Chapter 20: Construction

A. INTRODUCTION

As described in Chapter 1, "Project Description," the New York City Department of City Planning (DCP) is proposing zoning map and zoning text amendments (the "Proposed Actions") to implement land use and zoning changes affecting a 56-block area (the "Project Area") generally bounded by Astor Place and Houston Street to the north; Bowery, Lafayette Street, and Baxter Street to the east; Canal Street to the south, and Sixth Avenue, West Broadway, and Broadway to the west. A total of 26 projected development sites and 58 potential development sites have been identified in the Project Area on which new buildings could be constructed through the year 2031. Since potential development sites are less likely to be developed over the analysis period, they are not evaluated for construction impacts.

Construction activities under the Proposed Actions, as is the case with most any construction projects, are expected to result in temporary disruptions in the surrounding area. For analysis purposes, a reasonable worst-case conceptual construction phasing and schedule for the development anticipated to occur under the Proposed Actions was established to illustrate how development could occur through the year 2031. The conceptual construction schedule conservatively accounts for overlapping construction activities and simultaneously operating construction equipment, thus capturing the cumulative nature of potential construction impacts which would result at nearby receptors.

According to the 2020 *City Environmental Quality Review (CEQR) Technical Manual*, a proposed project with an overall construction period lasting two years or longer and that is near to sensitive receptors (i.e., residences, open spaces, etc.) should undergo an impact assessment. Each of the individual projected development sites are estimated to take approximately eight months to two and a half years to complete, depending on the size of the development. There is also the potential for construction activities to be underway at multiple sites in the Project Area with overlapping construction timelines within the same geographic area. Accordingly, an assessment of potential construction impacts was prepared in accordance with the guidelines of the *CEQR Technical Manual*, and is presented in this chapter. The assessment of potential impacts of construction activity focuses on transportation, air quality, noise, and vibration, as well as consideration of other technical areas including land use and neighborhood character, socioeconomic conditions, community facilities, open space, historic and cultural resources, and hazardous materials.

PRINCIPAL CONCLUSIONS

Construction activities associated with the projected developments assumed under the Reasonable Worst-Case Development Scenario (RWCDS) developed for the Proposed Actions would result in temporary disruptions in the surrounding area. Some of the construction-related disruptions would result in temporary significant adverse impacts on noise. In addition, the construction-related disruptions would result in significant adverse impacts on archaeological resources.. Additional information for key technical areas is summarized below.

TRANSPORTATION

Construction travel demand is expected to peak in the first quarter of 2028, and the first quarter of 2029 was selected as a reasonable worst-case analysis period for assessing potential cumulative transportation impacts from operational trips for completed portions of the of the projected developments and construction trips associated with construction activities. Both of these periods are therefore analyzed for potential transportation impacts during construction.

Traffic

During construction, traffic would be generated by construction workers commuting via autos and by trucks making deliveries to projected development sites. In the 2028 peak construction period, construction traffic during the 6:00 to 7:00 AM and 3:00 to 4:00 PM construction peak hours is not expected to add 50 or more incremental trips at any intersection in proximity to the Project Area. Similarly, combined construction and operational traffic during the 2029 cumulative analysis period is also not expected to add 50 or more incremental trips at any intersection. Consequently, significant adverse traffic impacts are not expected to occur in either the 2028 peak construction period or the 2029 cumulative analysis period based on *CEQR Technical Manual* guidance.

Transit

In the 2028 peak construction period, the number of incremental construction trips by transit are not expected to exceed the 200-trip *CEQR Technical Manual* analysis threshold for a subway station or the 50-trip threshold for a bus analysis (per route, per direction) during any peak hour. In addition, construction worker transit trips would primarily occur outside of the AM and PM commuter peak periods when area transit facilities and services typically experience their greatest demand. As such, significant adverse transit impacts are not anticipated in the 2028 peak construction period.

During the 2029 analysis period for cumulative construction and operational travel demand, incremental construction worker subway and bus trips in the 6:00 to 7:00 AM and 3:00 to 4:00 PM construction peak hours combined with the net incremental increase in operational subway and bus trips from completed projected development sites would be substantially less than the net increase in operational subway and bus trips during the 8:00 to 9:00 AM and 5:00 to 6:00 PM commuter peak hours with full build-out of the Proposed Actions in 2031. Therefore, 2029 transit conditions during the 6:00 to 7:00 AM and the 3:00 to 4:00 PM construction peak hours are expected to be generally better than during the analyzed commuter peak hours with full build-out of the Proposed Actions in 2031.

Consequently, there would be less likelihood of significant adverse subway station impacts during the 2029 cumulative analysis period than with full build-out of the projected development in 2031. As discussed in Chapter 21, "Mitigation," the Proposed Actions would result in unmitigated significant adverse impacts to one street stair in the AM and PM operational peak hours at the Canal Street (A/C/E) subway station on the Eighth Avenue Line. Should this significant adverse subway station impact occur during the 2029 cumulative analysis period, it would also remain unmitigated.

Lastly, as the Proposed Actions are not expected to result in significant adverse subway line haul or bus impacts, the smaller numbers of subway and bus trips that would be generated in the 2029 analysis period for cumulative construction and operational travel demand are similarly not expected to result in any significant adverse impacts to subway line haul conditions or bus services.

Pedestrians

In the 2028 peak construction period, it is estimated that there would be a net increment of approximately 470 construction workers on site daily. Pedestrian trips by these workers would be widely dispersed among the 13 projected development sites that would be under construction in this period. They would also primarily occur outside of the weekday AM and PM commuter peak periods and the weekday midday peak period when area pedestrian facilities typically experience the greatest demand. No single sidewalk, corner, or crosswalk is expected to experience 200 or more peak-hour trips, the threshold below which significant adverse pedestrian impacts are considered unlikely to occur based on *CEQR Technical Manual* guidance. Consequently, significant adverse pedestrian impacts in the 2028 peak construction period are not anticipated.

During the 2029 analysis period for cumulative construction and operational travel demand, incremental construction worker pedestrian trips in the 6:00 to 7:00 AM and 3:00 to 4:00 PM construction peak hours combined with the net incremental increase in operational pedestrian trips from completed projected development sites would be less than the net increase in operational pedestrian trips during the 8:30 to 9:30 AM and 5:00 to 6:00 PM operational peak hours with full build-out of the Proposed Actions in 2031. Therefore, 2029 pedestrian conditions during the 6:00 to 7:00 AM and the 3:00 to 4:00 PM construction peak hours are expected to be generally better than during the analyzed operational peak hours with full build-out of the Proposed Actions in 2031. As the Proposed Actions are not expected to result in significant adverse pedestrian impacts during the 8:30 to 9:30 AM and 5:00 to 6:00 PM operational peak hours, the smaller numbers of pedestrian trips that would be generated in the 6:00 to 7:00 AM and 3:00 to 4:00 PM construction peak hours in the 2029 analysis period for cumulative construction and operational travel demand are similarly not expected to result in any significant adverse pedestrian impacts.

Parking

Construction worker parking demand would total approximately 67 spaces in the midday in the 2028 peak construction period, and combined demand from construction workers and completed projected development sites would total approximately 148 spaces in the midday during the 2029 analysis period for cumulative construction and operational travel demand. Any shortfalls in on-street and off-street parking capacity that may result from this incremental demand in the 2028 peak construction period or the 2029 analysis period for cumulative construction and operational demand would not be considered significant adverse parking impacts under *CEQR Technical Manual* criteria due to the availability of alternative modes of transportation.

AIR QUALITY

Measures required to reduce pollutant emissions during construction include all applicable laws, regulations, and the City's building codes. These include dust suppression measures, idling restriction, and the use of ultra-low sulfur diesel (ULSD) fuel. With the implementation of these emission reduction measures, the dispersion modeling analysis of construction-related air emissions for both on-site and on-road sources determined that particulate matter ($PM_{2.5}$ and PM_{10}), annual-average nitrogen dioxide (NO_2), and carbon monoxide (CO) concentrations would be below their corresponding *de minimis* thresholds or National Air Quality Ambient Standards (NAAQS), respectively. Therefore, construction under the Proposed Actions would not result in significant adverse air quality impacts due to construction sources.

NOISE

Based on the projected construction predicted at each development site, construction-generated noise is expected to exceed the *CEQR Technical Manual* noise impact thresholds as well as result in "objectionable" and "very objectionable" noise level increases at some receptors. One peak construction period per year was analyzed at each development site from 2023 to 2031. Receptors where noise level increases were predicted to exceed the construction noise evaluation thresholds for extended durations were identified.

The noise analysis results show that the predicted noise levels due to construction could exceed the *CEQR Technical Manual* impact criteria throughout the Project Area, including at projected development sites that are completed and occupied while other nearby or adjacent projects are under construction. Construction could produce noise levels that would be noticeable and potentially intrusive during the most noise-intensive construction activities. While the highest levels of construction noise would not persist throughout construction, and noise levels would fluctuate resulting in noise increases that would be intermittent, these locations would experience construction noise levels whose magnitude and duration could constitute significant adverse impacts.

At locations predicted to experience an exceedance of the noise impact threshold criteria, the exceedances would be due principally to noise generated by on-site construction activities (rather than construction-related traffic). As previously discussed, the noise analysis examined the reasonable worst-case peak hourly noise levels resulting from construction in an analyzed month, and is therefore conservative in predicting increases in noise levels. Typically, the loudest hourly noise level during each month of construction would not persist throughout the entire month. Finally, this analysis is based on RWCDS conceptual site plans and construction schedules. It is possible that the actual construction may be of less magnitude, or that construction on multiple projected development sites may not overlap, in which case construction noise would be less than the analysis predicts.

HISTORIC AND CULTURAL RESOURCES

Regarding architectural resources, construction activities would affect 14 individually listed New York City Landmarks (NYCLs), nine individually State/National Register-listed (S/NR) buildings, one National Historic Landmark (NHL), and buildings within the five designated NYCHDs and/or S/NR-listed historic districts that are located within 90 feet of projected and potential development sites. To avoid potential adverse impacts to historic architectural resources from construction-related activities, a Construction Protection Plan (CPP) would be prepared in consultation with the Landmarks Preservation Commission (LPC) of any excavation or construction activities on the projected and potential development sites where there are NYCLs and/or S/NR-listed historic resources that are located within 90 feet of these development sites. Historic resources included in the SoHo-Cast Iron Historic District and Extension, the NoHo Historic District and Extension, the Bowery Historic District, and the Chinatown and Little Italy Historic District are also located within 90 feet of the projected or potential development sites, and are subject to the protections of the New York City Department of Buildings' (DOB) *Technical Policy and Procedure Notice (TPPN) #10/88*. With the protective measures of a CPP in place, no significant adverse construction-related impacts would occur to these resources.

As described in detail in Chapter 7, "Historic and Cultural Resources," a Phase 1A Archaeological Documentary Study determined that all or portions of 21 lots on 17 projected and potential development sites are potentially archaeologically sensitive for resources associated with the 19th Century occupation of the Project Area. The Phase 1A Study recommended additional archaeological analysis for certain development sites, including Phase 1B Archaeological Testing and continued consultation with LPC to determine the presence or absence of any resources on these sites. The 21 lots are privately owned and are expected to be developed as-of-right subsequent to the proposed rezoning. As there is no mechanism in place to require a private landowner to conduct Phase 1B archaeological testing or to require the preservation or documentation of archaeological resources, should they exist, the Proposed Actions would result in significant adverse impacts on archaeological resources on the 17 projected and potential development sites with archaeological sensitivity. Construction activities on the 21 archaeologically sensitive lots on 17 projected and potential development sites would result in significant adverse construction-related impacts on archaeological resources on those parcels. Construction activities on the projected and potential development sites that were not identified as potentially archaeologically sensitive would not result in significant adverse construction-related impacts on archaeological resources.

GOVERNMENTAL COORDINATION AND OVERSIGHT

Construction oversight involves several City, state, and federal agencies. **Table 20-1** lists the primary involved agencies and their areas of responsibility. For projects in New York City, primary construction oversight lies with DOB, which oversees compliance with the New York City Building Code. The areas of oversight include installation and operation of equipment such as cranes, sidewalk bridges, safety netting, and scaffolding. In addition, DOB enforces safety regulations to protect workers and the general public during construction. The New York City Department of Parks and Recreation (NYC Parks) is responsible for the oversight, enforcement, and permitting of the replacement of street trees that are lost due to construction. The New York City Department of Environmental Protection (DEP) enforces the *New York City Noise Code*, reviews and approves any needed Remedial Action Plan (RAP) and associated Construction Health and Safety Plan (CHASP), water and sewer connections, as well as any necessary abatement of hazardous materials. The New York City Fire Department (FDNY) has primary oversight of compliance with the *New York City Fire Code* and the installation of tanks containing flammable materials. The New York City Department of Transportation (DOT) Office of Construction Mitigation and Coordination (OCMC) reviews and approves any traffic lane and sidewalk closures. New York City Transit (NYCT) is responsible for subway access and, if necessary, bus stop relocations. NYCT also regulates vibrations that might affect the subway system. LPC is responsible for protecting New York City's architecturally, historically, and culturally significant buildings and sites by granting them landmark or historic district status, and regulating them after designation. LPC approves CPPs and monitoring measures established to prevent damage to historic structures. New York City maintains a 24-hour-a-day telephone hotline (311) so that construction concerns can be registered with the City.

Table 20-1
Summary of Primary Agency Construction Oversight

Agency	Areas of Responsibility
New York City	
Department of Buildings	Building Code, site safety, and public protection
Department of Parks and Recreation	Street trees
Department of Environmental Protection	Noise Code, RAPs/CHASPs, water and sewer connections, hazardous materials
Fire Department	Compliance with Fire Code, fuel tank installation
Department of Transportation	Lane and sidewalk closures
New York City Transit	Subway access, bus stop relocation
Landmarks Preservation Commission	Archaeological and architectural protection
New York State	
Department of Labor	Asbestos Workers
Department of Environmental Conservation	Hazardous materials and fuel/chemical storage tanks
United States	
Environmental Protection Agency	Air emissions, noise, hazardous materials
Occupational Safety and Health Administration	Worker safety

At the state level, the New York State Department of Labor (DOL) licenses asbestos workers. 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. At the federal level, the U.S. Environmental Protection Agency (EPA) regulates air emissions, noise, and hazardous materials, although much of its responsibility is delegated to the state and city levels. The Occupational Safety and Health Administration (OSHA) sets standards for work site safety and construction equipment.

B. CONCEPTUAL CONSTRUCTION PHASING AND SCHEDULE

A total of 26 projected development sites have been identified in the Project Area on which new buildings could be constructed or existing buildings enlarged and/or converted through 2031. At this time, there are no finalized construction programs or designs for the projected developments. Actual construction methods and materials may vary, depending on how the construction contractors choose to implement work to be most cost-effective within the requirements set forth in bid, contract, and construction documents. Construction specifications will require that construction contractors comply with applicable environmental regulations and obtain necessary permits for the duration of construction. Construction of each projected development would follow applicable federal, state, and local laws for building and safety, as well as local noise ordinances, as appropriate.

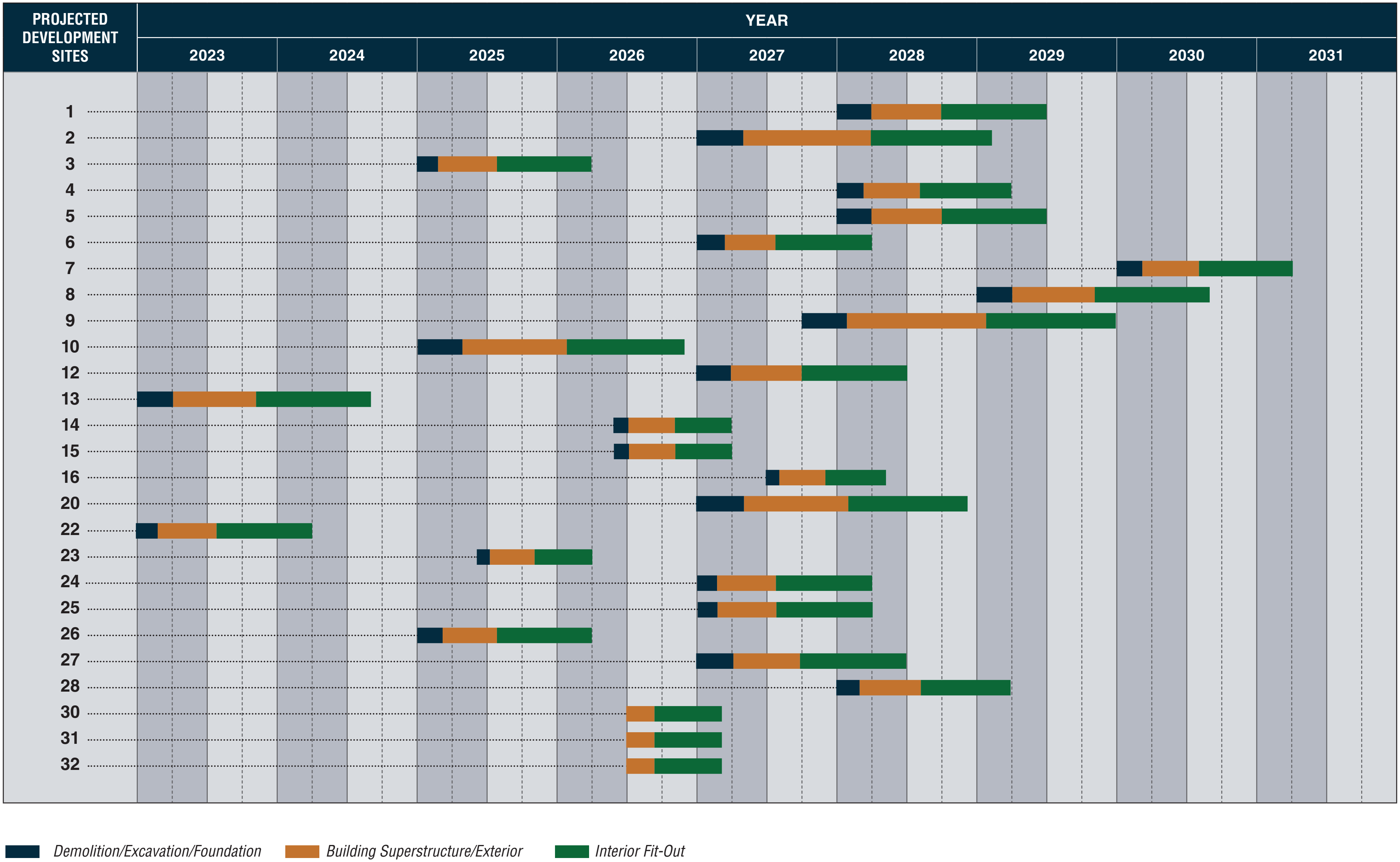
For analysis purposes, conceptual construction phasing for the projected development expected under the Proposed Actions was prepared by DCP to illustrate how development may proceed through 2031. Because the projected development sites are in private ownership and there are no specific development proposals associated with them under the Proposed Actions, the timing of the development of those sites is unknown. As such, the RWCDS presented in Chapter 1, "Project Description," does not describe which of the sites would be developed first to assume a particular sequence of development. Owner interest, market, and other site-specific considerations would ultimately determine future build-out.

In estimating the duration of the construction for each development site, it is generally assumed that development sites less than 225,000 square feet in size would take less than 24 months to complete, whereas projected development sites with more floor area are assumed to take longer. The conceptual construction schedule conservatively accounts for overlapping construction activities at development sites in proximity to one another to capture the cumulative nature of construction impacts with respect to number of worker vehicles, trucks, and construction equipment at any given time within reasonable construction scheduling constraints for each of the development sites in the Project Area.

Figure 20-1 presents the conceptual construction sequencing for use in the analysis of the Proposed Actions. In the conceptual construction schedule, construction activities are assumed to begin in the first quarter of 2023 and continue through 2031. It is conservatively assumed that construction of all projected development sites would be completed by the end of the 2031 analysis year. Based on their size, construction of a majority of the projected development sites (24 out of the 26 sites) is considered to be short term (i.e., up to 24 months) per the *CEQR Technical Manual*.

C. CONSTRUCTION DESCRIPTION

Twenty-six projected development sites have been identified as likely to be developed with new building(s) during the construction analysis period through 2031. Building construction in New



Conceptual Construction Schedule
Figure 20-1

York City typically follows the following pattern. The first task is construction startup, which involves installing public safety measures (i.e., signs and fences) and siting of work trailers. Then, if there are existing buildings on the development site, any potential hazardous materials such as asbestos are abated and then the buildings are demolished. Excavation of the soils is next along with the construction of the foundation. 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 starts. The core and shell stages of construction are typically referred to as the "superstructure." As the building progresses upward, the exterior façade is installed, and interior fit-out activities begins. These typical activities for building construction are described in greater detail below.

GENERAL CONSTRUCTION STAGES

DEMOLITION, EXCAVATION, AND FOUNDATION

Construction begins with the demolition of existing buildings where applicable. First, demolition scaffolds would be erected around these buildings. The buildings to be demolished would be abated of any hazardous materials before the start of demolition. A New York City-certified asbestos investigator would inspect the building for asbestos-containing materials (ACM); if present, those materials would be removed by a DOL-licensed asbestos abatement contractor prior to interior demolition. Asbestos abatement is strictly regulated by DEP, DOL, EPA, and OSHA to protect the health and safety of construction workers and nearby residents. Depending on the extent and type of ACMs, if any, these agencies would be notified of the asbestos removal project and may inspect the abatement site to ensure that work is being performed in accordance with applicable regulations. Any activities with the potential to disturb lead-based paint (LBP) would be performed in accordance with applicable OSHA regulations (including federal OSHA regulation 29 CFR 1926.62—*Lead Exposure in Construction*). In addition, any suspected poly-chlorinated biphenyls (PCB)-containing equipment (such as fluorescent light ballasts) that would be disturbed would be evaluated prior to disturbance. Unless labeling or test data indicate the contrary, such equipment would be assumed to contain PCBs, and would be removed and disposed of at properly licensed facilities in accordance with all applicable regulatory requirements.

General demolition is the next step, beginning with removal of any economically salvageable materials that could be reused. Then the interior of the buildings are deconstructed to the floor plates and structural columns. Netting around the exterior of the building is typically used to prevent falling materials. Hand tools, excavators with hoe ram attachments, and front-end loaders are typically used in the demolition of the existing structures. Demolition debris is sorted prior to being disposed of at landfills to maximize recycling opportunities.

Regarding excavation activities, where necessary, sheeting is installed to stabilize soil around the excavation area and excavators are then used to excavate soil. The soil is loaded onto dump trucks with front-end loaders for transport to a licensed disposal facility or for reuse on any portion of the development site that needs fill. This stage of construction also includes the construction of the new building's foundation and below-grade elements. Foundation work could typically include pile driving and columns and concrete walls would be built to the grade level.

Dewatering

Water from rain and snow collected in the excavation area during construction would be removed as necessary using a dewatering pump. If dewatering is required, testing would be performed to ensure compliance with DEP sewer discharge permit/approval requirements and, if necessary, pre-treatment would be conducted prior to discharge to the sewer.

SUPERSTRUCTURE AND EXTERIOR

The superstructure of a building includes the building's framework such as beams, slabs, and columns. Construction of the interior structure, or core, of the building includes elevator shafts; vertical risers for mechanical, electrical, and plumbing systems; electrical and mechanical equipment rooms; core stairs; and restrooms. A mobile crane or a tower crane (for larger buildings) is typically brought onto the development site during the superstructure stage to lift structural components, façade elements, and other large materials. Superstructure activities typically also require the use of rebar benders, welding equipment, and a variety of trucks. In addition, temporary construction elevators (hoists) are used for the vertical movement of workers and materials during superstructure activities.

INTERIOR FIT-OUT

Interior fit-out activities typically include the construction of interior partitions, installation of lighting fixtures, and interior finishes (e.g., flooring, painting, etc.), and mechanical and electrical work—such as the installation of elevators, and lobby finishes. Final cleanup and building system (e.g., electrical system, fire alarm, plumbing, etc.), testing and inspections are also part of this stage of construction. Equipment used during interiors and finishing generally include hoists, forklifts, scissor lifts, delivery trucks, and a variety of small hand-held tools.

GENERAL CONSTRUCTION PRACTICES

HOURS OF WORK

Building construction would generally be carried out in accordance with City laws and regulations, which allow construction activities between 7:00 AM and 6:00 PM on weekdays. Weekday construction work typically begins at 7:00 AM, with most workers arriving between 6:00 AM and 7:00 AM. Normal workdays end at 3:30 PM, but it can be expected that, in order to complete certain time-sensitive tasks (i.e., finishing a concrete pour for a floor deck), the workday may occasionally be extended beyond normal work hours. Any extended workdays generally last until approximately 6:00 PM and do not include all construction workers on-site, but only those involved in the specific task requiring additional work time.

Weekend or night work may also be required for certain construction activities such as the erection of the tower crane and/or to make up for weather delays. Appropriate work permits from DOB must be obtained for any necessary work outside of the allowable construction hours detailed above and no work outside of these hours could be performed until such permits are obtained. The numbers of workers and pieces of equipment in operation for weekend work would be limited to those needed to complete the particular authorized task. Therefore, the level of activity for any weekend work would be less than a normal workday. The weekend workday, if necessary, would typically be a Saturday.

ACCESS, STAGING AREAS, AND SITE SAFETY

Access to a development site during construction is typically controlled at the perimeter. The work areas would be fenced off with limited access points for workers and construction vehicles. After work hours, the gates are closed and locked. As is typical with New York City construction in a dense urban setting, curb lanes and sidewalks are expected to be narrowed or closed for varying periods of time. Maintenance and Protection of Traffic (MPT) plans would be developed for any temporary curb-lane and/or sidewalk closures as required by DOT. Approval of these plans and implementation of the closures would be coordinated with DOT's OCMC. It is expected that construction staging of materials and equipment would be primarily within the development sites themselves, or the adjacent curb-lane.

A variety of measures are typically required by the City and implemented to ensure public safety during project construction. These include sidewalk bridges during above-grade construction activities to provide overhead protection for pedestrians; construction safety signs to alert the public of ongoing construction activities; flaggers posted as necessary to control trucks entering and exiting the construction area, to provide guidance to pedestrians, and/or to alert or slow down the traffic; and implementing all DOB safety requirements to minimize disruption to the community.

RODENT CONTROL

Construction contracts typically include provisions for a pre-construction rodent control program. Before the start of construction, the contractor surveys and baits the appropriate areas and provides for proper site sanitation, as necessary. During construction, the contractor also carries out a maintenance program, as needed. Signage is posted, and coordination conducted with the appropriate public agencies.

NUMBER OF CONSTRUCTION WORKERS AND MATERIAL DELIVERIES

Construction is labor-intensive, and the number of workers varies with the general construction task and/or building size. Likewise, material deliveries and removals generate truck trips, and the number also varies depending on the task and/or the building size. Workers and truck projections were based on representative sites of similar size and use and information for similar known construction projects in the City.[1] Projected development sites were categorized based on similar size and use, and the most intense month from each stage of construction (demolition / excavation / foundation, superstructure / exterior, and interior) for each site was identified and used as a scaling factor for projections. Each of the 26 projected development sites was then assigned to the appropriate size category, and worker and truck projections were scaled on a per-square-foot basis. The resultant estimate of the number of trucks and workers per quarter is summarized in **Table 20-2**. As indicated in the table, the number of workers would peak in the first quarter of 2028, with an estimated 470 workers per day. The number of trucks would also peak in the first quarter of 2028, with an estimated 80 trucks per day.

[1] For purposes of this analysis, construction impact analysis data from the 2017 *East Harlem Rezoning FEIS* were used.

Table 20-2
Average Number of Daily Construction Workers and Trucks by Year and Quarter

Year	2023				2024				2025			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	33	70	67	59	55	38	25	0	72	111	125	122
Trucks	11	10	11	12	12	7	5	0	16	16	17	19
Year	2026				2027				2028			
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th
Workers	105	67	125	97	224	306	334	400	**470**	459	398	355
Trucks	16	7	16	18	56	41	46	63	**80**	58	50	49
Year	2029				2030				2031		Average	Peak
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd		
Workers	250	212	155	147	51	58	42	13	13	---	153	470
Trucks	43	29	18	18	11	10	9	4	4	---	24	80

D. THE FUTURE WITHOUT THE PROPOSED ACTIONS (NO ACTION CONDITION)

As described in Chapter 1, "Project Description," in the future without the Proposed Actions (the No Action condition), the identified projected development sites are assumed to either remain unchanged from existing conditions, or being developed as-of-right (new construction, conversions, or enlargements) under the existing zoning.

E. THE FUTURE WITH THE PROPOSED ACTIONS (WITH ACTION CONDITION)

Construction under the Proposed Actions—as is the case with most large construction projects—would result in some temporary disruptions in the surrounding area. The following analysis describes the overall temporary effects on 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 Proposed Actions would result in the construction of predominantly mixed-use developments on 26 projected development sites in the Project Area over the construction analysis period through 2031. These developments would replace vacant land as well as existing development on the projected development sites. During construction periods, projected development sites would generate trips from workers traveling to or from the construction sites and from the movement of materials and equipment. Given typical construction hours, worker trips would be more concentrated in the early morning and mid-afternoon periods on weekdays than during peak travel periods.

TRAFFIC

As discussed above, average daily on-site construction workers and trucks were forecast for new construction anticipated on each of the projected development sites under the With Action condition. The With Action construction worker and truck estimates reflect the net incremental demand attributable to construction associated with the Proposed Actions. As shown in **Table 20-2**, the average number of workers would peak at an estimated 470 per day in the first quarter of 2028, while the average number of trucks per day would peak at an estimated 80 in the same quarter. The first quarter of 2028 is therefore expected to be the peak period for total construction travel demand (worker trips and truck trips combined). These represent peak days of work, and other days during the construction period would have fewer construction workers and trucks on-site.

While construction traffic is expected to peak in the first quarter of 2028, the first quarter of 2029 was selected as the reasonable worst-case analysis period for assessing potential cumulative traffic impacts from operational trips from completed portions of the projected developments and construction trips associated with construction activities. An assessment of traffic generated during these two peak periods is presented below.

Peak Construction Worker Travel Demand and Truck Trips—2028 (First Quarter)

Modal split and vehicle occupancy rates for construction workers were based on data for Manhattan cited in the 2019 *New York City Borough-Based Jail System FEIS*. Based on these data, it is anticipated that approximately 69.9 percent of construction workers would use public transportation in their commute to and from the construction sites in the Project Area, which is well-served by subway and bus transit. Approximately 28.9 percent of workers are expected to travel by personal automobile with an average occupancy of approximately 2.04 persons per vehicle, and 1.2 percent are expected to walk or bicycle. **Table 20-3** shows a forecast of incremental hourly construction worker auto and construction truck trips during the 2028 peak construction period. The temporal distribution for these vehicle trips was based on typical work shift allocations and conventional arrival/departure patterns for construction workers. Each worker was assumed to arrive in the morning and depart in the afternoon or early evening; whereas, truck deliveries would occur throughout the construction day. To avoid congestion and ensure that materials are on-site for the start of each shift, construction truck deliveries would often peak during the hour before the regular day shift, overlapping with construction worker arrival traffic. Each truck delivery was assumed to result in two truck trips during the same hour (one inbound and one outbound). For analysis purposes, truck trips were converted into Passenger Car Equivalents (PCEs) based on one truck being equivalent to an average of two PCEs.

Table 20-3
2028 (First Quarter) Peak Incremental Construction Vehicle Trip Projections (in PCEs)

	Auto Trips					Truck Trips					Total Vehicle Trips		
	In		Out			In		Out					
Hour	%	#	%	#	Total	%	#	%	#	Total	In	Out	Total
6-7 AM	80%	54	0%	0	54	25%	40	25%	40	80	94	40	134
7-8 AM	20%	13	0%	0	13	10%	16	10%	16	32	29	16	45
8-9 AM	0%	0	0%	0	0	10%	16	10%	16	32	16	16	32
9-10 AM	0%	0	0%	0	0	10%	16	10%	16	32	16	16	32
10-11 AM	0%	0	0%	0	0	10%	16	10%	16	32	16	16	32
11 AM-12 PM	0%	0	0%	0	0	10%	16	100%	16	32	16	16	32
12-1 PM	0%	0	0%	0	0	10%	16	10%	16	32	16	16	32
1-2 PM	0%	0	0%	0	0	5%	8	5%	8	16	8	8	16
2-3 PM	0%	0	5%	3	3	5%	8	5%	8	16	8	11	19
3-4 PM	0%	0	80%	54	54	2.5%	4	2.5%	4	8	4	58	62
4-5 PM	0%	0	15%	10	10	2.5%	4	2.5%	4	8	4	14	18
5-6 PM	0%	0	0%	0	0	0%	0	0%	0	0	0	0	0

As shown in **Table 20-3**, construction-related traffic is expected to peak during the 6:00 to 7:00 AM and 3:00 to 4:00 PM periods in the first quarter of 2028. During the 6:00 to 7:00 AM peak hour there would be a total of 134 PCE vehicle trips, including 94 inbound trips and 40 outbound trips. During the 3:00 to 4:00 PM peak hour there would be a total of 62 PCE trips, including four inbound trips and 58 outbound trips.

Table 20-4 presents a comparison of 2028 peak incremental construction vehicle trips with the numbers of incremental operational trips that would be generated with full build-out of the project in 2031. The 8:00 to 9:00 AM and 5:00 to 6:00 PM hours are assumed as the peak hours for operational traffic, consistent with *CEQR Technical Manual* guidance. As shown in **Table 20-4**, during the 8:00 to 9:00 AM and 5:00 to 6:00 PM operational peak hours and the 3:00 to 4:00 PM construction peak hour, the number of 2028 construction vehicle trips would be less than the number of 2031 operational vehicle trips—i.e., 136, 186, and 68 fewer trips, during each of these periods, respectively. During the 6:00 to 7:00 AM construction peak hour, 2028 construction vehicle trips would exceed 2031 operational trips by 117.

Table 20-4
Comparison of 2028 (First Quarter) Peak Incremental Construction Vehicle Trips with 2031 Operational Vehicle Trips (in PCEs)

Peak Hour	Net Incremental Vehicle Trips in PCEs		
	2031 Operational Trips	2028[1] Construction Trips	Net Difference
6-7 AM	17	134	117
8-9 AM [2]	168	32	(136)
3-4 PM	130	62	(68)
5-6 PM [2]	186	0	(186)

Notes:
[1] 2028 construction trips represent the first quarter of that year.
[2] 8:00 to 9:00 AM and 5:00 to 6:00 PM are assumed as the weekday AM and PM operational traffic peak hours, consistent with *CEQR Technical Manual* guidance.

As discussed in Chapter 14, "Transportation," significant adverse traffic impacts are not expected to occur under the Proposed Actions in either the weekday 8:00 to 9:00 AM or 5:00 to 6:00 PM operational peak hours, as no intersection would experience a net incremental increase of 50 or more trips during these periods. As shown in **Table 20-4**, peak construction activity in 2028 would result in 136 and 186 fewer incremental vehicle trips during these same operational peak hours, respectively, than would full build-out of the projected development sites under the Proposed Actions. Therefore significant adverse traffic impacts are also not expected to occur during these operational peak hours in the 2028 construction analysis year.

In the 3:00 to 4:00 PM peak construction period, there would be 68 fewer vehicle trips generated by peak construction activity in 2028 compared to the number of operational trips generated during the same peak hour with full build-out of the Proposed Actions in 2031. They would also be substantially less than the number of operational trips generated by full build-out of the Proposed Actions in either of the operational peak hours, with 106 fewer trips (i.e., 37 percent fewer) compared to the AM operational peak hour and 124 fewer trips (i.e., 33 percent fewer) compared to the PM peak hour. As the Proposed Actions would not result in a net incremental increase of 50 or more trips at any intersection during either the AM or PM operational peak hours, peak construction activity during the 3:00 to 4:00 PM construction peak hour is also not expected to exceed 50 or more trips at any intersection. Therefore, significant adverse traffic impacts are not expected to occur as a result of peak construction activity during the 3:00 to 4:00 PM construction peak hour in the 2028 construction analysis year.

During the 6:00 to 7:00 AM construction peak hour, peak construction activity in 2028 would result in 134 construction vehicle trips, 117 more than would be generated with the fully built project during the same peak hour in 2031. However, this would be 34 fewer trips (i.e., 20 percent fewer) than would be generated by the fully built project in the 8:00 to 9:00 AM operational peak hour and 52 fewer trips (i.e., 28 percent fewer) than in the 5:00 to 6:00 PM operational peak hour. As the Proposed Actions would not result in a net incremental increase of 50 or more trips at any intersection during either the AM or PM operational peak hours, peak construction activity during the 6:00 to 7:00 AM construction peak hour is also not expected to exceed 50 or more trips at any intersection. Therefore, significant adverse traffic impacts are not expected to occur as a result of peak construction activity during the 6:00 to 7:00 AM construction peak hour in the 2028 construction analysis year.

Cumulative Construction and Operational Traffic—2029 (First Quarter)

Table 20-5 shows hourly worker auto trips and construction truck trips (in PCEs) in the 2029 (first quarter) analysis period when construction travel demand would overlap with operational demand from completed projected development sites. During this cumulative construction and operational traffic analysis period, there would be 18 sites that are already completed and operational and seven sites that are under construction. Prior years would see the completion of substantially less new development, whereas subsequent years would see a decreasing intensity of construction activity and lower levels of construction traffic. Construction auto and truck trips in the 2029 analysis period were based on the same travel demand assumptions utilized for the 2028 forecast presented above.

Table 20-5
2029 (First Quarter) Peak Incremental Construction Vehicle Trip Projections (in PCEs)

Hour	Auto Trips			Truck Trips			Total Vehicle Trips		
	In	Out	Total	In	Out	Total	In	Out	Total
6:00-7:00 AM	28	0	28	22	22	44	50	22	72
7:00-8:00 AM	7	0	7	9	9	18	16	9	25
8:00-9:00 AM	0	0	0	9	9	18	9	9	18
9:00-10:00 AM	0	0	0	9	9	18	9	9	18
10:00-11:00 AM	0	0	0	9	9	18	9	9	18
11:00 AM-12:00 PM	0	0	0	9	9	18	9	9	18
12:00-1:00 PM	0	0	0	9	9	18	9	9	18
1:00-2:00 PM	0	0	0	4	4	8	4	4	8
2:00-3:00 PM	0	2	2	4	4	8	4	6	10
3:00-4:00 PM	0	28	28	1	1	2	1	29	30
4:00-5:00 PM	0	5	5	1	1	2	1	6	7
5:00-6:00 PM	0	0	0	0	0	0	0	0	0

As shown in **Table 20-5**, during the 6:00 to 7:00 AM construction peak hour in 2029, a total of 72 construction vehicle trips (in PCEs), including 50 inbound trips and 22 outbound trips, are anticipated; during the 3:00 to 4:00 PM construction peak hour, a total of 30 trips, including one inbound trip and 29 outbound trips, are anticipated. By comparison, construction vehicle trips during the 8:00 to 9:00 AM operational peak hour would total approximately 18, with none during the 5:00 to 6:00 PM operational peak hour.

As shown in **Table 20-6**, combined with the operational trips generated by completed projected developments, there would be a net increase of approximately 78 vehicle trips during the 6:00 to 7:00 AM construction peak hour and a net increase of 73 trips during the 3:00 to 4:00 PM construction peak hour. During the 8:00 to 9:00 AM and 5:00 to 6:00 PM operational peak hours, combined operational and construction vehicle trips would total approximately 83 and 55, respectively. During these operational peak hours, construction trips would account for only 18 of the combined trips in the AM and none in the PM.

Table 20-6
2029 (First Quarter) Incremental Peak Hour Construction and Operational Traffic Volumes (in PCEs)

Hour	Construction Trips	Operational Trips[1]	Total Trips
6–7 AM	72	6	78
8-9 AM[2]	18	65	83
3-4 PM	30	43	73
5-6 PM[2]	0	55	55

Notes:
[1] Operational trips reflect the net increment of With Action condition developments expected to be completed by the first quarter of 2029 minus the demand from No Action condition developments on projected development sites that are expected to be undergoing construction in the first quarter of 2029.
[2] 8:00 to 9:00 AM and 5:00 to 6:00 PM are assumed as the weekday AM and PM operational traffic peak hours, consistent with 2020 *CEQR Technical Manual* guidance.

As discussed in Chapter 14, "Transportation," the maximum incremental peak hour demand generated by the fully built project would total 186 vehicle trips in the PM peak hour. This level of demand is not expected to add 50 or more new trips at any intersection and is therefore considered unlikely to result in significant adverse traffic impacts based on *CEQR Technical Manual* guidance. As the combined incremental construction and operational trips in the first quarter of 2029 would total no more than 83 trips in the 6:00 to 7:00 AM and 3:00 to 4:00 PM construction peak hours and the 8:00 to 9:00 AM and 5:00 to 6:00 PM operational peak hours, substantially less than the fully built project, significant adverse traffic impacts are also not expected to occur in the 2029 analysis period for combined construction and operational traffic.

Street Lane and Sidewalk Closures

Temporary curb lane and sidewalk closures are anticipated adjacent to construction sites, similar to other construction projects in New York City, and these would be expected to have dedicated gates, driveways, and/or ramps for access by trucks making deliveries. Truck movements would be spread throughout the day and would generally occur between 6:00 AM and 5:00 PM, depending on the stage of construction. Flaggers are expected to be present during construction to manage the access and movement of trucks. Detailed MPT plans for each construction site would be submitted for approval to DOT's OCMC.

TRANSIT

As previously discussed and shown in **Table 20-2**, in the 2028 peak (first) quarter for construction travel demand, there would be a net increase of approximately 470 construction workers traveling to and from projected development sites each day under the Proposed Actions. Approximately 69.9 percent of construction workers are expected to travel to and from the Project Area by public transit (subway and bus). The construction sites are located in a neighborhood that is well-served by public transportation, with a total of nine subway stations or station complexes and seven local bus routes located in proximity to the Project Area.

As noted above, it is estimated that approximately 80 percent of all construction workers would arrive and depart in the peak hour before and after each shift. Therefore, in the first quarter of 2028, construction worker travel demand is expected to generate a total of approximately 263 transit trips in each of the 6:00 to 7:00 AM and 3:00 to 4:00 PM construction peak hours. Given that construction worker transit trips would be distributed among up to nine subway stations / station complexes and seven bus routes in proximity to projected development sites throughout the Project Area, the number of incremental construction trips by transit are not expected to exceed the 200-trip *CEQR Technical Manual* analysis threshold for a subway station or the 50-trip threshold for a bus analysis (per route, per direction) in either construction peak hour in 2028. In addition, as noted previously the construction worker transit trips would primarily occur outside of the AM and PM commuter peak periods when area transit facilities and services typically experience their greatest demand. As such, significant adverse transit impacts are not anticipated in the 2028 peak construction period.

As shown in **Table 20-2**, during the 2029 (first quarter) analysis period for cumulative construction and operational travel demand, it is estimated that there would be an incremental increase of approximately 250 construction workers on-site daily under the Proposed Actions. Based on the same mode choice and temporal factors utilized for the 2028 analysis, incremental construction worker subway and bus trips are expected to total approximately 114 and 27, respectively, in both the 6:00 to 7:00 AM and the 3:00 to 4:00 PM construction peak hours in 2029. During these same peak hours, the net increase in operational subway trips from completed projected development sites would total approximately 81 and 342, respectively, while operational bus trips would increase by one during the 6:00 to 7:00 AM period and 25 during the 3:00 to 4:00 PM period. Combined construction and operational transit trips would total 195 and 456 by subway in the 6:00 to 7:00 AM and 3:00 to 4:00 PM periods, respectively, and 28 and 52, respectively, by bus. By comparison, the net increase in operational subway trips with full build-out of the Proposed Actions in 2031 would be substantially greater in number, totaling approximately 835 and 978 trips during the weekday 8:00 to 9:00 AM and 5:00 to 6:00 PM commuter peak periods when overall demand on area subway facilities and services typically peaks. The net increase in operational bus trips in 2031 would also be greater in number, totaling 47 and 75 trips during the weekday 8:00 to 9:00 AM and 5:00 to 6:00 PM commuter peak periods when overall demand on area bus services typically peaks. Therefore, 2029 transit conditions during the 6:00 to 7:00 AM and the 3:00 to 4:00 PM construction peak hours are expected to be generally better than during the analyzed commuter peak hours with full build-out of the Proposed Actions in 2031. Consequently, there would be less likelihood of significant adverse subway station impacts during the 2029 cumulative analysis period than with full build-out of the projected development in 2031.

As discussed in Chapter 21, "Mitigation," the proposed Actions would result in unmitigated significant adverse impacts to one street stair in the AM and PM operational peak hours at the Canal Street (A/C/E) subway station on the Eighth Avenue Line. Should this significant adverse subway station impact occur during the 2029 cumulative analysis period, it would also remain unmitigated.

Lastly, as the Proposed Actions are not expected to result in significant adverse subway line haul or bus impacts, the smaller numbers of subway and bus trips that would be generated in the 2029 (first quarter) analysis period for cumulative construction and operational travel demand are similarly not expected to result in any significant adverse impacts to subway line haul conditions or bus services.

PEDESTRIANS

As discussed above, during the 2028 (first quarter) peak construction travel period it is estimated that there would be a net increment of approximately 470 construction workers on site daily under the Proposed Actions, approximately 69.9 percent of whom are expected to travel to/from the Project Area by transit, walking to and from area subway stations and bus stops. Up to an additional 1.2 percent are expected to walk to or from the Project Area. In addition, approximately 28.9 percent would be traveling by private auto, many of whom would likely walk to and from off-site parking. As approximately 80 percent of construction worker trips are expected to occur during any one peak hour, net incremental travel demand on area sidewalks and crosswalks is expected to total approximately 377 trips in the 6:00 to 7:00 AM and the 3:00 to 4:00 PM construction peak hours. These trips would be widely distributed among the 13 projected development sites that would be under construction in the first quarter of 2028 and would primarily occur outside of the weekday AM and PM commuter peak periods and weekday midday and Saturday peak periods when area pedestrian facilities typically experience their greatest demand. It is therefore unlikely that any single sidewalk, corner area, or crosswalk would experience 200 or more incremental peak-hour trips (the threshold below which significant adverse pedestrian impacts are considered unlikely to occur based on *CEQR Technical Manual* guidance). Consequently, significant adverse pedestrian impacts in the 2028 peak (first) quarter for construction worker travel demand are not anticipated. At locations where temporary sidewalk closures are required during construction activities, adequate protection or temporary sidewalks and appropriate signage would be provided in accordance with DOT requirements.

As shown in **Table 20-2**, during the 2029 peak (first) quarter for analysis of cumulative construction and operational travel demand, it is estimated that the Proposed Actions would add a net increment of approximately 250 construction workers on-site daily. Based on the same mode choice and temporal factors utilized for the 2028 analysis, construction worker pedestrian trips (transit walk trips, walk-only trips, and trips to/from off-site parking, combined) are expected to total approximately 201 in the 6:00 to 7:00 AM and the 3:00 to 4:00 PM construction peak hours in 2029. When combined with operational pedestrian trips from completed projected development sites (144 and 611 trips in each period, respectively), the Proposed Actions would result in a net total of approximately 345 and 812 pedestrian trips during these periods, respectively, in 2029. By comparison, incremental pedestrian trips with full build-out of the Proposed Actions in 2031 would be substantially greater in number, totaling 1,747 and 2,308 during the analyzed weekday 8:30 to 9:30 AM and 5:00 to 6:00 PM operational peak hours, respectively. 2029 pedestrian conditions during the weekday 6:00 to 7:00 AM and 3:00 to 4:00 PM construction peak hours are therefore expected to be generally better than during the analyzed weekday AM and PM operational peak hours with full build-out of the Proposed Actions in 2031. As the Proposed Actions are not expected to result in significant adverse pedestrian impacts in the weekday AM and PM operational peak hours, the smaller numbers of weekday peak hour pedestrian trips that would be generated in the 2029 (first quarter) analysis period for cumulative construction and operational travel demand are similarly not expected to result in any significant adverse pedestrian impacts.

PARKING

As shown in **Table 20-2** and discussed above, during the 2028 peak (first) quarter for construction traffic, it is estimated that there would be approximately 470 construction workers on site daily, approximately 28.9 percent of whom would be expected to travel to the Project Area by private auto. Based on an average vehicle occupancy of 2.04 persons per vehicle, the maximum daily parking demand from project site construction workers would total approximately 67 spaces in the midday period (see **Table 20-7**). These workers are expected to park on-street and in off-street public parking facilities in proximity to projected development sites throughout the Project Area.

Table 20-7
2028 (First Quarter) and 2029 (First Quarter)
Construction Worker Parking Accumulation

Hour	2028 (Q1)			2029 (Q1)		
	In	Out	Total	In	Out	Total
6:00-7:00 AM	54	0	54	28	0	28
7:00-8:00 AM	13	0	67	7	0	35
8:00-9:00 AM	0	0	67	0	0	35
9:00-10:00 AM	0	0	67	0	0	35
10:00-11:00 AM	0	0	67	0	0	35
11:00 AM-12:00 PM	0	0	67	0	0	35
12:00-1:00 PM	0	0	67	0	0	35
1:00-2:00 PM	0	0	67	0	0	35
2:00-3:00 PM	0	3	64	0	2	33
3:00-4:00 PM	0	54	10	0	28	5
4:00-5:00 PM	0	10	0	0	5	0
5:00-6:00 PM	0	0	0	0	0	0

As also shown in **Table 20-2**, above, during the 2029 peak (first) quarter for cumulative construction and operational traffic, it is estimated that there would be approximately 250 workers on site daily. Based on the same mode choice and vehicle occupancy factors utilized for the 2028 analysis, and as presented in **Table 20-7**, the maximum daily parking demand from project site construction workers in 2029 would total approximately 35 spaces in the midday. In addition, during this cumulative construction and operational analysis period, there would be 18 sites that are already completed and operational and seven sites that are under construction. Net incremental parking demand from these sites would total approximately 113 spaces in the midday. Therefore, the net increment parking demand during the 2029 peak cumulative construction period would total approximately 148 spaces in the midday.

As discussed in Chapter 14, "Transportation," under *CEQR Technical Manual* guidance for proposed projects located in Manhattan, the inability of a proposed project or the surrounding area to accommodate a project's future parking demands is considered a parking shortfall, but is generally not considered significant due to the magnitude of available alternative modes of transportation. Therefore, any shortfalls in on-street and off-street parking capacity that may result from the 67 spaces of construction worker parking demand generated by the Proposed Actions during the 2028 peak construction period, and the 148 spaces of incremental parking demand that would be generated during the 2029 peak period for cumulative construction and operational traffic, would not be considered significant adverse parking impacts under *CEQR Technical Manual* criteria.

AIR QUALITY

Emissions from on-site construction equipment and on-road construction vehicles, as well as dust-generating construction activities, all have the potential to affect air quality. The analysis of potential construction air quality impacts included both on-site and on-road sources of air emissions, and the combined impact of both sources, where applicable.

In general, much of the heavy equipment used in construction is powered by diesel engines that have the potential to produce relatively high levels of nitrogen oxides (NO_x) and particulate matter (PM) emissions. Fugitive dust generated by construction activities is also a source of PM. Gasoline engines produce relatively high levels of carbon monoxide (CO). Since EPA mandates the use of ULSD fuel for all highway and non-road diesel engines, sulfur oxides (SO_x) emitted from the Proposed Actions' construction activities would be negligible. Therefore, the pollutants analyzed for the construction period are NO_2—which is a component of NO_x that is a regulated pollutant, particles with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}), particles with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and CO. **Table 20-8** shows the pollutants analyzed in the construction air quality analysis and the corresponding averaging periods.

Table 20-8
Pollutants for Analysis and Averaging Periods

Pollutant	Averaging Period
$PM_{2.5}$	24-hour
	Annual Local
PM_{10}	24-hour
NO_2	Annual
CO	1-hour
	8-hour

Concentrations were predicted using dispersion models to determine the potential for air quality impacts during on-site construction activities and due to construction-generated traffic on local roadways. Concentrations for each pollutant of concern due to construction activities at each sensitive receptor were predicted during the most representative worst-case time period. The potential for significant adverse impacts were determined by comparing modeled PM_{10}, NO_2, and CO concentrations to NAAQS, and modeled $PM_{2.5}$ to applicable *de minimis* thresholds.

The detailed approach for assessing the effect of construction activities resulting from the Proposed Actions on air quality is discussed further below.

ON-SITE CONSTRUCTION ACTIVITY ASSESSMENT

Based on the preliminary construction schedule, the overall construction duration for each of the projected development sites is anticipated to be short-term (i.e., less than two years) in accordance with the *CEQR Technical Manual*, with the exception of Projected Development Sites 2 (25 months duration) and 9 (27 months duration). Since Projected Development Site 9 is the largest projected development site under the rezoning and is anticipated to have the longest construction duration, Projected Development Site 9 was selected for dispersion modeling of annual and short-term (i.e., 24-hour, 8-hour, and 1-hour) averaging periods. Projected Development Sites 24 and 25, which are located within one block of Projected Development Site 9, are anticipated to have overlapping construction elements with Projected Development Site 9 based on the preliminary construction schedule, so the sites were also included in the dispersion modeling analysis. To determine which construction activities at Projected Development Site 9 constitute the worst-case periods for the pollutants of concern (PM, CO, and NO_2), construction-related emissions were calculated throughout the duration of construction on a rolling annual and peak day basis for $PM_{2.5}$. $PM_{2.5}$ is selected for determining the worst-case periods for all pollutants analyzed because the ratio of predicted $PM_{2.5}$ incremental concentrations to impact criteria is anticipated to be higher than for other pollutants. Therefore, initial estimates of $PM_{2.5}$ emissions throughout the construction years were used for determining the worst-case periods for analysis of all pollutants. Generally, emission patterns of PM_{10} and NO_2 would follow $PM_{2.5}$ emissions, since they are related to diesel engines by horsepower. CO emissions may have a somewhat different pattern but would also be anticipated to be highest during periods when the most activity would occur. Based on the resulting emissions profiles, October 2027 and the annual period between October 2027 and September 2028 were identified as the worst-case short-term and annual periods, respectively, and were selected for analysis.

Engine Emissions

The sizes, types, and number of units of construction equipment were estimated based on the construction activity schedule developed for the Proposed Actions. Emission rates for NO_X, CO, PM_{10}, and $PM_{2.5}$ from truck engines were developed using the EPA Motor Vehicle Emission Simulator (MOVES2014b) emission model. Emission factors for NO_x, CO, PM_{10}, and $PM_{2.5}$ from on-site construction engines were developed using the NONROAD emission module included in the MOVES2014b emission model. The emission factor calculations took into account any emissions reduction measures (i.e., the application of diesel particulate filters, etc.) that is required for the projected development sites.

On-Site Dust Emissions

In addition to engine emissions, dust emissions from operations (e.g., excavation and transferring of excavated materials into dump trucks) were calculated based on EPA procedures delineated in AP-42 Table 13.2.3-1. Since construction is required to follow the New York City Air Pollution Control Code regarding construction-related dust emissions, a 50 percent reduction in particulate emissions from fugitive dust was conservatively assumed in the calculation (dust control methods such as wet suppression would often provide at least a 50 percent reduction in particulate emissions).

Dispersion Modeling

Potential impacts from the Proposed Actions' construction sources were evaluated using a refined dispersion model, the EPA/AMS AERMOD dispersion model. AERMOD is a state-of-the-art dispersion model, applicable to rural and urban areas, flat and complex terrain, surface and elevated releases, and multiple sources (including point, area, and volume sources). AERMOD is a steady-state plume model that incorporates current concepts about flow and dispersion in complex terrain and includes updated treatments of the boundary layer theory, understanding of turbulence and dispersion, and handling of terrain interactions.

Source Simulation

For short-term model scenarios (predicting concentration averages for periods of 24 hours or less), all stationary sources, such as compressors, cranes, or concrete trucks, which idle in a single location while unloading, were simulated as point sources. Other engines, which would move around the site on any given day, were simulated as area sources. For periods of eight hours or less (less than the length of a shift), it was assumed that all engines would be active simultaneously.

All sources with the exception of tower cranes would move around the site throughout the year and were therefore simulated as area sources in the annual analyses.

Meteorological Data

The meteorological data set consists of five consecutive years of latest available meteorological data: surface data collected at the nearest representative National Weather Service Station (La Guardia Airport) from 2015 to 2019 and concurrent upper air data collected at Brookhaven, New York. The meteorological data provide hour-by-hour wind speeds and directions, stability states, and temperature inversion elevation over the five-year period. These data were processed using the EPA AERMET program to develop data in a format which can be readily processed by the AERMOD model.

Background Concentrations

To estimate the maximum expected total pollutant concentrations, the calculated impacts from the emission sources must be added to a background value that accounts for existing pollutant concentrations from other sources. The background levels are based on concentrations monitored at the nearest DEC ambient air monitoring stations, and are consistent with the background concentrations to be used for the operational stationary source air quality analysis.

Receptor Locations

Receptors were placed at locations that would be publicly accessible, at residential and other uses at both ground-level and elevated locations (e.g., residential windows), at adjacent sidewalk locations, at publicly accessible open spaces, and at completed and occupied buildings at projected development sites where applicable. In addition, a ground-level receptor grid was placed to enable extrapolation of concentrations throughout the study area at locations more distant from construction activities.

On-Road Sources

As presented above, under "Transportation," the traffic increments during construction are lower than the operational traffic increments for the full build-out with the Proposed Actions. In addition, construction worker commuting trips and construction truck deliveries would generally occur during off-peak hours. Furthermore, when distributed over the transportation network, the construction trip increments would not be concentrated at any single location. Nevertheless, since emissions from on-site construction equipment and on-road construction-related vehicles may contribute to concentration increments concurrently, on-road emissions adjacent to the construction sites were included with the on-site dispersion analysis (in addition to on-site truck and non-road engine activity) to address all local project-related emissions cumulatively.

On-Road Vehicle Emissions

Vehicular engine emission factors were computed using the EPA mobile source emissions model, MOVES2014b.[2] This emissions model is capable of calculating engine emission factors for various vehicle types, based on the fuel type (gasoline, diesel, or natural gas), meteorological conditions, vehicle speeds, vehicle age, roadway type and grade, number of starts per day, engine soak time, and various other factors that influence emissions, such as inspection maintenance

[2] EPA. Motor Vehicle Emission Simulator (MOVES), User Guide for MOVES2014b, December 2018.

programs. The inputs and use of MOVES incorporate the most current guidance available from DEC.

On-Road Fugitive Dust

$PM_{2.5}$ emission rates were determined with fugitive road dust to account for their impacts. However, fugitive road dust was not be included in the annual average $PM_{2.5}$ microscale analyses, as per current *CEQR Technical Manual* guidance used for mobile source analysis. Road dust emission factors were calculated according to the latest procedure delineated by EPA.[3] An average weight of 17.5 tons and 2.5 tons was assumed for construction trucks and worker vehicles in the analyses, respectively.

Traffic Data

Traffic data for the air quality analysis was derived from existing traffic counts, projected future growth in traffic, and other information developed as part of the construction traffic analysis for the Proposed Actions.

Impact Criteria

The *CEQR Technical Manual* states that the significance of a predicted consequence of a project (i.e., whether it is material, substantial, large, or important) should be assessed in connection with its setting (e.g., urban or rural), its probability of occurrence, its duration, its irreversibility, its geographic scope, its magnitude, and the number of people affected.[4] In terms of the magnitude of air quality impacts, any action predicted to increase the concentration of a criteria air pollutant to a level that would exceed the concentrations defined by the NAAQS would be deemed to have a potential significant adverse impact. In addition, to maintain concentrations lower than the NAAQS in attainment areas, or to ensure that concentrations will not be significantly increased in non-attainment areas, threshold levels have been defined for certain pollutants; any action predicted to increase the concentrations of these pollutants above the thresholds would be deemed to have a potential significant adverse impact, even in cases where violations of the NAAQS are not predicted.

EMISSION CONTROL MEASURES

Measures are expected to be taken to reduce pollutant emissions during construction under the Proposed Actions in accordance with all applicable laws, regulations, and building codes. These required measures include dust suppression measures as specified in the DEP *Construction Dust Rules*, diesel- and gas-powered equipment reduction, the use of ULSD fuel, and truck idling restrictions. Overall, these emission control measures are expected to reduce air pollutant emissions during construction under the Proposed Actions.

ANALYSIS RESULTS

Maximum predicted concentration increments from construction under the Proposed Actions, and maximum overall concentrations including background concentrations, are presented in **Table**

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[3] EPA. Compilations of Air Pollutant Emission Factors AP-42, Fifth Edition, Volume I: Stationary Point and Area Sources, Ch. 13.2.1, NC, http://www.epa.gov/ttn/chief/ap42, January 2011.

[4] New York City. *CEQR Technical Manual*. Chapter 1, section 222. March 2014; and New York State Environmental Quality Review Regulations, 6 NYCRR § 617.7

20-9 for the construction peak period analyzed. For $PM_{2.5}$, monitored background concentrations are not added to modeled concentrations from sources, since impacts are determined by comparing the predicted increment from construction activities to the CEQR *de minimis* criteria. The maximum predicted concentration increments include both on-site construction sources and on-road construction sources. As described above, October 2027 and the annual period between October 2027 and September 2028 were identified as the worst-case short-term and annual periods, respectively, and were selected for analysis. These peak periods include construction activities at Projected Development Sites 9, 24, and 25.

Table 20-9
Maximum Predicted Pollutant Concentrations from Construction Site Sources—Peak Analysis Periods (µg/ m³)

Pollutant	Averaging Period	Background	Maximum Modeled Increment	Total Concentration	*De Minimis* Criteria	NAAQS
$PM_{2.5}$	24-hour[1]	—	4.0	—	7.7 [2]	—
	Annual Local[1]	—	0.29	—	0.3	—
	Annual Neighborhood[1]	—	0.004	—	0.1	—
PM_{10}	24-hour	39.3	8.7	48.0	—	150
NO_2	Annual	32.8	5.1	37.9	—	100
CO	One-hour	1.7 ppm	1.8 ppm	3.5 ppm	—	35 ppm
	Eight-hour	1.1 ppm	0.2 ppm	1.3 ppm	—	9 ppm

Notes:
Results for any other time period and/or location are expected to be comparable or lower.
$PM_{2.5}$ concentration increments were compared with the applicable *de minimis* criteria. Total concentrations were compared with the NAAQS.
1 Monitored concentrations are not added to modeled $PM_{2.5}$ values.
2 $PM_{2.5}$ *de minimis* criteria—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 µg/m³.

As shown in **Tables 20-10**, the maximum predicted total concentrations of PM_{10}, CO, and annual-average NO_2 are below the applicable NAAQS. The maximum predicted 24-hour average $PM_{2.5}$ incremental concentration (4.0 µg/m³) would occur at a building receptor to the west of Projected Development Site 9, and the maximum predicted annual average $PM_{2.5}$ incremental concentration (0.29 µg/m³) would occur at a sidewalk location to the east of Projected Development Site 9. The maximum predicted $PM_{2.5}$ incremental concentrations would not exceed the applicable CEQR *de minimis* criterion of 7.7 µg/m³ in the 24-hour average period or 0.30 µg/m³ in the annual average period.

Although the modeled results are based on the representative peak construction periods, conclusions regarding other periods could be derived based on the lower concentration increments from construction that would generally be expected during periods with lower construction emissions.

CONCLUSIONS

Measures would be taken to reduce pollutant emissions during construction in accordance with all applicable laws, regulations, and building codes. These include dust suppression measures, idling restriction, and the use of ULSD. With the implementation of these emission reduction measures, the dispersion modeling analysis of construction-related air emissions for both on-site and on-road sources determined that $PM_{2.5}$, PM_{10}, annual-average NO_2, and CO concentrations would be below their corresponding *de minimis* thresholds or NAAQS, respectively. Therefore, construction under the Proposed Actions would not result in significant adverse air quality impacts due to construction sources.

NOISE

Potential impacts on community noise levels during construction under the Proposed Actions could result from construction equipment operation as well as construction vehicles traveling to and from the development sites. Noise levels at a given location would be dependent on the type and number of pieces of construction equipment in operation, the acoustical utilization factor of the equipment (i.e., the percentage of time a piece of equipment is operating at full power), the distance from the construction site, and any shielding effects from structures such as buildings, walls, or barriers. Noise levels caused by construction activities would vary widely, depending on the stage of construction and the location of the construction relative to receptor locations. The most noise-intensive construction activities are typically intermittent and would not occur throughout the workday or the duration of the construction task. During hours when the loudest pieces of construction equipment would not be in use, receptors would experience lower construction noise levels. Construction noise levels would fluctuate during the construction period at each receptor, with the greatest levels of construction noise occurring for limited periods during construction. The most substantial construction noise sources are expected to be impact-related equipment such as pile drivers and heavy equipment such as dump trucks and excavators.

Construction noise is regulated by the requirements of the *New York City Noise Control Code* (also known as Chapter 24 of the *Administrative Code of the City of New York*, or Local Law 113) and the DEP Notice of Adoption of Rules for Citywide Construction Noise Mitigation (also known as Chapter 28). These requirements mandate that specific construction equipment and motor vehicles must meet specified noise emission standards; that construction activities be limited to weekdays between the hours of 7:00 AM and 6:00 PM; and that those construction materials be handled and transported in such a manner as not to create unnecessary noise. Permits would be required to be obtained, as specified in the *New York City Noise Control Code*, for weekend and after-hour work if they become necessary. As required under the *New York City Noise Control Code*, a site-specific noise mitigation plan for the Proposed Actions would be developed and implemented that may include source controls, path controls, and receiver controls.

CONSTRUCTION NOISE IMPACT CRITERIA

Chapter 22 of the *CEQR Technical Manual* breaks construction duration into “short-term” and “long-term” and states that construction noise is not likely to require analysis unless it “affects a sensitive receptor over a long period of time.” Consequently, the construction noise analysis considers the potential for construction of a project to create high noise levels (the “intensity”), whether construction noise would occur for an extended period of time (the “duration”), and the locations where construction has the potential to produce noise (“receptors”) in evaluating potential construction noise effects.

The noise impact criteria described in Chapter 19, Section 410, of the *CEQR Technical Manual* serve as a screening-level threshold for potential construction noise impacts. If construction of the proposed project would not result in any exceedances of these criteria at a given receptor, then that receptor would not have the potential to experience a construction noise impact. The screening level noise impact criteria for mobile and on-site construction activities are as follows:

- If the No Action noise level is less than 60 dBA $L_{eq(1)}$, a 5 dBA $L_{eq(1)}$ or greater increase would require further consideration.

- 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 require further consideration.
- 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 PM and 7 AM), the threshold requiring further consideration would be a 3 dBA $L_{eq(1)}$ or greater increase.

The *CEQR Technical Manual* characterizes noise exposure into "acceptable," "marginally acceptable," "marginally unacceptable," or "clearly unacceptable" categories based on the $L_{10(1)}$ noise level and land use. For the purposes of construction noise evaluation, noise levels in the "acceptable" or "marginally acceptable" categories are not considered to exceed the screening threshold. If construction of the proposed project would result in "marginally unacceptable" or "clearly unacceptable" noise levels that exceed these noise impact criteria at a receptor, then further consideration of the intensity and duration of construction noise is warranted at that receptor. Generally, exceedances of these criteria for more than 24 consecutive months are considered to be significant impacts. Noise level increases that would be considered objectionable (i.e., greater than or equal to 15 dBA) lasting 12 consecutive months or longer and noise level increases considered very objectionable (i.e., greater than or equal to 20 dBA)[5] lasting three months or longer would also be considered significant impacts.

NOISE ANALYSIS FUNDAMENTALS

As stated above, construction activities would be expected to result in increased noise levels as a result of: (1) the operation of construction equipment on the projected development sites; and (2) the movement of construction-related vehicles (i.e., worker trips and material and equipment trips) on the roadways to and from the projected development sites. The effect of each of these noise sources was evaluated. The results presented below show the effects of construction activities (i.e., noise due to both on-site construction equipment and construction-related vehicle operation) on noise levels at nearby noise receptor locations.

Noise from the operation of construction equipment 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 from construction fence, nearby buildings, etc.

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.);

[5] Definition of "objectionable" and "very objectionable" noise level increases based on Table B from New York State Department of Environmental Conservation Assessing and Mitigating Noise Impacts policy manual, revised February 2001.

- Volume of vehicular traffic on each roadway segment;
- Vehicular speed;
- The distance between the roadway and the receptor;
- Topography and ground effects; and
- Shielding.

MOBILE SOURCE CONSTRUCTION NOISE ANALYSIS

A Noise PCE screening was used to evaluate construction mobile source noise. At each roadway segment, the construction worker vehicle and construction truck trips during the analysis hour were converted to Noise PCEs and compared to the existing level of Noise PCEs to determine whether there would be a potential exceedance of CEQR construction noise screening thresholds (i.e., a 3 dBA increase in noise levels). The 6:00 AM to 7:00 AM hour was selected as the analysis hour because this would be the hour when the highest number of worker vehicle and construction truck trips to and from the construction site would occur.

Construction truck trips that would occur during the construction work day (i.e., after 7:00 AM) are included in the modeling of construction noise as discussed below.

ON-SITE CONSTRUCTION NOISE ANALYSIS METHODOLOGY

A detailed modeling analysis was used to evaluate potential construction noise effects at existing noise receptors (e.g., residences) near projected development sites as well as at completed and occupied projected development sites. A noise-sensitive receptor is defined in Chapter 19, "Noise," Section 124 of the 2020 *CEQR Technical Manual* and includes indoor receptors such as residences, hotels, health care facilities, nursing homes, schools, houses of worship, court houses, public meeting facilities, museums, libraries, theaters, and commercial offices. Outdoor sensitive receptors include parks, outdoor theaters, golf courses, zoos, campgrounds, and beaches.

Construction noise levels were calculated for each phase of construction at selected projected development sites. The results of the construction noise analyses at these selected sites were used along with the conceptual construction schedule to extrapolate construction noise from all projected development sites. Based on the extrapolated construction noise levels, the intensity and duration of construction noise at each receptor was evaluated to identify potential noise impacts from construction.

Specifically, the construction noise analysis involved the following process:

1. Select analysis hours for cumulative on-site equipment and construction truck noise analysis. The 7:00 AM hour was selected as the analysis hour because this would be the hour when the highest number of truck trips to and from the construction site would overlap with on-site equipment operation.
2. Select representative construction sites for analysis. The two selected sites included the largest projected developments (i.e., Projected Development Site 9) and a typical projected development site (i.e., Projected Development Site 5). Projected Development Site 9 was used to represent construction noise from projected development sites greater than 92,000 gross-square-feet (gsf) (i.e., Projected Development Sites 1, 2, 8, 9, 10, 12, 13, and 20), and Projected Development Site 5 was used to represent all other development sites. At representative Projected Development Sites 5 and 9, construction noise levels were calculated during each major construction phase (i.e., excavation/foundation work, superstructure work, and

interior fit-out work). Because the analysis is based on construction phases, it does not capture the natural daily and hourly variability of construction noise at each receptor. The level of noise produced by construction fluctuates throughout the days and months of the construction stages, while the construction noise analysis is based on the worst-case time periods only, which is conservative. Based on the location of the two projected development sites selected for quantitative analysis, construction from each site would not have the potential to simultaneously affect noise levels at any surrounding receptor sites. Consequently, the projected development sites were analyzed independently.

3. Select receptor locations for quantitative cumulative on-site equipment and construction truck noise analysis at the representative construction sites. Selected receptors were representative of open space, educational, residential, or other noise-sensitive uses potentially affected by construction on the representative construction sites during operation of on-site construction equipment and/or along routes taken to and from the sites by construction trucks.
4. Establish existing noise levels at selected receptors. Noise levels were measured at several at-grade locations, and calculated for the other noise receptor locations included in the analysis. Noise measurement locations are shown in Figure 17-1 in Chapter 17, "Noise." Existing noise levels at noise receptors other than the selected noise measurement locations were established using the CadnaA model along with existing condition traffic information collected during noise measurements. The calculated existing noise levels were conservatively used to represent No Action condition noise levels, since noise levels are not projected to increase substantially between the existing and No Action conditions.
5. Calculate construction noise levels for each construction phase at each receptor location based on the sound power level, acoustical usage factor, and physical placement of each piece of equipment. Given the on-site equipment and construction truck trips that are expected during each of the analysis periods at each construction site, and the location of the equipment, which was based on construction logistics and construction truck and worker vehicle trip assignments, a CadnaA model for each construction phase was created for both projected development sites. All models included each of the construction noise sources during the construction phase and analysis hour, calculation points representing multiple locations on various façades and floors of the associated receptors previously identified, as well as the noise control measures that would be used on the site, as described below.
6. Determine total noise levels and noise level increments during construction at the selected receptor locations during construction of Projected Development Sites 5 and 9. For each analysis period, the calculated construction noise level at each receptor location was logarithmically added to the existing noise level to determine the cumulative total noise level. The existing noise level at each receptor was then arithmetically subtracted from the cumulative noise level in each analysis period to determine the noise level increments during construction.
7. Compare total noise levels and noise level increments with impact criteria as described above in "Construction Noise Impact Criteria." The predicted noise levels were compared with the noise impact criteria to determine the potential effects of construction noise based on the magnitude of construction noise at each receptor.
8. Establish range of impact criteria exceedances for each analyzed projected development site in terms of distance from each construction site. Based on the results of the quantitative construction noise analyses at Projected Development Sites 5 and 9 as described above, the range from each site that noise levels are predicted to exceed the impact criteria was established.

9. Establish magnitude of construction noise at noise receptors near other projected development sites other than those analyzed. Projected Development Site 9 was used to represent construction noise from projected development sites greater than 92,000 gsf (i.e., Projected Development Sites 1, 2, 8, 9, 10, 12, 13, and 20), and Projected Development Site 5 was used to represent all other development sites. Extrapolating from the construction noise analysis results at the selected construction sites, based on the expected stages of construction during each year at each project development site according to the conceptual construction schedule and the ranges established in item 8, above, noise receptors were identified that would be expected to experience exceedances of the impact criteria due to construction of the other projected development sites.
10. Establish construction noise duration. For each receptor, the noise level increments in each analysis period were examined to determine the phases of construction at the nearby construction sites that would result in exceedances of the *CEQR Technical Manual* impact criteria. Based on the conceptual construction schedule and the ranges established in item 8 above, at each development site, the worst-case month per year of the construction schedule was used to determine conservatively the duration of construction noise at the analyzed receptors.
11. Identify and describe potential significant adverse construction noise impacts. At each receptor, based on the magnitude and duration of predicted noise level increases due to construction, a determination was made as to whether the Proposed Actions would have the potential to result in significant adverse construction noise impacts.

CONSTRUCTION NOISE MODELING

Noise effects from construction activities were evaluated using the CadnaA model, a computerized model developed by DataKustik for noise prediction and assessment. The model can be used for the analysis of a wide variety of noise sources, including stationary sources (e.g., construction equipment, industrial equipment, power generation equipment), 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 CadnaA model is based on the acoustic propagation standards promulgated in International Standard ISO 9613-2. This standard is currently under review for adoption by the American National Standards Institute (ANSI) as an American Standard. The CadnaA model is a state-of-the-art tool for noise analysis and is approved for construction noise level prediction by the *CEQR Technical Manual*.

Geographic input data used with the CadnaA model included drawings that define 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 for each piece of construction equipment operating at the projected development sites, as well as noise control measures—were input to the model. Reflections and shielding by barriers erected on the construction site and shielding from adjacent buildings 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. The $L_{10(1)}$ noise levels were conservatively estimated by adding 3 dBA to the $L_{eq(1)}$ noise levels, as is standard practice[6].

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[6] Federal Highway Administration Roadway Construction Noise Model User's Guide, Page 15. http://www.fhwa.dot.gov/environment/noise/construction_noise/rcnm/rcnm.pdf.

ANALYSIS TIME PERIOD SELECTION

At both of the analyzed projected development sites, construction noise levels were analyzed for each major construction phase (i.e., excavation/foundation, superstructure, and interior fit-out). The noise emission levels and extent of potential impacts during each analyzed construction scenario were used to represent noise effects from the other projected development sites.

At each development site, the month with the greatest potential to result in construction noise screening threshold[7] exceedances at nearby receptors was identified (i.e., the month of the year with the most noise-intensive construction activities). Projections of the construction noise from the projected development sites at which detailed construction noise calculations were not conducted conservatively assumed that the worst-case month of each year would represent the entire year. The construction activity considered during each year at each development site is shown below in **Table 20-10**.

Table 20-10
Construction Activities at Projected Development Sites

Site ID	2023	2024	2025	2026	2027	2028	2029	2030	2031
1	-	-	-	-	-	E/F	I	-	-
2	-	-	-	-	E/F	S	I	-	-
3	-	-	E/F	I	-	-	-	-	-
4	-	-	-	-	-	E/F	I	-	-
5	-	-	-	-	-	E/F	I	-	-
6	-	-	-	-	E/F	I	-	-	-
7	-	-	-	-	-	-	-	E/F	I
8	-	-	-	-	-	-	E/F	I	-
9	-	-	-	-	E/F	E/F	S	-	-
10	-	-	E/F	S	-	-	-	-	-
12	-	-	-	-	E/F	I	-	-	-
13	E/F	I	-	-	-	-	-	-	-
14	-	-	-	E/F	I	-	-	-	-
15	-	-	-	E/F	I	-	-	-	-
16	-	-	-	-	E/F	I	-	-	-
20	-	-	-	-	E/F	S	-	-	-
22	E/F	I	-	-	-	-	-	-	-
23	-	-	E/F	I	-	-	-	-	-
24	-	-	-	-	E/F	I	-	-	-
25	-	-	-	-	E/F	I	-	-	-
26	-	-	E/F	I	-	-	-	-	-
27	-	-	-	-	E/F	I	-	-	-
28	-	-	-	-	-	E/F	I	-	-
30 (conversion)	-	-	-	C	C	-	-	-	-
31 (conversion)	-	-	-	C	C	-	-	-	-
32 (conversion)	-	-	-	C	C	-	-	-	-

Notes: Excavation and Foundation is abbreviated as "E/F", Superstructure and Exteriors is abbreviated as "S", and Interior Fit out is abbreviated as "I". In addition, conversion activities are abbreviated as "C".
"-" indicates that the projected development site is not under construction during that year

7 The noise impact criteria in Section 410 of Chapter 19 of the *CEQR Technical Manual* serve as screening thresholds for potential construction noise impacts, i.e., if construction noise would not exceed those thresholds at a given receptor, then there would be no potential for impact at that receptor, but if these thresholds would be exceeded, than it would be necessary to consider the intensity and duration of construction noise at that receptor to determine whether construction noise would rise to the level of a significant adverse impact.

DETERMINATION OF NON-CONSTRUCTION NOISE LEVELS

Noise generated by construction activities (calculated using the CadnaA model as described above) was added to noise generated by non-construction traffic on adjacent roadways to determine the total noise levels at each receptor location. Noise levels generated by existing traffic were used as non-construction noise levels to which construction noise levels would be added.

NOISE REDUCTION MEASURES

Construction of the Proposed Actions would be required to follow the requirements of the *NYC Noise Control Code* for construction noise control measures. Specific noise control measures would be incorporated in noise mitigation plan(s) required under the *NYC Noise Control Code*. These measures could 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 *NYC Noise Control Code*:

- Equipment that meets the sound level standards specified in Subchapter 5 of the *NYC Noise Control Code* would be utilized from the start of construction. **Table 20-11** shows the noise levels for typical construction equipment and the mandated noise levels for the equipment that would be used for construction under the Proposed Actions.
- As early in the construction period as logistics would 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 practicable, 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 Title 24, Chapter 1, Subchapter 7, Section 24-163 of the *NYC Administrative Code*.
- 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 practicable:

- 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.
- Noise barriers constructed from plywood or other materials would be erected to provide shielding; and
- Path noise control measures (i.e., portable noise barriers, panels, enclosures, and acoustical tents, where feasible) for certain dominant noise equipment would be employed to the extent feasible and practical based on the results of the construction noise calculations. The details to construct portable noise barriers, enclosures, tents, etc. are shown in DEP's "Rules for Citywide Construction Noise Mitigation."[8]

[8] As found at: http://www.nyc.gov/html/dep/pdf/noise_constr_rule.pdf.

Table 20-11
Typical Construction Equipment Noise Emission Levels (dBA)

Equipment List	Typical Noise Level at 50 feet[1]
All Other Equipment > 5 HP	85
Bar Bender	80
Concrete Mixer Truck	85
Concrete Trowel	70
Crane	85
Dozer	85
Dump Truck	84
Excavator	85
Forklift	64[2]
Front End Loader	80
Generator	82
Hoist	68[3]
Impact Pile Driver	95
Jackhammer	73
Pump	77
Scissor Lift	85
Vibratory Concrete Mixer	76[4]
Welder	73

Sources:
1 "Rules for Citywide Construction Noise Mitigation," Chapter 28, DEP, 2007, except where noted.
2 Dantruck.com.
3 Report for Defra UK, 2005
4 FTA Transit Noise and Vibration Impact Assessment Manual, FTA Report No. 0123, September 2018

NOISE RECEPTOR SITES

Within the area surrounding the analyzed development sites, receptor locations were placed at buildings or noise-sensitive open spaces near the analysis locations for the construction noise analysis. These receptors are either located adjacent to planned areas of activity or streets where construction trucks would travel. At some buildings, multiple building façades were analyzed. At high-rise buildings, noise receptors were selected at multiple elevations. The receptor sites selected for detailed analysis are representative locations where maximum project effects due to construction noise would be expected.

At-grade noise measurements were conducted at 16 locations to determine existing noise levels in the study area as described in Chapter 17, "Noise." Figure 17-1 shows the locations of the noise monitoring locations. The baseline noise levels at each of the noise survey locations are described in detail in Chapter 17, "Noise." At all noise measurement locations, the dominant existing noise source was from vehicular traffic on the adjacent roadways. See **Appendix H** for the noise receptor locations as well as the associated land use.

CONSTRUCTION NOISE ANALYSIS RESULTS

Construction Mobile Sources (6:00 to 7:00 AM)

Construction worker vehicles and trucks traveling on roadways prior to the start of the construction work day would have the potential to generate noise at receptors along the routes used to access the construction sites. A screening analysis using the methodology described above found that construction worker vehicles and trucks would not have the potential to result in a significant increase in noise levels (i.e., would not result in a doubling of Noise PCEs, which would be necessary to produce a 3 dBA noise level increase) on any roadways from 6:00 to 7:00 AM. Construction vehicles traveling to and from construction sites during the construction workday are included the detailed construction noise analysis described below.

Projected Development Site 5

Using the methodology described above, cumulative noise analyses were performed to determine maximum 1-hour equivalent ($L_{eq(1)}$) noise levels that would be expected during one (1) worst-case month for each phase of construction at Projected Development Site 5. This resulted in a predicted range of peak hourly construction noise levels throughout the construction period (see **Appendix H** for the complete construction noise analysis results).

Construction at Projected Development Site 5 is predicted to result in significant noise level increases at noise-sensitive receptors in the study area at some times during the construction period. Areas immediately adjacent to construction work areas would experience the highest levels of construction noise (while construction is ongoing immediately adjacent), whereas receptors located further from the Project Area would experience less noise because of the greater distance from the on-site construction equipment. The results of the detailed construction noise analysis for Projected Development Site 5 are summarized in **Table 20-12**.

The maximum predicted noise levels shown in **Table 20-12** would occur during the most noise-intensive activities of construction, which typically do not occur every day, and do not occur during every hour on days during which those activities are conducted. During hours when the loudest pieces of construction equipment (e.g., impact pile driver) are not in use, receptors would experience lower construction noise levels. As described below, construction noise levels would fluctuate during the construction period at each receptor, with the greatest levels of construction noise occurring for limited periods during construction.

During demolition, excavation, and foundation construction at Projected Development Site 5, the primary noise sources would include impact pile drivers, excavators, and bulldozers. The pile driver would operate intermittently during a portion of the approximately three months of this construction period. Excavators and bulldozers would operate on the site regularly during demolition activities and excavation activities, but infrequently during foundation activities; there would be relatively little time during which both of these sources would overlap on the site. The construction noise analysis, however, is conservatively based on a worst-case time period including all of these sources. The maximum predicted noise level increment during this construction phase would be approximately 30 dBA, which would be considered readily noticeable to very objectionable. This maximum incremental change in noise levels would occur at only one receptor immediately overlooking the Projected Development Site 5 construction site and would only occur intermittently during the three month period when the pile driver is operating. At all other receptors, maximum predicted noise level increments would be up to 22 dBA. Noise levels exceeding CEQR construction noise screening thresholds were predicted to occur within approximately 265 feet of the construction site, objectionable noise levels were predicted to occur within approximately 84 feet, and very objectionable noise levels were predicted to occur within approximately 52 feet during demolition, excavation and foundation construction at Projected Development Site 5.

Table 20-12
Projected Development Site 5 Noise Analysis Results in dBA

Receptor	Location	Existing L_{EQ}		Total L_{EQ}		Change in L_{EQ}	
		Min	Max	Min	Max	Min	Max
1	Block 227, Lot 19	60.7	60.7	61.3	90.2	0.5	29.5
2	Block 227, Lot 19	60.7	61.1	61.7	81.4	0.7	20.5
3	Block 227, Lot 19	60.7	60.7	61.2	77.3	0.5	16.6
4	Block 227, Lot 19	60.7	60.7	61.2	81.7	0.5	21.0
5	Block 227, Lot 16	60.7	60.7	61.3	77.4	0.6	16.7
6	Block 227, Lot 16	60.7	61.4	61.4	72.8	0.6	12.1
7	Block 227, Lot 16	60.7	60.7	61.2	70.0	0.5	9.2
8	Block 227, Lot 16	60.7	60.7	61.5	74.7	0.8	14.0
9	Block 227, Lot 28	60.7	60.7	61.3	78.1	0.6	17.4
10	Block 227, Lot 28	60.7	60.7	62.4	83.1	1.7	22.4
11	Block 227, Lot 28	62.5	65.4	65.0	76.8	1.8	13.3
12	Block 227, Lot 28	60.7	66.2	60.8	66.4	0.1	0.6
13	Block 227, Lot 28	62.3	65.5	62.4	66.4	0.1	1.5
14	Block 227, Lot 7	60.7	60.7	60.8	61.3	0.1	0.6
15	Block 227, Lot 7	60.7	60.7	60.8	61.1	0.1	0.4
16	Block 227, Lot 7	60.7	60.7	60.9	61.3	0.1	0.5
17	Block 227, Lot 1	62.2	62.7	62.9	71.2	0.7	8.8
18	Block 227, Lot 1	67.6	68.8	68.1	72.1	0.5	3.9
19	Block 227, Lot 1	73.0	74.0	73.0	74.0	0.0	0.1
20	Block 228, Lot 10	68.1	69.2	68.6	72.3	0.4	3.4
21	Block 228, Lot 10	73.0	73.9	73.0	73.9	0.0	0.1
22	Block 228, Lot 5	71.5	73.9	71.6	74.0	0.0	0.4
23	Block 228, Lot 1	72.1	74.1	72.1	74.1	0.0	0.1
24	Block 228, Lot 1	64.7	66.9	64.7	67.0	0.0	0.1
25	Block 228, Lot 7502	60.7	60.7	60.8	61.6	0.1	0.8
26	Block 228, Lot 7502	60.7	60.7	60.9	67.8	0.2	7.1
27	Block 228, Lot 7502	60.7	60.7	60.9	67.5	0.2	6.8
28	Block 228, Lot 7502	63.0	65.6	66.7	77.3	1.6	14.0
29	Block 228, Lot 7503	60.7	60.7	60.9	62.5	0.2	1.8
30	Block 228, Lot 7503	60.7	60.7	61.1	65.4	0.4	4.7
31	Block 228, Lot 22	60.7	62.7	63.0	75.1	0.8	14.3
32	Block 228, Lot 22	62.2	64.9	68.6	81.3	3.9	18.8
33	Block 228, Lot 7504	62.8	65.1	67.6	80.3	2.8	17.2

Table 20-12 (cont'd)
Projected Development Site 5 Noise Analysis Results in dBA

Receptor	Location	Existing L_{EQ}		Total L_{EQ}		Change in L_{EQ}	
		Min	Max	Min	Max	Min	Max
34	Block 228, Lot 7504	60.7	60.7	60.9	61.8	0.2	1.1
35	Block 228, Lot 7504	60.7	60.7	60.9	62.6	0.2	1.9
36	Block 475, Lot 1	60.7	60.7	65.3	73.8	4.5	13.1
37	Block 475, Lot 1	61.8	61.8	65.7	74.0	3.9	12.2
38	Block 475, Lot 28	60.7	61.0	62.7	69.2	1.7	8.4
39	Block 475, Lot 28	60.7	60.7	61.1	65.2	0.4	4.5
40	Block 475, Lot 7501	60.7	60.7	63.4	72.4	2.7	11.7
41	Block 475, Lot 7501	60.7	60.7	60.9	62.9	0.2	2.2
42	Block 475, Lot 7502	60.7	60.7	60.9	62.6	0.1	1.9
43	Block 475, Lot 7502	60.7	60.7	60.8	62.6	0.1	1.9
44	Block 475, Lot 19	60.7	60.7	60.9	61.6	0.2	0.9
45	Block 475, Lot 19	60.7	60.7	60.9	61.5	0.2	0.8
46	Block 475, Lot 10	60.7	60.7	62.3	67.9	1.6	7.2
47	Block 475, Lot 10	60.7	60.7	60.9	61.8	0.2	1.0
48	Block 475, Lot 12	60.7	61.6	61.9	66.3	1.1	5.0
49	Block 475, Lot 12	60.7	60.7	60.9	62.0	0.1	1.3
50	Block 475, Lot 16	60.7	60.7	60.8	61.3	0.1	0.6
51	Block 475, Lot 16	60.7	60.7	60.9	61.4	0.1	0.7
52	Block 476, Lot 81	61.0	62.2	63.1	82.7	1.5	21.7
53	Block 476, Lot 81	60.7	60.7	64.4	75.8	3.6	15.1
54	Block 476, Lot 85	60.7	60.7	61.7	81.8	0.9	21.1
55	Block 476, Lot 89	60.7	60.8	62.0	74.9	1.2	14.1
56	Block 476, Lot 89	60.7	60.7	61.3	68.0	0.5	7.3
57	Block 476, Lot 7502	60.7	60.7	63.6	72.4	2.8	11.7
58	Block 476, Lot 7502	60.7	60.7	60.9	71.7	0.2	10.9
59	Block 476, Lot 73	60.7	60.7	60.7	61.0	0.0	0.3
60	Block 476, Lot 73	60.7	60.7	60.7	64.0	0.0	3.3
61	Block 476, Lot 62	60.7	61.0	60.8	67.3	0.1	6.6
62	Block 476, Lot 62	63.6	69.0	63.6	69.0	0.0	0.3
63	Block 476, Lot 70	64.8	68.2	64.9	68.3	0.0	0.4
64	Block 476, Lot 70	60.7	60.7	61.8	65.5	1.1	4.8
65	Block 476, Lot 7	60.7	60.7	60.9	71.3	0.1	10.6
66	Block 476, Lot 7	60.7	66.9	60.8	67.0	0.0	0.5
67	Block 476, Lot 7	62.9	68.4	63.1	68.7	0.0	2.4
68	Block 476, Lot 7	60.7	61.3	60.9	71.4	0.2	10.4
69	Block 476, Lot 1	60.7	60.7	60.9	71.3	0.1	10.6
70	Block 476, Lot 1	60.7	60.7	61.6	69.6	0.9	8.9
71	Block 476, Lot 1	60.7	60.7	60.8	61.2	0.1	0.5
72	Block 476, Lot 45	60.7	61.8	62.1	71.4	1.0	10.7
73	Block 476, Lot 45	60.7	60.7	61.3	72.1	0.6	11.4
74	Block 227, Lot 52	60.7	62.4	61.2	69.3	0.3	8.3
75	Block 227, Lot 52	60.7	62.1	61.1	72.8	0.3	11.8
76	Block 227, Lot 52	64.3	66.8	64.3	67.4	0.0	0.8
77	Block 212, Lot 70	74.5	74.6	74.5	74.9	0.0	0.3
78	Block 212, Lot 70	68.7	69.7	68.8	70.4	0.1	0.8
79	Block 212, Lot 7503	67.4	70.0	67.5	70.3	0.0	2.3
80	Block 212, Lot 7503	67.0	69.7	67.1	69.9	0.0	0.7
81	Block 212, Lot 7503	60.7	60.7	60.8	60.9	0.0	0.2
82	Block 212, Lot 7503	60.7	62.3	60.8	62.5	0.0	0.2
83	Block 212, Lot 18	63.4	66.7	63.4	67.0	0.0	0.4
84	Block 212, Lot 18	60.7	61.7	60.8	61.8	0.0	0.2

Table 20-12 (cont'd)
Projected Development Site 5 Noise Analysis Results in dBA

Receptor	Location	Existing L_{EQ}		Total L_{EQ}		Change in L_{EQ}	
		Min	Max	Min	Max	Min	Max
85	Block 212, Lot 18	60.7	60.7	60.8	60.9	0.0	0.1
86	Block 212, Lot 7505	60.7	60.7	60.7	60.8	0.0	0.1
87	Block 212, Lot 7505	60.7	66.1	60.8	66.2	0.1	0.1
88	Block 212, Lot 7505	60.7	60.7	60.8	60.8	0.0	0.1
89	Block 212, Lot 45	60.7	63.2	60.9	64.6	0.2	1.6
90	Block 212, Lot 45	67.7	68.8	67.8	69.0	0.0	0.3
91	Block 212, Lot 7501	63.3	67.1	63.7	67.5	0.1	1.7
92	Block 212, Lot 7501	60.7	65.8	60.8	65.9	0.1	0.1
93	Block 211, Lot 24	71.9	74.6	72.0	74.8	0.0	0.6
94	Block 211, Lot 24	67.5	69.1	67.8	70.6	0.2	1.9
95	Block 211, Lot 28	74.4	74.5	74.4	74.5	0.0	0.0
96	Block 211, Lot 28	66.8	67.7	66.8	67.9	0.0	0.2
97	Block 211, Lot 16	66.6	68.0	66.8	68.9	0.1	1.2
98	Block 211, Lot 16	65.4	66.3	65.4	66.4	0.0	0.1
99	Block 211, Lot 7501	60.7	60.7	60.8	61.3	0.0	0.5
100	Block 211, Lot 7501	60.7	61.9	60.8	62.4	0.1	0.5
101	Block 192, Lot 1	60.7	63.3	60.8	65.8	0.0	3.2
102	Block 192, Lot 1	60.7	63.1	60.7	64.7	0.0	3.0
103	Block 192, Lot 1	60.7	60.7	60.7	60.8	0.0	0.1
104	Block 192, Lot 1	60.7	60.7	60.7	60.8	0.0	0.0
105	Block 192, Lot 1	60.7	67.3	60.8	67.3	0.0	0.2
106	Block 210, Lot 4	66.8	67.9	66.8	67.9	0.0	0.0
107	Block 210, Lot 4	73.9	73.9	73.9	73.9	0.0	0.0
108	Block 210, Lot 1	60.7	61.1	60.8	61.2	0.0	0.1
109	Block 210, Lot 1	60.7	60.7	60.7	60.8	0.0	0.1
110	Block 210, Lot 7501	71.3	74.1	71.3	74.1	0.0	0.0
111	Block 210, Lot 7501	60.7	60.7	60.7	60.8	0.0	0.1
112	Block 210, Lot 12	74.1	74.1	74.1	74.1	0.0	0.0
113	Block 210, Lot 26	60.7	60.7	60.7	60.8	0.0	0.1
114	Block 229, Lot 3	60.7	60.7	60.8	61.1	0.1	0.4
115	Block 229, Lot 3	65.3	67.3	65.3	67.4	0.0	0.1
116	Block 229, Lot 3	71.2	74.2	71.2	74.2	0.0	0.0
117	Block 229, Lot 6	71.6	74.3	71.6	74.3	0.0	0.0
118	Block 229, Lot 6	65.1	66.9	65.1	67.1	0.0	0.3
119	Block 229, Lot 36	60.7	60.7	60.8	61.3	0.1	0.6
120	Block 229, Lot 36	60.7	62.6	60.8	62.8	0.0	0.2
121	Block 229, Lot 36	60.7	60.7	60.8	61.1	0.1	0.4
122	Block 229, Lot 15	60.7	60.7	60.8	61.3	0.1	0.5
123	Block 229, Lot 15	60.7	60.7	60.9	61.2	0.2	0.5
124	Block 229, Lot 22	60.7	61.2	61.0	62.7	0.2	1.5
125	Block 229, Lot 22	60.7	60.7	60.8	61.3	0.1	0.6
126	Block 229, Lot 20	60.7	61.2	61.1	63.4	0.4	2.5
127	Block 229, Lot 20	60.7	60.7	61.0	61.8	0.2	1.1
128	Block 229, Lot 31	60.7	60.7	60.8	62.0	0.1	1.3
129	Block 229, Lot 31	60.7	60.7	60.8	61.8	0.1	1.1
130	Block 475, Lot 61	60.7	60.7	61.3	66.5	0.6	5.7
131	Block 475, Lot 61	60.7	60.7	60.9	63.3	0.2	2.6
132	Block 475, Lot 61	60.7	60.7	60.9	65.2	0.2	4.5
133	Block 475, Lot 56	60.7	60.9	61.2	64.5	0.5	3.8
134	Block 475, Lot 56	60.7	60.7	60.9	62.7	0.1	2.0
135	Block 475, Lot 7505	60.7	60.7	60.8	63.4	0.1	2.7

Table 20-12 (cont'd)
Projected Development Site 5 Noise Analysis Results in dBA

Receptor	Location	Existing L_{EQ}		Total L_{EQ}		Change in L_{EQ}	
		Min	Max	Min	Max	Min	Max
136	Block 475, Lot 7513	60.7	60.7	60.8	61.2	0.1	0.4
137	Block 475, Lot 46	60.7	60.7	60.8	61.2	0.0	0.5
138	Block 475, Lot 46	60.7	60.7	60.8	61.8	0.0	1.1
139	Block 475, Lot 7512	60.7	60.7	60.8	62.7	0.1	2.0
140	Block 475, Lot 7512	60.7	60.7	60.8	64.3	0.1	3.5
141	Block 486, Lot 7502	60.7	60.7	60.8	61.0	0.0	0.3
142	Block 486, Lot 7502	60.7	60.7	60.8	61.6	0.1	0.8
143	Block 486, Lot 39	60.7	60.7	60.8	62.9	0.0	2.2
144	Block 486, Lot 39	60.7	60.7	60.8	63.6	0.1	2.9
145	Block 486, Lot 5	60.7	60.7	60.8	61.0	0.0	0.2
146	Block 486, Lot 5	60.7	60.7	60.8	60.9	0.0	0.1
147	Block 486, Lot 25	60.7	60.7	60.7	61.1	0.0	0.4
148	Block 486, Lot 25	60.7	60.7	60.7	61.0	0.0	0.3
149	Block 486, Lot 11	60.7	60.7	60.7	61.5	0.0	0.8
150	Block 486, Lot 11	60.7	60.7	60.7	61.1	0.0	0.4
151	Block 486, Lot 11	60.7	60.7	60.7	60.8	0.0	0.1
152	Block 486, Lot 17	60.7	60.7	60.7	60.8	0.0	0.1
153	Block 486, Lot 17	60.7	60.7	60.7	60.8	0.0	0.1
154	Block 487, Lot 7	60.7	60.7	61.2	65.0	0.5	4.3
155	Block 487, Lot 7	60.7	60.7	61.3	64.3	0.6	3.5
156	Block 487, Lot 1	60.7	60.7	60.8	64.6	0.1	3.9
157	Block 487, Lot 1	60.7	60.7	60.8	61.2	0.0	0.5
158	Block 487, Lot 12	60.7	60.7	61.1	63.2	0.4	2.4
159	Block 487, Lot 12	60.7	60.7	60.7	61.2	0.0	0.5
160	Block 487, Lot 28	60.7	60.7	60.7	60.8	0.0	0.1
161	Block 487, Lot 28	60.7	60.7	60.7	60.8	0.0	0.1
162	Block 487, Lot 20	60.7	60.7	61.1	62.0	0.3	1.3
163	Block 487, Lot 20	60.7	60.7	60.8	61.1	0.1	0.4
164	Block 487, Lot 20	60.7	60.7	60.8	61.8	0.1	1.1
165	Block 488, Lot 34	64.4	65.3	64.5	65.6	0.1	0.7
166	Block 488, Lot 34	60.7	60.7	61.2	63.1	0.5	2.4
167	Block 488, Lot 7501	60.7	60.7	60.8	61.8	0.0	1.1
168	Block 488, Lot 7501	60.7	60.7	60.7	62.3	0.0	1.6
169	Block 488, Lot 7502	60.7	60.7	61.1	62.3	0.4	1.6
170	Block 488, Lot 7502	60.7	60.7	60.7	60.8	0.0	0.1
171	Block 488, Lot 8	60.7	60.7	60.7	60.8	0.0	0.1
172	Block 488, Lot 8	60.7	60.7	60.7	60.8	0.0	0.1
173	Block 488, Lot 21	60.7	60.7	61.0	61.8	0.3	1.1
174	Block 488, Lot 21	60.7	60.7	60.8	61.2	0.1	0.5
175	Block 488, Lot 15	60.7	60.7	60.7	60.8	0.0	0.0
176	Block 488, Lot 15	60.7	60.7	60.7	60.8	0.0	0.1
177	Block 476, Lot 15	65.5	67.8	65.5	67.9	0.0	0.3
178	Block 476, Lot 15	66.0	67.1	66.0	67.1	0.0	0.1
179	Block 476, Lot 25	64.5	66.6	64.5	66.9	0.0	1.8
180	Block 476, Lot 25	62.6	63.8	62.6	65.6	0.0	2.6
181	Block 476, Lot 25	60.7	60.7	60.7	61.3	0.0	0.6
182	Block 476, Lot 19	63.9	65.7	63.9	65.8	0.0	0.1
183	Block 476, Lot 19	60.7	60.7	60.8	61.3	0.0	0.6
184	Block 489, Lot 7502	60.7	61.2	60.8	61.4	0.0	0.2
185	Block 489, Lot 7502	60.7	60.7	60.8	65.1	0.0	4.4
186	Block 489, Lot 7502	60.7	60.7	60.7	62.7	0.0	2.0

Table 20-12 (cont'd)
Projected Development Site 5 Noise Analysis Results in dBA

Receptor	Location	Existing L_{EQ}		Total L_{EQ}		Change in L_{EQ}	
		Min	Max	Min	Max	Min	Max
187	Block 489, Lot 7502	61.9	64.2	61.9	64.2	0.0	0.1
188	Block 489, Lot 9	60.7	60.7	60.7	60.8	0.0	0.1
189	Block 489, Lot 7501	60.7	60.7	60.7	60.9	0.0	0.2
190	Block 489, Lot 25	60.7	60.7	60.7	60.8	0.0	0.1
191	Block 489, Lot 25	60.7	60.7	60.7	60.8	0.0	0.0
192	Block 489, Lot 17	60.7	60.7	60.7	60.8	0.0	0.0
193	Block 489, Lot 17	60.7	60.7	60.7	60.8	0.0	0.0
194	Block 490, Lot 7502	60.7	60.7	60.7	61.2	0.0	0.4
195	Block 490, Lot 7502	61.8	67.9	61.8	67.9	0.0	0.0
196	Block 490, Lot 7501	60.7	60.7	60.7	60.8	0.0	0.0
197	Block 490, Lot 7501	60.7	60.7	60.7	60.8	0.0	0.0
198	Block 490, Lot 21	65.1	67.3	65.1	67.3	0.0	0.0
199	Block 490, Lot 21	60.7	61.8	60.7	61.8	0.0	0.0
200	Block 490, Lot 21	63.2	64.7	63.2	64.7	0.0	0.0
201	Block 490, Lot 29	60.7	60.7	60.7	60.8	0.0	0.1
202	Block 490, Lot 29	64.3	65.3	64.3	65.3	0.0	0.0
203	Block 491, Lot 7501	60.7	60.7	60.7	61.1	0.0	0.4
204	Block 491, Lot 7501	60.7	60.7	60.7	60.8	0.0	0.1
205	Block 477, Lot 66	66.7	67.9	66.7	67.9	0.0	0.0
206	Block 477, Lot 66	64.7	66.9	64.7	67.1	0.0	0.3
207	Block 477, Lot 7502	60.7	66.9	60.7	66.9	0.0	0.1
208	Block 477, Lot 7502	60.7	60.7	60.7	60.8	0.0	0.0
209	Block 477, Lot 7502	60.7	60.7	60.7	60.9	0.0	0.2
210	Block 477, Lot 11	61.5	65.6	63.0	66.7	0.0	5.2
211	Block 477, Lot 11	60.7	67.3	60.7	67.3	0.0	0.2
212	Block 477, Lot 11	62.1	64.4	62.5	64.8	0.1	1.1
213	Block 477, Lot 1	60.7	60.8	60.8	61.0	0.0	0.2

During building superstructure and exteriors construction at Projected Development Site 5, the primary noise sources would include generators, concrete mixer trucks, and crawler cranes. The concrete mixer trucks would operate on the site regularly during building superstructure activities, while the crawler crane and generator would be expected to operate on the site throughout both building superstructure and exterior activities. The construction noise analysis, however, is conservatively based on a worst-case time period including all of these sources. The maximum predicted noise level increment during this construction phase would be 22 dBA which would be considered readily noticeable to very objectionable. Noise levels exceeding CEQR construction noise screening thresholds were predicted to occur within approximately 309 feet of the construction site, objectionable noise levels were predicted to occur within approximately 84 feet of the construction site, and very objectionable noise levels were predicted to occur within approximately five feet of the construction site during superstructure and exteriors construction at Projected Development Site 5.

During interior fit-out activities at Projected Development Site 5, the primary noise sources would include crawler cranes and hoists. The maximum predicted noise level increment during this construction phase would be approximately 10 dBA, which would be considered readily noticeable to less than objectionable. Noise levels exceeding CEQR construction noise screening thresholds were predicted to occur within approximately 135 feet of the construction site during interior fit out at Projected Development Site 5.

Projected Development Site 9

Using the methodology described above, cumulative noise analyses were performed to determine maximum 1-hour equivalent ($L_{eq(1)}$) noise levels that would be expected during one (1) worst-case month for each phase of construction at Projected Development Site 9. This resulted in a predicted range of peak hourly construction noise levels throughout the construction period (see **Appendix H** for the complete construction noise analysis results).

Construction of Projected Development Site 9 is predicted to result in significant noise level increases at noise-sensitive receptors in the study area at some times during the construction period. Areas immediately adjacent to construction work areas would experience the highest levels of construction noise (while construction is ongoing immediately adjacent), whereas receptors located further from the Project Area would experience less noise because of the greater distance from the on-site construction equipment. The results of the detailed construction noise analysis for Projected Development Site 9 are summarized in **Table 20-13**.

The maximum predicted noise levels shown in **Table 20-13** would occur during the most noise-intensive activities of construction, which typically do not occur every day, and do not occur during every hour on days during which those activities are conducted. During hours when the loudest pieces of construction equipment (e.g., impact pile driver) are not in use, receptors would experience lower construction noise levels. As described below, construction noise levels would fluctuate during the construction period at each receptor, with the greatest levels of construction noise occurring for limited periods during construction.

During demolition, excavation, and foundation construction at Projected Development Site 9, the primary noise sources would include impact pile drivers, excavators, and bulldozers. The pile drivers would operate intermittently during a portion of the approximately four months of this construction period. Excavators and bulldozers would operate on the site regularly during demolition activities and excavation activities, but infrequently during foundation activities; there would be relatively little time during which both of these sources would overlap on the site. The construction noise analysis, however, is conservatively based on a worst-case time period including all of these sources. The maximum predicted noise level increment during this construction phase would be approximately 26 dBA, which would be considered readily noticeable to very objectionable. Noise levels exceeding CEQR construction noise screening thresholds were predicted to occur within approximately 509 feet of the construction site, objectionable noise levels were predicted to occur within approximately 115 feet of the construction site, and very objectionable noise levels were predicted to occur within approximately 67 feet of the construction site during demolition, excavation and foundation construction at Projected Development Site 9.

During building superstructure and exteriors construction at Projected Development Site 9, the primary noise sources would include generators, concrete mixer trucks, and crawler cranes. The concrete mixer trucks would operate on the site regularly during building superstructure activities, while the crawler crane and generator would be expected to operate on the site throughout both building superstructure and exterior activities. The construction noise analysis, however, is conservatively based on a worst-case time period including all of these sources. The maximum predicted noise level increment during this construction phase would be approximately 21 dBA, which would be considered readily noticeable to very objectionable. Noise levels exceeding CEQR construction noise screening thresholds were predicted to occur within approximately 327 feet of the construction site, objectionable noise levels were predicted to occur within approximately 95 feet of the construction site, and very objectionable noise levels were predicted to occur within approximately 10 feet of the construction site during superstructure and exteriors construction at Projected Development Site 9.

Table 20-13
Projected Development Site 9 Noise Analysis Results in dBA

Receptor	Location	Existing L_{EQ}		Total L_{EQ}		Change in L_{EQ}	
		Min	Max	Min	Max	Min	Max
1	Block 208, Lot 1	60.6	60.6	61.0	71.7	0.5	11.2
2	Block 208, Lot 1	60.6	60.6	61.0	67.3	0.4	6.8
3	Block 208, Lot 4	60.6	60.6	60.6	76.2	0.0	15.7
4	Block 208, Lot 4	60.6	60.6	60.6	64.4	0.0	3.8
5	Block 208, Lot 7501	61.9	65.4	62.4	69.4	0.3	7.3
6	Block 208, Lot 7501	60.6	60.6	63.5	78.3	3.0	17.7
7	Block 207, Lot 7	60.6	60.6	63.6	78.6	3.1	18.0
8	Block 207, Lot 7	60.6	60.6	64.8	82.1	4.2	21.6
9	Block 207, Lot 7	60.6	60.6	60.6	63.1	0.1	2.5
10	Block 207, Lot 7	60.6	60.6	60.7	64.0	0.1	3.4
11	Block 207, Lot 13	60.6	60.7	62.3	70.7	1.6	10.2
12	Block 207, Lot 13	60.6	60.6	60.8	64.3	0.3	3.7
13	Block 207, Lot 20	60.6	60.6	60.6	64.6	0.0	4.0
14	Block 207, Lot 20	60.6	60.6	60.6	60.9	0.0	0.3
15	Block 207, Lot 1	67.4	69.2	68.7	80.3	0.6	12.5
16	Block 207, Lot 1	70.8	73.7	70.9	73.8	0.0	1.0
17	Block 198, Lot 30	70.9	73.9	71.0	74.3	0.0	2.3
18	Block 198, Lot 30	68.1	70.2	68.2	70.3	0.0	0.8
19	Block 198, Lot 30	60.6	61.2	60.7	66.3	0.1	5.1
20	Block 198, Lot 27	73.4	73.8	73.5	75.6	0.1	2.0
21	Block 198, Lot 27	68.0	69.1	68.3	73.2	0.3	4.1
22	Block 198, Lot 27	60.6	60.6	60.7	65.2	0.1	4.7
23	Block 197, Lot 26	73.0	73.7	73.1	78.8	0.1	5.8
24	Block 197, Lot 26	68.4	69.2	68.6	73.8	0.2	4.8
25	Block 197, Lot 26	60.6	60.6	60.7	65.0	0.2	4.5
26	Block 197, Lot 7501	60.6	60.6	60.7	65.2	0.1	4.7
27	Block 197, Lot 7501	64.8	65.6	64.9	69.6	0.1	4.6
28	Block 196, Lot 21	67.0	68.4	67.1	73.0	0.1	5.2
29	Block 196, Lot 21	71.7	73.5	71.7	73.9	0.0	2.0
30	Block 196, Lot 13	71.5	73.4	71.5	73.5	0.0	0.3
31	Block 196, Lot 13	62.9	65.4	63.0	65.6	0.0	0.3
32	Block 196, Lot 29	60.6	60.6	60.6	61.0	0.0	0.4
33	Block 196, Lot 29	60.6	60.6	60.6	62.0	0.0	1.5
34	Block 196, Lot 26	60.6	60.6	60.6	62.1	0.1	1.5
35	Block 196, Lot 26	60.6	60.6	60.6	64.0	0.0	3.4
36	Block 196, Lot 26	60.6	60.6	60.6	64.8	0.0	4.3
37	Block 196, Lot 22	60.6	60.6	60.6	62.7	0.1	2.1
38	Block 196, Lot 22	64.7	65.7	64.8	72.3	0.1	7.5
39	Block 209, Lot 24	67.6	68.7	67.7	73.8	0.1	5.8
40	Block 209, Lot 24	72.2	73.8	72.2	74.0	0.0	0.7
41	Block 209, Lot 21	65.7	66.2	66.0	70.3	0.2	4.3
42	Block 209, Lot 19	61.8	65.3	62.5	76.3	0.5	13.2
43	Block 209, Lot 19	60.6	60.6	61.5	65.4	0.9	4.9
44	Block 209, Lot 11	60.6	60.6	61.7	62.9	1.1	2.4
45	Block 209, Lot 5	60.6	60.6	61.5	61.9	0.9	1.4
46	Block 209, Lot 5	66.1	67.4	66.1	67.5	0.0	0.1
47	Block 209, Lot 5	60.6	63.8	60.6	64.1	0.0	0.4
48	Block 209, Lot 1	69.1	70.2	69.1	70.2	0.0	0.0
49	Block 209, Lot 1	73.7	74.0	73.7	74.0	0.0	0.0
50	Block 209, Lot 32	71.5	73.9	71.5	74.0	0.0	0.4

Table 20-13 (cont'd)
Projected Development Site 9 Noise Analysis Results in dBA

Receptor	Location	Existing L_{EQ}		Total L_{EQ}		Change in L_{EQ}	
		Min	Max	Min	Max	Min	Max
51	Block 196, Lot 5	60.6	62.7	60.6	63.0	0.1	0.4
52	Block 196, Lot 5	65.4	66.9	65.4	67.0	0.0	0.1
53	Block 196, Lot 9	70.0	73.7	70.0	73.7	0.0	0.2
54	Block 196, Lot 9	67.0	69.9	67.0	69.9	0.0	0.1
55	Block 196, Lot 11	72.7	73.5	72.7	73.6	0.0	0.1
56	Block 196, Lot 31	60.6	60.6	60.6	60.9	0.0	0.3
57	Block 196, Lot 31	60.6	60.6	60.6	60.8	0.0	0.3
58	Block 196, Lot 1	60.6	60.6	60.6	60.9	0.0	0.3
59	Block 196, Lot 1	63.5	65.7	63.5	65.8	0.0	0.2
60	Block 233, Lot 26	60.6	60.6	63.0	69.4	2.4	8.8
61	Block 233, Lot 26	60.8	64.8	65.5	72.7	1.1	11.3
62	Block 233, Lot 33	60.6	60.6	61.9	66.0	1.4	5.4
63	Block 233, Lot 33	60.6	60.6	60.7	61.4	0.2	0.8
64	Block 233, Lot 2	60.6	65.8	62.3	72.3	0.3	11.7
65	Block 233, Lot 2	60.6	60.6	60.6	60.9	0.0	0.4
66	Block 233, Lot 17	63.2	65.4	63.5	66.7	0.2	3.3
67	Block 233, Lot 17	63.1	65.1	63.2	65.2	0.1	0.2
68	Block 233, Lot 8	60.6	60.6	60.6	60.8	0.0	0.2
69	Block 233, Lot 8	63.4	64.2	63.4	64.3	0.0	0.1
70	Block 232, Lot 21	60.6	60.6	60.7	61.2	0.1	0.7
71	Block 232, Lot 21	60.6	60.6	61.5	63.7	1.0	3.2
72	Block 232, Lot 1	60.6	62.0	61.3	63.8	0.6	2.2
73	Block 232, Lot 1	63.7	67.5	63.8	67.6	0.0	0.1
74	Block 232, Lot 5	64.9	66.6	64.9	66.6	0.0	0.1
75	Block 232, Lot 5	60.6	60.6	60.6	60.9	0.0	0.4
76	Block 232, Lot 8	64.6	67.1	64.6	67.1	0.0	0.1
77	Block 232, Lot 8	60.6	60.6	60.6	60.9	0.0	0.3
78	Block 232, Lot 7501	60.6	60.6	60.6	60.9	0.0	0.3
79	Block 232, Lot 7501	62.3	64.3	62.3	64.4	0.0	0.2
80	Block 232, Lot 12	63.2	67.0	63.2	67.0	0.0	0.1
81	Block 232, Lot 12	61.2	64.7	61.2	64.8	0.0	0.2
82	Block 234, Lot 17	60.6	60.6	62.1	71.7	1.5	11.1
83	Block 234, Lot 17	64.1	66.6	65.1	71.6	0.7	7.5
84	Block 234, Lot 17	62.4	64.9	62.8	67.9	0.3	5.5
85	Block 234, Lot 7501	62.0	67.0	62.7	69.6	0.3	6.8
86	Block 234, Lot 7501	61.3	65.5	61.4	65.8	0.1	0.9
87	Block 234, Lot 11	60.6	60.6	60.6	60.9	0.0	0.4
88	Block 234, Lot 11	60.6	60.6	60.6	64.6	0.0	4.0
89	Block 235, Lot 29	60.6	60.6	60.6	78.0	0.0	17.4
90	Block 235, Lot 29	60.6	60.6	60.6	75.3	0.0	14.8
91	Block 235, Lot 7501	60.6	63.6	62.1	71.6	1.2	11.0
92	Block 235, Lot 7501	60.6	60.6	60.8	62.4	0.2	1.8
93	Block 235, Lot 4	60.6	60.6	60.7	61.7	0.2	1.2
94	Block 235, Lot 4	64.2	66.3	66.6	79.1	2.4	14.9
95	Block 235, Lot 8	65.4	66.5	66.6	74.3	1.0	8.7
96	Block 235, Lot 8	60.6	60.6	60.7	61.8	0.2	1.3
97	Block 235, Lot 13	60.6	60.6	60.7	70.5	0.1	9.9
98	Block 235, Lot 13	60.6	60.6	60.6	61.8	0.1	1.2
99	Block 235, Lot 13	61.9	65.1	62.1	66.0	0.1	3.5
100	Block 235, Lot 13	63.8	66.9	64.4	70.9	0.4	7.1
101	Block 236, Lot 7501	60.6	60.6	60.6	61.6	0.1	1.1

Table 20-13 (cont'd)
Projected Development Site 9 Noise Analysis Results in dBA

Receptor	Location	Existing L_{EQ}		Total L_{EQ}		Change in L_{EQ}	
		Min	Max	Min	Max	Min	Max
102	Block 236, Lot 7501	60.6	60.6	60.6	61.5	0.1	1.0
103	Block 236, Lot 7501	61.3	63.7	61.3	63.8	0.0	0.3
104	Block 236, Lot 17	62.6	63.6	62.6	63.8	0.0	0.2
105	Block 236, Lot 17	60.6	60.6	60.6	60.9	0.1	0.3
106	Block 236, Lot 18	61.5	62.8	61.6	63.0	0.0	0.4
107	Block 236, Lot 18	60.6	60.6	60.6	61.0	0.1	0.4
108	Block 236, Lot 25	60.6	60.6	60.6	61.0	0.1	0.5
109	Block 236, Lot 25	60.6	60.6	60.6	60.9	0.0	0.3
110	Block 236, Lot 31	60.6	60.6	60.7	61.6	0.2	1.1
111	Block 236, Lot 31	60.6	60.8	61.1	63.6	0.5	2.9
112	Block 236, Lot 33	60.6	60.9	61.1	63.9	0.5	3.1
113	Block 236, Lot 33	60.6	60.6	60.8	62.0	0.2	1.4
114	Block 206, Lot 7501	60.6	60.6	60.8	64.6	0.2	4.0
115	Block 206, Lot 7501	60.6	60.6	61.0	68.6	0.5	8.1
116	Block 206, Lot 16	60.6	60.6	61.0	64.7	0.4	4.1
117	Block 206, Lot 16	60.6	60.6	60.7	61.4	0.1	0.8
118	Block 206, Lot 20	60.6	60.6	60.6	60.9	0.0	0.3
119	Block 206, Lot 20	60.6	60.6	60.6	60.8	0.0	0.3
120	Block 206, Lot 26	60.6	62.3	60.6	62.5	0.0	0.2
121	Block 206, Lot 26	71.1	75.0	71.1	75.0	0.0	0.0
122	Block 206, Lot 26	60.6	60.6	60.6	60.9	0.0	0.4
123	Block 206, Lot 34	71.8	73.7	71.8	73.9	0.0	0.4
124	Block 206, Lot 34	67.9	68.8	67.9	69.4	0.0	0.7
125	Block 206, Lot 1	60.6	62.4	60.6	64.9	0.1	2.8
126	Block 206, Lot 1	60.6	60.6	60.6	61.0	0.0	0.4
127	Block 199, Lot 7501	69.8	71.2	69.8	71.3	0.0	0.2
128	Block 199, Lot 7501	60.6	62.8	60.6	63.0	0.0	0.4
129	Block 199, Lot 11	66.6	69.3	66.6	69.4	0.0	0.1
130	Block 199, Lot 11	60.6	63.7	60.6	64.1	0.0	0.5
131	Block 199, Lot 7	60.6	60.6	60.6	60.8	0.0	0.3
132	Block 199, Lot 7	60.6	60.6	60.6	61.5	0.0	0.9
133	Block 198, Lot 126	60.6	64.4	60.6	64.6	0.0	0.5
134	Block 198, Lot 126	60.6	64.0	60.8	71.5	0.2	7.9
135	Block 198, Lot 126	60.6	62.6	61.2	72.6	0.5	10.2
136	Block 197, Lot 7502	60.6	61.3	60.7	69.4	0.1	8.2
137	Block 197, Lot 7502	60.6	63.0	60.7	72.7	0.1	9.8
138	Block 197, Lot 7502	60.6	60.6	60.6	62.4	0.1	1.8
139	Block 197, Lot 7	60.6	60.8	60.7	68.4	0.1	7.8
140	Block 197, Lot 7	60.6	62.8	60.7	71.7	0.1	8.9
141	Block 195, Lot 17	60.6	60.6	60.7	69.7	0.1	9.1
142	Block 195, Lot 17	60.6	60.6	60.6	69.7	0.1	9.1
143	Block 195, Lot 17	60.6	60.6	60.6	61.8	0.0	1.3
144	Block 195, Lot 13	60.6	60.6	60.6	62.2	0.1	1.6
145	Block 195, Lot 13	60.6	60.6	60.6	61.2	0.0	0.6
146	Block 195, Lot 9	60.6	60.6	60.6	61.8	0.0	1.3
147	Block 195, Lot 9	60.6	60.6	60.6	61.1	0.0	0.5
148	Block 195, Lot 30	60.6	60.6	60.6	60.8	0.0	0.3
149	Block 195, Lot 30	60.6	60.6	60.6	60.8	0.0	0.2
150	Block 195, Lot 30	60.6	60.6	60.6	61.1	0.0	0.6
151	Block 195, Lot 21	60.6	60.6	60.6	61.1	0.0	0.5
152	Block 195, Lot 21	60.6	60.6	60.6	64.0	0.1	3.4

Table 20-13 (cont'd)
Projected Development Site 9 Noise Analysis Results in dBA

Receptor	Location	Existing L_{EQ}		Total L_{EQ}		Change in L_{EQ}	
		Min	Max	Min	Max	Min	Max
153	Block 195, Lot 7	60.6	60.6	60.6	64.3	0.0	3.7
154	Block 195, Lot 7	60.6	60.6	60.6	62.4	0.0	1.8
155	Block 195, Lot 7	60.6	60.6	60.6	60.7	0.0	0.2
156	Block 195, Lot 4	60.6	60.6	60.6	60.9	0.0	0.3
157	Block 195, Lot 4	60.6	60.6	60.6	60.9	0.0	0.3
158	Block 195, Lot 1	60.6	60.6	60.6	60.8	0.0	0.2
159	Block 195, Lot 1	60.6	60.6	60.6	60.7	0.0	0.1
160	Block 195, Lot 1	60.6	60.6	60.6	60.7	0.0	0.1
161	Block 193, Lot 7501	60.6	60.6	60.6	63.6	0.0	3.0
162	Block 193, Lot 7501	60.6	60.6	60.6	63.5	0.0	2.9
163	Block 193, Lot 7501	60.6	60.6	60.6	61.1	0.0	0.5
164	Block 193, Lot 50	60.6	60.6	60.6	60.7	0.0	0.1
165	Block 193, Lot 50	60.6	60.6	60.6	60.7	0.0	0.1
166	Block 193, Lot 7502	60.6	60.6	60.6	60.7	0.0	0.1
167	Block 193, Lot 7502	60.6	60.6	60.6	60.6	0.0	0.1
168	Block 193, Lot 7511	60.6	60.6	60.6	60.6	0.0	0.1
169	Block 193, Lot 7511	60.6	60.6	60.6	60.7	0.0	0.1
170	Block 194, Lot 42	60.6	66.2	60.7	66.3	0.0	4.0
171	Block 194, Lot 42	60.6	60.6	60.6	61.2	0.0	0.7
172	Block 194, Lot 42	60.6	63.1	60.6	65.0	0.0	2.2
173	Block 194, Lot 38	66.2	66.8	66.2	66.9	0.0	0.1
174	Block 194, Lot 38	60.6	62.8	60.6	62.9	0.0	0.2
175	Block 194, Lot 32	60.6	60.6	60.6	60.7	0.0	0.2
176	Block 194, Lot 32	60.6	60.6	60.6	60.7	0.0	0.1
177	Block 194, Lot 7510	60.6	60.6	60.6	60.8	0.0	0.2
178	Block 210, Lot 21	72.6	73.7	72.6	73.7	0.0	0.0
179	Block 210, Lot 21	70.0	70.7	70.0	70.7	0.0	0.0
180	Block 210, Lot 21	60.6	60.6	60.6	60.7	0.0	0.2
181	Block 210, Lot 17	60.6	60.6	60.6	60.8	0.0	0.2
182	Block 210, Lot 17	72.6	73.6	72.6	73.6	0.0	0.0
183	Block 231, Lot 1	69.1	69.9	69.1	70.0	0.0	0.1
184	Block 231, Lot 1	73.7	74.1	73.7	74.1	0.0	0.0
185	Block 231, Lot 8	66.2	67.4	66.3	67.5	0.0	0.1
186	Block 231, Lot 8	60.6	60.6	61.2	61.9	0.7	1.3
187	Block 231, Lot 5	71.6	74.1	71.6	74.1	0.0	0.0
188	Block 231, Lot 5	62.9	65.9	62.9	65.9	0.0	0.1
189	Block 231, Lot 5	60.6	60.6	61.2	61.8	0.6	1.2
190	Block 231, Lot 14	63.9	66.5	63.9	66.6	0.0	0.2
191	Block 231, Lot 14	60.6	61.1	61.0	61.9	0.4	0.8
192	Block 231, Lot 7502	60.6	60.6	61.1	61.9	0.5	1.3
193	Block 231, Lot 7502	60.6	60.6	60.6	60.8	0.1	0.2
194	Block 231, Lot 37	64.4	66.7	64.4	66.7	0.0	0.1
195	Block 231, Lot 37	60.6	60.6	60.6	60.8	0.0	0.2
196	Block 231, Lot 30	64.7	67.2	64.7	67.2	0.0	0.1
197	Block 231, Lot 30	62.8	67.7	62.8	67.7	0.0	0.1
198	Block 231, Lot 26	60.6	60.6	60.6	60.7	0.0	0.1
199	Block 231, Lot 26	60.9	66.7	60.9	66.7	0.0	0.1
200	Block 473, Lot 1	60.6	60.6	60.6	60.8	0.0	0.2
201	Block 473, Lot 1	61.7	65.4	61.7	65.4	0.0	0.1
202	Block 473, Lot 1	63.9	67.3	63.9	67.3	0.0	0.1
203	Block 473, Lot 7501	60.6	60.6	60.6	61.5	0.0	0.9

Table 20-13 (cont'd)
Projected Development Site 9 Noise Analysis Results in dBA

Receptor	Location	Existing L_{EQ}		Total L_{EQ}		Change in L_{EQ}	
		Min	Max	Min	Max	Min	Max
204	Block 473, Lot 7501	62.0	67.2	62.0	67.2	0.0	0.0
205	Block 473, Lot 14	63.6	66.6	63.6	66.6	0.0	0.0
206	Block 473, Lot 14	60.6	60.6	60.6	60.6	0.0	0.1
207	Block 473, Lot 18	60.6	60.6	60.6	60.6	0.0	0.1
208	Block 473, Lot 18	60.6	60.6	60.6	60.7	0.0	0.2
209	Block 473, Lot 7503	60.6	60.6	60.6	60.6	0.0	0.1
210	Block 473, Lot 7503	60.6	60.6	60.6	60.7	0.0	0.1
211	Block 473, Lot 40	60.6	60.6	60.8	60.9	0.2	0.3
212	Block 473, Lot 40	62.8	64.6	63.0	64.9	0.2	0.3
213	Block 473, Lot 31	60.6	60.6	60.6	60.7	0.0	0.2
214	Block 473, Lot 31	60.6	60.6	60.6	61.0	0.0	0.4
215	Block 473, Lot 45	63.2	65.0	63.4	65.3	0.2	0.4
216	Block 473, Lot 45	60.6	60.6	60.7	61.7	0.2	1.1
217	Block 473, Lot 45	60.6	60.6	60.6	60.9	0.1	0.4
218	Block 473, Lot 51	60.6	60.6	60.7	61.8	0.1	1.2
219	Block 473, Lot 51	61.8	64.3	61.9	64.4	0.0	0.6
220	Block 473, Lot 51	60.6	60.6	60.6	60.7	0.0	0.1
221	Block 472, Lot 28	60.6	60.6	60.8	63.3	0.2	2.8
222	Block 472, Lot 28	60.6	60.6	60.9	61.4	0.3	0.9
223	Block 472, Lot 25	64.9	65.5	65.0	66.2	0.1	0.7
224	Block 472, Lot 25	67.2	67.3	67.4	69.8	0.2	2.6
225	Block 472, Lot 19	64.1	67.3	64.3	68.9	0.2	2.4
226	Block 472, Lot 10	61.3	64.6	61.5	64.9	0.2	0.3
227	Block 472, Lot 10	60.6	61.2	60.7	61.5	0.1	0.3
228	Block 472, Lot 12	60.6	61.7	60.7	62.0	0.2	0.4
229	Block 472, Lot 12	62.9	67.9	63.1	68.7	0.2	1.9
230	Block 472, Lot 7501	60.6	65.3	61.3	69.4	0.0	8.8
231	Block 472, Lot 7501	61.6	66.6	62.1	68.6	0.2	6.3
232	Block 472, Lot 7501	60.6	66.1	60.8	67.2	0.2	5.0
233	Block 472, Lot 7501	60.6	61.5	60.7	62.4	0.1	1.6
234	Block 472, Lot 7501	60.6	60.6	60.6	60.6	0.0	0.1
235	Block 472, Lot 7501	60.6	60.6	60.6	61.4	0.0	0.9
236	Block 208, Lot 1	60.6	60.6	60.8	83.4	0.3	22.9
237	Block 208, Lot 7501	60.6	60.6	61.1	86.9	0.5	26.3

During interior fit out at Projected Development Site 9, the primary noise sources would include crawler cranes and hoists. The maximum predicted noise level increment during this construction phase would be approximately 9 dBA, which would be considered readily noticeable to less than objectionable. Noise levels exceeding CEQR construction noise screening thresholds were predicted to occur within approximately 296 feet of the construction site, and objectionable noise levels were predicted to occur within approximately 135 feet of the construction site during interior fit out at Projected Development Site 9.

CONSTRUCTION NOISE ANALYSIS ASSESSMENT

Using the methodology described above and considering the noise abatement measures for source and path controls to satisfy DEP's *Rules for Citywide Construction Noise Mitigation* specified above, cumulative noise analyses were performed to determine maximum 1-hour equivalent

($L_{eq(1)}$) noise levels that would be expected to occur during each of the major construction stages of Projected Development Sites 5 and 9.

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 noise impact threshold criteria for an extended period of time as described above in "Construction Noise Impact Criteria." While increases exceeding the noise impact threshold criteria for short periods of time may be noisy and intrusive, they are not considered to be significant adverse noise impacts using the *CEQR Technical Manual* methodology unless they reach the "very objectionable" or "objectionable" categories.

Based on the construction stage predicted to occur at each development site according to the conceptual construction schedule during each of the selected analysis periods as shown in **Table 20-10**, receptors expected to experience an exceedance of the *CEQR Technical Manual* noise impact threshold, the objectionable threshold, or the very objectionable thresholds were identified. Receptors where noise level increases were predicted to meet or exceed the noise impact threshold criteria for two or more consecutive years, meet or exceed the objectionable threshold for one year or more, or meet or exceed the very objectionable threshold for three months or more would experience significant construction noise impacts.

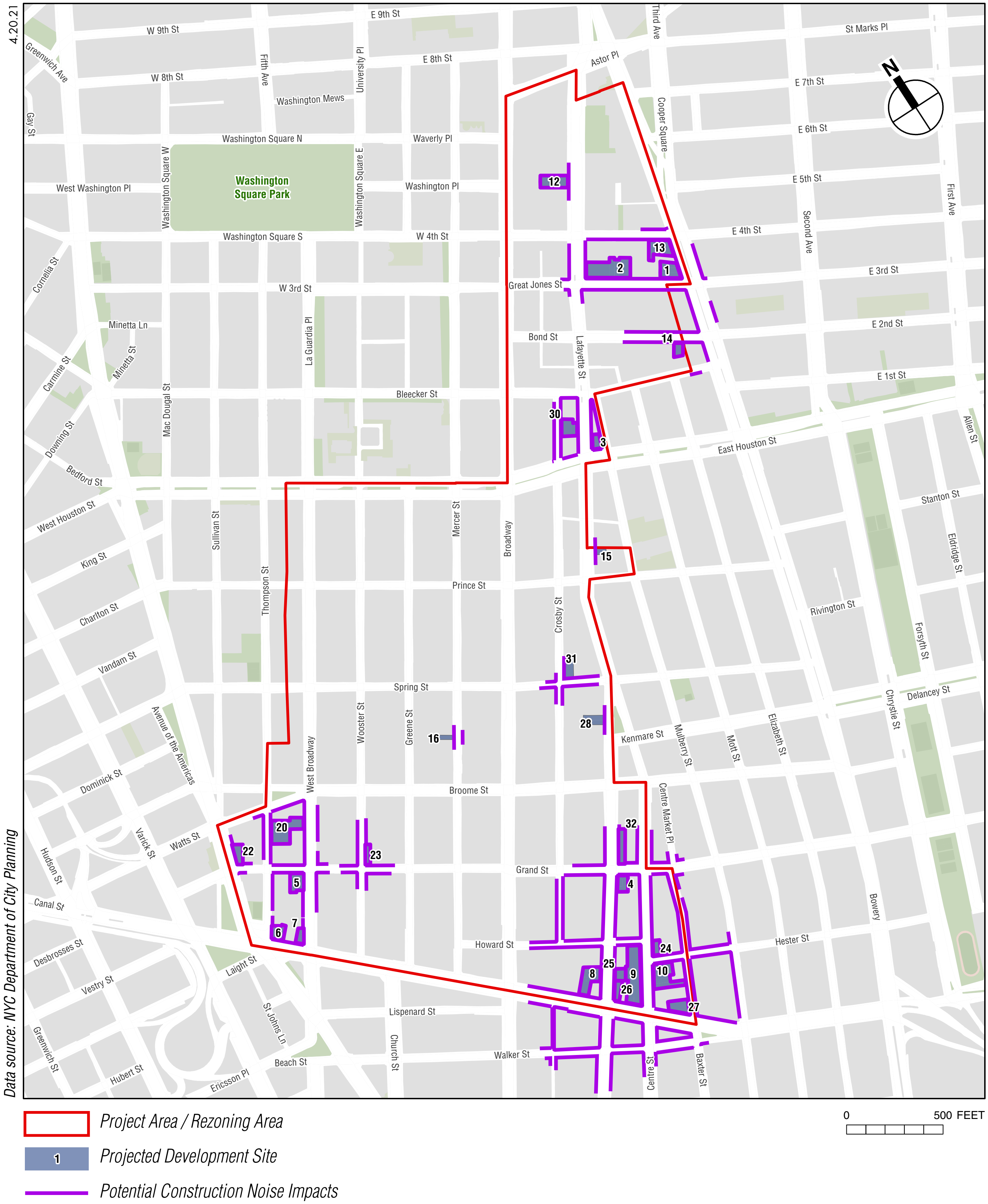
The construction noise analysis indicates that the predicted noise levels could result in significant adverse impacts throughout the Project Area and beyond. **Figure 20-2** shows where receptor locations are predicted to experience noise level increases during construction that would constitute significant impacts based on the analysis and criteria discussed above.

At locations predicted to experience an exceedance of the noise impact criteria, the exceedances 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 in an analyzed month, and consequently is conservative in predicting significant increases in noise levels. Typically, the loudest hourly noise level during each month of construction would not persist throughout the entire month. Furthermore, this analysis is based on conceptual site plans and construction schedules. It is possible that the actual construction may be of less magnitude, or that construction on multiple projected development sites may not overlap, in which case construction noise would be less intense than the analysis predicts.

CONSTRUCTION NOISE AT COMPLETED AND OCCUPIED DEVELOPMENT SITES

Since certain projected development sites are expected to include noise-sensitive uses (e.g., residential, community facility) that may be exposed to construction noise (i.e., when a building is completed and occupied, but other development assumed under the Proposed Actions would still be under construction), there is the potential that all of the development sites within the regions identified in **Figure 20-2** could experience significant construction noise impacts. Based on **Figure 20-2**, Projected Development Sites 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 12, 13, 14, 20, 22, 23, 24, 25, 26, 27, 30, and 32 have the potential to experience significant construction noise impacts should they be completed and occupied while construction is occurring on other sites.

At these affected sites, even with the 25 dBA window/wall attenuation that would be provided by standard façade construction or up to 35 dBA window/wall attenuation that would be provided in accordance with the noise attenuation measures specified in Table 17-8 of Chapter 17, "Noise," interior noise levels would have the potential to exceed the 45 dBA interior noise level recommended



Construction Noise Impacts

Figure 20-2

for residential use according to CEQR noise exposure guidance. These exceedances would be intermittent and temporary, and would not occur during the nighttime hour when residences are most sensitive to noise. However, due to the spacing and configuration of the development sites and the potential for construction to occur in a sequencing other than the conceptual schedule assumed for the purposes of the construction noise analysis, the potential for significant adverse construction noise impacts would exist at all of the projected development listed above.

As with the existing receptors, the predicted exceedances of acceptable noise levels at the completed and occupied development sites 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 in an analyzed month, and consequently is conservative in predicting significant increases in noise levels. Typically, the loudest hourly noise level during each month of construction would not persist throughout the entire month. In addition, this analysis is based on conceptual site plans and construction schedules. It is possible that the actual construction may be of less magnitude, or that a site would not be completed and occupied during construction immediately adjacent, in which case the site would not experience the predicted levels of construction noise.

VIBRATION

Construction activities have the potential to result in vibration levels that may result in structural or architectural damage, and/or annoyance or interference with vibration-sensitive activities. Vibratory levels at a receiver are a function of the source strength (which 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 the case 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.

CONSTRUCTION VIBRATION CRITERIA

For purposes of assessing potential structural or architectural damage, the determination of a significant impact was based on the vibration impact criterion of a Peak Particle Velocity (PPV) of 0.50 inches/second as specified in the DOB *TPPN #10/88*. For non-fragile buildings, vibration levels between 0.5 inches/second and 2.0 inches/second would typically 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 VdB would have the potential to result in significant adverse impacts if they were to occur for a prolonged period of time.

ANALYSIS METHODOLOGY

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

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

where: PPV_{equip} is the peak particle velocity in in/sec of the equipment at the receiver location;

PPV_{ref} is the reference vibration level in in/sec at 25 feet; and

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

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

$$L_v(D) = L_v(ref) – 30\log(D/25)$$

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

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

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

Table 20-14 shows vibration source levels for typical construction equipment.

Table 20-14
Vibration Source Levels for Construction Equipment

Equipment		PPV_{ref} (in/sec)	Approximate L_v (ref) (VdB)
Pile Driver (impact)	Upper Range	1.518	112
	Typical	0.644	104
Bulldozer		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79

Source: *Transit Noise and Vibration Impact Assessment*, FTA Report No. 0123, September 2018.

CONSTRUCTION VIBRATION ANALYSIS RESULTS

The buildings of most concern with regard to the potential for structural or architectural damage due to vibration are historic buildings and structures (see Table 7-5 in Chapter 7, "Historic and Cultural Resources," for a list of historic structures) immediately adjacent to the projected development sites. Vibration levels at these buildings and structures within 55 feet of a projected development site may exceed the 0.50 in/sec PPV during pile driving. However, because these historic buildings and structures would be within 90 feet of the projected development sites, vibration monitoring would be required per DOB *TPPN #10/88* regulations, and construction means and methods would need to be altered as necessary to avoid generating vibration exceeding the 0.50 inches/second threshold.

For non-historic buildings and other structures immediately adjacent to projected development sites, vibration levels within 25 feet of pile driving may result in PPV levels between 0.50 and 2.0 in/sec, which is generally considered acceptable for a non-historic building or structure.

In terms of potential vibration levels that would be perceptible and annoying, the equipment that would have the most potential for producing levels that exceed the 65 VdB limit is also the pile driver. It would have the potential to produce perceptible vibration levels (i.e., vibration levels exceeding 65 VdB) at receptor locations within a distance of approximately 550 feet depending on soil conditions. However, the operation would only occur for limited periods of time, typically four months or less at a particular location and therefore would not result in any significant adverse impacts.

Consequently, there is no potential for significant adverse vibration impacts under the Proposed Actions.

OTHER TECHNICAL AREAS

LAND USE AND NEIGHBORHOOD CHARACTER

According to the *CEQR Technical Manual*, a construction impact analysis for land use and neighborhood character is typically needed if construction requires continuous use of property for an extended duration, thereby having the potential to affect that land use and/or neighborhood character. A land use and neighborhood character assessment for construction impacts examines construction activities at a site (or portions of the site) and the duration. The analysis determines whether the type and duration of the activities would affect neighborhood land use patterns or neighborhood character. For example, a single property might be used for staging for several years, resulting in a "land use" that is industrial in nature. Depending upon the types of land uses in the surrounding area, the use of a single piece of property for an extended duration and its compatibility with surrounding properties may be assessed to determine whether it would have a significant adverse impact on the surrounding land uses or neighborhood character.

Construction of the 26 projected development sites would be spread out from 2023 to 2031, throughout an approximately 56-block area. As noted above, construction of most of the projected development sites (24 sites) would be short-term (i.e., lasting up to 24 months). Construction activities resulting from the Proposed Actions would affect land use on the development sites, but would not alter surrounding land uses. As is typical with construction projects, during periods of construction there would be some disruption, predominantly noise, in the immediate vicinity of these sites. There would also be construction trucks and construction workers travelling to the various development 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 with limited effects on land uses in the study area, particularly as most construction activities are located within each of the development sites or within portions of sidewalks, curbs, and travel lanes of public streets immediately adjacent to these sites.

Throughout the construction period, as required by City regulations, access to residences, businesses, and institutions in the area surrounding the development sites must be maintained. In addition, as discussed in detail above in "Air Quality" and "Noise and Vibration," measures would be implemented to control air pollutant emissions, noise, and vibration on construction sites. While construction of the new buildings under the Proposed Actions would cause temporary disruption, particularly related to noise, it is expected that such effects in any given area would be relatively short in duration, even under the worst-case construction sequencing and, therefore, would not create a neighborhood character impact. Therefore, no significant adverse construction impacts to land use and neighborhood character are expected.

SOCIOECONOMIC CONDITIONS

According to the *CEQR Technical Manual*, construction impacts on socioeconomic conditions are possible if a proposed action would involve construction of a long duration that could affect access to and the viability of businesses, and if the failure of those businesses has the potential to affect neighborhood character.

Construction could, in some instances, temporarily affect pedestrian and vehicular access on street frontages immediately adjacent to the development sites. However, lane and/or sidewalk closures are expected to be of very limited duration, and would not restrict access to any existing or planned retail businesses (i.e., alternative access routes need to be provided). Utility service would also be maintained to all businesses, although there may be very short-term interruptions (i.e., hours) when new equipment (e.g., a transformer, or a sewer or water line) is put into operation. Overall, construction resulting from the Proposed Actions 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. Construction activities would also create indirect benefits created by expenditures by materials suppliers, construction workers, and other employees at the project sites. Construction would also contribute to increased tax revenues for New York City and New York State, including those from personal income taxes.

COMMUNITY FACILITIES

According to the *CEQR Technical Manual*, construction impacts to community facilities are possible if a community facility were directly affected by construction (e.g., if construction would disrupt services provided at the facility or close the facility temporarily, etc.).

The construction sites would be surrounded by construction fencing and barriers that would limit the impacts of construction on nearby community facilities. Construction of the projected buildings would not block or restrict access to any facilities in the area, and would not affect emergency response times of the New York City Police Department (NYPD) and FDNY given the geographic distribution of the police and fire facilities and their respective coverage areas. Therefore, no construction impacts would be expected to community facilities as a result of the Proposed Actions.

OPEN SPACE

According to the *CEQR Technical Manual*, construction impacts to open space are possible if the open space is taken out of service for a period of time during the construction process. As described in Chapter 5, “Open Space,” there are no publicly accessible open spaces on any of the projected development sites. While several of the projected development sites are located near existing open space resources, no open space resources are located on any of the projected development sites, nor would any access to publicly accessible open space be impeded during construction within the Project Area. In addition, measures would be implemented to control air emissions, dust, noise, and vibration on the construction sites. While construction under the Proposed Actions may cause temporary disruptions to the community, particularly related to noise, it is expected that such disruptions in any given area would be temporary and would not be ongoing for the full duration of the construction period. As shown in **Figure 20-2**, there are no existing publicly accessible open space resources within the areas where potential significant adverse construction noise impacts are identified. However, two NYC Parks capital projects are planned in the future irrespective of the Proposed Actions. These open spaces would be developed in connection with a DEP infrastructure project. The planned open spaces are located at Bowery and East 4th Street (immediately east of the Merchants’ House Museum) and at the northwest corner of Grand and Lafayette Streets. The planned open spaces would be within the areas where potential significant adverse construction noise impacts are identified.

HISTORIC AND CULTURAL RESOURCES

A detailed assessment of potential impacts on historic and cultural resources (including both archaeological and architectural resources) is described in Chapter 7, “Historic and Cultural Resources.” This section summarizes the potential for significant adverse impacts on historic and cultural resources during the construction period as presented in Chapter 7, “Historic and Cultural Resources.”

A Phase 1A Archaeological Documentary Study determined that all or portions of 21 lots on 17 projected and potential development sites are potentially archaeologically sensitive for resources associated with the 19th Century occupation of the Project Area. The Phase 1A Study recommended additional archaeological analysis for certain development sites, including Phase 1B Archaeological Testing and continued consultation with LPC to determine the presence or absence of any resources on these sites. The 21 lots are privately owned and are expected to be developed as-of-right subsequent to the proposed rezoning. As there is no mechanism in place to require a private landowner to conduct Phase 1B archaeological testing or to require the preservation or documentation of archaeological resources, should they exist, the Proposed Actions would result in significant adverse impacts on archaeological resources on the 17 projected and potential development sites with archaeological sensitivity. Construction activities on the 21 archaeologically sensitive lots on 17 projected and potential development sites would result in significant adverse construction-related impacts on archaeological resources on those parcels. Construction activities on the projected and potential development sites that were not identified as potentially archaeologically sensitive would not result in significant adverse construction-related impacts on archaeological resources.

The Proposed Actions would also result in the demolition of architectural resources and new development in the NYCHD SoHo-Cast Iron Historic District and Extension and in the NYCHD NoHo Historic District and Extension which are subject to LPC’s review and approval in accordance with the New York City Landmarks Law. New development anticipated under the Proposed Actions would also result in the demolition of contributing buildings in three S/NR-listed historic districts – the portion of the SoHo Historic District that is outside the NYCHD SoHo-Cast Iron Historic District boundaries, the Bowery Historic District, and the Chinatown and Little Italy Historic District. Because S/NR-listed historic districts are not protected by the New York City Landmarks Law, the demolition of contributing buildings to these historic districts would result in a direct significant adverse impact these S/NR-listed historic districts. As required by DOB *TPPN #10/88*, to avoid potential adverse impacts to historic architectural resources from construction-related activities, a CPP would be prepared in consultation with LPC prior to construction and implemented by a licensed professional engineer before the start of any excavation or construction activities on the projected and potential development sites where there are NYCL and/or S/NR-listed historic resources that are located within 90 feet of these development sites.

HAZARDOUS MATERIALS

As discussed in greater detail in Chapter 10, “Hazardous Materials,” the potential for significant adverse impacts related to hazardous materials resulting from the Proposed Actions would be precluded through the placement of (E) designations for all projected and potential development sites with potential hazardous or contaminated materials concerns. This (E) designation requires, prior to change of use or redevelopment requiring ground disturbance, that the fee-owner of the property conduct a Phase I Environmental Site Assessment, subsurface testing, and remediation (where appropriate) to the satisfaction of the New York City Mayor's Office of Environmental Remediation (OER). DOB permits associated with such actions cannot be issued without OER approval. The OER review would ensure protection of human health and the environment from known or suspected hazardous materials. With the above measures in place, the Proposed Actions would avoid the potential for significant adverse impacts related to hazardous materials. ✷