ARCHAEOLOGICAL FIELD SURVEY OF THE FOREIGN TRADE ZONE PROJECT AT HOWLAND HOOK STATEN ISLAND, NEW YORK

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prepared for THE PORT AUTHORITY OF NEW YORK AND NEW JERSEY

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ABSTRACT

A literature study and visual examination of the designated areas of the Foreign Trade Zone Project at Howland Hook, Staten Island, performed in the summer of 1982, has indicated that this area was once the location of an extensive Woodland Period Village site known as the Bowmans Brook Site, first reported on in 1904 by Alanson Skinner. This extensive site has subsequently yielded material dating to the Archaic Period. It was postulated from the literature study and visual examination that some portions of this site may be preserved within the wooded eastern section of the tract immediately west of Holland Avenue. The wooded section east of the railroad spur is of less archaeological interest, and the large 7 acre area along the Staten Island Rapid Transit Line Tracks at the south end was believed unlikely to have preserved archaeological resources because of its unfavorable low topography and disturbance. Consideration of historic data and observed surface conditions suggests that the marshy ponds which have been artificially created and then refilled or altered are not likely to have any significant prehistoric evidence preserved.

The present study describes subsurface testing which was performed in three areas totaling about 3 acres on both sides of the Greiff Container Corporation to definitively determine presence or absence of archaeological resources. A total of 88 shovel tests or test excavations and 10 backhoe trenches were dug and no archaeological material was found. It is concluded that the southern portion (designated Study Areas B and C) was not greatly disturbed, but was too far removed from water courses to have been heavily used by prehistoric occupants. The northern portion (Study Area A) had been substantially disturbed in some places. There is no evidence of any prehistoric site remains on the three acres investigated.

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I. PURPOSE OF STUDY

It has been determined by discussions between the Port Authority of New York and New Jersey and the Landmarks Preservation Commission of the City of New York, that the Foreign Trade Zone Project at Howland Hook, Staten Island, requires some archaeological work to determine if there are buried prehistoric cultural resources in "limited portions of the site that were not radically altered by means of land stripping". It was decided by the above-mentioned parties that there were three areas of land which had not been disturbed between 1911 and 1981 (the date of the latest topographic maps of the study area).

In July and August of 1982, an archaeological reconnaissance without sub-surface testing was performed. The Archaeological Reconnaissance showed that:

- one of the most important archaeological sites on Staten Island (and one which has given its name to one of the diagnostic Woodland Period pottery styles) once occupied the Tract.
- it further showed that, despite extensive disturbance of most of the Tract since 1903, there are still finds made by amateurs in the old steel works area.
- 3) no scientific excavation has been conducted here for more than 60 years, and the only work then was a poorly recorded salvage operation.
- 4) approximately 3 acres of wooded land along the eastern margin of the Tract is not apparently disturbed, based on historical evidence and visual examination, and was considered to have a high probability of containing archaeological evidence (Kardas and Larrabee 1982).

For these reasons it was recommended that subsurface testing be performed in the approximately 3 acres (which lies both north and south of Greiff Container Corporation), to determine if elements of this significant site were still preserved.



II. DESCRIPTION OF STUDY AREA

A. TOPOGRAPHIC SETTING

The Foreign Trade Zone Tract under examination is on the Howland Hook, an area of relatively high ground surrounded by marsh to the west and south, near the northwest corner of Staten Island (See Figure 1). The tract is a rectangle, roughly 2,700 feet long north to south, by 1,000 feet wide east to west, comprising approximately 60 acres, bounded on the north by Richmond Terrace, on the east by an irregular boundary along the back lines of house lots that front on Holland Avenue, and around Greiff Container Corporation, on the south by a rail yard, and on the west by the Port Ivory industrial area. Artificial landfilling has moved the waterfront 1,000 feet north of its natural location. In the 17th century the shoreline was only a few hundred feet north of Richmond Terrace.

This land is generally known as the old Milliken Bros. or Bethlehem Steel factory site. The tract is now vacant, with a number of large concrete pylons and other foundations. Most of the tract is open, graded landscape with several large ponds surrounded by stands of reed grass. There are wooded areas near the south end and along the east edge, where there is slightly higher ground which does not appear to have been disturbed. It is these wooded areas, totaling about 3 acres, which are the specific study area for this report. (See Figures 5 and 6).

The tract is on a promontory of land which extends west from Port Richmond through Mariners Harbor to Howland Hook and Old Place. Elevations on the ridge are about 30 feet above sea level, with maxima over 40 feet on several knolls. The most noted of these is Gerties Hill or Knoll which was over 44 feet high in 1911, and stood immediately east of the project tract. The east edge of the tract where testing is to be performed is at elevations of 10 to 20 feet, and was originally the western or northwestern slope of Gerties Knoll.

The most significant topographic feature is a water drainage system, now partly obscured by channelization and the creation of several ponds. Water flows westward, down the slope from the higher ground east of Holland Avenue, near the north end and near the center of the wooded Study Area A, along the east side of the tract. It then gathers in several ponds, and drains northward, in some cases through or under displaced fill, toward Richmond Terrace and Newark Bay. This disturbed drainage is Bowmans Brook, which ran in a clearly marked stream course from two upper branches which combined on the tract until industrial disturbance in the early 20th century (Figures 2 -4).

The surface soils of the higher ground within the Study Area are sandy. Two foundation studies done on the tract in the last decade confirm that the higher ground has soils of a different nature than the disturbed portion of the site. The boring logs indicate that the soils along the eastern side of the project tract are clear of fill and large quantities of historic refuse. The soils in the central and western parts of the tract have as many as 5 to 6 feet of fill with cinder, brick and glass frag-

ments. This appears to indicate that the eastern soils are relatively undisturbed (Ward 1970; Woodward Clyde 1981). In the lower wet portions of the tract some of the soils contain more clay and silt.

B. REGIONAL PREHISTORY

Staten Island, politically defined as the Borough of Richmond, New York City, is geographically a part of New Jersey, from which it is separated only by the narrow tidal waters of the Kill van Kull and Staten Island Sound. The shore bordering these bodies of water in its natural state was characteristically marshy. The shoreline consisted of salt meadow and swamp cut by innumerable tidal creeks varying in length from a few hundred yards to a mile or more where the topography became wooded upland. This sequence was irregularly broken by the presence of long dunes or "hummocks" of red sand or "islands", particularly along the northern and northwestern shore of the island. Along the sound side of the Island, extending from West New Brighton and running as far as Tottenville, wherever these dunes occur, is an "unbroken chain of sites of former Indian habitations and the like" (Skinner 1909:3). These remains consist of villages, shellheaps, burial and camps.

One of the major village-burial complexes of this distribution was located at Mariner's Harbor. The tract to be surveyed coincides with the recorded prehistoric site of Bowman's Brook.

Bowmans Brook (Mariner's Harbor) Site, as described for the first time in 1909, extended over many acres from above South Avenue to below Western Avenue, with three concentrated areas around the headwaters of Bowmans Brook (also known as Newton's Creek or Dehart Brook); on Gerties Knoll; and, across Arlington Avenue (see sketch map below).



Fig. 1. Sites at Mariner's Harbor. (Skinner 1909:6) Starting in 1903 much of this concentrated area was disturbed by construction of a large steel plant by the firm of Milliken Bros. As the sand was dug out and carted away, shell pits, fireplaces and refuse dumps of a large village were exposed. Skinner recorded the presence of from 50 to 100 pits which were exposed and destroyed, many with their contents, between the years 1903-1907. These varied in size from four to six feet in width and three to six feet in depth. These contained organic food remains, tools, pottery sherds and ornaments. Later a burial ground was discovered during widening of the railroad cut. Skeletons were characteristically three to four feet beneath the sand. Some apparently represent reburials.

In an article published in 1926, Alanson Skinner referred to this site as "the greatest of Indian Sites on the north shore of Staten Island." He relates that much collecting continued at the site after 1909 while he was away at college and on scientific expeditions, and during this hiatus no notes were kept on the work. Once again in the fall and winter of 1917-18 he returned to Bowman's Brook under the auspices of the Museum of the American Indian, Heye Foundation of New York. At this time the property was owned by the Downey Brothers, a large shipbuilding firm, and although the property was further altered, he was able to find several more pits (1926:73). Skinner also reported that workmen told him of digging a trench which contained human skeletons associated with British military buttons and the remains of heavy hobnailed shoes. These he interprets were "probably Hessians wounded at the Battle of Monmouth in the Revolutionary War, and

whom tradition states were brought to this locality to recuperate" (1926:72). He does not specifically locate where these burials were discovered.

Since 1926, many amateurs on Staten Island have made additional findings at this site. The most significant of these has been written up in Ritchie's <u>The Archaeology of New York</u> <u>State</u>. Ritchie describes Anderson and Sainz digging in a small, partially bulldozed, partially trash covered, section formerly under foundry buildings, and finding a series of components of different cultures and apparently different ages. The bottommost of this sequence appears to represent the earliest known Archaic horizon on Staten Island (Ritchie 1969:143-145).

It is apparent both from present_maps_of_the project area and Skinner's description of the early 20th_century_that_most_of_ the village - burial areas and ossuary have been destroyed. However, Albert J. Anderson and Donald L. Sainz of Staten Island have continued to collect artifactual material from this property (A.J. Anderson, personal communication 7/29/82) and it is possible that small sections of the site are preserved in the wooded perimeter near Holland Avenue and below old foundations. The deep nature of the features (4 to 7 feet below the surface) and the deeply stratified nature of the multicomponents make such preservation likely since insurance and other maps of the post 1911 era show no development of several strips of land (compare Figure 4 with Figures 5 and 6).

From Skinner's notes and Smith's analysis of similiar coastal sites we can predict the following about the nature of this site: (Smith 1950)

 it is a multicomponent site with material from both the Archaic and the Woodland Periods represented.

2. in the Woodland Period it was a large village site situated near a stream containing many refuse heaps, bowl shaped pits; hearths; human and animal burials; and cultural evidence indicating a subsistence predominantly based on shell fish gathering and maize agriculture. The site yielded a wide variety of artifacts including stone tools, bone and antler industries, ceramics and good preservation of organic materials (seeds, nuts, bone, shell, etc). Burials are representative of both Woodland extended and reburial patterns and possibly historic period Revolutionary War graves.

The vast abundance of material from Bowman's Brook and the importance of the site in the development of a regional prehistory, a position it has held since 1903, indicates that some archaeological subsurface testing should be undertaken to determine if any pits, burial or village features still remain. Archaeological methodology and technology are vastly improved since 1903 when Skinner began his collections at Bowmans Brook, and any additional data which could be collected would greatly contribute to our understanding of the prehistory of Staten Island and the Central Atlantic Region.







C. RESULTS OF THE AUGUST 1982 VISUAL RECONNAISSANCE

The entire tract was examined by four persons experienced in field survey on 21 July 1982. At that time swaths had been cleared through some of the wooded areas by bulldozer to allow a boring rig access to various drilling locations. In the wooded areas these swaths had removed much undergrowth, but had avoided mature trees where possible. They had scraped the upper soil levels which made it possible to examine exposed Soil swaths (see Plates 9 & 10). For locations of the three wooded study areas please refer to Figures 5 & 6.

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We found that the soils in the wooded study area along the east edge of the tract appeared to be undisturbed sandy loams with a shallow forest humus. In the southern part of the tract were extensive reedgrass marshes. This area had clearly been disturbed, as had the location of several ponds in the east central portion (Plates 11).

An area of woods was marked for survey near the southern end of the tract. Upon visual examination, this area, near the rail yards and cut by the embankments of industrial rail spurs that once serviced the plant here, was found to be very low, with much reed grass and wet woods. It was not an area adjacent to any stream, and had considerable signs of disturbance during railroad building. This southern portion (nearly 7 acres) is considered to have very low probability for prehistoric material (Study Area C, see Plate 13).

A small wooded section (Study Area B) of just under 2 acres exists south of Greiff Container Corporation and west of Holland Avenue (Plates 2 & 12). About half of this was found to be disturbed, but the remainder had sandy soil conditions and is considered to be an area of medium probability for preservation of archaeological material, and to rank even higher because of its proximity to the former course of Bowmans Brook.

The most promising area was that north of the Greiff Container Corp, where a wooded strip of about 4 1/2 acres was on sloping land on the east side of the tract (Study A). Approximately half of this strip had been disturbed by bank cutting and other work, and at the southern end (adjacent to Greiff) there is a marshy area where the two branches of Bowmans Brook joined each other. When these portions are subtracted, there remains several acres of surface which show little visible evidence of disturbance, and are soils in which prehistoric cultural remains should be well preserved. This land is along the two former branches of Bowmans Brook, and so is an area where finds are likely, based on proximity to water.

III. RESEARCH DESIGN

The field survey was designed to include subsurface testing consisting of shovel and auger tests, with all soil screened through 1/4 inch mesh hardware cloth, to determine presence or absence of prehistoric material in a particular location, followed by careful excavation of 60 cm squares and backhoe trenches (approximately 1 M across) to locate features. Tests were to be continued in depth into C horizon soils or the water table, or where resources were found present, into culturally sterile soils. Backhoe trenches were to be made as deep as possible to show macro-stratigraphy.

The purpose of testing would be:

- 1) to determine if archaeological evidence is present
- 2) if so, to determine horizontal and vertical extent of site
- 3) to determine, if possible, cultural periods and kinds of activity represented
- 4) to determine the degree to which the site is intact, and to assess its archaeological significance
- 5) to determine the effect of the proposed development on the site
- 6) to recommend steps for avoidance or protection, if feasible, or means of mitigating the loss of scientific information, if such steps are not feasible.

A written report to professional standards was to describe the results of the testing. The present report fulfills that requirement.

IV. FIELD SURVEY

Field work was performed by a crew of 14 persons on November 18 and 19, and December 9 and 10, 1982.* a total of 88 test pits were excavated in the three study areas, 15 of which were 2 foot by 2 foot squares, and 73 of which were 20 inch diameter shovel tests. The soils from these tests were passed through 1/4 inch mesh screens and throroughly inspected for archaeological evidence. These are listed in the Test Pit Table (Appendix 1); and are shown graphically on the test pit location maps at the back of this report (Figures 5 & 6). Tripods were used to support large screens for ease in sifting soil from the 2 foot square test excavations, and for backhoe trench samples.

The 8 backhoe trenches were each 3 feet wide and ranged in length from 20 feet to 60 feet. In each case, the trench was dug as deep as the operator could go without losing the sidewalls of the trench. The high water table and porous sands limited this to between 30 inches and 66 inches.

On 18 November, Test Pits 1 through 16 were excavated along the south side of Study Area B. This first line was 300 feet long on an east to west axis. Test 1 was 30 feet west of the centerline of the dirt road (also the sewer line) at a point 45 feet north of a line projecting east along the north wall of foundation ruins for a warehouse. This line of test pits runs west by northwest for 300 feet to Test 16 which is on the rail-

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road embankment. Shovel Tests were placed every 20 feet along this line, with a 2 foot by 2 foot square placed at 100 foot intervals. At present this area is flat and heavily wooded (see Plates 1 & 2). The field crew then moved to Study Area A and excavated Tests 17 through 40 along a second survey line starting 200 feet north from the Greiff Container Corporation property and 135 feet west of the the row of houses along Holland Avenue. The same 20 foot spacing sequence was used with test squares placed every 100 feet. Brambles forced us to offset the line 25 feet to the east at Test 27, after which the testing continued for another 200 feet.

On November 19th, work started with excavation of two Test Squares, numbers 41 and 42, in the open lot adjacent to Holland Avenue, which is in the southeast portion of Study Area A. These tests were both in heavy commercial clinker fill. Having determined that the area did not contain surficial deposits, two deep backhoe trenches were excavated across this lot (Trenches A and B). Both of these quickly dug through the overlaying fill deposits and exposed varigated sandy strata which contained some modern garbage suggesting redeposition. After the water table was penetrated we were unable to climb into the trenches, and digging could not continue below this depth because any removal of bottom material collapsed the upper strata (see Plates 3-5).

Backhoe trenching was then moved into the area sampled by shovel tests on the previous day, and a series of long trenches, C through G, were dug throughout Study Area A (see Plates 6-9). Selected samples of the backdirt from all of these were screened. Analysis of the profiles will be presented in the following

section of this report. At the end of the day, the field crew excavated a series of experimental tests at the far north end of Study Area A on the slight rise of land adjacent to Richmond Terrace (Tests 43-46). These confirmed the disturbed nature of the northern end of the property (see Plates 10-11). The backhoe then moved to Study Area B and dug trenches H through J along the northern boundary to complement the distribution of hand tests and confirm that there were no deeply buried cultural deposits deposits here.

On December 9th, a line of Test Pits (nos. 47-56) was excavated running south to north at 20 foot spacing approximately 50 feet west of the eastern boundary of Study Area B. A second line of test pits (nos. 57 - 64) ran north to south parallel to the first line, approximately 190 feet to the west of it. Test Pit 74 was excavated between the two lines in the center of Study Area B. Combined with the tests manually excavated on 18 November (Nos. 1-16) and the backhoe trenches dug on 19 November (H, I, & J), this completed examination of Study Area B (see Plate 12).

We then began testing in the area west of the railroad embankment (Tests 65-73) at 50 foot spacings. The west, central and northern portions of Study Area C were determined to be too low and swampy and were not tested (see Plate 13).

The next stage of field testing was performed on 9 December, when tests 77 through 88 were placed in a grid to sample an apparently undisturbed small promontory of nearly level ground. This was in Study Area A, between two channelized water courses.

Final work, on 10 December, consisted of a visual inspection for possible additional test locations, surface survey, and collection of soil samples (see Appendix 2).

All test pits and backhoe trenches were recorded as each was completed. The soils were described and the stratigraphy measured for each, and potential archaeological evidence was noted. Detailed soil profiles were drawn for each backhoe trench as it was completed (see Appendix 1). All test pits and trenches were immediately backfilled after excavation and recording.



PLATE 1: Archaeological field crew excavating shovel tests in the line of tests across the wooded south side of Study Area B. The tests were 20 ft. apart. Each was excavated with a shovel, then the soils were passed through 1/4 inch hardware cloth mesh and thoroughly inspected for archaeological evidence. Each test was recorded and backfilled as they were completed. View faces east, from Test 13, past Test 12, to Test 11.



PLATE 2: Crew member (foreground) inspects screen for archaeological evidence at Test 12, while another team is excavating and screening Test 13, which is 20 ft. away. These tests are near the southest corner of Study Area B. View faces west.

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PLATE 3: View from Holland Ave. across the open lot at the southeast portion of Study Area A. Test Squares 41 (midground) and 42 (background) are being excavated. Backhoe Trench A was excavated between Test Squares 41 and 42, and Backhoe Trench B was excavated next to Test Square 42.

Crew members are using tripods which support extra large screens. This screening method increases the speed with which the test squares could be completed. View faces west.



PLATE 4: The backhoe excavating Backhoe Trench A in the open lot on Holland Ave. This trench revealed a very disturbed stratigraphy, composed of many layers of modern construction fill, on a former house site. Test Square 42 is being excavated in the background to the left. View faces west.

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PLATE 5: View into Backhoe Trench A, showing the north sidewall. The measuring rod indicates the depth of the trench (5 ft.), with water at the bottom. Each Backhoe Trench was thoroughly inspected and a profile was drawn of one sidewall. View faces west.



PLATE 6: Crew member clearing roots from the east sidewall of Backhoe Trench C. This trench was 60 ft. long and almost 5 ft. deep, revealing a uniform profile on both sidewalls, that indicated no disturbance of the subsoil, but removal of some of the natural surface. View faces north.

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PLATE 7: Crew member screening soils from Backhoe Trench D. Selected samples of the backdirt from all the trenches were screened and inspected for archaeological evidence. View faces north.



PLATE 8: The exposed sidewall of Backhoe Trench F. Three strata are visible in the sidewall. The top is a very dark grey loam with organic material, the middle is a strong brown sandy loam and the thick lower stratum is a red brown clay loam. This stratigraphic profile suggests a truncated soil profile. View faces east.

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PLATE 9: Backhoe filling Backhoe Trench E, after excavation and recording were completed. The trench was excavated in the bulldozed swath that runs north-south through Study Area A. View faces south.



PLATE 10: View of the heavily disturbed northeast corner of the project tract. This is a bulldozed swath through this wooded area, which is covered by a layer of fill. View faces north.

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PLATE 11: View across the dug out and completely altered former steel factory site west of Study Area A. This low wet area has been scraped and bulldozed, and rubble and fill have been strewn across it. The photographer is standing approximately on the previous course of Bowmans Brook, looking toward Richmond Terrace. View faces north.



PLATE 12: Field crew members taking soil samples at the location of Test Square 61. Samples were taken from each soil stratum, at measured depths, for close analysis for archaeological evidence. View faces north.

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PLATE 13: Panorama across the central portion of Study Area C, taken from the railroad embankment that runs between Study Areas B and C. Test Pits 65 - 73 were excavated on the left side of this view, in the southeast portion of Study Area C. Right of this view the surface elevation drops and the ground is low and wet. View faces west.

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V. FINDINGS

A. Study Area A

This study area is north of the Grieff Container property and adjacent to the rear property of the houses which front along the west side of Holland Avenue (See Figure 5). This is the north end of the least disturbed portion of the project tract. The Historic Sites Research field crew dug 40 test pits and screened and recorded 7 Backhoe Trenches across this study area and recovered no prehistoric archaeological evidence and no significant historic evidence. There was a scatter of 20th century refuse in the uppermost stratum in some of the test units, and piles of modern garbage on the surface (see Plates 9 - 11).

The test pits and backhoe trenches were placed in areas that were visually determined to have little disturbance. The west side of this study area was greatly modified and few tests were done there after it was visually inspected. Test Pits 77-88 were the westernmost tests in Study Area A, and were located on an apparently undisturbed level promontory adjacent to wet and dugout areas to the west and north. Tests Pits 17-31 and Backhoe Trench C were excavated on the east portion of this level area and revealed the same soil profile with an undisturbed lower stratigraphy (Plate 5). Test Pits 75 and 76 were placed just southeast of Backhoe Trench C at the edge of a heavily disturbed open lot on Holland Avenue. They confirmed the essentially natural condition of the ground surface up to the west edge of the lot.

The open lot on at the southeast portion of Study Area A has been greatly altered by house construction and later demolition, and contains many layers of fill. Test Pits 41 and 42 and Backhoe Trenches A and B were excavated along the north portion of this lot and revealled these layers of fill and disturbance (see Plates 3-5, and Appendix I).

Northwest of the open lot the level surface described above is interrupted by a broad drainage which runs through the 80 foot interval between Test Pits 31 and 32. This drainage is the channelized course of Bowmans Brook that runs through a second open lot on Holland Avenue east of Test Pits 32 - 34. That lot was inspected and found to be completely artificial, with construction fill and grading. The water course flows westerly from this lot between Test Pits 31 and 32, then on to the low wet area that is north of Tests 77-82. Test pits 32 and 33 indicate disturbance which was probably associated with channelizing the brook during the early 20th century (see Appendix 1).

Test Pits 34-40 and Backhoe Trench D are on the north continuation of the level surface. East of these tests the ground slopes sharply up to fill and disturbance associated with the construction of houses and outbuildings on Holland Avenue, and to the west the ground surface has been altered by earthmoving. Comparison of the 1911 topographic map (Figure 4) with current conditions (Figure 5) shows that a rail spur or siding once ran immediately along the west side of Study Area A. The same scatter of 20th century debris was recovered in the upper stratum of these ten tests (see Plate 7).

Further north is a narrow level surface with some visible disturbance. Backhoe Trenches E, F, and G were excavated here _ and revealed substantial removal of the upper strata, leaving a truncated profile with lower strata only (see Plates 8 & 9). Directly east of these tests is a sharp slope down into an area of massive surface modification with standing water, in a former steel factory pond location (see Plates 10 and 11, and Figure 4).

Test Pits 43 through 46 were excavated in the extreme northeast corner of the project tract, north of study area A and just south of Richmond Terrace. This area has been scraped and filled, as indicated by the finding of modern rubble, garbage and clinker at the bottom of these tests, the deepest of which penetrated more than 1 M.

In summary, Study Area A appears to be sufficiently altered in most parts to have destroyed any archaeological evidence. The only portions of any size with minimal disturbance were the level promontory or terrace south of the water course, examined by Tests 77 through 88, and a smaller terrace just north of the water course. Top soil had been removed in a narrow area at the foot of disturbed slope near the north end of Study Area A, examined by Backhoe Trenches E, F and G. Information from local residents indicated that some prehistoric material could be found in the large vacant area east of Holland Avenue (and out of this project). None reported finding anything in gardens of rear vards adjacent to Study Area A. We conclude that prehistoric occupation was originally further east than Study Area A (i.e. near Gertie's Knoll, and on the gentle slope south of it, part of which is now the vacant space east of Holland Avenue), and in a

few desirable locations west of Study Area A, which were subsequently removed by the early 20th century construction observed by Skinner. The thin north-south strip of woods representing Study Area A was mostly on a northwest facing slope between these former two occupation areas and presented a relatively less desirable habitation site. Following that, substantial portions of Study Area A have been modified, although this was not readily evident until subsurface tests had been made. If there ever was any prehistoric occupation in this area, the disturbance has destroyed the evidence.

B. Study Area B

This area is bordered on the north by the Grieff Container property, which has been graded and bulldozed, on the east by massive alteration associated with construction of the sewer line, on the south by 20th Century concrete factory foundations and construction disturbance, and on the west by the railroad embankment which turns north into the former Milliken Factory Complex (see Figure 6, and Plates 1,2, and 12).

This relatively undisturbed area, approximately 340 feet by 280 feet, slopes gradually down to the west. The western portion is low with a marshy area. All of the tests in this area revealed similiar soil types and stratigraphy. Only Test 16 was radically different and it was excavated into the railroad embankment. These tests occassionally recovered modern 20th century refuse in the upper stratum, but no other archaeological evidence. Study Area B is considered to be relatively undisturbed, but too far from water courses to make it a favored occupation area.

C. Study Area C

Test Pits 65-73 were excavated in the southeast portion of this study area. This portion of the study area is part of the same gentle slope to the west that is seen in Study Area B, and is separated only by the railroad embankment. These tests revealed soils and strata consistent with those found in Study Area B, but with a greater clay content and indications of gleying suggestive of a high water table (see Profile of Test 66, and Figure 6 and Plate 13). No archaeological evidence was recovered.

The portions of this study area to the north and west are very low marshy areas with standing water making archaeological testing impractical. The pond at the west end is probably associated with the construction of a large railroad embankment on its west, the alteration to the flow of water, and the construction of ponds for the Milliken Factory. Both the west and north portions of Study Area C appear to have been heavily modified by construction of the Milliken complex. The tested portion of Study Area C is considered to be subject to the same interpretations as Study Area B.

D. Interpretation of Soil Stratigraphy

1. Previous Interpretations

A hypothetical reconstruction of the soil sequence at Bowman's Brook was published by Ritchie in 1969 based on conversations with Anderson and Sainz. He described a series of components of different cultures and apparently different ages "enclosed in a homogeneous tan-colored sand which covers the

whole northern shore area". Depth precision is questionable in this model because the series discussed was not directly superimposed and there was no surface datum. Material was recorded from a humus zone (Ø-14 inches thick) with underlying sand variously referred to as "red" or "tan" to depths of 32 inches from the surface. Most of the artifacts and features were concentrated between 16 and 22 inches of the surface (Ritchie 1969: 146-148).

Other archaeological sites in Staten Island may provide a model which can be used to interpret the Bowman's Brook soils. Typical soil stratigraphy at Harick's Sandy Ground and the Goodrich site indicate the following sequence: humus and brown earth (Strata I and II) ranging in depth from 5 to 11 inches and containing aboriginal materials, overlying a yellow sand (Stratum III) about 12 inches thick, overlying a "beige sand" and red clay with rocks. Artifacts are almost entirely concentrated above the "beige sand" (Lavin 1980, Eisenberg n.d. :7).

2. Soil Profiles from Study Area B

Tests 1 through 16, and 47 through 64 show natural soils formed on sloping topography with parent material (red clay/shale) near the surface along the highest elevations and greater depth of sandy deposits as one moves down the slope. The subsoils are sandy loams and clay loams with numerous clay intrusions, not typical of known site areas (see below). A typical profile here is as follows: a dark brown humic sandy A horizon, sometimes with modern debris, overlying a strong brown to medium or yellow brown loamy sand. In those tests which were dug into parent material a reddish sandy clay or pale red clay was found at the bottom with broken shale bedrock immediately

below that (see Profiles of Tests 1,2,8,10,12,13,56 and 60, and fmodern debris Backhoe Trench H).

ca. 36 in. or 90 cm. humus & thin underlying brown sand strong brown loamy sand pale red clay

< * X decomposing shale bedrock

This is congruent with the typical profiles derived from Ritchie, Lavin and Eisenberg. According to these sources artifacts are primarily concentrated in the upper part of the yellow brown sand. No prehistoric artifacts, features or site indicators were present in any of the tests excavated in Study Area B.

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Analysis of pollen from a sample near the west center of Study Area B indicates that the lower strata (7 to 20 inches depth) were soils accumulated under conditions moister than those prevailing in that location recently, when the upper 7 inches of soil accumulated (see Appendix 2). There was evidence that cleared ground (for housing or industrial developement, or for agriculture or horticulture) was nearby throughout the soil column, which suggests that this soil sample, at least into the third stratum, has developed since European settlement of the general area during the late 17th or 18th century. Also present in the surface stratum was a great quantity of black particles, traces of which were also present in the lower samples. We interpret this black material to be particles of coal soot or fly ash from the Milliken Brothers Steel Works (in operation by 1907 immediately northwest of Study Area B), and/or from the railroad switchyard (immediately to the south, and in operation during the 1890's). The trace of black particles in the lower levels is

probably contamination from the sampling process. In summary, the soil sampled by Test 61, which is representative of Study Area B, has accumulated from at least 15 or 16 inches depth to the present surface recently, probably in the last three centuries, at first under moist conditions. Very recently the conditions were noticeably drier, and a heavy concentration of carbon particles was present. This represents the 20th century period, after the railroad spur embankment separated this area from the lower, wetter land to the west, and when industrial air pollution created soot fall-out.

3. Soils in Study Area C.

Profiles in Study Area C (tests 65 through 73) show gleyed or clay subsoils overlain by a thin sandy humus. No prehistoric site indicators were present in any of these tests. A pollen analysis was made here also, a short distance west of the railroad spur embankment (see Appendix 2). It indicated moist conditions, like those in the lower strata in Study Area B. There was evidence of cleared ground nearby, and abundant black particles. This is reasonable, because the sample is on the windward side of the raised railroad embankment, and several hundred feet closer to former sources of industrial air pollution. It also is apparently a soil which accumulated fairly recently.

4. Soils in Study Area A

Profiles in Study Area A demonstrated two different sequences: Tests 17 through 31 and 77-88 were excavated in deep sandy deposits overlain by thick humus and a scatter of modern

trash. These cross a small sandy promontory between two of the channelized drainage courses of Bowman's Brook, and although the stratigraphy appears 'natural' it was devoid of all prehistoric cultural material or site indicators.

Tests 32 and 33 were adjacent to an arm of Bowman's Brook which was channelized by 1911, and showed mixed clay strata indicative of altered or overturned stream bed and bank soils. Tests 34 through 40, continuing north with Backhoe Trenches D, E, F, and G, were all made north of this channelized arm of Bowman's Brook. The zone between tests 34 and 40 was generally comparable to the area south of the arm of the brook, and presented a similiar 'natural' stratigraphy, also without prehistoric artifacts.

The entire tract north of Trench G has been scraped and then refilled with reddish clay soils, clinker, and 20th century garbage. The contours there clearly show a steep, artificial, slope, created during the steel plant construction or levelling of house lots along Holland Avenue.

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APPENDIX 1

TEST PIT AND BACKHOE TRENCH PROFILES



Historic Sites Research, Dec. 1982



Historic Sites Research, Dec.1982

TEST PIT TABLE

Note: All test pits were excavated into sterile subsoils.

(2x2)= 2ft.x2ft. Test Square, all other Test Pits were 20in. diameter shovel tests.

* = Test Pit contained 20th century debris.

TEST	DEPTH	SOIL STRATIGRAPHY
1	75cm	see profile sheet
2	60cm	see profile sheet
3	45cm	same as Test 2
4(2x2)	85cm	same as Test 2
5	60cm	same as Test 2
*6	60cm	same as Test 2
7	60cm	same as Test 2
*8	110cm	see profile sheet
9(2x2)	55cm	same as Test 2
10	55cm	see profile sheet
11	50cm	same as Test 10
12	60 cm	see profile sheet
13	бØст	see profile sheet
14(2x2)	65cm	same as Test 10
15	95cm	same as Test 2
16	45cm	see profile sheet
17	60cm	see profile sheet
*18	60cm	see profile sheet
19	65cm	same as Test 2
20	55cm	same as Test 2
21	6Øcm	same as Test 2
22(2x2)	160cm	see profile sheet
23	75cm	same as Test 2
24	8Øcm	same as Test 2
25	75cm	same as Test 2
*26	6Øcm	same as Test 2
*27 (2x2)	105cm	same as Test 2
*28	85cm	same as Test 2
29	75cm	same as Test 2
*30	8Øcm	same as Test 2
31	75cm	same as Test 2
32	8Øcm	see profile sheet
*33	65cm	see profile sheet
34(2x2)	125cm	same as Test 2
35	75cm	same as Test 18
36	7Øcm	same as Test 18
*37	75cm	same as Test 18
38	75cm	same as Test 2
*39 (2x2)	65cm	same as Test 2
40	70cm	same as Test 18

TESI	2	DEPTH		SOIL	STI	RATIC	RAP	HY
*41	(2x2)	135cm		see	prof	Eile	she	et
*42	(2x2)	60cm		see	prof	ile	she	et
*43	(2x2)	1Ø5cm		see	prof	Eile	she	et
44	(2x2)	90cm		see	prof	Eile	she	et
*45		60cm		see	prof	file	she	et
*46		70cm		see	prof	Eile	she	et
47		75cm		same	as	Test	2	
48		60cm		same	as	Test	2	
49		7Øcm		same	as	Test	2	
5Ø		75cm		same	as	Test	: 12	
51	(2x2)	85cm		same	as	Test	10	
52	• 00-00 - 000 - 1000 •	75cm		same	as	Test	2	
53		70cm		same	as	Test	. 8	
54		65cm		same	as	Test	8	
55		65cm		same	as	Test	2	
*56		65cm	د	see	prof	Eile	she	et
57		7Øcm		same	as	Test	2	
58		75cm		same	as	Test	2	
59		70cm		same	as	Test	56	
60		7Øcm		see	prof	ile	she	et
61	(2x2)	60cm		same	as	Test	12	
62		65cm		same	as	Test	60	
63		70cm		same	as	Test	60	
64		65cm		same	as	Test	60	
65		7Øcm		same	as	Test	8	
66	(2x2)	90cm		see	prof	Eile	she	et
67		75cm		same	as	Test	6Ø	
68		65cm		same	as	Test	: 2	
69		100cm		same	as	Test	60	
70		6Øcm		same	as	Test	: 60	
71		45cm		same	as	Test	60	
72		65cm		same	as	Test	: 60	
73		70cm		same	as	Test	: 2	
74	(2x2)	75cm		see	proi	Eile	she	et
75		75cm		same	as	Test	2	
*76		65cm		same	as	Test	: 2	
77		75cm		same	as	Test	. 2	
78		70cm		same	as	Test	: 2	
79		90cm		same	as	Test	: 2	
8Ø		70cm		same	as	Test	: 2	
81		7Øcm		same	as	Test	: 2	
82		7Øcm		same	as	Test	: 2	
83		70cm		same	as	Test	: 2	
84		45cm		same	as	Test	: 2	
85		6Øcm		same	as	Test	: 2	
86		65cm		same	as	Test	: 2	
87		7Øcm		same	as	Test	: 2	
88		65cm		same	as	Test	: 2	

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APPENDIX 2

POLLEN ANALYSIS OF SOIL SAMPLES

Pollen Analysis of Soil Samplesfrom Howland Hook Foreign Trade Zone Study Area

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SAMPLE ONE (next to Test 61, Study Area B) 0-7 inches (0-18 cm.) Very dark brown (10 YR 2/2) Loamy sand

Arboreal species are dominated by Alder, Oak, Birch & sweetgum. Present in lesser quantities are Black Gum, Holly, Beech, Birch & Cedar.

Non-Arboreal species are dominated by Grasses and Ragweed

Ferns, etc. : very few spores

Cultivars: 2 specimens of Zea

- Non-organic: many specimens of angular, black, opaque, carbonaceous material, ranging from a few microns to 50 microns in size.
 - Comments: organic-rich forest floor soil, almost peaty in its organic content, desposited under relatively dry floral conditions (few fern spores, no reed grass, and dry ground trees). Ragweed suggests open fields or clearance, and corn indicates some agriculture or horticulture nearby. Plentiful carbonaceous particles may be hard charcoal, more likely coal soot or similar material.

7-14 inches (18-36 cm.) Light yellowish brown (10 YR 6/4) Loamy sand, some clay.

Arboreal:same as in Ø-7 inch level, but more cedar in the dominant group. Of interest is 1 specimen of Walnut. The single item is not significant, but in greater quantity this is often an indicator of farmyard proximity in 17th through 19th century contexts.

Non-arboreal: much grass and Ragweed

Ferns, etc.: abundant fern spores, including 2 specimens of Sphagnum

CultivarS: 1 specimen Zea

Non-organic: trace of carbonaceous particles

Comments: This stratum developed under wetter conditions than the upper stratum. Clearance and plant cultivation were also present, and a few of the black particles. 14-20 inches (36-50 cm.)

All pollen were very sparse in this sample, but there were a few Cedar, Birch, Alder, and some grasses and composites, and relatively abundant ferns.

Comments: Soil deposited under conditions not conducive to pollen accumulation or preservation, but moist, like the stratum immediately above it, as opposed to the drier surface stratum. Some ground clearing indicated.

SAMPLE 2 (between Tests 65 and 66, Study Area C)

(0-8 inches was forest-floor surface layer, which was assumed to be recent, and like that of Sample 1, so it was not submitted for analysis)

8-12 inches (20-30 cm.) Pale brown (10 YR 6/3) Sandy clay loam

Again, all pollen were sparse. Birch was dominant in the Arboreal, and Ragweed in the Non-arboreal. Some grasses were also present, and abundant fern spores. Carbonaceous particles were present in considerable qunatity.

Comments: Similar to eqivalent stratum from Sample 1 (poor accumulation or preservation of pollen, moist conditions) and with presence of much black particle material.

SUMMARY TABLE

Sample 1.

Depth	Conditions of growth	Field or Ground Clearance nearby	Carbonaceous Particles
Ø-7 in.	drier	present	abundant
7-14 in.	moister	present	scarce
14-20 in. (moister very little pol	present len)	scarce
Samp	le 2		

8-12in. moister present abundant (very little pollen)



