

As an integral part of New York City's Department of Transportation, the Division of Bridges has a two-fold mission: to maintain an optimal transportation network by ensuring smooth mobility on the city's bridges, and to ensure the safety of the public.

The New York City Department of Transportation's Division of Bridges is comprised of four major bureaus. The **Chief Bridge Officer** is responsible for formulating policy and providing executive direction. He oversees all aspects of the design, construction, rehabilitation and reconstruction, maintenance, operation and administration of the 789 bridges (including 5 tunnels), and 53 culverts presently under the jurisdiction of the New York City Department of Transportation (NYCDOT). In addition to broad supervision, the Chief Bridge Officer also provides overall executive and administrative direction for the Division of Bridges, and ensures that all contractors are promptly paid.

Reporting to the Chief Bridge Officer, the **Community Affairs Unit** maintains liaison with elected officials, community boards, community groups, and civic/neighborhood associations. The Unit takes a pro-active approach in addressing design issues, roadway closures, and detours by reaching out to communities prior to the onset of construction. This enables the Division to proceed with its rehabilitation program with community input, and allows the Agency and its contractors to co-exist in a more harmonious manner with the community surrounding the project. Issues and problems of concern to the communities are brought to the attention of the appropriate Division personnel and addressed.

The **Bureau of Bridge Maintenance, Inspections and Operations** employs almost 500 engineering, professional, administrative, and skilled trades employees in the maintenance and smooth operation of New York City's elevated infrastructure, and in specialized skilled trades and contract supervision functions. It is composed of six major sections:

The **Flag Engineering** section is an engineering group that reviews, routes, and tracks hazardous or potentially hazardous safety and structural conditions ("flags") in or on the city's 789 bridges (including 5 tunnels). The Flags staff is on call 24 hours a day to respond to bridge emergencies. The section can be alerted to flag conditions by city and state inspectors and other sources, such as the Communications Center. All conditions undergo an evaluation involving review of the flag report and photographs of the condition, and, if necessary, a visit to the site. Subsequently, a "flag packet" describing the type of repair or response that is required is created and routed to an appropriate group, in-house or contractor, for elimination. The section monitors the status of each flag, reporting on all activities on a monthly basis.

The **Bridge Repair and Preventive Maintenance** section is composed of three major units. *Bridge Repair* performs repairs to resolve flagged conditions. Flag repairs include structural and safety work, such as the repair of steel members damaged by corrosion or accident impact, the replacement of box beams and bridge railings, the replacement of roadway gratings, repairs to traffic control devices, and the rebuilding of wooden walkways. Much of this work is performed in the off-hours, either to accommodate traffic or in response to emergencies.

This section also rehabilitates and replaces damaged, worn, or defective components whose failure can affect service. This type of work, known as corrective repair, primarily involves the electrical, mechanical and operational control systems for the twenty-four movable bridges, as well as the travelers (movable underdeck access platforms) on the four East River bridges. The Bridge Repair Section is also responsible for the lubrication of the movable bridges as well as the mechanical components and the main cables of the East River bridges.

Preventive Maintenance is a vital part of the overall bridge program. This section is responsible for functions including debris removal; mechanical sweeping; pointing of masonry brick and block; and emergency response, such as snow removal, oil/cargo spills, and overpass hits. The section

also performs some corrective repair work such as asphalt and concrete deck repairs, sidewalk patching, fence repair, and brick and masonry repairs. Preventive Maintenance is responsible for conducting the Department's anti-icing operations on the four East River bridges.

The *East River and Movable Bridges Preventive Maintenance* unit administers federal funds for selected preventive maintenance activities on the East River and movable bridges. Work is performed with a combination of in-house and contracted personnel.

The ***Bridge Inspections and Bridge Management*** section performs three essential functions: *Bridge Inspections*, *Bridge Management*, and *Research and Development*.

The *Inspections Unit* inspects the city's bridges in accordance with state and federal standards; monitors bridge conditions with a high hazard potential, such as temporary repairs, outstanding flags, and fire hazards; responds to emergency inspection requests from NYCDOT and external sources; recommends repairs and remedial measures for hazardous conditions; generates flag and inspection reports for the Division; engages in special programs such as non-destructive monitoring of sensitive bridge components by advanced techniques; supervises inspections by consultants working for the Division; conducts inspections and inventories of expansion joints; conducts acoustic emission monitoring; and inspects non-structural cladding.

The *Bridge Management Unit* develops and maintains the database for the City's bridge inventory, condition ratings, and inspection information. The unit is also responsible for maintaining records of privately-owned bridges in the City. The database is the source of information used in a variety of reports, including the present Bridges and Tunnels Annual Condition Report. This unit uses the bridge and span condition database to determine current and future needs for bridge rehabilitation, bridge component rehabilitation, flag forecasting, inspections and monitorings.

This Section is also responsible for investigating new materials and methods to improve existing bridge conditions. It sponsors a series of lectures by experts on subjects relevant to design, construction, and maintenance, such as seismic retrofitting of bridges, salt substitutes, cathodic protection against corrosion, concrete patching materials, new paint strategies, non-destructive bridge testing, and deck resurfacing. The unit also participates in research programs with interested transportation and infrastructure entities. In conjunction with the Port Authority, MTA Bridges and Tunnels, and NYS Bridge Authorities, it sponsored a report on suspension bridge cables that led to a federal project for the entire United States. A number of articles on bridge management are published by the unit in technical journals in the United States, Japan, France, and elsewhere. This section created the system for generating bridge inspection reports with portable computers; a similar system is now being adopted by the NYSDOT.

Bridge and Tunnel Operations is responsible for operating the 24 City-owned movable bridges that span city waterways. This section operates under a variety of federal mandates that call for 24-hour coverage at many locations; its mission is to provide safe and expedient passage to all marine and vehicular traffic under and on movable bridges. In calendar year 2013 Bridge Operations effected a total of 4,271 openings, 3,812 of which allowed 6,855 vessels to pass beneath the bridges. The remaining 459 openings were for operational and maintenance testing. The section also operates the city's five mechanically-ventilated tunnels, performing electrical maintenance and arranging for roadway cleaning.

The ***Bridge Painting*** section's function is to maintain the protective coating of the City's bridges. The section is divided into two programs, the in-house (expense) program and the capital program. The capital program oversees total paint removal and repainting, performed by contractors; this is done at twelve-year intervals on bridges measuring more than 100,000 square feet of painted area, and bridges over railroads. In-house personnel provide the inspection services on East River Bridge preventive maintenance contracts for quality control purposes. The in-house program is responsible for full steel painting of bridges measuring less than 100,000 square feet, and bridges that are not over railroads. This includes local surface preparation of deteriorated areas and overcoating of the entire bridge. In addition, the in-house program is responsible for salt splash/spot painting.

Salt splash/spot painting is performed four years after full steel painting, and again four years later. After another four years, we once again perform full steel painting. The interval between full steel applications remains twelve years.

Members of the in-house program respond to emergency flag repairs alongside the in-house repair forces, to perform surface preparation prior to, and painting upon completion of, the steel work. In-house painting personnel also perform environmental clean-up after the iron workers finish their repair work.

The engineers and inspectors of the ***When and Where Unit*** supervise the contractors' repairs of structural and safety flags citywide under both marine and general repair contracts, as well as a new capital contract. The use of these contracts allows the unit greater flexibility in deploying the contractors' resources as necessary, and in obtaining a variety of construction equipment and materials that are not readily available to in-house forces. In addition, the unit responds to bridge emergencies, providing on-site inspection to verify field conditions, taking measurements for repairs and providing emergency lane closures. The section also supervises the repair work performed during night hours to reduce the impact on traffic and on public safety.

The overall mission of the Bureau of Bridge Maintenance, Inspections and Operations is to maintain the structural integrity of elevated structures and tunnels and to prolong their life by slowing the rate of deterioration. While our objective may be seen as "maintaining the status quo" of the infrastructure, we continue to take a new look at our methods, procedures, and general focus as we formulate our operational plans for the next several years.

As more bridges are rehabilitated, it becomes incumbent upon us to protect the government's investment in the infrastructure by developing and implementing a more ***substantive preventive maintenance program*** to keep these bridges in good condition.

The Deputy Chief Engineer for Bridge Maintenance, Inspections and Operations also acts as the **Deputy Chief Bridge Officer**, assuming the responsibilities of the Chief Bridge Officer in that person's absence.

The **Bureau of Bridge Capital Design & Construction** is made up of four major sections:

The **East River and Movable Bridges Section** is responsible for all design and construction activities for all rehabilitation/reconstruction work that is planned, or currently taking place on the four East River Bridges, as well as all City-owned movable bridges and tunnels. This involves overseeing and supervising design consultants who prepare plans and specifications for bridge rehabilitation/reconstruction projects on the four East River Bridges and all Movable Bridges, as well as overseeing and supervising contractors, Resident Engineers and Inspection Consultants, and Construction Support Services Consultants during the construction phase.

This Section consists of two major areas: ***East River Bridges***, and ***Movable Bridges***. Each of these areas is headed by a Director to whom Section Heads or Engineers-in-Charge report. Each is assigned a specific bridge, or bridges, where they are responsible for all design and construction activities. The Directors, in turn, report to the Deputy Chief Engineer of the Bureau.

The **Roadway Bridges Section** is responsible for both design and construction activities for all rehabilitation/reconstruction work that is planned, or currently taking place on all City-owned, non-movable bridges, with the exception of the four East River Bridges. This involves overseeing and supervising design consultants who prepare plans and specifications for bridge rehabilitation/reconstruction projects, as well as overseeing and supervising contractors, Resident Engineers and Inspection Consultants, and Construction Support Services Consultants during the construction phase.

This Bureau covers two major geographic areas; ***Brooklyn and Manhattan Bridges***, and ***Bronx, Queens and Staten Island Bridges***. In each geographic area, the workload is divided by

Community Board. Engineers-In-Charge report to the Directors of each major area, who, in turn, report to the Deputy Chief Engineer of the Bureau.

Component Rehabilitation is the revamping or replacement of damaged, worn or defective bridge components. This type of work is performed primarily on those structures not classified as being “deficient,” but which contain specific components that have low condition ratings. By rehabilitating these components, the Division can ensure that these bridges remain in “good” or “very good” condition; usually extending the bridge’s useful life by up to 10 years. Section Heads or Engineers-in-Charge report to the Director of Component Rehabilitation. Each is assigned a specific bridge, or bridges, for which they are responsible for all component rehabilitation activities. The Component Rehabilitation Program is an ongoing program with cumulative effects. Each Fiscal Year, a number of bridges are selected for inclusion in the program and construction is completed on others. For the ten year period ending fiscal year 2018, the program will obligate approximately \$152.1 million.

The **Design-Build/Emergency Contracts Group** provides technical and procurement expertise related to the following areas: preparing Emergency Declarations for unsafe conditions that require immediate remediation; assisting the Chief Bridge Officer in the contractor selection process for declared emergency situations; providing technical expertise related to the development, procurement and administration of Design-Build contracts throughout the various areas of the Division; preparing and administering Design-Build agreements; and supervision of Design-Build project design, construction, and inspection services.

The **Engineering Review and Support Bureau** is responsible for providing Division-wide engineering support services. The following areas make up this Bureau: ***In-House Design, Engineering Support, Engineering Review, and Quality Assurance***.

In-House Design staff (comprised of the Structural, Electrical, and CADD Groups) prepare plans and specifications for bridge rehabilitation/replacement projects that enable the Division to restore bridges considered “structurally deficient,” to a “very good” condition rating. This unit also handles urgent Division projects, as well as special repair projects of the **Bureau of Bridge Maintenance, Inspections and Operations**. Over the last 20 years, In-House Design has completed contract documents for over 30 major replacement/rehabilitation projects. Some of these structures were in highly environmentally sensitive areas, such as the FDR Drive from 42nd to 54th Streets, Hylan Boulevard over Lemon Creek, Chelsea Road over Sawmill Creek, Cropsey Avenue over Coney Island Creek, the Exterior Street Ramp, Belt Parkway Bridge over Paerdegat Basin, 145th Street Bridge over Harlem River, and the Greenpoint Avenue Bridge over Newtown Creek. The staff also provided plans, working drawings, and shop drawings for in-house built projects such as the temporary Pedestrian Bridge for PS-5, Ferry Terminals at 34th Street, the Hamilton Avenue Asphalt Plant conveyor supports, the Yankee Stadium Ferry Access, the concrete barrier at Cross Bay Boulevard, the fencing at Navy Street Pedestrian Bridge, and the bridge railing at Van Name Street Bridge.

The Electrical Group reviews and/or prepares contract documents for the electrical and street lighting work for all projects in the Division’s capital program. They further review plans and specifications prepared by consultants and review test results of electrical systems conducted by vendors on the movable bridges.

The ***Engineering Support Section*** is comprised of four units: *Specifications, Survey, Records Management, and Special Projects*.

The *Specifications Unit* prepares and reviews contract bid documents and specifications for all Federal and City-funded, private developer, City-let in-house and consultant-designed bridge and various other construction projects, processes the contracts for bidding, after ensuring that they comply with the City, New York State and Federal standards, prepares, reviews, and transmits addenda, maintains and updates City-let bridge construction boiler plates in compliance with

FHWA and NYSDOT Engineering bulletins and instructions, and updates and maintains an inventory of all NYC and NYS special specifications used in bridge and other construction projects. This Unit approves and issues item numbers for newly written special specifications for the city funded projects. In addition, it prepares “Revisions to NYSDOT Standard Specifications” (R-pages), which are compiled from NYSDOT Engineering Bulletins and Engineering Instructions, and reviews contract drawings for compliance with contract bid proposal books.

The *Survey Unit* performs field surveys and visual inspections of bridges and retaining walls, monitorings of cracks and longitudinal and transverse movements in bridge structures as well as foundation settlement. This unit surveys bridge girder alignments and twisted movements in steel girders and floor beams due to damage by oversized trucks or fires. It also prepares and verifies elevations in the field to find existing vertical clearances of bridge structures.

The *Records Management and Electronic Media Unit* establishes drafting guidelines for contract plans and digital media standards for the archiving of bridge records. It reviews design, as-built and shop drawings prepared by consulting firms, as well as CDs and DVDs containing pdf and CAD files. This unit maintains original plan files, upgrades the records database and converts original drawings into electronic media in retrievable formats. It also responds to requests received from private, public and other agencies for information regarding records of City-owned bridges.

The *Special Projects Unit* reviews contract bid documents and specifications for public and private agencies to ensure compliance with City, State and Federal standards and guidelines.

The ***Engineering Review Section*** consists of ten units: *Structural Review, Retaining Wall, Bridge Hold, Cost Estimate, Other Agency/Private Developer, Scope Development, Overweight Truck Permit, Geotechnical, Land Use Planning, and Utilities.*

The *Structural Review Unit* reviews all City-let bridge construction contract drawings, oversees seismic design requirements for City-let contracts for bridge projects, reviews analysis and design calculations and ensures that the work to be performed conforms to NYCDOT requirements. This unit establishes design standards, including seismic requirements.

The *Retaining Wall Unit* is responsible for inspecting City-owned retaining walls, identifying walls in poor condition, and creating an inventory of all City-owned retaining walls. Retaining walls in poor condition requiring immediate attention are referred to in-house repair staff or When and Where contractors. Data on poorly rated retaining walls are developed into scope packages and forwarded to the New York City Department of Design and Construction for permanent rehabilitation with DOT funding. Walls of questionable ownership are researched for ownership and jurisdiction. A consultant has been assisting the unit in the inspection, condition assessment, temporary repair design, inventorying and budgeting for the permanent rehabilitation of the retaining walls.

The *Bridge Hold Unit* was established in February 2011, based on OCMC requests to review construction permit applications for any proposed work located within 100 feet of any City-owned bridge structure. The permit applications may also originate from other City agencies, private developers, and utility companies. The Unit reviews the proposed work to ensure that it does not compromise the integrity of the structure and that it is in compliance with Agency requirements. Based on the review’s recommendations, the hold will be released or rejected.

The *Cost Estimate Unit* reviews and oversees design and construction cost estimates of City projects.

The *Other Agency/Private Developer Unit* currently provides engineering review supervision of projects from other agencies and private developers such as the Atlantic Yards Project, the Eastside Access Project, and the Riverside South Project. In addition, the unit conducts non-bridge engineering projects, such as the annual balloon wind study for the Macy’s Thanksgiving Day Parade.

The *Scope Development Unit* reviews inspection reports, as-built drawings, and structural condition ratings, performs field inspection of bridges to develop the scope of work for the

rehabilitation of deficient and poorly rated bridges, and initiates the procurement of Design Consultant contracts. The Unit is also responsible for reviewing of quarterly budgetary plans for bridge rehabilitation projects and coordinates these reviews with the Bureau of Bridge Maintenance, Inspections and Operations, and the Capital Procurement and Capital Planning Sections.

The *Overweight Truck Permit Unit* in coordination with the Division's Truck Permit Unit reviews the engineering aspects of overweight and over-dimensional truck and self-propelled crane permit applications, performs load rating analyses, and reviews load postings for City owned bridges. The Unit also reviews resurfacing, snow removal and other heavy equipment permit requests from within the Agency and from other agencies.

The *Geotechnical Engineering Unit* provides geotechnical-engineering services. This unit reviews bridge rehabilitation/reconstruction project reports, soil investigation/geotechnical foundation reports, City-let bridge construction contract drawings and other agency/private developers' geotechnical work which impacts City-owned projects.

The *Land Use Planning Unit* reviews and maintains a database of easement issues, right-of-way, and Uniform Land Use Review Procedures. This unit also reviews Design reports and Environmental Impact Statements of various other Agency projects with respect to their impact on City-owned bridges.

The *Utilities Unit* coordinates all issues related to utility design as they affect City-owned bridge projects and related projects.

The **Quality Assurance Section** ensures that materials installed for the Bridge Rehabilitation Program meet contractual requirements and are incorporated in strict compliance with plans and specifications. This section operates under its own formulated Quality Assurance Plan that is based on NYSDOT requirements and procedures. Quality Assurance has contractually retained the services of private inspection/testing firms. The provision of services required for various projects is better coordinated through this centralized method, which is also timely and cost effective.

Off-site Quality Assurance services relative to a wide variety of basic and manufactured construction materials including concrete, asphalt, soils, reinforcing steel, bridge bearings, timber, structural steel and precast/prestressed structural components for all bridge projects, irrespective of the funding source, are handled by this section. Through its engineers at bridge construction sites, Quality Assurance ensures that only acceptable materials are incorporated into rehabilitation/reconstruction work in strict accordance with plans, specifications and acceptable construction practice. Current major projects include the Brooklyn Bridge, Manhattan Bridge, Willis Avenue Bridge, Roosevelt Island Bridge, Belt Parkway Bridge over Paerdegat Basin, Belt Parkway Bridge over Rockaway Parkway, Belt Parkway Bridge over Fresh Creek Basin, Belt Parkway Bridge over Gerritsen Basin, St. George Staten Island Ferry Terminal Ramps, Protection Against Marine Borers, Shore Road Circle Bridge, Ocean Avenue Bridge over NY Atlantic Railroad, Carlton Avenue Bridge over LIRR Yard, and the Claremont Parkway Bridge. In addition, the Section provides services to the Component Rehabilitation Section on an as-needed basis.

The Section is currently involved in extending its services for inspection of concrete at batching plants for the Sidewalk and Inspection Management Citywide Concrete Program via its contract with a City-contracted inspection firm.

Through its *Environmental Engineering Unit*, Quality Assurance also oversees the implementation of the Final Environmental Impact Statement on bridge construction projects involving the removal and disposal of lead-based paint. The unit's active involvement in training the supervisors and overseeing the abrasive blasting operations has resulted in the successful completion of various paint removal projects. This unit also oversees the proper and safe disposal of other hazardous waste and regulated waste encountered during construction activities.

DIVISION OVERVIEW

In addition to enforcing the lead paint removal protocols, the unit handles other environmental concerns. Typically, the unit participates in the design stage to ensure that any environmental issues are addressed during the construction phase of the project. These issues include, but are not limited to, asbestos abatement, soil sampling, groundwater sampling, remediation of contaminated soils and groundwater, worker exposure to environmental contaminants, management of waste oil, storage of hazardous waste, management of storm water runoff, soil erosion controls, management of concrete washout wastewater, site safety, and OSHA compliance. The role of this unit in ensuring public safety has been recognized and commended by the community.

The unit continues to monitor waste water discharge for numerous projects involving dewatering activities, such as the Belt Parkway Bridges project. This includes dewatering of cofferdams, dredge spoil dewatering, and treatment of water for discharge to recharge basins.

The unit is responsible for discharge monitoring in conjunction with the NYS SPDES Discharge Permits for discharges at the Eastern Boulevard Bridge, Hunters Point Avenue Bridge, Greenpoint Avenue Bridge, Cropsey Avenue Bridge, Manhattan Plaza Underpass, Battery Park Underpass, and the Metropolitan Avenue Bridge. The unit continues to provide environmental oversight and compliance on major capital projects such as Willis Avenue Bridge, Manhattan Bridge, Williamsburg Bridge, Brooklyn Bridge, and Belt Parkway Bridges, as well as Component Rehabilitation, Roadway Bridge, and Design/Build projects such as the reconstruction of the ramps at the St. George Ferry Terminal in Staten Island, Bruckner Expressway over the Bronx River and the Bruckner Expressway Bridges over Conrail/Amtrak.

The unit is currently coordinating mitigation tasks at the Marine Borers project with the NYSDEC to satisfy the permit mitigation requirements. Additionally, the unit has been involved with various NYSDEC mitigation projects such as the Floyd Bennett Field Wetland Mitigation and the Wetland Mitigation at Bergen Beach.

The **Bureau of Management and Support Services** provides essential administrative and analytic services to each of the operational bureaus of the Division of Bridges. The Bureau is divided into five primary sections: ***Office of the Executive Director, Administration and Finance, Capital Procurement, Capital Coordination, and the Truck Permit Unit.*** Each highly-specialized section is designed to address those issues and requirements that are critical to the operation of the respective Bureaus within the Division.

In addition to the Division-wide responsibility for conflict resolution, Equal Employment Opportunity enforcement, confidential investigations, Bridges' Engineering Service Agreements, space allocation, and special projects, the ***Executive Director*** oversees, on an executive level, the following areas and functions:

The ***Senior Director of the Administration and Finance Section*** oversees and administers all administrative/personnel-related functions for the Division, acting as a liaison with the Central Personnel Coordinator in NYCDOT Personnel including, but not limited to, recruiting for vacancies (this includes reviewing for completeness and submitting the necessary paperwork, and reviewing and distributing candidates' resumes); maintaining all Managerial Position Descriptions; maintaining all Division organization charts; scheduling training; confidential investigations; maintaining records of IFA-funded positions; initiating and assisting in resolving disciplinary/grievance actions; serving as Conflicts of Interest and Financial Disclosure Officer; collecting and reviewing managerial and non-managerial performance evaluations; absence control; providing interpretive advice to Division management regarding City and Agency policy and procedures; and overseeing telephone and facility-related issues for personnel located at 55 Water Street and 59 Maiden Lane in Manhattan.

The Senior Director of the Administration and Finance Section also oversees the following three units:

The *Analytic Unit* prepares comprehensive bi-weekly and monthly reports that address major issues confronting the Division; compiles statistical data detailing the Division's productivity; processes and monitors all FOIL requests; frames issues in which oversight assistance is required for use by the Division, NYCDOT Executive Management and the Mayor's Office; and prepares the City Charter-mandated ***Bridges and Tunnels Annual Condition Report***.

The *Vehicle Coordination Unit* tracks the placement and condition of all vehicles under the jurisdiction of Bridges. It maintains a database and prepares reports containing this information; provides information and reports to appropriate inquiring Divisions and Agencies such as the Auditor General's Office, NYCDOT Legal Department and NYCDOT Litigation Support Services; coordinates the assignments of vehicles and their movement throughout various borough field locations and job sites; prepares reports on Vehicle Status and replacement; prepares reports for the purpose of tracking Overnight Vehicle Assignments for all Division vehicles; receives and routes vehicle Accident Reports, Police Reports and Security Incident Reports relating to vehicle accident, theft and/or vandalism; coordinates priorities for vehicle and equipment repair with Fleet Services; prepares reports and memoranda regarding vehicle safety issues and communication procedures for the NYCDOT Communication Center; and collects required documentation from field personnel for checking Driver Certifications with the Department of Motor Vehicles and EZ Pass.

The *Finance Unit* oversees the Division's entire expense budget process including, but not limited to, base-line preparation, spending plans, overtime control, financial plan changes, and budget modifications. The unit further oversees all Division-wide fiscal activities, including the establishment and monitoring of all IFA-related project budgets, while simultaneously ensuring that the budget and plans represent the Division's priorities.

The ***Capital Procurement Section*** serves as a liaison between the Division of Bridges and the Office of the Agency Chief Contracting Officer, other Agency Divisions, the public and private railroads, and the various consulting firms involved with the procurement process. The duties of this unit include: overseeing the Division's capital consultant contract procurement from scope to registration; preparing status reports; processing of the Division's change orders through registration, and coordinating Railroad Force Account Agreements and railroad invoice payments for Division construction projects.

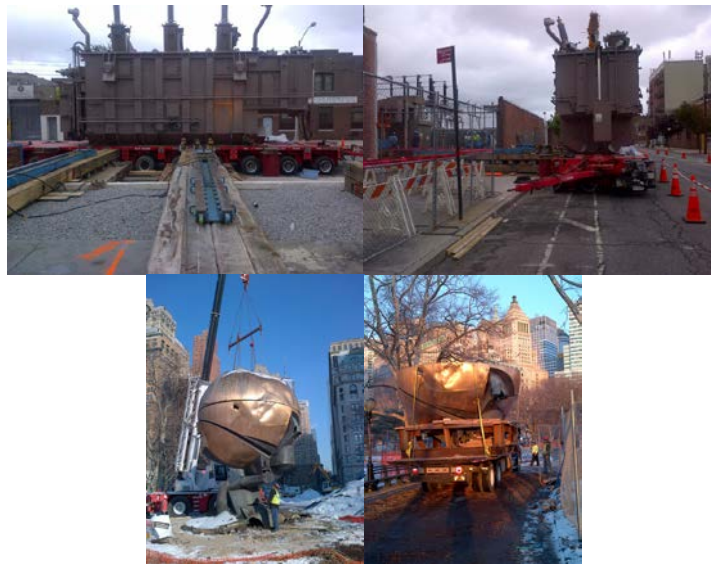
Railroad Force Account Agreements are a vital component in the rehabilitation/reconstruction program since train traffic affects 327 (41.4%) of City-owned bridges. Careful cooperation between the NYCDOT and the various railroad agencies that service the metropolitan area is required. The Railroad Coordinator provides a single point of contact for all railroad issues. This coordination includes the use of railroad personnel for track safety, approval of reconstruction design drawings, track shutdowns and reductions in train service for bridge construction work. The coordinator informs managers of "typical" railroad problems and attempts to avoid them through proactive measures. Upon registration of the railroad force account contracts between the City of New York and the respective railroad, Notices to Proceed [NTPs] are issued, and invoices are generated. The invoices, once approved by the engineers for the railroad and the corresponding DOT Project Manager, are sent to the Railroad Coordinator for processing and actual payment by the New York City Comptroller's Office.

NYCDOT bridge designers make every effort to prepare accurate and complete contract documents. Unfortunately, in many instances, the original design drawings for the deteriorating bridges no longer exist, and previous records of modifications and repairs are not available. When the contract documents for the bridge reconstruction projects do not accurately address conditions found in the field, Contract Change Requests (CCR) are needed. Change order work can not proceed until the CCR is registered. Due to the nature of bridge construction projects, change order work is often on the critical path. Any delay in the issuance of a change order affects the overall project, and adds substantial overruns to the final cost. A tracking process for change orders has been implemented that significantly reduces the time for the approval process.

Certificates to Proceed [CPs] are a critical component for the registration of any Construction, Consultant Programs, Force Account, Change Order and Engineering Service Agreement and assigned ESA tasks. Coordinating the submission of New and Revised Certificates to Proceed for submission to the Capital Budget is overseen by the Capital Procurement Unit.

The **Capital Coordination Section** is responsible for preparing, coordinating and updating the capital budget and capital program initiative within the Division of Bridges. Currently, the Division's Ten Year Capital Plan is worth approximately \$4.5 billion. This plan is designed to rehabilitate the City's bridges. Responsibilities include: administering and participating in the development and implementation of planning capital projects; acting as liaison with oversight agencies, DOT Administration and all responsibility centers within Bridges; reviewing and processing transfer of fund requests in an attempt to resolve funding issues; and maintaining the Division's registration report for all current year capital contracts. In addition, this section coordinates the Division's submission of Initial Financial Plans, Annual Financial Plan and Construction Management Plans prepared by Project Managers that must be submitted to the Office of Finance, Contracts & Program Management.

The **Truck Permit Section** issues approximately 1000 Annual Overweight Load Permits (renewals only), and approximately 40,350 other permits, including Annual Self-Propelled Crane Permits, Daily Oversize/Overdimensional/Supersize Truck Permits, and Bulk Milk Permits; all in accordance with the New York City Department of Transportation Policy and Procedures and the New York City Traffic Rules and Regulations section 4-15.



In July 2013, the Section Coordinated the Move of a 423,464 Pound Consolidated Edison Transformer in Queens. In December 2013, the Koenig "Sphere" was moved 500 within Battery Park, crossing over the Battery Park Underpass with speed restriction of not more than 5 miles per hour, to reduce the impact on the structure. The 25-foot-tall bronze globe, which still bears the scars of Sept. 11, 2001, was relocated to a spot closer to Castle Clinton, to accommodate the park's renovations.

(Credit: Lawrence V. Mauro)

JANUARY

Anti-Icing

Anti-icing crews were deployed on the East River bridges from 12:30 AM to 6:00 PM on January 6, 2013; no applications of chemicals were necessary.

Harper Street Asphalt Plant (Queens)

On January 2 – 4, 2013, Division ironworkers performed emergency repairs to a broken link-pin atop the silo.

Jamaica Avenue Bridge over Cross Island Parkway (Queens)

Cleaning and painting of this bridge, which began on December 24, 2012, was completed on January 7, 2013.

Harper Street Asphalt Plant (Queens)

On January 12 and 19, 2013, Division ironworkers repaired the chute and cold-feed bins.

Anti-Icing

Anti-icing crews were deployed on the East River bridges from 10:00 PM on January 15, 2013 until 6:30 AM the following morning. The Brooklyn and Ed Koch - Queensboro Bridges received one application of chemicals each.

Ocean Avenue Pedestrian Bridge over Sheepshead Bay (Brooklyn)

After Hurricane Sandy, extensive damage was found on the bridge. Damages to the timber hand rail, timber deck planks, light pole and electrical components were attributed to the intensity of the storm and ships striking the bridge. Repairs were made in-kind to the damaged components. The planks and handrails were repaired by in-house forces, along with uprighting, resetting and rewiring the damaged light pole. Bridge repair work began on November 9, 2012, and the bridge reopened on January 18, 2013. Work was completed on February 22, 2013. The repainting of the bridge was performed in the spring.



Inspecting the Damaged Bridge in December 2012.



Newly Repaired Ocean Avenue Pedestrian Bridge. (Credit: Russell Holcomb)

Anti-Icing

Anti-icing crews monitored deck conditions on the East River bridges from midnight to 4:30 AM on January 18, 2013, and from 2:30 PM to midnight on January 21; no applications of chemicals were necessary. Icicle patrols were active the night of January 18 on the FDR Drive, Battery Park Underpass, and the Brooklyn-Queens and Cross-Bronx Expressways.

Council Member Juanita E. Watkins Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on January 24, 2013, in tribute to former Council Member Juanita E. Watkins, 78, who died on January 20. Council Member Watkins served in the Council from 1992 to 2001. She represented District 31 in Queens for 3 terms, covering the communities of Arverne, Bayswater, Edgemere, Far Rockaway, JFK Airport, Laurelton, Rosedale, Springfield Gardens, and parts of Cambria Heights and South Ozone Park. Council Member Watkins made advocacy for senior citizens one of her top priorities, sponsoring Senior Empowerment Conferences for seniors within her district. During her political career, she served in many functions including: delegate and member to the Democratic National Convention, Queens County Democratic District Leader and Queens County Committee Chair, before being elected to the City Council. The flags were raised on January 29, 2013.



Council Member Juanita E. Watkins.

Anti-Icing

On January 25, 2013, 1.5 inches of snow fell in Central Park, 0.7 at La Guardia Airport, and 0.8 at JFK Airport. On January 28, 2013, 0.2 inches of snow fell at La Guardia Airport, and 0.1 inches at JFK Airport. Anti-icing crews were deployed on the East River bridges from 4:00 PM on January 25 until 5:00 AM the following morning; 9,600 gallons of liquid chemicals and 20 tons of solid were applied. Crews were again deployed from 8:30 AM until 12:30 PM on January 28; no applications were necessary. Icicle patrols were active on the FDR Drive, Battery Park Underpass, and the Brooklyn-Queens and Cross-Bronx Expressways.

Harper Street Asphalt Plant (Queens)

On January 26, 2013, Division ironworkers repaired the main, feed, and cold-feed bins.

Eight Ramps and One Pedestrian Bridge at the St. George Staten Island Ferry Terminal (Staten Island)

On January 26, 2013, all of the ramps and bus gates, serving both vehicular and bus traffic, were restored to their original configuration.

Belt Parkway Bridge over Paerdegat Basin (Brooklyn)

Demolition of the existing bridge structure commenced in January 2013.



Paerdegat Basin Bridge in January 2013: Demolition of and Removal Bridge Deck at the Old Paerdegat Basin Bridge. The Timber Debris Shielding was Supported on the Lower Flanges of the Bridge Stringers. Demolition of Span 10 in February 2013.

Belt Parkway Bridge over Rockaway Parkway (Brooklyn)

Structural pile installation was completed, and abutment footing construction commenced in January 2013.



Rockaway Parkway Bridge in January 2013: Driving Steel Pipe Piles at the South East Abutment. Pumping and Vibrating Concrete into Steel Pipe Piles at the Southwest Abutment. Southwest Abutment Epoxy Coated Rebars for the Abutment Walls.

FEBRUARY

Mayor Edward I. Koch Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on February 1, 2013, in tribute to former Mayor Edward I. Koch, 88, who died that morning. He served as the City's 105th Mayor from 1978 to 1989. He is credited with leading the City government back from near bankruptcy in the 1970's to prosperity in the 1980's. He also began one of the city's most ambitious housing programs, which continued after he left office and eventually, over the next 15 years and four mayoral administrations, built or rehabilitated more than 200,000 housing units, revitalizing once-forslorn neighborhoods. He earned a European-African-Middle Eastern Campaign Medal with two campaign stars, a World War II Victory Medal, and the Combat Infantryman Badge for service in the European Theater of Operations in World War II. Before becoming mayor, Mr. Koch served two years as a Council Member and nine more in Congress representing the 17th District, the East Side of Manhattan. He later represented the 18th District after a redistricting. He supported public transportation and housing, Social Security

and tax reform, home health care for the elderly, aid to Israel, amnesty for draft resisters, solar energy research, federal financing of abortions and consumer protection measures.

Mayor Koch was known for addressing constituents at subway stations and street corners with his trademark saying, "How'm I doin'?" After leaving public service, he was active as a television judge, radio talk-show host, author, law partner, newspaper columnist, movie reviewer, professor, commercial pitchman and political gadfly. A prolific author, Mayor Koch wrote 17 books, including political commentaries, murder mysteries, and, together with his sister, even a children's book. On March 23, 2011, the New York City Council voted to rename the Queensboro Bridge as the "Ed Koch Queensboro Bridge" in honor of the former mayor. The flags were raised on March 3, 2013.



Mayor Edward I. Koch.

Harper Street Asphalt Plant (Queens)

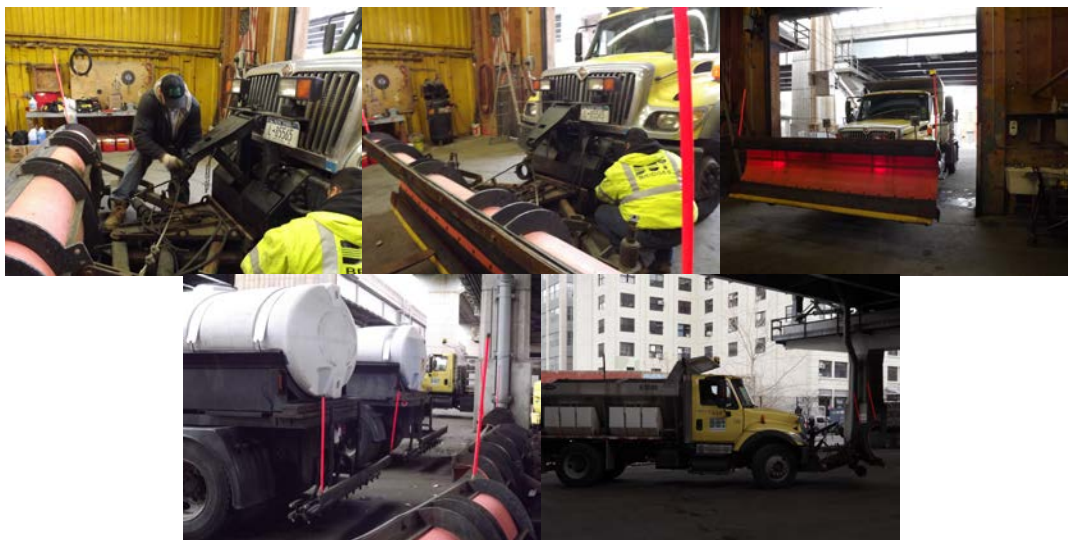
On February 2 and 16, 2013, Division ironworkers repaired the silo and main drum.

Anti-Icing

On February 2, 2013, 0.1 inches of snow fell in Central Park, 0.4 at La Guardia Airport, and 0.3 at JFK Airport. On February 3, 2013, 0.3 inches of snow fell in Central Park, 0.3 at La Guardia Airport, and 0.5 at JFK Airport. Anti-icing crews were deployed on the East River bridges from 4:00 PM on February 2 until midnight; three applications of liquid chemical were made. Crews were again deployed on February 3 from midnight until 4:00 PM; four applications of liquid chemical and one of solid were made. Crews were again deployed from 11:00 PM on February 4 until 8:00 AM the following morning; two applications of liquid chemical were made. Icicle patrols were active on the FDR Drive, Battery Park Underpass, and the Brooklyn-Queens and Cross Bronx Expressways.

Anti-Icing

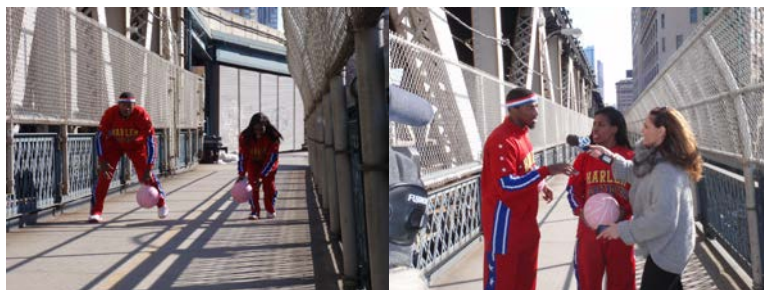
On February 8, 2013, 6.3 inches of snow fell in Central Park, 6.4 at La Guardia Airport, and 2.9 at JFK Airport. On February 9, 2013, 5.7 inches of snow fell at La Guardia Airport. Anti-icing crews were deployed on the East River bridges from 2:00 AM on February 8 until 6:00 AM on February 10; 29 applications of liquid chemical and 13 applications of solid were made. Snow was cleared from priority overpasses, and icicle patrols were active on the FDR Drive, Battery Park Underpass, and the Cross-Bronx and Brooklyn-Queens Expressways.



Preparing the Plows and Spray Trucks. (Credit: Thomas Whitehouse)

Manhattan Bridge

On February 12, 2013, members of the Harlem Globetrotters, including their first female player in nearly 20 years, Fatima “TNT” Maddox, dribbled a basketball across the Manhattan Bridge to celebrate Globetrotter Week in New York City.



Harlem Globetrotters on the Manhattan Bridge.

Anti-Icing

Anti-icing crews for the East River bridges were on standby on February 13, 2013 from 5:00 PM to 3:00 AM, on February 16 from 3:00 PM to noon, and again from 7:00 PM to 4:00 AM the following morning; no applications of chemicals were necessary. Snow was cleared from priority overpasses on February 14. Icicle patrols were active on the FDR Drive, Battery Park Underpass, and the Brooklyn-Queens and Cross -Bronx Expressways.

Douglaston Parkway Bridge over Cross Island Parkway (Southbound) (Queens)

Cleaning and painting of this bridge’s railings, which began on January 11, 2013, was completed on February 19, 2013.

Belt Parkway Bridge over Gerritsen Inlet (Brooklyn)

A Notice to Proceed for the reconstruction of this bridge was issued to the contractor with a start date of February 25, 2013.

Francis Lewis Boulevard Bridge over Laurelton Parkway (Eastbound) (Queens)

Cleaning and painting of the bridge, which began on February 20, 2013, was completed on February 28, 2013.

MARCH**Anti-Icing**

Anti-icing crews were deployed on the East River bridges from 7:00 PM on March 6, 2013 until 4:30 AM the following morning; no applications of chemicals were necessary. On March 8, 2013, 4 inches of snow fell in Central Park, 3.1 inches at La Guardia Airport, and 3 inches at JFK Airport. Crews were deployed from 7:00 PM on March 7 until 4:00 PM the following day; six applications of liquid chemical and one of solid were made. Snow was cleared from priority overpasses.

Commissioner Irene R. Halligan Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on March 13, 2013, in tribute to former Commissioner Irene R. Halligan, Chief of Protocol (1994-2002) and Commissioner for the United Nations, Consular Corps and Protocol (1997-2002), 83, who died on March 11. Commissioner Halligan's office was responsible for coordinating official visits to the World Trade Center site following the events of September 11, 2001. She escorted heads of state, prime ministers, foreign ministers and defense ministers to the site. Earlier during her political career, she served as president of the Women's National Republican Club and three times as a New York delegate to the Republican National Convention. The flags were raised on March 16, 2013.



Commissioner Irene R. Halligan.

Harper Street Asphalt Plant (Queens)

On March 16, 23, and 30, 2013, Division ironworkers repaired the main mixer drum, brackets, and platform and supporting angles.

Anti-Icing

On March 18, 2013, 3 inches of snow fell in Central Park, 2.9 inches at La Guardia Airport, and 1.4 inches at JFK Airport. Anti-icing crews were deployed on the East River bridges from 2:00 PM on March 18 until 1:00 AM the following morning; eight applications of liquid chemicals were made. Icicle patrols were active on the FDR Drive and Cross -Bronx Expressway.

Belt Parkway Bridge over Rockaway Parkway (Brooklyn)

The new concrete entrance ramp from Canarsie Circle to the eastbound Belt Parkway opened on March 22, 2013.



New Entrance Ramp D.

APRIL

Award

In April 2013, the American Council of Engineering Companies of New York selected the reconstruction of the East 8th Street Access Ramp (Guider Avenue Ramp to Belt Parkway) over Belt Parkway for a Gold Award in the structural systems category in its 2013 Engineering Excellence Awards.

Belt Parkway Bridge over Rockaway Parkway (Brooklyn)

The new eastbound exit ramp from the Belt Parkway to Canarsie Circle opened on April 5, 2013.



New Exit Ramp C. The Old Ramp is on the Left.

Harper Street Asphalt Plant (Queens)

On April 6, 2013, Division ironworkers repaired the main drum and bins.

Houston Street Bridge over FDR Drive (Manhattan)

Cleaning and painting of the bridge, which began on March 22, 2013, was completed on April 11, 2013.

Harper Street Asphalt Plant (Queens)

On April 13 and 20, 2013, Division ironworkers repaired the hot tower motor, mixer drum, and silo.

Boston Marathon Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on April 16, 2013 as a mark of respect for the victims of the bombings that occurred on April 15 at the Boston Marathon. The flags were raised on April 20, 2013.

Division Years of Service Ceremony

Division personnel were honored on April 17, 2013 for their years of service to the City. The awards were presented by Chief Bridge Officer Henry D. Perahia, Executive Director Management and Support Services Dorothy Roses, Chief Staff Manager/Executive Director of Community Affairs Joannene Kidder, and Deputy Chief Engineer Maintenance, Inspections and Operations George W. Klein.

40 Years of Service

Staff Analyst Valerie Kemp.

35 Years of Service

Secretary Patricia Foster and Associate Staff Analyst Alice Todd.

30 Years of Service

Administrative Manager Rona Brown, Electrician Gary Emmanuel, Supervisor Highway Repairer Joseph Flood, Oiler Rene Francis, Highway Repairer Roosevelt Gee, Jr., Bridge Operator David Leifer, Supervisor Bridge Operator Domingo Porrata, Principal Administrative Associate Marija Raborg, and Electrician Robert Stackpole.

25 Years of Service

Highway Repairer Angelo Capone, Bridge Repairer and Riveter Michael Collins, Clerical Associate Maritza Costan, Area Supervisor Highway Maintenance Thomas Cupo, Jr., Electrician Patrick Fitzgerald, Administrative Staff Analyst James Gallagher, Associate Project Manager Richard Gwasda, Associate Staff Analyst Maria Holland, Principal Administrative Associate Milagros Jorge, Administrative Engineer Walter Kulczycki, Principal Administrative Associate Doreen Langhorne, Associate Project Manager Reza Lotfi, Civil Engineer Omar Makki, Cement Mason Lawrence Marks, Carpenter Joseph Moschella, Administrative Manager Diana Neal, Bridge Repairer and Riveter James Philip, Carpenter William Sic, Administrative Manager Beverly Smith, and Oiler Tom Strommen.

Ocean Avenue, Parkside Avenue, and Crooke Avenue Bridges over NYCT Brighton Line (Brooklyn)

The project to remove spalled concrete from these bridges over train tracks, which began on the weekend of March 8, 2013, was completed over the weekend of April 19, 2013.



Removing Spalled Concrete From Bridges Over Train Tracks.

Brooklyn Bridge

On April 27, 2013, the Massachusetts Institute of Technology Club of New York visited the Brooklyn Bridge. Divisional responsibilities and capabilities were discussed and questions were answered.



Oiler Thomas McAuliffe, Supervisor Highway Repairer Joseph Flood, and Deputy Chief Engineer George Klein With the MIT Alumni on the Bridge.

Harper Street Asphalt Plant (Queens)

On April 27, 2013, Division ironworkers repaired the hopper and the mixer bins.

Wards Island Pedestrian Bridge over Harlem River (Manhattan)

The reconstruction of this bridge was substantially completed on April 30, 2013.

MAY

Belt Parkway Bridge over Rockaway Parkway (Brooklyn)

The bridge deck concrete was placed on May 3, 2013.



Cleaning the Eastbound Bridge Deck.

Harper Street Asphalt Plant (Queens)

On May 1 – 4, 6 – 7, and 18, 2013, Division ironworkers repaired the crusher.

36th Annual Five Borough Bike Tour

In preparation for the 42-mile Five Borough Bike Tour on May 5, 2013, Division personnel swept the Ed Koch – Queensboro, Pulaski, Madison Avenue, and Third Avenue Bridges along the route and patrolled them for potholes. Carpenters installed temporary plywood covers over the finger joints of the Pulaski Bridge, which were removed after the tour concluded that day.



Cyclists on the Madison Avenue, Third Avenue, and Ed Koch Queensboro Bridges. (Credit: Mark Feinman)

Commissioner Joel A. Miele, Sr. Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on May 9, 2013, in tribute to former Commissioner Joel A. Miele, Sr., 78, who died on May 6. A professional civil engineer, he served as New York City Department of Buildings Commissioner from 1994 to 1996, Department of Environmental Protection Commissioner from 1996 to 2002, and as a Commissioner at the New York City Board of Standards and Appeals from 2002 to 2005. Commissioner Miele oversaw the opening, in 1998, of the first segment of a new water tunnel system linking the city to its upstate water supply — a 13.5-mile tunnel under Brooklyn and Queens. Earlier during his political career, he held posts as the Queens representative on the Department of City Planning and as chairman of Community Board 10 covering Howard Beach, Ozone Park and Richmond Hill for more than a decade.

He was commissioned in the United States Navy's Civil Engineer Corp, serving over three years on active duty and 29 years on inactive duty, retiring in 1988 at the rank of Captain in the Corp's Reserve. This service included two years as commander and commodore (Rear Admiral New York Naval Militia) of the 7th Naval Construction Regiment, which comprised over 2,600 officers and men located throughout the Northeastern United States. The flags were raised on May 10, 2013.



Commissioner Joel A. Miele, Sr.

Shore Road Circle Bridge over Amtrak (Bronx)

The reconstruction of this bridge was substantially completed on May 10, 2013.



New Shore Road Circle Bridge. New Fence.

Brooklyn Bridge

On May 14, 2013, the student association of the departments of Building Engineering and Structural Engineering at the Civil Engineering faculty of the Delft University of Technology (Netherlands) visited the Brooklyn Bridge. Divisional responsibilities and capabilities were discussed and questions about the Brooklyn Bridge reconstruction project were answered.



Deputy Chief Engineer Robert O. Collyer (in Safety Vest) With the Delft University of Technology Students on the Bridge.

Peace Officers Memorial Day Tribute

The Brooklyn Bridge American flags flew at half-mast on May 15, 2013, to commemorate Peace Officers Memorial Day.

Guyon Avenue Bridge over SIRT South Shore (Staten Island)

Contractor cleaning and painting of the bridge, which began on September 4, 2012, was completed on May 16, 2013.

Memorial Day Tribute

The Brooklyn Bridge American flags flew at half-mast until noon on May 27, 2013, to commemorate those who died serving the nation during war.

Northern Boulevard Bridge over Cross Island Parkway (Queens)

Cleaning and painting of the bridge, which began on April 1, 2013, was completed on May 30, 2013.

Richmond Valley Road Bridge over SIRT South Shore (Staten Island)

Contractor cleaning and painting of the bridge, which began on December 19, 2012, was completed on May 30, 2013.

Belt Parkway Bridge over Mill Basin (Brooklyn)

Due to heat expansion, the Mill Basin Bridge was closed to marine traffic beginning at 11:44 AM on May 30, 2013. It was returned to service at 10:03 PM.

Hutchinson River Parkway Bridge over Hutchinson River (Bronx)

Due to heat expansion, the Hutchinson River Parkway Bridge was closed to marine traffic beginning at 1:30 PM on May 31, 2013. It was returned to service at 1:00 AM on June 1.

Belt Parkway Bridge over Fresh Creek (Brooklyn)

Installation of the box beam and single rail on the westbound bridge barrier commenced in May 2013.

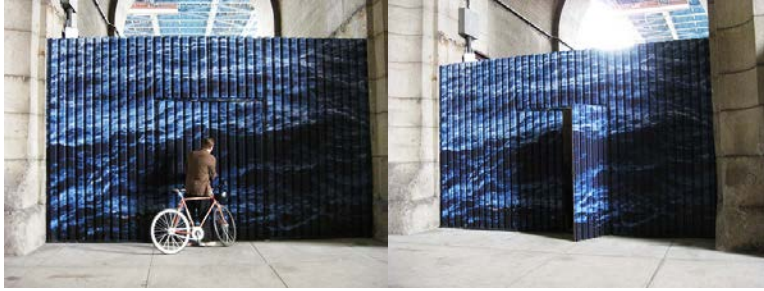


Drilling Through the Back of the Barrier to Install Box Beam Rail on the Face of the Barrier.

Water Street Arch

The Agency's Urban Art Program enhances public space through art and improved street design and streetscapes. Launched in October 2008, the program brings the vision of the Agency's World Class Streets initiative to life by partnering with community organizations to install murals, sculptures and other art forms in plazas and on medians, triangles, sidewalks, Jersey barriers and construction fences for up to 11 months on NYCDOT properties.

Casey Opstad's "Water Gate" is a 275 square foot pixelated mural painted onto a corrugated metal fence located within the Arch under the Manhattan Bridge in DUMBO, between Adams Street and Anchorage Place. The artist selected water imagery for the fence because of the neighborhood's proximity to the East River waterfront and the overall global importance of water. Over the two-week installation period, the artist hand-painted over 100,000 half-inch squares according to an eight-color schema inspired by the East River. Laid in a straight line, the pixelated squares would stretch out for more than a mile. The exhibit opened in May 2013.



"Water Gate" Exhibit on the Manhattan Bridge.

JUNE

Award

In June 2013, the Metropolitan Section of the American Society of Civil Engineers selected the rehabilitation of the St. George Staten Island Ferry Terminal Ramps as its Design-Build Project of the Year.

Harper Street Asphalt Plant (Queens)

On June 1, 2013, Division ironworkers repaired the hopper and stairs.

Water Street Arch

From June 1 to 16, 2013, the Water Street Arch hosted one of the 88 baby grand pianos placed in New York City public spaces courtesy of arts nonprofit Sing for Hope. Local artists performed various genres of music, including cowboy country, Latin jazz, New Orleans brass, pop karaoke, and alternative country.

Harper Street Asphalt Plant (Queens)

On June 8, 2013, Division ironworkers repaired the crusher bin and installed catwalks over the hopper and drum

17th Avenue Bridge over NYCT (Brooklyn)

Remedial repairs of the pre-cast pier elements were originally scheduled to take place in November 2012, but were cancelled due to higher priority MTA Hurricane Sandy recovery work. The repairs were rescheduled to spring 2013 and were completed by the contractor on June 8, when the ambient temperatures were adequate for the repair materials.



Smoothing the Upper Repaired Wall After Stripping Forms. Grinding the Repaired Wall.



Removing Form Nails From the Stripped Keyway. The Completed Repairs.

Williamsburg Bridge

On June 20, 2013, Division electricians assisted a film crew for a Nike commercial at the Williamsburg Bridge.

East 156th Street Bridge over Access to Housing (Bronx)

Cleaning and painting of the bridge, which began on March 25, 2013, was completed on June 21, 2013.

Harper Street Asphalt Plant (Queens)

On June 22, 2013, Division ironworkers repaired the drum and silo.

Huguenot Avenue Bridge over SIRT South Shore (Staten Island)

Contractor cleaning and painting of the bridge, which began on February 1, 2013, was completed on June 22, 2013.

Seguine Avenue Bridge over SIRT South Shore (Staten Island)

Contractor cleaning and painting of the bridge, which began on January 15, 2013, was completed on June 22, 2013.

Ninth Street Bridge over Gowanus Canal (Brooklyn)

Due to heat expansion, the Ninth Street Bridge was closed to marine traffic beginning at 3:23 PM on June 25, 2013. It was returned to service at 7:30 PM.

Harper Street Asphalt Plant (Queens)

On June 29, 2013, Division ironworkers repaired the crushers and compressor door.

Giffords Lane Bridge over SIRT South Shore (Staten Island)

Contractor cleaning and painting of the bridge, which began on March 15, 2013, was completed on June 30, 2013.

Manhattan Bridge

Jen Liu's "Melon Mysticism for Everyone," part of the Agency's Urban Art Program, is a series of vinyl banners on the chain link fence located on the Manhattan Bridge adjacent to the bike lane at Canal and Forsyth Streets in Manhattan. The artwork's content was inspired by the neighboring fruit and vegetable markets located below the site. The artist carved mandala patterns into a watermelon and then documented various animals (cats, dogs and chickens) eating the fruit. Within the playful imagery, the communal enjoyment of the watermelon by the animals acts as a humorous and poetic allegory for the cohesion of immigrant communities in New York City. The exhibit opened in June 2013.



"Melon Mysticism for Everyone" Exhibit on the Manhattan Bridge.

JULY

Jackie Robinson Parkway and Union Turnpike Bridge over Austin Street (Queens)

The component rehabilitation of this bridge was substantially completed on July 2, 2013.



Jackie Robinson Parkway Bridge. (Credit: NYSDOT). Retaining Wall Repair – Before, During, and After. Deck and Joint Repairs. Under Deck Repairs.

13th Avenue Bridge over LIRR and Sea Beach (Brooklyn)

The component rehabilitation of this bridge was substantially completed on July 2, 2013.



13th Avenue Bridge. (Credit: NYSDOT) Repairing the Under Deck and Deck Joint. Bridge After Repair.

Harper Street Asphalt Plant (Queens)

On July 6, 2013, Division ironworkers repaired the drum, ducts, and the compressor protection room.

Greenpoint Avenue Bridge over Newtown Creek (Brooklyn/Queens)

Due to heat expansion, the bridge was closed to marine traffic beginning at 5:10 PM on July 8, 2013. It was returned to service at 8:50 PM.

Metropolitan Avenue Bridge over English Kills (Brooklyn)

Due to heat expansion, both marine and vehicular traffic were delayed from 8:55 PM until 11:20 PM on July 8, 2013.

Carroll Street Bridge over Gowanus Canal (Brooklyn)

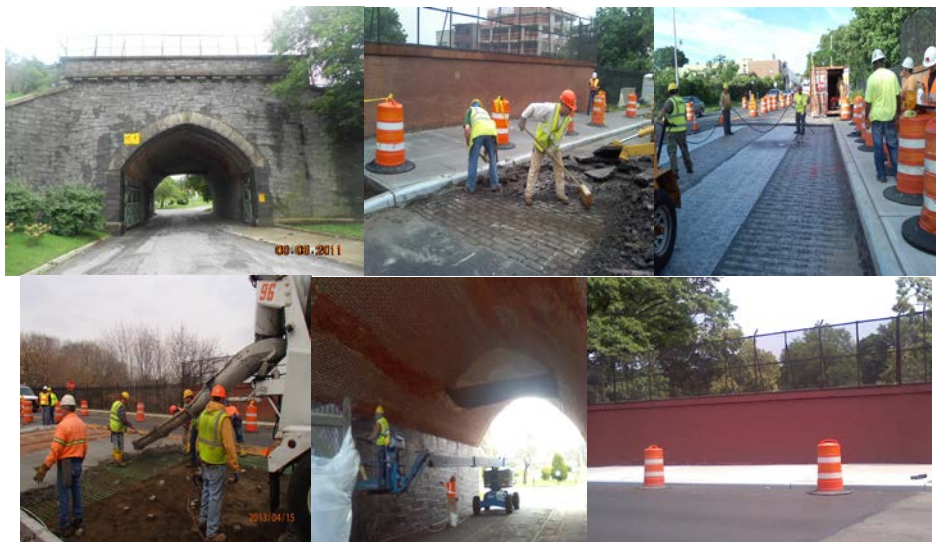
The bridge is a two span movable–retractile type bridge. The bridge roadway carries a single travel lane in the east direction. There are no parking lanes on the bridge. There is a sidewalk on each side of the bridge. The scope of rehabilitation work included the following: replace the deteriorated timber deck; restore the expansion joints; clean masonry walls at the west abutment; replace impacted stiffeners, angles, and plates; clean and paint structural steel; reset roadway paving units at west abutment and repair/replace concrete sidewalks at both approaches; install new timber curbs on both sides of the roadway; and install new rubber dock fenders at both abutments. The component rehabilitation of this bridge was substantially completed on July 9, 2013.



Carroll Street Bridge. (Credit: NYSDOT) Repairing the Deck, Approach, Fender, and Steel. Bridge After Repair.

Fifth Avenue Bridge over Greenwood Cemetery (Brooklyn)

The bridge is a one span masonry arch structure. The brick arch can be classified as a gothic style arch. The bridge carries one travel lane and one parking lane in each direction. The sidewalk consists of grass and dirt on both side of a 5 feet wide concrete walkway. The scope of rehabilitation work included the following: remove and replace existing asphalt from the bridge and approach slabs; clean and seal cracks in asphalt at both approach pavements; remove existing 5 foot wide sidewalk on both sides of the bridge and replace with a 13 foot wide sidewalk; replace existing stone curb with cast-in-place concrete curb; clean, repair, tuck point and restore the stone masonry; and rehabilitate the brick arch. The component rehabilitation of this bridge was substantially completed on July 9, 2013.



Fifth Avenue Bridge. (Credit: NYSDOT). Repairing the Deck and Approach, Waterproofing, Concrete Sub Base, and Under Deck. Bridge After Repair.

Council Member Walter McCaffrey Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on July 10, 2013, in tribute to former Council Member Walter McCaffrey, 64, who died that day. Council Member McCaffrey served in the Council from 1985 to 2001. He represented District 26 in Queens, covering the communities of Woodside, Sunnyside and Long Island City, and counting among his successes legislation that banned or restricted adult entertainment venues from residential neighborhoods. Earlier during his political career, he served as chief of staff to former Manhattan Borough President Andrew Stein. The flags were raised on July 16, 2013.



Council Member Walter McCaffrey.

Eight Ramps and One Pedestrian Bridge at the St. George Staten Island Ferry Terminal (Staten Island)

The design-build reconstruction of these bridges was substantially completed on July 15, 2013.



St. George Ferry Terminal Ramps A, B, C and D.



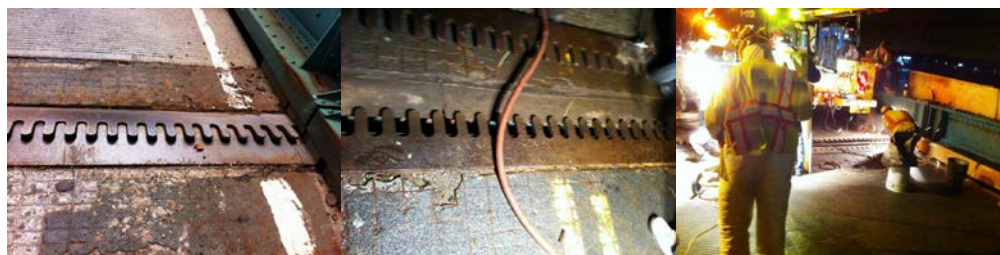
St. George Ferry Terminal Bus Canopy Grating. North Ramp. Project Site Overview.

Greenpoint Avenue Bridge over Newtown Creek (Brooklyn/Queens), Hutchinson River Parkway over Hutchinson River (Bronx), Belt Parkway Bridge over Mill Basin (Brooklyn), Bruckner Expressway (Northbound and Southbound Service Road) over Westchester Creek (Unionport Bridge) (Bronx), and Pulaski Bridge over Newtown Creek (Brooklyn/Queens)

Due to heat expansion, these bridges were all closed to marine traffic for various periods from July 16 through July 21, 2013. Division staff used water trucks to cool down the bridges.

City Island Road Bridge over Eastchester Bay (Bronx)

On July 17, 2013, the Division received word of an urgent condition affecting the finger joints on the City Island Bridge that occurred after the City's record-breaking heat wave. The joints, steel plates that resemble overlapping human fingers, allow the bridge to expand and contract in response to changes in temperature or load. Division crews were on the scene quickly closing down the effected lane of traffic to protect motorists. Overnight repairs were scheduled on July 25 when it was determined that the bridge had cooled sufficiently for the work to proceed. The repairs involved opening the joint plates and installing plug welds, which helped correct the plates' position and recreated the proper gap to allow the bridge to expand and contract safely.



City Island Bridge Finger Joint Before the Repair. Open Finger Joint. Division Crews Repairing the Joints.



City Island Bridge: View Beneath the Finger Joint. The Joint Plates are Placed to Check for the Proper Gap. Leveling the Plate Before Welding. Close-Up of a Plug Weld. After 17 Plug Welds, the Finger Joints Sit Flush on the Roadway.

Harper Street Asphalt Plant (Queens)

On July 20, 2013, Division ironworkers repaired the hopper, silo, and support ducts.

Manhattan Bridge

On July 25, 2013, the Agency's summer interns visited the Manhattan Bridge. Divisional responsibilities and capabilities were discussed and questions were answered.



Manhattan Bridge Engineer-in-Charge Brian Gill Answering Interns' Questions, Along With Supervisor Carpenter Joseph Vaccaro and Assistant Civil Engineer Clara Medina (in Safety Vests). (Credit: Russell Holcomb) Project Manager Sergey Kholdarov, Assistant Civil Engineer Clara Medina, Retired Deputy Chief Engineer Russell Holcomb, and Manhattan Bridge Engineer-in-Charge Brian Gill With the Interns. (Credit: Anita Navalurkar)

Harper Street Asphalt Plant (Queens)

On July 26 – 28, 2013, Division ironworkers dismantled and removed the old duct structure from the hopper and installed a new one.

9th Street Bridge over Gowanus Canal (Brooklyn)

Due to heat expansion, the 9th Street Bridge was closed to marine traffic beginning at 1:35 PM on July 29, 2013. It was returned to service at 6:00 AM on July 30.

Seeley Street Bridge over Prospect Avenue (Brooklyn)

Cleaning and painting of the bridge began and was completed in July 2013.

Dorchester Road Bridge over BMT Subway, Brighton (Brooklyn)

Lev Zeitlin's "Now & Then," part of the Agency's Urban Art Program, is a decorative mural at the Dorchester Avenue Bridge between East 16th Street and Marlborough Road in Brooklyn. The

simple painting technique utilized a color palette complimentary to the tree-lined streets and Victorian architecture in the neighborhood. Over the course of two weeks, volunteers assisted the artist with implementation of the mural. The exhibit opened in July 2013.



"Now & Then" Exhibit on the Dorchester Avenue Bridge.

AUGUST

Park Avenue Tunnel over 34th Street (Manhattan)

As part of the sixth annual Summer Streets program in August 2013, the Park Avenue Tunnel, which runs from 33rd Street to 40th Street, was open to pedestrians at the 33rd Street entrance between the hours of 7 AM and 1 PM on August 3, 10, and 17, 2013. "Voice Tunnel" was an interactive light and sound installation by Mexican-Canadian artist Rafael Lozano-Hemmer, and transformed the 1,400 foot long Park Avenue Tunnel with 360 theatrical spotlights that produced glimmering arches of light along the tunnel's walls and ceiling. Participants were able to influence the intensity of each light by speaking into a special intercom at the tunnel's center which recorded their voice and looped it. Louder speech increased the lights' brightness proportionally, creating a Morse-like code of flashes throughout the tunnel. The individual voices were heard as pedestrians walked through the tunnel, on 180 loudspeakers, one beside each light arch and synchronized with it. At any given time, the tunnel was illuminated by the voices of the past 90 participants: as new participants spoke into the intercom, older recordings were pushed away by one position down the array of light fixtures until they left the tunnel, so that the content of the piece changed constantly.



"Voice Tunnel" Exhibit in the Park Avenue Tunnel. (Credit: Russell Holcomb)

Eagle Avenue Bridge over East 161st Street (Bronx)

Cleaning and painting of the bridge, which began on May 20, 2013, was completed on August 20, 2013.

Flatbush Avenue Bridge over Belt Parkway (Brooklyn)

Cleaning and painting of the bridge, which began on October 15, 2012, was completed on August 20, 2013.

Belt Parkway Bridges over Paerdegat Basin, Fresh Creek, and Rockaway Parkway (Brooklyn)

The first part of the seven bridge Belt Parkway reconstruction program was substantially completed on August 22, 2013. Contract #1 included the Paerdegat Basin, Fresh Creek, and Rockaway Parkway bridges.



Paerdegat, Fresh Creek, and Rockaway Bridges.

Belt Parkway Bridge over Paerdegat Basin (Brooklyn)

On August 27, 2013, a chain linked fence with privacy glare screens was installed behind the timber rail fencing on the westbound Belt Parkway at the Paerdegat Basin Bridge. Residents of the Bergen Beach community had expressed their concerns regarding the rapid succession of vehicular lights coming from the newly constructed Paerdegat Basin Bridge. The fence will prevent vehicular headlight glare from streaming directly into the adjacent Bergen Beach community. The privacy glare fence measures 6 feet high by 392 feet long.



Installing the Privacy Glare Fence.

9th Street Bridge over Gowanus Canal (Brooklyn)

Due to heat expansion, the 9th Street Bridge was closed to marine traffic beginning at 9:30 AM on August 28, 2013. It was returned to service at 4:30 PM.

Harper Street Asphalt Plant (Queens)

On August 31, 2013, Division ironworkers repaired the crusher and mixer.

Earlene Powell

Deputy Director of In-House Painting Earlene Powell was the subject of the “Staff Spotlight” feature in the August 2013 edition of “Byways,” the official Agency newsletter.



Deputy Director of In-House Painting
Earlene Powell on the Brooklyn Bridge.

SEPTEMBER

Claremont Parkway Bridge over Metro North (Bronx)

The reconstruction of this bridge was substantially completed on September 3, 2013.

Highland Boulevard Bridge (Northbound) over Vermont Avenue (Brooklyn)

Cleaning and painting of the bridge, which began on August 9, 2013, was completed on September 3, 2013.

Harper Street Asphalt Plant (Queens)

On September 7, 2013, Division ironworkers repaired the cold feed bin and duo drum.

Patriot Day Tribute

The Brooklyn Bridge flags flew at half-mast on September 11, 2013 to commemorate the National Day of Service and Remembrance.



Brooklyn Bridge Flag at Half-
Mast at Dusk. (Credit:
Michele N. Vulcan)

Harper Street Asphalt Plant (Queens)

On September 14, 2013, Division ironworkers repaired the bin support beams.

Washington D.C. Navy Yard Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on September 17, 2013 as a mark of respect for the victims of the shooting violence that occurred on September 16 at the Washington D.C. Navy Yard. The flags were raised on September 21, 2013.

Astoria Boulevard Bridge (Eastbound) over Brooklyn-Queens Expressway (West Leg) (Queens)

Cleaning and painting of the bridge, which began on April 29, 2013, was completed on September 18, 2013.

Award

On September 19, 2013, Director of Component Rehabilitation Krishan Baweja received an Outstanding Achievement Award from the South Asian American Association.

Department of Transportation Shops at Kent Avenue (Brooklyn)

On September 19, 2013, a Division construction project manager assisted a film crew from the television series "Person of Interest" at the Kent Avenue Facility.

Harper Street Asphalt Plant (Queens)

On September 28, 2013, Division ironworkers repaired the bins, material elevator, and the conveyor belt.

City Island Road Bridge over Eastchester Bay (Bronx)

A Notice to Proceed for the replacement of this bridge was issued to the contractor with a start date of September 30, 2013.

OCTOBER

Grand Concourse Bridge over East 175th Street (Bronx)

Cleaning and painting of the bridge, which began on August 22, 2013, was completed on October 2, 2013.

American Cancer Society's "Making Strides Against Breast Cancer" Campaign

During September and October 2013, Division personnel and their friends and families participated in bake and book sales and other fundraisers, and sponsored the DOT Teams for the American Cancer Society's annual "Making Strides Against Breast Cancer" walk.

Roosevelt Island Bridge over East River/East Channel (Manhattan/Queens)

On October 7 and 15, 2013, a Division engineer and Supervisor of Bridge Operations assisted a film crew from the television series "Elementary" at the Roosevelt Island Bridge.

Ed Koch Queensboro Bridge

A truck caught fire on the bridge on August 16, 2013, and damaged three stringers that support the eastbound upper roadway. Division engineers measured the displacement and determined that one could be repaired but the other two required replacement. While preparatory work began in September, the Queens-bound right lane of the upper roadway remained closed over the affected area. Using nighttime lane closures, rivets were replaced with bolts to speed the replacement process once the new stringers would be fabricated and ready for installation. Replacement of the two damaged stringers and the repair of a third were completed on the weekend of October 12, 2013. The Queens-bound upper and lower roadways were closed from 1:00 a.m. on October 12 to 3:00 p.m. on October 13. All work was performed by in-house forces.



August 2013: Firefighters Examining the Damage. Repairing the Bridge Included Custom Designing the Steel Beams, as Well as Fabrication and Installation. Division Ironworkers Fabricated Two 26-Foot-Long, 1.5-Ton Beams in Their Brooklyn Shop. October 2013: Removing the Warped Beams. The New Beams.

Grand Concourse Bridge over East Kingsbridge (Bronx)

Cleaning and painting of the bridge, which began on September 19, 2013, was completed on October 21, 2013.

Hurricane Sandy Tribute

The Brooklyn Bridge flags flew at half-mast on October 29, 2013 as a mark of respect for the memory of those who lost their lives one year earlier due to Hurricane Sandy.

Mosholu Parkway Bridge over Webster Avenue (Bronx)

Cleaning and painting of the bridge, which began on October 4, 2013, was completed on October 29, 2013.

Albee Avenue Bridge over SIRT South Shore (Staten Island)

The component rehabilitation of this bridge was substantially completed on October 31, 2013.



Albee Avenue Bridge. Repairing Fence and Fence Post, Pier Bent, and Deck Concrete. Bridge After Repair.

Hunts Point Avenue Bridge over Amtrak – CSX (Bronx)

Sharon De La Cruz's "Ruby Walks," part of the Agency's Urban Art Program, is a series of painted metal panels depicting Ruby Bridges along a bridge at Hunts Point Avenue between Bruckner Boulevard and Garrison Avenue. Ms. Cruz chose the iconic image of Ruby Bridges, the first African-American student to attend an all-white elementary school in the South, because she represents change, community and female empowerment. The exhibit opened in October 2013.



"Ruby Walks" Exhibit on the Hunts Point Bridge.

NOVEMBER

Award

In November 2013, the *Engineering News-Record of New York* selected the rehabilitation of the St. George Staten Island Ferry Terminal Ramps for an Award of Merit in the Airports/Transit category in its 2013 Best Projects Competition, spanning the New York, New Jersey and Connecticut region.

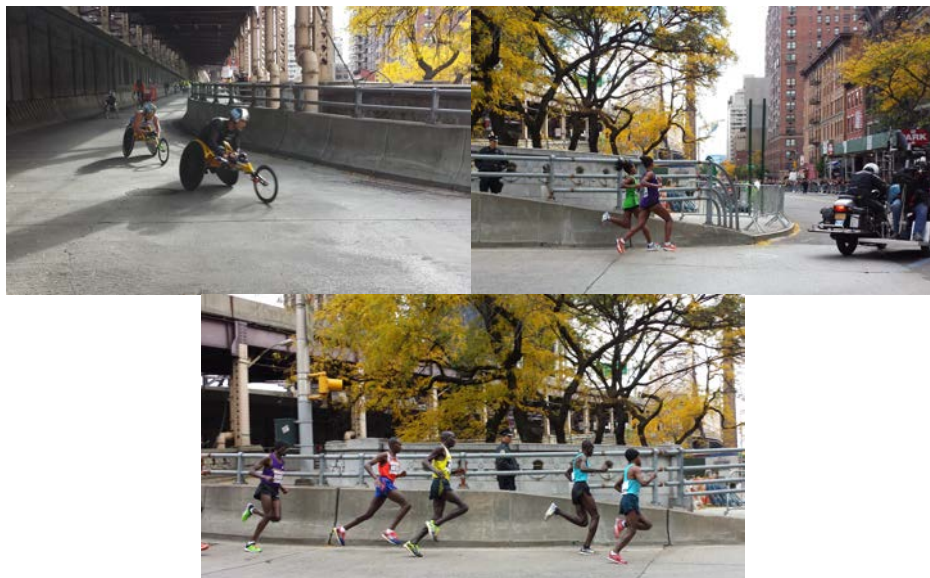
Hamilton Avenue Asphalt Plant (Brooklyn) and Harper Street Asphalt Plant (Queens)

On November 2 and 3, 2013, Division ironworkers repaired the dryers and conveyor belt.

New York City Marathon

In preparation for the Marathon on November 3, 2013, Division personnel mechanically swept the Madison Avenue, Pulaski, and Ed Koch Queensboro (lower level) bridges, reconfigured the

Jersey barriers on the Ed Koch Queensboro Bridge's outer roadway and 60th Street ramp, and installed hay bales. Operations were also performed by the Willis Avenue Bridge contractor.



At Mile 16 – the Ed Koch Queensboro Bridge, Coming Down the South Outer Roadway onto 59th Street. Australia's Kurt Fearnley (3rd place Male Pushrim Wheelchair – On Left) and Switzerland's Marcel Hug (Winner – On Right). United States' Tigist Tufa Demisse (8th Place – On Left) and United States' Buzunesh Deba (2nd place – On Right). Kenya's Stanley Biwott (5th Place – On Left), South Africa's Lusapho April (3rd Place – 2nd From Left), Kenya's Geoffrey Mutai (Winner – 4th From Right), Kenya's Peter Cheruiyot Kirui (8th Place – 3rd From Right). (Credit: Paul Schwartz)

Belt Parkway Bridge over Bay Ridge Avenue (Brooklyn)

A Notice to Proceed for the reconstruction of this bridge was issued to the contractor with a start date of November 4, 2013.

Division Hurricane Sandy Response Recognition Ceremony

On October 29, 2012, the New York Metropolitan area was impacted by Hurricane Sandy (Post-Tropical Cyclone Sandy), causing flooding, loss of power and damage to many components of New York City's infrastructure. Division employees ensured the safety of City residents and infrastructure. Division personnel were honored on November 4, 2013 for their outstanding work before, during, and after Hurricane Sandy. The awards were presented by Chief Bridge Officer Henry D. Perahia, Deputy Chief Engineer Maintenance, Inspections and Operations George W. Klein, Deputy Chief Engineer Bridge Capital Design and Construction Robert O. Collyer, Deputy Chief Engineer Engineering Review and Support Anilkumar Vyas, Administrative Superintendent Bridge Operations George Kern, and Administrative Superintendent Highway Operations Paul Schwartz.

Bridge Painting Team

Supervisor Bridge Painters Hughie Flood, Reynaldo Grant, and David Yanolatos.

Bridge and Tunnel Operations Team

Supervisor Electrician Ronald Marano, and Electrician Steven Radice.

Preventive Maintenance Team

Highway Repairer Danny Alvarado, Supervisor Highway Repairer Victor Andrade, Highway Repairers Rudolph Bentley, Andrew Bondi, and Sharon Britt, Assistant City Highway Repairer Anthony Brucculeri, Area Supervisor Highway Maintenance James Campbell, Assistant City Highway Repairer Luciano Cardona, Highway Repairers Thomas Cruz, Michael Cunningham, and Joseph Davis, Assistant City Highway Repairer Deon Francois, Highway Repairers Gary George and John Godfrey, Assistant City Highway Repairer James Kelleher, Tractor Operator Andrew Mondì, Highway Repairer Ralston Myers, Supervisor Highway Repairer Michael Parise, ,

Assistant City Highway Repairer Nigel Ramirez, Area Supervisor Highway Maintenance Charles Remi, Highway Repairer David Russell, Supervisor Highway Repairer Joseph Turchiano, and Assistant City Highway Repairer Danny Wright.

Roadway Bridges Team

Construction Project Manager Syed Alam and Administrative Engineer Daniel Hom.

Truck Permit Team

Assistant Civil Engineer Darlyn Alvarez, Administrative Manager Monique Bryson-Sambula, Computer Aide Lisa Burns, Administrative Engineer Udaya Dommaraju, Administrative Manager David-Paul Gerber, Assistant Civil Engineer Jafar Haider, Clerical Associate George Liang, Associate Staff Analyst Kevin Lobat, Administrative Manager Diana Neal, Civil Engineering Intern Monica Palacio-Rodriguez, Civil Engineer Farid Tadros, Clerical Associate Tiffany Utley, and Associate Project Manager Mariya Zhurakhinskaya.

Individual Awards

Bridge Painting: Supervisor Bridge Painter Cesar Pazmino

Bridge Painting/Office of Emergency Management: Staff Analyst Earlene Powell

Preventive Maintenance Administration: Administrative Superintendent Highway Operations Paul Schwartz

Preventive Maintenance – Pulaski Yard: Motor Grader Operator Peter Paramithis

Office of Emergency Management/Shelter Relief: Principal Administrative Associate Milagros Jorge

Shelter Relief: Administrative Manager Lourdes Acevedo

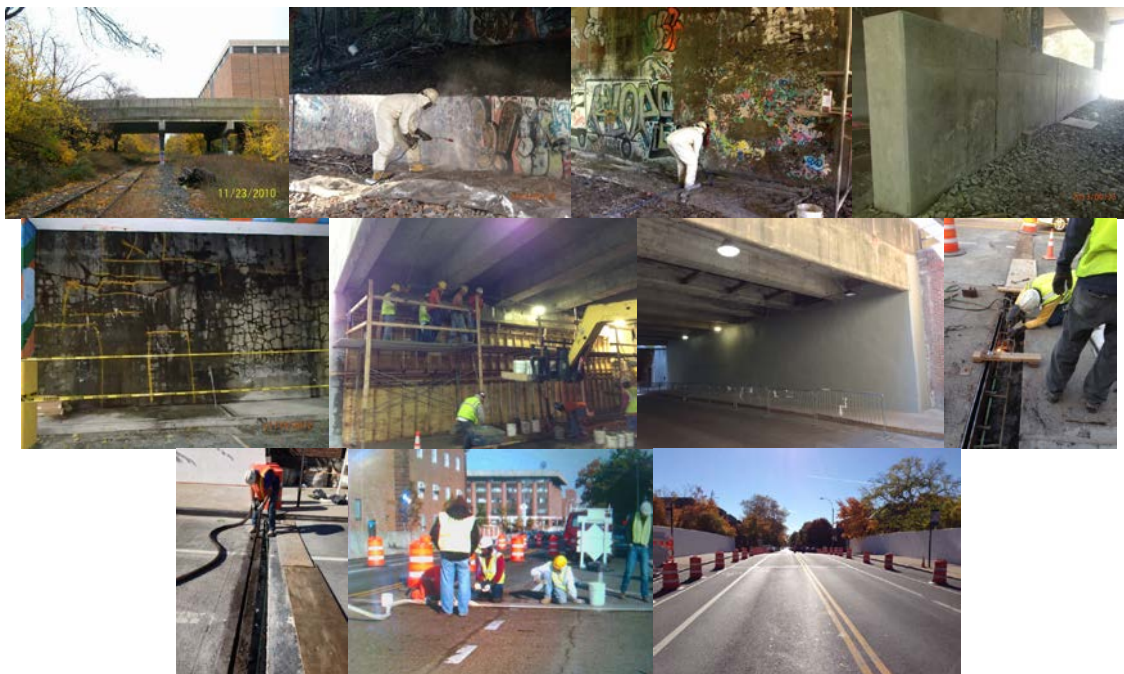
Lifesaving: Assistant City Highway Repairer Deon Francois



Hurricane Sandy Response Award Ceremony Participants.

Bedford Avenue Bridge over LIRR Bay Ridge (Brooklyn)

The bridge is a 6 span structure, and carries one travel lane in each direction. There is a parking lane and a bicycle lane on each side of the bridge. The scope of rehabilitation work included the following: seal and repair cracks and spalls at the deck, abutments and piers; replace compression seals; and clean concrete and apply an anti-graffiti protective coating on the abutments and piers. The component rehabilitation of this bridge was substantially completed on November 6, 2013.



Bedford Avenue Bridge. (Credit: NYSDOT) Removing Graffiti and Applying Anti-Graffiti Coating – Before and After. Abutment Wall Concrete Repair – Before and After. Armored Joint Repair. Bridge After Repair.

Brooklyn Bridge

On November 6, 2013, 3rd year civil engineering students at the Rensselaer Polytechnic Institute visited the Brooklyn Bridge. Divisional responsibilities and capabilities were discussed and questions about the Brooklyn Bridge reconstruction project were answered.



Deputy Chief Engineer Robert O. Collyer (in Safety Vest) and Assistant Civil Engineer Clara Medina With the Rensselaer Polytechnic Institute Students on the Bridge.

Department Recognition Ceremony

Division personnel were honored on November 12, 2013 for their outstanding work on various projects. The awards were presented by Commissioner Janette Sadik-Khan and First Deputy Commissioner Lori A. Ardito.

Belt Parkway Bridge Reconstruction

Administrative Engineer Muhammad Afzal, Construction Project Manager Syed Alam, Highway Transportation Specialist Eric Callender, Administrative Engineer Andre Celestin, Deputy Chief

Engineer Bridge Capital Design and Construction Robert O. Collyer, Administrative Engineer Udayakumar Dommaraju, Administrative Engineer David Dunn, Assistant Civil Engineer Getachew Gedfe, Civil Engineer Mikhail Geller, Administrative Engineer Daniel Hom, Administrative Engineer Ayman Jacob, Civil Engineer Edvard Jeamgocian, Chief Staff Manager/Executive Director of Community Affairs Joannene Kidder, Administrative Engineer John Kurre, Associate Project Manager Tajul Lodhi, Assistant Civil Engineer Ramakumar Magge, Assistant Civil Engineer Khalid Mohammed, Civil Engineer Gregory Novofastovsky, Administrative Engineer Sanjeev Patel, Administrative Engineer Roly Parroco, Civil Engineer Jagdish Patel, Associate Project Manager Alina Platonova, Civil Engineer Serge Rigaud, Civil Engineer Reza Sharif, Administrative Engineer Mahabal Shah, and Deputy Chief Engineer Engineering Review and Support Anilkumar Vyas.

Brooklyn Bridge Rehabilitation

Administrative Engineer Hasan Ahmed, Civil Engineer Li-Ping Chao, Deputy Chief Engineer Bridge Capital Design and Construction Robert O. Collyer, Civil Engineer Thomas DeLuca, Civil Engineer Mohammad Hossain, Civil Engineer Jagtar Khinda, Chief Staff Manager/Executive Director of Community Affairs Joannene Kidder, Administrative Engineer Walter Kulczycki, Assistant Civil Engineer Ramakumar Magge, Civil Engineer Maria Mikolajczyk, Industrial Hygienist Vismit Patel, Civil Engineer Mohammad Rahman, Civil Engineer Kamran Sikandar, and Associate Project Manager Vadim Sokolovsky.

Coverage During Citywide Emergencies

Staff Analyst Earlene Powell.

Ed Koch Queensboro Bridge Emergency Repairs

Bridge Repairer and Riveter Shawn Ahearn, Assistant Civil Engineer Andrew Hoang, Civil Engineer Edvard Jeamgocian, Supervisor Bridge Repairer and Riveter John Jones, Deputy Chief Engineer Maintenance, Inspections and Operations George W. Klein, Assistant Civil Engineer Aleksandr Kotlyanskiy, Civil Engineer Alfred Lee, Bridge Repairer and Riveter Yiu Liu, Civil Engineer Thirugnanam Mohan, Supervisor Bridge Painter Cesar Pazmino, Supervisor Bridge Repairer and Riveter Gean Pilipiak, Administrative Superintendent Highway Operations Paul Schwartz, Administrative Engineer Mahabal Shah, Civil Engineer Jiaji Shi, Construction Project Manager Hany Soliman, and Executive Director of Bridge Preventive Maintenance and Repair Thomas Whitehouse.

Manhattan Bridge Contract #14

Administrative Engineer Hasan Ahmed, Civil Engineer Adam Caplan, Deputy Chief Engineer Bridge Capital Design and Construction Robert O. Collyer, Administrative Engineer Brian Gill, Administrative Engineer John Kurre, Civil Engineer Masroor Mahmood, Administrative Engineer Abdur Razzaq, Assistant Civil Engineer Giuseppe Sanfilippo, Civil Engineer Javed Sarwar, and Assistant Civil Engineer Dinesh Shah.

Plaza Program

Chief Staff Manager/Executive Director of Community Affairs Joannene Kidder.

St. George Ferry Terminal Ramps

Administrative Engineer Muhammad Afzal, Project Manager Tamara Berlyavsky, Industrial Hygienist Alex Bezchastnov, Deputy Chief Engineer Bridge Capital Design and Construction Robert O. Collyer, Civil Engineer Thomas DeLuca, Administrative Engineer Udayakumar Dommaraju, Construction Project Manager Beatriz Duran, Civil Engineer Mikhail Geller, Assistant Mechanical Engineer Nancy Guernsey, Administrative Engineer Ayman Jacob, Chief Staff Manager/Executive Director of Community Affairs Joannene Kidder, Assistant Civil Engineer Sarah-Ann Klein, Associate Project Manager Reza Lotfi, Civil Engineer Masroor Mahmood, Associate Project Manager Patrick Nestor, Civil Engineer Andreas Paraschos, Civil Engineer Mohammad Rahman, Civil Engineer Javed Sarwar, and Administrative Engineer Mahabal Shah.

Borden Avenue Bridge over Dutch Kills (Queens)

On November 13, 2013, a Division engineer assisted a film crew from the television series “Elementary” at the Borden Avenue Bridge.

President John F. Kennedy Tribute

The Brooklyn Bridge flags flew at half-mast on November 22, 2013 to observe the 50th anniversary of the assassination of President John F. Kennedy, and as a mark of respect for his memory.

87th Annual Macy's Thanksgiving Day Parade

Division engineers reviewed and approved the design specifications of Toothless – How to Train Your Dragon, Snoopy and Woodstock, Finn and Jake – Adventure Time, SpongeBob SquarePants, and Oz Hot Air Balloon, four new and one returning large balloons to be introduced in the parade. A balloon is classified as large if it is larger than 5,000 cubic feet. However, the balloons in the parade cannot be taller than 70 feet, wider than 40 feet, or longer than 78 feet. Division representatives attended the test flights of the balloons at the Meadowlands Sports Complex in New Jersey on November 9, 2013, with NYPD and other agencies.

On November 28, 2013, wind speeds were relatively low and all 16 large balloons flew in the parade without incident. The maximum wind speed was approximately 22.1 miles per hour. All the balloons were flown safely and no significant incident was reported. Chief Bridge Officer Henry D. Perahia, Deputy Chief Engineer Anil Vyas, Director of Engineering Review Udaya Dommaraju, Construction Project Manager George Jarvis, Assistant Civil Engineers Jana Krettova and Jafar Haider, and three consultant engineers were positioned at various locations along the parade route to observe compliance with the approved procedures. Seven anemometers were mounted on top of light poles along the route between 77th Street and 34th Street to measure the wind speed during the parade. Division and consultant engineers were assigned to the anemometer locations to monitor the wind gusts.



Testing the Balloons (Finn and Jake – Adventure Time, Snoopy and Woodstock, Toothless – How to Train Your Dragon, and SpongeBob SquarePants) in New Jersey on November 9. (Credit: George Jarvis)



Parade 2013: Director of Engineering Review Uday Dommaraju, Deputy Chief Engineer Anil Vyas, Assistant Civil Engineer Jana Krettova, Construction Project Manager George Jarvis, and Consultant Engineers Erik Zuker and Juan Garcia. Typical Weather Station Fixed to the Top of a Light Pole.



Snoopy and Woodstock. SpongeBob SquarePants. Toothless – How to Train Your Dragon. Oz Hot Air Balloon. Finn and Jake – Adventure Time.

Manhattan Bridge

Contract #14, which included the rewrapping of the main cables and the replacement of the suspenders, was substantially completed on November 27, 2013.

Belt Parkway Bridge over Gerritsen Inlet (Brooklyn)

Driving of piles for the west and east abutments and for the cofferdam at Pier #2 was completed in November 2013.



Gerritsen Bridge Facing North (Eastbound) - Driving Piles at Pier #2.

DECEMBER

Traffic Enforcement Agent Kalyanarat Ranasinghe Tribute

The American flags on the Brooklyn Bridge were lowered to half-mast by Division painters on December 2, 2013, in tribute to NYPD Traffic Enforcement Agent Kalyanarat Ranasinghe, who was struck and killed by a vehicle while on-duty in Midtown Manhattan on November 30, 2013. Mr. Kalyanarat, 71 years-old, served as member of the Department for more than six years. He immigrated to the United States in 2001, and became a Traffic Enforcement Agent in 2006. Within 18 months of his appointment, he was promoted to Traffic Enforcement Agent Level II.



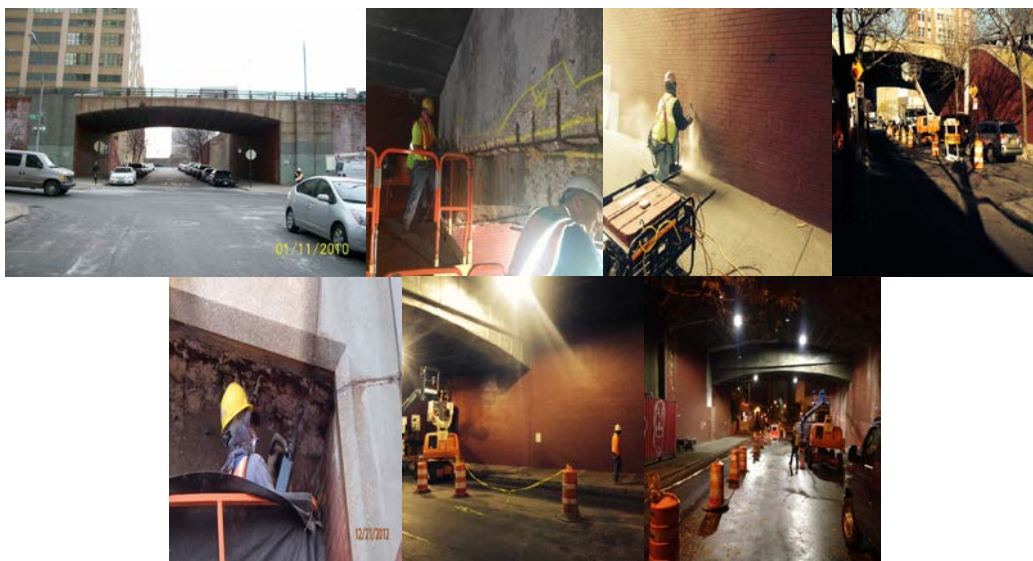
Traffic Enforcement Agent
Kalyanarat Ranasinghe.

Brooklyn-Queens Expressway over Adams Street (Northbound and Southbound) (Brooklyn)

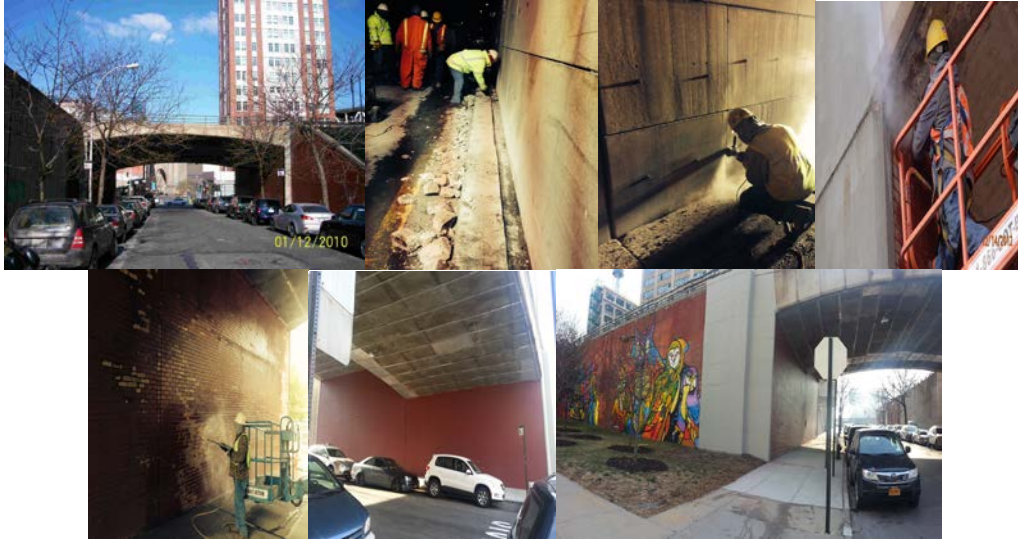
The northbound bridge is a one-span reinforced concrete arch structure, and carries three southbound travel lanes. There is a safety walk on each side of the bridge. The scope of rehabilitation work included the following: clean and seal cracks in asphalt overlay on top of bridge and approaches; remove unsound concrete and repair the underdeck concrete deteriorated areas; clean and seal cracks in brick finish at both abutments; clean the brick finish at abutments and wingwalls and apply an anti-graffiti protective coating; clean scupper; and restore the bridge expansion joint system between NB and SB structures.

The southbound bridge is a one-span reinforced concrete arch structure, and carries three northbound travel lanes. There is a safety walk on each side of the bridge. The scope of rehabilitation work included the following: clean and seal cracks in asphalt overlay on top of bridge and approaches; remove unsound concrete and repair the underdeck concrete deteriorated areas; clean and seal cracks in brick finish at both abutments; clean the brick finish at abutments and wingwalls and apply an anti-graffiti protective coating; clean scuppers; and remove deteriorated lamppost and install a new one.

The component rehabilitation of these bridges was substantially completed on December 3, 2013.



BQE over Adams Street Bridge (Northbound). (Credit: NYSDOT) Repairing Curtain Wall, Abutment, Lighting, and Under Deck. Bridge After Repair.



BQE over Adams Street Bridge (Northbound). (Credit: NYSDOT) Repairing Water Leakage, Tile Joint, Under Deck, and Masonry. Bridge After Repair.

South African President Nelson Rolihlahla Mandela Tribute

The American flags on the Brooklyn Bridge that had been lowered to half-mast in tribute to NYPD Traffic Enforcement Officer Kalyanarat Ranasinghe remained at half-mast in tribute to former South African President and global icon for human rights Nelson Mandela, 95, who died on December 5.

Mr. Mandela joined the African National Congress in 1944 when he helped to form the ANC Youth League. He was sentenced to life imprisonment on June 11, 1964 and was not released until February 11, 1990, nine days after the unbanning of the ANC and the Programme of Action and nearly four months after the release of his remaining comrades. Throughout his imprisonment he had rejected at least three conditional offers of release. Mr. Mandela immersed himself in official talks to end white minority rule and in 1991 was elected ANC President. In 1993 he and President FW de Klerk jointly won the Nobel Peace Prize and in April 1994 he voted for the first time in his life. On 10 May 1994 he was inaugurated South Africa's first democratically elected President. True to his promise President Mandela stepped down in 1999 after one term as President.



South African President Nelson Mandela.

National Pearl Harbor Remembrance Day

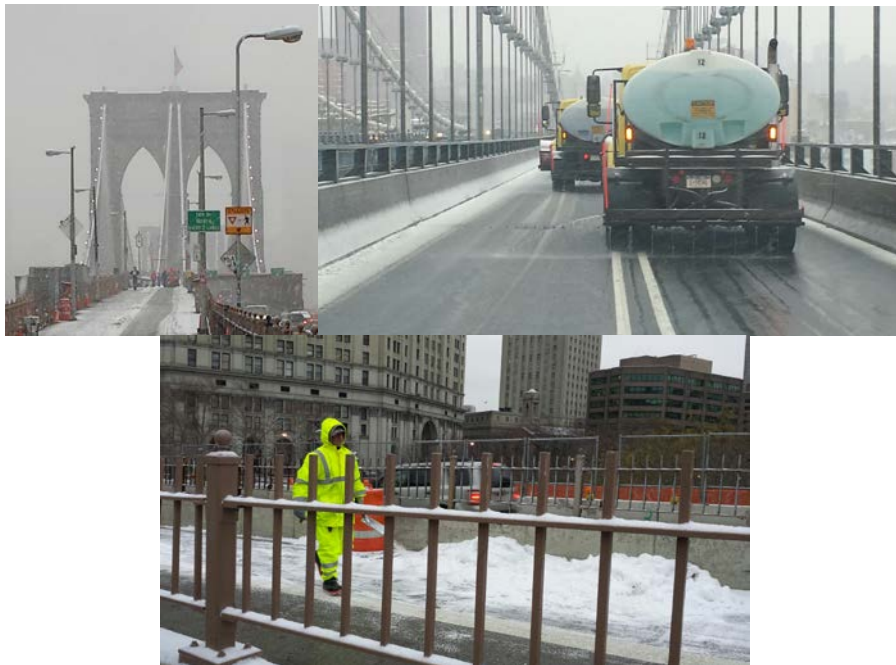
The Brooklyn Bridge flags remained at half-mast on December 7, 2013 to commemorate National Pearl Harbor Remembrance Day, in honor of those who died as a result of their service at Pearl Harbor and to pay special tribute to veterans of World War II. The flags were raised on December 10, 2013.

Anti-Icing

On December 10, 2013, a record 1.5 inches of snow fell in Central Park, 1.1 inches at La Guardia Airport, and 2.1 inches at JFK Airport. On December 14, 2013, 5 inches of snow fell in Central

CHRONOLOGY

Park, 4.7 inches at La Guardia Airport, and 3.2 inches at JFK Airport. Anti-icing crews were deployed on the East River bridges from December 8 at 4:00 PM until 5:00 AM on December 9; 3,300 gallons of liquid anti-icer and 5 tons of solid de-icer were applied. From 5:00 AM until 3:30 PM on December 10, crews applied a total of 900 gallons of liquid anti-icer. Crews were again deployed from 6:00 AM on December 14 until 1:00 AM on December 15 and applied 10,750 gallons of liquid anti-icer and 36 tons of solid de-icer.



Plowing the Bicycle Path on the Brooklyn Bridge. Applying Anti-Icing Chemicals on the Manhattan Bridge. Cement Mason Victor Porowski Spreading Sodium Acetate on the Walkway of the Brooklyn Bridge. (Credit: Paul Schwartz)

ACCOMPLISHMENTS & PLANNED PROJECTS

Bridge Capital Design & Construction

East River Bridges

Movable Bridges

Roadway Bridges

Brooklyn and Manhattan Roadway Bridges

Bronx, Queens, and Staten Island Roadway Bridges

Design-Build/Emergency Contracts

Component Rehabilitation

Engineering Review & Support

In-House Design

Engineering Support

Engineering Review

Quality Assurance

Bridge Maintenance, Inspections & Operations

ACCOMPLISHMENTS & PLANNED PROJECTS

East River Bridges

BROOKLYN BRIDGE

Arguably the most influential bridge in American history, the Brooklyn Bridge remains one of New York City's most celebrated architectural wonders. Designed by the brilliant engineer John Augustus Roebling, and completed by his equally ingenious son Washington Roebling and daughter-in-law Emily Roebling, this elegant structure was, at the time of its completion in 1883, the longest suspension bridge in the world. It was declared a National Historic Landmark in 1967.



Brooklyn Bridge. (Credit: Bojidar Yanev and Earlene Powell)

The Brooklyn Bridge carries some 100,288 vehicles and 2,661 commuter bicyclists daily. The \$936 million reconstruction commenced in 1980 with Contract #1, and continues with Contract #6, scheduled for completion in 2015. This contract includes the rehabilitation of both approaches and ramps, the painting of the entire bridge, as well as the seismic retrofitting of the structural elements that are within the Contract #6 project limits.

Work completed on the bridge to date includes reconditioning of the main cables, replacement of the suspenders and cable stays, rehabilitation of the stiffening trusses, and the replacement of the suspended spans deck and the four travelers.

Contract #6

A Notice to Proceed for this \$508 million project was issued to the contractor with a start date of January 19, 2010. The ramps and approaches to the Brooklyn Bridge are in need of rehabilitation and repair, to improve safety and reduce congestion along both the Brooklyn-side and Manhattan-side approaches, particularly from the FDR Drive. With stimulus money from the federal government's American Recovery and Reinvestment Act, the ramps in Brooklyn and Manhattan will be rehabilitated and widened and the entire bridge will be repainted to prevent steel corrosion on the structure.

The approach roadway to the Brooklyn Bridge is aging, with a failed membrane system and deteriorated closure walls. The existing roadway pavement above the historic arch blocks and masonry structures will be rehabilitated. A precast concrete roadway slab will be installed in segments, over sprayed-on waterproofing membrane. Rusted historic railings at Franklin Square, York, and Main Street structures, some from the original bridge construction, will be refurbished and reinstalled. The existing ramp from the FDR southbound roadway will be widened from one to two lanes to reduce bottlenecks and pinch points in traffic flow. All steel structures, including the ramp structures and the main span, will be painted, restoring them to their original Brooklyn Bridge Tan color, as chosen by the Landmarks Preservation Commission.

On all the bridge approach structures on both the Manhattan and Brooklyn sides, the existing deck will be removed by lifting out sections and replacing them panel by panel with precast concrete-filled steel grid deck panels. This approach will greatly reduce noise from drilling and jackhammers, and will also increase the reliability of the start and end times of construction activities every night.

ACCOMPLISHMENTS & PLANNED PROJECTS



Painting work, to prevent steel corrosion and improve aesthetics, will occur in negative-pressure containment units that travel along the bridge structure, high above the traffic. All three travel lanes will be maintained during the course of this work, and painting will take approximately two years. Equipment will be placed underneath the FDR Drive, and on land abutting the Brooklyn tower. Dust collection, vacuum and recycle units will be employed to minimize environmental air quality risks, and there will be continuous air monitoring during operations. All painting work will be conducted in accordance to the US Environmental Protection Act and NYS Department of Environmental Conservation requirements. Noise generated by these units will conform to the NYC Noise Code standards adopted in 2007.

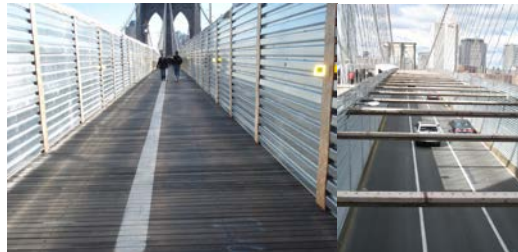
In order to facilitate the reconstruction and associated painting work, the contractor began to mobilize in the area known as the Brooklyn Banks and Red Brick Park, between Pearl Street and Park Row on the north side of the Manhattan approach of the Brooklyn Bridge. The area was closed to the public starting June 2, 2010. The security plan for this area requires that the Red Brick area be completely closed to the public for the duration of this phase of work. Pedestrian access between Pearl Street and the Rose Street/City Hall area is maintained through a walkway adjacent to the banks along Avenue of the Finest.

On the Brooklyn side, two lanes of free-flowing traffic will be created at the Cadman Plaza exit, and approach roadways will be rehabilitated to replace the membrane system and deteriorated closure walls. On the Manhattan side, rusted railings and safety barriers will be replaced, and two lanes of free-flowing traffic will be created from the southbound FDR Drive onto the Brooklyn Bridge.

The contract allows for 24 full weekend closures over the duration of the contract; however, the contract also contains clauses that encourage fewer weekend closures with monetary compensation. Although the promenade will be open, there will be sections immediately under the painting area, which will be narrowed by a foot on each side to facilitate work.

ACCOMPLISHMENTS & PLANNED PROJECTS

In 2010, after mobilization, the contractor started work on the ramp foundation; installed protective shielding under the Brooklyn main and Brooklyn side spans, the Franklin Square structure, and some of the Manhattan ramps; installed vertical walls at both sides of the Brooklyn and Manhattan-bound roadways at the Brooklyn main and Brooklyn side spans; began the set-up of the containment for the lead paint removal at all of these locations; and proceeded with blasting and painting activities. Other activities included detailed surveying, installation of super slabs and the fabrication of precast members.



Bicycle/Pedestrian Path with Protective Shielding in November 2010. Roadway Shielding in October 2010.

Lead paint removal operations are conducted in a Class 1A containment unit. Rigid containment walls, HEPA filters, and negative air pressure are used to prevent material release. Ambient air quality readings are conducted during lead paint abatement work. Airborne lead levels are continuously monitored using high-volume total suspended particulate samplers at multiple locations in Brooklyn and Manhattan. Additional in-depth testing for volatile organic compounds was conducted at five locations in the summer of 2011.

In March 2012, airborne particulate samples were collected in accordance with regulatory guidelines, at locations where dust is most likely to be deposited during dust-generating activities. Additional tests were replicated in June 2012 for respirable silica, suspended particulates and asbestos. All results were acceptable according to standards set by the Occupational Safety and Health Administration, the National Institute for Occupational Safety and Health, and the American Conference of Industrial Hygienists.



Noise Reduction Along the Sound Pathway – Acoustical Barriers on the Bridge During Night Construction Activities. Acoustical Curtains Along Frankfort Street. Two Crews Work Along Frankfort Street in April 2012. Cranes (On Left) Lift Material In And Out of Walled Enclosures of Sound Blankets. Inspector Taking Noise Measurements.

In 2011, painting was completed at the Franklin Square structure and is currently in progress at the Manhattan ramps and Brooklyn main and Brooklyn side spans with continuous installation of protective shielding and containment. Painting of the truss top struts was also started, and is currently in progress at the Brooklyn-bound Manhattan side span. The following construction work was started in 2011 and is currently in progress: on the Manhattan approach, activities include Brooklyn-bound roadway removal, waterproofing and super slab installation, Franklin Square floor beam replacement, south cantilever beam excavation and repair, and arch block strengthening. On the Manhattan ramps, work includes bearing replacement, widening, and deck replacement, and fascia removal. Asbestos abatement work is taking place in the Brooklyn maintenance shop. Electrical work is also in progress with activities that include light pole and abandoned equipment removal, temporary lightning installation, and temporary power provisions.

ACCOMPLISHMENTS & PLANNED PROJECTS

Other activities include detailed surveying, testing and repairing of dry-standpipe system, fabrication of precast and steel members.



December 2011: Painted Top Struts of the Brooklyn-Bound Manhattan Side Span.
Summer 2011: Manhattan Approach - Ramp C Deck Replacement.
December 2011: Ramp C.

In 2012, work continued on the Manhattan side of the bridge, including deck replacement on ramps and the south cantilever, super-slab installation and arch block strengthening. Painting under the Brooklyn main and side spans was completed, as well as the top struts along the Brooklyn-bound roadway. Painting of the Manhattan main and side spans started in 2012 and will continue through 2013.

In Brooklyn, new shielding was installed under the Prospect and Washington Street structure in anticipation of deck removal. In addition, preparatory work is ongoing for superstructure replacement of the York and Main Street structures.

As part of the contract to rehabilitate the Brooklyn Bridge ramps and approaches, a full closure of the Manhattan-bound lanes of the bridge was performed on two full weekends: from 11:59 PM October 5 to 6:00 AM October 8, and again from 11:59 PM October 12 to 6:00 AM October 15. The first weekend closure was for work on Ramp A (from the southbound FDR Drive to the bridge) for concrete placement. Brooklyn-bound approach work and abrasive blasting was also progressed. The second weekend closure was for work on Ramp A (from the southbound FDR Drive to the bridge), South Cantilever closure pour concrete placement, Brooklyn-bound approaches rehabilitation work, painting of Ramp D/Span 4, Franklin Square Structure orthotropic deck welding, Ramp F (from the southbound FDR Drive to Pearl Street) Stage I grid deck removal/replacement, and preparatory work for widening the exit ramp to Cadman Plaza.

Asbestos abatement was completed in the Brooklyn maintenance shop and was in progress in the Manhattan arch blocks. By the end of 2012, 321 bearings were replaced under the Manhattan ramps and the flag repairs on the suspended spans were in progress.



April 2012: Overview. (Credit: Maria Mikolajczyk) Manhattan Approach Existing Deck Demolition. June 2012: Brooklyn Side Span Netting Protection for Main Cable and Suspender Rope Painting. June 2012: Structural Steel Repairs. June 2012: Duct Hose Platform Over Esplanade. July 2012: Painting Brooklyn-Bound Top Struts. August 2012: Manhattan Main Span Vertical Wall. August 2012: Manhattan Side Span Containment at Manhattan Tower.

ACCOMPLISHMENTS & PLANNED PROJECTS



First Full Roadway Closure: Ramp A Concrete Placement. Second Full Roadway Closure: Brooklyn Approach. December 2012: Brooklyn Main Span in Finish Coat.

In 2013, lead-based paint removal and new coating applications were completed on the Manhattan main and side spans including all four stiffening trusses, the under-deck system, and the promenade. The main bridge vertical protective shield systems were removed. Painting of the main cables, suspender cables and overhead struts continues and is approximately 60% complete. In addition to the Main Bridge painting, paint removal and coating application continues on the Manhattan side ramps and is also approximately 70% complete.



May 2013: Painter Applying Primer Stripe Coat on the Manhattan Main Span. June 2013: Painter on Sway Bracing on the Brooklyn Side Span. (View Credit: Earlene Powell)



November 2013: Painting Fascia Steel on Ramp C.

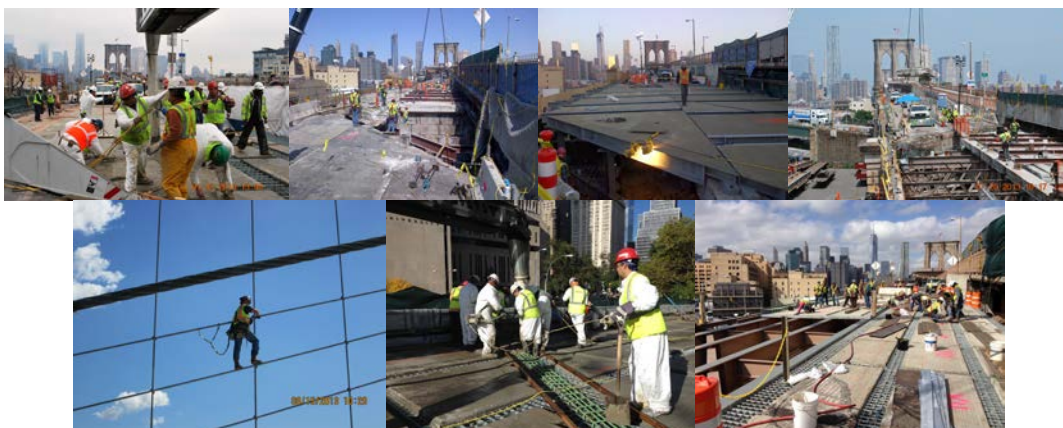
2013 saw significant progress for structural rehabilitation work, which included: completion of the Brooklyn-bound orthotropic deck panel installation at the Franklin Square Structure; the installation of the new concrete-filled grid deck systems at the outbound York Street, Main Street and Park Row structures as well as Prospect Street, Washington Street and the maintenance shop deck systems for both inbound and outbound directions. Concrete-filled grid deck installation for the inbound York Street, Main Street, North Cantilever and Franklin Square structures is in progress. The approach super slab installation was completed in the outbound direction and was about 20% complete inbound. The main bridge structural steel flag repairs continue to be identified by biennial and special inspections.

In 2013 three significant traffic improvements were implemented that changed exits from one-lane exit to two-lane exits, thereby reducing queuing-related congestion. In May 2013, key access ramps to and from the Brooklyn Bridge and the FDR Drive were expanded. Each of the two enhanced ramps now accommodates two traffic lanes and simplifies traffic patterns, easing notorious traffic bottlenecks for many of the 120,000 vehicles that cross the bridge daily as the bridge rehabilitation continues. The first ramp, connecting the exit from the bridge's Manhattan-

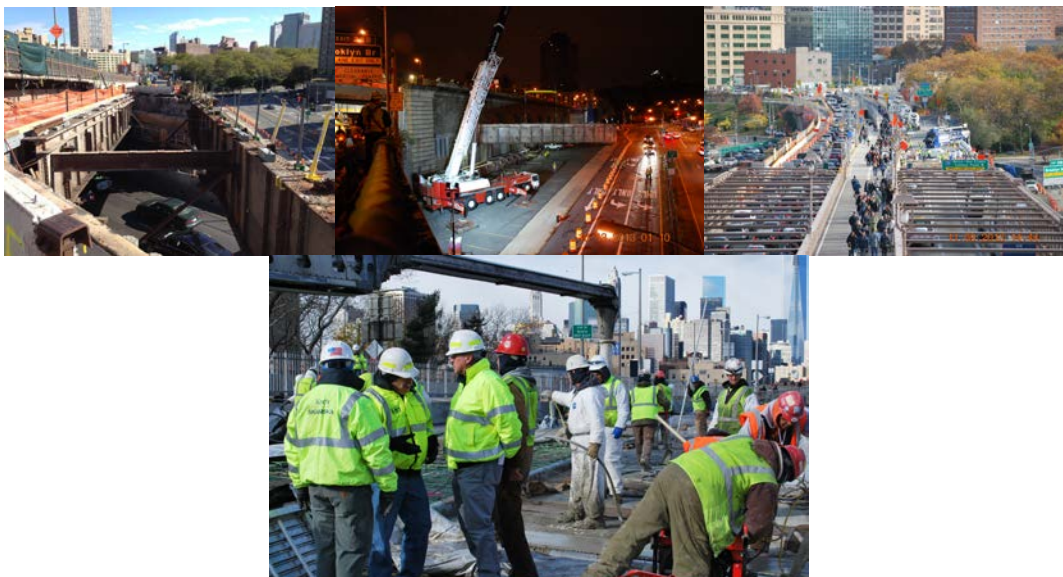
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bound lanes with the FDR Drive, was expanded from one to two lanes, easing backups that often extend across the bridge. The second ramp, connecting the southbound FDR Drive with the approach to the bridge's Brooklyn-bound lanes, was also expanded from one to two lanes, easing congestion and reducing the impact of cars that aggressively cut into the queue of cars at the entrance to the ramp. The work on a third ramp, connecting the bridge's Brooklyn-bound lanes to Cadman Plaza West and Old Fulton Street in Brooklyn Heights, which was also expanded to two travel lanes, was completed in September 2013.

Noise monitoring and mitigation efforts continue for all night-time project operations with ongoing community and sensitive receptor coordination.



January 2013: Concrete Placement on Eastbound Prospect Street Structure. April 2014: Removal of Existing Deck and Installation of Temporary Deck Units at the York Street Structure Over Brooklyn-Queens Expressway. July 2013: Removal of the Existing Concrete Slab on the Eastbound Main Street Structure. August 2013: Ironworker Replacing Cable Clamp Assemblies on the Suspended Span. October 2013: Concrete Placement and Grid Deck Panel Installation at the Eastbound Park Row Structure.

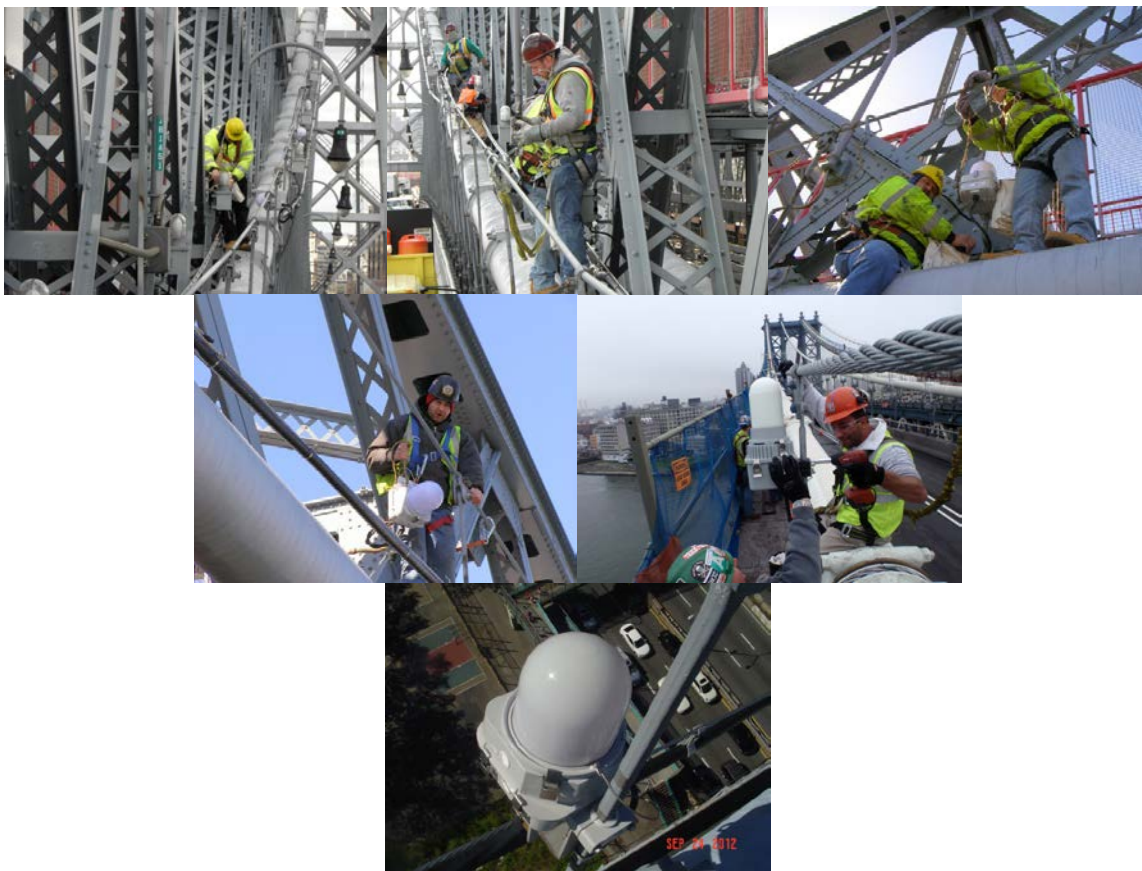


October 2013: Eastbound Brooklyn-Queens Expressway Traffic Flowing Under the Exposed Steel of the Eastbound York Street Structure. Removing the Fascia Steel From the Eastbound York Street Structure. November 2013: Concrete Placement at the Eastbound York Street Structure. Chief Bridge Officer Henry D. Perahia (2nd From Left) Observing the Concrete Placement at the Westbound Washington and Prospect Street Structures.

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NECKLACE LIGHTS

In the fall of 2008, to compare options for energy efficiency, we replaced 20 100-watt mercury vapor lamps of the necklace lights on the Brooklyn and Manhattan Bridges with 10 LED fixtures and 10 induction fixtures. The test was completed in spring 2009; we chose an LED fixture in a dish style and will obtain them for the Ed Koch Queensboro, Williamsburg and Brooklyn Bridges. The test fixtures were removed on April 24, 2009. The replacement of the existing mercury vapor lights on the Williamsburg Bridge was completed in summer 2012. The replacement of those on the Ed Koch Queensboro and the Manhattan Bridges was completed in June 2013. The replacement of the Brooklyn Bridge necklace lights will not be scheduled until the completion of Contract #6. Approximately 80% of the old fixtures from the Ed Koch Queensboro and Williamsburg Bridges have been sold at auction.



Installing New LED Necklace Lights on the Williamsburg Bridge in April 2012: Electrician Thomas Cipriano, Supervisor Bridge Repairer and Riveter Gean Pilipiak (in Front). (Credit: Thomas Whitehouse) May 2012: Electricians Thomas Cipriano and Ropert Stackpole on the Williamsburg Bridge. Bridge Repairer and Riveter Neil Dalton. (Credit: Hany Soliman). Installing New LED Necklace Lights Along D Cable on the Manhattan Bridge in May 2012. New LED Necklace Light on Cable D of Williamsburg Bridge. (Credit: NYSDOT)

MANHATTAN BRIDGE

The youngest of the three NYCDOT suspension bridges that traverse the East River, the Manhattan Bridge carries some 484,087 commuters – 89,087 vehicles, 5,000 bicyclists, and 390,000 mass transit riders - between Manhattan and Brooklyn daily. The bridge's total length is 5,780 feet long abutment to abutment at the lower level, and 6,090 feet on the upper roadways portal to portal; its main span length is 1,470 feet and each of its four cables is 3,224 feet. It was designed by Leon Moisseiff and first opened in 1909. The bridge supports seven lanes of vehicular traffic, a bikeway and walkway, as well as four transit tracks upon which four different train lines operate.

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Manhattan Bridge in July 2009 and June 2012. (Credit: Bernard Ente and NYSDOT) Arch and Part of the Colonnades in March 2011. (Credit: Bojidar Yanev)

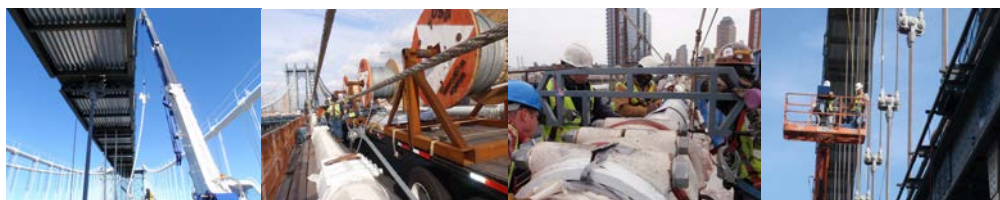
The \$963.9 million reconstruction program commenced in 1982 with Contract #1, and continues with Contract #14 (substantially completed in November 2013) to rewrap the cables and replace the suspenders and 166 necklace lights. Work completed on the bridge to date includes reconstruction of the south and north upper roadways, re-anchoring the north interior main cable, reconstruction of the north and south subway lines, installation of a truss stiffening system to reduce twisting, restoration of the Manhattan Plaza, including the historic arch and colonnades, reconstruction of the south walkway, installation of a new north bikeway, replacement of the lower roadway, and rehabilitation of the Brooklyn Plaza.

Contract #14

Most of the existing suspenders on the Manhattan Bridge were installed under a \$2.2 million contract with Roebling and Sons in 1956 and was one of their last before closing their Bridge Division in 1964. Under Contract #14, the existing main cables were rehabilitated with new wire wrapping and a neoprene barrier to insulate from weather. In addition, all vertical suspenders were replaced. A Notice to Proceed for this \$149 million construction project was issued to the contractor with a start date of December 28, 2009.

Major activities undertaken during 2010 included the modifications to the approach span subway stringers (to repair flagged cracks), microsurfacing of the North upper roadway, truss vertical rehabilitation, beginning of the main cable rewrapping, suspender replacement, and continuity plate replacement.

Major activities completed during 2011 included the replacement of all suspenders along two of the four cables, replacement of the wire wrapping with new wire and neoprene wrapping along two of the four cables, and replacement of the cable band bolts along two of the cables.



March 2011: Removal of Existing Suspender, 'C' Truss. April 2011: Installation of New Hand Ropes for 'C' Cable. April 2011: Checking Bolt Tension in New Cable Band Bolts. August 2011: Checking Suspender Loads With an Accelerometer.

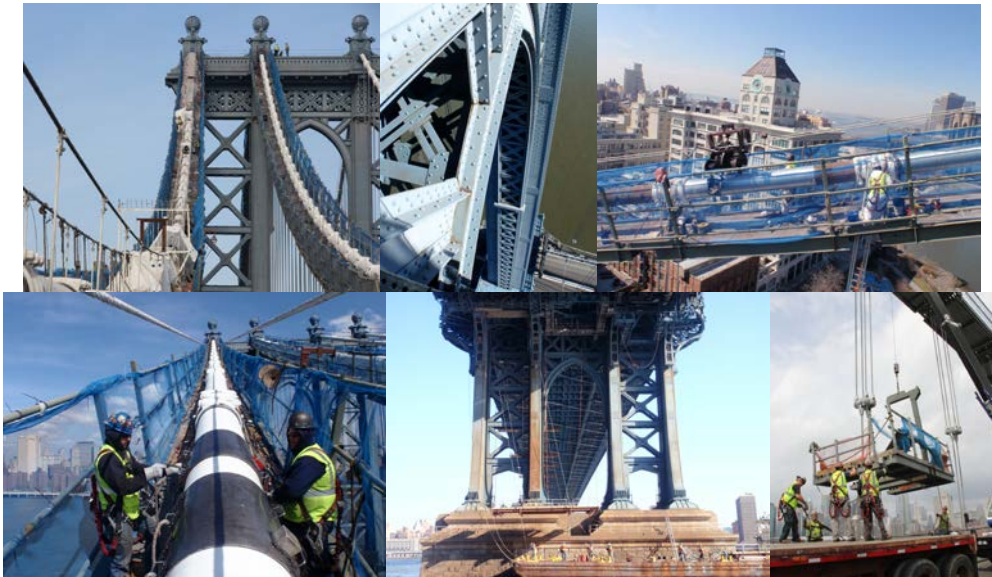
Major activities completed during 2012 included the replacement of suspenders on three cables, replacement of wire wrapping with new wires and neoprene wrapping on three cables, replacement of cable band bolts on all four cables and replacement of the necklace lights on the north exterior cable. Also completed was the bearing replacement for the north trusses at the towers during a weekend train outage.

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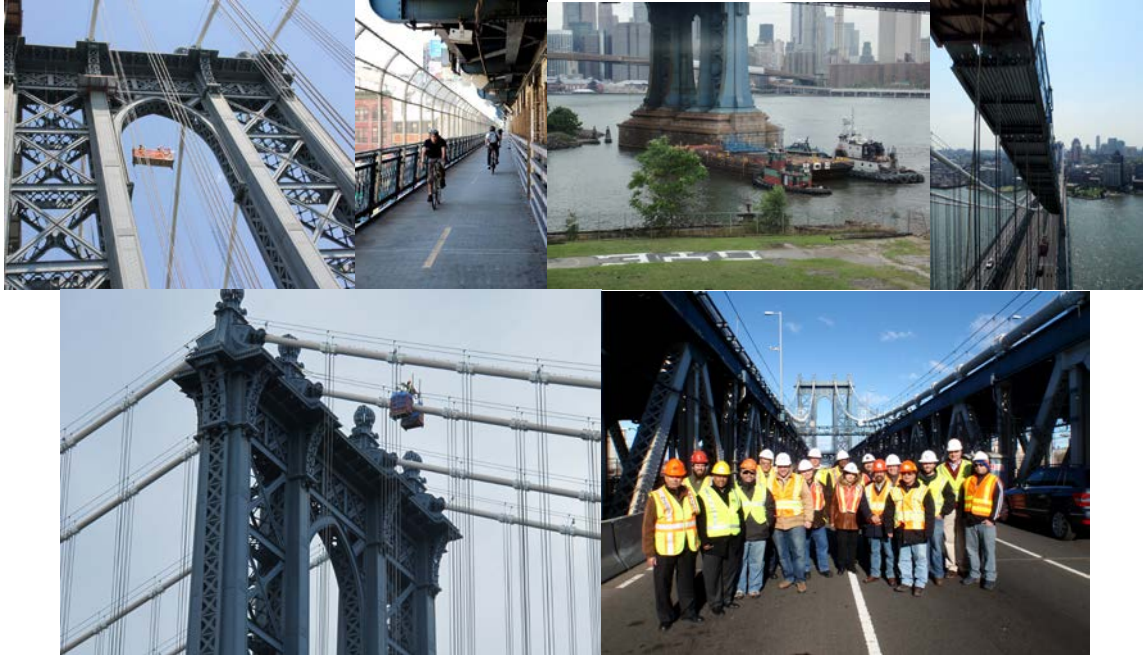
June 2012: Measuring New Cable Band Bolts. September 2012: Main Cable Work Platforms. New Suspenders Along Truss B. September 2012: Jacking Struts and Work Platforms. November 2012: Sidewalk Protection Sheds. April and September 2012: Manhattan Bridge Suspender Replacement. (Credit: Bojidar Yanev)

On-going activities completed during 2013 included the replacement of suspenders, wire wrapping and neoprene wrapping, installation of maintenance platforms at the towers, bearing replacement for the south trusses at the towers during a weekend train outage, and replacement of light poles and conduit on the south upper roadway. Contract #14, which included the rewrapping of the cables and the replacement of the suspenders, was substantially completed on November 27, 2013.



January 2013: Removal of Caulking and Existing Wrapping Wires. March 2013: Bridge Detail. April 2013: Ironworkers Relocating the Main Cable Wrapping Machine, And Installing Elastomeric Cable Wrapping. Ironworkers Preparing to Hoist Temporary Platform. May 2013: Removal of TA Platforms.

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June 2013: Ironworkers Descending in a Spider After Temporary Platform Installation. Bicycle Path. August 2013: Delivering the Inspection Platform Brooklyn Side Span Via Barge. August 2013: Main Cable Platforms Along the South Cable. Inspecting the Suspenders in October 2013. (Credit: Bojidar Yanev) Project Inspection on November 11, 2013: Civil Engineer Javed Sarwar, Dustin Doroshuk, Civil Engineer Shaikh Islam, Associate Project Manager Vadim Sokolovsky, Civil Engineer Adam Caplan, Sam Summerville, Miron Kuchuk, Greg Zenk, Civil Engineer Antoine Aubourg, Lyudmila Bord, Sammy Miraglia, Joseph Mondillo, James Tarpey, King Fong, Louis Perry, Manhattan Bridge Engineer-in-Charge Brian Gill, and Peter Deligiannis.



Brooklyn and Manhattan Bridges in July 2013. (Credit: Alexander Engel)

ACCOMPLISHMENTS & PLANNED PROJECTS

Movable Bridges

As NYCDOT completes reconstruction work on the East River Bridges, more attention is being devoted to other key City-owned bridges, such as the movable bridges. Building on the success of the East River Bridge projects, the Department is implementing many of the innovative concepts originated during the rehabilitation of East River Bridges on these other major reconstruction projects.

BATTERY PARK UNDERPASS AND WEST STREET UNDERPASS (MANHATTAN) – EMERGENCY CONTRACT

The Battery Park Underpass is a two-span rigid frame reinforced concrete tunnel structure connecting eastbound and westbound traffic between the FDR Drive and West Street (Route 9A) at the southern end of Manhattan. The West Street Underpass is a one-span rigid frame reinforced concrete tunnel structure connecting southbound traffic from West Street heading toward the entrance to the Brooklyn Battery Tunnel (Hugh L. Carey Tunnel).

On October 29, 2012, the New York Metropolitan area was impacted by Hurricane Sandy, causing flooding, loss of power and damage to many components of New York City's infrastructure. On October 30, 2012, a site inspection by the Department revealed major damage to both tunnels. Specifically, certain electrical, mechanical and structural issues with regard to the tunnels must be addressed.

Salt water penetrated the electrical and mechanical equipment in both tunnels, including but not limited to, motors, lighting and pumps. It is therefore, necessary to solicit the services of a specialty contractor to perform all necessary repairs.

Due to the potentially serious danger to life and public safety posed by the current condition, it is critical that the repair work be performed as expeditiously as possible.

On November 7, 2012, in the interest of public safety, pursuant to Section 103(4) of the General Municipal Law and Section 315 of the New York City Charter, the Department declared that an emergency exists relative to the Battery Park Underpass and West Street Underpass on Route 9A in Manhattan.

A temporary repair of the Battery Park Underpass ventilation system which allowed normal traffic flow as opposed to single-lane traffic is began in April 2013. A permanent repair of the systems in the underpass is expected to begin in Spring 2014 and to be complete in Summer 2016.

A Letter of Intent for the emergency repairs of these underpasses is expected to be issued in Fall 2014.

A project to mitigate future flooding at both underpasses by adding protection measures for the repaired systems in the underpasses will be undertaken in a separate contract.

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Battery Park Underpass - View Looking West at the South Portal Entrance Near the FDR Drive. View Looking South at the North Portal Entrance Near West Street. Both Tunnels Were Flooded to Their Roofs, Which Means That all Tunnel Ventilation, Electrical, and Mechanical Systems Were Entirely Submerged in Saltwater.

METROPOLITAN AVENUE BRIDGE OVER ENGLISH KILLS (BROOKLYN), GRAND STREET BRIDGE OVER NEWTOWN CREEK (BROOKLYN/QUEENS), GREENPOINT AVENUE BRIDGE OVER NEWTOWN CREEK (A.K.A. J. J. BYRNE MEMORIAL BRIDGE (BROOKLYN/QUEENS), PULASKI BRIDGE OVER NEWTOWN CREEK (BROOKLYN/QUEENS), BORDEN AVENUE BRIDGE OVER DUTCH KILLS (QUEENS), HUNTERS POINT AVENUE BRIDGE OVER DUTCH KILLS (QUEENS), UNION STREET BRIDGE OVER GOWANUS CANAL (BROOKLYN), CARROLL STREET BRIDGE OVER GOWANUS CANAL (BROOKLYN), THIRD STREET BRIDGE OVER GOWANUS CANAL (BROOKLYN), NINTH STREET BRIDGE OVER GOWANUS CANAL (BROOKLYN), THIRD AVENUE BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN), MADISON AVENUE BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN), 145TH STREET BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN), MACOMBS DAM BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN), AND WEST 207TH STREET/WEST FORDHAM ROAD BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN) (A.K.A. UNIVERSITY HEIGHTS BRIDGE) – EMERGENCY CONTRACT

On October 29, 2012, the New York Metropolitan area was impacted by Hurricane Sandy, causing flooding, loss of power and damage to many components of New York City's infrastructure. On October 30, 2012, a site inspection by the Department revealed major damage to the operational portions of these bridges. Specifically, certain electrical and mechanical issues parts must be repaired or replaced immediately.

Salt water penetrated the electrical and mechanical equipment in the bridges, including but not limited to, motors, electric relays, lock control devices, gates, pier lights, and pumps. It is therefore, necessary to solicit the services of a specialty contractor to perform all necessary repairs.

The Metropolitan Avenue Bridge over the English Kills is located between Queens and Brooklyn and is a double-leaf trunnion bascule that carries four lanes of vehicular traffic and two sidewalks. The bridge was subject to heavy flooding.

The Grand Street Bridge over the Newtown Creek is located between Queens and Brooklyn and is a rim-bearing swing bridge that carries two lanes of vehicular traffic and two sidewalks. The bridge was subject to extreme surge tide.

The Greenpoint Avenue Bridge over Newtown Creek is located in Queens and is a double-leaf trunnion bascule that carries four lanes of vehicular traffic and two sidewalks. The bridge was subject to an extreme surge tide and minor repairs are necessary. The navigation lights on the fender system were flooded.

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The Pulaski Bridge over Newtown Creek is located in Queens and is a double leaf trunnion bascule that carries four lanes of vehicular traffic and two sidewalks. The bridge was subject to heavy winds. Minor repairs are required to the warning gate arms damaged during storm.

The Borden Avenue Bridge over Newtown Creek is located in Queens and is a single-leaf retractile span that carries two lanes of vehicular traffic and two sidewalks. The bridge and its mechanical and electrical systems were subject to heavy flooding.

The Hunters Point Avenue Bridge over the Dutch Kills is located in Queens and is a single-leaf rolling bascule bridge that carries two lanes of vehicular traffic and two sidewalks. The bridge was subject to heavy flooding as well as high winds. The warning gate arm was damaged due to high winds.

The Union Street Bridge over the Gowanus Canal is located in Brooklyn and is a double leaf rolling bascule that carries two lanes of vehicular traffic and two sidewalks. The bridge was subject to heavy flooding.

The Carroll Street Bridge over the Gowanus Canal is located in Brooklyn and is a single-leaf retractile span that carries one lane of vehicular traffic and two sidewalks. The bridge and its mechanical and electrical systems were subject to heavy flooding which resulted in extensive damage.

The Third Street Bridge over the Gowanus Canal is located in Brooklyn and is a double-leaf rolling bascule that carries two lanes of vehicular traffic along with two sidewalks. The bridge and its mechanical and electrical systems were subject to heavy flooding.

The Ninth Street Bridge over Gowanus Canal is located in Brooklyn and is a tower-drive vertical lift bridge that carries four lanes of vehicular traffic and two sidewalks. The bridge and portions of its mechanical and electrical systems were subject to minor flooding.

The Third Avenue Bridge over the Harlem River bridge is located between Manhattan and the Bronx and is a center-bearing swing bridge that carries four lanes of vehicular traffic and two sidewalks. The bridge was subject to flooding of the land on either side of bridge as well as the center pivot fender system.

The Madison Avenue Bridge over the Harlem River is located between Manhattan and the Bronx and is a rim-bearing swing bridge that carries four lanes of vehicular traffic and two sidewalks. The bridge was subject to flooding of the land on either side of bridge as well as the center pivot fender system.

The 145th Street Bridge over the Harlem River is located between Manhattan and the Bronx and is a rim-bearing swing bridge that carries four lanes of vehicular traffic and two sidewalks. The bridge center pivot pier was subject to an excessive high tide.

The Macombs Dam Bridge over the Harlem River is located between Manhattan and the Bronx and is a rim bearing swing bridge that carries four lanes of vehicular traffic and two sidewalks. The bridge was subject to an extreme surge tide, and the center pivot pier and fender were flooded.

The West 207th Street (University Heights) Bridge over the Harlem River is located between Manhattan and the Bronx and is a rim-bearing swing bridge that carries four lanes of vehicular traffic and two sidewalks. The bridge was subject to an extreme surge tide and the center pivot pier was subject to flooding. The traffic signal assembly was subject to high winds and was damaged.

Common to all the bridges will be the need for the maintenance and protection of traffic. This shall primarily consist of daily temporary lane or shoulder closures to allow contractor access to the bridge for material delivery and equipment usage. For the structures that have extensive damage to the electrical system, full roadway closures will be performed to allow the operating systems to be tested. This will be done at night and occurs over a period of evenings.

Also common to all the bridges will be the local removal of hazardous or asbestos containing

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materials. Areas where suspect materials that may contain lead, PCB and/or asbestos have been identified based on visual inspection. Testing will be performed as part of the contract prior to the start of work to confirm their presence. This will include PCB caulking, lead paint and/or asbestos containing material in various components. If testing proves their presence exists, abatement will be done before repairs occur to the mechanical and electrical systems.

These bridges provide a necessary service in compliance with federal law which requires that the bridges be operational for marine traffic. It is critical that the repair work be performed as expeditiously as possible.

On November 20, 2012, in the interest of public safety, pursuant to Section 103(4) of the General Municipal Law and Section 315 of the New York City Charter, the Department declared that an emergency exists relative to these 15 movable bridges in the Bronx, Brooklyn, Manhattan, and Queens.

As of May 28, 2013, all Hurricane Sandy-related damages on the Pulaski Bridge and Greenpoint Avenue Bridge were repaired by the in-house bridge maintenance group. As such, these two bridges will now be eliminated from the first group of bridges, leaving only the Metropolitan Bridge in this category.

A Letter of Intent for the emergency repairs of the Metropolitan Avenue Bridge over English Kills (Brooklyn) is expected to be issued in Summer 2014.

The second group of bridges consists of Macombs Dam Bridge over Harlem River (Bronx/Manhattan), 145th Street Bridge over Harlem River (Bronx/Manhattan), Third Avenue Bridge over Harlem River (Bronx/Manhattan), Madison Avenue Bridge over Harlem River (Bronx/Manhattan), Hunters Point Avenue Bridge over Dutch Kills (Queens), Carroll Street Bridge over Gowanus Canal (Brooklyn), Ninth Street Bridge over Gowanus Canal (Brooklyn), Third Street Bridge over Gowanus Canal (Brooklyn), and Union Street Bridge over Gowanus Canal (Brooklyn). A Letter of Intent for the emergency repairs of the second group of bridges is expected to be issued in September 2014.

The third group of bridges consists of West 207th Street/West Fordham Road Bridge over Harlem River (Bronx/Manhattan), Borden Avenue Bridge over Dutch Kills (Queens), and Grand Street Bridge over Newtown Creek (Brooklyn/Queens). A Letter of Intent for the emergency repairs of these bridges is also expected to be issued in September 2014.



East End of the West 207th Street Bridge - Missing Traffic Signal was Knocked Down by the Hurricane Winds. Borden Avenue Bridge Operator's House Basement Level - Depicted Flood Line was Approximately 5 Feet Above the Floor.

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Grand Street Bridge – Standing Water in the Access Light Fixture at the East Wedge Walkway. Madison Avenue Bridge - General View of Fender and Center Pier—the Red Line Depicts the Approximate Water Level.

BELT PARKWAY BRIDGE OVER MILL BASIN (BROOKLYN)

Opened on June 29, 1940, the Mill Basin Bridge is adjacent to the Jamaica Bay Wildlife Refuge and the Gateway National Recreation Area. It is the only movable bridge on the Belt Parkway. The current clearance over Mean High Water is 35-feet. When the Mill Basin Bridge was constructed during the first half of the 20th century, New York City's inland waterways were among the most heavily navigated thoroughfares in the country. However, as maritime traffic in New York City steadily decreased since the mid-1960s, the need for movable bridges lessened as well. In 1941, during its first full year of operation, the Mill Basin Bridge was opened 3,100 times; by 1953, that figure decreased to 2,173; by 2013, the number of openings declined further to a total of only 246 openings.

In addition, significant and costly traffic congestion results from the operation of this outmoded drawbridge. In 2012, the Mill Basin Bridge carried 136,875 vehicles per day. The average opening and closing time for the bridge (and others like it) is ten minutes. Thus, this structure's operation has a negative and significant effect on the efficiency of New York City's vehicular traffic flow.

In 2013, on a New York State-mandated scale from 1 to 7, this bridge had a condition rating of 3.284, or "fair." While the bridge is not in any immediate danger of structural failure, its reconstruction is required in order to maintain mobility and public safety on this vital artery.

The existing Mill Basin Bridge is 864-feet long and 14 spans, including double movable leaf bascule spans and a steel superstructure, supported on reinforced concrete pier on timber piles, and abutments supported on pre-cast concrete piles. The existing structure and immediate approaches will be demolished and replaced.

The replacement will be a 2,645-foot, 17 span fixed bridge. It will consist of a steel composite superstructure and reinforced concrete substructure on piled footings, and will be constructed on a new alignment set on the north side of the existing bridge and partially overlapping with the existing bridge. The new bridge and approach will have three 12-foot wide traffic lanes, a 12-foot wide right shoulder on the bridge, a 10-foot wide right shoulder on the approaches, and a minimum left shoulder in each direction. The eastbound side will carry a dedicated pedestrian/bicycle path along the south fascia. The new bridge will be a fixed structure with a 60-foot vertical clearance over Mean High Water, obviating the need for opening and closing the structure to accommodate tall vessels. The new design of the bridge will result in increased sight distances, an increase in lane width from 11-feet 4-inches to 12-feet, and the inclusion of safety shoulders in both directions. The channel will remain navigable during construction, and the clear channel width will remain the same after the new structure is in place. A new fender system will be installed to protect the bridge substructure from marine traffic. The reconstruction of the Mill Basin Bridge (part of the second Belt Parkway Group) is scheduled to start in winter 2014, and to last approximately 4 years.

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BROADWAY BRIDGE OVER THE HARLEM RIVER (BRONX/MANHATTAN)

Broadway extends from the southern tip of Manhattan, through the Bronx and terminates in Westchester County. The Broadway Bridge, a lift type movable bridge crossing the Harlem River, is located between West 220th Street in Manhattan and West 225th Street in the Bronx. In 2012, the bridge carried 35,411 vehicles per day. Three tracks of the IRT subway are carried on its upper deck and a five-lane two-way roadway with sidewalks on either side is carried on its lower deck. The two roadways each measure 34 feet and the sidewalks are 7 feet wide.

The vertical lift bridge is the third movable steel structure at this location. The original steam powered single-deck swing span built in 1895 carried only highway and pedestrian traffic. The second structure was built in 1905 to accommodate the extension of IRT subway into the Bronx from Manhattan. The second bridge was again a double deck swing span to carry the subway line on the upper deck and highway traffic on the lower deck. The current structure, a double deck vertical lift bridge to carry the subway and vehicular traffic, was built in 1960.



Broadway Bridge – West and East Elevations. (Credit: Bhaskar Gusani)

The bridge underwent a protective coating project to protect the steel components of the bridge against the effects of corrosion. This project was completed in October 2003 at a cost of approximately \$8.7 million.

The bridge also underwent a recent component rehabilitation, including miscellaneous steel repairs, grating replacement, sealing and waterproofing of its deck, repair of spalled concrete pavement, new expansion joints and new median barrier at an approximate cost of \$2.14 million. This project was completed in May 2004.

Currently in its final design phase, the reconstruction of the bridge is scheduled to start in August 2016. The project's scope of work includes a major rehabilitation of the roadway deck, superstructure steel and substructure elements of the vertical lift span, as well as the approach spans. It will also include the replacement and rehabilitation of the electrical and mechanical components of the vertical lift span, as well as replacement of the existing fender system with a new larger and stronger one. Construction is expected to be complete in July 2019.

BRUCKNER EXPRESSWAY (NB & SB SERVICE ROAD) OVER WESTCHESTER CREEK (UNIONPORT BRIDGE) (BRONX)

A bridge has been located in this location since the late 19th century: the original swing-type bridge was built around 1872, replaced by a new double-leaf bascule bridge in 1918. The current double-leaf trunnion bascule bridge was built in 1953, and underwent major modifications in 1971, including the demolition of the north side of the bridge, to allow for the construction of the overhead Bruckner Expressway.

The Unionport Bridge lies in the midst of the Bruckner Expressway (I-278) interchange which is comprised of the Bruckner Expressway (I-278), the Cross Bronx Expressway (I-95) and the Hutchinson River Parkway. Along with providing a connection to the Bruckner Interchange and

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Cross Bronx Expressway, the Unionport Bridge also connects the local streets including Brush Avenue, east of the bridge, and Zerega Avenue, west of the bridge. It is an important link between the Unionport section and Schuylerville sections of the Bronx. This 17-span structure (three waterway spans and fourteen concrete approach spans) carries five lanes of the Bruckner Boulevard Expressway service road traffic over Westchester Creek. This bridge opens for important fuel oil deliveries up to 300 times a year. The bascule span open deck grating and grating support channels were all replaced by Division staff during the late part of 1997 and early part of 1998. In 2012, the bridge carried 62,485 vehicles per day. The reconstruction design of the bridge underwent a Value Engineering Study by the Office of Management and Budget which recommended several changes to the design that are being incorporated.

Subsequent to the study, concepts for two temporary movable bridges (for MPT purposes only) were developed in lieu of a complete bridge closure during construction. However, an assessment revealed a significant impact on local traffic would occur, due to the required traffic rerouting via local streets to the temporary bridges, and the location of the temporary bridges would have a severe impact on the operations of the Department of Sanitation and a Department of Environmental Protection pump station. In addition, the cost of implementing the temporary bridges for only a couple of years was very high, in the order of \$40 million. The concept of rehabilitating the bridge by constructing new temporary bridges for MPT purposes was then abandoned.

A follow-up feasibility study was conducted for completely replacing the existing bridge with a new wider bridge in phases while maintaining traffic on the existing bridge. The project's new scope of work includes: a complete replacement of the bascule, flanking, and approach substructures and superstructures, providing six 12-foot travel lanes with standard shoulders on both sides of the bridge; a new 15-foot bicycle/pedestrian path, separated from traffic with a barrier; replacement of the existing mechanical and electrical systems for the bascule span; reconstruction of the bridge operator and control houses, and replacement of the existing fender system, drainage system, street lighting, traffic signal facilities, and gates. Construction is expected to start in fall 2016.



Unionport Bridge in 1953 and 2009.



Unionport Bridge (#1066510) in 2010 and 2002. (Credit: NYSDOT) Eastbound View.

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MACOMBS DAM BRIDGE OVER THE HARLEM RIVER (BRONX/MANHATTAN)

The Macombs Dam Bridge, which has one of the longest swing spans in the world, was opened in 1895, and was designated a City landmark in 1992. The bridge and the West 155th Street Viaduct carry two lanes of traffic in each direction. In 2012, the bridge carried 39,020 vehicles per day. The \$145 million reconstruction of this landmark bridge, which was completed in May 2007, included the West 155th Street viaduct, the west approach plaza over the Harlem River Drive and Seventh Avenue, the swing span over the Harlem River, the deck and camelback trusses over Metro-North Railroad and Conrail, the Major Deegan interchange (consisting of the east approach and four ramps), and the Jerome Avenue viaduct. The rehabilitation work not only strengthened the structure, it returned the bridge's appearance to its turn of the century grandeur.

As part of this project, the historic John Hooper Fountain, which dates from 1894, was fully rehabilitated in 2000. After studying detailed old photographs, the globe and weather vane were recast and replicated. Cast aluminum was used with high impact glazing similar to the lanterns installed in Central Park in the 1980's. Just east of the fountain, a garden of rose bushes was added for the community's pleasure. Other additions included a new paved island, new curbs, and a steel fence. Bollards were installed at the western end of the island to protect the fountain from vehicular traffic.



Close-up of the 1894 Dedication Plaque. (Credit: Hani Faouri) Bridge After Reconstruction in May 2007. West Approach to Bridge.

A new project will rehabilitate the West 155th Street Viaduct and the fender system. The scope of work includes replacement of columns, floorbeams, girder ends, bearings, expansion deck joints above floorbeams, cross frames and lateral bracings, and the ornamental brackets. The existing swing span fender is misaligned, and the timber cribbing is under attack by marine borers which could lead to the failure of the timber cribbing and the collapse of the stone fill. The project's scope of work includes installing formwork around the perimeter of the existing fender, filling the voids in the fender sand-cement grout, bonding the existing timber and rock into one solid mass, and constructing a fender extension on the northeast corner. The rehabilitation project is currently scheduled to start in March 2015 and end in September 2017.



Aerial View. West 155th Street Viaduct. The Timber Fender.

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MADISON AVENUE BRIDGE OVER HARLEM RIVER (BRONX/MANHATTAN)

A project for electrical, mechanical, and miscellaneous operating system-related work is scheduled to be performed between March 2017 and September 2018. The bridge is currently operating with the very old machinery components, along with a temporary electrical system known as the “Interim Drive System” installed during the 1994 rehabilitation contract. Some of the machinery components currently in service are over 100 years old and have far exceeded their service life. Moreover, the bridge does not have any back-up operating system which renders the bridge inoperable in case of failure of any component of the Interim Drive System. The preliminary design phase of this project began in early 2011. In 2012, the bridge carried 41,782 vehicles per day.



Madison Avenue Bridge Sign in 2007. (Credit: Duane Bailey-Castro) Bridge in 2009. (Credit: Bernard Ente) General View of Truss Swinging in 2010 and Right Elevation of Span 15 in 2012. (Credit: NYSDOT)

PARK AVENUE TUNNEL OVER 34TH STREET (MANHATTAN)

The Park Avenue Tunnel was originally built as an open cut in 1836 to accommodate horse drawn trolley cars between East 33rd Street and East 42nd Street. In 1854, a five course brick arch roof was constructed and the underground tunnel was used by the New York and Harlem River Railroad steam engine trains from East 42nd Street to its terminal then located at East 30th Street and Park Avenue. In 1870 the rail road was converted to electric powered trolleys.

The tunnel in its present form was converted to vehicular traffic only in 1917, when trolley tracks were covered with fill and roadway pavement was built. In its present form, the tunnel is located under the center mall of Park Avenue South. The roadway width inside the tunnel varies from 19'-2" to 22'-5" and used to carry a single lane of traffic in each direction. On August 3, 2008, the traffic in the tunnel was restricted to only a single northbound lane.

Some rehabilitation work was completed on the tunnel in November 2005. That contract included the rehabilitation of the fans and the ventilation system. The new project is currently in its final engineering design phase. The scope of work includes complete rehabilitation of civil and structural components of the tunnel as well as upgrading of fire detection and ventilation system of the tunnel. Construction is expected to start in May 2015 and be complete in May 2017.

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Two Views of Park Avenue Tunnel in 2010. (Credit: NYSDOT)

SHORE ROAD BRIDGE OVER THE HUTCHINSON RIVER (BRONX)

This bridge, built in 1908, was originally called the Pelham Parkway Bridge over Eastchester Bay. The existing bridge consists of a double leaf, rolling lift bascule span, flanked on each end by three earth filled concrete spandrel arch approach spans. The bridge is 864 feet in length. It carries two traffic lanes in each direction, and a sidewalk on its south side. The existing bascule leaves at mid-span consist of steel grating deck which is concrete filled over the machinery portion of the structure. In 2012, the bridge carried 17,668 vehicles per day. The \$5 million interim rehabilitation of the existing bridge superstructure and substructure enables the Department to keep it operational while a new bridge is being designed and built adjacent to the existing bridge. The existing bridge will be demolished once the new bridge is in service. The rehabilitation project began in April 2001, and all traffic lanes were reopened to traffic on April 24, 2002, three days earlier than scheduled. The interim rehabilitation of this bridge was substantially completed on June 17, 2002.



Shore Bridge in 2007. (Credit: Peter Basich)

A new mid-level, single leaf bascule movable bridge will be designed. It will be constructed to the south of the existing bridge, with a wider navigation channel, and incorporate a raised profile to effectively increase the vertical clearance above the navigation channel of the main span. In its closed position, the bascule main span will have a vertical clearance above mean high water of 35 feet. This clearance will accommodate 83% of marine vessels passing beneath. For taller vessels, the bascule's single leaf will be drawn to its open position providing unlimited vertical clearance. With a longer main span than the existing structure, the mid-level bascule bridge will offer a widened navigation channel as well as improved lateral clearance to the structure. These improvements are expected to lessen the likelihood of vessel damage to the fender system and the bascule substructure when compared to the existing structure configuration. The increased vertical clearance above the navigation channel would also reduce wear on the bridge's mechanical and electrical components by decreasing the frequency of bascule openings and closings. The completed structure will be comprised of ten spans totaling 1,442 feet, including a 110-foot steel bascule span and nine continuous steel multi-stringer approach spans. Substructures will consist of conventional multi-column or hammer head concrete piers founded on either spread footings or piles. The new design consultant, upon its procurement, will perform

ACCOMPLISHMENTS & PLANNED PROJECTS

the required Environmental Study as required under NEPA. Construction of the proposed bridge is expected to begin in 2020, with the new bridge open to traffic in late 2025.



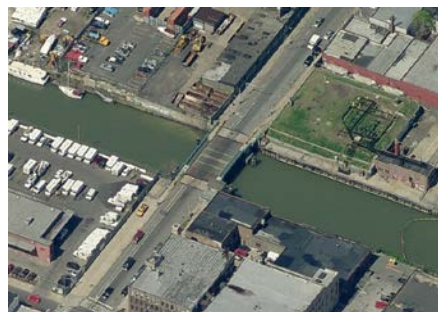
Open Bridge in 2007. (Credit: Peter Basich) Bridge Closing in 2010. (Credit: NYSDOT)
General View of Bridge Operator House #3 in 2011.

UNION STREET BRIDGE OVER GOWANUS CANAL (BROOKLYN)

The original Union Street Bridge over the Gowanus Canal was constructed in 1870 as part of the construction of Prospect Park. A major crossing over the Gowanus Canal, this bridge is the last in a series of five eastbound crossings, and it is 885 feet from the canal's end. The neighborhood, located in the Gowanus section of Brooklyn, is primarily industrial; however, public facilities such as schools, parks, and public transportation are nearby.

In its current configuration, the bridge is a double-leaf Scherzer type (rolling lift) bascule bridge, which was opened in 1905. The bridge carries two lanes of eastbound traffic, a delineated bike lane and a sidewalk.

During the preliminary design, eight alternatives were identified for the rehabilitation of the bridge. The recommended design alternative proposes a replacement of the entire bridge structure with a new single leaf fixed trunnion bascule bridge on a reinforced concrete substructure and new pile foundation. Preliminary plans have been developed. However, during the Value Engineering study in 2009, the team recommended converting the movable span into a low level fixed bridge. NYCDOT, OMB and other affected agencies are currently reviewing the feasibility of this alternative. The construction is anticipated to begin around April 2019.



Aerial View of Union Street Bridge.

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Union Street Bridge - 2010 and Schoolchildren Crossing in 2012. (Credit: NYSDOT)

WARDS ISLAND PEDESTRIAN BRIDGE OVER HARLEM RIVER (MANHATTAN)

The Wards Island Bridge is a pedestrian bridge connecting the East River Housing Project at East 103rd Street in Manhattan to Wards Island. Located on the East River, this bridge is located between exits 14 and 15 of the FDR Drive. This vertical-lift bridge has a total of twelve spans. Four spans are located on the Manhattan side of the bridge and are oriented in the south/north direction, whereas the remaining spans are oriented in the west/east direction. The curb-to-curb width of the lift span is 3.66 meters, the clear width of the Manhattan approach ramp is 3.66 meters and the clear width of the Wards Island approach ramp measures about 3.76 meters. The bridge's Wards Island approach provides immediate pedestrian access to the 68-acre Wards Island Park.



Wards Island Bridge August 2011. (Credit: Duane Bailey-Castro)

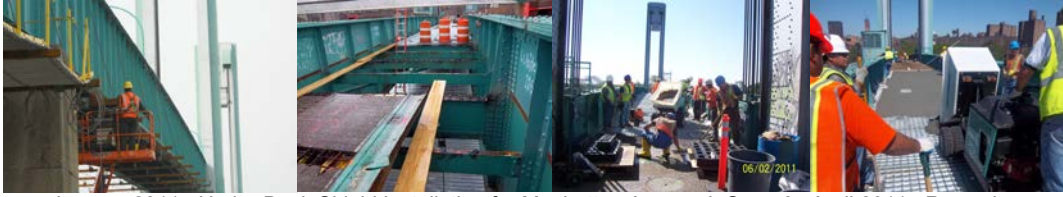
The bridge was built by the U.S. Army Corps of Engineers in 1951 and was designed by Othmar Hermann Ammann.

A protective coating project was completed in May 2003 at an approximate cost of \$1.2 million. A Notice to Proceed for the reconstruction of this bridge was issued to the contractor with a start date of June 14, 2010. The project's scope of work includes the replacement of the electrical components, the replacement of the walkway deck on the lift span, the repair and overlay of the deck on the other spans and approaches, the rehabilitation of the steel superstructure members, new fencing and lighting, and restoring the control and tender houses to their original condition.

In 2010, the contractor mobilized and began the installation of protective containment shielding. Following training from Division Bridge Operations personnel, the contractor took over operational control of the bridge on November 12, 2010. Deck cracks were repaired, and the old bridge railing and protective fencing were removed in preparation for removal of the steel grid decking.

In 2011, the contractor installed a new concrete-filled steel grid deck on the lift span. Concrete repairs were performed on piers over land as well as in the East River. The bridge was temporarily opened to pedestrians on June 30, 2011 for the summer months and was closed from November 21, 2011 through May 7, 2012 for remainder of the construction. The bridge was reopened to pedestrian and bicycle use at 10:45 AM on June 1, 2012. The reconstruction of the bridge was substantially completed on April 30, 2013.

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January 2011: Under-Deck Shield Installation for Manhattan Approach Span 6. April 2011: Removing Concrete Decking Material. June 2011: Pouring Concrete Decking at Span 7.



Construction in August, October, and December 2011. Installing Handrails Between Spans 7 and 9.



June 2012: Pedestrians and Bicyclist on Bridge. (Credit: Nicole Garcia) July 2012: Pier #8 Looking Northwest.

WILLIS AVENUE BRIDGE OVER THE HARLEM RIVER (BRONX/MANHATTAN)

Measuring 3,212 feet in length and opened to traffic on August 23, 1901, the old Willis Avenue Bridge was one of New York City's most heavily traveled bridges. The bridge was a bowstring truss swing bridge which spanned the Harlem River, and connected Manhattan's First Avenue and 125th Street to Willis Avenue and Bruckner Boulevard in the Bronx. Engineered by Thomas C. Clarke, the bridge was designed to relieve traffic congestion on the Third Avenue Bridge.

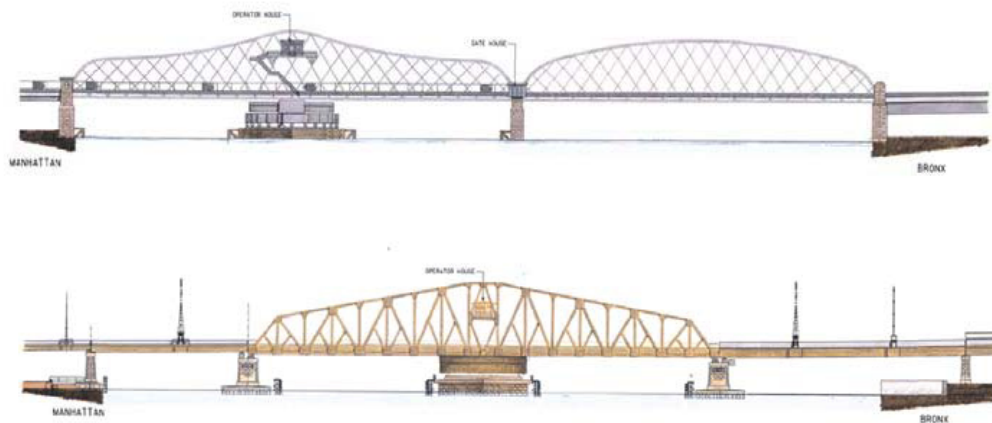
A major hub between the FDR Drive in Manhattan, the Major Deegan Expressway and the Bruckner Boulevard in the Bronx, the Willis Avenue Bridge carried approximately 62,062 vehicles per day in 2012. Ten local and interstate bus lines use the bridge as a principal route from New York City to points throughout the northeastern United States.

Because of substandard curves that were present on the structure's approaches, the Willis Avenue Bridge was one of the City's most accident-prone crossings. Between 1992 and 1994, there were 809 vehicular accidents on the bridge, for an average of 269 per year.

Because of the advanced age and condition of the Willis Avenue Bridge, the City of New York decided to replace the existing bowstring truss swing bridge with a new swing span bridge constructed just to the south of the existing bridge. The project also replaced the FDR Drive approach ramp and the ramp onto Bruckner Boulevard, and improved the alignment. NYCDOT will also reconstruct Willis Avenue over the Major Deegan Expressway for the New York State Department of Transportation. It also included a direct connection to the northbound Major Deegan Expressway in the Bronx with wider travel lanes and shoulders, and a broader, combined pedestrian/bicycle pathway along the north side of the bridge.

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The old swing bridge, which opened for tall vessels, had a vertical clearance of 24 feet above Mean High Water Level (MHWL) when closed. The new swing bridge when closed has a 25 foot clearance above the Mean High Water Line which makes it consistent with other bridges along the river. It also incorporated the placement of a solid riding surface on the swing span instead of the existing open grating deck. In addition, modern electrical, mechanical and communications systems are being installed.



Old and New Willis Avenue Bridge Span.

A Notice to Proceed for the replacement of this bridge was issued to the contractor with a start date of August 27, 2007. Foundation construction work was in progress by the end of 2007.

Traffic continued to use the current bridge until the new bridge opened, resulting in limited impact to motorists and nearby communities. The NYC Marathon was not impacted: runners continued to use the old bridge each year until the new swing span was completed.

Throughout the project, little impact to marine traffic was experienced. The new swing span was fabricated and assembled off site, and floated into place once the foundations, center pier and rest piers were ready to receive it.

On January 3, 2008, the East 125th Street exit ramp off the northbound FDR Drive was closed. This closure was necessary so that work on the construction of a temporary loop ramp, as well as construction of the new north-bound FDR Drive ramp to the Willis Avenue Bridge, could begin. The East 125th Street exit ramp, which typically carries only a low volume of traffic, was reopened after its reconstruction in June 2012.

In 2008, the project focused on foundation construction work, along with construction of a temporary ramp from the north-bound FDR Drive onto the bridge. At the end of 2008 the loop ramp was nearing completion. It went into service on January 24, 2009. This allowed the removal of the existing ramp and the construction of the new ramp to proceed. One half of the foundations for the new FDR Ramp were installed. Additionally one of the four piers in the river was in place, and work on a second had begun. The foundations in the Harlem River Rail Yard were more than 50 percent complete, and work had begun on the footings for the new Bruckner Boulevard Ramp.

In 2009, the project continued to focus on foundation construction work, with the installation of footings and piers for the new ramp from the FDR Drive as well as the one-half of the 1st Avenue Approach. The precast concrete pier box for River Pier 5 was transported in February 2009 by oceangoing tug and barge from the fabrication yard in Virginia to the contractor's yard in Jersey City, New Jersey. Over 30 automobiles were removed from the Manhattan channel in spring 2009. At the end of 2009 the contractor began the installation of the steel superstructure over the FDR Drive. The work in the river consisted of the installation of the drilled shafts for the four river

ACCOMPLISHMENTS & PLANNED PROJECTS

piers and the installation of three of the four precast pier boxes in the river. The assembly of the new swing span began in Coeymans, near Albany, New York in June 2009.

In the Bronx, a temporary pedestrian bridge was installed in May 2009 over the Major Deegan Expressway, just south of the existing bridge, to carry pedestrians until the new bridge is constructed. More than half of the paving and drainage work on the expressway was completed. One-half of the bridge over the Major Deegan was removed and work on the new abutment wall began. One-half of the abutment at Bruckner Boulevard was reconstructed and the piers to carry the south half of the new bridge were installed. The foundations in the Harlem River Rail Yard were completed and the first phase of the new Bruckner Boulevard exit ramp was also completed.

The contractor began 2010 with construction of the FDR Drive entrance ramp, and the First Avenue Approach on the Manhattan side of the bridge. On the Bronx side, the new Bruckner Boulevard exit ramp was partially opened to traffic on February 12, 2010. The work then proceeded with the demolition of the existing ramp. Assembly of the new swing span along with new machinery and electrical system was continued.

The swing span was floated down the river and towed to the bridge site on July 26, 2010. The new swing span was floated on to the new pier on August 9, 2010.



Voyage up the East River on July 26, 2010. New Willis Avenue Bridge Span Passing Under the Brooklyn Bridge. (Credit: Douglas Reese)

Work continued on the new bridge span in August 2010 with the placement of a new lightweight concrete deck surface, bridge machinery and electrical utility work. Demolition of the existing Willis Avenue Overpass over the Major Deegan Expressway was completed by September 2010.

On October 2, 2010, with the completion of the FDR Drive approach, partial First Avenue Approach, and the Willis Approach in Bronx, traffic was allowed over the new swing span and the existing bridge was closed to traffic. The old bridge was retired after 109 years of service.



New and Old Willis Avenue Bridges on October 2, 2010. Old Willis Avenue Spans in December 2010. (Credit: Duane Bailey-Castro) Aerial View in September 2011. (Credit: Hardesty and Hanover)

The float-out of the old existing swing span took place on October 21, 2010, and the adjacent, flanking bow-string arch span was floated out on November 3, 2010. Both spans remained on site through November for the asbestos abatement process before being floated to the contractor yard in Jersey City. The first bridge test operation of the new swing span was conducted successfully during the early morning hours of December 23, 2010.

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In 2011, the contractor completed work on the existing swing and flanking spans and towed them to the recycling facility in New Jersey. In Manhattan, work continued on the remaining half of the First Avenue approach roadway and spans, the demolition of the temporary loop ramp, and the reconstruction of the 125th Street exit and local streets. In the last quarter of 2011, work also continued on the Manhattan ramp and stairs and the auxiliary bridge operator's house.

In the river, the contractor started removal of the river piers and continues work to complete the demolition of center pier and the west rest pier by blasting. They also worked on the installation of the fender system for the new piers as well as the final alignment of the bridge machinery and testing of the electrical and mechanical system. In the last quarter of 2011, the contractor completed demolition work at pier 10 and carried out blasting of pier 9. Post-blasting excavation continued at Pier 9 for removal of the pier, and fender building work continued in the river. Work also continued for the construction of bridge machinery and testing of the electrical and mechanical systems. Installation of granite continued throughout the project.

In the Bronx, the contractor continued work on the relieving platforms, construction of the remaining superstructure and decks for the spans over the Harlem River Yard and mainline. They also worked on the construction of combined pedestrian/bicycle bridge over the Major Deegan Expressway as well as the new direct ramp to the northbound Major Deegan Expressway.



June 2011 River Work: Picking Up Waste With a Clamshell Bucket. July 2011: Demolition of Old Pier 9. March 2011: Stage III Caisson Concrete Placement at Caisson #2 at Pier 11. Setting Granite Stone Facing at Pier 11. Finished Stage VB Removal of Steel Girder at South Bay at Existing Span 15.



February 2011: Pedestrian/Bicycle Bridge and Ramp to Major Deegan Expressway. September 2011: Granite Installation for Approach to Connector Ramp. Bridge in November 2011. (November Credit: Hardesty and Hanover)

2012 started with the opening of the ramp to the northbound Major Deegan Expressway as well as the complete opening of the Bruckner Ramp and Bruckner Boulevard. Ramp C, which provides a direct connection to the Major Deegan Expressway, was opened on January 10. The contractor opened the sidewalk to the North Access Road on January 30. Most of the landscaping was done in the spring with some minor work left for the fall. Reconstruction of the 125th Street exit ramp and the 127th Street work was completed and opened to traffic. In the river, fenders for the new piers were completed and testing of electrical, machinery and control system continued. Reconstruction of Willis Avenue between 132nd Street and Bruckner Boulevard was completed and was opened to traffic on September 24, 2012.

Architectural work at the bridge operator house is near completion. By October 2012, all of the traffic lanes and shoulders throughout the project were completed with final pavement markings. The pedestrian bridge over the Major Deegan Expressway and the adjacent walkway/bikeway were opened to the public on November 1, 2012.

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Demolition of Old Piers 13 – 15 in May and June 2012. May 2012: Pier 6 North Fender. Preparing and Installing Granite Stone Pavers at Ramp-C End Abutment.

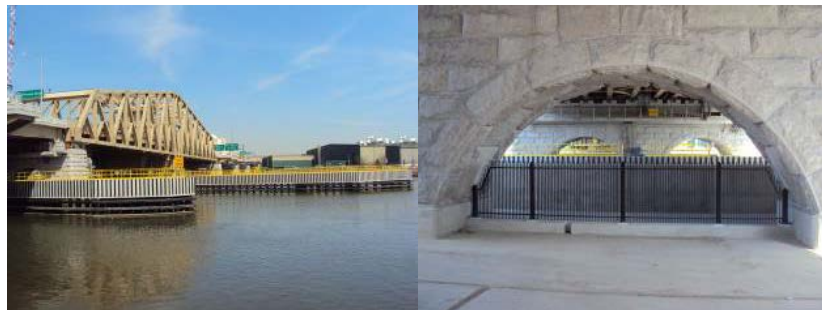


September 2012: Bridge Fender North Elevation Looking South. Bridge South Elevation Looking North. Pier 6 South Fender Looking South.

In 2013, the contractor completed granite masonry work in the Bronx, architectural work at the bridge, and landscaping, and began testing of the bridge's electrical and mechanical systems. In addition, all construction work on the Manhattan Ramp and stairs connecting to the waterfront area below was substantially completed in 2013, however, these structures will not be opened to the public until the waterfront area is developed for public use. The project is slated for completion in November 2014.



February 2013: Bridge Operator House. General View Taken From the West Side – Looking East. Pier 11- Continued installation of granite stone retrofit anchors.



March 2013: Fenders of the River Piers. Pier 4 Picket Fence.

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Willis Avenue Bridge Plaque.

WILLIS AVENUE GRANITE IN PUBLIC PLAZAS

New York City has a program to encourage public plazas in neighborhoods lacking in open space. The program plays a key role in ensuring that all New Yorkers live within a 10-minute walk of quality open space, as proposed in the PlaNYC 2030. Public plazas improve the quality of life and transform the cityscape by providing spaces where people can sit, socialize, and enjoy public life. During the reconstruction of the Willis Avenue Bridge, more than 7,500 square yards of granite (approximately 5,000 blocks) were removed from the site, mostly excavated from the bridge piers, abutments and gate houses both in Manhattan and the Bronx. These granite slabs have been repurposed as seating in several of the plazas.

In 2013, the slabs were added to the following plazas: Borinquen Place, George B. Post Plaza, and Frost Street Plaza in Williamsburg, Old Fulton in Dumbo, West 12th Street Plaza in Coney Island, Ozone Park Plaza on the City line between Brooklyn and Queens, Marcus Garvey Park in Harlem, Washington Street in the Financial District, Water Street in Lower Manhattan, and the Grand Concourse in Mosholu.



Frost Street, Ozone Park, and Washington Street Plazas.

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Roadway Bridges

INNOVATIONS

Innovations in the design and construction of Roadway Bridges continued in 2013. Where feasible, the continued use of accelerated bridge construction methods helped reduce construction duration and the resulting negative impacts on the traveling public. In addition, the use of Best Management Practices (BMP) in all applicable projects, most notably in stormwater drainage design, will mitigate the impact of bridge projects on the surrounding environment.

BROOKLYN AND MANHATTAN BRIDGES

ATLANTIC AVENUE BRIDGE OVER LIRR – ATLANTIC BRANCH (BROOKLYN)

The Atlantic Avenue Bridge is a 75 span viaduct located between Eastern Parkway and Georgia Avenue in Brooklyn. The bridge carries two traffic lanes each eastbound and westbound, divided by a center median. Two LIRR tracks (of the Atlantic Branch) run under and parallel to the bridge for its entire length. The bridge was built in 1942 by the Transit Commission. The bridge superstructure consists of steel stringers and floor beams. The substructure consists of steel piers and concrete bearing walls founded on spread footings. The Agency replaced the structural deck in 1985 with a new concrete deck slab overlay. The project will include rehabilitating the deteriorated steel members, concrete abutments and bearing walls; replacing the bridge wearing surface, drainage scuppers, and expansion joints; performing localized concrete deck repairs; and retrofitting the viaduct to meet current seismic requirements. Construction is expected to begin in early 2017.

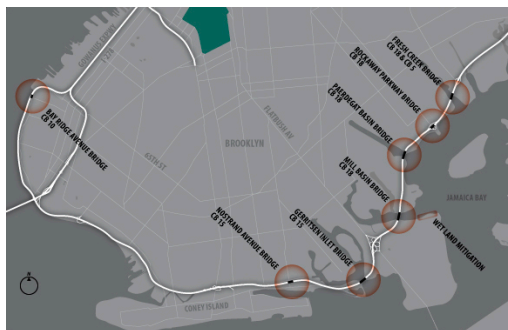


Aerial View in 2009. Elevation Left Spans 38 -43 and Elevation Right Spans 20 – 34. (Credit: NYSDOT)

BELT PARKWAY BRIDGES OVER PAERDEGAT BASIN, FRESH CREEK, ROCKAWAY PARKWAY, GERRITSEN INLET, MILL BASIN, BAY RIDGE AVENUE, AND NOSTRAND AVENUE (BROOKLYN)

The newly constructed Paerdegat Basin Bridges and the reconstructed Fresh Creek and Rockaway Bridges are now rated “very good.” On a New York State-mandated scale from 1 to 7, the remaining four of the seven bridges possess a condition rating of “fair” (3.001 – 4.999). In 2013, the Gerritsen Inlet Bridge was 3.463; the Mill Basin Bridge was 3.284; the Bay Ridge Avenue Bridge was 3.625; and the Nostrand Avenue Bridge was 3.986. All are original structures, which were built beginning in 1939. While none of the bridges are in any immediate danger of structural failure, their reconstruction is required in order to maintain mobility and public safety on this vital artery.

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The Seven Belt Parkway Bridges.

Reconstruction of the seven bridges and their approaches on the Belt Parkway (over three local streets and four waterways) began in the fall of 2009. Group 1 (Paerdegat Basin, Fresh Creek, and Rockaway Parkway Bridges) were substantially completed in August 2013. Gerritsen Inlet Bridge started in February 2013 and is expected to be complete in summer 2017. Mill Basin Bridge is expected to start in winter 2014, and to be complete in summer 2020. Bay Ridge Avenue Bridge started in November 2013 and is expected to be complete in fall 2015. Nostrand Avenue Bridge is expected to start in Fiscal Year 2022.

During the past 65 years, traffic demand along the Belt Parkway corridor has increased dramatically. The opening of New York International Airport (now JFK Airport) in 1948, the development of suburban communities on Long Island post World War II, and the opening of the Verrazano-Narrows Bridge in 1964 have dramatically increased demand on the Belt Parkway. When the parkway first opened the two-way average daily traffic was about 20,000 vehicles per day. Presently it is about 150,000 vehicles per day.

Reconstruction of these bridges and their approach roadways is necessary to alleviate substandard conditions and bring these areas into compliance with current state and federal standards. These standards require wider lanes, safety shoulders, concrete median barriers, super-elevation of the roadway around curves, and realignment of the approach roadways to improve sight distances. The Department anticipates that these improvements will reduce the current accident rate on this section of the Belt Parkway by approximately 45%.

NYCDOT conducted research to provide recommendations and design guidelines for the treatment of the parkway corridor. The goals of the analysis were threefold: first, to propose improvements to the parkway to satisfy safety and accessibility standards; second, to preserve and re-establish the historic character of the parkway; and third, to retain and improve public access for all parkway users. The recommendations also include complementary designs of the seven bridges.

The research provided detailed recommendations on how common elements should be incorporated to achieve a consistent and historical character to the corridor. Items considered included trees and vegetation, lighting fixtures, railings and fences, design of bicycle and pedestrian paths across the bridges, as well as stonework detailing on bridge abutments with relief detailing on bridge parapets.

On July 18, 2006, the Art Commission (now known as the Public Design Commission) selected the Seven Belt Parkway Bridge reconstruction project for a Design Award in its 24th annual Excellence in Design Awards.

All of the bridges, except for the Bay Ridge Avenue and Nostrand Avenue Bridges, are located adjacent to the Gateway National Recreation Area, (GNRA) a division of the National Park Service. This bridge and highway program is in full compliance with New York City Department of Environmental Protection requirements for the initiation of a long-term plan that will increase wetlands, decrease pollution into the bay, and decrease the highway's footprint around the rim of Jamaica Bay. NYCDOT is also working closely with New York City Department of Parks and Recreation, the New York State Department of Environmental Conservation, Gateway National

ACCOMPLISHMENTS & PLANNED PROJECTS

Recreation Area, the US Coast Guard, and the US Army Corps of Engineers to ensure compliance with all environmental protocols.

An upland mitigation project, to be administered by the New York City Department of Parks and Recreation, will include the planting of replacement trees to offset the number of trees being removed during the course of the bridge replacement project. The number of trees that will be planted will be determined in accordance with the caliper rule for tree replacement.

In addition to mitigating environmental impacts along the Belt Parkway corridor, an off-site Tidal Wetland Mitigation project was performed. A Notice to Proceed was issued to the Belt Group 1 contractor with a start date of March 8, 2011. The plan focused on compensating for wetland losses at the waterway bridges by increasing and improving the quality of habitats at a nearby location. Approximately 2.3 acres of land at Floyd Bennett Field was cleaned of rubbish and debris and converted to tidal wetland area. The project was substantially completed during 2012.

The overall goal of the mitigation project was to restore selected areas of the Floyd Bennett shoreline with productive habitats, including unvegetated intertidal areas, vegetated intertidal areas restored with naturally occurring *Spartina* marsh, and high marsh habitats. A significant portion of the area involved the removal of approximately 20,000 cubic yards of previously filled areas and the restoration of the areas to productive vegetated and unvegetated wetland resources.

Restoration of the area, specifically, the removal of existing fill and debris from the Floyd Bennett Field Mitigation site has increased the functional value of the area. This area is an important contributor to primary production and breakdown of organic materials. In addition, algal communities often found in these areas are producers, and provide a food source for snails and other benthic organisms, which in turn, provide food sources for larger animals that forage along the shorelines of Jamaica Bay.

Planting at the intertidal wetland and the high marsh zones was completed in summer 2011. The installation of cabled concrete erosion control revetment was started in June 2011 and completed in July 2011. In fall 2012, all replacement and final upland tree plantings were completed. Monitoring of the wetland mitigation project, as mandated by the New York State Department of Environmental Conservation, is expected to be complete in early 2017.

On October 29, 2012, Hurricane Sandy impacted the east coast and caused major damage. A survey after the storm discovered severe plant and revetment damage at the contract site. The established site grades were overwhelmed by the storm surge, ground protection and slope stabilization measures were displaced, and the plantings were uprooted and washed away. The National Park Service put the worksite off limits while Hurricane Sandy cleanup operations were in progress. A site inspection was held on January 23, 2013. The contractor had access during March, and was asked to furnish a cost proposal to restore the site. As a result of an August 26, 2013 site inspection, GNRA agreed to explore other possible suitable sites for restoration in place of the original areas.

In June 2011, the contractor was directed to perform Bergen Beach Wetland Mitigation of 1.4 acres for the work associated with outfalls at the Paerdegat and Rockaway bridges, the temporary trestles at Paerdegat Bridge, and the temporary bridge at Fresh Creek. Later, the Agency decided to increase the mitigated wetland area to 3.6 acres at the Bergen Beach site. The additional acreage will be used to offset future impacts on upcoming Belt Parkway bridge projects. The Bergen Beach mitigation work is planned to occur in two phases. The first phase of 1.4 acres was started in the first week of June 2013. By the end of June 2013, grading was completed. Planting started on July 9, 2013, and was completed by the end of the month. The second phase grading started in mid-September 2013, and was completed on November 13, 2013. It is anticipated that planting will occur in the spring of 2014.

ACCOMPLISHMENTS & PLANNED PROJECTS



Tidal Wetland Mitigation Site. Inspecting the Hurricane Sandy Damage at the Site in January 2013.



July 2013: Phase I Planting at the Bergen Beach Mitigation Area.

The old Paerdegat Basin Bridge was a 692-foot long, 13 span, multi-girder, simple supported steel superstructure, supported on reinforced concrete pier cap beams and abutments supported on reinforced concrete piles. The bridge had two 34-foot wide roadways carrying three lanes of traffic in each direction; with a 3-foot safety walk on the north side, a 4-foot wide center median/barrier, and an 8-foot wide south pedestrian/bicycle sidewalk. The existing structure and immediate approaches were demolished and replaced by two new bridges and new approach roadways on split alignments. The existing structure was permanently closed to traffic on December 20, 2012, upon opening of the new westbound structure. Demolition of the existing structure was completed in May 2013.

The old bridge consisted of 12 cast-in-place concrete bents. Two navigation channels crossed under the bridge. At one of these channels (bent number 7) a concrete pier was damaged. Because of this damage and other structural concerns, the Paerdegat Basin Bridge was under continuous monitoring since September of 2004.

The replacement bridges consist of two trapezoidal steel box girder structures: the 825-foot, 3 span westbound bridge, north of the existing structure, and the 1,227-foot, 5 span eastbound bridge, south of the existing structure, remaining at 28 feet over the navigable channel. Both bridges have a 36-foot wide roadway with a 12-foot wide right shoulder. The eastbound bridge has a 4-foot wide left shoulder, while the westbound bridge has a 10-foot wide left shoulder. The southern structure carries eastbound traffic while the northern structure accommodates westbound traffic. Both the horizontal and vertical alignments changed resulting in improved sight distances on the bridge and its approach roadways. The bridge carrying eastbound traffic also has a dedicated pedestrian/ bicycle path along the south side. The pedestrian/bicycle path is separated from traffic lanes by a concrete barrier on the bridge, and by a 15-foot wide grass mall on the approach roadways.

ACCOMPLISHMENTS & PLANNED PROJECTS



Old Paerdegat Basin Bridge.

The Fresh Creek Bridge was a 264.5 foot, 5 span, multi-girder, simple supported steel superstructure, supported on pre-cast concrete columns founded on four reinforced concrete piers on concrete piles with concrete gravity abutment walls on timber piles. One navigation channel crossed under the bridge. The bridge had two 34'-2" wide roadways, a 5-foot wide center median/barrier, and a 10-foot wide south sidewalk. The parkway, east and west of the bridge, has a 10-foot wide bicycle/pedestrian path on the south side. The existing structure and immediate approaches were demolished in spring 2012, and the replacement structure was fully opened in August 2013.

The replacement bridge is a 316-foot, 3 span structure; the new structure has only two support piers, resulting in a wider channel. The bridge deck and approaches were widened to 126 feet from the former 86 feet to accommodate three 12-foot lanes in each direction, 12-foot wide right shoulders, and a 12-foot wide bicycle/pedestrian path, separated from the traffic lanes by a barrier system. The profiles of the approach roadways and bridge structure accommodate stopping sight distances for a design speed of 60 miles per hour. The remainder of the construction will result in improved landscaping on the bridge approaches. The existing pedestrian and bicycle pathway were maintained and open at all times during construction.



Old Fresh Creek Bridge in 2002. (2002 Credit: NYSDOT)

The Rockaway Parkway Bridge was a 150-foot, 4 span, multi-stringer, simple supported steel superstructure, supported on steel cap beams on concrete filled steel pipe columns, and reinforced concrete abutment walls supported by concrete pile foundations. The bridge had two 34'-2" wide roadways, a 5-foot wide center median/barrier, and a 10-foot wide south sidewalk. The existing structure and immediate approaches were demolished in fall 2012, and the replacement structure was fully opened in August 2013.

The replacement bridge is a single span structure to improve visibility along Rockaway Parkway. The new structure was built in the same alignment as the existing bridge. The bridge deck was widened to 109 ½ feet from the former 84 feet to accommodate three 12-foot lanes with a 12-foot wide right shoulder and 4-foot left shoulder in each direction, including 5 ½ feet for median and parapet width. The right shoulder on each approach is 10 feet wide (while the width of the right shoulders on the bridge structure are 12 feet), with the other dimensions the same width as those on the bridge. In addition to reconstruction of the bridge, four access ramps were also reconstructed as was Rockaway Parkway in the vicinity of the Belt Parkway.

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Old Rockaway Parkway Bridge in 2002. (Credit: NYSDOT)

A Notice to Proceed for the reconstruction of the Group 1 bridges was issued to the contractor with a start date of October 26, 2009.

In 2010, 2011, 2012, and 2013, work on the Paerdegat Basin bridges progressed on the construction of the new eastbound and westbound bridges, and the project was substantially completed on August 22, 2013. Various construction milestones have been completed to date, including the temporary relocation of the bicycle/pedestrian path which runs along the eastbound roadway; the removal of the existing median and installation of temporary roadway lighting; the replacement of the existing sludge force main within the project area using open cut and directional boring methods; the installation of earth embankments for the new eastbound and westbound approach roadways; the installation of new drainage structures and pipe, the opening of both the new eastbound bridge (including the new bicycle/pedestrian path), and the new westbound bridge, and the completion of the approach roadway sections and concrete median barriers.

All substructure work for the new eastbound bridge, including the pier and abutment footings, pier columns, pier caps and abutments, was completed during the spring of 2011. The erection of the 51 sections of trapezoidal steel box girders was completed during the summer and was followed by nine concrete deck placements in the early fall. Installation of the concrete barrier sections and modular joints were completed during the fall, as was the construction of the eastbound approach roadway sections, drainage and electrical work. The new eastbound bridge, including the new bicycle/pedestrian path, was formally opened to traffic on December 19, 2011. Traffic was switched from the former westbound bridge to the existing eastbound bridge on December 29 to enable construction of the new westbound bridge.



February 2011: Pumping Concrete at Paerdegat Basin Cofferdam for Pier No.3. April 2011: Setting Tub Girder Sections at Eastbound Bridge Between West Abutment and Pier No. 1. June 2011: Hammer Being Positioned to Drive Steel Sheet Piling for Cofferdam at Westbound Bridge – Pier # 2. July 2011: Setting Final Tub Girder Section at East Abutment.



Paerdegat Bridge in August 2011. (Credit: Daniel Hom) Placing Concrete at Headers for Modular Joints in November 2011. November Aerial View. December 2011: New Eastbound Bridge.

For the new westbound bridge, cofferdams were constructed in 2011 and pile installation commenced for the construction of the new bridge piers and abutment substructures. All substructure work for the new westbound bridge, including the pier and abutment footings, pier

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columns, pier caps and abutments, was completed during the summer of 2012. The erection of the 33 sections of trapezoidal steel box girders was completed during the summer and was followed by five concrete deck placements in the early fall. Installation of the concrete barrier sections and modular joints were completed during the fall, as was the construction of the westbound approach roadway sections, drainage and electrical work. The new westbound bridge was formally opened to traffic on December 19, 2012. Final demolition of the existing bridge commenced at the end of 2012 and was completed in May 2013.



Paerdegat Basin Bridge in February 2012: Driving Piles for Temporary Work Trestles on the North Side for the Future Westbound Bridge. April 2012: Galvanized Steel Rebars for Westbound Pier 1 Cap Beam. June 2012: Erecting Steel Falsework Temporary Supports for the Westbound Paerdegat Tub Girders. Unloading Tub Girder Section for Westbound Paerdegat Basin Bridge at Contractor's Storage Yard. August 2012: Paerdegat Basin- Eastbound Belt Parkway Traffic on New Eastbound Bridge Shown at Left. Westbound Belt Parkway Traffic on Old Paerdegat Basin Bridge at Center. Tub Girder Erection in Progress at Right Side by Crane on a Temporary Work Platform at Future Westbound Bridge. September 2012: Setting the Last Tub Girder Section for the Westbound Bridge at the East Abutment.

The removal of the bridge superstructure was completed in March 2013. The traffic switch to Stage 4B was completed during the overnight of May 3, 2013. The contractor completed demolition of the existing bridge sub-structure in May. The approach roadway sections were completed on either side of the new bridges in the summer of 2013, along with the installation of the concrete median barriers and the final street lighting system. The bridges and approach roadway sections were fully opened in their final configuration on August 22, 2013. It is anticipated that work will continue on punch list work and change order work through the summer of 2014.

In summer 2013, the contractor was directed to install approximately 2297 feet of a new, temporary concrete barrier at the Mill Basin-Paerdegat interface. The barrier is intended to stay in place through the early stages of MPT for the Mill Basin Bridge project. Material was delivered to the jobsite, and installation work started on October 3, 2013. Final installation, pinning and reflectorization, was completed on November 18, 2013.



Paerdegat Basin Bridge in January 2013: Driving Support Piles for the Drainage System at the West Side. February 2013: Demolishing the Old Bridge. March 2013: Removing Temporary Piles for the Falsework Structure.

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Paerdegat Basin Bridge in May 2013: New Bridges: Eastbound on Left, Westbound on Right. July 2013: Setting a Precast Concrete Median Barrier Section.



August 2013: Working on the Fencing and Bicycle Path. Administrative Engineer Daniel Hom at the Site. (Hom Credit: Russell Holcomb)

During 2011, the contractor's Value Engineering proposal to utilize a temporary Fresh Creek bridge to facilitate the reconstruction of the existing bridge was implemented. The temporary bridge was opened to traffic in March and traffic was shifted to allow for the demolition of the south half of the bridge during the summer. As demolition was completed, deep foundation cofferdams were constructed in advance of the pile installation work, which was completed in late summer. Substructure work, including the pier and abutment footings, pier columns, pier caps and abutments, proceeded accordingly through the fall and were completed in advance of steel erection. All steel was erected during November and concrete deck placements continued through the winter of 2011-2012 in tight adherence to the Agency's winter concrete guidelines and procedures. Relocation of the existing sludge force main within the project area, using open cut and jacking methods, was also completed during 2011, as was the installation of permanent drainage structures and outfalls. The contractor also continued the installation of new permanent lighting, and completed the lead abatement of the existing superstructure steel in advance of demolition.



Fresh Creek Bridge March 2011: Westbound Temporary Bridge at Left, Existing Bridge at Right. July 2011: Concrete Pouring in Piles. November 2011: The Remaining Bridge Carrying East Bound Traffic and Temporary Bridge Carrying West Bound Traffic. (Credit: NYSDOT) December 2011: Commenced Installation of Winter Tent Enclosure for Stage IIB Concrete Bridge Deck Placement. (Tent Credit: Daniel Hom)

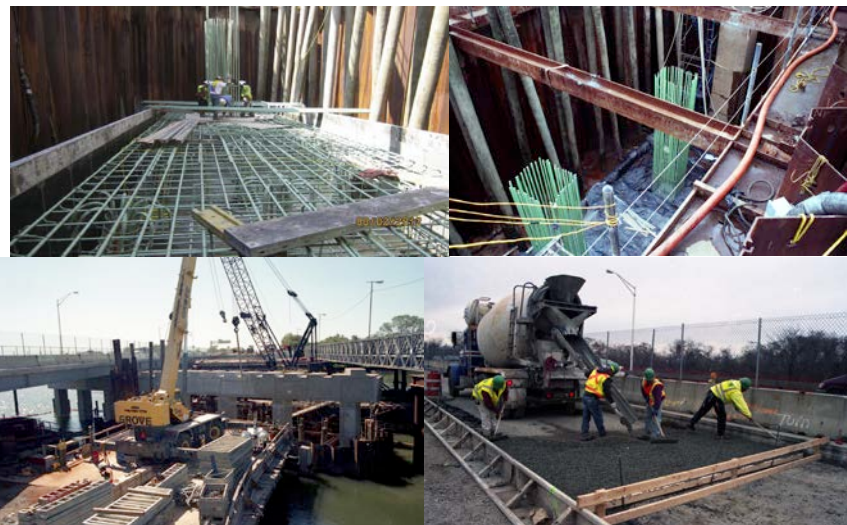
On March 24, 2012, the new eastbound side of the bridge, including the new bicycle/pedestrian path, was formally opened to traffic. Demolition of the final half of the existing bridge continued and was completed in the spring. As demolition was completed, deep foundation cofferdams were constructed in advance of the pile installation work, which was completed in the spring, followed by the substructure work, which was completed in the summer. Steel erection commenced and was completed in the fall, and concrete deck placements continued through the

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winter in accordance with specified winter concrete guidelines and procedures. The new westbound side of the bridge was opened to traffic on February 15, 2013, followed by removal of the temporary bridge.



Fresh Creek Bridge in January 2012: Winter Tent Enclosure for Stage IIB Concrete Bridge Deck Placement. Fresh Creek Bridge in April 2012: Stage 3 Demolition of Piers of Old Fresh Creek Westbound Bridge. Workers Cutting off Excess Steel Pipe Casing for Cast-in-Place Concrete Piles at Future Westbound Bridge. Temporary Bridge at Left.



August 2012: Pier #1 Westbound. Setting Rebars for Piers and Footing Inside the Cofferdam. September 2012. November 2012.

The traffic switch to the new westbound bridge was performed in the early morning of February 16, 2013. The approach roadway sections were completed on either side of the new bridge in the summer of 2013, along with the installation of the concrete median barriers and the final street lighting system. The bridge and approach roadway sections were fully opened in their final configuration on August 22, 2013. It is anticipated that work will continue on punch list work and change order work through the summer of 2014.



Fresh Creek Bridge in February, March, and April 2013: Timber Pier Protection Fender Under Construction, Turbidity Curtain, and New Pier.

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Fresh Creek Bridge in April 2013: View. Southeast Quadrant Rip Rap. May 2013: Site Overview.



June 2013: Preparing Recess in the Deck Prior to Installation of Elastometric Expansion Joint. Placing Concrete for On-Grade Pavement at Bridge Approach by Means of Conveyor Belt. September 2013: Bicycle/Pedestrian Path on South Side of Bridge - Timber Rail on the Bridge Approach Leads to 7 Rail Bridge Rail on the Bridge.

In 2010, significant progress was made in moving the Rockaway Parkway Bridge through Stage 1 and into Stage 2A. Stage 1 activities that were completed included the removal of the center median slab and curb; the installation of a temporary center median barrier; the paving of the center median and right shoulders to create the additional travel lanes necessary to allow for construction shifts; the installation of temporary street lighting in the center median and along the shoulders; the installation of construction fences and tree protection; the removal of existing trees as specified in the contract; and the installation of soil stabilization and erosion control measures. The existing water main along the east side of Rockaway Parkway was also relocated.

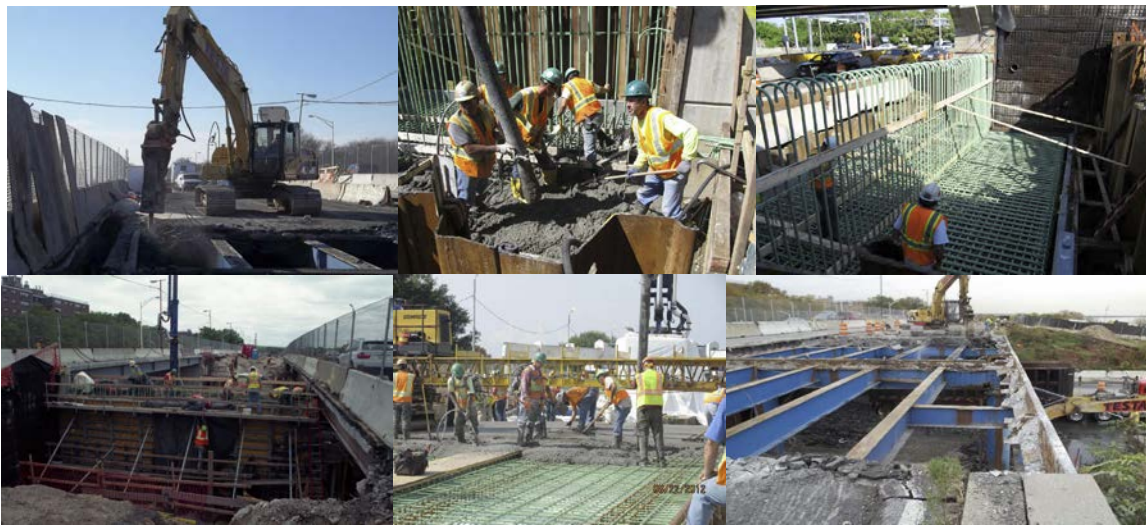
In 2011, construction moved through Stages 2A and 2B, and into Stage 3. Stage 2A began with the shift of traffic to the south side on the approaches and over the bridge to create a work zone for the removal of the north portion of the existing Rockaway Parkway Bridge. Work on the bridge and approaches included the installation of temporary support steel; and the removal of existing deck and support steel. In addition, the widths of the existing westbound entrance and exit ramps were reduced to allow for construction of the new portion of the highway along the west bound shoulder. Excavation, fill and grading to elevation for the new north section of the bridge on the northeast and northwest slopes between the main line and the two ramps was completed and approach pavement sections were placed. The contractor completed the excavation and removal of the existing substructure and the installation of piles and new abutments. Steel erection was completed during overnight hours in early August 2011, and the new concrete bridge deck was placed in late September. Barrier and approach roadway construction, including drainage and electrical work, continued through the fall. The northern section of the new bridge was opened to traffic on December 8 and the traffic pattern shifted to Stage 3 to replace the center portion of the structure. The new ramps were opened in sections with the northern sides of the ramps (Stage 2A) opening in the early summer and the southern sides of the ramps (Stage 2B) opening in line with the December opening of the bridge and the shift to Stage 3. Work also continued on the installation of new street lighting around Canarsie Circle to the south of the bridge.

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May 2011: Preparing Rebar for Northeast Abutment Footing. October 2011: Pouring Concrete for Northeast Approach. Aerial View in November 2011.

In 2012, construction moved through Stage 3 and into Stage 4. Excavation, fill and grading to elevation for the new center section of the bridge along the main line were completed and approach pavement sections were placed. The contractor completed the excavation and removal of the existing substructure and the installation of piles and new abutments in the spring. Steel erection was completed during overnight hours in July 2012, and the new concrete bridge deck was placed in August. Approach roadway construction, including drainage and electrical work, continued into the fall. The center section of the new bridge was opened to traffic on October 18, and the traffic pattern shifted to Stage 4 to replace the southern section of the structure and the ramps on the south side of the parkway. The final section of the existing bridge was demolished in the fall, and excavation, fill and grading to elevation for the new southern section of the bridge between the main line and ramps commenced. Excavation and removal of the existing substructure and the installation of piles and new abutments continued through winter 2012 - 2013.



Rockaway Parkway Bridge in January 2012: Stage III Deck Removal and Concrete Demolition. May 2012: Pumping and Vibrating Plastic Concrete Into West Abutment Forms. June 2012: Rebars for Footing and East Abutment Wall of Eastbound Bridge. August 2012: Placing Deck Concrete at Eastbound Bridge. October 2012: South Side of Old Bridge Under Demolition, Facing East. Eastbound Traffic on New Bridge at Left.

Traffic was shifted to the new eastbound ramp on April 5, 2013. The approach roadway sections were completed on either side of the new bridge in the summer of 2013, along with the installation of the concrete median barriers and the final street lighting system. The final section of the new bridge was opened to traffic in July 2013, and the ramps were opened to traffic in August 2013. The bridge, ramps and approach roadway sections were fully opened in their final configuration on August 22, 2013. It is anticipated that work will continue on punch list work and change order work through the summer of 2014.

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Rockaway Parkway Bridge in January 2013: Placing On-Grade Concrete Pavement at Ramp "D" Eastbound Entrance to the Belt Parkway. February 2013: Southeast Abutment Area Showing Steel Sheeting, Cast-in-Place Concrete-Filled Steel Pipe Piles, and Concrete Footing With Epoxy Coated Rebars. East Abutment Concreting.



March 2013: Pumping Concrete for the West Abutment Wall. April 2013: Ironworkers Installing Structural Steel. East Abutment at Right. May 2013: Site Overview. July 2013: Nighttime Sign Structure Erection.

Milestone A consisted of all work required to complete the reconstruction of the Paerdegat Basin, Fresh Creek, and Rockaway Parkway Bridges, including all roadway sections and ramps, within the limits of the construction, adjacent to and between the bridge structures. The contract provided for an incentive of \$35,000 per day for each day that milestone A was finished early, with a maximum incentive of \$14.98 million. There was a similar disincentive if the milestone date were to be exceeded, with no maximum. By reaching substantial completion on August 22, 2013, the contractor earned the maximum incentive. On December 12, 2013, the project was awarded the Excellence in Partnering Award for Informal Partnering from the AGC of New York State, LLC.

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Paerdegat, Fresh Creek, and Rockaway Bridges.

The existing Gerritsen Inlet Bridge is a 520-foot long, 9 span, steel girder and reinforced concrete beam superstructure, supported on reinforced concrete piers, and abutments supported on timber piles. The existing structure and immediate approaches will be demolished and replaced.

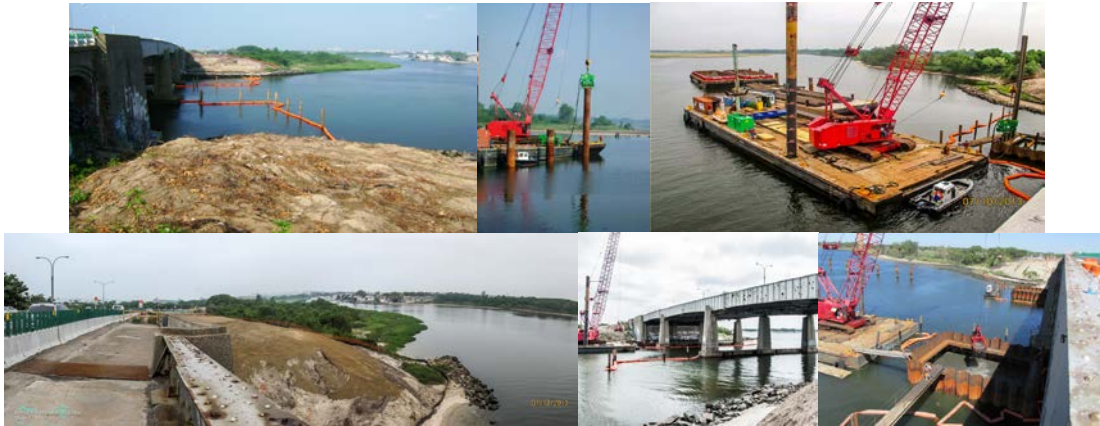
The replacement bridge will consist of a 496-foot, 3 span bridge, aligned 10'-6" north of the centerline of the existing structure, and remaining 35 feet over the navigable channel. The bridge will have a 36-foot wide roadway with a 12-foot wide right shoulder and a 4-foot wide left shoulder in each direction. The eastbound side will carry a dedicated pedestrian/bicycle path along the south fascia. A Notice to Proceed was issued to the contractor with a start date of February 25, 2013.

Construction operations performed in spring 2013 included the installation of temporary concrete barriers as part of the Stage 1 maintenance and protection of traffic; the installation of construction fences and tree protection; clearing and grubbing along the north side of the parkway including the removal of existing trees as specified in the contract; and the installation of soil stabilization and erosion control measures. As the summer and Stage 1 progressed, the contractor installed earth embankments for the new eastbound and westbound approach roadways; installed new drainage structures and pipe; and repaired bridge flags on the existing bridge structure. In the fall, the Stage I abutment piles and footings were constructed, as were the two deep foundation cofferdams for the new water piers. The pier pile installation work was completed in December 2013, in advance of the substructure work, including the pier footings, plinths, columns and pier caps, which are scheduled to conclude in the spring of 2014.

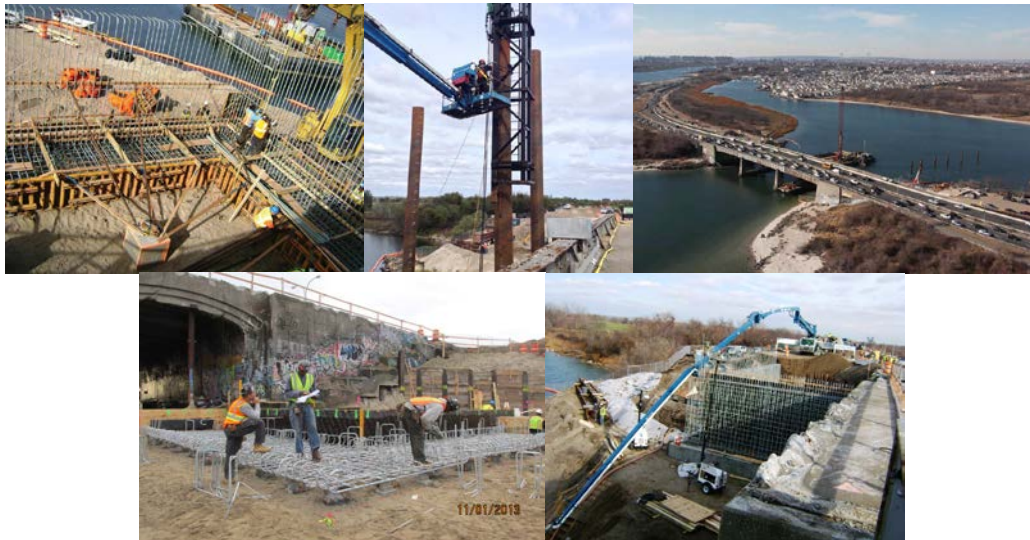
ACCOMPLISHMENTS & PLANNED PROJECTS



Gerritsen Inlet Bridge in 2013. Proposed Gerritsen Inlet Bridge.



June 2013: North Side of Gerritsen Bridge - Turbidity Curtains Placed on Both Sides of Navigable Channel. Driving Temporary Piles From Work Barge on North Side of Bridge. July 2013: Work Barges Driving Steel Sheeting for Pier #1 Cofferdam. View of Site And Bay. North Face of Bridge, Seen From South Shore. September 2013.



October 2013: Rebars and Form Work for Footing and Walls at the Northwest Abutment. Stage 1 Piles. November 2013: Northwest View. Inspecting Rebar. December 2013: Tremie Concrete Pour at Pier #2.

Opened on June 29, 1940, the Mill Basin Bridge is adjacent to the Jamaica Bay Wildlife Refuge and the Gateway National Recreation Area. It is the only movable bridge on the Belt Parkway. The current clearance over Mean High Water is 35-feet. When the Mill Basin Bridge was constructed during the first half of the 20th century, New York City's inland waterways were among the most heavily navigated thoroughfares in the country. However, as maritime traffic in

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New York City steadily decreased since the mid-1960s, the need for movable bridges lessened as well. In 1941, during its first full year of operation, the Mill Basin Bridge was opened 3,100 times; by 1953, that figure decreased to 2,173; by 2013, the number of openings declined further to a total of only 246 openings.

In addition, significant and costly traffic congestion results from the operation of this outmoded drawbridge. In 2012, the Mill Basin Bridge carried 136,875 vehicles per day. The average opening and closing time for the bridge (and others like it) is ten minutes. Thus, this structure's operation has a negative and significant effect on the efficiency of New York City's vehicular traffic flow.

The existing Mill Basin Bridge is 864-feet long and 14 spans, including double movable leaf bascule spans and a steel superstructure, supported on reinforced concrete piers on timber piles, and abutments supported on pre-cast concrete piles. The existing structure and immediate approaches will be demolished and replaced.

The replacement will be a 2,645-foot, 17 span fixed bridge. It will consist of a steel composite superstructure and reinforced concrete substructure on piled footings, and will be constructed on a new alignment set on the north side of the existing bridge and partially overlapping with the existing bridge. The new bridge and approach will have three 12-foot wide traffic lanes, a 12-foot wide right shoulder on the bridge, a 10-foot wide right shoulder on the approaches, and a minimum left shoulder in each direction. The eastbound side will carry a dedicated pedestrian/bicycle path along the south fascia. The new bridge will be a fixed structure with a 60-foot vertical clearance over Mean High Water, obviating the need for opening and closing the structure to accommodate tall vessels. The channel will remain navigable during construction, and the clear channel width will remain the same after the new structure is in place. A new fender system will be installed to protect the bridge substructure from marine traffic.



Current Belt Parkway Bridge Over Mill Basin. Aerial Views. Proposed Bridge. Open Bridge.

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May 2013 – Inspecting the Bridge From a Barge. Freshwater and Tidal Wetland Mitigation Sites.

The existing Bay Ridge Avenue Bridge is a 58-foot long, single span, reinforced concrete deck on a multi-girder system superstructure over Bay Ridge Avenue. The superstructure is supported by concrete gravity type abutments on pile foundations. There is pedestrian access under the bridge to both the American Veterans Memorial Pier and the Shore Parkway Seawall pedestrian and bicycle paths. The underpass is also access to the NYCDEP Owl's Head Wastewater Treatment Plant. The existing superstructure will be demolished and replaced.

The replacement bridge superstructure will consist of precast, pre-stressed concrete box beams and a reinforced concrete slab. The bridge will have three 12-foot wide lanes in the eastbound direction and two 12-foot wide lanes separated by a 4-foot wide painted stripe flush median in the westbound direction. There is no pedestrian/bicycle path on the structure. The clearance will be increased to 14-feet 6-inches, which removes the need for clearance signs currently posted for a substandard condition and will obviate the need for underdeck wood shielding. A Notice to Proceed was issued to the contractor with a start date of November 4, 2013. The only construction operations performed in fall 2013 were the survey and stake out of the project.



Bay Ridge Avenue Bridge in 2012. (Credit: NYSDOT) Proposed Bay Ridge Avenue Bridge. Current Aerial View.

The existing Nostrand Avenue Bridge is a 140-foot long, 3 span, multi-girder superstructure, consisting of a concrete deck with an asphalt overlay over Nostrand Avenue. The superstructure

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is supported by concrete pier columns with a steel cap beam, and abutments on concrete filled steel pile foundations. The existing structure and immediate approaches will be demolished and replaced. Reconstruction is anticipated to start in 2021. The condition rating of this bridge is better than the other remaining bridges in this program; rescheduling will not negatively impact the bridge users.



Nostrand Avenue Bridge in 2010. (Credit: NYSDOT) Right Girder in November 2012.

A computerized traffic simulation model was developed to analyze traffic conditions in connection with the Division's plans to reconstruct these seven bridges on the Belt Parkway. This model was a useful tool for understanding the impact of construction on the traveling public and helped us determine appropriate construction schedules. It enabled us to rapidly evaluate the impact of a variety of combinations of construction staging.

HENRY HUDSON PARKWAY OVER 72ND STREET VIADUCT (MANHATTAN)

The viaduct was originally constructed in 1937. Since then, several rehabilitation projects were performed, including deck replacement and structural steel repair at various locations. The reconstruction project will consist of repairs of the deck and steel elements of the viaduct superstructure in ten spans from West 72nd Street to West 82nd Street. The deck repairs will include top pavement replacement, concrete barrier repairs and deck joints replacement. The steel repairs will include installation of reinforcements to the deteriorated girders, columns, connections and bearings. The deck top work will be performed in stages to minimize the parkway closures. Construction is expected to begin in 2016.



Aerial View of the Viaduct.

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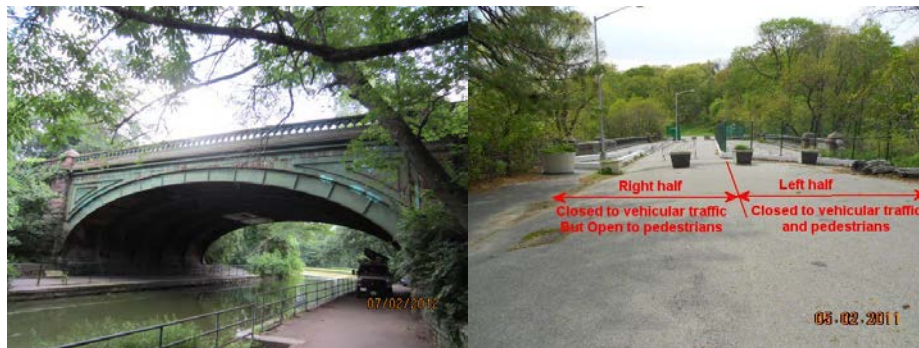
HILL DRIVE BRIDGE (TERRACE BRIDGE) OVER PROSPECT PARK LAKE (BROOKLYN)

The landmark Hill Drive Bridge was built in 1890, and was designed by Calveart Vaux. It was previously known as the Breeze Hill Bridge. The existing Parks bridge is a three span simply supported steel girder/beam structure, with the center arch span crossing Prospect Park Lake, and the other two spans consisting of underground masonry cellular structures with multiple interior masonry-bearing walls and non-composite concrete deck and concrete sidewalk. The substructure of the bridge consists of solid gravity masonry abutments with U-type wing walls.

This project will include the replacement of the existing masonry cellular abutments with new reinforced concrete abutments clad with existing stone and new brick masonry; the removal, storage, and reinstallation of the existing stone wing walls with a new reinforced concrete core; the replacement of the existing stringers and floor beams with new steel stringers; the reinforcement of the existing arch girders with new cover plates; the reinstallation of the steel arch girders at their current locations to replicate original construction; and the replacement of the existing masonry arches spanning between floor beams by masonry cladding on the underside of the new arched concrete deck. The concrete deck, approaches, sidewalk, and roadway will be replaced within the project limits.

The ornamental cast iron and stones will be rehabilitated and reinstalled, replicating all the historic features and aesthetics of the original bridge. New bridge lighting and drainage systems will be installed. The park landscape will be restored, and trees identified by the Prospect Park Alliance as rare and/or historic shall remain undisturbed during construction.

The project to reconstruct the bridge has been suspended until such time as Parks funding is available. Repairs requiring immediate attention are performed by the When and Where contractor. This bridge is closed to vehicular traffic.



Hill Drive Bridge in 2012. End Approach in May 2011: The Bridge is Closed to Vehicular Traffic. The Left Half of the Bridge is Closed to Pedestrians. (Credit: NYSDOT)

MARINE BORER REMEDIATION (MANHATTAN & BROOKLYN)

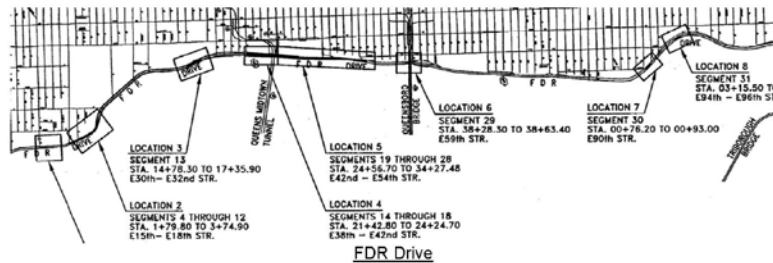
Marine borers pose an immediate and serious danger to the thousands of piles and other structures of timber built in the marine environment. In New York Harbor, as the water quality improved due to many years of clean-up efforts, marine borer (limnoria, teredo, etc.) activity has increased significantly in recent years. The recent inspections of timber structures by various local agencies (such as The Port Authority of NY & NJ, NYS Department of Transportation, NYC Department of Sanitation, and NYC Economic Development Corporation) indicate increasing damage to their structures resulting from marine borer activity. These agencies are implementing measures to protect the structures against marine borers.

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Marine Borer – Limnoria Species. Marine Borer – Teredo Species. Teredo Damage (Holes up to ¼" Diameter).

In October 1999, the Department began a study to assess the existing damage caused by marine borers as well as the potential for future damage at several waterfront DOT structures, including the supporting structures of the relieving platforms along the FDR (from East 15th to East 96th Street) Drive, and the timber piles and structures of the Carroll Street and Ocean Avenue bridges in Brooklyn. The underwater inspection of timber piles supporting the FDR Drive began on May 8, 2000. Inspection of the Brooklyn sites was conducted during the week of October 23, 2000. The inspections were completed in October 2000, and the Marine Borer Evaluation Report was published in June 2001. Using the results of the underwater inspections, preliminary plans were developed for the implementation of repairs and remediation measures to protect the structures from attack. These preliminary plans were completed in December 2001. An updated underwater inspection was performed within the limits of the proposed contract in 2009.



Carroll St



Ocean Ave

Project Locations.

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Severe Marine Borer Infestation in Timber Cribbing of Carroll Street Bridge and Moderate Marine Growth Below Waterline on the Ocean Avenue Pedestrian Bridge in 2009. (Credit: NYSDOT)

The construction project will be performed almost entirely underwater and will include barrier wrapping (placement of plastic barrier wrap around a timber pile to prevent marine borers from settling on and penetration into exposed wood); pile encasement (concrete encasement of selected severely damaged piles to reinforce and protect them from marine borers); pile posting (cutting off deteriorated upper portion of pile and replacing it with a new treated timber post); pile cap encapsulation (encapsulation of submerged timber pile caps and timber fascia with plastic lumber and synthetic mastic); bracing replacement (replacement of structural timber bracing with new treated lumber); timber removal (removing timber stays, bracing and formwork located at the top of the piles); installation of additional two-way bracing (installation of two-way bracing using tread lumber to upgrade the strength of piles by reducing the unbraced length); placement of light weight concrete fill (filling in locations where the distance from underside of the platform deck to the top of the mudline is less than one meter creating insufficient headroom for divers to wrap or jacket piles); and superstructure timber replacement (timber pile caps, railing members and other timber superstructure elements along with severely corroded steel correction hardware located above the high water line will be replaced in kind). A Notice to Proceed was issued to the contractor with a start date of April 2, 2012. The construction work is expected to be complete in August 2016.

RIVERSIDE DRIVE BRIDGE OVER WEST 158TH STREET (MANHATTAN)

The Riverside Drive Viaduct is located between West 153rd Street and West 161st Street. It is approximately 1,924 feet long and has 77 spans. This viaduct consists of intermittent straight portions, and six curves of different radii. The bridge carries four lanes (two each way). The superstructure is made of two types of framing. The northern part is a steel bent type structure, whereas the southern part is a steel cantilever type structure with half of the deck over Amtrak railroad tracks. The area below the entire bridge is utilized for storage of Agency vehicles and roadway maintenance materials. Construction is expected to begin in 2017.



Riverside Drive Bridge in 2010. (Credit: NYSDOT)

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TRANS-MANHATTAN EXPRESSWAY CONNECTOR RAMP FROM THE HARLEM RIVER DRIVE (HARLEM RIVER DRIVE RAMP TO GEORGE WASHINGTON BRIDGE OVER HARLEM RIVER DRIVE SOUTHBOUND) (MANHATTAN)

The Trans-Manhattan Expressway Connector Ramp is an elevated viaduct that consists of a multi-span steel superstructure supporting a concrete deck. The ramp connects the Trans-Manhattan Expressway to the Harlem River Drive and it was built in 1939. The project will rehabilitate the bridge steel and concrete components. Construction is expected to begin in fall 2014.



Trans-Manhattan Expressway Connector Ramp in 2010 – Elevation Rights Spans 13 to 1, and 43 to 13. (Credit: NYSDOT)

17TH AVENUE AND 27TH AVENUE PEDESTRIAN BRIDGES OVER BELT PARKWAY (BROOKLYN)

The 17th Avenue and 27th Avenue Bridges are three-hinged, steel arch girder bridges with granite-faced concrete abutments and Art Deco steel railings. These two pedestrian overpasses have deteriorated over time, and due to low vertical clearance, have suffered impact damage from overheight vehicle traffic on the Belt Parkway below. In addition, these structures are not in compliance with American Disability Act (ADA) requirements.

The 17th Avenue Bridge provides the only pedestrian access to the shoreline promenade from the surrounding Bath Beach and Bensonhurst communities. The 27th Avenue Bridge provides the main pedestrian access from the community to Dreier Offerman-Calvert Vaux Park.

In this project, the overpasses at 17th and 27th Avenues will be completely replaced. The structures will be designed to current codes and standards and all substandard features will be eliminated. Additionally, as the existing bridges were constructed under the Robert Moses era Master Plan for NYC, the proposed bridge designs will follow the Shore (Belt) Parkway Design Guidelines which were developed in November 2006, in order to preserve and reestablish the historic character of the parkway for drivers and pedestrians while enhancing and strengthening the visual cohesiveness of the greenspace connected to the adjacent park and recreation land. Construction is anticipated to begin in 2015, and is expected to be complete in 2016.

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17th Avenue Bridge. 27th Avenue Bridge in 2012.

WEST 79TH STREET BRIDGE OVER AMTRAK (MANHATTAN)

The West 79th Street Bridge over Amtrak, built in 1937, is a single span structure, with steel, non-composite girders and a reinforced concrete slab. The bridge carries two lanes of traffic in each direction and has a sidewalk on each side. The project work will include the removal of the existing concrete deck, sidewalks and the pedestrian safety barrier. The deck will be replaced with a 9.5 inch concrete slab with integral wearing surface, a new sidewalk and safety barriers on a rehabilitated superstructure. Construction is expected to begin in 2017.



West 79th Street Bridge Over Amtrak
in 2010. (Credit: NYSDOT)

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BRONX, QUEENS, AND STATEN ISLAND BRIDGES

TEN CULVERTS: GALLOWAY AVENUE OVER MARIANNE STREET, FOREST AVENUE OVER CRYSTAL AVENUE, NAUGHTON AVENUE OVER PATTERSON AVENUE, MIDLAND AVENUE OVER HYLAN BOULEVARD, ROCKLAND AVENUE OVER BRIELLE AVENUE, FOREST AVENUE OVER RANDALL AVENUE, GREGG PLACE OVER RANDALL AVENUE, ARTHUR KILL ROAD OVER MULDOON AVENUE, RICHMOND HILL ROAD OVER RICHMOND ROAD, AND ARTHUR KILL ROAD OVER RIDGEWOOD AVENUE (STATEN ISLAND)

This ten culvert reconstruction project is in the final design stage.

The Galloway Avenue culvert is a single span timber pedestrian culvert supported on a concrete abutment. It is located approximately 262.4' east of the intersection of Galloway Avenue and Crystal Avenue. The channel beneath the culvert bisects Galloway Avenue, thereby making the culvert the only means of carrying pedestrians from one side of the channel to the other. The existing culvert will be removed and a new culvert will be constructed. The culvert will be closed during construction.

The Forest Avenue culvert over Crystal Avenue is a single span reinforced concrete box culvert. It is located approximately 230' east of the intersection of Forest Avenue with Crystal Avenue. The reconstruction will consist of the demolition of the existing culvert, clearance of debris from the channel, replacement of the culvert with a concrete deck slab supported on steel beams on reinforced concrete abutment and wingwalls. The construction work is planned to be performed in four stages with proposed four traffic lanes being maintained at all times.

The Naughton Avenue culvert consists of three parallel reinforced concrete pipes at the north and south ends separated by a twin barrel box culvert. It is barricaded at the east end by guide rail and bordered at the west by a wooded area. The rehabilitation will include repairing the concrete cracks and spalls, cleaning the debris, and replacing the missing anchor bolts for the retractable steel grates. The construction is planned to be performed in one stage and no lane closure is required during construction.

The Midland Avenue culvert consists of a single span reinforced concrete box, which will be replaced with a new pre-cast box culvert. It is located on Midland Avenue between Boundary Avenue and Mason Avenue. The rehabilitation will include replacing the existing concrete box structure with a new concrete box structure, new sidewalk, curb, pipe railing, chain link fence and asphalt wearing surface. The work will be performed in three stages, with one lane of traffic maintained in each direction at all times.

The Rockland Avenue reinforced concrete culvert project will include concrete repair and a lined and stabilized north embankment. It is located approximately 361' west of the intersection of Rockland and Manor Avenue. The rehabilitation work includes clearing the debris and vegetation from the channel and installing a structural lining. The construction is planned to be performed in one stage and no street closures will be required during construction.

The Forest Avenue culvert over Randall Avenue is a single span concrete box culvert, located at Forest Avenue between Randall Avenue and University Place. It will be replaced with a new precast concrete box culvert with new sidewalks and asphalt pavement. The work will take place in three stages while maintaining one traffic lane in each direction during construction.

The Gregg Place culvert is a single span reinforced concrete box culvert, located approximately 98.4' west of the intersection of Gregg Place and Randall Avenue. The rehabilitation includes replacing the southern portion with a new precast box culvert with new pavement. The construction is planned to be performed in one stage and the north side of the road will remain open to through traffic.

The Arthur Kill Road culvert over Muldoon Avenue consists of a reinforced concrete pipe at north

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and a reinforced box culvert at south. It is located on Arthur Kill Road between Muldoon Avenue and Arden Avenue. The box culvert will be replaced with a new box culvert, and a structural lining will be installed in the pipe culvert. The construction will be performed in one stage with one lane of traffic maintained in each direction.

The Richmond Hill Road culvert consists of a single span stone masonry arch, built in 1845 according to a sign posted by the wingwall of the culvert. It is located on Richmond Hill Road between Richmond and Old Mill Roads. The rehabilitation work will include removing and re-pointing the stone masonry, removing and replacing the fill and asphalt wearing surface above the arch, and cleaning the vegetation and sedimentation. The work is proposed to be completed in one stage and no road closures will be necessary.

The Arthur Kill Road culvert over Ridgewood Avenue consists of a non-reinforced concrete pipe at south and a corrugated metal pipe at north. It is located approximately 100' west of the intersection of Arthur Kill Road and Ridgewood Avenue. The rehabilitation work will include installing a structural lining inside the concrete pipe and repairing the concrete at the head walls and catch basins. There will be one stage of construction and one lane of traffic will be maintained in each direction.

This project to rehabilitate and/or replace the ten culverts is currently in the final design stage, and is expected to begin in August 2014 and to be complete in 2016.



Galloway Avenue over Marianne Street, Forest Avenue over Crystal Avenue. Naughton Avenue over Patterson Avenue, Midland Avenue over Hylan Boulevard. Rockland Avenue over Brielle Avenue, Forest Avenue over Randall Avenue. Gregg Place over Randall Avenue, Arthur Kill Road over Muldoon Avenue. Richmond Hill Road over Richmond Road, Arthur Kill Road over Ridgewood Avenue.

BRYANT AVENUE BRIDGE OVER AMTRAK AND CSX (BRONX)

The Bryant Avenue Bridge, oriented east to west between Buckner Boulevard and Garrison Avenue, is a one span structure constructed in 1908. It spans 90 feet over four railroad tracks. This project includes replacement of the steel superstructure, bearings, approaches, water mains and rehabilitation of the existing substructures by removing and replacing the top portion of the concrete abutments to accommodate the new superstructure. The abutments will be retrofitted to meet seismic criteria. The proposed superstructure will consist of a reinforced concrete deck over pre-stressed concrete adjacent box beams. The two existing water mains will be removed and replaced. Both water mains will be installed on top of the north sidewalk in a fenced-off area. The Division's in-house design staff will now complete the design for this project. Construction is expected to begin in June 2014, with a duration of eighteen months.

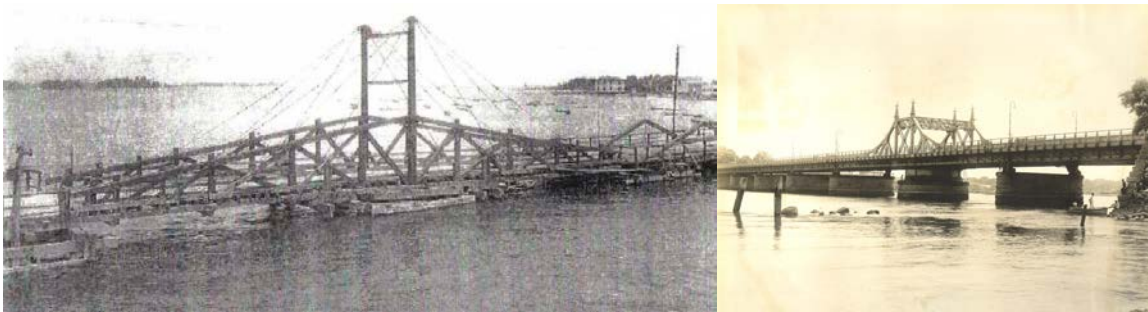
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Bryant Avenue Bridge in 2011. (Credit: NYSDOT) Bridge View From the Pedestrian Overpass. Rendering of the Bridge After Construction.

CITY ISLAND ROAD BRIDGE OVER EASTCHESTER BAY (BRONX)

The existing City Island Road Bridge was built in 1901 and is the only vehicular, bicycle and pedestrian access between the mainland Bronx and City Island. In 2012, the bridge carried 16,424 vehicles per day. The bridge is part of City Island Road, which is located within Pelham Bay Park and crosses over Eastchester Bay. With seven spans and six piers in the water, the bridge has outlived its useful life and requires extensive continuous maintenance. Spans two and three are supported by an overhead truss that originally functioned as a movable swing span but was permanently fixed in 1963.



Original City Island Bridge in 1873. Bridge in 1928.

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Aerial View of Current Bridge. Welcome Sign.

The existing bridge will be replaced along the same alignment with a new three span bridge with two piers in the water. The new bridge will be approximately 17 feet wider than the existing one to accommodate three standard 12-foot wide traffic lanes, a 6-foot wide bicycle lane and a 6-foot wide pedestrian walkway on each side. The bridge will be a multi-girder continuous bridge with an integral deck. The new bridge will be designed to current standards and with its wider roadway width, will allow future repair and rehabilitation to be carried out while maintaining one 12-foot lane in each direction. It will also eliminate the vehicle height restriction caused by the existing overhead truss. In order to maintain traffic during the demolition of the existing bridge and construction of the new bridge, a temporary bridge will be constructed on the south side of the existing bridge. Marine traffic will remain undisturbed beneath the bridge during peak boating season.

At the City Island side there is a seawall along the shore which is about 500 feet in length starting from the bridge and heading in a southerly direction. This seawall will be rehabilitated and turned over to the Department of Parks and Recreation along with the esplanade which it is supporting. The rehabilitation of the existing concrete seawall will include a steel rod tieback system as a precaution against loss of stability due to overturning or sliding. In addition, all unsound concrete will be removed from the face of the wall and a new reinforced concrete facing will be cast along the entire length. The esplanade will receive landscape improvements such as a new railing above the wall, new plantings, trees, grass, and paver blocks.



Existing Seawall.

Turtle Cove Culvert is located under City Island Road approximately half a mile west of the existing bridge. As part of the wetland impact mitigation activities for the project, this culvert will be replaced with a larger one that will allow for greater tidal flooding from Eastchester Bay to the upland portions of Turtle Cove.

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City Island Road Bridge in 2010. (Credit: Bojidar Yanev) Span 4, Right Sidewalk Near Pier 4 in October 2013. Vertical Clearance Posting. (Credit: NYSDOT) 9 Foot Tall Ornamental Finial.

A Notice to Proceed for the project was issued to the contractor with a start date of September 30, 2013. At the end of 2013, the contractor was preparing to proceed with test pits, staging area work, building surveys, and the installation of construction signing. The construction phase for this Federally-funded project has an approximate duration of 3 years.



Rendering of New City Island Road Bridge. Side View Rendering of New City Island Road Bridge.

CLAREMONT PARKWAY BRIDGE OVER METRO NORTH RR (BRONX)

The Claremont Parkway Bridge was built in 1889, with major reconstruction in 1938. Claremont Parkway is a roadway link in the Crotona Park section of the Bronx where the street system

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features few continuous east-west routes. The existing bridge is a steel superstructure encased in concrete supported on the original stone masonry abutments. It spans the tracks of the extremely busy Harlem Valley and New Haven lines of Metro-North Railroad, an essential regional commuter link between the northern areas of the metropolitan region, key points in the Bronx and Harlem, and the Manhattan central business district. Reconstruction will extend the life of the bridge by 40 years.



Claremont Parkway Bridge. (Credit: NYSDOT) Looking Northwest in 2008.

The reconstruction of the bridge included removal of the entire superstructure and approaches. The new bridge consists of pre-stressed concrete box beams supporting a reinforced concrete deck and approach slab, concrete sidewalks and reinforced concrete parapet walls with protective fencing, and reconstructed approach roadways. A portion of both existing abutments was removed to accommodate the new bridge profile. The utility work included the installation of two new water mains, a gas main, and electrical conduits. The bridge was constructed in four stages, with one traffic lane and one sidewalk open in each direction at all times during construction. A Notice to Proceed for the project was issued to the contractor with a start date of April 4, 2011.

The contractor began setting up the maintenance and protection of traffic for stage 1 construction on July 11, 2011. All Stage 1 demolition was completed in October 2011. By the end of 2011, the contractor completed the installation of vertical protective shielding above the existing abutment, the demolition of the existing abutment caps and forming, the placement of reinforcing bars, and the placement of concrete on each of the abutment caps.



Existing North Side Guardrail and Fence. Proposed Guardrail and Fence. Stage 1 in October 2011: Removal of the Existing Bridge Girders.



Installation of Pre-Cast Box Beams for Stage 1 in November 2011.

In 2012, the contractor completed the removal and reconstruction of the southern half of the bridge (Stage 1 Construction) and reconfigured the work zone traffic control. Traffic was detoured onto the newly constructed half of the bridge in August 2012. The contractor then began

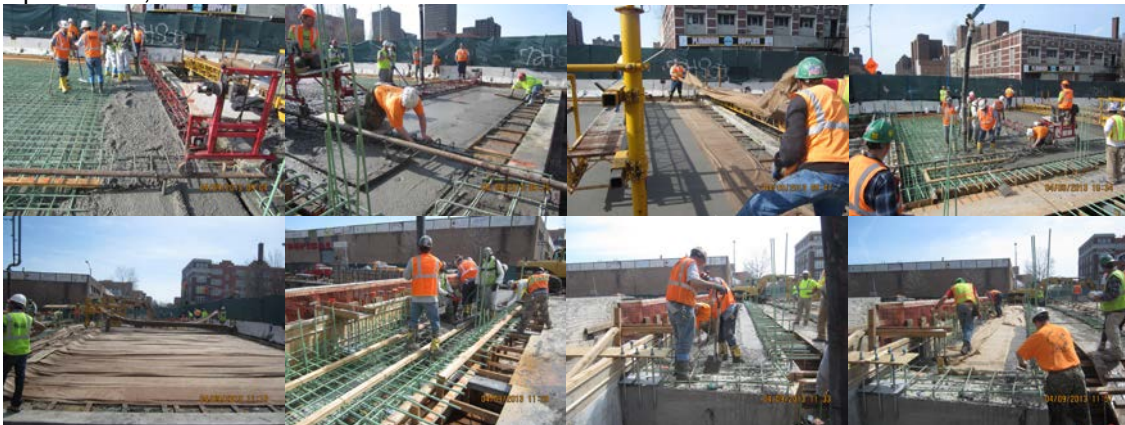
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preparatory work (such removing existing utilities, saw cutting concrete deck for removal, removing exiting bridge rails and the protective fence) for the removal and reconstruction of the remaining portion of the existing structure as part of Stage 2 Construction activities.



October 2012: Second Stage Demolition: Removal of the Remaining Portion (10 Concrete-Encased Steel Girders) of the Existing Bridge Superstructure.

In the beginning of 2013, the contractor constructed utilities, curb, roadway sub-base and concrete base at the approaches; and began preparatory work (grouting and post-tensioning the concrete girders, installation of utility supports, formwork) for the placement of concrete for the bridge deck – Stage 2 Construction. Lightweight concrete fill was placed at the approaches; and concrete was placed for the bridge backwalls, deck, sidewalk, railing, approach slabs and sidewalk approaches. The water main and Con Ed electric work were completed, as were the installation of catch basins, street lighting and traffic signals, and the construction of roadway, curb and sidewalk at the northeast and southeast corners of Claremont Parkway and Park Avenue. The new wall and chain link fence at Little Claremont Park were constructed, and the asphalt roadway paving, installation of street signs and placement of thermoplastic pavement markings were completed. The reconstruction of the bridge was substantially completed on September 3, 2013.



Stage 2 Bridge Deck Concrete Placement on April 9, 2013. Placement of Burlap Blankets on Concrete.

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GRAND CONCOURSE BRIDGE OVER METRO NORTH (BRONX)

The bridge was originally built in 1906. It is a single span bridge consisting of a concrete deck supported on five steel plate girders, one truss, and a steel truss subway structure located in the center of the bridge. The bridge carries three lanes of vehicular traffic in each northbound and southbound direction as well as NYCT subway traffic underneath the Grand Concourse Boulevard and above the Metro North railroad right of way. The upper portion of the bridge carrying the roadway is now structurally supported by the lower portion carrying the subway. The two portions of the bridge are dependent upon each other for support and stability but are being maintained individually by two separate agencies, the NYC Department of Transportation, and NYC Transit Subways respectively. The subway portion of the structure, comprised of four warren trusses, is stabilized by the roadway portion floor beams and the roadway portion is supported by the subway trusses.

In the new rehabilitation scheme, the roadway will be supported independently from the subway structure: the structures will be physically separated. Steel members will be added to the subway trusses to provide the stability previously provided by the roadway portion floor beams. The substructure consists of two concrete abutments bearing on rock ledges. The tops of these abutments lie at two levels, an upper level which supports the bridge stringers and a lower level which supports the subway trusses. The bridge stringers over the subway tracks bear on a composite steel beam/concrete backwall which will be replaced as part of this project. The foundation for the new trusses being installed to carry the roadway superstructure will bear on the rock behind the existing abutments.

The reconstruction project will also include building new sidewalks, as well as bridge railings with protective fencing, expansion deck joints, electrical conduits and fixtures, and the relocation of the existing water main under the sidewalk. Two lanes of vehicular traffic and the pedestrian walkway will be maintained in each direction on the Grand Concourse. Deterioration was discovered during a final design inspection to assess the structural condition of the bridge, and the consultant has been instructed to prepare an interim load rating to establish the structural capacity. This project, currently in the final design phase, is expected to begin construction in February 2018, and is expected to be complete in May 2020.



Grand Concourse Bridge over Metro North in 2010. (Credit: NYSDOT) Aerial View. Sidewalk.

GRAND CONCOURSE BRIDGE OVER EAST 174TH STREET (BRONX)

The bridge was originally built in 1914 as a reinforced concrete arch and in early 1931, a major reconstruction was performed to accommodate a truss bridge structure to carry subway trains. The subway structure is supported on its own concrete piers. The superstructure consists of two single in-fill concrete arches carrying Grand Concourse across East 174th Street. In between those two arches, NYCT has a steel structure supporting their tracks underneath Grand Concourse and crossing above East 174th Street. The arch substructures consist of massive reinforced stem walls bearing on rock. The subway structure piers are supported on individual concrete footings with steel grillage bearing on rock.

The project will include replacing the existing roadway, sidewalks and parapets with new reinforced concrete deck slab, providing bridge railing and fencing, repairing concrete arches by adding reinforcing bars with concrete encasements to the entire underside and top of arches to

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make the bridge seismically resistant, repairing east/west spandrel walls, and replacing the subway bearings at pier support.

This project is expected to begin construction in September 2018, and is expected to be completed in August 2020.



Grand Concourse Bridge over East 174th Street in 2007. Northbound View and Right Elevation in 2012.
(Credit: NYSDOT)

HIGH BRIDGE PEDESTRIAN BRIDGE OVER THE HARLEM RIVER (BRONX/MANHATTAN)

This eleven span landmark structure is the oldest (circa 1848) bridge over the Harlem River. The bridge is under the Department of Parks and Recreation's (DPR) jurisdiction. It was erected to carry water from the Croton aqueduct, and has been closed since 1970. The bridge spans the Harlem River, connecting the neighborhoods of Highbridge in the Bronx and Washington Heights in Manhattan.

Designed on principles of Roman aqueduct architecture, the granite bridge is about 116 feet in height, with the peak of its arches 100 feet above the Harlem River. The bridge is 1,450 feet long, measured from gatehouse to gatehouse, with a 1,200-foot-long brick walkway. The High Bridge was begun in 1839 and completed in 1848. Larger water pipes were added and the walkway was built in 1861-64. In 1927-28, after many years of calls for complete demolition of the bridge, the city replaced five of the original 15 arches with a central steel span to ease the passage of large ships. The rest of the majestic stone arches still stand, the majority on the Bronx side of the river. The bridge has never carried vehicles.

In support of DPR, the Division prepared a detailed scope of work for the comprehensive in-depth inspection of the bridge. Engineering consultants conducted this inspection, which was completed in the summer of 2006, at an estimated cost of \$2.5 million. The Division administered and supervised this work.



High Bridge Pedestrian Bridge in 2004. (Credit: Michele N. Vulcan)

The \$61.73 million restoration of the bridge is being managed by the New York City Department of Design and Construction in partnership with DPR. The reopened High Bridge will be an essential link in New York City's expanding waterfront Greenway. It will allow Bronx residents to

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reach the Highbridge Pool and Recreation Center, and Manhattan residents to reach the Harlem River shoreline. Planned improvements will make the bridge more accessible and safe. The rehabilitation will follow historic preservation principles to restore the architectural details of this landmarked structure for public enjoyment.

Both the central steel span and the stone arches will be cleaned and repaired; the steel span will be repainted and the masonry structure will be repointed and strengthened. Architectural lighting will be installed beneath both spans. The brick paver walkway on top of the structure will be removed and reconditioned, new waterproofing and concrete will be installed, then the historic brickwork will be reinstalled. The aqueduct running beneath the structure will be repaired and stabilized. New lampposts and safety fencing will be installed and the original iron railing will be repaired. Barrier-free access ramps will be built on both sides of the bridge to allow access for the disabled. Three viewing platforms with bench seating will be installed along the length of the bridge.

The design of the restoration of the bridge was completed in December 2011. Construction began in August 2012, and is expected to be complete in December 2014.



Rendering of the Restored High Bridge, View From the Bronx to Manhattan, View From Manhattan to the Bronx, and ADA Access Area. Repairs in Progress in April 2013. May and December 2013. (May and December Credits: NYCDDC)

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HIGHLAND PARK PEDESTRIAN BRIDGE OVER PEDESTRIAN PATH (QUEENS)

The Highland Park Pedestrian Bridge, built in 1935, is a single span arch structure with a clear opening of 60 feet under the bridge. Unlike a conventional steel or concrete bridge structure, the main structure is a brick masonry arch, with wing walls and parapet walls consisting of stacks of random size rocks set in mortar. The height of the parapet walls from the roadway surface varies from two to four feet. The bridge, located inside Highland Park, spans a hiking trail, and carries pedestrian and bicycle traffic. It is 27 feet wide with neither sidewalks nor shoulders.

A recent inspection revealed significant deterioration of the masonry arch. The project, currently in the final design phase, will include the rehabilitation of the existing brick masonry arch structure and the specialized wearing surface. The bridge will be closed to all traffic and will be reconstructed in one stage. Construction is expected to begin in July 2014, and is expected to be complete in eighteen months.



Highland Park Bridge.

METROPOLITAN AVENUE (FRESH POND) BRIDGE OVER LIRR -NY&ATL (QUEENS)

This bridge is a two span structure built between 1914 and 1915. It spans over the Long Island Railroad (LIRR) Montauk Branch and carries the roadway that is part of the intersection of Metropolitan Avenue with Fresh Pond Road and the adjoining property of the former Mobil gasoline station which was acquired by the City. The superstructure consists of concrete encased steel beams with a concrete deck and varying depths of asphalt wearing surface. The substructure consists of a reinforced concrete pier and gravity type plain concrete abutments and wing walls.

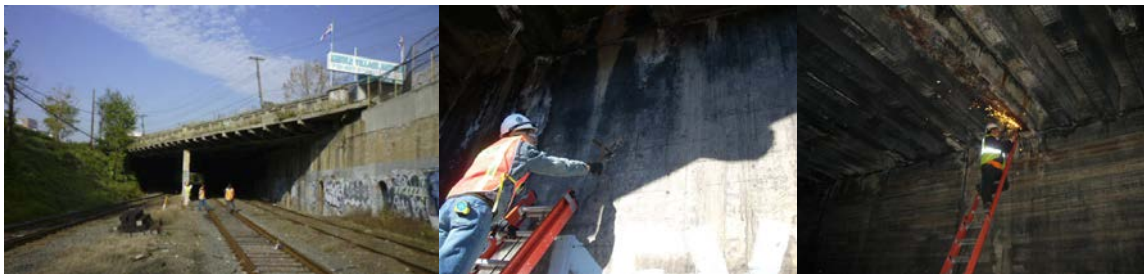
The existing vertical clearance over LIRR tracks is 15 feet 9 inches. Per New York State Railroad Law Section 51-a (7), a minimum clearance of 22 feet is required over a railroad whenever a structure built prior to 1959 is to be reconstructed unless a waiver is granted by NYSDOT. Since a 22 foot clearance was not achievable due to the existing grades of the bridge being restricted by adjacent buildings and the constraint from an existing sewer line under the tracks, the waiver request was not granted by NYSDOT. However, NYSDOT agreed to a clearance of 20 feet 6 inches. In May 2012, NYCDEP conceptually accepted the modification of the existing sewer to achieve the requisite clearance of 20 feet 6 inches.

One alternative to achieve the required 20 feet 6 inches clearance is to lower the railroad tracks. The primary obstruction to lowering the railroad tracks is the existing 60" diameter combined sewer which runs along the centerline of Fresh Pond Road. The sewer crosses beneath the tracks and is approximately 3 feet below the top of rail. To lower the tracks, the combined sewer must be rerouted or reconfigured (or both).

In September 2012, the LIRR and NY Atlantic Railways agreed to have 17 feet 6 inches clearance as an immediate goal and 20 feet 6 inches as a future goal. In response to the LIRR waiver request made in December 2012, NYSDOT accepted LIRR waiver request of railroad 17 feet 6 inches above the top of rail, incorporating provisions for lowering the track to a clearance of 20 feet 6 inches in the future. Currently, NYCDOT is coordinating with LIRR and all the utilities

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and proceeding with the final design of the bridge. Construction is expected to begin in the end of 2014 and expected to be complete in 2017.



Metropolitan Avenue Bridge in 2009. (Credit: NYSDOT) 2010 Inspection - Hands-On Inspection of A Pier. Obtaining a Steel Coupon Sample From a Stringer.

ROOSEVELT AVENUE BRIDGE OVER VAN WYCK EXPRESSWAY (QUEENS)

The existing bridge is a two level dual-use steel viaduct consisting of 27 spans. The first level, which carries Roosevelt Avenue, consists of a plate girder floor beam system supported by steel columns, intermediate piers supporting a bascule span spanning over the Van Wyck Expressway, and end abutments. This level carries two lanes of vehicular traffic in each direction and pedestrian sidewalks on each side. The second level of the viaduct supports and carries the overhead NYC Transit Authority's #7 – Flushing line three track subway structure. It is an essential regional facility and truck route that links communities east and west over the Grand Central Parkway and provides access to Flushing Meadows Park, the National Tennis Center, and Citifield, home of the New York Mets.

The viaduct structure consists of 22 steel bents supporting longitudinal steel girders at the roadway and track level. The length of the east viaduct is approximately 284 feet and the length of the west viaduct is 809 feet. The overall length of the bascule and viaduct structures is 1400 feet. The bridge was originally built between 1925 and 1927. The original bridge had a double leaf bascule span, which was used as a draw bridge, providing clearance for boat traffic passing beneath. When the Van Wyck Expressway was built in the late 1950's and the river was no longer navigable, the bridge was permanently set in a closed position. Subsequently, major roadway modifications were performed in the early 1980's. Concrete deck repairs were performed in July, August, and October of 2003, June and July of 2004, April, May, June, and July of 2005, and June and July of 2006. In the summer of 2005, the When and Where contractor repaired red and yellow flag conditions caused by damage by over-sized trucks using the Van Wyck Expressway. Red-flagged steel shoring and yellow-flagged cracked stringer connection angles were repaired in the spring of 2008.

The project, currently in the final design phase, will include the construction of a new concrete-filled steel grid deck, rehabilitation of the existing east and west viaduct sections, bascule span, piers, abutments, and painting of the entire bridge. In addition, a new bicycle/pedestrian path will be constructed on the north and south sides of the bridge.

The lower level carrying Roosevelt Avenue will be reconstructed in three stages. Both vehicular and pedestrian traffic will be maintained throughout the construction of the bridge, with one lane in each direction.

This federally-funded project is currently in the final design phase with construction anticipated to start in summer 2014 and to be complete in August 2018.

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Roosevelt Avenue Bridge (#2240507) in 2002, 2004, and 2010.. (Credit: NYSDOT) Aerial View.

SHORE ROAD CIRCLE BRIDGE OVER AMTRAK (BRONX)

This project will include the removal of the existing two span bridge and the construction of a new single span bridge structure with a reinforced concrete deck over steel girders. The work will also include the construction of new reinforced concrete abutments and wing walls, as well as new parapet walls with protective steel fences. The bridge will be reconstructed in three stages, with one lane of traffic maintained in each direction during construction. A Notice to Proceed for the project was issued to the contractor with a start date of May 18, 2008.



July 2008: Track Level View of the Existing Superstructure (Left) and Substructure (Right). Roadway Level View of the Existing Bridge (Left) and Bridge Sidewalk and Fence (Right).

Construction was expected to begin in May 2008, however, due to Amtrak's inability to provide the electric traction crew services for track outage, the construction activities on this project were on hold from September 21, 2008 until April 15, 2009.

Construction activity during 2010 included the following: High voltage overhead cables were relocated, allowing construction work to proceed at the west abutment; temporary shoring towers were erected to allow the demolition of the super structure; and soldier piles were drilled behind the abutments and excavation supporting systems installed prior to start of the removal of the existing stone abutments. In the fall of 2010, the contractor started excavating behind the abutments to prepare for the removal of the old abutments and wing walls.

Construction activity during 2011 included the following: Removal of existing sidewalk and steel beams for Stage-1B; installation of protective shielding for Stage-2; demolition of Stage-1A/3A and 1B/3B east and west abutments; pouring of concrete for abutments Stage-1A/3A and 1B/3B; installation of prefabricated structural drain behind Stage-1A/3A and 1B/3B abutments; backfilling behind Stage-1A/3A and 1B/3B east and west abutments; application of protective sealant for Stage-1A/3A and 1B/3B substructure; erection of steel beams for Stage-1A and Stage-1B superstructure; installation of protective shielding for Stage-1A and 1B; pouring of concrete for Stage 1A and Stage 1B superstructure slabs; installation of conduits for Street lighting, high

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voltage, and communications; and placement of temporary asphalt concrete pavement for stage-1A and Stage-1B east and west approaches.



December 2010: Demolition of Existing Stage-1A Deck. April and May 2011: Formwork for Stage-1 Abutment Footing and Abutment. July 2011: Backfill Behind New Stage-1 Abutment.

Construction activity during 2012 included the following: Demolition of Stage 2 concrete deck; removal of Stage 2 steel girders, floor beams and pier; demolition of Stage 2 east and west abutments; excavation for and installation of new abutment footings, stem walls and back walls; installation of new bridge pedestals and bearings at Stage 2; setting Stage 2 steel superstructure; installing new 2" conduit and electric cables for street lighting; placement and curing of new Stage 2 concrete superstructure slab; placement of new east and west approach slabs; installation of armored joints; placement of closure pour concrete; placement of new bridge sidewalk and steel face curb at north side of bridge; paving of approach roadway sub-base and binder on the north side of the bridge; placement of north cast-in-place concrete curbs with underdrain; installation of street lighting lamppost foundation on northwest corner; installation of chain link fence on north side of the bridge; and planting of trees in Pelham Bay Park as directed by the Department of Parks and Recreation.



February 2012: Demolition of Existing Stage-2 Superstructure. April 2012: Existing Stage-2 Section of Bridge Demolished and Rebar for New Stage-2 Abutment Footing Placed. July 2012: Stage-2 Steel Erection. Formwork, Rebar Placement, and Concrete Placement for Stage-2 Superstructure Slab. December 2012: Removing Shielding and Formwork.

Construction activity during 2013 included the following: Placement of new bridge sidewalk and steel face curb at south side of bridge; paving of approach roadway sub-base and binder on the south side of the bridge; placement of south cast-in-place concrete curbs with underdrain and south approach sidewalks; installation of street lighting lamppost foundation on southeast corner; installation of chain link fence on south side of the bridge; installation of guiderail at all four bridge corners; placement of top course asphalt pavement for entire east and west approach roadways; pavement striping and installation of traffic signs; installation of new lampposts and cables for street lighting; and all site restoration. The reconstruction of the bridge was substantially completed on May 10, 2013.

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January 2013: Cleanup And Grading at Track Level. Stage 3C: Grading West Approach. Installing Guide Rail.



April 2013: Final Paving Operations - East and West Approach Roadways. Placing And Rolling Asphalt. Tack Coat.



April 2013: Density Testing. Final Striping.



June 2013: Track Level View of the New Superstructure (Left) and Substructure (Right). May 2013: Roadway Level View of the New Bridge (Left) and Bridge Sidewalk and Fence (Right).

WESTCHESTER AVENUE BRIDGE OVER THE HUTCHINSON RIVER PARKWAY (BRONX)

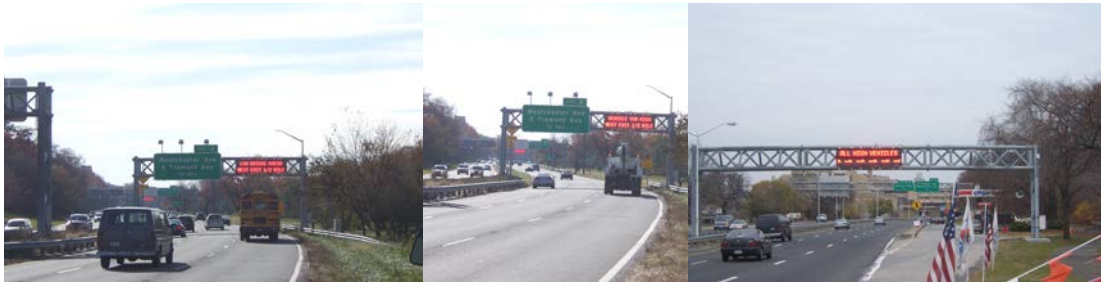
This two span continuous multi-stringer bridge is supported by reinforced piers and abutments. The bridge spans over the Hutchinson River Parkway and it supports the NYCT elevated subway structure of the Pelham Bay Line. It was built in 1940 by the Triborough Bridge and Tunnel Authority. No major modifications to the bridge are recorded except for minor repairs at the south approach sidewalk and temporary flag repairs to bridge girders damaged by vehicle impacts in the southbound and northbound roadway. A project to install an ITS solution, which includes an overheight vehicle detection system that flashes signs directing vehicles identified as being over 9' in height to exit the parkway, was substantially completed on December 3, 2004. The contractor completed extra work associated with landscaping in the spring of 2006. The underdeck at both spans is currently covered by approximately 154 square feet of timber

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planking. In addition, the underdeck at span 1 is covered with approximately 18 square feet of steel wire mesh netting.



Westchester Avenue Bridge Elevation Left and Right in 2012. (Credit: NYSDOT) Overheight Sensor Unit on the Hutchinson River Parkway. (Credit: Roly Parroco)



Vehicle Detection System.

The Westchester Avenue Bridge's vertical clearance over the Hutchinson River Parkway is sub-standard. Due to the number of truck and bus vehicles that mistakenly enter the Hutchinson River Parkway, where commercial vehicles are not allowed, the fascia steel girders of the bridge have been severely impacted and damaged numerous times.



Damaged Bridge, Cargo Container, and Contractor Truck After An Over-Height Trailer Struck the Bridge in January 2012.

The rehabilitation of the bridge will include the replacement of the existing reinforced concrete deck slab with a new reinforced concrete deck, steel faced curbs, a new parapet wall and protective screenings, concrete sidewalks, rehabilitation of the damaged steel fascia girders, and replacement of the diaphragms and other bridge elements, including a new steel water main.

In March 2011, a value engineering study was conducted in which it was recommended that further studies of alternative options be performed to raise the bridge clearance through a shallower bridge structure and/or by raising the roadway profile above the bridge.

Following the recommendation of the value engineering study, a hazardous material field investigation of the bridge was conducted in May 2013 and a hazardous material report was issued in June 2013. The report included the results of asbestos, lead and other hazardous materials field investigations, including laboratory testing results.

The consultant is currently investigating the feasibility of the study's recommendations to modify the bridge superstructure in order to improve the vertical clearance under the bridge without lowering the highway, and is studying ways to increase the vertical clearance of the bridge over the parkway without adversely impacting the NYCT elevated structure and its transit train operations. This may entail temporary support of the transit structure in order to replace the

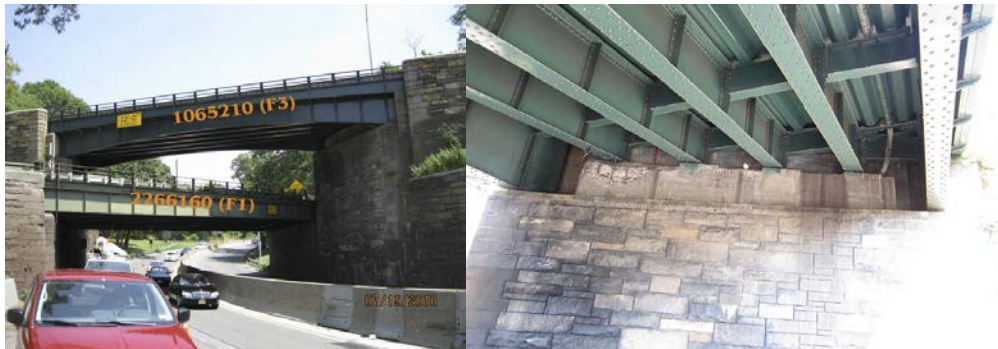
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existing roadway bridge structure in stages with a thinner more efficient structure to gain additional clearance over the parkway below. Expected completion of this feasibility study is in the spring of 2014.

This rehabilitation project is currently in final design. Construction is expected to begin in September 2015, and is expected to be complete in May 2018.

WHITESTONE EXPRESSWAY/VAN WYCK EXPRESSWAY (SB) TO CROSS ISLAND PARKWAY (EB) OVER ACCESS ROAD FROM WHITESTONE EXPRESSWAY/VAN WYCK EXPRESSWAY (QUEENS)

The bridge is a multi-girder, single span, simply supported structure with a span length of 77 feet and is 24 feet wide curb to curb. There are two lanes (one way) on the bridge. The substructure consists of two gravity type concrete abutments. The west and east abutments of the existing bridge are a continuation of the abutments of the overhead bridge. Construction is expected to begin in August 2018, and is expected to be completed in 2020.



Bridge (Lower Structure) in 2010. (Credit: NYSDOT)

EAST 175TH STREET BRIDGE OVER METRO NORTH (BRONX)

The East 175th Street Bridge over Metro North was originally built in 1889 and it underwent reconstruction in 1938. The reconstruction work included a new steel superstructure, concrete deck slab and sidewalk in conjunction with repairs to the existing stone masonry substructure and relocation of various utilities. It is a single span multi-girder steel structure with a steel reinforced concrete deck, and it measures 61.68 feet long from abutment to abutment and 60 feet wide from parapet to parapet. Construction is expected to begin in 2019.



East 175th Street Bridge in 2002 and 2012. (Credit: NYSDOT) South Sidewalk.

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Design-Build

Design-Build contracts retain the same company for both design and construction on selected projects. It is evident that there are many advantages to the Design-Build program, including the use of one consolidated procurement rather than two or more, resulting in significant time savings; the ability to commence construction before design completion; the avoidance of project escalation costs as construction commences two or three years earlier than with the conventional design-bid-build method; minimization of design change orders; and better coordination between design and construction, as critical field issues are addressed expeditiously. In addition, the design is custom made and reflects the capabilities and strength of the specific contractor; the Department establishes a single point of contact for communicating its goals and objectives; and overall costs are reduced substantially.

FDR DRIVE AT HOUSTON STREET OVERPASS (MANHATTAN)

The overpass consists of three bridge structures. The main bridge is a two-span reinforced concrete slab structure spanning over the FDR Drive's northbound and southbound roadways. Two approach ramp structures provide access to and from the FDR Drive northbound roadway and the main bridge. Each of these structures is also a reinforced concrete slab structure supported on longitudinal concrete walls that run adjacent to the FDR Drive's northbound roadway. These bridges were constructed circa 1953, and are thus almost 60 years old. On the main bridge, the superstructure slab is supported on bearing wall abutments continuously founded on piles, and on one pier at the center of the FDR Drive that consists of a steel cap beam supported on multi-steel columns continuously founded on piles. The structural slabs have asphalt overlays, and the main bridge has three sections of concrete sidewalks.

Project work will include the removal and replacement of the existing bridge superstructure, including deck slab, sidewalks, center median island and parapets. The substructure (abutments and pier) will be modified at their top to support the new superstructure. Other rehabilitation work will include the removal of hollow and spalled underdeck concrete, cleaning and repair of corroded rebar, removal of asphalt overlay, installation of waterproofing membrane, installation of new signals and an ADA-compliant pedestrian ramp, and placement of new asphalt overlay over the existing deck slabs. The project is in the final design stage, and construction is expected to begin in summer 2015.



The Three Structures of the FDR Drive at Houston Street Overpass. (Credit: NYSDOT)

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2011: Main Bridge – Top of Deck Looking West. South Approach Ramp – Top of Deck Looking South. North Approach Ramp – Top of Deck Looking North.

HARLEM RIVER DRIVE BRIDGE AT EAST 127TH STREET (MANHATTAN)

The Harlem River Drive Bridge over the ramp from East 127th Street is an eleven-span structure consisting of seven main spans of multiple steel stringers and concrete deck and four approach spans of reinforced concrete structural slabs supported by reinforced concrete girders and retaining walls. The bridge currently carries three traffic lanes in the southbound direction and two lanes plus a wide striped shoulder in the northbound direction. The parkway is not subject to truck traffic with the exception of emergency vehicles and school buses.

The existing bridge was designed and built by the Department from 1955 to 1958 as part of the Harlem River Drive Improvement Project from East 125th Street to East 132nd Street. The bridge is an eleven-span structure consisting of seven main spans of multiple steel stringers and concrete deck and four approach spans of reinforced concrete structural slabs supported by reinforced concrete girders and retaining walls. The bridge is owned and maintained by the Department; the rest of the Drive is owned by the New York State Department of Transportation.

This project includes over \$126 million in Federal funds. Construction will follow the on-line bridge replacement with auxiliary exit and entrance lanes and left-lane exit to Second Avenue. It involves the replacement of the existing 11 span bridge and the reconstruction of the Harlem River Drive between the Willis Avenue and Third Avenue Bridges, in addition to various highway improvements. The proposed replacement structure will consist of two adjacent bridges, with the bridge located to the west dedicated to southbound traffic and the bridge located to the east dedicated to northbound traffic. The new structures will be approximately 1027 feet long.

It eliminates a major weaving problem between the southbound Harlem River Drive traffic destined for the Second Avenue exit and the Third Avenue Bridge exit ramp. The project will also allow at-grade access for a future Park/Promenade to be developed by the Department of Parks at 127th Street between the Harlem River Drive and the Harlem River. The viaduct currently serves approximately 79,000 vehicles per day. This area currently has 40 times the State average number of accidents. Construction is expected to begin in late summer 2014, and is expected to be complete in spring 2018.



Harlem River Drive Bridge at East 127th Street.

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Rendering of New Harlem River Drive Bridge.



Looking East at the 127th Street Off-Ramp: Current and Proposed View. Looking East at 2nd Avenue: Current and Proposed View. Looking South From 3rd Avenue Bridge: Current Harlem River Drive and 2nd Avenue Exit and Proposed Harlem River Drive With Left Lane Exit to 2nd Avenue.

EIGHT RAMPS AND ONE PEDESTRIAN BRIDGE AT THE ST. GEORGE STATEN ISLAND FERRY TERMINAL (STATEN ISLAND)

Ferry service between Staten Island and Manhattan began in 1898, and its operations were taken over by the City's Department of Docks and Ferries in 1905. Today it is run by NYCDOT's Passenger Transport Division and services more than 19 million passengers each year, according to Captain James C. DeSimone, the ferry's Chief Operations Officer. The St. George Ferry Terminal itself recently underwent a major reconstruction project. The old drab, dingy building was converted into a well-lit, modern multi-modal facility. In addition to ferry service, the terminal also includes a very active MTA bus station and a Staten Island Railway Station. The rehabilitated ramps serve 23 NYC Transit bus routes that contribute significantly to ferry ridership. To complete the make-over of the St. George Terminal, the Division's Design-Build Unit also recently completed a major rehabilitation project to upgrade vehicular access to the site.

Currently a series of eight ramps carry bus and passenger car traffic in and out of the facility. The eight vehicular ramp structures provide access to the Staten Island Ferry Terminal for pedestrians, private vehicles, taxis, and New York City Transit buses. The ramps span over the Staten Island Railway, terminal buildings, and terminal parking. Two of the structures serve as a bus station as well as providing a roof over the rail station below. Limited parking is provided on several of the ramps. The North Ramp provides access to the North Municipal Parking Field and the Richmond County Bank Stadium and stadium parking lot, which provides supplemental parking to the Ferry Terminal. The five span pedestrian bridge provides access between the

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main Ferry Terminal building and the 69th Street Terminal building as well as access to the Bus Entrance Ramp (Ramp B) above and the Commuter Pick-Up and Drop-Off Area below.

Seven of the eight ramps were constructed in 1948, with the eighth dating back to the early part of the 20th century. The last major structural work on these bridges was a deck replacement project in 1985 that only addressed three of the eight bridge structures. The design-build project upgraded these eight vehicular structures (and one pedestrian bridge), and will provide a design life of 75 years. For seven of the ramps, the project provided new decks and eliminated joints where feasible, retrofitted poorly detailed steel connections, and rehabilitated/replaced deteriorated steel superstructure and substructure members, as well as installed new paint systems. Lead paint removal and the installation of a new drainage system as well as a pigeon deterrent system were also included. The eighth ramp was the existing load-restricted north ramp adjacent to the Richmond County Bank Stadium. It was demolished and reconstructed on a more efficient alignment in order to alleviate traffic congestion at the intersection of Richmond Terrace and Wall Street. In addition, this project replaced the superstructure of a pedestrian bridge (the 69th Street Terminal Building Overpass) connecting the terminal to an office facility, and addressed traffic improvements for the entire stretch of Richmond Terrace outside the terminal.

A Notice to Proceed for the reconstruction of these structures was issued to the contractor with a start date of July 27, 2009. During the demolition of the concrete encasement at the old viaduct, which began in October 2009, lead paint on the underlying structural steel was discovered. Lead paint and underlying rust was removed from all structures and non-lead paint was reapplied. This protective coating is an essential preventive maintenance operation used to protect and extend the life of bridge infrastructure. All lead paint removal work was performed within an entirely sealed Class 1A Containment System which prevented materials from leaving the work zone. Soil and air in the St. George area were monitored and tested in accordance with safety requirements set forth by the United States Environmental Protection Agency and Occupational Safety and Health Administration, New York City Departments of Health and Environmental Protection and the New York State Departments of Health and Environmental Conservation.

Active construction began in early 2010 when modifications were made to the Kiss and Ride area. These modifications allowed the area to accommodate the closure of Ramp D (Kiss and Ride exit ramp) for demolition (on June 21, 2010) and the resulting two-way operation of Ramp C (Kiss and Ride entrance ramp). Ramp A and D demolition was completed in September. Bus gates A and B were relocated as of September 12, and the south half of the old viaduct was closed on September 13. The buses were relocated and pedestrians were routed to the opposite sidewalk. By the end of the year, the reconstruction of Ramp A and rehabilitation of Ramp D were underway. The pedestrian breezeway, located above the Kiss and Ride and linking the ferry terminal with the Ferry Administration building, was also being rehabilitated. Demolition was completed in March of 2011, and rebuilding of the structure began.



January 2011: Panoramic View. March 2011: Ramp D South Side Fascia Repair. Existing North Ramp (Foreground) and New North Ramp (Background).

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August 2011: Bus Ramp A Canopy. North Ramp Center Pier. December 2011: Bus Ramp D.

Shielding installation and red flag repairs were completed in August 2011. Construction of the new north ramp's T-wall and piers was completed in September. Ramps A and D were completed in November. Ramp D opened on November 17, and Bus Ramps A and B opened on November 18. Stage 1 of the Old Viaduct was opened on November 18, as well. The North Ramp (leading into the North Municipal Parking Lot and NYCEDC Parking facilities), closed for construction on December 1, and demolition began. Construction began on a new ramp on a new alignment, adjacent to the Richmond County Bank Ball Park. By the end of the year, the reconstruction of Bus Gates A and B and the Old Viaduct were underway.

The new North Ramp, located at Richmond Terrace and Wall Street, providing access to the North Municipal Parking Lot and NYCEDC stadium parking lots re-opened during the early morning hours of June 16, 2012. The ramp was constructed on a new alignment and included a full-width pedestrian walkway.

By the end of 2012, chipping of spalls at the retaining wall of Ramp A was moving ahead. At Ramp B, the longitudinal saw cut grooving operation was complete; installation for anchor bolts for precast concrete barriers and reconstruction of west approach sidewalk were in progress; and blast cleaning and painting operations and expansion joint system installation were also in progress. At Stage 2 on the south half of Ramp C, the longitudinal saw cut grooving operation, installation of precast barriers and concrete placement for sidewalk at south side were complete, and the reconstruction of the west approach sidewalk and chipping of spalls on the retaining wall were in progress. At Ramp D, the removal of the platform shielding was in progress, as well as the chipping of spalls on the retaining wall. At the Bus Station North (BSN) and Bus Station South (BSS), the sidewalk concrete placement (BSN) was complete; blast cleaning and painting operations and expansion joint system installation were in progress; and the installation of the new roofing system and installation of bricks for the canopy were in progress. At Stage 3 on the old viaduct, the concrete placement for the approach slab was complete; structural steel repairs were in progress; and the temporary support system installation and blast cleaning and painting operations were in progress. At the pedestrian breezeway, electrical fixtures installation and drainage downspout installation were in progress, as was the installation of a bird deterrent system. At the TWIC area and the north municipal parking lot, the installation of the drainage system and restoration of the roadway were in progress. At the Bay Street Landing connector, sidewalk reconstruction was in progress. The North Municipal parking lot was opened for traffic on December 12, 2012.



January 2012: North Ramp Span 1. February 2012: Breezeway. Taxi Ramp. Mini Pile Installation. Ramp C.

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April 2012: BSN Overlay, Towards South. North Ramp, East Approach. September 2012: BSS West. Old Viaduct West. November 2012: Bay Landing Drainage Work.



June 2012: New North Ramp. December 2012: Project Site.

On January 26, 2013, all of the ramps and bus gates, serving both vehicular and bus traffic, were restored to their original configuration. Other work in January and February included under deck shielding platform removal, drainage systems installation, roadway restoration, and structural steel painting operations. The contractor completed the Bay Street Landing Connector in April 2013. In the spring of 2013, work related to installation of aluminum gratings on all four canopies was completed. In addition, spalls were repaired, and fencing and bird deterrents were installed. Work related to the SIRTOA staircase at the North Ramp took place in May 2013. The design-build reconstruction of these bridges was substantially completed on July 15, 2013.



March 2013: Associate Project Managers Reza Lotfi and Patrick Nestor. (Credit: Peter Basich). ARRA Sign. (Credit: Michele N. Vulcan) April 2013: Old Viaduct Shotcrete, South Fascia New Triangle Sidewalk. Bus Station "Lollipop" Signs. April 2013: North Ramp Shotcrete.



April 2013: North Ramp Fence. Shield Removal. May 2013: Ramps A and B.

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May 2013: Ramps C And D. Old Viaduct South Fascia Removal. Installing Bird Netting at Ramp B.



May 2013: Installing Pedestrian Fencing. June 2013: Containment For Steel Painting. Thin Deck Replacement. Ramp B Benches.



June 2013: Site Overview.

Component Rehabilitation

CARROLL STREET BRIDGE OVER GOWANUS CANAL (BROOKLYN), 5TH AVENUE BRIDGE OVER GREENWOOD CEMETERY (BROOKLYN), BEDFORD AVENUE BRIDGE OVER LIRR BAY RIDGE (BROOKLYN), BROOKLYN-QUEENS EXPRESSWAY BRIDGE OVER ADAMS STREET (NB) (BROOKLYN), BROOKLYN-QUEENS EXPRESSWAY BRIDGE OVER ADAMS STREET (SB) (BROOKLYN), BELT PARKWAY BRIDGE OVER BEDFORD AVENUE (BROOKLYN), 4TH AVENUE BRIDGE OVER BELT PARKWAY (BROOKLYN), HILL DRIVE BRIDGE (CLEFT RIDGE SPAN) OVER PEDESTRIAN PATH SOUTH OF BOATHOUSE (BROOKLYN), CROWN STREET BRIDGE OVER FRANKLIN SHUTTLE (BROOKLYN), AND UNION STREET BRIDGE OVER BROOKLYN-QUEENS EXPRESSWAY (BROOKLYN)

A Notice to Proceed for the component rehabilitation of these bridges was issued to the contractor with a start date of July 23, 2012.

In October 2012, New York was devastated by Superstorm Sandy. During the period immediately following the storm, construction efforts across the city were focused on emergency response and storm clean-up. Work associated with this contract was stopped for an extended period of time. To date, five of the ten bridges in the contract have been substantially completed, two are underway and construction on the remaining three will commence in 2014.

The Carroll Street Bridge is a two span movable–retractile type bridge. The bridge roadway carries a single travel lane in the east direction. There are no parking lanes on the bridge. There is a sidewalk on each side of the bridge. The scope of rehabilitation work included the following:

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replacing the deteriorated timber deck; restoring the expansion joints; cleaning the masonry walls at the west abutment; replacing impacted stiffeners, angles, and plates; cleaning and painting structural steel; resetting roadway paving units at west abutment and repairing/replacing concrete sidewalks at both approaches; installing new timber curbs on both sides of the roadway; and installing new rubber dock fenders at both abutments. The Carroll Street Bridge was substantially completed on July 9, 2013.

The 5th Avenue Bridge is a one span masonry arch structure. The brick arch can be classified as a gothic style arch. The bridge carries one travel lane and one parking lane in each direction. The sidewalk consists of grass and dirt on both side of a 5 feet wide concrete walkway. The scope of rehabilitation work included the following: removing and replacing existing asphalt from the bridge and approach slabs; cleaning and sealing cracks in asphalt at both approach pavements; removing existing 5 foot wide sidewalk on both sides of the bridge and replacing with a 13 foot wide sidewalk; replacing existing stone curb with cast-in-place concrete curb; cleaning, repairing, tuck pointing and restoring the stone masonry; and rehabilitating the brick arch. The 5th Avenue Bridge was substantially completed on July 9, 2013.

The Bedford Avenue Bridge is a 6 span structure. The bridge carries one travel lane in each direction. There is a parking lane and a bicycle lane on each side of the bridge. The scope of rehabilitation work included the following: sealing and repairing cracks and spalls at the deck, abutments and piers; replacing compression seals; and cleaning concrete and applying an anti-graffiti protective coating on the abutments and piers. The Bedford Avenue Bridge was substantially completed on November 6, 2013.

The Brooklyn-Queens Expressway Bridge over Adams Street (NB) is a one-span reinforced concrete arch structure. The bridge carries southbound three travel lanes. There is a safety walk on each side of the bridge. The scope of rehabilitation work included the following: Cleaning and sealing cracks in asphalt overlay on top of bridge and approaches; removing unsound concrete and repairing the underdeck concrete deteriorated areas; cleaning and sealing cracks in brick finish at both abutments; cleaning the brick finish at abutments and wingwalls and applying an anti-graffiti protective coating; cleaning the scuppers; and restoring the bridge expansion joint system between NB and SB structures.

The Brooklyn-Queens Expressway Bridge over Adams Street (SB) is a one-span reinforced concrete arch structure. The bridge carries northbound two travel lanes. The third travel lane is closed. There is a safety walk on each side of the bridge. The scope of rehabilitation work included the following: cleaning and sealing cracks in asphalt overlay on top of bridge and approaches; removing unsound concrete and repairing the under deck-concrete deteriorated areas; cleaning and sealing cracks in brick finish at both abutments; cleaning the brick finish at abutments and wingwalls and applying an anti-graffiti protective coating; cleaning the scuppers; and removing the deteriorated lamppost and installing a new one. The Brooklyn-Queens Expressway Bridges were substantially completed on December 3, 2013.

The Belt Parkway Bridge over Bedford Avenue is a three span steel stringer structure. The bridge carries three travel lanes in each direction. There is a shoulder and a safety walk on each side of the bridge. The concrete median that divides the eastbound and westbound traffic has guide railing on both sides. The scope of rehabilitation work shall include the following: replace asphalt concrete over expansion joints and seal cracks in asphalt overlay; clean and paint replaced or rehabilitated steel items; replace seals at abutments; replace deteriorated structural steel; repair concrete deteriorated areas; clean masonry; apply an anti-graffiti protective coating on abutments, wingwalls and piers; and clean scuppers. This project was approximately 20% complete at the end of 2013.

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Belt Parkway Bridge over
Bedford Avenue.

The 4th Avenue Bridge over the Belt Parkway is a two span concrete rigid frame. The bridge carries a travel lane in each direction, divided by a concrete median. There are no parking lanes on the bridge and approaches. The west sidewalk is wide and the east sidewalk is narrow. There is a concrete parapet on each side of the bridge. The scope of rehabilitation work shall include the following: remove and the existing asphalt concrete on bridge and approaches; clean pressure relief joints; repair concrete deteriorated areas at sidewalks and median and apply a sealing protective coating; repair concrete deteriorated areas at abutments, pier, and underdeck; and clean masonry surfaces and apply an anti-graffiti protective coating. This project was approximately 60% complete at the end of 2013.



4th Avenue Bridge.

The Hill Drive Bridge (Cleft Ridge Span) Bridge is a one span semi-circular arch type structure. The bridge carries one travel lane in each direction. There are no parking lanes on the bridge. The scope of rehabilitation work shall include the following: repair the asphalt wearing surface; repair spalled and cracked concrete at the wingwalls; clean the bridge and provide an anti-graffiti protective coating; and restore the under drain system behind the bridge fascias.



Hill Drive Bridge (Cleft Ridge Span) Bridge.

The Crown Street Bridge is a 3 span bridge that carries one travel lane and one parking lane in each direction. The bridge has protective screening and a bridge railing on the south side. There is a building adjacent to the bridge north fascia. The scope of rehabilitation work shall include the following: seal cracks in the concrete overlay; replace seals above abutments; repair, clean, and apply an anti-graffiti protection coating to the abutments, piers, and crashwalls; and clean existing gutters.

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Crown Street Bridge.

The Union Street Bridge is a two span steel continuous stringer structure. The bridge carries eastbound two travel lanes. There is an unmarked parking lane on each side of the bridge. There is a sidewalk, a railing and protective screening on each side of the bridge. The scope of rehabilitation work shall include the following: remove and replace concrete overlay; replace seals at abutments; repair concrete deteriorated areas; replace corroded rivets; paint structural steel; clean abutments and pier walls; and restore bearings.



Union Street Bridge.

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Engineering Review and Support

IN-HOUSE DESIGN

In-House Design staff prepare plans and specifications for bridge replacement/rehabilitation projects that enable the Division to restore bridges considered “structurally deficient” to a “very good” condition rating. This unit handles urgent Division projects, as well as special projects under construction by the Bureau of Bridge Maintenance, Inspections and Operations.

The unit continued the design of the Bryant Avenue Bridge over Amtrak and CSXT in the Bronx. This is a one span structure constructed in 1908, with a span length of 90 feet. This project includes replacement of the steel superstructure, bearings, approaches, water mains, and rehabilitation of both abutments. The proposed superstructure will consist of a reinforced concrete deck over prestressed concrete adjacent box beams. The two existing water mains will be removed, and replaced with two new pipes. Both water mains will be installed on top of the north sidewalk in a fenced-off area. Six existing Con Edison electrical conduits will be removed from the bridge. The construction of this bridge is scheduled to commence in summer 2014, and is expected to last eighteen months.

Design also continued of the Henry Hudson Parkway Viaduct from West 72nd Street to West 82nd Street and the Henry Hudson Parkway Viaduct from West 94th Street to West 98th Street. The rehabilitation work will include the repair or replacement of various deteriorated structural steel members, concrete deck, abutments, and the retaining walls. Construction work on these viaducts is expected to begin in fiscal years 2016 and 2017.

The unit continued the preliminary design for the replacement of the Union Turnpike Bridge over the Cross Island Parkway in Queens. This is a two span rigid frame structure constructed in 1939. The entire bridge will be removed and replaced at the same location. Several alternatives for the new bridge are currently being investigated. Construction is expected to begin in fiscal year 2021.

As the designer of the recently completed contract to replace the Belt Parkway Bridge over Paerdegat Basin, this unit was involved in the construction support services for the entire duration of construction.

In-House Design staff supervised the reinstallation of joint material across the roadway and at the four corners of the bridge, performed as part of a settlement agreement by the Design-Build contractor at Belt Parkway Bridge over Ocean Parkway.



May 2013: Substantial Completion Inspection of the Shore Road Circle Bridge –Assistant Civil Engineer Evgenia Campbell, Civil Engineer Kirolos Dimian, and Assistant Civil Engineer Yui-Cheong Poon. July 2013: In-House Design Engineers Inspecting the Boston Post Road Bridge over Hutchinson River Parkway – Deputy Director of In-House Design Jagdish Patel, Director of In-House Design Ferdinand John, and Civil Engineers Gregory Novofastovsky, Lev Gold, Kirolos Dimian, and Edvard Jeamgocian.
(Credit: Leonid Sagalovskiy)

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August 2013: Substantial Completion Inspection of the New Paerdegat Basin Bridges – Civil Engineers Edvard Jeamgocian and Gregory Novofastovsky, Assistant Civil Engineer Yiu-Cheong Poon, Director of In-House Design Ferdinand John, Deputy Chief Engineer Anil Vyas, Deputy Director of In-House Design Jagdish Patel, Civil Engineers Svetlana Kaganovskaya and Valentina Krolikova, and Administrative Engineer Sanjeev Patel. (Credit: Daniel Hom) November 2013: Assistant Civil Engineer Radu Georgescu and Director of In-House Design Ferdinand John Inspecting the Remedial Work at the Ocean Parkway Bridge. (Credit: Lev Gold)

This unit also handled the following emergency project that required expeditious response by the Division: the design of a collision protection beam attached to the north fascia of the park and promenade bridge over the FDR Drive southbound roadway to protect the bridge's superstructure from strikes by illegal trucks on the parkway. The unit was also involved in the remedial work required after the August 2013 truck fire on the Ed Koch – Queensboro Bridge, which damaged several steel stringers.

In-House Design's Electrical Group reviews and/or prepares contract documents for all electrical and street lighting work on all projects on the Division's Capital Program. In 2013, the group prepared electrical contract documents for the Bryant Avenue Bridge over Amtrak and CSXT in the Bronx. Some of the contracts reviewed during 2013 included the Broadway Bridge and Wards Island Pedestrian Bridge over the Harlem River; the Belt Parkway Bridge over Paerdegat Basin; the Metropolitan Avenue Bridge over English Kills; Unionport Bridge over Westchester Creek; the Battery Park Underpass; and other agencies' equipment installation on several bridges.

ENGINEERING SUPPORT

BRIDGE PROJECT SPECIFICATIONS

In 2013, the Specifications Unit of the Engineering Support Section prepared and/or reviewed contract proposal books and/or specifications for 18 contracts, including 16 bridge rehabilitation and new construction/reconstruction contracts and 2 component rehabilitation contracts, in addition to replying to specification requests for 5 on-going construction projects. Five of the above contracts totaling approximately \$207 million in construction costs were advertised for bid and two were bid in 2013.

Notable among the construction contracts prepared and /or reviewed, advertised and sent for bid were: the component rehabilitation of ten bridges citywide, the component rehabilitation of another nine bridges citywide, the reconstruction of the Belt Parkway Bridge over Bay Ridge Avenue, Belt Parkway Bridge over Mill Basin, Bryant Avenue Bridge over Amtrak and CSX, Trans-Manhattan Expressway Connector Ramp, Harlem River Drive over Ramp at East 127th Street, the replacement of the City Island Bridge over Eastchester Bay, and the preventive maintenance of the four East River Bridges.

The unit also updated the federal boiler plate to reflect 2013 FHWA-1273 and NYSDOT updates, updated the Guidelines for Preparation of Bridge Construction Contract Proposal Book and

ACCOMPLISHMENTS & PLANNED PROJECTS

advised Agency Divisions and consultants on the preparation of contract proposal books and construction contract related issues.

CONVERSION OF DIVISION ENGINEERING ARCHIVES

The Records Management Unit converted 142,414 TIFF (Tag Image File Format) drawings to PDF (Portable Document Format) format and completed the indexing of 115,513 drawings. Some 200,000 TIFF drawings will be converted to PDF format.

The switch to electronic media and server-based archiving will save money on drawing submissions as well, and will lead to the establishment of a unified electronic database for bridge archives. Digitizing documents and storing them online, where they are easy to access and print, will simplify contract submission process and cut project costs in a long run.

The Records Management unit also reviewed and approved as-built drawings and contract drawings for 19 contracts in 2013, including Williamsburg Bridge, Harlem River Drive over Ramp at East 127th Street, Belt Parkway Bridge over Bay Ridge Avenue, Bryant Avenue Bridge over Amtrak and CSX, component rehabilitation of ten bridges citywide, St. George Ferry Terminal Ramp Project, component rehabilitation of another nine bridges citywide, Trans-Manhattan Expressway Connector Ramp, the 11th Avenue Viaduct, and the Wards Island Pedestrian Bridge.

SURVEYING

Unit staff monitored seven bridges in 2013: Depot Place Bridge over Conrail Yard, Third Street Bridge over Gowanus Canal, Pelham Parkway Bridge, Stone Arch Bridge in Central Park, Ninth Street Bridge over Gowanus Canal, 17th Avenue Pedestrian Bridge over Belt Parkway, and the Footbridge over Clove Lake. As an emergency assignment, the unit measured the displacement of the three steel stringers that were damaged by a truck fire on August 16, 2013 at the Ed Koch - Queensboro Bridge.

ENGINEERING REVIEW

MACY'S THANKSGIVING DAY PARADE

As in past years, the staff of the Engineering Review Section actively participated in the 2013 Macy's Thanksgiving Parade. Months before the parade, the engineers reviewed the balloon specifications and flight analyses. A balloon is classified as large if it is larger than 5,000 cubic feet. However, the balloons in the parade cannot be taller than 70 feet, wider than 40 feet, or longer than 78 feet. This project was coordinated with Macy's and various City agencies such as City Hall, NYPD, DOB, and OEM.

CRP/EXTELL PARCEL H PROJECT

The CRP/Extell Parcel H, LP project (Riverside Drive between 59th and 72nd Streets) includes the construction of seven new bridges, a ramp, two relieving platforms, and connector roads along Riverside Drive as a part of the residential and commercial development over the former Penn Central Rail Yard. The project also includes a half tunnel section in what was formerly known as the Miller Highway Tunnel. When completed, the infrastructure network will be transferred to

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DOT for maintenance. The Division is providing engineering review of the design drawings, as well as quality assurance inspections, to ensure the developer's compliance with DOT's construction and design standards. The bridges are substantially completed and open to traffic. The first phase of construction for the half tunnel section is complete and phase two is in progress.

RETAINING WALLS

In May 2005, the Department started a program for the periodic inspection of City-owned retaining walls. The City currently owns 634 retaining walls. Those retaining walls were built during the interstate construction program between the 1940's and 1970's and are an important part of the city's street infrastructure. However, some of them are approaching the end of their service lives and are falling into poor condition due to various factors such as spalling/cracking of concrete, loosened mortar joints, broken stone masonry, falling coping stones, deteriorated joints, leakage through the walls due to improper drainage arrangements (clogged weep holes), bulging of walls due to hydrostatic pressure build-up on the back of the walls, and many other problems. In order to protect the infrastructure they support, the retaining walls require regular inspections and monitoring, and depending upon the condition of the walls, rehabilitation/replacement is required. Since 2005, 17 retaining walls have completed rehabilitation/replacement, and 18 retaining walls are in various stages of design and construction. The retaining walls which are in fair to poor condition will be in a capital program for future rehabilitation.



Retaining Walls: Southeast Corner of West 108th Street and Riverside Drive. Left Side of Ramp From Riverside Drive to George Washington Bridge. Irwin Avenue.

OVERWEIGHT TRUCK PERMIT REVIEWS

The Overweight Truck Permit Unit receives an average of 100 permit applications per week for overweight/over-dimensional trucks, self-propelled cranes, and occasional superload moves from utility companies crossing City-owned bridges, including critical bridges such as the Manhattan and Ed Koch Queensboro Bridges. Most of the permit requests must be reviewed and approved on the same day.

BRIDGE SEISMIC DESIGN AND RETROFITTING

The seismic retrofitting of bridges in New York City is part of the inspection and rehabilitation program mandated by Congress and administrated by the FHWA through the local authorities. During the period of 1993 to 1996, four major bridge owners in the New York City area (NYCDOT, NYSDOT, MTA, and the Port Authority of New York and New Jersey) retained seismologists to study hard rock seismic ground motions. The rock motions generated by these studies differed from each other and from the AASHTO spectrum as modified by NYSDOT. The differences were such that the resulting retrofit costs varied widely, depending upon which

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motions were adopted. To resolve this issue, NYCDOT, in association with NYSDOT and the FHWA, retained a consultant to assemble an expert panel to develop recommendations for rock motions that would be adopted uniformly by the New York City region. The panel consisted of a team of six internationally recognized experts in the fields of seismology, geology, earthquake engineering, ground motion, and geotechnical studies. There were several brainstorming workshops held in New York, where the senior officials from NYCDOT, NYSDOT, and the FHWA provided their input to the panel members.

The expert panel formulated recommendations regarding rock motions and corresponding time histories. Subsequently, the consultant derived soil generic response spectra, based on the hard rock motions and NEHRP amplification factors. The consultant also established bridge performance criteria to be used for critical, essential or other bridges undergoing structural analyses. The recommendations are described in the report entitled "New York City, Seismic Hazard Study and its Applications, Final Report, December 1998." This report is now extensively used by NYCDOT, NYSDOT, the FHWA, their consultants, and other agencies in the New York area for bridge projects. Thus, NYCDOT's leading role and efforts to establish ground motion standards have brought uniformity in seismic design to the New York City area.

In 2002, the consultant convened a second panel of seismologists to update the 1998 Hazard Study and associated rock motions. On June 3, 2004, after the USGS national hazard maps were adopted by NEHRP, in a meeting attended by NYCDOT, NYSDOT and FHWA, it was unanimously agreed to adopt the new hard rock ground motions recommended by the panel of seismologists.

Following the adoption of the very hard rock motions, the consultant started the preparation of a new edition of the NYCDOT Seismic Design Guidelines for Bridges. Data from geotechnical bridge studies performed within the five boroughs of NYC were compiled. A series of generalized subsurface soil and bedrock profiles were developed to be representative of the range of soil profiles, overburden thickness, and rock types found within NYC. A fully probabilistic approach, utilizing Random Vibration Theory (RVT) in conjunction with the new hard rock ground motions, (from the 2002 Hazard Study) and the generalized NYC subsurface profiles, was used to develop vertical and horizontal Uniform Hazard Spectra (UHS), which, in turn, served as the starting point to derive design rock and soil response spectra. The method allowed computation of soil UHS, while preserving the hazard level of the very hard rock UHS. It accounted, in a rigorous probabilistic manner, for variations and uncertainties in soil stiffness, stress-strain nonlinearity, and material damping; depth of soil to rock; and, stiffness of the rock under the soil.

Generic horizontal and vertical design spectra were derived using the calculated UHS as the starting point. Generic design V/H ratios to be used in site-specific studies to generate site specific vertical motions, were also produced. All the generic soil curves are presented as a function of three parameters: soil class; depth to rock; and, rock class under the soil.

The development of these parameters for the NYCDOT Guidelines represent a significant improvement to the previous guidelines and other codes, since it will result in better representation of the ground motions at a bridge site, bringing closer the generic ground motions to those that could be obtained from site-specific studies. The fact that the new guidelines better fit the specific characteristics of the NYC region, will permit the engineers to evaluate the need for retrofitting existing bridges or strengthening new ones at the right places.

Recommendations for liquefaction evaluation are also provided in the guidelines, including recommendations for earthquake magnitude and peak ground surface accelerations, which are critical parameters for evaluating liquefaction potential and which have not been included in previous guidelines. The new document also includes recommendations for site-specific studies, providing guidelines and minimum requirements that must be satisfied. These include: procedures to establish soil horizontal and vertical design motions; recommendations to evaluate the effects of the depth to the rock surface; recommendations to account for uncertainties in the soil properties; minimum requirements to establish lower bound horizontal design motions; recommendations for time history analysis of bridges; recommendations for the incorporation of

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spatial variation effects in the analysis; and different requirements for critical and non-critical bridges site-specific studies.

The final draft of the new NYCDOT Seismic Design Guidelines for Bridges was submitted to NYSDOT for peer review in September 2008. Upon completion of their review, these guidelines will be adopted for the seismic and retrofit design of bridges in New York State. The review is expected to be complete by the end of April 2014.

ENVIRONMENTAL ENGINEERING

In 2013, the Environmental Engineering staff of the Quality Assurance section continued to provide expertise and oversight of the various environmental issues of the reconstruction of the Paerdegat Basin Bridge, Rockaway Parkway Bridge and Fresh Creek Bridge in the Belt Parkway Project. This includes monitoring and oversight of wetland restorations, management of storm water erosion and run off controls, asbestos and lead paint abatement, hazardous waste management, spill control/management, management of waste water, and groundwater/soil management.

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Bridge Maintenance, Inspections and Operations

EAST RIVER BRIDGES ANTI-ICING PROGRAM

Traditional snow and ice control practices rely heavily on the use of salt, a material known to corrode steel and accelerate the deterioration of concrete and asphalt surfaces. A new method of snow and ice control was needed to protect the City's \$2.5 billion investment in the rehabilitated East River Bridges. This method, known as anti-icing, involves the application of a chemical freezing point depressant to the roadway surface to prevent snow and ice from bonding to the roadway. Frequent plowing removes any accumulation of unbonded snow or ice before traffic is affected.

The Division's Anti-Icing Program uses the liquid chemical potassium acetate and aggregate chemical sodium acetate. The anti-icing fleet consists of twenty-two application trucks, five plow trucks and several smaller plows. Ten of the spray trucks are combination spray/plow trucks with a 1,000 gallon tank capacity, and five are spray-spreader/plow trucks with a 360 gallon spray capacity, and a nine cubic yard spreader capacity. There are twenty chemical storage tanks, with a total storage capacity of 114,250 gallons.

New anti-icing yards storing both chemicals have been established under all four East River bridges. Supervisors monitor the bridge decks during storm events by traversing them and using thermal instrumentation installed in their vehicles to make informed decisions as to when to apply chemicals. GPS capabilities have been installed in key vehicles to assist supervisors with the decision making process.

In the winter of 2012-2013, a total of 43,540 gallons of potassium acetate and 107 tons of sodium acetate were applied on the roadways of all four East River Bridges.

INSPECTIONS

In 2013, Inspections covered 100 bridges and 543 spans. Emphasis was placed on ensuring public safety through the monitoring of potentially hazardous conditions and temporary repairs. The unit performed 430 monitoring inspections, and 76 special winter monitoring inspections of cellular structures, shorings, and potential fire hazards. In addition, 126 emergency inspections were conducted in response to hot line calls, in-house requests, or citizen complaints.



Inspecting 69th Street Over the Brooklyn-Queens Expressway and 73rd Street Pedestrian Bridge (Bow Bridge) (From a Boat) in April 2013.

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Assistant Civil Engineer Prabir Dhar Inspecting East Drive (East Wood Arch) and Mill Basin Bridge (From a Barge) in May 2013.



Winter Monitoring Locations: Manhattan, Williamsburg, and Ed Koch – Queensboro Bridges.

In 2013, as part of the upgrades following Hurricane Sandy, the Bridge Inspection field office was relocated from the low lying area near Newtown Creek in Brooklyn to a new upgraded facility in Long Island City, Queens. In addition, a new high rail bucket truck with capability to ride on rails as well as on road surfaces was obtained for the inspectors.

The Bridge Data System (BDS) allows inspection reports to be generated and transmitted electronically. It provides access to data from the latest inspection reports on all bridges to all Division units. In addition, when an emergency arises, our inspectors are able to send photographs and other information to the main office via a wireless connection to the internet. This feature enables bridge repair engineers to assess the condition and dispatch repair crews with the appropriate equipment in a timely manner. The updated version of the system was field tested by the contractor and the Bridge Management Unit in 2012 and was fully implemented in March 2013.

A future contract is anticipated to expand the BDS capabilities by incorporating data from capital reconstruction projects. Additional features will include in-depth inspection reports by consultants as well as GPS data.

Since 2002, the Division stores all bridge inspection reports in electronic format. Flag reports are now also transmitted electronically. As of September 2003, standard inspection work is funded by a federal grant. Emergency response inspections and administrative support remain city funded.

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The Bridge Management Unit developed a map of truck routes and bridges under capital contracts for the purposes of the Truck Permits Unit. This unit also provided Bridge Maintenance with estimates of the life-cycle benefits of various maintenance tasks, obtained by the software package designed for that purpose.

NON-DESTRUCTIVE TESTING

The Bridge Inspection and Management Units have pioneered the use of various nondestructive tests on City bridges, including X-ray diffraction, fiber optics, strain-gauging, ground penetrating radar, and ultrasonic testing. Future applications of such technologies are under consideration. For demonstration purposes, the Manhattan Bridge was surveyed with a radar scanner. The results indicated that the stiffening of the bridge has reduced its torsional motion under subway traffic very significantly. The results matched independent measurements by Global Positioning Systems (GPS).

In November 2010, the cable research project moved to its final phase as sensors were installed on Cable "D" of the Manhattan Bridge with the help of bridge maintenance personnel. The data collection from the instruments in the cable was concluded in October 2011. The final report will recommend appropriate non-invasive technology for monitoring of suspension cables.

As part of the project, a unique magnetic flux field test was conducted on the cable. The method was developed by Japanese researchers specifically for this test. Its purpose is to estimate the amount of healthy steel in the cable without exposing the wires. The findings were presented at the Agency by the researchers in February 2011. This capability will be considered for future inspections of suspension cables.

A new engineering services contract was registered for monitoring the Manhattan side approaches of the Brooklyn Bridge. Under the contract, selected locations will be instrumented with fiber optic sensors, allowing on-line monitoring until the rehabilitation of the spans. Completion is expected in 2014.

In 2012, the Bridge Management Unit awarded a contract for the design and installation of a real time on-line system monitoring of the abutments of three bridges in the Bronx identified as vulnerable to scour. As a first step, the consultant inspected the sites in-depth, and the findings resulted in emergency repairs conducted by the Where and When Unit. In 2013, the contract proceeded on schedule. Field data acquisition and transmission are being tested.

CLEANING

In 2013, 7,207 cubic yards of debris were removed from bridges and their surrounding areas, and 1,711 drains were cleaned.



Water Spraying the 9th Street Bridge over Gowanus Canal in July 2012.

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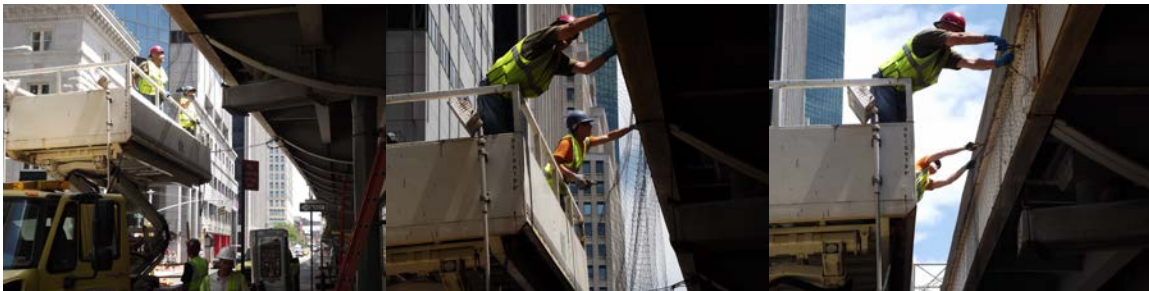
PIGEON DETERRENCE

Excessive numbers of pigeons cause property deterioration, unsafe working conditions and health hazards. Besides being unsightly, accumulation of pigeon droppings and feathers is corrosive to steel structures and raises concerns about health hazards. Many disease organisms have been associated with pigeons. They harbor ectoparasites which can infest or bite humans. Pigeon droppings also harbor fungi that can trigger serious, even fatal, lung diseases such as Histoplasmosis, Cryptococcosis and Toxoplasmosis, when the spores are transmitted to humans who breathe in the harmful dust.

The Division utilizes a relatively low tech, and passive, approach to deterring pigeons. In 2006, the type of barrier used to cage out pigeons was changed from the drop ceiling method to netting. The netting is supported by steel cables that are clipped to the beams. This method is currently in use under the Brooklyn Queens Expressway (over Prospect Street), at the Pulaski Bridge, under the Brooklyn Bridge at “Ash Alley,” and at the anti-icing tank storage area under the Brooklyn Bridge at Dover Street. In addition, a pigeon deterrent system involving low voltage wires is in place at the Belt Parkway Bridge over Ocean Parkway. The wires are installed along the web of the girders and are hardly visible, yet highly effective. The system has been in operation for over seven years now and no pigeons have been observed under or by the bridge ever since. The community is pleased that we addressed one of their most serious and longstanding complaints. The system requires minimum maintenance and is extremely easy to operate.

In 2013, we continued to experiment with a new method on the flanges over the north sidewalk at the Brooklyn-Queens Expressway over Atlantic Avenue: a gel, whose active ingredient is capsaicin, that is applied to the spots unwanted birds would normally perch. The burning sensation caused by the capsaicin irritates the birds’ feet and results in them roosting elsewhere.

In 2013, pigeon dropping removal and/or pigeon proofing were performed at the Brooklyn-Queens Expressway at Queens Boulevard and at Atlantic Avenue, the Cross Island Parkway at Linden Boulevard, the Long Island Expressway at Junction Boulevard and Woodhaven Boulevard, and Queens Boulevard at Eliot Avenue.



Installing Pigeon Netting at Old Slip (FDR Drive at the South Street Viaduct) in June 2012: Carpenters Stephen Buckley, William Sic, and Joseph Moschella, and Supervisor Carpenter Joseph Vaccaro. (Credit: Thomas Whitehouse)



Nature's Pigeon Deterrent—Falcons on the Brooklyn Bridge South Side Tower, Manhattan Tower Top, and Cables. Falcons Have Lived on the Brooklyn Bridge Since 1995. Falcon Family on the Williamsburg Bridge. According to the New York State Department of Environmental Conservation, New York State now has the largest population of peregrines in the eastern United States. There Were 20 Active Nesting Falcon Pairs in New York City in 2013. (Family Credit: Russell Holcomb)

ACCOMPLISHMENTS & PLANNED PROJECTS



“Owl” Guarding the Machinery Room of the Broadway Bridge. A Hawk on the Broadway Bridge. (Owl and Hawk Credit: Albert Hong)

BRIDGE CLASSIFICATION

The Coast Guard regulations, which govern the operation of the City’s movable bridges, define the owner’s responsibility to the mariner by classifying a bridge as “open on demand” or “open on advance notice.” An “on demand” bridge provides an immediate opening to any vessel wishing to pass the bridge. An “advance notice” bridge opens after the mariner requests an opening several hours in advance. “On demand” bridges must be staffed at all times. “Advance notice” bridges are staffed only when necessary. DOT redesigned the work process in order to reduce personnel costs to the City and improve the delivery of services to the maritime community.



Pulaski Bridge Opening in February 2010. (Credit: Bernard Ente) Third Street Bridge Opening in June 2012. (Credit: Nikita Gupta) 145th Street Bridge Open in June 2013. (Credit: Ting Yu Huang) Ninth Street Bridge Open in September 2013. (Credit: Vera Ovetskaya)

In October 2000, the Department implemented the United States Coast Guard-approved changes, establishing a four-hour notice for the Harlem River bridges, and a two-hour notice for the remaining “advance notice” bridges. The “on demand” classification remains for three bridges. The revised advance notice requirements allowed the formation of mobile crews with overlapping responsibilities, meeting the mariners’ needs and, in some instances, improving service by providing two mobile crews to expedite a vessel’s travel along a waterway.

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The reduction in planned personnel saves approximately \$1,042,480 annually. In addition, bridge operational capabilities, general maintenance, and debris and snow removal have been enhanced through the more efficient utilization of existing personnel.

Currently in its final design phase, the reconstruction of the Mill Basin Bridge (part of the second Belt Parkway Group) is scheduled to start in winter 2014. The new bridge will be a fixed structure with a 60-foot clearance over Mean High Water, obviating the need for opening and closing the structure to accommodate tall vessels.

The Shore Road Bridge over Hutchinson River will be replaced with a new bridge built with a higher clearance, thereby reducing the number of times the bridge must be opened. At that time, we can determine if advance notice is justified.

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Summary of Vessel Openings 1999 - 2013

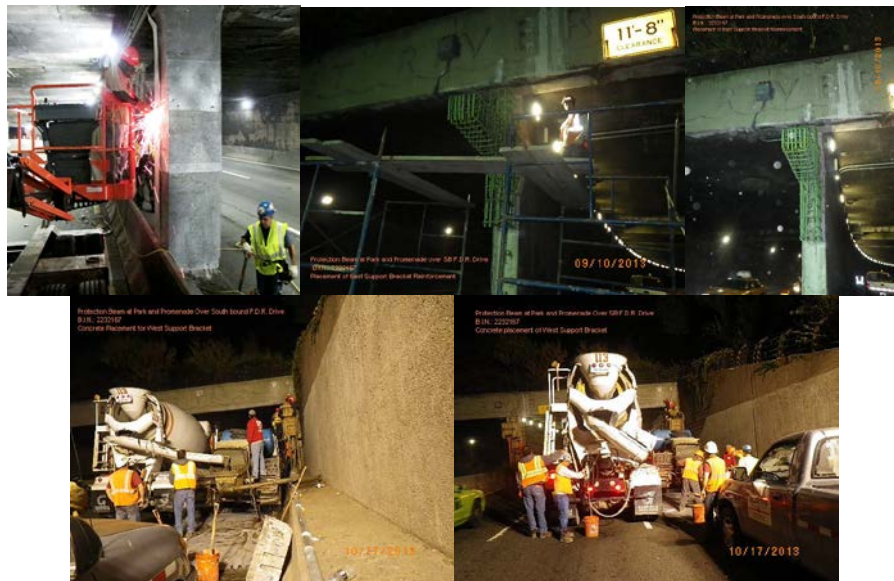
| | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 | 2013 |
|------------------------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Brdn Ave. (Q) | 3 | 0 | 28 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| Brdwy (B/M) | 0 | 6 | 27 | 83 | 49 | 16 | 2 | 18 | 42 | 58 | 57 | 15 | 11 | 44 | 0 |
| Brecknr Expwy (Unnpnt Brdg) (B) | 345 | 385 | 420 | 332 | 300 | 309 | 253 | 250 | 281 | 323 | 349 | 308 | 198 | 143 | 143 |
| Carroll St. (K) | 174 | 102 | 80 | 124 | 186 | 49 | 22 | 28 | 13 | 38 | 91 | 146 | 29 | 95 | 2 |
| Grand St. (K/Q) | 24 | 17 | 50 | 19 | 10 | 8 | 5 | 2 | 5 | 0 | 0 | 0 | 3 | 3 | 0 |
| Grnpoint Ave. (K/Q) | 787 | 688 | 641 | 659 | 738 | 1093 | 1045 | 905 | 641 | 485 | 428 | 388 | 667 | 733 | 609 |
| Hmltn Ave. (K) | 982 | 933 | 832 | 946 | 824 | 757 | 677 | 1077 | 354 | 0 | 150 | 905 | 1060 | 965 | 651 |
| Hntrs Point Ave. (Q) | 1 | 0 | 36 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Htchnsn River PkwY (B) | 46 | 5 | 120 | 30 | 5 | 37 | 10 | 2 | 51 | 61 | 170 | 224 | 169 | 197 | 275 |
| Macombs Dam (B/M) | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 4 | 2 | 0 | 3 | 1 | 22 | 0 |
| Mdsn Ave. (B/M) | 0 | 0 | 0 | 0 | 0 | 7 | 0 | 9 | 35 | 8 | 0 | 3 | 1 | 6 | 0 |
| Metrlptn Ave. (K) | 513 | 279 | 366 | 339 | 342 | 153 | 0 | 104 | 329 | 245 | 240 | 254 | 413 | 468 | 378 |
| Mill Bsn (K) | 433 | 336 | 317 | 142 | 173 | 164 | 162 | 174 | 182 | 190 | 183 | 197 | 236 | 277 | 246 |
| Pulaski (K/Q) | 383 | 276 | 208 | 308 | 599 | 694 | 734 | 433 | 489 | 639 | 611 | 467 | 591 | 476 | 484 |
| Rsvlt Islnd (M/Q) | 0 | 58 | 48 | 125 | 63 | 669 | 150 | 54 | 48 | 0 | 62 | 0 | 0 | 55 | 55 |
| Shore Rd (Pelham Pky) (B) | 2162 | 2168 | 2222 | 1897 | 1910 | 2011 | 1683 | 1704 | 1645 | 1446 | 806 | 1197 | 811 | 613 | 697 |
| Union St. (K) | 144 | 85 | 101 | 62 | 24 | 21 | 11 | 9 | 5 | 10 | 28 | 32 | 4 | 36 | 0 |
| Ward's Isnd Pdstrn (M) | 0 | 0 | 279 | 0 | 0 | 7 | 2 | 8 | 4 | 6 | 3 | 5 | 0 | 0 | 0 |
| Willis Ave. (B/M) | 4 | 4 | 40 | 0 | 7 | 25 | 2 | 41 | 67 | 17 | 9 | 1 | 1 | 0 | 0 |
| 3 rd Ave. (B/M) | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 6 | 60 | 7 | 0 | 3 | 3 | 4 | 2 |
| 3 rd St. (K) | 157 | 178 | 117 | 212 | 152 | 99 | 43 | 31 | 39 | 49 | 89 | 74 | 27 | 68 | 0 |
| 9th St. (K) | 192 | 513 | 808 | 733 | 547 | 457 | 360 | 480 | 333 | 287 | 387 | 475 | 670 | 585 | 270 |
| 145 th St. (B/M) | 0 | 1 | 6 | 0 | 0 | 9 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 6 | 0 |
| W.207 th St. (B/M) | 0 | 6 | 14 | 4 | 6 | 10 | 1 | 12 | 24 | 2 | 3 | 7 | 5 | 23 | 0 |
| TOTAL | 6352 | 6041 | 6761 | 6015 | 5935 | 6595 | 5163 | 5347 | 4652 | 3873 | 3666 | 4704 | 4901 | 4819 | 3812 |

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When and Where Unit

In 2013, the following structures were worked on under the Division's When and Where contracts: Henry Hudson Parkway Viaduct over West 72nd to West 79th Street, Trans-Manhattan Expressway over Harlem River Drive Northbound Ramp, Riverside Drive Bridge over West 158th Street, West 155th Street Pedestrian Bridge over Amtrak 30th Street Branch, Promenade over FDR over FDR/East 79th Street- East 91st Street, FDR Drive Overpass at 90th Street – Protection Beam, Pedestrian Bridge at 73rd Street over Conrail, East 6th Street Pedestrian Bridge over FDR Drive, West 181st Street Pedestrian Bridge over Henry Hudson Parkway Northbound, East 126th Street Pedestrian Bridge over FDR Drive, West 207th Street Bridge over Harlem River, Boston Post Road Bridge over Hutchinson River, West 34th Street Bridge over Amtrak 30th Street Branch, Bruckner Expressway Service Road Bridge over Westchester Creek, East 241st Street Bridge over Bronx River Parkway-Metro North, Ramp to Northbound Henry Hudson Parkway over Amtrak, East 233rd Street Bridge over Metro North Railroad, Nereid Avenue Bridge (East 240th Street) over Bronx River Parkway, Third Avenue Bridge over Harlem River, Madison Avenue Bridge over Harlem River, Northern Boulevard Westbound over Flushing River, Northern Boulevard Eastbound over Flushing River, 44th Street Bridge over Grand Central Parkway, Bell Boulevard Bridge over LIRR, and 28th Avenue Pedestrian Bridge over Cross Island Parkway.

Currently scheduled projects include the construction of a protection beam for the Park and Promenade over the southbound FDR Drive at 91st Street. This protection beam is necessary because on too many occasions, errant trucks have found their way onto the southbound FDR Drive and caused damage to the underside of the overhead structure supporting the park and promenade between East 79th Street and East 91st Street. The effect of such repetitive hits is cumulative, and increases the threat to the safety of the FDR Drive traffic and the users of the promenade and park above it in this area. The beam will reduce the chances of trucks making contact with the overhead structure and thus provide an additional measure of safety for the public.



Night Work on Safety Flags on the FDR Drive in July 2013. FDR Drive Protection Beam: Placement of East Support Bracket Reinforcement. Concrete Placement for West Support Bracket.

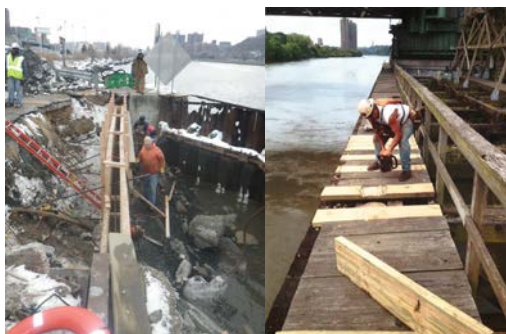
MARINE WHEN AND WHERE

New York State DOT conducts the underwater inspections of our waterway structures. A contract was needed to facilitate the performance of marine repairs and to maintain structures in need.

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The objective is to perform marine structural repairs and maintenance together with other appurtenant work, which constitutes repairs of defective and deteriorated parts of bridge structures due to, and in a water environment. The Department has neither the in-house staffing nor the equipment to handle this type of special work. These repairs could not be handled under the usual time and materials When and Where contract, because the work is unique, in that it requires a consultant with licensed underwater capability to supervise and inspect the work for compliance and adequacy. Furthermore, detailed note taking is necessary by the inspectors to check and approve payments for the contractor's work.

Marine bridge repairs addressed in 2013 include 145th Street Bridge over Harlem River, Wards Island Pedestrian Bridge over Harlem River, Bruckner Expressway Service Road Bridge over Westchester Creek (Unionport Bridge), Shore Road (Pelham Parkway) Bridge over Hutchinson River, Depot Place Bridge over Conrail Hudson, East 81st Street Pedestrian Bridge over FDR Drive, Hutchinson River Parkway Bridge over Hutchinson River, West 207th Street Bridge over Harlem River, and Macombs Dam Bridge over Harlem River.



Depot Place Bridge Over Conrail Hudson –
Rebuilding a Collapsed Bulkhead and Undermined
Roadway. West 207th Street Bridge: Repairing the
Pier Deck.

Some of these locations experience repeated damage due to heavy marine traffic and/or a narrow channel, such as the Shore Road (Pelham Parkway) Bridge over the Hutchinson River. The issuance of new flags occasionally necessitates new visits to even recently completed projects. Timber fender systems especially susceptible to recurring hits by barge traffic, and consequently require periodic restoration in relatively short time periods. In addition to damage due to impact, timber elements are also replaced because of deterioration and attack by marine borers, whose activity has vastly increased as the water quality in the New York City area has improved.

Numerous barge hits at the Shore Road Bridge occur repeatedly. As a result, a continuation and completion of previously reported work of replacing timber planking and walers took place at this location, as well as installation of a special plastic material called “UltraPoly” at the top portion of the fender planking and at selected dolphin piles. So far, this material has been shown to protect against rubbing damage.

At the Bruckner Expressway Service Road Bridge over Westchester Creek (Unionport Bridge), extremely serious deterioration occurred at critical steel structural elements. A red flag notification was placed on this condition, and major repairs were made. These repairs had to be staged from the waterway below on a work barge, to avoid an unacceptable massive traffic interruption that would be caused at this critical connector to the Bruckner Expressway and Cross-Bronx Expressway by working from the bridge deck surface.

A similar situation presented itself on the heavily traveled Hutchinson River Parkway Bridge over Hutchinson River. Severe deterioration of key structural steel elements supporting the steel grid deck of the southeastern quadrant of the span forced urgent measures to be taken, first, by providing immediate temporary replacements to take over part of the lost support capability, and

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subsequently, by installing new steel replacement “sleeper” beams and heavy local support at deteriorated stringer sections.

The southwest fender system of the Wards Island Pedestrian Bridge was severely battered by an impact from a large barge, leaving its timber structure dislocated, damaged and incapable of providing the designed protection from future barge hits. It was immediately necessary to temporarily provide safety measures to warn off mariners from coming too close to the debris field created as a result of that impact. However a complete replacement fender system must be built to ensure the safety of the west tower of the bridge. Preparations for that construction began in December 2013.



Macombs Dam Bridge over Harlem River: Fender System Repair.



Bruckner Expressway Service Road Bridge over Westchester Creek (Unionport Bridge): Steel Repairs. Completed Steel Repair With Primer Paint Coat.



145th Street Bridge Over Harlem River: Repairing the Horizontal Fender System. Wards Island Pedestrian Bridge: Collapsed Pier #6 Fender. Installing Protective Fencing.

PAINTING

In 2013 the following bridges were painted as part of the in-house maintenance program: Flatbush Avenue Bridge over Belt Parkway, Westchester Avenue Bridge over Hutchinson River Parkway, Jamaica Avenue Bridge over Cross Island Parkway, Miller Highway Terrain,

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Douglaston Parkway Bridge Railings over Cross Island Parkway, Francis Lewis Boulevard Bridges (Westbound and Eastbound) over Laurelton Parkway, Houston Street Bridge over the FDR Drive, East 156th Street Access Bridge to Housing, Northern Boulevard Bridge over Cross Island Pkwy, Astoria Boulevard Bridge (Eastbound) over Brooklyn-Queens Expressway West Leg, Eagle Avenue Bridge over East 161st Street, Seeley Street Bridge over Prospect Avenue, Highland Boulevard Bridge (Northbound) over Vermont Avenue, Ocean Avenue Pedestrian Bridge over Sheepshead Bay, Grand Concourse over East 175th Street, Grand Concourse over East Kingsbridge, Mosholu Parkway Bridge over Webster Avenue, West 176th Street Pedestrian Bridge Approach to George Washington Bridge, Atlantic Avenue Service Road (Westbound) over East New York Avenue, and, Jackie Robinson Parkway Bridge over Austin Street.

In 2013 the following bridges were painted as part of the capital program: Huguenot Avenue, Giffords Avenue, Richmond Valley Road, and Seguine Avenue Bridges over Staten Island Rail Road, and the Greenpoint Avenue Bridge over Newtown Creek.

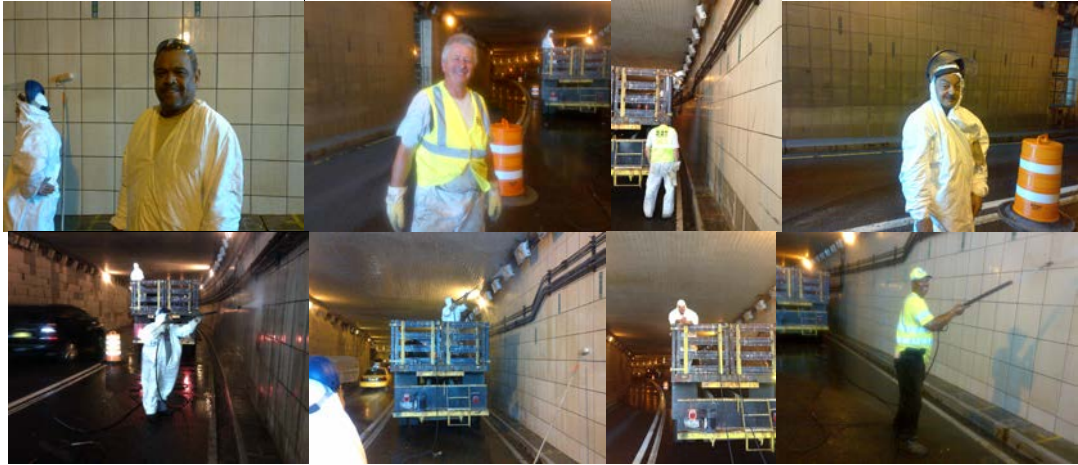


May 2013: Greenpoint Avenue Bridge. (Credit: Vadim Sokolovsky)

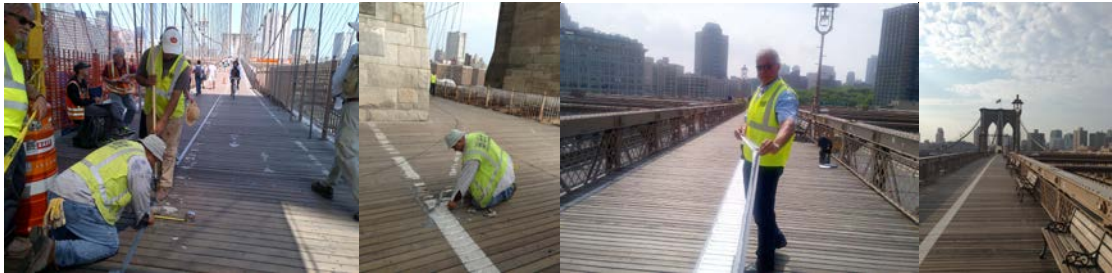


May and August 2013: Painting the Miller Highway Terrain. Bridge Painters Herbert Rodriguez, Richard Mocciano, Arlindo Lima, and Frank Duic, Deputy Director of In-House Painting Earlene Powell, and Bridge Painters Michael Scotti and Willie Tyler. (Credit: Hughie Flood) Checking the Work in October 2013: Bridge Painter Herbert Rodriguez, Supervisor Bridge Painter Hughie Flood, Bridge Painters Richard Mocciano, Willie Tyler, Michael Scotti, Arlindo Lima, and Frank Duic. (Credit: Earlene Powell)

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July 2013: Bridge Painters Jaime Andrade, Branko Grzanic, Louis Masucci, Nicholas Krevatas, and Supervisor Bridge Painter Reynaldo Grant Power Washing the Battery Park Underpass. (Credit: Earlene Powell)



June 2013: Bridge Painters Robert Avellino, Goncalo Lima, and Safdar Ali Reapplying the Brooklyn Bridge Line Striping. Bridge Painter Goncalo Lima. Supervisor Bridge Painter Vincent Babajko Checking the Work. Completed Striping. (Credit: Earlene Powell)

During 2013, the following structures were also painted: Battery Park Tunnel areas, Department of Transportation Ironworker Shop and Garage at 59th Street, Department of Transportation Facility at Wythe Avenue, Department of Transportation Facilities at the Harper Street Maintenance and Repair Shop, Department of Transportation Ironworker and Carpenter Shops at Kent Avenue, Department of Transportation Facilities at South 6th Street, Greenpoint Avenue Bridge House, Department of Transportation Mason Facility in Long Island City, First Avenue Tunnel at 47th Street, Park Avenue Underpass control room, Department of Transportation Facility at Metropolitan Avenue, FDR Drive underpass at East 84th Street, and 57th Street Underpass at Sutton Place.

The following locations were also worked on in support of the DOT Iron Worker Shop: Hamilton Avenue Asphalt Plant, Grand Street Bridge, FDR Drive at Marginal Street, Harlem River Drive Ramp to Harlem River Drive Northbound, Ed Koch - Queensboro Bridge, Westchester Avenue Bridge over Hutchinson River Parkway, Mill Basin Bridge, and Union Street Bridge.

GRAFFITI REMOVAL

In 2013, 3,541,000 square feet of graffiti were eliminated. This program focuses its primary attention on the four East River bridges, as well as the following 21 arterial highways: Clearview Expressway, Gowanus Expressway/Belt Parkway, Major Deegan Expressway, Harlem River Drive, Van Wyck Expressway/Whitestone Expressway, Brooklyn-Queens Expressway, Jackie Robinson Parkway, Sheridan Expressway, Hutchinson River Parkway, Henry Hudson Parkway, West Shore Expressway, Richmond Parkway, Martin Luther King Jr. Expressway, Staten Island Expressway, Bruckner Expressway, Prospect Expressway, Grand Central Parkway, Long Island Expressway, Cross Bronx Expressway, Nassau Expressway, and Bronx River Parkway.

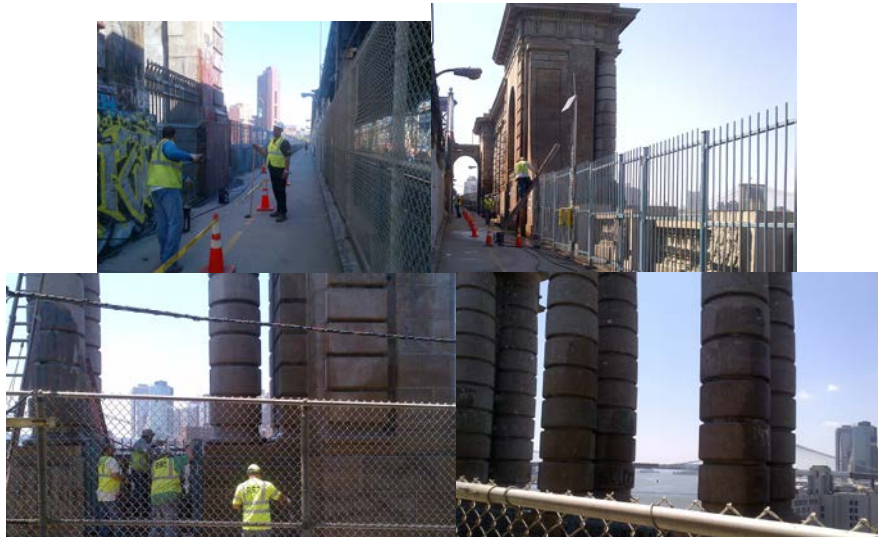
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June 2013: Removing Graffiti at Canal and Forsythe Streets. (Credit: Robert Avellino)



June 2013: Bridge Painter Willie Tyler Removing Graffiti From the Brooklyn Bridge. (Credit: Earlene Powell) Bridge Painter William Budge Removing Graffiti From the Manhattan Bridge. October 2013: Bridge Painters Jaime Andrade and Louis Masucci Removing Graffiti From the Long Island Expressway. (Credit: Earlene Powell)



June 2013: Bridge Painter Jaime Andrade and Supervisor Bridge Painter Reynaldo Grant Removing Graffiti on the Manhattan Bridge. (Credit: Earlene Powell)

During 2013, graffiti was also removed from the following structures: Monroe Street under Manhattan Bridge, Richmond Avenue at Richmond Creek, Cross Island Parkway, 78th Avenue at Woodhaven Boulevard, Borden Avenue Bridge, Hawtree Basin at 163rd Avenue, Jerome Avenue

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at Parkview Terrace, Laurel Hill Boulevard at Brooklyn-Queens Expressway, Parkview Terrace at East 196th Street, 25th to 27th Street at FDR Drive, 35th to 37th Street at FDR Drive, 215th Street at Broadway, Cherry Street under Manhattan Bridge, Pulaski Bridge, Five Borough Bike Tour Route, Staten Island Ferry Terminal, Mosel Avenue at Staten Island Expressway, Havermayer Avenue at Williamsburg Bridge approach, Columbus Avenue and 90th Street, Grand Concourse at 172nd Street, Bruckner Boulevard, South 6th Street Department of Transportation Garage, Conduit Boulevard, Grand Concourse at East 161st Street, FDR Drive and Grand Avenue, Belt Parkway at Bay 14th Street and Bay 8th Street, 212th Street in Queens, Honeywell Street Overpass at 39th Street, 31st Avenue at 68th Street, Astoria Boulevard over Brooklyn-Queens Expressway, Belt Parkway at East 12th Street, Grand Concourse at Kingsbridge Road, Jackie Robinson Parkway at Austin Street, 11 Avenue and 33rd Street, and the NYC Marathon route.

RESEARCH AND PRESENTATIONS

In 2013 research work and/or case histories of the Division were presented in the following proceedings:

The Society for Protective Coatings, 2013 International Conference and Exhibition, San Antonio, Texas, 14 – 17 January 2013. Vainblat, G. *Brooklyn Bridge - Repainting the Most Iconic Structure in the World.*

Municipal Engineers of the City of New York, New York City, 28 February 2013. Duran, B., Lotfi, R., Desai, M., and Ankrah, H. *Rehabilitation of Ramps at the St. George Ferry Terminal.*

ASCE Metropolitan Section Infrastructure Group Seminar, New York City, 8 - 9 April 2013. Collyer, Robert O. *Storm Surge Impact on NYCDOT Bridges and Tunnels.*

New York State Association of Transportation Engineers Annual Conference, Rochester, New York, 10 May 2013. Collyer, Robert O. *Storm Surge Impact on NYCDOT Bridges and Tunnels.*

Cabinet Talk Show VII, New York City, 30 May 2013. Yanev, B. *NYCDOT Bridge Inspection History and Mission.*

ICOSSAR2013 - 11th International Conference on Structural Safety & Reliability, New York City, 16 – 20 June 2013. Savoia, M., Vincenzi, L., Bassoli, E., Gambarelli, P., Betti, R., and Testa, R. *Identification of the Manhattan Bridge Dynamic Properties for Fatigue Assessment.*

2013 New York City Bridge Conference, New York City, 26 – 27 August 2013. Gandhi, K. *Lindenthal and Manhattan Bridge Eyebars Chain Controversy.*

2013 New York City Bridge Conference, New York City, 26 – 27 August 2013. Leo, R., and Reynolds, P. *Brooklyn Bridge Orthotropic Deck Installation.*

2013 New York City Bridge Conference, New York City, 26 – 27 August 2013. Vainblat, G. *Repainting the Iconic Brooklyn Bridge.*

École des Ponts ParisTech, Paris, 19 September 2013. Dr. Yanev lectured on bridge management.

Federal Highway Administration's Exploratory Advanced Research Program and the National Center for Education and Research on Corrosion and Materials Performance - Workshop on Corrosion Management for Sustainable Bridges, Akron, Ohio, 10 – 12 December 2013. Dr. Yanev delivered the opening presentation.

Dr. Yanev chairs the Subcommittee on Bridge Safety and Security, and is a member of the Transportation Research Board Committees on Bridge Maintenance, Management, Seismic Design, and Non-Destructive Testing.

In addition, the Division sponsors an in-house lecture series, inviting speakers from industry and academia several times a month. Highlight topics of the presentations in 2013 included: Liquid

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waterproofing system, corrosion technology, elastomeric concrete for bridge deck and joint repairs, bridge deck expansion joints, and design and construction of the Milton Madison Bridge.



Repairing the Concrete Overlay on the South Upper Roadway of the Ed Koch – Queensboro Bridge in June 2013.
(Credit: Sunil Desai)



Bridge Repairer and Riveter Kevin Clarkson Installing Anemometers on the Ed Koch-Queensboro Bridge in July 2013.
(Credit: Paul Schwartz)



June and August 2013 – Ninth Street and 145th Street Bridges: Summer Interns Ting Yu Huang and Brandon Bernard Conducting Strain Gauge Testing. (Credit: Vera Ovetskaya). October 2013 - Summer Intern Brandon Bernard and Assistant Mechanical Engineer Vera Ovetskaya on the Greenpoint Avenue Bridge.

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August 2013: Supervisor Highway Repairer Salvatore Zito and Assistant City Highway Repairer Luciano Cardona Removing Unauthorized Decorations From the Brooklyn Bridge. (Credit: Michael Cumiskey). Chief Bridge Officer Henry D. Perahia at the 2013 New York City Bridge Conference. (Credit: Jagtar Khinda)



October 2013: Repairing the Ed Koch – Queensboro Bridge Stringers After a Truck Fire. Assistant Civil Engineer Andrew Hoang Inspecting the Measurements. Bridge Repairer and Riveters Charlie Zhao (Green Jacket), Yiu Liu (Yellow Jacket), Randall Palmenta, and Ignazio Trapani. Putting Up the New Beam. (Credit: Hany Soliman)



December 2013 – Repairing Deteriorated and Spalled Concrete (Yellow Flag) at the Top Portions of the Pier Columns on the Astoria Boulevard Bridge over BQE West Leg.