

A. OVERVIEW OF CONSTRUCTION ACTIVITIES

This chapter summarizes the preliminary construction plan for Brooklyn Bridge Park and identifies impacts that could result from project construction. Construction stages and activities are described first (to the extent that they are known), followed by the types of impacts likely to occur during construction. The description of construction starts with upland new construction, then upland renovation, followed by in-water construction. The technical areas where the potential for impact are analyzed include: economic conditions, air quality, noise, transportation, contaminated materials, water quality and natural resources, infrastructure, and rodent control. The assessment also describes methods that may be employed to minimize those impacts. As detailed below, no significant adverse impacts are expected from the construction of Brooklyn Bridge Park.

B. CONSTRUCTION ACTIVITIES

The construction of the proposed Brooklyn Bridge Park is expected to begin in 2007 or 2008 with completion anticipated in 2012. Construction activities would involve park and landscaping, new building construction, renovation and reuse of existing buildings, and waterfront construction of the bulkhead, piers, and marina. Each construction area would require different types of construction activities. The upland elements, including parks, buildings and renovations, are expected to generally use conventional construction techniques. The equipment and storage areas would likely be land-based. The in-water elements, such as bulkhead, pier, and marina construction, would likely employ marine-based rather than shore-based construction techniques. Large barges would be used for the heavy construction equipment, such as the pile drivers. Materials would likely be transported and stored on waterborne barges. However, certain areas may be inaccessible to barges due to inadequate water depth, and the equipment may have to be land-based. The proposed project elements and construction required for each element are described below.

SCHEDULE

Under the construction schedule that is currently anticipated, design development and construction documents for the various park areas would be completed in 2006 and 2007. Following bid negotiations, construction on the first park segments would begin in 2007, with the earliest construction commencing on Piers 1-5, the John Street Site, and portions of the area upland of the project piers. In the last quarter of 2007, work would begin in the area underneath the Brooklyn Bridge, and by 2008 work would be underway on Pier 6. Portions of the park would be completed by 2010 and the final construction on the development component of Pier 1 (the hotel and residential building) would be completed in 2012. Other than the conversion of 360 Furman Street, which would be the first development area to be completed, construction of the development parcels would generally proceed in tandem with that of the adjacent area of the

park and on overall basis the development parcels would not be completed prior to construction of the full park.

UPLAND

NEW CONSTRUCTION

Currently six new buildings are planned for Brooklyn Bridge Park. Two new residential buildings with a total of about 430 units would be constructed on the Pier 6 upland. The residential, hotel, and restaurant development in the vicinity of Pier 1 would consist of three buildings. The hotel would be about 225 rooms, the residential development would be about 150 units, and the restaurant would be about 10,000 square feet. A 130-unit residential building would be constructed on a parcel along John Street between Adams and Pearl Streets, known as the John Street Site. In the design and construction of the permanent structures, floodplain protection measures, such as elevating the structure above flood hazard level or flood-proofing the lower levels, would be implemented.

In addition to building construction, work throughout the upland areas of the park would entail earthwork and landscaping and construction of park entrances, walkways, site furnishings, playgrounds, pavement, and lighting. Approximately 20 of the 33 acres located within the upland portion of the project area would be graded and converted to pervious landscaped plant habitats. A paved promenade would run the full length of the park along the waterfront, allowing access to the waterfront and providing a visual connection to the East River and Upper New York Harbor.

Some new roadways would be constructed from Furman Street to provide access to the new buildings by Piers 1 and 6 and to 360 Furman Street. Limited parking would be constructed on Pier 5, Pier 1, and on the Con Edison site. Overall, about 1,283 parking spaces would be provided. An elevated connection would be created over Furman Street between the Pier 1 area and the existing Squibb Park, just west of Columbia Heights at Middagh Street.

Several large buildings would need to be demolished to accommodate the new construction, including the National Cold Storage buildings and the Purchase building. Demolition would be the first activity on the development parcels.

The installation of connections to the existing water, gas, electric, telephone, and sanitary utility lines would also be required. The majority of the utility connection work would be within the park area. Basic infrastructure already exists in the streets.

CONSTRUCTION ACTIVITIES

It is anticipated that the bulk of construction activities related to the new construction would take place Monday through Friday, although the delivery or installation of certain critical equipment and construction activities could occur on weekend days. The permitted hours of construction, which are regulated by the New York City Noise Code and the New York City Department of Buildings (DOB), apply in all areas of the City, and are reflected in the collective bargaining agreements with major construction trade unions. In the event that overtime work is required, appropriate work permits from the DOB would be obtained. In accordance with City regulations, work could begin at 7 AM on weekdays, with some workers arriving to prepare work areas between 6 AM and 7 AM. Normally, work would end at 4:30 PM, unless overtime is required

and appropriately permitted. On occasion, overtime may be required to complete some time-sensitive tasks beyond normal work hours on weekdays and possibly on weekends.

Construction staging would most likely occur within or next to the development sites themselves, but may extend into one lane on adjacent streets. Efforts would be made to maintain traffic flow and to minimize adverse effects from potential lane/sidewalk closures on pedestrian and vehicular circulation. Builders would be required to plan and carry out noise and dust control measures during construction. In addition, there would be requirements for street crossing and entrance barriers, protective scaffolding, and strict compliance with all applicable construction safety measures. The anticipated construction phases are described below.

Demolition

The first phase of demolition is asbestos abatement and lead-based paint removal. These are specialty tasks that are strictly regulated in New York City to protect the health and safety of the construction workers and nearby residents and workers. Depending on the extent of the asbestos and lead-based paint, either the whole building or portions of the building would be enclosed in plastic sheeting. The sheeting prevents any asbestos or paint particles from becoming airborne into the surrounding area. Specially trained workers in protective clothing use hand tools to remove the asbestos and lead-based paint. These materials are sealed in bags and taken to licensed landfills for disposal. After a New York City inspector certifies that the building is asbestos and lead-based paint free, general demolition begins. Depending on the amount of asbestos and lead-based paint to be removed, 10 to 20 workers can be on site, and about one or two truckloads of materials can be removed per day. This phase is expected to last about a month.

The next step in general demolition is to remove any economically salvageable materials, and then large equipment is used to collapse the building. Typical demolition requires solid temporary walls around the building to prevent accidental dispersal of building materials into areas accessible to the general public. After the building is collapsed, bulldozers and front-end loaders are used to load materials into dump trucks. The demolition debris is taken to landfills for disposal. Depending on the size of the building demolished, about 10 to 20 workers are on site, and two to four truckloads of debris are removed per hour. The general demolition phase is expected to last 1 to 3 months.

Because of their condition, the National Cold Storage buildings would be demolished with or without the proposed project. Special techniques would be required for demolition of the National Cold Storage buildings, because of their extremely thick walls.

Foundations and Below-Grade Construction

Post-demolition construction for new buildings would begin with excavation for the foundation and below-grade work. Foundation work would include the use of such equipment as excavators, bulldozers, rockbreakers, loaders, pumps, backhoes, tractors, hammers, pile drivers, motorized concrete buggies, concrete pumps, jack hammers, pneumatic compressors, a variety of small, mostly hand-held tools, dump trucks, and concrete trucks. Excavation of the foundation would be the first step. The bulldozers would excavate the soil and load it onto trucks for transport and disposal. The trucks would remove any excavated material and construction debris or redistribute it on-site. Then, concrete trucks would arrive at the site with pre-mixed concrete and pump it into the site to form the foundations and building walls. At the same time, infrastructure

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connections would be built. These include lines for water, sewer, stormwater, electricity, and telecommunications.

Because of the proximity of the East River, excavation areas may have to be dewatered. The water would be sent to a sedimentation tank so that the suspended solids could settle out. Depending on the building site, the decanted water would be discharged either into the New York City sewer system or the East River, and the settled sediment conveyed to a licensed disposal area. Discharge into the sewer system is governed by New York City Department of Environmental Protection (DEP) regulations, and discharge into the East River is governed by New York State Department of Environmental Conservation (DEC) regulations.

It is estimated that foundations and below-grade construction for each of the proposed buildings would last for approximately 6 to 9 months. Uncontaminated excavated material would be disposed off-site via trucks or potentially reused on the project site as fill. Pile driving may be required during this phase and would last for approximately 2 to 3 months. During this phase of construction, about 40 to 50 construction workers would be on site.

Superstructure

Construction of the exterior enclosure or “shell” of the new buildings would include construction of the buildings’ framework (installation of beams and columns), floor decks, facade (exterior walls and cladding), and roof construction. These activities would require the use of equipment such as tower cranes, derricks, compressors, personnel and material hoists, front-end loaders, concrete pumps, on-site bending jigs, welding machines, and a variety of hand-held tools, in addition to the delivery trucks bringing construction materials to and waste from the site. On average, about 75 to 100 construction workers would be required for this phase on a daily basis for each building with more expected during overlapping phases.

Interior Construction and Finishing

This stage would include the construction of interior walls, installation of lighting fixtures, and interior finishes (flooring, painting, etc.), as well as mechanical and electrical work, such as the installation of elevators. For renovated buildings, interior demolition of buildings, or partial removal of walls, could also be required. Mechanical and other interior work would last 12 to 18 months and could overlap with other phases. As mentioned above, it is expected that this phase would employ 100 to 150 employees with a greater number of employees expected during phase overlaps. Equipment used during interior construction would likely include exterior hoists, pneumatic equipment, delivery trucks, and a variety of small hand-held tools.

Landscape

Upland construction activities would utilize excavation machinery for placement of underground utilities (gas, electric, sanitary, and sewers) and new structures on the uplands. Graders, bulldozers, and backhoes would likely be utilized for removal of asphalt, pavement, or earth areas. Areas of concrete would require removal by jack hammers and air compressors. Concrete spreaders, mixers, and vibrators would be required for pavement bases, retaining walls, and footings throughout the park. Excavators, backhoes, front-end loaders, dump trucks, and flatbed transport trucks with boom cranes would be utilized for the planted areas of the park. Fill material to be used in the construction of the upland hills would be brought by barge and stored on site.

RENOVATION

Several existing buildings in the project area would be renovated and reused. These include the building at 360 Furman Street between Piers 5 and 6, which would be enlarged with a 2-story addition on the main roof and would be converted to residential use. The now-vacant historic Empire Stores warehouses would be converted to a restaurant/retail/institutional facility, and an existing building at the Pier 6 upland would be reused. Portions of other buildings would also be retained: the exterior shell of the former Tobacco Warehouse would be restored, along with other possible improvements, and portions of the warehouse sheds on Piers 2 and 3 would be reused for active recreation or transformed into shade structure. The existing building used by DEP, adjacent to the Manhattan Bridge at Washington Street, may also be reused.

Renovation of buildings involves fewer phases than new construction. The foundations and core are already in place and do not have to be newly constructed. The first phase is asbestos abatement and lead-based paint removal. As discussed above, these are specialty tasks that are strictly regulated in New York City to protect the health and safety of the construction workers and nearby residents and workers. After a New York City inspector certifies that the building is asbestos and lead-based paint free, general interior demolition begins. Depending on the condition of the building and the construction, all interior walls could be removed for a “gut” renovation or only some of the interior partitions demolished. The waste materials are removed for disposal at a licensed landfill. The interior finishing is the same as described above for new construction.

WATERFRONT CONSTRUCTION

BULKHEAD TREATMENT

Under the current plan, an esplanade would be constructed around the perimeter of each pier, and Piers 3 and 2 would also have water-level pedestrian walkways. A waterfront promenade would extend roughly along the bulkhead line. Walkways and shallow water habitat would be created along the vicinities of Piers 1 and 5, and walkways and an esplanade would be constructed along the bulkhead line north of the existing Main Street Park.

Portions of the park promenade would be created from the existing high- and low-level relieving platform that runs between Piers 4 and 5 the shoreline between Piers 1 and 6. Where the park promenade would be constructed in the vicinity of the low-level platforms, the excavation of existing fill from the top of the existing low-level relieving platform, located inland of the high-level platform, would be followed by demolition of the low-level platform. The high-level platforms would be stabilized and repaired. In the area of Pier 4, approximately ½ acre of upland material would be removed to create a beach, new open water and intertidal areas. To create the beach, the existing upland material would be excavated, regraded, and covered with sand. In areas between Piers 4 and 5, rip-rap slopes would be provided to link the existing upland area with the new intertidal area. In a similar fashion, rip rap slopes would be provided to link the existing pile supported Pier 4 structures and associated upland with the new intertidal areas, effectively transforming the existing Pier 4 into an island.

At Piers 2 and 3, where portions of the high-level platforms are to be removed, the asphalt and fill on the low-level platform would be excavated and the platforms repaired. Along the southern face of Pier 1, the timber bulkhead wall would be removed and replaced with a rip-rap edge. In addition, the existing high level platform and approximately half of the existing piles at Pier 1 would be removed. The piles would be removed to the mudline. Along the eastern side of Pier 1,

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a new steel sheetpile bulkhead would replace the existing timber bulkhead and connect to the new rip rap edge. New sheetpile with rip-rap would be installed on the eastern side of Pier 1 to stabilize the bulkhead wall, and new riprap would also be installed at the toe of the existing sheet pile along the East River. A steel bulkhead with retained fill would be constructed at the John Street Site. Bulkhead repairs would require cranes, most likely mounted on barges, to remove and/or replace stones and front-end loaders to transport stones or other construction materials from the stockpile site.

PILE AND PIER REMOVAL

Construction plans for several of the piers would require their removal or partial removal. Work would occur at Piers 1, 2, 3, 4, 5, and the John Street Site. As described above, relieving platforms would be partially demolished and upland excavated to create natural edges in certain locations along the shoreline between Piers 1 and 5. Work at the low-level relieving platform between Piers 5 and 6 would require the placement of lightweight concrete below the existing timber platform. Piles would also be removed as part of the modifications to the high- and low-level relieving platforms to create the park promenade. Work at the low-level relieving platforms between Piers 4 and 5 would require the removal of piles and soil fill atop the platforms. Pier 4 would be left to serve as a habitat area. Portions of the high-level platform for Piers 2 and 3 nearest the bulkhead line, which connects Piers 2 and 3 to the upland, would be removed to create a channel. A portion of the existing pile supported pier structure (platform) and concrete deck on the southern end of Pier 1 would be removed, as described above, as would the timber sheet piling at the south face of the pier. Some timber piles at Pier 1 would be left in place after the deck is removed. The remnants of an existing timber wharf at the John Street Site would also be removed.

Platform removal, sheet piling, and timber wharf work would probably be performed by barge-based equipment and would involve cutting the elements and then lifting them onto barges for disposal by crane. Where piles need to be removed, they would be cut at the mudline rather than pulled out to decrease disturbance to the mudline. Timber piles would be snapped, cut by divers, or broken by machines, such as hydraulic shears. Steel piers would be burned at the mudline by divers. Containment booms would be used to contain floatables.

CONSTRUCTION OF OVERWATER STRUCTURES

Narrow over water pile supported structures, ranging from 10 feet to 30 feet in width, are proposed in several areas including between Piers 1 and 2, between 3 and 5 and within the Interbridge Area, north of the Manhattan Bridge. Floating walkways and boardwalks, anchored by steel piles, would be constructed between Piers 2 and 5. A beach barrier landscape would be constructed on Pier 6 and Pier 5 would have outdoor fields. In the area of Pier 4, new floating boardwalks would be constructed to prohibit access to the underside of the existing pier infrastructure, and a new pile-supported structure would be constructed south of the pier. One pedestrian and vehicular bridge/walkway at Piers 2 and 3 would connect the piers to the upland. The bridges are anticipated to span the proposed channel.

Pile driving would be required for each of the pier structures and the anchor piles. As noted previously, piles would be used to support the overwater walkway from the park promenade to Pier 1, and across the cove and under the Manhattan Bridge. Containment booms would be used to contain floatables during shoreline enhancement activities associated with the development of the park promenade and shallow-water habitat. Construction activity on the piers and platforms

would utilize pile driving equipment at all locations requiring complete reconstruction or significant stabilization. Typically two or more pile driving rigs mounted on separate barges would be used. A pile driver can drive one or two steel or concrete piles per day, or four to five wooden piles. The total duration of pile driving is likely to require two years, although a longer period may be required if the project is divided into multiple segments.

MARINA/WAVEBREAK CONSTRUCTION

The marina would be constructed between Piers 4 and 5, with 185 slips for moorings. A small amount of dredging may be needed in the safe water channel formed by removing the eastern portions of Piers 2 and 4. A wave fence would be constructed between Piers 3 and 5 and between Piers 1 and 2. The wave fence would be an integral part of the proposed fixed pile-supported pier in both of these locations. The marina entrance would be between Piers 4 and 5 in the general location of the existing subway tunnel. The fence would be a fixed pile-supported pier. Safe water booms are proposed along the existing bulkhead alignment from Pier 1 to Pier 4 and in areas along Piers 2 and 3, where no floating walkways or boardwalks would be installed, in order to prevent access to areas beneath the piers or high- and low-level platforms.

CONSTRUCTION ACTIVITIES

Barges would likely be used for much of the delivery, storage, and staging of waterfront construction activities. To prevent the potential spillage of bulk items, such as sand or concrete, into the East River, hopper barges (barges with sides) would be used for bulk materials, rather than open deck barges. Construction equipment and non-bulk items (fixtures, benches, railings, etc.) could utilize open deck barges and be lashed down. To address spillage of fuel from the refueling of equipment on barges, construction contracts would specify fuel sumps under the fill valves of equipment during refueling.

C. POTENTIAL IMPACTS

Potential construction impacts on the relevant areas of concern are discussed below. These include economic conditions, air quality, noise, transportation, contaminated materials, water quality and natural resources, infrastructure, and rodent control.

ECONOMIC CONDITIONS

The construction activity associated with the proposed program for Brooklyn Bridge Park would affect the New York City and State economies. Construction of the proposed project would have a direct effect on the economy by increasing construction jobs and salaries and overall economic output over the course of the construction period. These direct jobs, earnings, and output would, in turn, lead to additional indirect and induced economic effects. Indirect effects would stem from inter-industry purchases—contractors buying goods and services from other businesses. Induced effects would stem from the new economic demand created by households spending salaries earned through the direct and indirect jobs.

The construction activity would also generate tax revenues for New York City and State. Sales tax revenue would be generated by the sale of construction materials for use in the residential, hotel, and retail components of the project. (Materials used for park construction would not be subject to sales tax because the project is public.) In addition, the project would generate income and business taxes from direct, indirect, and induced employment.

AIR QUALITY

Possible impacts on local air quality during construction of the proposed action include fugitive dust (particulate) emissions from land clearing operations and demolition, and mobile source emissions, including hydrocarbons, nitrogen oxide, and carbon monoxide emissions.

FUGITIVE EMISSIONS

Fugitive dust emissions from land-clearing operations can occur from excavation, hauling, dumping, spreading, grading, compaction, wind erosion, and traffic over unpaved areas. Actual quantities of emissions depend on the extent and nature of the clearing operations, the type of equipment employed, the physical characteristics of the underlying soil, the speed at which construction vehicles are operated, and the type of fugitive dust control methods employed. Much of the fugitive dust generated by construction activities consists of relatively large-size particles, which are expected to settle within a short distance from the construction sites and not significantly impact the nearby buildings or people. All appropriate fugitive dust control measures, including watering of exposed areas and dust covers for trucks, would be employed. These measures would prevent fugitive dust from being a significant adverse impact.

MOBILE SOURCE EMISSIONS

Mobile source emissions are emissions of air pollutants from motor vehicles, referred to as mobile sources. During construction, such emissions may result from trucks delivering construction materials and removing debris, workers' private vehicles, disruptions in traffic near the construction site, and construction equipment.

Localized increases in mobile source emissions would be minimized by incorporating traffic maintenance requirements into the construction contract documents to ensure that:

- Construction requiring temporary street closings for the relocation of utilities and for other purposes in heavily traveled areas would be performed, to the maximum extent possible, during off-peak hours;
- Existing number of traffic lanes would be maintained to the maximum extent possible; and
- Idling of delivery trucks or other equipment would not be permitted during periods when they are being unloaded or are not in active use.

These measures would prevent mobile source emissions from being a significant adverse impact.

For the localized particulate matter (PM) levels, emission factors, projected traffic volumes, and worst-case meteorological conditions were used as inputs to the dispersion model to estimate future concentrations from traffic in the vicinity of the proposed project. Model results were multiplied by the 24-hour and annual persistence factors to determine the modeled concentrations for those time periods. The background 24-hour and annual PM levels were added to the 24-hour and annual concentrations to determine the total concentrations of particulate matter. The estimated concentrations are predicted to be below the ambient air quality standards, and the construction of the proposed Brooklyn Bridge Park would not cause significant impacts for particulate matter.

NOISE

Impacts on community noise levels during construction of the proposed project include noise and vibration from construction equipment operation and noise from construction vehicles and delivery vehicles traveling to and from the site. The level of impact of these noise sources depends on the noise characteristics of the equipment and activities involved, the construction schedule, and the location of potentially sensitive noise receptors.

Noise and vibration levels at a given location are dependent on the kind and number of pieces of construction equipment being operated, as well as the distance from the construction site. Typical noise levels of construction equipment that may be employed during the construction process are given in Table 18-1. Noise levels caused by construction activities would vary widely, depending on the phase and location of construction. It is anticipated that the most significant noise source associated with the construction equipment would be jackhammers, paving breakers, and pile drivers.

Construction noise is regulated by the New York City Noise Control Code and by the U.S. Environmental Protection Agency (EPA) noise emission standards for construction equipment. These local and federal requirements mandate that certain classifications of construction equipment and motor vehicles meet specified noise emissions standards; that, except under exceptional circumstances, construction activities be limited to weekdays between the hours of 7 AM and 6 PM; and that construction material be handled and transported in such a manner as not to create unnecessary noise. If overtime work is required, appropriate work permits from the DOB would be obtained. In addition, appropriate low-noise emission level equipment and operational procedures would be used. Compliance with noise control measures would be included in the contract documents as material specifications and by directives to the construction contractor. Noise, while being intrusive for short periods of time during certain construction activities, would not be a significant adverse impact.

TRANSPORTATION

The project would generate trips from workers traveling to and from the site, as well as from the movement of goods and equipment. Given typical construction hours, worker trips would be concentrated in off-peak hours and would not represent a substantial increment during peak travel periods. Construction worker travel would be primarily by public transportation, with a smaller percentage by private auto. The average number of construction workers on site at any one time would depend on the phase of construction: The range is expected to be from about 20 during the initial and final phases to up to 150 during the peak construction period.

For the upland construction, truck movements would be spread throughout the day and would vary depending on the period of construction. Peak deliveries at a staging site could generate approximately eight to 10 large trucks per day, or up to approximately two per hour. Trucking activity related to the construction of the residential, restaurant, and hotel structures and the demolition of the National Cold Storage buildings would be expected to be higher, because this construction would require foundations or paving areas as well as extensive delivery of construction equipment. Depending on the number of pieces of equipment working, truck trips could range between six and eight per hour. Truck holding and staging would typically be accommodated on the development parcel. In addition, park areas, where large lawns and plantings are proposed, could serve as additional staging sites particularly because these would be completed toward the end of the construction window.

**Table 18-1
Typical Noise Emission Levels for Construction
Equipment**

Equipment Item	Noise Level at 50 ft (dBA)
Air Compressor	81
Asphalt Spreader (paver)	89
Asphalt Truck	88
Backhoe	85
Bulldozer	87
Compactor	80
Concrete Plant	83 ¹
Concrete Spreader	89
Concrete Mixer	85
Concrete Vibrator	76
Crane (derrick)	88
Delivery Truck	88
Diamond Saw	90 ²
Dredge	88
Dump Truck	88
Front End Loader	84
Gas-driven Vibro-compactor	76
Hoist	76
Jackhammer (Paving Breaker)	88
Line Drill	98
Motor Crane	83
Pile Driver/Extractor	101
Pump	76
Roller	80
Shovel	82
Truck	88
Tug	85 ³
Vibratory Pile Driver/Extractor	89 ⁴
Notes:	
¹ Wood, E.W. and A.R. Thompson, "Sound Level Survey, Concrete Batch Plant: Limerick Generating Station," Bolt Beranek and Newman Inc., Report 2825, Cambridge, MA, May 1974. ² New York State Department of Environmental Conservation, "Construction Noise Survey," Report No. NC-P2, Albany, NY, April 1974. ³ Bungener, J.H., "Sound Level Survey: Wise's Landing, Kentucky," Bolt Beranek and Newman Inc., Report 2880, Downers Grove, IL, June 1975. ⁴ F.B. Foster Company, "Foster Vibro Driver/Extractors," "Electric Series Brochure, W-925-10-75-5M."	
Sources: Patterson, W.N., R.A. Ely, and S.M. Swanson, "Regulation of Construction Activity Noise," Bolt Beranek and Newman, Inc., Report 2887, for the Environmental Protection Agency, Washington, D.C., November 1974. Except for footnoted items.	

For the upland buildings, materials would be staged on-site. It is anticipated that all parking of equipment and worker vehicles would be on-site as well. However, lanes may have to be closed for periods of time to allow for cranes and other large equipment during the construction of buildings near Piers 1 and 6 and the John Street Site. It is doubtful that Furman Street would be completely closed to traffic. Special restrictions would be imposed on the contractors to ensure that the existing uses, such as Barge Music and River Café, would have vehicular access during their working hours and that Old Fulton Street would remain usable. Details of the construction

would be worked out in coordination with the Mayor's Traffic Construction Coordinating Council. Roadway traffic would increase during periods of upland construction, but would not be a significant adverse impact.

It is anticipated that bulkhead repairs and pier reconstruction/stabilization work would likely be done using barges to: (1) transport pier/bulkhead construction materials; (2) stockpile materials; and (3) serve as platforms for cranes, pile drivers, and other heavy equipment. Therefore, in-water construction would not have a significant adverse impact on traffic.

CONTAMINATED MATERIALS

Development of the Brooklyn Bridge Park would involve excavation and disturbance of the existing on-site soil as part of construction activities, which may result in temporary increases in exposure pathways for construction workers and workers on nearby sites to recognized and potential contaminants in the soil. As discussed in Chapter 11, "Hazardous Materials," the investigations concluded that there is a potential for adverse hazardous materials impacts during construction activities resulting from the presence of fill from unknown sources and possible underground storage tanks. Preventative measures would be undertaken to protect the safety of the public, community residents, and construction workers, as well as the larger environment for areas where redevelopment has the potential to encounter areas of contamination. The environmental conditions identified at the project site during the current and previous environmental studies would be remediated prior to initiating operation of the proposed park and providing public access to the project area.

Prior to construction on a site, a site-specific Construction Health and Safety Plan would be prepared. It would include health and safety procedures to minimize exposure to workers and the public, including possible dust monitoring and/or volatile organic compound (VOC) monitoring, if applicable, and provisions for the identification and management of known and unexpected buried tanks or contaminated materials that might be encountered during the soil disturbance activities associated with construction. Such a plan would ensure that the construction workers, the surrounding community, and the environment are not adversely affected by environmental conditions exposed by or encountered during the construction activities. In addition, existing fill remaining on-site would be either covered with 2 feet of certified clean fill or capped with concrete or asphalt pavement, or permanent structures. With the proposed measures in place, the health and safety of construction workers and the visiting public would be protected from adverse environmental conditions during construction.

WATER QUALITY AND NATURAL RESOURCES

CONTAMINATED MATERIALS

As discussed in Chapter 11, "Hazardous Materials," trace levels of petroleum-related contaminants were detected in the groundwater in localized areas near underground storage tanks or former maintenance facilities where the use of petroleum and/or solvents was common. During demolition of existing structures, debris removal, and grading, any hazardous materials encountered would be handled and removed in accordance with DEP, DEC, U.S. Occupational Safety and Health Administration (OSHA), and EPA requirements, minimizing the potential for adverse impacts to water quality. Furthermore, because the groundwater under this area of Brooklyn is not used for drinking water and because people do not normally come into contact with it, the contamination has not been of concern. During the construction of Brooklyn Bridge

Park, dewatering may be needed for certain construction below the water table. If dewatering is required, the dewatered groundwater would be discharged into the City sewerage or into the East River. The dewatered liquid would be sampled and tested before it is discharged to ensure that it meets the appropriate standards. If the water is to be discharged into the City sewers, it would meet DEP’s requirements shown on Table 18-2. If it is to be discharged into the East River, it would be treated to DEC standards to ensure that it would not cause water quality standard violations in the East River.

**Table 18-2
DEP Sewer Discharge Standards**

Substance	Concentrations (mg/l)
Petroleum hydrocarbons	50
Cadmium	2
Hexavalent chromium	5
copper	5
Amenable cyanide	0.2
Lead	2
Mercury	0.05
Nickel	3
Zinc	5
Note: mg/l is milligrams per liter and equivalent to parts per million.	
Source: CEQR Technical Manual.	

SUSPENDED SEDIMENT

In-water construction activities for the proposed project that result in sediment disturbance have the potential to cause short-term adverse impacts to water quality. While disturbance of sediment has the potential to result in increased suspended sediment in the water column and resuspension and redeposition of contaminants, these temporary effects would be localized to the immediate vicinity of pile driving and shoreline disturbance. On the basis of the rapid flushing and accumulation rates of sediment suggested for the project area, any increase in suspended sediment would be expected to dissipate shortly after the completion of the sediment-disturbing activity and would not be expected to result in significant adverse impacts to water quality. Similarly, any contaminants released to the water column as a result of sediment disturbance would be expected to dissipate rapidly and would not be expected to result in significant long-term impacts to water quality.

STORMWATER RUNOFF

An estimated 257 acre-feet (1 acre of water, one foot deep) of annual stormwater runoff would be produced from the project area’s 73 acres of upland area. A drainage system to manage the runoff would be one of the first features to be built. However, for the period prior to completion of the drainage system, erosion and stormwater runoff would be controlled by such measures as hay bales placed around catch basins and scuppers, silt fences, trenches, and/or sedimentation/retention basins as required to produce best results. Implementation of erosion and sediment control measures, and stormwater management measures as part of the Storm Water Pollution Protection Plan (SWPPP) during construction of the proposed project would minimize potential impacts to water quality of the East River associated with stormwater runoff during land-disturbing activities that would occur in upland areas. The erosion and sediment

control measures included in the SWPPP would be in accordance with DEC's Stormwater Management Design Manual.

Depending on the building site, the decanted water would be discharged either into the New York City sewer system or the East River, and the settled sediment conveyed to a licensed disposal area. Discharge in the sewer system is governed by DEP regulations, and discharge into the East River is governed by DEC regulations.

FLOODPLAINS AND WETLANDS

Most of the elements of the proposed project that would be located within the 100-year floodplain are passive recreation areas, such as the water's edge park promenade, shallow water habitat, and newly created landscaped areas. The only construction that would occur within the 100-year floodplain would be related to the work on the low-level relieving platform. The reuse of the existing relieving platforms would not affect flooding within or adjacent to the project area. The increase in pervious cover related to upland landscaping would have the potential to result in beneficial effects to the floodplain by decreasing the volume of surface runoff generated from within the project area.

Portions of the Pier 6 residential structures and the Pier 1 hotel and residential structures would be located within the 100-year floodplain. All habitable facilities associated with the project have to be constructed to minimize or eliminate flood damage in accordance with Local Law 3 of 1988. The proposed construction of these structures would not be expected to result in significant adverse impacts to the floodplain or result in increased flooding of adjacent areas.

There are no wetlands under the jurisdiction of the U.S. Army Corps of Engineers (COE) within the project area. Portions of the two coves within the project area, located in the interbridge area and under the Manhattan Bridge, contain littoral zone tidal wetlands regulated by DEC. The 10-foot-wide fixed pile supported walkway proposed for both of the coves would not impair the movement of tidal waters into or out of the coves. Additionally, the piles would replace a small portion of the littoral zone. Therefore, the placement of the proposed fixed pile walkway through these coves would not result in significant adverse impacts to tidal wetlands.

Littoral zone wetlands could occur adjacent to the shoreline within the project area. Construction of the park promenade from the existing high-level and low-level relieving platforms, the fixed pile walkway from the shoreline to Pier 1; the removal of the existing bulkhead and relieving platform to form the proposed shallow-water habitats between Piers 4 and 5, the removal of upland in the vicinity of Pier 4; replacement of timber sheet pile with steel sheet pile on the eastern (newly exposed) edge of Pier 1; the replacement of timber sheetpile with riprap along the southern face of Pier 1 and the replacement of the timber wharf at the John Street Site with a steel sheetpile bulkhead and retained fill has the potential to result in temporary impacts to littoral zone wetlands that may occur in these locations, due to temporary disturbance of the bottom sediment. During construction, measures would be implemented to minimize adverse impacts to any littoral zone wetlands that may occur in these areas (e.g. the aforementioned containment booms and pile removal techniques). The shoreline improvements that would result from modifications to the relieving platforms would benefit wetland resources through the creation of intertidal wetland habitat along the newly exposed shoreline that would be armored with riprap and planted with intertidal vegetation. The development of the shallow-water habitats would result in approximately 25,000 square feet of open water habitat, some which would be expected to be littoral zone. Additional measures to minimize potential impacts to wetlands would be identified during the permitting process for these shoreline enhancements by

federal and state agencies. The proposed 10-foot-wide fixed pile walkway between the shore and Pier 1 would not be expected to result in significant adverse impacts to wetlands because of their narrowness.

AQUATIC BIOTA

Implementation of the SWPPP would minimize potential significant adverse impacts to aquatic biota from the discharge of stormwater during construction of the upland project elements. The construction of the in-water project elements has the potential to result in temporary adverse impacts to fish and macroinvertebrates due to increases in suspended sediment, noise associated with pile driving, and loss of bottom habitat and associated benthic invertebrates.

The temporary increase in suspended sediment associated with pile driving, and other in-water construction activities resulting in sediment disturbance, is expected to be localized and of limited duration and is not expected to result in significant adverse impacts to aquatic biota. East River sediments have been found to contain contaminants at concentrations that may pose a risk to some benthic macroinvertebrates. However, the hydrodynamic environment within the project area would result in rapid dissipation of these sediments such that redeposition associated with disturbance during construction within or outside the project area would not be expected to adversely affect benthic macroinvertebrates or bottom fish.

Estuarine-dependent and anadromous fish species, bivalves, and other macroinvertebrates are fairly tolerant of elevated suspended sediment concentrations and have developed behavioral and physiological mechanisms for dealing with variable concentrations of suspended sediment. While the localized increase in suspended sediment may cause fish to temporarily avoid the area where bottom disturbing activities are occurring, the affected area would be expected to be small and similar suitable alternative habitats would be available. Fish can expel materials that may clog their gills, and shellfish can tolerate short-term exposures by closing valves or reducing pumping activity. Thus, temporary increases in suspended sediment resulting from in-water construction activities would not be expected to result in significant adverse impacts to fish and mobile benthic macroinvertebrates.

Pile driving can produce underwater sound pressure waves that can affect fish, with the type and intensity of sounds varying with such factors as the type and size of the pile, firmness of the substrate, depth of water, and the type and size of the pile driver. Because only one pile would be driven at a time and the length of time for driving each pile should be less than an hour or two, individual fish would not be expected to be exposed to potentially dangerous sound pressure levels long enough to result in mortality. Therefore, the pile driving that would occur as a result of the proposed project would not be expected to result in significant adverse impacts to aquatic biota.

The installation of piles, removal of bulkhead, removal of piles and relieving platform, and placement of additional riprap to further armor the bulkhead at the channel side of Pier 1 would result in the loss of benthic habitat and benthic macroinvertebrates associated with these areas that are unable to move from the area of activity. The gradual loss of these areas of habitat for benthic macroinvertebrates and fish would not be expected to result in significant adverse impacts to populations of aquatic species using the East River or Upper New York Harbor. The permanent loss of benthic macroinvertebrates within the piling footprints would not significantly impact the food supply for fish foraging in the area. Additionally, the piles, riprap, and bulkhead installed would provide hard surfaces for encrusting organisms. The space between the stones of the riprap and the piles themselves would provide refuge for macroinvertebrates and fish.

The use of work barges could also disturb the benthic environment. Because of the lower water levels experienced at low tide, work barges located in relatively shallow areas might spend some portion of each day resting on the bottom. The extent of defaunation would generally be limited to that area in direct proximity to the pilings and bulkhead being repaired. Therefore, the extent of disturbed area would be limited and the time of disturbance of short duration. Recolonization of benthos following defaunation due to these relatively small physical disturbances would begin within weeks and would typically be completed within 1 year.

Overall, during construction of the in-water project elements, temporary increases in suspended sediment, noise generated by pile driving, and loss of bottom habitat and benthic macroinvertebrates unable to move from the area of activity would not be expected to result in significant adverse impacts to aquatic biota of the East River.

TERRESTRIAL RESOURCES

Wildlife habitat within the proposed Brooklyn Bridge Park area is limited to the relatively low-quality terrestrial habitat found within the existing Empire-Fulton Ferry State Park and Main Street Park next to it, and the wading bird and waterfowl foraging habitat found within the two coves at the northern end of the project area. Although the bird and other wildlife species expected to occur within the project area are those tolerant of urban conditions and the current noise level within the project area, land-clearing activities in the upland portions of the site have the potential to disturb wildlife individuals currently using Empire-Fulton Ferry State Park. Adverse impacts would occur to some individual birds and other wildlife currently using this limited wildlife habitat if construction activities cause them to leave the project area, and there are no suitable habitats that are available nearby. However, the wildlife species expected to occur within the project area are common to urban areas and the loss of some individuals would not result in a significant adverse impact on the bird and wildlife community of the New York City region. Therefore, no significant adverse impacts to terrestrial resources are anticipated as a result of construction of the proposed project.

Construction of the overwater walkways through the two cove areas at the northern portion of the project area has the potential to limit use of the coves for feeding habitat while the piles and decking are being installed. However, these two cove areas are small, and the temporary loss as feeding habitat would not adversely affect the populations of wading birds and waterfowl within the New York metropolitan region. Because the pedestrian bridges over the coves would be expected to allow some light to reach the aquatic habitat beneath them, adverse impacts to food availability would be limited.

INFRASTRUCTURE

The project site is currently served by some utilities. A water transmission main, 24 inches in diameter, runs under Furman Street and turns to continue under Water Street. This transmission main feeds 8- and 12-inch water lines beneath the project site and the surrounding streets. The water lines branch directly into Piers 1 through 6. Combined sewers that collect stormwater runoff (from roof and street drainage) and sanitary sewage serve the area surrounding the project site. On the piersheds and the aprons that front the piers, stormwater is collected in separate stormwater sewers and discharged directly into the East River. Seven regulators discharge along the project site's waterfront.

New utilities required for operation of the park would be tie-ins to the existing utility lines. No disruption to existing services to accommodate new services is anticipated.

RODENT CONTROL

Construction contracts would include provisions for a rodent (mouse and rat) control program. Prior to the start of construction, the contractor would survey and bait the appropriate areas and provide for proper site sanitation. During the construction phase, as necessary, the contractor would carry out a maintenance program. Coordination would be maintained with appropriate public agencies. Only EPA-and DEC-registered rodenticides would be permitted, and the contractor would be required to perform rodent control programs in a manner that avoids hazards to persons, domestic animals, and non-target wildlife. *