


PHOTO 17 - Conduit excavation just west of manhole on Plymouth Street showing existing utilities around which line was placed (view to W)



PHOTO 18 - Path of conduit approaching Hudson Street intersection (view to WNW)



PHOTO 19 - Conduit excavation just east of Hudson Street intersection on Plymouth Street showing existing utilities encountered to base of trench (view to S)

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1993a Stage I-A Cultural Resources Survey, Documentary Study and Assessment of Potential Impact, Proposed Navy Yard Cogeneration Facility, Borough of Brooklyn, Kings County, New York. Prepared For Blasland and Bouck Engineers, P.C., Middletown, New York.
- 1993b Stage I-B Field Monitoring of Dry Dock 2 Area Monitoring Wells, B-41 Cogeneration Project, Borough of Brooklyn, Kings County, New York. Prepared for Blasland and Bouck Engineers, P.C., Middletown, New York.
- 1995 Stage I-B Field Monitoring, Monitoring Well and Test Boring Locations, Brooklyn Navy Yard Cogeneration Project, Borough of Brooklyn, Kings County, New York. Prepared for ENSR Consulting and Engineering, Somerset, New Jersey.

APPENDIX - TEST BORING LOGS

BROOKLYN NAVY YARD

WGI Warren
George Inc.

SUBSURFACE EXPLORATION

SHEET 1 OF 1
LOCATION BROOKLYN, NY
HOLE NO. E-3
LINE & STA _____
OFFSET _____

L. 95128

FOR FMNC/JOINT VENTURE

DEPTH _____ #1 _____ #1 CASING OUT DATE _____
DEPTH _____ #1 ALL CASING OUT DATE _____

DATE, START	<u>4-18-95</u>
DATE, FINISH	<u>4-18-95</u>

GROUND ELEVATION _____
GROUND WATER ELEVATION _____

CASING O.D. _____ I.D. _____
SAMPLER O.D. _____ I.D. _____
DIAMOND BIT SIZE _____

WEIGHT OF HAMMER 300-140 LBS
INSIDE LENGTH OF SAMPLER 24 IN

HAMMER FALL
CASING 24" SAMPLER 30"

[illegible]

Soil Engineer: _____ Driller: JORGE TIRADO

Drilling Inspector: _____ Helper: TONY KURZYNOWSKI

BROOKLYN NAVY YARD

WGI Warren
George Inc.

SUBSURFACE EXPLORATION

SHEET 1 OF 1
LOCATION BROOKLYN, NY
HOLE NO. B-4
LINE & STA _____
OFFSET _____

L. 95128

FOR FMNC/JOINT VENTURE

DEPTH _____ FT _____ FT CASING OUT DATE _____
DEPTH _____ FT ALL CASING OUT DATE _____

DATE, START	<u>4-18-95</u>
DATE, FINISH	<u>4-18-95</u>

GROUND ELEVATION _____
GROUND WATER ELEVATION _____

CASING O.D. _____ I.D. _____
SAMPLER O.D. 3" I.D. _____
DIAMOND BIT SIZE _____

WEIGHT OF HAMMER 300-140 LBS
INSIDE LENGTH OF SAMPLER 24 IN

HAMMER FALL
CASING 24" SAMPLER 30"

[illegible]

Soil Engineer _____ Driller: JORGE TIRADO

Drilling Inspector: _____ Helper: TONY KURZYNOWSKI

BROOKLYN NAVY YARD

WGI Warren
George Inc.

SUBSURFACE EXPLORATION

SHEET 1 OF 1
LOCATION BROOKLYN, NY
HOLE NO. B-6
LINE & STA _____
OFFSET _____

L. 95128

FOR: PMNC/JOINT VENTURE

DEPTH _____ FT CASING OUT DATE _____
DEPTH _____ FT ALL CASING OUT DATE _____

DATE START	4-17-95
DATE FINISH	4-17-95

GROUND ELEVATION _____
GROUND WATER ELEVATION _____

CASING O.D. _____ I.D. _____
 SAMPLER O.D. 3" I.D. _____
 DIAMOND BIT SIZE _____

WEIGHT OF HAMMER 300-140 LBS
INSIDE LENGTH OF SAMPLER 24 IN

HAMMER FALL
CASING 24" SAMPLER 30"

[illegible]

Soil Engineer _____ Driller: JORGE TIRADO
Drilling Inspector _____ Helper: TONY KURZYNOWSKI

BROOKLYN NAVY YARD

WGI Warren
George Inc.

SHEET 1 OF 1
LOCATION BROOKLYN, NY
HOLE NO. B-7
LINE & STA _____
OFFSET _____

L. 95128

FOR PMNC/JOINT VENTURE

DEPTH _____ FT. _____ FT. CASING OUT DATE _____
DEPTH _____ FT. ALL CASING OUT DATE _____

DATE START	4-18-95
DATE FINISH	4-18-95

GROUND ELEVATION _____
GROUND WATER ELEVATION _____

CASING O.D. _____ I.D. _____
SAMPLER O.D. 3" I.D. _____
DIAMOND BIT SIZE _____

WEIGHT OF HAMMER 300-140 LBS
INSIDE LENGTH OF SAMPLER 24 IN

HAMMER FALL
CASING: 24" SAMPLER 30"

[illegible]

Soil Engineer: _____ Driller: JORGE TIRADO

Drilling Inspector _____ Helper: TONY KURZYNOWSKI

BROOKLYN NAVY YARD

SUBSURFACE EXPLORATION

L. 95128

FOR: PMNC/JOINT VENTURE

SHEET 1 OF 1
LOCATION BROOKLYN, NY
HOLE NO. B-8
LINE & STA _____
OFFSET _____

DEPTH _____ ft _____ ft CASING OUT DATE _____
DEPTH _____ ft ALL CASING OUT DATE _____

DATE. START	4-17-95
DATE. FINISH	4-17-95

GROUND ELEVATION _____
GROUND WATER ELEVATION _____

CASING O.D. _____ I.D. _____
SAMPLER O.D. 3" I.D. _____
DIAMOND BIT SIZE _____

WEIGHT OF HAMMER 300-140 LBS.
INSIDE LENGTH OF SAMPLER 24 IN

HAMMER FALL
CASING 24" SAMPLER 30"

[illegible]

Soil Engineer _____ Driller JORGE TIRADO

Drilling Inspector _____ Helper TONY KURZYNOWSKI

BROOKLYN NAVY YARD

WGI Warren
George Inc.

SUBSURFACE EXPLORATION

SHEET 1 Of 1
LOCATION BROOKLYN, NY
HOLE NO. B-9
LINE & STA _____
OFFSET _____

L. 95128

FOR: FMNC/JOINT VENTURE

DEPTH _____ FT _____ FT CASING OUT DATE _____
DEPTH _____ FT ALL CASING OUT DATE _____

DATE START	4-14-95
DATE FINISH	4-14-95

GROUND ELEVATION _____
GROUND WATER ELEVATION _____

CASING O.D. _____ I.D. _____
SAMPLER O.D. 3" I.D. _____
DIAMOND BIT SIZE _____

WEIGHT OF HAMMER 300-140 LBS
INSIDE LENGTH OF SAMPLER 24 IN

HAMMER FALL
CASING 24" SAMPLER 30"

[illegible]

Soil Engineer _____ Driller JORGE TIRADO

Drilling Inspector _____ Helper FRED NAVARRO

BROOKLYN NAVY YARD

WGI Warren
George Inc.

SUBSURFACE EXPLORATION

SHEET 1 OF 1
LOCATION BROOKLYN, NY
HOLE NO B-10
LINE & STA _____
OFFSET _____

L. 95128

FOR: PMNC/JOINT VENTURE

DATE _____ FT. _____ FT. CASING OUT DAILY

DEPTH _____ FEET ALL CASING OUT DATE _____

DATE: 4-14-95

DATE, FINISH 4-14-35

GROUND ELEVATION _____

GROUND WATER ELEVATION _____

CASING O.D. _____ I.D. _____

SAMPLER O.D. 3" I.D.

DIAMOND BIT SIZE _____

WEIGHT OF HAMMER 300-140 LBS

INSIDE LENGTH OF SAMPLER 24 IN

HAMMER FALL

CASING 24" SAMPLER 30"

[illegible]

Soil Engineer _____ Driller JORGE TIRADO

Drilling Inspector: _____ Helper: FRED NAVARRO

BROOKLYN NAVY YARD

WGI Warren
George Inc.

SUBSURFACE EXPLORATION

SHEET 1 OF 1
LOCATION BROOKLYN, NY
HOLE NO. E-11
LINE & STA _____
OFFSE1 _____

L. 95128

FOR: FMNC/JOINT VENTURE

DEPTH _____ FT _____ FT CASING OUT DATE _____
DEPTH _____ FT ALL CASING OUT DATE _____

DATE START	4-17-95
DATE FINISH	4-17-95

GROUND ELEVATION _____
GROUND WATER ELEVATION _____

CASING O.D. _____ I.D. _____
SAMPLER O.D. 3" I.D. _____
DIAMOND BIT SIZE _____

WEIGHT OF HAMMER 300-140 LBS
INSIDE LENGTH OF SAMPLER 24 IN

HAMMER FALL
CASING 24" SAMPLER 30"

[illegible]

Soil Engineer

Driller*

JORGE TIRADO

Drilling Inspector

Helpe:

FRED NAVARRO

WGI Warren
George Inc.

SUBSURFACE EXPLORATION

LOCATION BROOKLYN, NY
HOLE NO. B-12
LINE & STA. _____
OFFSET _____

FOR FMNC/JOINT VENTURE

DEPTH _____ FT _____ FT CASING OUT DATE _____
DEPTH _____ FT ALL CASING OUT DATE _____

DATE START	<u>4-14-95</u>
DATE FINISH	<u>4-14-95</u>

GROUND ELEVATION _____
GROUND WATER ELEVATION _____

CASING O.D. _____ I.D. _____
SAMPLER O.D. 3" I.D. _____
DIAMOND BIT SIZE _____

WEIGHT OF HAMMER 300-140 LBS
INSIDE LENGTH OF SAMPLER 24 IN

HAMMER FALL
CASING 24" SAMPLER 30"

[illegible]

Soil Engineer _____ Driller: JORGE TIRADO

Drilling Inspector: _____ Helper: FRED NAVARRO

WGI Warren
George Inc.

SUBSURFACE EXPLORATION

LOCATION: BROOKLYN, NY
HOLE NO.: B-13
LINE & STA _____
OFFSET _____

FOR PMNC/JOINT VENTURE

DEPTH _____ FE _____ FE CASING OUT DATE _____
DEPTH _____ FE _____ FE CASING OUT DATE _____

DATE START	4-13-95
DATE FINISH	4-13-95

GROUND ELEVATION _____
GROUND WATER ELEVATION _____

CASING O.D. _____ I.D. _____
SAMPLER O.D. 3" I.D. _____
DIAMOND BIT SIZE _____

WEIGHT OF HAMMER 300-140 LBS.
INSIDE LENGTH OF SAMPLER 24 IN

HAMMER FALL
CASING 24" SAMPLER 30"

[illegible]

Soil Engineer: _____ Driller: JORGE TIRADO

Drilling Inspector: _____ Helper: FRED NAVARRO

WGI Warren
George Inc.

LOCATION BROOKLYN, NY
HOLE NO. B-14
LINE & STA _____
OFFSET _____

FOR FMNC/JOINT VENTURE

DEPTH _____ FT _____ FT CASING OUT DATE _____
DEPTH _____ FT ALL CASING OUT DATE _____

DATE, START	<u>4-13-95</u>
DATE, FINISH	<u>4-13-95</u>

GROUND ELEVATION _____
GROUND WATER ELEVATION _____

CASING O.D. _____ I.D. _____
 SAMPLER O.D. 3" I.D. _____
 DIAMOND BIT SIZE _____

WEIGHT OF HAMMER 300-140 LBS
INSIDE LENGTH OF SAMPLER 24 IN.

HAMMER FALL
CASING 24" SAMPLER 30"

[illegible]

Soil Engineer _____ Driller: JORGE TIRADO

Drilling Inspector _____ Helper: FRED NAVARRO

WGI Warren
George Inc.

SUBSURFACE EXPLORATION

LOCATION BROOKLYN, NY
HOLE NO. B-15
LINE & STA. _____
OFFSET _____

FOR: PMNC/JOINT VENTURE

DEPTH _____ FT. _____ IN. CASING OUT DATE _____ DATE, START _____ 4-13-95 GROUND ELEVATION _____

DEPTH _____ FT. _____ IN. CASING OUT DATE _____ DATE, FINISH _____ 4-13-95 GROUND WATER ELEVATION _____

CASING O.D. _____ I.D. _____ WEIGHT OF HAMMER 300-140 LBS. HAMMER FALL _____
 SAMPLER O.D. 3" I.D. _____ INSIDE LENGTH OF SAMPLER 24 IN. CASING 24" SAMPLER 30"
 DIAMOND BIT SIZE _____

[illegible]

Soil Engineer _____ Driller JORGE TIRADO

Drilling Inspector _____ Helper FRED NAVARRO

WGI Warren
George Inc.
SUBSURFACE EXPLORATION

LOCATION BROOKLYN, NY
HOLE NO. B-16
LINE & STA _____
OFFSET _____

FOR: PMNC/JOINT VENTURE

DEPTH _____ FT. _____ FT. CASING OUT DATE _____
DEPTH _____ FT. ALL CASING OUT DATE _____

DATE START 4-14-95
DATE FINISH 4-14-95

GROUND ELEVATION _____
GROUND WATER ELEVATION _____

CASING O.D. _____ I.D. _____
SAMPLER O.D. 3" I.D. _____
DIAMOND BIT SIZE _____

WEIGHT OF HAMMER 300-140 LBS
INSIDE LENGTH OF SAMPLER 24 IN

HAMMER FALL
CASING 24" SAMPLER 30"

[illegible]

Soil Engineer _____ Driller: JORGE TIRADO

Drilling Inspector _____ Helper: FRED NABERO

STEPHEN J. OBERON
ARCHAEOLOGICAL CONSULTANT
HAND HOLLOW ROAD
EAST CHATHAM, NEW YORK 12060

13 September 1996

Mr. Joern Seigies
Mission Energy
12500 Fair Lakes Circle - Suite 300
Fairfax, Virginia 22033

Re: Report of 1995 Stage I-B Archaeological Monitoring
Navy Yard Cogeneration Project
Borough of Brooklyn, Kings County, New York

Dear Joern:

Enclosed you will find two copies of our final report for monitoring of test borings, conduit excavation and overhead steam line support excavations, along with related maps, soil boring information, and one set of original photos. I am sending one copy unbound to facilitate making additional copies as needed, along with a copy of the invoice sent to Roux Associates to expedite payment.

Do not hesitate to call if you have any questions. It has been a pleasure serving you on this project; I hope we will have the opportunity to work together with you again in the near future.

With best regards,



Stephen J. Oberon

Co-Principal Investigator

STEPHEN J. OBERON
ARCHAEOLOGICAL CONSULTANT
HAND HOLLOW ROAD
EAST CHATHAM, NEW YORK 12060

* * I N V O I C E * *

Mr. Peter Gerbasi
Roux Associates, Inc.
1377 Motor Parkway
Islandia, New York 11788

Invoice Date: 17 September 1996
Invoice No: S0003B-I5-9-96

Re: Stage I-B Field Monitoring
Brooklyn Navy Yard Cogeneration Project
Borough of Brooklyn, Kings County, New York

FOR PROFESSIONAL SERVICES:

FOR MONITORING AND PHOTODOCUMENTATION OF CONDUIT
TRENCH AND STEAM LINE SUPPORT EXCAVATIONS AFTER
21 JULY 1995, ANALYSIS OF FIELD DATA, PREPARATION
OF FINAL STAGE IB REPORT TEXT, ILLUSTRATIONS, ETC.
IN COLLABORATION WITH JOAN GEISMAR, AS SET FORTH
IN SUBCONTRACTOR AGREEMENT DATED 17 MARCH 1995

Principal Investigators (field monitoring, travel,
data analysis, report preparation):

2 days @ \$600./day.....\$1200.00
42 hours @ \$75./hour.....\$3150.00

Production Assistant (report production)

2 days @ \$276./day.....\$ 552.00
2½ hours @ \$34./hour.....\$ 85.00

Graphics Assistant (graphics preparation)

1 day @ \$368./day.....\$ 368.00

TOTAL.....\$5355.00

TOTAL DUE ON RECEIPT....\$5355.00