APPENDIX E

NATURAL RESOURCES

- *Joint Permit Application*
- *Agency Correspondence*

JOINT APPLICATION FOR:

USACE INDIVIDUAL SECTION 10/404 PERMIT, AND NYSDEC TIDAL WETLANDS, AND PROTECTION OF WATERS, AND EXCAVATION AND FILL IN NAVIGABLE WATERWAYS PERMIT, AND SECTION 401 WATER QUALITY CERTIFICATION

RIVER RING DEVELOPMENT

BLOCK 2355, LOTS 1 AND 20;
BLOCK 2361, LOTS 1, 20 AND 21;
AND, BLOCK 2376, LOT 50
BROOKLYN, NEW YORK

Prepared For:

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Prepared By:

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LANGAN

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1.0 INTRODUCTION

Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. (Langan) has prepared this Joint Permit Application (Application) on behalf of River Street Partners LLC (River St Partners) for the proposed River Ring development in Brooklyn, New York. The purpose of the regulated work, in conjunction with an upland residential development (collectively, "River Ring"), is to expand public waterfront access along the East River north from Domino Park and Grand Ferry Park esplanade, while enhancing and sustaining habitat and increasing the resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway.

This Joint Permit Application (Application) is an application for an individual Section 10/404 permit from U.S. Army Corps of Engineers (USACE); an application for New York State Department of Environmental Conservation (NYSDEC) Tidal Wetlands, and Protection of Waters Permits, an Excavation and Fill in Navigable Waterways Permit, and Section 401 Water Quality Certification; and an application for New York State Department of State (NYSDOS) and New York City Department of City Planning (NYCDCP) Waterfront Revitalization Program (WRP) Coastal Consistency Concurrence. The applicant proposes to create a waterfront ecological park consisting of a protected cove (protected by breakwaters and groins) for water-dependent recreation (e.g., kayaks and paddle boards) and habitat creation (e.g., salt marsh, coastal scrub, man-made reef, and tide pools); a shore public walkway along the East River to connect a vital piece of the waterfront between Grand Ferry Park (and Domino Park beyond) to the south and 184 Kent Avenue to the north; and, upland, improve the site as a mixed-income residential development consisting of two residential towers. Regulated proposed waterfront work that is the subject of this Application includes the removal of existing wharf, catwalks, platforms, dolphins and cellular caissons; construction of two pile-supported breakwaters; construction of a pile-supported walkway from land to the breakwaters; excavation and fill to reshape the shoreline to create a groin and cove; shoreline protection consisting of a bulkhead (southern portion of the site) and riprap revetment or cobble sill (northern portion of the site); and habitat creation on the breakwaters and along the shoreline. These activities, collectively the "Project", are described in detail in Section 3.0.

2.0 SITE LOCATION AND DESCRIPTION

2.1 General Site Information

The River Ring site (Tax Block 2355, Lots 1 and 20; Block 2361, Lots 1, 20 and 21; Block 2376, Lot 50) is in the Williamsburg neighborhood of Brooklyn, New York. The site is bordered by North 3rd Street on the north, River Street (north of North 1st Street) and a New York Power Authority (NYPA) facility (south of North 1st Street) on the east, North 1st

Street (at NYPA) and Grand Ferry Park (and Domino Park beyond) to the south, and the East River on the west. A site vicinity map is provided as Figure 1; a site location map is provided as Figure 2.

The site is about 390,000 square feet, with about 230,000 SF being lands underwater. The upland portion of the site is vacant with most of the site covered in compacted sand and gravel. A temporary Climate Change Miniature Golf Course will be constructed along the shoreline on the site (under NYSDEC Permit Application ID #2-6101-01409/00001) before the activity described in this applications would be undertaken. Site grades range from about EL 16[1] (at the intersection of River Street and North 1st Street) to EL 5 (along the top of bank or bulkhead).

2.2 Site History

The site is within the historic limits of the East River. The original shoreline was original along River Street. By 1836, the site had been partially filled and the shoreline extended a bit west of what is now River Street (then called Water Street). By 1874, the site had been filled and the shoreline had been extended to its fullest extent with piers extending from North 1st Street, North 2nd Street (later renamed Metropolitan Avenue) and from just south of North 3rd Street, and a ferry landing at the south end of the site.

The site has been occupied by industrial uses since at least the 1830s. Prior to 1900 the site was occupied by the Nassau Ferry Company (south), a lumber yard (middle) and a sugar refinery (north). In the 1920s the middle of the site was converted to coal storage, and in the 1940s it was converted to fuel storage. By 1947, the ferry terminal in the southern portion of the site was demolished and was used by Charles Pfizer and Company (predecessor to Pfizer) as molasses storage. A wharf was construed at the shoreline to replace the ferry docks and to accommodate shipping. Four cellular caissons were constructed in the early 1960s, along with a new pier between North 1st Street and Metropolitan Avenue (fuel service pier) and catwalks connecting the three southern caissons; the northern-most caisson was connected to the North 3rd Street Pier by a catwalk. Between 1966 and 1974, the site north of North 1st Street was entirely covered by fuel storage tanks that spanned the full upland extent of the property boundaries; two large circular fuel storage tanks occupied a portion of the site south of North 1st Street. During this same period, the Metropolitan Avenue Pier had been demolished; the North 1st Street Pier and the new pier between North 1st and Metropolitan Avenue were reduced

[1] All elevations are given in reference to the North American Vertical Datum of 1988 (NAVD 88).

in width to their current configuration. By 1991, the North 3rd Street Pier was reduced to a finger pier and platform.

Most recently, Consolidated Edison owned and operated the site since 1993, using most of it for fuel storage, until the site was decommissioned and the tanks were demolished between 2009 and 2013. When the site was decommissioned, the bulkhead on the northern-most block was replaced with a fabricated armored slope protected from erosion by cobbles (cobble slope).

Copies of historic aerial photographs are provided in Attachment D; copies of Sanborn Maps are provided in Attachment E; copies of USGS topographic maps are provided in Attachment F.

2.3 Existing Waterfront Structures

The existing shoreline protection, described from south to north, consists of a 265-foot-long by 25-foot-wide wharf, a 65-foot-long riprap revetment, a 205-foot-long bulkhead, and a 285-foot-long cobble slope. The wharf consists of a 9-inch thick concrete deck, supported on timber bent beams spaced at 9 feet on center, founded on timber piles spaced at 6 feet on center along the bents. A timber sheet pile closure wall is at the landward edge of the wharf platform. Several sinkholes have developed behind the closure wall, indicating that soil has been washed out by the tide through openings in the sheet piles. The revetment is functional: it is about 30 to 40 feet wide and is armored with riprap averaging about 12 inches in size. The bulkhead consists of a steel sheet pile wall oversheeted with another steel sheet pile wall about 2-feet seaward of the first wall; concrete infill has been placed in between the two walls. There is a return wall extending back into the site at each end of the bulkhead; the south return extends 35 feet upland and the north return extends 65 feet. The bulkhead is also functional. No signs of ground loss or water getting behind the bulkhead have been observed. The cobbled slope is a fabricated unit about 40 to 50 feet wide and consists of a shallow slope (1V:4H[2] or shallower) with cobbles averaging about 6 inches in size as armoring for erosion protection. The cobbled slope is functional, but signs of settlement and/or erosion are visible at the landward edge.

A 230-foot-long pile-supported apron walkway is seaward of and parallel to the existing bulkhead. The southern portion of the apron walkway is 12-foot wide; the northern portion is 6-foot wide. The apron walkway consists of metal grate decking, supported by steel framing, founded on steel H-piles. A pile-supported fuel service pier extends from the

[2] 1 vertical to 4 horizontal (1V:4H)

middle of the apron walkway to a pile-supported fuel service platform, about 200 feet from the bulkhead. The pier and platform both consist of metal grate decking, supported on steel framing, founded on steel H-piles. Some of the steel H-piles have been encapsulated in concrete. The pier and platform are in fair condition.

The North 1st Street Pier extends perpendicular to the shore about 195 feet and is about 5-feet wide; however, the segment that connected the pier to the shore is no longer present. At about the pier's midpoint is a pile-supported dolphin, about 12-feet wide. The pier consists of metal deck supported on concrete bent beams, founded on steel pipe piles. The dolphin consists of a concrete cap founded on a grouping of steel H-piles. The pier is in fair condition, except for the dolphin which is in poor condition.

About 200 feet seaward of the shoreline are four cellular caissons. The caissons range in diameter from about 28 to 47 feet. Each caisson consists of flat steel sheet piles surrounding a concrete cap. The caissons are likely filled beneath the cap. They are in satisfactory to fair condition. Three of the four caissons extend beyond the US Pierhead Line by up to about 13 feet.

The southern three caissons and the fuel service platform are connected by pile-supported catwalks about 5 feet wide. The North 1st Street Pier terminates at this catwalk. The catwalk between the southern two caissons consists of metal grate decking supported on concrete bent beams, founded on steel pipe piles. The catwalk between the middle two caissons and the fuel service platform are timber and span from the caisson to the platform on either side. The catwalks are in fair condition.

The North 3rd Street Pier once extended into the river about 245 feet from the former bulkhead, but the deck of the near shore portion no longer exists; only the piles that once supported the deck remain for this portion. A pile-supported timber platform (about 38,000 square feet) at the end of the former North 3rd Street Pier still exists. It consists of timber deck supported on timber framing and founded on timber piles. A 20-foot-wide catwalk extends from the platform to the northern most caisson. The catwalk consists of timber decking, supported on timber framing, and founded on timber piles. The remaining platform is in fair condition and the catwalk is in critical condition.

An existing 24-inch diameter combined sewer outfall runs beneath Metropolitan Avenue and discharges into the East River. The regulating chamber is within the River Street right-of-way. The combined sewer system was reportedly constructed circa 1962.

Representative photographs of the shoreline and waterfront structures are provided in Attachment G.

2.4 Tidal Wetlands and Waters of the US

According to the National Wetland Inventory Map, the East River adjacent to the site is mapped as Estuarine and Marine Deepwater. According to the NYSDEC Tidal Wetlands Map the East River adjacent to the site is mapped as a Littoral Zone (LZ). However, 6 NYCRR § 661.4(b)(hh)(4) provides that, notwithstanding this designation, "there shall be no littoral zone under waters deeper than six feet at mean low water. Pending determination by the commissioner in a particular case, the most recent, as of the effective date of this Part, national ocean survey maps published by the national ocean survey, national oceanic and atmospheric administration shall be rebuttable presumptive evidence of such six foot depth." Accordingly, much of the Project site is not regulated tidal wetland Littoral Zone despite the map designation. The relevant portion of the National Wetland Inventory and the Tidal Wetlands Maps are provided on Figures 4 and 5.

The following Tidal Datums were computed with VDatum online tool, V4.0.1 for the East River adjacent to the site[3]:

- Mean Higher High (MHHW) el 2.2
- Mean High Water (MHW) el 1.8
- Mean Low Water (MLW) el -2.4
- Mean Lower Low Water (MLLW) el -2.6

The extent of inundation at MHW and at MHHW are shown on the Boundary and Topographic Survey prepared by Control Point Associates Inc., PC, dated 27 March 2020.

The tidal wetland boundary shown on the NYSDEC Tidal Wetlands Map does not coincide with the surveyed location of the existing MHW line. No vegetated wetlands are present on the site. For purposes of this Joint Permit Application, we have used the existing extent of inundation at MHW as the tidal wetland boundary for NYSDEC and the extent of inundation at MHHW (being that MHHW is close to Spring High Water, which has not been determined at this site) as the jurisdictional boundary for USACE.

NYSDEC also regulates Tidal Wetland Adjacent Area (TWAA). We have estimated the extent of the TWAA based on our review of Sanborn Maps, USGS topographical maps, and historic aerials, and our understanding of the applicable regulations (specifically

[3] Latitude 40.718223, Longitude -73.966622. Reported vertical uncertain is 0.23 feet.

6 NYCRR § 661.4). The following factors have been considered in setting the estimated TWAA boundary:

1) The bulkhead fronting the East River on Block 2361, Lot 1 (between North 1st and Metropolitan Avenue) is a legally existing functional structure, more than 100 feet in length, that predates the 20 August 1977 effective date of the Part 661 tidal wetlands regulations and provides definite separation between land and water. According to 6 NYCRR § 661.4(b)(1)(ii), the bulkhead thus cuts off the extent of the TWAA.

2) The paved streets (i.e., North 1st Street, Metropolitan Avenue, and North 3rd Street) also cut off the extent of the TWAA.

3) All other shoreline protection structures (wharf, revetment, and cobble slope) were deemed not to limit adjacent area jurisdiction for purposes of this Joint Permit Application.

4) The paved area on Block 2376, Lot 6 (landward of the wharf) limits the TWAA because the current intact pavement has been in place since the mid-1990s (shortly after ConEd purchased the site), which is well before the wharf was deemed non-functional (in a 2016 inspection report for ConEd).

5) Note that we did not take credit for cutting off the adjacent area at the historic EL 10 contour on Block 2361, Lot 1 (taken from the 1979 USGS Map, which appears to match the EL 10 contour on the 1974 USGS Map). We have assumed, for purposes of this Joint Permit Application, the TWAA extends to the maximum 150 ft.

The extent of the TWAA is shown on the existing survey and proposed site plan in Figures 8 and 9, respectively. Copies of the historic aerials, Sanborns, and USGS maps are provided in Attachments E, F, and G, respectively.

2.5 Flood Information

The following information is from the Flood Insurance Rate Maps (FIRM) for the City of New York, Community-Panel Number 3604970204F, published by the Federal Emergency Management Agency (FEMA) on 5 September 2007, and the Preliminary FIRM for Community-Panel Number 3604970204F, published by FEMA on 5 December 2013.

According to the 2007 FIRM, the western portion of the site is within Special Flood Hazard Area "AE." The Base Flood Elevation (BLE) for a 1% annual-chance of being exceeded is EL 8.9 (reported as EL 10 NGVD on the map). According to the 2013 Preliminary FIRM, the western portion of the site is within Special Flood Hazard Area "VE." The BFE for a 1% annual-chance of being exceeded is EL 14. The relevant portions of the FIRM and Preliminary FIRM are provided on Figure 6.

3.0 PROPOSED PROJECT

3.1 Purpose and Need

The purpose of River Ring, including the regulated work in conjunction with an upland residential development, is to expand public waterfront access along the East River north from Domino Park and Grand Ferry Park esplanade, while enhancing and sustaining habitat and increasing the resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. The redevelopment of the property would open public access to the waterfront on former industrial properties that have excluded all public waterfront access for about 200 years. This newly opened public access would greatly enhance recreational and educational opportunities in a safe and more natural setting than typical urban waterfront access projects. The Project would provide a stable and resilient waterfront and would create aquatic, upland and wetland vegetative communities that would promote fish and wildlife habitat development. Finally, the upland portion of River Ring would redevelop vacant, derelict and partially dilapidated urban waterfront properties with much needed affordable and market rate residential development.

3.2 River Ring

River Ring would create approximately 267,840 SF of new waterfront public space (including upland, intertidal, and in-river water accessible areas) to facilitate the continuation of public waterfront access from Domino Park and Grand Ferry. River Ring would expand public waterfront access along the East River from Grand Ferry Park (and Domino Park beyond) to the south, while enhancing and creating habitat and increasing the shoreline protection and resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. Active areas within the waterfront public space area would include approximately 125,150 SF of upland open space along the waterfront; 39,390 SF of intertidal area; and 103,300 SF of protected open water space within the East River for publicly accessible recreation. The Project would provide public waterfront access, encourage water-dependent recreation, create a mosaic of native intertidal and sub-tidal habitats, and encourage ecological education. The proposed Project is completely water dependent, as it features public waterfront access, in-water recreation, and in-water habitat creation.

Though largely outside of relevant jurisdictional area, the upland portion of River Ring includes a new residential development with two new mixed income residential towers, new waterfront public space, and an esplanade. The new buildings would have a gross floor area of approximately 1.27 million gross square feet (GSF). The building footprints only account for about 30% of the available upland area. The remaining 70% of the developable area is being dedicated to creating a world class public park, which would include an estimated 900 ft long shore public walkway along the East River that would create a continuous connection from Grand Ferry Park to North 3rd Street.

An overall site plan is provided as Drawing L-110, prepared by James Corner Field Operations. The proposed waterfront improvements are shown on Drawings W-001 through W-509 and C-101, prepared by Langan.

3.3 In-water and Shoreline Improvements

The proposed in-water and shoreline improvements would include demolition of all existing in-water structures except for three of the existing caissons, reshaping of the entire shoreline to create a protected cove (via in-water excavation and backfill), construction of new shoreline protection measures (e.g., bulkhead, revetment), construction of new breakwaters in consideration of navigational interests and to protect the cove and the habitats that would be created inside the breakwaters, construction of new walkways connecting to the breakwaters, and creation and enhancement of in-water and upland vegetative habitats (e.g., man-made reefs, salt marsh, tide pools, coastal scrub shrubs).

In-water structures and shoreline protection measures to be demolished and removed include:

- All existing pile-supported piers, wharfs, platforms, walkways, catwalks, and dolphins over water would be removed (removing about 20,830 SF and 20,938 SF of cover over water with respect to MHW and MHHW respectively).

- All piles would either be removed or cut at the mudline (removing about 187 CY of fill below MHW and about 192 CY of fill below MHHW).

- The closure wall behind the wharf at the south end of the site and the bulkhead along the shoreline at the middle of the site would be removed by pulling the sheeting or by cutting the sheeting at the mudline (about 600 LF).

- The southern-most caisson in the water would be removed by demolishing the concrete cap, excavating the soil inside the sheet piles, and cutting the sheet piles at the mudline (creating about 805 SF of open water, and removing about 1,097 CY of fill below MHW and 1,109 CY of fill below MHHW).

- Debris from the former North 3rd Street Pier would be removed from the river bottom (removing about 674 CY of debris from below MHW and MHHW)

The existing shoreline would be reshaped by excavating historic fill (placed about 150 to 200 years ago) to create a cove and intertidal shallows (about 18,737 SF and 11,664 CY of new water below MHW, and about 18,838 SF and 11,574 CY of new water below MHHW). A portion of the cove would be used to create a non-swim beach and canoe/kayak launch for publicly accessible in-water boating, and a portion of the cove would be used to create new habitat (salt marsh and tide pools, described in more detail in the Habitat Creation and Enhancement section below). The shoreline at the beach would be partially protected by a pebble and cobble river rock sill along the shoreline; the salt marsh and tide pools would be protected by a riprap sill.

Based on wave modeling at the site, the proposed beach and habitat would require some form of protection to reduce the energy from waves and wakes to acceptable levels. A sill on its own would not provide adequate protection against erosion. Furthermore, without providing additional protection from waves and wakes, active in-water recreation would be impractical. Wake-generated waves from passing vessels along this high-traffic section of the East River are typically directed at the site shoreline from the southwest (from northbound vessels) and from the northwest (from southbound vessels). A copy of the wave modeling results is provided in Attachment I.

In order to protect the cove (including the created habitat, public beach, and in-water recreation area) and allow the continuation of commercial maritime activity without disruption, two pile-supported breakwaters would be constructed at the south and west sides of the site (to protect the site from waves from the southwest), and a soil and rock-filled groin would be constructed at the north side of the site (to protect the site from waves from the northwest). The breakwaters and groin are the minimum measures required to reduce wave and wake energies to acceptable levels for survivability of the proposed new habitat, to protect against sediment transport from the beach, and to allow in-water recreation within the protected area.

These measures to protect the cove would also significantly improve the flood resiliency of the site, primarily by dissipating the energy of crashing waves during storms. As described above, the western side of the site is within a Special Flood Hazard Area “VE”-

Zone, meaning that the shoreline is subject to breaking waves in excess of three feet in height. The Base Flood Elevation (BFE), shown on the Preliminary FIRM, is determined by adding the estimated flood wave height to the estimated stillwater flood elevation (e.g., for floods causing a stillwater flood elevation of EL 11 with flood waves up to 3 feet above stillwater, the BFE would be EL 14). By constructing the two wave breaks and groin, flood waves would break away from the shoreline; wave heights inside the protected area would be reduced to one foot or less along the shoreline, which significantly reduces the elevation of protection needed (in other words, BFE can be reduced by the amount the wave height is reduced). In addition, the shoreline protection (described below, consisting of ecological armoring on the breakwaters, riprap armoring on the groin and the salt marsh sill, and pebble/cobble river rock armoring on the beach sill) provides adequate protection against erosion and reduces wave run-up, further protecting the public waterfront open space and the buildings beyond.

The new breakwaters would be constructed entirely landward of the US Pierhead Line. The breakwaters would be constructed of precast concrete tubs ("U"-shaped cross section) supported on 30-inch diameter piles. In order to provide adequate protection from waves and wakes, the bottom of the precast tubs (breakwater structure) would be set at EL -9.0 and would be at least 37 feet wide at the southern breakwater and at least 26 feet wide at the western breakwater. The precast concrete tubs would incorporate ECOncrete® precast panels to promote biological growth on the vertical surface of the concrete. The top of the precast concrete tub walls would be set at EL -3.0, below MLLW. The tubs would be filled with combination of clean soil and geofoam to create a berm. A walkway would be created on top of the berm to allow public access on top of the breakwaters. The side slopes of the berms would extend below MLLW, with ecological armoring (described in more detail in the Habitat Creation and Enhancement section below) providing protection from erosion. Pile supported walkways would connect the two breakwaters to the upland shore public walkway, and to each other. The breakwaters and walkways would cover about 51,865 SF of water at MHW and about 51,889 SF at MHHW. Of the 51,865 SF of water covered at MHW, only about 284 SF of Littoral Zone and 179 SF of Intertidal Zone would be covered. About 99% of the water being covered is in open water with water depths generally greater than 20 feet deep. The breakwater and walkway piles, structure and berms would fill about 16,244 CY of water below MHW and 16,693 CY below MHHW.

By creating berms on top of the precast concrete tubs that form the structure of the breakwaters, new shallow water habitat would be created. Although the proposed breakwaters and walkways increase the coverage over water by 31,035 SF above MHW and 30,951 SF above MHHW from the existing condition, a portion of this would be offset by creating about 6,735 SF of new Littoral Zone and about 14,793 SF of new Intertidal Zone at MHW with ecological armoring to create new habitat (about 6,735 SF of Littoral Zone and 16,148 SF of Intertidal Zone at MHHW). An additional approximately 9,024 SF would be offset by creating coastal scrub shrub areas upland of MHW on the breakwaters. The new habitats being created on the breakwaters, as well as the other habitats being created along the shoreline (described in the Habitat Creation and Enhancement section below), more than compensate for the additional cover – resulting in a net positive result. For more information, see the Habitat Creation and Enhancement section below.

At the east (landward) side of the south breakwater, a new closure wall (bulkhead) would be installed about 12 feet landward of the existing closure wall behind the wharf. The soil behind the existing closure wall would be excavated, creating about 3,429 SF of water (below the breakwater) and removing about 5,977 CY of fill below MHW; and about 3,144 SF and 5,977 CY of water below MHHW.

Three of the existing caissons would remain; the breakwaters would be built around the existing caissons that remain. In order to protect the caissons from further corrosion and extend their longevity, the caissons would be encased with a Fiber Reinforced Polymer (FRP) jacket infilled with grout. The total thickness of the encasement would be about 6 inches (FRP jacket and grout combined) and would occupy about 288 CY of water below MHW and about 294 CY of water below MHHW.

The groin would be constructed of soil fill with riprap armoring along the new shoreline. The riprap armoring is needed to protect against erosion due to waves and wakes coming from the northwest, and to protect against sediment transport from the northernmost end of the beach. The groin would fill about 6,851 SF and 2,343 CY of water below MHW and about 6,803 SF and 2,445 CY of water below MHHW. See the Cut-Fill Analysis section below for more information about the overall in-water impact of the Project.

The existing combined sewer outfall would be relocated from Metropolitan Avenue to North 3rd Street, north of the new groin (and outside of the protected cove created as part of this Project).

Two new 24-inch diameter private stormwater outfalls would be installed to manage stormwater runoff from the proposed development: one at the northern end of the site and one at the southern end of the site. Water quality units would be installed upstream of the outfalls to treat stormwater before discharge to the East River. The water quality units would be designed to treat stormwater in accordance with the New York State Stormwater Management Design Manual. Tide gates would be installed inside manholes downstream from each water quality unit.

3.4 Adjacent Area Improvements

The proposed River Ring upland improvements within the TWAA would include public open space with about 900 LF of shore public walkway. The layout of the public open space and shore public walkway are shown on Drawing L-101. A portion of the shore public walkway would extend over a portion of the new salt marsh and tide pools being created along the south end of the cove. Active and passive recreation would also be provided in the public open space including a public beach on the new cove, amphitheater area facing the beach with granite block seating, a ramped boat launch for non-motorized watercraft (e.g., kayaks, paddleboards), a nature play area, landscaped plantings, and community kiosks.

Most of the pedestrian paths within the shore public walkway (except for a 16-foot wide boardwalk and the walkway over the created habitat) would be constructed using permeable pavers that would be designed in accordance with the New York State Stormwater Management Design Manual. The boardwalk over the created habitat would be metal grating with at least 50% openings.

The kiosks are upland of the TWAA, but the western end of some kiosks (about 266 SF) extend into the TWAA. These kiosks would be used as community space and commercial retail supporting the activity within the waterfront public open space, in accordance with Policy 8 under the New York City's Waterfront Revitalization Program (WRP).

A portion of the building footprints (about 9,576 SF) would extend into the TWAA. Only a very small fraction of the building's square footage within the TWAA will be non-residential, and that small portion will support the residential elements or will be occupied by water-dependent uses, including kayak and paddle board rentals, and ecological education, as well as locker and changing rooms and public restrooms supporting the water-dependent uses.

Overall, impervious coverage within the Adjacent Area is anticipated to be approximately 17.1%, which is less than the 20% allowed under the 6 NYCRR § 661.6(a)(1) Development Restrictions. Coverage within the TWAA is shown on Figure 10, along with calculations for impervious cover.

3.5 Habitat Creation and Enhancement

The benefits of the Project that more than offset any impacts to or incompatibility with wetland values include the significant creation and enhancement of various marine habitats. A brief summary of the types of habitat being created is provided below. The location of these habitats is shown on Figure 11.

1) Salt Marsh and Tide Pools – About 19,044 SF of salt marsh and tide pools would be created along the cove between the beach and the boat ramp. About 4,650 SF of the salt marsh and tide pools would be covered by a metal grate boardwalk at MHW (4,657 SF at MHHW). The tide pools and channels are located under the boardwalk to minimize the impact of shading on the salt marsh planted areas.

2) Upland Adjacent & Coastal Scrub Shrub – About 21,137 SF of upland coastal scrub shrub areas would be created on large portions of the breakwaters, on the north and south end of the beach, and various upland locations along the shore public walkway.

3) Reef Balls & Oyster Cages – About 21,996 SF of man-made reefs would be created on the river bottom adjacent to the breakwaters, along the shoreline east of the salt marsh, and on the south side of the groin (within the protected cove). The reefs would be made primarily of oyster cages and manufactured reef balls, and would be installed in areas that are permanently submerged underwater.

4) Shoreline Shallows – About 17,855 SF of shoreline shallows would be created within the cove adjacent to the public beach and salt marsh.

5) Intertidal and Littoral Zones – about 6,735 SF of new Littoral Zone habitat and about 14,793 SF of new Intertidal Zone habitat would be created on the new breakwaters at MHW (about 6,735 SF of Littoral Zone habitat and 16,148 SF of Intertidal Zone habitat at MHHW). Ecological armoring and seawall panels would be used in the new Littoral Zone to encourage biological growth and habitation. The precast concrete tubs forming the structure of the breakwaters would have ECOncrete® seawall precast panels attached. Ecological armoring units (e.g., ECO Armor Blocks, Tide Pool Armor, and Mats by ECOncrete®) would be used as erosion protection on the berms forming the top of the breakwaters. In addition, the excavation to create the cove and salt marsh would net another about 5,227 SF of created Littoral Zone and about 2,024 SF of Intertidal Zone along the shoreline at MHW (about 4,774 SF net created Littoral Zone and 591 SF of net created Intertidal Zone at MHHW). Overall, the Project creates about 11,962 SF of Littoral Zone and 16,817 SF of Intertidal Zone below MHW (about 11,509 SF of Littoral Zone and 16,739 SF below MHHW).

6) Eel Grass Pilot Program – About 9,958 SF of eel grass would be planted within the sandy substrate of the shoreline shallows as a pilot program. The survivability and health of the eel grass would be evaluated over time.

In all, a total of about 106,804 SF (2.45 acres) of new or enhanced marine and tidal wetland habitats would be created by this Project. A full habitat assessment is provided in Attachment J. A Shade Study evaluating the impact of shading on the proposed habitats is provided in Attachment K.

3.6 Essential Fish Habitat

Langan has completed an evaluation of potential impacts to threatened and endangered species and essential fish habitats. The Project is expected to have no long-term impact on threatened and endangered species, or on essential fish habitats. Upon completion of the construction, the Project will provide significant improvements in habitats (as described above). Permits for the Domino Park construction, to the south of this project, did not require moratoriums during construction. Since this project is in the same stretch of the East River and has similar construction procedures, moratoriums are not expected to be necessary for this Project. Essential Fish Habitat Assessment is provided in Attachment L.

3.7 Cut-Fill Analysis

The Project would result in an increase in water, tidal wetlands, and habitat, as summarized in the table below.

Net Increase In:	With Respect to MHW	With Respect to MHHW
Area of Created Water	55,742 SF	55,513 SF
Volume of Created Water	2,575 CY	2,305 CY
Area of Covered Water	31,035 SF	30,951 SF

Area of water created is shown on Drawings W-504 through W-507. As a whole, the Project would create about 55,742 SF of water below MHW, and 55,513 SF of water below MHHW. Volume of cut and fill is shown on Drawings W-508 and W-509. The Project would result in a net cut of 2,575 CY below MHW and 2,305 below MHHW. While the new breakwaters and walkways would increase the cover of open water by about 31,035 SF at MHW and 30,951 at MHHW (as shown on W-501 through W-503), the creation of new open water and the creation of 106,804 SF of new and enhanced habitat (as shown on Figure 11) would more than compensate for the additional cover. The breakwaters themselves would create 6,735 SF of new Littoral Zone habitat and about 14,793 SF (MHW) / 16,148 SF (MHHW) of new Intertidal Zone habitat (as shown on W-

505) and an additional 9,024 SF of new coastal scrub shrubs habitat that otherwise could never be created on the existing river bottom.

4.0 ALTERNATIVES TO THE PROPOSED PROJECT

As proposed, the Project would greatly increase net wetland values through the ecosystem creation and improvements described above. Nevertheless, alternatives to the proposed Project were evaluated to determine if practicable alternatives exist that would have less environmental impact. These alternatives are discussed below.

4.1 Ecological Park Alternatives

The following paragraphs describe alternatives that were evaluated for shoreline protection at the Project site.

1) No-Action Alternative

Under the No-Action Alternative, the site would not be developed and would remain vacant. The shoreline would not be stabilized or made more resilient; neither open water nor tidal wetland habitat would be enhanced or created; public waterfront access at the site would not be restored, and a shore public walkway would not be created. In this alternative, the existing waterfront structures (e.g., piers, wharf, gangways, caissons, bulkhead, revetments) would continue to deteriorate and could eventually collapse into the water. The shoreline would continue to erode and sinkholes would expand behind the wharf, with soil being washed away as a result of tidal fluctuations, daily wave action and wakes from vessels using the East River, and coastal storms.

Impacted historic fill on the site would remain. Additional adverse impacts resulting from the decaying shoreline protection would result in sedimentation of the East River (by historic fill material) and the potential degradation of water quality created by the poor condition of the waterfront. The TWAA would remain as is, barren fill area interspersed with non-native and invasive plant species.

Based on the above, the No-Action Alternative does not achieve any part of the Project's stated purpose and need. Therefore, the No-Action Alternative is not practicable and would be more environmentally damaging than the proposed Project.

2) Sheet Pile Bulkhead Alternative

Under the Sheet Pile Bulkhead Alternative, the shoreline would be stabilized by constructing a vertical steel sheet pile bulkhead in a roughly linear arrangement along the existing shoreline; the alignment of the bulkhead would be established to result in no net fill. Existing waterfront structures that are in poor or critical condition (e.g., wharf, dolphins, and some catwalks) would be removed due to their condition. The other waterfront structures either would be removed to balance cuts and fills or would be repaired and integrated into a new shore public walkway. In-water repairs would likely include encapsulation of the caissons and piles that remain. The top of the new bulkhead would be set at about EL 12 to raise site grades above the Base Flood Elevation (per Preliminary Flood Insurance Rate Maps published by FEMA). Sheet pile bulkheads, in general, offer less storm resiliency and natural habitat compared to the living shoreline approach proposed under the Preferred Alternative.

A shore public walkway would be constructed on the landward side of the new sheet pile bulkhead with the buildings set back about 40 feet from the bulkhead. The site grades behind the bulkhead would be significantly higher than the River water level, by about 10 feet at high tide and 14 feet at low tide, diminishing the accessibility of the water and eliminating recreational and educational opportunities compared to the Preferred Alternative. In addition, what little habitat value the existing cobble slope, riprap revetment, and pile supported structures provide would be lost under this alternative. No new open water, Littoral zone, wetland or upland habitat would be constructed, other than small vegetated and managed upland landscape planting areas within the shore public walkway. The breakwaters would not be constructed, meaning that there would be no opportunity to create new Littoral Zone in the deeper water area under this alternative, and there would be no protection against wakes from passing vessels or from storm-induced waves. Storm events would result in higher surge levels and wave run up, resulting in a less resilient shoreline than the Preferred Alternative.

This Sheet Pile Bulkhead Alternative reduces public access and resiliency as compared to the Preferred Alternative, and does not accomplish the Project's purpose of creating, enhancing and sustaining marine habitat. This alternative results in loss of habitat and is thus more environmentally damaging than the Preferred Alternative. Therefore, this alternative is not practicable because it does not meet the Project's overall purpose and is more damaging to the environment.

3) <u>Vegetated Embankment Alternative</u>

In the Vegetated Embankment Alternative, the existing shoreline would be replaced with a vegetated wetland on a gentle slope, about 1 vertical to 4 horizontal (1V:4H), along the entire shoreline. All existing waterfront structures would need to be demolished under this alternative.

In order to create the shallow slope required to build a vegetated wetland and to maintain the 40-foot wide shore public walkway required by New York City Zoning Regulations, water in front of the wharf closure wall (at the south end of the site) would need to be filled; there is insufficient width of land to create the required slope within the width of property available for development in this area (where the existing NYPA property abuts the Project site). Soil behind the bulkhead would have to be removed to balance cuts and fills in water, and some of the in-water structures might need to be removed to achieve no net fill on the site. The area of disturbance likely would exceed that of the Preferred Alternative.

Furthermore, due to severe wakes from passing vessels (e.g., passenger ferries for the city-wide ferry service), wind-driven waves (primarily during storms) and the general current in the East River, the Vegetated Embankment Alternative would not provide adequate protection to the shoreline. Due to the amount of cut and fill required to construct a vegetated embankment, it would not be possible to construct breakwaters under this alternative without significant offsite mitigation; the lack of breakwaters would mean that the vegetated wetland would be unprotected from the waves, wakes, and currents in the river. The plantings likely would not survive, resulting in a significant loss of habitat compared to the Preferred Alternative. Once the vegetation was lost, the slope would rapidly erode, increasing suspended solids in the East River (potentially with historic fill material), further impacting the East River, and would eventually threaten the stability of the shore public walkway. This alternative would therefore be more environmentally damaging than the Preferred Alternative and would not meet the Project's overall purpose of increasing resilience of the site and upland areas.

4) Riprap and Planted Revetment Alternatives

These alternatives (riprap and planted revetments) are essentially the same from a footprint and wetland impact perspective, and therefore are considered together. A riprap revetment is comprised of stone armoring with gravel bedding; a planted revetment would include the same armoring, but it would also be enhanced with vegetative plantings. This alternative would provide for sufficient land area to construct the upland mixed income residential development.

Under the Revetment Alternatives, the existing site shoreline would be replaced with a riprap or planted revetment along the entire shoreline. Like the Vegetated Embankment Alternative, a slope would be constructed using a combination of excavation and backfill. Under this alternative, however, the slope would be significantly steeper (1V:2H) than the Vegetated Embankment Alternative and could be constructed with less impact to the tidal wetlands. The steeper slope allows for the shoreline protection to occur in a much smaller footprint than the vegetative embankment alternative. This is because the riprap is composed of large stone blocks, which allow it to be stable at a steeper slope and provide a much stronger erosion protective measure.

Like the bulkhead alternative (Alternative 2), the top of the rip-rap revetment would be set at EL 12.0 to keep the upland portion of the site above the Base Flood Elevation. In order to achieve a balanced cut-fill, the existing cobble embankment at the north end of the site would be replaced by rip-rap but its dimensions and location would stay roughly the same; soil behind the bulkhead area would excavated to create the slope; filling water in front of the wharf closure wall would be required to create a slope for the revetment; and the removal of the existing in-water structures would be needed to create a balanced cut-fill. If the Planted Revetment Alternative were implemented, the new revetment would be constructed with riprap armoring, and live staking trees and shrubs would be planted in round, concrete or PVC planters, generally located between pieces of riprap.

A 40-foot wide shore public walkway would be constructed at the top of the revetment. Under this alternative the walkway would be 10 to 14 feet higher than the normal high and low tide elevations of the East River and as such, design elements such as stepped "getdowns" and/or sloped walkways would have to be incorporated into the walkway design to allow access to the water.

No breakwaters would be constructed under these alternatives. Although either revetment alternative would provide sufficient erosion protection, launching kayaks and paddle boards would not be feasible due to wakes, waves, and currents that daily occur in this stretch of the East River.

While these alternatives provide shoreline protection, they offer virtually no habitat creation and enhancement compared to the Preferred Alternative. Although these alternatives do allow for public access to the waterfront, they do not allow for active recreation in the water, like the Preferred Alternative does. These alternatives also do not provide the extensive waterfront amenities, aesthetics, and upland wetland and aquatic ecological enhancements that the Preferred Alternative would offer. Moreover, these alternatives would not allow for the creation of new Littoral Zone without placing a significant amount of fill and removing deep water habitat. Thus, while practicable, these alternatives would not fully achieve the stated goals of the Project. In addition, while they would have similar impacts as the Preferred Alternative, they would not offer nearly as many environmental benefits; the

Preferred Alternative therefore remains the least environmentally damaging practicable alternative.

4.2 Breakwater Alternatives

City and Sea Group LLC (CAS Group) performed a coastal assessment study and a preliminary sediment transport study for the development with and without a breakwater. The coastal assessment study included on-site measurements of waves and wakes, and wave modeling using DHI modeling software. A copy of the study is provided in Appendix I.

The coastal assessment study demonstrates that breakwaters are required to protect the proposed habitat and allow for active in-water recreation. The primary factor affecting survival of the proposed habitat and allowing in-water recreation is wakes caused by ferries passing by the site on average about 130 times per day. These wakes exceed the magnitude of wind-driven waves caused by a 100-year storm, and they occur every day. The selected breakwater would need to be designed to dissipate wave energies from wind-driven waves during storms (with shallow wave heights and short periods), as well as the daily wakes from passing ferries (with deeper wave heights and longer periods). The breakwater would also need to account for sea level rise, so as to protect against storm-generated wind-driven waves for years to come.

Several alternatives were considered for the design of the breakwaters. Under these alternatives, only the breakwaters are changed; the rest of the development would proceed as described in Section 3.0 above, unless otherwise noted below.

1) No-Breakwater Alternative

Under this alternative, no breakwater would be installed. Active in-water recreation from the site would not be possible due to the frequency and magnitude of wakes from passing ferries. As such, the boat ramp would be eliminated under this alternative. The proposed habitats would not survive. Similarly, the beach would quickly be washed away, carrying sediment into the River and exposing the shoreline to further erosion. In this alternative, the existing waterfront structures (e.g., piers, wharf, gangways, caissons, bulkhead, revetments) would continue to deteriorate and eventually collapse into the water. This alternative is susceptible to storms, reduces resiliency, does not protect the shoreline from erosion, causes sedimentation of the River, and does not allow for the creation of new habitat. As such, this alternative does not meet the Project's overall purposes and has more environmental impacts than the proposed alternative.

2) Floating Wave Attenuators

Under this alternative, the pile-supported breakwaters would be replaced with floating wave attenuators. Floating wave attenuators can be effective in reducing short period waves (such as those experienced during storms), typically in protected bays or harbors. While the floating wave attenuators are resilient for storm surge and sea level rise because they can rise with water level, they become less effective as they rise and are not effective in reducing longer period waves (such as wakes generated from passing ferries as would occur at the Project site). As such, floating wave attenuators are unlikely to be sufficient protection for some of the ecological habitats proposed under the Preferred Alternative. Since they also need to be fairly wide in order to be effective, generally wider than fixed breakwaters (such as the breakwaters proposed under the Preferred Alternative),they would result in a greater amount of cover than the Preferred Alternative. Their width results in large stresses with the structure of the float when impacted by crashing waves and wakes, which can significantly reduce their lifespan over other alternatives. Floating wave attenuators also cannot typically be used for public access because of the movement they experience when attenuating wave energy. Because the top of the floats sit above water, it is not possible to create intertidal or littoral habitat on the attenuators in the way that the proposed breakwater armoring is planned under the Preferred Alternative, therefore, the environmental benefits would be further reduced under this alternative.

While the floating wave attenuators alternative would meet the upland development goals, it would only partially meet the ecological enhancement and resiliency goals. This alternative would also result in greater environmental impact (specifically cover over water) and would result in less environmental benefit (specifically in created habitat) than the Preferred Alternative.

3) Cellular Wave Screen Alternative

Under the cellular wave screen alternative, the breakwater platforms would be replaced with solid-filled cellular caissons, consisting of flat sheet piles installed in interlocking cylindrical arrangements (cells) and backfilled with soil and capped with concrete. To withstand the design wave loads, the cells would need a significant self-weight (from the soil infill) to resist overturning and ensure protection of the cove. The weight is generally determined by the diameter of the cells (generally having diameters in excess of 30 ft). The fill required to construct the cellular wave screen would greatly exceed what is proposed for the breakwater platforms under the Preferred Alternative. To the extent that fill volume is associated with potential environmental impacts, the impacts of the cellular wave screen far exceed those of the Preferred Alternative.

The cellular wave screen would provide full-depth protection against waves and wakes and would prevent all wave energy from entering the Project site (except at the two entry points into the cove from the East River). Unfortunately, full-depth protection would also prevent the free flow of water through the site. The lack of water circulation would potentially lead to poor water quality and siltation inside the cove. Although the cellular wave screen meets the resiliency and upland development goals of River Ring, it only partially meets the ecological habitat goals and would result in potentially significant impacts to the environment.

4) <u>Partial-Depth Wave Screen Alternative</u>

Under this alternative, the proposed breakwater platforms would be replaced with a partial-depth wave screen, consisting of a solid wall facing the East River, and a pile-supported frame to resist wave forces. Foundation support for the wave scren would consist of plumb and batter piles driven to adequate depth below river bottom to handle the necessary tension and compressive forces from wave loading and impact. The bottom solid wall of the wave screen would be optimized to keep wave magnitude within the cove at an acceptable level. The wave screen frame would be at least as wide as the breakwater platforms proposed under the Preferred Alternative, and the number of piles required to support the wave screen structure would likely be significantly more than would be required for the breakwater platforms under the Preferred Alternative.

A partial-depth wave screen would provide adequate wave protection for the cove, would improve resiliency at the Project site, and would abate some of the environmental concerns posed by full-depth protection. However, the partial-depth wave screen would not allow for new habitat on the wave screen itself. The partial-depth wave screen would meet the resiliency and upland development goals, and partially meet the ecological habitat goals, but would have fewer net environmental benefits than the Preferred Alternative (specifically less habitat created). It also has the same impact as the Preferred Alternative.

5) <u>Submerged Living Breakwater Alternative</u>

Under this alternative, the proposed breakwater platforms would be replaced with a submerged living breakwater. Constructed reefs and subtidal breakwaters have successfully been installed in various coastal environments primarily to control shoreline erosion and in some cases build beaches. Some proprietary subtidal breakwater systems can also provide structured habitat enhancement (such as Reef Balls, oyster castles, etc.). As these types of systems are intended to remain submerged, they do not provide significant storm wave attenuation, especially during storms with elevated water levels, which may become more common in the future with the projected sea level rise. Additionally, as the seas rises, daily operations of vessels would no longer be protected unless the structures continue to be raised. With the water depths that are currently present on site, an extensive amount of fill would be required to make these breakwaters viable, thus increasing potential environmental impact due to increased fill volume as compared to the Preferred Alternative. This alternative also would not meet the Project's resiliency and recreational access goals.

4.3 Adjacent Area Use Alternative

Small portions of some of the kiosks (about 266 SF) and the buildings (about 9,576 SF) are within the TWAA. The buildings are residential, consisting mostly of a mix of affordable and market-rate residential units and ancillary supporting uses for residents. Residential development is considered a Generally Compatible Use within the TWAA per Use #46 under 6 NYCRR § 661.5. A small percentage of the kiosks and the buildings' floor area would be dedicated for water-dependent commercial tenants and public amenities, such as kayak and paddle board rentals, which are water-dependent uses that require direct access to the water, as well as locker rentals, changing rooms and public restrooms that support the water-dependent uses and are required for visitors to use the active recreation area in the cove. These proposed uses would be considered Generally Compatible under 6 NYCRR § 661.5 uses #5, 47 and 49.

Commercial space within the TWAA within the cellar of the south tower would include a community facility recreation space that would be open to the public. Although it supports River Ring's water-dependent uses, the community facility itself would not be considered water-dependent. Commercial facilities that do not require access to the water are considered Presumptively Incompatible in the TWAA per Use #48 under 6 NYCRR § 661.5). Although a small percentage of commercial space within an entirely residential development arguably falls within the Generally Compatible uses identified in § 661.5 uses #5, 47 and 49, the following paragraphs nevertheless evaluate alternatives for the small amount of commercial space that is not directly water-dependent within the TWAA at the Project site.

1) Relocate Commercial Space Alternative

This alternative would relocate the portion of the non-water-dependent commercial space within the buildings that are within the TWAA to an area upland of the TWAA. Specifically, this alternative evaluates relocating a community facility recreation space in the basement under the north tower. The commercial space on the first floor is dedicated for water-dependent uses (specifically kayak and paddleboard rental and storage) and support of water-dependent uses, and would not be relocated.

Because of the large cove being constructed along the shoreline, which offers significant environmental benefits by creating and enhancing wetland habitats, there is not enough upland real estate to locate these spaces anywhere else on the property or within the building. The community facility recreation space in the cellar offers unique benefits to the community by providing space for public recreation and education.

Furthermore, even if it were possible to shift this uses somewhere else within the building, it would not change the footprint of the building or reduce cover within the TWAA. This use has no effect on the wetlands and actually enhance wetland values by promoting their enjoyment by the public. Any presumptive incompatibility is overcome by the net wetland value benefits of the Project, which are substantial, and by the fact that these particular uses support other water-dependent uses and provide significant benefit to the community through education and recreation.

2) <u>Relocate Kiosks Alternative</u>

This alternative would relocate the kiosks to an area upland of the TWAA. The kiosks would be used for local vendors that may or may not be directly water-dependent. The mix of community vendors would activate and energize the shore public walkway (e.g., food sales, wares from local artists, community engagement, ecological studies and tours) during seasonal operations. It is possible that these uses would be considered Presumptively Incompatible under 6 NYCRR § 661.5 under use #48. However, the kiosks would not be expected to have any significant adverse impacts on the environment, and they would provide significant improvement in engaging the public in active recreation at the site, including boating, ecological tours, waterfowl watching, and other recreational usage. This is consistent with New York City's Waterfront Revitalization Program (WRP), which encourages waterfront-facing commercial space as a way to increase public usage of the shore. If the kiosks were relocated outside of the adjacent area, the distance to the waterfront would be significantly greater than in the Preferred Alternative, and would materially reduce the ability of the public to use the shoreline for active water-dependent recreation, which is a goal of the Project.

As noted, the commercial uses within the kiosks are intended to encourage other water-dependent uses and active recreation at the site. Note also that only a very small portion of the kiosks extend into the TWAA and they have been pushed as far east as possible, up against the western edge of the NYPA property, without impacting their ability to activate the waterfront. The kiosks are expected to have no adverse impacts on wetland values at the location shown. They would, in fact, directly or indirectly support water-dependent uses at the site, so their relocation is undesirable and would be viewed negatively under the WRP. As such, this alternative is undesirable. In addition, the significant amount of habitat creation and other environmental benefits of this Project (as described below) more than justifies the approval of these small commercial areas within the TWAA.

4.4 Preferred Alternative

The Preferred Alternative, as described in Section 3.0 above, minimizes impacts to and significantly improves the value, diversity and quantity of natural resources at the site. Some limited environmental impacts would occur, but these potential impacts would be temporary and would occur mainly during construction. These limited, temporary impacts would be far outweighed by the significant long-term environmental benefits offered by this Project. Specifically, this Project minimizes environmental impacts and improves the natural resources on and adjacent to the site in the following ways:

1) *Minimal Impervious Coverage* – The proposed Project would keep the impervious coverage within the TWAA to below 20% when the Project is completed. This is accomplished by using extensive planted landscaped areas, permeable pavers, beach, created intertidal and littoral zones, and various new habitat areas.

2) *Habitat Creation* – The proposed Project would create about 21,996 SF of reef, 19,044 SF of salt marsh and tide pools, 21,137 SF of coastal scrub shrub areas, and 17,855 SF of shoreline shallows. The newly created habitats would be protected by the new breakwaters and groin.

3) *Intertidal and Littoral Zone* – The proposed Project is the only alternative that would create new Intertidal and Littoral Zone habitat without filling or removing deep water habitat. About 6,735 SF of Littoral Zone habitat and 14,793 SF (MHW) / 16,148 SF (MHHW) of Intertidal Zone Habitat using ecological armoring and seawall panels would be created on top of the new breakwaters. In addition, excavation for the cove and salt marsh would create a net increase for the total Project of 11,962 SF of Littoral Zone and 16,817 SF

of Intertidal Zone below MHW and 11,509 SF of Littoral Zone and 16,739 SF of Intertidal Zone below MHHW

4) *Increased Water* – The Project would create about 55,742 SF and 2,575 CY of water below MHW and about 55,513 SF and 2,305 CY of water below MHHW.

5) *Building Siting* – The new buildings would be set at least 40 feet behind the proposed MHW line at the created salt march and about 138 feet behind the proposed MHW line at the shoreline, which is more than the 30-foot minimum setback required by 6 NYCRR § 661.6.

6) *Shoreline Protection and Resiliency* – The Project would follow the Comprehensive Restorative Plan and NYSDEC's Living Shorelines recommendations to protect the shoreline from erosion and improve storm resiliency. The navigational channel activities and resiliency elements would be protected by the breakwaters and groins.

In addition to these environmental considerations, the proposed River Ring would provide public access to the waterfront. Currently the site is fenced off and is generally inaccessible to the public. As described above, the proposed River Ring would include a new public waterfront walkway, and would allow for active water-based recreation within protected coves.

5.0 NYSDEC STANDARDS OF ISSUANCE

5.1 Protection of Waters Permit

In accordance with Article 15, Title 5 (6 NYCRR Part 608), the Project would require a Protection of Waters Permit for the temporary disturbance in navigable waters of the State (i.e., East River). Specifically, the disturbance would be associated with: removal of existing wharf, catwalks, platforms, dolphins and cellular caissons; construction of two pile supported breakwaters; construction of a pile-supported walkway from land to the breakwaters; excavation and fill to reshape the shoreline to create a groin and cove; shoreline protection consisting of a bulkhead (southern portion of the site) and riprap revetment or cobble sill (northern portion of the site); and habitat creation on the breakwaters and along the shoreline.

According to 6 NYCRR Part 621, this Project is classified as a major project for (1) disturbance of the bed or bank or a protected stream in excess of 100 linear feet; (2) construction of new platforms and breakwaters; and (3) excavation and placement of fill in navigable waters in excess of 100 cubic yards and 5,000 SF. The permit would also be subject to the public notice requirements of 6 NYCRR § 621.6.

The Project meets the standards for issuance of a Protection of Waters Permit under 6 NYCRR § 608.8. The Project:

1) Is reasonable and necessary – The existing shoreline is dilapidated, no longer provides adequate protection against erosion, and needs to be replaced. The Project would provide a stable and resilient shoreline that would protect against erosion, greatly improve resiliency during storm events and create protected area for habitat creation and active in-water recreation, without compromising navigation in the East River. The Project cannot be relocated upland because it is a water-dependent use, specifically designed to create aquatic, wetland, and upland habitat, and to encourage active in-water recreation. Upland, River Ring would redevelop vacant, derelict and partially dilapidated urban waterfront properties with much needed affordable and market rate residential development. The redevelopment of the property would open public access to the waterfront on former industrial properties that have excluded all public waterfront access for nearly 200 years. This newly opened public access would greatly enhance recreational and educational opportunities in a safe and more natural setting than typical urban waterfront access Projects.

   The robust alternatives analysis in this JPA demonstrates that the Project as presented is reasonable. The Preferred Alternative minimizes the impact to the environment while maximizing benefits to the environment (e.g., creating 2.46 acres of new or enhanced habitats) and to the community (e.g., providing a more resilient shoreline, access to the water, recreation in the water, and education about waterfront ecology). The limited impacts to the environment only occur during the construction period, and would be far outweighed by the new habitat being created that would significantly enhance the ecological value of the waterfront at the site.

   Based on our analysis, this Project is both reasonable and necessary.

2) Will not endanger the health, safety or welfare of the people of the State of New York – The proposed activities would significantly improve public health, safety and welfare. The Project would remove dilapidated waterfront structures from the site, would stabilize areas of the shoreline that are currently eroding, and would significantly improve resiliency and reduce storm

surge levels at the site. None of the proposed activities would endanger the health, safety or welfare of the people of New York.

3) Will not cause unreasonable, uncontrolled or unnecessary damage to the natural resources of the State – The Project would result in a net benefit to the natural resources of the State by increasing the volume and footprint of State waters, and by creating and enhancing habitats that improve the overall ecological value of the waterfront at the site. The limited impacts to the environment only occur during the construction period and would be far outweighed by the new habitat being created that would significantly enhance the ecological value of the waterfront at the site. Best management practices would be implemented during construction to contain river bottom sediment disturbed during construction. There would be no permanent impacts to the environment, and there would be significant environmental benefits.

5.2 Tidal Wetlands Permit

The proposed Project would require activities below the MHW line of the East River (el 1.8) This portion of the East River is categorized by NYSDEC as a Littoral Zone (see Figure 5). Proposed activities below MHW include the removal of existing wharf, catwalks, platforms, dolphins and cellular caissons; construction of two pile supported breakwaters; construction of piles that support a walkway from land to the breakwaters; excavation and fill to reshape the shoreline to create a groin and cove; shoreline protection consisting of a bulkhead (southern portion of the site) and riprap revetment or cobble sill (northern portion of the site); two outfalls and associated headwalls; and habitat creation on the breakwaters and along the shoreline.

Therefore, the Project would involve regulated activities in the surface waters listed in 661.4(ee)(1), specifically, "(i) any form of draining, dredging, excavation or removal, either directly or indirectly, of soil, mud, sand, shells, gravel or other aggregate; (ii) any form of dumping, filling or depositing, either directly or indirectly, of any soil, stones, sand, gravel, mud, rubbish or fill of any kind; and (iii) the erection of any structures or construction of any facilities or roads, the driving of any pilings or placing of any other obstructions, whether or not changing the ebb and flow of the tide."

As described below, the Project meets the Standards for Issuance of Permits for Tidal Wetlands found in 6 NYCRR § 661.9. The Project:

1) Is compatible with the policy of the Act to preserve and protect tidal wetlands and will not have an undue adverse impact on the present or potential value

of the affected tidal wetland area - The Project would result in a net benefit to the tidal wetland area by increasing the volume and footprint of tidal wetlands (and significantly increasing littoral and intertidal zones), and by creating and enhancing habitats that improve the overall ecological value of the waterfront at the site. The limited impacts to the environment only occur during the construction period and would be far outweighed by the new habitat being created that would significantly enhance the ecological value of the waterfront at the site. Best management practices would be implemented during construction to contain river bottom sediment disturbed during construction. There would be no permanent impacts to the environment, and there would be significant environmental benefits.

2) Is compatible with the public health and welfare – The proposed activities would significantly improve public health, safety and welfare. The Project would remove deteriorating waterfront structures from the site, would stabilize areas of the shoreline that are currently eroding, and would significantly improve resiliency and reduce storm surge levels at the site. None of the proposed activities would endanger the health, safety or welfare of the people of New York.

3) Is reasonable and necessary – The existing shoreline no longer provides adequate protection against erosion and needs to be replaced. The Project would provide a stable and resilient shoreline that would protect against erosion, greatly improve resiliency during storm events and created protected area for habitat creation and active in-water recreation, without compromising navigation in the East River. The Project cannot be relocated upland because it is a water-dependent use, specifically designed to create aquatic, wetland, and upland habitat, and to encourage active in-water recreation. Upland, the Project would redevelop vacant, derelict and partially dilapidated urban waterfront properties with much needed affordable and market rate residential development. The redevelopment of the property would open public access to the waterfront on former industrial properties that have excluded all public waterfront access for about 200 years. This newly opened public access would greatly enhance recreational and educational opportunities in a safe and more natural setting than typical urban waterfront access projects.

Through a robust alternatives analysis, this JPA has demonstrated the Project as presented herein is both reasonable and necessary. The Preferred Alternative minimizes the impact to the environment while maximizing benefits to the environment (e.g., creating 2.46 acres of new or enhanced habitats) and to the community (e.g., a more resilient shoreline, providing access to the water, recreation in the water, and education about waterfront ecology). The impacts to the environment are limited to the construction period and would be far outweighed by the new habitat being created that would significantly enhance the ecological value of the waterfront at the site.

4) Complies with the use guidelines contained in 6 NYCRR § 661.5 – According to 6 NYCRR § 661.5(b)(24), the "substantial restoration or reconstruction of existing functional structures or facilities of any kind" is considered a "Generally Compatible" use within a Littoral Zone. As such, the proposed activities are a Generally Compatible use.

5.3 Adjacent Area Activities

The proposed Project would require activities within the TWAA. Proposed activities within the TWAA include construction of a salt marsh and tide pool habitat, installation of a pile-supported walkway; excavation and fill to reshape the shoreline to create a groin and cove; shoreline protection consisting of a riprap revetment or cobble sill; habitat creation along the shoreline; publicly accessible beach and step seating along the shoreline; creation of a shore public walkway (esplanade) with associated landscaping; several kiosks; and two residential towers providing market rate and affordable housing.

Therefore, the Project would involve regulated activities in the surface waters listed in 6 NYCRR § 661.4(ee)(1), specifically, "any other new activity within a tidal wetland or on an adjacent area which directly or indirectly may substantially alter or impair the natural condition or function of any tidal wetland."

As described below, the Project meets the Standards for Issuance of Permits for Adjacent Area found in 6 NYCRR § 661.9. The Project:

1) Is compatible with the public health and welfare – The proposed activities would significantly improve public health, safety and welfare. The Project would remove dilapidated waterfront structures from the site, would stabilize areas of the shoreline that are currently eroding, and would significantly improve resiliency and reduce storm surge levels at the site. None of the proposed activities would endanger the health, safety or welfare of the people of New York.

2) Complies with the development restrictions contained in 6 NYCRR § 661.6 – The Project fully complies with the development restrictions in 6 NYCRR §

661.6. Buildings are set back 138 ft from MHW along the shoreline and 40 ft from MHW at the created salt marsh, which exceeds the required 30 ft setback requirement. The Project would result in 17.1% impervious cover within the TWAA, which is below the 20% maximum allowed without a variance. All pavements would be constructed using permeable pavers in accordance with NYSDEC's New York State Stormwater Management Design Manual. A significant portion of stormwater within the TWAA would infiltrate through pervious surfaces (e.g., landscaping, beach, permeable pavement). Stormwater runoff would be collected and treated using water quality units (one at each of two stormwater outfalls).

3) <u>Will not have an undue adverse impact on the present or potential value of any adjacent or nearby tidal wetlands</u> – The Project would result in a significant net benefit to the tidal wetland and adjacent areas by increasing the volume and footprint of tidal wetlands (and significantly increasing littoral and intertidal zones), and by creating and enhancing habitats that improve the overall ecological value of the tidal wetlands and adjacent areas at the site. The limited impacts to the environment only occur during the construction period and would be far outweighed by the new habitat being created that would significantly enhance the ecological value of the waterfront at the site. Best management practices would be implemented during construction to prevent sedimentation from upland sources during construction. There would be no permanent impacts to the environment and there would be significant benefits.

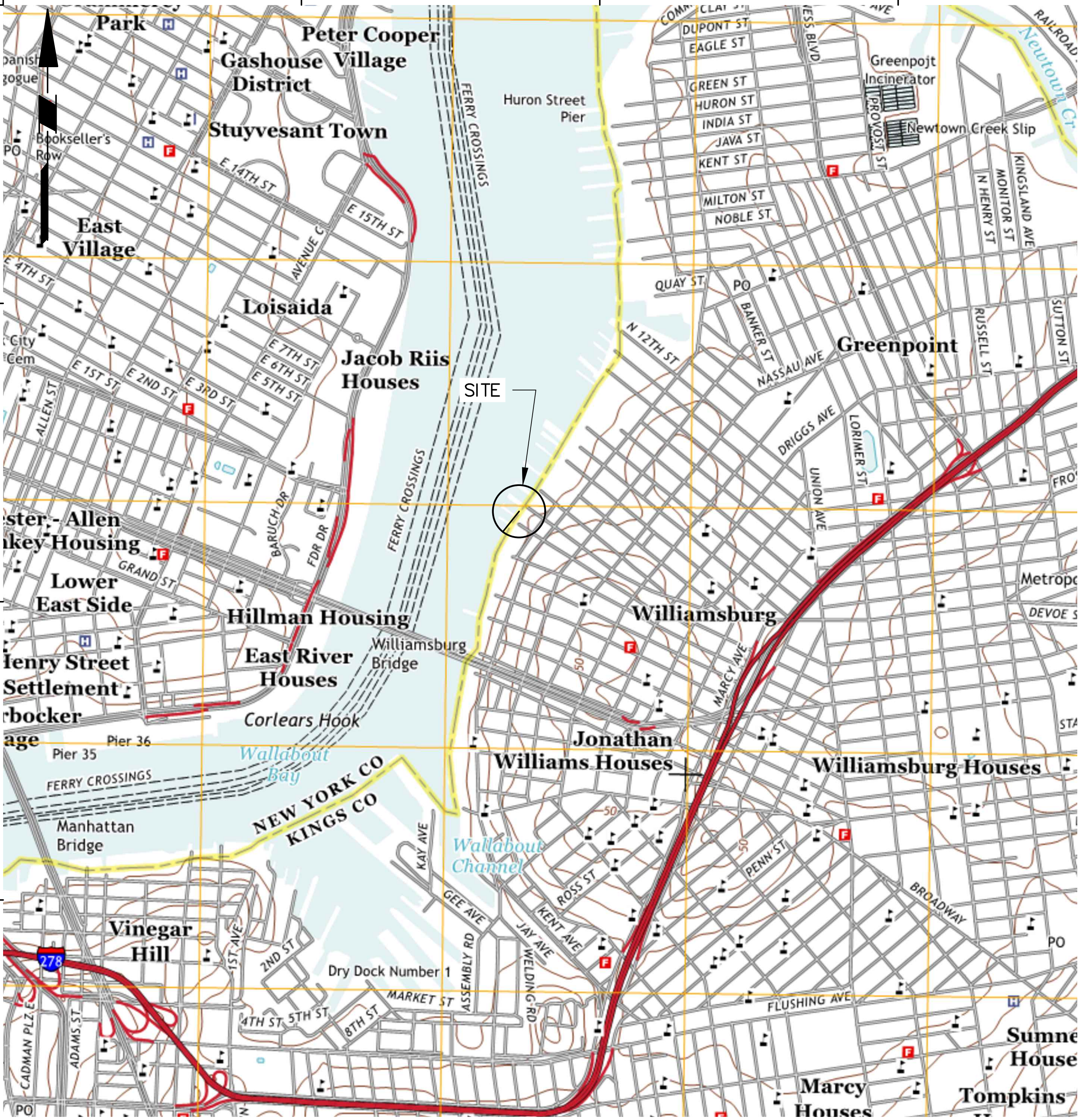
4) <u>Complies with the use guidelines contained in 6 NYCRR § 661.5</u> – The upland development is a residential development with two residential towers. According to 6 NYCRR § 661.5(b) Use #46, the "construction of single family dwellings and multiple family dwellings" is considered a "Generally Compatible" use within a TWAA. Commercial space within the TWAA on the first floor of the buildings would support water-dependent uses of the cove. This would include such uses as kayak and paddleboard rentals and storage, which are water-dependent uses that require direct access to the water, as well as locker rentals, changing rooms and public restrooms that support the water-dependent uses and are required for visitors to use the active recreation area in the cove. According to 6 NYCRR § 661.5(b) Use #5 " Boating, hiking, swimming, camping, picnicking and other similar non-motorized forms of outdoor activity," Use # 47 "Construction of commercial and industrial use facilities requiring water access," and Use #49 "Construction of accessory

structures or facilities for any use listed in items 46 and 47, other than accessory structures or facilities covered by item 50 or covered specifically in this list" are all considered "Generally Compatible" uses within a TWAA. The community facility gymnasium in the basement of the north tower is a not a water-dependent use, and according to 6 NYCRR § 661.5(b) Use #48 would be considered "Presumptively Incompatible" use in a TWAA. Any presumptive incompatibility is easily overcome by the overall benefits of the Project to wetland values, which are immense, and by the fact that these particular uses support other water-dependent uses, or provide significant benefits to the community through education and recreation.

6.0 CONCLUSION

This application demonstrates that the Project is consistent with Section 10 of the Rivers and Harbors Act, Section 404 of the Clean Water Act, and the 404(b)1 Guidelines. This application also demonstrates that the Project is consistent with the standards of issuance for a NYSDEC Tidal Protection of Waters Permit, Excavation and Fill in Navigable Waters Permit, Tidal Wetlands Permit, and individual Section 401 Water Quality Certification. As such, the applicant requests authorization from the NYSDEC and USACE for this Project pursuant to their respective permit programs

FIGURES



SOURCE: "BROOKLYN NEW YORK 7.5–MINUTE SERIES", U.S. GEOLOGICAL SURVEY, 2013

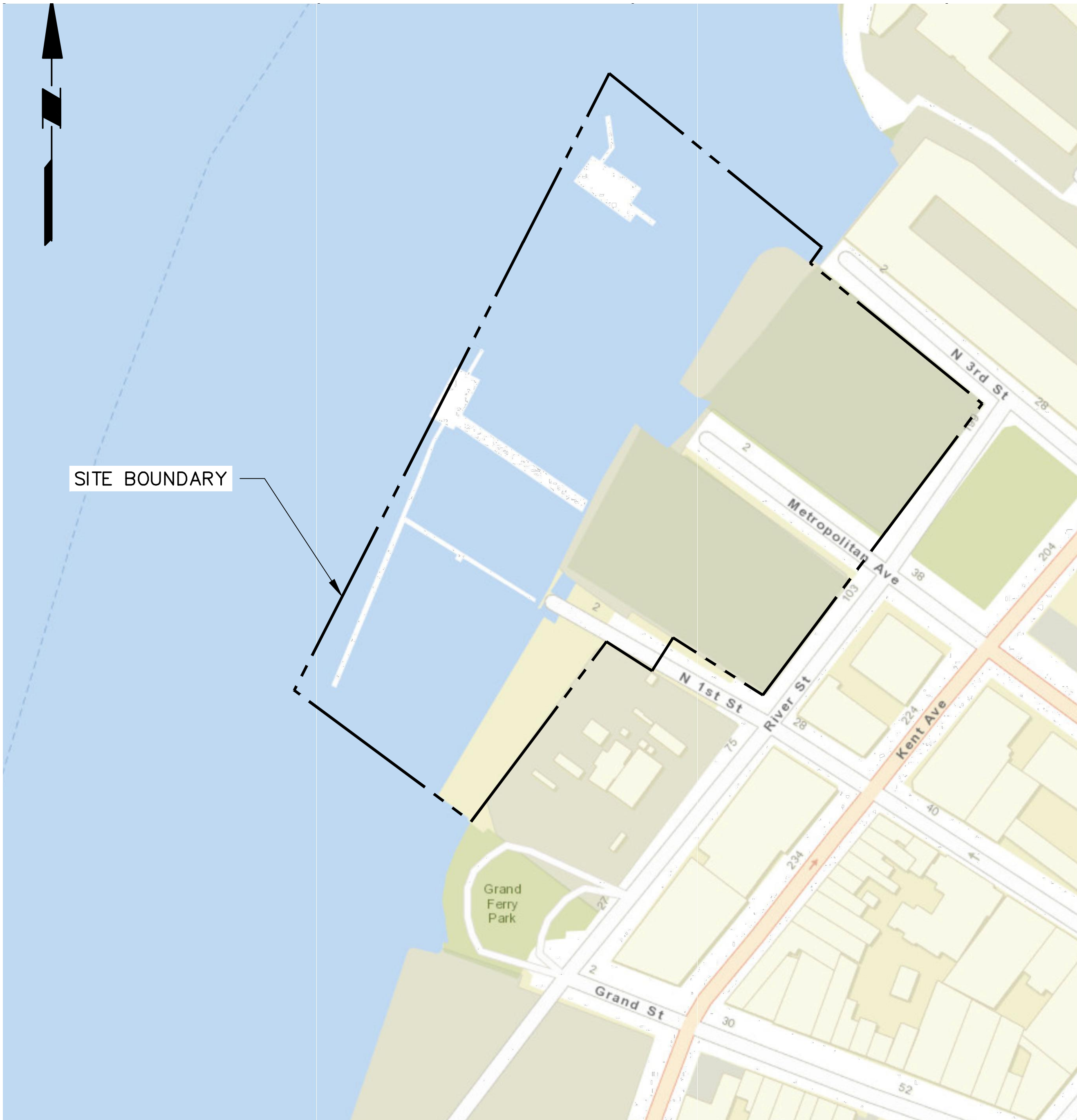
NOTE: ELEVATIONS ARE REFERENCED TO THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88).

2000 0 1000 2000

SCALE IN FEET

LANGAN Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	Project **RIVER RING** BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	Figure Title **SITE VICINITY MAP**	Project No. 170594401 Date 03/15/2021 Drawn By KRW Checked By KH	Figure No. **1** Sheet 1 of 11

Filename: c:\bms\langan-pw-01\dms41746\170594401-0301-BL101-0102.dwg Date: 3/15/2021 Time: 18:21 User: fdemelo Style Table: Langan.stb Layout: FIG 1 - SITE VICINITY MAP



SOURCE: LANGAN SITE ANALYZER SOURCES INCLUDING ESRI, HERE, GARMIN, USGS, INTERMAP, AND OTHER CONTRIBUTORS.

200 0 100 200

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

KINGS NEW YORK

Figure Title

SITE LOCATION MAP

Project No. 170594401

Date 03/15/2021

Drawn By KRW

Checked By KH

Figure No. **2**

Sheet 2 of 11

SOURCE: LANGAN SITE ANALYZER SOURCES INCLUDING ESRI, HERE, GARMIN, USGS, INTERMAP, AND OTHER CONTRIBUTORS.

NOTE: SEE ATTACHMENT N FOR LIST OF OWNERS FOR NEIGHBORING PROPERTIES.

200 0 100 200

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Filename: C:\bms\langan-pw-01\dms41746\170594401-0301-BL101-0102.dwg Date: 3/22/2021 Time: 19:10 User: kweg Style Table: Langan.stb Layout: FIG 3 - BLOCK AND LOT PLAN

SOURCE: LANGAN SITE ANALYZER SOURCES INCLUDING ESRI, HERE, GARMIN, USGS, INTERMAP, AND OTHER CONTRIBUTORS.

LEGEND:

- Site Boundary
- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

200 0 100 200

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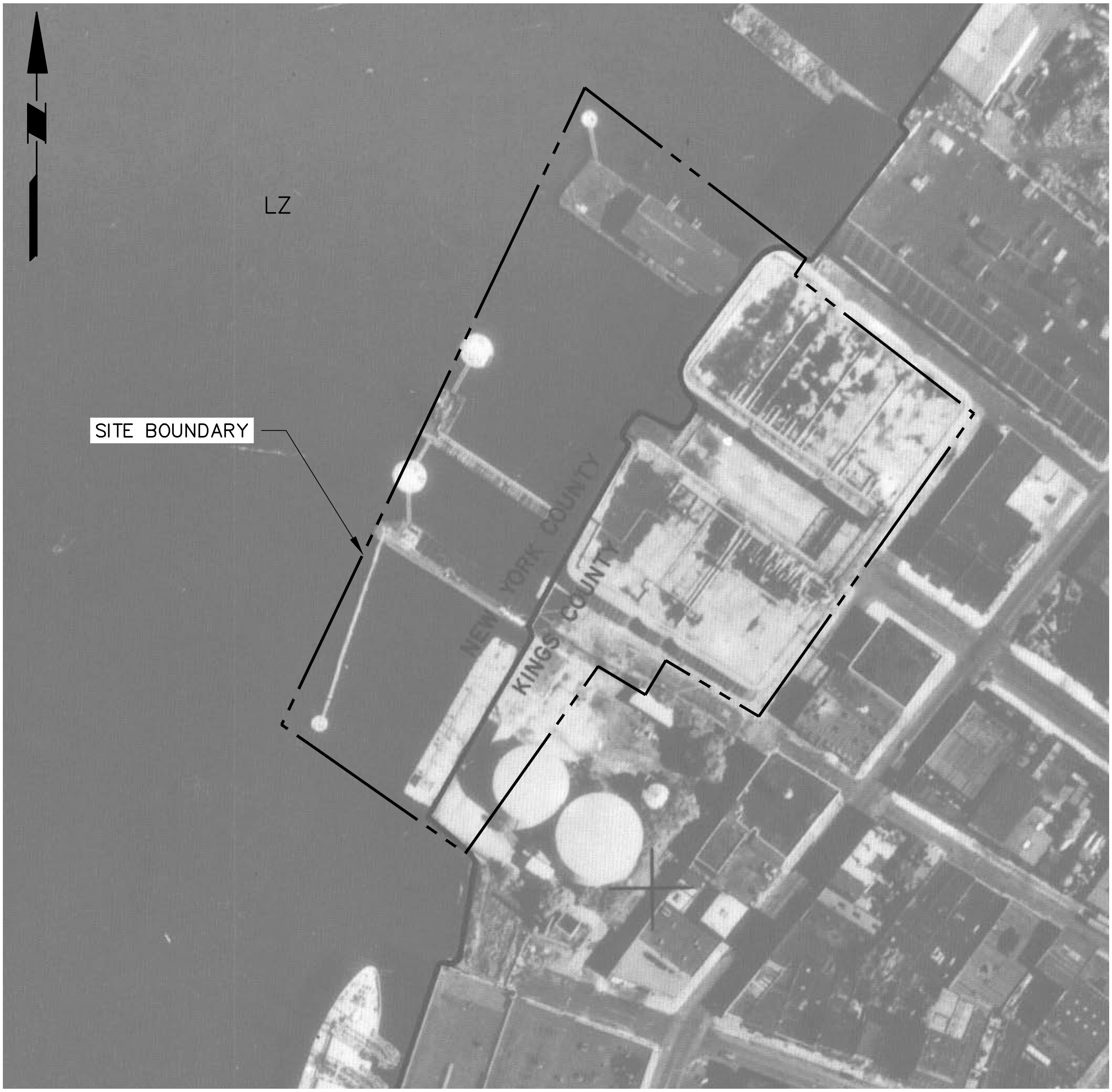
Project	Figure Title	Project No.	Figure No.
RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	NWI WETLAND MAP	170594401 Date 03/15/2021 Drawn By KRW Checked By KH	4 Sheet 4 of 11

Filename: c:\bms\langan-pw-01\dms41746\170594401-0301-BL101-0102.dwg Date: 3/15/2021 Time: 18:21 User: fdemelo Style Table: Langan.stb Layout: FIG 4 - NWI WETLAND MAP



SOURCE: NEW YORK DEPARTMENT OF ENVIRONMENTAL CONSERVATION TIDAL WETLANDS MAP 586-506, INDEX MAP NUMBER 1, 1974

LEGEND
WETLANDS CATEGORIES:

LZ LITTORAL ZONE

200 0 100 200
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RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

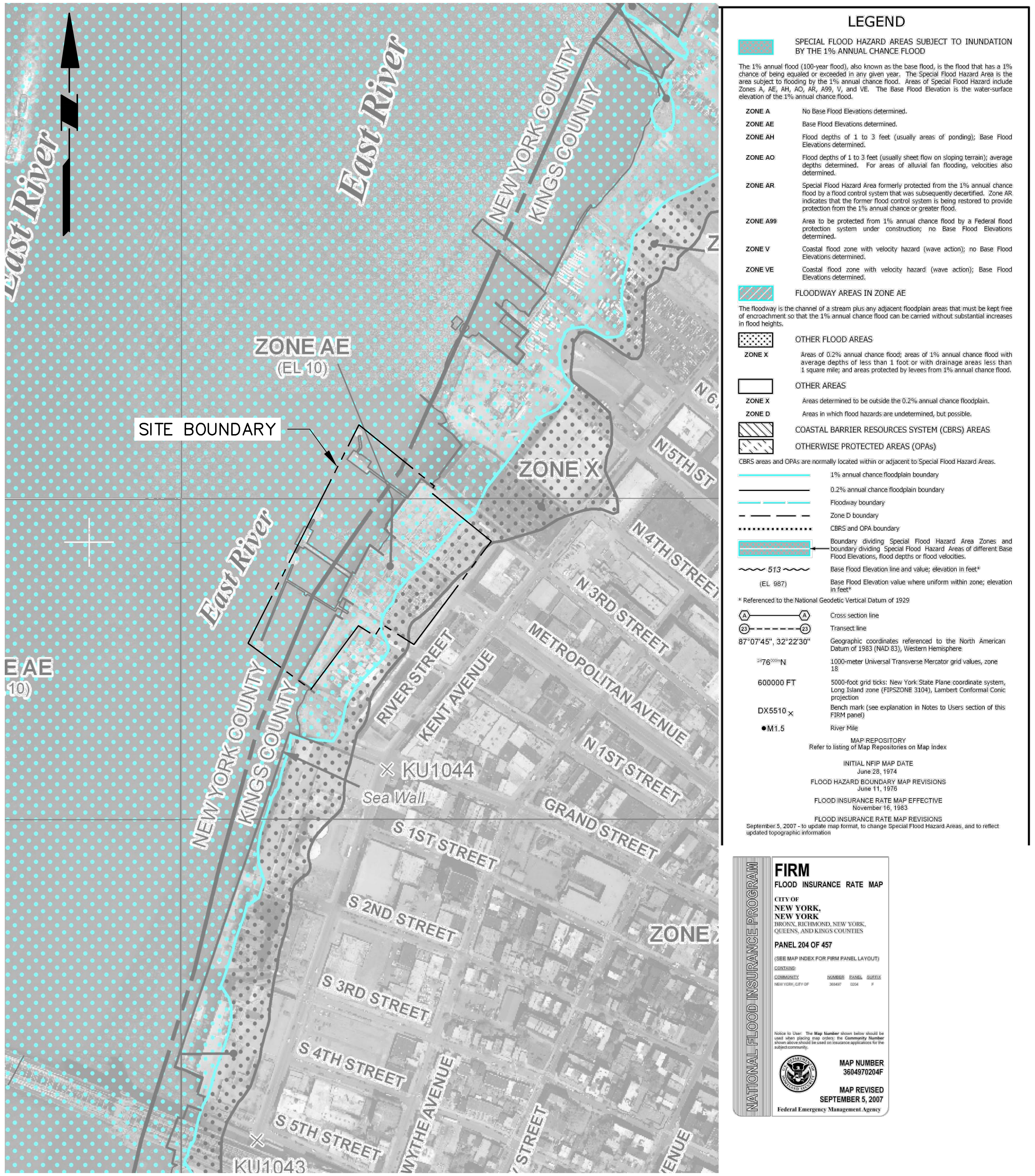
Figure Title
NYS DEC TIDAL WETLANDS MAP

Project No. 170594401
Date 03/15/2021
Drawn By KRW
Checked By KH

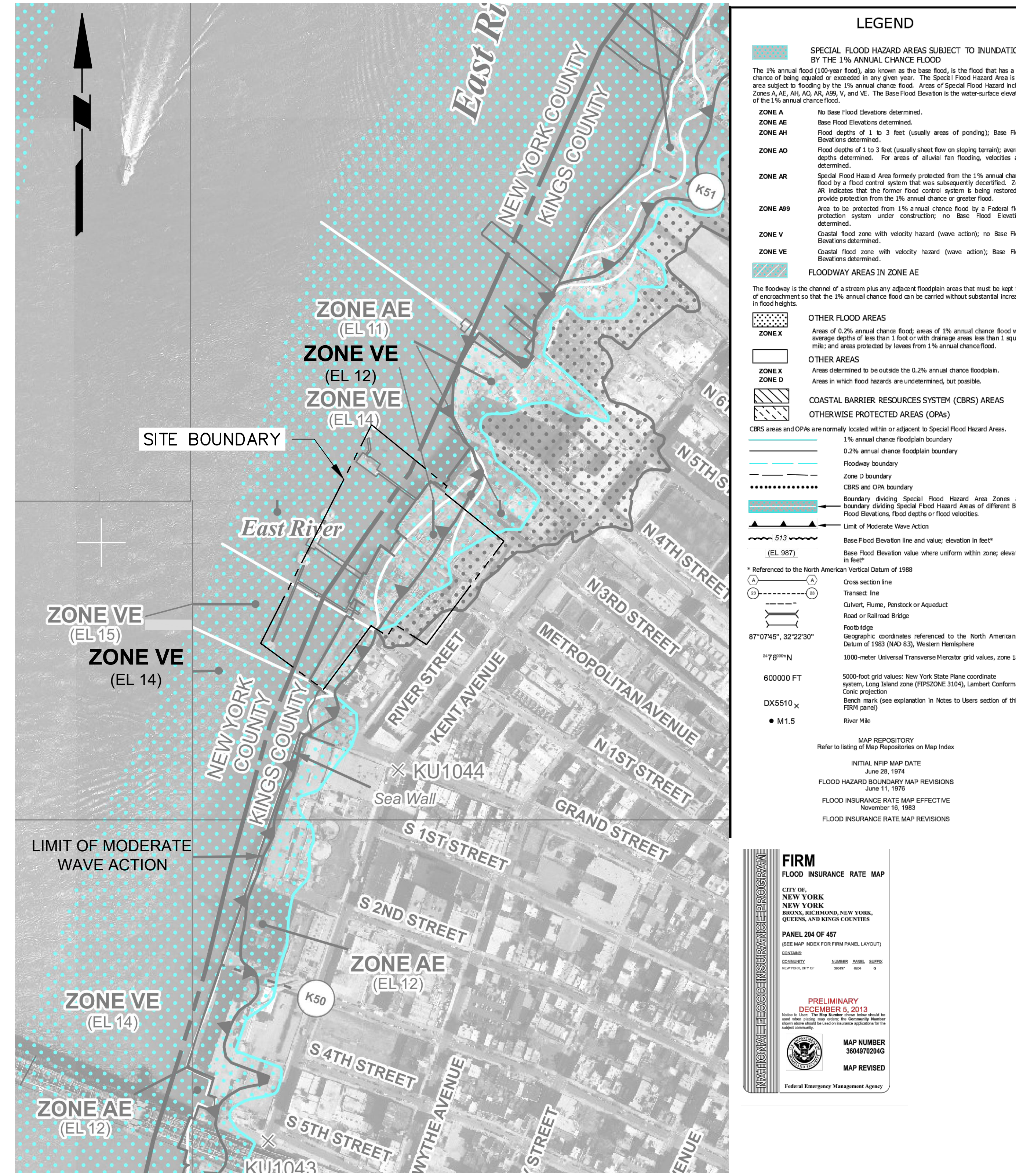
Figure No. **5**

Sheet 5 of 11

Filename: c:\bms\langan-pw-01\dms41746\170594401-0301-BL101-0102.dwg Date: 3/15/2021 Time: 18:21 User: fdemelo Style Table: Langan.stb Layout: FIG 5 - DEC TIDAL WETLANDS MAP



NOTE: FIRM FLOOD RATE INSURANCE MAP FOR THE CITY OF NEW YORK, NEW YORK PANEL NO. 3604970204F, DATED SEPTEMBER 5, 2007.



NOTE: PRELIMINARY FIRM FLOOD RATE INSURANCE MAP FOR THE CITY OF NEW YORK, NEW YORK PANEL NO. 3604970204G, DATED DECEMBER 5, 2013.

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SCALE IN FEET

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Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	EFFECTIVE AND PRELIMINARY FEMA FIRM MAP	170594401 Date 03/15/2021 Drawn By KRW Checked By KH	6 Sheet 6 of 11

SOURCE: ENVIRONMENTAL RESOURCE MAPPER SOURCES INCLUDING ESRI, HERE, GARMIN, USGS, INTERMAP AND OTHER CONTRIBUTORS.

LEGEND

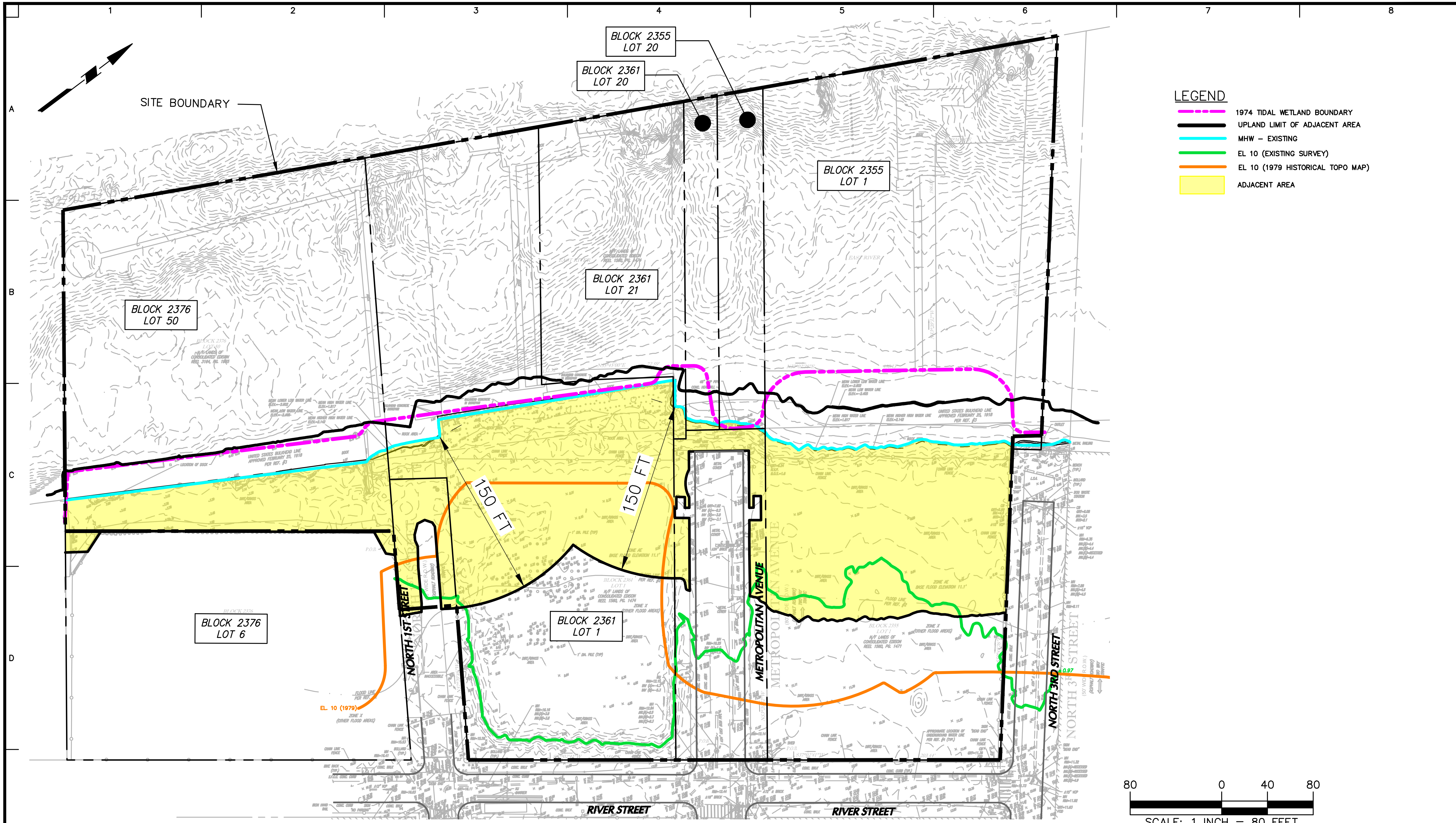
RARE PLANTS OR ANIMALS

500 0 250 500

SCALE IN FEET

LANGAN	Project	Figure Title	Project No.	Figure No.
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	**RIVER RING** BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	**NYS DEC ENVIRONMENTAL RESOURCE MAP**	170594401 Date 03/15/2021 Drawn By KRW Checked By KH	7 Sheet 7 of 11

Filename: c:\bms\langan-pw-01\dms41746\170594401-0301-BL101-0102.dwg Date: 3/15/2021 Time: 18:21 User: fdemelo Style Table: Langan.stb Layout: FIG 7 - ENVIRONMENTAL RESOURCE MAP



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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

KINGS NEW YORK

Figure Title

TIDAL WETLAND & ADJACENT AREA (EXISTING)

Project No. 170594401

Date 03/15/2021

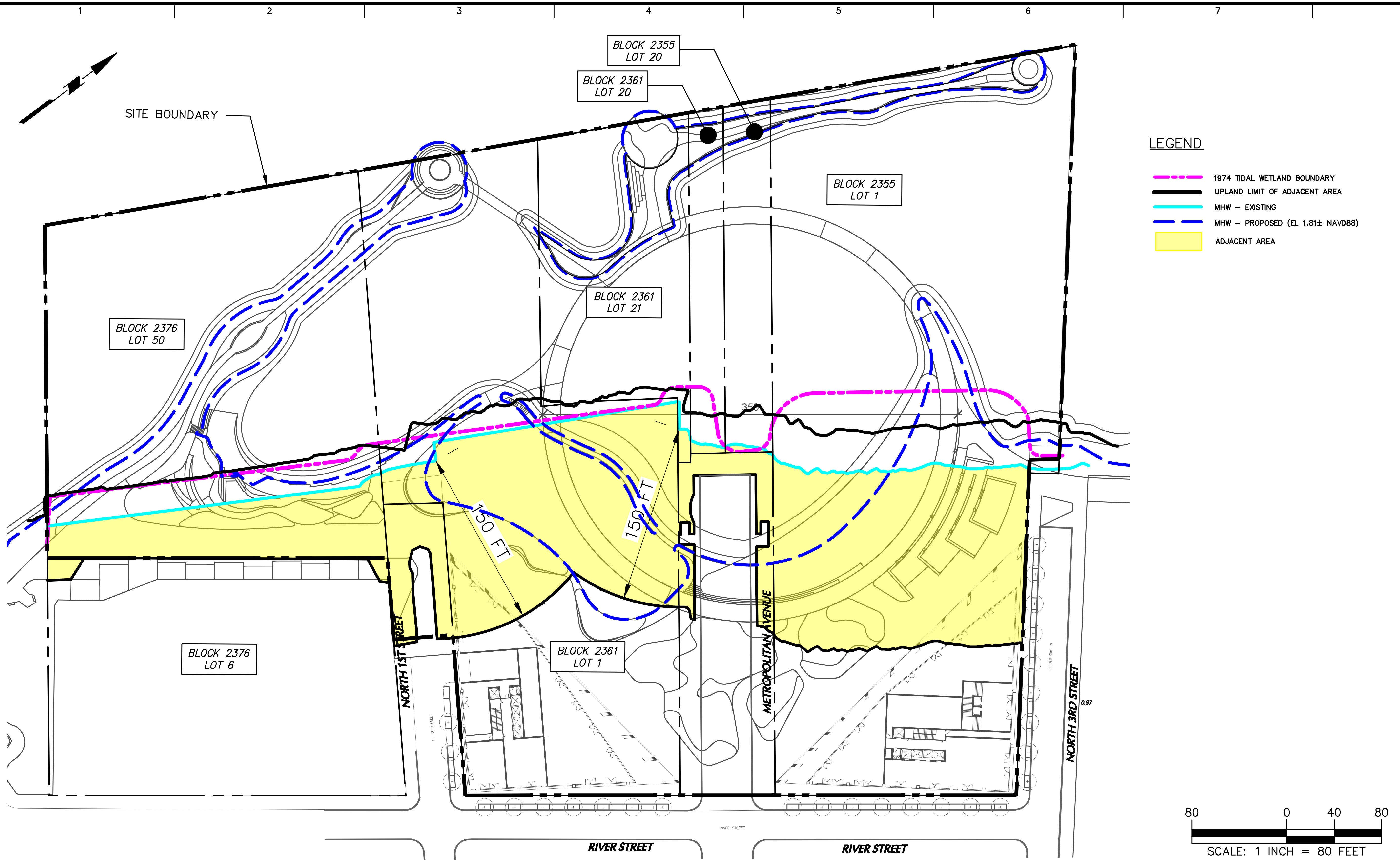
Drawn By KRW

Checked By KH

Figure No.

8

Sheet 8 of 11



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PROJECT NO. 170594401

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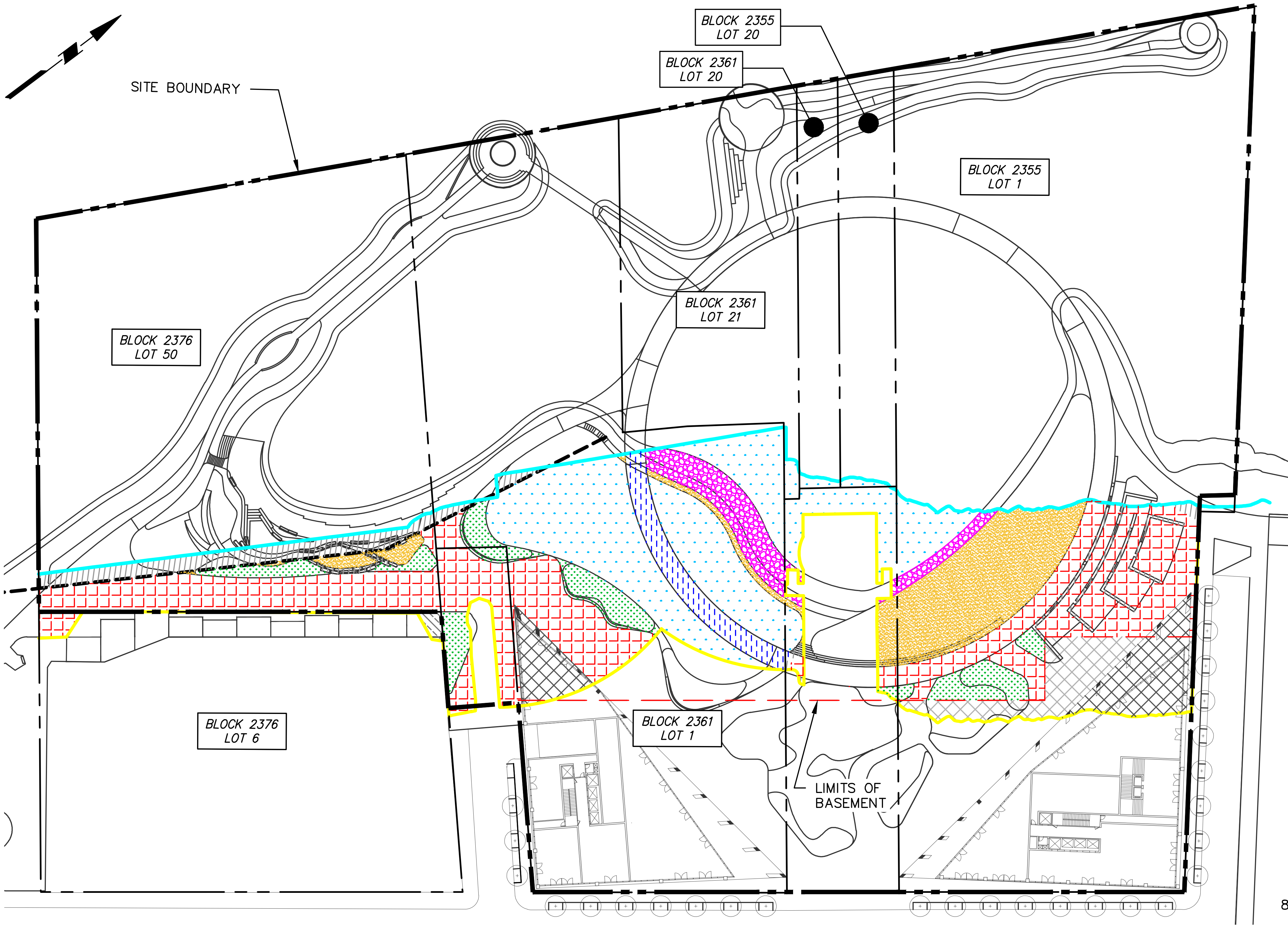
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Figure Title
TIDAL WETLAND & ADJACENT AREA (PROPOSED)

Project No. 170594401
Date 03/15/2021
Drawn By KRW
Checked By KH

Figure No. 9
Sheet 9 of 11

Filename: C:\bms\langan-pw-01\dms41748\170594401-ADJACENT AREA.DWG Date: 3/15/2021 Time: 20:18 User: kweg Style Table: Langan.stb Layout: TIDAL WETLAND & ADJACENT AREA (PROPOSED)



LEGEND

- ADJACENT AREA
- MHW – EXISTING
- PROPOSED BULKHEAD
- LIMITS OF BASEMENT
- BUILDING SUPERSTRUCTURE (IMPERVIOUS)
- BUILDING BASEMENT (IMPERVIOUS)
- BREAKWATER PLATFORM (IMPERVIOUS)
- KIOSK (IMPERVIOUS)
- PAVERS (PERVIOUS)
- GRASS (PERVIOUS)
- MARSH/WETLAND (PERVIOUS)
- STONE/RIPRAP (PERVIOUS)
- SAND (PERVIOUS)
- GRATING (PERVIOUS)

	AREA (SF)
ADJACENT AREA	87,594
PERVIOUS/CREATED WETLAND AREA	
PERMEABLE PAVERS	26,853
GRASS	6,464
MARSH/WETLAND	22,332
STONE/RIPRAP	3,820
SAND	10,320
GRATING	2,837
IMPERVIOUS AREA	
BUILDING SUPERSTRUCTURE	5,671
BUILDING BASEMENT	3,905
BREAKWATER PLATFORM	5,126
KIOSK	266
TOTAL IMPERVIOUS	14,968
PERCENT IMPERVIOUS	17.1%

80 0 40 80

SCALE: 1 INCH = 80 FEET

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BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
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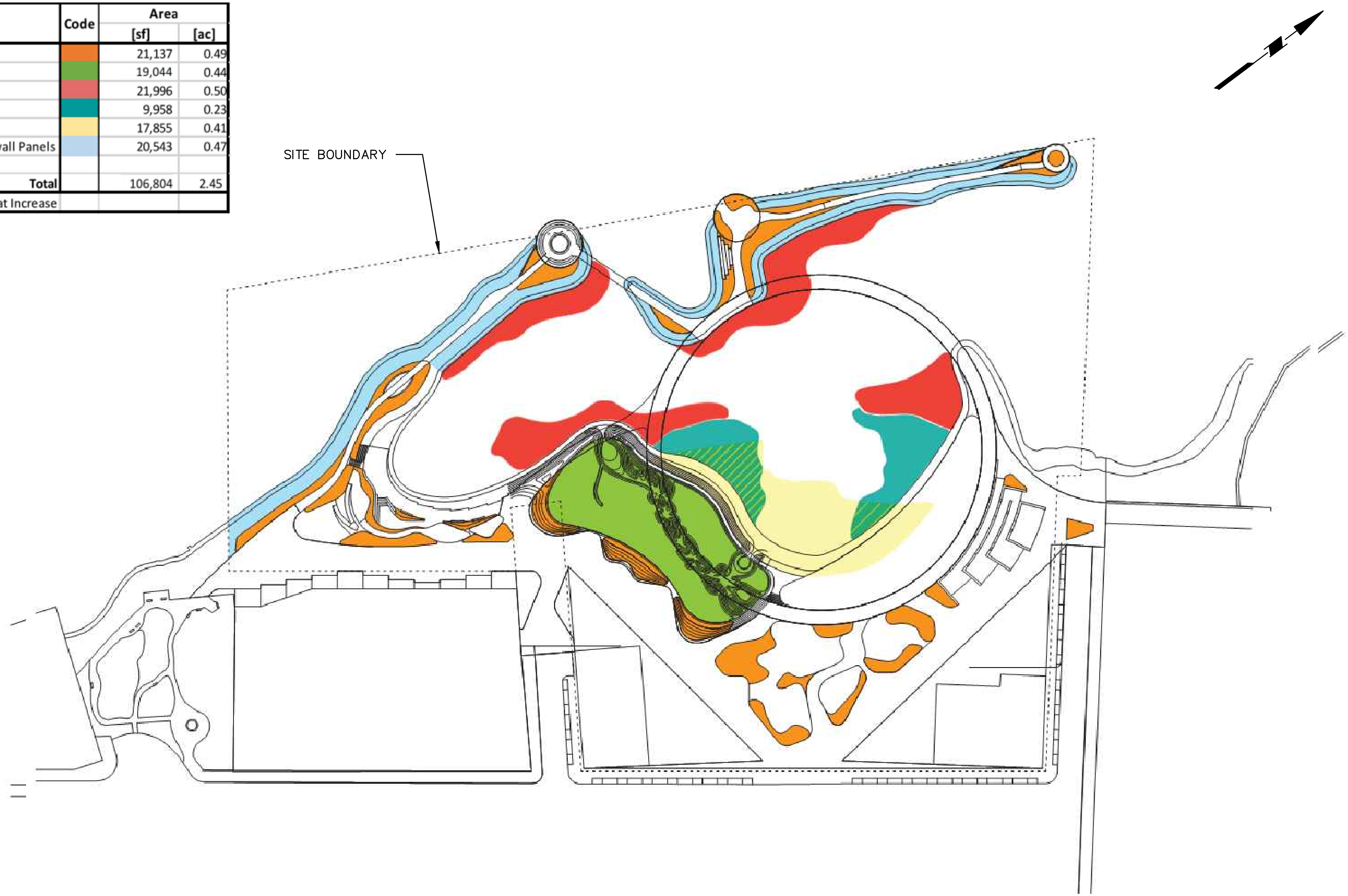
Figure Title
IMPERVIOUS COVER PLAN

Project No. 170594401
Date 03/15/2021
Drawn By KRW
Checked By KH

Figure No. 10
Sheet 10 of 11

Filename: C:\bms\langan-pw-01\dms41748\170594401-BL103-0101.dwg Date: 3/15/2021 Time: 20:22 User: kweg Style Table: Langan.stb Layout: IMPERVIOUS COVER PLAN

Habitat Type	Code	Area [sf]	Area [ac]
Upland Coastal Scrub Shrub		21,137	0.49
Salt Marsh & Tidal Pools		19,044	0.44
Reef Balls/Oyster Gabions		21,996	0.50
Eel Grass Pilot		9,958	0.23
New Shoreline Shallows		17,855	0.41
Ecological Armoring Units & Seawall Panels		20,543	0.47
Total		106,804	2.45
Net Habitat Increase			



SOURCE: HABITAT MOSAIC RECIEVED FROM EDESIGN DYNAMICS ON 5 JANUARY 2021.

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BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

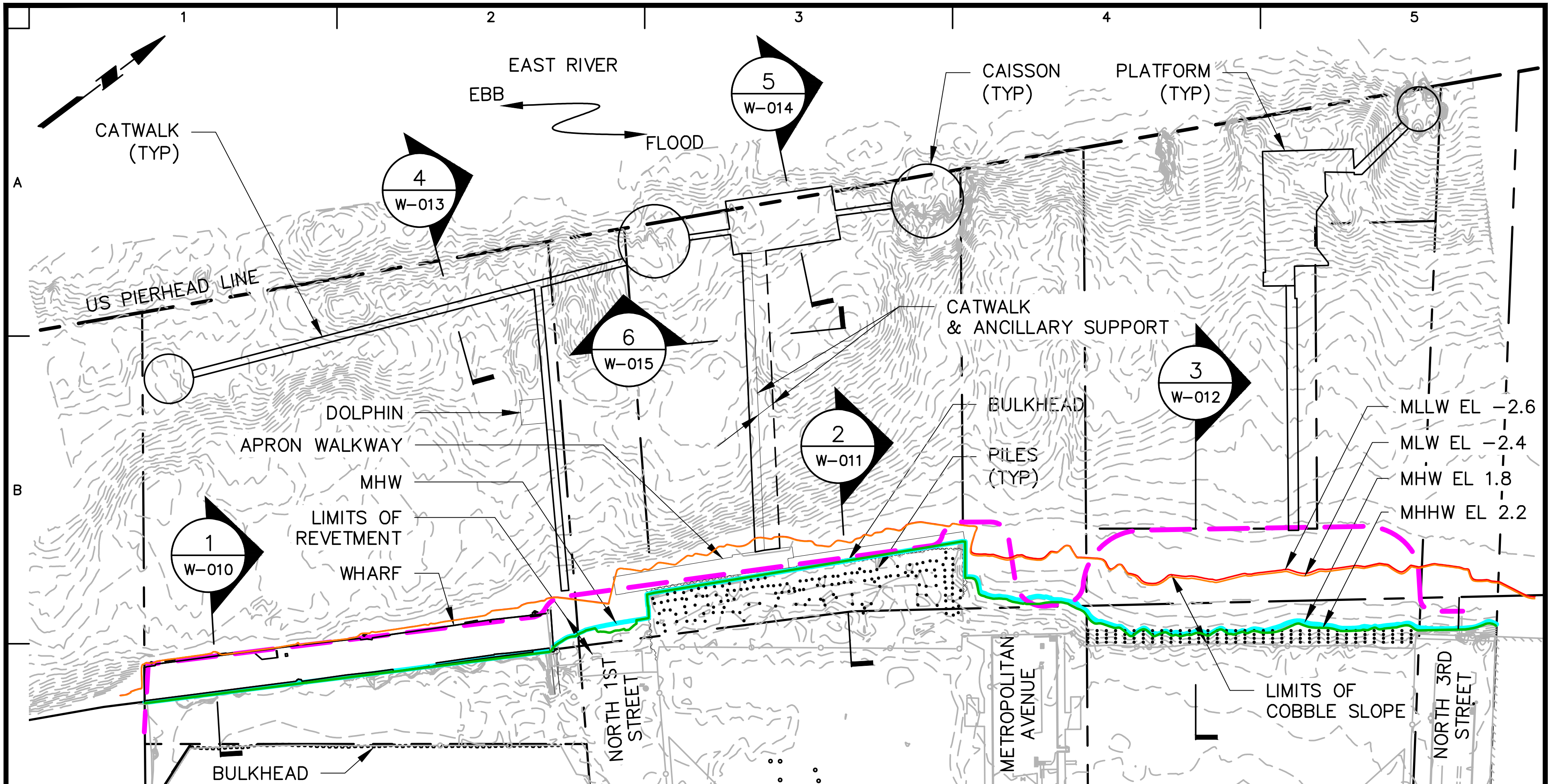
Figure Title
HABITAT MOSAIC

Project No. 170594401
Date 03/15/2021
Drawn By KRW
Checked By KH

Figure
11
Sheet 11 of 11

Filename: C:\bms\langan-pw-01\dms41746\170594401-BI002-0101.DWG Date: 3/22/2021 Time: 19:27 User: kweg Style Table: Langan.stb Layout: HABITAT MOSAIC

DRAWINGS



NOTES:

1. BACKGROUND REFERENCED FROM "ALTA/NSPS LAND TITLE SURVEY, RIVER STREET & NORTH 1ST STREET", BY CONTROL POINT ASSOC. INC., REVISED 27 MARCH 2020.
2. 1974 TIDAL WETLAND BOUNDARY REFERENCED FROM "TIDAL WETLANDS MAP – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION – MAP 856–506, INDEX MAP NUMBER 1".

LEGEND:

- 1974 TIDAL WETLAND BOUNDARY
- MEAN HIGHER HIGH WATER (MHHW)
- MEAN HIGH WATER (MHW)
- MEAN LOW WATER (MLW)
- MEAN LOWER LOW WATER (MLLW)

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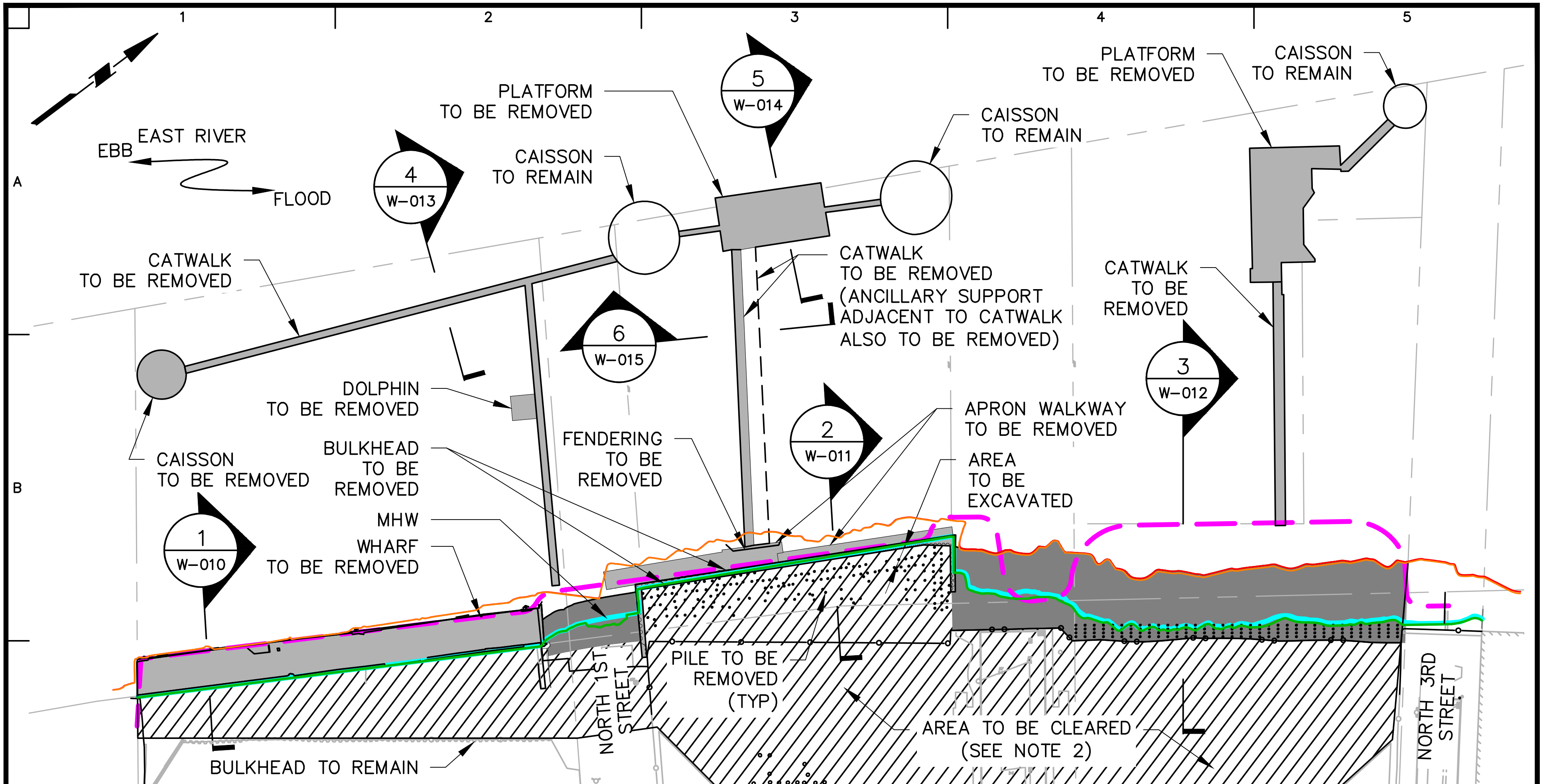
Project **RIVER RING** BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	Drawing Title **EXISTING WATERFRONT STRUCTURES**	Project No. 170594401 Date 3/15/2021 Drawn By KRW Checked By KH	Drawing No. **W-001** Sheet 1 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-BL101-0104.DWG Date: 3/23/2021 Time: 17:45 User: kweg Style Table: Langan.stb Layout: ANSIA-BL



NOTES:
1. BACKGROUND REFERENCED FROM "ALTA/NSPS LAND TITLE SURVEY, RIVER STREET & NORTH 1ST STREET", BY CONTROL POINT ASSOC. INC., REVISED 27 MARCH 2020.
2. WORK IN AREA TO BE CLEARED INCLUDES BUT IS NOT LIMITED TO REMOVAL OF STONE, VEGETATION, TOPSOIL, AND PAVEMENT.
3. ALL PILES SHOWN TO BE REMOVED OR CUT AT SUBGRADE.

LEGEND:
- 1974 TIDAL WETLAND BOUNDARY
- MEAN HIGHER HIGH WATER (MHHW)
- MEAN HIGH WATER (MHW)
- MEAN LOW WATER (MLW)
- MEAN LOWER LOW WATER (MLLW)

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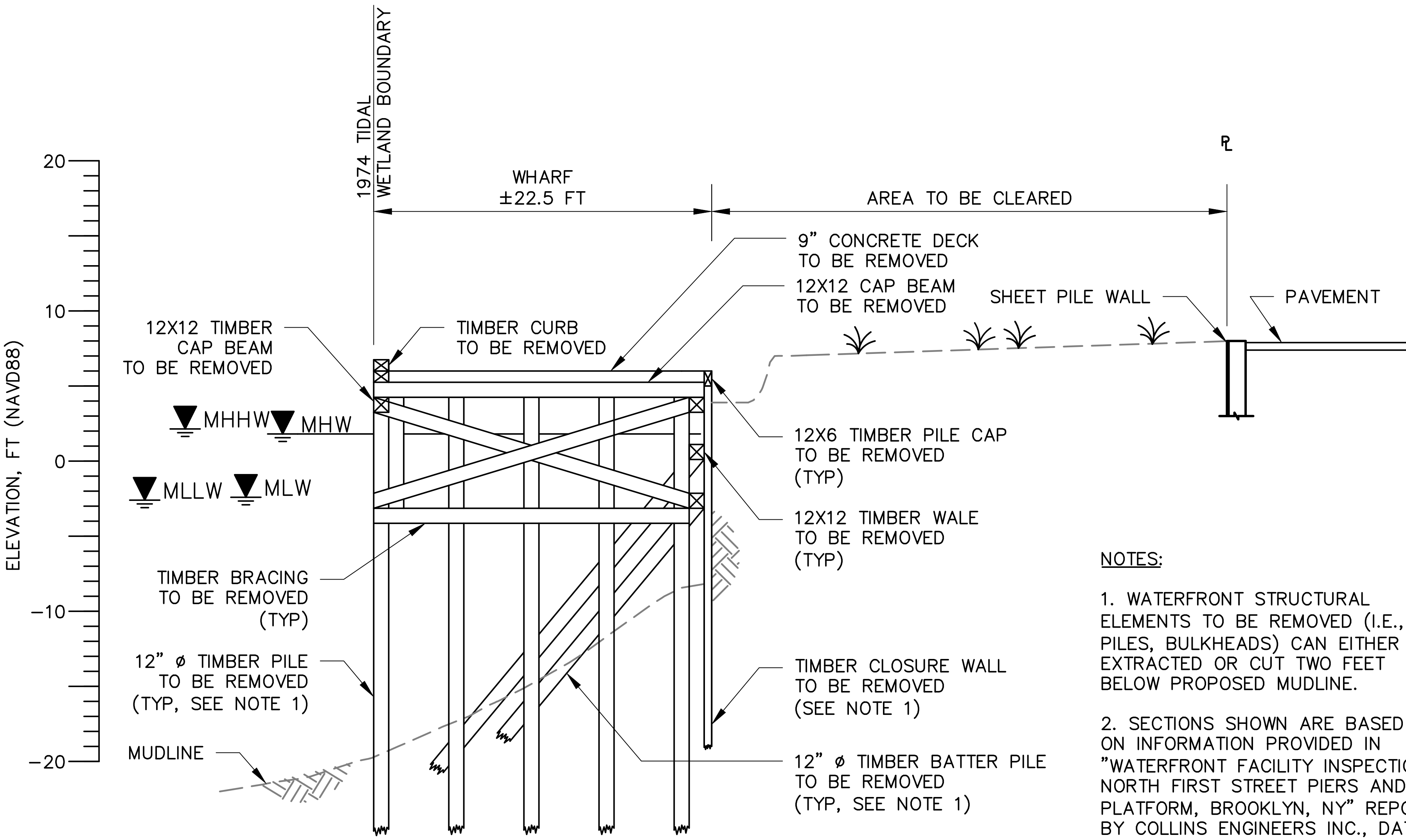
Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
REMOVALS PLAN

Project No. 170594401
Date 3/15/2021
Drawn By KRW
Checked By KH

Drawing No.
W-002

Filename: c:\bms\langan-pw-01\dms41745\170594401-BL101-0104.DWG Date: 3/23/2021 Time: 17:45 User: kweg Style Table: Langan.stb Layout: ANSIA-BL (2)



NOTES:

1. WATERFRONT STRUCTURAL ELEMENTS TO BE REMOVED (I.E., PILES, BULKHEADS) CAN EITHER BE EXTRACTED OR CUT TWO FEET BELOW PROPOSED MUDLINE.

2. SECTIONS SHOWN ARE BASED ON INFORMATION PROVIDED IN "WATERFRONT FACILITY INSPECTION NORTH FIRST STREET PIERS AND PLATFORM, BROOKLYN, NY" REPORT BY COLLINS ENGINEERS INC., DATED JUNE 2016. STRUCTURE CONFIGURATION IS PROVIDED FOR REFERENCE ONLY AND SHALL BE VERIFIED IN FIELD.

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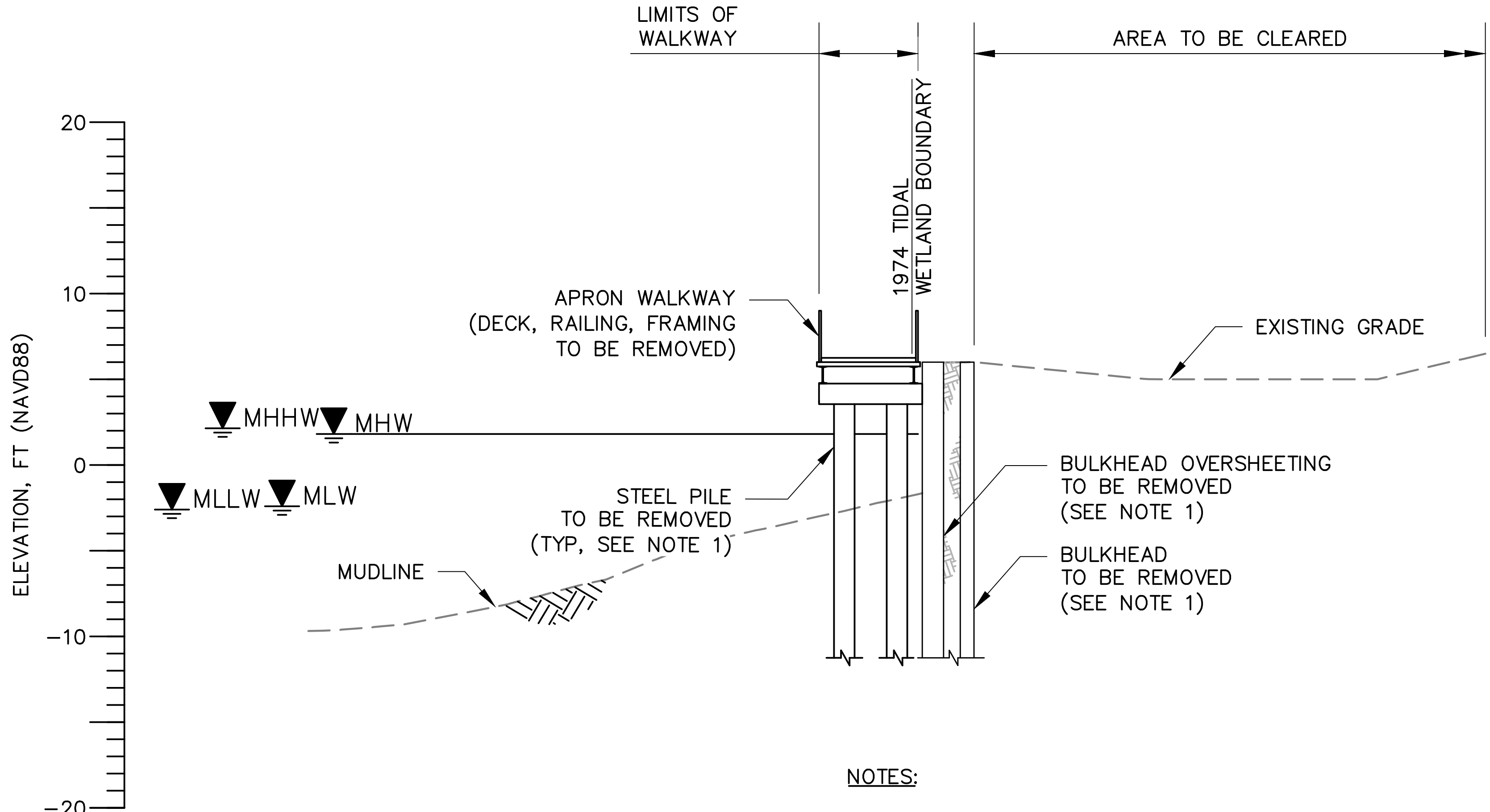
Project	Drawing Title	Project No. 170594401	Drawing No.
RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	EXISTING SECTION 1	Date 3/15/2021 Drawn By KRW Checked By KH	W-010 Sheet 3 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-BW301-0101.DWG Date: 3/23/2021 Time: 17:17 User: kweg Style Table: Langan.stb Layout: ANSIA-BL



NOTES:

1. WATERFRONT STRUCTURAL ELEMENTS TO BE REMOVED (I.E., PILES, BULKHEADS) CAN EITHER BE EXTRACTED OR CUT TWO FEET BELOW PROPOSED MUDLINE.

2. SECTIONS SHOWN ARE BASED ON INFORMATION PROVIDED IN "WATERFRONT FACILITY INSPECTION NORTH FIRST STREET PIERS AND PLATFORM, BROOKLYN, NY" REPORT BY COLLINS ENGINEERS INC., DATED JUNE 2016. STRUCTURE CONFIGURATION IS PROVIDED FOR REFERENCE ONLY AND SHALL BE VERIFIED IN FIELD.

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title

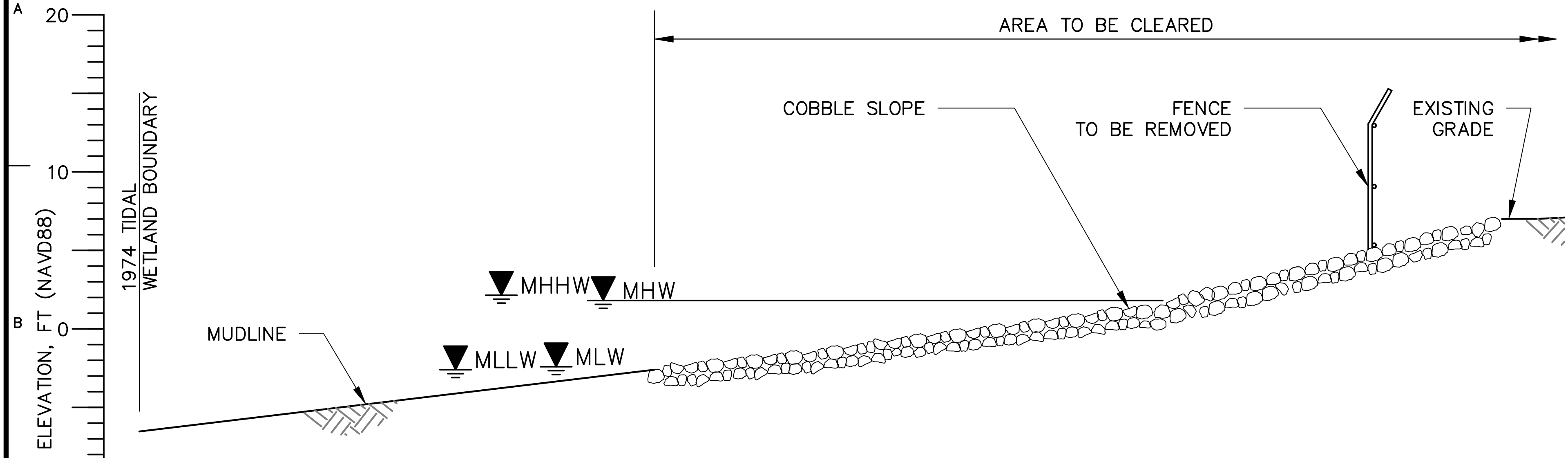
EXISTING SECTION 2

Project No. 170594401
Date 3/15/2021
Drawn By KRW
Checked By KH

Drawing No.

W-011

Filename: c:\bms\langan-pw-01\dms41745\170594401-BW301-0102.DWG Date: 3/23/2021 Time: 17:17 User: kweg Style Table: Langan.stb Layout: ANSIA-BL



NOTES:

1. EXISTING ABANDONED PILES IN THE SLOPE TO BE REMOVED ARE NOT SHOWN. REFER TO W–002 FOR GENERAL LOCATIONS OF WHERE PILES MAY EXIST.

2. SECTIONS SHOWN ARE BASED ON INFORMATION PROVIDED IN "WATERFRONT FACILITY INSPECTION NORTH FIRST STREET PIERS AND PLATFORM, BROOKLYN, NY" REPORT BY COLLINS ENGINEERS INC., DATED JUNE 2016. STRUCTURE CONFIGURATION IS PROVIDED FOR REFERENCE ONLY AND SHALL BE VERIFIED IN FIELD.

10 0 2 4 10
SCALE IN FEET

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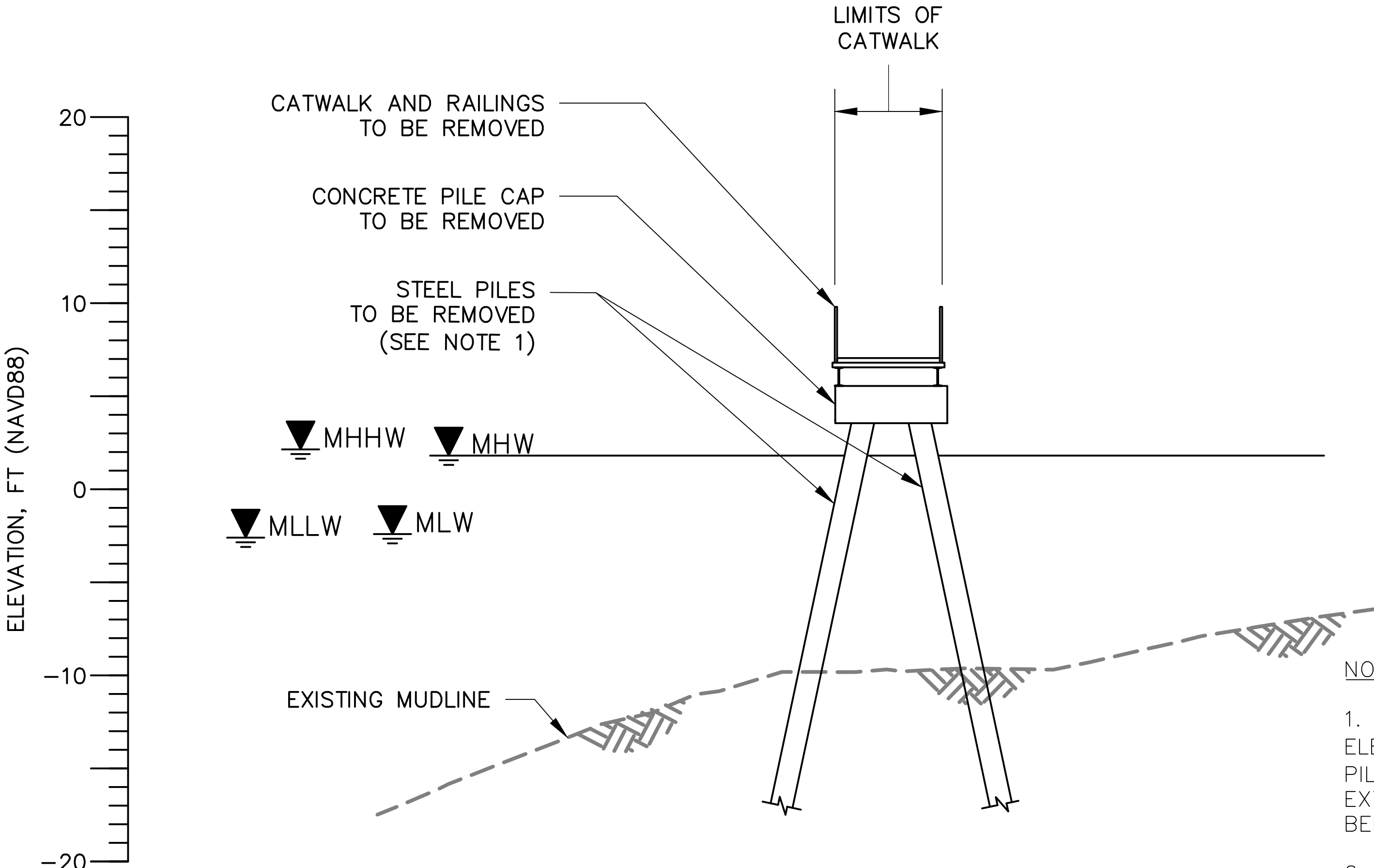
Project	Drawing Title	Project No. 170594401	Drawing No.
RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	EXISTING SECTION 3	Date 3/15/2021 Drawn By KRW Checked By KH	W-012 Sheet 5 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-BW301-0103.DWG Date: 3/23/2021 Time: 17:17 User: kweg Style Table: Langan.stb Layout: ANSIA-BL



NOTES:

1. WATERFRONT STRUCTURAL ELEMENTS TO BE REMOVED (I.E., PILES, BULKHEADS) CAN EITHER BE EXTRACTED OR CUT TWO FEET BELOW PROPOSED MUDLINE.

2. SECTIONS SHOWN ARE BASED ON INFORMATION PROVIDED IN "WATERFRONT FACILITY INSPECTION NORTH FIRST STREET PIERS AND PLATFORM, BROOKLYN, NY" REPORT BY COLLINS ENGINEERS INC., DATED JUNE 2016. STRUCTURE CONFIGURATION IS PROVIDED FOR REFERENCE ONLY AND SHALL BE VERIFIED IN FIELD.

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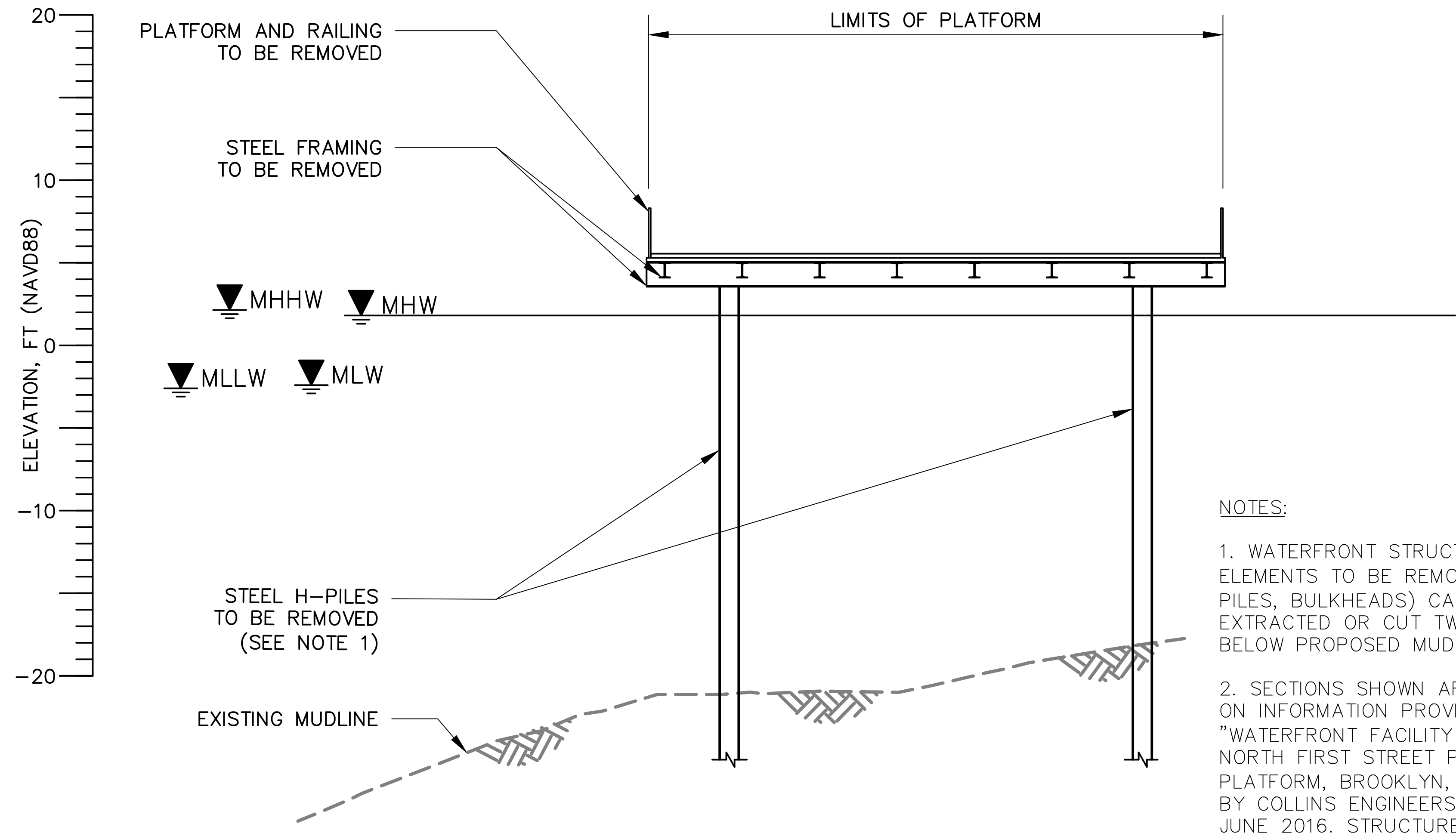
Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
EXISTING SECTION 4

Project No.	Drawing No.
170594401	W-013
Date: 3/15/2021	
Drawn By: KRW	
Checked By: KH	Sheet 6 of 43



NOTES:

1. WATERFRONT STRUCTURAL ELEMENTS TO BE REMOVED (I.E., PILES, BULKHEADS) CAN EITHER BE EXTRACTED OR CUT TWO FEET BELOW PROPOSED MUDLINE.

2. SECTIONS SHOWN ARE BASED ON INFORMATION PROVIDED IN "WATERFRONT FACILITY INSPECTION NORTH FIRST STREET PIERS AND PLATFORM, BROOKLYN, NY" REPORT BY COLLINS ENGINEERS INC., DATED JUNE 2016. STRUCTURE CONFIGURATION IS PROVIDED FOR REFERENCE ONLY AND SHALL BE VERIFIED IN FIELD.

10 0 2 4 10
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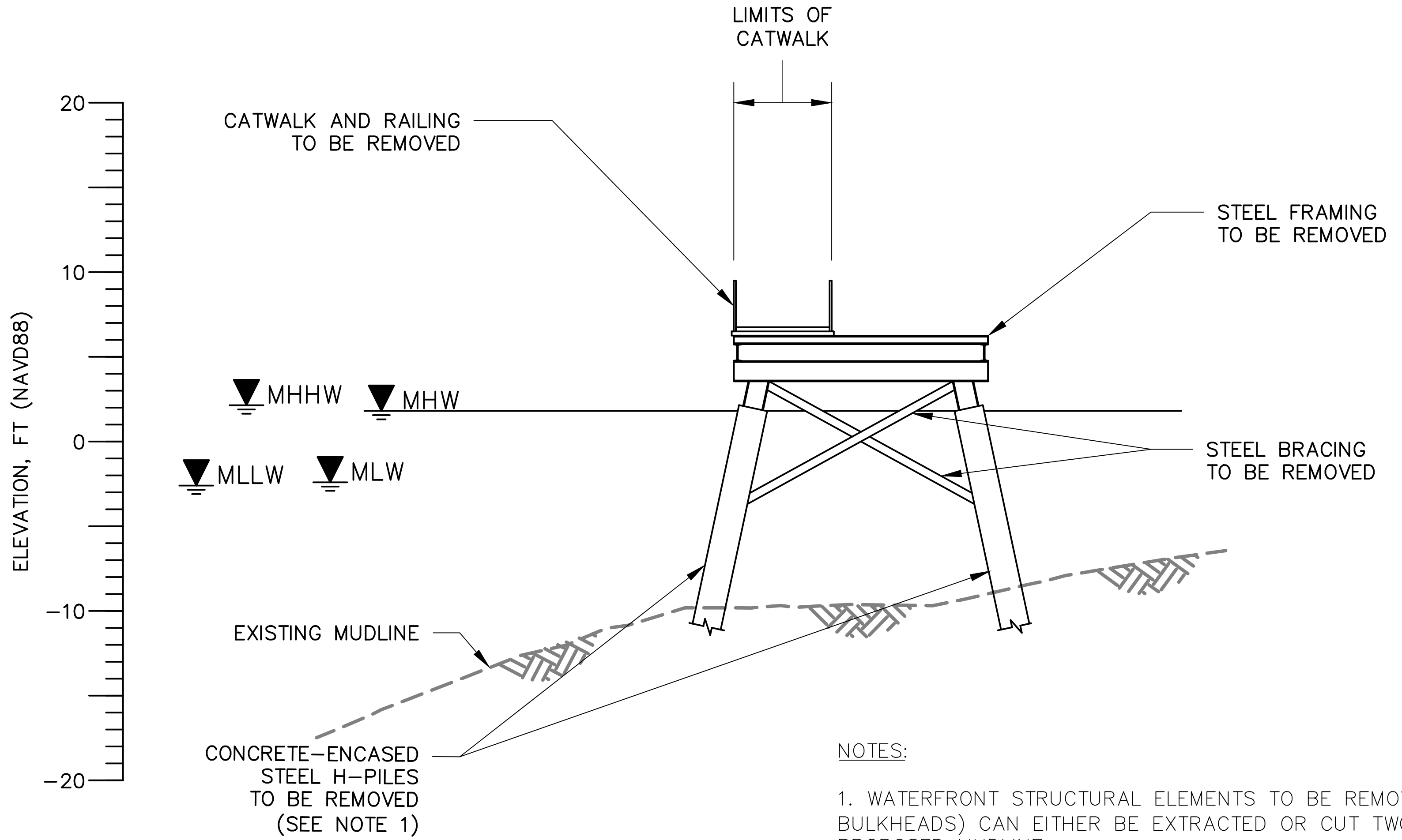
Project	Drawing Title	Project No. / Date / Drawn By / Checked By	Drawing No.
RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	EXISTING SECTION 5	Project No. 170594401 Date 3/15/2021 Drawn By KRW Checked By KH	W-014 Sheet 7 of 43

Date: 3/23/2021 Time: 17:45 User: kweg Style Table: Langan.stb Layout: EXISTING SECTION 5 Document Code: 170594401-0201-BW301-0105



NOTES:

1. WATERFRONT STRUCTURAL ELEMENTS TO BE REMOVED (I.E., PILES, BULKHEADS) CAN EITHER BE EXTRACTED OR CUT TWO FEET BELOW PROPOSED MUDLINE.

2. SECTIONS SHOWN ARE BASED ON INFORMATION PROVIDED IN "WATERFRONT FACILITY INSPECTION NORTH FIRST STREET PIERS AND PLATFORM, BROOKLYN, NY" REPORT BY COLLINS ENGINEERS INC., DATED JUNE 2016. STRUCTURE CONFIGURATION IS PROVIDED FOR REFERENCE ONLY AND SHALL BE VERIFIED IN FIELD.

10 0 2 4 10
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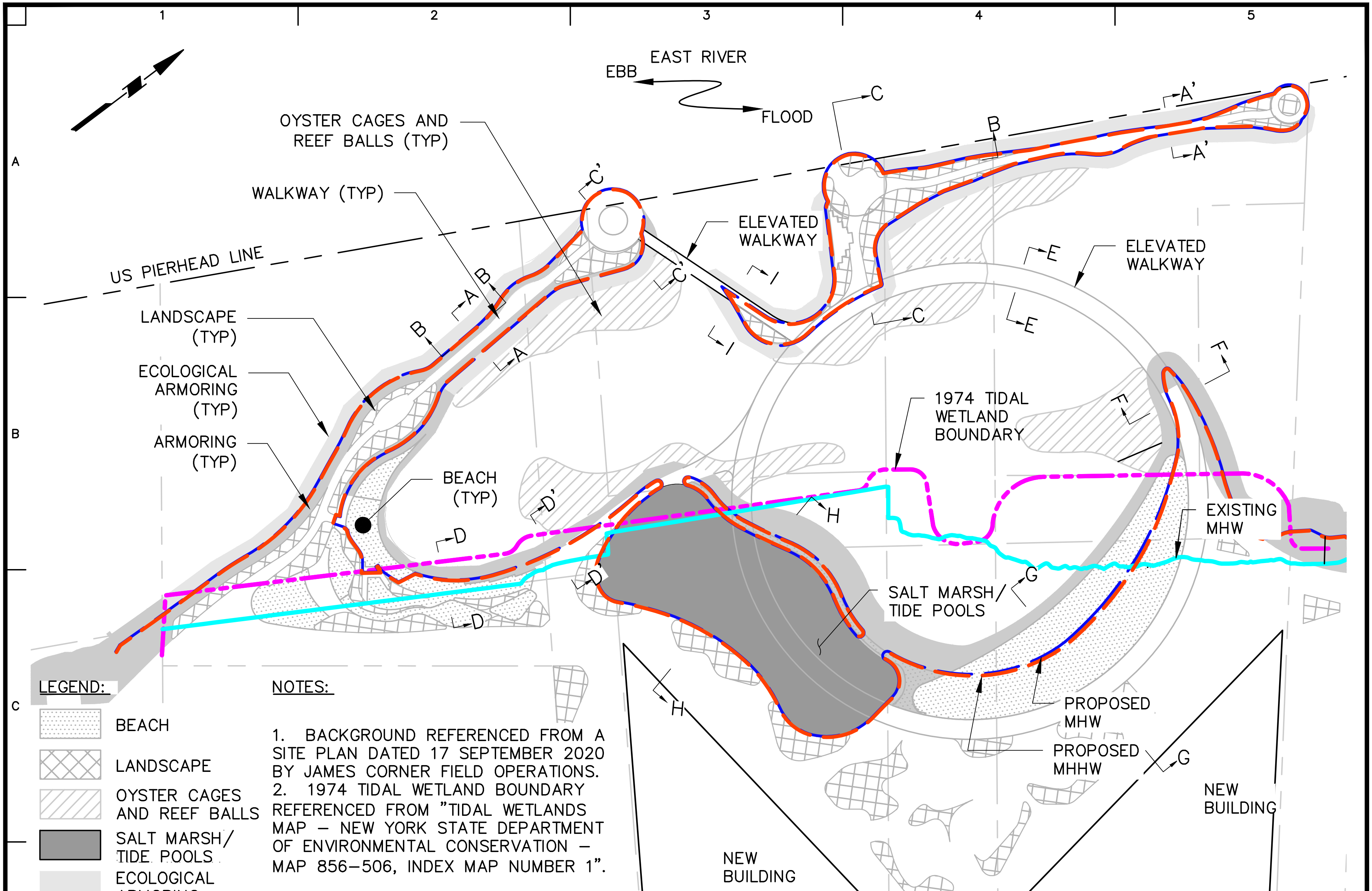
LANGAN Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	Project **RIVER RING** BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	Drawing Title **EXISTING SECTION 6**	Project No. 170594401 Date 3/15/2021 Drawn By KRW Checked By KH	Drawing No. **W-015** Sheet 8 of 43



NOTES:

1. BACKGROUND REFERENCED FROM A SITE PLAN DATED 17 SEPTEMBER 2020 BY JAMES CORNER FIELD OPERATIONS.
2. 1974 TIDAL WETLAND BOUNDARY REFERENCED FROM "TIDAL WETLANDS MAP – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION – MAP 856–506, INDEX MAP NUMBER 1".

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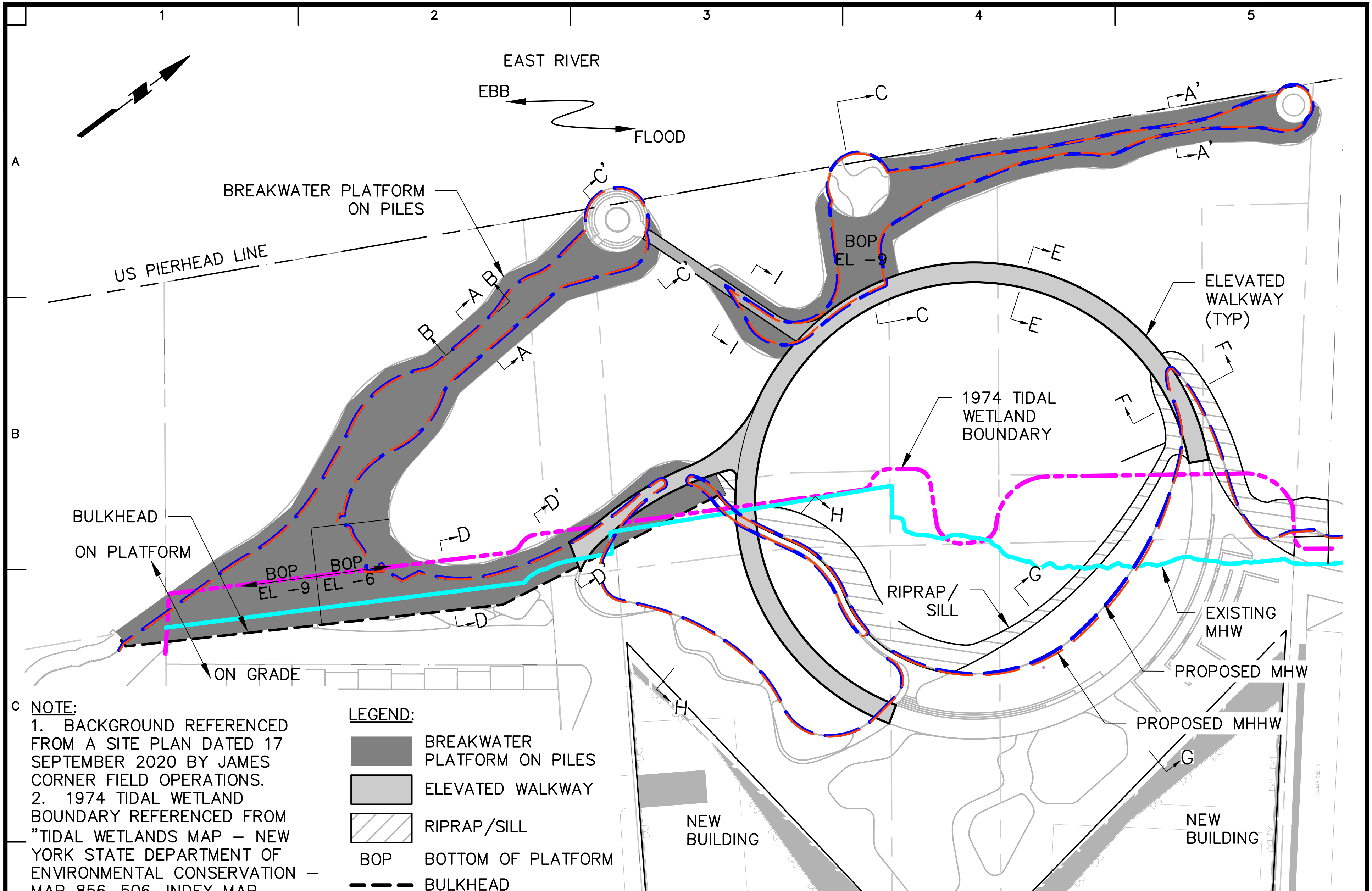
Project: **RIVER STREET**
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title: **PROPOSED SITE PLAN**

Project No. 170594401
Date 3/15/2021
Drawn By KRW
Checked By KH

Drawing No. **W-100**
Sheet 9 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-BL101-0102.DWG Date: 3/23/2021 Time: 17:45 User: kweg Style Table: Langan.stb Layout: ANSIA-BL



NOTE:
1. BACKGROUND REFERENCED FROM A SITE PLAN DATED 17 SEPTEMBER 2020 BY JAMES CORNER FIELD OPERATIONS.
2. 1974 TIDAL WETLAND BOUNDARY REFERENCED FROM "TIDAL WETLANDS MAP – NEW YORK STATE DEPARTMENT OF ENVIRONMENTAL CONSERVATION – MAP 856-506, INDEX MAP NUMBER 1".

LEGEND:

	BREAKWATER PLATFORM ON PILES
	ELEVATED WALKWAY
	RIPRAP/SILL
BOP	BOTTOM OF PLATFORM
	BULKHEAD

100 0 50 100
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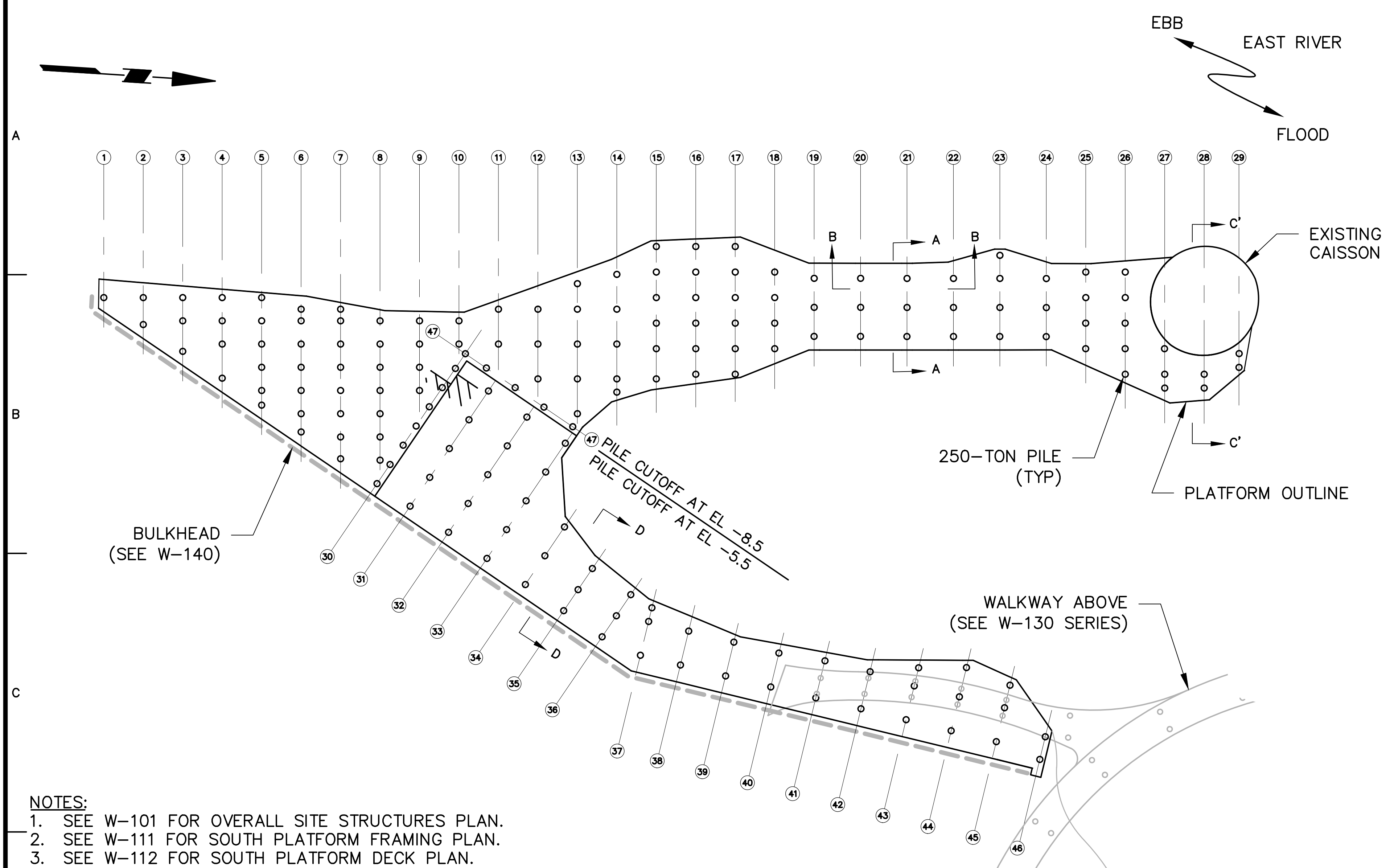
Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
PROPOSED WATERFRONT STRUCTURES

Project No. 170594401
Date 3/15/2021
Drawn By KRW
Checked By KH

Drawing No.
W-101
Sheet 10 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BL101-0110.DWG Date: 3/23/2021 Time: 17:17 User: kweg Style Table: Langan.stb Layout: PROPOSED WATERFRONT STRUCTURES



NOTES:
1. SEE W-101 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE W-111 FOR SOUTH PLATFORM FRAMING PLAN.
3. SEE W-112 FOR SOUTH PLATFORM DECK PLAN.

60 0 20 40 60
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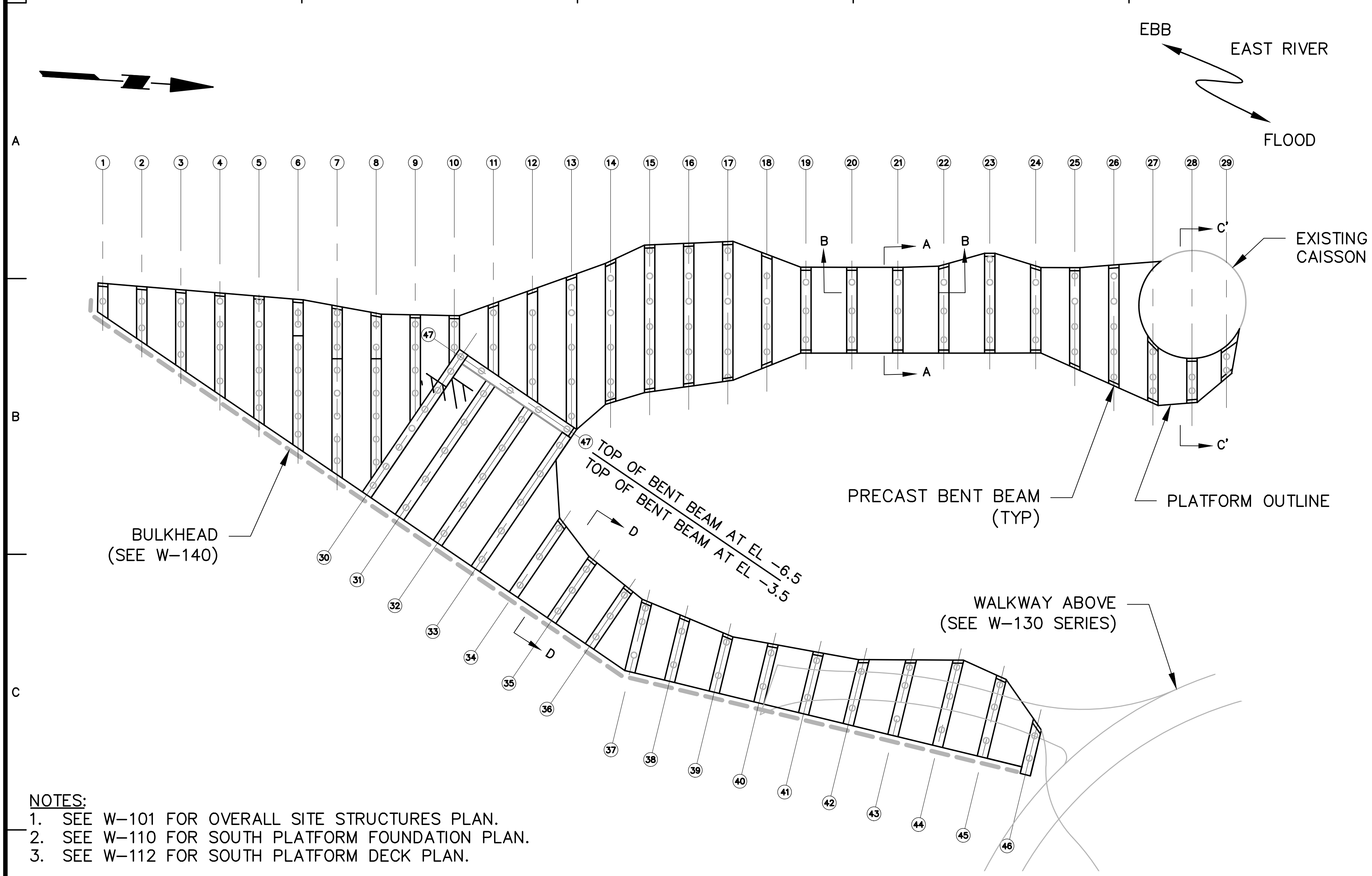
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
SOUTH PLATFORM FOUNDATION PLAN

Project No.	170594401
Date	3/15/2021
Drawn By	KRW
Checked By	KH

Drawing No.
W-110
Sheet 11 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BF101-0101.dwg Date: 3/23/2021 Time: 17:45 User: kweg Style Table: Langan.stb Layout: ANSIA-BL (4)



NOTES:
1. SEE W-101 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE W-110 FOR SOUTH PLATFORM FOUNDATION PLAN.
3. SEE W-112 FOR SOUTH PLATFORM DECK PLAN.

60 0 20 40 60
SCALE IN FEET

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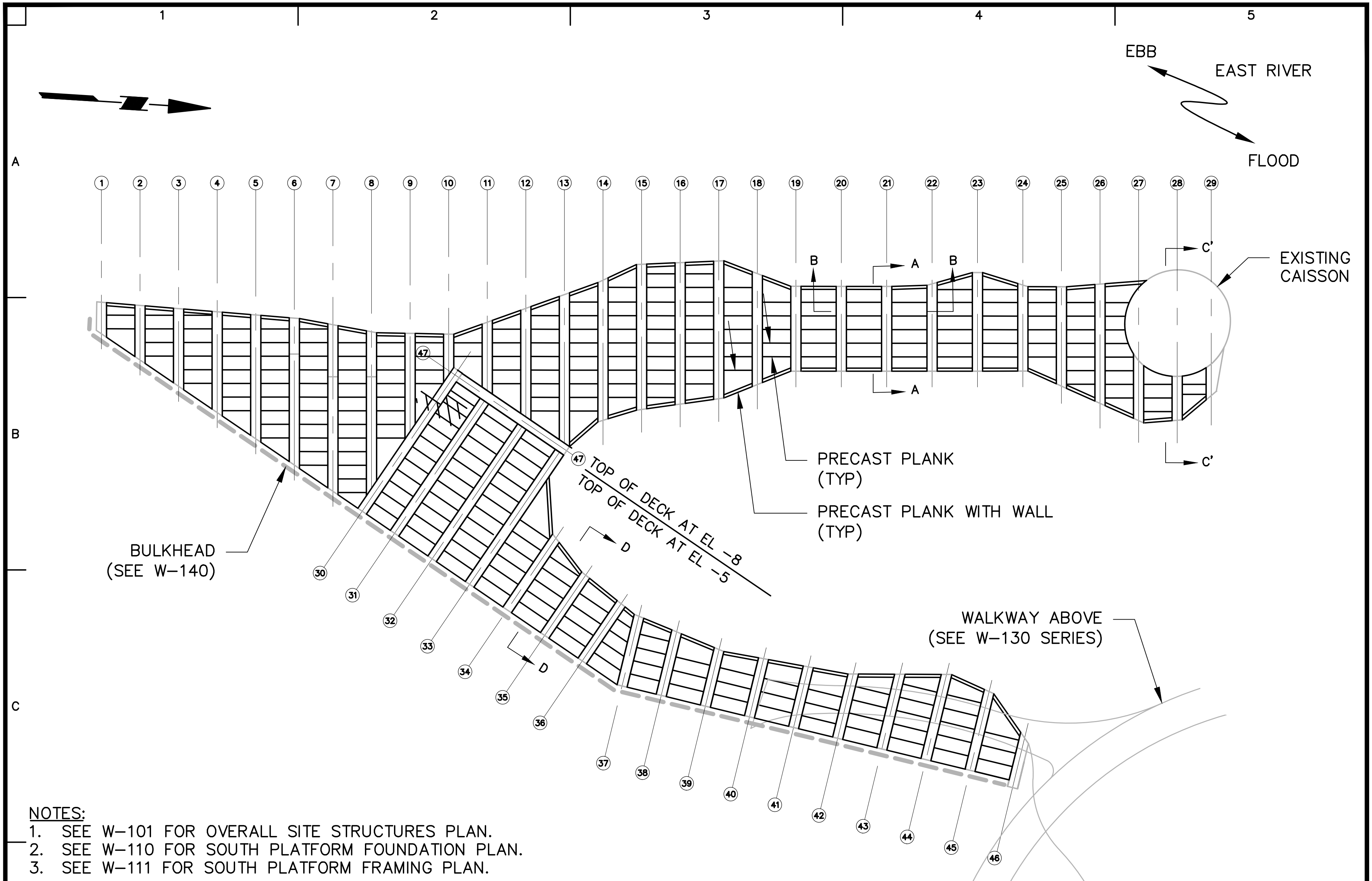
Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
SOUTH PLATFORM FRAMING PLAN

Project No. 170594401
Date 3/15/2021
Drawn By KRW
Checked By KH

Drawing No.
W-111
Sheet 12 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BF101-0101.dwg Date: 3/23/2021 Time: 17:18 User: kweg Style Table: Langan.stb Layout: ANSIA-BL (5)



NOTES:
1. SEE W–101 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE W–110 FOR SOUTH PLATFORM FOUNDATION PLAN.
3. SEE W–111 FOR SOUTH PLATFORM FRAMING PLAN.

60 0 20 40 60
SCALE IN FEET

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title

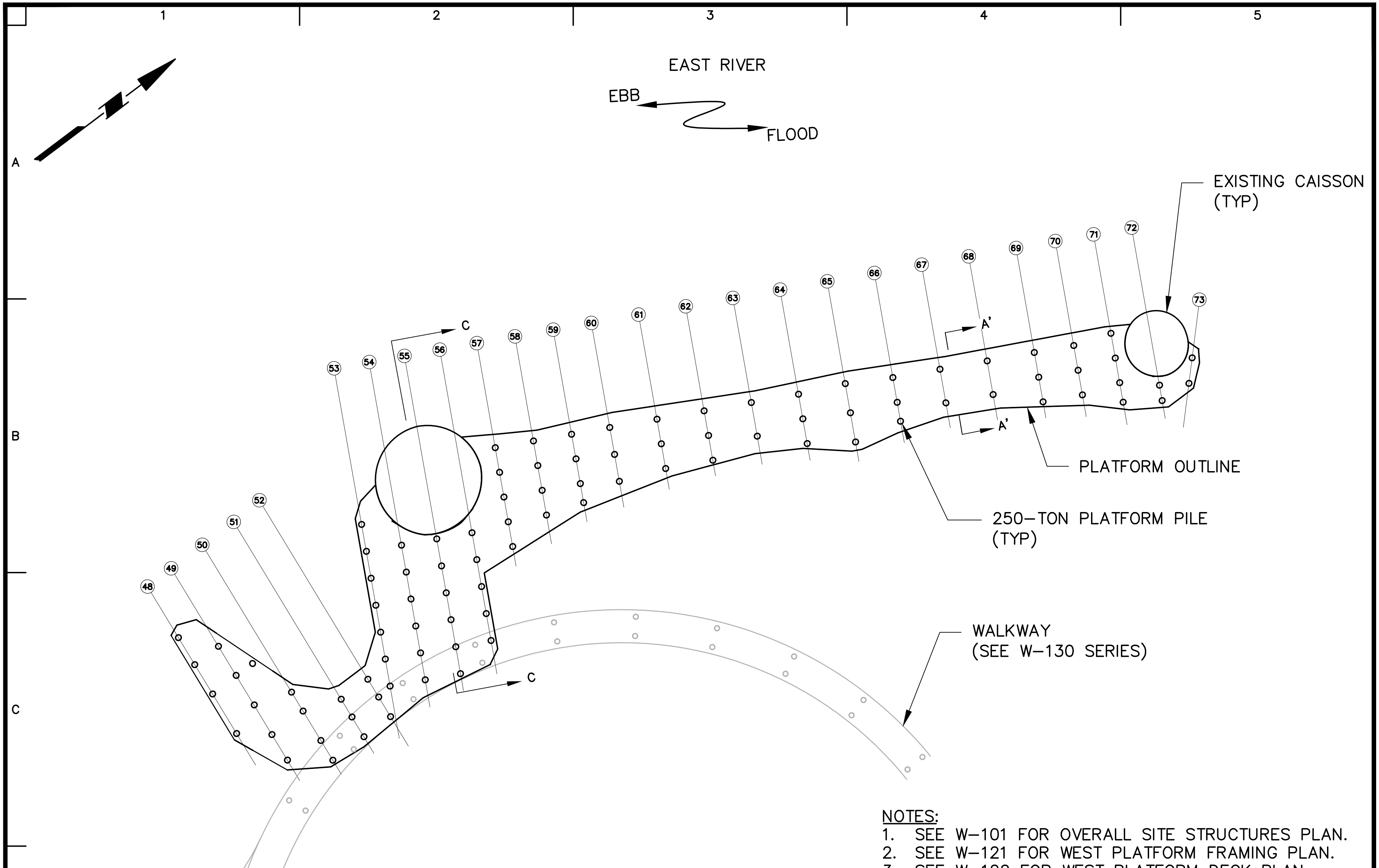
SOUTH PLATFORM DECK PLAN

Project No.	170594401
Date	3/15/2021
Drawn By	KRW
Checked By	KH

Drawing No.

W-112

Sheet 13 of 43



NOTES:
1. SEE W–101 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE W–121 FOR WEST PLATFORM FRAMING PLAN.
3. SEE W–122 FOR WEST PLATFORM DECK PLAN.

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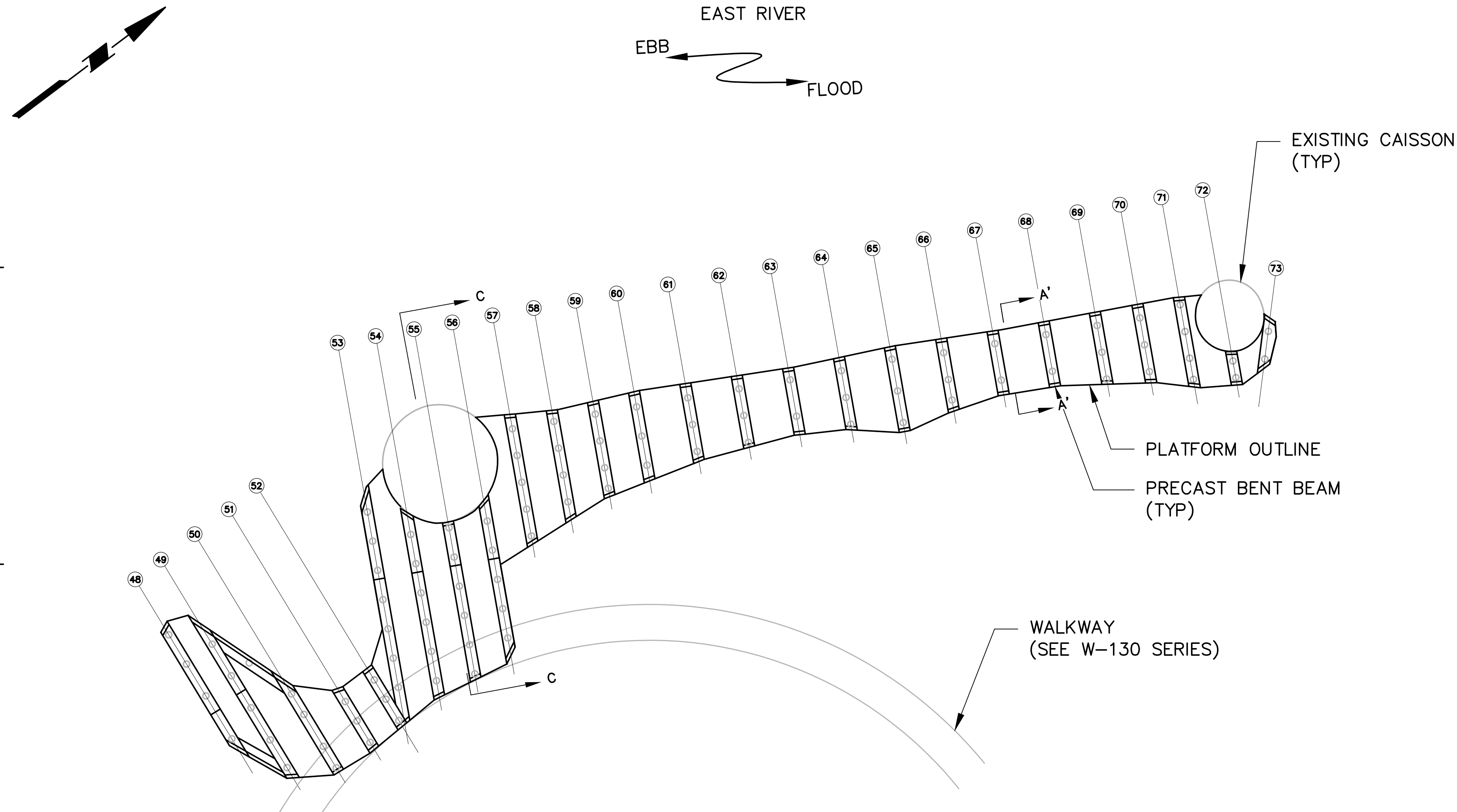
Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
WEST PLATFORM FOUNDATION PLAN

Project No. 170594401
Date 3/15/2021
Drawn By KRW
Checked By KH

Drawing No.
W-120
Sheet 14 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BF101-0102.dwg Date: 3/23/2021 Time: 17:18 User: kweg Style Table: Langan.stb Layout: ANSIA-BL



NOTES:
1. SEE W–101 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE W–120 FOR WEST PLATFORM FOUNDATION PLAN.
3. SEE W–122 FOR WEST PLATFORM DECK PLAN.

60 0 20 40 60
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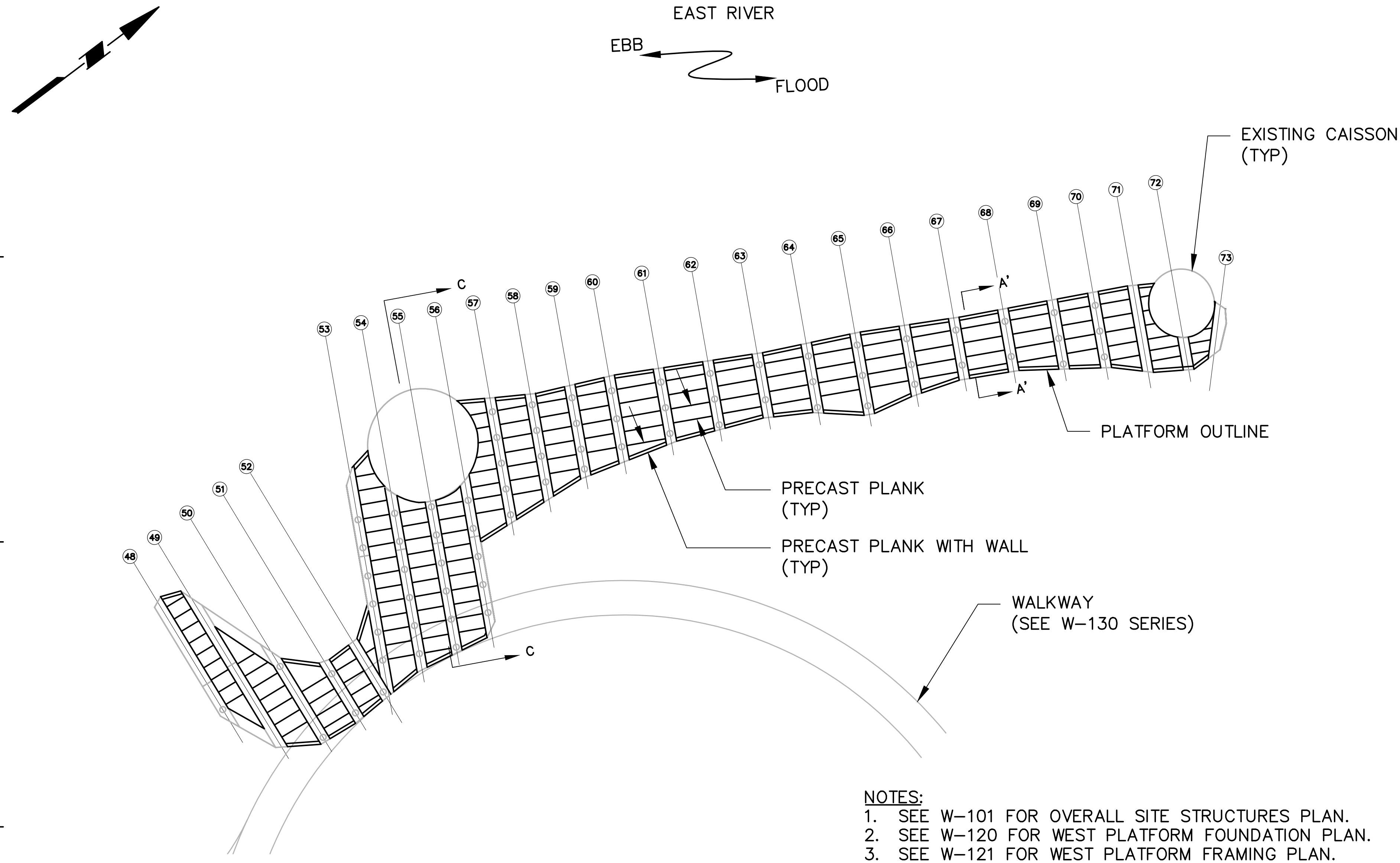
Project	Drawing Title	Project No.	Drawing No.
RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	WEST PLATFORM FRAMING PLAN	170594401 Date 3/15/2021 Drawn By KRW Checked By KH	W-121 Sheet 15 of 43



NOTES:
1. SEE W-101 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE W-120 FOR WEST PLATFORM FOUNDATION PLAN.
3. SEE W-121 FOR WEST PLATFORM FRAMING PLAN.

60 0 20 40 60
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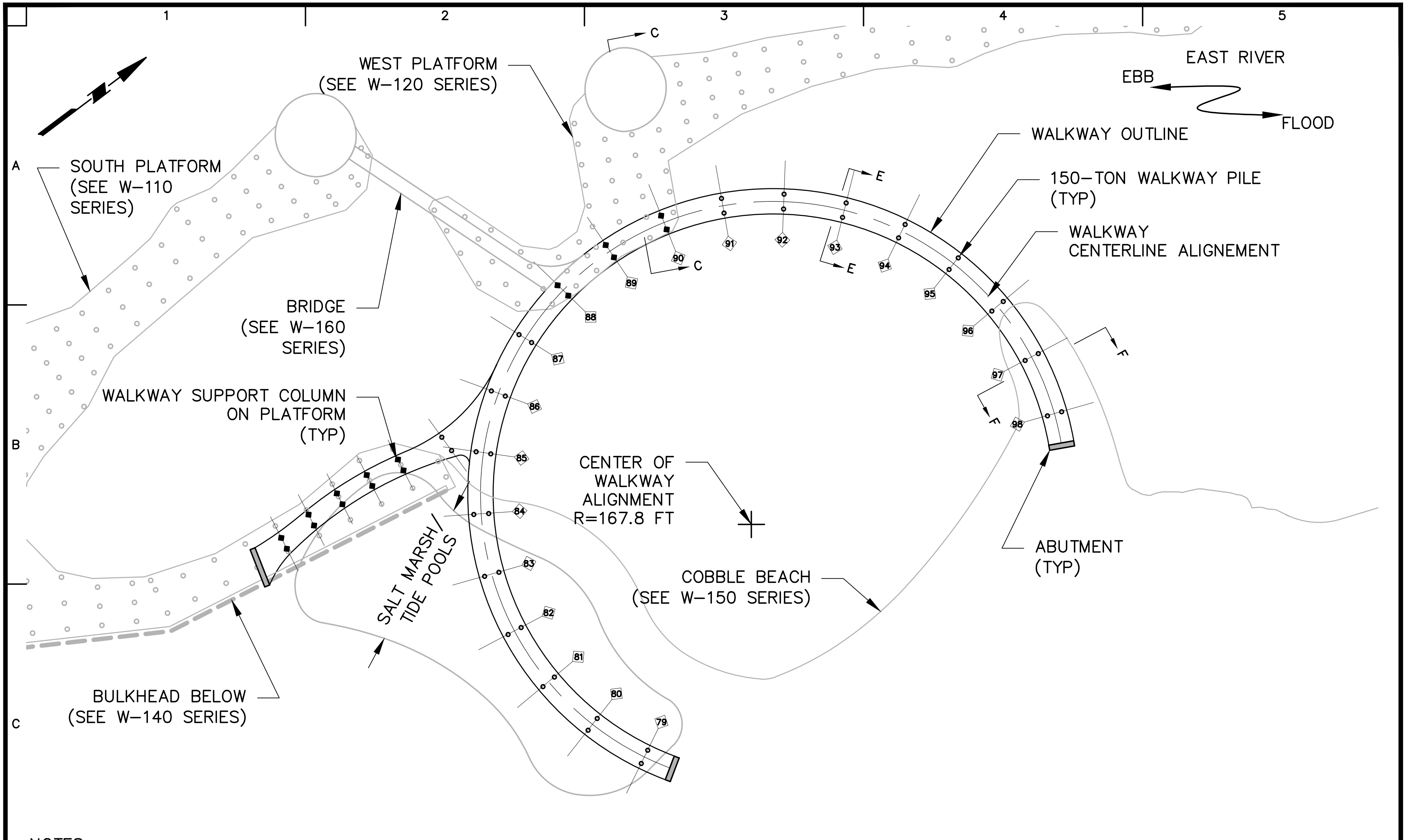
Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
WEST PLATFORM DECK PLAN

Project No. 170594401
Date 3/15/2021
Drawn By KRW
Checked By KH

Drawing No.
W-122
Sheet 16 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BF101-0102.dwg Date: 3/23/2021 Time: 17:18 User: kweg Style Table: Langan.stb Layout: ANSIA-BL (3)



NOTES:

1. SEE W–101 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE W–131 FOR WALKWAY FRAMING PLAN.
3. SEE W–132 FOR WALKWAY DECK PLAN.

80 0 40 80

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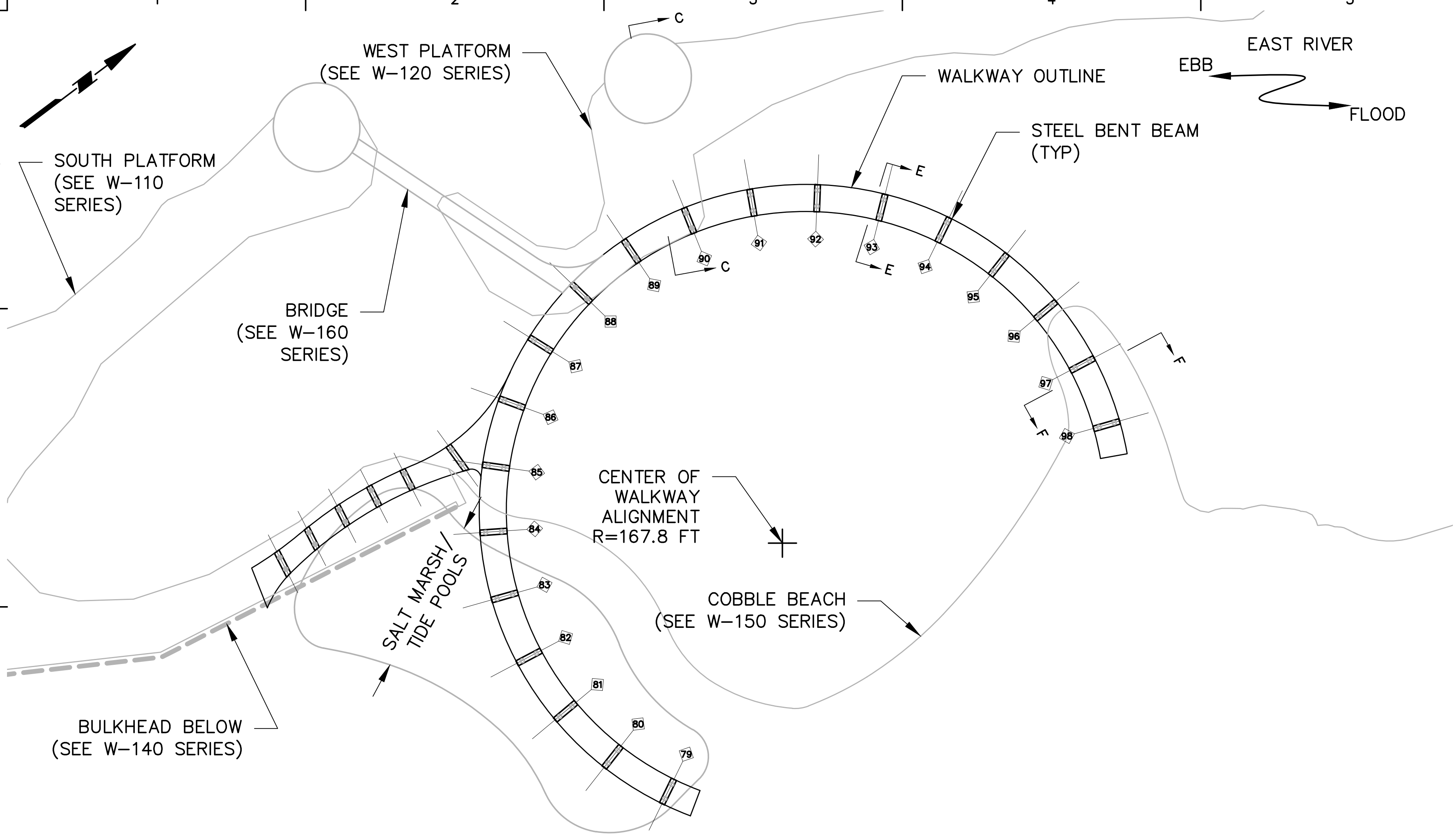
Project	Drawing Title	Project No. 170594401	Drawing No.
RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	**WALKWAY FOUNDATION PLAN**	Date 3/15/2021 Drawn By KRW Checked By KH	**W-130** Sheet 17 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BF101-0103.dwg Date: 3/23/2021 Time: 17:18 User: kweg Style Table: Langan.stb Layout: ANSIA-BL (7)



NOTES:
1. SEE W–101 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE W–130 FOR WALKWAY FOUNDATION PLAN.
3. SEE W–132 FOR WALKWAY DECK PLAN.

80 0 40 80
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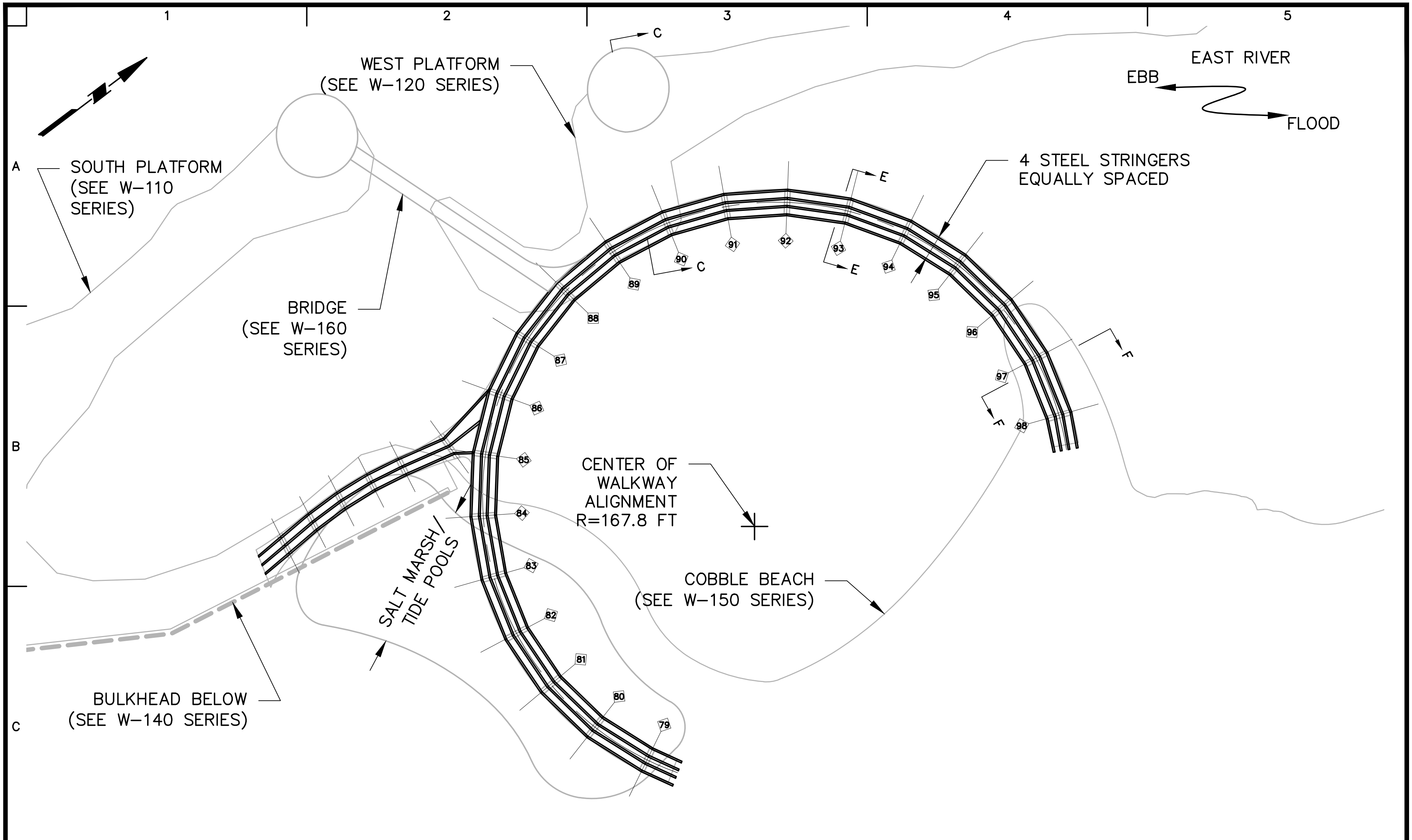
Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
WALKWAY FRAMING PLAN

Project No. 170594401
Date 3/15/2021
Drawn By KRW
Checked By KH

Drawing No.
W-131
Sheet 18 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BF101-0103.dwg Date: 3/23/2021 Time: 17:18 User: kweg Style Table: Langan.stb Layout: ANSIA-BL (8)



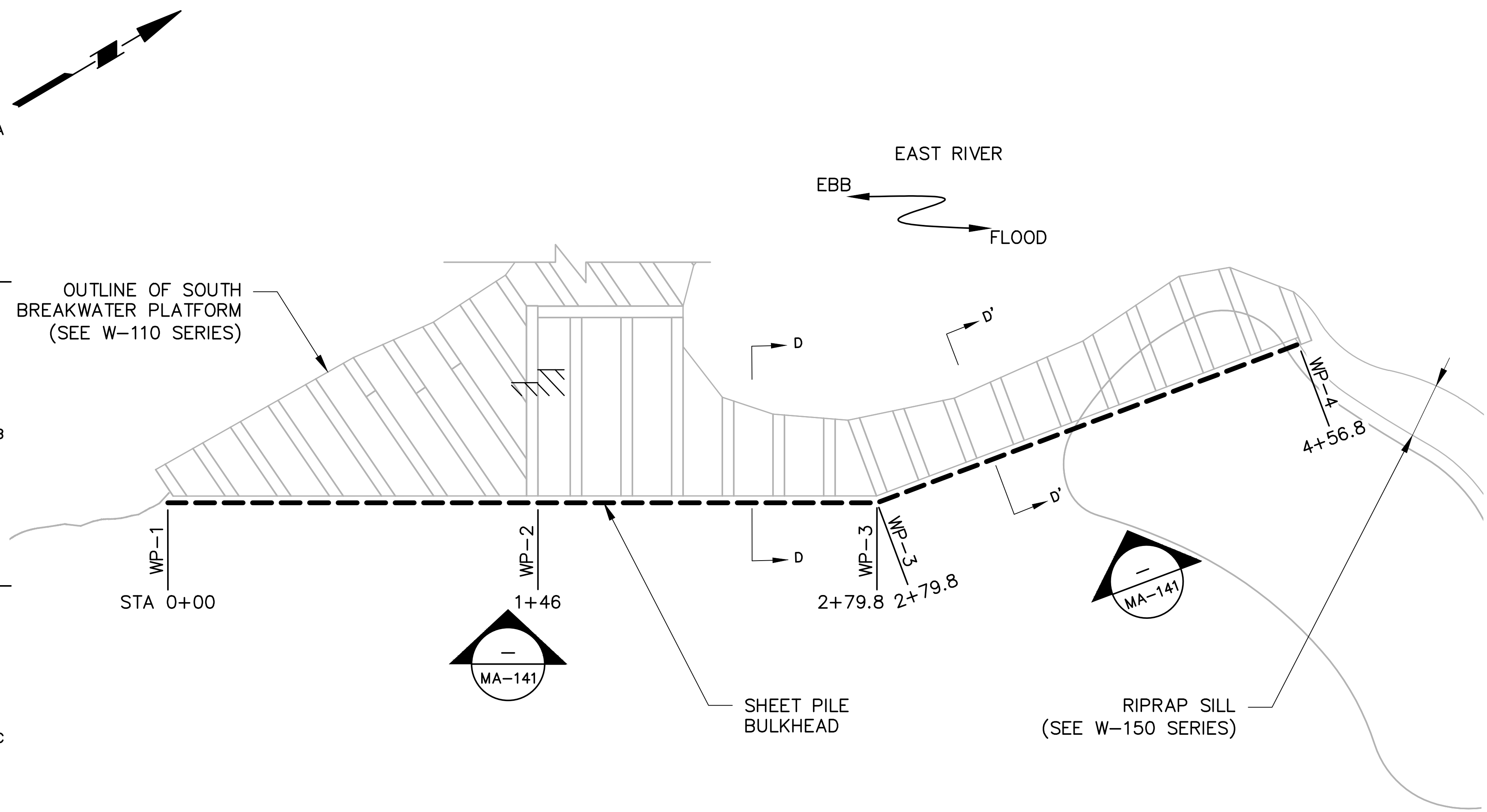
NOTES:
1. SEE W-101 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE W-130 FOR WALKWAY FOUNDATION PLAN.
3. SEE W-131 FOR WALKWAY FRAMING PLAN.

80 0 40 80

SCALE IN FEET

LANGAN Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	Project RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	Drawing Title WALKWAY DECK PLAN	Project No. 170594401 Date 3/15/2021 Drawn By KRW Checked By KH	Drawing No. W-132 Sheet 19 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BF101-0103.dwg Date: 3/23/2021 Time: 17:18 User: kweg Style Table: Langan.stb Layout: ANSIA-BL (9)



NOTES:

1. SEE W-101 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE W-141 FOR BULKHEAD PROFILE.

80 0 40 80

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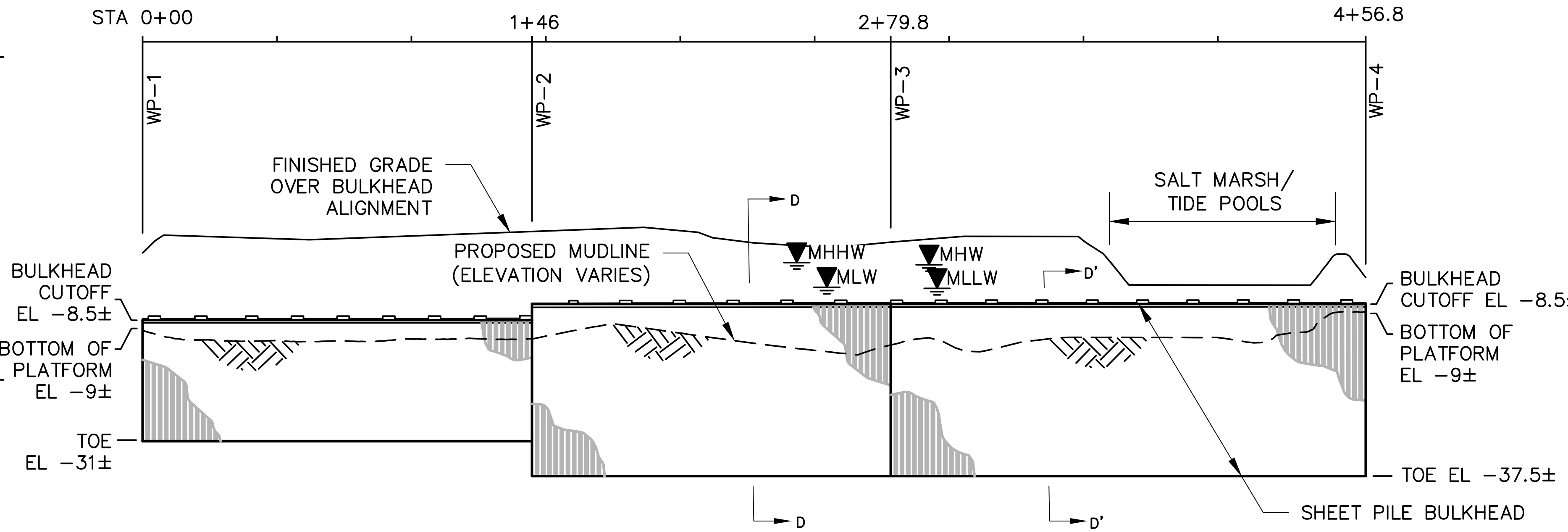
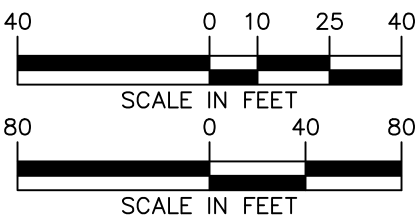
Project	Drawing Title	Project No. 170594401	Drawing No.
RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	BULKHEAD PART PLAN	Date 3/15/2021 Drawn By KRW Checked By KH	W-140 Sheet 20 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BF101-0104.dwg Date: 3/23/2021 Time: 17:18 User: kweg Style Table: Langan.stb Layout: ANSIA-BL (10)



NOTES:

1. SEE W–101 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE W–142 FOR BULKHEAD PART PLAN.
3. ELEVATION SHOWS BACK FACE OF BULKHEAD.
4. VERTICAL SCALE IS 1" = 40'. HORIZONTAL SCALE IS 1" = 80'.



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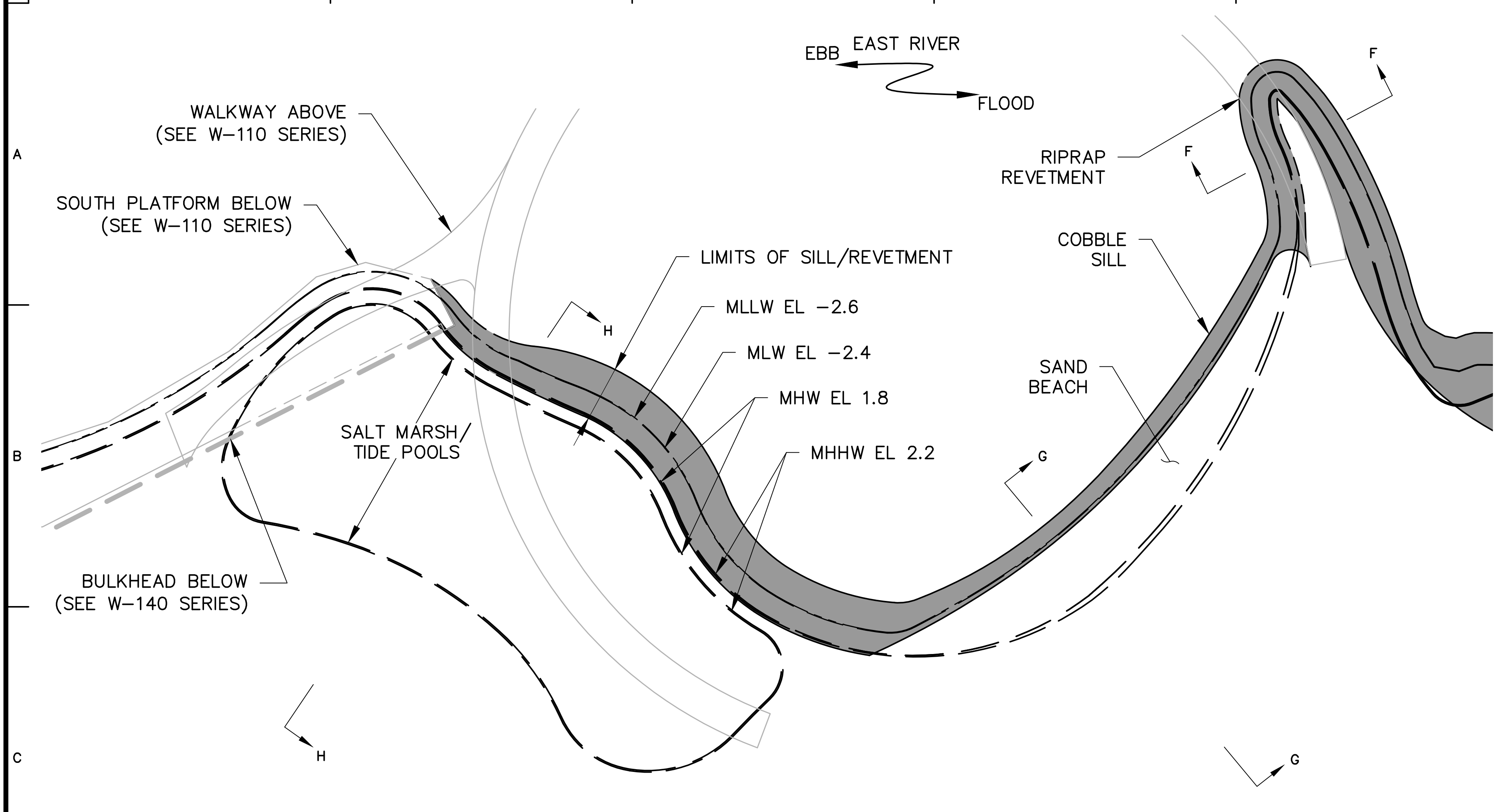
Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
BULKHEAD PROFILE

Project No. 170594401
Date 3/15/2021
Drawn By KRW
Checked By KH

Drawing No. W-141
Sheet 21 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BF101-0104.dwg Date: 3/23/2021 Time: 17:18 User: kweg Style Table: Langan.stb Layout: ANSIA-BL (11)



NOTE:
SEE W–101 FOR OVERALL SITE STRUCTURES PLAN.

60 0 20 40 60
SCALE IN FEET

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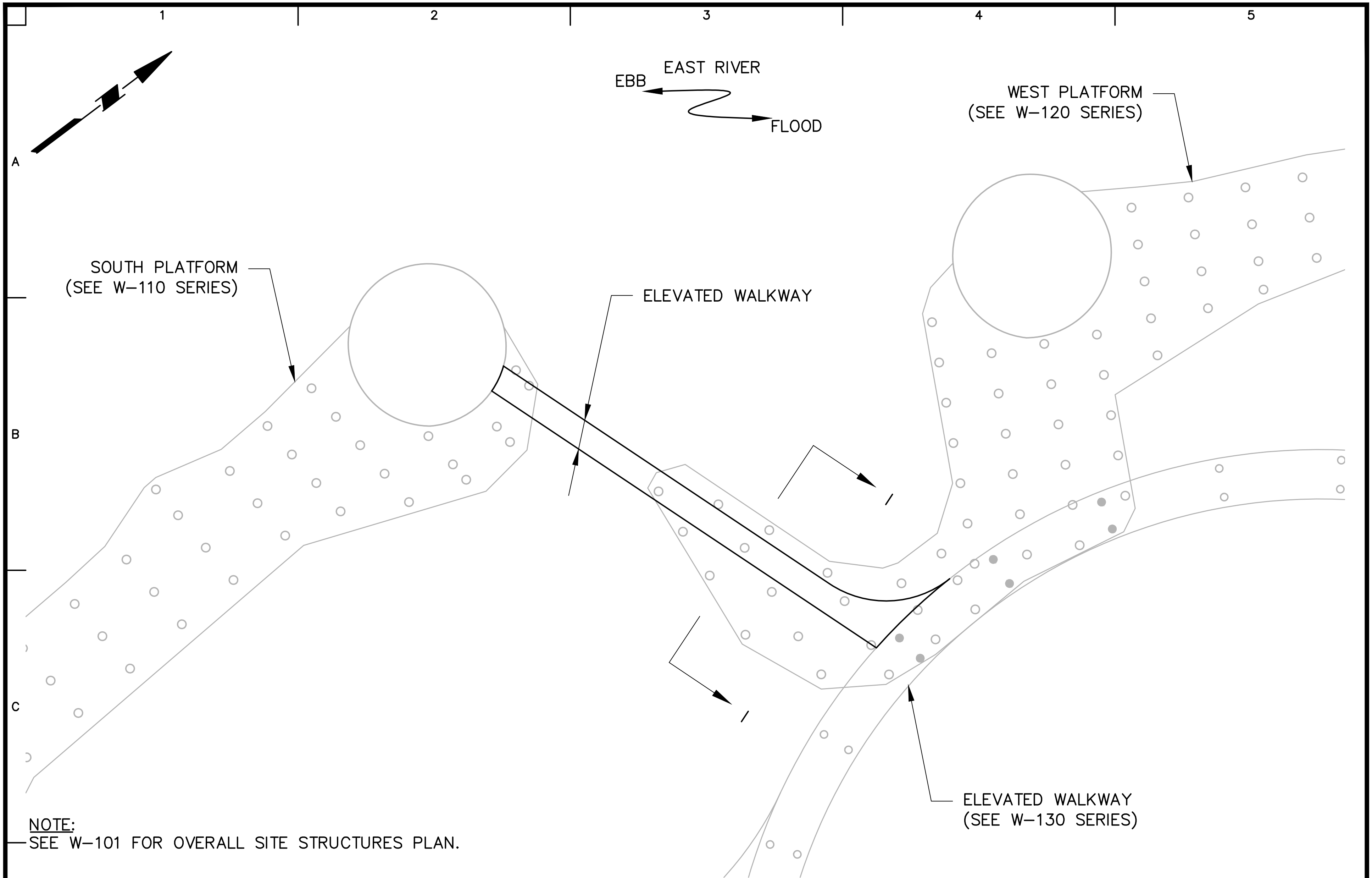
Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
SHORELINE PART PLAN

Project No. 170594401
Date 3/15/2021
Drawn By KRW
Checked By KH

Drawing No.
W-150
Sheet 22 of 43



NOTE:
SEE W–101 FOR OVERALL SITE STRUCTURES PLAN.

40 0 10 25 40
SCALE IN FEET

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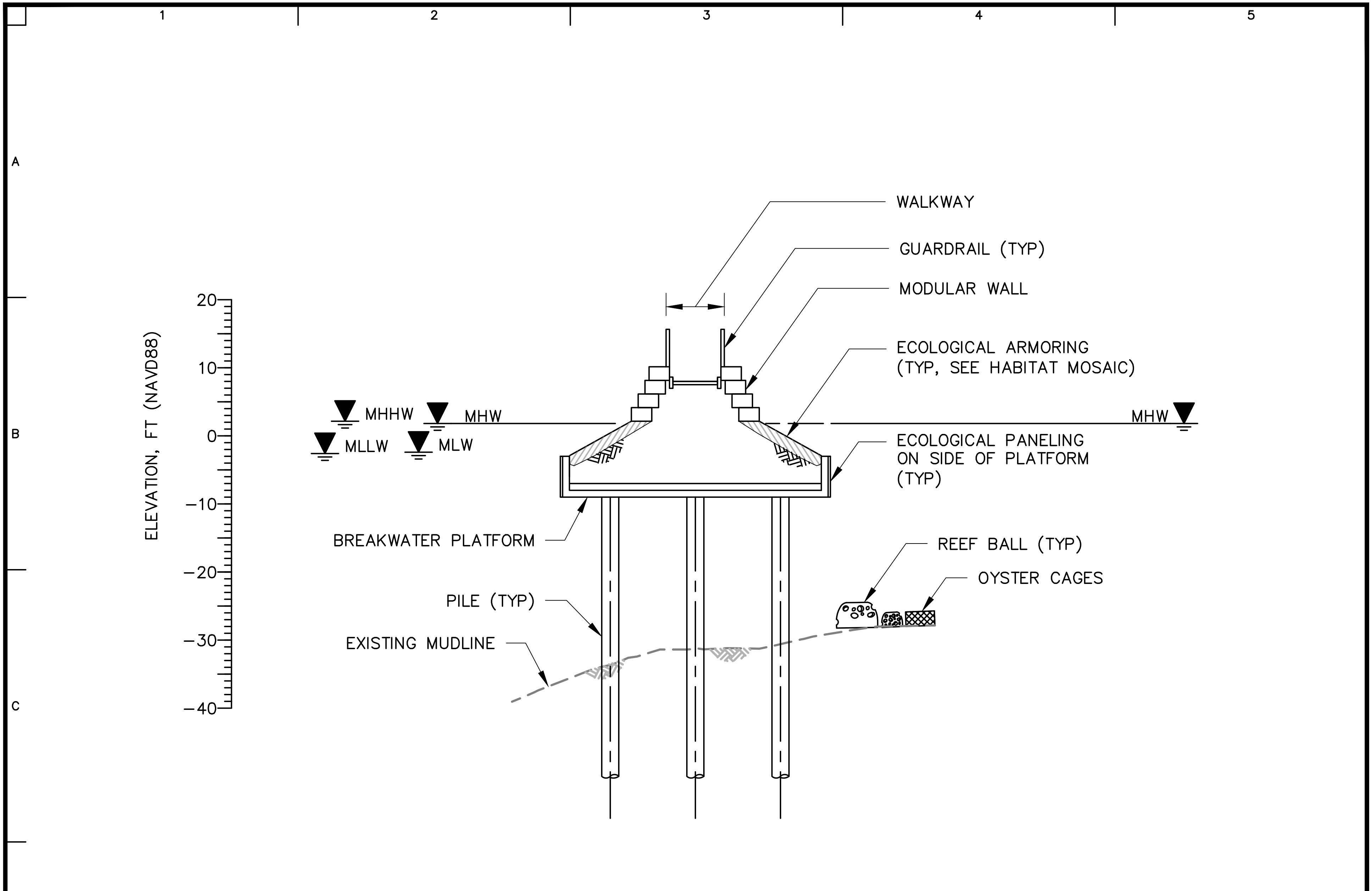
Project	Drawing Title	Project No. 170594401	Drawing No.
RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	BRIDGE PLAN	Date 3/15/2021 Drawn By KRW Checked By KH	W-160 Sheet 23 of 43

Filename: c:\bms\langan-pw-01\dms41745\BRIDGE PLAN.dwg Date: 3/23/2021 Time: 17:19 User: kweg Style Table: Langan.stb Layout: BRIDGE PLAN



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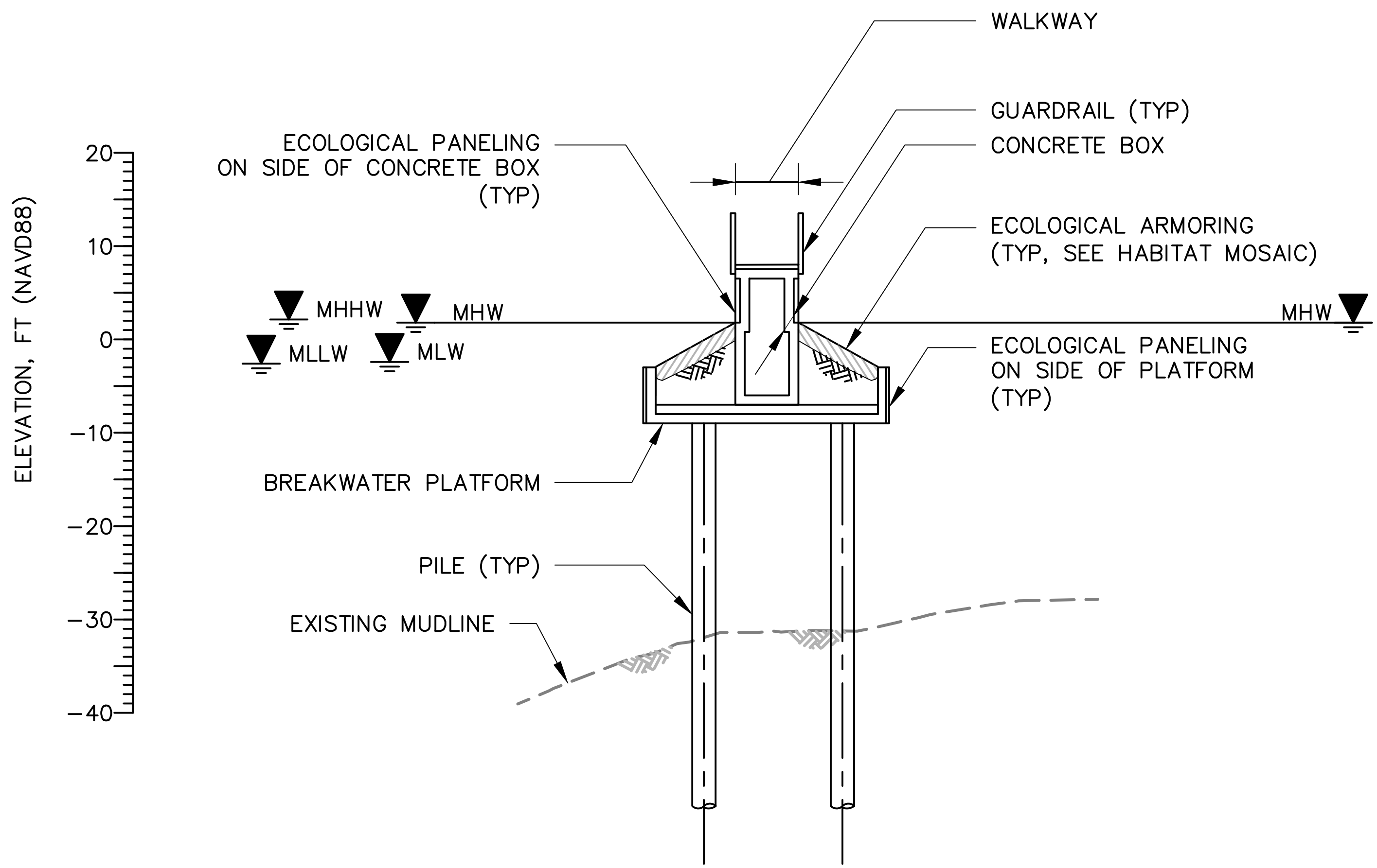
Filename: c:\bms\langan-pw-01\dms41745\170594401-BI301-0102.DWG Date: 3/23/2021 Time: 17:19 User: kweg Style Table: Langan.stb Layout: ANSIA-BL



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SCALE IN FEET

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RIVER RING

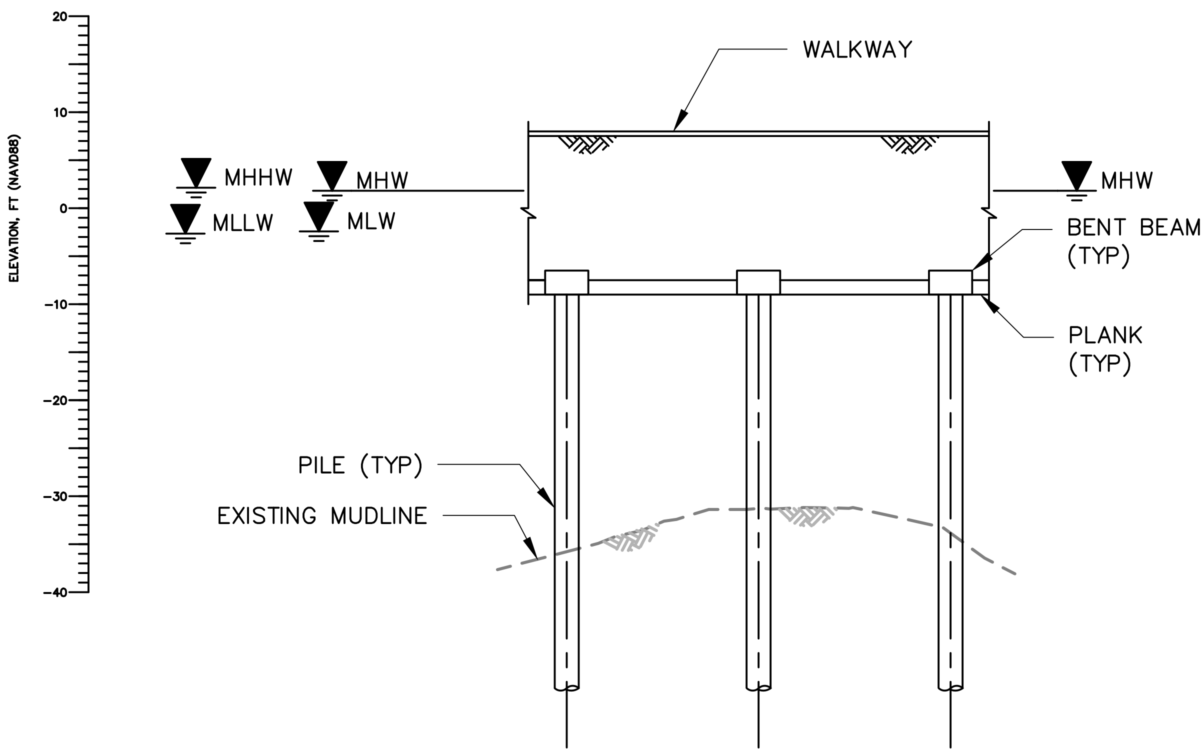
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

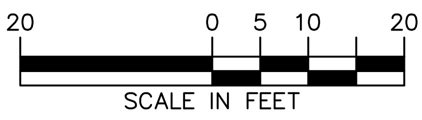
Drawing Title

PROPOSED SECTION A'

Project No.	Drawing No.
170594401	W-301
Date 3/15/2021	
Drawn By KRW	
Checked By KH	Sheet 25 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-BI301-0102.DWG Date: 3/23/2021 Time: 17:19 User: kweg Style Table: Langan.stb Layout: PROPOSED SECTION A'





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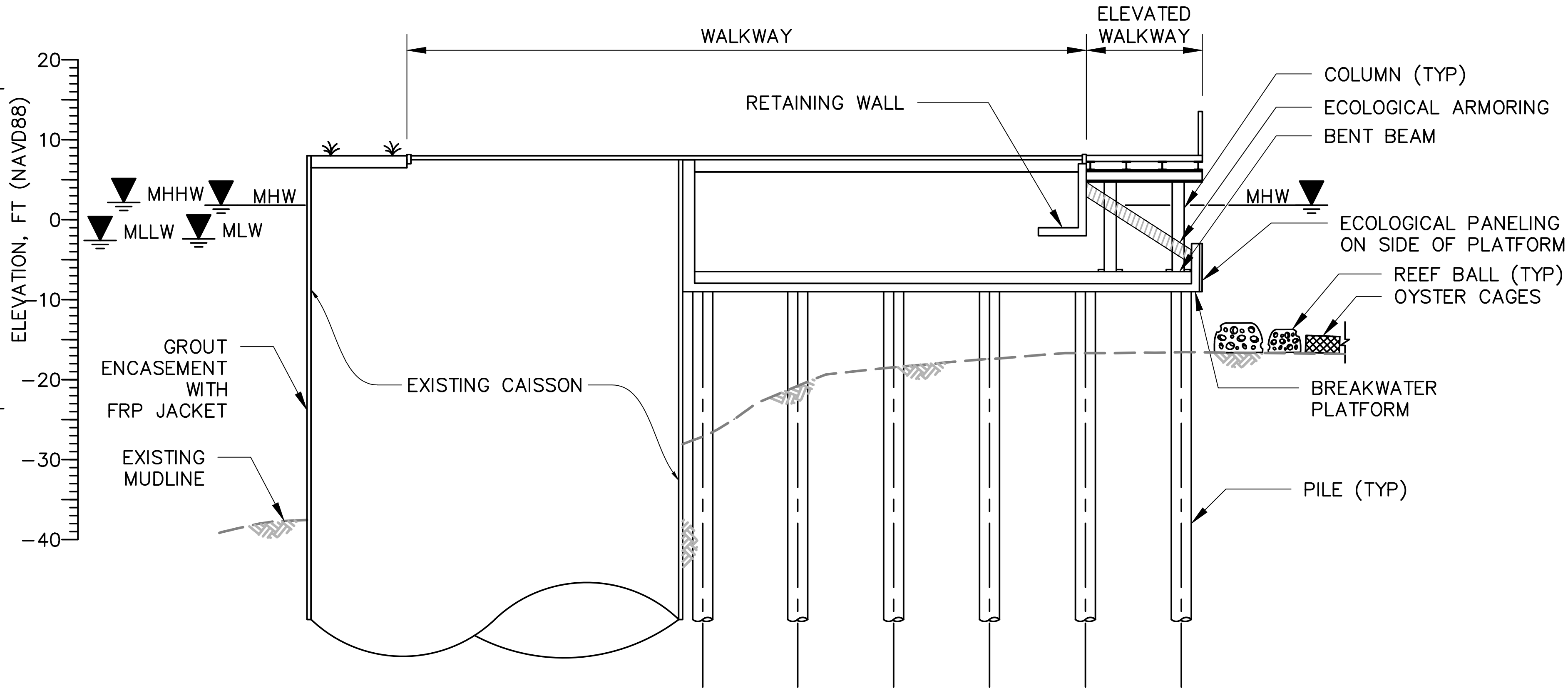

NOTE:
SECTION C' SIMILAR.

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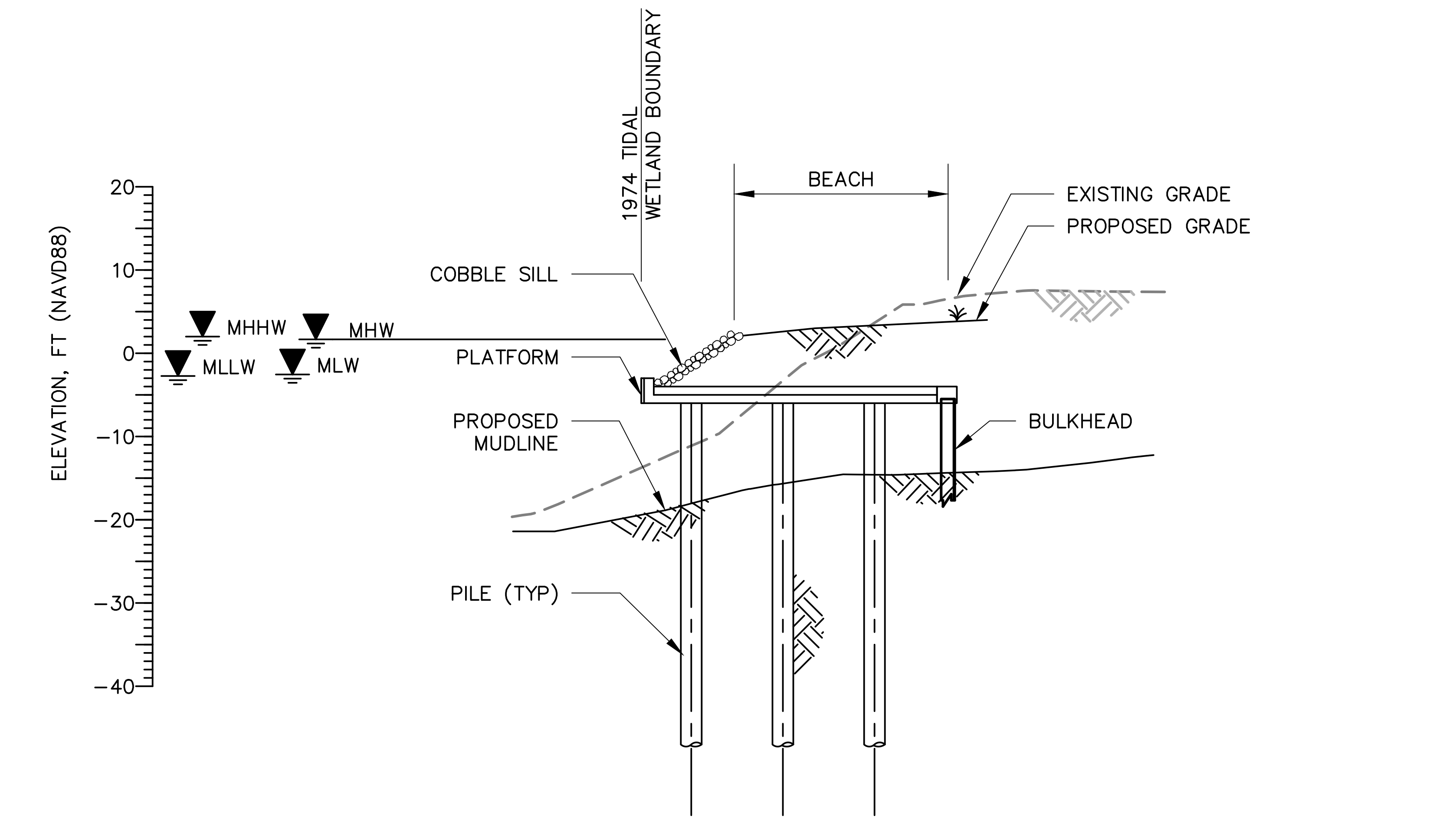
Project	Drawing Title	Project No. / Date / Drawn By / Checked By	Drawing No.
RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	PROPOSED SECTION C	Project No. 170594401 Date 3/15/2021 Drawn By KRW Checked By KH	W-303 Sheet 27 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-BI301-0103.DWG Date: 3/23/2021 Time: 17:19 User: kweg Style Table: Langan.stb Layout: ANSIA-BL



NOTE:
SECTION D' SIMILAR.

20 0 5 10 20
SCALE IN FEET

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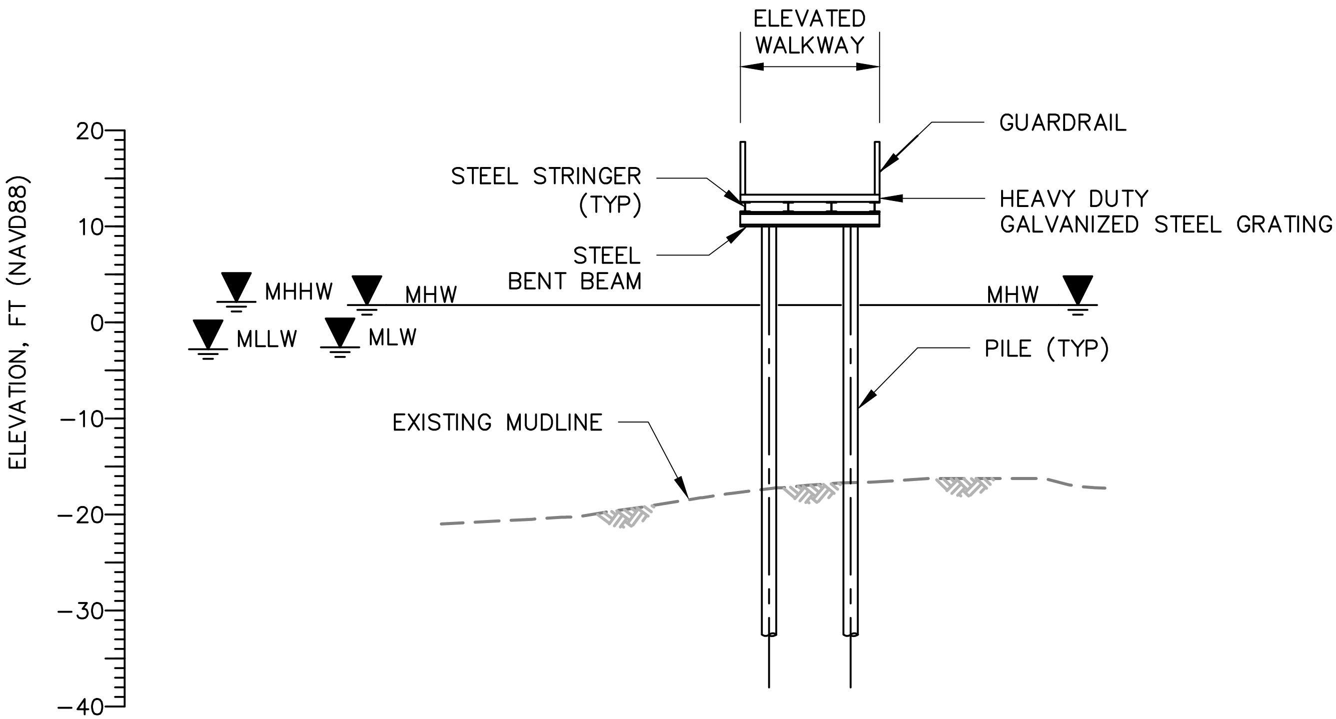
Project	Drawing Title	Project No. / Date / Drawn By / Checked By	Drawing No.
RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	**PROPOSED SECTION D**	Project No. 170594401 Date 3/15/2021 Drawn By KRW Checked By KH	**W-304** Sheet 28 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-BI301-0101.DWG Date: 3/23/2021 Time: 17:19 User: kweg Style Table: Langan.stb Layout: ANSIA-BL



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Project

RIVER RING

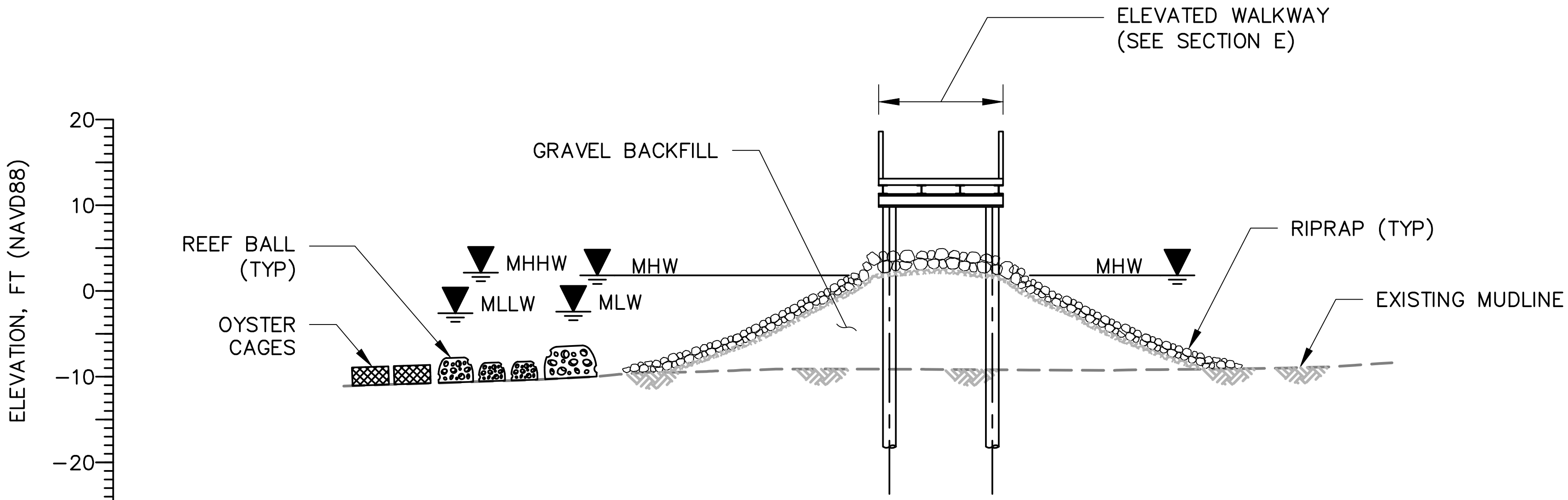
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title

PROPOSED SECTION E

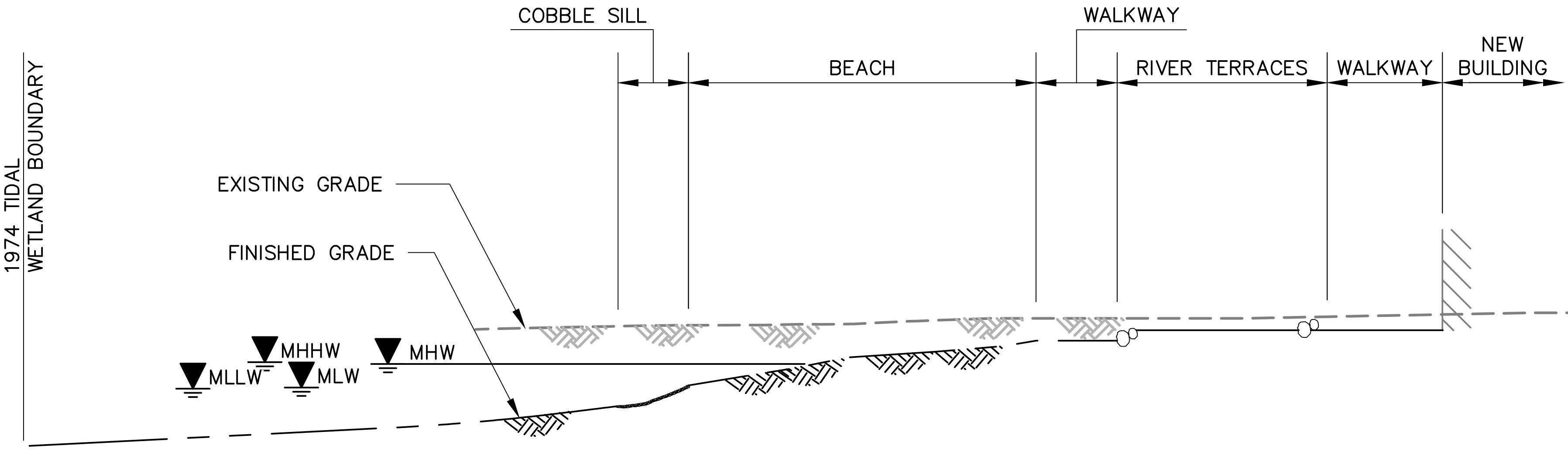
Project No. 170594401	Drawing No.
Date 3/15/2021	**W-305**
Drawn By KRW	
Checked By KH	Sheet 29 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-BI301-0105.DWG Date: 3/23/2021 Time: 17:19 User: kweg Style Table: Langan.stb Layout: ANSIA-BL



LANGAN	Project	Drawing Title	Project No.	Drawing No.
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	**RIVER RING** BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	**PROPOSED SECTION F**	170594401 Date 3/15/2021 Drawn By KRW Checked By KH	**W-306** Sheet 30 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-BI301-0106.DWG Date: 3/23/2021 Time: 17:20 User: kweg Style Table: Langan.stb Layout: ANSIA-BL



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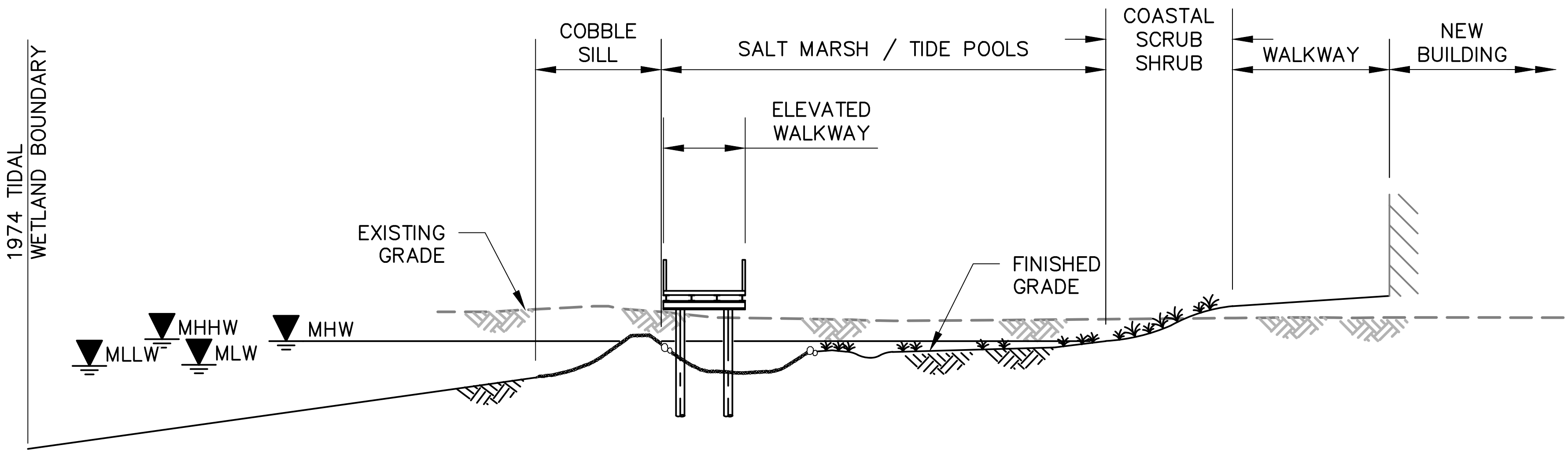
Project	Drawing Title		Drawing No.
RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	PROPOSED SECTION G	Project No. 170594401 Date 3/15/2021 Drawn By KRW Checked By KH	W-307 Sheet 31 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-BI301-0107.DWG Date: 3/23/2021 Time: 17:20 User: kweg Style Table: Langan.stb Layout: ANSIA-BL



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SCALE IN FEET

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title

PROPOSED SECTION H

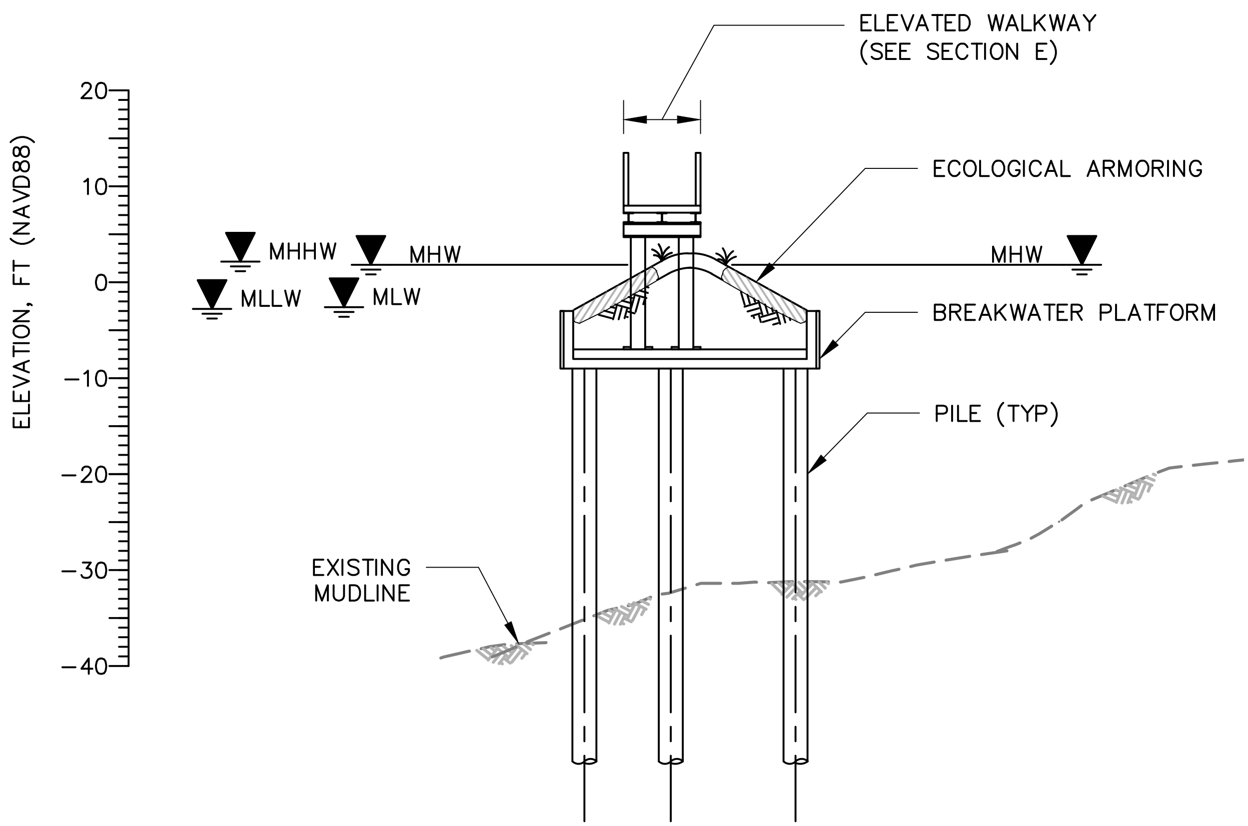
Project No. 170594401
Date 3/15/2021
Drawn By KRW
Checked By KH

Drawing No.

W-308

Sheet 32 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-BI301-0108.DWG Date: 3/23/2021 Time: 17:20 User: kweg Style Table: Langan.stb Layout: ANSIA-BL



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RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

KINGS NEW YORK

Drawing Title

PROPOSED SECTION I

Project No. 170594401

Date 3/15/2021

Drawn By KRW

Checked By KH

Drawing No.

W-309

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BI301-0109.dwg Date: 3/23/2021 Time: 17:20 User: kweg Style Table: Langan.stb Layout: PROPOSED SECTION I

LEGEND:

EXISTING COVER

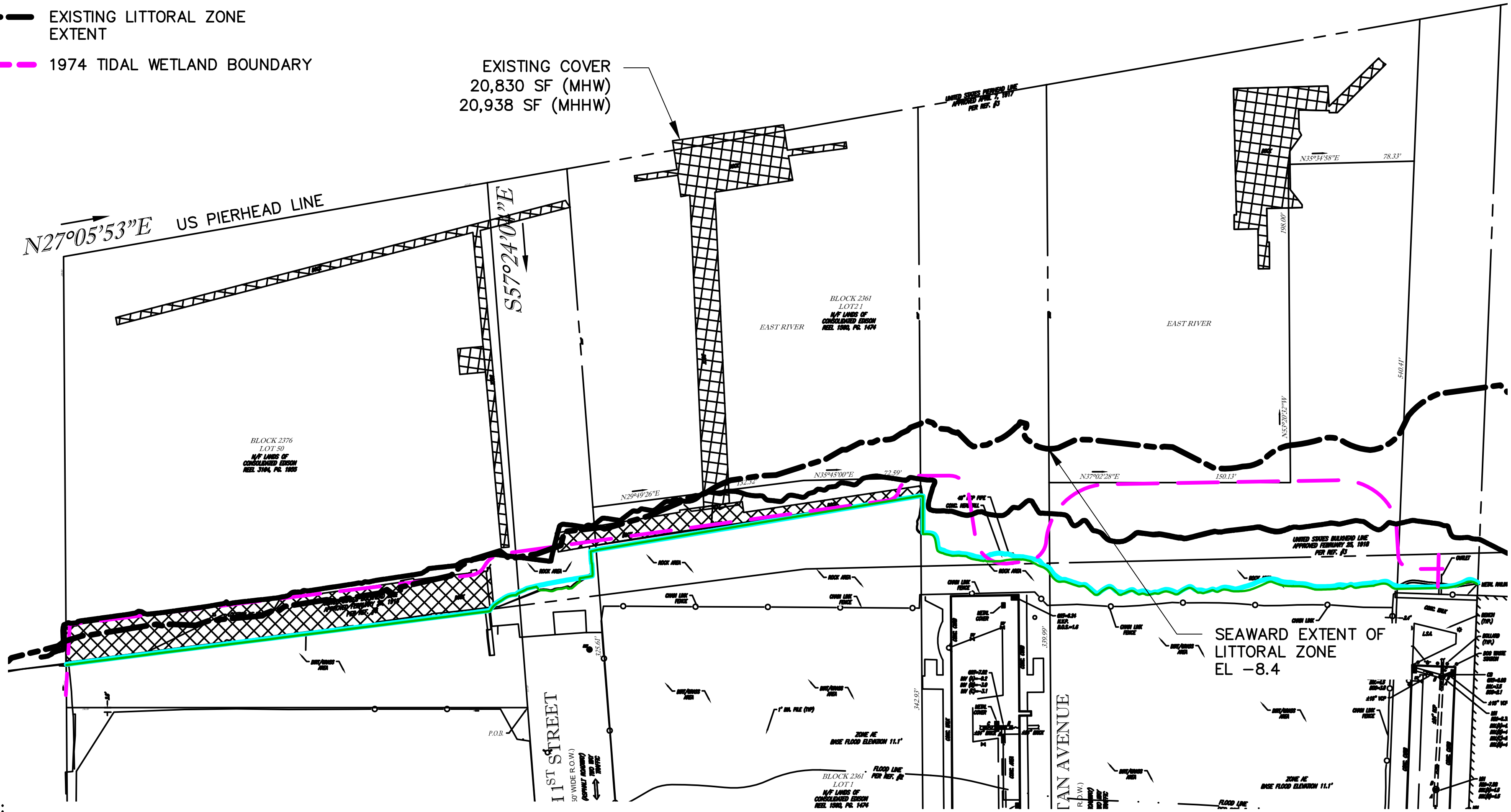
EXISTING MEAN HIGH WATER

EXISTING MEAN HIGHER HIGH WATER

EXISTING LITTORAL ZONE EXTENT

1974 TIDAL WETLAND BOUNDARY

EXISTING COVER	
TOTAL	20,830 SF
OPEN WATER	13,659 SF
LITTORAL ZONE	7,171 SF
INTERTIDAL ZONE	0 SF



NOTE:
BACKGROUND REFERENCED FROM SURVEY PREPARED BY CONTROL POINT ASSOCIATES INC. PC TITLED "BOUNDARY & TOPOGRAPHIC SURVEY" REVISED 27 MARCH 2020.

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RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title

EXISTING COVER

Project No. 170594401

Date 3/15/2021

Drawn By CD

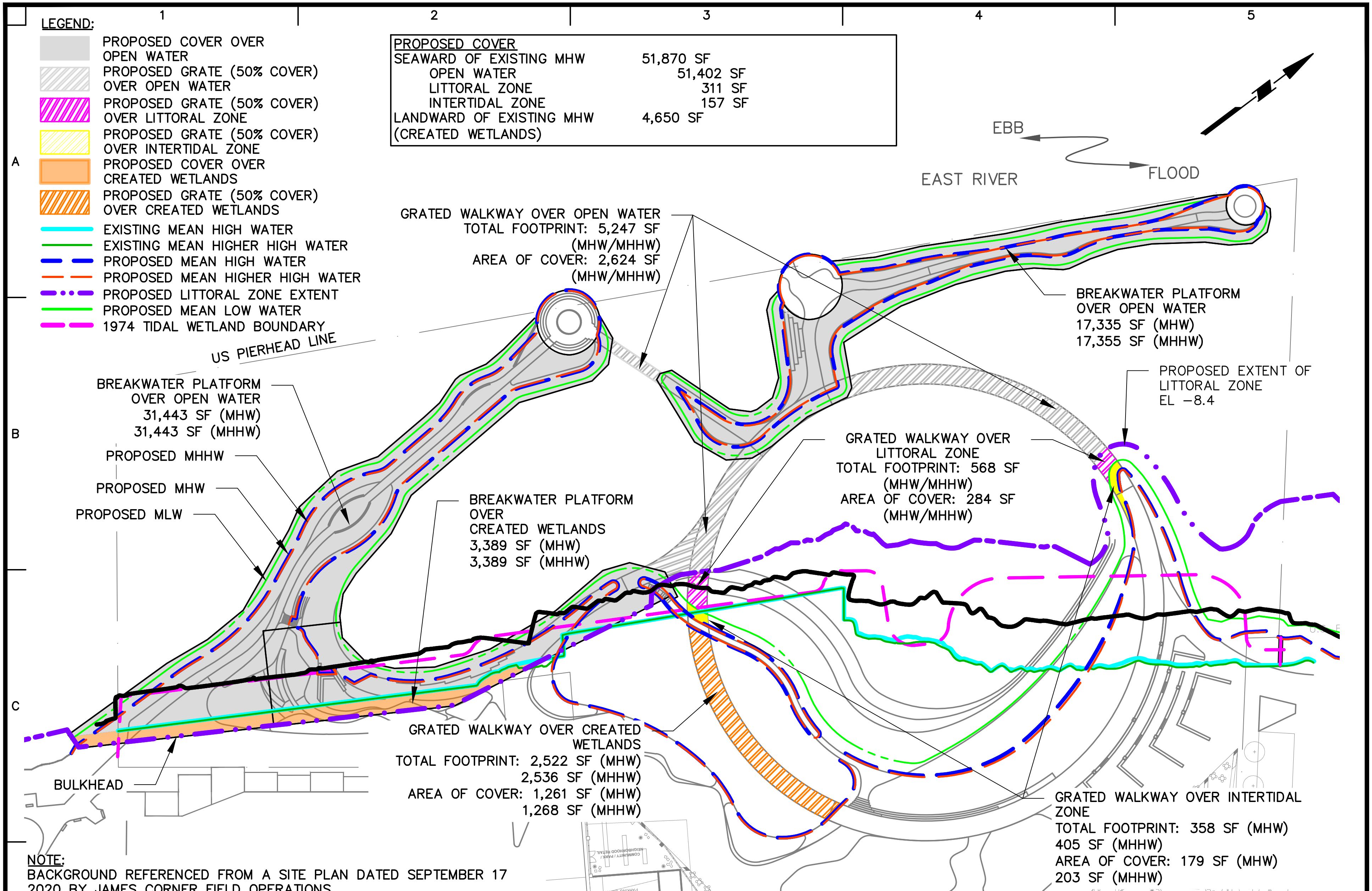
Checked By KH

Drawing No.

W-501

Sheet 34 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BL101-0109.dwg Date: 3/23/2021 Time: 17:20 User: kweg Style Table: Langan.stb Layout: EXISTING COVER



PROPOSED COVER	
SEAWARD OF EXISTING MHW	51,870 SF
OPEN WATER	51,402 SF
LITTORAL ZONE	311 SF
INTERTIDAL ZONE	157 SF
LANDWARD OF EXISTING MHW (CREATED WETLANDS)	4,650 SF

NOTE:
BACKGROUND REFERENCED FROM A SITE PLAN DATED SEPTEMBER 17 2020 BY JAMES CORNER FIELD OPERATIONS.

100 0 50 100
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Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
PROPOSED COVER

Project No. 170594401
Date 3/15/2021
Drawn By CD
Checked By KH

Drawing No.
W-502
Sheet 35 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BL101-0109.dwg Date: 3/23/2021 Time: 17:20 User: kweg Style Table: Langan.stb Layout: PROPOSED COVER

NET COVER WITH RESPECT TO MEAN HIGH WATER			
WETLAND ZONE	**EXISTING (SF)**	**PROPOSED (SF)**	**NET CHANGE (SF)**
OPEN WATER	13,659	51,402	37,743 (INCREASE)
LITTORAL ZONE	7,171	284	(6,887) (DECREASE)
INTERTIDAL ZONE	0	179	179 (INCREASE)
TOTAL	20,830	51,865	31,035 (INCREASE)
CREATED WETLANDS		4,650	4,650 (INCREASE)

NET COVER WITH RESPECT TO MEAN HIGHER HIGH WATER			
WETLAND ZONE	**EXISTING (SF)**	**PROPOSED (SF)**	**NET CHANGE (SF)**
OPEN WATER	13,659	51,402	37,743 (INCREASE)
LITTORAL ZONE	7,279	284	(6,995) (DECREASE)
INTERTIDAL ZONE	0	203	203 (INCREASE)
TOTAL	20,938	51,889	30,951 (INCREASE)
CREATED WETLANDS		4,657	4,657 (INCREASE)

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Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
NET COVER

Project No. 170594401
Date 3/15/2021
Drawn By CD
Checked By KH

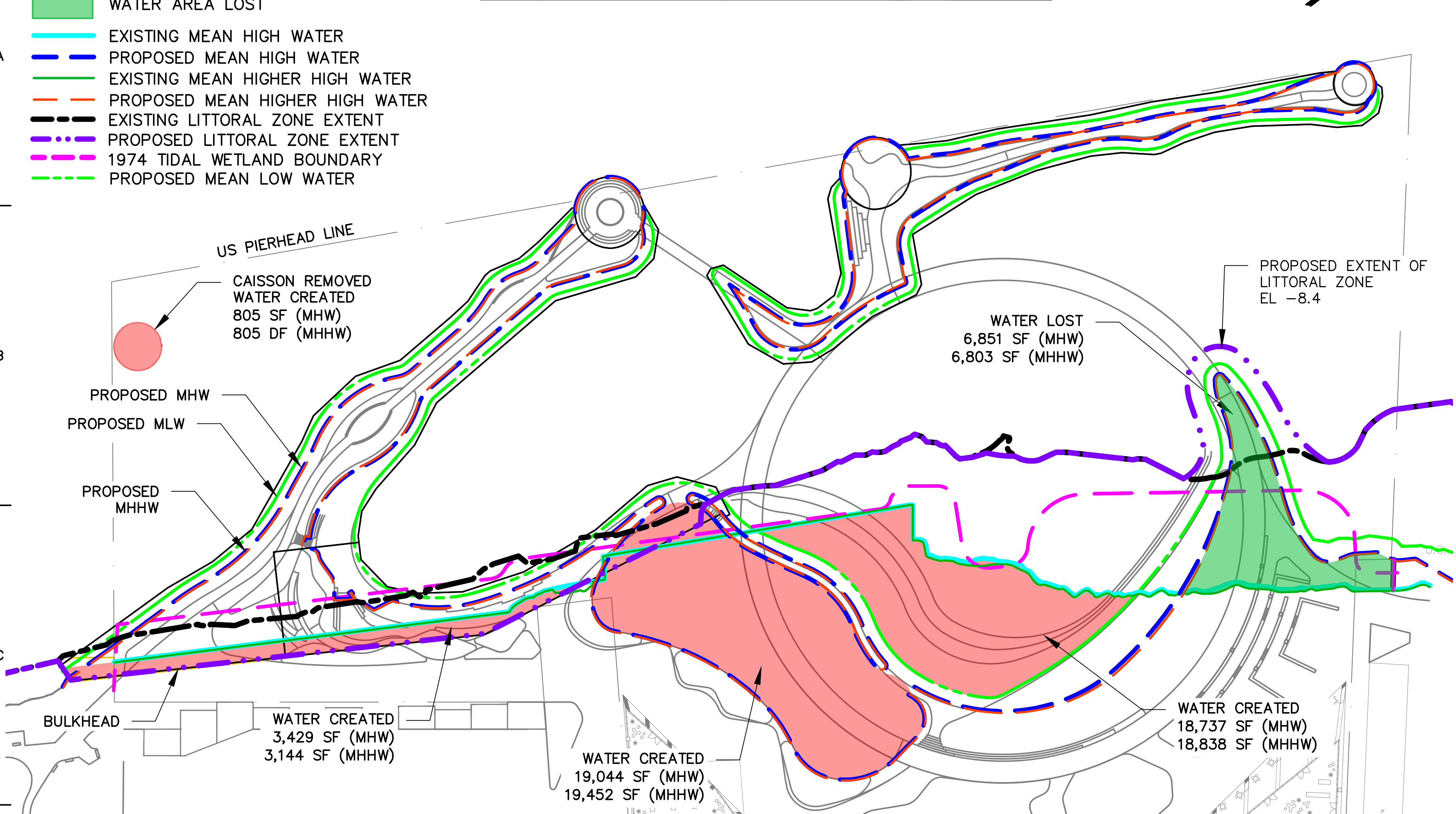
Drawing No.
W-503

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BL101-0109.dwg Date: 3/23/2021 Time: 17:21 User: kweg Style Table: Langan.stb Layout: Net Cover Chart Only

	WATER CREATED (SF)	WATER LOST (SF)	NET CHANGE (SF)
MHW	42,015	6,851	35,164 (CREATED)
MHHW	41,434	6,803	34,631 (CREATED)

LEGEND:

- WATER AREA CREATED
- WATER AREA LOST
- EXISTING MEAN HIGH WATER
- PROPOSED MEAN HIGH WATER
- EXISTING MEAN HIGHER HIGH WATER
- PROPOSED MEAN HIGHER HIGH WATER
- EXISTING LITTORAL ZONE EXTENT
- PROPOSED LITTORAL ZONE EXTENT
- 1974 TIDAL WETLAND BOUNDARY
- PROPOSED MEAN LOW WATER



NOTE:
BACKGROUND REFERENCED FROM A SITE PLAN DATED SEPTEMBER 17
2020 BY JAMES CORNER FIELD OPERATIONS.

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title

WATER AREA CREATED PLAN

Project No. 170594401

Date 3/15/2021

Drawn By CD

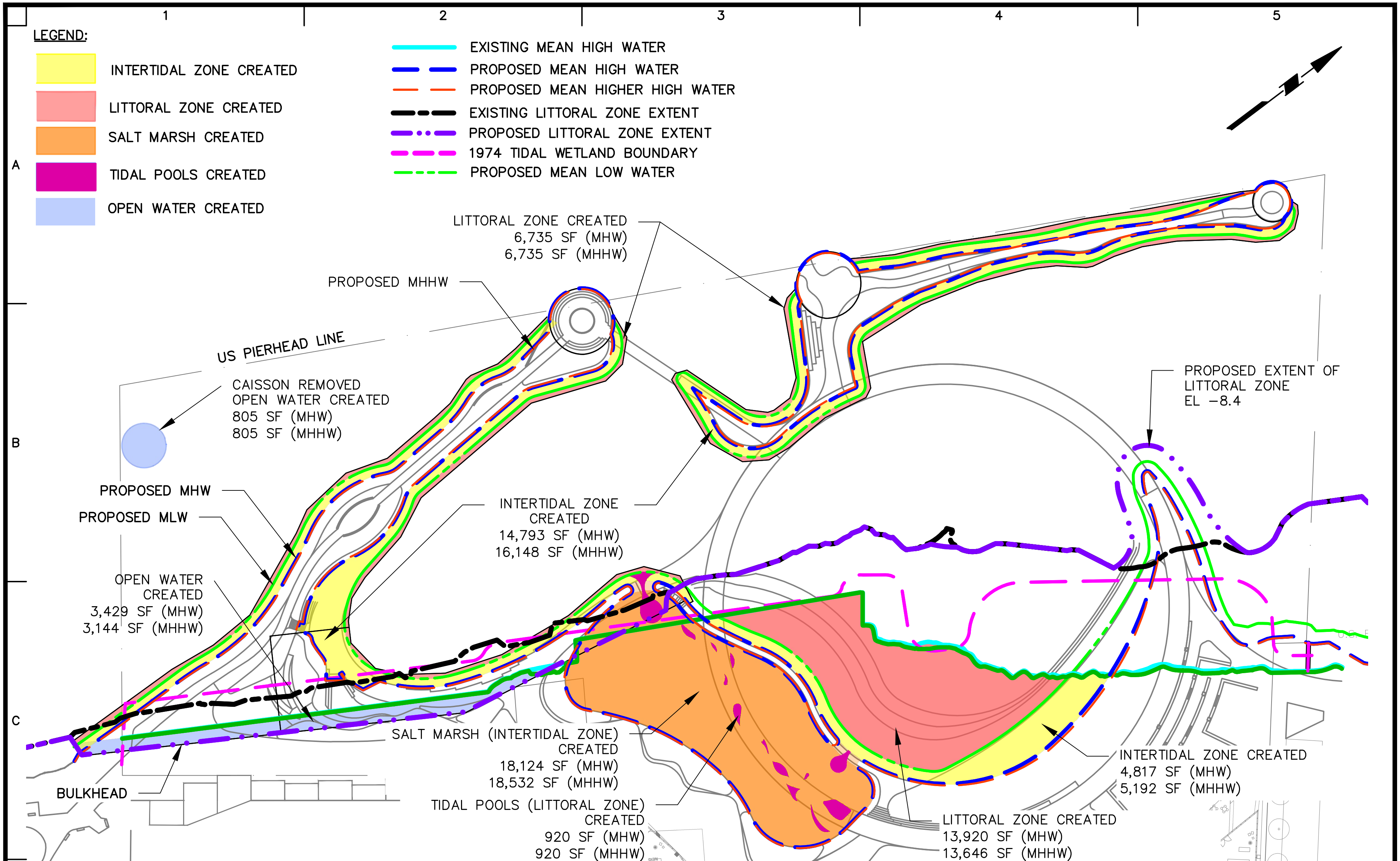
Checked By KH

Drawing No.

W-504

Sheet 37 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BL101-0109.dwg Date: 3/23/2021 Time: 17:21 User: kweg Style Table: Langan.stb Layout: WATER AREA CREATED PLAN



NOTE:
BACKGROUND REFERENCED FROM A SITE PLAN DATED SEPTEMBER 17
2020 BY JAMES CORNER FIELD OPERATIONS.

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SCALE IN FEET

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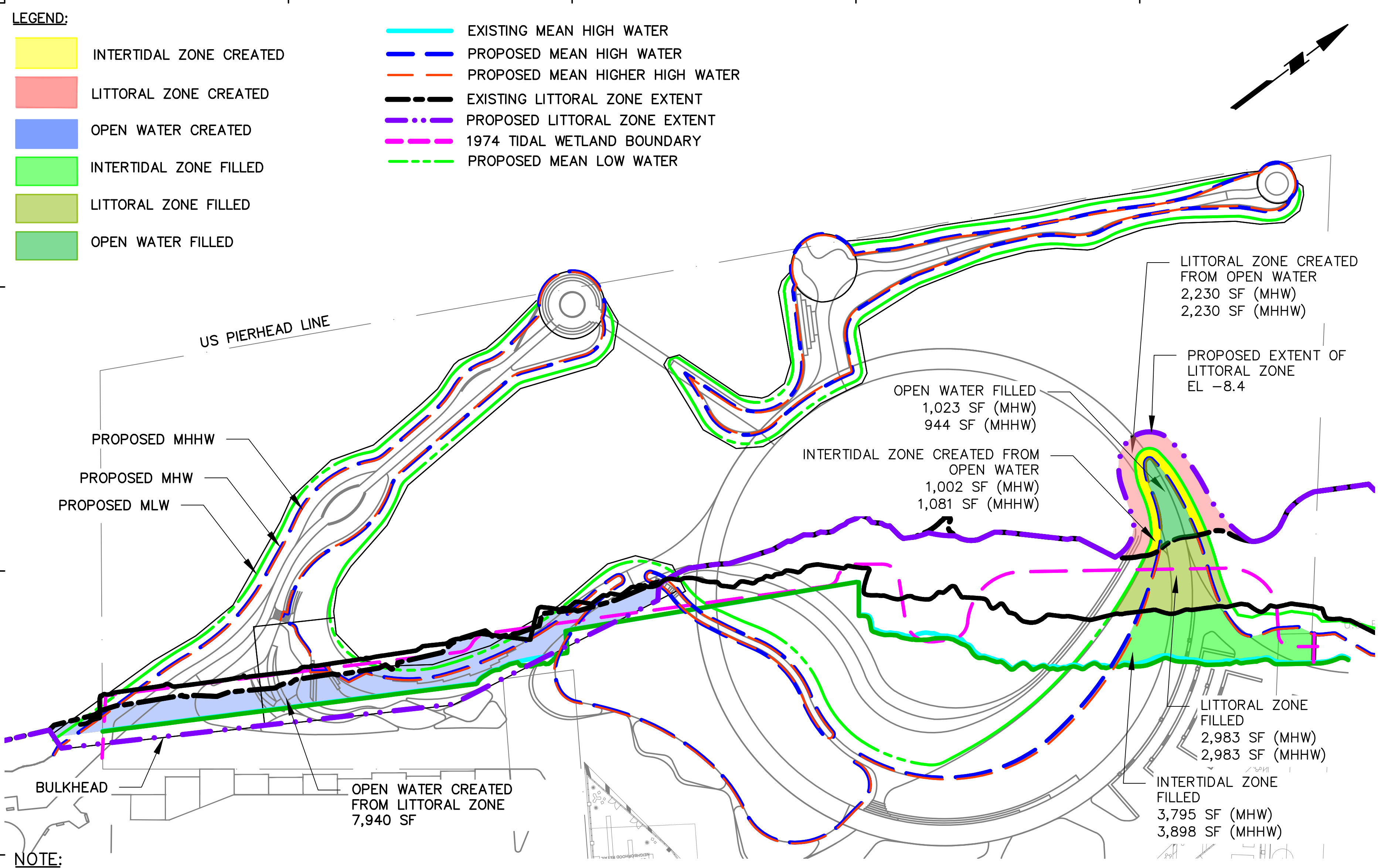
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C. 21 Penn Plaza, 360 West 31st Street, 8th Floor New York, NY 10001 T: 212.479.5400 F: 212.479.5444 www.langan.com	RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	NEW WETLAND ZONES CREATED PLAN	170594401 Date 3/15/2021 Drawn By CD Checked By KH	W-505 Sheet 38 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BL101-0109.dwg Date: 3/23/2021 Time: 17:21 User: kweg Style Table: Langan.stb Layout: NEW WETLAND ZONES CREATED PLAN



NOTE:
BACKGROUND REFERENCED FROM A SITE PLAN DATED SEPTEMBER 17 2020 BY JAMES CORNER FIELD OPERATIONS.

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Project	Drawing Title	Project No. 170594401	Drawing No.
RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	CHANGES TO EXISTING WETLAND ZONES	Date 3/15/2021 Drawn By CD Checked By KH	W-506 Sheet 39 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BL101-0109.dwg Date: 3/23/2021 Time: 17:21 User: kweg Style Table: Langan.stb Layout: CHANGES TO EXISTING WETLAND ZONES

WETLAND AREAS WITH RESPECT TO MEAN HIGH WATER				
WETLAND ZONE	NEW ZONES CREATED (SF) SEE W-505	CHANGES TO EXISTING WETLAND ZONES (SF) SEE W-506	EXISTING ZONES FILLED (SF) SEE W-506	NET CHANGE (SF)
OPEN WATER	4,234	4,708	(1,023)	7,919 (CREATED)
LITTORAL ZONE	20,655	(5,710)	(2,983)	11,962 (CREATED)
INTERTIDAL ZONE	19,610	1,002	(3,795)	16,817 (CREATED)
SALT MARSH	18,124			18,124 (CREATED)
TIDAL POOLS	920			920 (CREATED)
TOTAL	63,543	0	7,801	55,742 (CREATED)

WETLAND AREAS WITH RESPECT TO MEAN HIGHER HIGH WATER				
WETLAND ZONE	NEW ZONES CREATED (SF) SEE W-505	CHANGES TO EXISTING WETLAND ZONES (SF) SEE W-506	EXISTING ZONES FILLED (SF) SEE W-506	NET CHANGE (SF)
OPEN WATER	3,949	4,808	(944)	7,813 (CREATED)
LITTORAL ZONE	20,381	(5,889)	(2,983)	11,509 (CREATED)
INTERTIDAL ZONE	21,340	1,081	(3,898)	16,739 (CREATED)
SALT MARSH	18,532			18,532 (CREATED)
TIDAL POOLS	920			920 (CREATED)
TOTAL	65,122	0	7,825	55,513 (CREATED)

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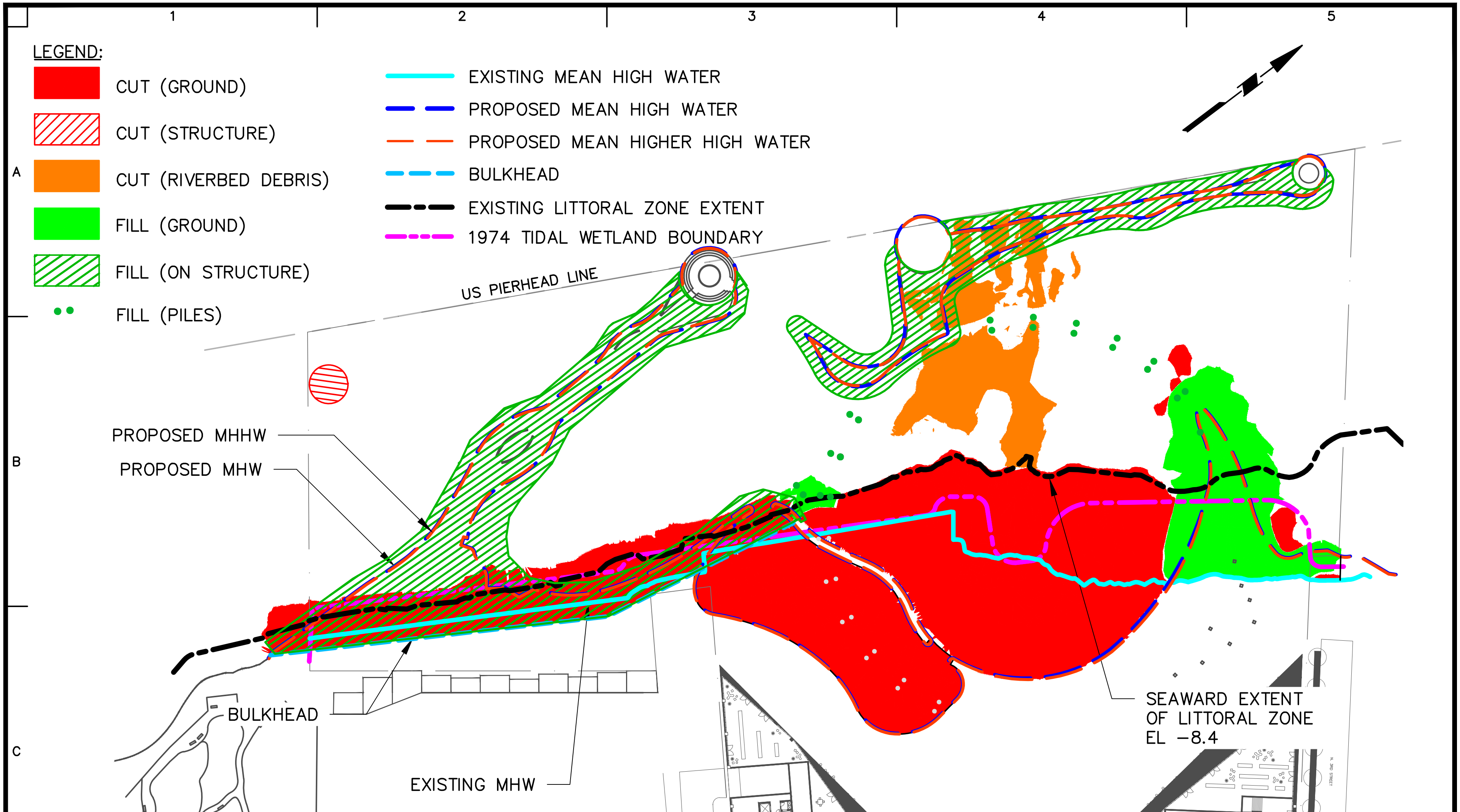
Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
NEW WETLAND ZONES SUMMARY TABLE

Project No. 170594401
Date 3/15/2021
Drawn By CD
Checked By KH

Drawing No.
W-507

Filename: c:\bms\langan-pw-01\dms41745\170594401-0201-BL101-0109.dwg Date: 3/23/2021 Time: 17:21 User: kweg Style Table: Langan.stb Layout: NEW WETLAND ZONES SUMMARY TABLE



NOTES:

1. BACKGROUND REFERENCED FROM A SITE PLAN DATED SEPTEMBER 17 2020 BY JAMES CORNER FIELD OPERATIONS.
2. REEF STRUCTURES ON RIVER BOTTOM ARE NOT SHOWN IN PLAN BUT ARE INCLUDED AS AN ALLOWANCE IN THE CUT/FILL VOLUME TABLE ON W-509.
3. EXISTING PILES TO BE REMOVED AND NEW PILES TO BE INSTALLED FOR THE BREAKWATER PLATFORMS ARE NOT SHOWN IN PLAN BUT ARE INCLUDED IN THE CUT/FILL VOLUME TABLE ON W-509.
4. FILL (ON STRUCTURE) REFERS TO FILL PLACED ABOVE THE BREAKWATER PLATFORMS. OPEN WATER REMAINS BENEATH THE PLATFORMS (I.E. FILL DOES NOT EXTEND TO RIVER BOTTOM).

120 0 60 120

SCALE IN FEET

LANGAN

Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001

T: 212.479.5400 F: 212.479.5444 www.langan.com

Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
NET CUT/FILL PLAN

Project No. 170594401
Date 3/15/2021
Drawn By CD
Checked By KH

Drawing No.
W-508

Sheet 41 of 43

Filename: c:\bms\langan-pw-01\dms41745\170594401-CA101-0101.DWG Date: 3/23/2021 Time: 17:21 User: kweg Style Table: Langan.stb Layout: NET CUT & FILL PLAN

		NET VOLUME (CY) MHW	NET VOLUME (CY) MHHW
Ex. Cofferdam Removed		-1097	-1109
Ex. Piles Removed		-187	-192
Riverbed Debris Removed		-674	-674
West Breakwater Platform		5965	6076
South Breakwater Platform		9428	9765
Breakwater Piles		790	790
Boardwalk Piles		61	62
Marsh and Tidal Pools		-3546	-3726
River Bottom	Cove	-11664	-11574
	Groin	2343	2445
	Bulkhead	-5977	-5977
Cofferdam Concrete Encasement		288	294
Net Volume (CY)		**-4270**	**-4000**

Reefs (allowance)	1695	1695
Net Volume (CY)	**-2575**	**-2305**

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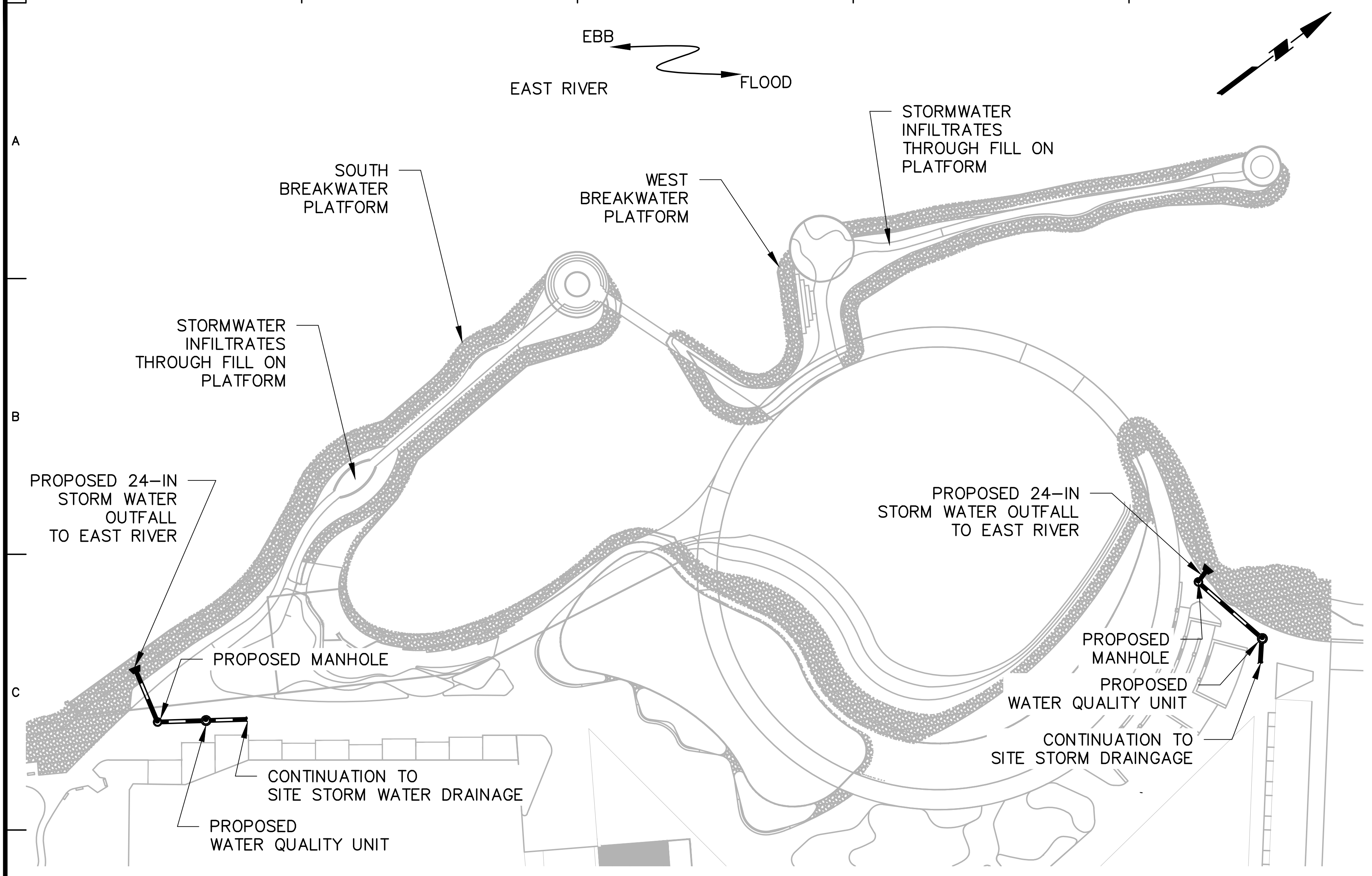
Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Drawing Title
NET CUT/FILL VOLUMES SUMMARY CHART

Project No. 170594401
Date 3/15/2021
Drawn By CD
Checked By KH

Drawing No.
W-509

Filename: c:\bms\langan-pw-01\dms41745\170594401-CA101-0101.DWG Date: 3/23/2021 Time: 17:21 User: kweg Style Table: Langan.stb Layout: NET CUT & FILL SUMMARY CHART



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New York, NY 10001

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Project	Drawing Title	Project No. 170594401	Drawing No.
RIVER RING BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	**OUTFALL PLAN**	Date 3/15/2021 Drawn By CD Checked By KH	**CS101** Sheet 43 of 43

ATTACHMENT A

JOINT PERMIT APPLICATION

New York State Department of Environmental Conservation | Office of General Services | Department of State | US Army Corps of Engineers

JOINT APPLICATION FORM

For Permits for activities activities affecting streams, waterways, waterbodies, wetlands, coastal areas, sources of water, and endangered and threatened species.

You must separately apply for and obtain Permits from each involved agency before starting work. Please read all instructions.

1. **Applications To:**

>NYS Department of Environmental Conservation — ☑ Check here to confirm you sent this form to NYSDEC.

Check all permits that apply:

- ☐ Stream Disturbance
- ☑ Excavation and Fill in Navigable Waters
- ☑ Docks, Moorings or Platforms
- ☐ Dams and Impoundment Structures
- ☑ 401 Water Quality Certification
- ☐ Freshwater Wetlands
- ☑ Tidal Wetlands
- ☐ Wild, Scenic and Recreational Rivers
- ☐ Coastal Erosion Management
- ☐ Water Withdrawal
- ☐ Long Island Well
- ☐ Incidental Take of Endangered / Threatened Species

>US Army Corps of Engineers — ☑ Check here to confirm you sent this form to USACE.

Check all permits that apply: ☑ Section 404 Clean Water Act ☑ Section 10 Rivers and Harbors Act

Is the project Federally funded? ☐ Yes ☑ No

If yes, name of Federal Agency:

General Permit Type(s), if known:

Preconstruction Notification: ☐ Yes ☑ No

>NYS Office of General Services — ☑ Check here to confirm you sent this form to NYSOGS.

Check all permits that apply:

- ☑ State Owned Lands Under Water
- ☐ Utility Easement (pipelines, conduits, cables, etc.)
- ☑ Docks, Moorings or Platforms

>NYS Department of State — ☑ Check here to confirm you sent this form to NYSDOS.

Check if this applies: ☑ Coastal Consistency Concurrence

2. **Name of Applicant**: River Street Partners LLC

Taxpayer ID (if applicant is NOT an individual): 83-2400736

Mailing Address: 45 Main Street

Post Office / City: Brooklyn | State: NY | Zip: 11201

Telephone: (718) 222-2500 | Email: BCampbell@Twotreesny.com

Applicant Must be (check all that apply): ☑ Owner ☐ Operator ☐ Lessee

3. **Name of Property Owner (if different than Applicant)**

Mailing Address:

Post Office / City: | State: | Zip:

Telephone: | Email:

For Agency Use Only	Agency Application Number:

4. **Name of Contact / Agent**
Kenneth Huber, PE c/o Langan

Mailing Address	Post Office / City	State	Zip
360 West 31st Street, 8th Floor	New York	NY	10001

Telephone: (212) 479-5415 Email: khuber@langan.com

5. **Project / Facility Name**
River Ring Development

Property Tax Map Section / Block / Lot Number:
Block 2355/Lot 1,20; 2361/1,20,21; 2376/6,50

Project Street Address, if applicable	Post Office / City	State	Zip
105 & 87 River Street	Brooklyn	NY	11211

Provide directions and distances to roads, intersections, bridges and bodies of water
Take Brooklyn-Queens Expressway to Metropolitan Avenue and head west. The project site is at the end of Metropolitan Avenue on the eastern bank of the East River

☐ Town ☐ Village ☑ City: New York
County: Kings
Stream/Waterbody Name: East River

Project Location Coordinates: Enter Latitude and Longitude in degrees, minutes, seconds:
Latitude: 40 ° 43 ' 6.3042 " Longitude: -73 ° 57 ' 58.1394 "

6. **Project Description:** Provide the following information about your project. Continue each response and provide any additional information on other pages. **Attach plans on separate pages.**

a. Purpose of the proposed project:
The purpose of the regulated work, in conjunction with an upland residential development, is to expand public waterfront access along the East River north from the Domino Park and Grand Ferry Park esplanade, while enhancing and sustaining habitat and increasing the resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. See Section 3.1 of the JPA Report

b. Description of current site conditions:
The site is about 390,000 square feet, with about 230,000 SF being lands underwater. The upland portion of the site is vacant with most of the site covered in compacted sand and gravel. The existing shoreline protection, described from south to north, consists of a 265-foot-long by 25-foot-wide wharf, a 65-foot-long riprap revetment, a 205-foot-long bulkhead, and a 285-foot-long cobble slope. There is a walkway apron adjacent to the bulkhead, and 3 piers that extend to the edge of the navigation channel, about 200 ft from shore. Four cellular caissons are spaced along the navigation channel; 3 of them are connected by pile-supported walkways and platforms. See Section 2.0 of the JPA Report.

c. Proposed site changes:
Removal of existing wharf, catwalks, platforms, dolphins and cellular caissons; construction of two pile supported breakwaters; construction of a pile-supported walkway from land to the breakwaters; excavation and fill to reshape the shoreline to create a groin and cove; shoreline protection consisting of a bulkhead (southern portion of the site) and riprap revetment or cobble sill (northern portion of the site); habitat creation on the breakwaters and along the shoreline; and construction of a shore public walkway. See Section 3.0 of the JPA Report.

d. Type of structures and fill materials to be installed, and quantity of materials to be used (e.g., square feet of coverage, cubic yards of fill material, structures below ordinary/mean high water, etc.):
The breakwaters and walkways would cover about 51,865 SF of water below MHW and 51,909 SF below MHHW; they would also cover about 4,650 SF of created water (at bulkhead & salt marsh) under MHW and 4,657 SF under MHHW. The breakwater structure and walkway piles would occupy about 4,048 CY of water below MHW and 4,049 CY below MHHW. The groin and breakwater berms would be constructed of soil and gravel fill with riprap and ECOncrete armoring, and would fill about 14,539 CY of water below MHW and 15,089 CY below MHHW. The project results in a net increase in water area of 55,742 SF at MHW and 55,513 SF at MHHW; a net cut of 2,575 CY below MHW and 2,305 CY below MHHW; and net increase in cover of 31,035 SF over MHW and 30,951 over MHHW (not including the cover over the created water).

e. Area of excavation or dredging, volume of material to be removed, location of dredged material placement:
Removal of all existing pile-supported structures (including a filled cellular caisson) would: (a) eliminate about 20,830 SF of cover over water at MHW and 20,938 SF of cover at MHHW; (b) remove 1,284 CY of fill below MHW and 1,301 CY below MHHW; and (c) create about 805 SF of water at MHW and MHHW. In addition, about 674 CY of debris would be removed from the river bottom. Excavation of the new cove, salt marsh and installing a new bulkhead would: (a) create about 41,210 SF at MHW and 41,434 SF at MHHW; and (b) remove another approximately 21,187 CY of historic fill below MHW and 21,277 CY below MHHW.

f. Is tree cutting or clearing proposed? ☐ Yes If Yes, explain below. ☑ No
Timing of the proposed cutting or clearing (month/year):
Number of trees to be cut: Acreage of trees to be cleared:

g. Work methods and type of equipment to be used:

Excavation of historic fill along the shoreline and placement of new fill for the groin, breakwater berms and armoring would be completed using an excavator staged upland of MHHW. Demolition of structures in/over water, installation of new piles and sheet piles, construction of new breakwaters and walkways in/over water, and removal of debris under water would all completed using a barge-mounted crane. Piles and sheet piles will be driven using a vibratory or impact hammer. The breakwater structure will be constructed of precast concrete elements; the walkway structure would be steel elements. Debris would be removed using a grapple or dredge bucket. Caisson encasement will be done by divers and supported by the barge-mounted crane.

h. Describe the planned sequence of activities:

Install soil erosion and sediment controls. Demolish existing structures to be removed. Remove debris under water. Install new bulkhead sheet piles. Excavate bulkhead, cove and salt marsh area. Backfill to construct groin. Install new piles. Erect breakwater structure and backfill to create berms. Install stormwater outfalls and water quality units. Install armoring along the shoreline and on the breakwater berms. Construct reefs, tide pools, salt marsh, and coastal scrub shrub areas. Erect elevated walkways. Complete upland development. Construct walkways and structural landscaping. Install upland plantings. Remove soil erosion and sediment controls.

i. Pollution control methods and other actions proposed to mitigate environmental impacts:

Heavy equipment would be operated only above water, either by setting equipment on land above MHHW or by setting equipment on a barge over water. Demolition debris and debris removed from the river bottom will be stockpiled in high-walled scow barges. Historic fill excavated along the shoreline will be stockpiled in containment areas lined with plastic; decanted water will be collected and either disposed offsite, or treated (if needed) and discharged to the East River. Excavated soils will be tested for waste characterization and disposed offsite or reused outside the TWAA in accordance with applicable regulations. Care will be taken to avoid dropping debris or soil into the water.

j. Erosion and silt control methods that will be used to prevent water quality impacts:

Temporary erosion protection measures would be provided and maintained throughout construction. A stabilized construction entrance will be installed at the construction entrance. During in-water work, best management practices, such as turbidity curtains or air curtains, would be used to contain sediments disturbed during construction. After in-water work is finished, a silt fence would be installed along the shoreline. Temporary erosion protection measures would be inspected regularly and repaired as necessary to maintain their function.

k. Alternatives considered to avoid regulated areas. If no feasible alternatives exist, explain how the project will minimize impacts:

Alternatives considered include (1) No Action, (2) Sheet Pile Bulkhead, (3) Vegetated Embankment, (4) Riprap and Planted Revetment, (5) No Breakwater, (6) Floating Wave Attenuators, (7) Cellular Wave Screen, (8) Partial-Depth Wave Screen, (9) Submerged Living Breakwater, (10) Relocated Commercial Space, (11) Relocated Kiosks, and (12) Preferred Alternative [protected cove]. See Section 4.0 of the JPA Report for details of each alternative.

l. Proposed use: ☐ Private ☑ Public ☐ Commercial

m. Proposed Start Date: Summer 2023 Estimated Completion Date: Summer 2025

n. Has work begun on project? ☐ Yes If Yes, explain below. ☑ No

o. Will project occupy Federal, State, or Municipal Land? ☐ Yes If Yes, explain below. ☑ No

p. List any previous DEC, USACE, OGS or DOS Permit / Application numbers for activities at this location:

N/A

q. Will this project require additional Federal, State, or Local authorizations, including zoning changes?

☑ Yes If Yes, list below. ☐ No

New York City Department of Small Business Services (NYCSBS) Waterfront Permit Unit
New York City Department of City Planning (NYCDCP) Waterfront Revitalization Program
New York City Uniform Land Use Review Procedure (ULURP)

7. **Signatures.**

Applicant and Owner (If different) must sign the application. If the applicant is the landowner, the **landowner attestation form** can be used as an electronic signature as an alternative to the signature below, if necessary. Append additional pages of this Signature section if there are multiple Applicants, Owners or Contact/Agents.

I hereby affirm that information provided on this form and all attachments submitted herewith is true to the best of my knowledge and belief.

Permission to Inspect - I hereby consent to Agency inspection of the project site and adjacent property areas. Agency staff may enter the property without notice between 7:00 am and 7:00 pm, Monday - Friday. Inspection may occur without the owner, applicant or agent present. If the property is posted with "keep out" signs or fenced with an unlocked gate, Agency staff may still enter the property. Agency staff may take measurements, analyze site physical characteristics, take soil and vegetation samples, sketch and photograph the site. I understand that failure to give this consent may result in denial of the permit(s) sought by this application.

False statements made herein are punishable as a Class A misdemeanor pursuant to Section 210.45 of the NYS Penal Law. Further, the applicant accepts full responsibility for all damage, direct or indirect, of whatever nature, and by whomever suffered, arising out of the project described herein and agrees to indemnify and save harmless the State from suits, actions, damages and costs of every name and description resulting from said project. In addition, Federal Law, 18 U.S.C., Section 1001 provides for a fine of not more than $10,000 or imprisonment for not more than 5 years, or both where an applicant knowingly and willingly falsifies, conceals, or covers up a material fact; or knowingly makes or uses a false, fictitious or fraudulent statement.

Signature of Applicant [signature] | Date: 4/21/21

Applicant Must be (check all that apply): ☑ Owner ☐ Operator ☐ Lessee

Printed Name: Bonnie Campbell | Title: Principal

Signature of Owner (if different than Applicant) | Date:

Printed Name: | Title:

Signature of Contact / Agent [signature] | Date: 04/21/2021

Printed Name: Kenneth A. Huber, PE | Title: Senior Project Manager

For Agency Use Only **DETERMINATION OF NO PERMIT REQUIRED**

Agency Application Number: ______

______ (Agency Name) has determined that No Permit is required from this Agency for the project described in this application.

Agency Representative:

Printed Name: ______ Title: ______

Signature: ______ Date: ______

ATTACHMENT B

ENVIRONMENTAL QUESTIONNAIRE

ENVIRONMENTAL QUESTIONNAIRE

This is intended to supplement ENG Form 4345, Application for Department of the Army Permit, or the Joint Application for Permit used in the State of New York. Please provide complete answers to all questions below which are relevant to your project. Any answers may be continued on separate sheet(s) of paper to be attached to this form.

PRIVACY ACT STATEMENT

The purpose of this form is to provide the Corps of Engineers with basic information regarding your project. This information will be used to facilitate evaluation of your permit application and for public dissemination as required by regulation. Failure to provide complete information may result in your application being declared incomplete for processing, thereby delaying processing of your application.

GENERAL--APPLICABLE TO ALL PROJECTS

1. Explain the need for, and purpose of, the proposed work.

The purpose of River Ring, including the regulated work in conjunction with an upland residential development, is to expand public waterfront access along the East River north from the Domino Park and Grand Ferry Park esplanade, while enhancing and sustaining habitat and increasing the resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. The redevelopment of the property would open public access to the waterfront on former industrial properties that have excluded all public waterfront access for about 200 years. This newly opened public access would greatly enhance recreational and educational opportunities in a safe and more natural setting than typical urban waterfront access projects. The Project would provide a stable and resilient waterfront and would create aquatic, upland and wetland vegetative communities that would promote fish and wildlife habitat development. Finally, the upland portion of River Ring would redevelop vacant, derelict and partially dilapidated urban waterfront properties with much needed affordable and market rate residential development.

2. Provide the names and addresses of property owners adjacent to your work site (if not shown on the application form or project drawings).

A list of adjacent landowners is provided in Attachment N.

(Please note that depending upon the nature and extent of your project, you may be requested to provide the names and addresses of additional property owners proximate to your project site to ensure proper coordination.)

3. Photographs of the project site should be submitted. For projects in tidal areas, photographs of the waterway vicinity should be taken at low tide. Using a separate copy of your plan view, indicate the location and direction of each photograph as well as the date and time at which the photograph was taken. Provide a sufficient number of photographs so as to provide a clear understanding of conditions on and proximate to your project site.

Photographs are provided in Attachment H.

4. Provide a copy of any environmental impact statement, or any other environmental report which was prepared for your project.

A comprehensive City and State Environmental Quality Review Act (CEQR/SEQR) Environmental Impact Statement (EIS) is being prepared as part of the Uniform Land Use Review Procedure (ULURP), with the City Planning Commission acting as Lead Agency. Copies would be provided under separate cover upon acceptance of the Draft EIS (DEIS).

5. Provide a thorough discussion of alternatives to your proposal. This discussion should include, but not necessarily be limited to, the "no action" alternative and alternative(s) resulting in less disturbance to waters of the United States. For filling projects in waters of the United States, including wetlands, your alternatives discussion should demonstrate that there are no practicable alternatives to your proposed filling and that your project meets with current mitigation policy (i.e. avoidance, minimization and compensation).

Alternatives considered include (1) No Action, (2) Sheet Pile Bulkhead, (3) Vegetated Embankment, (4) Riprap and Planted Revetment, (5) No Breakwater, (6) Floating Wave Attenuators, (7) Cellular Wave Screen, (8) Partial-Depth Wave Screen, (9) Submerged Living Breakwater, (10) Relocated Commercial Space, (11) Relocated Kiosks, and (12) Preferred Alternative [protected cove]. See Section 4.0 of the JPA Report for details of each alternative.

DREDGING PROJECTS

Answer the following if your project involves dredging.

The Project would not involve dredging sediments, but would involve excavation below water of historic fill along the shoreline that was placed over 150 years ago. The proposed excavation below water is described below.

1. Indicate the estimated volume of material to be dredged and the depth (below mean low water) to which dredging would occur. Would there be overdepth dredging?

The Project would not involve dredging sediments, but would involve excavation below water of historic fill along the shoreline that was placed over 150 years ago. Excavations would extend up to 6 feet below Mean Lower Low Water (MLLW) within the proposed cove and up to 11.5 feet below MLLW along the proposed bulkhead. Areas within the cove may be over-excavated by up to 2 feet below proposed mudline and backfilled with sand to create suitable substrate for the new shoreline shallows and eel grass pilot program habitats.

2. You can apply for a ten-year permit for maintenance dredging. If you wish to apply for a ten-year permit, please provide the number of additional dredging events during the ten-year life of the permit and the amount of material to be removed during future events.

N/A. No maintenance dredging is proposed.

3. Indicate of your drawings the dewatering area (if applicable) and disposal site for the dredged material (except landfill sites). Submit a sufficient number of photographs of the dewatering and disposal sites as applicable so as to provide a clear indication of existing conditions. For ten-year maintenance dredging permits, indicate the dewatering/disposal sites for future dredging events, if known.

Historic fill excavated along the shoreline would be stockpiled in containment areas lined with plastic; decanted water would be collected and either disposed offsite, or treated (if needed) and discharged to the East River. The location of the stockpiles has not yet been determined, but would within the site boundaries. Representative photographs of the site are included in Attachment H. Excavated soils would be tested for waste characterization and disposed offsite or reused outside the TWAA in accordance with applicable regulations.

4. Describe the method of dredging (i.e. clamshell, dragline, etc.) and the expected duration of dredging.

Excavation of historic fill along the shoreline and placement of new fill for the groin, breakwater berms and armoring would be completed using long reach excavators staged upland of MHHW and or staged on floating barges. A standard bucket would be used for excavation, except that a flat steel plate would be welded across the teeth for excavation within 6 inches of proposed subgrade.

5. Indicate the physical nature of the material to be dredged (i.e. sand, silt, clay, etc.) and provide estimated percentages of the various constituents if available. For beach nourishment projects, grain size analysis data is required.

The material to be excavated below water would be primarily of historic fill consisting of mostly sand with varying amounts of gravel, silt and clay.

6. Describe the method of dredged material containment (i.e. hay bales, embankment, bulkhead, etc.) and whether return flow from the dewatering/disposal site would reenter any waterway. Also indicate if there would be any barge overflow.

Historic fill excavated along the shoreline would be stockpiled in containment areas lined with plastic; decanted water would be collected and either disposed offsite, or treated (if needed) and discharged to the East River.

MOORING FACILITIES

Answer the following if your project includes the construction or rehabilitation of recreational mooring facilities.

1. It is generally recommended that any fixed piers and walk ramps be limited to four feet in width, and that floats be limited to eight feet in width and rest at least two feet above the waterway bottom at mean low water. Terminal floats at private, non-commercial facilities should be limited to 20 feet in length. If you do not believe your proposal can meet with these recommendations, please provide the reason(s).

N/A. No mooring facilities are proposed.

2. Using your plan view, show to scale the location(s), position(s) and size(s) (including length, beam and draft) of vessel(s) to be moored at the proposed facility, including those of transient vessel(s) if known.

N/A. No mooring facilities are proposed.

3. For commercial mooring sites such as marinas, indicate the capacity of the facility and indicate on the plan view the location(s) of any proposed fueling and/or sewage pumpout facilities. If pumpout facilities are not planned, please discuss the rationale below and indicate the distance to the nearest available pumpout station.

N/A. No mooring facilities are proposed.

4. Indicate on your plan view the distance to adjacent marine structures, if any are proximate and show the locations and dimensions of such structures.

N/A. No mooring facilities are proposed.

5. Discuss the need for wave protection at the proposed facility. Please be advised that if a permit is issued, you would be required to recognize that the mooring facility may be subject to wave action from wakes of passing vessels, whose operations would not be required to be modified. Issuance of a permit would not relieve you of ensuring the integrity of the authorized structure(s) and the United States would not be held responsible for damages to the structure(s) and vessel(s) moored thereto from wakes from passing vessels.

N/A. No mooring facilities are proposed.

BULKHEADING/BANK STABILIZATION/FILLING ACTIVITIES

Answer the following if your project includes construction of bulkheading (also retaining walls and seawalls) with backfill, filling of waters/wetlands, or any other bank stabilization fills such as riprap, revetments, gabions, etc.

1. Indicate the total volume of fill (including backfill behind a structure such as a bulkhead) as well as the volume of fill to be placed into waters of the United States. The amount of fill in waters of the United States can be determined by calculating the amount of fill to be placed below the plane of spring high tide in tidal areas and below ordinary high water in non-tidal areas.

The breakwaters and walkways would cover about 51,865 SF of water below MHW and 51,889 SF below MHHW; they would also cover about 4,650 SF of created water (including along the bulkhead and at the salt marsh) under MHW and 4,657 SF under MHHW. The breakwater structure and walkway piles would occupy about 4,048 CY of water below MHW and 4,049 CY below MHHW. The groin and breakwater berms would be constructed of clean soil and gravel fill with riprap and ECOncrete® armoring, and would fill about 14,539 CY of water below MHW and 15,089 CY below MHHW.

Removal of all existing pile-supported structures (including a filled cellular caisson) would: (a) eliminate about 20,830 SF of cover over water at MHW and 20,938 SF of cover at MHHW; (b) remove 1,284 CY of fill below MHW and 1,301 CY below MHHW; and (c) create about 805 SF of water at MHW and MHHW. In addition, about 674 CY of debris would be removed from the river bottom. Excavation of the new cove, salt marsh and installing a new bulkhead would: (a) create about 41,210 SF at MHW and 41,434 SF at MHHW; and (b) remove another approximately 21,187 CY of historic fill below MHW and 21,277 CY below MHHW.

The project results in a net increase in water area of 55,742 SF at MHW and 55,513 SF at MHHW; a net cut of 2,575 CY below MHW and 2,305 CY below MHHW; and net increase in cover of 31,035 SF over MHW and 30,951 over MHHW (not including the cover over the created water).

2. Indicate the source(s) and type(s) of fill material.

The breakwaters would be constructed of precast concrete tubs supported on steel piles. The top of the piles would be filled with concrete to connect the pile to the precast concrete tubs. The precast concrete tubs would be faced with ECOncrete® precast panels to promote biological growth on the vertical surface of the concrete. The tubs would be filled with combination of clean soil, stone, and geofoam to raise elevations within the tubs. A walkway (consisting of permeable pavers) would be created on top of the berm to allow public access on top of the breakwaters. The side slopes of the berms would extend below MLLW, with ecological armoring (consisting of a combination of riprap, ECO Armor Blocks, and COASTALOCK™ by ECOncrete®) on a clean gravel bedding providing protection from erosion. A steel sheet pile bulkhead would be installed at the upland edge of the south breakwater.

Elevated walkways would be constructed of steel bent beams, girders and grating (with at least 50% openings) supported on steel pipe piles.

The caissons would be encased with Fiber Reinforced Polymer (FRP) sheet pile jackets; the 3-inch annulus would be infilled with grout.

The groin would be constructed of clean soil with riprap on a clean gravel bedding providing protection from erosion. Ecological armoring (consisting of a combination of ECO Mat, ECO Armor Blocks, and COASTALINK™ by ECOncrete®) may be incorporated into the armoring along with riprap.

Areas within the cove that are over-excavated (as described in the "Dredging" section above) would be backfilled with clean sand to create suitable substrate for the new shoreline shallows and eel grass pilot program habitats. The shoreline of the cove would be protected from erosion with riprap armoring and clean gravel bedding.

3. Indicate the method of fill placement (i.e. by hand, bulldozer, crane, etc.). Would any temporary fills be required in waterways or wetlands to provide access for construction equipment? If so, please indicate the area of such waters and/or wetlands to be filled, and show on the plan and sectional views.

Excavation of historic fill along the shoreline and placement of new fill for the groin, breakwater berms and armoring would be completed using long reach excavators staged upland of MHHW and or staged on floating barges. Demolition of structures in/over water, installation of new piles and sheet piles, construction of new breakwaters and walkways in/over water, and removal of debris under water would all completed using a barge-mounted crane or demolition excavator.

Piles and sheet piles would be driven using a vibratory or impact hammer. The breakwater structure would be constructed of precast concrete elements; the walkway structure would be steel elements. Debris would be removed using a grapple or dredge bucket. Caisson encasement would be done by divers and supported by the barge-mounted crane.

Heavy equipment would be operated only above water, either by setting equipment on land above MHHW or by setting equipment on a barge over water. Demolition debris and debris removed from the river bottom would be stockpiled in high-walled scow barges. Historic fill excavated along the shoreline would be stockpiled in containment areas lined with plastic; decanted water would be collected and either disposed offsite, or treated (if needed) and discharged to the East River. Excavated soils would be tested for waste characterization and disposed offsite or reused outside the TWAA in accordance with applicable regulations. Care would be taken to avoid dropping debris or soil into the water.

Temporary erosion protection measures would be provided and maintained throughout construction. A stabilized construction entrance would be installed at the construction entrance. During in-water work, best management practices, such as a turbidity curtain installed along the shoreline or an air curtain installed along the navigation channel, would be used to contain sediment disturbed by construction. Currents in the East River range from 1 to 5 knots; any sediment resuspended during construction activity would quickly move away from the area and would be expected to dissipate dissipate rapidly and would not result in significant long-term impacts to water quality. After in-water work is finished, a silt fence would be installed along the shoreline. Temporary erosion protection measures would be inspected regularly and repaired as necessary to maintain their function.

The foregoing requests basic information on the most common types of projects requiring Department of the Army permits. It is intended to obviate or reduce the need for requesting additional information; however, additional information may be requested above and beyond what is requested in this form.

Please feel free to add any additional information regarding your project which you believe may facilitate our review.

ATTACHMENT C

FEDERAL COASTAL CONSISTENCY ASSESSMENT

NEW YORK STATE DEPARTMENT OF STATE
COASTAL MANAGEMENT PROGRAM

Federal Consistency Assessment Form

An applicant, seeking a permit, license, waiver, certification or similar type of approval from a federal agency which is subject to the New York State Coastal Management Program (CMP), shall complete this assessment form for any proposed activity that will occur within and/or directly affect the State's Coastal Area. This form is intended to assist an applicant in certifying that the proposed activity is consistent with New York State's CMP as required by U.S. Department of Commerce regulations (15 CFR 930.57). It should be completed at the time when the federal application is prepared. The Department of State will use the completed form and accompanying information in its review of the applicant's certification of consistency.

A. APPLICANT (please print)

1. Name: Bonnie Campbell / River Street Partners LLC

2. Address: 45 Main Street, Brooklyn, NY 11201

3. Telephone: Area Code ( ) 718-222-2500

B. PROPOSED ACTIVITY

1. Brief description of activity:

Removal of existing wharf, catwalks, platforms, dolphins and cellular caissons; construction of two pile supported breakwaters; construction of a pile-supported walkway from land to the breakwaters; excavation and fill to reshape the shoreline to create a groin and cove; shoreline protection consisting of a bulkhead (southern portion of the site) and riprap revetment or cobble sill (northern portion of the site); habitat creation on the breakwaters and along the shoreline; and construction of a shore public walkway. See Section 3.0 of the JPA Report.

2. Purpose of activity:

The purpose of River Ring, including the regulated work in conjunction with an upland residential development, is to expand public waterfront access along the East River north from Domino Park and Grand Ferry Park esplanade, while enhancing and sustaining habitat and increasing the resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. See Section 3.1 of the JPA Report

3. Location of activity:

Kings	Brooklyn	105 & 87 River Street
County	City, Town, or Village	Street or Site Description

4. Type of federal permit/license required: USACE Section 10/404 Individual Permit

5. Federal application number, if known:

6. If a state permit/license was issued or is required for the proposed activity, identify the state agency and provide the application or permit number, if known:

NYSDEC Protection of Waters, Excavation and Fill in Navigable Waters, and Tidal Wetlands Permit

C. COASTAL ASSESSMENT Check either "YES" or "NO" for each of these questions. The numbers following each question refer to the policies described in the CMP document (see footnote on page 2) which may be affected by the proposed activity.

1. Will the proposed activity result in any of the following:	YES	NO
a. Large physical change to a site within the coastal area which will require the preparation of an environmental impact statement? (11, 22, 25, 32, 37, 38, 41, 43)	☒	☐
b. Physical alteration of more than two acres of land along the shoreline, land under water or coastal waters? (2, 11, 12, 20, 28, 35, 44)	☒	☐
c. Revitalization/redevelopment of a deteriorated or underutilized waterfront site? (1)	☒	☐
d. Reduction of existing or potential public access to or along coastal waters? (19, 20)	☐	☒
e. Adverse effect upon the commercial or recreational use of coastal fish resources? (9,10) . . .	☐	☒
f. Siting of a facility essential to the exploration, development and production of energy resources in coastal waters or on the Outer Continental Shelf? (29)	☐	☒
g. Siting of a facility essential to the generation or transmission of energy? (27)	☐	☒
h. Mining, excavation, or dredging activities, or the placement of dredged or fill material in coastal waters? (15, 35)	☒	☐
i. Discharge of toxics, hazardous substances or other pollutants into coastal waters? (8, 15, 35)	☐	☒
j. Draining of stormwater runoff or sewer overflows into coastal waters? (33)	☒	☐
k. Transport, storage, treatment, or disposal of solid wastes or hazardous materials? (36, 39) .	☒	☐
l. Adverse effect upon land or water uses within the State's small harbors? (4)	☐	☒

2. Will the proposed activity affect or be located in, on, or adjacent to any of the following:	YES	NO
a. State designated freshwater or tidal wetland? (44)	☒	☐
b. Federally designated flood and/or state designated erosion hazard area? (11, 12, 17,)	☒	☐
c. State designated significant fish and/or wildlife habitat? (7)	☐	☒
d. State designated significant scenic resource or area? (24)	☐	☒
e. State designated important agricultural lands? (26)	☐	☒
f. Beach, dune or barrier island? (12)	☐	☒
g. Major ports of Albany, Buffalo, Ogdensburg, Oswego or New York? (3)	☐	☒
h. State, county, or local park? (19, 20)	☐	☒
i. Historic resource listed on the National or State Register of Historic Places? (23)	☐	☒

3. Will the proposed activity require any of the following:	YES	NO
a. Waterfront site? (2, 21, 22)	☒	☐
b. Provision of new public services or infrastructure in undeveloped or sparsely populated sections of the coastal area? (5)	☐	☒
c. Construction or reconstruction of a flood or erosion control structure? (13, 14, 16)	☒	☐
d. State water quality permit or certification? (30, 38, 40)	☒	☐
e. State air quality permit or certification? (41, 43)	☐	☒

4. Will the proposed activity occur within and/or affect an area covered by a State approved local waterfront revitalization program? (see policies in local program document) . . . . ☒ YES ☐ NO

D. ADDITIONAL STEPS

1. If all of the questions in Section C are answered "NO", then the applicant or agency shall complete Section E and submit the documentation required by Section F.

2. If any of the questions in Section C are answered "YES", then the applicant or agent is advised to consult the CMP, or where appropriate, the local waterfront revitalization program document*. The proposed activity must be analyzed in more detail with respect to the applicable state or local coastal policies. On a separate page(s), the applicant or agent shall: (a) identify, by their policy numbers, which coastal policies are affected by the activity, (b) briefly assess the effects of the activity upon the policy; and, (c) state how the activity is consistent with each policy. Following the completion of this written assessment, the applicant or agency shall complete Section E and submit the documentation required by Section F.

E. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with the State's CMP or the approved local waterfront revitalization program, as appropriate. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program, or with the applicable approved local waterfront revitalization program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Name: Kenneth Huber, PE c/o Langan

Address: 360 West 31st Street, 8th Floor, New York, NY 10001

Telephone: Area Code (212) 479-5415

Applicant/Agent's Signature: ______________ Date: 04/24/2021

F. SUBMISSION REQUIREMENTS

1. The applicant or agent shall submit the following documents to the **New York State Department of State, Office of Coastal, Local Government and Community Sustainability, Attn: Consistency Review Unit, 1 Commerce Plaza, 99 Washington Avenue - Suite 1010, Albany, New York 12231.**

a. Copy of original signed form.
b. Copy of the completed federal agency application.
c. Other available information which would support the certification of consistency.

2. The applicant or agent shall also submit a copy of this completed form along with his/her application to the federal agency.

3. If there are any questions regarding the submission of this form, contact the Department of State at (518) 474-6000.

*These state and local documents are available for inspection at the offices of many federal agencies, Department of environmental Conservation and Department of State regional offices, and the appropriate regional and county planning agencies. Local program documents are also available for inspection at the offices of the appropriate local government.

New York State Coastal Management Program
Consistency Assessment Form
Section C– Coastal Assessment
River Ring Development
Brooklyn, New York

This document provides an assessment of the effects of the proposed Project relevant to the New York State Coastal Management Program policies and standards identified in Section C of the attached Federal Consistency Assessment Form. The relevant policies and applicable standards are listed below in **bold** and are followed by compliance statements describing how the proposed activities would be consistent with the goals of the policies and standards.

Policy 1: Restore, revitalize, and redevelop deteriorated and underutilized waterfront areas for commercial, industrial, cultural, recreational and other compatible uses.

Compliance Statement: The purpose of River Ring, including the regulated work, in conjunction with an upland residential development, is to expand public waterfront access along the East River north from the Domino Park and Grand Ferry Park esplanade, while enhancing and sustaining habitat and increasing the resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. The redevelopment of the property would open public access to the waterfront on former industrial properties that have excluded all public waterfront access for about 200 years. This newly opened public access would greatly enhance recreational and educational opportunities in a safe and more natural setting than typical urban waterfront access projects. The Project would provide a stable and resilient waterfront and would create aquatic, upland and wetland vegetative communities that would promote fish and wildlife habitat development. Finally, the upland portion of River Ring would redevelop vacant, derelict and partially dilapidated urban waterfront properties with much needed affordable and market rate residential development.

River Ring would create approximately 267,840 SF of new waterfront public space (including upland, intertidal, and in-river water accessible areas) to facilitate the continuation of public waterfront access from Domino Park and Grand Ferry. River Ring would expand public waterfront access along the East River from Grand Ferry Park (and Domino Park beyond) to the south, while enhancing and creating habitat and increasing the shoreline protection and resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. Active areas within the waterfront public space area would include approximately 125,150 SF of upland open space along the waterfront; 39,390 SF of intertidal area; and 103,300 SF of protected open water space within the East River for publicly accessible recreation. The waterfront portion of the proposed Project would provide public waterfront access, encourage water-dependent recreation, create mosaic of native intertidal and sub-tidal habitats, and encourage ecological education. The proposed Project is completely water dependent, as it features public waterfront access, in-water recreation, and in-water habitat creation.

The upland development includes two new mixed income residential towers, new waterfront public space, and an esplanade. The new buildings would have a gross floor area of approximately 1.27 million gross square feet (GSF). The building footprints only account for about 30% of the available upland area. The remaining 70% of the developable area is being dedicated to creating a world class public park, which would include an estimated 900 ft long shore public walkway along the East River that would create a continuous connection from Grand Ferry Park to N. 3rd Street

Based on this information, the proposed Project is consistent with this policy.

Policy 2: Facilitate the sitting of water dependent uses and facilities on or adjacent to coastal waters.

Compliance Statement: The proposed in-water and shoreline improvements would include demolition of all existing in-water structures except for three of the existing caissons, reshaping of the entire shoreline to create a protected cove (via in-water excavation and backfill), construction of new shoreline protection measures (e.g., bulkhead, revetment), construction of new breakwaters in consideration of navigational interests and to protect the cove and the habitats that would be created inside the breakwaters, construction of new walkways connecting to the breakwaters, and creation and enhancement of in-water and upland vegetative habitats (e.g., man-made reefs, salt marsh, tide pools, coastal scrub shrubs).

The waterfront portion of the proposed Project would provide public waterfront access, encourage water-dependent recreation, create various types of in-water habitats, and encourage ecological education. The proposed Project is heavily water dependent, as it features public waterfront access, in-water recreation, and in-water habitat creation.

Based on this information, the proposed Project is consistent with this policy.

Policy 11: Buildings and other structures will be sited in the coastal area so as to minimize damage to property and the endangering of human lives caused by flooding and erosion.

Compliance Statement: Breakwaters and other structures constructed to protect the cove would significantly improve the flood resiliency of the site, particularly by dissipating the energy of crashing waves during storms. The western side of the site is within a Special Flood Hazard Area "VE"-Zone, meaning that the shoreline is subject to breaking waves in excess of three feet in height. The Base Flood Elevation (BFE), shown on the Preliminary FIRM, is determined by adding the estimated flood wave height to the estimated stillwater flood. In order to account for sea level rise, the FEMA 100-year return period stillwater flood level is increased by 1.5 feet, based on NY State DEC Guidelines (Part 490, 6 NYCRR).

By constructing the two wave breaks and groin, flood waves would break away from the shoreline; wave heights inside the protected area would be reduced to one foot or less along the shoreline, which significantly reduces the elevation of protection needed (in other words, BFE can be reduced by the amount the wave height is reduced). In addition, the shoreline protection (consisting of ecological armoring on the breakwaters, riprap armoring on the groin, and pebble/cobble river rock armoring on the sills) provides adequate protection against erosion and reduces wave run-up, further protecting the public waterfront open space and the buildings beyond.

Based on this information, the proposed Project is consistent with this policy.

Policy 12: Activities or development in the coastal area will be undertaken so as to minimize damage to natural resources and property from flooding and erosion by protecting natural protective features including beaches, dunes, barrier islands and bluffs.

Compliance Statement: No natural protective features would be affected by the proposed work. The proposed breakwaters, groin, and cove are more protective against flooding and erosion than the existing rubble shorelines and bulkheads.

Based on this information, the proposed Project is consistent with this policy.

Policy 13: The construction or reconstruction of erosion protection structures shall be undertaken only if they have a reasonable probability for controlling erosion for at least thirty years as demonstrated in design and construction standards and/or assured maintenance or replacement programs.

Compliance Statement: Erosion protection would consist of two pile-supported breakwaters at the south and west sides of the site (to protect the site from waves from the southwest) with ecological armoring on the breakwaters, a soil and rock-filled groin at the north side of the site (to protect the site from waves from the northwest) with riprap armoring, pebble/cobble river rock sill along the shoreline adjacent to the beach, riprap armoring along the shoreline adjacent to the salt marsh, and a bulkhead (upland of the south breakwater) along the shoreline south of the salt marsh. The system is specifically designed to protect the cove and inshore structures from erosion due to daily-occurring waves and wakes from passing vessels on the East River, as well as storm-generated waves during floods per FEMA flood studies. The Project has accounted for up to 1.5 feet for sea-level rise through the year 2059. The erosion protection measures have been designed to have a 50 year design life. The erosion protection measures would be inspected on a regular basis (about every 3 to 5 years) and would be maintained by addressing any concerns raised by the routine inspections.

Based on this information, the proposed Project is consistent with this policy.

Policy 14: Activities and development, including the construction or reconstruction of erosion protection structures, shall be undertaken so that there will be no measurable increase in erosion or flooding at the site of such activities or development, or at other locations.

Compliance Statement: The existing shoreline no longer provides adequate protection against erosion, and needs to be replaced. The Project would provide a stable and resilient shoreline that would protect against erosion, greatly improve resiliency during storm events and create protected area for habitat creation and active in-water recreation, without compromising navigation in the East River. the shoreline protection (described below, consisting of ecological armoring on the breakwaters, riprap armoring on the groin and the salt marsh sill, and pebble/cobble river rock armoring on the beach sill) provides adequate protection against erosion and reduces wave run-up, further protecting the public waterfront open space and the buildings beyond. Furthermore, the proposed development would reduce flooding, wave magnitude during storms, and wave run-up on adjacent properties, especially at 184 Kent Avenue and 1 North 4th Place, immediately north of the site.

Based on this information, the proposed Project is consistent with this policy.

Policy 15: Mining, excavation or dredging in coastal waters shall not significantly interfere with the natural coastal processes which supply beach materials to land adjacent to such waters and shall be undertaken in a manner which will not cause an increase in erosion of such land.

Compliance Statement: Preliminary sediment transport modeling has demonstrated that the Project would not significantly alter the natural processes in the East River. The constructed cover would become neither a zone of erosion nor a zone of accretion; the Project would not interfere with the natural processes occurring elsewhere.

Based on this information, the proposed Project is consistent with this policy.

Policy 16: Public funds shall only be used for erosion protection structures when necessary to protect human life, and new development which requires a location within or adjacent to an erosion hazard area to be able to function, or an existing development; and only where the public benefits outweigh the long term monetary and other costs

including the potential for increased erosion and adverse effects on natural protective features.

Compliance Statement: No public funds would be used for erosion protection structures.

Based on this information, the proposed Project is consistent with this policy.

Policy 17: Non-structural measures to minimize damage to natural resources and property from flooding and erosion shall be used whenever possible.

Compliance Statement: Non-structural erosion protection measures (such as vegetated slope) would not provide adequate erosion protection for the wake and wave energies experienced in this portion of the East River and would not allow in-water recreation or habitat creation at the site. See the Joint Permit Application Report Section 4.0 for all alternatives considered.

Based on this information, the proposed Project is consistent with this policy.

Policy 20: Access to the publicly-owned foreshore and to lands immediately adjacent to the foreshore or the water's edge that are publicly-owned shall be provided and it shall be provided in a manner compatible with adjoining uses.

Compliance Statement: The purpose of River Ring, including the regulated work in conjunction with an upland residential development, is to expand public waterfront access along the East River north from the Domino Park and Grand Ferry Park esplanade, while enhancing and sustaining habitat and increasing the resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. The redevelopment of the property would open public access to the waterfront on former industrial properties that have excluded all public waterfront access for about 200 years. This newly opened public access would greatly enhance recreational and educational opportunities in a safe and more natural setting than typical urban waterfront access projects. The Project would provide a stable and resilient waterfront and would create aquatic, upland and wetland vegetative communities that would promote fish and wildlife habitat development. Finally, the upland portion of River Ring would redevelop vacant, derelict and partially dilapidated urban waterfront properties with much needed affordable and market rate residential development.

Based on this information, the proposed Project is consistent with this policy.

Policy 21: Water dependent and water enhanced recreation will be encouraged and facilitated, and will be given priority over non-water related uses along the coast.

<u>Compliance Statement:</u> The waterfront portion of the proposed Project would provide public waterfront access, encourage water-dependent recreation, create various types of in-water habitats, and encourage ecological education. The proposed Project is completely water dependent, as it features public waterfront access, in-water recreation, and in-water habitat creation.

Based on this information, the proposed Project is consistent with this policy.

Policy 22: Development when located adjacent to the shore will provide for water-related recreation whenever such use is compatible with reasonably anticipated demand for such activities, and is compatible with the primary purpose of the development.

<u>Compliance Statement:</u> The Project would provide significant opportunities for water-related recreation. A beach would be constructed at the northern portion of the shoreline to encourage passive recreation and enjoyment at the water's edge. A ramp for kayaks and paddleboards would be constructed at the southern portion of the shoreline to allow for boating within the protected cove without interference with commercial navigation on the East River. Kayak and paddleboard rentals, along with changing and locker rooms and public restrooms, would be available in the first floor of the buildings. Tenants in kiosks and on the first floor of the building and would further support and activate recreation along the shoreline and provide educational opportunities about shoreline ecology and the environment. Walkways would be constructed beside and over the salt marsh, allowing for observation of a newly created habitat at the shoreline.

Based on this information, the proposed Project is consistent with this policy.

Policy 25: Protect, restore or enhance natural and man-made resources which are not identified as being of statewide significance, but which contribute to the overall scenic quality of the coastal area.

<u>Compliance Statement:</u> The proposed Project would significantly improve the scenic quality of the coastal area. The redevelopment of the property would open public access to the waterfront on former industrial properties that have excluded all public waterfront access for about 200 years. Dilapidated waterfront structures would be removed and the existing shoreline would be reshaped to create a more natural looking curvilinear shoreline with beach,

salt marsh, tide pools and other coastal habitats. View corridors would be created to provide inviting portals to the water's edge. A shore public walkway would provide public access to the waterfront and the open space views up and down the River and across to Manhattan. The elevated circular walkway would provide access out to the breakwaters, which have designated spots for scenic overlooks and bird watching.

Based on this information, the proposed Project is consistent with this policy.

Policy 28: Ice management practices shall not interfere with the production of hydroelectric power, damage significant fish and wildlife and their habitats, or increase shoreline erosion or flooding.

Compliance Statement: Ice management is not necessary for this Project.

Based on this information, the proposed Project is consistent with this policy.

Policy 30: Municipal, industrial, and commercial discharge of pollutants, including but not limited to, toxic and hazardous substances, into coastal waters will conform to state and national water quality standards.

Compliance Statement: The proposed Project does not propose municipal, industrial, or commercial discharge.

Based on this information, the proposed Project is consistent with this policy.

Policy 32: Encourage the use of alternative or innovative sanitary waste systems in small communities where the costs of conventional facilities are unreasonably high, given the size of the existing tax base of these communities.

Compliance Statement: This policy doesn't apply to Brooklyn, NY and a sanitary sewer is available in the streets adjacent to the site.

Based on this information, the proposed Project is consistent with this policy.

Policy 33: Best management practices will be used to ensure the control of stormwater runoff and combined sewer overflows draining into coastal waters.

Compliance Statement: Stormwater would be collected and directed to two new 24-inch diameter private stormwater outfalls to manage stormwater runoff from the proposed development: one at the northern end of the site and one at the southern end of the site. Water quality units would be installed upstream of the outfalls to treat stormwater before discharge to the East River. The water quality units would be designed to treat stormwater in accordance with the New York State Stormwater Management Design Manual. Tide gates would be installed inside manholes downstream from each water quality unit. By collecting, treating and directing stormwater to the East River, we are alleviating flows in the combined sewer system during storms, when peak flows are expected in the existing sewer system.

Based on this information, the proposed Project is consistent with this policy.

Policy 35: Dredging and filling in coastal waters and disposal of dredged material will be undertaken in a manner that meets existing State dredging permit requirements, and protects significant fish and wildlife habitats, scenic resources, natural protective features, important agricultural lands, and wetlands.

Compliance Statement: Excavation of historic fill along the shoreline and placement of new fill for the groin, breakwater berms and armoring would be completed using long reach excavators staged upland of MHHW and or staged on floating barges. Demolition of structures in/over water, installation of new piles and sheet piles, construction of new breakwaters and walkways in/over water, and removal of debris under water would all completed using a barge-mounted crane or demolition excavator.

Piles and sheet piles would be driven using a vibratory or impact hammer. The breakwater structure would be constructed of precast concrete elements; the walkway structure would be steel elements. Debris would be removed using a grapple or dredge bucket. Caisson encasement would be done by divers and supported by the barge-mounted crane.

Heavy equipment would be operated only above water, either by setting equipment on land above MHHW or by setting equipment on a barge over water. Demolition debris and debris removed from the river bottom would be stockpiled in high-walled scow barges. Historic fill excavated along the shoreline would be stockpiled in containment areas lined with plastic; decanted water would be collected and either disposed offsite or treated (if needed) and discharged to the East River. Excavated soils would be tested for waste characterization and disposed offsite or reused outside the TWAA in accordance with applicable regulations. Care would be taken to avoid dropping debris or soil into the water.

Based on this information, the proposed Project is consistent with this policy.

Policy 36: Activities related to the shipment and storage of petroleum and other hazardous materials will be conducted in a manner that will prevent or at least minimize spills into coastal waters; all practicable efforts will be undertaken to expedite the cleanup of such discharges; and restitution for damages will be required when these spills occur.

Compliance Statement: About 21,187 CY of potentially contaminated historic fill would be excavated below MHW from the shoreline as part of this Project. Historic fill excavated along the shoreline would be stockpiled in containment areas lined with plastic; decanted water would be collected and either disposed offsite, or treated (if needed) and discharged to the East River. Excavated soils would be tested for waste characterization and disposed offsite or reused outside the TWAA in accordance with applicable regulations. Care would be taken to avoid dropping debris or soil into the water.

Based on this information, the proposed Project is consistent with this policy.

Policy 37: Best management practices will be utilized to minimize the non-point discharge of excess nutrients, organics and eroded soils into coastal waters.

Compliance Statement: Temporary erosion protection measures would be provided and maintained throughout construction. A stabilized construction entrance would be installed at the construction entrance. During in-water work, best management practices, such as a turbidity curtain installed along the shoreline or an air curtain installed along the navigation channel, would be used to contain sediment disturbed by construction. Currents in the East River range from 1 to 5 knots; any sediment resuspended during construction activity would quickly move away from the area and would be expected to dissipate dissipate rapidly and would not result in significant long-term impacts to water quality. After in-water work is finished, a silt fence would be installed along the shoreline. Temporary erosion protection measures would be inspected regularly and repaired as necessary to maintain their function.

Based on this information, the proposed Project is consistent with this policy.

Policy 38: The quality and quantity of surface water and ground water supplies, will be conserved and protected, particularly where such waters constitute the primary or sole source of water supply.

Compliance Statement: The Project is not near sources of water supply and would not affect sources of water supply.

Based on this information, the proposed Project is consistent with this policy.

Policy 39: The transport, storage, treatment and disposal of solid wastes, particularly hazardous wastes, within coastal areas will be conducted in such a manner so as to protect groundwater and surface water supplies, significant fish and wildlife habitats, recreation areas, important agricultural land, and scenic resources.

Compliance Statement: About 21,187 CY of potentially contaminated historic fill would be excavated below MHW from the shoreline as part of this Project. Historic fill excavated along the shoreline would be stockpiled in containment areas lined with plastic; decanted water would be collected and either disposed offsite, or treated (if needed) and discharged to the East River. Excavated soils would be tested for waste characterization and disposed offsite or reused outside the TWAA in accordance with applicable regulations. Care would be taken to avoid dropping debris or soil into the water.

Temporary erosion protection measures would be provided and maintained throughout construction. A stabilized construction entrance would be installed at the construction entrance. During in-water work, best management practices, such as a turbidity curtain installed along the shoreline or an air curtain installed along the navigation channel, would be used to contain sediment disturbed by construction. Currents in the East River range from 1 to 5 knots; any sediment resuspended during construction activity would quickly move away from the area and would be expected to dissipate dissipate rapidly and would not result in significant long-term impacts to water quality. After in-water work is finished, a silt fence would be installed along the shoreline. Temporary erosion protection measures would be inspected regularly and repaired as necessary to maintain their function.

Based on this information, the proposed Project is consistent with this policy.

Policy 40: Effluent discharged from major steam electric generating and industrial facilities into coastal waters will not be unduly injurious to fish and wildlife and shall conform to state water quality standards.

Compliance Statement: The proposed Project is not a steam electric generating or industrial facility.

Based on this information, the proposed Project is consistent with this policy.

Policy 41: Land use or development in the coastal area will not cause national or State air quality standards to be violated.

Compliance Statement: The proposed Project would create approximately 267,840 SF of new waterfront public space (including upland, intertidal, and in-river water accessible areas) to facilitate the continuation of public waterfront access from Domino Park and Grand Ferry. The Project would expand public waterfront access along the East River from Grand Ferry Park (and Domino Park beyond) to the south, while enhancing and creating habitat and increasing the shoreline protection and resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. The upland portion of the Project includes a new residential development with two new mixed income residential towers, new waterfront public space, and an esplanade.

The proposed development would not have a negative effect on air quality.

Based on this information, the proposed Project is consistent with this policy.

Policy 43: Land use or development in the coastal area must not cause the generation of significant amounts of the acid rain precursors: nitrates and sulfates.

Compliance Statement: The proposed Project does not involve the generation of significant amounts of nitrates and sulfates.

Based on this information, the proposed Project is consistent with this policy.

Policy 44: Preserve and protect tidal and freshwater wetlands and preserve the benefits derived from these areas.

Compliance Statement: The Project results in a net increase of water area of 55,742 SF at MHW and 55,591 SF at MHHW; and a net cut of 2,575 CY below MHW and 2,305 below MHHW. While the Project results in a net increase in cover over water of 31,035 SF over MHW and 30,951 over MHHW, about 99% of the water being covered is open water, with water depths generally greater than 20 feet where light doesn't penetrate to the river bottom.

In addition, the Project would create a total of 106,804 SF (2.45 acres) or new or enhanced habitat, including the following:

- About 19,044 SF of salt marsh and tide pools would be created along the cove between the beach and the boat ramp.
- About 21,137 SF of upland coastal scrub shrub areas would be created on large portions of the breakwaters, on the north and south end of the beach, and various upland locations along the shore public walkway.
- About 21,996 SF of man-made reefs would be created on the river bottom adjacent to the breakwaters, along the shoreline east of the salt marsh, and on the south side of the groin (within the protected cove).
- About 17,855 SF of shoreline shallows would be created within the cove adjacent to the public beach and salt marsh.
- About 6,735 SF of new Littoral Zone habitat and about 14,793 SF of new Intertidal Zone habitat would be created on the new breakwaters at MHW (about 6,735 SF of Littoral Zone habitat and 16,226 SF of Intertidal Zone habitat at MHHW). In addition, the excavation to create the cove and salt marsh would net another about 5,227 SF of created Littoral Zone and about 2,024 SF of Intertidal Zone along the shoreline at MHW (about 4,774 SF net created Littoral Zone and 591 SF of net created Intertidal Zone at MHHW).
- About 9,958 SF of eel grass would be planted within the sandy substrate of the shoreline shallows as a pilot program.

Based on this information, the proposed Project is consistent with this policy.

ATTACHMENT D

NYC WATERFRONT REVITALIZATION PROGRAM ASSESSMENT

FOR INTERNAL USE ONLY	WRP No. ______
Date Received: ______	DOS No. ______

NEW YORK CITY WATERFRONT REVITALIZATION PROGRAM
Consistency Assessment Form

Proposed actions that are subject to CEQR, ULURP or other local, state or federal discretionary review procedures, and that are within New York City's Coastal Zone, must be reviewed and assessed for their consistency with the *New York City Waterfront Revitalization Program* (*WRP*) which has been approved as part of the State's Coastal Management Program.

This form is intended to assist an applicant in certifying that the proposed activity is consistent with the WRP. It should be completed when the local, state, or federal application is prepared. The completed form and accompanying information will be used by the New York State Department of State, the New York City Department of City Planning, or other city or state agencies in their review of the applicant's certification of consistency.

A. APPLICANT INFORMATION

Name of Applicant: River Street Partners LLC

Name of Applicant Representative: Bonnie Campbell

Address: 45 Main Street, Brooklyn, NY 11201

Telephone: 718-222-2500 Email: BCampbell@Twotreesny.com

Project site owner (if different than above): ______

B. PROPOSED ACTIVITY

If more space is needed, include as an attachment.

1. Brief description of activity

Removal of existing wharf, catwalks, platforms, dolphins and cellular caissons; construction of two pile supported breakwaters; construction of a pile-supported walkway from land to the breakwaters; excavation and fill to reshape the shoreline to create a groin and cove; shoreline protection consisting of a bulkhead (southern portion of the site) and riprap revetment or cobble sill (northern portion of the site); habitat creation on the breakwaters and along the shoreline; and construction of a shore public walkway. See Section 3.0 of the JPA Report.

2. Purpose of activity

The purpose of River Ring, including the regulated work in conjunction with an upland residential development, is to expand public waterfront access along the East River north from Domino Park and Grand Ferry Park esplanade, while enhancing and sustaining habitat and increasing the resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. See Section 3.1 of the JPA Report

C. PROJECT LOCATION

Borough: Brooklyn Tax Block/Lot(s): Block 2355/Lot 1,20; 2361/1,20,21; 2376/6,50

Street Address: 105 & 87 River Street, Brooklyn, NY 11211

Name of water body (if located on the waterfront): East River

D. REQUIRED ACTIONS OR APPROVALS

Check all that apply.

City Actions/Approvals/Funding

City Planning Commission ☐ Yes ☐ No

- ☐ City Map Amendment
- ☐ Zoning Map Amendment
- ☐ Zoning Text Amendment
- ☐ Site Selection – Public Facility
- ☐ Housing Plan & Project
- ☐ Special Permit
  (if appropriate, specify type: ☐ Modification ☐ Renewal ☐ other) Expiration Date: ________
- ☐ Zoning Certification
- ☐ Zoning Authorizations
- ☐ Acquisition – Real Property
- ☐ Disposition – Real Property
- ☐ Other, explain: ________
- ☐ Concession
- ☐ UDAAP
- ☐ Revocable Consent
- ☐ Franchise

Board of Standards and Appeals ☐ Yes ☐ No

- ☐ Variance (use)
- ☐ Variance (bulk)
- ☐ Special Permit
  (if appropriate, specify type: ☐ Modification ☐ Renewal ☐ other) Expiration Date: ________

Other City Approvals

- ☐ Legislation
- ☐ Rulemaking
- ☐ Construction of Public Facilities
- ☐ 384 (b) (4) Approval
- ☑ Other, explain: NYCSBS Waterfront Permit Unit
- ☐ Funding for Construction, specify: ________
- ☐ Policy or Plan, specify: ________
- ☐ Funding of Program, specify: ________
- ☐ Permits, specify: ________

State Actions/Approvals/Funding

- ☑ State permit or license, specify Agency: NYSDEC, NYSDOS Permit type and number: Tidal Wetlands, Protection of Waters, Excavation and Fill in Navigable Waterways, Section 401 Water Quality Certification; Coastal Consistency Concurrence
- ☐ Funding for Construction, specify: ________
- ☐ Funding of a Program, specify: ________
- ☐ Other, explain: ________

Federal Actions/Approvals/Funding

- ☑ Federal permit or license, specify Agency: USACE Permit type and number: Section 10/404
- ☐ Funding for Construction, specify: ________
- ☐ Funding of a Program, specify: ________
- ☐ Other, explain: ________

Is this being reviewed in conjunction with a Joint Application for Permits? ☑ Yes ☐ No

E. LOCATION QUESTIONS

		Yes	No
1.	Does the project require a waterfront site?	☑ Yes	☐ No
2.	Would the action result in a physical alteration to a waterfront site, including land along the shoreline, land under water or coastal waters?	☑ Yes	☐ No
3.	Is the project located on publicly owned land or receiving public assistance?	☑ Yes	☐ No
4.	Is the project located within a FEMA 1% annual chance floodplain? *(6.2)*	☑ Yes	☐ No
5.	Is the project located within a FEMA 0.2% annual chance floodplain? *(6.2)*	☑ Yes	☐ No
6.	Is the project located adjacent to or within a special area designation? *See Maps – Part III of the NYC WRP. If so, check appropriate boxes below and evaluate policies noted in parentheses as part of WRP Policy Assessment (Section F).*	☐ Yes	☑ No

- ☐ Significant Maritime and Industrial Area (SMIA) (*2.1*)
- ☐ Special Natural Waterfront Area (SNWA) (*4.1*)
- ☐ Priority Maritime Activity Zone (PMAZ) (*3.5*)
- ☐ Recognized Ecological Complex (REC) (*4.4*)
- ☐ West Shore Ecologically Sensitive Maritime and Industrial Area (ESMIA) (*2.2, 4.2*)

F. WRP POLICY ASSESSMENT

Review the project or action for consistency with the WRP policies. For each policy, check Promote, Hinder *or* Not Applicable (N/A). *For more information about consistency review process and determination, see* ***Part I*** *of the NYC Waterfront Revitalization Program. When assessing each policy, review the full policy language, including all sub-policies, contained within* ***Part II*** *of the WRP. The relevance of each applicable policy may vary depending upon the project type and where it is located (i.e. if it is located within one of the special area designations).*

For those policies checked Promote *or* Hinder, *provide a written statement on a separate page that assesses the effects of the proposed activity on the relevant policies or standards. If the project or action promotes a policy, explain how the action would be consistent with the goals of the policy. If it hinders a policy, consideration should be given toward any practical means of altering or modifying the project to eliminate the hindrance. Policies that would be advanced by the project should be balanced against those that would be hindered by the project. If reasonable modifications to eliminate the hindrance are not possible, consideration should be given as to whether the hindrance is of such a degree as to be substantial, and if so, those adverse effects should be mitigated to the extent practicable.*

		Promote	Hinder	N/A
1	**Support and facilitate commercial and residential redevelopment in areas well-suited to such development.**	☑	☐	☐
1.1	Encourage commercial and residential redevelopment in appropriate Coastal Zone areas.	☑	☐	☐
1.2	Encourage non-industrial development with uses and design features that enliven the waterfront and attract the public.	☑	☐	☐
1.3	Encourage redevelopment in the Coastal Zone where public facilities and infrastructure are adequate or will be developed.	☑	☐	☐
1.4	In areas adjacent to SMIAs, ensure new residential development maximizes compatibility with existing adjacent maritime and industrial uses.	☐	☐	☑
1.5	Integrate consideration of climate change and sea level rise into the planning and design of waterfront residential and commercial development, pursuant to WRP Policy 6.2.	☑	☐	☐

		Promote	Hinder	N/A
2	**Support water-dependent and industrial uses in New York City coastal areas that are well-suited to their continued operation.**	☐	☐	☑
2.1	Promote water-dependent and industrial uses in Significant Maritime and Industrial Areas.	☐	☐	☑
2.2	Encourage a compatible relationship between working waterfront uses, upland development and natural resources within the Ecologically Sensitive Maritime and Industrial Area.	☐	☐	☑
2.3	Encourage working waterfront uses at appropriate sites outside the Significant Maritime and Industrial Areas or Ecologically Sensitive Maritime Industrial Area.	☐	☐	☑
2.4	Provide infrastructure improvements necessary to support working waterfront uses.	☐	☐	☑
2.5	Incorporate consideration of climate change and sea level rise into the planning and design of waterfront industrial development and infrastructure, pursuant to WRP Policy 6.2.	☐	☐	☑
3	**Promote use of New York City's waterways for commercial and recreational boating and water-dependent transportation.**	☑	☐	☐
3.1.	Support and encourage in-water recreational activities in suitable locations.	☑	☐	☐
3.2	Support and encourage recreational, educational and commercial boating in New York City's maritime centers.	☐	☐	☑
3.3	Minimize conflicts between recreational boating and commercial ship operations.	☑	☐	☐
3.4	Minimize impact of commercial and recreational boating activities on the aquatic environment and surrounding land and water uses.	☑	☐	☐
3.5	In Priority Marine Activity Zones, support the ongoing maintenance of maritime infrastructure for water-dependent uses.	☐	☐	☑
4	**Protect and restore the quality and function of ecological systems within the New York City coastal area.**	☑	☐	☐
4.1	Protect and restore the ecological quality and component habitats and resources within the Special Natural Waterfront Areas.	☐	☐	☑
4.2	Protect and restore the ecological quality and component habitats and resources within the Ecologically Sensitive Maritime and Industrial Area.	☐	☐	☑
4.3	Protect designated Significant Coastal Fish and Wildlife Habitats.	☐	☐	☑
4.4	Identify, remediate and restore ecological functions within Recognized Ecological Complexes.	☐	☐	☑
4.5	Protect and restore tidal and freshwater wetlands.	☑	☐	☐
4.6	In addition to wetlands, seek opportunities to create a mosaic of habitats with high ecological value and function that provide environmental and societal benefits. Restoration should strive to incorporate multiple habitat characteristics to achieve the greatest ecological benefit at a single location.	☑	☐	☐
4.7	Protect vulnerable plant, fish and wildlife species, and rare ecological communities. Design and develop land and water uses to maximize their integration or compatibility with the identified ecological community.	☐	☐	☑
4.8	Maintain and protect living aquatic resources.	☐	☐	☑

		Promote	Hinder	N/A
5	**Protect and improve water quality in the New York City coastal area.**	☑	☐	☐
5.1	Manage direct or indirect discharges to waterbodies.	☑	☐	☐
5.2	Protect the quality of New York City's waters by managing activities that generate nonpoint source pollution.	☑	☐	☐
5.3	Protect water quality when excavating or placing fill in navigable waters and in or near marshes, estuaries, tidal marshes, and wetlands.	☑	☐	☐
5.4	Protect the quality and quantity of groundwater, streams, and the sources of water for wetlands.	☐	☐	☑
5.5	Protect and improve water quality through cost-effective grey-infrastructure and in-water ecological strategies.	☑	☐	☐
6	**Minimize loss of life, structures, infrastructure, and natural resources caused by flooding and erosion, and increase resilience to future conditions created by climate change.**	☑	☐	☐
6.1	Minimize losses from flooding and erosion by employing non-structural and structural management measures appropriate to the site, the use of the property to be protected, and the surrounding area.	☑	☐	☐
6.2	Integrate consideration of the latest New York City projections of climate change and sea level rise (as published in *New York City Panel on Climate Change 2015 Report, Chapter 2: Sea Level Rise and Coastal Storms*) into the planning and design of projects in the city's Coastal Zone.	☑	☐	☐
6.3	Direct public funding for flood prevention or erosion control measures to those locations where the investment will yield significant public benefit.	☐	☐	☑
6.4	Protect and preserve non-renewable sources of sand for beach nourishment.	☐	☐	☑
7	**Minimize environmental degradation and negative impacts on public health from solid waste, toxic pollutants, hazardous materials, and industrial materials that may pose risks to the environment and public health and safety.**	☐	☐	☑
7.1	Manage solid waste material, hazardous wastes, toxic pollutants, substances hazardous to the environment, and the unenclosed storage of industrial materials to protect public health, control pollution and prevent degradation of coastal ecosystems.	☐	☐	☑
7.2	Prevent and remediate discharge of petroleum products.	☑	☐	☐
7.3	Transport solid waste and hazardous materials and site solid and hazardous waste facilities in a manner that minimizes potential degradation of coastal resources.	☑	☐	☐
8	**Provide public access to, from, and along New York City's coastal waters.**	☑	☐	☐
8.1	Preserve, protect, maintain, and enhance physical, visual and recreational access to the waterfront.	☑	☐	☐
8.2	Incorporate public access into new public and private development where compatible with proposed land use and coastal location.	☑	☐	☐
8.3	Provide visual access to the waterfront where physically practical.	☑	☐	☐
8.4	Preserve and develop waterfront open space and recreation on publicly owned land at suitable locations.	☑	☐	☐

		Promote	Hinder	N/A
8.5	Preserve the public interest in and use of lands and waters held in public trust by the State and City.	✓		
8.6	Design waterfront public spaces to encourage the waterfront's identity and encourage stewardship.	✓		
9	**Protect scenic resources that contribute to the visual quality of the New York City coastal area.**	✓		
9.1	Protect and improve visual quality associated with New York City's urban context and the historic and working waterfront.	✓		
9.2	Protect and enhance scenic values associated with natural resources.	✓		
10	**Protect, preserve, and enhance resources significant to the historical, archaeological, architectural, and cultural legacy of the New York City coastal area.**			✓
10.1	Retain and preserve historic resources, and enhance resources significant to the coastal culture of New York City.			✓
10.2	Protect and preserve archaeological resources and artifacts.			✓

G. CERTIFICATION

The applicant or agent must certify that the proposed activity is consistent with New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program. If this certification cannot be made, the proposed activity shall not be undertaken. If this certification can be made, complete this Section.

"The proposed activity complies with New York State's approved Coastal Management Program as expressed in New York City's approved Local Waterfront Revitalization Program, pursuant to New York State's Coastal Management Program, and will be conducted in a manner consistent with such program."

Applicant/Agent's Name: Kenneth Huber

Address: 360 West 31st Street, 8th Floor, New York, NY 10001

Telephone: 212-479-5415 Email: khuber@langan.com

Applicant/Agent's Signature:

Date: 04/24/2021

Submission Requirements

For all actions requiring City Planning Commission approval, materials should be submitted to the Department of City Planning.

For local actions not requiring City Planning Commission review, the applicant or agent shall submit materials to the Lead Agency responsible for environmental review. A copy should also be sent to the Department of City Planning.

For State actions or funding, the Lead Agency responsible for environmental review should transmit its WRP consistency assessment to the Department of City Planning.

For Federal direct actions, funding, or permits applications, including Joint Applicants for Permits, the applicant or agent shall also submit a copy of this completed form along with his/her application to the NYS Department of State Office of Planning and Development and other relevant state and federal agencies. A copy of the application should be provided to the NYC Department of City Planning.

The Department of City Planning is also available for consultation and advisement regarding WRP consistency procedural matters.

New York City Department of City Planning
Waterfront and Open Space Division
120 Broadway, 31st Floor
New York, New York 10271
212-720-3696
wrp@planning.nyc.gov
www.nyc.gov/wrp

New York State Department of State
Office of Planning and Development
Suite 1010
One Commerce Place, 99 Washington Avenue
Albany, New York 12231-0001
518-474-6000
www.dos.ny.gov/opd/programs/consistency

Applicant Checklist

- ☐ Copy of original signed NYC Consistency Assessment Form
- ☐ Attachment with consistency assessment statements for all relevant policies
- ☐ For Joint Applications for Permits, one (1) copy of the complete application package
- ☐ Environmental Review documents
- ☐ Drawings (plans, sections, elevations), surveys, photographs, maps, or other information or materials which would support the certification of consistency and are not included in other documents submitted. All drawings should be clearly labeled and at a scale that is legible.
- ☐ Policy 6.2 Flood Elevation worksheet, if applicable. For guidance on applicability, refer to the WRP Policy 6.2 Guidance document available at www.nyc.gov/wrp

New York City Waterfront Revitalization Program
Coastal Consistency Assessment
River Ring Development
Brooklyn, NY

PROJECT SUMMARY

The purpose of River Ring, including the regulated work in conjunction with an upland residential development, is to expand public waterfront access along the East River north from the Domino Park and Grand Ferry Park esplanade, while enhancing and sustaining habitat and increasing the resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. The redevelopment of the property would open public access to the waterfront on former industrial properties that have excluded all public waterfront access for about 200 years. This newly opened public access would greatly enhance recreational and educational opportunities in a safe and more natural setting than typical urban waterfront access Projects. The Project would provide a stable and resilient waterfront and would create aquatic, upland and wetland vegetative communities that would promote fish and wildlife habitat development. Finally, the upland portion of River Ring would redevelop vacant, derelict and partially dilapidated urban waterfront properties with much needed affordable and market rate residential development.

River Ring would create approximately 267,840 SF of new waterfront public space (including upland, intertidal, and in-river water accessible areas) to facilitate the continuation of public waterfront access from Domino Park and Grand Ferry. River Ring would expand public waterfront access along the East River from Grand Ferry Park (and Domino Park beyond) to the south, while enhancing and creating habitat and increasing the shoreline protection and resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. Active areas within the waterfront public space area would include approximately 125,150 SF of upland open space along the waterfront; 39,390 SF of intertidal area; and 103,300 SF of protected open water space within the East River for publicly accessible recreation. The waterfront portion of the proposed Project would provide public waterfront access, encourage water-dependent recreation, create a mosaic of native intertidal and sub-tidal habitats, and encourage ecological education. The proposed Project is completely water dependent, as it features public waterfront access, in-water recreation, and in-water habitat creation.

The upland portion of River Ring includes a new residential development with two new mixed income residential towers, new waterfront public space, and an esplanade. The new building would have a gross floor area of approximately 1.27 million gross square feet (GSF). The building footprints only account for about 30% of the available upland area. The remaining 70% of the developable area is being dedicated to creating a world class public park, which would include an estimated 900 ft long shore public walkway along the East River that would create a continuous connection from Grand Ferry Park to N. 3rd Street.

POLICY COMPLIANCE ANALYSIS

Policy 1: Support and Facilitate Commercial and Residential Redevelopment in Areas Well-Suited to Such Development

As evidenced by the assessment of Policies 1.1, 1.2, 1.3, and 1.5 below, the proposed activities support and facilitate commercial and residential redevelopment in areas well-suited to such development. As such, the proposed activities promote Policy 1.

Policy 1.1: Encourage commercial and residential redevelopment in appropriate Coastal Zone areas.

The upland portion of the Project includes a new residential development with two new mixed income residential towers, new waterfront public space, and an esplanade. The new building would have a gross floor area of approximately 1.27 million gross square feet (GSF). The building footprints only account for about 30% of the available upland area. The remaining 70% of the developable area is being dedicated to creating a world class public park, which would include an estimated 900 ft long shore public walkway along the East River that would create a continuous connection from Grand Ferry Park to N. 3rd Street.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 1.2: Encourage non-industrial development with uses and design features that enliven the waterfront and attract the public.

The redevelopment of the property would open public access to the waterfront on former industrial properties that have excluded all public waterfront access for about 200 years. This newly opened public access would greatly enhance recreational and educational opportunities in a safe and more natural setting than typical urban waterfront access projects.

The proposed Project would provide public waterfront access, encourage water-dependent recreation, create various types of in-water habitats, and encourage ecological education. A protected cove would be created to protect new habitats being created, allow for active in-water recreation, and allow the continuation of commercial maritime activity without disruption. The cove would be protected by two pile-supported breakwaters at the south and west sides of the site (to protect the site from waves from the southwest), and a soil and rock-filled groin at the north side of the site (to protect the site from waves from the northwest). A beach would be constructed at the northern portion of the shoreline to encourage passive recreation and enjoyment at the water's edge. A ramp for kayaks and paddleboards would be constructed at the southern portion of the shoreline to allow for boating within the protected cove without interference with commercial navigation on the East River. Kayak and paddleboard rentals, along with changing and locker rooms and public restrooms, would be available in the first floor of the buildings. Tenants in kiosks and on the first floor of the building and would further support and activate recreation along the shoreline and provide educational opportunities about shoreline ecology and the environment. Walkways would be constructed beside and over the salt marsh, allowing for observation of a newly created habitat at the shoreline.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 1.3: *Encourage redevelopment in the Coastal Zone where public facilities and infrastructure are adequate or will be developed.*

The site is in Brooklyn, New York. There are adequate infrastructure and public services in the immediate area to support the Project both during and after construction.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 1.5: *Integrate consideration of climate change and sea level rise into the planning and design of waterfront residential and commercial development, pursuant to WRP Policy 6.2.*

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Breakwaters and other structures constructed to protect the cove would significantly improve the flood resiliency of the site, particularly by dissipating the energy of crashing waves during storms. The western side of the site is within a Special Flood Hazard Area "VE"-Zone, meaning that the shoreline is subject to breaking waves in excess of three feet in height. The Base Flood Elevation (BFE), shown on the Preliminary FIRM, is determined by adding the estimated flood wave height to the estimated stillwater flood. In order to account for sea level rise, the FEMA 100-year return period stillwater flood level is increased by 1.5 feet, based on NY State DEC Guidelines (Part 490, 6 NYCRR).

By constructing the two wave breaks and groin, flood waves would break away from the shoreline; wave heights inside the protected area would be reduced to one foot or less along the shoreline, which significantly reduces the elevation of protection needed (in other words, BFE can be reduced by the amount the wave height is reduced). In addition, the shoreline protection (consisting of ecological armoring on the breakwaters, riprap armoring on the groin, and pebble/cobble river rock armoring on the sills) provides adequate protection against erosion and reduces wave run-up, further protecting the public waterfront open space and the buildings beyond.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 3 Promote Use of New York City's Waterways for Commercial and Recreational Boating and Water-Dependent Transportation

As evidenced by the assessment of Policies 3.1, 3.3, and 3.4 below, the proposed activities promote use of New York City's waterways for commercial and recreational boating and water-dependent transportation. As such, the proposed activities promote Policy 3.

Policy 3.1: *Support and encourage in-water recreational activities in suitable locations.*

The Project would provide significant opportunities for water-related recreation. A beach would be constructed at the northern portion of the shoreline to encourage passive recreation and enjoyment at the water's edge. A ramp for kayaks and paddleboards would be constructed at the southern portion of the shoreline to allow for boating within the protected cove without interference with commercial navigation on the East River. Kayak and paddleboard rentals, along with changing and locker rooms and public restrooms, would be available in the first floor of the buildings. Tenants in kiosks and on the first floor of the building and would further support and activate recreation along the shoreline and provide educational opportunities about shoreline ecology and the environment. Walkways would be constructed beside and over the salt marsh, allowing for observation of a newly created habitat at the shoreline.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 3.3: *Minimize conflicts between recreational boating and commercial shipping operations.*

In order to protect the cove (including the created habitat, public beach, and in-water recreation area) and allow the continuation of both recreational boating and commercial shipping activity without disruption, two pile-supported breakwaters would be constructed at the south and west sides of the site (to protect the site from waves from the southwest), and a soil and rock-filled groin would be constructed at the north side of the site (to protect the site from waves from the northwest). The breakwaters and groin would be the minimum measures required to reduce wave and wake energies to acceptable levels for survivability of the proposed new habitat, to protect against sediment transport from the beach, and to allow in-water recreation within the protected area. The breakwaters provide clear separation between commercial shipping in the navigation channel and recreational boating on site.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 3.4: *Minimize impact of commercial and recreational boating activities on the aquatic environment and surrounding land and water uses.*

In order to protect the cove (including the created habitat, public beach, and in-water recreation area) and allow the continuation of commercial maritime activity without disruption, two pile-supported breakwaters would be constructed at the south and west sides of the site (to protect the site from waves from the southwest), and a soil and rock-filled groin would be constructed at the north side of the site (to protect the site from waves from the northwest). The breakwaters and groin would be the minimum measures required to reduce wave and wake energies to acceptable levels for survivability of the proposed new habitat, to protect against sediment transport from the beach, and to allow in-water recreation within the protected area.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 4 Protect and Restore the Quality and Function of Ecological Systems within the New York City Coastal Area

As evidenced by the assessment of Policy 4.5 below, the proposed activities protect and restore the quality and function of ecological systems within the New York City coastal area. The proposed activities promote Policy 4.

Policy 4.5 Protect and restore tidal and freshwater wetlands.

The Project results in a net increase of water area of 55,742 SF at MHW and 55,513 SF at MHHW; and a net cut of 2,575 CY below MHW and 2,305 below MHHW. While the Project results in a net increase in cover over water of 31,035 SF over MHW and 30,951 over MHHW, about 99% of the water being covered is open water, with water depths generally greater than 20 feet where light doesn't penetrate to the river bottom.

Temporary erosion protection measures would be provided and maintained throughout construction. A stabilized construction entrance would be installed at the construction entrance. During in-water work, best management practices, such as a turbidity curtain installed along the shoreline or an air curtain installed along the navigation channel, would be used to contain sediment disturbed by construction. Currents in the East River range from 1 to 5 knots; any sediment resuspended during construction activity would quickly move away from the area and would be expected to dissipate dissipate rapidly and would not result in significant long-term impacts to water quality. After in-water work is finished, a silt fence would be installed along the shoreline. Temporary erosion protection measures would be inspected regularly and repaired as necessary to maintain their function.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 4.6 In addition to wetlands, seek opportunities to create a mosaic of habitats with high ecological value and function that provide environmental and societal benefits. Restoration should strive to incorporate multiple *habitat characteristics to achieve the greatest ecological benefit at a single location*

the Project would create a total of 106,804 SF (2.45 acres) or new or enhanced habitat, including the following:

- About 19,044 SF of salt marsh and tide pools would be created along the cove between the beach and the boat ramp.
- About 21,137 SF of upland coastal scrub shrub areas would be created on large portions of the breakwaters, on the north and south end of the beach, and various upland locations along the shore public walkway.
- About 21,996 SF of man-made reefs would be created on the river bottom adjacent to the breakwaters, along the shoreline east of the salt marsh, and on the south side of the groin (within the protected cove).
- About 17,855 SF of shoreline shallows would be created within the cove adjacent to the public beach and salt marsh.
- About 6,735 SF of new Littoral Zone habitat and about 14,793 SF of new Intertidal Zone habitat would be created on the new breakwaters at MHW (about 6,735 SF of Littoral Zone habitat and 16,226 SF of Intertidal Zone habitat at MHHW). In addition, the excavation to create the cove and salt marsh would net another about 5,227 SF of created Littoral Zone and about 2,024 SF of Intertidal Zone along the shoreline at MHW (about 4,774 SF net created Littoral Zone and 591 SF of net created Intertidal Zone at MHHW).
- About 9,958 SF of eel grass would be planted within the sandy substrate of the shoreline shallows as a pilot program.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 5 Protect and Improve Water Quality in the New York City Coastal Area

As evidenced by the assessment of Policy 5.1, 5.2, 5.3 and 5.5 below, the proposed activities protect and improve water quality in the New York City coastal area. The proposed activities promote Policy 5.

Policy 5.1 Manage direct or indirect discharges to waterbodies.

Stormwater would be collected and directed to two new 24-inch diameter private stormwater outfalls to manage stormwater runoff from the proposed development: one at the northern end of the site and one at the southern end of the site. Water quality units would be installed upstream of the outfalls to treat stormwater before discharge to the East River. The water quality units would be designed to treat stormwater in accordance with the New York State Stormwater Management Design Manual. Tide gates would be installed inside manholes downstream from each water quality unit. By collecting, treating and directing stormwater to the East River, we are alleviating flows in the combined sewer system during storms, when peak flows are expected in the existing sewer system.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 5.2 *Protect the quality of New York City's waters by managing activities that generate nonpoint source pollution.*

Stormwater would be collected and directed to two new 24-inch diameter private stormwater outfalls to manage stormwater runoff from the proposed development: one at the northern end of the site and one at the southern end of the site. Water quality units would be installed upstream of the outfalls to treat stormwater before discharge to the East River. The water quality units would be designed to treat stormwater in accordance with the New York State Stormwater Management Design Manual. Tide gates would be installed inside manholes downstream from each water quality unit. By collecting, treating and directing stormwater to the East River, we are alleviating flows in the combined sewer system during storms, when peak flows are expected in the existing sewer system.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 5.3 *Protect water quality when excavating or placing fill in navigable waters and in or near marshes, estuaries, tidal marshes, and wetlands.*

Excavation of historic fill along the shoreline and placement of new fill for the groin, breakwater berms and armoring would be completed using long reach excavators staged upland of MHHW and or staged on floating barges. Demolition of structures in/over water, installation of new piles and sheet piles, construction of new breakwaters and walkways in/over water, and removal of debris under water would all completed using a barge-mounted crane or demolition excavator.

Piles and sheet piles would be driven using a vibratory or impact hammer. The breakwater structure would be constructed of precast concrete elements; the walkway structure would be steel elements. Debris would be removed using a grapple or dredge bucket. Caisson encasement would be done by divers and supported by the barge-mounted crane.

Heavy equipment would be operated only above water, either by setting equipment on land above MHHW or by setting equipment on a barge over water. Demolition debris and debris removed from the river bottom would be stockpiled in high-walled scow barges. Historic fill excavated along the shoreline would be stockpiled in containment areas lined with plastic; decanted water would be collected and either disposed offsite, or treated (if needed) and discharged to the East River. Excavated soils would be tested for waste characterization and disposed offsite or reused outside the TWAA in accordance with applicable regulations. Care would be taken to avoid dropping debris or soil into the water.

Temporary erosion protection measures would be provided and maintained throughout construction. A stabilized construction entrance would be installed at the construction entrance. During in-water work, best management practices, such as a turbidity curtain installed along the shoreline or an air curtain installed along the navigation channel, would be used to contain sediment disturbed by construction. Currents in the East River range from 1 to 5 knots; any sediment resuspended during construction activity would quickly move away from the area and would be expected to dissipate dissipate rapidly and would not result in significant long-term impacts to water quality. After in-water work is finished, a silt fence would be installed along the shoreline. Temporary erosion protection measures would be inspected regularly and repaired as necessary to maintain their function.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 5.5 *Protect and improve water quality through cost-effective grey-infrastructure and in-water ecological strategies.*

Stormwater would be collected and directed to two new 24-inch diameter private stormwater outfalls to manage stormwater runoff from the proposed development: one at the northern end of the site and one at the southern end of the site. Water quality units would be installed upstream of the outfalls to treat stormwater before discharge to the East River. The water quality units would be designed to treat stormwater in accordance with the New York State Stormwater Management Design Manual. Tide gates would be installed inside manholes downstream from each water quality unit. By collecting, treating and directing stormwater to the East River, we are alleviating flows in the combined sewer system during storms, when peak flows are expected in the existing sewer system.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 6 Minimize Loss of Life, Structures, Infrastructure, and Natural Resources Caused by Flooding and Erosion, and Increase Resilience to Future Conditions Created by Climate Change

As evidenced by the assessment Policy of 6.1 and 6.2 below, the proposed activities minimize loss of life, structures, infrastructure, and natural resources caused by flooding and erosion, and increase resilience to future conditions created by climate change. The proposed activities promote Policy 6.

Policy 6.1: *Minimize losses from flooding and erosion by employing non-structural and structural management measures appropriate to the site, the use of the property to be protected, and the surrounding area.*

Breakwaters and other structures constructed to protect the cove would significantly improve the flood resiliency of the site, particularly by dissipating the energy of crashing waves during storms. The western side of the site is within a Special Flood Hazard Area "VE"-Zone, meaning that the shoreline is subject to breaking waves in excess of three feet in height. The Base Flood Elevation (BFE), shown on the Preliminary FIRM, is determined by adding the estimated flood wave height to the estimated stillwater flood. In order to account for sea level rise, the FEMA 100-year return period stillwater flood level is increased by 1.5 feet, based on NY State DEC Guidelines (Part 490, 6 NYCRR).

By constructing the two wave breaks and groin, flood waves would break away from the shoreline; wave heights inside the protected area would be reduced to one foot or less along the shoreline, which significantly reduces the elevation of protection needed (in other words, BFE can be reduced by the amount the wave height is reduced). In addition, the shoreline protection (consisting of ecological armoring on the breakwaters, riprap armoring on the groin, and pebble/cobble river rock armoring on the sills) provides adequate protection against erosion and reduces wave run-up, further protecting the public waterfront open space and the buildings beyond.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 6.2: *Integrate consideration of the latest New York City projections of climate change and sea level rise (as published in New York City Panel on Climate Change 2015 Report, Chapter 2: Sea Level Rise and Coastal Storms) into the planning and design of projects in the city's Coastal Zone.*

The proposed development is designed to resist flooding under sea level rise predictions through the year 2059 by adding 1.5 feet to the FEMA 100-year return period stillwater flood level, based on NY State DEC Guidelines (Part 490, 6 NYCRR). The exceeds the sea level rise projections in New York City Climate Resiliency Design Guidelines for the same time period (16 inches).

Based on this assessment, the proposed activities are consistent with this policy.

Policy 7 Minimize Environmental Degradation And Negative Impacts On Public Health From Solid Waste, Toxic Pollutants, Hazardous Materials, And Industrial Materials That May Pose Risks To The Environment And Public Health And Safety

As evidenced by the assessment Policy of 7.2 and 7.3 below, the proposed activities minimize environmental degradation and negative impacts on public health from solid waste, toxic pollutants, hazardous materials, and industrial materials that may pose risks to the environment and public health and safety. The proposed activities promote Policy 6.

Policy 7.2: *Prevent and remediate discharge of petroleum products.*

About 21,187 CY of potentially contaminated historic fill would be excavated below MHW from the shoreline as part of this Project. Historic fill excavated along the shoreline would be stockpiled in containment areas lined with plastic; decanted water would be collected and either disposed offsite, or treated (if needed) and discharged to the East River. Excavated soils would be tested for waste characterization and disposed offsite or reused outside the TWAA in accordance with applicable regulations. Care would be taken to avoid dropping debris or soil into the water.

Policy 7.3: *Transport solid waste and hazardous materials and site solid and hazardous waste facilities in a manner that minimizes potential degradation of coastal resources.*

About 21,187 CY of potentially contaminated historic fill would be excavated below MHW from the shoreline as part of this Project. Historic fill excavated along the shoreline would be stockpiled in containment areas lined with plastic; decanted water would be collected and either disposed offsite, or treated (if needed) and discharged to the East River. Excavated soils would be tested for waste characterization and disposed offsite or reused outside the TWAA in accordance with applicable regulations. Care would be taken to avoid dropping debris or soil into the water.

Policy 8 Provide Public Access to, from, and along New York City's Coastal Waters

As evidenced by the assessment of Policies 8.1 through 8.6 below, the proposed activities provide public access to, from, and along New York City's coastal waters. The proposed activities promote Policy 8.

Policy 8.1: *Preserve, protect, maintain, and enhance physical, visual and recreational access to the waterfront.*

The purpose of the regulated work, in conjunction with an upland residential development, is to expand public waterfront access along the East River north from the Domino Park and Grand Ferry Park esplanade. The redevelopment of the property would open public access to the waterfront on former industrial properties that have excluded all public waterfront access for about 200 years.

The proposed Project would provide public waterfront access, encourage water-dependent recreation, create various types of in-water habitats, and encourage ecological education. The proposed Project is heavily water dependent, as it features public waterfront access, in-water recreation, and in-water habitat creation.

The proposed upland improvements would include public open space with about 900 LF of shore public walkway. A portion of the shore public walkway would extend over a portion of the new salt marsh and tide pools being created along the south end of the cove. Active and passive recreation would also be provided in the public open space including a public beach on the new cove, amphitheater area facing the beach with granite block seating, a ramped boat launch for non-motorized watercraft (e.g., kayaks, paddleboards), a nature play area, landscaped plantings, and community kiosks.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 8.2: *Incorporate public access into new public and private development where compatible with proposed land use and coastal location.*

The proposed upland improvements would include public open space with about 900 LF of shore public walkway. A portion of the shore public walkway would extend over a portion of the new salt marsh and tide pools being created along the south end of the cove.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 8.3: *Provide visual access to the waterfront where physically practical.*

The proposed waterfront development would provide scenic corridors to the waterfront in addition to providing publicly-accessible waterfront access. The shoreline would enhance the scenic quality of the coastal area with beaches, a tidal pool and salt marsh, and coastal shrubs. This would be an improvement from the current shoreline, which is not accessible or visible to the public.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 8.4: *Preserve and develop waterfront open space and recreation on publicly owned land at suitable locations.*

Tax Block 2355, Lot 20; Block 2361, Lots 20 and 21; and a portion of Block 2376, Lot 50 are publicly owned. The publicly owned lands will be dedicated in their entirety to creating a world class public park, which would include an estimated 900 ft long shore public walkway along the East River and would create a continuous connection from Grand Ferry Park to North 3rd Street.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 8.5: *Preserve the public interest in and use of lands and waters held in public trust by the State and City.*

Tax Block 2355, Lot 20; Block 2361, Lots 20 and 21; and a portion of Block 2376, Lot 50 are publicly owned. The publicly owned lands will be dedicated in their entirety to creating a world class public park, which would include an estimated 900 ft long shore public walkway along the East River and would create a continuous connection from Grand Ferry Park to North 3rd Street.

The Project would result in significant environmental benefits including (a) create about __ SF of water below MHW and ___ SF below MHHW; (b) remove about __ CY of fill below MHW and __ CY MHHW; and (c) create 106,904 SF of new and enhanced habitat. The Project will also provide public access to the waterfront on former industrial properties that have excluded all public waterfront access for about 200 years. The protected cove created by the Project would encourage active recreation in the water and passive recreation along the shoreline.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 8.6: *Design waterfront public spaces to encourage the waterfront's identity and encourage stewardship.*

The proposed upland improvements would include public open space with about 900 LF of shore public walkway. A portion of the shore public walkway would extend over a portion of the new salt marsh and tide pools being created along the south end of the cove. Active and passive recreation would also be provided in the public open space including a public beach on the new cove, amphitheater area facing the beach with granite block seating, a ramped boat launch for non-motorized watercraft (e.g., kayaks, paddleboards), a nature play area, landscaped plantings, and community kiosks. Man-made freshwater wetland would also be created upland of the shoreline. The proposed Project would provide public waterfront access, encourage water-dependent recreation, create various types of in-water habitats, and encourage ecological education.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 9 **Protect scenic resources that contribute to the visual quality of the New York City coastal area.**

As evidenced by the assessment of Policies 9.1 and 9.2 below, the proposed activities provide public access to, from, and along New York City's coastal waters. The proposed activities promote Policy 9.

Policy 9.1: *Protect and improve visual quality associated with New York City's urban context and the historic and working waterfront.*

The proposed Project would significantly improve the scenic quality of the coastal area. The redevelopment of the property would open public access to the waterfront on former industrial properties that have excluded all public waterfront access for about 200 years. Dilapidated waterfront structures would be removed and the existing shoreline would be reshaped to create a more natural looking curvilinear shoreline with beach, salt marsh, tide pools and other coastal habitats.

View corridors would be created to invite access to the water's edge. A shore public walkway would provide public access to the waterfront and open space views up and down the River and across to Manhattan. The elevated circular walkway would provide access out to the breakwaters, which have designated spots for scenic overlooks and bird watching.

Based on this assessment, the proposed activities are consistent with this policy.

Policy 9.2: Protect and enhance scenic values associated with natural resources.

The proposed Project would significantly improve the scenic quality of the coastal area. The redevelopment of the property would open public access to the waterfront on former industrial properties that have excluded all public waterfront access for about 200 years. Dilapidated waterfront structures would be removed and the existing shoreline would be reshaped to create a more natural looking curvilinear shoreline with beach, salt marsh, tide pools and other coastal habitats. View corridors would be created to provide inviting portals to the water's edge. A shore public walkway would provide public access to the waterfront and open space views up and down the River and across to Manhattan. The elevated circular walkway would provide access out to the breakwaters, which have designated spots for scenic overlooks and bird watching.

Based on this assessment, the proposed activities are consistent with this policy.

NYC Waterfront Revitalization Program - Policy 6.2 Flood Elevation Workhsheet

COMPLETE INSTRUCTIONS ON HOW TO USE THIS WORKSHEET ARE PROVIDED IN THE "CLIMATE CHANGE ADAPTATION GUIDANCE" DOCUMENT AVAILABLE AT www.nyc.gov/wrp

Enter information about the project and site in highlighted cells in Tabs 1-3. Tab 4, "Summary Charts" contains primary results. Tab 5, "0.2%+SLR" produces charts to be used for critical infrastructure or facilities. Tab 6, "Calculations" contains background computations. Appendix A contains tide elevations for station across the city to be used for the elevation of MHHW if a site survey is not available. Non-highlighted cells have been locked.

Background Information	
Project Name	River Ring Development
Location	87 River Street, Brooklyn, NY
Type(s)	☑ Residential, Commercial, Community Facility ☑ Parkland, Open Space, and Natural Areas ☑ Tidal Wetland Restoration ☐ Critical Infrastructure or Facility ☐ Industrial Uses ☑ Over-water Structures ☑ Shoreline Structures ☐ Transportation ☐ Wastewater Treatment/Drainage ☑ Coastal Protection
Description	Removal of existing wharf, catwalks, platforms, dolphins and cellular caissons; construction of two pile supported breakwaters; construction of a pile-supported walkway from land to the breakwaters; excavation and fill to reshape the shoreline to create a groin and cove; shoreline protection consisting of a bulkhead (southern portion of the site) and riprap revetment or cobble sill (northern portion of the site); habitat creation on the breakwaters and along the shoreline; and construction of a shore public walkway. See Section 3.0 of the JPA Report.
Planned Completion Date	2023
Expected Project Lifespan	2059

For technical assistance on using this worksheet, email wrp@planning.nyc.gov, using the message subject "Policy 6.2 Worksheet."

Last update: Sept. 7, 2018

Establish current tidal and flood heights.

	FT (NAVD88)	Feet	Datum	Source
MHHW	2.20	**2.20**	**NAVD88**	
1% flood height	12.00	**12.00**	**NAVD88**	*VE Zone*
Design flood elevation	14.50	**14.50**	**NAVD88**	
As relevant:				
0.2% flood height	14.00	14.00	**NAVD88**	

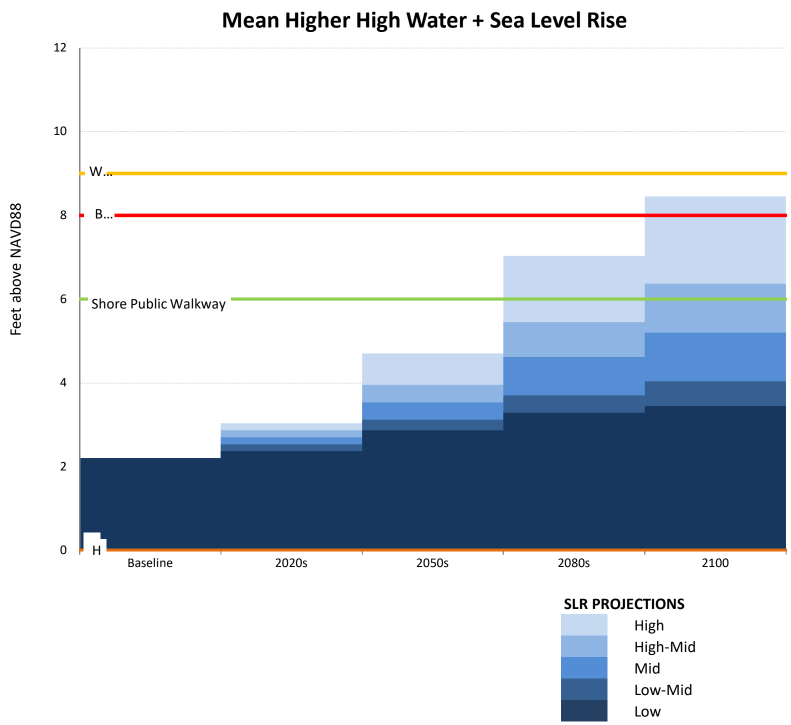
Data will be converted based on the following datums:

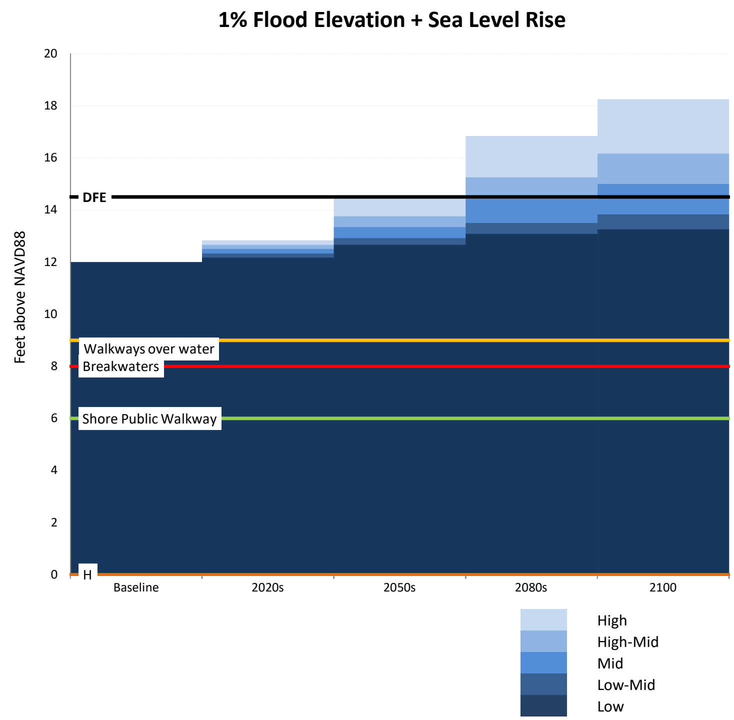
Datum	FT (NAVD88)
NAVD88	*0.00*
NGVD29	*-1.10*
Manhattan Datum	*1.65*
Bronx Datum	*1.51*
Brooklyn Datum (Sewer)	*0.61*
Brooklyn Datum (Highway)	*1.45*
Queens Datum	*1.63*
Richmond Datum	*2.09*

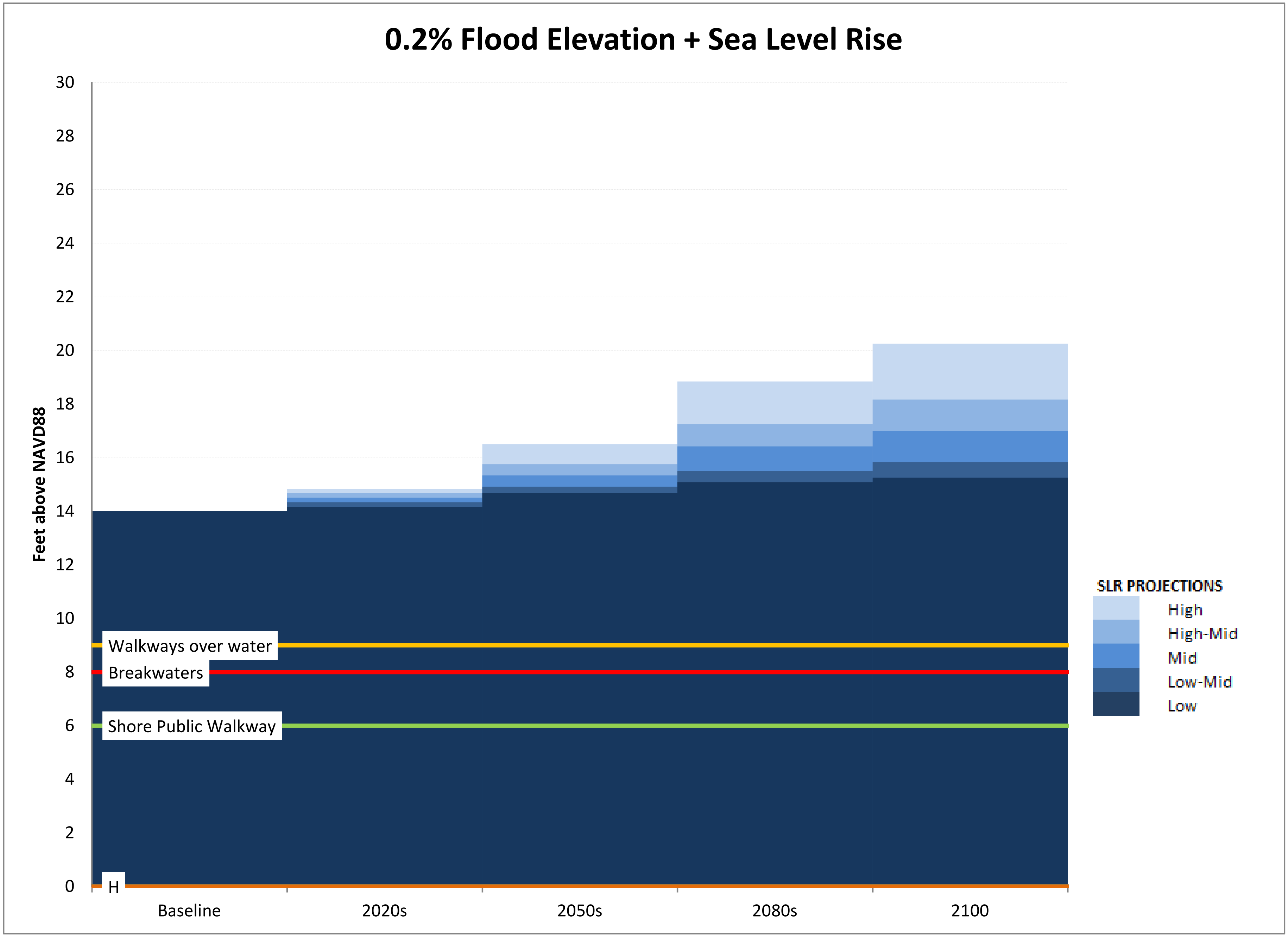
Describe key physical features of the project.

Feature *(enter name)*	Feature Category	Lifespan	Elevation	Units	Datum	Ft	Ft Above NAVD88	Ft Above MHHW	Ft Above 0.2% flood height
Breakwaters	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☑ Other	50	8.0	Feet	NAVD88	8.0	8.0	5.8	-6.0
The breakwaters would be constructed of precast concrete tubs ("U"-shaped cross section) supported on 30-inch diameter piles. The bottom of the precast tubs (breakwater structure) would be set at EL -9.0 and the top of the precast concrete tub walls would be set at EL 3.0. The tubs would be filled with combination of clean soil and geofoam to create a berm.									
Walkways over water	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☑ Other	50	9.0	Feet	NAVD88	9.0	9.0	6.8	-5.0
Elevated walkways would be constructed of steel bent beams, girders and grating (with at least 50% openings) supported on steel pipe piles.									
Shore Public Walkway	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☑ Other	30	6.0	Feet	NAVD88	6.0	6.0	3.8	-8.0
Permeable Pavers and landscaping									
	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other			Feet	NAVD88				
Description of Planned Uses and Materials									
E	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other			Feet	NAVD88				
Description of Planned Uses and Materials									
F	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other			Feet	NAVD88				
Description of Planned Uses and Materials									
G	☐ Vulnerable ☐ Critical ☐ Potentially Hazardous ☐ Other			Feet	NAVD88				
Description of Planned Uses and Materials									
H	☐ Vulnerable ☐ Critical ☑ Potentially Hazardous ☐ Other			Feet	NAVD88				
Description of Planned Uses and Materials									

Assess project vulnerability over a range of sea level rise projections.







0.2% Flood Elevation + Sea Level Rise
Feet above NAVD88
30
28
26
24
22
20
18
16
14
12
10
8
6
4
2
0
Walkways over water
Breakwaters
Shore Public Walkway
H
Baseline
2020s
2050s
2080s
2100
SLR PROJECTIONS
High
High-Mid
Mid
Low-Mid
Low

ATTACHMENT E

HISTORIC AERIALS

INQUIRY #: 5785303.8

YEAR: 2017

= 500'

N

INQUIRY #: 5785303.8

YEAR: 2013

= 500'

N

INQUIRY #: 5785303.8

YEAR: 2009

= 500'

N

EDR

INQUIRY #: 5785303.8

YEAR: 2006

= 500'

N

EDR

INQUIRY #: 5785303.8

YEAR: 1994

= 500'

N

EDR

INQUIRY #: 5785303.8

YEAR: 1991

= 500'

N

EDR

INQUIRY #: 5785303.8

YEAR: 1984

= 500'

N

EDR

INQUIRY #: 5785303.8

YEAR: 1980

= 500'

N

EDR

INQUIRY #: 5785303.8

YEAR: 1976

= 500'

N

EDR

INQUIRY #: 5785303.8

YEAR: 1974

= 500'

N

EDR®

INQUIRY #: 5785303.8

YEAR: 1966

= 500'

N

EDR

INQUIRY #: 5785303.8

YEAR: 1961

= 500'

N

EDR

INQUIRY #: 5785303.8

YEAR: 1954

= 500'

N

EDR

INQUIRY #: 5785303.8

YEAR: 1951

= 500'

N

INQUIRY #: 5785303.8

YEAR: 1924

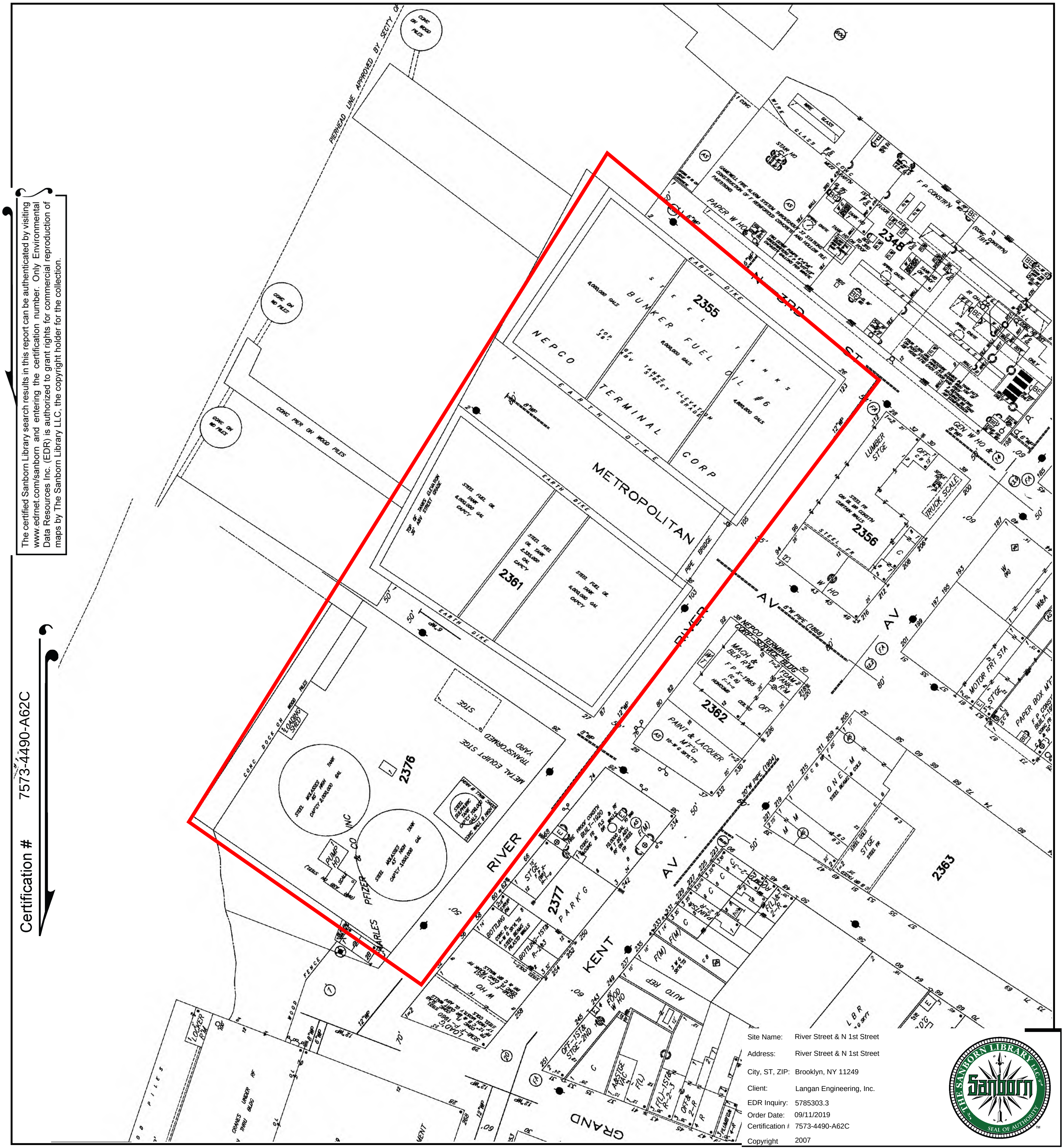
= 500'

N

ATTACHMENT F

SANBORN MAPS

Certification # 7573-4490-A62C



Site Name:	River Street & N 1st Street
Address:	River Street & N 1st Street
City, ST, ZIP:	Brooklyn, NY 11249
Client:	Langan Engineering, Inc.
EDR Inquiry:	5785303.3
Order Date:	09/11/2019
Certification #	7573-4490-A62C
Copyright	2007

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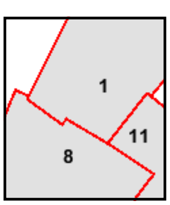

Volume 4, Sheet 11
Volume 4, Sheet 1
Volume 3, Sheet 8

N

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2006

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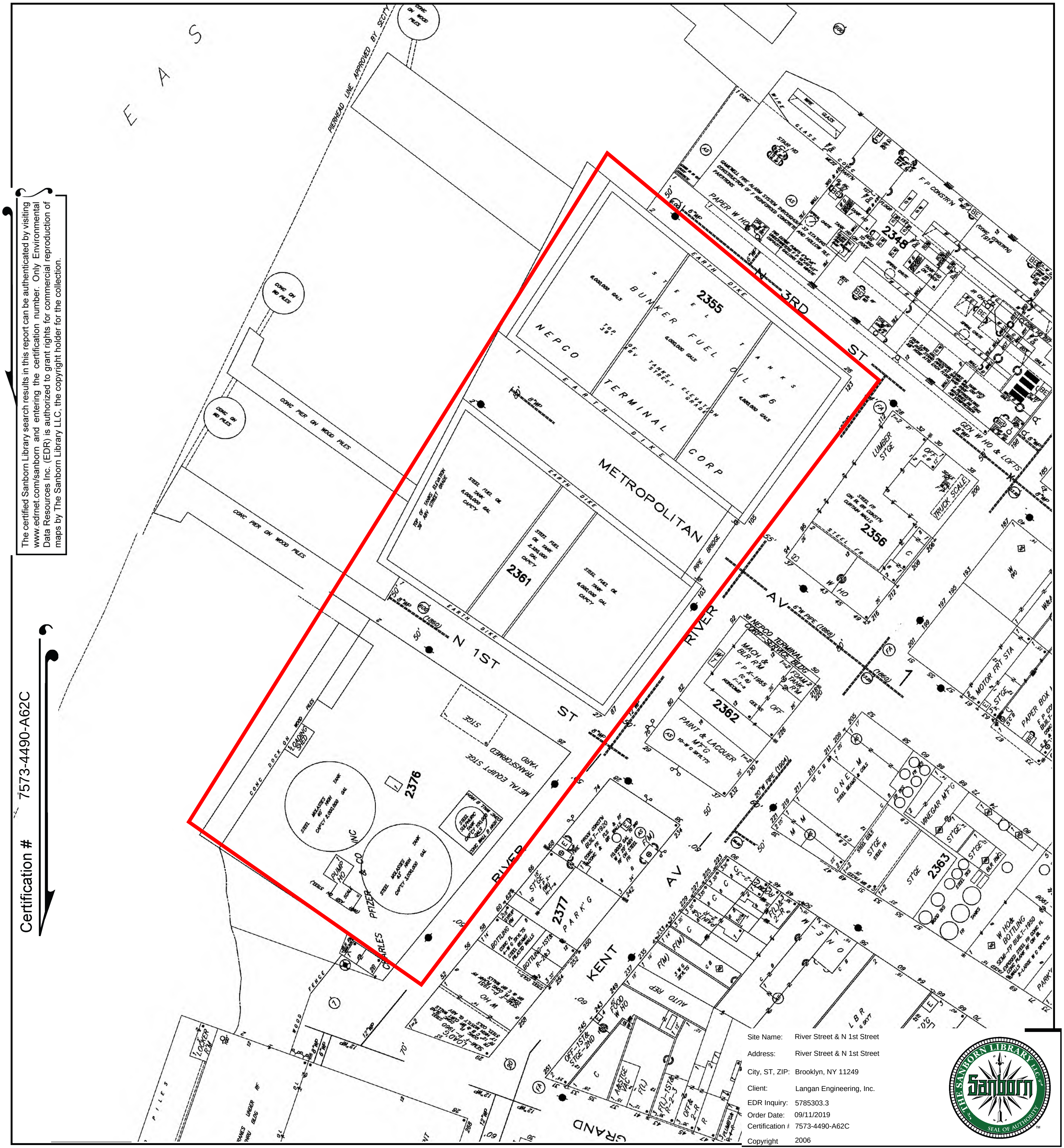

Site Name: River Street & N 1st Street
Address: River Street & N 1st Street
City, ST, ZIP: Brooklyn, NY 11249
Client: Langan Engineering, Inc.
EDR Inquiry: 5785303.3
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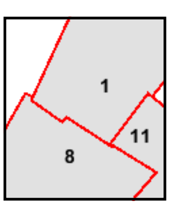

Volume 3, Sheet 8
Volume 4, Sheet 11
Volume 4, Sheet 1

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2005

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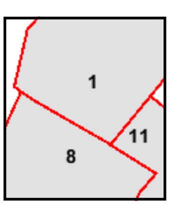

Volume 4, Sheet 1
Volume 4, Sheet 11
Volume 3, Sheet 8

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2004

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Volume 4, Sheet 1

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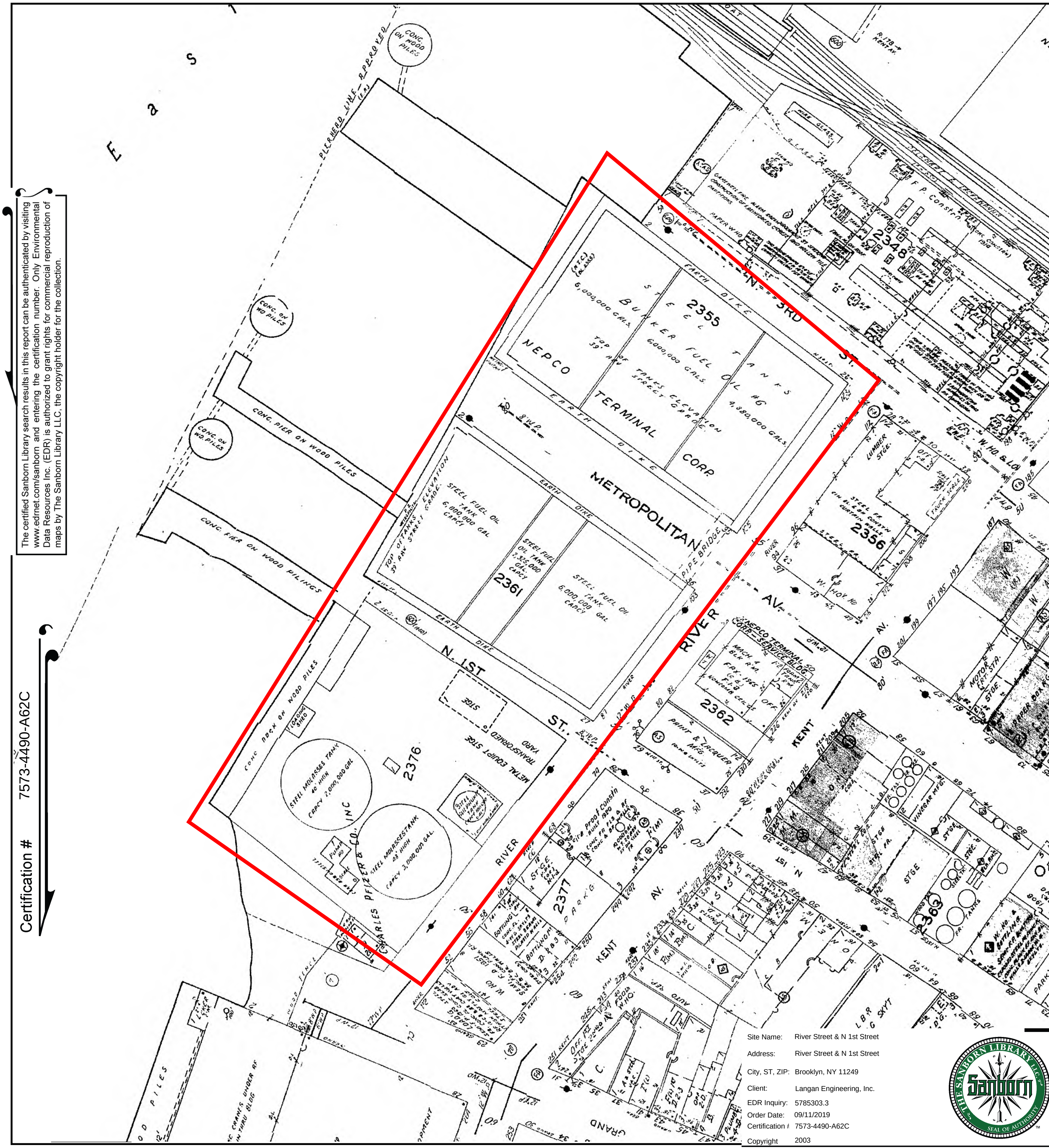

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Address:	River Street & N 1st Street
City, ST, ZIP:	Brooklyn, NY 11249
Client:	Langan Engineering, Inc.
EDR Inquiry:	5785303.3
Order Date:	09/11/2019
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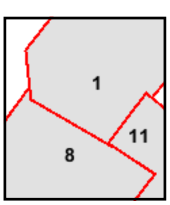

Volume 4, Sheet 11
Volume 4, Sheet 1
Volume 3, Sheet 8

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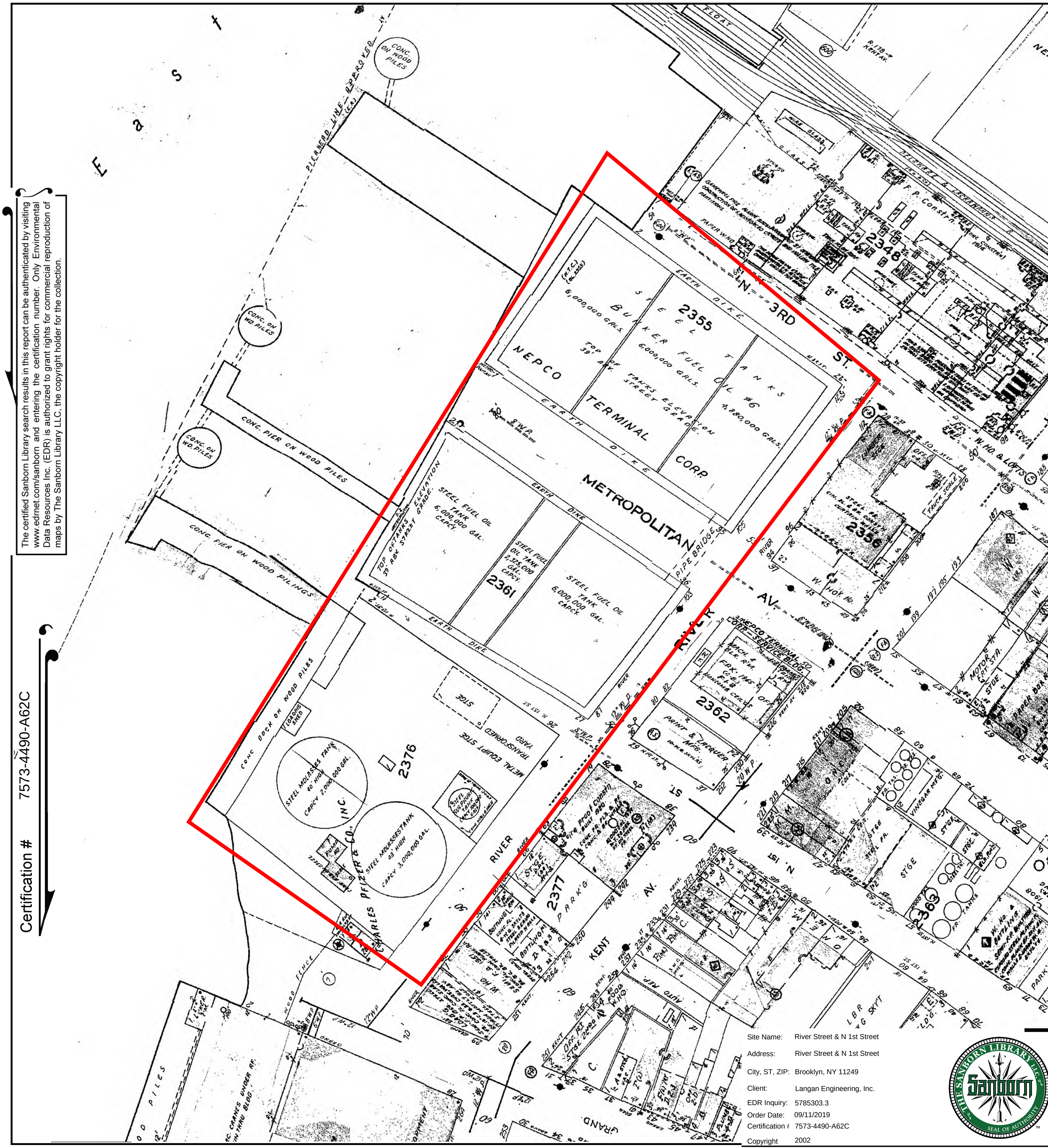
2002



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City, ST, ZIP:	Brooklyn, NY 11249
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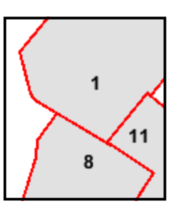

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N

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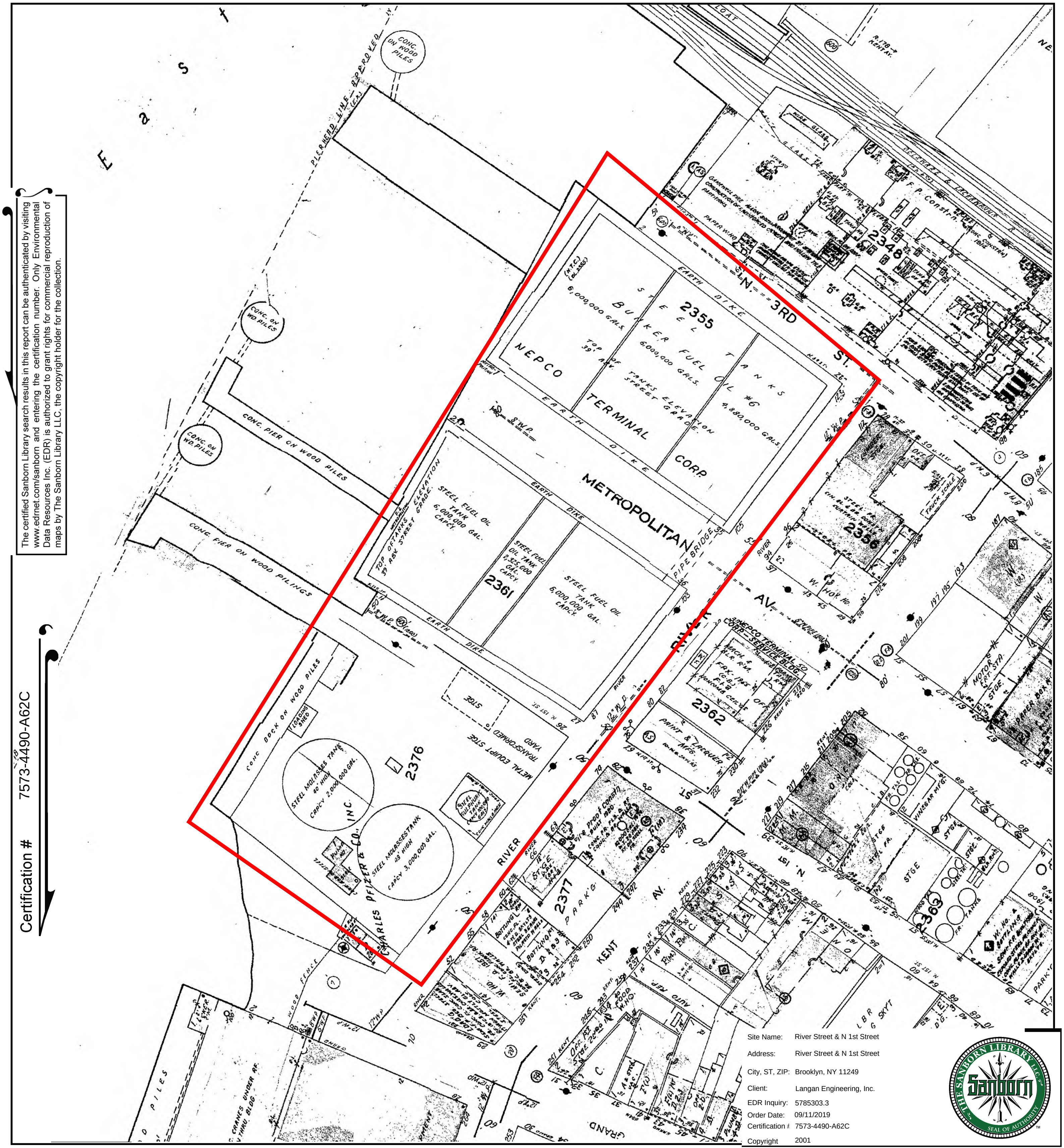
2001



Site Name: River Street & N 1st Street

Address: River Street & N 1st Street

City, ST, ZIP: Brooklyn, NY 11249

Client: Langan Engineering, Inc.

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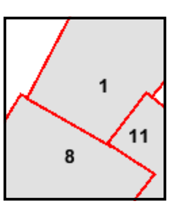

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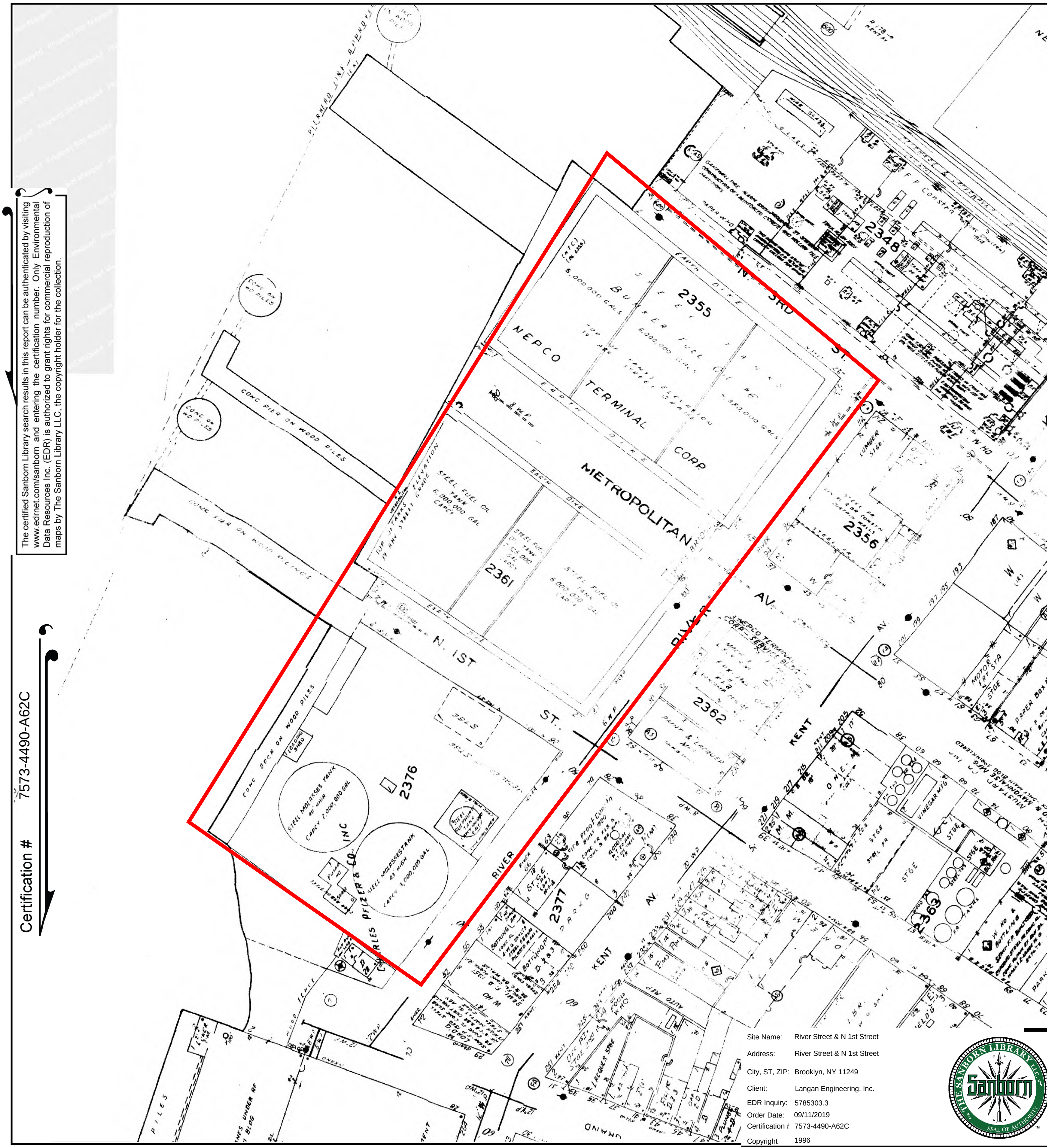
1996



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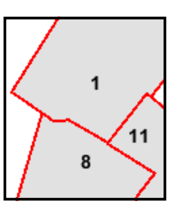

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1995

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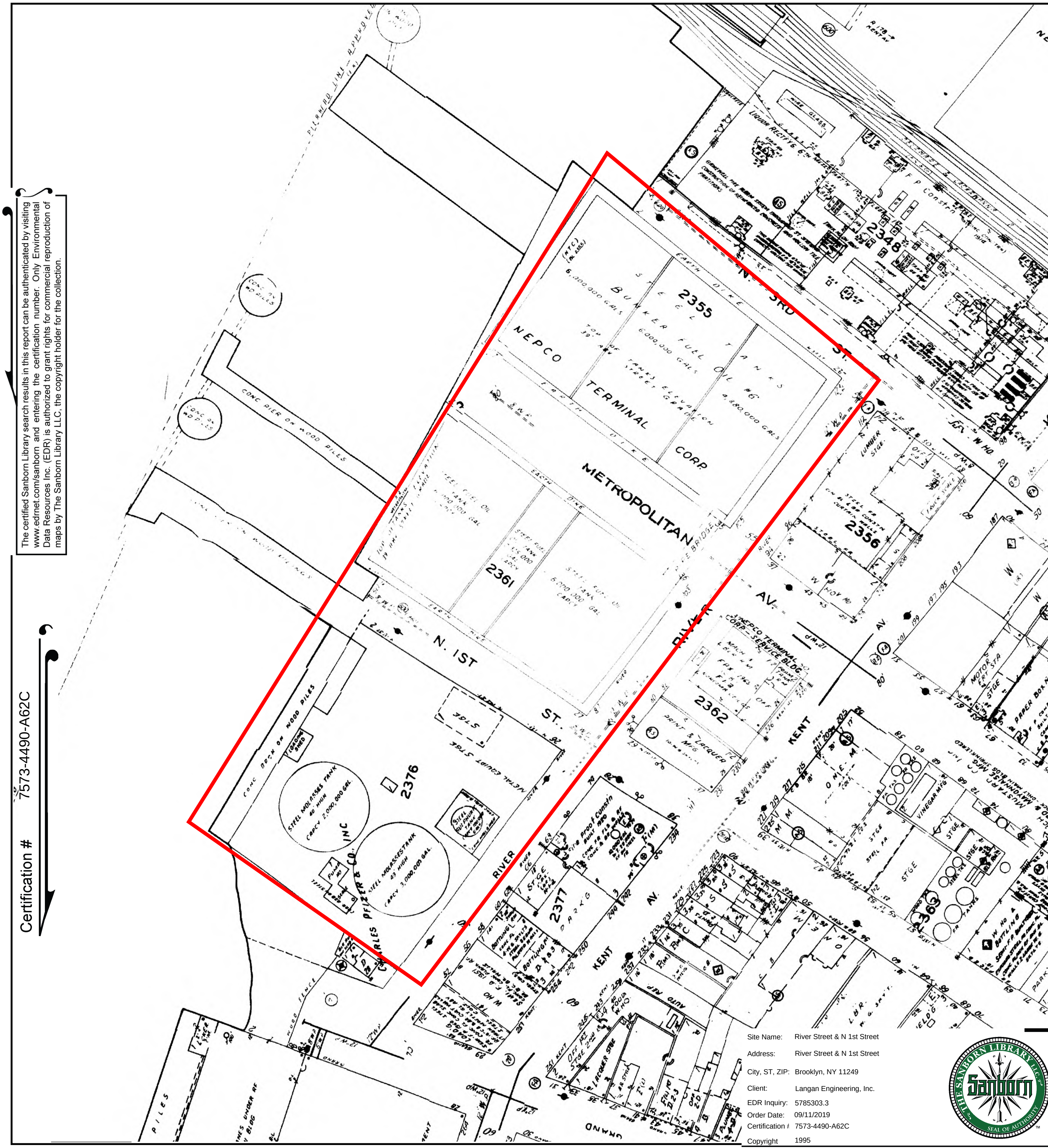

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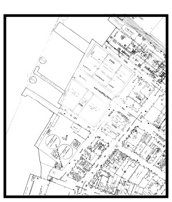

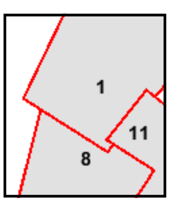

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Volume 4, Sheet 1

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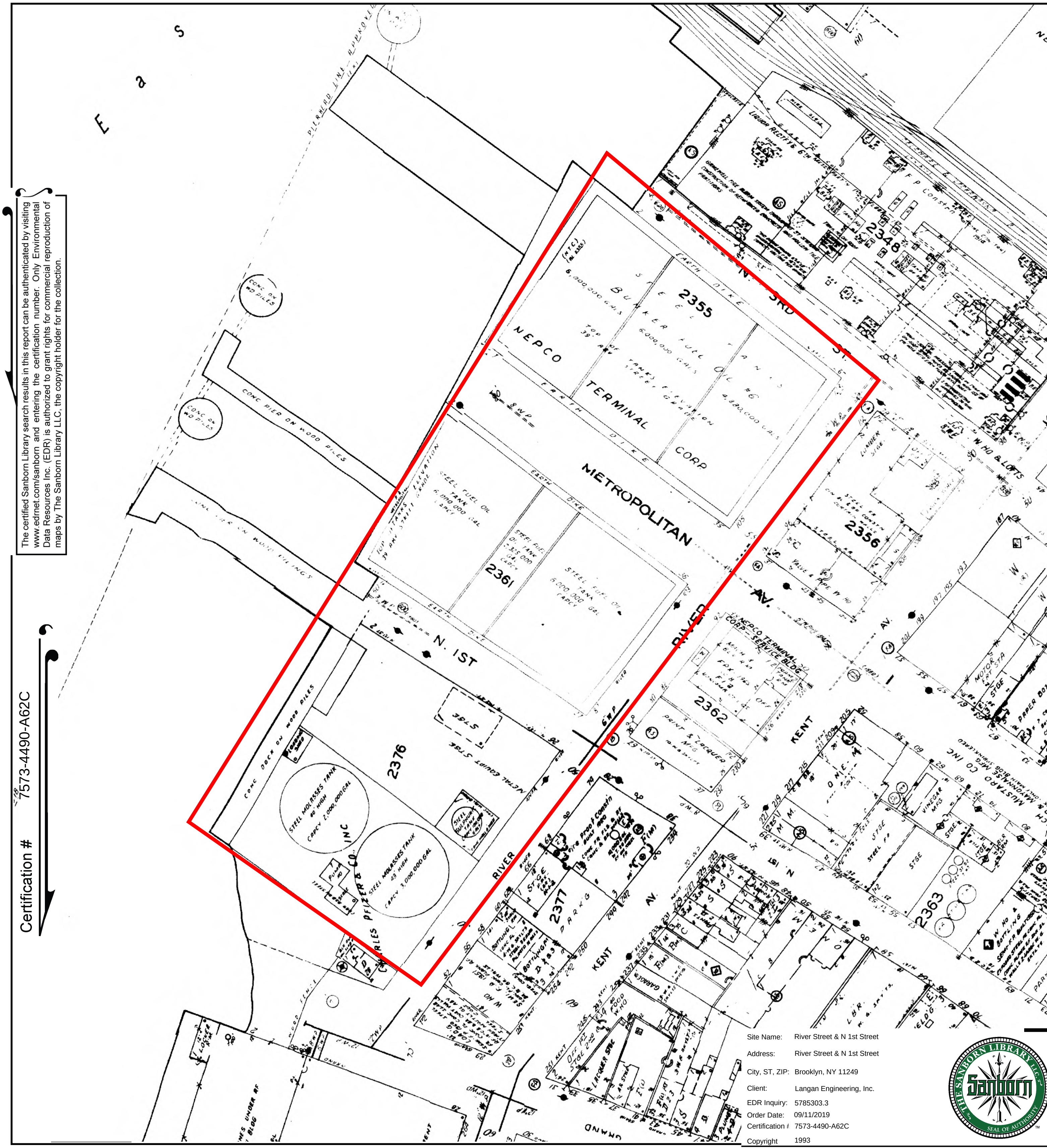
1993



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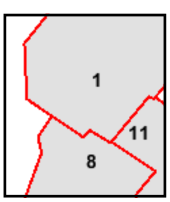

Volume 4, Sheet 1
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Volume 3, Sheet 8

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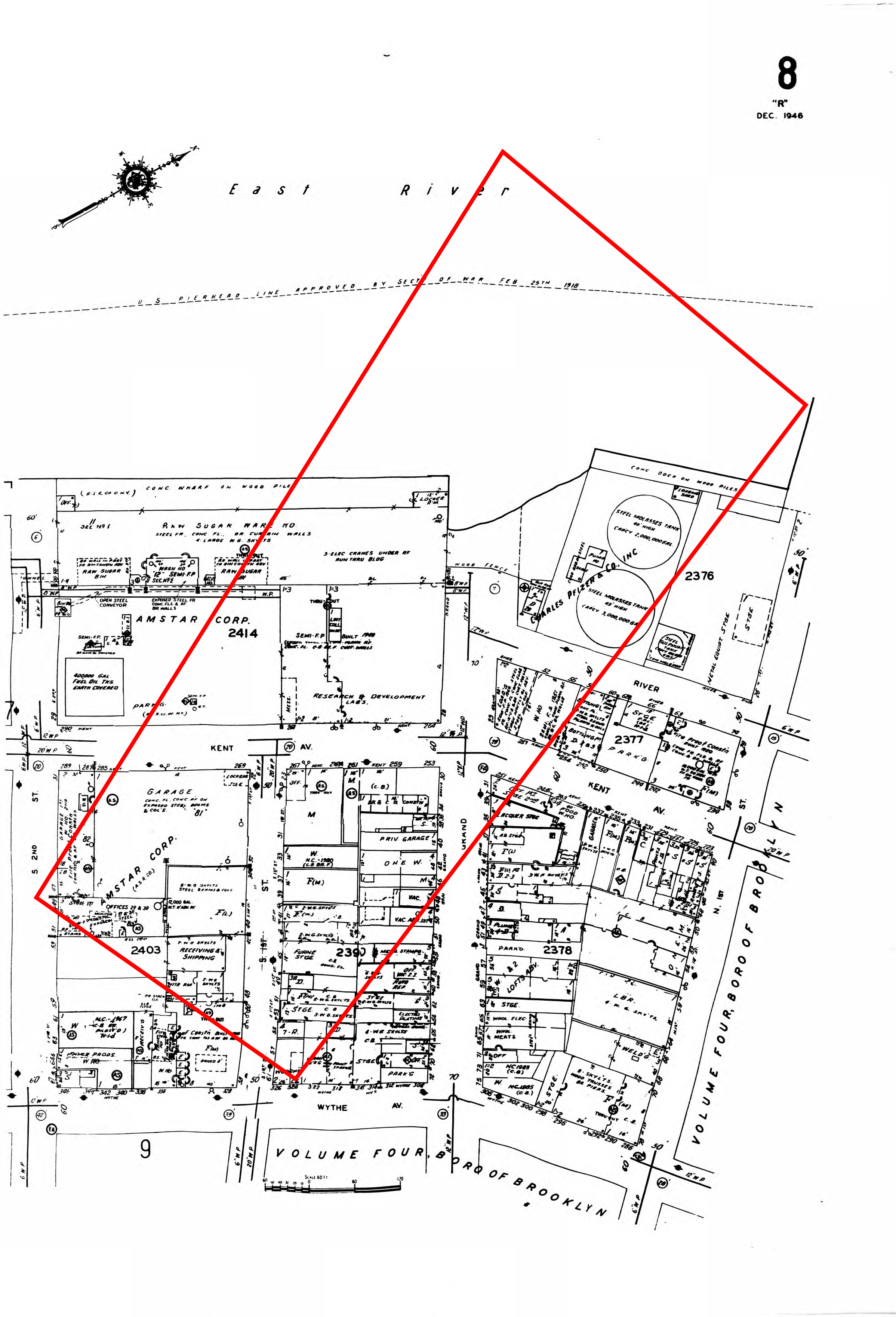

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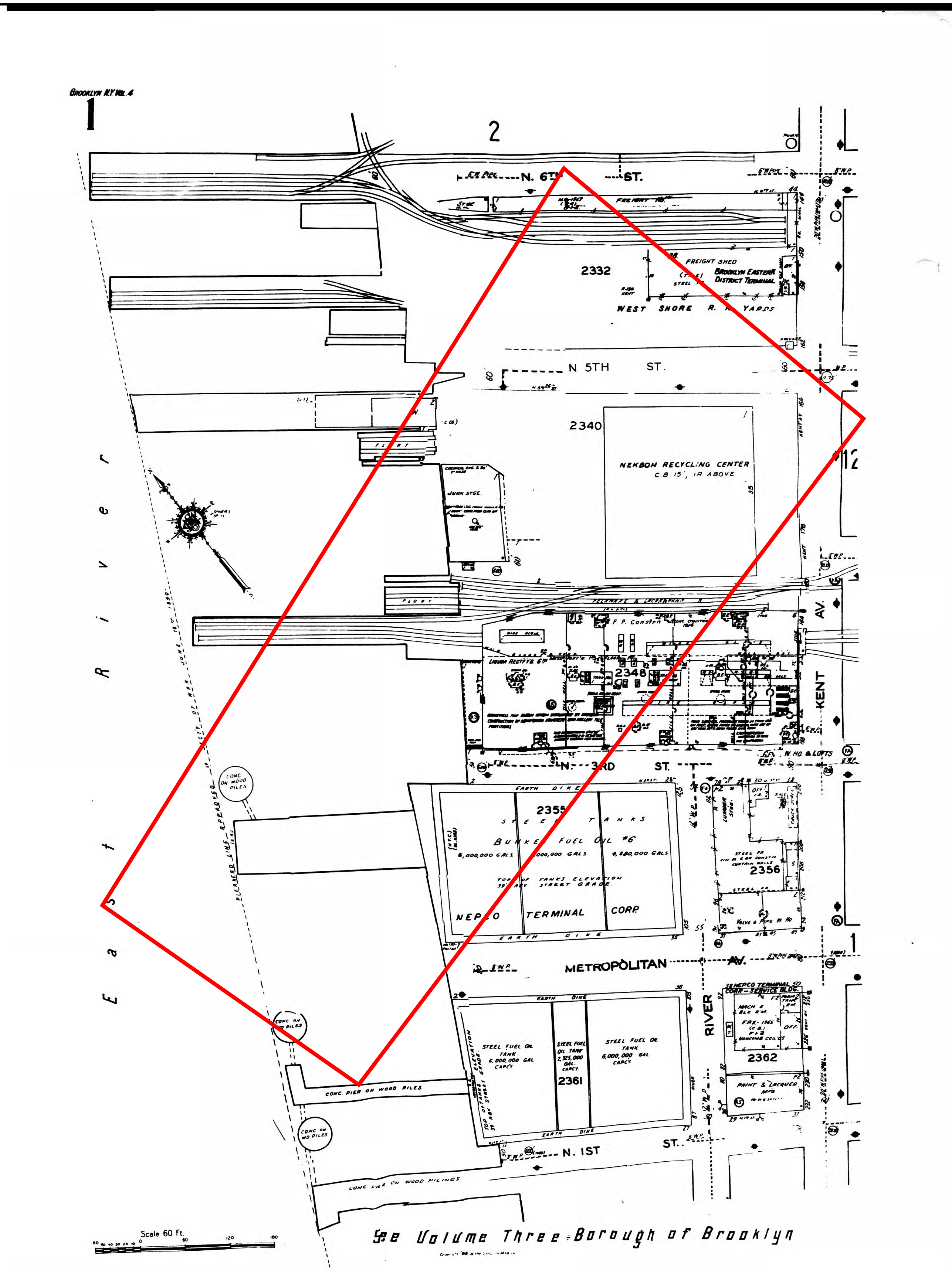

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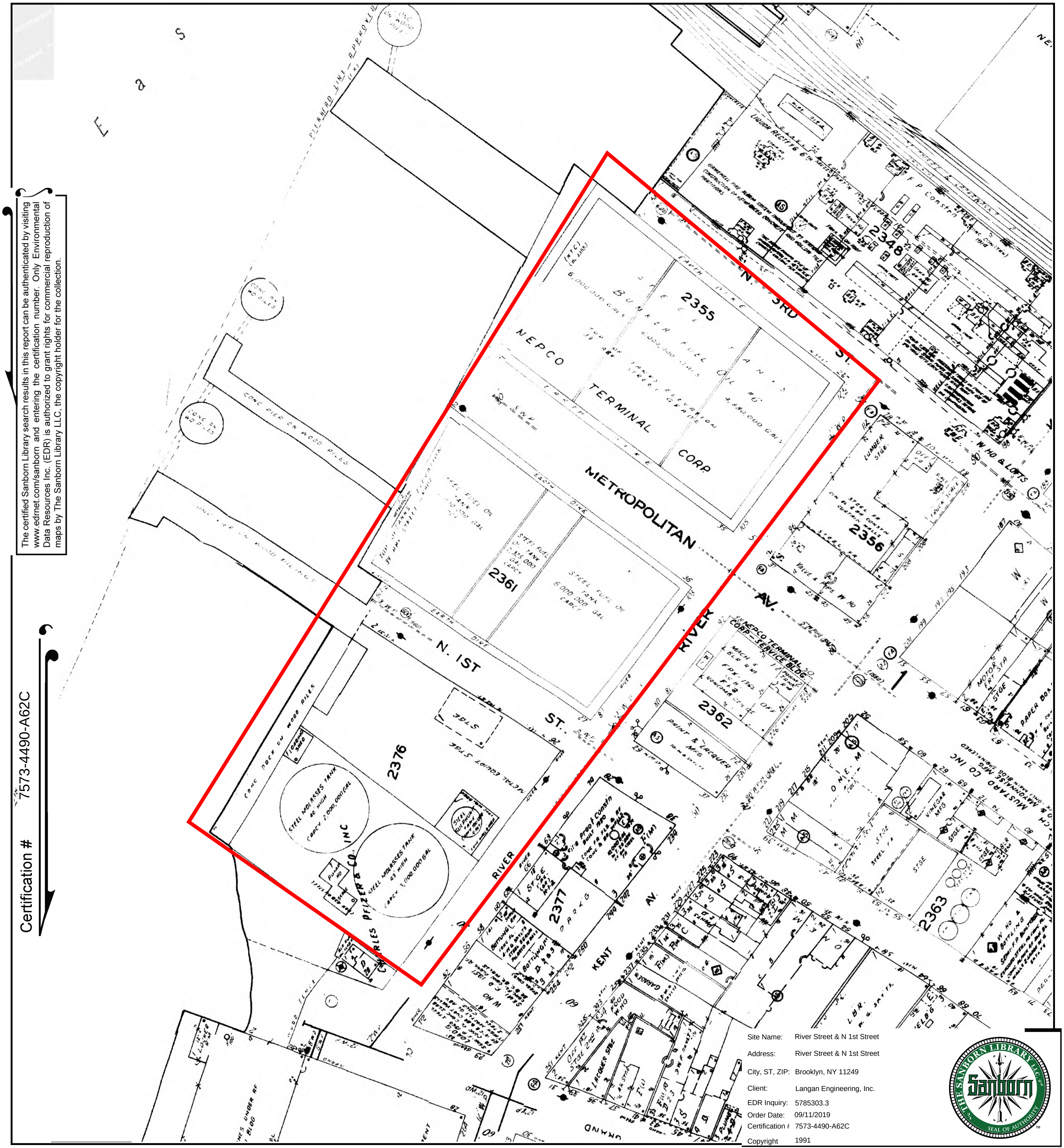
1991



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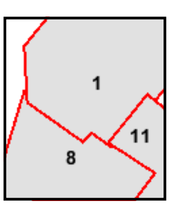

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N

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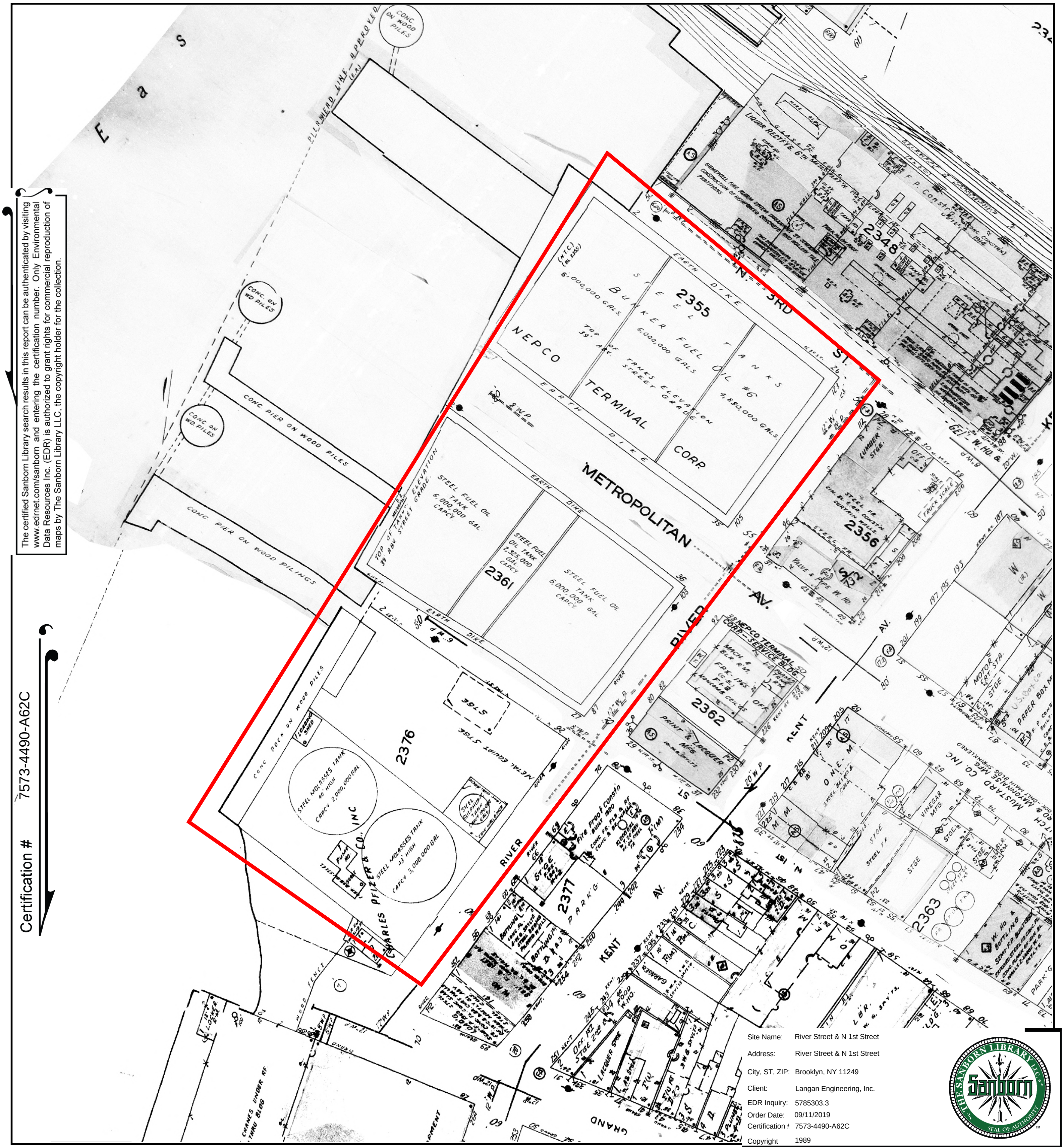
1989



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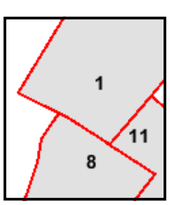

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1988

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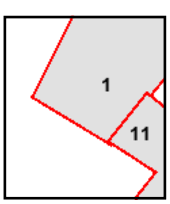

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1987

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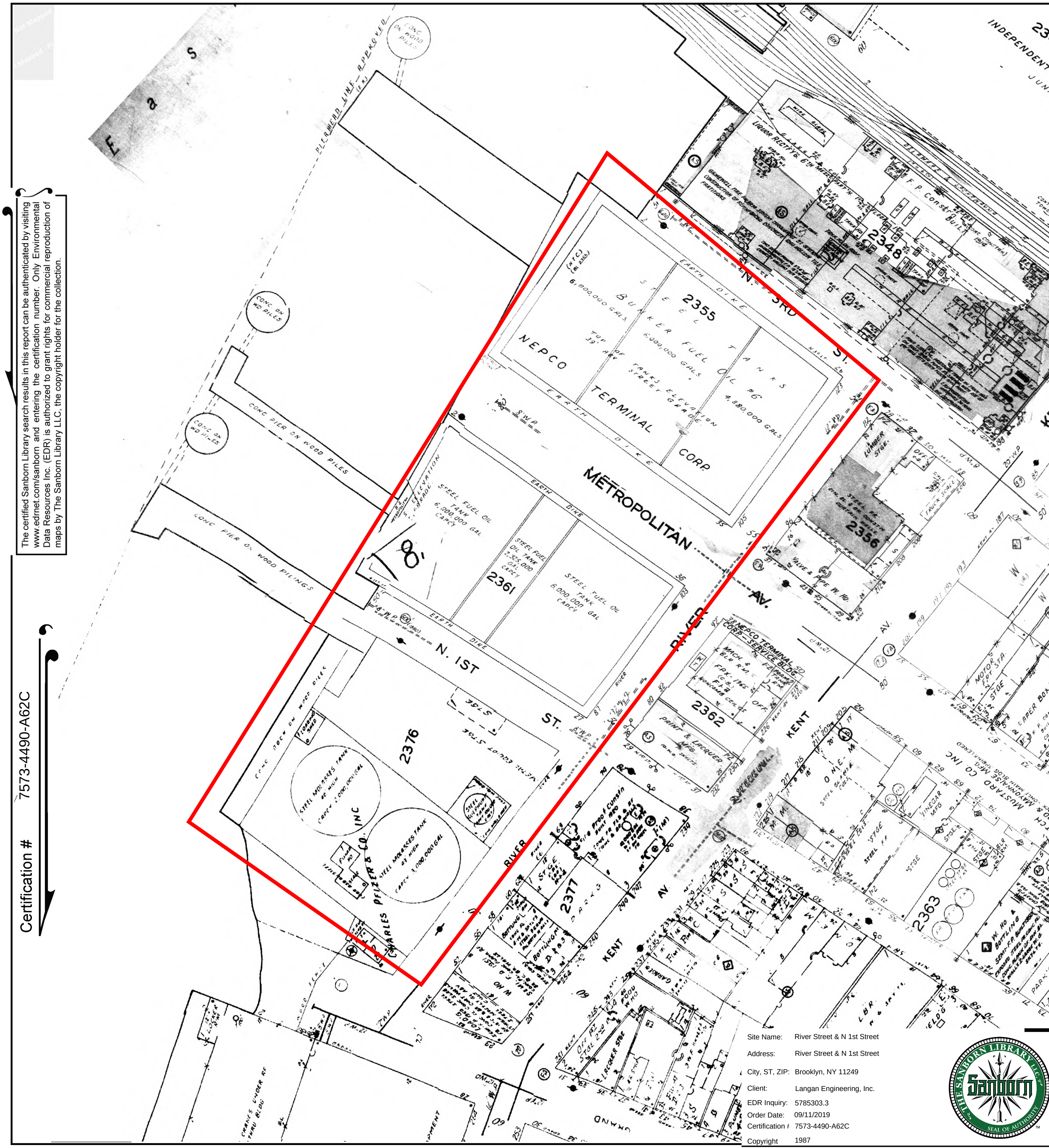

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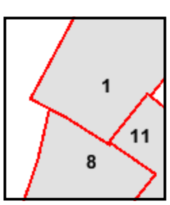

Volume 3, Sheet 8
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Volume 4, Sheet 1

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EDR

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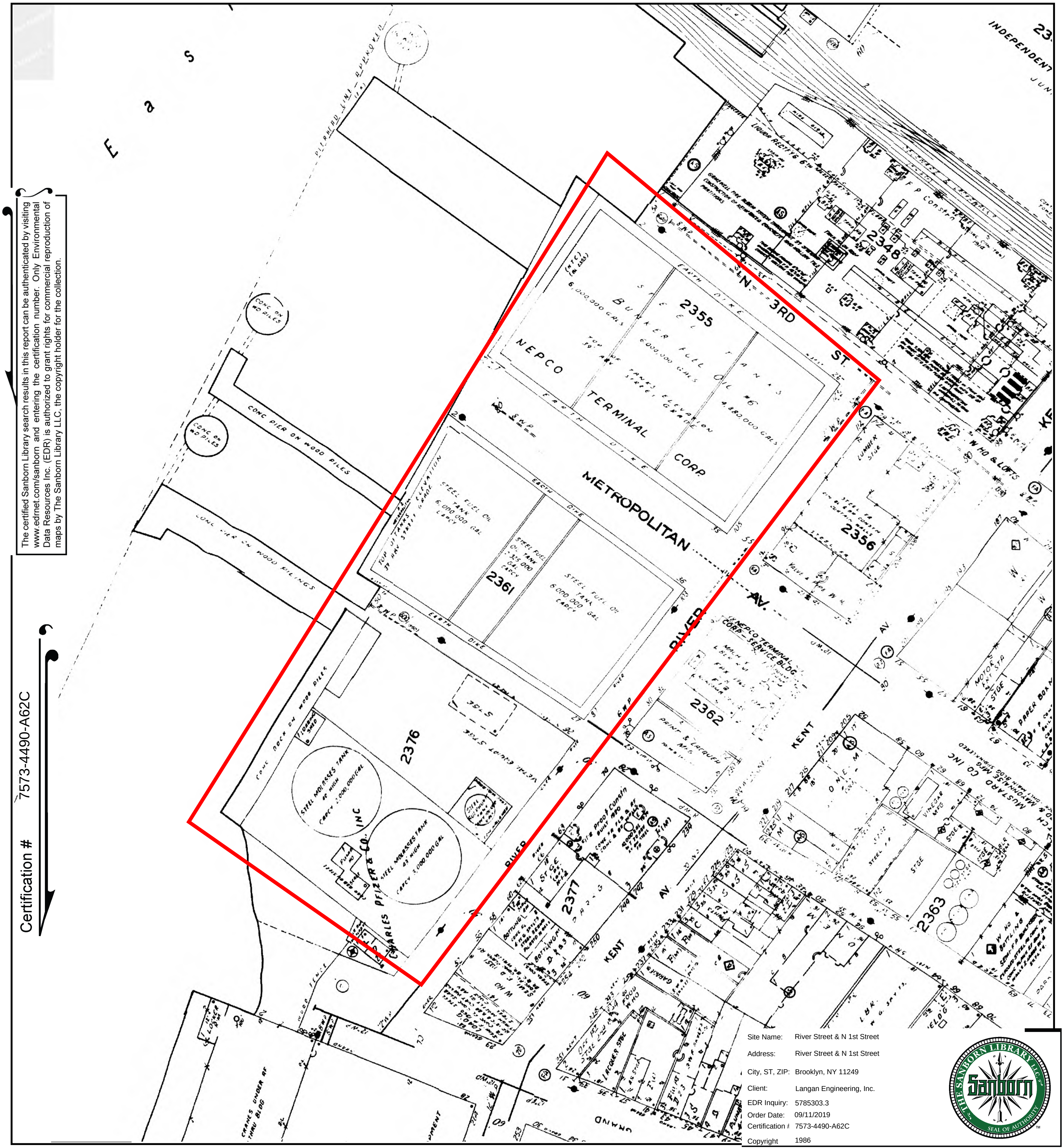
1986



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Certification #	7573-4490-A62C
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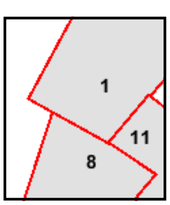

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1984

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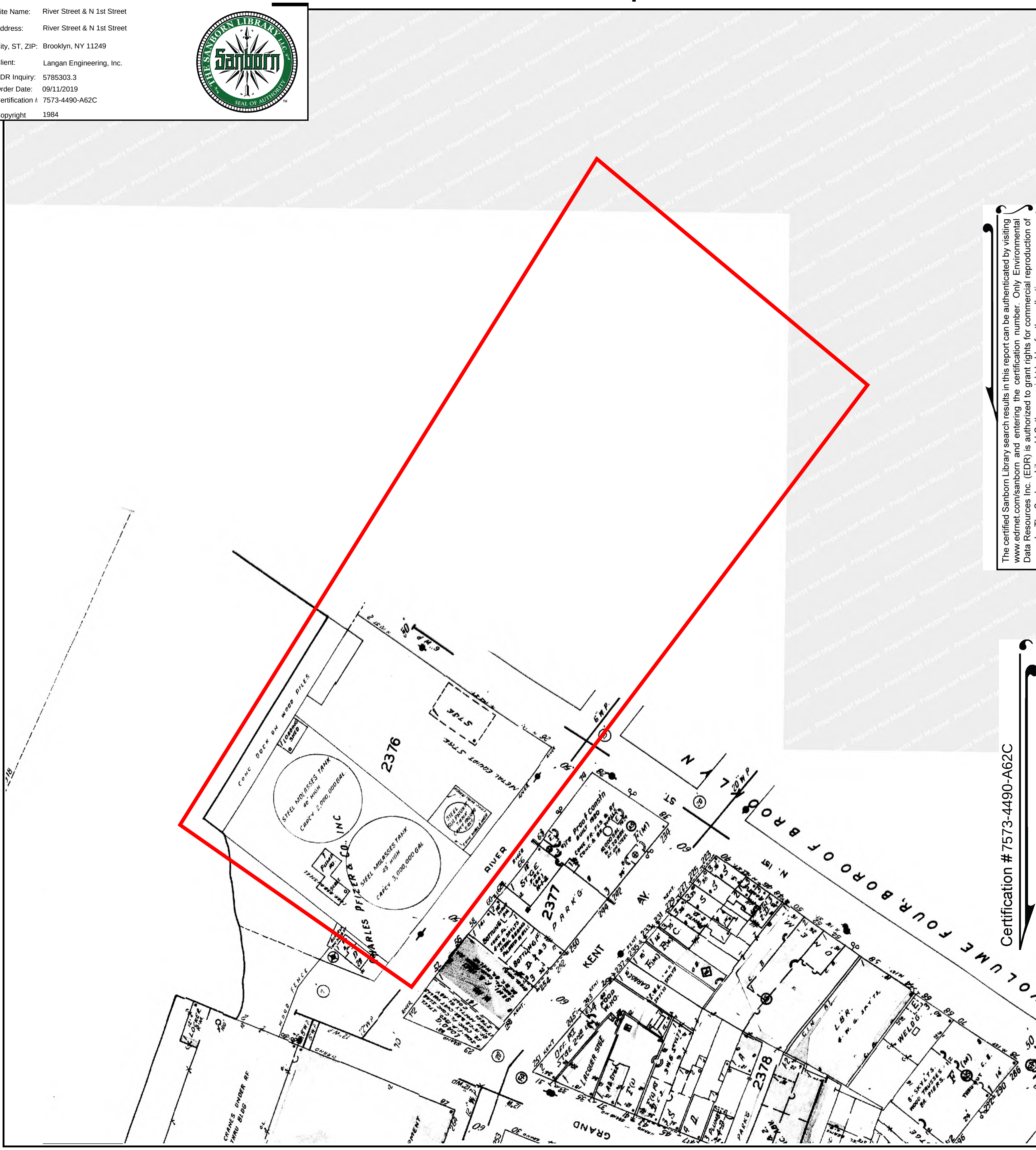

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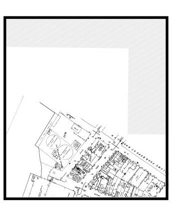

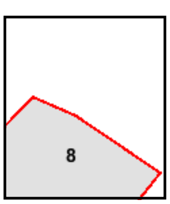

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1983

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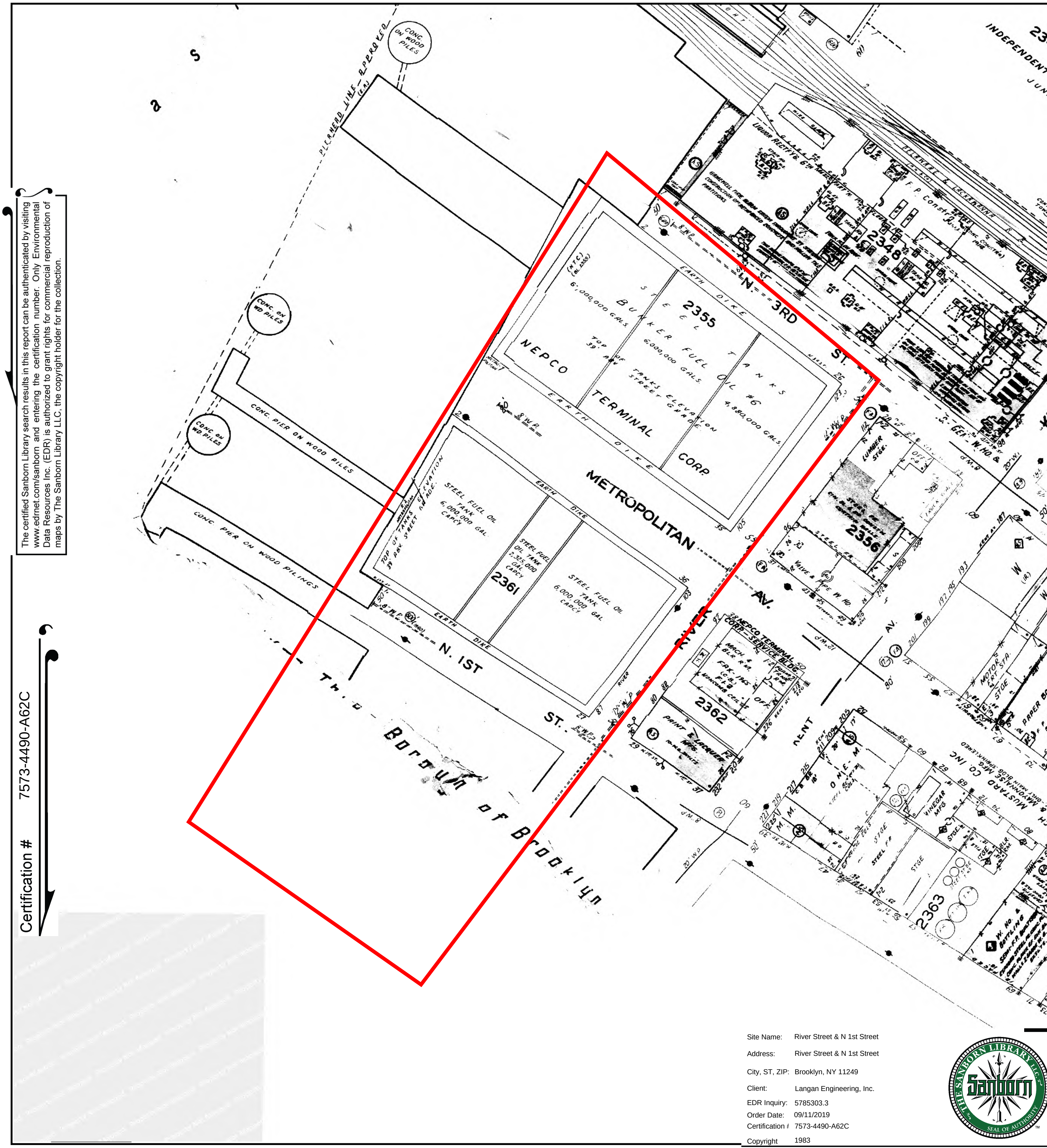

Site Name: River Street & N 1st Street
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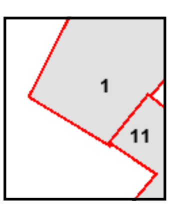

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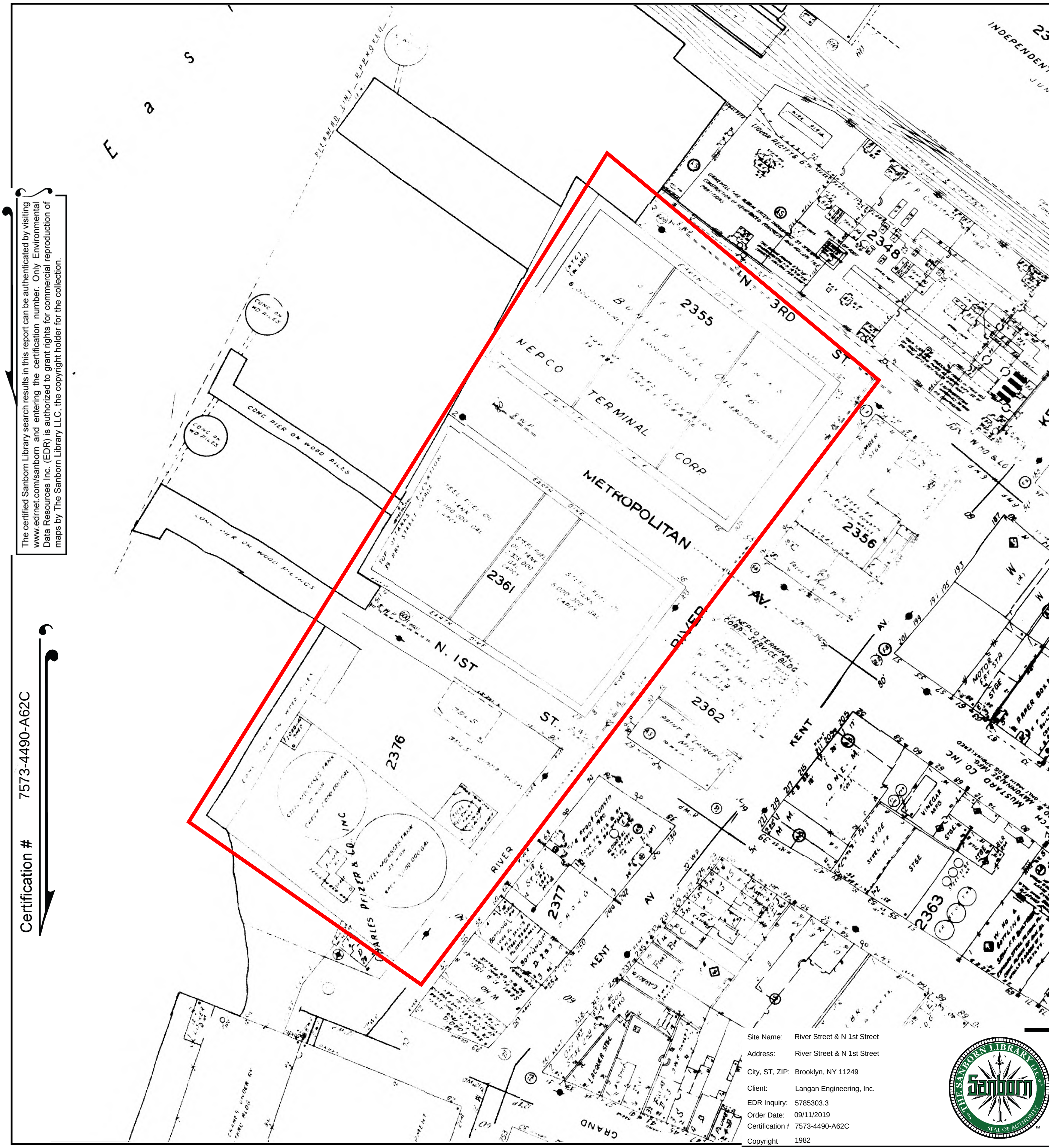
1982



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City, ST, ZIP:	Brooklyn, NY 11249
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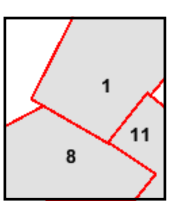

Volume 4, Sheet 11
Volume 4, Sheet 1
Volume 3, Sheet 8

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N

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1981

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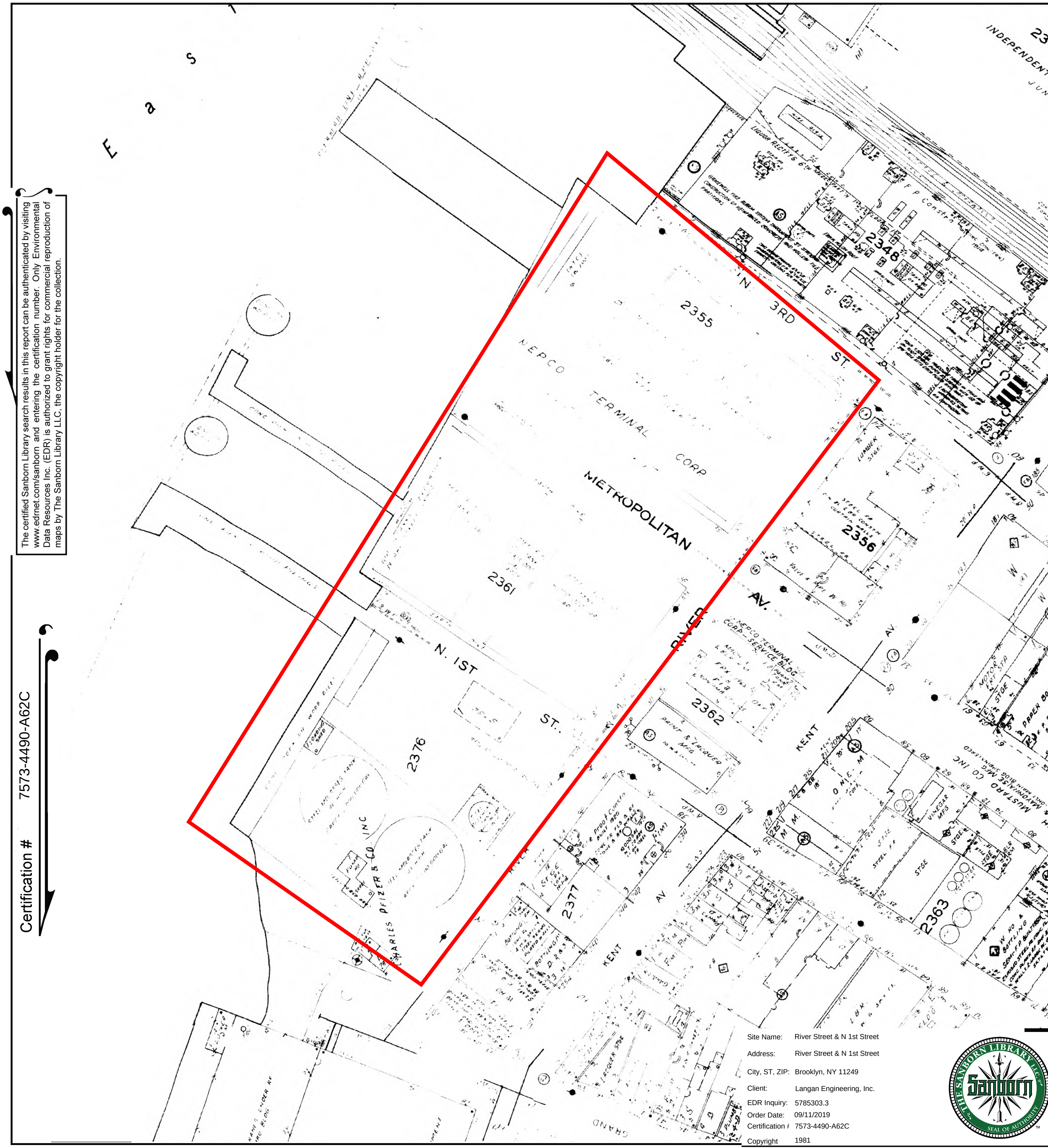

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Address: River Street & N 1st Street
City, ST, ZIP: Brooklyn, NY 11249
Client: Langan Engineering, Inc.
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Order Date: 09/11/2019
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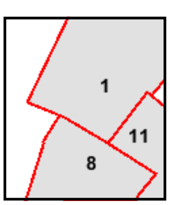

Volume 4, Sheet 11
Volume 4, Sheet 1
Volume 3, Sheet 8

0 Feet 150 300 600

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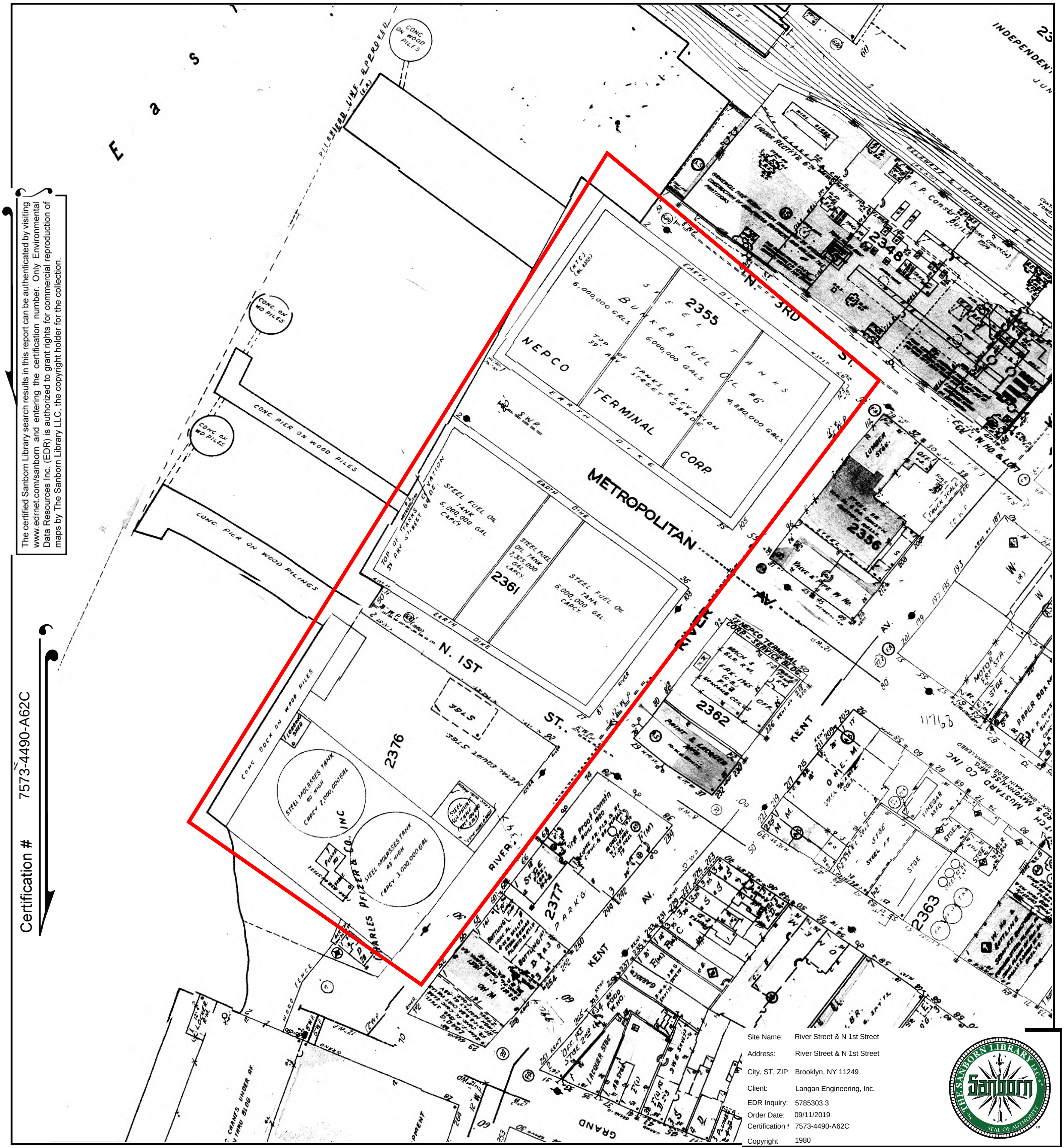
1980



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Certification #	7573-4490-A62C
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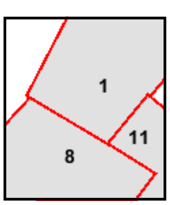

Volume 3, Sheet 8
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Volume 4, Sheet 1

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1979

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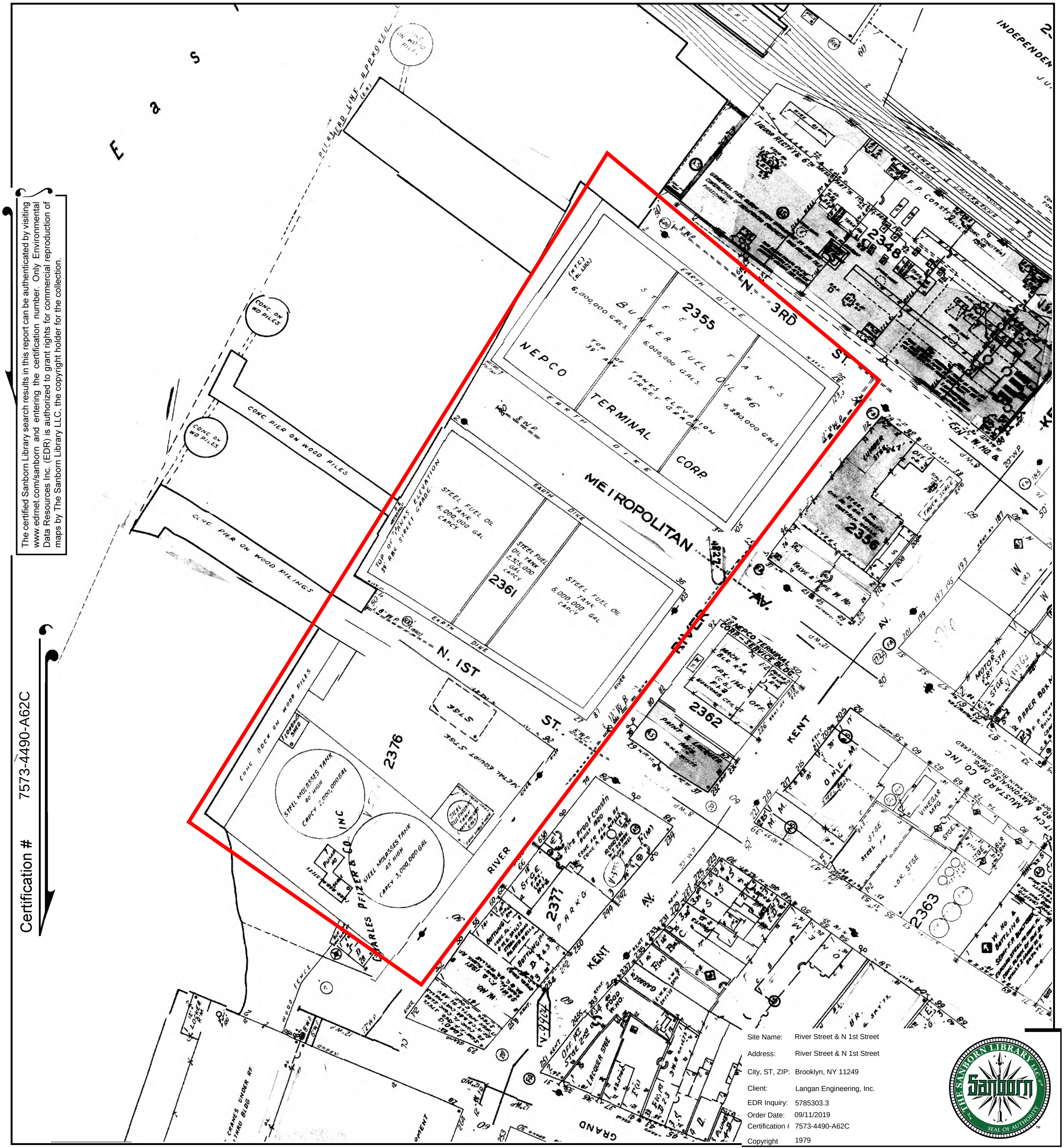

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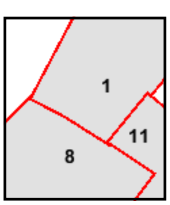

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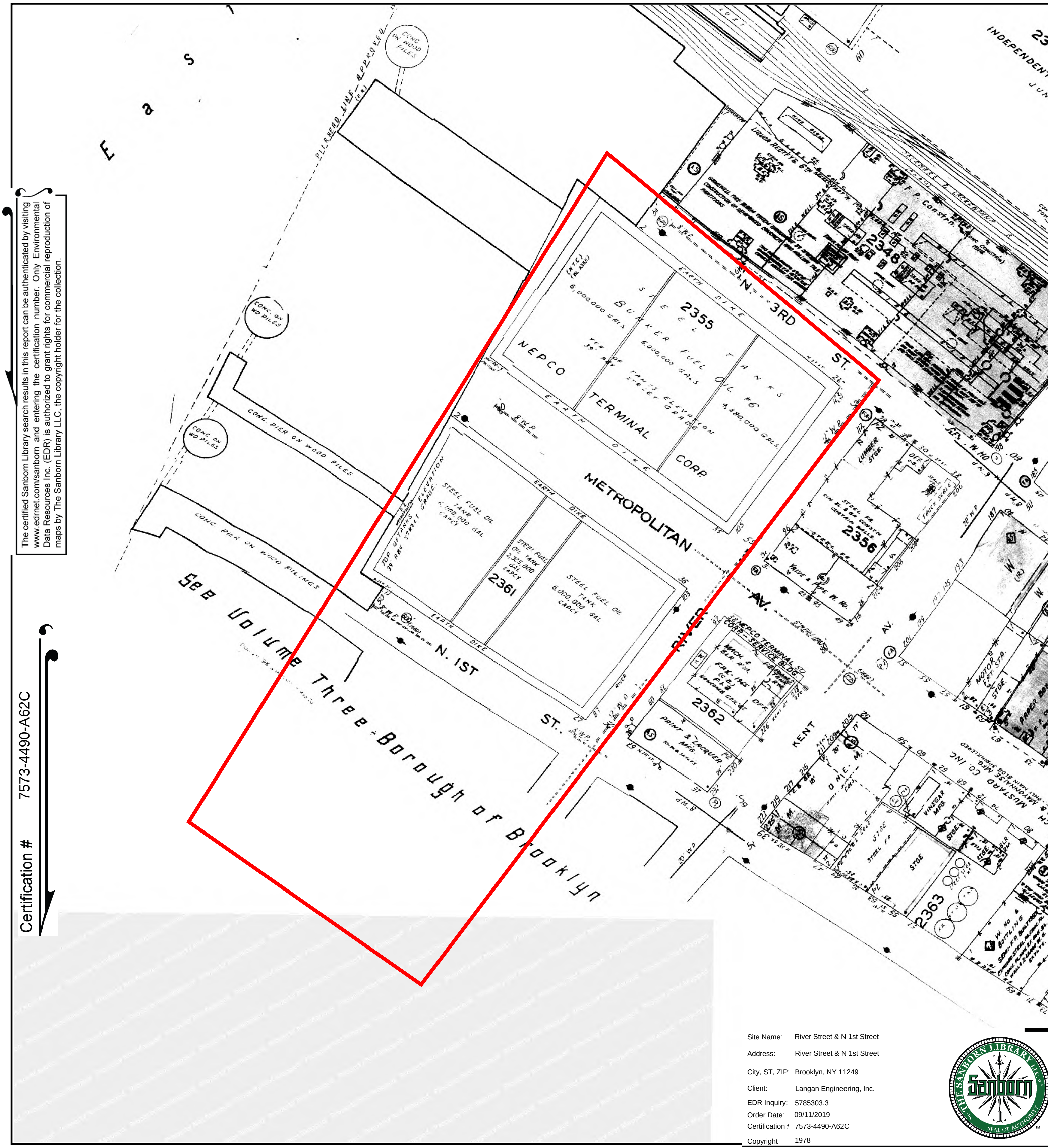
1978



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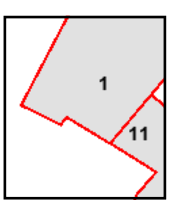

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1977

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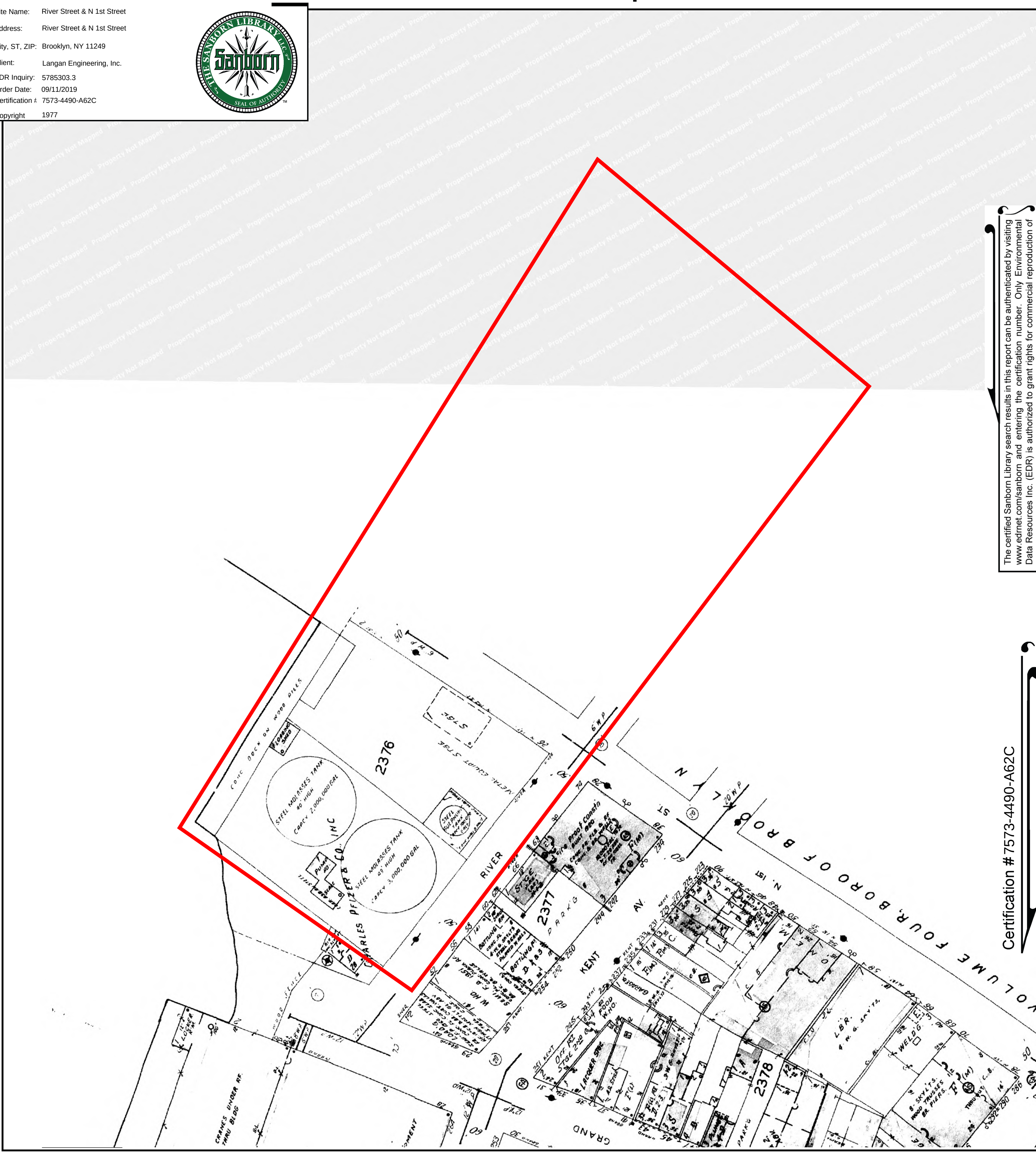

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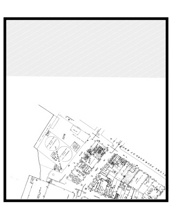

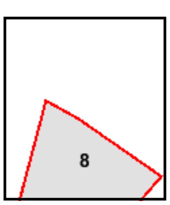

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1965

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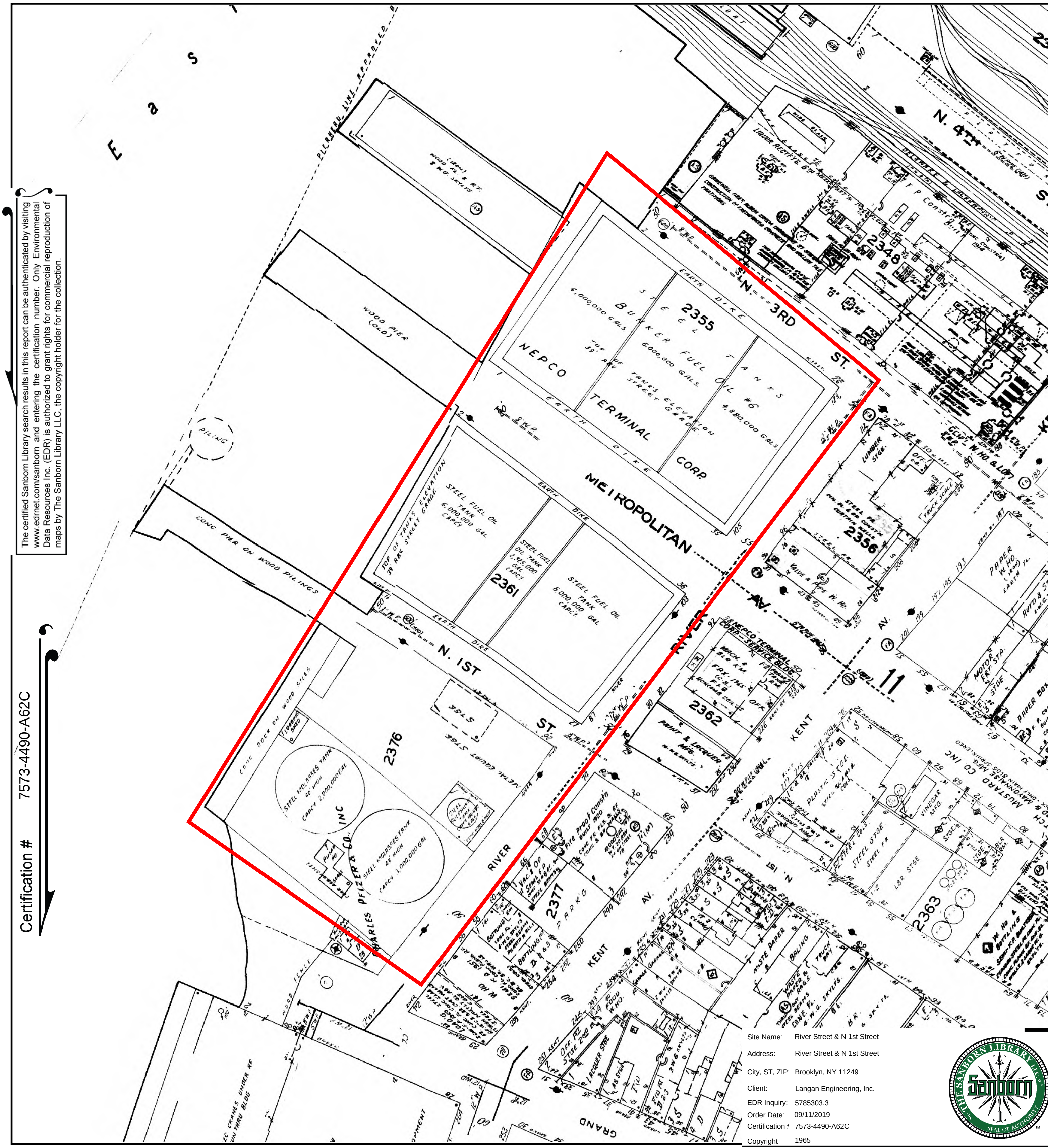

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City, ST, ZIP:	Brooklyn, NY 11249
Client:	Langan Engineering, Inc.
EDR Inquiry:	5785303.3
Order Date:	09/11/2019
Certification #	7573-4490-A62C
Copyright	1965

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

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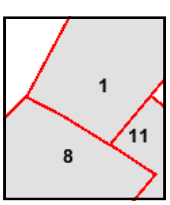
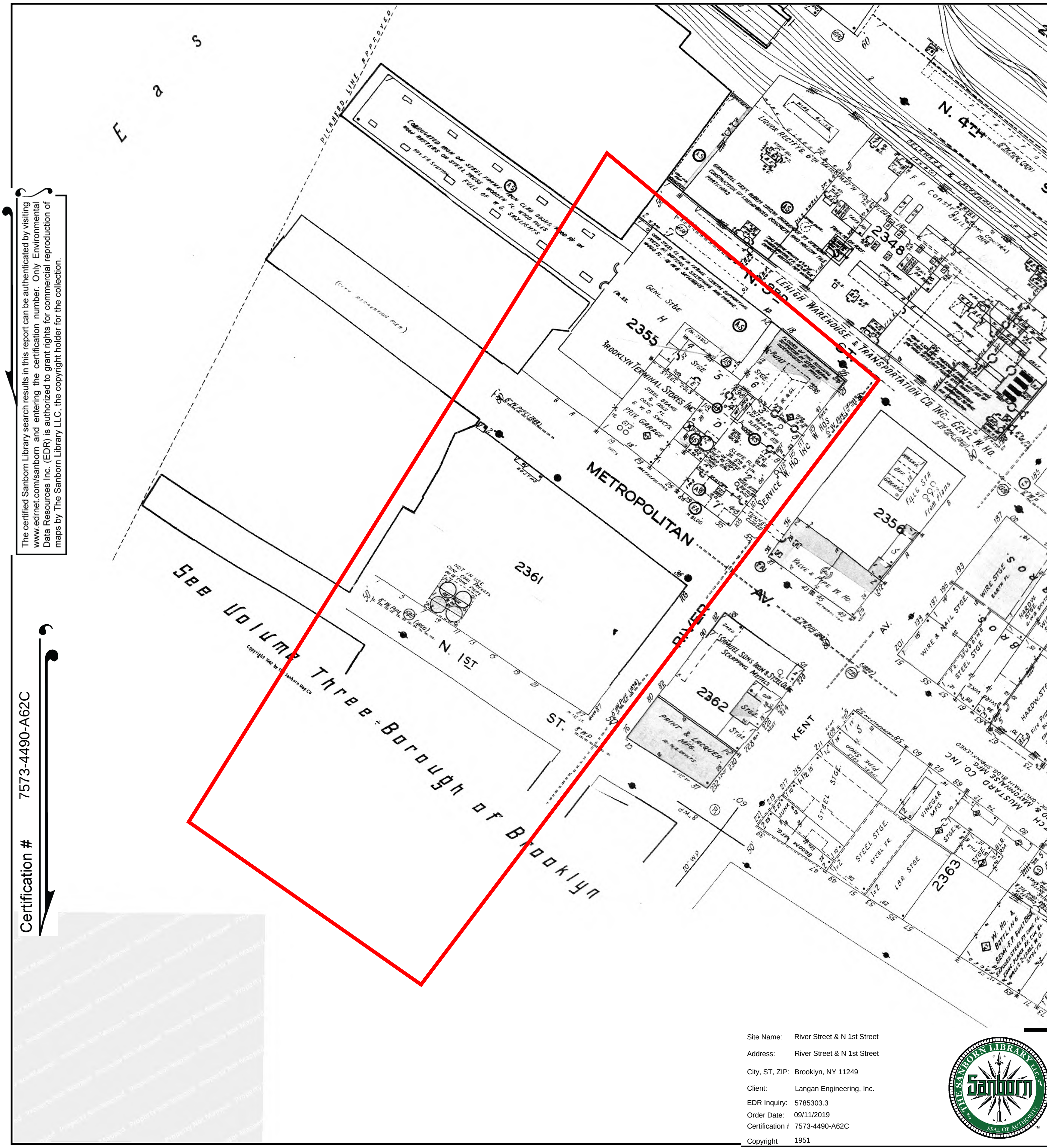


Volume 3, Sheet 8
Volume 4, Sheet 1
Volume 4, Sheet 11

N

Certification # 7573-4490-A62C



Site Name: River Street & N 1st Street
Address: River Street & N 1st Street
City, ST, ZIP: Brooklyn, NY 11249
Client: Langan Engineering, Inc.
EDR Inquiry: 5785303.3
Order Date: 09/11/2019
Certification # 7573-4490-A62C
Copyright 1951

This Certified Sanborn Map combines the following sheets.
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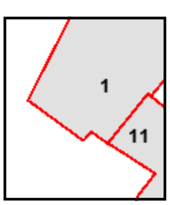


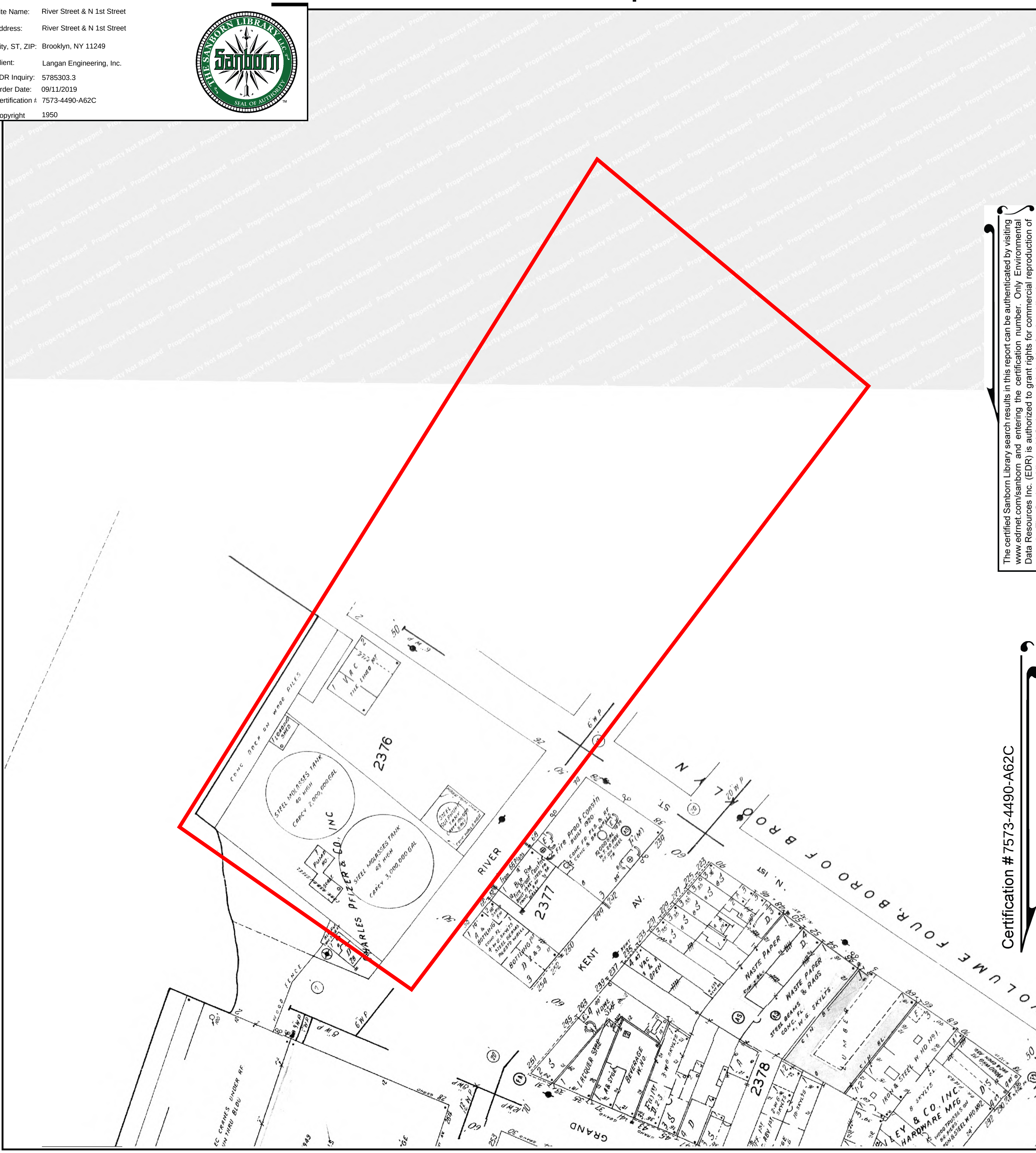
Volume 4, Sheet 11
Volume 4, Sheet 1

N.

Certified Sanborn® Map

1950

Site Name: River Street & N 1st Street
Address: River Street & N 1st Street
City, ST, ZIP: Brooklyn, NY 11249
Client: Langan Engineering, Inc.
EDR Inquiry: 5785303.3
Order Date: 09/11/2019
Certification # 7573-4490-A62C
Copyright 1950



Certification # 7573-4490-A62C

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

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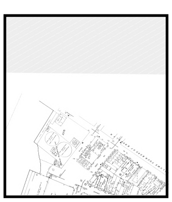
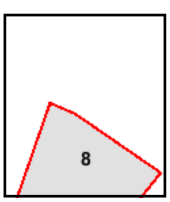
Volume 3, Sheet 8

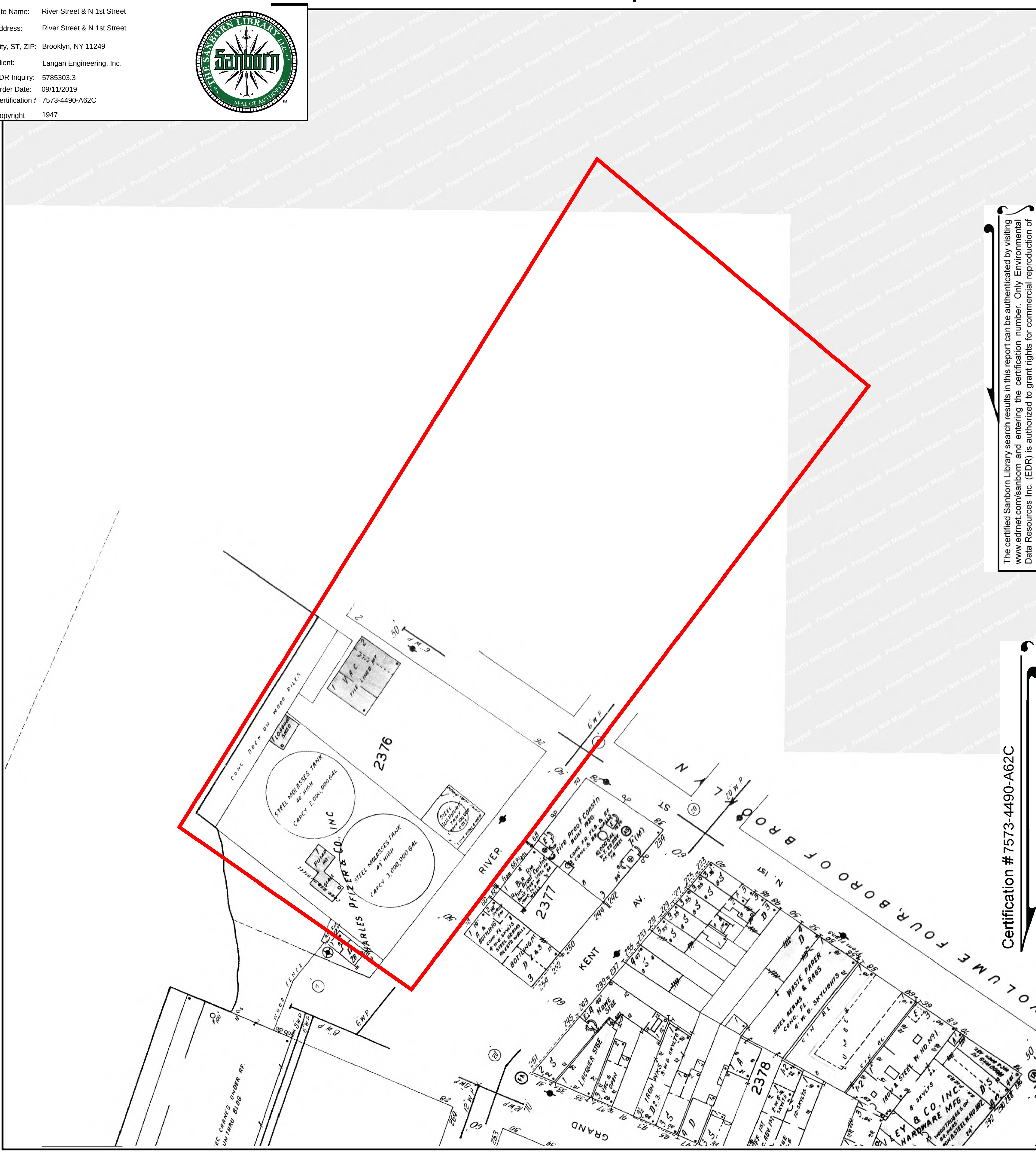




Certified Sanborn® Map

1947

Site Name: River Street & N 1st Street
Address: River Street & N 1st Street
City, ST, ZIP: Brooklyn, NY 11249
Client: Langan Engineering, Inc.
EDR Inquiry: 5785303.3
Order Date: 09/11/2019
Certification # 7573-4490-A62C
Copyright 1947



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Certification # 7573-4490-A62C

This Certified Sanborn Map combines the following sheets.
Outlined areas indicate map sheets within the collection.

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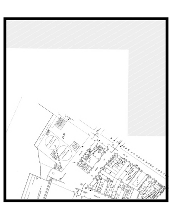
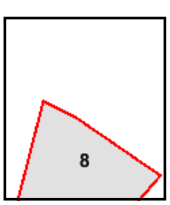




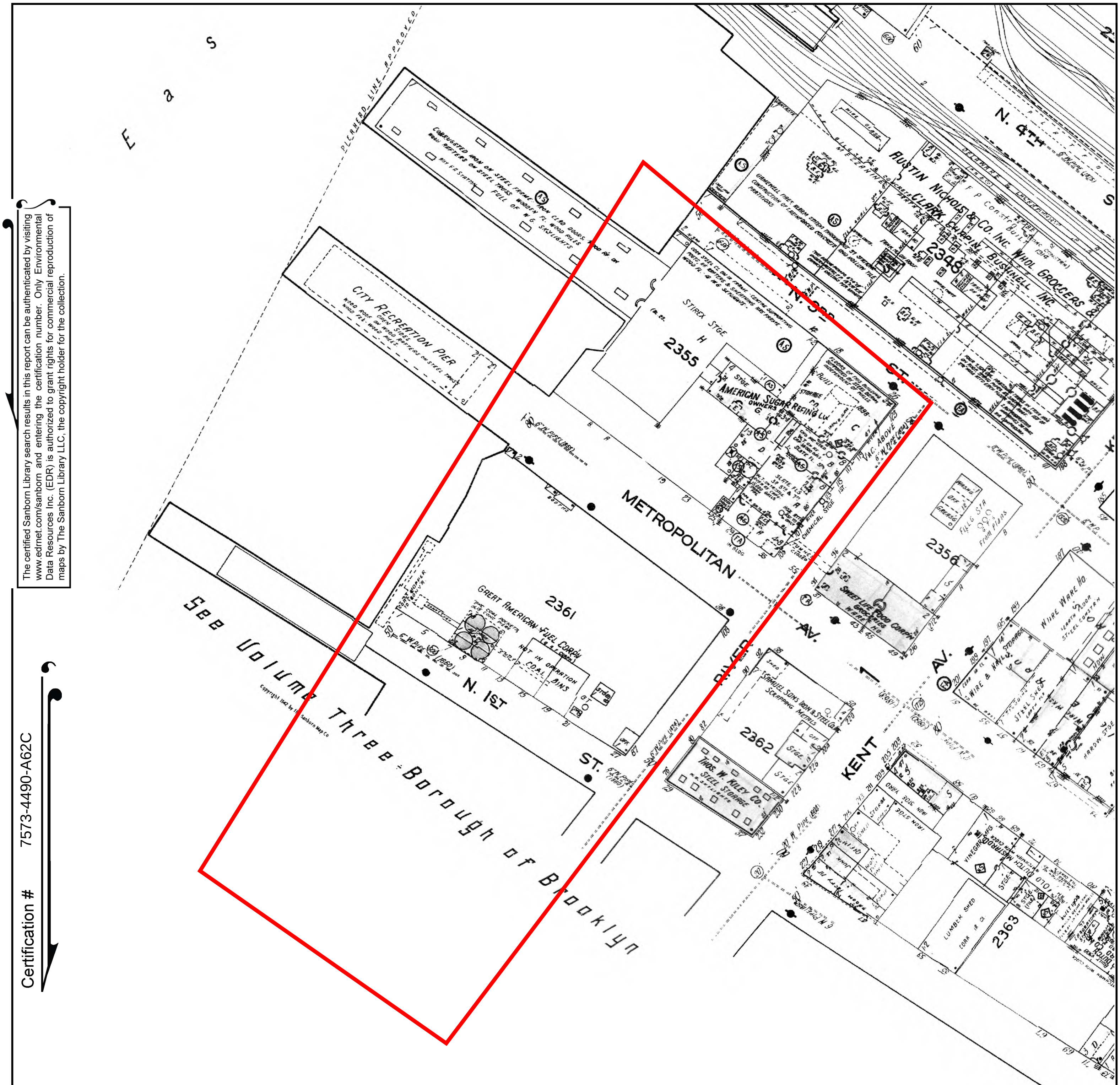
Volume 3, Sheet 8

N

Certified Sanborn® Map

1942

Certification # 7573-4490-A62C



Site Name:	River Street & N 1st Street
Address:	River Street & N 1st Street
City, ST, ZIP:	Brooklyn, NY 11249
Client:	Langan Engineering, Inc.
EDR Inquiry:	5785303.3
Order Date:	09/11/2019
Certification #	7573-4490-A62C
Copyright	1942

This Certified Sanborn Map combines the following sheets.
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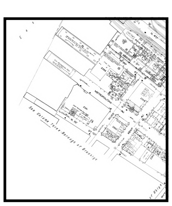
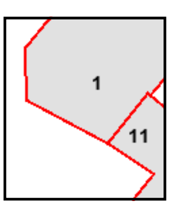


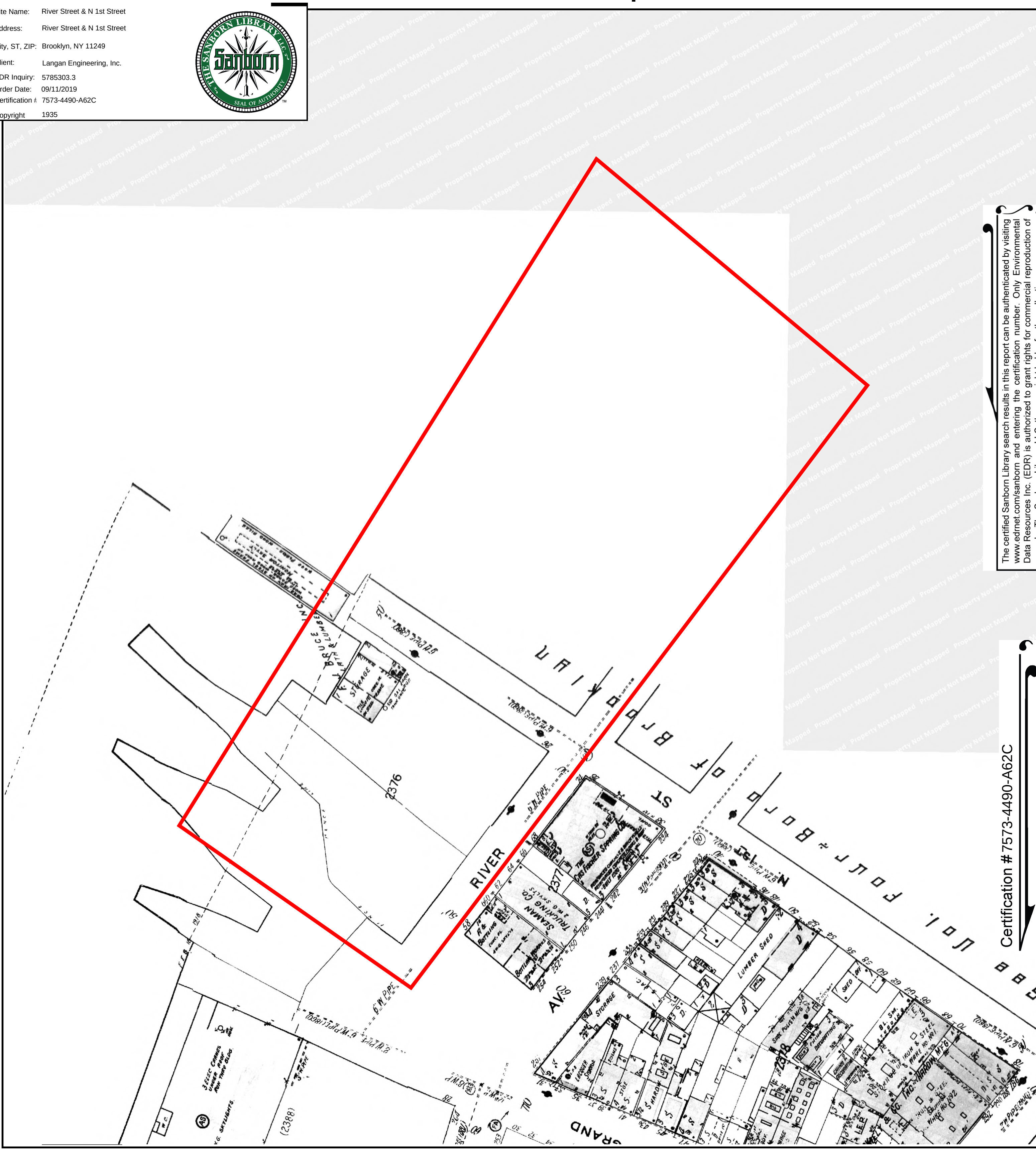


Volume 4, Sheet 11
Volume 4, Sheet 1

Certified Sanborn® Map

1935

Site Name: River Street & N 1st Street
Address: River Street & N 1st Street
City, ST, ZIP: Brooklyn, NY 11249
Client: Langan Engineering, Inc.
EDR Inquiry: 5785303.3
Order Date: 09/11/2019
Certification # 7573-4490-A62C
Copyright 1935



Certification # 7573-4490-A62C

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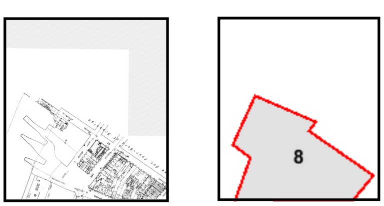
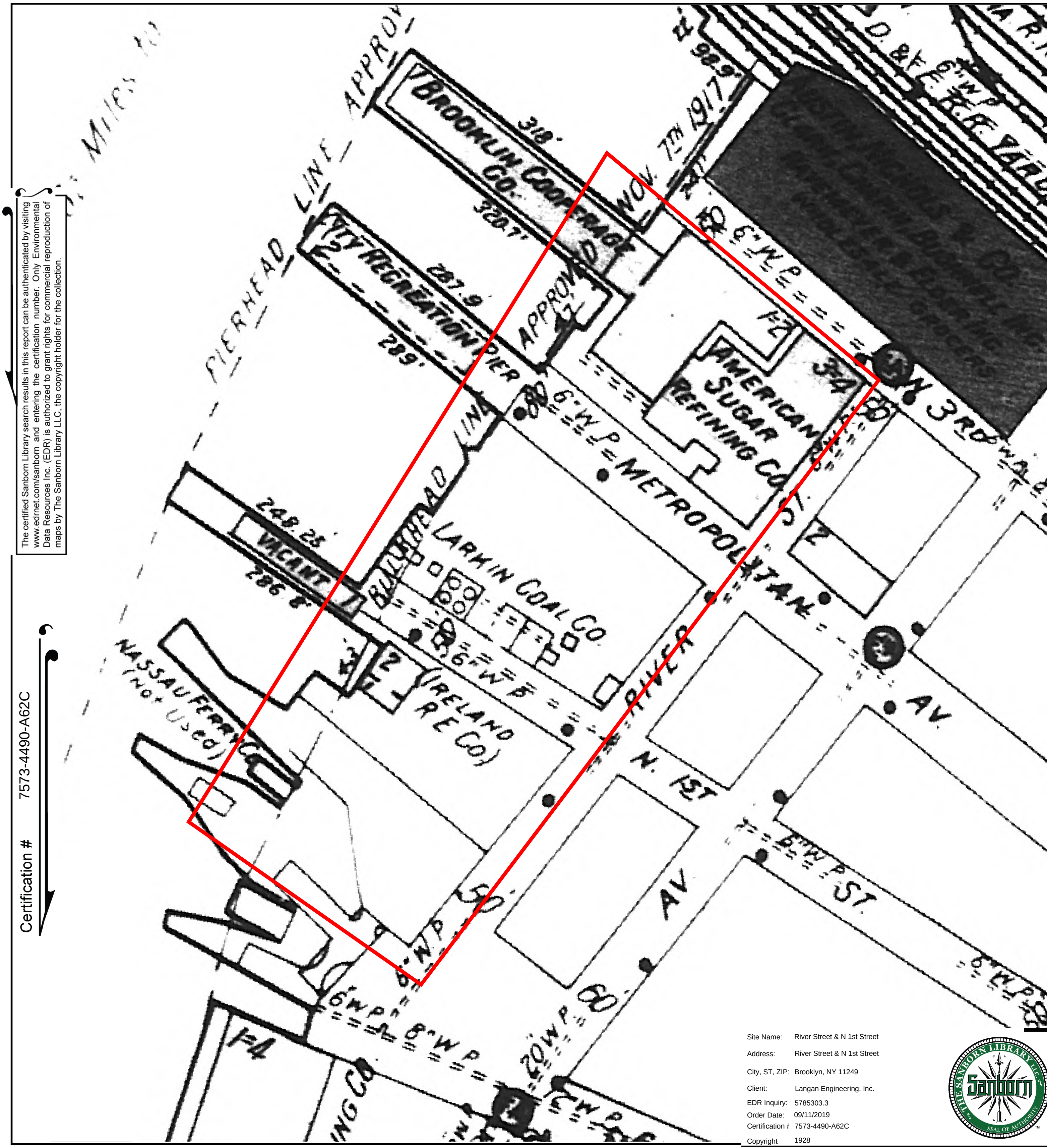


Volume 3, Sheet 8

Certified Sanborn® Map

1928

Certification # 7573-4490-A62C



Site Name:	River Street & N 1st Street
Address:	River Street & N 1st Street
City, ST, ZIP:	Brooklyn, NY 11249
Client:	Langan Engineering, Inc.
EDR Inquiry:	5785303.3
Order Date:	09/11/2019
Certification #	7573-4490-A62C
Copyright	1928

0 Feet 150 300 600

N

This Certified Sanborn Map combines the following sheets.
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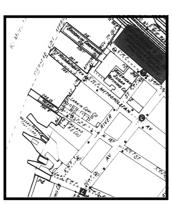

42

Volume Pier Maps, Sheet 42

Certified Sanborn® Map

1922

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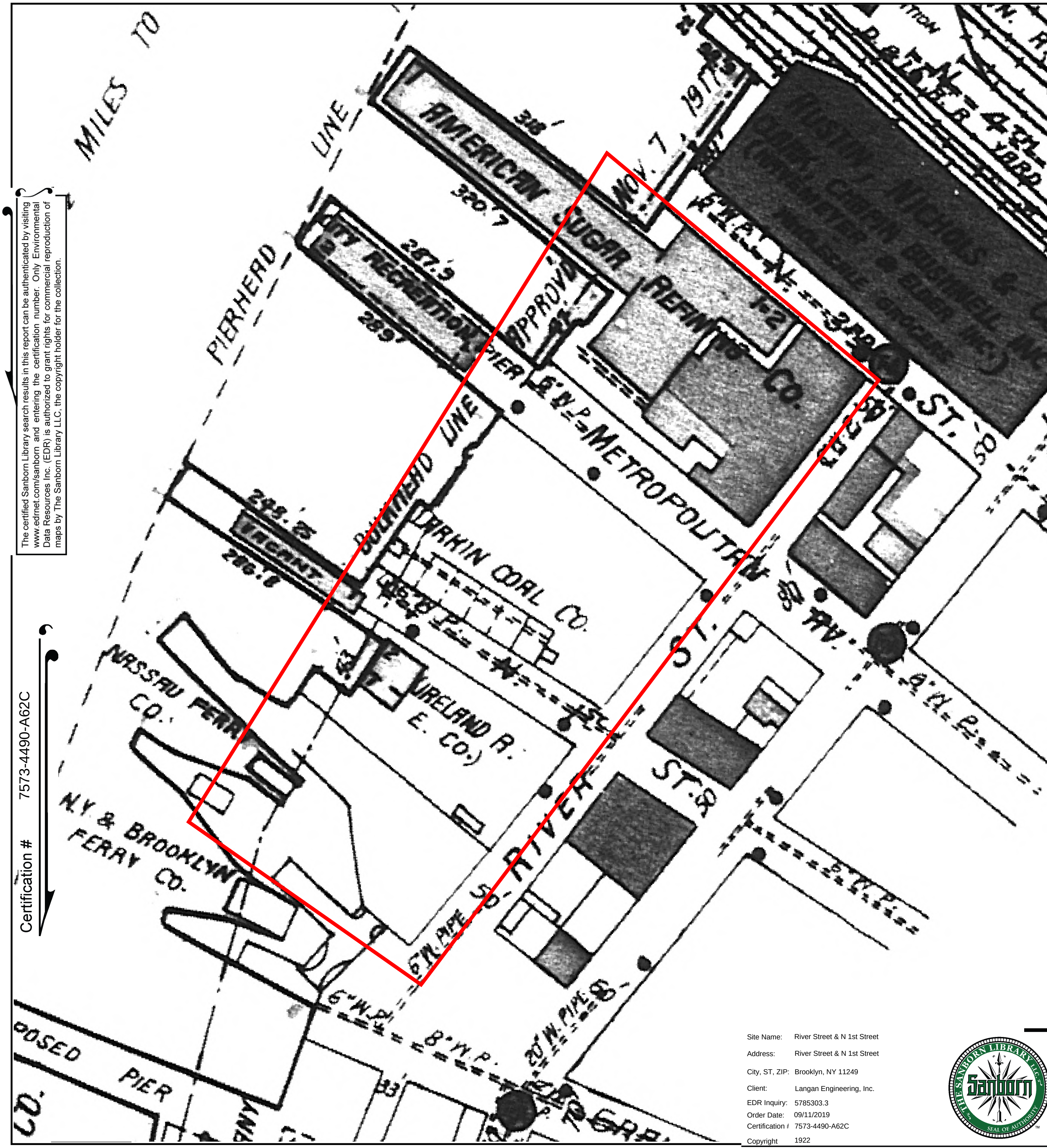
Certification # 7573-4490-A62C



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Address:	River Street & N 1st Street
City, ST, ZIP:	Brooklyn, NY 11249
Client:	Langan Engineering, Inc.
EDR Inquiry:	5785303.3
Order Date:	09/11/2019
Certification #	7573-4490-A62C
Copyright	1922

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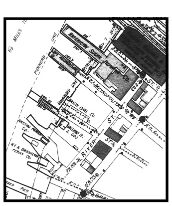
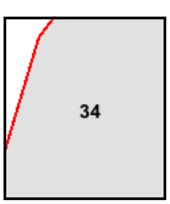




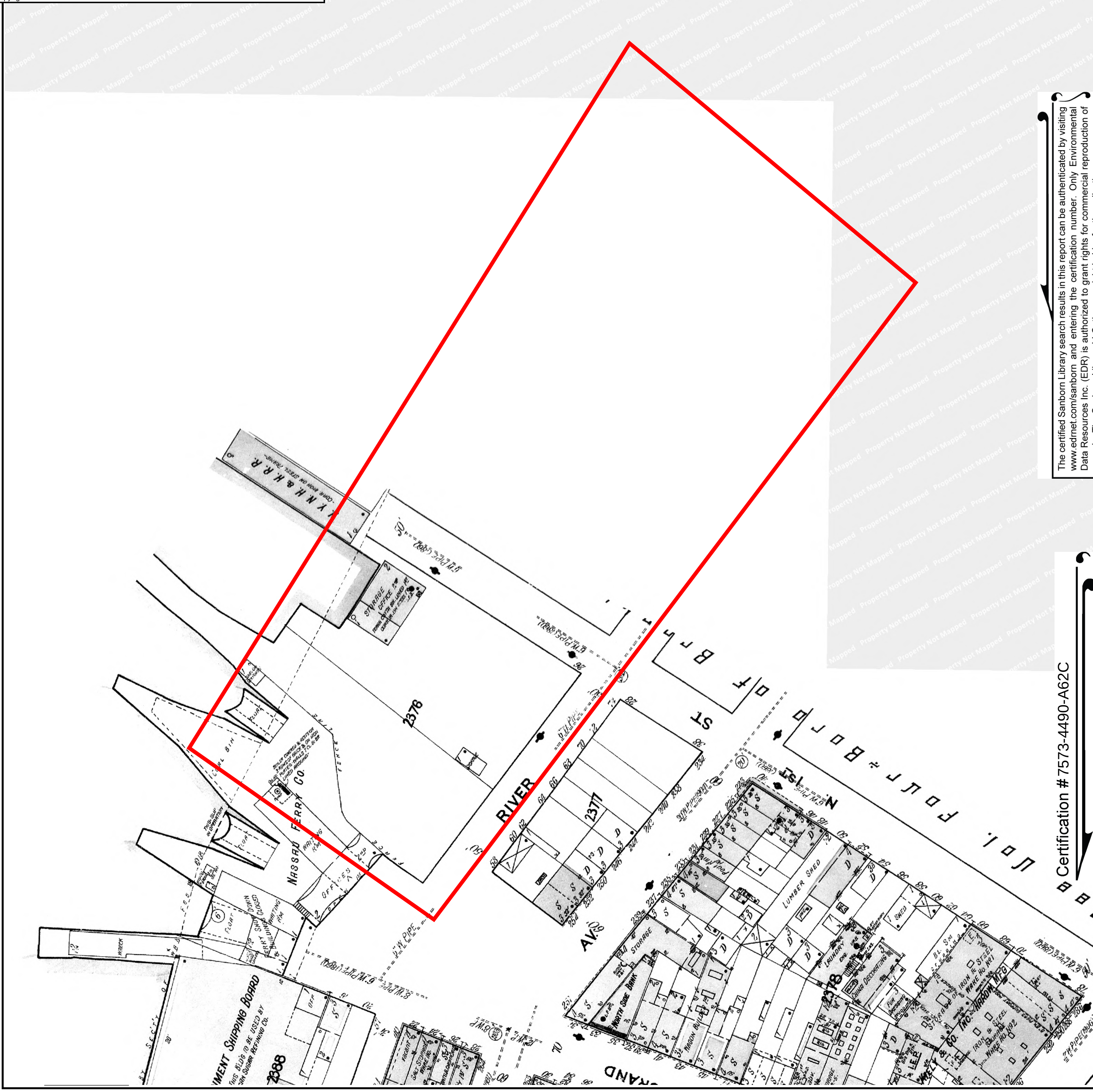
Volume Pier Maps, Sheet 34

N

Certified Sanborn® Map

1918

Site Name:	River Street & N 1st Street
Address:	River Street & N 1st Street
City, ST, ZIP:	Brooklyn, NY 11249
Client:	Langan Engineering, Inc.
EDR Inquiry:	5785303.3
Order Date:	09/11/2019
Certification #	7573-4490-A62C
Copyright	1918



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Certification # 7573-4490-A62C

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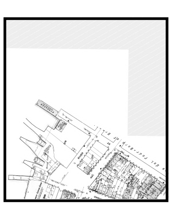

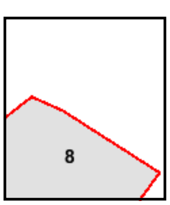

Volume 3, Sheet 8

0 Feet 150 300 600

N

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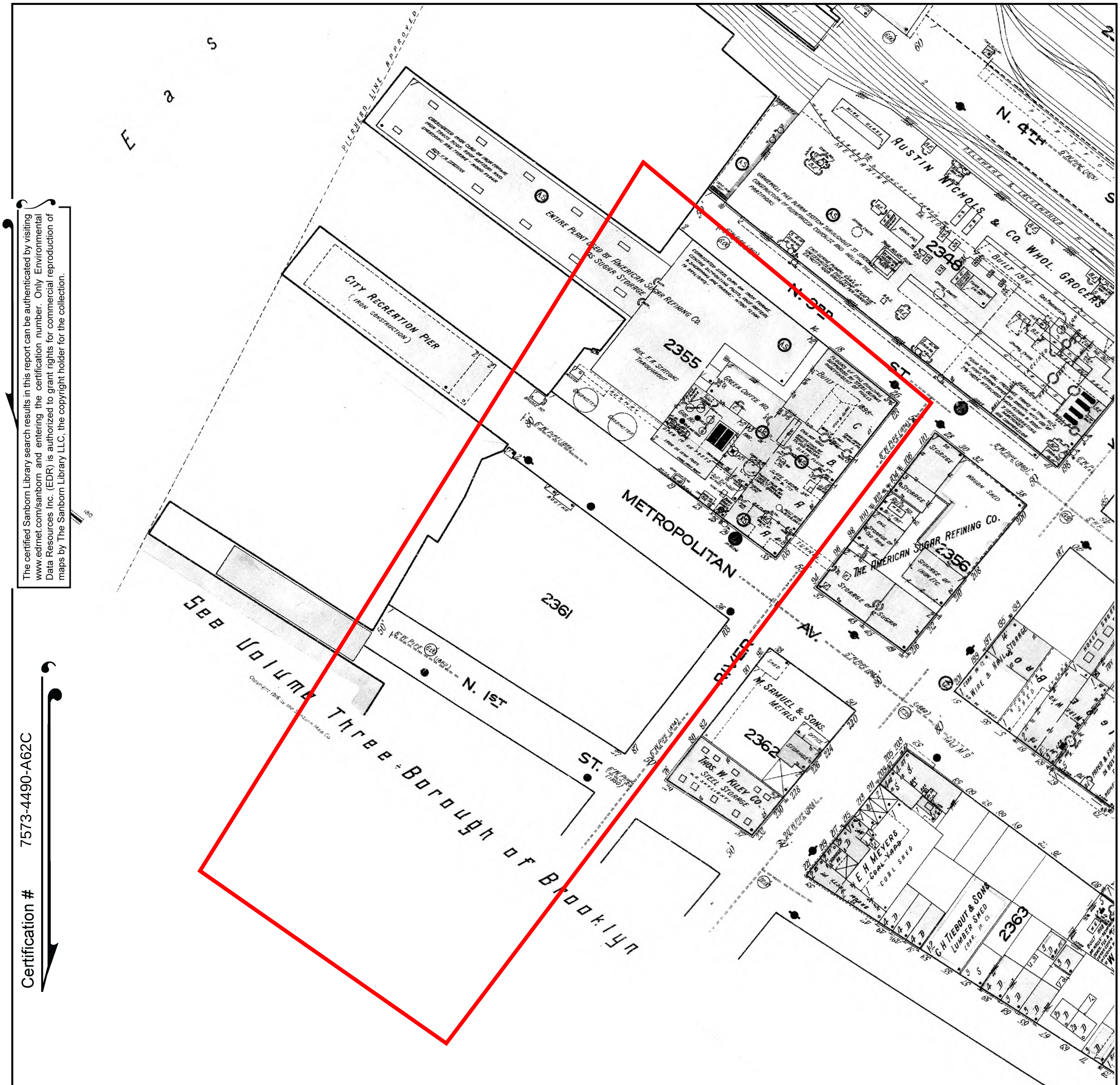
Certified Sanborn® Map

1916



Certification # 7573-4490-A62C

Site Name:	River Street & N 1st Street
Address:	River Street & N 1st Street
City, ST, ZIP:	Brooklyn, NY 11249
Client:	Langan Engineering, Inc.
EDR Inquiry:	5785303.3
Order Date:	09/11/2019
Certification #	7573-4490-A62C
Copyright	1916

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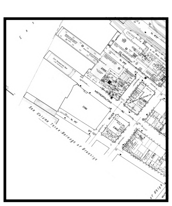
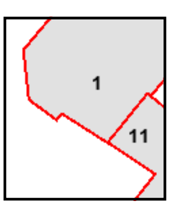




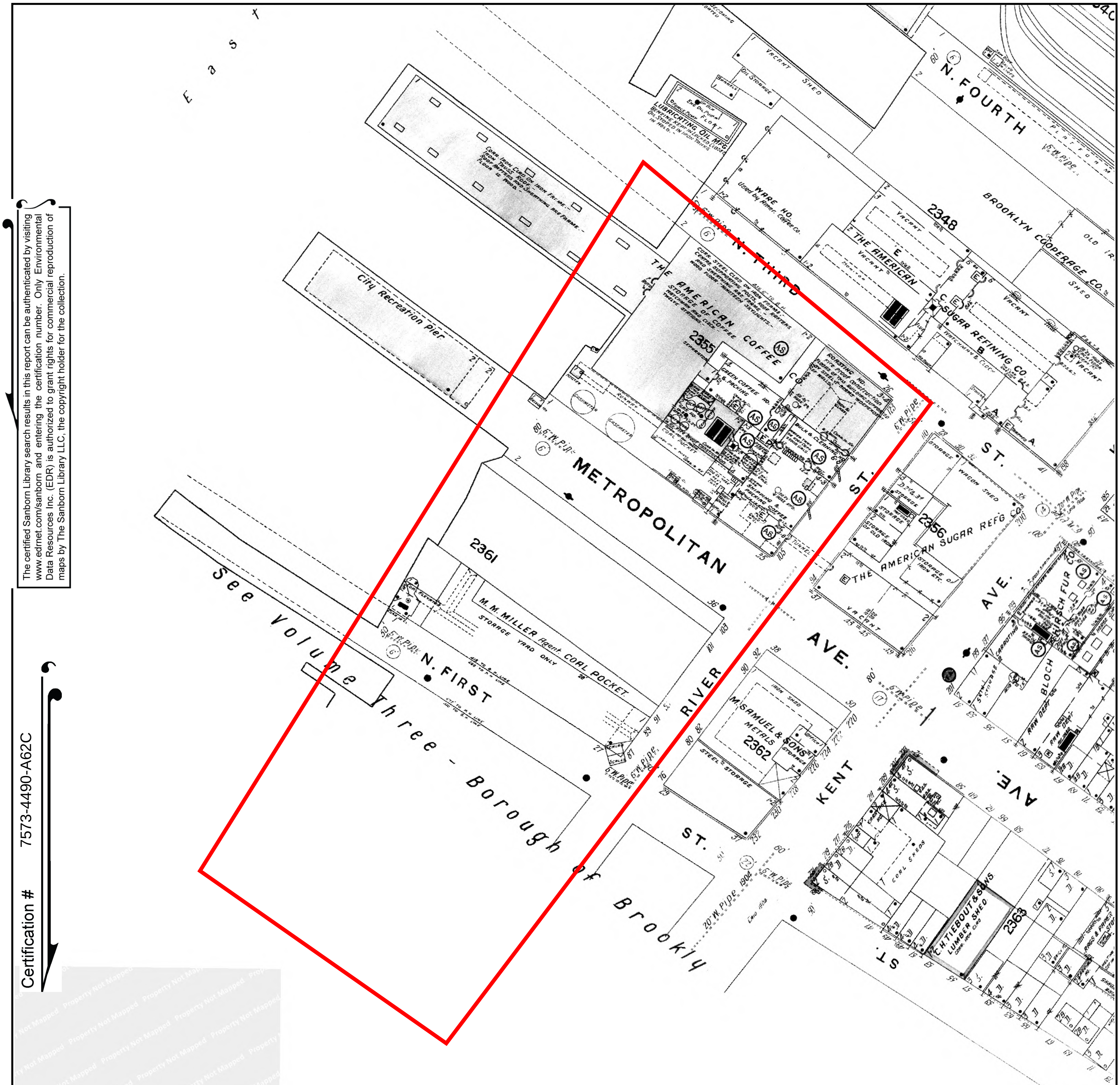
Volume 4, Sheet 11
Volume 4, Sheet 1

0 Feet 150 300 600

N

Certified Sanborn® Map

1905



Certification # 7573-4490-A62C

Site Name:	River Street & N 1st Street
Address:	River Street & N 1st Street
City, ST, ZIP:	Brooklyn, NY 11249
Client:	Langan Engineering, Inc.
EDR Inquiry:	5785303.3
Order Date:	09/11/2019
Certification #	7573-4490-A62C
Copyright	1905

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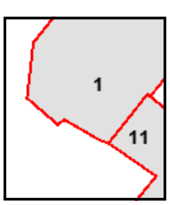


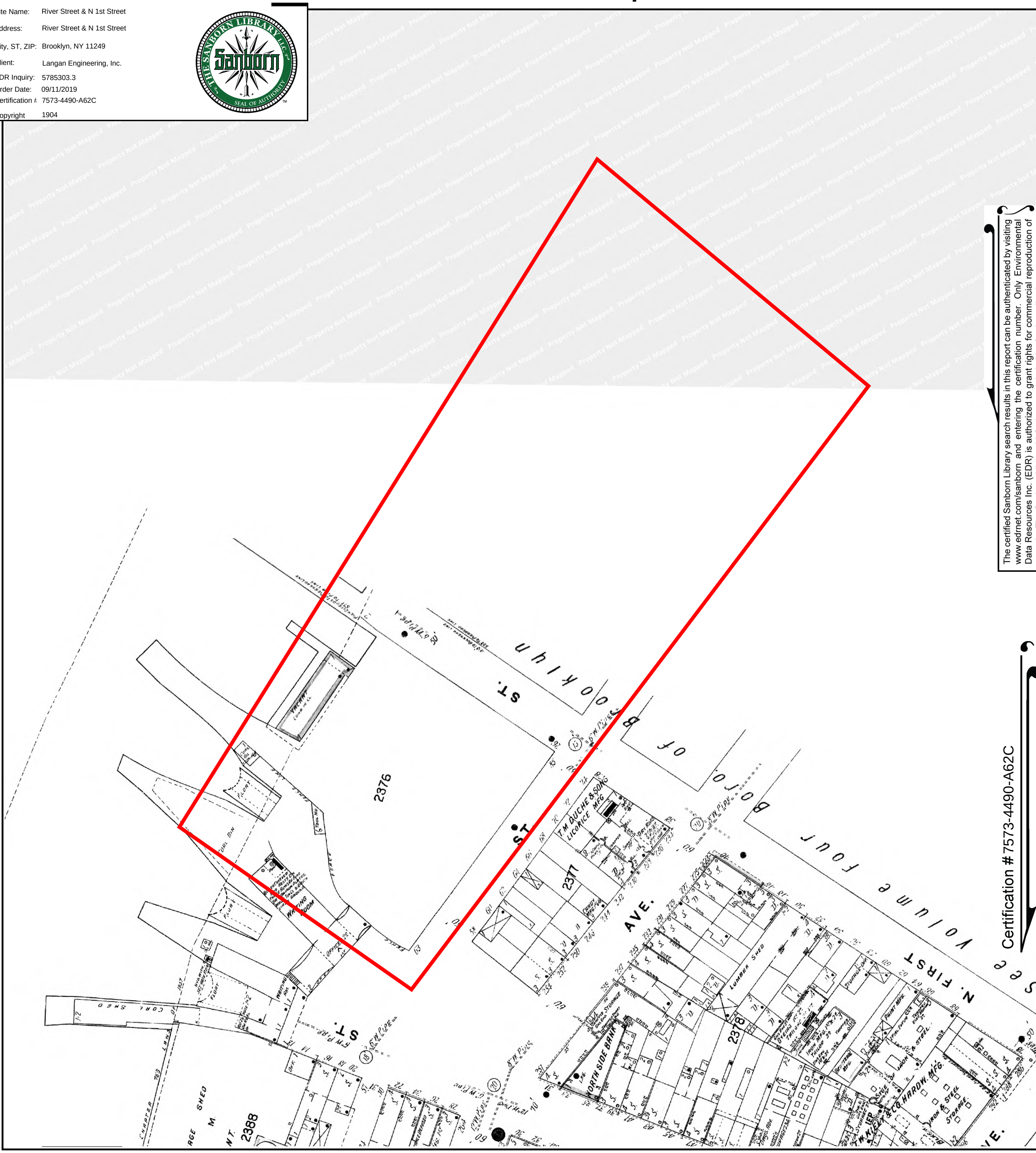
Volume 4, Sheet 11
Volume 4, Sheet 1

N

EDR®

Certified Sanborn® Map

Site Name: River Street & N 1st Street
Address: River Street & N 1st Street
City, ST, ZIP: Brooklyn, NY 11249
Client: Langan Engineering, Inc.
EDR Inquiry: 5785303.3
Order Date: 09/11/2019
Certification # 7573-4490-A62C
Copyright 1904



Certification #7573-4490-A62C

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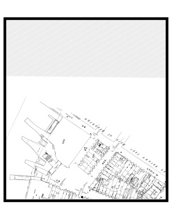
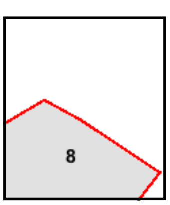
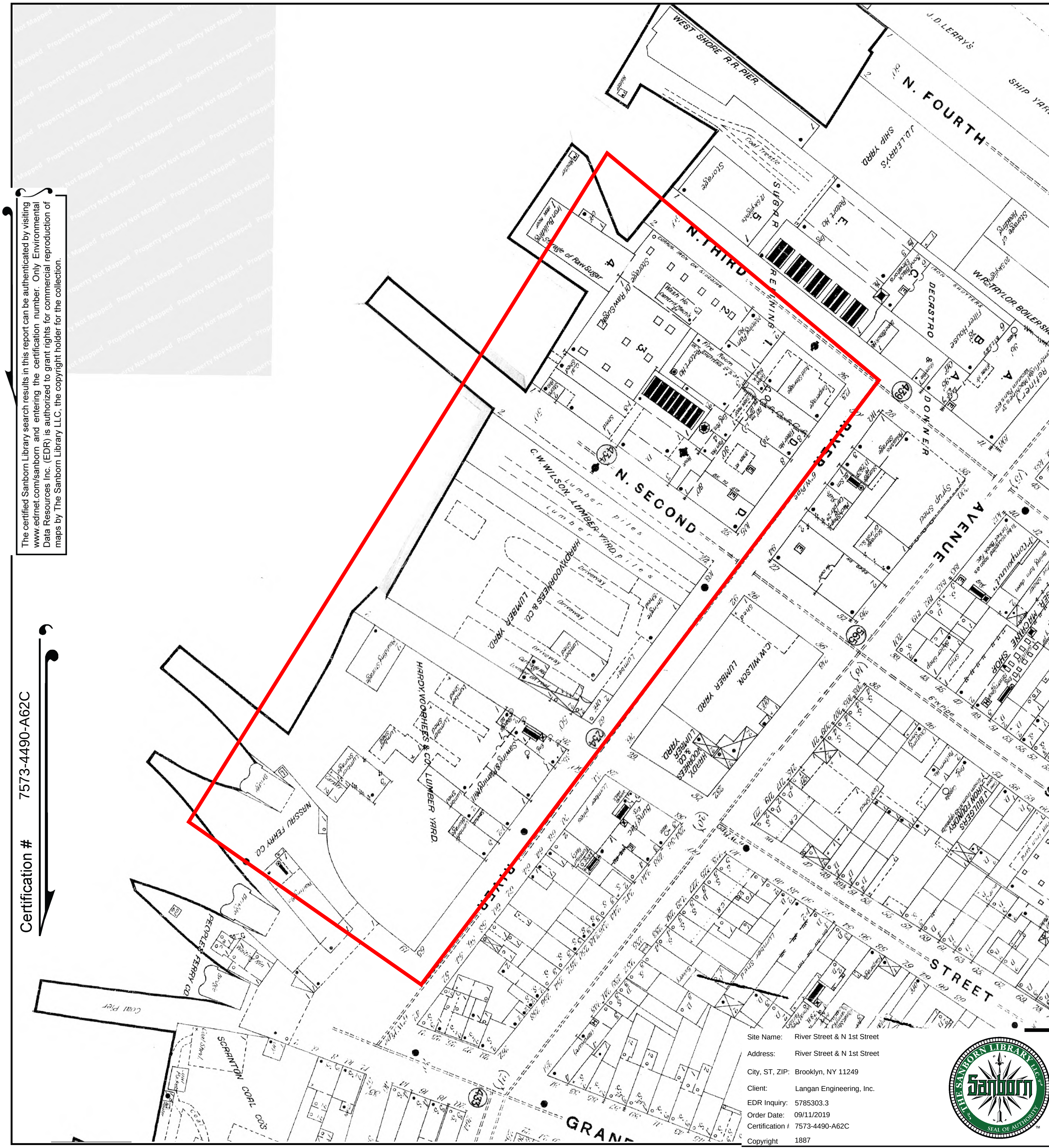




Volume 3, Sheet 8

N



Certification # 7573-4490-A62C

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Address:	River Street & N 1st Street
City, ST, ZIP:	Brooklyn, NY 11249
Client:	Langan Engineering, Inc.
EDR Inquiry:	5785303.3
Order Date:	09/11/2019
Certification #	7573-4490-A62C
Copyright	1887

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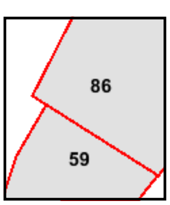


Volume 3, Sheet 59
Volume 4, Sheet 86

ATTACHMENT G

USGS MAPS

Historical Topo Map

2013

This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

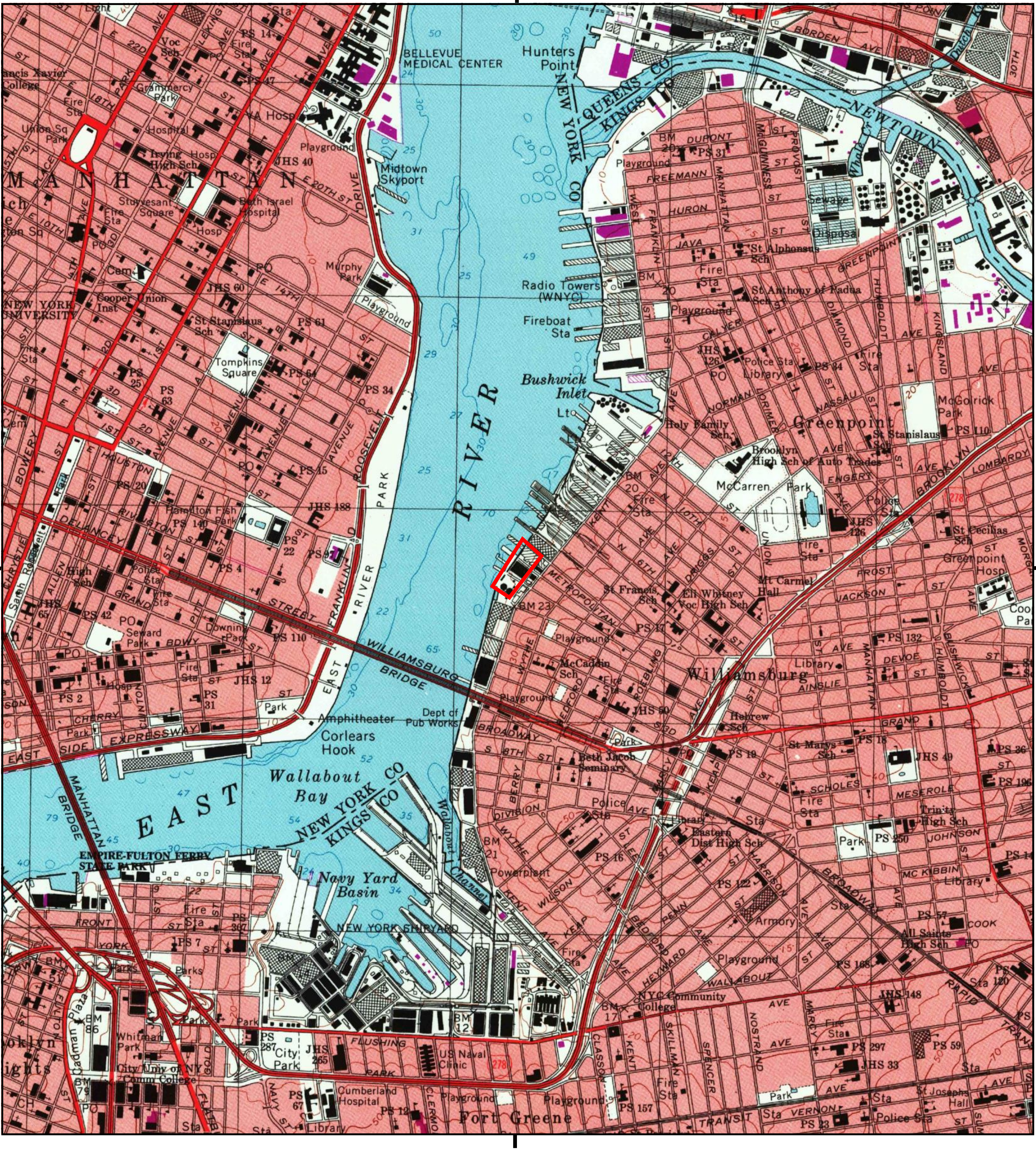
TP, Brooklyn, 2013, 7.5-minute

SITE NAME: River Street & N 1st Street
ADDRESS: River Street & N 1st Street
Brooklyn, NY 11249
CLIENT: Langan Engineering, Inc.

N

Historical Topo Map

1995



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NW N NE
W E
SW S SE

TP, Brooklyn, 1995, 7.5-minute

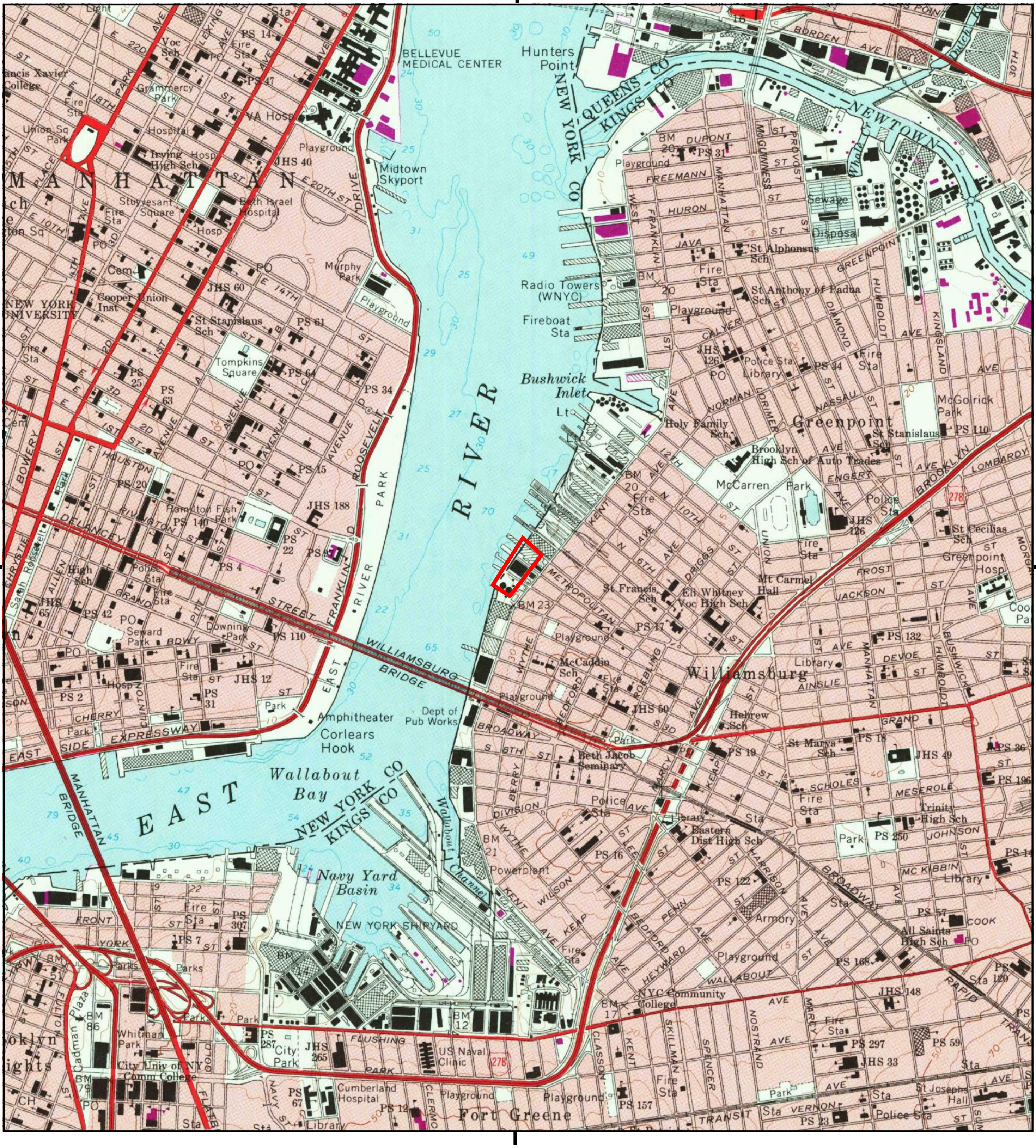
SITE NAME: River Street & N 1st Street
ADDRESS: River Street & N 1st Street
Brooklyn, NY 11249
CLIENT: Langan Engineering, Inc.

N

EDR®

Historical Topo Map

1979



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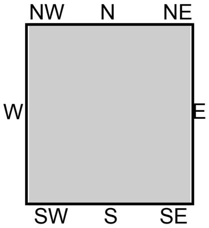


TP, Brooklyn, 1979, 7.5-minute

SITE NAME: River Street & N 1st Street
ADDRESS: River Street & N 1st Street
Brooklyn, NY 11249
CLIENT: Langan Engineering, Inc.

N

Historical Topo Map

1967

This report includes information from the following map sheet(s).

0 Miles | 0.25 | 0.5 | 1 | 1.5

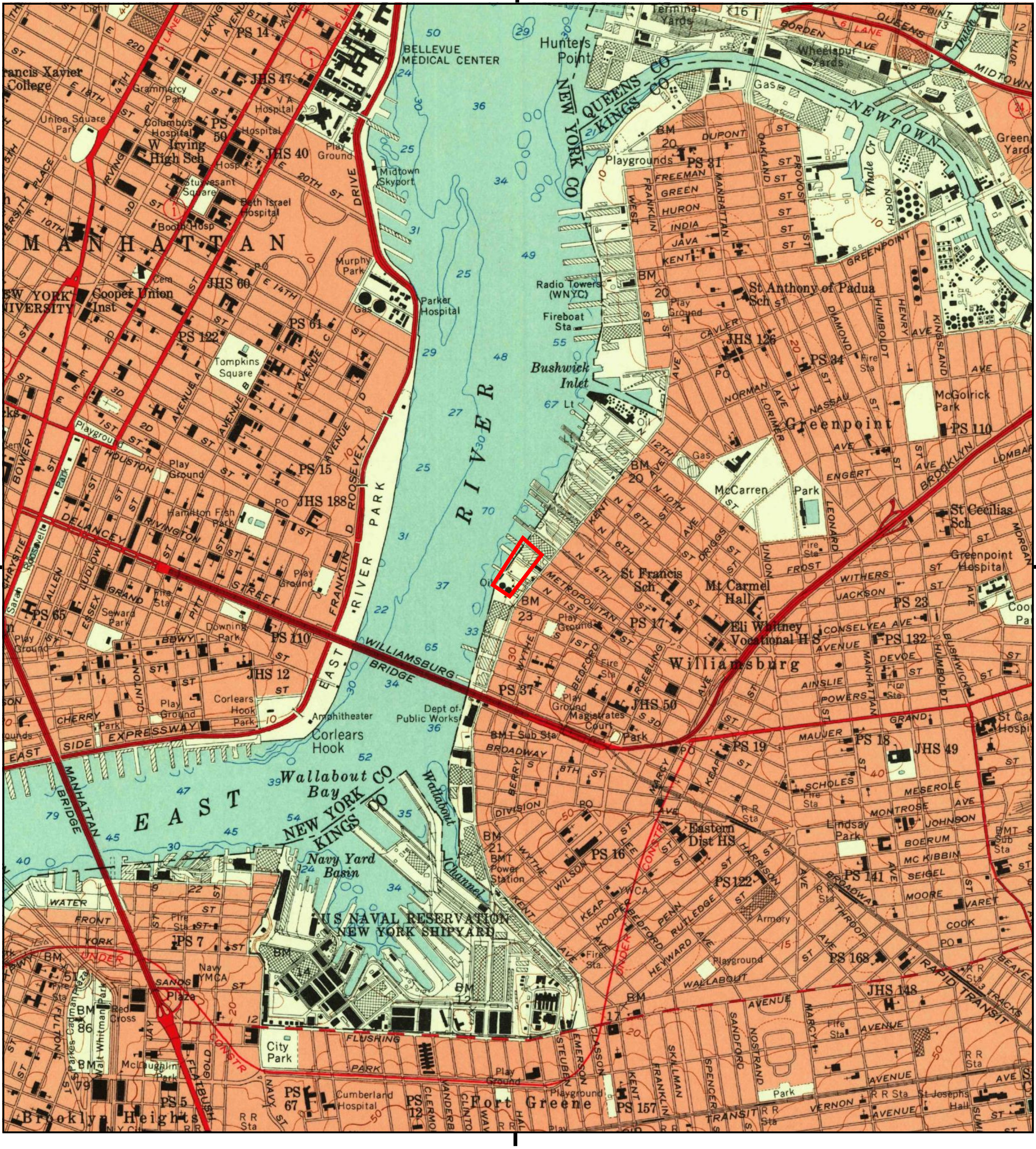
NW N NE
W E
SW S SE

TP, Brooklyn, 1967, 7.5-minute

SITE NAME: River Street & N 1st Street
ADDRESS: River Street & N 1st Street
Brooklyn, NY 11249
CLIENT: Langan Engineering, Inc.

Historical Topo Map

1956



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W E
SW S SE

TP, Brooklyn, 1956, 7.5-minute

SITE NAME: River Street & N 1st Street
ADDRESS: River Street & N 1st Street
Brooklyn, NY 11249
CLIENT: Langan Engineering, Inc.

N

Historical Topo Map

1947

This report includes information from the following map sheet(s).

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NW N NE
W E
SW S SE

TP, Brooklyn, 1947, 7.5-minute

SITE NAME: River Street & N 1st Street
ADDRESS: River Street & N 1st Street
Brooklyn, NY 11249
CLIENT: Langan Engineering, Inc.

N

Historical Topo Map

1900

This report includes information from the following map sheet(s).

0 Miles 0.25 0.5 1 1.5

NW N NE
W E
SW S SE

TP, Brooklyn, 1900, 15-minute

SITE NAME: River Street & N 1st Street
ADDRESS: River Street & N 1st Street
Brooklyn, NY 11249
CLIENT: Langan Engineering, Inc.

N

Historical Topo Map

1898

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NW N NE
W E
SW S SE

TP, Brooklyn, 1898, 15-minute

SITE NAME: River Street & N 1st Street
ADDRESS: River Street & N 1st Street
Brooklyn, NY 11249
CLIENT: Langan Engineering, Inc.

N

Historical Topo Map

1897

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NW N NE
W E
SW S SE

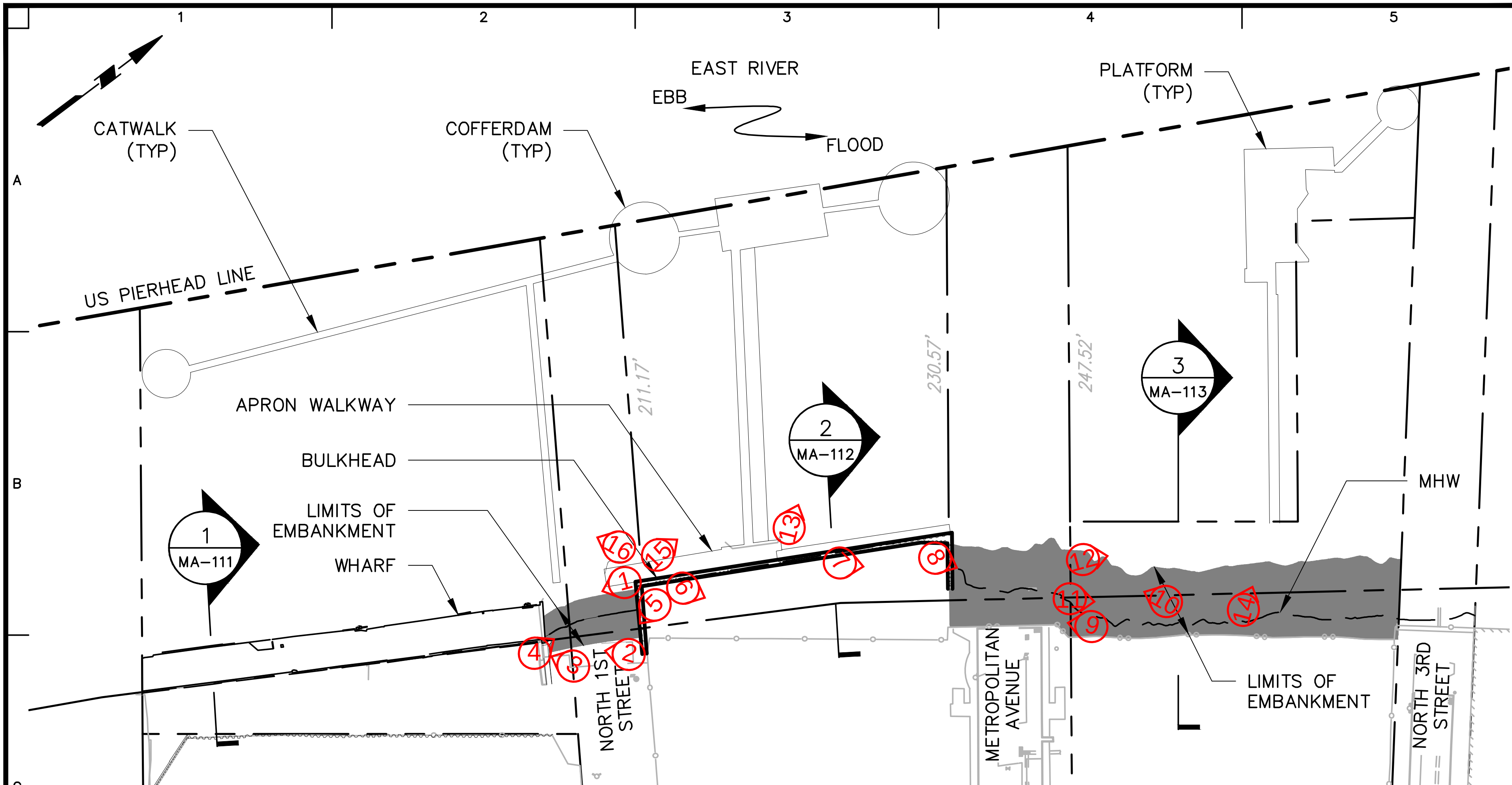
TP, Brooklyn, 1897, 15-minute

SITE NAME: River Street & N 1st Street
ADDRESS: River Street & N 1st Street
Brooklyn, NY 11249
CLIENT: Langan Engineering, Inc.

N

ATTACHMENT H

REPRESENTATIVE PHOTOGRAPHS



NOTE:
BACKGROUND REFERENCED FROM "BOUNDARY & TOPOGRAPHIC SURVEY, RIVER STREET & NORTH 1ST STREET", BY CONTROL POINT ASSOC. INC., DATED 17 OCTOBER 2019.

100 0 50 100
SCALE IN FEET

LANGAN
Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com

Project	Drawing Title	Project No. 170594401	Drawing No.
1 RIVER STREET BLOCK No. 2355, LOT No. 1 BLOCK No. 2361, LOT No. 1, 21 BLOCK No. 2376, LOT No. 6, 50 BROOKLYN KINGS NEW YORK	**EXISTING WATERFRONT STRUCTURES**	Date 3/20/20 Drawn By KRW Checked By KH	**MA-101** Sheet 1 of 22

Filename: \\langan.com\data\NYC\data4\170594401\project data\CAD\01\sheetfiles\JPA Figures\170594401-BL101-0104.dwg Date: 3/20/2020 Time: 10:13 User: kweg Style Table: Langan.stb Layout: ANSIA-BL

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Photo 2

Photo 3

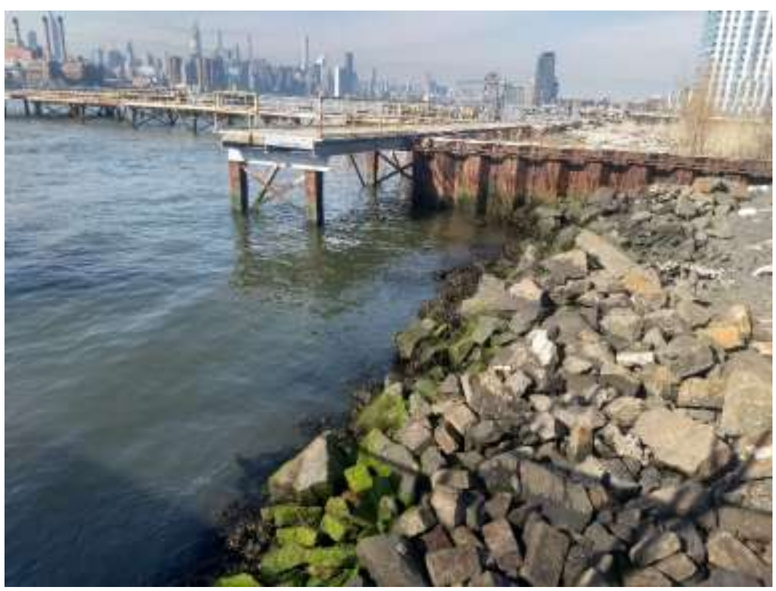

Photo 4

Photo 5

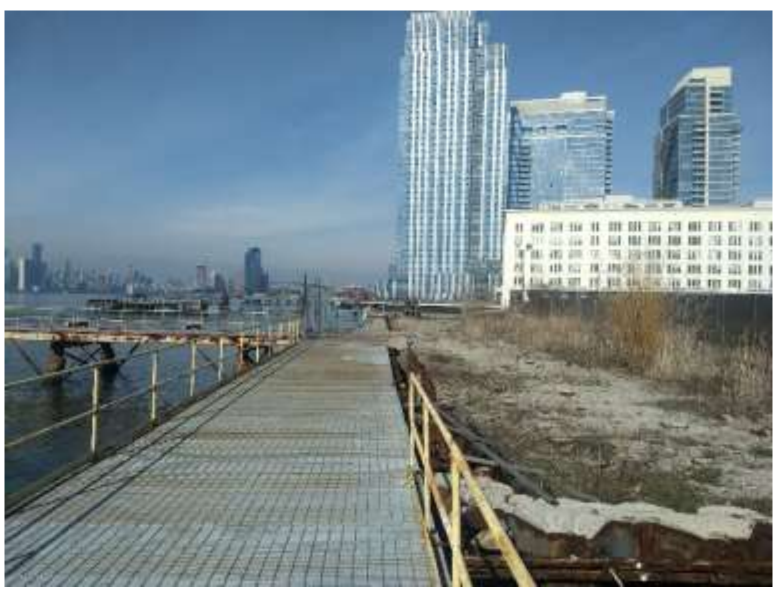

Photo 6

Photo 7

Photo 8

Photo 9

Photo 10

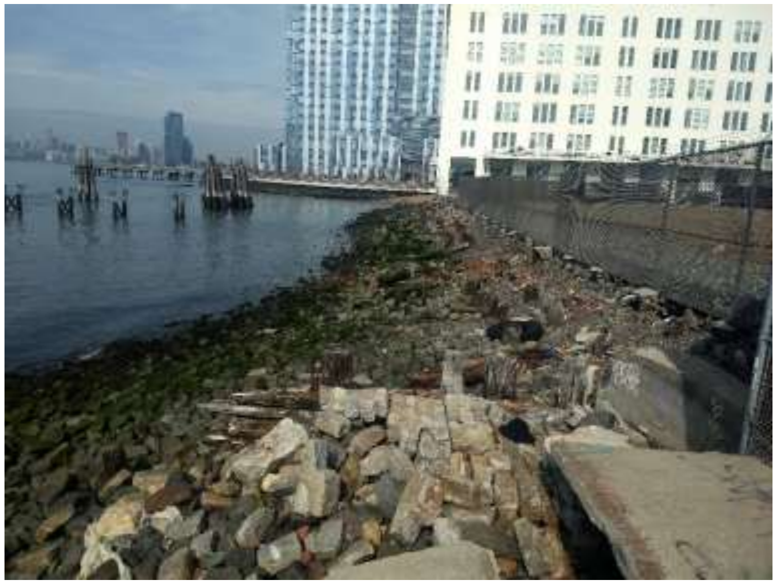

Photo 11

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Photo 12

Photo 13

.

Photo 14

Photo 15

.

Photo 16

Photo 17

ATTACHMENT I

COASTAL ASSESSMENT STUDY

October 15, 2019

Two Trees Management Company
45 Main Street, 12th Floor
Brooklyn, NY 11201

Attn: Marina Trejo email: mtrejo@twotreesny.com

Re: Two Trees Con Edison Property
River Street and North 1st Street
Brooklyn, NY 11249
Final Report – Coastal Site Assessment
TMS Project No. 19034

Dear Ms. Trejo,

TMS Waterfront and our consultant, City and Sea Group, LLC (CAS), performed a coastal site assessment at the Two Trees Con Edison property project located at River Street and North 1st Street. The proposed "Two Trees Cove" for waterfront and recreational access will be a significant modification to the shoreline. As such, the wind, wave, wake and current climates on site are critical to the success of the features.

To support early schematic design of the project, two acoustic Doppler current profiler (ADCP) units and one pressure transducer were installed by TMS dive crews at the project site on July 25, 2019 for a short-term data acquisition program to monitor tides, currents, waves, and wakes. These instruments were retrieved, and their collected data downloaded, on August 23, 2019 (30-day program). The collected data was augmented by hindcasting wind and water level data and combining it with Vessel Traffic data to create a complete marine site characterization. A summary of the completed coastal assessment is described below and the final report compiled by CAS is attached.

Vessel Traffic and Wakes

- Even in major storm events, the governing criteria for design will be wake-driven waves from vessel traffic. While this fact was anticipated, it was very clear from the data that the site experiences a very high volume of ferry traffic (roughly 90 percent of all vessels). These vessels operate at speeds around 20 knots and are typically running at the critical speeds that generate the largest and longest waves.
- The ferries operate consistently between 6am and 8pm. There is no mid-day lag as anticipated.
- The ferries and vessels pass very close to the proposed site, most likely due to the transit between India Street Ferry landing, Williamsburg Landing, and either Shaeffer Landing or Fulton Landing to the south. Vessels operating that close are a danger and have significantly higher wake and energy transmitted than vessels passing further away.

- Ferry-associated wakes are consistently high with periods of 4-7 seconds and wave heights of 0.8 to 0.5 meters. This is critical in that the waves are more "swell" than "choppy". Short, choppy waves can be stopped easily by surface attenuators and deflection. Longer swells carry a lot more energy and are a deeper wave, i.e. their profile extends down into the water much deeper than the surface. Typically, these waves pass under pile supported structures and floats, and can only be attenuated with deep wave fences or rubble mound/island structures (e.g., groins, breakwaters).

Tidal Currents

- The existing structures on site (caissons and bulkhead to the north at the Northside Piers (164 Kent Avenue)) acts as a barrier to tidal ebb, which slows down the current in the project vicinity and causes a counterclockwise circulation pattern. As such, the current direction will directly impact the proposed opening of the program's features when the river is flowing towards Domino Sugar Park. Close to shore, the peak current is about 2.4 knots (1.2 m/s) and the residual flow is north. Offshore, the peak current is about 1.8 knots (0.9 m/s) and the residual flow is south.
- Currents are as much as 2.5 knots along the project site, which is very high for water activities and recreational boating. However, the proposed water features will deflect currents flowing towards the waterfront edge development, creating a more placid recreational area in the new "Two Trees Cove".
- Currents are constant with depth meaning that the system can be modeled simply.
- Detailed analysis and modelling of the currents and how they will morph and bend around the proposed water features, as well as designing features that will purposefully deflect the current, will be required during the design phase to ensure placidity and reasonable conditions for waterfront access.

Wind and Wind-generated Waves

- Prevailing wind conditions are from the North-Northwest. The exposure distance along the water in that direction is short (3.5 km fetch), and therefore waves generated by winds are slight, especially in comparison with the vessel-generated waves.
- The site will be protected by land features from wind and wind-generated waves from the other directions – South, Southeast, East and Northeast. Nor'easter storms common in fall will not significantly affect the site.

Water Levels

- FEMA 500-year return period flood level is 13.9' (NAVD88) and 15.4' (NAVD88).
- FEMA 100-year return period flood level is 10.9' (NAVD88) and 12.4' (NAVD88).
- The second elevation above includes anticipated sea level rise based upon NOAA water data. New York City, as you know, is BFE (Base Flood Elevation) +2' for Appendix G flood zone compliance for buildings, however, the MTA and the PANYNJ are at +4' and +3', respectively.
- Due to the site's waterfront use, higher high tides in the next two decades will present overtopping concerns (where waves break over the land). Since this will be a waterfront access project, such concerns will have to be planned for.

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The data herein is of design quality and can be used to generate preliminary through final design, except for the current modelling and sediment transport modelling. These two items would be performed in the 30 percent design scope for advancing the structures.

Should you have any questions or concerns, please feel free to contact me at 917-426-6788 or via email at shea@tms-waterfront.com.

Very truly yours,

Shea Thorvaldsen
President

Attachments: East River Coastal Site Assessment, North 1st Street – CAS Group (2019)

Cc: File
Dena Prastos, TMS
Eleanor Beckwith, TMS

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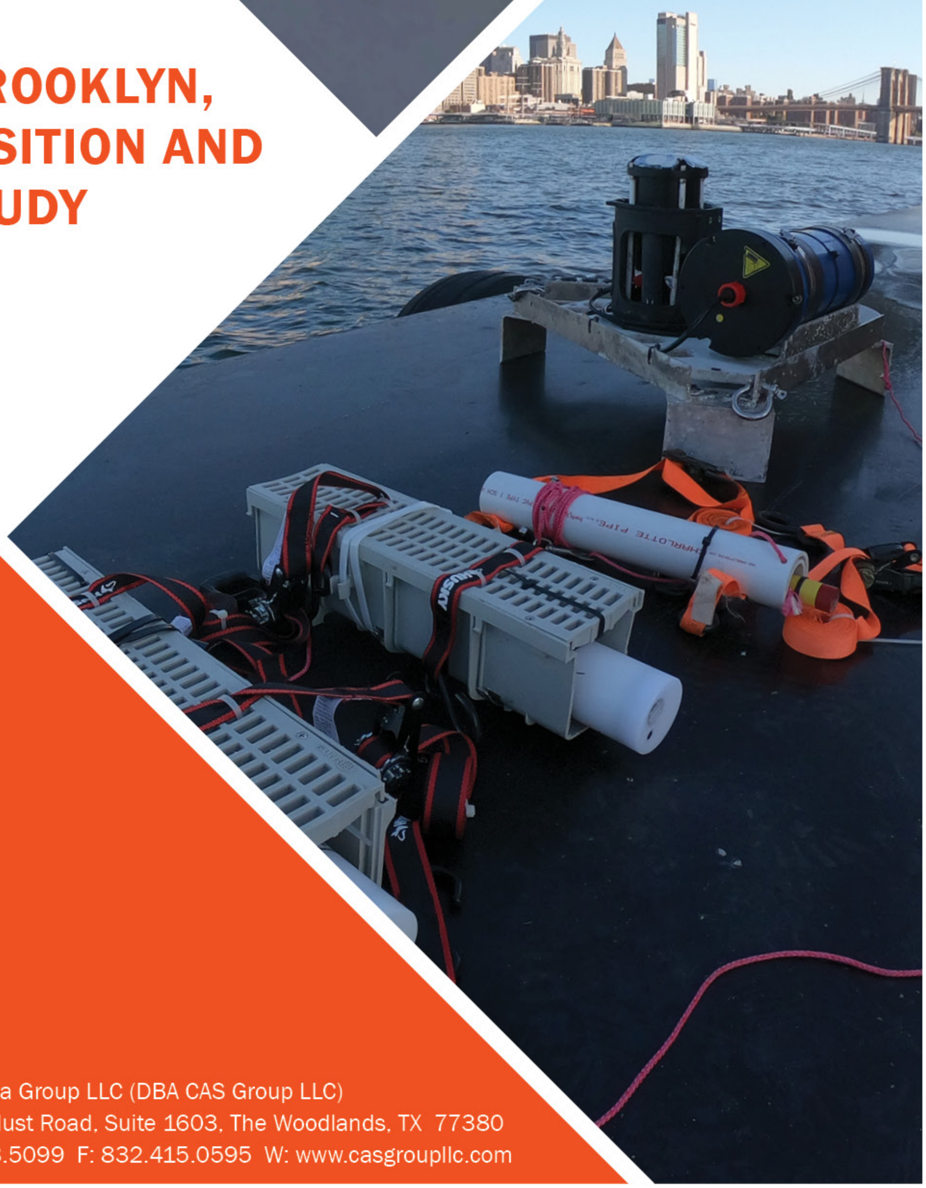

REPORT FOR

NORTH 1ST STREET, BROOKLYN, COASTAL DATA ACQUISITION AND SITE ASSESSMENT STUDY

September 30, 2019

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REV.	**DATE**	**DESCRIPTION**	**BY:**	**CHKD BY:**	**APP.BY:**

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1. Introduction

The site is located on the East River in the vicinity of North 1st Street in Brooklyn, New York (Figures 2-1 and 2-2). Planning is currently underway by Two Trees Management Company for a major waterfront development at this site, and the primary purpose of the study is to support the planning and conceptual design development for this project. It is a coastal data acquisition and site assessment study with the following major tasks:

1. Data acquisition program to monitor waves, wakes, currents and water levels at the site for a period of 30 days (see Chapter 2. Data Acquisition Program);
2. Analysis of historical vessel traffic data near the site and empirical analysis of vessel wakes (see Chapter 3. Ship Traffic Data and Vessel Wakes); and
3. Analysis of winds, wind generated waves and water level and coastal flood conditions at the site, based on analysis of available data sources (see Chapter 4. Winds, Waves and Water Levels).

Figure 1-1: Area map

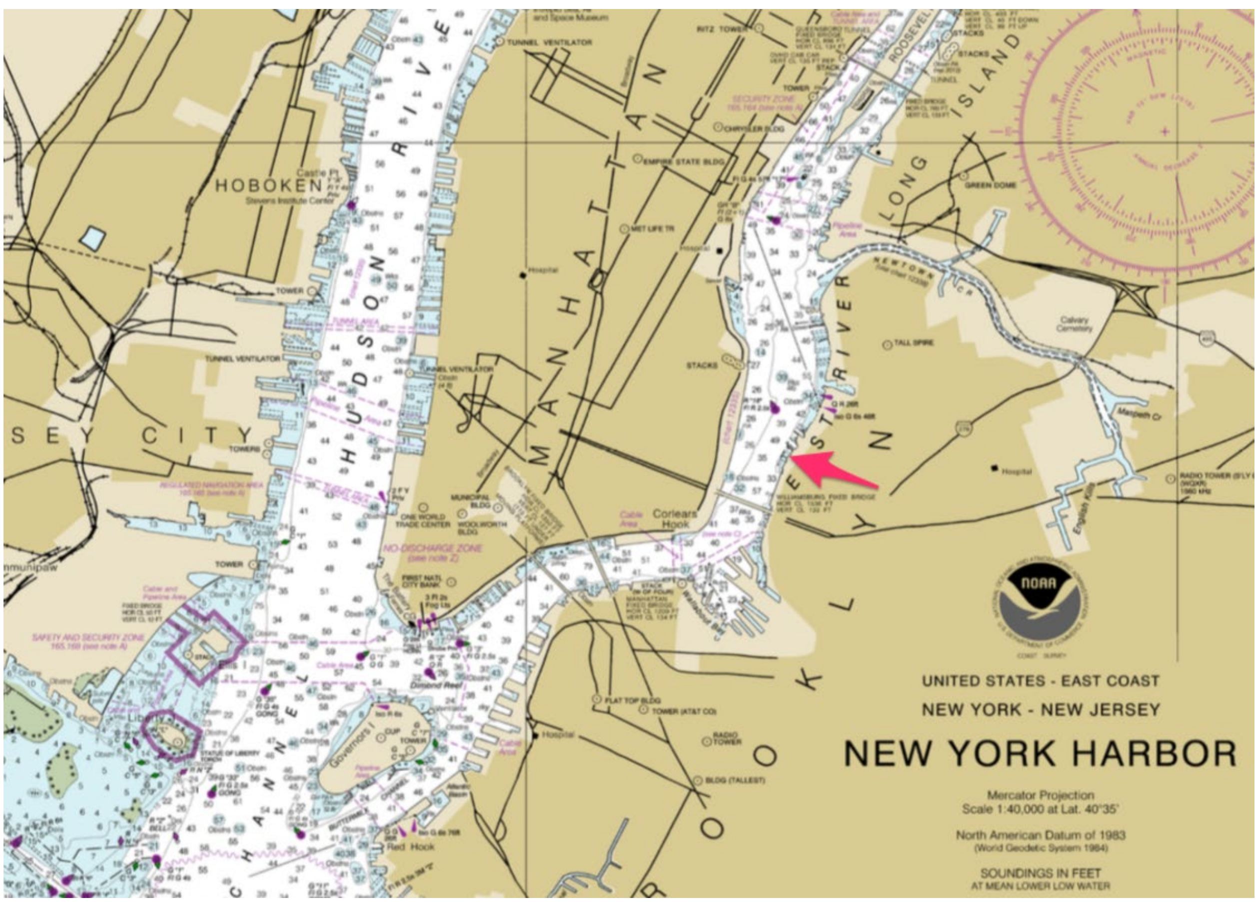


Figure 1-2: Site location near North 1st Street, Brooklyn

2. Data Acquisition Program

A short-term data acquisition program was performed to evaluate the wave, wake and tidal current conditions at the site. The program featured two bottom-mounted Signature series Nortek Acoustic Doppler Current Profilers (AD2CP), as shown in the location map in Figure 2-1:

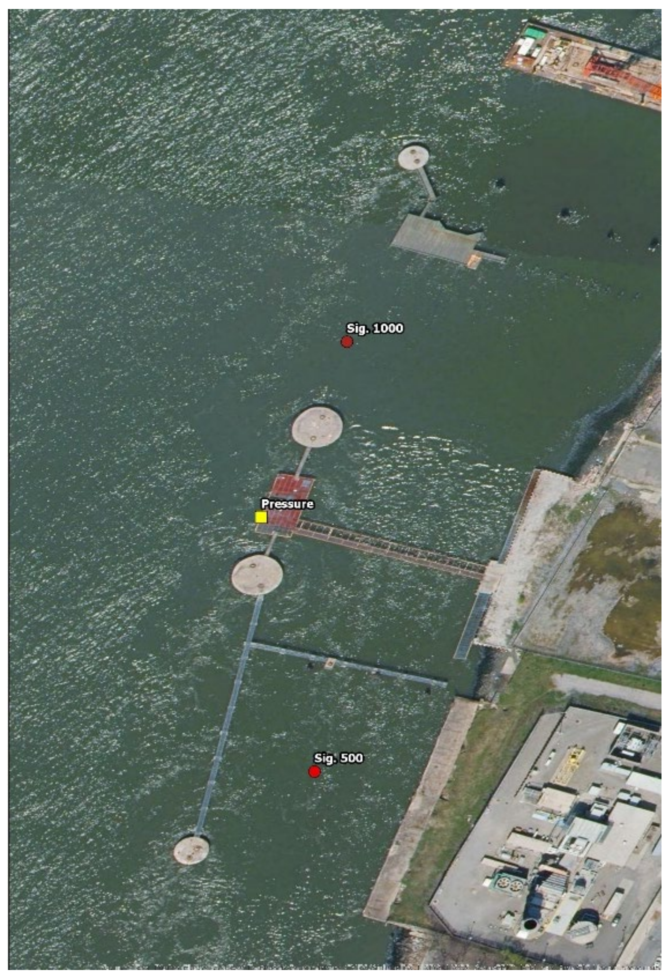
- Signature 500 deployed in the south portion of the site approximately 27 m from shore, at an average water depth of 7.5 m; and
- Signature 1000 deployed towards the north end of the site, near the Pierhead line, approximately 90 m from shore at an average water depth of 11.5 m.

The Technical Specification of the AD2CP can be found in Appendix A. For discussion purposes here the Signature 500 is referred to as the "nearshore" station and the Signature 1000 as the "offshore" station. These locations provide information on the spatial variation of tidal currents and wakes in the study area while minimizing potential flow interference effects with existing marine structures (notably, large sheet pile cellular dolphins). A pile-mounted RBR pressure transducer was also deployed as a contingency measure in order to monitor waves and wakes. However, the data recovery from the AD2CP was excellent and processing/analysis of the pressure transducer data was not required.

The signature series AD2CP instruments are ideal for high resolution monitoring of vessel wakes and profiling of currents. They feature acoustic surface tracking (AST) which permits extremely accurate and high frequency water level measurements, even when deployed in relatively deep water. In this regard they are superior to conventional ADCP (such as the ones manufactured by Teledyne) which rely on pressure transducers or low frequency acoustic surface tracking. For the purpose of this study both instruments offer similar performance (Signature 1000 has twice the sampling rate of Signature 500).

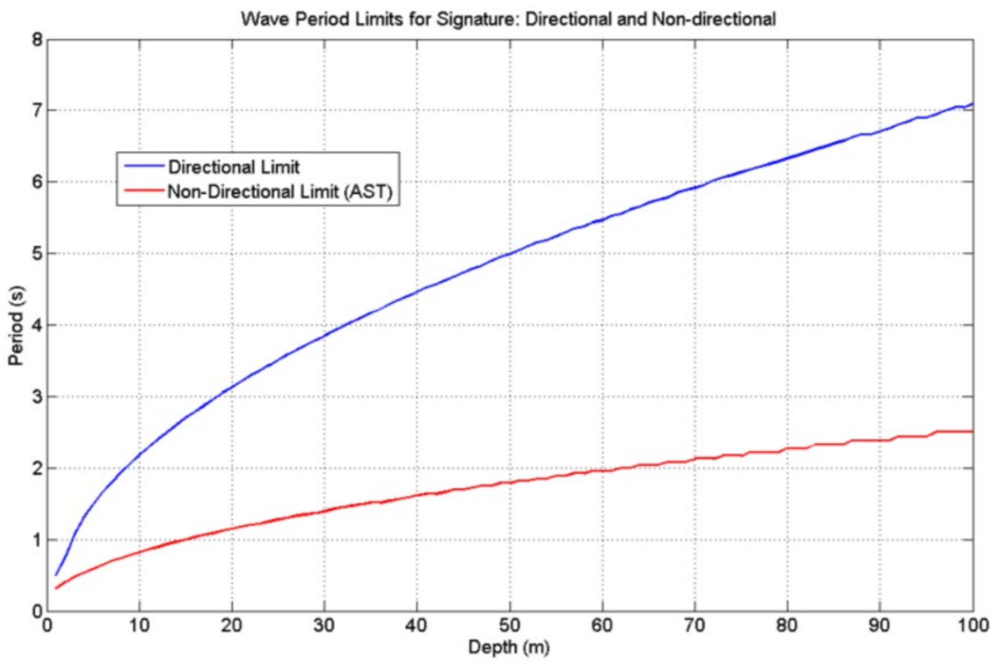
The wave period performance versus depth curves for the Signature 500 and Signature 1000 AD2CP are shown in Figure 2-2. For an average water depth of 11.5 m at the offshore station (Sign. 1000) the AD2CP

Figure 2-1: N1st Street data acquisition deployment plan



can accurately measure wave direction when the wave period exceeds about 2.2 s. For non-directional wave measurements at this water depth the minimum wave period that can be resolved is about 0.9 s. At the nearshore station (Sign. 500) the average water depth is about 7.5 m and the available wave period resolution is about 0.8 s for non-directional waves and 1.9 s for directional wave measurements. For this study we are interested primarily in wakes with periods of 3 s or more and for this purpose the Signature 500 and Signature 1000 AD2CP performance is more than adequate.

Figure 2-2: Wave period versus depth performance curves for Nortek Signature 500 and 1000 AD2CP



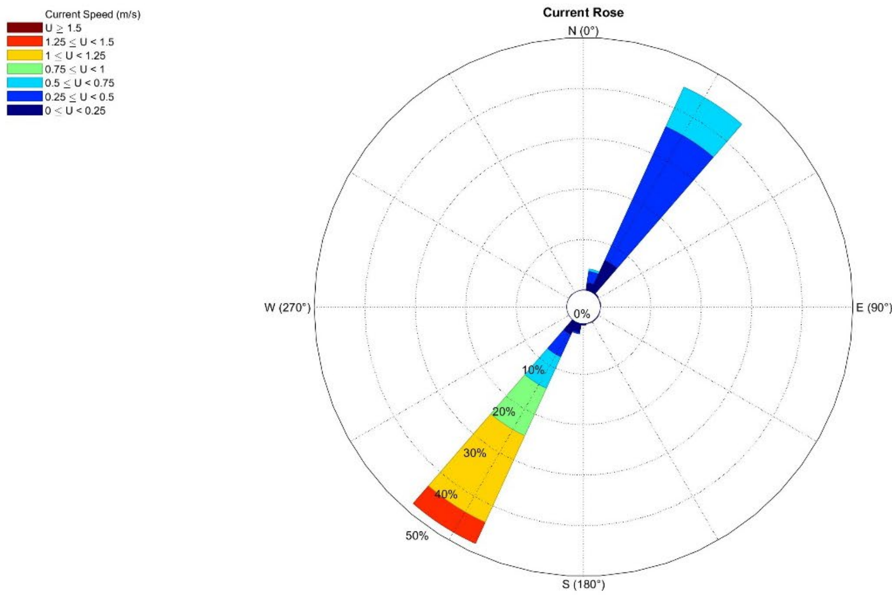
For data processing of the wave, water level and current data from the AD2CP several proprietary software packages were used, developed by Nortek and CAS Group LLC.

2.2 Tidal Currents

2.2.1 Currents for Nearshore Station (Sig. 500)

The depth averaged current pattern at the nearshore station is described by the current rose in Figure 2-3. Flood currents are from south-southwest (SSW), with an average heading approximately 215 degrees N, and ebb currents are from north-northeast (NNE), with an average heading approximately 35 degrees N. The ebb and flood currents are colinear and the alignment is approximately parallel to the adjacent shoreline bulkhead. The current rose shows that flood currents are much higher than the ebb currents and there is a net (residual) flood flow towards NNE at this location.

Figure 2-3: Depth-averaged current rose at nearshore station (Sign. 500)



Time-series data for tidal currents at the nearshore station is presented in Figures 2-4 and 2-5. Figure 2-4 is for the entire period of record whereas Figure 2-5 is for a two-day period (August 1 and August 2) to illustrate the features of the time-series in more detail. Four coincident time-series are shown in these figures:

Top: Mean water depth — reflecting the tide variations;
Middle Two: Current profiles, shown separately for north-south and east west components; and
Bottom: Depth-averaged currents, shown separately for north-south and east-west components.

Figure 2-4: Time-series for water level and currents at nearshore station (Sign. 500)

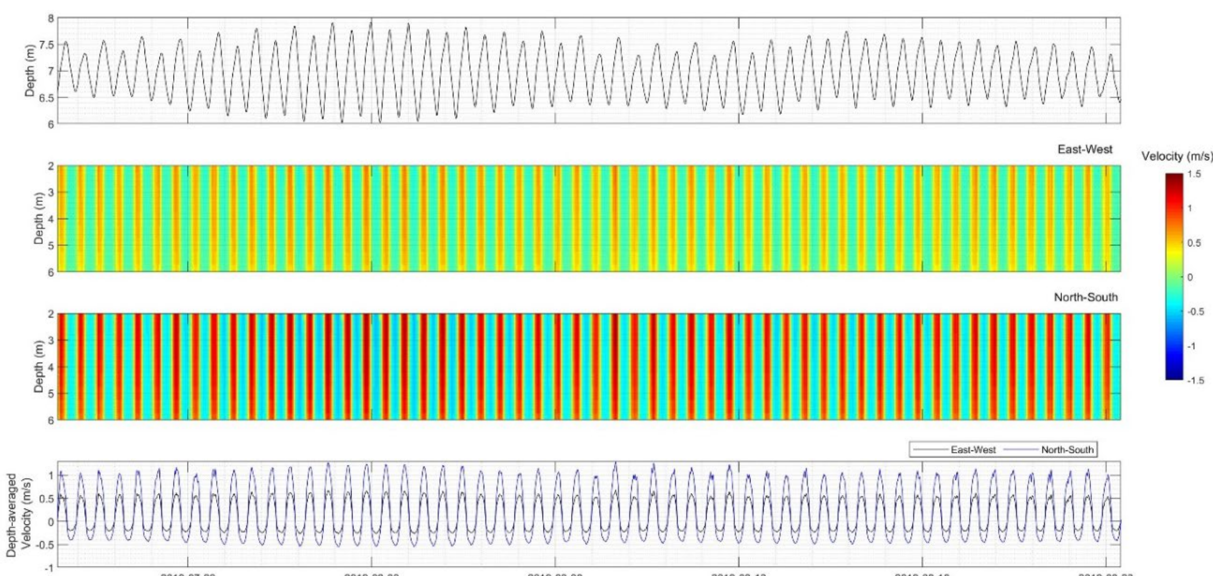
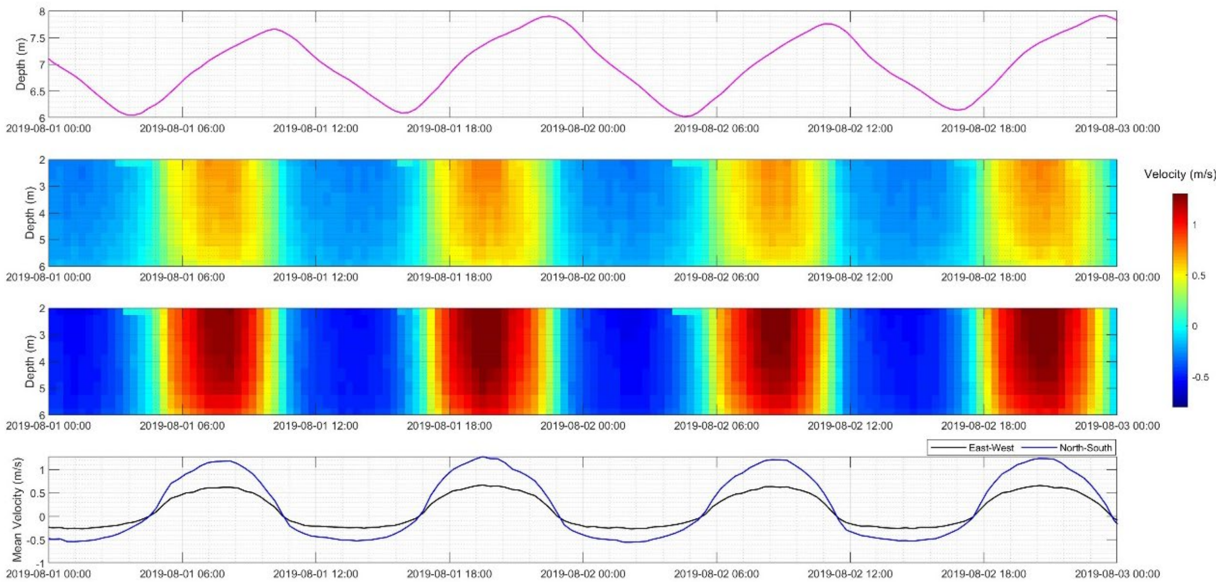


Figure 2-5: Detailed sample of time-series at nearshore station (Sign. 500)



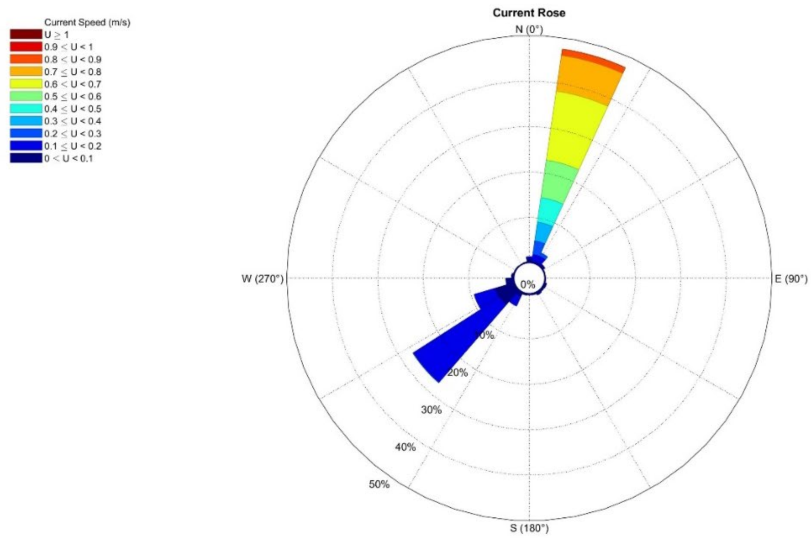
General conclusions from the time-series data for the nearshore station are:

1. Currents profiles are relatively constant and flow can be approximated as 2D rather than 3D;
2. Peak flood current is about 1.2 m/s (2.4 knots) and peak ebb current is about 0.5 m/s (1.0 knot); and
3. Net / residual current is towards north.

2.2.2 Currents for Offshore Station (Sig. 1000)

The depth-averaged current pattern at the offshore station is described by the current rose in Figure 2-6. Flood currents are from southwest (SW) with average heading of 230 degrees N, and ebb currents are from north-northeast (NNE) with an average heading of approximately 15 degrees N. In contrast to the colinear tidal currents pattern observed at the nearshore station, at the offshore station there is a distinctive “kink” in the alignment between ebb and flood currents, with an average difference in alignment of about 35 degrees. The ebb currents here are much higher than flood currents and there is a net (residual) flood flow towards SSE at this location. This is the reverse of the pattern observed at the nearshore station where the net flow is NNE.

Figure 2-6: Depth-averaged current rose at offshore station (Sign. 1000)



Time-series data for tidal currents for the nearshore station is presented in Figures 2-7 and 2-8. Figure 2-7 is for the entire period of record whereas Figure 2-8 is for a two-day period to illustrate the features of the time-series data in more detail. As before, four coincident time-series are shown:

Top: Mean water depth - reflecting tide levels;

Middle: Current profiles, shown separately for north-south and east west components; and

Bottom: Depth-averaged currents, shown separately for north-south and east-west components.

Figure 2-7: Time-series for water level and currents at offshore station (Sign. 1000)

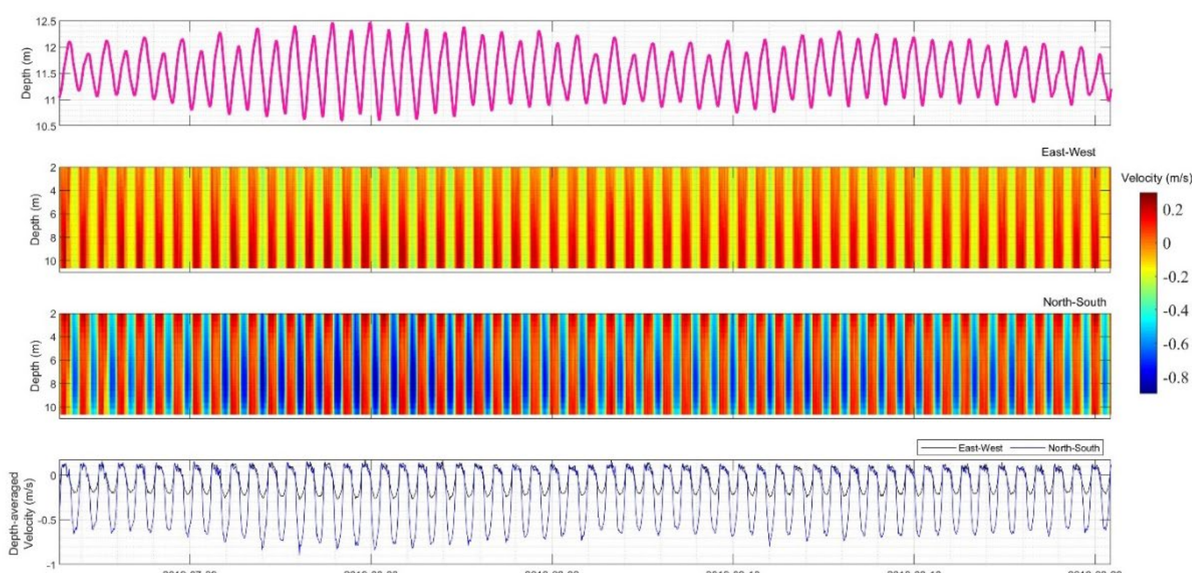
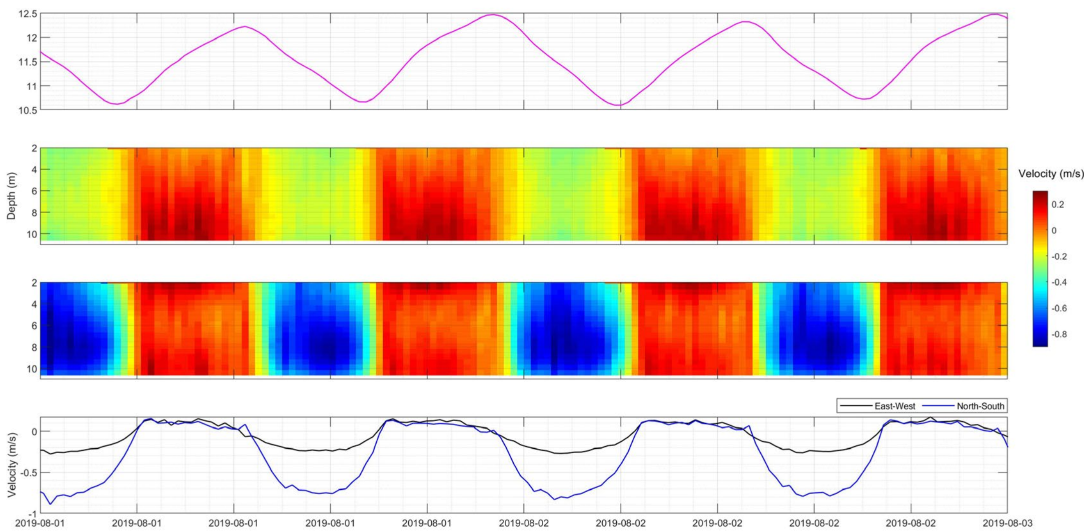


Figure 2-8: Detailed sample of time-series at offshore station (Sign. 1000)



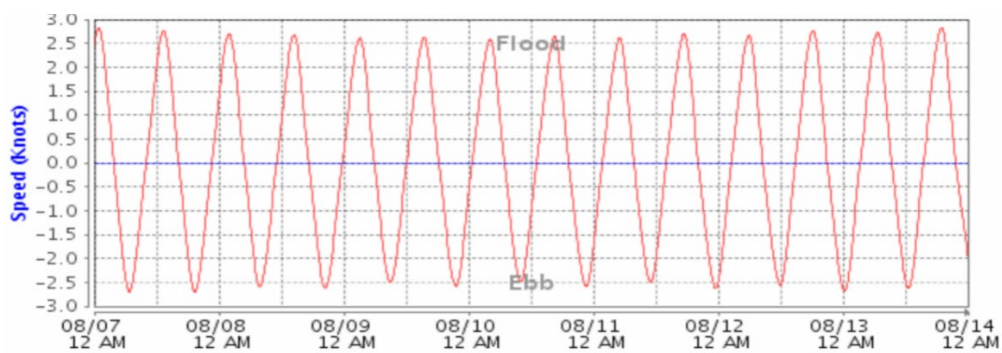
General conclusions from the time series data are as follows:

1. Currents profiles are relatively constant and flow can be approximated as 2D rather than 3D;
2. Peak flood current is about 0.2 m/s (0.4 knot) and peak ebb current is about 0.9 m/s (1.8 knot);
3. Net/residual current is towards south; and
4. The duration of the peak current is significantly longer here than at the nearshore station (say three hours duration versus one hour).

2.2.3 Conclusions on Tidal Currents

In the main channel of the East River the tidal currents are colinear and nearly symmetrical, with peak currents that are in the range of approximately 1.2 to 1.4 m/s (2.4 to 2.8 knots). A representative one-week time-series is shown in Figure 2-9 based on predictions for the NOAA station located close to the site, about 0.5 km north of the Williamsburg Bridge.

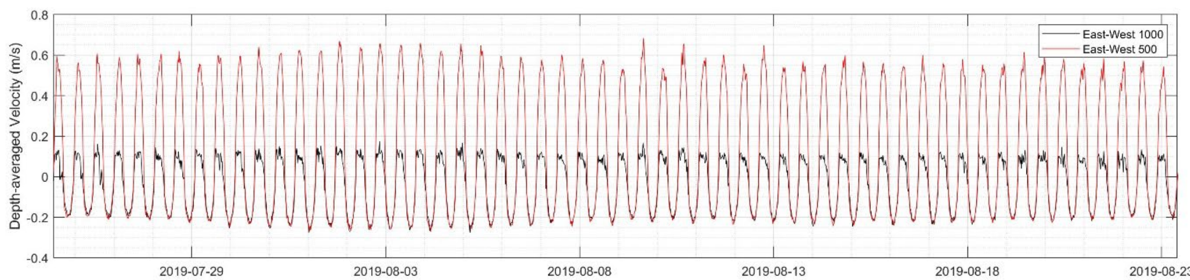
Figure 2-9: Tidal currents in main channel of East River



Tidal current patterns at the site are much different from the currents within the channel, as described in sections 2.2.1 and 2.2.2 and the following figures:

- **Figure 2-10:** Comparative time-series for the two instruments, for depth-averaged north-south and east-west components; and
- **Figure 2-11:** Current roses shown in relation to the two monitoring stations.

Figure 2-10: Comparison of depth-averaged currents at the two stations



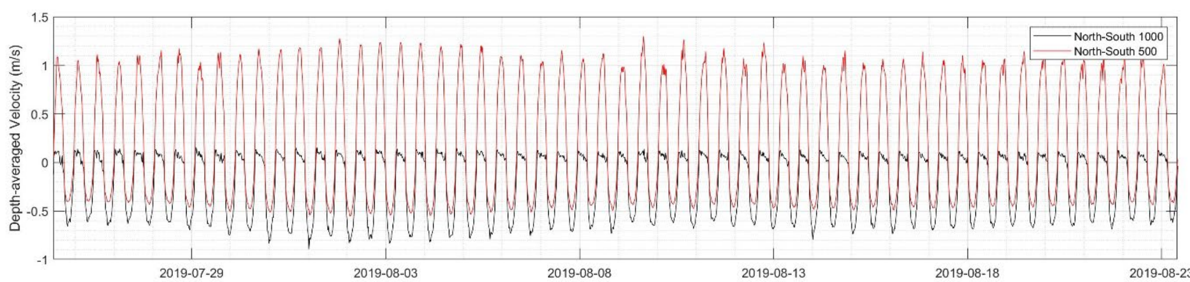
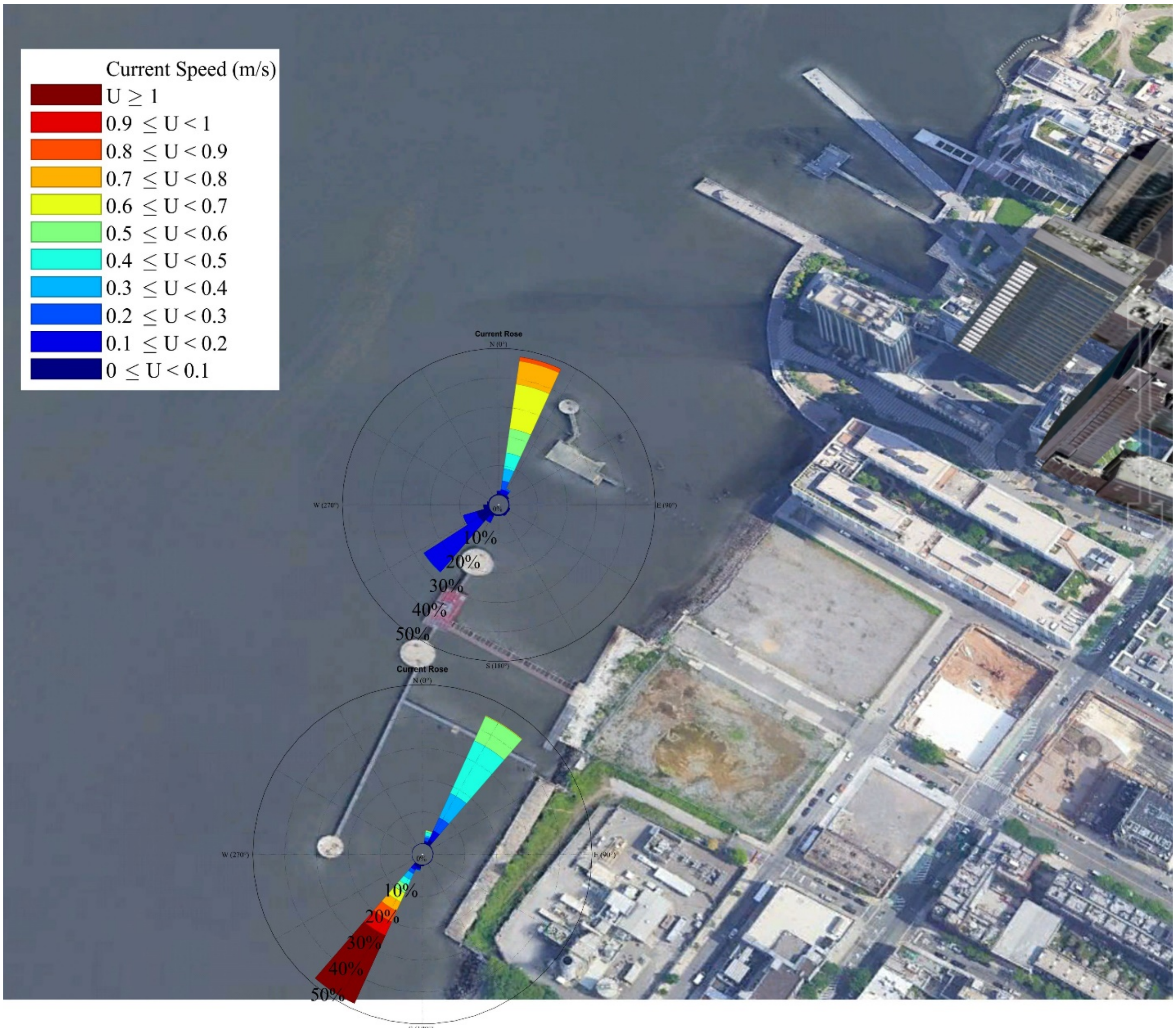


Figure 2-11: Current roses at the nearshore and offshore stations



There is a residual flow to the north at the nearshore station (Sign. 500) and a residual flow to the south at the offshore station (Sign. 1000). This suggests a counterclockwise net circulation which may be due to flow interaction effects with the large land feature located immediately north of the site (Figure 2-10). There may also be significant effects from nearby marine structures, particularly the large diameter sheet pile cellular dolphins.

2D Hydrodynamic modeling will be needed to further evaluate the complex current patterns in the study area for both the existing conditions and the future conditions with the project in place. The AD2CP data will be quite value in helping to calibrate and verify this model.

2.3 Wave and Wake Measurements

2.3.1 Overview of the Wave Data

Figure 2-12 and 2-13 present histograms of wave height and period for the two instruments. They are based on statistical analysis of all individual waves that were measured at each station, based on zero-crossing analysis of the time series, and represents a total of more than one million waves. The histograms are rather similar at the two monitored stations, with highest frequencies waves having minimal wave height (< 0.1 m) and short periods (in range of 1 to 2 s). The average wave height is somewhat higher at the nearshore station (Sign. 500), which might be due to wave amplification effects from the adjacent bulkhead.

Figure 2-12: Histograms of wave height and period for all measured waves (Sign. 500)

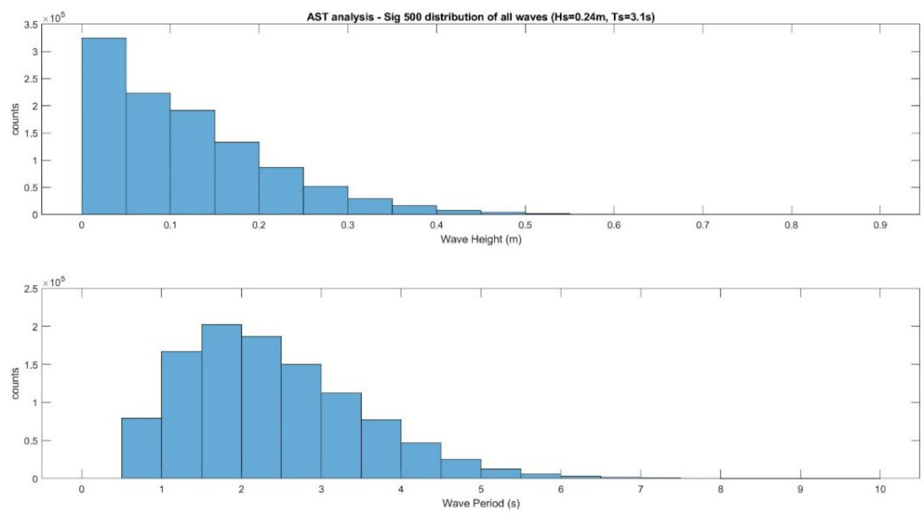
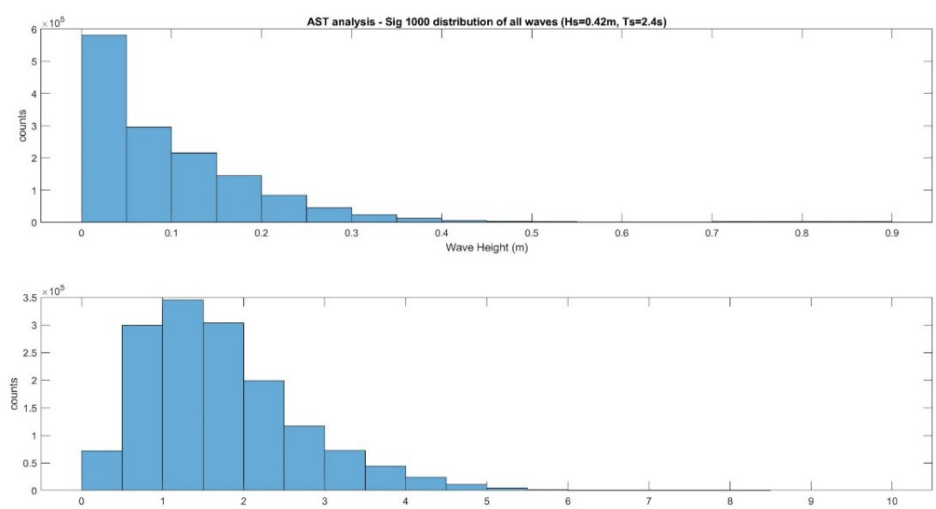


Figure 2-13: Histograms of wave height and period for all measured waves (Sign. 1000)



Wave roses for the two instruments are shown in Figures 2-14 and 2-15 and are considered roughly indicative of the approach directions for the larger wake events. At the offshore station (Figure 2-15) the most frequent direction for high waves is from south-southwest, which is likely attributed to wakes from northbound vessels passing close to the site at high speed. For the nearshore wave rose, the incident directions are much more diffuse. This is probably due to nearshore interaction effects such as wave reflections from the adjacent bulkhead and shielding from marine structures.

Figure 2-14: Wave rose for nearshore station (Sign. 500)

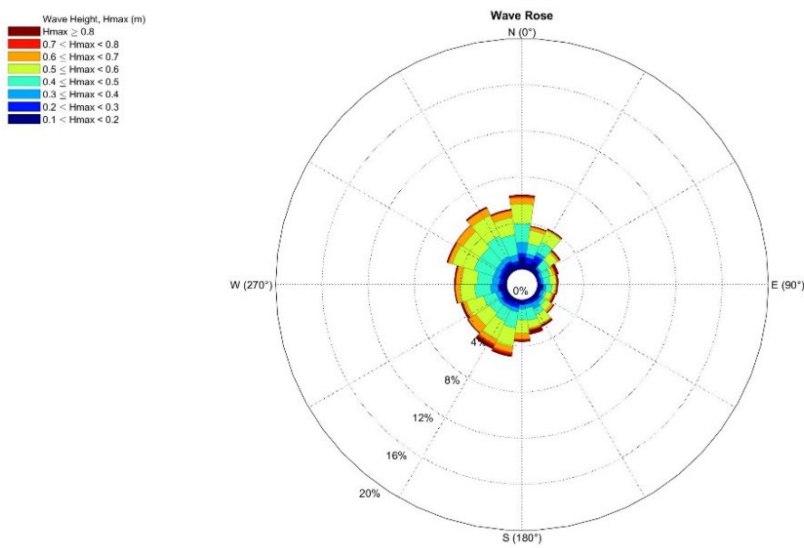
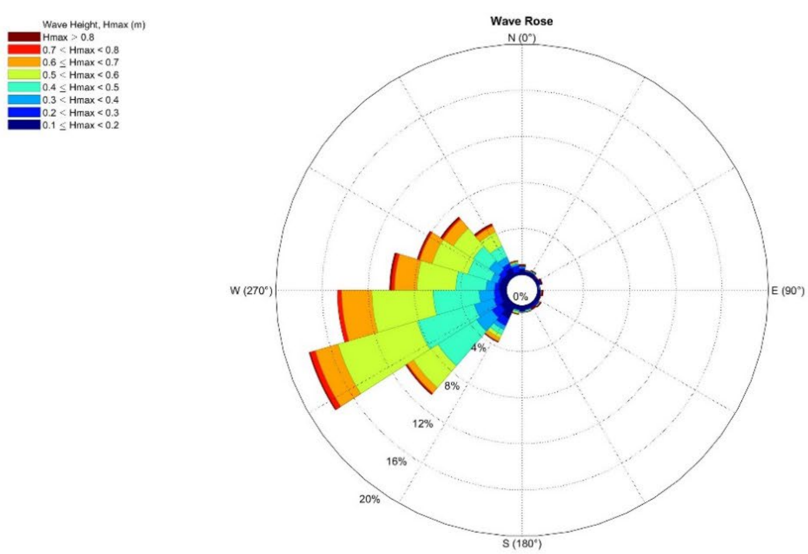


Figure 2-15: Wave rose for offshore station (Sign. 1000)



2.3.2 Overview of Wake Measurements

The primary concern here is not all wave conditions but rather the substantial wake events that impact the site. To evaluate wakes, the time series was broken into twenty-minute time segments and maximum conditions were identified for each segment. This includes:

- **Hmax =** highest individual wave height (wake event) observed during any twenty-minute period; and
- **Tmax =** wave period associated with Hmax.

Figure 2-16 shows the time series of Hmax and Tmax for the duration of the monitoring period and Figure 2-17 shows histograms for Hmax (counts for the entire monitoring period for wave heights categorized by 0.1 m bins).

Figure 2-16: Time series of wake height (Hmax) and associated period (Tmax)

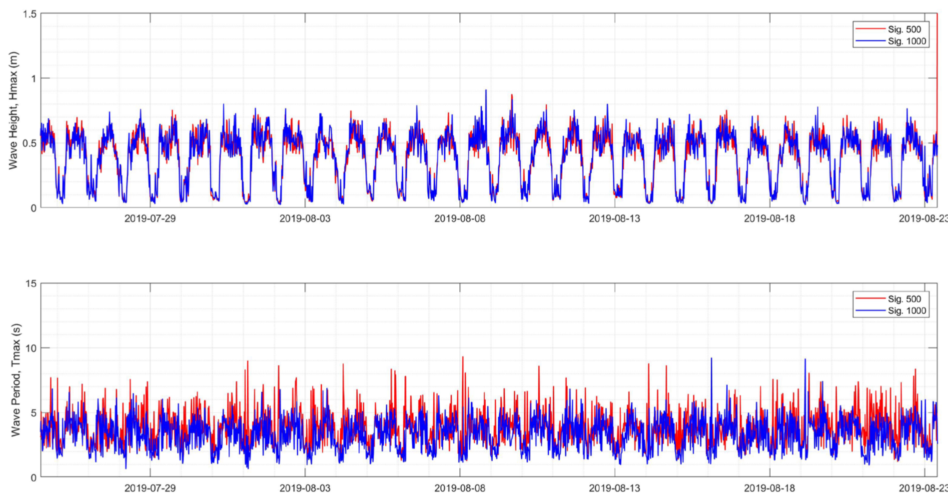
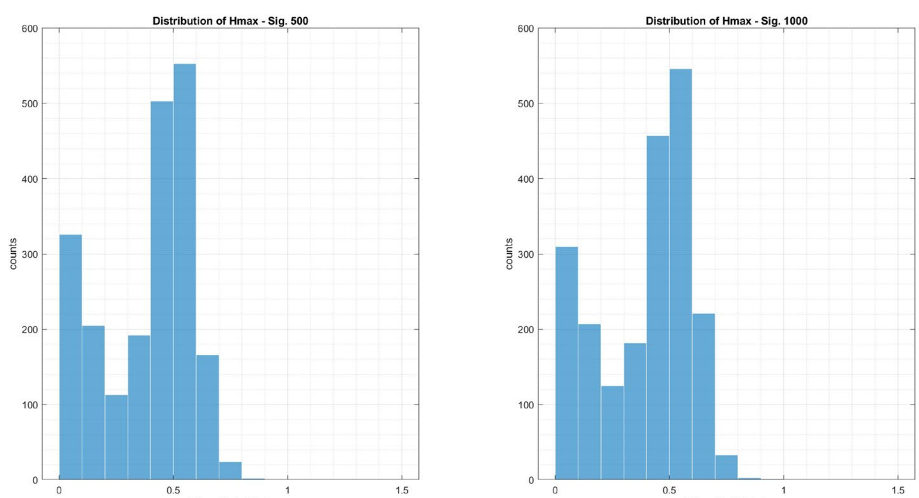


Figure 2-17: Histograms for wake height Hmax for the two instruments



The histograms for the two instruments are quite similar with the most frequent Hmax values in the range of 0.5 to 0.6 m. The number of wake events of 0.5 m or higher is about 800 over the entire monitoring period, which represents an average recurrence interval of about once per hour. Accordingly, wakes with maximum wave height of 0.5 m or more are extremely common at this site, occurring numerous times every day.

Figures 2-18 and 2-19 are scatter plots of Hmax versus Tmax for the two instruments. The results are quite similar and show that wave periods exceeding 5 s are common for higher wake events, exceeding say Hmax = 0.5 m. Extremely high wave events (say Hmax> 0.7 m) tend to have moderate wave periods (say Tmax = 4s) whereas lower wave height events can have much longer periods with Tmax of 7 s or even higher. Based on these results two scenarios are proposed for preliminary planning and design of wave attenuation measures at the site:

- **Case 1:** Hmax = 0.8 m, Tmax = 4 s
- **Case 2:** Hmax = 0.5 m, Tmax = 7 s

Figure 2-18: Scatter plot of Hmax vs. Tmax for nearshore station (Sign. 500)

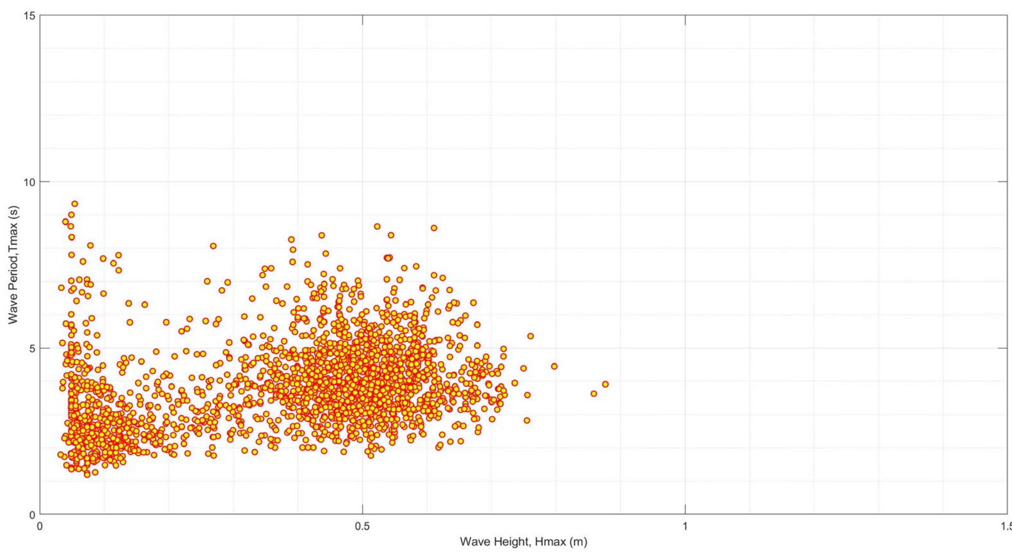
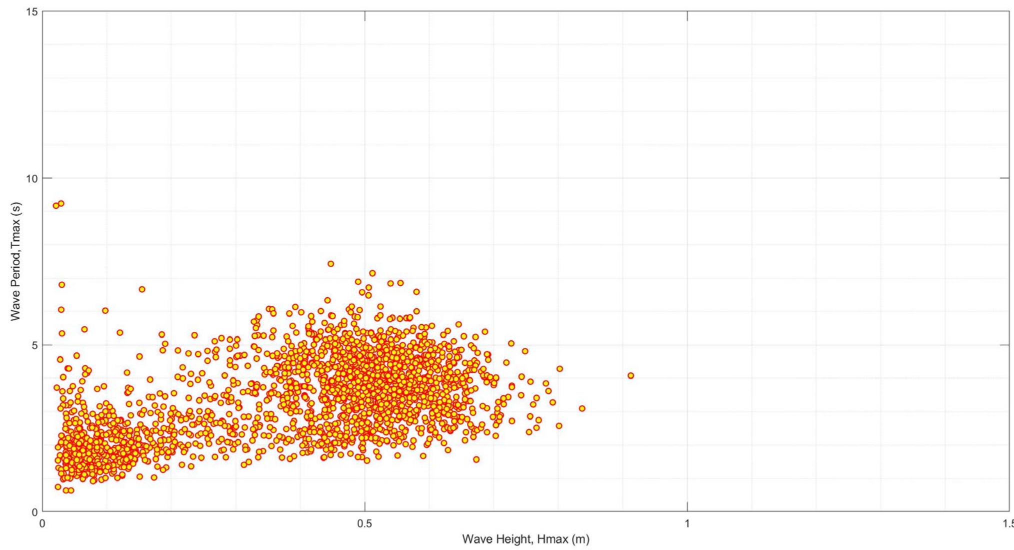


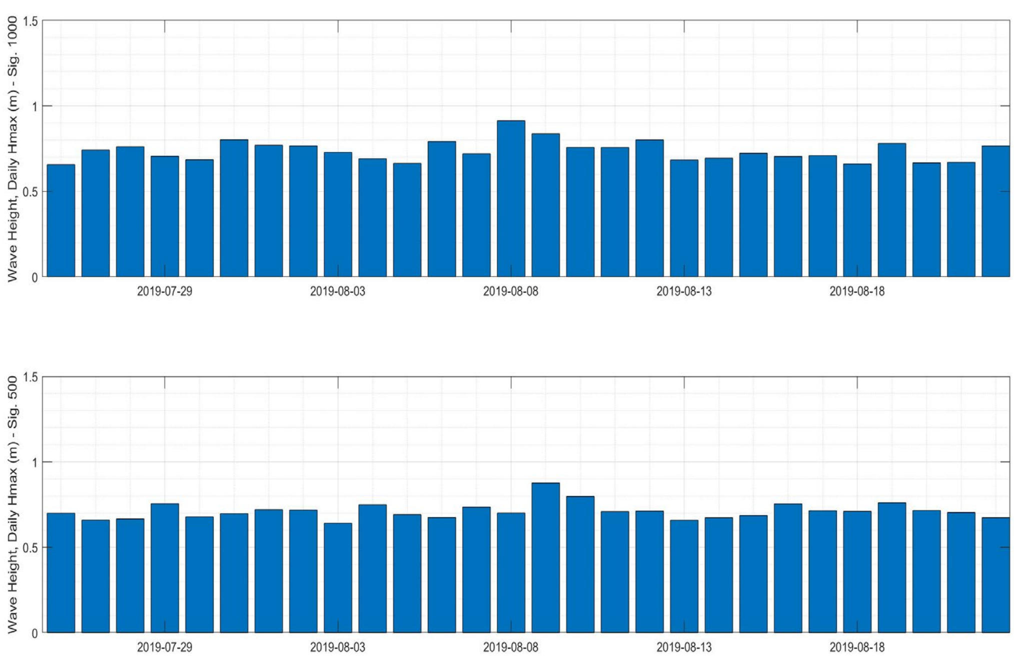
Figure 2-19: Scatter plot of Hmax vs. Tmax for offshore station (Sign. 1000)



2.2.3 Temporal Variation of Wake Heights

Figure 2-20 is a histogram showing the highest wave height measured each day of the monitoring period. The lower figure is for the nearshore station (Sign. 500) and the upper figure is for the offshore station (Sign. 1000). The highest daily wave height averages about 0.7 m and consistently ranges between 0.6 to 0.9 m, with only minor variations between the two instruments.

Figure 2-20: Daily maximum wake height for the two instruments



Figures 2-21 and 2-22 are hourly scatter plots of Hmax vs. Tmax for the two instruments. The results show relatively high wake conditions essentially all day long except for late at night until early morning hours (say from 10 pm to 6 am). As will be discussed further in section 3.3, this observation is consistent with the pattern of high ferry traffic throughout the day, which is the primary cause of wakes at the site.

Figure 2-21: Hourly scatter plots of Hmax vs. Tmax for nearshore station (Sign. 500)

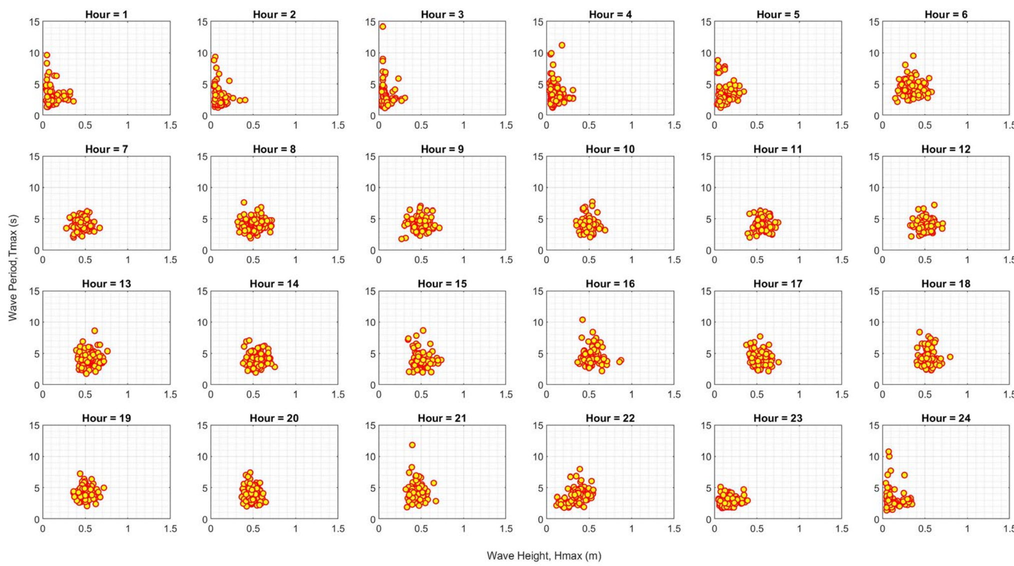
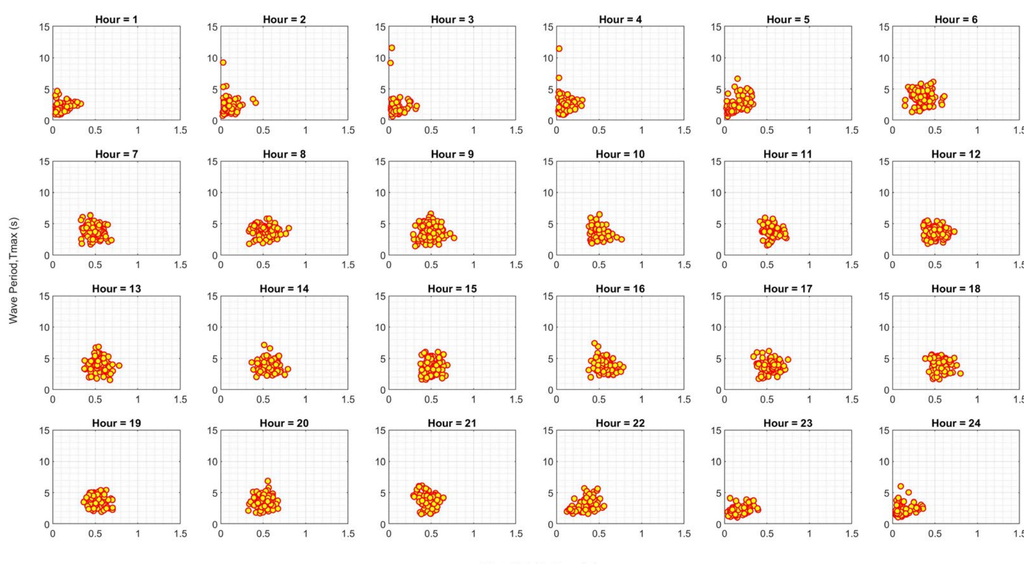


Figure 2-22: Hourly scatter plots of Hmax vs. Tmax for offshore station (Sign. 1000)



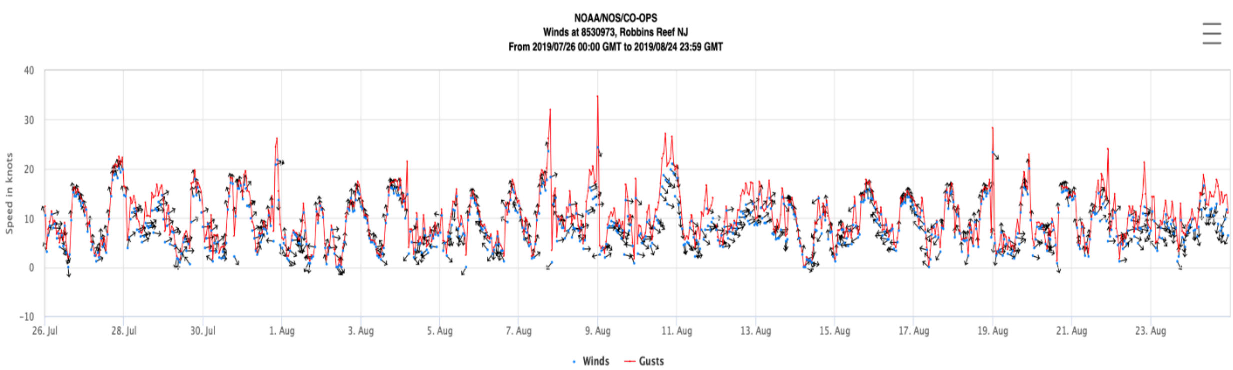
2.2.4 Winds and Wind Waves During Monitoring Period

Figure 2-23 is time series of wind data during of data acquisition program from the NOAA Station at Robbins Reef, NJ, located about 10 km southwest of the site. At this station, winds are measured continuously and recorded at 6-minute intervals (though plotted here at one-hour intervals for sake of clarity). The data shows occasional gusts in the range of 30 knots that are likely due to thunderstorm events.

From the standpoint of wind generated waves at the site, the most significant event occurred on the evening of July 27 when there was a prolonged period of 20 knot winds from southerly directions were recorded. Wind waves generated from such winds would be in the range of Hs = 0.2 m with period Tp of less than 2 s, which are much lower than the peak wakes that are frequently encountered at the site.

Accordingly, we conclude that waves with a height of more than 0.1 m measured at the site are attributed almost entirely to wakes from passing vessels. This includes secondary effects such as the interaction between multiple wakes from different vessels and wave reflections from bulkheads and other structures. Wind generated waves are generally a secondary factor here and there are other isolated events such as seaplane landings in the river that may occasionally affect wave conditions at the site.

Figure 2-23: Wind speeds and direction vectors during the monitoring period at Robbins Reef, NJ



Vessel traffic conditions in the East River in the vicinity of the North 1st Street site have been evaluated based on a comprehensive analysis of one year of AIS vessel traffic data for the calendar year 2018. The objective is to develop a detailed understanding of the nature and frequency of vessel traffic in the area and provide reasonable basis for the selection of parameters to estimate vessel wake characteristics using empirical methods. For a given passing vessel event, the wake at a particular location depends on several parameters:

- Speed of vessel (relative to local current);
- Froude numbers, based on vessel speed in relation to both the vessel length and channel depth;
- Vessel displacement and hull configuration;
- Direction of travel and the attenuation distance from the sailing line to the point of interest;
- Reflections from bulkheads and other interactions with marine structures; and
- Local depth effects, including shoaling and refraction.

Most of the parameters for wake analysis can be approximated using AIS data. A shortcoming of the data is that it is based on speed over ground and cannot be readily adjusted to account for local speed relative to current. Peak tidal currents near the site are on the order of three knots and if we consider a typical travel speed of say 15 knots this represents a potential variation +/-20 percent by using the over ground speed versus the relative in-water speed.

3.1 Analysis of AIS Vessel Traffic Data

Ship traffic in New York Harbor (and in most locations) is monitored and managed on a real-time basis through the Automatic Identification System (AIS). AIS Information includes:

- Date and time (UTC timestamp);
- Vessel name and IMO number;
- Vessel position (UTM coordinates);
- Speed over ground (knots);
- Course heading (degrees);
- Vessel type and ID code;
- Vessel parameters - length (LOA), beam, and draft; and
- Various other data.

In general, pre-processing of the data was performed with proprietary MATLAB codes and the database queries and statistical analysis were performed using Microsoft ACCESS and EXCEL. The dataset is extremely large (millions of records) and requires extensive pre-processing and geospatial analysis.

The following sections provide an overview of the AIS database, particularly the ferry traffic. It is noted that the AIS database is limited to commercial and larger vessel, generally larger than 60 tons displacement. Accordingly, most of the recreational boating traffic is not captured in the AIS database.

3.2 Overview of the AIS Database

The following table provides an overview of the vessel traffic data near the site, showing that a total of 58,224 vessel movements above 10 knots occurred at the site, of which 5,099 (about nine percent) were for unspecified vessel categories. By far the dominant traffic was for passenger vessels (ferries), with 47,825 vessel movements for the year – representing an average of 131 movements per day or 5.5 movements per hour. For data where the vessel type information has been specified, passenger vessels (specified by AIS ID no. 30) represent nearly 90 percent of the total vessel traffic.

Table 3-1: Summary of AIS vessel traffic data

AIS Category	Type	Count in Year	Average per Day	Average Speed (knots)	Average Parameters (m) Length	Beam	Draft	Critical Speed Froude = 0.9
30	Fishing	99	0.3	13.6	22.7	5.5	1.9	13.4
31	Towing	815	2.2	11.9	33.2	10.0	3.8	16.2
37	Pleasure Craft (yacht)	360	1.0	13.7	37.8	7.8	2.4	17.3
40	High Speed Craft	1,301	3.6	22.0	33.6	7.3	2.9	16.3
51	Search & Rescue	225	0.6	19.7	19.9	4.7	2.0	12.6
52	Tug	1,126	3.1	12.2	37.6	9.5	4.4	17.3
55	Law Enforcement	397	1.1	20.5	17.1	4.5	1.8	11.7
60	Passenger / ferry	47,825	131.0	19.5	27.6	7.2	2.0	14.8
80	Tanker	977	2.7	13.0	91.9	17.6	4.9	27.0
--	Unspecified	5,099	14.0					
	totals --	58,224	159.5					

3.3 Analysis of Ferry Traffic

The following table summarizes vessel characteristics of the more frequent ferries passing the area, for vessels that passed the site at least 100 times over the year.

Table 3-2: Summary ferry traffic data

		Vessel Speed (knots)		Vessel Parameters (m)		
Ferry Name	**Count**	**Average**	**Maximum**	**Length**	**Beam**	**Draft**
CHRISTOPHER COLUMBUS	165	19.3	27.5	27.0	8.0	2.0
CIRCLE LINE BRONX	542	14.2	23.2	47.0	10.0	2.1
CIRCLE LINE BROOKLYN	254	14.1	20.6	47.0	10.0	2.1
CIRCLE LINE LIBERTY	287	13.1	21.0	50.0	11.0	2.3
CIRCLE LINE QUEENS	467	13.7	18.7	47.0	10.0	2.1
CIRCLE LINE STATEN ISLAND	402	14.2	24.9	47.0	10.0	2.1
CIRCLELINE MANHATTAN	334	13.9	18.6	47.0	10.0	2.1
CONNECTOR	930	22.3	29.4	26.0	8.0	2.0
ED ROGOWSKY	344	18.4	26.8	22.0	8.0	2.3
FIORELLO LAGUARDIA	700	17.8	27.2	26.0	10.0	2.0
FLYER	1122	22.5	30.4	26.0	8.0	2.0
FRIENDSHIP EXPRESS	2025	19.9	28.1	26.0	8.0	1.7
GARDEN STATE	119	14.4	19.4	24.0	7.0	2.0
GEORGE WASHINGTON	188	13.4	25.9	21.0	8.0	2.0
GREAT EAGLE	2945	21.4	27.4	26.0	8.0	2.0
H202	116	19.0	26.3	26.0	8.0	1.7
H206	1959	19.6	28.0	26.0	8.0	2.0
H207	2538	19.9	37.9	26.0	8.0	2.0
H208	2689	19.7	28.3	26.0	8.0	2.0
H209	2334	20.0	29.8	26.0	8.0	2.0
HAPPY HAULER	2405	21.0	28.1	26.0	7.0	2.0
HB 106	652	20.7	27.8	26.0	8.0	2.0
HB 106	1209	19.4	27.2	26.0	8.0	2.0
HB 107	2331	20.3	27.9	26.0	8.0	1.9
LUNCHBOX	2632	19.7	27.7	26.0	8.0	2.0
MCSHINY	111	16.9	24.2	26.0	8.0	2.0
MUNSEE	108	17.5	25.6	26.0	8.0	2.0
OPPORTUNITY	789	22.3	30.3	26.0	8.0	2.0
OWLS HEAD	2245	20.9	28.7	26.0	8.0	2.0
ROBERT FULTON	253	13.2	17.5	28.0	8.0	2.0
SAM HOLMES	1065	18.8	30.1	21.0	7.0	2.3
SEASTREAK NEW YORK	291	20.7	38.1	44.0	12.0	4.7
SEN FRANK LAUTENBERG	148	19.1	27.9	26.0	9.0	2.0
SEYMOUR B DURST	544	18.5	26.0	22.0	8.0	2.3
STARLIGHT	105	17.8	24.8	26.0	8.0	2.0
SUNSET CROSSING	2035	20.1	27.2	26.0	4.0	2.0
URBAN JOURNEY	2605	20.1	28.1	26.0	8.0	1.9
WAVES OF WONDER	2350	19.8	26.8	26.0	4.0	2.0
YOGI BERRA	894	17.2	26.6	25.0	8.0	2.0

Most of the traffic is from the New York City ferry system, with catamaran type vessels with typical dimensions of approximately 26 m length x 8 m beam x 2 m draft. “Urban Journey” is a typical vessel of this category of ferry as shown in the following photographs:

Figure 3-1: Typical NYC Ferry "Urban Journey" (26 m length x 8 m beam)

The speed distribution for "Urban Journey" is shown in Figure 3-2 for observed speeds exceeding 10 knots. The data shows a wide range of speeds with the highest frequencies occurring for speeds in the range of 20 to 24 knots. At such speeds the length-based Froude number is above the critical value of about 0.9, and they are traveling on a planning mode with moderate wake development.

Figure 3-2: Speed distribution for typical NYC Ferry ("Urban Journey")

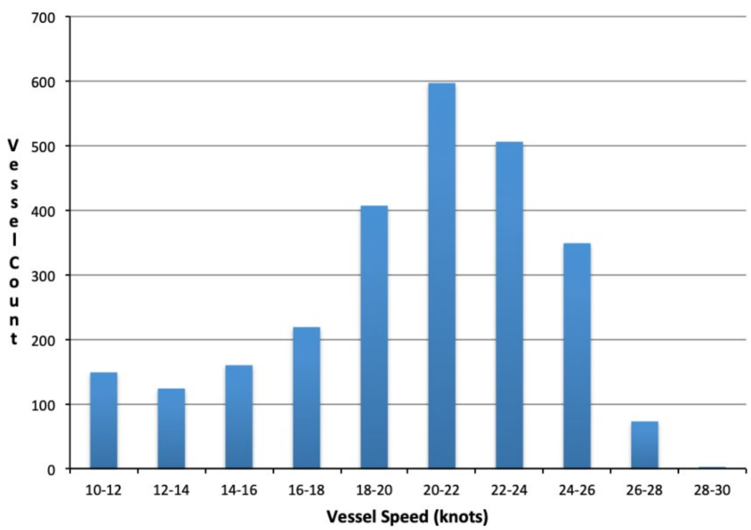


Figure 3-3 shows the frequency distribution for ferry traffic as a function of the time of day, where the UTC based time has been converted into local time (LST / LDT). It shows that the traffic level is relatively constant from approximately 6:00 AM to 10:00 PM and (as expected) it is much lower late at night and in the early morning hours.

Figure 3-3: Hourly distribution of ferry traffic for the year

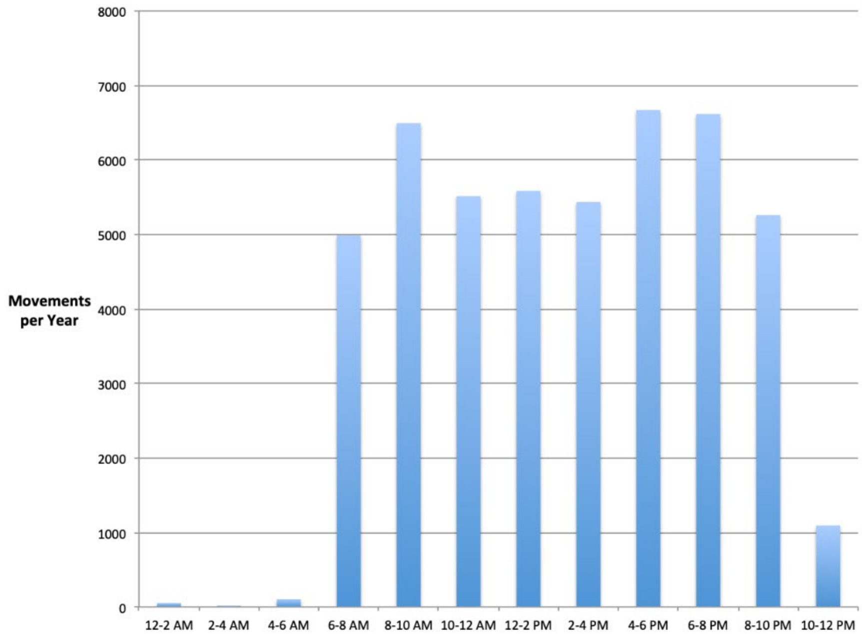
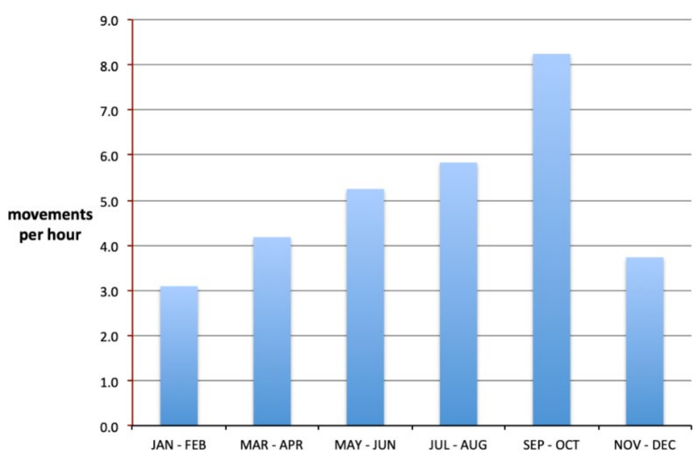


Figure 3-4 shows the monthly frequency distribution for ferry traffic based on average number of ferry movements per hour. The data indicates that traffic is relatively low during the winter months, increases in the spring and summer, and peaks in the September–October timeframe.

Figure 3-4: Monthly distribution of ferry traffic



The AIS vessel position data was analyzed to evaluate the variability of vessel tracks relative to the site. Figure 3-5 shows histograms of vessel counts based on vessel track, where blue indicates northbound traffic and red is for southbound traffic. The data for sailing position is presented relative to the bulkhead along the waterfront of the site (i.e. from the waterfront edge on the Brooklyn side of the East River). For northbound traffic the most common track is 100 to 150 m west of the bulkhead, which is in very close proximity to the existing / abandoned pier construction. For southbound traffic the most common track is about 50 m further west, but also runs close to the site. Figure 3-6 is a scatter plot of AIS vessel positions within the study area (for speeds exceeding 10 knots), confirming the that high-speed vessel traffic can occur at essentially any location in this area of the East River.

Figure 3-5: Vessel counts for annual distribution of sailing distance

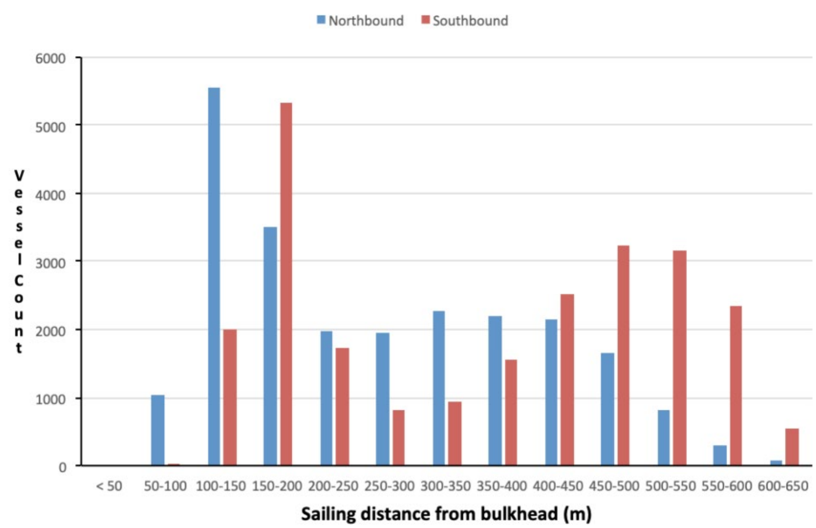


Figure 3-6: Scatter plot of AIS vessel position data

3.4 Empirical Calculations for Wakes

3.4.1 Wake Height

Empirical calculations have been performed to develop independent estimates of the wake conditions that can be anticipated, including wake heights, periods and approach directions. Most methods depend largely on the depth-based Froude number:

$$F = \frac{V_s}{\sqrt{gd}}$$

where Vs is vessel speed and d is water depth (assumed constant).

A number of empirical methods are available to estimate wake height but they are not directly applicable to our site conditions where the highest wakes are caused mainly by ferries with catamaran type hulls traveling at high Froude numbers. As an example, the method by Sorensen and Weggel (1984) is widely used and gives the following results for a NYC Ferry traveling at typical speed of 20 knots in 14 m water depth:

Separation distance = 100 m: Hmax = 1.4 m
Separation distance = 300 m: Hmax = 1.0 m

In comparison, the monitoring data indicates that maximum wave heights are in the range of Hmax = 0.8 m. This discrepancy is not surprising considering that the method is based on a database of vessels with conventional displacement hull configurations traveling at modest Froude numbers (less than 0.7). Empirical methods are not available to assess wakes from catamaran vessels traveling at high Froude number.

3.4.2 Period and Wave Approach Direction

The following sketch illustrates the typical wake pattern for a vessel with a conventional (displacement) hull traveling in deep water, at relatively low Froude number:

Figure 3-7: Wake pattern for vessel traveling at moderate Froude number

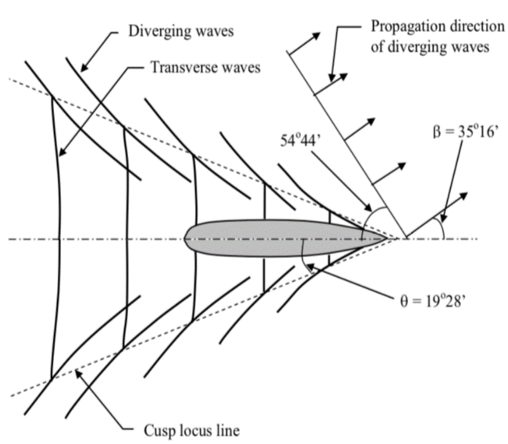


Table 3-3 summarizes calculations for wave approach angle beta and wave period as a function of vessel speed and depth-based Froude number. The results are not strictly applicable for catamaran hulls but the calculated periods exceeding 5 s at high Froude numbers are consistent with the measurements presented in Section 2.

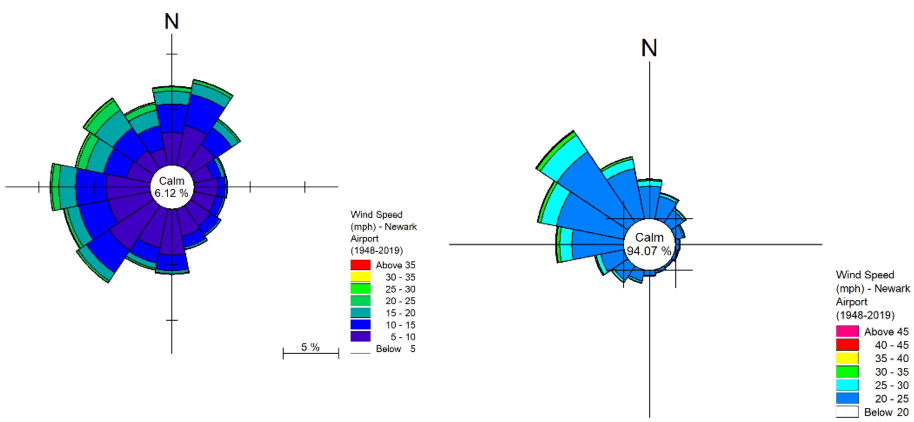
Table 3-3: Wake angle and period versus vessel speed (depth = 14 m)

speed (knots)	Froude Number	Beta (degrees)	Period (s)
4	0.17	35.3	1.1
8	0.35	35.3	2.1
12	0.52	35.2	3.2
16	0.70	34.4	4.3
18	0.78	32.7	4.9
20	0.87	27.8	5.8
22	0.96	14.0	7.0

4.1 Winds and Wind Generated Waves

Wind conditions at the site have been evaluated based on a 70-year database of hourly wind measurements at Newark Airport, located approximately 17 km south-southwest of the site. Wind roses based on this data are presented in Figure 4-1 where the wind rose on the left represents all data and the one on right is for higher wind speeds, above 25 mph threshold. The predominant winds are from westerly and northerly directions and stronger winds occur most frequently from the northwest, caused mainly by the passage of “Nor’easter” type storm systems during winter. It is noted the wind in the Newark Airport database has been pre-processed in order to eliminate short duration high speed events that are likely due to thunderstorms. These short duration events do not generate high waves at the site.

Figure 4-1: Wind roses



Extreme value statistical analysis (EVA) has been performed using various extreme value probability distributions and optimal estimates were selected based on best-fit statistical criteria (see Appendix B and Table 4-1). For the 100-year return period (RP) hourly wind speed the omni-directional estimate is 61 mph (53 knots). For wind generated waves the longest available fetch is from north (3.5 km fetch) and the 100-year RP wind speed from this direction is 45.6 mph (39.6 knots). Using standard empirical methods for wave forecasting the estimated 100-year RP wave conditions at the site are:

Hs = 0.73 m; Hmax = 1.31 m

Tp = 2.35 s

Table 4-1: Extreme value estimates for winds and wind-generated waves at the site

	Extreme Hourly Winds		Extreme Waves from N		
RP (years)	OMNI	North	Hs (m)	Hmax (m)	Tp (s)
1	38.1	28.6	0.35	0.63	1.83
10	45.0	34.1	0.50	0.90	2.06
50	56.9	41.4	0.65	1.17	2.26
100	61.0	45.6	0.73	1.31	2.35

4.2 Operational and Extreme Water Levels

NOAA water level data for the area is summarized in Table 4-2 for two locations: The Battery and Williamsburg Bridge Station. The Battery is a primary tidal gaging station with a 99-year record of hourly water level measurements whereas the Williamsburg Bridge Station is a secondary station with tide levels that are based on analysis of tidal harmonic constituents as determined from numerical models or short-term monitoring. The tide levels for the Williamsburg Bridge station are considered directly applicable to the site conditions whereas data from the Battery is provided as a useful reference for extreme historical water levels in the area. Table 4-2 shows that the mean tide range (MHW-MLW) at the site is 4.22 ft. (1.29 m) and the extreme measured water levels at the Battery are:

Extreme high water = 14.04 ft. MLLW (11.27 ft. NAVD88)

Extreme low water = -4.29 ft. MLLW (-7.06 ft. NAVD88)

Table 4-2: Water level data at nearby NOAA stations

	NOAA water level datum (ft. MLLW)	
Water level condition	Williamsburg Br.	The Battery
Highest observed (H. Sandy)	--	14.04
High astronomical tide (HAT)	--	6.35
Mean high high water (MHHW)	4.75	5.05
Mean high water (MHW)	4.42	4.73
NAVD88 datum	2.61	2.77
Mean sea level (MSL)	2.39	2.57
Mean low water (MLW)	0.20	0.20
Mean low low water (MLLW)	0.00	0.00
Low astronomical tide (LAT)	--	-1.39
Lowest observed level	--	-4.29

Information on coastal flood levels at the site is presented in Table 4-3, both with and without an allowance for future sea level rise. The FEMA 100-year RP still water flood level is 10.9 ft. (3.32 m) NAVD88 and the proposed allowance for sea level rise is 1.5 ft., based on NY State DEC Guidelines (Part 490, 6 NYCRR). The mid-range statistical estimate for sea level rise is 16 inches through the 2050's (i.e. through 2059), which is approximately 18 inches when referenced to NAVD88. The total 100-year RP water level estimate including sea level rise is therefore 10.9 + 1.5 = 12.4 ft. (3.78 m) NAVD88. This is a static flood level and does not include the dynamic effects of waves.

Table 4-3: Coastal flood levels

Flood Event (still water level)	Flood Level (ft. NAVD88)	Flood Level plus Sea Level Rise
FEMA 500-year RP	13.9	15.4
Highest observed (H. Sandy)	11.3	--
FEMA 100-year RP	10.9	12.4
FEMA 50-year RP	9.6	11.1
FEMA 10-year RP	6.9	8.4

The major conclusions of the study are summarized below.

Wakes

Vessel traffic in the East River is dominated by ferries, especially the smaller NYC ferries that have extremely high volume and frequently travel at high speed near the site (averaging about 20 knots). High wakes in the range of 0.6 to 0.7 m occur at the site from ferries and other vessel traffic on a daily basis. Based on detailed analysis of the results of the wave / wake monitoring program and AIS vessel traffic data, as well as consideration of empirical wake calculations, we propose two scenarios for the "operational" (weekly) conditions:

Case 1A: Hmax = 0.8 m, T = 4 s
Case 2A: Hmax = 0.5 m, T = 7 s

For "extreme" conditions (annual) we proposed slightly higher conditions, taking into account the possibility of higher wakes in the future from different types of vessels and / or more severe traffic patterns:

Case 1B: Hmax = 1.0 m, T = 4 s
Case 2B: Hmax = 0.7 m, T = 7 s

Currents

Tidal currents are strong and vary spatially at the site. Close to shore the peak current is about 1.2 m/s (2.4 knots) and there is a residual flow to the north, whereas, further offshore (near the Pierhead Line) the peak current is about 0.9 m/s (1.8 knots) and the residual flow is to the south. Overall there appears to be a counterclockwise circulation at the site that may be caused by interactions with adjacent land features and marine structures. 2D hydrodynamic modeling will be needed to evaluate this situation in detail, for the both existing conditions and the future conditions with the project in place. The AD2CP current and water level data collected for this project will be valuable for calibrating and verifying such a model.

Winds and Wind Generated Waves

Wind conditions at the site have been assessed based on statistical analysis of 70 years of hourly wind data at nearby Newark Airport. This includes extreme value analysis (EVA) of extreme winds from several directions of interest. The EVA for the omni-directional 100-year RP hourly wind speed is 61 mph (53 knots). For gust wind speed, ASCE 7-16 gives mean value estimate of 96 mph (84 knots) for the 100-year RP 3 s gust wind speed.

The exposure to wind generated waves at the site is quite limited. The most critical direction is from north, where the available fetch is about 3.5 km. Using empirical methods, the 100-year RP wave conditions from north are:

Hs = 0.64 m; **Hmax =** 1.15 m
Tp = 2.3 s

These wave conditions are moderate and will not be problematic for design. The main concern here is the persistent wakes, particularly when associated with relatively long wave periods.

Water Levels

Available tidal and extreme water level data has been summarized based on measured data at two nearby NOAA stations.

For coastal flooding, a 100-year RP flood level of El. 12.4 ft. (3.78 m) NAVD88 is tentatively proposed. This level is based on the currently proposed FEMA flood level for the project area plus an allowance of 1.5 ft. (0.46 m) for a mid-range statistical estimate of future sea level rise. This represents a still water level and does not include the dynamic effects of waves and the mitigation of wave overtopping, which needs to be evaluated once the site plan has been developed. The proposed flood level is slightly higher than the highest water level of record at the Battery, which is El. 11.3 ft. (3.45 m) NAVD88 and occurred during Hurricane Sandy (2012).

appendix a

Specifications for Nortek Signature AD2CP

BROADBAND SERIES

Signature1000/500

A HIGH PERFORMANCE SCIENTIFIC POWERHOUSE

NORTEK

TRUE INNOVATION MAKES A DIFFERENCE

SIGNATURE1000/500

A HIGH PERFORMANCE SCIENTIFIC POWERHOUSE

Signature1000 and Signature500, two advanced five-beam current profiling systems, are made with the most demanding scientific user in mind. Built on the entirely new AD2CP platform, Signature1000 and Signature500 are designed for unprecedented performance in high energy turbulent environments, while also giving users the freedom to employ two measurement schemes at one time.

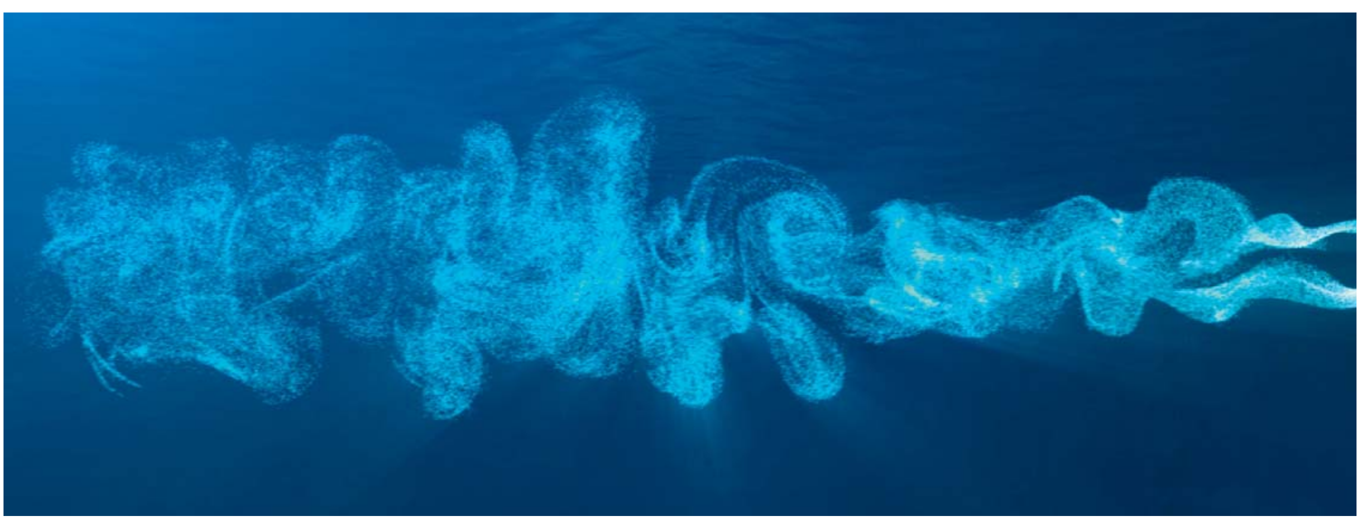
Turbulence

Turbulence, as used here, refers to short-term variations in the current velocity. There are three aspects of the Signature Series that make it particularly suitable for measuring these variations:

Faster Sampling – Detecting variations is simplified if the instrument collects many independent current profiles in quick succession. The Signature1000 features sampling rates as high as 16 Hz, which effectively provide four times the information as previous instruments sampling at 4Hz.

AD2CP Broadband Technology – The use of new processing algorithms means that each velocity profile is more precise and has less instrument noise, making it easier to detect small velocity variations.

Five Beams – To measure turbulent kinetic energy and even turbulent stress, five beams provide a significant advantage because all five second-order variables can be estimated directly. This is in contrast to the mean current, which only requires three, or even just two beams to estimate all relevant velocity components.



The AD2CP is Nortek's broadband Doppler signal processing platform. It is the product of thousands of engineering man-hours and includes a series of innovative elements, which will open doors to new applications and inspire exciting research possibilities.

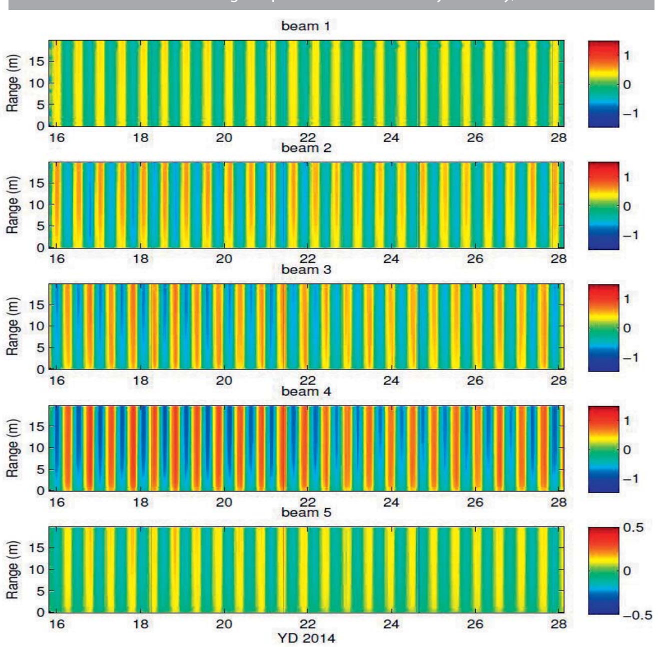
- AD2CP broadband combines frequency-modulated transmissions with fast sampling rates and adjustable bandwidth. The result is unparalleled performance in both standard and specialized applications.
- AD2CP hardware can alternate between multiple measurement modes. One instrument replaces several by offering concurrent or alternating measurements of currents, turbulence, waves and ice.
- AD2CP recorders will store all raw Doppler and sensor data. Improve data quality by removing contamination from fish or other influences.
- AD2CP Ethernet connection provides easy access to the instrument from any location, simple integration into instrumentation networks, and fast recorder download.
- AD2CP adjustable power output facilitates long endurance operation by allowing new short-range applications, which combine higher vertical resolution with lower power consumption.
- AD2CP blue light illuminates when power is applied and blinks when the transmitter is active. Deploy the instrument with the utmost confidence that it is operating.

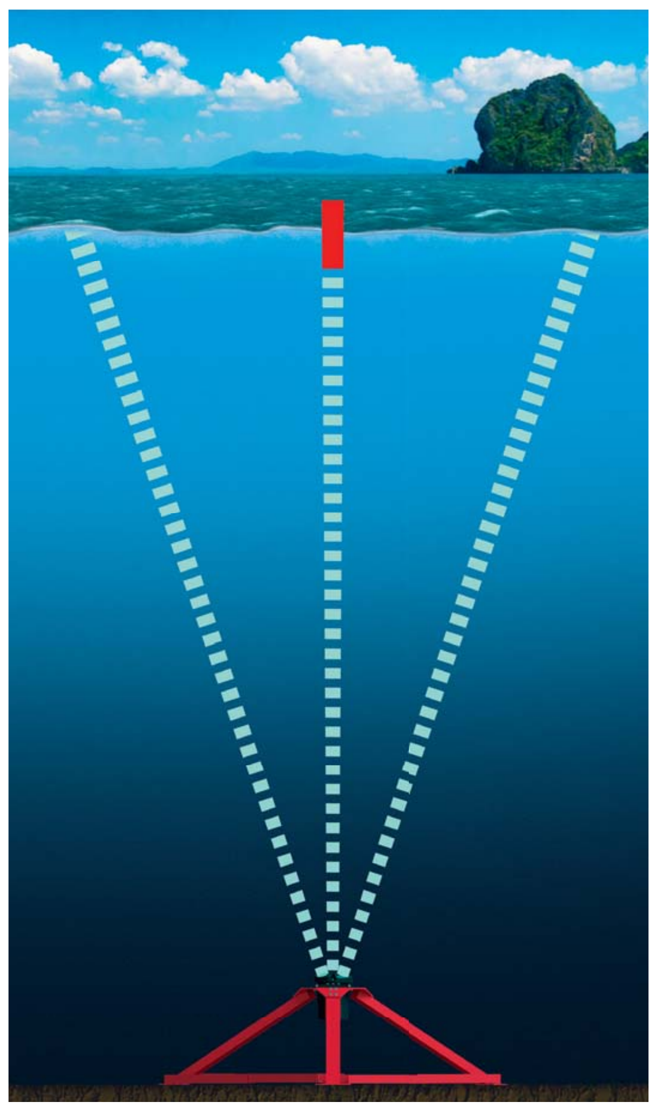
Concurrent Measurement of Velocity Profiles and Wave Height

The Signature series allows concurrent measurements of the velocity profile and the distance to the surface. This improves our understanding of the interaction between waves and currents. This data-intensive information is best suited for scientific applications.

In contrast, Acoustic Surface Tracking (AST) is implemented in the Nortek AWAC, an established device for measuring all common wave statistical parameters and the mean current profile. The AWAC, with its full suite of associated hardware and software, is recommended for efficient data transfer and power in online applications.

AD2CP: Beam Velocities
Data collected along 5 separate beams in the Bay of Fundy, Canada



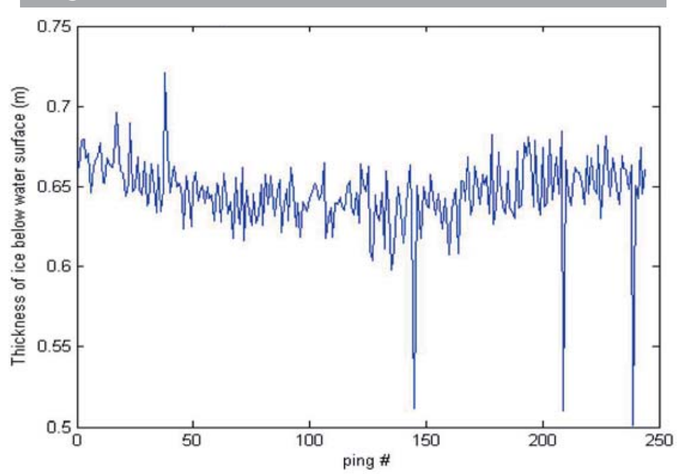


Combined Ice Thickness and Ice Velocity

The Signature Series is the first line of scientific instruments to combine ice thickness and ice velocity measurements into a single unit. The ice draft is calculated as the difference between the pressure sensor reading and the distance to the ice keel utilizing the altimeter function.

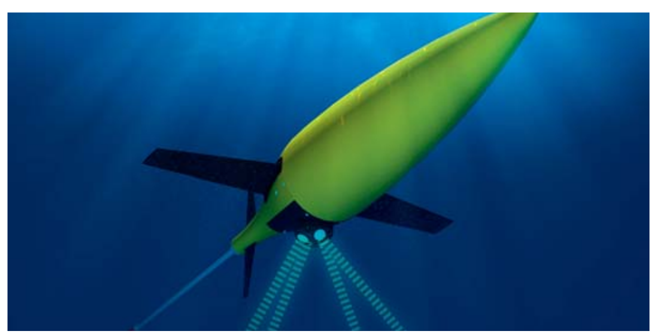
The velocity of the ice sheet or iceberg is then measured from the Doppler shift recorded at the water/ice surface. Finally, the times series are adjusted using atmospheric pressure data and periods of open water. (Nortek offers data analysis services for measurements collected under ice)

Signature500 Ice thickness measurement

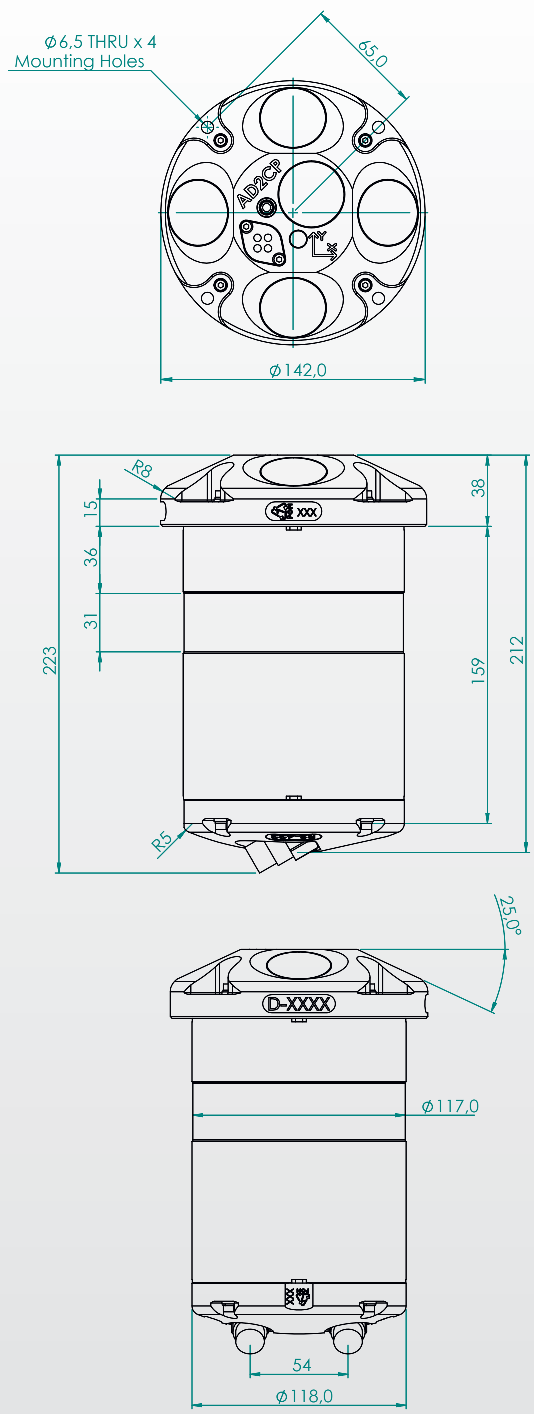


Power Limited Applications

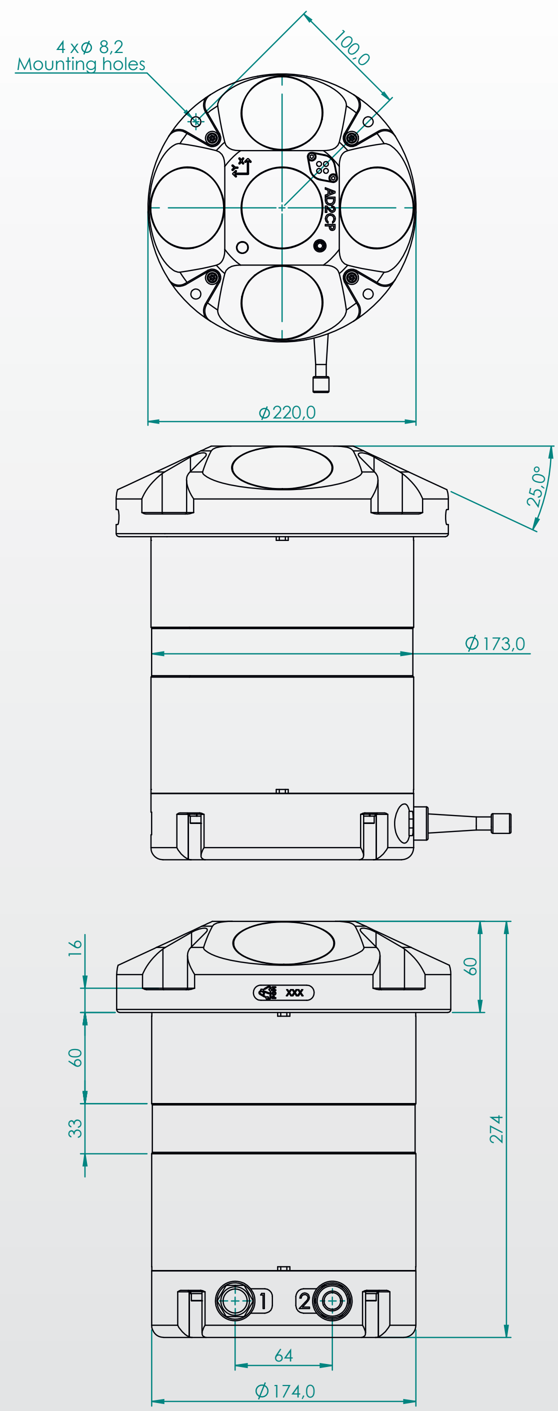
The Signature Series is very flexible, making it a great tool for investigating many different aspects of ocean movement. The Signature Series instruments can operate with low output power and high velocity precision modes to significantly extend battery life. This technology has been employed in ocean gliders, where power is a limiting factor for deployment duration. The Nortek Glider-AD2CP, originally developed for the SeaGlider, is now also installed on Spray Gliders operating in the Pacific Ocean.



Signature1000



Signature500



All dimensions in mm.

Technical Specifications

Water Velocity Measurements		
	Signature1000	**Signature500**
Profiling Range*	30m	70m
Cell Size	0.2 - 2m	0.5 - 4m
Min. Blanking	0.1m	0.5m
Max # cells	128(burst)/200(average)	128(burst)/200(average)
Velocity Range (along beam)	User Selectable 1.0, 1.25, 2.5, 3.75, 5.0, 20 m/s	User Selectable 1.0, 1.25, 2.5, 3.75, 5.0, 20 m/s
Minimum accuracy: (Inquire for more accurate firmware or hardware versions)	0.3% of measured value +- 0.3cm/s	0.3% of measured value +- 0.3cm/s
Velocity Resolution	0.1 cm/s	0.1 cm/s
Max Sampling Rate	16Hz	8Hz
Max Sampling Rate Five beams	8Hz	4Hz

*) maximum range depends on transmit power and acoustic scattering conditions

Echo Intensity	
Sampling:	Same as velocity
Resolution:	0.5dB
Dynamic range:	70dB
No. of beams:	5, 4 slanted at 25°, 1 vertical
Beam width:	2.9°

Sensors	
Temperature:	Thermistor embedded in head
Range:	–4°C to 40°C
Accuracy/Resolution:	0.1°C/0.01°C
Time response:	2 min
Compass:	Solid State Magnetometer
Accuracy/Resolution:	2° for tilt <20°/0.01°
Tilt:	Solid State Accelerometer
Accuracy/Resolution:	0.2° for tilt <30°/0.01°
Maximum tilt:	Full 3D
Up or down:	Automatic detect
Pressure:	Piezoresistive
Standard Range:	0–100m (inquire for options)
Accuracy/Precision:	0.1% FS / Better than 0.002% of full scale

Data Communication	
I/O:	Ethernet or configurable RS-232/RS422
Serial Communication Baud rate:	300–1250000 baud
Recorder download baud rate:	20 Mbit/s (Ethernet only) - 1 GByte in 6 minutes
Controller Interface:	ASCII command interface with telemetry options over Telnet and serial interface. Complete data download over standard Ethernet FTP. Telemetry file downloadable over serial interface. See interface manual for more information.

Data Recording	
Capacity (standard):	16 GB / Optional 64 GB
Data record:	86 bytes + 4 x Nbeams x Ncells
Mode:	Stop when full

Real Time Clock	
Accuracy:	±1 min/year
Clock retention in absence of external power:	1 year

Backup battery recharges automatically when the instrument is powered

Software	
Operating system:	Windows® 7 or later
Functions:	Deployment planning, start with alarm, data retrieval, conversion to ASCII and Matlab format.
Online data:	Collection and graphical display.

Power	
DC input:	12–48VDC
Max. average consumption at 1Hz:	8 Watts. Peak currents 1.5A at 12V, 1A at 24V. Ethernet adds 0.75 W
Typical average consumption:	See deployment software
Sleep Consumption:	100uA, power depends on supply voltage
Transmit power:	0.3–30W per beam, adjustable levels
Ping sequence:	Parallel

Materials	
Connectors:	MCBH6F-G2-WB with water block MCBH2F-G2-WB with water block
Standard model:	Delrin® with titanium bolts.

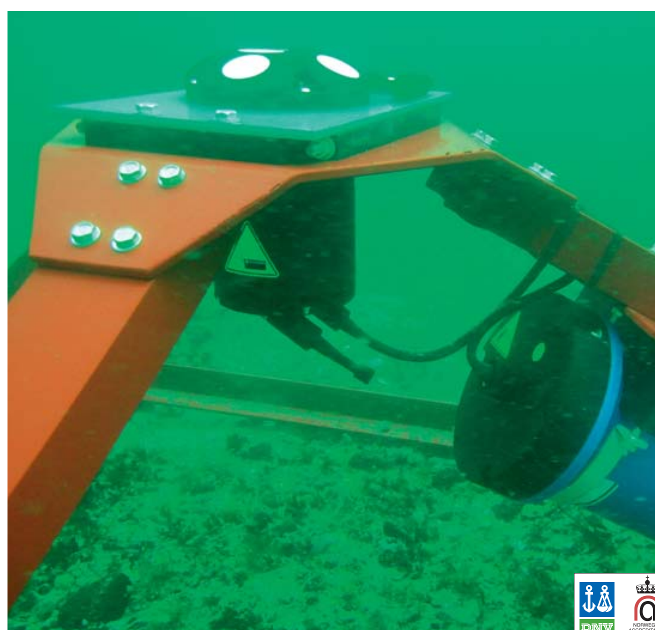
Environmental	
Operating temperature:	–4°C to 40°C
Storage temperature:	–20°C to 60°C
Shock and vibration:	IEC 60068-1/IEC60068-2-64
Depth rating:	300 m

Batteries	
Internal:	1MHz:100Wh, 500kHz:180Wh
External:	Single or double alkaline 540Wh or lithium 1800 Wh
Duration	See deployment software

The battery consumption is a complex function of the instrument configuration. Please consult the Signature deployment software for more information

Dimensions		
	See drawings	
	Signature1000	**Signature500**
Weight in air:	2.92Kg	8.20Kg
Weight in water:	0.62Kg	1.45Kg

Wave Measurement option	
Maximum Depth:	30 /70m
Height Range:	-15 to +15m
Accuracy/Resolution (Hs):	<1% of measured value / 2cm
Accuracy/Resolution (Dir):	2° / 0.1°
Period Range:	2-50s
Cut-Off Period(Hs):	25m depth; 1 sec 50m depth; 2 sec
Cut-off Period (dir):	Please inquire
Sampling Rate (Velocity and AST):	4Hz
Max altitude	1MHz: 30m, 500kHz: 100m
Min Altitude	1MHz: 1m, 500kHz: 2m
Precision	2 cm



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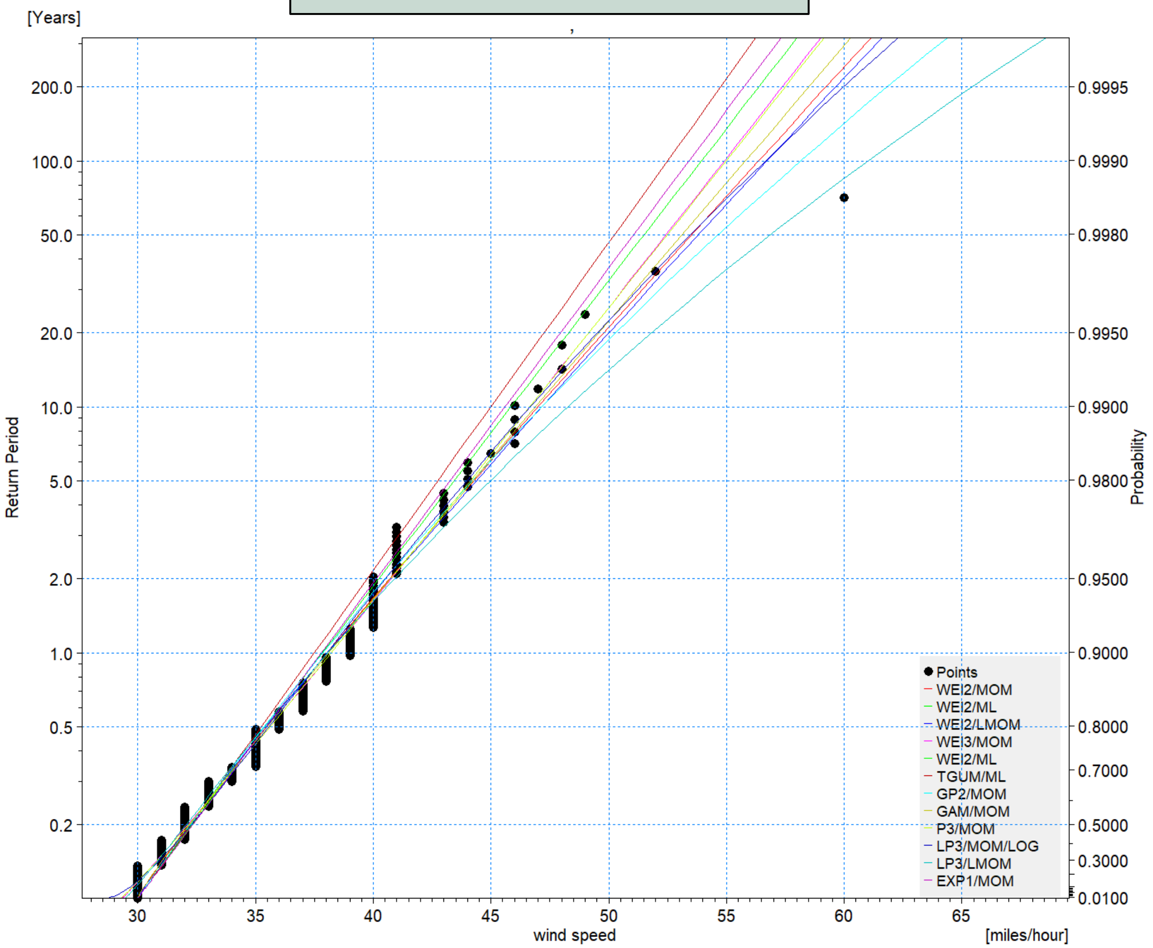
appendix b

Extreme Value Analysis of Wind Data

EVA for Hourly Wind Data – Omni Directional

CASGROUP

All distributions used



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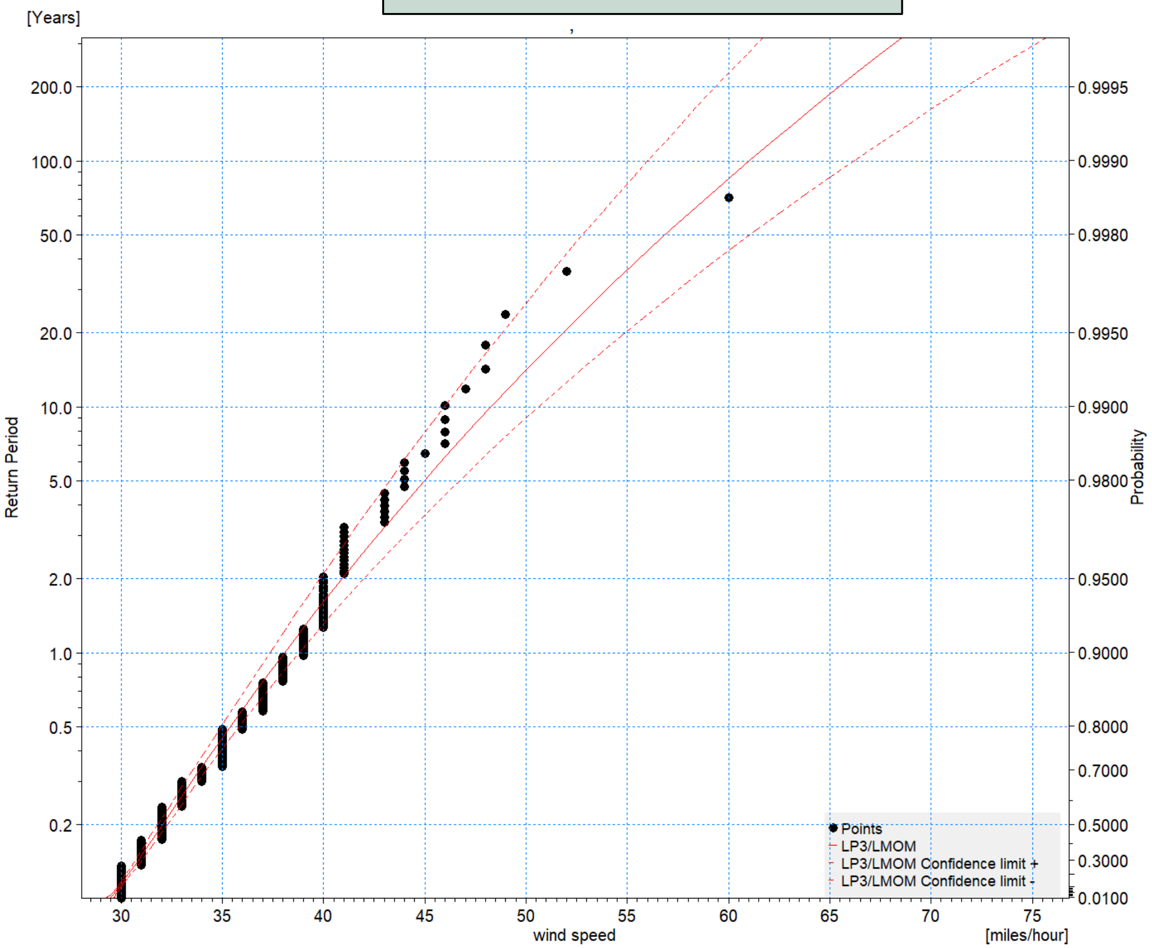
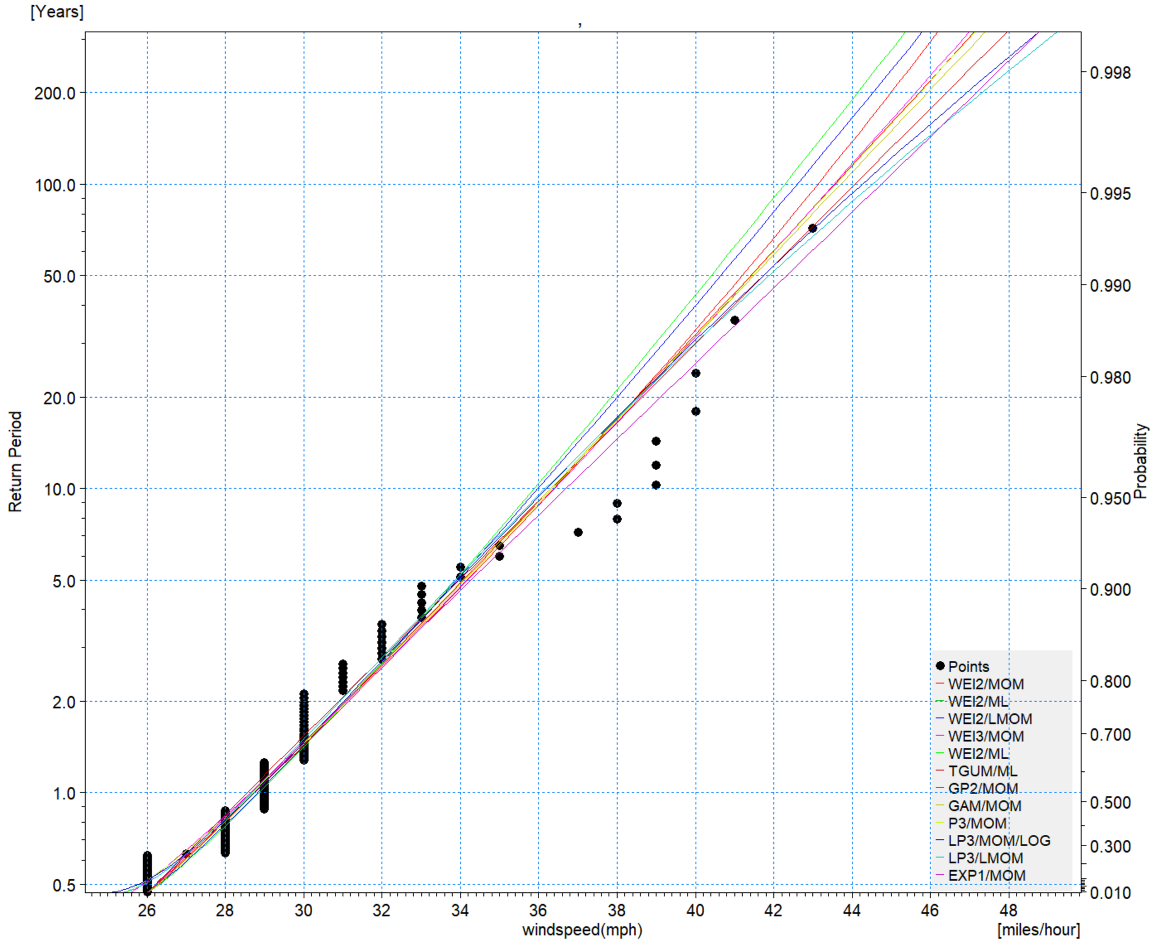


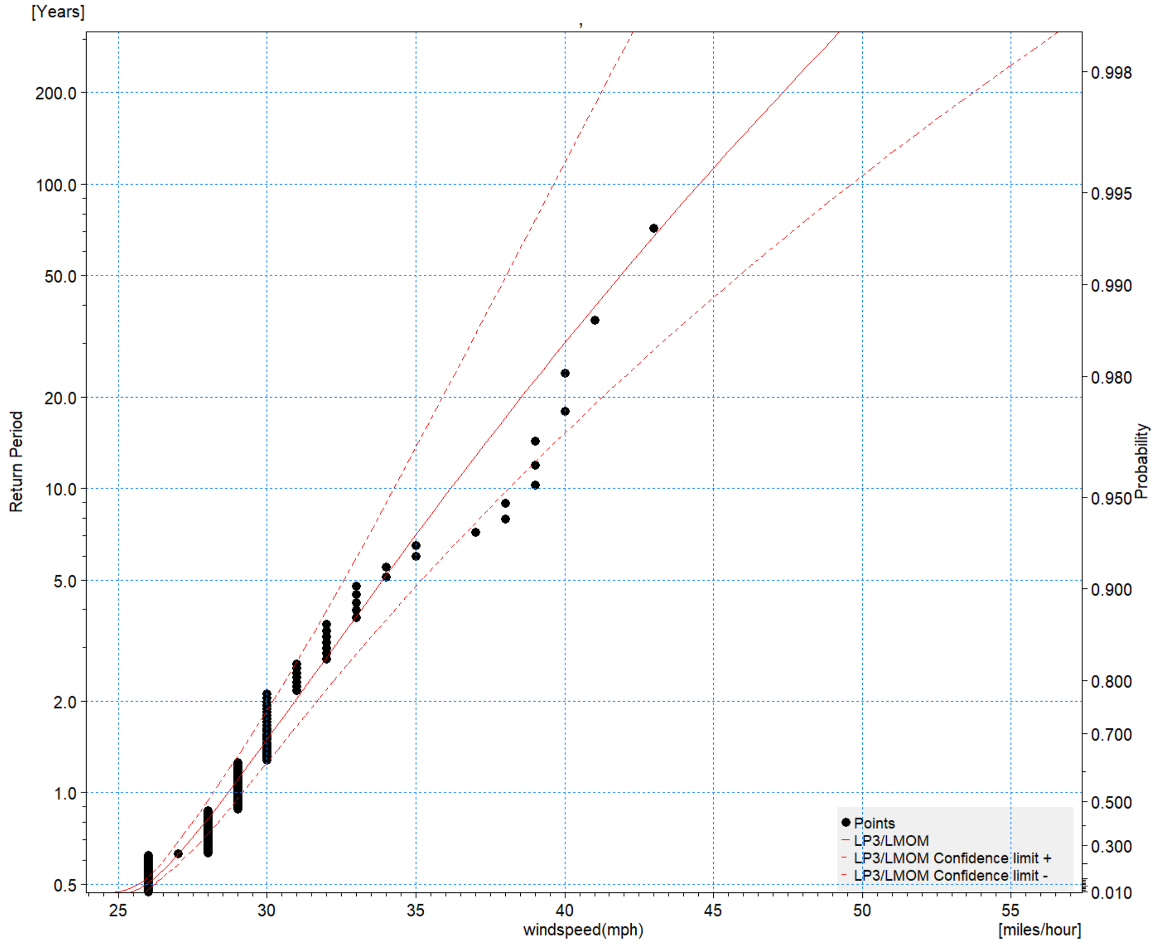
Dashed lines denote 95% confidence levels

EVA for Hourly Wind Data – N Direction (worst case for waves)

All distributions used



Selected



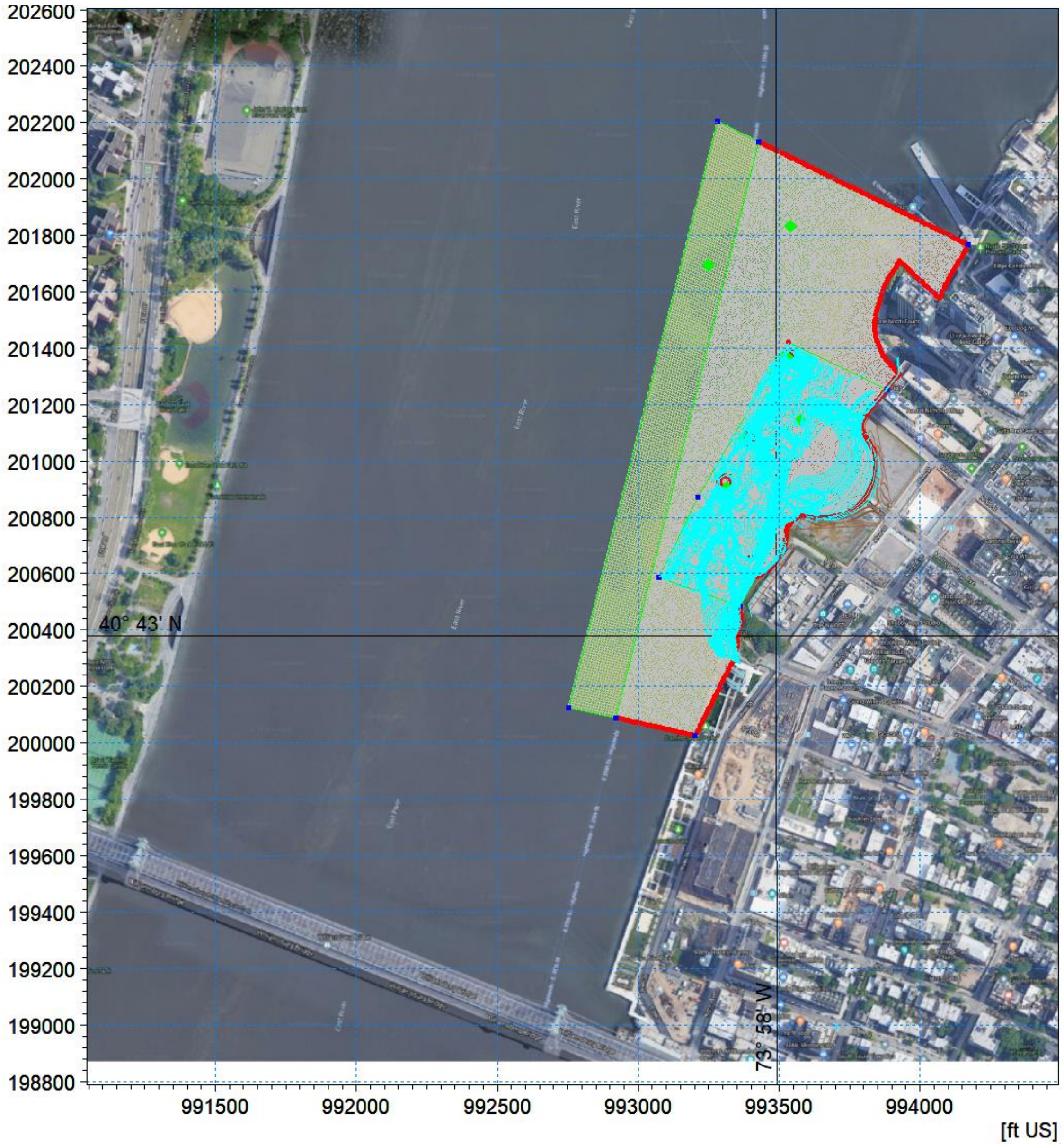
Dashed lines denote 95% confidence levels

MIKE 3 Waves FM Modeling Summary

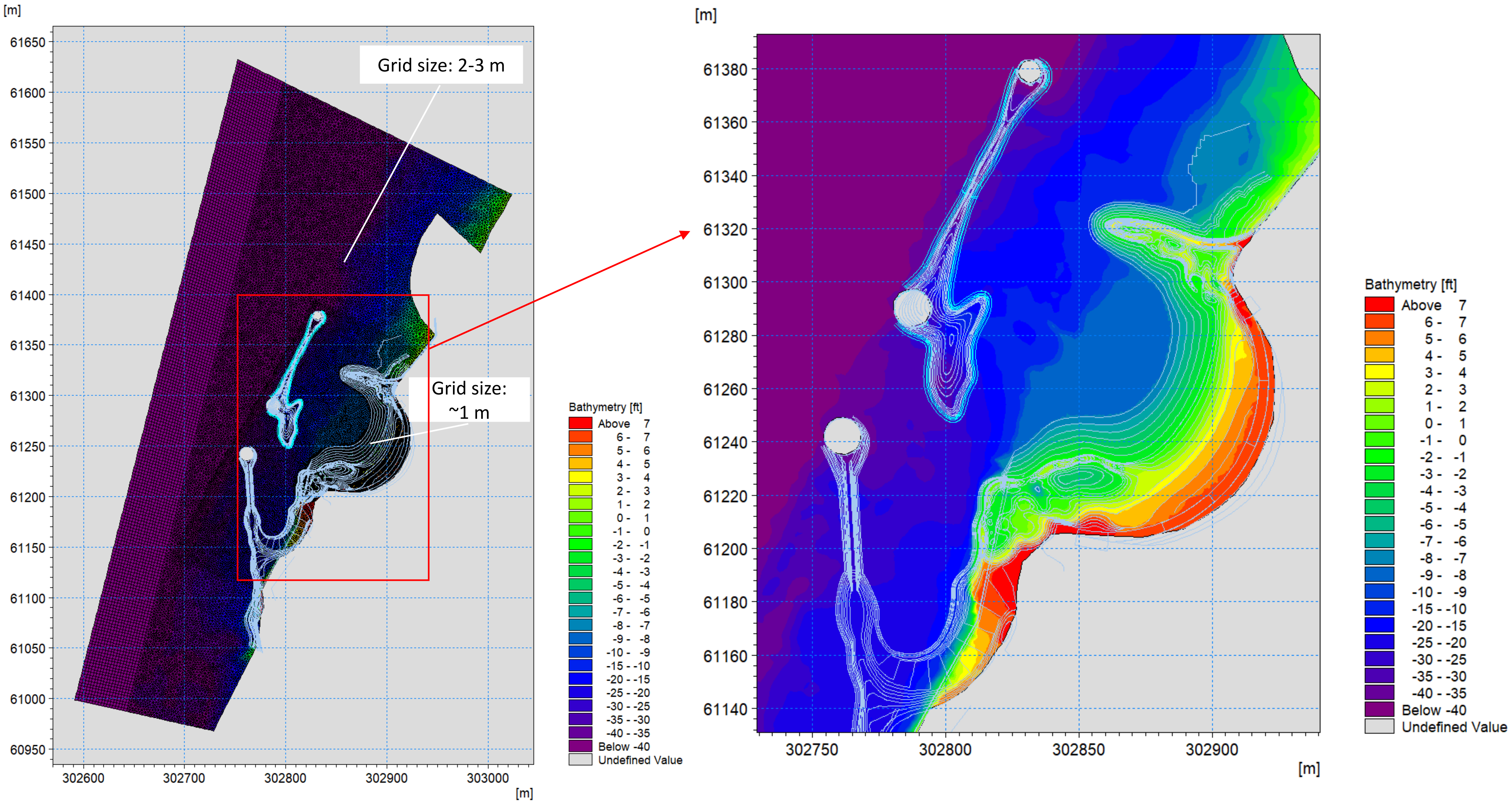
January 29, 2020

Table of Contents

1. Wave Model Setup - Model Domain



1. Wave Model Setup - Model Mesh and Bathymetry



2. Run Matrix

Run matrix was determined based on:

i. Wake waves generated from northbound traffics (see Fig. 1) and southbound traffics (see Fig. 2)
ii. Field wave measurement data (see Fig. 3)
iii. 270 degrees denotes a more unfavorable wave direction for the north beach

Run Matrix

No.	Wave Direction (°N)	Wave period (s)	Wave Height (m)
1	240	5	1
2	350	5	1
3	270	5	1
4	240	4	1
5	350	4	1
6	270	4	1

Fig. 1

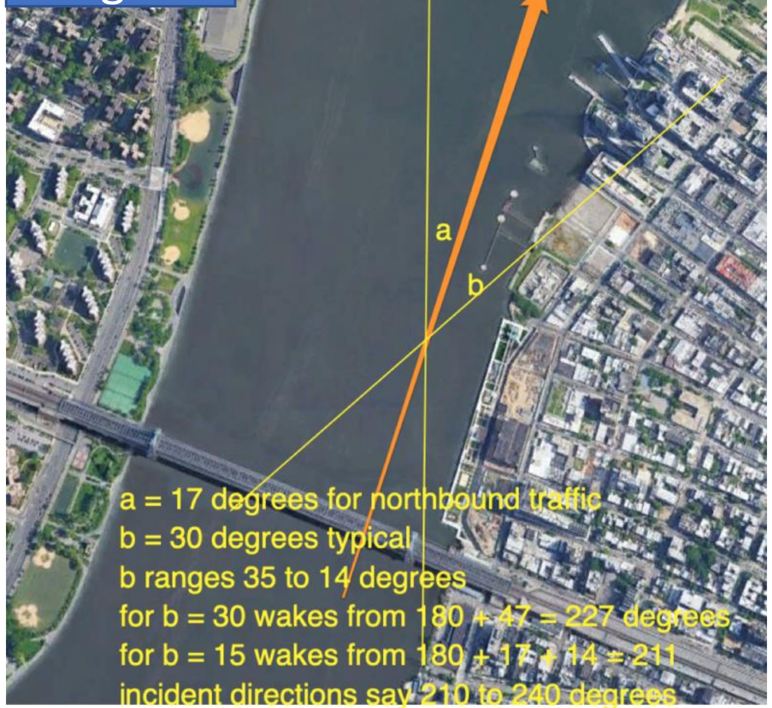


Fig. 2

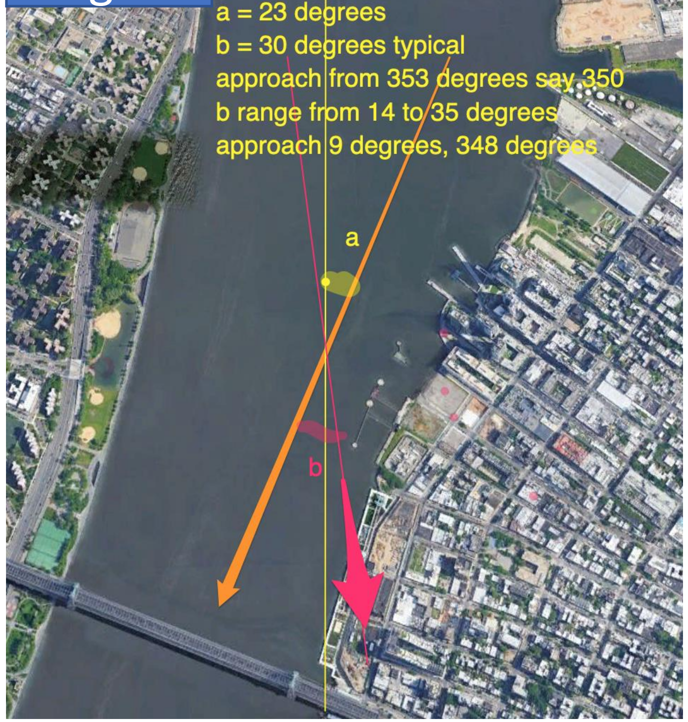
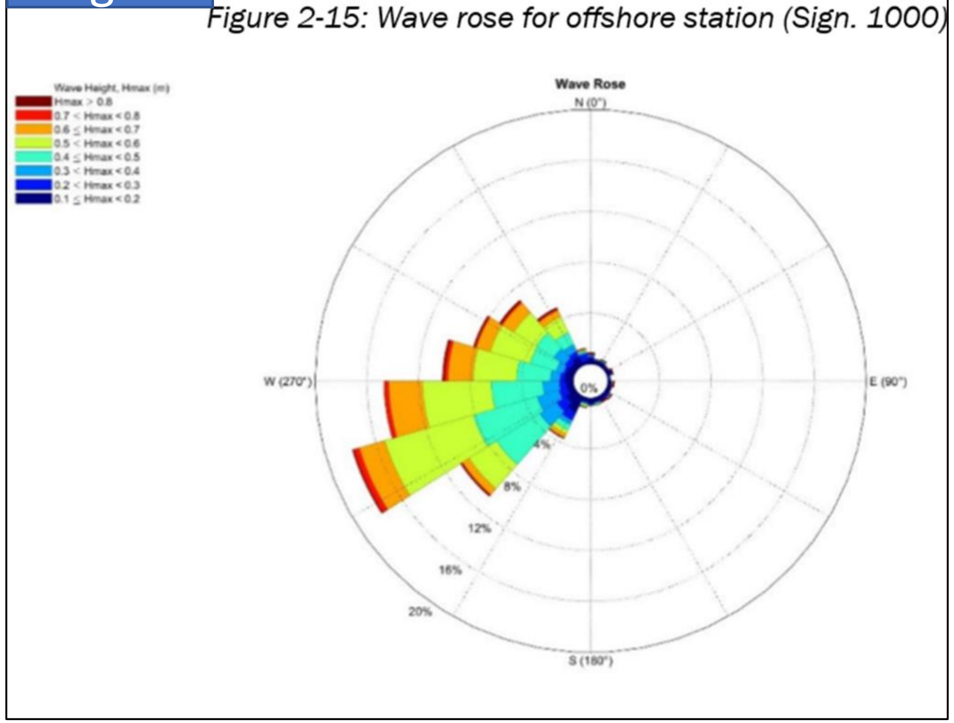


Fig. 3

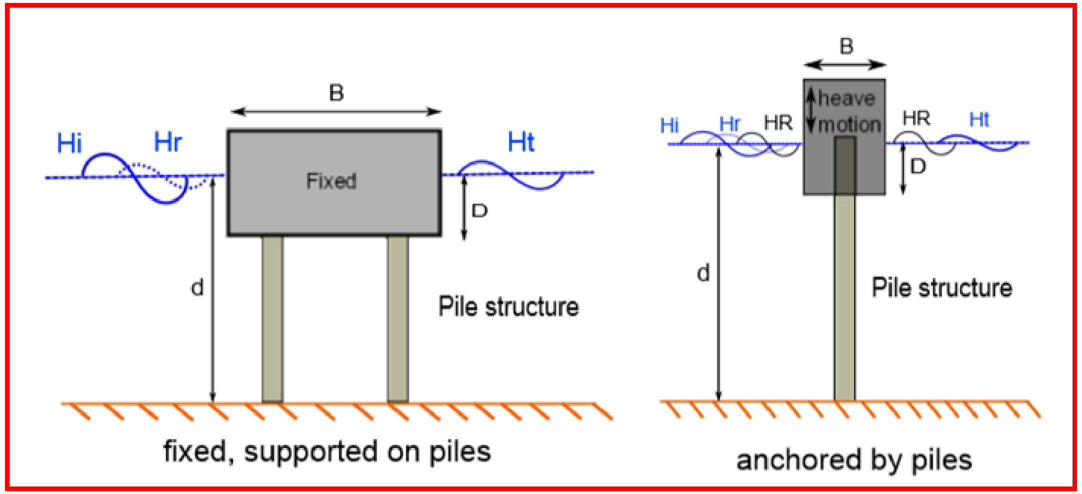


3. Wave Transmission - Theories

Wave Transmission Theories (and References) for Fixed Floating Breakwater:

- Ursell (1947)
- **Macagno (1954)**
- Wiegel (1960)
- Kriebel and Bollmann (1996)
- **PIANC (1994)**
- **Koutandos et.al (2005)**

Consider effect of structure width



Wave transmission is a function of:

- Wave period ↑
- Local water depth (d) ↓
- Structure penetration depth (D) ↓
- Structure beam (B) ↓

PIANC

which are based on the theory by Macagno (1954) and the above-referenced theoretical equation from Wiegel (1964). Figures 2.8 through 2.10 in Jones (1971) represent the effect of width and relative water depths which may be encountered in typical floating breakwater projects.

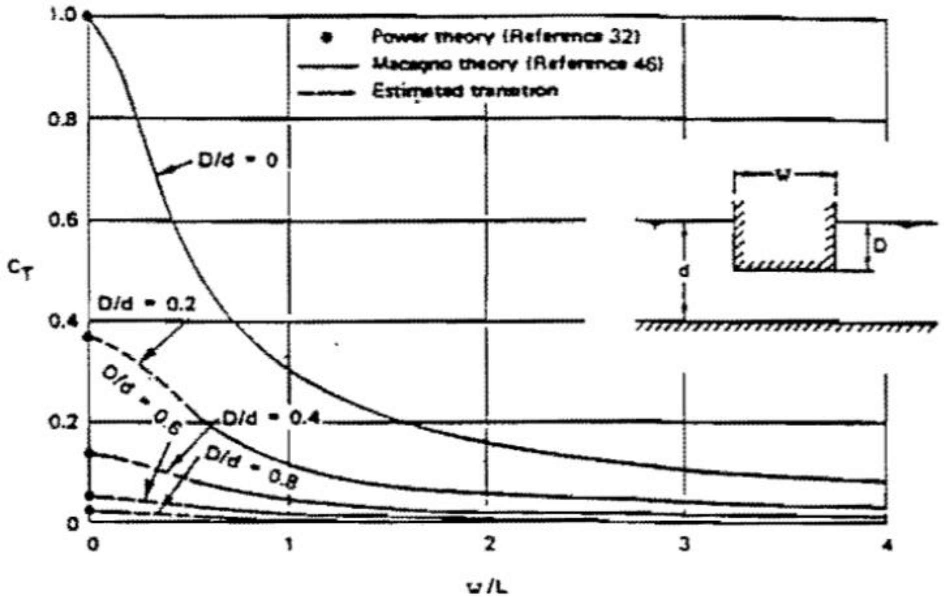


Figure 2.8 - Transmission coefficient for rigid, rectangular surface barrier (L/d = 1.25)

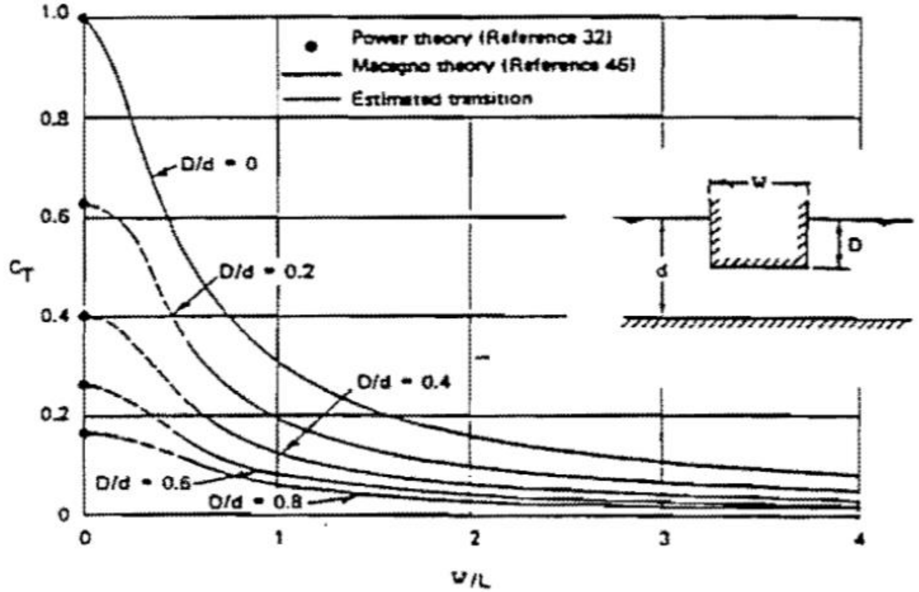


Figure 2.9 - Transmission coefficient for rigid, rectangular surface barrier (L/d = 2.5)

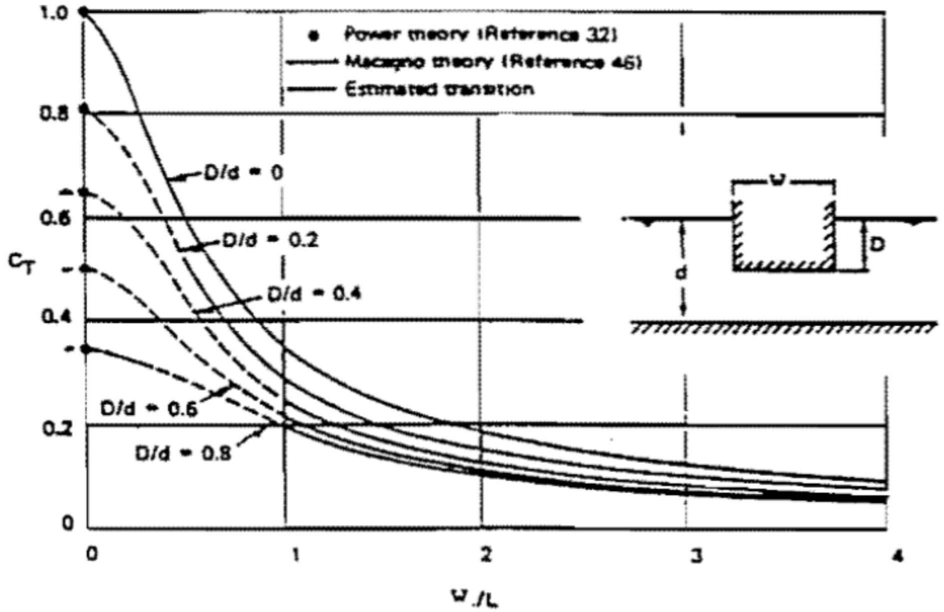


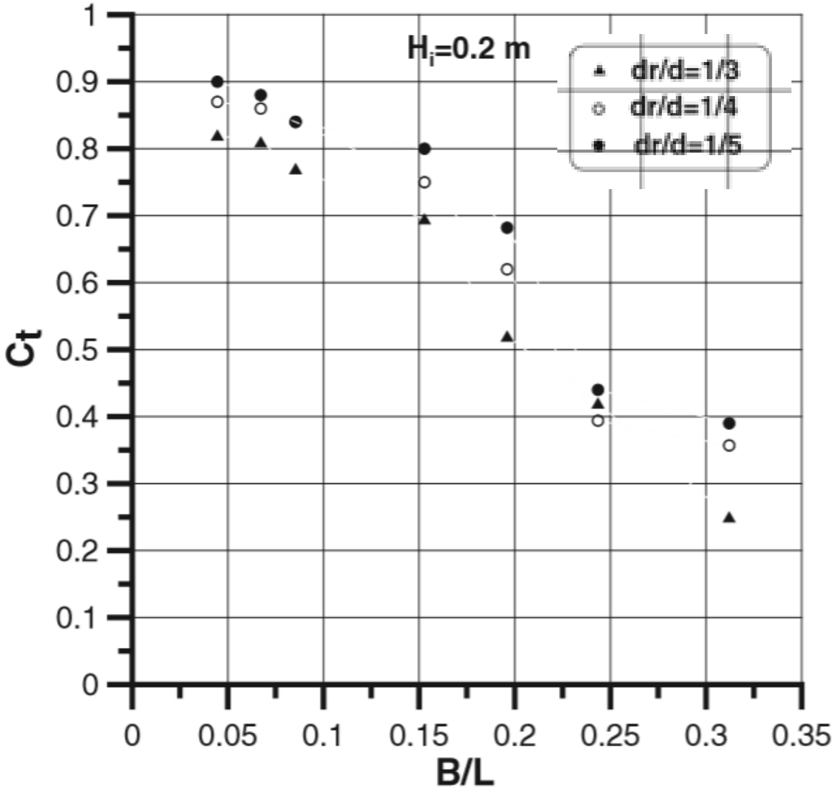
Figure 2.10 - Transmission coefficient for rigid,

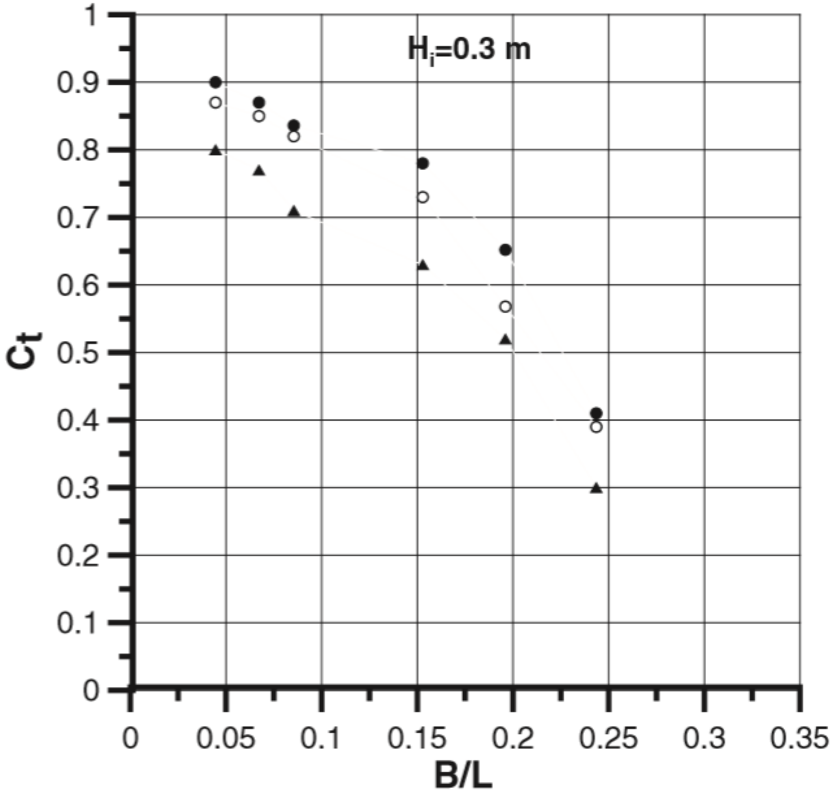
Koutandos et al (2005)

Floating breakwaters under regular and irregular wave forcing–Reflection and transmission characteristics

Article *in* Journal of Hydraulic Research · January 2005
DOI: 10.1080/00221686.2005.9641234

- Based on laboratory tests
- Water depth: 2m
- Regular Wave period tested: 2 - 9 s
- Draft: 0.4/0.5/0.65m

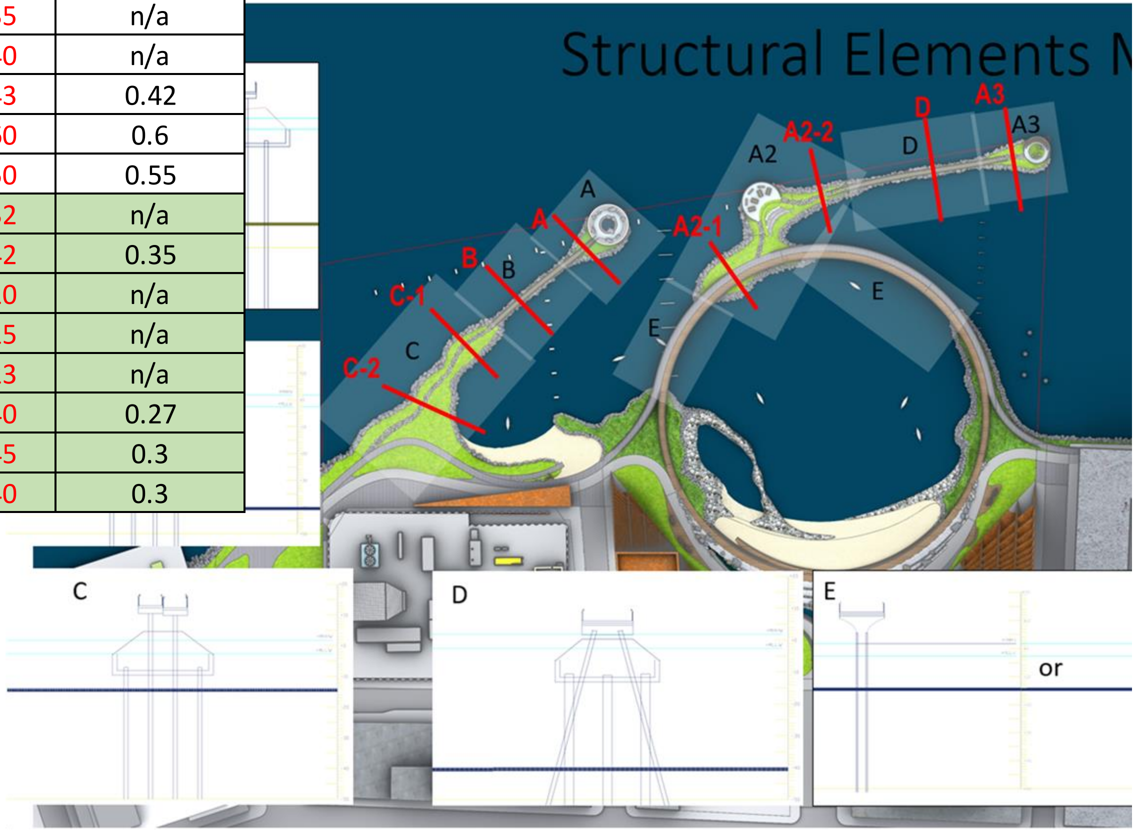




3. Wave Transmission – Estimated Wave Transmission Coefficients

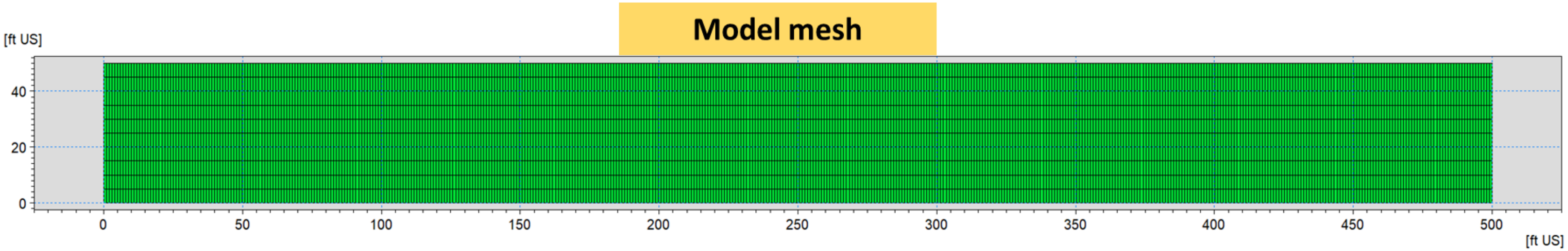
Structure Zone	Transect	Draft (ft)	Width (ft)	local water depth (ft)	Wave Period (s)	Wave length (ft)	L/d	W/L	D/d	Ct (Macagno)	Ct (PIANC)	Ct (Koutandoes)
A	A-1	10	40	30	5	118.1	3.9	0.34	0.33	0.54	0.50	0.25
B	B-1	10	23	26	5	114.2	4.4	0.20	0.38	0.75	0.55	0.5
C	C-1	10	52	23	5	110.6	4.8	0.47	0.43	0.45	0.40	n/a
C	C-2	10	80	23	5	110.6	4.8	0.72	0.43	0.31	0.35	n/a
A2	A2-1	10	46	23	5	110.6	4.8	0.42	0.43	0.50	0.40	n/a
A2	A2-2	10	25	27	5	115.2	4.3	0.22	0.37	0.72	0.43	0.42
D	D-1	10	22	34	5	120.7	3.6	0.18	0.29	0.76	0.60	0.6
A3	A3-1	10	26	38	5	123.0	3.2	0.21	0.26	0.70	0.50	0.55
A	A-1	10	40	30	4	80.4	2.7	0.50	0.33	0.30	0.32	n/a
B	B-1	10	23	26	4	79.4	3.1	0.29	0.38	0.48	0.42	0.35
C	C-1	10	52	23	4	78.1	3.4	0.67	0.43	0.24	0.20	n/a
C	C-2	10	80	23	4	78.1	3.4	1.02	0.43	0.16	0.15	n/a
A2	A2-1	10	46	23	4	78.1	3.4	0.59	0.43	0.27	0.23	n/a
A2	A2-2	10	25	27	4	79.7	3.0	0.31	0.37	0.45	0.40	0.27
D	D-1	10	22	34	4	81.0	2.4	0.27	0.29	0.49	0.45	0.3
A3	A3-1	10	26	38	4	81.4	2.1	0.32	0.26	0.42	0.40	0.3

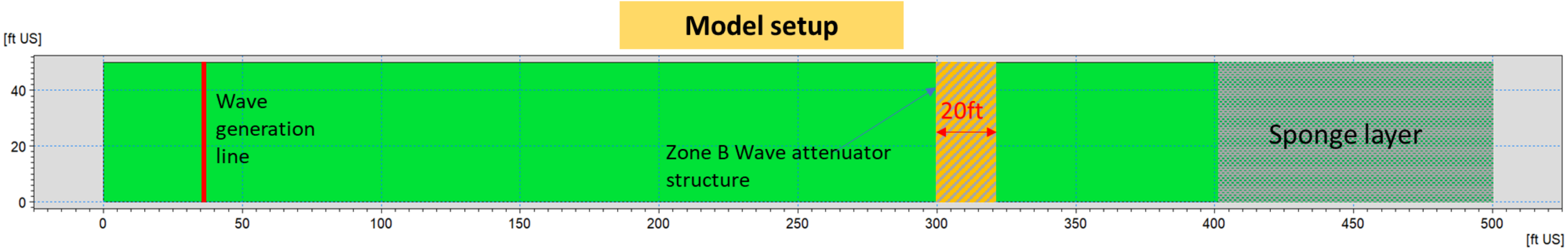
Wave Transmission Coefficients estimated based on PIANC were adopted



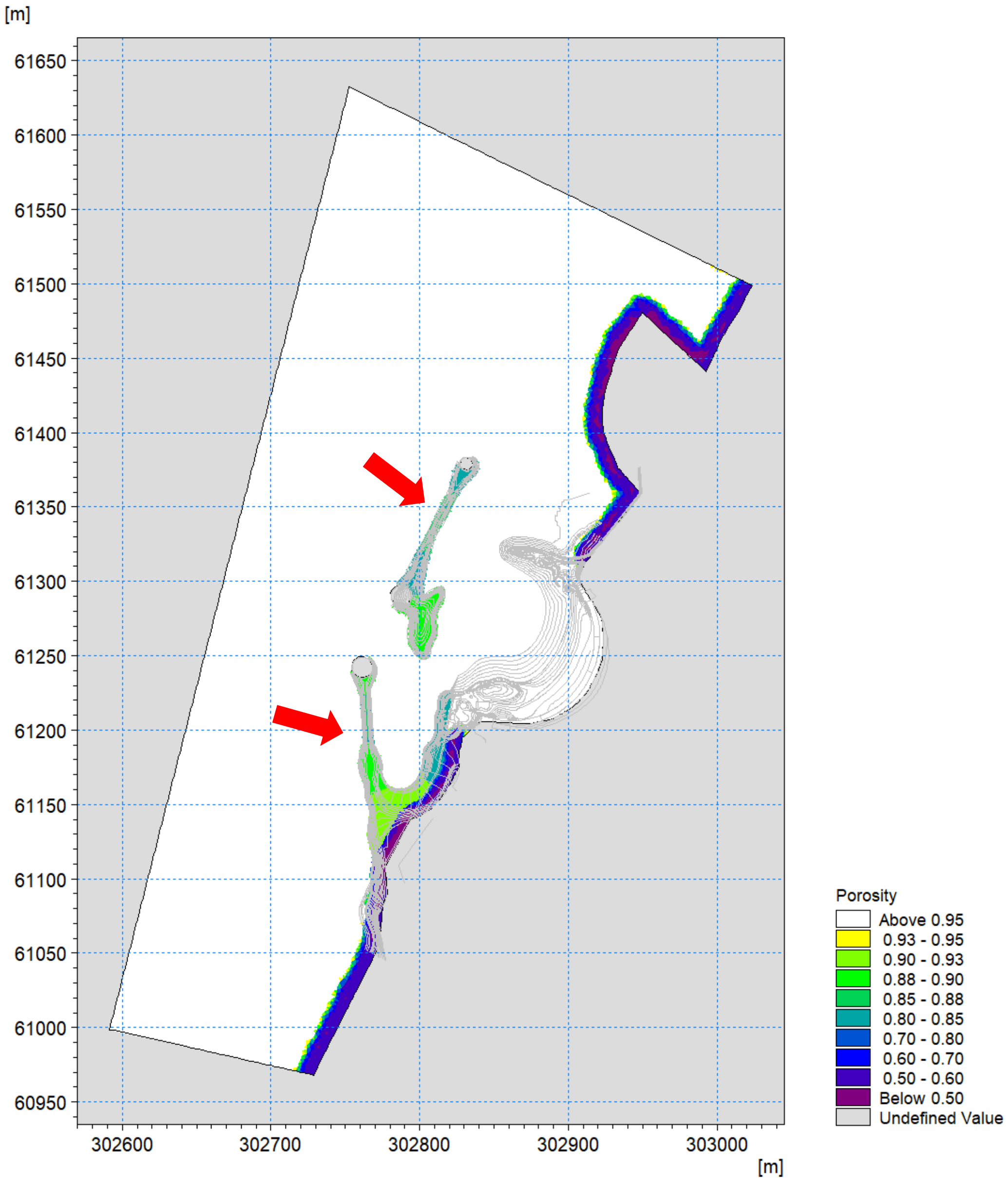
4. Modeling of Wave Transmission in MIKE 3 Waves FM

- Basic idea is using porosity layers to model wave transmission through the surface penetrating platform structures
- Porosity layers were designed in such to achieve the target wave transmission for each section and in each zone (see previous slide)
- 1-D numerical experiments conducted to determine the ‘correct’ porosity value for each section and each wave period (see below for illustration)





4. Modeling of Wave Transmission in MIKE 3 Waves FM
– Example Porosity Layer Map

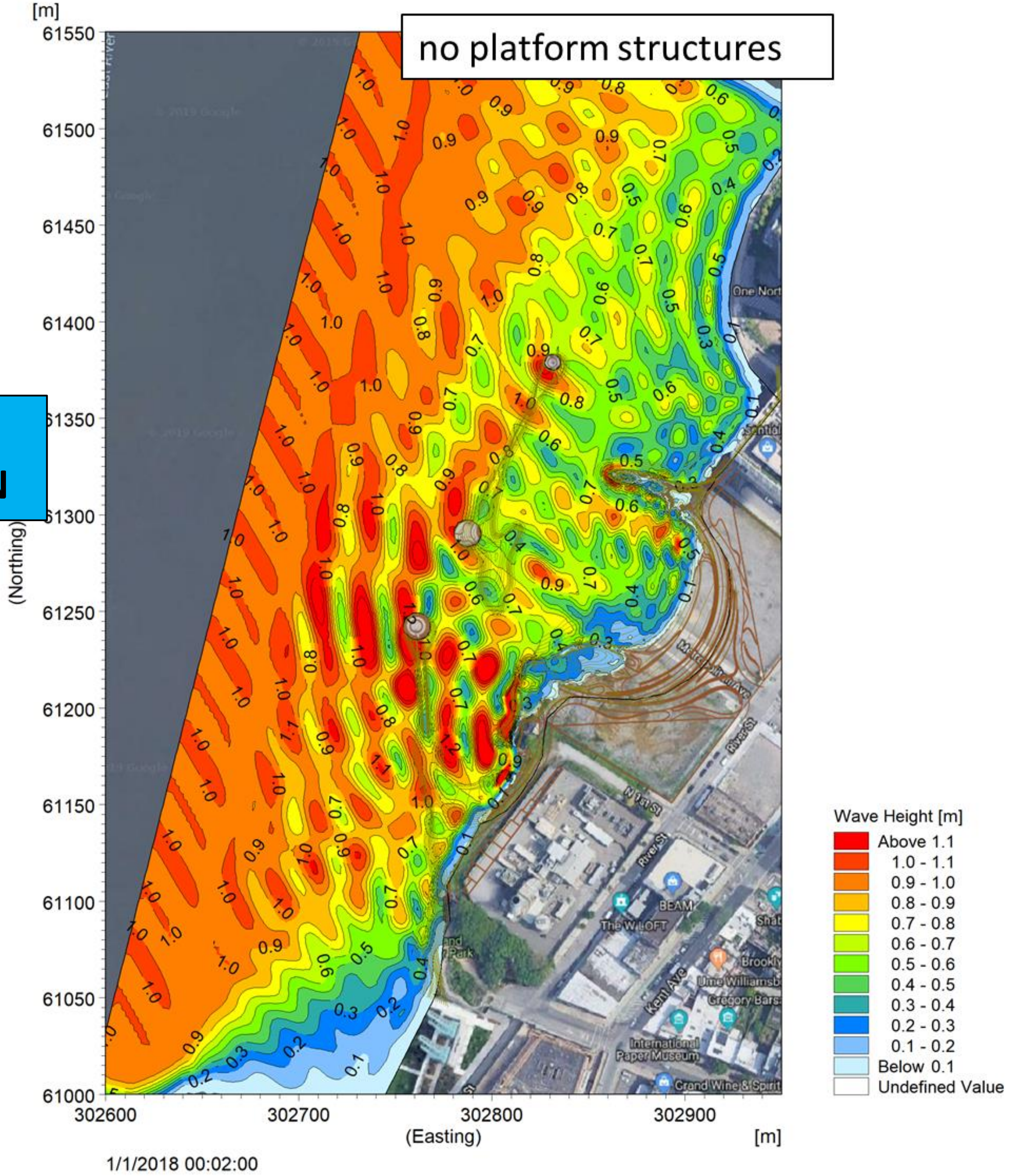


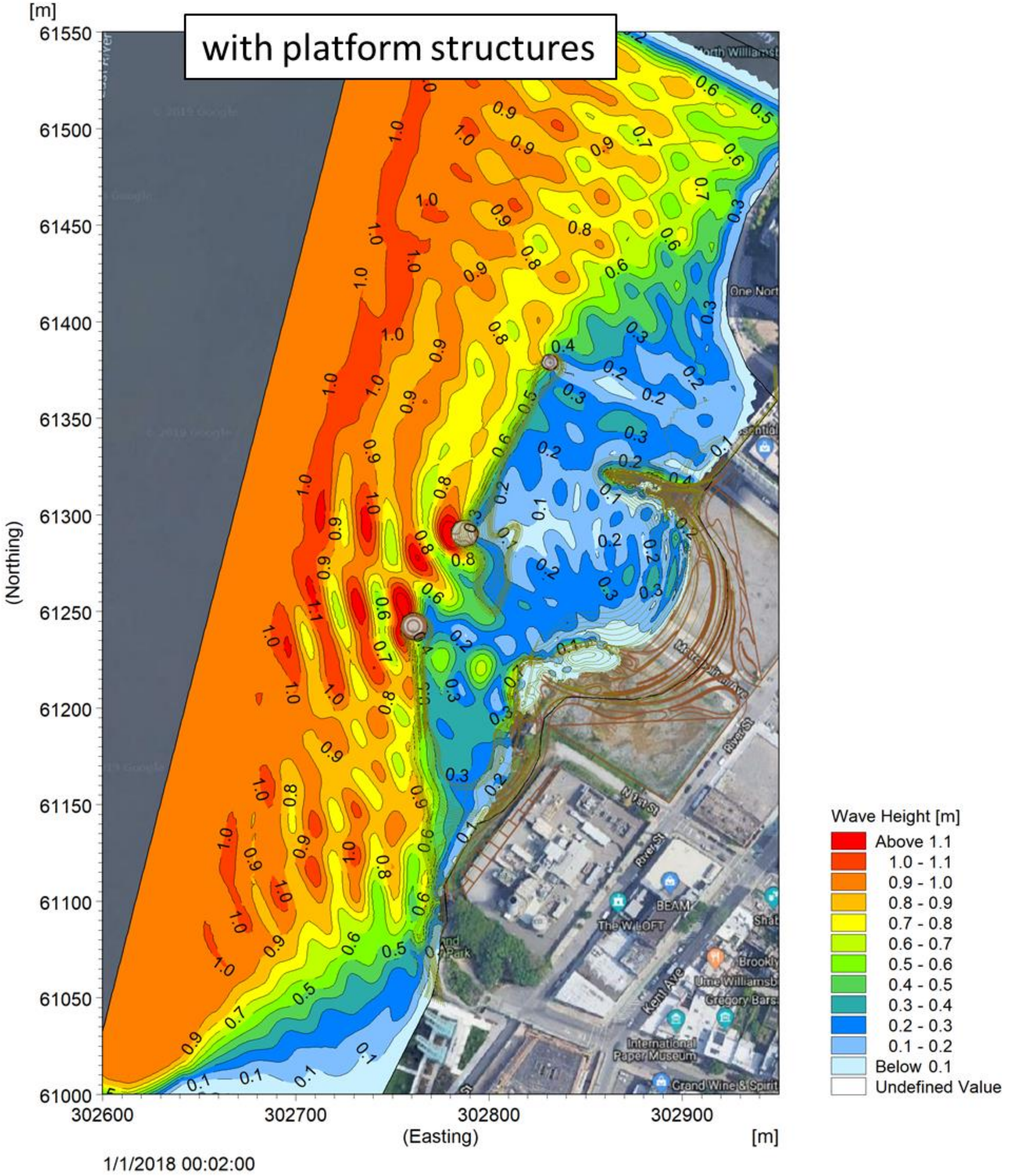
5. Model Results

5.1 Comparison between without vs. with the surface penetrating platform structures in place

Wave Agitation Map

Wave Case:
1m, 5s, 240°N



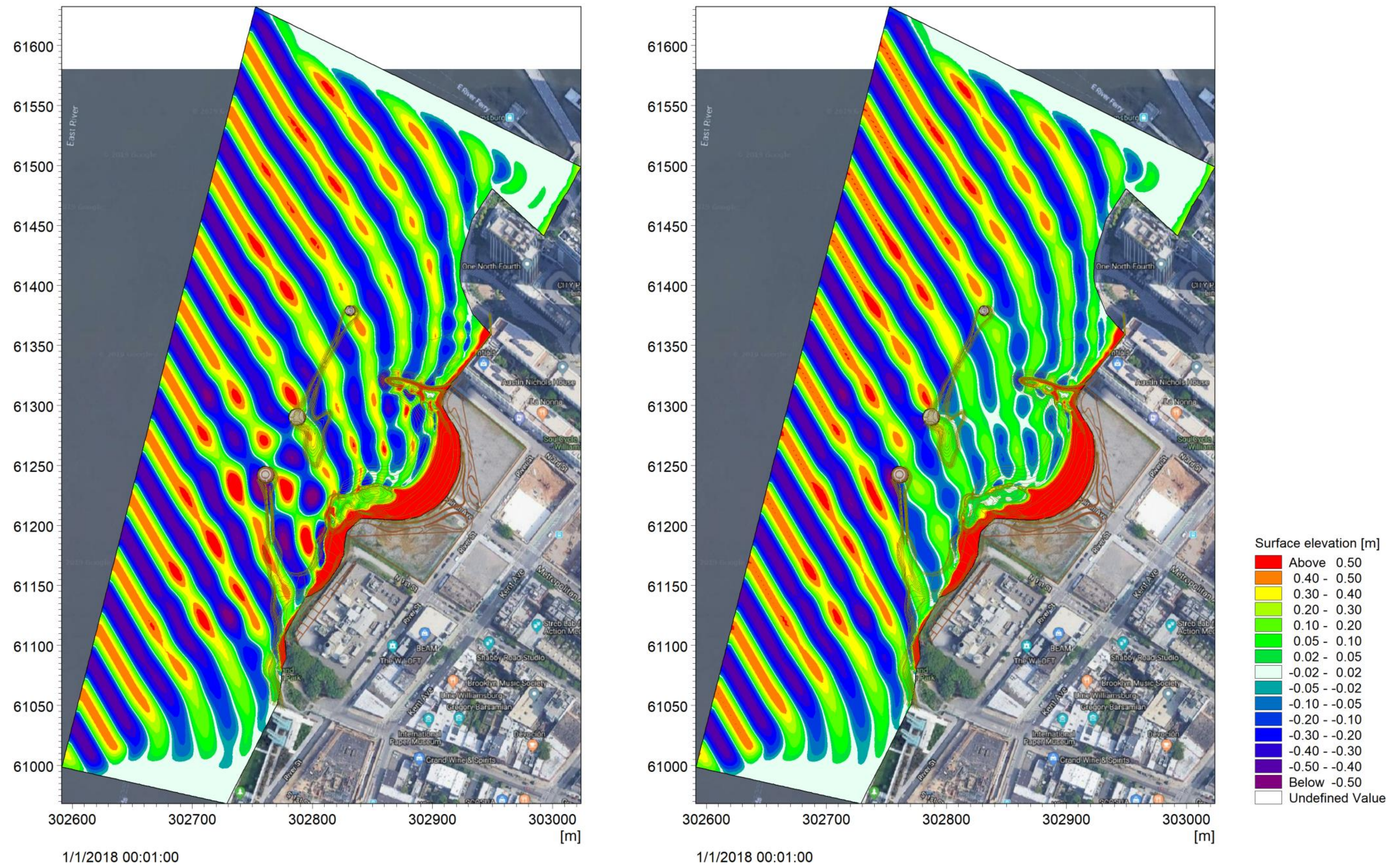


Snapshot T=60s

Wave Case: 1m, 5s, 240°N

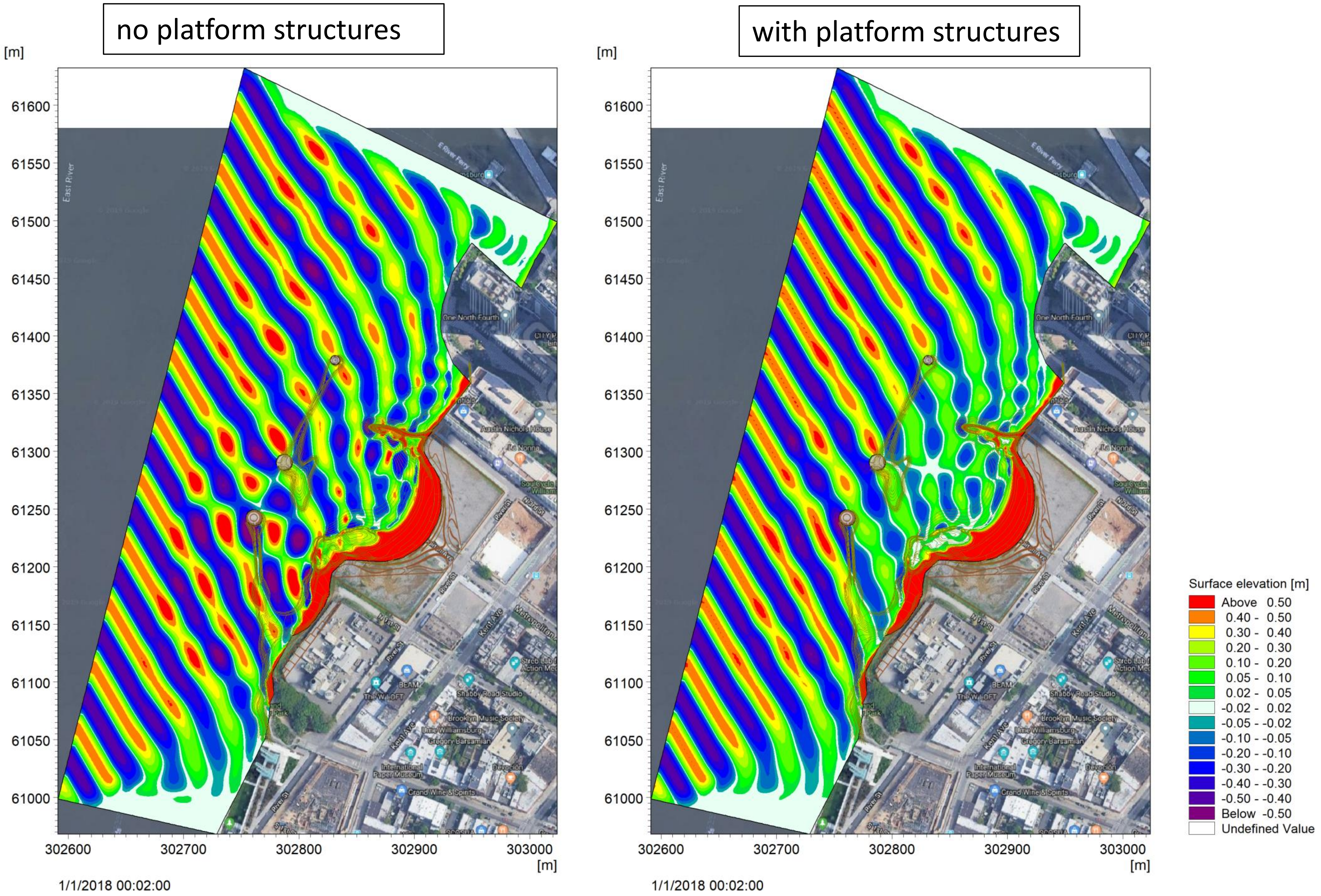
no platform structures

with platform structures

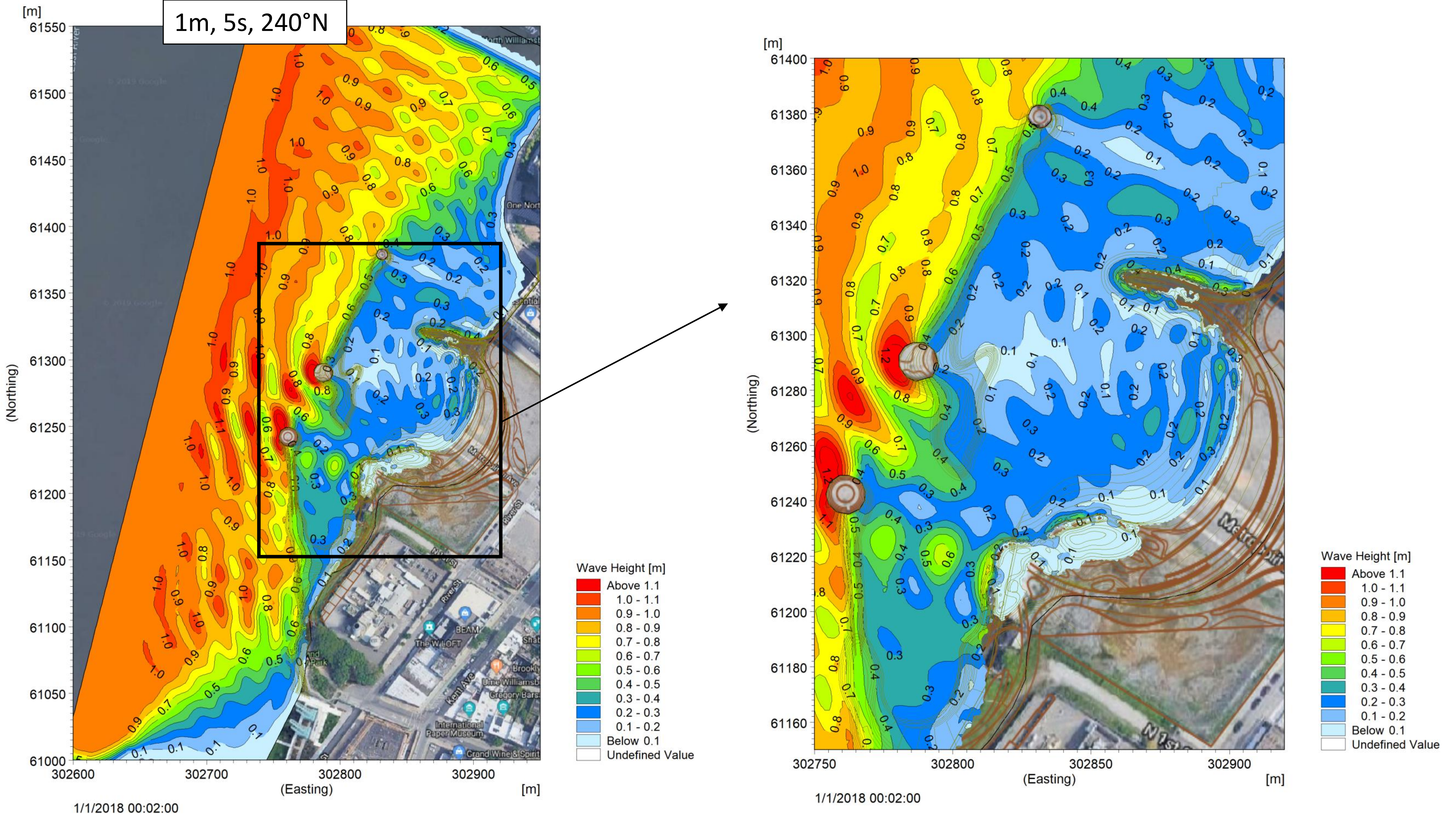


Snapshot T=120s

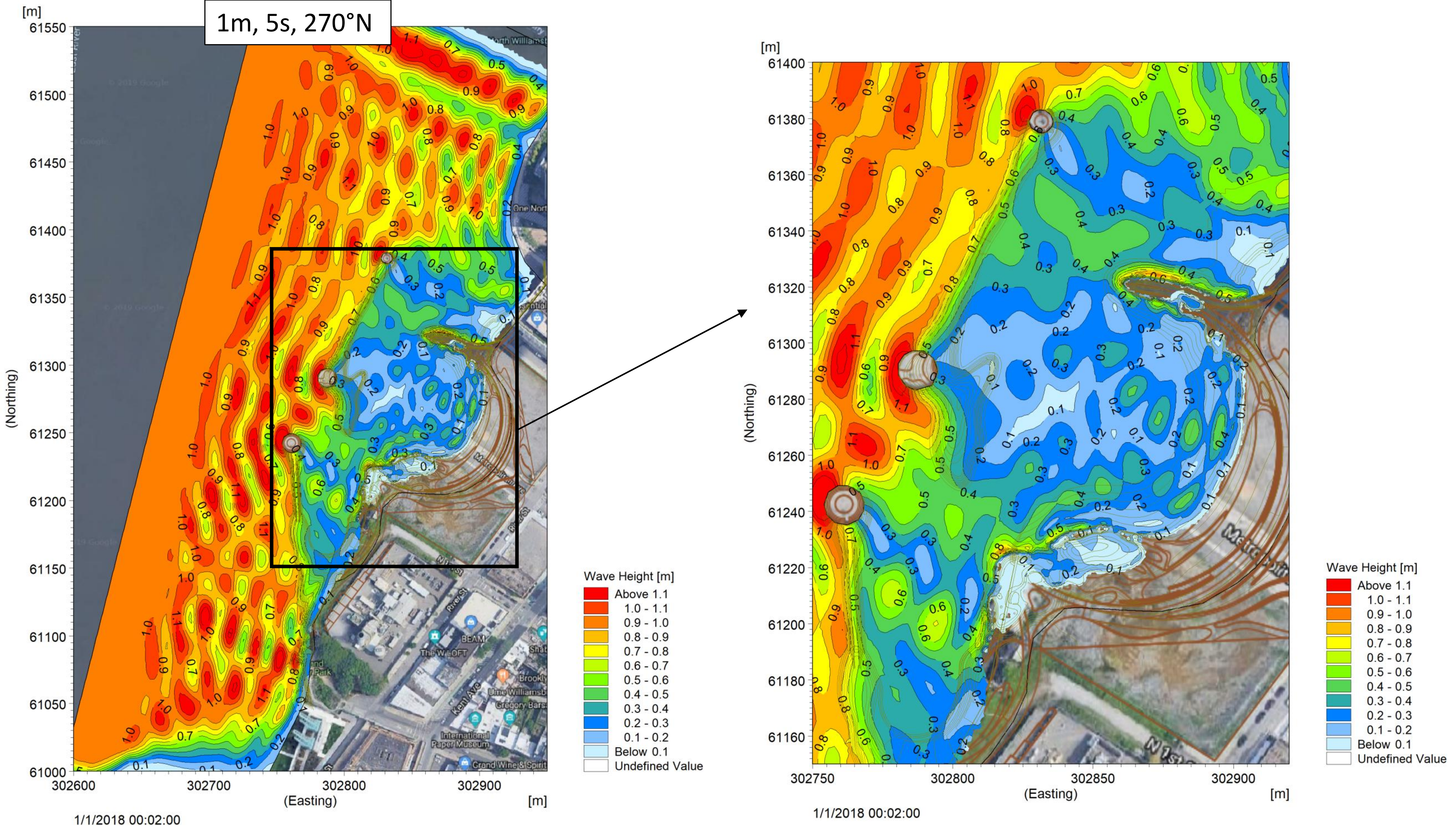
Wave Case: 1m, 5s, 240°N

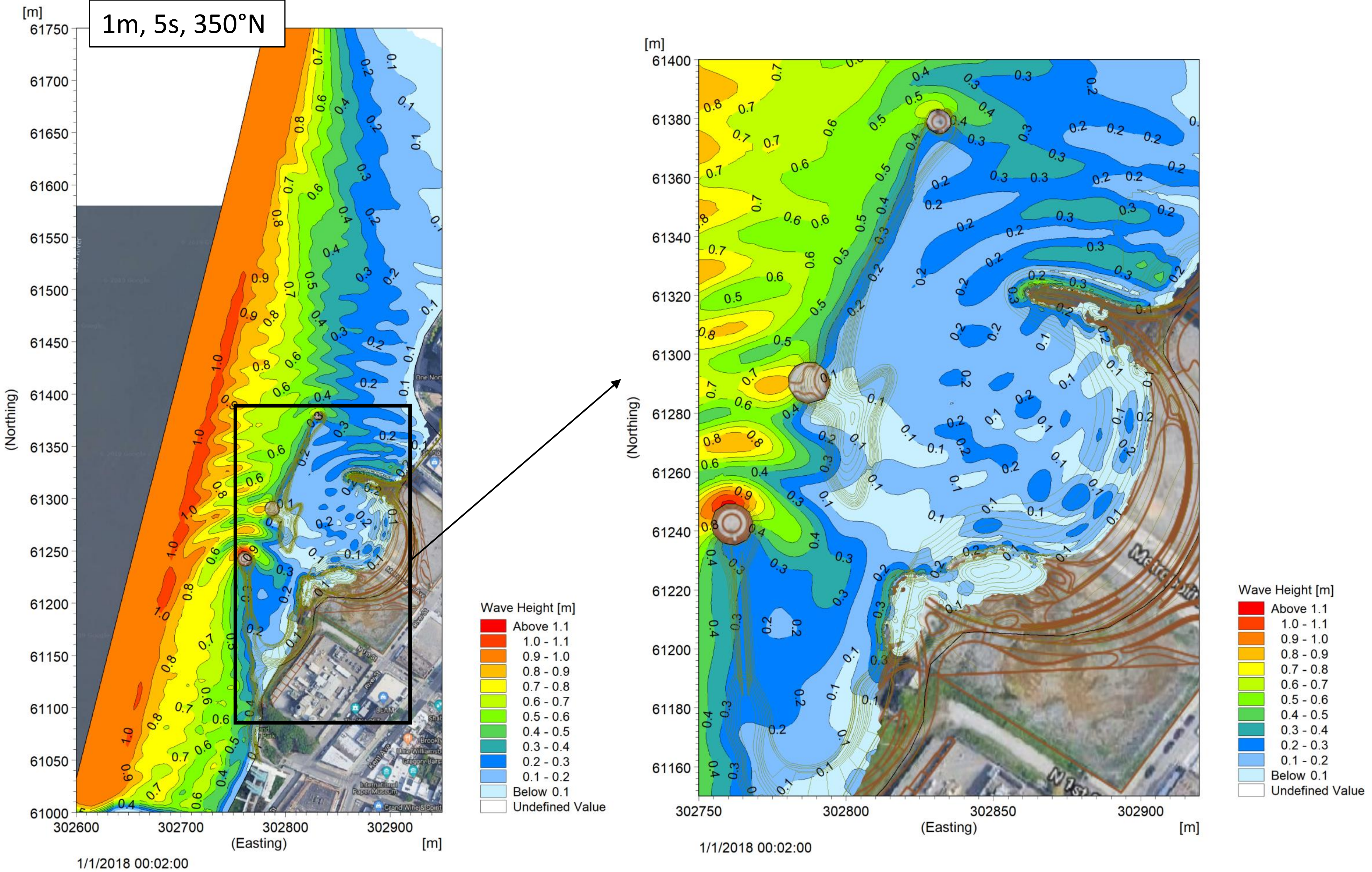


5.2 Wave Agitation Maps

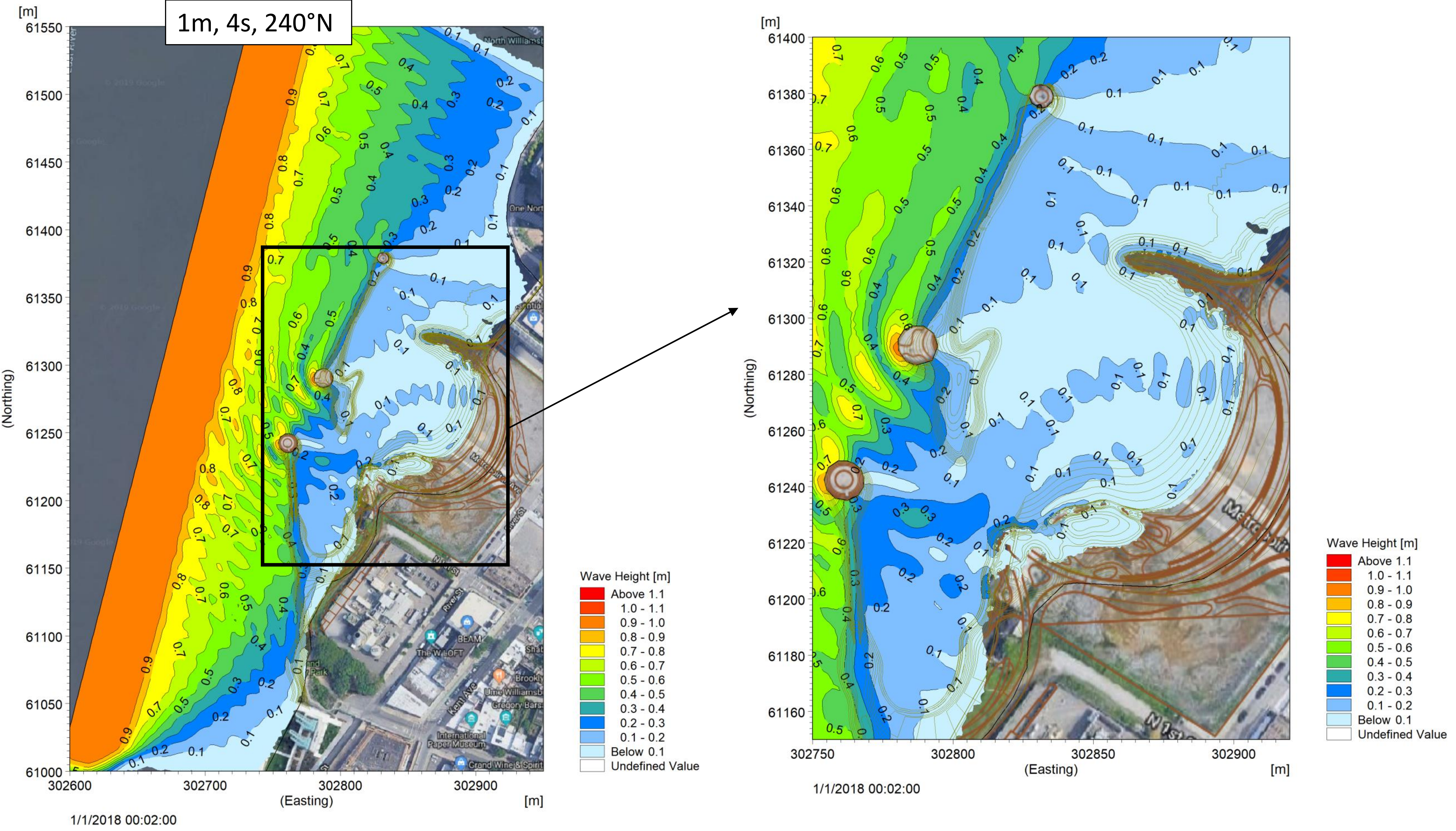


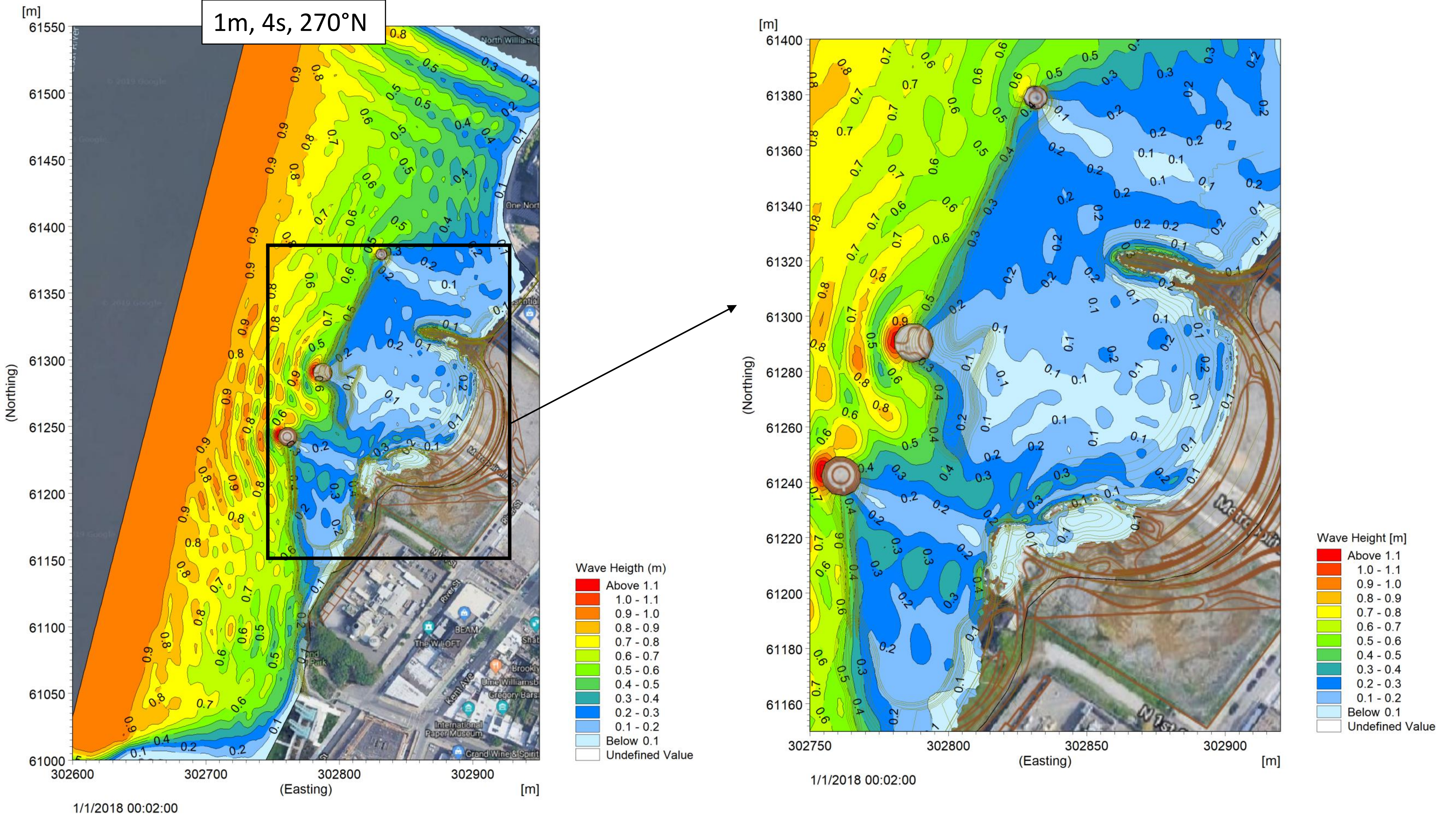
1m, 5s, 240°N
[m]
61550
61500
61450
61400
61350
61300
61250
61200
61150
61100
61050
61000
(Northing)
302600
302700
302800
302900
(Easting)
[m]
1/1/2018 00:02:00
Wave Height [m]
Above 1.1
1.0 - 1.1
0.9 - 1.0
0.8 - 0.9
0.7 - 0.8
0.6 - 0.7
0.5 - 0.6
0.4 - 0.5
0.3 - 0.4
0.2 - 0.3
0.1 - 0.2
Below 0.1
Undefined Value
[m]
61400
61380
61360
61340
61320
61300
61280
61260
61240
61220
61200
61180
61160
(Northing)
302750
302800
302850
302900
(Easting)
[m]
1/1/2018 00:02:00
Wave Height [m]
Above 1.1
1.0 - 1.1
0.9 - 1.0
0.8 - 0.9
0.7 - 0.8
0.6 - 0.7
0.5 - 0.6
0.4 - 0.5
0.3 - 0.4
0.2 - 0.3
0.1 - 0.2
Below 0.1
Undefined Value


1m, 5s, 270°N
[m]
61550
61500
61450
61400
61350
61300
61250
61200
61150
61100
61050
61000
(Northing)
302600
302700
302800
302900
(Easting)
[m]
1/1/2018 00:02:00
Wave Height [m]
Above 1.1
1.0 - 1.1
0.9 - 1.0
0.8 - 0.9
0.7 - 0.8
0.6 - 0.7
0.5 - 0.6
0.4 - 0.5
0.3 - 0.4
0.2 - 0.3
0.1 - 0.2
Below 0.1
Undefined Value
[m]
61400
61380
61360
61340
61320
61300
61280
61260
61240
61220
61200
61180
61160
(Northing)
302750
302800
302850
302900
(Easting)
[m]
1/1/2018 00:02:00
Wave Height [m]
Above 1.1
1.0 - 1.1
0.9 - 1.0
0.8 - 0.9
0.7 - 0.8
0.6 - 0.7
0.5 - 0.6
0.4 - 0.5
0.3 - 0.4
0.2 - 0.3
0.1 - 0.2
Below 0.1
Undefined Value

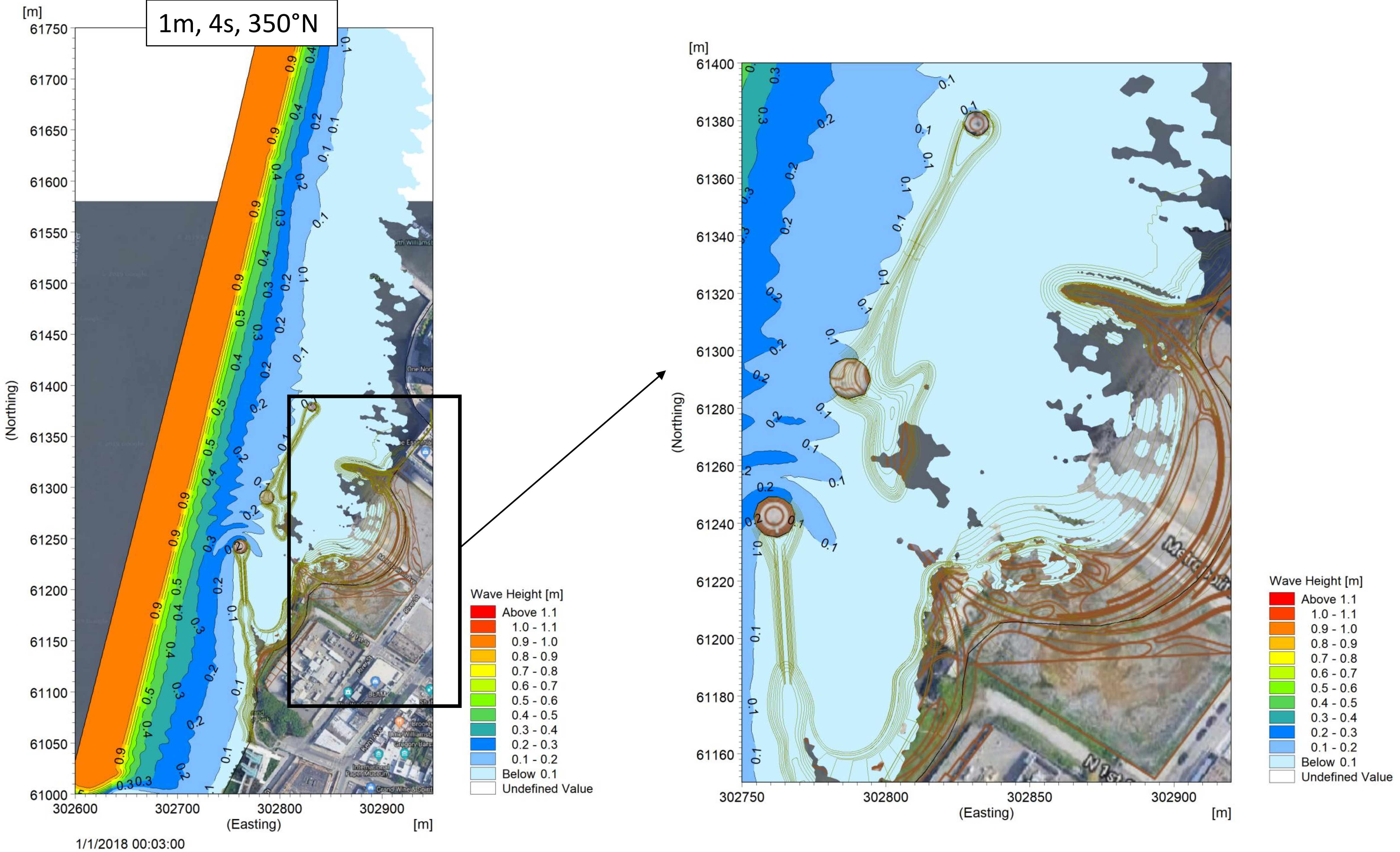


1m, 5s, 350°N
[m]
(Northing)
(Easting)
[m]
1/1/2018 00:02:00
Wave Height [m]
Above 1.1
1.0 - 1.1
0.9 - 1.0
0.8 - 0.9
0.7 - 0.8
0.6 - 0.7
0.5 - 0.6
0.4 - 0.5
0.3 - 0.4
0.2 - 0.3
0.1 - 0.2
Below 0.1
Undefined Value


1m, 4s, 240°N
[m]
61550
61500
61450
61400
61350
61300
61250
61200
61150
61100
61050
61000
(Northing)
302600
302700
302800
302900
(Easting)
[m]
1/1/2018 00:02:00
Wave Height [m]
Above 1.1
1.0 - 1.1
0.9 - 1.0
0.8 - 0.9
0.7 - 0.8
0.6 - 0.7
0.5 - 0.6
0.4 - 0.5
0.3 - 0.4
0.2 - 0.3
0.1 - 0.2
Below 0.1
Undefined Value
[m]
61400
61380
61360
61340
61320
61300
61280
61260
61240
61220
61200
61180
61160
(Northing)
302750
302800
302850
302900
(Easting)
[m]
1/1/2018 00:02:00
Wave Height [m]
Above 1.1
1.0 - 1.1
0.9 - 1.0
0.8 - 0.9
0.7 - 0.8
0.6 - 0.7
0.5 - 0.6
0.4 - 0.5
0.3 - 0.4
0.2 - 0.3
0.1 - 0.2
Below 0.1
Undefined Value



1m, 4s, 270°N
[m]
(Northing)
(Easting)
[m]
1/1/2018 00:02:00
Wave Heigth (m)
Above 1.1
1.0 - 1.1
0.9 - 1.0
0.8 - 0.9
0.7 - 0.8
0.6 - 0.7
0.5 - 0.6
0.4 - 0.5
0.3 - 0.4
0.2 - 0.3
0.1 - 0.2
Below 0.1
Undefined Value
Wave Height [m]
Above 1.1
1.0 - 1.1
0.9 - 1.0
0.8 - 0.9
0.7 - 0.8
0.6 - 0.7
0.5 - 0.6
0.4 - 0.5
0.3 - 0.4
0.2 - 0.3
0.1 - 0.2
Below 0.1
Undefined Value

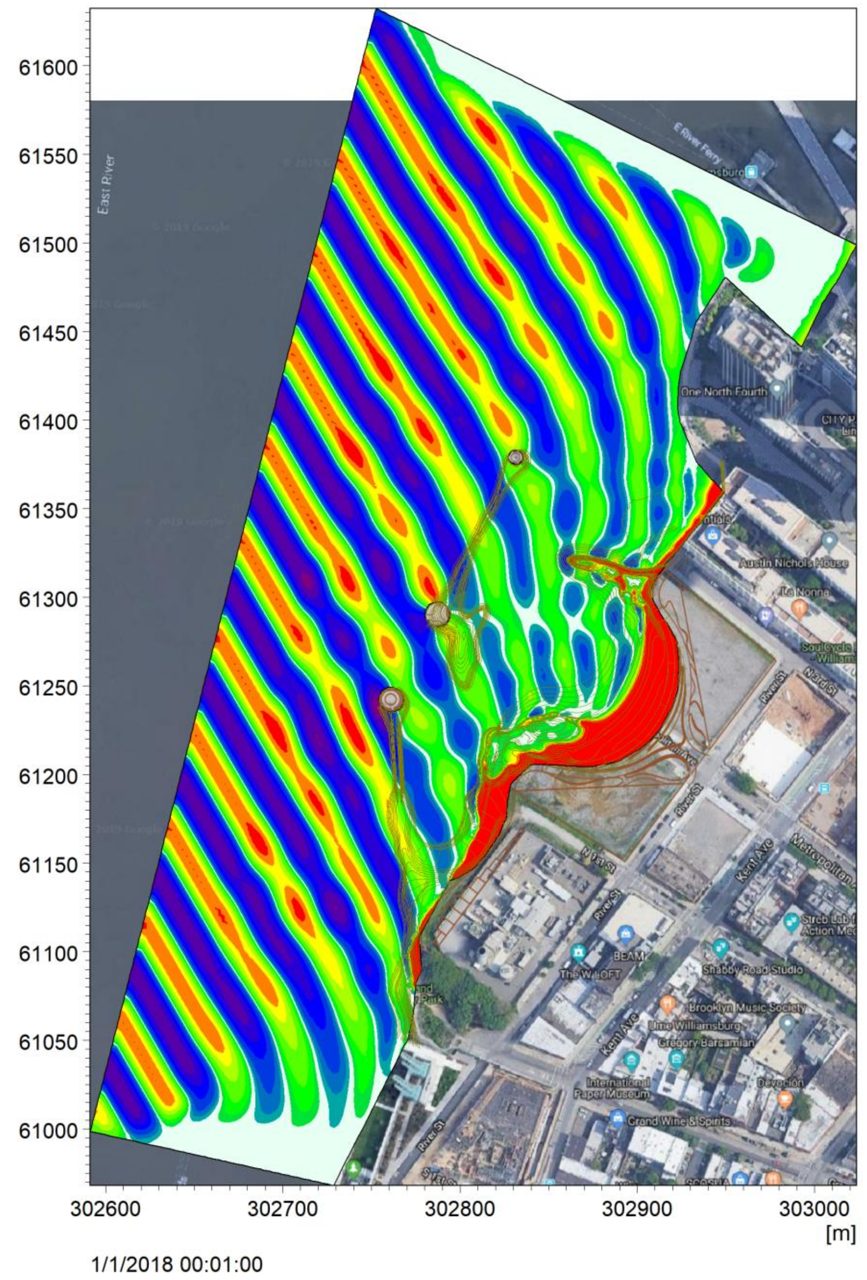


1m, 4s, 350°N
Wave Height [m]
Above 1.1
1.0 - 1.1
0.9 - 1.0
0.8 - 0.9
0.7 - 0.8
0.6 - 0.7
0.5 - 0.6
0.4 - 0.5
0.3 - 0.4
0.2 - 0.3
0.1 - 0.2
Below 0.1
Undefined Value
(Northing)
(Easting)
[m]
1/1/2018 00:03:00

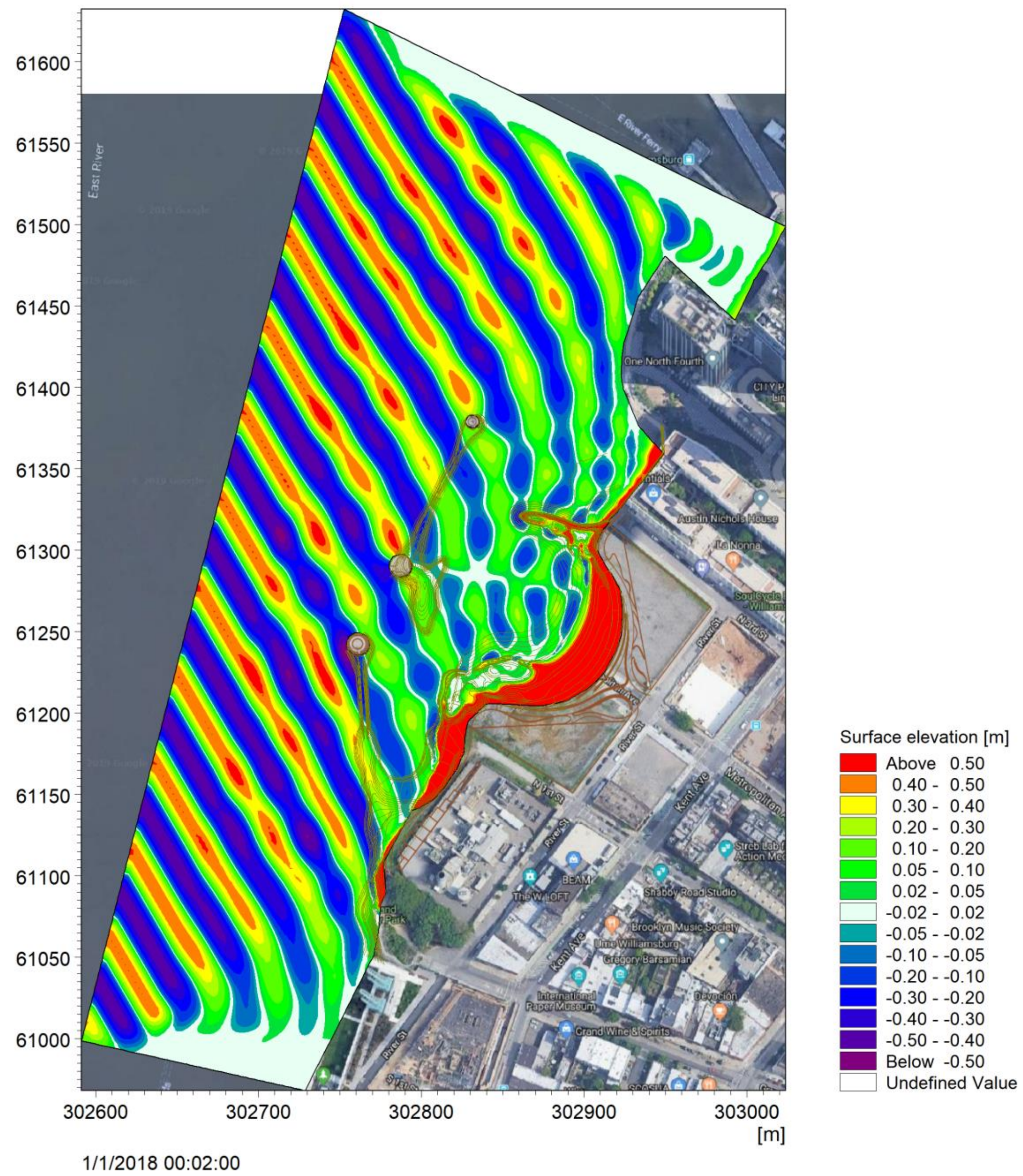
5.3 Snapshots of Wave Crests and Troughs

Wave Case:
1m, 5s, 240°N

T=60s

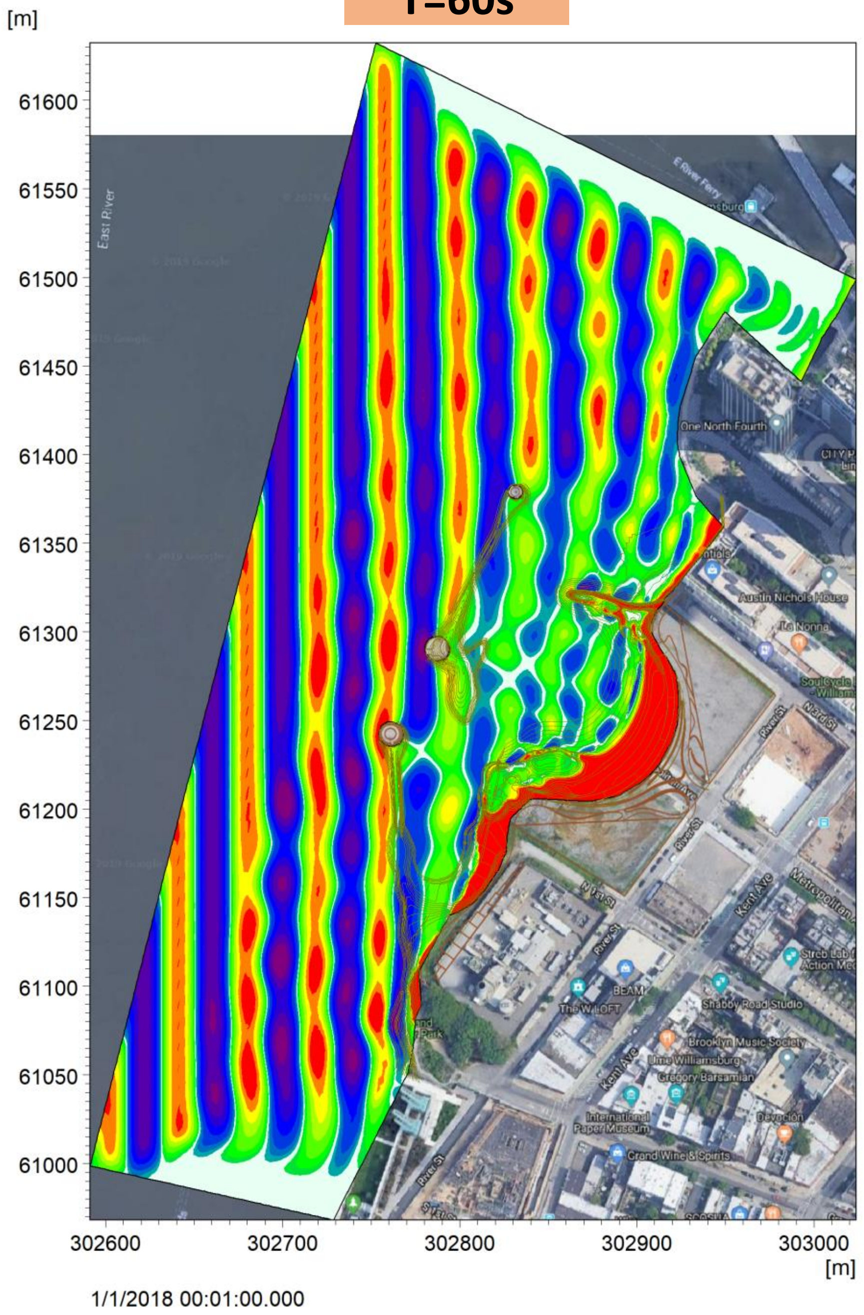


T=120s



Wave Case:
1m, 5s, 270°N

T=60s



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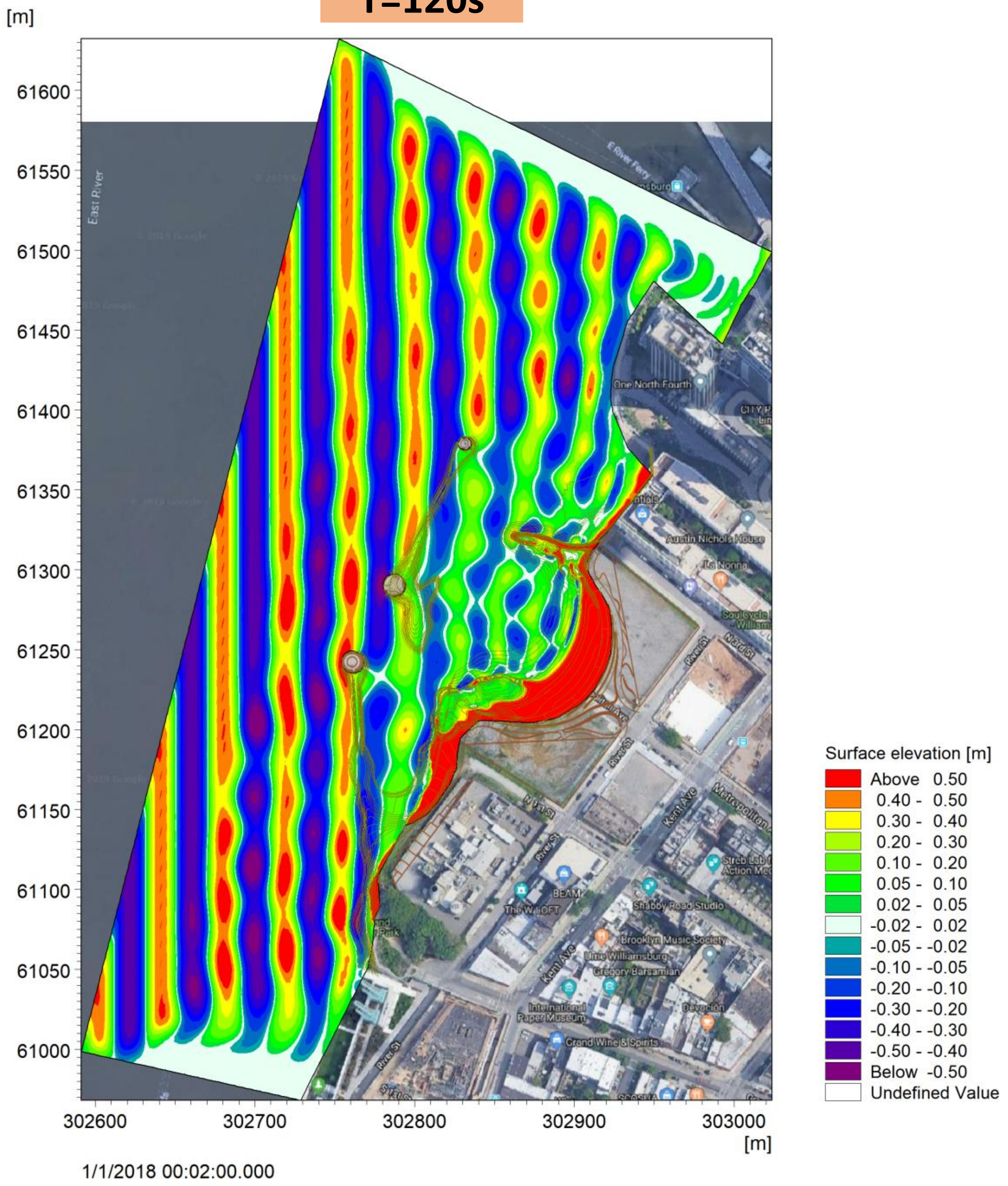
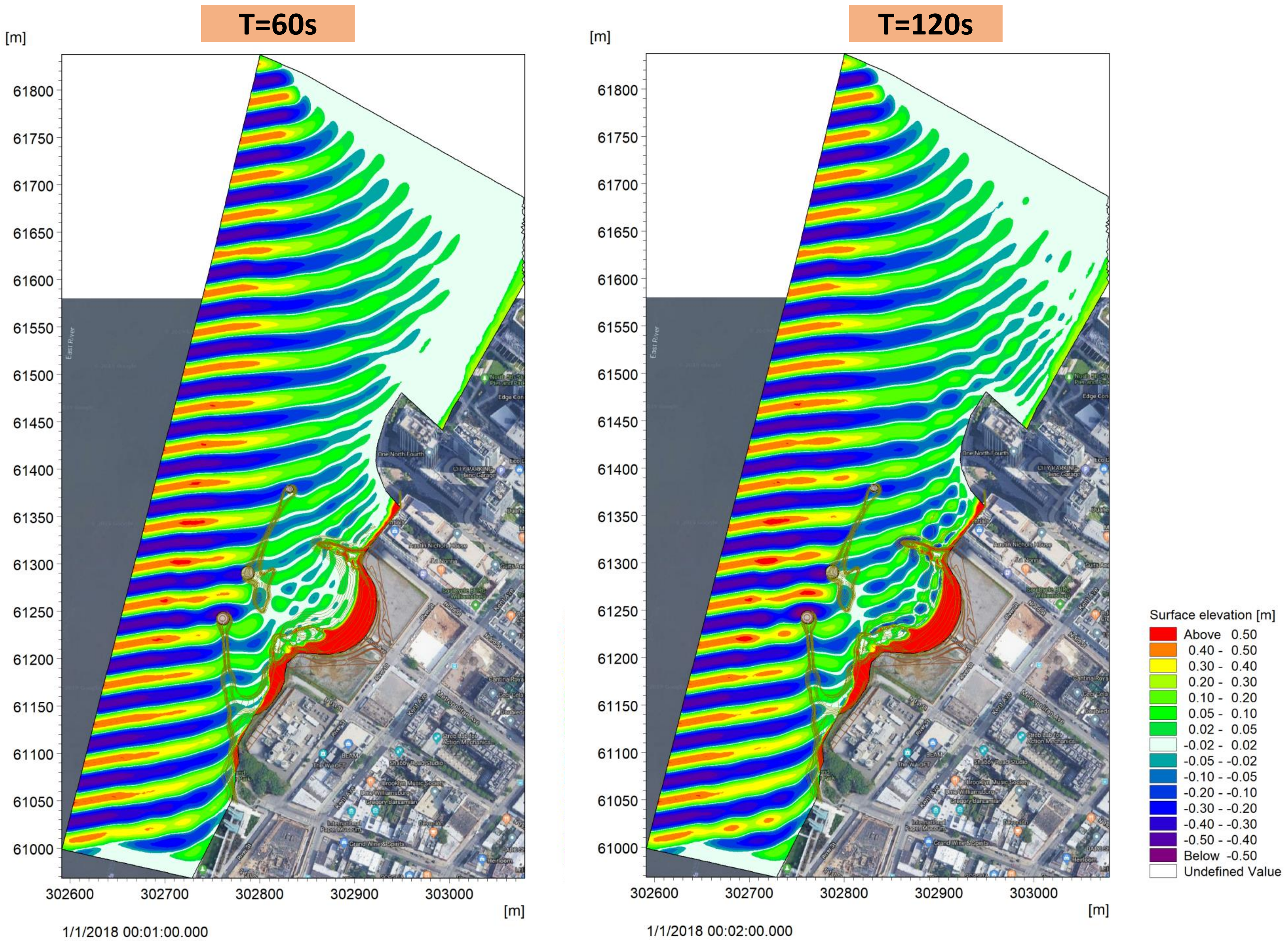
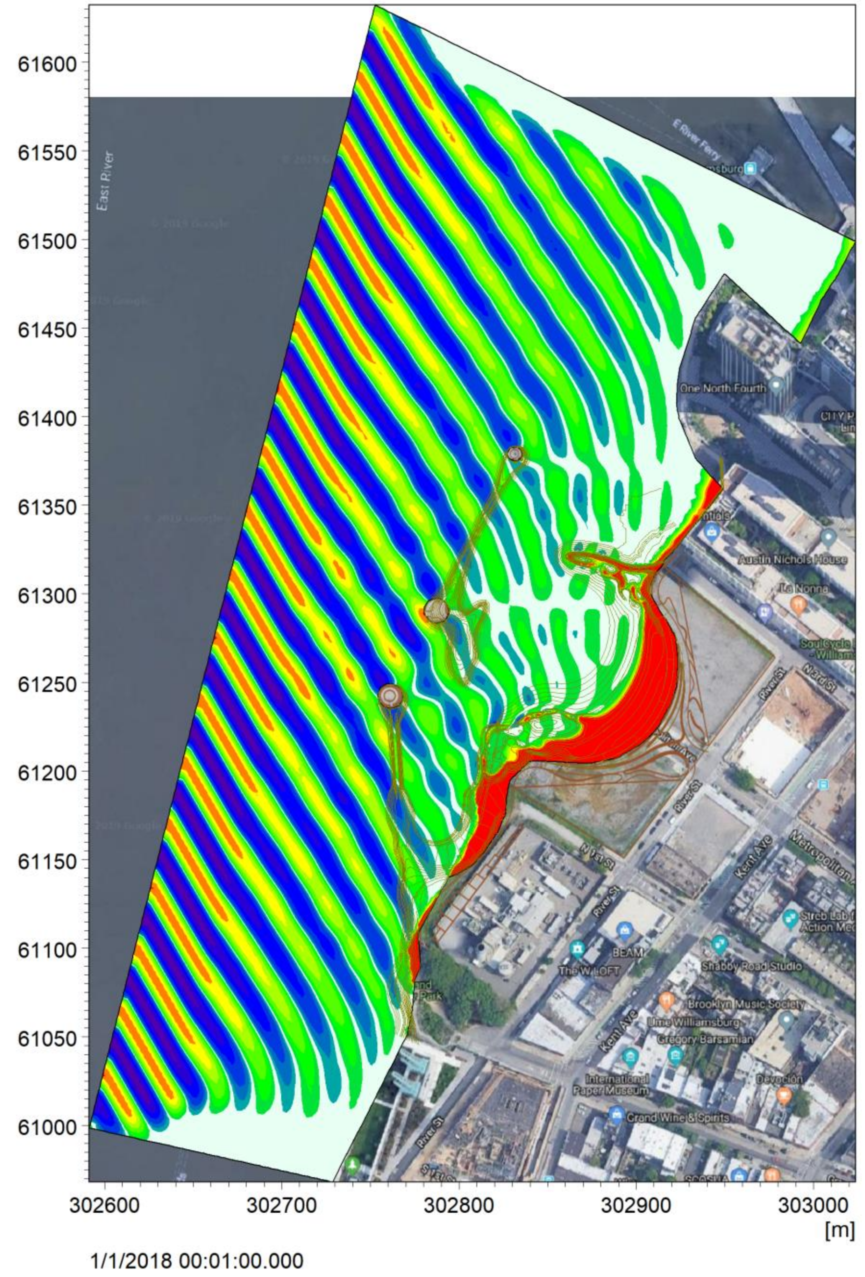


Wave Case:
1m, 5s, 350°N

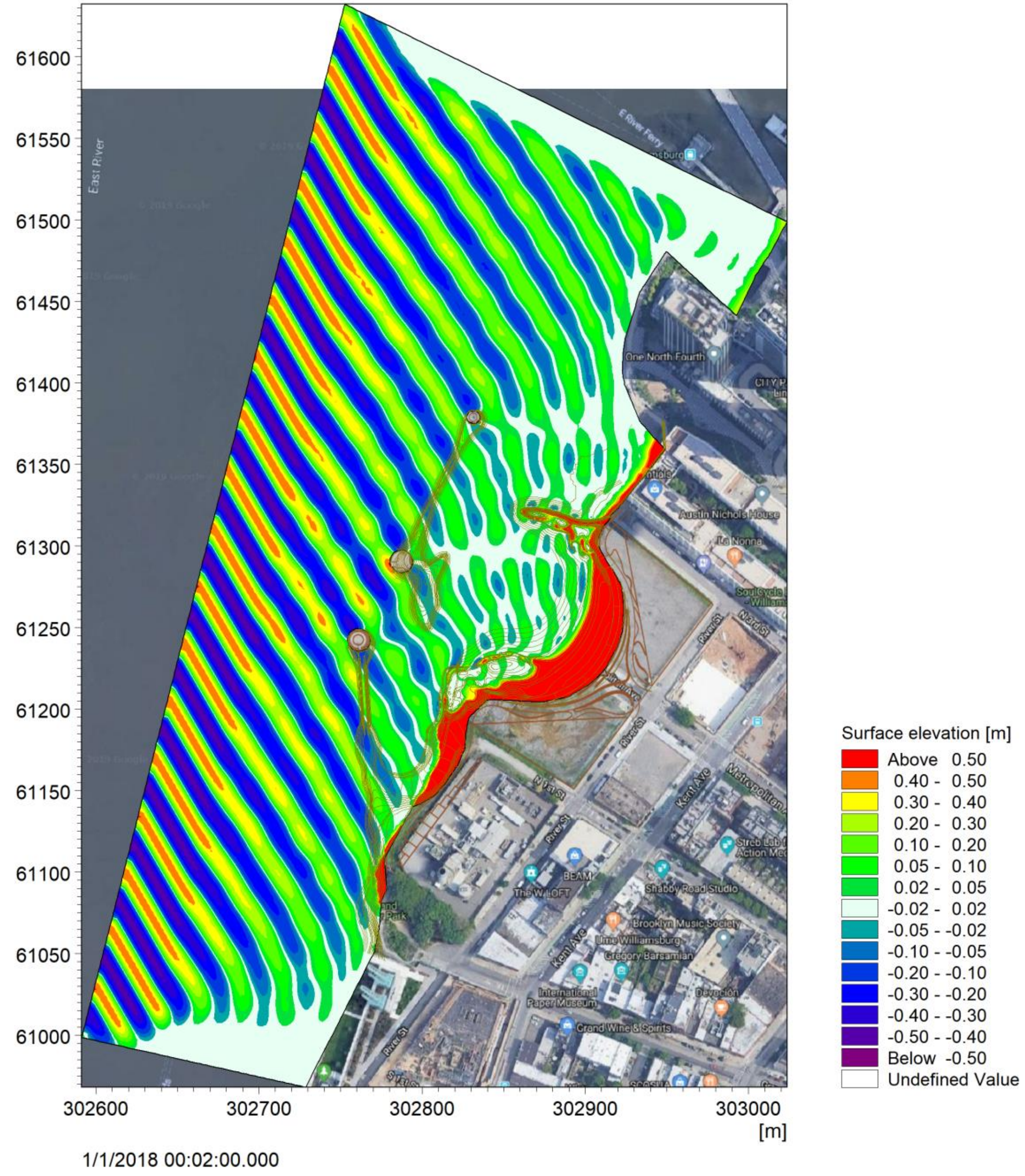


Wave Case:
1m, 4s, 240°N

T=60s

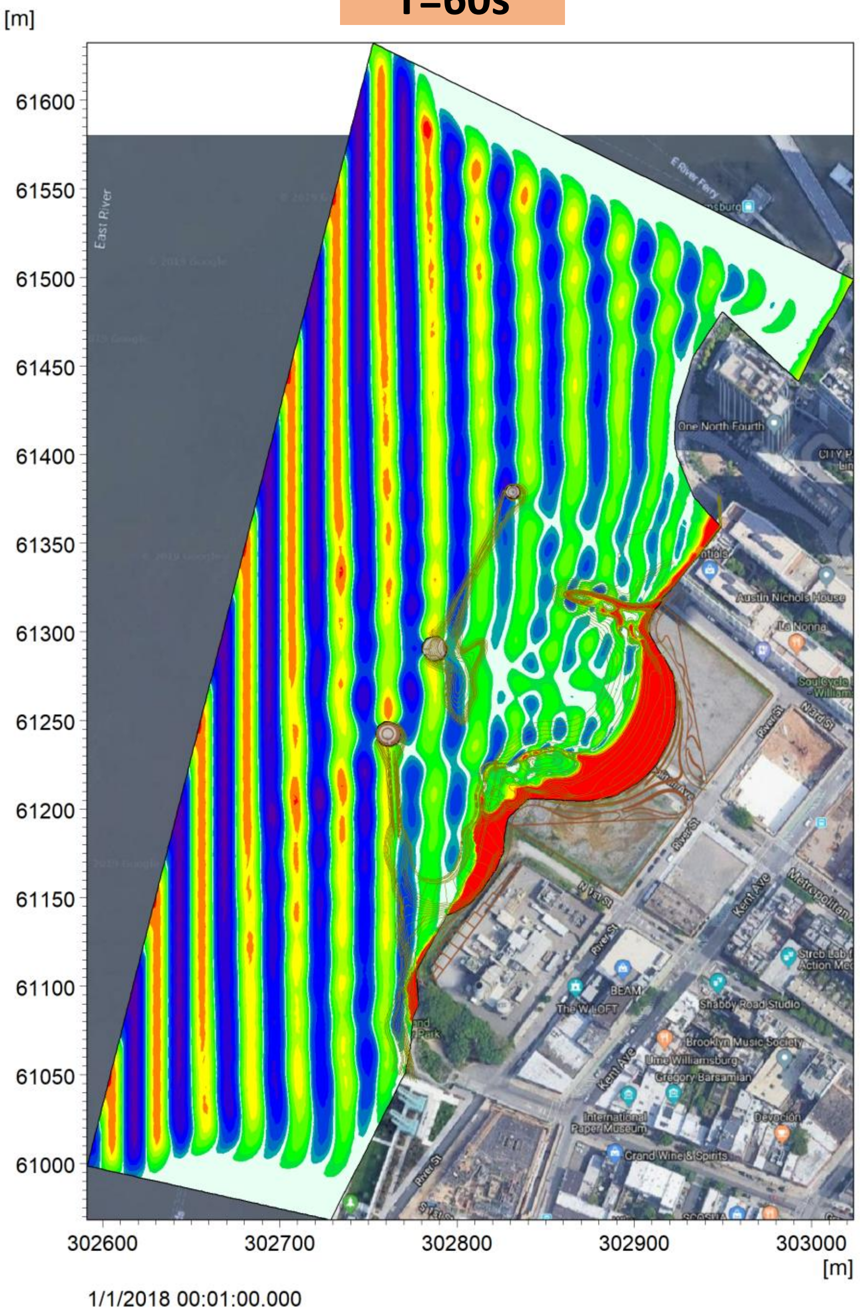


T=120s

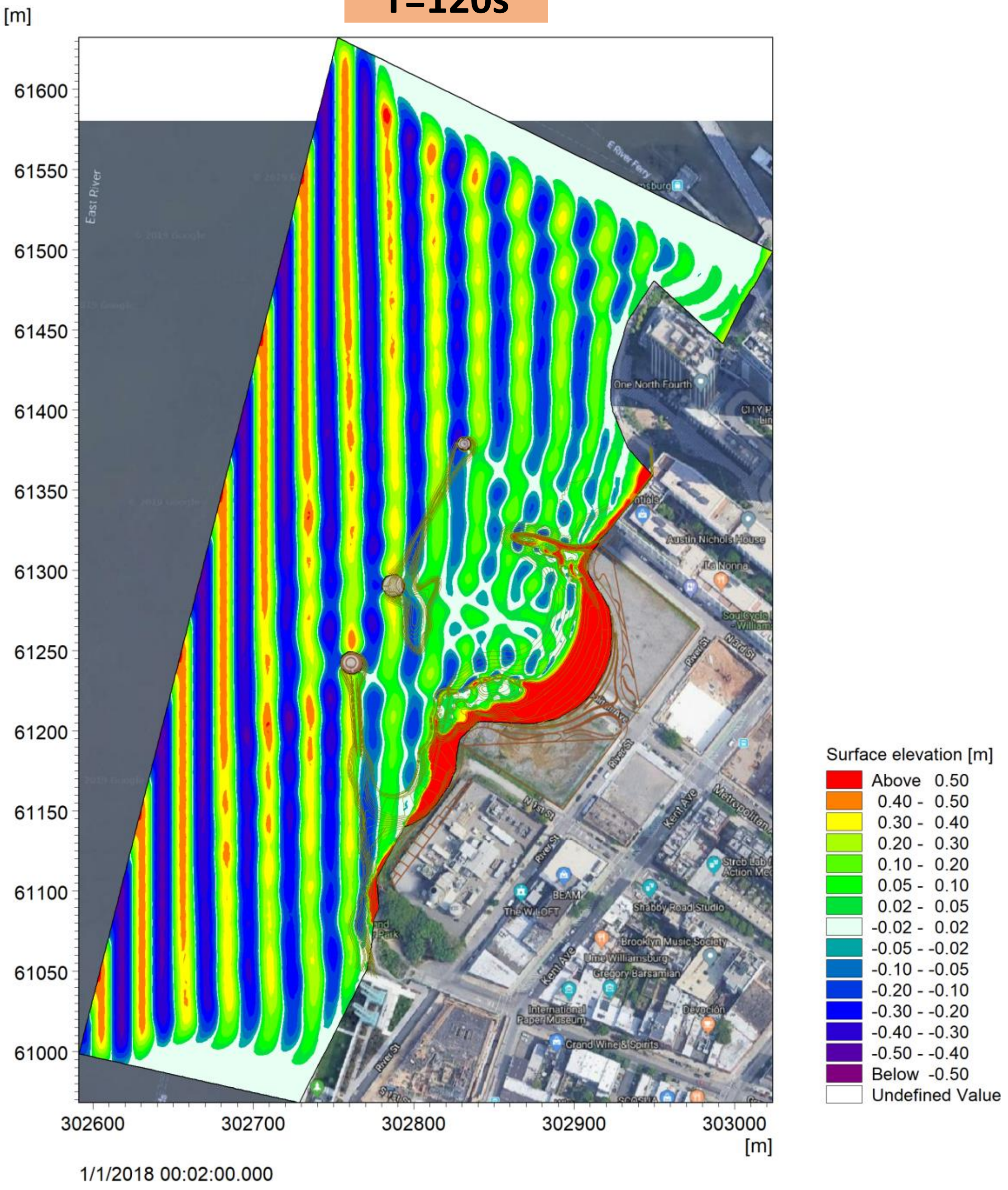


Wave Case:
1m, 4s, 270°N

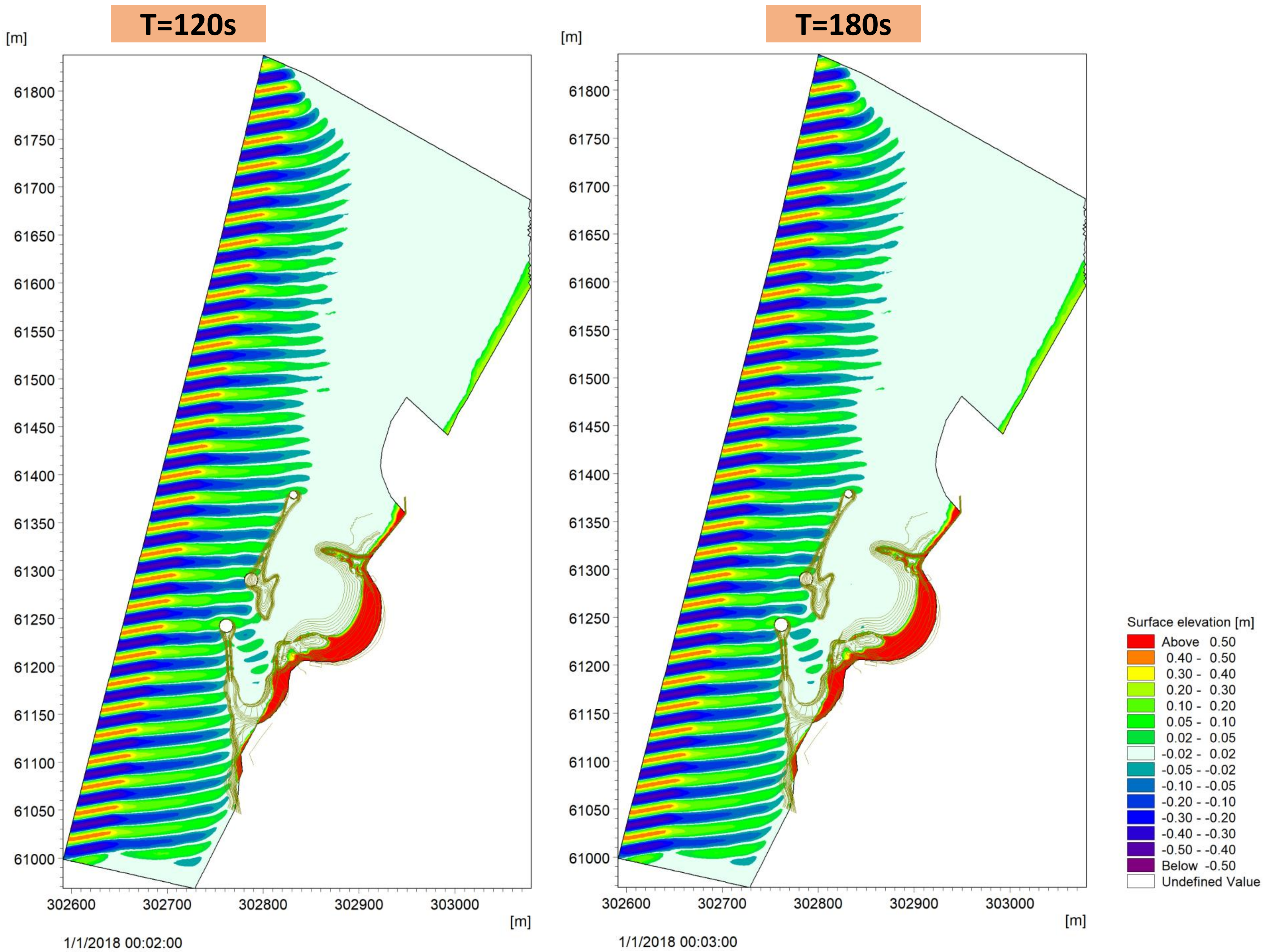
T=60s



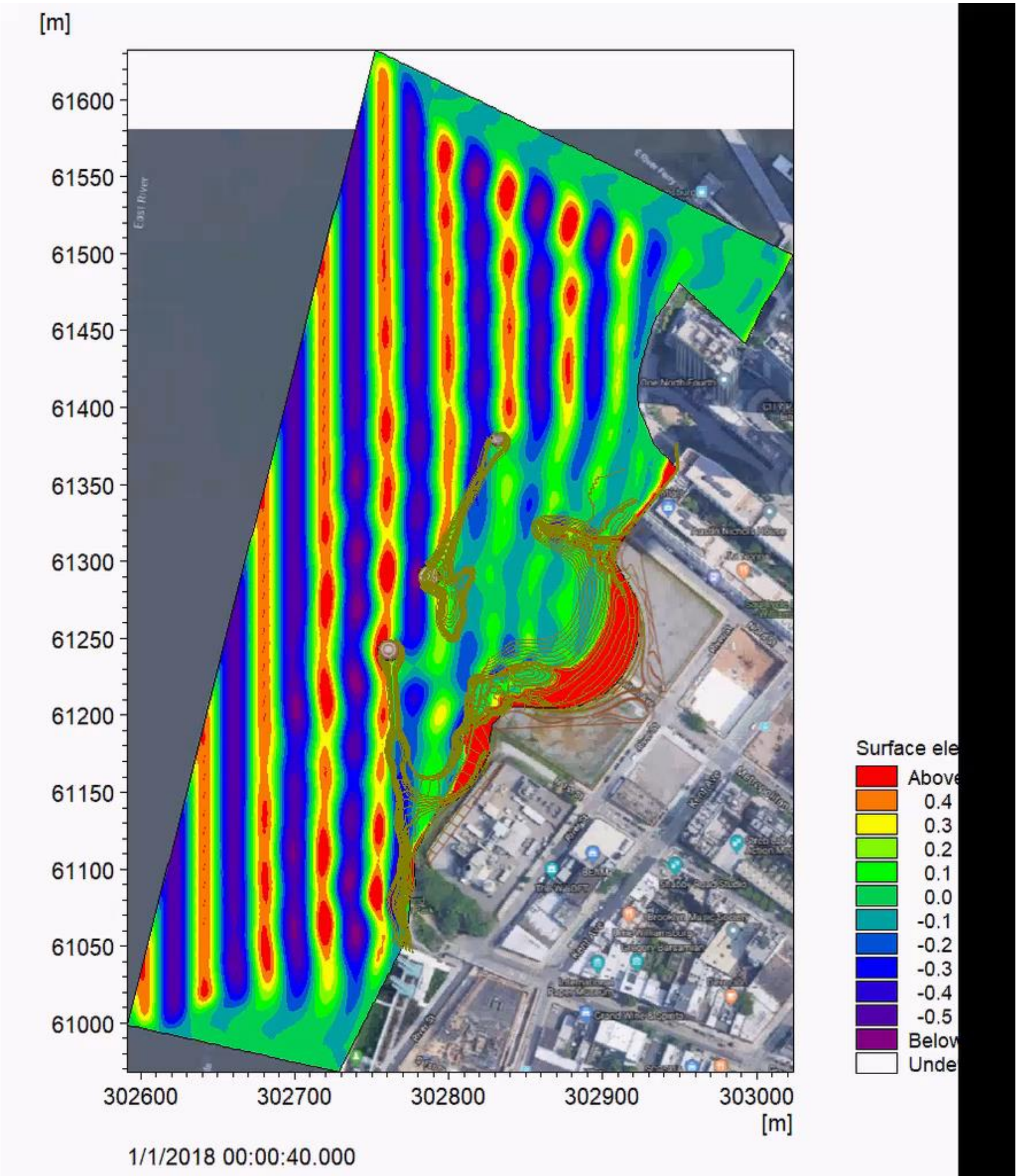
T=120s



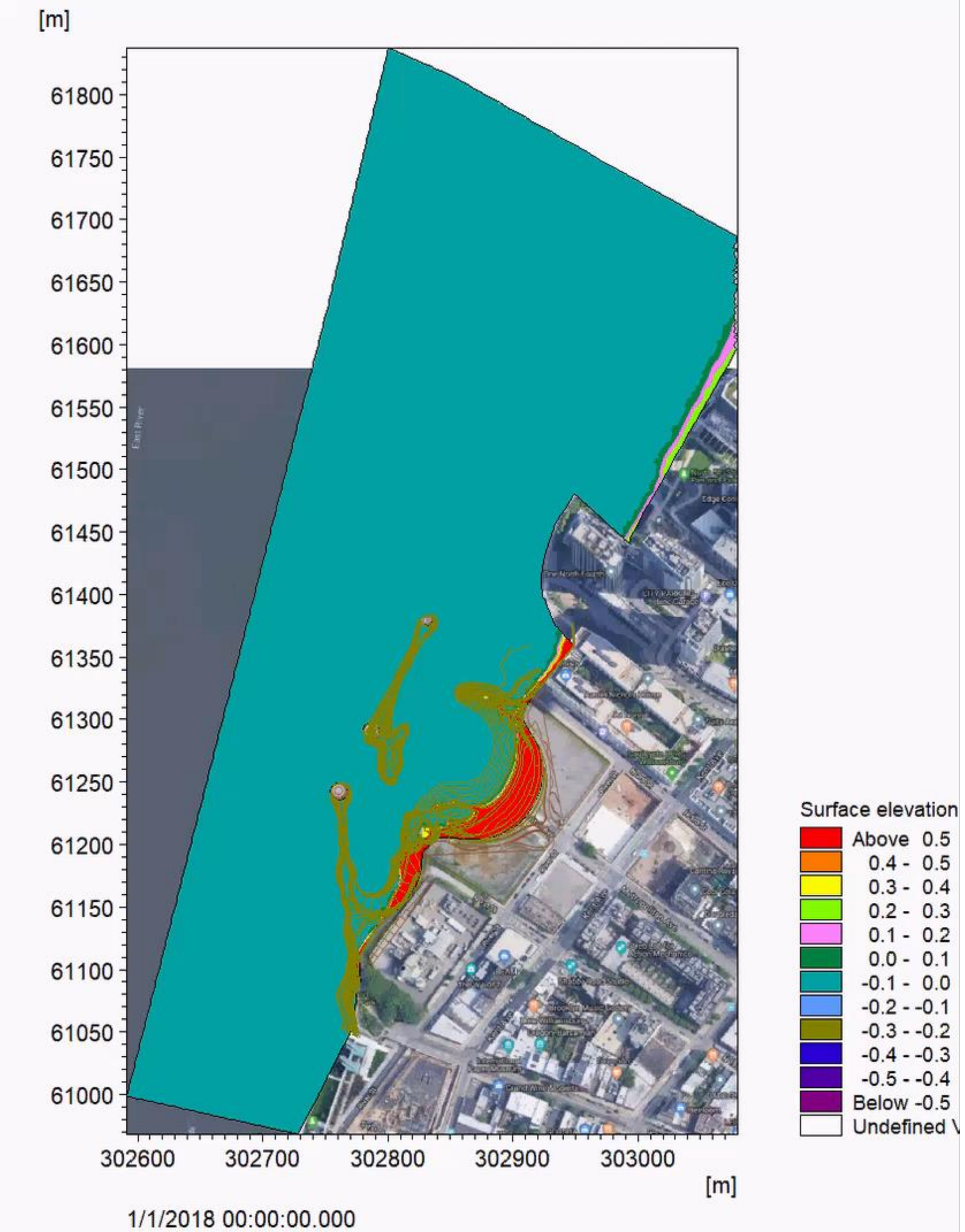
Wave Case:
1m, 4s, 350°N



Animation for H=1m, T=5s, Dir=270°N

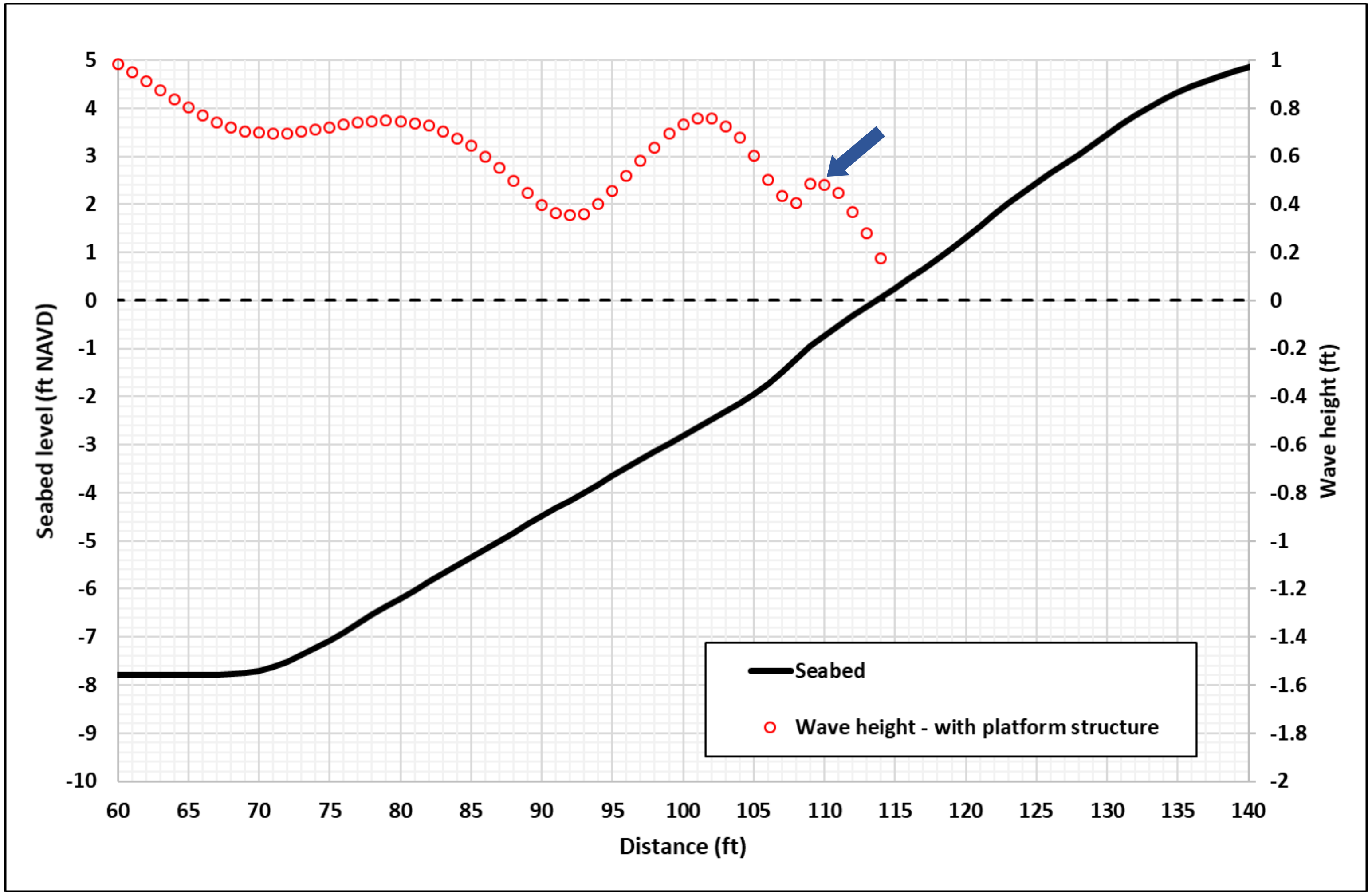


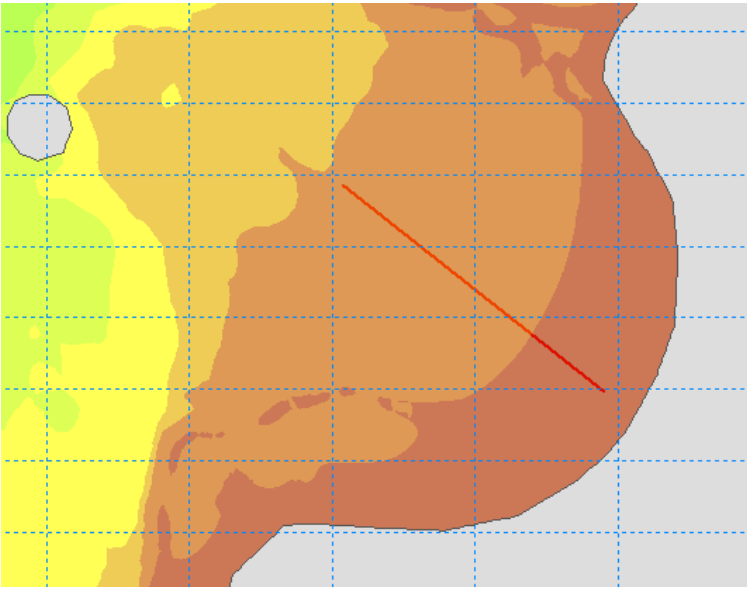
Animation for H=1m, T=5s, Dir=350°N



5.4 Breaking Wave Condition at the North Beach

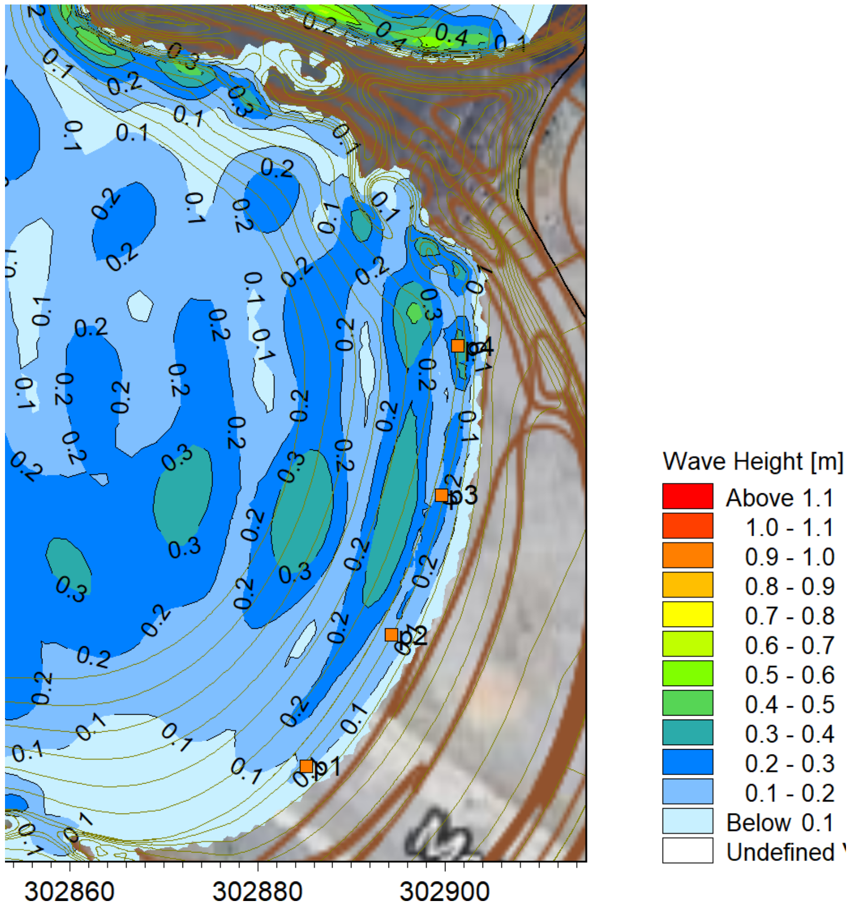
Wave height along transect: H=1m, T=5s, Dir=240°N

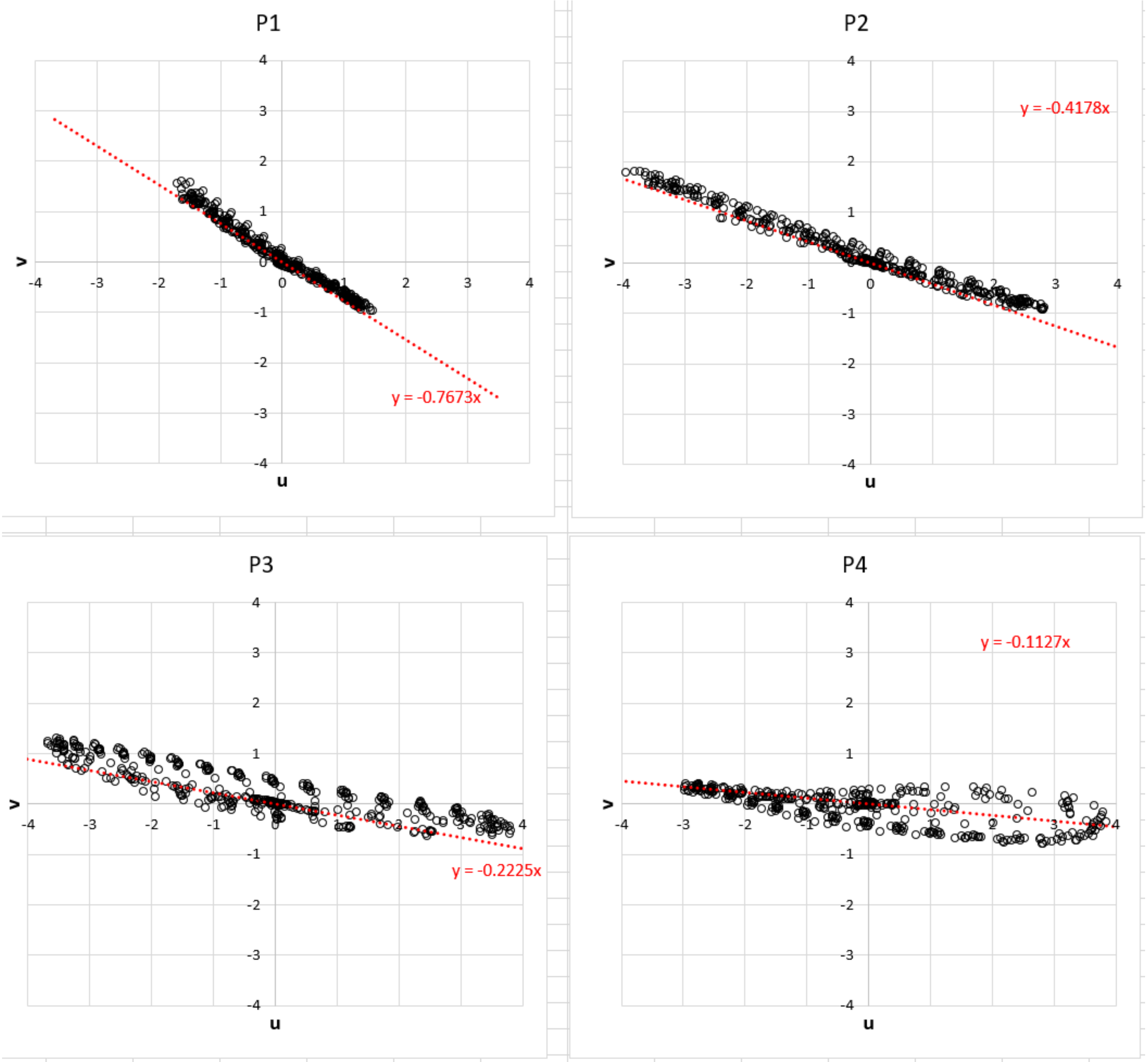




Breaking wave height (H=1m, T=5s, Dir.=240 degrees)

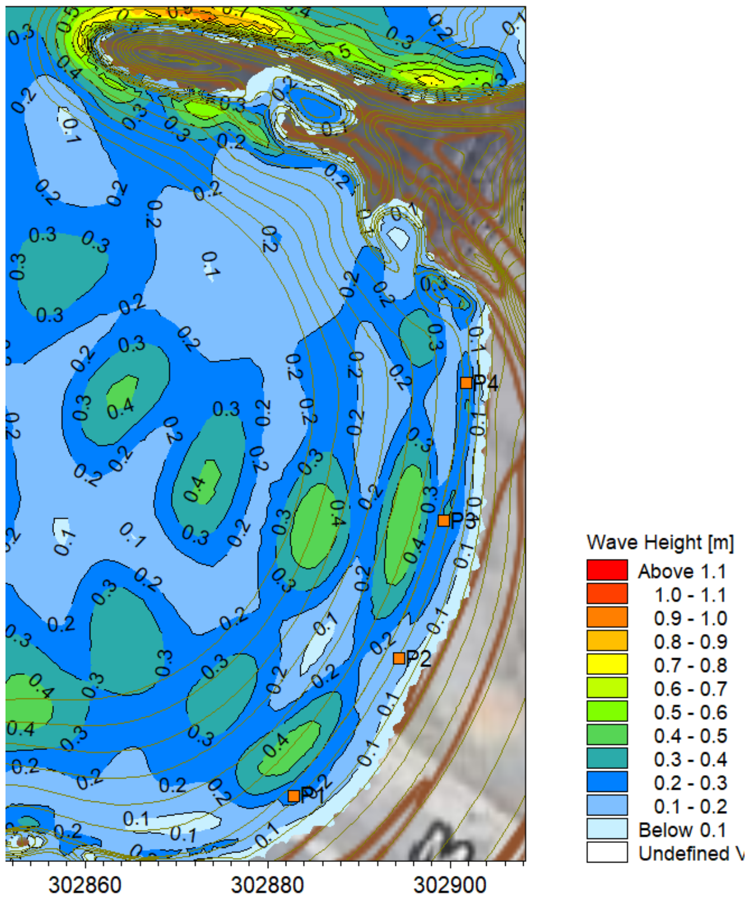
Point	H_b (ft)	Direction from (deg.N)
P1	0.39	307
P2	0.58	293
P3	0.75	283
P4	1.19	276

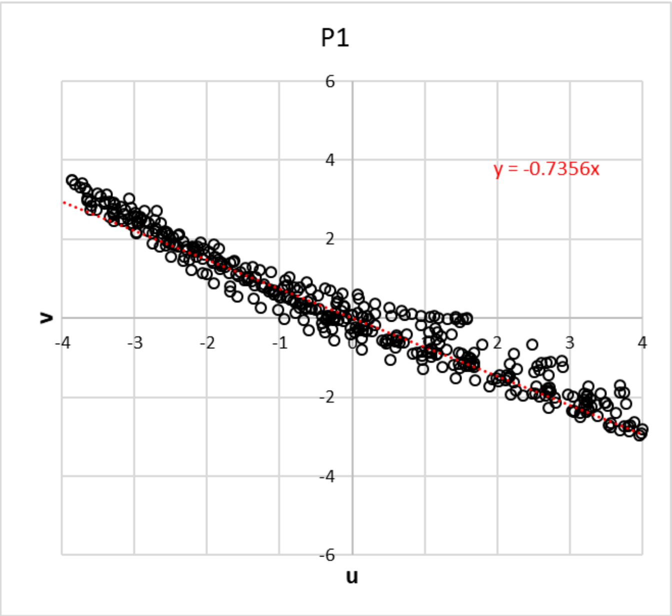


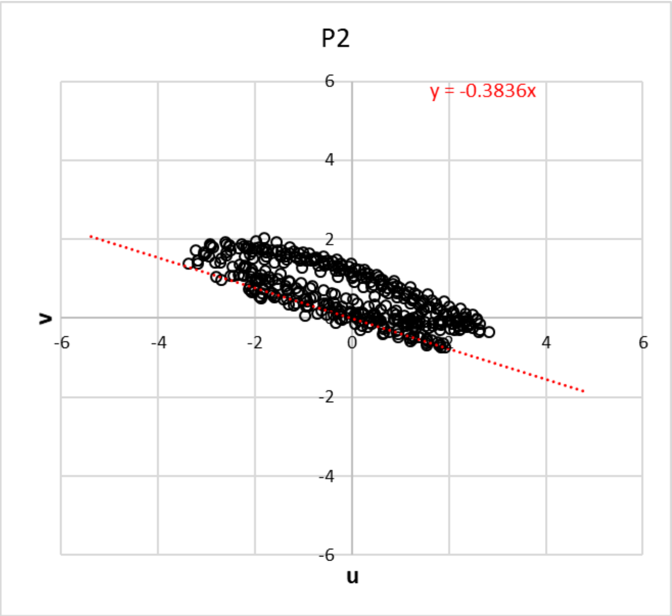


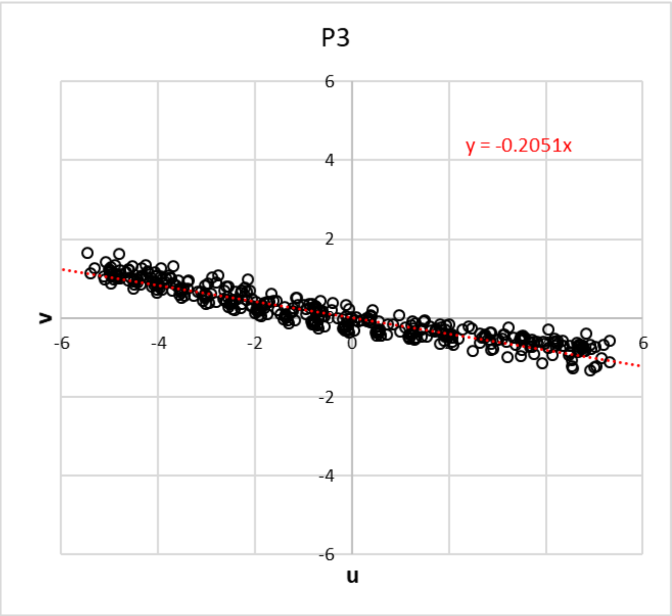
Breaking wave height (H=1m, T=5s, Dir.=270 degrees)

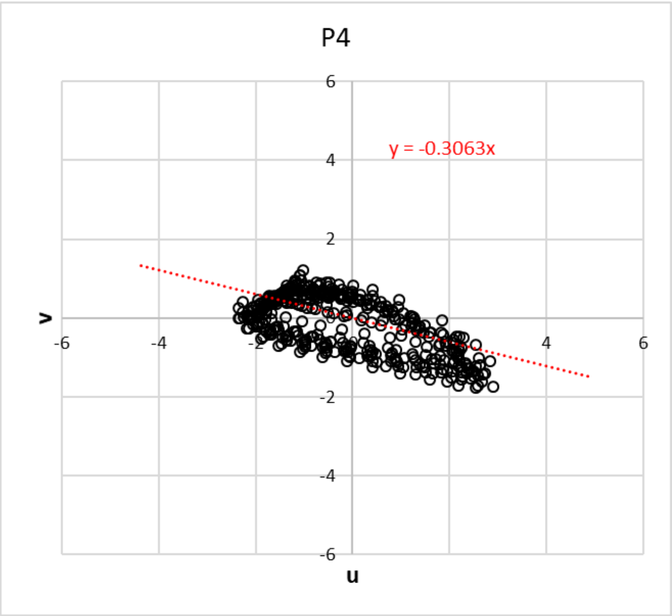
Point	H_b (ft)	Direction from (deg.N)
P1	0.78	306
P2	0.52	291
P3	0.97	282
P4	0.91	287





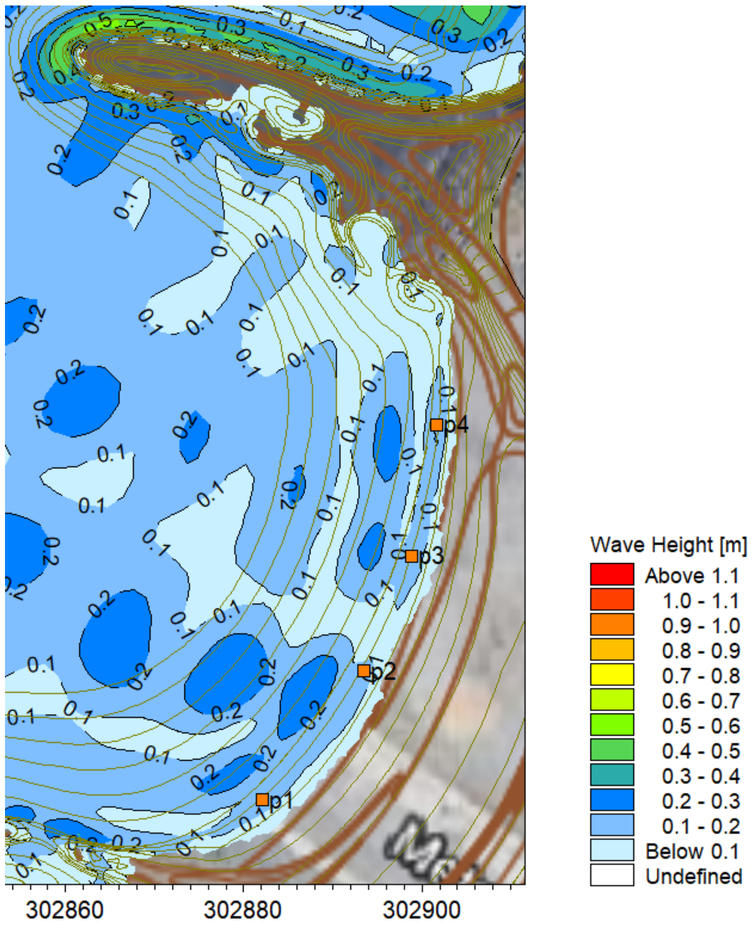


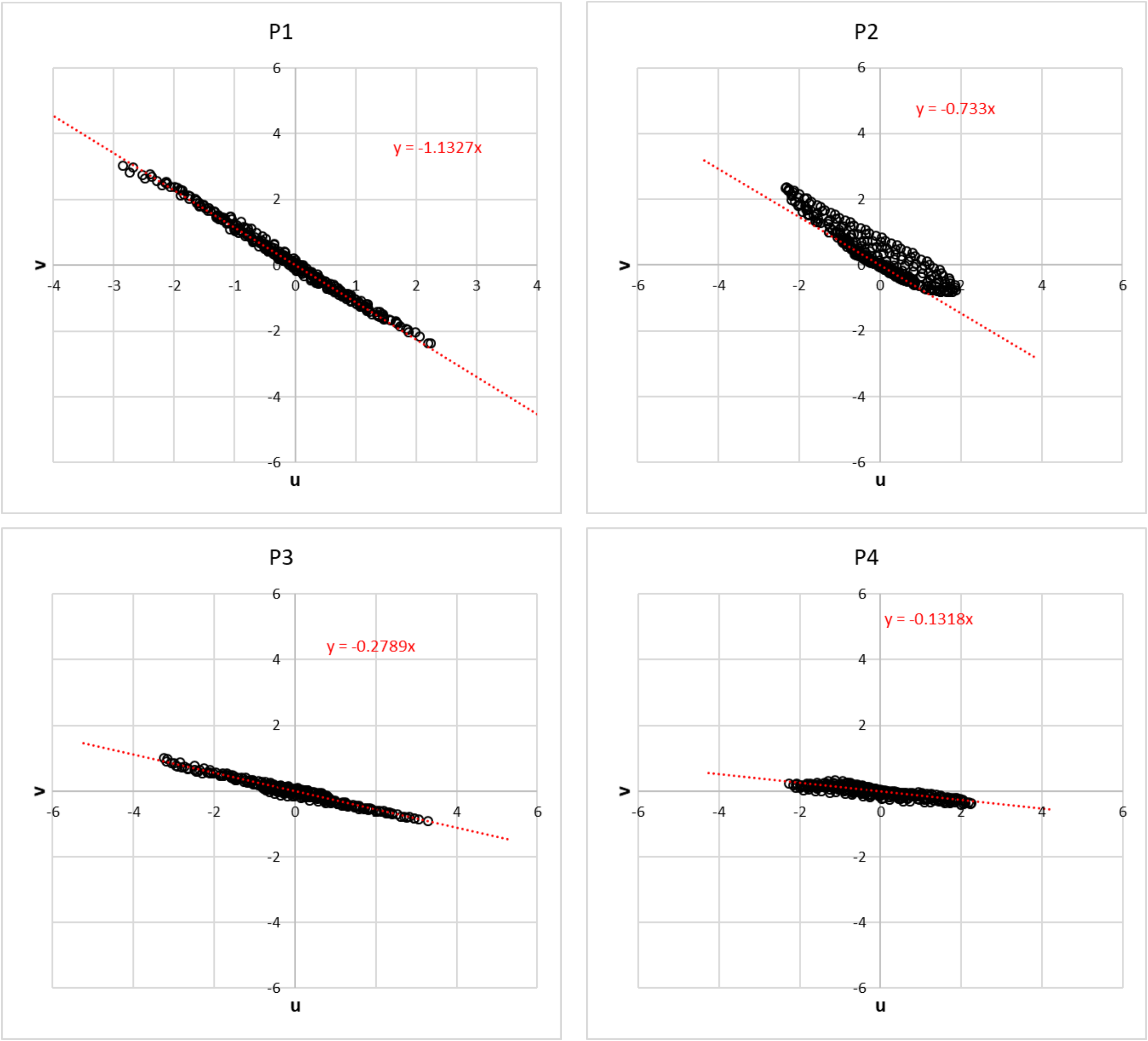




Breaking wave height (H=1m, T=5s, Dir.=350 degrees)

Point	H_b (ft)	Direction from (deg.N)
P1	0.53	319
P2	0.41	306
P3	0.53	286
P4	0.63	278

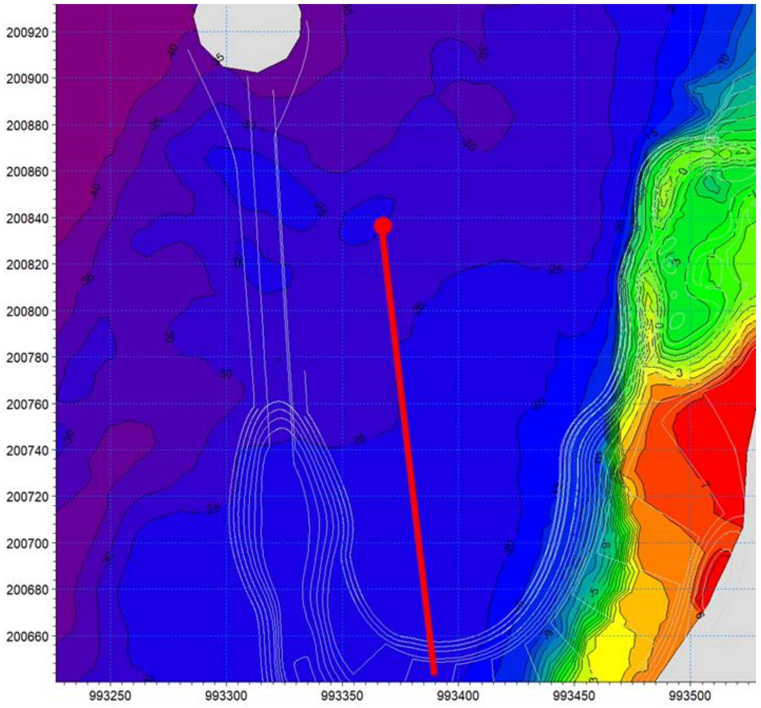


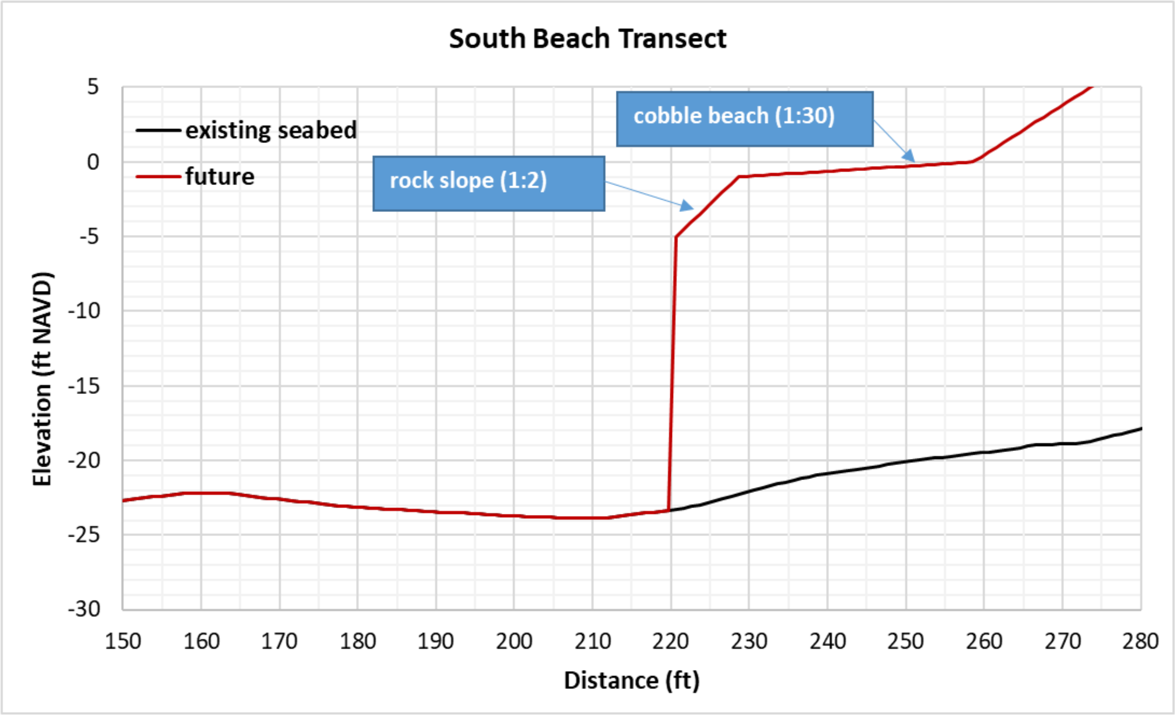


5.5 Breaking Wave Condition at the South Beach

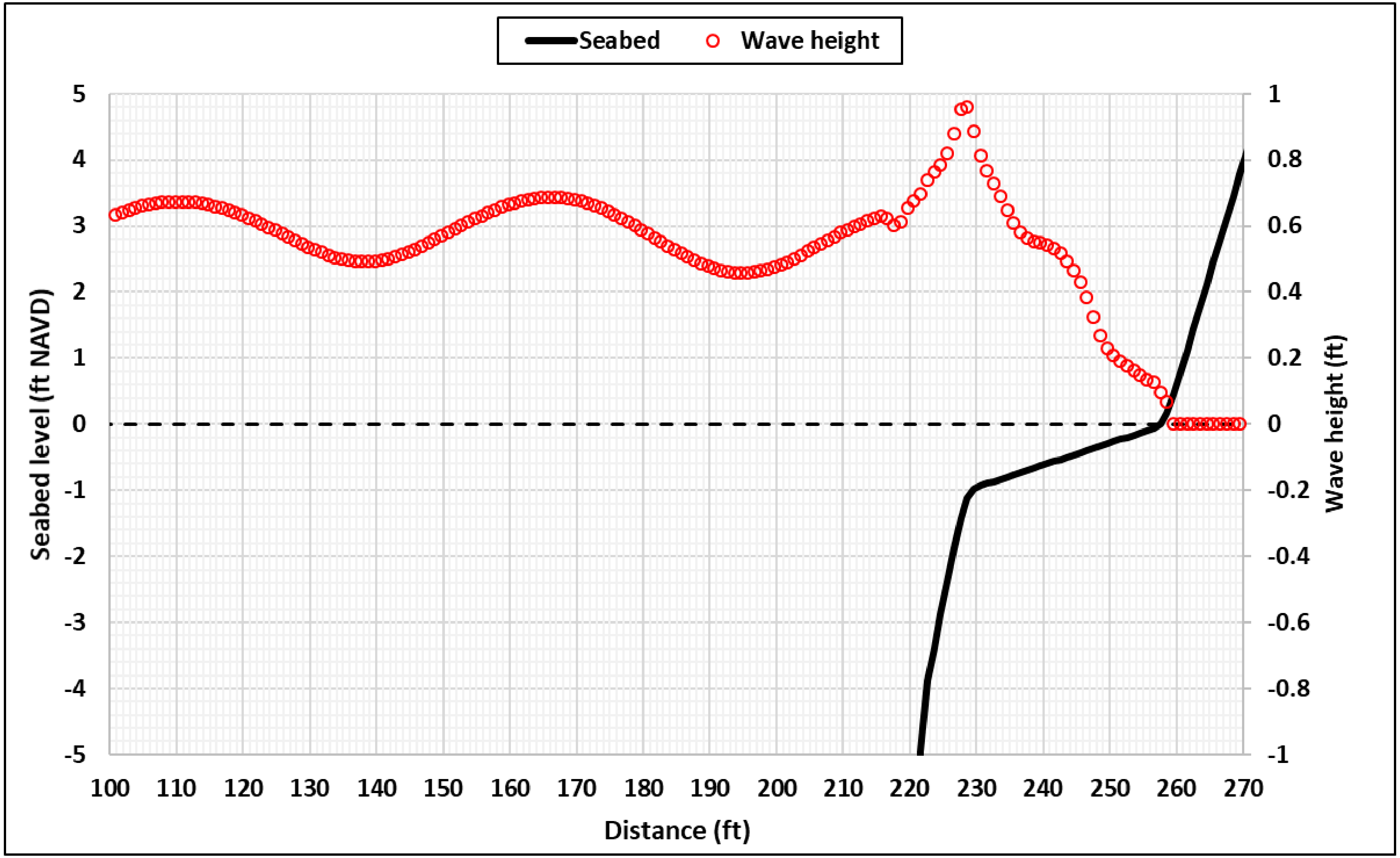
Methodology

- **Extract results from the 2D model at a location in front of the south beach area, for input waves**
- **Extract bathy profile and include the platform structure at the end of the bathy profile**
- **Assume shoreward of the platform edge being filled**
- **The south beach is governed by wake wave from southbound traffic (i.e., waves from NW)**

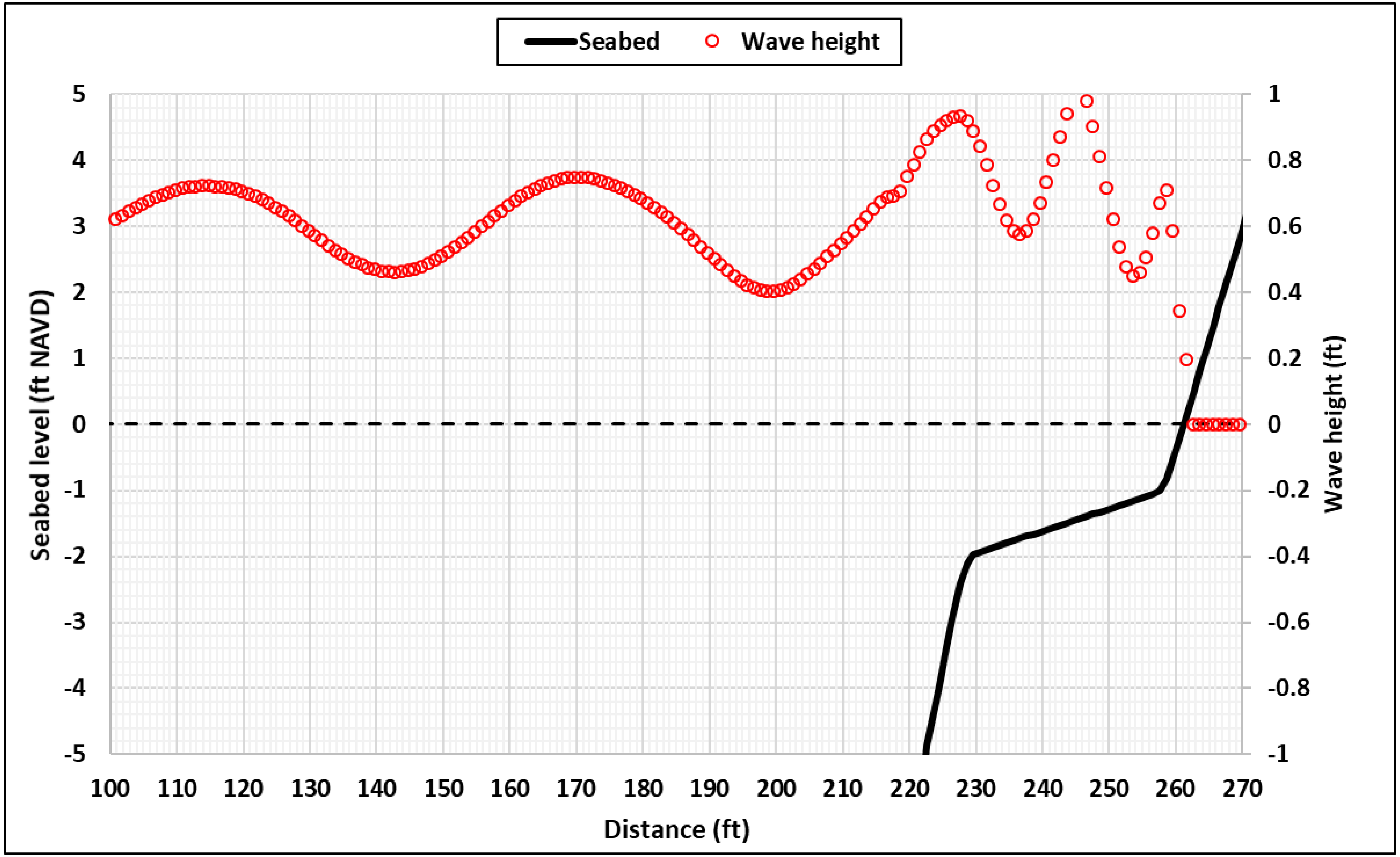




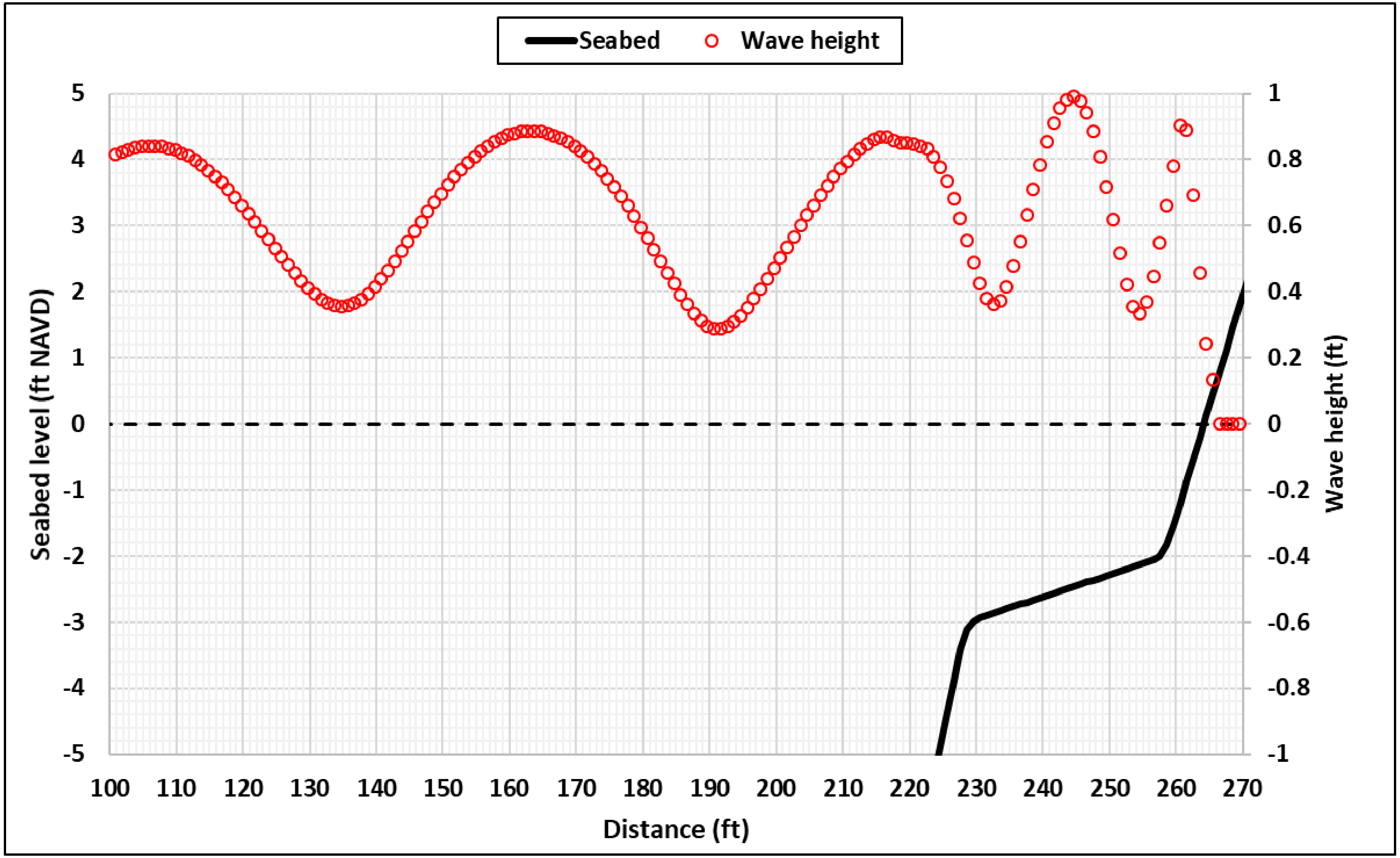
H=0.2m (0.66ft); T=5s; WL=0ft



H=0.2m (0.66ft); T=5s; WL=1ft

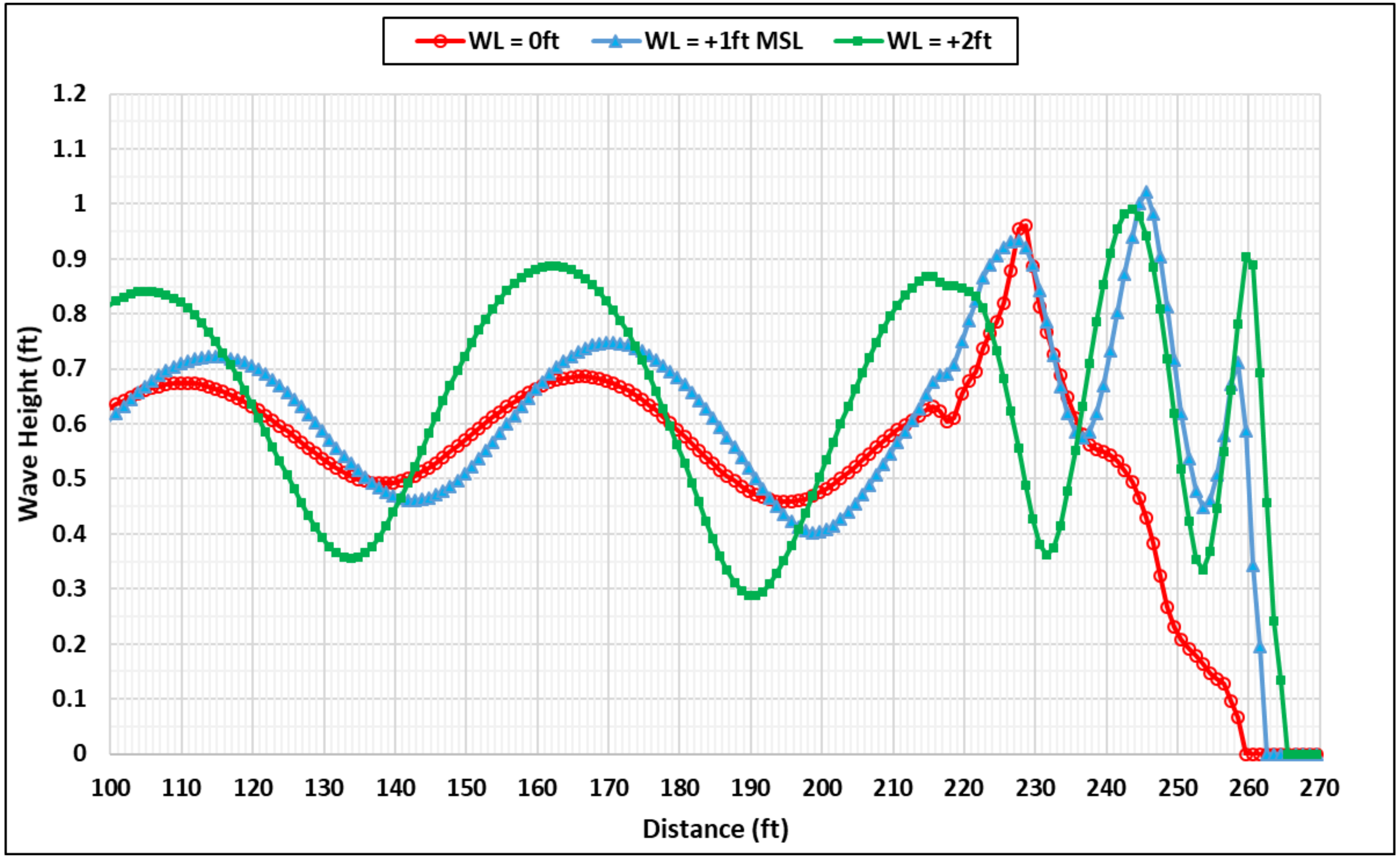


H=0.2m (0.66ft); T=5s; WL=2ft



Breaking Wave Height and peak bed shear stress

WL (ft)	H_b (ft)	Peak bed shear stress (N/m²)
0	0.96	30
1	1.02	14
2	0.99	15



ATTACHMENT J

HABITAT EVALUATION

DRAFT RIVER STREET EXISTING AND PROPOSED HABITAT EVALUATION

March 30, 2020

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Table of Contents

Introduction

On behalf of Two Trees Management, eDesign Dynamics has prepared the following report in support of the proposed River Street development project located at 1 River Street in Brooklyn, New York (the "project"). The purpose of the proposed project is to expand waterfront public access along the East River north from the Grand Ferry Park esplanade, while enhancing and sustaining habitat and increasing the resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. The project would link fragmented elements of the Williamsburg public waterfront by creating a comprehensive ecological park on the East River adjacent to a planned upland residential development. This report will compare existing and proposed conditions to provide an overview of baseline conditions and show how the proposed ecological restoration will result in improved waterfront access, climate resilience, and ecological connectivity.

For habitat planning, Jamaica Bay was selected as a reference site because it is widely identified by the ecosystem professional community as the City's most critical marine ecosystem habitat. Jamaica Bay also shares many similar baseline conditions as the River Street site, including depth, water quality, substrate, salinity, and flushing rates. The in-water and adjacent upland portions of the proposed project aim to replicate the habitat mosaic of Jamaica Bay on a compact scale with built and natural design features including: upland and coastal scrub-shrub; freshwater wetland; salt marsh and tidal pools; offshore shallows; reef balls, oyster cages, and eel grass pilot planting. These features will be implemented within three basic habitat zones with overlapping habitats: upland zone, inter-tidal zone, and sub-tidal zone. This report will evaluate how the restoration of these three zones will bring essential habitat back to the East River while providing numerous secondary benefits. The final project components will be designed and implemented in close coordination with regulators.

1.1 Background

Two centuries of industrialization and shipping have rendered the East River ecologically sparse with limited habitat for terrestrial and aquatic species. The last two decades have seen a revival of the waterfront for both human use and ecosystem function. Projects including Randall's Island Park, Brooklyn Bridge Park, Hunter's Point Park, Bushwick Inlet Park, and Domino Park have demonstrated the potential to integrate native ecosystems into waterfront developments that benefit users and the environment. Yet only a handful of these sites have attempted to restore the inter-tidal and sub-tidal habitats that once made the East River an abundant ecosystem of finfish, shellfish, crustaceans, and bird life. The majority of the waterfront is disconnected from the river by hard edges, separating people from the water and thwarting the return of native habitat and species.

1.2 Objectives

The project will promote connections between land and water using a softened shoreline consisting of native habitat including upland scrub, salt marshes, tidal pools, and oyster beds. The resulting habitat mosaic will replicate the favorable ecological conditions found in Jamaica Bay while improving upon

Jamaica Bay's current velocities, flushing time, and water quality in terms of nitrates and turbidity. The River Street development will showcase a new model for natural, urban shorelines with three main benefits: waterfront access, climate resilience, and ecological connectivity. Table 1 compares how the proposed project compares to typical waterfront developments

Table 1. A new model for urban shorelines, the River Street development will promote waterfront access, climate resilience, and ecological connectivity

	Typical Waterfront Developments	River Street Project
Waterfront Access	Separated from the water with a hardened shoreline; the river is programmatically inactive and ecologically unimproved	Ties together upland, inter-tidal, and sub-tidal zones through softened shoreline; the river is programmatically active and ecologically beneficial
Climate Resilience	Hardened shorelines exacerbate the effects of storm surge; water piles up and overtops barriers, causing flooding	Soft shorelines mitigate the effects of storm surge; waves are dampened by breakwaters and water is absorbed and further dampened by salt marshes
Ecological Connectivity	The lack of managed aquatic ecosystems on the East River makes it ecologically sparse, with the majority of aquatic and avian species occupying the Hudson River and Long Island Sound	Introducing inter-tidal and sub-tidal habitat encourages fish, invertebrates, and birds to inhabit the East River, as well as using the East River as a conduit between other ecosystems

The River Street project dovetails with recent recommendations from the US Army Corps of Engineers (USACE) and the New York State Department of Environmental Conservation (DEC). The project addresses 7 of the 12 targets put forth by USACE in the 2016 Hudson-Raritan Estuary Comprehensive Restoration Plan (CRP), including: create and restore coastal and freshwater wetlands; restore and protect colonial water bird roosting, nesting, and foraging habitats; establish sustainable oyster reefs at several locations; establish eelgrass beds at several locations (eelgrass restoration will be a pilot program); create or restore shoreline and shallow sites; create functionally related habitats for fish, crab, and lobster; and improve direct access to water and linkage with recreational areas. (USACE, 2016) River Street also provides a number of benefits identified by the DEC in the 2017 Living Shorelines guidance, which emphasizes natural and nature-based solutions to control flooding and erosion, with a number of tangible benefits: improved water quality; improved waterfront habitat; public benefit; resilience; and erosion control. (NYDEC, 2017)

There are three interrelated factors that have been taken into account to ensure the success of the project's restored inter-tidal and shallow sub-tidal zone. First, new structures will act as breakwaters, slowing water velocity enough to mitigate erosion while being high enough to avoid settling of fine materials. This calmer water will also allow for marsh habitat to flourish. Second, all new substrate imported to the site will include a sand-gravel-cobble bottom to promote fisheries. Third, physical structures will utilize ecological concrete materials with crenellations and chemically beneficial surface materials to provide attachment sites for invertebrates and foraging opportunities for finfish.

The following sections will describe how these conditions will be achieved for the proposed project by implementing best practices in ecological restoration in the upland, inter-tidal, and sub-tidal zones.

2.0 Existing Conditions

The River Street site was formerly a No. 6 fuel oil storage complex for Con Edison North First Street Terminal. The aboveground fuel oil storage tanks were removed when the terminal was decommissioned, but vestiges of the industrial site remain, including vacant lots, bulkheads on the shoreline, and pile-supported piers corresponding to the upland, inter-tidal, and subtidal zones, respectively. Two ecological surveys were conducted to identify existing flora and fauna (see Appendix A) as well as the underlying structural conditions. The first survey of the sub-tidal and inter-tidal zones was conducted on November 20, 2019. The second survey of the upland zone was conducted on March 3, 2020. The sections below describe these findings along with research gathered from studies at adjacent sites in the East River where conditions are expected to be the same.

2.1 Upland Zone

The upland zone is divided into two rectangular lots on the north and south side of Metropolitan Avenue and one L-shaped lot south of North 1st Street. The two rectangular lots, including ecological zones 1-4 as given in Appendix A, are characterized by soil and gravel fill with little to no herbaceous or animal life. The lots are largely flat with limited plant growth. The borders around the lots are delineated by construction fences with sparse plant growth at the fenceline. The only wildlife observed in these three zones was a killdeer (*Charadrius vociferous*), a type of wading bird which is known to use construction sites for foraging and nesting. The lot south of North 1st Street, designated as ecological zone 5 in Appendix A, is characterized by grass, shrubs, and small trees. Two larger trees of greater than six inch DBH, a pin oak (*Quercus palustris)* and a black cherry (*Prunus serotina)*, are present on the lot although they appear to be stunted due to poor soil conditions. The only wildlife observed in zone 5 was a single dark-eyed junco (*Junco hyemalis)*, a type of perching bird, but habitat exists for other opportunistic birds, insects, and mammals to occupy the site during other seasons including the spring, summer, and fall.

2.1.1 Structure

The upland zone of the site, which sits approximately 10 feet above sea level, consists of soil and recycled concrete fill. Like many waterfront areas, the upland portion of the project area was filled to raise its grades and create more usable land. The source of the fill is unknown but the fill material that was observed is generally unsuitable to support native habitat. In the neighboring Grand Ferry Park site, this fill material reached a depth of up to 30 feet below grade. (AKRF, Inc., 2010)

2.1.2 Flora

A survey of the upland habitat at the River Street site revealed a total of five ecological zones given in Appendix A representing differences in available moisture, substrate, and sunlight. Of the five zones surveyed, one had no plant life, three had limited life, and the final zone displayed more measurable plant life.

The three vegetation-limited zones, as well as the barren zone were observed to have different types of fill, including recycled concrete and soil top dressing. As in many urban lots, fill material including concrete and brick sustains weedy species that favor a more alkaline, higher pH environment. Of the three zones with observable plant life, zones 1 and 3 were observed to have small, herbaceous plants underneath the construction fenceline including mugwort (*Artemisia vulgaris*) and bedstraw. Zone 4 had a greater variety of plants adjacent to the depression including mugwort (*Artemisia vulgaris*), aster, seaside goldenrod (*Solidago sempervirens*), cool season grass, and bedstraw. With mugwort being the dominant species, these zones are considered non-native dominant. Vegetation was absent in Zone 2.

The fifth and final zone, zone 5 south of North 1st Street had the greatest variety of plant life. Observed plant species included mugwort (Artemisia vulgaris), Japanese honeysuckle (Lonicera japonica), common reed (Phragmites australis), cool season grass, Queen Anne's Lace (Daucus carota), sweet clover, multiflora rose (Rosa multiflora), wormwood (Artemisia absinthium), early goldenrod (Solidago juncea), groundsel bush (Baccharis halmifolia), switchgrass (Panicum virgatum), white snakeroot (Ageratina altissima), foxtail (Alopecurus), and common milkweed (Asclepias syriaca). The trees on site are clustered along fence lines where mowers and trimmers cannot be used and birds tend to perch and defecate creating a nutrient rich substrate. The tree species in Zone 5 include black cherry (*Prunus serotina*), Callery Pear (*Pyrus calleryana*), cottonwood (*Populus deltoides*), Red cedar (*Juniperus virginiana)*, and pin oak (*Quercus palustris*).

2.1.3 Fauna

Only two birds were observed in the upland zone, a killdeer (*Charadrius vociferous*) in Zone 3 and a dark-eyed junco (*Junco hyemalis*) in Zone 5. It is expected that more birds would occupy the site in the spring and summer when there are greater foraging opportunities on fruits, seeds, and insects. Common birds representing a typical urban suite would include: rock pigeon (*Columba livia*), mourning dove (*Zenaida macroura*), American robin (*Turdus migratorius*), northern mockingbird (*Mimus polyglottos*), European starling (*Sturnus vulgaris*), and house sparrow (*Passer domesticus*). (AKRF, Inc., 2010) However, there is little nesting habitat available due to the lack of structural diversity that would otherwise be provided by a higher density of trees, shrubs, and man-made features.

2.2 Inter-Tidal Zone

The inter-tidal zone is characterized by a mixture of man-made structures, including pile-supported piers and platforms, and rocky, sandy shoreline. The flora and fauna in this zone are limited to encrusting organisms including algae, cyanobacteria, and barnacles. There is no evidence of wetland vegetation. A small collection of insects were observed on the beach and only one bird species was observed on the water. It is expected that more varieties of fauna would occupy the inter-tidal zone at other times of year, though the finite habitat would continue to be a limiting factor on species diversity.

2.2.1 Structure

The shoreline at River Street features pile-supported platforms (wharf, piers, apron walkway, catwalks) and bulkhead/closure walls interspersed with rocky, sandy shoreline. Approximately 472 feet of the shoreline consists of bulkheads, while another 357 feet is rocky beach. The closure wall at the wharf on the southern end of the site consists of timber sheet piles, with a pile-supported wharf waterward of the closure wall. The bulkhead north of that (middle of the site) consists of steel sheet piling backfilled with crushed concrete with a pile-supported apron walkway waterward of the bulkhead. The existing bulkhead and closure wall provide minimal habitat for waterfowl and shorebirds other than as resting and perching habitat.

2.2.2 Flora

Existing piles and bulkheads exhibit early succession of typical epibenthic flora and fauna. These encrusting organisms begin with colonization by bacteria, cyanobacteria, and algal films. Next to colonize are filamentous algae, then more complex and durable green, red, and brown algae including rockweed (*Ascophyllum nodosum*). More species of phytoplankton are almost certain to exist, as evidenced by a survey of the East River conducted from 1996 through 2003, which found 29 taxa of phytoplankton that varied by location and time of observation. In other surveys of the East River, up to 107 taxa were collected, including the green algae *Nannochloris* and the diatom *Skeletonema costatum*. No vegetated tidal wetlands are present within the project site. (AKRF, 2010)

2.2.3 Fauna

Encrusting organisms found on the shoreline structures included hydroids, tunicates, and barnacles. While the bulkheads preclude fish habitat, the pile-supported platforms have the potential to offer protection while allowing light penetration underneath the structures. Shade created by platforms create foraging opportunities for ambush predators like striped bass near the edge where there is still some light penetration, but most fish will not venture to the darkest regions of the under-pier spaces. The rocky beach provides habitat for insects beneath rocks and attachment sites for algae and barnacles on rocks and abandoned pilings. Scuds and midges were observed to be grazing on algae from the pilings. The only bird observed in the inter-tidal zone was a bufflehead *(Bucephala albeola)*, a typical winter transient “bay duck”, which was likely grazing on rockweed.

2.3 Sub-Tidal Zone

The sub-tidal zone is characterized by a deep, dredged river bottom, swift currents, and a lack of structure except for pile-supported piers. These conditions have prevented the establishment of diverse sub-tidal habitats that would otherwise exist. Without such habitats, fish populations are constrained and the East River largely functions as a conduit between more productive habitats.

2.3.1 Structure

The site currently features pile-supported platforms (piers, catwalks) and caissons that create the opportunity for attachment sites for oysters and mussels; however, none were observed during the November survey. Currently the sub-tidal zone at the River Street site lacks the conditions needed for oysters and submerged aquatic vegetation, (SAV), to thrive. Today, oyster beds are barely present in the estuary due to overharvesting, navigational dredging, and degraded water quality among numerous other causes.

2.3.2 Flora

SAV is unlikely to be found in the project site because these vascular plants depend on light as their main energy source and their presence in the East River is limited by turbidity and increased depths from dredging, both of which reduce light penetration. (AKRF, 2010) Common macro-algae in the East River include the Phaeophyte species *Fucus vesiculosus*, and the Chlorophyte species *Ulva lactuca* and *Enteromorpha intestinalis*. These species were observed on the pilings in the sub-tidal zone of the site; they colonize hard substrate such as pilings, rocks, and bulkheads.

2.3.3 Fauna

As the connection between the Hudson River and Long Island Sound, the East River is an important migratory route for marine fish, estuarine fish, anadromous fish (species that migrate up rivers from the sea to breed in freshwater), and catadromous fish (species that live in freshwater but migrate to marine waters to breed). That said, the populations of these fish in the East River are relatively small compared to neighboring water bodies due to swift currents, lack of shoals, and lack of protected habitat. Many of the migratory species are only seasonally abundant, whereas species in lower trophic levels are present year-round. (AKRF, Inc., 2010)

An environmental impact study (EIS) conducted for the development of Domino Park adjacent to the River Street site reports the types of species that are commonly found in the lower East River, and are likely to be found at the adjacent project site. The study showed that arthropods and protozoa are abundant. More than 100 benthic invertebrate taxa (mostly crustaceans or polychaete worms) have been identified in the East River. (AKRF, 2010) Within the portion of the Harbor Estuary comprising the Hudson River, East River, and Upper New York Harbor, common macroinvertebrates include oligochaete worms, polychaetes, gastropods, bivalve mollusks, barnacles, cumaceans, amphipods, isopods, crabs, and shrimp. (AKRF, Inc., 2010)

Fish types can be categorized according to marine species that migrate inshore from the sea; estuarine species that live in the estuary year-round; anadromous species; and catadromous species. Common marine species include winter flounder (*Pseudopleuronectes americanus*), scup (*Stenotomus chrysops*), and bluefish (*Pomatomus saltatrix*). Common estuarine species include bay anchovy (*Anchoa mitchilli*), Atlantic silverside (*Menidia menidia*), striped mummichog (*Fundulus majalis*), common mummichog (*Fundulus heteroclitus*), and white perch (*Morone Americana*). Common anadromous species include striped bass (*Morone saxatilis*), tomcod (*Microgadus tomcod*), and members of the herring family (*Clupeidae*). A common catadromous species is the American eel (*Anguilla rostrata*). (AKRF, Inc., 2010) While all of these species have the potential to be present at the River Street site, none were observed during the survey.

3.0 Proposed Conditions

Given the sparsity of habitat suitable to native flora and fauna, the River Street site represents an opportunity for a comprehensive redesign focusing on native habitat. To accomplish this redesign, the project team began by considering the existing soils / substrate, hydrology, water quality, and light regime and the potential for their improvement. These four building blocks dictate the types and spatial distribution of habitats that can be created at the site. Different species of plants thrive in habitats with unique combinations of these and other environmental factors. At the project site, native vegetation will be paired with the appropriate substrate, hydrology, and solar exposure, so the site will require less maintenance than traditional park spaces while providing more ecosystem services. Planting with a diverse assemblage of natives will also minimize the risk of weeds by promoting interspecies competition.

3.1 Upland Zone

The upland zone of the River Street site will be transformed from a flat, ecologically compromised area to one that interconnects seamlessly with the waterfront. The habitat goals within the upland area include: supplementing foraging and nesting grounds currently not available in the project area for coastal and migrating birds, butterflies, insects, and other wildlife; sustaining native plant communities consistent with nearby reference sites; promoting connectivity with adjacent natural areas; stabilizing and sustaining the soils and slopes in the project area; and providing passive recreation opportunities for park visitors.

3.1.1 Structure

Soil selection is the first and foremost concern in upland ecological restoration. The River Street site will utilize low pH, loamy sand planting soil which contain 70-80% sand with the remainder being silt and clay, which has ideal nutrient and moisture-limiting characteristics. Opportunistic invasive plants with higher moisture and nutrient needs are less likely to out-compete native species in loamy sand. Upland areas will be graded to provide a range of elevations to promote diversity among the soil moisture regimes and plant communities, including coastal scrub-shrub, meadows, and native trees. Additionally, freshwater wetlands within the larger upland zones will manage stormwater and provide additional habitat value.

3.1.2 Flora

The proposed project will employ appropriate soil and hydrologic conditions to give a competitive advantage to native species over the multitude of weed species such as common mugwort (*Artemisia vulgaris*), common reed (*Phragmites australis*), and Japanese knotweed (*Polygonum cuspidatum*) which are known to colonize aggressively in the region. The proposed project will be designed to support native species including pasture rose (*Rosa Carolina*), coral honeysuckle (*Lonicera sempervirens*), eastern red cedar (*Juniperus virginiana*), mixed milkweeds, and native warm season grasses. Late flowering native plants, particularly nectar-rich goldenrods, asters, and thoroughworts among other native coastal herbaceous plants will be planted. Additional target objectives will be developed from an assessment of desired plant communities, soil restoration needs, habitat priorities, water quality improvements, and costs. Freshwater wetlands within the larger upland zone will be planted with emergent and floodplain native species such as pickerelweed (*Pontederia cordata*), blueflag iris (*Iris versicolor*), soft rush (*Juncus effuses*), and multiple sedges. These plantings will improve water quality and provide additional habitat for dragonflies and damselflies.

3.1.3 Fauna

According to the New York State Breeding Bird Atlas, upland birds with the potential to breed within the project area include peregrine falcons (*Falco peregrinus*), rock pigeons (*Columba livia*), mourning doves (*Zenaida macroura*), chimney swifts (*Chaetura pelagica*), downy woodpeckers (*Dryobates pubescens*), American robins (*Turdus migratorius*), northern mockingbirds (*Mimus polyglottos*), European starlings (*Sturnus vulgaris*), northern cardinals (*Cardinalis cardinalis*), and house sparrows (*Passer domesticus*). A restored upland zone inclusive of freshwater wetlands will also provide potential nesting grounds for waterfowl and wading birds including American black ducks (*Anas rubripes*), American widgeons (*Anas americana*), buffleheads (*Bucephala albeola*), canvasbacks (*Aythya valisineria*), greater scaups (*Aythya marila*), green-winged teals (*Anas carolinensis*), hooded mergansers (*Lophodytes cucullatus*), lesser scaups (*Aythya affinis*), mallards (*Anas platyrhynchos*), northern shovelers (*Anas clypeata*), red-breasted mergansers (*Mergus serrator*), ruddy ducks (*Oxyura jamaicensis*), great egrets (*Ardea alba*), snowy egrets (*Egretta thula*), black crowned night herons (*Nycticorax nycticorax*), and glossy ibises (*Plegadis falcinellus*). Robins, mockingbirds, catbirds, song sparrows, and common yellowthroats (*Geothlypis trichas*) are some of the species most likely to utilize the site.

The upland restoration seeks to restore not only regional ecosystems but also continental ecological processes as well. Birds, butterflies, and dragonflies migrate south in the fall following the coastline from Canada and New England. These species avoid crossing water bodies because air tends to down draft over water, making flight more difficult. As a result, avian species cross water bodies at narrows or where resting points are visible. The proposed project will provide this habitat, in hopes that migratory birds, butterflies and bees will stage in the area, resting and feeding to prepare for longer flights along the Atlantic coast. In particular, the monarch butterfly (*Danaus plexippus*) and checkered-white butterfly (*Pontia protodice*) could utilize the site for breeding or as a stopover. Likewise, animals flying north in the spring would seek foraging grounds and would require time to rest and feed to replenish their energy. The upland restoration at River Street will become a valuable link in these migrations.

3.2 Inter-tidal Zone

The River Street development will restore the shoreline to its pre-industrial state with a soft edge in place of piers and bulkheads. Doing so will improve resilience to sea level rise and extreme weather events while serving as transitional habitats where ecological communities overlap, enabling connections between plants, animals, and people. Two primary systems will be implemented to achieve a softened shoreline that promotes inter-tidal habitat: salt marsh and tide pools.

Salt marsh has proven to be one of the most successful waterfront restoration ecosystems in the New York City area. Salt marshes are native to the northeast and represent some of the most productive and biologically diverse coastal habitat structures, rivaling the tropical rain forests in the amount of biomass produced each year. The resulting habitat will attract foraging birds, provide breeding and hatching grounds for fish, and improve marine water quality through aeration, filtration and sequestration. Salt marshes will also provide a shoreline anchor for benthic communities such as ribbed mussels (*Geukensia demissa*).

Tide pools also provide valuable habitat by being submerged under high tides and then retaining water as the tide recedes. This retention allows marine life to colonize areas higher up in the intertidal zone promoting biodiversity. The narrow band between the low and high water mark will support populations of both plant and animal life adapted to living part of each day submerged by the ocean or brackish water and the rest of the time exposed to the drying sun and wind.

3.2.1 Structure

The redesigned shoreline at the site will share characteristics with two common typologies. The first restoration profile will follow a cross section that ranges from shoreline shallows at the lowest elevations to low marsh, high marsh, transition zone, and upland at the highest elevations. This profile will resemble coastal plain salt marshes typical of the Mid Atlantic, the south shore of Long Island, and southern New England marshes. The second restoration profile will follow a cross section consisting of low salt marsh at the toes of a steep slope with an abrupt transitions to upland vegetation. This will resemble shorelines seen on the north shore of Long Island, New England's rocky shoreline, and along coastal bluffs in Staten Island and Maryland.

These salt marshes have the potential to thrive as long as several basic conditions are met: sun exposure; correct substrate; correct topography; protection from erosion; and creating a low energy system. To achieve these conditions, clean sand will be imported and installed to a depth of one foot for elevations between Mean Higher High Water, (MHHW, +2.4 NAVD88) and two-thirds tide (+0.4 NAVD88) and graded to a minimum 3% slope. In conjunction with a stormwater pollution prevention plan (SWPPP), adjacent upland areas would be graded to eliminate any concentrated flow into the marsh that could cause erosion. At channels, the shoreline would be reinforced with pebble and cobble river stone sill.

To create a low energy system, the wave action and the energy associated with tidal movements must be dissipated. This will be achieved by setting a breakwater up to an elevation of at least one foot above MHHW elevation. The one foot of "allowance" will provide energy dissipation from waves, thus protecting the intertidal habitat. River stone may be used to create the sheltered conditions needed to sustain the marshes while also connecting them to the larger landscape through a common material. The gaps among the stones allow necessary tidal exchange, while the grasses are protected from wave action and sediment loss.

Tidal pools will be integrated into a riprap revetment (a groin constructed at the north end of the site) and river stone sill by substituting precast concrete structures for some of the riprap or stone and by creating and sealing depressions to create the pooling effect during low tides. Large, light-colored, rough boulders will be used in the revetment to minimize temperature changes and allow for a more habitable rock surface. The foot of the boulders will be embedded into the moist substrate, dissipating collected solar heat through the cooling effect of water and shaded substrate. To promote biodiversity and enhance species richness, the pools will be varied in size, depth, and elevation between Mean High Water level (MHW, +1.8 NAVD88) and Mean Low Water level, (MLW, -2.4 NAVD88). In shaping the pools, complicated patterns will be used that create crevices and low energy zones for marine life to find shelter. Voids between rocks will form microclimates for macroinvertebrates. Salvaged shells from oyster (*Crassostrea virginica*) and blue mussel (*Mytilis edulis*) will be used to form a fine substrate for the tidal pool bottom. These shells will create chemical cues to encourage shellfish larvae to settle in the tide pools. Finally, the pools will be inoculated with aged rocks harvested from existing tide pools to aid in the recruitment of aquatic organisms.

The specific type of concrete will be selected based on its receptivity to biological activity. Properties of concrete that best facilitate such activity are having a pH as close as possible to the surrounding seawater coupled with a very rough or porous surface. Recently, cement mixes have been developed that are specifically geared toward biologically receptive marine construction, such as ECOncrete by SeArc Consulting. Cement will be used along with standard concrete aggregates and, when cured, will create a surface matrix with a rough, porous texture and pH lower than that of typical concrete.

3.2.2 Flora

Salt marshes will be planted with smooth cordgrass (*Spartina alterniflora*), the principal vascular plant of salt marshes, which thrives at elevations between Mean High Water and slightly above mean sea level. This is roughly the upper one-third of the mean tide range where it will be flooded by tidal waters twice a day. Denser stands of grass stems will slow tidal water thereby increasing sediment deposition. In the high marsh between Mean High Water and Mean Higher High Water, salt meadow cordgrass (*Spartina patens*), black grass (*Juncus gerardii*), and spike grass (*Distichlis spicata*) will dominate. These plants are shorter in height than their low marsh counterpart with finer stems and leaves. Their roots and rhizomes will form a dense turf which is preferable for the edge of the salt marsh bordering the upland areas.

In tidal pools, vegetation will be volunteer species differentiated by exposure to water, air, and sunlight. Algae will inhabit the high tide zone, which will be flooded for a few hours each day during high tide, withstanding wave action and currents while providing shelter to various aquatic organisms. Common algae would include *Blidingia minima*, *Ulva lactuca*, *Fucus spiralis*, *Fucus vesiculosus*, *Enteromorpha intestinalis*, *Enteromorpha linza*, *Enteromorpha prolifera*, *Chondrus crispus*, *Hildenbrandia sp.*, *Cladophora sericea*, and *Rhozoclonium riparium.* Lichens, which require stability, will favor the spray/splash zone which will be flooded only by the highest tides and storm waves.

3.2.3 Fauna

The River Street project seeks to create nearly 0.45 acres of new salt marsh and tidal pool habitat, greatly expanding the area viable for crustaceans, fish and bird habitat. Over time, decaying cordgrass will break into detritus, fueling the marsh and the myriad of organisms that rely upon it, including amphipods, crabs, snails, shellfish, and small finfish. In spring and summer, the marshes will be lush and highly productive. In late fall, the green cordgrass will begin to golden as leaves dieback and decomposition begins. Water, waves, wind and storms will dislodge and break up decaying leaves and transport them to mud flats and other locations around the marsh. The detritus will form attachment sites for microscopic organisms such as bacteria, fungi, and small algae. These organisms will colonize the broken bits of plant material and break down portions of the detritus that are not digestible by animals. For the most part, this decomposition will occur on or in the sediments where bottom-dwelling scavengers such as worms, fishes, shrimps and crabs live. These animals eat the decaying plant material, along with the bacteria, fungi and attached organisms. The undigested plant material will be colonized again by microorganisms. As the microorganisms utilize detritus and reduce it to smaller and smaller pieces, the remaining detritus will become fertilizer for the next cordgrass crop. In this way, the whole food web cycle will be repeated.

The proposed salt marshes at River Street will also create habitat for insects vital to the larger river ecosystem. Most of these salt marsh invertebrates will consume living plants or fluids secreted by the plants. Some insects will also feed on detritus, though the importance of their role in the food web as grazers and detritus feeders will be small compared to their importance to the abundant species of birds that depend on them for food. The undigested grass eaten by insects will be deposited as feces on the marsh surface where it will become part of the detrital food web. Many fish species living near the salt marsh will rely on insects for food during part of the year.

Decomposed salt marsh cordgrass will provide a habitat and food source for a myriad of organisms in higher trophic levels. Notably, cordgrass stands will create habitat for fiddler crabs and ribbed mussels (*Guekensia demissa*), both of which will enhance the growth of the cordgrass. Ribbed mussels will be ecologically important to the inter-tidal ecosystem. As filter feeders, ribbed mussels will improve water quality and nutrient cycling in estuarine habitats. Ribbed mussels will also increase the structural complexity of the habitat. Clusters of ribbed mussels will be a keystone species in the salt marshes where they will attach themselves to cordgrass stalks and to each other using byssal threads. Ribbed mussels will be found throughout the mid-to-low intertidal elevations. Their upper intertidal limits will be determined by both exposure to high temperatures and limited food availability during the longer periods of tidal exposure. Lower intertidal limits will be determined by the availability of effective refuge, mainly from crab predators.

Salt marshes will also attract an array of other invertebrates including sevenspine bay shrimp (*Crangon septemspinosa*), daggerblade grass shrimp (*Palaemonetes pugio*), blue crabs (*Callinectes sapidus*), and a variety of mollusks. Many of these will serve as prey for ecologically valuable finfish including Atlantic sturgeon (*Acipenser oxyrinchus*), shortnose sturgeon (*Acipenser brevirostrum*), American shad (*Alosa sapidissima*), and striped bass (*Morone saxatilis*). The smaller prey will also attract herons and egrets, raptors, and migratory birds along the Atlantic Flyway.

Organisms found in the tide pools will occupy two basic habitats: the high tide zone and the spray/splash zone. The high tide zone will be flooded for few hours every day during each high tide. Organisms in the high tide zone must survive rough waves and long exposure to air and sun, while algae protect small creatures from the sun. The high tide zone will attract sea anemones, starfishes, chitons, and crabs including hermit crabs, common mud crabs (*Panopeus herbstii*), green crabs (*Carcinus maenus*), and rock crabs (*Cancer irroratus*). Bivalves and gastropods will attach themselves to the rocks, including common mussels (*Mytilus edulis*), ribbed mussels (*Geukensia demissa*), oysters (*Crassostrea virginica*), mud dog whelks (*Llyanassa obsoleta*), and common periwinkles (*Littorina littorea*). The marine algae will provide shelter for such organisms as nudibranchs and hermit crabs. Waves and currents will bring in food to the filter feeders and other tide pool animals. In the spray/splash zone, which will be flooded only by the highest tides and storm waves, there will likely be barnacles favoring dryer conditions including little grey barnacles (*Chthamalus fragilis*) and northern rock barnacles (*Balanus balonoides*). Seabirds such as herring gulls (*Larus argentatus*) and black-backed gulls (*Larus marinus*) will also be likely to visit tide pools as a food source.

3.3 Sub-tidal Zone

The decline of oysters, SAV, and fish populations in the East River tells a larger story of the decline of the estuaries and bays, once pristine examples of coastal ecology. However, with the dedicated efforts of planners, park-builders, and organizations like the Billion Oyster Project, the sub-tidal ecosystem richness can return to the East River. The River Street development would join these efforts with a multi-faceted restoration of sub-tidal habitat supporting oysters, SAV, and fish.

3.3.1 Structure

Sub-tidal restoration will begin by replacing the structure that was lost to channeling and dredging. At the River Street site, two types of structures will be used to create sub-tidal habitat: reef balls, and oyster cages. Reef balls are hollow perforated half-spheres designed to provide protection for foraging fish, a food source for game fish, and surfaces for oysters to build upon. Most of their weight is near the bottom of the structure, allowing them to absorb the force of the currents. The proposed reef balls range in size from 3.0 to 6.0 feet in diameter, 2.0 to 3.8 feet in height, respectively, and will be placed at depths ranging from 6 to 40 feet below Mean Lower-Low Water (MLLW) (-2.6 NAVD88). Minimum depth will be maintained under the minimum tideline due to freezing conditions. Spacing of reef balls relies on the effective protective void space for desirable species. The radius of travel that a fish creates around a reef ball becomes protective void space, and to avoid creating isolated communities, these void spaces will overlap.

In the River Street project, reef balls are proposed to be both anchored to new substrate in nearshore habitat. Proposed reef balls will provide shelter and foraging sites for fish and benthic invertebrates, as well as exponentially larger surface areas for algae and other sub-tidal flora to attach and grow. Placing reef balls adjacent to proposed new shoreline shallows and eel grass pilot planting will allow for synergies between new habitats.

Additional habitat features proposed in the River Street project include oyster cages, steel gabion structures with galvanized steel mesh that will hold oyster shells and promote the propagation of oyster colonies using the "spat-on-shell" method. The shells will host oyster larvae (spat) that grow on their surface, which after time will form dense clusters and eventually grow outside of the cage walls, forming reefs. Gabion cages are best suited for projects in environments with strong currents and deep waters like the project site. Oyster cages have been widely used by the Billion Oyster Project at locations including Brooklyn Bridge Park, Governors Island, Hudson Reefs (underneath Governor Mario M. Cuomo Bridge), Lemon Creek Lagoon on Staten Island, and Jamaica Bay. For the River Street project, oyster gabions are proposed to be stacked in new nearshore habitat. These proposed habitat features will be placed shore-side of the proposed upland adjacent & coastal scrub shrub regions, further bolstering the protection of the calmer nearshore waters and acting as resilient breakwater structures.

3.3.2 Flora

In addition to reef structure, the River Street development will restore native sub-aquatic vegetation. SAV consists of rooted aquatic plants growing in beds that favor shallow areas of estuaries and provide habitat for fish for foraging and reproduction. Eelgrass (*Zostera marina)* pilot sites will be established at River Street to take advantage of reduced water velocity and shallows close to shore. Eelgrass is an important but rare species of SAV that once thrived throughout the estuary. Dredging, poor water quality, and lack of light penetration have driven eelgrass and other SAV out of the East River.

Pilot projects have attempted to reintroduce eelgrass to the estuary with some success. Planting was done in Jamaica Bay at Rockaway Beach, Little Egg Marsh, and Barren Island, though poor water quality and insufficient light penetration hampered its propagation. Eelgrass grows well on the shoreline of Connecticut in Long Island Sound where conditions are more favorable. At the River Street site, conditions will be tailored to favor eelgrass including moderate to low water velocities, substrate ranging from sand to gravel to mud, and ample light penetration, which is a function of turbidity and depth. (USACE, 2016)

3.3.3 Fauna

Oyster cages and reef balls will provide attachment sites for oysters and other shellfish, including crabs and shrimp. This rich ecosystem will in turn attract estuarine fish species including banded killifish (*Fundulus diaphanous*), mummichog (*Fundulus heteroclitus*), Atlantic silverside (*Menidia menidia*), winter flounder (*Pseudopleuronectes americanus*), American shad (*Alosa sapidissima*), alewife (Alosa pseudoharengus), Atlantic sturgeon (*Acipenser oxyrinchus oxyrinchus*), shortnose sturgeon (*Acipenser brevirostrum*), striped bass (*Morone saxatilis*), and American eel (*Anguilla rostrate*). If successfully established, eelgrass will be a productive habitat, providing food; support for fish eggs, barnacles, and bryozoans; shelter for crabs, scallops, snails, and mussels; and foraging for larger species of fish and birds.

4.0 Discussion of Habitat Improvements

4.1 Upland Zone

The upland habitat restoration, including freshwater wetlands, will stabilize soils during storm surge, improve water quality, and attract a variety of desirable species including: Neotropical migratory songbirds, raptors, wading birds, and insects such as butterflies, damselflies and dragonflies, and native pollinating bees. Butterflies and bees are of particular concern due to the decline of both species in recent years. Milkweeds will provide an early season nectar and larval food source for monarch butterflies (*Danaus plexippus*). Planting of milkweeds as a larval host and nectar sources such goldenrods and asters will ease the passage of these butterflies. Bees, which only fly short distances, depend on interconnected natural areas such as green roofs and parks. The River Street development will help link fragmented habitat and facilitate the movement of both bees and butterflies by providing appropriate plants and nesting structures, thereby contributing to global efforts to conserve these two insects. Additionally, the creation of upland and coastal scrub shrub communities directly next to proposed salt marshes will provide vital ecotones.

4.2 Inter-tidal Zone

Where hard marine infrastructure once displaced most of the native intertidal habitat in the East River, in recent years, salt marsh and tidal pools have been used to create soft shorelines favorable to native flora and fauna. Salt marsh as planned for the proposed project will serve to trap and anchor suspended sediment, filter and purify coastal waters, sequester large amounts of carbon (often more efficiently than terrestrial ecosystems), reduce the height of storm surge waves, and create habitat for fish, mammals, birds, crustaceans, bivalves, microorganisms, and other estuarine fauna.

The proposed project's soft edge also will help withstand the turbulent East River, sea level rise, and the destructive forces of extreme weather events while providing ecological benefits that bulkheads do not. The marsh will reduce the high energy found in the East River, slowing the velocity of waves before they reach land, mitigating storm surges. Habitat damage assessments performed in the wake of Hurricane Sandy have begun to demonstrate that "nourished" coastlines (salt marshes and/or dunes) provided greater protection from storm surge damage by dissipating wave energy and reducing coastal flooding. Moreover, the proposed salt marshes will trap nutrients and sediment, building organic matter to form peat so they will be able to grow and keep pace with the rising sea levels.

Finally, the proposed project's salt marshes and tide pools would serve as transitional habitats where ecological communities overlap, creating the right conditions for rich connections among plants, animals, and humans. They will serve as spawning grounds for fish and other marine organisms, stopover points for migratory birds, and shelter for other animals. They will thus serve as biodiversity “builders” for certain species in a critical type of ecosystem that is diminishing. From a user and educational perspective, the marsh will become an exciting location to observe shoreline habitat close-up.

4.3 Sub-tidal Zone

Reef balls, oyster cages, and caissons will provide habitat to shellfish and finfish by simulating natural reefs. Reefs will benefit the health of the site and surrounding estuary by providing solid structure within the water column for sessile (permanently attached or fixed) organisms and by creating homes and hiding places for organisms seeking refuge from predation such as Polychaete worms and blue crabs (*Callinectes sapidus*). Developed reefs will also provide spawning-appropriate substrate for fishes, stabilize bottom sediments for benthic organisms and aquatic plants, and concentrate prey species for larger predator fishes. By using different structures at different distances and depths, the site at River Street will simulate the natural, variegated marine landscape that is typical of shoreline shallows, attracting a wider variety of fish and other organisms. Adding SAV, especially eelgrass, will provide the necessary habitat for many other organisms and the revitalization of a historically and ecologically significant coastal habitat.

Conclusion

The River Street development will showcase the benefits of ecologically-minded waterfront development. First, it will strengthen native ecosystems found in upland, inter-tidal, and sub-tidal zones by enabling soft edges with native habitat. Second, it will leverage a softened waterfront to provide key ecosystem services including water filtration and protection against storm surge. Third, it will provide a key connection with other adjacent ecosystems, contributing to an archipelago of foraging and nesting grounds for aquatic and avian species. The success of the project will strengthen and clarify the message that the flourishing of human communities and the natural environment are not mutually exclusive goals. As more of these projects are undertaken, the East River may in time be restored to a thriving ecosystem in which people and the natural environment co-exist.

References

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2. New York Department of Environmental Conservation (2017). *Living Shorelines Techniques in the Marine District of New York State*
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Appendix A: Existing Site Ecological Survey and Site Map

Zone ID	Ecological Description	General Notes	Species (Common Name)	Species (Scientific Name)
1	Urban Lot	Upland with broken concrete substrate	Mugwort Bedstraw	*Artemisia vulgaris* *Galium Sp.*
2	Urban Lot	Soil Fill	None	*None*
3	Urban Lot	Soil Fill	Mugwort Bedstraw Killdeer	*Artemisia vulgaris* *Galium Sp.* *Charadrius vociferous*
4	Terrestrial Herbaceous	Upland with broken concrete substrate	Mugwort Aster Seaside goldenrod Cool season grass Bedstraw	*Artemisia vulgaris* *Asteraceae Sp.* *Solidago sempervirens* *Daucus carota* *Galium Sp.*
5	Terrestrial Herbaceous	Meadow along 1st street entryway and waterfront	Mugwort Japanese honeysuckle Common reed Black cherry Cool season grass Queen Anne's lace Sweet clover Callery Pear Multiflora rose Cottonwood Wormwood Early goldenrod Groundsel bush Switchgrass Red cedar White snakeroot Foxtail Common milkweed Pin oak Dark-Eyed Junco	*Artemisia vulgaris* *Lonicera japonica* *Phragmites australis* *Prunus serotina* *Poaceae* *Daucus carota* *Melilotus sp.* *Pyrus calleryana* *Rosa multiflora* *Populus deltoides* *Artemisia absinthium* *Solidago juncea* *Baccharis halmifolia* *Panicum virgatum* *Juniperus virginiana* *Ageratina altissima* *Alopecurus sp.* *Asclepias syriaca* *Quercus palustris* *Junco hyemalis*
6	Intertidal Hard Structure	Wooden piling with full light penetration	Barnacle Bladder wrack Green algae	*Balanus sp.* *Fucus vesiculosus* *Enteromorpha cf. intestinalis*

7	Intertidal Hard Structure	Open water, piers, pilings	Bufflehead Barnacles Higher tide green algae Brown algae Brown, microscopic hydroids Lower tide green algae	*Bucephala albeola* *Cirripedia* *Chlorophyta* *Fucus vesiculosus* *Hydrozoan* *Chlorophyta*
8	Terrestrial Herbaceous	Caissons with small pockets of soil around bollards	Ring-billed gull Seaside goldenrod Wormwood Moss Umbrella sedge Cool Season Grass Aster Barnacles Heath aster	*Larus delawarensis* *Solidago sempervirens* *Artemisia absinthium* *Cf. Bryum sp.* *Cyperus sp.* *Poaceae* *Symphyotrichum sp.* *Cirripedia* *Symphyotrichum ericoides*
9	Intertidal Shoreline	Rocky shoreline	Brown algae Midges Green algae Barnacles White Mulberry Black cherry Hackberry English plantain Mugwort Black nightshade Sweet clover	*Fucus vesiculosus* *Diptera* *Chlorophyta* *Cirripedia* *Morus alba* *Prunus serotina* *Celtis occidentalis* *Plantago lanceolata* *Artemisia vulgaris* *Solanum nigrum* *Melilotus sp.*
10	Terrestrial Herbaceous	Upland with broken concrete substrate	High tide bush Common reed Aster Seaside goldenrod Cottonwood Sweet clover	*Iva frutescens* *Phragmites australis* *Symphyotrichum* *Solidago sempervirens* *Populus deltoides* *Melilotus sp.*
11	Intertidal Shoreline	Rock beach	Scuds (amphipods) Red algae High tide worm Green algae Brown algae Sea lettuce	*Gamarrus sp.* *Polysiphonia Sp.* *Nereis sp.* *Enteromorpha cf. intestinalis* *Fucus vesiculosus* *Ulva lactuca*


RIVER ST. SITE VISIT - EXISTING HABITAT ASSESSMENT
METROPOLITAN AVE.
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ATTACHMENT K

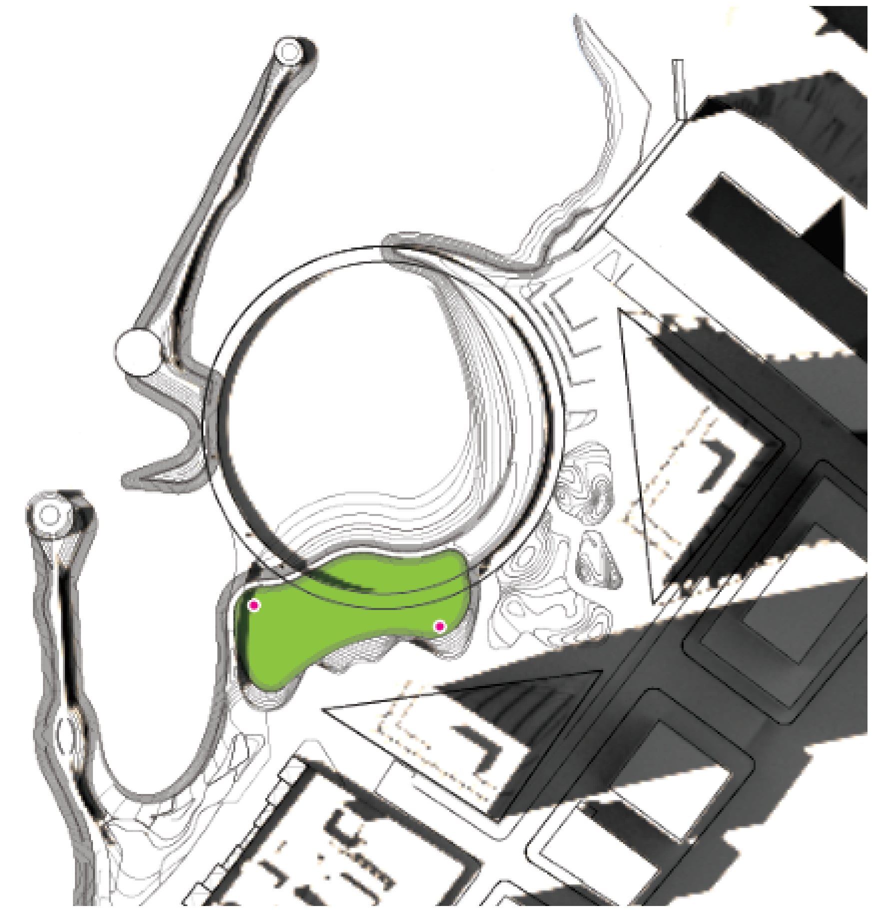
SHADE STUDY

River St. Site Shade Analysis

Comparison with John St. Park

SUMMARY TABLE

DATE	Sunrise Time	Sunset Time	Hours of Sunlight			
			River St (W)	River St. (E)	John St. (W)	John St. (E)
4/15/2020	6:18 AM	7:35 PM	7	7	6	2
5/15/2020	5:39 AM	8:06 PM	7	8	7	6
6/15/2020	5:24 AM	8:29 PM	6	8	9	11
7/15/2020	5:37 AM	8:26 PM	7	9	8	7
8/15/2020	6:06 AM	7:54 PM	8	7	5	4
9/15/2020	6:36 AM	7:05 PM	8	4	4	1
10/15/2020	7:07 AM	6:16 PM	5	1	3	0
11/15/2020	6:43 AM	4:38 PM	5	0	3	0
		TOTAL	53	44	45	31
		AVG	6.6	5.5	5.6	3.9



KEY

Marsh Zone

Sunlight Survey Location

STUDY METHODOLOGY

Salt marsh is commonly identified as an ecosystem that requires full-sun conditions for growth and survival. However, ecosystem restoration professionals have been completing successful salt marsh restorations in the New York City estuary in partially sun-obstructed locations. A shade study was completed to compare the projected shade conditions within the proposed salt marsh at River Street with the existing shade conditions of a successful salt marsh restoration at John Street Park, Brooklyn located on the East River to the south of the River Street site. For both the John Street and proposed River Street marshes, the most shaded points were selected for comparison as they represented worst case scenarios. The 15th of each month immediately prior to, during, and immediately after the growing season were selected. The year 2020 was utilized, however, there are no fluctuations in predicted shade from year to year. The total number of hours of sunlight was calculated for comparison between sites. It was determined that the proposed salt marsh at River Street will receive more sunlight throughout the growing season than the successful restoration at the John Street marsh and, therefore, shade will not be a limiting factor for successful marsh restoration at River Street.

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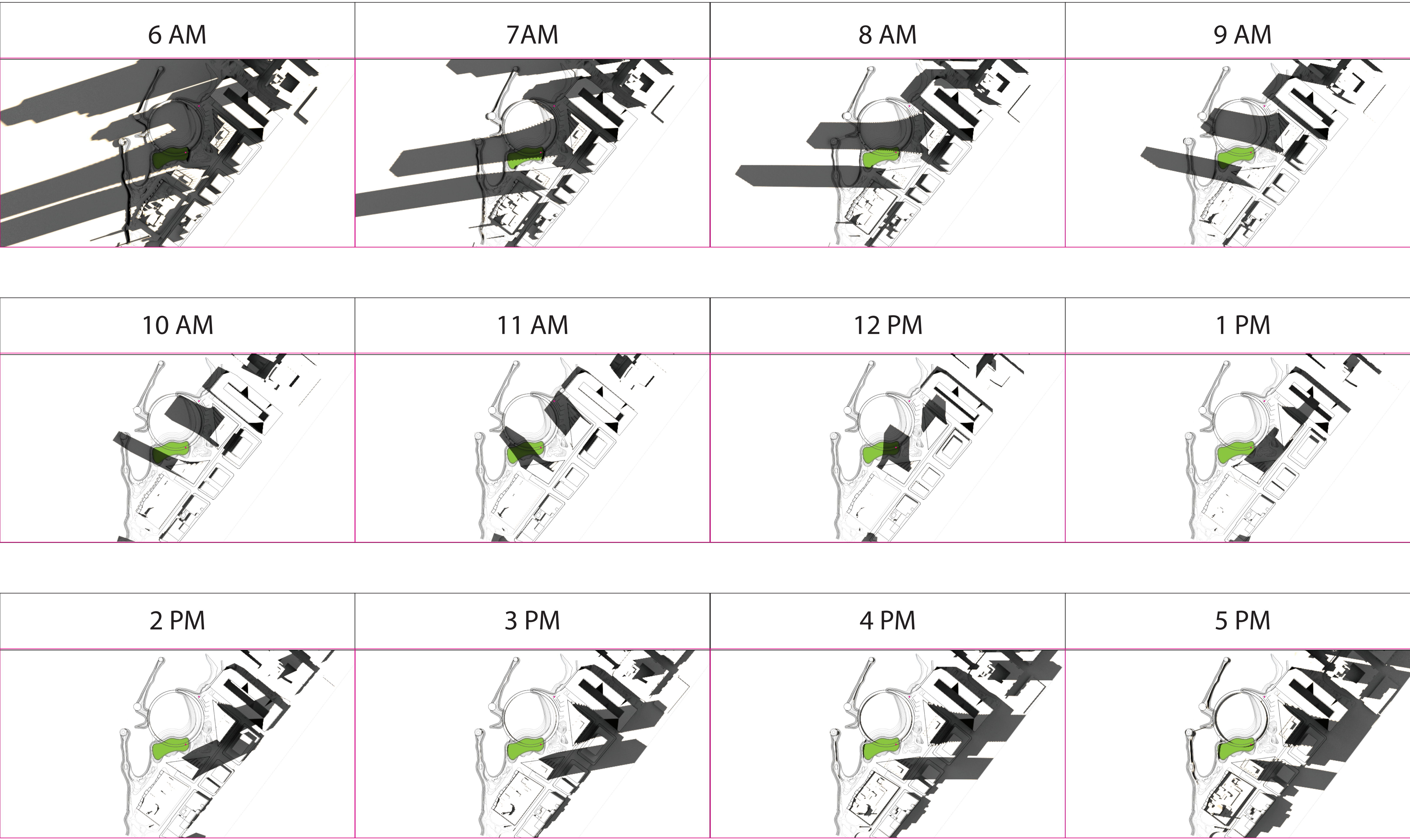

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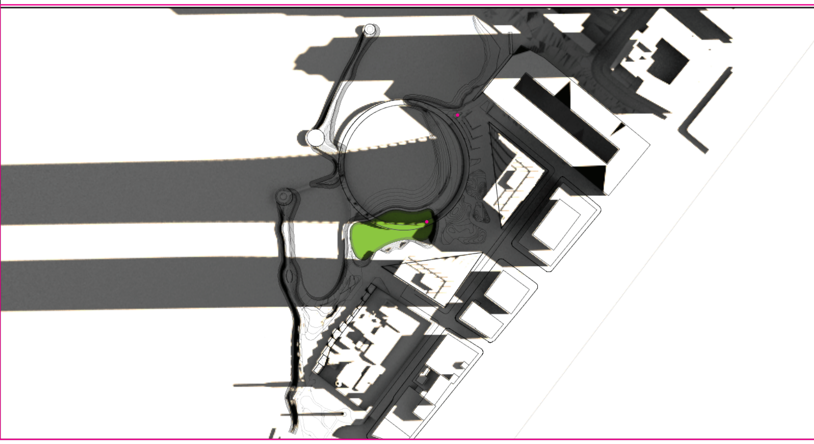

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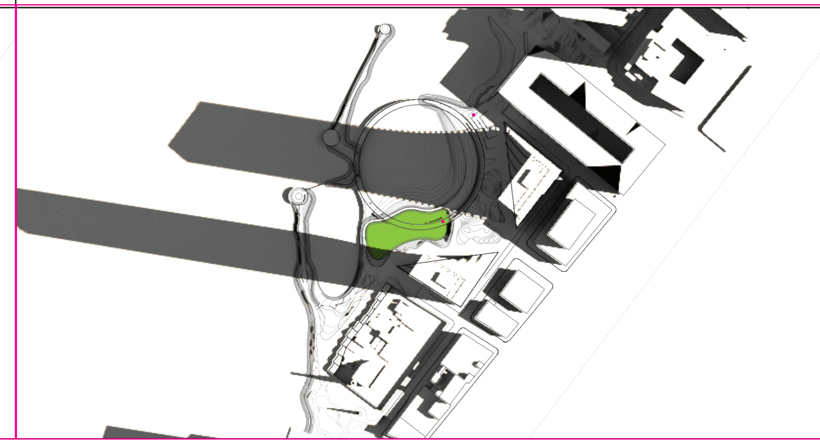

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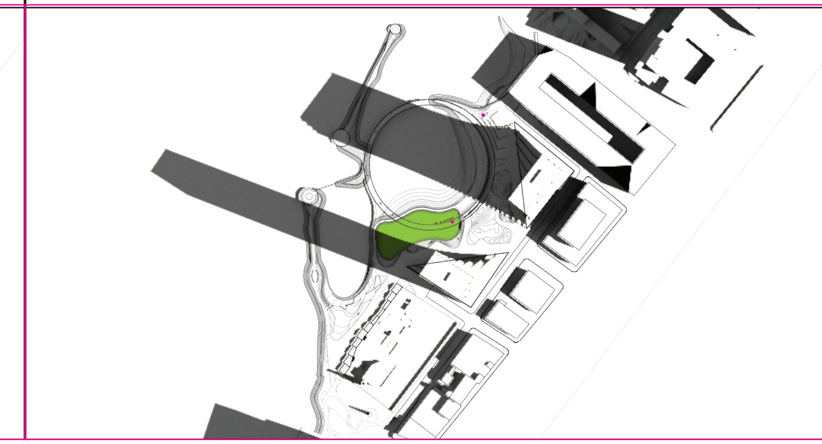

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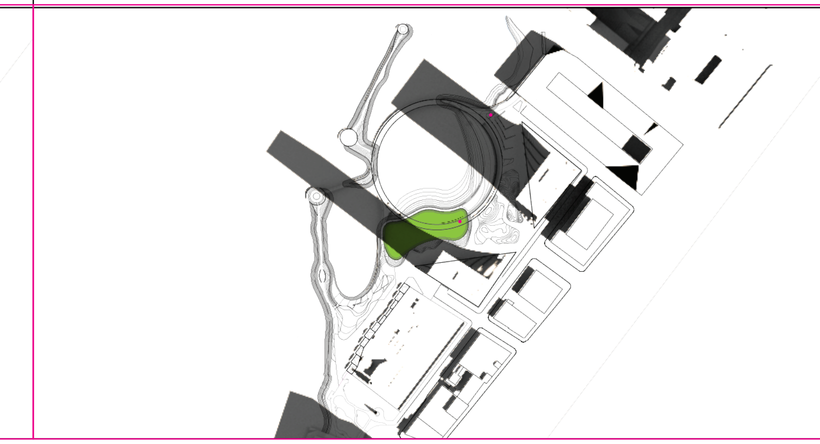

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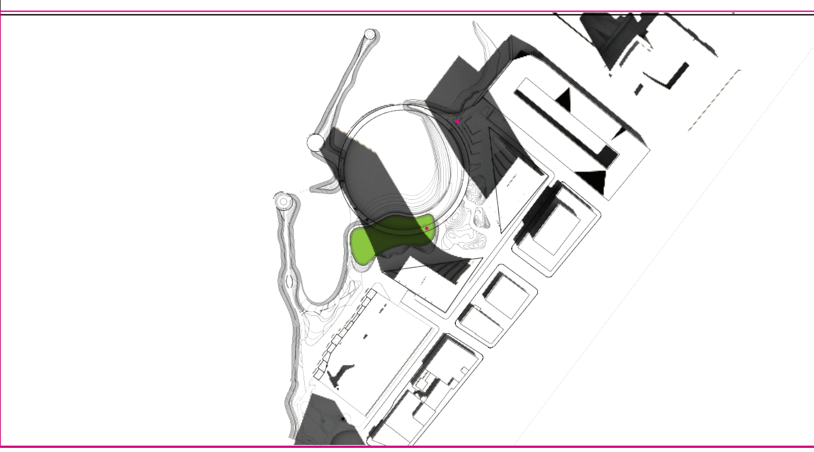

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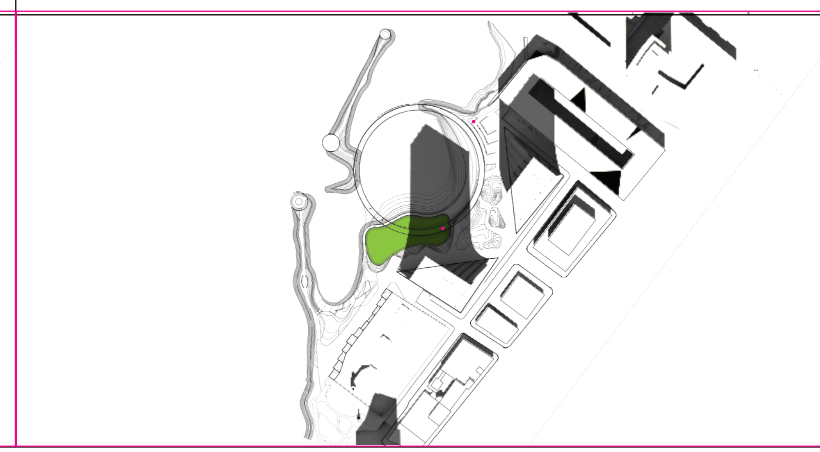

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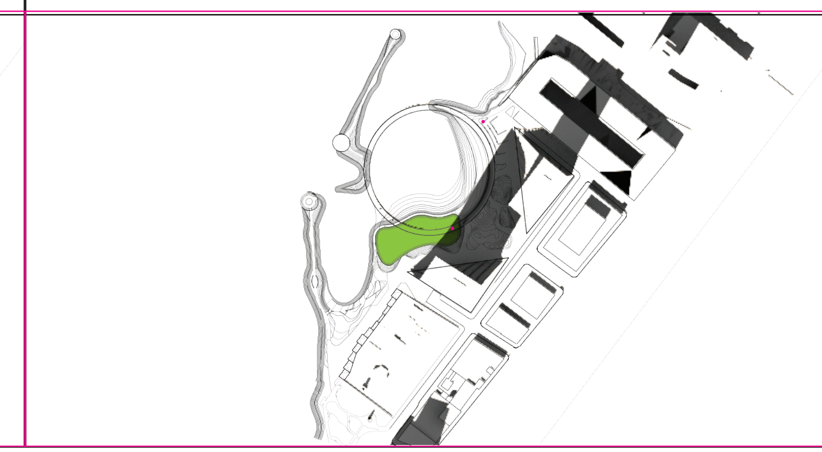

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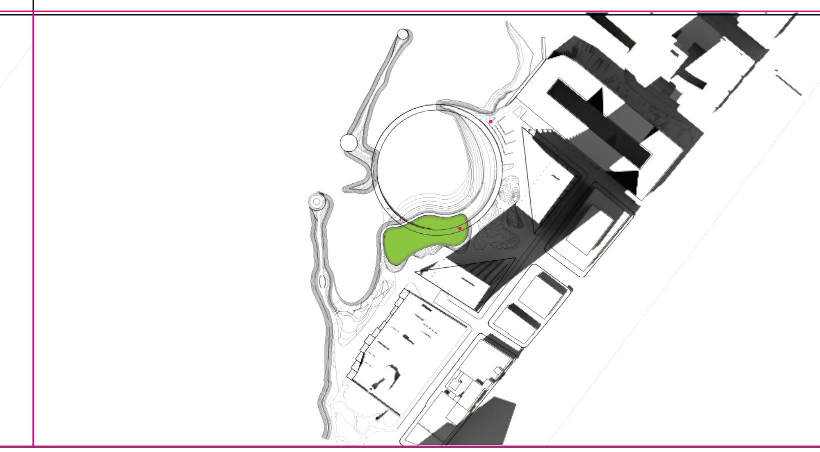

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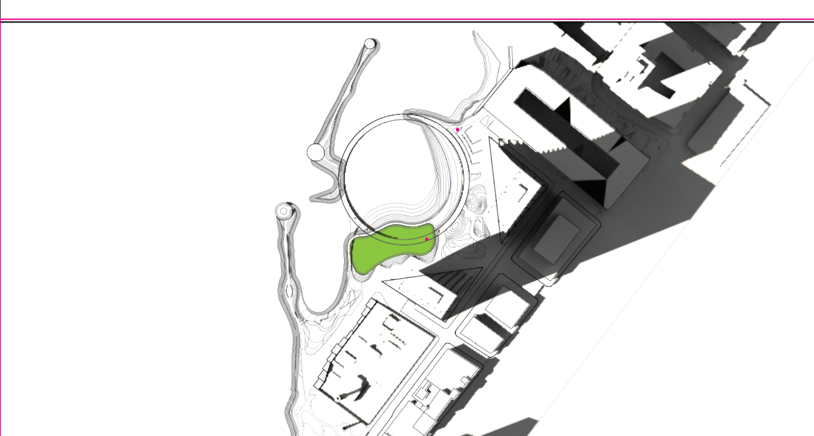

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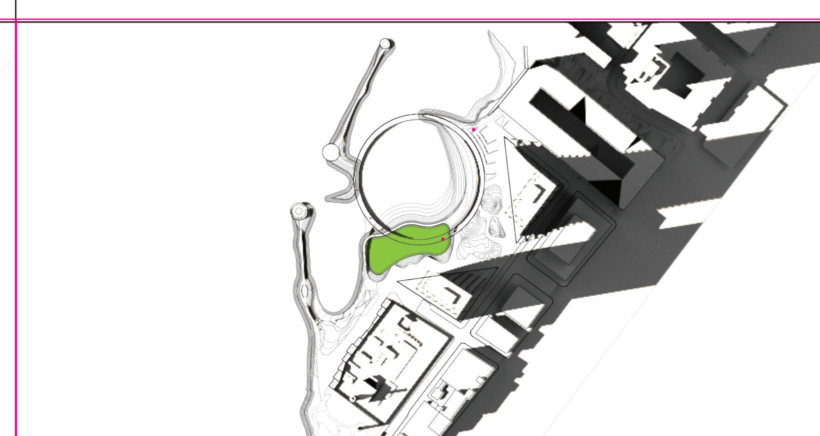

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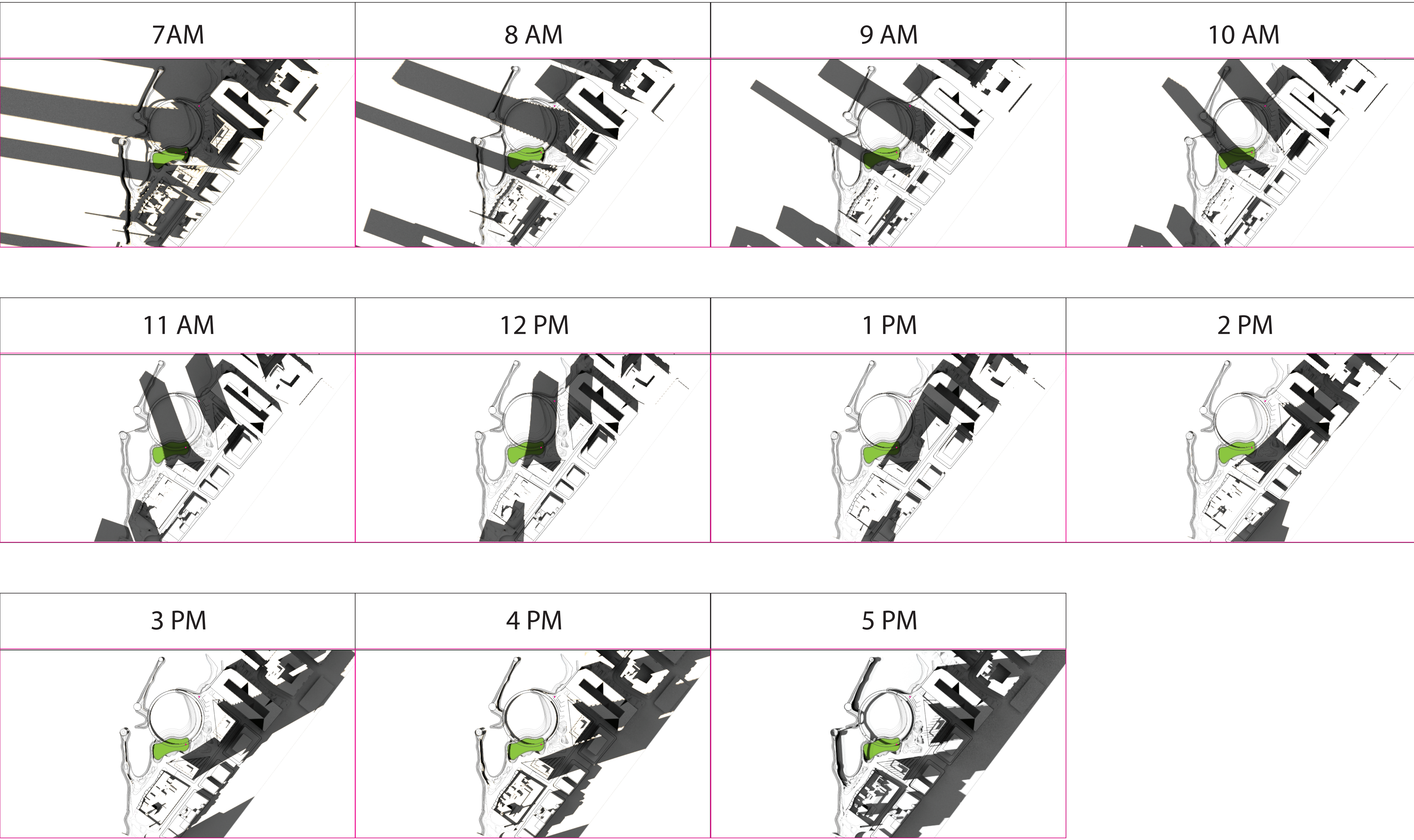

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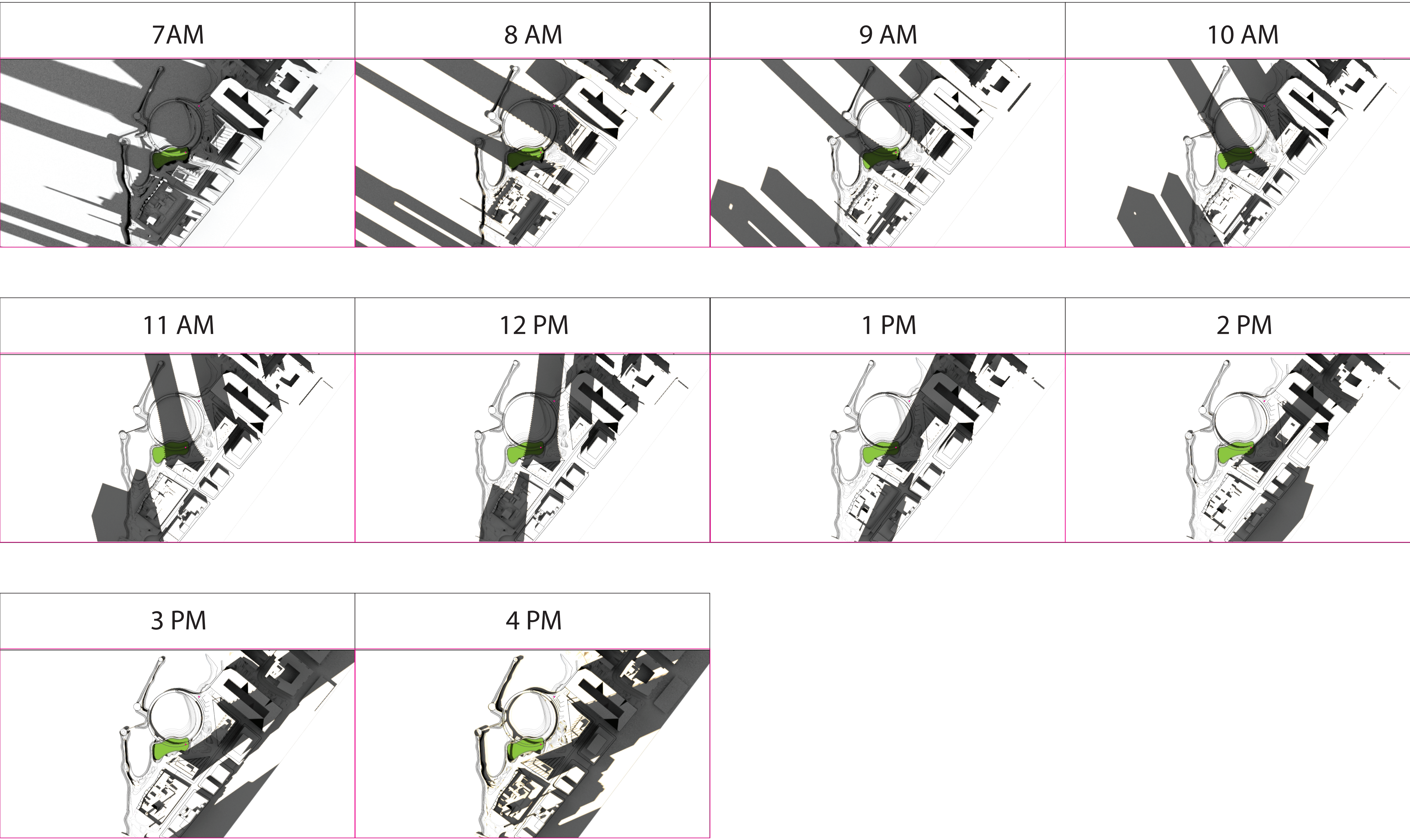

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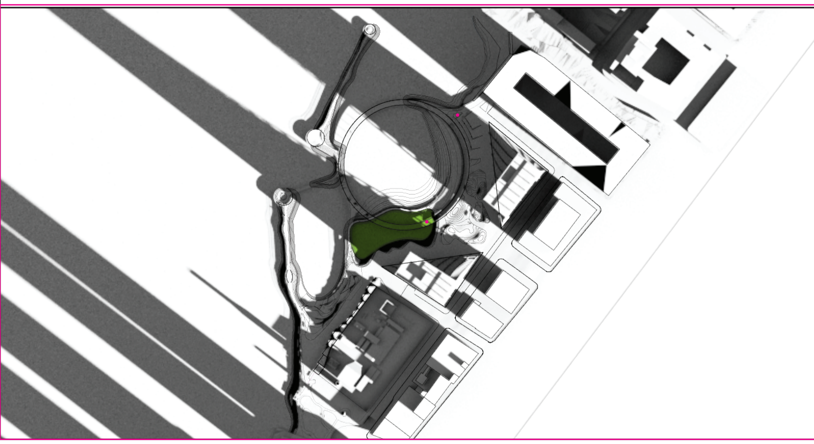

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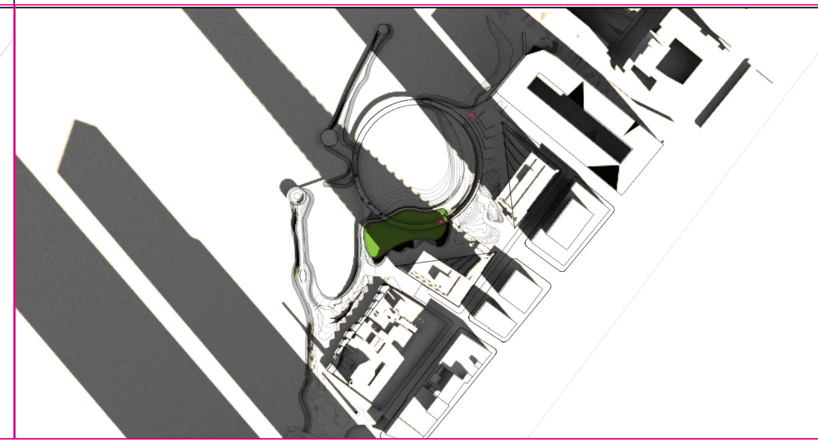

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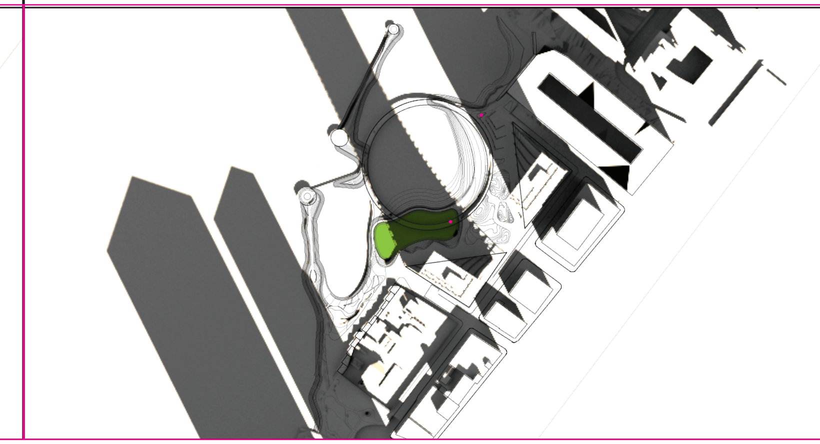

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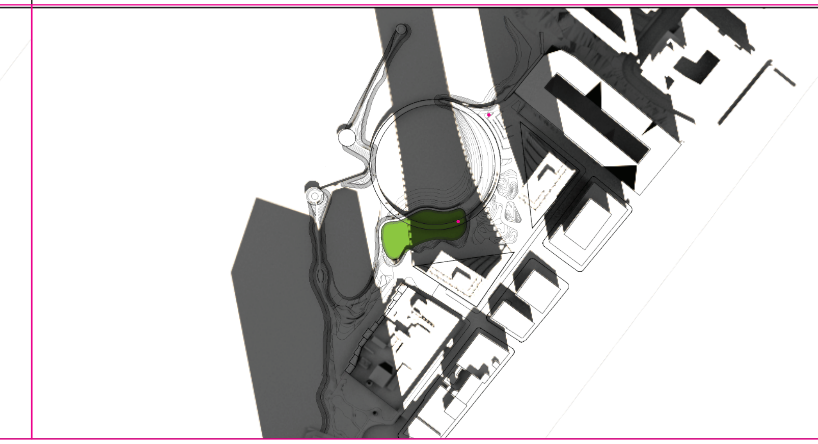

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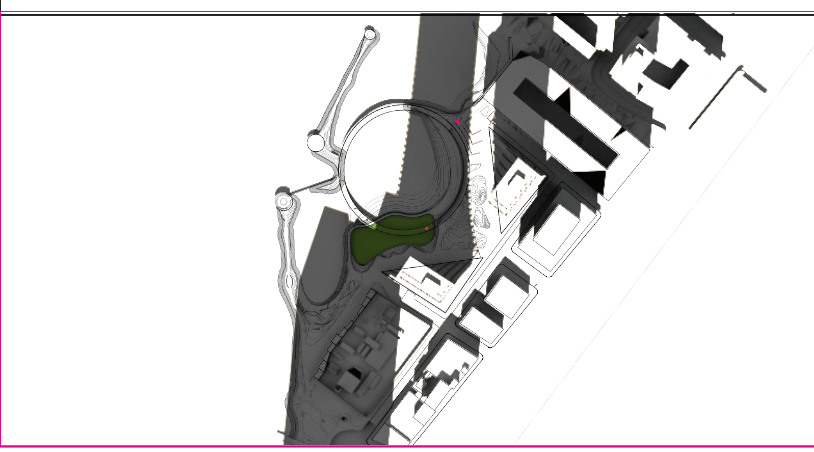

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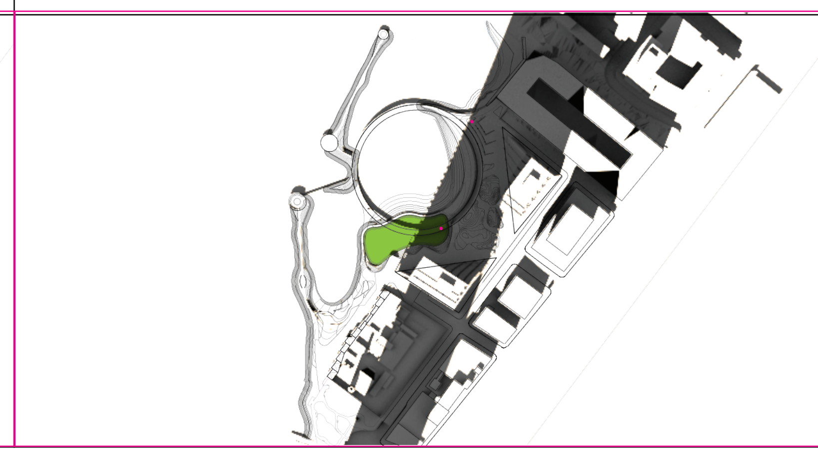

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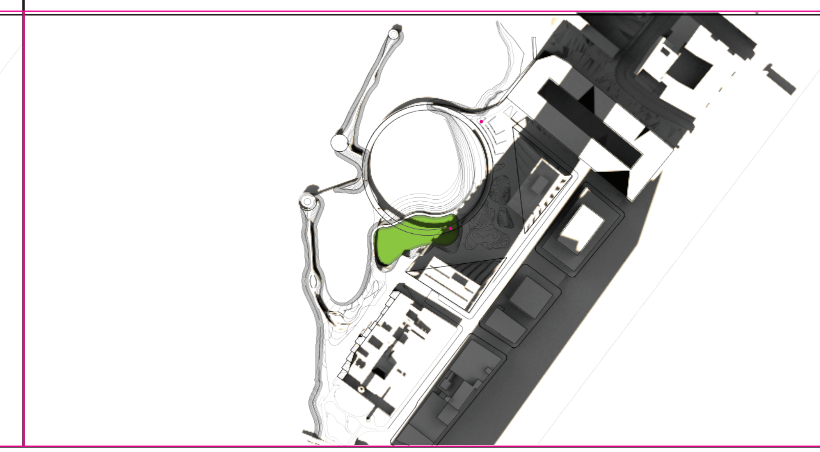

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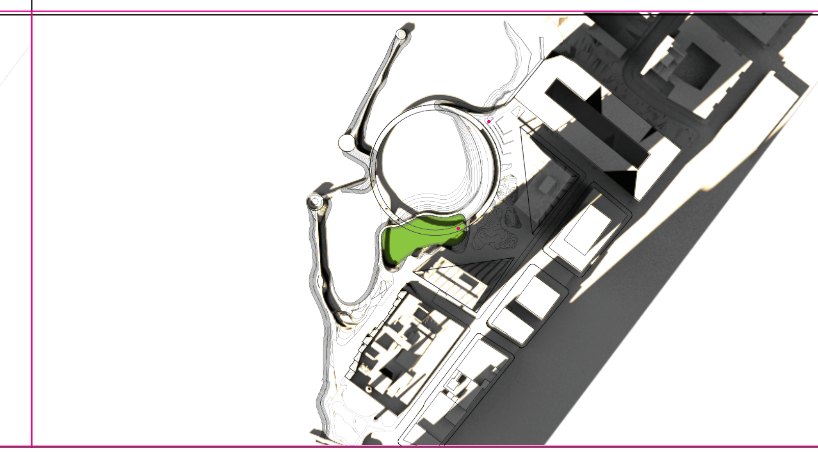

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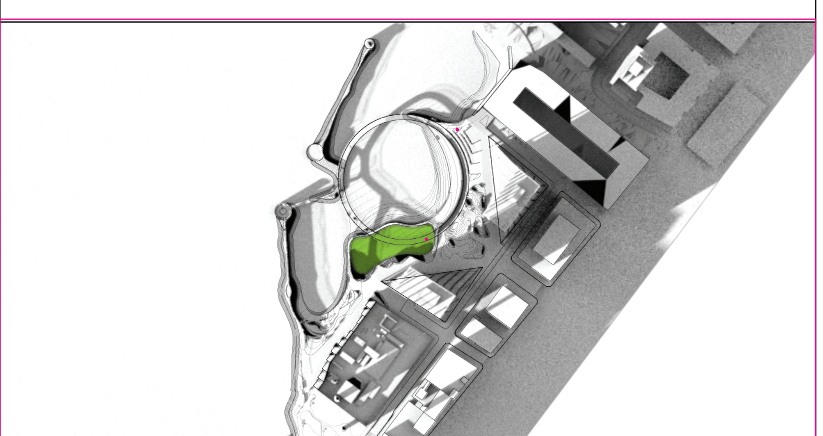

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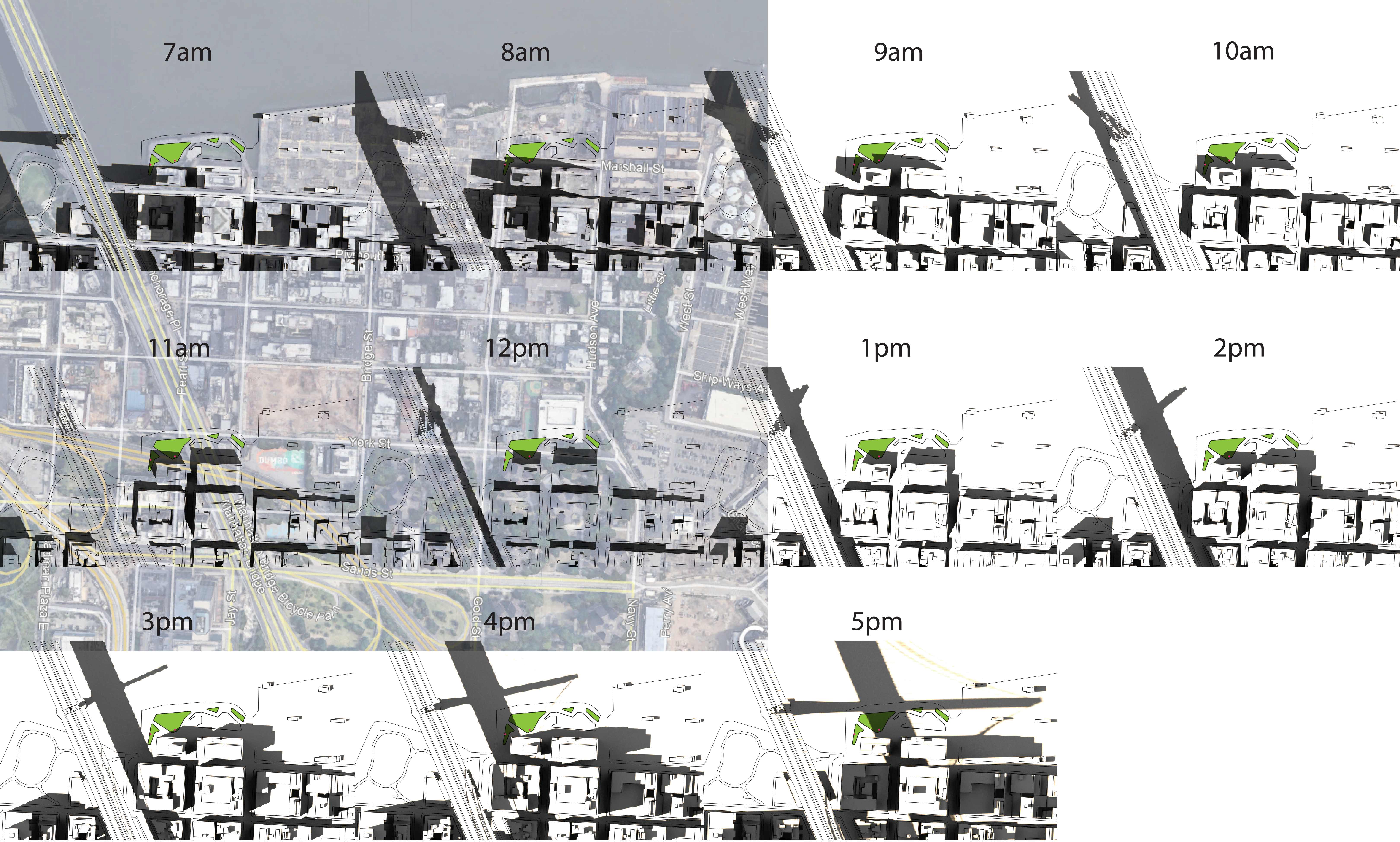

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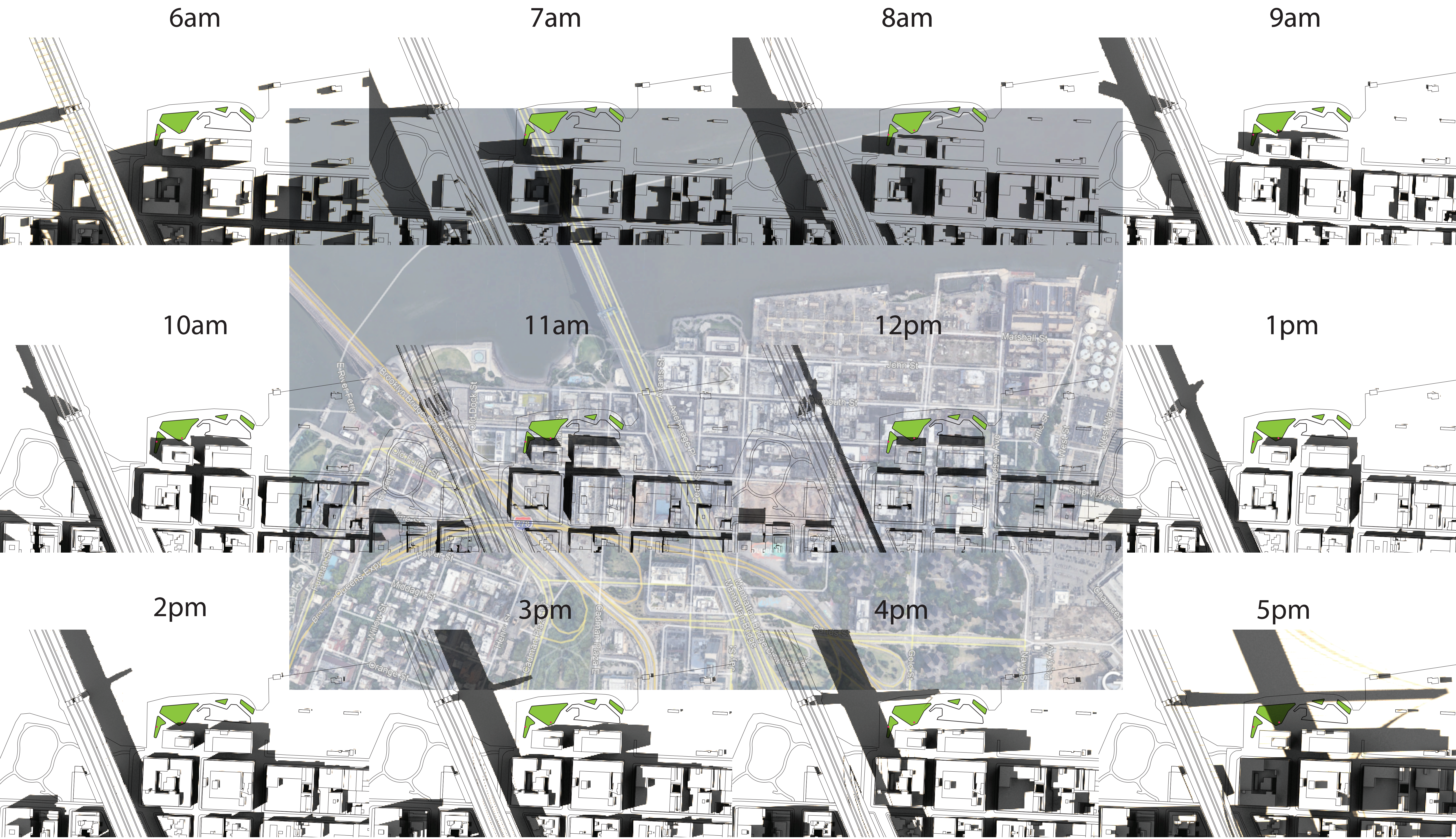

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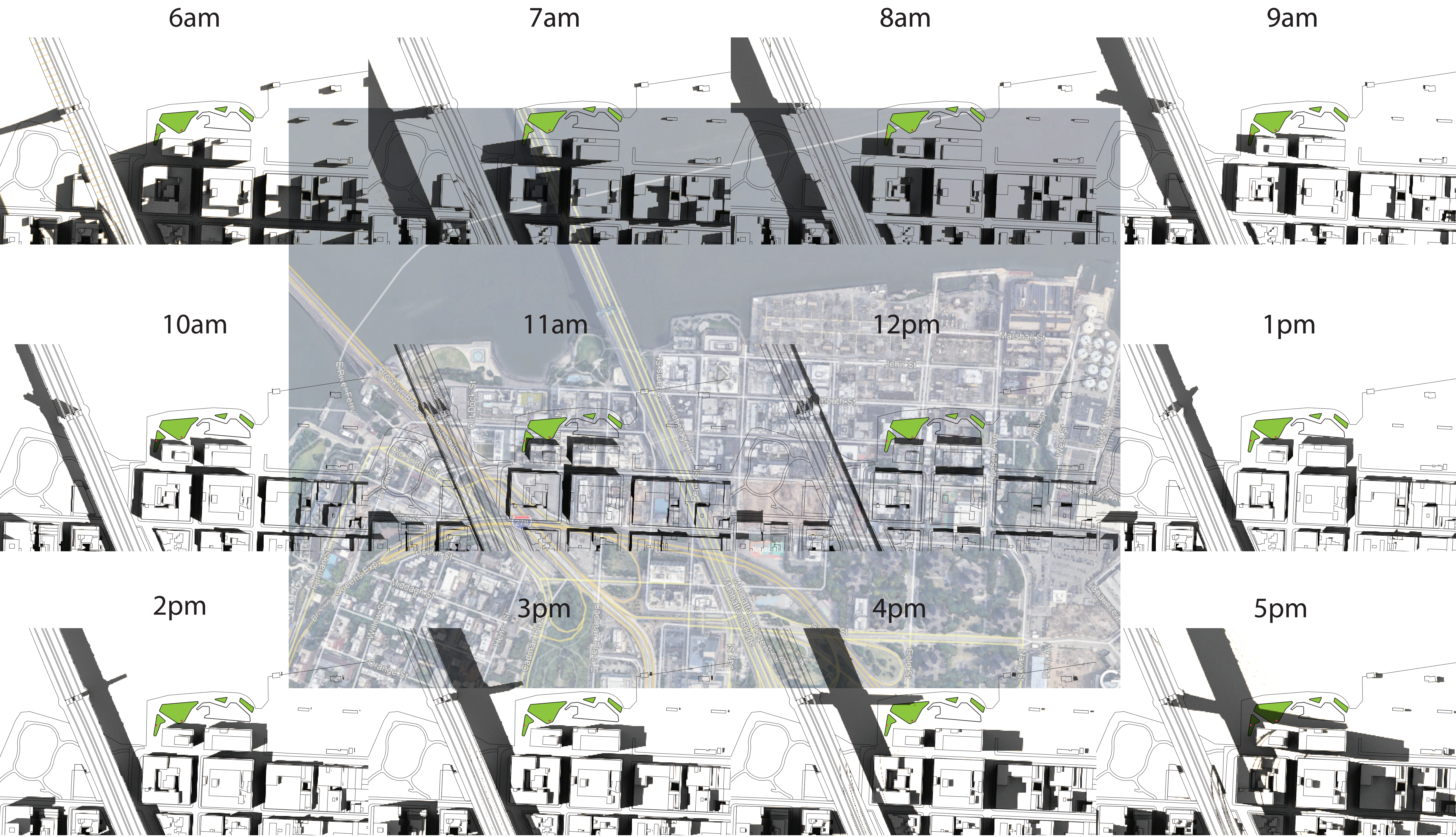

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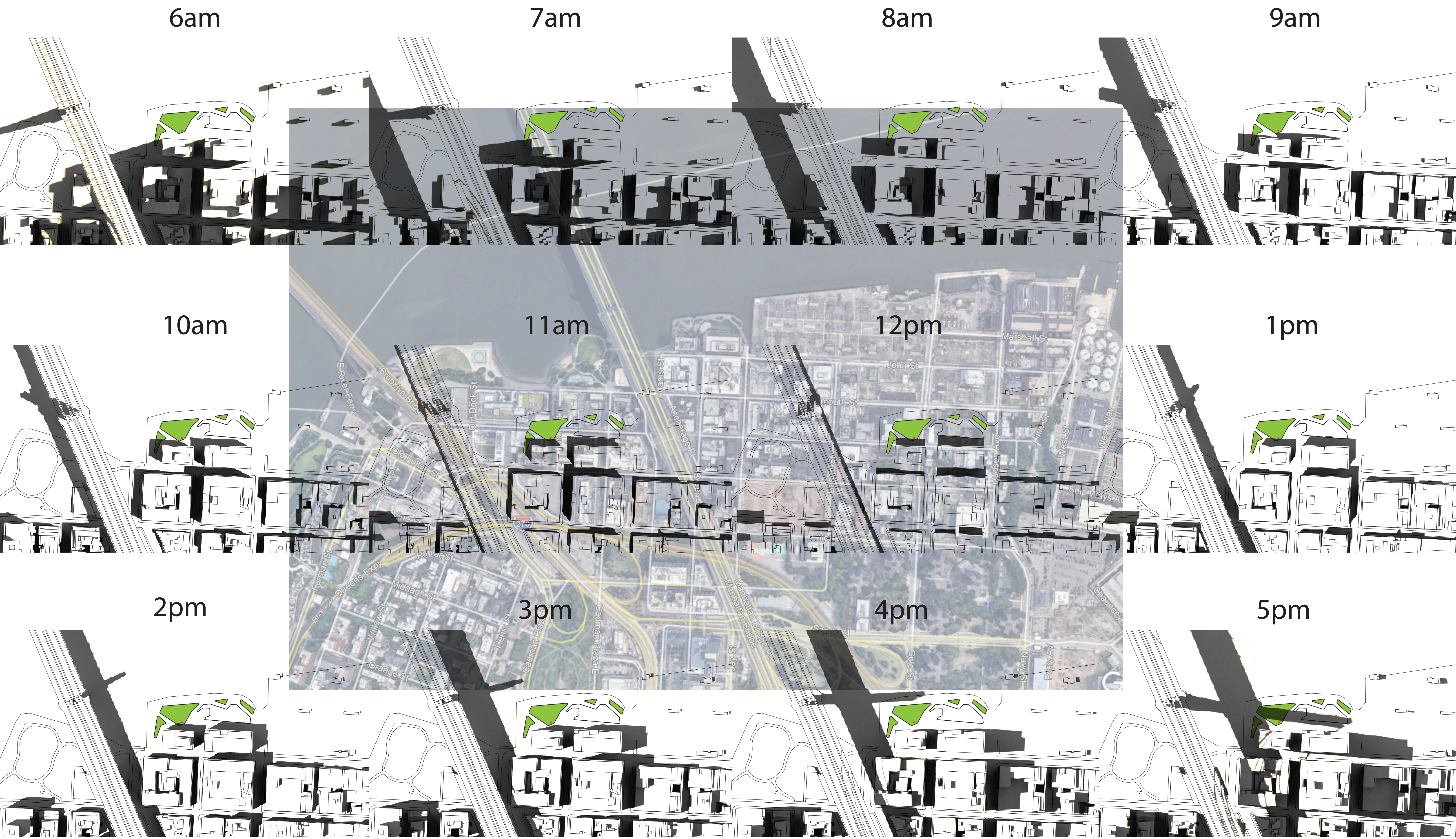

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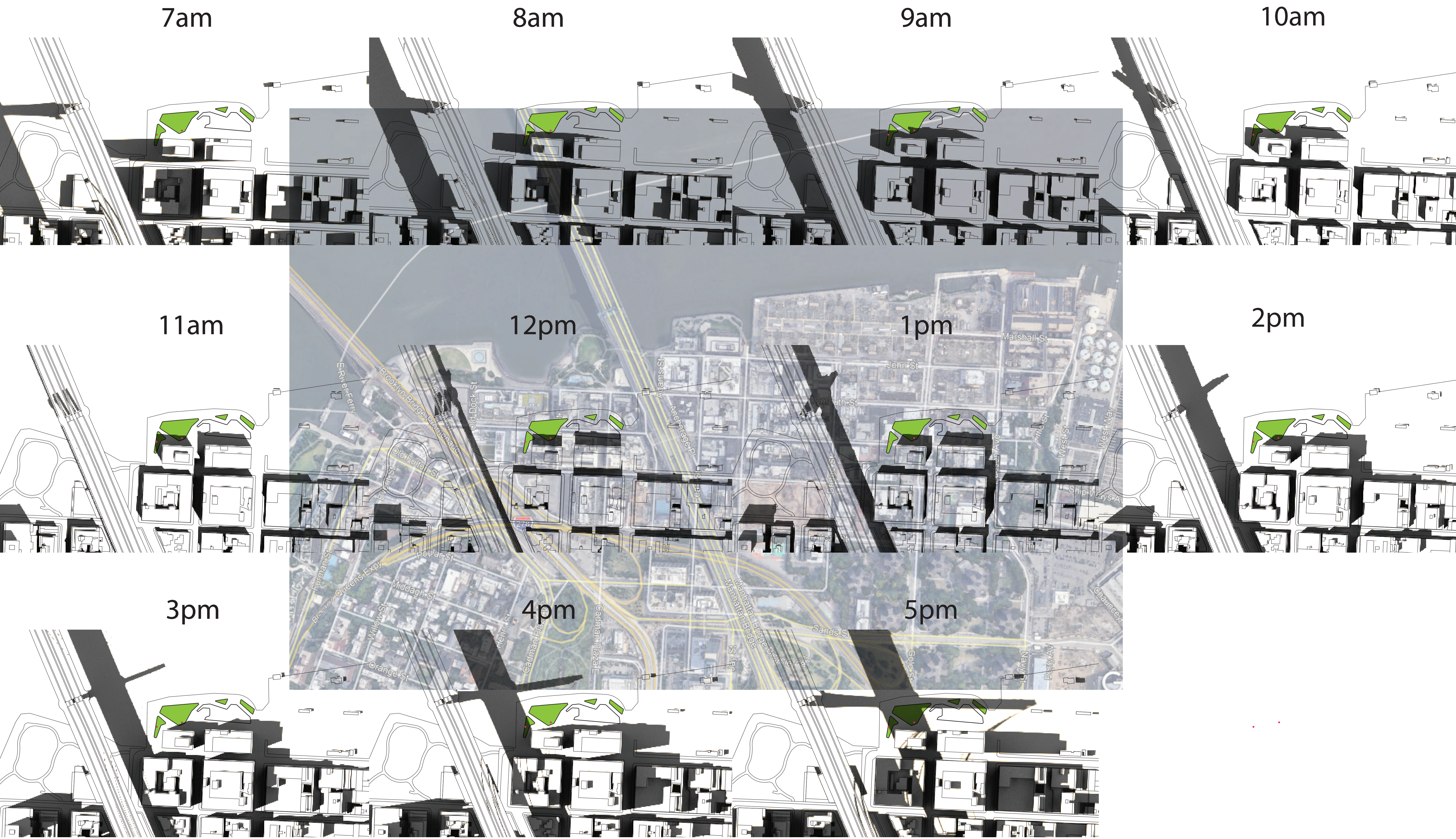

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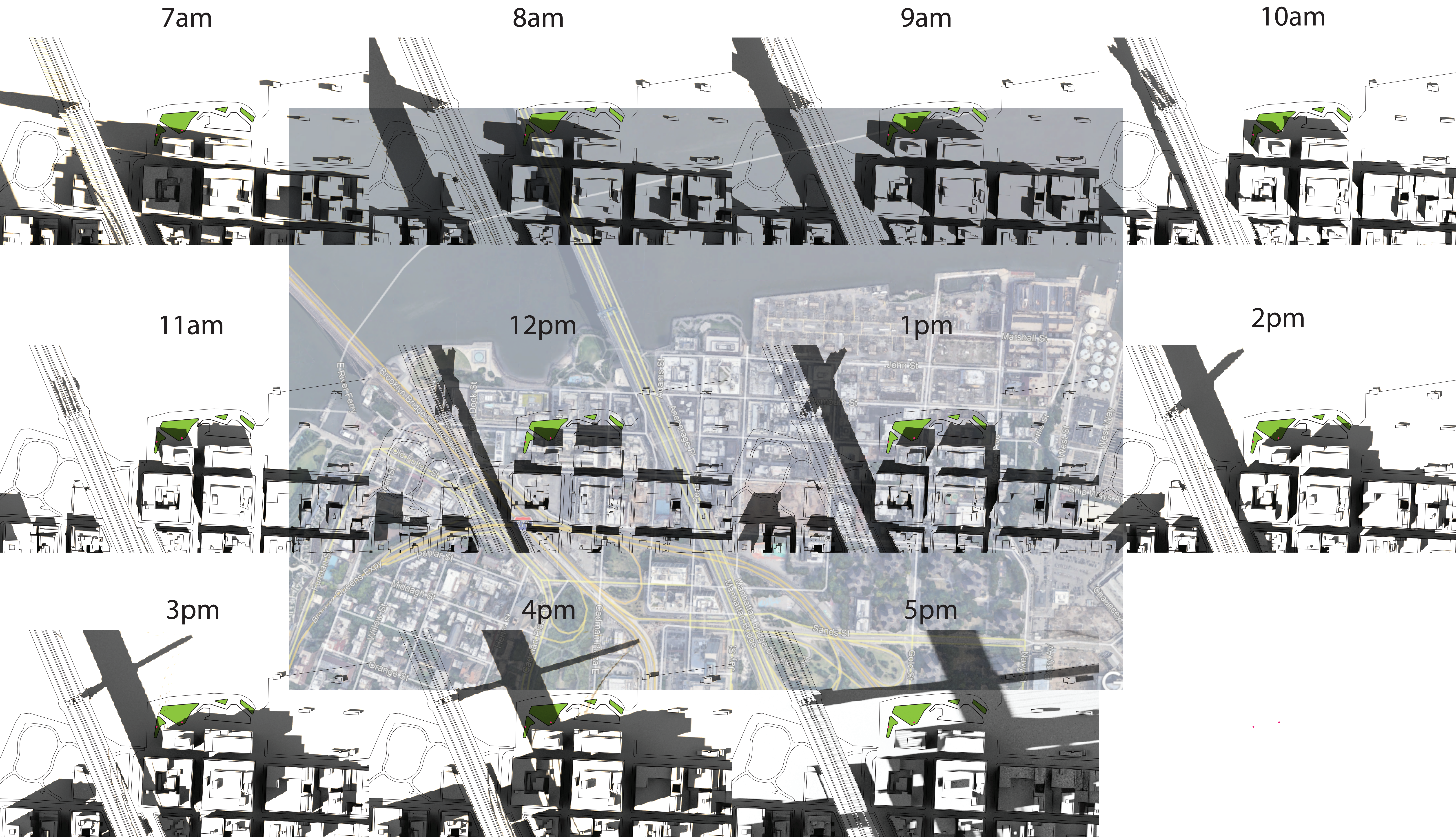

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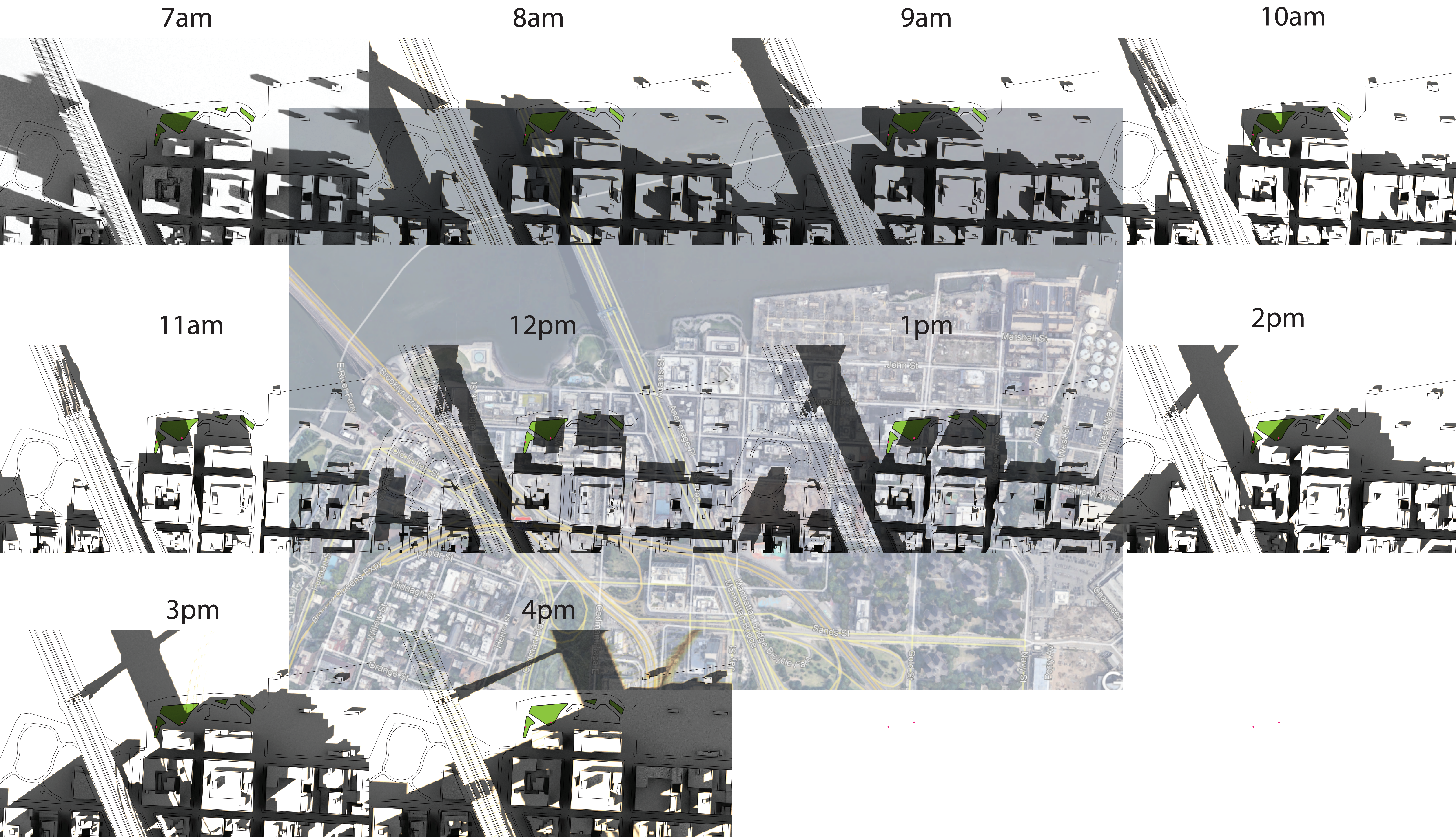

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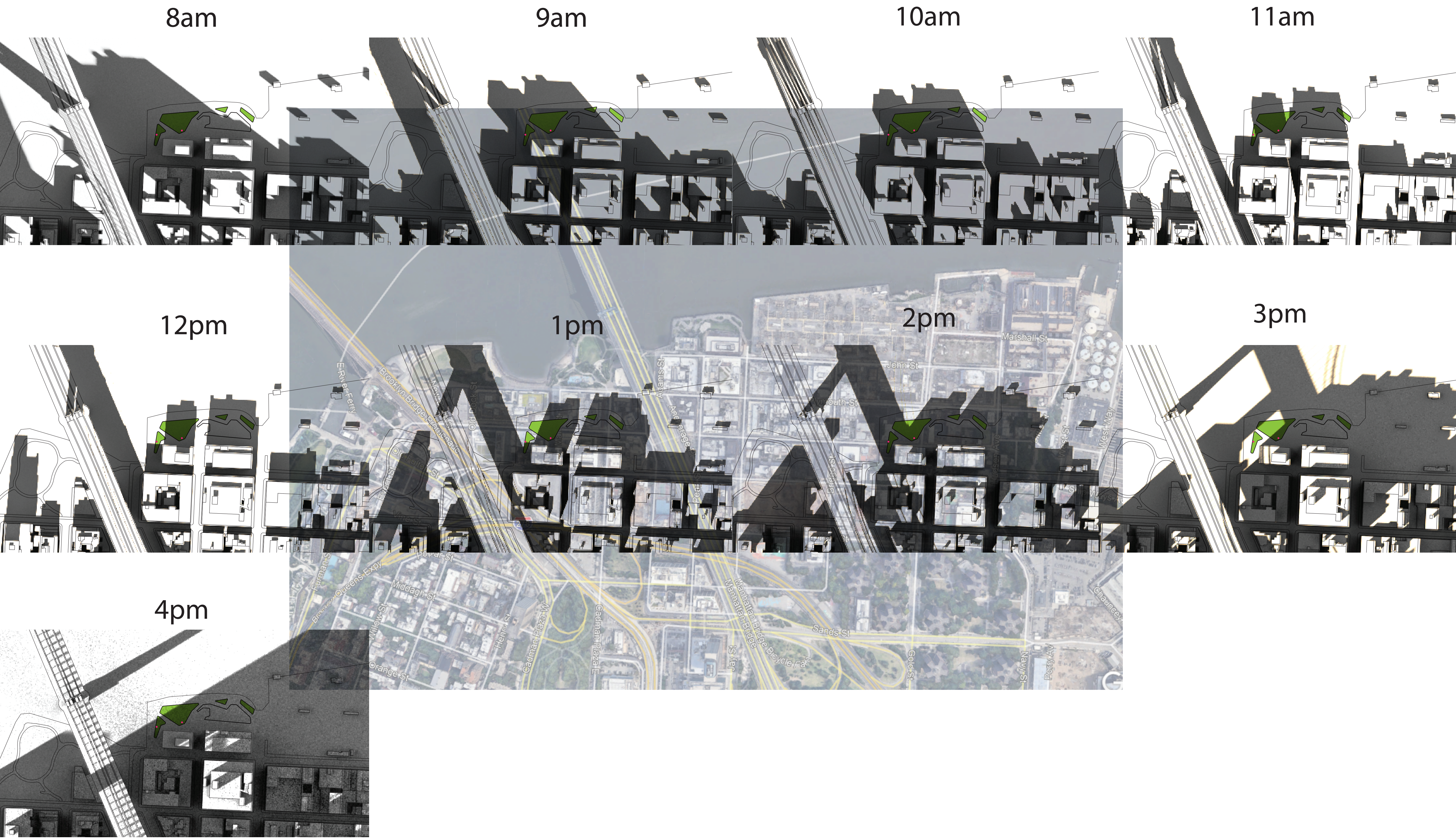

NOVEMBER 2020

JOHN ST. PARK

ATTACHMENT L

ESSENTIAL FISH HABITAT ASSESSMENT

24 April 2021

U.S. Army Corps of Engineers, NY District
Attn: Regulatory Branch – Room 1937
26 Federal Plaza, 19th Floor
New York, New York 10278-0090

Attn: Mr. Stephen Ryba
Chief, Regulatory Branch

Re: NOAA Essential Fish Worksheet
River Street
87-105 River Street
Brooklyn, New York
Langan Project No.: 170594401

Dear Mr. Ryba:

On behalf of Two Trees Management, Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, DPC (Langan) has prepared the attached NOAA Essential Fish Habitat (EFH) Assessment Worksheet for the proposed River Street project, as is required for proposed in-water construction. A summary of the proposed project is provided below.

SITE DESCRIPTION

The River Street project site (Tax Block 2355, Lot 1; Block 2361, Lot 1 and 21; Block 2376, Lot 50) is in the Williamsburg neighborhood of Brooklyn, New York. The site is bordered by North 3rd Street on the north, River Street (north of North 1st Street) and a New York Power Authority (NYPA) facility (south of North 1st Street) on the east, North 1st Street (at NYPA) and Grand Ferry Park (and Domino Park beyond) to the south, and the East River on the west.

The existing shoreline protection, described from south to north, consists of a 265-foot-long by 25-foot-wide wharf, a 65-foot-long riprap revetment, a 205-foot-long bulkhead, and a 285-foot-long cobble slope. A 230-foot-long pile supported apron walkway is waterward of and parallel to the existing bulkhead. A pile-supported fuel service pier extends from the middle of the apron walkway to a pile-supported fuel service platform, about 200 feet from the bulkhead. The North 1st Street Pier extends about 195 feet and is about 5-feet wide; however, the segment that connected the pier to the shore is no longer present. About 200 feet waterward of the shoreline are four cellular caissons. The caissons range in diameter from about 28 to 47 feet. The southern three caissons and the fuel service platform are connected by pile-supported catwalks about 5 feet wide. The North 3rd Street Pier once extended about 245 feet from the former bulkhead, but the deck of the near shore portion no longer exists; only the piles that once supported the deck remain for this portion. A pile-supported timber platform (about 38,000 square feet) at the end of the former North 3rd Street Pier still exists.

PROPOSED PROJECT

The proposed Project would create approximately 267,840 SF of new waterfront public space to facilitate the continuation of public waterfront access. The project would expand public waterfront access along the East River from the Grand Ferry Park (and Domino Park beyond) to the south, while enhancing and creating habitat and increasing the shoreline protection and resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. The upland portion of the project includes a new residential development with two new mixed income residential towers, new waterfront public space, and an esplanade.

The proposed in-water and shoreline improvements would include demolition of all existing in water structures except for three of the existing caissons, reshaping of the entire shoreline to create a protected cove (via in-water excavation and backfill), construction of new shoreline protection measures (e.g., bulkhead, revetment), construction of new breakwaters in consideration of navigational interests and to protect the cove and the habitats that would be created inside the breakwaters, construction of new walkways connecting to the breakwaters, and creation and enhancement of in-water and upland vegetative habitats (e.g., man-made reefs, saltwater marsh, coastal scrub shrubs, tide pools).

The proposed project would include the creation and enhancement of various marine and freshwater habitats, resulting in significant improvements to on-site habitats upon project completion.

1) Salt Marsh and Tide Pools – About 19,044 SF of salt marsh and tide pools would be created along the cove between the beach and the boat ramp. About 4,650 SF of the salt marsh and tide pools would be covered by a metal grate boardwalk at MHW (4,657 SF at MHHW). The tide pools and channels are located under the boardwalk to minimize the impact of shading on the salt marsh planted areas.

2) Upland Adjacent & Coastal Scrub Shrub – About 21,137 SF of upland coastal scrub shrub areas would be created on large portions of the breakwaters, on the north and south end of the beach, and various upland locations along the shore public walkway.

3) Reef Balls & Oyster Cages – About 21,996 SF of man-made reefs would be created on the river bottom adjacent to the breakwaters, along the shoreline east of the salt marsh, and on the south side of the groin (within the protected cove). The reefs would

be made primarily of oyster cages and manufactured reef balls, and would be installed in areas that are permanently submerged underwater.

4) Shoreline Shallows – About 17,855 SF of shoreline shallows would be created within the cove adjacent to the public beach and salt marsh.

5) Intertidal and Littoral Zones – about 6,735 SF of new Littoral Zone habitat and about 14,793 SF of new Intertidal Zone habitat would be created on the new breakwaters at MHW (about 6,735 SF of Littoral Zone habitat and 16,148 SF of Intertidal Zone habitat at MHHW). Ecological armoring and seawall panels would be used in the new Littoral Zone to encourage biological growth and habitation. The precast concrete tubs forming the structure of the breakwaters would have ECOncrete® seawall precast panels attached. Ecological armoring units (e.g., ECO Armor Blocks, Tide Pool Armor, and Mats by ECOncrete®) would be used as erosion protection on the berms forming the top of the breakwaters. In addition, the excavation to create the cove and salt marsh would net another about 5,227 SF of created Littoral Zone and about 2,024 SF of Intertidal Zone along the shoreline at MHW (about 4,774 SF net created Littoral Zone and 591 SF of net created Intertidal Zone at MHHW). Overall, the Project creates about 11,962 SF of Littoral Zone and 16,817 SF of Intertidal Zone below MHW (about 11,509 SF of Littoral Zone and 16,739 SF below MHHW).

6) Eel Grass Pilot Program – About 9,958 SF of eel grass would be planted within the sandy substrate of the shoreline shallows as a pilot program. The survivability and health of the eel grass would be evaluated over time.

In all, a total of about 106,804 SF (2.45 acres) of new or enhanced marine and tidal wetland habitats would be created by this Project.

Temporary construction impacts would be mitigated using turbidity curtains, environmental buckets, and other best management practices. Based on the new habitat creation and restoration, the site would become better habitat for fish and shellfish once construction is completed.

ESSENTIAL FISH HABITAT ASSESSMENT

Langan has completed an evaluation of potential impacts to threatened and endangered species and essential fish habitats. The Project is expected to have no long-term impact on threatened and endangered species, or on essential fish habitats. Upon completion of the construction, the Project will provide significant improvements in habitats (as described above). Permits for the Domino Park construction, to the south of this project, did not require moratoriums during construction. Since this project is in the same stretch of the East River and has similar construction procedures, moratoriums are not expected to be necessary for this Project.

CLOSING

If you have any questions regarding the enclosed materials, please do not hesitate to contact our office.

Sincerely,
Langan Engineering and Environmental Services, Inc.

Kenneth Huber, PE
Senior Project Manager

Enclosure: Essential Fish Habitat (EFH) Assessment Worksheet

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NOAA FISHERIES
GREATER ATLANTIC REGIONAL FISHERIES OFFICE
Essential Fish Habitat (EFH) Consultation Guidance
EFH ASSESSMENT WORKSHEET

Introduction:

The Magnuson-Stevens Fishery Conservation and Management Act (MSA) mandates that federal agencies conduct an essential fish habitat (EFH) consultation with NOAA Fisheries regarding any of their actions authorized, funded, or undertaken that may adversely affect EFH. An adverse effect means any impact that reduces the quality and/or quantity of EFH. Adverse effects may include direct or indirect physical, chemical, or biological alterations of the waters or substrate and loss of, or injury to, benthic organisms, prey species and their habitat, and other ecosystem components. Adverse effects to EFH may result from actions occurring within EFH or outside of EFH and may include site-specific or habitat-wide impacts, including individual, cumulative, or synergistic consequences of actions.

This worksheet has been designed to assist in determining whether a consultation is necessary and in preparing EFH assessments. This worksheet should be used as your EFH assessment or as a guideline for the development of your EFH assessment. At a minimum, all the information required to complete this worksheet should be included in your EFH assessment. If the answers in the worksheet do not fully evaluate the adverse effects to EFH, we may request additional information in order to complete the consultation.

An expanded EFH assessment may be required for more complex projects in order to fully characterize the effects of the project and the avoidance and minimization of impacts to EFH. While the EFH worksheet may be used for larger projects, the format may not be sufficient to incorporate the extent of detail required, and a separate EFH assessment may be developed. However, regardless of format, the analysis outlined in this worksheet should be included for an expanded EFH assessment, along with additional information that may be necessary. This additional information includes:

- the results of on-site inspections to evaluate the habitat and site-specific effects
- the views of recognized experts on the habitat or the species that may be affected
- a review of pertinent literature and related information
- an analysis of alternatives to the action that could avoid or minimize the adverse effects on EFH.

Your analysis of adverse effects to EFH under the MSA should focus on impacts to the habitat for all life stages of species with designated EFH, rather than individual responses of fish species. Fish habitat includes the substrate and benthic resources (e.g., submerged aquatic vegetation, shellfish beds, salt marsh wetlands), as well as the water column and prey species.

Consultation with us may also be necessary if a proposed action results in adverse impacts to other NOAA-trust resources. Part 6 of the worksheet is designed to help assess the effects of the action on other NOAA-trust resources. This helps maintain efficiency in our interagency coordination process. In addition, further consultation may be required if a proposed action impacts marine mammals or threatened and endangered species for which we are responsible. Staff from our Greater Atlantic Regional Fisheries Office, Protected Resources Division should be contacted regarding potential impacts to marine mammals or threatened and endangered species.

Instructions for Use:

Federal agencies must submit an EFH assessment to NOAA Fisheries as part of the EFH consultation. Your EFH assessment must include:

1) A description of the proposed action.
2) An analysis of the potential adverse effects of the action on EFH, and the managed species.
3) The federal agency's conclusions regarding the effects of the action on EFH.
4) Proposed mitigation if applicable.

In order for this worksheet to be considered as your EFH assessment, you must answer the questions in this worksheet fully and with as much detail as available. Give brief explanations for each answer.

Federal action agencies or the non-federal designated lead agency should submit the completed worksheet to NOAA Fisheries Greater Atlantic Regional Fisheries Office, Habitat Conservation Division (HCD) with the public notice or project application. Include project plans showing existing and proposed conditions, all waters of the U.S. on the project site, with mean low water (MLW), mean high water (MHW), high tide line (HTL), and water depths clearly marked and sensitive habitats mapped, including special aquatic sites (submerged aquatic vegetation, saltmarsh, mudflats, riffles and pools, coral reefs, and sanctuaries and refuges), hard bottom habitat areas and shellfish beds, as well as any available site photographs.

For most consultations, NOAA Fisheries has 30 days to provide EFH conservation recommendations once we receive a complete EFH assessment. Submitting all necessary information at once minimizes delays in review and keeps review timelines consistent. Delays in providing a complete EFH assessment can result in our consultation review period extending beyond the public comment period for a particular project.

The information contained on the HCD Consultation website and NOAA's EFH Mapper will assist you in completing this worksheet. Please note that the Mapper is currently being up-dated with new designations and EFH maps and text descriptions for many species are temporarily missing. When you open the Mapper, read the WARNING that pops up when you click on the Greater Atlantic Region. It will direct you to a document with maps and text descriptions for each of the missing New England Species and to the Mapper's Data Inventory where a data layer for all the missing species is available for downloading into GIS software. Once the Mapper is up-dated, you can do a Location Query for your project location, but until then, the only way to easily generate a list of the missing species and life stages is to use your own GIS software. Before you fill out the worksheet, we recommend that you check with the appropriate HCD staff member to ensure that your list is complete and accurate. They will be able to answer any questions that you have.

Also note that a number of new Habitat Areas of Particular Concern (HAPCs) have been designated in the Greater Atlantic Region. HAPC maps will also be added to the Mapper the next time it is up-dated. Currently, they can be viewed by following the instructions on the warning page for the region. We expect the Mapper to be fully up-dated and functional later this spring.

EFH ASSESSMENT WORKSHEET FOR FEDERAL AGENCIES (modified 3/2016)

PROJECT NAME: River Street

DATE: 04/07/2021

PROJECT NO.: 170594401

LOCATION (Water body, county, physical address):

The project site (Tax Block 2355, Lot 1; Block 2361, Lot 1 and 21; Block 2376, Lot 50) is in the Williamsburg neighborhood of Brooklyn, New York. The site is bordered by North 3rd Street on the north, River Street (north of North 1st Street) and a NYPA facility (south of North 1st Street) on the east, North 1st Street (at NYPA) and Grand Ferry Park (west of NYPA) to the south, and the East River on the west.

PREPARER: Morgan Devlin

Step 1: Use NOAA's EFH Mapper to generate the list of designated EFH for federally-managed species and life stages for the geographic area of interest. Use this list as part of the initial screening process to determine if EFH for those species occurs in the vicinity of the proposed action. The list can be included as an attachment to the worksheet. Make a preliminary determination on the need to conduct an EFH consultation.

1. INITIAL CONSIDERATIONS

EFH Designations	Yes	No
Is the action located in or adjacent to EFH designated for eggs? **List the species:** Winter Flounder, Red Hake, Windowpane flounder, and Longfin Inshore Squid	✔	☐
Is the action located in or adjacent to EFH designated for larvae? **List the species:** Winter Flounder, Atlantic Herring, Red Hake, Windowpane Flounder, Atlantic Butterfish, and Summer Flounder	✔	☐
Is the action located in or adjacent to EFH designated for juveniles? **List the species:** Winter Flounder, Little Skate, Atlantic Herring, Red Hake, Windowpane Flounder, Winter Skate, Clearnose Skate, Bluefish, and Summer Flounder	✔	☐

Is the action located in or adjacent to EFH designated for adults or spawning adults? List the species: Winter Flounder, Little Skate, Atlantic Herring, Red Hake, Windowpane Flounder, Winter Skate, Clearnose Skate, Bluefish, and Summer Flounder	✔	☐
If you answered 'no' to all questions above, then an EFH consultation is not required - go to Section 5. **If you answered 'yes' to any of the above questions, proceed to Section 2 and complete the remainder of the worksheet.**		

Step 2: In order to assess impacts, it is critical to know the habitat characteristics of the site before the activity is undertaken. Use existing information, to the extent possible, in answering these questions. Identify the sources of the information provided and provide as much description as available. These should not be yes or no answers. Please note that there may be circumstances in which new information must be collected to appropriately characterize the site and assess impacts. Project plans that show the location and extent of sensitive habitats, as well as water depths, the HTL, MHW and MLW should be provided.

2. SITE CHARACTERISTICS

Site Characteristics	Description
Is the site intertidal, sub-tidal, or water column?	The site is in a high boat traffic area in the East River. The site extends from the land (on the east) through an intertidal area and out into the water column at old ship terminals (consisting of caissons, platforms and catwalks) along the US Pierhead Line (on the west).
What are the sediment characteristics?	The man-made shoreline, described from south to north, consists of a 265-foot-long by 25-foot-wide pile-supported wharf, a 65-foot-long riprap revetment, a 205-foot-long steel sheet pile bulkhead, and a 285-foot-long cobble slope. The substrate in the intertidal areas at the revetment and cobble slope are characterized as cobbley and rocky. Subtidal sediment waterward of the revetment and cobble slope is predominately sandy soils.
Is there submerged aquatic vegetation (SAV) at or adjacent to project site? If so describe the SAV species and spatial extent.	No submerged aquatic vegetation on or near the project site.
Are there wetlands present on or adjacent to the site? If so, describe the spatial extent and vegetation types.	There are no federal jurisdictional, vegetated wetlands on or adjacent to the site. The project site is located within NYSDEC mapped Tidal Wetlands (Littoral Zone). However, 6 NYCRR 661.4(b)(hh)(4) provides that, notwithstanding this designation, "there shall be no littoral zone under waters deeper than six feet at mean low water. Pending determination by the commissioner in a particular case... shall be rebuttable presumptive evidence of such six foot depth." Accordingly, much of the East River – and much of our project site – is not regulated tidal wetland Littoral Zone, despite the map designation. Areas within the East River are waters of the United States and are located within the Estuarine and Marine Deep Water Habitat mapped by the National Wetland Inventory. There are no wetlands located in the upland areas of the site.

Is there shellfish present at or adjacent to the project site? If so, please describe the spatial extent and species present.	Based on field inspection and due to the presence of existing structures and the nature of the East River, shellfish are present on-site. In addition, a Habitat Evaluation completed on 27 March 2020 by e-Design Dynamics identified barnacles along the shoreline on the rocky beach and piles in the intertidal and subtidal zones. Bivalves such as barnacles are present on the existing in water structures and it is likely that crabs are present along the bottom. An environmental impact study (EIS) conducted in 2010 for the development of Domino Park adjacent to the River Street site reports the types of species that are commonly found in the lower East River. Within the portion of the Harbor Estuary comprising the Hudson River, East River, and Upper New York Harbor, common macroinvertebrates includes gastropods, bivalve mollusks, barnacles, cumaceans, amphipods, isopods,crabs, and shrimp.
Are there mudflats present at or adjacent to the project site? If so please describe the spatial extent.	There are no mudflats on or near the project site.
Is there rocky or cobble bottom habitat present at or adjacent to the project site? If so, please describe the spatial extent.	The intertidal zone and shallower portions of the sub-tidal zone at the revetment and cobble slope generally have a bolder or cobble substrate.
Is Habitat Area of Particular Concern (HAPC) designated at or near the site? If so for which species, what type habitat type, size, characteristics?	There is a Habitat Area of Particular Concern designated for the Summer Flounder near the site according to the Essential Fish Habitat Mapper. However, the Summer Flounder HAPC is not determined by a particular location, but rather habitat conditions for health and foraging. The HAPC state: "All native species of macroalgae, seagrasses, and freshwater and tidal macrophytes in any size bed, as well as loose aggregations, within adult and juvenile summer flounder EFH is HAPC." The site within the East River has high boat traffic and does not have submerged aquatic vegetation or sea grasses. Therefore, it is unlikely that activities for this project would impact the Summer Flounder HAPC.
What is the typical salinity, depth and water temperature regime/range?	The current depth ranges from 0 at the shoreline to about 40 feet below mean sea level along the US Pierhead Line. The salinity fluctuates and ranged from 16.8 to 23.5 and the temperature ranged from 54 - 74.3 degrees Fahrenheit from May to October of 2019. This was calculated using the Riverkeeper's East River Mid-Channel at 23rd Street location.
What is the normal frequency of site disturbance, both natural and man-made?	The project site is located in/along the East River in a high boat traffic area.The site is within the historic limits of the East River. The historic shoreline was originally along River Street. The site has been occupied by industrial uses since the 1830s.Prior to the 1900s the site was occupied by the Nassau Ferry Company, a lumber yard and a sugar refinery.In the 1920s the site was converted to coal storage and in the 1940s it was converted to fuel storage. By 1947, the ferry terminal was demolished and was used as molasses storage.Consolidated Edison owned and operated the site since 1993, using most of it for fuel storage, until the site was decommissioned and the tanks were demolished between 2009 and 2013.When the site was decommissioned the bulkhead on the northern block was replaced with a fabricated armored slope.
What is the area of proposed impact (work footprint & far afield)?	The area where project related activities are proposed range from the shoreline to the US Pierhead Line. The proposed project will include the removal of existing in-water structures except for three existing caissons, reshaping the entire shoreline to create a protected cove (via in-water excavation and backfill), construction of new shoreline protection measures (e.g., bulkhead, revetment), construction of new breakwaters to protect the cove and the habitats that will be created inside the breakwaters, new walkways connecting to the breakwaters, and creation and enhancement of in-water and upland vegetative habitats (e.g., man-made reefs, saltwater marsh, coastal scrub shrubs, tide pools). A new waterfront public space and esplanade will be built immediately upland of the shoreline and a residential development will be constructed beyond.

<u>Step 3</u>: This section is used to describe the anticipated impacts from the proposed action on the physical/chemical/biological environment at the project site and areas adjacent to the site that may be affected.

3. DESCRIPTION OF IMPACTS

Impacts	Y	N	Description
Nature and duration of activity(s). Clearly describe the activities proposed and the duration of any disturbances.			The proposed project involves the construction of a new waterfront public space and esplanade on the existing upland portion of the site. The proposed in-water and shoreline improvements would include demolition of all existing in water structures except for three of the existing caissons, reshaping of the entire shoreline to create a protected cove (via in-water excavation and backfill), construction of new shoreline protection measures (e.g., bulkhead, revetment, groin), construction of new breakwaters in consideration of navigational interests and to protect the cove and the habitats that would be created inside the breakwaters, construction of new walkways connecting to the breakwaters, and creation and enhancement of in-water and upland vegetative habitats (e.g., man-made reefs, saltwater marsh, coastal scrub shrubs, tide pools). The existing shoreline would be reshaped by excavating historic fill soils (placed about 150 to 200 years ago) to create a cove and intertidal shallows(about 18,737 SF and 11,664 CY of new water below MHW). A portion of the cove would be used to create a beach and unpowered boat launch for publically accessible in-water recreation, and a portion of the cove would be used to create new habitat. The shoreline at these areas would be partially protected by a cobble and riprap sill along the shoreline. In-water construction is estimated to last for 18 months.
Will the benthic community be disturbed? If no, why not? If yes, describe in detail how the benthos will be impacted.	✔		The project will disturb the benthic community. The proposed in-water and shoreline improvements will include demolition of all existing in water structures, reshaping the entire shoreline to create a protected cove and groin (via in-water excavation and backfill), construction of new shoreline protection measures (e.g., bulkhead, revetment), construction of new breakwaters to protect the cove and the habitats that will be created inside the breakwaters, new walkways connecting to the breakwaters, and creation and enhancement of in-water and upland vegetative habitats (e.g., man-made reefs, saltwater marsh, coastal scrub shrubs, tide pools). The existing shoreline would be reshaped by excavating historic fill soils (placed about 150 to 200 years ago) to create a cove and intertidal shallows(about 18,737 SF and 11,664 CY of new water below MHW). The shoreline at these areas will be partially protected by a cobble and riprap sill along the shoreline. In order to protect the cove (including the created habitat, public beach, and in-water recreation area), two pile-supported breakwaters will be constructed at the south and west sides of the site (to protect the site from waves from the southwest), and a soil and rock-filled groin will be constructed at the north side of the site (to protect the site from waves from the northwest). Once construction is done, the site will provide better habitat for benthic species.
Will SAV be impacted? If no, why not? If yes, describe in detail how the SAV will be impacted. Consider both direct and indirect impacts. Provide details of any SAV survey conducted at the site.		✔	There is no submergent aquatic vegetation onsite; therefore no SAV will be impacted. This is a highly trafficked area, portions of which have been dredged in the past. Based on this and the fact that the substrate is largely comprised of debris which is a poor supporter of submerged aquatic vegetations, it is unlikley SAV would be impacted by the project. With that said, there will be a pilot Eel Grass Program, where eel grass will be planted as a test case to determine the survivability. These plantings are strictly a pilot program and are not a form of mitigation or mandatory vegetation planting.
Will salt marsh habitat be impacted? If no, why not? If yes, describe in detail how wetlands will be impacted. What is the aerial extent of the impacts? Are the effects temporary or permanent?		✔	Salt marsh habitat is not present on or near the site. As such, no impact will occur to salt marsh habitat. However, the project proposes to create new salt marshes and tidal pools that will encourage a more natural habitat.

Will mudflat habitat be impacted? If no, why not? If yes, describe in detail how mudflats will be impacted. What is the aerial extent of the impacts? Are the effects temporary or permanent?		✓	There are no mudflats onsite and therefore mudflats will not be impacted by the projects.
Will shellfish habitat be impacted? If so, provide in detail how the shellfish habitat will be impacted. What is the aerial extent of the impact? Provide details of any shellfish survey conducted at the site.	✓		Most of the existing water structures will be removed, accounting for most of the habitat for shellfish on site. However removing these will only cause temporary impacts as the reefs, salt marshes, and in water structures proposed will provide new and better habitat for shellfish species. According to a Essential fish Habitat Assessment from a nearby project in 2010, shellfish are resilient species and are adapted to turbid conditions due to their natural habitat. Most are resistant to construction activities that cause sediment. With that said, best management practices, such as turbidity curtains or air curtains, will be used as necessary to reduce impacts to these species. Currents in the East River range from 1 to 5 knots; any sediment resuspended during construction activity would quickly move away from the area and would be expected to dissipate dissipate rapidly and would not result in significant long-term impacts to water quality.
Will hard bottom (rocky, cobble, gravel) habitat be impacted at the site? If so, provide in detail how the hard bottom will be impacted. What is the aerial extent of the impact?	✓		The rocky debris at the riprap revetment and cobble embankment will be impacted as the riprap, cobbles, debris, and soils will be removed to create a more natural substrate and a living shoreline with intertidal shallows for habitat restoration. Some of the subtidal and intertidal areas within the site boundary will be excavated and restored. Within the proposed cove, existing rocky/cobbly hard bottom will be replaced primarily with sand. The shoreline will be protected with combinations of cobble river rock sill (along the beach and salt marsh), riprap revetment (at the groin) ecological armoring consisting of a combination of riprap, ECO Armor Blocks, and COASTALOCKTM by ECOncrete® (at the breakwaters). In addition, four man-made reefs will be created using oyster cages and reef balls. Once construction is done, the site will provide more hard bottom habitat than the current conditions. About 13,150 SF of existing riprap revetment and cobble embankment will be disturbed during construction. About 33,503 SF of cobble, riprap, and ecological armoring and about 21,996 SF of man-made reefs will be constructed as part of this project (a total increase of 42,349 of hard bottom).
Will sediments be altered and/or sedimentation rates change? If no, why not? If yes, describe how.	✓		Some of the existing sediments and debris will be removed and therefore altered. However, the project proposes to restore the area with a living shoreline and remove structures in the water. The existing shoreline would be reshaped by excavating historic fill soils (placed about 150 to 200 years ago) to create a cove and intertidal shallows (about 18,737 SF and 11,664 CY of new water below MHW). A portion of the cove would be used to create a beach and unpowered boat launch for publicly accessible in-water recreation, and a portion of the cove would be used to create new habitat (saltwater marsh and tide pools). The shoreline at these areas would be partially protected by a cobble and riprap sill along the shoreline.
Will turbidity increase? If no, why not? If yes, describe the causes, the extent of the effects, and the duration.	✓		There will be a temporary turbidity increase due to sediment dispersal during the the project activities. Increased turbidity will occur due to the use of heavy machinery used excavate the sediment and to remove the existing hardened shoreline structures and the addition of newer, more natural shoreline controls. The impacts will be temporary and once construction is complete will subside. In-water construction is estimated to last for 18 months. Disturbance will be limited to the project site. Best management practices, such as turbidity curtains or air curtains, will be used as necessary to contain turbidity to the site. Currents in the East River range from 1 to 5 knots; any sediment resuspended during construction activity would quickly move away from the area and would be expected to dissipate dissipate rapidly and would not result in significant long-term impacts to water quality.

Will water depth change? What are the current and proposed depths?	✔		The current depth ranges from 0 at the shoreline to about 40 feet below mean sea level along the US Pierhead Line. The water depth will change as the shoreline structure methods are changing from hardened structures such as bulkheads to a living shoreline with a gradual decline into deeper waters. In addition, additional open water area and new wetlands will be created as a result of excavating portions of the existing upland areas. Most of the grade changes will be made near the shoreline and will result in significant expansion of littoral zone and intertidal areas. This will be accomplished by excavating existing upland areas, and constructing new littoral habitat on top of new pile-supported breakwater structures in deep water. The range of water depths remains the same as existing, 0 to 40 feet below mean sea level.
Will contaminants be released into sediments or water column? If yes, describe the nature of the contaminants and the extent of the effects.		✔	Some sediments may be released during construction specifically during earthwork. Best management practices, such as turbidity curtains or air curtains, will be used to minimize migration of contaminants during excavation of upland areas and excavation of fill within existing water areas. It is anticipated that concentrated areas of upland contamination adjacent to the shoreline, if any, will be remediated prior to shoreline excavation. Release of contaminants into the water column is expected to be minimized due to remediation and implementation of best management practices. Currents in the East River range from 1 to 5 knots; any sediment resuspended during construction activity would quickly move away from the area and would be expected to dissipate dissipate rapidly and would not result in significant long-term impacts to water quality.
Will tidal flow, currents, or wave patterns be altered? If no, why not? If yes, describe in detail how.	✔		Tidal flow and wave patterns will be altered with this project. Based on wave modeling at the site, the proposed beach and habitat would require some form of protection to reduce the energy from waves and wakes to acceptable levels. The project will result in the net creation of tidally flowed areas and therefore the tide will extend further landward in the central and northern portions of the waterfront. In order to protect the cove (including the created habitat, public beach, and in-water recreation area) and allow the continuation of commercial maritime activity without disruption, two pile-supported breakwaters would be constructed at the south and west sides of the site (to protect the site from waves from the southwest), and a soil and rock-filled groin would be constructed at the north side of the site (to protect the site from waves from the northwest). This will reduce wave heights by 70 to 90% along the shoreline and will create a protected cove of calmer water currents.
Will water quality be altered? If no, why not? If yes, describe in detail how. If the effects are temporary, describe the duration of the impact.		✔	Water quality may be temporarily affected during construction as a result of potential release of sediments. Best management practices, such as turbidity curtains or air curtains, will be used to minimize turbidity. Currents in the East River range from 1 to 5 knots; any sediment resuspended during construction activity would quickly move away from the area and would be expected to dissipate dissipate rapidly and would not result in significant long-term impacts to water quality. Overall, with the creation of more open water, tidal and freshwater wetlands, and a stable shoreline, this new natural shoreline is expected to improve water quality.
Will ambient noise levels change? If no, why not? If yes, describe in detail how. If the effects are temporary, describe the duration and degree of impact.		✔	The site is in an urban waterfront in high boat traffic area. The proposed project will not result in an increase in motorized vessels using the area. There will be short term increased noise levels due to the demolition of hardened shoreline structures, driving of piles, and the construction of the more natural shoreline. Demolition and construction activity is expected to last for approximately 24 months, but noisy activities will be performed as minimally as possible.
Does the action have the potential to impact prey species of federally managed fish with EFH designations?	✔		There is the potential for this project to impact prey species of federally managed fish during construction. The project proposes to remove degraded structures and rebuild the area with a natural shoreline providing better habitat such as: Salt Marsh and Tide Pools – About 19,044 SF of salt marsh and tide pools would be created; Reef Balls & Oyster Cages – About 21,996 SF of man-made reefs would be created and made primarily of oyster cages and manufactured reef balls and would be installed in areas that are permanently underwater; Shoreline Shallows – About 17,855 SF of shoreline shallows would be created within the cove; Littoral Zone – about 6,735 SF of new Littoral Zone habitat and about 14,793 SF of new Intertidal Zone habitat would be created on the new breakwaters at MHW (about 6,735 SF of Littoral Zone habitat and 16,148 SF of Intertidal Zone habitat at MHHW). In addition, the excavation to create the cove and salt marsh would net another about 5,227 SF of created Littoral Zone and about 2,024 SF of Intertidal Zone along the shoreline at MHW (about 4,774 SF net created Littoral Zone and 591 SF of net created Intertidal Zone at MHHW).

Step 4: This section is used to evaluate the consequences of the proposed action on the functions and values of EFH as well as the vulnerability of the EFH species and their life stages. Identify which species (from the list generated in Step 1) will be adversely impacted from the action. Assessment of EFH impacts should be based upon the site characteristics identified in Step 2 and the nature of the impacts described within Step 3. NOAA's EFH Mapper should be used during this assessment to determine the ecological parameters/ preferences associated with each species listed and the potential impact to those parameters.

4. EFH ASSESSMENT

Functions and Values	Y	N	Describe habitat type, species and life stages to be adversely impacted
Will functions and values of EFH be impacted for:			
Spawning If yes, describe in detail how, and for which species. Describe how adverse effects will be avoided and minimized.		✔	The EFH mapper did not identify the site as habitat for spawning fish. Therefore, spawning will not be impacted by this project.
Nursery If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.	✔		As per the EFH mapper, the site location does have the potential for eggs, larvae and juvenile fish. Species listed as EFH for eggs include: Winter Flounder, Red Hake, Windowpane Flounder, and Longfin Inshore Squid. Species listed as EFH for larvae include: Winter Flounder, Atlantic Herring, Red Hake, Windowpane Flounder, Atlantic Butterfish, and Summer Flounder. Species listed as EFH for juveniles include: Winter Flounder, Little Skate, Atlantic Herring, Red Hake, Windowpane Flounder, Winter Skate, Clearnose Skate, Bluefish, and Summer Flounder. A similar project for the Domino Sugar Park just south of the site did not require timing restrictions. Due to similar species present and similar project activities, no timing restrictions are anticipated. In addition, once the project is complete, the living shoreline will be a better habitat for these species to flourish.
Forage If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.	✔		As per the EFH mapper, the site location does have the potential for juvenile and adult fish that may forage within the site. Species listed as EFH for juveniles and adults include: Winter Flounder, Little Skate, Atlantic Herring, Red Hake, Windowpane Flounder, Winter Skate, Clearnose Skate, Bluefish, and Summer Flounder. A similar project for the Domino Sugar Park just south of the site did not require timing restrictions. Due to similar species present and similar project activities, no timing restrictions are anticipated. Best management practices, such as turbidity curtains or air curtains, will be used to help minimize sediment migration during construction. Currents in the East River range from 1 to 5 knots; any sediment resuspended during construction activity would quickly move away from the area and would be expected to dissipate dissipate rapidly and would not result in significant long-term impacts to water quality. Fish are also mobile animals and can avoid the construction area during activity times. In addition, once the project is complete, the living shoreline will provide better habitat for these species to flourish.
Shelter If yes, describe in detail how and for which species. Describe how adverse effects will be avoided and minimized.	✔		Due to the current conditions of the site and past uses, it is unlikely that there is shelter for any juvenile or adult EHF designation. However, to be conservative per the EFH mapper, the site location does have the potential for juvenile and adult fish that may use the site as shelter within the site. Species listed as EFH for juveniles and adults include: Winter Flounder, Little Skate, Atlantic Herring, Red Hake, Windowpane Flounder, Winter Skate, Clearnose Skate, Bluefish, and Summer Flounder. A similar project for the Domino Sugar Park just south of the site did not require timing restrictions. Due to similar species present and similar project activities, no timing restrictions are anticipated. Best management practices, such as turbidity curtains or air curtains, will be used to help minimize the migration of sediments. Currents in the East River range from 1 to 5 knots; any sediment resuspended during construction activity would quickly move away from the area and would be expected to dissipate dissipate rapidly and would not result in significant long-term impacts to water quality. Once the project is complete, the living shoreline will be a better habitat for these species to flourish.

Will impacts be temporary or permanent? Please indicate in description box and describe the duration of the impacts.			Impacts will be temporary associated with construction activities such as earthwork, removal of in water structures and the removal of hardened shorelines. Impacts include the change from using a hardened shoreline to a living shoreline and the use of breakwaters to protect the cove. This will result with a healthier environment for the aquatic/marine biota, terrestrial and avian wildlife as a more naturally vegetated and gradual slope into the water will be provided.
Will compensatory mitigation be used? If no, why not? Describe plans for mitigation and how this will offset impacts to EFH. Include a conceptual compensatory mitigation plan, if applicable.	✔	☐	The proposed project results in the creation of open waters, vegetated wetlands and vegetated terrestrial/maritime habitat. As such these activities will more than mitigate any potential, temporary impacts associated with the construction of the project. The project proposes to remove degraded structures and rebuild the area with a natural shoreline providing better habitat such as: Salt Marsh and Tide Pools – About 19,044 SF of salt marsh and tide pools would be created; Reef Balls & Oyster Cages – About 21,996 SF of man-made reefs would be created and made primarily of oyster cages and manufactured reef balls and would be installed in areas that are permanently underwater; Shoreline Shallows – About 17,855 SF of shoreline shallows would be created within the cove; Littoral Zone – about 6,735 SF of new Littoral Zone habitat and about 14,793 SF of new Intertidal Zone habitat would be created on the new breakwaters at MHW (about 6,735 SF of Littoral Zone habitat and 16,148 SF of Intertidal Zone habitat at MHHW). In addition, the excavation to create the cove and salt marsh would net another about 5,227 SF of created Littoral Zone and about 2,024 SF of Intertidal Zone along the shoreline at MHW (about 4,774 SF net created Littoral Zone and 591 SF of net created Intertidal Zone at MHHW).

Step 5: This section provides the federal agency's determination on the degree of impact to EFH from the proposed action. The EFH determination also dictates the type of EFH consultation that will be required with NOAA Fisheries.

Please note: if information provided in the worksheet is insufficient to allow NOAA Fisheries to complete the EFH consultation additional information will be requested.

5. DETERMINATION OF IMPACT

Federal Agency's EFH Determination		
Overall degree of adverse effects on EFH (not including compensatory mitigation) will be: **(check the appropriate statement)**	☐	**There is no adverse effect on EFH or no EFH is designated at the project site.** **EFH Consultation is not required.**
	☐	**The adverse effect on EFH is not substantial. This means that the adverse effects are either no more than minimal, temporary, or that they can be alleviated with minor project modifications or conservation recommendations.** **This is a request for an abbreviated EFH consultation.**
	☐	**The adverse effect on EFH is substantial.** **This is a request for an expanded EFH consultation.**

Step 6: Consultation with NOAA Fisheries may also be required if the proposed action results in adverse impacts to other NOAA-trust resources, such as anadromous fish, shellfish, crustaceans, or their habitats as part of the Fish and Wildlife Coordination Act Some examples of other NOAA-trust resources are listed below. Inquiries regarding potential impacts to marine mammals or threatened/endangered species should be directed to NOAA Fisheries' Protected Resources Division.

6. OTHER NOAA-TRUST RESOURCES IMPACT ASSESSMENT

Species known to occur at site (list others that may apply)	Describe habitat impact type (i.e., physical, chemical, or biological disruption of spawning and/or egg development habitat, juvenile nursery and/or adult feeding or migration habitat). Please note, impacts to federally listed species of fish, sea turtles, and marine mammals must be coordinated with the GARFO Protected Resources Division.
alewife	
American eel	
American shad	
Atlantic menhaden	
blue crab	Blue crab are known to use the East River; therefore they are expected to be onsite. As described above for other species, the project will only cause temporary impacts and once complete will provide a better habitat and environment for this species.
blue mussel	
blueback herring	

Eastern oyster	
horseshoe crab	Horseshoe crabs are known to use the East River; therefore they are expected to be onsite. As described above for other species, the project will only cause temporary impacts and once complete will provide a better habitat and environment for this species.
quahog	
soft-shell clams	
striped bass	Striped Bass are known to use the East River; therefore they are expected to be onsite. As described above for other species, the project will only cause temporary impacts and once complete will provide a better habitat and environment for this species. In addition, fish are mobile species and during construction will avoid the area.
other species:	

Useful Links

National Wetland Inventory Maps

EPA's National Estuaries Program

Northeast Regional Ocean Council (NROC) Data

Mid-Atlantic Regional Council on the Ocean (MARCO) Data

Resources by State:

Maine
Eelgrass maps

Maine Office of GIS Data Catalog

Casco Bay Estuary Partnership

Maine GIS Stream Habitat Viewer

New Hampshire
New Hampshire's Statewide GIS Clearinghouse, NH GRANIT

New Hampshire Coastal Viewer

Massachusetts
Eelgrass maps

MADMF Recommended Time of Year Restrictions Document

Massachusetts Bays National Estuary Program

Buzzards Bay National Estuary Program

Massachusetts Division of Marine Fisheries

Massachusetts Office of Coastal Zone Management

Rhode Island
Eelgrass maps

Narraganset Bay Estuary Program

Rhode Island Division of Marine Fisheries

Rhode Island Coastal Resources Management Council

EFH Data Notice: Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional Fishery Management Councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

Greater Atlantic Regional Office
Atlantic Highly Migratory Species Management Division

Query Results

Degrees, Minutes, Seconds: Latitude = 40º43'3" N, Longitude = 74º1'58" W
Decimal Degrees: Latitude = 40.72, Longitude = -73.97

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

*** W A R N I N G ***

Please note under "Life Stage(s) Found at Location" the category "ALL" indicates that all life stages of that species share the same map and are designated at the queried location.

EFH

Show	Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
			Winter Flounder	Eggs Juvenile Larvae/Adult	New England	Amendment 14 to the Northeast Multispecies FMP
			Little Skate	Juvenile Adult	New England	Amendment 2 to the Northeast Skate Complex FMP
			Atlantic Herring	Juvenile Adult Larvae	New England	Amendment 3 to the Atlantic Herring FMP
			Red Hake	Adult Eggs/Larvae/Juvenile	New England	Amendment 14 to the Northeast Multispecies FMP
			Windowpane Flounder	Adult Larvae Eggs Juvenile	New England	Amendment 14 to the Northeast Multispecies FMP

Show	Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
			Winter Skate	Adult Juvenile	New England	Amendment 2 to the Northeast Skate Complex FMP
			Clearnose Skate	Adult Juvenile	New England	Amendment 2 to the Northeast Skate Complex FMP
			Longfin Inshore Squid	Eggs	Mid-Atlantic	Atlantic Mackerel, Squid,& Butterfish Amendment 11
			Bluefish	Adult Juvenile	Mid-Atlantic	Bluefish
			Atlantic Butterfish	Larvae	Mid-Atlantic	Atlantic Mackerel, Squid,& Butterfish Amendment 11
			Summer Flounder	Larvae Juvenile Adult	Mid-Atlantic	Summer Flounder, Scup, Black Sea Bass

HAPCs

Show	Link	Data Caveats	HAPC Name	Management Council
			Summer Flounder	undefined

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data. **For links to all EFH text descriptions see the complete data inventory: open data inventory -->
All spatial data is currently mapped for this region

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967-2258
Phone: (631) 286-0485 Fax: (631) 286-4003

In Reply Refer To: April 08, 2021
Consultation Code: 05E1LI00-2021-SLI-0465
Event Code: 05E1LI00-2021-E-01090
Project Name: River Ring Development

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2) (c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967-2258
(631) 286-0485

Project Summary

Consultation Code: 05E1LI00-2021-SLI-0465
Event Code: 05E1LI00-2021-E-01090
Project Name: River Ring Development
Project Type: ** OTHER **
Project Description: Residential Development with public waterfront park
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@40.717786000000004,-73.96597794416051,14z

Counties: Kings and New York counties, New York

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. The location of the critical habitat is not available. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern *Sterna dougallii dougallii* Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

Flowering Plants

NAME	STATUS
Seabeach Amaranth *Amaranthus pumilus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8549	Threatened

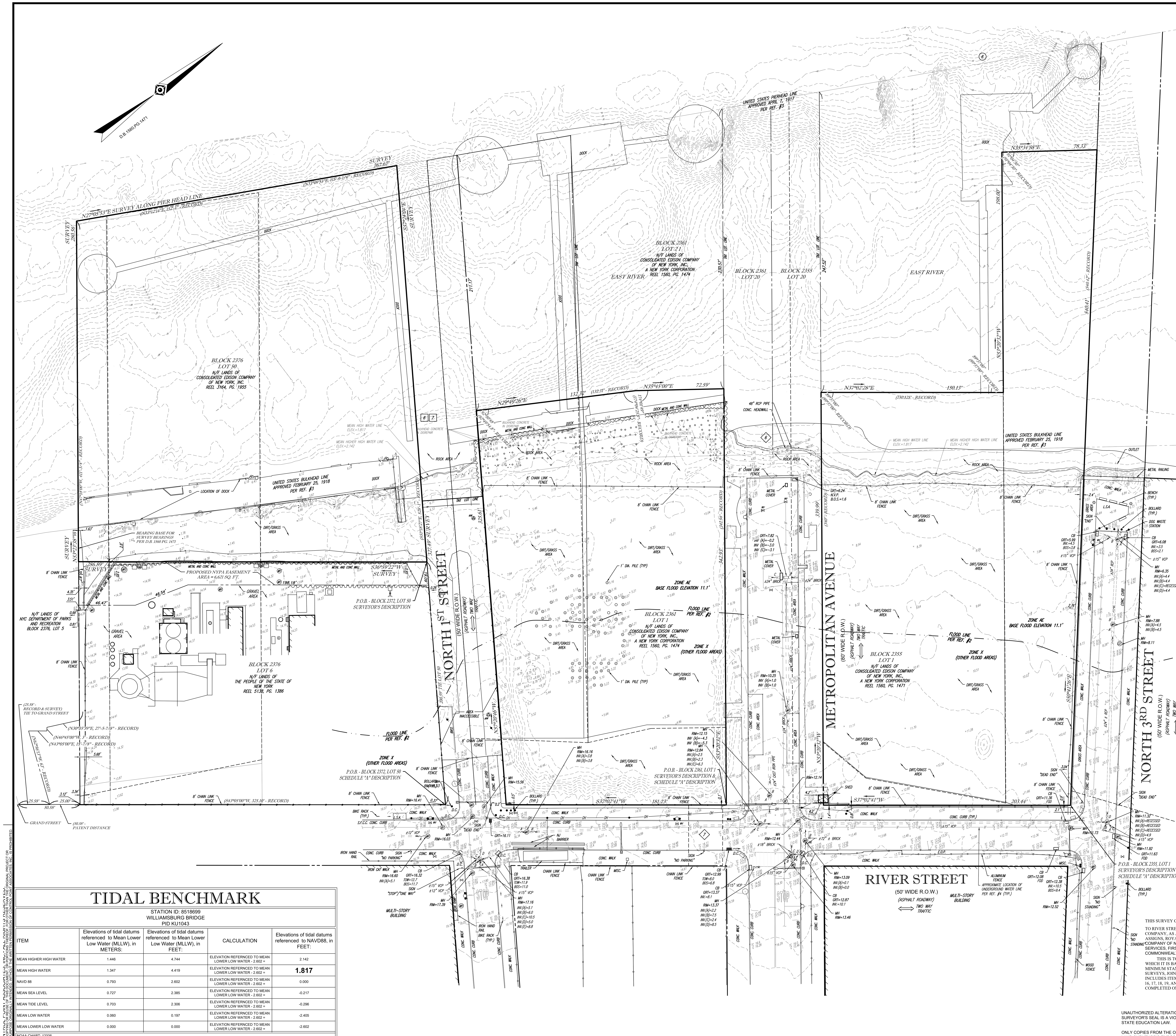
Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

ATTACHMENT M

TOPOGRAPHIC SURVEY

VICINITY MAP
© 2008 DeLorme. Street Atlas USA
NOT TO SCALE



LEGEND

124 / 125	EXISTING CONTOUR
× 123.45	EXISTING SPOT ELEVATION
× TC 123.45	EXIST. TOP OF CURB ELEVATION
× G 122.95	EXIST. GUTTER ELEVATION
	DEPRESSED CURB
	HYDRANT
MH	UNKNOWN MANHOLE
	UTILITY POLE
	STREET LIGHT
	SIGN
	CATCH BASIN OR INLET
D.C.	DEPRESSED CURB
E.O.P.	EDGE OF PAVEMENT
(TYP.)	TYPICAL
D.W.P.	DETECTABLE WARNING PAD
RIM=125.00	RIM NAVD 88
INV.=123.00	INV. NAVD 88
× [125.45]	GRADE ELEVATION ESTABLISHED IN HIGHWAY DATUM PER REF. #6
OH	OVERHEAD WIRES
W	APPROX. LOC. UNDERGROUND WATER LINE
	BOLLARD
	DECIDUOUS TREE
L.S.A.	LANDSCAPED AREA
N.V.P.	NO VISIBLE PIPE
BOS.	BOTTOM OF STRUCTURE
TOW	TOP OF WATER
F.O.D.	FILLED w/DEBRIS
	FLOW DIRECTION

GRAPHIC SCALE

30 0 15 30 60 120

(IN FEET)
1 inch = 30 ft.

TIDAL BENCHMARK

STATION ID: 8518699
WILLIAMSBURG BRIDGE
PID KU1043

ITEM	Elevations of tidal datums referenced to Mean Lower Low Water (MLLW), in METERS:	Elevations of tidal datums referenced to Mean Lower Low Water (MLLW), in FEET:	CALCULATION	Elevations of tidal datums referenced to NAVD88, in FEET:
MEAN HIGHER HIGH WATER	1.446	4.744	ELEVATION REFERNCED TO MEAN LOWER LOW WATER - 2.602 =	2.142
MEAN HIGH WATER	1.347	4.419	ELEVATION REFERNCED TO MEAN LOWER LOW WATER - 2.602 =	**1.817**
NAVD 88	0.793	2.602	ELEVATION REFERNCED TO MEAN LOWER LOW WATER - 2.602 =	0.000
MEAN SEA LEVEL	0.727	2.385	ELEVATION REFERNCED TO MEAN LOWER LOW WATER - 2.602 =	-0.217
MEAN TIDE LEVEL	0.703	2.306	ELEVATION REFERNCED TO MEAN LOWER LOW WATER - 2.602 =	-0.296
MEAN LOW WATER	0.060	0.197	ELEVATION REFERNCED TO MEAN LOWER LOW WATER - 2.602 =	-2.405
MEAN LOWER LOW WATER	0.000	0.000	ELEVATION REFERNCED TO MEAN LOWER LOW WATER - 2.602 =	-2.602

NOAA CHART: 12335
PUBLICATION DATE: 09/15/2004
NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION https://tidesandcurrents.noaa.gov/benchmarks.html?id=8518699

THIS SURVEY CERTIFIED TO:

TO RIVER STREET PARTNERS LLC, MANUFACTURERS AND TRADERS TRUST COMPANY, AS ADMINISTRATIVE AGENT, AND ITS SUCCESSORS AND/OR ASSIGNS, ROYAL ABSTRACT OF NEW YORK LLC, CONSOLIDATED EDISON COMPANY OF NEW YORK, INC., KENSINGTON VANGUARD NATIONAL LAND SERVICES, FIRST AMERICAN TITLE INSURANCE COMPANY AND COMMONWEALTH TITLE INSURANCE COMPANY:

THIS IS TO CERTIFY THAT THIS MAP OR PLAT AND THE SURVEY ON WHICH IT IS BASED WERE MADE IN ACCORDANCE WITH THE 2016 MINIMUM STANDARD DETAIL REQUIREMENTS FOR ALTA/NSPS LAND TITLE SURVEYS, JOINTLY ESTABLISHED AND ADOPTED BY ALTA AND NSPS, AND INCLUDES ITEMS 2, 3, 4, 6(A), 6(B), 7(A), 7(B)(1), 7(C), 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, AND 20 OF TABLE A THEREOF. THE FIELDWORK WAS COMPLETED ON 10-22-2019.

UNAUTHORIZED ALTERATION OR ADDITION TO A SURVEY MAP BEARING A LICENSED LAND SURVEYOR'S SEAL IS A VIOLATION OF SECTION 7209, SUB-DIVISION 2, OF THE NEW YORK STATE EDUCATION LAW.

ONLY COPIES FROM THE ORIGINAL OF THIS SURVEY MARKED WITH AN ORIGINAL OF THE LAND SURVEYOR'S EMBOSSED SEAL SHALL BE CONSIDERED TO BE VALID TRUE COPIES.

PREPARED BY:
CONTROL POINT ASSOCIATES INC. PC
9 TIMES SQUARE,
200 WEST 41ST STREET, SUITE 1203
NEW YORK, NY 10136
646.780.0411 - 908.668.9595 FAX
WWW.CPASURVEY.COM
WARREN, NJ 908.668.0099
CHALFONT, PA 215.712.9800
MT. LAUREL, NJ 609.857.2099
LONG ISLAND, NY 631.580.2645
SOUTHBOROUGH, MA 508.948.3000
ALBANY, NY 518.217.5010

NO.	DATE	BY	DESCRIPTION	APPROVED
3.	03-27-2020	K.V.G.	REVISE HIGH WATER LINES	J.D.S.
2.	12-5-2019	J.J.W.	CLIENT COMMENTS	A.P.W.
1.	12-3-2019	J.L.E.	REVISE CERTIFIED PARTIES	A.P.W.

REVISIONS

PROJECT NAME

RIVER STREET & N 1st STREET

BLOCK 2355, LOT 1, BLOCK 2376, LOT 50, & BLOCK 2361, LOT 1
BOROUGH OF BROOKLYN, KINGS COUNTY
CITY AND STATE OF NEW YORK

DRAWING TITLE

ALTA/NSPS LAND TITLE SURVEY

SEAL & SIGNATURE

STATE OF NEW YORK · JAMES C. WEED · LICENSED LAND SURVEYOR · 050765
NOT VALID UNTIL SEALED

James C. Weed 03/27/2020
JAMES C. WEED DATE
NEW YORK PROFESSIONAL LAND SURVEYOR #50765-1

FIELD DATE:	03-26/27-2019 04-03-2019
FIELD BK:	19-03 19-15
F. B. PAGE:	142;146 14
DATE:	11-21-2019
SCALE:	1"=30'
PROJECT No:	01-190134-00
DRAWING BY:	MJB
CHK BY:	ARM
APPROVED BY:	APW
DWG No:	V-001.0.0
CAD FILE No:	01-190134-00
PAGE No:	1 OF 2

ATTACHMENT N

ADJACENT PROPERTY OWNERS

ADJACENT OWNERS

The following list of adjacent properties correlates to the property labels on Figure 3.

- **Neighbor 1 - Block 2348, Lot 7501**
  Address: 184 Kent Avenue, Brooklyn, NY 11249
  Owner: 184 Kent Fee LLC c/o Marathon Real Opportunity Fund LLC
- **Neighbor 2 - Block 2356, Lot 1**
  Address: 206 Kent Avenue, Brooklyn, NY 11249
  Owners: G4 18201, LLC; 206 Kent Investor LLC; and 206 Kent LLC
- **Neighbor 3 - Block 2362, Lot 3**
  Address: 218 River Street, Brooklyn, NY 11249
  Owner: Consolidated Edison Co.
- **Neighbor 4 - Block 2362, Lot 1**
  Address: 230 Kent Avenue, Brooklyn, NY 11249
  Owner: Kent Riverview LLC
- **Neighbor 5 - Block 2377, Lot 12**
  Address: 234 Kent Avenue, Brooklyn, NY 11249
  Owner: 240 Kent LLC
- **Neighbor 6 - Block 2376, Lot 6**
  Address: 49 River Street, Brooklyn, NY 11249
  Owner: People of the State of New York – Power Authority of the State of New York
- **Neighbor 7 - Block 2376, Lot 5**
  Address: 1 Grand Street, Brooklyn, NY 11249
  Owner: New York City Department of Parks and Recreation

ATTACHMENT O

AGENCY CORRESPONDENCE

2021-02-17 - Environmental Resource Map

February 17, 2021

1:4,514

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), (c) OpenStreetMap contributors, and the GIS User Community

Author: KWeg
Not a legal document

EFH Data Notice: Essential Fish Habitat (EFH) is defined by textual descriptions contained in the fishery management plans developed by the regional Fishery Management Councils. In most cases mapping data can not fully represent the complexity of the habitats that make up EFH. This report should be used for general interest queries only and should not be interpreted as a definitive evaluation of EFH at this location. A location-specific evaluation of EFH for any official purposes must be performed by a regional expert. Please refer to the following links for the appropriate regional resources.

Greater Atlantic Regional Office
Atlantic Highly Migratory Species Management Division

Query Results

Degrees, Minutes, Seconds: Latitude = 40º43'3" N, Longitude = 74º1'58" W
Decimal Degrees: Latitude = 40.72, Longitude = -73.97

The query location intersects with spatial data representing EFH and/or HAPCs for the following species/management units.

*** W A R N I N G ***

Please note under "Life Stage(s) Found at Location" the category "ALL" indicates that all life stages of that species share the same map and are designated at the queried location.

EFH

Show	Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
			Winter Flounder	Eggs Juvenile Larvae/Adult	New England	Amendment 14 to the Northeast Multispecies FMP
			Little Skate	Juvenile Adult	New England	Amendment 2 to the Northeast Skate Complex FMP
			Atlantic Herring	Juvenile Adult Larvae	New England	Amendment 3 to the Atlantic Herring FMP
			Red Hake	Adult Eggs/Larvae/Juvenile	New England	Amendment 14 to the Northeast Multispecies FMP
			Windowpane Flounder	Adult Larvae Eggs Juvenile	New England	Amendment 14 to the Northeast Multispecies FMP

Show	Link	Data Caveats	Species/Management Unit	Lifestage(s) Found at Location	Management Council	FMP
			Winter Skate	Adult Juvenile	New England	Amendment 2 to the Northeast Skate Complex FMP
			Clearnose Skate	Adult Juvenile	New England	Amendment 2 to the Northeast Skate Complex FMP
			Longfin Inshore Squid	Eggs	Mid-Atlantic	Atlantic Mackerel, Squid,& Butterfish Amendment 11
			Bluefish	Adult Juvenile	Mid-Atlantic	Bluefish
			Atlantic Butterfish	Larvae	Mid-Atlantic	Atlantic Mackerel, Squid,& Butterfish Amendment 11
			Summer Flounder	Larvae Juvenile Adult	Mid-Atlantic	Summer Flounder, Scup, Black Sea Bass

HAPCs

Show	Link	Data Caveats	HAPC Name	Management Council
			Summer Flounder	undefined

EFH Areas Protected from Fishing

No EFH Areas Protected from Fishing (EFHA) were identified at the report location.

Spatial data does not currently exist for all the managed species in this area. The following is a list of species or management units for which there is no spatial data. **For links to all EFH text descriptions see the complete data inventory: open data inventory -->
All spatial data is currently mapped for this region

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967-2258
Phone: (631) 286-0485 Fax: (631) 286-4003

In Reply Refer To: April 08, 2021
Consultation Code: 05E1LI00-2021-SLI-0465
Event Code: 05E1LI00-2021-E-01090
Project Name: River Ring Development

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

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We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

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This species list is provided by:

Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967-2258
(631) 286-0485

Project Summary

Consultation Code: 05E1LI00-2021-SLI-0465
Event Code: 05E1LI00-2021-E-01090
Project Name: River Ring Development
Project Type: ** OTHER **
Project Description: Residential Development with public waterfront park
Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/@40.717786000000004,-73.96597794416051,14z

Counties: Kings and New York counties, New York

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

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See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

---

1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
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Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern *Sterna dougallii dougallii* Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

Flowering Plants

NAME	STATUS
Seabeach Amaranth *Amaranthus pumilus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8549	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

ATTACHMENT P

QUALIFICATIONS OF PREPARER

KENNETH A. HUBER, PE

SENIOR PROJECT MANAGER

GEOTECHNICAL ENGINEERING & WATERFRONT DESIGN

Mr. Huber has over 22 years of experience in geotechnical and waterfront engineering. His experience includes development and supervision of subsurface explorations; design of shallow and deep foundation systems; evaluation of earth slope stability; design of retaining walls, reinforced earth, anchored bulkheads, and other earth retaining structures; design of excavation support systems; design of waterfront structures, bulkheads, piers, and ferry landings; preparation of geotechnical engineering reports and recommendations; development, installation and monitoring of geotechnical instrumentation; and coordination and supervision of construction inspection services. Mr. Huber has served as an instructor for Langan's in-house training programs on subsurface exploration, and engineering inspection during construction.

SELECTED PROJECTS

- Kamco Bulkhead Replacement, Brooklyn, NY
- Sunset Industrial Park, Brooklyn, NY
- River Rings, Brooklyn, NY
- 479 Degraw Street, Brooklyn, NY
- 355 and 399 Exterior Street, Bronx, NY
- Fordham Landing, Bronx, NY
- Gownas Canal Northside, Brooklyn, NY
- 420 Carroll Street, Brooklyn, NY
- 595 to 659 Smith Street, Brooklyn, NY
- Cape Liberty Cruise Port Wharf Improvements, Bayonne, NJ
- Bronx Point, Bronx, NY
- Lowe's Gowanus, Brooklyn, NY
- 300 Huntington Street, Brooklyn, NY
- Bayonnne Logistics Center, Bayonne, NJ
- 1110 Oak Point, Bronx, NY
- 163 6th Street, Storage Deluxe, Brooklyn, NY
- 155 3rd Street, Monadnock, Brooklyn, NY
- 450 Union Street, Brooklyn, NY
- Powerhouse Workshop, Brooklyn, NY
- Day's End at Gansevoort Peninsula, New York, NY
- NYCEDC Brooklyn Cruise Terminal, Pier 11, Red Hook, Brooklyn, NY
- 68 Ferris & 300 Coffey Streets, Sitex Development, Brooklyn, NY
- Anable Basin, Long Island City, NY
- US Coast Guard, Menemsha Boathouse, Chilmark, Martha's Vineyard, MA
- Canal Dock, New Haven, CT
- Bay Head Yacht Club, Bay Head, NJ
- Benson Scrap Metal, Bulkhead Replacement, Brooklyn, NY
- Lima Pier Rehabilitation, Governors Island, NY
- Yankee Pier Ferry Landing, Governors Island, NY
- Roosevelt Island Ferry Landing, Roosevelt Island, NY

EDUCATION

M.S., Civil Engineering
Virginia Polytechnic Institute and State University

B.E., Civil Engineering
Stevens Institute of Technology

PROFESSIONAL REGISTRATION

Professional Engineer (PE) in NY, NJ, and PA

AFFILIATIONS

Tau Beta Pi

American Society of Civil Engineers (ASCE)

ASCE, Coasts, Oceans, Ports, and Rivers Institute (COPRI), Member

Geo-Institute

- Waterfront Multi-Tower Residential Development at 615 River Road, Edgewater, NJ
- 80 South Street, 135-Story Residential Tower, New York, NY
- 290 West Street, 9-Story Waterfront Residential Building New York, NY
- Holt Marine Terminal, Philadelphia, PA
- Harborside Plaza 5 and Plaza 10, Jersey City, NJ
- Harborside South Pier Hotel, Jersey City, NJ
- BP Former Marcus Hook Refinery, Marcus Hook, PA
- Nereid Bulkhead Restoration, Rutherford, New Jersey

SELECTED PUBLICATIONS, REPORTS, AND PRESENTATIONS

Engineering Inspection during Construction, Training Manual, Langan, 2000.

“Building the Devils Playground: How a Ground Improvement Program Eliminated the Need for Pile Foundations,” 38th DFI Annual Conference on Deep Foundations, September 26-28, 2013.

“Protecting Adjacent Structures During Construction of a 60-Story Residential High-Rise,” Geotechnical Aspects of Safeguarding Infrastructure, One-Day Seminar by ASCE Metropolitan Section - Geo-Institute Chapter, May 12, 2016.

ATTACHMENT Q

FULL-SIZE DRAWINGS (MA-SERIES)

RIVER RING DEVELOPMENT

(BLOCK 2355, LOT 1, BLOCK 2361, LOTS 1, 21, BLOCK 2376, LOTS 6, 50)

IN

BROOKLYN, NEW YORK

PREPARED FOR

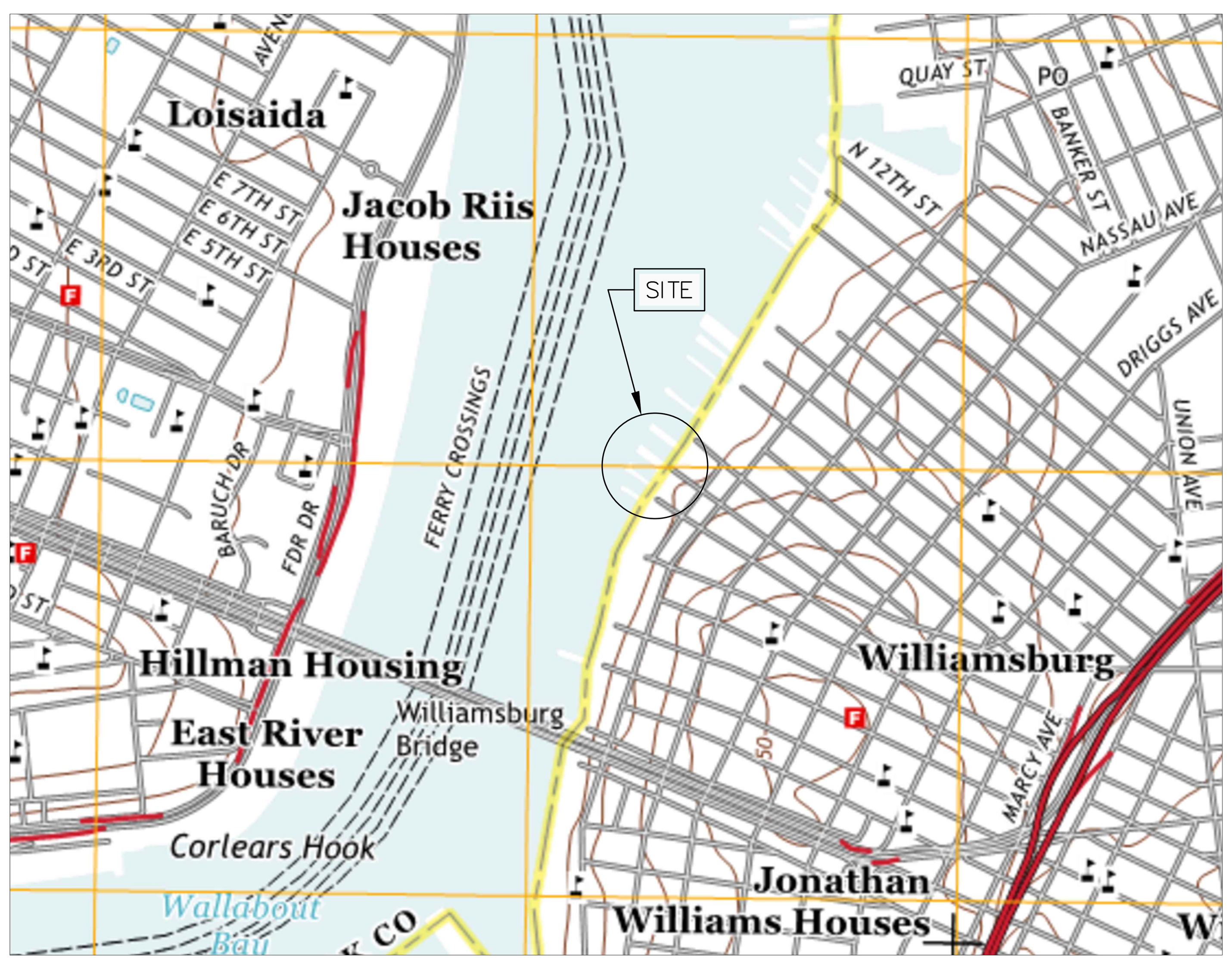
TWO TREES MANAGEMENT CO., LLC

PREPARED BY

LANGAN ENGINEERING, ENVIRONMENTAL, SURVEYING, LANDSCAPE ARCHITECTURE AND GEOLOGY, D.P.C.

DRAWING LIST

DRAWING NO.	TITLE
MA-000	COVER SHEET
MA-001	EXISTING WATERFRONT STRUCTURES
MA-002	REMOVALS PLAN
MA-010	EXISTING SECTIONS
MA-100	WATERFRONT SITE PLAN
MA-110	SOUTH PLATFORM FOUNDATION PLAN
MA-111	SOUTH PLATFORM FRAMING PLAN
MA-112	SOUTH PLATFORM DECK PLAN
MA-120	WEST PLATFORM FOUNDATION PLAN
MA-121	WEST PLATFORM FRAMING PLAN
MA-122	WEST PLATFORM DECK PLAN
MA-130	WALKWAY FOUNDATION PLAN
MA-131	WALKWAY BENT PLAN
MA-132	WALKWAY FRAMING PLAN
MA-140	BULKHEAD PART PLAN AND ELEVATION
MA-150	SHORELINE PART PLAN
MA-160	BRIDGE PLAN
MA-300	BREAKWATER PLATFORM SECTIONS
MA-301	BREAKWATER PLATFORM SECTIONS
MA-302	WALKWAY SECTIONS
MA-303	BULKHEAD SECTIONS
MA-304	SHORELINE SECTIONS
MA-305	BRIDGE SECTIONS
MA-500	BREAKWATER PLATFORM DETAILS



SOURCE: "BROOKLYN NEW YORK 7.5-MINUTE SERIES", U.S. GEOLOGICAL SURVEY, 2013

SITE LOCATION PLAN

SCALE: 1" = 1000'

SOURCE: AERIAL IMAGERY TAKEN FROM NEARMAP ON 20 SEPTEMBER 2019

AERIAL MAP

SCALE: 1" = 1000'

Date	Description	No.

REVISIONS

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Signature Date

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

KINGS NEW YORK

Figure Title

COVER SHEET

Project No. 170594401

Date -

Drawn By KRW

Checked By RL

Drawing No. MA-000

Sheet 1 of 24

PROJECT NO. 170594401

NOTE:
BACKGROUND REFERENCED FROM "BOUNDARY & TOPOGRAPHIC SURVEY, RIVER STREET & NORTH 1ST STREET", BY CONTROL POINT ASSOC. INC., DATED 17 OCTOBER 2019.

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RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

KINGS NEW YORK

Figure Title

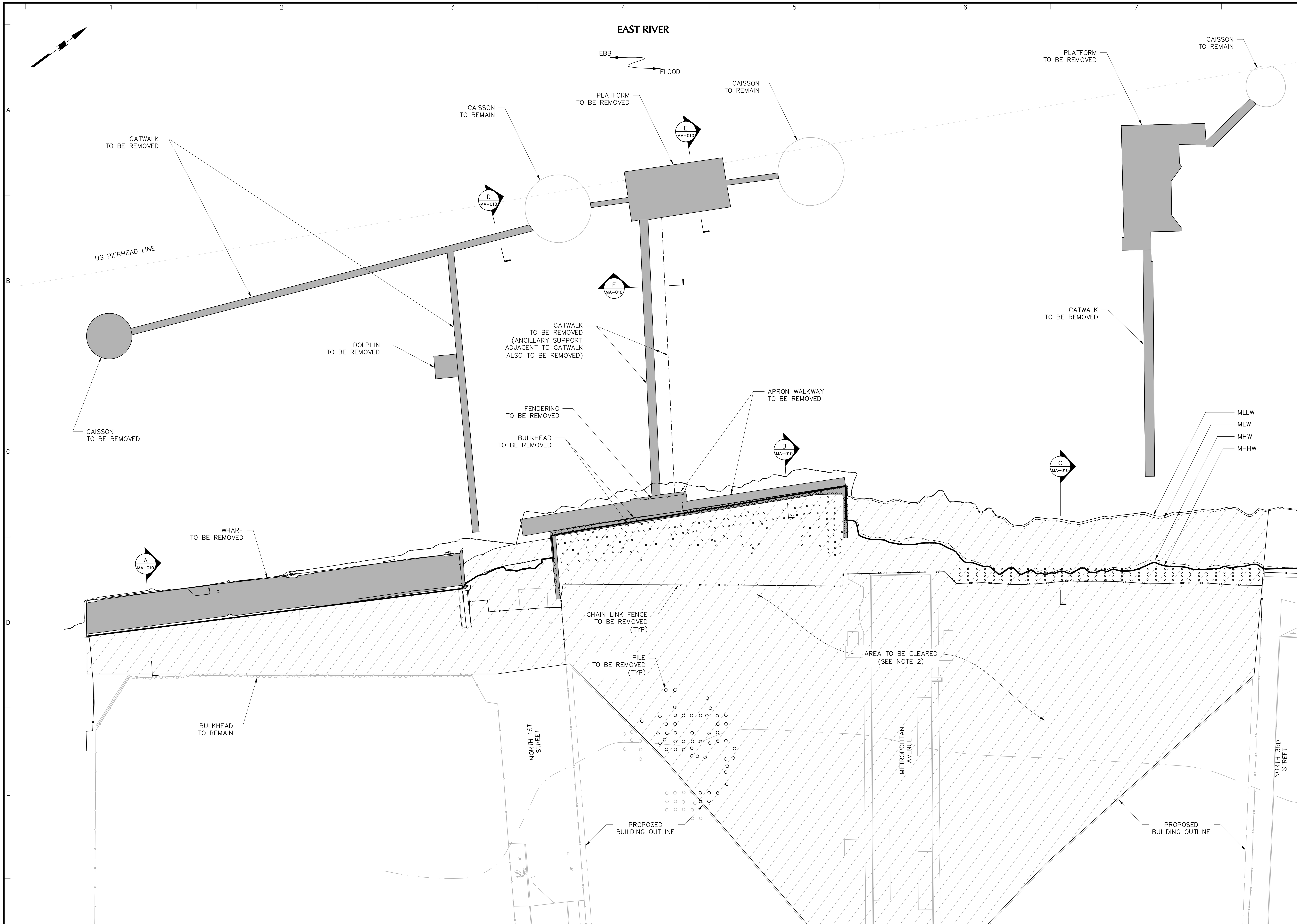
EXISTING WATERFRONT STRUCTURES

Project No.	Drawing No.
170594401	MA-001
Date: -	
Drawn By: KRW	
Checked By: RL	Sheet 2 of 24

PROJECT NO. 170594401

LANGAN

Date: 1/22/2021 Time: 11:54 User: kweg Style Table: Langan.stb Layout: EXISTING WATERFRONT STRUCTURES Document Code: 170594401-0502-BD101-0102



NOTE:
1. BACKGROUND REFERENCED FROM "BOUNDARY & TOPOGRAPHIC SURVEY, RIVER STREET & NORTH 1ST STREET", BY CONTROL POINT ASSOC. INC., DATED 17 OCTOBER 2019.
2. WORK IN AREA TO BE CLEARED INCLUDES BUT IS NOT LIMITED TO REMOVAL OF STONE, DEBRIS, VEGETATION, TOPSOIL, AND PAVEMENT.

30 0 15 30
SCALE IN FEET

Date	Description	No.

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Project

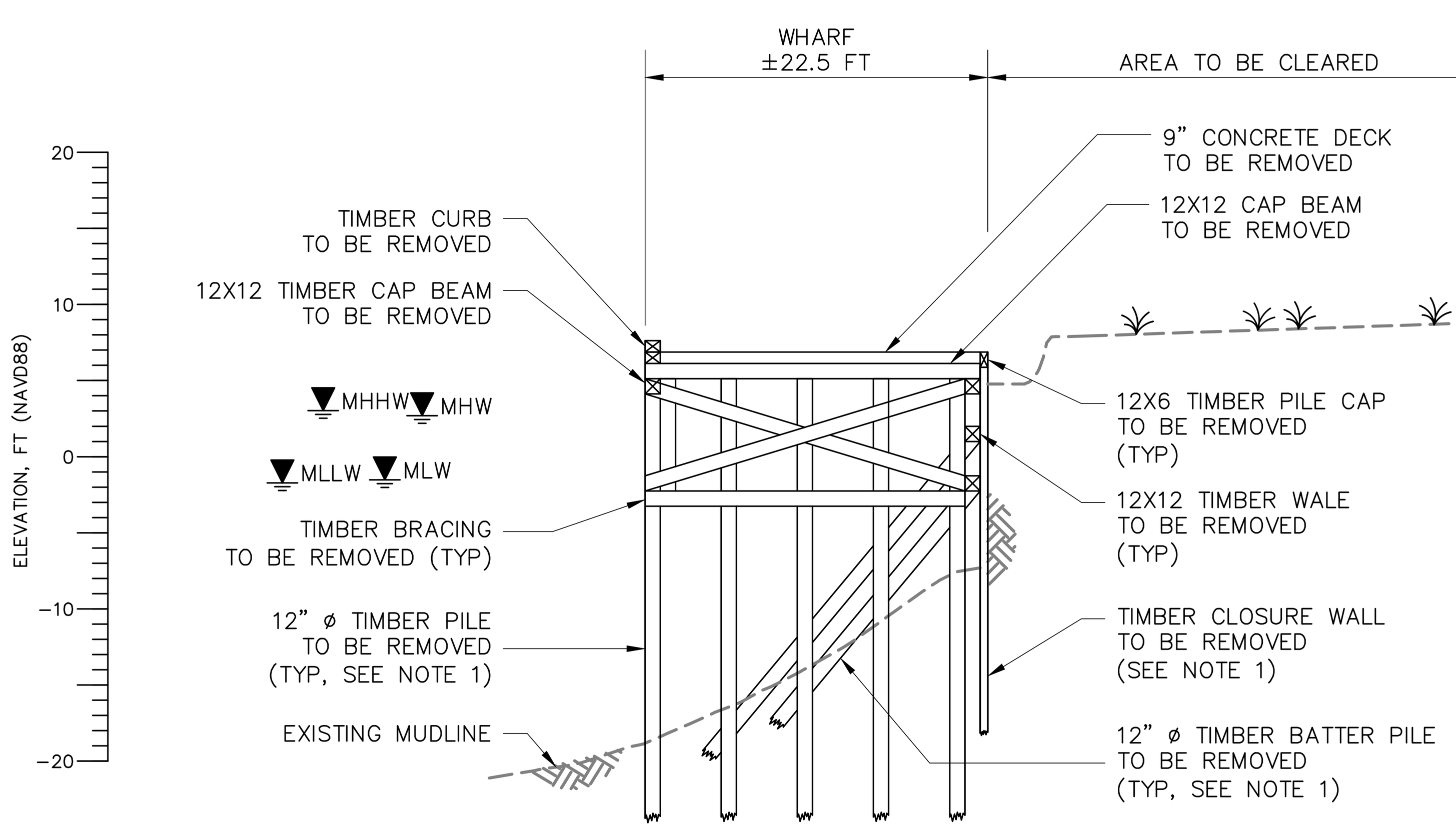
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Figure Title

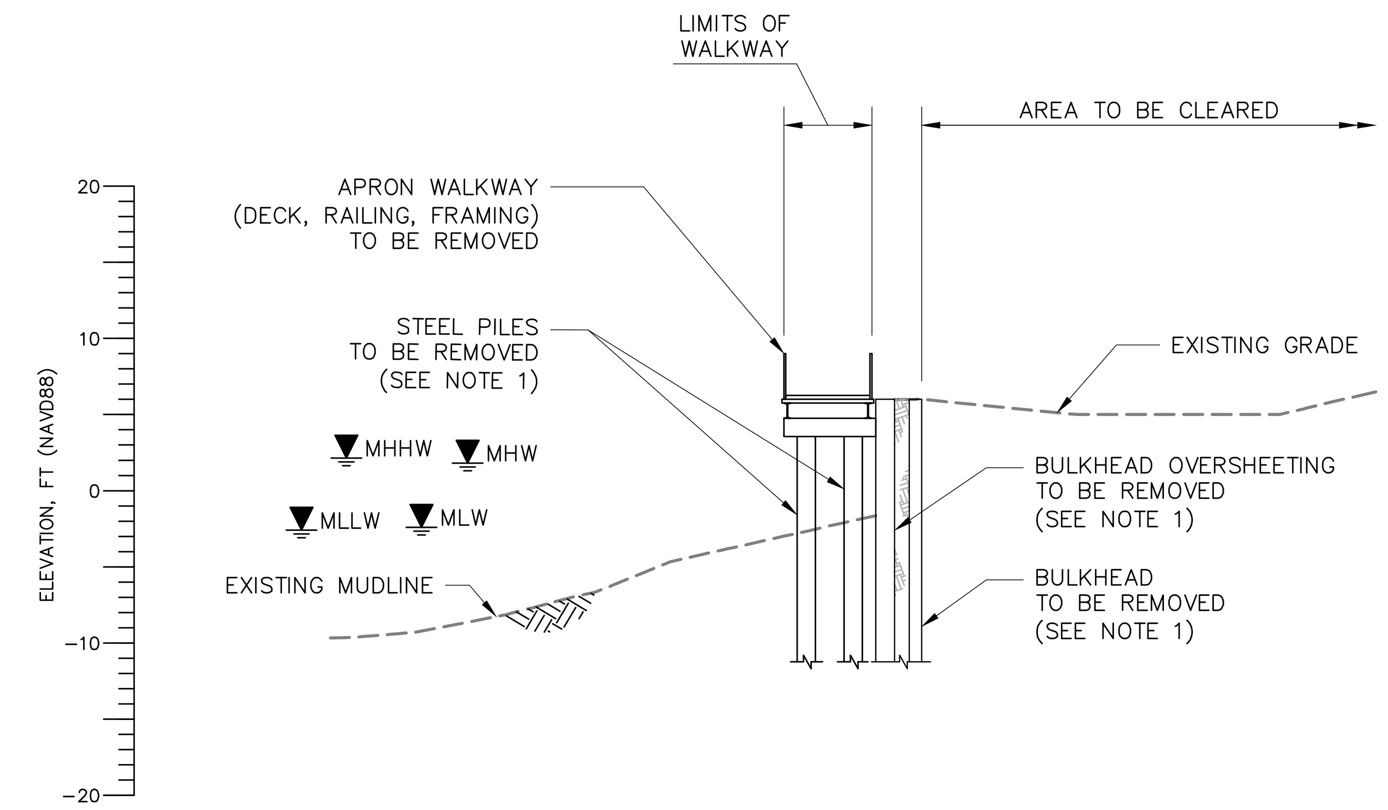
REMOVALS PLAN

Project No. 170594401
Date -
Drawn By KRW
Checked By RL
Drawing No. MA-002
Sheet 3 of 24

PROJECT NO. 170594401



A
MA-010
SECTION
1" = 10'



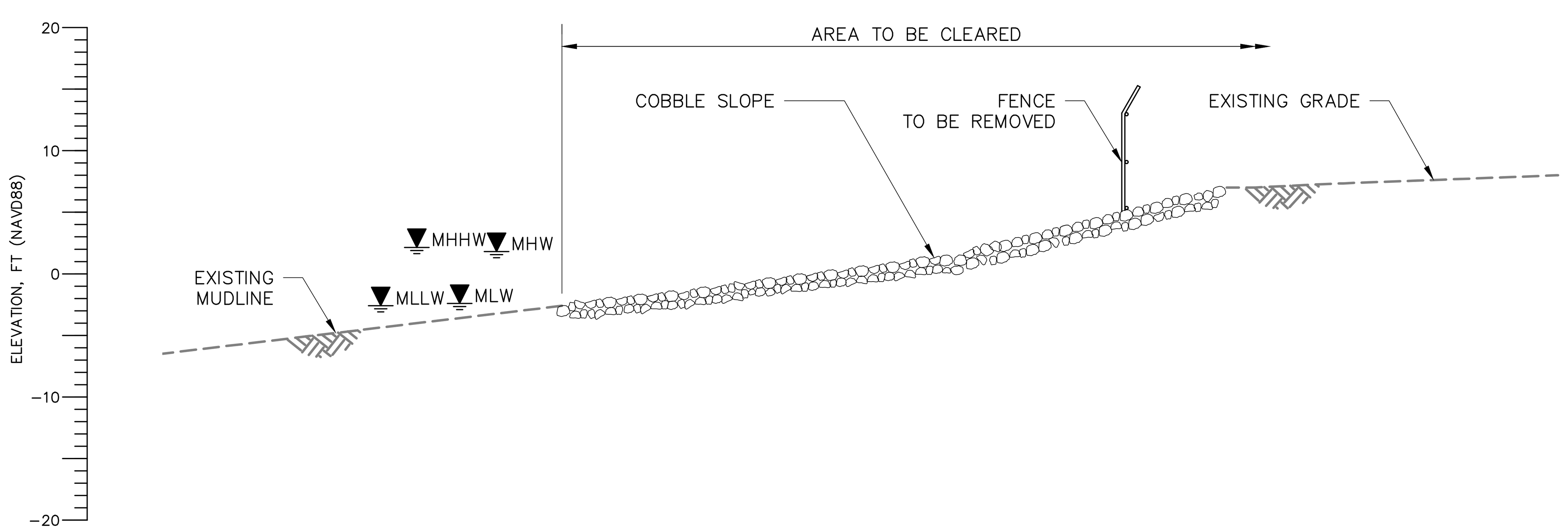
B
MA-010
SECTION
1" = 10'

NOTES:

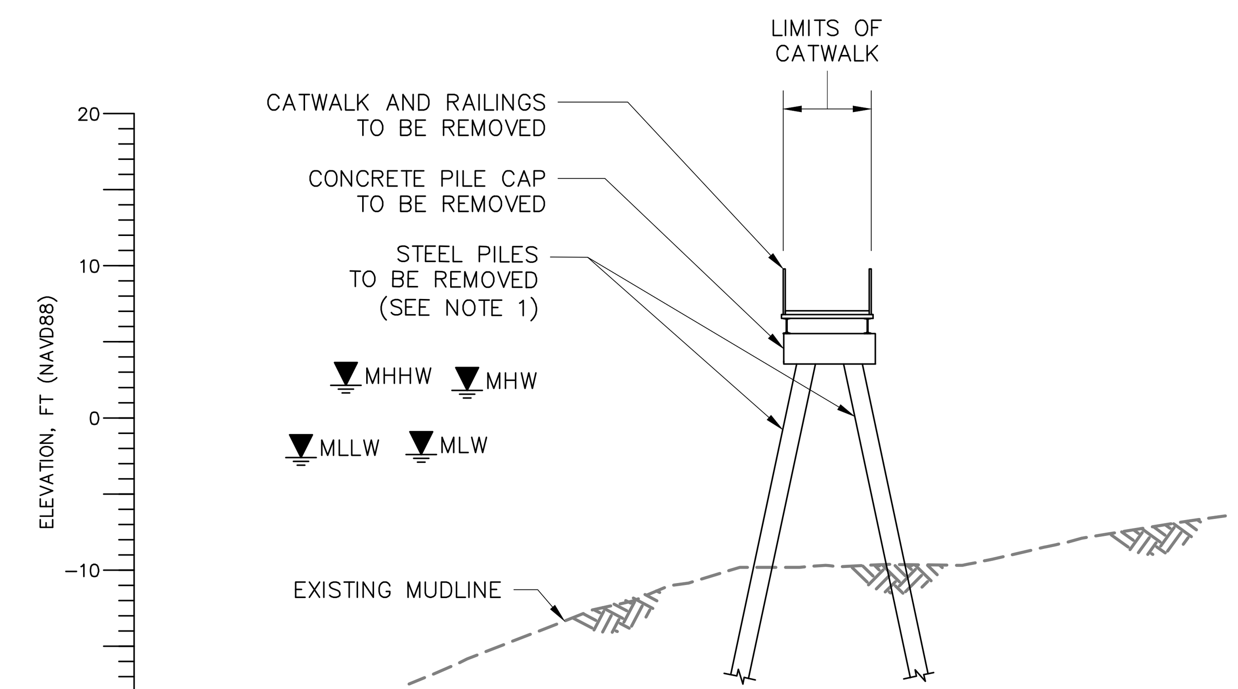
1. WATERFRONT STRUCTURAL ELEMENTS TO BE REMOVED (I.E., PILES, BULKHEADS) CAN EITHER BE EXTRACTED OR CUT TWO FEET BELOW PROPOSED MUDLINE.

2. EXISTING ABANDONED PILES IN THE SLOPE TO BE REMOVED ARE NOT SHOWN. REFER TO MA-002 FOR GENERAL LOCATIONS OF WHERE PILES MAY EXIST.

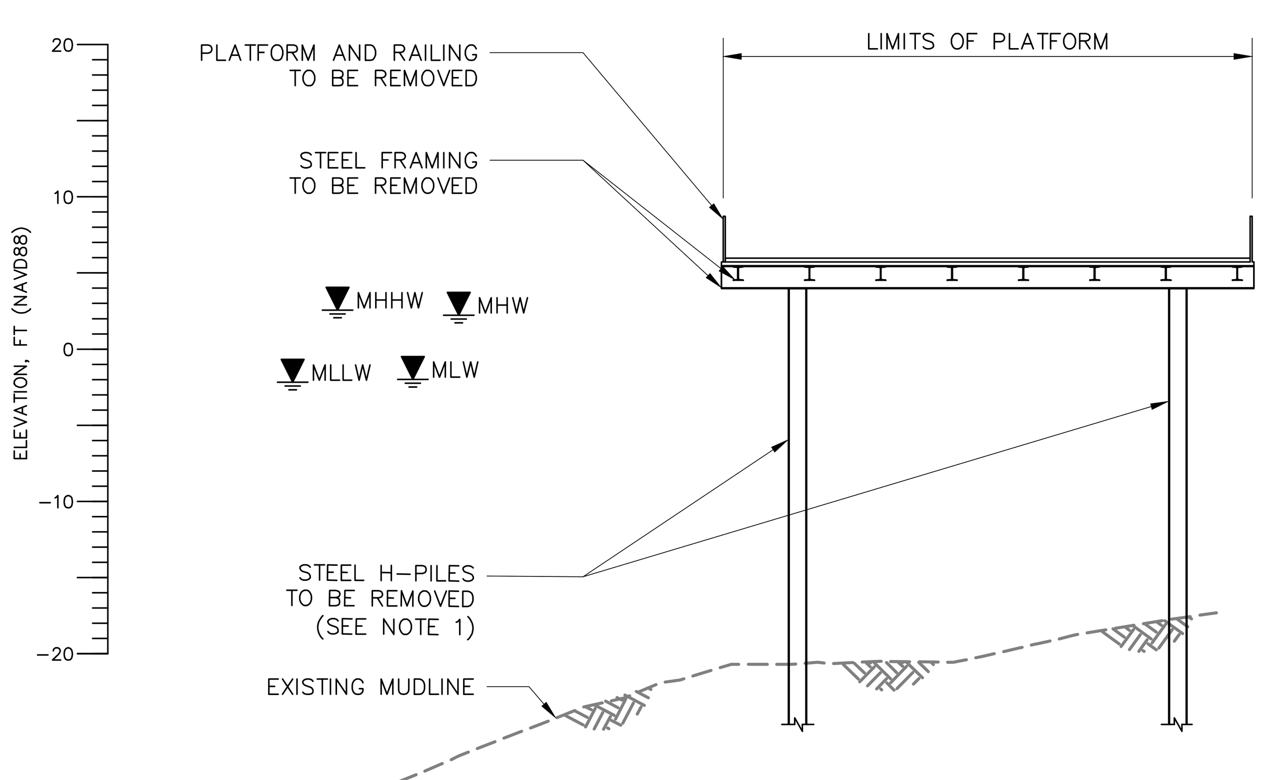
3. SECTIONS SHOWN ARE BASED ON INFORMATION PROVIDED IN "WATERFRONT FACILITY INSPECTION NORTH FIRST STREET PIERS AND PLATFORM, BROOKLYN, NY" REPORT BY COLLINS ENGINEERS INC., DATED JUNE 2016. STRUCTURE CONFIGURATION IS PROVIDED FOR REFERENCE ONLY AND SHALL BE VERIFIED IN FIELD.



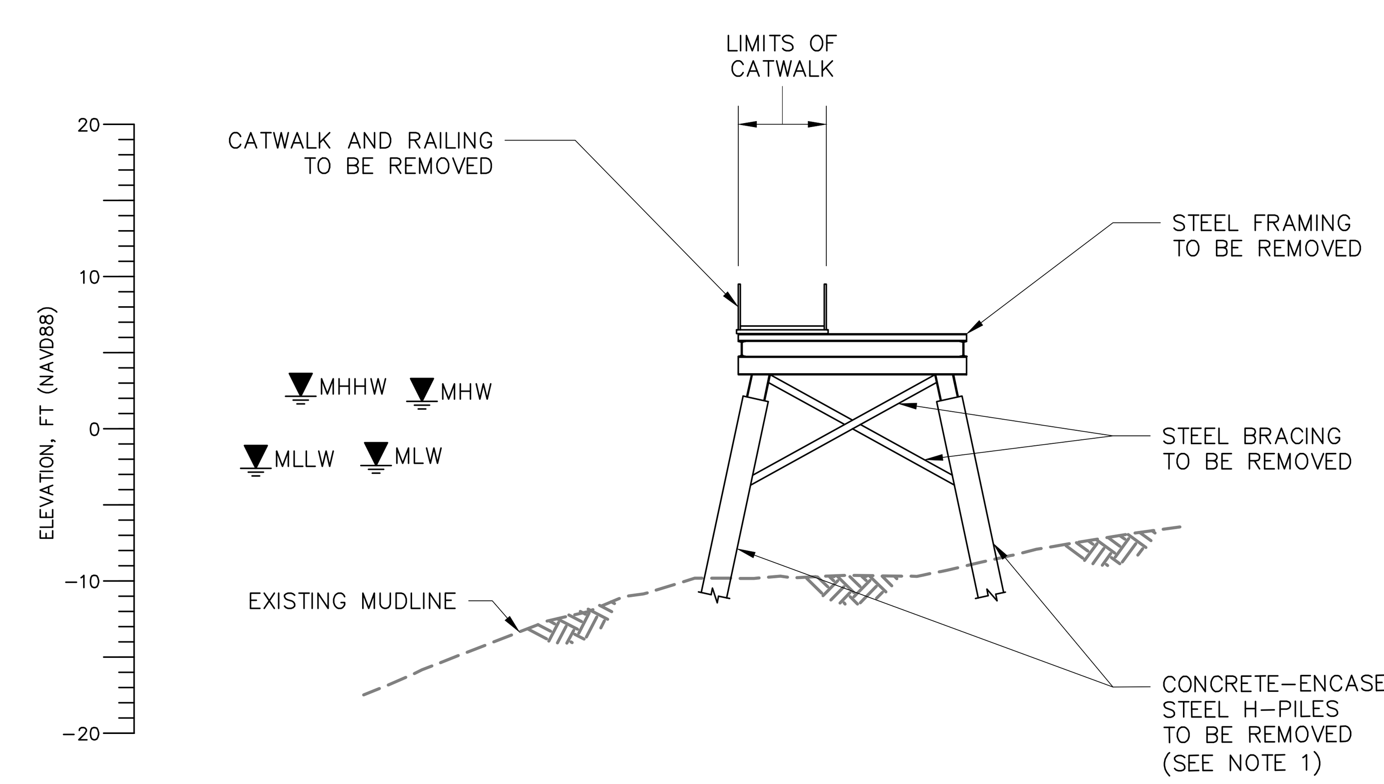
C
MA-010
SECTION
1" = 10'



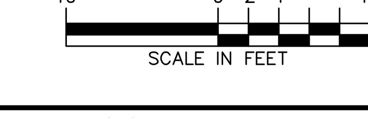
D
MA-010
SECTION
1" = 10'



E
MA-010
SECTION
1" = 10'



F
MA-010
SECTION
1" = 10'



Date	Description	No.

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

KINGS NEW YORK

Figure Title

EXISTING SECTIONS

Project No. 170594401	Drawing No.
Date -	MA-010
Drawn By KRW	
Checked By RL	Sheet 4 of 24

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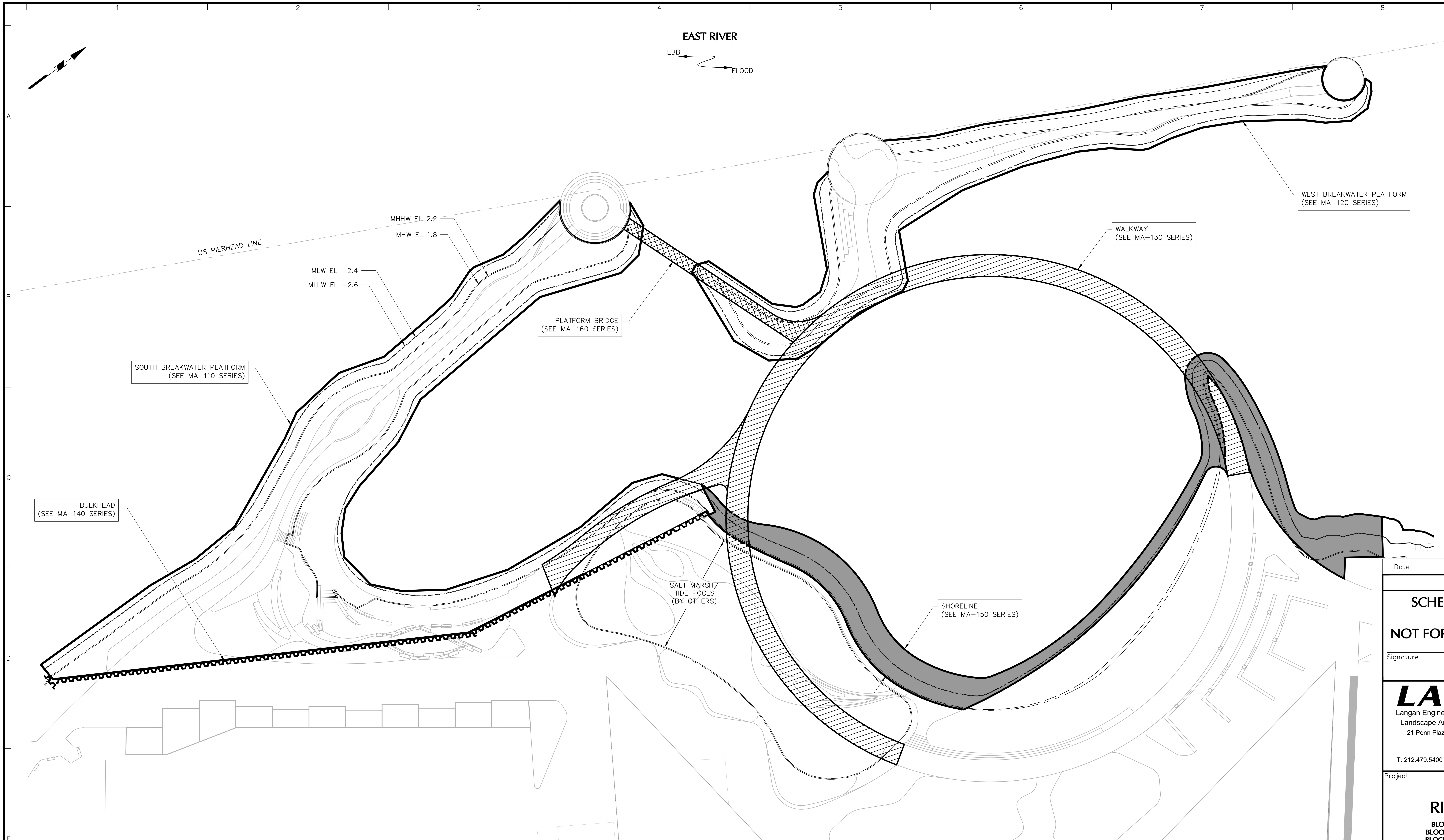
PROJECT NO. 170594401



NOTES:
1. BACKGROUND REFERENCED FROM "RIVER STREET LAYOUT PLAN" DATED 27 JULY 2020 BY JAMES CORNER FIELD OPERATIONS.
2. WATERFRONT STRUCTURES SHOWN ARE DETAILED IN THE FOLLOWING SHEETS:
   - SEE MA−110 SERIES FOR SOUTH PLATFORM PART PLANS.
   - SEE MA−120 SERIES FOR WEST PLATFORM PART PLANS.
   - SEE MA−130 SERIES FOR WALKWAY PART PLANS.
   - SEE MA−140 SERIES FOR BULKHEAD PART PLANS AND ELEVATIONS.
   - SEE MA−150 SERIES FOR SHORELINE PART PLANS.
   - SEE MA−160 SERIES FOR PLATFORM BRIDGE PART PLANS.

30 0 15 30
SCALE IN FEET

Date	Description	No.

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RIVER RING

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BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

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Figure Title

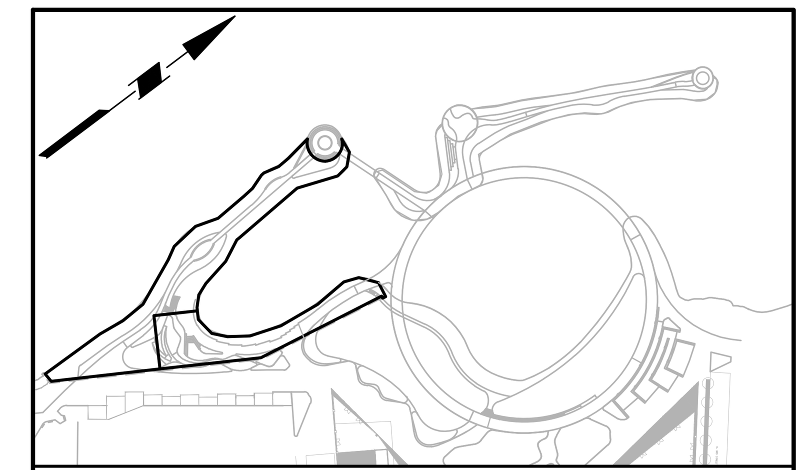
WATERFRONT
SITE PLAN

Project No. 170594401
Date -
Drawn By KRW
Checked By RL

Drawing No.
MA-100

Sheet 5 of 24

PROJECT NO. 170594401



KEY PLAN

SCALE: 1" = 200'

NOTES:
1. SEE MA-100 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE MA-111 FOR SOUTH PLATFORM FRAMING PLAN.
3. SEE MA-112 FOR SOUTH PLATFORM DECK PLAN.
4. SEE MA-500 FOR TYPICAL PLATFORM DETAILS.

20 0 5 10 20
SCALE IN FEET

Date	Description	No.

REVISIONS

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

KINGS NEW YORK

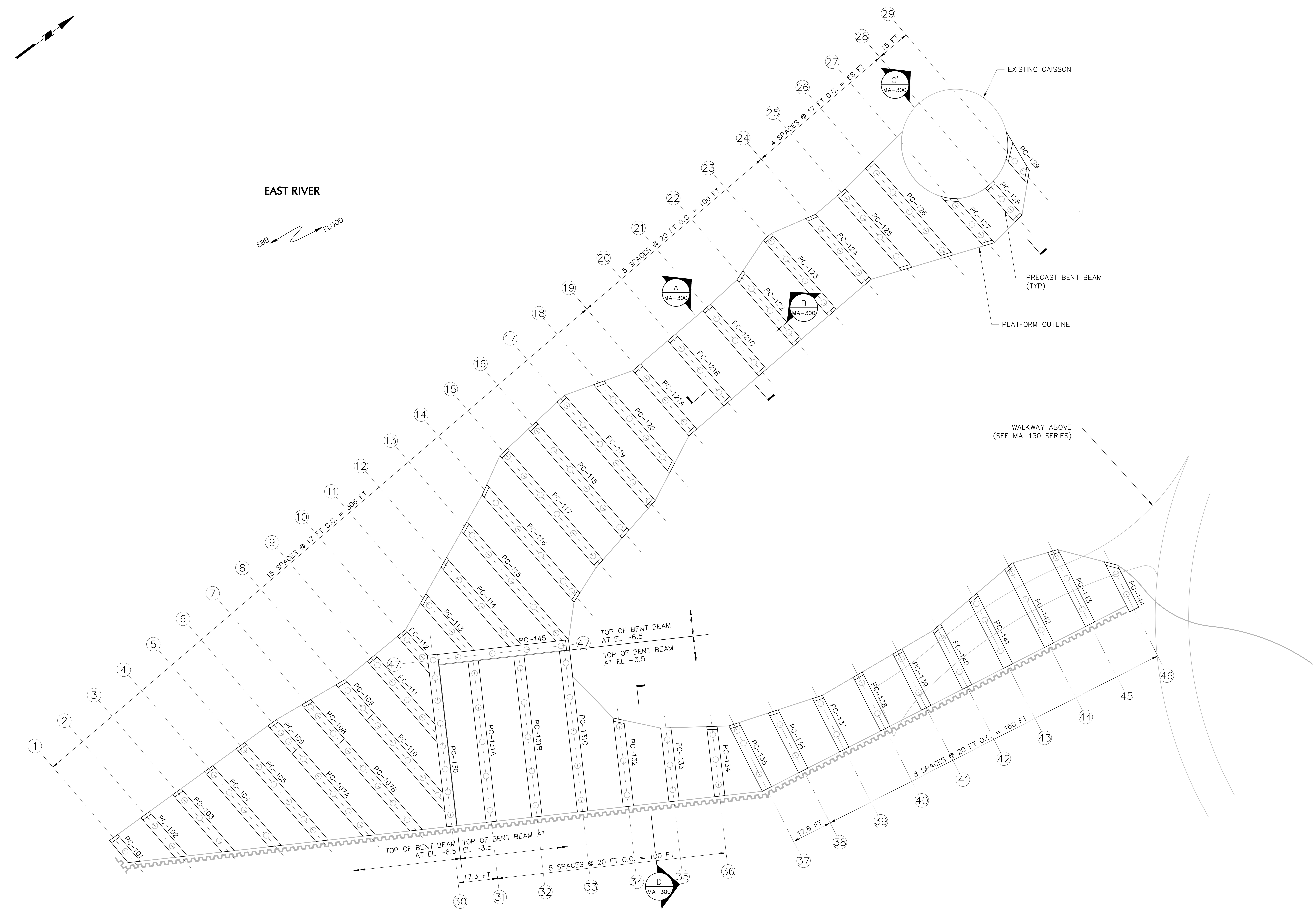
Figure Title

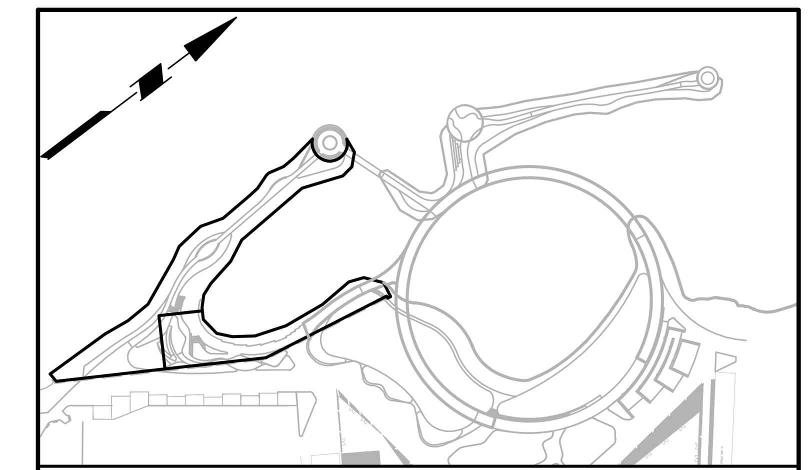
SOUTH PLATFORM FOUNDATION PLAN

Project No. 170594401	Drawing No.
Date -	MA-110
Drawn By KRW	
Checked By RL	Sheet 6 of 24

PROJECT NO. 170594401

Date: 1/22/2021 Time: 14:17 User: kweg Style Table: Langan.stb Layout: SOUTH Document Code: 170594401-0502-BF101-0106





KEY PLAN

SCALE: 1" = 200'

NOTES:
1. SEE MA-100 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE MA-110 FOR SOUTH PLATFORM FOUNDATION PLAN.
3. SEE MA-112 FOR SOUTH PLATFORM DECK PLAN.
4. SEE MA-500 FOR TYPICAL PLATFORM DETAILS.

20 0 5 10 20
SCALE IN FEET

Date	Description	No.

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Project

RIVER RING

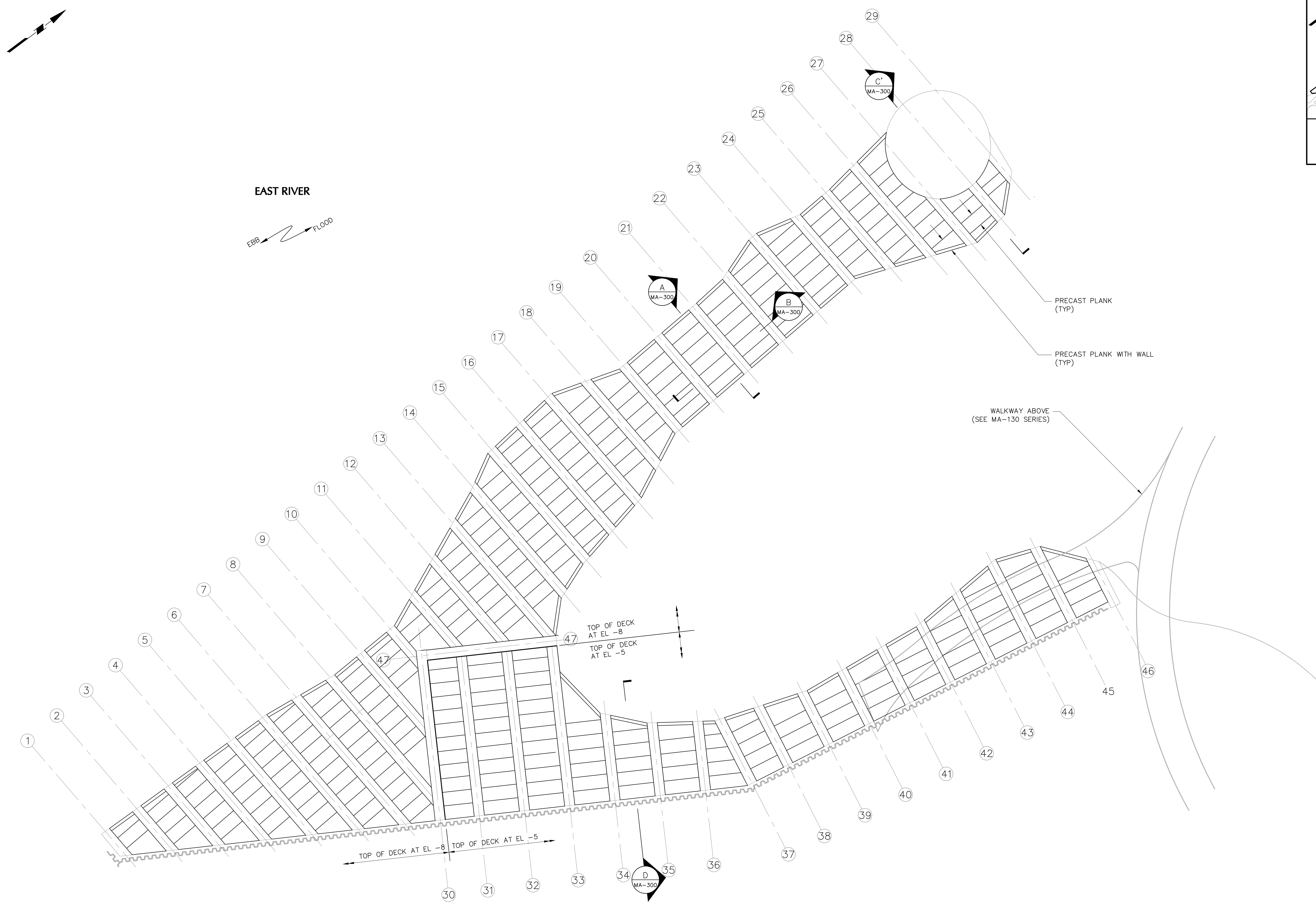
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

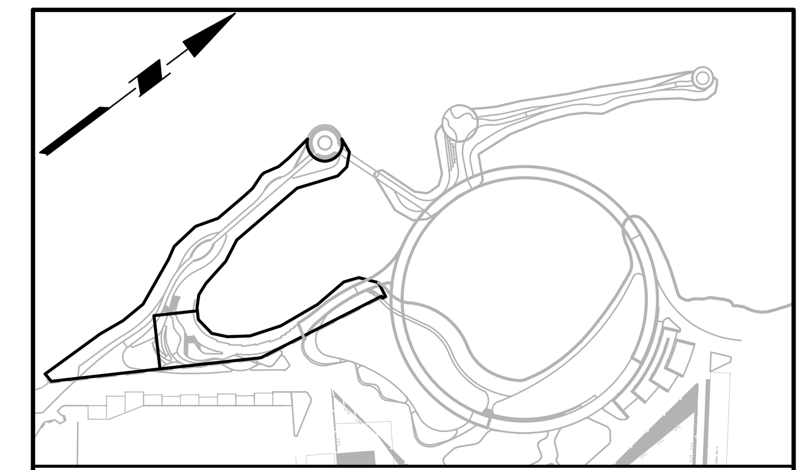
Figure Title

SOUTH PLATFORM FRAMING PLAN

Project No.	Drawing No.
170594401	MA-111
Date: -	
Drawn By: KRW	
Checked By: RL	Sheet 7 of 24

PROJECT NO. 170594401





KEY PLAN

SCALE: 1" = 200'

NOTES:
1. SEE MA-100 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE MA-110 FOR SOUTH PLATFORM FOUNDATION PLAN.
3. SEE MA-111 FOR SOUTH PLATFORM FRAMING PLAN.
4. SEE MA-500 FOR TYPICAL PLATFORM DETAILS.

20 0 5 10 20
SCALE IN FEET

Date	Description	No.

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Figure Title

SOUTH PLATFORM DECK PLAN

Project No.	Drawing No.
170594401	MA-112
Date: -	
Drawn By: KRW	
Checked By: RL	Sheet 8 of 24

PROJECT NO. 170594401

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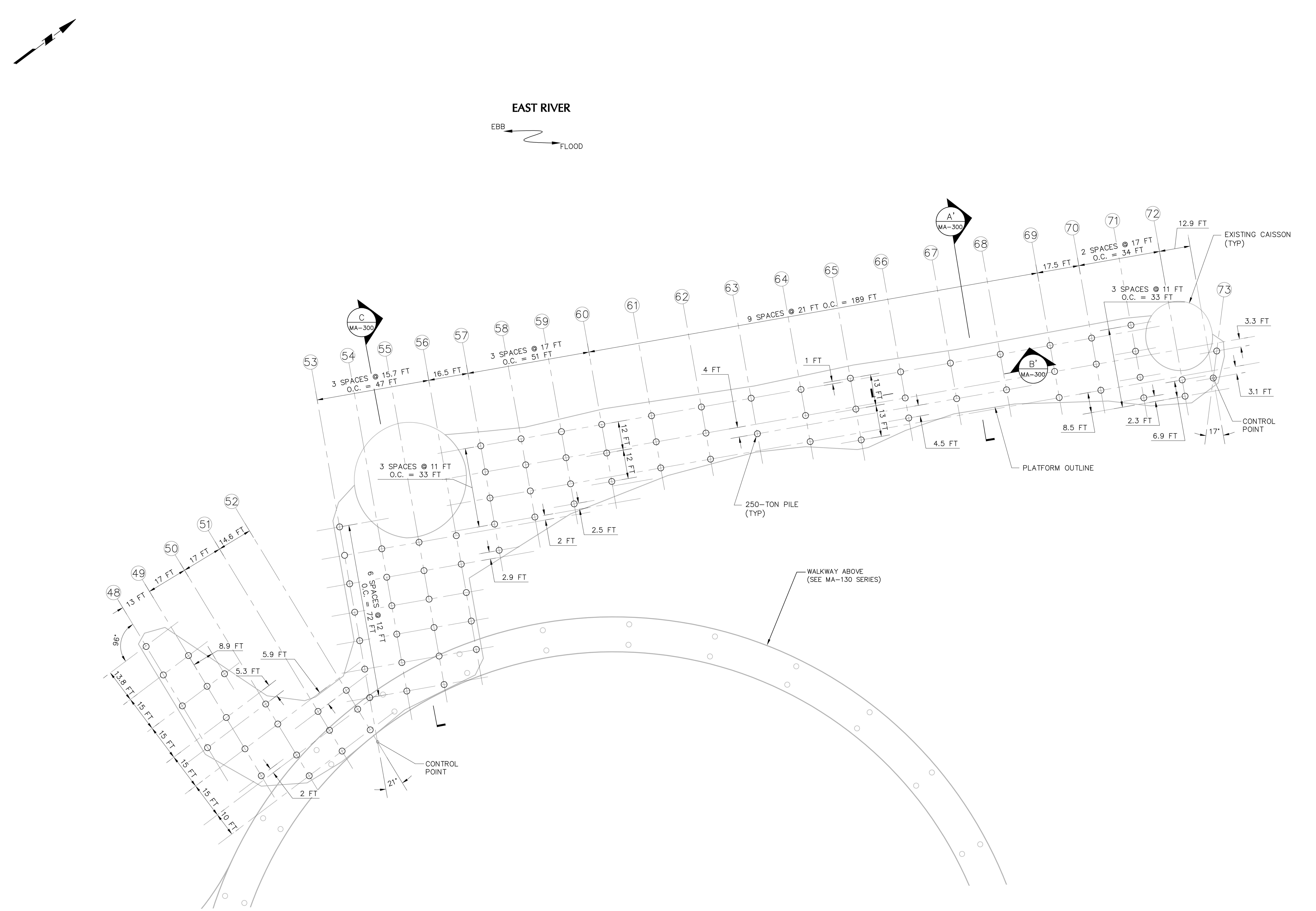
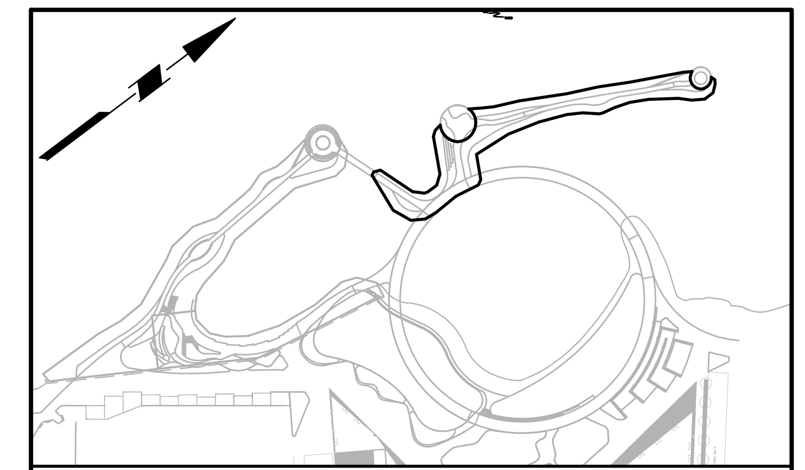
Date: 1/22/2021 Time: 14:45 User: kweg Style Table: Langan.stb Layout: SOUTH DECK Document Code: 170594401-0502-BF101-0107



KEY PLAN

SCALE: 1" = 200'



NOTES:
1. SEE MA-100 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE MA-121 FOR WEST PLATFORM FRAMING PLAN.
3. SEE MA-122 FOR WEST PLATFORM DECK PLAN.
4. SEE MA-500 FOR TYPICAL PLATFORM DETAILS.

SCALE IN FEET

Date	Description	No.

REVISIONS

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

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Figure Title

WEST PLATFORM FOUNDATION PLAN

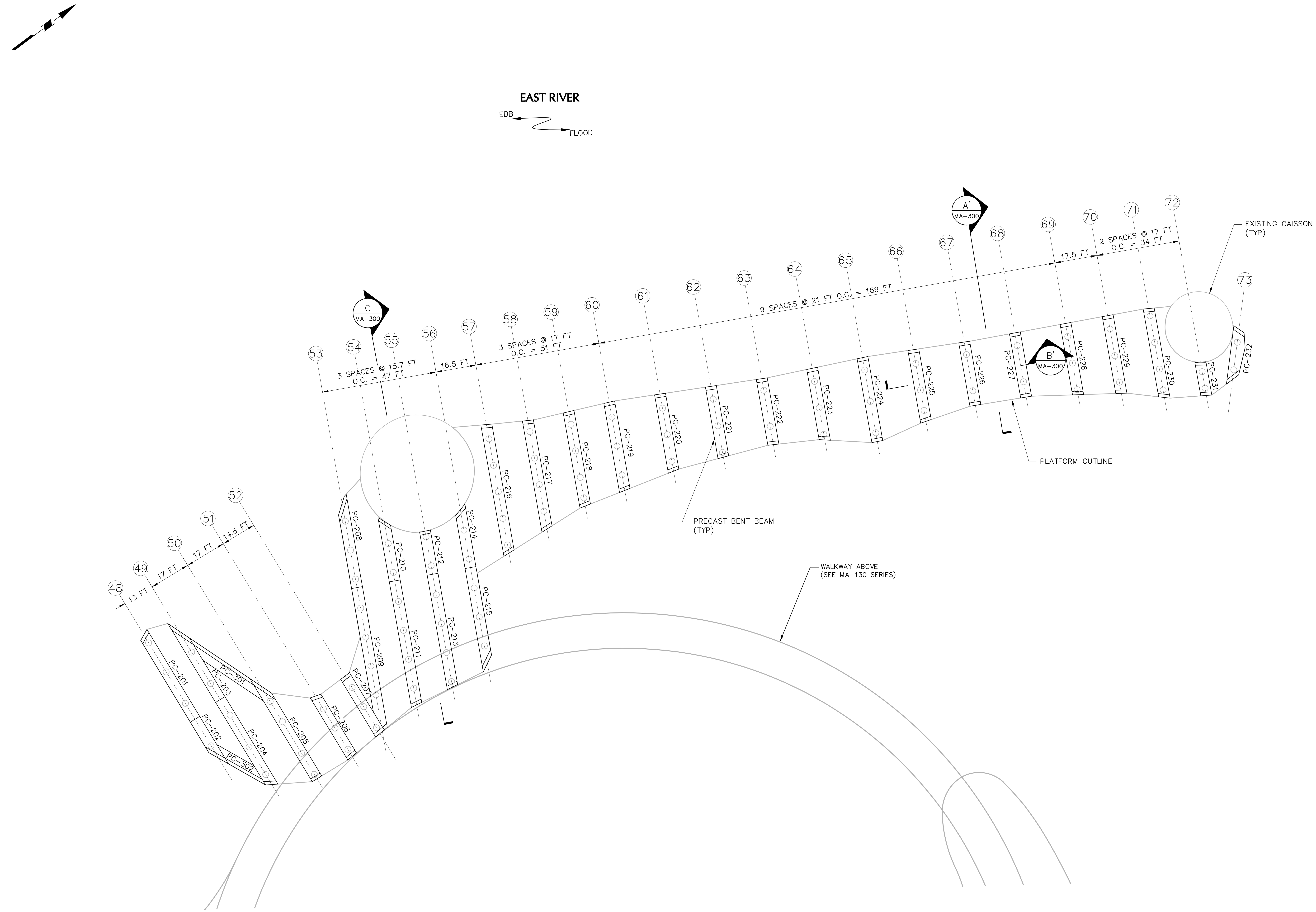
Project No. 170594401
Date -
Drawn By KRW
Checked By RL

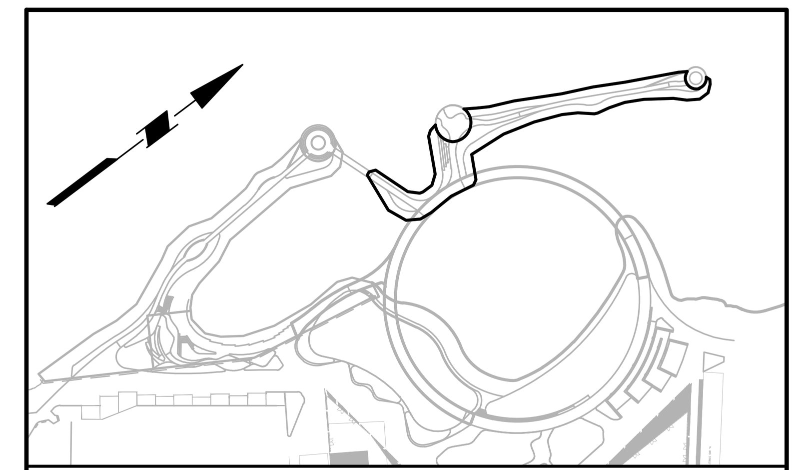
Drawing No. MA-120

Sheet 9 of 24

PROJECT NO. 170594401

Date: 3/16/2021 Time: 10:04 User: kweg Style Table: Langan.stb Layout: NORTH Document Code: 170594401-0502-BF101-0103





KEY PLAN
SCALE: 1" = 200'

NOTES:
1. SEE MA-100 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE MA-120 FOR WEST PLATFORM FOUNDATION PLAN.
3. SEE MA-122 FOR WEST PLATFORM DECK PLAN.
4. SEE MA-500 FOR TYPICAL PLATFORM DETAILS.

20 0 5 10 20
SCALE IN FEET

Date	Description	No.

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Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Figure Title
WEST PLATFORM FRAMING PLAN

Project No. 170594401
Date -
Drawn By KRW
Checked By RL
Drawing No. MA-121
Sheet 10 of 24

PROJECT NO. 170594401

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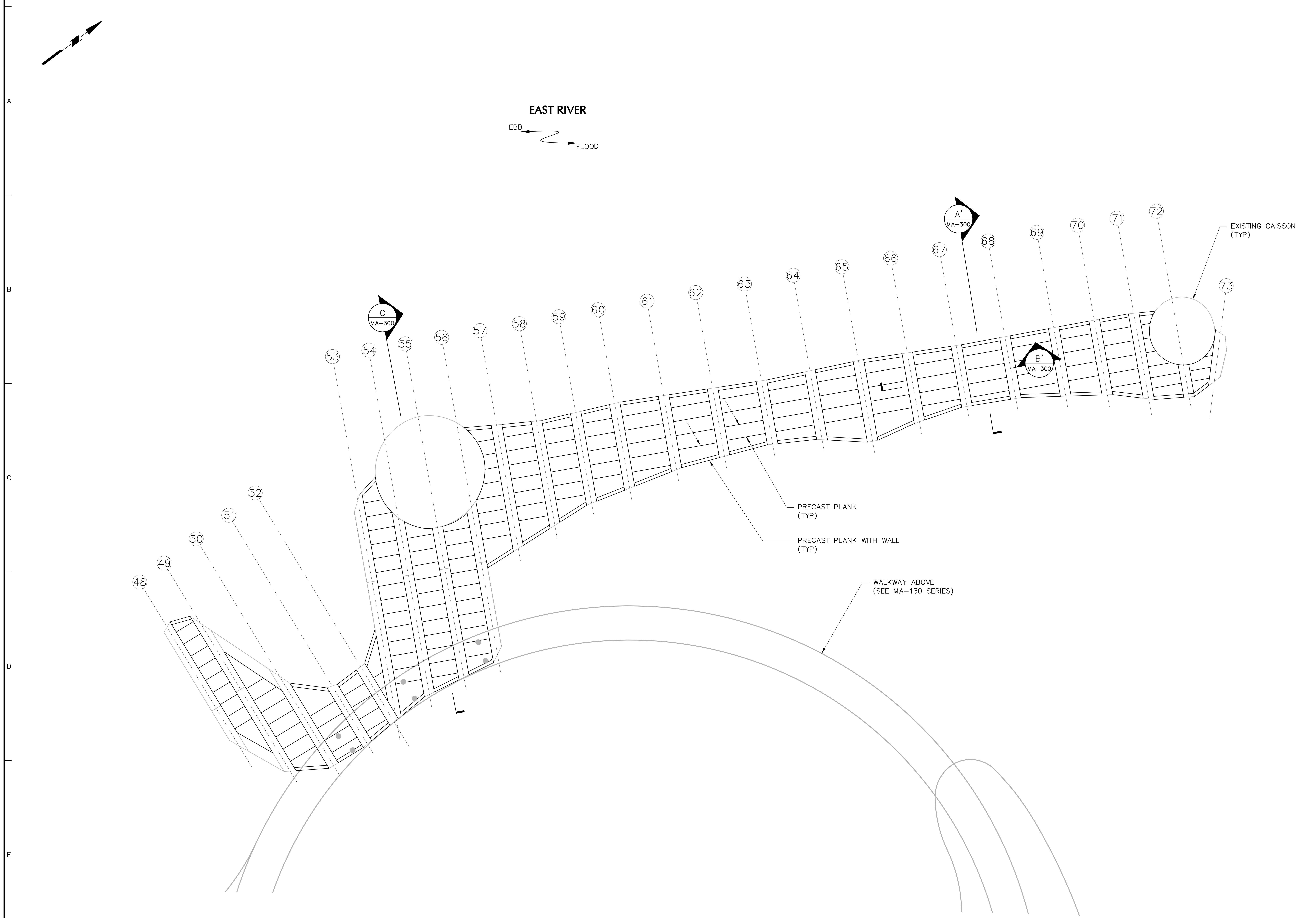

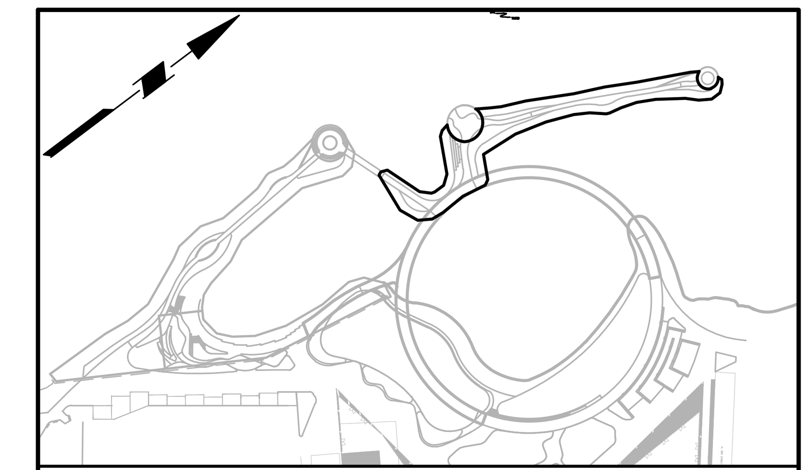

KEY PLAN

SCALE: 1" = 200'

NOTES:
1. SEE MA-100 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE MA-120 FOR WEST PLATFORM FOUNDATION PLAN.
3. SEE MA-121 FOR WEST PLATFORM FRAMING PLAN.
4. SEE MA-500 FOR TYPICAL PLATFORM DETAILS.

20 0 5 10 20
SCALE IN FEET

Date	Description	No.

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

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Figure Title

WEST PLATFORM DECK PLAN

Project No. 170594401

Date -

Drawn By KRW

Checked By RL

Drawing No.

MA-122

PROJECT NO. 170594401

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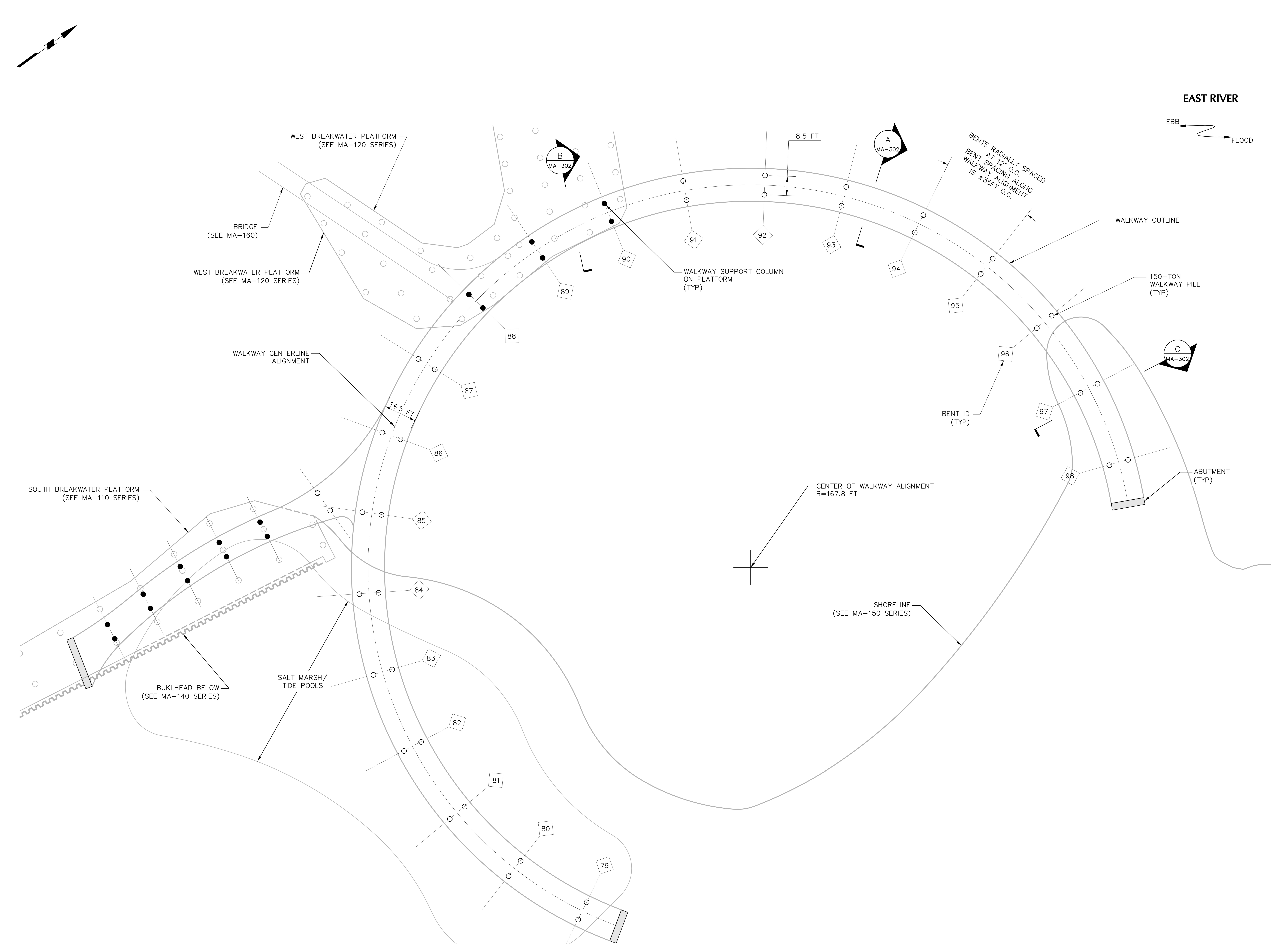
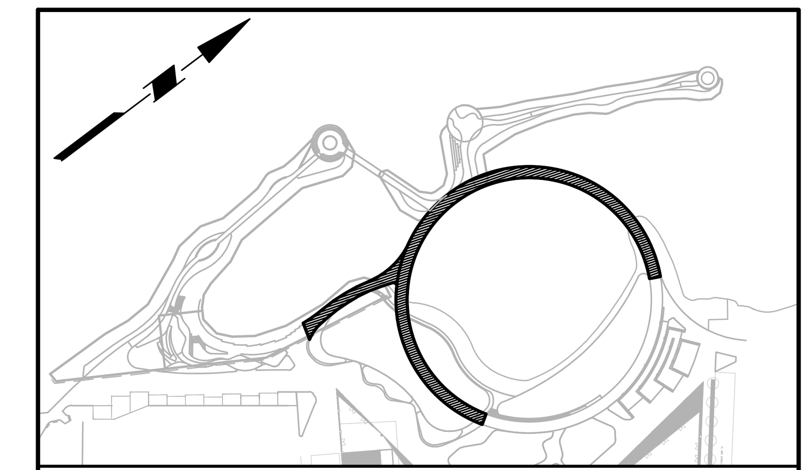
Date: 3/16/2021 Time: 10:08 User: kweg Style Table: Langan.stb Layout: NORTH DECK Document Code: 170594401-0502-BF101-0108





KEY PLAN

SCALE: 1" = 200'

NOTES:
1. SEE MA-100 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE MA-131 FOR WALKWAY FRAMING PLAN.
3. SEE MA-132 FOR WALKWAY DECK PLAN.

Date	Description	No.

REVISIONS

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1/22/2021
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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

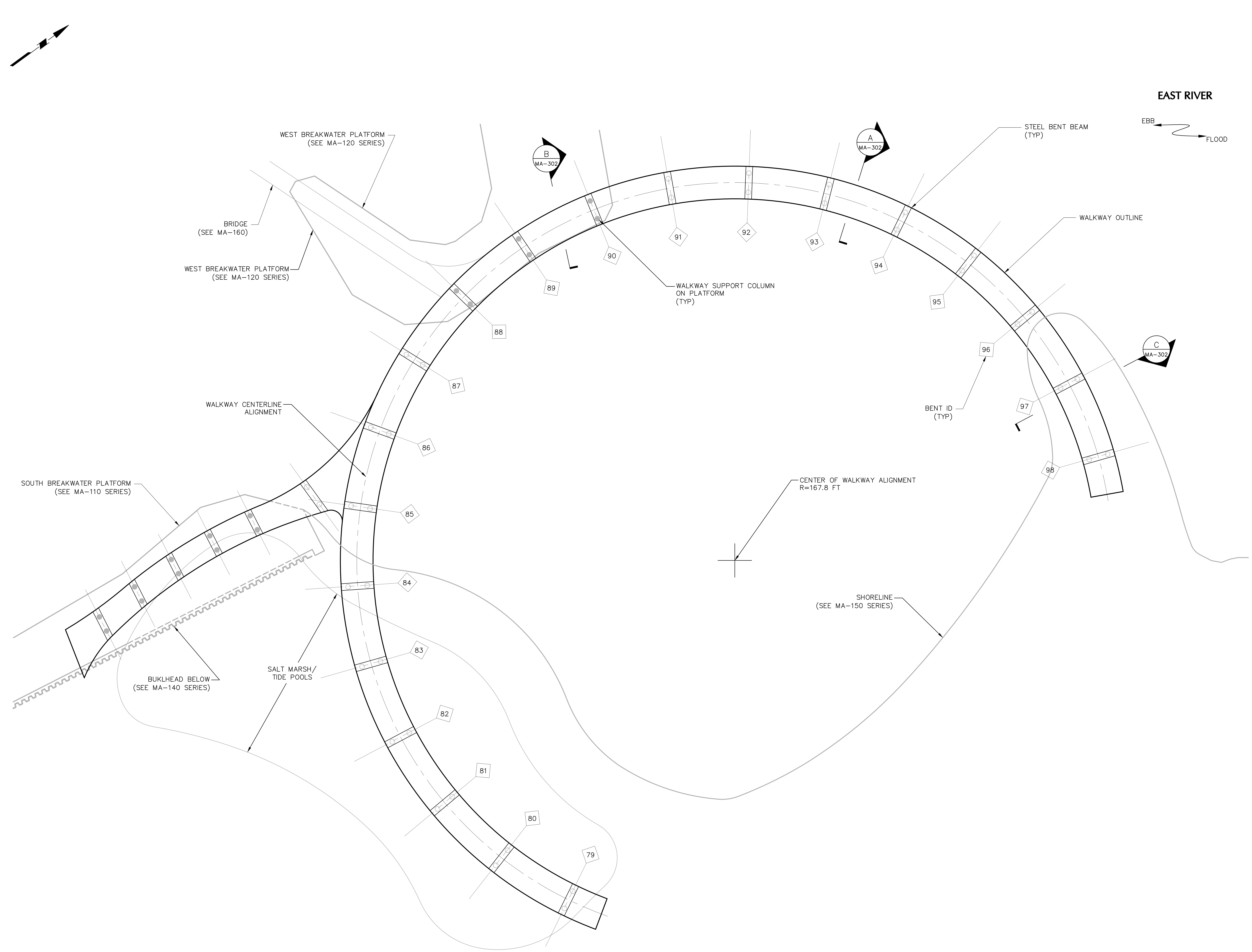
Figure Title

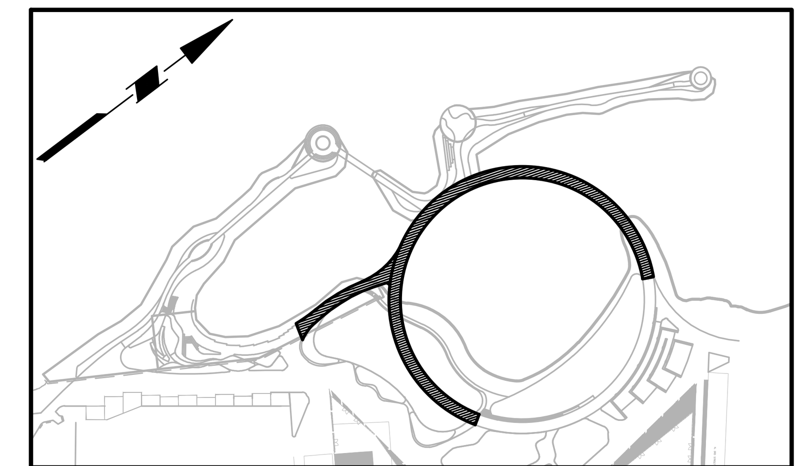
WALKWAY FOUNDATION PLAN

Project No. 170594401	Drawing No. MA-130
Date -	
Drawn By KRW	
Checked By RL	Sheet 12 of 24

PROJECT NO. 170594401

Date: 3/16/2021 Time: 10:25 User: kweg Style Table: Langan.stb Layout: PILES Document Code: 170594401-0502-BF401-0103





KEY PLAN

SCALE: 1" = 200'

NOTES:
1. SEE MA-100 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE MA-130 FOR WALKWAY FOUNDATION PLAN.
3. SEE MA-132 FOR WALKWAY DECK PLAN.

20 0 5 10 20
SCALE IN FEET

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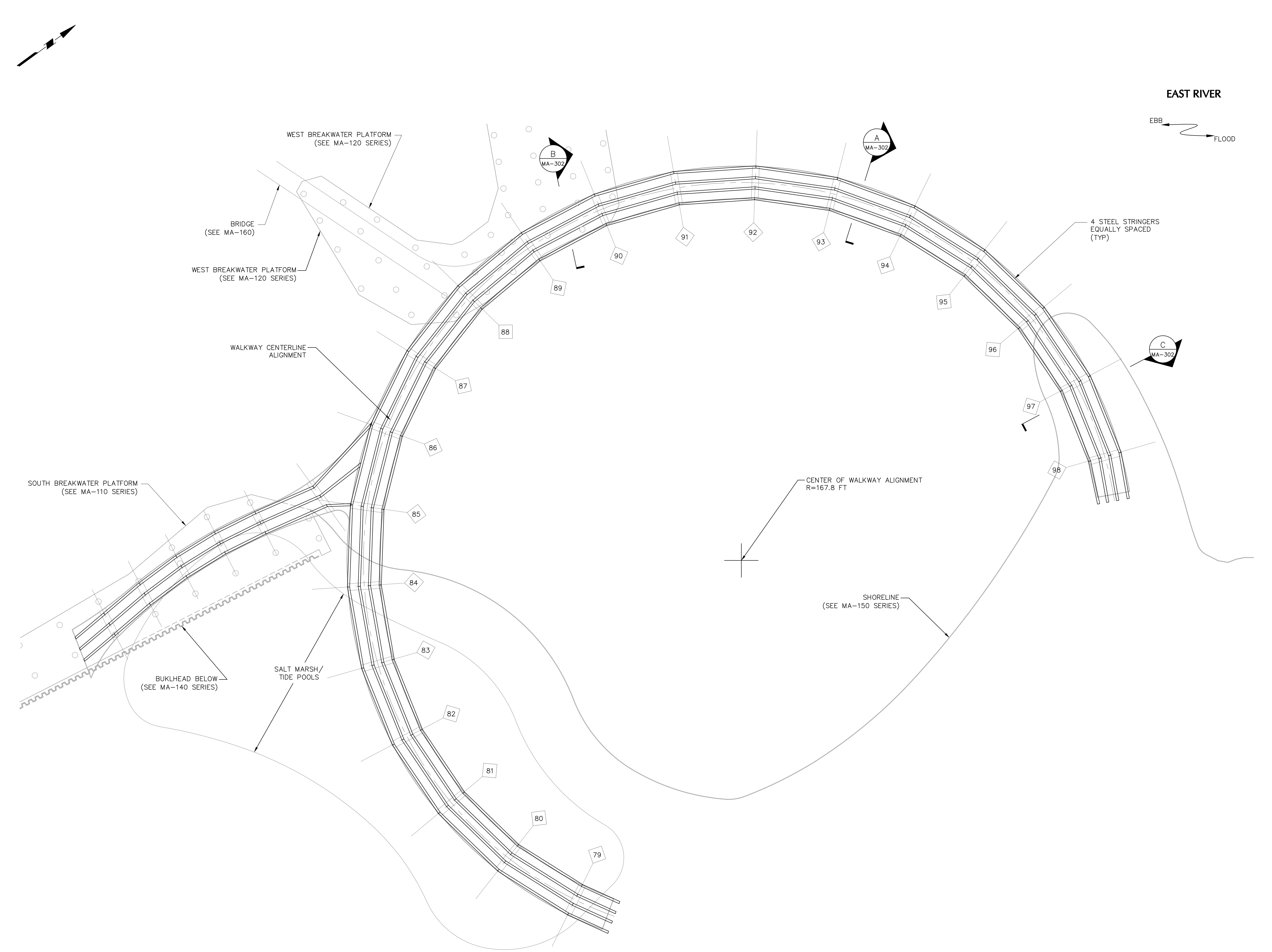
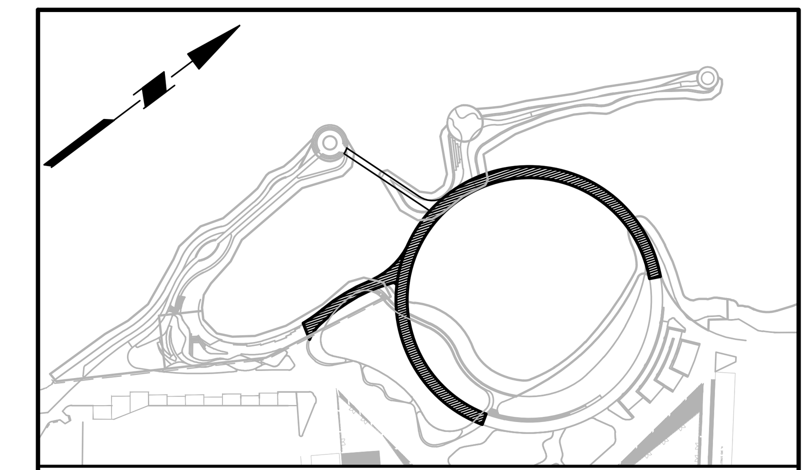
Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Figure Title
WALKWAY BENT PLAN

Project No. 170594401
Date -
Drawn By KRW
Checked By RL
Drawing No. MA-131
Sheet 13 of 24

PROJECT NO. 170594401





KEY PLAN

SCALE: 1" = 200'

NOTES:
1. SEE MA-100 FOR OVERALL SITE STRUCTURES PLAN.
2. SEE MA-130 FOR WALKWAY FOUNDATION PLAN.
3. SEE MA-131 FOR WALKWAY FRAMING PLAN.

Date	Description	No.

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Signature Date

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Langan Engineering, Environmental, Surveying, Landscape Architecture and Geology, D.P.C.
21 Penn Plaza, 360 West 31st Street, 8th Floor
New York, NY 10001

T: 212.479.5400 F: 212.479.5444 www.langan.com

Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

KINGS NEW YORK

Figure Title

WALKWAY FRAMING PLAN

Project No. 170594401

Date -

Drawn By KRW

Checked By RL

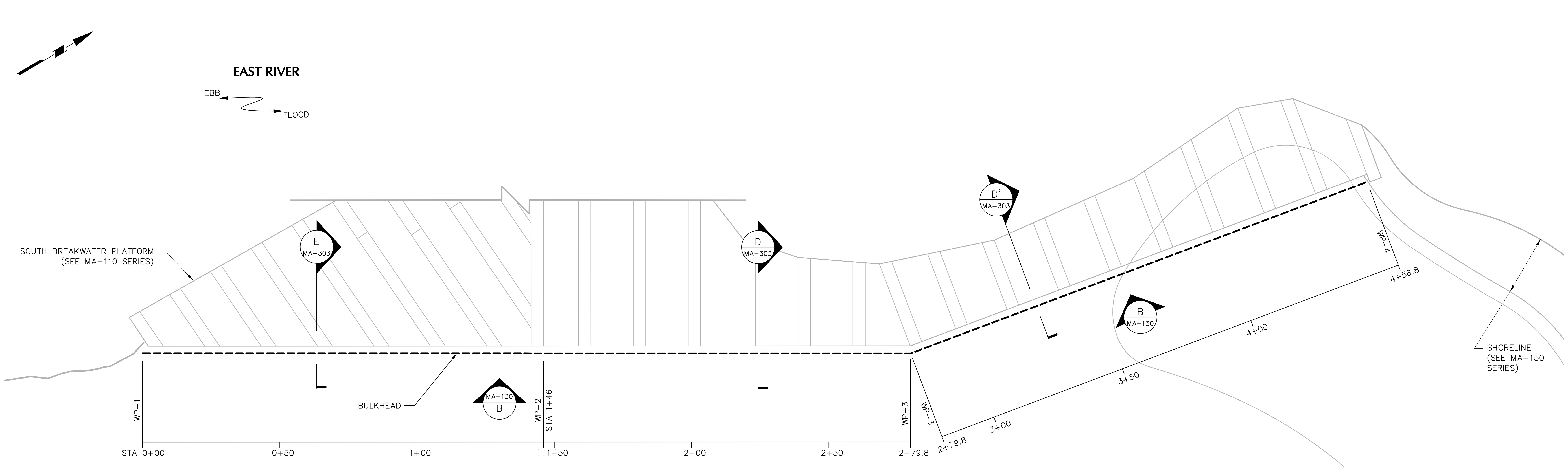
Drawing No. MA-132

Sheet 14 of 24

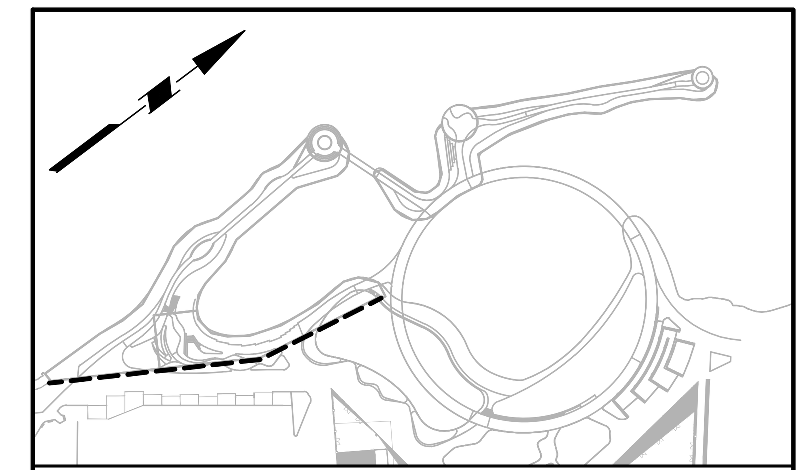
PROJECT NO. 170594401

LANGAN

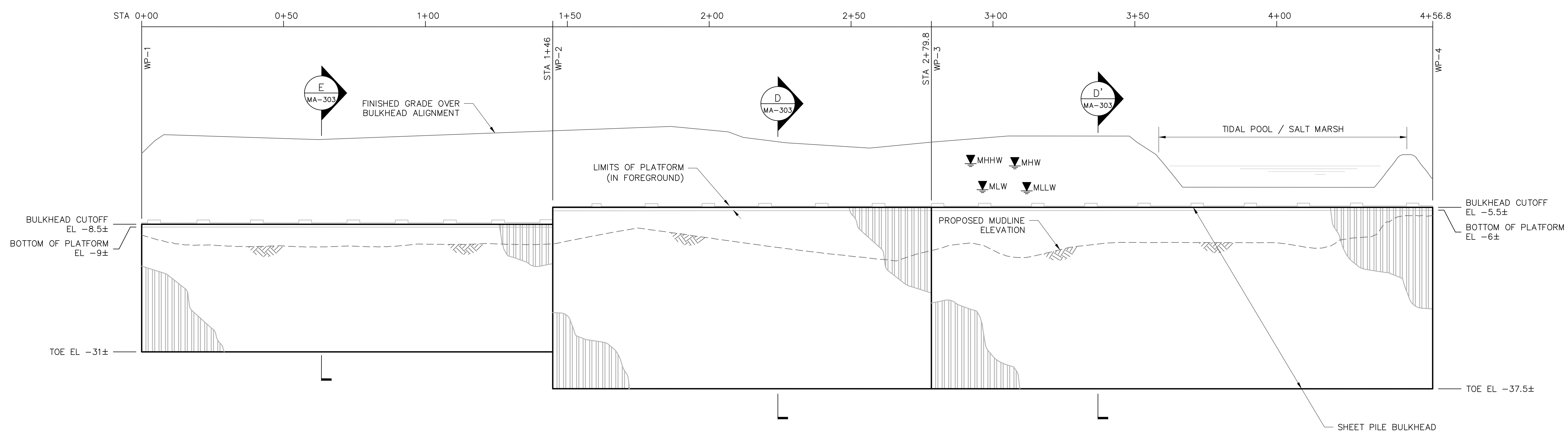
Date: 3/16/2021 Time: 10:45 User: kweg Style Table: Langan.stb Layout: DECK Document Code: 170594401-0502-BF401-0105



A
MA-120
PLAN
1" = 20'



KEY PLAN
SCALE: 1" = 200'



NOTE:
ELEVATION SHOWS BACK FACE OF BULKHEAD.

B
MA-120
ELEVATION
HORIZONTAL 1" = 20'
VERTICAL 1" = 10'

SCALE IN FEET (10 0 2 4 10)
SCALE IN FEET (20 0 5 10 20)

Date	Description	No.

REVISIONS

SCHEMATIC DESIGN
1/22/2021
NOT FOR CONSTRUCTION

Signature Date

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Landscape Architecture and Geology, D.P.C.
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Project

RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Figure Title

BULKHEAD
PART PLAN
AND ELEVATION

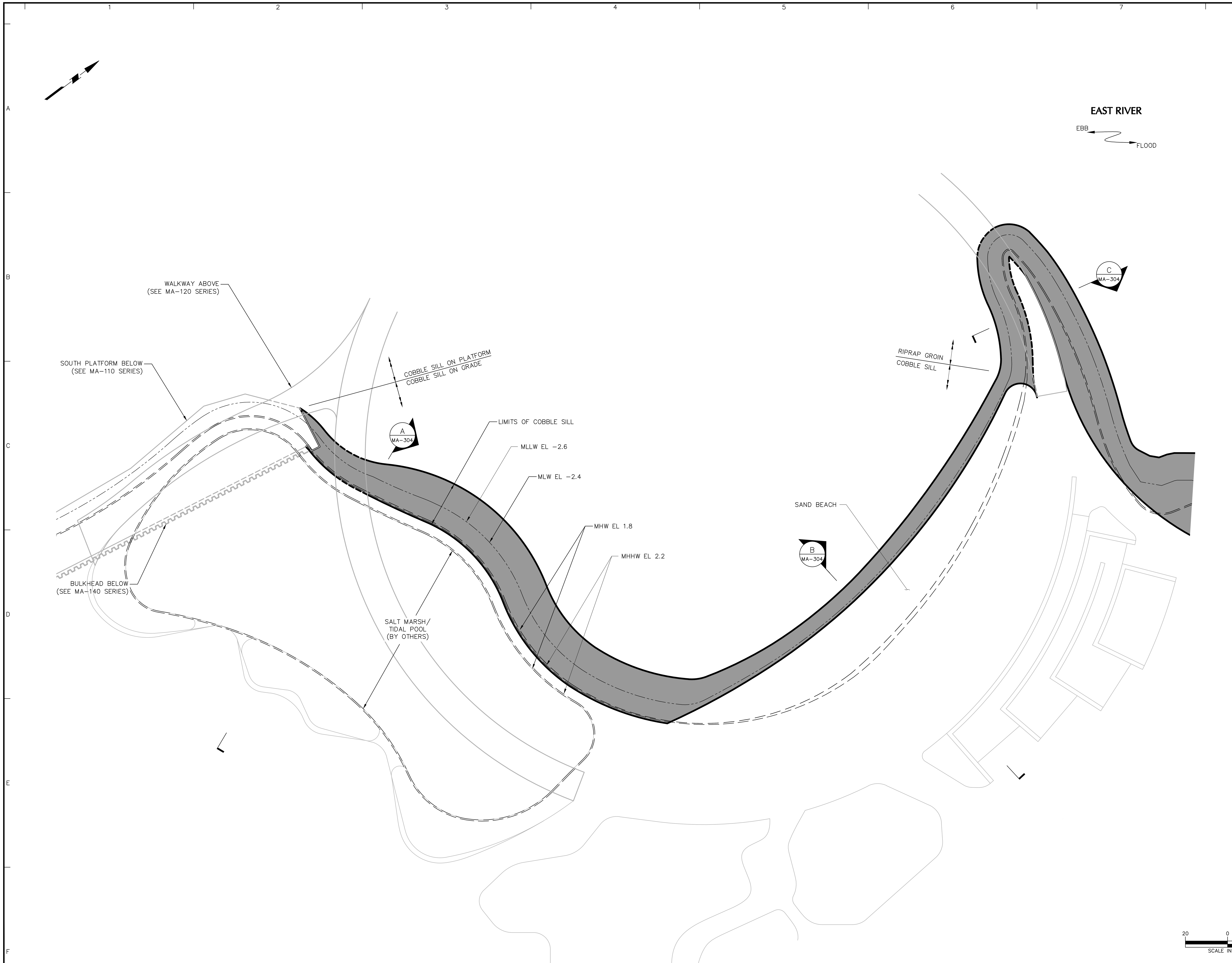
Project No. 170594401
Date -
Drawn By KRW
Checked By RL
Drawing No. MA-140

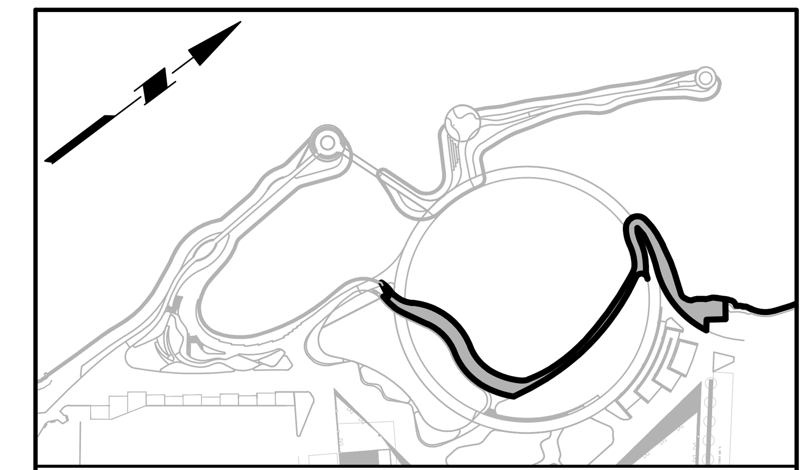
Sheet 15 of 24

PROJECT NO. 170594401

LANGAN

Date: 1/21/2021 Time: 23:15 User: kweg Style Table: Langan.stb Layout: BULKHEAD Document Code: 170594401-0502-BF401-0102





KEY PLAN
SCALE: 1" = 200'

Date	Description	No.

REVISIONS

SCHEMATIC DESIGN
1/22/2021
NOT FOR CONSTRUCTION

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Project

RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Figure Title

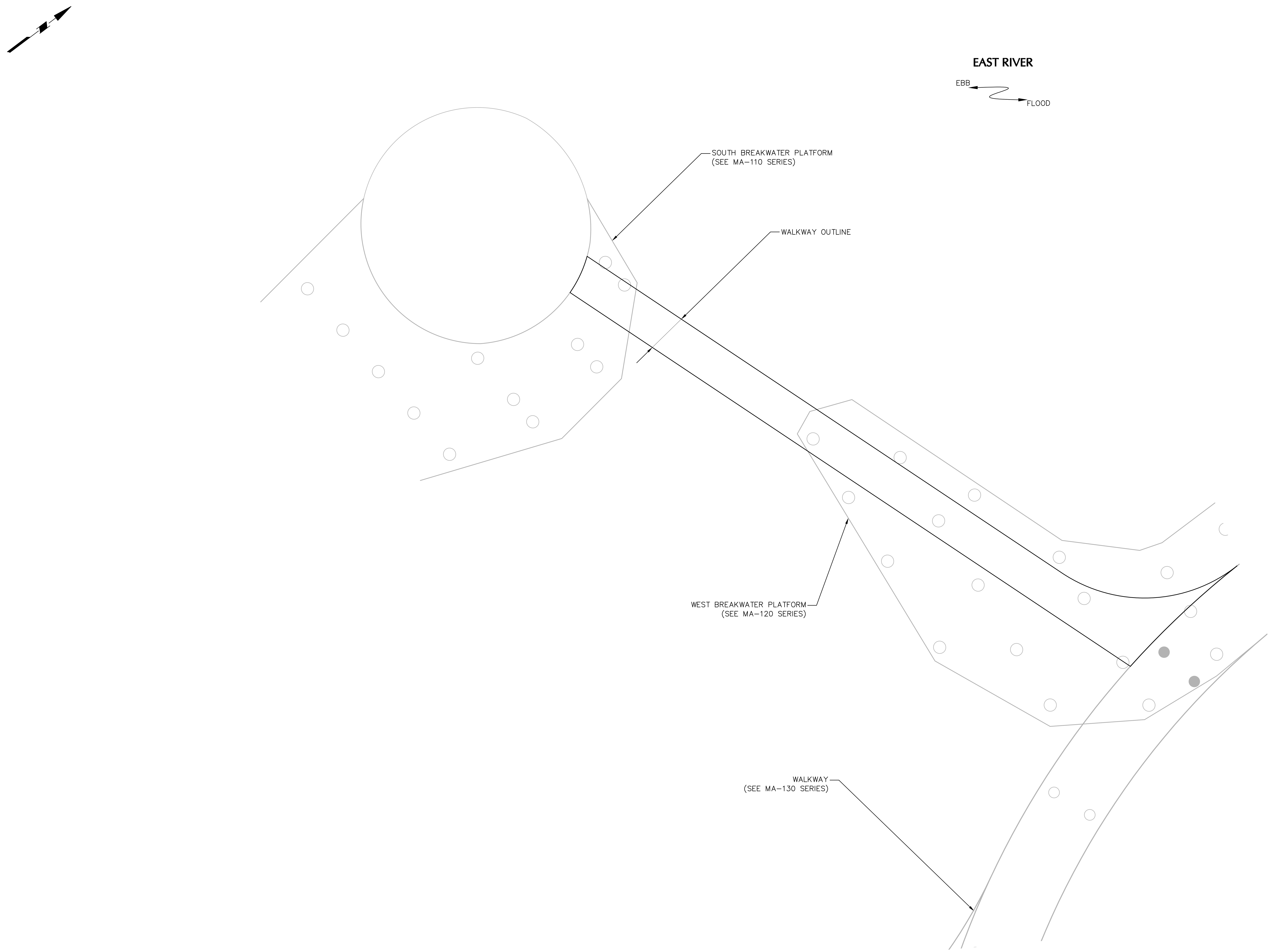
SHORELINE
PART PLAN

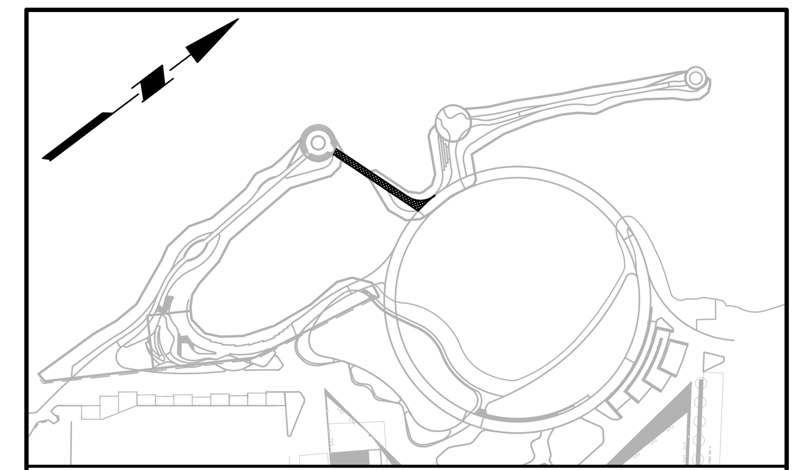
Project No. 170594401
Date -
Drawn By KRW
Checked By RL
Drawing No. MA-150
Sheet 16 of 24

PROJECT NO. 170594401

LANGAN

Date: 3/16/2021 Time: 11:06 User: kweg Style Table: Langan.stb Layout: SHORELINE Document Code: 170594401-0502-BF401-0106





KEY PLAN

SCALE: 1" = 200'

NOTE:
SEE MA-100 FOR OVERALL SITE STRUCTURES PLAN.

10 0 2 4 10
SCALE IN FEET

Date	Description	No.

REVISIONS

SCHEMATIC DESIGN
1/22/2021
NOT FOR CONSTRUCTION

Signature Date

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

KINGS NEW YORK

Figure Title

BRIDGE
PLAN

Project No. 170594401
Date -
Drawn By KRW
Checked By RL

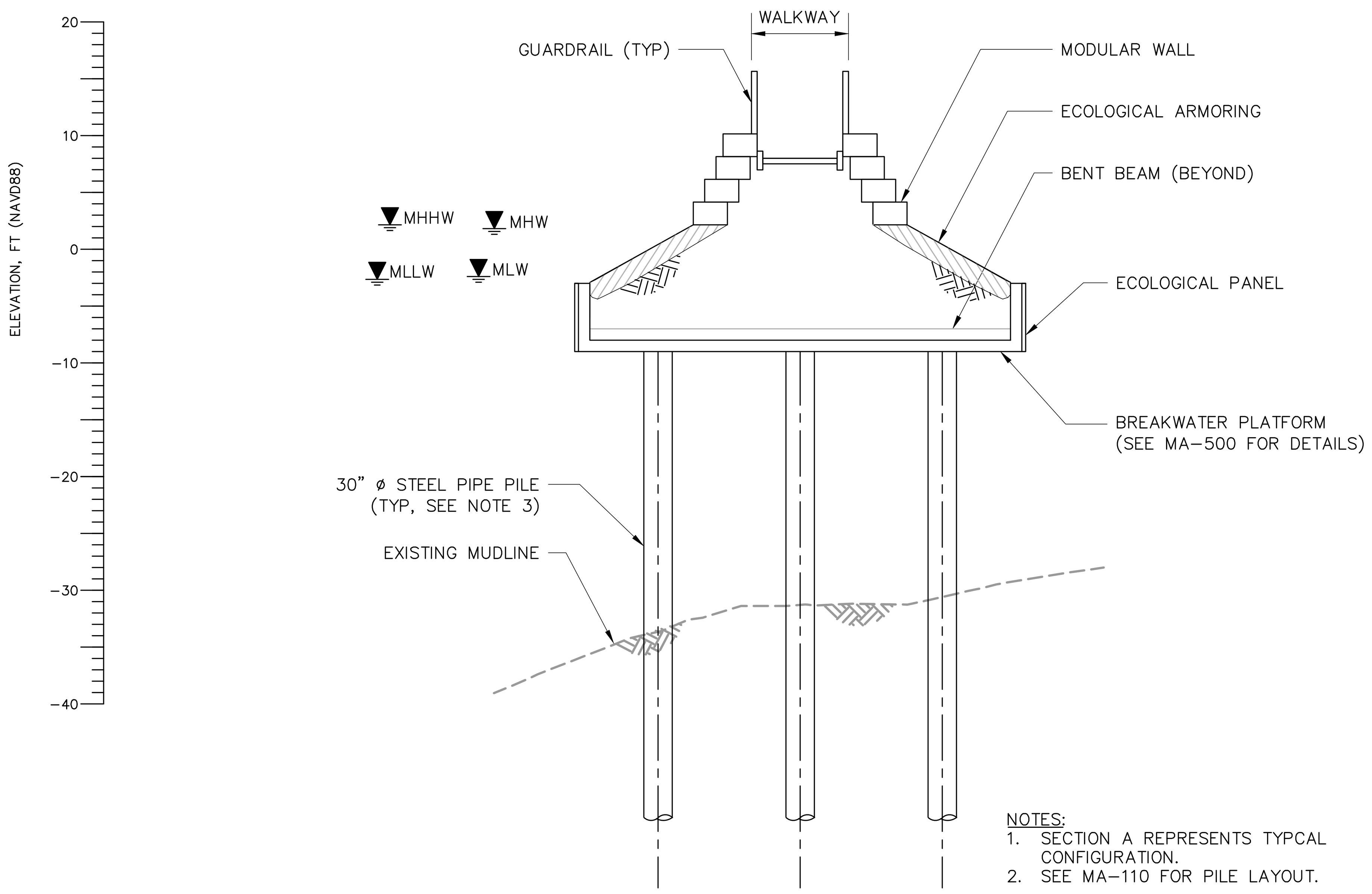
Drawing No. MA-160

Sheet 17 of 24

PROJECT NO. 170594401

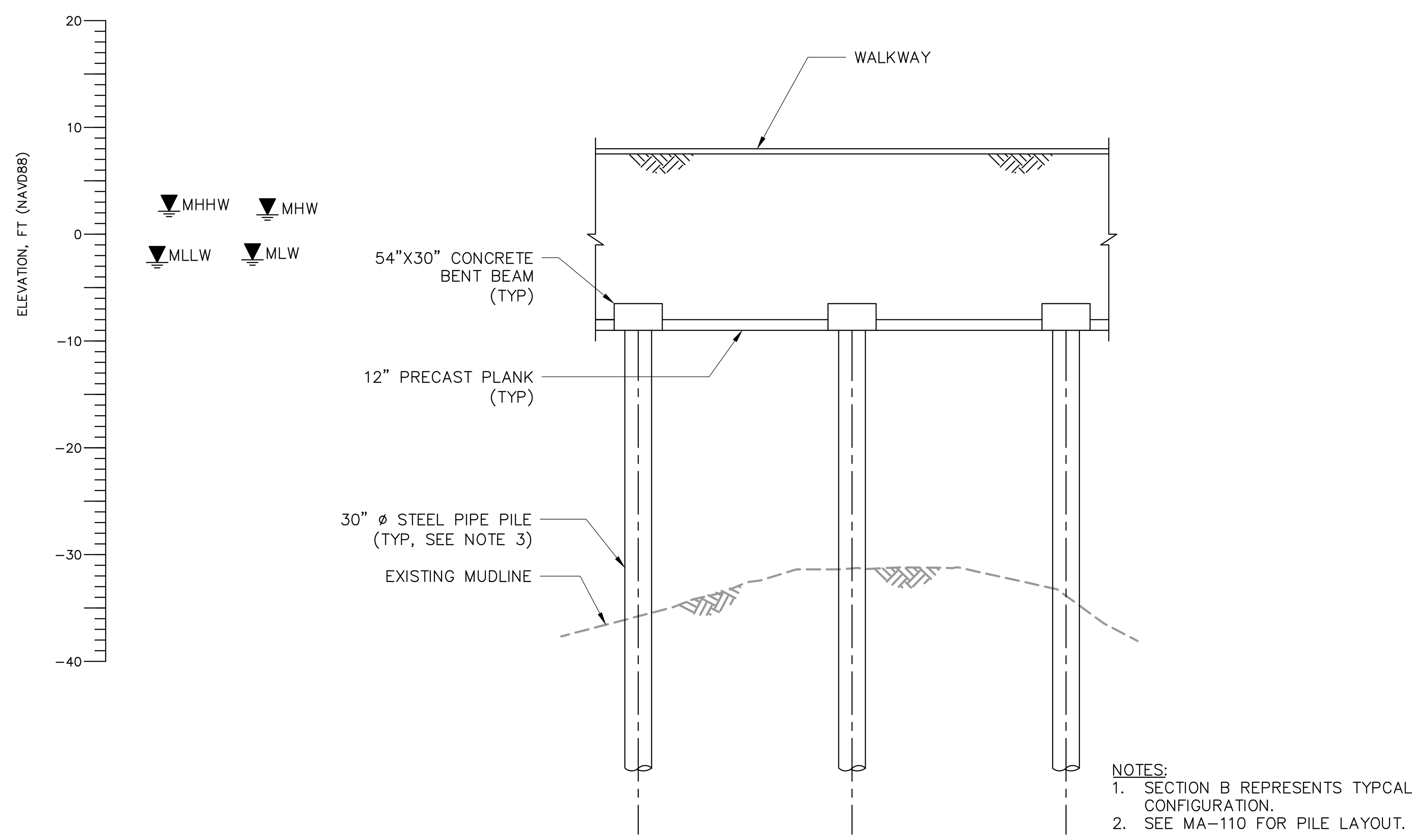
LANGAN

Date: 1/22/2021 Time: 16:26 User: kweg Style Table: Langan.stb Layout: PILES Document Code: 170594401-0502-BF401-0107



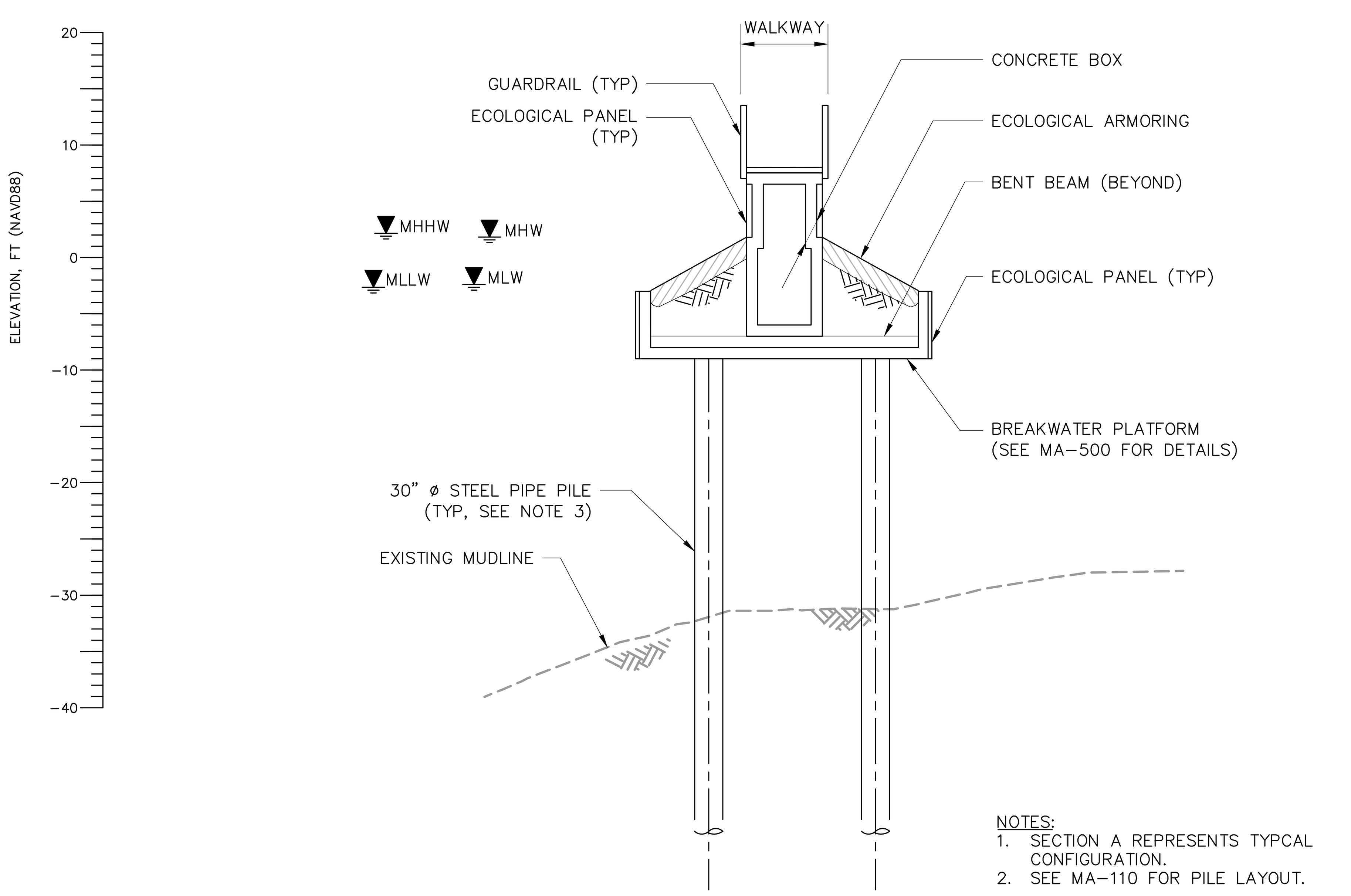
NOTES:
1. SECTION A REPRESENTS TYPCAL CONFIGURATION.
2. SEE MA-110 FOR PILE LAYOUT.

A MA-300 SECTION 1" = 10'



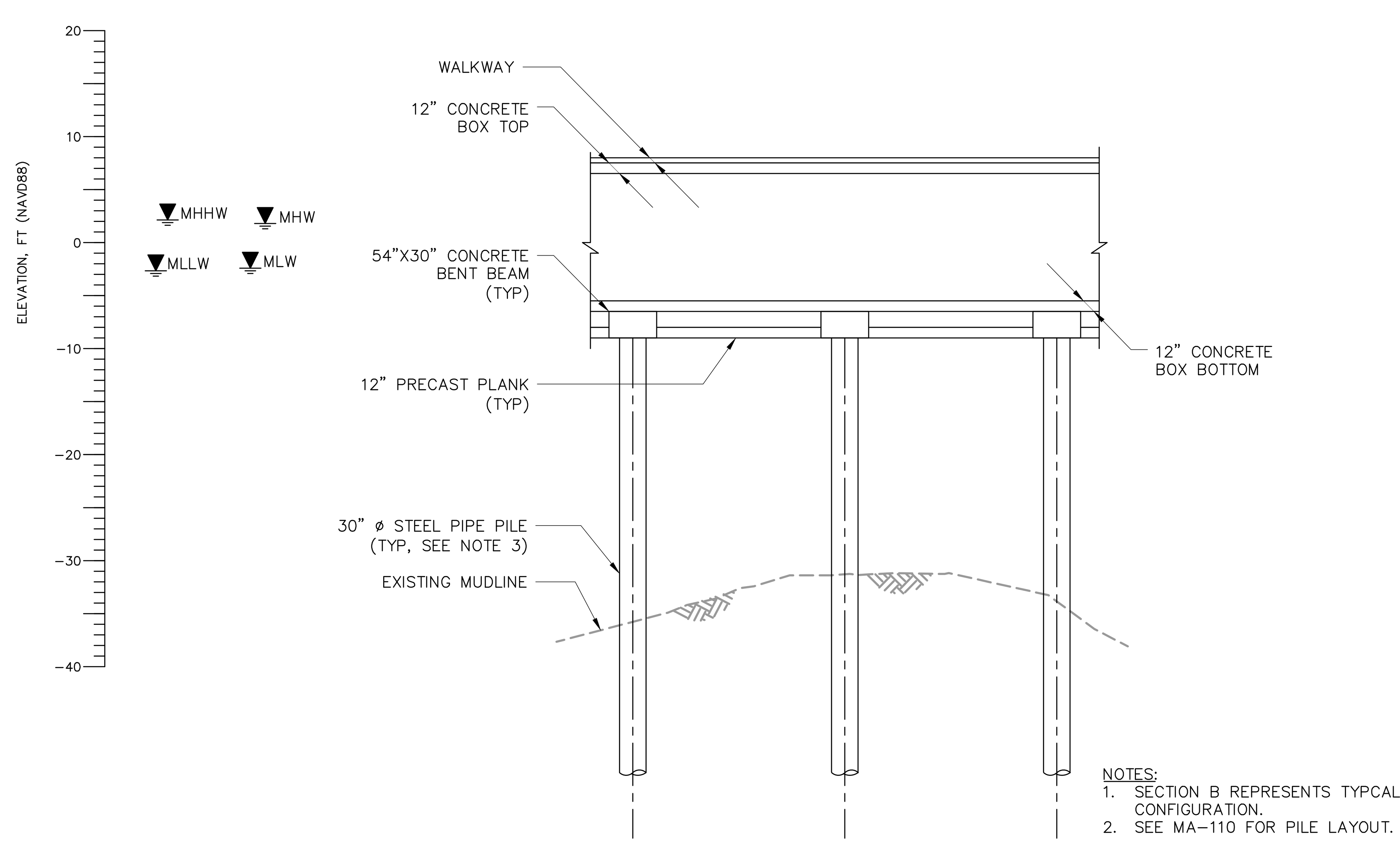
NOTES:
1. SECTION B REPRESENTS TYPCAL CONFIGURATION.
2. SEE MA-110 FOR PILE LAYOUT.

B MA-300 SECTION 1" = 10'



NOTES:
1. SECTION A REPRESENTS TYPCAL CONFIGURATION.
2. SEE MA-110 FOR PILE LAYOUT.

A' MA-300 SECTION 1" = 10'



NOTES:
1. SECTION B REPRESENTS TYPCAL CONFIGURATION.
2. SEE MA-110 FOR PILE LAYOUT.

B' MA-300 SECTION 1" = 10'

10 0 2 4 10
SCALE IN FEET

Date	Description	No.

REVISIONS

SCHEMATIC DESIGN
1/22/2021
NOT FOR CONSTRUCTION

Signature Date

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

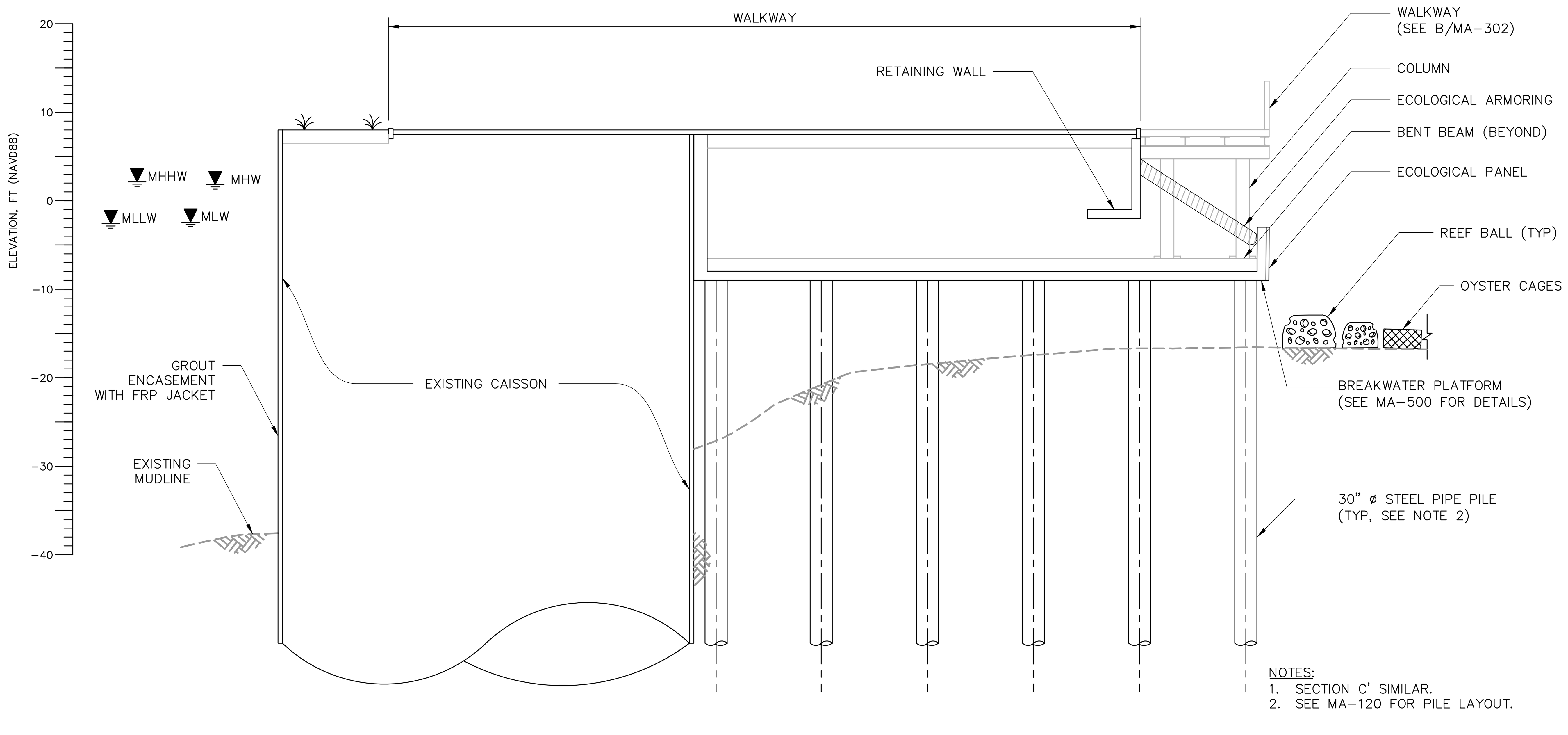
Figure Title

BREAKWATER PLATFORM SECTIONS

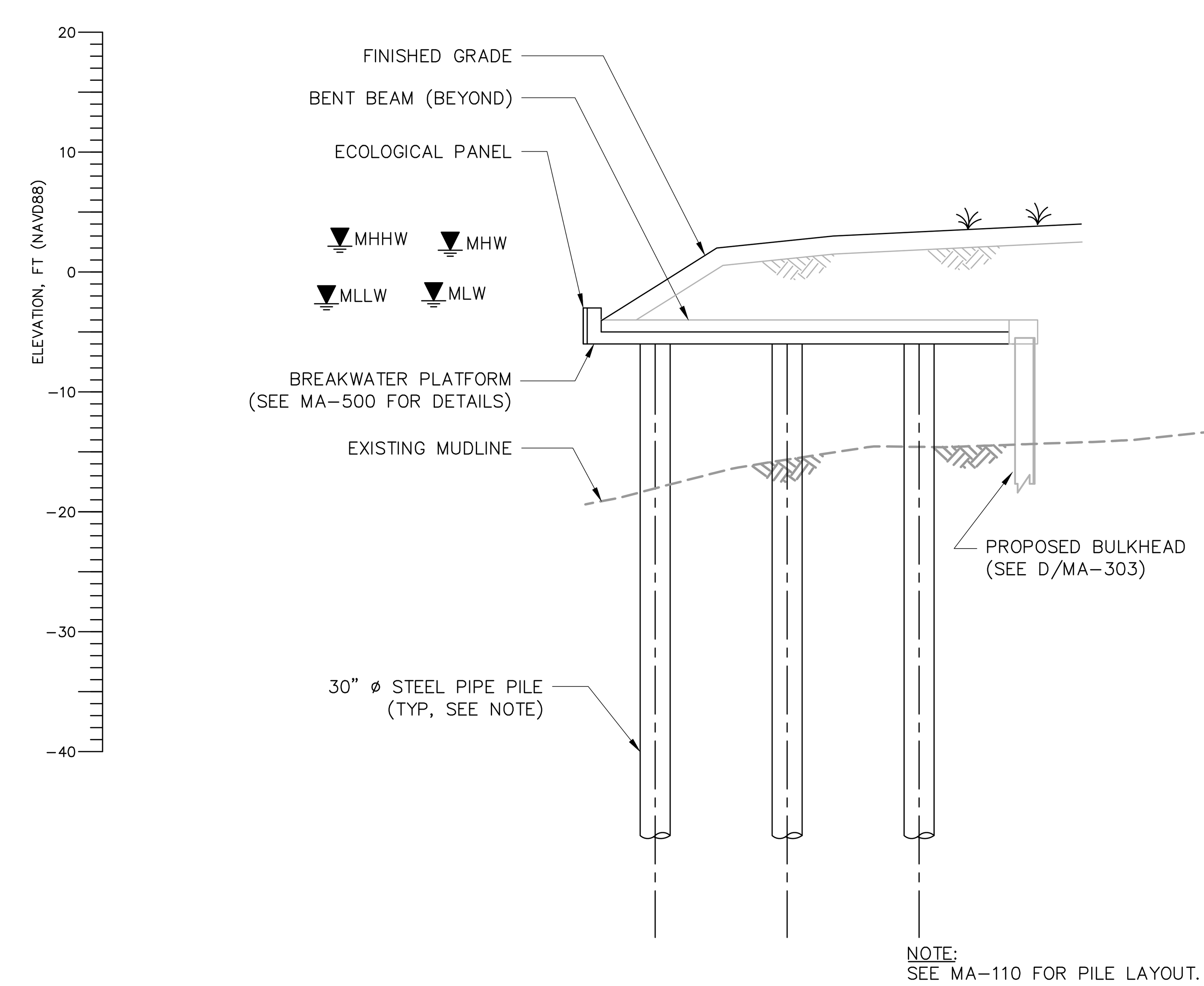
Project No. 170594401
Date -
Drawn By KRW
Checked By RL
Drawing No. MA-300
Sheet 18 of 24

PROJECT NO. 170594401

Date: 3/16/2021 Time: 12:06 User: kweg Style Table: Langan.stb Layout: SOUTH Document Code: 170594401-0502-BF301-0101



C MA-301 SECTION 1" = 10'



D MA-301 SECTION 1" = 10'

10 0 2 4 10
SCALE IN FEET

Date	Description	No.

REVISIONS

SCHEMATIC DESIGN
1/22/2021
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Project

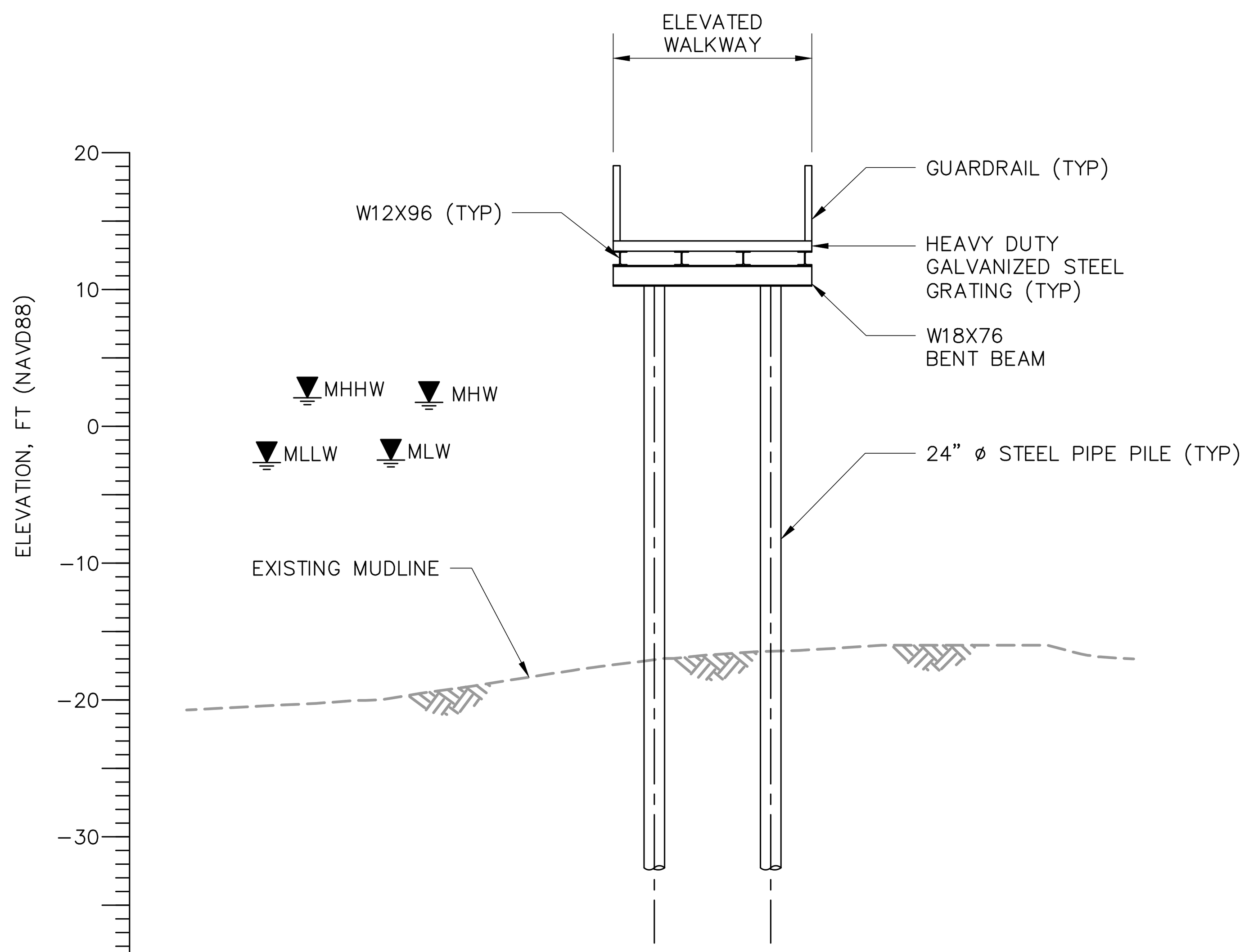
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Figure Title

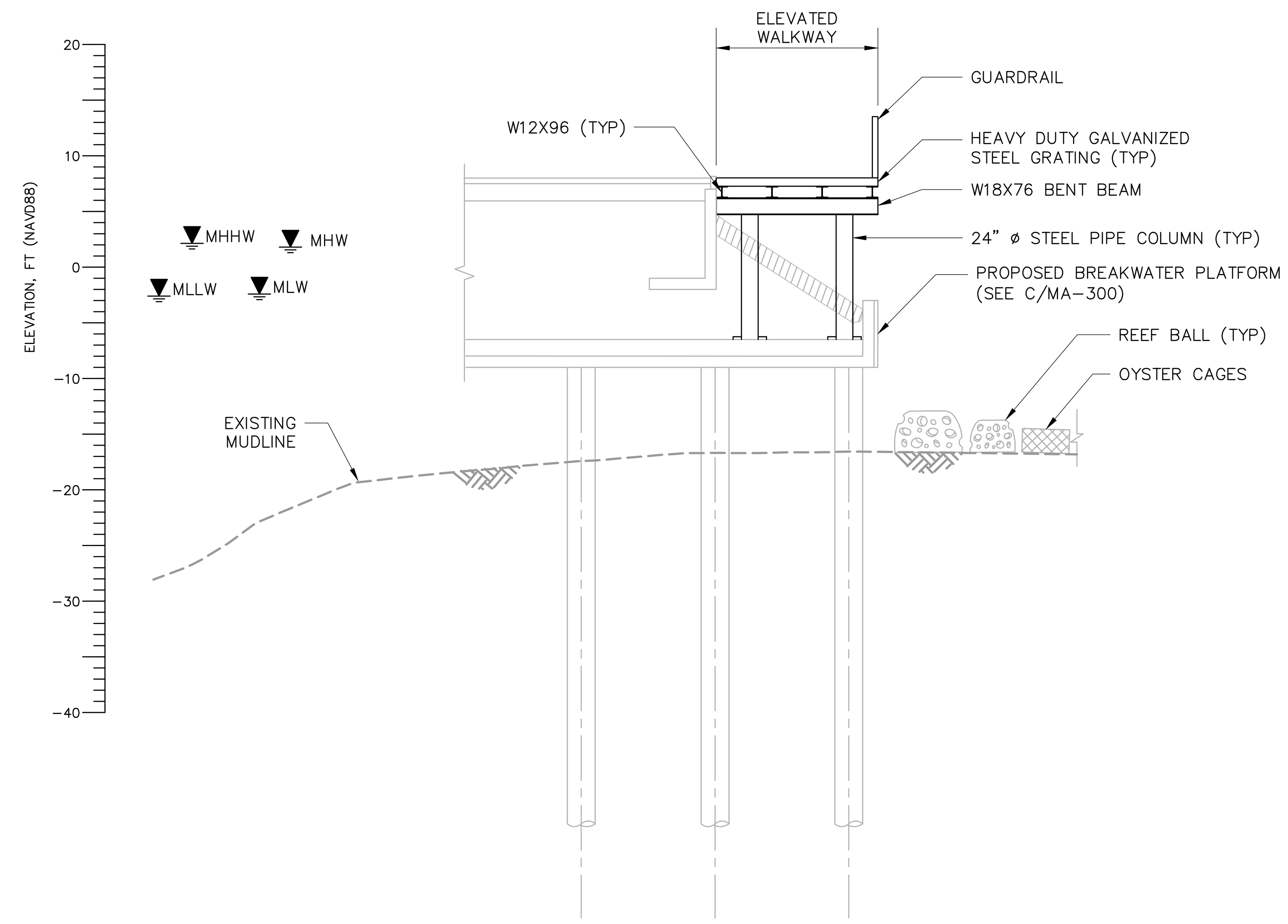
BREAKWATER PLATFORM SECTIONS

Project No. 170594401
Date -
Drawn By KRW
Checked By RL
Drawing No. MA-301
Sheet 19 of 24

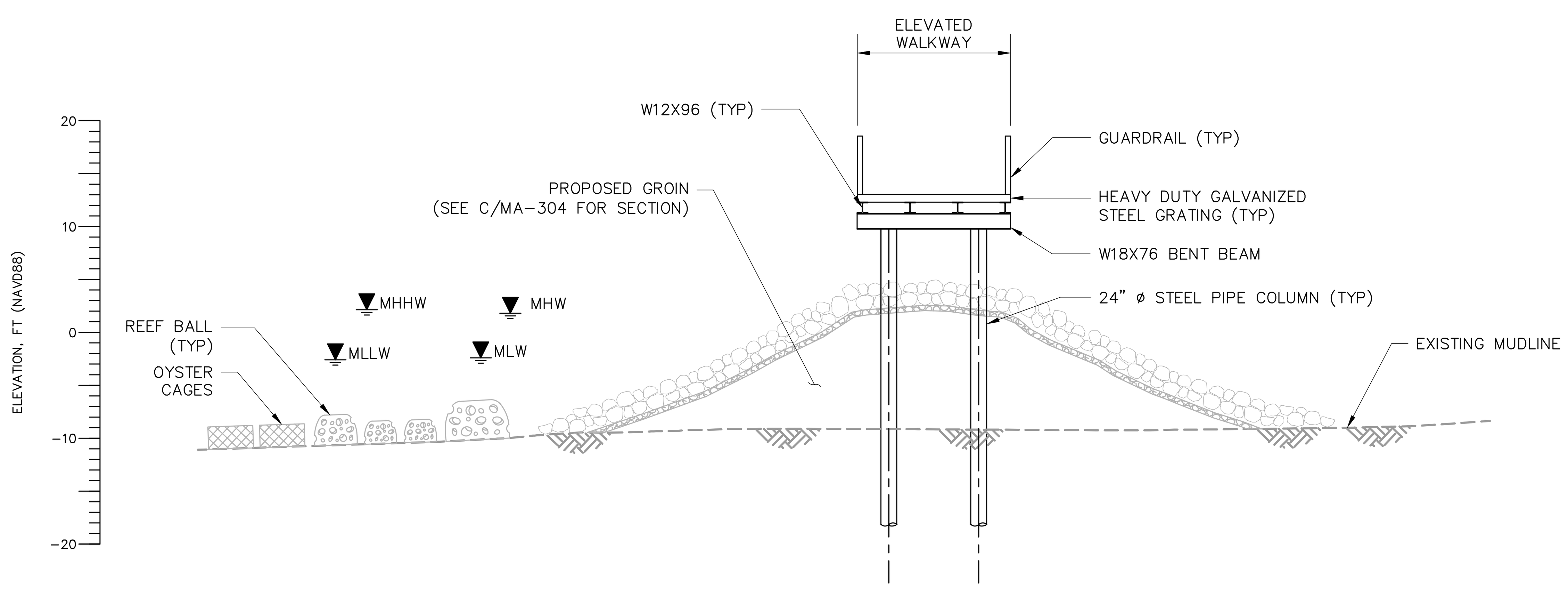
PROJECT NO. 170594401



A
MA-302
SECTION
1" = 10'



B
MA-302
SECTION
1" = 10'



C
MA-302
SECTION
1" = 10'

10 0 2 4 10
SCALE IN FEET

Date	Description	No.

REVISIONS

SCHEMATIC DESIGN
1/22/2021
NOT FOR CONSTRUCTION

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

KINGS NEW YORK

Figure Title

WALKWAY SECTIONS

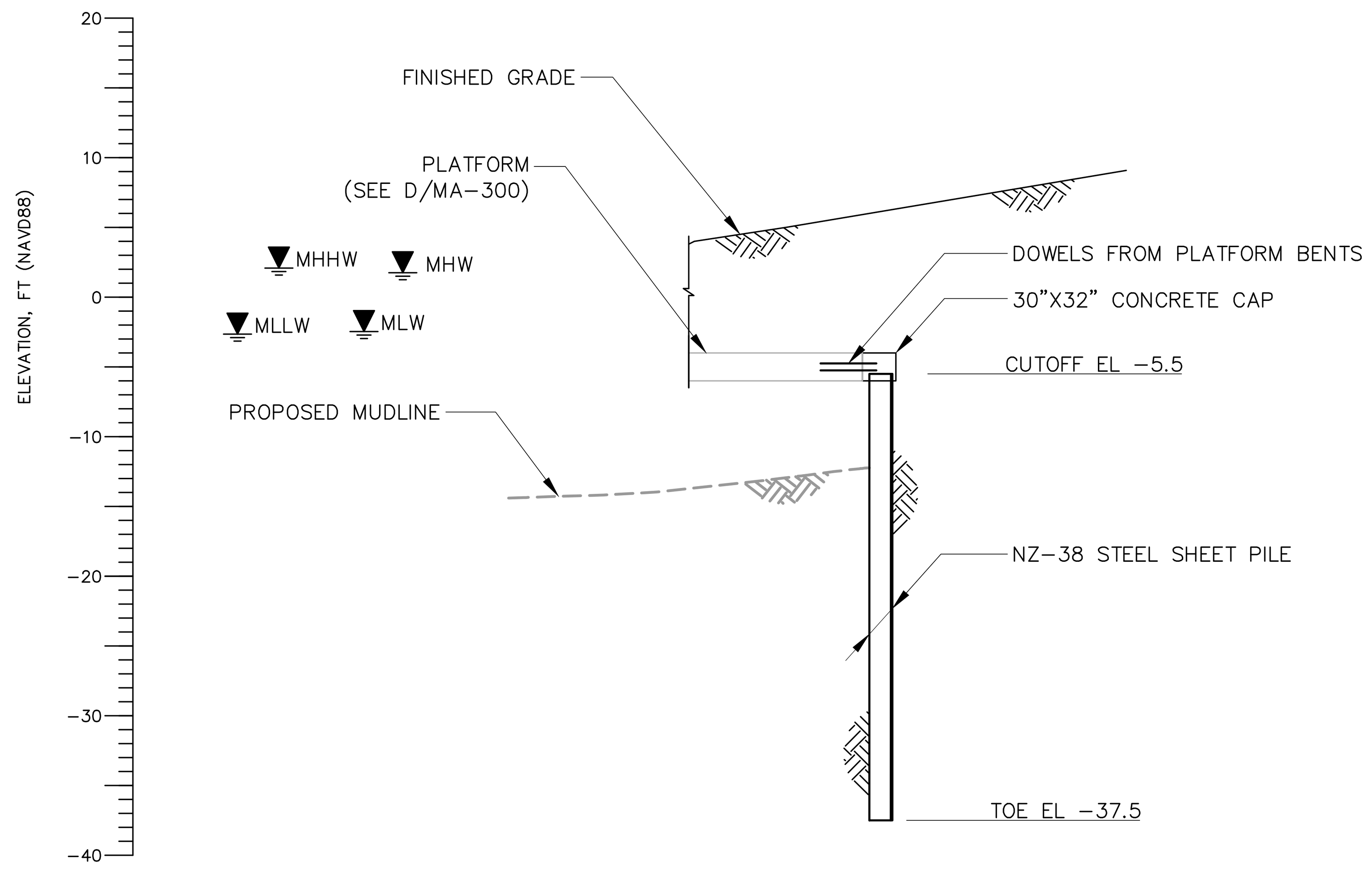
Project No. 170594401
Date -
Drawn By KRW
Checked By RL

Drawing No. MA-302

Sheet 20 of 24

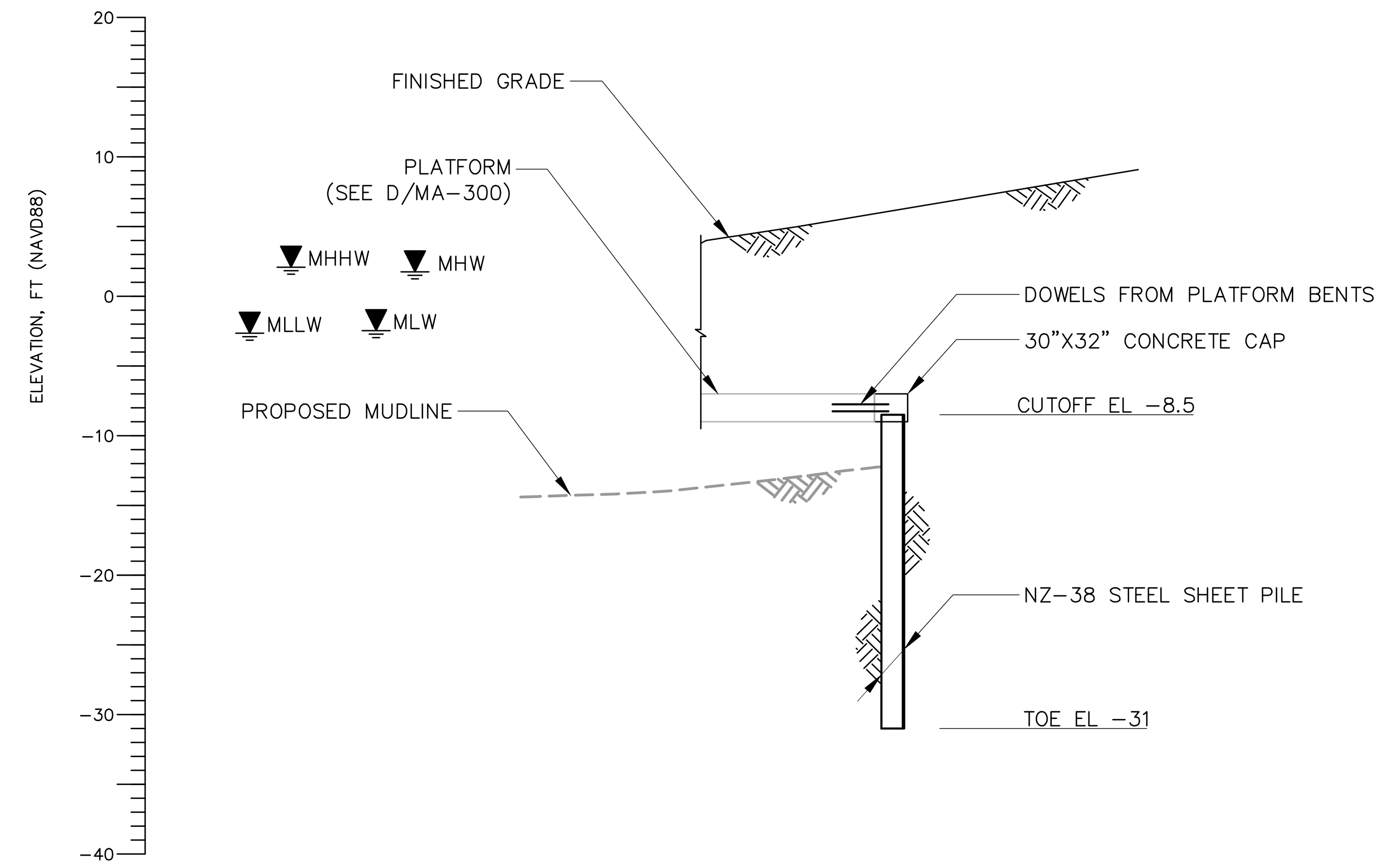
LANGAN

PROJECT NO. 170594401



NOTES:
1. SECTION D' SIMILAR.

D
MA-303
SECTION
1" = 10'



E
MA-303
SECTION
1" = 10'

10 0 2 4 10
SCALE IN FEET

Date	Description	No.

REVISIONS

SCHEMATIC DESIGN
1/22/2021
NOT FOR CONSTRUCTION

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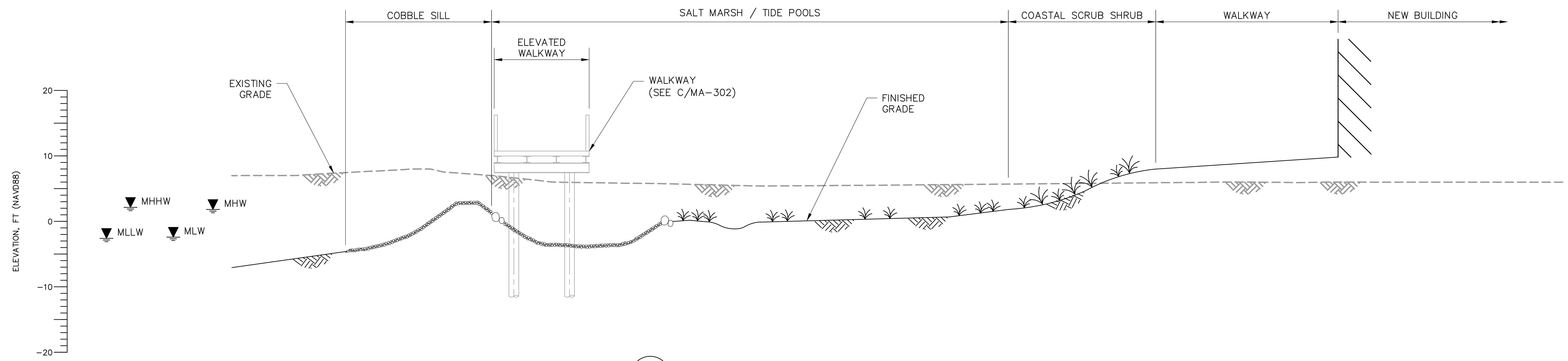
New York, NY 10001
T: 212.479.5400 F: 212.479.5444 www.langan.com

Project
RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

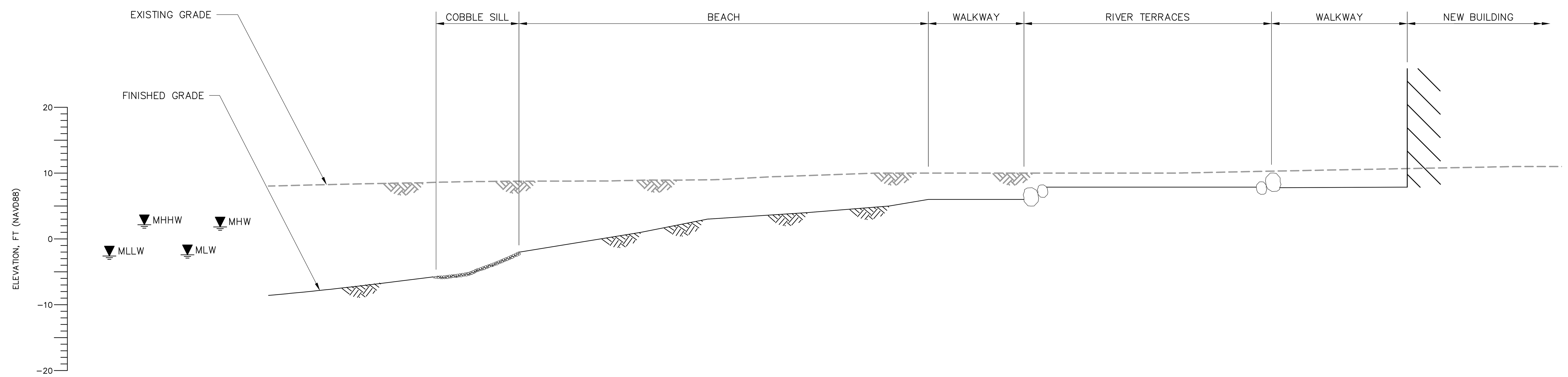
Figure Title
BULKHEAD SECTIONS

Project No. 170594401
Date -
Drawn By KRW
Checked By RL
Drawing No. MA-303
Sheet 21 of 24

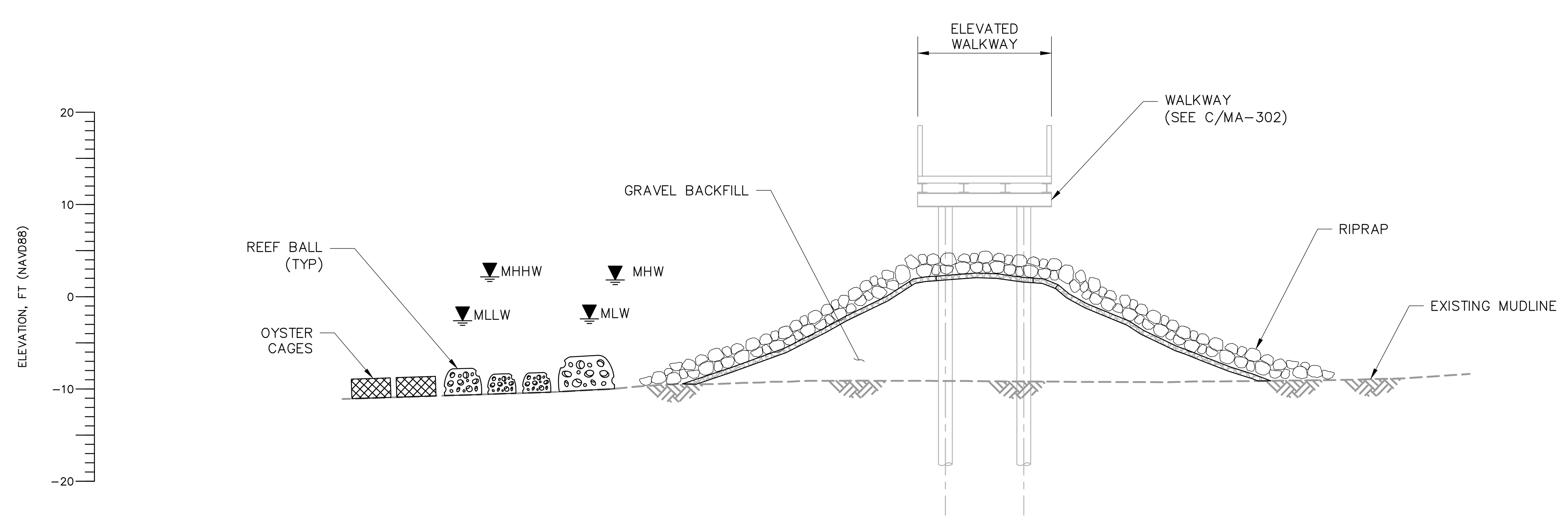
PROJECT NO. 170594401



A MA-304 SECTION
1" = 10'



B MA-304 SECTION
1" = 10'



C MA-304 SECTION
1" = 10'

10 0 2 4 10
SCALE IN FEET

Date	Description	No.

REVISIONS

SCHEMATIC DESIGN
1/22/2021
NOT FOR CONSTRUCTION

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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

KINGS NEW YORK

Figure Title

SHORELINE SECTIONS

Project No. 170594401
Date -
Drawn By KRW
Checked By RL

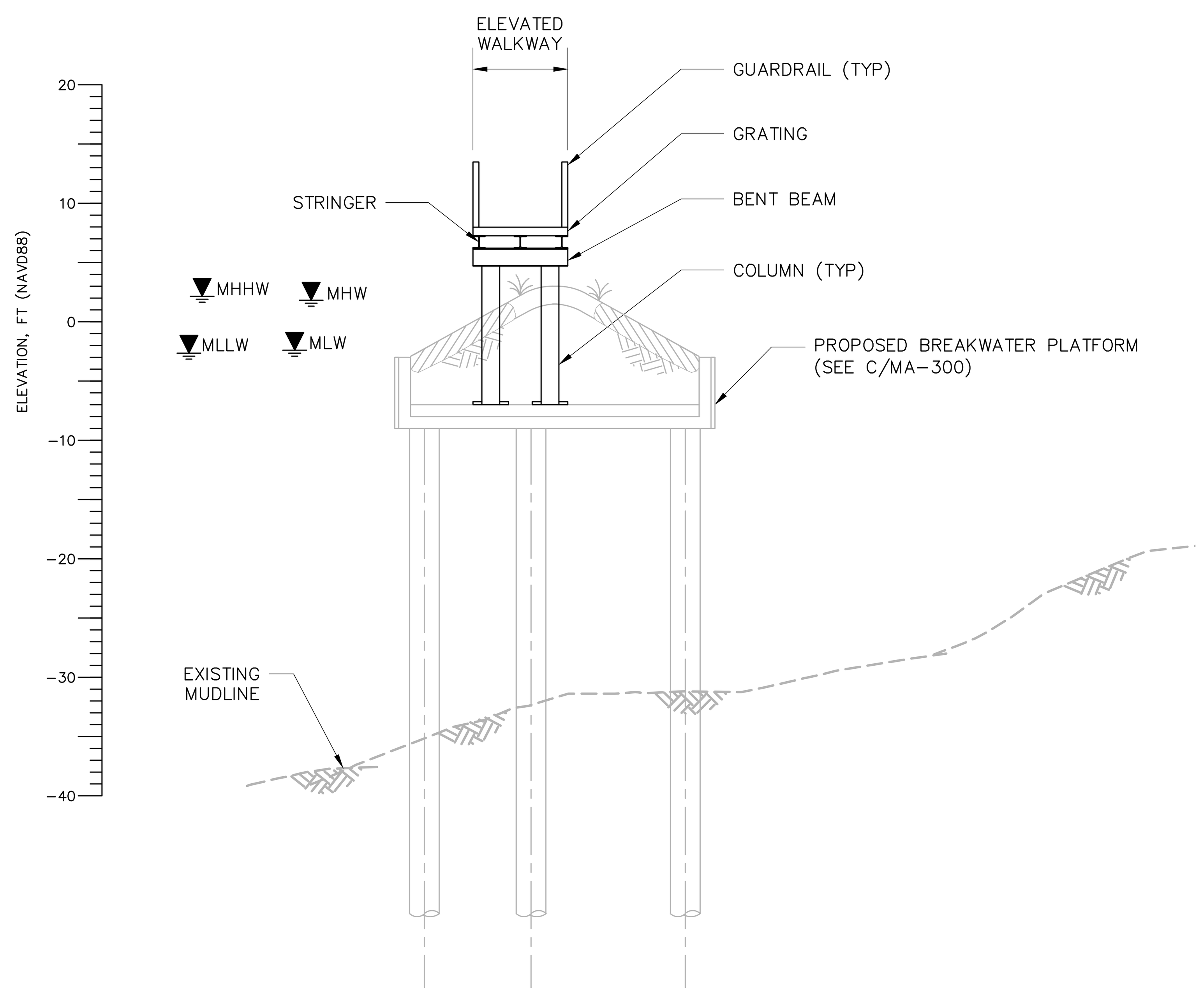
Drawing No. MA-304

Sheet 22 of 24

PROJECT NO. 170594401

LANGAN

Date: 3/16/2021 Time: 12:26 User: kweg Style Table: Langan.stb Layout: SHORELINE Document Code: 170594401-0502-BF301-0104



A
MA-305
SECTION
1" = 10'

10 0 2 4 10
SCALE IN FEET

Date	Description	No.

REVISIONS

SCHEMATIC DESIGN
1/22/2021
NOT FOR CONSTRUCTION

Signature Date

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New York, NY 10001
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Project

RIVER RING

BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN

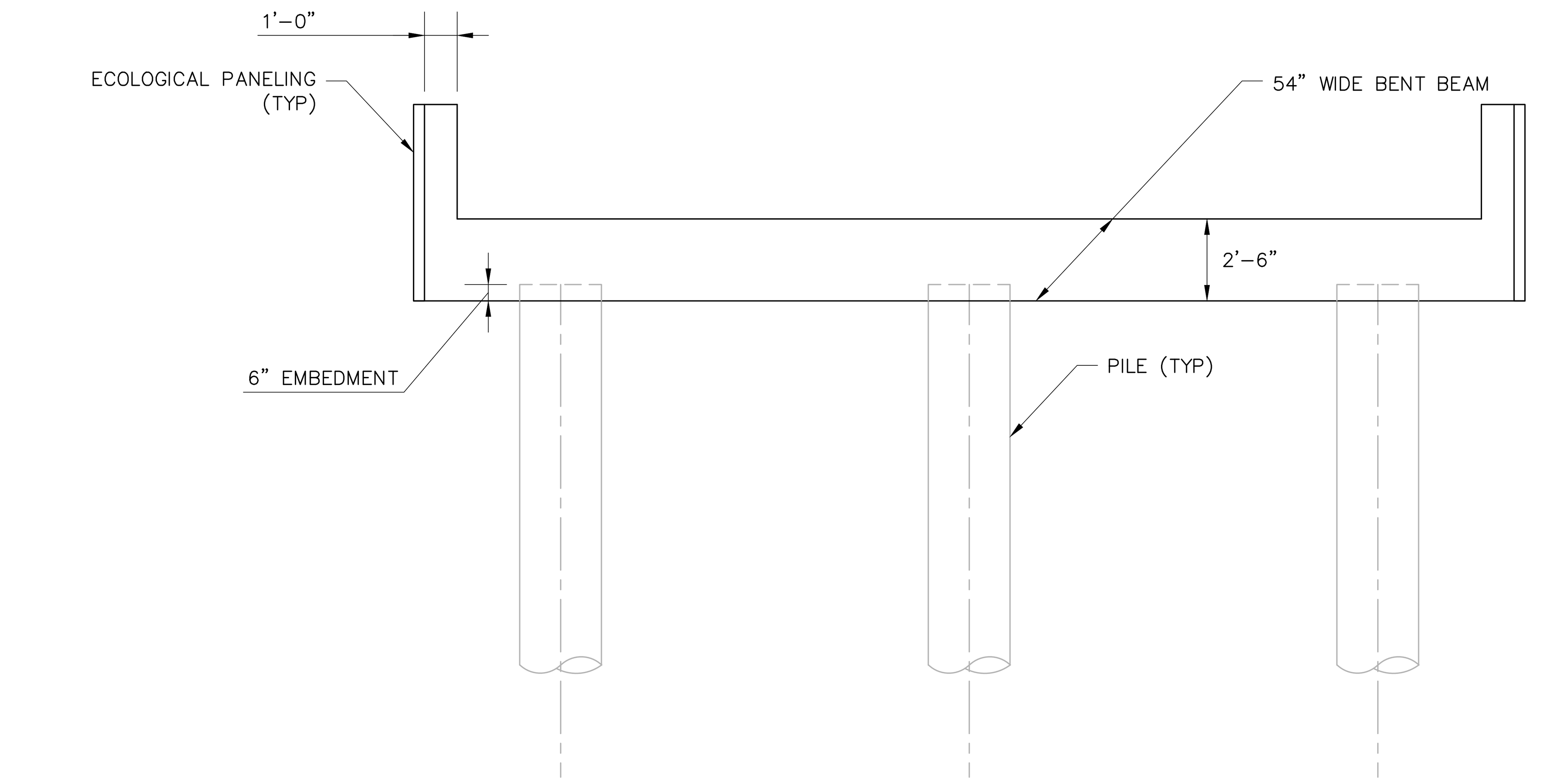
KINGS NEW YORK

Figure Title

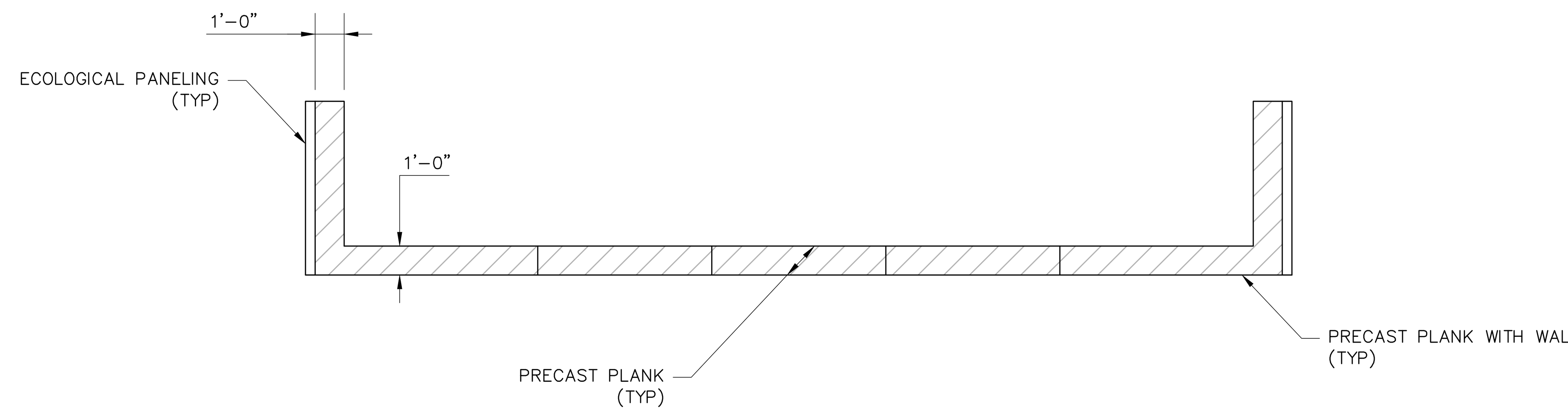
BRIDGE SECTIONS

Project No. 170594401
Date -
Drawn By KRW
Checked By RL
Drawing No. MA-305
Sheet 23 of 24

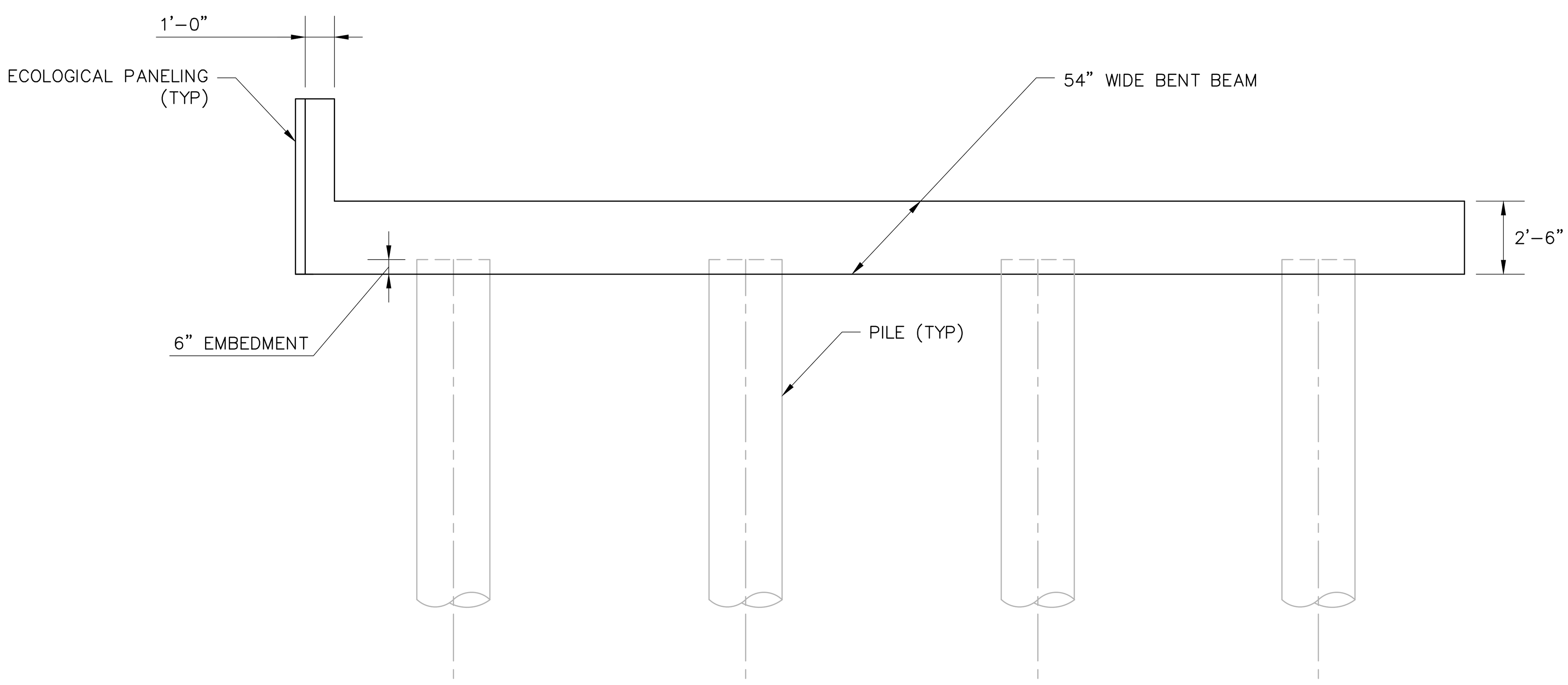
PROJECT NO. 170594401



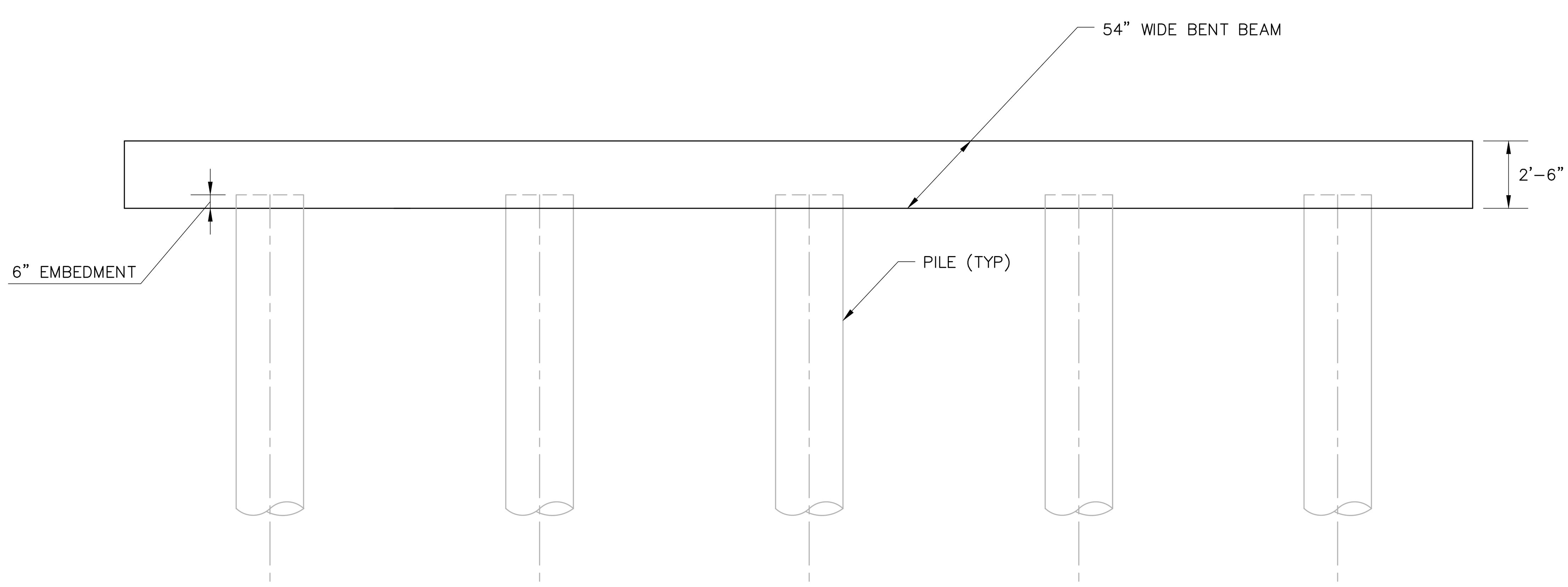
1 MA-500 DETAIL - PLATFORM BENT BEAM TYPE 1
1/2" = 1'-0"



4 MA-500 DETAIL - PLATFORM PRECAST PLANK
1/2" = 1'-0"



2 MA-500 DETAIL - PLATFORM BENT BEAM TYPE 2
1/2" = 1'-0"



3 MA-500 DETAIL - PLATFORM BENT BEAM TYPE 3
1/2" = 1'-0"

Date	Description	No.

REVISIONS

SCHEMATIC DESIGN
1/22/2021
NOT FOR CONSTRUCTION

Signature Date

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Project

RIVER RING
BLOCK No. 2355, LOT No. 1
BLOCK No. 2361, LOT No. 1, 21
BLOCK No. 2376, LOT No. 6, 50
BROOKLYN
KINGS NEW YORK

Figure Title

BREAKWATER PLATFORM DETAILS

Project No. 170594401
Date -
Drawn By KRW
Checked By RL
Drawing No. MA-500

PROJECT NO. 170594401

Date: 1/22/2021 Time: 13:03 User: kweg Style Table: Langan.stb Layout: Layout1 Document Code: 170594401-0502-BF501-0101

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967-2258
Phone: (631) 286-0485 Fax: (631) 286-4003

In Reply Refer To: April 01, 2020
Consultation Code: 05E1LI00-2020-SLI-0410
Event Code: 05E1LI00-2020-E-00944
Project Name: River Street Development

Subject: List of threatened and endangered species that may occur in your proposed project location, and/or may be affected by your proposed project

To Whom It May Concern:

The enclosed species list identifies threatened, endangered, proposed and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 *et seq.*).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please feel free to contact us if you need more current information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. This verification can be completed formally or informally as desired. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested through the ECOS-IPaC system by completing the same process used to receive the enclosed list.

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Under sections 7(a)(1) and 7(a)(2) of the Act and its implementing regulations (50 CFR 402 *et seq.*), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species and to determine whether projects may affect threatened and endangered species and/or designated critical habitat.

A Biological Assessment is required for construction projects (or other undertakings having similar physical impacts) that are major Federal actions significantly affecting the quality of the human environment as defined in the National Environmental Policy Act (42 U.S.C. 4332(2)(c)). For projects other than major construction activities, the Service suggests that a biological evaluation similar to a Biological Assessment be prepared to determine whether the project may affect listed or proposed species and/or designated or proposed critical habitat. Recommended contents of a Biological Assessment are described at 50 CFR 402.12.

If a Federal agency determines, based on the Biological Assessment or biological evaluation, that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Service recommends that candidate species, proposed species and proposed critical habitat be addressed within the consultation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

http://www.fws.gov/endangered/esa-library/pdf/TOC-GLOS.PDF

Please be aware that bald and golden eagles are protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668 *et seq.*), and projects affecting these species may require development of an eagle conservation plan (http://www.fws.gov/windenergy/eagle_guidance.html). Additionally, wind energy projects should follow the wind energy guidelines (http://www.fws.gov/windenergy/) for minimizing impacts to migratory birds and bats.

Guidance for minimizing impacts to migratory birds for projects including communications towers (e.g., cellular, digital television, radio, and emergency broadcast) can be found at: http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/towers.htm; http://www.towerkill.com; and http://www.fws.gov/migratorybirds/CurrentBirdIssues/Hazards/towers/comtow.html.

We appreciate your concern for threatened and endangered species. The Service encourages Federal agencies to include conservation of threatened and endangered species into their project planning to further the purposes of the Act. Please include the Consultation Tracking Number in the header of this letter with any request for consultation or correspondence about your project that you submit to our office.

Attachment(s):

- Official Species List

Official Species List

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

Long Island Ecological Services Field Office
340 Smith Road
Shirley, NY 11967-2258
(631) 286-0485

Project Summary

Consultation Code: 05E1LI00-2020-SLI-0410

Event Code: 05E1LI00-2020-E-00944

Project Name: River Street Development

Project Type: DEVELOPMENT

Project Description: The River Street project site (Tax Block 2355, Lot 1; Block 2361, Lot 1 and 21; Block 2376, Lot 50) is in the Williamsburg neighborhood of Brooklyn, New York. The site is bordered by North 3rd Street on the north, River Street (north of North 1st Street) and a New York Power Authority (NYPA) facility (south of North 1st Street) on the east, North 1st Street (at NYPA) and Grand Ferry Park (and Domino Park beyond) to the south, and the East River on the west.

The proposed Project would create approximately 267,840 SF of new waterfront public space to facilitate the continuation of public waterfront access. The project would expand public waterfront access along the East River from the Grand Ferry Park (and Domino Park beyond) to the south, while enhancing and creating habitat and increasing the shoreline protection and resilience of the site and upland areas, in a manner that recognizes the constraints imposed by the busy navigational waterway. The upland portion of the project includes a new residential development with two new mixed income residential towers, new waterfront public space, and an esplanade.

The proposed in-water and shoreline improvements would include demolition of all existing in water structures except for three of the existing caissons, reshaping of the entire shoreline to create a protected cove (via in-water excavation and backfill), construction of new shoreline protection measures (e.g., bulkhead, revetment), construction of new breakwaters in consideration of navigational interests and to protect the cove and the habitats that would be created inside the breakwaters, construction of new walkways connecting to the breakwaters, and creation and enhancement of in-water and upland vegetative habitats (e.g., man-made reefs, saltwater marsh, coastal scrub shrubs, tide pools).

Project Location:

Approximate location of the project can be viewed in Google Maps: https://www.google.com/maps/place/40.718156976016964N73.96617296233538W

Counties: Kings, NY | New York, NY

Endangered Species Act Species

There is a total of 4 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries[1], as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. NOAA Fisheries, also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

Birds

NAME	STATUS
Piping Plover *Charadrius melodus* Population: [Atlantic Coast and Northern Great Plains populations] - Wherever found, except those areas where listed as endangered. There is **final** critical habitat for this species. Your location is outside the critical habitat. Species profile: https://ecos.fws.gov/ecp/species/6039	Threatened
Red Knot *Calidris canutus rufa* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/1864	Threatened
Roseate Tern *Sterna dougallii dougallii* Population: Northeast U.S. nesting population No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/2083	Endangered

Flowering Plants

NAME	STATUS
Seabeach Amaranth *Amaranthus pumilus* No critical habitat has been designated for this species. Species profile: https://ecos.fws.gov/ecp/species/8549	Threatened

Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.