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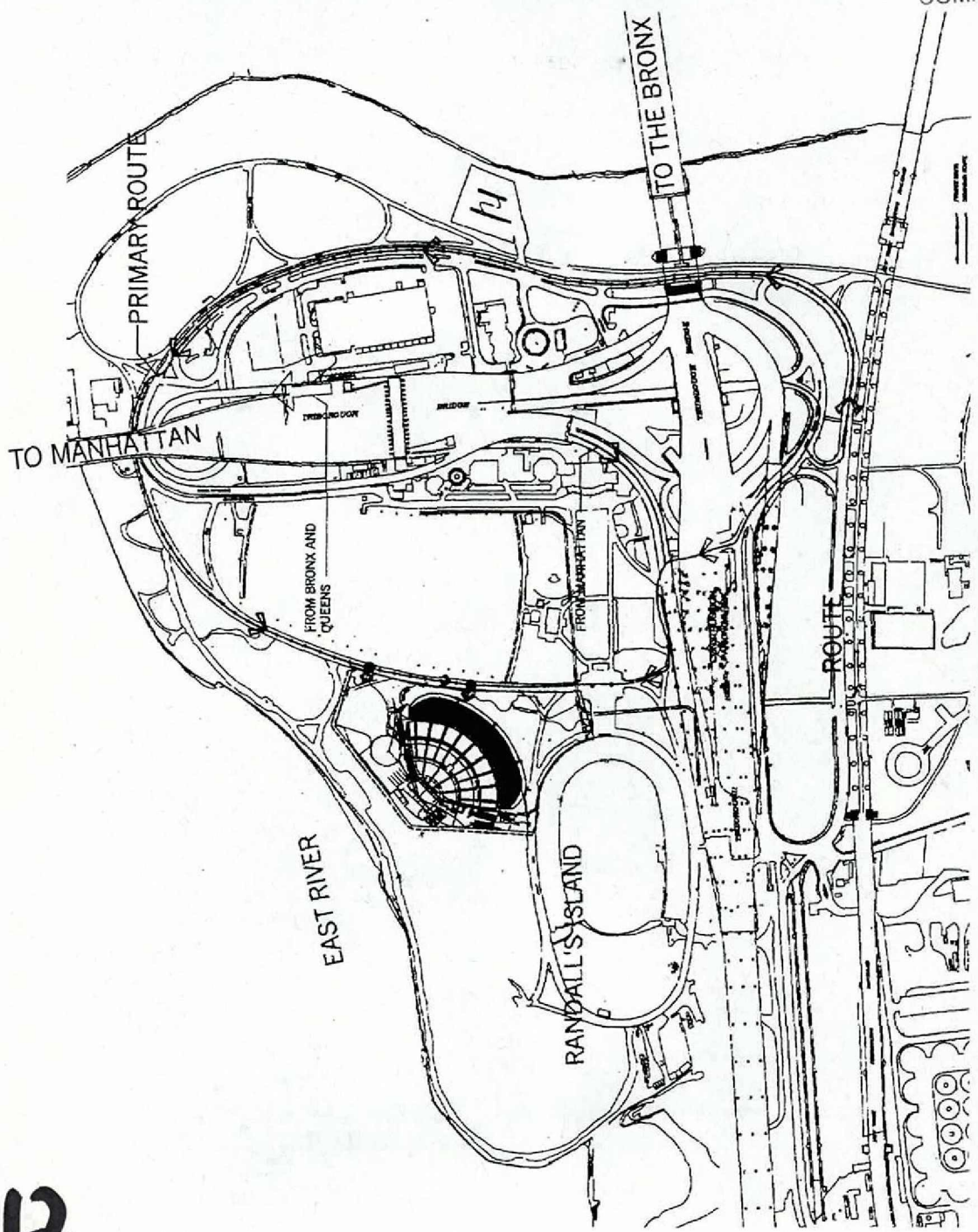
June 2002

Randall's Island, New York
Amphitheater Site Test Pits

Archaeological Report



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Prepared for TDX Construction Corporation
Prepared by Joan H. Geismar, Ph.D.
June 2002

RANDALL'S ISLAND, NEW YORK
AMPHITHEATER SITE TEST PITS
ARCHAEOLOGICAL REPORT

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ABSTRACT

This report presents the findings of field testing and additional research at a proposed approximately 9-acre amphitheater site on Randall's Island, New York, a New York City Department of Parks and Recreation (NYCDPR) property being developed by Q Prime/Quincunx under the aegis of the New York City Economic Development Corporation (NYCEDC) and NYCDPR. Field testing was undertaken at the request of the NYC Landmarks Preservation Commission (LPC) to determine if human burials might be an issue, and the report was prepared for TDX Construction Corporation, the project's construction managers. Four days of testing, which concentrated mainly on the approximately 3-acre amphitheater footprint where deep excavations are planned but included some locations beyond it, began on March 13 and was completed on March 18. During that time, thirty-four 7 to 12-foot deep, archaeologically monitored, backhoe-excavated test pits and one 90-foot long test trench, were excavated. Deep fill was documented throughout. A cache of non-food related animal bones, later determined to be the remains of one cow and two horses, was encountered, but no evidence of human burials or bone was found. Subsequent archival research indicated that the entire project area had been highly disturbed and reconfigured during the 19th and 20th centuries. Since food-related bones are a common fill component, it is recommended that an archaeologist and faunal expert be on call during foundation excavations, or any subsurface disturbance below 3 feet, to identify bone material that may be uncovered during construction. The stipulation to permit this assessment should be part of the project's construction protocol.

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Principal Investigator/Author/Research: Joan H. Geismar, Ph.D.
Assistant Research/Field/Production: Shelly Spritzer
Graphics: Amy Geller

INTRODUCTION

This report presents the findings of field testing at an approximately 9-acre amphitheater site on Randall's Island, New York, a New York City Department of Parks and Recreation (NYCDPR) property being developed by Q Prime/Quincunx under the aegis of the New York City Economic Development Corporation (NYCEDC) and NYCDPR (Figures 1 and 2). The field investigation, comprising archaeologically monitored, backhoe-excavated test pits, was undertaken for TDX Construction Corporation (TDX), the project's construction managers. Field work was carried out in March 2002 by Joan H. Geismar, Ph.D., the Principal Investigator, assisted by Shelly Spritzer. A faunal expert, Dr. Sophia Perdikaris of the Brooklyn College Zooarchaeology Laboratory of the CUNY Northern Science Center at Brooklyn College, was on call during the excavations and ultimately completed a faunal analysis of animal bones recovered from the site (see Appendix B).

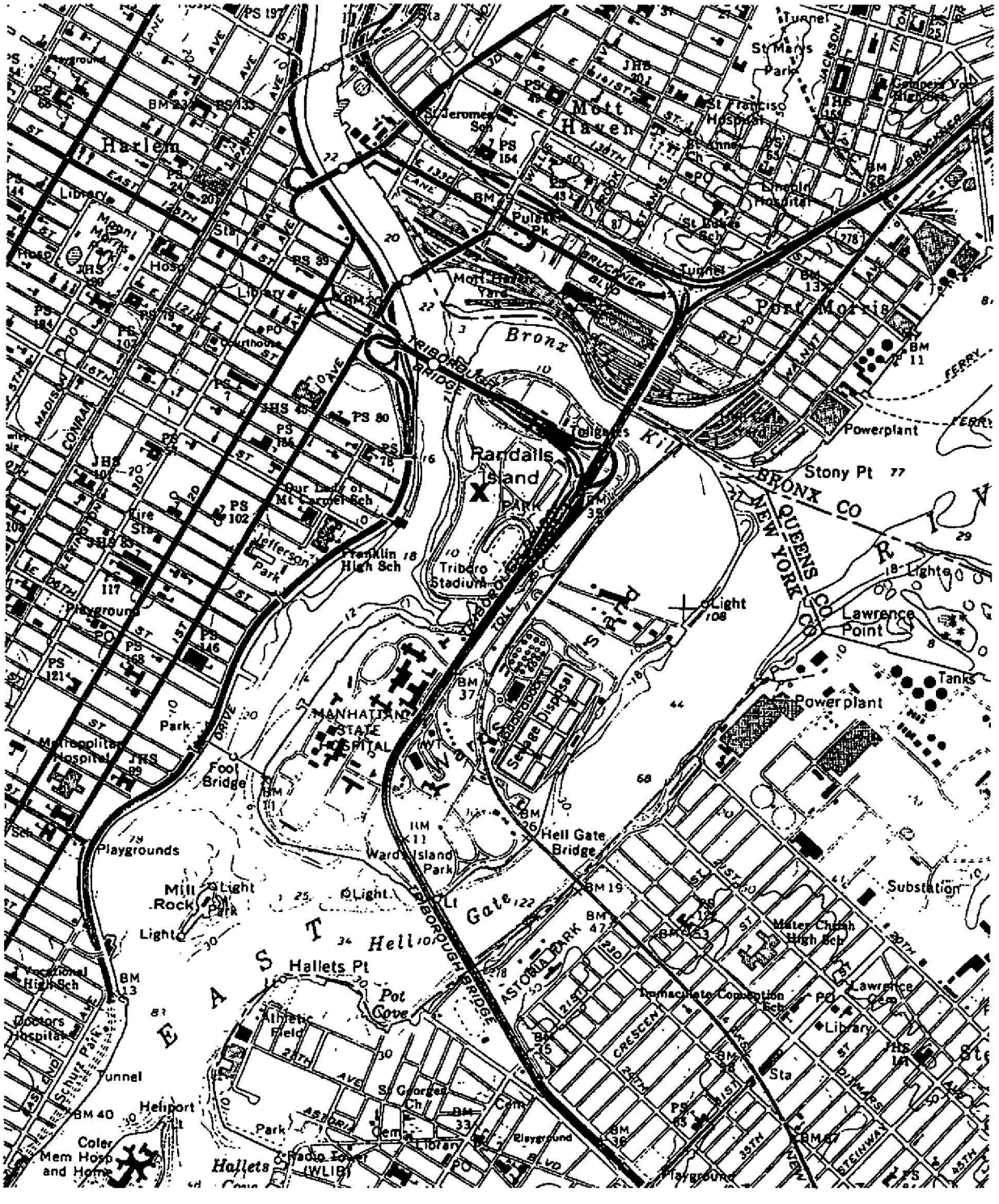
Following a request by the New York City Landmarks Preservation Commission (LPC), the field testing program was initiated to determine if construction of the proposed amphitheater would impact historical resources. At issue were human burials, possibly thousands of them interred in an imprecisely-located potter's field on the southern part of the island from 1843 to 1851 (e.g., Historical Perspectives 2001a, 2001b:2-3). Documentary studies that included a 1A report and two addenda had been completed (Historical Perspectives 2000, 2001a, 2001b); based on this information, the LPC determined that the burials issue required field testing. In this regard, 22 test pits scheduled to reassess soil contamination were coordinated with archaeological monitoring with the understanding that additional test pits would be implemented if the archaeologists determined they were warranted.

In preparation for field testing, all previous documentary studies and soil evaluations made available by TDX and by representatives of NYCEDC were reviewed. Following field work, additional research was carried out in the archives of the Metropolitan Transportation Authority Bridges & Tunnels (MTA B&T) and at the New York City Department of Parks and Recreation, where Laura Rosen at the MTA B&T and Steve Rizick of Parks were both very helpful. In addition, Cece Saunders of Historical Perspectives, Inc., generously provided notes requested on a research issue. The findings of the field investigation and subsequent research and analysis are presented here.

A total of 34 test pits (TP) were ultimately excavated, 11 of them specifically for archaeological purposes, two of these defining the ends of a 90-foot test trench (beginning on the north side of TP33 and ending with TP34; see Figures 10 and 11 for locations). This was in addition to 11 soil borings and 9 test pits previously excavated to obtain geotechnical information (Langan 2000, 2001) and 22 soil borings drilled for environmental purposes (Parsons Brinckerhoff 2001). None of this subsurface testing produced any evidence of human burials.

It should be noted that earlier documentary research did not identify the project site as the location of burials, and there is strong evidence they were probably located further south on the island (e.g., Historical Perspectives 2001a, 2001b:3, 4; NYCEDC 2001). However, ambiguity in available historical data gave rise to concern. For example, a statement from a mid-19th century report on the island's institutions that "the Potter's Field occupied all the area that was not 'swamp or rock' " Building Committee Final Report cited in Historical Perspectives 2001a:4) while unlikely, is hard to ignore. But previous testing and the current field investigations belie this statement.

RANDALL'S ISLAND AMPHITHEATER SITE Project Location (USGS Central Park N.Y.-N.J. Quad 1966, Photorevised 1979) **1**



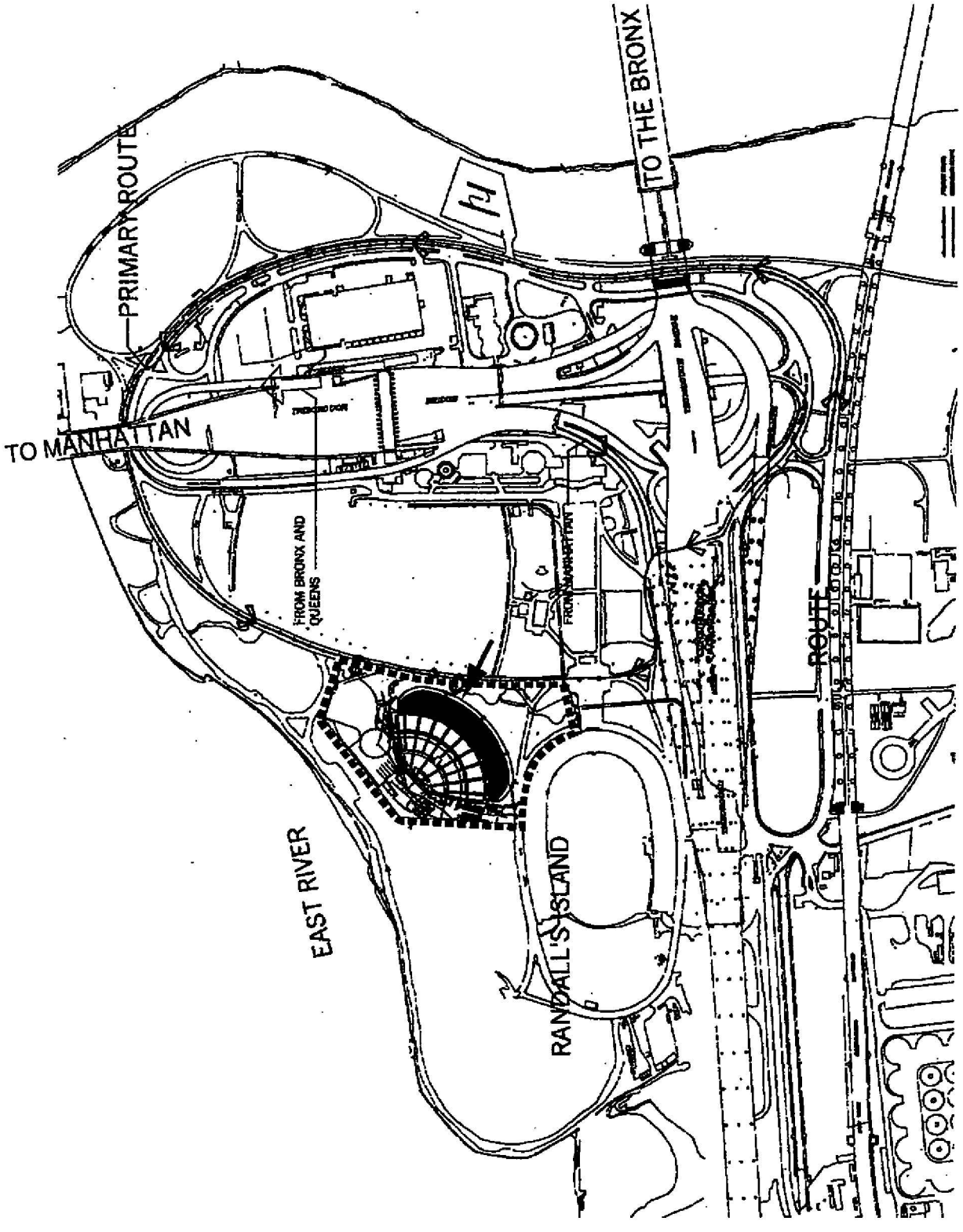
X project location

0 2000 ft.

N

RANDALL'S ISLAND AMPHITHEATER SITE Project Site

2



SITE CONDITIONS

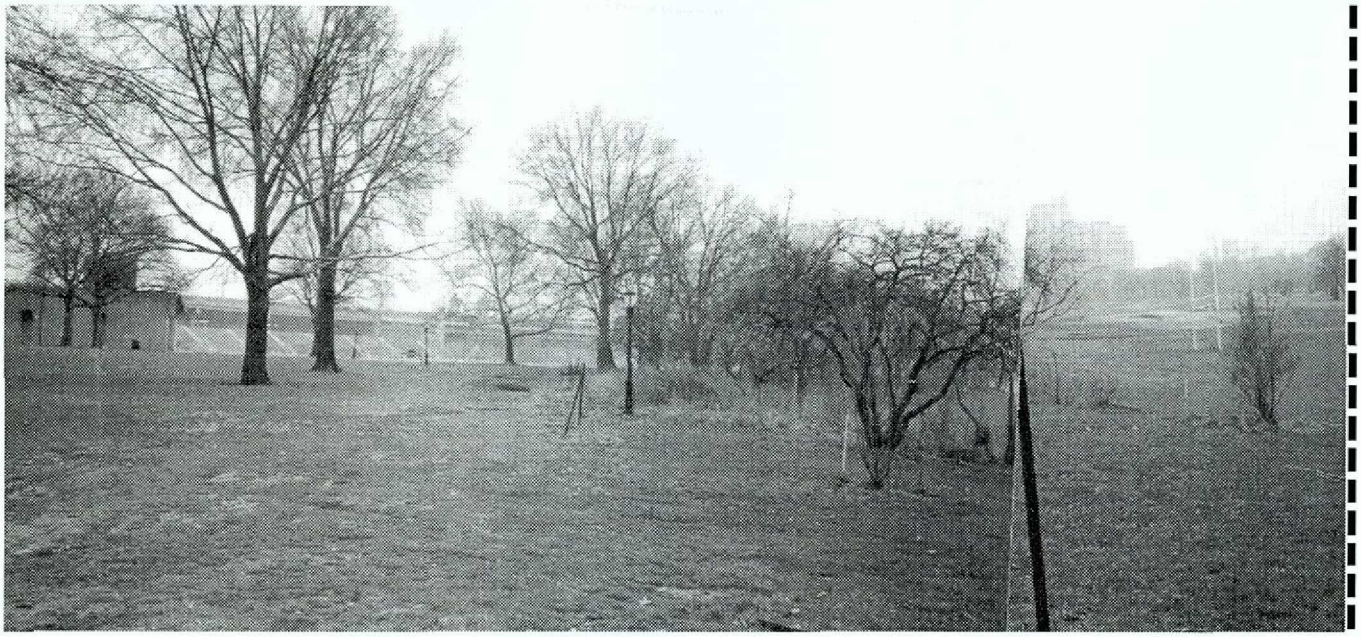
At this writing, the subject site is vacant land that is the location of a soccer field and part of a man-made berm that sloped up toward Downing Stadium. The stadium, a Robert Moses-era structure that stood east of the amphitheater site when testing began, has now been demolished.[1] To the west is a stone seawall along the East River, and Manhattan, in the vicinity of East 119th Street, is beyond (Figures 3 and 4). To the north is the Randall's Island golf driving range with the Queens arm of the Triborough Bridge to the east, and vacant land connected to Wards Island to the south.

Prior to filling, Ward's and Randall's Islands were separated by Little Hellgate. The House of Refuge, a city institution, once stood between the amphitheater site and Little Hellgate (Historical Perspectives 2001:11; Bromley and Robinson 1879; see Figure 5 this report). This was a large facility for juvenile delinquents built in 1854 (a year after the Potter's Field was closed), expanded in 1860, closed in 1935, and demolished in 1936. The Commissioners of Charities and Corrections also erected other child-related hospitals and correctional facilities and their support structures on the island beginning in the 1860s. (Richmond 1871:562-571; WPA 1939:424-425). These too were razed in 1936.

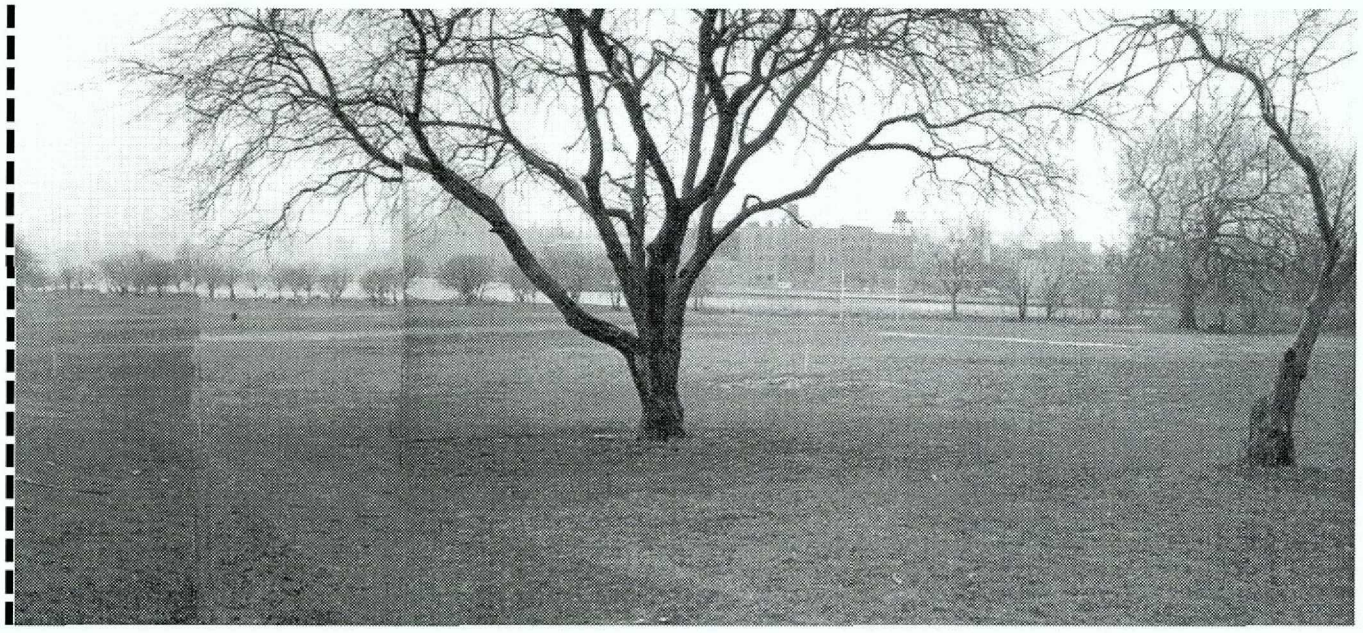
A 1936 plan indicates that four structures scheduled for demolition stood directly within the amphitheater footprint (Triborough Bridge Authority 1936; Figure 6); a 1935 demolition plan identifies one as the morgue and paint shop of the City Hospital complex located north of the House of Refuge property (Triborough Bridge Authority 1935; incorporated into Figure 6). Four other structures to be demolished, two of them located east of the amphitheater footprint, were also within the project site limits. The 1935 demolition plan indicates one was a blacksmith's shop but the others were not identified (see Figure 6). All but one was on the City Hospital property.[2] The 1936 plan, developed when construction of the bridge resumed after a four-year hiatus (Rosen 2002:Personal communication), indicates the site area was crossed by macadam roads leading to and from these structures (see Figure 6). This interconnecting system, which has now been graded away, was densest in the eastern part of the project site where a plaza is proposed (see Figure 6).

A photo in the 1A documentary report shows construction huts scattered over the project site and graphically suggests extensive disturbance associated with building the stadium and bridge in 1936 (Historical Perspectives 2001:Figure 12). Another photo from this same era reinforces this perception of upheaval throughout the entire amphitheater site (Figure 7 this report). When topographic maps from various years are compared–during construction of the bridge in 1936, after the bridge was completed in 1939, and in 1994, prior to consideration of the amphitheater site--it is apparent that elevations and contours have been manipulated over time (compare Figures 6, 8, and 9).[3]

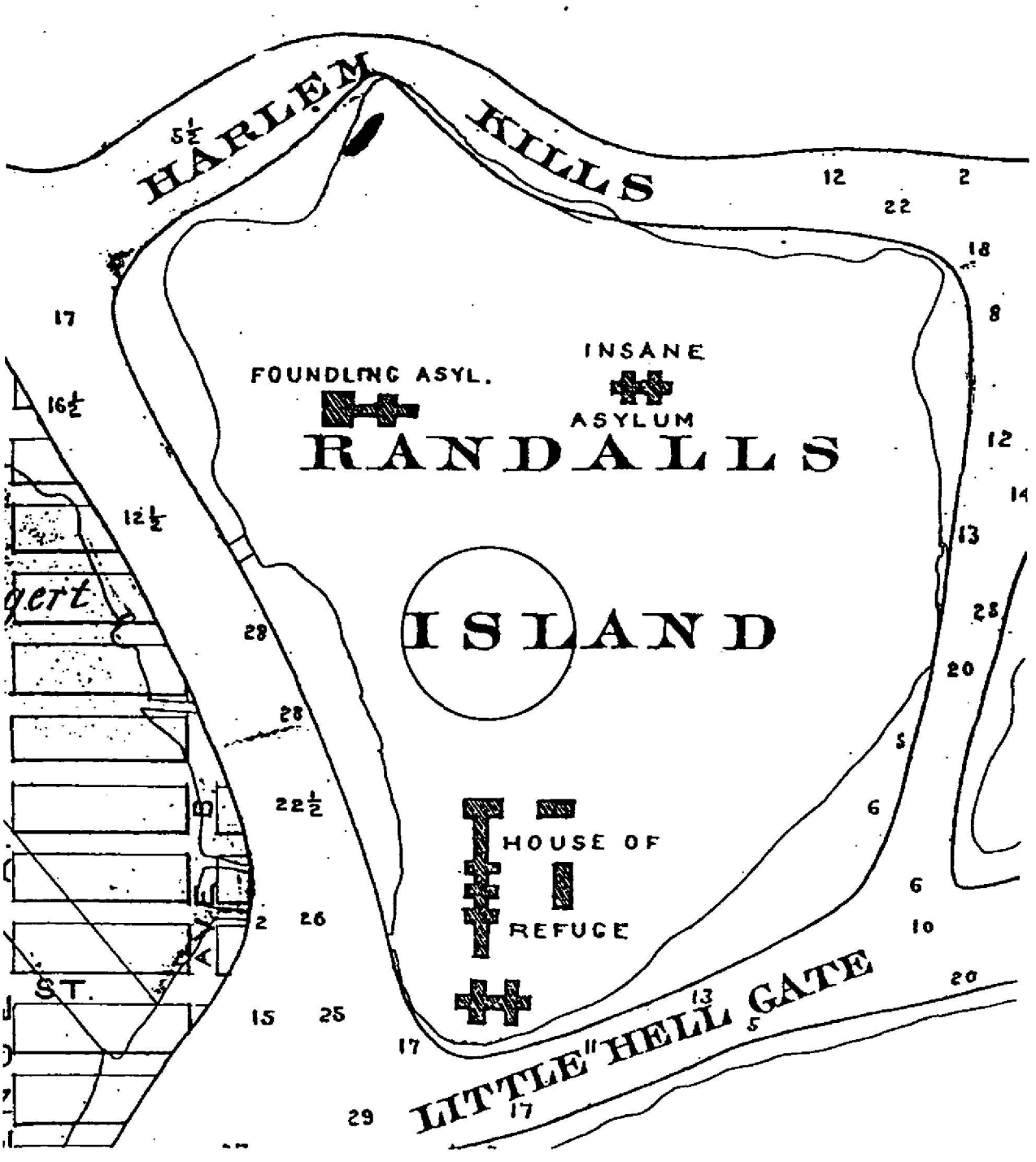
East of the amphitheater, where a plaza is planned, disturbance will be limited mainly to shallow grading (cutting to approximately 1 foot and filling) and most excavation will not exceed 3 feet below finished grade (BFG) (Hurst 2002:personal communication).[4] An exception is a ticket booth near the plaza's eastern limit where excavation may extend 4 feet BFG. Another exception is an 8-foot high perimeter fence with posts that will extend 3 feet BFG. However, past disturbance is documented throughout the plaza area. For example, in addition to contour reconfiguration, there is an existing storm drain system that will be adapted to service the new plaza (Hurst 2002:personal communication), and the introduction of deeply buried high tension electrical feeders has previously disturbed part of the site.[5]

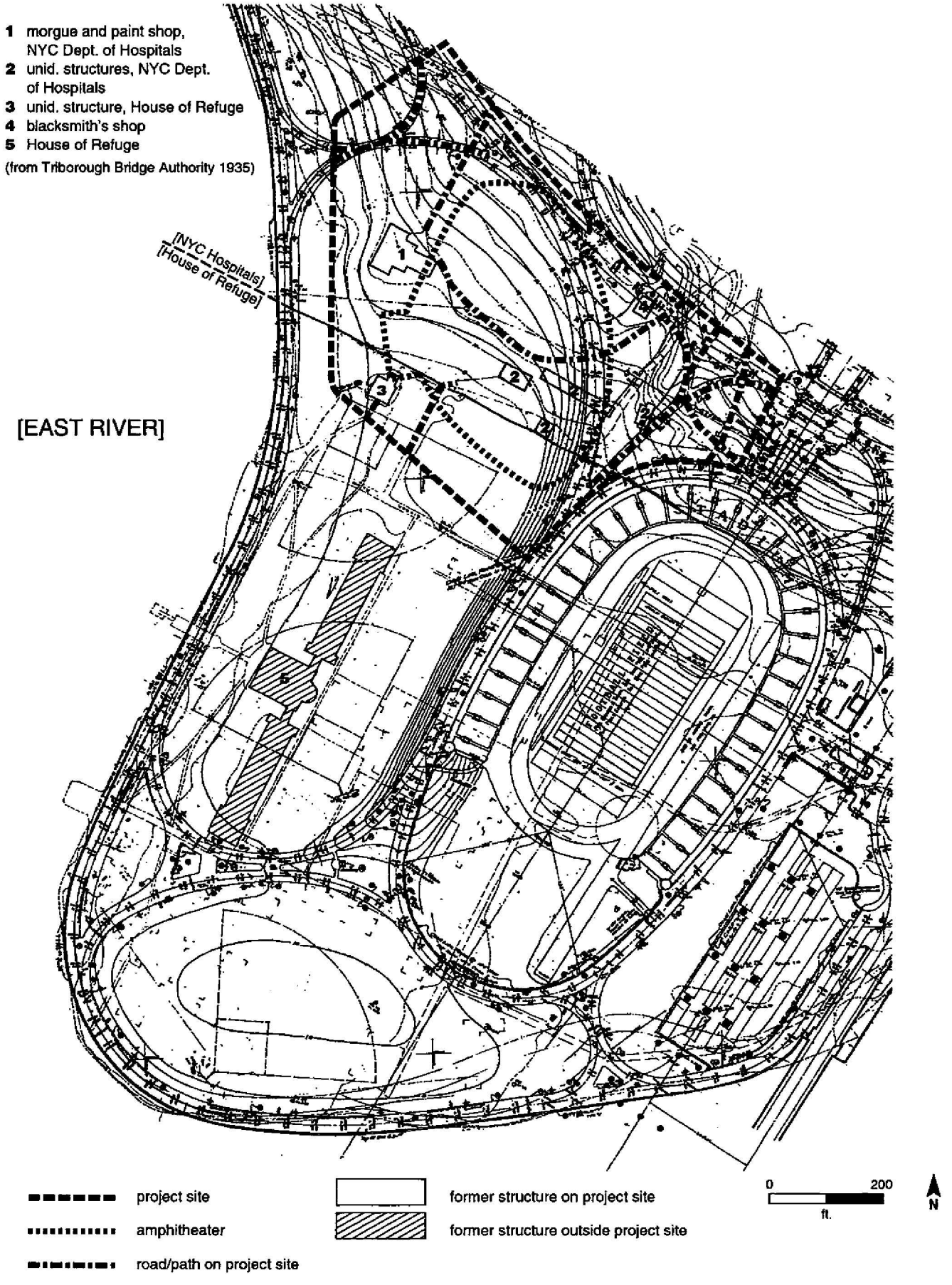


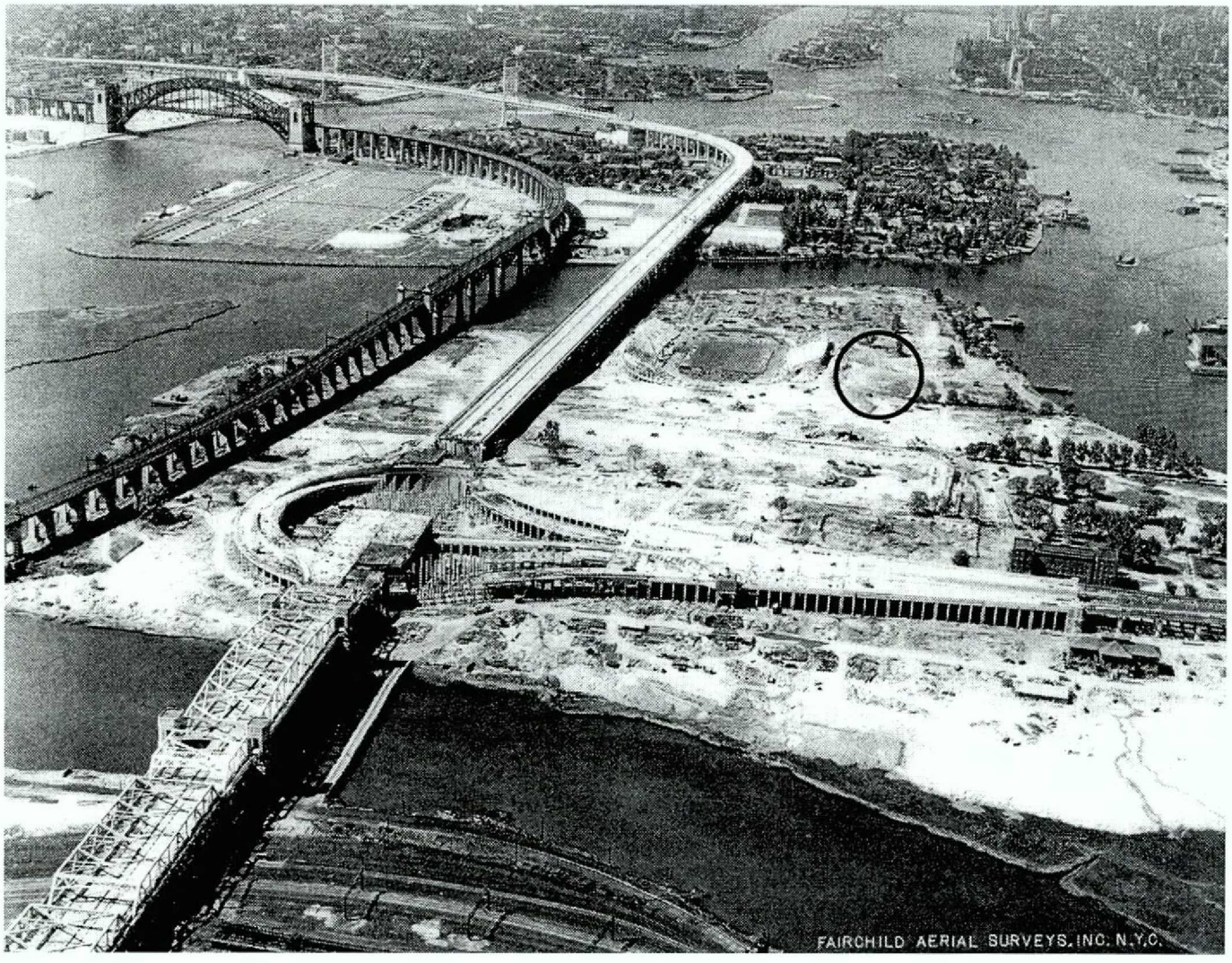
3 Pan view across eastern part of the project area with Downing Stadium to the left and a Ward's Island hospital building in the background. (Geismar 3/8/02)



4 Pan view across western part of the project area, including a soccer field in the vicinity of the amphitheater site. The East River is in the background with Manhattan in the vicinity of E. 119th Street beyond. (Geismar 3/8/02)


HARLEM
KILLS
FOUNDLING ASYL.
INSANE
ASYLUM
RANDALLS
ISLAND
HOUSE OF
REFUGE
LITTLE HELL GATE
ST.
project site (approx.)
N

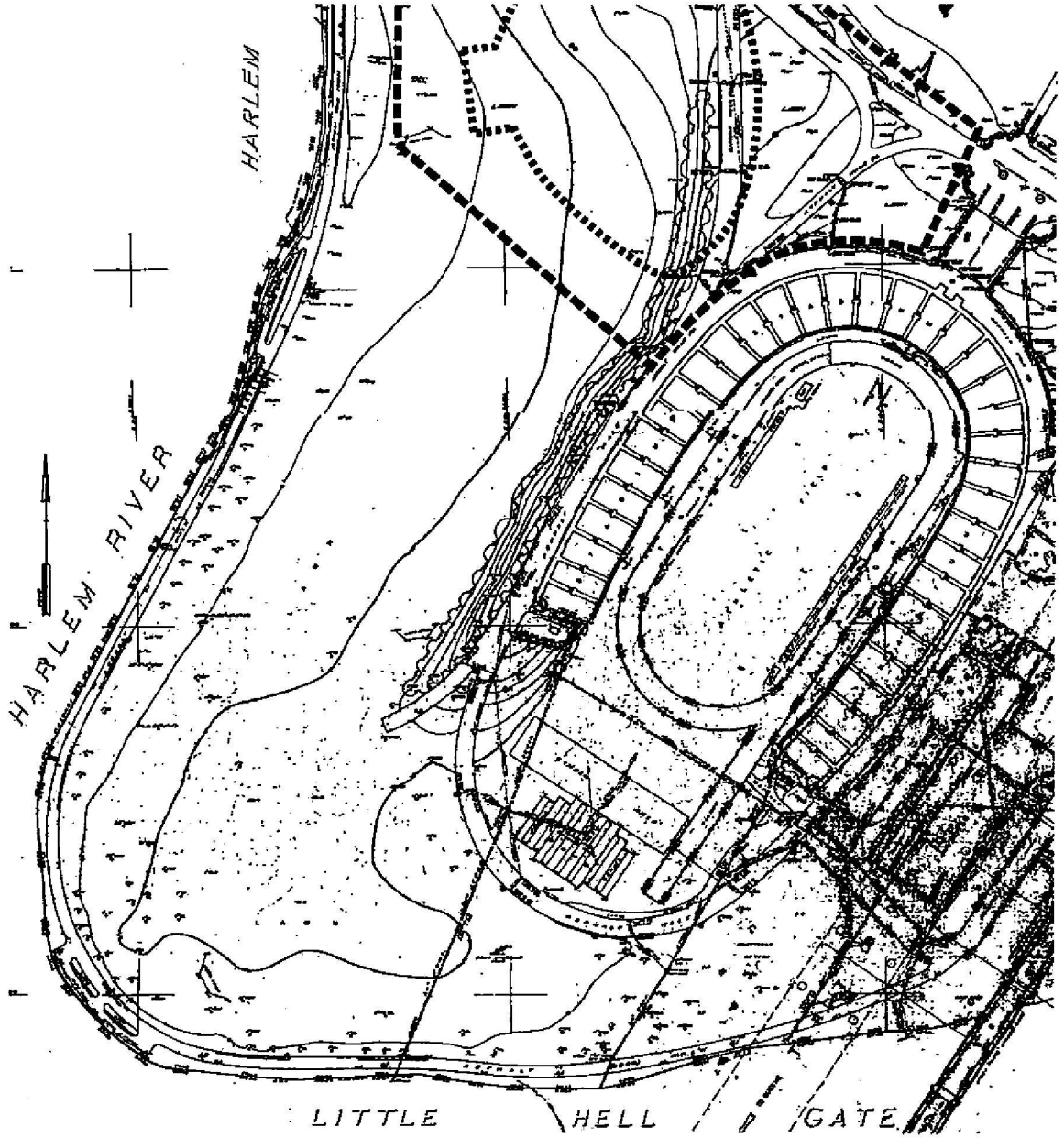

1 morgue and paint shop, NYC Dept. of Hospitals
2 unid. structures, NYC Dept. of Hospitals
3 unid. structure, House of Refuge
4 blacksmith's shop
5 House of Refuge
(from Triborough Bridge Authority 1935)
[NYC Hospitals]
[House of Refuge]
[EAST RIVER]
project site
amphitheater
road/path on project site
former structure on project site
former structure outside project site
0
200
ft.
N



7 Project area during construction of Triborough Stadium (later Downing Stadium) and the Triborough Bridge in 1936. The approximate project site (circle) is visibly disturbed by the construction. (Fairchild Aerial Surveys 1936; courtesy of the MTA B&T)

RANDALL'S ISLAND AMPHITHEATER SITE Part of Project Area 1939 (Triborough Bridge Plan 1935)

8

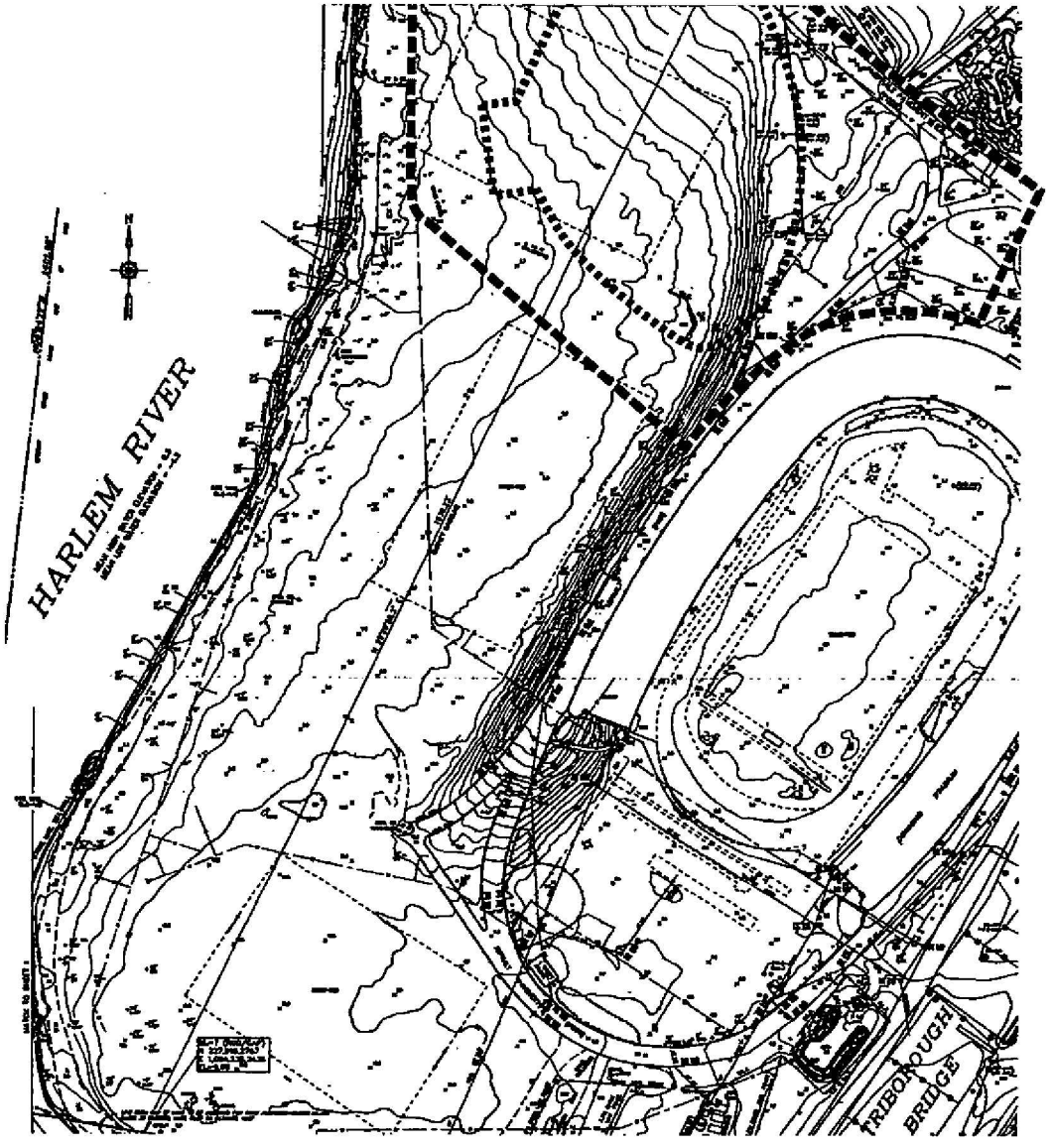


project site (part of)

amphitheater (part of)

0 200 ft.

N



project site (part of)

amphitheater (part of)

0 200 ft.

N

FIELD INVESTIGATIONS

A site visit was made on March 8, 2002, when photographs were taken (e.g., see Figures 3 and 4) and monitored testing began on March 13, 2002. Shelly Spritzer was on site throughout the 4-day testing program, and Rich Styker, the AKRF project geologist, was in attendance for the first three days when he monitored and collected samples from 28 of the 34 test pits. The Principal Investigator was on site for the final three days of the four-day testing program, the last one solely dedicated to collecting data for the archaeological assessment.

As noted in the introduction, Dr. Sophia Perdikaris was on call throughout the field investigations. Also on site to expedite the testing program were Henry Vala and Freddie Robinson of TDX. Mr. Robinson also surveyed the test pit and test trench locations, and Mr. Vala prepared a location plan from these sitings (Figure 10). Appendix A describes each pit, its location, and the findings from an archaeological perspective;[6] Figure 11 superimposes the test pit location plan over the amphitheater master site plan. A Case 580 Super L Extendahoe with a 30-inch bucket was initially used for the investigation, but mechanical problems occurred on the first day of field work and a Case 580 Super M Extendahoe with a 24-inch bucket was substituted.

Originally 22 test pits were planned, mainly where deep foundation excavations were anticipated, but, to accommodate archaeological issues, ten more were added as was the aforementioned 90-foot-long test trench (designated TT1). Fill material was documented throughout the tested area that included a broad sample within the amphitheater footprint as well as several locations beyond it. In all but one instance, and with the exception of several pits where extensive demolition debris was found, a basically clean soil fill was documented. This fill included some small ceramic, coal, and brick fragments, bricks, fragments of trashed terra-cotta and metal drain and water pipes, and, in two instances, shell. Among the latter were an unidentified fragment at 9.5 feet below the ground surface (BGS) in TP30 and a piece of oyster shell in TT1. Identifiable glass, a ubiquitous fill material, was almost non-existent (an exception was a "modern" bottle fragment at 7.5 BGS in TP24) as was food-related animal bone; ash deposits were noted in several pits. The exception to this generally "clean" fill was an extraordinary deposit of animal bones uncovered in Test Pit 14 (TP14).

The first bones found in TP14 were exposed in the south wall of the pit approximately 4 feet BGS (Figure 12 is a profile, Figure13 a photo of the south wall of TP14 where the bones were initially uncovered). These included a large skull fragment, another with an attached horn, and numerous long bones. All observed bone was collected and ultimately turned over to Dr. Perdikaris for analysis. Even to those in the field it was apparent that these were animal bones that represented at least one cow and one horse. The assessment of a single cow, represented by 26 bones, proved correct, but 57 bones were found to be those of two horses. There were also three bones from a sheep or goat and one chicken bone. Other bones, either unidentified or from small and medium sized terrestrial mammals, were also catalogued (see Faunal Report Appendix B). Two additional cow ribs, later found just below the surface of TP20 in building rubble, were not collected.

TP14 was extended to determine the extent of the bone deposit, first to the west and south and, the following day, to the north and east; bones were recovered to depths of 11 or 12 feet in all

project site

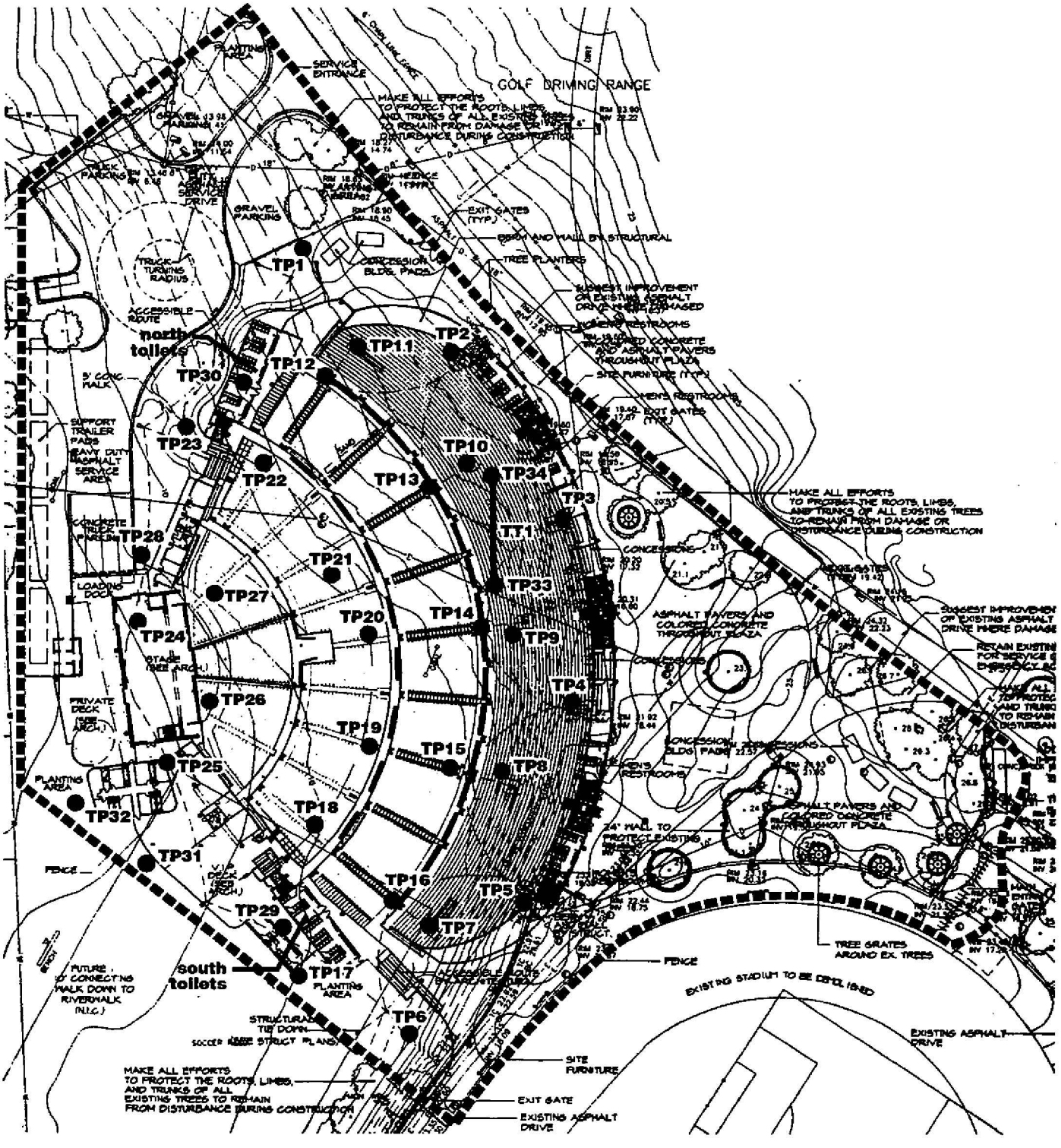
TP (not to scale)

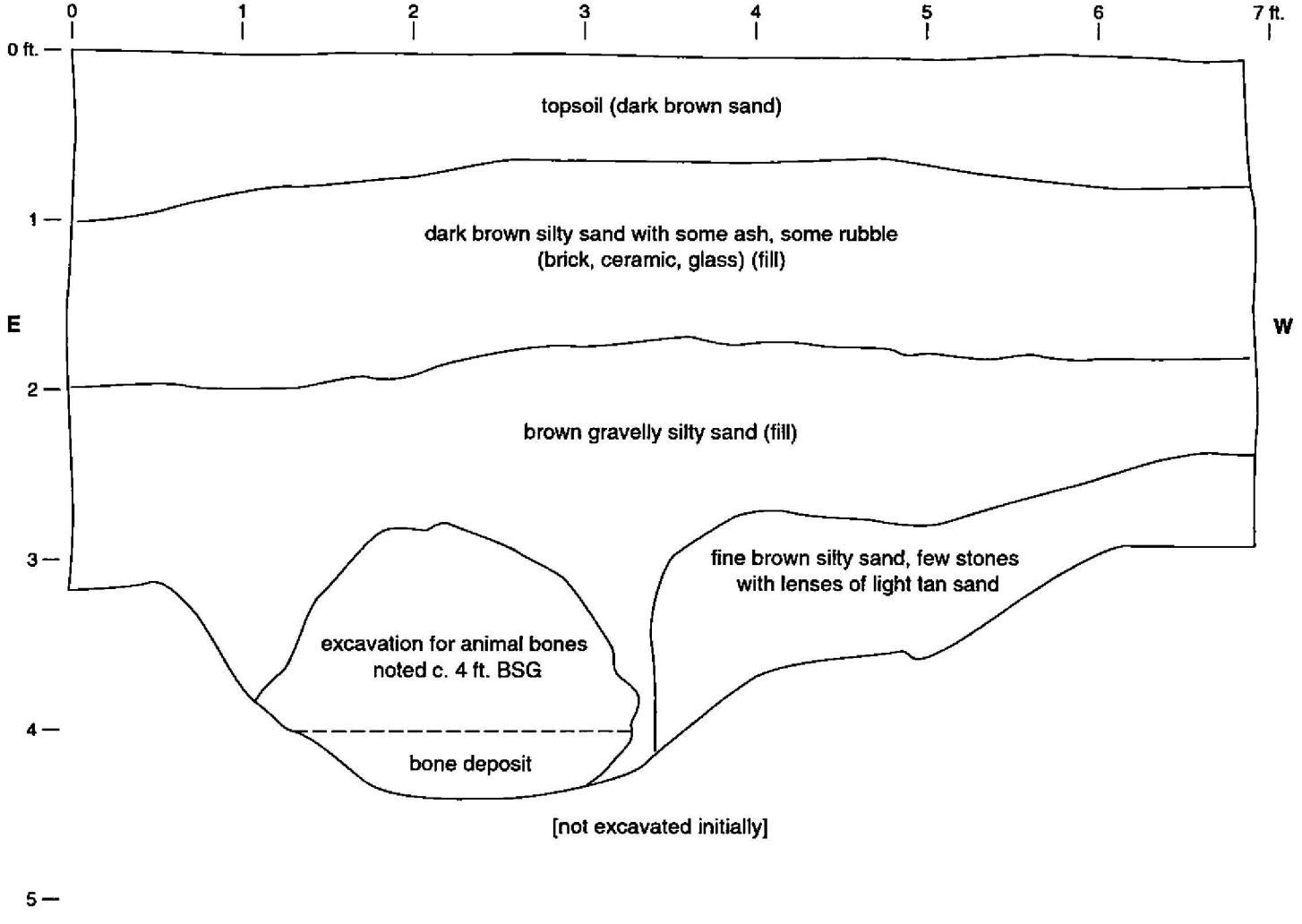
0 50 ft. N

(prepared by TDX Construction Corporation)

RANDALL'S ISLAND AMPHITHEATER SITE Test Pit Locations Superimposed on Master Site Plan

11




0
1
2
3
4
5
6
7 ft.
0 ft.
1
2
3
4
5
E
W
topsoil (dark brown sand)
dark brown silty sand with some ash, some rubble (brick, ceramic, glass) (fill)
brown gravelly silty sand (fill)
fine brown silty sand, few stones with lenses of light tan sand
excavation for animal bones noted c. 4 ft. BSG
bone deposit
[not excavated initially]

directions (e.g., Figure 14), but ultimately this material dissipated. The aforementioned 90-foot long test trench (TT1) was run to the northwest (Figures 15 and 16), but no additional bones were found.

Evidence of former structures was uncovered in several test pits: TP16 appeared to be in a basement; an old boiler system and building rubble in TP23 suggested another structure that later proved to be a former morgue and paint shop in the aforementioned City Hospital complex (Figure 17); TP31 and TP32, on the southern fence line of the project site, also produced a great deal of building rubble that included dressed stone and bricks. At the request of the LPC archaeologist, test pits were excavated where toilet facilities are planned (TP29 to the south and TP30 to the north), but, again, deep fill was documented (see Appendix A). Nowhere was any evidence of human burials uncovered, nor was any isolated human bone found.

As noted previously, a total of 34 test pits, twelve more than originally proposed, were excavated, mostly within the amphitheater footprint, but at least eight beyond it (see Figure 11). The pits were 7 to 12 feet deep with the majority (10 of them) 11 feet BGS. The test trench run from the north side of TP33 to TP34 was 7 feet deep and 2 to 4 feet wide. All test pits and the test trench were backfilled after being described and photographed (see Appendix A and e.g., Figures 12 to 17).

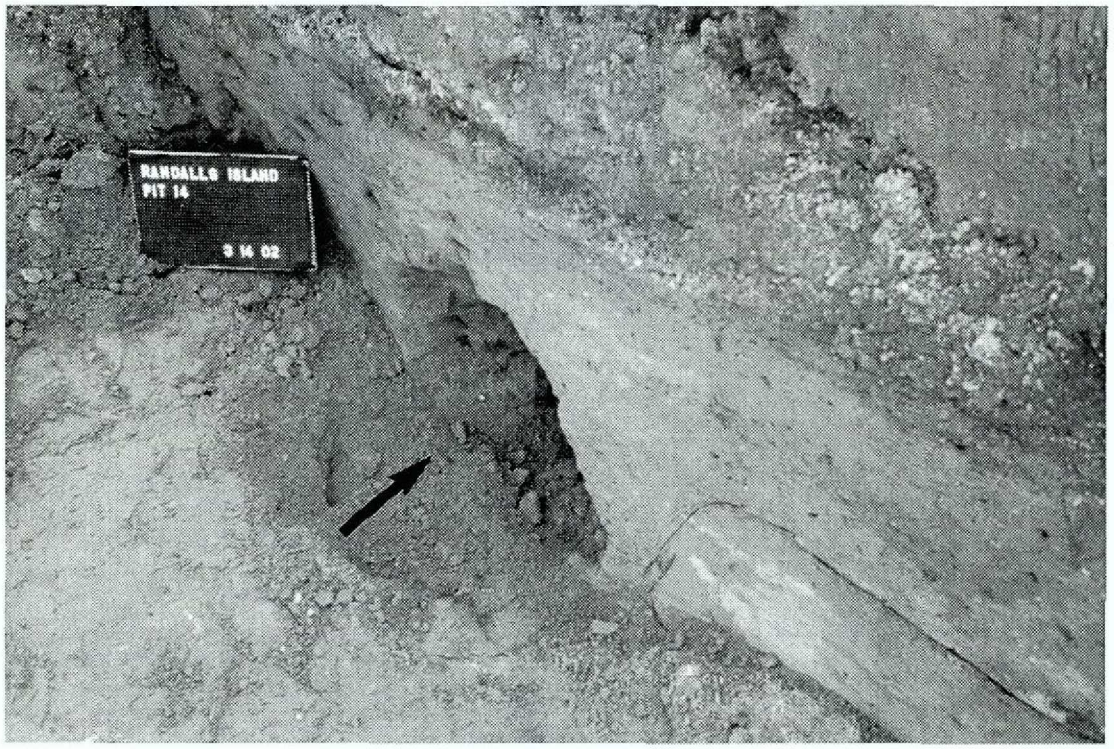
CONCLUSIONS AND RECOMMENDATIONS

Research indicates the entire project site has undergone topographical reconfiguration and at least some building construction during the mid-to late 19th century and, more extensively, during creation of the Triborough Bridge and Triborough Stadium, later Downing Stadium, in the 1930s. This assessment was suggested by information from 34 test pits and a 90-foot test trench excavated to depths ranging between 7 and 12 feet that documented fill throughout the amphitheater footprint and beyond. It was verified by assorted historical maps and photos, and in the findings of soils analyses conducted by AKRF. The test pits, like nine previously excavated and 33 earlier soil borings, revealed no evidence of human remains.

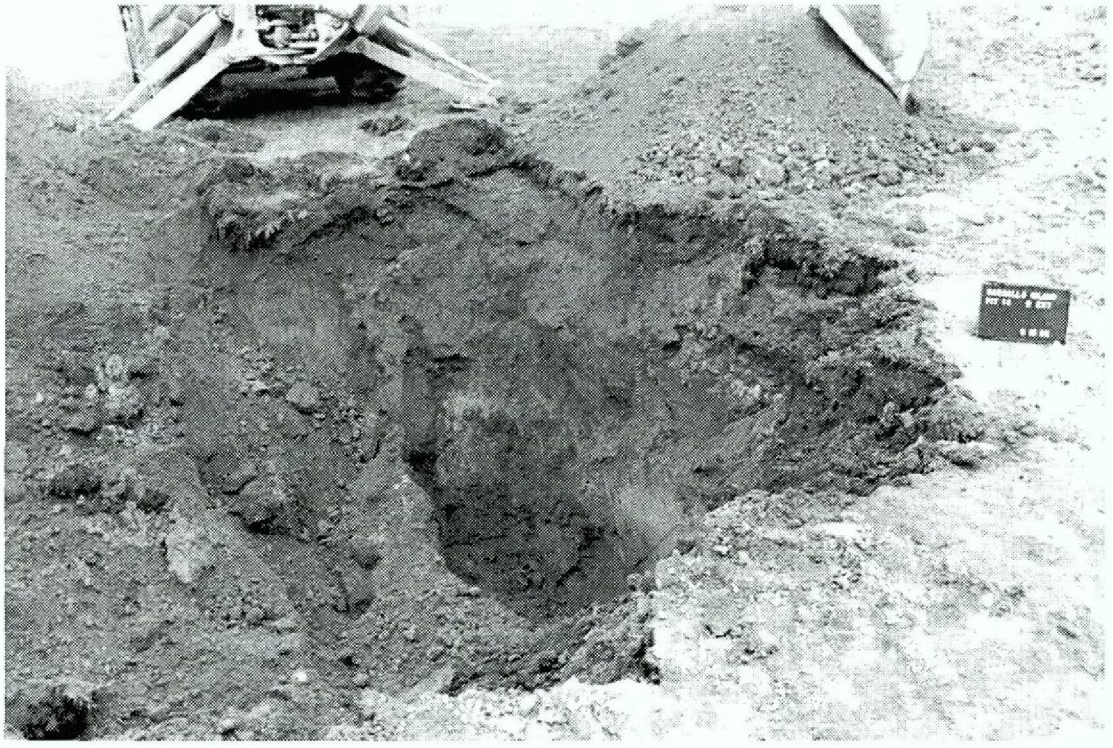
Testing suggested there were at least four former structures within the amphitheater footprint, one with a basement or underground accommodation for a boiler. This finding was corroborated by the historical plans located after field work was completed. These plans also document four other buildings on the site, two of them in the plaza area, and an extensive road network. Drainage and electrical lines were also encountered or documented.

The deepest fill was found in the eastern part of the amphitheater footprint, in the vicinity of a berm, where seating will be located. It was also documented along the southern fence line and where toilet facilities are planned in the northern and southern parts of the site. A large cache of animal bones that extended from 4 to 11 or 12 feet BGS in TP14 and its extensions proved to represent the carcasses of a cow and two horses buried in the fill at some unknown date. The bones, analyzed by Dr. Sophia Perdikaris, have been accepted by Brooklyn College as part of their teaching collection.

Although human burials do not appear to be an issue on the project site, it is recommended that an archaeologist and faunal expert be on call during foundation excavations, or any subsurface disturbance below 3 feet, to identify any additional bone material that may be uncovered during construction. The stipulation to permit this assessment should be part of the construction protocol.



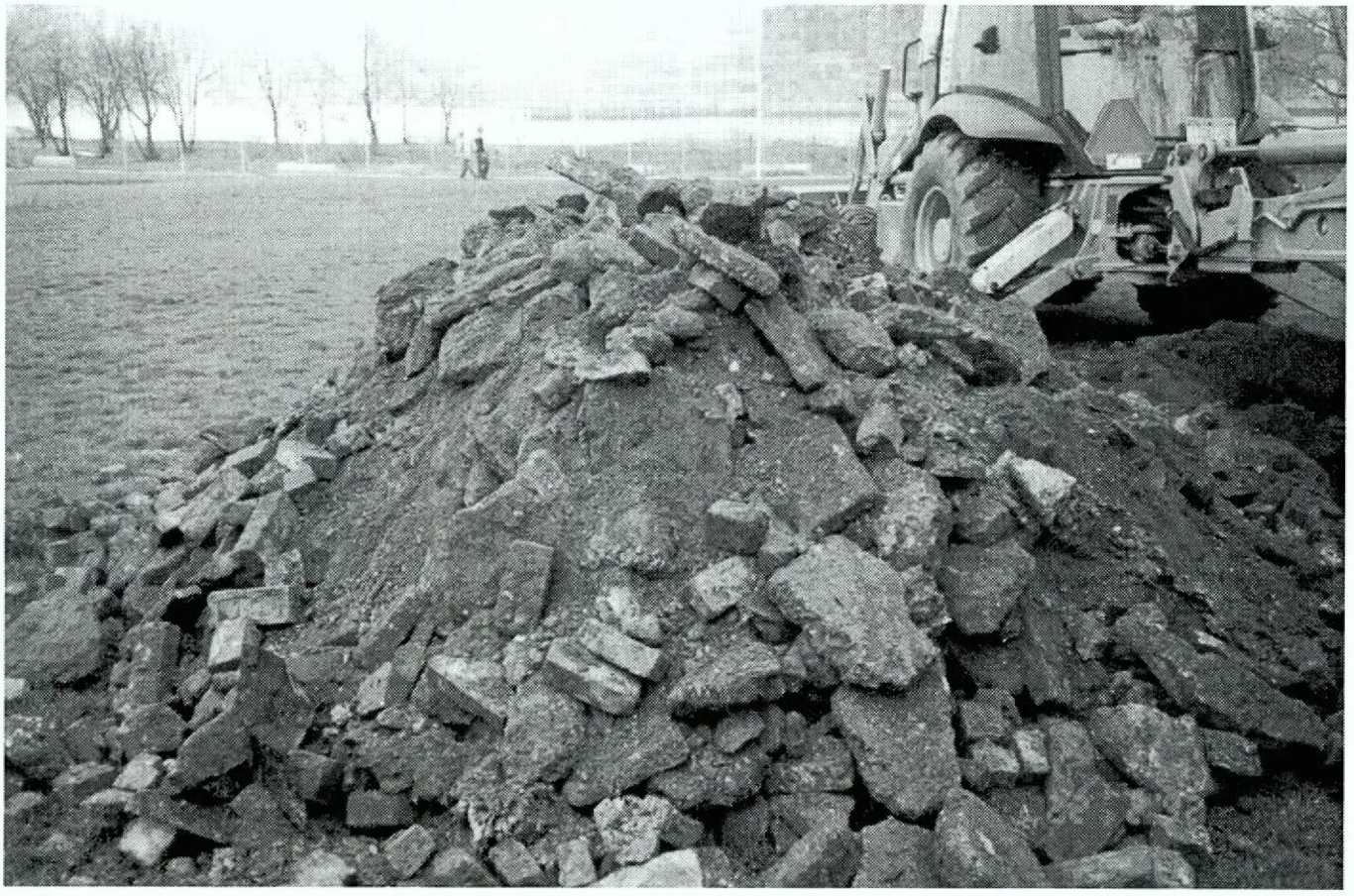
13 South wall of TP14 where a cache of animal bones was found (arrow). Additional animal bones, minimally representing two horses and a cow, were first recovered c. 4 ft. below the ground surface (BSG). (Geismar 3/14/02)



14 Extension of TP14 where additional animal bones were recovered up to 11 ft. BSG. (Geismar 3/15/02)

15 Test Trench 1 (between TP33 and TP34), approximately 90 ft. long and 7 ft. deep, the trench tested the area north of TP14 and 14 extension where deeply buried deposits of animal bone were found. View is north; see Figure 10. (Geismar 3/18/02)

16 Same as Figure 14, view south; see Figure 10. (Geismar 3/18/02)



17 Building debris from TP23 suggested it was the location of a former structure. This was reinforced by a buried boiler system exposed in the pit. Subsequent research identified it as the location of a morgue and paint shop that was part of the City Hospital Complex formerly on the site. (Spritzer 3/15/02)

ENDNOTES

[1]The stadium and the Triborough Bridge, with its viaducts to the Bronx and Queens that crossed the island, were completed in 1936.

[2]The line between the grounds of the City Hospital and the House of Refuge bisected the amphitheater site (see Figure 6).

[3]Figures 8 and 9 show only part of the amphitheater site but record pertinent changes.

[4]Three concession buildings on the plaza will be erected on slab.

[5]According to Con Edison, top elevations for these feeders are 8 to 10 feet below the current finished grade (NYCEDC/NYCDPR 2001; Darr 2002:Personal communication).

[6]A separate report prepared by AKRF analyzed the soils from an environmental perspective and found conditions indicative of fill throughout (AKRF 2002).

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RANDALL'S ISLAND AMPHITHEATER SITE APPENDIX A Test Pit Descriptions

Tier 4 - top section (easternmost)

TP No.	Size	Depth BGS	Soils	Contents	Remarks
1	c 5 x 8 ft	c 12 ft	Topsoil* over brown silty sand to c 5 ft BGS; light brown silty sand to c 12 ft BGS	Brick frags to at least c 3 ft BGS	Fill to c 3 ft BGS & possibly below
2	c 5 x 8 ft	11-11.5 ft	Topsoil over brown silty sand to c 5 ft BGS; light brown/ yellow silty sand to bottom	Brick frags in topsoil & just below it	Fill to c 5 ft BGS & possibly below
3	c 5 x 8 ft	c 11 ft	Topsoil over brown silty sand to c 6 ft BGS; light brown silty sand to bottom	Brick frags near top of pit	Fill to c 6 ft BGS, 1 oyster shell c 2.5 ft BGS; area contains electrical lines
4	c 5 x 6 ft	c 8 ft	Topsoil over brown sand; light brown sand to c 8 ft BGS; a change from deposits to N	Brick frags at top of pit; quantity of "rotten rock"; cobbles	Fill; isolated brick observed in W wall at c 5.5 ft in light brown sand
5	c 4 x 8 ft	c 7 ft	Topsoil over brown sand with some gravel	Some building rubble, red & yellow brick frags, concrete; bricks whole & frags at c 6 ft BGS; large & small rocks, cobbles; 1 pc terra-cotta pipe	Fill; pit on steep incline at bottom of existing berm; depth difficult to measure
6	—	10-11 ft	Topsoil over brown sand with some gravel	Brick frags, concrete down to c 8 - 9 ft; metal pipe in pit	Fill to c 9 ft; pit at bottom of existing berm; ground water seepage at bottom

Tier 4 west of section above

7	c 3 x 7 ft	c 9 ft	Topsoil over brown sand to c 4 ft; grayish brown to bottom	Brick frags, metal (rebars) & concrete to bottom of pit	Fill; ground water entered pit at accelerated rate; terminated c 7 ft BGS
8	c 3 x 7 ft	10-11 ft	Topsoil over brown sand; ash deposit at c 8-10 ft BGS varied in size/shape across pit	Brick frags, ceramic frags, ash at c 8 - 10 ft	Fill to at least c 10 ft BGS; pit located at base of berm
9	c 3 x 8 ft	c 11 ft	Topsoil over brown sand to c 5.5 ft; brown/ red sand to bottom	Brick frags to c 5.5 ft	Fill to c 5.5 ft & possibly below; pit moved 25 ft to E to avoid live electric lines
10	c 3 x 8 ft	c10 ft	Topsoil over light brown silty sand to c 4 ft BGS; brown sand to bottom	Brick frags to c 5 ft	Fill to c 5 ft BGS & possibly below
11	c 4 x 8 ft	c 8-9 ft	Topsoil over brown sand to c 4 ft BGS; brown/ red silty sand to bottom	Brick frags to c 3 ft	Fill to c 4 ft BGS & possibly below

RANDALL'S ISLAND AMPHITHEATER SITE APPENDIX A Test Pit Descriptions (continued)

Aisle between Tiers 3 and 4

TP No.	Size	Depth BGS*	Soils	Contents	Remarks
12	c 2 x 6 ft	c 9.5 ft	Topsoil over brown sand to c 3 ft BGS; brown/ red sand to bottom	Brick frags, concrete to c 3 ft BGS	Fill to c 3 ft BGS & possibly below; pit N of soccer filed on slightly sloping land
13	c 2 x 6 ft	c 10 ft	Topsoil over brown sand to c 4 ft BGS; light brown sand to bottom	Brick frags, metal to c 3 ft BGS; boulders/ cobbles below 3 ft	Fill to c 4 ft BGS & possibly below; still on loping land N of soccer field
14	**3/14/02** original test pit 4 x 8 ft; widened to 11 ft N-S and 17 E-W **3/15/02** widened pit to 12 ft N-S, 19 ft E-W	**3/14/02** original pit 4.2 ft; **3/15/02** S extension c 11 ft; E extension 9-12 ft	**3/14/02** Topsoil over dark brown silty sand; in extension rock content increased; large boulder at 10.8 ft BGS **3/15/02** Decomposed rock (marble) at c 12 ft BGS E extension - topsoil over a dark brown silty sand to c 3-4 ft BGS; brown/red/yellow sand to bottom	2 ft BGS small undiagnostic whiteware ceramic frags Brick frags, ceramics (see below) & glass frags (small) little ash etc; bones uncovered in S wall of pit c 4 ft BGS - long bones, crania (with horns attached), maxilla, mandible, ribs, pelvic bone, etc; terra-cotta pipe c 4-4.5 ft BGS; in extension - ceramic frags, coal; horseshoe c 10 ft BGS **3/15/02** - ash layer with animal bone c 4-5 ft BGS; undiagnostic green bottle glass frag c 6 ft BGS; undiagnostic whiteware ceramic frag c 7 ft BGS; animal bones (horse, cow [see Appendix B]) c 9.4 ft - c 11 ft BGS E extension - coal 4.5 ft BGS	**3/14/02** Fill to c 12 ft BGS; original pit widened N-S & E-W; bones c 4 - c 11 ft BGS; all observed bone taken for analysis; S wall profiled to c 4.5 ft & photographed; entire pit ultimately photographed **3/15/02** Pit enlarged to N; more animal bone; pit extended 2 ft further E; no bone observed in this extension. Entire pit fill
15	c 5 x 8 ft	c 12 ft	Topsoil over brown silty sand to c 4 ft BGS; dark brown sand to c 8 ft BGS; brown/red sand to bottom	Wood timbers, brick frags, metal, glass frags to c 4.5 ft; ash 4.8 to 8.2 ft BGS	Fill with rubble c 3 ft BGS followed by fill to c 8.2 ft, no artifacts observed; strong odor near bottom of pit
16	c 4 x 8 ft	c 10.5 ft	Topsoil over brown sand to c 4 ft BGS; grayish brown sand to bottom	Building rubble - "STAPLES" bricks; also unmarked bricks, brick frags; metal to c 9 ft BGS; below c 10 ft BGS soil is clean	Fill; ground water c 9.5 ft BGS; strong odor near bottom of pit; appears to be basement of old structure

Aisle between Tiers 2 and 3 - pits centered between originally proposed locations to avoid weakening load bearing capabilities of soil

17	c 4 x 8 ft	c 11.5 ft	Brown sand to c 10 ft BGS; light brown to bottom	Building rubble - bricks; brick frags, dressed stone, concrete to c 11 ft BGS; ash pit in S wall c 2.5 to 3.5 ft BGS	Fill to c 11.5 ft BGS; playing area of soccer field; ground water seepage near bottom; appears to be site of former structure
18	c 2 x 8 ft	c 9.5 ft	Topsoil over brown sand of varying shades & textures to bottom	Brick frags, ash, small undiagnostic glass & ceramic frags to bottom of pit	Fill to c 9.5 ft BGS; some ground water c 3 ft BGS, possible water table (AKRF); water flow at 8.5 ft BGS

RANDALL'S ISLAND AMPHITHEATER SITE APPENDIX A Test Pit Descriptions (continued)

Aisle between Tiers 2 and 3 (continued)

TP No.	Size	Depth BGS*	Soils	Contents	Remarks
19	c 5 x 8 ft	c 11.5 ft	Topsoil over brown sand to c 10 ft BGS; brown silty sand to bottom	Brick, brick frags, terra-cotta & metal pipe, flat glass, ceramic frags; oyster shell (minimal) down to c 5ft; modern bottle frag c 7.5 ft; schist at bottom of pit with fine sand & silt	Fill to c 7.5 ft BGS & possibly below; ground water c 10 ft BGS
20	c 5 x 8 ft	c 10.5 ft	Topsoil over brown sand to c 6 ft BGS; brown/ red silty sand to c 9 ft BGS; grayish brown sand to bottom	Brick frags at top; 2 pcs of cow bone (rib) just under grass line	Fill to c 3.5 ft BGS & possibly below; ground water c 10 ft BGS; no bone material found below grass line
21	—	c 11 ft	Topsoil over varying brown sands to bottom	Brick frags, ash, small glass & ceramic frags to c 5 ft	Fill to c 5 ft BGS & possibly below; pit 40 ft E of active electric manhole
22	c 8 x 10 above 5 ft BGS; c 3 x 10 ft below	c 12 ft	Topsoil over light brown sand to c 3 ft BGS; varying brown sands to c 7 ft BGS; 1 ft of grey clay over orange /brown fine to medium sands to bottom	Building rubble - bricks, brick frags, concrete slab, wood, metal pipe, rubber frags, ash to c 7 ft	Fill to c 7 ft BGS; ground water seepage at c 11.5 ft BGS; possible former building site
23	c 5 x 8 ft	c 8 ft	Topsoil to 1-2 ft BGS; soils loosely compacted	Building rubble, several pcs of terra-cotta pipe, 1 metal pipe (T-shaped), many "IXL" bricks; debris to bottom of pit; old boiler system - steam/ water tanks intact - asbestos, concrete slab at bottom	Fill to bottom of pit, in former building substructure; terminated c 8 ft BGS, because of pit wall collapse - dangerous situation; sample of asbestos taken for analysis (AKRF);

Stage Area

24	c 5-6 x 8 ft	c 10 ft	Topsoil over brown sand to c 5 ft BGS; below 5 ft soil moist, unstable; brown/ orange sand to bottom	Brick frags, concrete, cobbles to c 5 ft BGS	Fill to c 5 ft BGS; located near center stage area (N & E of the radius point); ground water c 10 ft BGS
25	c 5 x 8 ft	c 9.5 ft	Topsoil over brown sand to c 4.5 ft BGS; soils below moist, unstable; brown/ orange to tan silty sand to bottom	Brick frags, ash near top of pit; some cobbles c 4.5 ft to 5.5 ft BGS	Fill to c 4.5 ft; ground water c 9 ft BGS
26	c 4 x 8 ft	c 9 ft	Topsoil over brown sand to c 3- 3.5 ft BGS; soils below c 8ft BGS brown/ orange, moist, unstable;	Brick, brick frags; wood down to c 3.5 ft BGS; some cobbles	Fill to c 4 ft & possibly below; ground water seepage c 8 ft BGS
27	c 4 x 8 ft	c 9 ft	Topsoil over varying brown sands to bottom of pit	Very few brick frags; old terra-cotta (sewer?) pipe in E end of pit	Fill to c 5 ft; ground water c 8 ft BGS

RANDALL'S ISLAND AMPHITHEATER SITE APPENDIX A Test Pit Descriptions (continued)

Stage Area (continued)

TP No.	Size	Depth BGS*	Soils	Contents	Remarks
28	c 4 x 8 ft	c 10 ft	Topsoil over brown sand to c 3ft BGS; brown/ orange sand to bottom	Small undiagnostic ceramic frags near to of pit	Fill to c 3 ft; ground water c 10 ft BGS

Vicinity of S toilets to be built on slab

29	c 5 x 9 ft	c 8+ ft	Topsoil over brown sand to c 2-3 ft BGS; brown sand to bottom	Brick frags, ash, near top of pit; 1 brick in W wall c 4 ft BGS; undiagnostic ceramic frag c 8 ft BGS	Fill to c 8 ft BGS; ground water c 8 ft BGS

Vicinity of N toilets to be built on slab

30	c 4 x 10 ft	c 11 ft	Topsoil over brown sand to c 3 ft BGS; construction sands orange/ brown loosely packed to bottom	Undiagnostic kaolin pipe frag c 2 ft BGS; glass frags in fill; shell, coal frags c 9.5 ft BGS	Fill to c 10 ft & possibly below

Test Pits on S fence line

31	c 4 x 8 ft	c 7 ft	Topsoil over brown sand to c .5ft BGS; brown/ orange sands to bottom	Building rubble - brick frags, dressed stones, etc - to c 7 ft BGS; ash layer c 1.5 to 2.2 ft BGS	Fill to c 7 ft BGS; large amount of stones made digging difficult,; ground water c 7 ft BGS
32	c 4x 8 ft	c 7 ft	Topsoil over brown sand to c 1.3ft BGS; brown/ orange sands to bottom	Building rubble - brick frags, dressed stones, metal frags, etc - to c 7 ft BGS	Fill to c 7 ft BGS; large amount of stones made digging difficult; ground water c 6 ft BGS

N of earlier extension of TP14

33	c 6.5 x 11 ft (E-W)	c 7 ft	Topsoil over brown sand to c 2-3 ft BGS; brown/ orange sand to bottom	Isolated small ceramic frags	Just N of TP 14 extension; fill; halted where an active electrical line was indicated; resumed on N side of electrical line and became S end of TT1 (see below)

TT1 N of electrical line

TT1 (TP 33 to TP 34)	2-4 ft wide x 90 ft long	c 7 ft	Topsoil over brown sand to c 2-3 ft BGS; brown/ orange sand to bottom	Brick, brick frags, terra-cotta pipe, crock base (6-8 inch diameter, unglazed exterior, Albany slip interior), oyster shell, whiteware ceramic frags to c 4 ft; large boulder at c 6 ft BGS	Fill to c 4 ft BGS & possibly below; cleaner in N section of trench; no bones observed; a modern cartridge shell near surface

*Surficial topsoil with grass overlying fill

Note: TP1-3 were excavated with a Case 580 Super L Extendahoe with a 30-inch bucket; it was replaced with a Case 580 Super M Extendahoe with a 24- inch bucket when the first machine had mechanical trouble. Also, during a break in excavation, post holes for fencing that will surround the site were observed by the archaeologist; nothing significant noted

BGS = Below Ground Surface; TP = Test Pit; TT = Test Trench

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EXECUTIVE SUMMARY

During field testing at Randall's Island, New York, a pit containing animal bones was located. The majority of the remains were uncovered and extracted by backhoe. The back-dirt from the excavation was examined and all visible bone collected by Dr. Joan Geismar and her team, and the remains sent to Dr. Sophia Perdikaris of the Brooklyn Zooarchaeology Laboratory. Analysis was conducted at the City University of New York's Northern Science & Education Center's Zooarchaeology Laboratory at Brooklyn College. The analyzed bone material, essentially a grab sample from an expanded pit approximately 3 to 11 feet deep, was kindly donated by Dr. Geismar and has been added to the comparative collection at the Brooklyn laboratory, thereby ensuring their long-term curation. These bones are of immense educational value for students working with other faunal collections from the New York area.

This collection differs from all other studied bone material from New York in that the bone material was complete and devoid of butchery marks. From this line of evidence, it appears that whole animals were dumped at this location after death. If this had been a subsistence based collection, significant butchery marks would have been visible, along with possible smaller size elements indicative of portions sectioned by a butcher. Also lacking was a differential representation of body parts. If the deposit had been food based, a majority of the elements would have belonged to meat-rich parts instead of being full skeletal representation. Most midden refuse material shows significant modification from gnawing and chewing rodents and/or carnivores as opportunistic feeders.

The material was very moist and showed exfoliation. It has now been dried and catalogued. Some minor post mortem damage caused by the backhoe was noted.

Introduction - data and methods

The deposit probably represents a single dumping episode. The bone material is not directly associated with structures. Overall preservation was good and the 15 kg of analyzed bone material represents 100% of the total assemblage. Since it was essentially a grab sample, with no stratigraphic basis for sub-division, the archaeofauna was analyzed as a unit.

Laboratory Methods: Analysis was carried out at Brooklyn College's Zooarchaeology Laboratory and data entry was done by Dr. Sophia Perdikaris. All fragments were sorted by family (mammal, bird) and were identified as fully as possible using current methods (no sub-sampling or restricted-element-range approaches were employed). Basic data were recorded through the NABO Zooarchaeology working group NABONE system (7th edition, see NABO website www.geo.ed.ac.uk/nabo for updates and sample data sets) which combines Access database with specialized Excel Spreadsheets. The NABONE package allows application of multiple measures of abundance, taphonomic indicators, and skeletal element distribution (see Appendix and all text figures) and is the current standard record for North Atlantic archaeofauna. NABONE is freeware and should be cited as "North Atlantic Biocultural Organization Zooarchaeology Working Group (2002) *NABONE Zooarchaeological Recording Package 7th edition*, CUNY, NY."

Overview of Species Present

Table 1 provides an overview of species present in the Randall's Island archaeofauna, Table 2 is a detailed presentation of NISP (number of identified specimens) while Tables 3, 4, and 5 provide fuller taxonomic breakdown of the domestic mammals present.

Table 1

Scientific Names	*English Common Names*
Bos taurus dom.	Cattle
Equus caballus	Horse
Ovis/ Capra sp. Indet.	Caprine [sheep/goat]

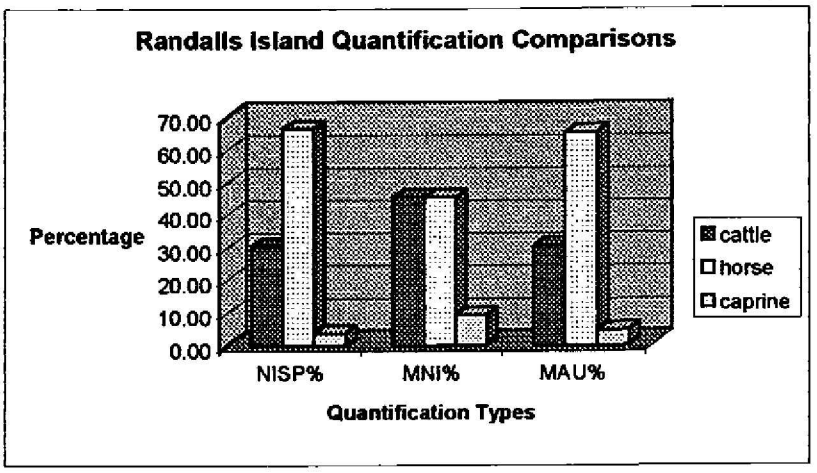
Age at Death

While the domestic mammal remains did not contain enough tooth rows for a reasonable reconstruction of mortality profiles, from analysis of patterns of tooth eruption and wear (Payne 1973, 1984), a number of specimens were clearly from animals that were adult, i.e., cattle and horse, while the caprine bones were of younger individuals, less than 1 year old (Schmidt 1979). The age of the cattle bones points to a single individual and possible dairy production since they were of large size and of an adult animal while not big enough to be oxen. The horse bones belong to at least two individuals of different sizes, both adults. The presence of canines indicates the horses were stallions since mares do not have canines. It is quite possible the horse bones represent draught animals used to pull carriages and/or wagons.

Quantification Methods

Quantification in this report follows NABO ZWG recommendations by making NISP (number of identified specimens) the basic quantitative measure, as this simple counting technique has proven successful in numerous sampling experiments (Grayson 1984, Gilbert & Singer 1982, Ringrose 1993, Pilgrim & Marshall 1995, Gautier 1984, Lie 1980) and is easily replicable by other investigators. However, as the collection is dominated by complete cattle and horse bones MNI (minimum number of individuals) estimates were carried out as well. NISP (number of identified specimens) counts simply total numbers of all fragments that can be identified to species level or to some other useful taxonomic level (e.g., "Caprine" and "Ovis/Capra" include both the bones that can be securely identified as either sheep or goat and the much larger number of fragments that must be one or the other but cannot be assigned to species). MNI attempts to reduce interdependence (multiple bones from the same skeleton being counted) by estimating the smallest number of animals that would have had to die to produce the skeletal elements identified as the same species. MAU mean (minimum animal unit = RF of Perkins & Daly, see Daly 1969) divides the NISP count per element by the number of times the bone element appears in the species' body then takes the mean of the result for the whole skeleton (for detailed discussion see Grayson 1984). There is extensive literature on the statistical behavior of these different indicators (see Grayson 1984, Rackham 1994, Reitz & Wing 1999, Gilbert & Singer 1982, Lie 1980, Lyman 1994, Pilgrim & Marshall 1995, Payne 1972), but most workers today selectively employ different quantitative approaches according to the depositional context. Catastrophic deposits, or the disposal of complete carcasses such those of the cattle and horse remains from Randall's Island, justify an MNI approach. This would not be the case if the deposit were accretional in nature (such as gradually accumulating trash piles and middens) which is better handled with NISP and other indicators (for discussion see McGovern et al. 1996, Meltzer et al. 1992).

TABLE 6



As Figure 6 demonstrates, all three methods produce broadly similar results when applied to the domestic mammal bones from Randall's Island, indicating that horse bones are twice as common as cattle bones, and that caprine makes up a small part of the collection.

Note that MNI produces the outlying estimate, emphasizing the cattle and horse remains but also showing a very high percentage for the 3 caprine bones. This is a predictable characteristic of MNI, which is very sensitive to anomalous distributions of elements, and tends to over-count rare animals represented by a limited range of skeletal elements.

Bone Preservation & Taphonomy

Most bones present in living animals have disappeared entirely from archaeological sites, recycled by many efficient agents of attrition or victims of soil acidity or reworking of deposits. The bone fragments usually available for study by a zooarchaeologist are the exceptions to this rule, and inevitably form a small and usually biased sample of a lost whole. The process of transformation by attrition is called *taphonomy*, and represents a major sub-field of zooarchaeology in its own right (Lyman 1994, 1996). Archaeofauna (like pollen grains, seeds, or insect parts) are thus proxy indicators of the relative abundance and role of animals in a past economy and environment, and analysts must be aware of the impact of taphonomic processes that intervene between the present sample and past target population.

NABONE software tracks several taphonomic indicators, the most useful of which are burning, fragmentation, and animal gnawing.

As Table 3, 4 and 5 illustrate, this collection has a pattern of fragmentation, with fewer smaller bones surviving and many more large fragments in the 10 cm and larger size category. Although the soils were not screened, this difference in fragmentation appears to represent a genuine pattern of deposition rather than a consequence of excavation and recovery.

Mammal Element Frequency

The causes of different recovered frequencies of different skeletal elements in different archaeofauna has long been a topic of intensive research in zooarchaeology (Daly 1969, Binford 1976, 1981, Crabtree 1990, 1996, Speth 1983, Lyman 1994, Hesse 1982, Davis 1987, Amorosi et al. 1994, 1996, 1997, Halstead 1998, Grayson 1984, Lyman 1992, Marshall & Pilgrim 1991, Payne 1972, 1973, Perdikaris 1993, 1996, 1998, 1999). The absence or disproportionate presence of particular bones can convey important cultural information such as long distance transport of cuts of meat, status or wealth differences, ethnic differences, changing food ways, or changing availability of species in the local environment. However, animal skeletons have their own inherent characteristics (bone density, shape, pattern of articulation) that tend to impose structure on any collection. Likewise, different taphonomic histories (acid soil, frost action, butchery strategy, scavenger gnawing, burning, etc.) produce different patterns of bone attrition and survival.

Some skeletal elements are extremely dense (most mandibles, teeth) and usually appear in considerable numbers even on "ravaged" sites that have been subjected to extreme attrition. Other elements (proximal humerus, proximal femur) are far less dense and are also located at points of articulation (shoulder, hip) that tend to be heavily damaged during primary disjointing (especially if heavy metal cutting tools are used).

Some elements are associated with major muscle masses (humerus, femur, proximal radius, proximal tibia) or substantial amounts of recoverable bone marrow (metatarsus, metacarpus) and others (toes) are associated with less recoverable meat. Complicating factors are the presence of "riders"- low meat value bones that are tightly bound to higher value elements by tendons and ligaments (tarsals and carpals) and tend to travel with them, the varied industrial utility of low meat value elements like antler, hoof, and horn, and cultural and situational factors affecting desirability of a cut of meat.

Some cultures (many hunter-gatherers) regularly discard most skull bones at the kill site, while others (like the medieval and early modern Icelanders) make extensive use of meat, brains, and other tissue associated with the bones of the skull. Butchers who can slaughter animals close to their point of final consumption are able to make fuller use of carcasses than those facing a long walk from kill site to consumption site. Finally, not all bone elements are equally identifiable in most collections due to biological similarity of elements in related species that can be expected to occur in a known region or period (archaeofauna composed entirely of whales and mice are a notable, if rare, exception). Most mammal vertebrae and ribs, and many long bone shaft fragments cannot be securely identified to species level and are properly assigned by most workers to the more vague (if safer) categories of "large terrestrial mammal," "medium terrestrial mammal," and the like (see Table 2).

This complex web of interdependent variables makes element frequency study one of the most challenging areas of zooarchaeological analysis and interpretation and has long generated controversy and multiple interpretations of data sets (Binford 1981). Most modern workers suggest employing a range of indicators (Rackham 1994, Payne 1972) and the NABONE package provides a number of tools for investigating element frequency.

A first step is to inspect the general distribution of archaeologically recovered bones over the known pattern of the animal's skeleton. Looking at the distribution of cow and horse bones in the Randall's Island collection, all of the animal is represented while the caprine appears to be represented solely by the elements present in a leg of lamb.

It is also useful to aggregate bone elements (riders as well) into major body parts for a more generalized (and more immediately understandable) pattern of relative percent of body part frequency (based on MAU). Note that the small number of ribs and vertebrae are an artifact of analysis, and most of these (very abundant) bones are probably in the "large terrestrial mammal" category.

Concluding Remarks

Animal bone from Randall's Island provides an interesting assemblage indicating a disposal site for large animals that may have served various capacities in the New York economic system. The food refuse represented by the caprine and chicken bones is a statistically small indicator of local consumption.

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