

CHAPTER 3

AFFECTED ENVIRONMENT

This chapter describes the existing baseline conditions within the project site (primary study area) and the secondary study area, as described below, that may be directly or indirectly affected by the proposed action. In order to assess the primary and secondary impacts of the proposed action, the existing conditions at the project site and the adjacent areas are described separately, as follows:

- Primary Study Area - coterminous with the proposed project site, as shown in Figure 3.1-1. The project site is bounded by East 132nd Street on the north (with one parcel excepted east of the Triborough Bridge Approach) the Harlem River and Bronx Kill to the south, Lincoln Avenue to the west, and to the east, a line that would extend Feiss Avenue (formerly Walnut Avenue) south to the Bronx Kill;
- Secondary Study Area - for land use a one-quarter mile radius from the project area is used; for socioeconomic and open space analysis a one quarter mile radius using census tract boundaries where 50 percent or more of the tract area is within the quarter-mile radius (Figure 3.1-1). Community facilities boundaries followed service areas districts or boundaries. The secondary study areas for transportation, air quality and noise relate to the distribution of project related trips and are generally within one-quarter mile of the site, consistent with the 1982 EIS for the Oak Point Link.

The primary study area is situated within Bronx Community District 1. The secondary study area includes a small portion of Manhattan Community District 11 to the southwest, but is otherwise contained within Bronx Community District 1.

3.1 Zoning and Land Use

3.1.1 Existing Zoning

Primary Study Area

Most of the primary study area (project site) lies in the M3-1 heavy industrial district (Figure 3.1-2). One section of the area, parallel with the Triborough Bridge Approach, is zoned M2-1 for 200 feet either side of the bridge. A summary of the zoning regulations in these districts is presented in Table 3.1-1.

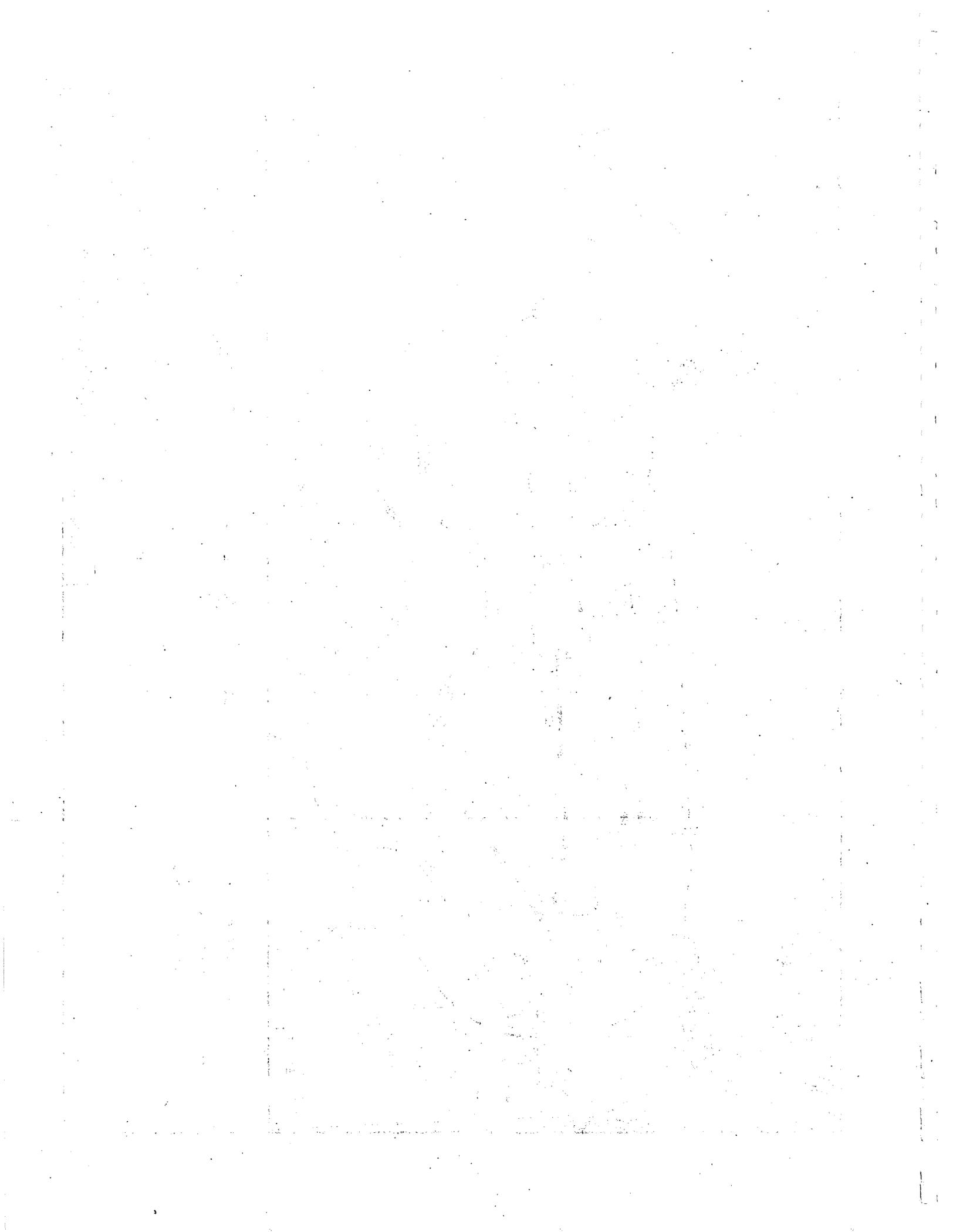
Zoning in Secondary Study Area

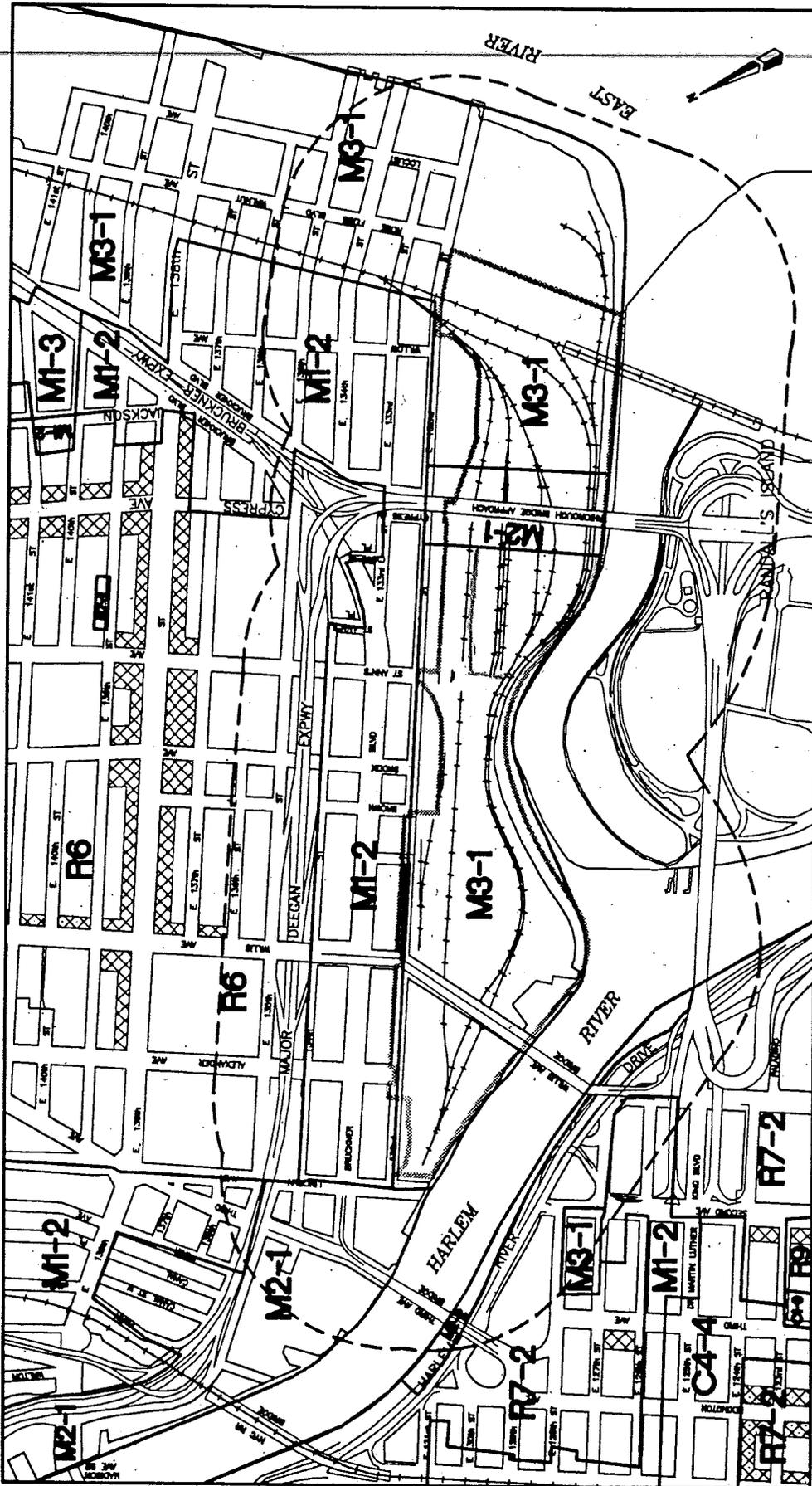
The project site is surrounded by other manufacturing districts: M3-1 to the northeast, M2-1 to the west, and M1-2 for most of the area to the immediate north (Figure 3.1-2). The M1-2 district provides a buffer to an R6 residential district that lies some 900 feet to the north of the project site, beyond the Major Deegan Expressway. The secondary study area includes M3-1, M1-2 and R7-2 districts across the Harlem River in Manhattan. A C1-4 commercial overlay district occurs on the east side of Willis Avenue, north of East 136th Street, to serve the residential district.

3.1.2 Land Use

Primary Study Area

The project site is a 95-acre rail yard that parallels the waterfront of the southern tip of the Bronx for a distance of approximately one mile, extending inland approximately 900 feet. East 132nd Street is its northern boundary, with the exception of several lots that front East 132nd Street extending from Brown Place east to Willow Avenue.





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Zoning Map

Legend

- Property Boundary
- Quarter Mile Radius
- Zoning Boundary
- C2-4 Overlay
- C1-4 Overlay

DATE: NOV 16, 1992

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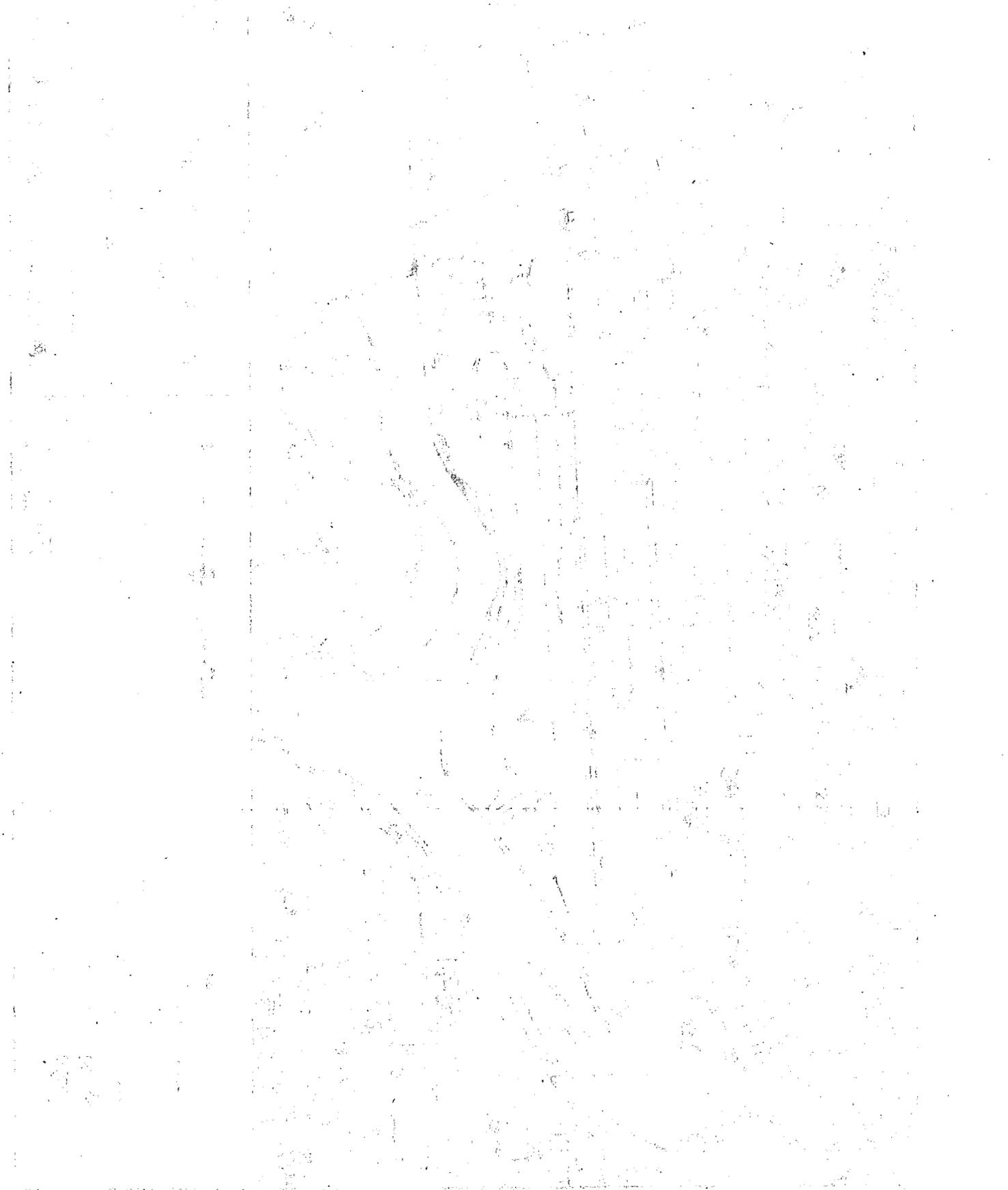


TABLE 3.1-1

SUMMARY OF ZONING DISTRICTS IN STUDY AREA

Zoning District	Description - uses permitted	Allowable FAR	Minimum OSR	Required Parking (% of du's)
R6	Non-Quality Housing Option - medium density, general to residential district of 6-12 story apartment buildings, permitting densities of up to 176 D.U.s per acre.	0.78 to 2.43	30.0 to 33.5	70
R6	Quality Housing Option provisions increase FAR on wide streets (75 feet and wider).	3.0	**	50 min.
R6	Quality Housing Option provisions on narrow streets (less than 75 ft.)	2.0	*	50 min.
R7-2	Medium density apartment house district with densities of 208 to 226 D.U.s per acre (based on 2.5 zoning rooms per D.U.)	0.87 to 3.44	15.5 to 22.0	50 min.
C1-4	Overlay commercial zone providing local shopping and services. In an R6 district, max. FAR is 2.0 for commercial.	2.0	***	Varies by use.
M1-2	Light manufacturing, high performance uses, often a buffer to residential districts. Must be fully enclosed. Certain community facility uses permitted by special permit.	2.0	-	Varies by use.
M2-1	Medium manufacturing with less stringent standards than with use M1 districts. Need not be fully enclosed.	2.0	-	Varies by use.
M3-1	Heavy manufacturing uses with low performance standard.	2.0	-	Varies by use.

Notes: * Allowable lot coverage of 60 percent (interior lot) or 80 percent (corner lot).
 ** Allowable lot coverage of 65 percent (interior lot) or 80 percent (corner lot).
 *** Residential bulk is governed by the regulations of the surrounding residential district.

Source: NYC Zoning Resolution.

The site is mostly vacant with used and unused railroad tracks stretching the length of the property. Five long and narrow warehouses, formerly associated with rail yard operations, remain in the center portion of the site. There is also a four-story red brick building, near the Willis Avenue Bridge, associated with the original rail yard. This is now mostly vacant but some non-conforming residential occupation appears to exist, describing itself as "East River Plaza". Some heavy construction materials, huge concrete blocks and large-dimension metal pipes, are stored at the western end of the site. A portion of the site adjacent to East 132nd Street between the Willis Avenue Bridge and Brown Place is used for coal storage by Gasman Coal & Oil Co. The eastern end of the site, east of the Little Hell Gate Bridge, is used as a parking lot.

Secondary Study Area

The project site is surrounded on the north, west, and east by predominantly industrial uses (Figure 3.1-3). A wide variety of industries are represented in this area, including the following:

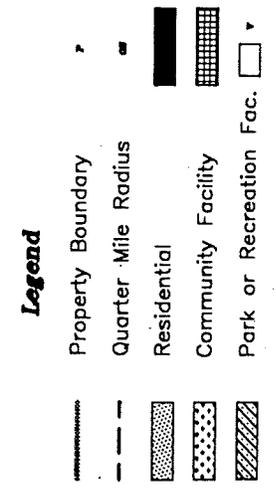
- medical waste disposal incinerator;
- organic fertilizer production;
- bulk oil storage;
- US Postal Service Distribution Center;
- Con Edison Power plant;
- coal and oil distributors;
- NYC Transit Authority bus terminal;
- NYC Transit Authority cable maintenance center;
- NYC Department of Sanitation truck maintenance;
- carting, haulage and sanitation truck garages;
- a variety of warehouse and distribution activities;
- a variety of construction trade contractors (electrical, roofing, glass, steel, stone, lumber, doors and windows);
- furniture manufacturing;
- knitting and rag mills;



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LAND USE

- Legend**
- Property Boundary
 - Quarter Mile Radius
 - Residential
 - Community Facility
 - Park or Recreation Fac.
 - Parking
 - Open Storage
 - Commercial
 - Industrial/Warehouse/Automotive
 - Vacant



DATE: NOV 23, 1992

TAMS CONSULTANTS, Inc. Figure 3.1-3



- luggage manufacturing;
- scientific and electrical goods manufacturing;
- a variety of auto repair and service activities.

A number of industrial buildings, especially older lofts, are vacant for sale or lease. A wide variety of building heights accommodates these industrial uses; most are in one- to two-story structures but there are a substantial number of loft buildings of five to six stories.

There are also a variety of commercial activities interspersed among the industrial uses, particularly eating and drinking places, as well as an antique center that has concentrated on the north side of Bruckner Boulevard between Willis and Alexander Avenues.

In addition, there are a few remnant residential clusters that are nonconforming in this industrial zone, notably East 134th Street between Willis and Brown Avenues, and the block between East 133rd and 134th Streets, Willow Avenue and the Triborough Bridge.

North of the Major Deegan Expressway and west of Cypress Avenue, a zoned residential district is comprised mainly of two large public housing complexes: the John Purroy Mitchel Houses to the west, between East 135th and 138th Streets, Willis to Lincoln Avenues (ten 17- to 20-story towers); and Mill Brook Houses to the east, between East 135th and 137th Streets, Cypress to Brook Avenues (ten 16-story towers). Between these two projects is a residential district comprised mainly of older three- to five- story row houses and tenements.

Two elementary schools are located in this residential area: PS 43 on Brown Place, between East 135th and 136th Streets, and PS 154 on Alexander Avenue, between 135th Street and the Mitchel Houses.

Several parks are located in the study area (see Section on Community Facilities for more detailed discussion). Two of these are associated with the public housing projects and face East 135th Street. In the industrial district, Pulaski Park is on the south side of Bruckner

Boulevard east of Willis Avenue. There is also a park area across the portal as Bruckner Boulevard descends and transitions to the Bruckner Expressway.

Across the Harlem River, a small section of Manhattan is included within the quarter-mile study area. Three small park complexes occur here, each of which are associated with the bridges (Triborough, Willis and Third Avenues) as their roadways transition with the Harlem River and FDR Drives. Much of the remaining land use in this section is industrial or automobile oriented (there are two bus garages as well as the East Harlem Recycling Center). PS 30 is at the periphery of the study area between East 127th and 128th Streets, west of Third Avenue. A small number of residences are located on East 126th Street between First and Second Avenues (nonconforming uses in this M1-2 area).

Located across the narrow water body known as the Bronx Kill, south of the project site, is Randalls Island. Much of this area is a park with ball fields, tennis courts and a pool. It is also the location of the headquarters of the Triborough Bridge and Tunnel Authority and the NYC Fire Department Training Academy.

Land Use Trends

Residential use in the study area declined slightly over the period 1980-90, with the total number of units declining from 5,147 to 5,001 (see Section on Housing). The decline in residential use reflects a drop in population in the area of 6.9 percent (see Section on Population). Business activity has also declined in the area, in part measured by the decline in employment in the surrounding zip code of 1,905 employees, or 21 percent, over the period 1986-91 (see Section on Employment). A substantial number of loft buildings are vacant for sale or lease in the surrounding area and very little leasing activity is occurring at this time (N. Pariser, SOBRO, November 11, 1992). Other development trends in the area are associated with the expansion and modernization of the Con Edison plant, the medical waste incinerator, and the renovation of part of Bruckner Boulevard for an antique center.

Across the Harlem River in Manhattan, there are plans being sponsored by the Manhattan Borough President's Office for a Harlem River Esplanade to run from East 125th Street to East 145th Street. The first phase, north of East 135th Street to East 139th Street and beyond the study area, is scheduled to open in 1997.

Immediately to the north of the study area, a Nehemiah housing project of 200 to 250 units is proposed in the area known as St. Mary's Park South (between the park, East 138th Street, Jackson, and St. Ann's Avenues. This will help stabilize the residential district to the north of the project.

3.2 Urban Design Characteristics

Primary Study Area

The project site is a 96-acre former rail yard that parallels the waterfront of the southern tip of the Bronx for a distance of approximately one mile, extending inland approximately 900 feet (Photo 1). The site is mostly vacant with used and unused railroad tracks stretching the length of the property. Some deteriorated barge loading wharves are located on the Harlem River, at the western end of the site (Photo 2). Several nondescript structures associated with the former rail yard and warehousing operations remain in the center portion of the site (Photo 3). These structures include four one-story warehouses and one two-story warehouse. There is also a four-story red brick building, near the Willis Avenue Bridge, associated with the original rail yard (Photo 4). All these structure have long, lean dimensions, reflecting their positioning between various rail sidings (Photo 5).

Some large construction materials, huge concrete blocks and large-dimension metal pipes, are stored at the western end of the site. The eastern end of the site, east of the Little Hell Gate Bridge, is used as a parking lot. The remainder of the vacant areas tends to be weed covered, without trees, and surrounded and dissected by chain link fencing with razor wire.

The low elevation and flat topography of the site permits views across the Bronx Kill to Randalls Island Park and across the Harlem River to Harlem (Photo 6). Views into the Bronx are generally obscured by industrial and warehouse buildings along East 132nd Street, which generally acts as the northern boundary of the project site.

Secondary Study Area

The secondary study area, within one quarter mile of the project site, includes the southern tip of the Bronx together with a small area of East Harlem and part of Randall's Island. The area exhibits a built environment of diverse character, including a mixture of industrial,

commercial and residential buildings, and parkland. Industrial activities surround the landside of the project site usually for a radius of two or more blocks, while the predominantly residential district of Mott Haven extends to the north of the visual and physical barriers created by the Major Deegan and Bruckner Expressways. The Major Deegan descends from a structure in the west to a block-wide cut (East 134th to 135th Streets) in the center of the study area; thereafter, it continues on structure south to the Triborough Bridge, or north as the Bruckner Elevated Expressway. The New York-New Haven railroad, also on structure, dissects the industrial eastern end of the study area, providing rail access to the rail sidings of the project site and south, across the Hell Gate Bridge to Queens via Randalls Island.

The well-established industrial character of much of the area is made manifest by many older lofts and other industrial structures, vacant lots and open storage. This area generally lacks a cohesive urban design, exhibiting a wide diversity of building types and architectural styles, ranging from nineteenth century six-story red brick lofts with handsome fenestration, to modern windowless one-story warehouses (Photos 7 and 8). A sense of clutter is introduced by the vacant lots with open storage, the ubiquitous chain link and razor wire fences, advertising billboards, some utility poles and, in the eastern section where Con Edison's plant is located, there are blocks of transformers open and visible (Photos 9, 10).

Recent decades have witnessed a local economy that has suffered much decline in demand, causing the vacancy and frequent deterioration of many buildings and properties. The resulting visual impression is one of a once-thriving industrial district left rather rundown and shabby around its edges, but still with substantial business vitality (Photo 11).

The residential district north of the Major Deegan Expressway provides two different characters. To the east and west are mega-blocks of public housing built in the period 1957-65, with numerous well-maintained towers set in landscaped open space with playgrounds and ball courts. Between these two areas are several blocks of Nineteenth Century tenements of a more mixed character. Some are very well-maintained and boast of

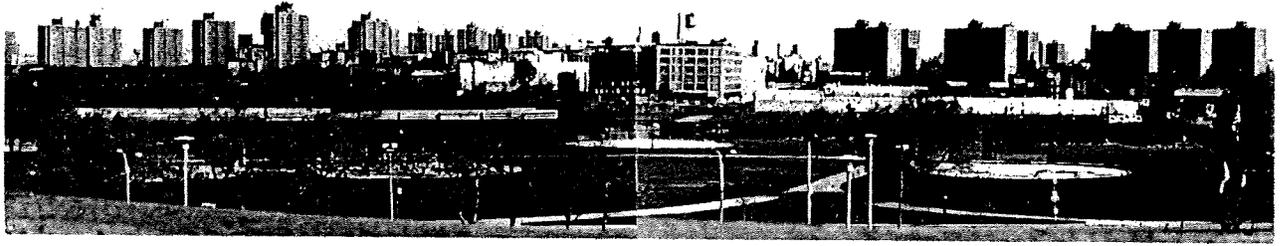


Photo 1: Panorama of Study Area with Randalls Island Park in foreground, industrial and warehouses beyond project site, and public housing towers to east (Mill Brook) and west (Mitchel).

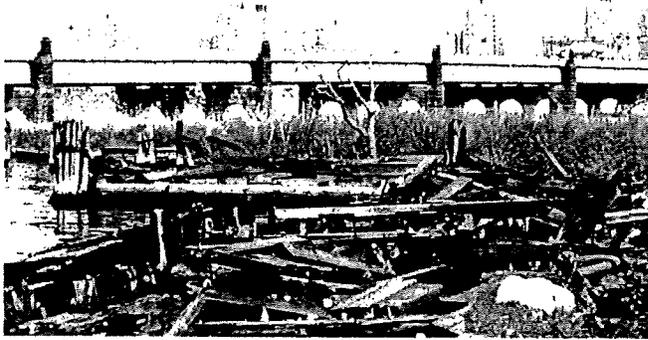


Photo 2: Decayed wharves on Harlem River.



Photo 3: Warehouses on Project Site.



Photo 4: Former railroad "Station House."



Photo 5: Warehouses and tracks on Project Site. Triborough Bridge and Hell Gate Bridges in rear.

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Photo 6: Looking from Project Site, across Bronx Kill to Randalls Island and Little Hell Gate Bridge.

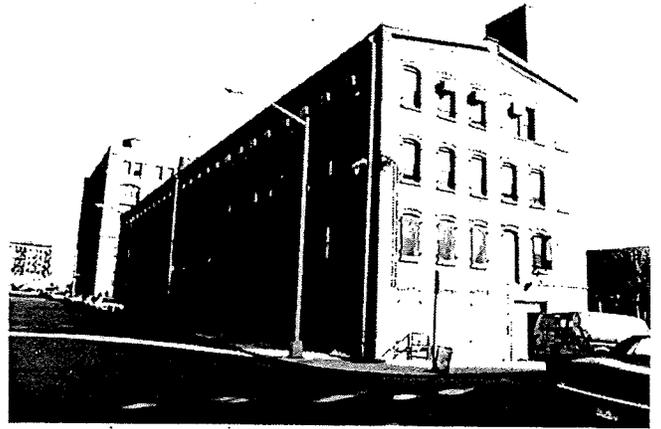


Photo 7: Lofts on Willow Avenue.



Photo 8: Warehouse on St. Ann's Avenue.



Photo 9: Bruckner Boulevard looking north.



Photo 10: Bruckner Boulevard looking west.





Photo 11: Lofts on E. 132nd Street from Project Site.



Photo 12: North side of E. 136th Street.



Photo 13: South side of E. 134th Street.



Photo 14: Contextual In-fill Housing on E. 137th Street.



Photo 15: Lincoln Corners Building.

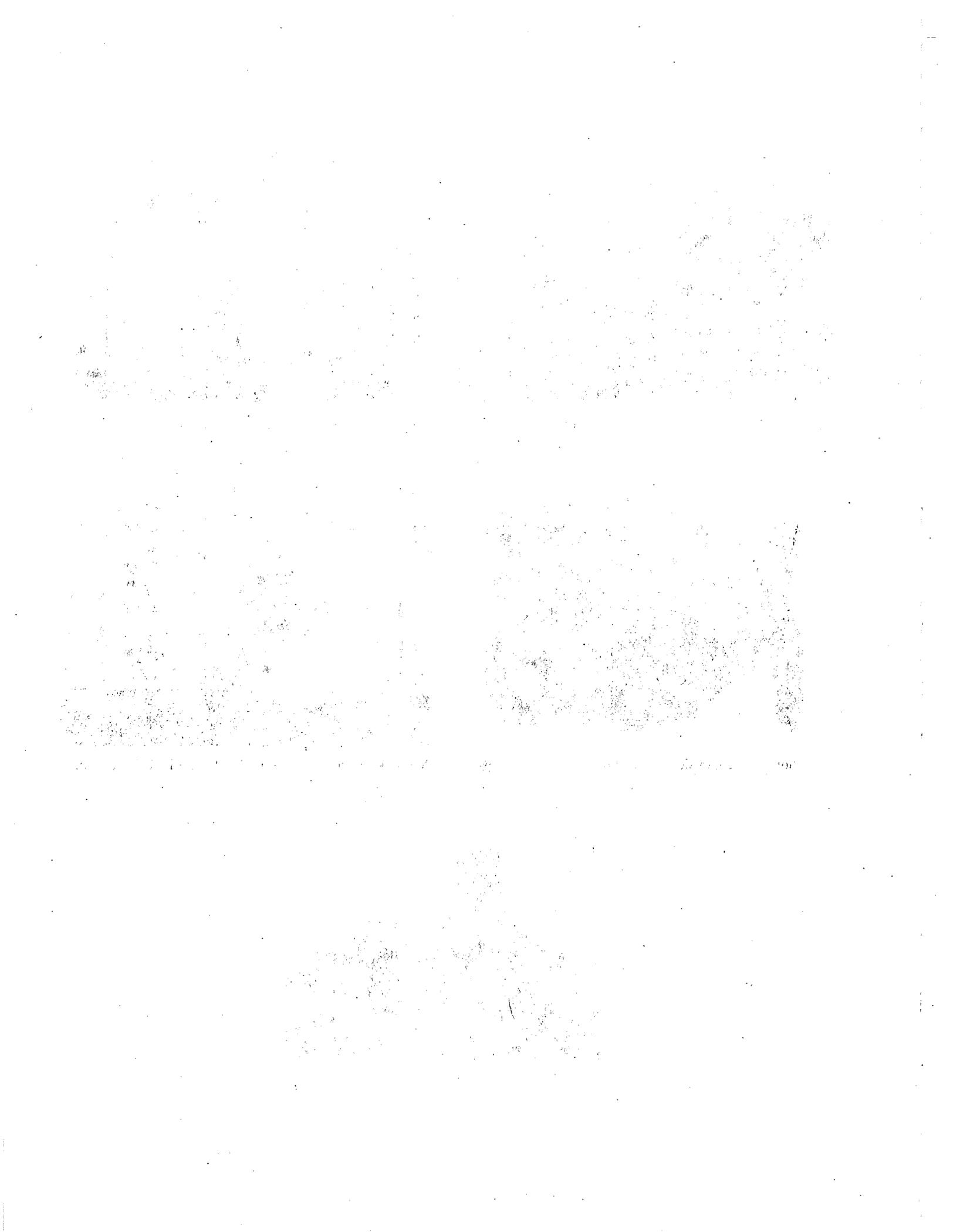




Photo 16: "Antique Row" on Bruckner Boulevard.



Photo 17: Tiny row houses on E. 134th Street.



Photo 18: Mill Brook Houses from E. 135th Street looking east toward Brook Avenue.

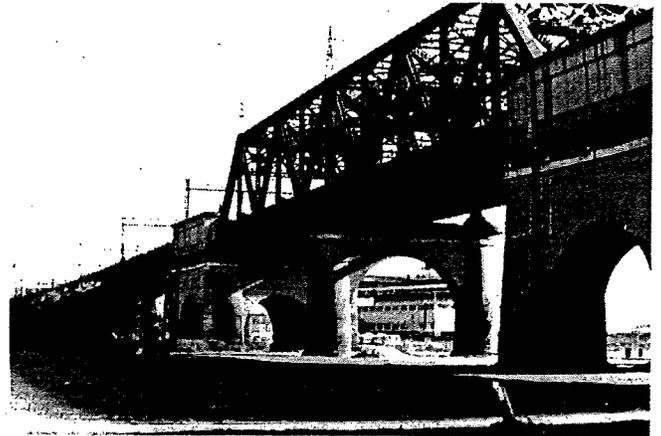


Photo 19: Little Hell Gate Bridge and rail line crossing Bronx Kill and Randall's Island Park.



interesting architectural detail and cohesive form, as for example on East 136th Street between Willis Avenue and Brown Place (Photos 12 and 13). Others are more deteriorated and with vacant lots and sealed buildings scattered among them. There are also some new contextual buildings that have provided some in-fill among these older residential blocks (Photo 14).

Due to the functional nature and often deteriorated condition of many of the structures in the study area, the buildings tend to be of low to medium visual quality. Architectural visual quality is reflected in whether buildings are good representations of particular styles, the quality of the design, and the condition in which a building is maintained.

The higher visual quality buildings remaining in the study area include: the railroad building near the Willis Avenue Bridge (Photo 4); the Lincoln Corners (Tower) Building on Bruckner Boulevard and Lincoln Avenue (Photo 15); several four- to six-story loft buildings on Willow Avenue at East 135th and 136th Streets (Photo 7); the row of storefronts and apartments on Bruckner Avenue east of Alexander Avenue ("antiques row") (Photo 16); the residential rows on East 134th and 136th Streets, between Willis Avenue and Brown Place (Photos 12 and 13); and the tiny residential row of homes on East 134th Street west of Willis Avenue (Photo 17).

The topography of this area of the South Bronx rises gently from the waterfront, which is mostly the project site, to an elevation of 50 feet at the northern edge of the study area. The areas of higher elevation are dissected by a north-south valley in the vicinity of Brook Avenue. Views east and west across the valley are usually terminated by the towers of the public housing projects (Photo 18). The block-wide cut provided for the Major Deegan Expressway permits some views towards the west, of Harlem with some residential towers and the State Office Building on the skyline. The north-south orientation of the avenues permits some partial views of the skyline of Mid-Town Manhattan from a number of vantage points.

The small portion of the study area in Manhattan extends in an arc reaching a maximum of some 700 feet inland from the Harlem River. The dominant feature of the area is its proximity to the River and the Harlem River Drive, which transitions to the Franklin Delano Roosevelt Drive (FDR) south of the Triborough Bridge at East 125th Street. The Triborough, Willis Avenue and Third Avenue Bridges are also major features as their landing and connecting ramps account for large portion of the land of this part of the study area.

Much of the remaining land associated with these connecting ramps became parkland in the 1930s and 1940s. Although these parks are somewhat isolated by the heavy vehicular traffic associated with the drives and bridges, they do provide landscaped havens with relatively mature trees, ball fields and seating. Further inland, the area is mostly industrial with a diverse character of building types, ranging from old loft structures to modern bus terminals. Some occupied and some vacant older tenements remain on East 126th Street, between First and Second Avenues. A small cluster of modern and well maintained institutional uses (including PS 30 and a parochial school), at Third Avenue and East 128th Street, contrasts with the generally deteriorated character of the area. Rubble strewn vacant lots characterize much of upper Second Avenue in the center of this area. The demolition of many structures here has left remaining isolated structures with their sides and rears exposed. The waterfront of much of this area, stretching almost one half mile north from the Triborough Bridge, is presently occupied by a concrete distributor and by a huge salt pile. The open storage nature of these uses adds to the careless and disorderly appearance of much of the area.

Across the Triborough Bridge from both East Harlem and from the Bronx, is Randalls Island. The study area here is dominated by the bridge roadways on their massive concrete structures, as they channel traffic to each of the three Boroughs of Manhattan, Bronx and Queens, as well as the bridge toll booths. The Hell Gate Railroad Bridge, also on concrete structure, parallels the road bridge as it transits south from the Bronx to Queens (Photo 19). The headquarters of the Triborough Bridge and Tunnel Authority (TBTA) is located close

beneath the Manhattan bound section of the bridge, as is also a maintenance facility for the NYC Department of Parks and Recreation.

Elsewhere in the study area the island is parkland with open ball fields and tree-lined road and walkways. Generally unrestricted views are available from the park area across the Bronx Kill, to the project site, other industrial features, and the public housing towers. More aesthetic vistas extend eastward across the East River, as this water body continues towards Long Island Sound.

3.3 Socioeconomics

The socioeconomic baseline conditions for the secondary study area are based on US Census data. Eight census tracts define the secondary study area (Figure 3.3-1). The primary study area is an anomalous census tract that includes the project site and then extends along the waterfront of the East River more than a mile from the project site (Tract 81) and incorporates exclusively industrial property. The 1990 Census does report 39 residents for this tract, but because these could be located more than a mile from the project and due to the general nonresidential nature of this tract, the tract is not incorporated in the socioeconomic analysis. The project site itself has no residential population. References to the "Study Area" will therefore signify the "Secondary Study Area" as used here.

3.3.1 Population

The 1990 Census records a population of 18,767 persons residing in the study area, characterized as notably younger than in the Bronx, or the City as a whole (Table 3.3-1). Persons under age 18 represent 32.4 percent of the total, compared to 23 percent for the City. Elderly persons over 65 represent 8.3 percent in the study area, compared to 13 percent in the City. Over the period 1980-90, the study area experienced a net loss of 1,382 persons (6.9 percent) (Table 3.3-2). This decline compares to a gain of 2.98 percent in the Bronx and 3.55 percent in NYC, over the same period.

TABLE 3.3-1

AGE DISTRIBUTION OF POPULATION
(1990)

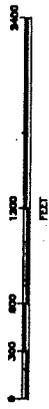
Census Tract	Total Persons	Under 18 Years		Age 65 & Over	
		Persons	Percent	Persons	Percent
Bronx 11	725	197	27.17	42	5.79
15	47	12	25.53	2	4.26
17	817	250	30.60	49	6.00
23	4,665	1,468	31.47	608	13.03
25	5,484	1,894	34.54	333	6.07
27	2,922	1,042	35.66	173	5.92
NY 192	3,669	1,095	29.84	313	8.53
202	438	123	28.08	38	8.68
Study Area	18,767	6,081	32.40	1,558	8.30
Bronx	1,203,789	331,648	27.55	140,220	11.65
New York	1,487,536	246,827	16.59	197,384	13.27
NYC	7,322,564	1,686,718	23.03	953,317	13.02

Source: 1990 Census, STF1A and PLF 94-171, NYCDOP 1991.



Legend

- Property Boundary
- - - Quarter Mile Radius
- Census Tract Boundary
- 240** Census Tract Number



HARLEM RIVER YARD VENTURES INC.
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CENSUS TRACTS

DATE: NOV 17, 1992.

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Figure 3.3-1

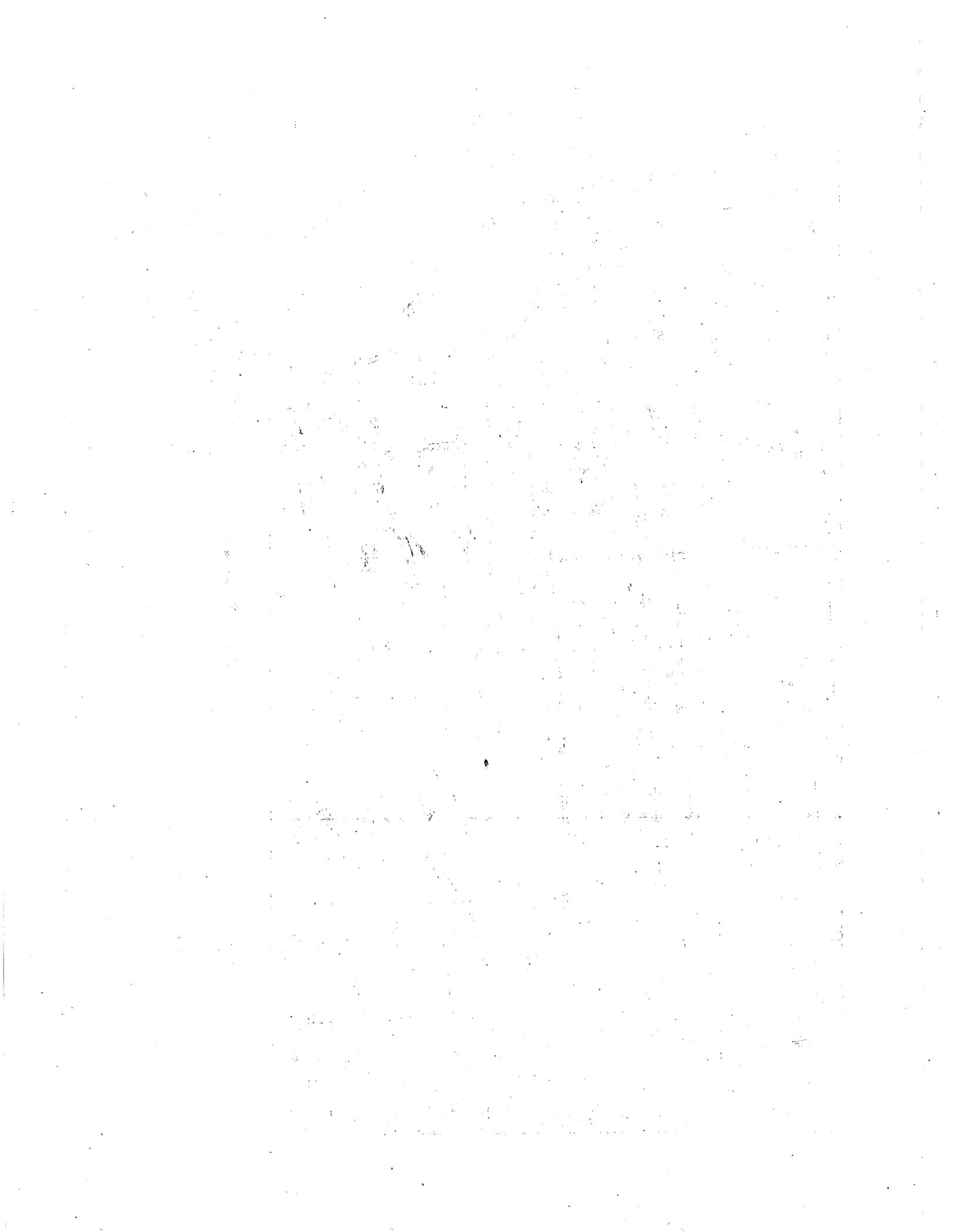


TABLE 3.3-2

AGE DISTRIBUTION OF POPULATION
(1980-1990)

Census Tract	Total Persons		Percent Change	Under 18 Years		Percent Change	Age 65 & Over		Percent Change
	1980	1990		1980	1990		1980	1990	
Bronx 11	610	725	18.85	189	197	4.23	53	42	-20.75
15	39	47	20.51	13	12	-7.69	0	2	n/a
17	834	817	-2.04	319	250	-21.63	42	49	16.67
23	5,123	4,665	-8.94	1816	1,468	-19.16	650	608	-6.46
25	5,299	5,484	3.49	2156	1,894	-12.15	244	333	36.48
27	3,396	2,922	-13.96	912	1,042	14.25	176	173	-1.70
NY 192	4,351	3,669	-15.67	4,076	1,095	-73.14	275	313	13.82
202	497	438	-11.87	470	123	-73.83	27	38	40.74
Study Area	20,149	18,767	-6.86	9,951	6,081	-38.89	1,467	1,558	6.20
Bronx	1,168,972	1,203,789	2.98	341,710	331,648	-2.94	151,298	140,220	-7.32
New York	1,428,285	1,487,536	4.15	203,244	246,827	21.44	204,437	197,384	-3.45
NYC	7,071,639	7,322,564	3.55	1,765,467	1,686,718	-4.46	951,732	953,317	0.17

Source: US Census, 1990, STF1A and PLF 94-171, NYCDOP 1991; US Census, 1980.

3.3.2 Income and Poverty

The study area is generally characterized as one with substantial populations in poverty, receiving much lower incomes than elsewhere in the Bronx and the City. The 1990 Census data provides income and poverty data for 1989. The median household income in the census tracts comprising the study area ranged from \$4,999 to \$15,250 (Table 3.3-3). The area is identified as a distinctly lower-income area when compared to the medians for the Bronx (\$21,944) and the City as a whole (\$29,823). For families, the median income ranged from \$4,999 to \$45,139, although most tracts were in the \$10,000 to \$13,000 range. These family income levels also appear low compared to the rest of the Bronx (\$25,479) and the rest of the City (\$34,360).

The Census definition of poverty for persons in 1989 is shown in Table 3.3-3, where 51.4 percent of the study area's population are identified below the poverty level. Among the tracts comprising the study area, the percent in poverty ranges from 36 percent to 100 percent. These data compare to 28.7 percent for the Bronx and 19.3 percent for the City.

Additional data on income and poverty is available for the Community District. In 1990, Bronx Community District 1 reported 52.7 percent of its population received income support (AFDC, SSI, or Medicaid). This percent increased from 45.4 percent in 1980, (Department of City Planning Community District Needs FY 1993). These percentages, for 1990, would compare to 29.4 percent in the Bronx, and 18.7 percent for NYC.

TABLE 3.3-3

INCOME AND POVERTY

Census Tract	Households		Families		Persons		
	Total	Median Income \$	Total	Median Income \$	Total	Below Poverty Level	
					Total	Total	Percent
Bronx 11	182	15,250	128	45,139	729	262	35.94
15	10	4,999	10	4,999	39	39	100.00
17	265	9,430	179	13,686	788	496	62.94
23	1,690	7,925	1,110	15,189	4,477	2,272	50.75
25	1,804	8,246	1,271	9,807	5,567	2,924	52.52
27	1,001	8,128	776	10,109	3,004	1,742	57.99
NY 192	1,296	11,284	966	11,279	3,641	1,612	44.27
202	227	9,338	112	13,571	427	244	57.14
Study Area	6,475		4,552		18,672	9,591	51.37
Bronx	423,191	21,944	291,978	25,479	1,163,947	334,137	28.71
New York	716,811	32,262	305,368	36,831	1,450,698	297,617	20.52
NYC	2,816,274	29,823	1,755,718	34,360	7,181,155	1,384,994	19.29

Source: US Census 1990, STF3A, NYCDTCP 1992.

3.3.3 Employment

Employment in the area is generally focussed on manufacturing activity, which experienced some growth in recent years. However, employment as a whole has seen a notable decline in the area. Data from the 1990 Census is not yet available on the labor characteristics of the resident population in the study area.

The New York State Department of Labor maintains records of employment by Standard Industrial Classification (SIC) codes by zip code. These data include unemployment insurance covered employment but government employment is not included. (Some caution with these data is appropriate in that headquarters' personnel records may be counted rather than the actual location of employment.) Zip code area 10454 covers almost all of the study area and so these data permit a profile of local business activity. Data for 1986 and 1991 are presented in Table 3.3-4.

In 1991, manufacturing employment accounted for 44.2 percent of all employment in the area. The next most important classifications were Trade, at 25.8 percent, and Services at 10.1 percent. A large number of the detailed industrial classifications are suppressed because of the small number of firms and the requirement to maintain confidentiality. However, in the major industry group category, Manufacturing is seen to have grown from 2,814 employees in 1986 to 3,238 in 1991, an increase of 15 percent. On the other hand, overall employment in the area declined from 9,228 to 7,323 over the period. Most of this decline appears to have occurred in Services and Trade categories.

TABLE 3.3-4

EMPLOYMENT BY INDUSTRY CATEGORY
ZIPCODE 10454

SICC	Industry	Firms			Employees		
		1986	1991	Change 1986-91	1986	1991	Change 1986-91
Major Groups							
0	Unclassified	3	4	1	*	4	n/a
3	Construction	36	36	0	415	622	207
4	Manufacturing	104	106	2	2,814	3,238	424
5	Transport, Utilities, & Comm.	23	20	(3)	*	378	n/a
6	Trade	173	170	(3)	2,095	1,886	(209)
7	F.I.R.E.	38	43	5	75	452	377
8	Services	75	80	5	1,237	743	(494)
	Totals	452	459	7	9,228	7,323	(1,905)
Detailed Groups							
0	Unclassified	3	4	1	*	4	n/a
15	General Construction	3	8	5	*	*	n/a
16	Heavy Construction	0	1	1	0	*	n/a
17	Special Trade Const.	33	27	(6)	0	420	420
20	Food Products	7	8	1	347	*	n/a
22	Textile Mill Products	4	4	0	*	*	n/a
23	Apparel	16	16	0	540	558	18
24	Lumber & Wood Products	5	8	3	*	182	n/a
25	Furniture	9	9	0	89	102	13
26	Paper & Allied	6	5	(1)	91	41	(50)
27	Printing & Publishing	2	1	(1)	*	*	n/a
28	Chemicals	4	6	2	137	166	29
30	Rubber & Misc. Plastics	4	3	(1)	*	*	n/a
31	Leather Products	2	1	(1)	*	*	n/a
32	Stone & Clay	3	4	1	*	*	n/a
33	Primary Metal Industries	3	1	(2)	*	*	n/a
34	Fabricated Metal Products	13	10	(3)	320	133	(187)
35	Machinery & Computers	9	9	0	*	*	n/a
36	Electronic (excpt Computers)	5	5	0	*	*	n/a
37	Transportation Eqpt.	0	1	1	0	*	n/a
38	Measuring Instruments	2	1	(1)	*	*	n/a

SICC	Industry	Firms			Employees		
		1986	1991	Change 1986-91	1986	1991	Change 1986-91
39	Misc. Manufacturing	10	14	4	345	355	10
41	Transit	0	1	1	0	*	n/a
42	Transportation & Warehousing	14	14	0	*	308	n/a
47	Transportation Services	3		(3)	*		n/a
48	Communications	6	4	(2)	*	*	n/a
49	Electric/gas/sanitary	0	1	1	0	*	n/a
50	Wholesale Trade (Durables)	15	18	3	271	242	(29)
51	Wholesale Trade (Nondurables)	23	18	(5)	310	418	108
52	Building Materials Supply	7	8	1	41	53	12
53	General Merchandise Stores	6	6	0	*	*	n/a
54	Food Stores	54	49	(5)	617	331	(286)
55	Auto Dealers & Gas Stations	7	6	(1)	20	20	0
56	Apparel Stores	4	9	5	*	23	n/a
57	Home Furnishings	6	9	3	*	*	n/a
58	Eating & Drinking	21	21	0	104	182	78
59	Misc. Retail	30	26	(4)	168	124	(44)
60	Depository Institutions	3	2	(1)	*	*	0
64	Insurance Agents	3	2	(1)	*	*	0
65	Real Estate	32	39	7	48	405	357
72	Personal Services	14	9	(5)	*	38	n/a
73	Business Services	8	12	4	*	56	n/a
75	Auto Repair & Parking	5	10	5	21	24	3
76	Misc. Repair	3	4	1	*	6	n/a
79	Amusement & Recreation	1	1	0	*	*	n/a
80	Health Services	22	16	(6)	247	146	(101)
82	Educational Services	9	6	(3)	113	69	(44)
83	Social Services	8	16	8	299	378	79
86	Membership Organizations	4	5	1	*	12	n/a
87	Other Prof. Services	1	1	0	*	*	n/a

Note: * indicates data suppressed for reasons of confidentiality.

Source: NYS Department of Labor, Covered Employment Reports, 1986 and 1991.

3.3.4 Housing

Census data generally show the study area to have a relatively stable housing stock which is overwhelmingly occupied by renters at rather high densities, characterized by structures with large numbers of housing units.

The 1990 Census recorded 6,496 housing units in the 357-acre study area, with a resident population of 18,767. This implies a population density of 52.5 persons per acre and 18.2 housing units per acre (Table 3.3-5). These population and housing densities are somewhat higher than those for the Bronx, with population density at 44.75 persons per acre and housing density at 16.39 units per acre, and the City as a whole, at 37.0 and 15.1, respectively.

The 1980 Census recorded 6,496 year round housing units in the study area (Table 3.3-6). Of the 6,353 occupied units, 197 (3.1 percent) were owner occupied, and 6,156 renter occupied (96.9 percent). These tenure rates compare to 82.1 percent renters in the Bronx and 71.4 percent for the City as a whole. Vacancy rates for rental units were very low at 1.6 percent in the study area, compared to 3.1 percent for the Bronx and 4.1 percent for the City. The number of housing units in the study area declined slightly during the 1980s, by 146 units or 2.8 percent (Table 3.3-7).

TABLE 3.3-5

POPULATION AND HOUSING DENSITY
(1990)

Census Tract	Total Population	Total Housing Units	Acres	Persons Per Acre	Housing Units per Acre
Bronx 11	725	205	105.017	6.903	1.952
15	47	17	18.038	2.605	0.942
17	817	300	61.280	13.332	4.895
23	4,665	1,740	24.957	186.921	69.719
25	5,484	1,809	28.169	194.682	64.219
27	2,922	930	21.497	135.925	43.261
NY 192	3,669	1,291	48.184	76.145	26.793
202	438	204	50.161	8.731	4.066
Study Area	18,767	6,496	357.303	52.524	18.181
Bronx	1,203,789	440,955	26,899.058	44.752	16.393
New York	1,487,536	785,127	18,161.355	81.906	43.230
NYC	7,322,564	2,992,169	197,722.007	37.035	15.133

Source: US Census 1990, STF1A, NYCDP 1992.

TABLE 3.3-6

HOUSING OCCUPANCY AND TENURE (1990)

Census Tract	Total Housing Units	Total Occupied Units	Owner Occupied Units	Percent Owner Occupied	Renter Occupied Units	Percent Renter Occupied	Rental Vacancy Rate	Owner Vacancy Rate
Bronx 11	205	190	64	34	126	66.32	1.6	3.0
15	17	17	6	35.29	11	64.71	0.0	0.0
17	300	274	36	13.14	238	86.86	6.7	0.0
23	1,740	1,734	23	1.33	1,711	98.67	0.3	0.0
25	1,809	1,756	35	1.99	1,721	98.01	2.2	0.0
27	930	919	7	0.76	912	99.24	1.2	0.0
NY 192	1,291	1,280	25	1.95	1,255	98.05	0.6	0.0
202	204	183	1	0.55	182	99.45	9.5	0.0
Study Area	6,496	6,353	197	3.10	6,156	96.90	1.6	1.0
Bronx	440,955	424,112	75,842	17.88	348,270	82.12	3.1	2.5
New York	785,127	716,422	128,037	17.87	588,385	82.13	6	6
NYC	2,992,169	2,819,401	807,378	28.64	2,012,023	71.36	4.1	3.0

Source: US Census 1990, STF1A, NYDCDP 1992.

This rate of loss was similar to the Bronx as a whole (2.3 percent) while the City saw a housing growth of 1.7 percent. Owner-occupied units actually increased in the study area at rates slightly higher than for the Bronx and City, albeit from a very small base of 136 units to 171 units.

In 1990, 53.6 percent of units were in structures with 50 or more units, while only 2.2 percent were in single family structures (Table 3.3-8). In all, units in structures with ten or more units accounted for 83.9 percent of all units.

TABLE 3.3-7

HOUSING OCCUPANCY AND TENURE
(1980-1990)

Census Tract	Total Housing Units			Owner Occupied Units			Renter Occupied Units		
	1980	1990	Percent Change 1980-90	1980	1990	Percent Change 1980-90	1980	1990	Percent Change 1980-90
Bronx 11	248	205	-17.3	45	64	42.2	168	126	-25.0
15	21	17	-19.0	4	6	50.0	9	11	22.2
17	297	300	1.0	30	36	20.0	235	238	1.3
23	1,774	1,740	-1.9	16	23	43.8	1,754	1,711	-2.5
25	1,687	1,809	7.2	33	35	6.1	1,617	1,721	6.4
27	1,120	930	-17.0	8	7	-12.5	1,020	912	-10.6
NY 192	1,362	1,291	-5.2	15	25	66.7	1,318	1,255	-4.8
202	292	204	-30.1	1	1	0.0	242	182	-24.8
Study Area	5,147	5,001	-2.8	136	171	25.7	4,803	4,719	-1.7
Bronx	451,118	440,955	-2.3	62,883	75,842	20.6	366,374	348,270	-4.9
New York	753,756	785,127	4.2	54,785	128,037	133.7	649,717	588,385	-9.4
NYC	2,940,837	2,992,169	1.7	652,105	807,378	23.8	2,136,425	2,012,023	-5.8

Source: US Census 1990, STF1A, NYCDP 1992; US Census of Population and Housing 1980.

TABLE 3.3-8

HOUSING BY UNITS IN STRUCTURE
(1990)

Census Tract	Total Housing Units	Single Family	Two to Four Units	Five to Nine Units	Ten to Nineteen Units	Twenty to Forty-nine Units	Fifty or More Units
Bronx 11	205	61	65	10	28	24	0
15	17	5	2	0	9	0	0
17	300	39	104	82	70	0	0
23	1,740	1	12	10	124	186	1,345
25	1,809	32	96	209	299	572	575
27	930	3	11	10	123	43	681
NY 192	1,291	5	49	27	78	221	881
202	204	0	8	3	88	105	0
Study Area	6,496	146	347	351	819	1,151	3,482
Percent	100	2.2	5.3	5.4	12.6	17.7	53.6
Bronx	440,955	43,932	60,803	14,030	25,335	119,185	168,771
New York	785,127	4,652	17,327	47,100	94,490	193,481	415,956
NYC	2,992,169	439,135	466,105	201,410	201,928	514,422	942,494

Source: US Census 1990, STF1A, NYCDOP 1992.

3.4 Community Resources

The study area is the southern tip of the South Bronx together with a small area of East Harlem and part of Randalls Island. The study area within one quarter mile of the project site exhibits a diverse character of mixed industrial, commercial and residential uses. Industrial uses surround the project site for a radius of two or more blocks, while the predominantly residential district extends to the north of the barriers created by the Major Deegan and Bruckner Expressways.

As a consequence of the industrial character of most of the study area, there are relatively few community facilities located there. Those that do exist tend to be associated with the residential district in the central northern part of the study area. Existing community resources are identified below, these include commercial services, religious and cultural institutions, schools, libraries, health facilities, public safety, and recreation.

3.4.1 Commercial Services

A number of eating and drinking places are scattered throughout the industrial district, ranging from diners to Spanish restaurants to McDonalds. Some local convenience stores are also to be found serving the workers and small residential population of the manufacturing district. A neighborhood commercial district is located on East 138th Street, from Alexander Avenue to Bruckner Boulevard, with some overflow on 137th Street, but all of this is slightly to the north of the study area. More regional shopping facilities are located at the "Hub" on East 149th Street, about three-quarters of a mile north of the project site.

3.4.2 Religious and Cultural Institutions

Relatively few religious and cultural institutions are located in the study area because of its predominantly industrial character. The only substantial church is St. Jerome, at Alexander Avenue and East 137th Street. Several small storefront type churches, usually of a Pentecostal denomination, are scattered among the small residential pockets in the area.

3.4.3 Schools

The study area is primarily served by Bronx Community School District 7. The small portion of the study area in Manhattan is split between Community School Districts 4 and 5, although the only school in the study area is in District 5. Schools and other community facilities are identified in Figure 3.4-1.

Presently, the only public schools in the study area are at the elementary level. The numbers of pupils enrolled by grade in 1991-92 and school capacities are shown in Table 3.4-1. Two private parochial schools exist in the area, St. Jerome's School on Alexander Avenue and the Kings Academy on upper Third Avenue in Manhattan. These private schools account for 17 percent of all the students enrolled in the area.

Higher education facilities are available within easy reach of the study area, including Hostos Community College (which is currently undergoing a major expansion) on the Grand Concourse, at East 149th Street, City College of CUNY is less than 1.5 miles to the east, and the College of New Rochelle is at 378 East 151st Street in the Bronx. Bronx Community College, Herbert H. Lehman College, Manhattan College, and Fordham University are three to five miles to the north and are easily reached by public transportation.

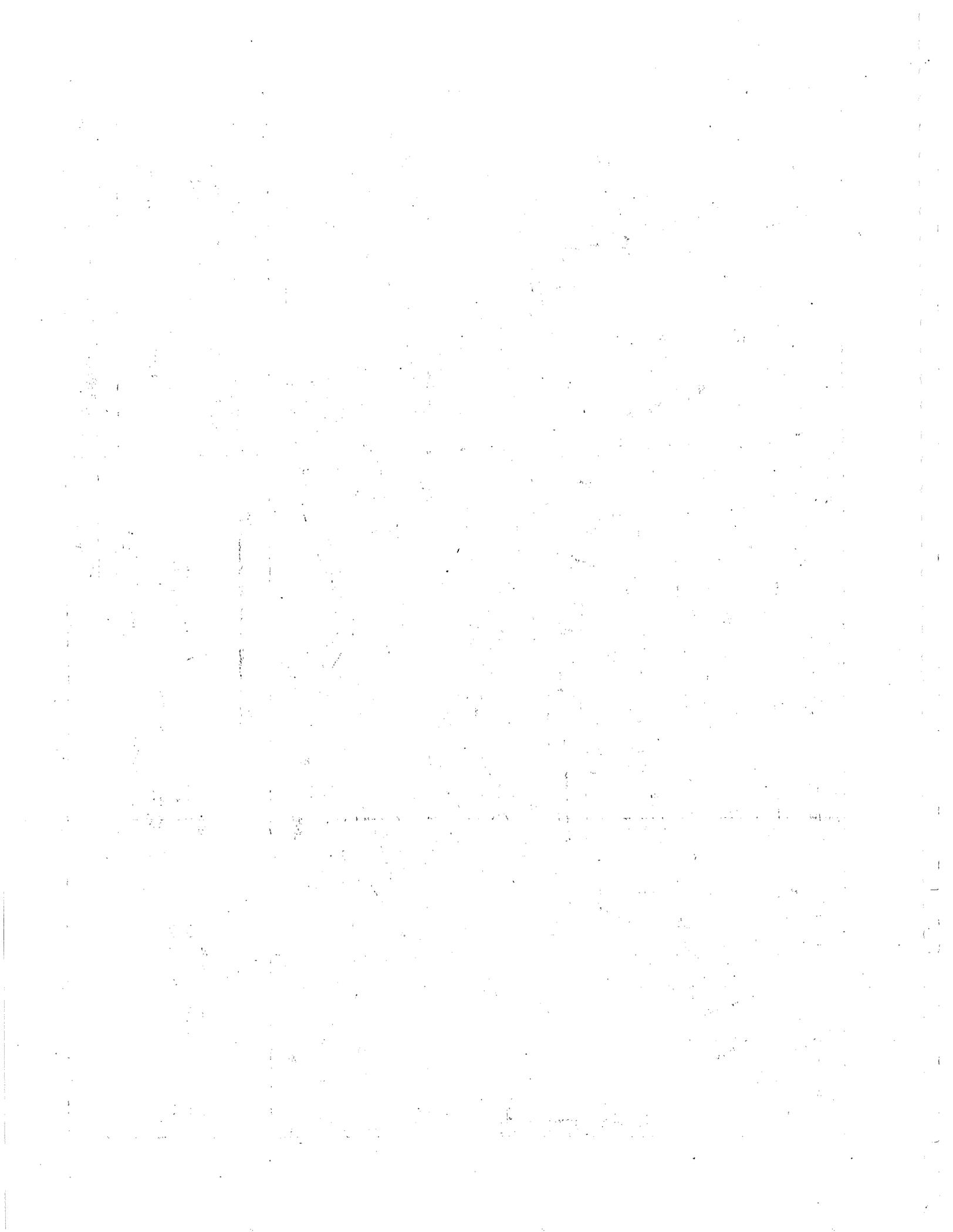


TABLE 3.4-1

SCHOOL CHARACTERISTICS

School	Grades	Year Built	1991 Capacity	1991-92 Enrollment	Utilization	
					Number	Percent
District 7 Bronx						
PS 154	K-6	1962	982	707	-275	72
PS 43	K-6	1906	856	493	-278	78
	Special			188		
District 5 Manhattan						
PS 30	K-6	1968	1217	796	-303	74
	Special			108		

Source: NYCDOP 1992.

TABLE 3.4-2

PAROCHIAL SCHOOL CHARACTERISTICS (1990-91)

School	Enrollment
St. Jerome	223
Kings Academy	180
Total	403

Source: NYCDOP 1992.

3.4.4 Libraries

The only library serving the area is Mott Haven Public Library at East 140th Street east of Alexander Avenue. This a relatively small facility with an annual circulation of 60,391 books (Community District Needs Statement, FY 1993).

3.4.5 Police and Fire

Police services in the Bronx portion of the study area are provided by the 40th Precinct. The Police Precinct Station is located immediately to north of the study area at East 138th Street and Alexander Avenue. The precinct is essentially coterminous with Community District 1. The 40th Precinct is comprised of approximately 200 police officer plus officers and civilian support personnel. At least 13 patrol cars are available for service. In addition to the usual community policing etc., the precinct operates an Anti-Crime Division (PO Ada Rodriguez, Community Affairs Officer, 40th Precinct, November 6, 1992). The station house is slated to move to a new facility near the Hub at East 149th Street in approximately one year. A Bronx Harbor Police administrative facility is located at Locust Avenue and East 135th Street; actual marine equipment are fielded from College Point in Queens.

Fire services are provided most directly by the fire station located at East 138th Street west of Cypress Avenue, Engine Company 83 and Ladder Company 29. The next nearest facility is Engine 60/Ladder 17 at 341 East 143rd Street. Both of these facilities are under the command of the 14th Battalion. Each facility would field one engine and one truck and each comprise 25 men (Deputy Chief Thomas Kilker, 11/6/92).

3.4.6 Health Care Facilities

The major hospital serving the study area is Lincoln Medical and Mental Health Center at East 149th Street and Morris Avenue. This is a City hospital providing 641 beds. The Bronx-Lebanon Hospital Center (Fulton Division), a voluntary facility providing 285 beds, is

located 2.5 miles north of the project area at 1276 Fulton Avenue. In Manhattan, the Harlem Hospital Center, a City facility providing 678 beds, is located at 5th Avenue and East 135th Street, about one half mile from the project site.

3.4.7 Recreation

The study area for the open space analysis incorporates a 1,200 foot (approximately one quarter-mile) radius from the project area (the equivalent of a five-minute walk, and a reasonable distance for daytime workers to travel for local open space and recreation, (Figure 3.4-2)). A census tract was included in the analysis when at least 50 percent of the tract was within the appropriate study radius.

There are a total of 12 publicly accessible open space and recreational facilities in the study area (Figure 3.4-2, Table 3.4-3). These include eight facilities operated by the NYC Department of Parks and Recreation (NYCDPR), three facilities operated by the Housing Authority, and one with no identification. Most of the facilities are not well maintained, although Randalls Island Park is in good condition.

Because the project is a non-residential project, an appropriate method to assess the utilization of existing facilities is to use the traditional method adopted by the NYCDPR: a threshold guideline of 0.5 acres of passive open space per 1,000 residential population and 0.15 acres of passive open space per 1,000 daytime workers/visitors. Overall residential ratios average 1.5 acres per 1,000 population Citywide (NYC Office of Environmental Coordination, 1992).

Estimating passive open space by field reconnaissance, the total park acreages are adjusted as in Table 3.4-1. The table shows that when all the parks in the quarter mile study area are included there would be an adequate supply of passive open space in the area. Total required passive open space would be 10.27 acres. The study area provides 56.43 acres, well above the suggested guideline. Randalls Island Park provides the bulk of this open space

and it is readily accessible near the project site by means of a short pedestrian walkway attached to the Triborough Bridge where it crosses the Bronx Kill.



Legend

- Property Boundary
- Quarter Mile Radius
- Park or Recreation

- Park and Recreation Facilities
1. PFC Carlos Lozada Plgd
 2. Mill Brook Houses Plgd
 3. Bruckner & Cypress Plgd
 4. Pulaski Park
 5. Mitchel Houses Gym
 6. Basketball Court
 7. Basketball Courts
 8. Playgrounds
 9. Louis Cuvillies Park
 10. Triborough Bridge Park
 11. Harlem River Drive Parks
 12. Randall's Island



HARLEM RIVER YARD VENTURES INC.
 INTERMODAL TRANSPORTATION AND
 DISTRIBUTION CENTER

PARKS AND RECREATION

TAMS CONSULTANTS, Inc.

DATE: NOV 17, 1992

Figure 3.4-2

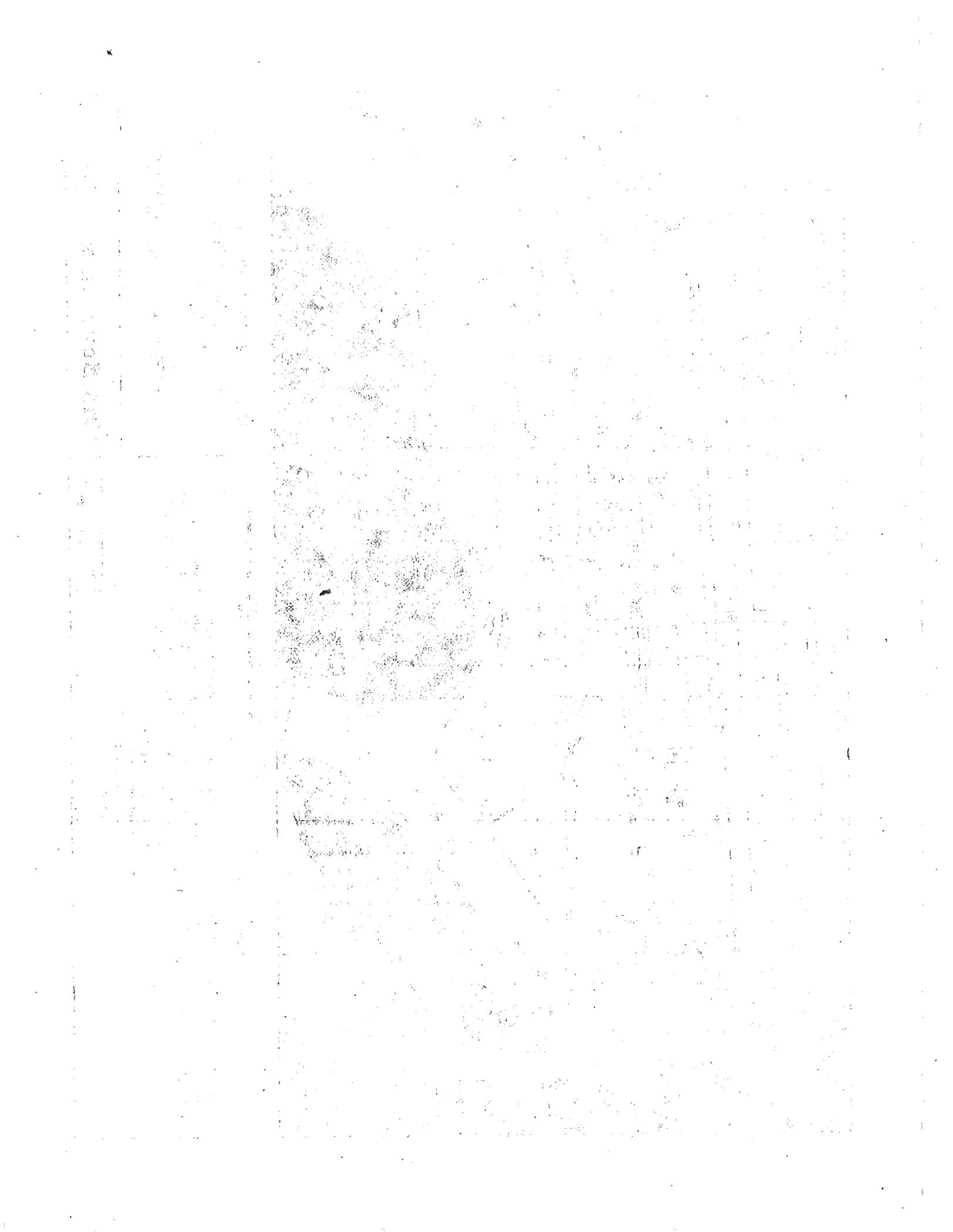


TABLE 3.4-3

PARKS AND RECREATIONAL SPACE IN THE STUDY AREA

Map Key	Facility	Agency Jurisdiction	Acreage Within Quarter Mile	Percent Passive	Acreage Passive
In Bronx Community Board 1					
1	PFC Carlos Lozada Plgd.	NYCDPR	1.05	20	0.21
2	Mill Brook Houses Plgd.	NYCDPR	1.05	40	0.42
3	Plgd. Bruckner & Cypress Ave.	NYCDPR	2.05	100	2.05
4	Pulaski Park	NYCDPR	1.43	30	0.43
5	Mitchel House Gymnasium	NYCHA	n/a		
6	Basket Ball Court	No Id.	0.25	0	0.00
7	Basket Ball Courts	NYCHA	0.4	10	0.04
8	Playgrounds	NYCHA	0.4	10	0.04
In Manhattan Community Board 11					
9	Louis Cuvillier Park	NYCDPR	0.2	80	0.16
10	Triborough Bridge Park	NYCDPR	2.75	20	0.55
11	Harlem River Drive Park (a)	NYCDPR	10.60	70	7.42
12	Randall's Island Park *	NYCDPR	136.69	33	45.11
Totals			156.87		56.43
Acreage per 1000 residents			8.36		3.01
1990 Resident Population			18,767		
1980 Worker Population**			5,913		
Required Passive Acreage per 1000 Population					9.38
Required Passive Acreage per 1000 Visitors					0.89
Total Required Passive Acreage					10.27

Notes: * Assumes 50 percent of park is in study area.
 ** NYCDPR, 1993.

3.5 Cultural Resources

While the issue of the site's prehistoric and historic significance was addressed in a report titled the Archival Documentation of a Phase 1A Cultural Resource Survey for the Harlem River Yard Oak Point Link Study (Johannemann and Schroeder 1982), the New York City Landmarks Preservation Commission requested additional research (LPC 1992). Consequently, research focused on the ownership, occupation, development history, and archaeological potential of the entire project site.

Primary research sources have included maps, deeds, wills, tax and other municipal records, federal census manuscripts, and directories. Secondary sources mainly comprised published histories that in this case were particularly abundant because of the achievements of the Morris family, published and unpublished reports (including the above-mentioned Johannemann and Schroeder report), and newspaper and scrap book articles. In addition to county offices, research was done at several institutions including the Bronx County and New York Historical Societies, the Westchester County Archives, the Municipal Archives, the Avery Library of Columbia University, and the New York Public and New York Society Libraries. Interviews were also conducted with local residents or owners.

It should be noted that the line of St. Ann's Avenue, a major thoroughfare north of the project area, partially follows the route of Mill Brook on the project site. This stream has long been culverted, but it was named for its mill sites (beyond the project area) and is cited historically as a land boundary.

3.5.1 National Register and NYC Landmarks Properties

North of East 132nd Street are the industrial buildings and turn-of-the-century tenements typical of this part of the Bronx. A 1982 NYSDOT study identified several nearby buildings/structures as eligible for nomination to the National Register of Historic Places

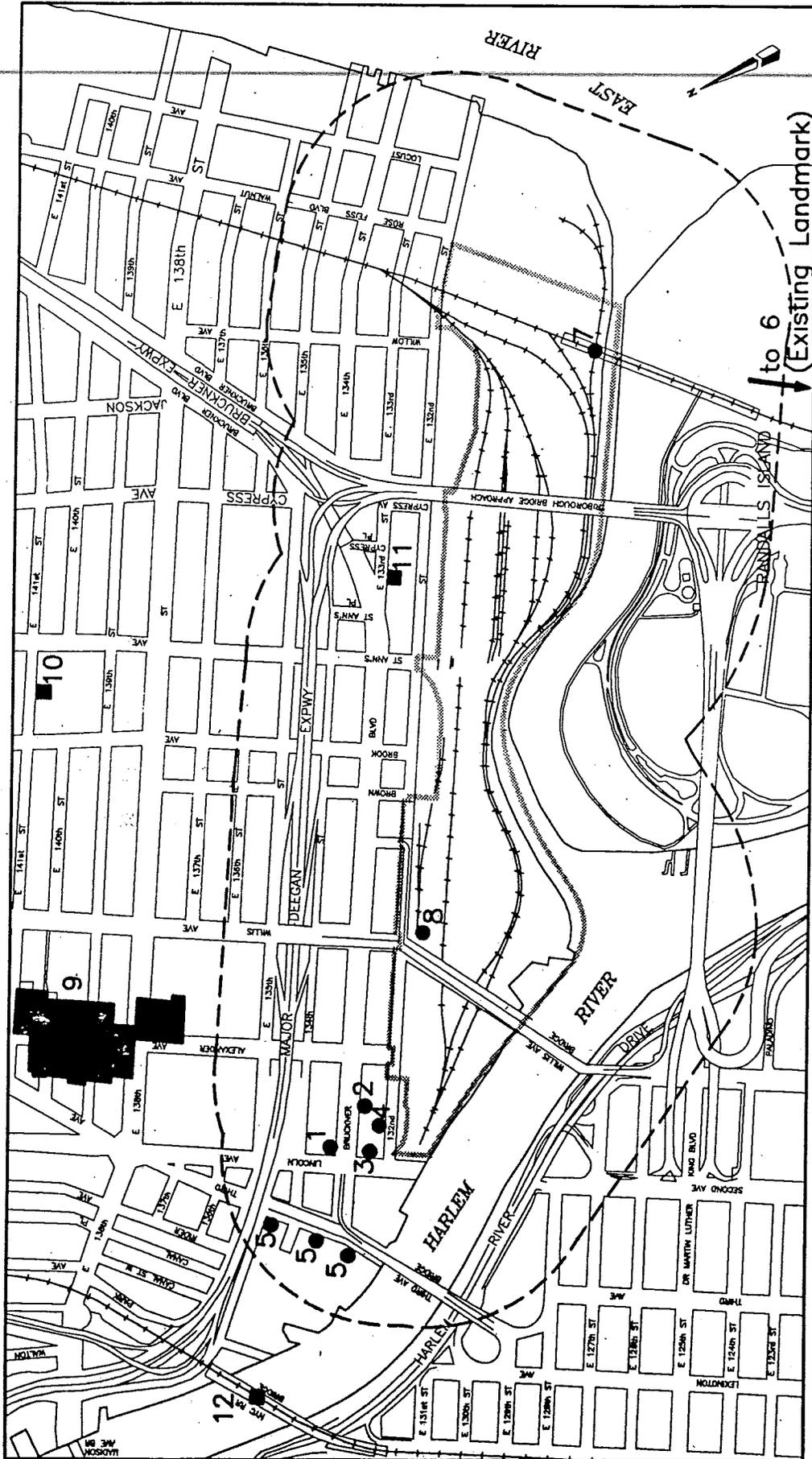
(E.O. 11593:1983), a determination that affords the protection of a National Register property. These include (Figure 3.5-1):

- Estey Piano Factory (13-21 Bruckner Boulevard) (Map Location 1);
- Haines Piano Factory (26 Bruckner Boulevard) (Map Location 2);
- Henry Spies Building (82-96 Lincoln Avenue) (Map Location 3);
- Jacob Brewer Ice Plant (281 East 132nd Street) (Map Location 4);
- three buildings that comprise the J. L. Mott Iron Works Complex located on the Harlem River northwest of the project site (2401 and 2413 Third Avenue [this latter building now altered] and 220 East 134th Street) (Map Location 5);
- Harlem River Railroad Bridge (Map Location 12).

The Ward's Island Water Pollution Control Plant (Map Location 6) has also been found eligible, and is also a New York City Landmark (Dolkart 1992:personal communication).

The Bronx Grit Chamber at 158 Bruckner Boulevard (Map Location 11), a component of the Ward's Island Water Pollution Control Plant, is itself a New York City Landmark. Its neo-classical exterior makes it one of the city's most unusual industrial structures (Hermalin and Kornfeld 1989:25).

The site is crossed by three bridges, including the Little Hellgate Bridge (Map Location 13) which is a small railroad bridge that is part of the New York Connecting Railroad system. Opened in 1917 (WPA 1939:564- 565), it is a component of the rail system that connects South and West with New England and the only freight link between the Bronx and Island (Donnelly 1992:personal communication). This 350-ft. double bascule bridge, an entire bridge and viaduct system of which is part, was found eligible for listing in the National Register of Historic Places in 1977 (E.O. 11593:1977).



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**LANDMARKS AND HISTORIC
 PLACES**

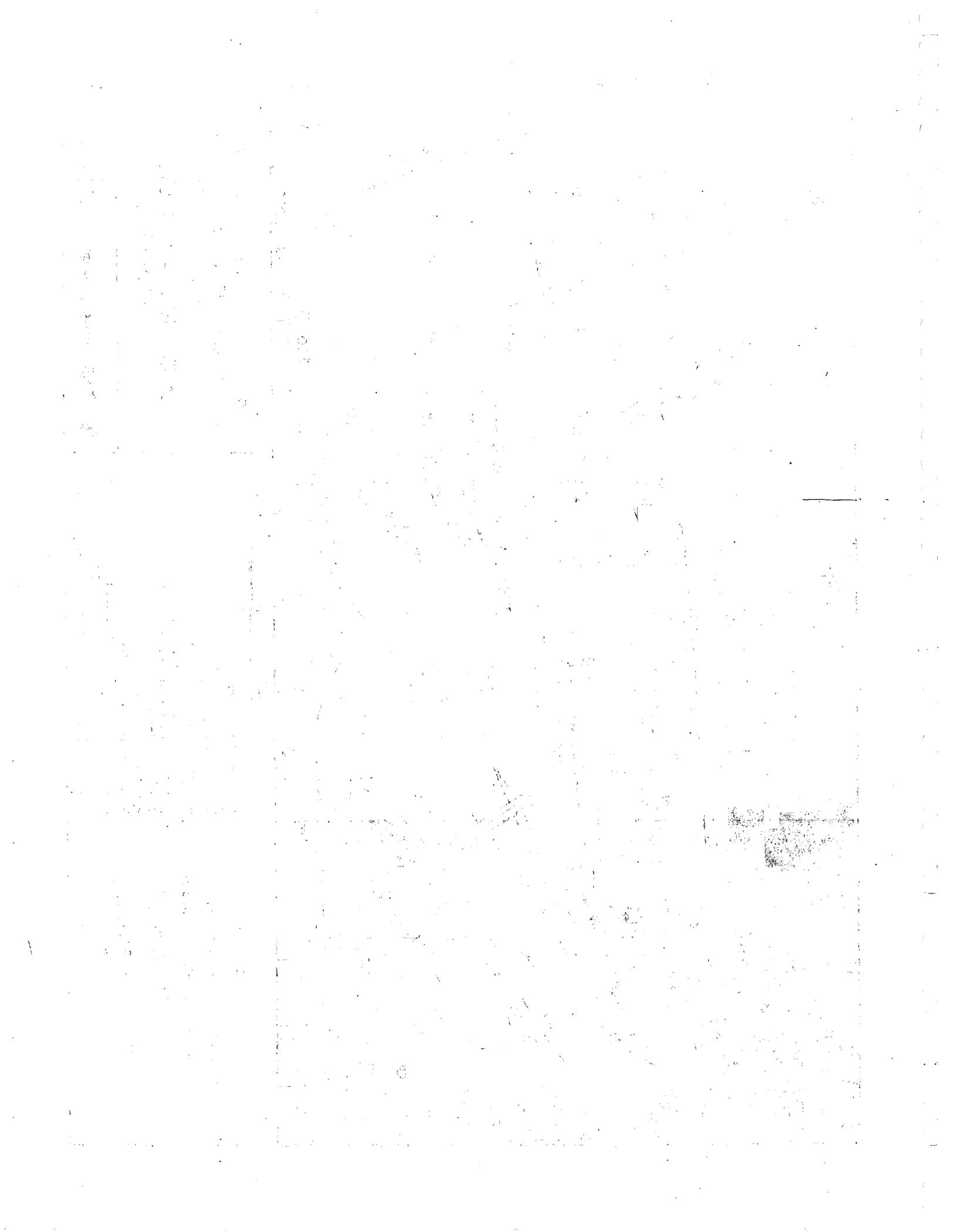
TAMS CONSULTANTS, Inc. Figure 3.5-1

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 FEET

Legend

- Property Boundary
 - - - Quarter Mile Radius
 - Existing Landmark or Historic District
 - Potential Landmark or National Register Property
1. Estey Piano Factory
 2. Haines Piano Factory
 3. Henry Spies Building
 4. Jacob Brewer Ice Plant
 5. J.L. Mott Iron Works Complex
 6. Wards Island Water Pollution Control Plant
 7. Little Hellgate Bridge
 8. Willis Avenue Station
 9. Mott Haven Historic District
 10. St. Ann's Church and Graveyard
 11. Bronx Grit Chamber
 12. Harlem River Railroad Bridge

DATE: DEC 18, 1992



The project site surrounds a three-story brick structure situated on a plateau just east of Willis Avenue (Map Location 8; also see following photographs). Figure 3.5-2 shows additional features around the station site. It was built in 1891 as the Harlem River Station, but is now known as the Willis Avenue Station. The above-mentioned 1982 eligibility assessment determined that this privately-owned building was also eligible for inclusion to the National Register of Historic Places.

Within one half mile of the project site are two additional historic sites with both National Register of Historic Places and New York City designations. The Mott Haven Historic District (Map Location 9) is a New York City Historic District located approximately between East 141st Street to the north and East 137th Street to the south on either side of Alexander Avenue. This area contains several old churches and row houses built in the Dutch style, and includes some historic residences. St. Ann's Church and Graveyard (Map Location 10) is a New York City Landmark located at 295 St. Ann's Avenue. Gouverneur Morris II build the church in 1841, and the graveyard contains the tombs of the elder Gouverneur Morris and his wife Anne.

3.5.2 Topographical Features

Topographical surveys from 1873 and 1892 indicate that until about 1892, the site terrain included at least two rises, two streams or brooks, and marshland (Commissioners of the Dept. of Parks 1873; Figure 3.5-3; Bronx Final Map 1895). In addition, the 1873 map shows water or marsh covering most of the site east of Cypress Avenue. A modern topographic map (TAMS 1992a) suggests that part of a former 30-foot rise lying west of Brown Avenue, near East 132nd Street, still exists in a reduced form, its most obvious remnant being the plateau where the Willis Avenue station (82 Willis Avenue) is situated (it appears this plateau was created in part when an embankment on its southern boundary was cut sometime after 1892). The rest of the site has been made basically flat and featureless by the filling and grading undertaken to create a rail yard and industrial site.

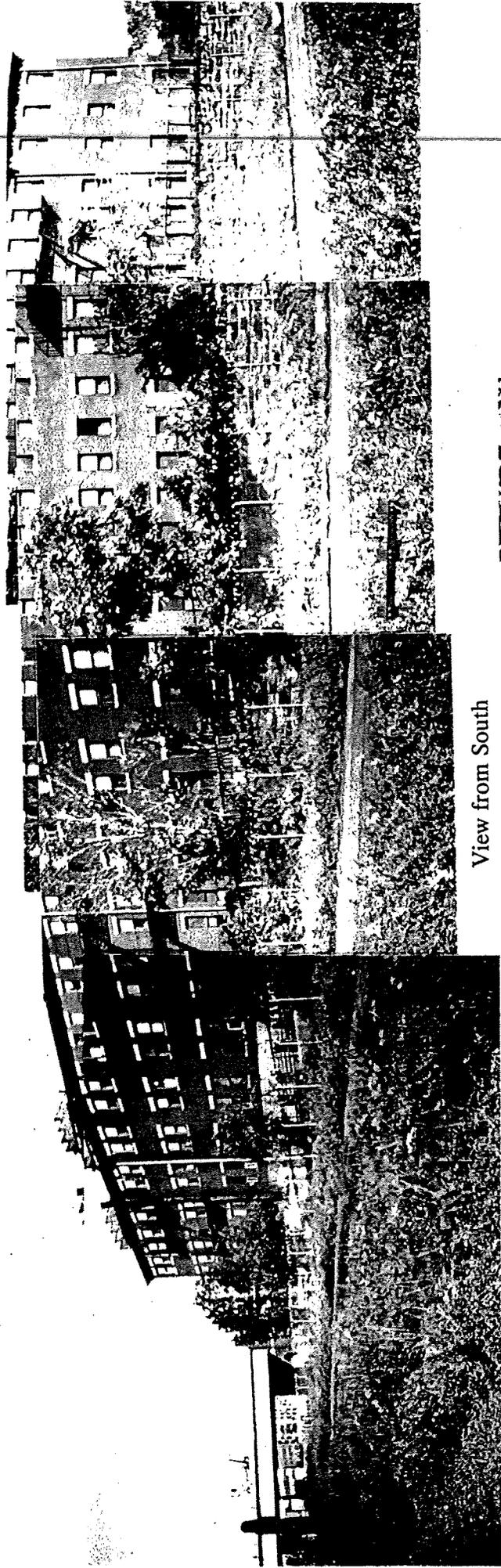
Comparison of the late-19th century topographical maps with recent ones has been made to determine land alterations over time (Johannemann and Schroeder 1982 Attachments A, B, and C). This is an important issue since grading and filling are factors in the preservation of potential archaeological sites. These and other maps (NYSDOT 1988) indicate that recent filling or grading has taken place in parts of the project area over the last six years, but not in areas deemed potentially sensitive in this study. Based on the contour maps made in 1873 and 1892, which show the contours unchanged, and one made in 1982, it also appears that at least 8 feet of fill have been introduced south of the plotted line of East 130th Street since 1892 (East 130th Street was apparently never run). In addition, the shoreline has been differentially altered over time. These factors have important implications for preservation of at least one Morris house site and possibly prehistoric or early-historic era Native American features.

Another consideration is the location of sewer and utility lines or rights-of-way (ROW) (TAMS 1989). Based on historical documentation, it appears those now on the site do not affect any potentially sensitive historical resources; their effect on any prehistoric or Revolutionary War sites or features is unknown.

3.5.3 Prehistoric Considerations

The Mill Brook that divided the site into eastern and western segments would have been attractive to Native American hunters and gatherers as a food source and, north of its mouth, for fresh water. Adding to the site's prehistoric potential is a fresh water spring documented east of Mill Brook on an 1816 survey (Randel 1816; see Figure 3.5-4) and its 1850 update (Findlay 1850 in Robinson 1888; see Figure 3.5-5). It seems quite likely that this fresh water source was also known to local Native Americans before the site was settled by Europeans.

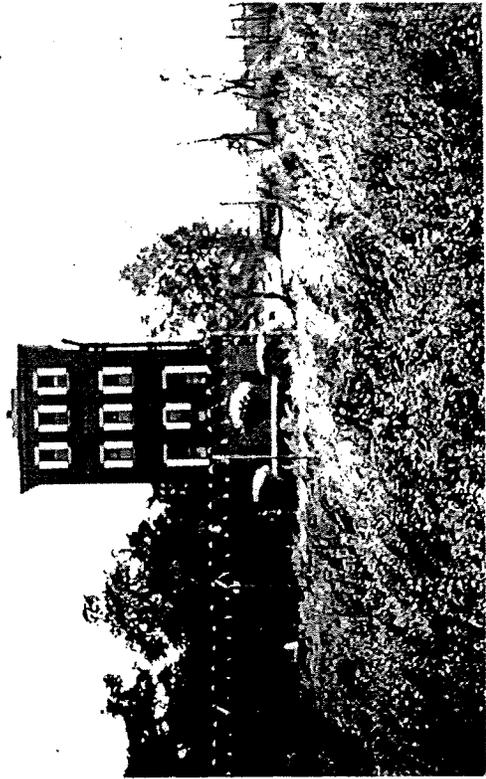
In the vicinity of the spring and a Morris family residence, Reginald Bolton identified the "Ranachqua" site that he described as a "tract of land, about 500 acres in extent," and



View from South

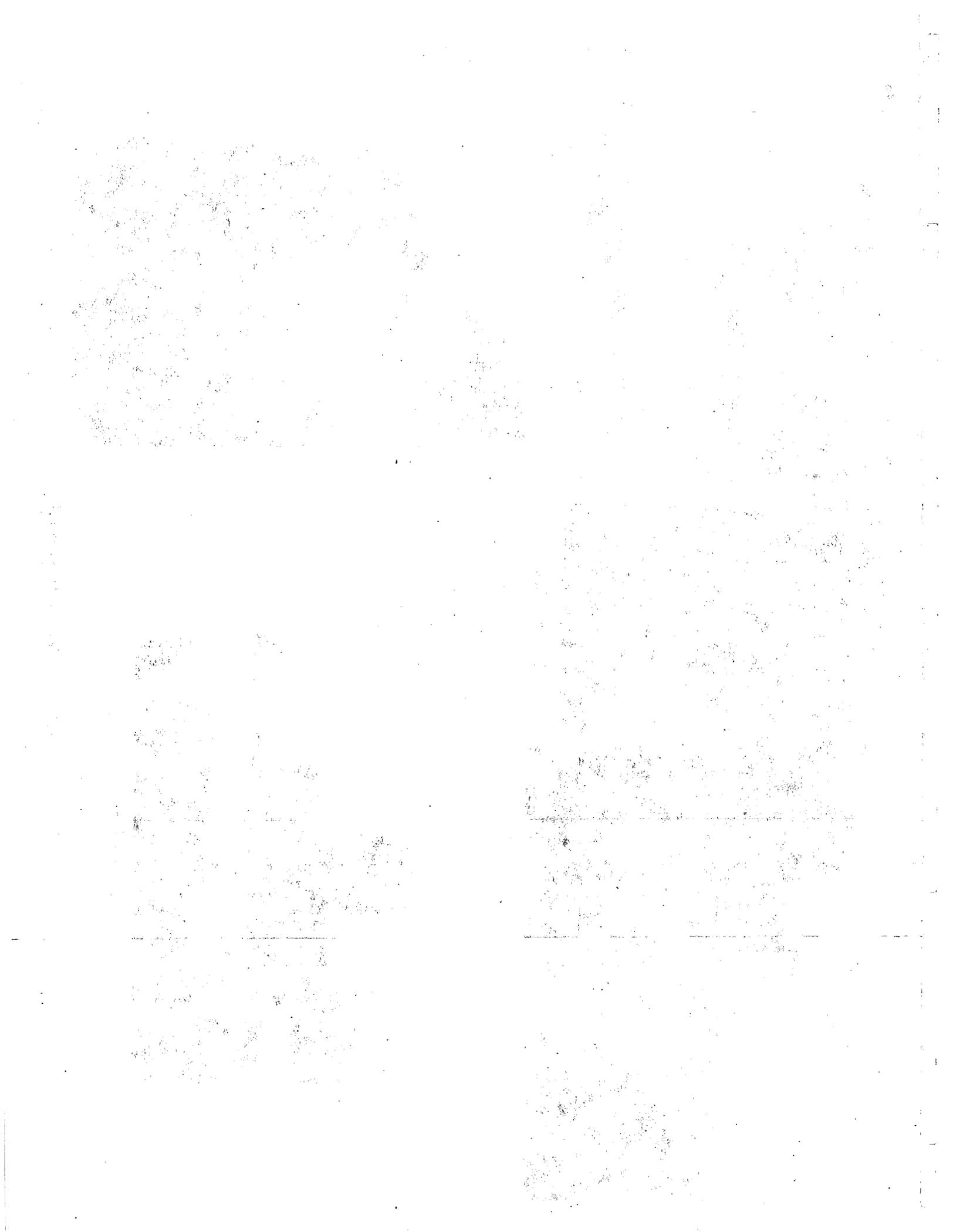


View from East



View from West

WILLIS AVENUE STATION



BRUCKNER BOULEVARD

WILLIS AVENUE
BRIDGE ROW

EXISTING
UTILITY
EASEMENT

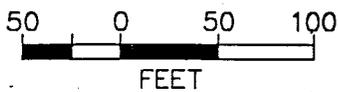
ROAD
SIDEWALK

COAL PILES

WILLIS AVENUE STATION

EXISTING STONE WALL WITH IRON FENCE

EXISTING CHAIN LINK FENCE



LEGEND

- *— Fence Line
- - - Easement
- Property Line

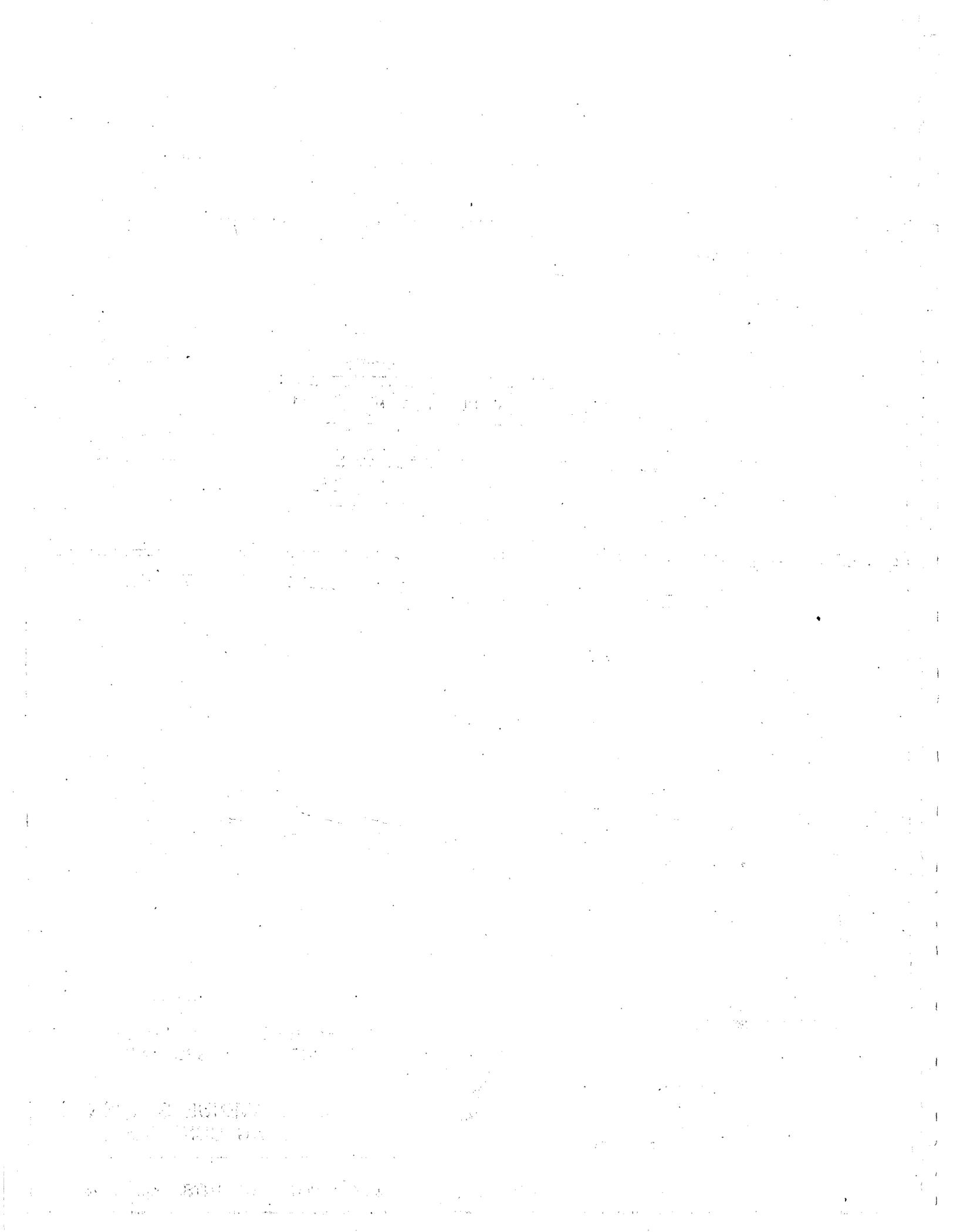


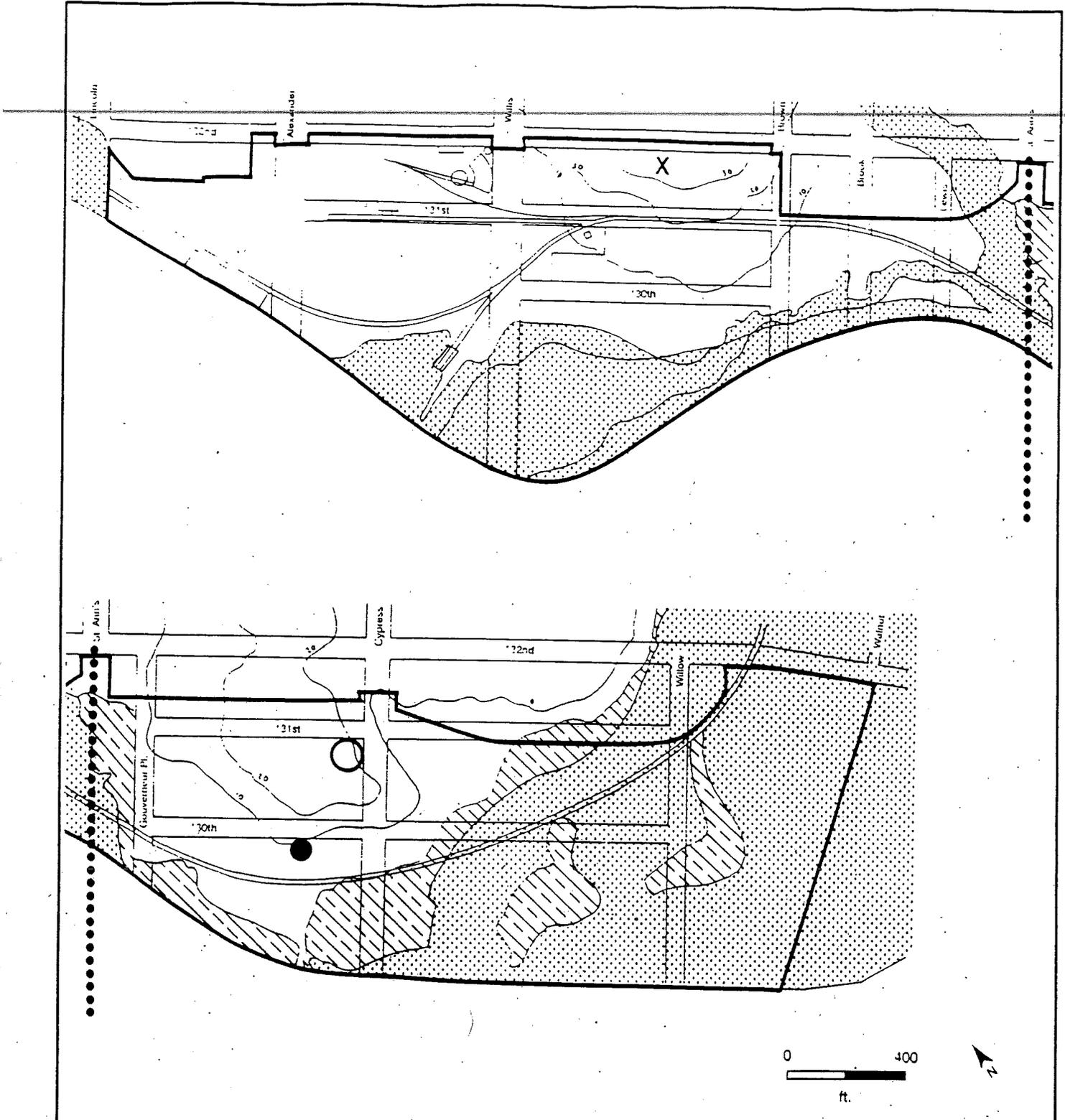
HARLEM RIVER YARD VENTURES INC.
INTERMODAL TRANSPORTATION AND

WILLIS AVENUE STATION
EXISTING CONDITIONS

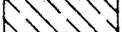
DATE:
OCT 26, 1993

TAMS CONSULTANTS, Inc. Figure 3.5-2





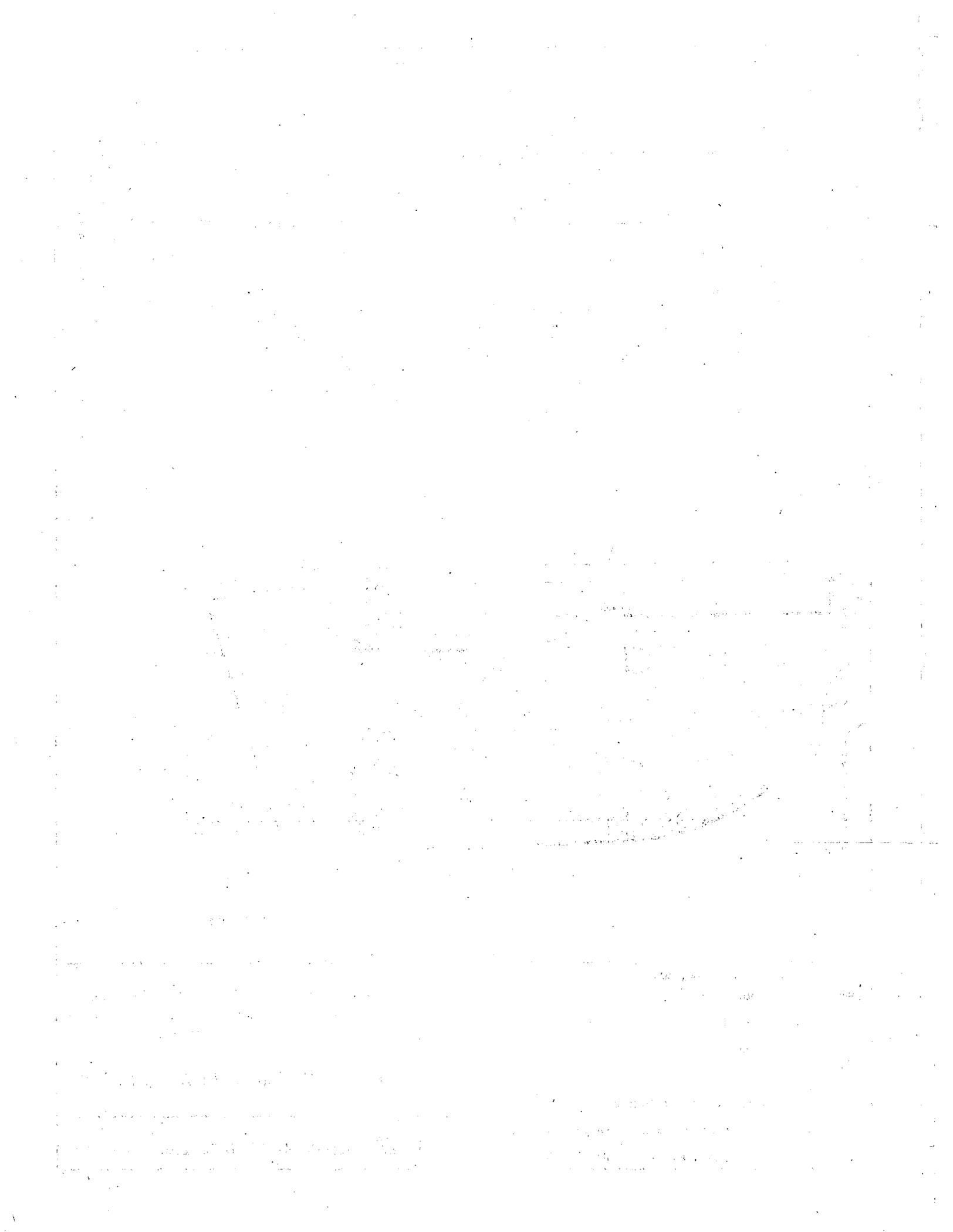
Legend

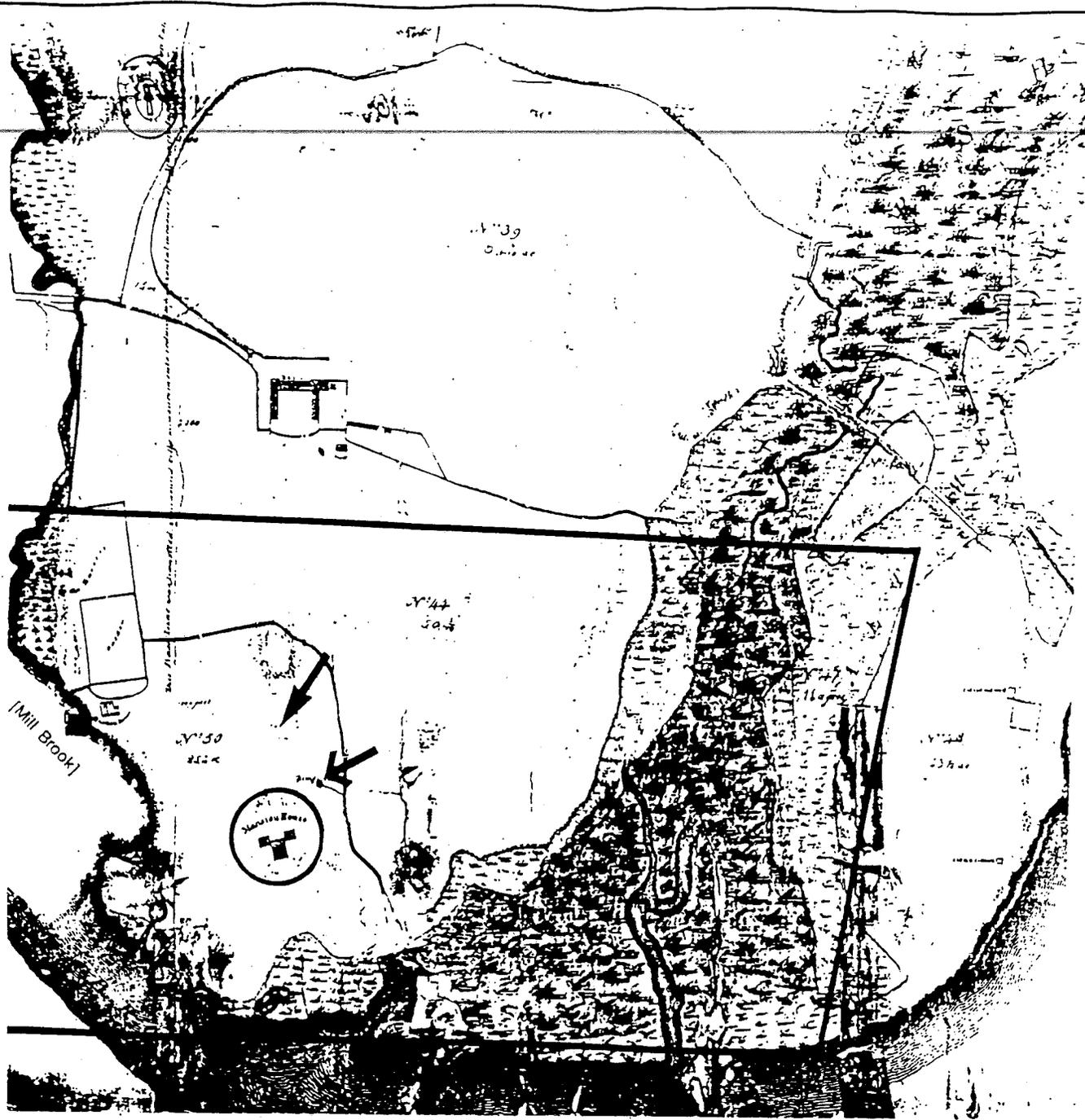
-  Property Line
-  Match Line (to St. Ann's Ave.)
-  Water
-  Marsh
-  Lewis Manor Site (approx.)
-  Gouverneur Morris II House Site (approx.)
-  Hon. Gouverneur Morris Mansion (approx.)

HARLEM RIVER YARD VENTURES INC.
 INTERMODAL TRANSPORTATION AND
 DISTRIBUTION CENTER

1873 TOPOGRAPHICAL SURVEY

TAMS CONSULTANTS, Inc. Figure 3.5-3



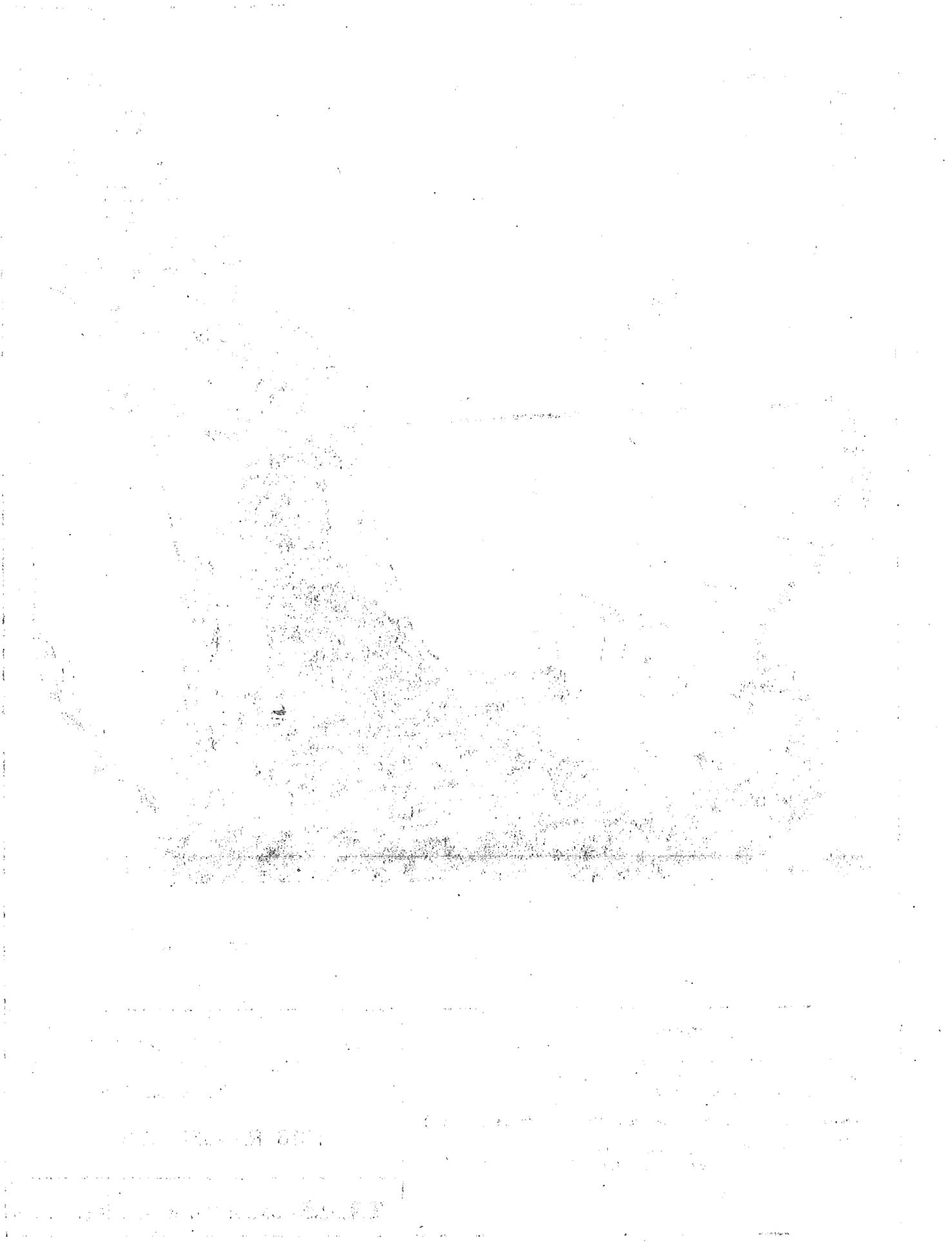


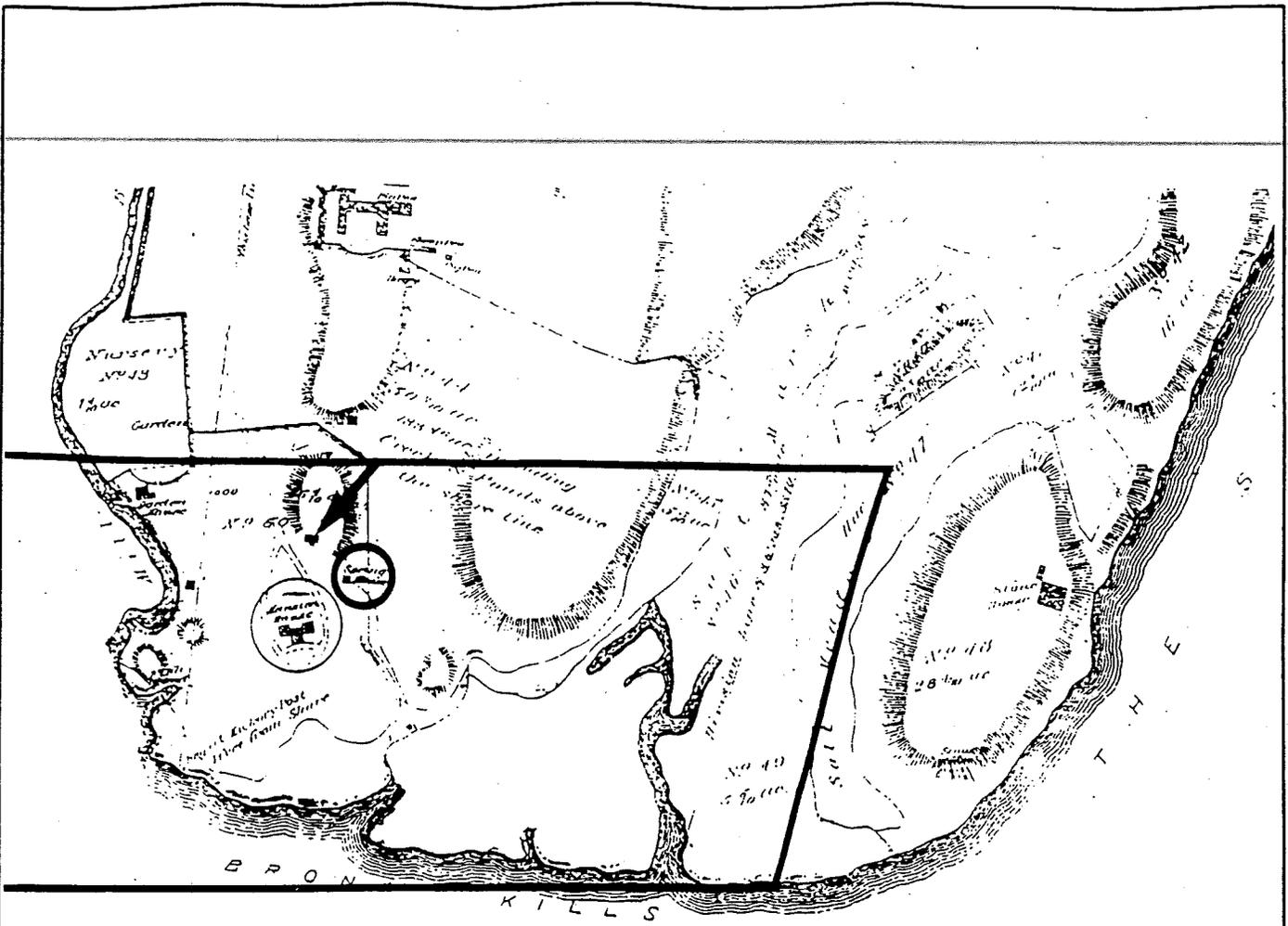
Legend

-  Project Site (part and approx.)
-  Hon. Gouverneur Morris Mansion
-  Later Site of Gouverneur Morris II House (approx.)
-  Hon. Gouverneur Morris Burial Vault (approx. site of St. Ann's Church)
-  Spring House

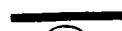
HARLEM RIVER YARD VENTURES INC.
 INTERMODAL TRANSPORTATION AND
 DISTRIBUTION CENTER

1816 RANDEL SURVEY





Legend

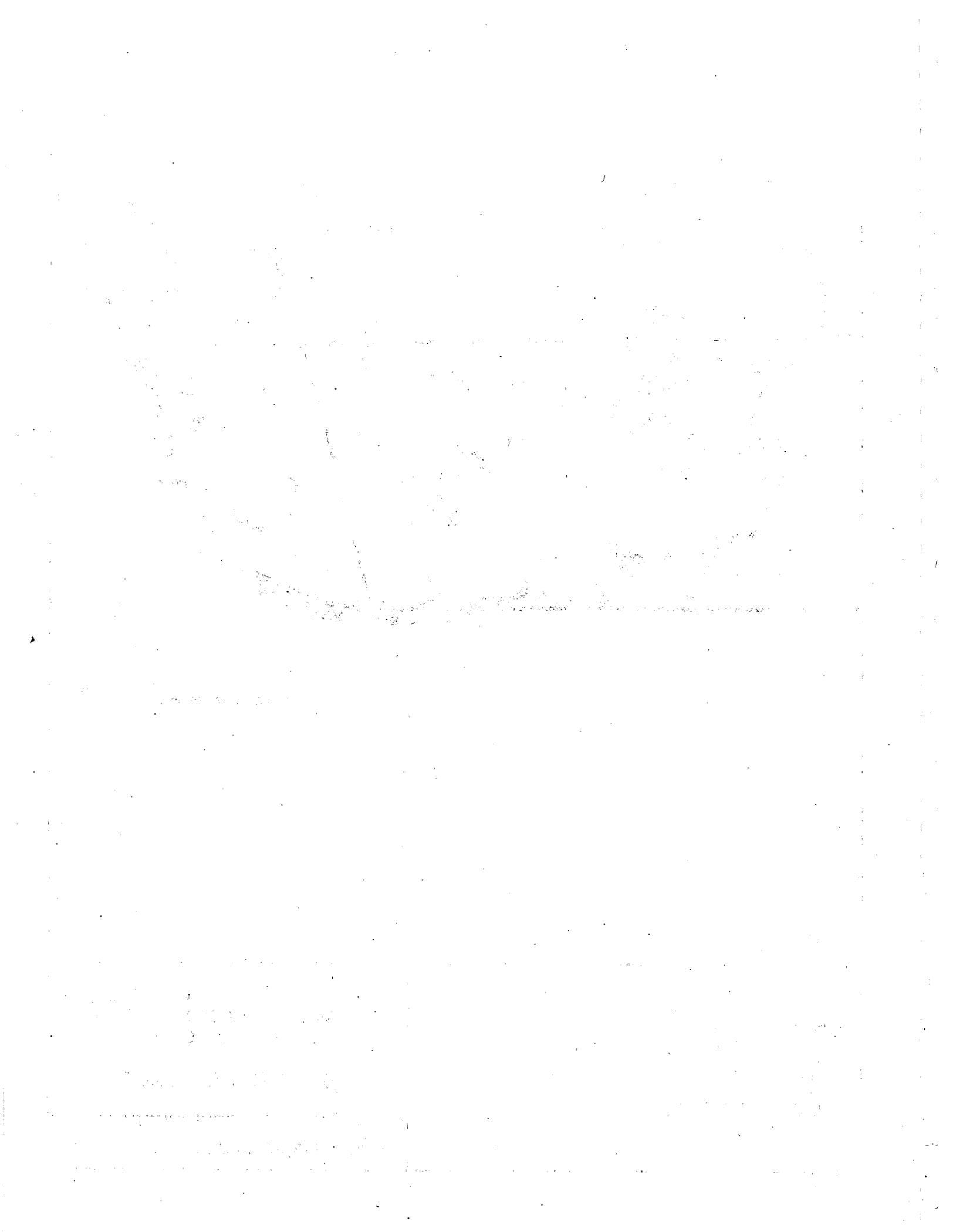
-  Property Line
-  Hon. Gouverneur Morris Mansion
-  Gouverneur Morris II House
-  Spring House

HARLEM RIVER YARD VENTURES INC.
 INTERMODAL TRANSPORTATION AND
 DISTRIBUTION CENTER

1850 UPDATED SURVEY

TAMS CONSULTANTS, Inc.

Figure 3.5-5



therefore the whole of Jonas Bronck's original 1639 land patent. Bolton goes on to say "The occupied site of a native village seems to have been at Cypress Avenue, near 131st Street, where food-pits and Indian implements have been found" (Bolton 1934:137). Elsewhere, he notes "Fireplaces, and shell-pits with pottery, discovered around the site of the Morris mansion, foot of Cypress ave. [sic]" (Bolton 1920:303). And still elsewhere he says that it was situated "around the knoll on which the mansion of Gouverneur Morris stood at East 132nd St. near Cypress Ave." (Bolton 1922 in Johannemann and Schroeder 1982:26). As will be seen, this was probably the site of Gouverneur Morris II's home at East 131st Street, not 132nd, and Cypress, but whether it was also the site of his father's mansion remains a question (see below).

Johannemann and Schroeder computed that 8 to 9 feet, or about 80,800 cubic yards of earth, were taken from the knoll where this mansion stood (1982:26). They also calculated that about 9 feet were removed from the proposed Lewis Morris Manor site located on another knoll west of the Mill Brook (St. Ann's Avenue) (Johannemann & Schroeder 1982:29). It was estimated that this grading removed about 145,000 cubic yds. of soil that may have been used to fill the site's low areas (Johannemann and Schroeder 1982:26). Whatever the actual amount of soil removed, the map data indicate grading in these two potentially sensitive areas that would have eliminated evidence of Native American occupation or use. However, where fill has been introduced, prehistoric and historical sites or features could remain, and historical features--such as foundations and yard privies, cisterns, or wells, might persist.

Nearby shell middens (discarded mollusk shells mixed with other trash) were mentioned by Robert Bolton (not to be confused with the archaeologist Reginald Bolton cited above). He referred to them as 'shell beds' and noted in the 1848 edition of his History of the County of Westchester "they were still to be seen" along the East and Harlem Rivers (Bolton 1848: 280). He went on to say that "several Indian tumuli (graves) have been accidentally opened in the vicinity of Gouverneur Morris's residence, and found to contain large sized skeletons of the Aborigines." This was repeated, word for word, in the 1881

revised edition of his work published posthumously (Bolton 1881:451), but it appears likely that the information was by then obsolete. The historical Native American presence is confirmed by eighteenth-century Indian deeds, the first to Bronck based on tradition rather than documentation (Grumet 1992:personal communication), the second to Lewis Morris (Bolton 1881:463).

It appears that grading would have eliminated the core area of the "Ranachqua" Indian site, but unknown components may yet be found where there is fill. This is particularly so of fill introduced in preparation for constructing a railroad line in the first half of the 19th century (Liber of Deeds [hereafter LD] 20 1840:265). However, no rail bed was built until 1873 when the New Haven & Portchester line was run on the site (Scharf 1886:480).

3.5.4 Historical Considerations

The site's European ownership dates to 1639, only 15 years after initial Dutch settlement in Lower Manhattan. This is when Jonas Bronck (or Bronk), possibly of Swedish or Danish descent (Jenkins 1912:26; Riker 1904:135), is believed to have received a 500-acre land patent from local Native Americans that included the project site. This grant was later confirmed by a Dutch ground brief (Bolton 1881:451). Bronck may have built his house, named "Emmaus," on Lincoln or Willis Avenues, just within or beyond the bounds of the project area (e.g., Bolton II 1881:489; Jenkins 1912: 27-28; Cook 1913; Stokes II 1916:204; Wilkinson 1966:58).

After a short occupation by Bronck and several tenants, it passed through a number of owners (Table 3.5-1) until 1670, when it came into the possession of Richard Morris, a New York City merchant (Bolton 1881:455, 460). Morris, a former officer of Cromwell's army, was then living in Barbados as was his brother, Lewis. Richard's ownership of the site

TABLE 3.5-1
HARLEM RIVER YARD
HISTORY OF OWNERSHIP (1639 THROUGH 1905)

Owner	Dates	Occupation	Comments	Source
ENTIRE PROJECT AREA (bounded north by E. 132nd St., west by Lincoln Ave., south by the Harlem River and Bronx Kills, and east by Walnut Ave.)				
Jonas Bronck	1639	Homestead dwelling "Emmaus," built c. 1841-43 near present Lincoln Ave. & E. 132nd St.	Through deed by local Native Americans; confirmed by later Dutch ground brief. Bronck dies by 1643.	Bolton II 1881:451 Wilkinson 1966:44, 48 Bolton II 1881:452; 489
Arendt Van Curler, or Corlear (second husband of Bronck's widow, Antonia)	c. 1643	Van Curler resides at Albany and/or Schenectady, not on wife's inherited land.	Ground brief by Dutch Director General Kieft.	Bolton II 1881:452-453
Samuel Edsall	by 1664		Purchase from Herman Smeeman of Commoonepau on the Maine; transaction confirmed by royal British patent.	Bolton II 1881:454
Captain Richard Morris	1670	May have built 2nd "Emmaus" on site of Bronck's homestead at Lincoln & E. 132nd St.	Morris, officer in Cromwell's army & later merchant in Barbados, acting for self & brother, Lewis. Richard & wife die leaving infant son, Lewis.	Bolton II 1881:455 Bolton II 1881:489 Wilkinson 1966:44 Bolton II 1881:458
Colonel Lewis Morris	1672	Probably builder of Manor on or near Bronck's site west of Mill Brook; also on land were barns, boat dock, & burial ground for family & slaves.	Lewis, brother of Richard, assumes guardianship of infant nephew, Lewis; is granted land by English patent 1676, confirmed by Indian deed 1684.	Bolton II 1881:461-463 Wilkinson 1966:44, 48 Randell 1816
Hon. Lewis Morris	1691	Son of Richard, born at Morrisania, lives much of adult life in NJ.	Third Morris owner & heir of uncle. First Royal Governor of NJ & prominent legislator. Has property designated as a manor & becomes 1st proprietor.	Bolton II 1881:473-474 Scharf 1886:826 Bolton II 1881:470
Isabella Morris	1746	Wife of Hon. Lewis Morris, has life interest in property west of Mill Brook after death of husband in 1746.		Bolton II 1881:480-481
Judge Lewis Morris	1746 (east of Mill Brook) 1752 (west of Mill Brook)	Apparently lived elsewhere on Morrisania property; may have built new house east of Mill Brook. General Lewis receives old Manor House prior to the Revolutionary War.	Fourth Morris owner & heir of father; marries Eliz. Staats, mother of Gen. Lewis & Staats Long Morris; 2nd wife Sarah Gouverneur is mother of Honorable Gouverneur Morris.	Bolton II 1881:opp. 455, 481; Scharf 1886:827; Utan 1976:2; Spooner 1906:259

TABLE 3.5-1
HARLEM RIVER YARD
HISTORY OF OWNERSHIP (1839 THROUGH 1905)

Owner	Dates	Occupation	Comments	Source
At the death of Judge Lewis Morris in 1762, family lands were divided at Mill Brook. The western side of the property had been received by General Lewis Morris during his father's lifetime, while Staats Long Morris inherited the land east of Mill Brook (Scharf 1886:603).				
WESTERN PART OF PROJECT AREA (bounded north by E. 132nd St., west by Lincoln Ave., south by the Harlem River and Bronx Kill, east by Mill Brook (St. Ann's Ave.))				
General Lewis Morris	1762	Forced to vacate old Manor House during War for Independence; house used as Gen. De Lancey's headquarters 1777-1781 & suffered war damage; Gen. Morris restores house & grounds after war.	Illustrious patriot & brigadier-general of Continental Army; signer of Declaration of Independence.	Scharf 1886:827 Ultan 1976:2) Wilkinson 1966:40, 44 Wilkinson 1966:56-57
Lt. Col. Lewis Morris	1798	Lives & dies at Morrisania.	Aide to Gen. Nathaniel Green in War for Independence.	Bolton II 1881:483
Col. Lewis Morris	1824		Son & heir of Lt. Col. Morris, dies at Adams Run, S.C. in 1863.	Bolton 1881 II:484
Clarence S. Brown	1865	Brown has land surveyed for subdivision, but no development appears to have occurred in project area.	Brown, a NYC banker, buys from Harry M. Morris, executor & son of Col. Lewis Morris (d. 1863). Land bounded by Boston Post Rd., E: 138th St., Mill Brook, the "Kill", & Harlem & Harlem River: 106+ ac.; also lands under water granted to Lewis Morris in 1851.	LD 1865 122:43, NYC Directory 1870 Free Map No. 419; Book of Patents 31:173 cited in LD 1865 122:43
Lewis B. & Emma Brown, James M. Brown, John Crosby & Mary Brown, William Kyle, Harriet Fink, et. al	1869-1892	Site of old Manor House, south side of 132nd St. between Brook & Willis, leased to others by owner, Lewis B. Brown. Rudolph D. Christ has hotel & park (or tavern & beer garden) on site 1876-1879. Gustav Baur has park & hotel 1885-1890.	Brown's land in project area sold in multiple transactions by Brown, his heirs & others.	Misc. Bronx Co. libers; Bolton 1881 II:484 NYC Directories; Bolton 1881:490; Beers 1885; LD 1889 2191:339
New York, New Haven & Hartford Railroad Co.	1882-1892	Railroad structures built on site (see text). Old Manor House site sold to NYNH&HRR Co. in 1888. House demolished same year.	Brown's heirs & executors sell his land to NYNH&HRR Co. 1882 & 1891 in multiple transactions.	Misc. libers; see LD 1904 38:283 for recitation. LD 1889 2191:339 Wilkinson 1966:44
New York, New Haven & Hartford Railroad	1904		Through lease, Harlem River & Portchester line becomes Harlem River Branch of NYNH&HRR.	LD 1904 38:283 Scharf 1886:480

TABLE 3.5-1
 HARLEM RIVER YARD
 HISTORY OF OWNERSHIP (1639 THROUGH 1905)

Owner	Dates	Occupation	Comments	Source
CENTRAL PART OF PROJECT AREA (bounded north by E. 132nd St., west by Mill Brook (St Ann's Ave.), south by Bronx Kills, and east by Willow Ave.)				
Staats Long Morris	1762	Owns, but does not appear to occupy site.	As noted above, inherits estate east of Mill Brook from father, Judge Lewis Morris. A General in the British Army, Staats serves in India; remains loyal to Britain during Revolution; lives in England & Canada; appointed Governor of Quebec in 1797.	Bolton II 1881:483 Cook 1913:14 Bolton II 1881:492
Gouverneur Morris (the Honorable)	1786	Lives in Phila. & abroad for most of adult life; builds new mansion house near 130th St. & Cypress c. 1799; lives here until death in 1816.	Acquires family lands east of Mill Brook from half-brother, Staats Long Morris. A distinguished statesman & framer of the Constitution, minister to France, US Senator for NYS. At age 57 marries Anne Cary Randolph. Son Gouverneur Morris II, born 1813.	Scharf 1881:603 Wilkinson 1966:260 Spooner 1906:566 Scharf 1886:603-604 Cook 1913:19
Gouverneur Morris, II	1837	As a child, lives on property with widowed mother. Morris and family listed here on census records 1850-1870.	Inherits after death of mother in 1837; pioneer railroad builder & developer of Bronx commerce & real estate; marries cousin Patsy Jefferson Cary in 1842. Receives grant of lands under water fronting homestead property.	Scharf 1886:308; Cook 1913:18; Geismar 1992; Spooner 1906:328 LD 1890 2274:454
New York & Harlem Railroad	1841	Morris living on property; some of land leased for farming.	Gouverneur Morris II sells right-of-way across property but railroad not operational until 1873 (see text).	FC 1840 LD 1841 20:265; Scharf 1886:480
Orlando Fairfax	1854	Fairfax of Alexandria, Va.	Homestead of Gouverneur Morris 2nd (see text) put in trust for Patsy J. Morris; rents & profits used for her benefit during her life, & then divided among her children.	LD 1854 287:2
Gouverneur Morris 3rd, Ann Cary Morris, Mary Fairfax Morris, Margaret Morris, Powhattan Randolph Morris	1874	Patsy J. Morris dies in NYC in 1873. Family appears to live at Bartow-on-the-Sound where Gouverneur 2nd lives until his death in 1888.	As per Patsy's will, land divided among her 5 children. Gouverneur Morris 2nd remarries without issue.	LD 1874 1301:81-162 FC 1880; Spooner 1906:328; Barber 1942:46-48:6; Barber 1942 54:53

TABLE 3.5-1
HARLEM RIVER YARD
HISTORY OF OWNERSHIP (1639 THROUGH 1905)

Owner	Dates	Occupation	Comments	Source
Clarence Cary & Henry Lewis Morris	1891	Mary F. (Morris) Davenport (widow) lives on property with her family & Anne Cary Morris, from at least 1880 through at least 1891. By 1891, Margaret (Morris) Rutherford lives in London. P. Randolph Morris lives in Parachute, Colo. where he is active in politics & real estate development.	Cary & H. L. Morris to hold land of Ann, Mary & Margaret in trust.	LD 1891 3:305, 311, 316, 320, 325 LD 1891 1:423 Spooner 1906:328
New York, New Haven & Hartford Railroad Co.	1905	By this year, Anne C. Morris (Maudslay) is married, lives in England. House leased, tenant unknown. House demolished this year.	Sale by trustees, Cary & H. L. Morris. Sale subject to lease that expired 5/1/1905 on Morris house on Mary F. M. Davenport's land	LD 1905 45:25, 27, 30, 31, 152 Spooner 1906:328 Wilkinson 1966:44
EASTERN PART OF PROJECT AREA (bounded by north by E. 132nd St., west by Willow Ave., south by Bronx River, and Bronx Kill) and east by Walnut Ave.)				
Honorable Gouverneur Morris	1786		Part of purchase from half brother Staats Long Morris.	Scharf 1886: 603
New York & Harlem Railroad	1841		As noted above, Gouverneur Morris II sells right-of-way across land; railroad not operational until 1873. Two stone houses east of Walnut Ave. may have been tenant occupied.	LD 1841 20:265; Randel 1816; Randel/Findlay 1850; Scharf 1886:480
Port Morris Land & Improvement Co.	1868		Morris conveys numerous properties to Port Morris Land & Improvement Co. (PML&I); he & co-investors hope to develop Port Morris (northeast of project site as a seaport. Deeds appear also to relate to land in project area.	LD 1868 142:478; LD 1868 148:220, LD 1868 152:234 Port Morris Map, Board of Real Estate 1868
Port Morris Land & Improvement Co.	1890		Grant of land under water, opposite land already owned by PML&I Co. from line of Willow Ave. to line of 1853 water grant of G. Morris II.	LD 1890 3374:454
New York, New Haven & Hartford Railroad	1904		NYNH&HRR subsumes Harlem River & Portchester line, acquiring title to all project land west of Willow Ave.	Scharf 1886:480 LD 1904 38:283 Wells et al 1927:768

property began the Morris family possession that endured for more than 200 years, ending in the early years of the twentieth century and included such individuals as:

- Lewis Morris (termed "the Honorable") - a statesman and prominent legislator and the first Royal Governor of New Jersey;
- Lewis Morris - an ardent patriot, a brigadier-general of the Continental Army, and a signer of the Declaration of Independence;
- Staats Long Morris - a brigadier-general in the British Army and lifelong Tory and Royal Governor of Quebec;
- Gouverneur Morris (also the "Honorable") - a framer of the United States Constitution, minister to France, and a United States senator from New York State. He was also one of three commissioners appointed in 1807 to lay out Manhattan's street and road grid (Stokes V 1926: 1457), and, in 1811, was appointed to a commission to develop inland navigation between the Great Lakes and the Hudson River that resulted in the building of the Erie Canal (Stokes V 1926:1532; Morris II 1888:518);
- Gouverneur Morris II - son of the Honorable Gouverneur Morris, land and railroad speculator and developer. Created the new village of Morrisania, north of the project site.

During the nearly two hundred years of Morris family occupation of the site several residences were built as discussed below.

Westchester County was created in 1683 (Zoebelein 1964:3), and the Morris family holding became a township in the county in 1697 (Bolton 1881:470). Named Morrisania, it remained part of Westchester for almost two centuries. The West Bronx where Morrisania was situated was annexed by New York City as the 23rd and 24th Wards in 1874 (Dolkart 1987), and the project area became known as North New York.

In 1898, all the land north of the Harlem River--including the two annexed wards--became part of the Borough of the Bronx, but one with no borough autonomy (Zoebelein 1964:5). After years of trying to establish the Bronx as a political entity, Bronx County was finally created in 1912 (Zoebelein 1964:10-16). By this time, the project site no longer belonged

to members of the Morris family and its subsequent history is tied to transportation and industry.

Old Manor or Mansion House

Colonel Lewis Morris (brother of Richard) built the first of the Morris family residences. This house, west of Mill Brook, ultimately became known as the Old Manor or Mansion House. General Lewis Morris (son of Judge Morris) received the western part during his father's lifetime and occupied the old manor house. The General and his family vacated the manor house west of Mill Brook during the Revolutionary War when it was occupied first by the Americans and then by the British under General James De Lancey.

It has been said that "70 soldiers huts" were on the property (Lamb 1877:280) and that the house sustained considerable damage (Wilkinson 1966:40, 44), while others say it burned to the ground (e.g., Bolton 1881:500). Whatever the fate of the house, more than 1000 acres of woodland were apparently burned. After the war, General Morris returned to restore the house and grounds west of Mill Brook where, according to Wilkinson, he remained until his death in 1798 (Wilkinson 1966:56-57).

After passing through several other Morris heirs, Henry M. Morris sold a tract of land in 1865 that included the project site to Clarence S. Brown, a Wall Street banker (LD 1865 122:43; NYC Directory 1870). Lewis Brown, an heir and possibly Clarence's son, leased the manor house site, and perhaps the house itself, to various amusement park proprietors. Brown and others, probably family members, sold their land west of Mill Brook to the New York, New Haven and Hartford Railroad in various transactions between 1882 and 1892 (LD 1904 38:283). A structure believed to be the old manor house was demolished in 1891 (e.g., Jenkins 1912:360; Wilkinson 1966:44).

The Honorable Gouverneur Morris Residence

In 1799, Gouverneur Morris built a mansion house "on the foundation of that in which I was born and in which my parents died" (Morris II 1888:419). Based on surveys from 1816 (Randel 1816; Figure 3.5-4) and 1850 (Findlay in Robinson 1888; Figure 3.5-5), this somewhat austere (e.g., Bolton 1848:313), 130-foot stone house with three wings was located east of Mill Brook, just south of East 130th Street and west of Cypress Avenue. Over time, only the central area of this building survived and was the home of Morris's son, Gouverneur II, at least through 1848 (Bolton 1848:315). The fate of the house is unknown, but it appears to have been demolished sometime after 1850.

Gouverneur Morris II Residence

Based on the aforementioned surveys and subsequent map data (e.g. Bromley 1879; Robinson 1885; Robinson 1897), it appears that Gouverneur Morris II built, or refurbished, yet another residence just northeast of his father's house sometime before 1850 when both his home and his father's mansion appear on the same survey (Findlay 1850; Figure 3.5-5). This second house may erroneously be considered the mansion built by his father years before even though this building was of brick (Perris & Browne 1873) and his father's of stone (e.g., Bolton 1848:313). Nineteenth and early 20th-century drawings and photographs of Gouverneur II's house raise further questions since its style, which is Dutch colonial, dates to the 1760s (Dolkart 1992:personal communication; McAllister 1991:112ff, 336ff), almost 100 years before it is first documented on a map.

The house and all the land comprising the project site between Mill Brook and Willow Avenue was sold by the trustees to the New York New Haven and Hartford Railroad in 1905 (LD 45:25, 27, 30, 31, 152). The former family home was then under lease (LD 1905 45:30), but its occupant is unknown. It was demolished later in that year (Wilkinson 1966:44).

Development of the Site for Rail Use

Gouverneur Morris II was active in promoting development of Bronx commerce and real estate, and was a principal agent in bringing rail transportation to Westchester County (Scharf 1886:478). In 1840, he sold a railroad right-of-way across his Morrisania land, having prepared the way by surveying and grading the area (LD 1840 20:265). Since Morris charged the railway company \$1,350 in damages paid to the "lessee on the farm," this deed tells us that at least some of the property was then farmed by a tenant, or tenants. It also tells us that it had undergone its first episode of grading. Although the deed stipulated that the railroad was to be built within a year, it was not until 1873, when the New York, New Haven & Hartford Railroad Company leased the right-of-way and laid track, that a railroad crossed the site (Scharf 1886:480; Wells et al 1927:768).

By the 1870s, the character of the area--once praised for its quiet pastoral scenes and spectacular views of Hell Gate and Randalls Island (Bolton 1881:490)--was changing, at least in part because of the commercial development planned and promoted by Gouverneur Morris II. In company with other Bronx investors, he established the Port Morris Land and Improvement Company in order to develop the waterfront just northeast of the project site as a major seaport. Morris sold numerous properties to the Port Morris Land and Improvement Company beginning in 1868 (miscellaneous transactions made in 1868; see Table 3.5-1). About the time of the 1873 opening of the rail line across the Morris homestead property, the marshland to the east was apparently filled (e.g., Bromley 1879), undoubtedly in connection with this railroad building.

By 1904, the project site east of Willow Avenue had also been acquired by the New York, New Haven and Hartford Railroad. This company had subsumed the Harlem River and Portchester line in 1873 (Scharf I 1886:480) and bought additional land from the Port Morris Land and Improvement Company (see LD 1890 2274:454, and LD 1904 38:283 for recitations).

3.6 Transportation

3.6.1 Traffic

Local Street Network

The Harlem River Yards project site, located at the southern tip of the Bronx, is bounded by the Bronx Kill and Harlem River on the south, East 132nd Street on the north, Lincoln Avenue on the west, and the southerly extension of Rose Feiss Boulevard - Walnut Avenue on the east. The site is presently vacant although unused freight rail lines are located on the property.

Access to the site is provided by major expressways in conjunction with local arterials. The Major Deegan Expressway provides access from the west Bronx, the George Washington Bridge (New Jersey), and Westchester County while the Bruckner Expressway provides access from the Triborough, the Whitestone and the Throgs Neck Bridges, the east Bronx, and New England. Other principal arterials within the primary and secondary impact areas include: Third Avenue, Alexander Avenue, Willis Avenue, St. Ann's Avenue, East 135th Street and Bruckner Boulevard. Traffic flow directions, signalized intersections, and truck routes in the study area are shown in Figure 3.6-1.

For the purposes of this study, the primary traffic study area extends from the northern project boundary at East 132nd Street to Bruckner Boulevard between Third Avenue and St. Ann's Avenue. The secondary study area extends from Bruckner Boulevard to East 135th Street, also between Third Avenue and St. Ann's Avenue.

Transportation characteristics in the study area are primarily commuter related during the AM and PM peak hours of travel although substantial delivery and service trips related to local area industrial and commercial business occur throughout the day. The commuter traffic is a mix of locally generated and regional trips that use the Triborough Bridge and

the Third Avenue Bridge and the Willis Avenue Bridge crossings of the Harlem River for destinations in Manhattan, Queens and Long Island.

Third Avenue is an important southbound arterial through the study area. It is a one-way road with six travel lanes in the southbound direction with parking provided on both sides. It provides direct access to the Third Avenue Bridge into Manhattan. Within the study area, the land use along Third Avenue is primarily commercial. Traffic operation is relatively smooth.

Lincoln Avenue provides alternative access to the Third Avenue Bridge via Bruckner Boulevard. It is a two-way roadway with one travel lane in each direction. Parking is permitted on both sides. Land uses along this road within the study area consist of industrial developments south of East 135th Street. North of East 135th Street, a large residential housing development and commercial land uses abut the roadway. Traffic operation is relatively smooth with some double parking observed at residential buildings. Lincoln Avenue provides direct access to the project site.

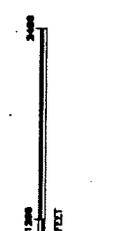
Alexander Avenue is a north-south arterial through the study area. It is a two-way road with one travel lane in each direction and parking on both sides. Mainly industrial land uses exist between East 135th Street and the project site; residential uses exist between East 135th Street and East 138th Street. Traffic movement on this roadway within the study area is unconstrained. However, double parking occurs in the residential area.

St. Ann's Avenue is a two-way road with one travel lane in each direction. It is an important north-south arterial that provides direct access to the project site. It links the project site with the commercial activities east along East 138th Street. Land use along St. Ann's Avenue within the study area is mainly industrial. Traffic operations on this road are relatively smooth with interruptions only at the signalized intersections. However, constrained operations occur at the Bruckner Boulevard intersection.



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LOCAL STREET NETWORK



- Legend**
- Property Boundary
 - Signalized Intersection
 - ▬ Truck Route
 - ↔ Traffic Direction

DATE: DEC 15, 1992

TAMS CONSULTANTS, Inc. Figure 3.6-1



~~East 135th Street is a westbound one-way road two to four travel lanes wide that serves as~~
the service road to the northbound Major Deegan Expressway. Land use along the north side of the road is residential within the study area. Traffic operation is relatively smooth. However, constrained operation occurs at the Willis Avenue intersection.

Bruckner Boulevard is an important arterial that provides local street access to Manhattan via the Third Avenue Bridge and Willis Avenue Bridge one-way couplet. It is a two-way road with two travel lanes in each direction and parking on both sides. Direct access into the project site is available at the Bruckner Boulevard intersections with St. Ann's and Lincoln Avenues. Land use along this road within the study area is mainly industrial. Traffic generally experiences constrained operation in the east-west directions at the signalized intersections.

Local Truck Network

Due to the manufacturing and industrial land uses within the study area, existing truck volumes are heavy throughout the day. A system of local and through truck routes provide for the circulation of these trucks around the project site.

Local truck routes designated by the NYC Department of Transportation provide for local truck circulation within the project area. These routes include the following:

- Bruckner Boulevard between Third Avenue and Willis Avenue;
- Bruckner Boulevard north of East 138th Street;
- East 138th Street;
- East 149th Street;
- Third Avenue;
- Willis Avenue.

Designated through truck routes provide for truck circulation between the project area and the rest of the Bronx and outlying areas. These routes (Figure 3.6-1) include the following:

- Major Deegan Expressway;
- Third Avenue Bridge;
- Willis Avenue Bridge;
- Willis Avenue south of East 135th Street;
- Bruckner Boulevard between Willis Avenue and East 138th Street;
- Bruckner Expressway.

Truck cordon studies completed in 1987 by the Port Authority of New York and New Jersey (1987 Truck Cordon Report) found that 35,000 trucks enter (one-way trips) the 17 county New York-New Jersey region on a typical weekday. The region includes New York City, Long Island, the northern and central counties of New Jersey, and the southernmost counties of New York and Connecticut.

Approximately 13 percent (4,700) of these one-way truck trips have destinations within New York City; approximately 1,000 trucks have destinations in the Bronx using the regional highway system. These truck volumes do not include truck traffic generated inside the 17-county New York-New Jersey region.

Existing truck percentages range as high as 36 percent within the study area. Table 3.6-1 provides truck percentage and volumes for each intersection approach studied.

**TABLE 3.6-1
EXISTING TRUCK PERCENTAGES AND VOLUMES**

Approach	AM Peak		Off Peak		PM	
	Truck Percent	Truck Volume	Truck Percent	Truck Volume	Truck Percent	Truck Volume
E. 135th St. & Third Ave.						
WB	3	62	2	28	2	37
SB	4	30	4	24	8	52
E. 135th St. & Alexander Ave.						
WB	7	159	3	48	6	120
NB	36	20	21	13	24	26
SB	24	17	6	5	6	5
Bruckner Blvd. & Alexander Ave.						
EB	27	20	24	25	12	11
WB	6	134	6	74	5	65
NB	36	5	0	0	33	1
SB	24	50	15	27	3	8
E. 135th St. & Willis Ave.						
WB	2	44	8	121	3	59
NB	4	15	4	20	1	3
SB	0	0	20	14	16	15
Bruckner Ave. & Willis Ave. Bridge Exit Ramp						
EB	21	24	15	33	7	16
WB	17	283	9	65	2	16
NB	8	100	12	195	5	106
Bruckner Blvd. & Willis Ave.						
EB	16	14	9	16	16	22
WB	24	403	7	52	6	48
NB	0	0	0	0	0	0
SB	5	31	5	29	3	19

**TABLE 3.6-1
EXISTING TRUCK PERCENTAGES AND VOLUMES**

Approach	AM Peak		Off Peak		PM	
	Truck Percent	Truck Volume	Truck Percent	Truck Volume	Truck Percent	Truck Volume
E. 135th St. & St. Ann's Ave.						
WB	10	34	8	15	4	10
NB	4	8	8	20	10	32
SB	8	6	4	4	0	0
E. 134th St. & St. Ann's Ave.						
EB	8	19	8	21	8	28
NB	24	26	12	18	4	6
SB	25	26	18	20	7	8
Bruckner Blvd & St. Ann's Ave.						
EB	12	163	11	199	6	140
WB	16	272	7	47	7	53
NB	26	17	30	36	0	0
SB	21	28	24	36	12	21
Major Deegan Serv. Rd & Third Ave.						
EB	10	78	4	25	5	34
NB	2	1	2	1	2	1
SB	4	108	3	56	5	109
Bruckner Blvd & Lincoln Ave.						
EB	2	1	2	1	2	1
WB	8	189	3	39	3	43
NB	0	0	0	0	0	0
SB	8	45	5	16	9	37

Twenty-four hour automatic traffic recorder (ATR) counts were taken at six locations. Five locations were counted for 24 hours between September 28th and October 1st, 1992 and one control station was counted for seven days (September 28 to October 4, 1992). A review of ATR data confirmed the weekday peak travel periods to be 7:00 to 9:00 AM and 4:00 - 6:00 PM. Typical weekday volumes are shown in Table 3.6-2. ATR count locations are shown in Figure 3.6-2.

Turning movement and vehicle classification counts were conducted at twelve locations. These counts were performed for a continuous 12-hour period (6:00 AM - 6:00 PM) during three typical mid-week weekdays during October 1992. Figure 3.6-2 shows the traffic count locations.

Each of the signalized intersections counted was also inventoried to identify those parameters used to determine the capacity of the intersection and its approaches, as specified in the 1985 Highway Capacity Manual (HCM).

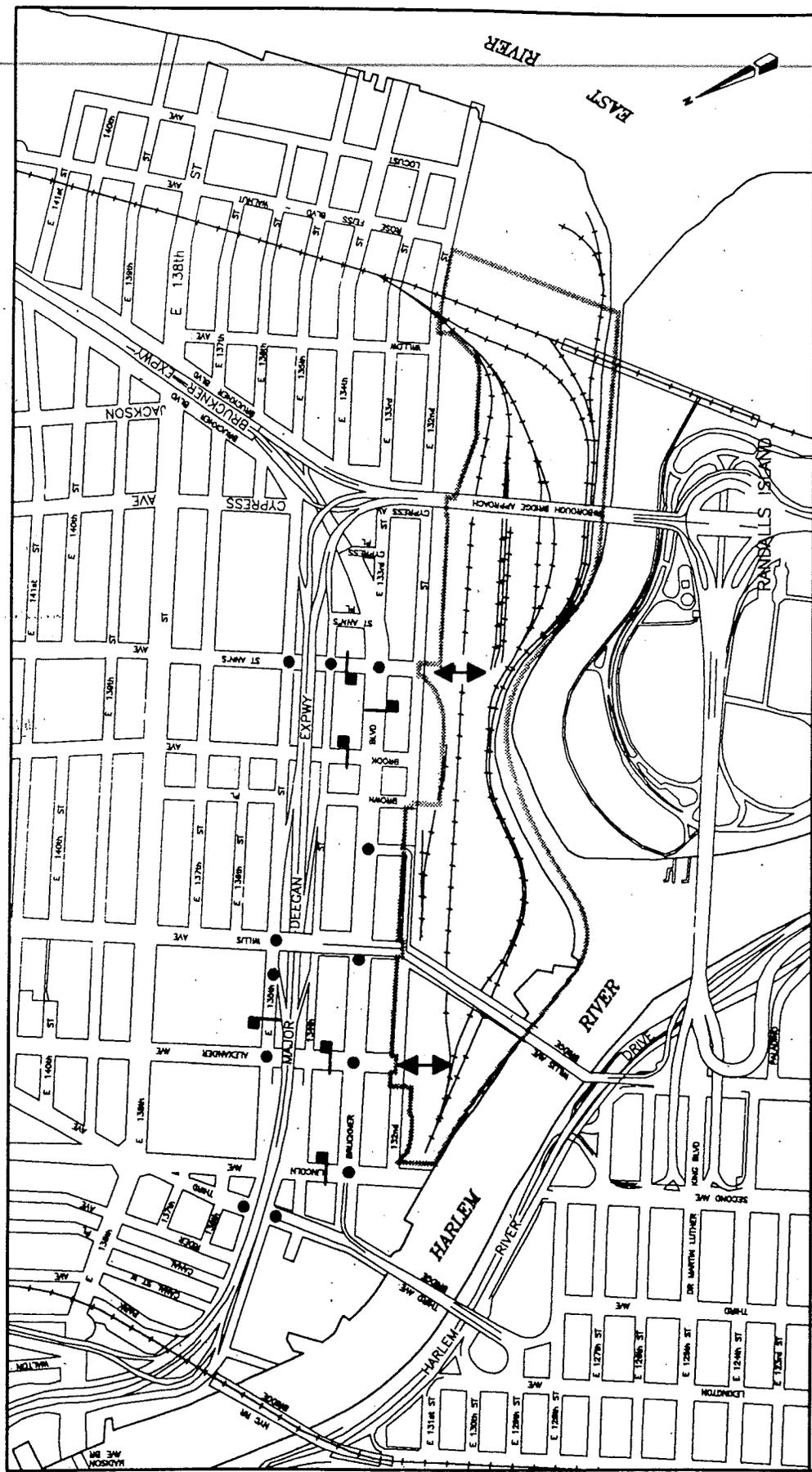
Specifically, each traffic signal was inventoried for its cycle length, phasing (green time allocated for each movement) and progression (to determine the traffic "arrival type"). Geometric conditions of the intersection, such as street widths, lane widths, and crosswalk widths, were also recorded. General operating conditions were also observed. These include posted parking regulations, number of parking maneuvers by vehicles during peak periods, impacts on traffic made by local buses making stops, and pedestrian interference with traffic movements.

TABLE 3.6-2

24 HOUR TRAFFIC VOLUMES RECORDED IN STUDY AREA

LOCATION	AVERAGE DAILY VOLUME	
Lincoln Avenue Between Bruckner Blvd and East 134th Street	NB 794	SB 4,333
Alexander Avenue Between Bruckner Boulevard and East 134th Street	NB 1,329	SB 3,032
East 135th Street Between Alexander Avenue and Willis Avenue	--	WB 28,203
Brook Avenue Between Bruckner Boulevard and East 134th Street	--	SB 5,990
St. Ann's Avenue Between Bruckner Boulevard and East 134th Street	NB 2,587	SB 2,693
Bruckner Boulevard Between Brook Avenue and St. Ann's Avenue	EB 34,082	WB 7,290
Bruckner Boulevard (7 Day Average) Between Brook Avenue and St. Ann's Avenue	EB 32,302	WB 6,926

Based on ATR Volumes recorded between September 28th and October 4th, 1992 by TAMS Consultants, Inc.



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**ATR LOCATIONS -
 TURNING MOVEMENT/VEHICLE
 CLASSIFICATION COUNT LOCATIONS**



Legend

- Property Boundary
- Site Entrance
- 12 Hour Manual Count Location
- ATR Count Location

DATE: DEC 16, 1992

TAMS CONSULTANTS, Inc. Figure 3.6-2



Capacities for the signalized intersections were calculated using the methodology described in the 1985 HCM. All of the analyses were conducted using the Highway Capacity Software Version 1.5.

Signalized Intersection Capacity and Level-of-Service

The quality of traffic flow through a signalized intersection is commonly described by two measures, the volume/capacity (V/C) ratio and level of service (LOS). The methodology in the 1985 HCM for signalized intersections differs significantly from the procedures used in earlier manuals, such as the 1965 HCM and the Transportation Research Board (TRB) Circular 212 (1980). The 1965 HCM was published as a guide for the design and operational analysis of highway facilities. Signalized urban intersections were evaluated in terms of volume to capacity ratios. The TRB Circular 212 was a collection of interim materials distributed prior to the publication of a revised HCM. This document introduced the analytical concept of evaluating "critical movements" for an entire signalized urban intersection. The critical movement is defined as that traffic movement requiring the most amount of green time during a particular phase of a signal cycle.

In the 1985 HCM, the definition of level of service for signalized intersections is not directly related to the computation of v/c ratios. Instead, level of service is defined by the "average stopped delay" time per vehicle for various movements within the intersection (see Table 3.6-3 for the level of service criteria expressed in terms of average stopped delay).

In the 1985 HCM, a poor level of service does not necessarily indicate that the intersection is approaching saturation (i.e., has high v/c ratio). Even at moderate v/c ratios, a poor level of service can occur because of a combination of factors such as a long signal cycle, an inappropriate allocation of green times for various traffic movements, and/or an unbalanced progressive timing of traffic signals on the approaches to the intersection. Thus,

TABLE 3.6-3

**TRAFFIC LEVEL OF SERVICE DEFINITIONS
FOR SIGNALIZED INTERSECTIONS**

LOS	Description
A	Level A describes operations with very low delay, i.e., less than 5.0 seconds per vehicle. This occurs when progression is extremely favorable, and most vehicles arrive during the green phase. Most vehicles do not stop at all. Short cycle lengths may also contribute to low delay.
B	Level B describes operations with delay in the range of 5.1 to 15.0 seconds per vehicle. This generally occurs with good progression and/or short cycle lengths. More vehicles stop than for LOS A, causing higher levels of average delay.
C	Level C describes operations with delay in the range of 15.1 to 25.0 seconds per vehicle. These higher delays may result from fair progression and/or longer cycle lengths. Individual cycle failures may begin to appear in this level, although many still pass through the intersection without stopping.
D	Level D describes operations with delay in the range of 25.1 to 40.0 seconds per vehicle. At Level D, the influence of congestion becomes more noticeable. Longer delays may result from some combination of unfavorable progression, long cycle lengths, or high v/c ratios. Many vehicles stop, and the proportion of vehicles not stopping declines. Individual cycle failures are noticeable.
E	Level E describes operations with delay in the range of 40.1 to 60.0 seconds per vehicle. This is considered to be the limit of acceptable delay. These high delay values generally indicate poor progression, long cycle lengths, and high v/c ratios. Individual cycle failures are frequent occurrences.
F	Level F describes operations with delay in excess of 60.0 seconds per vehicle. This is considered to be unacceptable to most drivers. This condition often occurs with over saturation, i.e., when arrival flow rates exceed the capacity of the intersection. It may also occur at high v/c ratios below 1.00 with many individual cycle failures. Poor progression and long cycle lengths may also be major contributing causes to such delay levels.

Source: Transportation Research Board Special Report, 209, Highway Capacity Manual.

in evaluating signalized intersections it is necessary to consider both the level of service and the v/c ratio as two separate measures of the adequacy of intersection operations.

The 1985 HCM provides a methodology to determine capacity of signalized intersections for each lane group (i.e., one or more lanes of traffic at an intersection approach serving one or more traffic movements), approach and intersection as a whole. The capacity of an intersection is defined as the maximum rate of flow that may pass through the intersection under prevailing traffic conditions (vehicular and pedestrian), roadway conditions (geometry and lane use) and signalization conditions (signal timing, type of signal control, and an evaluation of signal progression on each approach).

Volume to capacity ratios are computed for individual movements, and a composite v/c ratio is computed for the sum of critical movements or lane groups within the intersection. The composite, or "critical v/c ratio" is useful in evaluating the overall operation of the intersection, but in some cases will not reveal problems of poor signal timing.

Based on the computed capacity and on observed traffic flow characteristics, an estimate of delay time can be made using the 1985 HCM procedures. The estimates of delay are subsequently translated into levels of service, according to criteria provided in the 1985 HCM.

For the existing conditions, four time periods were analyzed, the AM peak (8AM-9AM), PM peak (5PM-6PM), AM off-peak (11AM-12 noon,) and PM off-peak (1PM-2PM). The balanced volumes of traffic traveling on specific study area intersections during each of these analysis periods is shown in Figures 3.6-3 to 3.6-8. Table 3.6-4 provides a summary of intersection approach volume, volume/capacity ratios, stopped delay and approach level of service for the analyzed intersections for all four time periods. Following is a brief description of each intersection and its existing operational characteristics.

TABLE 3.6-4
SUMMARY OF LOS ANALYSIS - EXISTING CONDITIONS

Intersection	AM Peak Hour				PM Peak Hour			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
E. 135th St. & Third Ave.								
WB L	1950	0.907	19.8	C	1545	0.916	20.6	C
WB LT	120	0.913	20.3	C	280	0.930	22.2	C
SB TR	755	0.303	26.2	D	655	0.297	26.1	D
Overall:		0.736	21.9	C		0.747	22.8	C
E. 135th St. & Alexander Ave.								
WB LTR	2270	0.858	12.6	B	2000	0.730	10.5	B
NB L	30	0.071	7.6	B	60	0.113	7.7	B
NB T	25	0.050	7.5	B	50	0.075	7.6	B
SB TR	70	0.092	7.6	B	85	0.133	7.8	B
Overall:		0.489	12.3	B		0.443	10.2	B
Bruckner Blvd. & Alexander Ave.								
EB L	20	0.751	40.1	E	15	0.360	9.4	B
EB TR	55	0.106	6.9	B	80	0.137	7.0	B
WB LTR	2140	1.080	59.8	E	1290	0.608	10.7	B
NB LTR	15	0.024	20.9	C	10	0.019	20.9	C
SB LTR	210	0.286	23.0	C	225	0.285	22.9	C
Overall:		0.808	54.0	E		0.498	12.3	B
E. 135th St. & Willis Ave.								
WB TR	2210	0.932	16.2	C	1950	0.925	15.7	C
NB L	65	0.192	27.5	D	75	0.211	27.7	D
NB T	300	0.423	29.4	D	265	0.356	28.8	D
SB R	45	0.078	26.7	D	95	0.172	27.4	D
Overall:		0.803	18.2	C		0.780	17.8	C
Bruckner Blvd. & Willis Ave. Exit Ramp								
EB T	115	0.271	30.9	D	235	0.398	31.9	D
WB T	1565	0.777	8.0	B	800	0.331	3.8	A
NB L	15	0.058	29.5	D	20	0.066	29.6	D
NB R	1240	0.678	7.3	B	2090	0.971	20.9	C
Overall:		1.130	8.9	B		1.002	17.6	C
Bruckner Blvd. & Willis Ave.								
EB L	15	0.298	8.8	B	25	0.121	6.9	B
EB TR	75	0.074	6.7	B	115	0.121	6.9	B
WB LTR	1580	0.913	19.8	C	800	0.440	8.9	B
NB LTR	10	0.020	20.9	C	10	0.040	21.0	C
SB LTR	625	0.722	29.0	D	640	0.742	29.5	D
Overall		0.848	21.7	C		0.543	16.7	C

TABLE 3.6-4
SUMMARY OF LOS ANALYSIS - EXISTING CONDITIONS

Intersection	AM Peak Hour				PM Peak Hour			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
E. 135th St. & St. Ann's Ave.								
WB LTR	340	0.262	10.1	B	255	0.166	9.7	B
NB LTR	210	0.155	5.4	B	320	0.228	5.7	B
SB TR	80	0.065	5.1	B	100	0.094	5.2	B
Overall:		0.199	8.0	B		0.203	7.1	B
E. 134th St. & St. Ann's Ave.								
EB L	140	0.299	11.9	B	205	0.448	12.9	B
EB TR	100	0.194	11.4	B	145	0.282	11.8	B
NB TR	110	0.073	4.1	A	150	0.106	4.2	A
SB LT	105	0.079	4.2	A	115	0.085	4.2	A
Overall:		0.157	7.8	B		0.227	8.4	B
Bruckner Blvd. & St. Ann's Ave.								
EB L	10	0.194	7.5	B	90	1.246	*	F
EB TR	1345	1.270	*	F	2235	1.246	*	F
WB L	50	1.000	109.9	F	5	0.093	6.8	B
WB TR	1550	1.511	*	F	755	0.690	12.5	B
NB LTR	65	0.092	21.4	C	70	0.094	21.4	C
SB L	75	0.205	22.3	C	115	0.325	23.4	C
SB TR	60	0.155	21.9	C	60	0.155	21.9	C
Overall:		1.065	*	F		0.931	*	F
Major Deegan Service Rd. and Third Avenue								
EB TR	775	0.889	33.5	D	680	0.660	25.1	D
NB R	5	0.011	8.0	B	10	0.023	8.0	B
SB L	5	0.006	7.9	B	10	0.012	8.0	B
SB T	2690	0.578	12.1	B	2165	0.511	11.4	B
Overall:		0.698	17.2	C		0.569	14.4	B
Bruckner Blvd. & Lincoln Ave.								
EB TR	10	0.012	4.1	A	15	0.017	4.1	A
WB LTR	2260	1.054	42.9	E	1420	0.665	7.7	B
NB L	5	0.047	18.1	C	5	0.062	18.2	C
NB TR	10	0.036	18.0	C	25	0.062	18.2	C
SB LTR	560	0.769	25.7	D	415	0.579	22.0	C
Overall:		0.970	39.1	D		0.640	11.1	B

Note: When the V/C ratio exceeds 1.2, the stopped delay calculation is meaningless.

TABLE 3.6-4 (continued)
SUMMARY OF LOS ANALYSIS - EXISTING CONDITIONS

Intersection	AM Off-Peak Hour				PM Off-Peak Hour			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
E. 135th St. & Third Ave.								
WB L	1450	0.713	10.7	B	1235	0.627	9.1	B
WB LT	145	0.719	10.9	B	115	0.623	9.2	B
SB TR	535	0.210	25.4	D	585	0.250	25.7	D
Overall:		0.572	14.8	B		0.522	14.8	B
E. 135th St. & Alexander Ave.								
WB LTR	1730	0.628	9.5	B	1525	0.537	8.8	B
NB L	25	0.054	7.5	B	20	0.062	7.5	B
NB T	25	0.045	7.5	B	40	0.062	7.5	B
SB TR	55	0.093	7.6	B	75	0.061	7.5	B
Overall:		0.370	9.3	B		0.308	8.7	B
Bruckner Blvd. & Alexander Ave.								
EB L	15	0.289	8.6	B	15	0.461	12.6	B
EB TR	75	0.082	6.8	B	85	0.155	7.1	B
WB LTR	1170	0.631	11.0	B	1190	0.629	11.0	B
NB LTR	15	0.025	20.9	C	15	0.032	21.0	C
SB LTR	210	0.342	23.5	C	175	0.260	22.8	C
Overall:		0.532	13.0	B		0.505	12.3	B
E. 135th St. & Willis Ave.								
WB TR	1710	0.694	8.2	B	1460	0.611	7.1	B
NB L	45	0.128	27.1	D	75	0.226	27.8	D
NB T	175	0.239	27.9	D	400	0.577	31.2	D
SB R	60	0.152	27.2	D	65	0.149	27.2	D
Overall:		0.578	11.1	B		0.602	13.8	B
Bruckner Blvd. & Willis Ave. Exit Ramp								
EB T	165	0.287	31.0	D	210	0.430	32.2	D
WB T	725	0.372	4.0	A	690	0.351	3.9	A
NB L	10	0.039	29.4	D	30	0.120	29.9	D
NB R	1110	0.606	6.5	B	1530	0.863	11.8	B
Overall:		0.756	7.7	B		0.936	11.7	B
Bruckner Blvd. & Willis Ave.								
EB LTR	125	0.127	7.0	B	175	0.130	7.0	B
WB LTR	735	0.510	9.6	B	720	0.392	8.6	B
NB LTR	10	0.033	21.0	C	10	0.020	20.9	C
SB LTR	535	0.675	28.0	D	560	0.701	28.5	D
Overall		0.566	15.6	C		0.498	16.0	C

TABLE 3.6-4 (continued)
SUMMARY OF LOS ANALYSIS - EXISTING CONDITIONS

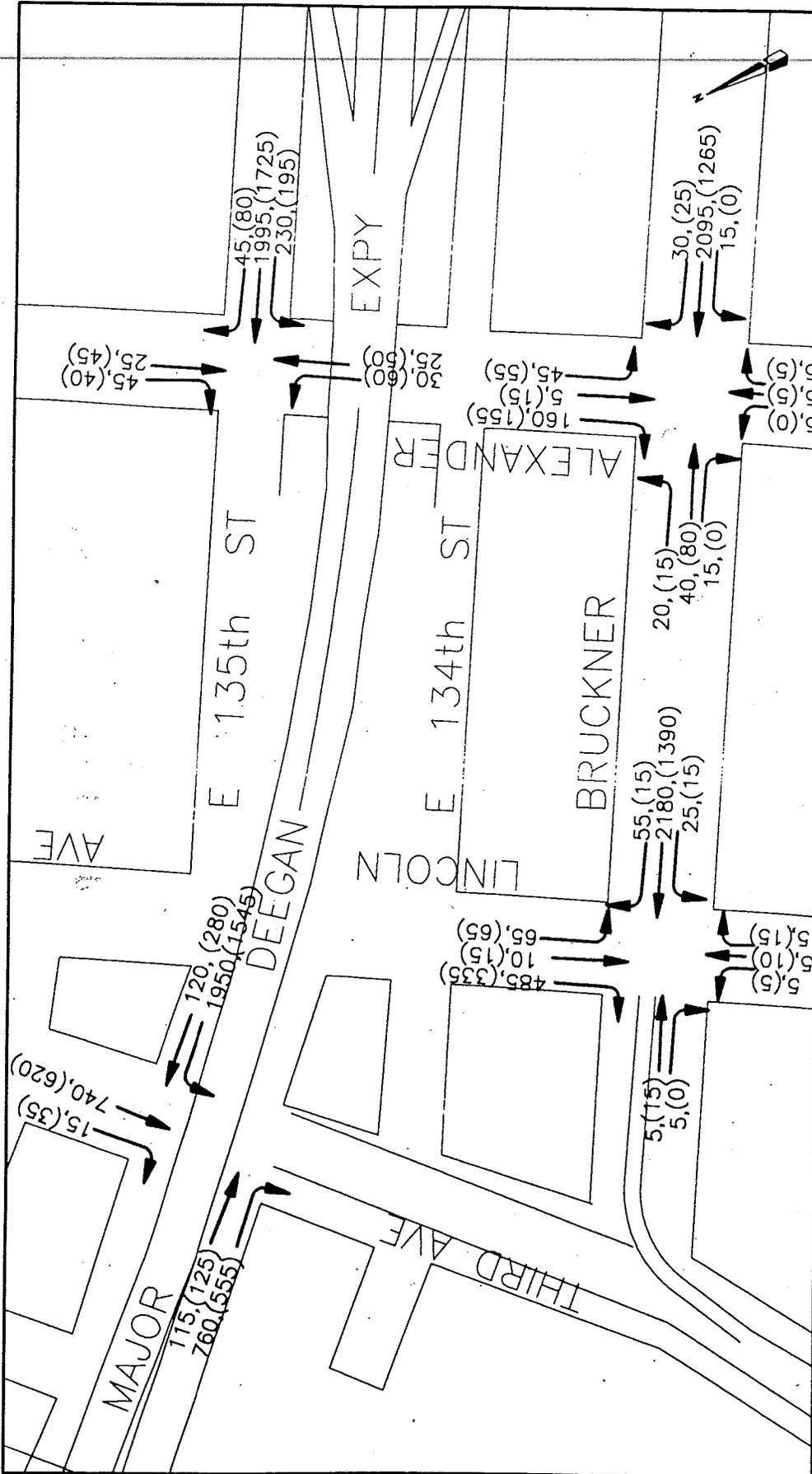
Intersection	AM Off-Peak Hour				PM Off-Peak Hour			
	Appr. Volume	V/C Ratio	Stopped Delay	LOS	Appr. Volume	V/C Ratio	Stopped Delay	LOS
E. 135th St. & St. Ann's Ave.								
WB LTR	195	0.119	9.6	B	185	0.122	9.6	B
NB LTR	175	0.124	5.3	B	240	0.162	5.4	B
SB TR	85	0.075	5.2	B	100	0.075	5.2	B
Overall:		0.122	7.0	B		0.146	6.9	B
E. 134th St. & St. Ann's Ave.								
EB L	90	0.279	11.7	B	135	0.316	12.0	B
EB TR	120	0.279	11.7	B	115	0.242	11.6	B
NB TR	115	0.083	4.2	A	145	0.085	4.2	A
SB LT	105	0.122	4.3	A	105	0.083	4.2	A
Overall:		0.177	7.6	B		0.166	7.8	B
Bruckner Blvd. & St. Ann's Ave.								
EB LTR	1275	0.703	12.2	B	1740	1.194	127.0	F
WB L	5	0.458	9.2	B	5	0.096	6.8	B
WB TR	580	0.458	9.2	B	640	0.606	11.0	B
NB LTR	75	0.126	21.7	C	115	0.158	21.9	C
SB L	65	0.192	22.2	C	85	0.272	22.9	C
SB TR	65	0.174	22.0	C	60	0.163	22.0	C
Overall:		0.528	12.5	B		0.878	90.9	F
Major Deegan Service Rd. and Third Ave.								
EB TR	610	0.599	24.1	C	600	0.584	23.8	C
NB R	5	0.011	8.0	B	10	0.021	8.0	B
SB L	5	0.006	7.9	B	10	0.012	8.0	B
SB T	1945	0.466	10.9	B	1785	0.422	10.5	B
Overall:		0.518	13.8	B		0.484	13.5	B
Bruckner Blvd. & Lincoln Ave.								
EB TR	15	0.025	4.1	A	10	0.014	4.1	A
WB LTR	1285	0.649	7.5	B	1250	0.587	6.9	B
NB LTR	15	0.046	18.1	C	15	0.030	18.0	C
SB LTR	320	0.440	20.6	C	310	0.420	20.4	C
Overall:		0.587	10.1	B		0.537	9.7	B

Note: When the V/C ratio exceeds 1.2, the stopped delay calculation is meaningless.

- East 135th Street and Third Avenue - This intersection is controlled by a two-phase, 120-second cycle. Despite the heavy left turning volumes from westbound East 135th Street to the southbound Third Avenue Bridge, the intersection operates at LOS C during the AM and PM peaks and LOS B during the AM and PM off-peak. One-way operation of both streets that permits the unopposed left turns results in generally satisfactory operating conditions at this location.
- East 135th Street and Alexander Avenue - This intersection is controlled by a two-phase 60-second cycle. Operation of this intersection is satisfactory (LOS B) for all time periods. The one-way operation of East 135th Street and the short cycle length both help to lower overall stopped delay.
- Bruckner Boulevard and Alexander Avenue - This intersection is controlled by a two-phase, 120-second cycle. The intersection operates poorly (LOS E) during the AM peak due to a heavy westbound through movement on Bruckner Boulevard destined for the Third Avenue Bridge and Manhattan in the morning. During the other time periods, this volume is significantly lower and the intersection operates satisfactorily (LOS B).
- East 135th Street and Willis Avenue - This intersection is controlled by a two-phase, 120-second cycle. The westbound approach experiences heavy volumes from vehicles destined for the northbound Major Deegan Expressway and the Third Avenue Bridge. The intersection can successfully accommodate this movement due to the one-way operation and low volumes on the two Willis Avenue approaches. The intersection operates at LOS C or better for all time periods.

However, the operations of this intersection are at times seriously affected by merging backups at the entrance to the northbound Major Deegan Expressway immediately west of this intersection (see discussion below) which often extend into the intersection during peak periods. These conditions cannot be represented in the HCM analysis for this signalized intersection.

- Bruckner Boulevard and Willis Avenue Bridge Exit Ramp - This intersection is controlled by a three-phase, 120-second cycle. The intersection experiences its heaviest volumes during the PM peak when vehicles from the Willis Avenue Bridge and Manhattan use this intersection for access to the local street network. Overall, however, the intersection operates at LOS C or better during all time periods.
- Bruckner Boulevard and Willis Avenue - This intersection is controlled by a two-phase, 120-second cycle. The overall operation of the intersection is satisfactory for all but the AM peak. During this period a heavy westbound



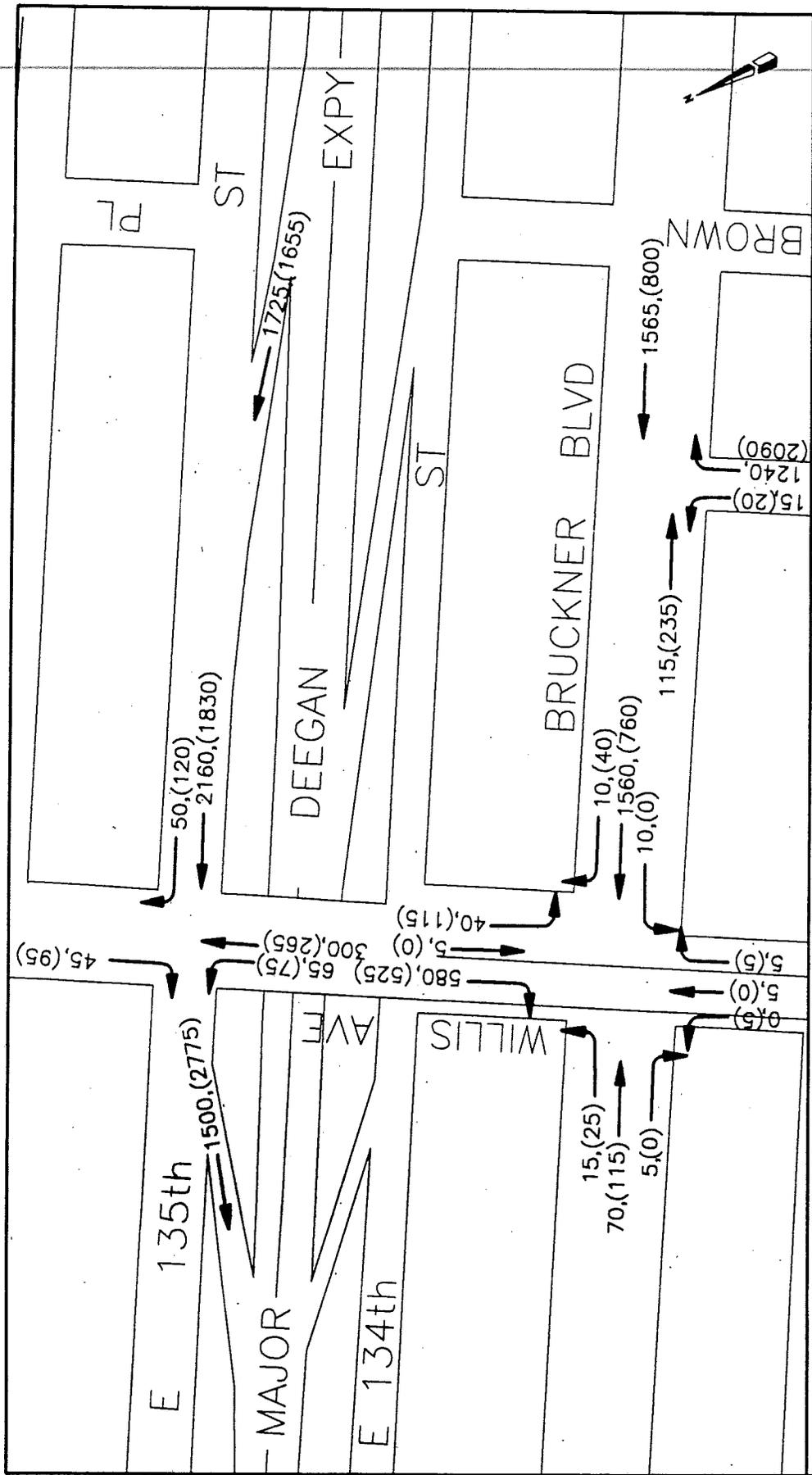
HARLEM RIVER YARD VENTURES INC.
INTERMODAL TRANSPORTATION AND
DISTRIBUTION CENTER

**EXISTING PEAK
BALANCED TRAFFIC FLOW**

DATE: DEC 3, 1992

TAMS CONSULTANTS, Inc. Figure 3.6-3





Legend

195 AM Peak Flow Count
 (150) PM Peak Flow Count
 Traffic Movement

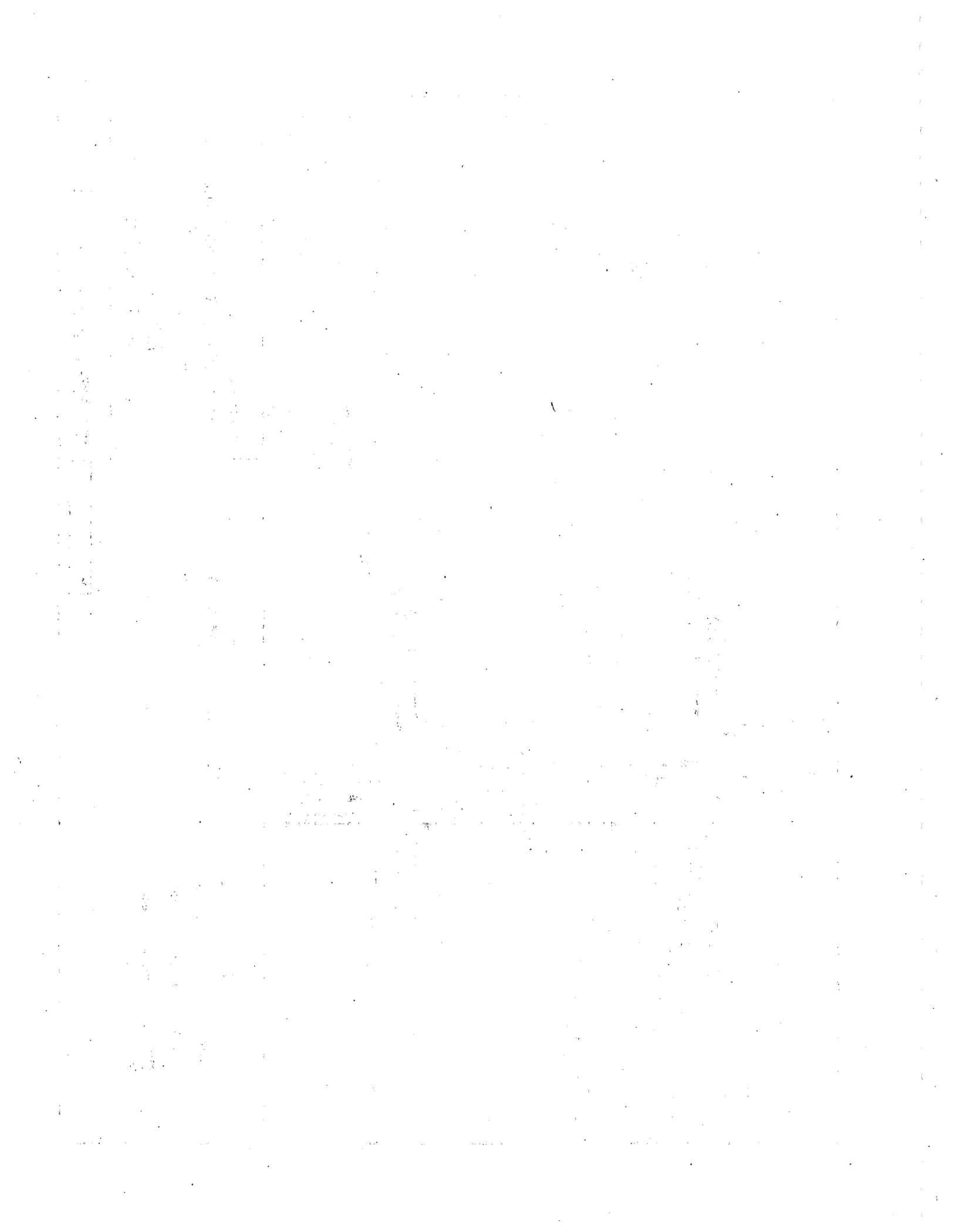
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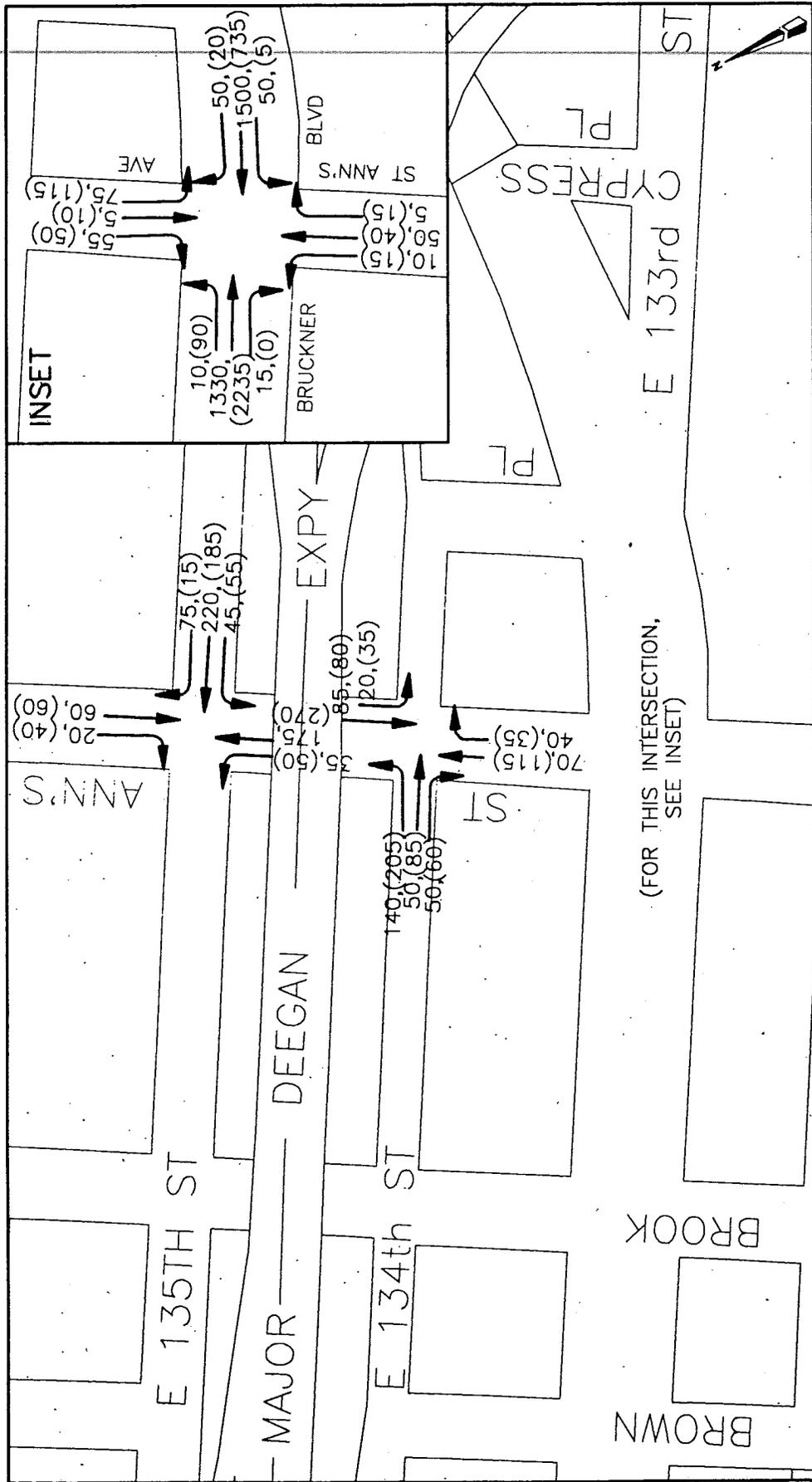
HARLEM RIVER YARD VENTURES INC.
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**EXISTING PEAK
 BALANCED TRAFFIC FLOW**

DATE: DEC 4, 1992

TAMS CONSULTANTS, Inc. Figure 3.6-4





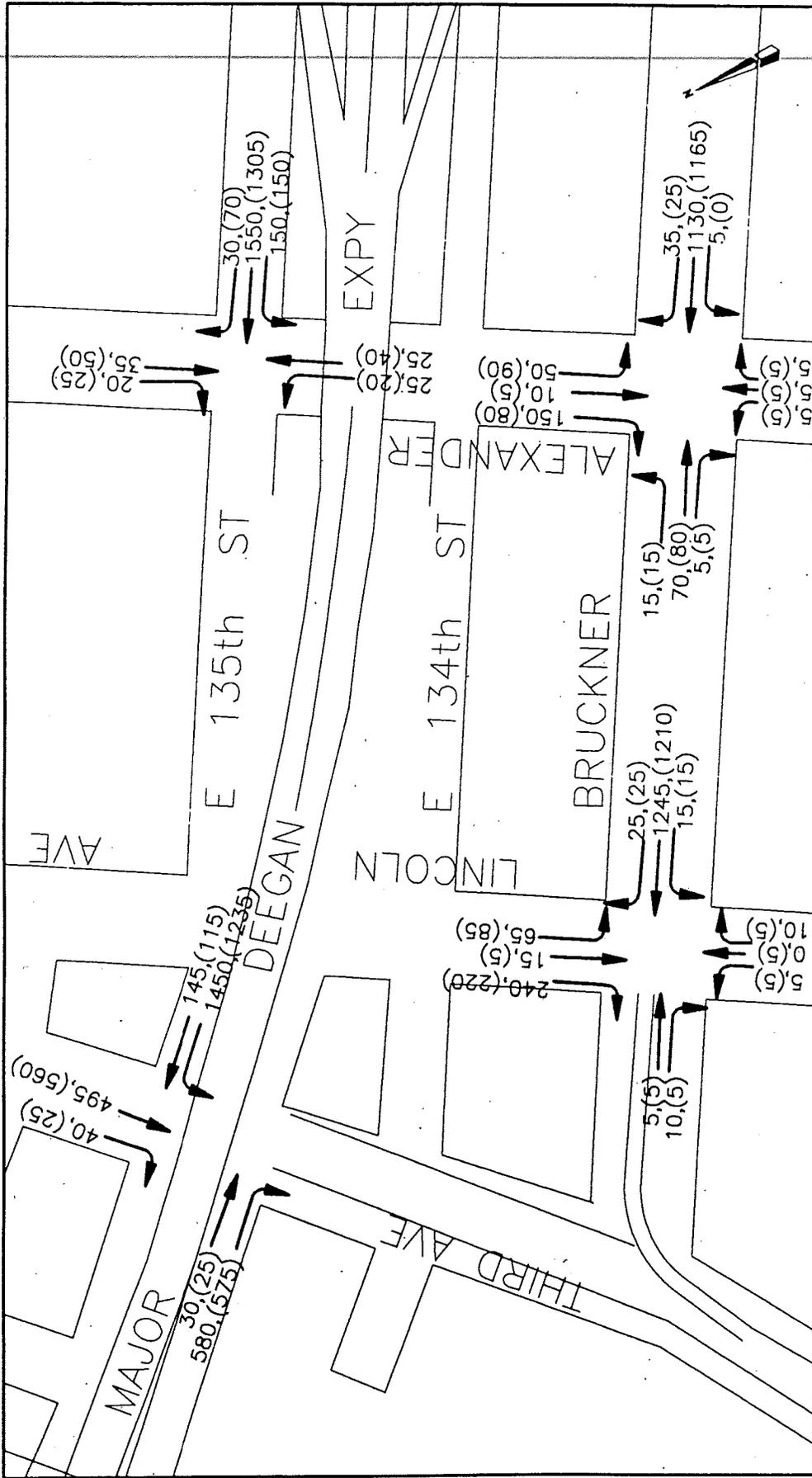
HARLEM RIVER YARD VENTURES INC.
 INTERMODAL TRANSPORTATION AND
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**EXISTING PEAK
 BALANCED TRAFFIC FLOW**

TAMS CONSULTANTS, Inc. Figure 3.6-5

DATE: DEC 4, 1992



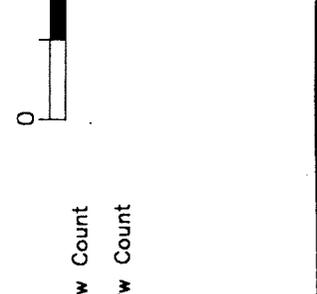


HARLEM RIVER YARD VENTURES INC.
 INTERMODAL TRANSPORTATION AND
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**EXISTING OFF-PEAK
 BALANCED TRAFFIC FLOW**

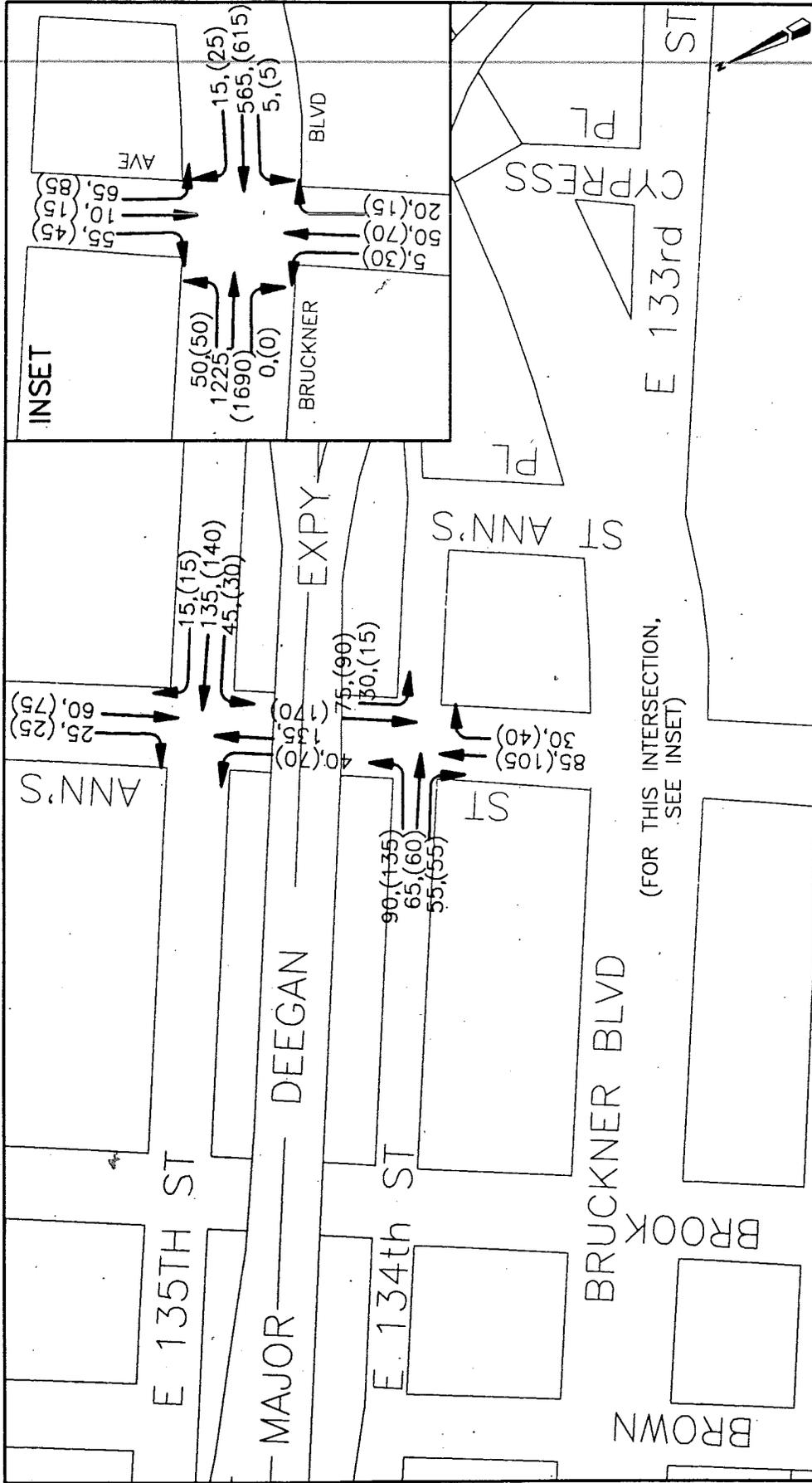
TAMS CONSULTANTS, Inc. Figure 3.6-6

DATE: DEC 4, 1992



Legend

- 195 AM Off-Peak Flow Count
- (150) PM Off-Peak Flow Count
- Traffic Movement



(FOR THIS INTERSECTION, SEE INSET)



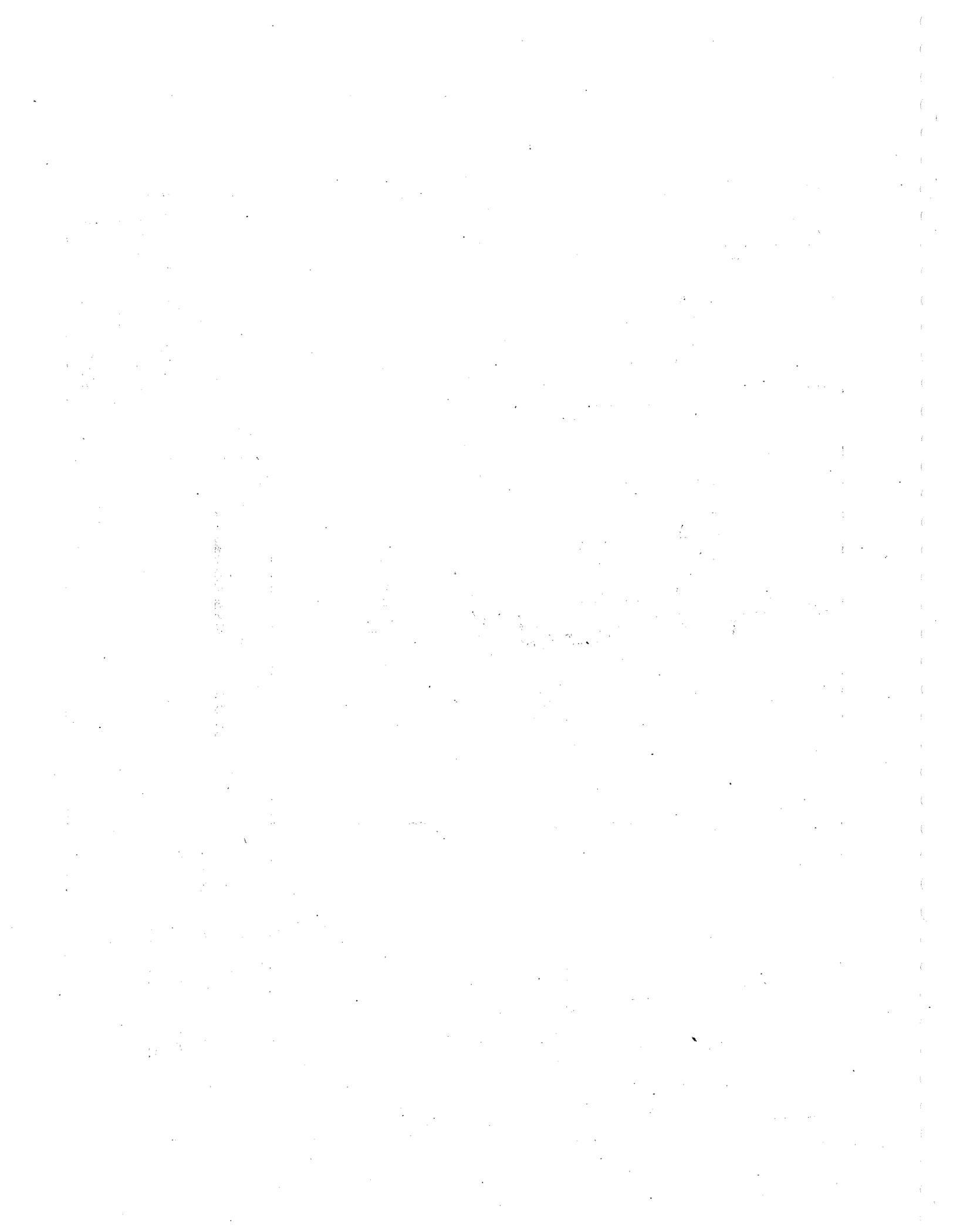
- Legend**
- 195 AM Off-Peak Flow Count
 - (150) PM Off-Peak Flow Count
 - Traffic Movement

HARLEM RIVER YARD VENTURES INC.
INTERMODAL TRANSPORTATION AND
DISTRIBUTION CENTER

**EXISTING OFF-PEAK
BALANCED TRAFFIC FLOW**

DATE: DEC 4, 1992

TAMS CONSULTANTS, Inc. Figure 3.6-B



through movement on Bruckner Boulevard destined for the Third Avenue Bridge and Manhattan causes the intersection to degrade slightly to LOS C.

- East 135th Street and St. Ann's Avenue - This intersection is controlled by a two-phase, 60-second cycle. Because of light traffic volumes and a short cycle length, this intersection operates at a satisfactory LOS B during all time periods.
- East 134th Street and St Ann's Avenue - This intersection is controlled by a two-phase 60-second cycle. Low traffic volumes and a short cycle length result in satisfactory operation at this location (LOS B) for all time periods.
- Bruckner Boulevard and St. Ann's Avenue - This intersection is controlled by a two-phase, 120-second cycle. The operation of this intersection is the poorest of all study area intersections due to heavy volumes along both directions of Bruckner Boulevard. Breakdown conditions (LOS F) are experienced for all time periods with the exception of the AM off-peak.
- Major Deegan Service Road and Third Avenue - This intersection is controlled by a two-phase, 120-second cycle. The southbound through movement on Third Avenue is heavy from vehicles entering Manhattan via the Third Avenue Bridge. Despite the high volumes at this intersection, one-way operation on Third Avenue and the Service Road results in satisfactory operation (LOS C or better) during all time periods.
- Bruckner Boulevard and Lincoln Avenue - This intersection is controlled by a two-phase, 90-second cycle. Overall operation of the intersection is favorable (LOS B) with the exception of the AM peak. During this period, a heavy westbound through movement on Bruckner Boulevard of vehicles destined for the Third Avenue Bridge causes the approach to operate at LOS E. Overall the operation operates at LOS D during the AM peak.
- Major Deegan West Bound Entrance Ramp West of Willis Avenue - The unsignalized location cannot be analyzed in accordance with HCM procedures because it involves the merging of traffic flows from East 135th Street and a free-flow left turn lane from the Willis Avenue bridge which is separated from the signalized intersection of East 135th Street and Willis Avenue. Because of the severely limited geometrics of the merging area and the high volumes which merge at the mouth of the ramp, backups occur especially during peak periods, that are indicative of breakdown conditions (LOS F). When the backups occur, they frequently extend to the signalized intersection of East 135th Street and Willis Avenue and affect operations at that location.

Travel Speeds

Average travel speeds of vehicles along principal streets between links within the study area were obtained using the floating car method. This technique uses a field vehicle which travels at speeds under prevailing traffic conditions. These runs were conducted during the AM peak, AM off-peak, PM off-peak and the PM peak periods. The speed runs were performed on the following links: Third Avenue southbound, Lincoln Avenue in each direction, Alexander Avenue in both directions, Willis Avenue northbound between First Avenue in Manhattan and East 138th Street in the Bronx and southbound between East 138th Street and East 135th Street, St. Anne's Avenue in both directions and Bruckner Boulevard in both directions between East 138th Street and Third Avenue. Table 3.6-5 provides link by link average travel speeds for the AM peak, AM off-peak, PM off-peak and PM peak periods.

The study area's speeds range from 2 to 53 miles per hour (MPH). The slower travel speeds links are usually the result of stopped delay caused by vehicles waiting at traffic signals due to traffic overflows on some links. For example, travel speeds on Willis Avenue southbound between East 136th and East 135th Streets are greatly impaired during the peak periods by traffic overflow at the entrance ramp onto the Major Deegan Expressway. Other slow links include: St. Anne' Avenue southbound between East 134th Street and Bruckner Boulevard, St. Anne's Avenue northbound between East 137th Street and East 138th Street, Bruckner Boulevard westbound between Lincoln and Third Avenues and eastbound between Willis Avenue and Brown Place. The highest speeds were recorded on Bruckner Boulevard in both directions between East 138th Street and St. Anne's Place, which serves as a service roadway for the Bruckner Expressway.

TABLE 3.6-5
AVERAGE TRAVEL SPEEDS

Location	Speed (mph) by Time Period			
	AM	AM Off	PM Off	PM
Westbound on E. 135th St.				
Brown Pl. to Willis Ave.	17	17	14	12
Willis Ave. to Alexander Ave.	18	15	17	20
Alexander Ave. to Lincoln Ave.	15	21	17	17
Lincoln Ave. to Third Ave.	8	15	15	13
Third Ave. to Rider Ave.	24	26	25	27
Rider Ave. to Canal Pl.	17	16	19	20
Southbound on Third Ave.				
E. 138th St. to E. 137th St.	24	21	23	23
E. 137th St. to E. 136th St.	28	26	26	24
E. 136th St. to E. 135th St.	5	5	9	8
E. 135th St. to E. 134th St.	22	22	24	23
E. 134th St. to Bruckner Blvd.	14	17	16	16
Northbound On Alexander Ave.				
Dead End to Bruckner Blvd.	10	7	6	7
Bruckner Blvd to E. 134th St.	23	21	24	25
E. 134th St. to E. 135th St.	12	12	10	12
E. 135th St. to E. 138th St.	8	10	12	11
Southbound on Alexander Ave.				
E. 138th St. to E. 135th St.	15	16	16	13
E. 135th St. to E. 134th St.	27	28	35	26
E. 134th St. to Bruckner Blvd.	5	6	7	5
Bruckner Blvd to Dead End	35	33	33	29
Northbound on Lincoln Ave.				
E. 132nd St. to Bruckner Blvd	20	9	7	11
Bruckner Blvd. to E. 134th St.	20	25	17	19
E. 134th St. to E. 135th St.	19	27	24	14
E. 135th St. to E. 136th St.	16	15	11	14
E. 136th St. to E. 137th St.	34	26	28	24
E. 137th St. to E. 138th St.	16	20	16	18
Southbound on Lincoln Ave.				
E. 138th St. to E. 137th St.	37	35	38	34
E. 137th St. to E. 136th St.	17	19	18	18
E. 136th St. to E. 135th St.	7	10	12	8
E. 135th St. to E. 134th St.	33	36	35	33
E. 134th St. to Bruckner Blvd.	9	8	8	6
Bruckner Blvd. to E.132nd St.	26	21	25	24
Northbound on Willis Ave.				
First Ave (Man.) to E. 135th St.	20	18	20	18
E. 135th St. to E. 136th St.	18	13	10	16

TABLE 3.6-5
AVERAGE TRAVEL SPEEDS

Location	Speed (mph) by Time Period			
	AM	AM Off	PM Off	PM
E. 136th St. to E. 137th St.	23	20	11	9
E. 137th St. to E. 138th St.	17	7	12	9
Southbound on Willis Ave.				
E. 138th St. to E. 137th St.	24	24	30	20
E. 137th St. to E. 136th St.	27	32	31	31
E. 136th St. to E. 135th St.	3	3	3	2
E. 135th St. to Alexander Ave.	20	28	22	22
Eastbound on Bruckner Blvd.				
Third Ave. to Lincoln Ave.	11	12	10	12
Lincoln Ave. to Alexander Ave.	18	25	32	17
Alexander Ave. to Willis Ave.	21	17	19	17
Willis Ave. to Willis Ave. Ramp	6	5	5	5
Willis Ave. Ramp to Brown Pl.	6	5	5	4
Brown Pl. to Brook Ave.	21	21	17	14
Brook Ave. to St. Ann's Ave.	21	22	20	13
St. Ann's Ave. to St. Ann's Pl.	26	25	13	15
St. Ann's Pl. to E. 138th St.	45	42	43	32
Westbound on Bruckner Blvd.				
E. 138th St. to St. Ann's Pl.	46	48	53	52
St. Ann's Pl. to St. Ann's Ave.	16	16	14	16
St. Ann's Ave. to Brook Ave.	29	27	27	29
Brook Ave. to Brown Pl.	31	25	30	29
Brown Pl. to Willis Ave. Ramp	13	13	19	13
Willis Ave. Ramp to Willis Ave.	13	22	12	13
Willis Ave. to Alexander Ave.	10	17	14	16
Alexander Ave. to Lincoln Ave.	12	14	15	15
Lincoln Ave. to Third Ave.	5	4	5	6
Northbound on St. Ann's Ave.				
E. 132nd St. to Bruckner Blvd.	8	6	7	12
Bruckner Blvd. to E. 134th St.	24	17	19	18
E. 134th St. to E. 135th St.	30	28	33	15
E. 135th St. to E. 137th St.	10	13	9	13
E. 137th St. to E. 138th St.	11	7	6	5
Southbound on St. Ann's Ave.				
E. 138th St. to E. 137th St.	11	11	15	10
E. 137th St. to E. 135th St.	16	18	11	15
E. 135th St. to E. 134th St.	29	20	29	28
E. 134th St. to Bruckner Blvd.	6	4	5	6
Bruckner Blvd. to E.132nd St.	15	22	26	18

3.6.2 Rail Freight Traffic

Previous studies of a proposed rail link and an intermodal freight yard across the project site (NYSDOT, 1982) between the MTA's Hudson Division and the Oak Point Rail Yards, northeast of the site, identified that regional freight service to New York City and Long Island, not including car float service to the Brooklyn waterfront, is provided from Selkirk, NY to the Oak Point Yard. The routing of two conventional freight trains daily in each direction occurs over the Hudson Division, through Mott Haven Junction, across MTA's Harlem Division to Melrose Junction and MTA's Port Morris Branch to the Oak Point Yard. The heavy volume of commuter trains in the Mott Haven Junction area, severely limit freight service through this point with freight trains precluded from using the junction area during peak commuter periods.

Current rail freight access to the site is provided by connecting tracks from the Oak Point Yard. Rail freight service to the site is currently limited to Conrail crossing yard trackage to access the SPM Environmental facility located at the east side of the site at Locust Avenue and East 132nd Street. SPM Environmental ships containerized NYC sewage sludge via rail.

3.6.3 Public Transportation

The project site is served by both bus and subway transportation. ~~The Bx33 is an east-west route along East 138th Street north of the site that crosses the Madison Avenue Bridge and continues along West 135th Street in Harlem.~~ The Bx 17 runs along St. Anne's Avenue from the northern boundary of the project site to the north central Bronx at Fordham Plaza. The Bx 41 on Lincoln Avenue extends from Bruckner Boulevard to the Bronx-Westchester county line. The Bx 15 extends from Fordham Plaza along Willis and Third Avenues to and across 125th Street in Harlem. Each of these lines can serve as feeder routes from the project site to the IRT subway on East 138th Street. Table 3.6-6 provides the terminals and operating frequencies of these routes. Since the ~~Bx 33~~, Bx 17, and the Bx 41 terminate in

**TABLE 3.6-6
BUS ROUTES SERVING THE HARLEM RIVER YARD**

Route	Route of Operation	Destinations		Frequency of Operation*
		From	To	
Bx 15	Willis Ave./ Third Ave.	Fordham Plaza	Harlem/ 12th Ave.	9 min.
Bx 17	St. Ann's Ave./ E. 133rd St.	Fordham Plaza	Port Morris/ E. 132nd St.	8 min.
Bx 33	E. 138th St.	Port Morris/ E. 132nd St.	Harlem/ St. Nicholas Ave.	12 min.
Bx 41	Bruckner Blvd./ Lincoln Ave./ Alexander Ave.	Wakefield/ E. 241st St.	Mott Haven/ E. 133rd St.	5 min.

Note: * Approximate frequency of service during AM and PM Commuter Peaks.

**TABLE 3.6-7
BUS PASSENGER LOADINGS**

	Direction	Passengers	Trips	Dates	Time Period
BX-15					
Willis Av & 138th St	S/B	2,249	99	10/01, 10/07/91	18 Hours
3rd Av & 150th St	S/B	2,593	101	10/01, 10/07/91	18 Hours
Willis Av & 138th St	N/B	2,676	105	10/01, 10/07/91	18 Hours
3rd Av & Westchester Av	N/B	2,558	103	10/01, 10/07/91	18 Hours
BX-41					
Melrose Av & 150th St	S/B	1,484	195	10/08, 10/09/91	18 Hours
Bruckner Blvd & Lincoln Av	S/B	118	193	10/08, 10/09/91	18 Hours
Melrose Av & 149th St	N/B	2,962	176	10/08, 10/09/91	18 Hours
Bruckner Blvd & Lincoln Av	N/B	123	170	10/08, 10/09/91	18 Hours
BX-17					
183rd St & Crotona Av	S/B	336	9	11/03/88	16-17
	N/B	351	8	11/03/88	07-08
BX-33					
138th St. & St. Ann's Ave.	W/B	648	86	5/08,5/13/91	18 Hours
	E/B	570	88	5/08,5/13/91	18 Hours
138th St. & Third Ave.	W/B	1010	86	5/08,5/13/91	18 Hours
138th St. & Lincoln Ave.	E/B	922	88	5/08,5/13/91	18 Hours

Source: NYCTA - Operations Planning/System Data and Traffic

the immediate vicinity of the site, available reserve passenger capacity is substantial on these routes (passenger loadings are provided in Table 3.6-7).

The IRT No. 6 - Lexington Avenue Local - Pelham Bay line which runs along East 138th Street provides the nearest subway service to the site from the Bronx and Manhattan. The No. 6 line operates as a local train in Manhattan and a peak direction express and local in the Bronx. The nearest subway stations to the project site are on East 138th Street at Third Avenue, Brook Avenue and Cypress Avenue. Passenger loadings for the No. 6 train are provided in Table 3.6-8.

Figure 3.6-9 presents the bus and rail routes which serve the study area.

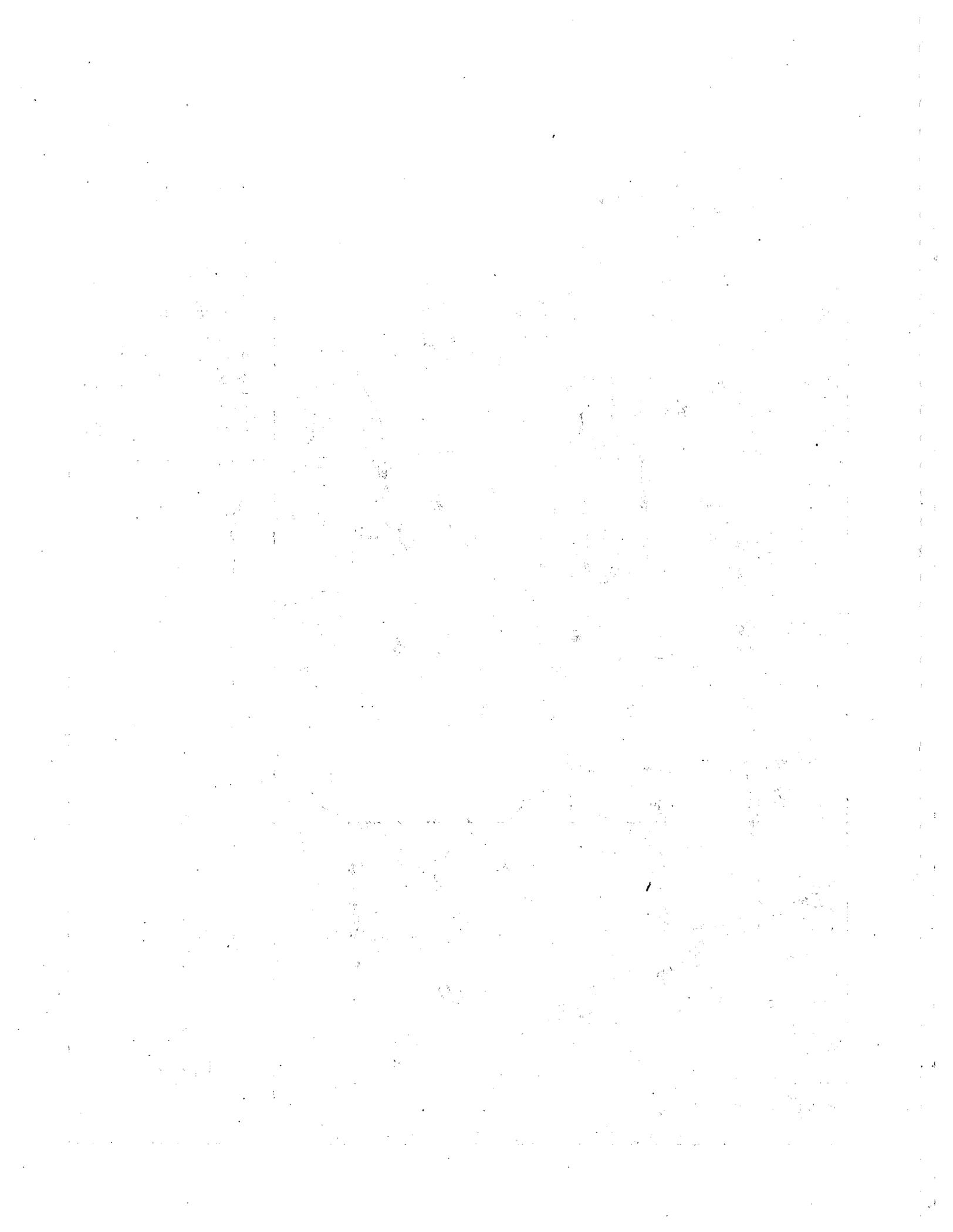
3.6.4 Pedestrian Activity

General observations of pedestrian activity within the study area were made during the four time periods studied. It was noted that pedestrian activity is very light, especially south of East 135th Street. Most of the activity occurred around the housing developments north of the project site.

TABLE 3.6-8
PASSENGER LOADINGS NO. 6 TRAIN

Station	Average Weekday	Annual Registrations
138th Street - 3rd Avenue	3,799	1,151,276
Brook Avenue	3,343	1,060,951
Cypress Avenue	1,609	456,172
East 143rd Street	452	117,376
East 149th Street	1,370	455,239
Longwood Avenue	1,634	492,335
Hunts Point Avenue	6,120	1,735,480

Source: NYCTA - Operations Planning/System Data and Traffic



3.7 Air Quality

3.7.1 Regulations

Criteria pollutants are those pollutants for which ambient air quality standards have been set by the U.S. Environmental Protection Agency (USEPA) under the requirements of the Clean Air Act. These include carbon monoxide (CO), ozone (O_3), nitrogen dioxide (NO_2), particulate matter (PM 10), sulfur dioxide (SO_2) and lead (Pb). Federal standards for these pollutants, known as the National Ambient Air Quality Standards (NAAQS) are shown in Table 3.7-1, together with the New York State standards.

Federal standards are defined at primary and secondary levels. The primary standards are intended to protect the public health. The secondary standards are intended to protect the nation's welfare and account for air pollutant effects on soil, water, visibility, materials, vegetation and other aspects of the general welfare.

The project area is located in New York City which is presently designated as a nonattainment area (i.e., not meeting the NAAQS) for carbon monoxide and ozone. The New York City area was designated as unclassified for the primary PM 10 standard, SO_2 , and NO_2 .

The primary pollutant emissions from automobiles are CO, NO_2 and hydrocarbon (HC). Lead emissions from automobiles are not significant and have declined in recent years through the increased use of unleaded gasoline. Potential emissions of particulates and sulfur dioxides from indirect (mobile) sources such as automobiles are insignificant in comparison with direct (non-mobile) emission sources. Therefore, only the potential impact of vehicle-related emissions of CO, NO_2 , and HC pollutants are considered with respect to indirect sources.

TABLE 3.7-1

FEDERAL AND NEW YORK STATE AMBIENT AIR QUALITY STANDARDS⁽¹⁾

Pollutant	Averaging Period	New York State Standards	Federal Standards	
			Primary	Secondary
Carbon Monoxide	8-hour 1-hour	9 ppm 35 ppm	10 mg/m ³ 40 mg/m ³	10 mg/m ³ 40 mg/m ³
Ozone	1-hour	0.08 ppm ⁽²⁾	235 ug/m ³	235 ug/m ³
Nitrogen Dioxide	1-year	0.05 ppm	100 ug/m ³	100 ug/m ³
Lead	3-month	(3)	1.5 ug/m ³	1.5 ug/m ³
PM10	1-year 24-hour	(3) (3)	50 ug/m ³ 150 ug/m ³	50 ug/m ³ 150 ug/m ³
Sulfur Dioxide	1-year 24-hour 3-hour	0.03 ppm 0.14 ppm 0.50 ppm	80 ug/m ³ 365 ug/m ³	1300 ug/m ³

NOTES:

- All maximum values are standards not to be exceeded more than once a year, except the ozone standard which is not to be exceeded more than one day per year.

ppm = parts per million
ug/m³ = micrograms per cubic meter
mg/m³ = milligrams per cubic meter
- Existing NYS Standard for ozone of 0.08 ppm not yet officially revised via regulatory process to coincide with the federal standard of 0.12 ppm which is currently being applied to determine compliance status.
- Federal standard for PM10 and lead not yet officially adopted by New York State, but is currently being applied to determine compliance status.
- New York State also has standards for beryllium, fluorides, hydrogen sulfide, settleable particulates (dustfall) and total suspended particulates.

Carbon monoxide, the predominant pollutant emitted by motor vehicles, is a site-specific pollutant, with major concentrations generally found immediately adjacent to roadways. As a result, it is usually of concern on a local or microscale basis. Therefore, air quality impacts are typically evaluated through a microscale analysis of traffic-related CO levels.

Hydrocarbons and nitrogen oxides (NO_x) react in the presence of sunlight to form a photochemical smog, of which the major constituent is ozone. Thus, HC and NO_x are reactive contaminants whose impact generally occurs well beyond the areas immediately adjacent to a roadway. This reaction is time dependent and usually takes place far downwind from the site where the contaminants were originally emitted. The formation of secondary pollutants is related to the ambient temperature, the amount of incoming ultraviolet radiation, the relative concentrations of each primary pollutant at a particular moment, and the time required for the reaction to occur. Because of the complex chemistry and transport, no models are available which can accurately predict ozone on a microscale level. As a result, NO_x and HC are not site specific as is CO, and should be analyzed on a regional or mesoscale basis for mobile sources of air pollution.

Sulfur dioxide, PM 10, NO_2 are the principal pollutants normally of concern from fuel combustion stationary (direct) sources such as boilers. The emissions from these sources are primarily the result of fuel burning for space heating and hot water. In some instances, however, other pollutants may also be of concern.

3.7.2 Mobile Sources

Carbon monoxide is a site-specific pollutant, with its major concentrations generally found immediately adjacent to roadways. As a result, it is usually of concern on a local or microscale basis. Therefore, the study of air quality impacts as a result of project-generated traffic is typically evaluated through a microscale analysis of traffic-related CO levels.

Local CO concentrations are estimated through the use of computerized mathematical models, since data on street level CO concentrations in urban areas is not at a level of detail relevant for most projects. Using the models, worst case CO levels are calculated for the peak one-hour and eight-hour time periods, corresponding to the averaging periods of the state and federal ambient CO standards.

Generally, the CO concentrations which occur at any one site result from a contribution of several emission sources. Ambient CO concentrations consist of two components: the local source contribution (i.e., vehicles on the roadway(s) next to the analysis site) and background. The CO levels due to local roadway source contribution are dependent on traffic and operating conditions (e.g., volumes, speeds). The background CO concentration is a function of land use, land use density, and transportation related activity in the general community, as opposed to the specific localized sources.

For New York City, the New York City Department of Environmental Protection (NYCDEP) periodically provides estimates of background CO levels for use in air quality analyses. Based on revised emissions model, the NYCDEP has calculated the 1992 second highest one-hour and eight-hour values to be 7.8 and 3.3 ppm, respectively. The second highest CO levels are utilized because the federal and New York State standards for CO can be exceeded only once per year; therefore, the potential worst case project impact must not result in a second violation.

The CO contribution from local traffic is determined in two steps. First, emissions from vehicle exhausts are calculated. These numbers and assumptions about meteorology are then used to calculate the concentrations of CO in the air. Conservative assumptions are made with respect to model inputs so that worst case CO levels can be calculated. Emissions were calculated using the USEPA's MOBILE4.1 computer emissions model.

Carbon monoxide concentrations due to vehicles were then calculated by using the USEPA's CAL3QHC computer dispersion model. The concentrations determined by using this model

are a function of such input parameters as wind speed, wind direction, and atmosphere stability class. The CAL3QHC model was used with the inputs described in Appendix C.

Several receptor sites were identified where CO concentration impacts were estimated. They were selected based on consideration of where the maximum changes in traffic patterns would occur and where residential properties now exist or will as part of project development. The receptor locations are shown in Figure 3.7-1 and results of the computer modeling are presented in Table 3.7-2 (concentrations shown are for the AM peak period, which were higher than the PM period). Based on this effort, no current violations of the one-hour CO standard is predicted. However, violations of the eight-hour standard are predicted to currently occur at all locations.

TABLE 3.7-2

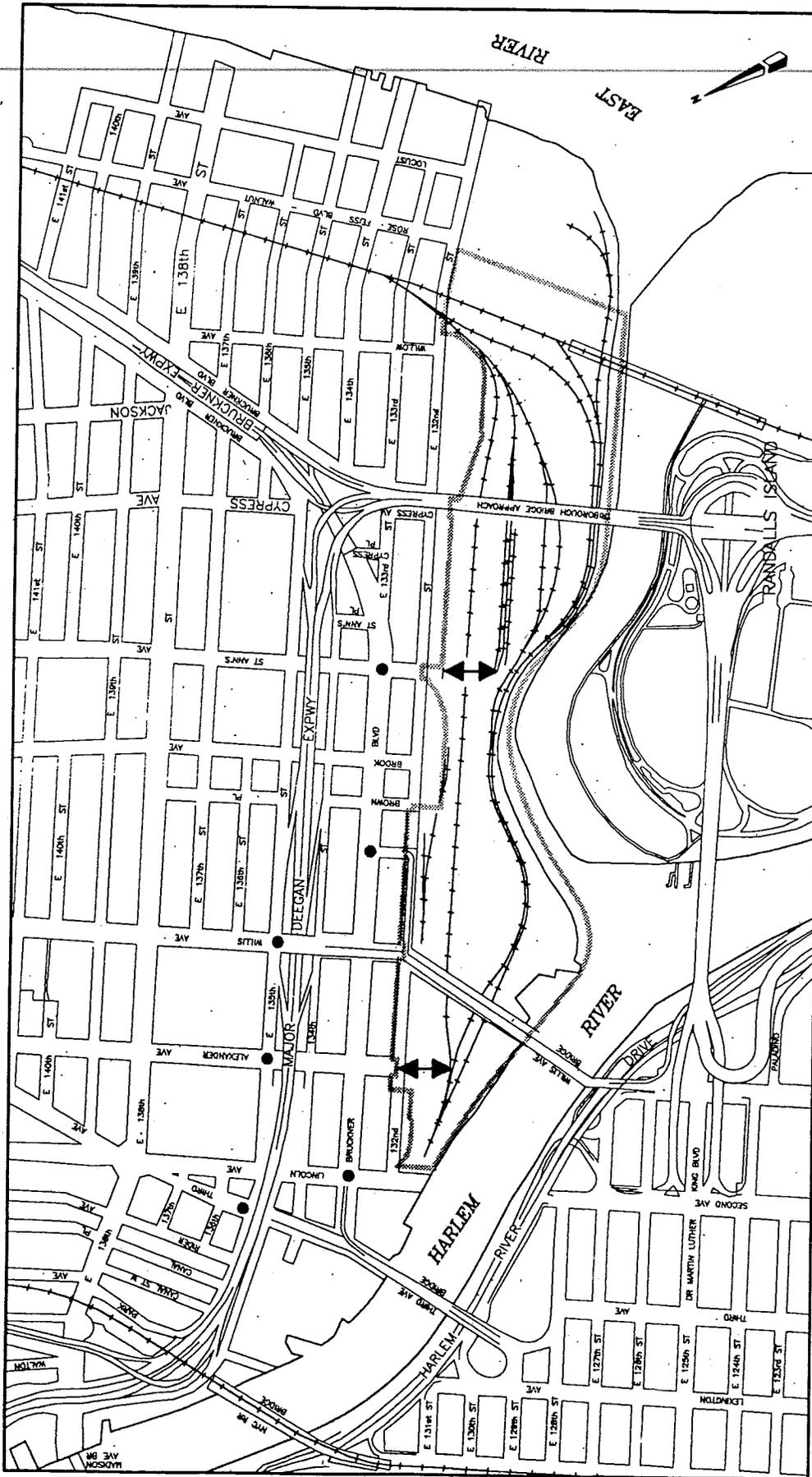
EXISTING CARBON MONOXIDE LEVELS

Receptor	One Hour (ppm)	Eight Hour (ppm)
1. Third Ave./E 135th St.	26.2	16.5
2. Alexander Ave./E 135th St.	21.3	13.1
3. Willis Ave./E 135th St.	19.9	12.1
4. Lincoln Ave./Bruckner Blvd.	19.5	11.8
5. Willis Ave Bridge Exit/Bruckner Blvd.	18.7	11.3
6. St. Ann's Ave. /Bruckner Blvd.	16.8	10.0

Note: CO levels include 1992 background concentrations of 7.3 ppm (one-hour) and 3.3 ppm (eight-hour).

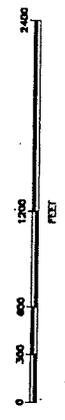
3.7.3 Stationary Sources

In the project area, there are five existing warehouses. The emissions from these warehouses are primarily from space heating of the office areas and are not significant.



Legend

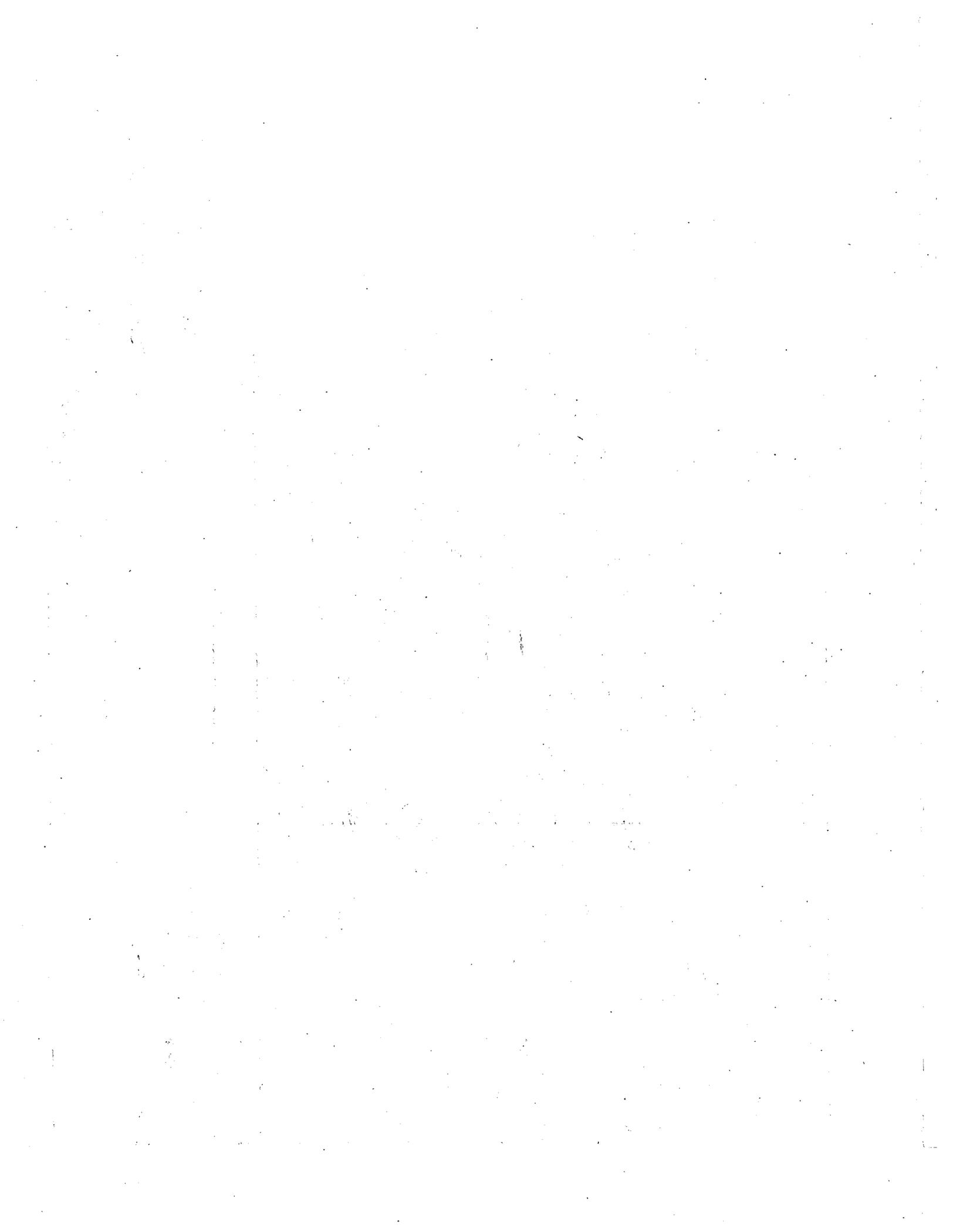
- Property Boundary
- ↔ Site Entrance
- Receptor Location



HARLEM RIVER YARD VENTURES INC.
 INTERMODAL TRANSPORTATION AND
 DISTRIBUTION CENTER
 AIR QUALITY RECEPTORS.

DATE: SEPT 30, 1992

TAMS CONSULTANTS, Inc. Figure 3.7-1



3.8.1 Noise Fundamentals and Methodology

Noise pollution in an urban environment comes from numerous sources. Some are activities essential to the health, safety, and welfare of the city's inhabitants such as noise from emergency vehicle sirens, from garbage collection operations, and from construction and maintenance equipment. Other sources, such as traffic, stem from the movement of people and goods, activities that are essential to the viability of the city as a place to live and do business.

Ways to Measure Noise

A number of factors affect sound as it is perceived by the human ear. These include the actual level of the sound (or noise), the frequencies involved, the period of exposure to the noise, and changes or fluctuations in the noise levels during exposure. Levels of noise are measured in units called decibels. Since the human ear cannot perceive all pitches or frequencies equally well, these measures are adjusted or weighted to compensate for the human lack of sensitivity to low pitched and high pitched sounds. This adjusted unit is known as the A-weighted decibel, or dBA. The A-weighted network de-emphasizes both very low and very high pitched sound, so the measured levels correlate well with the human perception of loudness.

Human response to changes in noise levels depends on a number of factors, including the quality of the sound, the magnitude of the changes, the time of day at which the changes take place, whether the noise is continuous or intermittent, and the individual's ability to perceive the changes. Human ability to perceive changes in noise levels varies widely with the individual, as does response to the perceived changes. Generally, changes in noise levels

less than 3 dBA will barely be perceptible to most listeners, whereas, a 10 dBA change normally is perceived as a doubling (or halving) of noise levels. These guidelines permit direct estimation of an individual's probable perception of changes in noise levels.

Since dBA describes a noise level at just one moment, and very few noises are constant, other ways of describing noise over extended periods are needed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific time period, as if it had been a steady, unchanging sound. For this condition, a descriptor called the equivalent sound level, L_{eq} , can be computed. L_{eq} is the constant sound level that, in a given situation and time period (e.g., one-hour $L_{eq}[1]$, or 24-hour $L_{eq}[24]$), conveys the same sound energy as the actual time-varying sound. Statistical sound level descriptors such as L_1 , L_5 , L_{10} , L_{50} , L_{90} , and L_x are also sometimes used to indicate noise levels which are exceeded 1, 5, 10, 50, 90, and x percent of the time, respectively.

Alternatively, it is often useful to account for the difference in response of people in residential areas to noises that occur during sleeping hours as compared to waking hours. A descriptor, the day-night noise level (L_{dn}), defined as the A-weighted average sound level in decibels during a 24-hour period with a 10 dB weighting applied to nighttime sound levels, is a widely used indicator for such evaluations. L_{dn} has been proposed by the USEPA and other organizations as one of the most appropriate criteria for estimating the degree of nuisance or annoyance that increased noise levels would cause in residential neighborhoods.

The maximum one-hour equivalent sound level ($L_{eq}[1]$), the 24-hour equivalent sound level ($L_{eq}[24]$), and the day-night noise level (L_{dn}) have been selected as the noise descriptors to be used in the noise impact analysis of this project. Minimum one-hour equivalent sound levels were used to provide an indication of highest expected sound levels.

3.8.2 Noise Standards and Criteria

Noise levels associated with operation of the project are subject to the noise standards of the New York City Noise Control Code, the NYC Zoning Resolution Performance Standards, and (for the waste management facility only) NYSDEC Part 360, Solid Waste Management Facilities Guidelines. These criteria are used as a means of comparison. Other standards and guidelines promulgated by city and federal agencies do not specifically apply to this project, but are useful to review in that they provide measures of impact.

23CFR772

The Code of Federal Regulations (23CFR772) contains FHWA noise regulations that require that a noise analysis be conducted for all highway projects. The standards contain noise abatement criteria considered by FHWA to be the acceptable limits for noise levels for exterior land uses and outdoor activities and for certain interior uses (Table 3.8-1).

The FHWA Noise Abatement Criteria lists developed land use types as Categories A, B, C, or E. In this study, Category B, which includes residences, schools and churches, represents most of the receptors that lie in close proximity to the project.

Future noise levels are predicted to determine if there is an impact with respect to the noise abatement criteria. If the criteria is equalled or exceeded, or if there is a substantial increase above the existing noise level, abatement measures will be considered.

TABLE 3.8-1
NOISE ABATEMENT CRITERIA

Activity Category	$L_{eq}(h)$	$L_{10}(h)$	Description of Activity Category
A	57 (exterior)	60 (exterior)	Land for which serenity and quiet are of extraordinary significance and serve an important public need and where the preservation of those qualities is essential if the area is to continue to serve its intended purpose.
B	67 (exterior)	70 (exterior)	Picnic areas, recreation areas, playgrounds, active sports areas, parks, residences, motels, hotels, schools, churches, libraries, and hospitals.
C	72 (exterior)	75 (exterior)	Developed lands, properties or activities not included in Categories A or B above.
D	---	---	Undeveloped lands.
E	52 (interior)	55 (interior)	Residences, motels, hotels, public meeting rooms, schools, churches, libraries, hospitals and auditoriums.

Note: Either $L_{10}(h)$ or $L_{eq}(h)$ (but not both) may be used on a project.

TABLE 3.8-2
PART 360 SITE ACCEPTABILITY STANDARDS

Character of Community	Time Period	
	7AM to 10PM	10PM to 7AM
Rural	57 dBA	47 dBA
Suburban	62 dBA	52 dBA
Urban	67 dBA	57 dBA

Note: If the sound level excluding any contributions from the background sound level exceeds these limits, the operation of the facility must not cause the L_{eq} sound level to exceed the background ambient.

This regulation states that noise levels at the facility must be controlled to prevent sound levels beyond the property line at locations zoned or otherwise authorized for residential purposes from exceeding the hourly L_{eq} values presented in Table 3.8-2. If the background noise levels exceed these limits, the operation of the facility must not exceed the ambient noise levels.

New York CEPO-CEOR Noise Standards

The New York City Department of Environmental Protection, Bureau of Noise Abatement has set external noise exposure guidelines. These guidelines for non-airport environs are shown on Table 3.8-3. Noise exposure is classified into four categories: acceptable, marginally acceptable, marginally unacceptable and clearly unacceptable. The standards shown in Table 3.8-3 are based on maintaining a cumulative interior noise level of:

- L_5 less than or equal to 45 dBA during nighttime hours (between 11 PM to 7 AM) and 55 dBA during daytime hours (between 7 AM and 11 PM), and;
- worst case hour L_{10} less than or equal to 45 dBA for nighttime hours and 55 dBA for daytime hours.

New York City Noise Code

The New York City Noise Control Code contains sound level standards for certain types of motor vehicles, air compressors, and paving breakers; requires that all exhausts be muffled; and prohibits all unnecessary noise adjacent to schools, hospitals, or courts. The code further limits construction activities to weekdays between 7 AM and 6 PM. However, a variance may be granted to permit work other than on weekdays from 7AM to 6PM under urgent necessity and in the interest of public safety.

TABLE 3.8-3

NOISE EXPOSURE STANDARDS FOR CEQR REVIEW

Noise Receptor Classification	General External Exposure (dBA)			
	Acceptable	Marginally Acceptable	Marginally Unacceptable	Clearly Unacceptable
1. Outdoor areas requiring serenity and quiet	$L_5 \leq 55$ $L_{10} \leq 55$			
2. Hospitals and nursing homes	$L_5 \leq 55$ $L_{10} \leq 55$	$55 < L_5 \leq 65$ $55 < L_{10} \leq 65$	$65 < L_5 \leq 80$ $65 < L_{10} \leq 80$	$L_5 > 80$ $L_{10} > 80$
3. Residential including residential hotels and motels	$L_5 \leq 65$ $L_{10} \leq 65$	$65 < L_5 \leq 70$ $65 < L_{10} \leq 70$	$70 < L_5 \leq 80$ $70 < L_{10} \leq 80$	$L_5 > 80$ $L_{10} > 80$
4. Schools, museums, libraries, courts, houses of worship, transient hotels and motels, public meeting rooms, auditoriums, and out-patient public health facilities	<----- same as residential day -----> (7am to 11pm)			
5. Commercial offices	<----- same as residential day -----> (7am to 11pm)			
6. Industrial, public areas only	$L_5 \leq 70$ $L_{10} \leq 70$	$70 < L_5 \leq 80$ $70 < L_{10} \leq 80$		$L_5 > 80$ $L_{10} > 80$

Notes:

1. All L_{10} standards refer to the worst hour.
2. The applicable time period for noise receptor classifications 1, 4, 5, and 6 is cumulative for the hours of use; for classifications 2 and 3 the periods are 7 am to 11 pm and 11 pm to 7 am.

In 1979, Section 1403.3-6.01 of the code was re-enacted as Local Law No. 64. This new law established ambient noise quality criteria and standards based on existing land use zoning designations. Table 3.8-4 summarizes the ambient noise quality criteria established under Local Law No. 64. Conformance with the noise level values contained in the law is determined by considering noise emitted directly from stationary activities within the boundaries of a project. Construction activities are not included within the provisions of this law.

Performance Standards for Manufacturing Districts

New York City's Zoning Resolution imposes performance standards for uses in manufacturing districts. Noise levels from any activity, whether open or enclosed, cannot exceed certain prescribed sound pressure levels (db) on or beyond the lot line. Operations of motor vehicles or transportation facilities are not included in the performance standards. The standards are shown on Table 3.8-5.

3.8.3 Noise Monitoring

A noise measurement survey was conducted in the primary study area. Eleven measurement locations were selected to provide an indication of the existing noise levels (Figure 3.8-1). A sampling measurement program was conducted at Sites 1 through 9 for five time periods (October 20 through October 22, 1992 and November 10 through November 25, 1992); a similar program was undertaken at Site 11 on January 7, 1993. A 24-hour measurement program was conducted at Site 10 (November 23 and 25, 1992). Measurements were taken five feet from the existing building walls of the receptor locations except where there were empty lots and the microphone was located on the property line. Microphone height for all receptors was eight feet above ground. In addition to noise sources described there were constant jet flyovers, landing and takeoffs, during the sampling period. These sources were edited out during the monitoring program.

TABLE 3.8-4

CITY OF NEW YORK AMBIENT NOISE QUALITY CRITERIA (dBA)

Ambient Noise Standards Quality Zone	Daytime Standards (L_{eq}) 7AM to 10PM	Nighttime Standards (L_{eq}) 10PM to 7AM
Low Density Residential Land Use	60	50
High Density Residential Land Use	65	55
Commercial & Manufacturing Land Use	70	70

Source: City of New York Local Law No. 64, 1979.

TABLE 3.8-5

MAXIMUM PERMISSIBLE OCTAVE BAND SOUND LEVEL FOR A MANUFACTURING DISTRICT ADJOINING A RESIDENTIAL DISTRICT

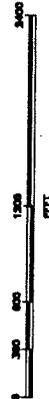
Center Frequency Octave Band (Hertz)	Sound Pressure Level (dB)		
	M1	M2	M3
31.5	74	74	75
63	70	71	71
125	63	65	67
250	57	60	62
500	51	54	56
1000	44	48	50
2000	38	44	46
4000	35	40	42
8000	32	37	39
A-Scale	54	57	59



Legend

— Property Boundary

● Receptor Location and Number



HARLEM RIVER YARD VENTURES INC.
 INTERMODAL TRANSPORTATION AND
 DISTRIBUTION CENTER
 NOISE RECEPTORS

DATE: JAN 6, 1993

TAMS CONSULTANTS, Inc. Figure 3.8-1



- Site 1: Sitting area on ball field on Randall's Island. Background noise levels include traffic noise from the Triboro Bridge and aircraft traffic at La Guardia Airport.
- Site 2: Pulaski Park, seating area adjacent to off ramp from the Willis Avenue Bridge. Noise source is from traffic on the off-ramp and on Bruckner Blvd.
- Site 3: Residential block between Cypress and Willow Avenues. The microphone was located in front of 705 East 133rd Street.
- Site 4: Microphone was located in front of residential building at 128 Alexander Avenue. This is located between Bruckner Blvd and 134th Street on the east side of Alexander Avenue. Noise source is from Bruckner Boulevard and the elevated Major Deegan.
- Site 5: Microphone was located in front of 147 Lincoln Avenue a residential building. This receptor is located between the Major Deegan and East 134th Street on the west side of Lincoln Avenue. The major noise source is from the elevated Major Deegan.
- Site 6: This block is a commercial retail strip on street level with residential on the three floors above the commercial. The microphone was located in front of 65 Bruckner Blvd between Alexander and Willis Avenues. Noise source is from traffic on Bruckner Blvd.
- Site 7: Residential buildings on East 135th Street that front the elevated Major Deegan between St. Ann's and Brook Avenue. The microphone was located in a sitting area between the two corner buildings. The major noise source is from the Major Deegan.
- Site 8: School on East 135th Street that fronts the Major Deegan, which is in a cut but still has a line of site with the school. The receptor is located between Brown Place and Willis Avenue.
- Site 9: School and playground on East 135th Street between Alexander and Willis Avenue. Microphone was located in the playground at the property line. The major Deegan is at grade and the major noise source is from the highway and from traffic exiting the highway on East 135th Street.
- Site 10: A residential building on St. Ann's Avenue between Bruckner Blvd and East 132nd Street. The major noise source is from background traffic from Bruckner Blvd. The microphone was located in a side lot of the corner residential building at Bruckner and St. Ann's Avenue.

Site 11: Former Willis Avenue Station, now partially a residence. The microphone was placed on the south side of the building overlooking the proposed site of the intermodal facilities.

The field monitoring program was conducted using the following equipment:

- Bruel & Kjaer Type 2231 Precision Sound Level Meter
- Bruel & Kjaer Type 2218 Graphic Printer
- Bruel & Kjaer Type 4230 Sound Level Calibrator
- Bruel & Kjaer Type 4133 1/2 inch microphone
- Bruel & Kjaer Type 2614 microphone preamplifier

Measurements at each sampling location were made on the A-scale (dBA) for a sampling period of 30 minutes. Twenty-four hour measurements ran continuously. A wind screen was used to minimize wind noise across the face of the microphone. The data were digitally recorded by the noise analyzer and displayed at the end of the measurement period in units of dBA L_{eq} , L_1 , L_5 , L_{10} , L_{50} , and L_{90} .

3.8.4 Existing Noise Levels

The one-hour equivalent noise levels ($L_{eq}[1]$), measured at Sites 1 through 9 and 11 are presented in Table 3.8-6. The 24-hour monitoring results for Site 10 are shown in Table 3.8-7. At all measurement locations, the predominant source of noise was from vehicular traffic.

All of the measured noise levels exceed the acceptable NYC CEPO - CEQR noise standard classification levels. Site 1 is in the marginally acceptable range and the remaining nine sites are in the marginally unacceptable range (Table 3.8-8). However, the high noise levels are common on commercial blocks in New York City, and these existing measurements reflect the level of activity and vehicular traffic present.

TABLE 3.8-6

EXISTING SOUND LEVELS - SITES 1 THROUGH 9, 11

Time Period	One-Hour L_{eq} in dBA									
	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6	Site 7	Site 8	Site 9	Site 11
AM Peak (7 - 9 am)	62	66	65	66	70	73	66	76	75	58
Midday (10am - 2pm)	64	67	66	67	68	71	68	75	76	59
PM Peak (5 - 7 pm)	65	69	67	69	69	73	69	77	77	55
Pre-Midnight (9pm-12 am)	60	66	62	63	65	69	66	72	72	54
Post Midnight (12-2 am)	59	64	60	62	63	66	65	68	69	61
$L_{eq}[24]$	63	67	64	66	67	71	68	74	74	59
L_{dn}	67	73	69	71	72	76	74	78	79	66

TABLE 3.8-7

EXISTING SOUND LEVELS - SITE 10

Time Period	One-Hour L_{eq} in dBA
	Site 5
AM	
12-1	64
1-2	63
2-3	62
3-4	61
4-5	64
5-6	66
6-7	66
7-8	67
8-9	67
9-10	67
10-11	66
11-12	67
PM	
12-1	67
1-2	68
2-3	68
3-4	67
4-5	69
5-6	69
6-7	68
7-8	69
8-9	67
9-10	66
10-11	65
11-12	65
$L_{eq}[24]$	67
L_{dn}	71

TABLE 3.8-8
COMPARISON OF EXISTING NOISE LEVELS
WITH CEPO STANDARDS

Site	L _e (dBA)	L ₁₀ (dBA)	Time Period	CEPO Standards
1	67	66	PM Peak	Marginally Acceptable
2	72	72	PM Peak	Marginally Unacceptable
3	70	69	PM Peak	Marginally Unacceptable
4	69	71	PM Peak	Marginally Unacceptable
5	72	72	AM Peak	Marginally Unacceptable
6	76	76	AM Peak	Marginally Unacceptable
7	72	71	PM Peak	Marginally Unacceptable
8	79	79	PM Peak	Marginally Unacceptable
9	80	79	PM Peak	Marginally Unacceptable
10	71	71	PM Peak	Marginally Unacceptable
11	61	63	AM Peak	Acceptable

Octave band sound pressure levels were not monitored since there were no existing identifiable manufacturing uses that generated noise levels that would adversely affect any existing or proposed residential units.

The NYSDEC Part 360 regulations specify noise levels at residential uses which are at a waste management facility property line. The existing noise levels at Site 11 (which would be representative of noise levels at the site boundary of the transfer station) meet the daytime values but exceed the nighttime values in the regulations. However, there are no residential uses which bound the transfer station site.

The FHWA Criteria for residential land use is 67 dBA. Existing noise levels exceed the FHWA criteria at sites 2 through 10. Site 1, the park on Randalls Island, and Site 11 (old Willis Avenue Station) are not subject to adjacent local street traffic noise. The only noise present is background traffic from the Triborough Bridge.

The NYC Daytime Noise Quality Criteria Standard of 65 dBA for high density residential land use is exceeded at sites 2 through 10 for at least one hour each day. The nighttime criteria of 55 dBA for high density residential land use is exceeded at all sites except Site 11 during the 1-2 AM period when the existing noise level is 54 dBA.

These measured existing levels at all receptors except Site 1 and 11, reflect very high existing noise levels, which is very typical for urban areas. At all sites, except Site 1, these measurements exceed the local and federal criteria that were selected as a measure of impact.

3.9 Infrastructure

3.9.1 Water Supply

New York City obtains its potable water supply from the Croton, Catskill and Delaware systems. These systems provide the 1.5 billion gallons of water used each day. Potable water for the Harlem River Yard is provided by the Delaware-Catskill reservoir system. Gravity head and regulating valves are predominantly responsible for maintenance of flow throughout the system at about 35 to 60 pounds per square inch (psi) of pressure.

No pumping stations exist on-site. The site is served by water mains that run along East 132nd Street north of the site. Existing service to the site enters at Lincoln Avenue (24" main), St. Ann's Avenue (4" main), and Willis Avenue (24" main) (Figure 3.9-1).

3.9.2 Wastewater

Sanitary Waste Treatment

Sanitary sewage generated in the south and western Bronx and the east side of Manhattan is conveyed to the Wards Island Water Pollution Control Plant (WPCP) by means of a combined storm and sanitary sewer system. The plant, located on Wards Island in the East River, was built in 1937 and is the oldest sewage treatment plant in the City. Sanitary sewage undergoes primary and secondary treatment at the plant.

The Wards Island WPCP treated an annual dry weather average of 258 million gallons of sewage during the period August 1992 to July 1993. Effluent from the plant is discharged into the East River and is regulated by the NYSDEC under the State Pollution Discharge Elimination System (SPDES) (discharge permit No. 26131, dated September 30, 1988, modified July 29, 1991, and valid until September 29, 1993). Parameters regulated under the SPDES permit include the amount of dry weather sewage flow, the percent removal of

biological oxygen demand (BOD) and total suspended solids (TSS), mass loadings of BOD and TSS (i.e., the organic strength of the discharged effluent), and fecal coliform counts.

The SPDES permit sets an average dry weather monthly flow limit of 250 million gallons per day (mgd). Table 3.9-1 shows the monthly flows over the past year and the plant's annual average monthly dry weather flow during that period.

TABLE 3.9-1

WARDS ISLAND WPCP MONTHLY FLOWS

Month	Flow (mgd)	Month	Flow (mgd)
August 1992	259	February	256
September	271	March	265
October	251	April	254
November	252	May	240
December	252	June	262
January 1993	252	July	273

Source: NYCDEP, September 1993.

Average monthly dry weather flows to the plant caused a contravention of its permitted discharge limits by 8 mgd over the 12-month period ending in July 1993. During this 12-month interval the WPCP exceeded its SPDES flow limits during 11 of the 12 months.

In order to address the plant's consistent exceedance of the SPDES requirements, the NYCDEP entered into an Order on Consent with the NYSDEC in January 1989. The agreement mandated a variety of steps to reduce flows to the plant so that its annual running average would not exceed the plant's permitted dry weather flow limit. The steps carried out by the NYCDEP included installation of calibrated influent flow meters, acceleration of water meter installations, installation of locking caps on drainage basin, completion of door-to-door surveys along sewer lines where flow was found to be higher than expected, removal of Central and Van Cortlandt parks overflows from the combined sewer system, and institution of a public information program.

Storm and Sanitary Sewers

In the Harlem Yard vicinity existing storm sewer lines include two lines at Cypress Avenue (26" x 36", and 24"), two lines at St. Ann's Avenue (12"), and several smaller lines at the west end of the site (Figure 3.9-2). Existing storm culverts averaging 18" in diameter occur along the Harlem Yard shoreline.

Sanitary sewers in the site vicinity are comprised of a 50" x 62" line at Lincoln Avenue and a 10'-6" diameter line east of St. Ann's Avenue. A 12' x 9.8' combined sanitary/storm sewer line crosses the site at Brook Avenue; another similar line crosses at Lincoln Avenue.

3.9.3 Sanitation/Solid Waste

The approximately 14,000 tons of residential waste generated each day in New York City is collected by the Department of Sanitation. Commercial and industrial waste generated (approximately 12,000 tons per day) is collected by private carters. Most residential waste is disposed of at the Fresh Kills Landfill; the rest is managed locally at three incinerators and one other landfill. Commercial/industrial waste is exported out of New York City to predominantly out-of-state disposal sites.

Commercial waste generated by on-site facilities at the Harlem River Yard is handled by private carters. In addition, as required by New York City law, businesses must have arrangements for their recyclables to be collected for recycling, including paper, glass, metals and plastic.

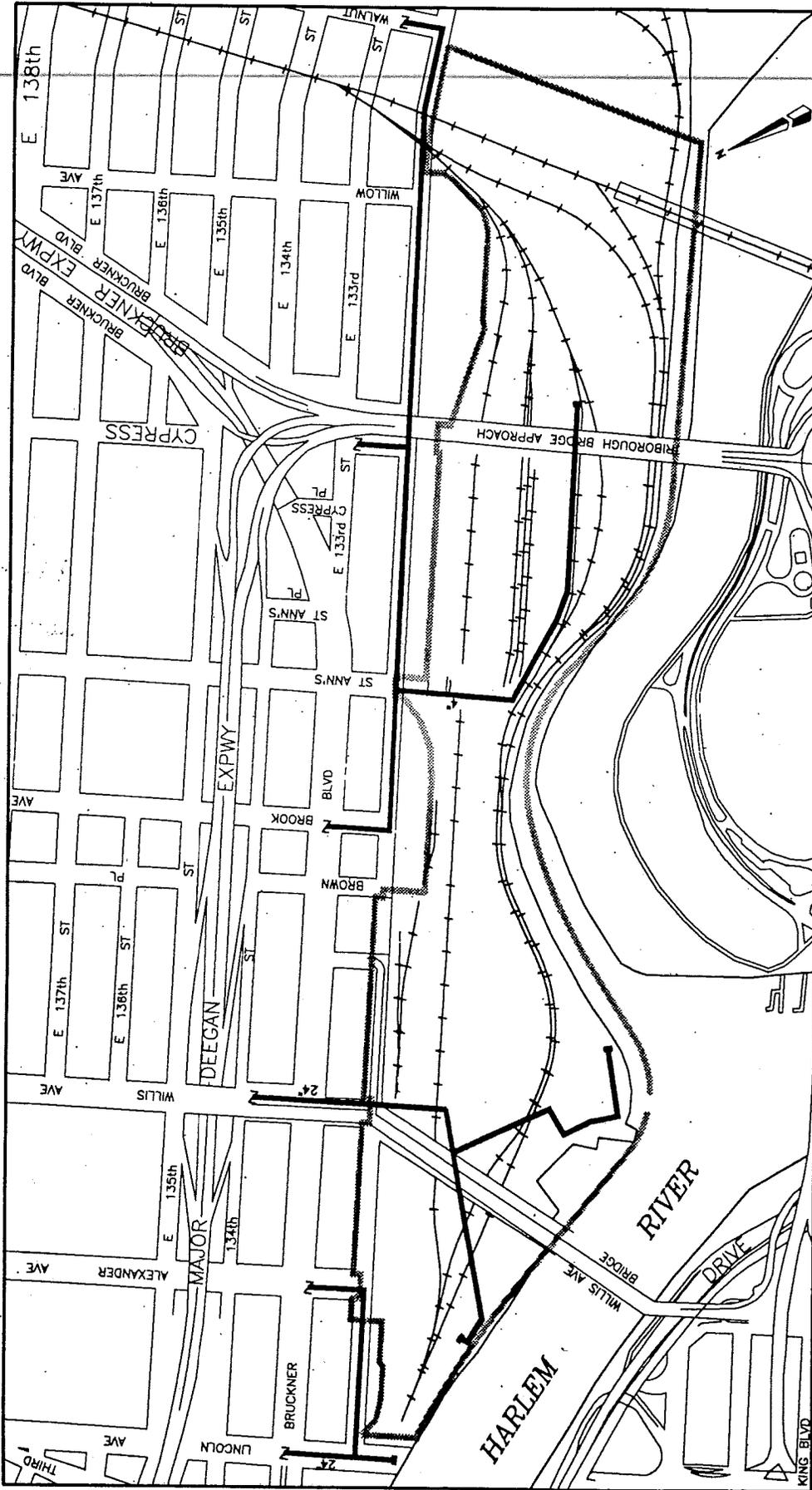
3.9.4 Energy

Electricity and gas service to the Harlem River Yard is provided by Con Edison. Existing electrical service on-site is provided from East 132nd Street and enters the site at Lincoln, Alexander and Willis Avenues.

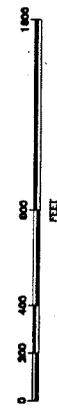
Gas mains run along East 132nd Street north of the site and no gas distribution system presently exists on the site.

3.9.5 Waterfront

The Harlem River Yard waterfront borders the Harlem River at the west end of the site and the Bronx Kill for the remainder of the site. The waterfront is built-up along practically the entire shoreline. The west end is mostly comprised of bulkheads, dotted with two timber piers. To the east of the Willis Avenue Bridge overpass lies a former rail barge dock area with timber piers as well as a wooden deck. The timber piers and wooden deck presently are in a deteriorated state. The area between the barge dock area and the Triboro Bridge overpass is mostly rip-rapped. The area east of the Triborough Bridge is predominantly earth fill material, with intermittent rip-rap except around the foundations of the Triborough and Little Hell Gate Bridges where concrete piers and structures line the waters edge.



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WATER SUPPLY SYSTEM

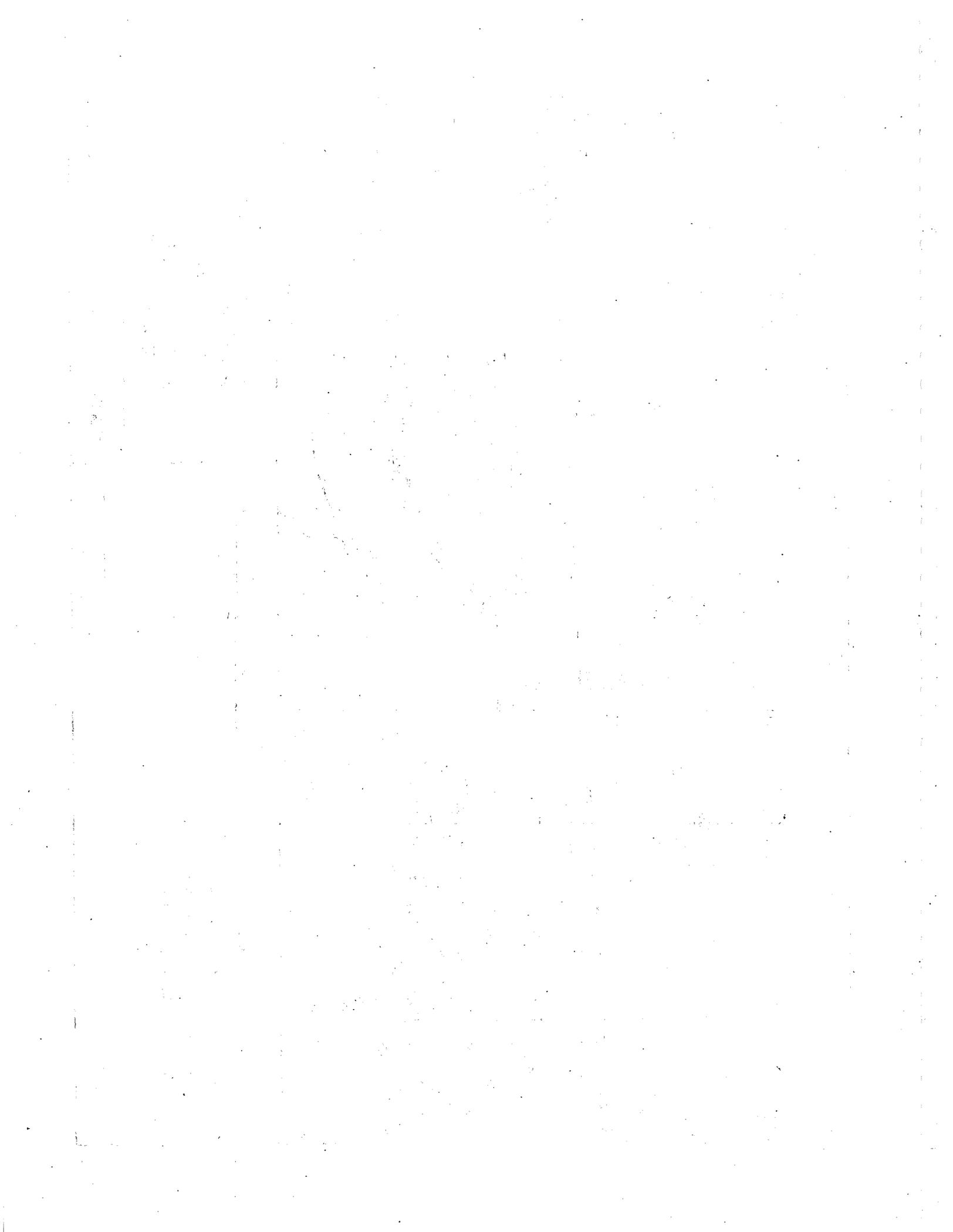


- Legend**
- Property Boundary
 - Water Supply Line

DATE: DEC 9, 1992

TAMS CONSULTANTS, Inc. Figure 3.9-1





3.10.1 Geology

The Harlem River Yard site is underlain by consolidated pre-Cambrian rocks. The three most extensive formations are Fordham Gneiss, Inwood Marble, and Manhattan Schist. The Fordham, Inwood, and Manhattan Formations comprise the New York City Group. The strata of the three principal formations are tightly folded, and both the folding and subsequent erosion have produced a belted outcrop pattern and also a series of northeast-trending ridges and valleys.

The southern portion of Bronx County, where the site is located, is underlain by the Fordham Gneiss and narrow bands of infolded Inwood Marble. The marble typically underlies the low areas, forming long, narrow valleys. During the Pleistocene epoch, a relatively thin covering of glacial deposits, consisting chiefly of till, was laid down upon the pre-Cambrian rocks, and some stratified drifts were deposited in the valleys underlain by the Inwood Marble.

Fordham Gneiss is considered to be the oldest formation of the New York City Group. The gneiss is a well-foliated rock, and it normally exhibits a distinct banded appearance. Alternating light and dark gray to black bands can be seen on freshly exposed rock. Composed largely of the minerals quartz and orthoclase feldspar, the light-colored bands are most distinct when pure quartz is in definite concentrations. The dark bands contain abundant and aligned concentrations of biotite mica. Plagioclase feldspars and occasionally some hornblende are also present. But, feldspar, quartz and biotite mica are the predominant minerals.

Inwood Marble overlies the Fordham Gneiss and is relatively younger than the gneiss. The principal rock in this formation is a dolomitic marble. The major mineral constituent is calcite, an equidimensional mineral which does not produce foliation. Therefore, Inwood

Marble is a non-foliated rock. Other minor constituents are phlogopite mica, pyrite, tremolite, and occasionally graphite. Sugary appearing, medium to coarse-grained, and white to blue-gray on the surface, the Inwood Marble is frequently stained rust brown where weathered.

Among the pre-Cambrian rocks in Bronx County, Inwood Marble is the most productive source of groundwater. The marble is a metamorphosed limestone. It is less resistant to erosion than either the Fordham Gneiss or the Manhattan Schist. Also, it is soluble in slightly acidic water which may result in the development of underground channels.

Because the formation is weak, it underlies low ground almost everywhere. During the Pleistocene epoch, glacial melt-water streams occupied these low areas, and in part filled them with permeable stratified deposits. The increased permeability due to solutional activities, and the presence of a permeable overburden accounts for the greater productivity of the Inwood Marble than from the other consolidated rocks in the New York City Group.

The unconsolidated deposits in the Bronx County consist of upper Pleistocene deposits and Recent alluvium. A large deposit of stratified drift underlies the site. This deposit is roughly a quarter mile wide and extends south-southwestward across the western part of the county. It occupies a narrow valley that was formed in pre-Pleistocene time on the outcrop of the Inwood Marble. The stratified drift deposited on the Inwood Marble is composed of mostly sand and gravel. This drift may have been excavated by construction over the years and may not be present. Construction debris and fill may have replaced this drift.

3.10.2 Floodplains

The Federal Emergency Management Agency (FEMA) employs consultants to conduct hydrological analyses for flood insurance studies. These studies are used for a variety of purposes, including environmental planning, insurance maps, feasibility studies, and others. FEMA regulations are codified in 44CFR and specify requirements pertaining to

~~construction of buildings in floodplains. The City of New York implements the federal~~
regulations on a local level through Local Laws No. 58 of 1983 and No. 33 of 1988 which amend Section 27 of the Administrative Code of New York City. This process involves preconstruction review by the Departments of Buildings and City Planning (Waterfront Development Office) of projects to be built in floodplains.

In order to facilitate the varied uses of the detailed hydrological data, FEMA has standardized designations to delineate areas of concern. The term 'flood' is used to describe a temporary condition of partial or complete inundation of normally dry land areas by the overflow of inland or tidal waters. Flood events are normally referred to by the statistically determined return period; e.g., a '100-year flood' is the flood that has a one percent chance of occurrence in any given year, or the probability of occurring once in every 100 years. Return periods are determined by statistical analyses of available records, such as rainfall, tidal events, and river discharges.

Flood elevations for the 100- and 500-year floods are determined by mathematically modeling the selected area with a computer model. The boundaries are then plotted on contour maps as shown in Figure 3.10-1 (which are based on 1983 FEMA maps). The zones presented on Figure 3.10-1 are the FEMA designations for the following flooding events:

- **Zone A1-30:** FEMA Zone A is the flood hazard area inundated by the 100-year flood. The numerical suffix indicates that the area has had a Flood Hazard Factor determined for it. The Flood Hazard Factor is a correlation with insurance rate tables made by the Federal Insurance Administration. On-site Zone A elevations generally range from 11 to 15 feet (NGVD).
- **Zone B:** Zone B is the FEMA designation for the area between the limits of the 100- and 500-year floods, inundated by the flood with a 0.2 percent chance of occurrence, or the probability of occurring every 500 years. On-site Zone B elevations generally range from 11 to 16 feet.

- Zone C: Zone C is the FEMA designation for the area that would not be inundated even if a 500-year flood occurred. On-site Zone C elevations generally run from 16 feet and higher.

Approximately 62 acres of the project site are mapped as Zone A1-30.

3.10.3 Ecosystems

The Harlem River Yard site has been filled, paved and built upon to such an extent that few natural features remain. Existing vegetative communities are dominated by invasive, opportunistic species such as mugwort, goldenrod, purple loosestrife and common reed. These species are typical of disturbed areas. The following is a general listing of vegetative species observed within the study area:

- Mugwort (Artemisia vulgaris);
- Goldenrod (Solidago sp.);
- Purple loosestrife (Lythrum salicaria);
- Common reed (Phragmites australis);
- Cattail (Typha latifolia);
- Sedges (Carex sp.);
- Smartweed (Polygonum sp.);
- Black willow (Salix nigra);
- Southern catalpa (Catalpa bignonioides).

There are active drainage ditches along much of the existing railroad tracks. These narrow ditches are dominated by common reed and comprise less than 1/10 of an acre. Per US Army Corps of Engineers Federal Regulations (Vol. 51, No.219, Preamble Pt. 328), these drainage ditches do not meet the criteria of waters of the United States.

The Harlem River and the Bronx Kill lie just south of the project site. New York State tidal wetland regulations (6NYCRR661) indicate that all lands under tidal waters that are less than six feet deep at mean low water, and that are not included in any other tidal



Legend

- Property Boundary
- - - Quarter Mile Radius
- ▨ 100 Year Flood Plain
- ▤ 500 Year Flood Plain



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100 YEAR FLOOD PLAIN

DATE: DEC 21, 1991

TAMS CONSULTANTS, Inc. Figure 3.10-1



wetland category are defined as littoral zones. Therefore, those portions of the Harlem River and the Bronx Kill that are less than six feet deep at mean low water are considered littoral zones.

There is insufficient habitat within the study area to support diverse wildlife communities. Avifauna that were directly observed on-site are: herring gull (Larus argentatus), slate-colored junco (Junco hyemalis), ring-necked pheasant (Phasianus colchicus), house sparrow (Passer domesticus), American crow (Corvus brachyrhynchos), European starling (Sturnus vulgaris), common grackle (Quiscalus quiscula), and domestic pigeon (Columba livia). Because the site is not densely vegetated and likely contains numerous rodents, it might provide foraging habitat for raptors. It is unlikely however, that other avian species would be able to actively exploit the other limited resources of the study area.

The only mammal observed within the study area was the Eastern cottontail (Sylvilagus floridanus). Other mammalian species typically found in urban areas and which are expected to exist at this site include the Norway rat (Rattus norvegicus), the house mouse (Mus musculus) and domestic dogs and cats.

No species observed in the study area are identified as threatened or endangered by either the NYSDEC or the US Fish and Wildlife Service. In addition, there is no habitat present within the area that would be suitable to maintain any protected species.

3.10.4 Water Quality

The sections of the Harlem River and Bronx Kill which lie just south of the project site are classified as Class I waters by New York State. The state indicates that Class I waters shall be suitable for secondary contact recreation and any other usage except for primary contact recreation and shellfishing for market purposes.

The New York City Department of Environmental Protection (NYCDEP), Bureau of Water Pollution Control, and other agencies have been collecting water quality data throughout the harbor area since 1909. The Harlem River is considered to be a polluted waterway. Three parameters among many that are generally used by NYCDEP to assess water quality are dissolved oxygen, organics and metals. Summer values for dissolved oxygen range from between 3.4 to 4.4 mg/l. These values are below the generally accepted lower limit of 5 mg/l that most finfish need for adequate respiration.

Harlem River sediments contain higher levels of certain organic pollutants than any other local waterway. Some of these pollutants are highly toxic to biota and include groups such as herbicides, pesticides, transformer oils and polychlorinated biphenyls. Harlem River sediments also exhibit elevated levels of soluble metals including mercury, copper, lead, nickel, and zinc. Many of these metals are quite toxic to aquatic life and may be one of the limiting factors to development of the resident biotic communities. Results from field studies previously conducted in the vicinity of the project site, clearly showed that a stressed biotic system was present.

3.11 Hazardous Materials

A hazardous waste site assessment was conducted in two phases for the Harlem River Yard Project. The first phase was performed in two parts. Phase IA consisted of:

- a review of historical and current site records from various federal, state, and local agencies;
- a detailed visual reconnaissance to record current site conditions and to note possible sampling locations; and
- recommendation of a strategic program of sampling to confirm or negate potential hazardous waste concerns.

The Phase IB program consisted of a soil gas survey in the vicinity of underground storage tanks near the Triborough Bridge and collection of a series of surface and near-surface soil samples in other selected areas. These areas are characterized by stained soils, coal storage, dumping activities, above ground and underground storage tanks, and historical activities of environmental concern (such as railroad operations or coal storage). Four objectives were defined for this Phase IB assessment, as follows:

- Confirm or negate the presence of surface or near-surface soil contamination at selected locations;
- Determine the nature and severity of soil contamination, if any, at these locations;
- Consider possible means of remediation of detected contamination to manage health risks or environmental liability, if necessary; and
- Indicate the potential for groundwater contamination.

Phase II was performed to provide further information with regard to the hydrogeologic environment, while at the same time addressing data requirements identified during the Phase IB investigation.

3.11.1 Phase IA

Records Review

To determine potential sources of environmental concerns, a six step procedure was followed:

1. Summaries of computerized USEPA and NYSDEC records of activities or locations of potential environmental concern in the vicinity of the site were obtained.
2. Sanborn Fire Insurance Maps were analyzed for the locations of potential sources of concern. The Sanborn maps reviewed are dated 1891, 1908, 1946, and 1989.
3. Aerial photographs of the Harlem River Yard site were also analyzed for 1951, 1962, 1970, and 1977. The aerial photographs cover the years where Sanborn maps were not available.
4. Borings logs from the NYS Department of Transportation were reviewed for potentially hazardous materials which may have been buried at the site.
5. Organizations such as Con Edison and the New York City Department of Environmental Protection were contacted regarding utility lines and right-of-ways which transect the site.
6. Areas of potential concern indicated by steps 1, 2, or 3 above were assessed for likely contaminants.

From USEPA records, no sites are listed on the National Priorities List, the Comprehensive Environmental Response, Compensation and Liability Index System, or the National Spill Reports list. From the Facilities Index System Database, which lists properties that have been investigated or reviewed by the USEPA for any reason, and the RCRA Notifier List, which lists facilities which generate, store, transport, treat, or dispose of hazardous waste, 14 sites were found to be within or near the Harlem River Yard site (i.e. south of 134th Street). These locations are listed in Table 3.11-1.

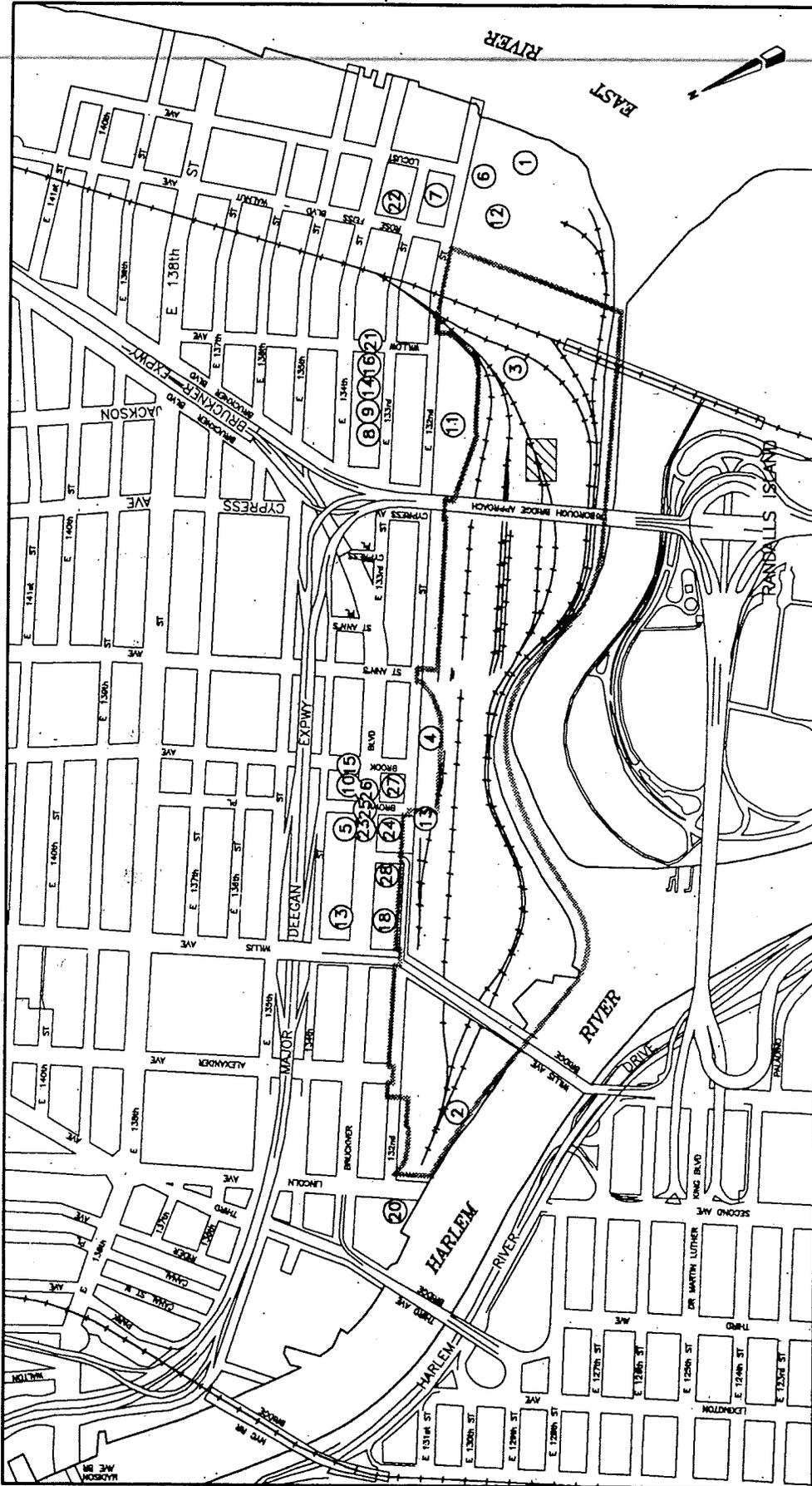
TABLE 3.11-1
AREAS OF POTENTIAL ENVIRONMENTAL CONCERN

SOURCE OF INFORMATION	FACILITY	POSSIBLE CONTAMINANTS	LOCATION FIGURE 3.11-1
1951 Sanborn	Coal Piles	Coal, Slag	1
1989 Sanborn	Heavy Equipment Storage Yard	Metals	2
1989 Sanborn	Auto Storage Yard	Metals, Oils and Grease	3
1989 Sanborn	Photomarker	Silver and Solvents	4
FINDS data base	American Pharmaceutical Co.	Chemical Solutions	5
FINDS data base	Berg Chemical Company, Inc.	Solvents	6
FINDS data base	Con Edison-Hell Gate Substation	Oil, Grease	7
FINDS data base	Flex-O-Tex Drapery Cleaners	Cleaning Solutions	8
FINDS data base	Majestic Drug Company	Solvents	9
FINDS data base	Merit Oil Corporation	Oil, Grease, Metals	10
FINDS data base	NYC Dept of Sanitation: Bx-W-1	Oil, Grease, Metals	11
FINDS data base	NYC Transit Authority	Oil, Grease, Metals	12
FINDS data base	Service Station	Oil, Grease, Metals	13
FINDS data base	Zodiac, Healox & Lustray	Oil and Grease	14
FINDS data base	Racon Manufacturing Company	Solvents	15
RCRA data base	Murray Feiss Import	Metals	16
RCRA data base	George Lopez's Cleaners	Cleaning Solutions	17
RCRA data base	Statewide Medical		18
UST data base	Gassman Coal & Oil Company	Oil and Coal	19
UST data base	Gerosa, Incorporated	Fuel Oil	20
UST data base	ISS Renofab Services	Fuel Oil	21
UST data base	Manhattan Beer Distribution, Inc.	Fuel Oil	22
UST data base	Merit Bruckner	Fuel Oil, Gasoline	23
UST data base	Mobil Service Station	Fuel Oil, Gasoline	24
UST data base	Alabama Auto Center, Inc.	Fuel Oil, Gasoline	25
UST data base	Wedtech Corporation	Fuel Oil, Gasoline	26
UST data base	Zaro Bake Shop, Inc.	Fuel Oil, Gasoline	27
Solid Waste Facility Index	Vigliotti & Sons Transfer Station	Solid Waste	28

From NYSDEC records, no locations on the Registry of Inactive Waste Disposal sites were found within or near the site. A search of the New York Underground Storage Tank Database, yielded ten locations where one or more such tanks are found. No sites were found on the 1989 open dump inventory of facilities that do not comply with USEPA's "Criteria for Classification of Solid Waste Disposal Facilities and Practices". A search of the New York Register of Solid Waste Management Facilities, Owner/Operator listing showed one transfer station in the vicinity of the site. These sites are listed on Table 3.11-1.

Review of the 1891, 1908, 1946, 1951, and 1989 Sanborn maps identified 25 locations on or near the site as areas of potential concern. These are also listed in Table 3.11-1 and are shown in Figure 3.11-1. Aerial photographs taken in 1951, 1962, 1970, and 1977 were also analyzed for possible sites because Sanborn maps were not available for the period between 1951 and 1989. The 1951 aerial photograph shows freight cars being kept between Willis Avenue Bridge and Brook Avenue. Sanborn maps for years 1946 and 1951, shows four workshops and one machine shop adjacent to the tracks by the pier. Maintenance of the freight cars may have occurred in that vicinity. The 1962 aerial photograph shows some of the tracks between Willis and Brook Avenues removed. Freight cars were still kept in that area and also at the bend beneath the Triborough bridge. The 1970 aerial photograph shows the absence of the workshops and machine shop by the pier. At that time, freight cars were primarily evident beneath the Triborough bridge with some near the Willis Avenue Bridge. The 1977 aerial photograph shows the tracks near the Willis Avenue Bridge mostly abandoned and storage of freight cars confined to the area beneath the Triborough bridge.

Boring logs and site plans for the Harlem River Yard Intermodal Terminal obtained from the NYSDOT were examined for possible contaminants encountered during the borings. The borings cover the site from Lincoln Avenue to the Little Hell Gate Bridge. Many of the borings record demolition debris (wood, bricks, glass, concrete, and boulders) and cinders near the surface. Ash was found buried by the Little Hell Gate Bridge near 132nd



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**AREAS OF POTENTIAL
 ENVIRONMENTAL CONCERN**

- Legend**
- Property Boundary
 - ① Area of Potential Environmental Concern
(See Table 3.11-1)
 - ▨ Soil Gas Survey Location
(See Figure 3.11-2)

DATE: NOV 19, 1992

TAMS CONSULTANTS, Inc. Figure 3.11-1



Street. Asphalt was encountered on the east side of the Triborough Bridge close to the platforms.

From the NYSDOT site plans, four NYC utility or sewer lines were identified transecting the site. The first line extends from Alexander Avenue, the second line from Brook Avenue, the third from St. Ann's Avenue, and the last from between St. Ann's Avenue and Cypress Avenue. The Con Edison easement adjacent to the eastern edge of the site carries a gas line and electric cables which are connected with Astoria.

Site Reconnaissance

Detailed visual reconnaissance of the site was conducted on May 18, 1990. Reconnaissance activities consisted of walking through accessible areas of the site, making a record of observations, taking photographs of site features and potential sampling locations, and disturbing surficial materials in various locations to observe the constituency.

A rubbish heap is located next to the entrance gate at Lincoln Avenue. The rubbish consists mainly of construction debris and remnants of an abandoned car. Near the entrance, deposits of coal directly beneath the surface were observed. Underneath the Willis Avenue Bridge, several abandoned cars are located next to one pier. The soil around the pier is stained black with oil.

Based on a conversation with the owner of the Willis Avenue Company property, junk cars are frequently abandoned in this area, and several abandoned cars were recently removed by the Department of Sanitation. It was noted during this reconnaissance that numerous vehicles and partially stripped vehicles were scattered about the site, particularly beneath the bridges. Some appeared to be in use as shelters by squatters. The Willis Avenue Company owner indicated that while he often saw dumping of solid materials on the site, he had never witnessed the dumping of liquid wastes.

A location behind Gassman Coal and Oil company was identified as a coal yard on the 1891, 1908, and 1951 Sanborn maps. Also the Underground Storage Tank Database identified three buried tanks beneath that site. Currently there are open piles of coal on property occupied by Gassman.

Two deteriorated drums were found along the drainage ditch which runs beside the railroad lines. The area between the Triborough Bridge and the Little Hell Gate Bridge appears to have been used extensively for disposal of demolition debris. Also, pieces of coal and coal slag were found on the ground. Growth in the area is limited to weeds. Spent sealant cartridges were strewn about the ground beneath the Little Hell Gate Bridge along with old window sash and broken glass.

Also, a pile of used automobile gasoline tanks and various piles of trash and rubbish were noted in areas beneath the bridge and immediately to the east. An underground storage tank is located next to the loading platforms. This tank contains diesel fuel and the area around the fuel pump is stained.

Recommended Phase IB Program

Based on the records review and site reconnaissance, the Phase IB program consisted of a soil gas survey in the vicinity of the underground storage tank near the Triborough Bridge and collection of a series of surface and near-surface soil samples in other selected areas. The program was designed to confirm the presence and nature of soil contamination and indicate the potential for groundwater contamination.

3.11.2 Phase IB

Soil Gas Survey

During site reconnaissance under Phase IA of this assessment, TAMS personnel observed a fuel dispensing pump and underground storage tank filler caps in the concrete slab north of and immediately adjacent to a set of railroad tracks just east of the Triborough Bridge. No documentation of tanks in this location was found in the New York State Underground Storage Tank Registry. It was observed that the pump hose had no receptacle, but is simply draped over the pump housing when not in use, dripping fuel on the ground around the tanks. The soil and concrete surfaces surrounding the pump were noted to be stained, puddles showed iridescent sheens and a noticeable odor of fuel was present.

A soil gas survey was performed to assess the general extent of the surficial problems in the tank area and to determine whether the soil contamination extends deeper into the subgrade. Samples were taken at two-foot and four-foot intervals (Figure 3.11-2). During the soil gas survey, TAMS' field personnel observed a delivery of diesel fuel by the Whaleco Oil Company of Brooklyn at the tank location. The driver indicated that there are two 4,000-gallon tanks in service, each having a 72-inch diameter. According to the driver, one tank was used by the New Haven Distribution Company and deliveries by Whaleco average 1,400 gallons per week. The second tank was used by the Baldwin Company and deliveries average 3,000 gallon per week.

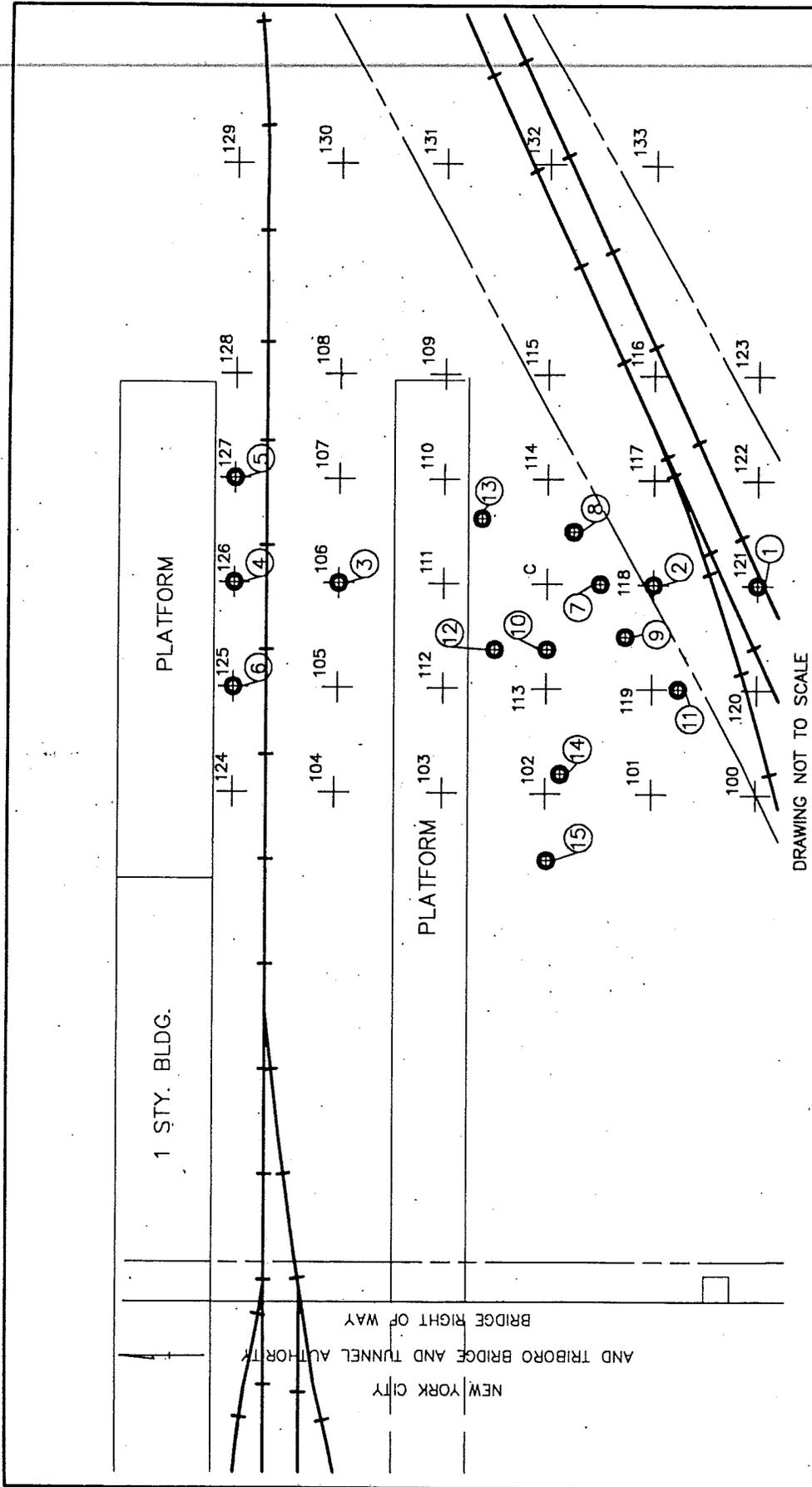
Information has been received from Lieutenant Broderick of the New York City Fire Department indicating that the tanks are registered with that organization, are constructed of steel, and were installed in 1974. He confirmed the sizes stated by the Whaleco driver and indicated that these tanks were tested in the 1988/89 cycle and no leaks were discovered.

The results (Table 3.11-2) show that measurable soil vapor contamination exists in the area of the underground storage tanks at both the two-foot and four-foot intervals. The contamination decreases in concentration with distance from the pump area, both horizontally and with depth. Taking into account the information from the Fire Department that the tanks have been shown not to be leaking, the observations made and results obtained during the course of this investigation strongly suggest that the contamination in the tank area has a surficial origin. It is likely that the problem has resulted from the pump hose dripping on the ground or other sloppy practices over the years.

Soil Sampling

Analytical results for surface and near-surface soil samples are presented in Appendix E. Analytical parameters included Target Compound List (TCL) volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), and pesticides/PCBs; Target Analyte List (TAL) inorganics, including cyanide (lead only for certain samples); and total petroleum hydrocarbons (TPHC). For organic fractions, complete lists of target analytes are presented before the results. Results are reported only for those compounds present in at least one sample analyzed. Where non-target peaks were scanned (i.e., for VOCs and SVOCs), totals are presented for the tentatively identified compounds (TICs) in one or more categories within the fractions.

The near-surface samples were collected from locations well-distributed over the western and middle portions of the site, from Lincoln Avenue to the Triborough Bridge. According to Phase IA program, this is where the bulk of recent and historical activities appear to have occurred.



Legend

- 110 + Grid Location
- Sampling Location

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**SOIL GAS SURVEY GRID
 AND MONITORING LOCATIONS**

DATE: DEC 7, 1992

TAMS CONSULTANTS, Inc. Figure 3.11-2

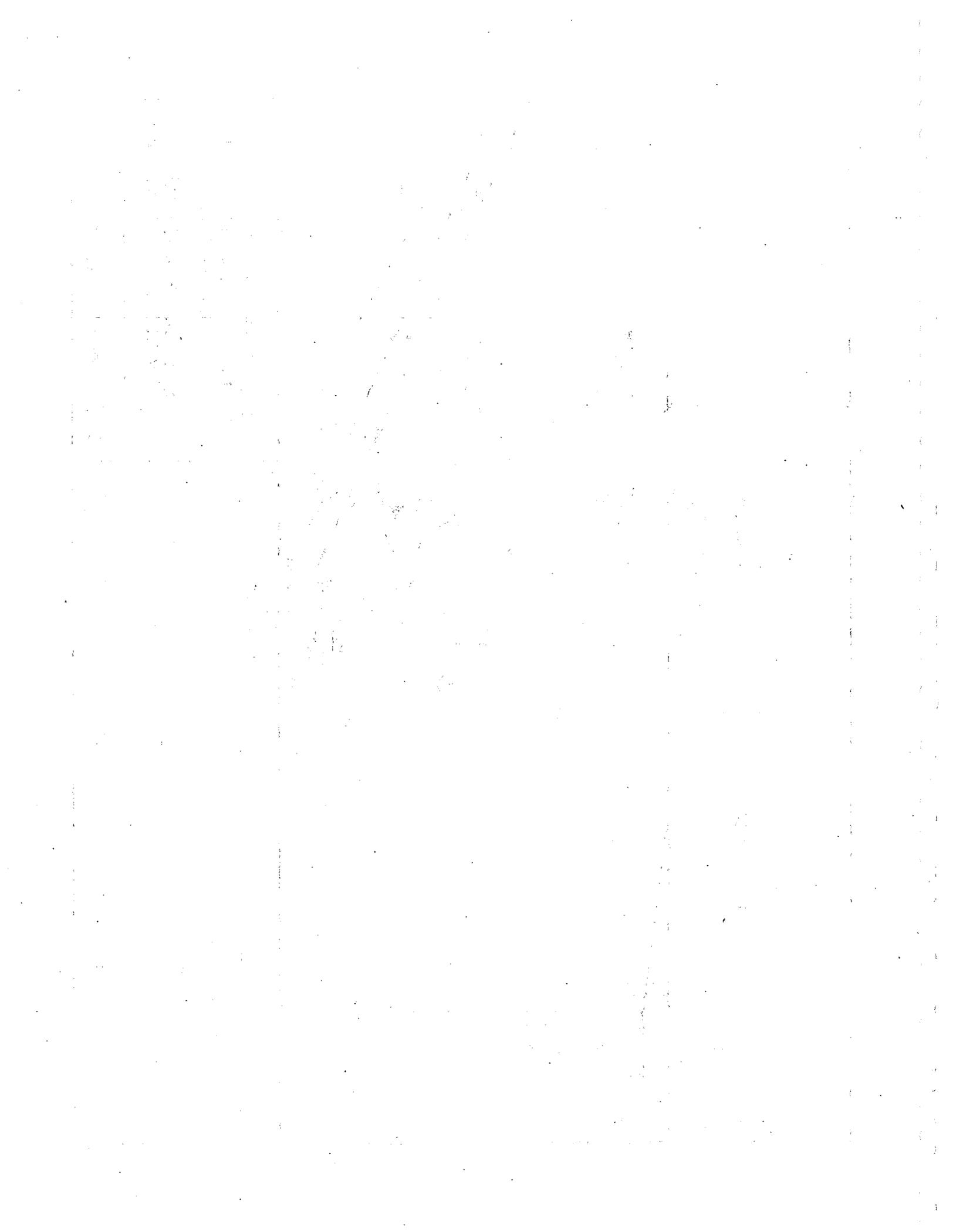


TABLE 3.11-2

PHASE 1B
SOIL GAS SURVEY RESULTS

SAMPLE LOCATION	2-FOOT DEPTH			4-FOOT DEPTH		
	HNu-PID READING (ppm)	OVA READING (ppm)	GC ANALYSIS (ppm)	HNu-PID READING (ppm)	OVA READING (ppm)	GC ANALYSIS (ppm)
1	0.0	1.0		0.1	0.2	
2	0.4	2.0		0.5	0.0	
3	0.1	0.1		0.2	0.7	
4	0.5	0.7		0.6	0.8	
5	0.5	0.7		0.6	0.8	
6	0.1	0.0		**	**	
7	39.0	38.0	336	12.0	42.0	
8	0.3	2.0		0.2	0.0	
9	0.2	12.0	107	0.2	20-60	388
10	5.0	500*	1048	11.0	35+	
11	0.1	0.0		0.2	0.0	105
12	0.2	0.5		**	**	601
13	0.2	0.7		0.2	0.2-0.6	
14	0.2	18.0		0.4	24.0	xxx
15	0.0	0.0	27	0.1	2.0	

NOTES:

- * Peak Reading
- ** No reading taken
- xxx Insufficient sample

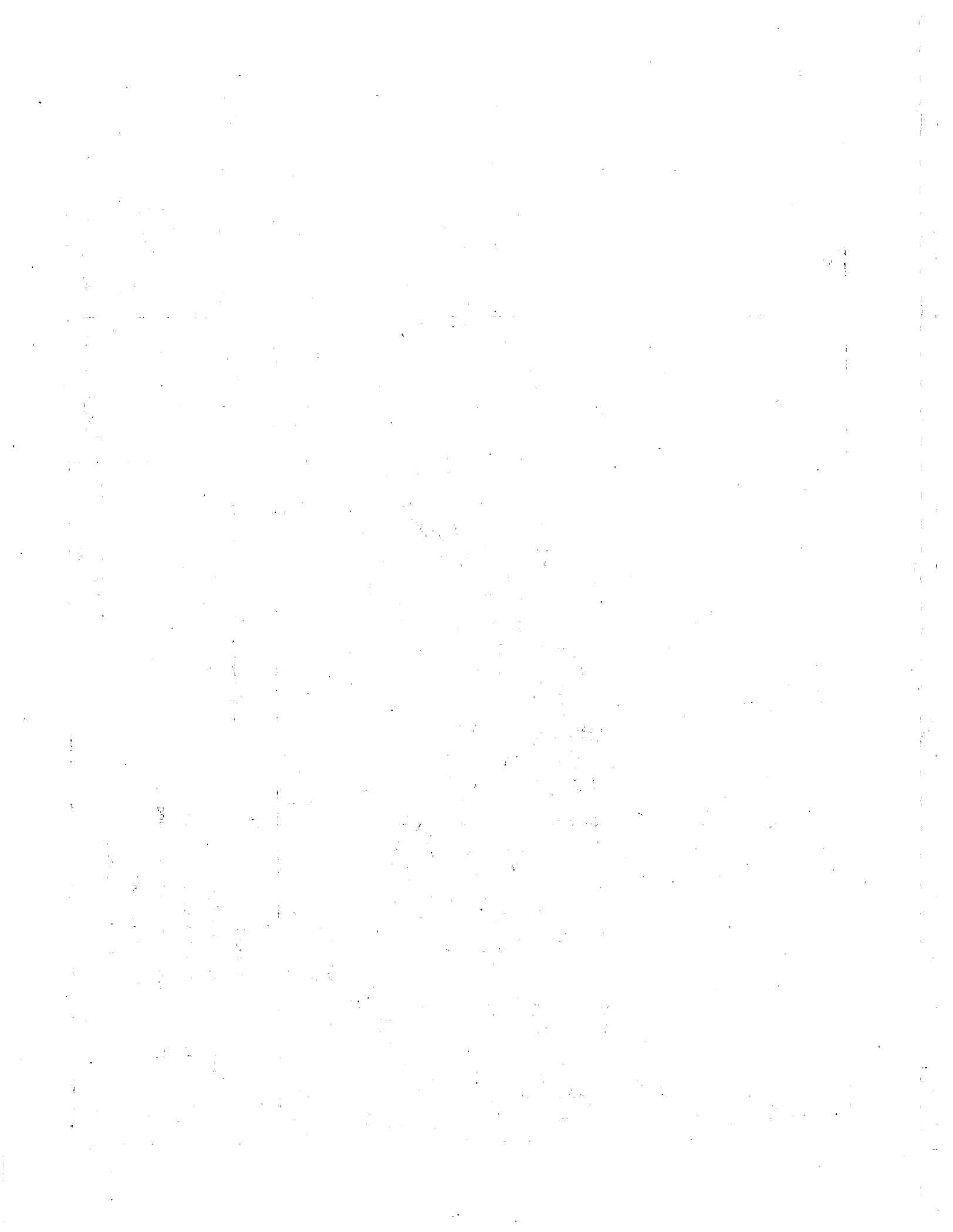
HNu PID readings using 10.2 eV lamp, referenced to benzene.
 OVA FID readings referenced to methane.
 GC analysis using USEPA Method T012, referenced to propane.

The analytical results were evaluated by comparing detected levels of contamination to those levels used by New York State or New Jersey to determine the need for site remediation. A detailed explanation of these action levels is provided in Appendix E. The NYSDEC will generally evaluate sites in terms of: (1) the potential to contaminate ground or surface water, and (2) the potential health risks from direct exposure to surficial contamination. Whether remediation will be required and the objectives of the remediation program are highly dependent on the proposed site use and the relation of the site to adjacent land and water resources.

Thirty surface and near-surface soil samples were collected at 22 locations on the site (Figure 3.11-3). Every sample collected showed detection of at least one parameter or class of compounds in excess of a calculated NYSDEC soil criterion or NJDEP action level.

In each of the 24 samples for which SVOCs were analyzed, individual PAHs detected exceed calculated NYSDEC soil criteria, often by many multiples. In addition, the NJDEP action level for total B/N compounds, which include PAHs, is consistently exceeded. Concentrations of selected inorganics exceed NJDEP action levels in nine of the 22 samples in which they were analyzed. These inorganics include arsenic, cadmium, copper, mercury and zinc. Lead was also detected at elevated concentrations in many samples. These results are consistent with the observable widespread presence of coal residues in surface and near-surface soils at the site.

Levels of TPHC detected are in excess of the NJDEP action level for 16 of the 18 samples in which they were measured (13 of 13 locations). For samples collected near storage tanks, the results are consistent with discharges of petroleum products near the tanks. Combined with results of the soil gas survey, these findings confirm visual observations of surficial contamination and release of fuel to the ground by inadequate dispensing equipment near the underground storage tanks. The concentration decreases with distance and depth from the pump area. VOC results for the sample nearest the above-ground storage tank confirm the TPHC results and are consistent with a discharge in the area nearest the tank.



~~Detections of TPHC in excess of the NJDEP action level in current or former railroad bed~~
or roundhouse locations are consistent with spills or discharges of fuels or lubricants during operation and maintenance activities. Exceedances of TPHC detections in bridge rights-of-way may be attributed to vehicular traffic on the bridges or rail operations across the bridge easements.

PCBs were analyzed in 14 samples from 10 locations in petroleum storage tank areas and railroad bed areas. Only one detection in a railroad bed sample exceeds 5 ppm, which is the NJDEP action level for an industrial area. This detection is, however, below the Federal TSCA remediation action level. Only two other locations showed detections of PCB compounds and these were below 5 ppm. These findings do not indicate any significant concern in regard to PCBs at the site.

Pesticides were analyzed in five samples in three locations. Pesticides were detected in one sample at each location in total concentrations ranging from 9.4 ppb to 41.4 ppb and consisting of Chlordane compounds, as well as DDT and a derivative. The concentrations detected may reflect the past use of pesticides on the site or, perhaps, disposal of pesticides or pesticide containers among debris on the site. There are no action levels for pesticides in soil other than toxicity limits under regulations pursuant to the Resource Conservation and Recovery Act (RCRA). No such determinations were made.

In short, this investigation has confirmed the widespread presence of surficial soil contamination at the site in excess of calculated NYS soil criteria and NJDEP action levels. The contamination detected is consistent with the observable widespread distribution of coal residues about the site (through storage, handling or movement of residue-containing soils), discharges of petroleum products around track areas and under bridges, and sloppy operations or practices in the vicinity of above ground and underground fuel storage tanks. The presence of pesticides on the site has also been confirmed.

In general, concentrations of contaminants detected were shown to decrease with depth of the sample collected, although this pattern was somewhat less pronounced or consistent for metals than for SVOCs. However, samples collected from the 24-inch to 30-inch interval also showed exceedances of criteria or action levels for several fractions or analytes. Borings conducted on the site in 1985 by Warren George for NYSDOT showed the groundwater table to be between approximately seven and fifteen feet below the surface, depending on location. Subsurface deposits were largely classified as rubble and granular materials with some finer constituents.

3.11.3 Phase II

Subsurface Soil Sampling

In order to further define site contamination, subsurface soil samples were collected from thirteen borings for chemical analysis (Figure 3.11-4). The analytical parameters chosen for soil sample analysis were based on information obtained from the Phase IA and IB investigations. Concentrations above calculated NYS soil criteria and other guidelines for semivolatile organic compounds, inorganics, and petroleum hydrocarbons were identified in many of the Phase IB surface and near-surface soil samples.

Samples which were collected from 0 to 2 feet and from just above the water table at a given boring location were analyzed for Target Compound List (TCL) organic parameters (volatile organic compounds, semivolatile organic compounds, and pesticides/PCBs), Target Analyte List (TAL) inorganic parameters, total organic carbon (TOC), and total petroleum hydrocarbons (TPHC). Additional samples collected from the profile borings were analyzed for TCL semivolatile organic compounds and TAL inorganics plus cyanide. Table 3.11-3 provides a summary of samples collected from each boring, depth of sample collection, and the analyses performed on each sample.

TABLE 3.11-3

PHASE II SITE INVESTIGATION REPORT
SUMMARY OF SUBSURFACE SOIL SAMPLE ANALYSES

SAMPLE ID	BORING	DEPTH	TCL VOC	TCL SVOC	TCL PEST/PCB	TAL INORG	TPHC	TOC
SSB1-1	B-1	0-2	X	X	X	X	X	X
SSB1-2	B-1	2-4	X	X		X	X	X
SSB1-3	B-1	4-6		X		X	X	
SSB1-4	B-1	6-8	X	X	X	X	X	
SSB2-1	B-2	0-2	X	X	X	X	X	X
SSB2-2	B-2	2-4				X		
SSB2-3	B-2	4-6	X	X	X	X	X	X
SSB2-4	B-2	6-8				X		
SSB2-5(DUP)	B-2	6-8				X		
SSB3-1	B-3	3-5	X	X	X	X	X	X
SSB4-1	B-4	3-5	X	X	X	X	X	X
SSB5-1	B-5	2-4	X	X	X	X	X	X
SSB6-1	B-6	5-7	X	X	X	X	X	X
SSB7-1	B-7	0-2	X	X	X	X	X	X
SSB7-2	B-7	2-4		X		X		
SSB7-3	B-7	4-6		X		X		
SSB7-4	B-7	6-8	X	X	X	X	X	X
SSB7-5(DUP)	B-7	2-4		X		X		
SSB8-1	B-8	0-2	X	X	X	X	X	X
SSB8-2	B-8	2-4		X	X			
SSB8-3	B-8	4-6		X	X			
SSB8-4	B-8	6-8	X	X	X	X	X	X
SSB9-1	B-9	0-2	X	X	X	X	X	X
SSB9-2	B-9	2-4		X		X	X	
SSB9-3	B-9A	4-6		X		X		
SSB9-4	B-9A	8-10	X	X	X	X	X	X
SSB10-1	B-10	3-5	X	X	X	X	X	X
SSB11-1	B-11	0-2	X	X	X	X	X	X
SSB11-2	B-11	3-5	X	X	X	X	X	X
SSB12-1	B-12	0-2	X	X	X	X	X	X
SSB12-2	B-12	2-4		X		X		
SSB12-3	B-12	4-6		X		X		
SSB12-4	B-12	6-8	X	X	X	X	X	X
SSB13-1	B-13	0-2	X	X	X	X	X	X
SSB13-2	B-13	2-4				X		
SSB13-3	B-13	4-6	X	X	X	X	X	X

Grain size analyses were also performed for seven subsurface soil samples to confirm field classifications. Samples collected for this purpose include Boring B-1, Sample S-3 (B-1, S-3, 4 to 6 ft depth interval), and B-4, S-2 (1.5 to 3 ft), both from the western zone; B-5, S-3 (4 to 6 ft), B-6, S-3 (3 to 5 ft), and B-7, S-2 (2 to 4 ft), all from the central zone; and B-9, S-2 (2 to 4 ft), and B-11, S-4 (5 to 7 ft), both from the eastern zone.

Table 3.11-3 provides a summary of analyses performed for samples collected at each boring location. Results of the analyses are included in Appendix E.

Surface and Near-Surface Soil and Sediment Sampling

Surface and near-surface soil samples were collected for chemical analysis at three locations identified during the Phase IB investigation as areas of potential contamination. Sampling locations S-1 through S-3 are within the eastern zone of the site as shown on Figure 3.11-4. The samples were collected by TAMS personnel on August 14 and 15, 1991.

Two sediment samples, SED-1 and SED-2, were collected by TAMS personnel on August 15, 1991 from the edge of a small ponded area between a one-story warehouse and the Bronx Kill, and just to the west of the Triborough Bridge, as shown on Figure 3.11-4. The sampling locations were based on observations of a 55-gallon drum and an oil container floating in a depression filled with water during the Phase IA investigation. The two samples were collected from 0 to 6 inches in depth using dedicated stainless steel hand bucket augers.

The six surface and near-surface soil samples and two sediment samples were analyzed for TCL organics, TAL inorganics, TPHC, and TOC.

Table 3.11-3 provides a summary of analyses performed for samples collected at each surface and sediment location. Analytical results are summarized in Appendix E. The six surface and near-surface soil samples are designated on the tabulated data with the prefix

"HRYS", following the location number (1, 2, or 3) and the depth (-1 for surface [less than 12 inches below the surface], and -2 for near-surface [24 to 30 inches below the surface]). Two additional surface soil samples, labeled as sediment samples SED-1 and SED-2, were collected from potentially contaminated areas in which ponded water had been observed previously.

Groundwater Sampling

Groundwater samples were collected from each monitoring well on September 9, 1991. The groundwater samples were collected to determine if the shallow soil contamination were leaching into the groundwater present at the site. The samples were analyzed for TCL organics, TAL inorganics, TPHC, and chlorides. Chlorides were analyzed to confirm results of the tidal study discussed below, in regard to salt water intrusion.

Twelve groundwater samples were collected and analyzed for TCL organics and inorganics, TPHC, and chlorides. A field duplicate of the sample from well B-2, labeled B-13, was also collected and analyzed. A summary of analytical data is presented in Appendix E.

3.11.4 Summary of Phase IA and IB and Phase II Findings

Semivolatile organics (especially PAHs) and metals (especially lead) are the predominant contaminants detected at the site. There is no evidence that the presence of the organic contaminants in the surface and subsurface soils is affecting groundwater quality at the site. For certain monitoring locations, measured groundwater quality does not meet 6NYCRR Part 703 standards for a number of metals; however, in many instances this is due to the present of silt (suspended solids) in unfiltered samples. There is little correlation between the metals detected in soil samples at concentrations exceeding reported background values and the metals exceeding groundwater standards.

The results of this investigation are generally consistent with the results of the Phase IB investigation, and add to the database for the site.

Surface and subsurface soil contaminants reported in the Phase II investigation are consistent with the Phase IB data, both in terms of the identity of the contaminants detected at the site and the concentrations at which they were detected.

Inorganic soil contamination appears to be somewhat more prevalent in the eastern zone of the site than in the western and central zones; however, there is no consistent relationship between sample depth and inorganic contaminant concentration. A similar pattern is also evident for the TCL organics, especially the SVOCs and in particular, PAHs.

On the other hand, a definite relationship between sample depth and TPHC concentration was observed, but without any apparent relationship between TPHC concentration and zone (western, central, or eastern). This trend in the TPHC data is consistent with visual observations and the conclusions of the Phase IB report, in which it is stated that TPHC contamination likely originates as surficial contamination, and only gradually migrates downward.

Interpretation of the groundwater data is hindered by the unusual flow patterns at the site. The complex hydrogeologic conditions make strict definitions of monitoring wells as "upgradient" or "downgradient" difficult. In the eastern zone of the site, where it does appear that B-9 is upgradient of B-11 and B-12, the chemical analytical data are inconclusive as to the effect of the site on groundwater quality. Inorganic analyte concentrations in the sample from B-11 do not appear to be significantly greater than in the B-9 sample; however, some inorganic analyte concentrations are higher for B-12 than for B-9.

The groundwater data are generally consistent with the history of the site; i.e., the random placement of fill of varying composition from various sources. Metals in the dissolved state

exceeding applicable criteria are generally limited to iron, magnesium, manganese, and sodium.

