Chapter 17: Construction

A. INTRODUCTION

As described in Chapter 1, "Project Description and Analytical Framework," the Applicant seeks a special permit, modifications to a previously approved large-scale general development (LSGD), zoning text amendments, and authorizations (the Proposed Actions) from the City Planning Commission (CPC) to facilitate the ~~Proposed Project~~previously proposed project in the South Street Seaport neighborhood of Lower Manhattan, Community District 1.[1] The ~~Proposed Project~~previously proposed project would consist of the development of a mixed-use building of up to approximately 680,500 gross square feet (gsf), containing market-rate and affordable housing, retail, office, and community facility spaces as well as parking at 250 Water Street (Block 98, Lot 1; the Development Site), as well as the restoration, reopening, and potential expansion of the South Street Seaport Museum (the Museum) at 89-93 South Street, 2-4 Fulton Street, 167-175 John Street (Block 74, a portion of Lot 1; the Museum Site). The ~~Proposed Project~~previously proposed project would also include operation changes to facilitate passenger drop off on the Pier 17 access drive as well as minor improvements to the Pier 17 access drive area and building, and may include streetscape, open space, or other improvements (e.g., planters) under the Proposed Actions within the Project Area.

Construction at the Development Site in the future with the ~~Proposed Project~~previously proposed project (the With Action condition) would occur in a single phase and is anticipated to begin in 2022 and be complete in 2025, over an approximately three-year period. The development at 250 Water Street is expected to be operational by 2026. The renovation, reopening, and potential expansion of the Museum is also expected to be operational by 2026. Construction at the Development Site in the future without the ~~Proposed Project~~previously proposed project (the No Action condition) would occur over an approximately 32-month period. As discussed in Chapter 1, "Project Description and Analytical Framework," absent the ~~Proposed Project~~previously proposed project, it is assumed that there would be no renovated spaces for the Museum, nor would there be a potential expansion of the Museum.

This chapter summarizes the planned construction program for the ~~Proposed Project~~previously proposed project and assesses the potential for significant adverse impacts during the construction period. The city, state, and federal regulations and policies that govern construction are described, followed by the anticipated construction schedule and the types of activities likely to occur during construction. The types of construction equipment are also discussed, along with the number of workers and truck deliveries. Finally, the potential impacts from construction activity are assessed.

[1] Since the publication of the DEIS, the Applicant has withdrawn the application for the previously proposed project and submitted a modified application (Application Number C 210438(A) ZSM; the "A-Application") with proposed changes to the project—this modified version of the project is described and considered in this FEIS as the Reduced Impact Alternative, as outlined in Chapter 18, "Alternatives."

PRINCIPAL CONCLUSIONS

Construction associated with the ~~Proposed Project~~previously proposed project would result in temporary disruptions in the surrounding area. As described below, the ~~Proposed Project~~previously proposed project's construction activities could result in significant adverse noise, open space, and traffic impacts. For all other technical areas, construction activities associated with the ~~Proposed Project~~previously proposed project would not result in significant adverse impacts. Findings specific to each of the key technical areas are summarized below.

TRANSPORTATION

Potential transportation impacts during peak construction conditions were assessed in the same manner as the operational impacts, as presented in Chapter 11, "Transportation."

Traffic

For purposes of the construction traffic analysis, the combined daily workforce and truck trip projections in the peak quarter (fourth quarter of Year 2) were used as the basis for estimating peak hour construction trips. Based on a detailed assignment of these project-generated vehicle trips, three intersections (Pearl Street and Beekman Street, Pearl Street and Peck Slip, and Pearl Street and Frankfort Street/Dover Street) were selected for detailed analysis during the ~~would incur construction-related vehicle trips that exceed the analysis threshold of 50 PCEs during the~~construction AM peak hour (6:00 to 7:00 AM)~~peak hour only~~. Significant adverse traffic impacts were identified at one intersection, Pearl Street and Dover Street, compared to three intersections in the operational analyses. Potential improvement measures that may be implemented to mitigate these impacts are discussed in Chapter 19, "Mitigation." ~~These three intersections were studied as part of the operational analyses, with no significant adverse traffic impacts identified at Pearl Street and Peck Slip, and unmitigatable significant adverse traffic impacts identified at Pearl Street and Beekman Street and Pearl Street and Frankfort Street/Dover Street during the AM peak hour. The magnitudes of the background traffic and the traffic increments associated with the Proposed Project are significantly lower during the construction AM (6–7) peak hour compared to the operational AM (8–9) peak hour. Therefore, it is expected that any significant adverse traffic impacts associated with the construction of the Proposed Project would be of equal or lesser magnitude than those disclosed for the operational analyses. As such, the same or similar operational mitigation measures could be imposed to address construction-related traffic impacts. However, similar to the operational conditions, the Proposed Project could potentially result in unmitigatable significant adverse traffic impacts at the Pearl Street and Beekman Street and Pearl Street and Frankfort Street/Dover Street intersections during the construction AM peak hour.~~

Transit

During peak construction, the estimated number of peak-hour transit trips would be 239, with 168 subway trips, 44 Port Authority Trans-Hudson Corporation (PATH) trips, and 27 bus trips. These trips would be below the 2020 *City Environmental Quality Review (CEQR) Technical Manual* analysis thresholds of 200 or more subway or railroad (PATH) trips per station and 50 or more peak hour bus riders on a bus route in a single direction. Construction worker-related transit trips would also be made outside of the commuter peak hours, which correspond with lower background transit levels and are typically not subject to concern or assessment of operating conditions. Additionally, the projected peak hour transit trips during peak construction are substantially lower than the operational transit trips, for which quantified analyses were determined to be unwarranted.

Therefore, consistent with the *CEQR Technical Manual*, a detailed transit analysis for the ~~Proposed Project~~previously proposed project's construction condition is not warranted and the ~~Proposed Project~~previously proposed project would not result in any significant adverse construction transit impacts.

Pedestrians

During peak construction, the estimated number of peak-hour pedestrian trips traversing the area's sidewalks, corners, and crosswalks would be approximately 336 (243 pedestrian trips adjacent to the Development Site and 93 pedestrian trips adjacent to the Museum Site). Given the relatively low number of pedestrian trips expected at the Development and Museum Sites and the number of pedestrian routes to/from area parking facilities and transit services, no sidewalk, crosswalk, or intersection corner is expected to experience 200 or more pedestrian trips during an hour, the *CEQR Technical Manual* pedestrian analysis threshold. Additionally, construction worker-related pedestrian trips would take place during hours when background pedestrian levels are significantly lower than the commuter peak hours and are typically not subject to concern or assessment of operational conditions. Therefore, consistent with the *CEQR Technical Manual*, a detailed pedestrian analysis for the previously proposed project~~Proposed Project~~'s construction condition is not warranted and the ~~Proposed Project~~previously proposed project would not result in any significant adverse construction pedestrian impacts.

Parking

The anticipated construction activities are projected to generate a maximum parking demand of 93 spaces during peak construction. This parking demand is expected to be accommodated by off-street spaces and parking facilities within a ¼-mile radius of the Development and Museum Sites such that the ~~Proposed Project~~previously proposed project would not result in a parking shortfall during construction. Even if a parking shortfall is predicted to occur, per the *CEQR Technical Manual*, a parking shortfall in Manhattan would not constitute a significant adverse impact, due to the magnitude of available alternative modes of transportation.

AIR QUALITY

An emissions reduction program would be implemented for the ~~Proposed Project~~previously proposed project to minimize the effects of construction activities on the surrounding community. Measures would include, to the extent practicable, dust suppression measures, use of ultra-low sulfur diesel (ULSD) fuel, idling restrictions, diesel equipment reduction, the utilization of newer equipment (i.e., equipment meeting the U.S. Environmental Protection Agency's [EPA] Tier 3 emission standard), and best available tailpipe reduction technologies. With the implementation of these emission reduction measures, the dispersion modeling analysis of construction-related air emissions for both non-road 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 of the ~~Proposed Project~~previously proposed project would not result in significant adverse air quality impacts due to construction sources.

NOISE

Noise levels from construction of the ~~Proposed Project~~previously proposed project are expected to be comparable to those from typical New York City construction involving a new building or buildings with concrete slab floors and foundation on piles. Similarly, potential disruptions to adjacent residences and other receptors from elevated noise levels generated by construction would be expected to be comparable to those that would occur immediately adjacent to a typical New York City construction site during the portions of construction when the loudest activities would occur.

The detailed analysis of construction noise concluded that construction pursuant to the Proposed Actions has the potential to result in construction noise levels that exceed the *CEQR Technical Manual* construction noise screening threshold for an extended period of time or the additional construction noise impact criteria defined herein at receptors surrounding the proposed construction work areas, including the Museum, the school receptors at 1 Peck Slip (PS 343), the Pearl Street Playground, the north-facing residential and school receptors along Water Street between Beekman Street and Peck Slip, the residential receptors at ~~127 John Street,~~ 100 Beekman Street (Southbridge Towers), 299 Pearl Street (Southbridge Towers), 333 Pearl Street (Southbridge Towers), 49 Fulton Street, 117 Beekman Street, and at 23-33 Peck Slip.

At these receptors, construction could produce noise level increases that would be noticeable and potentially intrusive during the most noise-intensive nearby construction activities and would produce noticeable increases over the course of construction. The analysis evaluated the construction periods with the potential to result in the greatest levels of construction noise; however, the predicted maximum levels would not persist throughout construction, and the noise levels would fluctuate throughout the construction period. Construction noise control measures are discussed in Chapter 19, "Mitigation."

VIBRATION

Since the Project Area is located within the NYCL South Street Seaport Historic District, construction of the proposed buildings on the Development Site and Museum Site is subject to the New York City Landmarks Preservation Commission (LPC)'s review and approval. The Applicant would prepare a Construction Protection Plan (CPP) that would include measures to protect architectural resources located close enough to project construction (within 90 feet) from inadvertent construction-related damage including ground-borne vibration, falling debris, and accidental damage from heavy machinery during project construction. Additional receptors farther away from the Development Site and Museum Site would experience less vibration than those listed above, and similarly would not be expected to cause structural or architectural damage.

Consequently, there is no potential for significant adverse vibration impacts from construction under the ~~Proposed Project~~previously proposed project.

B. GOVERNMENTAL COORDINATION AND OVERSIGHT

Construction oversight involves several city, state, and federal agencies. **Table 17-1** lists the primary involved agencies and their areas of responsibility. For projects in New York City, primary construction oversight lies with the New York City Department of Buildings (DOB), which ensures that construction projects meet the requirements of the New York City Building Code and that buildings are structurally, electrically, and mechanically safe. In addition, DOB enforces safety regulations to protect workers and the general public during construction: the areas of oversight include installation and operation of equipment such as cranes, sidewalk sheds, and safety netting and scaffolding. The New York City Department of Environmental Protection (DEP) enforces the New York City Noise Code, reviews and approves any needed Remedial Action Work Plans (RAWPs) and Construction Health and Safety Plans (CHASP), and regulates water disposal into the sewer system as well as 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. DOT's OCMC reviews and approves any traffic lane and sidewalk closures. The 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 also approves CPPs, and monitoring measures established to prevent damage to historic structures.

Table 17-1
Construction Oversight in New York City

Agency	Areas of Responsibility
New York City	
Department of Buildings	Primary oversight for Building Code and site safety
Department of Environmental Protection	Noise, RAPs/CHASPs, dewatering, hazardous materials abatement
Fire Department	Compliance with Fire Code, fuel tank installation
Department of Transportation	Lane and sidewalk closures
Landmarks Preservation Commission	Historic and archaeological resources
New York State	
Department of Environmental Conservation	Hazardous materials and fuel/chemical storage tanks
United States	
Environmental Protection Agency	Air emissions, noise, hazardous materials, poisons
Occupational Safety and Health Administration	Worker safety

At the state level, 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 EPA has wide-ranging authority over environmental matters, including air emissions, noise, hazardous materials, and the use of poisons, although much of the responsibility is delegated to the state level. The Occupational Safety and Health Administration (OSHA) sets standards for work site safety and construction equipment.

C. CONSTRUCTION PHASING AND SCHEDULE

Table 17-2 presents the anticipated construction schedule for the construction at the Development Site for the ~~Proposed Project~~previously proposed project. Construction at the Development Site for the ~~Proposed Project~~previously proposed project would occur in a single phase and is anticipated to begin in 2022 and be complete in 2025, over an approximately three-year period. The development at 250 Water Street is expected to be operational by 2026. The overall construction duration for the No Action building at the Development Site is anticipated to be shorter than that for the ~~Proposed Project~~previously proposed project by approximately five months. Construction at the Development Site would consist of the following stages: excavation and foundation; superstructure; exteriors; interiors and finishing; and sitework. As shown in **Table 17-2**, these stages of construction are scheduled to occur sequentially, with some overlaps, resulting in a total anticipated construction duration of approximately three years. These stages are described in greater detail below.

Table 17-2
Anticipated Construction Schedule—Development Site (250 Water Street)

Construction Task	Start Month	Finish Month	Approximate Duration (months)[1]
Excavation and Foundation	Month 1	Month 13	13
Superstructure	Month 13	Month 23	11
Exteriors	Month 19	Month 30	12
Interiors and Finishing	Month 20	Month 37	18
Sitework	Month 33	Month 36	4

Note: [1] Construction would proceed in several stages, some of which would overlap.
Source: Lend Lease Construction, March 2021

Table 17-3 presents the anticipated construction schedule for the renovation and potential expansion of the Museum, which is also expected to be operational by 2026. Absent the ~~Proposed Project~~previously proposed project, there would be no renovated spaces for the Museum, nor would there be a potential expansion of the Museum.

Table 17-3
Anticipated Construction Schedule—Museum Site

Construction Task	Start Month	Finish Month	Approximate Duration (months)[1]
Renovation	Month 1	Month 11	11
Expansion – Excavation and Foundation	Month 12	Month 14	3
Expansion – Superstructure	Month 15	Month 18	4
Expansion – Exteriors	Month 18	Month 23	6
Expansion – Interiors and Finishing	Month 17	Month 31	15

Note: [1] Construction would proceed in several stages, some of which would overlap.
Source: Pavarini, March 2021

D. CONSTRUCTION DESCRIPTION

The following provides a description of the general construction practices and activities, which would occur during the construction of both the ~~Proposed Project~~previously proposed project and the No Action condition.

GENERAL CONSTRUCTION PRACTICES

HOURS OF WORK

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

While not expected to be frequent, weekend or night work may also be occasionally required for certain construction activities. Appropriate work permits from DOB would be obtained for any necessary work outside of normal construction hours and no work outside of normal construction hours would be performed until such permits are obtained. The numbers of workers and pieces of equipment in operation for night or weekend work would typically be limited to those needed to complete the particular authorized task. Therefore, the level of activity for any weekend or night work would be less than that of a normal workday.

DELIVERIES AND ACCESS

During construction, access to the construction area would be fully controlled. Work areas would be fenced off, and limited access points for workers and trucks would be provided. Material deliveries to the construction area would be controlled and scheduled. Based on preliminary construction logistics for the Development Site and the Museum Site, construction trucks such as dump trucks or concrete trucks are anticipated to access the construction area along Pearl Street and South Street, respectively. Vehicular access on streets adjacent to the construction sites would be maintained during all stages of construction. As discussed in Chapter 11, "Transportation," Water Street between Peck Slip and Beekman Street and Peck Slip between Pearl Street and Water Street are designated School Play Streets. Construction logistics will be developed in consideration of this roadway designation to maintain these roadway segments play street functionality to the extent possible. MPT plans would be developed for any required temporary sidewalk and lane narrowing and/or closures to ensure the safety of the construction workers and the public passing through the area. Approval of these plans and implementation of the closures would be coordinated with DOT's OCMC. Measures specified in the MPT plans that are anticipated to be implemented would include parking lane closures, safety signs, safety barriers, and construction fencing.

PUBLIC AND SITE SAFETY

A variety of measures would be employed to ensure public safety during the construction, including sidewalk bridges to provide overhead protection; safety signs to alert the public about active construction work; safety barriers to ensure the safety of the public passing by construction areas; flag persons to control trucks entering and exiting the construction areas and/or to provide guidance for pedestrians and bicyclists safety; and safety nettings as the superstructure work advances upward to prevent debris from falling to the ground. All DOB safety requirements would be followed to ensure the safety of the community and the construction workers themselves.

The contractor would be required to develop a CHASP prior to initiating construction. This plan would guide all contractor activities to ensure emergency plans are in place in the event of a number of emergency conditions, including a storm event. In the event of a storm, the contractor would be required to safely secure all construction equipment and contain any fill that is stockpiled on site using applicable Best Management Practices, including impervious surface covers or temporary seeding for any fill that would be held on site for extended periods of time. These measures would reduce erosion or runoff potential to the community or East River in the event of a storm and would provide dust control in dry weather.

RODENT CONTROL

Construction contracts would include provisions for a rodent (i.e., mouse and rat) control program. Before the start of construction, the contractor would survey and bait the appropriate areas and provide for proper site sanitation. During construction, the contractor would carry out a maintenance program, as necessary. Signage would be posted, and coordination would be conducted with appropriate agencies.

DESCRIPTION OF CONSTRUCTION ACTIVITIES AT THE DEVELOPMENT SITE

Prior to the commencement of construction, the work area would be prepared for construction, including the installation of public safety measures such as barriers, netting, and signs. The construction areas would be fenced off. Worker and truck access points would be established, and existing street trees would be protected.

Construction at the Development Site for both the ~~Proposed Project~~previously proposed project and under the No Action condition would then proceed with excavation and foundations, superstructure, exteriors, interiors and finishing, and sitework stages, which are discussed below.

EXCAVATION AND FOUNDATIONS

The ~~Proposed Project~~previously proposed project would require excavation activities at the Development Site for the proposed building's foundation. Excavation work would begin with the installation of walls to contain soil around the excavation area, and excavators would then be used to excavate soil. Specific measures that would be employed to protect public health, worker safety, and the environment during soil disturbance activities are described in Chapter 9, "Hazardous Materials." A temporary ramp would be built from the Pearl Street frontage to provide access for the dump trucks to the excavation area. No blasting is anticipated to be needed for excavation. Excavation would be followed by the construction of the foundation and below-grade elements of the proposed building. Piles would be installed with the use of drill rigs. Excavation and foundations activities may also involve the use of a rubber tire crane, concrete trowels, welder, and rebar benders.

Dewatering

Water from rain and snow collected in the excavation area during construction would be removed using a dewatering pump. If groundwater dewatering is required, it would be performed in accordance with DEP sewer use requirements.

SUPERSTRUCTURE

The superstructure work would include the framework for the proposed building, such as beams, slabs, and columns. Construction of the interior structure—or core—of the building would include elevator shafts; vertical risers for mechanical, electrical, and plumbing systems; electrical and mechanical equipment rooms; core stairs; and restroom areas. A tower crane would first be brought onto the Development Site during the superstructure task and would be used to lift structural components and other large materials. Superstructure activities may also include the use of compressors, rebar benders, concrete vibrators, concrete trowels, and a variety of trucks. In addition, temporary construction elevators (hoists) would be used for the vertical movement of workers and materials during superstructure activities.

EXTERIORS

During this stage of construction, the exterior envelope systems of the proposed building would be installed. The exterior units would be transported via a hoist to the appropriate floors for installation or lifted into place by a crane. This stage of construction would overlap with a portion of the superstructure work.

INTERIORS AND FINISHING

Activities during the interiors and finishing stage would 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 touchup of the building and final building system (e.g., electrical system, fire alarm, plumbing, etc.) testing and inspections would be part of this stage of construction. Equipment used during interiors and finishing would include a hoist, scissor lifts, forklifts, and a variety of small handheld tools.

Interiors and finishing would typically be the quietest period of construction in terms of its effect on the public, because most of the construction activities would occur inside the building with the façades substantially complete and the proposed building enclosed.

SITEWORK

During the sitework stage, soil would be brought to the site for the grassy areas and landscaping. Where necessary, sidewalks adjacent to the Development Site would be resurfaced. Site work would include equipment such as tampers and rollers.

DESCRIPTION OF CONSTRUCTION ACTIVITIES AT THE MUSEUM SITE

The ~~Proposed Project~~previously proposed project would also include the restoration and potential expansion of the South Street Seaport Museum. The restoration and reopening of the Museum would consolidate its spaces within approximately 27,996 gsf of renovated space at the corner of Fulton Street and South Street (91-93 South Street and 2-4 Fulton Street) and provide a new, more prominent entrance at the street corner. Renovation activities would involve the use of manlifts and a variety of handtools. The Museum's approximately 26,312-gsf "Collections" space (167-171 John Street) would also reopen under the ~~Proposed Project~~previously proposed project, but no construction activities would occur in these buildings. The potential expansion of the Museum would result in a seven-story, approximately 62-foot tall, 32,383-gsf building on the John Street Lot that would be integrated with other Museum areas and include gallery spaces and a multi-use auditorium space on the ground level. The potential new expansion would involve excavation and foundation, superstructure, exteriors, and interiors and finishing activities, similar to those described above for the proposed building at 250 Water Street. However, a tower crane would not be needed for the construction of the proposed seven-story expansion at the Museum Site and construction would be shorter in duration.

E. NUMBER OF CONSTRUCTION WORKERS AND MATERIAL DELIVERIES

Table 17-4 shows the estimated averaged daily numbers of workers and deliveries to the Development Site by calendar quarter for all construction activities. The average number of workers throughout the construction period would be 186 per day. The peak number of workers would be 360 per day in the second quarter of Year 3 construction. For truck trips, the average number of trucks would be 14 per day, and the peak would occur in the fourth quarter of Year 2 construction, with 22 trucks per day.

Table 17-4
Average Number of Daily Workers and Trucks by Quarter
Development Site (250 Water Street)

Year	Year 1				Year 2				Year 3				Year 4	Peak	Average
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st		
Workers	75	75	75	75	103	105	147	304	347	**360**	308	240	151	304	186
Trucks	14	14	14	14	19	16	17	**22**	12	13	12	10	8	22	14

Source: Lend Lease Construction, March 2021

Table 17-5 shows the estimated averaged daily numbers of workers and deliveries to the Museum Site by calendar quarter for all construction activities. The average number of workers throughout the construction period would be 63 per day. The peak number of workers would be 116 per day in the fourth second quarter of Year 2 construction. For truck trips, the average number of trucks would be 7 per day, and the peak would occur in the third quarter of Year 2 construction, with 13 trucks per day.

Table 17-5
Average Number of Daily Workers and Trucks by Quarter
Museum Site

Year	Year 1				Year 2				Year 3				Peak	Average
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th		
Workers	44	44	44	22	31	88	115	**116**	74	74	13	-	116	63
Trucks	4	4	4	3	8	9	**13**	11	7	7	3	-	13	7

Source: Pavarini, March 2021

F. ENVIRONMENTAL EFFECTS OF THE PREVIOUSLY PROPOSED PROJECT'S CONSTRUCTION ACTIVITIES

Similar to other construction projects in New York City, construction of the ~~Proposed Project~~previously proposed project would result in some temporary disruptions to the surrounding area. The following analysis describes the temporary effects on transportation, air quality, noise, and vibration. It also considers potential effects in other technical areas including land use and neighborhood character, socioeconomic conditions, community facilities, open space, historic and cultural resources, hazardous materials, and water and sewer infrastructure.

TRANSPORTATION

The construction transportation analysis assesses the potential for construction activities to result in significant adverse impacts to traffic, transit (i.e., subway, railroad, and bus), pedestrian elements (i.e., sidewalks, corners, and crosswalks), and parking conditions. The analysis is based on the peak worker and truck trips during construction of the ~~Proposed Project~~previously proposed project which, as described below, are developed based on several factors, including worker modal splits (how the workers access the site per mode of transportation: automobile, taxi, transit, or walking), vehicle occupancy and trip distribution, truck passenger car equivalents (PCEs), and arrival/departure patterns. As presented in **Tables 17-4 and 17-5**, the combined peak construction worker vehicle and truck trip generation would occur during the fourth quarter of Year 2 construction for the ~~Proposed Project~~previously proposed project.

TRAFFIC

An evaluation of construction sequencing and worker/truck projections was undertaken to assess potential traffic impacts.

Construction Trip Generation Projections

The quarterly average worker and truck trip projections shown in **Tables 17-4 and 17-5** were further refined to account for worker modal splits and vehicle occupancy, arrival and departure distribution, and truck PCEs.

Daily Workforce and Truck Deliveries

For a reasonable worst-case analysis of potential traffic-related impacts during construction, the daily workforce and truck trip projections in the peak quarter were used to estimate peak hour construction trips. It is expected that construction of the ~~Proposed Project~~previously proposed project would generate the highest amount of combined daily traffic in the fourth quarter of Year 2 construction, with an estimated average of 304 workers and 22 truck deliveries per day for the Development Site and 116 workers and 11 truck deliveries per day for the Museum Site, for a cumulative total of 420 workers and 33 truck deliveries per day. These estimates of construction activities are discussed further below.

Construction Worker Modal Splits and Vehicle Occupancy

Based on the latest available U.S. Census data for workers in the construction and excavation industry (2000 Census), it is anticipated that 27 percent of construction workers would commute to the Development and Museum Sites using private autos at an average occupancy of approximately 1.23 persons per vehicle. Similarly, it is expected that 71 percent of construction workers would commute via transit, one percent would commute via taxi, and one percent would walk.

Peak Hour Construction Worker Vehicle and Truck Trips

Similar to other construction projects in New York City, most of the construction activities at the Development and Museum Sites are expected to take place from 7 AM to 3:30 PM. While construction truck trips would occur throughout the day (with more trips during the morning), and most trucks would remain in the area for short durations, most construction workers would commute during the hours before and after the work shift. For analysis purposes, each truck delivery was assumed to result in two truck trips during the same hour (one "in" and one "out"), whereas each worker vehicle was assumed to arrive near the work shift start hour and depart near the work-shift end hour. Further, in accordance with the *CEQR Technical Manual*, it was assumed that each truck has a PCE of two.

The estimated daily vehicle trips were distributed throughout the workday based on projected work shift allocations and likely arrival/departure patterns for construction workers and trucks. For construction workers, the majority (approximately 80 percent) of the arrival and departure trips would take place during the hour before and after each work shift (6 to 7 AM for arrival and 3 to 4 PM for departure on a regular day shift). Construction truck deliveries into the construction site typically peak during the hour (6 to 7 AM) before each shift (25 percent), overlapping with construction worker arrival traffic.

Tables 17-6 and 17-7 present the hourly trip projections for the peak construction period that is anticipated to occur during the fourth quarter of Year 2 construction for the ~~Proposed~~

~~Project~~previously proposed project. As shown in **Tables 17-6 and 17-7**, the maximum construction-related traffic increments would be approximately 81 PCEs between 6 AM and 7 AM and 61 PCEs between 3 PM and 4 PM for the Development Site and approximately 34 PCEs between 6 AM and 7 AM and 26 PCEs between 3 PM and 4 PM for the Museum Site. As presented in **Table 17-8**, the total combined maximum construction-related traffic increments would be approximately 115 PCEs between 6 AM and 7 AM and 87 PCEs between 3 PM and 4 PM.

Table 17-6
Peak Construction Vehicle Trip Projections
Development Site (250 Water Street)

Hour	Auto Trips			Taxi Trips			Truck Trips			Total					
										Vehicle Trips			PCE Trips		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Fourth Quarter of Year 2 Construction															
6 AM–7 AM	53	0	53	2	2	4	6	6	12	61	8	69	67	14	81
7 AM–8 AM	14	0	14	0	0	0	2	2	4	16	2	18	18	4	22
8 AM–9 AM	0	0	0	0	0	0	2	2	4	2	2	4	4	4	8
9 AM–10 AM	0	0	0	0	0	0	2	2	4	2	2	4	4	4	8
10 AM–11 AM	0	0	0	0	0	0	2	2	4	2	2	4	4	4	8
11 AM–12 PM	0	0	0	0	0	0	2	2	4	2	2	4	4	4	8
12 PM–1 PM	0	0	0	0	0	0	2	2	4	2	2	4	4	4	8
1 PM–2 PM	0	0	0	0	0	0	2	2	4	2	2	4	4	4	8
2 PM–3 PM	0	4	4	0	0	0	1	1	2	1	5	6	2	6	8
3 PM–4 PM	0	53	53	2	2	4	1	1	2	3	56	59	4	57	61
4 PM–5 PM	0	10	10	0	0	0	0	0	0	0	10	10	0	10	10
Daily Total	67	67	134	4	4	8	22	22	44	93	93	186	115	115	230

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

Table 17-7
Peak Construction Vehicle Trip Projections
Museum Site

Hour	Auto Trips			Taxi Trips			Truck Trips			Total					
										Vehicle Trips			PCE Trips		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Fourth Quarter of Year 2 Construction															
6 AM–7 AM	20	0	20	1	1	2	3	3	6	24	4	28	27	7	34
7 AM–8 AM	6	0	6	0	0	0	1	1	2	7	1	8	8	2	10
8 AM–9 AM	0	0	0	0	0	0	1	1	2	1	1	2	2	2	4
9 AM–10 AM	0	0	0	0	0	0	1	1	2	1	1	2	2	2	4
10 AM–11 AM	0	0	0	0	0	0	1	1	2	1	1	2	2	2	4
11 AM–12 PM	0	0	0	0	0	0	1	1	2	1	1	2	2	2	4
12 PM–1 PM	0	0	0	0	0	0	1	1	2	1	1	2	2	2	4
1 PM–2 PM	0	0	0	0	0	0	1	1	2	1	1	2	2	2	4
2 PM–3 PM	0	2	2	0	0	0	0	0	0	0	2	2	0	2	2
3 PM–4 PM	0	20	20	1	1	2	1	1	2	2	22	24	3	23	26
4 PM–5 PM	0	4	4	0	0	0	0	0	0	0	4	4	0	4	4
Daily Total	26	26	52	2	2	4	11	11	22	39	39	78	50	50	100

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

Table 17-8
Peak Construction Vehicle Trip Projections
Cumulative (Development Site and Museum Site)

Hour	Auto Trips			Taxi Trips			Truck Trips			Total Vehicle Trips			Total PCE Trips		
	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total	In	Out	Total
Fourth Quarter of Year 2 Construction															
6 AM–7 AM	73	0	73	3	3	6	9	9	18	85	12	97	94	21	115
7 AM–8 AM	20	0	20	0	0	0	3	3	6	23	3	26	26	6	32
8 AM–9 AM	0	0	0	0	0	0	3	3	6	3	3	6	6	6	12
9 AM–10 AM	0	0	0	0	0	0	3	3	6	3	3	6	6	6	12
10 AM–11 AM	0	0	0	0	0	0	3	3	6	3	3	6	6	6	12
11 AM–12 PM	0	0	0	0	0	0	3	3	6	3	3	6	6	6	12
12 PM–1 PM	0	0	0	0	0	0	3	3	6	3	3	6	6	6	12
1 PM–2 PM	0	0	0	0	0	0	3	3	6	3	3	6	6	6	12
2 PM–3 PM	0	6	6	0	0	0	1	1	2	1	7	8	2	8	10
3 PM–4 PM	0	73	73	3	3	6	2	2	4	5	78	83	7	80	87
4 PM–5 PM	0	14	14	0	0	0	0	0	0	0	14	14	0	14	14
Daily Total	93	93	186	6	6	12	33	33	66	132	132	264	165	165	330

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

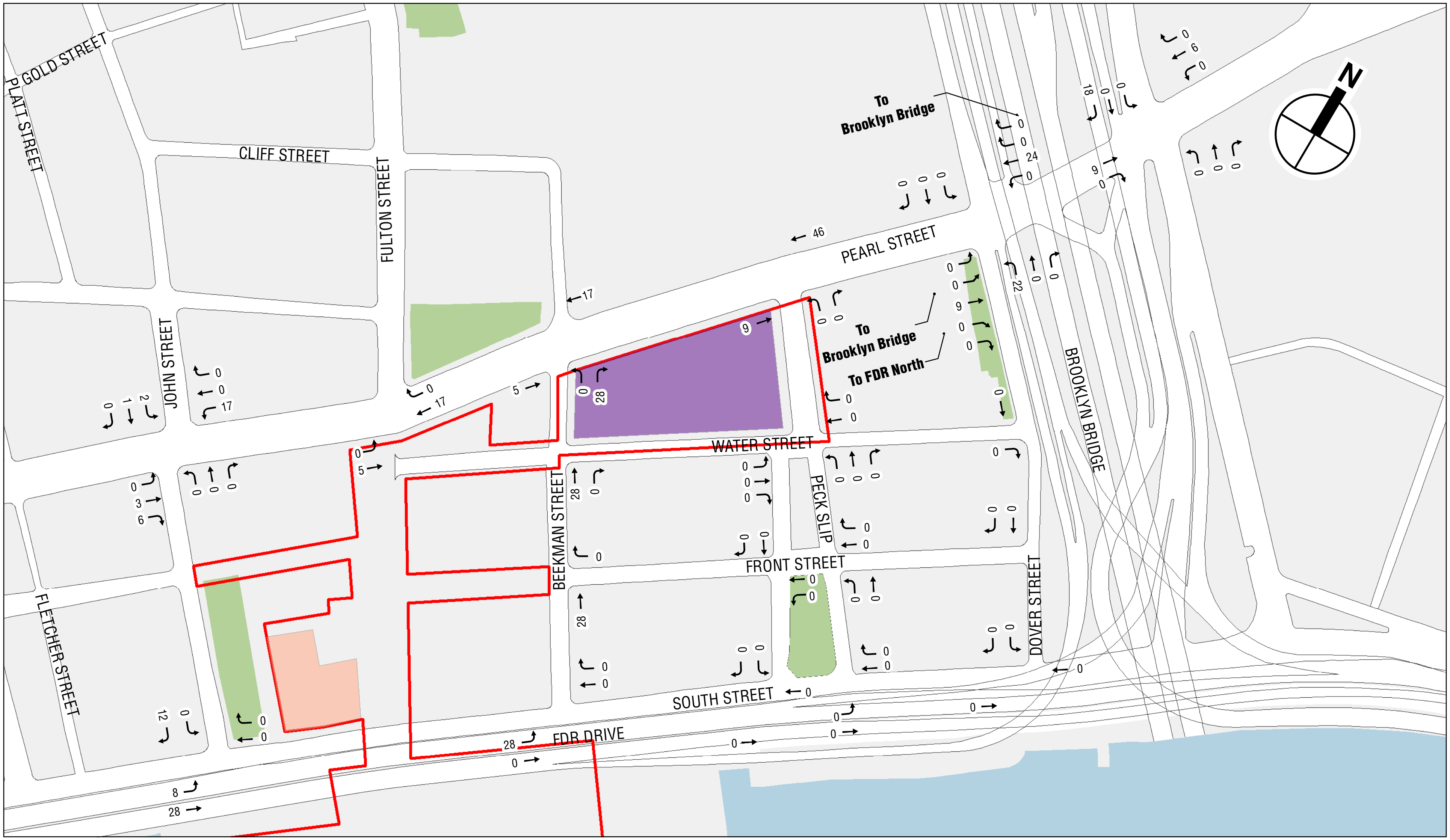
LEVEL 2 SCREENING

Since the projected construction PCEs would exceed the *CEQR Technical Manual* threshold of 50 vehicle-trips (a "Level 1" screening) during the 6 AM to 7 AM and 3 PM to 4 PM peak hours, a trip assignment ("Level 2") screening assessment was conducted for the ~~Proposed Project~~previously proposed project. As part of the Level 2 screening assessment, the ~~Proposed Project~~previously proposed project's construction trips were assigned to specific intersections near the Development and Museum Sites. Further quantified analyses to assess the potential impacts of the construction of the ~~Proposed Project~~previously proposed project on the transportation system could be warranted if the trip assignments were to identify key intersections incurring 50 or more peak hour vehicle-trips.

The ~~Proposed Project~~previously proposed project's construction vehicle trips shown in **Tables 17-6 and 17-7** have been assigned to area intersections based on the most likely travel routes to and from the Development and Museum Sites, prevailing travel patterns, commuter origin-destination (O-D) summaries from the census data, locations of parking facilities, and nearby land use and population characteristics. Construction workers were assigned to various off-street parking facilities within ¼-mile of the Development and Museum Sites. As detailed in Chapter 11, "Transportation," after accounting for the displacement of the existing off-street facility located on the Development Site, there would be a total off-street capacity of approximately 1,380 spaces (across 15 facilities) within ¼-mile of the Development and Museum Sites. Trucks would follow DOT truck routes and would make deliveries on Pearl Street at the Development Site and on South Street at the Museum Site.

Figures 17-1 and 17-2 show the total construction vehicle trips in PCEs for the ~~Proposed Project~~previously proposed project for the weekday construction AM and PM peak hours. As shown in **Table 17-9** and **Figures 17-1 and 17-2**, three intersections (Pearl Street and Beekman Street, Pearl Street and Peck Slip, and Pearl Street and Frankfort Street/Dover Street) would incur construction-related vehicle trips that exceed the analysis threshold of 50 PCEs during the AM peak hour only. These three intersections were studied as part of the operational analyses, with no

4.23.21



Project Area

Development Site

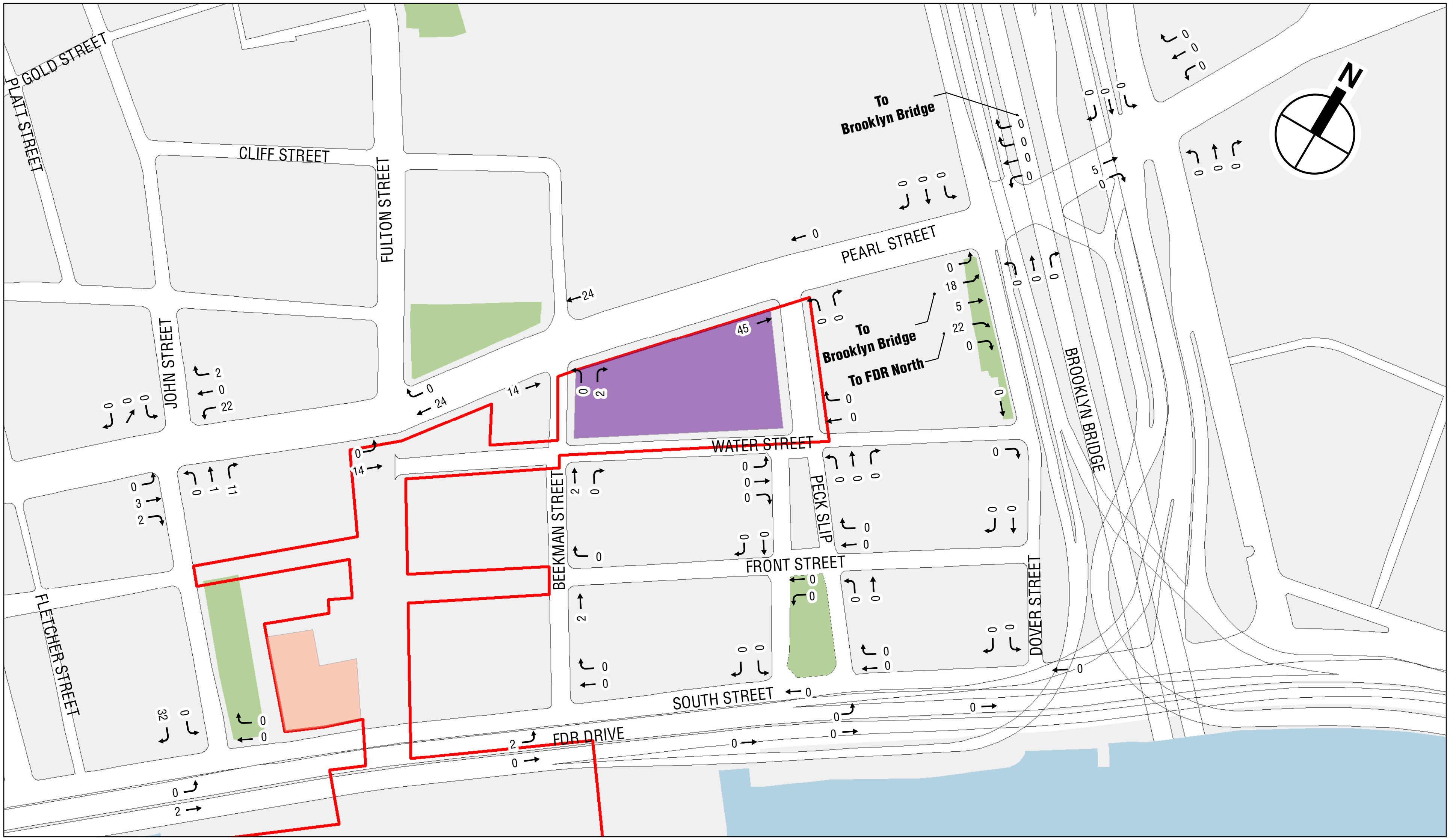
Museum Site

Proposed Project Construction PCE Trips
Weekday 6-7 AM Peak Hour

250 WATER STREET

Figure 17-1

4.23.21



Project Area

Development Site

Museum Site

Proposed Project Construction PCE Trips
Weekday 3-4 PM Peak Hour

250 WATER STREET

Figure 17-2

significant adverse traffic impacts identified at Pearl Street and Peck Slip, and unmitigatable significant adverse traffic impacts identified at Pearl Street and Beekman Street and Pearl Street and Frankfort Street/Dover Street during the AM peak hour. The magnitudes of the background traffic and the traffic increments associated with the Proposed Project are significantly lower during the construction AM (6–7) peak hour compared to the operational AM (8–9) peak hour. Therefore, it is expected that any significant adverse traffic impacts associated with the construction of the Proposed Project would be of equal or lesser magnitude than those disclosed for the operational analyses. As such, the same of similar operational mitigation measures could be imposed to address construction-related traffic impacts.

While the potential traffic impacts during peak construction are expected to be within the envelope of significant adverse traffic impacts identified for the future with the previously proposed project condition in Chapter 11, "Transportation," a detailed construction traffic analysis at these three intersections was prepared to identify specific temporary traffic impacts that may occur during the construction AM peak hour. However, similar to the operational conditions, the Proposed Project could potentially result in unmitigatable significant adverse traffic impacts at the Pearl Street and Beekman Street and Pearl Street and Frankfort Street/Dover Street intersections during the construction AM peak hour.

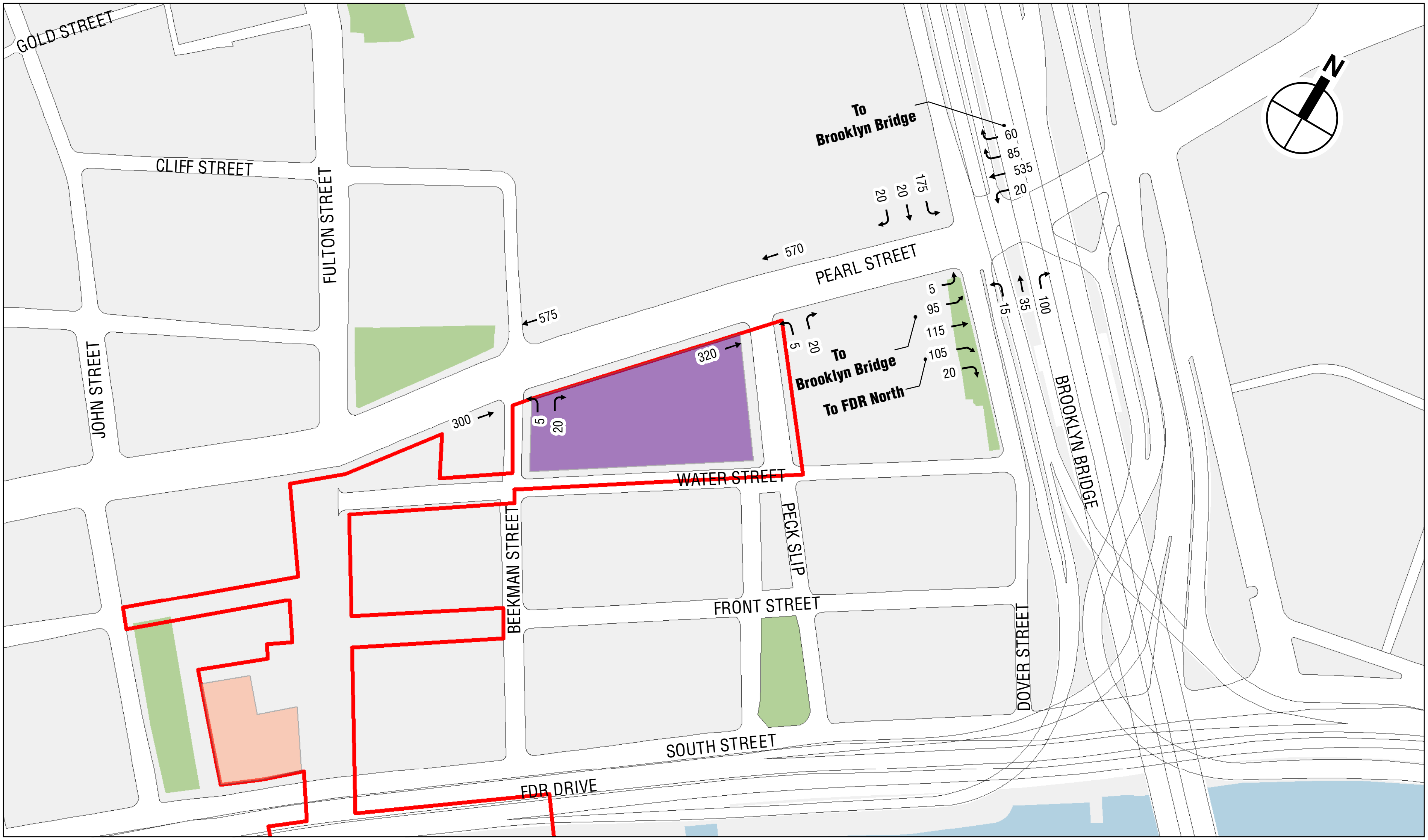
Table 17-9
Construction Traffic Level 2 Screening Analysis Results

Intersection	Construction PCE Trips (Weekday)	
	AM	PM
Water Street and John Street	29	41
Water Street and Fulton Street	22	38
Pearl Street and Beekman Street	**50**	40
Pearl Street and Peck Slip	**55**	45
Pearl Street and Frankfort Street/Dover Street	**55**	45
Pearl Street and Avenue of the Finest	33	5
Water Street and Beekman Street	28	2
Front Street and John Street	24	36
Front Street and Beekman Street	28	2
South Street and John Street	48	34
South Street and Fulton Street	28	2
South Street and Beekman Street	28	2

TRAFFIC CONDITIONS

In order to establish an existing condition for the construction peak hour, automatic traffic recorder (ATR) data and video intersection counts were collected for the weekday AM construction analysis peak hour (6:00 to 7:00 AM). Due to current COVID-19 pandemic conditions and based on the data collection guidance issued by DOT in October 2020, the collected traffic data were compared and calibrated against historical data, as described in Chapter 11, "Transportation", to arrive at appropriate baseline volumes for analysis.

The existing, No Action, and With Action construction AM peak hour traffic volumes are shown in **Figures 17-3 through 17-5**, respectively. The 2023 construction No Action condition was developed by layering the CEQR background growth and trips generated by discrete No Build projects in the area, on top of the existing (2021) traffic volumes. The 2023 construction With Action volumes were developed by adding the construction vehicle trips presented in **Figure 17-1**, to the No Action traffic volumes.



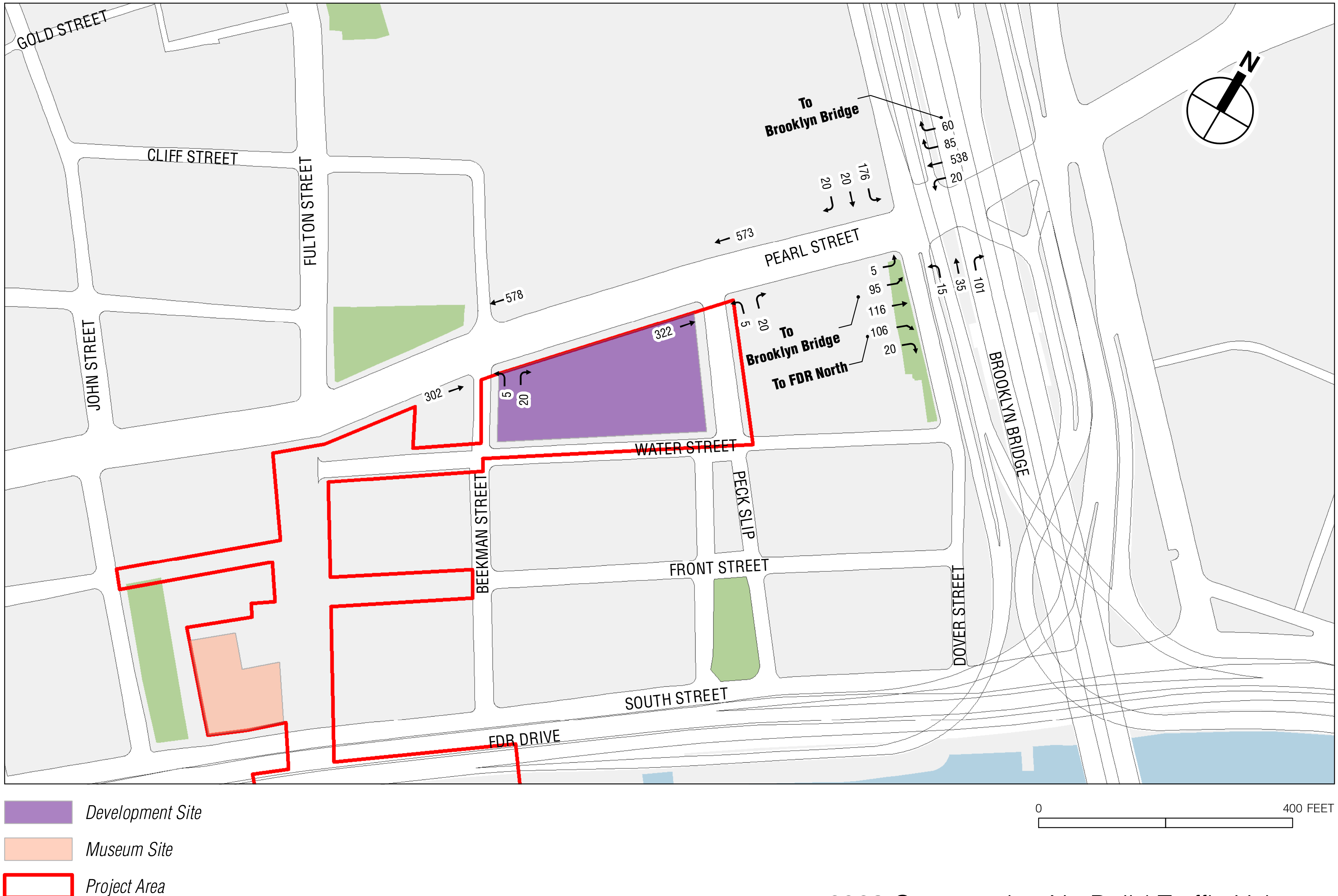
Development Site

Museum Site

Project Area

2021 Construction Existing Traffic Volumes
Weekday 6-7 AM Peak Hour Peak Hour

This figure is new for the FEIS



Development Site

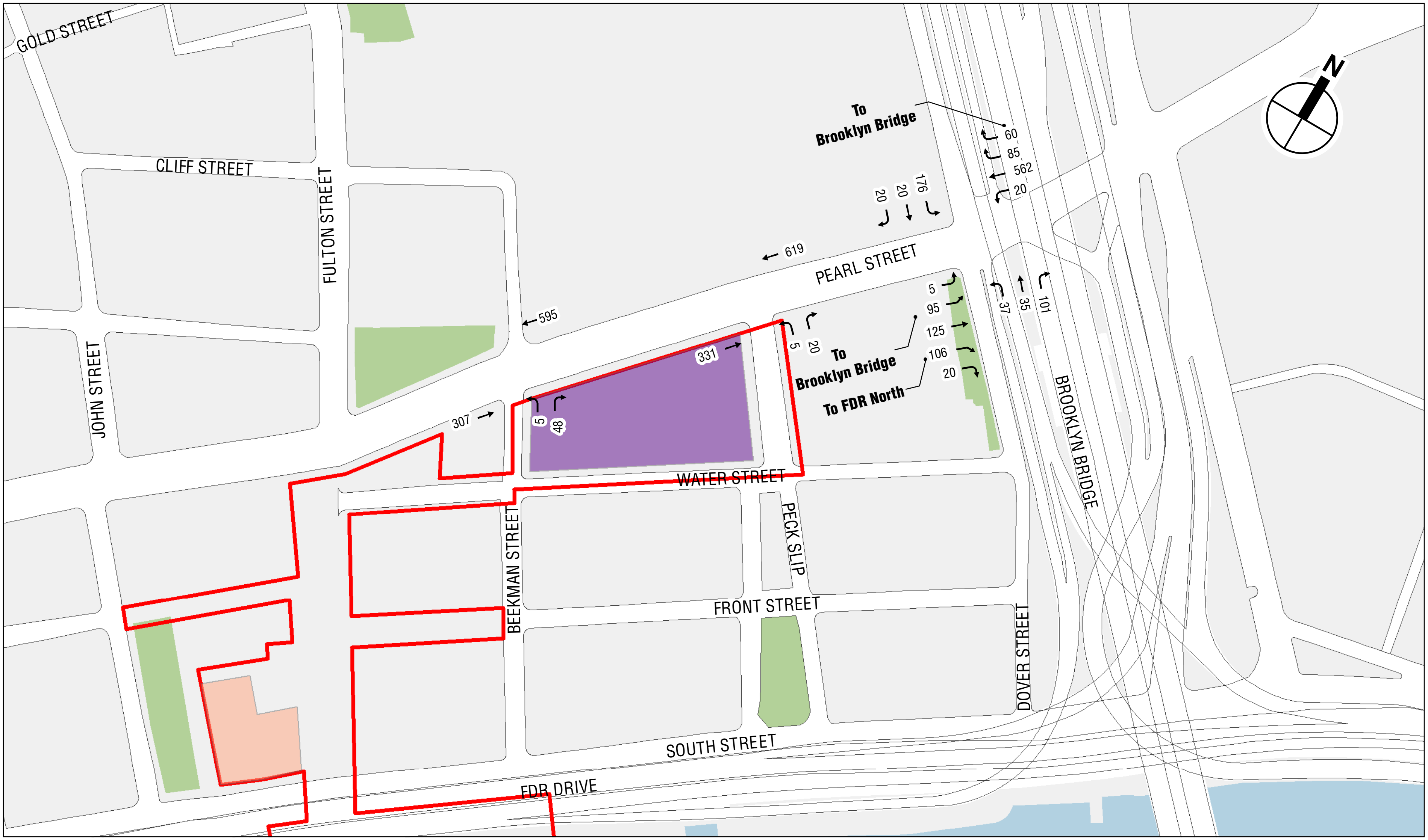
Museum Site

Project Area

2023 Construction No Build Traffic Volumes
Weekday 6-7 AM Peak Hour Peak Hour

Figure 17-4

This figure is new for the FEIS



Development Site

Museum Site

Project Area

0 400 FEET

2023 Construction Build Traffic Volumes
Weekday 6-7 AM Peak Hour Peak Hour

Figure 17-5

The operation of all the signalized intersections in the study area were assessed using methodologies presented in the 2000 Highway Capacity Manual (HCM) using the *Highway Capacity Software (HCS+ 5.5)*. The results of the traffic analysis summarized in **Table 17-10** shows that similar to the operational analyses, the intersection of Pearl Street and Dover Street would be significantly impacted in the 2023 construction With Action Condition.

Table 17-10
2023 Construction With Action Condition—
Summary of Significant Adverse Traffic Impacts

Intersection		Weekday AM Construction Peak Hour
EB/WB Street	**NB/SB Street**	
Pearl Street	Beekman Street	No Significant Impact
Pearl Street	Peck Slip	No Significant Impact
Pearl Street	Dover Street	SB-L
Total Impacted Intersections/Lane Groups		**1/1**

Notes:
EB = Eastbound; WB = Westbound; NB = Northbound; SB = Southbound; L = Left Turn; T = Through; R = Right Turn

Detailed traffic analysis results for the construction conditions in terms of level of service (LOS), v/c ratios, and average delays are presented in **Table 17-11**. As discussed below, a significant adverse traffic impact was identified for the southbound left-turn of Pearl Street and Dover Street during the construction AM peak hour.

Table 17-11
Construction Existing, No Action, and With Action Conditions LOS Analysis
Weekday 6-7 AM Peak Hour

	Weekday 6-7 AM											
	Existing				2023 No Action				2023 With Action			
Int.	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS	Lane Group	v/c Ratio	Delay (sec)	LOS
Pearl Street and Beekman Street												
EB	T	0.24	10.2	B	T	0.24	10.2	B	T	0.25	10.2	B
WB	T	0.50	13.1	B	T	0.50	13.1	B	T	0.52	13.3	B
NB	LR	0.10	27.0	C	LR	0.10	27.0	C	LR	0.23	29.1	C
Pearl Street and Peck Slip												
EB	T	0.28	11.0	B	T	0.28	11.1	B	T	0.29	11.1	B
WB	T	0.50	13.7	B	T	0.51	13.7	B	T	0.55	14.4	B
NB	L	0.02	25.1	C	L	0.02	25.1	C	L	0.02	25.1	C
	R	0.09	26.2	C	R	0.09	26.2	C	R	0.09	26.2	C
Pearl Street and Dover Street												
EB	DefL	0.51	17.9	B	DefL	0.51	18.0	B	DefL	0.53	19.2	B
	TR	0.41	11.2	B	TR	0.41	11.3	B	TR	0.42	11.5	B
WB	LTR	0.51	11.6	B	LTR	0.52	11.6	B	LTR	0.53	11.8	B
NB	LTR	0.42	28.7	C	LTR	0.42	28.7	C	LTR	0.50	30.7	C
SB	L	0.97	85.2	F	L	0.98	86.3	F	L	1.02	98.1	F+
	TR	0.13	24.4	C	TR	0.13	24.4	C	TR	0.14	24.4	C

Notes: EB = Eastbound, WB = Westbound, NB = Northbound, SB = Southbound, Int = Intersection, L = Left Turn, T = Through, R = Right Turn, DefL = Defacto Left Turn, LOS = Level of Service, + Denotes a significant adverse traffic impact

Pearl Street and Dover Street

The southbound left-turn at this intersection would deteriorate within LOS F with a v/c ratio of 0.98 and 86.3 seconds per vehicle (spv) of delay to a v/c ratio of 1.02 and 98.1 spv of delay in the weekday AM construction peak hour, an increase in delay of more than three seconds. This increase in delay constitutes a significant adverse impact.

Potential improvement measures that may be implemented to mitigate this significant adverse impact are discussed in Chapter 19, "Mitigation."

TRANSIT

Based on 2000 U.S. Census data on workers in the construction and excavation industry, it is estimated that approximately 71 percent of construction workers would commute to the Development and Museum Sites via transit (8 percent by bus, 13 percent by PATH, and 50 percent by subway). The Proposed Projectpreviously proposed project is located in the vicinity of multiple transit options, including the No. 2, 3, 4, 5, 6, A, C, J, Z, and PATH trains and the M9, M15, M15 Select Bus Service (SBS), M22, M55, and M103 bus routes. During the peak construction worker period (a maximum of 420 average daily construction workers in the 7 AM to 3:30 PM shift), an estimated 289 workers would travel by transit. With 80 percent of these workers arriving or departing during the construction peak hours, the estimated number of peak-hour transit trips would be 239, with 168 subway trips, 44 PATH trips, and 27 bus trips. These trips would be below the *CEQR Technical Manual* analysis thresholds of 200 or more subway or railroad (PATH) trips per station and 50 or more peak hour bus riders on a bus route in a single direction. Construction worker-related transit trips would also be made outside of the commuter peak hours, which correspond with lower background transit levels and are typically not subject to concern or assessment of operating conditions. Additionally, the projected peak hour transit trips during peak construction are substantially lower than the operational transit trips, for which quantified analyses were determined to be unwarranted. Therefore, a detailed transit analysis for the Proposed Projectpreviously proposed project's construction condition is not warranted and the Proposed Projectpreviously proposed project would not result in any significant adverse construction transit impacts.

PEDESTRIANS

As summarized above, up to 420 average daily construction workers are projected in the 7 AM to 3:30 PM shift during peak construction for the Proposed Projectpreviously proposed project. With 80 percent of these workers arriving or departing during the construction peak hours (6 AM to 7 AM and 3 PM to 4 PM), the corresponding number of peak-hour pedestrian trips traversing the area's sidewalks, corners, and crosswalks would be approximately 336 (243 pedestrian trips adjacent to the Development Site and 93 pedestrian trips adjacent to the Museum Site), which exceeds the *CEQR Technical Manual* analysis threshold of 200 pedestrian-trips (a "Level 1" screening). Given the relatively low number of pedestrian trips expected at the Development and Museum Sites and the number of pedestrian routes to/from area parking facilities and transit services, no sidewalk, crosswalk, or intersection corner is expected to experience 200 or more pedestrian trips during an hour, the *CEQR Technical Manual* pedestrian analysis threshold. Additionally, construction worker-related pedestrian trips would take place during hours when background pedestrian levels are significantly lower than the commuter peak hours and are typically not subject to concern or assessment of operational conditions. Therefore, a detailed pedestrian analysis for the Proposed Projectpreviously proposed project's construction condition is not warranted and the Proposed Projectpreviously proposed project would not result in any significant adverse construction pedestrian impacts. As discussed in Chapter 11, "Transportation," it is assumed that the existing CitiBike Station on the east sidewalk of Pearl Street between Peck Slip and Beekman Street will be relocated under the No Action and With Action conditions to facilitate future development at the Development Site. The Applicant will coordinate with DOT regarding the relocation of this public resource to a suitable location, following the procedures and outreach guidance provided by DOT. This stipulation will be included in the Restrictive Declaration.

PARKING

As described above, the estimated total number of workers would be 420 per day during peak construction. It is estimated that approximately 27 percent of construction workers would commute to the Development and Museum Sites by private autos at an average occupancy of approximately 1.23 persons per vehicle. The anticipated construction activities are therefore projected to generate a maximum parking demand of 93 parking spaces during peak construction. This parking demand is expected to be accommodated by off-street spaces and parking facilities within a ¼-mile radius of the Development and Museum Sites such that the ~~Proposed Project~~previously proposed project would not result in a parking shortfall during construction. Even if a parking shortfall is predicted to occur, per the *CEQR Technical Manual*, a parking shortfall in Manhattan would not constitute a significant adverse impact, due to the magnitude of available alternative modes of transportation.

AIR QUALITY

The construction of the ~~Proposed Project~~previously proposed project would require the use of both non-road construction equipment and on-road vehicles. Non-road construction equipment includes equipment operating on-site, such as cranes, loaders, and excavators. On-road vehicles include worker vehicles and construction trucks arriving to and departing from the construction site as well as operating on-site.

Emissions from non-road construction equipment and on-road vehicles have the potential to affect air quality. In addition, emissions from dust-generating construction activities (i.e., truck loading and unloading operations) also have the potential to affect air quality. A quantitative analysis of the overall combined impact of both on-site and on-road sources of construction-related air emissions, including dust emissions, was performed to determine the potential for significant adverse impacts from these sources of air emissions generated during construction of the ~~Proposed Project~~previously proposed project. Chapter 12, "Air Quality," contains a review of these air pollutants; applicable regulations, standards, and benchmarks; and general methodology for the air quality analyses. Additional details relevant only to the construction air quality analysis methodology are presented in this section.

EMISSIONS REDUCTION MEASURES

Construction activity in general, and large-scale construction in particular, has the potential to adversely affect air quality as a result of diesel emissions. Measures would be taken to reduce pollutant emissions during construction in accordance with all applicable laws, regulations, and building codes. In addition, contractors would be required under contract specifications to implement an emissions reduction program to minimize the air quality effects from construction of the ~~Proposed Project~~previously proposed project, consisting of the following components:

- *Dust Control.* To minimize dust emissions from construction activities, a dust control plan including a robust watering program would be required. For example, all trucks hauling loose material would be equipped with tight-fitting tailgates and their loads securely covered prior to leaving the Development Site; and water sprays would be used for all demolition, excavation, and transfer of soils so that materials would be dampened as necessary to avoid the suspension of dust into the air. Stockpiled soils or debris would be watered, stabilized with a chemical suppressing agent, or covered. Stabilized truck exit areas would be established for washing off the wheels of all trucks where feasible; truck routes within the Development Site would be either watered as needed or, in cases where such route would remain in the same place for an extended duration, the routes would be stabilized, covered with gravel, or temporarily paved to avoid the resuspension of dust. All measures required by DEP's *Construction Dust Rules* regulating construction-related dust emissions would be implemented.

- *Idling Restriction.* In addition to adhering to the local law restricting unnecessary idling on roadways, on-site vehicle idle time would be restricted to three minutes for all equipment and vehicles that are not using their engines to operate a loading, unloading, or processing device (e.g., concrete mixing trucks) or are otherwise required for the proper operation of the engine.
- *Clean Fuel*. ULSD fuel[2] would be used exclusively for all diesel engines throughout the Development Site.
- *Diesel Equipment Reduction*. In accordance with the New York City Noise Control Code as discussed below, under "Noise," electrically powered equipment would be preferred over diesel-powered and gasoline-powered versions of that equipment to the extent practicable. Equipment that would use grid power in lieu of diesel engines includes, but may not be limited to, hoists and small equipment (such as welders).
- *Utilization of Newer Equipment.* EPA's Tier 1 through 4 standards for non-road diesel engines regulate the emission of criteria pollutants from new engines, including PM, CO, NO_x, and hydrocarbons. To the extent practicable, all diesel-powered non-road construction equipment 50 horsepower (hp) or greater would meet at least the Tier 3[3] emissions standard.
- *Best Available Tailpipe Reduction Technologies*. Non-road diesel engines with a power rating of 50 hp or greater and controlled truck fleets (i.e., truck fleets under long-term contract with the project) including but not limited to concrete mixing and pumping trucks would utilize the best available tailpipe (BAT) technology for reducing diesel particulate matter (DPM) emissions. Diesel particulate filters (DPFs) have been identified as being the tailpipe technology currently proven to have the highest reduction capability. Construction contracts would specify that all diesel non-road engines rated at 50 hp or greater and controlled truck fleets would utilize DPFs, either installed by the original equipment manufacturer or retrofitted, to the extent practicable and feasible. Retrofitted DPFs must be verified by EPA or the California Air Resources Board. Active DPFs or other technologies proven to achieve an equivalent reduction may also be used. The use of DPFs for diesel engines meeting the Tier 3

---

[2] USEPA required a major reduction in the sulfur content of diesel fuel intended for use in locomotive, marine, and nonroad engines and equipment, including construction equipment. As of 2015, the diesel fuel produced by all large refiners, small refiners, and importers must be ULSD fuel, with sulfur levels in nonroad diesel fuel limited to a maximum of 15 parts per million.

[3] The first federal regulations for new non-road diesel engines were adopted in 1994, and adopted by EPA into regulation in a 1998 Final Rulemaking. The 1998 regulation introduces Tier 1 emissions standards for all equipment 50 hp and greater and phases in the increasingly stringent Tier 2 and Tier 3 standards for equipment manufactured in 2000 through 2008. In 2004, the EPA introduced Tier 4 emissions standards with a phased-in period of 2008 to 2015. The Tier 1 through 4 standards regulate the EPA criteria pollutants, including PM, hydrocarbons (HC), NO_x and carbon monoxide (CO). Prior to 1998, emissions from non-road diesel engines were unregulated. These engines are typically referred to as Tier 0.

emissions standard achieves similar emission reductions as the newer Tier 4 particulate matter emission standard.

Overall, this emissions reduction program is expected to substantially reduce diesel emissions.

ON-SITE CONSTRUCTION ACTIVITY ASSESSMENT`

Analysis Periods

To determine which construction periods constitute the worst-case periods for the pollutants of concern (PM, CO, NO_2), construction-related emissions were calculated for each calendar year throughout the duration of construction on a rolling annual and peak day basis for $PM_{2.5}$. $PM_{2.5}$ was 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 multi-year profiles of annual average and peak day average emissions of $PM_{2.5}$ and the proximity of the construction activities to sensitive uses (i.e., residences, school) in the area, February 2023 (Month 13) and the 12-month period from April 2022 to March 2023 (Month 3 to Month 14) were identified as worst-case short-term and annual construction periods for activities at the Development Site, respectively, since the highest project-wide emissions were predicted in these periods. During these times, excavation and foundation activities at the Development Site are anticipated to occur. In addition, the worst-case annual construction period also includes superstructure activities. For the Museum Site, March 2023 (Month 14) and the 12-month period from August 2022 to July 2023 (Month 7 to Month 18) were identified as worst-case short-term and annual construction periods. The short-term peak period includes excavation and foundation activities while the annual perk period includes excavation and foundation activities as well as renovation, superstructure, exteriors, and interiors and finishing activities. For a conservative analysis, it was assumed that the short-term peak periods for activities at the Development Site and Museum Site would occur at the same time.

Dispersion of the relevant air pollutants from the construction sites during these periods were analyzed. Broader conclusions regarding potential concentrations during non-peak periods are discussed qualitatively, based on the reasonable worst-case analysis period results.

Engine Emissions

The sizes, types, and number of units of construction equipment was estimated based on the construction activity schedule developed for the ~~Proposed Project~~previously proposed project. Emission rates for NO_x, CO, PM_{10}, and $PM_{2.5}$ from truck engines was 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 as described above, under “Emissions Reduction Measures,” that would be required for the ~~Proposed Project~~previously proposed project.

On-Site Dust Emissions

In addition to engine emissions, dust emissions from operations (e.g., excavation and transferring of excavated materials into dump trucks) was calculated based on EPA procedures delineated in AP-42 Table 13.2.3-1. Since construction is required to follow DEP's *Construction Dust Rules* 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 Project~~previously proposed project's 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 and generators, which are expected to operate in a single location—were simulated as point sources. Other engines, such as excavators and loaders, which would move around the site on any given day, were simulated as area sources. All sources 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 meteorological data: surface data collected at the LaGuardia Airport National Weather Service Station (2016 to 2020), 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. The land uses around the site where meteorological surface data were available was classified using categories defined in digital United States Geological Survey (USGS) maps.

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 were based on concentrations monitored at the nearest DEC ambient air monitoring stations and were consistent with the background concentrations used for the operational stationary source air quality analysis (see Chapter 12, "Air Quality").

Receptor Locations

Receptors were placed at locations that would be publicly accessible, at residential, school, and other sensitive uses at both ground level and elevated locations, at adjacent sidewalk locations, at publicly accessible open spaces, and at completed portions of the ~~Proposed Project~~previously proposed project, where applicable.

ON-ROAD SOURCES

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 was included with on-site emissions in the 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.[4] 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, inspection and maintenance programs and various other factors that influence emissions. The inputs and use of MOVES incorporate the most current resource available from DEC.[5]

On-Road Dust Emissions

$PM_{2.5}$ emission rates were determined with road dust to account for their impacts. However, road dust was not 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.[6] An average weight of 20 tons and 2.5 tons was assumed for construction trucks and worker vehicles in the analyses, respectively.

CONSTRUCTION AIR QUALITY ANALYSIS RESULTS

Maximum predicted concentrations during the representative worst-case construction periods for the ~~Proposed Project~~previously proposed project are presented in **Table 17-~~10~~12**. To estimate the maximum total pollutant NO_2, CO, and PM_{10} concentrations, the modeled concentrations from the ~~Proposed Project~~previously proposed project were added to a background value that accounts for existing pollutant concentrations from other nearby sources. As shown in **Table 17-~~10~~12**, the maximum predicted total concentrations of NO_2, CO, and PM_{10} are below the applicable NAAQS. The maximum predicted 24-hour average $PM_{2.5}$ incremental concentration (2.1 $\mu g/m^3$) would occur at a sidewalk location to the west of the Development Site, and the maximum predicted annual average $PM_{2.5}$ incremental concentration (0.21 $\mu g/m^3$) would occur at a receptor location at the Imagination Playground to the west of the Museum Site. The maximum predicted $PM_{2.5}$ incremental concentrations would not exceed the applicable CEQR de minimis criterion of 7.7 $\mu g/m^3$ in the 24-hour average period or 0.30 $\mu g/m^3$ in the annual average period. Emissions from the other less intensive construction periods would be less than the emissions during the modeled worst-case periods; therefore, the resulting concentrations from these non-peak periods are

[4] EPA, Motor Vehicle Emission Simulator (MOVES), User Guide for MOVES2014a, November 2015.

[5] DEC, Redesignation Request and Maintenance Plan for the 1997 Annual and 2006 24-Hour $PM_{2.5}$ NAAQS Appendix D, "New York State On-Road Motor Vehicle Emission Budget MOVES Technical Support Documentation," June 2013.

[6] 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.

expected to be less than the concentrations presented in **Table 17-~~10~~12**. Therefore, construction of the ~~Proposed Project~~previously proposed project would not result in significant adverse air quality impacts due to construction sources.

Table 17-~~10~~12
Maximum Pollutant Concentrations

Pollutant	Averaging Period	Units	Maximum Modeled Impact	Background Concentration(1)	Total Concentration	Criterion
NO_2	Annual	μg/m³	9.1~~7.7~~	32.3	41.4~~40.0~~	100(2)
CO	1-hour	ppm	3.2	2.5	5.7	35(2)
	8-hour	ppm	0.8	1.2	2.0	9(2)
PM_{10}	24-hour	μg/m³	8.8~~10.6~~	39.3	48.1~~49.9~~	150(2)
$PM_{2.5}$	24-hour	μg/m³	1.7~~2.1~~	N/A	N/A	7.7(3)
	Annual—Local	μg/m³	0.24~~0.21~~	N/A	N/A	0.30(4)
	Annual—Neighborhood	μg/m³	0.006~~0.005~~	N/A	N/A	0.10(4)

Notes:
N/A—Not Applicable
1 The background levels are based on the most representative concentrations monitored at DEC ambient air monitoring stations (see Table 11-3 in Chapter 11, "Air Quality").
2 NAAQS.
3 $PM_{2.5}$ *de minimis* criterion—24-hour average, not to exceed more than half the difference between the background concentration and the 24-hour standard of 35 μg/m³.
4 $PM_{2.5}$ *de minimis* criterion—annual (local and neighborhood scale).

NOISE

Construction of the ~~Proposed Project~~previously proposed project has the potential to result in noise impacts generated by the operation of construction equipment on both construction sites and construction-related vehicles traveling to and from the Project Area on adjacent roadways. The potential for noise impacts due to the construction of the ~~Proposed Project~~previously proposed project is discussed below.

SOUND LEVEL DESCRIPTORS

Chapter 14, "Noise," defines the sound level descriptors. The $L_{eq(1)}$ is the noise descriptor recommended for use in the *CEQR Technical Manual* for vehicular traffic and construction noise impact evaluation and is used to provide an indication of highest expected sound levels. The 1-hour L_{10} is the noise descriptor used in the *CEQR Technical Manual* noise exposure guidelines. The maximum 1-hour equivalent sound level ($L_{eq(1)}$) and maximum 1-hour L_{10} were selected as the noise descriptors used in the construction noise impact evaluation.

CONSTRUCTION NOISE ANALYSIS FUNDAMENTALS

Construction activities increase noise levels as a result of (1) the operation of construction equipment on site; and (2) the movement of construction-related vehicles (i.e., worker trips, and material and equipment trips) on the roadways to and from the construction site. The combined effect of each of these noise sources was evaluated.

Noise from the on-site 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 location is a function of the following:

- The noise emission level of the equipment;

- The distance between the piece of equipment and the receptor;
- Topography and ground effects; and
- Shielding.

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

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

CONSTRUCTION NOISE ANALYSIS METHODOLOGY

A detailed modeling analysis was conducted to quantify potential construction noise effects at nearby areas of noise-sensitive land use (i.e., "noise receptors" such as residences, open space, houses of worship, schools, etc.). The analysis is consistent with the guidance contained in the *CEQR Technical Manual* as well as the DEC Assessing and Mitigating Noise Impacts policy manual, revised February 2001.

The construction noise methodology is as follows:

1. **Select analysis hours for construction mobile source noise analysis.** 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 construction worker auto and construction truck trips to and from the construction site would simultaneously occur.
2. **Conduct construction mobile source noise analysis.** At intersections adjacent to the construction work areas that represent noise-sensitive uses, 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 doubling, which would result in an exceedance of CEQR construction noise screening thresholds (i.e., a 3 dBA increase in noise levels).
3. **Select analysis hours for cumulative on-site equipment and construction truck noise analysis.** The 7:00 AM to 8:00 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.
4. **Select receptor locations for cumulative on-site equipment and construction truck noise analysis.** Selected receptors represent open space, residential, or other noise-sensitive uses potentially affected by the construction associated with the ~~Proposed Project~~previously proposed project during operation of on-site construction equipment and/or along routes taken to and from the development site by construction trucks.
5. **Establish existing noise levels at selected receptors.** A CadnaA model representing the existing conditions (including existing building geometry and existing condition traffic levels) was validated based on the measured existing noise levels and used to calculate baseline noise levels at the other noise receptor locations included in the analysis.

6. **Establish worst-case noise analysis periods under the anticipated construction schedule.** The worst-case noise analysis periods are the periods during the construction schedule that are expected to have the greatest potential to result in construction noise effect. The selected time periods are described below in the "Analysis Periods" section.
7. **Calculate construction noise levels for each analysis period at each receptor location.** Given the on-site equipment and construction truck trips expected during each of the analysis periods, and the location of the equipment, which is based on construction logistics diagrams and construction truck and worker vehicle trip assignments, a CadnaA model file for each analysis period was created. All models include each of the construction noise sources during the analysis period and 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 construction site.
8. **Determine total noise levels and noise level increments during construction.** For each analysis period and each noise receptor, the calculated level of construction noise 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.
9. **Compare construction noise increments to impact criteria.** For each analysis period and each noise receptor, the predicted noise increments due to construction was compared to CEQR noise impact thresholds and additional incremental noise impact criteria as described below.
10. **Establish construction noise duration.** For each receptor, the noise level increments in each analysis period were evaluated to determine the duration during construction that the receptor would experience exceedances of impact criteria.
11. **Identify potential construction noise impacts.** At each existing receptor where exceedances of construction noise impact criteria are predicted, a determination was made as to whether the proposed actions would have the potential to result in significant adverse construction noise impacts.

Construction Mobile Source Analysis

A Noise PCE screening analysis was conducted for noise levels from construction mobile sources. At intersections adjacent to the construction work areas that represent noise-sensitive uses, 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 doubling, which would result in an exceedance of *CEQR Technical Manual* 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 workday (i.e., after 7:00 AM) were included in the modeling of construction noise as discussed below.

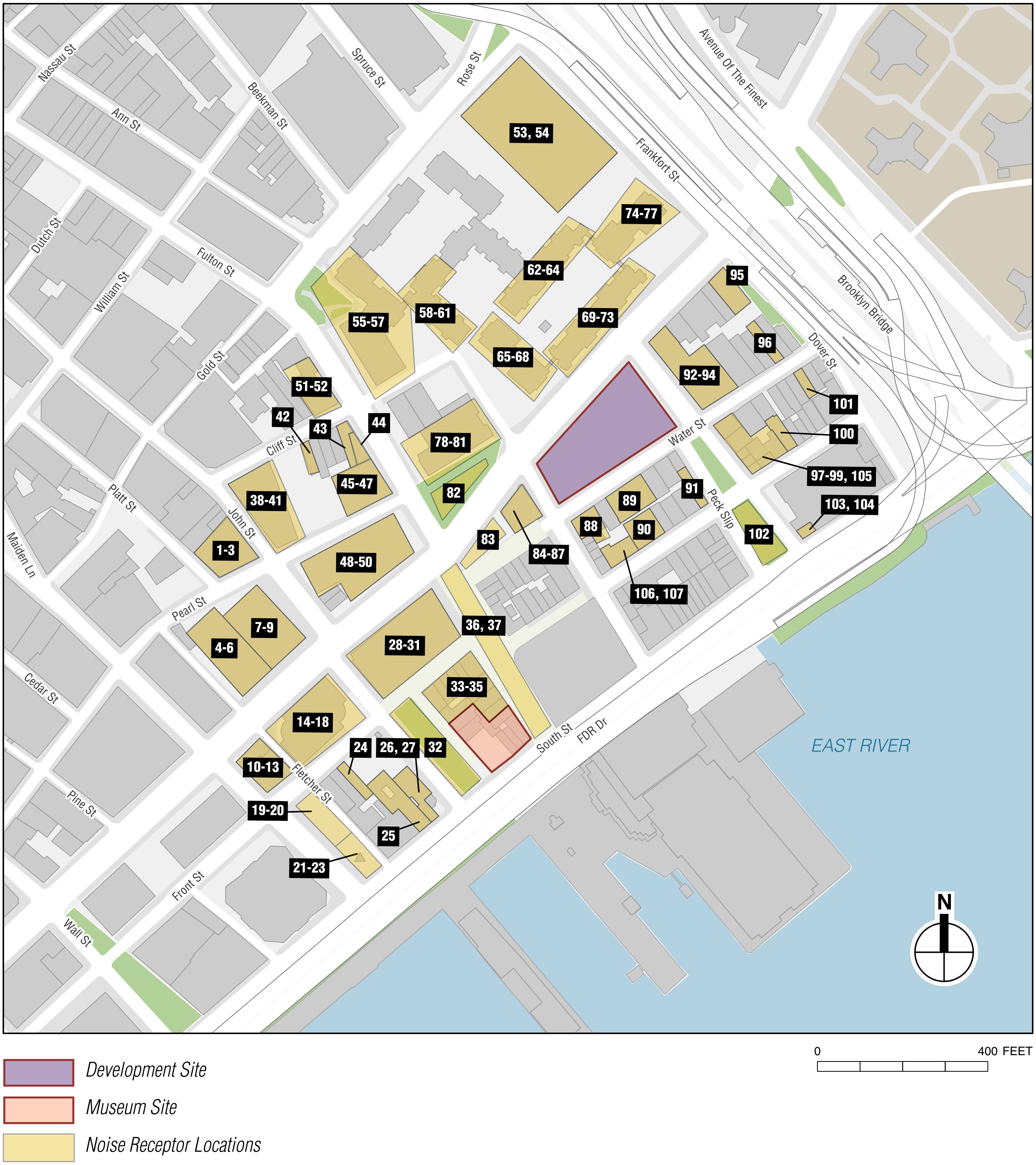
Noise Receptor Sites

A noise-sensitive receptor is defined in Chapter 19, Section 124 of the *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, and theaters. Outdoor sensitive receptors include parks, outdoor theaters, golf courses, zoos, campgrounds, and beaches.

Within the study area, multiple receptor locations that have the potential to experience elevated noise as a result of construction were selected for the construction noise analysis to represent buildings and future buildings anticipated to be completed and occupied during the construction analysis periods. These receptors are located adjacent to the Development and Museum Sites, planned areas of activity, or streets where construction trucks would pass. At some buildings, multiple façades were analyzed as receptors. At high-rise buildings, noise receptors at multiple elevations were analyzed. The receptor sites selected for detailed analysis represent locations where maximum project effects due to construction noise would be expected.

Within the study area, 107 receptor locations were selected for the construction noise analysis. **Figure 17-~~3~~6** shows the locations of the noise receptor sites, and **Table 17-~~11~~13** lists the noise measurement sites (i.e., sites M1 to M6) as well as the noise receptor sites (i.e., sites 1 to 107) and the associated land use at these sites.

10.4.21



Construction Noise Receptor Locations

Table 17-~~11~~13
Noise Receptors by Location and Land Use

Receptor	Location	Block / Lot	Associated Land Use
M1	Pearl Street between Beekman Street and Peck Slip	N/A	Noise Measurement Location
M2	Peck Slip between Pearl Street and Water Street	N/A	Noise Measurement Location
M3	Water Street between Beekman Street and Peck Slip	N/A	Noise Measurement Location
M4	Beekman Street between Pearl Street and Water Street	N/A	Noise Measurement Location
M5	Burling Slip adjacent to Museum Project Site	N/A	Noise Measurement Location
M6	South Street adjacent to Museum Project Site	N/A	Noise Measurement Location
1-3	116 John Street	Block 69 / Lot 32	Mixed Residential & Commercial
4-6	160 Water Street	Block 70 / Lot 43	Commercial Offices
7-9	180 Water Street	Block 70 / Lot 32	Mixed Residential & Commercial
10-13	156 Front Street	Block 71 / Lot 1	Mixed Residential & Commercial
14-18	175 Water Street	Block 71 / Lot 7501	Commercial Offices
19, 20	151 Maiden Lane	Block 72 / Lot 7	Hotel
21-23	161 Maiden Lane	Block 72 / Lot 7502	Residential
24	165 Front Street	Block 72 / Lot 14	Mixed Residential & Commercial
25	85 South Street	Block 72 / Lot 27	Residential
26, 27	170 John Street	Block 72 / Lot 7501	Mixed Residential & Commercial
28-31	199 Water Street	Block 74 / Lot 7501	Commercial Offices
32	Imagination Playground	Block 74 / Lot 1	Open Space
33-35	South Street Seaport Museum	Block 74 / Lot 1	Institution
36, 37	Fulton Street south of Water Street	N/A	Open Space
38-41	111 John Street	Block 75 / Lot 30	Commercial Offices
42	26 Cliff Street	Block 75 / Lot 43	Residential
43	34 Cliff Street	Block 75 / Lot 48	Mixed Residential & Commercial
44	46 Fulton Street	Block 75 / Lot 7501	Mixed Residential & Commercial
45-47	40 Fulton Street	Block 75 / Lot 21	Commercial Offices
48-50	127 John Street	Block 75 / Lot 1	Residential
51, 52	56 Fulton Street	Block 76 / Lot 6	Mixed Residential & Commercial
53, 54	100 Gold Street	Block 94 / Lot 25	Commercial Offices
55-57	77 Fulton Street (Southbridge Towers)	Block 94 / Lot 1	Residential
58-61	80 Beekman Street (Southbridge Towers)	Block 94 / Lot 1	Residential
62-64	90 Beekman Street (Southbridge Towers)	Block 94 / Lot 1	Residential
65-68	100 Beekman Street (Southbridge Towers)	Block 94 / Lot 1	Residential
69-73	299 Pearl Street (Southbridge Towers)	Block 94 / Lot 1	Residential
74-77	333 Pearl Street (Southbridge Towers)	Block 94 / Lot 1	Residential
78-81	49 Fulton Street	Block 95 / Lot 27	Residential
82	Pearl Street Playground	Block 95 / Lot 27	Open Space
83	Titanic Memorial Park	Block 95 / Lot 101	Open Space
84-87	117 Beekman Street	Block 95 / Lot 7501	Mixed Residential & Commercial
88	130 Beekman Street	Block 97 / Lot 7502	Residential
89	233-251 Water Street	Block 97 / Lots 49, 55, 57, 7501, 7505	School
90	220 Front Street	Block 97 / Lot 7503	Mixed Residential & Commercial
91	24 Peck Slip	Block 97 / Lot 32	Mixed Residential & Commercial
92-94	1 Peck Slip	Block 106 / Lot 9	School
95	334 Pearl Street	Block 106 / Lot 20	Place of Worship
96	272 Water Street	Block 106 / Lot 7503	Residential
97-99, 105	23-33 Peck Slip	Block 107 / Lot 38, 40, 42	Mixed Residential & Commercial, Hotel
100	244 Front Street	Block 107 / Lot 35	Residential
101	275 Water Street	Block 107 / Lot 49	Residential
102	Peck Slip open space	Block 107 / Lot 60	Open Space
103, 104	45 Peck Slip	Block 107 / Lot 10	Mixed Residential & Commercial
106, 107	214 Front Street	Block 97 / Lot 7504	Mixed Residential & Commercial

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 site work areas, adjacent building footprints and heights, locations of streets, and locations of sensitive receptors. For each analysis period, the approximate geographic location and operational characteristics—including equipment usage rates (percentage of time operating at full power) for each piece of construction equipment operating at the proposed development site, as well as noise control measures—were input to the model.

Construction equipment source strength was determined by the L_{max} levels presented in Table 22-1 of the *CEQR Technical Manual*. For construction equipment not included in this table, manufacturer specifications or field measured noise levels were used.

In addition, construction-related vehicles were assigned to the adjacent roadways. The model calculated 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.

Determination of Non-Construction Noise Levels

Noise generated by construction activities (calculated using the CadnaA model as described above) were added to baseline (i.e., non-construction) noise levels, including noise generated by non-construction traffic on adjacent roadways, to determine the total noise levels at each receptor location. Baseline noise levels were calculated using the CadnaA model using existing condition traffic data. The existing condition CadnaA model included the noise measurement locations described in Chapter 14, "Noise," for the purpose of validating the calculated existing condition noise level modeling.

Analysis Time Period Selection

The construction noise analysis estimated construction noise levels based on projected activity and equipment usage as well as the level of construction traffic for various stages of construction of the ~~Proposed Project~~previously proposed project. Based on the anticipated construction schedule and preliminary construction estimates developed for the ~~Proposed Project~~previously proposed project, specific time periods during construction were selected for detailed analysis. These were selected to capture the most noise-intensive construction activities (e.g., excavation/foundation work) at each site, as well as occurrence of major construction stages at two or more individual construction sites at the same time, in order to evaluate worst-case noise levels and to capture less noise-intensive activities (e.g., interior fit-out work) to determine the expected variability in construction noise during the schedule. Each analysis time period conservatively represents 2 to 8 months of time based on the duration of activities that would be underway during the time period.

The selected analysis periods are shown in **Table 17-~~12~~14**.

Table 17-~~12~~14
Summary of Construction Noise Analysis Periods

Time (Year / Month)	Construction Activities
2022 / July	Development Site – Foundation (with Impact Pile Driving)
2022 / December	Development Site – Foundation (without Impact Pile Driving)
2023 / March	Museum Site – Excavation and Foundation Development Site – Foundation and Superstructure
2023 / June	Museum Site – Superstructure Development Site – Foundation and Superstructure
2023 / July	Museum Site – Superstructure and Exteriors Development Site – Superstructure
2023 / December	Museum Site – Exteriors and Interiors Development Site – Superstructure, Exteriors, and Interiors
2024 / July	Museum Site – Interiors Development Site – Exteriors and Interiors
2024 / September	Development Site – Interiors

Construction Noise Impact Criteria

Chapter 22, Section 100, 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 both 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 a 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. However, as is the case with the ~~Proposed Project~~previously proposed project, if construction would result in exceedances of these noise impact criteria, then further consideration of the intensity and duration of construction noise is warranted at that receptor. 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 or equal to 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 3 dBA $L_{eq(1)}$.

In addition to the CEQR construction criteria above, determination of significant adverse construction noise impact would be considered based on the intensity and duration (i.e., noise level increment of 15 dBA or more for a period of 12 months or more or noise level increment of 20 dBA or more for a period of three months or more).

Evaluation of Construction Noise Levels

The predicted exterior noise level increments during construction of the ~~Proposed Project~~previously proposed project at the analyzed receptor sites were compared to the construction noise impact thresholds described above. At the noise-sensitive receptors that experience exceedances of these thresholds during the analysis periods, as determined above, the duration of exceedance of each impact threshold was determined. The significance of the exceedances was determined based on the predicted magnitude and duration of the construction noise at these locations according to the criteria described above. Based on the incremental noise level increase, overall exterior noise levels for each analysis period were also determined.

NOISE REDUCTION MEASURES

Construction under the ~~Proposed Project~~previously proposed project would be required to follow 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) for construction noise control measures. Additionally, construction under the ~~Proposed Project~~previously proposed project would incorporate some noise control measures that go beyond those required by Code. Specific noise control measures would be incorporated in noise mitigation plan(s) required under the *New York City 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 *New York City Noise Code*:

- Equipment that meets the sound level standards specified in Subchapter 5 of the *New York City Noise Control Code* would be utilized from the start of construction. **Table 17-~~13~~ 15** shows the noise levels for typical construction equipment and the mandated noise levels for the equipment that would be used for construction of the ~~Proposed Project~~previously proposed project.
- 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 electrical equipment cannot be used, diesel or gas-powered generators and pumps would be located within buildings 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 3 minutes at the construction site based upon Title 24, Chapter 1, Subchapter 7, Section 24-163 of the New York City Administrative Code.
- Contractors and subcontractors would be required to properly maintain their equipment and mufflers.

Table 17-~~13~~15
Typical Construction Equipment Noise Emission Levels (dBA)

Equipment List	L_{max} Noise Level at 50 feet[1]
Auger Drill Rig	85
Bar Bender	80
Chainsaw	85
Chipping Gun	75[3]
Circular Saw	76
Compactor (ground)	80
Compressor	80
Concrete Pump	82
Concrete Truck	85
Concrete Trowel	67
Concrete Vibrator	76
Cranes (Mobile)	85
Cranes (Tower)	85
Excavator	85
Forklift	64[2]
Generator	82
Hoist	75[3]
Impact Pile Driver	95
Jackhammer	85
Manlift	85
Pavement Scarafier	85
Pumps	77
Roller	85
Scissor Lift	70
Table Saw	76
Welding Machine	73

Source:
[1] *Rules for Citywide Construction Noise Mitigation*, Chapter 28, DEP, 2007, except where noted.
[2] Manufacturer's specification
[3] Project-specific equipment noise level commitment

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:

- 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 at least 8 feet tall with a cantilever toward the work area would be erected around the Development Site to provide shielding.
- Noise barriers would be erected around the Museum Site to provide shielding, which would be 12 feet tall along the edge of the site facing the Imagination Playground, and 8 feet tall along the remaining perimeter.
- The barriers would be constructed from plywood or other materials consistent with the noise barrier requirements set forth in the New York City Department of Environmental Protection (DEP)'s "Rules for Citywide Construction Noise Mitigation;"

- Concrete trucks would be required to be located inside site-perimeter noise barriers while pouring or being washed out;[7] and
- Path noise control measures (i.e., portable noise barriers, panels, enclosures, and acoustical tents) for certain dominant noise equipment 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]

CONSTRUCTION NOISE ANALYSIS RESULTS

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

Construction worker vehicles and trucks traveling on roadways prior to the start of the construction workday 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 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 AM 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.

Cumulative On-Site and Mobile Construction Noise Sources

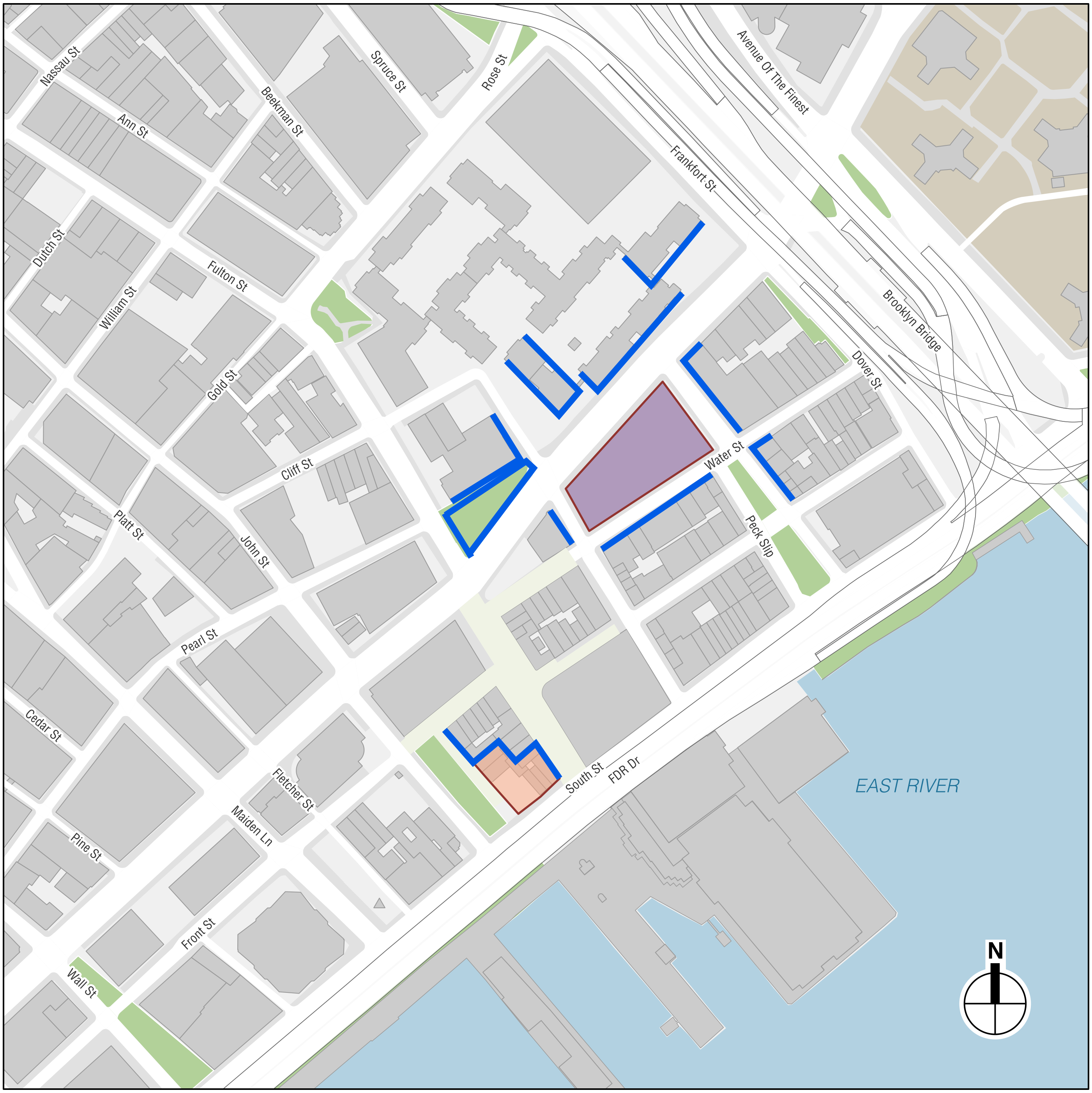
Using the methodology described and considering the noise abatement measures specified above, cumulative noise analyses were performed to determine maximum 1-hour equivalent ($L_{eq(1)}$) noise levels that would be expected at each of the 107 noise receptor locations during each of the seven selected construction periods. This resulted in a predicted range of peak hourly construction noise levels throughout the construction period. The results of the detailed construction noise analysis are summarized in **Table 17-~~14~~16** and **Figure 17-~~4~~7**.

[7] This path control measure will be among the project's commitments related to the environment (i.e., PCREs).

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

10.4.21

This figure was revised for the FEIS.



0 400 FEET

Development Site

Museum Site

Predicted Construction Noise Impacts

Predicted Construction Noise Impacts

250 WATER STREET

Figure 17-7

Table 17-~~14~~16
Construction Noise Analysis Results in dBA

Receptor	Address	Existing L_{10}	Max Total L_{10}	Max Change in L_{10}	Maximum Continuous Duration (months)		
					Exceedance of CEQR Screening Threshold	"Objectionable" Increase	"Very Objectionable" Increase
1-3	116 John Street	61.8	70.3	8.6	4	0	0
4-6	160 Water Street	69.5	72.2	7.5	6	0	0
7-9	180 Water Street	69.4	74.4	10.5	12	0	0
10-13	156 Front Street	65.6	67.8	5.6	0	0	0
14-18	175 Water Street	70.4	75.1	13.6	12	0	0
19, 20	151 Maiden Lane	63.7	71.6	10.0	12	0	0
21-23	161 Maiden Lane	75.5	75.8	11.7	12	0	0
24	165 Front Street	64.2	72.1	8.2	9	0	0
25	85 South Street	63.4	72.5	9.1	12	0	0
26, 27	170 John Street	75.3	81.6	14.1	23	0	0
28-31	199 Water Street	70.5	77.0	14.0	20	0	0
32	Imagination Playground	69.0	86.5	17.5	23	9	0
33-35	South Street Seaport Museum	75.1	86.8	20.3	23	12	3
36, 37	Fulton Street south of Water Street	68.8	75.4	10.5	20	0	0
38-41	111 John Street	63.0	72.0	9.6	12	0	0
42	26 Cliff Street	61.5	62.1	0.6	0	0	0
43	34 Cliff Street	62.5	62.7	0.2	0	0	0
44	46 Fulton Street	61.5	62.5	1.0	0	0	0
45-47	40 Fulton Street	63.8	75.6	12.6	12	0	0
48-50	127 John Street	69.8	78.6	16.2	20	6	0
51, 52	56 Fulton Street	62.0	67.5	6.0	0	0	0
53, 54	100 Gold Street	61.5	70.0	8.5	0	0	0
55-57	77 Fulton Street (Southbridge Towers)	61.5	72.8	11.3	12	0	0
58-61	80 Beekman Street (Southbridge Towers)	61.5	77.3	15.8	12	3	0
62-64	90 Beekman Street (Southbridge Towers)	61.5	74.4	12.9	20	0	0
65-68	100 Beekman Street (Southbridge Towers)	67.0	81.9	17.6	37	12	0
69-73	299 Pearl Street (Southbridge Towers)	69.3	81.1	15.7	37	6	0
74-77	333 Pearl Street (Southbridge Towers)	67.1	75.3	13.8	37	0	0
78-81	49 Fulton Street	65.4	80.3	18.4	37	12	0
82	Pearl Street Playground	66.5	82.0	15.5	26	4	0
83	Titanic Memorial Park	67.4	74.3	6.9	23	0	0
84-87	117 Beekman Street	69.8	86.9	24.2	37	20	12
88	130 Beekman Street	61.5	75.5	14.0	6	0	0
89	233 - 251 Water Street	62.9	84.9	23.4	37	37	6
90	220 Front Street	64.6	73.0	10.4	17	0	0
91	24 Peck Slip	65.6	75.1	13.6	14	0	0
92-94	1 Peck Slip	69.9	82.8	18.9	37	3	0
95	334 Pearl Street	69.2	70.2	1.2	0	0	0
96	272 Water Street	61.5	63.7	2.2	0	0	0
97-99, 105	23-33 Peck Slip	67.1	78.9	17.3	37	6	0
100	244 Front Street	65.0	70.2	5.3	3	0	0
101	275 Water Street	61.8	72.2	10.7	12	0	0
102	Peck Slip open space	67.4	74.1	6.7	20	0	0
103, 104	45 Peck Slip	75.5	75.6	4.5	12	0	0
106, 107	214 Front Street	64.6	78.1	16.6	20	4	0

The noise levels shown in **Table 17-1416** are maximum 1-hour noise levels; however, noise levels resulting from construction typically fluctuate throughout the day and from day to day during each construction phase and would not be sustained at these maximum values. Additionally, noise levels expected to result from the construction of the Proposed Projectpreviously proposed project would be comparable to those from typical construction sites in New York City involving a new building with concrete slab floors and foundation. Similarly, potential disruptions to adjacent residences and other receptors from elevated noise levels generated by construction would be expected to be comparable to those that would occur immediately adjacent to a typical New York City construction site during the portions of the construction period when the loudest activities would occur.

At some receptors, construction of the Proposed Projectpreviously proposed project would result in increments that would exceed the CEQR construction noise screening thresholds and/or that would be considered objectionable (i.e., 15 dBA or greater), and/or that would be considered very objectionable (i.e., 20 dBA or greater). The potential for significant adverse impacts at these receptors was determined by evaluating the duration of these increments, as described below.

Maximum construction noise levels at the Museum, the active recreation receptors at the Imagination Playground and the Pearl Street Playground, the school receptors at 1 Peck Slip, the north-facing residential and school receptors along Water Street between Beekman Street and Peck Slip, and the residential receptors at 170 John Street, 100 Beekman Street (Southbridge Towers), 299 Pearl Street (Southbridge Towers), 49 Fulton Street, and 117 Beekman Street would exceed an L_{10} of 80 dBA, and consequently be considered "clearly unacceptable" according to *CEQR Technical Manual* noise exposure guidance. The predicted "clearly unacceptable" noise levels at these receptors would occur at times during relatively short periods of peak noise generation, i.e., during times when multiple pieces of noise-intensive construction equipment would be operating simultaneously adjacent to the receptors. Construction noise levels would more generally be in the "marginally unacceptable" range throughout the construction period.

South Street Seaport Museum

Receptors 33 through 35 represent the existing Museum. Existing noise levels at these receptors are in the low 60s to mid-70s dBA, which would be considered "marginally unacceptable" according to *CEQR Technical Manual* noise exposure criteria.

At receptor 35, which faces away from construction, construction is predicted to produce noise levels up to the mid-70s dBA, resulting in noise level increases up to 9 8 dBA during the most noise-intensive stages of construction (i.e., concrete operations at the Museum Site), which would occur for up to approximately 12 6 months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur for up to approximately 20 months. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at this receptor would be in the "marginally unacceptable" category.

At receptors 33 and 34 (i.e., the façades of this building facing John Street and South Street, respectively), construction is predicted to produce noise levels up to the mid-80s dBA, resulting in noise level increases up to 22 20 dBA during the most noise-intensive stages of construction (i.e., drill rig activity at the Museum Site), which would occur for up to approximately three months. Noise level increases greater than 20 dBA, which would be considered very objectionable, would occur only during these three months. Noise level increases greater than 15 dBA at these receptors, which would be considered objectionable, would occur for up to approximately 12 months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur for up to approximately ~~12~~ 23 months. During this time, total noise levels at these receptors would be in the high 70s to low 80s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "clearly unacceptable" category.

At the portion of the existing Museum where the potential Museum addition will connect to the existing building, there are windows facing the Museum Site construction area. This portion of the existing Museum could experience noise levels slightly different from those described above if it were occupied during construction at the Museum Site; however, it is expected that since the façade in this area will be at least partially demolished to facilitate connection of the potential addition, it would not be occupied during construction at the Museum site and would consequently not experience construction noise.

Based on the prediction of construction noise levels up to the mid-80s dBA resulting in construction noise level increments up to approximately ~~22~~ 20 dBA, which would be considered very objectionable, occurring over the course of up to three months, construction noise associated with the ~~Proposed Project~~previously proposed project would result in a temporary significant adverse impact at receptors at the South Street Seaport Museum facing John Street and South Street. These receptors are discussed further in Chapter 19, "Mitigation."

~~*Residential Receptors at 127 John Street*~~

~~Receptors 48 through 50 represent the residential receptors at 127 John Street. Existing noise levels at these receptors are in the low 70s dBA, which would be considered "marginally unacceptable" according to *CEQR Technical Manual* noise exposure criteria.~~

~~At receptors 48 and 49, which face away from construction, construction is predicted to produce noise levels up to the mid-70s dBA, resulting in noise level increases up to 7 dBA during the most noise-intensive stages of construction (i.e., superstructure at the Development Site), which would occur for up to approximately four months. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "marginally unacceptable" category.~~

~~At receptor 50 (i.e., the façade of this building facing east towards the Development Site), construction is predicted to produce noise levels up to the mid-70s dBA, resulting in noise level increases up to 12 dBA during the most noise-intensive stages of construction (i.e., superstructure at the Development Site), which would occur for up to approximately 4 months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur at these receptors for up to approximately 37 months. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "marginally unacceptable" category.~~

~~Based on the prediction of construction noise levels up to the mid-70s dBA resulting in construction noise level increments up to approximately 12 dBA occurring over the course of up to 37 months, construction noise associated with the previously proposed project would result in a temporary significant adverse impact at east-facing receptors at 127 John Street. These receptors are discussed further in Chapter 19, "Mitigation."~~

Residential Receptors at 100 Beekman Street (Southbridge Towers)

Receptors 65 through 68 represent the residential receptors at 100 Beekman Street (Southbridge Towers). Existing noise levels at these receptors are in the low to high 60s dBA, which would be considered "marginally acceptable" according to *CEQR Technical Manual* noise exposure criteria.

At receptor 65, which faces away from construction, construction is predicted to produce noise levels up to the low 70s dBA, resulting in noise level increases up to 9 dBA during the most noise-intensive stages of construction (i.e., concrete operations at the Museum Site), which would occur for up to approximately 9 months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur only during these 9 months. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at this receptor would be in the "marginally unacceptable" category.construction is predicted to produce noise levels up to the high 60s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "marginally acceptable" category.

At receptors 66 through 68, construction is predicted to produce noise levels up to the low 80s dBA, resulting in noise level increases up to approximately 16 18 dBA during the most noise-intensive stages of construction (i.e., the overlap of foundation construction with superstructure at the Development Site), which would occur for up to approximately three months. Noise level increases greater than 15 dBA at these receptors, which would be considered objectionable, would occur for up to approximately 12 months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur for up to approximately 37 months. During this time, total noise levels at these receptors would be in the high 70s to low 80s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "clearly unacceptable" category.

Based on the prediction of construction noise levels up to the low 80s dBA resulting in construction noise level increments up to approximately 16 18 dBA, which would be considered objectionable, and exceedances of the *CEQR Technical Manual* construction noise screening thresholds occurring over the course of up to 37 12 months, construction noise associated with the Proposed Projectpreviously proposed project would result in a temporary significant adverse impact at south, east, and west-facing receptors at 100 Beekman Street (Southbridge Towers). These receptors are discussed further in Chapter 19, "Mitigation."

Residential Receptors at 299 Pearl Street (Southbridge Towers)

Receptors 69 through 73 represent the residential receptors at 299 Pearl Street (Southbridge Towers). Existing noise levels at these receptors are in the high 60slow 70s dBA, which would be considered "marginally unacceptable" according to *CEQR Technical Manual* noise exposure criteria.

At receptors 70 and 73, which faces away from construction, construction is predicted to produce noise levels up to the low 70s dBA, resulting in noise level increases up to 9 dBA during the most noise-intensive stages of construction (i.e., the overlap of foundation construction with superstructure at the Development Site), which would occur for up to approximately 3 months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur only during these 3 months. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at this receptor would be in the "marginally unacceptable" category.construction is predicted to produce noise levels up to the high 60s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "marginally acceptable" category.

At receptors 69, and 71, and through 73 72, construction is predicted to produce noise levels up to the low 80s dBA, resulting in noise level increases up to approximately 14 16 dBA during the most noise-intensive stages of construction (i.e., the overlap of foundation construction with superstructure at the Development Site), which would occur for up to approximately three months. Noise level increases greater than 15 dBA at these receptors, which would be considered objectionable, would occur for up to approximately 6 months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur for up to approximately 37 months. During this time, total noise levels at these receptors would be in the high 70s to low 80s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "clearly unacceptable" category.

Based on the prediction of construction noise levels up to the low 80s dBA resulting in construction noise level increments up to approximately ~~14~~ 16 dBA and exceedances of the *CEQR Technical Manual* construction noise screening thresholds occurring over the course of up to 37 months, construction noise associated with the ~~Proposed Project~~previously proposed project would result in a temporary significant adverse impact at south~~, east,~~ and west-facing receptors at 299 Pearl Street (Southbridge Towers). These receptors are discussed further in Chapter 19, "Mitigation."

Residential Receptors at 333 Pearl Street (Southbridge Towers)

Receptors 74 through 77 represent the residential receptors at 333 Pearl Street (Southbridge Towers). Existing noise levels at these receptors are in the high 60s~~low 70s~~ dBA, which would be considered "marginally ~~un~~acceptable" according to *CEQR Technical Manual* noise exposure criteria.

At receptors 76 and 77, which face away from construction, construction is predicted to produce noise levels up to the high 60s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "marginally acceptable" category.~~construction is predicted to produce noise levels up to the low 70s dBA, resulting in noise level increases up to 7 dBA during the most noise-intensive stages of construction (i.e., the overlap of foundation construction with superstructure at the Development Site), which would occur for up to approximately three months. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "marginally unacceptable" category.~~

At receptors 74 and 75, construction is predicted to produce noise levels up to the mid-70s dBA, resulting in noise level increases up to approximately 14 dBA during the most noise-intensive stages of construction (i.e., impact pile driving at the Development Site), which would occur for up to approximately six months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur for up to approximately 37 months. During this time, total noise levels at these receptors would be in the mid-70s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "marginally unacceptable" category.

Based on the prediction of construction noise levels up to the mid-70s dBA resulting in construction noise level increments up to approximately 14 dBA and exceedances of the *CEQR Technical Manual* construction noise screening thresholds occurring over the course of up to 37 months, construction noise associated with the ~~Proposed Project~~previously proposed project would result in a temporary significant adverse impact at south and west-facing receptors at 333 Pearl Street (Southbridge Towers). These receptors are discussed further in Chapter 19, "Mitigation."

Residential Receptors at 49 Fulton Street

Receptors 78 through 81 represent the residential receptors at 49 Fulton Street. Existing noise levels at these receptors are in the low to mid-60s dBA, which would be considered “marginally acceptable” according to *CEQR Technical Manual* noise exposure criteria.

At receptors 78 and 79, which face away from construction, construction is predicted to produce noise levels up to the high 60s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the “marginally acceptable” category.

At receptors 80 and 81 (i.e., the façades of this building facing south and east towards the Development Site), construction is predicted to produce noise levels up to the low 80s dBA, resulting in noise level increases up to ~~17~~ 18 dBA during the most noise-intensive stages of construction (i.e., concrete operations at the Development Site), which would occur for up to approximately 12 months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening levels at these receptors would be in the high 70s to low 80s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the “clearly unacceptable” category.

Based on the prediction of construction noise levels up to the low 80s dBA resulting in construction noise level increments up to approximately ~~17~~ 18 dBA, which would be considered objectionable, occurring over the course of up to 12 months, construction noise associated with the ~~Proposed Project~~previously proposed project would result in a temporary significant adverse impact at south and east-facing receptors at 49 Fulton Street. These receptors are discussed further in Chapter 19, “Mitigation.”

Pearl Street Playground

Receptor 82 represents the Pearl Street Playground. Existing noise levels at these receptors are in the high 60s dBA, which would be considered “marginally acceptable” according to *CEQR Technical Manual* noise exposure criteria.

At these receptors, construction is predicted to produce noise levels up to the low 80s dBA, resulting in noise level increases up to ~~13~~ 16 dBA during the most noise-intensive stages of construction (i.e., superstructure at the Development Site), which would occur for up to approximately four months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur for up to approximately 26 months. During this time, total noise levels at these receptors would be in the high 70s to low 80s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the “clearly unacceptable” category.

Based on the prediction of construction noise levels up to the low 80s dBA resulting in construction noise level increments up to approximately ~~13~~ 16 dBA and exceedances of the *CEQR Technical Manual* construction noise screening thresholds occurring over the course of up to 26 months, construction noise associated with the ~~Proposed Project~~previously proposed project would result in a temporary significant adverse impact at the Pearl Street Playground. This receptor is discussed further in Chapter 19, “Mitigation.”

Residential Receptors at 117 Beekman Street

Receptors 84 through 87 represent the residential receptors at 117 Beekman Street. Existing noise levels at these receptors are in the low 60s to high 60slow 70s dBA, which would be considered "marginally unacceptable" according to *CEQR Technical Manual* noise exposure criteria.

At receptors 84 through 86, which face away from construction, construction is predicted to produce noise levels up to the mid-70s dBA, resulting in noise level increases up to 12 dBA during the most noise-intensive stages of construction (i.e., impact pile driving at the Development Site), which would occur for up to approximately six months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur for up to approximately 12 months. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "marginally unacceptable" category.

At receptor 87 (i.e., the façade of this building facing east towards the Development Site), construction is predicted to produce noise levels up to the mid-80s dBA, resulting in noise level increases up to 21 24 dBA during the most noise-intensive stages of construction (i.e., concrete operations at the Development Site), which would occur for up to approximately six months. Noise level increases greater than 20 dBA, which would be considered very objectionable, would occur only during these six monthsfor up to approximately 12 months. Noise level increases greater than 15 dBA at these receptors, which would be considered objectionable, would occur for up to approximately 12 20 months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur for up to approximately 37 months. During this time, total noise levels at these receptors would be in the high 70s to low 80s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "clearly unacceptable" category.

Based on the prediction of construction noise levels up to the mid-80s dBA resulting in construction noise level increments up to approximately 21 24 dBA, which would be considered very objectionable, occurring over the course of up to six 12 months, construction noise associated with the Proposed Projectpreviously proposed project would result in a temporary significant adverse impact at east-facing receptors at 117 Beekman Street. These receptors are discussed further in Chapter 19, "Mitigation."

North-Facing Residential and School Receptors along Water Street

Receptor 89 represents the north-facing residential and school receptors along Water Street between Beekman Street and Peck Slip. Existing noise levels at these receptors are in the mid-60s dBA, which would be considered "acceptable" according to *CEQR Technical Manual* noise exposure criteria.

At these receptors, construction is predicted to produce noise levels up to the mid-80s dBA, resulting in noise level increases up to 23 dBA during the most noise-intensive stages of construction (i.e., impact pile driving at the Development Site), which would occur for up to approximately six months. Noise level increases greater than 15 dBA at these receptors, which would be considered objectionable, would occur for up to approximately 37 months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur for up to approximately 37 months. During this time, total noise levels at these receptors would be in the high 70s to mid-80s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "clearly unacceptable" category.

Based on the prediction of construction noise levels up to the mid-80s dBA resulting in construction noise level increments up to approximately 23 dBA, which would be considered very objectionable, occurring over the course of up to six months, construction noise associated with the ~~Proposed Project~~previously proposed project would result in a temporary significant adverse impact at the residential and school receptors along Water Street between Beekman Street and Peck Slip. These receptors are discussed further in Chapter 19, "Mitigation."

School Receptors at 1 Peck Slip

Receptors 92 through 94 represent the school receptors at 1 Peck Slip. Existing noise levels at these receptors are in the low 60s to high 60s~~low 70s~~ dBA, which would be considered "acceptable" to "marginally ~~un~~acceptable" according to *CEQR Technical Manual* noise exposure criteria.

At receptor 94, which faces away from construction, construction is predicted to produce noise levels up to the high 60s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "marginally acceptable" category.

At receptors 92 and 93 (i.e., the façades of this building facing north towards Pearl Street and facing west towards the Development Site, respectively), construction is predicted to produce noise levels up to the low 80s dBA, resulting in noise level increases up to ~~21~~ 19 dBA during the most noise-intensive stages of construction (i.e., foundations activity at the Development Site), which would occur for up to approximately three months. ~~Noise level increases greater than 20 dBA, which would be considered very objectionable, would occur only during these three months.~~ Noise level increases greater than 15 dBA at these receptors, which would be considered objectionable, would occur only during these three months~~would occur for up to approximately 12 months~~. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur for up to approximately 37 months. During this time, total noise levels at these receptors would be in the high 70s to low 80s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "clearly unacceptable" category.

Based on the prediction of construction noise levels up to the low 80s dBA resulting in construction noise level increments up to approximately ~~21~~ 19 dBA and exceedances of the *CEQR Technical Manual* construction noise screening thresholds occurring over the course of up to 37 months~~, which would be considered very objectionable, occurring over the course of up to three months~~, construction noise associated with the ~~Proposed Project~~previously proposed project would result in a temporary significant adverse impact at north and west-facing receptors at 1 Peck Slip. These receptors are discussed further in Chapter 19, "Mitigation."

Residential Receptors at 23-33 Peck Slip

Receptors 97 through 99 and 105 represent the residential receptors at 23-33 Peck Slip. Existing noise levels at these receptors are in the low to mid-60s dBA, which would be considered "marginally acceptable" according to *CEQR Technical Manual* noise exposure criteria.

At these receptors, construction is predicted to produce noise levels up to the high 70s dBA, resulting in noise level increases up to approximately 17 dBA during the most noise-intensive stages of construction (i.e., the overlap of foundation construction with superstructure at the Development Site), which would occur for up to approximately three months. Noise level increases greater than 15 dBA at these receptors, which would be considered objectionable, would occur for up to approximately 6 months. Noise level increases exceeding the *CEQR Technical Manual* construction noise screening thresholds would occur for up to approximately 31 37 months. During this time, total noise levels at these receptors would be in the high 70s to low 80s dBA. According to *CEQR Technical Manual* noise exposure criteria, maximum construction noise levels at these receptors would be in the "clearly marginally unacceptable" category.

Based on the prediction of construction noise levels up to the high 70slow 80s dBA resulting in construction noise level increments up to approximately 17 dBA, which would be considered objectionable, and exceedances of the *CEQR Technical Manual* construction noise screening thresholds occurring over the course of up to 31 37 months, construction noise associated with the Proposed Projectpreviously proposed project would result in a temporary significant adverse impact at the residential receptors at 23-33 Peck Slip. These receptors are discussed further in Chapter 19, "Mitigation."

Other Nearby Receptors

At the remaining receptors, construction of the Proposed Projectpreviously proposed project may, for some portion of the construction period, result in noise level increases that would exceed the *CEQR Technical Manual* construction noise screening thresholds, and in some cases would exceed the 15 dBA threshold for an objectionable noise level increase. However, at these receptors, any exceedances of the *CEQR Technical Manual* construction noise screening thresholds would occur for less than 24 consecutive months, and any exceedances of the objectionable noise level increase threshold would occur for less than 12 consecutive months. Consequently, while construction noise would be perceptible at these receptors, the predicted construction noise levels would not rise to the level of a significant impact at these receptors according to the impact criteria described above.

VIBRATION

The vibration analysis considers the potential for construction to result in vibration levels that could 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. An assessment has been prepared to quantify potential vibration impacts of construction activities on structures and residences near the construction sites.

CONSTRUCTION VIBRATION CRITERIA

For purposes of assessing potential structural or architectural damage at historic buildings, the determination of a significant impact is typically based on the vibration impact criterion used by LPC 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 below 0.60 inches/second would not be expected to result in any structural or architectural damage.

VIBRATION ANALYSIS

Potential structural or architectural damage is determined using the following formula:

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

where:

PPV_{equip} is the peak particle velocity in inches/second 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.

Table 17-~~15~~ 17 shows vibration source levels for typical construction equipment.

Table 17-~~15~~17
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
Hydromill (slurry wall)	In soil	0.008	66
	In rock	0.017	75
Clam shovel drop (slurry wall)		0.202	94
Vibratory roller		0.210	94
Hydraulic break ram		0.089	87
Large bulldozer		0.089	87
Caisson drilling		0.089	87
Loaded trucks		0.076	86
Jackhammer		0.035	79
Small bulldozer		0.003	58

Source: FTA Transit Noise and Vibration Impact Assessment (September 2018)

Construction Vibration Analysis Results

Since the Project Area is located within the NYCL South Street Seaport Historic District, construction of the proposed buildings on the Development Site and Museum Site is subject to LPC review and approval. To avoid adverse physical impacts on architectural resources located close enough to project construction (within 90 feet), the ~~Proposed Project~~previously proposed project would develop and implement a CPP in consultation with LPC. The CPP would include a requirement for monitoring to determine the amount of vibration at the subject structures during the construction period, as well as a prohibition on vibration exceeding the acceptable threshold (i.e., 0.5 in/sec). If construction were to result in vibration exceeding this threshold, the CPP would require construction means and methods to be altered to avoid producing such exceedances.

For construction at the Development Site, which would include impact pile driving, based on the distance to the nearest of the surrounding structures (i.e., approximately 50 feet), vibration levels at these structures would not be expected to exceed 0.50 in/sec PPV, including during pile driving, which would be the most vibration-intensive activity associated with construction under the Proposed Actions. For construction at the Museum site, at which the most vibration-intensive activity would be use of an auger drill rig, vibration levels at least 10 feet from drilling locations would not be expected to exceed 0.50 in/sec PPV as a result of construction. Additionally, as described above and in the "Historic and Cultural Resources" section, the structures adjacent to these work areas would be covered by a CPP requiring vibration monitoring and requiring that construction means and methods be designed to avoid producing vibration levels greater than 0.5

in/sec. Additional receptors farther away from the Development Site and Museum Site would experience less vibration than those listed above, which would not be expected to cause structural or architectural damage. As such, the predicted levels of vibration would not be considered significant. In no case are significant adverse impacts from vibrations expected to occur.

OTHER TECHNICAL AREAS

LAND USE AND NEIGHBORHOOD CHARACTER

As is typical with construction projects, during periods of peak activity there would be some disruption to the nearby area. There would be construction trucks and construction workers coming to the area, as well as trucks and other vehicles backing up, loading, and unloading. These disruptions would be most pronounced in areas immediately adjacent to the Development Site and the Museum Site but would have more limited effects on land uses in the larger study area, as most construction activities would take place within the Development Site and the Museum Site or within portions of sidewalks and parking lanes immediately adjacent to the construction areas. Overall, construction activities at the Development Site and the Museum Site would be evident to the local community. However, throughout the construction period, measures would be implemented to control air quality, noise, and vibration within the Development Site and the Museum Site, including the erection of construction barriers. The barriers would reduce potentially undesirable views of construction areas, buffer noise emitted from construction activities, and protect the safety of pedestrians and bicyclists. Therefore, the construction would not result in significant or long-term adverse impacts on local land use patterns or the character of the broader neighborhood.

SOCIOECONOMIC CONDITIONS

Construction of the ~~Proposed Project~~previously proposed project would not block or restrict access to any facilities in the area, affect the operations of any nearby businesses, or obstruct major thoroughfares used by customers or businesses. Construction would create direct benefits resulting from expenditures on labor, materials, and services, and indirect benefits created by expenditures by material suppliers, construction workers, and other employees involved in the construction activity. Construction would also contribute to increased tax revenues for the city and state, including those from personal income taxes. Therefore, construction activities associated with the ~~Proposed Project~~previously proposed project would not result in any significant adverse impacts on socioeconomic conditions.

COMMUNITY FACILITIES

No community facilities would be directly affected (e.g., closed) by construction activities. The construction area would be surrounded by construction barriers that would limit the effects of construction on nearby facilities. Measures outlined in the MPT plan to be implemented for the ~~Proposed Project~~previously proposed project would ensure that lane closures and sidewalk closures are kept to a minimum and that adequate pedestrian access is maintained. Construction workers would not place any burden on public schools and would have minimal, if any, demands on libraries, childcare facilities, and health care facilities. New York City Police Department (NYPD) and FDNY emergency services and response times would not be materially affected by construction.

OPEN SPACE

No open space resources would be used for staging or other construction activities. The nearest open space resources are the Imagination Playground immediately west of the Museum Site and the Pearl Street Playground and Titanic Memorial Park to the west of the Development Site. Access to these open space resources and any other nearby open space resources would be maintained throughout the duration of the construction period. Measures would be implemented to control air emissions, dust, noise, and vibration on the Development Site and Museum Site during construction. However, as discussed above in "Noise," based on the prediction of construction noise levels up to the low 80s dBA resulting in construction noise level increments up to approximately 13 dBA and exceedances of the *CEQR Technical Manual* construction noise screening thresholds occurring over the course of up to 26 months, construction noise associated with the ~~Proposed Project~~previously proposed project would result in a temporary significant adverse impact at the Pearl Street Playground. This receptor is discussed further in Chapter 19, "Mitigation."

HISTORIC AND CULTURAL RESOURCES

Historic and cultural resources include both archaeological and architectural resources. A detailed assessment of potential impacts on archaeological and architectural resources is described in Chapter 6, "Historic and Cultural Resources."

The majority of the archaeological area of potential effect (APE) (Block 73, Lots 10, 11, 14, and 17) has been previously determined by LPC and New York State Historic Preservation Office (SHPO) to have no archaeological sensitivity. Consistent with the recommendations of prior studies that evaluated the remainder of the archaeological APE, a protocol for archaeological field testing and/or monitoring would be developed in coordination with LPC and SHPO for any work to be conducted on the vacant John Street Lot (Block 74, part of Lot 1), beneath the Franklin D. Roosevelt (FDR) Drive, and within the portion of the East River Esplanade north of Pier 17.

Since the Project Area is in a New York City Historic District (NYCHD) and/or involve NYCL, the proposed buildings and work on the Development Site and Museum Site are subject to review and approval under the New York City Landmarks Law.

In addition, construction of various components of the ~~Proposed Project~~previously proposed project would occur within 90 feet of architectural resources. Therefore, a CPP would be prepared and implemented for these resources to ensure that the ~~Proposed Project~~previously proposed project would not result in any direct adverse impacts on historic and cultural resources.

HAZARDOUS MATERIALS

A detailed assessment of the potential effects related to the construction of the ~~Proposed Project~~previously proposed project with respect to any hazardous materials is described in Chapter 9, "Hazardous Materials."

Although hazardous materials are potentially present both in the subsurface (related to former gas station or petroleum releases either on or near the construction sites and historical fill materials at the construction sites) and inside buildings (primarily related to asbestos and LBP), with the implementation of a variety of measures prior to and during construction (including both testing and health and safety procedures) as presented in Chapter 9, "Hazardous Materials," no significant adverse impacts related to hazardous materials would be expected to be associated with the ~~Proposed Project~~previously proposed project.

WATER AND SEWER INFRASTRUCTURE

Infrastructure activities at the Development Site and the Museum Site would include utility connections to existing water, sewer, electric, gas, and telecommunications. These activities would be coordinated with DEP, Con Edison, or the appropriate private utility company to ensure that service to customers in nearby areas is not disrupted. All utility lines would be located either in the street bed or within the below-grade space. Residents and workers in nearby buildings are not expected to experience substantial disruptions to water supply or wastewater removal. Any disruption to service that may occur when new equipment (e.g., a transformer, or a sewer or water line) is put into operation is expected to be very short-term (i.e., hours). Therefore, the construction of the ~~Proposed Project~~previously proposed project's infrastructure improvements would not cause any significant adverse impacts to nearby users of these services. ✷