Chapter 20: Construction Impacts

A. INTRODUCTION

This chapter summarizes the construction plans and analyzes the potential for significant adverse construction impacts for the primarily residential development on the East Site and the expanded and upgraded open space on the Triangle Site. This chapter also includes analysis of construction plans for the new Center for Comprehensive Care in a renovated O'Toole Building. All analyses have been prepared in accordance with the methodologies contained in the *CEQR Technical Manual.*

The East Site would be redeveloped primarily for residential use and would entail the demolition of the Coleman, Link, and Reiss Pavilions and Cronin Building; renovations to the Raskob/Smith Buildings, Nurses' Residence, and Spellman Pavilion; and the construction of new buildings to replace the demolished structures (see Figure 1-16). The new buildings on the East Site would include a new 16-story residential mixed-use building to be constructed on the site of the Link and Coleman Pavilions facing Seventh Avenue, a new 8- to 10-story apartment building that would replace the Reiss Pavilion on West 12th Street, and a row of five 5-story townhouses that would replace the Cronin Building on West 11th Street. Currently there are eight buildings on the East Site, and at the completion of construction there would be six buildings on-site. For consistency, the number of buildings will be referred to as six, even though the transition is from eight to six. An accessory parking garage with 152 spaces would be constructed below-grade with access and egress on West 12th Street. The East Site would be developed by ~~an affiliate of Rudin Management, RSV, LLC~~ West Village Residences LLC.

On the Triangle Site, the Materials Handling Facility would be ~~largely~~ demolished and ~~only a small portion (its west corner) would be retained. North Shore-Long Island Jewish Health System (NSLIJ) would store medical gas tanks for the Center for Comprehensive Care and would use the driveway adjacent to the medical gas storage area. The remainder of the triangle~~ the ~~site~~ open space would be expanded, improved, and made publicly accessible as part of the proposed East Site project.

The interior of the O'Toole Building would be rebuilt to house an emergency department on the ground floor with ambulatory surgery facilities, imaging center, and other health care services on the upper floors. The façade would be altered to accommodate a truck dock and an ambulance entrance on West 12th Street. At the northwest corner of the building on West 13th Street, a new outpatient entrance would be created by expanding the ground floor and adding Americans with Disabilities Act (ADA)-compliant ramps and a canopy.

In this chapter, techniques likely to be employed for the construction of the proposed East Site project and Center for Comprehensive Care are described and followed by the types of activities likely to occur during construction for each phase. The construction schedule is summarized, and the number of workers and truck deliveries are estimated for the entire construction period.

Finally, this chapter includes an assessment of potential impacts of construction activity and the methods that would be employed to minimize these potential impacts.

Since the preparation of the Draft EIS (DEIS), the project sponsors have agreed to address community concerns on early construction activities by implementing a delay to the start time of project construction by one hour from 7 AM to 8 AM and not having truck deliveries before 8 AM on the side streets (i.e. West 11th, West 12th, and West 13th Streets). In addition, changes to the construction schedule, equipment to be used, required workforce, and truck activities have been made. These changes and the related revised analyses are detailed below in this Final EIS (FEIS).

Revisions to the amount of excavation required and planned early activities have altered the schedule for the East Site. Certain areas of the cellar have been lowered to facilitate mechanical equipment and circulation spaces. This removal of additional soil increased the total duration of the project from 37 months to 44 months. However, this 7-month extension was offset by the early 2012 start of interior demolition of existing finishes and mechanical systems. This 4-month advancement of work, partially offset the 7-month delay during excavation and the project's end date is now anticipated to be 3 months latter than disclosed in the DEIS. The current project end date is now mid-2015.

PRINCIPAL CONCLUSIONS

TRANSPORTATION

Traffic

Construction of the proposed projects is expected to generate the highest amount of construction traffic during the early morning peak period in the ninth quarter of construction (months 25-27). In the DEIS, a detailed traffic analysis was conducted for the area intersections most affected by construction-related traffic. This analysis concluded that projected construction activities would not result in any significant adverse traffic impacts. ~~During public review,~~ Since publication of the DEIS, the project sponsors agreed, in response to community comments, to delay the start time of noisier construction activities to 8 AM and to limit any deliveries prior to 8 AM to the Seventh Avenue entrance. A revised analysis was prepared to address the anticipated changes in daily construction worker vehicle and truck delivery patterns. As in the DEIS, the revised analysis concluded that projected construction activities would not result in any significant adverse traffic impacts.

Delivery trips would be made along the New York City Department of Transportation (NYCDOT)-designated truck routes. Flaggers would be present at construction site driveways to manage the access and movements of trucks. Temporary curbside lane or sidewalk closures would take place in accordance with the detailed NYCDOT Office of Construction Mitigation and Coordination (OCMC)-approved Maintenance and Protection of Traffic (MPT) plans.

Parking

Based on a quantified analysis, parking demand generated by the construction activities, mostly from the construction workers who commute by private automobile, would be accommodated by available ~~nearby~~ off-street parking facilities. Hence, the construction of the proposed projects is not expected to result in any significant adverse parking impacts.

Transit

The study area is well served by public transit, including the A, C, E, and L subway lines at the Eighth Avenue-14th Street station; 1, 2, and 3 subway lines at the Seventh Avenue-14th Street station; and F, L, and M subway lines and PATH service at the Sixth Avenue-14th Street station. There are also several local bus routes, including the M5, M6, M7, M14, and M20. Based on the number of projected construction workers being distributed among the various subway and bus routes, station entrances, and bus stops near the project area, only nominal increases in transit demand would be experienced along each of these routes and at each of the transit access locations during hours outside of the typical commuter peak ~~periods~~ hours of 8-9 AM and 5-6 PM. Hence, there would not be a potential for significant adverse transit impacts attributable to the projected construction worker transit trips. Any temporary relocation of bus stops along bus routes that operate adjacent to the project area would be coordinated with and approved by NYCDOT and New York City Transit (NYCT) to ensure proper access is maintained.

Pedestrians

Considering that pedestrian trips generated by construction workers would occur during hours outside of the typical commuter ~~off-~~peak hours of 8-9 AM and 5-6 PM and would be distributed among numerous sidewalks and crosswalks in the area, the preliminary analysis found that there would not be a potential for significant adverse pedestrian impacts attributable to the projected construction worker pedestrian trips. ~~For limited periods of time,~~ Some sidewalks ~~may~~ would be closed during construction~~. However~~ but pedestrian circulation and access would be maintained at all times through the use of temporary sidewalks or sidewalk bridges.

AIR QUALITY

In order to prevent significant adverse impacts from construction equipment air emissions, the following measures would be implemented. These measures for the East Site project would also be included in the Restrictive Declaration as part of the approval process for the proposed projects.

1. *Diesel Equipment Reduction*. Construction of the Center for Comprehensive Care and the East Site would minimize the use of diesel engines and use electric engines, which may operate on grid power 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. In addition, the capacity of the existing electric systems serving the O'Toole Building and the East Site would be investigated to determine the feasibility of using those systems to power construction prior to any new Con Edison service. 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 SO_x 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 diesel particulate matter (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, 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 or later construction equipment 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 EPA non-road diesel emission standards would be used in construction, where practical and feasible.

Using a worst-case emissions scenario, the detailed analysis of both on-site and on-road emissions, combined, determined that the maximum predicted incremental concentrations of particulate matter finer than 2.5 micron ($PM_{2.5}$) would not exceed the applicable interim guidance criteria, and, therefore, no significant adverse impact from $PM_{2.5}$ would be expected to occur. Annual-average nitrogen dioxide (NO_2), carbon monoxide (CO), and particulate matter finer than 10 microns (PM_{10}) would be below their corresponding National Ambient Air Quality Standards (NAAQS). Therefore, the proposed projects would not cause or contribute to any significant adverse air quality impacts with respect to these standards.

Given the uncertainties regarding background concentrations and analysis methodology for the new 1-hour NO_2 standard, exceedances of the 1-hour NO_2 standard resulting from construction activities cannot be ruled out. Therefore, measures would be implemented by the proposed projects to minimize NO_x emissions from construction activities.

NOISE

Based on a detailed analysis, construction activities would be expected to result in significant noise impacts during weekday construction hours at the locations along West 11th and West 12th Streets adjacent to the project area. Significant adverse impacts are predicted to occur at the following residential locations:

- On the north side of West 12th Street between Sixth and Seventh Avenues, at various locations on the front façades of the residential buildings located at 127 West 12th Street through 179 West 12th Street (Receptors J, I1, I2, and I3), including terrace locations at 179 West 12th Street (Receptor J);

- At various locations on the rear and west façades of the residential building located at 130 West 12th Street (I9 and I9a);
- On south side of West 11th Street between Sixth and Seventh Avenues, at various locations on the front façades of the residential buildings located at ~~126~~ 128 West 11th Street through 158 ~~160~~ West 11th Street (Receptors ~~X1~~, X and X2, ~~and X3~~);
- On the north side of West 11th Street between Sixth and Seventh Avenues, at ~~various locations on the front façades of the residential buildings located at 121 West 11th Street through 131 West 12th Street (Receptors X7, X8, and X9), as well as~~ various locations on the rear façade of the residential buildings at 117 West 11th Street through 131 West 11th Street (Receptors X11 and X12); ~~and~~
- At various locations on the south façade~~(s)~~ ~~facing the proposed projects~~ of the residential building~~s~~ located at 219 West 12th Street through 229 West 12th Street (Receptors K); and
- At the fifth and sixth floor (there are only two windows on this facade) on the west façade of the residential building located at 219 West 12th Street through 229 West 12th Street (Receptors K1).

The buildings at most sensitive receptor locations, where the significant adverse noise impacts are predicted to occur, have both double-glazed windows and some form of alternative ventilation (i.e., central air conditioning, packaged terminal air conditioner [PTAC] units, or window air conditioning units). Consequently, depending upon the window attenuation and the type of air conditioning, even during warm weather conditions, interior noise levels would be approximately 25-35 decibels A weighted (dBA) less than exterior noise levels. To maintain an interior $L_{10(1)}$ noise level of 45 dBA (the City Environmental Quality Review (CEQR) acceptable interior noise level criteria), a minimum of 30 dBA window/wall attenuation would be required. At locations on these buildings where significant noise impacts are predicted to occur, ~~absent the development of additional measures to reduce project-related construction noise,~~ the project sponsors would offer to provide storm windows and/or window air conditioning units to mitigate project-related construction noise impacts to owners of buildings that do not have double-glazed windows and alternative ventilation (i.e., some form of air conditioning). With existing building attenuation measures (i.e., double-glazed windows and/or storm windows and alternative ventilation) and the mitigation measures offered by the project sponsors, interior noise levels during much, if not all, of the time when project construction activities are taking place, would be expected to be below 45 dBA $L_{10(1)}$ (the CEQR acceptable interior noise level criteria).

With regard to the residential terrace locations at Receptor J, $L_{10(1)}$ levels for the No Build condition would be in the mid-60s dBA and the highest Build $L_{10(1)}$ noise levels would be in the mid 70s dBA during some peak periods of construction activity. While noise levels at these terraces already exceed the acceptable CEQR range (55 dBA $L_{10(1)}$ or less) for an outdoor area requiring serenity and quiet, during the daytime analysis periods construction activities are predicted to significantly increase noise levels and would exacerbate these exceedances and result in significant adverse noise impacts. No feasible mitigation measures have been identified that could be implemented to eliminate the significant noise impacts at these terraces.

Noise levels at the open space locations (i.e., Receptors 3, Y, and Z) are currently above the 55 dBA $L_{10(1)}$ *CEQR Technical Manual* noise level for outdoor areas. Proposed construction activities would slightly exacerbate these exceedances, but in each case the increase would be less than 3 dBA and would not be perceptible; average Build $L_{10(1)}$ noise levels would be in the high 60s dBA in these open space locations. These predicted noise levels would result principally from the noise generated by traffic on nearby roadways, and no practical and feasible mitigation measures could be implemented to reduce noise levels to below the 55 dBA $L_{10(1)}$ guideline. However, the noise levels in these locations are already fairly high and are comparable to noise levels in portions of other public open spaces in this area that are also located adjacent to trafficked roadways, including Jackson Square, Corporal John A. Seravalli Playground, and McCarthy Square. Although the 55 dBA $L_{10(1)}$ guideline is a worthwhile goal for outdoor areas requiring serenity and quiet, this relatively low noise level is typically not achieved in parks and open space areas in New York City. Consequently, noise levels in these open space locations, while exceeding the 55 dBA $L_{10(1)}$ CEQR guideline value, would not result in a significant adverse noise impact.

~~Between the DEIS and FEIS, options will be explored to (1) determine the practicability and feasibility of implementing any additional construction equipment control measures (beyond those already included in this analysis) that could be implemented during construction to reduce the magnitude of or eliminate project impacts; and (2) perform additional window/wall survey work for any sensitive receptors where significant noise impacts are expected to occur due to construction, so that mitigation measures can be more accurately defined. Absent the implementation of the proposed mitigation measures, the proposed projects would have significant noise impacts at the locations specified above. The mitigation measures mentioned above and any developed during the analysis between DEIS and FEIS would also be included in the Restrictive Declaration as part of the approval process for the proposed projects.~~

A traffic noise analysis examined impacts due to peak construction-related vehicular (~~autos and trucks~~) trips, which would occur between the hours of ~~6~~ 7 AM and ~~7~~ 8 AM, prior to the start of operational construction activities. A screening analysis was performed using proportional techniques to determine whether the additional trips would be sufficient to result in a significant noise impact (i.e., the additional trips have the potential to result in a doubling of noise passenger car equivalents [Noise PCEs], which would result in a 3 dBA increase for more than two years) at the 12 monitoring receptor sites. Based upon the screening analysis results, construction-related traffic would not result in a doubling of PCEs at any receptor sites for more than one year. Consequently, no significant construction-related noise impacts are predicted to occur, and a detailed analysis is not needed. ~~Based on the proportional modeling analysis results, two locations were identified as having the potential for significant impacts. At these two sites a detailed analysis was performed using the Federal Highway Administration's (FWHA) *Traffic Noise Model* (TNM). The TNM results indicated that, at these two locations, construction-related traffic would increase future without the proposed projects (No Build) noise levels by more than the 3-5 dBA *CEQR Technical Manual* impact criteria. However, the exceedance of the CEQR impact criteria at these locations would occur for less than two years, the threshold set forth in the *CEQR Technical Manual* for identifying likely significant adverse impacts. Therefore, while the predicted increases of 3-5 dBA at these receptor sites may be perceptible and the related activities noisy and intrusive, the increases would not result in significant adverse noise impacts because of their limited duration.~~

VIBRATION

The buildings and structures of greatest concern with regard to the potential for structural or architectural damage due to vibration are the Smith/Raskob Buildings, Nurses' Residence, and Spellman Pavilion on the East Site, and 130 West 12th Street and 131 West 11th Street immediately adjacent to the East Site. Generally, the types of construction equipment involved in construction activities that have the highest potential for resulting in architectural damage due to vibration are pile driving, ram hoes, truck loading/unloading, and jackhammers. To minimize the potential for high vibration levels, drilled caissons are expected to be installed for the tower building on Seventh Avenue in the East Site. In terms of potential vibration levels that could result in architectural damage, construction that would have the most potential for producing levels exceeding 0.5 inches per second peak particle velocity (PPV) are within approximately 13 feet of pile driving; approximately 8 feet from a hoe ram or truck loading/unloading; and approximately 5 feet from a jackhammer. To avoid any significant adverse impacts, a Construction Protection Plan (CPP) would be developed to protect known architectural resources within a lateral distance of 90 feet from the proposed construction activities. The CPP would include a monitoring component to ensure that if the 0.5 inches per second PPV limit is exceeded during construction, corrective action would be taken.

In terms of potential vibration levels that would be perceptible and annoying, the dominant vibration equipment (i.e., pile driving rig) would have the most potential for producing levels which exceed the 65 vibration decibels (VdB) limit at receptor locations within a distance of approximately 215 feet. However, the operation would only occur for limited periods of time at a particular location and therefore would not result in any significant adverse impacts. Although blasting is not expected to be used, if it were to be used, it is expected to produce vibrations less perceptible than the operation of the pile driving rig. In no case are significant adverse impacts from vibrations expected to occur.

OTHER TECHNICAL AREAS

Land Use and Neighborhood Character

Construction on the East Site and O'Toole Building Site would take place over a period of about ~~three years~~ 44 months. Construction on the Triangle Site would take place over approximately 12 months and would overlap with construction on the other two properties. Throughout construction, access to surrounding residences, businesses, and institutions in the area would be maintained. In addition, measures would be implemented to control noise, vibration, emissions, and dust on construction sites, including the erection of construction fencing incorporating sound-reducing measures. Because none of these impacts would be continuous or ultimately permanent, a preliminary analysis found that construction would not create significant adverse impacts on land use patterns or neighborhood character in the area.

Socioeconomic Conditions

Construction activities associated with the proposed projects would, in some instances, temporarily affect pedestrian and vehicular access in the area. However, these sidewalk and/or lane closures are not expected to obstruct entrances to any existing businesses or obstruct major thoroughfares used by customers, and businesses are not expected to be significantly affected by any temporary reductions in the amount of pedestrian foot traffic or vehicular delays that could occur as a result of construction activities. Utility service would be maintained to all businesses, although very short term interruptions (duration in hours) may occur when new equipment (e.g., a transformer, or a sewer or water line) is put into operation. Overall, a preliminary analysis found that construction of the proposed projects is not expected to result in any significant adverse impacts on surrounding businesses.

Historic and Cultural Resources

The proposed projects received detailed analyses for the potential of impacts on historic and cultural resources. The New York City Landmarks Preservation Commission (LPC) indicated that the project area has no archaeological significance in a letter dated August 25, 2008. The New York State Office of Parks, Recreation, and Historic Preservation (OPRHP) concurred in that opinion in their review of the O'Toole Building Site (letter dated March 21, 2011). Therefore, archaeological resources are not a consideration for construction of the proposed East Site project nor the renovation of the O'Toole Building.

Under New York City Landmarks Law, LPC reviewed and determined appropriate the proposed changes to the existing hospital buildings on the East Site and the proposed designs of the new residential buildings on the East Site. Alterations to the exterior of the O'Toole Building have been approved by LPC. Demolition of ~~almost all of~~ the Materials Handling Facility and design of the open space on the Triangle Site ~~are subject to~~ have been reviewed and ~~approval~~ approved by LPC. Adverse impacts to the historic character of the Greenwich Village Historic District would thus be avoided.

~~NSLIJ would retain~~ The unique architectural form of the O'Toole Building would be retained and its façade would be restored~~ the building's façade~~. To allow for the renovation of this building to house the Center for Comprehensive Care, a number of alterations would be required including modification of the ground floor at its northwest and southwest corners and a new doorway, canopy, and ADA-compliant ramps at the West 13th Street and Seventh Avenue entrances. In addition, the need for sufficient mechanical equipment would require a vertical enlargement of the existing sixth floor while preserving the distinctive circular forms on the roof.

Construction of the proposed projects has the potential to result in inadvertent physical impacts to adjacent architectural resources in the Greenwich Village Historic District if appropriate precautions are not taken. The buildings to be retained as part of the proposed East Site project—the Smith and Raskob Buildings, the Nurses' Residence, and the Spellman Pavilion—would themselves undergo alterations and would be located immediately adjacent to proposed demolition and construction activities for the new buildings. To avoid any construction-related impacts to these and other buildings in the Greenwich Village Historic District, a CPP would be developed in consultation with LPC. Implementation of the CPP would be initiated by a professional engineer before any demolition, excavation, and construction would occur.

Hazardous Materials

Detailed laboratory analysis of project area soil and groundwater samples identified generally low levels of analytes in the soil and groundwater, typical of those often found in developed areas. Potential contaminants identified at the time of construction would be remediated (cleaned up) as part of the development of this area. Contaminated soil, historic fill, and demolition debris would be disposed of off-site in accordance with all applicable regulations. Potential impacts during construction and development activities would be avoided by implementing a Construction Health and Safety Plan (CHASP). The CHASP would ensure that there would be no significant adverse impacts on public health, workers' safety, or the environment as a result of potential hazardous materials exposed by or encountered during construction. Following construction, any remaining contamination would be isolated from the environment, and it is expected that there would be no further potential for exposure. ~~A Remedial Action Plan (RAP)~~

would be prepared and would be approved by the New York City Department of Environmental Protection (DEP), if necessary, in response to a reported petroleum spill.

As described in Chapter 10, "Hazardous Materials," both a Remedial Action Plan (RAP) and CHASP were prepared and submitted to the New York City Department of Environmental Protection (DEP) for review, and DEP issued a letter of approval dated December 12, 2011 (see **Appendix B**).

With these measures in place, no significant adverse impacts related to hazardous materials are expected to occur as a result of the proposed projects.

Rodent Control

Construction contracts would include provisions for a rodent (mouse and rat) control program. Before 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 U.S. Environmental Protection Agency (EPA) and New York State Department of Environmental Conservation (DEC) registered rodenticides would be permitted, and the contractor would be required to perform rodent control programs in a manner that avoids hazards to persons, domestic animals, and non-target wildlife.

B. METHODOLOGY

This section discusses the methodologies used to assess the potential for significant adverse impacts in each of the technical areas presented in the *CEQR Technical Manual.* The analyses in this chapter represent the reasonable worst-case development scenario for each technical area. The reasonable worst-case can occur at different times for different analyses. For example, the noisiest part of the construction is not at the same time as the heaviest construction traffic. Therefore, the analysis periods differ for traffic, air quality, and noise. In each section, the methodologies to determine the period of reasonable worst-case potential impacts are explained. All methodologies used in the impact analyses are in accordance with the *CEQR Technical Manual.*

Detailed, quantified technical analyses were performed for transportation, air quality, and noise. Explanations of the preliminary and detailed analysis techniques are given in each individual section. In addition, explanations of the analysis techniques are contained in the chapters addressing potential significant adverse impacts from operation of the proposed projects for these three technical areas. The analysis methods for land use and neighborhood character are given in the chapter on potential operational impacts and a preliminary assessment of conditions during construction is presented in this chapter. A preliminary qualitative assessment was undertaken for socioeconomic conditions, based on plans from the construction manager which show that access would not be blocked to any business. Since no community facilities or services would be directly affected by the construction, an analysis of potential impacts on community facilities or services is not warranted. Similarly, since there are no publicly accessible open spaces that would be affected by the proposed projects, no analysis of construction impacts on open space was undertaken. Detailed analyses were done for historic and cultural resources, and the analysis techniques are described in the chapter addressing operational impacts. The one, small, and common natural resource in the project area would be enhanced by the proposed East Site project, and therefore, no natural resource analysis for construction was done. The methodology for assessing potential impacts from hazardous materials is given in the chapter addressing potential operational impacts. No disruptions to infrastructure are expected, and therefore an analysis of potential infrastructure impacts from construction is not warranted.

The next section in this chapter describes the expected construction schedule, the construction methods to be used, and City, state, and federal regulations and policies that govern construction. This section establishes a framework for the construction that is used for the assessment of potential impacts. The construction timeline is set with the phases of construction—such as foundations, superstructure, and interior finishing—described. The types of equipment are discussed, and the number of workers and truck deliveries estimated. The analyses use these data to determine the potential for significant adverse environmental impacts.

C. CONSTRUCTION PHASING AND ACTIVITIES

INTRODUCTION

If the proposed projects are approved, complete build-out would occur in about 44 months just over three years. This section of the chapter first gives an overview of the construction of the proposed East Site project and the contemporaneous development of the Center for Comprehensive Care, and then provides a detailed description of each type of construction activity. The activities discussed include abatement and demolition, excavation, foundations, construction of the core and shells or conversion of the buildings, exterior cladding, and interior fit-out. General construction practices, including those associated with deliveries and access, hours of work, and sidewalk and lane closures, are then presented. Estimates of the number of construction workers and truck trips are presented. Based on the changes in working hours and limits on early deliveries on the side streets, traffic on West 11th and 12th Streets would be lower than disclosed in the DEIS. Following the discussion of construction techniques, the chapter analyzes the potential for significant adverse construction impacts with regard to land use, historic and cultural resources, socioeconomic conditions, hazardous materials, traffic and transportation, air quality, noise and vibration, public health, and rodent control, using the methodologies of the *CEQR Technical Manual* as discussed above.

It is possible that certain as-of-right activities, such as remediation, may commence as early as fall in 2011. However, for a more conservative analysis, the activities associated with this work are assumed to occur starting in the spring of early 2012 along with other construction activities.

CONSTRUCTION OVERVIEW

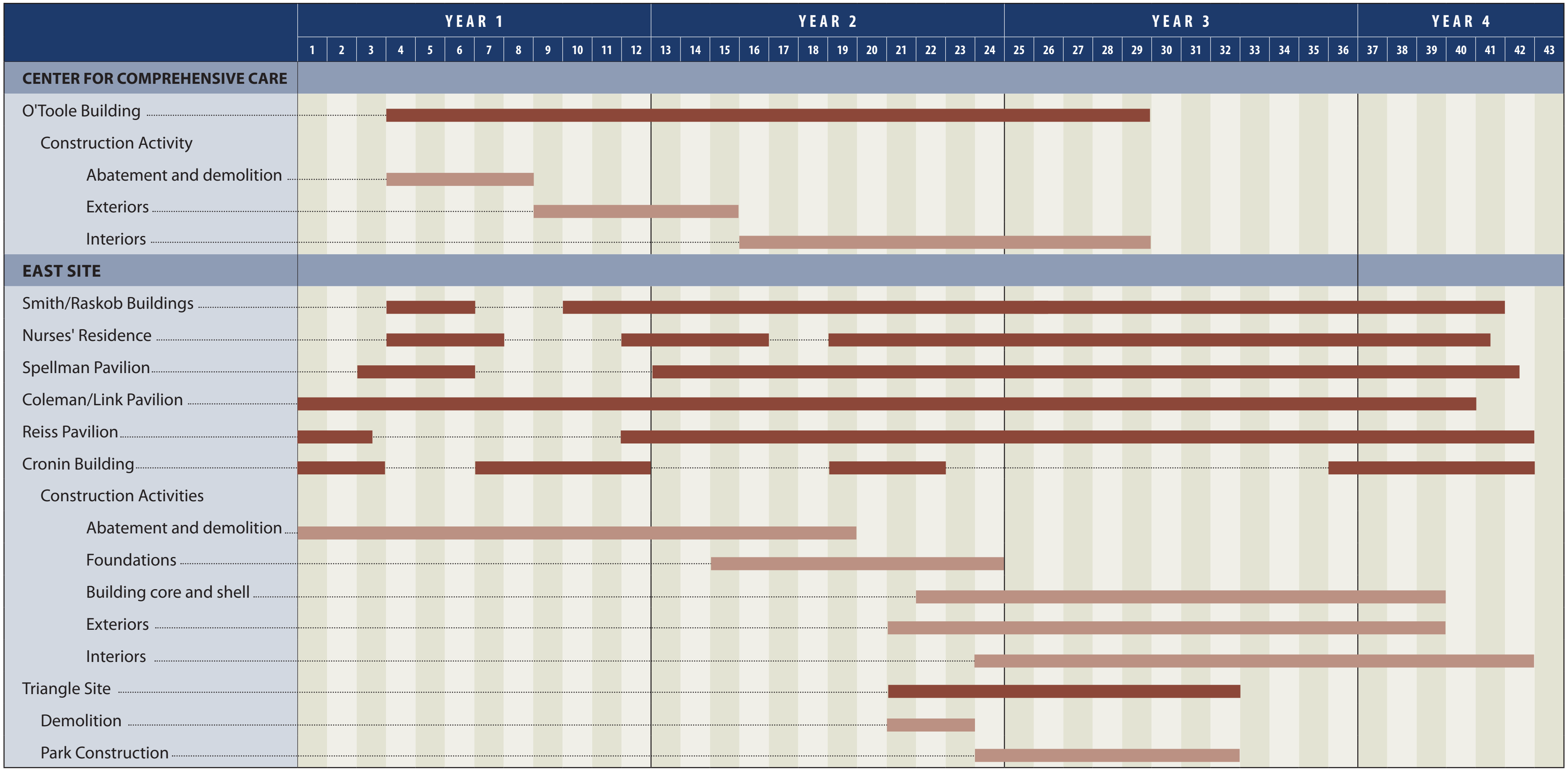
Preconstruction activities involve the installation of public safety measures, such as fencing, sidewalk sheds, and Jersey barriers. Trailers for the construction managers and engineers could either be placed in the curb lane of one of the side streets or over the sidewalk sheds. The buildings to be renovated would be covered with netting to prevent debris from falling onto the streets or sidewalk sheds. The first step in the construction of both the residential development on the East Site and the Center for Comprehensive Care in the O'Toole Building as well as demolition of the Materials Handling Facility would be abatement of asbestos and any other hazardous materials within the existing buildings and structures. Part of the interior of the O'Toole Building would be reconfigured for the new Center for Comprehensive Care. In Chapter 1, "Project Description," Figure 1-2 shows the location and names of the existing buildings, and Figure 1-16 shows the locations of the renovated and new buildings. On the East Site, the Coleman, Link, and Reiss Pavilions and Cronin Building would be razed. The interiors of the Spellman Pavilion, Nurses' Residence, and Smith/Raskob Buildings would be removed, while almost all of the exteriors would be preserved, except that extensions on the rear of the Nurses' Residence and the Spellman Pavilion would be removed. New windows with some window openings enlarged and roofing systems would be installed and repairs completed on the exteriors where extensions would be removed.

For the O'Toole Building, the existing foundations would be used, and no excavation or rock removal would be required. Since the publication of the DEIS, the construction managers have decided to use the internal elevators in the O'Toole Building for the vertical movement of personnel and materials (mobile cranes would also be used to move materials). The hoist that was described in the DEIS as being on the West 12th Street side of the building would no longer be installed and used during construction. On the East Site, the existing foundations for the Spellman Pavilion, Nurses' Residence, and Smith/Raskob Buildings would be used. On the rest of the East Site, the finished cellar grade would be about 15 feet below street level with a partial sub-cellar level of about 30 feet below street grade. Both the cellar and sub-cellar levels would require some excavation below the existing basement levels. A slab-on-grade would be installed for portions of the cellar and the entire sub-cellar. Structural supports for the buildings to remain as well as the new buildings would be installed, while the below-grade floor is being constructed.

When the below-grade construction is completed, the core and shell construction of the new buildings on the East Site would be started. The core is the central part of the building and is the main part of the structural system. It contains the elevators and the mechanical systems for heating, ventilation, and air conditioning (HVAC). The shell is the outside of the building. As the core and floor decks of the building are being erected, installation of the mechanical and electrical internal networks would start. As the building progresses upward, the exterior cladding would be placed, and the interior fit out would begin. During the busiest time of building construction, the upper core and structure would be built while mechanical/electrical connections, exterior cladding, and interior finishing are progressing on lower floors.

The Triangle Site would be revitalized by expanding and improving the existing, fenced open space and making it accessible to the public. The existing Materials Handling Facility would be demolished ~~except for the medical gas storage area. NSLIJ would reuse the existing medical gas storage area for the Center for Comprehensive Care. NSLIJ would also use the driveway adjacent to the medical gas storage area~~. The ~~rest~~ entirety of the Triangle Site, including the area of the demolished building, would be converted to open space. The new open space would be an at-grade ~~plaza~~ amenity with planting, seating, elements for children, a water feature, memorial elements, and lighting. Work on the Triangle Site would begin in about the ~~24~~ 20th month and be completed in the 32nd month, which would be less than 30 months from the project's approval ~~before the residential buildings on the East Site are occupied~~.

Table 20-1 and **Figure 20-1** show the conceptual construction schedule. **Figure 20-1** also shows the timing of expected construction activities. All proposed buildings are expected to be completed by 2015. The total duration of construction for the Center for Comprehensive Care is about 26 months and would be completed in mid 2014, assuming ~~a spring~~ an early 2012 start date. The residential construction would also start in 2012 and be completed in mid 2015 for a total construction period of about ~~37~~ 44 months. The breaks or hiatuses in Table 20-1 are due to crews completing their specialty work on one building and moving to another building. In terms of overall schedule, construction would be continuous. A more detailed discussion of the



Source: Turner Construction Company

Figure 20-1
Conceptual Construction Schedule

different stages of construction is given below, followed by a discussion of general construction practices expected to be followed for the proposed projects.

Table 20-1
Conceptual Construction Schedule

Building	Start Month	Finish Month	Approximate duration (months)
O'Toole Building			
Center for Comprehensive Care	~~1~~ 4	~~26~~ 29	26
Residential Development			
Smith/Raskob Building Rehabilitation	~~3~~ 1	~~36~~ 43	~~34~~ 38 [1]
Nurses' Residence Rehabilitation	~~4~~ 3	~~37~~ 34	~~31~~ 34 [2]
Spellman Pavilion Rehabilitation	~~3~~ 2	~~36~~ 32	~~27~~ 32 [3]
Coleman/Link Replacement	~~1~~ 2	~~35~~ 44	~~35~~ 42
Reiss Replacement	~~2~~ 1	~~37~~ 34	~~33~~ 32 [4]
Cronin Replacement	~~2~~ 1	~~35~~ 44	~~31~~ 19 [5]
Triangle Site			
~~Materials Handling Facility &~~ Open Space	~~24~~ 20	~~35~~ 32	12

Source:
Turner Construction Company
[1] 3-month hiatus during demolition
[2] 4-month hiatus during demolition and 2 month hiatus between completion of finishes and commissioning
[3] ~~3~~ 6-month hiatus during demolition
[4] 6 month hiatus during demolition
[5] ~~3~~ 5-month hiatus during demolition, 6 month hiatus between completion of demolition and start of superstructure, and 13 month hiatus between completion of foundations and start of remaining work.

CENTER FOR COMPREHENSIVE CARE CONSTRUCTION ACTIVITIES

PRECONSTRUCTION TASKS

Preconstruction activities at the O'Toole Building would include placing 8-foot to 15-foot high wooden walls around the perimeter of the site. The gate for trucks would be on West 12th Street. Jersey barriers with noise panels would separate the West 12th Street's north curb lane from the travel lanes. The West 12th Street north sidewalk would be closed to pedestrians, but a temporary pedestrian walkway around the construction would be provided. On Seventh Avenue and West 13th Street, full sidewalk overhead protection would be installed. The subway grating on Seventh Avenue would be protected from dirt and debris. Construction netting would be placed on all of the O'Toole Building. Window and wall protection would be draped on the buildings immediately to the west of the O'Toole Building to protect them from any debris. This activity would take about one month.

ABATEMENT AND INTERIOR DEMOLITION

A New York City-certified asbestos investigator has inspected the O'Toole Building for asbestos-containing materials (ACMs) and those materials must be removed by a New York State Department of Labor (DOL)-licensed asbestos abatement contractor prior to interior demolition. Asbestos abatement is strictly regulated by DEP, DOL, EPA, and the U. S. Occupational Safety and Health Administration (OSHA) to protect the health and safety of construction workers and nearby residents and workers. Depending on the extent and type of ACMs, these agencies would be notified of the asbestos removal project and may inspect the abatement site to ensure that work is being performed in accordance with applicable regulations, including the new February 2, 2011 DEP regulations. 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 surrounding area with a containment system and a decontamination system. The types of these systems 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 asbestos-permitted 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 monitoring, if applicable, the general demolition work can begin. Depending on the amount of ACMs to be removed and project phasing, 25 workers are expected to be needed for abating the O'Toole Building because of its size and age. About one to four truckloads of material could be removed per day. The truck loading and marshalling would occur behind Jersey barriers with noise walls on the curb lane of West 12th Street. This phase is expected to last about two months.

Any activities with the potential to disturb lead-based paint would be performed in accordance with the applicable OSHA regulation (OSHA 29 CFR 1926.62—*Lead Exposure in Construction*). When conducting demolition (unlike lead abatement work), lead-based paint 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 lead paint or cutting of steel with lead-containing coatings. 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 (such as fluorescent light ballasts) 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.

General demolition is the next step, and first any economically salvageable materials are removed. Then the interior of the building is deconstructed to the floor plates and structural columns. On the West 12th Street side, part of the second floor would be removed to allow for the new ambulance bay, described below under exterior work. The windows of the O'Toole Building on the upper floors would remain in place during demolition. On the first floor, portions of the exterior façade would be removed to accommodate a new floor configuration. The first floor would be squared off on the northwest and southwest sides, a reconfigured pedestrian entrance installed on the east side, and a new ambulance bay built on the south side. Netting around the exterior of the building would be used to prevent materials from falling into public areas or onto the surrounding building. As the interior is being deconstructed, the existing elevators would be used to move debris from the higher floors to ground level. When structures on the roof and the upper floor interiors are being razed, ~~the elevators would no longer be functional, and~~ enclosed chutes would be 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. About 25 workers are expected to be on-site, and typically six to eight truckloads of debris would be removed per day. The general demolition phase is expected to last about four months. The total abatement and demolition is expected to last about five months. As during abatement, the loading of the trucks would take place on the south side of the site, and the trucks would be loaded behind Jersey barriers with noise walls along the curb land of West 12th Street. ~~The personnel and materials hoist would be located on the West 12th Street side of the building throughout the whole construction period.~~

FOUNDATIONS AND BELOW-GRADE CONSTRUCTION

Limited excavation would be required to install grade beams at the southwest and northwest corners of the building to allow the ground floor alterations and new ADA-compliant (ADA) entrance ramps and steps.

ABOVE-GRADE BUILDING CONSTRUCTION

Above-grade construction is expected to last approximately 20 to 21 months in total and would involve modifying the exterior of the building, and constructing and installing interior partitions, finishings, and medical equipment. In addition, the mechanical, electrical, and plumbing system would be upgraded to meet today's standards. New windows would also be installed.

Exteriors

On the first floor, the building's original Seventh Avenue entrance would be renovated and used for walk-in emergency cases; ADA-compliant ramps would be installed parallel to the building. On West 12th Street, a new ambulance bay would be built, and a new loading dock would be provided at the west end of the building. These would require a façade alteration to accommodate ambulances and trucks, respectively. On the building's West 13th Street side, a new outpatient entrance would be provided by expanding the ground floor and adding an ADA-compliant ramp parallel to the building.

The existing glass block wall facing Seventh Avenue would be restored and repointed. The entrance doors would be changed, and a new canopy with signage identifying the emergency department walk-in entrance would be provided.

The new ambulance and vehicular entry on West 12th Street would require lengthening an existing curb cut and adding a new curb cut providing a U-shaped driveway passing through the south side of the building. The curved portion of the ground floor would be indented and squared off to provide for ambulance discharge under the building overhang. A portion of the overhanging concrete façade would be removed above the ambulance exit to allow for ambulance clearance. The existing garage entrance on West 12th Street would be converted to a one-truck loading dock recessed into the building. Above the loading dock and the emergency entrance, new windows would replace the current concrete façade.

Additional space would be created on the north side of the building by squaring off the ground floor at the northwest quadrant of the building on West 13th Street. The additional ground floor space would continue to be recessed beneath the overhanging concrete façade of the upper floors.

The façade of the O'Toole Building would be repaired. At the roof level, the existing rooftop penthouse would be expanded to accommodate building mechanical systems within a 20-foot-tall structure set back from the parapets.

Truck staging would be located along the curb lanes of both West 12th and 13th Streets with Jersey barriers separating the trucks from the street traffic. The Jersey barriers would have plywood panels attached for noise attenuation. The sidewalks on both West 12th and 13th Streets along the building face would be closed, and walkways would be provided around the truck staging areas. A covered sidewalk shed would be provided along Seventh Avenue and over the West 12th subway entrance, which would remain accessible throughout the construction period.

Exterior construction would take about six to seven months. Mobile cranes would be used to lift the materials into place. Excavation for the grade beams would be done by small backhoes and hand shovels. The steps and ramps would involve limited concrete deliveries over several weeks. Anywhere from ~~120~~ 100 to ~~150~~ 120 workers per day would be needed for the exterior construction. About 12 to 15 delivery trucks per day are expected for exterior work.

Interior Fit-Out and Finishing

This stage would include the construction of interior partitions and installation of interior finishes (flooring, painting, etc.). In addition, the mechanical, electrical, and plumbing system would be upgraded to today's standards to meet the requirements of medical facilities. The elevator shafts would be relocated, and new elevators installed. Interior fit-out of a medical facility involves extensive installation of specialized machinery and equipment. Procedure rooms, laboratories, the emergency room, and any number of other hospital facilities have unique requirements that call for expert personnel to equip the hospital properly. The recessed windows at the upper levels would be replaced with more energy-efficient units.

The interior work would employ the greatest number of construction workers and take the longest period of time to complete. At any given time over 100 workers would be working on the interior. During periods of maximum activity, about 200 workers would be on-site. The overall interior finishing is expected to about 14 months. During the interior fit-out, about 20 delivery trucks per day are expected. Equipment used during interior construction would include hoists, pneumatic equipment, and a variety of small hand-held tools. This stage of construction is the quietest and does not generate fugitive dust.

EAST SITE CONSTRUCTION ACTIVITIES

Some of the construction activities on the East Site would be the same as those on the O'Toole Building. This section will point out those activities that are the same, but will not repeat the discussion given above. Activities that are different are discussed.

PRECONSTRUCTION TASKS

~~The preconstruction tasks would be very similar to those for the new Center for Comprehensive Care. The trailers for the engineers and construction managers would be placed on the East Site, and a perimeter construction fence would be installed. On south side of West 12th Street, Jersey barriers would be placed along the curb lane, and several entrance gates for trucks to enter and leave the site would be constructed in the perimeter fence. Two entrance gates would be constructed on West 11th Street.~~

The offices for the engineers and construction managers would be placed on the East Site, and a perimeter construction fence would be installed.–During the early interior demolition phase, approximately 60 percent of the sidewalk along the east frontage of Seventh Avenue would be used to off-load the removed materials from the site. Pedestrians would be relocated to the parking lane adjacent to the sidewalk, the sidewalk closed and a 15-foot high fence erected separating the public from the work. West 11th and 12th Streets would not be affected. This condition would exist for approximately 6 months at which time sidewalk bridges would be installed to protect the public during the oncoming building wrecking stage and the remainder of the project. These sidewalk bridges will be erected in the parking lanes of the West 11th Street, West 12th Street and Seventh Avenue frontages. The sidewalks would be closed and the pedestrians would be directed to the parking lanes within the protection of the sidewalk bridges. This configuration would remain in place until all exterior work to the buildings' facades is complete.

Several entrance gates for trucks to enter and leave the site would be constructed in the perimeter fence. One entrance would be on 12th Street (where the Reiss building stood), two on West 11th Street (one where the Link building stood and one where the Cronin Building stood) and one on Seventh Avenue (where the Coleman building stood). These gates' locations would be re-located only slightly as the work moves from the excavation and foundation stage to the core and shell construction stage. As the structures go up and the interior courtyard slab is completed, deliveries would be directed thru the Seventh Avenue entrance, into the courtyard and back onto the streets via the 11th Street gate. The 12th Street gate would only be utilized for deliveries into the cellar via the new parking garage ramp.

ABATEMENT AND DEMOLITION

The abatement task for the buildings on the East Site would be similar to that task on the O'Toole Building. The same precautions would be taken and the same regulations followed for removal of ACMs, lead based paints, and electrical equipment that could contain PCBs.

Only the Coleman, Link, and Reiss Pavilions, and the Cronin Building would be completely demolished. The Smith/Raskob Buildings, Nurses' Residence, and the Spellman Pavilion would be completely renovated. On the interior, all walls would be removed, and, where necessary, the floors aligned to one level. The elevators and stairs would be replaced. On the exterior, all windows and roofs would be replaced. The exteriors on the rear of certain buildings would be rebuilt. For all buildings, the demolition would start at the top of the building, and to the extent possible the existing vertical passageway (i.e., elevator shafts and stairwells) would be used to move the debris downward for loading onto trucks. The trucks would be located behind the construction fence. As with the interior demolition of the O'Toole Building, salvageable and recyclable materials, such as copper and iron, would be removed prior to general deconstruction.

Most of the abatement and demolition would be started and completed on all buildings in the first five months of construction. However, certain buildings would have a hiatus in demolition as the demolition crews move from building to building. The number of workers would range from about 50 to about 150 per day. The number of trucks would range from about 40 to 80 per day. For the interior demolition, equipment would include small front end loaders and bull dozers to move the debris to the vertical shafts. The majority of the actual deconstruction would be done using hand tools. On the buildings being completely demolished, small mini-excavators with chopping attachments would be used on the upper stories to remove the structure and the existing elevators would be used to send the debris to the ground level. Bulldozers at the ground level would push the debris into piles for front end loader to put onto trucks.

FOUNDATIONS, EXCAVATION, AND BELOW-GRADE CONSTRUCTION

The East Site is planned to have a cellar with a depth below street level of 15 feet with a partial sub-cellar of about 30 feet below street grade. The existing cellars are at various depths. After the buildings have been deconstructed, and the ground has been cleared, soil would be excavated to about 16 to 17 feet (finished depth of 15 feet below-grade plus depth for bottom slab). For the small area of the sub-cellar, the excavation would also be 1 to 2 feet deeper than the finished depth. Excavators and backhoes would be used to dig the loose soil and load it onto dump trucks for removal from the site. The soil could be sold for clean fill or used as daily cover at a landfill unless determined to be contaminated, as discussed below.

All of the loading and unloading would be done within the site perimeter. When the bottom of the excavation is reached, the slab-on-grade would be poured in sections. Like the dump trucks for the excavation, the concrete trucks for the slab-on-grade and the upper foundation wall would use the ramps and all work would be done within the site perimeter. Temporary ramps to both West 11th and West 12th Streets would be used by the trucks. The final phase of the below-grade construction would be constructing the podium (slab supporting the new buildings) at the street level. Podium construction would also be within the site perimeter.

During below-grade construction, it is expected that excavators and mini-excavators would be used at any given time. In addition, dump trucks and concrete mixers would be on-site during excavation and foundation construction. The excavation and foundation construction is expected to last 10 to 11 months, longer than disclosed in the DEIS, because of additional excavation. Slightly less than 10 to 15 trucks per day would come to the site. Two to three hundred workers would be employed daily during this task.

Below-Grade Construction Subjects

Hazardous Materials

All of the measures described above for the O'Toole Building to prevent potential impacts from hazardous materials would be followed on the East Site. The additional concern on the East Site is uncovering petroleum tanks during excavation. As described in Chapter 10, "Hazardous Materials," both a Remedial Action Plan (RAP) and CHASP were prepared and submitted to the New York City Department of Environmental Protection (DEP) for review, and DEP issued a letter of approval dated December 12, 2011 (see Appendix B). ~~For areas to be excavated, a Phase II Subsurface Investigation (including the collection and laboratory analysis of soil and groundwater samples) would be conducted prior to any soil disturbance to determine whether contamination is present. The scope of the Phase II would be reviewed and approved by DEP prior to its implementation.~~ All subsurface soil disturbances would be performed in accordance with the DEP-approved RAP and CHASP~~, the scope of which would be based on the findings of the Phase II. At a minimum.~~ The RAP ~~would~~ provides for the appropriate handling, stockpiling, testing, transportation, and disposal of excavated materials, as well as any unexpectedly encountered tanks, in accordance with all applicable federal, state, and local regulatory requirements. ~~If necessary,~~ The RAP ~~would~~ also provides for a vapor barrier beneath new construction as a precautionary vapor control measure~~s such as vapor barriers or placing residential uses above separately ventilated parking areas~~. The CHASP outlines procedures to ~~would~~ ensure that all subsurface disturbance is done in a manner protective of both workers, the community, and the environment. The applicant will enter into a Restrictive Declaration with the City to ensure the RAP/CHASP are implemented.

Dewatering

The excavated area would not be water proof until the slab-on-grade is built. In addition, rain and snow could collect in the excavation, and that water would have to be removed. The water 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 the New York City sewer system. The settled sediments, spent filters, and removed materials would be transported to a licensed disposal area. Discharge in the sewer system is governed by DEP regulations.

DEP has a formal procedure for issuing a Letter of Approval to discharge into the New York City sewer system. The authorization is issued by the DEP Borough office if the discharge is less than 10,000 gallons per day; an additional approval by the Division of Connections & Permitting is needed if the discharge is more than 10,000 gallons per day. All chemical and physical testing of the water has to be done by a laboratory that is certified by the New York State Department of Health (NYSDOH). The design of the pretreatment system has to be signed by a New York State Professional Engineer or Registered Architect. For water discharged into New York City sewers, DEP regulations specify the following maximum concentration of pollutants.

- Petroleum hydrocarbons 50 parts per million (ppm)
- Cadmium 2 ppm
- Hexavalent chromium 5 ppm
- Copper 5 ppm
- Amenable cyanide 0.2 ppm
- Lead 2 ppm
- Mercury 0.05 ppm
- Nickel 3 ppm
- Zinc 5 ppm
- pH between 5 to 12
- Temperature less than 150 degrees Fahrenheit (F)
- Flash Point greater than 140 degrees F
- Benzene 134 parts per billion (ppb)
- Ethylbenzene 380 ppb
- Methyl-Tert-Butyl-Ether (MTBE) 50 ppb
- Naphthalene 47 ppb
- Tetrachloroethylene (perc) 20 ppb
- Toluene 74 ppb
- Xylenes 74 ppb
- PCB 1 ppb
- Total Suspended Solids 350 ppm

Any groundwater discharged in the New York City system would meet these limits. DEP can also impose project-specific limits, depending on the location of the project and contamination that has been found in nearby areas.

ABOVE-GRADE BUILDING CONSTRUCTION AND RENOVATION

The above-grade building construction would be a mixture of new buildings and “gut” renovation. As discussed above, the Smith/Raskob Buildings, the Nurses’ Residence, and the Spellman Pavilion would be renovated. Portions of the interiors would be removed and replaced. The exterior windows and roofing systems would be replaced, and elements of the rear walls would be removed and reconstructed. The Coleman, Link, and Reiss Pavilions, and the Cronin Building would be deconstructed and replaced. Construction of the new buildings where the Coleman, Link, and Reiss Pavilions and the Cronin Building are located is discussed first, followed by a discussion of the renovation of the Smith/Raskob Buildings, the Nurses’ Residence, and the Spellman Pavilion.

Replacement of the Link/Coleman and Reiss Pavilions and the Cronin Building

Core and Superstructure

After the below-grade work reaches street level, the interior courtyard would be used for ~~most~~ the majority of the construction deliveries ~~equipment and material laydown~~. The material laydown areas for the replacement buildings at Reiss and Coleman/Link would be behind the site fence along the perimeter ~~at street level in the courtyard and below-grade~~. Access points to the interior courtyard would be as described on page 20-16 ~~at the eastern end of the East Site to and from West 11th and West 12th Streets~~. ~~For the most part t~~ The hoists and the large crane for constructing the new tower on Seventh Avenue would be located on Seventh Avenue ~~in the courtyard and away from the buildings across the street~~. This location would enable the crane to reach all areas of the new building and not require an additional crane to be used to erect in the previously inaccessible areas. This change from the DEIS is accounted for throughout this chapter. Compared to the DEIS, it would lower the construction traffic volumes on West 11th and 12th Streets, because trucks would only travel on Seventh Avenue to reach the crane and hoist. ~~However, d~~ During certain periods of above-grade construction, cherry pickers and mobile cranes would be located on West 11th and West 12th Streets to erect the new buildings once occupied by the Reiss and Cronin Buildings and to deliver mechanical equipment located in these buildings.

The cores of each building create the building’s framework (beams and columns) and floor decks. The structure would likely consist of reinforced concrete. Construction of the interior structure, or core, of the proposed buildings would include elevator shafts; vertical risers for mechanical, electrical, and plumbing systems; electrical and mechanical equipment rooms; core stairs; and restroom areas. Core construction would begin when the podium is completed and would continue through the interior construction and finishing stage.

Superstructure activities would require the use of cranes, derricks, delivery trucks, forklifts, or loaders, and other heavy equipment such as ~~tower cranes,~~ concrete pumps, welding machines, rebar benders and cutters, and compressors. Temporary construction elevators (hoists) would also be constructed for the delivery of materials and vertical movement of workers during this stage. Cranes would be used to lift structural components, façade elements, large construction equipment, and other large materials. Smaller construction materials and debris generated during this stage of construction would generally be moved with hoists. During peak construction, the number of workers would be about 200 to 300 per day on the East Site. Anywhere from 55 to 75 trucks per day would deliver materials to the site.

Exteriors

As the core advances upward, the vertical mechanical system would start to be installed. After the core is 5 to 10 floors above street grade, the exterior façade would be installed on the lower floors, and the interior finishing would begin. The replacement building on the Coleman/Link Pavilions site would be the tallest of the new residential development at about 203 feet above street level at the top of the mechanical bulkhead and require the most construction time. This building would take about 16 months of above-grade construction. The other buildings would be lower with a resulting shorter period of above-grade, exterior construction. The shortest above-grade, exterior construction period would be about 11 months for the townhouses replacing the Cronin Building. These buildings would be the last to be completed because site access would be maintained through this area as long as possible, allowing for the other buildings to be completed and the interior gardens of the courtyard to be finished. It is expected that construction on all of the East Site buildings would be occurring simultaneously.

Interiors

This stage would include the construction of interior partitions, installation of lighting fixtures, and interior finishes (flooring, painting, etc.), and mechanical and electrical work, such as the installation of elevators. Mechanical and other interior work would overlap with the building core and shell construction. This activity would employ the greatest number of construction workers: with generally 20 to 60 per building or about 120 to 360 workers total. Equipment used during interior construction would include exterior hoists, pneumatic equipment, delivery trucks, and a variety of small hand-held tools. However, this stage of construction is the quietest and does not generate fugitive dust.

Above-Grade Renovation of the Smith/Raskob Buildings, Nurses' Residence, and Spellman Pavilion

Exterior Renovations

For the exterior work, the buildings would have scaffolding installed, on which would be netting to prevent materials or tools from inadvertently falling onto the sidewalk or street below. New rooftop additions would be built atop the Smith/Raskob Buildings—a one-story penthouse on the Smith Building and a three-story penthouse on the Raskob Building. The ground floor window openings in the Smith/Raskob Buildings would be enlarged along Seventh Avenue and along West 12th Street within about 75 feet of the Avenue to be compatible with planned retail uses on the Seventh Avenue. All of the windows on the upper floors would be replaced with new windows appropriate for the intended residential uses. The roof in its entirety would be replaced.

The existing extension in the rear yard of the Nurses' Residence would be removed to create a 60-foot-wide courtyard between this building and the Spellman Pavilion. Two new entrances would be introduced on either side of the West 12th Street existing main entrance. Window openings would be enlarged, and new windows suitable for residential use installed. The existing mechanical penthouse would be enlarged, and the roofing replaced.

The existing extension in the rear yard of the Spellman Pavilion would be removed to create a courtyard between this building and the Nurses' Residence. Other proposed alterations include removal of the top floor of the existing mechanical bulkhead, replacement of the roof, and the addition of a cloth canopy at the West 11th Street entrance. Windows would be enlarged and replaced.

The exterior renovations would take about 12 months, and employ about 30 to 70 workers per building. About 10 to 12 truck deliveries per day for all buildings being renovated are expected.

Equipment would include mobile cranes in the backyard, mortar mixers, power trowels, generators, and welding machines.

Interior Renovations

Much of the interior renovation work would be similar to that described for the Center for Comprehensive Care. Interior walls and ceilings would be demolished. Floors would be leveled, especially in the Smith/Raskobs Buildings, which were built separately with the floors at slightly different elevations, but the buildings are now joined. The interior work would be the longest task and take about 14 months. Each building would have about 10 to 50 workers during this period, and about 30 truck deliveries total per day. Interior finishing work is the quietest of the construction tasks and generates the least amount of dust and disruption to the neighborhood.

TRIANGLE SITE

The demolition of the Materials Handling Facility would be accomplished in the same manner as described above. The building would be abated of asbestos, electrical equipment that could contain PCB, and lead based paint. Recyclable materials then would be removed, followed by general demolition. The demolition would involve about 10 workers and about 5 to 7 trucks per day. The landscaping would be done using small powered equipment and hand tools. The landscaping would involve about 10 to 20 workers and about 10 to 15 trucks per day. Overall, work on the Triangle Site would take about 10 to 12 months. In the DEIS, more demolition and less landscaping would have occurred than now projected in the FEIS. However, the overall construction period would remain about the same.

GENERAL CONSTRUCTION PRACTICES

Certain activities would be employed throughout the construction of the proposed East Site project as well as for the Center for Comprehensive Care. The project sponsors would have a field representative on-site throughout the entire construction period. The representative would serve as the contact point for the community and local leaders. The representative would be available to meet and work with the community 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 demolition activities begin, a security staff would be on the specific construction sites 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 20-2** shows the main agencies involved in construction oversight and the agencies's areas of responsibilities. The primary responsibilities lie with the New York City Department of Buildings (DOB), which has the primary responsibility for ensuring that the construction meets the requirements of the Building Code and that the buildings are structurally, electrically, and mechanically safe. In addition, DOB enforces safety regulations to protect both the 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, DOB with LPC concurrence approves the CPP used when the construction is in proximity to historic structures. DEP enforces the Noise Code, approves RAPs/CHASPs, regulates water disposal into the sewer system and the 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.

NYCDOT reviews and approves any traffic lane and sidewalk closures. NYCT is responsible for subway access and, if necessary, bus stop relocations. NYCT also regulates vibrations that might damage the subway system. LPC approves studies, the CPP, and monitoring to prevent damage to historic structures.

Table 20-2
Construction Oversight in New York City

Agency	Areas of Responsibility
New York City	
Department of Buildings	Primary oversight for Building Code and site safety
Department of Environmental Protection	Noise, hazardous materials, dewatering, tanks
Fire Department	Compliance with Fire Code, tanks
Department of Transportation	Lane and sidewalk closures
New York City Transit	Subway access, bus stop relocation
Landmarks Preservation Commission	Archaeological and architectural protection
New York State	
Department of Labor	Asbestos workers
Department of Environmental Conservation	Hazardous materials and tanks
United States	
Environmental Protection Agency	Air emissions, noise, hazardous materials, poisons
Occupational Safety and Health Administration	Worker safety

DEC regulates disposal of hazardous materials, and construction and operation of bulk petroleum and chemical storage tanks. DOL licenses asbestos workers. On the federal level, the EPA 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. OSHA sets standards for work site safety and the construction equipment.

DELIVERIES AND ACCESS

Because of site constraints, the presence of large equipment, and the type of work, access to the construction sites would be tightly controlled. The work areas would be fenced off, and limited access points for workers and trucks would be provided. Typically, private 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 after work hours and over the weekends to prevent unauthorized access.

As is the case with almost all large urban construction sites, material deliveries to the site would be highly 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 excavation, each dump truck would be assigned a specific time that it must arrive on the site and a specific allotment of time to receive its load. If a truck is late for its turn, it would be accommodated if possible, but if not, the truck would be assigned to a later time. A similar regimen would be instituted for concrete deliveries, but the schedule would be even stricter. If a truck is late, it would be accommodated if possible, but if on-time concrete trucks are in line, the late truck would not be allowed on-site. Because construction documents specify a short period of time within which concrete must be poured (typically 90 minutes), the load would be rejected if this time limit is exceeded.

During the finishing of the building interiors, individual deliveries would be scheduled to the maximum extent possible. Studs for the partitions, drywall, electrical wiring, mechanical piping, ductwork, and other mechanical equipment are some of the myriad materials that must be delivered and moved within each building. ~~The Center for Comprehensive Care would likely have two hoists and~~ Internal elevators, rather than external hoists as assumed in the DEIS, would be used in the Center for Comprehensive Care for vertical travel, and five hoists would be used on the East Site. The available time for subcontractors' use of the hoists would be tightly scheduled. A trade, such as the drywall subcontractor, would be assigned a specific time to have its materials delivered and hoisted into the building. If the delivery truck arrives outside its assigned time slot, it would be accommodated if possible without disrupting the schedule of other deliveries. However, if other scheduled deliveries would be disrupted, the out-of-turn truck would be turned away.

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. In addition, they would provide an additional traffic aid as the trucks enter and exit the on-street traffic streams.

HOURS OF WORK

Construction for the new Center for Comprehensive Care is expected to take place Monday through Friday and about 50 percent of the Saturdays. Construction activities on the East Site would generally take place Monday through Friday with some Saturday work during the finishing stages. Certain exceptions to these schedules 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 AM and 7:00 AM~~. Construction work at all three sites would begin at 8:00 AM and deliveries on the side streets would also start at 8:00 AM. However, when the crane and hoist for the East Site are in place on Seventh Avenue (about months 25 through 32), deliveries would start on Seventh Avenue at 7:00 AM and workers would move to the higher floors at about 7:30 AM. Delivery activities to the Triangle Site may also begin at 7:00 AM along the Seventh Avenue frontage. No noisy construction work or equipment would start until 8:00 AM. Normally weekday work would end at ~~3:30 or~~ about 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 occasions. The work could include such tasks as completing the drilling of piles, finishing a concrete pour for a floor deck, or completing the bolting of a steel frame erected that day. The extended workday would generally last until about 6:00 PM and would not include all construction workers on-site, but just those involved in the specific task requiring additional work time.

At limited times on the East Site, 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.

On all three sites, a few tasks may have to be completed without a break, and the work can extend more 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 and could weaken the building. This type of concrete pour is usually associated with foundations.

An example of this is pouring concrete for foundations and podiums, which would be poured in sections. This type of concrete pour can require over 12 hours to complete. These long concrete pours often begin late on a Saturday, when traffic is light, and continue into Sunday. The plans for each long concrete pour would be coordinated with NYCDOT. In addition, a noise mitigation plan pursuant to New York City Code would be developed and implemented to minimize intrusive noise emanating into nearby areas and affecting sensitive receptors. A copy of the noise mitigation plan would be kept on-site for compliance review by DEP and DOB.

SIDEWALK AND LANE CLOSURES

During the course of construction, traffic lanes and sidewalks would have to be closed or protected for varying periods of time as described in the Preconstruction Tasks section on page 20-15. Some street lanes and sidewalks could be continuously closed, and some lanes and sidewalks would be closed only intermittently to allow for certain construction activities. However, pedestrian circulation and access would be maintained through the use of temporary sidewalks or sidewalk bridges. This work would be coordinated with and approved by NYCDOT. The approvals may stipulate that traffic lanes or sidewalks could not be closed during periods of heavy traffic, such as the December holidays. Street closings for the most part would only be required at limited times when necessary to lift mechanical equipment or other heavy objects to the roofs or for jumping cranes to higher floors. This will happen only rarely. It is usually done on weekends, subject to NYCDOT approvals, and takes several hours, after which the street is reopened to traffic.

East Site

As stated earlier, during the early interior demolition phase, the sidewalk along the east frontage of 7th Avenue would be used to off-load the removed materials from the site. Pedestrians would be relocated to the parking lane adjacent to the sidewalk, the sidewalk closed and a fence erected separating the public from the work. 11th Street and 12th Street would not be affected.

This condition would exist for approximately 6 months at which time sidewalk bridges would be installed to protect the public during the oncoming building wrecking stage and ensuing remainder of construction. These sidewalk bridges would be erected in the parking lanes of the 11th Street, 12th Street and Seventh Avenue frontages and remain there until all building exterior work is complete. The sidewalks would be closed and the pedestrians directed to the parking lanes within the protection of the sidewalk bridges

Pedestrian access around the East Site would be maintained throughout the construction period with overhead sidewalk bridges at certain times. The sidewalks would be completely open during the abatement and demolition tasks, about the first 12 months. Then an overhead sidewalk bridge would be placed facing the Spellman Pavilion and Cronin Building. The extent of the overhead sidewalk shed would be expanded to include all of West 12th Street and the Raskob Building portion of Seventh Avenue. The whole sidewalk would be protected by an overhead sidewalk bridge and open to pedestrians at about a year and a half into construction on the East Site. By the third year of construction, the overhead sidewalk bridge would be removed while the interior finishing is taking place.

During construction on the East Site, the south curb lane on the portion of West 12th Street fronting the East Site would be closed to traffic and used by construction trucks and equipment. While concrete is being poured for the new buildings—about Months 14 to 19 of construction—

~~the east curb lane the portion of Seventh Avenue fronting the East Site would be closed to traffic. Sporadic closures of the north curb lane of West 11th Street could occur, while large pieces of equipment or materials are being delivered.~~

Center for Comprehensive Care

During construction of the new Center for Comprehensive Care, the sidewalk along Seventh Avenue would be open and protected by an overhead sidewalk bridge. Along the south side of West 13th Street, the portion of the sidewalk fronting the O'Toole Building would be open for the first seven months of construction and protected by an overhead sidewalk bridge. On the north side of West 12th Street, the portion of the sidewalk in front of the O'Toole Building would be closed to pedestrians, but temporary sidewalks or sidewalk bridges would be employed. After about the seventh month of construction, the portions of the sidewalks fronting the O'Toole Building would have pedestrian walkways around the building until the end of construction on both West 12th and West 13th Streets.

The curb lanes on the streets and avenue fronting the O'Toole Building would follow a similar pattern. All lanes including the west curb lane on the portion of Seventh Avenue fronting the O'Toole Building would remain open during construction with pedestrian protection. The north curb lane fronting the O'Toole Building on West 12th Street would be closed throughout construction of the new Center for Comprehensive Care. The south curb lane on the portion of West 13th Street fronting the O'Toole Building would be open for the first seven months of construction. The West 13th Street curb lane would be closed to traffic after about the seventh month until the completion of construction. A travel lane would be open on all streets facing the construction.

Triangle Site

On West 12th Street, the sidewalk would be closed, and a pedestrian walkway provided. The width of the street would be sufficient for truck turning out of both the Triangle Site and the O'Toole Building.

NUMBER OF CONSTRUCTION WORKERS AND MATERIAL DELIVERIES

Table 20-3 shows the estimated numbers of workers and deliveries to the project area by calendar quarter for the East Site, the Triangle Site, and the new Center for Comprehensive Care together. These represent peak days of work within each quarter, and a number of days during the quarter would have fewer construction workers and delivery trucks. The average number of workers would be about 351 per day during the construction of the proposed projects. The peak number of workers would be 622 per day in the second quarter of year 3. For truck trips, the average number of trucks would be 65 per day, and the peak would occur in the first quarter of year 3 with 128 trucks per day. Detailed workforce and delivery projections, assuming a construction start date in ~~the spring (2nd quarter) of~~ early 2012, can be found in **Appendix D-1**.

Table 20-3
Number of Construction Workers and Delivery Truck

Year	1				2				3				4			Project	
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	Peak	Average
Workers	93	214	219	443	513	536	524	552	590	622	339	235	152	93	18	622	351
Trucks	27	52	45	67	69	63	57	100	128	110	81	73	49	29	7	128	65

Note: This table represents estimated conditions in each quarter and may differ from the numbers discussed in some analysis sections. The analyses are based on reasonable worst-case development scenario assumptions for that particular analysis area.
Source: Turner Construction Company

D. THE FUTURE WITHOUT THE PROPOSED PROJECTS

This analysis assumes that the East Site buildings will remain vacant and in their current form in the future without the proposed projects. In the No Build condition, it is also expected that the O'Toole Building would be used for doctors' offices and related health care facilities. This use would be consistent with the history of the site and with the variety of community facilities located in the surrounding study areas. The Triangle Site would remain fenced and closed to the public.

It is expected that NYCT will install emergency ventilation fans for the Eighth Avenue subway line between West 4th and West 14th Streets. In addition, the emergency ventilation fans may be able to service the Seventh Avenue subway line between Christopher Street and West 14th Street. The preferred alternative would require construction of a single emergency ventilation plant on NYCT-owned property at 61 Greenwich Avenue (Mulry Square). This property is located on a triangular lot at the intersection of Seventh and Greenwich Avenues. The majority of the construction would be underground. According to the Final EIS (FEIS) for this NYCT project, heavy equipment would not be used for the excavation, because of space constraints. The construction was scheduled to end in mid-2013 for the preferred alternative.

Currently, NYCT is preparing a Technical Memorandum for the construction of this facility, the scope of which has changed since the publication of the FEIS. This Technical Memorandum will address the current design of the Ventilation Plant and logistics of construction activities. The construction contract will likely be let in ~~late 2011 or~~ early 2012, with start of work anticipated for June 2012. The construction project is estimated to take approximately 40 months to complete, with a 10-12 hour duration workload during the workweek and work starting at around 7:00 AM in the morning. In the last 7 months of construction, all work is expected to be limited to within the Ventilation Plant building when it becomes functionally ready for equipment installation. By this time, there would not be any disruptions to the surrounding area due to construction.

According to NYCT, when construction begins Seventh Avenue between Greenwich Avenue and Perry Street is expected to experience 15 months (June 2012 to August 2013) of partial lane closures, moving from the east curb to the west curb. This section of Seventh Avenue generally contains two parking lanes and four moving lanes. The MPT for the Ventilation Plant construction would stipulate that three moving lanes would be functional at all times. After the connection across Seventh Avenue is completed, surface disruptions would move to the west side of Greenwich Avenue, resulting in the closure of the southbound roadway between Seventh Avenue and Perry Street. Northbound Greenwich Avenue traffic would be maintained at all times. Southbound traffic from Greenwich Avenue and from Seventh Avenue, however, would be detoured one block south along Seventh Avenue and turning onto Perry Street. This condition would prevail for the next 15 months from September 2015 to November 2014.

E. PROBABLE IMPACTS OF THE PROPOSED PROJECTS

Similar to many large development projects in New York City, construction can be disruptive to the surrounding area for limited periods of time throughout the construction period. The following analyses describe potential construction impacts on transportation, air quality, noise as well as other areas including land use, socioeconomic conditions, historic and cultural resources, and hazardous materials. As discussed under "Methodology," analyses of potential impacts on community facilities and service, open space, and natural resources are not warranted.

The analyses in this chapter represent the reasonable worst-case development scenario in each technical area. The reasonable worst-case can occur at different times for different analyses. For example, the nosiest part of the construction is not at the same time as the heaviest construction traffic. Therefore, the analysis periods differ for traffic, air quality, and noise. In each section, the methodologies to determine the period of reasonable worst-case potential impacts are explained. All methodologies used in the impact analyses are in accordance with the *CEQR Technical Manual.*

According to the applicant, there will be a field representative on-site throughout the entire construction period. The representative would serve as the contact point for the community and local leaders. The representative would be available to meet and work with the community 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 demolition activities begin, a security staff would be on the specific construction sites 24 hours a day, 365 days a year.

TRANSPORTATION

TRAFFIC

Construction activities would generate construction worker and truck traffic. An evaluation of construction sequencing and worker/truck projections was undertaken to assess potential transportation-related impacts. As demonstrated below, the construction of the proposed projects is not expected to result in any significant adverse traffic impacts.

Level 1 Construction Trip Generation Screening Assessment

Average daily construction worker and truck activities by quarter were projected for the entire construction period, as shown in **Table 20-3**. With construction anticipated to begin in early 2012 and completed in mid 2015, the first quarter of 2012 was used as the start of construction activities for purposes of the transportation analyses presented below. These projections were further refined to account for worker modal splits and vehicle occupancy, arrival and departure distribution, and passenger car equivalent (PCE) factor for construction truck traffic.

Daily Workforce and Truck Deliveries

For a reasonable worst-case development scenario analysis of potential transportation-related impacts during construction, the daily workforce and truck trip projections in the peak quarter were used as the basis for estimating peak hour construction trips. It is expected that construction activities would generate the highest amount of traffic in the first quarter of 2014 (or first quarter of year 3 construction), with an estimated average of 590 workers and 128 truck deliveries per day (see **Appendix D-2** for details). Because trucks are considered to be equivalent to two passenger vehicles each and they are assumed to enter and exit the construction site within the one hour, the large number of trucks during this period cause it to have the largest number of PCEs, although there are other periods during construction with more anticipated construction workers. These estimates of construction activities are further discussed below.

Construction Worker Modal Splits

Based on the survey conducted at the construction site of the New York Times Building in 2006, it is anticipated that construction workers' travel within or commute to Manhattan would be primarily by public transportation (approximately 70 percent), with a smaller percentage by private auto (approximately 30 percent).

Peak Hour Construction Worker Vehicle and Truck Trips

As discussed above, the project sponsors have committed to delay the start time of construction. Site activities, therefore, would mostly take place during the construction shift of 8:00 AM to 4:30 PM. However, some construction tasks would extend to 6:00 PM, requiring a portion of the construction workforce to remain for this extended shift. The renovation on the O'Toole Building would also require limited weekend shift from 8:00 AM to 4:00 PM.

While 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, construction workers would typically commute 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 early evening, whereas each truck delivery was assumed to result in two truck trips during the same hour (one "in" and one "out"). Furthermore, in accordance with the *CEQR Technical Manual*, the traffic analysis assumed that each truck has a PCE of 2.

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 before and after each shift. With the later starting time, the peak arrival/departure times would be 7 to 8 AM and 4 to 5 PM, respectively. For construction trucks, deliveries would occur throughout the day when the construction site is active. The DEIS assumed a typical pattern of construction truck deliveries ~~typically~~ peaking during the early morning (25 percent) and overlapping with construction worker arrival traffic. With the new commitments made by the project sponsors since publication of the DEIS, truck deliveries would not begin until 7 AM and would be restricted to the Seventh Avenue frontages only prior to 8 AM. After 8 AM, deliveries would be distributed across different frontages, including the side streets. Hence, during the 7 to 8 AM hour, truck deliveries to the East and Triangle sites would be made along Seventh Avenue only. There would not be any deliveries to the O'Toole Building Site during this hour because all deliveries for the construction of that site would take place only along West 12th and West 13th Streets. These changes would result in one less hour of permitted delivery time at the O'Toole Building Site and reduced delivery activities at the East and Triangle sites during the first hour of delivery. The hour-by-hour truck delivery profile reflecting these changes to the DEIS assumptions would essentially lessen the level of construction activities during the first hour of the day (7 to 8 AM) and distribute the delivery peaking to the adjacent hour (8 to 9 AM), thereby resulting in less overlapping of peak worker arrival and truck delivery traffic. For the Saturday work at the O'Toole Building Site, the same 8 AM to 4 PM shift assumed in the DEIS was assumed for the FEIS, with most workers arriving between 7 and 8 AM. However, truck deliveries would similarly not commence until 8 AM.

The revised peak construction hourly trip projections are summarized in **Table 20-4.** The maximum construction activities would result in ~~194~~ 111 PCEs between 7 and 8 AM, 101 PCEs between 8 and 9 AM, and ~~73~~ 80 PCEs between 4 and 5 PM on weekdays in the first quarter of 2014, and ~~40~~ 25 PCEs between 8 and 9 AM and 24 PCEs between 4 and 5 PM on weekends through out the second year of construction (second quarter of 2013 to first quarter of 2014) at the O'Toole Building Site.

Table 20-4
Peak Construction Vehicle Trip Projections

Hour	Auto Trips						Truck Trips						Total					
	Regular Shift			Extended Shift			Regular Shift			Extended Shift			Vehicle Trips			PCE Trips		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Weekday (1st Quarter of 2014)																		
5 AM – 6 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 AM - 7 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 AM - 8 AM	**56**	**0**	**56**	**11**	**0**	**11**	**9**	**9**	**18**	**2**	**2**	**4**	**78**	**11**	**89**	**89**	**22**	**111**
8 AM - 9 AM	14	0	14	3	0	3	17	17	34	4	4	8	38	21	59	59	42	101
9 AM - 10 AM	0	0	0	0	0	0	11	11	22	2	2	4	13	13	26	26	26	52
10 AM - 11 AM	0	0	0	0	0	0	11	11	22	2	2	4	13	13	26	26	26	52
11 AM - Noon	0	0	0	0	0	0	11	11	22	2	2	4	13	13	26	26	26	52
Noon - 1 PM	0	0	0	0	0	0	11	11	22	2	2	4	13	13	26	26	26	52
1 PM - 2 PM	0	0	0	0	0	0	11	11	22	2	2	4	13	13	26	26	26	52
2 PM - 3 PM	0	0	0	0	0	0	11	11	22	1	1	2	12	12	24	24	24	48
3 PM - 4 PM	0	4	4	0	0	0	11	11	22	1	1	2	12	16	28	24	28	52
4 PM - 5 PM	**0**	**56**	**56**	**0**	**0**	**0**	**5**	**5**	**10**	**1**	**1**	**2**	**6**	**62**	**68**	**12**	**68**	**80**
5 PM - 6 PM	0	10	10	0	3	3	0	0	0	1	1	2	1	14	15	2	15	17
6 PM - 7 PM	0	0	0	0	11	11	0	0	0	1	1	2	1	12	13	2	13	15
7 PM - 8 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Weekend (2nd Quarter of 2013 to 1st Quarter of 2014)																		
5 AM – 6 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6 AM - 7 AM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 AM - 8 AM	20	0	20	0	0	0	0	0	0	0	0	0	20	0	20	20	0	20
8 AM - 9 AM	**5**	**0**	**5**	**0**	**0**	**0**	**5**	**5**	**10**	**0**	**0**	**0**	**10**	**5**	**15**	**15**	**10**	**25**
9 AM - 10 AM	0	0	0	0	0	0	2	2	4	0	0	0	2	2	4	4	4	8
10 AM - 11 AM	0	0	0	0	0	0	2	2	4	0	0	0	2	2	4	4	4	8
11- AM - Noon	0	0	0	0	0	0	2	2	4	0	0	0	2	2	4	4	4	8
Noon - 1 PM	0	0	0	0	0	0	2	2	4	0	0	0	2	2	4	4	4	8
1 PM - 2 PM	0	0	0	0	0	0	2	2	4	0	0	0	2	2	4	4	4	8
2 PM - 3 PM	0	0	0	0	0	0	2	2	4	0	0	0	2	2	4	4	4	8
3 PM - 4 PM	0	3	3	0	0	0	2	2	4	0	0	0	2	5	7	4	7	11
4 PM - 5 PM	**0**	**20**	**20**	**0**	**0**	**0**	**1**	**1**	**2**	**0**	**0**	**0**	**1**	**21**	**22**	**2**	**22**	**24**
5 PM - 6 PM	0	2	2	0	0	0	0	0	0	0	0	0	0	2	2	0	2	2
6 PM - 7 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7 PM - 8 PM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Notes: Hourly construction worker and truck trips were derived from an estimated quarterly average number of construction workers and truck deliveries per day, with each truck delivery resulting in two daily trips (arrival and departure).

Since the projected peak hour vehicle trip estimates (in PCEs) exceed the *CEQR* analysis threshold of 50 peak hour vehicle trips for the weekday ~~morning~~ 7 AM to 2 PM and ~~mid-afternoon~~ 3 to 5 PM hours, a Level 2 screening assessment was conducted for the three hours with the highest projected construction traffic: 7 to 8 AM, 8 to 9 AM, and 4 to 5 PM to determine the need for additional quantified traffic analyses, as discussed below. For ~~the other construction peak periods, including~~ the weekend AM and PM construction peak hours, projected construction generated traffic would be below the CEQR threshold of 50 peak hour vehicle trips. Hence, additional analyses are not warranted and weekend construction activities would not have the potential to result in significant adverse traffic impacts.

Level 2 Construction Generated Trip Assignment Screening Assessment

Auto trips made by construction workers were assigned to the nearby available off-street parking facilities in the traffic network. Delivery trips made by construction trucks were assigned to NYCDOT-designated truck routes, including Sixth Avenue, Seventh Avenue, Eighth Avenue, Greenwich Avenue, and 14th Street. The roadway closure anticipated for southbound Greenwich Avenue between Seventh Avenue and Perry Street, resulting from the construction of the NYCT Ventilation Plant, was incorporated in this Level-2 trip assignment analysis. Illustrative traffic assignments for the construction-generated vehicle trips during the weekday peak hours of the first quarter of 2014 are shown in **Figures 20-2, 20-3, and 20-4**. As discussed above, the 7 to 8 AM trip assignment assumed no deliveries would occur on the side streets, whereas the 8 to 9 AM and 4 to 5 PM trip assignments accounted for delivery activities across all frontages of the construction sites, including Seventh Avenue and the side streets. These assignments show that incremental construction vehicle trips (in PCEs) during the 7 to 8 AM, 8 to 9 AM, and 4 to 5 PM peak hours in the first quarter of 2014 would be below the CEQR threshold of 50 peak hour vehicle trips at all area intersections. Since there would be fewer projected construction vehicle trips during the other weekday 8 to 9 AM and 9 to 10 AM hours than the 7 to 8 AM hours, area intersections would similarly not incur 50 or more peak hour vehicle trips. Therefore, a quantitative traffic analysis is not warranted and weekday construction activities during the hours of 7 AM to 7 PM would not have the potential to result in significant adverse traffic impacts. In the DEIS, a quantified construction traffic analysis was prepared for the weekday 6 to 7 AM hour since the incremental construction traffic during this hour was determined to weekday 6 to 7 AM construction peak hour in the second quarter of 2014 would exceed the CEQR threshold at several study area intersections, a quantified construction traffic analysis was prepared for this one time period. For the FEIS, this analysis is not warranted and has been deleted.

Traffic Capacity Analysis

Based on the weekday 6 to 7 AM construction traffic assignments for the second quarter of 2014, as shown in **Figure 20-2**, intersections that would experience 50 or more PCEs of construction-related traffic were selected for a detailed traffic analysis. These locations, as listed below, are all signalized intersections. The operations of these intersections were analyzed using Highway Capacity Software (HCS+) version 5.5, which is based on the methodologies presented in the *2000 Highway Capacity Manual (HCM)*.

- Sixth Avenue and West 13th Street;
- Seventh Avenue and West 14th Street;
- Seventh Avenue and West 13th Street;
- Seventh Avenue and West 12th Street; and
- Seventh Avenue, Greenwich Avenue and West 11th Street.

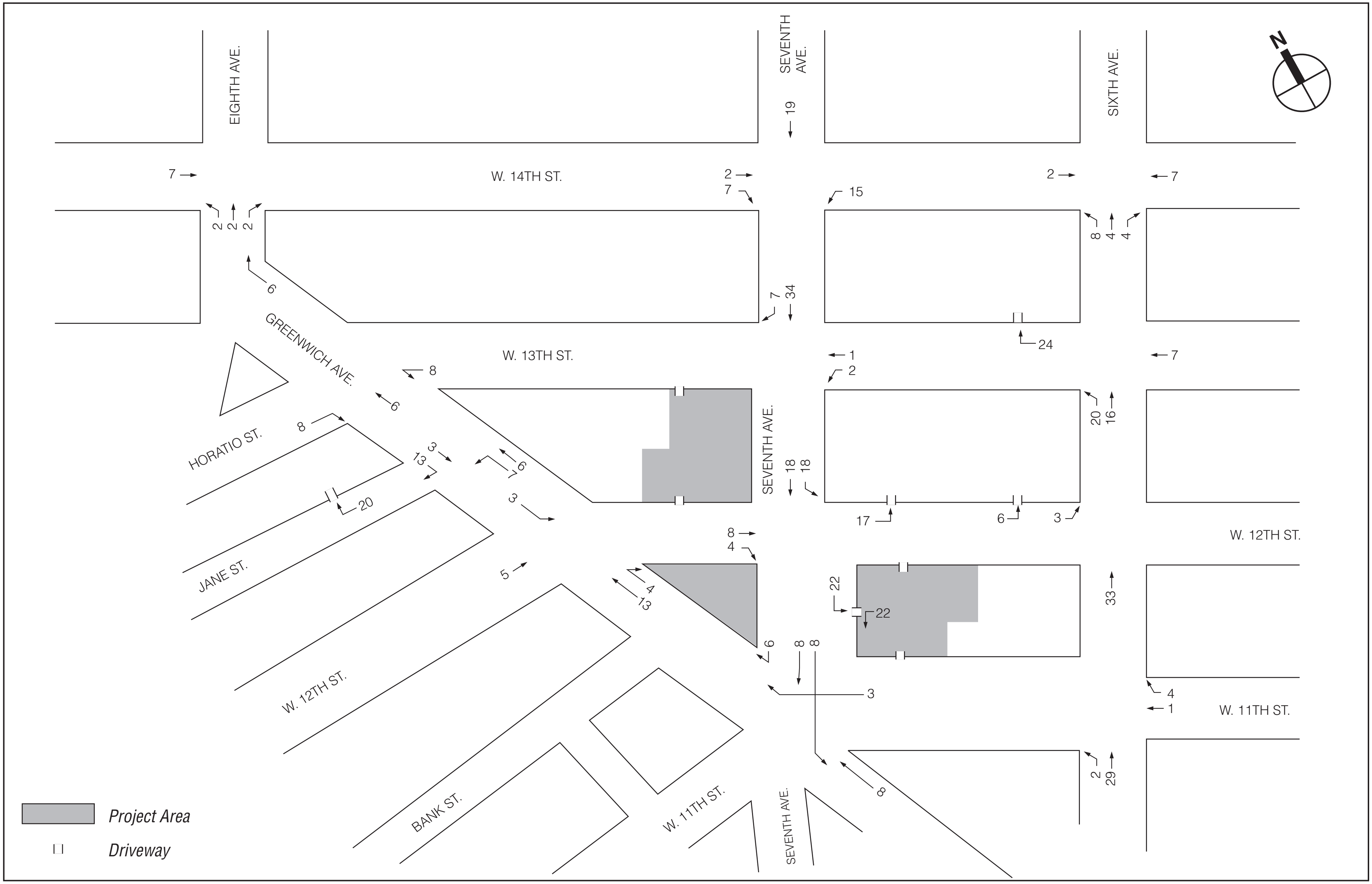
Analysis Methodology for Signalized Intersections

The level-of-service (LOS) for a signalized intersection is based on the average stopped delay per vehicle for the various lane groups (grouping of movements in one or more travel lanes). The levels of service are defined as follows:

LOS Criteria for Signalized Intersections

Level-of-Service (LOS)	Delay
A	≤ 10.0 seconds
B	> 10.0 and ≤ 20.0 seconds
C	> 20.0 and ≤ 35.0 seconds
D	> 35.0 and ≤ 55.0 seconds
E	> 55.0 and ≤ 80.0 seconds
F	> 80.0 seconds
Source: Transportation Research Board. *Highway Capacity Manual*, 2000.	

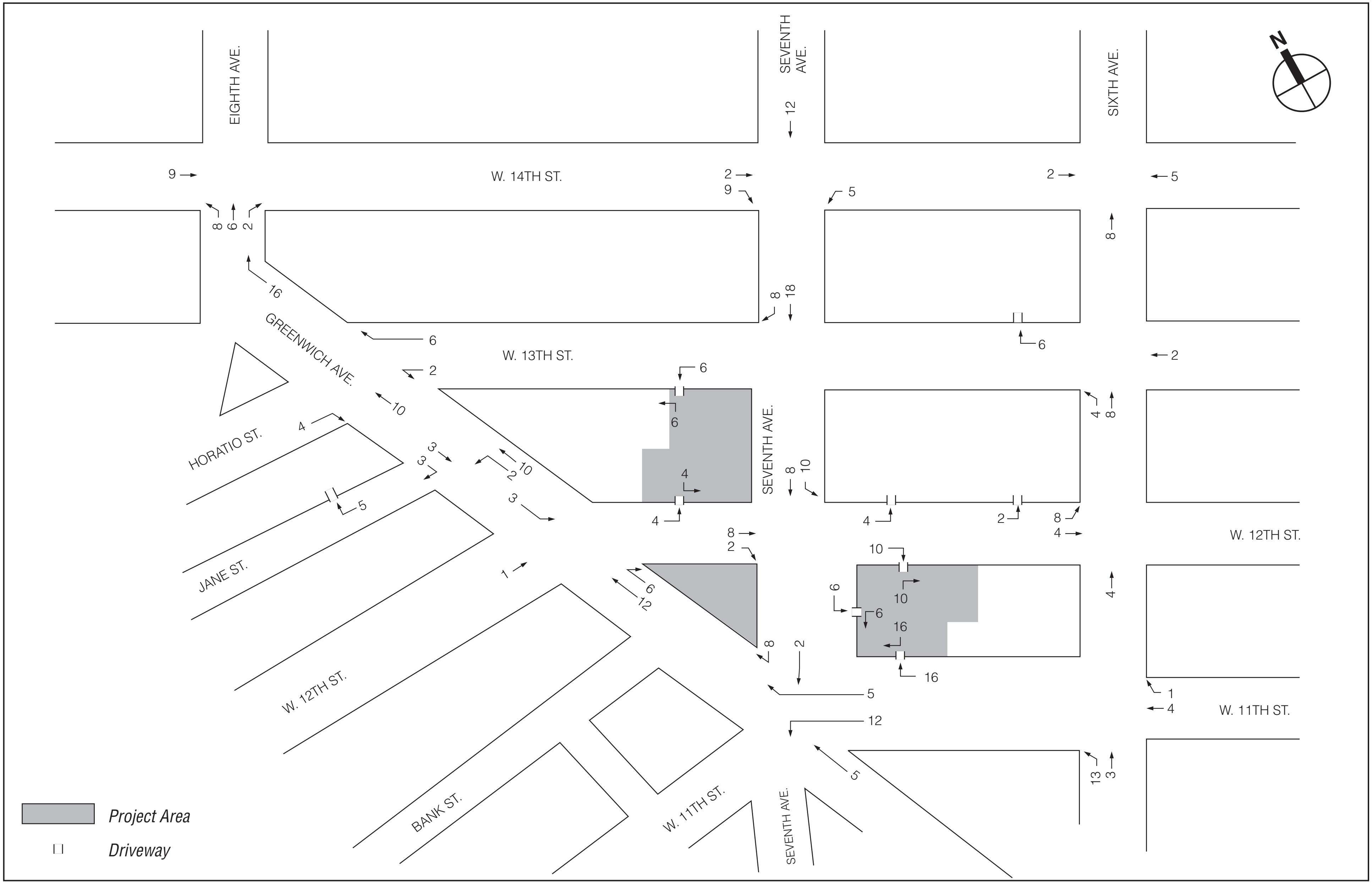
1.9.12



NOT TO SCALE

Figure 20-2

2014 Construction Generated Traffic Volumes
Weekday (7 AM to 8 AM)

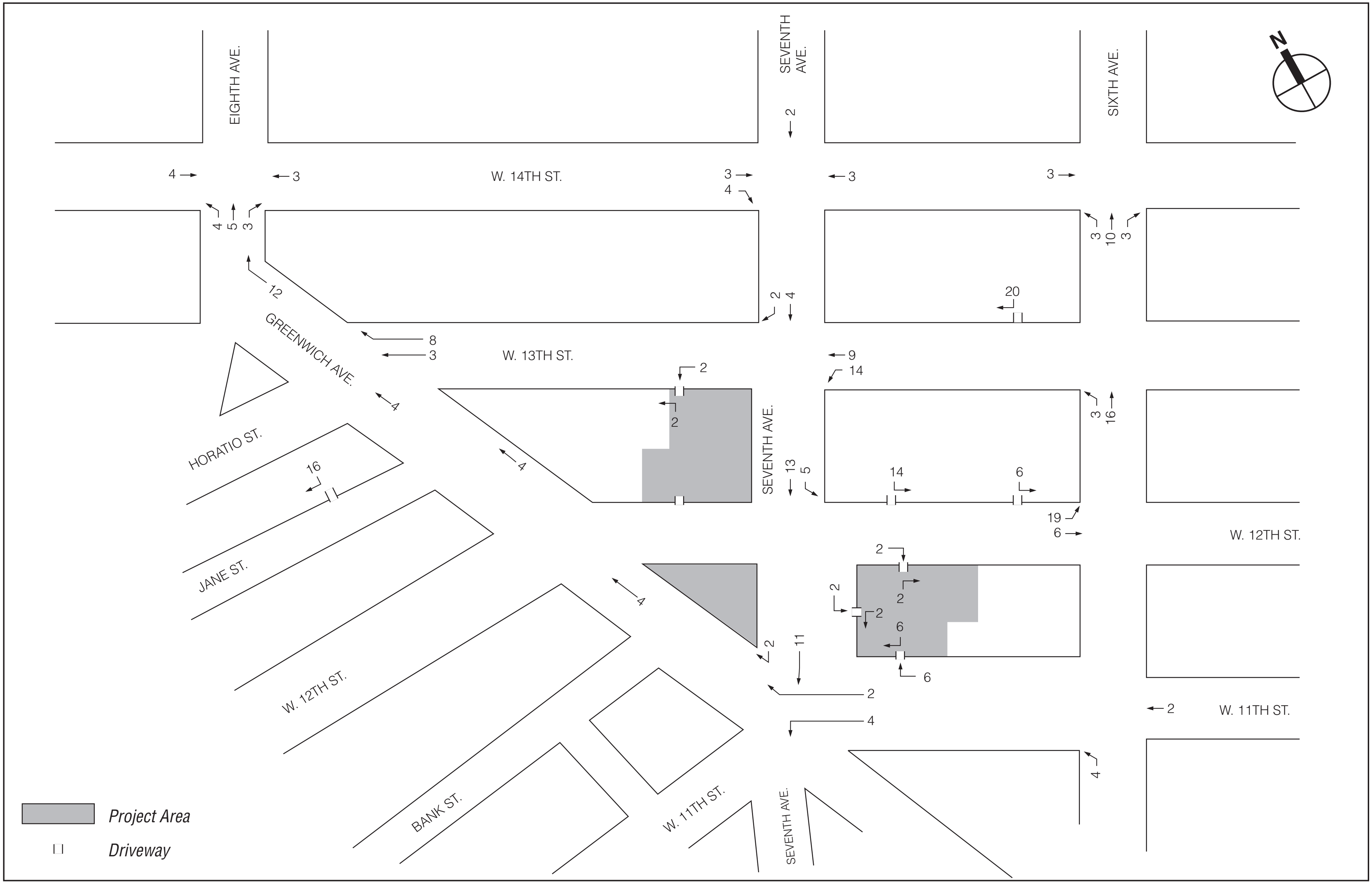


NOT TO SCALE

Figure 20-3

2014 Construction Generated Traffic Volumes
Weekday (8 AM to 9 AM)

11.29.11



NOT TO SCALE

Figure 20-4

2014 Construction Generated Traffic Volumes
Weekday (4 PM to 5 PM)

Although the *HCM* methodology calculates a volume-to-capacity (v/c) ratio, there is no strict relationship between v/c ratios and LOS as defined in the *HCM*. A high v/c ratio indicates substantial traffic passing through an intersection, but a high v/c ratio combined with low average delay actually represents the most efficient condition in terms of traffic engineering standards, where either an approach or the entire intersection processes traffic close to its theoretical maximum with minimal delay. However, very high v/c ratios especially those approaching or greater than 1.0 are often correlated with a deteriorated LOS. Other important variables affecting delay include cycle length, progression, and green time. LOS A and B indicate good operating conditions with minimal delay. At LOS C, the number of vehicles stopping is higher, but congestion is still fairly light. LOS D describes a condition where congestion levels are more noticeable and individual cycle failures (a condition where motorists may have to wait for more than one green phase to clear the intersection) can occur. Conditions at LOS E and F reflect poor service levels, and frequent cycle failures. The *HCM* methodology provides for a summary of the intersection's operating conditions by identifying the two critical movements (the worst case from each roadway) and calculating critical v/c ratio, delay, and LOS.

Existing Conditions

Existing traffic volumes were established based on turning movement counts and automatic traffic recorder (ATR) data collected in February 2011. Official signal timings obtained from NYCDOT were used in the analysis for all intersections. **Figure 20-5** shows the 6 to 7 AM traffic volumes for the 2011 existing condition.

Future without Construction

No Build traffic volumes are typically developed by applying background traffic growth and adding traffic generated by other potential developments within the study area. The *CEQR Technical Manual* recommends a background growth rate of 0.25 percent per year for Manhattan. As discussed above, the construction of the NYCT Emergency Ventilation Plant is currently scheduled to take place between 2012 and 2015. The second phase of the construction (January 2014 to March 2015) would result in the closure of southbound Greenwich Avenue between Seventh Avenue and Perry Street. This street closure would temporarily eliminate the southbound through movement from Greenwich Avenue and the southbound left-turn movement from Seventh Avenue, and detour the affected traffic one block south to Perry Street. At this point, traffic can make a left turn onto Perry Street, then a right turn to continue south on Greenwich Avenue. Based on the information presented in the FEIS for that project and meeting with NYCT, the potential detours in traffic due to this roadway closure and vehicle trips generated by the construction of the Ventilation Plant were included in the 2014 construction No Build analysis. **Figure 20-6** shows the 6 to 7 AM traffic volumes for the 2014 No Build condition.

Future with Construction

The analysis contemplated a future with the proposed projects (Build) condition that incorporates the No Build traffic volumes and overlays these volumes with construction-generated vehicle trips (in PCEs), as shown in **Figure 20-7**. **Table 20-5** summarizes the capacity analysis results for the 6 to 7 AM construction peak hour under Existing, No Build, and Build conditions. All approach lane groups and movements of the studied intersections would operate at acceptable LOS C or better during the morning construction peak hour. Based on the impact criteria outlined in the *CEQR Technical Manual*, construction activities during the 6 to 7 AM peak hour in the second quarter of 2014 would not result in any significant adverse traffic impacts.

Table 20-5
2011 Existing and 2014 No Build and Construction Build LOS Summary

Intersection	Approach	2011 Existing 6-7AM				2014 No Build 6-7AM				2014 Construction 6-7AM			
		Lane Group	V/C Ratio	Delay (SPV)	LOS	Lane Group	V/C Ratio	Delay (SPV)	LOS	Lane Group	V/C Ratio	Delay (SPV)	LOS
Sixth Avenue &	WB	TR	0.38	24.7	C	TR	0.39	24.9	C	TR	0.40	25.1	C
West 13th Street	NB	LT	0.68	11.6	B	LT	0.68	11.7	B	LT	0.70	12.0	B
-		INT		12.7	B	INT		12.8	B	INT		13.1	B
Seventh Avenue &	EB	TR	0.55	24.0	C	TR	0.56	24.1	C	TR	0.59	24.8	C
West 14th Street	WB	LT	0.37	21.0	C	LT	0.37	21.0	C	LT	0.40	21.5	C
-	SB	LTR	0.51	12.3	B	LTR	0.51	12.4	B	LTR	0.53	12.5	B
-		INT		16.3	B	INT		16.4	B	INT		16.8	B
Seventh Avenue &	WB	LT	0.22	17.4	B	LT	0.22	17.4	B	LT	0.23	17.6	B
West 13th Street	SB	TR	0.55	15.0	B	TR	0.56	15.1	B	TR	0.58	15.4	B
-		INT		15.2	B	INT		15.3	B	INT		15.6	B
Seventh Avenue &	EB	T	0.12	13.9	B	T	0.12	13.9	B	TR	0.13	14.0	B
West 12th Street	-	R	0.01	12.9	B	R	0.01	12.9	B				
-	SB	LT	0.64	19.5	B	LT	0.65	19.6	B	LT	0.68	20.2	C
-		INT		19.2	B	INT		19.3	B	INT		19.8	B
Seventh Avenue,	WB	L	0.21	30.8	C	L	0.21	30.9	C	L	0.28	32.2	C
Greenwich Avenue &		LT	0.28	31.5	C	LT	0.28	31.6	C	LT	0.38	33.7	C
West 11th Street	NB	L	0.13	30.1	C	L	0.12	28.4	C	L	0.12	28.4	C
		T	0.34	33.6	C	T	0.31	31.3	C	T	0.35	32.0	C
	SB	TR	0.31	33.3	C	R	0.31	31.8	C	R	0.31	31.8	C
	SB	LTR	0.59	18.7	B	TR	0.62	20.8	C	TR	0.63	20.9	C
		INT		21.4	C			22.9	C			23.4	C

Notes:
EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; INT = Intersection. L = Left-Turn; T = Through; R = Right-Turn.
V/C = Volume to Capacity; SPV = Seconds per Vehicle; LOS = Level of Service.

Curb Lane Closures and Staging

Because the majority of construction activities would be accommodated on-site, construction trucks would be staged primarily within the project area, or on streets adjacent to active construction sites. Temporary curb lane closures for truck deliveries are expected along Seventh Avenue, West 11th Street, West 12th Street, and West 13rd Street. During the entire construction period, at least one moving lane would be maintained along all cross streets and only curb lanes along Seventh Avenue, which are currently used for parking and/or deliveries, may be temporarily closed for construction.

Over the periods of the construction, each of the construction sites would have dedicated gates, driveways, or ramps for delivery vehicle access. Flaggers are expected to be present at these active driveways to manage the access and movements of trucks. Some of the site deliveries may also occur along the perimeters of the construction site within delineated closed-off areas for concrete pour or steel delivery. As with any other construction projects, these activities would take place in accordance with NYCDOT-approved MPT plans and would be managed by on-site flag-persons.

MPT plans would be developed for any curb lane and sidewalk closures. Approval of these plans and implementation of all temporary sidewalk and curb lane closures during construction would be coordinated with NYCDOT OCMC.

PARKING

The construction activities of the proposed projects would generate a maximum daily parking demand of up to approximately 90 spaces during the ~~third~~ second quarter of 2014. For the construction traffic analysis, the construction worker vehicles were assigned to the nearest off-street parking facilities that are expected to have available parking capacity to accommodate this demand. These facilities are generally located along West 12th and West 13th Streets between Sixth and Seventh Avenues, and along Jane Street west of Greenwich Avenue. As discussed in Chapter 14, "Transportation," the nearby off-street parking facilities would provide a total parking supply of approximately 1,300 spaces within the ¼-mile walking distance with over 600 spaces available during the morning period and approximately 250 spaces available during the peak midday parking utilization period[1]. Therefore, the parking demand from construction worker vehicles (maximum of 88) is expected to be adequately accommodated within the off-street parking facilities nearby.

TRANSIT

The study area is well served by public transit, including the A, C, E, and L subway lines at the Eighth Avenue-14th Street station, 1, 2, and 3 subway lines at the Seventh Avenue-14th Street station, and F, L, and M subway lines and PATH service at the Sixth Avenue-14th Street station. There are also several local bus routes, including the M5, M7, M14, and M20.

With nearly 30 percent of the construction workers projected to travel via auto, the bulk of the remaining 70 percent would travel to and from the project area via transit. During peak construction of the proposed projects (maximum of 622 average daily construction workers, as shown in **Table 20-3**), this distribution would represent approximately 440 daily workers traveling by transit. With 80 percent of these workers arriving or departing during the construction peak hours, the total estimated number of peak hour transit trips would be approximately 350. Since these incremental construction transit trips would be distributed among the various available subway and bus services, no single transit element is expected to experience an increase of more than 200 peak hour transit riders, the recommended CEQR threshold for a detailed quantified analysis. Hence, there would not be a potential for significant adverse transit impacts attributable to the projected construction worker transit trips. Any temporary relocation of bus stops along bus routes that operate adjacent to the project area would be coordinated with and approved by NYCDOT and NYCT to ensure proper access is maintained.

PEDESTRIANS

For the same reasons provided on transit operations, a detailed pedestrian analysis would also not be warranted to address the projected demand from the travel of construction workers to and from the project area. With a maximum of 622 average daily construction workers, as shown in **Table 20-3**, there would be up to approximately 500 workers arriving or departing during the construction peak hours via various modes of transportation. Considering that these pedestrian

[1] According to Table 14-20, the peak midday 2015 No Build public parking utilization was projected to be 1,208. However, with the O'Toole Building under construction, the 84-space parking demand estimated for it, under the future No Build condition, would not occur. Hence, the amount of public parking spaces available at peak midday utilization during construction of the proposed projects would be approximately 250 spaces within the ¼-mile parking study area.

trips would primarily occur outside of the typical commuter peak hours (8 to 9 AM and 5 to 6 PM), spread over three construction sites, several nearby transit services, and a number of area parking facilities, and therefore be distributed among numerous sidewalks and crosswalks in the area, there would not be a potential for significant adverse pedestrian impacts attributable to the projected construction worker pedestrian trips. In addition, sidewalk protection or temporary sidewalks would be provided in accordance with NYCDOT requirements to maintain pedestrian access.

AIR QUALITY

Construction activities have the potential to result in air quality impacts as a consequence of emissions from on-site construction engines and emissions from on-road construction-related vehicles (e.g., dump trucks). The analysis of potential impacts on air quality from construction of the proposed projects includes a quantitative analysis of both on-site and on-road sources of air emissions, and the overall combined impact of both sources where applicable. **Appendix D-3** provides additional supportive data for this analysis.

In general, much of the heavy equipment used in construction has diesel powered engines and produces relatively high levels of nitrogen oxides and particulate matter. Gasoline engines produce relatively high levels of carbon monoxide (CO), and changes in traffic levels and patterns could increase mobile source-related emissions of CO as well. Construction activities also generate fugitive dust emissions. As a result, the air pollutants analyzed for the construction activities include nitrogen dioxide (NO_2), particulate matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}), particulate matter with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and carbon monoxide. Since ultra-low-sulfur diesel (ULSD) would be used for all engines in the construction of the proposed projects, sulfur oxides (SO_x) emitted from those construction activities would be negligible. For more details on air pollutants, see Chapter 15, "Air Quality."

As stated above, 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 particulates. To ensure that construction of the new Center for Comprehensive Care in a renovated O'Toole Building and the East Site residential development results in the lowest feasible diesel particulate matter (DPM) emissions, an emissions reduction program for all construction activities in the project area would be implemented and would consist of the following components:

1. *Diesel Equipment Reduction.* Construction of the Center for Comprehensive Care and the East Site would minimize the use of diesel engines and use electric engines, which may operate on grid power 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. In addition, the capacity of the existing electric systems serving the O'Toole Building and the East Site would be investigated to determine the feasibility of using those systems to power construction prior to any new Con Edison service. 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 SO_x 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,[2] 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[3] or later construction equipment 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 EPA non-road diesel emission standards would be used in construction, where practical and feasible.

In addition, to minimize their effects, some emissions sources such as concrete trucks and pumps, would be located away from sensitive land uses, 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

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[2] 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).

[3] The first federal regulations for new non-road 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 non-road diesel engines were unregulated. These engines are typically referred to as Tier 0.

construction sites. Trucks entering and leaving the site with excavated or other materials would be covered. 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 period 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, affected streets would be cleaned as needed.

Additional measures would be taken to reduce pollutant emissions during construction of the proposed projects 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, this program is expected to reduce emissions by more than the reduction that would be achieved by applying the currently defined best available control technologies under New York City Local Law 77, which are required only for publically funded city projects.

As discussed in Chapter 15, “Air Quality,” EPA recently established a 1-hour average standard for NO_2. Great uncertainty exists as to 1-hour NO_2 background concentrations at ground level, especially near roadways, since these concentrations have not been measured. In addition, as previously noted, there are no clear methods to predict the rate of transformation of NO to NO_2 at ground-level given the level of existing data and models. Therefore, the significance of predicted construction impacts cannot be determined based on comparison with the new 1-hour NO_2 NAAQS since total 98th percentile values, including local area roadway contributions, cannot be estimated. In addition, construction-related air quality analysis methodologies have not been developed to predict accurately 1-hour NO_2 concentrations from construction activities. However, exceedances of the 1-hour NO_2 standard resulting from construction activities cannot be ruled out and therefore, as discussed above, certain measures would be implemented by the proposed projects in order to control emissions from construction activities:

Non-road diesel-powered vehicles and construction equipment meeting or achieving EPA non-road diesel emission standards higher than Tier 2 would be used in construction where practical and feasible. The reduction of overall diesel emissions would be achieved by using electric power in lieu of diesel where practicable.

AIR QUALITY ANALYSIS METHODOLOGIES

The following sections delineate additional details relevant only to the construction air quality analysis methodology. For a review of the applicable regulations, standards, and criteria for stationary source air quality analyses, refer to Chapter 15, “Air Quality.”

Stationary Source Analyses

A stationary source air quality analysis was conducted to evaluate potential construction impacts for the East Site and the O’Toole Building Site. Construction at the East Site would include a number of activities, such as excavating, materials handling, concrete pouring, and erecting of the proposed buildings. Air emission sources include exhausts on fuel burning equipment, fugitive dust from excavation/transfer activities, and road dust. The analysis was performed following EPA and *CEQR Technical Manual* suggested procedures and analytical tools, as further discussed below, to determine source emission rates. The estimated emission rates were then used as input to an air quality dispersion model to determine the potential impacts.

Construction Activity Assessment

Overall, construction of the Center for Comprehensive Care and the East Site is expected to occur over about a three year period. To determine which construction periods constitute the worst-case periods for the pollutants of concern, construction-related emissions were calculated throughout the duration of construction on an annual and peak-day basis for $PM_{2.5}$. $PM_{2.5}$ was selected as the worst-case pollutant, because as compared to other pollutants, $PM_{2.5}$ has the highest ratio of emissions to impact criteria. Therefore, $PM_{2.5}$ was used for determining the worst-case periods for analysis of all pollutants. Generally, emission patterns of other pollutants would follow $PM_{2.5}$ emissions, since most pollutant emissions are proportional to diesel engines by horsepower. CO emissions may have a somewhat different pattern, but generally would also be highest during periods when the most activity would occur. Based on the resulting multi-year profiles of annual average and peak day average emissions of $PM_{2.5}$, a worst-case year and a worst-case short-term period for each site were identified for the modeling of annual and short-term (i.e., 24-hour and 8-hour) averaging periods. To be conservative, the worst-case periods for each site were modeled simultaneously to determine maximum potential combined stationary source impacts.

Broader conclusions regarding potential concentrations during other construction periods, which were not modeled explicitly, are discussed as well, based on the multi-year emissions profiles and the worst-case period results.

Analysis Periods

The construction analyses used an emission estimation method and a modeling approach that has been previously used for evaluating air quality impacts of construction projects in New York City. Because the level of construction activities would vary from month to month, the approach includes a determination of worst-case emission periods based on the number of each equipment type, rated horsepower of each unit, and a monthly construction work schedule which assumes a typical 8-hour shift per day for the East Site and an ~~11-hour~~ extended workday and weekend work for the Center for Comprehensive Care.

As previously described, the construction sequencing includes two separate project sites being developed with overlapping construction schedules, the Center for Comprehensive Care and the East Site. As a result, both sites were considered for quantitative analysis. Analysis periods for each project are discussed below.

Based on the $PM_{2.5}$ emissions profile (discussed above), the worst-case short-term emissions (e.g., maximum daily emissions) for the Center for Comprehensive Care and the East Site were found to occur in the following monthly timeframe:

- Center for Comprehensive Care: short-term analysis period—Month ~~5~~8 of construction; and
- East Site: short-term analysis period—Month 15 of construction.

The maximum annual emissions were found to occur during the following twelve month time periods (based on a twelve month rolling average):

- Center for Comprehensive Care: Annual period—Months ~~1 to 12~~4 to 15 of construction; and
- East Site: Annual period—Months ~~7 to 18~~11 to 22 of construction.

Triangle Site

Construction activities at the expanded and upgraded public open space on the Triangle Site were also included in the multi-year emissions profiles. However, based on these emissions profiles, the construction activities at the Triangle Site would be much less intense than those at the East Site and the O'Toole Building. In addition, since the construction activities at the Triangle Site would occur towards the latter part of the three year construction period and would not overlap with the peak construction activities at the East Site and the O'Toole Building, the Triangle Site was not included in the worst-case period analyses.

NYCT Ventilation Plant

It is expected that NYCT will install emergency ventilation fans for the Eight Avenue subway line between West 4th and West 14th Streets. However, the majority of the construction would be underground and heavy equipment would not be used for the excavation. Therefore, the pollutant concentrations resulting from the installation of emergency ventilation fans would be less intense than those at the East Site and the O'Toole Building. Nevertheless, since the construction of the NYCT Ventilation Plant would overlap with the peak construction activities at the East Site and the O'Toole Building, the construction of the NYCT Ventilation Plant was included in the worst-case period analyses.

Construction Data

The specific construction information used to calculate air pollutant emissions generated by the construction activities includes, but is not limited to, the following:

- The number of units and fuel-type of construction equipment to be used;
- Rated horsepower for each piece of equipment;
- Hours of operation on-site;
- Excavation and processing rates; and
- Average distance traveled on-site by construction trucks.

The air emissions can be classified into two categories: engine exhaust emissions and fugitive dust emissions.

Engine Exhaust Emissions

The sizes, the types, and the number of construction equipment were based on the construction activities schedule. Emission factors for NO_X, PM_{10}, $PM_{2.5,}$ and CO from the combustion of ULSD fuel for on-site construction equipment were developed using the latest EPA-adopted NONROAD Emission Model. The model is based on source inventory data accumulated for specific categories of off-road equipment. The emission factors for each type of equipment were calculated from the output files for the NONROAD model (i.e., calculated from regional emissions estimates). Emission rates for dump trucks, concrete trucks, and other heavy trucks were developed using the EPA's MOBILE6.2 emission model. New York City law regulating idle time restriction was employed for the dump trucks and other heavy trucks. For analysis purposes, it was assumed that the concrete trucks would operate continuously. Detailed examples of the peak hour engine exhaust emission rate calculations for the analysis are included in **Appendix D-3**. Short-term and annual emission rates were adjusted from the peak hour emissions by applying usage factors for each equipment unit. Usage factors were determined using the construction equipment schedule.

The air quality analysis also took into account the application of available pollutant control technologies committed to by the applicant. Estimated PM emission rates for non-road equipment were reduced to account for add-on DPF control technologies. The control efficiency assumed for the DPFs is 90 percent.

Fugitive Emission Sources

Road dust emissions from vehicle travel were calculated using equations from EPA's AP-42, Section 13.2.1 for paved roads, and Section 13.2.2 for unpaved roads. PM_{10} emissions were estimated for dump trucks traveling in and out of the excavation area. Average vehicle weights (i.e., unloaded going in and loaded going out) were used in the analysis and a reasonably conservative round trip distance was estimated for on-site travel. In addition, the contractor would be required to implement a dust control plan. For example, stabilized truck exit areas would be established for washing off the wheels of all trucks that exit the large construction sites. Trucks entering and leaving the site with excavated or other materials would be covered. 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 needed. These control measures would provide at least a 50 percent reduction in PM_{10} emission. Also, since on-site travel speeds would be restricted to 5 miles per hour, on-site travel for trucks would not be a significant contributor to $PM_{2.5}$ fugitive emissions.

Particulate matter emissions could also be generated by material handling activities (i.e., loading/drop operations for excavated soils or debris). Estimates of PM_{10} and $PM_{2.5}$ emissions from these activities were developed using EPA's AP-42 Sections 13.2.4. Material transfer rates used for the analysis were based on information provided by the construction manager.

Dispersion Modeling

Potential impacts from on-site construction equipment were evaluated using the EPA/AMS AERMOD dispersion model. The AERMOD model is applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area, and volume sources). AERMOD is a steady-state plume model that incorporates current concepts about flow and dispersion in complex terrain, including updated treatments of the boundary layer theory, understanding of turbulence and dispersion, and includes handling of terrain interactions. The AERMOD model calculates pollutant concentrations based on hourly meteorological data.

Source Simulation

During construction, various types of construction equipment would be used at different locations throughout the site. Some of the equipment is mobile and would operate throughout the site while some would remain stationary on-site at distinct locations during short-term periods (i.e., daily and hourly). Stationary emission sources include (but are not limited to) air compressors, rebar benders, and concrete pumps. These sources were considered to be point sources and were placed at fixed locations in the modeling analysis. The input data for point sources included stack heights that were equivalent to the height of engine exhaust points or tailpipes and an exhaust temperature of 250° Celsius (a temperature within the normal operating range of most diesel engines). Based on estimated fuel consumption rates per 100 hp and potential pressure drops with diesel particulate filters on the exhaust, a stack velocity of 17.2 feet per second (or 5.24 meters per second) per 100 hp was used for each exhaust point along with a diameter of six inches (or 0.152 meters).

Equipment such as excavators and dump trucks would operate throughout the site. In the short-term periods, these sources were simulated as area sources for the purpose of the modeling analysis, and their emissions were distributed evenly across the construction site. In the modeled annual period all sources were simulated as area source emissions.

Receptor Locations

AERMOD was used to predict maximum pollutant concentrations at nearby locations of likely public exposure ("receptors"). Discrete receptors were placed along sidewalks and residential buildings. Receptors were also placed along the sidewalks surrounding the construction sites that would be publicly accessible. Residential receptors were placed at the nearest windows and façades facing the construction site.

Meteorological Data

The meteorological data set consisted of the latest five years of data that are available: surface data collected at LaGuardia Airport (2005-2009) and concurrent upper air data collected at Brookhaven, New York.

Background Concentrations

Where needed to determine potential air quality impacts from the construction of the proposed East Site project and Center for Comprehensive Care, background ambient air quality data for criteria pollutants were added to the predicted off-site concentrations. The background data was obtained from nearby DEC monitoring stations that best represented the area surrounding the site for the monitoring years 2005 through 2009. These background concentrations are provided below in **Table 20-5**. The 1-hour CO and 8-hour CO background levels are based on maximum second highest concentrations recorded over the most recent five year period for which monitoring data are available. The 24-hour average PM_{10} background concentration is based on the maximum second-highest 24-hour average concentration measured over the most recent 3-year period. Annual NO_2 concentration is based on the maximum value of the most recent five year data set.

Table 20-5
Background Pollutant Concentrations

Pollutant	Monitoring Station	Averaging Period	Background Concentration	Ambient Standard
NO_2	IS 52	Annual	55 µg/m^3	100 µg/m^3
CO	Queens College II	1-hr	3.1 ppm	35 ppm
		8-hr	2.0 ppm	9 ppm
PM_{10}	Division Street	24-hr	53 µg/m^3	150 µg/m^3

Source: New York State Air Quality Report Ambient Air Monitoring System, DEC, 2005–2009.

Mobile Source Analyses

The prediction of vehicle-generated CO and PM emissions and their dispersion in an urban environment incorporates meteorological phenomena, traffic conditions, and physical configurations (e.g., street widths, sidewalk locations). Air pollutant dispersion models mathematically simulate how traffic, meteorology, and source-receptor geometry combine to affect pollutant concentrations. The mathematical expressions and formulations contained in the various models attempt to describe an extremely complex physical phenomenon as closely as possible. However, because all models contain simplifications and approximations of actual conditions and interactions and it is necessary to predict the reasonable worst-case development scenario, most of these dispersion models predict conservatively high concentrations of pollutants, particularly under adverse meteorological conditions.

The mobile source analyses for the proposed East Site project and Center for Comprehensive Care employ models approved by EPA that have been widely used for evaluating the air quality impacts of projects in New York City, other parts of New York State, and throughout the country. The modeling approach includes a series of conservative assumptions relating to meteorology, traffic, and background concentration levels resulting in a conservatively high estimate of anticipated pollutant concentrations that could ensue from mobile sources associated with the proposed projects. The assumptions used in the PM analysis were based on the latest $PM_{2.5}$ draft interim guidance developed by DEP.

The following sections provide an overview of the analytical tools used to determine mobile source impacts.

Dispersion Model for Microscale Analyses

Maximum CO concentrations adjacent to streets near the project area, resulting from vehicle emissions, were predicted using the CAL3QHC model Version 2.0. The CAL3QHC model employs a Gaussian (normal distribution) dispersion assumption and includes an algorithm for estimating vehicular queue lengths at signalized intersections. CAL3QHC predicts emissions and dispersion of CO from idling and moving vehicles. The queuing algorithm includes site-specific traffic parameters, such as signal timing and delay calculations, saturation flow rate, vehicle arrival type, and signal actuation (i.e., pre-timed or actuated signal) characteristics to predict accurately the number of idling vehicles. The CAL3QHC model has been updated with an extended module, CAL3QHCR, which allows for the incorporation of hourly meteorological data into the modeling, instead of worst-case assumptions regarding meteorological parameters. This refined version of the model, CAL3QHCR, is employed if maximum predicted future CO concentrations are greater than the applicable ambient air quality standards or when *de minimis* thresholds are exceeded using the first level of CAL3QHC modeling.

To determine motor vehicle generated PM concentrations adjacent to streets near the project area, the CAL3QHCR model was applied. This refined version of the model can utilize hourly traffic and meteorology data, and is therefore more appropriate for calculating 24-hour and annual average concentrations.

Meteorology

In general, the transport and concentration of pollutants from vehicular sources are influenced by three principal meteorological factors: wind direction, wind speed, and atmospheric stability. Wind direction influences the accumulation of pollutants at a particular location (receptor), and atmospheric stability accounts for the effects of vertical mixing in the atmosphere.

CO calculations were performed using the CAL3QHC model. In applying the CAL3QHC model, the wind angle was varied to determine the wind direction resulting in the maximum concentrations at each receptor.

Following EPA guidelines, CO computations were performed using a wind speed of 1 meter per second and the neutral stability class D. The 8-hour average CO concentrations were estimated by multiplying the predicted 1-hour average CO concentrations by a factor of 0.79 to account for persistence of meteorological conditions and fluctuations in traffic volumes. A surface roughness of 3.21 meters was chosen. At each receptor location, concentrations were calculated for all wind directions, and the highest predicted concentration was reported, regardless of frequency of occurrence. These assumptions ensured that worst-case meteorology was used to estimate impacts.

PM calculations were performed using the CAL3QHCR model. In applying the CAL3QHCR model, the meteorological data set consisted of the latest five years of data that are available: surface data collected at LaGuardia Airport (2005-2009) and concurrent upper air data collected at Brookhaven, New York.

Analysis Year

An air quality analysis was performed for the first quarter of year 3 construction (or first quarter of 2014, as assumed in the transportation section above), the peak construction period for traffic (i.e., project increments). The future analysis was performed for the No Build and Build conditions.

Vehicle Emissions Data

Vehicular CO and PM engine emission factors were computed using MOBILE6.2. This emissions model is capable of calculating engine emission factors for various vehicle types, based on the fuel type (gasoline, diesel, or natural gas), meteorological conditions, vehicle speeds, vehicle age, roadway types, number of starts per day, engine soak time, and various other factors that influence emissions, such as inspection maintenance programs. Idle emission factors were used when vehicles were queuing, and free flow emission factors were based on vehicle travel speeds when traffic was moving. The inputs and use of MOBILE6.2 for the proposed projects were consistent with the most current guidance available from DEC and DEP.

Vehicle classification data were based on field studies outlined in the traffic section (including project-generated traffic). Appropriate credits were used to reflect accurately the inspection and maintenance program. The inspection and maintenance programs require inspections of automobiles and light trucks to determine if pollutant emissions from the vehicles' exhaust systems are below emission standards. Vehicles failing the emissions test must undergo maintenance and pass a repeat test to be registered in New York State. All construction-worker-generated vehicles were simulated as hot stabilized for arrivals and cold starts for departures. An ambient temperature of 43.0° Fahrenheit (F) was used for the analysis.

Traffic Data

Traffic data for the air quality analysis were derived from existing traffic counts, projected future growth in traffic, and other information developed as part of the traffic analysis for the proposed projects (see "Traffic and Parking," above) for the peak construction traffic period in the first quarter of year 3 construction. Traffic data for the No Build and Build conditions were employed in the respective air quality modeling scenarios. Weekday AM ~~(6 to 7AM)~~(7 to 8 AM) peak hour period was used for microscale CO analysis. This time periods was selected because it produces the maximum anticipated project-generated traffic and therefore have the greatest potential for significant air quality impacts.

Background Concentrations

Background concentrations for mobile sources are those pollutant concentrations not accounted for through the modeling analysis, which directly accounts for vehicle-generated emissions on the streets within 1,000 feet and line-of-sight of the receptor location. Background concentrations must be added to mobile source modeling results to obtain total pollutant concentrations at a study location.

The 8-hour average background CO concentration used in this analysis was 2.0 parts per million (ppm). This value is representative for the mobile source receptor locations in the future year. The 24-hour average background concentration for PM_{10} was 53 micrograms per cubic meter ($\mu g/m^3$). For $PM_{2.5}$, background concentrations are not considered, since impacts are determined on an incremental basis only.

Mobile Source Analysis Site

The intersection of Seventh Avenue and West 12th Street was used in the analysis for the assessment of CO and PM impacts (see **Table 20-6**). This intersection was selected because it is where the largest levels of project-generated (incremental) traffic in the project study area are expected and, therefore, where the greatest air quality impacts and maximum changes in concentrations would be anticipated.

Table 20-6
Mobile Source Analysis Intersection Location

Analysis Site	Location
1	Seventh Avenue and West 12th Street

Receptor Locations

Multiple receptors (i.e., precise locations at which concentrations are predicted by the model) were modeled along the approach and departure links of the selected intersection at spaced intervals. The receptor locations included sidewalks and roadside locations near intersections with continuous public access.

EXISTING CONDITIONS

A review of the existing monitored air quality conditions can be found in Chapter 15, "Air Quality."

THE FUTURE WITHOUT THE PROPOSED PROJECTS

Stationary Source Impacts

In the future without the proposed projects, air quality is anticipated to be similar to that described for existing conditions. Land uses are expected to remain generally the same in this neighborhood in midtown Manhattan. Since air quality regulations mandated by the Clean Air Act are anticipated to maintain or improve air quality in the region, it can be expected that air quality conditions in the future without the proposed projects would be no worse than those that presently exist.

Mobile Source Impacts

Carbon Monoxide ~~CO~~

CO concentrations without the proposed projects were determined using the methodology previously described. **Table 20-7** shows the future maximum predicted 8-hour average CO concentration without the proposed projects at the analysis intersection in the project study area. The values shown are the highest predicted concentrations for the receptor locations at the intersection. As indicated in **Table 20-7,** the predicted 8-hour concentrations of CO, including background, are below the corresponding ambient air quality standard.

Table 20-7
No Build Maximum Predicted 8-Hour
Carbon Monoxide Concentrations (parts per million)

Analysis Site	Location	No Build 8-Hour Concentration (ppm)
1	Seventh Avenue and West 12th Street	3.1

Notes:
8-hour CO standard is 9 ppm.
An adjusted ambient background concentration of 2.0 ppm is included in the No Build values presented above.

Particulate Matter ~~PM~~

Concentrations of PM_{10} and $PM_{2.5}$ from mobile sources without the proposed projects were also determined at the intersection of Seventh Avenue and West 12th Street. Concentrations of PM_{10} included a 24-hour averaging period and $PM_{2.5}$ included the 24-hour and annual averaging periods. Including a background concentration of 53 $\mu g/m^3$, the maximum PM_{10} 24-hour No Build concentration is predicted to be approximately 71 $\mu g/m^3$ and is below the applicable NAAQS of 150 $\mu g/m^3$. Note that $PM_{2.5}$ concentrations for No Build condition are not presented, since impacts are assessed on an incremental basis.

PROBABLE IMPACTS OF THE PROPOSED PROJECTS

The results of the air quality modeling analyses are summarized below. As indicated, the modeling analyses demonstrated that no significant adverse impacts from construction sources are expected during the modeling analysis periods. The predicted concentrations were modeled for periods that represented the highest site-wide air emissions at each construction site. The construction sequencing indicates that the two separate project sites would be developed with overlapping construction schedules. To be conservative, the worst-case periods for each site were modeled simultaneously to determine maximum potential combined stationary source impacts. During other stages of construction that were not explicitly modeled, significant adverse impacts are not expected since the modeled scenarios are the most conservative approach.

Stationary Source Impacts

A dispersion modeling analysis was performed to estimate the maximum off-site pollutant concentrations associated with emissions produced by on-site construction activities at both project sites. A reasonable worst-case development scenario was used to generate the project emissions (see "Air Quality Analysis Methodologies," above). The modeling analyses were conducted using the AERMOD dispersion model and were performed in accordance with EPA and DEP guidance regarding the use of dispersion models for regulatory purposes. The predicted ambient concentrations of criteria pollutants have been used to demonstrate compliance with applicable air quality standards and DEP interim guidance values. As mentioned above, the worst-case periods for the East Site and the Center for Comprehensive Care were modeled simultaneously to determine maximum potential combined stationary source impacts. Presented below are the results of the analyses for receptors near the East Site and for receptors near the Center for Comprehensive Care. The predicted concentrations of the criteria pollutants are lower than in the DEIS. These reductions were caused in part by changes in the number of pieces of construction equipment and the revised construction schedule.

East Site

Table 20-8 presents the maximum predicted total concentration (including background) of three criteria pollutants for each applicable model averaging period near the proposed construction activities at the East Site, including the Triangle Site. The maximum impacts were predicted to occur at receptors nearest the project area. As indicated in the table the maximum predicted total concentrations of NO_2, PM_{10}, and CO would not result in any concentrations that exceed the NAAQS. This was true for all averaging periods, both short-term and annual, and for each pollutant modeled in the analysis using the worst-case emissions periods discussed above. Therefore, no significant adverse air quality impacts are predicted from the on-site construction sources due to these pollutants.

Table 20-8
East Site
Maximum Predicted Total Concentrations for Construction Activities

Pollutant	Averaging Period	Background Concentration	Predicted Concentration	Total Maximum Predicted Conc.	Ambient Standard
NO_2	Annual	55 µg/m^3	~~18~~17	~~73~~72	100 µg/m^3
PM_{10}	24-hour	53 µg/m^3	~~32~~33	~~85~~86	150 µg/m^3
CO	1-hour	3.1 ppm	~~26.2~~26.0	~~29.3~~29.1	35 ppm
	8-hour	2.0 ppm	~~5.9~~5.5	~~7.9~~7.5	9 ppm

The air quality analysis was also performed to predict the concentrations of $PM_{2.5}$ from construction activities. Concentrations of $PM_{2.5}$ were modeled for the 24-hour averaging period (a measure of daily exposure) and the annual averaging period (a measure of long-term exposure). The results of the $PM_{2.5}$ analysis are presented in **Table 20-9** and summarized below.

Table 20-9
East Site
Maximum $PM_{2.5}$ Increments

Pollutant	Averaging Period	Maximum Predicted Increment (µg/m^3)	DEP Criteria (µg/m^3)
$PM_{2.5}$	24-hour	~~1.9~~1.8	2/5
	Annual	~~0.19~~0.13	0.30

The maximum predicted 24-hour average (i.e., short-term) $PM_{2.5}$ incremental concentration from the proposed construction activities was modeled for comparison with the DEP 24-hour average interim guidance criteria for a discrete receptor location. The 24-hour $PM_{2.5}$ construction impact assessment considers the potential frequency and extent of incremental impacts if predicted concentrations are above the DEP interim guidance criteria (a discussion of the DEP interim guidance criteria is presented in Chapter 15, "Air Quality").

A modeling analysis was conducted for the worst-case short-term period in Month 15 of construction. At receptor locations placed on nearby sidewalks, the maximum predicted incremental concentration was equal to ~~1.9~~1.8 µg/m^3. At sensitive locations with a potential for 24-hour exposure, such as nearby residential receptors, the maximum predicted $PM_{2.5}$ incremental concentration was equal to ~~1.7~~1.4 µg/m^3. As indicated, all receptors, including residential receptors, would be below the current 24-hour interim guidance criteria of both 2 and 5 µg/m^3 for the maximum predicted value. The maximum incremental impacts discussed above were computed based on periods with the highest emissions. Therefore, during other construction time periods with lesser emissions, the potential 24-hour incremental exposures would be less.

In addition to the 24-hour average short-term concentrations discussed above, an analysis was performed to predict annually averaged $PM_{2.5}$ concentrations. These concentrations were modeled for comparison to the DEP annual average interim guidance values for discrete and neighborhood-scale receptors (see Chapter 15, "Air Quality"). The analysis period was Months ~~7 to 18~~11 to 22 of construction.

The maximum predicted annual average $PM_{2.5}$ incremental concentration (for a discrete receptor location) occurred at a sidewalk receptor and was equal to ~~0.16~~ 0.13 µg/m^3. At sensitive locations with a potential for 24-hour exposure such as nearby residential receptors, the maximum predicted $PM_{2.5}$ incremental concentration was equal to ~~0.19~~ 0.13 µg/m^3. As indicated, all maximum predicted concentrations are less than the interim guidance threshold of 0.3 µg/m^3.

The maximum predicted annual $PM_{2.5}$ incremental concentration from the proposed construction activities was modeled for comparison with the DEP annual average neighborhood-scale interim guidance criterion of 0.1 µg/m^3. The annual average neighborhood-scale concentration increment from the construction activities was predicted to be ~~0.006~~ 0.005 µg/m^3, which is less than the 0.1 µg/m^3 criterion.

Center for Comprehensive Care

Table 20-10 presents the maximum predicted total concentration (including background) of three criteria pollutants for each applicable model averaging period near the proposed construction activities at the Center for Comprehensive Care. The maximum impacts were predicted to occur at receptors nearest the project area. As indicated in the table, the maximum predicted total concentrations of NO_2, PM_{10}, and CO would not result in any concentrations that exceed the NAAQS. This was true for all averaging periods, both short-term and annual, and for each pollutant modeled in the analysis using the worst-case emissions periods discussed above. Therefore, no significant adverse air quality impacts are predicted from the on-site construction sources due to these pollutants.

Table 20-10
Center for Comprehensive Care
Maximum Predicted Total Concentrations for Construction Activities

Pollutant	Averaging Period	Background Concentration	Predicted Concentration	Total Max Predicted Conc.	Ambient Standard
NO_2	Annual	55 µg/m^3	~~15~~13	~~70~~68	100 µg/m^3
PM_{10}	24-hour	53 µg/m^3	2	55	150 µg/m^3
CO	1-hour	3.1 ppm	21.0	24.1	35 ppm
	8-hour	2.0 ppm	5.7	7.7	9 ppm

The air quality analysis was also performed to predict the concentrations of $PM_{2.5}$ from construction activities. Concentrations of $PM_{2.5}$ were modeled for the 24-hour averaging period (a measure of daily exposure) and the annual averaging period (a measure of long-term exposure). The results of the $PM_{2.5}$ analysis are presented in **Table 20-11** and summarized below.

Table 20-11
Center for Comprehensive Care
Maximum $PM_{2.5}$ Increments

Pollutant	Averaging Period	Maximum Predicted Increment (µg/m^3)	DEP Criteria (µg/m^3)
$PM_{2.5}$	24-hour	~~2.0~~1.7	2/5
	Annual	~~0.06~~0.05	0.30

The maximum predicted 24-hour average (i.e., short-term) $PM_{2.5}$ incremental concentration from the proposed construction activities was modeled for comparison with the DEP 24-hour average interim guidance criteria for a discrete receptor location. The 24-hour $PM_{2.5}$ construction impact assessment considers the potential frequency and extent of incremental impacts if predicted concentrations are above the DEP interim guidance criteria (a discussion of the DEP interim guidance criteria is presented in Chapter 15, "Air Quality").

A modeling analysis was conducted for the worst-case short-term period in Month 5 of construction. The maximum predicted 24-hour average $PM_{2.5}$ incremental concentration of ~~2.0~~1.7 µg/m³ was predicted at a residential and a sidewalk receptor immediately adjacent to the construction site. This peak value does not exceed the interim guidance values of 2 and5 µg/m³. ~~and was predicted at a single location and only once in the five years of meteorological data—since the likelihood of this meteorological condition coinciding with peak construction activity is very low, this peak concentration may not occur at all. In addition, this maximum predicted concentration is probably overstated because the model did not include the effects of the noise reduction wall along the site perimeter that would be between sensitive receptors and the source of the emissions, resulting in enhanced dispersion. All other receptors were below the DEP interim guidance value of 2 µg/m³.~~ The maximum incremental impacts discussed above were computed based on periods with the highest emissions. Therefore, during other construction time periods with lesser emissions, the potential 24-hour incremental exposures would be less.

In addition to the 24-hour average short-term concentrations discussed above, an analysis was performed to predict annually averaged $PM_{2.5}$ concentrations. These concentrations were modeled for comparison to the DEP annual average interim guidance values for discrete and neighborhood-scale receptors (see Chapter 15, "Air Quality"). The analysis period was Months ~~1 to 12~~4 to 15 of construction.

The maximum predicted annual average $PM_{2.5}$ incremental concentration (for a discrete receptor location) occurred at a sidewalk receptor and was equal to ~~0.06~~ 0.05 µg/m³. At sensitive locations with a potential for 24-hour exposure such as nearby residential receptors, the maximum predicted $PM_{2.5}$ incremental concentration was equal to ~~0.06~~ 0.05 µg/m³. As indicated, all maximum predicted concentrations are less than the interim guidance threshold of 0.3 µg/m³.

The maximum predicted annual $PM_{2.5}$ incremental concentration from the proposed construction activities was modeled for comparison with the DEP annual average neighborhood-scale interim guidance criterion of 0.1 µg/m³. The annual average neighborhood-scale concentration increment from the construction activities was predicted to be ~~0.006~~ 0.005 µg/m³, which is less than the 0.1 µg/m³ criterion.

Mobile Source Impacts

Carbon Monoxide ~~CO~~

A mobile source air quality analysis was conducted for the proposed projects during construction activities at the site for the peak construction traffic period in the third year of construction. Localized pollutant impacts from the vehicles queuing at the selected intersection were analyzed for CO and were determined for the 8-hour averaging period.

CO concentrations for the Build condition were determined using the methodology previously described. **Table 20-12** shows the future maximum predicted 8-hour average CO concentration with the proposed projects at the analysis intersection in the project study area.

The values shown are the highest predicted concentrations for the time period analyzed. Also shown in the table is a Not-to-Exceed value based on the *de minimis* criteria used to determine the significance of the incremental increase in CO concentrations that would result from the proposed projects. The *de minimis* criteria are derived using procedures outlined in the *CEQR Technical Manual* that set a minimum allowable change in 8-hour average CO concentrations due to a proposed project (i.e., the No Build concentration plus half the difference between No Build concentration and the 9.0 ppm standard).

Table 20-12
No Build Maximum Predicted 8-Hour Carbon Monoxide Concentrations (parts per million)

Analysis Site	Location	Future with the Proposed Projects 8-Hour Concentration (ppm)	Not-To-Exceed *De minimis* Criteria (ppm)
1	Seventh Avenue and West 12th Street	3.1	6.0

Notes:
8-hour CO standard is 9 ppm.
An adjusted ambient background concentration of 2.0 ppm is included in the No Build values presented above.

The results in **Table 20-12** indicate that in the future with the proposed projects, there would be no significant adverse mobile source air quality impacts (i.e., *de minimis* criteria were not exceeded). In addition, with or without the proposed projects, maximum predicted CO concentrations in the study area of the proposed projects would be less than the corresponding ambient air quality standards.

Particulate Mater ~~*PM*~~

The maximum predicted concentration of PM_{10} for the 24-hour averaging period at the intersection of Seventh Avenue and West 12th Street is approximately 71 μg/m^3. This concentration is below the applicable standard of 150 μg/m^3.

The maximum predicted incremental concentrations of $PM_{2.5}$ were modeled for the 24-hour and annual averaging periods, also at the intersection of Seventh Avenue and West 12th Street. The predicted incremental concentrations are 0.1 μg/m^3 for the 24-hour averaging period, and 0.01 μg/m^3 for the annual averaging period. Both of these values are below the applicable City interim guidance criteria for $PM_{2.5}$.

COMBINED STATIONARY AND MOBILE SOURCE IMPACTS

A mobile source analysis of CO and PM impacts for the intersection of Seventh Avenue and West 12th Street indicated that a maximum predicted concentration would occur at receptors placed along the sidewalks adjacent to this intersection. Total cumulative concentrations of CO from both mobile and stationary sources (conservatively combining two different peak analysis periods) are estimated to be 8.8 ppm. This value includes a maximum predicted concentration of ~~5.9~~ 5.7 ppm from stationary source construction activities, a maximum predicted concentration of 1.1 ppm from mobile sources, and includes a background level of 2.0 ppm. This concentration of 8.8 ppm is below the NAAQS air quality standard of 9 ppm. Therefore, no significant adverse air quality impacts for CO would occur due to the combined impacts of mobile and construction sources.

Total cumulative PM_{10} concentrations from both mobile and stationary sources (conservatively combining two different peak analysis periods) are estimated to be 104 μg/m^3. This value includes a maximum predicted concentration of ~~32~~ 33 μg/m^3 from stationary source construction activities, a maximum predicted concentration of ~~19~~ 18 μg/m^3 from mobile sources, and a background level of 53 μg/m^3. This concentration of 104 μg/m^3 is below the NAAQS air quality standard of 150 μg/m^3.

For $PM_{2.5}$, the cumulative results are similar to those presented in Tables 20-10 and 20-12 for on-site construction impacts. When adding the highest predicted short-term $PM_{2.5}$ increments from on-site and mobile sources, the highest predicted increment was ~~2.0~~ 1.9 μg/m^3. This value includes a maximum predicted increment of ~~2.0~~ 1.8 µg/m^3 from stationary source construction activities and a maximum predicted increment of 0.1 µg/m^3 from mobile sources. The maximum cumulative predicted neighborhood scale annual average $PM_{2.5}$ concentration was ~~0.19~~ 0.18 µg/m^3. This value includes a maximum predicted increment of ~~0.19~~ 0.16 µg/m^3 from stationary source construction activities and a maximum predicted increment of 0.02 µg/m^3 from mobile sources. The mobile source concentrations were an order of magnitude or more lower than the stationary source concentrations, and would therefore have negligible effect when combined with the stationary source concentration contribution. Therefore, no significant adverse air quality impacts for either PM_{10} or $PM_{2.5}$ would occur due to the combined impacts of mobile and stationary sources.

CONCLUSIONS

The analysis of both on-site and on-road emissions, combined, determined that the maximum predicted incremental concentrations of $PM_{2.5}$ (using a worst-case emissions scenario) would not exceed the applicable interim guidance criteria, and therefore, no significant adverse impact from $PM_{2.5}$ would be expected to occur. Annual-average NO_2, CO, and PM_{10} concentrations would be below their corresponding NAAQS standards. Therefore, the proposed projects would not cause or contribute to any significant adverse air quality impacts with respect to these standards.

Given the uncertainties regarding background concentrations and analysis methodology for the new 1-hour NO_2 standard, exceedances of the 1-hour NO_2 standard resulting from construction activities cannot be ruled out. Therefore, measures would be implemented by the proposed projects to minimize NO_x emissions from construction activities. Non-road diesel-powered vehicles and construction equipment meeting or achieving EPA non-road diesel emission standards higher than Tier 2 would be used in construction where practical and feasible. The reduction of overall diesel emissions would be achieved by using electric power in lieu of diesel where practicable.

NOISE

INTRODUCTION

Potential impacts on community noise levels during construction of the proposed projects could result from noise due to construction equipment operation and from noise due to 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 at full power), 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. The most significant construction noise sources are expected to be impact equipment such as jackhammers, excavators with ram hoes, drill rigs, rock drills, impact wrenches, cranes, and paving breakers, as well as the movements of trucks, and possible blasting.

Noise from construction activities and some construction equipment is regulated by the New York City Noise Control Code and by EPA. The New York City Noise Control Code, as amended December 2005 and effective July 1, 2007, requires the adoption and implementation of a noise mitigation plan for each construction site, limits construction (absent special circumstances as described below) to weekdays between the hours of 7:00 AM and 6:00 PM, and sets noise limits for certain specific pieces of construction equipment. Construction activities occurring after hours (weekdays between 6:00 PM and 7:00 AM, and on weekends) may be authorized in the following circumstances: (1) emergency conditions; (2) public safety; (3) construction projects by or on behalf of City agencies; (4) construction activities with minimal noise impacts; and (5) where undue hardship is demonstrated resulting from unique site characteristics, unforeseen conditions, scheduling conflicts and/or financial considerations. EPA requirements mandate that certain classifications of construction equipment meet specified noise emissions standards.

Given the scope and duration of construction activities for the proposed projects, a quantified construction noise analysis was performed. The purpose of this analysis was to determine if significant adverse noise impacts would occur during construction, and if so, to examine the feasibility of implementing mitigation measures to reduce or eliminate such impacts.

CONSTRUCTION NOISE IMPACT CRITERIA

The *CEQR Technical Manual* states that significant noise impacts due to construction would occur "only at sensitive receptors that would be subjected to high construction noise levels for an extensive period of time." This has been interpreted to mean that such impacts would occur only at sensitive receptors where the activity with the potential to create high noise levels would occur continuously for approximately two years or longer. In addition, the *CEQR Technical Manual* states that the impact criteria for vehicular sources, using the No Action noise level as the baseline, should be used for assessing construction impacts. As recommended in the *CEQR Technical Manual*, this study uses the criteria to define a significant adverse noise impact as follows:

- If the No Action noise level is less than 60 dB(A) $L_{eq(1)}$, a 5 dB(A) $L_{eq(1)}$ or greater increase would be considered significant.
- If the No Action noise level is 61 dB(A) $L_{eq(1)}$, a 4 dB(A) $L_{eq(1)}$ or greater increase would be considered significant.
- If the No Action noise level is equal to or greater than 62 dB(A) $L_{eq(1)}$, or if the analysis period is a nighttime period (defined in the CEQR criteria as being between 10:00 PM and 7:00 AM), the incremental significant impact threshold would be 3 dB(A) $L_{eq(1)}$.

NOISE ANALYSIS METHODOLOGY

Construction activities for the proposed projects would be expected to result in increased noise levels as a result of: (1) the movement of construction-related vehicles (i.e., worker trips, and material and equipment trips) on the surrounding roadways; and (2) the operation of construction equipment on-site. The effect of each of these noise sources was evaluated. Two analyses are presented below. The first analysis ("cumulative analysis") examines the combined effects of construction-related vehicles and on-site construction equipment during the 8 AM – 6 PM time period (with no construction activities occurring before 8 AM). The second analysis ("traffic analysis") examines the effects of just the peak construction-related vehicular traffic which would be expected to occur during the 7 AM – 8 AM time period, prior to the operation of on-site equipment.

Noise from the operation of construction equipment on-site at a specific receptor location near a construction site is calculated by computing the sum of the noise produced by all pieces of equipment operating at the construction site. For each piece of equipment, the noise level at a receptor site is a function of:

- The noise emission level of the equipment;
- A usage factor, which accounts for the percentage of time the equipment is operating at full power;
- The distance between the piece of equipment and the receptor;
- Topography and ground effects; and
- Shielding.

Similarly, noise levels due to construction-related traffic are a function of:

- The noise emission levels of the type of vehicle (e.g., auto, light-duty truck, heavy-duty truck, bus, etc.)
- Vehicular speed;
- The distance between the roadway and the receptor;
- Topography and ground effects; and
- Shielding.

On-Site Construction Equipment Noise Modeling

Noise effects from construction activities were evaluated using the CadnaA model, a computerized model developed by DataKustik for noise prediction and assessment. The model can be used for the analysis of a wide variety of noise sources, including stationary sources (e.g., construction equipment, industrial equipment, power generation equipment, etc.), transportation sources (e.g., roads, highways, railroad lines, busways, airports, etc.), and other specialized sources (e.g., sporting facilities, etc.). The model takes into account the reference sound pressure levels of the noise sources at 50 feet, attenuation with distance, ground contours, reflections from barriers and structures, attenuation due to shielding, etc. The CadnaA model is based on the acoustic propagation standards promulgated in International Standard ISO 9613-2. This standard is currently under review for adoption by the American National Standards Institute (ANSI) as an American Standard. The CadnaA model is a state-of-the-art tool for noise analysis and is an accepted model under CEQR.

Geographic input data used with the CadnaA model included CAD drawings that defined site work areas, adjacent building footprints and heights, locations of streets, and locations of sensitive receptors. For each analysis period, the geographic location and operational characteristics, including equipment usage rates (percentage of time equipment with full-horse power is used) for each piece of construction equipment operating in the project area, as well as noise control measures, were input to the model. In addition, reflections and shielding by barriers erected on the construction site, and shielding from both adjacent buildings and project buildings as they are constructed, were accounted for in the model. Construction-related vehicles were assigned to the adjacent roadways. The model produced A-weighted $L_{eq(1)}$ noise levels at each receptor location, for each analysis period, which showed the noise level at each receptor location, as well as the contribution from each noise source.

Traffic Noise Modeling

The Federal Highway Administration (FHWA) *Traffic Noise Model* (TNM) Version 2.5 was used to determine ground-level noise levels due to vehicular traffic at all receptor locations for the analyses that looked at the combined effects of construction equipment operation and traffic. The TNM model is a methodology recommended for mobile source analysis purposes in the 2010 *CEQR Technical Manual.*

In addition, since the time period for peak construction traffic (7 to 8 AM) is projected to occur prior to the hours when construction equipment would be operating (8 AM to 4 PM), a separate analysis was prepared which examined potential noise impacts due to peak construction traffic alone. For the peak hour period (7 to 8 AM) construction traffic analysis, a proportional modeling technique was used as a screening tool to estimate changes in noise levels. At locations where proportional modeling screening indicated the potential for significant adverse noise impacts, the TNM was used to obtain more detailed results. The proportional modeling used as a screening technique is also a methodologies recommended for analysis purposes in the 2010 *CEQR Technical Manual.*

Analysis Years

As described above, construction would take place on the O'Toole Building Site and the East Site over a period of about three years. During the construction on the East Site, construction activities would generally occur on weekdays only. During the construction of the O'Toole Building, construction activities would occur on both weekdays and weekends. Potential noise impacts would be expected to occur at adjacent sensitive noise receptors to the construction sites for the entire construction duration. Therefore, noise analyses were performed for the weekday and weekend periods.

A screening analysis was performed to determine the worst-case period (i.e., month) for each year of construction when the maximum potential for significant noise impacts would occur. The screening analysis was based on a construction schedule showing the number of workers, types and number of pieces of equipment, and number of construction vehicles anticipated to be operating during each quarter of the construction period. To be conservative, initially the detailed construction noise analysis assumed: the analysis month with the maximum potential for producing significant impacts for each year of construction for each phase; that these peak on-site construction activity conditions occurred for the entire year; and that both peak on-site construction activities and peak construction-related traffic conditions occurred simultaneously. After the initial analysis was performed, as an additional refinement, additional time periods were analyses to see if the impacts predicted to occur using one time period per year were overly conservative. This refined analysis used the following combination of months and years for the weekday analysis—June 2012, January 2013, July 2013, January 2014, July 2014, and January 2015, and for the Saturday analysis—June 2012, July 2013, January 2014, and May 2014, respectively.

Noise Reduction Measures

The construction noise analysis assumes that the project sponsors commit to a proactive approach to minimize noise during construction activities. This approach employs a wide variety of measures that exceed standard construction practices, but the implementation of which is deemed feasible and practicable to minimize construction noise and reduce potential noise impacts. These measures would be implemented and described in the Construction Noise

Mitigation Plan required by the New York City Noise Control Code.[4] This program includes both source controls and path controls, which are described below.

In terms of source controls (i.e., reducing noise levels at the source), the following measures for construction, which go beyond typical construction techniques, would be implemented:

- A range of equipment, which produce lower noise levels than typical construction equipment required by the New York City Noise Control Code would be utilized. **Table 20-13** shows the noise levels for typical construction equipment and the noise levels for the equipment that would be used for construction of the proposed projects. References for quieter equipment and path controls are provided in **Appendix D-4-1**. In addition, information on the power type for the equipment is also shown in **Appendix D-4-1**.
- As early in the construction period as practicable, electrical-powered equipment would be selected for certain noisy equipment, such as concrete vibrator, hand tools, hoist, masonry mixer, and welder (i.e., early electrification).
- Minimize the use of impact devices, such as jackhammers, pavement breakers, impact wrenches, pneumatic tools, and hoe rams.
- Where practicable and feasible, construction sites would be configured to minimize back-up alarm noise. In addition, trucks would not idle more than three minutes at the construction site, based upon New York City Local Law.
- 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 or enclosures between equipment and sensitive receptors), the analysis assumes that the following measures would be implemented:

- Noisier equipment, such as cranes, concrete pumps, concrete trucks, and delivery trucks, would be located away from and shielded from sensitive receptor locations. 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.
- Noise barriers would be utilized to provide shielding. The construction sites would have a 15-foot-high barrier adjacent to residential and other sensitive locations. However, at the Triangle Site and the Seventh Avenue portion of the O'Toole Building Site a minimum 8-foot high barrier will be utilized. Where possible, concrete trucks and delivery trucks would be behind these barriers.
- Path noise control measures (i.e., portable noise barriers, panels, enclosures, and acoustical tents, where feasible) were assumed to be used for certain dominant noise equipment i.e., concrete trowel, crane, hydraulic break ram, impact wrench, line drill, pile driver, pneumatic tool, rock driller, and electrical plant. The details to construct noise barriers, enclosures, tents, etc. are based upon the instructions of DEP's Chapter 28, Citywide Construction Noise Mitigation.

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[4] New York City Noise Control Code (i.e., Local Law 113). Citywide Construction Noise Mitigation, Chapter 28, Department of Environmental Protection of New York City, 2007.

Table 20-13
Construction Equipment Noise Emission Levels (dBA)

Equipment List	CEQR & FTA Typical Noise Levels at 50 feet[1]	Quieter Equipment Noise Levels at 50 feet[2]	Noise Reduction with Path Controls[3]	Actual Noise Level at 50 feet
Acetylene Torch	73			73
Asphalt Spreaders	85			85
Backhoe	80			80
Bar Bender	80			80
Bobcat (Skid Steer)	80			80
Boring Jack Power	80			80
Cherry Picker	85			85
Compactor	80			80
Compressor	58			58
Concrete Pump	82			82
Concrete Trowel	85		10	75
Concrete Truck	85			85
Concrete Vibrator	76			76
Crab to Erect CW Panels	85	75		75
Crane	85		10	75
Crane (Tower Crane)	85		10	75
Delivery Truck	84			84
Drill Rig	84		10	74
Dump Truck	84			84
Excavator	85			85
Fuel Truck	84			84
Generator	82			82
Hand Tool	85	59		59
Hydraulic Break Ram	90		10	80
Hydraulic Hammer	73			73
Impact Wrench	85		10	75
Line Drill	84		10	74
Loader	80			80
Man Lift (Hoist)	85	75		75
Masonry Mixer	75			75
Pile driving Rig	85		10	75
Pile driver (vibratory)	95	85[4]	10	75
Pneumatic Tool	85		10	75
Pump	77			77
Rock Driller	85		10	75
Rubbish Carting Truck	78			78
Telehandler	85	74		74
Temp Electrical Plant	85	75		75
Tractor	84			84
Welder	73			73

Notes:
1 Sources: Table 22-1, Noise Emission Reference Level (A-weighted decibels with RMS “slow” time constant), CEQR, May 2010; Transit Noise and Vibration Impact Assessment, Federal Transit Administration (FTA), May 2006.
2 Sources and references for typical quieter equipment are provided in Appendix D-3-1.
3 Path controls include noise barriers, enclosures, acoustical panels, and curtains, whichever feasible and practical, and 10 dBA of reduction was assumed.
4 Typical equipment must meet the sound level standards specified in Subchapter 5 of the New York City Noise Control Code.

Receptor Sites

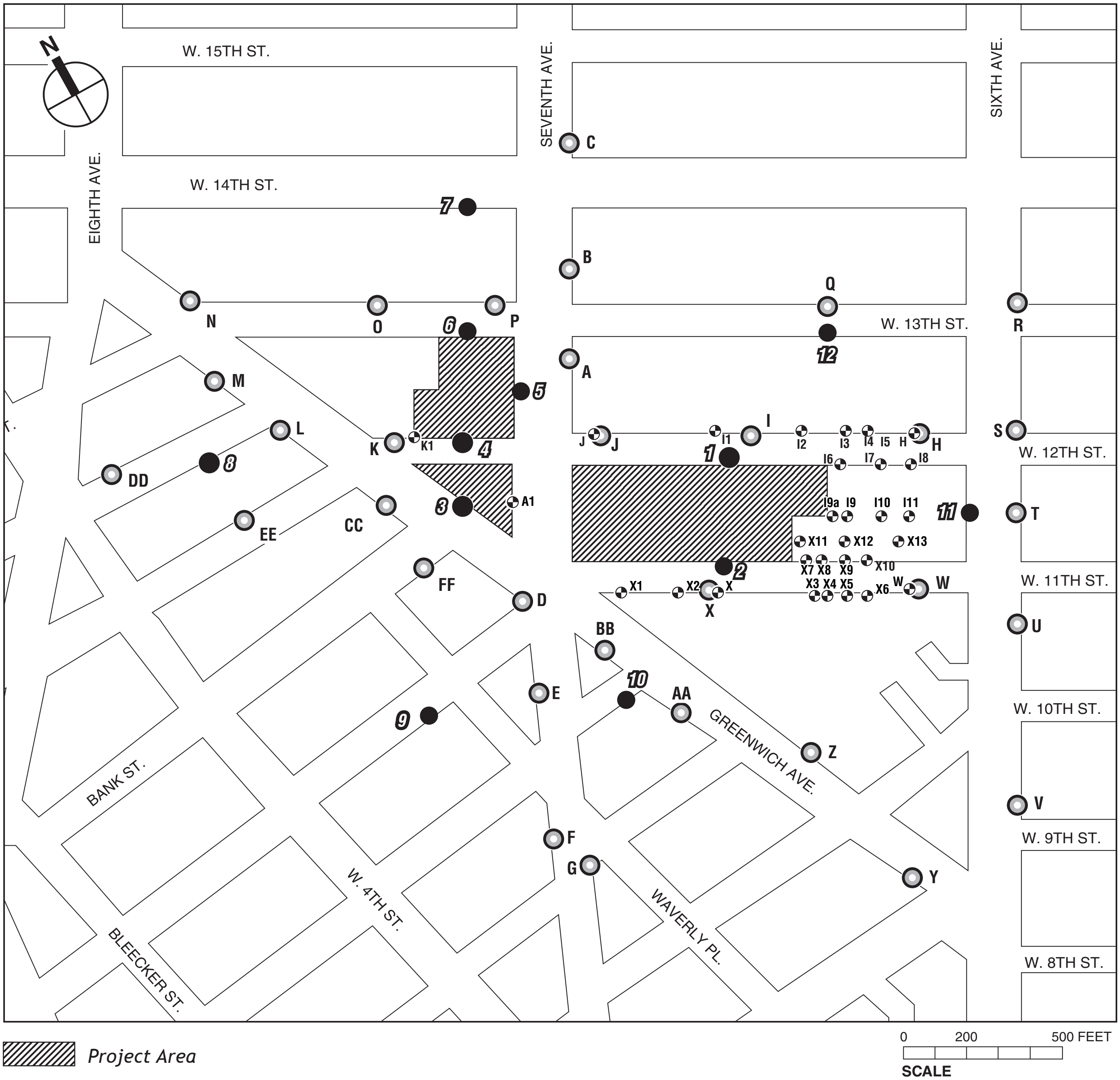
Twelve (12) receptor locations (i.e., sites 1 to 12) were selected as the noise monitoring sites to determine the baseline existing noise levels, and initially thirty-two (32) receptor locations (i.e., sites A to FF) close to the project area were selected as discrete noise receptor sites for the construction noise analysis. These receptors are either located directly adjacent to the project area or on streets where construction-related vehicles (i.e., trucks and autos) would be passing by. Each receptor site is the location of a residence or other noise sensitive use. At noise monitoring locations, receptors were placed at ground level (approximately five feet above-grade). At analysis locations, noise receptors were placed at multiple elevations. **Figure 20-5** shows the location of the noise receptor sites, and **Table 20-14** lists the noise receptor sites and their associated land uses. The receptor sites initially selected for detailed analysis are representative of locations where maximum project impacts due to construction noise would be expected.

Based upon initial modeling results, in consultation with representatives of DCP, it was decided to add additional noise receptor sites at locations immediately adjacent to the project area on West 11th and West 12th Streets, between Sixth and Seventh Avenues, in order to better define locations where significant adverse project impacts were likely to occur. In addition, between the DEIS and FEIS, two more noise receptors were assessed—the west façade of 130 West 12th Street and the East façade of 219-229 West 12th Street. **Figure 20-5** shows the locations of these additional noise receptor sites, and **Table 20-15a** lists the additional noise receptor sites and their associated land uses.

DETERMINING EXISTING AND NO BUILD NOISE LEVELS

TNM and the CadnaA model were used to determine existing and No Build noise levels at all discrete noise receptor sites. For ground level receptor locations, existing $L_{eq(1)}$ noise levels were calculated using the TNM model based on existing traffic components and adjusted by baseline measured values at monitoring receptor locations. Existing noise levels at 12 receptor sites were measured for 20-minute periods during the five peak periods—AM (7:00 – 9:00 AM), pre-midday (Pre-MD) (9:30 – 11:30 AM), midday (MD) (12:00 – 2:00 PM), pre-PM (2:30 – 4:30 PM), and PM (4:00 – 6:00 PM). The measured existing noise levels are provided in **Appendix D-4-2**. During the construction, the worst case for noise generated by construction activities would be happened at any time between 8 AM and 3 PM. To be conservative, the lowest existing $L_{eq(1)}$ values were used to calculate No Build noise levels that would result in higher increases in predicted noise levels due to construction. (Pre-MD and pre-PM measurements provided additional data to ensure that the analysis reflected the quietest ambient noise levels during the construction time period to maximize potential project impacts. However, these readings were not used for building attenuation analyses based upon the CEQR requirements)

For elevated receptor locations, existing noise levels were calculated using the CadnaA model based on existing traffic components (calculated using TNM). The difference in noise levels between ground level and elevated receptors was used to determine elevation adjustment factors. $L_{eq(1)}$ noise levels at elevated locations were determined by adding the adjustment factors to ground level noise levels. Future No Build Noise levels were determined by adding changes due to No Build traffic increases. The predicted lowest No Build $L_{eq(1)}$ values were used to determine construction-related noise impacts.



Project Area

A Construction Noise Analysis Receptor Location

1 Measured Noise Receptor Location

X1 Additional Construction Noise Analysis Receptor Location

Figure 20-5
Construction Noise Receptor Locations

Table 20-14
Construction Noise Receptor Locations

Receptor	Location	Associated Land Use
1	West 12th Street between Seventh and Sixth Avenues	Public Facilities and Institutions
2	West 11th Street between Seventh and Sixth Avenues	Public Facilities and Institutions
3	Greenwich Avenue between West 12th Street and Seventh Avenue	Public Facilities and Open Space
4	West 12th Street between Greenwich and Seventh Avenues	Public Facilities and Institutions
5	Seventh Avenue between West 13th and West 12th Streets	Public Facilities and Institutions
6	West 13th Street between Greenwich and Seventh Avenues	Public Facilities and Institutions
7	West 14th Street between Eighth and Seventh Avenues	Public Facilities and Institutions
8	Jane Street between West 4th Street and Greenwich Avenue	Residential
9	West 11th Street between West 4th Street and Waverly Place	Public Facilities and Institutions
10	Perry Street between Seventh and Greenwich Avenues	Residential
11	Sixth Avenue between West 12th and West 11th Streets	Residential and Retail
12	West 13th Street between Seventh and Sixth Avenues	Public Facilities and Institutions
A	Seventh Avenue between West 13th and West 12th Streets	Residential and Retail
B	Seventh Avenue between West 14th and West 13th Streets	Residential and Retail
C	Seventh Avenue between West 15th and West 14th Streets	Residential and Retail
D	Corner of West 11th Street and Greenwich Avenue	Residential and Retail
E	Seventh Avenue between West 11th and Perry Streets	Residential and Retail
F	Seventh Avenue between Perry and Charles Streets	Residential and Retail
G	Corner of Charles Street and Seventh Avenue	Residential and Retail
H	West 12th Street between Seventh and Sixth Avenues	Residential and Retail
I	West 12th Street between Seventh and Sixth Avenues	Residential
J	West 12th Street between Seventh and Sixth Avenues	Residential and Retail
K	West 12th Street between Greenwich and Seventh Avenues	Residential and Retail
L	Greenwich Avenue between Jane and West 12th Streets	Residential and Retail
M	Greenwich Avenue between Horatio and Jane Streets	Residential and Retail
N	Corner of Greenwich Avenue and West 13th Street	Transportation and Utilities
O	West 13th Street between Greenwich and Seventh Avenues	Residential
P	Corner of West 13th Street and Seventh Avenue	Church
Q	West 13th Street between Seventh and Sixth Avenues	Residential
R	Corner of Sixth Avenue and West 13th Street	Residential and Retail
S	Corner of Sixth Avenue and West 12th Street	Residential and Retail
T	Sixth Avenue between West 12th and West 11th Streets	Residential and Retail
U	Sixth Avenue between West 11th and West 10th Streets	Residential
V	Sixth Avenue between West 10th and West 9th Streets	Residential and Retail
W	West 11th Street between Greenwich and Sixth Avenues	Public School (P.S. 41)
X	West 11th Street between Greenwich and Sixth Avenues	Residential
Y	Greenwich Ave. between West 10th and Christopher Streets	Residential and Open Space
Z	Greenwich Avenue between Charles and West 10th Streets	Residential and Open Space
AA	Greenwich Avenue between Perry and Charles Streets	Residential and Retail
BB	Greenwich Avenue between West 11th and Perry Streets	Residential and Retail
CC	Greenwich Avenue between West 12th and Bank Streets	Residential and Retail
DD	Jane Street between West 4th Street and Greenwich Avenue	Residential and Retail
EE	West 12th St. between West 4th Street and Greenwich Ave.	Residential
FF	Bank Street between Waverly Place and Greenwich Avenue	Residential and Retail

Note: Receptor sites from 1 through 12 are noise monitoring locations.

Table 20-15a
Additional Construction Noise Receptor Locations

Receptor	Location	Associated Land Use
A1	Sidewalk on 7th Ave. between Greenwich Ave. and W. 12th Street	Open Space
I1	151-171 West 12th Street	Residential & Institution
I2	133-149 West 12th Street Seventh	Residential
I3	127-129 West 12th Street	Residential
I4	125 West 12th Street	Residential
I5	115 West 12th Street	Residential
I6	130 West 12th Street	Residential (under construction)
I7	114-120 West 12th Street	Residential
I8	100 West 12th Street	Residential with Commercial below
I9	Rear façade on 130 West 12th Street	Residential (under construction)
I9a	West façade on 130 West 12th Street	Residential (under construction)
I10	Rear façades on 114-120 West 12th Street	Residential
I11	Rear façade on 100 West 12th Street	Residential with Commercial below
X1	160 West 11th Street	Residential with Commercial below
X2	140-158 West 11th Street	Residential
X3	126-138 West 11th Street	Residential
X4	114 West 11th Street	School
X7	129-131 West 11th Street	Residential
X8	125-127 West 11th Street	Residential
X9	121-123 West 11th Street	Residential with Commercial below
X10	117-119 West 11th Street	Residential with Commercial below
X11	Rear façades on 125-131 West 11th Street	Residential
X12	Rear façades on 117-123 West 11th Street	Residential
X13	Rear façade on 111-115 West 11th Street	Residential
K1	East façade on 219-229 West 12th Street	Residential and Retail

CONSTRUCTION NOISE ANALYSIS RESULTS

Cumulative Analysis

Using the methodology described above, and considering the noise abatement measures for source and path controls specified above, cumulative noise analyses were performed to determine maximum one-hour equivalent ($L_{eq(1)}$) noise levels that would be expected to occur between the hours of 8AM and 6 PM during each year of construction. The results shown below reflect some refinements (i.e., eliminating hoists on West 12 Street adjacent the O'Toole Building, relocating the large tower crane on Seven Avenue, and lowing construction traffic volumes on West 11th and 12th Streets) that were made subsequent to the DEIS in terms of equipment usage and placement.

Weekday Results

Table 20-16 shows the following (see **Appendix D-4-3** for the complete list of results for details) for the initial 32 noise receptor locations due to construction on June 2012, January 2013, July 2013, January 2014, July 2014, and January 2015, based upon looking at only one worst-case construction month during each of the three years of construction:

- No Build noise levels;

- Maximum predicted total noise levels (i.e., cumulative noise levels), which are the sum of noise due to construction activities[5] and noise due to traffic on the adjacent street; and
- Maximum predicted increases in noise levels based upon comparing the total noise levels with No Build noise levels.

Table 20-16
Construction Noise Analysis Results for Weekday in dBA

Noise Receptor	Receptor Height (in stories)	2012-June			2013-July			2014-July		
		No Build Leq(1)	Total Leq(1)	Change	No Build Leq(1)	Total Leq(1)	Change	No Build Leq(1)	Total Leq(1)	Change
A	at-grade	71.3	71.5	0.2	71.4	71.5	0.1	71.4	71.7	0.3
	top floor	66.1	67.1	1.0	65.9	66.8	0.9	65.9	68.6	2.7
B	at-grade	69.9	70.0	0.1	69.9	70.1	0.2	69.9	70.0	0.1
	top floor	64.6	65.6	1.0	64.6	66.5	1.9	64.6	65.0	0.4
C	at-grade	73.1	73.1	0.0	73.2	73.2	0.0	73.2	73.2	0.0
	top floor	67.7	67.7	0.0	67.7	67.8	0.1	67.7	68.2	0.5
D	at-grade	74.3	74.5	0.2	74.4	74.8	0.4	74.4	74.7	0.3
	top floor	73.5	74.5	1.0	73.8	75.9	2.1	73.5	74.7	1.2
E	at-grade	73.1	73.2	0.1	72.1	72.3	0.2	71.9	72.1	0.2
	top floor	73.1	73.3	0.2	72.0	72.6	0.6	71.4	71.9	0.5
F	at-grade	71.3	71.4	0.1	71.3	71.5	0.2	71.3	71.5	0.2
	top floor	69.5	69.8	0.3	69.6	70.0	0.4	69.4	69.8	0.4
G	at-grade	73.1	73.2	0.1	73.1	73.2	0.1	73.1	73.2	0.1
	top floor	71.7	71.8	0.1	71.6	71.7	0.1	71.6	71.7	0.1
H	at-grade	65.0	65.8	0.8	65.1	66.3	1.2	65.1	65.6	0.5
	top floor	60.5	64.7	4.2	60.5	66.0	**5.5**	60.2	65.1	**4.9**
I	at-grade	64.6	67.3	2.7	64.6	70.3	**5.7**	64.6	66.2	1.6
	top floor	60.8	75.5	**14.7**	60.8	80.0	**19.2**	60.8	73.2	**12.4**
J	at-grade	67.7	70.6	2.9	67.8	69.7	1.9	67.8	68.8	1.0
	10	63.7	72.3	**8.6**	63.5	71.9	**8.4**	63.5	68.3	**4.8**
K	at-grade	66.6	68.7	2.1	66.7	69.5	2.8	66.7	69.8	**3.1**
	top floor	67.1	72.2	**5.1**	67.5	73.6	**6.1**	67.4	72.1	**4.7**
L	at-grade	64.8	65.0	0.2	64.9	65.3	0.4	64.9	65.9	1.0
	top floor	63.0	63.5	0.5	63.1	64.2	1.1	63.1	65.9	2.8
M	at-grade	62.7	62.8	0.1	62.8	62.9	0.1	62.8	63.5	0.7
	15	55.4	58.3	2.9	57.2	60.8	3.6	56.6	62.1	**5.5**
N	at-grade	67.7	67.8	0.1	67.7	67.8	0.1	67.7	67.7	0.0
	top floor	65.8	66.0	0.2	66.0	66.3	0.3	65.9	66.1	0.2
O	at-grade	63.9	64.7	0.8	63.9	65.2	1.3	63.9	64.0	0.1
	top floor	61.8	65.1	**3.3**	61.8	66.6	**4.8**	61.8	62.0	0.2
P	at-grade	67.4	68.0	0.6	67.4	68.5	1.1	67.4	67.5	0.1
	10	55.8	58.2	2.4	56.0	58.4	2.4	55.1	58.8	**3.7**
Q	at-grade	64.2	64.4	0.2	64.2	64.5	0.3	64.2	64.3	0.1
	top floor	57.6	61.2	**3.6**	57.4	65.4	**8.0**	57.4	62.9	**5.5**
R	at-grade	70.9	71.0	0.1	70.9	71.0	0.1	70.9	71.0	0.1
	top floor	63.3	63.6	0.3	63.3	63.8	0.5	63.3	63.5	0.2
S	at-grade	70.7	70.9	0.2	70.7	70.9	0.2	70.7	70.8	0.1
	top floor	64.8	65.7	0.9	64.9	66.3	1.4	64.7	65.9	1.2
T	at-grade	68.8	68.9	0.1	68.8	68.9	0.1	68.8	69.0	0.2
	top floor	66.3	66.6	0.3	66.3	66.8	0.5	66.3	66.8	0.5

[5] The maximum predicted noise level due to construction activities alone includes the noise generated by on-site construction activities, assuming maximum construction activity during the analysis time period, and noise generated by construction vehicles traveling to and from the project site during the hour which generated the maximum number of construction vehicles.

Table 20-16 (cont'd)
Construction Noise Analysis Results for Weekday in dBA

Noise Receptor	Receptor Height (in stories)	2012-June			2013-July			2014-July		
		No Build Leq(1)	Total Leq(1)	Change	No Build Leq(1)	Total Leq(1)	Change	No Build Leq(1)	Total Leq(1)	Change
U	at-grade	69.0	69.0	0.0	69.0	69.1	0.1	69.0	69.1	0.1
	top floor	67.5	67.6	0.1	67.5	67.8	0.3	67.5	67.8	0.3
V	at-grade	68.2	68.2	0.0	68.2	68.2	0.0	68.2	68.2	0.0
	top floor	64.4	64.5	0.1	64.5	64.8	0.3	64.4	64.8	0.4
W	at-grade	66.6	66.7	0.1	66.7	67.3	0.6	66.7	66.9	0.2
	top floor	67.5	67.9	0.4	67.6	69.3	1.7	67.6	68.0	0.4
X	at-grade	61.7	63.5	**1.8**	61.7	70.6	**8.9**	61.7	62.7	1.0
	top floor	60.0	70.7	**10.7**	62.6	79.2	**16.6**	60.1	62.9	2.8
Y	at-grade	66.2	66.3	0.1	66.3	66.4	0.1	66.3	66.5	0.2
	top floor	63.6	64.0	0.4	64.1	64.7	0.6	64.0	64.8	0.8
Z	at-grade	62.4	62.6	0.2	63.0	63.6	0.6	62.8	63.5	0.7
	top floor	59.3	60.4	1.1	61.9	63.7	1.8	61.0	62.9	1.9
AA	at-grade	64.9	64.9	0.0	66.2	66.3	0.1	65.8	66.3	0.5
	top floor	63.4	64.1	0.7	66.8	67.7	0.9	65.9	67.0	1.1
BB	at-grade	65.8	65.9	0.1	73.8	73.8	0.0	72.9	73.1	0.2
	top floor	65.4	66.4	1.0	75.7	76.0	0.3	73.4	73.8	0.4
CC	at-grade	65.8	66.1	0.3	66.0	66.5	0.5	66.0	67.5	1.5
	top floor	64.1	65.7	1.6	64.5	67.6	**3.1**	64.4	72.1	**7.7**
DD	at-grade	61.6	61.6	0.0	61.6	61.6	0.0	61.6	61.6	0.0
	top floor	57.7	60.0	2.3	57.9	62.1	4.2	57.7	59.9	2.2
EE	at-grade	65.9	65.9	0.0	65.9	65.9	0.0	65.9	65.9	0.0
	top floor	61.7	62.2	0.5	61.7	62.5	0.8	61.7	62.7	1.0
FF	at-grade	62.3	62.6	0.3	62.3	62.6	0.3	62.3	64.4	2.1
	top floor	61.9	62.4	0.5	61.9	62.7	0.8	61.9	68.6	**6.7**

Note: Locations where predicted noise levels exceed the CEQR impact criteria are shown in bold.

Representative elevated receptor information is provided in **Table 20-16** for each of the 32 receptor location buildings. However, construction effects have been analyzed for a large number of elevated receptor locations on each building, and the values shown are only the ground level noise levels and the highest noise levels on each building at an elevated location. (Additional details of the construction analysis are presented in **Appendix D-4-3**). In addition to the predicted noise levels at receptor sites, noise contours depicting the incremental noise due to construction activities (both on-site construction equipment operation and construction-related traffic) were developed for the area surrounding the project area and are presented in **Appendix D-4-4**.

In **Table 20-16**, locations where construction activities would result in noise levels that would exceed the CEQR impact criteria (i.e., increase by more than 3-5 dBA comparing the total noise level with No Build noise level) are shown in bold. The noise analysis results show that predicted noise levels would exceed the 3-5 dBA CEQR impact criteria during two or more consecutive years at receptor sites I, J, K, O, Q, and X. At these locations, the exceedance of the 3-5 dBA CEQR impact criteria would be due principally to noise generated by on-site construction activities (rather than construction related traffic). Where these exceedances are predicted to occur at elevated receptors, exceedances would also be expected at other locations on the same buildings and nearby sensitive receptors/buildings that have a direct line-of-sight to one or more construction sites.

At receptor sites I, J, K, O, Q, and X identified as having significant adverse impacts, an additional analysis was performed to examine whether the significant noise level increases would occur continually for at least two or more consecutive years. Specifically, the additional analysis examined the maximum predicted incremental noise levels during other time periods within the two or more years when exceedances of the 3-5 dBA impact criteria were predicted to occur at receptor sites I, J, K, O, Q, and X to determine whether these exceedances would occur for two or more consecutive years. The additional analysis showed that the exceedances of the 3-5 dBA impact criteria for two or more years would not occur continuously at sites O and Q. (The results for these additional time periods are shown in **Appendix D-4-3**.)

Based upon the results of this refined analysis, significant impacts were predicted to occur at sensitive receptor sites adjacent to Sites I and J on West 12th Street between Sixth and Seventh Avenues, at sensitive receptor sites adjacent to Site X on West 11th Street between Sixth and Seventh Avenues, and at Site K on the south façade of 221 West 12th Street. As described previously, in order to better define the extent of the impacts additional receptor sites were placed at locations on West 11th and West 12 Streets between Sixth and Seventh Avenues. **Table 20-16a** shows the results of this refined analysis for these receptor locations (see **Appendix D-4-3a and Appendix D-4-3b** for the complete list of results for details).

The results indicate that for weekday time periods, significant noise impacts are predicted to occur at the following residential locations (see also **Figure 20-6**):

- On the north side of West 12th Street between Sixth and Seventh Avenues, at various locations on the front façades of the residential buildings located at 127 West 12th Street through 179 West 12th Street (Receptors J, I1, I2, and I3), including terrace locations at 179 West 12th Street (Receptor J);
- At various locations on the rear and west façades of the residential building located at 130 West 12th Street (I9 and I9a);
- On south side of West 11th Street between Sixth and Seventh Avenues, at various locations on the front façades of the residential buildings located at 128 West 11th Street through 158 160 West 11th Street (Receptors X1, X and X2, and X3);
- On the north side of West 11th Street between Sixth and Seventh Avenues, at various locations on the front façades of the residential buildings located at 121 West 11th Street through 131 West 12th Street (Receptors X7, X8, and X9), as well as various locations on the rear façade of the residential buildings at 117 West 11th Street through 131 West 11th Street (Receptors X11 and X12); and
- At various locations on the south façade(s) facing the proposed projects of the residential buildings located at 219 West 12th Street through 229 West 12th Street (Receptors K); and
- At the fifth and sixth floor (there are only two windows on this facade) on the west façade of the residential building located at 219 West 12th Street through 229 West 12th Street (Receptors K1).

For impact determination purposes, the significance of adverse noise impacts is based on whether predicted incremental noise levels at sensitive receptor locations would be greater than the impact criteria suggested in the *CEQR Technical Manual* for two consecutive years or more. While increases exceeding the CEQR impact criteria for less than two years may be noisy and intrusive, they are not considered to be significant adverse noise impacts because of their limited duration, and they are typical of construction activities throughout New York City.

Construction activities at the other receptor sites in the study area would at times produce noise levels that would be noisy and intrusive, but due to their limited duration would not result in significant adverse noise impacts.

Figure 20-6
Noise Impact Locations

Table 20-16
Construction Noise Analysis Results for Weekday in dBA

Receptor Site	Receptor Height (in stories)	2012-June			2013-January			2013-July			2014-January			2014-July			2015-January		
		No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	Change	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change
A	at-grade	71.3	71.5	0.2	71.3	71.8	0.5	71.4	71.5	0.1	71.4	71.7	0.3	71.4	71.7	0.3	71.4	71.6	0.2
	top floor	66.1	67.1	1.0	66.1	67.9	1.8	65.9	66.8	0.9	65.9	68.2	2.3	65.9	68.6	2.7	65.9	67.1	1.2
B	at-grade	69.9	70.0	0.1	69.9	70.0	0.1	69.9	70.1	0.2	69.9	70.0	0.1	69.9	70.0	0.1	69.9	70.0	0.1
	top floor	64.6	65.6	1.0	64.6	65.2	0.6	64.6	66.5	1.9	64.6	65.8	1.2	64.6	65.0	0.4	64.6	64.8	0.2
C	at-grade	73.1	73.1	0.0	73.1	73.1	0.0	73.2	73.2	0.0	73.2	73.2	0.0	73.2	73.2	0.0	73.2	73.2	0.0
	top floor	67.7	67.7	0.0	67.7	67.8	0.1	67.7	67.8	0.1	67.7	68.1	0.4	67.7	68.2	0.5	67.7	67.7	0.0
D	at-grade	74.3	74.5	0.2	74.3	74.5	0.2	74.4	74.8	0.4	74.4	74.7	0.3	74.4	74.7	0.3	74.4	74.6	0.2
	top floor	73.5	74.5	1.0	73.5	74.4	0.9	73.8	75.9	2.1	73.8	74.7	0.9	73.5	74.7	1.2	73.5	74.1	0.6
E	at-grade	73.1	73.2	0.1	73.1	73.2	0.1	72.1	72.3	0.2	72.1	72.4	0.3	71.9	72.1	0.2	71.9	72.0	0.1
	top floor	73.1	73.3	0.2	73.1	73.3	0.2	72.0	72.6	0.6	72.0	72.6	0.6	71.4	71.9	0.5	71.4	71.5	0.1
F	at-grade	71.3	71.4	0.1	71.3	71.4	0.1	71.3	71.5	0.2	71.3	71.5	0.2	71.3	71.5	0.2	71.3	71.4	0.1
	top floor	69.5	69.8	0.3	69.5	69.8	0.3	69.6	70.0	0.4	69.6	70.3	0.7	69.4	69.8	0.4	69.4	69.5	0.1
G	at-grade	73.1	73.2	0.1	73.1	73.2	0.1	73.1	73.2	0.1	73.1	73.2	0.1	73.1	73.2	0.1	73.1	73.2	0.1
	top floor	71.7	71.8	0.1	71.7	71.9	0.2	71.6	71.7	0.1	71.6	71.7	0.1	71.6	71.7	0.1	71.6	71.7	0.1
H	at-grade	65.0	65.8	0.8	65.0	65.6	0.6	65.1	66.3	1.2	65.1	66.3	1.2	65.1	65.6	0.5	65.1	65.3	0.2
	top floor	60.5	64.7	4.2	60.5	63.6	**3.1**	60.5	66.0	**5.5**	60.5	68.4	**7.9**	60.2	65.1	**4.9**	60.2	60.7	0.5
I*	at-grade	64.6	67.3	2.7	64.6	66.9	2.3	64.6	70.3	**5.7**	64.6	69.0	**4.4**	64.6	66.2	1.6	64.6	64.9	0.3
	top floor	60.8	75.5	**14.7**	60.8	73.3	**12.5**	60.8	80.0	**19.2**	60.8	77.7	**16.9**	60.8	73.2	**12.4**	60.8	62.0	1.2
J*	at-grade	67.7	70.6	2.9	67.7	70.8	**3.1**	67.8	69.7	1.9	67.8	69.4	**1.6**	67.8	68.8	1.0	67.8	68.5	0.7
	10th floor	63.7	72.3	**8.6**	63.7	72.9	**9.2**	63.5	71.9	**8.4**	63.5	71.0	**7.5**	63.5	68.3	**4.8**	63.5	66.9	**3.4**
K*	at-grade	66.6	68.7	2.1	66.6	68.8	2.2	66.7	69.5	2.8	66.7	69.3	2.6	66.7	69.8	**3.1**	66.7	69.6	2.9
	top floor	67.1	72.2	**5.1**	67.1	72.3	**5.2**	67.5	73.6	**6.1**	67.5	73.2	**5.7**	67.4	72.1	**4.7**	67.4	71.9	**4.5**
L	at-grade	64.8	65.0	0.2	64.8	65.0	0.2	64.9	65.3	0.4	64.9	65.3	0.4	64.9	65.9	1.0	64.9	65.7	0.8
	top floor	63.0	63.5	0.5	63.0	63.7	0.7	63.1	64.2	1.1	63.1	64.3	1.2	63.1	65.9	2.8	63.1	65.4	2.3
M	at-grade	62.7	62.8	0.1	62.7	62.8	0.1	62.8	62.9	0.1	62.8	63.0	0.2	62.8	63.5	0.7	62.8	63.3	0.5
	15th floor	55.4	58.3	2.9	55.4	58.2	2.8	57.2	60.8	3.6	57.2	61.1	3.9	56.6	62.1	**5.5**	56.6	60.7	4.1
N	at-grade	67.7	67.8	0.1	67.7	67.7	0.0	67.7	67.8	0.1	67.7	67.8	0.1	67.7	67.7	0.0	67.7	67.7	0.0
	top floor	65.8	66.0	0.2	65.8	65.9	0.1	66.0	66.3	0.3	66.0	66.3	0.3	65.9	66.1	0.2	65.9	66.0	0.1
O	at-grade	63.9	64.7	0.8	63.9	64.1	0.2	63.9	65.2	1.3	63.9	64.9	1.0	63.9	64.0	0.1	63.9	64.0	0.1
	top floor	61.8	65.1	**3.3**	61.8	62.1	0.3	61.8	66.6	**4.8**	61.8	65.6	**3.8**	61.8	62.0	0.2	61.8	61.9	0.1
P	at-grade	67.4	68.0	0.6	67.4	67.6	0.2	67.4	68.5	1.1	67.4	68.0	0.6	67.4	67.5	0.1	67.4	67.5	0.1
	10th floor	55.8	58.2	2.4	55.8	58.0	2.2	56.0	58.4	2.4	56.0	61.9	**5.9**	55.1	58.8	**3.7**	55.1	55.5	0.4
Q	at-grade	64.2	64.4	0.2	64.2	64.3	0.1	64.2	64.5	0.3	64.2	64.5	0.3	64.2	64.3	0.1	64.2	64.2	0.0
	top floor	57.6	61.2	**3.6**	57.6	60.3	2.7	57.4	65.4	**8.0**	57.4	66.5	**9.1**	57.4	62.9	**5.5**	57.4	58.5	1.1
R	at-grade	70.9	71.0	0.1	70.9	71.0	0.1	70.9	71.0	0.1	70.9	71.0	0.1	70.9	71.0	0.1	70.9	71.0	0.1
	top floor	63.3	63.6	0.3	63.3	63.5	0.2	63.3	63.8	0.5	63.3	63.6	0.3	63.3	63.5	0.2	63.3	63.5	0.2
S	at-grade	70.7	70.9	0.2	70.7	70.9	0.2	70.7	70.9	0.2	70.7	70.9	0.2	70.7	70.8	0.1	70.7	70.8	0.1
	top floor	64.8	65.7	0.9	64.8	65.5	0.7	64.9	66.3	1.4	64.9	67.0	2.1	64.7	65.9	1.2	64.7	64.9	0.2
T	at-grade	68.8	68.9	0.1	68.8	68.9	0.1	68.8	68.9	0.1	68.8	68.9	0.1	68.8	69.0	0.2	68.8	68.9	0.1
	top floor	66.3	66.6	0.3	66.3	66.5	0.2	66.3	66.8	0.5	66.3	66.9	0.6	66.3	66.8	0.5	66.3	66.5	0.2

Table 20-16 (cont'd)
Construction Noise Analysis Results for Weekday in dBA

Receptor Site	Receptor Height (in stories)	2012-June			2013-January			2013-July			2014-January			2014-July			2015-January		
		No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	Change	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change
U	at-grade	69.0	69.0	0.0	69.0	69.0	0.0	69.0	69.1	0.1	69.0	69.1	0.1	69.0	69.1	0.1	69.0	69.0	0.0
	top floor	67.5	67.6	0.1	67.5	67.6	0.1	67.5	67.8	0.3	67.5	68.0	0.5	67.5	67.8	0.3	67.5	67.5	0.0
V	at-grade	68.2	68.2	0.0	68.2	68.2	0.0	68.2	68.2	0.0	68.2	68.3	0.1	68.2	68.2	0.0	68.2	68.2	0.0
	top floor	64.4	64.5	0.1	64.4	64.5	0.1	64.5	64.8	0.3	64.5	65.6	1.1	64.4	64.8	0.4	64.4	64.4	0.0
W	at-grade	66.6	66.7	0.1	66.6	66.7	0.1	66.7	67.3	0.6	66.7	66.9	0.2	66.7	66.9	0.2	66.7	66.9	0.2
	top floor	67.5	67.9	0.4	67.5	67.9	0.4	67.6	69.3	1.7	67.6	68.6	1.0	67.6	68.0	0.4	67.6	68.0	0.4
X*	at-grade	61.7	63.5	**1.8**	61.7	63.0	1.3	61.7	70.6	**8.9**	61.7	65.0	**3.3**	61.7	62.7	1.0	61.7	63.6	1.9
	top floor	60.0	70.7	**10.7**	60.0	69.2	**9.2**	62.6	79.2	**16.6**	62.6	69.0	**6.4**	60.1	62.9	2.8	60.1	68.6	**8.5**
Y	at-grade	66.2	66.3	0.1	66.2	66.3	0.1	66.3	66.4	0.1	66.3	66.5	0.2	66.3	66.5	0.2	66.3	66.4	0.1
	top floor	63.6	64.0	0.4	63.6	64.0	0.4	64.1	64.7	0.6	64.1	65.7	1.6	64.0	64.8	0.8	64.0	64.1	0.1
Z	at-grade	62.4	62.6	0.2	62.4	62.5	0.1	63.0	63.6	0.6	63.0	64.2	1.2	62.8	63.5	0.7	62.8	62.9	0.1
	top floor	59.3	60.4	1.1	59.3	60.3	1.0	61.9	63.7	1.8	61.9	66.0	**4.1**	61.0	62.9	1.9	61.0	61.4	0.4
AA	at-grade	64.9	64.9	0.0	64.9	64.9	0.0	66.2	66.3	0.1	66.2	66.8	0.6	65.8	66.3	0.5	65.8	65.9	0.1
	top floor	63.4	64.1	0.7	63.4	64.0	0.6	66.8	67.7	0.9	66.8	68.6	1.8	65.9	67.0	1.1	65.9	66.2	0.3
BB	at-grade	65.8	65.9	0.1	65.8	65.9	0.1	73.8	73.8	0.0	73.8	74.0	0.2	72.9	73.1	0.2	72.9	72.9	0.0
	top floor	65.4	66.4	1.0	65.4	66.3	0.9	75.7	76.0	0.3	75.7	76.1	0.4	73.4	73.8	0.4	73.4	73.6	0.2
CC	at-grade	65.8	66.1	0.3	65.8	66.1	0.3	66.0	66.5	0.5	66.0	66.6	0.6	66.0	67.5	1.5	66.0	67.2	1.2
	top floor	64.1	65.7	1.6	64.1	65.8	1.7	64.5	67.6	**3.1**	64.5	66.7	2.2	64.4	72.1	**7.7**	64.4	71.8	**7.4**
DD	at-grade	61.6	61.6	0.0	61.6	61.6	0.0	61.6	61.6	0.0	61.6	61.6	0.0	61.6	61.6	0.0	61.6	61.6	0.0
	top floor	57.7	60.0	2.3	57.7	60.4	2.7	57.9	62.1	4.2	57.9	61.3	3.4	57.7	59.9	2.2	57.7	58.3	0.6
EE	at-grade	65.9	65.9	0.0	65.9	65.9	0.0	65.9	65.9	0.0	65.9	65.9	0.0	65.9	65.9	0.0	65.9	65.9	0.0
	top floor	61.7	62.2	0.5	61.7	62.1	0.4	61.7	62.5	0.8	61.7	63.1	1.4	61.7	62.7	1.0	61.7	61.8	0.1
FF	at-grade	62.3	62.6	0.3	62.3	62.6	0.3	62.3	62.6	0.3	62.3	62.6	0.3	62.3	64.4	2.1	62.3	64.2	1.9
	top floor	61.9	62.4	0.5	61.9	62.6	0.7	61.9	62.7	0.8	61.9	62.5	0.6	61.9	68.6	**6.7**	61.9	68.2	**6.3**

Note: Locations where predicted noise levels exceed the CEQR impact criteria are shown in bold.
* Receptors where noise impacts would occur.

Table 20-16a
Construction Noise Analysis Results for Weekday in dBA

Recept or Site	Receptor Height (in stories)	2012-June			2013-January			2013-July			2014-January			2014-July			2015-January		
		No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	Change	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change
A1	at-grade	72.5	73.0	0.5	72.5	73.0	0.5	72.6	73.0	0.4	72.6	73.2	0.6	72.4	74.3	1.9	72.4	74.0	1.6
	at-grade	67.1	68.0	0.9	67.1	67.9	0.8	67.2	69.3	2.1	67.2	68.4	1.2	67.2	67.7	0.5	67.2	67.4	0.2
X1	top floor	67.7	70.9	**3.2**	67.7	70.7	**3.0**	67.7	73.5	**5.8**	67.7	69.7	2.0	67.7	68.6	0.9	67.7	68.2	0.5
	at-grade	63.2	65.0	1.8	63.2	64.8	1.6	63.3	69.6	**6.3**	63.3	65.7	2.4	63.3	64.3	1.0	63.3	64.1	0.8
X2*	top floor	62.6	68.5	**5.9**	62.6	68.4	**5.8**	62.7	73.8	**11.1**	62.7	67.3	**4.6**	62.7	64.3	1.6	62.7	64.9	2.2
	at-grade	62.5	63.1	0.6	62.5	63.1	0.6	62.5	66.2	**3.7**	62.5	63.7	1.2	62.5	63.1	0.6	62.5	63.8	1.3
X3	top floor	59.3	63.4	4.1	59.3	63.0	3.7	59.4	74.0	**14.6**	59.4	68.2	**8.8**	59.3	62.2	2.9	59.3	69.1	**9.8**
	at-grade	62.8	63.3	0.5	62.8	63.2	0.4	62.8	65.6	2.8	62.8	63.7	0.9	62.8	63.4	0.6	62.8	63.8	1.0
X4	top floor	62.7	63.7	1.0	62.7	63.7	1.0	62.7	66.8	**4.1**	62.7	64.4	1.7	62.7	63.5	0.8	62.7	64.3	1.6
	at-grade	63.5	64.0	0.5	63.5	64.0	0.5	63.6	66.0	2.4	63.6	64.2	0.6	63.6	64.0	0.4	63.6	64.2	0.6
X5	top floor	63.4	64.5	1.1	63.4	64.4	1.0	63.6	67.4	**3.8**	63.6	64.8	1.2	63.5	64.2	0.7	63.5	64.5	1.0
	at-grade	64.6	64.9	0.3	64.6	64.8	0.2	64.6	66.2	1.6	64.6	65.2	0.6	64.6	65.0	0.4	64.6	65.0	0.4
X6	top floor	64.6	65.2	0.6	64.6	65.2	0.6	64.6	67.2	2.6	64.6	65.8	1.2	64.6	65.2	0.6	64.6	65.2	0.6
	at-grade	61.8	62.2	0.4	61.8	62.0	0.2	61.9	66.8	**4.9**	61.9	62.4	0.5	61.9	62.2	0.3	61.9	64.5	2.6
X7	top floor	60.9	61.7	0.8	60.9	61.5	0.6	61.8	70.9	**9.1**	61.8	62.5	0.7	61.0	61.6	0.6	61.0	70.3	**9.3**
	at-grade	62.6	63.2	0.6	62.6	63.1	0.5	62.7	66.4	**3.7**	62.7	63.1	0.4	62.6	62.9	0.3	62.6	64.1	1.5
X8	top floor	61.8	62.3	0.5	61.8	62.2	0.4	62.2	69.5	**7.3**	62.2	62.8	0.6	61.8	62.4	0.6	61.8	67.4	**5.6**
	at-grade	63.1	63.6	0.5	63.1	63.5	0.4	63.2	66.0	2.8	63.2	63.5	0.3	63.2	63.4	0.2	63.2	64.2	1.0
X9	top floor	62.5	63.0	0.5	62.5	62.9	0.4	62.7	68.7	**6.0**	62.7	63.7	1.0	62.6	63.0	0.4	62.6	66.3	**3.7**
	at-grade	64.1	64.4	0.3	64.1	64.3	0.2	64.1	66.0	1.9	64.1	64.3	0.2	64.1	64.3	0.2	64.1	64.7	0.6
X10	top floor	63.9	64.2	0.3	63.9	64.1	0.2	63.9	68.0	**4.1**	63.9	65.7	1.8	63.8	64.5	0.7	63.8	65.6	1.8
	at-grade	54.6	59.3	4.7	54.6	55.4	0.8	54.7	61.8	**7.1**	54.7	61.4	**6.7**	54.7	61.0	**6.3**	54.7	60.9	**6.2**
X11*	top floor	57.8	72.4	**14.6**	57.8	60.4	2.6	57.9	74.5	**16.6**	57.9	68.0	**10.1**	57.9	71.9	**14.0**	57.9	71.8	**13.9**
	at-grade	54.6	56.9	2.3	54.6	55.2	0.6	54.7	58.2	3.5	54.7	57.5	2.8	54.7	57.9	3.2	54.7	57.8	3.1
X12*	top floor	60.7	65.9	**5.2**	60.7	61.6	0.9	60.8	66.8	**6.0**	60.8	65.4	**4.6**	60.8	67.2	**6.4**	60.8	67.1	**6.3**
	at-grade	54.6	56.4	1.8	54.6	55.8	1.2	54.7	59.5	4.8	54.7	59.7	**5.0**	54.7	58.6	3.9	54.7	57.5	2.8
X13	3	56.2	60.3	4.1	56.2	59.8	3.6	56.3	63.6	**7.3**	56.3	63.3	**7.0**	56.3	62.6	**6.3**	56.3	61.0	4.7
	at-grade	64.8	69.1	**4.3**	64.8	69.0	**4.2**	64.8	69.7	**4.9**	64.8	67.7	2.9	64.8	65.8	1.0	64.8	65.2	0.4
I1*	top floor	62.0	74.8	**12.8**	62.0	74.6	**12.6**	61.9	75.0	**13.1**	61.9	71.1	**9.2**	61.9	67.2	**5.3**	61.9	63.8	1.9

Table 20-16a (cont'd)
Construction Noise Analysis Results for Weekday in dBA

Recept or Site	Receptor Height (in stories)	2012-June			2013-January			2013-July			2014-January			2014-July			2015-January		
		No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	Change	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change
	at-grade	63.3	65.7	2.4	63.3	64.9	1.6	63.3	67.9	**4.6**	63.3	69.0	5.7	63.3	65.8	2.5	63.3	63.7	0.4
I2*	top floor	58.9	73.7	**14.8**	58.9	67.7	**8.8**	58.8	77.7	**18.9**	58.8	78.8	**20.0**	58.8	73.7	**14.9**	58.8	60.1	1.3
	at-grade	61.6	64.0	2.4	61.6	63.1	1.5	61.6	67.6	**6.0**	61.6	66.1	4.5	61.6	63.2	1.2	61.6	61.9	0.3
I3*	top floor	59.1	69.7	**10.6**	59.1	65.2	**6.1**	59.0	74.0	**15.0**	59.0	73.5	**14.5**	59.0	68.4	**9.4**	59.0	59.7	0.7
	at-grade	62	64.3	2.3	62.0	63.4	1.4	62.0	66.6	**4.6**	62.0	65.7	**3.7**	62.0	63.2	1.2	62.0	62.3	0.3
I4	top floor	59.7	67.5	7.8	59.7	64.7	**5.0**	59.5	70.6	**11.1**	59.5	71.8	**12.3**	59.5	67	**7.5**	59.5	60.2	0.7
	at-grade	62	63.9	1.9	62.0	63.2	1.2	62.1	65.0	2.9	62.1	65.0	2.9	62.1	63.1	1.0	62.1	62.3	0.2
I5	top floor	61	65.6	**4.6**	61.0	63.8	2.8	61.0	67.7	**6.7**	61.0	68.4	**7.4**	61.0	64.3	3.3	61.0	61.5	0.5
	at-grade	60.8	63.2	2.4	60.8	61.6	0.8	60.8	64.4	**3.6**	60.8	66.9	**6.1**	60.8	64.1	3.3	60.8	61.2	0.4
I6	top floor	55.4	60.9	**5.5**	55.4	58.7	3.3	55.4	63.2	**7.8**	55.4	66.8	**11.4**	55.4	62	**6.6**	55.4	56.1	0.7
	at-grade	61	62.6	1.6	61.0	62.0	1.0	61.0	64.5	3.5	61.0	66.5	**5.5**	61.0	63.9	2.9	61.0	61.3	0.3
I7	top floor	59.4	62.8	3.4	59.4	61.9	2.5	59.4	66.5	**7.1**	59.4	70.0	**10.6**	59.4	66.5	**7.1**	59.4	60.0	0.6
	at-grade	63.5	64.6	1.1	63.5	64.4	0.9	63.5	65.4	1.9	63.5	66.0	2.5	63.5	64.6	1.1	63.5	63.7	0.2
I8	top floor	61.9	64.8	2.9	61.9	64.4	2.5	61.9	66.2	**4.3**	61.9	67.4	**5.5**	61.9	64.7	2.8	61.9	62.2	0.3
	at-grade	54.7	60.1	**5.4**	54.7	58.4	3.7	54.7	65.4	**10.7**	54.7	61.4	**6.7**	54.7	62.3	**7.6**	54.7	60.6	5.9
I9*	3	56.6	63.6	**7.0**	56.6	62.4	**5.8**	57.1	69.7	**12.6**	57.1	66.8	**9.7**	56.7	65.7	**9.0**	56.7	63.8	**7.1**
	at-grade	54.7	62.3	**7.6**	54.7	58.8	1.1	54.7	65.5	**10.8**	54.7	60.0	**5.3**	54.7	61.8	**7.1**	54.7	61.4	**6.7**
I9a*	3	56.6	76.3	**19.7**	56.6	65.1	**8.5**	57.1	80.8	**23.7**	57.1	70.0	**12.9**	56.7	78.1	**21.4**	56.7	77.9	**21.2**
	at-grade	54.6	56.0	1.4	54.6	55.3	0.7	54.7	57.7	3.0	54.7	56.4	1.7	54.7	56.5	1.8	54.7	55.6	0.9
I10	3	56.5	57.9	1.4	56.5	57.3	0.8	56.6	59.7	3.1	56.6	59.1	2.5	56.6	59	2.4	56.6	57.7	1.1
	at-grade	54.6	56.7	2.1	54.6	56.3	1.7	54.6	59.4	4.8	54.6	57.8	3.2	54.6	58.7	4.1	54.6	56.9	2.3
I11	3	56.4	59.6	3.2	56.4	59.2	2.8	56.4	62.8	**6.4**	56.4	61.4	**5.0**	56.4	61.6	**5.2**	56.4	59.6	3.2
K1*	Top floor	67.1	70.4	**3.3**	67.1	70.4	**3.3**	67.5	74.9	**7.4**	67.5	74.6	**7.1**	67.4	73.1	**5.7**	67.4	72.8	**5.4**

Note: Locations where predicted noise levels exceed the CEQR impact criteria are shown in bold.
* Receptors where noise impacts would occur.

Saturday Results

Table 20-17 shows the following (see **Appendix D-4-5** for the complete list of results for details) for the initial 32 noise receptor locations due to construction on June 2012, July 2013, January 2014, and May 2014~~, based upon looking at only one worst-case construction month during each of the three years of construction~~:

Table 20-17
Construction Noise Analysis Results for Saturday in dBA

Noise Receptor	Receptor Height (in stories)	2012-June			2013-July			2014-January			2014-May		
		No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change
A	at-grade	68.9	68.9	0.0	68.9	68.9	0.0	68.9	68.9	0.0	68.9	69.0	0.1
	5	67.2	67.3	0.1	67.2	67.5	0.3	67.2	67.3	0.1	67.2	67.4	0.2
B	at-grade	67.4	67.5	0.1	67.4	67.5	0.1	67.4	67.5	0.1	67.4	67.5	0.1
	top floor	62.1	63.2	1.1	62.1	64.3	2.2	62.1	63.4	1.3	62.1	63.5	1.4
C	at-grade	70.5	70.5	0.0	70.5	70.5	0.0	70.5	70.5	0.0	70.5	70.5	0.0
	top floor	65.0	65.0	0.0	65.0	65.0	0.0	65.0	65.0	0.0	65.0	65.0	0.0
D	at-grade	71.6	71.6	0.0	71.6	71.6	0.0	71.6	71.6	0.0	71.6	71.6	0.0
	top floor	69.9	69.9	0.0	69.9	69.9	0.0	69.9	69.9	0.0	69.9	69.9	0.0
E	at-grade	68.8	68.8	0.0	68.8	68.8	0.0	68.8	68.8	0.0	68.8	68.9	0.1
	top floor	67.2	67.2	0.0	67.2	67.3	0.1	67.2	67.3	0.1	67.2	67.3	0.1
F	at-grade	68.8	68.8	0.0	68.8	68.8	0.0	68.8	68.8	0.0	68.8	68.9	0.1
	top floor	66.8	66.9	0.1	66.8	66.8	0.0	66.8	66.8	0.0	66.8	66.9	0.1
G	at-grade	70.7	70.7	0.0	70.7	70.7	0.0	70.7	70.7	0.0	70.7	70.8	0.1
	top floor	69.1	69.1	0.0	69.1	69.1	0.0	69.1	69.1	0.0	69.1	69.2	0.1
H	at-grade	63.0	63.1	0.1	63.0	63.1	0.1	63.0	63.0	0.0	63.0	63.1	0.1
	top floor	58.9	59.2	0.3	58.9	59.4	0.5	58.9	59.0	0.1	58.9	59.1	0.2
I	at-grade	62.8	63.0	0.2	62.8	63.0	0.2	62.8	62.9	0.1	62.8	62.9	0.1
	top floor	59.1	59.6	0.5	59.1	59.8	0.7	59.1	59.3	0.2	59.1	59.3	0.2
J	at-grade	66.2	66.5	0.3	66.2	66.5	0.3	66.2	66.3	0.1	66.2	66.4	0.2
	top floor	60.6	63.9	3.3	60.6	64.7	4.1	60.6	63.1	2.5	60.6	63.1	2.5
K	at-grade	64.7	65.9	1.2	64.7	65.8	1.1	64.7	65.0	0.3	64.7	65.0	0.3
	top floor	64.1	67.9	**3.8**	64.1	67.7	**3.6**	64.1	65.3	1.2	64.1	65.3	1.2
L	at-grade	64.2	64.2	0.0	64.2	64.2	0.0	64.2	64.2	0.0	64.2	64.2	0.0
	top floor	62.5	62.6	0.1	62.5	62.7	0.2	62.5	62.6	0.1	62.5	62.6	0.1
M	at-grade	62.0	62.0	0.0	62.0	62.0	0.0	62.0	62.0	0.0	62.0	62.0	0.0
	15	55.1	55.3	0.2	55.1	55.5	0.4	55.1	55.4	0.3	55.1	55.4	0.3
N	at-grade	67.0	67.0	0.0	67.0	67.1	0.1	67.0	67.1	0.1	67.0	67.1	0.1
	top floor	65.1	65.2	0.1	65.1	65.3	0.2	65.1	65.3	0.2	65.1	65.3	0.2
O	at-grade	61.0	61.6	0.6	61.0	62.8	1.8	61.0	62.6	1.6	61.0	62.6	1.6
	top floor	59.2	61.8	2.6	59.2	65.2	**6.0**	59.2	64.6	**5.4**	59.2	64.6	**5.4**
P	at-grade	65.0	65.5	0.5	65.0	66.3	1.3	65.0	65.9	0.9	65.0	65.9	0.9
	top floor	61.7	63.4	1.7	61.7	65.4	**3.7**	61.7	64.8	**3.1**	61.7	64.8	3.1
Q	at-grade	60.8	60.9	0.1	60.8	61.1	0.3	60.8	61.0	0.2	60.8	61.1	0.3
	top floor	54.4	55.5	1.1	54.4	57.6	3.2	54.4	56.9	2.5	54.4	56.9	2.5
R	at-grade	71.4	71.4	0.0	71.4	71.4	0.0	71.4	71.4	0.0	71.4	71.4	0.0
	top floor	63.9	64.0	0.1	63.9	64.1	0.2	63.9	64.1	0.2	63.9	64.1	0.2
S	at-grade	71.3	71.3	0.0	71.3	71.3	0.0	71.3	71.3	0.0	71.3	71.4	0.1
	top floor	65.3	65.3	0.0	65.3	65.3	0.0	65.3	65.3	0.0	65.3	65.4	0.1
T	at-grade	69.4	69.4	0.0	69.4	69.4	0.0	69.4	69.4	0.0	69.4	69.5	0.1
	top floor	66.9	66.9	0.0	66.9	66.9	0.0	66.9	66.9	0.0	66.9	67.0	0.1

Table 20-17 (cont'd)
Construction Noise Analysis Results for Saturday in dBA

Noise Receptor	Receptor Height (in stories)	2012-June			2013-July			2014-January			2014-May		
		No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change	No Build Leq(1)	Build Leq(1)	Change
U	at-grade	69.7	69.7	0.0	69.7	69.7	0.0	69.7	69.7	0.0	69.7	69.7	0.0
	top floor	68.3	68.3	0.0	68.3	68.3	0.0	68.3	68.3	0.0	68.3	68.3	0.0
V	at-grade	69.0	69.0	0.0	69.0	69.0	0.0	69.0	69.0	0.0	69.0	69.0	0.0
	top floor	65.2	65.2	0.0	65.2	65.2	0.0	65.2	65.2	0.0	65.2	65.2	0.0
W	at-grade	65.4	65.4	0.0	65.4	65.4	0.0	65.4	65.4	0.0	65.4	65.4	0.0
	top floor	66.5	66.5	0.0	66.5	66.5	0.0	66.5	66.5	0.0	66.5	66.5	0.0
X	at-grade	59.8	59.8	0.0	59.8	59.8	0.0	59.8	59.8	0.0	59.8	59.8	0.0
	top floor	58.3	58.4	0.1	58.3	58.4	0.1	58.3	58.3	0.0	58.3	58.3	0.0
Y	at-grade	66.0	66.0	0.0	66.0	66.0	0.0	66.0	66.0	0.0	66.0	66.0	0.0
	top floor	64.1	64.1	0.0	64.1	64.1	0.0	64.1	64.1	0.0	64.1	64.1	0.0
Z	at-grade	61.7	61.7	0.0	61.7	61.7	0.0	61.7	61.7	0.0	61.7	61.7	0.0
	top floor	58.8	58.8	0.0	58.8	58.9	0.1	58.8	58.8	0.0	58.8	58.8	0.0
AA	at-grade	64.2	64.2	0.0	64.2	64.2	0.0	64.2	64.2	0.0	64.2	64.2	0.0
	top floor	62.9	62.9	0.0	62.9	62.9	0.0	62.9	62.9	0.0	62.9	62.9	0.0
BB	at-grade	64.9	64.9	0.0	64.9	64.9	0.0	64.9	64.9	0.0	64.9	64.9	0.0
	top floor	63.9	63.9	0.0	63.9	64.0	0.1	63.9	64.0	0.1	63.9	64.0	0.1
CC	at-grade	65.2	65.3	0.1	65.2	65.2	0.0	65.2	65.2	0.0	65.2	65.2	0.0
	top floor	63.8	64.1	0.3	63.8	64.2	0.4	63.8	63.9	0.1	63.8	64.0	0.2
DD	at-grade	56.9	56.9	0.0	56.9	56.9	0.0	56.9	56.9	0.0	57.2	57.2	0.0
	top floor	53.1	54.9	1.8	53.1	55.0	1.9	53.1	54.0	0.9	53.4	54.2	0.8
EE	at-grade	61.1	61.1	0.0	61.1	61.1	0.0	61.1	61.1	0.0	61.1	61.1	0.0
	5th floor	56.9	57.0	0.1	56.9	57.1	0.2	56.9	57.0	0.1	56.9	57.0	0.1
FF	at-grade	57.6	57.8	0.2	57.6	57.8	0.2	57.6	57.7	0.1	57.6	57.7	0.1
	top floor	56.6	57.3	0.7	56.6	57.3	0.7	56.6	56.9	0.3	56.6	56.9	0.3

Note: Locations where predicted noise levels exceed the CEQR impact criteria are shown in bold.

- No Build noise levels;
- Maximum predicted total noise levels (i.e., cumulative noise levels), which are the sum of noise due to construction activities and noise due to traffic on the adjacent street; and
- Maximum predicted increases in noise levels based upon comparing the total noise levels with No Build noise levels.

Representative elevated receptor information is provided in **Table 20-17** for each of the receptor location buildings. However, construction effects have been analyzed for a large number of elevated receptor locations on each building, and the values shown are only the ground level noise levels and the highest noise levels on each building at an elevated location. (Additional details of the construction analysis are presented in **Appendix D-4-5**).

In addition to the predicted noise levels at receptor sites, noise contours depicting the incremental noise due to construction activities (both on-site construction equipment operation and construction-related traffic) were developed for the area surrounding the project area and are presented in **Appendix D-4-6**.

In **Table 20-17**, locations where construction activities result in noise levels which would exceed the CEQR impact criteria (i.e., increase by more than 3-5 dBA comparing the total noise level with No Build noise level) are shown in bold. The noise analysis results show that predicted noise levels would exceed the 3-5 dBA CEQR impact criteria during two or more consecutive years at receptor site K only, the exceedance of the 3-5 dBA CEQR impact criteria would be due principally to noise generated by on-site construction activities.

At receptor site K and K1 identified as having significant adverse impacts, an additional refined analysis was performed to examine whether the significant noise level increases would occur continually for at least two or more consecutive years. Specifically, the additional analysis examined the maximum predicted incremental noise levels during other time periods within the two or more years when exceedances of the 3-5 dBA impact criteria were predicted to occur at receptor site K to determine whether these exceedances would occur for two or more consecutive years. The additional analysis showed that the exceedances of the 3-5 dBA impact criteria for two or more years would not occur continuously at site K. The results for these additional time periods are shown in **Appendix D-4-5**. In addition, an additional receptor (i.e., Receptor K1) was added on the east façade facing the proposed project site. The additional analysis showed that no more than 3 dBA increases would occur at site K1. The results for the additional noise analysis at site K1 are shown in **Appendix D-4-5a**. Therefore, the construction activities would not result in significant adverse noise impacts during weekends.

Discussion of Cumulative Analysis Results

Based upon window/wall surveys, the buildings at most sensitive receptor locations where the significant noise impacts are predicted to occur, have both double-glazed windows and some form of alternative ventilation (i.e., central air conditioning, packaged terminal air conditioner [PTAC] units, or window air conditioning units). Consequently, depending upon the window attenuation and the type of air conditioning, even during warm weather conditions, interior noise levels would be approximately 25-35 dBA less than exterior noise levels. To maintain an interior $L_{10(1)}$ noise level of 45 dBA (the CEQR acceptable interior noise level criteria), a minimum of 30 dBA window/wall attenuation would be required. At locations on these buildings where significant noise impacts are predicted to occur, absent the development of additional measures to reduce project-related construction noise, the project sponsors would offer to provide storm windows and/or window air conditioning units to mitigate project-related construction noise impacts. With existing building attenuation measures (i.e., double-glazed windows and alternative ventilation) and the alternative ventilation (offered by the project sponsors) interior noise levels during much, if not all, of the time when project construction activities are taking place, would be expected to be below 45 dBA $L_{10(1)}$ (the CEQR acceptable interior noise level criteria).

With regard to the residential terrace locations at Receptor J, $L_{10(1)}$ levels for the No Build condition would be in the mid-60s dBA and the highest Build $L_{10(1)}$ noise levels would be in the mid 70s dBA during some peak periods of construction activity. While noise levels at these terraces already exceed the acceptable CEQR range (55 dBA $L_{10(1)}$ or less) for an outdoor area requiring serenity and quiet, during the daytime analysis periods construction activities are predicted to significantly increase noise levels and would exacerbate these exceedances and result in significant adverse noise impacts. No feasible mitigation measures have been identified that could be implemented to eliminate the significant noise impacts at these terraces.

Noise levels at the open space locations (i.e., Receptors 3, Y, and Z) are currently above the 55 dBA $L_{10(1)}$ *CEQR Technical Manual* noise level for outdoor areas. Proposed construction activities would slightly exacerbate these exceedances, but in each case the increase would be less than 3 dBA and would not be perceptible; average Build $L_{10(1)}$ noise levels would be in the high 60s dBA in these open space locations. These predicted noise levels would result principally from the noise generated by traffic on nearby roadways, and no practical and feasible mitigation measures could be implemented to reduce noise levels to below the 55 dBA $L_{10(1)}$ guideline. However, the noise levels in these locations are already fairly high and are comparable to noise levels in portions of other public open spaces in this area that are also located adjacent to trafficked roadways, including Jackson Square, Corporal John A. Seravalli Playground, and McCarthy Square. Although the 55 dBA $L_{10(1)}$ guideline is a worthwhile goal for outdoor areas requiring serenity and quiet, this relatively low noise level is typically not achieved in parks and open space areas in New York City. Consequently, noise levels in these open space locations, while exceeding the 55 dBA $L_{10(1)}$ CEQR guideline value, would not result in a significant adverse noise impact.

Subsequent to publication of the DEIS, some refinements (i.e., eliminating hoists on West 12 Street adjacent the O'Toole Building, relocating the large tower crane on Seven Avenue, and lowing construction traffic volumes on West 11th and 12th Streets) were made in terms of equipment usage and equipment placement. While these refinements slightly reduced the magnitude of project impacts, they did not eliminate any of the significant noise impacts. There are no practicable and feasible mitigation measures that could be implemented to eliminate the significant construction-related noise impact identified above. With these refinements, significant noise impacts have been eliminated at receptors X1, X3, X7, X8, and X9. At other impacted locations, there are no practicable and feasible mitigation measures that could be implemented to eliminate the significant construction-related noise impact identified above.

In summary, construction activities would result in a significant adverse noise impact at sensitive noise receptors located on sites K, K1, J, I, and X along West 11th and West 12th Streets (i.e., receptor sites K, J, I1, I2, I3, I9, I9a, XX1, X2, X3, X7, X8, X9, X11, and X12). The exceedance of the 3-5 dBA CEQR impact criteria would be due principally to noise generated by the large amount of construction equipment operating on-site for an extended period of time. In addition, while noise levels at the identified terraces exceed the CEQR acceptable range (55 dBA L_{10}) for an outdoor area requiring serenity and quiet, there are no feasible mitigation measures that could be implemented to eliminate the significant noise impacts at these locations and, therefore, a significant noise impact is identified in this EIS as an unmitigated adverse impact.

Traffic Analysis

A traffic noise analysis which examined impacts due to peak construction-related vehicular (autos and trucks) trips, which would occur between the hours of 7 AM and 8 AM, prior to the start of operational construction activities, was performed. Traffic effects were examined at the 12 monitoring sites described above, where the dominant noise source is vehicular traffic. During the peak hour (7 AM – 8 AM) of construction-related vehicular trips, noise from the construction traffic would have the potential for causing significant increases in ambient noise levels. A screening analysis was performed using proportional techniques to determine whether the additional trips would be sufficient to result in a significant noise impact (i.e., the additional trips have the potential to result in a doubling of noise passenger car equivalents [Noise PCEs], which would result in a 3 dBA increase for more than two years) at the 12 monitoring receptor sites. Based upon the screening analysis results, construction-related traffic would not result in a doubling of PCEs at any receptor sites for more than one year. Consequently, no significant construction-related noise impacts are predicted to occur, and a detailed analysis is not needed (see **Appendix D-4-7** for details) The analysis was performed in two parts – first a screening analysis was performed using proportional modeling techniques, and then at locations where the proportional modeling indicated the potential for significant impacts a detailed analysis was performed using the TNM model. Based on the proportional modeling analysis results two locations were identified as having the potential for significant impacts – receptor sites 1 and 2

VIBRATION

Introduction

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, generally construction activities do not reach the 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. An assessment has been prepared to assess quantitatively potential vibration impacts of construction activities on structures and residences near the project area.

Construction Vibration Criteria

For purposes of assessing potential structural or architectural damage, the determination of a significant impact was based on the vibration impact criterion used by LPC of a PPV of 0.50 inches per second. For non-fragile buildings, vibration levels below 0.60 inches per second would not be expected to result in any structural or architectural damage.

For purposes of evaluating potential annoyance or interference with vibration-sensitive activities, vibration levels greater than 65 vibration decibels (VdB) would have the potential to result in significant adverse impacts if they were to occur for a prolonged period of time.

Analysis Methodology

For purposes of assessing potential structural or architectural damage, the following formula was used:

$$PPV_{equip} = PPV_{ref} \times (25/D)^{1.5}$$

where: PPV_{equip} is the peak particle velocity in inches per second of the equipment at the receiver location;

PPV_{ref} is the reference vibration level in inches per second at 25 feet; and

D is the distance from the equipment to the received location in feet.

For purposes of assessing potential annoyance or interference with vibration sensitive activities, the following formula was used:

$$L_v(D) = L_v(ref) - 30\log(D/25)$$

where: $L_v(D)$ is the vibration level in VdB of the equipment at the receiver location;

$L_v(ref)$ is the reference vibration level in VdB at 25 feet; and

D is the distance from the equipment to the receiver location in feet.

Table 20-18 shows vibration source levels for typical construction equipment.

Table 20-18
Vibration Source Levels for Construction Equipment

Equipment		PPV_{ref} (in/sec)	Approximate L_v (ref) (VdB)
Pile Driver (sonic)	upper range	0.734	105
	Typical	0.170	93
Hydromill (slurry wall)	In soil	0.008	66
	In rock	0.017	75
Clam shovel drop (slurry wall)		0.202	94
Vibratory Roller		0.210	94
Ram Hoe		0.089	87
Large bulldozer		0.089	87
Caisson drilling		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58
Source: *Transit Noise and Vibration Impact Assessment*, FTA-VA-90-1003-06, May 2006.			

Construction Vibration Analysis Results

The buildings and structures of most concern with regard to the potential for structural or architectural damage due to vibration are the Smith/Raskob Buildings, Nurses' Residence and Spellman Pavilion in the East Site, and 130 West 12th Street (12-story institution building), and 131 West 11th Street (4-story residential building) immediately adjacent to the East Site. Generally, the types of construction equipment involved in construction activities that have the highest potential for resulting in architectural damage due to vibration are pile driving, ram hoes, truck loading/unloading, and jackhammers. To minimize the potential for high vibration levels, ~~sonic~~ drilled caisson rig (rather than impact) pile driving rigs are expected to be used for the foundation of the tower building on Seventh Avenue in the East Site. In terms of potential vibration levels that would result in architectural damage, the construction would have the most potential for producing levels which would exceed the 0.50 inches per second PPV limit at receptor locations within a distance of approximately 13 feet from the operation of the pile driving rig; approximately 8 feet from the operation of ram hoe or truck loading/unloading; and approximately 5 feet from the operation of jackhammer (see **Appendix D-4-8**). To avoid any significant adverse impacts, ~~RSV, LLC,~~ a CPP would be developed for the East Site to protect known architectural resources with a lateral distance of 90 feet from the proposed construction activities. The CPP would include a monitoring component to ensure that the 0.5 inches per second PPV limit is exceeded during construction, corrective action would be taken.

In terms of potential vibration levels that would be perceptible and annoying, the dominant vibration equipment (i.e., pile driving rig) would have the most potential for producing levels which exceed the 65 VdB limit at receptor locations within a distance of approximately 215 feet (**Appendix D-4-8**). However, the operation would only occur for limited periods of time at a particular location and therefore would not result in any significant adverse impacts. Any blasting that may occur would be expected to produce vibrations less perceptible than the operation of the pile driving rig. In no case are significant adverse impacts from vibrations expected to occur.

OTHER TECHNICAL AREAS

LAND USE AND NEIGHBORHOOD CHARACTER

Construction of the proposed East Site project and Center for Comprehensive Care would take place over a period of about three and a half years. Throughout the construction, access to surrounding residences, businesses, and institutions in the area would be maintained. In addition, measures would be implemented to control noise, vibration, emissions, and dust on construction sites, including the erection of construction fencing incorporating sound-reducing measures. Because none of these impacts would be continuous or ultimately permanent, they would not create significant impacts on land use patterns or neighborhood character in the area.

SOCIOECONOMIC CONDITIONS

Construction activities would temporarily affect pedestrian and vehicular access. However, lane and/or sidewalk closures would not obstruct entrances to any existing businesses, or obstruct major thoroughfares used by customers, and businesses are not expected to be significantly affected by any temporary reductions in the amount of pedestrian foot traffic or vehicular delays that could occur as a result of construction activities. Utility service would be maintained to all businesses, although very short term interruptions (i.e., hours) may occur when new equipment (e.g., a transformer, or a sewer or water line) is put into operation. Overall, construction of the proposed projects is not expected to result in any significant adverse impacts on surrounding businesses.

Construction would create direct benefits resulting from expenditures on labor, materials, and services, and indirect benefits created by expenditures by material suppliers, construction workers, and other employees involved in the direct activity. Construction also would contribute to increased tax revenues for the City and State, including those from personal income taxes.

HISTORIC AND CULTURAL RESOURCES

Chapter 7, "Historic and Cultural Resources," provides a detailed assessment of potential impacts on architectural and archaeological resources. This section summarizes potential impacts during construction.

For the East Site, construction has the potential to result in inadvertent physical impacts on architectural resources if appropriate precautions are not taken. The proposed East Site project would alter the Smith/Raskob Buildings, Nurses' Residence, and Spellman Pavilion and involve demolition and construction immediately adjacent to these architectural resources. To avoid any construction-related impacts on these architectural resources, including ground-borne vibration, falling debris, and accidental damage from heavy machinery, a CPP would be developed in consultation with LPC. The CPP would be implemented by a professional engineer before any demolition, excavation, and construction. The CPP would follow the guidelines set forth in section 523 of the *CEQR Technical Manual*, including conforming to *New York City Landmarks Preservation Commission Guidelines for Construction Adjacent to a Historic Landmark and Protection Programs for Landmark Buildings*. The CPP would also comply with the procedures set forth in DOB's *Technical Policy and Procedure Notice (TPPN) #10/88*. With these measures in place, the proposed demolition of the Link/Coleman and Reiss Pavilions and the Cronin Building, alterations to Smith/Raskob, Buildings, Nurses' Residence, and the Spellman Pavilion, and the new construction on the East Site would not have a significant adverse impact on the historic buildings in and near the project area.

Alterations to the exterior of the O'Toole Building have been approved by LPC and are described in detail in Chapter 7, "Historic and Cultural Resources."

Construction of the proposed East Site project and Center for Comprehensive Care has the potential to result in inadvertent physical impacts on adjacent and nearby architectural resources in the Greenwich Village Historic District. There are a number of historic properties located within 90 feet of the project area. To avoid any construction-related impacts on properties located within 90 feet of the project area, a CPP would be developed in consultation with LPC as described above. Therefore, neither the proposed East Site project nor the Center for Comprehensive Care is expected to result in any significant adverse physical impacts on buildings within the Greenwich Village Historic District.

HAZARDOUS MATERIALS

As more fully described in Chapter 10, "Hazardous Materials," laboratory analysis of project area soil and groundwater samples identified generally low levels of analytes in the soil and groundwater, typical of those often found in developed areas. Potential contaminants would be remediated (cleaned up) as part of the proposed projects.

A Phase 1 Environmental Site Assessment (ESA) identified potential hazardous materials concerns associated with petroleum product storage tanks, nearby gasoline stations, and reported spills of petroleum products. Excavation could result in adverse impacts by increasing pathways for human exposure to potential hazardous materials. In addition, as discussed above under "Abatement and Demolition," asbestos, lead based paints, and PCB-containing transformers are likely to be encountered during demolition.

Following the Phase I ESA, an August 2011 Phase II subsurface investigation was conducted which included the advancement of ten borings with collection of 19 soil samples and 7 groundwater samples for laboratory analysis. Laboratory results were compared to New York State Department of Environmental Conservation (DEC) Soil Cleanup Objectives (which assume long-term exposure to soils) and Class GA Water Quality Standards (which assume use for drinking water). Since neither of these assumptions occurs now or would be expected to occur in the future, comparisons to these criteria are highly conservative. Although the Phase II detected soil and groundwater constituents at levels generally below these most stringent guidelines, to minimize the potential for impacts to the community and construction workers, all soil disturbance would be performed in accordance with a DEP-approved Remedial Action Plan and environmental Construction Health and Safety Plan (RAP and CHASP~~), the scope of which would be based on the findings of the Phase II~~. ~~At a minimum, the~~ ~~The~~ RAP ~~would~~ provides for the appropriate handling, stockpiling, testing, transportation, and disposal of excavated materials, as well as any unexpectedly encountered tanks, in accordance with all applicable federal, state, and local regulatory requirements. ~~The RAP would also provides for vapor control measures such as vapor barriers or placing residential uses above separately ventilated parking areas.~~ Although the Phase II indicated at most low levels of VOCs in soil and groundwater, the RAP specifies a vapor barrier below the proposed new construction to reduce the potential for vapor intrusion. The CHASP would ensure that all subsurface disturbances are done in a manner protective of workers, the community, and the environment. As described in Chapter 10, "Hazardous Materials," both a RAP and CHASP were prepared and submitted to DEP for review, and DEP issued a letter of approval dated December 12, 2011 (see **Appendix B**).

In addition, all construction activities would be performed in accordance with the following:

- Prior to demolition activities, surveys would be conducted for ACM. Confirmed ACM would be removed and disposed of prior to demolition in accordance with all applicable regulations including the February 2, 2011 DEP regulations.
- Demolition activities would be conducted in accordance with the applicable Occupational Safety and Health Administration regulation (OSHA 29 CFR 1926.62 *Lead Exposure in Construction*).
- Unless labeling or test data indicates that any hydraulic lifts or fluorescent lighting fixtures installed prior to 1979 do not contain PCBs, and that fluorescent lights do not contain mercury, these objects would be handled and disposed of in accordance with all applicable regulatory requirements. In addition, non-PCB containing hydraulic lifts installed after 1979 would be disposed of in accordance with the applicable regulatory requirements.
- Since excavation would extend below the water table, dewatering would be necessary during construction and new foundations would require waterproofing, which would also act as a vapor barrier.
- Excavated soil would be screened for signs of contamination (such as odors, staining, or elevated photoionization detector readings). Any soil exhibiting signs of contamination would be removed from the site. All material that would need to be disposed of (including soil stockpiled in the basements, any contaminated soil, excess fill including demolition debris, or asbestos-containing bedrock) would be properly handled and disposed of off-site in accordance with all applicable requirements.
- In addition to Volatile Organic Compound (VOC) and methane monitoring, the construction site would be monitored for dust during any soil moving activity (excavation, loading onto dump trucks for off-site disposal, managing soil stockpiles, etc.).
- Prior to dewatering, testing would be performed to ensure that the groundwater would meet applicable requirements. If necessary, pretreatment would be conducted prior to discharge, as required by DEP Sewer Discharge permits.
- A Stormwater Pollution Prevention Plan (SWPPP) would be implemented to prevent contaminated sediment runoff. The SWPPP would include procedures for soil stockpiling and runoff control. Excavated soil would be stockpiled for future reuse or off-site disposal. Stormwater management measures, such as hay bales or silt fencing, would be placed around stockpiles and properly maintained to ensure that stormwater runoff complies with the applicable requirements.

With the implementation of these measures, no significant adverse impacts related to hazardous materials would result from construction activities in the project area.

RODENT CONTROL

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