Chapter 15: Construction

A. INTRODUCTION

This chapter examines the potential construction period impacts of the Memorial Sloan-Kettering Cancer Center (MSK ACC) and the City University of New York (CUNY)-Hunter College Science and Health Professions Building (CUNY-Hunter Building) on a project site located adjacent to the Franklin Delano Roosevelt (FDR) Drive between East 73rd and 74th Streets. In the conceptual construction schedule, demolition ~~could begin as early as July 2013~~ would begin in January 2014. ~~and is expected to take three months to complete~~. Construction of the MSK ACC and the CUNY-Hunter Building are both anticipated to commence ~~in February 2014~~ three months after the start of demolition activities with ~~the MSK ACC~~ both buildings expected to be complete by ~~November 2018 and the CUNY-Hunter Building expected to be complete by April 2018~~early 2018. ~~It is noted that in the event construction of the CUNY-Hunter Building is not fully funded, completion of the laboratory floors may be delayed. All other construction including excavation and foundations, core and shell construction, and full completion of the first six floors of classroom space as well as faculty offices would still occur simultaneously with the construction of the MSK ACC. Later completion of the laboratory floor interiors would be similar to updating of buildings which occurs from time to time and would not affect the operation of the MSK ACC.~~ Although the analysis year for full operation is assumed to be 2019, the conceptual construction schedule presented in this chapter represents a more compressed timeframe which produces conservative analysis showing overlapping construction activities for the MSK ACC and the CUNY-Hunter Building and simultaneously operating construction equipment. Thus, the analysis captures the cumulative nature of construction impacts, which would result in the greatest impacts at nearby receptors. If there are unanticipated delays in the completion of any element of the project, the duration of individual construction elements would not be expected to change appreciably and there would be less overlapping of construction activities. Therefore, the construction activities would be less intense and no new significant adverse impacts would be expected. In the event construction of the CUNY-Hunter Building is not fully funded, completion of the laboratory floors may be delayed. All other construction including excavation and foundations, core and shell construction, and full completion of the first six floors of classroom space as well as faculty offices would still occur simultaneously with the construction of the MSK ACC. Later completion of the laboratory floor interiors would be similar to updating of buildings which occurs from time to time and would not affect the operation of the MSK ACC.

It is possible that construction of the proposed project could overlap with that of the adjacent Hospital for Special Surgery (HSS) building (30-month construction with ~~completion~~ an anticipated start date in late 2015 ~~in 2016~~) but peak construction activities of the two projects are likely to be at least months apart. Compared to the proposed project, which would be approximately 1.1 million square feet (sf) in size, the HSS building will be substantially smaller, at approximately 214,000 sf, and is expected to yield substantially lower construction activities than the proposed project.

This chapter summarizes the construction plans for the proposed project and assesses the potential for significant adverse impacts during the construction period. The city, state, and federal regulations and policies that govern construction are described. The construction schedule summarized follows the types of activities likely to occur during construction. The types of equipment are then discussed, and the number of workers and truck deliveries are estimated. This chapter also discusses potential impacts with regard to transportation, air quality, noise and vibration, land use and neighborhood character, socioeconomic conditions, community facilities, open space, historic and cultural resources, and hazardous materials.

PRINCIPAL CONCLUSIONS

The analysis concludes that the proposed project would result in significant adverse construction impacts with respect to vehicular traffic. The results of the construction analyses for each technical area are discussed in more detail below.

TRANSPORTATION

Peak construction conditions in the ~~4th quarter of 2016~~ 2nd quarter of 2017 were considered for the analysis of potential transportation impacts during construction. Based on the construction trip projections and comparison with operational analysis results, construction of the proposed project (the "Build" condition) ~~is expected to~~ would result in significant adverse traffic impacts and ~~the potential for~~ a parking shortfall during peak construction, as summarized below. However, no significant adverse impacts to transit or pedestrian conditions are anticipated due to construction. As stated above, it can be expected that construction activities associated with HSS would be substantially lower than those for the proposed project. As a result, cumulative effects of simultaneous construction of the two projects from construction worker and truck trip-making ~~would not be expected to be materially different from the peak construction condition depicted for the proposed project~~ were analyzed, as summarized below.

Traffic

During peak construction in ~~2016~~2017, the project-generated trips would be less than what would be realized upon the full build-out of the proposed project in 2019. Therefore, the potential traffic impacts during peak construction would be within the envelope of significant adverse traffic impacts identified for the Build condition in Chapter 9, "Transportation." As detailed in Chapter 17, "Mitigation," measures to mitigate the operational traffic impacts were recommended for implementation at 11 different intersections during weekday peak hours. These measures would entail primarily signal timing adjustments and other operational measures, all of which could be implemented early at the discretion of the New York City Department of Transportation (NYCDOT) to address actual conditions experienced at that time. However, similar to the operational analysis, traffic impacts during construction at the York Avenue and East 79th Street intersection ~~would~~ are likewise ~~be~~ unmitigated. ~~Between the Draft and Final EIS, in coordination with NYCDOT, additional analysis of construction traffic will be prepared.~~

Maintenance and Protection of Traffic (MPT) plans would be developed, reviewed, and approved by NYCDOT's Office of Construction Mitigation and Coordination (OCMC) for curb-lane and sidewalk closures as well as equipment staging activities. It is expected that traffic and pedestrian flow along all surrounding streets would be maintained throughout the entire construction period.

Parking

The anticipated construction activities are projected to generate a maximum parking demand of ~~277~~ 319 spaces during the ~~4th quarter of 2016~~2nd quarter of 2017. Based on the parking analysis results presented in Chapter 9, "Transportation," with the proposed project, there would be a parking shortfall of 298 spaces within ¼-mile of the project site. ~~Although the parking demand associated with construction workers commuting via auto would contribute minimally to the overall parking demand in the area, it can be expected that a parking shortfall may still occur during construction.~~ Similarly during construction, there would be a parking shortfall of up to approximately 247 parking spaces within ¼-mile of the project site. However, as with the analysis results for the operational project presented in Chapter 9, it is anticipated that the excess demand could be accommodated with a slightly longer walking distance beyond the ¼-mile radius. Furthermore, as stated in the 2012 *City Environmental Quality Review (CEQR) Technical Manual*, a parking shortfall resulting from a project located in Manhattan does not constitute a significant adverse parking impact, due to the magnitude of available alternative modes of transportation.

Transit

The estimated number of total peak hour transit trips would be ~~282~~ 323 during peak construction in ~~2016~~2017. These construction worker trips would occur outside of peak periods of transit ridership and would be distributed and dispersed to nearby transit facilities and would not result in any significant adverse transit impacts during construction.

Pedestrians

The estimated number of total peak hour pedestrian trips traversing the area's sidewalks, corners, and crosswalks would be up to ~~552~~ 634 during peak construction in ~~2016~~2017. These trips are expected to have minimal effects on pedestrian operations during the construction peak hours. As discussed in Chapter 9, "Transportation," the proposed project would not result in any significant adverse pedestrian impacts at any of the analysis locations. Therefore, like the Build condition, travel by construction workers would not result in any significant adverse pedestrian impacts.

AIR QUALITY

No significant adverse air quality impacts would be expected at any sensitive receptor locations due to the on-site and off-site construction activities of the proposed project. To ensure that the construction of the proposed project would result in the lowest practicable diesel particulate matter (DPM) emissions, the project would implement an emissions reduction program for all construction activities, including: diesel equipment reduction; clean fuel; best available tailpipe reduction technologies; utilization of newer equipment; source location; dust control; and idle restriction.

Overall, the most intense construction activities (demolition/excavation/foundation work) in terms of air pollutant emissions would be less than two years. Based on the sizes of the proposed project buildings and the nature of the construction work involved, construction activities for the proposed project would not be considered out of the ordinary in terms of intensity and, in fact, emissions would be lower due to the emission control measures that would be implemented during construction of the proposed project. In addition, the project site is generally located at some distance away from sensitive uses, with the Con Edison East 74th Street Steam Plant (Con Edison Steam Plant) to the north of the project site, the FDR Drive to the east of the project site, and no sensitive uses immediately to the west of the project site during the demolition, excavation, and foundation work of the proposed project. The nearest existing residential building is located 55 feet south of the project site across East 73rd Street. Its lower levels consist of garage and service uses with residential uses beginning several floors above East 73rd Street. Such distance between the emissions sources and these sensitive locations would result in enhanced dispersion of pollutants and therefore potential concentration increments from on-site sources at such locations would be reduced. Furthermore, the construction would not result in increases in vehicle volumes higher than those identified in the operational condition and, therefore, an off-site construction mobile source analysis is not warranted.

While construction of the HSS building on the adjacent site to the west may occur at the same time as construction of the MSK ACC and the CUNY-Hunter Building, potential concentration increments due to the proposed project on residential locations along East 73rd Street and the Epiphany Community Nursery School on East 74th Street would be considerably diminished by dispersion due to the increased distance between the construction emission sources at the project site and these sensitive receptors. This would occur regardless of construction on the intervening site. Therefore, no significant adverse air quality impacts would occur due to the combined construction impacts of the HSS building and the proposed project.

Based on analysis of all of the factors affecting construction emissions, on-site and off-site construction activities due to construction of the project would not result in any significant adverse impact on air quality.

NOISE AND VIBRATION

Noise

Noise associated with the proposed project's construction activities would not result in any significant adverse impacts. This conclusion is based on a conservative analysis of the construction procedures, including peak quarterly (i.e., three month) levels assumed to represent each year of construction (with the exception of 2015, in which two quarters were analyzed), a maximum amount of construction equipment assumed to be operational on the project site and at locations closest to nearby receptors, and peak hour construction equipment and truck delivery operations occurring simultaneously. Construction on the project site would include noise control measures as required by the New York City Noise Control Code, including both path and source controls. ~~The nearest sensitive locations are residential and school receptors west and south of the project site on East 73rd and 74th Streets.~~ Even with these measures, the results of detailed construction analyses indicate that elevated noise levels are predicted to occur for two or more consecutive years at eight (8) of the sixty-one (61) receptor sites analyzed. Affected locations include residential, institutional and commercial areas adjacent to the proposed development sites and along routes expected to be traveled by construction-related vehicles to and from the project site. However, all affected buildings have double-glazed windows and air-conditioning, and would consequently be expected to experience interior $L_{10(1)}$ values less than 45 dBA, which would be considered acceptable according to CEQR criteria, throughout most of the construction period.

~~The construction of the proposed project would be expected to last a total of approximately five years but the most noise-intensive construction activities (demolition/excavation/foundation work) would last for only a portion of this duration, taking approximately 19 months. The construction of the HSS building to the west, being much smaller than the proposed project, would be expected to have a much shorter construction duration than the proposed project, such that even if both projects' construction durations were to overlap, the overall construction period would be less than~~

24 months. Consequently, exceedances of the *CEQR Technical Manual* noise impact criteria that would occur at the residential and school receptors west and south of the project site on East 73rd and 74th Streets during the noisiest work would not be expected to occur continuously for 24 months. Therefore, while the noise level increases may be perceptible and intrusive, they would not be considered "long-term" or significant according to CEQR criteria. During the portions of this period that might coincide with construction of the HSS on the adjacent site, noise level increases due to the construction of the proposed project would be below the *CEQR Technical Manual* noise impact criteria due to the distance of the proposed project from the nearby receptors and the noise levels generated by the construction activities on the adjacent site. Further, to the extent that the independent construction on the adjacent site is delayed or proceeds in advance of the proposed project, there may be a structure on the adjacent site that would provide noise shielding similar to a noise barrier. The East River Esplanade is located approximately 70 feet east of the construction site and is separated from the site by the FDR Drive. Noise levels at the esplanade from the construction of the proposed project would be imperceptible in comparison to the existing noise levels resulting from traffic on the FDR Drive. Noise levels resulting from the FDR Drive at this location are currently in the high 70s dBA and would be expected to remain as such in the future conditions without the proposed project (the "No Build" condition). Consequently, only minimal exceedances of 2012 *CEQR Technical Manual* impact criteria would be expected to occur and no significant adverse noise impacts would be expected at this location. Therefore, based on these factors, no significant adverse noise impacts would be expected at any sensitive receptor locations from the proposed construction activities.

If the peak construction activity on the HSS building occurs during the construction of the proposed project, the analyzed receptor locations may experience higher overall noise levels than those with construction of the proposed project by itself, even though the noise level increments resulting from the proposed project would be smaller. At some locations immediately adjacent to the HSS project site, during simultaneous construction of both the HSS building and the proposed project, noise levels may be in the low 80s dBA during peak construction activities. However, these noise levels are not perceptibly higher than those with construction of the HSS building, and occur primarily at receptors that would experience a large amount of construction noise resulting from the HSS building's construction and relatively little construction noise from the proposed project. At receptors predicted to experience noticeable changes in noise level resulting from construction of the proposed project, the additional noise level increment from the HSS building's construction would be considerably smaller.

Vibration

The proposed project is not expected to result in significant adverse construction impacts with respect to vibration. Use of construction equipment that would have the most potential to exceed the 65 vibration decibels (VdB) criterion at sensitive receptor locations (e.g., equipment used during pile driving and rock blasting) would be perceptible and annoying. Therefore, for limited time periods, perceptible vibration levels may be experienced by occupants and visitors to all of the buildings and locations on and immediately adjacent to the construction sites. However, the operations that would result in these perceptible vibration levels would only occur for finite periods of time at any particular location and, therefore, the resulting vibration levels, while perceptible, would not considered to be significant adverse impacts.

OTHER TECHNICAL AREAS

Land Use and Neighborhood Character

Construction activities would affect land use on the project site but would not alter surrounding land uses. As is typical with construction projects, during periods of peak construction activity there would be some disruption, predominantly noise, to the nearby area. There would be construction trucks and construction workers coming to the site. There would also be noise, sometimes intrusive, from building construction as well as trucks and other vehicles backing up, loading, and unloading. These disruptions would be temporary in nature and would have limited effects on land uses within the study area, particularly as most construction activities would take place within the project site or within portions of sidewalks, curbs, and travel lanes of public streets immediately adjacent to the project site. Overall, while the construction at the site would be evident to the local community, the limited duration of construction would not result in significant or long-term adverse impacts on local land use patterns or the character of the nearby area.

Socioeconomic Conditions

Construction activities associated with the proposed project would not result in any significant adverse impacts on socioeconomic conditions. Construction of the proposed project would not block or restrict access to any facilities in the area or affect the operations of any nearby businesses, including Glorious Foods—a gourmet marketplace—west of the project site. Lane closures are not expected to occur in front of entrances to any existing or planned retail businesses, and construction activities would not obstruct major thoroughfares used by customers or businesses. Utility service would be maintained to all businesses. Overall, construction of the proposed project 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 construction activity. Construction also would contribute to increased tax revenues for the City and State, including those from personal income taxes.

Community Facilities

While construction of the proposed project would result in temporary increases in traffic during the construction period, access to and from any facilities in the area, including the Epiphany Community Nursery School west of the project site, would not be affected during the construction period. In addition, the construction sites would be surrounded by construction fencing and barriers that would limit the effects of construction on nearby facilities. At limited times, activities such as excavation and foundation construction may be perceptible and intrusive to the residents and the school located generally west of the site. However, as discussed above in "Noise," these noise levels would not be considered "long-term" or significant according to CEQR criteria. Further, they would occur at some distance from the sensitive uses which would be shielded by intervening structures as well as the construction fence surrounding the project site. Construction workers would not place any burden on public schools and would have minimal, if any, demands on libraries, child care facilities, and health care. Construction of the proposed buildings would not block or restrict access to any facilities in the area, and would not materially affect emergency response times significantly. The New York City Police Department (NYPD) and the New York City Fire Department (FDNY) emergency services and response times would not be materially affected due to the geographic distribution of the police and fire facilities and their respective coverage areas.

Open Space

There are no publicly accessible open spaces within the project site, and no open space resources would be used for staging or other construction activities. The nearest open space is the East River Esplanade, which is located across the FDR Drive approximately 70 feet east of the project site. At limited times, activities such as excavation and foundation construction may generate noise that could impair the enjoyment of any nearby open space users, but such noise effects would be temporary. Further, for the East River Esplanade, given the intervening traffic on the FDR Drive and the construction fences around the project site the noise increases may not be perceptible to open space users on the esplanade. Construction of the proposed project would not limit access to the esplanade or other open space resources in the vicinity of the project site. Therefore, construction of the proposed project would not result in significant adverse impacts on open space.

Historic and Cultural Resources

Historic and cultural resources include both archaeological and architectural resources. The study area for archeological resources is the site itself where disturbance from excavation and construction is anticipated. The New York City Landmarks Preservation Commission (LPC) and the New York Office of Parks, Recreation, and Historic Preservation (OPRHP) determined that the project site is not archaeologically sensitive. Since the proposed project is located within 90 feet of two known architectural resources determined to be eligible for listing on the State/National Registers of Historic Places (S/NR) by OPRHP—the Con Edison Steam Plant and the garage at 524 East 73rd Street—a Construction Protection Plan (CPP) would be prepared to avoid inadvertent construction-related impacts on these structures. The CPP would contain measures to avoid construction-related impacts including ground-borne vibration and accidental damage from heavy machinery as appropriate. The CPP would be developed in consultation with LPC and OPRHP and implemented by a professional engineer prior to demolition or construction activities. The CPP would follow the guidelines set forth in Chapter 9, Section 523 of the *CEQR Technical Manual*. With the implementation of the CPP, construction of the proposed project would not result in significant adverse impacts on these architectural resources. Therefore, the proposed project would not result in significant adverse construction-related impacts to historic and cultural resources.

Hazardous Materials

The greatest potential for exposure to any contaminated materials would occur during subsurface disturbance associated with construction of the proposed project. However, the potential for adverse impacts associated with these activities would be minimized by adhering to the following protocols: all remedial activities at the project site (and off-site) would continue to be conducted in accordance with applicable regulations; additional subsurface investigations would be conducted to delineate the extent of the free-phase petroleum product observed within a geotechnical boring on the southeastern portion of the project site to evaluate appropriate remediation measures to address the contamination; if evidence of contaminated soil or rock is encountered, these materials would be disposed of in accordance with applicable federal, state and local regulations; if any underground storage tanks (USTs) are encountered, they would be properly assessed, and removed in accordance with state and local regulations; if more significant soil and/or groundwater contamination is discovered during excavation activities, such contamination would require further investigation and/or remediation in accordance with all applicable regulations; any demolition debris containing suspect asbestos-containing materials (ACM), lead-based paint (LPB), polychlorinated biphenyls (PCBs), and/or USTs encountered during redevelopment would be characterized and disposed of in accordance with applicable local, state and federal regulations; and prior to excavation activities, testing would be performed to evaluate the need for pre-treatment prior to discharge for compliance with the New York City Department of Environmental Protection (DEP) discharge permit/approval requirements. With the implementation of these measures outlined above, no significant adverse impacts related to hazardous materials would be expected to occur as a result of the construction of the proposed project.

B. GOVERNMENTAL COORDINATION AND OVERSIGHT

The following describes construction oversight by government agencies, which involves a number of city, state, and federal agencies. **Table 15-1** shows the main agencies involved in construction oversight and the agencies' areas of responsibilities. Primary responsibilities lie with the New York City Department of Buildings (DOB), which ensures 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 oversight include installation and operation of the equipment, such as cranes and lifts, sidewalk sheds, and safety netting and scaffolding. DEP enforces the Noise Code, approves any needed Remedial Action Plan (RAP) and Construction Health and Safety Plan (CHASP), and regulates water disposal into the sewer system. The Fire Department of New York City (FDNY) has primary oversight for compliance with the Fire Code and for the installation of tanks containing flammable materials. The NYCDOT OCMC reviews and approves any traffic lane and sidewalk closures. LPC, and in this case OPRHP, approves the historic and cultural resources analysis, determines if a CPP is needed, and reviews and approves its content and execution.

Table 15-1
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, RAPs/CHASPs, dewatering
Fire Department	Compliance with Fire Code, tanks
Department of Transportation	Lane and sidewalk closures
Landmarks of Preservation Commission	Archaeological and architectural protection
New York State	
State Office of Parks, Recreation and Historic Preservation	Archaeological and architectural protection
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

The New York State Department of Environmental Conservation (DEC) regulates disposal of hazardous materials, and construction and operation of bulk petroleum and chemical storage tanks, as well as approves the CPP used when the construction is in proximity to historic structures. On the federal level, the Environmental Protection Agency (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. The Occupational Safety and Health Administration (OSHA) sets standards for work site safety and the construction equipment.

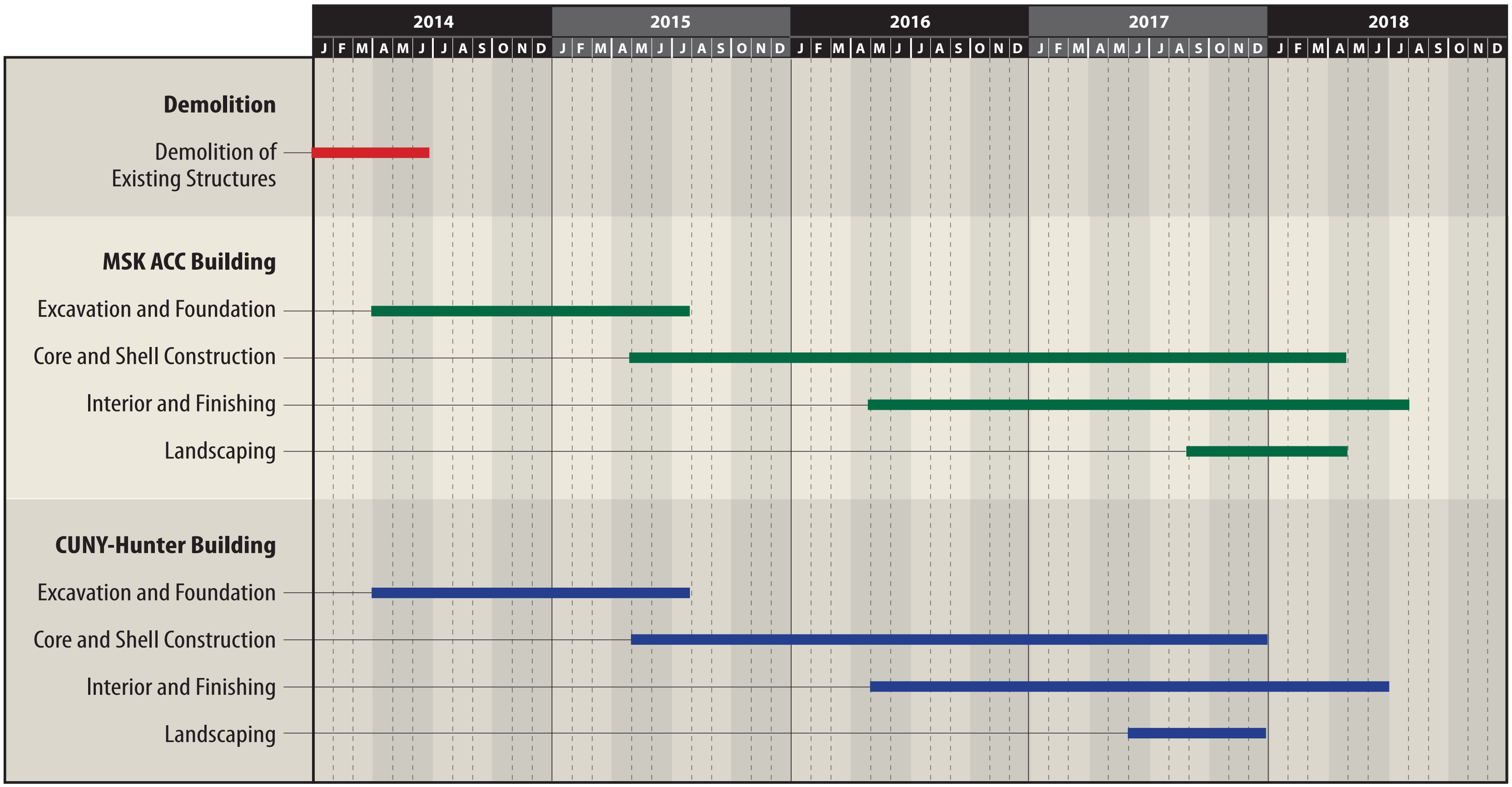
C. CONSTRUCTION PHASING AND SCHEDULE

The conceptual construction schedule is shown on **Figure 15-1** and **Table 15-2,** and reflects the sequencing of construction events as currently contemplated. In the conceptual construction schedule, demolition would begin in January 2014~~could begin as early as July 2013 and is expected to take about three months to complete~~. Construction of the MSK ACC and the CUNY-Hunter Building are both anticipated to commence ~~in February 2014~~three months after the start of demolition activities, with both buildings expected to be complete by early 2018. ~~The MSK ACC is expected to be completed by November 2018 while the CUNY-Hunter Building is expected to be completed by April 2018~~. It is noted that in the event construction of the CUNY-Hunter Building is not fully funded, completion of the laboratory floors may be delayed. All other construction including excavation and foundations, core and shell construction, and full completion of the first six floors of classroom space as well as faculty offices would still occur simultaneously with the construction of the MSK ACC. Later completion of the laboratory floor interiors would be similar to updating of buildings which occurs from time to time and would not affect the operation of the MSK ACC.

Table 15-2
Conceptual Construction Schedule

Building	Start Month	Finish Month	Approximate Duration (months)
Demolition			
Demolition of Existing Structures	~~July 2013~~ January 2014	~~September 2013~~ June 2014	~~3~~ 6
MSK ACC			
Excavation and Foundation	~~February 2014~~ April 2014	~~May 2015~~ July 2015	16
Core and Shell Construction	~~April 2015~~ May 2015	~~July 2018~~ April 2018	~~40~~ 36
Interior and Finishing	~~February 2017~~ May 2016	~~November 2018~~ July 2018	~~22~~ 27
Landscaping	~~March 2017~~ September 2017	~~September 2017~~ April 2018	~~7~~ 8
CUNY-Hunter Building			
Excavation and Foundation	~~February 2014~~ April 2014	~~May 2015~~ July 2015	16
Core and Shell Construction	~~November 2015~~ May 2015	~~January 2018~~ December 2017	~~27~~ 32
Interior and Finishing	~~October 2016~~ May 2016	~~April 2018~~ June 2018	~~19~~26
Landscaping	~~March 2017~~ June 2017	~~August 2017~~ December 2017	~~6~~ 7
Source: Turner Construction Company			

Although the operational analysis year is 2019, the conceptual schedule shown below represents a more compressed timeframe that produces a conservative analysis showing overlapping construction activities for the MSK ACC and the CUNY-Hunter Building and simultaneously operating construction equipment. Thus, the analysis captures the cumulative nature of construction impacts, which would result in the greatest impacts at nearby receptors. If there are unanticipated delays in the completion of any element of the project, the duration of individual construction elements would not be expected to change appreciably, and no new significant adverse impacts would be expected.



Conceptual Construction Schedule

Figure 15-1

For each of the technical areas, appropriate construction analysis years are selected to represent reasonable worst-case conditions relevant to that technical area, which can occur at different times for different analyses. For example, the noisiest part of the construction may not be at the same time as the heaviest construction traffic. Therefore, the analysis periods may differ for different analysis areas. Where appropriate, the analysis accounts for the effects of elements of the proposed project that would be completed and operational during the selected construction analysis years.

D. CONSTRUCTION DESCRIPTION

OVERVIEW

Construction of large-scale buildings in New York City typically follows a general pattern. The first task is construction startup, which involves the siting of work trailers, installation of temporary power and communication lines, and the erection of site perimeter fencing. At the project site where there are existing structures, the structures are demolished with some of the materials (such as concrete, block, and brick) either recycled or crushed on-site to be reused as fill and the debris taken to a licensed disposal facility. Excavation of the soils is next along with the construction of the foundations. When the below-grade construction is completed, construction of the core and shell of the new buildings begins. 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 is placed, and the interior fit out begins. During the busiest time of building construction, the upper core and structure is being built while mechanical/electrical connections, exterior cladding, and interior finishing are progressing on lower floors.

Since the construction approach and procedures for the MSK ACC and the CUNY-Hunter Building would be similar, general construction procedures are described followed by the major construction tasks (construction startup, demolition, excavation and foundation, core and shell construction, interior and finishing, and landscaping).

GENERAL CONSTRUCTION PRACTICES

MSK and CUNY would each have a field representative throughout the entire construction period. The field representative would serve as the contact point for the community and local leaders, and would be available 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.

HOURS OF WORK

For the proposed project, construction is expected to take place Monday through Friday and with minimal weather make-up work on Saturdays. 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 most workers arriving to prepare work areas between 6:00 AM and 7:00 AM. Normally weekday work would end by 3:30 PM, but it can be expected that to meet the construction schedule or to complete certain construction tasks, the workday would occasionally be extended beyond normal work. 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 only those involved in the specific task requiring additional work time. In addition, a noise mitigation plan pursuant to New York City Code would be developed and implemented to minimize intrusive noise affecting nearby sensitive receptors. A copy of the noise mitigation plan would be kept on-site for compliance review by DEP and DOB.

Weekend work would not be regularly scheduled, but could occur to make up for weather delays or other unforeseen circumstances. In such cases, appropriate work permits from DOB would be obtained. Similar to an extended workday, 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 9:00 AM with worker arrival and site preparation to 5:00 PM for site cleanup.

DELIVERIES AND ACCESS

Access to the construction sites would be controlled. The work areas would be fenced off, and limited access points for workers and trucks would be provided. Private worker vehicles would not be allowed into the construction area. Security guards and flaggers may be posted as necessary, 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 may patrol the construction sites after work hours and over the weekends to prevent unauthorized access. Material deliveries to the site would be controlled and scheduled. Unscheduled or haphazard deliveries would be minimized.

As noted above the NYCDOT OCMC reviews and approves all MPT plans which specify any planned sidewalk or lane closures and staging for all construction projects. In general practice construction managers for major projects on adjacent sites would coordinate their activities to avoid delays and inefficiencies.

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 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.

GENERAL CONSTRUCTION TASKS

CONSTRUCTION STARTUP TASKS

Construction startup work prepares a site for construction. First the project site would be fenced off and separate gates for workers and for trucks would be established. Sidewalk sheds and Jersey barriers would be erected. Trailers for the construction engineers and managers would be hauled to the site and installed. In addition, portable toilets, dumpsters for trash, and water and fuel tankers would be brought to the site and installed. Temporary utilities would be connected to the construction field. During the startup period, permanent utility connections may be made, especially if the contractor has obtained early electric power for construction use, but utility connections may be made almost any time during the construction sequence. Construction startup tasks would be completed within weeks.

DEMOLITION OF EXISTING STRUCTURES

The former sanitation garage at the project site was partially demolished in 2008, with parts of the structure still remaining on-site due to budget constraints. Demolition of the remainder of the sanitation facility would occur in accordance with DOB guidelines/requirements. Any demolition debris containing suspect ACM, LPB, PCBs, and/or USTs encountered during redevelopment would be characterized and disposed of in accordance with applicable local, state, and federal regulations. The structure would be deconstructed using excavators with hoe rams. During demolition, fencing would be required around the building to prevent accidental dispersal of building materials into areas accessible to the general public. The demolition debris would be sorted prior to being disposed at landfills to maximize recycling opportunities. Approximately 10 to 15 workers per day are expected to be on-site, and typically two to three truckloads of debris would be removed per hour.

EXCAVATION AND FOUNDATION

A spread footing foundations system is expected to be used for both the MSK ACC and the CUNY-Hunter Building. In this type of foundation system, concrete column footings would be used to accommodate the concentrated load placed on them and support the structure above. These concrete footings would be reinforced with rebar as they are traditionally done. The project buildings would be founded on rocks.

Excavators and front end loaders would be used for the tasks of soil excavation and rock removal. The soils and rocks would be loaded onto dump trucks for transport to a licensed disposal facility or for reuse on a construction site that needs fill. Next, the concrete footings would be erected and subsequently the basement floors would be installed. The installation of the footings and basements would require concrete trucks, concrete pumps, backhoes, rubber tire cranes, drill rigs, compressors, and various hand tools. During the excavation and foundation task, approximately 90 to ~~420~~180 workers would be on-site per day for the MSK ACC while the CUNY-Hunter Building would require approximately 55 to ~~280~~130 workers on-site per day, for a total of approximately 145 to ~~600~~310 workers on-site per day. In addition, approximately 5 to ~~20~~15 trucks would enter and leave the project site per day for the MSK ACC, and approximately 5 to ~~15~~10 trucks per day for the CUNY-Hunter Building, for a total of approximately 10 to ~~35~~25 trucks per day.

Below-Grade Hazardous Materials

All construction subsurface soil disturbances would be performed in accordance with a DEP-approved RAP and CHASP. The RAP would provide 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 CHASP would ensure that all subsurface disturbances are done in a manner protective of workers, the community, and the environment.

Dewatering

The excavated area would not be water proof until the "bathtub" is complete. In addition, rain and snow could collect in the excavation, and that water would have to be removed. Temporary erosion and sediment controls during construction may include settling ponds and approved filtration systems, some of which could become integrated into permanent site features. 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 (DOH). The design of the pretreatment system has to be signed by a New York State Professional Engineer or Registered Architect. DEP regulations specify the maximum pollutants concentration limits for water discharged into New York City sewers. DEP can also impose project-specific limits, depending on the location of the project and contamination that has been found in nearby areas.

CORE AND SHELL CONSTRUCTION

The cores of each project building create the building's framework (beams and columns) and floor decks. The superstructure of the MSK ACC and the CUNY-Hunter Building would either consist of reinforced concrete or steel. Construction of the interior structure, or core, of the proposed buildings would also 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 over the foundation is completed and would continue through the interior construction and finishing stage. The buildings would be completely enclosed by the end of the core and shell construction task.

Superstructure activities would require the use of rubber tire cranes, tower cranes, delivery trucks, forklifts, concrete pumps, and concrete buggies. 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.

As the superstructure advances upward above ground, installation of the vertical mechanical systems would commence. After the superstructure is five to ten floors above street grade, the exterior façade would be installed on the lower floors. The exterior façade would arrive on trucks and be lifted into place for attachment by cranes. Each day, approximately 50 to 400 workers and 5 to 20 trucks would be required for the core and shell construction of the MSK ACC and approximately 100 to 400 workers and 5 to 20 trucks would be required for the CUNY-Hunter Building.

INTERIOR AND FINISHES

This stage would include the construction of interior partitions, installation of lighting fixtures, and interior finishes (flooring, painting, etc.), and mechanical and electrical work. This activity would employ the greatest number of construction workers: with approximately 60 to 450 workers per day for each building. In addition, approximately 5 to 25 trucks per day per building would arrive and leave the construction site. Equipment used during interior construction would include exterior hoists, pneumatic equipment, delivery trucks, and a variety of small hand-held tools. Cranes may be used to lift mechanical equipment onto the roof of the building. While the greatest number of construction workers would be on-site during this stage of construction, this stage is the quietest because most of the construction activities would occur within the buildings.

LANDSCAPING

Top soil may be imported for installation of the grassy areas and landscaping. Concrete sidewalks would be poured, and street furniture, such as benches and tables, may be installed. Dump trucks would bring the soil to the site for spreading. Trees and shrubs would be planted. Equipment used during landscaping would include backhoes, rubber tire crane, jackhammer, asphalt saws, asphalt paver, and mini excavators. During the landscaping task, approximately 20 to 60 workers would be on-site per day for the MSK ACC, while the CUNY-Hunter Building would require approximately 10 to 40 workers on-site per day. In addition, approximately one to three trucks would enter and leave the project site per day for the MSK ACC, and approximately one to two trucks per day for the CUNY-Hunter Building.

E. NUMBER OF CONSTRUCTION WORKERS AND MATERIAL DELIVERIES

Construction is labor intensive, and the number of workers varies with the general construction task and the size of the building. Likewise, material deliveries generate many truck trips, and the number also varies. **Table 15-3** shows the estimated numbers of workers and deliveries to the project area by calendar quarter for all construction. These represent the average number of daily workers and trucks within each quarter. The average number of workers would be about ~~347~~ 422 per day throughout the construction period. The peak number of workers would be ~~690~~ 793 per day in the ~~fourth quarter of 2016~~2nd quarter of 2017. For truck trips, the average number of trucks would be ~~30~~ 26 per day, and the peak would occur in the ~~second and third quarters of 2017~~ 4th quarter of 2016 and the 1st quarter of 2017 with 50 trucks per day.

~~**Table 15-3**~~

~~**Average Number of Daily Workers and Trucks by Quarter**~~

Year	2013				2014				2015					
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th		
Workers	--	--	12	--	44	75	100	126	167	262	417	550		
Trucks	--	--	2	--	15	30	26	34	23	10	10	17		
Year	2016				2017				2018					
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	Average	Peak
Workers	613	640	675	**690**	644	583	479	388	269	206	97	58	347	690
Trucks	32	40	38	41	45	**50**	**50**	48	45	26	23	17	30	50

~~**Source:** Turner Construction Company~~

Table 15-3

Average Number of Daily Workers and Trucks by Quarter

Year	2014				2015				2016			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	47	144	229	282	305	301	342	477	701	693	762	767
Trucks	3	17	13	19	23	25	17	20	24	31	39	50
Year	2017				2018							
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	Average		Peak	
Workers	768	793	677	417	198	82	27	--	422		793	
Trucks	50	47	44	39	24	3	1	--	26		50	

Source: Turner Construction Company

F. THE FUTURE WITHOUT THE PROPOSED PROJECT

In the future without the proposed project, the project site is expected to remain largely vacant with the existing parking lot as the only active use. It is possible that abatement, demolition, and remediation would start prior to full project approval. A workplan for any additional testing would have to be submitted and approved, as would the ~~Construction Protection Plan~~ CPP, ~~Remedial Action Plan~~ RAP, and ~~Construction Health and Safety Plan~~ CHASP. However, no new development would take place, and the site would be completely vacant.

However, as discussed in Chapter 2, "Land Use, Zoning, and Public Policy," a planned development adjacent to the project site is expected to be completed by the 2019 analysis year. The ~~Hospital for Special Surgery~~ HSS plans to develop a new, 13-story, approximately 213,775-gross-square-foot (gsf) Ambulatory Surgery Center immediately west of the project site. The project, which is subject to CEQR, was reviewed and approved in December 2012 by the Board of Standards and Appeals. As described in the Environmental Assessment Statement (EAS) for that project, its construction would require approximately 30 months~~, with completion anticipated in 2016~~. The EAS further states that all necessary measures would be implemented during the construction of the Ambulatory Surgery Center to ensure that both the New York City Air Pollution Control Code regulating construction-related dust emissions and the requirements of the New York City Noise Control Code for construction noise control measures would be followed.

G. ENVIRONMENTAL EFFECTS OF PROJECT CONSTRUCTION ACTIVITIES

Similar to many large development projects in New York City, construction can be disruptive to the surrounding area for periods of time. The following analyses describe potential construction impacts with respect to transportation, air quality, noise and vibration, land use and neighborhood character, socioeconomic conditions, community facilities, open space, historic and cultural resources, and hazardous materials.

TRANSPORTATION

The effects of the construction activities from the proposed project were compared to the operational impacts identified for the full build-out of the proposed project in 2019 to assess the potential transportation impacts during construction and the measures that can be implemented to mitigate these impacts. Since the potential transportation impacts during construction are based on peak construction related activities, the quarter with the highest level of construction trip generation was assessed. For traffic, the cumulative peak construction worker vehicle and truck trip generation would occur during the ~~4th quarter of 2016~~2nd quarter of 2017. For parking, transit, and pedestrians, the greatest demand would also take place during the ~~4th quarter of 2016~~2nd quarter of 2017 when there is the greatest number of construction workers traveling to/from the site.

It is noted that ~~according to the EAS for~~ construction of the HSS Building to the west of the project site~~, that project~~ is expected to commence in late 2015 and would take approximately 30 months to complete ~~be finished in 2016~~. Further, construction of the two projects would be coordinated by the NYCDOT OCMC in its approval of the MPT plan for each project and by the construction managers themselves who would be motivated to coordinate to avoid delays or inefficiencies.

TRAFFIC

Construction activities would generate construction worker and truck traffic. An evaluation of construction sequencing and worker/truck projections was undertaken to assess potential traffic impacts. As demonstrated below, the ~~2016~~2017 peak construction traffic would be less than what would be realized upon the full build-out of the proposed project in 2019. Therefore, the anticipated impacts during construction would be within the envelope of significant adverse traffic impacts identified for the Build condition in Chapter 9, "Transportation," and can be similarly addressed with the mitigation measures described in Chapter 17, "Mitigation." ~~Between the Draft and Final EIS,~~ In coordination with NYCDOT, additional analysis of construction traffic ~~will be~~ was prepared as presented in this Final Environmental Impact Statement (FEIS).

Construction Trip Generation Projections

Average daily construction worker and truck activities by quarter were projected for the entire construction period. As detailed above, construction of sites within the proposed project site could be completed by 2018. The projected quarterly average worker and truck trip 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. These estimates are summarized in **Table 15-4** and discussed in further details below.

Daily Workforce and Truck Deliveries

For a reasonable worst-case 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 incremental daily traffic in the ~~4th quarter of 2016~~2nd quarter of 2017, with an estimated incremental average of ~~690~~ 793 workers and ~~41~~ 47 truck deliveries per day (see **Table 15-3** above and **Appendix E** for details). These estimates of construction activities are discussed further below.

Construction Worker Modal Splits and Vehicle Occupancy

Based on 2000 U.S. Census data on workers in the construction and excavation industry, it is anticipated that 49 percent of the construction workers~~'~~ commute to the project site by private autos at an average occupancy of approximately 1.22 persons per vehicle.

Peak Hour Construction Worker Vehicle and Truck Trips

Similar to other typical construction projects in New York City, most of the construction activities at project site are expected to take place during the construction shift of 7:00 AM to 3:30 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, 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.

~~Table 15-4~~
~~Build Construction Trip Generation~~

Vehicle PCE Trips (Auto + Truck)	2013		2014				2015				2016			
	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
6 AM - 7 AM	8	0	30	56	60	72	78	96	146	193	229	246	257	262
7 AM - 8 AM	1	0	8	18	16	22	21	25	37	48	61	63	66	67
8 AM - 9 AM	0	0	4	12	8	12	8	4	4	4	12	12	12	12
9 AM - 10 AM	0	0	4	12	8	12	8	4	4	4	12	12	12	12
10 AM - 11 AM	0	0	4	12	8	12	8	4	4	4	12	12	12	12
11 AM - 12 PM	0	0	4	12	8	12	8	4	4	4	12	12	12	12
12 PM - 1 PM	0	0	4	12	8	12	8	4	4	4	12	12	12	12
1 PM - 2 PM	0	0	4	12	8	12	8	4	4	4	12	12	12	12
2 PM - 3 PM	0	0	5	14	10	15	11	9	12	15	24	25	26	26
3 PM - 4 PM	4	0	18	36	40	52	62	88	138	181	209	218	229	234
4 PM - 5 PM	1	0	3	5	6	8	10	16	25	33	37	39	41	42
Daily Total	**14**	**0**	**88**	**201**	**180**	**241**	**230**	**258**	**382**	**494**	**632**	**663**	**691**	**703**

Vehicle PCE Trips (Auto + Truck)	2017				2018			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
6 AM - 7 AM	251	239	206	173	131	90	55	34
7 AM - 8 AM	68	63	54	47	38	25	16	9
8 AM - 9 AM	16	16	16	16	16	8	8	4
9 AM - 10 AM	16	16	16	16	16	8	8	4
10 AM - 11 AM	16	16	16	16	16	8	8	4
11 AM - 12 PM	16	16	16	16	16	8	8	4
12 PM - 1 PM	16	16	16	16	16	8	8	4
1 PM - 2 PM	16	16	16	16	16	8	8	4
2 PM - 3 PM	29	26	26	24	21	12	10	5
3 PM - 4 PM	223	203	170	141	103	74	39	22
4 PM - 5 PM	39	35	29	23	16	12	6	3
Daily Total	**706**	**664**	**581**	**504**	**405**	**261**	**174**	**97**

Table 15-4
Build Construction Trip Generation

Vehicle PCE Trips (Auto + Truck)	2014				2015				2016			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
6 AM - 7 AM	19	62	85	111	122	121	126	173	249	255	285	295
7 AM - 8 AM	4	20	22	31	33	36	35	46	64	68	77	81
8 AM - 9 AM	0	8	4	8	8	12	8	8	8	12	16	20
9 AM - 10 AM	0	8	4	8	8	12	8	8	8	12	16	20
10 AM - 11 AM	0	8	4	8	8	12	8	8	8	12	16	20
11 AM - 12 PM	0	8	4	8	8	12	8	8	8	12	16	20
12 PM - 1 PM	0	8	4	8	8	12	8	8	8	12	16	20
1 PM - 2 PM	0	4	4	4	4	4	4	4	4	8	8	8
2 PM - 3 PM	1	7	9	10	10	10	11	14	18	22	23	23
3 PM - 4 PM	15	50	77	95	102	101	114	157	229	231	253	255
4 PM - 5 PM	3	9	13	17	19	18	20	28	42	42	46	46
Daily Total	**42**	**192**	**230**	**308**	**330**	**350**	**350**	**462**	**646**	**686**	**772**	**808**

Vehicle PCE Trips (Auto + Truck)	2017				2018			
	1Q	2Q	3Q	4Q	1Q	2Q	3Q	4Q
6 AM - 7 AM	295	303	261	174	88	30	9	0
7 AM - 8 AM	81	84	70	50	24	7	2	0
8 AM - 9 AM	20	20	16	16	8	0	0	0
9 AM - 10 AM	20	20	16	16	8	0	0	0
10 AM - 11 AM	20	20	16	16	8	0	0	0
11 AM - 12 PM	20	20	16	16	8	0	0	0
12 PM - 1 PM	20	20	16	16	8	0	0	0
1 PM - 2 PM	8	8	8	8	4	0	0	0
2 PM - 3 PM	23	24	22	16	8	2	1	0
3 PM - 4 PM	255	263	225	142	68	26	9	0
4 PM - 5 PM	46	48	40	26	12	5	1	0
Daily Total	**808**	**830**	**706**	**496**	**244**	**70**	**22**	**0**

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. For construction trucks, deliveries would occur throughout the day when the construction site is active. Construction truck deliveries typically peak during the early morning (25 percent), overlapping with construction worker arrival traffic. Peak construction hourly trip projections for the ~~4th quarter of 2016~~2nd quarter of 2017 are summarized in **Table 15-5**. As shown, the maximum incremental construction activities would result in ~~262~~ 303 PCEs between 6 and 7 AM and ~~234~~ 263 PCEs between 3 and 4 PM on weekdays.

~~It is possible that construction of the proposed project could overlap with that of the adjacent HSS building (30-month construction with completion anticipated in 2016) but peak construction activities of the two projects are likely to be at least months apart. Based on the relative sizes of the two projects (i.e., approximately 1.1 million square feet for the proposed project, over five times the size of the 214,000 sf HSS project), it can be expected that construction activities associated with HSS would be substantially lower than those described above for the proposed project, such that cumulative effects of simultaneous construction of the two projects from construction worker and truck trip-making would not be expected to be materially different from the peak construction condition depicted above for the proposed project. The construction traffic increments summarized in **Tables 15-4** and **15-5** provide an indication that although there is a potential for significant adverse traffic impacts during construction, the peak hour traffic conditions during peak construction in 2016 would be more favorable than those identified for the full build-out of the proposed project in 2019. As detailed in Chapter 17, "Mitigation," measures to mitigate the operational traffic impacts in 2019 were recommended for implementation at 10 out of the 11 different intersections during weekday peak hours. These measures would encompass primarily signal timing adjustments and other operational measures, all of which could be implemented early at the discretion of NYCDOT to address actual conditions experienced at that time. However, similar to the operational analysis, traffic impacts during construction at the York Avenue and East 79th Street intersection would likewise be unmitigated. Between the Draft and Final EIS, in coordination with NYCDOT, additional analysis of construction traffic will be prepared.~~

~~Table 15-5~~

~~2016 Build Peak Construction Vehicle Trip Projections~~

	Auto Trips			Truck Trips			Total					
	Regular Shift			Regular Shift			Vehicle Trips			PCE Trips		
Hour	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
4th Quarter of 2016												
6 AM - 7 AM	222	0	222	10	10	20	232	10	242	242	20	262
7 AM - 8 AM	55	0	55	3	3	6	58	3	61	61	6	67
8 AM - 9 AM	0	0	0	3	3	6	3	3	6	6	6	12
9 AM -10 AM	0	0	0	3	3	6	3	3	6	6	6	12
10 AM -11 AM	0	0	0	3	3	6	3	3	6	6	6	12
11 AM - 12 PM	0	0	0	3	3	6	3	3	6	6	6	12
12 PM - 1 PM	0	0	0	3	3	6	3	3	6	6	6	12
1 PM - 2 PM	0	0	0	3	3	6	3	3	6	6	6	12
2 PM - 3 PM	0	14	14	3	3	6	3	17	20	6	20	26
3 PM - 4 PM	0	222	222	3	3	6	3	225	228	6	228	234
4 PM - 5 PM	0	42	42	0	0	0	0	42	42	0	42	42
Daily Total	**277**	**278**	**555**	**37**	**37**	**74**	**314**	**315**	**629**	**351**	**352**	**703**

Note: 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). The above hourly distribution of daily trips resulted in rounding errors; hence, the daily totals (i.e., for truck trips) do not match with those shown in Table 15-3.

Table 15-5
2017 Build Peak Construction Vehicle Trip Projections

Hour	Auto Trips Regular Shift			Truck Trips Regular Shift			Total Vehicle Trips			Total PCE Trips		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
2nd Quarter of 2017												
6 AM - 7 AM	255	0	255	12	12	24	267	12	279	279	24	303
7 AM - 8 AM	64	0	64	5	5	10	69	5	74	74	10	84
8 AM - 9 AM	0	0	0	5	5	10	5	5	10	10	10	20
9 AM -10 AM	0	0	0	5	5	10	5	5	10	10	10	20
10 AM -11 AM	0	0	0	5	5	10	5	5	10	10	10	20
11 AM - 12 PM	0	0	0	5	5	10	5	5	10	10	10	20
12 PM - 1 PM	0	0	0	5	5	10	5	5	10	10	10	20
1 PM - 2 PM	0	0	0	2	2	4	2	2	4	4	4	8
2 PM - 3 PM	0	16	16	2	2	4	2	18	20	4	20	24
3 PM - 4 PM	0	255	255	2	2	4	2	257	259	4	259	263
4 PM - 5 PM	0	48	48	0	0	0	0	48	48	0	48	48
Daily Total	**319**	**319**	**638**	**48**	**48**	**96**	**367**	**367**	**734**	**415**	**415**	**830**

Note:
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). The above hourly distribution of daily trips resulted in rounding errors; hence, the daily totals (i.e., for truck trips) do not match with those shown in Table 15-3.

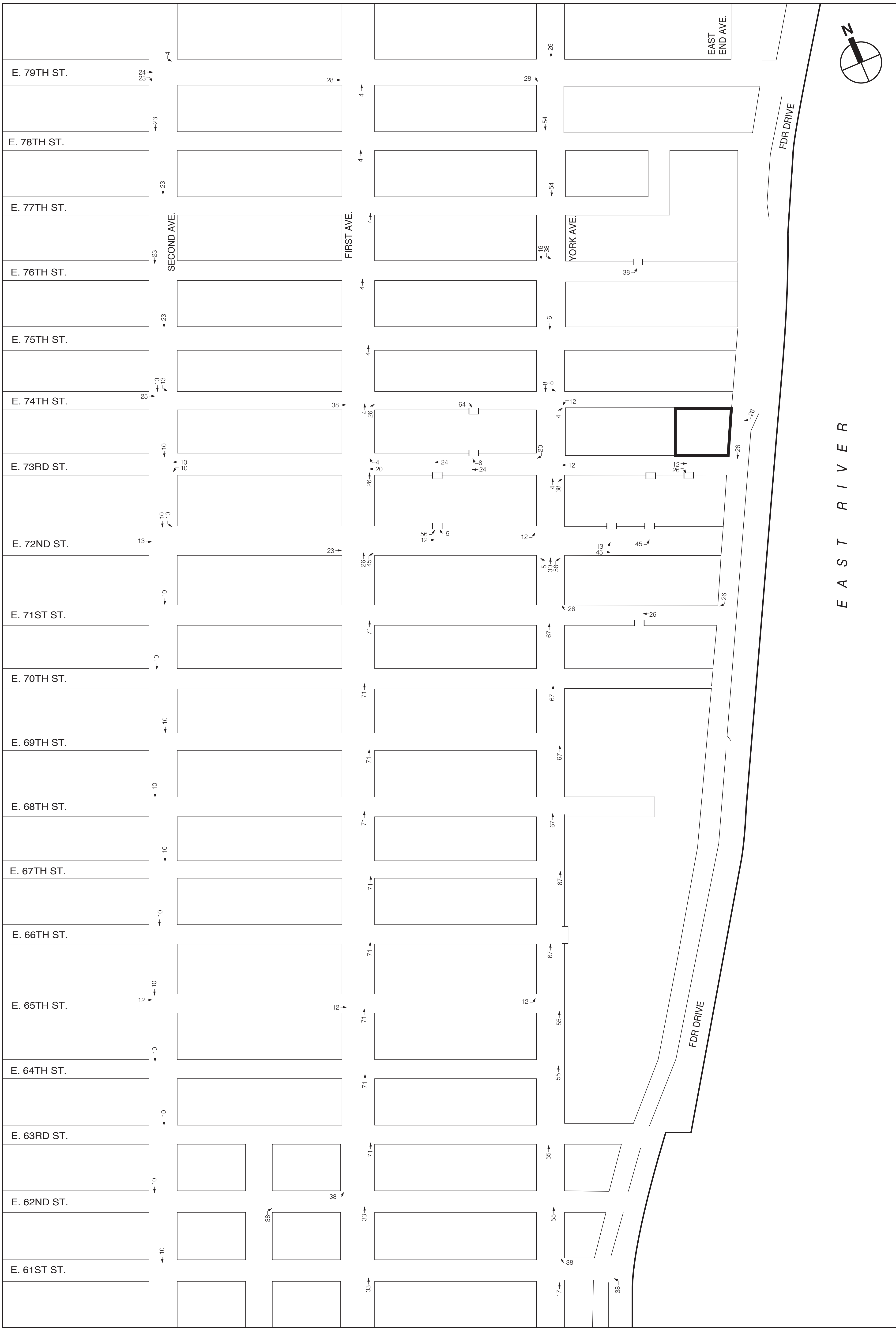
Construction Traffic Capacity Analysis

Vehicles generated by construction activities were assigned to the street network (see **Figures 15-2** and **15-3**). Eleven intersections were identified for analysis. These intersections are the intersections that have been identified as impacted during one or more peak hours in the Build condition in Chapter 9, “Transportation.” These intersections were analyzed from 6 to 7 AM and 3 to 4 PM, which corresponds to the hours of peak vehicular traffic generated by construction. These intersections include:

- York Avenue and East 79th Street;
- York Avenue and East 75th Street;
- York Avenue and East 74th Street;
- York Avenue and East 73rd Street;
- York Avenue and East 72nd Street;
- York Avenue and East 71st Street;
- York Avenue and East 66th Street;
- York Avenue and East 65th Street;
- York Avenue and East 61st Street;
- First Avenue and East 72nd Street; and
- First Avenue and East 65th Street.

The operations at these intersections were analyzed using the Highway Capacity Software (HCS+) version 5.5, which is based on the methodologies presented in the *2000 Highway Capacity Manual (HCM)*. A discussion of the analysis methodology can be found in Chapter 9, “Transportation.”

5.11.13



Project Site Boundary

NOT TO SCALE

Peak Construction Generated Traffic Volumes
Weekday (6AM to 7AM)

Figure 15-2

Peak Construction Generated Traffic Volumes
Weekday (3PM to 4PM)

Figure 15-3

Construction Peak Traffic Volumes and Conditions

Based on the Automatic Traffic Recorder (ATR) traffic volume data collected to determine existing conditions (see Chapter 9, "Transportation"), overall background traffic volumes during the 6 to 7 AM construction peak hour are approximately 27 percent lower than the 7:45 to 8:45 AM peak hour analyzed for the Build condition and overall traffic volumes during the 3 to 4 PM construction peak hour are approximately 4 percent higher than the 5:30 to 6:30 PM peak hour; therefore, the background traffic volumes were decreased for the 6 to 7 AM construction peak hour and increased for the 3 to 4 PM construction peak hour proportionate to the differences stated above.

Future Without Construction of the Proposed Project

The background AM and PM peak construction peak hour volumes were increased to year 2017 using a background growth rate of 0.25 percent per year from 2012 to 2017 for approximately 1.25 percent growth in overall traffic volumes. Traffic generated by future No Build projects were adjusted based on parking accumulation estimates to the 6 to 7 AM and 3 to 4 PM hours and were included in the No Build conditions for construction analysis. In addition, as described above, construction of the proposed project would overlap with the adjacent HSS building. Based on the HSS building construction schedule, construction activities during the 2nd quarter 2017 would generate approximately 82 auto trips and 8 truck trips during the 6 to 7 AM construction peak hour and 82 auto trips and 2 truck trips during the 3 to 4 PM peak hour. These trips have also been accounted for in the No Build conditions for the proposed project construction analysis. The 2017 construction No Build traffic volumes are shown in **Figures 15-4** and **15-5**.

Future With Construction of the Proposed Project

According to projections presented above (see **Table 15-5**), peak construction activities would generate 255 autos and 24 trucks during the 6 to 7 AM construction peak hour and 255 autos and 4 trucks during the 3 to 4 PM construction peak hour. Auto trips were assigned along roadways leading to off-site parking facilities in the study area, and trucks were assigned to NYCDOT-designated truck routes. The 2017 construction Build traffic volumes are shown in **Figures 15-6** and **15-7**.

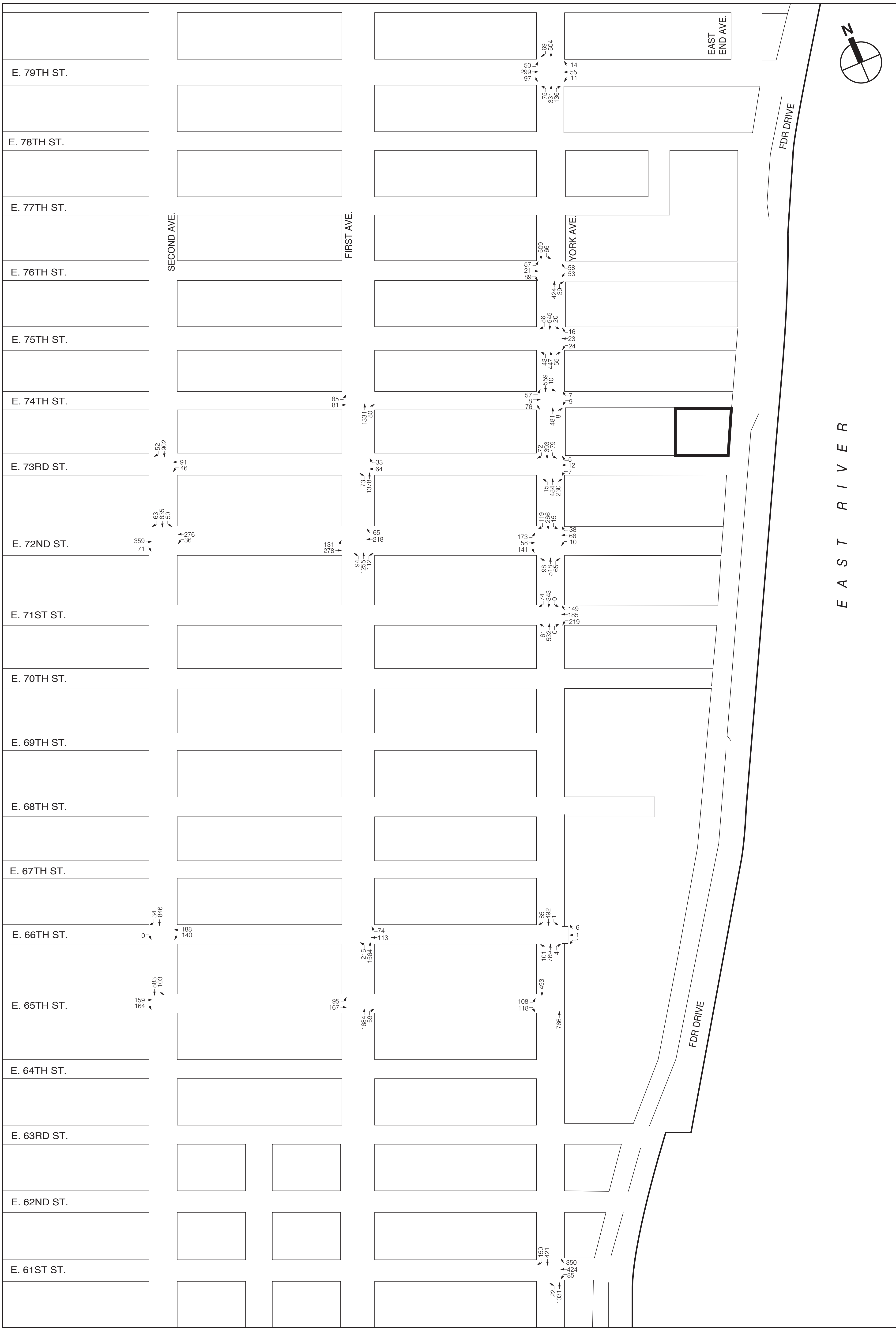
An analysis of the eleven construction study area intersections showed that three of the eleven intersections would be significantly impacted during the 3 to 4 PM construction peak hour. These three intersections include York Avenue and East 79th Street, York Avenue and East 73rd Street, and First Avenue and East 72nd Street.

Similar to the operational conditions, significant adverse impacts at the intersection of York Avenue and East 79th Street could not be fully mitigated during the construction conditions. The significant adverse impacts at the intersections of York Avenue and East 73rd Street and First Avenue and East 72nd Street could be fully mitigated during the 3 to 4 PM construction peak hour by applying mitigation measures similar to those proposed for mitigation under the operational conditions.

Tables 15-6 and **15-7** summarize the capacity analysis results and mitigation recommendations for the 6 to 7 AM and 3 to 4 PM construction peak hours, respectively. A discussion of these results for each of the impacted intersections is provided below.

York Avenue and East 79th Street

Similar to the operational conditions, the significant adverse impact at this intersection during the 3 to 4 PM construction peak hour could not be mitigated.



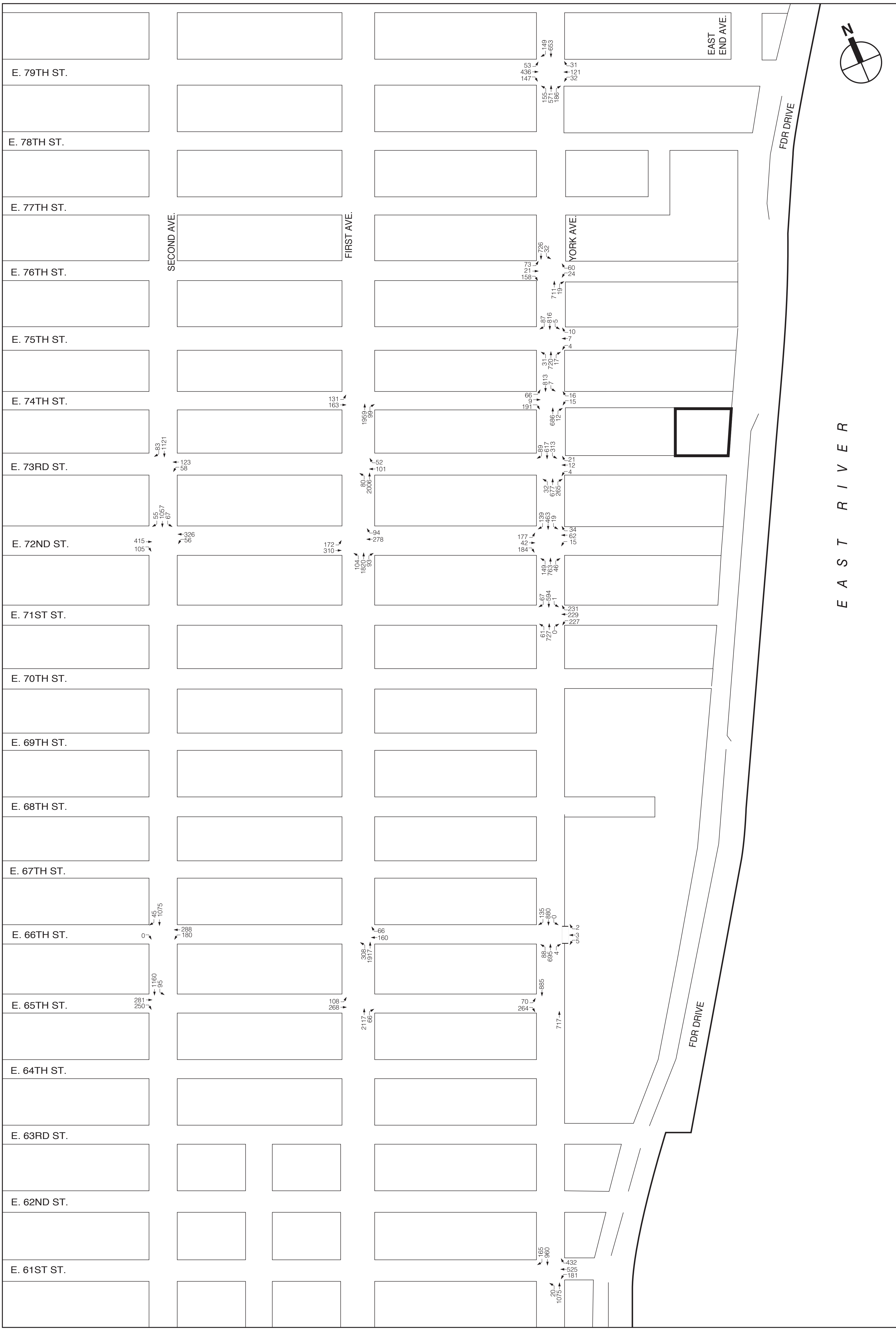
Project Site Boundary

NOT TO SCALE

2017 No Build Traffic Volumes
Weekday (6AM to 7AM)

Figure 15-4

6.14.13

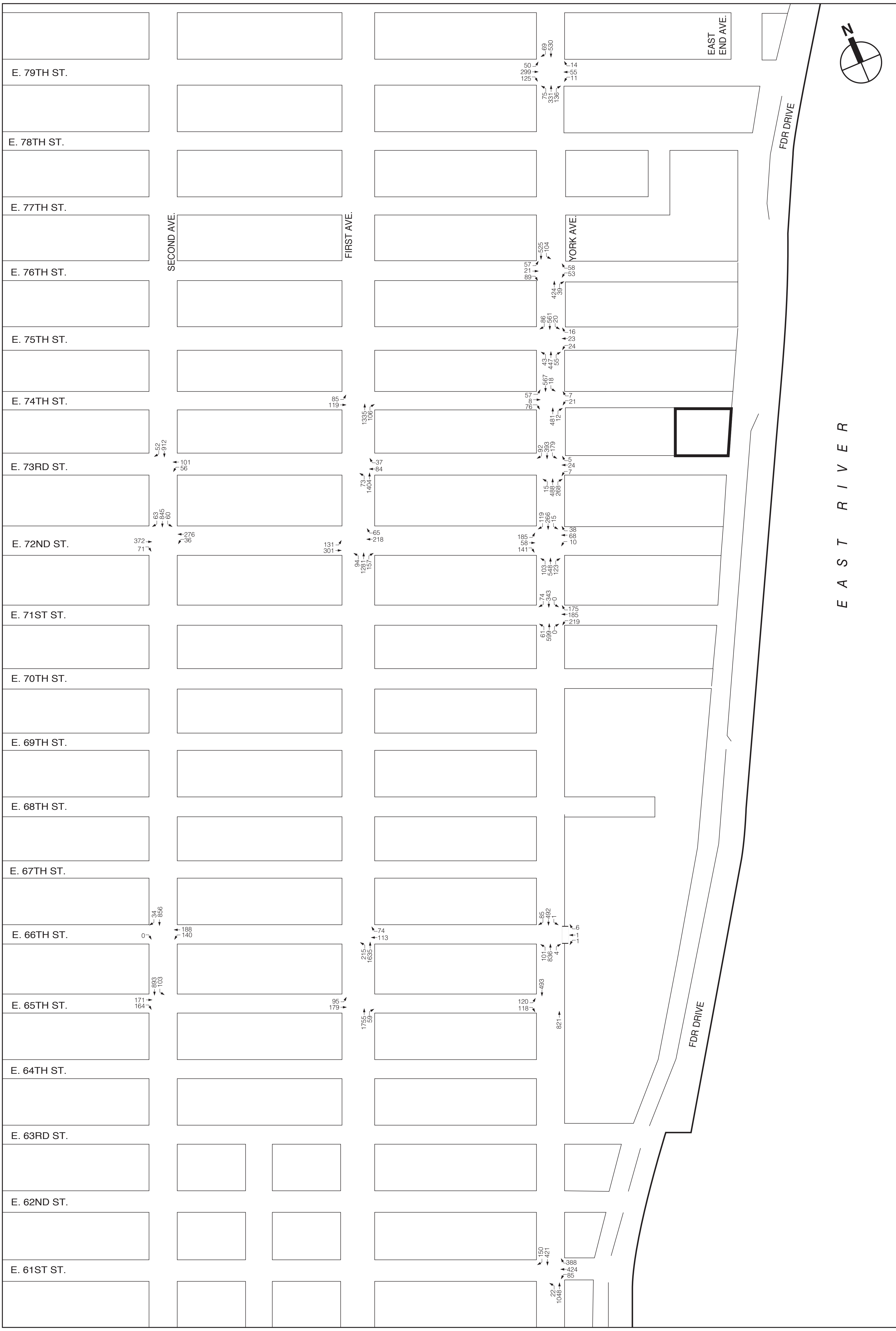


Project Site Boundary

NOT TO SCALE

2017 No Build Traffic Volumes
Weekday (3PM to 4PM)
Figure 15-5

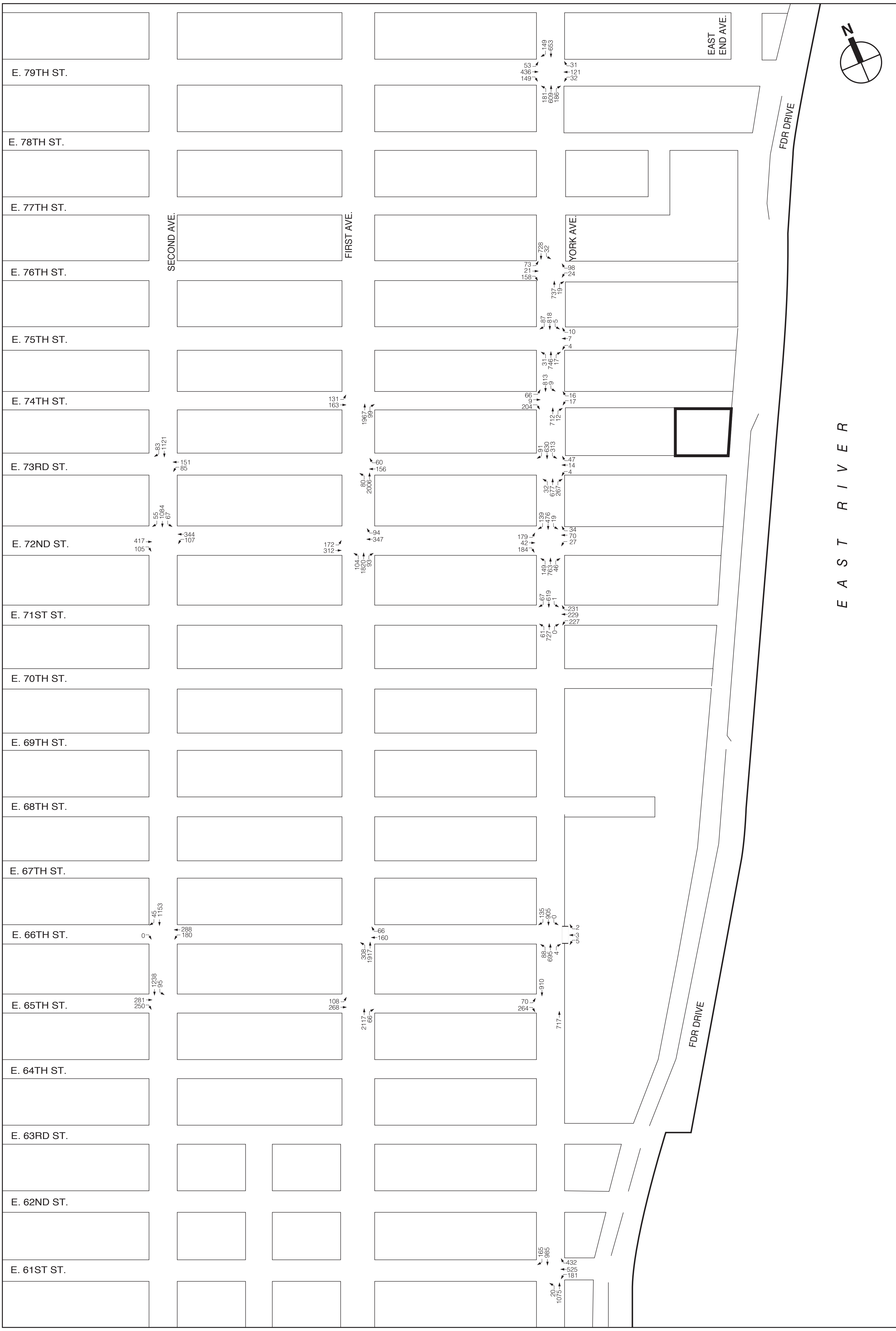
6.14.13



Project Site Boundary

NOT TO SCALE

2017 Construction Traffic Volumes
Weekday (6AM to 7AM)



Project Site Boundary

NOT TO SCALE

2017 Construction Traffic Volumes
Weekday (3PM to 4PM)
Figure 15-7

Table 15-6
2017 No Build, Build, and Mitigated Conditions Construction AM Peak Hour Traffic Level of Service

Intersection	Construction No Build Condition				Construction Build Condition				Construction Mitigated Condition				Recommended Mitigation Measures
	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	
York Avenue & East 79th Street													
Eastbound	LTR	0.72	44.0	D	LTR	0.77	46.9	D					No significant adverse impact
Westbound	LTR	0.15	31.3	C	LTR	0.15	31.3	C					
Northbound	LTR	0.69	28.5	C	LTR	0.70	28.8	C					
Southbound	TR	0.65	33.7	C	TR	0.68	34.5	C					
	Intersection		34.6	C	Intersection		35.9	D					
York Avenue & East 75th Street													
Westbound	LTR	0.22	32.3	C	LTR	0.22	32.3	C					No significant adverse impact
Northbound	LTR	0.52	15.0	B	LTR	0.52	15.0	B					
Southbound	LTR	0.52	14.9	B	LTR	0.53	15.1	B					
	Intersection		15.8	B	Intersection		15.9	B					
York Avenue & East 74th Street													
Eastbound	LTR	0.38	30.9	C	LTR	0.38	30.9	C					No significant adverse impact
Westbound	LR	0.06	25.5	C	LR	0.11	26.4	C					
Northbound	TR	0.39	15.7	B	TR	0.39	15.7	B					
Southbound	LT	0.49	17.4	B	LT	0.52	17.8	B					
	Intersection		18.4	B	Intersection		18.7	B					
York Avenue & East 73th Street													
Westbound	LTR	0.14	44.8	D	LTR	0.20	46.0	D					No significant adverse impact
Northbound	LTR	0.78	32.4	C	LTR	0.84	36.6	D					
Southbound	DefL	0.59	18.7	B	DefL	0.60	19.8	B					
	TR	0.70	22.2	C	TR	0.75	24.4	C					
	Intersection		27.3	C	Intersection		30.6	C					
York Avenue & East 72th Street													
Eastbound	DefL	0.66	43.6	D	DefL	0.70	46.6	D					No significant adverse impact
	TR	0.36	30.8	C	TR	0.36	30.8	C					
	R	0.27	29.7	C	R	0.27	29.7	C					
Westbound	LTR	0.33	30.1	C	LTR	0.33	30.1	C					
Northbound	LTR	0.68	22.4	C	LTR	0.79	27.0	C					
Southbound	LTR	0.41	16.3	B	LTR	0.41	16.4	B					
	Intersection		24.7	C	Intersection		27.1	C					
York Avenue & East 71th Street													
Westbound	LTR	0.60	30.3	C	LTR	0.64	31.3	C					No significant adverse impact
Northbound	LTR	0.56	22.1	C	LTR	0.62	23.6	C					
Southbound	LTR	0.40	19.3	B	LTR	0.40	19.3	B					
	Intersection		24.3	C	Intersection		25.2	C					
York Avenue & East 66th Street													
Westbound	LTR	0.02	29.0	C	LTR	0.02	29.0	C					No significant adverse impact
Northbound	LTR	0.88	29.4	C	LTR	0.94	36.6	D					
Southbound	LTR	0.54	22.3	C	LTR	0.54	22.3	C					
	Intersection		26.7	C	Intersection		31.4	C					
York Avenue & East 65th Street													
Eastbound	LR	0.71	48.2	D	LR	0.75	50.6	D					No significant adverse impact
Northbound	T	0.55	15.1	B	T	0.58	15.8	B					
Southbound	T	0.32	11.9	B	T	0.32	11.9	B					
	Intersection		19.2	B	Intersection		20.0	C					
York Avenue & East 61st Street													
Westbound	L	0.18	25.9	C	L	0.18	25.9	C					No significant adverse impact
	LTR	0.58	32.3	C	LTR	0.60	32.6	C					
	R	0.59	35.1	D	R	0.65	37.4	D					
Northbound	LT	0.83	28.9	C	LT	0.85	29.7	C					
Southbound	TR	0.31	15.5	B	TR	0.31	15.5	B					
	Intersection		27.0	C	Intersection		27.8	C					
First Avenue & East 72nd Street													
Eastbound	LT	0.66	27.2	C	LT	0.69	28.1	C					No significant adverse impact
Westbound	TR	0.32	20.1	C	TR	0.32	20.1	C					
Northbound	L	0.45	39.7	D	L	0.45	39.7	D					
	TR	0.58	16.8	B	TR	0.61	17.4	B					
	Intersection		20.3	C	Intersection		20.9	C					
First Avenue & East 65th Street													
Eastbound	LT	0.69	34.1	C	LT	0.72	35.5	D					No significant adverse impact
Northbound	TR	0.65	15.7	B	TR	0.68	16.1	B					
	Intersection		18.3	B	Intersection		18.9	B					

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = *de facto* Left Turn, LOS = Level of Service

Table 15-7
2017 No Build, Build, and Mitigated Conditions Construction PM Peak Hour Traffic Level of Service

	Construction No Build Condition				Construction Build Condition				Construction Mitigated Condition				
Intersection	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Recommended Mitigation Measures
York Avenue & East 79th Street													
Eastbound	LTR	1.03	84.9	F	LTR	1.03	85.8	F					Unmitigated
Westbound	LTR	0.44	36.6	D	LTR	0.44	36.6	D					
Northbound	LTR	1.20	132.5	F	LTR	1.28	167.6	F+					
Southbound	TR	0.94	54.1	D	TR	0.94	54.1	D					
	Intersection		87.0	F	Intersection		100.8	F					
York Avenue & East 75th Street													
Westbound	LTR	0.08	29.8	C	LTR	0.08	29.8	C					No significant adverse impact
Northbound	LTR	0.62	16.7	B	LTR	0.63	17.1	B					
Southbound	LTR	0.71	19.1	B	LTR	0.71	19.2	B					
	Intersection		18.2	B	Intersection		18.4	B					
York Avenue & East 74th Street													
Eastbound	LTR	0.61	37.6	D	LTR	0.64	38.8	D					No significant adverse impact
Westbound	LR	0.10	26.2	C	LR	0.11	26.4	C					
Northbound	TR	0.51	17.7	B	TR	0.53	18.0	B					
Southbound	LT	0.70	22.0	C	LT	0.70	22.2	C					
	Intersection		22.5	C	Intersection		22.9	C					
York Avenue & East 73th Street													
Westbound	LTR	0.25	47.4	D	LTR	0.47	55.1	E+	LTR	0.42	50.5	D	Shift 2 seconds of green time from the lead pedestrian interval (LPI) phase to the westbound phase and shift 1 second of green time from the LPI phase to the southbound phase.
Northbound	LTR	1.14	107.9	F	LTR	1.15	110.1	F	LTR	1.15	110.1	F	
Southbound	DefL	1.20	147.2	F	DefL	1.20	145.8	F	DefL	0.15	125.6	F	
	TR	1.02	61.2	E	TR	1.04	67.3	E+	TR	1.02	62.2	E	
	Intersection		96.7	F	Intersection		98.9	F	Intersection		94.5	F	
York Avenue & East 72th Street													
Eastbound	DefL	0.76	52.6	D	DefL	0.80	56.4	E					No significant adverse impact
	TR	0.49	35.3	D	TR	0.49	35.3	D					
	R	0.48	37.4	D	R	0.48	37.4	D					
Westbound	LTR	0.33	30.2	C	LTR	0.41	32.0	C					
Northbound	LTR	1.08	80.6	F	LTR	1.09	83.4	F					
Southbound	LTR	0.54	18.4	B	LTR	0.54	18.6	B					
	Intersection		52.9	D	Intersection		54.3	D					
York Avenue & East 71th Street													
Westbound	LTR	0.75	35.3	D	LTR	0.75	35.3	D					No significant adverse impact
Northbound	LTR	0.76	28.3	C	LTR	0.77	28.8	C					
Southbound	LTR	0.61	23.4	C	LTR	0.63	23.9	C					
	Intersection		29.1	C	Intersection		29.3	C					
York Avenue & East 66th Street													
Westbound	LTR	0.03	29.1	C	LTR	0.03	29.1	C					No significant adverse impact
Northbound	LTR	0.93	37.8	D	LTR	0.94	39.1	D					
Southbound	LTR	0.95	44.7	D	LTR	0.98	48.8	D					
	Intersection		41.9	D	Intersection		44.8	D					
York Avenue & East 65th Street													
Eastbound	LR	1.11	122.9	F	LR	1.11	122.9	F					No significant adverse impact
Northbound	T	0.47	13.8	B	T	0.47	13.8	B					
Southbound	T	0.59	15.9	B	T	0.61	16.2	B					
	Intersection		35.5	D	Intersection		35.4	D					
York Avenue & East 61st Street													
Westbound	L	0.36	29.0	C	L	0.36	29.0	C					No significant adverse impact
	LTR	0.64	33.6	C	LTR	0.64	33.6	C					
	R	0.66	38.2	D	R	0.66	38.2	D					
Northbound	LT	0.59	19.7	B	LT	0.59	19.7	B					
Southbound	TR	0.56	19.1	B	TR	0.57	19.3	B					
	Intersection		24.2	C	Intersection		24.3	C					
First Avenue & East 72nd Street													
Eastbound	DefL	0.72	39.4	D	DefL	0.80	48.9	D+	DefL	0.76	44.2	D	Shift 1 second of green time from the northbound phase to the eastbound/westbound phase.
	T	0.64	28.3	C	T	0.64	28.4	C	T	0.62	27.0	C	
Westbound	TR	0.45	21.9	C	TR	0.52	23.2	C	TR	0.51	22.2	C	
Northbound	L	0.50	40.8	D	L	0.50	40.8	D	L	0.50	40.8	D	
	TR	0.78	20.8	C	TR	0.78	20.8	C	TR	0.80	21.9	C	
	Intersection		23.5	C	Intersection		24.2	C	Intersection		24.4	C	
First Avenue & East 65th Street													
Eastbound	LT	1.11	105.0	F	LT	1.11	105.0	F					No significant adverse impact
Northbound	TR	0.85	20.6	C	TR	0.85	20.6	C					
	Intersection		34.4	C	Intersection		34.4	C					

Notes: L = Left Turn, T = Through, R = Right Turn, DefL = *de facto* Left Turn, LOS = Level of Service; + Denotes a significant adverse impact

York Avenue and East 73rd Street

The significant adverse impacts at the westbound approach and the southbound through/right-turn of this intersection could be fully mitigated by shifting 2 seconds of green time from the lead pedestrian interval (LPI) phase to the westbound phase and by shifting 1 second of green time from the LPI phase to the southbound phase.

First Avenue and East 72nd Street

The significant adverse impact at the eastbound *de facto* left-turn of this intersection could be fully mitigated by shifting 1 second of green time from the northbound phase to the eastbound/westbound phase.

Curb-Lane Closures and Staging

Similar to many other construction projects in New York City, temporary curb-lane and sidewalk closures are expected to be required adjacent to the project site, which would have dedicated gates, driveways, or ramps for delivery vehicle access. Flag-persons are expected to be present at these active driveway construction site entrances/exits, where needed, to manage the access and movement of trucks and to ensure no on-street queuing. Some of the Site deliveries and construction activities may alsowould occur along the perimeters of within the construction site fence-boundaries within delineated closed-off areas for concrete pour or steel delivery. 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. It is expected that traffic and pedestrian flow along all surrounding streets would be maintained throughout the entire construction period.

PARKING

The anticipated construction activities are projected to generate a maximum parking demand of 277 319 spaces during the 4th quarter of 20162nd quarter of 2017. Based on the parking analysis results presented in Chapter 9, "Transportation," with the proposed project, there would be a parking shortfall of 298 spaces within ¼-mile of the project site. Although the parking demand associated with construction workers commuting via auto would contribute minimally to the overall parking demand in the area, it can be expected that a parking shortfall may still occur during construction. Similarly during construction, there would be a parking shortfall of up to approximately 247 parking spaces within ¼-mile of the project site. However, as with the analysis results presented in Chapter 9, it is anticipated that the excess demand could be accommodated with a slightly longer walking distance beyond the ¼-mile radius. Furthermore, as stated in the *CEQR Technical Manual*, a parking shortfall resulting from a project located in Manhattan does not constitute a significant adverse parking impact, due to the magnitude of available alternative modes of transportation.

TRANSIT

Approximately half of the construction workers (51 percent) are estimated to travel to and from the construction site via transit. During peak construction (maximum of 690 793 average daily construction workers), this distribution would represent correspondingly up to 352 404 daily workers traveling by transit. With 80 percent of these workers arriving or departing during the construction peak hours, the estimated number of total peak hour transit trips would be 282 323 for the Build construction condition. These construction worker trips would occur outside of peak periods of transit ridership and would be distributed and dispersed to the nearby transit facilities, and would therefore not result in any significant adverse transit impacts during construction.

PEDESTRIANS

As summarized above, up to ~~690~~ 793 average daily construction workers were projected during peak construction. With 80 percent of these workers arriving or departing during the construction peak hours (6 to 7 AM and 3 to 4 PM), the corresponding numbers of peak hour pedestrian trips traversing the area's sidewalks, corners, and crosswalks would be up to ~~552~~ 634 under the Build construction condition. These trips are expected to have minimal effects on pedestrian operations during the construction peak hours. As discussed in Chapter 9, "Transportation," the proposed project would not result in any significant adverse pedestrian impacts at any of the analysis locations. Therefore, like the Build condition, travel by construction workers would not result in any significant adverse pedestrian impacts.

AIR QUALITY

Emissions from on-site construction equipment and on-road construction-related vehicles, as well as dust generating activities, have the potential to affect air quality. In general, much of the heavy equipment used in construction has diesel-powered engines and produces relatively high levels of nitrogen oxides (NO_x) and particulate matter (PM). Gasoline engines produce relatively high levels of carbon monoxide (CO). Fugitive dust generated by construction activities is composed of particulate matter. As a result, the primary air pollutants of concern for construction activities include nitrogen dioxide (NO_2), particulate matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}) and less than or equal to 2.5 micrometers ($PM_{2.5}$), and CO.

The *CEQR Technical Manual* lists several factors for consideration in determining whether a detailed quantified on-site and/or off-site construction impact assessment for air quality is appropriate. For on-site assessment, these factors include the duration of construction tasks, the intensity of construction activities, the location of nearby sensitive receptors (such as residences), and the use of emissions control measures. For off-site assessment, the factors include the need for a detailed transportation analysis. All of these factors have been taken into consideration in the construction air quality preliminary assessment undertaken for this project, which, as detailed in the following sections, concludes that a quantified analysis of on-site construction activities is not warranted, and the project would not result in significant adverse construction-period air quality impacts.

ON-SITE SOURCES

Duration

In terms of air pollutant emissions, the most intense construction activities are demolition, excavation and foundation work, where a number of large non-road diesel engines would be employed. Demolition of the existing structures at the project site is expected to take ~~three~~ six months to complete. The excavation and foundation work for the proposed project would take approximately 16 months to complete. Although core and shell construction, interior and finishing, and landscaping would continue after excavation and foundation work is complete, those efforts would result in much less emissions since heavy duty diesel equipment such as excavators and drill rigs associated with excavation and foundation work would no longer be needed on-site. The equipment that would be operating in these later tasks would mostly be small in engine size and/or dispersed vertically throughout the building, resulting in very low concentration increments in adjacent areas. While the construction period of the proposed buildings may take up to approximately five years (i.e., from 2014 to 2018) to complete, the most intense construction activities (demolition/excavation/foundation work) in terms of air pollutant emissions would last for only a portion of this duration, taking approximately 19 months. Although the complexity of the proposed projects requires a relatively long construction period, the emissions intensity over the duration of construction would be lower as described below.

Intensity

During the construction of the proposed project, a handful of large non-road diesel engines would operate throughout the construction site. The only engines expected to remain stationary for long periods of time are the tower cranes. Given the elevation of the tower crane engines, their locations relative to nearby sensitive elevated locations (as discussed below), and the emissions controls that would be implemented, the tower cranes would not result in substantial concentration increments. Other engines would generally move throughout the site, although a concrete pump would be located in one location during concrete pours. Based on the sizes of the proposed project buildings and the nature of the construction work involved, construction activities for the proposed project would not be considered out of the ordinary in terms of intensity, and in fact, emissions would be lower due to the emission control measures that would be implemented during construction of the proposed project (see “Emission Control Measures,” below).

Location of Nearby Sensitive Receptors

Generally, the site is located at some distance away from sensitive uses, with the Con Edison Steam Plant to the north of the construction site, the FDR Drive to the east of the construction site, and no sensitive uses immediately to the west of the construction site during the demolition, excavation, and foundation work of the proposed project. The nearest sensitive locations are the residential building located across East 73rd Street approximately 55 feet south of the construction site (its lower levels consist of garage and service uses with residential uses beginning several floors above East 73rd Street) and the East River Esplanade located across the FDR Drive approximately 70 feet east of the project site. There are also residential locations along East 73rd Street and the Epiphany Community Nursery School on East 74th Street more than 100 feet west of the proposed site. Such distance between the emissions sources and these sensitive locations would result in enhanced dispersion of pollutants and, therefore, potential concentration increments from on-site sources at such locations would be reduced. In addition, the esplanade is for transient use and people would not be expected to be present for extended durations.

In the future with or without the proposed project, construction of the HSS building is expected to occur on the adjacent site to the west. Portions of that construction period may overlap with construction on the proposed project. However, as stated above, potential concentration increments due to the proposed project would be considerably reduced by dispersion due to the increased distance between the proposed project site and the receptors. This would occur regardless of construction on the intervening site. Therefore, no significant adverse air quality impacts would occur due to the combined construction impacts of the HSS building and the proposed project.

Emission Control Measures

To ensure that the construction of the proposed project results in the lowest practicable diesel particulate matter (DPM) and dust emissions, the proposed project would implement an emissions reduction program for all construction activities to the extent practicable, consisting of the following components:

- *Diesel Equipment Reduction.* Construction of the proposed project would minimize the use of diesel engines and use electric engines, to the extent practicable. The applicant would apply for a grid power connection early on so as to ensure the availability of grid power, reducing the need for on-site generators, and require the use of electric engines in lieu of diesel where practicable.
- *Clean Fuel.* Ultra-low sulfur diesel (ULSD) would be used exclusively for all diesel engines throughout the construction sites.
- *Best Available Tailpipe Reduction Technologies*. Nonroad diesel engines with a power rating of 50 horsepower (hp) or greater and concrete mixing and pumping trucks and other controlled truck fleets (i.e., truck fleets under long-term contract with the project) ~~including but not limited to concrete mixing and pumping trucks,~~ would utilize the best available tailpipe (BAT) 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. Construction contracts would specify that all diesel nonroad engines rated at 50 hp or greater would utilize DPFs, either installed on the engine by the original equipment manufacturer (OEM) or retrofit with a DPF verified by EPA or the California Air Resources Board, and may include active DPFs if necessary; or other technology proven to ~~reduce DPM by at least 90 percent~~ achieve an equivalent emissions reduction.
- *Utilization of Newer Equipment.* EPA's Tier 1 through 4 standards for nonroad engines regulate the emission of criteria pollutants from new engines, including PM, CO, NO_x, and hydrocarbons (HC). All nonroad construction equipment in the proposed project with a power rating of 50 hp or greater would meet at least the Tier 3 emissions standard. Tier 3 NO_x emissions range from 40 to 60 percent lower than Tier 1 emissions and considerably lower than uncontrolled engines. All nonroad engines in the project rated less than 50 hp would meet at least the Tier 2 emissions standard.
- *Dust Control.* Fugitive dust control plans would 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 construction site. Truck routes within the site would be watered as needed to avoid the re-suspension of dust. All trucks hauling loose material would be equipped with tight fitting tailgates and their loads securely covered prior to leaving the site. In addition to regular cleaning by the City, streets adjacent to the site would be cleaned as frequently as needed by the construction contractor. Water sprays would be used for all transfer of spoils to ensure that materials are dampened as necessary to avoid the suspension of dust into the air. In addition, all necessary measures would be implemented to ensure that the New York City Air Pollution Control Code regulating construction-related dust emissions is followed.
- *Source Location.* In order to reduce the resulting concentration increments, large emissions sources and activities such as concrete trucks and pumps would be located away from residential buildings, academic locations, and publicly accessible open spaces to the extent practicable and feasible.

- *Idle Restriction.* In addition to adhering to the local law restricting unnecessary idling on roadways, on-site ~~vehicle~~ engine idle time would also be restricted to three minutes for all equipment and vehicles that are not using their engines to operate a loading, unloading, or processing device (e.g., concrete mixing trucks) or otherwise required for the proper operation of the engine.

Overall, the proposed emission reduction program is expected to significantly reduce DPM emissions consistent with the goals of the currently best available control technologies under New York City Local Law 77, which are required only for publicly funded City projects. Accordingly, a detailed qualitative rather than quantitative air quality analysis was provided to assess the potential impacts of on-site construction activities.

OFF-SITE SOURCES

Generally, if a transportation analysis is not needed with regard to construction activities, an air quality assessment of construction vehicles is likely not warranted. As demonstrated above under "Transportation," ~~construction of the proposed project does not require a transportation analysis.~~ the construction would not result in increases in vehicle volumes higher than those identified in the operational condition. In addition, the construction would not result in substantial lane or roadway closures, or traffic diversions. As discussed in Chapter 10, "Air Quality," no significant adverse impacts are predicted due to operational mobile sources. Therefore, construction of the proposed project would not result in significant adverse air quality impacts related to vehicular traffic, and further mobile-source analysis is not required.

CONCLUSION

Therefore, based on analysis of all of the factors affecting construction emissions, on-site and off-site construction activities due to construction of the project would not result in any significant adverse impact on air quality.

NOISE AND VIBRATION

NOISE

Introduction

Impacts on community noise levels during construction of the proposed project could result from noise from construction equipment operation and from construction and delivery vehicles traveling to and from the construction 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 vary widely and depend 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 the movements of trucks to and from the project site, as well as impact equipment such as excavators with ram hoes, pile rigs, rock drills, tower cranes, and paving breakers.

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 there is a claim of undue hardship 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.

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 (the "intensity") would occur continuously for approximately two years or longer (the "duration"). 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 following criteria to define a significant adverse noise impact from mobile and on-site construction activities:

- If the No Action noise level is less than 60 dBA $L_{eq(1)}$, a 5 dBA $L_{eq(1)}$ or greater increase would be considered significant.
- If the No Action noise level is between 60 dBA $L_{eq(1)}$ and 62 dBA $L_{eq(1)}$, a resultant $L_{eq(1)}$ of 65 dBA or greater would be considered a significant increase.
- If the No Action noise level is equal to or greater than 62 dBA $L_{eq(1)}$, 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 dBA $L_{eq(1)}$.

Noise Analysis Fundamentals

Construction activities for the proposed project would be expected to result in increased noise levels as a result of: (1) the operation of construction equipment on-site; and (2) the movement of construction-related vehicles (i.e., worker trips, and material and equipment trips) on the roadways to and from the project site.

Noise from the operation of construction equipment on-site at a specific receptor location near a construction site is generally 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 following:

- 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 following:

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

Construction Noise Modeling

Noise effects from construction activities were evaluated using the Cadna A 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), transportation sources (e.g., roads, highways, railroad lines, busways, airports), and other specialized sources (e.g., sporting facilities). 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 Cadna A 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 Cadna A model is a state-of-the-art tool for noise analysis and is approved for construction noise level prediction by the *CEQR Technical Manual*.

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 operating at full power) for each piece of construction equipment operating at the project site, 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. In addition, 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, as well as the contribution from each noise source.

Determination of No Action and Non-Construction Noise Levels

Noise generated by construction activities is added to noise generated by non-construction traffic on adjacent roadways in order to determine the total noise levels at each receptor location. Existing noise levels were conservatively used as the baseline noise levels for determining construction-generated noise level increases. Existing noise levels at the analysis receptors were determined by:

- Performing noise measurements at various at-grade locations;
- Calculating noise levels at the receptor sites and measurement locations using the CadnaA model with existing site geometry and existing traffic on adjacent roadways as inputs;
- Determining adjustment factors based on the difference between the measured and calculated existing noise levels at the measurement locations; and
- Applying the adjustment factors to the calculated existing noise levels at the construction noise receptors.

Analysis Periods

As described above, construction activities are expected to take place over a period of about 5 years (i.e., from 2014 through 2018). Except for unusual circumstances construction activities would occur on weekdays only. Therefore, construction noise analyses were performed only for the weekday AM time period since more construction truck deliveries would be made and construction activities in general would be more intense during the morning period.

Anticipated construction schedule and durations were developed by Turner Construction Company, an experienced New York City construction manager, and are representative of the reasonable worst-case conditions for assessing potential impacts. The schedule included projections of the number of workers, types and number of pieces of equipment, and number of construction vehicles anticipated to be operating during each month of the construction period. An analysis was performed based on this construction schedule to determine the quarters (i.e., the 3 month time period) during the construction period (i.e., 2014-2018) when the maximum potential for significant noise impacts would occur. This analysis conservatively assumed that the worst-case quarter of each year would represent the entire year, and the year was modeled according to its peak quarter, with the exception of 2015, in which two quarters were analyzed to reflect the high variation in the level of construction activity during that year.

In addition, to be conservative, the noise analysis assumed that both peak on-site construction activities and peak construction-related traffic conditions occurred simultaneously.

~~*Location of Nearby Sensitive Receptors*~~

~~As discussed above in “Air Quality,” the site is located at some distance away from sensitive uses, with the Con Edison Steam Plant to the north of the project site, the FDR Drive to the east of the project site, and no sensitive uses immediately to the west of the project site during the demolition, excavation, and foundation work of the proposed project. The nearest sensitive location is a residential building located across East 73rd Street approximately 55 feet south of the project site. Its lower levels consist of garage and service uses with residential uses beginning at the fourth floor above East 73rd Street. There are also residential locations along East 73rd Street and the Epiphany Community Nursery School on East 74th Street more than 100 feet west and south of the construction site.~~

~~The next closest sensitive receptor is the existing East River Esplanade east of the project site across from the FDR Drive, which is located approximately 70 feet from the project site and is separated from the project site by the FDR Drive.~~

Noise Reduction Measures

Construction of the proposed project would be required to follow the requirements of the New York City Noise Control Code (New York City Noise Code) for construction noise control measures. Specific noise control measures would be described in a noise mitigation plan required under the New York City Noise Code. These measures would include a variety of source and path controls.

In terms of source controls (i.e., reducing noise levels at the source or during the most sensitive time periods), the following measures would be implemented in accordance with the New York City Noise Code:

- Equipment that meets the sound level standards specified in Subchapter 5 of the New York City Noise Control Code would be used from the start of construction. **Table 15-~~6~~8** shows the noise levels for typical construction equipment and the mandated noise levels for the equipment that would be used for construction of the proposed project.

- As early in the construction period as logistics will allow, diesel- or gas-powered equipment would be replaced with electrical-powered equipment such as welders, water pumps, bench saws, and table saws (i.e., early electrification) to the extent feasible and practicable.
- Where feasible and practical, construction sites would be configured to minimize back-up alarm noise. In addition, all trucks would not be allowed to 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 mufflers.

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

- Where logistics allow, noisy equipment, such as cranes, concrete pumps, concrete trucks, and delivery trucks, would be located away from and shielded from sensitive receptor locations. Once building foundations are completed, delivery trucks would operate behind a construction fence, where possible;
- Noise barriers would be utilized to provide shielding (e.g., the construction sites would have a minimum 15-foot barrier and, where logistics allow, truck deliveries would take place behind these barriers once building foundations are completed); and
- Path noise control measures (i.e., portable noise barriers, panels, enclosures, and acoustical tents, where feasible) would be used for certain dominant noise equipment to the extent feasible and practical (i.e., asphalt pavers, drill rigs, excavators with ram hoe, and hoists). These barriers are conservatively assumed to offer only a 10 dBA reduction in noise levels for each piece of equipment to which they are applied, as shown in **Table 15-~~6~~8**. The details for construction of portable noise barriers, enclosures, tents, etc. are based upon DEP Citywide Construction Noise Mitigation.

Table 15-68
Typical Construction Equipment Noise Emission Levels (dBA)

Equipment List	DEP and FTA Typical Noise Level at 50 feet[1]	Mandated Noise Level at 50 feet[2] Under Subchapter 5 of the NYC Noise Control Code	Noise Level with Path Controls at 50 feet[3]
Asphalt Paver	85	85	75
Asphalt Roller	85	74	
Backhoe/Loader	80	77	
Compressors	80	67	
Concrete Pump	82	79	
Concrete Trucks	85	79	
Cranes	85	77	75
Cranes (Tower Cranes)	85	85	75
Delivery Trucks	84	79	
Drill Rigs	84	84	74
Dump Trucks	84	79	74
Excavator	85	77	75
Excavator with Ram Hoe	90	90	80
Fuel Truck	84	79	
Generators	82	68	
Hoist	85	80	70
Jackhammer	85	8273	72
Mortar Mixer	80	63	
Pile Driver	101	95	73[4]
Pump (Spray On Fire Proof)	82	76	
Pump (Water)	77	76	
Rebar Bender	80	80	
Rivet Buster	85	85	75
Rock Drill	85	85	75
Saw (Chain Saw)	85	75	
Saw (Concrete Saw)	90	85	75
Saw (Masonry Bench)	85	76	
Saw (Circular & Cut off)	76	76	
Saw (Table Saw)	76	76	
Tractor Trailer	84	79	
Welding Machines	73	73	

Notes:
1 Sources: Citywide Construction Noise Mitigation, Chapter 28, Department of Environmental Protection of New York City, 2007. Transit Noise and Vibration Impact Assessment, FTA, May 2006.
2 Mandated noise levels are achieved by using quieter equipment, better engine mufflers, and refinements in fan design and improved hydraulic systems.
3 Path controls include portable noise barriers, enclosures, acoustical panels, and curtains, whichever feasible and practical. These path controls would be used for certain dominant noise equipment to the extent feasible and practical (i.e., asphalt pavers, cranes, drill rigs, etc.)
4 Based on information from noise bellow system manufacturer.

~~Previous construction noise analyses have shown that construction with measures such as these usually results in noise levels in the mid 70s of dBA within approximately 100 feet from the construction site, which includes trucks and construction vehicles entering and exiting the site. This estimated construction noise level described above is based on various analyses of construction noise associated with large-scale single multi-building developments in New York City, including Seward Park, Riverside Center, and Domino Sugar. Only the construction source levels for this project were based on previous quantitative analyses, so specific background noise levels and distance to receptors for those other projects are not factors in this analysis. The source levels between one single building site from one of those other projects and this project would be expected to be similar since the types and number of construction equipment would be comparable (for individual building parcels, not a project-wide basis). However, because this project had only one building site and a much shorter construction duration, a quantitative analysis to examine potential impacts from overlapping construction sites is not necessary. Furthermore, the project already would incorporate a variety of source and path controls as described above. The mid-70s~~

of dBA represents the amount of noise generated during the most noise-intensive construction activities, including demolition, excavation, and foundation work by equipment such as pile drivers, excavators, cranes, concrete pumps, concrete trucks, concrete trowels, hoe rams, drill rigs, dump trucks, delivery trucks, compressors, generators, and other equipment. On any particular construction site, there is a limited amount of heavy equipment that can operate simultaneously and, therefore, a limited amount of equipment that can be located in close proximity to any one receptor location. The amount of equipment on-site during the demolition/excavation/foundation work associated with the proposed project would be comparable to the amount of equipment used for other large-scale construction projects in New York City, and would therefore be expected to generate comparable noise levels at its boundary.

Receptor Sites

Three (3) noise measurement locations (i.e., sites 1 to 3) were selected to determine the baseline existing noise levels, and sixty-one (61) receptor locations (i.e., sites A through MMMM) close to the project area were selected as discrete noise receptor sites for the construction noise analysis. These receptors were either located directly adjacent to the project site or streets where construction trucks would pass. Each receptor site was the location of a residence or other noise-sensitive use. At some buildings, multiple building façades were analyzed. At high-rise buildings, noise receptors were selected at multiple elevations. At open space locations, receptors were selected at street level. **Figure 15-8** shows the locations of the sixty-one (61) noise receptor sites, and **Table 15-9** lists the noise receptor sites and the associated land use at each site. The receptor sites selected for detailed analysis are representative of other noise receptors in the immediate project area and are the locations where maximum project impacts due to construction noise would be expected.

Construction Noise Analysis Results

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 during each year of construction.

The noise analysis results in Table 4, **Appendix E** show that predicted noise levels due to construction-related activities would result in increases in noise levels that would exceed the CEQR impact criteria during one or more years at thirteen (13) of the sixty-one (61) existing receptor sites.

For impact determination purposes, the significance of adverse noise impacts is determined 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 one year or less may be noisy and intrusive, they are generally not considered to be significant adverse noise impacts.

The noise analysis results show that predicted noise levels would exceed the CEQR impact criteria on one or more floors at eight (8) of the sixty-one (61) existing receptor sites representing twelve (12) separate building façades. **Figure 15-8** shows the receptor locations and **Table 15-10** summarizes analysis results where predicted noise level increases exceed the CEQR impact criteria (additional results of the construction analysis are presented in Table 4, **Appendix E**).

5.17.13

Project Site

67A *Existing Noise Receptor*

Measured Noise Receptor

Existing Locations Predicted to Experience two or more Years of Exceedance of CEQR Noise Impact Criteria

Existing Noise Receptor Locations

Figure 15-8

Table 15-9
Noise Receptor Locations

Receptor	Location	Associated Land Use
A	506 East 73rd Street	Residential
B	504 East 73rd Street	Residential
C	502 East 73rd Street	Residential
D1-D2	1368 York Avenue	Mixed Residential and Commercial
E1-E3	511 East 73rd Street	Residential
F1-F3	509 East 73rd Street	Residential
G1-G3	507 East 73rd Street	Residential
H1-H3	503 East 73rd Street	Mixed Residential and Commercial
J1	1370 York Avenue	Mixed Residential and Commercial
K1-K3	510 East 74th Street	Public Facilities and Institutions
L1-L2	506 East 74th Street	Commercial and Office Buildings
M1-M2	1384 York Avenue	Mixed Residential and Commercial
N1-N3	1394 York Avenue	Residential
O1-O2	519 East 75th Street	Residential
P1-P2	517 East 75th Street	Residential
Q1-Q2	515 East 75th Street	Residential
R1-R2	513 East 75th Street	Residential
S1-S2	511 East 75th Street	Residential
T	507 East 75th Street	Public Facilities and Institutions
U	503 East 75th Street	Public Facilities and Institutions
V1-V2	1414 York Avenue	Mixed Residential and Commercial
W1-W3	541 East 72nd Street	Residential
X1-X2	535 East 72nd Street	Residential
Y1-Y2	531 East 72nd Street	Residential
Z1-Z3	527 East 72nd Street	Residential
AA	1420 York Avenue	Mixed Residential and Commercial
BB	1410 York Avenue	Residential
CC	1380 York Avenue	Residential
DD	1376 York Avenue	Residential
EE	1372 York Avenue	Mixed Residential and Commercial
FF	1364 York Avenue	Mixed Residential and Commercial
GG	1360 York Avenue	Residential
HH1-HH2	1393 York Avenue	Public Facilities and Institutions
JJ1	1409 York Avenue	Mixed Residential and Commercial
KK	1413 York Avenue	Mixed Residential and Commercial
LL	1431A York Avenue	Mixed Residential and Commercial
MM	1435 York Avenue	Residential
NN	1441 York Avenue	Mixed Residential and Commercial
OO	446 East 77th Street	Mixed Residential and Commercial
PP1-PP4	530 East 73rd Street	Residential
QQ1-QQ4	521 East 72nd Street	Commercial and Office Buildings
SS1-SS5	515 East 72nd Street	Mixed Residential and Commercial
TT1-TT3	530 East 72nd Street	Residential
UU1-UU4	525 East 71st Street	Residential
VV1-VV3	521 East 72nd Street	Residential
WW1-WW2	511 East 72nd Street	Public Facilities and Institutions
XX1-XX3	520 East 71st Street	Residential
YY1-YY3	511 East 71st Street	Public Facilities and Institutions
ZZ1-ZZ4	1334 York Avenue	Commercial and Office Buildings
AAA1-AAA3	527 FDR Drive	Public Facilities and Institutions
BBB1	512 East 71st Street	Public Facilities and Institutions
CCC1-CCC4	505 East 70th Street	Public Facilities and Institutions
DDD1-DDD3	1339 York Avenue	Public Facilities and Institutions
EEE1-EEE3	1365 York Avenue	Residential
FFF1-FFF3	1385 York Avenue	Mixed Residential and Commercial
GGG1-GGG2	1401 York Avenue	Residential
HHH1-HHH4	530 East 76th Street	Mixed Residential and Commercial
JJJ1-JJJ4	506 East 76th Street	School
KKK1-KKK11	519 East 76th Street	Residential
LLL1-LLL3	509 East 77th Street	Residential
MMM1-MMM4	519-555 East 78th Street	Residential

Table 15-10
Locations Where Noise Increases Exceed CEQR Criteria for Two or More Consecutive Years

Building/ Location	Associated Land Use	Total Stories	Façade	Associated Receptor(s)	Impacted Floor(s)	Maximum Increase in dBA	Impact Duration (years)
506 East 73rd Street	Residential	2	North	A	All	4.8	2
511 East 73rd Street	Residential	6	South	E1	3-6	6.4	3
			East	E2	4-6	8.6	2
			West	E3	5-6	7.1	2
509 East 73rd Street	Residential	6	South	F3	5-6	5.0	2
507 East 73rd Street	Residential	6	South	G3	6	4.1	3
510 East 74th Street	School	4	North	K1	2-4	7.9	3
506 East 74th Street	Commercial and Office Buildings	5	North	L1	5	6.6	2
530 East 73rd Street	Residential	50	North	PP1	5-45	7.5	5
			West	PP2	5-40	12.6	5
521 East 72nd Street	Commercial and Office Buildings	9	North	QQ1	3-9	10.6	5
			East	QQ2	9	7.7	4

The conceptual schedule on which the noise analysis was based assumes a conservative potential timeline for construction that tended to show the most construction activity and most construction equipment operating simultaneously, which conditions would result in the largest increase in noise levels at the nearby receptors. Actual construction activities may take place over a longer time period, and result in lower noise levels over a longer period of time than those predicted for the worst-case conditions analyzed.

In addition, as discussed above, the construction noise analysis was performed using the quarter of each year that is anticipated to result in the maximum construction noise levels. The analysis conservatively assumed that this worst-case quarter would represent construction noise levels throughout the entire year. During times of less intense construction activity, construction noise levels are anticipated to be less. For instance, pile driving at any particular building site would be expected to last only two to three months depending on the building, and even shorter durations for each pile location within the building site. Consequently, an individual receptor location would experience pile driving noise for only a limited period of time out of the construction period. Furthermore, many of the loudest pieces of construction equipment, including excavators, asphalt paving equipment, concrete trowels, concrete trucks, portable cement mixers, etc., are mobile, and are moved throughout the site during days and months of construction. The construction analysis considers a reasonable worst-case scenario with all mobile equipment in the locations that would tend to generate the most noise at the adjacent receptors. Such a scenario, and the high noise levels associated with it, as have been examined in this noise analysis, would be likely to occur only during limited times throughout the construction period, and thus represent a conservative analysis

At the locations predicted to experience exceedance of the CEQR impact criteria, the exceedance would be due principally to noise generated by on-site construction activities (rather than construction-related traffic). As previously discussed, this noise analysis examined the reasonable worst-case peak hourly noise levels that would result from construction, and consequently is conservative in predicting significant increases in noise levels. Furthermore, this analysis is based on a conceptual site plan and construction schedule. It is possible that the actual construction may be of lesser magnitude, or that construction on multiple development sites may not overlap, in which case construction noise would be less intense than the analysis predicts.

All of the buildings listed in **Table 15-10** have double-glazed windows and alternate ventilation (i.e., air conditioners). For buildings with double-glazed windows and window air conditioners, interior noise levels would be approximately 20 to 25 dBA less than exterior noise levels, and for buildings with double-glazed windows and well-sealed through-the-wall/sleeve/PTAC [1] air conditioners interior noise levels would be approximately 25 to 30 dBA less than exterior noise levels. The typical attenuation provided by double-glazed windows and the alternate ventilation outlined above would be expected to result in interior noise levels during most of the time that are below 45 dBA $L_{10(1)}$ (the CEQR acceptable interior noise level criteria for residential and community facility uses; the interior noise level criteria for commercial uses is an $L_{10(1)}$ value of 50 dBA). However, although these structures have double-glazed windows and alternate ventilation, during some limited time periods (i.e., the periods when exterior $L_{10(1)}$ noise levels due to construction exceed 75 dBA, as shown in Table 4, **Appendix E**) construction activities may result in interior noise levels that would be above the 45 dBA $L_{10(1)}$ noise level recommended by CEQR for these uses.

Simultaneous Construction at the HSS

In the future with or without the proposed project, construction of the HSS building would occur on a site west of the proposed project site. Consequently, the noise analysis considers both the times when construction at both sites would overlap and times when construction would occur only at the proposed project site. Since the exact schedule of the HSS building construction is not currently known, the peak level of noise that would be expected to result from construction of the HSS building was calculated according to the methodology described above, and considered as though it could occur at any time during the construction of the proposed project. The results of the combined construction analysis are shown in Table 5, **Appendix E**.

Because construction of the HSS building would occur independent of the proposed project, the HSS building's construction noise would be included in the No Build noise level. The construction noise analysis above conservatively considers No Build noise levels without influence from construction of the HSS building, if the HSS building construction were included, the No Build background noise levels at some receptor locations would have been higher, and thus the construction noise increments lower.

However, if the peak construction activity on the HSS building occurs during the construction of the proposed project, the analyzed receptor locations may experience higher overall noise levels than those with construction of the proposed project by itself, even though the noise level increments resulting from the proposed project would be smaller. At some locations immediately adjacent to the HSS project site, during simultaneous construction of both the HSS building and the proposed project, noise levels may be in the low 80s dBA during peak construction activities. However, these noise levels are not perceptibly higher than those with construction of the HSS building , and occur primarily at receptors that would experience a large amount of construction noise resulting from the HSS building's construction and relatively little construction noise from the proposed project. At receptors predicted to experience noticeable changes in noise level resulting from construction of the proposed project, the additional noise level increment from the HSS building's construction would be considerably smaller.

[1] Package Terminal Air-Conditioner

If the HSS building is completed while construction of the proposed project is ongoing, the HSS building would provide shielding for residential and school receptors west of the project site, and these receptors would consequently experience substantially less construction noise than predicted by the noise analysis presented here. Additionally, if the HSS building is completed and occupied while construction of the proposed project is ongoing, it would be expected to experience noise levels comparable to what would have been experienced by those receptors to the west of the project site, in the high 60s to low 70s dBA. However, the HSS building is new construction and would be expected to include double-glazed windows and an alternate means of ventilation providing at least 30 dBA of window/wall attenuation, resulting in interior noise levels within the acceptable range according to CEQR interior noise level criteria.

Throughout the construction period, vehicles including construction related trucks and vehicles driven by workers at the construction site would travel to and from the project site. Most of these vehicles would be expected to use the FDR Drive, First Avenue, Second Avenue, and York Avenue. These large roadways are already heavily trafficked, and the construction traffic would therefore not result in substantially increased noise at locations along these roadways. Some vehicles associated with construction of the proposed project would use 79th Street, 72nd Street, and 65th Street, although further away from the project, the vehicles would be distributed amongst the different routes to and from the project, and the concentration of construction traffic would be low compared to the existing and No Build traffic levels on these streets. Consequently, the analysis focuses on noise receptors adjacent to the site and the roadways immediately surrounding the site.

The most noise-intensive construction activities (demolition/excavation/foundation work) would last for only approximately 19 months. As discussed above, the analysis looks first at the intensity of noise levels during construction, then assesses the potential duration of those noise levels, and finally makes a determination of the potential for impact.

In the future with or without the proposed project, construction of the HSS building would occur on a site, immediately west of the proposed project site. Consequently, the noise analysis considers both the times when construction at both sites would overlap and times when construction would occur only at the proposed project site.

Intensity of Construction Noise

Residential locations along East 73rd Street and the Epiphany Community Nursery School on East 74th Street west and south of the construction site represent the locations most likely to experience increased noise levels resulting from the operation of stationary construction equipment. The site of the HSS building to the west is between the proposed project site and the residential and school uses. Assuming comparable construction activities at both construction sites, the noise levels due to the proposed project at the receptor locations would be less than those from the intervening site, because of the increased distance between source and receptors. Noise level increases due to the proposed project would be less than 3dBA, which would not be considered an impact according to the *CEQR Technical Manual* noise impact criteria.

During the times when construction would occur only at the proposed project site, with the construction noise control measures described, noise levels during construction would be approximately in the mid to high 70s dBA at these locations. Measured existing noise levels at these locations were in the mid 60s dBA, and would be expected to remain unchanged in the future without the proposed project. Consequently, noise generated by on-site construction activities would be expected to result in exceedances of the *CEQR Technical Manual* noise impact criteria at these locations. Although detailed information about the construction program for HSS was not available, the chapter considers the possibility of simultaneous or subsequent construction of the proposed project and HSS. During the short time when construction at the proposed project and at the HSS building to the west could potentially overlap, noise generated by on-site construction activities at both project sites could result in exceedances of the *CEQR Technical Manual* noise impact criteria at these locations as well. Therefore, these residential and school receptors west and south of the project site on East 73rd and 74th Streets are discussed further in the following section "Duration of Construction Noise." To the extent that the independent construction on the adjacent site is delayed or proceeds in advance of the proposed project, there may be a structure on the adjacent site that would provide noise shielding similar to a noise barrier.

At the East River Esplanade, which is located approximately 70 feet east of the construction site and is separated from the site by the FDR Drive, noise levels due to construction would be approximately in the mid 70s dBA. Noise levels at the esplanade from the construction of the proposed project would be imperceptible in comparison to the existing noise levels resulting from traffic on the FDR Drive which are currently in the high 70s dBA and would be expected to remain as such in the future conditions without the proposed project. Consequently, only minimal or no exceedences of 2012 *CEQR Technical Manual* impact criteria would be expected to occur and no significant adverse noise impacts would be expected at this location. Therefore, the East River Esplanade is not discussed further.

Duration of Construction Noise

The noisiest construction activities would include the demolition, excavation, and foundation work; this work is expected to last approximately 19 months (as shown in **Appendix E**). Some of that time would be expected to overlap with construction of the HSS building on the adjacent site, during which construction of the proposed project would not result in any exceedances of the *CEQR Technical Manual* noise impact criteria. The construction of the HSS building to the west, being much smaller than the proposed project, would be expected to have a much shorter construction duration than the proposed project, such that even if both projects' construction durations were to overlap, the overall construction period would be less than 24 months. The later phases of construction of the proposed project, including core and shell construction and interiors and finishing, would require much less heavy construction equipment, and would be better shielded from the nearby sensitive receptors by the buildings being constructed. Construction equipment with higher noise levels such as pile drivers, drill rigs, excavators, etc. will not be used during the core and shell construction. In addition, fewer dump trucks would travel to and from the site during core and shell construction than during demolition, excavation, and foundation activities. Therefore, the core and shell construction activities would be expected to result in noise levels substantially less than demolition/excavation/foundation work. Equipment used during interiors and finishing would mainly include a variety of small hand-held tools. In addition, most of the construction activities would occur within the buildings so this stage of construction is usually the quietest. Therefore, during these later phases of construction, the noise levels from construction would not be expected to result in exceedances of the *CEQR Technical Manual* noise impact criteria. Consequently, exceedances of the *CEQR Technical Manual* noise impact criteria that would occur at residential and school receptors west and south of the project site on East 73rd and 74th Streets would not be expected to occur continuously for 24 months. Therefore, while the noise level increases may be perceptible and intrusive, they would not be considered "long-term" or significant according to CEQR criteria. Therefore, the residential and school locations west and south of the project site are not discussed further.

~~*Construction Noise Impacts*~~

~~No significant adverse noise impacts would result from construction noise at residential and school receptors west and south of the project site on East 73rd and 74th Street, the East River Esplanade, or at sensitive receptors north of the project site.~~

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 receiver 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 receiver, the characteristics of the transmitting medium, and the receiver building construction. 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 fragile and possibly historically significant structures or buildings, construction activities generally 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 quantify potential vibration impacts of construction activities on structures and residences near the project site.

Construction Vibration Criteria

For purposes of assessing potential structural or architectural damage, the determination of a significant impact is based on the vibration impact criterion used by LPC of a peak particle velocity (PPV) of 0.50 inches/second. For non-fragile buildings, vibration levels below 0.60 inches/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.

Construction Vibration Analysis Results

The structure of most concern with regard to the potential for structural or architectural damage due to vibration is the Con Edison Steam Plant located across East 74th Street to the north of the project site and the garage at 524 East 73rd Street south of the project site. These two known architectural resources are determined to be eligible for listing on the S/NR by OPRHP and are located within 90 feet of the proposed project. As ~~an~~ S/NR- or NYCL-eligible architectural resources, ~~this~~ these structures would require the application of the more stringent vibration criteria described above for such resource (the LPC criteria of 0.50 inches/second PPV). However, as a result of the distance between ~~this~~ these resources and the construction site, vibration levels at ~~this~~ these structures, as well as other less-sensitive nearby structures, would not be expected to exceed the 0.50 inches/second PPV limit. As described in Chapter 5, “Historic and Cultural Resources,” a CPP would be prepared to avoid inadvertent construction-related impacts on these structures. The CPP would contain measures to avoid construction-related impacts including ground-borne vibration and accidental damage from heavy machinery as appropriate. The CPP would be developed in consultation with LPC and OPRHP and implemented by a professional engineer prior to demolition or construction activities.

Use of construction equipment that would have the most potential to exceed the 65 VdB criterion at sensitive receptor locations (e.g., equipment used during pile driving and rock blasting) would be perceptible and annoying. Therefore, for limited time periods, perceptible vibration levels may be experienced by occupants and visitors to all of the buildings and locations on and immediately adjacent to the construction sites. However, the operations that would result in these perceptible vibration levels would only occur for finite periods of time at any particular location and, therefore, the resulting vibration levels, while perceptible, would not considered to be significant adverse impacts.

OTHER TECHNICAL AREAS

LAND USE AND NEIGHBORHOOD CHARACTER

Construction activities would affect land use on the project site but would not alter surrounding land uses. As is typical with construction projects, during periods of peak construction activity there would be some disruption, predominantly noise, to the nearby area. There would be construction trucks and construction workers coming to the construction sites. There would also be noise, sometimes intrusive, from building construction as well as trucks and other vehicles backing up, loading, and unloading. These disruptions would be temporary in nature and would have limited effects on land uses within the study area, particularly as most construction activities would take place within the project site or within portions of sidewalks, curbs, and travel lanes of public streets immediately adjacent to the construction sites. Overall, while the construction at the site would be evident to the local community, the limited duration of construction would not result in significant or long-term adverse impacts on local land use patterns or the character of the nearby area.

SOCIOECONOMIC CONDITIONS

Construction activities associated with the proposed project would not result in any significant adverse impacts on socioeconomic conditions. Construction of the proposed project would not block or restrict access to any facilities in the area or affect the operations of any nearby businesses, including Glorious Foods—a gourmet marketplace—west of the project site. Lane closures are not expected to occur in front of entrances to any existing or planned retail businesses, and construction activities would not obstruct major thoroughfares used by customers or businesses. Utility service would be maintained to all businesses. Overall, construction of the proposed project 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 construction activity. Construction also would contribute to increased tax revenues for the City and State, including those from personal income taxes.

COMMUNITY FACILITIES

While construction of the proposed project would result in temporary increases in traffic during the construction period, access to and from any facilities in the area, including the Epiphany Community Nursery School west of the project site, would not be affected during the construction period. In addition, the construction sites would be surrounded by construction fencing and barriers that would limit the effects of construction on nearby facilities. As discussed above in “Noise,” at limited times, activities such as excavation and foundation construction may be perceptible and intrusive to the residents and the school located generally west of the site. However, these noise levels would not be considered "long-term" or significant according to CEQR criteria. Further, they would occur at some distance from the sensitive uses which would be shielded by intervening structures as well as the construction fence surrounding the project site. Construction workers would not place any burden on public schools and would have minimal, if any, demands on libraries, child care facilities, and health care. Construction of the proposed buildings would not block or restrict access to any facilities in the area, and would not materially affect emergency response times significantly. The New York City Police Department (NYPD) and the New York City Fire Department (FDNY) emergency services and response times would not be materially affected due to the geographic distribution of the police and fire facilities and their respective coverage areas.

OPEN SPACE

There are no publicly accessible open spaces within the project site, and no open space resources would be used for staging or other construction activities. The nearest open space is the East River Esplanade, which is located across the FDR Drive approximately 70 feet east of the project site. At limited times, activities such as excavation and foundation construction may generate noise that could impair the enjoyment of any nearby open space users, but such noise effects would be temporary. Further, for the East River Esplanade, given the intervening traffic on the FDR Drive and the construction fences around the project site the noise increases may not be perceptible to open space users on the esplanade. Construction of the proposed project would not limit access to the esplanade or other open space resources in the vicinity of the project site. Therefore, construction of the proposed project would not result in significant adverse impacts on open space.

HISTORIC AND CULTURAL RESOURCES

Historic and cultural resources include both archaeological and architectural resources. Chapter 5, "Historic and Cultural Resources," identified two known historic resources within 90 feet of the proposed project. LPC and OPRHP determined that the project site is not archaeologically sensitive. Therefore, no significant adverse impacts to archaeological resources would occur during the construction of the proposed project.

Architectural resources are defined as buildings, structures, objects, sites or districts listed on the S/NR or determined eligible for such listing, NYCLs, NYCHDs and properties pending such designation. Impacts on architectural resources can include direct physical impacts, including damage from vibration (i.e., from construction blasting or pile driving) and additional damage from adjacent construction that could occur from falling objects, subsidence, collapse, or damage from construction machinery. Adjacent construction is defined as any construction activity that would occur within 90 feet of an architectural resource, as defined in DOB *Technical Policy and Procedure Notice* (TPPN) #10/88.[2]

As described in in Chapter 5, "Historic and Cultural Resources," the proposed project is located within 90 feet of the Con Edison Steam Plant and the garage at 524 East 73rd Street, both of which have been determined S/NR-eligible by OPRHP. A CPP would be prepared to avoid inadvertent construction-related impacts on these architectural resources. The CPP would

[2] TPPN #10/88 was issued by DOB on June 6, 1988, to supplement Building Code regulations with regard to historic structures. TPPN #10/88 outlines procedures for the avoidance of damage to historic structures that are listed on the NR or NYCLs resulting from adjacent construction, defined as construction within a lateral distance of 90 feet from the historic resource.

contain measures to avoid construction-related impacts including ground-borne vibration and accidental damage from heavy machinery as appropriate. The CPP would be developed in consultation with LPC and OPRHP and implemented by a professional engineer prior to demolition or construction activities. The CPP would follow the guidelines set forth in Chapter 9, Section 523 of the *CEQR Technical Manual*. With the implementation of the CPP, construction of the proposed project would not result in significant adverse impacts on these architectural resources.

Therefore, construction of the proposed project would not result in significant adverse impacts on historic and cultural resources.

HAZARDOUS MATERIALS

- As discussed in Chapter 7, "Hazardous Materials," the greatest potential for exposure to any contaminated materials would occur during subsurface disturbance associated with construction of the proposed project. However, the potential for adverse impacts associated with these activities would be minimized by adhering to the following protocols:
- All remedial activities at the project site (and off-site) would continue to be conducted in accordance with applicable regulations, including the DEC spill closure procedures and any site-specific requirements set forth by DEC.
- Additional subsurface investigations would be conducted, including the collection and laboratory analysis of subsurface soil and groundwater samples to delineate the extent of the free-phase petroleum product observed within a geotechnical boring on the southeastern portion of the project site to evaluate appropriate remediation measures to address the contamination.
- Future development entailing soil (or bedrock) disturbance could encounter contaminated soil and/or bedrock. If evidence of contaminated soil or rock (e.g., petroleum product, stains or odors) is encountered, these materials (and all other materials requiring off-site disposal) would be disposed of in accordance with applicable federal, state and local regulations. If any USTs are encountered, they would be properly assessed, and removed in accordance with state and local regulations. Soil and/or bedrock intended for off-site disposal would be tested in accordance with the requirements of the receiving facility. Transportation of material leaving the site for off-site disposal would be in accordance with federal, state, and local requirements covering licensing of haulers and trucks, placarding, truck routes, manifesting, etc. If more significant soil and/or groundwater contamination is discovered during excavation activities, such contamination would require further investigation and/or remediation in accordance with all applicable regulations.
- Any demolition debris containing suspect ACM, LPB, PCBs and/or ~~underground storage tanks~~ USTs encountered during redevelopment would be characterized and disposed of in accordance with applicable local, state and federal regulations.
- Prior to excavation activities, testing would be performed to evaluate the need for pre-treatment prior to discharge for compliance with DEP discharge permit/approval requirements.

With the implementation of these measures outlined above, no significant adverse impacts related to hazardous materials would be expected to occur as a result of the construction of the proposed project. ✷