HISTORICAL PERSPECTIVES INC.

Phase IA Archaeological Resources Assessment
GOSR Green Infrastructure Assessment and Implementation Project
Kings & Queens Counties, New York
NYCDEP / 12DEP054Y
OPRHP #18PR05554

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Date:

August 2019

MANAGEMENT SUMMARY

SHPO Project Review Number (if available): **18PR05554**

Involved State and Federal Agencies: **HUD, NYS GOSR, NYSDEC, DASNY, NYSDOT**

Phase of Survey: **Phase IA Archaeological Resources Assessment**

Location Information

Location: **Infrastructure Asset sites within NYRCR Planning Areas: Gravesend and Bensonhurst, Southeast Brooklyn Waterfront, Canarsie, Idlewild Watershed Communities, and Rockaway West**

Minor Civil Division: **04701, 08101**

County: **Kings and Queens**

Survey Area

Length: **Location of each infrastructure asset site, 10-20 or more feet in length**

Width: **Location of each infrastructure asset site, 3-6 or more feet in width**

Number of Acres Surveyed: **multiple**

USGS 7.5 Minute Quadrangle Map: **Brooklyn, Coney Island, Far Rockaway, Jamaica, and Lynbrook**

Archaeological Survey Overview

Number & Interval of Shovel Tests: **N/A**

Number & Size of Units: **N/A**

Width of Plowed Strips: **N/A**

Surface Survey Transect Interval: **N/A, urban area**

Results of Archaeological Survey

Number & name of precontact sites identified: **3**

Site 04701.020922 (Native American Village site aka Keskaechquerem, NieuwAmersfoort) in Southeast Brooklyn;
Site 04701.000113 (Native American village with planting fields) in Canarsie; and,
NYSM Site 4534 (erroneously mapped village and burial site) in Idlewild.

Number & name of historic sites identified: **None**

Number & name of sites recommended for Phase II/Avoidance: **None**

Report Authors(s): **Faline Schneiderman, M.A., R.P.A., Cece Saunders, M.A., R.P.A., Historical Perspectives, Inc.**

Date of Report: **August 2019**

EXECUTIVE SUMMARY

The Dormitory Authority of the State of New York (DASNY) and the Governor's Office of Storm Recovery (GOSR), in cooperation with the New York City Department of Environmental Protection (DEP), are proposing the installation of approximately 237 green infrastructure assets (GIAs) within the City street right-of-way (ROW) in five distinct areas within the Boroughs of Brooklyn and Queens (Kings and Queens Counties, respectively). These areas are subsets of the New York Rising Communities Reconstruction (NYRCR) Planning Areas of Canarsie, Gravesend and Bensonhurst, Southeast Brooklyn Waterfront, Rockaway West, and Idlewild Watershed Communities. Green infrastructure is an effective way to boost the City's resilience against flooding and improve harbor water quality in a sustainable, environmentally conscious manner. The DEP and agency partners have completed green infrastructure projects throughout many city neighborhoods within Brooklyn and Queens.

The proposed project involves the construction of GIAs that range in size from 10 to 20 feet long and 3 to 6 feet wide, with a typical depth of five feet. Each of the GIAs is within the City street ROW, and no impacts are expected to extend more than five feet below existing grade. Typical GIA installation entails saw cutting existing paved areas, excavating existing substrata, backfilling the site, restoring pavement, and planting trees/shrubs/grass.

According to the New York State Environmental Quality Review Act (SEQR) and the City Environmental Quality Review (CEQR) process, GOSR, as Lead Agency, must take into consideration the potential impact of the construction of each asset on historic resources. Historical Perspectives, Inc. (HPI) initiated this Archaeological Resources Assessment to satisfy the requirements of Section 106/SEQR/CEQR, and to comply with the standards of the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP) and the New York City Landmarks Preservation Commission (LPC) (CEQR 2014; SEQR 2010). A Historic Resources Assessment has been prepared under separate cover.

For ease of discussion, the five subsets of the NYRCR Planning Areas of Gravesend and Bensonhurst, Southeast Brooklyn Waterfront, Canarsie, Idlewild Watershed Communities, and Rockaway West will be referenced as Gravesend, Southeast Brooklyn, Canarsie, Idlewild, and Rockaway West. Collectively, they are referenced as the "five neighborhoods." For the purposes of this study, each GIA Site installation footprint constitutes the archaeological Area of Potential Effect (APE).

Potential impacts to archaeological resources in the five neighborhoods were identified and assessed for direct physical impacts from GIA installation. The archaeological resources assessment of the five neighborhoods found that all except the Rockaway West neighborhood have potential sensitivity for precontact and/or historic sites.

Multiple GIA Sites were found to have the potential for precontact resources, although the sensitivity assessment was found to be relatively low since there were no documented settlements in their footprints and because of subsequent disturbance. Southeast Brooklyn and Canarsie were found to have GIA Sites within a NYSM mapped area of precontact sensitivity. In Southeast Brooklyn, the NYSM documentation suggested sensitivity for Native American planting fields or earlier short term encampments associated with a more extensive habitation to the northeast. In Canarsie, GIA Sites in the documented NYSM area of sensitivity were described as planting fields associated with a more extensive settlement to the south. All potentially sensitive GIA Sites are listed below.

Summary of GIA Sites with Precontact Archaeological Potential

GIA Site	Potential Precontact Sensitivity
Gravesend	
All GIA Sites	Low – planting fields/ephemeral sites
Southeast Brooklyn	
59B and 59C	Low – planting fields/ephemeral sites
Canarsie	
49A	Low – planting fields/ephemeral sites
50B	Low – planting fields/ephemeral sites
51A	Low – planting fields/ephemeral sites
66A and 66B	Low – planting fields/ephemeral sites
70A	Low – planting fields/ephemeral sites

GIA Site	Potential Precontact Sensitivity
78A and 78C	Low – planting fields/ephemeral sites
79A	Low – planting fields/ephemeral sites
Idlewild	
All GIA Sites	Low – planting fields/ephemeral sites

Both the Gravesend and Idlewild neighborhoods had no precontact habitation sites reported close by, but the landscape in each could have also once supported Native American planting fields or short-term sites. In contrast, the Rockaway West neighborhood was found to lack precontact potential altogether.

Virtually all GIA Site locations were farmed by Europeans and their descendants from the mid-17th century onward, which would have eradicated traces of earlier planting fields. These sites were also later disturbed to a depth of at least 1.5 feet below grade by leveling, regulating, and opening streets and sidewalks. Therefore, while there is the remote possibility that deeply buried precontact resources in pit features – typically associated with habitations that are more permanent rather than short-term encampments - may have survived the process of urbanization in these neighborhoods, the likelihood is low. Documented larger long-term settlements at the time of European Contact were outside of the GIA Site locations.

Sensitivity for historic period archaeological resources focused on establishing the location of GIA Sites in proximity to historic structures that predated the availability of municipal sewer and water. The residents in these earlier structures would have had to rely on wells, cisterns, and privies since municipal utilities were not available in most neighborhoods until the 1890s or 1910s. Of the 237 GIA Sites, 21 locations in all but the Rockaway West neighborhood were found to be potentially sensitive for mid-19th to early 20th century shaft features that could contain artifacts dating to the period of occupancy. These potentially sensitive locations are listed on the following table.

Summary of GIA Sites with Historic Archaeological Potential

GIA Site #	Potential Historic Archaeological Sensitivity
Gravesend	
50A and 50B	domestic resources ca.1844-1920
51A and 51B	domestic resources ca.1844-1920
62A	domestic resources ca.1849-1920
64A and 64B	domestic resources ca.1849-1920
65A, 65B, and 65D	domestic resources ca.1849-1920
82-1A	domestic resources ca.1844-1920
99A	domestic resources ca.1852-1899
99B	domestic resources ca.1873-1920
SE Brooklyn	
8A and 8B	domestic resources ca.1873-1918
49A and 49B	domestic resources ca.1849-1890
Canarsie	
5A	domestic resources ca.1840-1920
Idlewild	
175-2A	domestic resources ca.1873-1918
251A	domestic resources ca.1891
263A	domestic resources ca.1891

Several of these GIA Sites are potentially sensitive for shaft features associated with the same structure, since they are in close proximity (e.g., 65A, B, and D in Gravesend).

For precontact resources, it is recommended that a sample of sensitive locations in each neighborhood (except Rockaway West) be subjected to archaeological monitoring and testing at the time of construction to establish the presence or absence of precontact deposits. Such testing would be most efficient if completed in conjunction with

excavations for GIA installation. Working with the backhoe operator, archaeologist could direct machine excavations and develop a strategy for testing strata beneath overburden. Such a strategy could include hand-excavating shovel tests in locations with seemingly undisturbed strata, and/or sifting a sampling of machine-excavated soils. Rather than testing all potentially sensitive locations, a sampling strategy should be developed to ensure that an adequate number of locations in each sensitive neighborhood are reviewed while avoiding testing redundancy (e.g., testing or monitoring multiple GIA Sites in proximity). A Work Plan should be developed and testing at the time of construction should focus on locations near established Native American trails, and locations that are less likely to have been disturbed by historic activities (e.g., highway construction, prior borings).

For historic archaeological resources, it is recommended that all GIA Sites that have been identified as potentially sensitive for shaft features listed on Table 13 be tested or monitored for resources at the time of construction, as described for precontact resources. If any intact historic archaeological resources are encountered from contained deposits (e.g., from features such as wells, privies, and cisterns), resources should be appropriately excavated and documented. Subsequently, focused documentary research should be undertaken to link artifacts to household residents.

A Work Plan for monitoring and/or testing at the time of construction in each of the four neighborhoods with potential sensitivity should be established in consultation with LPC and SHPO. All archaeological testing or monitoring should be conducted according to applicable standards (NYAC 1994; OPRHP 2005; LPC 2018). Professional archaeologists, with an understanding of and experience in urban archaeological excavation techniques, would be required to be part of the archaeological team.

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I. INTRODUCTION

The Dormitory Authority of the State of New York (DASNY) and the Governor's Office of Storm Recovery (GOSR), in cooperation with the New York City Department of Environmental Protection (DEP), are proposing the installation of approximately 237 green infrastructure assets (GIAs) within the City street right-of-way (ROW) in five distinct areas within the Boroughs of Brooklyn and Queens (Kings and Queens Counties, respectively; Figures 1a-e and 2a-e). These areas are subsets of the New York Rising Communities Reconstruction (NYRCR) Planning Areas of Canarsie, Gravesend and Bensonhurst, Southeast Brooklyn Waterfront, Rockaway West, and Idlewild Watershed Communities (Figure 3). Green infrastructure is an effective way to boost the City's resilience against flooding and improve harbor water quality in a sustainable, environmentally conscious manner. The DEP and agency partners have completed green infrastructure projects throughout many city neighborhoods within Brooklyn and Queens.

The proposed project involves the construction of GIAs that range in size from 10 to 20 feet long and 3 to 6 feet wide, with a typical depth of five feet. Each of the GIAs is within the City Street ROW, and no impacts are expected to extend more than five feet below existing grade. Typical GIA installation entails saw cutting existing paved areas, excavating existing substrata, backfilling the site, restoring pavement, and planting tree/shrub/grass. The locations of each proposed GIA Site are depicted on Figures 3-1 through 3-25.

According to the New York State Environmental Quality Review Act (SEQR) and the City Environmental Quality Review (CEQR) process, GOSR, as Lead Agency, must take into consideration the potential impact of the construction of each asset on cultural resources, both historic and archaeological. Historical Perspectives, Inc. (HPI) initiated this Phase IA Archaeological Resources Assessment (Phase IA), to satisfy the requirements of Section 106/ SEQR/CEQR, and to comply with the standards of the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP) and the New York City Landmarks Preservation Commission (LPC) (CEQR 2014; SEQR 2010). A Historic Resources Study has been prepared under separate cover (HPI 2019).

For ease of discussion in this report, the five subsets of the NYRCR Planning Areas of Gravesend and Bensonhurst, Southeast Brooklyn Waterfront, Canarsie, Idlewild Watershed Communities, and Rockaway West will be referenced as Gravesend, Southeast Brooklyn, Canarsie, Idlewild, and Rockaway West. Collectively, they are referenced as the "five neighborhoods."

II. METHODOLOGY

A. Area of Potential Effect (APE)

The Area of Potential Effect (APE) is defined in 36 CFR 800.16(d) as "the geographic area or areas within which an undertaking may directly or indirectly cause changes in the character or use of historic properties, if any such properties exist. The APE is influenced by the scale and nature of the undertaking and may be different for different kinds of effects cause[d] by the undertaking." The APE defines that area within which the identification of archaeological resources will occur. Included within the APE are all locations where there will be direct impacts below grade.

For the purposes of this study, each GIA Site installation footprint constitutes the APE (Figures 2a-2e and 3-1 through 3-25). In each of these approximately 237 locations, the archaeological APE for each infrastructure asset ranges in size from 10 to 20 feet in length, 3 to 6 feet in width, and a typical depth of roughly five feet. Each location is in an existing City street ROW. Therefore, the APE for archaeological resources for each installation is the full width, depth, and breadth of each asset plus additional areas adjacent to the asset necessary to facilitate construction and, where needed, connection to existing infrastructure. Typical green infrastructure installations entail saw cutting, excavation, backfilling, sidewalk restoration, and tree/shrub/grass planting.

A Historic Resources Study was completed for the five neighborhoods under separate cover (HPI 2019). For that study, the historic resources Study Area was defined as the totality of the footprint of all GIA Sites within a neighborhood, plus a radius of 400 feet. The neighborhood histories as well as the graphics from that report are presented herein; hence, the Study Area is referenced on several figures and in the titles of graphics.

B. Research Goals, Tasks, and Assumptions

For this report, the word precontact is used to describe the period prior to the use of formal written records. It is unlikely that potential precontact period archaeological resources, usually found at relatively shallow depths, would have survived the impacts of street, sidewalk, and utility installations within the APEs for each green infrastructure locus. Furthermore, after the streets were laid out, home lot shaft features (e.g., privies, cisterns, and wells) would not have been created in front yards or in the street beds, that later became, in part, sidewalks. To document prior significant ground disturbance in the APE and address historic land use, this Phase IA focuses on documenting disturbance episodes and establishing archaeological resource potential for resources dating prior to the creation of the city street systems in each of the five neighborhoods.

A research methodology was submitted to and approved by both LPC and OPRHP (Sutphin 9/18/2018; Perazio 9/18/2018). As described in the methodology, this study takes into account the archaeological depositional patterns established in New York City including: (1) the relatively shallow depth of precontact sites/ features; (2) the relatively minimum use of historic-era house lot front yards; (3) the potential for industrial, commercial, and other resources; and (4) the recognition of the disturbed soil matrix within the ROWs. Furthermore, research takes into account the fact that if the APEs could have once hosted shaft features, the archaeologically sensitive deeper levels (the base of shaft features) would most likely not be reached by the depth of excavation (five feet) for GIA Sites.

The approved methodology steps for both precontact archaeological resources and historic archaeological resources are described below.

Precontact Resources

HPI undertook the following tasks to assess the precontact archaeological potential of each GIA Site and the potential effect of the proposed asset installation on potential archaeological resources:

1. Each of the GIA Sites in the five neighborhoods was visually inspected to identify potentially sensitive locations (Cece Saunders and Faline Schneiderman, August 21 and 22, 2018). At that time, each GIA Site was photographed, with representative photographs included in this report (see Photographs).
2. Any location that was found to be within 100 feet of a known area of precontact sensitivity was considered potentially sensitive for precontact archaeologically resources unless there were mitigating circumstances, such as documented disturbance. Known Native American sites, trails, and previously reported areas of precontact use were established in relation to each GIA Site through a review of:
    a. New York Cultural Resources Information System NYCRIS mapped OPRHP and New York State Museum (NYSM) sites and locations of sensitivity;
    b. LPC sensitivity assessments;
    c. Prior archaeological studies completed in or near each neighborhood ; and,
    d. A review of the available archaeological literature (e.g., Bolton 1922, Grumet 1981, Parker 1920, Salwen 1975).
3. Any location on a predevelopment landform that had specific attributes known to be conducive for precontact habitation or a use that could have left an archaeological footprint (e.g., shellfish harvesting and processing) was considered potentially sensitive for archaeological resources. Predevelopment topography was established for each GIA Site by plotting locations on georeferenced predevelopment historic maps and atlases. Locations considered potentially sensitive for precontact resources are those that were found to be:
    a. Within 100 feet of fresh water, marshland, or a mapped resource;
    b. On a topographic landform similar to those with known precontact sites, such as elevated knolls and protected bays; and,
    c. On a landform considered potentially sensitive based on available paleoshoreline reconstruction models.

GIA Site locations that did not meet the threshold for potential precontact sensitivity based on the first three steps were not studied further. Those that were deemed potentially sensitive for precontact resources were then assessed for episodes of disturbance. Existing New York City building codes for sidewalk construction established the known depth of prior disturbance as 1.5 feet below grade, based on the depth of pavement, underlayment, and soil compaction beneath, while proposed construction will extend to no more than five feet below grade (NYCDOT 2010). Therefore, for locations of potential sensitivity, the following steps were taken to establish disturbance between 1.5 and five feet below grade:

4. Predevelopment and post-development elevations were compared, where data was available, for each potentially sensitive GIA location by plotting them on georeferenced predevelopment and later historic maps and atlases. Sites with a three-foot or more reduction in elevation were considered disturbed, since sidewalks have further disturbed the uppermost 1.5 feet below grade.
5. Where available, logs from soil borings undertaken as part of this project were reviewed to further establish subsurface conditions.
6. Site visits, described in Task 1, sought obvious evidence of disturbance such as utilities beneath sidewalks, and included the photographic recordation of each GIA location.

GIA locations that were evidently disturbed were not studied further, and documentation of that disturbance was made. Those that are not deemed disturbed were designated as potentially sensitive for precontact archaeological resources.

Historical Archaeological Resources

Historical archaeological resources are expected to be associated with early historic dwellings, public use structures (e.g., schools, hospitals, churches, etc.…), early plank roads, burial grounds, and small-scale industries (such as mills) that existed before the existing street grid system was established in each of the five neighborhoods. After the existing grid system of municipal streets was laid out, the dates of which varied by neighborhood, shaft features associated with buildings on individual city lots (e.g., privies, cisterns, and wells) would have been situated in backyards and side yards, not in the sidewalks or streets where the GIA Sites are located.

Historical sensitivity was established for each GIA Site by plotting their locations on georeferenced early historic maps and atlases as described above for precontact resources, focusing on maps created prior to the implementation of the existing street grid system. GIA Sites were considered potentially sensitive for historic archaeological resources if they were situated on a plank road, or were within 150 feet of a mapped historic structure - as described above – that was depicted prior to the establishment of the extant street grid system. Some early historic maps (e.g., Tehune 1674; Taylor Skinner 1781, Hassler 1835; Sidney 1849) lacked the level of accuracy necessary to be meaningfully georeferenced with GIA Sites or were digitized at a low resolution that did not allow for meaningful reproduction. These early maps were consulted, but were not reproduced for this report.

GIA Sites that are considered sensitive for historical archaeological resources were then assessed for later disturbance as described for precontact sites. Those that were not deemed disturbed were designated as potentially sensitive for historic period archaeological resources.

III. EXISTING CONDITIONS

A. Overall Five Neighborhoods

The GIA locations in each of the five neighborhoods consist of sidewalks in the City Street ROW (Figure 3). The conditions of sidewalks vary, and site photographs document these current conditions (Photographs). The locations of photographs showing examples of current conditions and identified resources are depicted on Figures 3-1 through 3-25.

The widths of both streets and sidewalks vary considerably in each of the neighborhoods. In most observed cases, sidewalks were originally established by reducing street width, as opposed to reducing the size of adjacent city blocks. Sidewalks are paved with asphalt and concrete, or a combination of the two, depending on location. Conditions vary from block to block, with some sidewalks exhibiting relatively intact concrete or asphalt pavement, while others have fair to poor pavement. None were found to have bluestone or stone curbing, likely due to the late

date that the city grid systems were built out in each of the five neighborhoods (see Photographs). Typically, in New York City the earlier date that a roadway was created or a neighborhood was gridded, the more likely it would have been to have bluestone pavers and curbing. The five neighborhoods were most intensively developed in the early to mid-20th century, and earlier roads have been realigned to conform to the grid system. Concurrent with this, they were repaved and upgraded with concrete curbing and sidewalks for neighborhood uniformity.

B. Current Conditions

Since the five neighborhoods were not subjected to gridding with the extant streets, avenues, blocks, and lots until the late 19th and early 20th centuries, earlier maps and atlases do not show pre-development topographic elevations at street corners. Elevations were only recorded for the period of initial intensive development and thereafter, so the extent of grading involved with creating the current topography is not readily evident.

Gravesend

The Gravesend GIA Sites are situated between the north side of Avenue P, south to the south side of Kings Highway. Ocean Parkway is at the east, and 8th Street is to the west. The area gently slopes uphill to the north, with lowest elevations found at the southwest near Quentin Avenue and 8th Street. Each GIA Site is situated between the 20-foot and 30-foot contour interval (NAVD 88 datum), and the majority of sites are located on Avenue P and Quentin Avenue (Figure 2a).

Like other sections of southern Brooklyn, the majority of development on the landscape in the Gravesend neighborhood postdates the adoption of the city grid system in the early 20th century. While the approximate route of Kings Highway and McDonald Avenue (formerly Gravesend Avenue) predate the grid system, their alignments were straightened and/or otherwise modified and incorporated into the grid.

A site visit completed on 8/22/18 found that development in the Gravesend area is mixed, but is predominantly characterized by two-story attached dwellings and multi-story apartment houses (Photographs G1-G13, and Photo Keys on Figures 3-8 through 3-14). The landscaped National Register of Historic Places (NRHP) and New York City Landmarked (NYCL) Ocean Parkway, a pedestrian, bike, and vehicular boulevard, bounds the GIA Sites to the east. Its verdant and inviting character contrasts visually with Avenue P, a predominantly commercial street with multi-story apartment buildings and retail establishments (Photographs G1-G4; Photo Keys on Figures 3-9 and 3-10). The IND Culver Line has an elevated station at Avenue P and McDonald Avenue (built 1919; renovated 2016/2017; Photograph G4; Photo Key on Figure 3-9), and further east fronting Avenue P is the NRHP-eligible PS 177 school (built 1939), at 346 Avenue P (Photographs G5, G6; Photo Key on Figure 3-9). At the western end of Avenue P, there is a series of two-story brick structures, some solely residential while others are mixed commercial and residential (Photograph G7; Photo Key on Figure 3-8). In contrast, Quentin Avenue to the west of McDonald Avenue is characterized by multi-story brick apartment buildings, whereas closer to the subway the buildings are predominantly commercial (Photographs G8-G11; Photo Keys on Figures 3-11, 3-12, and 3-14). Likewise, Kings Highway has a mix of building types, some of which are commercial, with at least one vacant lot being prepped for redevelopment (Photograph G12; Photo Key on Figure 3-13).

The side streets in the Gravesend neighborhood are characterized by multi-story brick apartment buildings, punctuated with smaller single-family dwellings and duplexes. Many of the original houses have had updates to façades and, where set back from the street, their front yards as well (e.g., Photograph G13; Photo Key on Figure 3-11). Most of these structures date to the period between 1920 and 1960 when the area experienced intensive development. However, as the neighborhood is experiencing a residential resurgence, it is witnessing a spate of redevelopment, especially on Avenue P and Kings Highway. All sidewalks throughout the Gravesend neighborhood are concrete with concrete curbing.

Southeast Brooklyn

The GIA Sites in Southeast Brooklyn are located between Flatbush Avenue, Nostrand Avenue, Kings Highway, and Quentin Road, a fairly level area, with each GIA Site situated between 15 feet and 20 feet above sea level (Figure 2b). Elevations generally rise from south to north, with the highest elevation observed near the intersection of Avenue N, East 35th Street, and Flatlands Avenue.

Much of the area is characterized by development that post-dates the laying out of the street grid in the early 20th century (Photographs S1-S10; Photo Keys on Figures 3-1 through 3-4). Although the approximate route of Kings Highway, Nostrand Lane, and Flatbush Avenue were laid out before the 19th century, these routes were straightened and/or modified to fit into the extant grid system. Hence, virtually all of the development in the neighborhood dates from the early 20th century onward. A site visit completed on 8/22/18 found no distinctly unique architectural types characterizing the neighborhood, and many buildings have drastic renovations to their original façades (e.g., Photograph S5; Photo Key on Figure 3-3). Building types included frame and brick duplexes, gambrel-roofed single-family dwellings, Tudor-revival multifamily buildings, and modern apartment buildings (Photographs S1-S10; Photo Keys on Figures 31- through 3-4). All sidewalks are concrete with concrete curbing.

Canarsie

The Canarsie neighborhood extends from the northwest side of Avenue J, southeast to the southeast side of Avenue K, between East 87th Street and East 98th Street (Figure 2c). The elevation through the area is relatively level, ranging between about 9 and 23 feet above sea level, although there is a steep downhill slope between Avenue J and Church Lane, which borders the north side of the Canarsie Cemetery.

Most of the extant structures in the area date to the early through mid-20th century when development here intensified. Single and multi-family dwellings are set back from the road and represent an amalgamation of architectural styles, with attached duplexes typically mid-block and single-family dwellings at corners. Many have had updates to their facades, and/or revisions to other architectural elements.

The streets in the neighborhood are broad, allowing for more than one lane of traffic in each direction, plus parking on either side (Photographs C1-C10; Photo Key on Figures 3-5 through 3-7). Multi-story apartment buildings front onto both Avenue J and Rockaway Parkway, and a high school with an adjoining athletic field fronts Rockaway Parkway between Avenue J and Avenue K. To the west by several blocks, Canarsie Cemetery stretches between Church Lane, Avenue K, East 86th Street, and Remsen Avenue (Photo C9; Photo Key on Figure 3-7). Commercial structures fronting onto Rockaway Parkway tend to be one to two stories in height, and vary in size and style. All of the sidewalks and curbs observed in the area are concrete.

Idlewild

The Idlewild neighborhood in Rosedale extends from just north of 135th Avenue, south to 143rd Avenue. Brookville Boulevard, Brookville Park, and the Belt Parkway are to the west, and the Queens/Nassau County line is to the east. North and South Conduit Avenue, the Sunrise Highway (aka State Highway 27), and the Long Island Railroad (LIRR) bisect the area (Figure 2d), with JFK International Airport situated to the southwest. North and South Conduit Avenues follow the route of the19th century pipeline that brought water from reservoirs to the north and east, west to the City of Brooklyn.

The neighborhood of Rosedale was developed in the late 19th century, and most extant structures in the area date to the early through mid-20th century when development here intensified. The area is dominated by single- family dwellings set back from the street, with grassed lawns between them. The majority of structures date to the 20th century (ca.1910-1970) and are single-family residential houses, punctuated by multi-family dwellings. Smaller commercial structures are located on South Conduit Avenue, Francis Lewis Boulevard, and Brookville Boulevard (Photographs I1-I26; Photo Key on Figures 3-15 through 3-21). House sizes vary from small traditional Cape Cod styles, to larger three-story dwellings with wrap-around porches. Some houses have been updated and/or replaced over the years (see Photos I20 and I24; Photo Key on Figure 3-15). All of the sidewalks and curbing in the area are concrete.

Rockaway West

The Rockaway West neighborhood is on Rockaway Peninsula between Beach 94th Street and Beach 108th Street. The GIA Sites are situated only a few feet above sea level, with the maximum elevation of 10 feet above sea level at the project site's northeastern most corner near the intersection of Rockaway Beach Boulevard and Beach 94th Street (Figure 2e).

Much of the area was significantly damaged by Hurricane Sandy in 2012, with many buildings and much infrastructure flooded or destroyed, including Rockaway Beach's iconic boardwalk. A site visit completed on 8/21/18 found numerous rebuilt and replaced structures along the north side of Shore Front Parkway adjacent to the locations of many of the proposed GIA Sites (Photographs R1 through R16; Photo Key on Figures 3-23 through 3-25). Smaller residential dwellings have been refaced, and larger apartment complexes, which dominate the landscape, have been repaired and outfitted with new landscaping. A new concrete boardwalk to replace the one destroyed in Hurricane Sandy has just been completed to the south of Shore Front Parkway, directly along the beach. Further, all sidewalks in the Rockaway West neighborhood are concrete with concrete curbing.

C. Geology

Long Island is the top of a Coastal Plain ridge formation that is covered with glacial drift, in reality an elevated sea bottom demonstrating low topographic relief and extensive marshy tracts. In the last million years, as glaciers advanced and receded three times, the surficial geology of the island, including the project site, was profoundly altered. "The glacier was an effective agent of erosion, altering the landscape wherever it passed. Tons of soil and stone were carried forward, carving and planing the land surface. At the margins of the ice sheet massive accumulations of glacial debris were deposited, forming a series of low hills or terminal moraines" (Eisenberg 1978). Circa 18,000 years ago, the last ice sheet reached its southern limit, creating the Harbor Hill moraine that traverses the length of Long Island. The moraine lies several miles north of the project site. North of the moraine, the complex rising and subsidence of the coastal plain, relieved of its glacial burden, and the rising sea level, caused by the volume of melting ice, created the coastline of embayed rivers and estuaries, with extensive marsh tracts, which stabilized approximately 3,000 years ago (Schuberth 1968).

D. Soils

According to the soil survey for New York City (Figures 18a-e), the majority of the Gravesend, Southeast Brooklyn, Canarsie, and Idlewild neighborhoods fall within soil mapping unit 211, known as "Pavement & buildings, Flatbush-Riverhead complex, 0 to 8 percent slopes" and described as:

> Nearly level to gently sloping urbanized areas of outwash plains that have been substantially cut and filled, mostly for residential use; a mixture of anthropogenic and gneissic outwash soils, with up to 80 percent impervious pavement and buildings covering the surface (USDA 2005:14).

The exception to this is a small segment of the Idlewild project site near Brookville Boulevard and the POW-MIA Memorial Highway that encompasses soil mapping unit 225 (Figure 17d), known as "Plymouth-Flatbush-Pavement & buildings complex, 0 to 8 percent slopes" and described as:

> Nearly level to gently sloping areas of outwash plains that have been partially disturbed, mostly for parks and cemeteries; a mixture of sandy outwash soils and anthropogenic soils, with more than 15 percent impervious pavement and buildings covering the surface; located south of the terminal moraine in Queens (USDA 2005:14).

The Rockaway West project site solely contains soil designated as mapping unit 208, known as "Pavement & buildings-Hooksan-Verrazano complex, 0 to 8 percent slopes" (Figure 17e) and described as:

> Nearly level to gently sloping urbanized areas of sandy sediments that have been substantially cut and filled mostly for residential use; a mixture of sandy soils and loamy-capped anthropogenic soils, with up to 80 percent impervious pavement and buildings covering the surface; located along the southern shorelines of Brooklyn and Queens (USDA 2005:14).

The core commonality between each of these soil types is that they are characterized as having been substantially cut and filled to allow for mostly residential development, with a high percentage of impervious pavement and buildings.

E. Soil Boring Review

In advance of GIA installation, a series of geoprobes was undertaken in each of the project neighborhoods. Soil boring logs from these geoprobes were reviewed to establish subsurface conditions. Assigned boring numbers coincide with GIA Site numbers, so that Boring 42A was completed at the site of proposed GIA Site 42A and so on. Some of the boring logs were taken at GIA Sites that were proposed in 2018, but such sites were removed from consideration in March 2019. Regardless, they are included in the following discussion and in the Appendix.

Gravesend

Attempts were made to complete 53 soil borings in the Gravesend neighborhood, and all but a few were successfully completed; the incomplete borings terminated at relatively shallow depths due to impediments or potentially hazardous strata (Appendix). Successful borings generally extended from the surface to 20 feet below existing grade elevation. Only one boring recorded the presence of a concrete sidewalk extending to one foot below grade (Boring GS35A).

The majority of boring logs for the Gravesend neighborhood reported dry or moist levels of brown fine to medium sand and gravel with traces of silt from the surface down to the termination of the boring (e.g., Borings GS8A, 8D, GS12D, 28A, 38A, and 42A). Several contained fill with architectural debris, including traces of brick, crushed mortar, glass, plastic, and wood, with some fill levels extending to 20 feet below grade (Borings 3A, GS10-1B, 11A, 17A, 46A, 54A, and 121C). Five of the borings with fill were taken on or near Avenue P (Boring 3A, GS10-1B, 11A, and 46A), one was on Quentin Street (Boring 54Aa), and one was taken from the Kings Highway (Boring 131C). In addition, one soil boring contained asphalt from about 12 to 15 feet below grade, suggesting a buried street surface or, more likely, deep disturbance with clean sandy fill added above (Boring 24A on the north side of Avenue P between Ocean Parkway and East 5th Street).

Borings logs for the neighborhood suggest that the majority of proposed GIA Sites have a relatively undisturbed stratigraphy, with seemingly natural levels of sand and gravel containing traces of silt (Appendix). Borings with the most subsurface disturbance, as evidenced by the presence of demolition material in deep levels, are predominantly located on Avenue P. What borings cannot clarify is whether or not any upper levels have been removed through the process of grading to create the relatively uniform landscape evident in the neighborhood.

Southeast Brooklyn

A total of 25 geoprobes were attempted in the Southeast Brooklyn neighborhood, but three terminated at shallow levels due to potential hazardous materials contamination. The remaining 22 boring logs reported levels of sand and gravel with traces of silt from the surface to about 20 feet below grade (Appendix). Several also reported sidewalk pavement in the uppermost level below grade. Only two boring logs reported fill, which extended from the surface to three feet below grade (Borings 8A and 39A). Boring 8A with undescribed fill was located on the west side of East 31st Street just south of Kings Highway, while Boring 39A with brick and asphalt fill was situated on the east side of East 35th Street, south of Flatlands Avenue.

The majority of borings had moist levels of sand and gravel to 20 feet below grade, and none reported shell or historic material apart from the uppermost fill levels in the two borings previously described. Boring GS59B, on the southwest side of East 38th Street south of Flatlands Avenue, contained organic material between 11 and 13 feet below grade, which could represent a buried living surface. The seemingly natural strata reported above the organic material may actually be clean fill, suggesting that this location was formerly wetland or a stream and was filled to level the terrain and make the site developable (Appendix). Alternatively, the organic material could represent a deep intrusion such as a thick lateral tree root. Historic maps and atlases did not show streams or wetlands in this location (U.S.C.S. 1844, Figure 4b; Conner 1852, Figure 5b; Beers 1873, Figure 6b, Robinson 1890, Figure 8b; Hyde 1899, Figure 10b).

Borings suggest that like other locations, the Southeast Brooklyn neighborhood has a relatively undisturbed subsurface stratigraphy. No evidence of extensive filling was reported although there is the possibility that clean fill was deposited where low-lying areas once existed. What borings do not address is whether the original surface formerly had higher elevations that were truncated in order to even out the topography. The presence of only one boring with organic material buried beneath 11 feet of clean fill or natural strata suggests that if there was an

unmapped stream or low-lying wetland in the neighborhood, it was filled. Alternatively, the organic material may represent the decomposing remains of a root from a nearby tree.

Canarsie

A series of 22 geoprobes was completed in the Canarsie neighborhood in August and September of 2018, each extending to a depth of 20 feet below grade (Appendix). The following is a summary of subsurface conditions encountered at the Canarsie GIA Sites.

Most borings, taken where GIA Sites are proposed in sidewalks and adjacent landscaped strips, encountered a one-foot level of topsoil immediately below grade, although in some locations topsoil was not recorded, possibly because of the presence of underlayment beneath the sidewalk (e.g., Boring 51A at the northwest intersection of Avenue K and East 94th Street). Beneath the topsoil in some locations a level of brown, medium fine sand with little silt and fine gravel (SM) was encountered to depths between three and five feet below grade, with levels of sand and clay (SC) or simply sand (SP) beneath (e.g., Boring GS2C at the northwestern intersection of Church Lane and East 89th Street). Other borings reported alternating levels of sand and/or sand with silt beneath the topsoil (e.g., Boring GS16F taken at the northwest intersection of Remsen Avenue and Avenue K). The water table varied, but was typically encountered at about 15 feet below grade. Only one boring had fill beneath added topsoil, Boring GS2F at the southwest corner of Avenue J and East 88th Street where a new building was constructed in 1985 (NYC OASIS, Block 8039 Lot 7501 Location Report). None of the soil boring logs reported the presence of shell, which is often a marker of precontact occupation (Appendix).

The boring logs suggest that in the locations of proposed GIA Sites there is a relatively intact natural stratigraphic sequence, or that in the process of earth moving for the creation of the city street grid, little modification of the terrain was required. Only one boring log reported the presence of a fill level, and that was taken from a site that was redeveloped in the 1980s. The presence of sand with silt in multiple locations (e.g., Boring78A at the northwestern intersection of Rockaway Parkway and Avenue J), attests to the relatively undisturbed subsurface conditions in the area, likely a result of the late date of development, and the fact that most GIA Site locations were predominantly farm land prior to the 1890s and the early 20th century implementation of the city street grid system.

Idlewild

A total of 75 soil borings were undertaken in the Idlewild neighborhood, while 15 additional borings terminated at less than six feet below grade due to obstructions or the presence of potentially hazardous material (Appendix). The majority of borings that encountered obstructions were located on either side of Brookville Boulevard between 141st Avenue and Francis Lewis Boulevard, a section of the Boulevard that has experienced multiple development episodes and is currently crossed by several major roads, an aqueduct, and railroad tracks (Borings 226B(1)(2), 228A(1)(2), 228C(1), and 255A).

Almost all the boring logs reviewed found that the Idlewild neighborhood soils contained alternating levels of moist to dry sand with traces of silt and gravel, varying widely in color between brown, orange, yellow, and gray or a combination thereof (Appendix). Many boring logs reported the presence of a foot or so of topsoil in the uppermost level of the boring, while several instead reported the presence of concrete or sidewalks. The results of Boring 119D, placed on the east side of 243rd Street north of 136th Avenue, differed from most others in that it contained only one uniform level of yellow brown sand with traces of silt extending from immediately beneath the topsoil to 20 feet below grade (Appendix). Likewise, Boring 168C taken on the east side of 241st Street north of 138th Avenue also contained a single level of brown sand with traces of silt from the topsoil to 20 feet below grade. While no streams were mapped in these locations, it is possible that these deep uniform levels represent depressions that were filled with clean sand.

Boring 176A, taken at the northwestern intersection of 138th Avenue and 244th Street, encountered dry wood at three feet below grade and was impeded at four feet below grade. A second attempt 12 feet to the north found no wood, only alternating levels of sand with traces of silt and gravel (Appendix). Dry wood pieces were also found in the uppermost three feet of Borings 294A and 295A, taken from 141st and 143rd Avenues between 241st and 243rd Streets. No other borings reported the presence of cultural material, fill levels, or other soil anomalies.

Overall, the inconsistent depth and thickness of subsurface levels suggest that the neighborhood has experienced a degree of topographic manipulation that resulted in varied subsurface stratigraphy. The presence of deep uniform levels of sand in two locations suggests they may have been intentionally manipulated with the addition of clean fill. Further, the lack of historic artifacts, fill, and shell reported in any of the boring logs suggest that if there was historic land manipulation, it involved redistributing existing natural strata rather than importing fill. Alternatively, these areas may have remained in a relatively pristine state with some locations experiencing seasonal flooding from streams to the east and west, with seemingly uniform sandy sediments accruing over time.

Rockaway West

A series of 31 geoprobes was completed in the Rockaway West neighborhood in July and August of 2018, each extending to a depth of 20 feet below grade (Appendix). The following is a summary of subsurface conditions encountered in the Rockaway GIA Sites.

Virtually all of the borings completed contained levels of light gray medium to fine sand either with or without traces of silt and/or gravel, and most did not have a marked distinction between levels (e.g., Boring 120A on Shorefront Parkway east of 108th Street). Descriptions of sand color varied from gray, light gray, brown, light brown, yellow, yellow brown, yellow gray, red, and a mix of brown, yellow, and red. Sand textures included coarse, medium, and fine, as well as a mix of the three. Few boring logs reported a distinct boundary between sand types and textures.

Only three borings reported levels of fill in the uppermost five feet of stratigraphy: Borings 123A and 124A, both on the east side of Beach 108th Street north of Shore Front Parkway, and Boring 135A, on Shore Front Parkway west of Beach 105th Street (Appendix). In all three cases, the presence of red brick distinguished the fill level from seemingly natural sandy strata beneath. While not reported as "fill," Boring 169A, between Beach 97th and Beach 98th Street on Shore Front Parkway, encountered levels of sand over wood found at about 10 feet below grade (Appendix). Likewise, Boring 212C on the east side of Beach 94th Street just north of Shore Front Parkway also contained wood at about five feet below grade. In both cases, it is likely that the wood originated from one of the multiple building and demolition episodes given the degree of historical construction and reconstruction along the shoreline.

Borings 215A and 214A, taken on the east side of Beach 94th Street north and south of Holland Avenue, each reported a level of reddish brown silt with traces of sand beneath the uppermost foot of topsoil (Appendix). In both cases, the silt level extended to a final depth of about three feet below grade, and lacked brick or other material indicative of a fill or a cultural level. Since these two locations are at some of the highest elevations in the Rockaway West neighborhood, there is the potential that they represent an undisturbed natural soil surface that has developed over the last four hundred years. However, given the devastation to the peninsula with hurricane Sandy and prior storms, it is more likely that the silt levels were added above the natural sand levels to stabilize this area when the street system was implemented and later upgraded.

Several borings had relatively shallow refusals, such as Boring 153A placed just west of Beach 100th Street on the Shore Front Parkway. Only one boring, 174C just west of Beach 96th Street on Shore Front Parkway, reported traces of shell in the first five feet below grade.

The data from the borings reflect the fact that the Rockaway West landscape has changed over time and has been subjected to the effects of time and tide. The peninsula has morphed; its length has grown at the hands of man and nature, and it has been subjected to tidal action as well as damage from significant storms. Historically, multiple hotels and amusement parks were built along the southern shorefront, with virtually each construct later destroyed or significantly damaged. The landscape has been considerably modified as new buildings were erected, and attempts were made to stabilize the topography, with the most recent changes following hurricane Sandy in 2012. The borings do not suggest an intact undisturbed stratigraphy in many places, and only several report anything other than sand.

IV. PRECONTACT SENSITIVITY

A. Precontact Period Summary

In the western hemisphere, the precontact period also refers to the time before European exploration and settlement of the New World. Archaeologists and historians gain their knowledge and understanding of precontact Native Americans in the greater metropolitan New York City area from three sources: ethnographic reports, Native American artifact collections, and archaeological investigations.

Based on data from these sources, a precontact cultural chronology has been devised for the New York City area. Scholars generally divide the precontact era into three main periods, the PaleoIndian (c. 14,000-9,500 years ago), the Archaic (c. 9,500-3,000 years ago), and the Woodland (c. 3,000-500 years ago). The Archaic and Woodland periods are further divided into Early, Middle, and Late substages. The Woodland was followed by the Contact Period (c. 500-300 years ago). Artifacts, settlement, subsistence, and cultural systems changed through time with each of these stages. Characteristics of these temporal periods have been well documented elsewhere, and in keeping with guidelines issued by the OPRHP (2005) and LPC (2018), will not be fully reiterated here. Instead, a summary of known precontact use in the region is presented.

Scholars often characterize precontact sites by their close proximity to a water source, fresh game, and exploitable natural resources (i.e., plants, raw materials for stone tools, clay veins, etc.). These sites are often separated into three categories: primary (campsites or villages), secondary (tool manufacturing, food processing), and isolated finds (a single or very few artifacts either lost or discarded). Primary sites are often situated in locales that are easily defended against both nature (weather) and enemies. Secondary sites are often found in the location of exploitable resources (e.g., shellfish, lithic raw materials).

Brooklyn

At the time of the first European contact with Native Americans, Kings County, at the western end of Long Island, was reportedly inhabited by Munsee-speaking Canarsee and Marechkawieck, members of the Delawaran or Lenape culture group. Although Canarsee is the traditional identification, it is probable that group affiliation was somewhat less monolithic, both geographically and temporally. Historical documents give only three direct references to the Canarsee, and these are restricted to the vicinity of the present Canarsie section of southeastern Kings County, and then only during the mid-17th century (Grumet 1981:6).

Nevertheless, historical narratives written by European travelers and settlers provide eyewitness descriptions of Native American customs and lifeways during the 17th century. Johannes de Laet, in his New World, or Description of West India, published in Holland in 1625 observed:

> They were clothed in the skins of elk, foxes and other animals. Their canoes were made out of the bodies of trees; their arms were bows and arrows, and the arrows had sharp points of stone fastened to them with hard pitch (Thompson 1918:93-94).

Some reportedly lead a wandering life, others live in bark houses, their furniture mainly mats and wooden dishes, stone hatchets, and stone pipes for smoking tobacco (Bolton 1972:16).

Native American settlement patterns at the time of contact incorporated seasonal hunting and gathering. Semi-permanent villages or hamlets, containing oval and round mat-covered structures, were established near planting fields. Large subsurface pits were dug nearby to store dried meat, fish, and corn, and were eventually filled with trash. Although fields were commonly burned at the end of the planting season to encourage floral and faunal repopulation, settlements centered on agricultural land were generally moved every ten to twenty years as soil fertility, firewood supplies, and game resources were depleted (Salwen 1975:57).

Contact with Europeans had far-reaching effects on Native American cultures. European goods such as metal and glass began to replace traditional materials, while warfare and European-introduced diseases against which the Indians had no protection decimated the population in the New York City area. This caused many groups to merge and remerge in complex ways in order to maintain viable communities. In 1670, Daniel Denton observed that the six towns on western Long Island had been reduced to two small villages (Thompson 1918:103). When the

Canarsee are last mentioned in 1684 they were joined with the Rockaway and Massapequa groups to the east. Although the Massapequa eventually moved farther east on Long Island, many Canarsee lingered on at the fringes of European settlements until well into the 19th century (Grumet 1981:6-7).

Nineteenth- and 20th-century research, survey, and excavation have revealed a strong Native American presence in the Borough of Brooklyn. Archeologist Arthur C. Parker noted that "without a doubt . . . it was occupied in nearly every part, and was once an important place of Indian travel and traffic" (Parker 1920:582). The southeastern section of the Borough of Brooklyn is particularly rich in known archaeological sites, and numerous historical documents refer to Native American settlements and toponyms, or place names. Very likely this is attributable to the excellent natural resources which the creeks and marshes presented to prehistoric man, and the relatively late and sparse commercial and residential development which these areas have undergone.

Queens

The earliest accounts (c. 1645) of land transactions in the southern part of Queens County recorded the presence of Native Americans in the vicinity area of Queens at the time the first European settlers arrived. These Native Americans were Munsee-speaking Upper Delaware or Lenape Indians. The place name or toponym Rockaway, from the Delawaran *Rackeaway* or *Rahawacke,* meaning "sandy place," was originally applied to the location, and was later used as a designation for a group of associated, culturally similar peoples. The Rockaway group lived on western Long Island, in portions of southeastern Queens and southwestern Nassau Counties, and their main settlement, *Rechqua Akie*, is believed to have been in Far Rockaway, Queens (Grumet 1981:47).

Settlement pattern data indicate that the Native Americans occupied different locations in settlements of greater and lesser size depending on available resources, such as shellfish, which were harvested seasonally. Such camps were usually near a harvesting station, and [as with *Rechqua Akie*,] large Indian villages were inland, within walking distance of shellfish collection stations (Lucianne Lavin to Cece Saunders, personal communication 11/4/86). Sheltered Jamaica Bay provided an ideal environment for clams, mussels, and "oysters [which] live best in certain shallow bays, sounds, creeks, and estuaries where the salinity, temperature, food supply, and bottom provide favorable combination for reproduction or growth" (Kochiss 1974:33).

Historians have long recorded the presence of shell middens along inlets around Jamaica Bay and on the north shore of the east end of Rockaway Peninsula, indicating the Native American exploitation of shellfish beds. Archaeologist Reginald P. Bolton, in his early 20th century research into Indian sites and paths in Queens County, recorded numerous Native American trails providing access to the bay (Bolton 1922:181). Archaeologist Robert S. Grumet's research on Native American place names and trails shows paths to settlement s near Jamaica and Far Rockaway. Recorded place names, or toponyms, are also indicators of the Native American presence throughout Queens (Grumet 1981:71).

B. Previously Recorded Native American Sites and Potential Sensitivity

The precontact archaeological record of the lands in Brooklyn and those surrounding Jamaica Bay in Queens indicates a long and complex human exploitation of the area. The following is a discussion of known Native American use in or near each of the five neighborhoods, as well as information about precontact archaeological sites that have been identified both in or within a one-mile radius of each of the five neighborhood APEs.

Gravesend

Several Native American sites have been reported a few miles south of the Gravesend GIA Sites near Sheepshead Bay, while no previously recorded precontact archaeological sites have been identified within a one-mile radius of the GIA Sites in Gravesend (NYCRIS 2018). Regardless, there is much evidence of Native American use of the area. According to historian Bolton, the Kings Highway - where several GIA Sites are located - was originally the main Indian path connecting the eastern shore of the East River in Brooklyn to Gravesend and Flatlands village. The trail was reportedly widened by earlier settlers, and in 1704 was officially laid out as a "King's Highway" (Bolton 1922:140). What was formerly Gravesend Road, now McDonald Avenue, was also a Native American trail that terminated to the south near several Native American settlements adjacent to the marshland once just north of Coney Island (Kelly 1946).

About 2000 feet west of the GIA Sites in the Gravesend neighborhood, was historically a small body of water known as Indian Pond (Conner 1852, Figure 5a; Beers 1873, Figure 6a). The pond was located near what is now West 11th Street and Bay Parkway, and was filled in the late 19th century. In the 1645 contract that created the Town of Gravesend, it was described as a "*Certaine pond in an ould Indian field.*" Its native name was "Makeop" or "Makeopaca," roughly translating to "a great clearing or open field" (Kadinsky 2016:78). At the time of Gravesend's founding, most local natives were gone, but a surviving elder reportedly sold the rights to the 31-acre pond for the value of "one gun, one blanket, and one kettle" (Ibid.). Grumet indicated that near the pond was a Native settlement named "Techkonis," that consisted of a single longhouse. Grumet also reported a discrepancy as to its recorded location (1981:56). He points out that historian Van Wyck (1924:403) placed the settlement on the banks of the Indian Pond, while historian Stokes (1915-28, Vol.2:cp l41) placed it west of Prospect Park, the one mapped southeast of the GIA Sites in 1873, not the current Prospect Park three miles to the north (Beers 1873, Figure 6a). The location of "Techkonis" was only portrayed on one historic cartographic source, the 1639 Manatus Map (Vinckeboons 1639), with little accuracy as to location (Grumet 1981:56).

The name Indian Pond itself, as well as the description of the old Indian field, suggests that this important water source and surrounding terrain was utilized by Native American populations, as well as the early European settlers who later occupied the area and preserved the name. And while the location "Techkonis" may have been either west or south of the GIA Sites, the proximity of the Kings Highway trail to the GIA Sites and the location of Indian Pond suggest that the area was well known and traversed by local Native Americans. However, research does not suggest that there is sensitivity for an intact precontact site that would have retained archaeological visibility, such as a village, campsite, or shell midden, in any specific GIA Site location. Instead, these locations are potentially sensitive for ephemeral resources that lack a discrete archaeological footprint, such as Native American planting grounds. The archaeological signature of these ephemeral resources likely did not survive later road grading and paving but there is the possibility that deeper features may exist, however remote.

Southeast Brooklyn

A site file search found one previously identified Native American site, Site 04701.020922, within a mile of the Southeast Brooklyn GIA Sites. The site was described as a Native American village with one longhouse, reportedly near the intersection of Flatbush Avenue and the Kings Highway (Grumet 1981:18). A survey of Native American sites in Brooklyn identified it as Site "26575 NA NMAI[1] Keskaechquerem, Nieuw Amersfoort, in Historic Flatlands" (Pagano 2018). Both Pagano (2018) and Grumet (1981) report several derivations of the name including "Keskachane" and "Keshaechquereren," understood to translate loosely to "the place of meeting for public purpose." Like "Techkonis" in Gravesend, it too is identified on the 1639 Manatus Map (Vinckeboons 1639). The meeting place was reportedly located at the junction of four Native American trails that connected Native settlements to the southeast, southwest, northeast, and northwest (Kelly 1946; Bolton 1922:152). This junction was just north of the intersection of what are now Flatbush Avenue and Kings Highway.

Historian Tooker indicated that the name "Keskaechquerem" was the location of the "council fire" or the main village of the Canarsie Indians near Flatlands (Tooker 1911:78). The name first appeared in documents in 1637 when Sachems from "Keshaechquereren" participated in a number of land transactions in Brooklyn. The settlement was reportedly abandoned by its residents sometime between 1639 and 1641, concurrent with the opening phase of the Governor Kieft War (1640), and was then appropriated as Dutch property (Grumet 1981:19). This intersection of four trails later became the settlement of Niew Amersfoort (Flatlands), with a church established in 1660 near the site of former Native American burial grounds. These became part of the original Dutch Church yard (Bolton 1922:152). The intersection of the four Indian trails and the site of the original village of Flatlands, one of the earliest in Brooklyn, were located about 1500 feet to the northeast of the northeastern most GIA Site - Site 59B on East 38th Street near its intersection with Flatlands Avenue, while the Dutch Church and burial ground were located more than 2000 feet to the northeast (Figure 3-1; Conner 1852, Figure 5b, Beers 1873, Figure 6b). However, the exact location of the reported longhouse in relation to the GIA Sites cannot be determined since its precise location is unknown.

The broadly mapped area of sensitivity reported on NYCRIS for Site 04701.020922, with both a Native American and early historic component, encompasses two GIA Sites, Sites 59B and 59C located on the west side of East 38th Street, south of Flatlands Avenue (Figure 3-1). However, as previously presented, all GIA sites are at least 1500'

[1] National Museum of the American Indian (NMAI)

away from the historic settlement of Flatlands, and further from the Dutch Church and associated burial ground. The NYSM mapped area of sensitivity is expanded beyond its actual location to provide a buffer of potential sensitivity. There is no evidence that any GIA Site is within the actual footprint of the Native American settlement. However, since they are within the buffer area, they may have a slightly elevated sensitivity for ephemeral precontact resources.

Canarsie

NYCRIS reported that Site 04701.000113, a Native American village site "with human remains," encompassed the northeastern one-third of the Canarsie neighborhood. The site inventory form reported that the village near Canarsie Beach extended "as far north as Avenue J and is centered on East 92nd Street" (Site Form USN 04701.000113). Brooklyn historian James Kelly also placed a settlement of Canarsie southeast of the southernmost GIA Site, near the shoreline of Jamaica Bay, accessed by a trail along East 92nd Street originating at Flatbush Avenue, it too a Native American trail (Kelly 1946). After the end of the Governor Kieft War (1645) and the sale of their homelands, the Marechkawieck and Keshaechquereren peoples reportedly relocated to the Canarsie section of Brooklyn. They remained there with the Canarsee until their lands were sold to the English in the 1680s. Some reportedly stayed on, living in "inconspicuous huts in the back lots of English settlements throughout the eighteenth century" (Grumet 1981:7). By 1830, the last of the Canarsee Indians living in the immediate vicinity had died (Ibid.).

Several historians concluded that the main village of the Canarsie was located closer to Nieuw Amersfoort (now Flatlands) to the northwest of the Canarsie GIA Sites, while others placed it on the shoreline to the south (e.g., Kelly). Bolton described Canarsie as "a village site" with "extensive planting fields, extended back from Canarsie Beach Park as far as Avenue J, centered on East 92nd Street," which the Site inventory form repeated verbatim (Bolton 1934:146). Archaeologically, the site is said to have been easily discernable because of "immense shell heaps."

Archaeologist Arthur C. Parker, writing in 1920, reported the presence of shell heaps at Canarsie near Flatlands, but made no mention of burials or shell heaps on the shoreline (1920:582). The closest burial he reported was a Native American "Burial place in South Brooklyn found on Avenue U and near Ryder's Pond and Sheepshead Bay," which would place it in Marine Park to the west (Ibid.). Historian Bolton also failed to mention Native American burials in the Canarsie area, but also placed burials at Ryder's Pond and Avenue U in Marine Park, far southwest of the Canarsie GIA Sites and separated by a marsh and creek (1934:146). The Site 04701.000113 inventory form made no mention of burials, nor was the box checked for mortuary remains; instead, it described the site as a village near the beach on land owned by the National Park Service. The site soils were described as eroding "organic humus and landfill." It is entirely possible that the interpretation of this site as having burials is a misreading of the presence of "organic humus" or simply that this site was confused with the well-known Ryder's Pond site to the southwest in Marine Park. No documents could be found corroborating the presence of Native American burials ever having been found in or near the location of the Canarsie GIA Sites.

Within the area designated as potentially sensitive for Site 04701.000113, the village and/or planting fields of the Canarsie, are nine GIA Sites (see locations on Figures 3-5 and 3-6):

49A on the north side of Avenue K;
50B and 70A on the south side of Avenue K;
51A on the west side of East 94th Street;
66A and 66B on the south side of Avenue J;
78A and 78C on the north side of Avenue J; and,
79A on the east side of Rockaway Parkway.

Since the shoreline was historically located about 0.8 miles south of the southernmost GIA Sites on Avenue K, it is unlikely that any of these GIA Sites are sensitive for the footprint of the village, but rather would have potentially been within the planting fields as reported by several historians.

Idlewild

Archaeologist Eugene Boesch's sensitivity assessment of Queens reported no sites in the Idlewild neighborhood, but suggested a potentially higher than average sensitivity for precontact resources due to the presence of Brookville Creek to the west and Hook Creek to the east (Boesch 1997). Hook Creek historically meandered from the north to Jamaica Bay, paralleling Hook Creek Boulevard to the east.

A site file search at NYCRIS found one NYSM precontact site in the Idlewild neighborhood that encompassed multiple GIA Sites, NYSM Site 4534, a shell heap and village shown as centered on Conduit Avenue near its intersection with 138th Avenue (Figure 3-19). However, the mapped location of this site may be incorrect. The original site form for Site 4534 places it far to the east of the Idlewild neighborhood, closer to Bergin Basin and the Aqueduct Racetrack, east of JFK Airport. In a prior site file search completed for the 1991documentary study of *The New York City Long Range Sludge Management Plan Generic Environmental Impact Statement III JFK West, Queens Phase IA Archaeological Assessment* (HPI 1991), Site 3454 was mapped at Hamilton Beach near Bergen Basin, almost five miles west of the Idlewild neighborhood. Parker described the site as being "near the Hook Creek station on the road to Far Rockaway" (Parker 1920:672). His map of site locations in Queens placed the site far east of the Idlewild neighborhood as well (Ibid.: Plate 208). Therefore, the Idlewild GIA Sites are not potentially sensitive for this precontact site.

NYSM Site 4547 was also reported about 0.3 miles southeast of the southeastern most GIA Site on 248th Street. While the NYCRIS database lacked a description of this site, it may refer to Native American planting fields reported by Grumet in the area of Brookville Park, immediately east of Brookville Boulevard and continuing south into Hook Creek and Idlewild Parks, outside of the Idlewild neighborhood (Grumet 1981:71). Historian Bolton failed to report any Native American sites in the immediate area, but did note a precontact site at Hassock Creek, west of the village of Springfield at least a mile from the Idlewild neighborhood. That site yielded pottery, stone tools, and shells (Bolton 1934:140).

Past work in the nearby area has found a precontact preference for higher elevation inland areas, noting the existence of low-lying streams and a lack of established precontact or Contact Period paths in the immediate area as the reason for a probable low site density (Grumet 1981:71; HPI 2000:2). Further, a Phase I archaeological investigation of a lot between North Conduit Avenue and Sunrise Highway opposite 138th Avenue found no precontact artifacts in any of the 20 shovel tests completed (Herrera 2017:10). Instead, the lot was found to have been disturbed by 20th century development in the immediate area.

While the Boesch sensitivity assessment suggested the potential for precontact resources throughout this neighborhood, traces of precontact use are likely to be ephemeral, at best, and representative of the use of the area in a transient and superficial way and possibly as planting fields, with larger settlements focused on wetlands to the south.

Rockaway West

The archaeological site file inventory from NYCRIS recorded no precontact sites within one mile of the GIA Sites. Further, neither Parker nor Grumet reported any sites or trails near the Rockaway West GIA Sites (Parker 1920: 625, pl. 191; Grumet 1981:71).

Although there is evidence of Native American sites including shell middens and burials on the north shore of the Rockaway Peninsula on sheltered land bordering Jamaica Bay in Bayswater, there is no definitive evidence of a Native American presence on the Rockaway peninsula near the Rockaway West neighborhood (Panamerican 2003:12). Prior studies of archaeological sensitivity for the peninsula have concluded that known settlement patterns show a preference for higher elevations to the east. Exposed locations with low elevations near the south beach argue against the presence of any form of sustained harvesting station, camp site, or village location (HPI 1989:5).

Historian Bellot writes that "the settlement of Edgemere and all of the westerly end [of the Rockaway Peninsula} consists of sand, much of which has been pumped in to make a more solid foundation than was afforded by the sandy marshes, which existed before real estate developers and builders took a hand in the matter. The other villages [to the east] are on solid terra firma and lakes, woods, and streams abound. There is no rock formation or

strata" (Bellot 1917). Conservation ecologist Eric Sanderson's study of the Rockaway peninsula likewise concludes that it only developed over the course of the last 400 years as a result of wave and storm action (2016:277).

Prior archaeological studies of the south shore of the Rockaway Peninsula have concluded that in situ precontact archaeological deposits dating to the period after the barrier beach reached its present location would not be anticipated (Panamerican 2003:12). Archaeologist Stephen Kopper's study of the south shore of the peninsula, east of the Rockaway West neighborhood, concluded that in such an environment, surface and underwater accumulations of artifacts, shells and other food debris, and even small features of human manufacture tend to become buried rapidly then re-exposed and dispersed or destroyed under the action of storm waves. He concludes that high-energy storm waves are capable of dispersing or destroying the relatively fragile remains of prehistoric activity that may be exposed underwater or above water on open storm beaches, such as those along what is now the Rockaway peninsula (1979:4). Therefore, while there may have been locations exposed above sea level prior to the development of the peninsula more than 400 years ago, any precontact deposits would have been significantly disturbed. The likelihood that in situ precontact resources exist in any of the GIA Sites is virtually nonexistent.

V. HISTORICAL PERIOD ARCHAEOLOGICAL SENSITIVITY

A. Historical Period Summary

Gravesend[2]

The Gravesend neighborhood encompassing the GIA Sites is bounded by West 7th Street to the west, the north side of Avenue P to the north, Ocean Parkway to the east, and the south side of Kings Highway to the south. Historically, Gravesend was bounded by Flatbush to the north, Flatlands to the east, the Atlantic Ocean to the south, and the town of New Utrecht, now Bensonhurst, to the west.

Gravesend was first officially settled in 1643 by a colony of English under Lady Deborah Moody, a woman of wealth and education who had been made baronet by King James in 1622 (Stockwell 1884:2). After a series of deleterious incidents in Massachusetts and her subsequent excommunication from the Church of England for her Anabaptist beliefs, her family and several other British dissidents relocated to Nieuw Amsterdam. Here they were joined by Nicholas Stillwell, a tobacco planter, and his comrades, who had already been driven from their settlement in eastern Manhattan by Indian attacks. The West India Company, desperate to secure settlers to occupy its lands and hold off the encroachments of expansionist New England, readily admitted the foreigners, and in June of 1643, Governor-General Willem Kieft gave Moody permission to settle at a site he named Gravesande[3], after the ancient residence of the Counts of Holland. The English settlers corrupted the name to Gravesend, probably thinking of the port of the same name on the Thames (Brodhead 1853:367; Stillwell 1884:5-6).

Moody and her compatriots were not the first European settlers in the area. A month previously, in May 1643, Kieft had issued a patent for 100 morgen (200 acres) to the southwest and west of the original Gravesend settlement to Antonie Jansen van Salee. The patent was made retroactive to August 1639, when he first petitioned for the lands, but there is no record of his settling there. One section of the property was named "Old Bowery" and was partially in the neighboring town of New Utrecht, an area later known as Unionville. The other section was long known as "Twelve Morgen," situated in a swampy area on Hubbards Creek, about two miles southwest of the GIA Sites (Conner 1852, Figure 5a).

Gravesend is unique in a number of ways. It was the only English town founded in present Kings County, with a town patent (1645), it is the only one in which a woman, Lady Moody, headed the list of patentees. The town patent was liberal, even for the Netherlands, guaranteeing freedom of worship "without magisterial or ministerial interference." Religion was left up to the individual, and therefore no provision for a church was made, neither for a burial ground, town hall, nor school. The town plan, comparable to the sophisticated orthogonal layout of New Haven and later Philadelphia, was based on a central square of 16 acres, divided into four smaller squares, each

[2] Portions of this section are excerpted from HPI's 1998 *Avenue V Pumping Station, Phase IA Archaeological Assessment* prepared for Allee King Rosen and Fleming, Inc., New York.

[3] *Gravensande* translates to "the count's beach."

surrounded by a street, with the town centered on the intersection of what are now McDonald Avenue and Gravesend Neck Road, about .6 miles south of the southernmost boundary of the project site. The perimeters of the four squares were divided into ten equal lots, one for each of the forty original patentees. The lots surrounded common yards, where cattle were to be kept when brought in from pasture. This town core was surrounded by a palisade, from which triangular "planters' lots" radiated like the spokes of a wheel (Conner 1852, Figure 5a). Among other things, this arrangement meant that all the farm lots were the same distance from the settlement, and each patentee could reach his own farm without trespassing (Stockwell 1884:160-162).

During the first year of settlement, Gravesend was almost destroyed by constant Indian attacks, during the colony-wide war that was a result of Governor Kieft's inept Indian policy. The community survived, and organized itself, choosing town court justices, a constable and town clerk. Laws were enacted against conducting business on Sundays, selling alcohol to Indians, and even selling more than a pint of alcohol at a time to other colonists (Stockwell 1884:163-165).

In 1657, a division of land around the village was made, with land to the immediate north subdivided into 12-acre lots (Stockwell 1884:9). With the English conquest of New Netherland in 1664, the existing town patent was confirmed. Between 1668 and 1685, the English designated Gravesend a "shire" town, necessitating the construction of a court of sessions in the northwestern village square. During and after this period, when the court was returned to Flatbush, the Sessions house was used as a meetinghouse for the Quakers, and later served as Gravesend's Dutch Reformed Church (Stillwell 1884:9-10).

Given the unstable political climate of the last quarter of the 17th century, the town attempted to strengthen its title to the surrounding area with real estate purchases from local Indians Crackewasco, Arrenopeah, Mamekto and Annenges (1684), including beach, meadow and valley land to the south and east of the town center. The northernmost part of town, including sections of the Gravesend neighborhood, was thickly wooded and thus was referred to as the "North Woods." This area was not subdivided between residents until 1684. By the 1690s, the Kings Highway had been laid out east to west in the northern section of town, and in the Gravesend neighborhood, to allow farmers from Flatlands to more easily access New Utrecht (Stockwell 1884:15).

The village of Gravesend and its surroundings changed little during the 18th and early 19th centuries. In 1698, the town had a population of 210, including 17 slaves (Stockwell 1884:14). By 1738, the number had only increased to 268 (Ibid.). Because of Gravesend's commodious harbor, Gravesend Bay, the early settlers had hoped to develop the town into a major port, but despite its size, the shallowness of the bay was unsuitable for even the ships of that century. Therefore, the town grew slowly, maintaining its rural character. During the American Revolution, British forces landed within a mile of the village in neighboring New Utrecht, and General Cornwallis passed through in 1776. Some soldiers were billeted in local houses, and after the war, several Hessians remained behind and settled within the township. By 1810, the population of Gravesend was only 520 (Stockwell 1884:15).

Met with opposition from local landholders in the mid-19th century, Gravesend Avenue (now McDonald Avenue) was extended outward from the village center to connect the Coney Island Bridge Road to the south with points to the north (U.S.C.S. 1844, Figures 4a; Conner 1852, Figure 5a). The road, originally four rods (64 feet) wide, extended north through the town of Flatbush up to "the Clove in Flatbush Hill, at the Patent-line between the towns of Flatbush and Brooklyn" (Stockwell 1884:16). It was widened to 100 feet by act of legislature in 1875 at the expense of abutters (Ibid.). In 1870, the Parks Commission passed an act to survey and lay out the grid system of streets evident on the landscape today (Stockwell 1884:18).

The NRHP Ocean Parkway was laid out in the 1870s, and completed in stages. The first section from Prospect Park to Gravesend was completed in 1875, and the remainder south of Kings Highway was completed by 1884. The existing parkway has a central roadway, complementary grassy median-pedestrian paths, and an access road on either side, with a total width of 210 feet (64 m). In his assessment of the parkway in 1884, Stockwell wrote, "it is simply the extension of Prospect Park, in one broad magnificent avenue to the Atlantic Ocean" (1884:17).

With the opening of three prominent racetracks (Sheepshead Bay Race Track, Gravesend Race Track, and Brighton Beach Race Course) in the late 19th century, and the blossoming of Coney Island into a popular vacation spot, the town of Gravesend was transformed into a successful resort community. One of the racetracks, founded by the Prospect Park Fairgrounds Association in 1868, was constructed on a 60-acre tract near Gravesend Avenue (now McDonald Avenue; Beers 1873, Figure 6a). After Ocean Parkway was completed, the track was relocated to the

west side of the Parkway, immediately south of Kings Highway just south of the GIA Sites, and became the Brooklyn Jockey Club (Stockwell 1884: 31). By 1890, the Parkway Driving Club had established another smaller racetrack on the north side of Kings Highway west of the Parkway, opposite the Brooklyn Jockey Club (Robinson 1890, Figure 8a; Hyde 1899, Figure 10a).

By 1886, the Kings County Water Company was supplying water to the village of Gravesend through a series of wells and pumping plants (*Brooklyn Daily Eagle* 10/8/1886). While the exact date of sewer and water installation in streets where GIA Sites are located is not definitive, presumably, they were installed concurrent with the laying out of the street grid system in the late 19th and early 20th centuries as each road was regulated and paved. Earlier structures would have had to rely on individual wells and privies or cesspools.

The majority of construction in and around the Gravesend neighborhood post-dates the actual implementation of the grid system in Gravesend. While paper streets and avenues existed in the 1890s, it was not until the early 20th century that streets were cleared of earlier structures, regulated, and opened, with standardized blocks and lots created between them (Hyde 1907, Figure 12a).

Residents of the area petitioned the City for relief from assessments for the expense of filling in "an excavation or sand pit" in Avenue P that the village of Gravesend bought in 1850 for quarrying sand and gravel. Removed material was used to upkeep streets in the surrounding neighborhood (NYBOEA 1913). In 1910, plans were being made to open Avenue P from Coney Island Avenue (East 11th Street) to Gravesend Avenue (McDonald Avenue) (*Brooklyn Daily Eagle* 2/2/1910a). In 1911, Avenue Q (Quentin Avenue) from Stillwell Avenue to Gravesend Avenue and from Ocean Parkway to East 12th street was opened (NYBOEA 1913), and sewers were laid in Avenue P between Ocean Parkway and East 9th Street (*Brooklyn Daily Eagle* 5/18/1922). Streets in the neighborhood between Gravesend (McDonald) Avenue, Avenue M, East 3rd Street, Avenue N, Ocean Parkway, and Avenue O all underwent line changes and grade changes that same year (Ibid.). Also, in 1922 plans were made to "lower the established grade of Avenue P about one foot at Dahill Road for a corresponding change in the grade of Avenue Q at its intersection with West lst street and also with Dahill road, and the introduction of a summit in each of the last named streets in the blocks between Avenue Q and Kings highway with the effect of raising the established grade a maximum of about 1 feet in each instance" (NYBOEA 1922). Each of these street changes has caused a degree subsurface disturbance to the locations of GIA Sites.

Southeast Brooklyn[4]

The Southeast Brooklyn GIA Sites are clustered south of the early historic village of Flatlands, and are bounded by Kings Highway on the north, Nostrand Avenue on the west, Avenue P on the south, and Coleman Avenue on the east. Historically it fell within Flatlands, although the neighborhood is now considered to be in Marine Park.

Initial settlement of what is now known as Flatlands was centered just north of the GIA Sites, near modern day Kings Highway and Flatbush Avenue. In 1636 the first recorded European landowners, Andries Hudde and Wolfert Gerritsen, purchased, under questionable legal circumstances, about 3,600 acres in the Southeast Brooklyn neighborhood from two "chiefs," Penhawitz and Kakapeteyno, and their party of seven Indians. Hudde was a member of Governor-General Wouter van Twiller's council, and seems to have used his political clout to secure illegal ownership of the desirable lands. In 1630 Gerritsen became the overseer of farms for the private colony or patroonship of Rennselaerswyck (Van Wyck 1924:15-16; Brodhead 1853:201, 223, 265). The existence of several European place names in the proximity to the GIA Sites suggests that undocumented and unauthorized settlement may have preceded this land grant. Brooklyn historian Henry Stiles wrote that "some rude settlement was probably formed here [in Flatlands] as early as 1624" (Stiles 1884:65).

Hudde and Gerritsen's property, called Achtervelt, was farmed by tenants. Wooden buildings were reportedly surrounded by a protective palisade (Ostrander 1894:54). The 1639 Manatus Map (Vinckeboons 1639) shows "2 plantations and 2 farms of Wolfert Geritsz and 2 of his partner." These structures became the center of a hamlet called Nieuw Amersfoordt, named for the village near Utrecht where Gerritsen was born (Ibid.:15). Hudde, who never resided here, sold his interest to Gerritsen in 1647 (Ibid.:15, 84). By the time the Hubbarde Map was drawn in

[4] Portions of this section are excerpted from HPI's 2010 *Archaeological Documentary Study, 2101-2115 Utica Avenue, Block, 7875, Lot 27, Brooklyn, Kings County, New York, CEQR: 26111 K* prepared for Dabes Realty Company, Brooklyn.

1666, the village at Flatlands had grown to at least 22 structures, including the octagonal Dutch church which was completed in 1663 to house the congregation founded in 1654. Most of the structures were located about 1500 feet northeast of the easternmost GIA Site.

The main change that occurred after the English conquest of New Netherland (1664) was the displacement of the settlement's Dutch name with the topographically descriptive term, Flatlands. Richard Nicholls, the first English governor, granted the town of "Amersfoort, alias Flatlands" with a charter, and in 1667, Nicholls further confirmed the ownership of the Hudde/Gerritsen patent to Elbert Elbertsen Stoothoff, who had married the widow of Wolfert Gerritsen van Kouwenhoven's eldest son (Van Wyck 1924:16; Ross 1903:310, 311). Throughout the late 17th century, the town of Flatlands, populated by farmers and artisans, continued to prosper. By 1683 there were 1,683 acres under cultivation in the town, and in 1698 the population of Flatlands was 256 (Stiles 1884:68-69).

The 18th century brought continued growth to the area and most of the population remained neutral during the conflict with England. Although British and Hessian troops passed through the settlement seizing foodstuff and equipment during the American Revolution, there is no evidence that any troops were quartered there. The village was left with just a single guard until the end of the war (Stiles 1884:70-73). The 1781 Taylor and Skinner map shows that at least by this time, what was known as "Mill Lane," a road that led from the center of Flatlands past the GIA Sites to the mill along Jamaica Bay, was in place, and several structures were located on either side of the road. The houses that dotted the landscape in the 17th and 18th centuries were the homes and plots of farmers, many of whom kept slaves up until 1827 when the system of slavery was abolished in New York.

By the mid-19th century, the GIA Sites fell within a 38-acre tract owned by P. Lott, and a 100-acre lot tract owned by George Wyckoff (U.S.C.S. 1844, Figure 4b; Conner 1852, Figure 5b; Beers 1873, Figure 6b). The Lotts were wealthy landowners who had occupied Flatlands and neighboring Flatbush for decades. In 1896, Flatlands at last was absorbed into the boundaries of Brooklyn, and in 1898, all of Kings County became part of New York City (Thompson 1918:146). By 1890, however, the city street grid that exists in Flatlands today had already been projected onto the landscape, and the 1890 Robinson atlas (Figure 8b) illustrates both the existing conditions for each GIA Site, as well as the new streets that were planned for the area. By the early 1900s, all buildings that formerly stood in planned street beds had been removed or relocated, and the grid system was firmly established (Hyde 1899, Figure 10b; Hyde 1907, Figure 12b; Hyde 1920, Figure 16a).

The majority of construction in and around the GIA Sites post-dates the implementation of the grid system in Flatlands. While paper streets and avenues existed in the 1890s, it was not until the early 20th century that streets were actually laid out, with standardized blocks and lots created between them (Hyde 1907, Figure 12b). In the 20th century, Flatlands was still agricultural, but eventually became a working and middle-class residential Brooklyn neighborhood, with multi-story brick apartment buildings and smaller two-family houses constructed in the 1920s through 1960s. Virtually all development on city blocks adjacent to the GIA APEs dates from the 1920s onward.

Canarsie[5]

The Canarsie GIA Sites are clustered in the southeastern part of Brooklyn, on land to the north of former marshes on Jamaica Bay, with Paerdegat Basin to the southwest, Fresh Basin to the northeast, and Foster Avenue to the north. The GIA Sites are slightly southwest of the main settlement of Canarsie, the main thoroughfare of which was Canarsie Road, now East 92nd Street.

Southeastern Kings County was originally divided among several towns, whose jurisdictions extended into the meadowlands bordering Jamaica Bay. One of these was the village of Nieuw Amersfoort, now Flatlands, established in 1636. The bulk of the contents of the original Flatlands patent lay inland. However, parts of the bay front received the residents' early and continued attention. The most important of these, between Bestovers or Befords Creek and Fresh Creek, was generally known as Canarsie (Black 1981:9).

In a January 21, 1647 patent, the first direct reference to the Canarsie was made when Governor Willem Kieft "… granted to George Baxter and Richard Clof, with their associates, a certain tract of land situate on the south side of Long Island called Canarsie with all the meadows belonging" (Tooker 1911:32-33). Later variations on the name

[5] Portions of this section are excerpted from HPI's 1998 *Stage 1A Cultural Resources Assessment, Belt Parkway Bridges Project, Brooklyn, New York, DOT CEQR No.97DOT006K.*

include Conorasset, 1656; "Piece of meadow land near the Canarisse," 1661; Canaryssen, 1666; Canause, 1666; Canarisea, 1680; and Kanarsingh, 1719 (Lopez and Wisniewski 1971:4).

Despite the1647 land transfer, Native Americans remained in the area through at least the mid-1660s, with residents in the village of Amersfoort renting their fields at Canarsie. The lands at Canarsie were sold outright to the Dutch in 1665, with the condition: ...that the purchasers once for always a fence shall set at Canarissen for the protection of the Indian cultivation..., and the land which becomes inclosed [sic] in fence shall by the Indian owners above mentioned all their lives to be used, to wit, by Wametappack, the Sachem, with his two brothers... (Stiles 1884 Vol. 1:81).

The first European to make a permanent home in the Canarsie area was Dutchman Peter Claesen Wyckoff, who arrived in 1652 after several years of indentured servitude in the Albany area. In 1655, Wyckoff signed a contract to become the superintendent of the bowery (farm) and cattle of Peter Stuyvesant in New Amersfoort, on Long Island. Wyckoff's residence was far to the northwest of the GIA Sites, at what is now Clarenden Road and Ralph Avenue, but he may have pastured sheep and cattle at the meadows of Canarsie. By 1660, what later became known as Canarsie Point was designated as Vischers (Fishers) Hook, after a Dutch fisherman by the name of Hoorn, who built a home there (Black 1981:21).

Farming and fishing were the main livelihoods in Canarsie until the Brooklyn and Rockaway Beach Railroad was built in 1865 as a way to connect to steamboat service taking passengers to the seaside resorts on Rockaway peninsula. Before then, when farming was the main source of subsistence in southeast Brooklyn, a diversity of crops and livestock were raised on small farms; excesses were minimal and sold for profit. To gain prosperity, farmers frequently had secondary skills, and each town had a small number of merchants and craftsmen (Black 1981:19). During this time, the meadowlands at Canarsie were considered very valuable. The Vanderveer family operated a tidal gristmill on Fresh Creek about a half-mile southeast of the GIA Sites beginning in 1750 and throughout the 19th century. Further, the harvested salt grasses were an important source of much-needed feed for domestic animals. The numerous small creeks that drained into Jamaica Bay were important for fishing, transportation, and were the locations of tidal gristmills. As visitors to Flatlands commented in 1679:

> There is toward the sea, a large piece of low flat land which is overflown at every tide, like the schorr [marsh] with us, miry and muddy at the bottom, and which produces a species of hard salt grass or reed grass. Such a place they call valey and mow it for hay, which cattle would rather eat than fresh hay or grass. It is so hard they cannot mow it with a common scythe, like ours, but must have the English scythe for the purpose….All the land from the bay to Vlacke Bos [Flatbush] is low and level, without the least elevation.
>
> There is also a tract which is somewhat large, of a kind of heath, on which sheep could graze . . . This meadow, like all the others, is well provided with good creeks which are navigable and very serviceable for fisheries. (Van Wyck 1924:183; Dankaerts and Sluyter 1966:131).

Portions of the meadows must have been extremely muddy, since the list of officials appointed at the neighboring town of Gravesend's founding included men to extricate trapped cattle from the marshes. On the other hand, exploiting the natural resources like their Native American predecessors, European settlers occupied and built structures on the few existing dry, elevated areas nearby, such as the village that grew into Canarsie.

In the early 18th century, as agriculture flourished in the area, the farmers of Canarsie became increasingly dependent on slave labor to intensify production. The residents relied on their slaves as agents of profitable agricultural production (Brooklyn Public Library 2016).

After slavery was abolished in the State of New York (1827), many free blacks living in Flatlands continued to work as farmhands or servants for the old Dutch families who had previously laid claim to them. In the latter part of the 18th century, a new generation of African Americans settled the meadows of Canarsie and established a free black community known as the "Colored Colony" (Merlis and Rosenzweig 2008: 206). As quoted on the website of the Brooklyn Public Library's *Black Canarsie: A History,*

> Many black families settled in small cottages fronting Baisley's Lane [*which ran from east 95th Street to Rockaway Parkway*]. By the late 1800s, the section near Rockaway Parkway, Skidmore

> Lane [*which ran between Flatlands Avenue and Avenue J*], and Avenues J and K grew into a sizable settlement. Residents of Weeksville (now Ocean Hill) would walk via Hunterfly Road to Canarsie to visit their relatives on Sundays after attending church (Brooklyn Public Library 2016 [italicized text added by author of article]; Merlis and Rosenzweig 2008:206).
>
> The Civil War and its social tribulations left an indelible mark on Canarsie's Colored Colony. As reported in the *Brooklyn Daily Eagle*, Canarsie attracted many black families who had fled Manhattan in the wake of the New York City Draft Riots (July 13-16, 1863), the worst episode of civil unrest in the nation's history. The riots resulted from the outrage of the white working class at new provisions in the federal Enrollment Act that allowed moneyed citizens to be exempt from conscription into the Union Army by way of a paid substitute, usually a poor Irish or German immigrant. Scapegoating blacks as the cause of the war and fearing increased job competition in the wake of emancipation, the mob loosed its furor on the African Americans of New York, lynching black men in the streets and burning an orphanage for black children to the ground. This violent insurrection prompted the flight of hundreds of African Americans from the city to the relative sanctuary of its outlaying regions, among them the village of Canarsie in Flatlands (Brooklyn Public Library 2016).

The "Colored Colony" established a separate place of worship, Plymouth Congregational Church, at the heart of their community. It was founded in 1880 by Rev. Emanuel Holmes under the name St. Paul's Congregational Church. Services were originally held "on the second floor of a house in East 92nd Street, near Skidmore Lane" (Brooklyn Public Library 2016). By the early 1890s, the congregation had been rechristened 'Plymouth' and relocated to a wooden building on Rockaway Parkway near Baisley's Lane (now gone), at what is now the southeastern intersection of Avenue J and East 96th Street (Robinson 1890, Figure 8c). The building was razed and a high school now stands in its place. The high school and much of what was once the African American community was centered between East 92nd Street and Rockaway Parkway, Avenue J, and Avenue K, although the implementation of the grid system caused the removal of most structures associated with this early enclave.

Development in the Canarsie area was initially focused on East 92nd Street, formerly Canarsie Road (Conner 1852, Figure 5c). In 1840, the Methodist Protestant Church was built at what is now the southwest corner of East 92nd Street and Church Lane (U.S.C.S. 1844; Figure 4c). The original structure was replaced by a larger one in 1870, and was later known as Grace Protestant Church, and is now the Church of the Rock at 1280 East 92nd Street. The land for the church was originally donated by John Remsen, and the church was constructed after a Sunday School had been established in a nearby building in 1840 by Ralph Van Houten (Stiles 1884 Vol. I:75). In 1842, when the original church construction was finished, the Reverend Frederick Dickerman became the first pastor (Ibid.). One year later, John Remsen donated additional land to the west to be used as a burial ground. Ultimately, there were two cemeteries to the south of what is now Church Lane, the Methodist Protestant cemetery between what are now East 92nd Street to a point west of East 91st Street, and Canarsie Cemetery. The Methodist Protestant Cemetery was bisected when East 91st Street was cut through it (Hyde 1899, Figure 10c), and was the topic of an intensive documentary study by archaeologist Joan Geismar (1987). She concluded that the graveyard once contained at least 150 burials, dating from at least 1846 to 1907, 91 of which were never reportedly exhumed (Ibid.:6). The cemetery has no standing headstones, and is fenced off. No GIA Sites are located within 150 feet of it.

The larger Canarsie Cemetery was established at the very end of the 19th century, south of Church Lane and west of Remsen Avenue (Figures 8c and 10c). The earliest documented burial there occurred in 1899, after Remsen Avenue was laid out, and over time, burials were reportedly removed from the old cemetery to the east and reinterred at Canarsie Cemetery (Stiles 1884 Vol. I:75). However, as Geismar noted, almost 100 burials were not relocated.

After Rockaway Parkway (then Avenue) was laid out in the 1870s, residential development between it and East 92nd Street grew. Narrow streets were laid out perpendicular to these two main routes, and subdivisions sprang up in the vicinity of what are now Farragut Road, Flatlands Avenue, and Avenue J (Beers 1873, Figure 6c). While the African American population retained ownership of much of the real estate in the "Colored Colony," through the end of the 19th century, their population began to decline as properties were condemned for the creation of the street grid system. In the first half of the 20th century, the population of Canarsie became increasingly white, and the "Colored Colony" dispersed as new streets and avenues eradicated older roads and houses in their routes (Robinson 1890, Figure 8c).

In 1896, Flatlands and Canarsie were annexed into the City of Brooklyn. With the creation of Greater New York two years later, the marshes around Jamaica Bay were seen more and more as a wasteland, ripe for development (Hyde 1899, Figure 10c). In 1905, the City Comptroller released a report calling for the filling of most of the marsh and bay, leaving channels between islands for shipping lanes. The lowlands were to be filled with city ash and refuse, and extensive bulkheads and numerous wharves built. However, due to the grandiose nature of the plan, scandal and the Great Depression, only parts of this plan were ever implemented, such as the construction of Paerdegat Basin and Canarsie Pier in 1925. By the 1920s, the street grid system had been further implemented (Hyde 1920, Figure 16b).

Sewer and water came late to the Canarsie neighborhood. Water lines were planned for several avenues in the neighborhood in 1899 (*Brooklyn Daily Eagle* 1/18/1899*)*, including some sections of Rockaway Parkway, Conklin and Flatbush Avenues, and Avenue K. However, much of the grid system in Canarsie had not been implemented by 1910, so sewer lines had not yet been laid out. The *Brooklyn Daily Eagle* reported that "The Sewer Bureau hasn't even drawn plans for a sewer system for Canarsie, because, as far as the sewer engineers are concerned, Conklin Avenue and the other important thoroughfares down there by the bay are not in existence," Conklin Avenue being about 1000 feet north of the GIA Sites (*Brooklyn Daily Eagle* 2/16/1910b). By 1915, sewer and water lines had been laid out through much of the Canarsie neighborhood, and building lots accessed by freshly macadamized roads with gas and water lines were advertised for sale on East 92nd Street (*Brooklyn Daily Eagle* 5/28/1915). Most structures predating this time, especially those not on main thoroughfares, would have had to rely on wells and privies or cesspools.

Idlewild

The Idlewild GIA Sites are located in the easternmost part of Queens near its border with Nassau County, in the community of what is now Rosedale. Brookville Boulevard (formerly Foster's Meadow Road) and the Belt Parkway just east of Simonson Creek, formerly Old Mill Creek, demarcate the western boundary of the Idlewild neighborhood, while Hook Creek Boulevard and the Queens/Nassau County boundary are to the east. To the north is 135th Avenue, and 143rd Avenue is to the south. North and South Conduit Avenue, the Sunrise Highway (aka State Highway 27), and the Long Island Railroad (LIRR) bisect the Idlewild neighborhood.

What is now the Rosedale neighborhood was historically part of the area designated by the Dutch as Rustdorp ("rest-town"), which encompassed all of southern Queens. In 1655, it was settled by English colonists from Massachusetts and Heemstede (Hempstead in present Nassau County), who requested permission from Director General Peter Stuyvesant to establish a town halfway between Hemstede and Amersfoort (Flatlands in Kings County). The settlers referred to the village as "jemeco" which was Delaware for beaver, due to its proximity to a beaver pond (far northwest of the GIA Sites in what is now the village of Jamaica), and was later corrupted to Jamaica (Munsell 1882:192). Jamaica's proprietors purchased surrounding lands from Native Americans in order to strengthen the town's title to lands granted by the Dutch colonial government. The settlement at Springfield, at the crossroads of what are now Merrick and Springfield Boulevards, and the area of Rosedale were settled equally early (Munsell 1882:198).

After the British established rule in 1664, New Amsterdam became "New York" and Long Island became "Yorkshire," with Yorkshire being divided into "ridings" or thirds. Jamaica became part of the "North Riding" (Seyfried and Asadorian 1991:vi). In 1683, the system of ridings was abolished under Governor Thomas Dongan, and ten counties were created; three on Long Island. It was at that time that Kings, Queens, and Suffolk Counties came into existence, and Rustdorp was renamed Jamaica.

While the main settlement of Springfield was to the west of the Idlewild neighborhood, what is now Rosedale and the area to the north was known as southern Foster's Meadow, named after Thomas and Christopher Foster who settled there in 1650. Fosters Meadow included land in both what are now Queens and Nassau Counties, with northern Foster's Meadow lying in Nassau. When first settled, the Fosters used the western tip of the Hempstead Plains as a sheep pasture (Munsell 1882:201). Most of the land in eastern Queens that was not marsh around Jamaica Bay, served as farmland for centuries.

Between 1675-1700, many of the streams in lower Queens were dammed and mills were built on them. One such mill was established on Simonson's Creek immediately northeast of the GIA Sites, where what is now Merrick Avenue (once a plank road) intersects Brookfield Boulevard (Munsell 1882:201). In 1700, farms were scattered

along the countryside between Jamaica and the Nassau County boundary, with dirt and plank roads connecting them. In the 18th and first half of the 19th century, the area was populated by descendants of Dutch and English immigrants who established a vibrant farming community (Figure 4d). But it was in the 1850s when the area received an influx of German immigrants that the ethnic identity of the area started to change (Munsell 1882:201).

In the 1850s, the Nassau Water Works Company, which supplied the city of Brooklyn with water, purchased the water rights to many of the fresh water streams in eastern Queens (Conner 1852, Figure 5d). The then formed Brooklyn Water Works cleaned out the old millponds on Simonson's Creek, built new dams, and created a large 14-acre pond north of Merrick Avenue and an 8-acre pond to the south (Munsell 1882:202). Together, the two were known as "Twin Ponds," and provided a daily supply of roughly 2,000,000 gallons of water (Munsell 1882:202). An east-west arched brick conduit was constructed running from the Hempstead Reservoir to Ridgewood Reservoir along present-day Sunrise Highway, and collected water from the dammed streams that crossed it, including Simonson's Creek. For decades, the two ponds on Simonson's Creek served to supply fresh water to the City of Brooklyn, and functioned as a place of recreation for nearby residents with fishing in the summer and ice-skating in the winter (Beers 1873, Figure 6d). In 1880 the water right was purchased from Frederick Loerz, and a well fifty feet in diameter was sunk to a depth fifteen feet lower than the bottom of the pond, providing an additional daily supply of 300,000 gallons (Munsell 1882: 202). After Brooklyn's absorption into New York City in 1898, the former city's Water Works fell into decline and the ponds were left to fill in. As highways around the ponds were constructed, the surface area of the ponds shrank, especially with the construction of the Laurelton Parkway in the late 1920s.

The Rosedale area was sparsely populated through the end of the 19th century, with few houses fronting onto what are now Brookville Boulevard, Francis Lewis Boulevard, and Hook Creek Boulevard. In the 1860s, the Southern Railroad of Long Island (now part of the LIRR) reached this area, with a stop at Laurelton to the west, and one at what is now Hook Creek Boulevard (then the Brookfield Station) to the east. This served to foster development nearby, but it was not until the last decade of the 19th century that Rosedale was actually created as a separate community (Wolverton 1891, Figure 9a).

When the Standard Land Company acquired holdings in southern Foster's Meadow in 1890 and set about building homes and laying out a street grid, it called its main thoroughfare Rosedale Avenue after wild roses found in the area (Florio 2017). Rosedale Avenue is now the southern end of Francis Lewis Boulevard. Maps made in the early 20th century show the steady implementation of the street grid system, with the creation of the "Rosedale Terrace" neighborhood north of the LIRR, and "Rosedale" to the south (Bromley 1909, Figure 13; Hyde 1918 Figure 15). Concurrent with the laying out of streets and avenues was the laying out of municipal water and sewer lines to serve newly created building lots. The construction of the Sunrise Highway (aka State Highway 27) was begun in 1926, and it is both an at-grade highway in some sections, and an elevated expressway in others. The elevated Rosedale Station of the LIRR opened in 1941, replacing earlier "at grade" stations to the east and west. Most development on the landscape today dates from the 1930s onward.

Rockaway West[6]

The Rockaway West GIA Sites are at the center of Rockaway Peninsula in the community of Seaside in Rockaway Beach. One of the earliest recorded mentions of the Rockaway area took place in 1642, when a meeting between 16 sachems representing local Native American groups and a group of Dutchmen headed by [David] DeVries, took place "in the woods" near "Rockaway," which was to the east at what is now Far Rockaway. The Indians sought redress for wrongs done to them by the Dutch, but received no satisfaction, and violent reprisals were carried out against Dutch settlers that winter. In the spring of 1643, the Indians wanted to end hostilities so that they could plant their corn, and a second meeting was held on Manhattan Island in the spring of 1643, but only two of the Dutch, DeVries and Jacob Olfertsen could be induced to return to Rockaway with them to settle matters. DeVries reported nearly 300 Indians and 30 wigwams at "Reckouwacky" at that time (Bellot 1917:9; Grumet 1981:47).

With New Netherland under English control beginning in 1664, Native Americans were paying an annual rent of five bushels of winter wheat to the English governor for use of the peninsula. By 1685, however, they had moved their chief settlement to Hog Island (later Barnum's Island) in Woodmere Bay to the east. Indian leaders

[6] Portions of this section are excerpted from HPI's 2008 report, *Phase IA Archaeological Assessment, Chandler Street Sewer Outfall, Far Rockaway, Queens, NY*, which was prepared for the NYCDDC.

Tackapousha of Little Neck and Rockaway sachem Paman then sold their interest in Rockaway Neck to English settler John Palmer, for £31 2s. The tract extended from the western tip of the peninsula eastward to just west of the present neighborhood of Wave Crest. At present, the western end of the peninsula is several miles farther west than it was in 1685 because of landfilling and sediment build up (Bellot 1917:9-10).

Governor Dongan licensed and confirmed the sale to Palmer, but both transactions were disputed by the Town of Hempstead. According to the division of Queens County at its creation in 1683, the Rockaway Peninsula had been assigned to Hempstead, and the Town considered it part of its municipal property. Hempstead accused Dongan of favoritism toward Palmer, and claimed it had no other pastureland. The latter assertion, at least, was patently untrue, and even Dongan noted that Rockaway was "no pasture at all, being all woodland." Hempstead lost this dispute, and although the peninsula remained under Hempstead jurisdiction, the land remained Palmer's private property (Town Minutes of Hempstead Town quoted in HPI 1989; Bellot 1917:10-11).

Shortly after securing his title to the land, Palmer sold it to Richard Cornell[7], an ironmaster from Flushing, in 1687. The parcel totaled approximately 8,000 acres. The Cornell family was one of the wealthiest on Long Island; in 1670 Richard Cornell had obtained permission to sell liquor and gunpowder to the Indians, which proved to be quite lucrative. In 1690, the Cornells left Flushing and established themselves at Rockaway, building a large wood frame house overlooking the Atlantic Ocean in what is now Far Rockaway, far to the east of the GIA Sites (Bellot 1917:12).

By the early 18th century, parts of the Cornell lands had been sold, or were occupied by tenant farmers (Bellot 1917:15, 16). In 1809, as a result of a partition suit brought by 16 of Richard Cornell's great-grandsons, the remaining property was divided into 46 parcels, and many were sold. An early road, approximating the present Rockaway Beach Boulevard, marked the dividing line between beach lots along the Atlantic Ocean, and 15 marsh lots along Jamaica Bay (*Brooklyn Daily Eagle* 1904).

By the 1830s, "Aunt" Abby Ryder, widow of Nathaniel Ryder, kept a small hostelry on the shore of Jamaica Bay, near a point that extended up into the bay that was later called Ryder's Point (Conner 1852, Figure 5e). Reportedly, hundreds of city visitors would row or sail there to get good clam chowder and libations (Bellot 1917:22). In 1850, Ryder's daughter married Garrett Eldert who erected a hotel on the spot known as Eldert's House (or Pavilion) in Eldert's Grove, near what is now Beach 85th Street, east of the easternmost GIA Site. The grove referred to a stand of cedar trees that once stood on the property.

The Rockaway Association, a group of wealthy New Yorkers, bought much of the property in what is now Rockaway Beach and began to build exclusive resorts there in the 1830s. In 1835, James Remsen purchased from them a large tract including land in the Rockaway West neighborhood between Beach 94th Street and Beach 126th Street (Lucev 2007:65). In 1839, the Marine Pavilion and several bathhouses were mapped west of the GIA Sites (Burr 1839).

Remsen sold off smaller building lots nearby to establish the community of Seaside (Ibid.). In 1844, no structures were mapped on the peninsula (U.S.C.S. 1844). In 1852, there were no buildings mapped in the Rockaway West neighborhood, and historian Munsell noted that in 1853, there only two or three little hotels at the upper end of the peninsula, closer to the Maine Pavilion (Conner 1852, Figure 5e). At that time, the beach was reached by a wagon road and yachts (Munsell 1882). Also in 1853, Remsen conveyed the rest of his land holdings to a Dr. Thompson, keeping title to only a strip of land 1,150 feet in width running from the ocean to bay, which he named Seaside Park (Bellot 1917:102). In turn, Thompson was held to building a railroad from New York to Canarsie and maintaining a steam ferry route between Canarsie and Seaside Park landing where Remsen's Seaside Hotel stood (Ibid.:103).

Competing with ferries was the railroad. In 1868, the South Side Railroad of Long Island (now the LIRR) began constructing a branch line from Valley Stream to Far Rockaway, completed in 1869 under the charter of the Far Rockaway Branch Railroad (Bellot 1917:34). In 1872, the line was extended west with the construction of the Rockaway Railway from Far Rockaway along the oceanfront to the Neptune House at Rockaway Beach near what is now Beach 116th Street, a distance of about four miles (Ibid.; Beers 1873, Figure 6e). The steam railroad stopped at multiple locations including Eldert's Grove. As more resorts were constructed to the west, such as Remsen and

[7]Also spelled Cornwell and Cornwall. A descendant, Ezra Cornell, founded Cornell University.

Wainright's Grand Seaside House on Jamaica Bay at Beach 103rd Street in 1874, train stops were added (Bellot 1917:104).

In 1878, Remsen gave a piece of land to the south of his hotel to the New York Woodhaven Railroad Company to establish the Seaside Station of a new rail line. Completed in 1880, the first trains ran over a five-mile length of trestle built by the railroad company across Jamaica Bay, reaching the beach at Hammel (east of the GIA Sites), and then proceeding westerly on a line laid to connect multiple stations including Seaside, and Neptune to the west (Sanborn 1885, Figure 7). The older line closer to the oceanfront was later removed. In 1886 the Rockaway Beach Boulevard, connecting Rockaway Beach with Far Rockaway was completed (Bellot 1917:106). The permanent population at the beach at that time was estimated at one thousand persons.

Public utilities (e.g., gas, water, and sewer), came to Rockaway West as growth demanded. According to historian Bellot,

> The water supply obtained by residents of the Rockaways until the year 1881 was by sinking individual wells, users drawing their own supplies directly from the ground. In that year a Holly pumping engine was installed and a well specially sunk to supply water to the famous mammoth Rockaway Beach Hotel. This well or in-choate waterworks was located north of the hotel on the site of the present Alberts Hotel at Fifth avenue, Rockaway Park. Water was sold to a few consumers in the district and the pumping station continued doing business in a small way for a year or more. It was eventually purchased and dismantled in 1890 by the Queens County Water Company, which company came into existence on March 20th, 1884. The first attempt to inaugurate a public supply system was the result of constant local agitation to abolish the well system, which, it was urged, was extremely dangerous in a growing section where the only means of sewage disposal was by the use of cesspools, which in time would be bound to contaminate the wells (1917:36).

Construction of the Rockaway Beach Hotel, and any hotel meant to accommodate a large population, also necessitated an effective means of removing sewage. "The drainage system is complete; all the refuse matter is discharged through massive iron pipes at a point distant from the hotel, and is carried by direct currents into Jamaica Bay" (Munsell 1882). Historians also noted that in the 1880s, a new "iron pier" was constructed by the Rockaway Beach Pier Company, the largest of its kind in the United States. It extended about 1,300 feet into the ocean, beyond the breakers, affording water sufficiently deep for landing from large steamers (Ibid.).

Rockaway Beach attracted thousands of visitors and became firmly established as a popular summer resort. Dozens of bath houses and additional hotels were erected during this period as access to the area became easier, including the Surf Pavilion Metropolitan Hotel and Grove, Atlas Hotel, Mammoth Pavilion, Ruland's Seaside Pavilion, Hillyer's Surf House, the Grand Republic Hotel, East End Hotel, and others (Bellot 1917:104). In 1892, a fire swept through the community of Seaside leveling hundreds of bathhouses, and destroying dozens of hotels on the south shore in the Rockaway West neighborhood (*Brooklyn Daily Eagle* 9/21/1892). The losses were estimated at over $500,000 (Ibid.). As hotels burned down or suffered the fate of time and tide, new ones were erected to take their place. The Rockaway Peninsula remained a beachfront resort town for decades, providing hotels, restaurants, and housing. Also in the 1890s, a variety of amusement parks were built (Wolverton 1891, Figure 9b; Sanborn 1904, Figure 11).

With the consolidation of Greater New York in 1898, the western towns in Queens County, including Flushing, Newtown, and Jamaica, were dissolved and incorporated into the new expanded city. Far Rockaway and the peninsula were taken away from Hempstead town and incorporated within Queens Borough as part of Greater New York. That same year, a trolley line was constructed connecting the towns on the peninsula. With the incorporation into New York City, new growth in transportation continued (Sanborn 1912, Figure 14a-e). According to the Parks website,

> Improvements in transportation, under the direction of Parks Commissioner Robert Moses in the 1930's, led to the growth of Rockaway. The completion of two bridges, the Marine Parkway Bridge in 1937 and the Cross Bay Bridge in 1939, connected Rockaway to mainland Queens and Brooklyn. Innovations in railroad service and the development of the elevated subway allowed

> popular access to the peninsula. Subway access stimulated Rockaway's transition from a vacation area to neighborhoods with permanent residents.
>
> …Rockaway Boardwalk runs from Beach 73rd Street to Beach 109th Street, bounded by Shore Front Parkway and the Atlantic Ocean. The boardwalk, measuring 40 feet in diameter, extends through the neighborhoods of Hammels and Seaside. In 1938, Parks acquired the land through condemnation under the direction of Commissioner Robert Moses. Shore Front Parkway was built a year later. The beaches continue to attract over one million people each year.
>
> Lifeguards are stationed on the beaches from Memorial Day through Labor Day. Visitors enjoy basketball and handball courts, roller-hockey rinks, sitting areas and playgrounds along the boardwalk and adjoining areas. Recent improvements to the area include the installation of "Whaleamena," a sculpture of a whale that was originally part of the Children's Zoo in Central Park. The whale was donated by Parks and subsequently restored by local volunteers. "Whaleamena" is located at the entrance to the Boardwalk at Beach 95th Street.[8]
>
> In 1999, for the first time in a quarter century, the entire boardwalk was open to the public following a multi-million dollar restoration project. The project included the repair of the boardwalk, the addition of spray showers and handicap accessible drinking fountains, and the installation of modern playground equipment between Beach 82nd and 86th Streets. The improvements also included the renovation of "The Wave" bus shelters. The interiors of the shelters now contain murals, painted by artist Ester A. Grillo, which depict aquatic scenes. (NYCParks, August 18, 2018).

In 1928, Rockaway Playland, an amusement park with roller coaster and other attractions, opened in the Rockaway Beach between Beach 97th and Beach 101st streets. Construction of the Rockaway Beach Parkway in 1939 entailed the total or partial demolition of many private residences and beachfront businesses and attractions, including a large portion of Rockaway Playland. The amusement park declined, and ceased operation in the 1980s. The Parkway has been reconfigured and is now a two-lane road with broad sidewalks and a bicycle path.

B. Neighborhood Specific Historical Development and Sensitivity

As described in the Methodology section of this study, research focused on establishing the proximity of GIA Sites to mapped historic structures prior to the development of the grid system in the late 19th and early 20th centuries. This was established through a review of maps and atlases georeferenced by Fisher Associates, as presented on Figures 4 through 17. For several reasons, including early historical mapping inaccuracies, lack of adequate coverage, and poor quality of digitization, not all maps and atlases consulted for this study could be accurately georeferenced or reproduced for this report. Regardless, they were reviewed to the degree possible and referenced in the following sensitivity assessments. Due to the great number of maps and atlases reviewed for each of the 237 GIA Sites, summary tables are presented regarding potential historic archaeological sensitivity.

Historical archaeological resources in the project neighborhoods would typically be those found in deeper shaft features, such as well, privies, and cisterns, the deeper levels of which may have survived superficial disturbance. Comparative data has shown that these types of archaeological resources frequently are found in urban contexts, particularly in Brooklyn and Queens. Masonry and wooden portions of these abandoned and truncated shaft features are often encountered because their deeper and therefore earlier layers remain undisturbed by subsequent construction, and in fact, construction often preserves the lower sections of the features by sealing them beneath structures and fill layers.

Privies were located furthest from the residences, often along the rear lot lines, while wells and cisterns frequently (but not always) were located closer to the rear walls of street-fronting buildings or outbuildings. Privies and cisterns would be excavated up to 10-15 feet below grade, while wells would need to be excavated as deep as the water table, which varied according to location. Until the introduction of piped city water, residents would have relied on rear yard shaft features, such as wells and cisterns. Privies and cesspools would have been used at least until the introduction of municipal sewers. Even as municipal sewer and water became available, owners of older

[8] Rockaway's iconic "Whaleamena" washed away with Hurricane Sandy in 2012.

houses often did not hook up their buildings to these lines until years, and sometimes decades, after the services were available, suggesting a potentially longer use-life for yard shaft features. Other archaeological studies in the two boroughs have shown that even when streets were supplied with municipal services, the houses on these streets, especially if they were constructed earlier, sometimes were not hooked up to these pipes until a number of years later, suggesting that the residents may have made use of wells, cisterns, or privies for a considerably longer period of time (HPI 1988, 2014). In contrast to shaft features, yard scatter around structures is usually disturbed in an urban context. This was taken into consideration when reviewing the location of the 237 GIA Sites in relation to mapped historic structures.

GIA Sites within 150 feet of a mapped historic structure were considered potentially sensitive for historic archaeological resources unless there were mitigating circumstances, as indicated on the following tables by footnotes 3 and 4. If a GIA Site was mapped in proximity to a historic resource on an early map, but later more detailed and precise maps consistently showed the same GIA Site more than 150 feet from the same mapped structure, it was considered to have no historic archaeological potential, and was demarcated by footnote 3. Further, if more concise maps clarified that a GIA Site within 150 feet of a mapped historic resource was actually in the road fronting the structure - rather than the side or rear yard - it was considered to have no sensitivity and demarcated by the footnote 4. Shaft features were not typically placed in active thoroughfares and hence these locations would not be sensitive. Finally, if a GIA Site was identified within 150 feet of a newly mapped structure post-dating the implementation of the city street grid system, it was not considered archaeologically sensitive due to its late date of construction, the fact that the structure fronted the street on a newly created block and lot, and the concurrent availability of municipal sewer and water. Consequently, these GIA Sites were not considered sensitive for historic archaeological resources and were not included in the neighborhood tables.

The following tables for each neighborhood list only those GIA Sites within 150 feet of a mapped historic resource on early historic maps, and provide an assessment of sensitivity based on findings.

Gravesend

Early historic maps place the main settlement of Gravesend centered on what is now McDonald Avenue and Gravesend Neck Road, 0.6 miles south of the GIA Sites. A survey completed in 1674 by John Tehune placed only one house in the vicinity of the GIA Sites at roughly what is now the southeast intersection of McDonald Avenue and Kings Highway, possibly within 150 feet of GIA Site 127A (Figure 3-14). Later maps show development increasing on Kings Highway and McDonald Avenue, with surrounding farmland left undeveloped for decades.

Table 1, below, summarizes Gravesend GIA Sites that are within 150 feet of a mapped historic resource on historic maps identified in the columns, and summarizes potential historical archaeological sensitivity based on the criteria described above.

Table 1: Gravesend Historic Archaeological Sensitivity

GIA Site # Fig. #	1781 Taylor Skinner	1844 U.S.C.S. Fig. 4a	1849 Sidney	1852 Conner Fig. 5a	1873 Beers Fig. 6a	1890 Robinson Fig. 8a	1899 Hyde Fig. 10a	1907 Hyde 12a	Hist. Arch. Sensitivity
49A Fig. 3-10	-	-	-	-	M. Schoonmaker	James Burrell	3	3	N
50A and 50B Fig. 3-11	-	1	1 R. Stillwell	1	G. R. Stillwell	House	J. C. Bennett	Out-building	**Y**
51A and 51B Fig. 3-11	-	1	1 R. Stillwell	1	G. R. Stillwell	House	J. C. Bennett	House	**Y**
62A Fig. 3-12	-	-	1 A. Barre	2	2	Abraham Barre	A. Barre	House	**Y**
64A and 64B Fig. 3-12	-	-	1 A. Barre	2	2	Abraham Barre	A. Barre	House	**Y**
65A, 65B, and 65D Fig. 3-12	-	-	1 A. Barre	2	2 (two structures)	Abraham Barre & R. M. Batrop	A. Barre & H. C. Ditmas	2 Houses	**Y**

GIA Site # Fig. #	1781 Taylor Skinner	1844 U.S.C.S. Fig. 4a	1849 Sidney	1852 Conner Fig. 5a	1873 Beers Fig. 6a	1890 Robinson Fig. 8a	1899 Hyde Fig. 10a	1907 Hyde 12a	Hist. Arch. Sensitivity
82-1A Fig. 3-11	-	1	1 M. Stillwell	Stillwell	T. Rice	Thomas Rice	S.S. Stillwell	Out-building	**Y**
99A Fig. 3-12	-	-	-	2	2	R. S. Van Kleck	2	-	**Y**
99B Fig. 3-12	-	-	-	-	2	R. S. Van Kleck	2	-	**Y**
121B Fig. 3-13	-	-	-	-	T. Rice	4	4	4	N
127A Fig. 3-14	1	1	1 E. Van Sicklen	4	4	4	4	4	N

- indicates no structure present within 150 feet
1 = GIA Site may or may not be within 150 feet of mapped structure; mapping not precise due to age of map.
2 = GIA Site within 150 feet of unlabeled mapped structure.
3 = GIA Site is more accurately portrayed greater than 150 feet from previously mapped structure.
4 = GIA Site is more accurately portrayed in front of the mapped historic building, in a road as old as the building.

In total, 13 GIA locations were considered to have potential sensitivity or historic archaeological resources. Of these 13 resources, some are more likely to yield intact deposits due to the proximity of the GIA Site to the rear and side yards of historic buildings.

Southeast Brooklyn

The following table summarizes GIA Sites in Southeast Brooklyn that are within 150 feet of a mapped historic resource, and summarizes potential historical archaeological sensitivity based on the criteria described above. It does not take into account later disturbance. Since there were no mapped structures in or near the location of GIA Sites in 1781, 1837, and 1844 (Taylor Skinner 1781; U.S.C.S. 1837a, 1844, Figure 4b), these cartographic sources are not included on Table 2 below.

Table 2: Southeast Brooklyn Historic Archaeological Sensitivity

GIA Site # Fig. #	1849 Sidney	1852 Conner Fig. 5b	1873 Beers Fig. 6b	1890 Robinson Fig. 8b	1899 Hyde Fig. 10b	1907 Hyde 12b	1920 Hyde Fig. 16a	Hist. Arch. Sensitivity
8A and 8B Fig. 3-2	-	-	J. L. Bergen	Mrs. Anna Bergen	Anna Bergen	Anna Bergen	2	**Y**
41A Fig. 3-1	-	-	E. Lott	-	-	-		N
42A Fig. 3-3			E. Lott	-	-	-		N
47A Fig. 3-3	-	-	E. Lott	-	-	-		N
48A and 48B Fig. 3-1	-	-	E. Lott	-	-	-	-	N
49A and 49B Fig. 3-1	1 P. Lott	P. Lott out-buildings	-	G. L. Lott out-buildings	-	-	-	**Y**

- indicates no structure present within 150 feet

Four GIA Sites were considered to have the potential for historic archaeological resources, two related to the Anna Bergen house, and two related to the Peter Lott House. The Anna Bergen house stood on the south side of Kings Highway, and was demolished in 1925. It was on the south side of Kings Highway, roughly on the line of East 31st Street. It was built by John L. Bergen house before 1875. Bergen was born in 1835, married Anna, the daughter of Peter Lott in 1872, and died in 1880. The house Anna continued to reside in was demolished in 1925 (Armbruster 1922). The P. Lott house was no longer mapped by 1899. Both dwellings were built prior to the availability of municipal sewer and water, and would likely have shaft features associated with them.

Canarsie

The main historic settlement of Canarsie was centered on the intersection of Church Lane and what is now East 92nd Street. No houses were shown in Canarsie on the 1781 Taylor Skinner map, while the 1835 Hassler map (U.S.C.S. 1835) survey showed several structures on both sides of East 92nd Street, but lacked the detail necessary to establish their exact locations. No historic structures were mapped within 150 feet of any GIA Site on the 1844 U.S.C.S. survey either (Figure 4c), so three these sources were not included in Table 3 below.

Table 3: Canarsie Historic Archaeological Sensitivity

GIA Site # Fig. #	1849 Sidney	1852 Conner Fig. 5c	1859 Walling	1873 Beers Fig. 6c	1890 Robinson Fig. 8c	1899 Hyde Fig. 10c	1920 Hyde Fig. 16a	Hist. Arch. Sensitivity
5A Fig. 3-7	A. R. Schenck	R. Schenck	R. Schenck	2	S. R. Schenck	S. R. Schenck	2	**Y**
40C Fig. 3-6	-	1 House E/side 92nd	1 House E/side 92nd	-	House E/side 92nd	4	4	N
41A and 41B Fig. 3-6	-	1 House E/side 92nd	1 House E/side 92nd	-	3	New Houses	4	N
48B Fig. 3-6	-	1 House E/side 92nd	1 House E/side 92nd	4	4	New Houses	New Houses	N
51A Fig. 3-6	-	-	-	2	3	New Houses	New Houses	N
52A Fig. 3-5	-	-	-	2	D. Thompson & R. Holmes	New Buildings	New Buildings	N
66A and 66B Fig. 3-5					Drague & Salemen	New Buildings	New Buildings	N

- indicates no structure present within 150 feet
1 = GIA Site may or may not be within 150 feet of mapped structure; mapping not precise due to age.
2 = GIA Site within 150 feet of unlabeled mapped structure.
3 = GIA Site is more accurately portrayed greater than 150 feet from previously mapped structure.
4 = GIA Site is more accurately portrayed in front of the mapped historic building, in a road as old as the building.

Only one GIA Site, 5A is considered potentially sensitive for historic archaeological resources, as it is situated in what was the back yard of the Schenck House which fronted onto Church Lane and stood from at least 1849 through1920 (Sidney 1849, Conner 1852, Figure 5c; Walling 1859; Beers 1873, Figure 6c; Robinson 1890, Figure 8c; Hyde 1899, Figure 10c; and Hyde 1920, Figure 16a). The Schenck family arrived in Flatlands in the 1650s, with generations of offspring farming land in the Canarsie area (Ross 1903:384).

Although there are two GIA Sites, 16A and 16B, adjacent to Canarsie Cemetery, established in 1899 on the west side of Remsen Avenue, neither is considered potentially sensitive for human remains. The boundary of the burial ground was established west of Remsen Avenue, after it was laid out. Although an earlier historic cemetery associated with the Methodist Protestant Church (now the Church of the Rock) was identified to the east of Canarsie Cemetery, there are no GIA sites within 150 feet of its mapped boundaries.

Idlewild

No structures were mapped on or within 150 feet of any GIA Sites in 1781 (Taylor-Skinner), so that map is not included in the table below. A search for information through the *Brooklyn Daily Eagle* archives regarding when water and sewer pipes were installed in the Idlewild neighborhood found few references to roads being laid out and macadamized prior to the development of Rosedale and Rosedale Terrace in the early 20th century. As late as 1908, complaints were being made about the main thoroughfares, Fosters Meadow Road (Brookville Boulevard), Rosedale Avenue (Francis Lewis Boulevard), and Merrick Boulevard, not being paved. Recommendations were made to oil them in attempt to keep them from degrading with all their vehicular traffic (*Brooklyn Daily Eagle* 7/1/1908). As the new developments were created, roads were laid out and municipal sewer and water lines were laid to accommodate the boom in residential construction.

Table 4, below, identifies locations of potential historic archaeological sensitivity.

Table 4: Idlewild Historic Archaeological Sensitivity

GIA Site # Fig. #	1837(b) U.S.C.S.	1844 U.S.C.S. Fig. 4d	1852 Conner Fig. 5d	1859 Walling	1873 Beers Fig. 6d	1891 Wolverton Fig. 9a	1909 Bromley Fig. 13a	1918 Hyde Fig. 15	Hist. Arch. Sensitivity
168A and 168C Fig. 3-15	2	2	3	3	-	-	-	-	N
175-2A Fig. 3-17	-	-	-	-	A. Chever & F. Kennow	Surf & F. Cannon	Two Houses	Two Houses	**Y**
223A Fig. 3-16	-	-	-	-	A. Van Nostrand	4	4	4	N
226A Fig. 3-18	-	-	-	-	A. Van Nostrand	4	4	4	N
251A Fig. 3-18	-	-	-	-	-	V. Mount	-	-	**Y**
263A Fig. 3-21	-	-	-	-	-	V. Mount	-	-	**Y**
276A Fig. 3-20	-	-	-	-	-	Key?	4	4	N
277A Fig. 3-20	-	-	-	1 P.Barb	P. Kinsey	3	4	4	N

- indicates no structure present within 150 feet
1 = GIA Site may or may not be within 150 feet of mapped structure; mapping not precise due to age.
2 = GIA Site within 150 feet of unlabeled mapped structure.
3 = GIA Site is more accurately portrayed greater than 150 feet from previously mapped structure.
4 = GIA Site is more accurately portrayed in front of the mapped historic building, in a road as old as the building.

One GIA Site, 175-2A, is located within 150 feet of two dwellings that stood from at least 1873 onward. Both fronted onto Hook Creek Boulevard, with the GIA Site located in what would have been their back yards (Beers 1873, Figure 6d; Wolverton 1891, Figure 9a; Bromley 1909, Figure 13a; Hyde 1918, Figure 15). The GIA Site is located on what is now 173rd Road, laid out sometime between 1918 and 1930 when houses on the road were being advertised for sale (*Brooklyn Daily Eagle* 11/11/1930). GIA Sites 251A and 263A were in the mapped back yard of a house belonging to V. Mount in 1873 (Beers 1873, Figure 6d). While later maps did not show any structures in this location (1891, 1909, 1918, Figures 9a, 13a, and 15), it is possible that the building was razed and the site remained undisturbed until 243rd Street was laid out between 1918 and 1930.

Rockaway West

By the time the 1885 Sanborn atlas of the Rockaway West neighborhood was published, multiple water pipes of varying diameters were shown in the existing street beds, and historians cite the availability of water pipes to as early as (Sanborn 1885, Figure 7; Munsell 1882). By 1899, the sewer system that served the residential neighborhoods of Seaside and Arvern, to the east, was described as a private one "consisting of a line of six or eight inch glazed drain tile under each street, following the slope from the ocean to Jamaica Bay...[whereas] water is derived from the works of the Queens County Water Company at Valley Stream (*Brooklyn Daily Eagle* 4/16/1899). As the residential communities on Rockaway peninsula grew, municipal utilities were installed to accommodate them.

Although there were hotels in Rockaway Beach as early as the 1860s, no structures were shown in the Rockaway West neighborhood on the 1781 Taylor Skinner map, the 1844 U.S.C.S. survey, the 1852 Conner map (Figure 5e), or the 1859 Walling map. The 1873 Beers atlas showed only bathhouses to the south of the GIA Sites on the shore (Figure 6e). Later maps and atlases are included in Table 5 below.

Table 5: Rockaway West Historic Archaeological Sensitivity

GIA Site # Fig. #	1878 U.S.C.S.	Sanborn 1885 Fig. 7	1891 Wolverton Fig. 9b	1904 Sanborn Fig. 11
123A Fig. 3-22	1 Building	Merckle's Cosmopolitan Hotel	-	-

GIA Site # Fig. #	**1878 U.S.C.S.**	**Sanborn 1885 Fig. 7**	**1891 Wolverton Fig. 9b**	**1904 Sanborn Fig. 11**
124A and 124B Fig. 3-22	1 Building	Merckle's Cosmopolitan Hotel	-	-
128A Fig. 3-22	1 Building	Merckle's Cosmopolitan Hotel	-	-
129A Fig. 3-22	1 Building	Merckle's Cosmopolitan Hotel	-	-
130A, 130B, and 130D Fig. 3-22	1 Building	Walshs Hotel	Ocean House	-
139A and 139B Fig. 3-23	1 Building	Pier House Hotel & Gem of The Sea	Pier House & Grand Ocean Hotel	Grand Ocean Pavilion, multiple buildings
140A Fig. 3-23	-	Grand Republic Hotel	Grand Ocean Hotel & Seaside Bathing Pavilion	Grand Ocean Pavilion, multiple buildings
142 A and 142B Fig. 3-23	-	Grand Republic Hotel	Grand Ocean Hotel & Seaside Bathing Pavilion	Wainright Smith, Hotel, Casino, Pavilion
143A and 143B Fig. 3-23	-	Building	Seaside Bathing Pavilion & Atlas Hotel	Wainright Smith, Hotel, Casino, Pavilion, Bath houses
143-1A and 143-1B Fig. 3-23	-	-	Seaside Bathing Pavilion & Atlas Hotel	Wainright Smith, Hotel, Casino, Pavilion, Bath houses
150A Fig. 3-23	-	-	Beachmere & Ocean Bay View	Shillings Hotel & Bathing Pavilion
153A and 153B Fig. 3-23	-	Ocean & Bay View House	Ocean Bay View	Hotel
160A Fig. 3-23	-	Pacific Hotel	-	Steeple Chase
165-1A Fig. 3-24	-	Pacific Hotel	-	Steeple Chase
169A and 169B Fig. 3-24	-	Atlantic Hotel	-	-
170A Fig. 3-24	-	Atlantic Hotel	-	-
174A and 174B Fig. 3-24	-	Atlantic Hotel	-	House
179A and 179B Fig. 3-24	-	-	-	House
212A, 212B, and 212C Fig. 3-24	-	-	Pavilion	-

- indicates no structure present within 150 feet

What Table 5 illuminates is the multitude of building episodes in the Rockaway West neighborhood over time. When a major fire devastated Seaside in 1898, many of the hotels in the GIA Site footprints were consumed. These were replaced, and by the early 20th century, the project site area was virtually covered with new structures. In both 1912 and 1933, before many of the Rockaway West neighborhood streets were laid out in their current configurations, dozens of buildings were mapped in the footprint of Shore Front Parkway and on the block between Beach 107th and Beach 108th Streets where GIA Sites are proposed (Sanborn 1912, 1933, Figure 14a-e, 17a-e). Buildings just north of the shoreline in the route of what is now Shore Front Parkway between Beach 94th Street and Beach 108th Street included dozens of cottages, hotels, bathhouses, amusement park structures, a movie house, dance pavilions, and at least one carousel. At the west, dozens of one-story cottages on small lots stood between Beach 107th and 108th Streets where GIA Site 123A is proposed. All of these buildings were constructed after the availability of municipal sewer and water.

While there may have been development in the footprint of some of the GIA Sites as early as 1878, maps and atlases definitively show that intensive redevelopment would have eradicated any potential archaeological deposits associated with them. Further, since sewer and water lines were in use by 1881, none of the later structures would have required on site privies, cisterns, or wells. Data about the use and functions of former structures can be acquired from historic accounts due to their late date. Therefore, the Rockaway West neighborhood is considered to have no potential for historic archaeological resources.

VI. SUMMARY OF ARCHAEOLOGICAL POTENTIAL AND PROJECT IMPACTS

A. Gravesend

Precontact Potential

The Gravesend neighborhood is located on and north of Kings Highway and McDonald Avenue (formerly Gravesend Avenue), both known Native American trails. While precontact sites have not been identified in the Gravesend neighborhood, there was a reported settlement with a longhouse either west or south of the GIA Sites. The land surrounding the settlement was reportedly used as planting fields by Native Americans, and then subsequently farmed by early colonists for roughly three hundred years. The GIA locations have a low sensitivity for precontact resources.

The first 1.5 feet below grade at each GIA Site has been disturbed by sidewalk and road construction. Disturbance may extend deeper since there is documentation that some of the streets were regraded in the early 1920s. In all likelihood, potential precontact resources have been disturbed by the process of urbanization. However, there is the remote possibility that precontact archaeological resources may exist beneath disturbed strata. Proposed GIA installation is expected to extend to five feet below grade. Therefore, all GIA Sites have a low sensitivity for precontact resources between 1.5 feet and 5 feet below grade.

Historic Potential

A review of maps and atlases found that multiple GIA Sites are located within 150 feet of a mapped historic resource and are considered to have historic archaeological potential. These locations are listed on Table 6 below.

Table 6: Gravesend GIA Sites with Historic Archaeological Potential

GIA Site # Fig. #	1844 U.S.C.S. Fig. 4a	1849 Sidney	1852 Conner Fig. 5a	1873 Beers Fig. 6a	1890 Robinson Fig. 8a	1899 Hyde Fig. 10a	1907 Hyde Fig. 12a	Potential Sensitivity
50A and 50B Fig. 3-11	1	1 R. Stillwell	1	G. R. Stillwell	House	J. C. Bennett	Out-building	ca.1844-1920
51A and 51B Fig. 3-11	1	1 R. Stillwell	1	G. R. Stillwell	House	J. C. Bennett	House	ca.1844-1920
62A Fig. 3-12	-	1 A. Barre	House	House	Abraham Barre	A. Barre	House	ca.1849-1920
64A and 64B Fig. 3-12	-	1 A. Barre	House	House	Abraham Barre	A. Barre	House	ca.1849-1920
65A, 65B, and 65D Fig. 3-12	-	1 A. Barre	House	Two Houses	Abraham Barre & R. M. Batrop	A. Barre & H. C. Ditmas	2 Houses	ca.1849-1920
82-1A Fig. 3-11	1	1 M. Stillwell	Stillwell	T. Rice	Thomas Rice	S.S. Stillwell	Out-building	ca.1844-1920
99A Fig. 3-12	-	-	House	House	R. S. Van Kleck	House	-	ca. 1852-1899
99B Fig. 3-12	-	-	-	House	R. S. Van Kleck	House	-	ca.1873-1899

- indicates no structure present within 150 feet
1 = GIA Site may or may not be within 150 feet of mapped structure; mapping not precise due to age.
2 = GIA Site within 150 feet of unlabeled mapped structure.
3 = GIA Site is more accurately portrayed greater than 150 feet from previously mapped structure.

Soil borings logs reported subsurface disturbance to multiple GIA Site locations, predominantly on Avenue P. However, borings taken at GIA Sites adjacent to those identified on Table 6 (e.g., Boring 51B) did not bear evidence of subsurface disturbance, instead reporting seemingly natural stratigraphic deposits containing no historic material (Appendix). Therefore, there is the possibility for historic archaeological deposits from shaft features to exist at these GIA Site locations.

Since prior sidewalk and road construction is known to have disturbed at least the uppermost 1.5 feet of strata immediately below grade, there is the potential sensitivity for historic archaeological deposits from shaft features associated with mapped historic resources below this depth. Since proposed construction will extend to a maximum of five feet below grade, potential historic deposits in these GIA Sites may be affected.

B. Southeast Brooklyn

Precontact Potential

Two GIA Sites in the Southeast Brooklyn neighborhood were identified within a NYSM mapped area of potential precontact sensitivity, although the focus of that sensitivity is more than 1000 feet to the northeast. Since there are no documented sites in their footprints, they are both considered to have low potential sensitivity for ephemeral resources. These two sites are described in Table 7, below:

Table 7: Southeast Brooklyn GIA Sites with Precontact Archaeological Potential

GIA Site # Fig. #	Location	Potential Sensitivity
59B and 59C Fig. 3-1	West side of East 38th Street south of Flatlands Avenue	Low – planting fields/ephemeral sites

Soil boring logs indicate a relatively undisturbed stratigraphic sequence throughout most of the Southeast Brooklyn neighborhood. Each of these locations was farmed by early historic settlers, and was later subjected to disturbance by sidewalk and road grading and paving. This impacted at least the uppermost 1.5 feet of strata below existing grade, and possible extended to a greater depth. Therefore, these eight locations have a low sensitivity for ephemeral precontact resources from 1.5 to 5 feet below grade.

Historic Potential

Four GIA Sites in the Southeast Brooklyn neighborhood were found to be potentially sensitive for historic archaeological resources, as listed Table 8 below.

Table 8: Southeast Brooklyn GIA Sites with Historic Archaeological Potential

GIA Site # Fig. #	1849 Sidney	1852 Conner Fig. 5b	1873 Beers Fig. 6b	1890 Robinson Fig. 8b	1899 Hyde Fig. 10b	1907 Hyde Fig. 12b	1920 Hyde Fig. 16a	Potential Sensitivity
8A and 8B Fig. 3-2	-	-	J. L. Bergen	Mrs. Anna Bergen	Anna Bergen	Anna Bergen	House	ca.1873-1920
49A and 49B Fig. 3-1	1 P. Lott	P. Lott out-buildings	-	G. L. Lott out-buildings	-	-	-	ca.1849-1890

- indicates no structure present within 150 feet

The Anna Bergen house stood on the south side of Kings Highway, and stood from at least 1873 through 1920. The Lott house was constructed by 1849, and was no longer mapped by 1899. Both were built prior to the availability of municipal sewer and water, and would likely have had shaft features associated with them.

The soil boring log for Boring 8A, a location potentially sensitive for the features associated with the Anna Bergen house, contained fill in the uppermost three feet immediately below the surface, but the nature of the fill was not described (Appendix). Given its proximity to the Bergen house, it is possible that the fill consists of demolition material associated with the former dwelling or represents the remains of a shallow feature. Boring 49A completed near the Lott house reportedly contained no historic artifacts, but appeared to have a relatively undisturbed stratigraphic sequence.

The proposed installation of GIA Sites 8A, 8B, 49A, and 49B could disturb historic archaeological resources in shaft features associated with the Bergen and Lott houses since excavations will extend to five feet below grade. While the uppermost 1.5 feet of soil at each GIA Site has most likely been disturbed by sidewalk and road installation, there is the possibility that deposits located beneath this depth are present and undisturbed. The boring logs suggest

that alternatively there is also the possibility that the uppermost three feet of soil in GIA Sites 49A and 49B has been disturbed, or that they may contain fill associated with the demolition of the Bergen house.

C. Canarsie

Precontact Potential

Nine GIA Sites in Canarsie are within a NYSM mapped area of precontact sensitivity, specifically for Native American planting fields associated with a more extensive village site to the south. These sites are described on Table 9 below.

Table 9: Canarsie GIA Sites with Precontact Archaeological Potential

GIA Site # Fig. #	Location	Potential Sensitivity
49A Fig. 3-6	North side of Avenue K between East 93rd and East 94th Streets	Low – planting fields/ephemeral sites
50B Fig. 3-6	South side of Avenue K between East 93rd and East 94th Streets	Low – planting fields/ephemeral sites
51A Fig. 3-6	West side of East 94th Street just north of Avenue K	Low – planting fields/ephemeral sites
66A and 66B Fig. 3-5	South side of Avenue J between East 95th and East 96th Streets	Low – planting fields/ephemeral sites
70A Fig. 3-6	South side of Avenue K between East 95th and East 96th Streets	Low – planting fields/ephemeral sites
78A and 78C Fig. 3-5	North side of Avenue J	Low – planting fields/ephemeral sites
79A Fig. 3-5	East side of Rockaway Parkway between Avenue J and Avenue K	Low – planting fields/ephemeral sites

The boring logs suggest that in the locations of proposed GIA Sites there is a relatively intact natural stratigraphic sequence, or that in the process of earth moving for the creation of the city street grid, little modification of the terrain was required. However, each of these locations was historically farmed by Europeans for several hundred years, and was then subjected to at least some disturbance by the creation of the street grid system, with grading, paving, and landscaping. While no other prior disturbances could be established, the road and sidewalk work would have impacted at least the upper 1.5 feet of strata below existing grade. The combination of farming with the process of urbanization suggests that these nine locations have a low sensitivity for precontact resources from 1.5 to 5 feet below grade.

Proposed construction would extend to no more than five feet below grade. Given the low sensitivity for precontact resources in these locations, there is low potential for GIA installation to disturb precontact resources.

Historic Resources

The earliest European settlement at Canarsie was centered on what is now East 92nd Street, and grew outward from there. A review of maps and atlases found that seven GIA Sites were in proximity to two historic houses. Table 10 below describes the one potentially sensitive GIA Site and the historic dwelling nearby.

Table 10: Canarsie GIA Sites with Historic Archaeological Potential

GIA Site # Fig. #	1849 Sidney	1852 Conner Fig. 5c	1859 Walling	1873 Beers Fig. 6c	1890 Robinson Fig. 8c	1899 Hyde Fig. 10c	1920 Hyde Fig. 16a	Potential Sensitivity
5A Fig. 3-7	A. R. Schenck	R. Schenck	R. Schenck	2	S. R. Schenck	S. R. Schenck	2	ca. 1849-1920

- indicates no structure present within 150 feet
2 = GIA Site within 150 feet of unlabeled mapped structure.

GIA Site 5A is potentially sensitive for historic archaeological resources associated with the Schenck House. The dwelling stood from at least 1849 through 1920. The house stood on the north side of Church Lane between East 88th and East 89th Street. When Avenue J was created, it was cut through the back yard of the house, precisely where historic wells, cisterns, and privies may have once been located.

While at least the uppermost 1.5 feet of soil in the GIA Site location has been disturbed by road and street construction, soil borings found that most of the Canarsie area lacked extensive disturbance. Therefore, there is the possibility that archaeologically sensitive levels beneath the known depth of disturbance related to the Schenck House have remained undisturbed. Proposed GIA installations entail excavating to five feet below grade. Therefore, there is the possibility that historic archaeological resources in shaft features between roughly 1.5 feet and five feet below grade would be disturbed.

D. Idlewild

Precontact Resources

Archaeologist Boesch suggested that the Idlewild neighborhood is has a high sensitivity for precontact resources due to the former presence of fresh water creeks to the west and east of the GIA Sites. Although there was a reported NYSM precontact site in the Idlewild neighborhood, its location was mapped in error and the site is actually located almost five miles to the west. The Idlewild neighborhood currently has no knolls or other distinguishing topographic features that would have made the area the focus of a long term Native American settlement, but it may have been used for shorter encampments and/or for planting fields, as was land in Brookville Park to the west. However, these same planting fields were subsequently used by Europeans for several centuries. Boring logs report an inconsistent subsurface stratigraphic sequence in the Idlewild neighborhood, which could have resulted from extensive manipulation of the original landform. Therefore, despite the Boesch assessment, the degree of prior disturbance by plowing and later development suggests that GIA Sites in Idlewild have only a low sensitivity for precontact resources.

Documentary research has established that the creation of sidewalks and streets in Idlewild caused at least 1.5 feet of disturbance below existing grade, and possibly more. The GIA excavations will extend to five feet below grade. Therefore, there is the potential for precontact resources between 1.5 feet and 5 feet below grade to be affected.

Historic Resources

When the communities of Rosedale and Rosedale Terrace in the Idlewild neighborhood were created in the late 19th and early 20th centuries, a street grid system was laid out through farm fields, and municipal utilities were made available to subsequent residents. Prior to that time, dwellings in the area would have had to rely on wells, privies, and cisterns for their sanitary needs.

A review of maps and atlases found three GIA Sites potentially sensitive for historic period archaeological resources as presented on Table 11 below.

Table 11: Idlewild GIA Sites with Historic Archaeological Potential

GIA Site # Fig. #	1837(b) U.S.C.S.	1844 U.S.C.S. Fig. 4d	1852 Conner Fig. 5d	1859 Walling	1873 Beers Fig. 6d	1891 Wolverton Fig. 9a	1909 Bromley Fig. 13a	1918 Hyde Fig. 15	Potential Sensitivity
175-2A Fig. 3-17	-	-	-	-	A. Chever & F. Kennow	Surf & F. Cannon	Two Houses	Two Houses	ca. 1873-1918
251A Fig. 3-18	-	-	-	-	-	V. Mount	-	-	ca. 1891
263A Fig. 3-21	-	-	-	-	-	V. Mount	-	-	ca.1891

- indicates no structure present within 150 feet

The uppermost 1.5 feet of soil in the GIA Site locations has been disturbed by road and street construction, but it is possible that there are archaeologically sensitive levels beneath this depth that may have remained undisturbed.

Proposed GIA installations entail excavating to five feet below grade, so there is the possibility that there are intact soils between 1.5 and 5 feet below grade. Therefore, there is the possibility that historic archaeological resources in shaft features associated with the Chever and Kennow houses as well as the V. Mount house, would be disturbed by proposed GIA installation in these location of GIA Sites 175-2A-C, 251A and 263A.

E. Rockaway West

Precontact Resources

The Rockaway West neighborhood was found to lack the potential for precontact resources due to a number of factors. Research has found that the extant peninsula formed over the last four hundred years, and if there were sections of it exposed for habitation during the post-glacial period, any precontact deposits would have been subjected to tidal forces that would have caused extensive site disturbance. The peninsula also experienced multiple development episodes during the historic period that caused further disturbance to the subsurface stratigraphy. The likelihood that there are any intact Native American archaeological resources in any of the GIA Site locations, therefore, is nonexistent.

Historic Resources

The Rockaway West neighborhood, and virtually the entire peninsula, experienced extensive development and redevelopment in the latter half of the 19th century and the first half of the 20th. All documented development post-dates the 1870s, and water lines were available by 1881. Sewage from hotels along the shore was handled by a combination of cesspools and pipes extending into the ocean or bay. If earlier structures had associated shaft features, they would have been eradicated by multiple subsequent construction episodes, and later by the demolition of buildings and the creation of Shore Front Parkway. Therefore, all GIA Sites in the Rockaway West neighborhood lack historic archaeological potential.

VI. CONCLUSIONS AND RECOMMENDATIONS

A. Conclusions

Potential impacts to archaeological resources in the five neighborhoods were identified and assessed for direct physical impacts from GIA installation. The archaeological resources assessment of the five neighborhoods found that all except the Rockaway West neighborhood have potential sensitivity for precontact and/or historic sites.

Multiple GIA Sites were found to have the potential for precontact resources, although the sensitivity assessment for most locations was relatively low since there were no documented settlements in their footprints. Southeast Brooklyn and Canarsie were found to have GIA Sites within a NYSM mapped area of precontact sensitivity. In Southeast Brooklyn, documentation suggested sensitivity for Native American planting fields or earlier short-term encampments associated with a more extensive habitation to the northeast. In Canarsie, GIA Sites in the documented area of sensitivity were described as planting fields associated with a more extensive settlement to the south. These neighborhoods' potentially sensitive GIA Sites are listed Table 12 below.

Table 12: Summary of GIA Sites with Precontact Archaeological Potential

GIA Site	Potential Sensitivity
Gravesend	
All GIA Sites	Low – planting fields/ephemeral sites
Southeast Brooklyn	
59B and 59C	Low – planting fields/ephemeral sites
Canarsie	
49A	Low – planting fields/ephemeral sites
50B	Low – planting fields/ephemeral sites
51A	Low – planting fields/ephemeral sites
66A and 66B	Low – planting fields/ephemeral sites

GIA Site	Potential Sensitivity
70A	Low – planting fields/ephemeral sites
78A and 78C	Low – planting fields/ephemeral sites
79A	Low – planting fields/ephemeral sites
Idlewild	
All GIA Sites	Low – planting fields/ephemeral sites

Both the Gravesend and Idlewild neighborhoods had no precontact habitation sites reported close by, but the landscape in each could have also once supported Native American planting fields or short-term sites. In contrast, the Rockaway West neighborhood was found to lack precontact potential altogether.

Virtually all GIA Site locations were farmed by Europeans from the mid-17th century onward, which would have eradicated traces of earlier planting fields. These sites were also later disturbed to a depth of at least 1.5 feet below grade by leveling, regulating, and opening streets and sidewalks. Therefore, while there is the remote possibility that deeply buried precontact resources in pit features – typically associated with habitations that are more permanent rather than short-term encampments - may have survived the process of urbanization in these neighborhoods, the likelihood is low. Documented larger long-term settlements at the time of European Contact were outside of the GIA Site locations.

Sensitivity for historic period archaeological resources focused on establishing the location of GIA Sites in proximity to historic structures that predated the availability of municipal sewer and water. The residents in these earlier structures would have had to rely on wells, cisterns, and privies since municipal utilities were not available in most neighborhoods until the 1890s or 1910s. Of the 237 GIA Sites, 21 locations in all but the Rockaway West neighborhood were found to be potentially sensitive for mid-19th to early 20th century shaft features that could contain artifacts dating to the period of occupancy. These potentially sensitive locations are listed on the following table.

Table 13: Summary of GIA Sites with Historic Archaeological Potential

GIA Site #	Potential Sensitivity
Gravesend	
50A and 50B	domestic resources ca.1844-1920
51A and 51B	domestic resources ca.1844-1920
62A	domestic resources ca.1849-1920
64A and 64B	domestic resources ca.1849-1920
65A, 65B, and 65D	domestic resources ca.1849-1920
82-1A	domestic resources ca.1844-1920
99A	domestic resources ca.1852-1899
99B	domestic resources ca.1873-1920
SE Brooklyn	
8A and 8B	domestic resources ca.1873-1918
49A and 49B	domestic resources ca.1849-1890
Canarsie	
5A	domestic resources ca.1840-1920
Idlewild	
175-2A	domestic resources ca.1873-1918
251A	domestic resources ca.1891
263A	domestic resources ca.1891

Several of these GIA Sites are potentially sensitive for shaft features associated with the same structure since they are in proximity to each other (e.g., 65A, B, and D in Gravesend).

B. Recommendations

For precontact resources, it is recommended that a sample of sensitive locations in each neighborhood (except Rockaway West) be subjected to archaeological monitoring and testing at the time of construction to establish the presence or absence of precontact deposits. Such testing would be most efficient if completed in conjunction with excavations for GIA installation. Working with the backhoe operator, archaeologist could direct machine excavations and develop a strategy for testing strata beneath overburden. Such a strategy could include hand-excavating shovel tests in locations with seemingly undisturbed strata, and/or sifting a sampling of machine-excavated soils. Rather than testing all potentially sensitive locations, a sampling strategy should be developed to ensure that an adequate number of locations in each sensitive neighborhood are reviewed while avoiding testing redundancy (e.g., testing or monitoring multiple GIA Sites in proximity). A Work Plan should be developed and testing at the time of construction should focus on locations near established Native American trails, and locations that are less likely to have been disturbed by historic activities (e.g., highway construction, prior borings).

For historic archaeological resources, it is recommended that all GIA Sites that have been identified as potentially sensitive for shaft features listed on Table 13 be tested or monitored for resources at the time of construction, as described for precontact resources. If any intact historic archaeological resources are encountered from contained deposits (e.g., from features such as wells, privies, and cisterns), resources should be appropriately excavated and documented. Subsequently, focused documentary research should be undertaken to link artifacts to household residents.

A Work Plan for monitoring and/or testing at the time of construction in each of the four neighborhoods with potential sensitivity should be established in consultation with LPC and SHPO. All archaeological testing or monitoring should be conducted according to applicable standards (NYAC 1994; OPRHP 2005; LPC 2018). Professional archaeologists, with an understanding of and experience in urban archaeological excavation techniques, would be required to be part of the archaeological team.

VIII. REFERENCES

Armbruster, Eugene L.
1922 *Brooklyn: Kings Highway - Nostrand Avenue No Date.* Eugene L. Armbruster Collection. New York Public Library. https://www.oldnyc.org/#705229f-a. Site accessed January 15, 2019.

Beers, Frederick W.
1873 *Atlas of Long Island, New York.* Beers, Comstock and Cline, New York.

Bellot, Alfred H.
1917 *History of the Rockaways from the year 1685 to 1917.* Bellot's Histories, Inc., Far Rockaway, NY.

Black, Frederick R.
1981 *Historic Resource Study, Jamaica Bay: A History. Gateway National Recreation Area New York, New Jersey Cultural Resource Management Study No. 3.* Prepared for the Division of Cultural Resources, North Atlantic Regional Office, National Park Service, U.S. Department of Interior, Washington, D.C.

Boesch, Eugene J.
1997 "Archaeological Evaluation and Sensitivity Assessment of the Precontact and Contact Period Aboriginal History of the Borough of Queens, New York City." Submitted to the New York City Landmarks Preservation Commission. May 27.

Bolton, Reginald Pelham
1922 Indian Paths in the Great Metropolis. *Indian Notes and Monographs, No. 23,* edited by F. W. Dodge. Museum of the American Indian, Heye Foundation, New York.

1934 *Indian Life Long Ago in the City of New York.* Bolton Books, New York.

Brodhead, John Romeyn
1853-1871 *History of the State of New York.* Harper & Brothers, New York.

Bromley, G.W.
1909 *Atlas of the City of New York, Borough of Queens.* G. W. Bromley Company, Philadelphia.

Brooklyn Daily Eagle
1886 Collapse of the Big Tower. *Brooklyn Daily Eagle.* October 10, 1886.

1892 Hundreds of Firemen, But No Water With Which to Battle the Seaside Blaze. *Brooklyn Daily Eagle.* September 21, 1892.

1899 Improvements of Last Year. *Brooklyn Daily Eagle.* January 18, 1899.

1899a Gravesend Water Plant. *Brooklyn Daily Eagle.* February 18, 1899.

1899b Some Interesting Facts About Greater New York. *Brooklyn Daily Eagle.* April 16, 1899.

1904 --. *Brooklyn Daily Eagle.* August 10, 1904.

1908 Aqueduct Boulevard Urged. *Brooklyn Daily Eagle.* July 1, 1908.

1910a The Real Beginning of Many Public Improvements in the Borough of Brooklyn. *Brooklyn Daily Eagle.* February 2, 1910.

1910b High Property Taxes Stir Canarsie's Ire. *Brooklyn Daily Eagle.* February 16, 1910.

1911 Borough Notices. *Brooklyn Daily Eagle.* 5/18/1911.

Brooklyn Daily Eagle (con't.)
1915 Real Estate at Auction. *Brooklyn Daily Eagle.* May 28, 1915.

1930 Real Estate. *Brooklyn Daily Eagle.* November 11, 1930.

Brooklyn Public Library
2016 *Black Canarsie History.* Available at: https://www.bklynlibrary.org/locations/jamaica-bay/black-canarsie-history. Site accessed October 16, 2018.

Burr, David H.
1839 *Map of New-York and its vicinity.* https://digitalcollections.nypl.org/items/510d47da-efbd-a3d9-e040-e00a18064a99. Site accessed December 18, 2018.

City Environmental Quality Review (CEQR)
2014 *City Environmental Quality Review Technical Manual*. City of New York, Mayor's Office of Environmental Coordination.

Conner, R. F. O.
1852 *Map of Kings and Part of Queens Counties, Long Island, N.Y*. M. Dripps, New York.

Dankaerts, Jasper and Peter Sluyter
1966 *Journal of a Voyage to New York.* Reprint of 1867 edition. University Microfilms, Ann Arbor.

Eisenberg, Leonard
1978 Paleo-Indian Settlement Patterns in the Hudson-Delaware River Drainages. *Occasional Publications in Northeastern Anthropology*, No. 4.

Florio, Bill
2017 *Around Elmont and Rosedale.* Arcadia Publishing, Charleston, South Carolina.

Geismar, Joan H.
1987 *Documentation of Block 8218, Lot26, Brooklyn, New York.* Prepared for the New York City Department of General Services Division of Real Property.

Grumet, Robert
1981 *Native American Place Names in New York City.* Heye Foundation, Museum of the City of New York, New York.

Herrera, Roberto
2017 *Phase I Archaeological Investigation Queens Safety City Site North Conduit Avenue at Intersection of 246th Street and 138th Avenue, Rosedale, Queens, New York.* Prepared by HDR for the NYCDOT.

Historical Perspectives, Inc. (HPI)
1988 *U.S. Truck Body Site, Queens, NY: Phase 1A Archaeological Assessment, CEQR No. 88-164Q.* Prepared for Allee King Rosen Fleming, Inc., New York.

1989 *Arverne Urban Renewal Project CEQR No. 85-322Q, Cultural Resources Survey, Queens, NY.* Submitted November 1986. Revised September 1989.

1991 *The New York City Long Range Sludge Management Plan Generic Environmental Impact Statement III JFK West, Queens Phase IA Archaeological Assessment*. Prepared for Allee, King, Rosen, and Fleming, Inc., New York.

1998 *Stage 1A Cultural Resources Assessment, Belt Parkway Bridges Project, Brooklyn, New York, DOT CEQR No.97DOT006K.* Prepared for Allee, King, Rosen, and Fleming, Inc., New York.

2008 *Phase IA Archaeological Assessment, Chandler Street Sewer Outfall, Far Rockaway, Queens, NY*, Prepared for the NYCDDC.

2010 *Archaeological Documentary Study, 2101-2115 Utica Avenue, Block, 7875, Lot 27, Brooklyn, Kings County, New York, CEQR: 26111.* Prepared for Dabes Realty Company, Brooklyn.

2014 *Phase IA Archaeological Documentary Study, 810-812 Kent Avenue, Brooklyn, New York 11205, Block 1883, Lots 35 and 36, LPC # Board of Standards and Appeals / 13BSA015K*. Prepared For: Avrumi Neiman, Best Embroidery, Inc., Brooklyn, NY 11219.

2019 *Historic Resources Assessment, GOSR Green Infrastructure Assessment and Implementation Project, Kings & Queens Counties, New York. NYCDEP / 12DEP054Y, OPRHP #18PR05554.* Prepared for Fisher Associates.

Hyde, E. Belcher
1899 *Atlas of the Borough of Brooklyn*. E. B. Hyde, Brooklyn, New York.

1907 *Atlas of the Borough of Brooklyn*. E. B. Hyde, Brooklyn, New York.

1918 *Atlas of the Borough of Queens.* E. B. Hyde, Brooklyn, New York.

1920 *Atlas of the Borough of Brooklyn*. E. B. Hyde, Brooklyn, New York.

Kadinsky, Sergey
2016 *Hidden Waters of New York City: A History and Guide to 101 Forgotten Lakes, Ponds, Creeks, and Streams in the Five Boroughs.* Countryman Press, Woodstock, Vermont.

Kelly, James A.
1946 *Indian Villages, Paths, Ponds and Places in Kings County.* Brooklyn Historical Society Map Collection.

Kopper, Stephen J.
1979 *Cultural Resources Reconnaissance, Dredging Project, East Rockaway Inlet, New York.* Prepared for the U.S. Army Corps of Engineers, New York District, New York.

Landmarks Preservation Commission (LPC)
2018 *Landmarks Preservation Commission Guidelines for Archaeological Work in New York City*.

Lopez, Julius and Stanley Wisniewski
1971 The Ryders Pond Site. In *The Bulletin*. New York State Archaeological Association, Vol. 53: November 1971.

Lucev, Emil R.
2007 *The Rockaways.* Arcadia Publishing, Charleston, S.C.

Merlis, Brian and Lee A. Rosenzweig
2008 *Brooklyn's Last Village: Canarsie on Jamaica Bay*. Brooklynpix.com in conjunction with Israelowitz Publishing. Brooklyn, New York.

Munsell, W. W. and Company
1882 *History of Queens County, New York: with illustrations, portraits, and sketches of prominent families and individuals.* W.W. Munsell and Co., New York.

New York Archaeological Council (NYAC)
1994 *Standards for Cultural Resource Investigations and the Curation of Archaeological Collections.* New York Archaeological Council.

New York Board of Estimate and Apportionment (NYBOEA)
1913 *Minutes of the Board of Estimate and Apportionment of the City of New York.* M. B. Brown Printing & Binding Company, New York.

1922 *Proceedings of the Board of Estimate and Apportionment of the City of New York.* M. B. Brown Printing & Binding Company, New York.

New York City Department of Parks and Recreation (NYCParks)
2018 *Rockaway Beach and Boardwalk.* https://www.nycgovparks.org/parks/rockaway-beach-and-boardwalk/highlights/7721. Site accessed August 18, 2018.

New York City Department of Transportation (NYCDOT)
2010 *Standard Details of Construction.* July, 2010. Available at: https://www1.nyc.gov/assets/ddc/downloads/publications/infrastructure/nyc-dot-standard-details-eff-031516.pdf. Site accessed August 14, 2018.

New York State Office of Parks, Recreation, and Historic Preservation (OPRHP)
2005 *Phase I Archaeological Report Format Requirements.*

Ostrander, Stephen M.
1894 *A History of the City of Brooklyn and Kings County, 2 vols.* Brooklyn, New York.

Panamerican Consultants, Inc.
2003 *Cultural Resources Assessment of T-Groin Placement, Atlantic Coast of New York, East Rockaway Inlet to Rockaway Inlet and Jamaica Bay, Queens County, New York Section 934*. Prepared for the U.S. Army Corps of Engineers.

Parker, Arthur C.
1920 The Archeological History of New York-Part II. *New York State Museum Bulletin,* 237/238, September/October, 471-743.

Robinson, Edward
1890 *Atlas of Kings County, New York.* Robinson and Pidgeon, Philadelphia.

Ross, Peter
1903 *A History of Long Island from the Earliest Settlement to the Present Time, Vol. 1.* Lewis Publishing Co., New York.

Sanborn Fire Insurance Map Company
1885 *Insurance Maps of the County of Queens*. Sanborn Map Company, New York.

1904 *Insurance Maps of the Borough of Queens, City of New York.* Sanborn Map Company, New York.

1912 *Insurance Maps of the Borough of Queens, City of New York*. Sanborn Map Company, New York.

1933 *Insurance Maps of the Borough of Queens, City of New York*. Sanborn Map Company, New York.

Sanderson, Eric W.
2016 Cartographic Evidence for Historical Geomorphological Change and Wetland Formation in Jamaica Bay, New York. *Northeastern Naturalist* 23(2):277-304.

Schuberth, Christopher J.
1968 *The Geology of New York City and Environs.* Natural History Press, Garden City, New York.

Seyfried, Vincent, and William Asadorian
1991 *Old Queens, N.Y. in Early Photographs.* Dover Publications, Inc., New York.

Sidney, J. C.
1849 *Sidney's map of twelve miles around New-York : with the names of property holders, &c., from entirely new & original surveys.* http://digitalcollections.nypl.org/items/510d47da-efb8-a3d9-e040-e00a18064a99.

Smith, Carlyle Shreeve
1950 The Archaeology of Coastal New York, Vol. 43, part 2. *Anthropological Papers of the Museum of Natural History,* New York.

Stiles, Henry R. Editor
1884 *The Civic, Political, Professional and Ecclesiastical History and Commercial and Industrial Record of the County of Kings and the City of Brooklyn, N.Y., from 1683 to 1884.* W.W. Munsell and Company, New York.

Stillwell, William
1884 History of Coney Island. In *The Illustrated History of Kings County*. Henry R. Stiles, ed. W. W. Munsell and Company, New York.

Stockwell, Austin P.
1884 A History of the Town of Gravesend. Reprinted from *The Illustrated History of Kings County.* Henry R. Stiles, ed. W.W. Munsell and Company, New York.

Stokes, I.N. Phelps
1915-1928 *The Iconography of Manhattan Island.* 6 vols. New York.

Taylor, George and Andrew Skinner
1781 *Map of New York & Staten Island and Part of Long Island.* Surveyed by order of Sir Henry Clinton.

Tehune, John
1674 *A Map of the Town of Gravesend.* http://bklyn-genealogy-info.stevemorse.org/Map/1674.Gravesend.Tehune.html.

Thompson, Benjamin Franklin
1918 *History of Long Island. Vol. 1.* Third edition. Robert H. Dodd, New York.

Tooker, William Wallace
1911 *The Indian Place Names on Long Island and Islands Adjacent With Their Probable Significations*. Kennikat Press, Port Washington, New York.

United States Coast Survey (U.S.C.S.)
1835 *South Coast of Long Island between the Pavilion of Rockaway and the Plum-gut [Reg. No. 4*]. F. R. Hassler, Superintendent. USC&GS, Washington D.C. Retrieved from Stony Brook University Digital Collection: Long Island Maps database.

1837a *Map of the Interior of Long Island From Brooklyn to Jamaica, New York [Reg. No. 36]*. F. R. Hassler, Superintendent. USC&GS, Washington D.C. Retrieved from Stony Brook University Digital Collection: Long Island Maps database.

1837b *Hicksville and Jamaica, Brushville and Miltham, New York [Reg. No. 37]*. F. R. Hassler, Superintendent. USC&GS, Washington D.C. Retrieved from Stony Brook University Digital Collection: Long Island Maps database.

1844 *Map of New-York Bay And Harbor And The Environs*. F.R. Hassler, Superintendent. USC&GS, Washington D.C. Retrieved from Stony Brook University Digital Collection: Long Island Maps database.

United States Geological Survey (U.S.G.S.)
2016 *Brooklyn; Coney Island; Far Rockaway, Lynbrook, and Jamaica, N.Y.* 7.5 Minute Topographic Quadrangles.

Van Wyck, Frederick
1924 *Keskachauge, or the First White Settlement on Long Island.* G.P. Putnam's Sons, the Knickerbocker Press, New York.

Vinckeboons, Joan.
1639 *Manatvs gelegen op de Noot [sic] Riuier (aka the Manatus Map).* https://www.loc.gov/resource/g3804n.ct000050. Site accessed January 4, 2019.

Walling, Henry F.
1859 *Topographical map of the counties of Kings and Queens, New York.* E. & A.A. Baker, New York.

Wolverton, C.
1891 *Atlas of Queens County, Long Island, New York*. Chester Wolverton, New York.

FIGURES

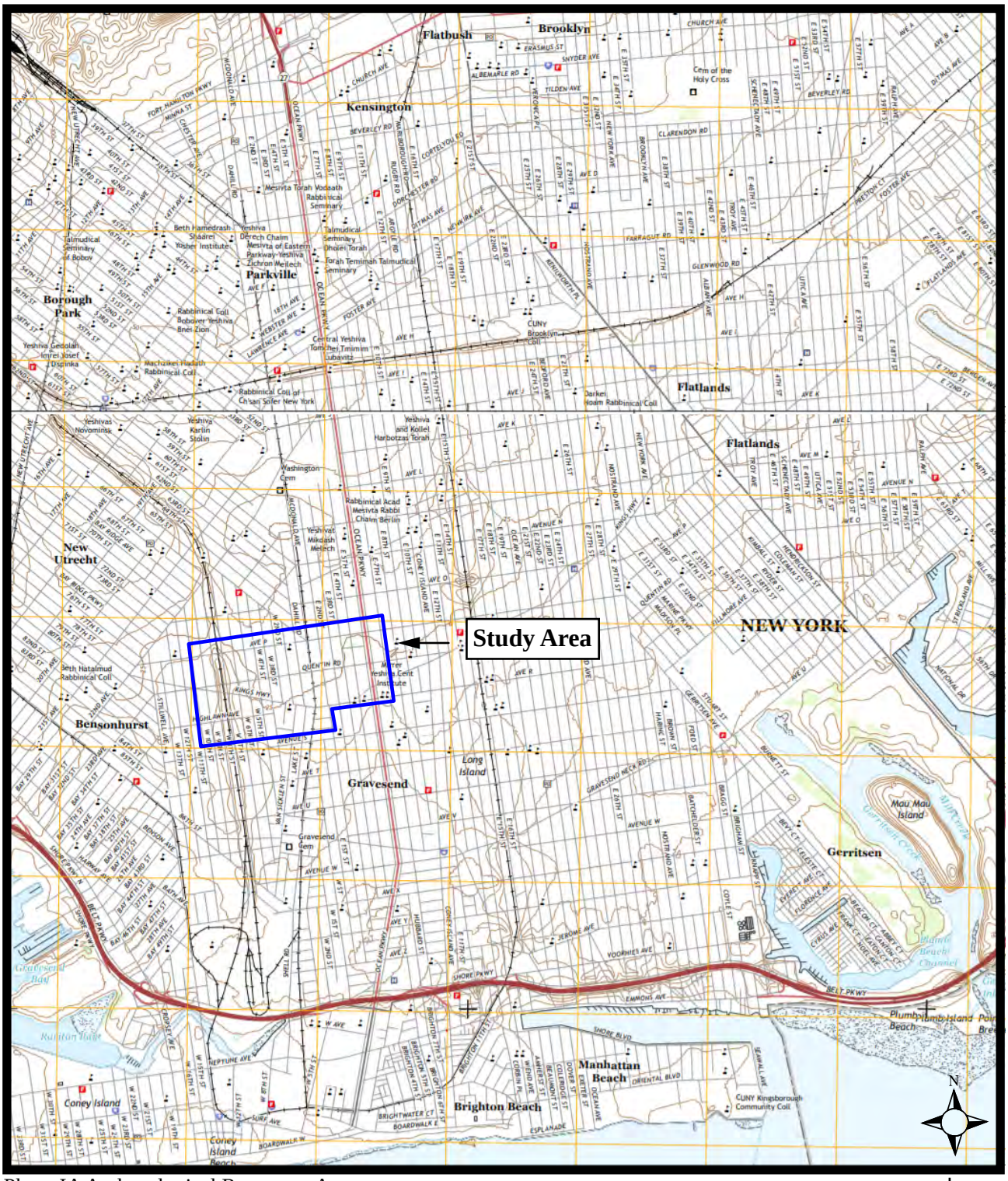

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Figure 1a: Gravesend Study Area on *Brooklyn, N.Y.* and *Coney Island, N.Y.-N.J.* topographic quadrangles (U.S.G.S. 2016).

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Figure 1b: Southeast Brooklyn Study Area on *Brooklyn, N.Y.* and *Coney Island, N.Y.-N.J.* topographic quadrangles (U.S.G.S. 2016).

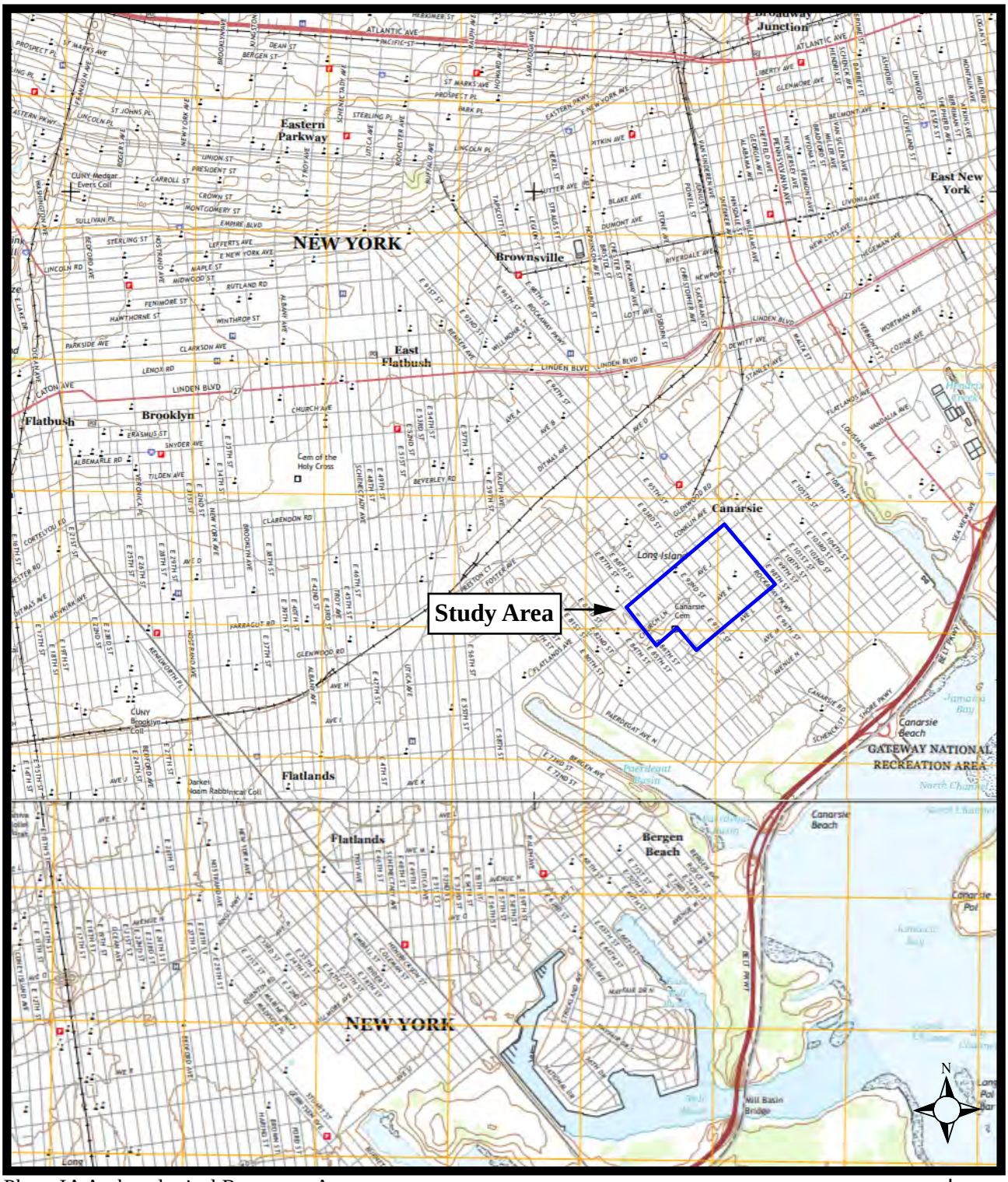

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Figure 1c: Canarsie Study Area on *Brooklyn, N.Y.* and *Coney Island, N.Y.-N.J.* topographic quadrangles (U.S.G.S. 2016).

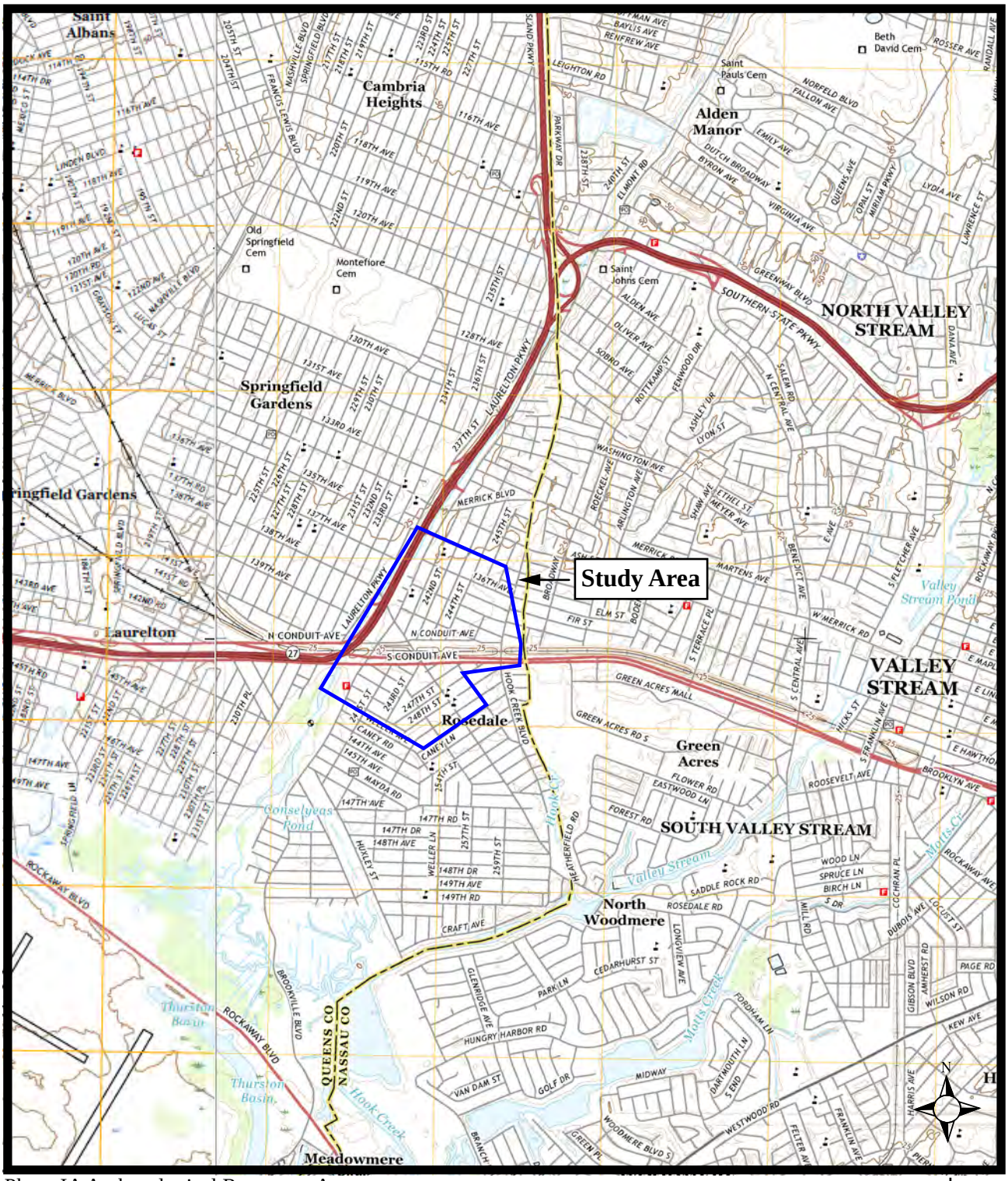

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Figure 1d: Idlewild Study Area on *Jamaica, N.Y.* and *Lynbrook, N.Y.* topographic quadrangles (U.S.G.S. 2016).

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Figure 1e: Far Rockaway Study Area on *Far Rockaway, N.Y.* topographic quadrangle (U.S.G.S. 2016).

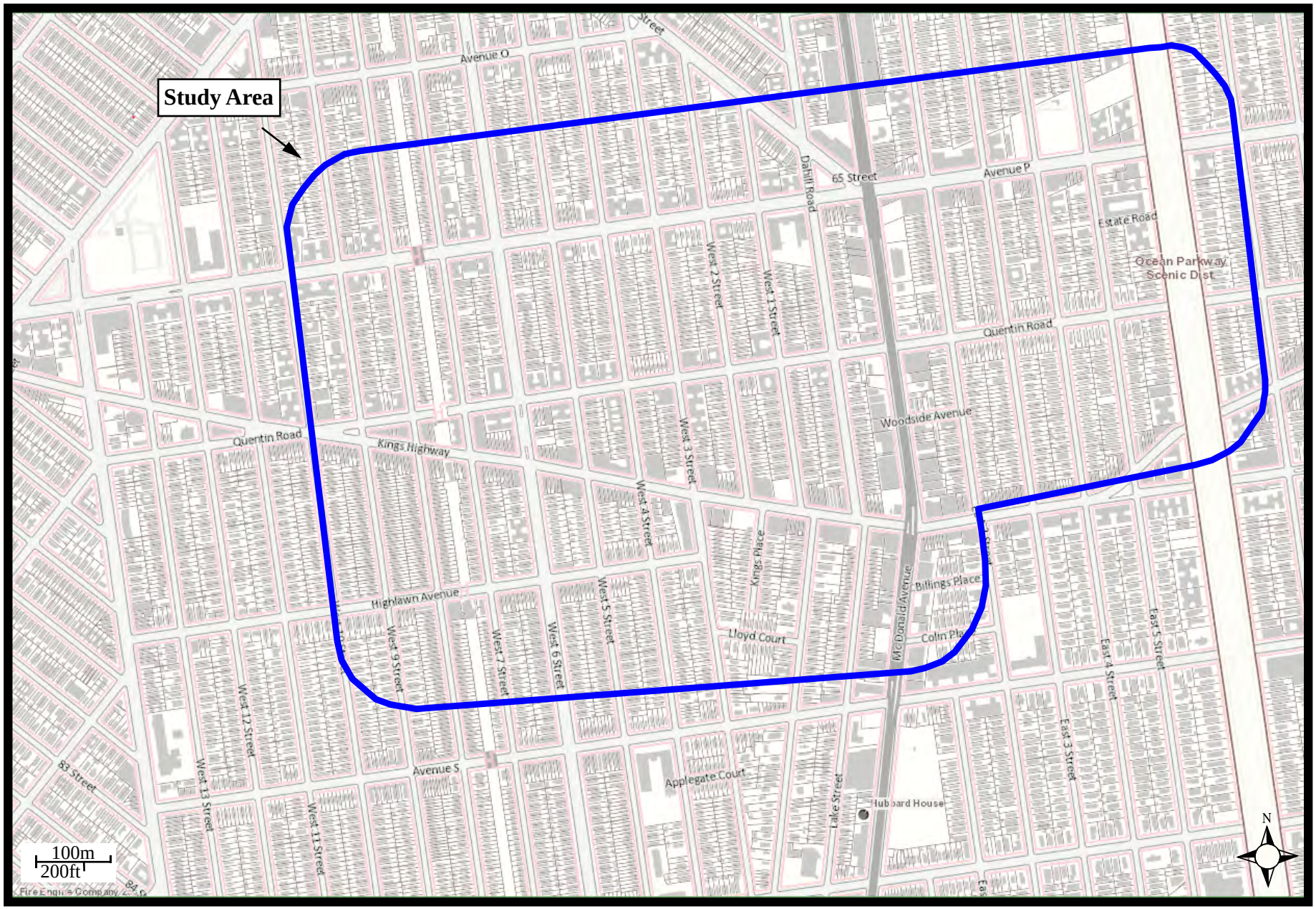

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Figure 2a: Gravesend Study Area on nycOASIS map (2018).

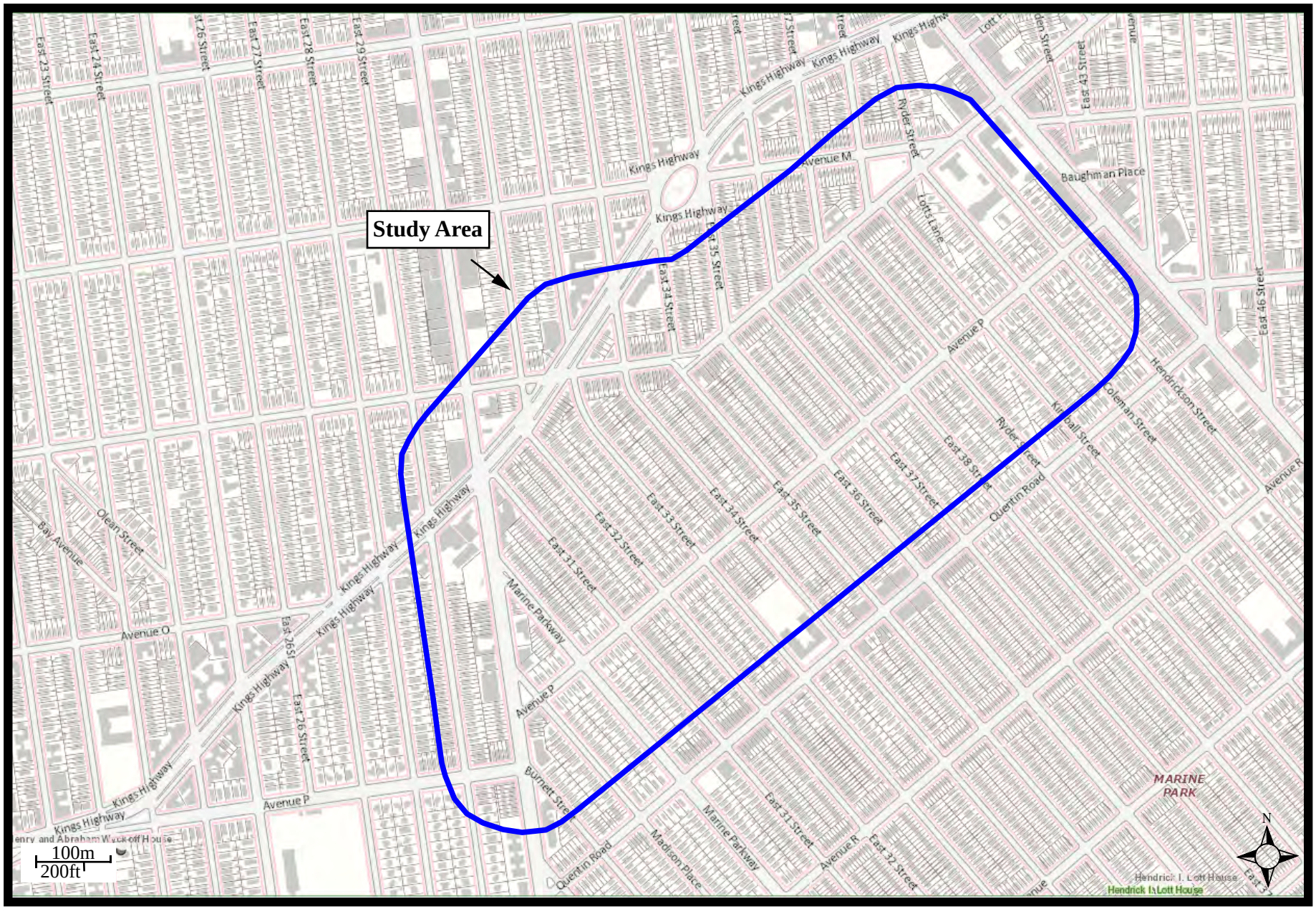

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Figure 2b: Southeast Brooklyn Study Area on nycOASIS map (2018).

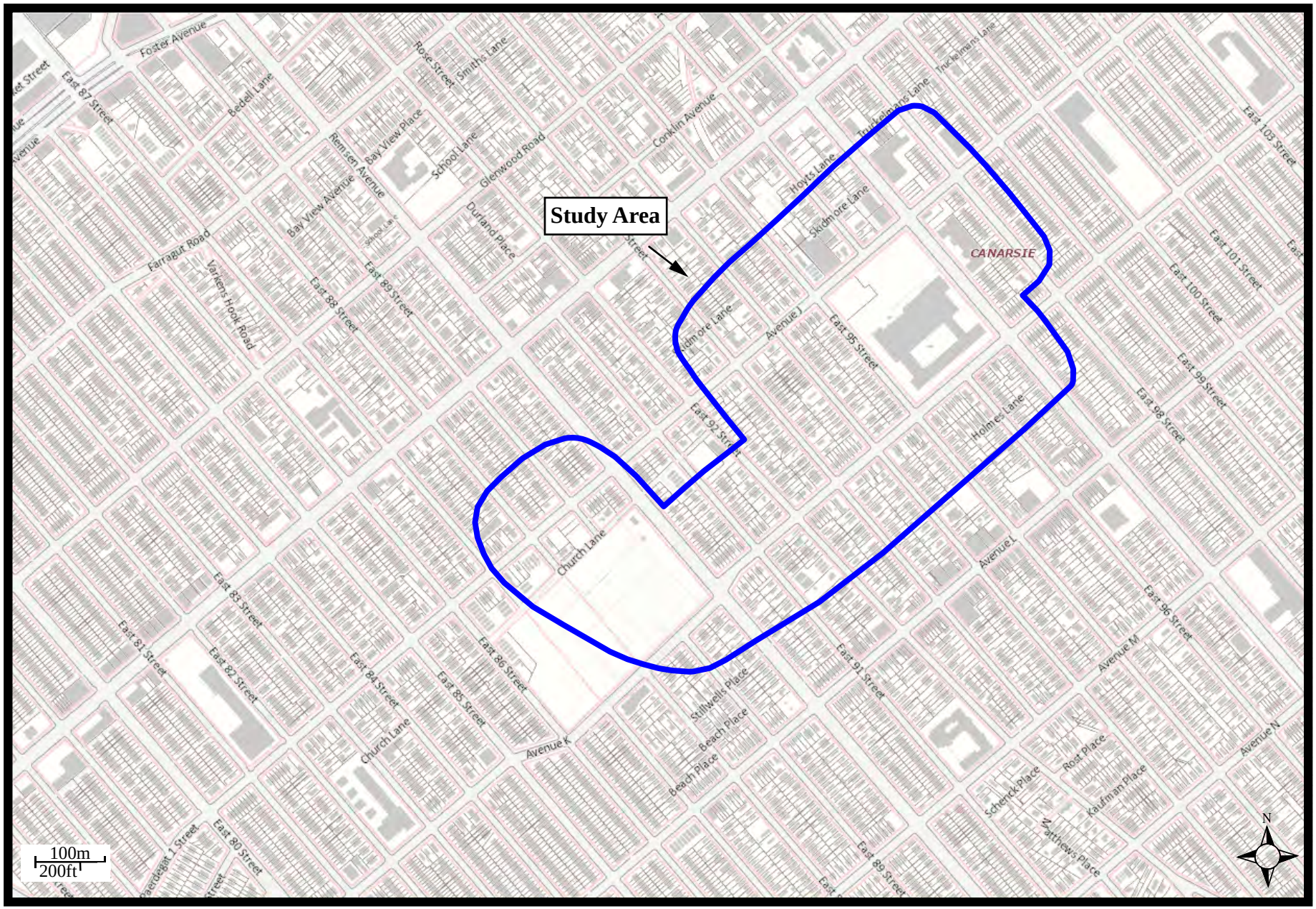

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Figure 2c: Canarsie Study Area on nycOASIS map (2018).

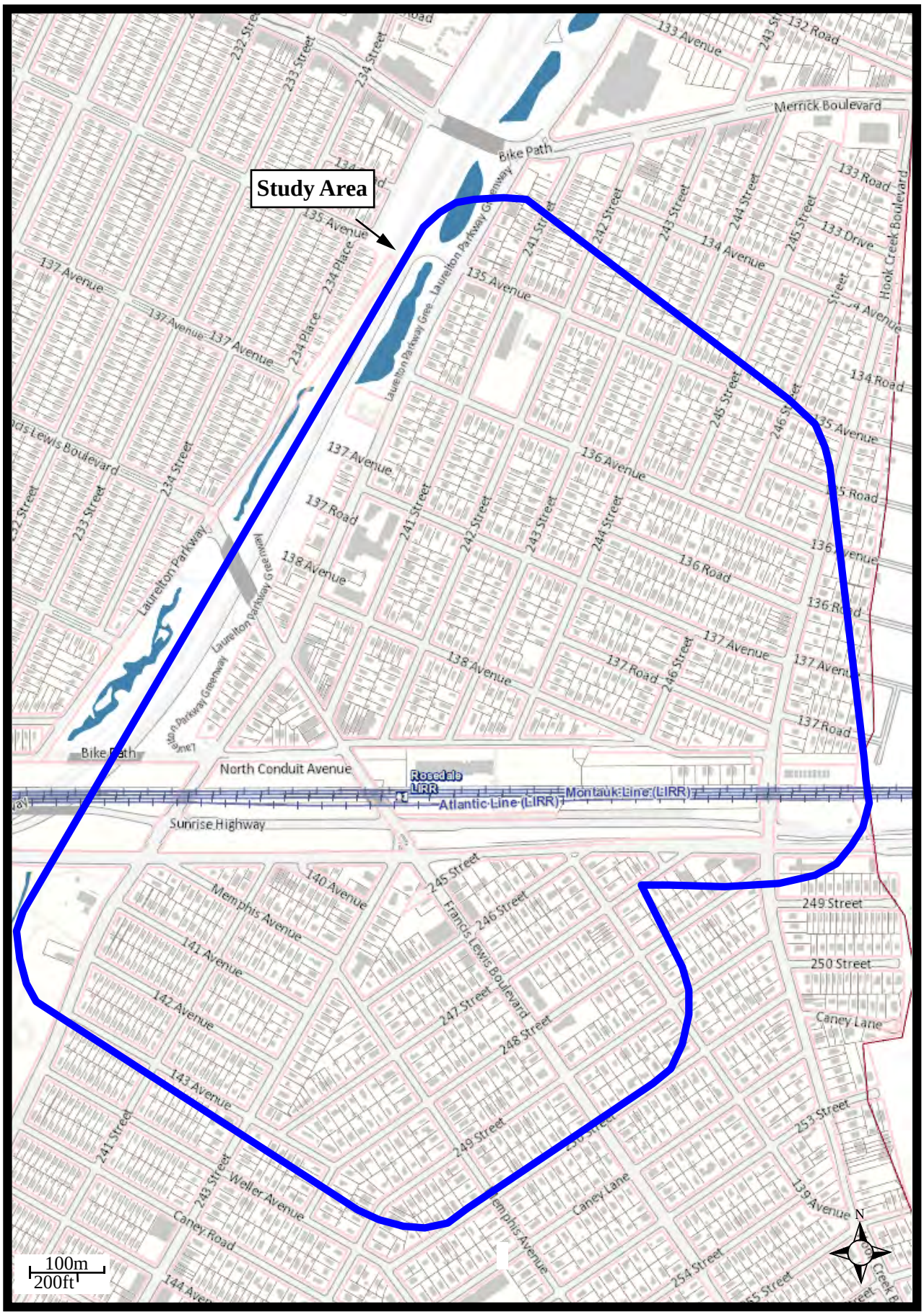

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Figure 2d: Idlewild Study Area on nycOASIS map (2018).

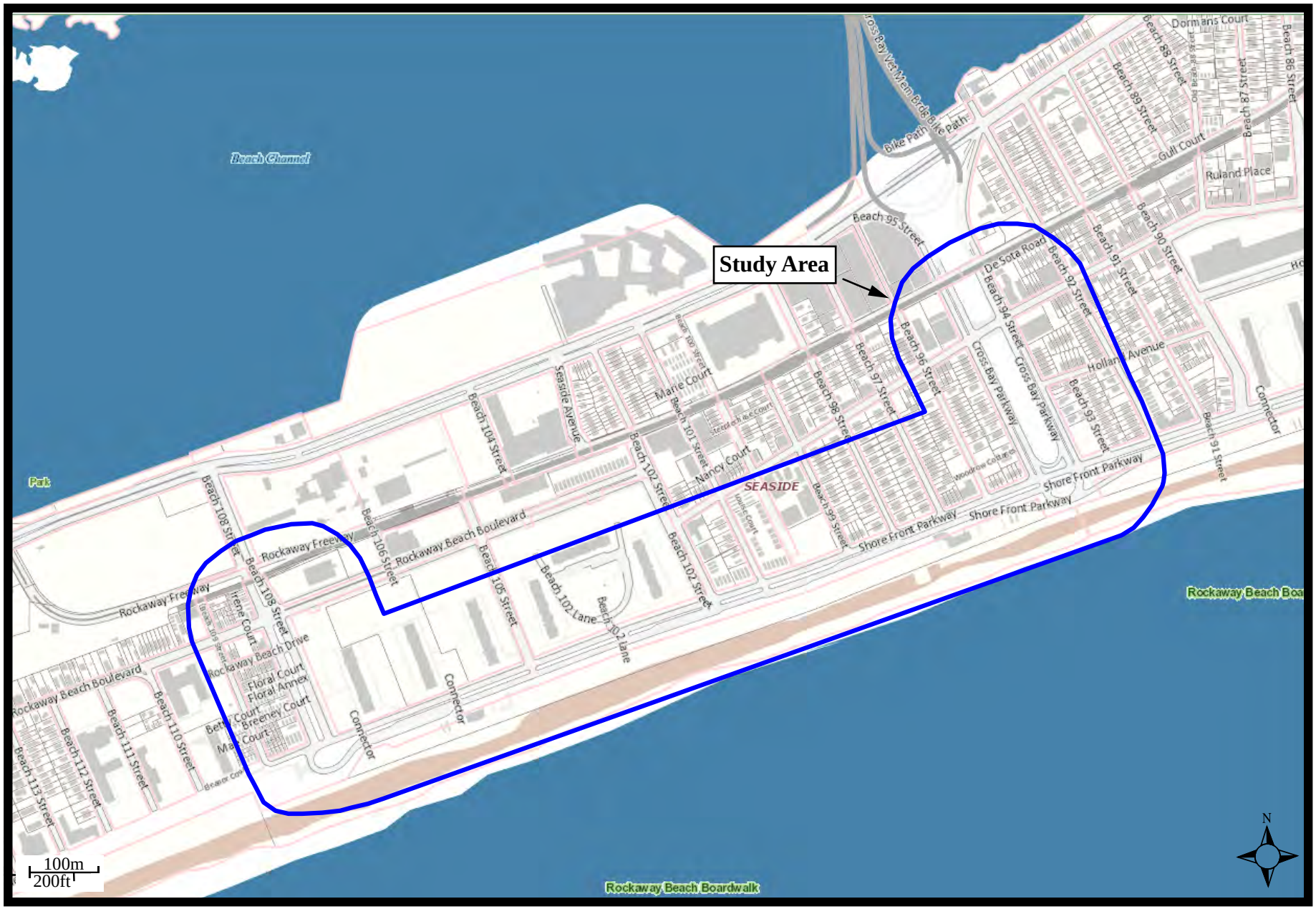

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Figure 2e: Rockaway West Study Area on nycOASIS map (2018).

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Figure 3: NYRCR Planning Areas (Fisher 2019).

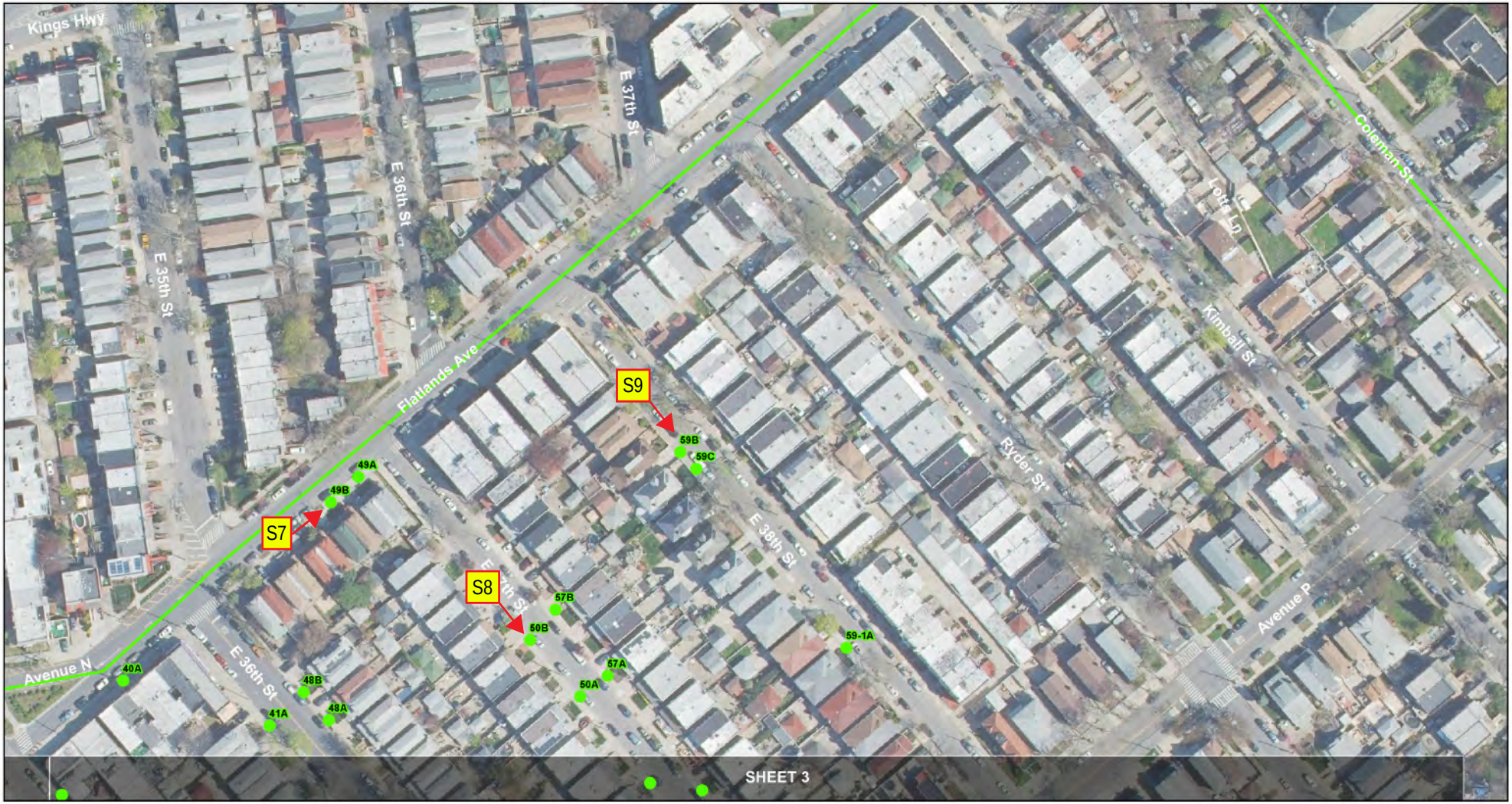

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Figure 3-1: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-2: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-3: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-4: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-5: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-6: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-7: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-8: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

Green Infrastructure Locations:
- Southeast Brooklyn Waterfront
- Canarsie
- Gravesend and Bensonhurst
- Idlewild Watershed Communities
- Rockaway West

NYRCR Planning Areas:
- Southeast Brooklyn Waterfront
- Canarsie
- Gravesend and Bensonhurst
- Idlewild Watershed Communities
- Rockaway West

1 - Photograph Number and Direction

0 50 100 Feet

Green Infrastructure Locations
Map Sheet 9 of 25
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Figure 3-9: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-10: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-11: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-12: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-13: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-14: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-15: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-16: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

Figure 3-17: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

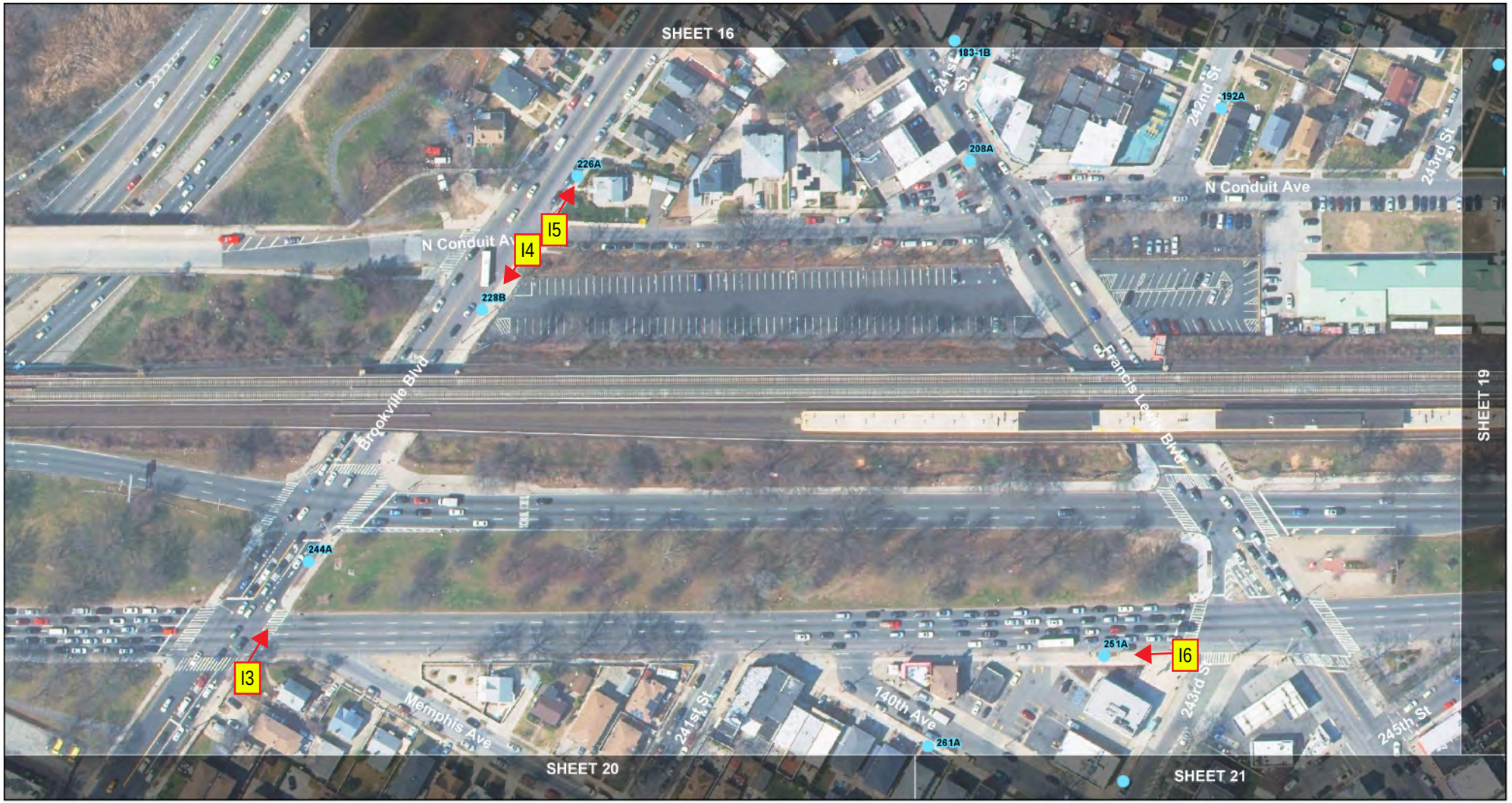

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Figure 3-18: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-19: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-20: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-21: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

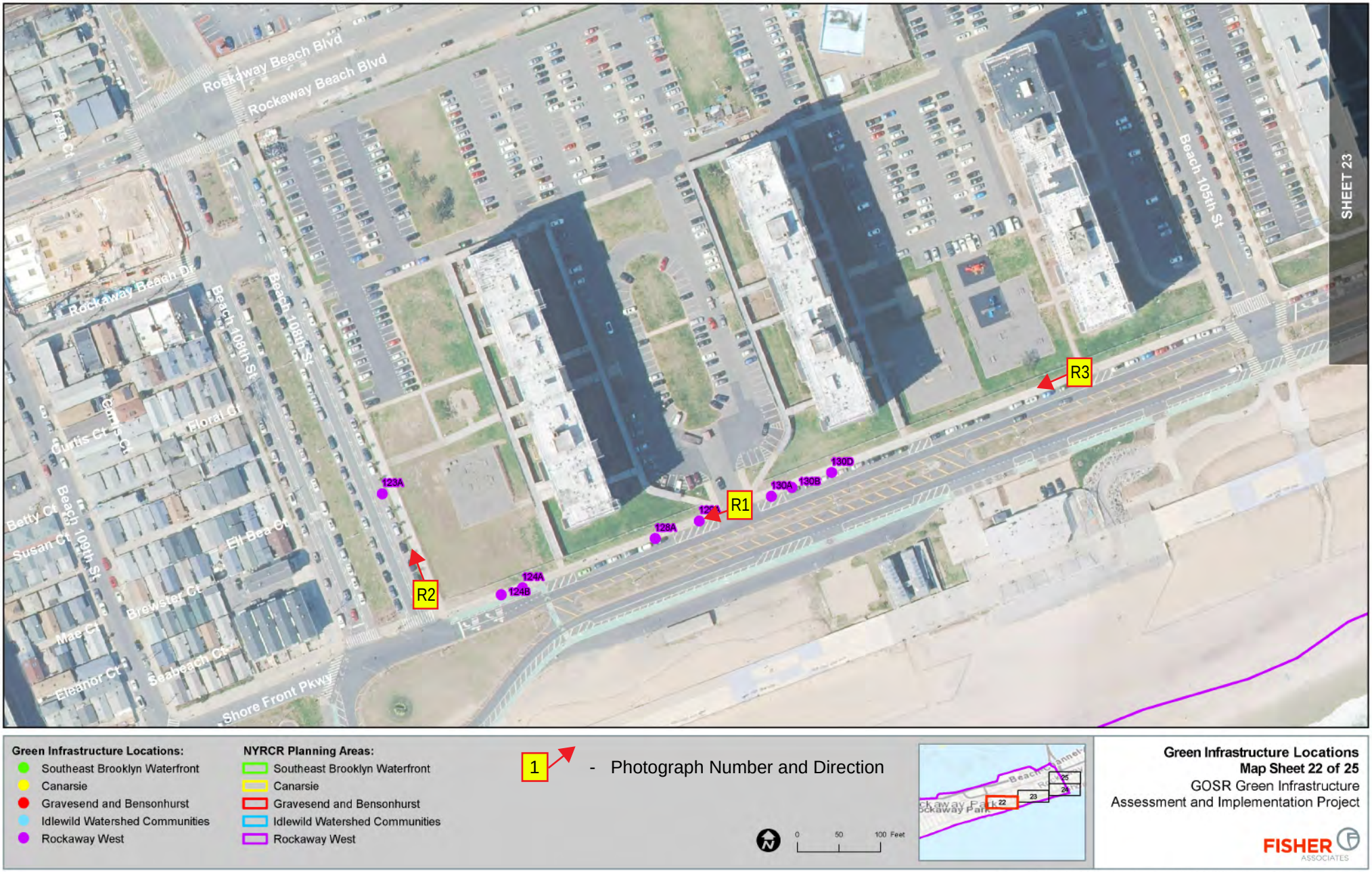

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Figure 3-22: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

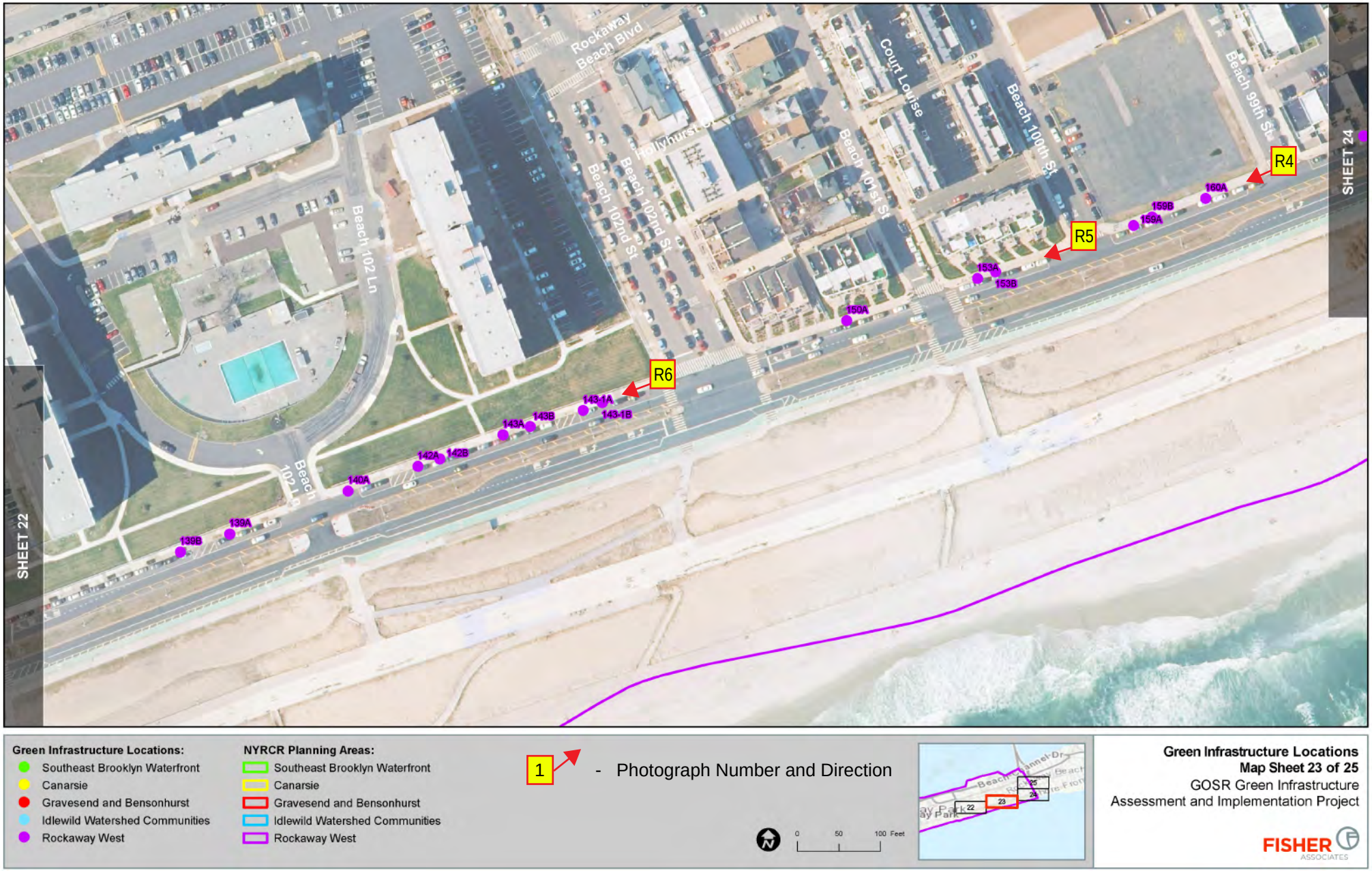

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Figure 3-23: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

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Figure 3-24: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).

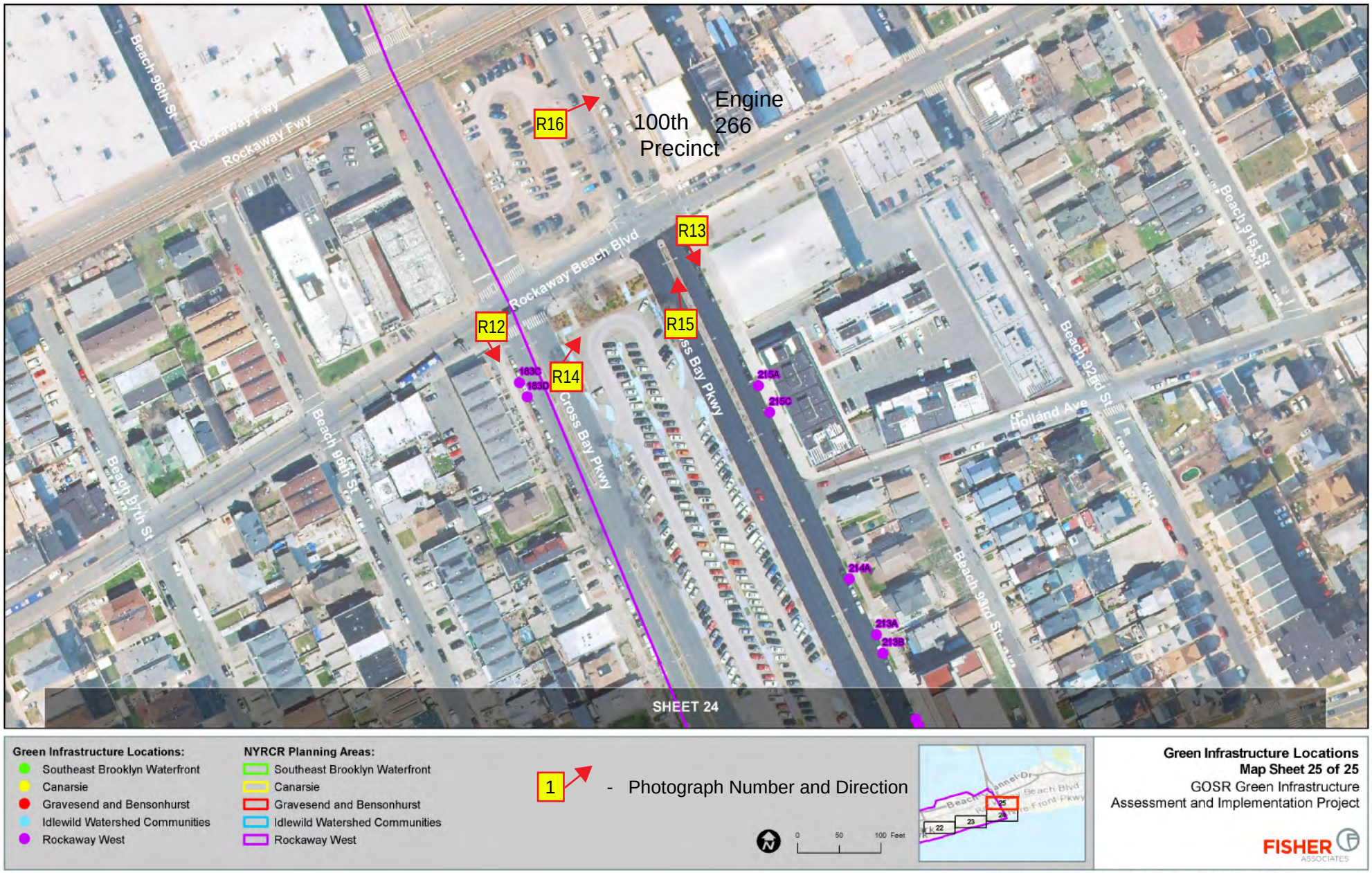

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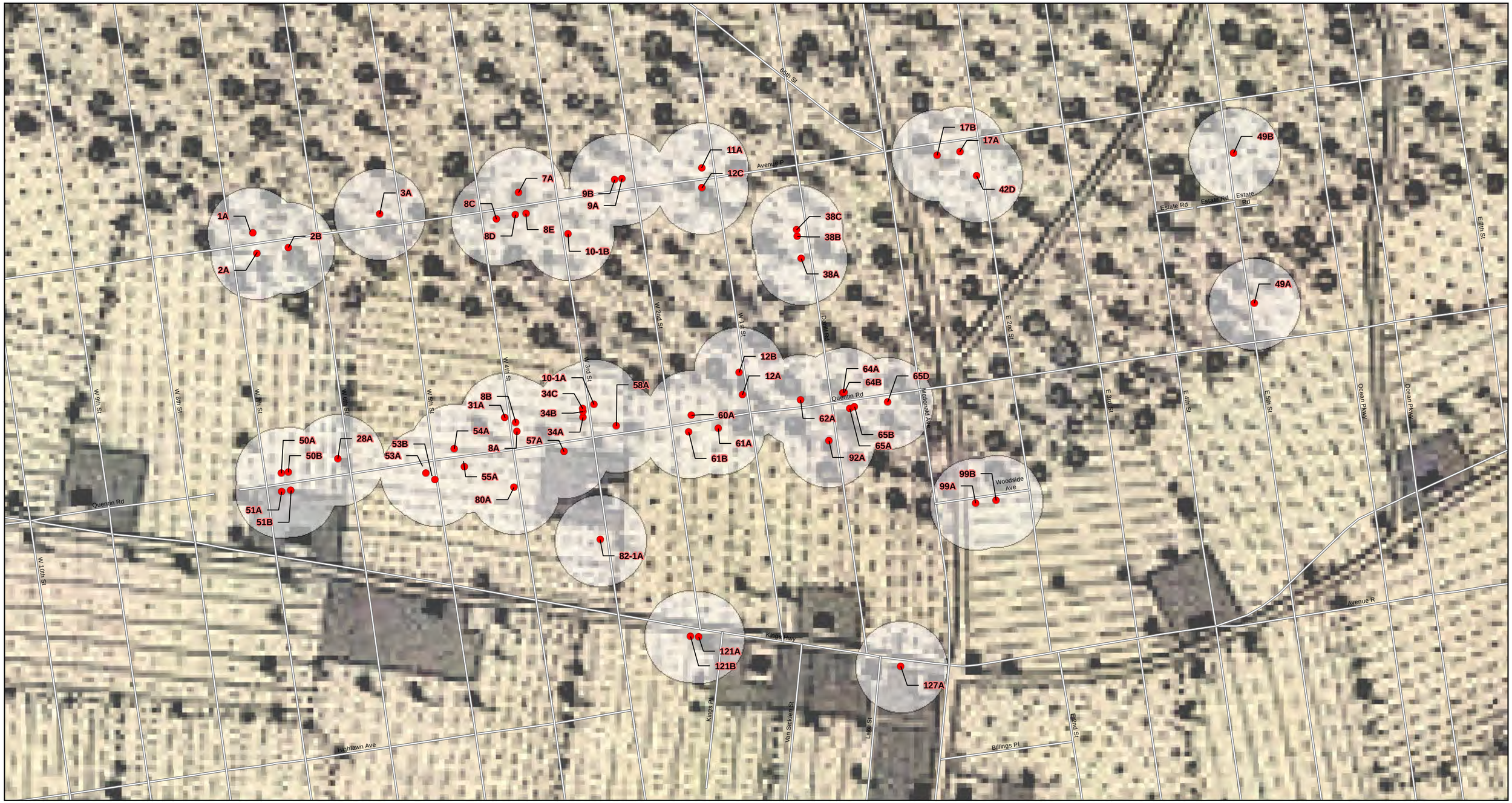
Figure 3-25: Area of Potential Effect and Photo Key on modern aerial photographs (Fisher 2019 and Historical Perspectives 2019).



Legend

- Green Infrastructure Location (Gravesend)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 4a: Gravesend Area of Potential Effect with 150-foot buffer on *Map of New-York Bay And Harbor And The Environs* (U.S.C.S. 1844)

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0 100 200 300 400 Feet

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Legend

- Green Infrastructure Location (Southeast Brooklyn)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 4b: Southeast Brooklyn Area of Potential Effect with 150-foot buffer on *Map of New-York Bay And Harbor And The Environs* (U.S.C.S. 1844)

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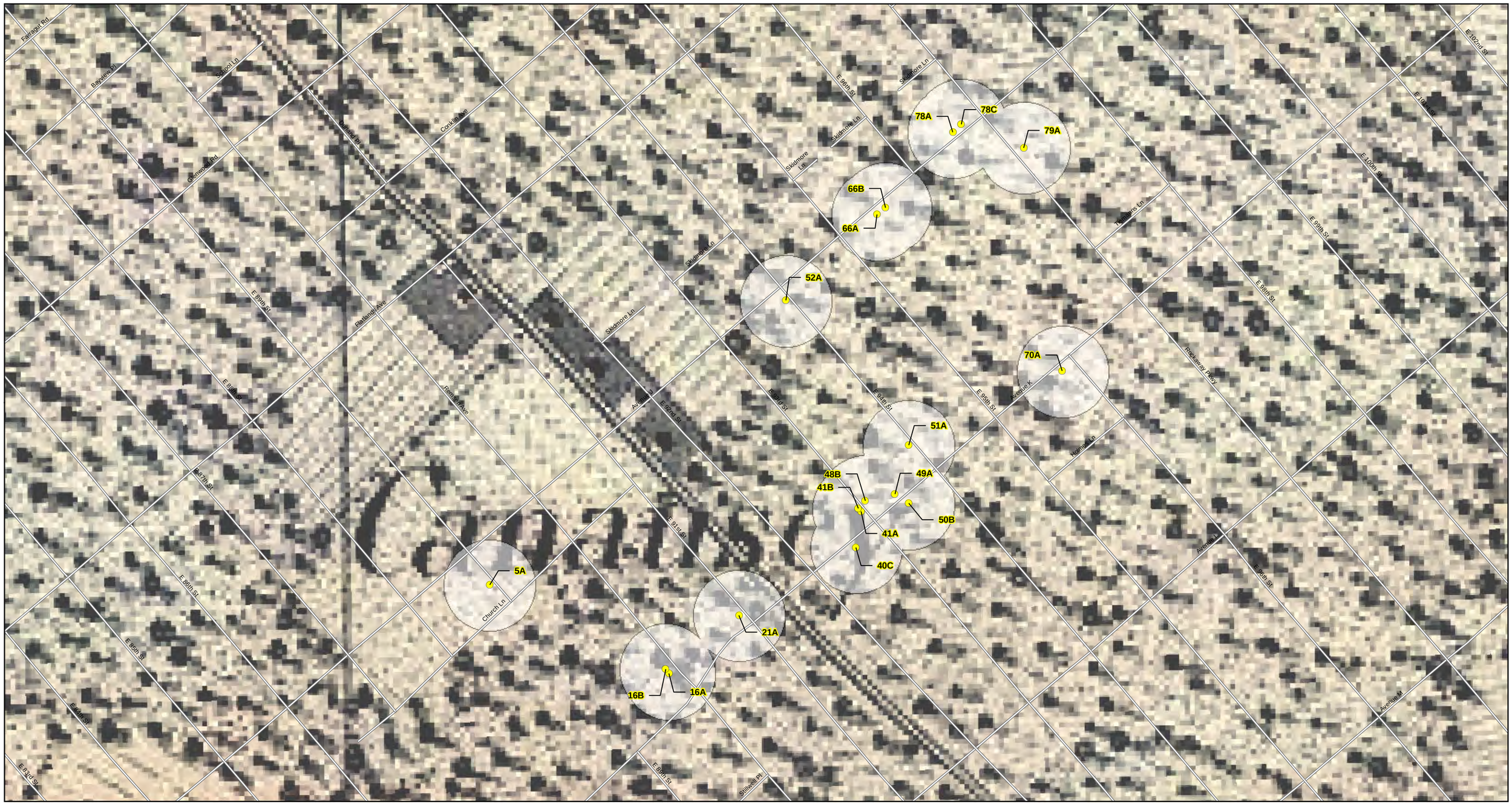
FISHER ASSOCIATES



Legend

- Green Infrastructure Location (Canarsie)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 4c: Canarsie Area of Potential Effect with 150-foot buffer on *Map of New-York Bay And Harbor And The Environs* (U.S.C.S. 1844)

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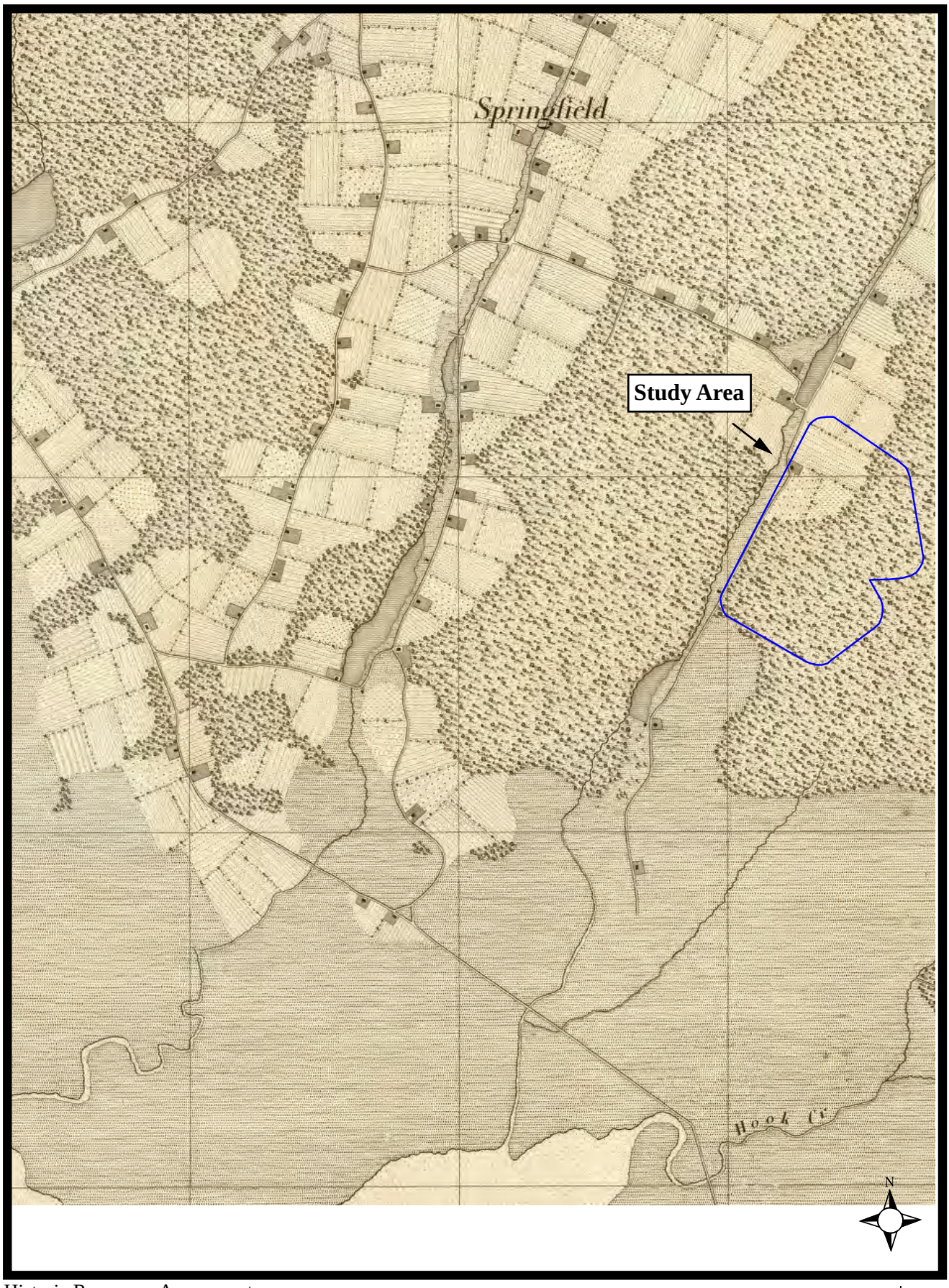

Historic Resources Assessment
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375m
1230 ft

Figure 4d: Idlewild Study Area on *Map of New-York Bay And Harbor And The Environs* (U.S.C.S. 1844).

Archaeological Resources Assessment
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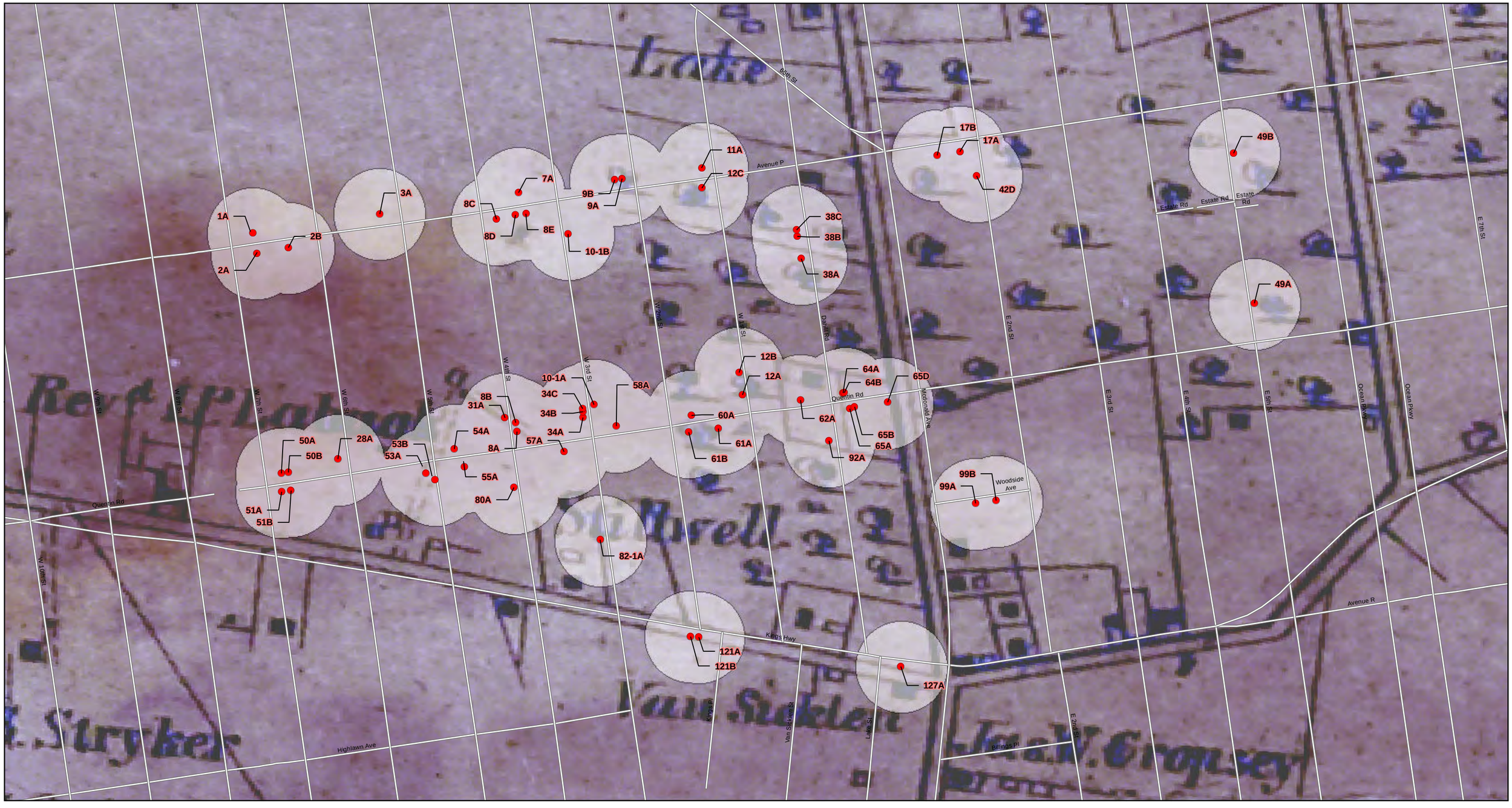
915 m
3000 ft

Figure 4e: Rockaway West Study Area on *Map of New-York Bay And Harbor And The Environs* (U.S.C.S. 1844).



Legend

- Green Infrastructure Location (Gravesend)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 5a: Gravesend Area of Potential Effect with 150-foot buffer on *Map of Kings and Part of Queens Counties, Long Island, New York* (Conner 1852)

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0 100 200 300 400 Feet

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Legend

- Green Infrastructure Location (Southeast Brooklyn)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 5b: Southeast Brooklyn Area of Potential Effect with 150-foot buffer on *Map of Kings and Part of Queens Counties, Long Island, New York* (Conner 1852)

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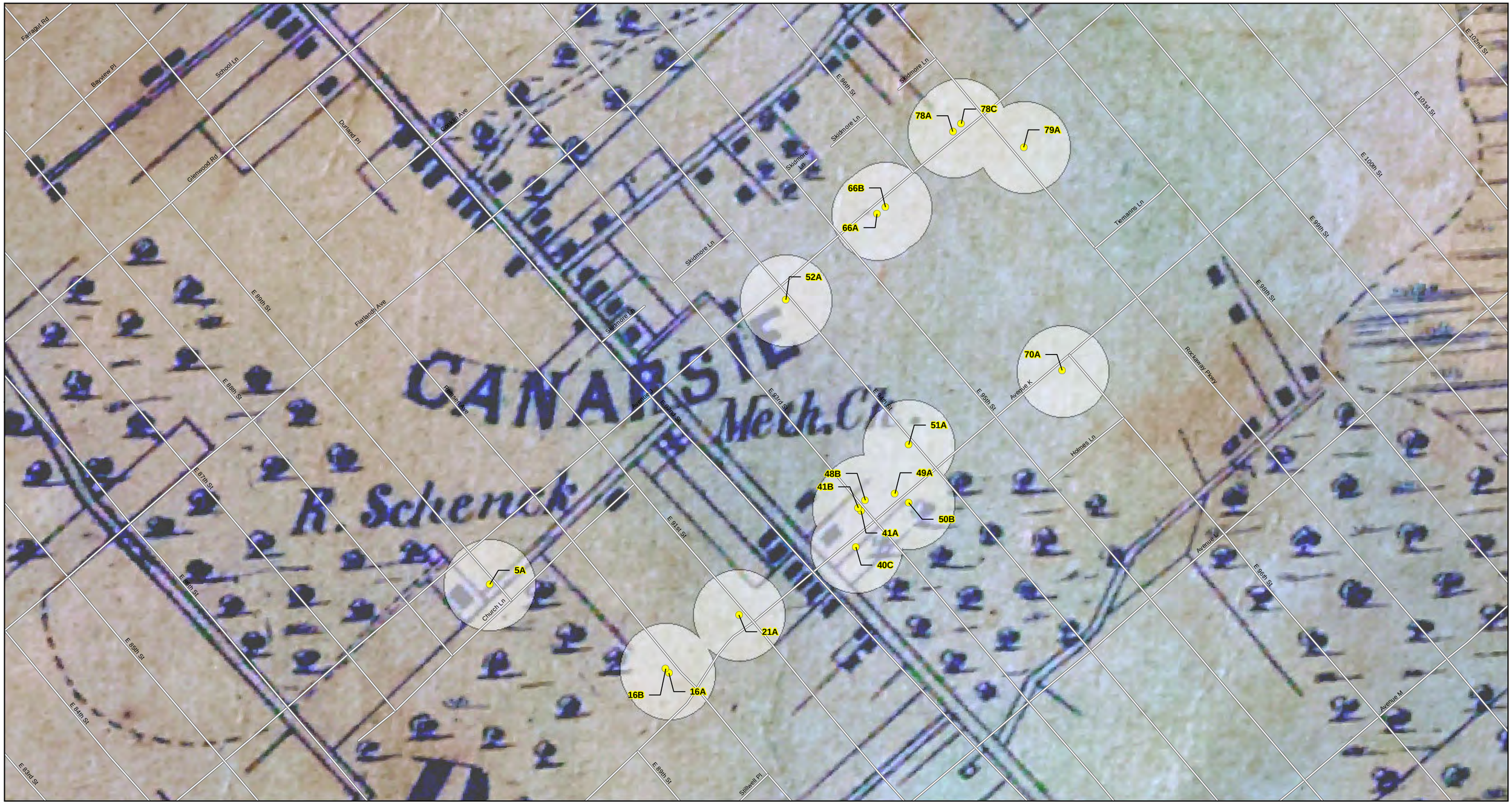
FISHER ASSOCIATES



Legend

- Green Infrastructure Location (Canarsie)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 5c: Canarsie Area of Potential Effect with 150-foot buffer on *Map of Kings and Part of Queens Counties, Long Island, New York* (Conner 1852)

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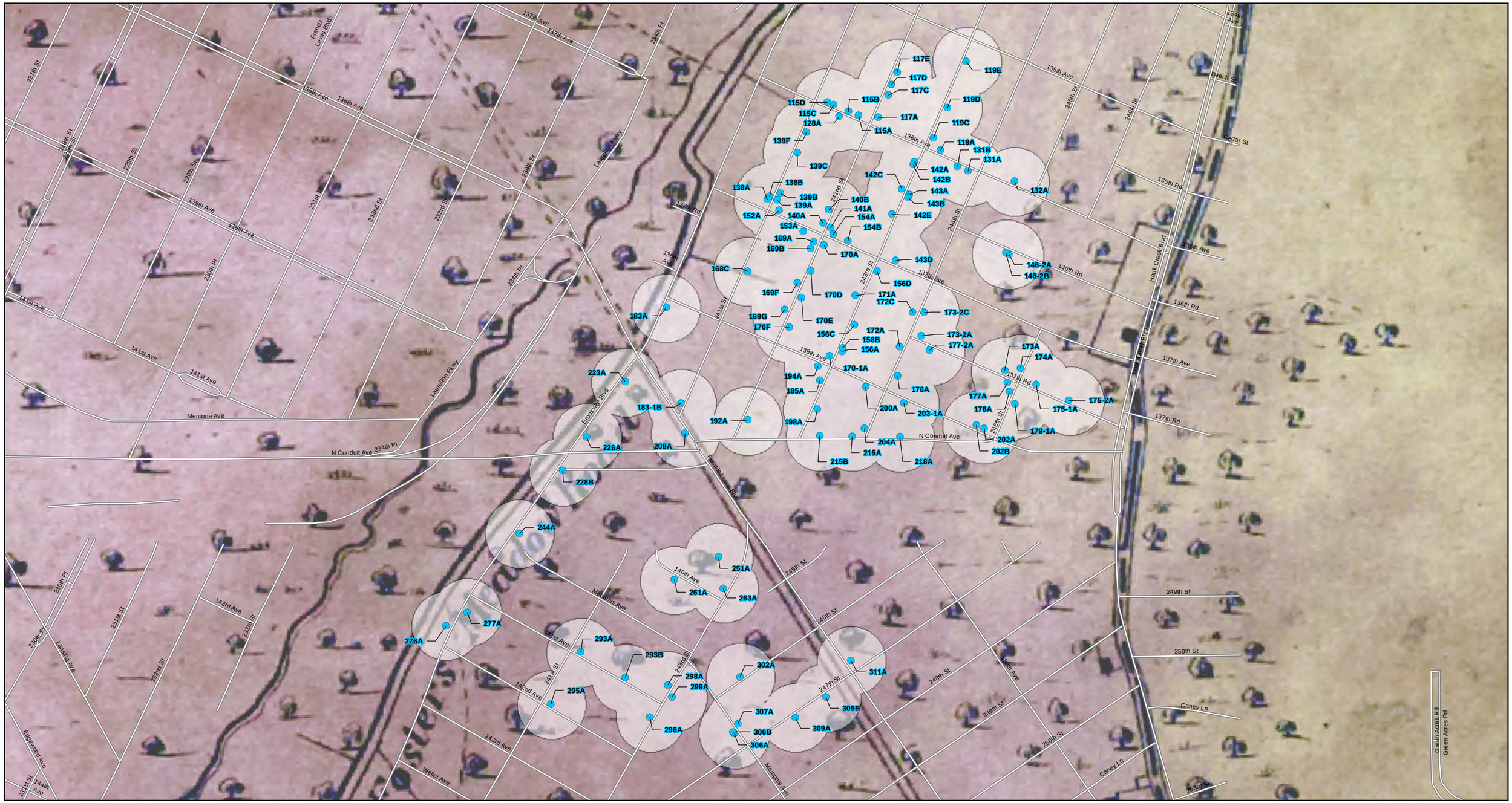

Legend

- Green Infrastructure Location (Idlewild)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 5d: Idlewild Area of Potential Effect with 150-foot buffer on *Map of Kings and Part of Queens Counties, Long Island, New York* (Conner 1852)

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Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 5e: Rockaway West Area of Potential Effect with 150-foot buffer on *Map of Kings and Part of Queens Counties, Long Island, New York* (Conner 1852)

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GOSR Green Infrastructure Assessment and Implementation Project
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0 100 200 300 400 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Gravesend)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 6a: Gravesend Area of Potential Effect with 150-foot buffer on *Atlas of Long Island, New York* (Beers 1873)

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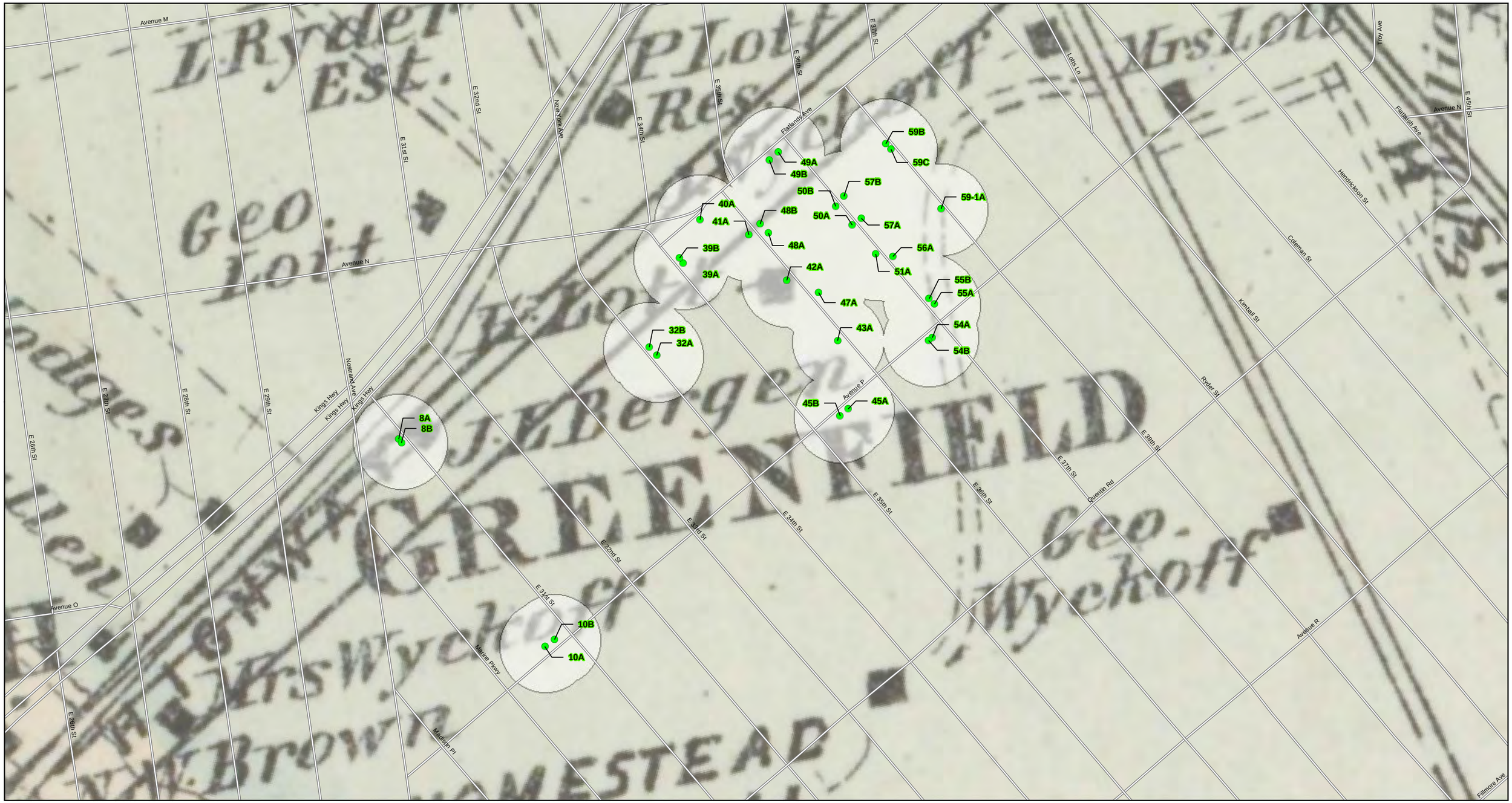

Legend

- Green Infrastructure Location (Southeast Brooklyn)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 6b: Southeast Brooklyn Area of Potential Effect with 150-foot buffer on *Atlas of Long Island, New York* (Beers 1873)

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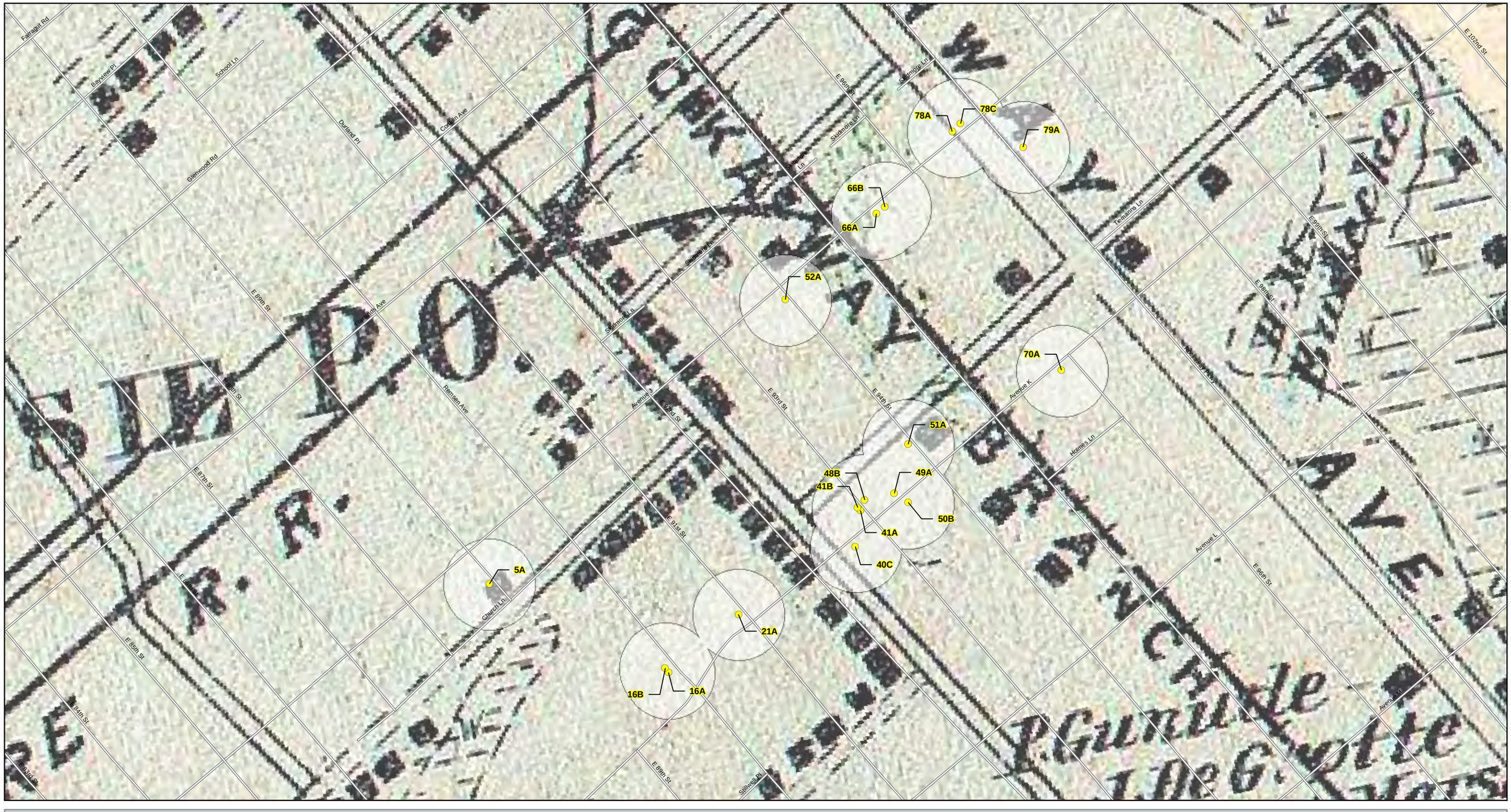

Legend

- Green Infrastructure Location (Canarsie)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 6c: Canarsie Area of Potential Effect with 150-foot buffer on *Atlas of Long Island, New York* (Beers 1873)

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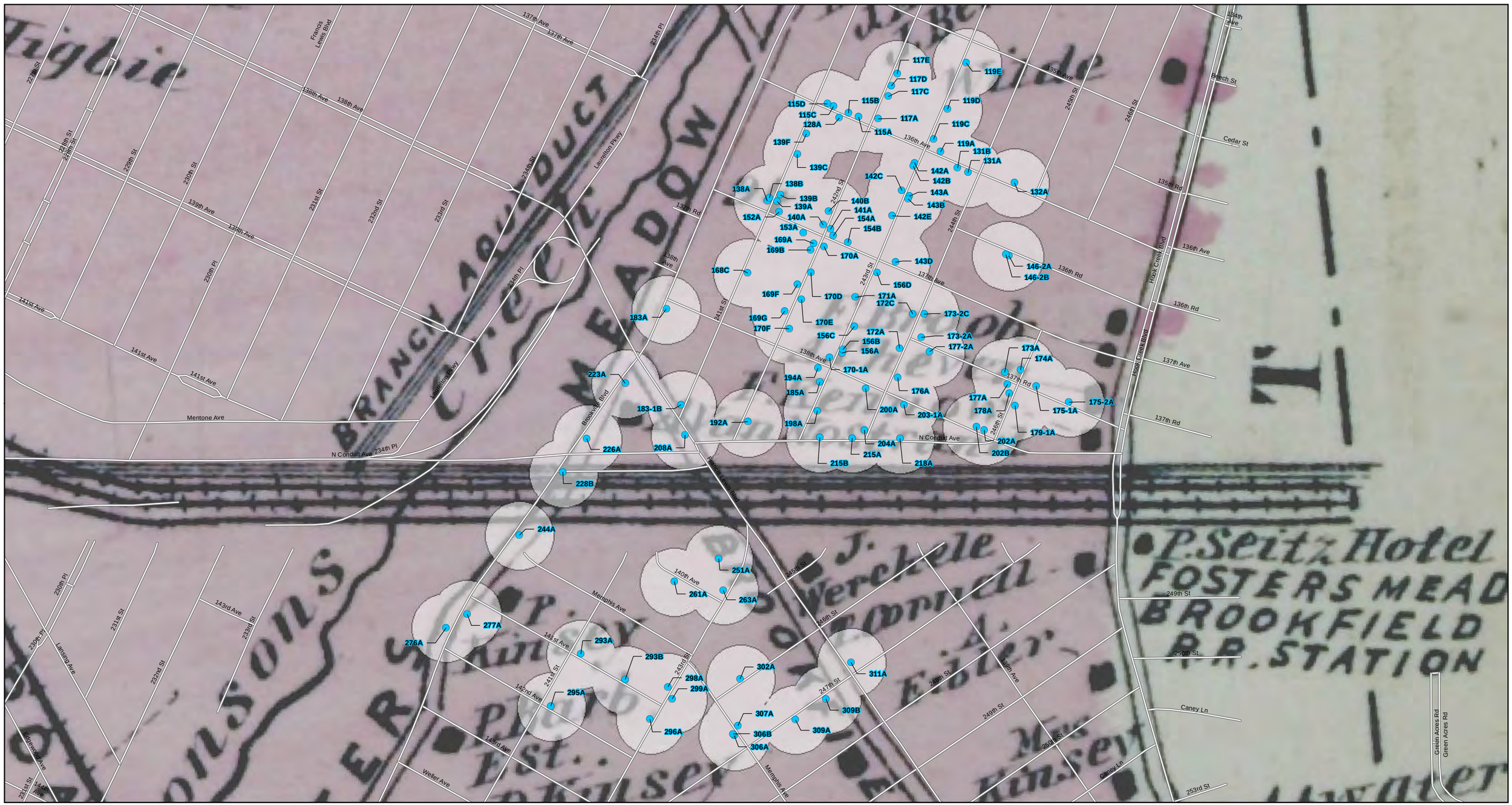

Legend

- Green Infrastructure Location (Idlewild)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 6d: Idlewild Area of Potential Effect with 150-foot buffer on *Atlas of Long Island, New York* (Beers 1873)

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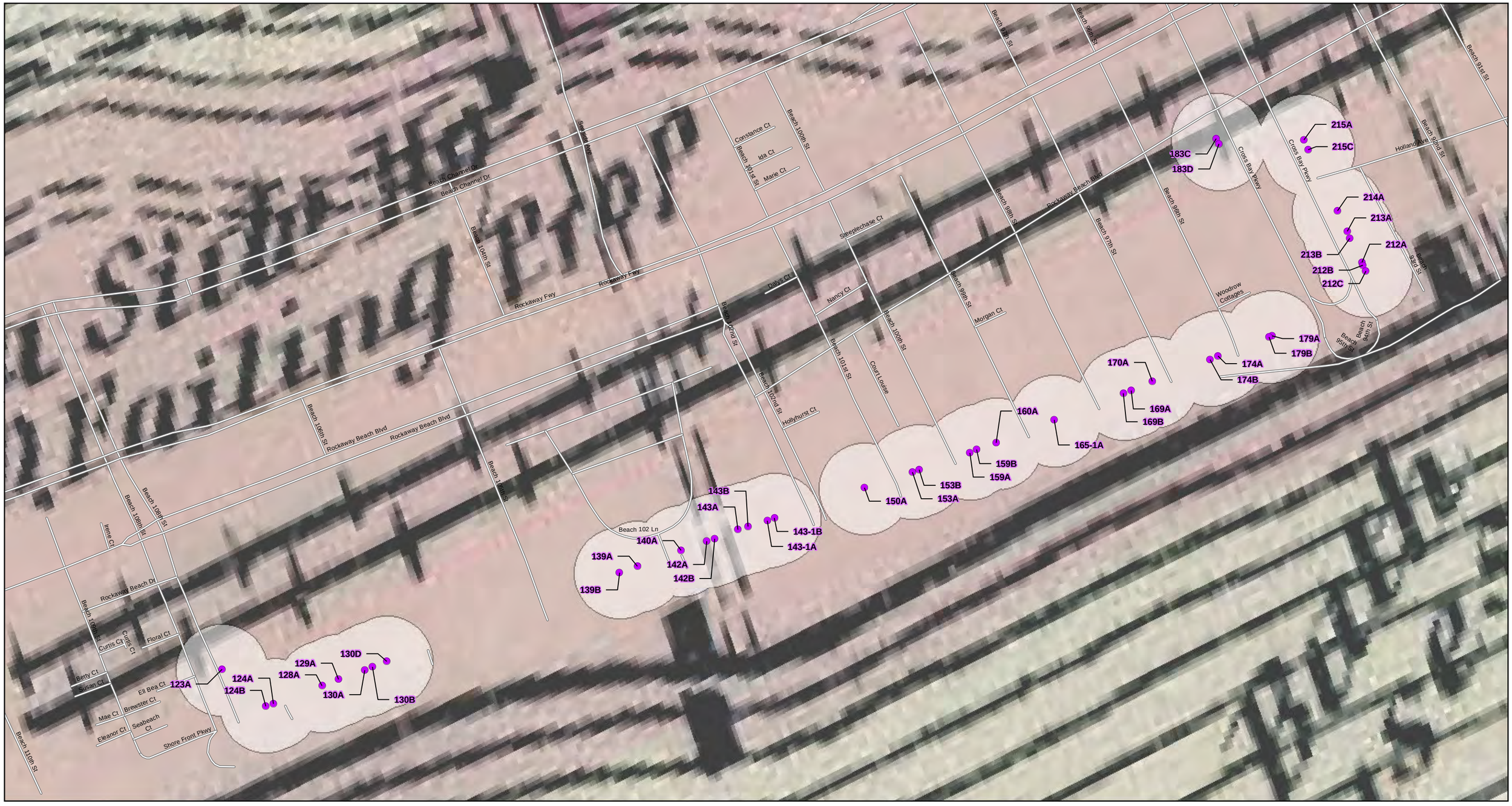
FISHER ASSOCIATES



Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 6e: Rockaway West Area of Potential Effect with 150-foot buffer on *Atlas of Long Island, New York* (Beers 1873)

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0 100 200 300 400 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 7: Rockaway West Area of Potential Effect with 150-foot buffer on *Insurance Maps of the County of Queens* (Sanborn 1885)

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0 100 200 300 400 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Gravesend)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 8a: Gravesend Area of Potential Effect with 150-foot buffer on *Atlas of Kings County, New York* (Robinson 1890)

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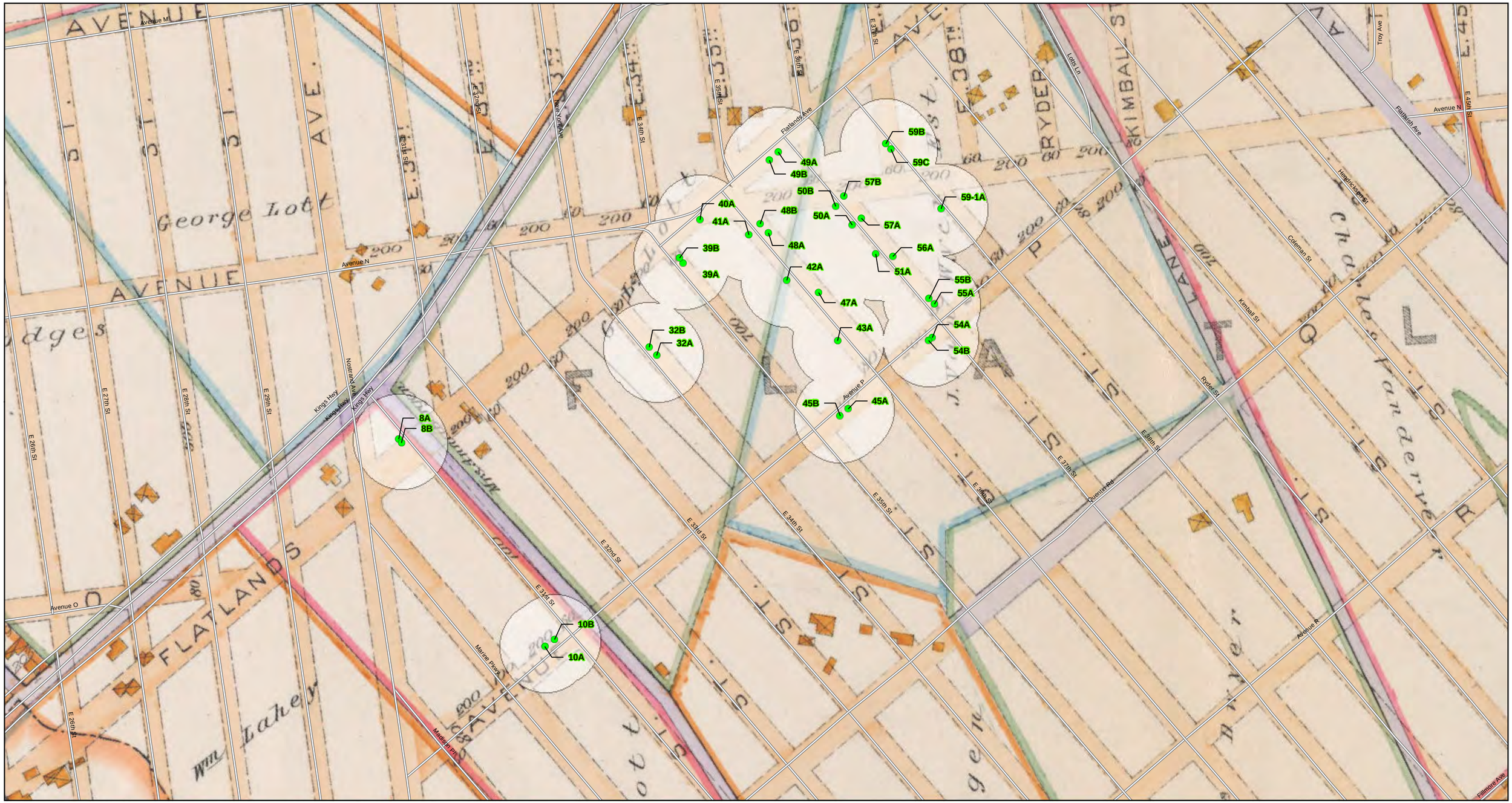
FISHER ASSOCIATES



Legend

- Green Infrastructure Location (Southeast Brooklyn)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 8b: Southeast Brooklyn Area of Potential Effect with 150-foot buffer on *Atlas of Kings County, New York* (Robinson 1890)

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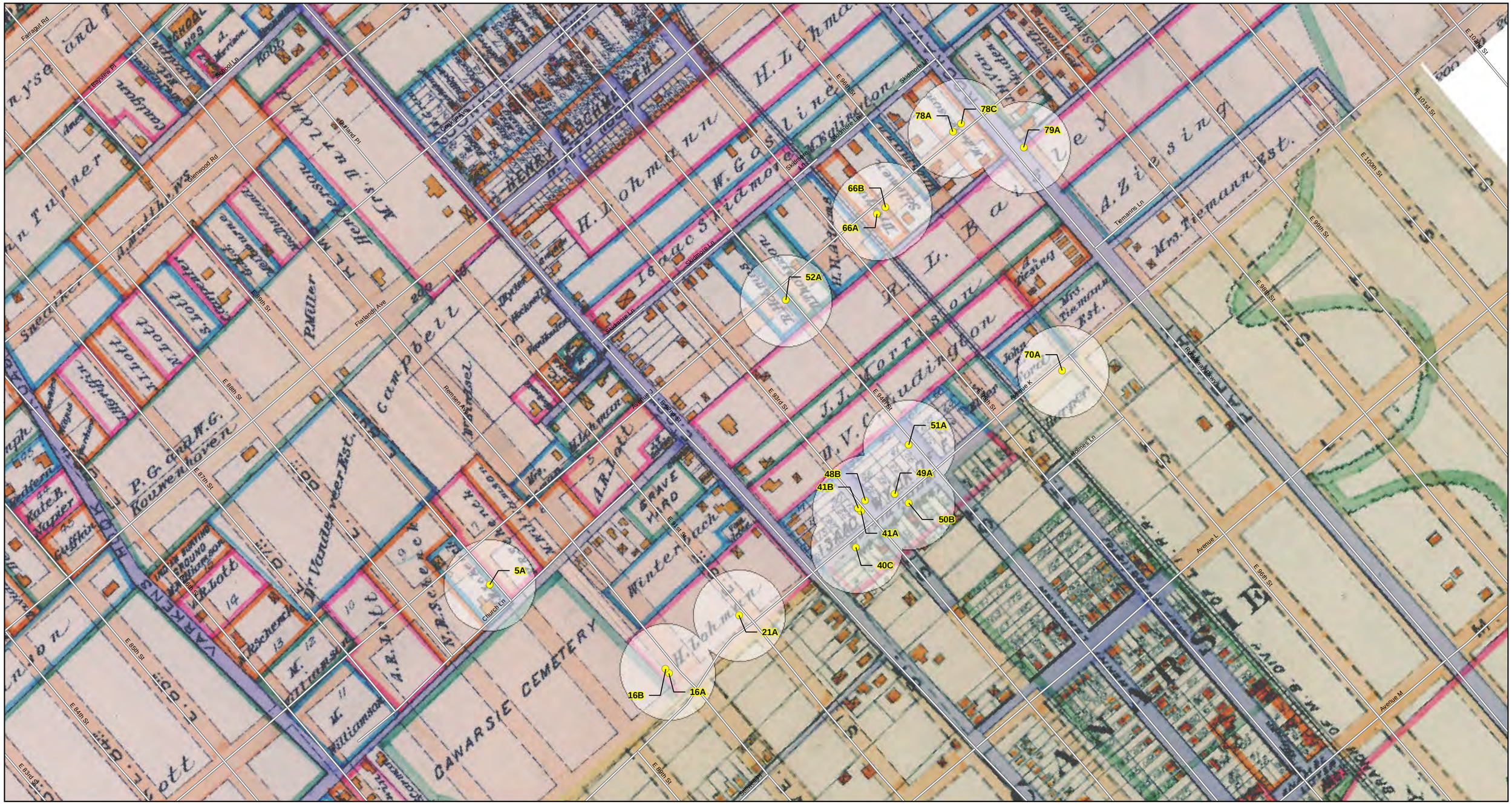
FISHER ASSOCIATES



Legend

- Green Infrastructure Location (Canarsie)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 8c: Canarsie Area of Potential Effect with 150-foot buffer on *Atlas of Kings County, New York* (Robinson 1890)

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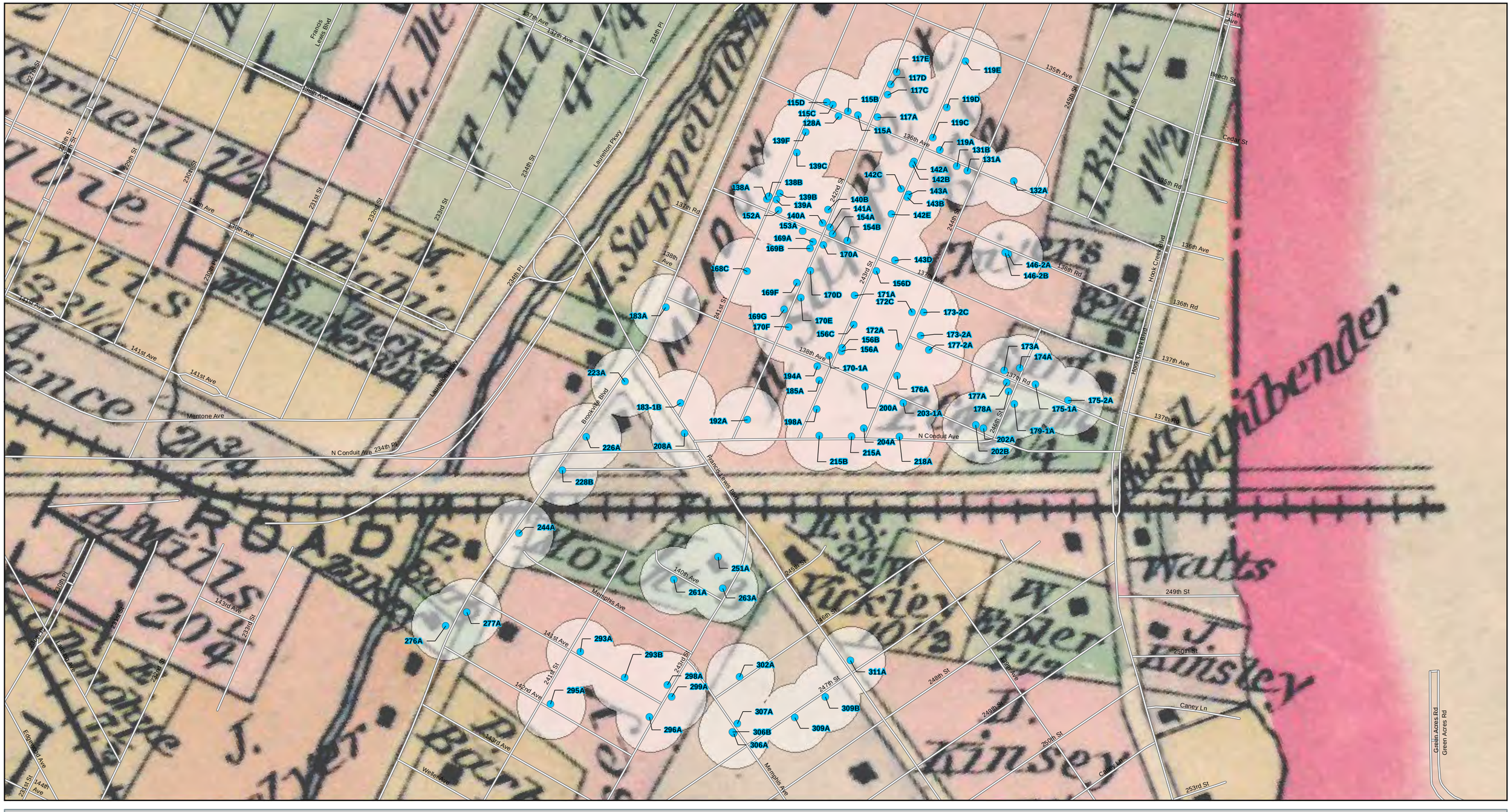
FISHER ASSOCIATES



Legend

- Green Infrastructure Location (Idlewild)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 9a: Idlewild Area of Potential Effect with 150-foot buffer on *Atlas of Queens County, Long Island, New York* (Wolverton 1891)

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0 100 200 300 400 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 9b: Rockaway Area of Potential Effect with 150-foot buffer on *Atlas of Queens County, Long Island, New York* (Wolverton 1891)

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0 100 200 300 400 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Gravesend)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 10a: Gravesend Area of Potential Effect with 150-foot buffer on *Atlas of the Borough of Brooklyn* (Hyde 1899)

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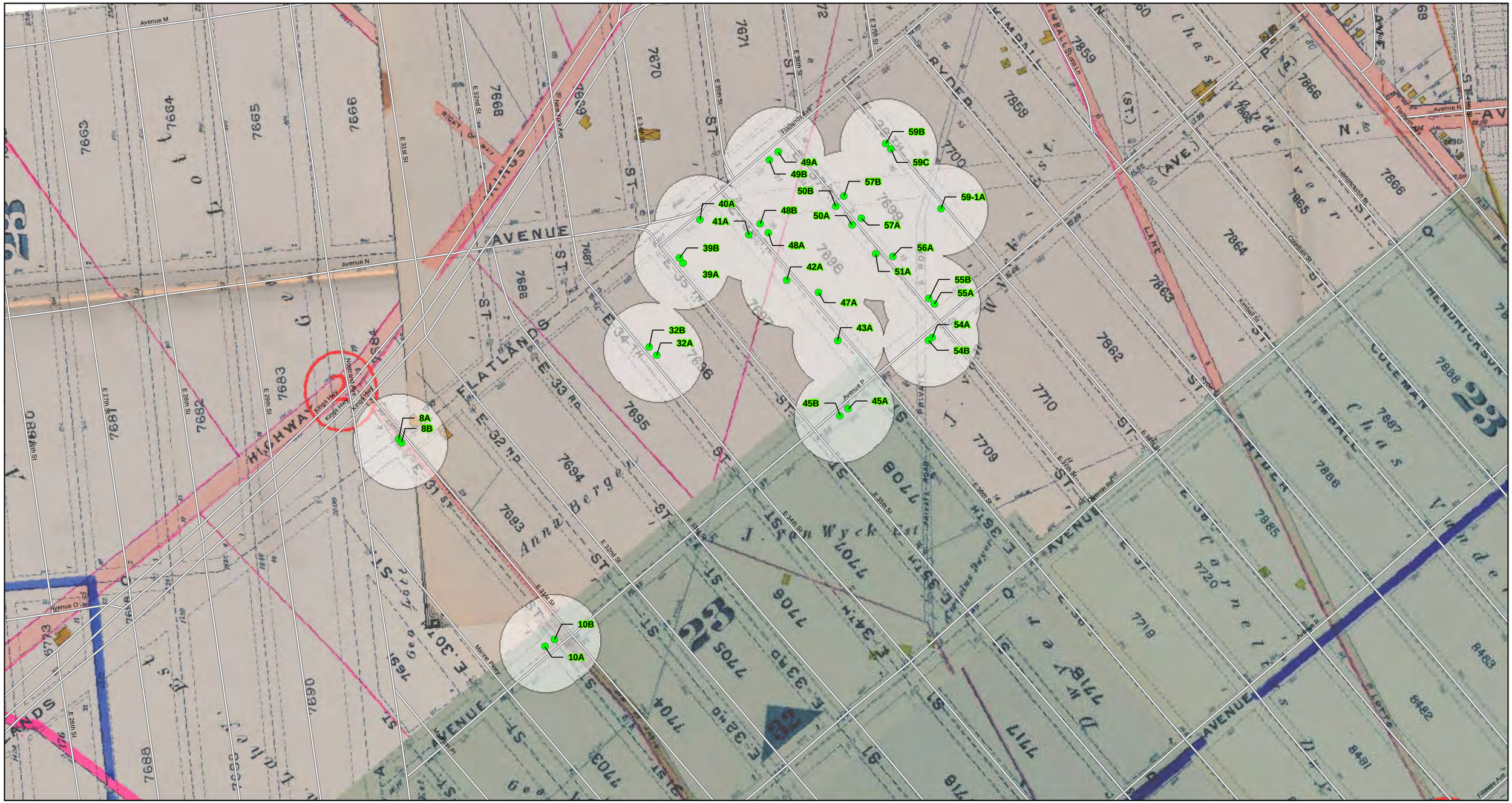
FISHER ASSOCIATES



Legend

- Green Infrastructure Location (Southeast Brooklyn)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 10b: Southeast Brooklyn Area of Potential Effect with 150-foot buffer on *Atlas of the Borough of Brooklyn* (Hyde 1899)

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0 100 200 300 400 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Canarsie)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 10c: Canarsie Area of Potential Effect with 150-foot buffer on *Atlas of the Borough of Brooklyn* (Hyde 1899)

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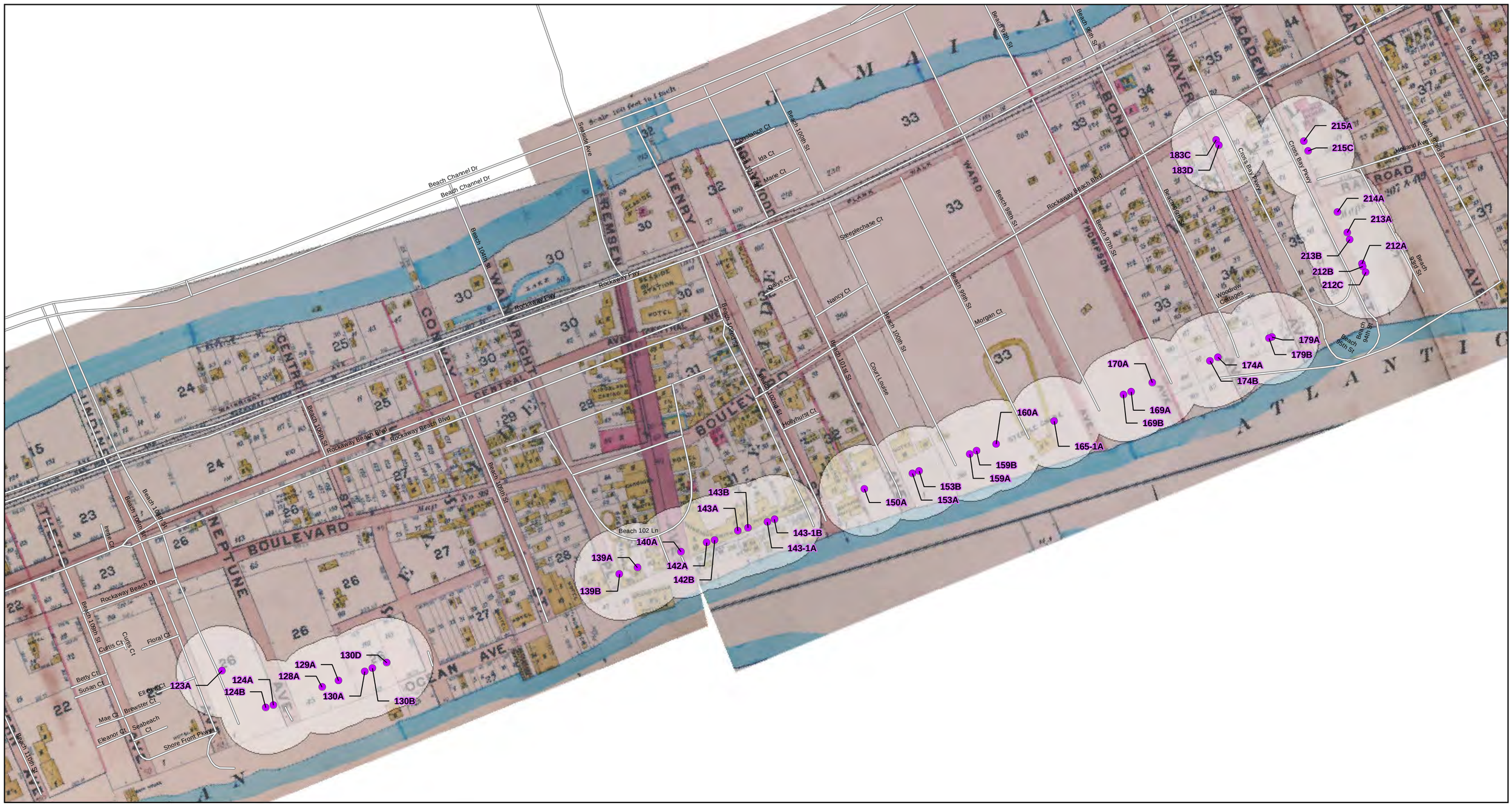
FISHER ASSOCIATES



Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 11: Rockaway West Area of Potential Effect with 150-foot buffer on *Insurance Maps of the Borough of Queens, City of New York* (Sanborn 1904)

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0 100 200 300 400 Feet

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Legend

- Green Infrastructure Location (Gravesend)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 12a: Gravesend Area of Potential Effect with 150-foot buffer on *Atlas of the Borough of Brooklyn* (Hyde 1907)

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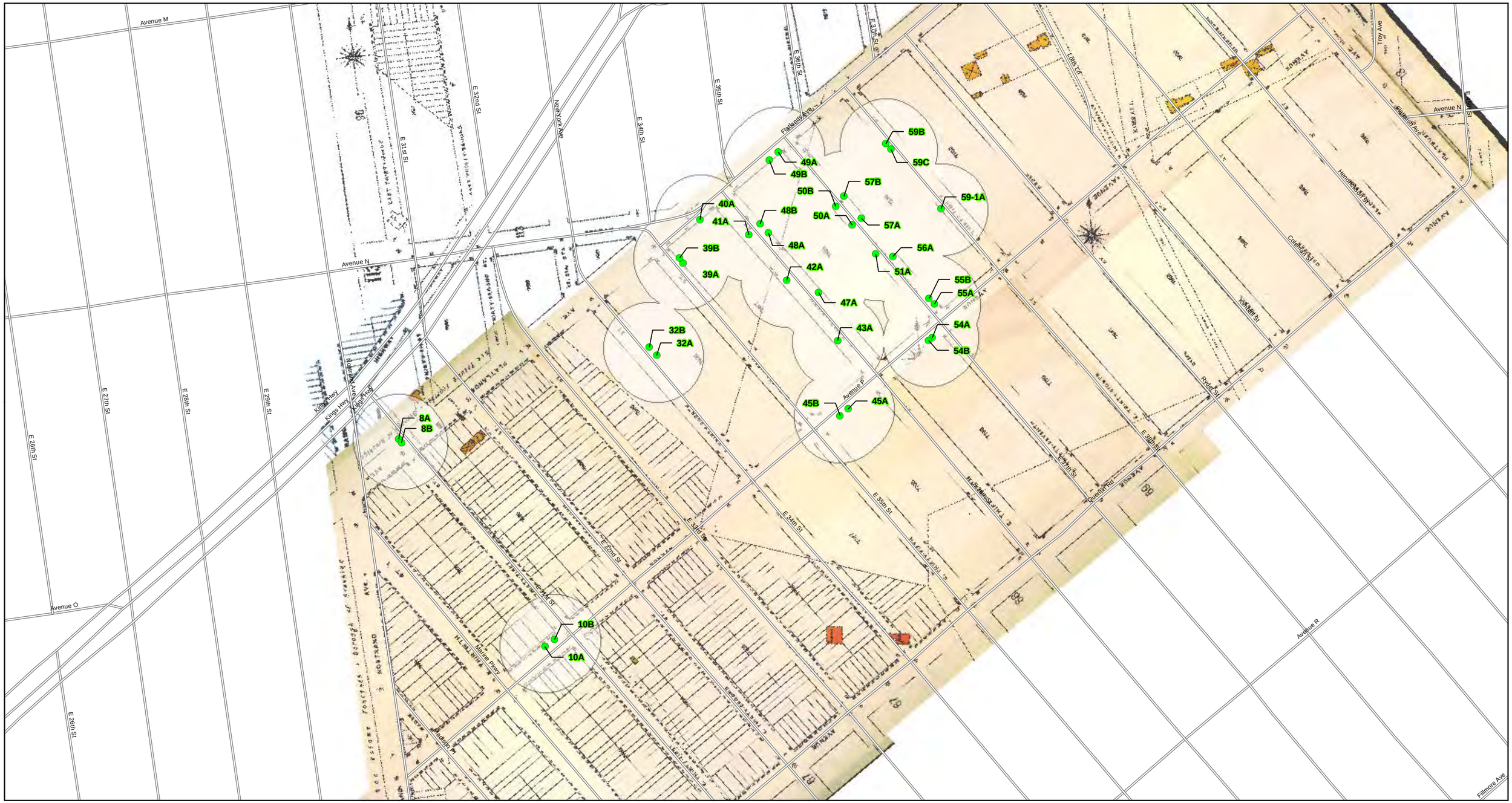
FISHER ASSOCIATES



Legend

- Green Infrastructure Location (Southeast Brooklyn)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 12b: Southeast Brooklyn Area of Potential Effect with 150-foot bufferon *Atlas of the Borough of Brooklyn* (Hyde 1907)

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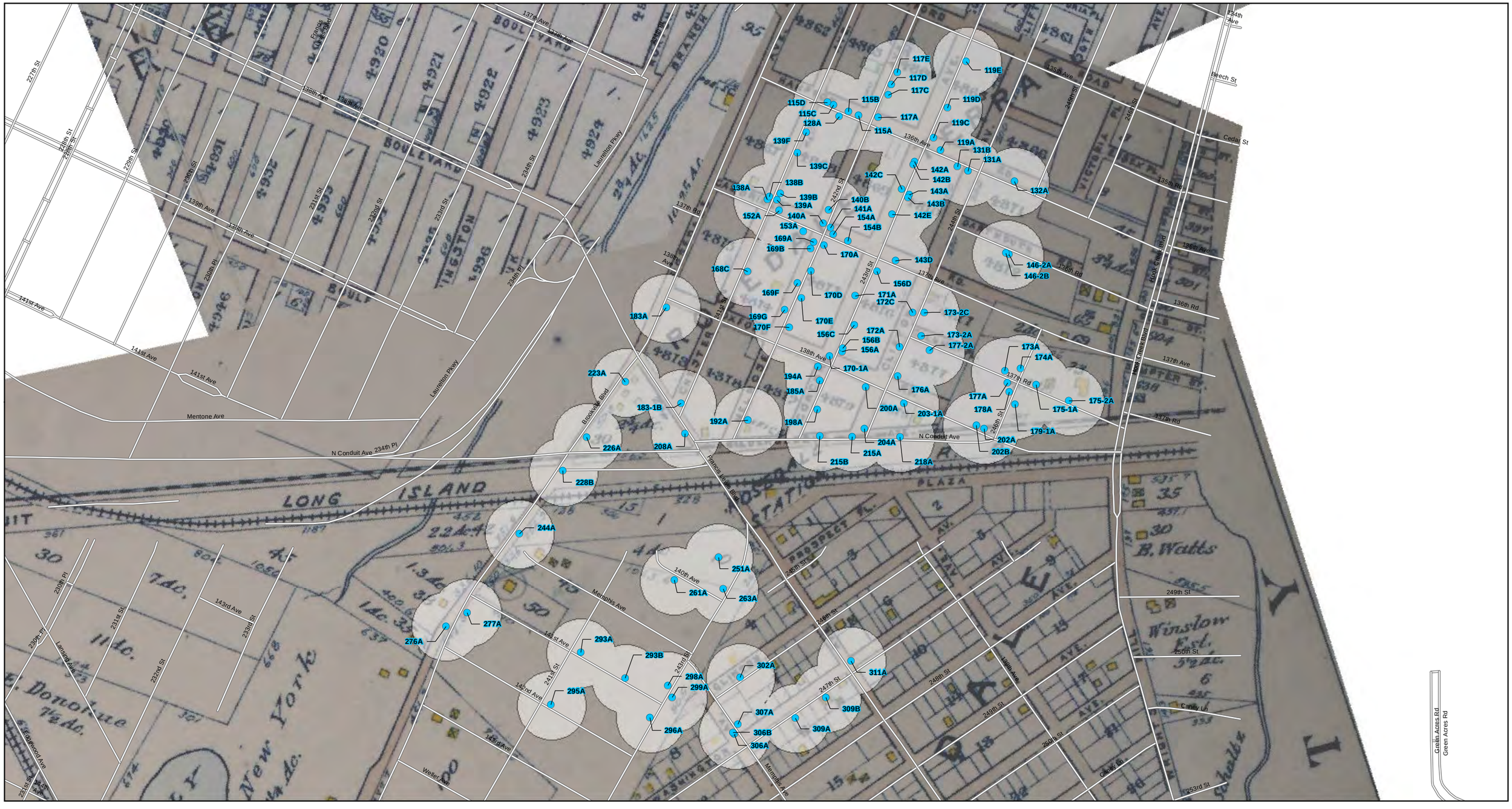
0 100 200 300 400 Feet

FISHER ASSOCIATES



Legend

- Green Infrastructure Location (Idlewild)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 13: Idlewild Area of Potential Effect with 150-foot buffer on *Atlas of the City of New York, Borough of Queens* (Bromley 1909)

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0 100 200 300 400 Feet

FISHER ASSOCIATES

183C
183D
215A
215C
214A
213A
213B
212A
212B
212C
179B
179A

Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 14a: Rockaway West Area of Potential Effect with 150-foot buffer on *Insurance Maps of the Borough of Queens, City of New York* (Sanborn 1912)

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0 100 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 14b: Rockaway West Area of Potential Effect with 150-foot buffer on *Insurance Maps of the Borough of Queens, City of New York* (Sanborn 1912)

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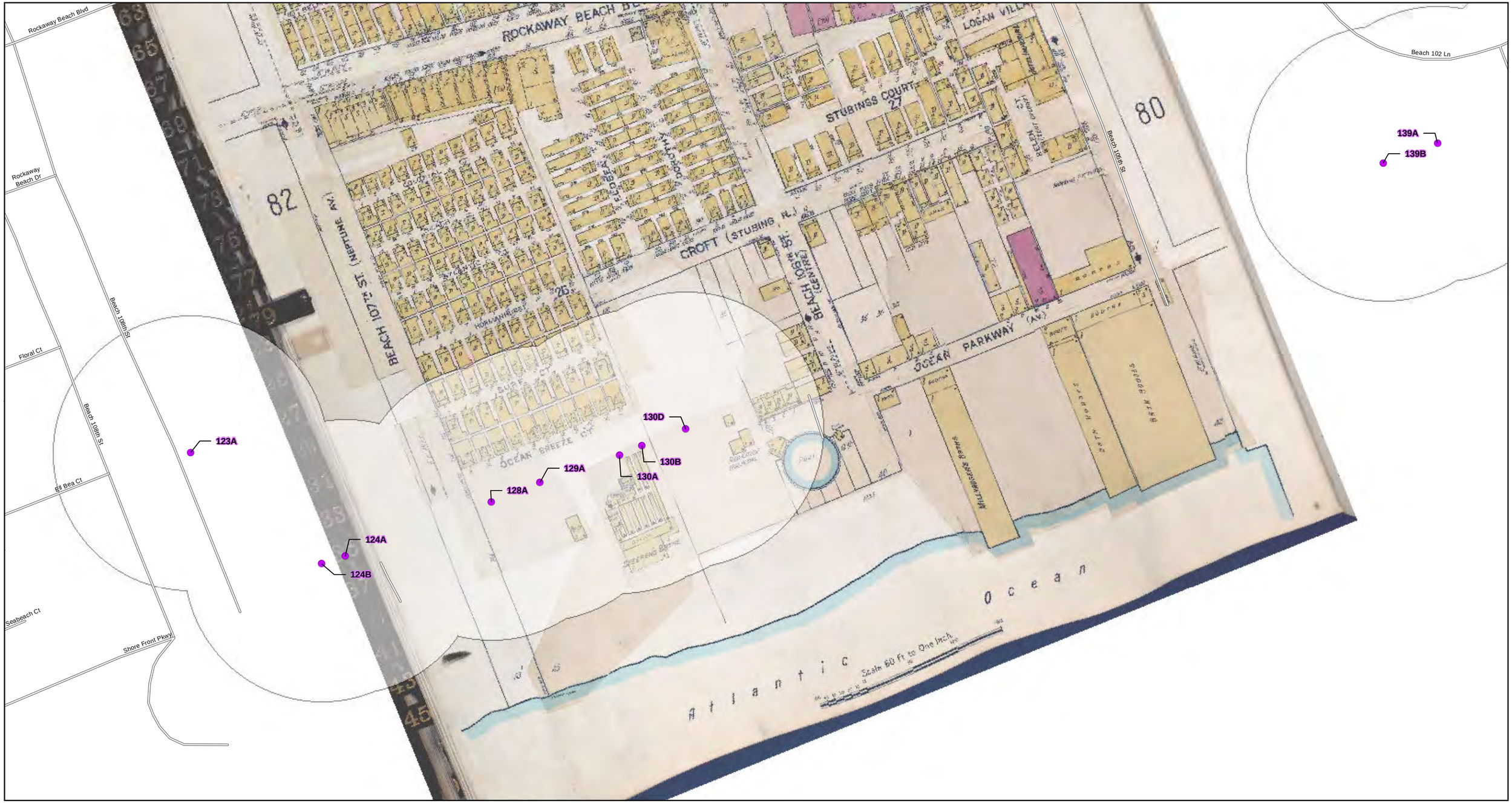
0 100 Feet

FISHER ASSOCIATES



Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 14c: Rockaway West Area of Potential Effect with 150-foot buffer on *Insurance Maps of the Borough of Queens, City of New York* (Sanborn 1912)

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0 100 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 14d: Rockaway West Area of Potential Effect with 150-foot buffer on *Insurance Maps of the Borough of Queens, City of New York* (Sanborn 1912)

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0 100 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 14e: Rockaway West Area of Potential Effect with 150-foot buffer on *Insurance Maps of the Borough of Queens, City of New York* (Sanborn 1912)

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0 100 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Idlewild)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 15: Idlewild Area of Potential Effect with 150-foot bufferon *Atlas of the Borough of Queens* (Hyde 1918)

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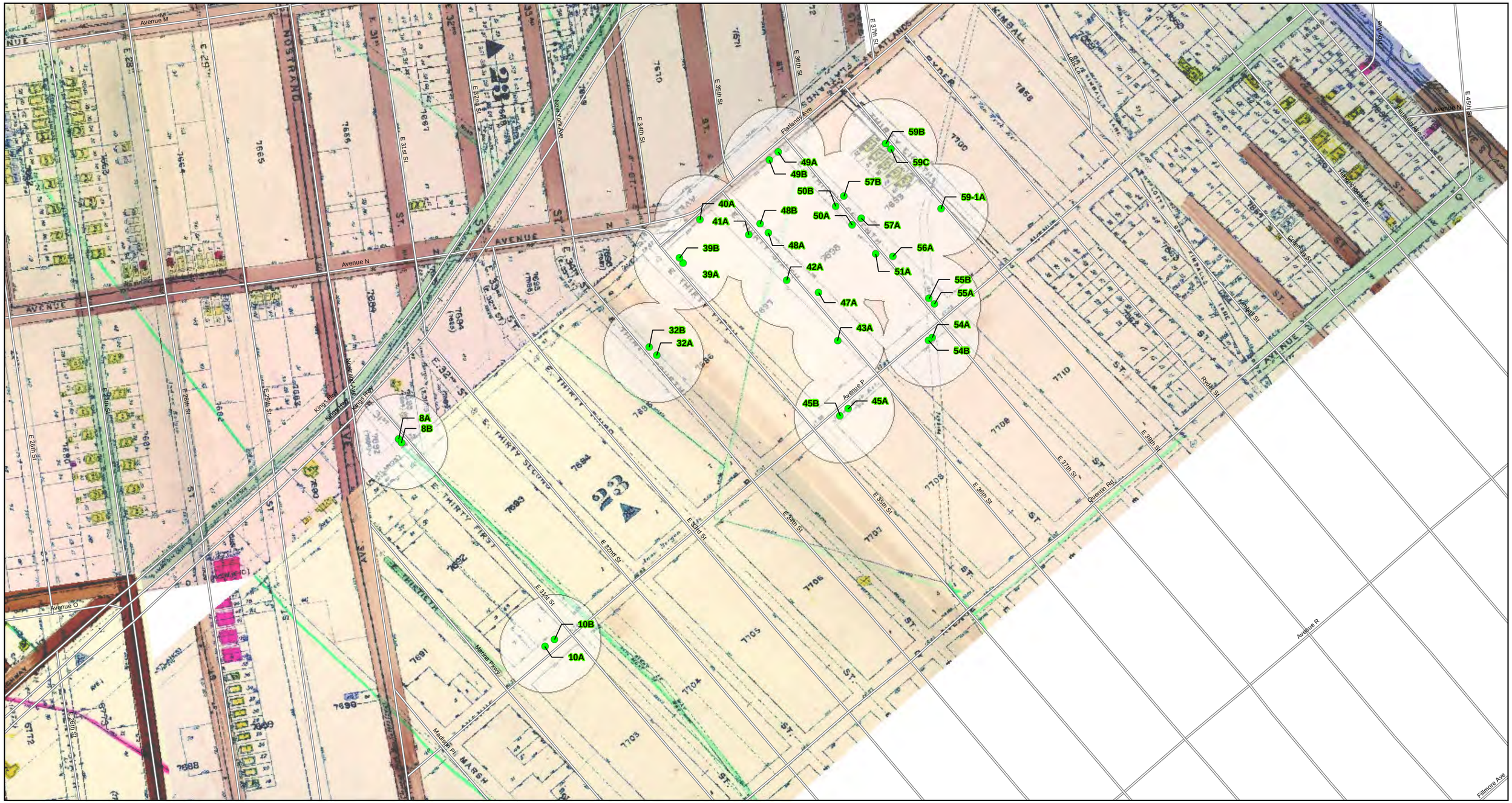
0 100 200 300 400 Feet

FISHER ASSOCIATES



Legend

- Green Infrastructure Location (Southeast Brooklyn)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 16a: Southeast Brooklyn Area of Potential Effect with 150-foot buffer on *Atlas of the Borough of Brooklyn* (Hyde 1920)

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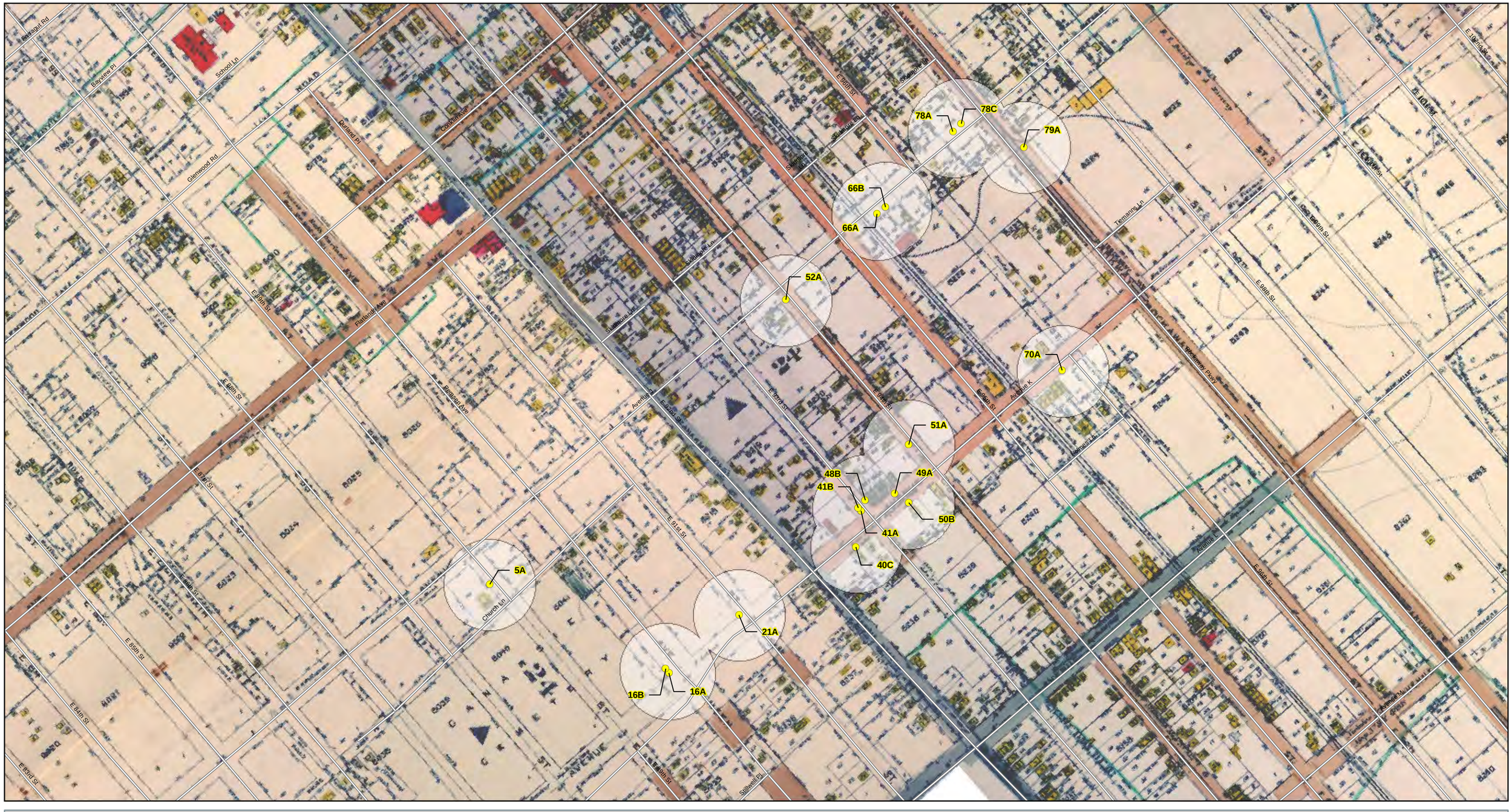
FISHER ASSOCIATES



Legend

- Green Infrastructure Location (Canarsie)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 16b: Canarsie Area of Potential Effect with 150-foot buffer on *Atlas of the Borough of Brooklyn* (Hyde 1920)

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0 100 200 300 400 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 17a: Rockaway West Area of Potential Effect with 150-foot bufferon *Insurance Maps of the Borough of Queens, City of New York* (Sanborn 1933)

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0 100 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 17b: Rockaway West Area of Potential Effect with 150-foot buffer on *Insurance Maps of the Borough of Queens, City of New York* (Sanborn 1933)

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0 100 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 17c: Rockaway West Area of Potential Effect with 150-foot buffer on *Insurance Maps of the Borough of Queens, City of New York* (Sanborn 1933)

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0 100 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 17d: Rockaway West Area of Potential Effect with 150-foot buffer on *Insurance Maps of the Borough of Queens, City of New York* (Sanborn 1933)

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0 100 Feet

FISHER ASSOCIATES

Legend

- Green Infrastructure Location (Rockaway West)
- City Streets (Current)
- Area within 150ft of Green Infrastructure Location

Map 17e: Rockaway West Area of Potential Effect with 150-foot buffer on *Insurance Maps of the Borough of Queens, City of New York* (Sanborn 1933)

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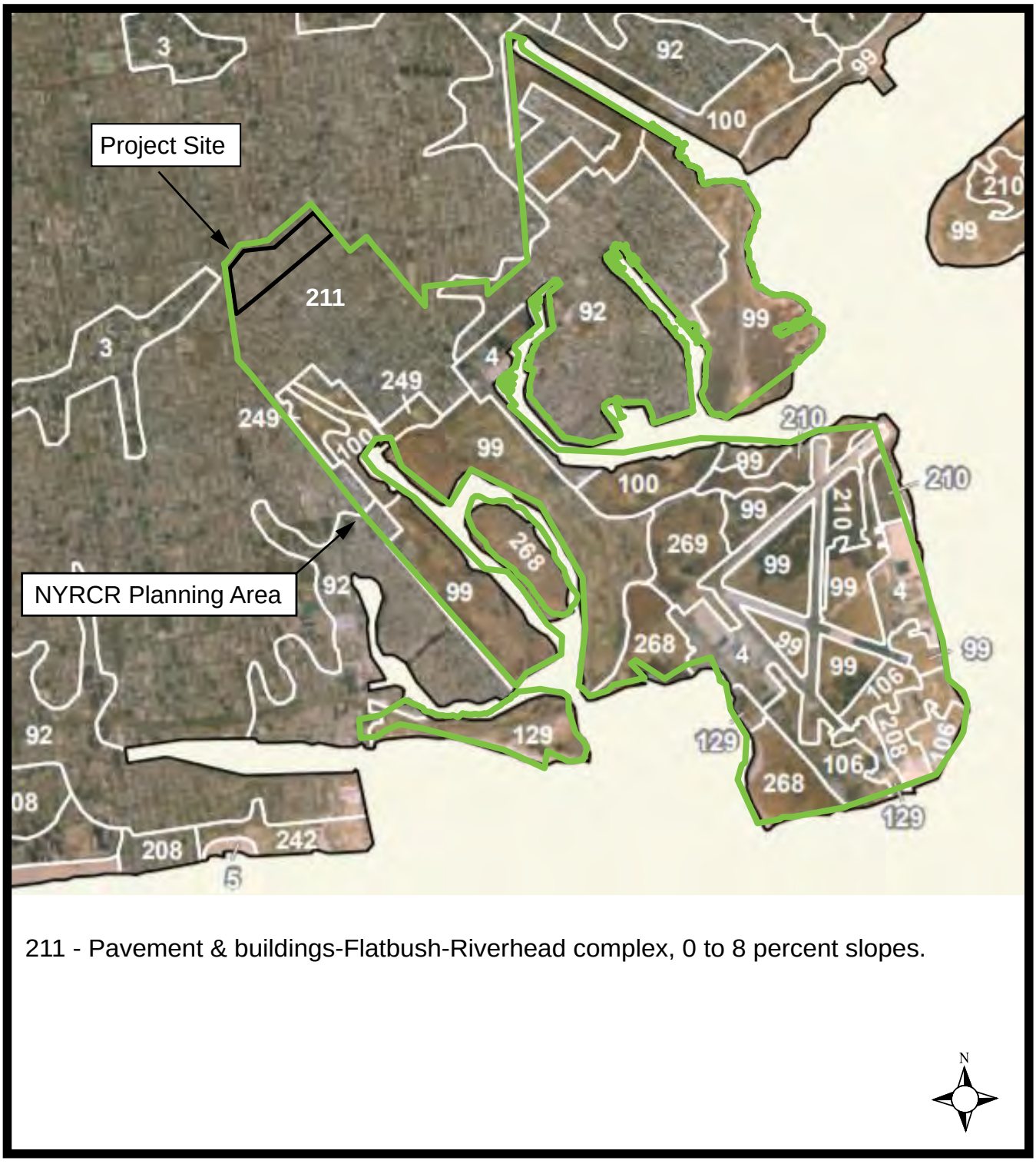
0 100 Feet

FISHER ASSOCIATES

211 - Pavement & buildings-Flatbush-Riverhead complex, 0 to 8 percent slopes.

Figure 18a: Gravesend Project site on *New York City Reconnaissance Soil Survey* (USDA 2005).



211 - Pavement & buildings-Flatbush-Riverhead complex, 0 to 8 percent slopes.

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Figure 18b: Southeast Brooklyn Project site on *New York City Reconnaissance Soil Survey* (USDA 2005).

211 - Pavement & buildings-Flatbush-Riverhead complex, 0 to 8 percent slopes.

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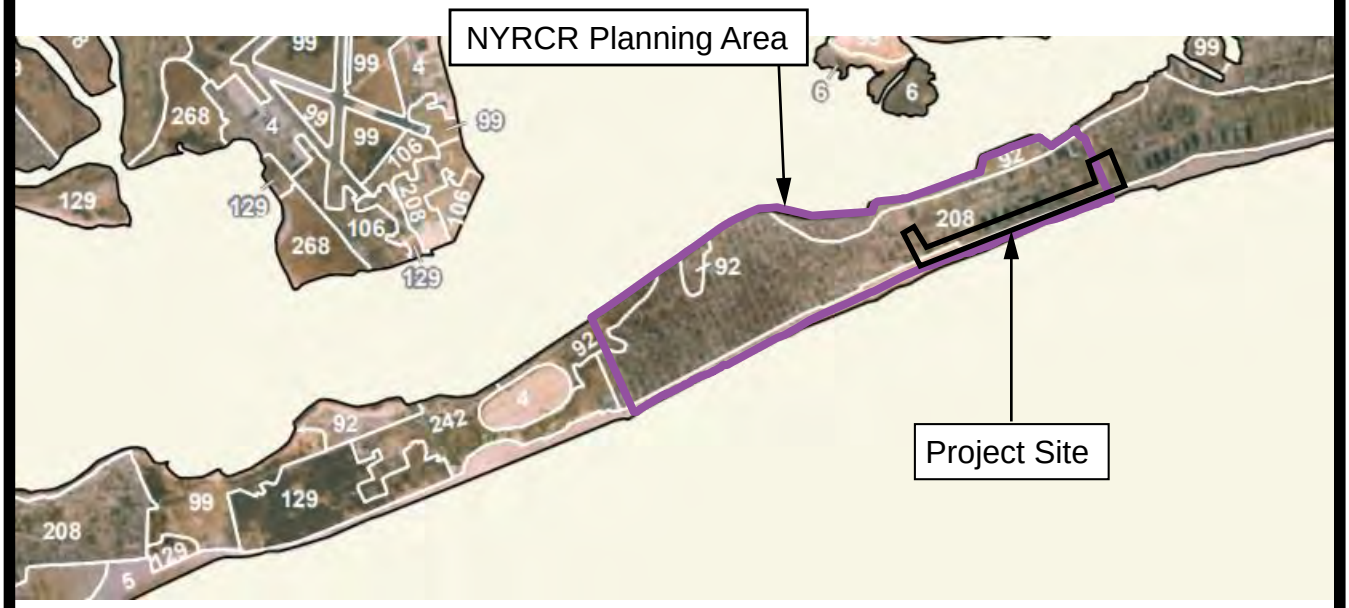
Figure 18c: Canarsie Project Site on *New York City Reconnaissance Soil Survey* (USDA 2005).

211 - Pavement & buildings-Flatbush-Riverhead complex, 0 to 8 percent slopes.
225 - Plymouth-Flatbush-Pavement & buildings complex, 0 to 8 percent slopes.

Figure 18d: Idlewild Project site on *New York City Reconnaissance Soil Survey* (USDA 2005).



208 - Pavement & buildings-Hooksan-Verrazano complex, 0 to 8 percent slopes.

N

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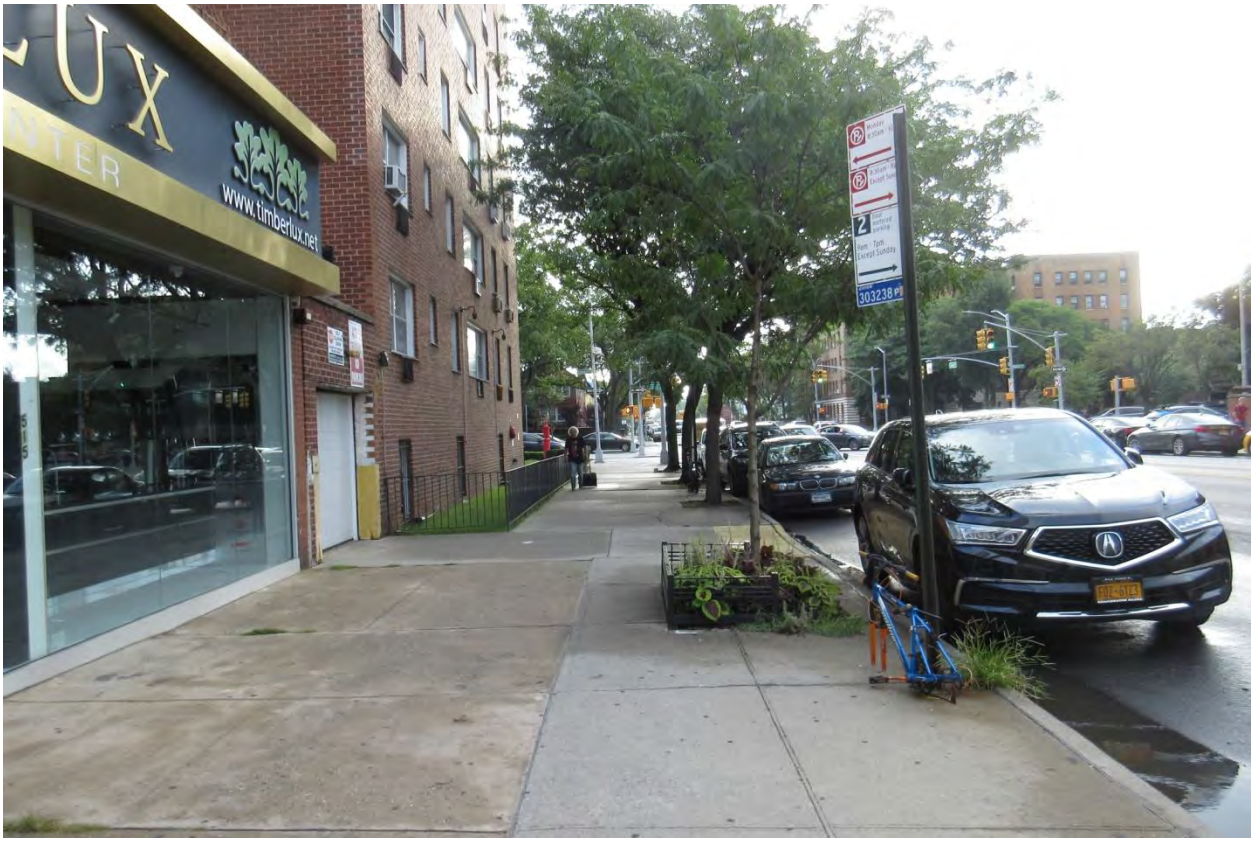
Figure 18e: Rockaway West Project site on *New York City Reconnaissance Soil Survey* (USDA 2005).

PHOTOGRAPHS

Photograph G1: Facing north from Avenue P to NYCL and S/NRHP Ocean Parkway bike trail and sidewalks in the grassy median on the west side of the boulevard.

Photograph G2: Facing west from NYCL and S/NRHP Ocean Parkway median to the north side of Avenue P. Note the red NYFD call box near the intersection.



Photograph G3: Facing east on the north side of Avenue P to the NYCL and S/NRHP Ocean Parkway.

Photograph G4: Facing southwest from the northeast corner of Avenue P and E. 2nd Street to Sites 17A and 17B, with the IND Culver Line (ca. 1919) over McDonald Avenue in the background.

Photograph G5: Facing southwest from the northeast corner of Avenue P and Dahill Road Sites 38A, 38B, and 38C on west side of Dahill Road in sidewalk adjacent to PS 177 (1939) located at 346 Avenue P.

Photograph G6: Facing south to façade of the NRHP-eligible PS 177 (1939) at 346 Avenue P.

Photograph G7: Facing southwest from the north side of Avenue P near West 3rd Street to Sites 8C, 8D, and 8E on the south side of Avenue P.

Photograph G8: Facing west on the south side of Quentin Road from West 6th Street to Sites 51A and 51B in sidewalk. Note the presence of sidewalk grates.

Photograph G9: Facing northeast from the south side of Quentin Road near West 3rd Street to Site 58A on the north side of Quentin Road.

Photograph G10: Facing east to the south side of Quentin Road from the southwest corner of Quentin Road and Dahill Road to Sites 65A-D with the IND Culver Line (ca. 1919) over McDonald Avenue in the background.

Photograph G11: Facing southwest from the north side of Kings Highway to Site 127A near the intersection of Lake Street and Kings Highway.


Photograph G12: Facing west on the south side of Kings Highway from the west side of Kings Place to Sites 121A and 121B. Note the NYFD call box in the sidewalk at the intersection of Kings Place and Kings Highway, located about 60 feet east of Site 121A.

Photograph G13: Facing northwest from center of West 6th Street to house with updated façade on west side of street.

Photograph S1: Facing south from northwest intersection of Nostrand Avenue and Kings Highway to S/NRHP Kingsway Jewish Center at 2810 Nostrand Avenue.


Photograph S2: Facing north from south side of Avenue P to Sites 10A and 10B near East 31st Street.


Photograph S3: Facing north from center of East 34th Street to Sites 32A and 32B.


Photograph S4: Facing south from north side of Avenue P to apparent water pipe repair work in yard adjacent to Sites 45A and 45B.

Photograph S5: Facing south from north side of Avenue P to Sites 54A and 54B.

Photograph S6: Facing southwest from northeast side of East 136th Street to Site 43A.

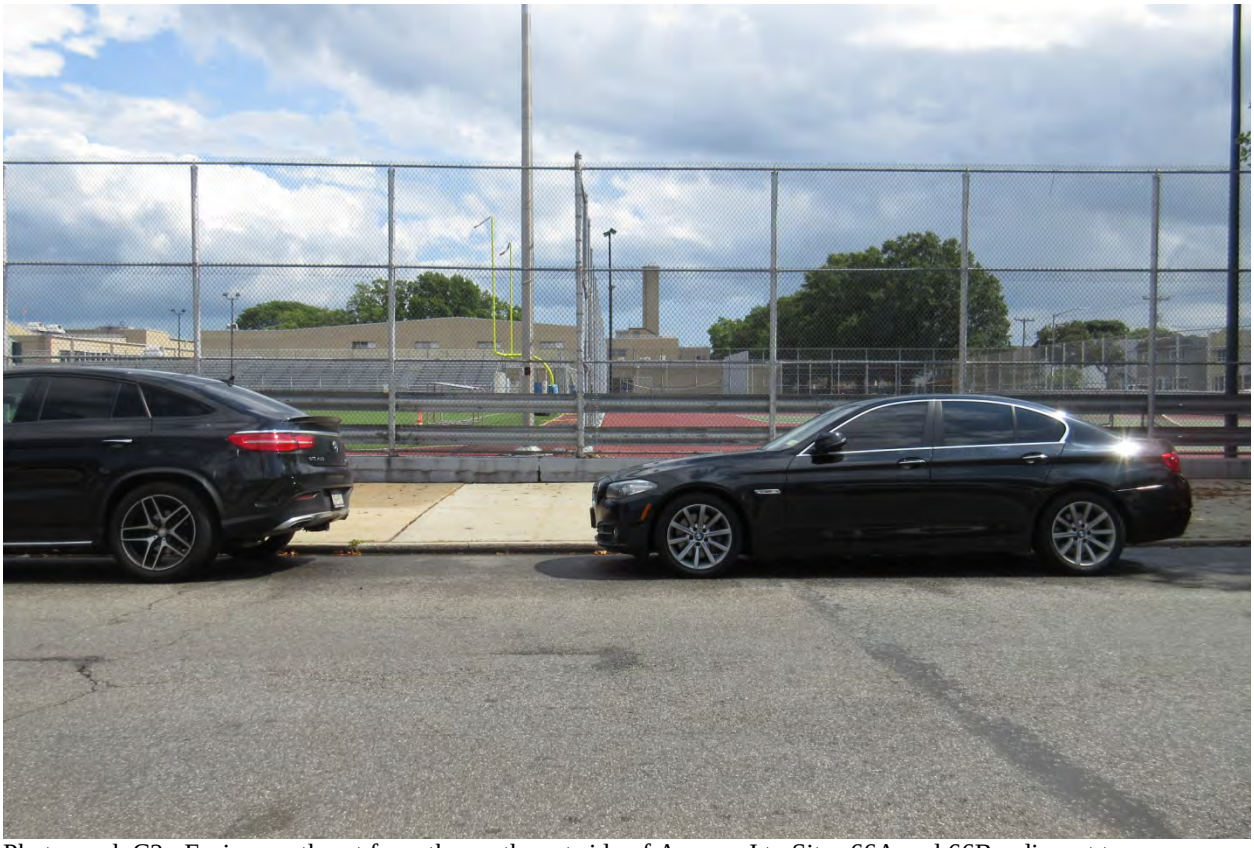
Photograph S7: Facing northeast on the south side of Flatlands Avenue to Sites 49A and 49B.

Photograph S8: Facing southeast on west side of East 37th Street to Sites 50A and 50B.

Photograph S9: Facing southeast on west side of East 38th Street to Sites 59B and 59C.

Photograph S10: Facing southwest from center of Madison Place just south of Avenue P to 1620 Madison Place in Study Area, which SHPO categorized as "Undetermined" for National Register eligibility.

Photograph C1: Facing southeast from north side of Avenue J to southeast side of East 94th Street and Site 52A.


Photograph C2: Facing southeast from the northwest side of Avenue J to Sites 66A and 66B, adjacent to a soccer/football field.

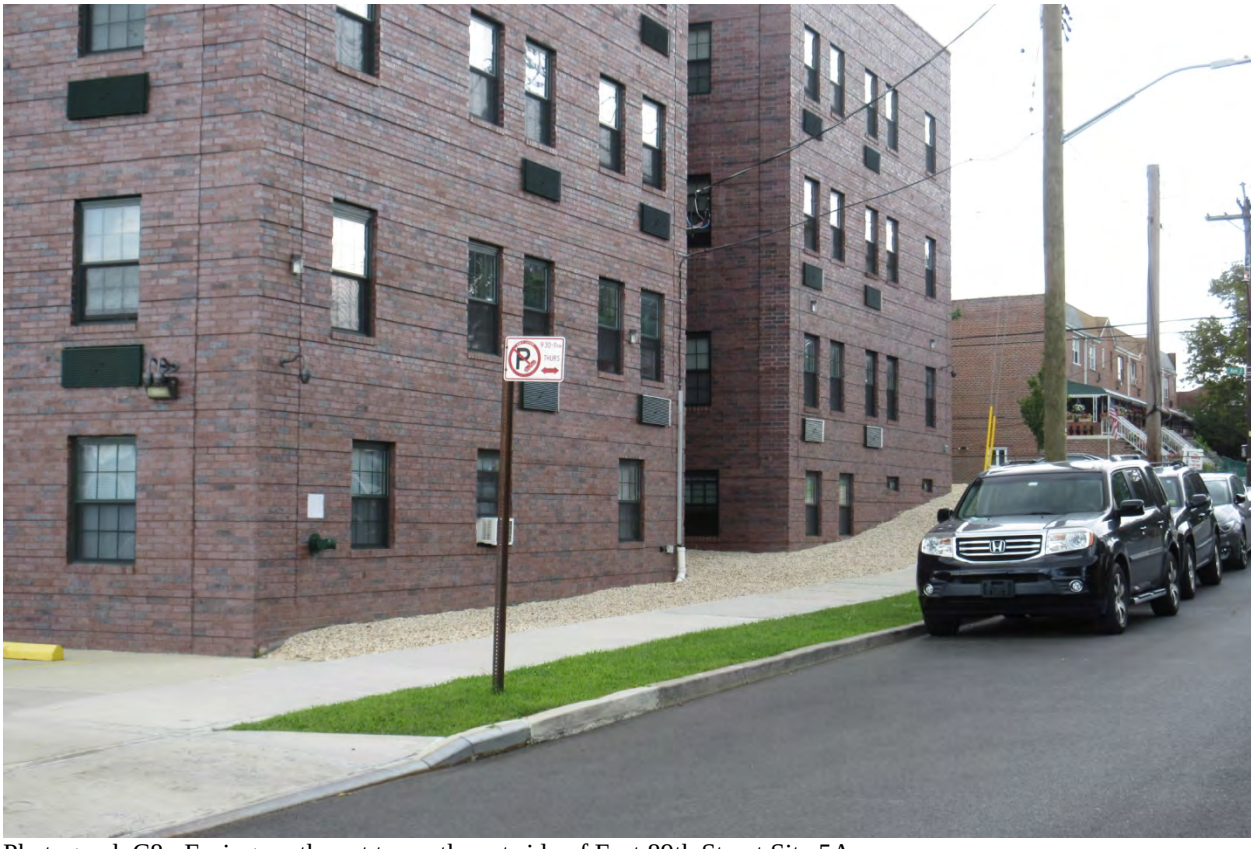
Photograph C3: Facing northwest from the center of Avenue J near Rockaway Parkway to Sites 78A and 78B.


Photograph C4: Facing north on northeast side of Rockaway Parkway to Site 79A.

Photograph C5: Facing northeast on southeast side of Avenue K at East 92nd Street to Site 40C.

Photograph C6: Facing northeast from center of Avenue K at East 93rd Street to Site 50B.

Photograph C7: Facing northwest from south side of Avenue K at East 93rd Street to Site 48B on east side of East 93rd Street (right) and Sites 41A and 41B on west side of East 93rd Street (left).


Photograph C8: Facing northwest to southwest side of East 89th Street Site 5A.

Photograph C9: Facing southeast on southwest side of Remsen Avenue adjacent to Canarsie Cemetery to Sites 16A and 16B at a distance.

Photograph C10: Facing southwest from northeast side of Rockaway Parkway to north end of 1580 Rockaway Parkway, Canarsie Branch of New York Public Library, which SHPO categorized as "Undetermined" for National Register eligibility.

Photograph I1: Facing northeast on west side of Brookville Boulevard opposite 142nd Avenue to Site 276A.

Photograph I2: Facing west from center of Brookville Boulevard at 142nd Avenue to the NRHP-eligible New York Fire Department Engine 314 at 142-04 Brookville Boulevard (built 1929), roughly 110 feet south of Site 276A.

Photograph I3: Facing northeast from south side of Sunrise Highway to east side of Brookville Boulevard Site 244A.

Photograph I4: Facing southwest on east side of Brookville Boulevard from North Conduit Avenue to Site 228B.

Photograph I5: Facing northeast on east side of Brookville Boulevard from North Conduit Avenue to Site 226A.

Photograph I6: Facing west on the south side of Sunrise Highway from 243rd Street to Site 251A.

Photograph I7: Facing northwest from northeast intersection of Francis Lewis Boulevard and 247th Street to Site 311A.


Photograph I8: Facing northwest from 247th Street on west side of Memphis Avenue to Sites 306A and 306B.

Photograph I9: Facing northeast on east side of Brookville Boulevard to Site 223A.

Photograph I10: Facing east from east side of Brookville Boulevard to façade of the NRHP-eligible St. Clare Roman Catholic Church (built 1927) at 137-21 138th Avenue roughly 100 feet north of Site 183A.

Photograph I11: Facing southwest on east side of 241st Street to Site 168C.

Photograph I12: Facing southwest from 137th Avenue on east side of 242nd Street to Sites 170A, 170D, and 170E.

Photograph I13: Facing southwest on west side of 243rd Street to Site 170-1A.

Photograph I14: Facing southwest on south side of 136th Road to Sites 146-2A and 146-2B.

Photograph I15: Facing southwest on east side of 244th Street to Site 173-2C and 173-2A.

Photograph I16: Facing southwest from west side of 244th Street to Site 172A in foreground, with St. Peter's Episcopal Church (1907, 1931) at 137-28 244th Street.