Chapter 20: Construction Impacts

A. INTRODUCTION

The Proposed Project would result in substantial construction activities. The construction schedule and methods for the Proposed Project are discussed in this chapter. The potential for construction-period impacts in the area around the Project Site is assessed, and measures to avoid, reduce, or mitigate the potential for significant adverse impacts are presented.

B. OVERVIEW OF CONSTRUCTION ACTIVITIES

The development of the Gateway Center Properties Phase II would involve four different construction developers—Related Retail Properties, Inc. and Hudson Properties, Inc. (collectively Gateway Center Properties Phase II, LLC), Nehemiah Housing Development Fund Co., and the City of New York. Nehemiah would build residential buildings with affordable housing, and Hudson Properties would construct mixed-use buildings with affordable housing and retail uses. Related Retail, or an affiliate, would build the shopping center. The City of New York, through various City entities and agencies, including the New York City Department of Deign and Construction (DDC), the New York City Department of Parks and Recreation (DPR), the New York City Department of Transportation (NYCDOT), and the New York City School Construction Authority (SCA), would be responsible for the provision of infrastructure, roads, the school, parks, day care, and other community facilities. The locations of the various buildings, color coded by construction manager, are shown on Figure 20-1.

SCHEDULE

Figure 20-2 presents a preliminary construction schedule. Construction of the infrastructure and some of the Nehemiah Housing begin in 2006, but the pace of construction on the project site would increase by 2009 and peak in 2010 with all three private developers constructing their portions of the project as well as New York City agencies continuing to build infrastructure. In 2011 the pace of construction is expected to slow considerably with Nehemiah Housing completing two sites, Hudson Properties working on one residential site, and the City working on the intermediate/high school and the senior housing. During 2012 and 2013, the expected last two years of construction, the City would complete the parks, day care center, and the community facility. During these two years, Nehemiah Housing would install the last of the affordable housing.

GENERAL CONSTRUCTION PRACTICES

Certain practices would be observed throughout the project. Each construction manager would designate a contact person for community relations throughout the construction period. This person would serve as the contact for the community to voice concerns about construction activities, and would be available to meet with the community to resolve concerns or problems.

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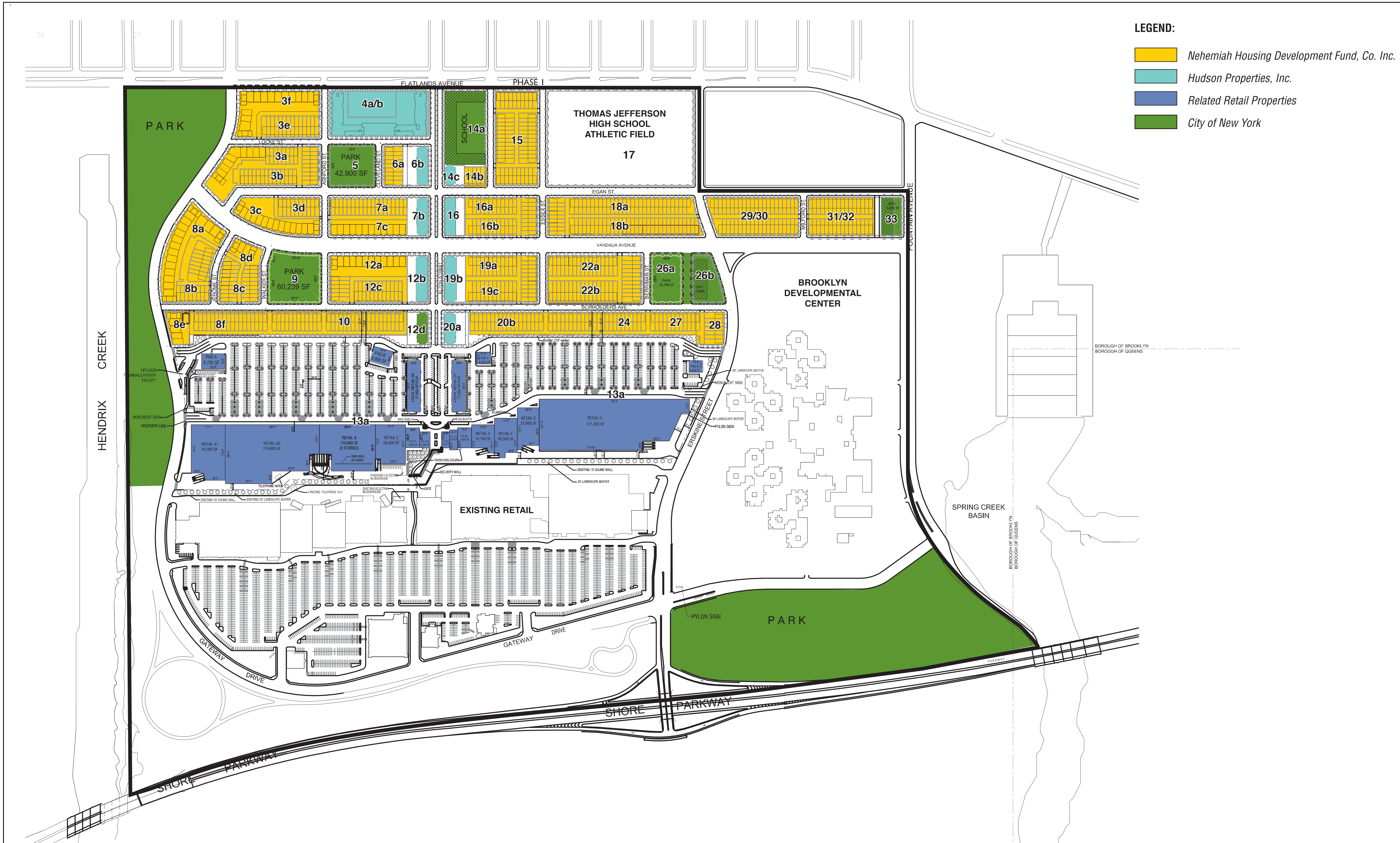
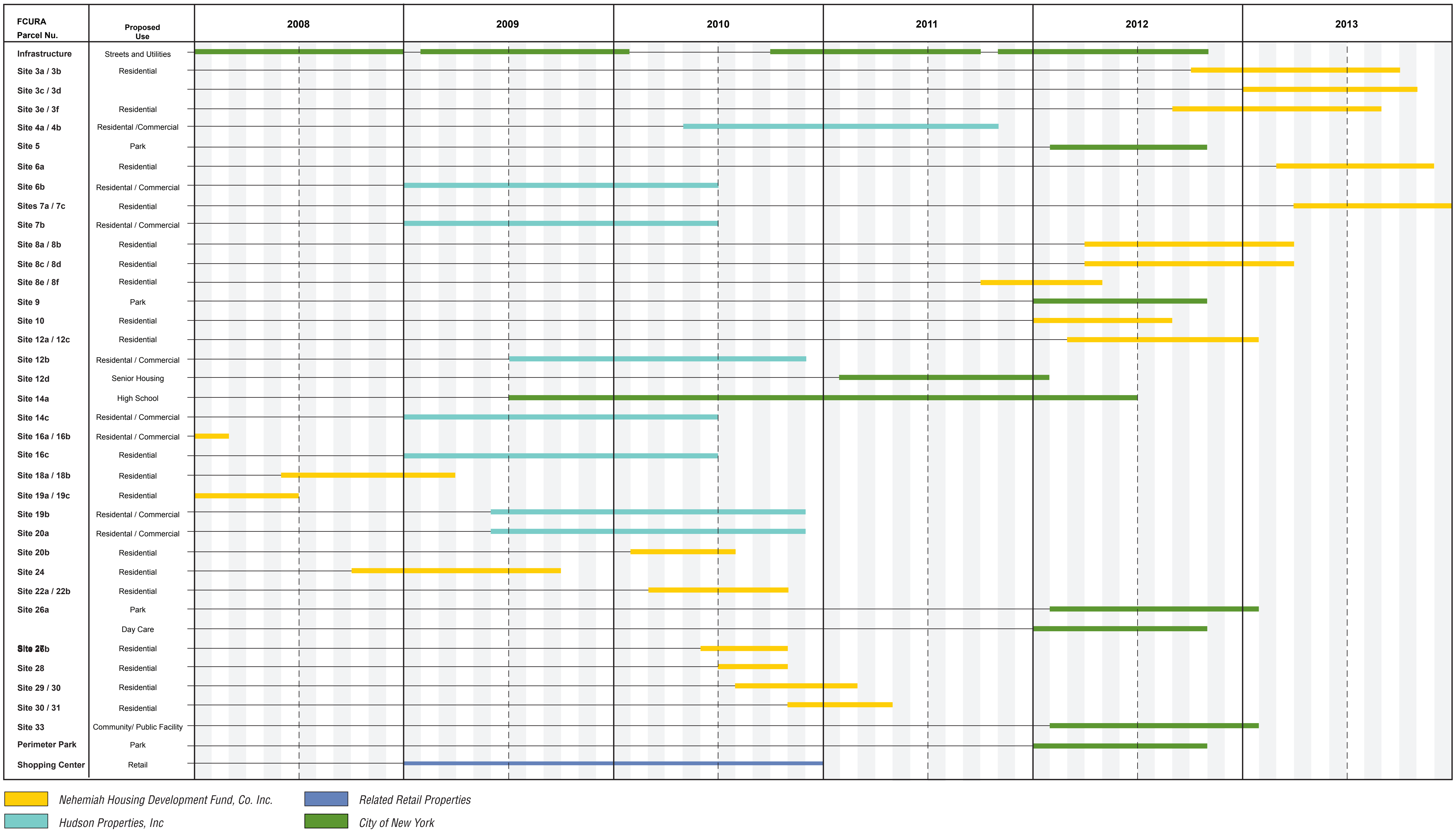


Construction Plan
Figure 20-1



GATEWAY ESTATES II

Preliminary Construction Schedule
Figure 20-2

The following describes typical construction practices in New York City. In certain instances, project practices may vary from those described below.

DELIVERIES AND ACCESS

Access to the construction sites would be controlled. The work areas would be fenced off, and limited access points for workers and trucks would be provided. 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. Unauthorized access would be prevented after work hours and during the weekend.

Material deliveries to the site would be controlled and scheduled. Unscheduled or haphazard deliveries would be minimized.

HOURS OF WORK

Construction activities for the buildings would take place in accordance with New York City laws and regulations which allow construction activities to take place between 7 AM and 6 PM. Construction work would begin at 7 AM on weekdays, with most workers arriving between 6 AM and 7 AM. Typically, work would end at 3:30 PM, but could be extended until 6 PM for such tasks as finishing a concrete pour for a pad, or completing the bolting of a steel frame erected that day. Extended workday activities would not include all construction workers on site, but only those involved in the specific task. Extended workdays would occur during foundation and superstructure tasks, and limited extended workdays could occur during other tasks over the course of construction.

At limited times over the course of constructing a building, weekend work would be required. Weekend work requires a permit from the New York City Department of Buildings (DOB) and, in certain instances, approval of a noise mitigation plan from the New York City Department of Environmental Protection (NYCDEP) under the City's Noise Code. The New York City Noise Control Code, as amended in December 2005 and effective July 1, 2007 limits construction (absent special circumstances as described below) to weekdays between the hours of 7 AM and 6 PM, and sets noise limits for certain specific pieces of construction equipment. Construction activities occurring after hours (weekdays between 6 PM and 7 AM and on weekends) may be permitted only to accommodate: (i) emergency conditions; (ii) public safety; (iii) construction projects by or on behalf of City agencies; (iv) construction activities with minimal noise impacts; and (v) undue hardship resulting from unique site characteristics, unforeseen conditions, scheduling conflicts and/or financial considerations. In such cases, the numbers of workers and pieces of equipment in operation would be limited to those needed to complete the particular authorized task. Therefore, the level of activity for any weekend work would be less than a normal workday. The typical weekend workday would be on Saturday, beginning with worker arrival and site preparation at 7 AM, and ending with site cleanup at 5 PM.

A few tasks may have to be completed without interruption, and the work can extend past 6 PM. In certain situations, concrete must be poured continuously to form one structure without joints. This type of concrete pour is usually associated with foundations and structural slabs at grade, which would require a minimum of 12 hours or more to complete.

SIDEWALK AND LANE CLOSURES

No lane closures are expected on Flatlands Avenue, Gateway Drive, or Erskine Street next to the existing retail development. Along these streets, some sidewalks may have protective sheds or pedestrian access may be within barriers when construction is taking place next to the sidewalk. In addition, it is expected that in certain locations temporary access ways for trucks and worker vehicles into the construction sites would cross sidewalks.

Within the Project Site, partial street closures and total sidewalk closures along one side of the streets would be required for various periods of time. Although much of the site is currently vacant and sufficient land appears to be available for off-street placement of the construction equipment and materials, during construction each site would be fully constructed, restricting the available space. As described below, the site preparation work and foundation construction precedes the erection of the buildings. After a site is prepared and the foundations are poured, that space is not suitable for storage of construction equipment or materials. Storage would take place along one side of the street.

Because each site would be fully built out, the construction cranes for hoisting materials would likely be in the street. In addition, construction materials, such as pre-cast concrete pieces, would likely be stored on trailers located on the street. The use of the streets for construction would cause lanes and sidewalks to be closed for several months to over a year. Some lanes and sidewalks would be closed only intermittently to allow for certain construction activities. This work would be coordinated with, and approved by, the appropriate governmental agencies.

These closures would be on streets that are used only for local traffic, and not on through streets, such as Flatbush Avenue or Gateway Drive. It is likely that a curb lane would be closed continuously during construction on a site. A second lane of traffic could be closed during periods of active construction. Large cranes have counterweights that extend beyond the cab and engine compartment. During periods of active construction, flaggers would be used to maintain safe traffic flow. Normal construction working hours are 7 AM to 3:30 PM, weekdays. An exception could be delivery of the modular housing units for the Nehemiah housing. These 20-feet by 40-feet units are delivered late at night when traffic is at its lightest.

NUMBER OF CONSTRUCTION WORKERS AND MATERIAL DELIVERIES

Table 20-1 presents the peak number of construction workers and delivery trucks expected for each quarter during the construction of the Proposed Project. The number of workers and truck deliveries peak during 2010 with a peak number of 1,380 workers per day and 475 deliveries per day. This occurs during the second quarter of 2010, based on the projected schedule. These numbers represent the highest number of workers and deliveries sustained over a several week period and may not reflect the single highest day.

STAGING AND LAYDOWN AREAS

Because of the density of the finished buildings, laydown areas would likely be on the curb lane of the local streets. It is not expected that through streets would be used for material laydown. Materials that are needed during the day are usually delivered early that day. These materials, such as reinforcing bars and prefabricated pieces, are stored until needed. In certain cases, several days of construction materials would be stored.

Table 20-1
Number of Construction Workers and Delivery Trucks (per day)

Year	2008				2009				2010				2011			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	175	165	225	205	425	455	865	1,265	1,365	1,380	1,100	1,065	545	515	435	320
Trucks	75	90	100	90	210	180	320	355	400	475	385	365	215	180	130	125
Year	**2012**				**2013**				**Project**							
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	Peak		Average					
Workers	670	840	775	605	555	655	580	140	1,380		639					
Trucks	270	325	320	275	230	280	275	145	475		243					

Note: The number of construction workers and delivery trucks represents the highest number over a one to two week period and may not reflect the absolute peak day.

The Nehemiah modular units are large and on dollies (road-worthy sets of wheels connected by steel beams). The modular units would be parked on the interior streets until they are put into place.

CONSTRUCTION WORKER PARKING

It is expected that the construction workers would park on the local streets next to the active construction site and would not park in the existing retail parking lots. Because of the size of the Project Site, sufficient street parking is expected to be available on the local streets.

CONSTRUCTION METHODS

Different construction techniques would be used on the various components of the Proposed Project. The Nehemiah Housing would use modular construction. The units are constructed off-site and trucked to the site, where they are lifted by cranes into position. The Hudson Properties residential units would utilize conventional construction techniques. The site would be prepared, piles driven, the foundation built, and then the building erected. The skeleton or core of the building would be built, and then the exterior or shell installed as the core rises to 6 to 8 stories. The buildings would involve extensive interior finishing for the walls, floors, and appliances. For the retail construction, the beginning work would be similar, but building would be about 20 to 25 feet high for certain retailers, such as building supply retailers; and 12 to 15 feet high for other retailers. The majority of the interior space would be one story with clear spans. The New York City construction would be varied because of the very different types of buildings and facilities. The work would involve public buildings, such as an intermediate/high school and a community facility, parks, roadways, and public utilities. The construction methods are described in more detail below.

NEHEMIAH HOUSING

Under the 1996 Fresh Creek Urban Renewal Plan (FCURP), Nehemiah housing was approved, and some of the approved Nehemiah housing was constructed. Some of the approved Nehemiah housing is currently under construction—specifically, sites 14b/14c, 15, 16a/16b/16c, 18a/18b, 19a/19c, 22a/22b are being constructed or are in the final design stages. The same type of construction that is currently underway is expected to be used in the future with the Proposed Action.

The Nehemiah housing would use modular construction where the housing is constructed in an off-site factory and trucked to the site for final assembly. The units are large, about 40 feet long, 20 feet wide, and 9 feet high. Two units are placed on top of another to make one residence of about 1,600 square feet (sf) for one-family buildings, and 2,400 sf for two-family buildings. The structure and all of the interior finishing, including the electrical, heating, sewer, and water, are constructed at the factory. The units are then transported to the site. Because of the size of the modules, the transport requires special permits from NYCDOT. The transport can only be done at night when traffic is low and with special escorts.

Site preparation includes excavation, driving of piles, and construction of the foundation pads for the modules. In addition, utility connections from the street are installed. When on-site, one module is lifted from the dollies by cranes and placed on the pads and secured. Then, the second module is placed on top of the first module and secured. After the modules are in place and connected top/bottom and to the units on the side, the utilities are connected and the exterior cladding is placed on the modules.

PUBLIC AND RESIDENTIAL BUILDINGS

The residential and public buildings would be built of masonry. The first step would be to prepare the site for construction using a 25 to 30 ton excavator for large earth moving, and a small mini-excavator for finishing the excavation. Because of the soil conditions, the leveled site would probably be compacted with vibrators to minimize settlement. About 10 workers would be on-site during these tasks. Then the 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 employ about 30 construction workers. In addition to the excavator and mini excavator, a pile driver and generator would be used. To construct the shell of the buildings two methods are likely to be used. The traditional method is block walls for the multi-story buildings and the school. This type of construction requires about 50 masons and laborers 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. With the second method, large pre-cast concrete planks would be 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, electric service may be provided, and generators would no longer be needed. The interior fit-out is the most labor intensive part of constructing the buildings, with about 70 workers per building on-site. Interior finishing involves electrical installation; heating, ventilation, and air conditioning; sheet rocking; painting; and furnishing. Mostly small hand tools are 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.

It is expected that almost all work would be done during normal construction hours of 7 AM to 3:30 PM, five days a week. On occasion, some extended shift work to 6 PM may be required to complete a particular task. Weekend and night work is not expected.

RETAIL

The primary difference between the retail development construction and the residential development construction is that the retail development has open spaces with long spans between walls and higher ceilings. The site preparation, excavation, pile driving, foundation, and exterior walls (shell) work would be the same as described above under the conventional residential construction. The additional work would involve the placement of steel columns to provide roof support. The interior work would be simpler because fewer interior rooms are provided with less framing, dry wall, and finishing work.

INFRASTRUCTURE

Certain of the streets within Project Site were constructed as part of the 1996 Plan. These include Vandalia Avenue and the northern portions of Elton and Erskine Streets. The utility lines have been installed in the street bed, and would require only the lateral lines to the new buildings. For these built portions of the streets, only the top or wearing course of pavement needs to be installed to complete the street and infrastructure construction. All other streets within the Project Site would need to have the utilities installed and the streets and sidewalks constructed.

To install water lines, a trench is dug, usually about four to 10 feet below the ground surface. Because the site consists of unconsolidated fill, short piles would be driven and pile caps installed to support the main water, sewer, power, and telecommunication lines and to prevent differential settling, which could damage the utility lines. The area around the pile caps would be filled with sand or gravel. Lengths of the water line would be laid and connected together and the pipes would be tested in sections, and then as a complete system. When a water line is installed, it would be connected to the existing water line in the surrounding streets. This task is usually done during times of low water demand because the water flow to this section of the water line has to be cut off. The water system is designed and built in such a way that the water can flow around the cut-off section, and water service to users is not interrupted.

Because this involves the construction of new streets, it is expected that the water lines, sewer lines, power lines, and telecommunications ducts would all be installed at the same time. Sewer is similar to water line installation, except the lengths of pipe are fitted together. To provide the level of energy service required by the Proposed Project would require new electrical transmission and distribution lines as well as telecommunication (telephone, cable, and fiber optic) lines. The water and sewer lines would likely be placed directly onto the pile caps. For the electric and telecommunication lines, ducts would be laid on the pile caps, and then the lines would be installed in the openings in the ducts. 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.

Typically, about 100 feet of utility lines can be installed per day. Trenches in the streets would not be left open during non-working times, but would either be filled and patched or covered with steel plates.

This work typically 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 site. 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 street.

ROADS

Construction of the roadways would start after the infrastructure and utilities have been placed in the street bed. The roads are graded, and then typically three to four layers of material are laid down to form the roadway. First a subbase is placed and compacted, followed by the base layer, a binder layer, and finally the top layer of asphalt. On streets where light traffic is expected, the base layer may be omitted. At the same time, the curbs and sidewalks would be installed. Foundations for lights and traffic control devices would also be installed. The final work would be striping the streets and crosswalks.

Construction of the roads would involve graders, bull dozers, and compactors for the first three layers. The asphalt would need a paving machine and rollers to compact the asphalt. The materials would be brought to the site by trucks and immediately placed by the graders and bull dozers. The roller/compactor would be used after each layer has been placed. The asphalt would be brought by trucks and placed into the paving machine for spreading and compacting. The road work uses large mechanical equipment.

Construction of the sidewalks and installation of the curbs and roadside appurtenances is more labor intensive than the road construction. Forms are placed by hand to shape the curb, sidewalk, and foundations for the street appurtenances. After reinforcing mesh is laid, concrete is poured from concrete trucks.

PARKS

During construction of the parks, clean top soil would be imported for installation of the grassy areas and landscaping. Concrete sidewalks would be poured, and street furniture, such as benches and tables, would be installed. The top soil would involve dump trucks bringing the soil and hand spreading. Trees with about a 3 to 4 inch caliper (diameter) and shrubs would be planted. Concrete trucks would be needed to bring concrete for the sidewalks. For the active recreation areas, the ground surfaces would be installed followed by the appropriate amenities (e.g., basketball hoops, volley ball nets, etc). The majority of this work would be done by hand. The construction of each park would take six to nine months and would involve only weekday work.

C. PROBABLE IMPACTS OF THE PROPOSED ACTION

Construction may at times be disruptive to nearby residential buildings and open spaces during the construction period. The following analysis describes the overall temporary effects of construction on the relevant areas of concern: land use, socioeconomic conditions, community facilities and services, open space, cultural resources, hazardous materials, infrastructure, traffic and transportation, air quality, and noise.

LAND USE

In general, construction would not alter surrounding land uses. During construction, access to all adjacent businesses, residences, and other uses would be maintained according to the regulations established by DOB. When work would take place within building shells, effects on the surrounding uses would be substantially reduced as compared to excavation and foundation activities. Construction management practices would be developed and implemented to minimize the effects of construction-related changes in access to land uses in the vicinity of the development parcels. Other changes, such as limited sidewalk closures, would also affect people living and working in the surrounding area, but implementation of the construction management practices would minimize the effects of these closures. There would be no significant adverse impacts on land use due to construction activity.

SOCIOECONOMIC CONDITIONS

Construction activities may include limited curb lane and/or sidewalk closures for different stages of construction. However, access to the existing Gateway Center and other local businesses would be maintained throughout the construction period.

Construction would create major direct benefits resulting from expenditures on labor, materials, and services, as well as substantial indirect benefits created by expenditures by material suppliers, construction workers, and other employees involved in the direct activity. Construction would also contribute to increased tax revenues for the City and State, including those from personal income taxes. There would be no significant adverse impacts on socioeconomic conditions due to construction.

COMMUNITY FACILITIES AND SERVICES

Construction activities would result in some interruptions to activities in the surrounding area with limited curb lane and/or sidewalk closures along Gateway Drive, Flatlands Avenue, and Erskine Street. However, access to the Brooklyn Developmental Center would be maintained throughout construction, and all of the streets affected would remain accessible to emergency vehicles. Coordination with both the New York City Police Department (NYPD) and the Fire Department of New York (FDNY) would be undertaken throughout the construction period to ensure that unimpeded emergency access and adequate emergency response could be achieved. There would be no significant adverse impacts on community facilities and services due to construction.

OPEN SPACE

Construction activities would not occur within the existing 9.7-acre portion of the parkland within the FCURA or the Thomas Jefferson Athletic Field, and access to these open space resources and others in the study area would be maintained throughout the construction period. Activities such as excavation and pile driving would generate noise that may impair the enjoyment of these resources, but such impacts would be temporary. Therefore, construction activities would not result in significant adverse impacts on open space.

HISTORIC RESOURCES

Construction of the Proposed Project would involve disturbance in the area determined to be sensitive for precontact period resources in the 1996 *Gateway Estates Final Environmental Impact Statement (FEIS)*. As per New York City Landmarks Preservation Commission (LPC) correspondence dated November 11, 2007, archaeological testing (Phase 1B testing) was conducted in this area in order to determine the presence or absence of archaeological resources. Testing consisted of the excavation of a series of 8 large rectangular trenches in order to remove 10-12 feet of modern fill currently covering the original ground surface. Natural soils were exposed by hand at the bottom of each trench and 1-2 small test pits were hand excavated to sample for prehistoric artifacts and to examine site stratigraphy. Testing recovered a small number of historic and modern artifacts mixed together, which is an indication of disturbed soil. A single piece of quartzite, which is believed to be naturally occurring, was also uncovered.

Disturbed remnants of the original ground surface were recovered in some of the trenches while in others the original ground surface has been removed and the modern fills extend to glacial tills. The area has been determined to have been extensively disturbed in the past, and therefore, the Proposed Action would not result in impacts to sensitive archaeological resources.

NATURAL RESOURCES

The Proposed Project would not result in new construction within the 100- or 500-year floodplain; however, it would result in greater areas of impervious surface resulting in more stormwater runoff. The proposed stormwater Best Management Practices would help reduce the discharge rate of stormwater (see Chapter 10, "Natural Resources").

During construction, the Proposed Project would not directly impact tidal wetlands of Hendrix Creek or Spring Creek Basin, and stormwater generated within the Project Site would be directed to the existing NYCDEP outfalls. Construction stormwater runoff would be managed by State Pollutant Discharge Elimination System (SPDES) permits from the New York State Department of Environmental Conservation (NYSDEC), which would include a Stormwater Pollution Prevention Plan (SWPPP). Sediment and erosion control procedures, consistent with the "New York Standards and Specifications for Erosion and Sediment Control," would be identified in the SWPPP and implemented during the construction activities to control runoff and pollutants from entering the stormwater management system and would minimize potential impacts to tidal wetlands.

Construction of the Proposed Project would impact terrestrial resources from activities such as grading, land clearing, temporary access roads for construction vehicles, piling of debris near or within vacant areas, and noise. As streets and buildings are constructed, the existing plant and wildlife communities within their footprints would be lost. However, the loss of the vegetation community would not result in significant adverse impacts to wildlife since the species that occur within this area are common to urban settings. Although some individuals may be unable to find suitable habitat nearby, new development within the Project Site would not substantially impair the bird and wildlife community of the New York City region.

Construction activities would not occur within the surface waters of Hendrix Creek or Spring Creek Basin. Stormwater generated within the portion of the Project Site disturbed by construction of the project elements would be discharged to Hendrix Creek or Spring Creek Basin through existing stormwater outfalls. Implementation of erosion and sediment control measures would minimize potential effects on the water quality and aquatic biota of Hendrix Creek and Spring Creek Basin from the discharge of stormwater. The discharge of stormwater would not result in further impairment of the water quality of Hendrix Creek and Spring Creek Basin for their designated use as Class I waters nor would it affect future water quality improvements that will result from the water quality and aquatic habitat improvement efforts that will occur independent of the Proposed Project.

Construction of the Proposed Project would not result in significant adverse impacts to wetlands, plant communities, wildlife, water quality, or the aquatic biota of Jamaica Bay. Therefore, the Proposed Project would not significantly affect the resources of Jamaica Bay responsible for its designation as a Significant Coastal Fish and Wildlife Habitat.

HAZARDOUS MATERIALS

Previous investigations have confirmed that historic and current uses of the Project Site and adjacent and surrounding properties have resulted in soil, groundwater, and methane impacts. In order to prevent potential risks and thereby avoid the potential for significant adverse impacts related to hazardous materials, the Proposed Project would include appropriate health and safety and remedial measures (conducted in compliance with all applicable laws and regulations and conforming to appropriate engineering practice) that would govern both soil disturbance activities and subsequent construction at the site.

These measures would include the development of a Remedial Action Plan (RAP) and environmental Health and Safety Plan (HASP) for soil disturbance that would include detailed procedures for managing both known contamination issues (e.g., fill) and any unexpectedly encountered contamination issues. When the project design has progressed sufficiently to determine the areas of proposed soil disturbance and details of foundation construction (with sufficient additional soil, soil gas and/or groundwater testing both to characterize the materials that would be disturbed and to design the required methane gas venting systems), the RAP and HASP would be sent to NYCDEP for review and approval. The HASP would include procedures for avoiding the generation of dust that could affect the surrounding community as well as any monitoring necessary to ensure that no such impacts would occur. The RAP would include design and installation of methane gas venting systems in all new buildings and would ensure that in areas not otherwise capped by buildings, pavements, or other impervious materials that surface soil (at least two feet deep) meets applicable guideline requirements for their respective, commercial, or residential uses. All work would be performed in accordance with applicable city, state, and federal requirements.

Prior to site excavation, a construction-specific HASP would be prepared to address both the known contamination issues (based on the previous studies) and contingency items (e.g., finding unexpected petroleum storage tanks or petroleum-contaminated soil). The HASP would describe in detail the health and safety procedures to minimize exposure of hazardous materials to workers and the public. The hazards across the Project Site would be evaluated by determining the subsurface contaminants of concern and their chemical and physical characteristics. Health hazards would be considered within the potential exposure associated with the work to be performed. The HASP would be developed in accordance with Occupational Safety and Health Administration United States Occupational Safety and Health Administration (OSHA) regulations and guidelines and is expected to include the elements described below:

- Appropriate personnel would be designated to ensure that all requirements of the HASP are implemented, including an on-site Site Safety Officer (SSO). The SSO would be responsible for coordinating and reporting all health and safety activities and would have completed a 40-hour training course, supervisory training, and updated annual refresher courses that meet OSHA requirements codified in 29 Code of Federal Regulations (CFR) Part 1910. The SSO would have stop-work authorization, which they would execute on their determination of an imminent safety hazard, emergency situation, or other potentially dangerous situation. If the SSO were to be absent from the site, they would designate a suitably qualified replacement familiar with the HASP.
- The HASP would require that on-site personnel are qualified and have received the required training. All those entering the work area while intrusive activities were being performed would receive mandatory instruction regarding the potential hazards to health and safety. Any construction worker in a hazardous materials area would be required to be 40-hour

OSHA trained. All construction personnel upon entering the site would attend a mandatory training meeting to:

- Inform workers of the potential hazards they may encounter;
- Provide the knowledge and skills necessary for workers to perform the work with minimal risk to health and safety;
- Inform workers of the purpose and limitations of safety equipment; and,
- Ensure that workers can safely avoid or escape from emergencies.

Each member of the construction crew would be instructed in these objectives before they would go onto the site. The SSO or other suitably trained individuals would be responsible for conducting the training program. Others who enter the site would have to be accompanied by a suitably trained construction worker.

- The HASP would include contingency response plans. All excavation would be continuously monitored for the presence of buried tanks, drums or other containers; along with sludges or soil that show evidence of potential contamination, such as discoloration, staining, or odors. The HASP would include a table of action levels for the particular monitoring equipment (photoionization detector and particulate monitor) and contingencies if these action levels are exceeded. If any of these are detected, excavation in the area would be halted, and appropriate personnel would be notified, including the SSO. The affected area would be cordoned off and no further work would be performed at that location until the appropriate contingency response plan described in the HASP was implemented. All contingency response actions would be carried out in accordance with special contingency health and safety procedures.
- To prevent the potential off-site transport of dust, dust control measures would be implemented during all earth-disturbing operations. Water would be available on-site for sprinkling/wetting to suppress dust in dry weather or as necessary. Water would also be available to suppress dust on haul roads, to wet equipment and excavation faces, and would be sprayed on buckets during excavation and dumping. All haul trucks would have tarp covers, and dust or mud would be removed from tires before leaving the site. Vehicle speeds would be limited on the Project Site.

WASTE MANAGEMENT

The RAP and HASP would also address procedures for stockpiling, testing, loading, transporting (including truck routes), and properly disposing of all excavated material. The extent and parameters of any required testing are dependent on the type of material and the requirements of the waste disposal facilities, each of which may have different requirements for representative waste sampling and laboratory analysis prior to accepting material for disposal. All excavated material would be re-used on site or handled and disposed of properly to comply with federal, state, and local environmental laws. Among the pertinent regulatory requirements are those found in 6 NYCRR Parts 360 through 376, which identify hazardous waste and other waste management requirements. Any waste disposal that would occur outside of New York State would be regulated by similar federal and individual state requirements. According to Toxic Characteristic Leaching Procedure (TCLP) results of soil testing performed as a part of the prior subsurface investigations, the soil did not exceed the U.S. Environmental Protection Agency's

(EPA's) threshold for hazardous waste, except for lead in one composite sample collected from the northern portion of the site, near the intersection of Vandalia Avenue and Elton Street.

Wastes containing hazardous materials require special handling, storage, transportation, and disposal methods to prevent releases that could impact human health or the environment. Depending on the nature of the material; federal, state, and local regulations require the use of special containers or stockpiling practices for on-site storage of the material to prevent the release of hazardous materials to the environment. The federal, state, and local departments of transportation have requirements for transporting wastes containing hazardous materials. Facilities that receive hazardous materials require federal, state, and local permits to accept the waste, and generally require that specific representative waste sampling and laboratory analysis protocols be conducted prior to accepting material for disposal.

PETROLEUM STORAGE TANKS

Any (unexpected) aboveground or underground petroleum storage tanks encountered would be removed. The removal is regulated by NYSDEC (6 NYCRR Section 613.9), which requires that tanks no longer in use be closed in place or removed according to specific requirements. Contaminated soils surrounding the tanks, separate phase product on the water table, or contaminants dissolved in the groundwater are also subject to NYSDEC regulations (6 NYCRR Section 611.6). Article 12 of the New York Navigation Law provides notification and management requirements for spills to the waters of the state.

COORDINATION AND IMPLEMENTATION

The LDA between HPD and Gateway Center Properties Phase II, LLC and Nehemiah Housing Development Fund Co., Inc. would include provisions related to hazardous materials mitigation. In connection with the disposition of City-owned property to the residential developers, a restrictive declaration would be recorded to restrict future use and/or development to a manner which is consistent with the hazardous materials mitigation systems. The provisions of the restrictive declaration would be designated to control land use and ensure long term maintenance and operations of engineering controls, which are part of the hazardous material mitigation systems. The restrictive declaration is a covenant, which binds the present owners, and all successors, and serves as notice to any future owner of the conditions and restrictions that are continuously binding on the land.

The SCA is an Involved Agency and would be responsible for the design and construction of the school facility on Block 4449. Under the terms of its enabling legislation, the SCA must comply with the requirements of SEQRA. Therefore, the SCA would conduct a Phase II Environmental Site Investigation to confirm subsurface conditions. Based on the findings of the Phase II Environmental Site Investigation, the SCA would develop management plans (e.g., soil management plan, groundwater management plan, construction HASP, etc.) to address any hazardous materials that may be encountered during construction of the school. The management plans prepared by the SCA would be separate from the RAP and HASP described above, but would include equally stringent requirements. At a minimum, the design of the new school would include a vapor barrier and an active sub-slab depressurization system (SSDS) to prevent potential migration of organic vapors and methane into the proposed school building. Additionally, for areas of the school where exposed soils may exist (i.e., landscaped areas), a twenty-four (24) inch thick layer of certified-clean fill would be placed over the soils.

INFRASTRUCTURE

The new utility connections to the existing systems in the surrounding streets would be coordinated with NYCDEP and the private utility companies to ensure that service to customers in nearby areas is not disrupted. NYCDEP and the private utilities would have to review and approve the temporary measures before they could be implemented. The review process would include evaluation to ensure that service to users would not be disrupted or impaired while the temporary measures are in place. All utility lines would be located in the streetbeds. Residents and workers in the nearby areas are not expected to experience any major disruptions to utility services. Any disruption to services that may occur when new equipment (e.g., a transformer, or a sewer or water line) is put into operation is expected to be very short term (i.e., hours). Therefore, the construction of the infrastructure improvements would not cause any significant adverse impacts on the users of these services.

TRAFFIC AND PARKING

The construction of the Proposed Project, from 2008 to 2013, would result in some surface disruptions and generate construction worker and truck traffic. Because of the lengthy duration of these activities, a detailed evaluation of construction sequencing and worker/truck projections was undertaken to assess the potential transportation-related impacts. As demonstrated below, the projected construction activities are not expected to result in significant adverse parking impacts. However, some significant adverse construction-related traffic impacts are anticipated as construction activities begin to accelerate in 2010.

CONSTRUCTION TRAFFIC PROJECTIONS

Average daily construction worker and truck activities by month and quarter were projected for the full six years of construction. The projections were further refined to account for worker modal splits and vehicle occupancy, arrival and departure distribution, and the passenger car equivalent (PCE) factor for truck traffic (i.e., each truck is considered to be the equivalent of two passenger cars).

Daily Workforce and Truck Deliveries

For a reasonable worst-case analysis of potential transportation-related impacts during construction, the average of the daily workforce and truck trip projections in the peak month was used as the basis for estimating peak hour construction trips. Based on a schedule of commencing construction in the beginning of 2008, the combined construction worker and truck traffic peak would occur in June 2010. The daily average number of construction workers and truck deliveries during this construction peak month were estimated at 1,380 workers and 479 truck deliveries per day. These estimates of construction activities are further discussed below.

Construction Worker Modal Splits

According to the U.S. Census reverse journey-to-work data, commuting to work via auto in New York City is more prevalent among construction and excavation personnel than for workers in most other occupations. According to the census data, approximately 86 percent of construction workers commute to project sites in Brooklyn via auto, with an average auto-occupancy of 1.23.

Peak Hour Construction Worker Vehicle Truck Trips

Site activities would mostly take place during the typical construction shift of 7 AM to 3:30 PM. Construction truck trips would be made throughout the day (with more trips made during the early morning), and most trucks would remain in the area for short durations. However, construction worker travel would typically take place during the hours before and after the work shift. For analysis purposes, each worker vehicle was assumed to arrive in the morning and depart in the afternoon or evening, whereas each truck delivery was assumed to result in two truck trips during the same hour.

The estimated daily vehicle trips were distributed throughout the workday based on projected work shift allocations and conventional arrival/departure patterns of construction workers and trucks. For construction workers, the majority (80 percent) of the arrival and departure trips would take place during the hour at the beginning and end of each shift (6–7 AM for arrival and 3–4 PM for departure). For construction trucks, deliveries would occur throughout the day when the construction site is active. However, to avoid traffic congestion, construction truck deliveries would also often peak during the hour before the regular day shift (25 percent of shift total), overlapping with construction worker arrival traffic. Based on these assumptions, the peak hour construction traffic was estimated for the entire construction period. The peak construction hourly trip projections for June 2010 are summarized in Table 20-2. Detailed projections of construction-related traffic are provided in Appendix E, "Traffic Technical Appendix".

Table 20-2
Peak Construction Trip Projections – June 2010

	Construction Worker Trips				Construction Truck Trips		Total Vehicle Trips		
	Worker Trips		Auto Trips						
Hour	In	Out	In	Out	In	Out	In	Out	Total
6 – 7 AM	1,104	0	772	0	119	119	891	119	1,010
7 – 8 AM	276	0	192	0	48	48	240	48	288
8 – 9 AM	0	0	0	0	48	48	48	48	96
9 – 10 AM	0	0	0	0	48	48	48	48	96
10 – 11 AM	0	0	0	0	48	48	48	48	96
11 AM – 12 PM	0	0	0	0	48	48	48	48	96
12 – 1 PM	0	0	0	0	48	48	48	48	96
1 – 2 PM	0	0	0	0	48	48	48	48	96
2 – 3 PM	0	138	0	96	24	24	24	120	144
3 – 4 PM	0	1,104	0	772	0	0	0	772	772
4 – 5 PM	0	138	0	96	0	0	0	96	96
Day Total	**1,380**	**1,380**	**964**	**964**	**479**	**479**	**1,443**	**1,443**	**2,886**

Note: Hourly construction worker and truck trips were derived from projected estimates of 1,380 workers and 479 trucks making two daily trips each (arrival and departure) in June 2010. Numbers of construction worker vehicles were calculated with an 86-percent auto split with vehicle occupancy of 1.23.
Source: AKRF, Inc.

TRAFFIC

Vehicles generated by construction activities were assigned to the street network to determine the location of critical intersections. The 6–7 AM and 3–4 PM peak hours were analyzed at six critical locations: Erskine Street and Gateway Drive; Flatlands Avenue and Fountain Avenue; Flatlands Avenue and Jerome Street; Flatlands Avenue and Pennsylvania Avenue; Linden Boulevard and Fountain Avenue; and Linden Boulevard and Pennsylvania Avenue. Under future conditions with construction, significant adverse impacts would occur at two of these six locations in the 6–7 AM peak hour and at four locations in the 3–4 PM peak hour. One of the two significantly impacted locations in the 6–7 AM peak hour, and all four significantly impacted locations in the 3–4 PM peak hour could be mitigated using measures similar to those recommended under Build conditions. The location of Flatlands and Pennsylvania Avenues would be unmitigatable in the 6–7 AM peak hour.

AM Construction Peak Traffic Volumes and Conditions – Existing

The 6–7 AM peak hour carries about 44 percent of the traffic that the 8–9 AM peak hour does. The 6–7 AM existing volumes were calculated by decreasing the 8–9 AM volumes by 56 percent. Overall intersection levels of service are LOS C or better during the 6–7 AM peak hour.

AM Construction Peak Traffic Volumes and Conditions – Future without Construction in 2010

The 6–7 AM existing volumes were increased to 2010 using a background growth rate of one percent per year. To be conservative, all background project trips were added to the traffic network. Overall intersection levels of service would be LOS C or better during the 6–7 AM peak hour.

AM Construction Peak Traffic Volumes and Conditions – Future with Construction in 2010

During the 6–7 AM peak hour, the construction activities would generate 772 construction worker auto trips and 119 delivery trips. Auto and delivery vehicle trips were assigned to the construction site along designated NYCDOT truck routes. The construction worker auto trip parking needs would be accommodated by 1) the new Gateway Center parking lot area (approximate capacity of 2,067 spaces), and 2) the on-street spaces along the new roadway network within the Project Site. Overall intersection levels of service would be unacceptable at Flatlands and Pennsylvania Avenues (LOS F). Significant adverse impacts would occur at Flatlands and Pennsylvania Avenues and at Linden Boulevard and Pennsylvania Avenue. The intersection of Flatlands and Pennsylvania Avenues would be unmitigatable. The 2010 peak construction impacts at the intersection of Linden Boulevard and Pennsylvania Avenue could be mitigated by applying the same physical mitigation measures (lane restriping, parking prohibition, median width reduction) as were identified under Build conditions; however, different signal timing shifts would be needed to mitigate the significant adverse impacts under construction Build conditions.

PM Construction Peak Traffic Volumes and Conditions – Existing

The 3–4 PM peak hour carries approximately 88 percent of the traffic that the 4:45–5:45 PM peak hour does. The 3–4 PM existing volumes were calculated by decreasing the 4:45–5:45 PM volumes by 12 percent. Under existing conditions, unacceptable overall intersection levels of service would occur at Linden Boulevard and Pennsylvania Avenue (unacceptable LOS D).

PM Construction Peak Traffic Volumes and Conditions – Future without Construction in 2010

The 3–4 PM existing volumes were increased to 2010 using a background growth rate of one percent per year. To be conservative, all background project trips were added to the traffic network. In the future without construction, unacceptable overall intersection levels of service would occur at Linden Boulevard and Pennsylvania Avenue (LOS E).

PM Construction Peak Traffic Volumes and Conditions – Future with Construction in 2010

There would be 772 auto trips and zero delivery trips during the 3–4 PM peak hour on typical work days. Overall levels of service would be unacceptable at Erskine Street and Gateway Drive (LOS E), and at Linden Boulevard and Pennsylvania Avenue (LOS E). Significant adverse impacts would occur at Erskine Street and Gateway Drive, Flatlands and Pennsylvania Avenues, Linden Boulevard and Fountain Avenue and Loring Avenue, and at Linden Boulevard and Pennsylvania Avenue. The 2010 peak construction impacts at these intersections could be mitigated by applying some or all of the same physical mitigation measures (lane restriping, parking prohibition, median width reduction) as were identified under Build conditions; however, different signal timing shifts would be needed to mitigate the significant adverse impacts under construction Build conditions.

PARKING

It is expected that the construction workers would park on the local streets next to the active construction site and would not park in the existing retail parking lots. Because of the size of the Project Site, sufficient street parking is expected to be available on the local streets. Therefore, the Proposed Action would not result in significant adverse impacts on public parking during the construction period.

TRANSIT AND PEDESTRIANS

TRANSIT

Bus service would be maintained within and near the Project Site during construction, and it is unlikely that bus stops would need to be temporarily relocated. Construction of the Proposed Project is expected to result in few, if any, new subway or bus trips from construction workers accessing the Project Site. Furthermore, when distributed among the various subway and bus routes, station entrances, and bus stops near the Project Site, there would be nominal increases in demand during the typical commuter peak periods. Hence, no further evaluation of nearby transit services is required, and there would not be a potential for significant adverse transit impacts attributable to the projected construction worker transit trips.

PEDESTRIANS

For the same reasons discussed above, with respect to transit operations, a detailed pedestrian analysis to address the projected demand from the travel of construction workers to and from the Project Site is not warranted. During construction, where temporary sidewalk closures may be required, adequate protection or temporary sidewalks and appropriate signage would be provided in accordance with NYCDOT requirements.

AIR QUALITY

During construction of the Proposed Project, emissions from on-site construction equipment and on-road construction-related vehicles, and their effect on background traffic, have the potential to impact air quality.

In general, most construction engines are diesel-powered, and produce relatively high levels of nitrogen oxides (NO_X) and particulate matter (PM). Construction activities also emit fugitive dust. Although diesel engines emit much lower levels of carbon monoxide (CO) than gasoline engines, the stationary nature of construction emissions and the large quantity of engines could lead to elevated CO concentrations, and impacts on traffic could increase mobile source-related emissions of CO as well. Therefore, the pollutants of concern for the construction period are NO_2, CO, particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}), and particles with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$). Ultra-low-sulfur diesel (ULSD) is now easily available and can be used in almost any diesel engine. Therefore, it is expected that the vast majority of equipment would use ULSD. Therefore, sulfur oxides (SO_x) emitted from those construction activities would be negligible and would not result in significant emissions of sulfur dioxide (SO_2).

Construction activity in general and large-scale construction in particular, 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 PM. To ensure that the construction would result in the low diesel particulate matter (DPM) emissions, the following components would be implemented to the extent feasible:

- Diesel Equipment Reduction — The construction of the development sites would minimize the use of diesel engines and use electric engines operating on grid power instead, to the extent practicable. Construction contracts would specify the use of electric engines where practicable and ensure the distribution of power connections throughout the area as needed. Equipment that would use grid power instead of diesel engines would include, but may not be limited to, material hoists and small compressors. This would also eliminate some generators that would normally be needed for construction equipment. Forklifts would be either electric powered or natural gas to the extent possible.
- Clean Fuel — ULSD would be used for diesel engines throughout the development sites. This would enable the use of tailpipe reduction technologies (see below) and would directly reduce DPM and SOX emissions.
- Best Available Tailpipe Reduction Technologies — Nonroad 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 nonroad engines rated at 50 hp or greater would to the extent possible 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). 90 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.

[1] There are two types of DPFs currently in use: passive and active. Most DPFs currently 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).

- Utilization of Tier 1 or Newer Equipment — In addition to the tailpipe controls commitments, the construction specifications would mandate the use of Tier 1[1] or later construction equipment for nonroad diesel engines greater than 50 hp. The use of "newer" engines, such as Tier 1 and 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. Additionally, 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, in order to reduce the resulting concentration increments at sensitive receptors, large emissions sources and activities, such as concrete trucks and pumps, would be located away from residential buildings and playing fields, to the extent practicable. Fugitive dust control plans will be required as part of contract specifications. For example, stabilized truck exit areas would be established for washing off the wheels of all trucks that exit the large construction sites. Truck routes within the sites would be either watered as needed or, in cases where such routes would remain in the same place for an extended duration, the routes would be stabilized, covered with gravel, or temporarily paved to avoid the resuspension of dust. In addition to regular cleaning by the City, area roads would be cleaned as frequently as needed. All appropriate fugitive dust control measures—including watering of exposed areas and dust covers for trucks—would be employed. All necessary measures would be implemented to ensure that the New York City Air Pollution Control Code regulating construction-related dust emissions is followed. The fugitive emissions reduction program would reduce $PM_{2.5}$ emissions by at least 50 percent for stockpiles and handling of excavated materials.

Additional measures would be taken to reduce pollutant emissions during construction of the Proposed Project in accordance with all applicable laws, regulations, and building codes. These include the restriction of on-site vehicle idle time to three minutes for all vehicles that are not using the engine to operate a loading, unloading, or processing device (e.g., concrete mixing trucks).

Overall, the proposed program is expected to significantly reduce DPM emissions to or close to the levels achieved by New York City Local Law 77 of 2005. All of the New York City sponsored construction would have to meet the requirements of Local 77. To the extent practical, the privately sponsored construction would attempt to meet the requirements of Local Law 77. Since the passage of Local Law 77, meeting its requirements has become more and more achievable. ULSD is readily available from almost all diesel fuel suppliers at costs comparable to regular diesel fuel. Tier 1 equipment and better is all that is available on the new

[1] The first federal regulations for new nonroad diesel engines were adopted in 1994, and signed by EPA into regulation in a 1998 Final Rulemaking. The 1998 regulation introduces Tier 1 emissions 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 EPA criteria pollutants, including particulate matter (PM), hydrocarbons (HC), oxides of nitrogen (NO_x) and carbon monoxide (CO). Prior to 1998, emissions from nonroad diesel engines were unregulated. These engines are typically referred to as Tier 0.

equipment market, and used Tier 1 equipment is being sold on the used equipment market. During the later stages of construction, it is expected that Tier 2 and 3 equipment will be available on the used equipment market. DPF's are easily available at low cost, and do not markedly increase operating cost. Therefore, it is reasonable to assume that the majority of equipment would be able to meet most if not all of the requirements of Local Law 77.

Under both New York State Environmental Quality Review Act (SEQRA) and New York City Environmental Quality Review (CEQR) requirements, the determination of the significance of impacts is based on an assessment of the predicted intensity, duration, geographic extent, and the number of people who would be affected by the predicted impacts. Guidelines for assessing potential impacts from NO_X, CO, and $PM_{2.5}$ are discussed in Chapter 18, "Air Quality." While it is possible that the construction activities may exceed certain thresholds used for assessing the potential for significant adverse air quality impacts, any exceedance would be limited in extent, duration, and severity. The Project Site is large, and much of it is well removed from any sensitive receptor. The majority of the construction would not affect the public. Based on the limited duration of these potential exceedances above threshold values, especially because of the distance from residences and schools, these limited potential increments greater than applicable thresholds are not expected to result in significant adverse impacts from construction activities.

NOISE

Impacts on community noise levels during construction of the Proposed Project can result from noise from construction equipment operation, and from construction vehicles and delivery vehicles traveling to and from the site. Noise and vibration levels at a given location are dependent on the kind and number of pieces of construction equipment being operated, the acoustical utilization factor of the equipment (i.e., the percentage of time a piece of equipment is operating), the distance from the construction site, and any shielding effects (from structures such as buildings, walls, or barriers). Noise levels caused by construction activities would vary widely, depending on the phase of construction and the location of the construction relative to receptor locations.

A wide variety of measures can be used to minimize construction noise and reduce potential noise impacts. A noise mitigation plan is required as part of the New York City Noise Control Code, and would include:

- source controls;
- path controls; and
- receptor controls.

In terms of source controls (i.e., reducing noise levels at the source or during most sensitive time periods), the following measures for construction would be implemented:

- The contractors would utilize equipment that meets the sound level standards for equipment (specified in Subchapter 5 of the New York City Noise Control Code) from the start of construction activities and use a wide range of equipment, including construction trucks, which produce lower noise levels than typical construction equipment.
- Where feasible, the project sponsors would use construction procedures and equipment (such as generators, concrete trucks, delivery trucks, and trailers) quieter than that required by the New York City Noise Control Code.

- As early in the construction period as practicable, diesel-powered equipment would be replaced with electrical-powered equipment, such as electric scissor lifts and electric articulating forklifts (i.e., early electrification).
- All contractors and subcontractors would be required to properly maintain their equipment and have quality mufflers installed.

In terms of path controls (e.g., placement of equipment, implementation of barriers between equipment and sensitive receptors), the following measures for construction would be implemented to the extent feasible:

- Noisy equipment, such as generators, cranes, trailers, concrete pumps, concrete trucks, and dump trucks, would be located away from and shielded from sensitive receptor locations, such as parks, residences, and institutions. For example, during the early construction phases of work, delivery and dump trucks, as well as many construction equipment operations, would be located and take place below grade to take advantage of shielding benefits. Once building foundations are completed, delivery trucks would operate behind noise barriers.
- Noise barriers would be utilized in consultation with NYCDEP to provide shielding if noise complaints are received from nearby residences. Truck deliveries would take place behind these barriers once building foundations are completed.

For impact determination purposes, significant adverse noise impacts are based on whether maximum predicted incremental noise levels at sensitive receptor locations off-site would be greater than the impact criteria suggested in the *CEQR Technical Manual* for two consecutive years or more. The impact criteria are explained in detail in Chapter 19, "Noise." While increases exceeding the CEQR impact criteria for one year or less may be noisy and intrusive, they are not considered to be significant adverse noise impacts. The residential and institutional buildings already contain double-glazed windows and/or alternative ventilation (i.e., air conditioning), which would greatly reduce interior noise levels compared with exterior noise levels and may result in interior noise levels of 45 dBA or less. In addition, no night work is expected, and any exceedences of the CEQR criteria at sensitive locations would occur during day. Therefore, no long-term, significant adverse noise impacts are expected from construction activities.

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