Chapter 21: Construction Impacts

A. INTRODUCTION

This chapter summarizes the preliminary construction plan for the Phased Redevelopment of Governors Island (the Proposed Project) and identifies potential impacts that could result from construction activities associated with the Proposed Project. Construction is expected to occur in two phases. Phase 1 of the Proposed Project would make improvements in the Historic District in the North Island and add approximately 23 acres of open space in the South Island. The Later Phases would complete the public spaces on the South Island, including the Grand Promenade, reuse more than 1.35 million square feet in existing North Island historic buildings, and develop and construct new buildings in the two future development zones on the South Island. For analysis purposes, it is assumed that building reuse on the North Island and new development on the South Island would collectively total three million square feet of development. The seawall would be reconstructed (with associated stormwater outfall consolidation project) in Phase 1 independent of the park construction.

Construction of Phase 1 would be completed in less than two years. It is anticipated that construction of the Later Phases-Park and Public Spaces would also be less than two years, but the specific schedule for start of construction is not known at this time.

Since the development for the Later Phases-Island Redevelopment has not yet been specifically proposed, defined, or designed, it is not possible to perform quantified construction analyses for this component of the Proposed Project. When the Later Phases-Island Redevelopment has been planned and designed, it is anticipated that it would require zoning or other land use actions that would be subject to City Environmental Quality Review (CEQR), and that the associated future environmental review would take into account a quantified analysis of the potential for construction impacts from the full development of the Proposed Project.

In this chapter, construction phases and activities are described to the extent that they are known and are followed by a description of typical construction practices. Lastly, the types of potential impacts to occur during construction are assessed. The technical areas where the potential for impacts are analyzed include: park uses, socioeconomic conditions, cultural resources, hazardous materials, transportation, air quality, noise and vibration, water quality and natural resources, and rodent control. The assessment also describes methods that may be employed to minimize those impacts.

B. PRINCIPAL CONCLUSIONS

Potential construction impacts on park use, socioeconomic conditions, cultural resources, hazardous materials, transportation, air quality, noise, vibration, water quality and natural resources, and rodent control were analyzed for the Proposed Project. At this time, the development for the Later Phases–Island Redevelopment has not yet been specifically proposed, defined, or designed. Therefore, it is not possible to perform detailed construction analyses for

all relevant areas of concern associated with the Later Phases–Island Redevelopment component.

PARK USERS

Construction activities are noisy, can create dust, cause air emissions, and generate heavy equipment and truck traffic. The Trust would institute a number of measures to minimize the effects on park users. While some park users would find their park experience disrupted to some degree, these measures would minimize the disruption during construction of Phase 1 and the Later Phases-Park and Public Spaces, each with a less than two-year duration of construction. Therefore, construction would not result in a significant adverse impact on park users.

SOCIOECONOMICS

Construction of the Proposed Project would create direct benefits on the economy from expenditures on labor, materials, and services over the course of the construction period. Construction would also result in substantial indirect and induced economic effects. The construction activity would also generate tax revenues for New York City and State. In addition, the Proposed Project would generate income taxes, and corporate and business taxes from direct, indirect, and induced activity. There would be no significant adverse impacts on socioeconomic conditions due to construction.

HISTORIC AND CULTURAL RESOURCES

Construction of the Proposed Project would require subsurface disturbance in multiple areas within the North Island (see Chapter 8, "Historic and Cultural Resources"). The protocol for all excavations planned within the Historic District, within areas of identified or potential archaeological sensitivity or adjacent to the seawall, would be as follows. Any planned excavations in these areas will be accompanied by construction plans and an archaeological work plan from an accredited archaeologist, to be reviewed and approved by the New York City Landmarks Preservation Commission (LPC) and/or the New York State Office of Parks, Recreation, and Historic Preservation (OPRHP) (as appropriate). Upon completion of the pre-approved excavation within these areas, an archaeological summary report will be sent to LPC and/or OPHRP. LPC and/or OPRHP (as appropriate) will be informed immediately if any artifacts are identified during excavations at any location within the Historic District.

The South Island is not considered to be potentially archaeologically sensitive, and thus the construction activities that would occur on this portion of the Island would not affect archaeological resources. Furthermore, LPC and OPRHP have determined that construction of the water mains would not affect significant archaeological resources within Brooklyn or Buttermilk Channel.

Since both Phase 1 and the Later Phases of the Proposed Project would occur on or within in close proximity to contributing elements of the Governors Island Historic District, a Construction Protection Plan (CPP) would be developed—based on the requirements stipulated in the New York City Department of Buildings (DOB) *Technical Policy and Procedure Notice* (TPPN) *#10/88*—to ensure that historic structures and landscape elements within 90 feet of construction activities would not be inadvertently affected during construction. The CPP would need to be reviewed and approved by LPC and/or OPRHP (as appropriate). Furthermore, construction of the Proposed Project would be conducted in accordance with the guidelines of the Design Manual. The Proposed Project's CPP also would include stipulations to ensure that

the off-Island potential resource at 43 Ferris Street would not be inadvertently affected during construction activities for the proposed water main.

HAZARDOUS MATERIALS

Impacts during construction of any component of the Proposed Project would be avoided by preparing a site-specific the Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP) for implementation during construction and submitted to NYCDEP for review and approval. The RAP would provide the appropriate clean fill importation criteria and criteria for allowable reuse of excavated site soils (whether in the uppermost layer of landscaped areas or elsewhere), and handling, stockpiling, testing, transportation, and disposal of excavated materials, including any unexpectedly encountered contaminated soil and petroleum storage tanks, in accordance with applicable regulatory requirements. The CHASP would ensure that subsurface disturbance is performed in a manner protective of workers, others on the Island, and the environment. With these measures, construction of the Proposed Project would not result in any significant adverse impacts related to hazardous materials.

TRANSPORTATION

Construction worker trips would be concentrated in off-peak hours and would not represent a substantial increment during peak travel periods. Based on surveys of construction workers, they would travel primarily by public transportation, with a smaller percentage by private auto. The construction workers would likely travel to the Island from the Battery Maritime Building or Brooklyn. However, certain construction companies could arrange travel to the Island from different locations, using commercial vessels. The sites where workers would gather for transportation on other commercial vessels could be located throughout the metropolitan area. No one locality would experience a concentration of constructions workers gathering during construction of Phase 1 and the Later Phases-Park and Public Spaces, each with a less than two-year duration of construction. Therefore, no significant adverse impacts on vehicular traffic are expected from construction workers during construction of Phase 1 and the Later Phases-Park and Public Spaces. The construction of the Later Phases-Island Redevelopment would likely require longer construction periods and substantially more construction workers and deliveries, which may result in significant adverse transportation impacts. These impacts and potential mitigation measures will be assessed as part of future environmental reviews when details on the Later Phases-Island Redevelopment components become more defined.

Like vehicular traffic, the public transit lines that workers would use are scattered throughout the metropolitan area, and no one subway or bus line would experience all workers using it. Therefore, no significant adverse impacts on public transit facilities are expected. Certain contractors may choose to stock pile construction materials at off-Island locations before transporting them to the Island. The trucks would come to the location over a period of days or weeks, and most likely, no contractor would try to accumulate a barge load of construction materials in one day. These stock-piling locations would be spread throughout New York Harbor, and no one location would be used for all Governors Island construction materials. Therefore, no significant adverse impacts are expected to be caused by the truck movement of construction materials. It is anticipated that waterborne transportation would be the primary means of moving construction workers, materials, and equipment to Governors Island during construction of the Proposed Project. The maritime trips generated by construction on Governors are expected to be limited to ferries and water taxis for the workers, and tug-assisted barges for equipment and materials. The number of daily trips to Governors Island for construction is

expected to be minimal compared with the existing trips and would not add significantly to the waterborne traffic in New York Harbor. Therefore, no significant adverse impacts on marine traffic are expected as a result of construction of the Proposed Project.

AIR QUALITY

Much of the fugitive dust generated by construction activities consists of relatively large particles, which are expected to settle within a short distance from the construction sites and not significantly impact any nearby buildings or people. All appropriate fugitive dust control measures, including watering of exposed areas and dust covers for trucks, would be employed during construction of all components of the Proposed Project. These measures would prevent fugitive dust from resulting in a significant adverse impact. To ensure that construction on Governors Island results in the lowest feasible diesel particulate matter (DPM) emissions, an emissions reduction program for all construction activities associated with the Proposed Project would be implemented. These measures would prevent engine emissions from resulting in a significant adverse impact.

NOISE AND VIBRATION

Construction noise is regulated by the New York City Noise Control Code and by the USEPA noise emission standards for construction equipment. 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 result in a significant adverse impact. Given the locations of construction on Governors Island, no significant adverse impacts caused by vibration are expected.

WATER QUALITY AND NATURAL RESOURCES

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. However, the effects would be temporary and would be localized to the immediate vicinity of the seawall reconstruction. Any increase in suspended sediment or any contaminants released to the water column 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.

Implementation of erosion and sediment control measures and stormwater management measures, as part of the Stormwater Pollution Prevention Plan (SWPPP), during construction of the Proposed Project would minimize potential impacts to water quality associated with stormwater runoff during land-disturbing activities that would occur in upland areas. Implementation of the SWPPP would also minimize potential significant adverse impacts to aquatic biota from the discharge of stormwater during construction of the upland project elements. The temporary increase in suspended sediment associated with in-water construction activities resulting in sediment disturbance is expected to be localized and of limited duration. 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. The nosiest activity associated with the in-water construction would occur only for short periods of time, and individual fish would not be expected to be exposed to potentially dangerous sound pressure levels long enough to

result in mortality. The use of work barges would generally be limited to that area in direct proximity to the seawall being repaired. Therefore, the extent of disturbed area for the benthic environment would be limited and the time of disturbance of short duration. Overall, during construction of the in-water project elements, temporary increases in suspended sediment, noise, 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 Upper New York Bay.

RODENT CONTROL

Construction contracts would include provisions for a rodent (mouse and rat) control program. During the construction phase, as necessary, the contractor would carry out a maintenance program. Coordination would be maintained with appropriate public agencies.

C. CONSTRUCTION PHASING AND SCHEDULE

The Proposed Project would redevelop Governors Island with park and public space, infrastructure improvements, tenancies in historic buildings, and new development in phases. Overall, 13 park and public space areas are planned to be developed and include: Soissons Landing, Yankee Landing, the Great Promenade, South Battery, Parade Ground, Colonels Row, Nolan Park, Liggett Terrace, Hammock Grove, Play Lawn, the Hills, Liberty Terrace, and South Prow (see Figures 1-15 and 1-16).

Because of a lack of direct vehicular access, it is expected that construction materials, supplies, equipment, and workers would arrive via waterborne transportation. The construction workers would likely access the Island using the existing ferry system. However, certain contractors could arrange for private waterborne transportation from their construction yard or other locations. These vessels would use the existing on-Island ferry terminals or other suitable docks or piers. The construction equipment would be brought onto the Island via a scow (flat deck, non-propelled barge) and it would remain on the Island for the duration of that particular contract. The scow would leave Governors Island as soon as the equipment is unloaded. The equipment would include trucks, cranes, pumps, compressors, generators, and similar types of machines. Lima Pier at the southeastern part of the Island is expected to be used. Construction supplies, such as reinforcing bars, sand, and gravel would also likely arrive via barge. The supplies may be stored at a laydown area on the South Island or on moored barges.

PHASE 1

Phase 1 would include the development of park and public space on lands owned by The Trust on the North Island as well as the construction of Hammock Grove and the Play Lawn on the South Island (see Figure 1-15). In addition, one or both of the new 12-inch water mains connecting from Brooklyn would be installed. **Table 21-1** presents the schedule for the features planned for construction in Phase 1.

Table 21-1
Phase 1 Construction Schedule

Project	Start Date	End Date
Soissons Landing	September 2012	May 2013
Nolan Park	September 2012	May 2013
Parade Ground	September 2012	May 2013
South Battery	September 2012	May 2013
Colonels Row	September 2012	October 2013
Liggett Terrace	September 2012	October 2013
Hammock Grove	September 2012	October 2013
Play Lawn	September 2012	October 2013
New Water Main(s)	October 2012	November 2013
Seawall Rehabilitation	October 2011	December 2013

Notes: Start of construction is usually at the beginning of the month and completion of construction is usually at the end of the month.
Sources: The Trust for Governors Island.

The majority of the Phase 1 work is walkways, plazas, and landscaping. Some utility and infrastructure work would also be under way.

REHABILITATION OF THE SEAWALL

Rehabilitation of the seawall would take place as four projects from October 2011 to December 2013. The first two projects would be completed by May 2012, and the last two projects by December 2013. Depending on the condition of the seawall and its location on the Island, the construction work would range from repointing to full replacement. In addition to reconstructing the seawall, in-water work would include reconstructing and consolidating stormwater outfalls and installing new riprap revetment to protect the seawall along the southern and southwestern portions of the Island.

LATER PHASES

The full development of the Proposed Project would include Phase 1 and two components of the Later Phases—Later Phases-Park and Public Spaces and Later Phases-Island Redevelopment. At this time, no schedule has been set for the start or completion of construction of any portion of the Later Phases. However, it is anticipated that these components would be constructed separately.

LATER PHASES-PARK AND PUBLIC SPACES

The park and public space components of the Later Phases would include:

- The Hills;
- Liberty Terrace;
- South Prow;
- Yankee Landing;

- Great Promenade; and
- Maintenance Facilities.

Because of the height of the Hills and the weight-bearing capacity of the underlying soils, the area would have to be preloaded with earth to allow for settling for about 18 months prior to building.

Although no start or finish date has been established, design work completed to date indicates that the construction work would take 20 to 22 months. Because funding sources for the Later Phases-Park and Public Spaces have not been identified and secured, the construction could take place any time from 2013 to 2030.

LATER PHASES-ISLAND REDEVELOPMENT

The two development zones on the South Island would be constructed separately from the facilities associated with the Later Phases-Park and Public Spaces. In addition, the currently vacant North Island historic buildings would be renovated for use in the Later Phases–Island Redevelopment. At this time, it is not known what would be constructed in the development zones. Certain uses have been prohibited (casino and permanent residential buildings), and as described in Chapter 2, "Framework for Analysis," the maximum square footage of development has been established. No schedule for the development zones or the renovation and reuse of the North Island historic structures has been established, except that full development of the Proposed Project would be in place by 2030. Therefore, a generic description of how a new building is typically constructed and how an existing building is renovated is provided below.

D. CONSTRUCTION PRACTICES

GENERAL CONSTRUCTION PRACTICES

Certain activities would occur throughout the construction of the Proposed Project. The Trust would have a field representative on-site throughout the entire construction period. The representative would serve as the contact point and would be available to meet and work with the public to resolve concerns or problems that arise during the construction process. New York City maintains a 24-hour-a-day telephone hotline (311) so that concerns can be registered with the City. Once activities begin, a security staff would be on each construction site 24 hours a day, 365 days a year.

GOVERNMENTAL COORDINATION AND OVERSIGHT

The following describes construction oversight by government agencies, which in New York City is extensive and involves a number of city, state, and federal agencies. **Table 21-2** shows the main agencies involved in construction oversight and the agency's areas of responsibilities. The New York City Department of Buildings (NYCDOB), which has the primary responsibility for ensuring that the construction meets the requirements of the Building Code and that buildings are structurally, electrically, and mechanically safe. In addition, NYCDOB enforces safety regulations to protect both workers and the public. The areas of responsibility include installation and operation of the equipment, such as cranes and lifts, sidewalk shed, and safety netting and scaffolding. In addition, NYCDOB approves the CPP when the construction is in proximity to historic structures. The New York City Department of Environmental Protection

Table 21-2
Construction Oversight in New York City

Agency	Areas of Responsibility
New York City	
Department of Buildings (NYCDOB)	Primary oversight for Building Code and site safety
Department of Environmental Protection (NYCDEP)	Noise, hazardous materials, dewatering, tanks
Fire Department (FDNY)	Compliance with Fire Code, tanks
Department of Transportation (NYCDOT)	Lane and sidewalk closures
New York City Transit (NYCT)	Subway access
Landmarks Preservation Commission (LPC)	Archaeological and architectural protection
New York State	
Department of Labor (NYSDOL)	Asbestos workers
Department of Environmental Conservation (NYSDEC)	Hazardous materials and tanks Adherence to permit conditions
United States	
Environmental Protection Agency (USEPA)	Air emissions, noise, hazardous materials, poisons
Occupational Safety and Health Administration (OSHA)	Worker safety
U.S. Army Corps of Engineers (USACE)	Adherence to permit conditions
Coast Guard (USCG)	Seaworthiness of vessels

(NYCDEP) enforces the Noise Code, approves the RAP and CHASP, and regulates water disposal into the sewer system and removal of tanks. The Fire Department of New York City (FDNY) has primary oversight for compliance with the Fire Code and for the installation of tanks containing flammable materials. The LPC approves studies, the CPP, and monitoring to prevent damage to historic structures.

The New York State Department of Environmental Conservation (NYSDEC) regulates disposal of hazardous materials and construction and operation of bulk petroleum and chemical storage tanks. In addition, NYSDEC regulates runoff from sites during construction under it States Pollutant Discharge Elimination System (SPDES) permit program. The New York State Department of Labor (NYSDOL) licenses asbestos workers. On the federal level, the United States Environmental Protection Agency (USEPA) has wide ranging authority over environmental matters, including air emissions, noise, hazardous materials, and the use of poisons. Much of the responsibility is delegated to the state level. The Occupational Safety and Health Administration (OSHA) sets standards for work site safety and construction equipment.

For the installation of the new water mains and work on the seawall and stormwater outfalls, permits would be needed for in-water work from USACE and NYSDEC. These types of permits typically contain general permit conditions and special permit conditions. The general permit conditions are those that the agencies have found to be necessary to prevent environmental impacts and to ensure adherence to laws and regulations on almost all projects. The special permit conditions are specific to a particular project and address the agencies' concerns about the project. Both agencies send inspectors to the site on an as-needed basis to check for adherence to the permit conditions. The United States Coast Guard (USCG) must also authorize the water mains under navigable waters under Section 9 of the Rivers and Harbors Act of 1899.

DELIVERIES AND ACCESS

Barges would likely be used for much of the delivery, storage, and staging of construction materials and equipment on Governors Island. Lima Pier at the southeast corner of Governors Island would be used to land the materials and equipment. To prevent the potential spillage of bulk items, such as sand or concrete, into Upper New York Bay and Buttermilk Channel, 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 be lashed down on open deck barges. 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.

Because of the presence of large equipment and the type of work required, access to the construction sites would be tightly controlled. The work areas would be fenced off, and limited access points would be provided for workers and trucks. Typically, worker vehicles would not be allowed into the construction area. Security guards and flaggers would be posted, and all persons and trucks would have to pass through security points. Workers or trucks without a need to be on the site would not be allowed entry. After work hours, the gates would be closed and locked. Security guards would patrol the construction sites to prevent unauthorized access.

As is the case with almost all construction sites, material deliveries to the site would be regimented and scheduled. Because of the high level of construction activity and constrained space, unscheduled or haphazard deliveries would not be allowed. For example, during preloading for the Hills, fill material would be barged to the Island and dump trucks on the Island would be assigned a specific place in the rotation of trucks hauling materials from barges to the construction site. In addition each truck would be assigned a specific allotment of time to load and unload. If a truck is late for its turn, it would be accommodated if possible, but if not, the truck would be assigned a later time. It is anticipated that for construction requiring large volumes of concrete, associated with new building construction in the development zones for the Later Phases-Island Redevelopment, it is possible that the contractor may set up a batch plant on Governors Island. If an on-site batch plant is not used, a similar regimen would be instituted for concrete deliveries (required for new building construction in the development zones).

To aid in adhering to the delivery schedules, as is normal for building construction in New York City, flaggers would be employed at each of the gates. The flaggers could be supplied by the subcontractor on-site at that time or by the construction manager. The flaggers would control trucks entering and exiting the site, so that they would not interfere with one another.

HOURS OF WORK

Construction is expected to take place Monday through Friday and on some Saturdays. Certain exceptions to the work schedule are discussed separately below. In accordance with New York City laws and regulations, construction work would generally begin at 7:00 AM on weekdays, with some workers arriving to prepare work areas between 6:00 and 7:00 AM. Normally, weekday work would end at 3:30 or 4:30 PM, but it can be expected that to meet the construction schedule or to complete certain construction tasks, the workday would be extended beyond normal work hours on occasion. This work could include such tasks as finishing a large concrete pour. The extended workday would generally last until about 6:00 PM and would not include all construction workers on site, just those involved in the specific task requiring additional work time.

At limited times, weekend work would be required. Again, the numbers of workers and pieces of equipment in operation would be limited to those needed to complete the particular task at hand. For extended weekday and weekend work, the level of activity would be reduced from the normal workday. The typical weekend workday would be on Saturday from 8:00 AM with worker arrival and site preparation to 4:30/5:00 PM for site cleanup.

A few tasks may have to be completed without a break with the work extending for longer than a typical 8-hour day. For example, in certain situations concrete must be poured continuously to form one structure without joints. If the concrete is poured and then stopped for a period of time before more concrete is poured, a weak joint is formed. This weak joint may not be structurally sound. This type of concrete pour can require over 12 hours to complete.

A noise mitigation plan would be developed and implemented to minimize intrusive noise emanating into nearby areas and affecting sensitive receptors on the Island. A copy of the noise mitigation plan would be kept on site for compliance review by NYCDEP and NYCDOB.

GOVERNORS ISLAND CONSTRUCTION TASKS

INFRASTRUCTURE

Phase 1 of the Proposed Project includes the construction of one or both of the new water mains connecting to the Island. Typically, underground infrastructure would be built or rebuilt before the new walkways and plazas are built in Phase 1, although certain circumstances may preclude this. As described in Chapter 2, "Analytical Framework," The Trust will also undertake several projects to rehabilitate, repair, replace, and upgrade other utilities on the Island in the future without the Proposed Project (No Build condition). The utility infrastructure work includes on-Island replacement and upgrade to the following services: storm sewer, domestic and fire protection water service, sanitary sewer, and electrical and telecommunications service (also includes upgrades of service to the Island). To minimize construction activities and the need for reconstruction, it is expected that the water lines, sewer lines, power lines, and telecommunications ducts would all be installed at the same time. Therefore, the following describes the process associated with the construction of all new infrastructure lines.

To install infrastructure lines, a trench is dug, usually about 4 to 10 feet below the ground surface. On the North Island where the soils are native, gravel would be placed in the bed of the trench and the pipe laid on the gravel. On the South Island where the soils consist of unconsolidated fill, short piles would likely be driven and pile caps installed to support the infrastructure lines and to prevent differential settling, which could damage the lines. The area around the pile caps would be filled with gravel. Lengths of the water line would be laid and welded together, and the pipes would be tested in sections and then as a complete system. Gravity sanitary sewer and stormwater pipes are not welded, but have bell joints to minimize inflow. When the water or sewer lines are installed, they would be connected to the existing lines. This task is usually done during times of low demand.

The water, sewer, and gas lines would likely be placed directly on the gravel bed or on the pile caps. Approximately 100 feet of utility lines can be installed per day. The work involves the use of jackhammers and pavement cutters if the street needs to be opened, backhoes to excavate the trench and place the backfill, and cranes to lift the utility lines into place. Flatbed delivery trucks are used to transport the lines and pipes to the work location. Dump trucks are used to bring the bedding material and clean fill, if needed, to the work site. Asphalt trucks and rollers are needed to patch the pavement. For the electric and telecommunication lines, ducts would be laid on the pile caps, and then these lines installed in the openings in the ducts. Steel plates would cover the trenches when active work is not taking place. After all the various utility lines are placed on the pile caps and the necessary ancillary items, such as manholes for access and fire hydrants are installed, the trench would be backfilled with compacted soil. If the removed soil is suitable, it would be reused; if not, clean soil would be brought in.

WALKWAYS AND PLAZAS

Construction of the walkways and plazas would start after the utilities have been installed. The soils are first graded and shaped. Then a subbase is placed and compacted, followed by the base layer. Depending on the final surface, construction could proceed in several different ways. For a concrete surface, reinforcing mesh is laid down and the concrete poured. If the surface is to be asphalt, such as for a road, a binder layer is placed and then the asphalt is poured. For a surface made of paving pieces, such as a mosaic, mastic is laid down, and the paving pieces placed in the mastic before it sets. Then the paving pieces are grouted into place. For porous pavements, mastic is not used, but a layer of permeable materials is put down, then the porous pavers are placed, and more permeable material is put down to lock the permeable pavers in place.

Construction of the walkways and plazas would involve graders, bull dozers, and compactors. The asphalt would need a paving machine, and concrete would be brought by truck. The paving materials would be brought to the work locations by trucks. The compactor would be used after the first two layers have been placed. The equipment would range from large mechanical equipment to small hand tools.

Construction of curb and appurtenances is more labor intensive than the plaza and walkway construction. Forms are placed by hand to shape the curbing and appurtenances. Prefabricated concrete curbs would be manufactured off-site and transported to the Island. Small cranes would be used to put the curbing pieces into place.

DEWATERING AND STORMWATER RUNOFF

In areas excavated for the plazas and walkways, groundwater would discharge into and precipitation would accumulate in the excavation; this water would have to be removed. Discharge of water into New York State waters, including the harbor, requires a permit from NYSDEC. In addition, because more than one acre of land would be disturbed, a SWPPP would have to be submitted to NYSDEC.

The SWPPP would be developed for the overall project construction activity in accordance with the requirements of NYSDEC's State Pollution Discharge Elimination System (SPDES) General Permit for Stormwater Discharges from Construction Activity (Permit No. GP-02-01). The SWPPP would include fully designed and engineered stormwater management practices with all necessary maps, plans, and construction drawings, providing the site-specific erosion and sediment control plan and best management practices. The SWPPP would include designation of responsible parties and personnel who would have a role in managing construction stormwater runoff. The SWPPP would outline a routine site inspection and reporting program for identification and prompt repair of any deficiencies found in the erosion and sediment control structures or practices.

Stormwater management during construction activities would be performed through implementation of a site-specific erosion and sedimentation control plan. In accordance with NYSDEC guidance, the SWPPP would include both structural and non-structural components. The structural components are expected to consist of hay-bale barriers/silt fencing, inlet protection, and installation of a stabilized construction entrance or other appropriate means to limit potential off-site transport of sediment. The non-structural "best management practices" would include routine inspection, dust control, cleaning, and maintenance programs; instruction on the proper management, storage, and handling of potentially hazardous materials; and

identification of parties responsible for implementation of maintenance programs. All temporary control measures would be maintained until disturbed areas of the site are stabilized.

The decanted water from the excavations would be sent to an on-site pretreatment system to remove the sediment. The pretreatment system often includes sedimentation tanks, filters, and carbon adsorption. The decanted water would then be discharged into Upper New York Bay. The settled sediments, spent filters, and removed materials would be transported to a licensed disposal area. If the sediments are suitable, they may be used on-Island. The water would be tested to ensure that it meets NYSDEC's limitation on discharged water.

LANDSCAPING

The first step in landscaping is to rough grade the ground. Top soil would then be brought in to raise the ground to finished grade. The thickness of the top soil would vary depending on the type of plantings to be used. If sod is to be used to make lawns, the rough grading would be to about 4 inches below finished grade. If the lawns are to be seeded, the rough grading would be to just below finished grade, and the top soil would be thin. For perennial and annual flower beds, the rough grading would be 1 to 2 feet below finished grade.

Shrubs and saplings below about 2 inches in diameter at breast height would typically be planted by hand. For larger trees, a backhoe would likely be used to dig and backfill the hole. The work would be overseen by a horticulturist or arborist. The equipment for this activity would include graders, skids, backhoes, and hand tools.

WATER MAINS

Two new water mains would be installed between Governors Island and Brooklyn. As noted in Chapter 1, "Project Description," The Trust may construct one or both of these new water mains in Phase 1. One route would be constructed from the north end of the Island to the Red Hook Container Terminal; the other route would extend from the south end of the Island to Sullivan Street. The water mains would connect from NYCDEP vaults on Sackett, Union, or President Streets at the intersection of Van Brunt Street for the north alignment, and at the corner of Sullivan and Conover Streets for the south alignment. The on-Island landing points would be on the northeastern corner near Building 85 on the North Island and near Half Moon Road on the South Island. On the Brooklyn side, the water mains would connect to the NYCDEP vaults on Sackett Street, Union Street, or President Street for the north alignment and on Sullivan Street for the south alignment. The most likely method of installation would be by horizontal directional drilling (HDD) across Buttermilk Channel. Because of the high level of activity in the Channel, open trenching would not be practical, and the water mains could not be laid on the seabed because of the danger of being snagged by an anchor. Both tunneling and micro-tunneling would not be practical because of costs and logistics.

HDD is commonly used by the petroleum industry and utilities to lay pipelines and conduit under environmentally sensitive areas and heavily trafficked throughways and water ways. HDD provides a method to install the cables and lines without needing a trench or disturbing the ground surface for the majority of the route. First, pits are drilled at the entry and exit points. Then the drilling commences and the drill bit is guided both vertically and horizontally. Sensors relay vertical angle, rotation, horizontal direction, and temperature data to a surface receiver. The signals are decoded and steering directions are sent to the bore machine operator. These data can be transmitted either through a cable or wireless.

When the drill bit reaches the exit pit, it is pulled back with a reamer that increases the diameter of the micro-tunnel. Drill cuttings are discharged into a pit for settling. The cuttings are sent to a landfill and the water is discharged after the sediments have settled out. The "back reaming" continues until the micro-tunnel is large enough to hold the water main without binding. The micro-tunnel is held open with either a polymer or a type of clay called bentonite. The water main is laid out on the exit pit side, and pulled back through to the entry pit. The polymer or bentonite is discharged into a holding pit or tank for reuse. After the water main is in place, it is connected to the existing water supply system using conventional means.

SEAWALL AND STORMWATER OUTFALLS

The seawall that encircles Governors Island has been inspected and evaluated. On the south and west sides of the Island, the seawall exhibits significant deterioration due to wave action generated by prevailing winds and harbor traffic prevalent on this part of the island. Additionally, 132 stormwater outfalls penetrate the seawall. At a number of these outfalls, deterioration of the stormwater infrastructure has contributed to the deterioration of the seawall, including on the more sheltered north and east sides of the island. The proposed action (see Figure 1-14) would involve the replacement, reconstruction, rehabilitation, or repair of the seawall, as appropriate, and the reconstruction and consolidation of the number of stormwater outfalls penetrating the seawall. Four different types of repair would be needed, ranging from repointing the seawall to full replacement. In addition to the repairs, new riprap revetment would be placed on the southwestern and southern perimeter of the Island.

The proposed stormwater outfall work includes reconstruction of 28 stormwater outfalls, construction of one new stormwater outfall, and abandoning and sealing the remaining 104 outfalls. Outfall piping would either be abandoned in place and capped at the seawall penetrations and inlets, and sealed with concrete, or the piping would be excavated and removed. The seawall rehabilitation and stormwater outfall reconstruction activities would require authorization from USACE under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act of 1899, and from NYSDEC under Articles 25 and 15 of the Environmental Conservation Law, and Section 401 Water Quality Certification.

Sections of the seawall on the west side of the island and within the historic district would be rebuilt. The rebuilt sections would involve the construction of a suitable wall foundation, replacement of general fill behind the wall with appropriate structural backfill, and reconstruction of the stone wall-face to exhibit a similar appearance to the existing wall. Holes would be drilled and dowels inserted and grouted into place through the stone wall. The area behind the seawall would be excavated, and geotextile fabric laid down. Gravel would be placed immediately behind the seawall and compacted fill would bring the ground up to grade. Pavement and curbing would be poured over the fill. This work would typically be done from the landside using power drills, excavators, and vibratory compactors. Rebuilding of the seawall would be undertaken in about seven short segments with each segment about 550 feet long. Approximately 700 feet of seawall in the vicinity of Castle Williams on the North Island would undergo full replacement using an augmented design to respond to challenging wave conditions.

The southwestern and southern parts of the seawall are exposed to waves generated in the open expanses of the Lower and Upper New York Bays. Over time these waves erode sediment at the base of the seawall and damage the stones in the seawall, leading to its eventual destruction. To prevent this, the seawall would be removed and replaced with a riprap revetment for about 3,750 feet. A new concrete head wall would be built between 12 to 17 feet behind the existing seawall.

The area behind the existing seawall would be excavated, geotextile fabric laid down, and a filter layer of 2- to 5-inch stones put onto the fabric. The head wall could be either cast in place or it could be precast off-Island, transported to the Island, put into place, and the pieces locked together. The construction of the head wall would be done from the land side. On the water side of the new head wall, the contractor could either excavate down to the extent possible and then dismantle the existing seawall, or the contractor could dismantle the seawall and dredge out in front of the new head wall. In either case, geotextile would be placed on the seabed, and the filter layer of 2- to 5-inch stones would be placed on the geotextile. The filter layer would have a minimum thickness of 1 foot. Larger stones would be placed over the filter layer. The large stones are expected to be about 4,500 pounds at the toe of the revetment and about 1,500 pounds on the upper part. The revetment would rise about 1 foot vertically for every 1.5 horizontal feet. This work would likely be done via barge-mounted cranes and other equipment. Divers would be used to check the placement of the geotextile, thickness of the filter layer, and placement of the stones.

The sections of the seawall on the north and east sides of the Island that do not warrant reconstruction would be rehabilitated or repointed as appropriate. Rehabilitation would occur at angles in the wall geometry where deterioration is more advanced and at locations where failures in the stormwater infrastructure have resulted in deterioration of the seawall. Rehabilitation would involve the partial removal of the seawall and unsuitable backfill and reconstruction of the wall using the same material pinned with reinforcement bars and with placement of suitable structural backfill. Stones would be placed by crane, and divers would grout them into place. Minor rehabilitation would also involve the addition of riprap at the toe of the seawall for scour protection. Repointing would involve removing weakened grout from the vertical and horizontal joints between the stones and replacing it with new, high-strength grout. This would be the most common repair undertaken on the seawall. This type of work is typically done by divers working in the water.

The proposed stormwater outfall reconstruction and consolidation work involves that reconstruction of 28 outfalls, construction of one new outfall and abandoning and sealing the remaining seawall outfall penetrations. The new stormwater lines would be trenched near the land side of the seawall, and the area behind the seawall dug out. An opening would be made in the seawall at an elevation that allows for the correct downward slope from the upland catch basins. The stormwater pipe would be fitted and grouted into the seawall. The area behind the seawall would be filled and compacted. Existing stormwater outfalls that are no longer needed would be backfilled and sealed with grout. This improvement, which would be undertaken as part of the seawall rehabilitation, would reduce the total number of outfalls from 132 to 29.

THE HILLS

Engineering analysis has determined that in order to build the Hills to about 30 to 80 feet above existing grade, the underlying soils would have to be strengthened to support the weight of the Hills. The method selected to provide the soil strengthening is preloading. Soil, rock, and other solids that would make up the core of the Hills would be placed early and remain as such for about 18 months. The weight of the materials would depress and consolidate the underlying soils, thereby strengthening the soil. Without the 18 months of preloading, the Hills would experience differential settling, cracking of the exposed ground, and loss of height.

The core of the Hills would be constructed of excess soil from excavations, debris from construction projects and building demolitions, and other suitable materials. Dump trucks would

bring the materials to the site, and bulldozers would be used to mound the materials. When the proper height and weight of materials is reached, the mounds would be covered with geotextile fabric to minimize dust and to separate the core materials from the finishing materials. The mounds would be allowed to settle until the underlying soils have gained sufficient strength to support the weight of the finished Hills. A slope of reinforced granular fill would then be placed on the core with its geotextile fabric cover. Above the granular fill would be the surface materials, which could be soil, pavers, concrete walks, and similar type materials. Dump trucks would bring the materials to the site, and bulldozers would do the rough grading. The finished grading would likely be done with small machines and by hand. For slopes steeper than 1 vertical to 1 horizontal, the Hills would be terraced for stability.

CONSTRUCTION OF A NEW BUILDING

The potential siting, height, massing, design, and materials of the buildings to be developed in the development zones on the South Island for the Later Phases-Island Redevelopment have not yet been planned, developed, or designed. Therefore, the following describes the construction process for a typical new building, which consists of four steps: excavation and foundations, superstructure, exterior, and interior finishing

Because of the high water table on the South Island, excavation would likely be shallow and involve bulldozers, cranes, and dump trucks. The South Island was built on uncontrolled fill and the soil conditions are highly variable. Therefore, it is likely that piles would be driven to support the buildings. Pile caps would be formed and concrete poured to build the foundations for the buildings. The pile driving and foundations would typically employ about 30 construction workers. In addition to an excavator and a mini-excavator, a pile driver and generator would be used.

Depending on the size and height of the buildings, different construction materials would be used. For buildings lower than six or eight stories, masonry and block walls are typically used. This type of construction requires about 50 masons and workers to build the walls, floors, and roof. A rough terrain fork lift would be used to move the masonry around the site and into position for the masons. Mortar mixers would also be used. A second possible method is using large, pre-cast concrete planks brought to the site on tractor trailers. The pre-cast elements would be lifted by large cranes from the bed of the tractor trailers and secured into place. This type of construction requires the same number of workers on site, about 50 per day. At this point in the construction process, electric service may be available, and generators would no longer be needed.

For buildings taller than six or eight stories, two different types of superstructure construction are typically used for the core. The more common is concrete structural members, but steel columns are also used, depending on the circumstances. Superstructure consists of the interior core of the building, the structural columns along the perimeter and interior of the building, and the floor decks. For a building using concrete for the structural members, plywood forms are built, reinforcing places within the forms, and concrete is poured for the columns. Concrete is pumped from the ground level up to the floor being constructed. Then steel sheets are typically used to form the floor plates with concrete being pumped up to the floor. Building the concrete superstructure requires the use of the tower crane, compressors, personnel and material hoists, concrete pumps, on-site reinforcing bar bending jigs, welding equipment, and a variety of hand-held tools. Typical high-rise concrete superstructure construction requires about 10 to 20 delivery and concrete trucks per day, and approximately 100 to 200 workers. The main

difference for a steel superstructure is that the columns are lifted into place by cranes and riveted into place. Concrete pumps are still needed for the floors. Fewer concrete pumps would be needed, but rivet guns, welding machines and other steel working equipment would be needed.

As the superstructure progresses upward, the exterior façade is installed on the lower floors, usually 6 to 10 stories below the superstructure construction. The façade pieces are usually fabricated off-site, transported to the site, and lifted into place with cranes. Hand tools are used to fasten the façade to the superstructure. Typically, about 200 workers are needed to install the exterior façade and include 5 to 10 truck deliveries per day.

The interior fit-out is the same for low- and high-rise buildings and is the most labor intensive part of constructing buildings, with about 70 workers per building on-site. Interior finishing involves electrical installation; heating, ventilation, and air conditioning; sheet rocking; painting; and furnishing. Small hand tools are mostly used for interior finishing, but a high number of deliveries for materials, such as sheet rock, ceiling tiles, flooring and interior electrical, mechanical, and plumbing fixtures are required. About 15 to 20 delivery trucks would enter and exit the site each working day in connection with this task. High-rise construction uses temporary hoists on the exterior buildings to provide vertical transportation for workers and materials. On low rise buildings, mobile lifts are typically used for vertical transportation.

RENOVATION OF EXISTING BUILDINGS

Abatement of potentially hazardous materials is the first task in renovating existing buildings. Prior to renovation, a New York City-certified asbestos investigator would inspect the portions of the building to be renovated for asbestos-containing materials (ACMs). If ACMs are found in these portions of the building, they must be removed by a NYSDOL-licensed asbestos abatement contractor prior to the renovation project. Asbestos abatement is strictly regulated by NYCDEP, NYSDOL, USEPA, and OSHA to protect the health and safety of construction workers and others nearby. Depending on the extent and type of ACMs, these agencies would be notified in advance of the asbestos removal project and may inspect the abatement areas to ensure that work is being performed in accordance with applicable regulations, including new NYCDEP regulations enacted in February 2, 2011. These regulations specify abatement methods, including wet removal of ACMs that minimize asbestos fibers from becoming airborne. The areas of the building with ACMs would be isolated from the surroundings with a containment and decontamination systems. The types of systems used would depend on the type and quantity of ACMs, and may include hard barriers, isolation barriers, critical barriers, and caution tape. Specially trained and certified workers wearing personal protective equipment would remove the ACMs and place them in bags or containers lined with plastic sheeting for disposal at an off-Island, licensed asbestos landfill. Depending on the extent and type of ACMs, an independent third-party air-monitoring firm would collect air samples before, during, and after the asbestos abatement. These samples would be analyzed in a laboratory to ensure that regulated fiber levels are not exceeded. After the abatement is completed and the work areas have passed a visual inspection and additional air monitoring, if applicable, the general renovation work can begin. Depending on the amount of ACMs to be removed and the phasing of the renovation, up to 25 workers could be needed. Usually about one to four truckloads of material could be removed per day.

Any project activities with the potential to disturb lead-based paint (LBP) would be performed in accordance with the applicable OSHA regulation (OSHA 29 CFR 1926.62—*Lead Exposure in Construction*). When conducting renovation (unlike asbestos abatement work), LBP is generally not stripped from surfaces. Structures are disassembled or broken apart with most paint still

intact. Dust control measures (spraying with water) would be used. The lead content of any resulting dust is therefore expected to be low. Work zone air monitoring for lead may be performed during certain activities with a high potential for releasing airborne lead-containing particulates in the immediate work zone, such as manual demolition of walls with LBP or cutting of steel coated with LBP. Such monitoring would be performed to ensure that workers performing these activities are properly protected against lead exposure.

Polychlorinated biphenyls (PCBs) were historically used in transformers (as a dielectric fluid), some underground high-voltage electric lines, hydraulically operated machinery, and fluorescent lighting ballasts. Suspected PCB-containing equipment that would be disturbed would be evaluated prior to disturbance. Unless labeling or test data indicate that the suspected PCB-containing equipment does not contain PCBs, it would be assumed to contain PCBs and removed and disposed of at properly licensed facilities in accordance with all applicable regulatory requirements.

For work on the exterior of buildings, scaffolding is typically installed with netting over the scaffolding to prevent materials or tools from inadvertently falling. The roof is typically replaced and depending on the condition of the building, some or all of the windows may be replaced. Depending on the size of the building, exterior renovations could take between 6 to 12 months, and employ about 30 to 70 workers per building. About 10 to 12 truck deliveries are expected per day for all buildings being renovated. Equipment would include mobile cranes in the backyard, mortar mixers, power trowels, generators, and welding machines.

The interior renovation work would not be particularly intrusive to the surrounding uses. Interior walls and ceilings are demolished. If needed, floors are leveled. As the interior is being deconstructed, the existing elevators shafts or stairwells would be used to move debris from the higher floors to ground level. Enclosed chutes would be installed in the vertical openings and used to move the debris to the ground level. Front-end loaders would be used on the ground floor to load materials into dump trucks. The demolition debris would be sorted prior to being disposed at landfills to maximize recycling opportunities. A building could have from 20 to 60 workers and up to 30 total truck deliveries per day.

GOVERNORS ISLAND LOGISTICS

Being an island, maritime transportation would have to be used for bringing workers, equipment, and materials to the construction site. This requires some unusual logistics that are not needed in a typical New York City construction project.

TRANSPORTATION TO GOVERNORS ISLAND

Workers

Site construction activities would mostly take place during the typical construction shift of 7:00 AM to 3:30 PM. However, some construction tasks would extend to 6:00 PM, requiring a portion of the construction workforce to remain for this extended shift. Workers could be transported to the Island in several ways. It is expected that ferries operating from the Brooklyn Maritime Building (BMB) and water taxies operating from Pier 6 in Brooklyn would be available to construction workers. Construction companies could also arrange for private water transportation service. A number of potential sites are available through New York Harbor, but it is likely that existing ferry operators would be contracted and their existing sites would be used. These sites are located through the waterfronts of Manhattan, Brooklyn, and Queens. Many of

the private ferry and water taxi operators have parking at their facilities and also offer transportation to the ferry site from nearby public transportation stations. The marine contractors for repairing the seawall would likely have its own waterfront site and would transport the workers from that location. Almost all of the New York Harbor marine construction companies have their yards on the north and west shores of Staten Island. It is not expected that workers would be allowed to use their own private boats to travel to Governors Island.

Equipment

It is expected that large construction equipment, such as cranes, dump trucks, and bull dozers, would be transported to the Island via a scow, and the equipment would be left on-Island for the duration of its use on the construction project. Smaller equipment, such as compressors, welding machines, and reinforcing bar benders, would be brought to the Island in a similar manner, but could also be transported on the deck of a work boat, and not require a scow and tug. The Trust would set up a logistics area in the vicinity of Lima Pier (see Figure 1-3) at the southern end of the Island for use by the construction contractors. It is expected that the equipment, when not in use, would be stored near Lima Pier. Hand tools, such as shovels, hammers, and saws, could be carried by the workers when they come to the Island or by work boats. The tools would likely be stored on the construction site.

Materials

It is expected that materials would be transported by barge to the Island. Loose materials, such as sand and gravel would come in hopper barges to minimize spillage. Other materials, such as precast concrete pieces and reinforcing bars, would likely come on flat deck scows to minimize loading and unloading time. Sand and gravel barges usually load at the quarry site and wait at designated mooring fields until the materials are needed at the site. Then the barge would be moved by a tug to Governors Island. It is likely that sand and gravel barges would moor at Lima Pier and be unloaded by crane as the materials are needed. Therefore, a hopper barge could spend one to several weeks at Lima Pier as it is unloaded. When the hopper barge is emptied, a new loaded barge would take its place, and a tug would move the empty barge back to the quarry.

Other materials would have to be marshaled at a maritime facility until a barge load has accumulated. One typical New York Harbor barge can carry 200 truck loads, and there are a number of large waterfront sites that have the space to accommodate the materials. The majority of the waterfront sites are on the New Jersey side of the harbor, but several exist on the New York side. These include, among others, Erie Basin, South Brooklyn Marine Terminal, and Brooklyn Army Terminal in Brooklyn, and various sites on Newtown Creek in Queens/Brooklyn.

For projects that need large volumes of concrete, associated with new building construction in the development zones for the Later Phases-Island Redevelopment, it is possible that the contractor may set up a batch plant on Governors Island. The cement would be stored on a closed barge and the aggregate on a hopper barge in the vicinity of Lima Pier. Concrete would be made in batches, as needed, and transported by concrete truck to the construction site.

STOCKPILING AND TRANSPORTATION ON GOVERNORS ISLAND

It is planned that the majority of the construction materials storage and handling would be at the southern end of the Island and this activity would be away from the North Island, except during

actual construction within the North Island. The materials loading and unloading dock would be Lima Pier, which would not be open to the public. Some materials would be stored on moored barges. Other materials, such as trees, shrubs, and drywall, would be stored in a laydown area south of the proposed Play Lawn. The one exception would be the new water main connecting to the North Island near Building 85 on Kimmel Road. For this, the water pipes would be strung just to the north of the entry pit.

Trucks would bring materials to the construction sites daily and haul excess soil back to the laydown area for future use. The trucks would use existing roadways or temporary roads may be constructed across unused land. Existing roadways on the Island also function as walkways and bikeways, and to the extent practical walking and biking routes would be re-routed away from active areas of construction. The use of other walkways and bikeways, except to cross into or out of construction sites would be minimized.

PARK USER PROTECTION MEASURES

Because of the park use of Governors Island, additional measures beyond normal construction practices would be taken to protect the park users from the construction activities. As described above, construction sites are normally fenced off from the surrounding areas and secured when construction is not active. The fences would be solid to reduce the construction noise and the spread of dust. Flaggers would be stationed at the vehicle entrances to the construction sites to control the vehicular and pedestrian flows. Where practical, walkways and bikeways would be re-routed away from active areas of construction. Drivers of on-Island trucks would receive pedestrian safety instruction at the start of each construction contract.

Signage about the Proposed Project and its expected completion date would be posted. The signs would also include the telephone number to report any observed dangerous or unusual conditions. The Trust personnel would be assigned to coordinate with the contractors to minimize disturbance to the park users. These personnel would also be available to receive any comments from the public about the construction and its possible effects on the park users. The Trust's web site would carry information about the location, timing, and type of each construction project.

E. FUTURE WITHOUT THE PROPOSED PROJECT

As discussed in Chapter 2, "Analytical Framework," The Trust is undertaking a number of construction projects that have undergone prior environmental review and approval separate from this Generic Environmental Impact Statement. These construction projects are needed to support the existing programs on the Island. These projects, to be completed in the future without the Proposed Project, include demolition of certain buildings, upgrading utilities, and rehabilitating waterfront structures.

All buildings on the South Island will be demolished (in accordance with applicable regulatory requirements including those relating to ACMs and LBP) and the surrounding area graded level. Although previous studies identified areas of soil contamination from the earlier uses on the Island, these areas have been remediated in accordance with applicable federal and state regulatory requirements. The utility infrastructure work includes on-Island replacement and upgrade to the following services: storm sewers; domestic and fire protection water service; sanitary sewerage; and electrical and telecommunications service (also includes upgrades of service to the Island). The waterfront work includes rehabilitation of both Pier 101 and Yankee

Pier, demolition of Tango Pier, and rehabilitation of the transfer bridges and fenders at both Soissons Dock and the BMB. This utility and waterfront work could encounter subsurface contamination or underground storage tanks, though more recent subsurface testing did not encounter any areas of significant contamination. Should tanks or other contamination be encountered, they would be addressed in accordance with applicable regulatory requirements, e.g., those relating to spill reporting, tank registration and off-site waste disposal.

F. PROBABLE IMPACTS OF THE PROPOSED PROJECT

Potential construction impacts on the relevant areas of concern are discussed below. These include park use, socioeconomic conditions, cultural resources, hazardous materials, transportation, air quality, noise, vibration, water quality and natural resources, and rodent control. At this time, the development for the Later Phases–Island Redevelopment has not yet been specifically proposed, defined, or designed. Therefore, it is not possible to perform detailed construction analyses for all relevant areas of concern associated with the Later Phases–Island Redevelopment component.

PARK USE

Construction activities are noisy, can create dust, cause air emissions, and generate heavy equipment and truck traffic. As discussed above, The Trust would institute a number of measures to minimize the effects on park users. These measures include:

- The Trust personnel assigned to address user complaints;
- Solid fencing around active construction sites;
- Covering and watering of soil piles;
- Flaggers for traffic control;
- Routing of construction traffic away for areas in active park use; and
- Temporary re-routing of walkways and bikeways away from active construction.

While some park users would find their park experience disrupted to some degree, the above measures would minimize the disruption during construction of Phase 1 and the Later Phases-Park and Public Spaces, each with a less than two-year duration of construction. In addition, during construction of Phase 1, the park would be open to the public on Fridays, Saturdays, Sundays, and holiday Mondays from Memorial Day weekend in May through late September, while construction activities would occur generally from Monday through Friday and on some Saturdays. Thus, construction activities would not be expected to affect park users on Saturdays or Sundays. Therefore, construction would not result in a significant adverse impact on park users.

When the Later Phases-Island Redevelopment has been planned and designed, it is anticipated that the associated future environmental review would take into account an analysis of the potential for construction impacts on park users from the full development of the Proposed Project.

SOCIOECONOMIC CONDITIONS

Construction activity associated with the Proposed Project would affect the New York City and State economies. Construction of the Proposed Project would create direct benefits on the

economy from expenditures on labor, materials, and services over the course of the construction period. Construction would also result in substantial 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 may be generated by the sale of construction materials for some components of the Later Phases-Island Redevelopment. Certain elements of the project may be exempt from paying sales tax on construction materials. For example, materials used for park construction would not be subject to sales tax because the project is public. In addition, the Proposed Project would generate income taxes, and corporate and business taxes from direct, indirect, and induced activity. There would be no significant adverse impacts on socioeconomic conditions due to construction.

HISTORIC AND CULTURAL RESOURCES

PHASE I

Archaeological Resources

Construction of Phase 1 of the Proposed Project would require subsurface disturbance in multiple areas within the North Island (see Chapter 8, "Historic and Cultural Resources"). As described above, the protocol for all excavations planned in the Historic District, within areas of identified or potential archaeological sensitivity or adjacent to the seawall would be as follows. Any planned excavations in these areas will be accompanied by construction plans and an archaeological work plan from an accredited archaeologist, to be reviewed and approved by LPC and/or OPRHP (as appropriate). Upon completion of the pre-approved excavation within these areas, an archaeological summary report will be sent to LPC and/or OPHRP. LPC and/or OPRHP (as appropriate) will be informed immediately if any artifacts are identified during excavations at any location within the Historic District.

The South Island is not considered to be potentially archaeologically sensitive, and thus the construction activities that would occur on this portion of the Island in Phase 1 would not affect archaeological resources. Furthermore, LPC and OPRHP have determined that the proposed water main(s) in Phase 1 would not affect significant archaeological resources within Brooklyn or Buttermilk Channel.

Architectural Resources

Since Phase 1 of the Proposed Project would occur on or in close proximity to contributing elements of the Governors Island Historic District, a CPP would be developed—based on the requirements stipulated in the New York City Department of Buildings (NYCDOB) *Technical Policy and Procedure Notice* (TPPN) *#10/88*—to ensure that historic structures and landscape elements within 90 feet of construction activities would not be inadvertently affected during construction. The CPP would be reviewed and approved by LPC and/or OPRHP (as appropriate). Since Phase 1 of the Proposed Project would involve no new building construction and would mainly consist of landscaping and paving improvements, no blasting, pile driving, or other vibration-intensive construction activities are assumed to be required. Therefore, it is assumed that the CPP would generally require protective fencing and netting around adjacent structures, rather than vibration monitors and pre-construction structural surveys. During Phase 1

of the Proposed Project, some seawall reconstruction work and outfall consolidation work would occur within 90 feet of the Castle Williams structure. Therefore, the Proposed Project's CPP would include stipulations to ensure that Castle Williams would not be inadvertently affected during construction activities at the seawall. Construction of the Proposed Project, including staging activities, also would be conducted in accordance with the guidelines of the Design Manual.

All of the buildings on the South Island—which have been determined not to be architectural resources—would be demolished in the Future Without the Proposed Project. Phase 1 work within the South Island would not involve the construction of any new buildings within the transition zone immediately south of Division Road. Therefore, construction activities for Phase 1 on the South Island would not have any adverse effects to architectural resources.

The Proposed Project's CPP would include stipulations to ensure that the off-Island potential resource at 43 Ferris Street would not be inadvertently affected during construction activities for the proposed water main.

LATER PHASES (THROUGH 2030)

Archaeological Resources

Coordination with LPC and/or OPRHP (as appropriate) will be conducted to determine the need for any additional archaeological work plans for the areas of the North Island that would experience subsurface disturbance for construction during the Later Phases of the Proposed Project. As necessary, this work would be conducted according to the protocol described above.

As described above, the South Island is not considered to be potentially archaeologically sensitive. Therefore, the construction activities that would occur on this portion of the Island in the Later Phases of the Proposed Project would not affect archaeological resources. Construction of the Later Phases of the Proposed Project would not involve any potential subsurface disturbance in the off-Island Area of Potential Effect beyond that already disclosed for Phase 1.

Architectural Resources

As for Phase 1 of the Proposed Project, since portions of the Later Phases of the Proposed Project would occur on or within in close proximity to contributing elements of the Governors Island Historic District, a CPP would be developed. At this time it is assumed that no blasting, pile driving, or other vibration-intensive construction activities would be required in the North Island for the Later Phases of the Proposed Project. Therefore, it is assumed that the CPP for this work would generally require protective fencing and netting around adjacent structures, rather than vibration monitors and pre-construction structural surveys. Construction work for the Great Promenade in the Later Phases of the Proposed Project would occur within 90 feet of Castle Williams. Therefore, the Proposed Project's CPP would include stipulations to ensure that Castle Williams would not be inadvertently affected during construction activities for the Great Promenade.

No construction work for the Later Phases of the Proposed Project would occur within the off-Island project areas, and thus would not disturb any architectural resources in those areas.

For more detail on the potential impacts of the Proposed Project on historic and cultural resources, see Chapter 8, "Historic and Cultural Resources."

HAZARDOUS MATERIALS

As discussed above, recent subsurface testing did not identify any areas with significant soil or groundwater contamination. In the past, known areas of soil contamination and other subsurface hazardous materials, such as petroleum products and unexploded ordinance, were remediated. Nevertheless, some areas of contamination may not have been identified during the various historical studies and there is some potential to encounter subsurface contamination or underground storage tanks during project work requiring subsurface disturbance. Therefore, certain precautions would be taken prior to and during construction in a particular area to avoid impacts from hazardous materials.

Impacts during construction would be avoided by preparing a site-specific RAP and CHASP for implementation during construction and submitted to NYCDEP for review and approval. The RAP would provide the appropriate clean fill importation criteria and criteria for allowable reuse of excavated site soils (whether in the uppermost layer of landscaped areas or elsewhere), and handling, stockpiling, testing, transportation, and disposal of excavated materials, including any unexpectedly encountered contaminated soil and petroleum storage tanks, in accordance with applicable regulatory requirements. The CHASP would ensure that subsurface disturbance is performed in a manner protective of workers, others on the Island, and the environment. With these measures, construction of the Proposed Project would not result in any significant adverse impacts related to hazardous materials.

For more detail on potential impacts from hazardous materials, see Chapter 11, “Hazardous Materials.”

TRANSPORTATION

The project would generate trips from workers traveling to and from the site, as well as from the movement of goods and equipment.

TRAFFIC

The workers would gather at the ferry and water taxi sites or locations arranged by individual contractors prior to the start of the days work for transportation to the Island. As discussed above, typical construction hours are from 7:00 AM to 3:30 PM. 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, which would be parked off-Island. 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 200 during the peak construction period. The gathering places for construction workers going by water to Governors Island are expected to be located throughout the metropolitan area. No one locality would experience a concentration of constructions workers gathering during construction of Phase 1 and the Later Phases-Park and Public Spaces, each with a less than two-year duration of construction. Therefore, no significant adverse impacts on vehicular traffic are expected from construction workers during construction of Phase 1 and the Later Phases-Park and Public Spaces.

The construction of the Later Phases-Island Redevelopment would likely require longer construction periods and substantially more construction workers and deliveries, which may result in significant adverse transportation impacts. These impacts and potential mitigation

measures will be assessed as part of future environmental reviews when details on the Later Phases-Island Redevelopment components become more defined.

TRANSIT

Like vehicular traffic, the public transit lines that workers would use are scattered throughout the metropolitan area, and no one subway or bus line would experience all workers using it. Therefore, no significant adverse impacts on public transit facilities are expected.

CONSTRUCTION MATERIALS

Certain contractors may choose to stock pile construction materials at off-Island locations before transporting them to the Island. As discussed above, one typical barge load is equivalent to about 200 truck loads. The stock-piling locations could be at marine contractors work yards or at under-used industrial waterfront sites. The trucks would come to the location over a period of days or weeks, and most likely, no contractor would try to accumulate a barge load of construction materials in one day. These stock-piling locations would be spread throughout New York Harbor, and no one location would be used for all Governors Island construction materials. Therefore, no significant adverse impacts are expected to be caused by the truck movement of construction materials.

MARINE

It is anticipated that waterborne transportation would be the primary means of moving construction workers, materials, and equipment to Governors Island during construction of the Proposed Project. New York Harbor is a busy maritime port with tour ferries, tugs, barges, ocean going ships, tour boats, and recreational vessels transversing the waters 24 hours a day. The Buttermilk Channel alone saw 1,628 commercial vessels trips in 2009, and this number does not include non-commercial and recreational transits. USCG operates a harbor surveillance system to help provide separation between large vessels. The maritime trips generated by construction on Governors are expected to be limited to ferries and water taxis for the workers, and tug-assisted barges for equipment and materials. All of these vessels are operated by captains licensed by USCG. The number of daily trips to Governors Island for construction is expected to be minimal compared with the existing trips and would not add significantly to the waterborne traffic in New York Harbor. Therefore, no significant adverse impacts on marine traffic are expected as a result of construction of the Proposed Project.

AIR QUALITY

Possible impacts on local air quality during construction of the Proposed Project include fugitive dust (particulate) emissions from land clearing operations and demolition, and mobile source emissions, including hydrocarbons, nitrogen oxide, and carbon monoxide emissions. For more background material on air quality, see Chapter 16, “Air Quality.”

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 particles, which are expected to settle within a short distance from the construction sites and not significantly impact any 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 resulting in a significant adverse impact.

EMISSIONS

Construction activity in general has the potential to adversely affect air quality as a result of diesel emissions. The main component of diesel exhaust that has been identified as having an adverse effect on human health is fine particulates. To ensure that construction on Governors Island results in the lowest feasible diesel particulate matter (DPM) emissions, an emissions reduction program for all construction activities would be implemented and would consist of the following components:

1. *Diesel Equipment Reduction.* Contractors would minimize the use of diesel engines and use electric engines to the extent practicable. To that end, the construction manager would contact Con Edison to seek the early connection of grid power to the sites by the start of construction. Construction contracts would specify the use of electric engines and ensure the distribution of power connections as needed and subject to availability. Equipment that would use electric power instead of diesel engines would include, but not be limited to, concrete vibrators, and material/personnel hoists.

2. *Clean Fuel.* Ultra-low sulfur diesel fuel (ULSD) would be used exclusively for all diesel engines throughout the construction sites. This would enable the use of tailpipe reduction technologies (see below) and would directly reduce DPM and sulfur oxide emissions.

3. *Best Available Tailpipe Reduction Technologies.* Non-road diesel engines with a power rating of 50 horsepower (hp) or greater and controlled truck fleets (i.e., truck fleets under long-term contract, such as concrete mixing and pumping trucks) would utilize the best available tailpipe technology for reducing DPM emissions. Diesel particle filters (DPFs) have been identified as being the tailpipe technology currently proven to have the highest reduction capability. The construction contracts would specify that all diesel non-road engines rated at 50 hp or greater would utilize DPFs, either original equipment manufacturer (OEM) or retrofit technology that would result in emission reductions of DPM of at least 90 percent (when compared with normal private construction practices). Ninety percent reduction has been verified by a study of actual reductions of $PM_{2.5}$ emissions from comparable engines used at a New York City construction site. Controls may include active DPFs,[1] if necessary.

4. *Utilization of Tier 2 or Newer Equipment.* In addition to the tailpipe controls commitments, the construction program would mandate the use of Tier 2[2] or later construction equipment

[1] There are two types of DPFs currently in use: passive and active. Most DPFs in use are the "passive" type, which means that the heat from the exhaust is used to regenerate (burn off) the PM to eliminate the buildup of PM in the filter. Some engines do not maintain temperatures high enough for passive regeneration. In such cases, "active" DPFs can be used (i.e., DPFs that are heated either by an electrical connection from the engine, by plugging in during periods of inactivity, or by removal of the filter for external regeneration).

[2] The first federal regulations for new non-road diesel engines were adopted in 1994, and signed by USEPA into regulation in a 1998 Final Rulemaking. The 1998 regulation introduces Tier 1 emissions

for non-road diesel engines greater than 50 hp. The use of "newer" engines, especially Tier 2, is expected to reduce the likelihood of DPF plugging due to soot loading (i.e., clogging of DPF filters by accumulating particulate matter); the more recent the "Tier," the cleaner the engine for all criteria pollutants, including PM. In addition, while all engines undergo some deterioration over time, "newer" as well as better maintained engines will emit less PM than their older Tier or unregulated counterparts. Therefore, restricting site access to equipment with lower engine-out PM emission values would enhance this emissions reduction program and implementation of DPF systems as well as reduce maintenance frequency due to soot loading (i.e., less downtime for construction equipment to replace clogged DPF filters). In addition, to minimize hourly emissions of NO_2, non-road diesel-powered vehicles and construction equipment meeting or achieving the equivalent of higher USEPA non-road diesel emission standards would be used in construction, where practical and feasible.

These measures would prevent engine emissions from resulting in a significant adverse impact.

NOISE AND VIBRATION

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 21-3**. 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 USEPA 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 NYCDOB would be obtained. In addition, appropriate low-noise emission level equipment and operational procedures would be used.

standards for all equipment 50 hp and greater and phases in the increasingly stringent Tier 2 and Tier 3 standards for equipment manufactured in 2000 through 2008. The Tier 1 through 3 standards regulate the USEPA criteria pollutants, including particulate matter (PM), hydrocarbons (HC), oxides of nitrogen (NO_x) and carbon monoxide (CO). Prior to 1998, emissions from non-road diesel engines were unregulated. These engines are typically referred to as Tier 0.

Table 21-3
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.

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 result in a significant adverse impact.

VIBRATION

Construction activities have the potential to result in vibration levels that may in turn result in structural or architectural damage, and/or annoyance or interference with vibration-sensitive activities. In general, vibration levels at a location are a function of the source strength (which in turn is dependent upon the construction equipment and methods utilized), the distance between the equipment and the location, the characteristics of the transmitting medium, and the building construction type at the location. Construction equipment operation causes ground vibrations which spread through the ground and decrease in strength with distance. Vehicular traffic, even in locations close to major roadways, typically does not result in perceptible vibration levels unless there are discontinuities in the roadway surface. With the exception of the case of fragile and possibly historically significant structures or buildings, construction activities generally do not reach levels that can cause architectural or structural damage, but can achieve levels that may be perceptible and annoying in buildings very close to a construction site. Given the locations of construction on Governors Island, no significant adverse impacts caused by vibration are expected.

For more background information on noise and vibration, see Chapter 18, "Noise."

WATER QUALITY AND NATURAL RESOURCES

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 sediments in other locations, these temporary effects would be localized to the immediate vicinity of the seawall reconstruction and outfall consolidation work. On the basis of the rapid flushing in 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

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 SWPPP during construction of the Proposed Project would minimize potential impacts to water quality 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 NYSDEC's Stormwater Management Design Manual.

Depending on the site, decanted water could be discharged either into the Upper New York Bay, and the settled sediment conveyed to a licensed disposal area. Discharge into Upper New York Bay is governed by NYSDEC regulations.

FLOODPLAINS AND WETLANDS

The Proposed Project activities 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. These areas would not be harmed by any flooding, and the development of Governors Island would not lead to increased coastal flooding.

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 construction, and loss of bottom habitat and associated benthic invertebrates.

The temporary increase in suspended sediment associated with 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. The hydrodynamics of Upper New York Bay 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-dwelling 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.

In-water construction can produce underwater sound pressure waves that can affect fish, with the type and intensity of sounds varying with such factors as the firmness of the substrate, depth of water, and the type and size of the equipment. The nosiest activity would occur only for short periods of time, and individual fish would not be expected to be exposed to potentially dangerous sound pressure levels long enough to result in mortality. Therefore, the in-water construction that would occur as a result of the Proposed Project would not be expected to result in significant adverse impacts to aquatic biota.

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 seawall 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, 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 Upper New York Bay.

For more details on potential impacts on water quality and natural resources, see Chapter 10, "Natural Resources."

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 NYSDEC-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. ✷