15

Construction

Construction activities, although temporary in nature, can sometimes result in significant adverse impacts. A project's construction activities may affect a number of technical areas analyzed for the operational period, such as air quality, noise, and traffic. This chapter assesses the potential for the Proposed Project to result in significant adverse impacts during construction.

Introduction

This chapter provides an assessment of the potential for construction of the Proposed Project, which would consist of a new, approximately 925,630-gross-square-foot (gsf) commercial office building up to approximately 1,050 feet tall, with ground floor retail uses and below-grade space (i.e., mechanical and back-of-house space). The project would provide transportation improvements on-site that create new pedestrian access to and from the Long Island Rail Road (LIRR) East Side Access (ESA) concourse (the existing connection from 45th Street to the Grand Central Terminal Roosevelt Passageway would remain adjacent to the site at 52 Vanderbilt Avenue). The Proposed Project would also improve passenger circulation at the Grand Central – 42nd Street Subway Station—including improvements to passenger connections to the IRT No. 7 Flushing Line platform. Absent the Proposed Project, an approximately 477,599 gsf commercial office building with ground floor retail uses could be constructed as of right and are also discussed in this chapter. The No-Action building would provide an easement for possible future ESA circulation, to be built by the MTA, but would not include the transportation improvements associated with the Proposed Project.

Principal Conclusions

A construction assessment was conducted based on the methodology set forth in the *CEQR Technical Manual*, and it concluded that the Proposed Project would not result in significant adverse construction period impacts.

Governmental oversight of construction in New York City is extensive and involves a number of City, State, and Federal agencies, each with specific areas of responsibility. Construction at the Project Site would be subject to government regulations and oversight described below in Construction Regulations and General Practices and would employ the general construction practices described below. The Proposed Project would also comply with the requirements of the New York City Noise Control Code.

Historic and Cultural Resources

The Yale Club, Vanderbilt Concourse Building, Roosevelt Hotel and Brooks Brothers Store are located within 90 feet of the Project Site. To avoid inadvertent construction-period damage to these four historic resources, BP 347 Madison Associates, LLC (BP) would develop and implement a construction protection plan (CPP) for the buildings in consultation with the New York City Landmarks Preservation Commission (LPC), New York State Historic Preservation Office (SHPO), and the Metropolitan Transportation Authority (MTA). The CPP would outline steps to complete a pre-construction field inspection of these adjacent historic resources and establish thresholds for vibrations and methods of monitoring vibrations during construction. Specifically, the CPP would set forth measures for protection and avoidance of structural and architectural damage from construction activities, monitoring of construction activities, and repair in the event of any damage. With these measures in place, construction would not be expected to result in significant adverse impacts on historic or cultural resources.

Transportation

Traffic

Construction activities for the Proposed Project would generate 27 construction worker auto trips and ten construction truck trips during the AM construction peak hour, and 26 construction worker auto trips and no construction truck trips during the PM construction peak hour. The *2020 CEQR Technical Manual* indicates that a detailed traffic analysis for construction activities is not necessary if the construction peak hour would generate fewer than 50 vehicle trips. Therefore, there is no potential for significant traffic impacts associated with the arrival and departure of construction related vehicles and no further quantified traffic analysis is warranted. Although no further traffic analyses were needed, vehicle trips generated by construction activities for the Proposed Project were assigned to the surrounding roadway network for the purpose of the other construction analyses (air quality and noise).

Parking

Construction workers would generate an estimated maximum daily parking demand of 34 spaces during the peak construction quarter. This parking demand could be accommodated by the off-street parking facilities available within a quarter mile radius of the Project Site.

Transit and Pedestrians

During the peak construction quarter, the Proposed Project would generate approximately 238 daily construction workers. It is expected that the majority of these workers (80 percent) would arrive during the AM construction peak hour and depart during the PM construction peak hour, and they would generate approximately 135 construction worker trips by public transportation during each construction peak hour. The study area is well served by public transit, including the No. 4,5,6,7, and S subway lines at the 42nd Street – Grand Central station as well as the B,D,F, and M subway lines at Fifth Avenue – Bryant Park and 47th – 50th Streets Rockefeller Center stations. Several Manhattan and Queens local bus routes, and express bus routes, also serve the study area. These trips would be distributed to the different transit options, and construction activities are not expected to result in transit or pedestrian impacts.

Air Quality

Based on the results of the emissions intensity and quantitative construction air quality analysis for on-site emissions (construction equipment, trucks and fugitive dust), and off-site emissions (approaching and departing construction trucks) effects of construction, the Proposed Project would not result in significant adverse impacts on air quality during construction.

Noise

Construction on the Project Site would involve standard construction activities and practices for buildings in New York City. Excavation, foundation, and superstructure phases of construction are when noisiest activities occur. The interior fitout phase of construction typically involves minimal exterior equipment substantially quieter noise conditions. The Proposed Project is near existing residential and commercial land uses; therefore, based on the proximity of these noise-sensitive land uses, there is the potential for construction to cause significant adverse noise impacts and detailed construction noise analysis is warranted.

Construction noise levels would not increase by 15 dBA or more during any phase of construction and noise levels would be below 84 dBA during the With-Action and would not exceed the public health noise criterion of 85 dBA. Construction noise levels would increase ambient levels by 3 dBA or more and exceed the interior noise criteria at 19 receptor locations during the excavation, foundation and superstructure phases for 24 months during the No-Action condition. Similarly, construction noise levels would increase by 3 dBA or more and exceed the interior noise criteria at the same 19 receptor locations during excavation, foundation, and superstructure phases for 28 months during the With-Action condition. The analysis results indicate that during excavation and foundation, construction equipment and durations would be the same between the No-Action and With-Action conditions. The analysis results indicate that during superstructure, construction noise levels would be within 1-2 dBA for the Proposed Action compared to the No-Action and would last for 4 months longer. Since construction noise levels would exceed 3 dBA or more and exceed the interior noise criteria for 24 months or more for both the No-Action and With-Action conditions at all of these receptors, there would not be significant noise impact due to the Proposed Action.

With the adherence to existing construction noise regulations, the implementation of a Construction Noise Mitigation Plan, as required by the New York City Noise Code, as well as the use of an 12-foot perimeter wall noise barrier and acoustic enclosures around generators and compressors, construction noise would be reduced and would not exceed the thresholds for significant adverse noise impact. The perimeter wall would have an absorptive surface on the interior side (facing the ~~project site~~Project Site) along the Madison Avenue and East 44th Street sides.

Vibration

The Proposed Project is not anticipated to result in significant adverse impacts as a result of construction vibration as most nearby buildings not on the immediate block are 60 feet or farther from proposed construction activities and vibration levels from drilling and other sources of vibration such as bulldozers and jackhammers would not exceed the LPC vibration criterion. Since 50 Vanderbilt Avenue (Yale Club) is an individual landmark, the DOB Technical Policy and Protection Notice (TPPN) #10/88 would apply, which requires a vibration monitoring program to reduce the likelihood of construction damage to adjacent New York City Landmarks and NR-listed properties within 90 feet. The applicant would employ means/methods that meet acceptable vibration levels as mandated by DOB.

In terms of construction vibration causing potential annoyance, the threshold for potential annoyance is 65 VdB inside buildings. Assuming a 10 VdB outdoor to indoor vibration attenuation for large masonry buildings, there is potential for human annoyance within 65 feet of most other equipment, such as drilling, bulldozers, and jackhammers. These construction activities would only occur for limited periods of time at any particular location. Therefore, there would be no significant adverse impacts as a result of construction vibration.

Construction Regulations and General Practices

Construction Oversight

Governmental oversight of construction in New York City is extensive and involves a number of City, State, and Federal agencies, each with specific areas of responsibility, as follows.

- The New York City Department of Buildings (DOB) has primary oversight of construction. DOB oversees compliance with the New York City Building Code to ensure that buildings are structurally, electrically, and mechanically safe. In addition, DOB enforces safety regulations to protect both workers and the general public during construction. Areas of oversight include installation and operation of equipment such as cranes and lifts, sidewalk sheds, safety netting, and scaffolding.
- The New York City Department of Environmental Protection (NYCDEP) enforces the New York City Noise Code, reviews and approves any needed Remedial Action Plans (RAPs)

and associated Construction Health and Safety Plans (CHASPs) as well as the removal of fuel tanks and abatement of hazardous materials. NYCDEP also regulates water disposal into the sewer system and reviews and approves any rerouting of wastewater flow.

- The New York City Fire Department (FDNY) has primary oversight of compliance with the New York City Fire Code and the installation of tanks containing flammable materials.
- The New York City Department of Transportation Office of Construction Mitigation and Coordination (~~NYCDOT~~NYC DOT OCMC) reviews and approves any traffic lane and sidewalk closures.
- New York City Transit (NYCT) is responsible for bus stop relocations and subsurface construction within 200 feet of a subway, if needed.
- The New York City Landmarks Preservation Commission approves studies and testing to prevent loss of archaeological resources and to prevent damage to architectural resources.
- The New York State Department of Environmental Conservation (NYSDEC) regulates disposal of hazardous materials, and construction, operation, and removal of bulk petroleum and chemical storage tanks. NYSDEC also regulates discharge of water into rivers and streams.
- The New York State Department of Labor (DOL) licenses asbestos workers.
- The New York State Department of Transportation (NYSDOT) reviews and approves any traffic lane closures on its roadways, should any be necessary.
- The U.S. Environmental Protection Agency (EPA) has wide-ranging authority over environmental matters, including air emissions, noise, hazardous materials, and the use of poisons, however, much of its responsibility is delegated to the state level.
- The Occupational Safety and Health Administration (OSHA) sets standards for work site safety and construction equipment.

Construction Hours

New York City regulates the hours of construction work through the New York City Noise Control Code, as amended in December 2005 and effective July 1, 2007. Construction is limited to weekdays between the hours of 7:00 AM and 6:00 PM, and noise limits are set for certain specific pieces of construction equipment. The City may permit work outside of these hours to accommodate: (1) emergency conditions; (2) public safety; (3) construction projects by or on behalf of City agencies; (4) construction activities with minimal noise impacts; and (5) undue hardship resulting from unique site characteristics, unforeseen conditions, scheduling conflicts, and/or financial considerations. The DOB issues these work permits, and for new building construction, like the projected development, approval of a noise mitigation plan from the DEP under the City's Noise Code is also required.

In New York City, construction work typically occurs on weekdays and begins at 7:00 AM, with most workers arriving between 6:00 AM and 7:00 AM. Work typically ends at 3:30 PM, with some exceptions when certain critical tasks (e.g., finishing a concrete pour for a floor deck, completing the drilling of piles, or completing the bolting of a steel frame erected that day) require that the workday be extended beyond normal work hours. Any extended workdays generally last until approximately 5:30 PM or 6:00 PM and do not include all construction workers on-site, but only those involved in the specific task requiring additional work time. For work outside of normal construction hours, work permits are obtained from DOB prior to such work commencing. The numbers of workers and pieces of equipment in operation for work outside normal hours is generally limited to those needed to complete the authorized task. Overall, the level of activity for any work outside of normal construction hours is less than a normal workday.

Construction Practices

Access, Deliveries and Staging Area

Access to construction sites is controlled. Work areas are fenced off, and limited access points for workers and construction-related trucks are provided. Typically, worker vehicles are not allowed into the construction area, and workers or trucks without a need to be on the site are not allowed entry. After work hours, the gates are closed and locked. Security guards may patrol the construction site after work hours and over weekends to prevent unauthorized access.

Material deliveries to the site are controlled and scheduled. To aid in adhering to the delivery schedules, as is normal for building construction in New York City, flaggers are employed at each of the construction site's access points. Flaggers are typically supplied by either the subcontractor on-site at the time or by the construction manager. The flaggers control trucks entering and exiting the ~~project site~~Project Site so that they would not interfere with one another. In addition, they provide an additional traffic aid as trucks enter and exit the on-street traffic streams.

Lane and Walkway Closures

Temporary curb-lane and sidewalk closures are typical for construction projects in New York City. To manage such closures, a Maintenance and Protection of Traffic (MPT) plan is developed consistent with ~~NYCDOT~~NYC DOT requirements. The MPT plan would highlight the extent of closure to travel and parking lanes and sidewalks, and details on temporary travel and parking lanes and walkways. The plan would also include design details of equipment utilized for maintenance and protection of traffic, such as signs, barriers, barricades, and drums. ~~NYCDOT~~NYC DOT OCMC reviews and approves MPT plans, and the implementation of the closures is also coordinated with ~~NYCDOT~~NYC DOT OCMC. Details of the construction activities are not certain at this time and those discussed in this chapter reflect a reasonable worst-case scenario presented for analysis purposes. The ~~actual location and~~ timing and specifics of any curb lane and/or sidewalk closures ~~will~~would need to be ~~refined~~coordinated with, and ~~further examined between the Applicant and NYCDOT between the Draft Environmental Impact Statement (DEIS) and Final EIS (FEIS).~~are subject to approval by, NYC DOT OCMC prior to construction. In general, construction managers for major projects on adjacent sites also coordinate their activities to avoid delays and inefficiencies.

Public Safety

A variety of measures are employed to ensure public safety during construction at sites within New York City. Examples include the use of sidewalk bridges to provide overhead protection for pedestrians passing by the construction site and the employment of flaggers to control trucks entering and exiting the construction site, to provide guidance to pedestrians, and/or to alert or slow down the traffic. Other safety measures include following DOB requirements during the installation and operation of tower cranes to ensure safe operation of the equipment and the installation of safety nettings on the sides of the project as the superstructure advances upward to prevent debris from falling to the ground. These safety measures are required as part of a Site Safety Plan reviewed and approved by DOB.

Rodent Control

Construction projects in New York City typically include provisions for a rodent (i.e., mouse and rat) control program with provisions for this formalized in construction contracts for the development. Rodent control programs are typically carried out throughout construction, beginning with surveying and baiting appropriate areas prior to construction and providing for proper site sanitation and maintenance during construction. Signage is posted, and coordination is conducted with appropriate public agencies. Only EPA- and NYSDEC-registered rodenticides are permitted, and the contractor is required to implement the rodent control program in a manner that is not hazardous to the general public, domestic animals, and non-target wildlife.

Construction Schedule and Activities

Construction Schedule

Figure 15-1 shows the anticipated construction schedule for the Proposed Project under the No-Action and With-Action conditions as well as the sequencing of construction stages as currently anticipated. The details of each construction schedule are described further below.

No-Action Condition

The Future No-Action condition building would begin construction in April 2022 but is anticipated to take 32 months to complete as compared with 42 months for the Proposed Project, as discussed below. Demolition of the buildings currently within the Project Site was approved by the MTA in 2018 and is being undertaken separate from the No-Action or With-Action conditions. Therefore, demolition is not considered part of the No-Action construction schedule.

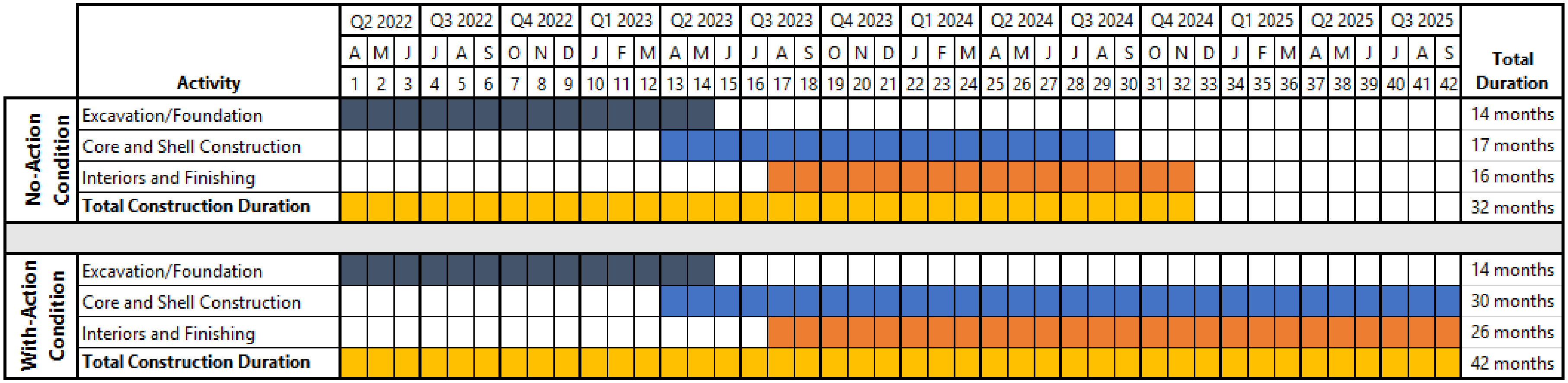
The Future No-Action condition building would include the following major construction stages (which will overlap at certain times throughout the process): excavation and foundations, core and shell and interiors. The Future No-Action condition building would contain an easement for transportation improvements on-site that create new pedestrian access to, and egress from, the LIRR ESA concourse. These access improvements would not be implemented as part of the Future No-Action condition building and would be constructed at some future time by the MTA, and therefore are not considered in the construction duration of the proposed project. The Future No-Action condition does not include off-site passenger improvements to the IRT Flushing Line.

With-Action Condition

Construction of the Proposed Project under the With-Action condition is anticipated to begin in April 2022 and is expected to be completed in September 2025 (42-month construction duration). As noted above, demolition of the buildings currently within the Project Site was approved by the MTA in 2018 and is being undertaken separate from the No-Action or With-Action conditions. Therefore, demolition is not considered part of the With-Action construction schedule.

Construction of the Proposed Project would include the following major construction stages (which would overlap at certain times throughout the process): excavation and foundations, core and shell and interiors. In addition, the proposed actions would include transportation improvements on-site that create new pedestrian access to, and egress from, the LIRR ESA concourse (the existing connection from 45th Street to the Grand Central Terminal (GCT) Roosevelt Passageway would remain adjacent to the site at 52 Vanderbilt). It would also provide off-site improvements that would improve passenger circulation at the Grand Central – 42nd Street Subway Station, including improvements to passenger connections to the IRT Flushing Line (#7 Train) platform. These transit improvements would take place throughout the construction duration of the Proposed Project.

Figure 15-1 Anticipated Construction Schedules



Construction Activities

Construction of the Proposed Project or the No-Action building would be subject to the government regulations and oversight detailed above and would employ the general construction practices described above. Demolition of the existing buildings will take place independent and separate from both the No-Action and With-Action conditions and are not considered here. Construction activities for the No-Action and With-Action conditions would be relatively similar in character, but of different durations as described above. The activities in each stage of construction apply to both the No-Action and With-Action conditions. Details of the construction activities are not certain at this time and those discussed below reflect a reasonable worst-cast scenario that is presented for analysis purposes only. The ~~actual location and~~ timing and specifics of any curb lane and/or sidewalk ~~and/or street~~ closures ~~will~~would need to be ~~refined~~coordinated with, and ~~further examined between the Applicant and NYCDOT between the DEIS and FEIS~~are subject to approval by, NYC DOT OCMC prior to construction.

Site Preparation, Excavation and Foundation

Construction at the Project Site would begin with a number of activities to prepare the site for construction work. Early activities would involve the installation of public safety measures, such as Jersey barriers and fencing. The construction site would be fenced off, with solid fencing to minimize interference between the persons passing by the site and the construction work. Gates for workers and for trucks would be installed. An office trailer for the construction engineers and managers would be placed on the site. Also, portable toilets, dumpsters for trash, and water and fuel tankers would be brought to the site and installed. Temporary utilities would be connected to the construction trailer. During the startup period, permanent utility connections may be made, especially if the construction manager has obtained early electric power for construction use, but utility connections may be made almost any time during the construction sequence. Interior turnarounds would be established. Roof protection would also be installed over the vent shaft building.

To present a reasonable worst case analysis framework, lane and sidewalk closures are assumed at the three locations listed below. The actual location and timing of these potential closures will be ~~further explored~~coordinated between the Applicant and ~~NYCDOT between the DEIS and FEIS~~NYC DOT prior to construction and will be ~~subject~~subjected to ~~NYCDOT~~NYC DOT OCMC approval.

- The length of the Project Site along East 44th Street with the exception of the vent shaft building frontage
- The length of Madison Avenue with the exception of the northernmost section of frontage
- The length of the Project Site along East 45th Street

Under this reasonable worst-case analysis framework, it is assumed that temporary pedestrian walkways would be provided along the East 45th Street and Madison Avenue frontages to maintain pedestrian access during sidewalk closures. A temporary pedestrian walkway is not proposed along East 44th Street in order to avoid conflicts between pedestrians and construction activities, such as vehicle site access and construction staging activities along this frontage. The closures are anticipated to be needed for most of the 42 months of construction of the Proposed Project compared to the 30 months expected for the No-Action building.

During the commuter periods, pedestrian volumes along the East 44th Street north sidewalk consist primarily of commuters traveling between their workplaces and the entrances to Grand Central Terminal along Vanderbilt Avenue. During construction, when the north sidewalk would be closed, it is anticipated that the majority of these pedestrian trips would divert to either the East 44th Street south sidewalk, or to other sidewalks along adjacent streets. A number of transit improvement projects would be completed prior to construction or during the early stages of construction and it would be expected that some of the pedestrian trips would choose alternative routes from GCT and the subway station to their workplaces (or vice versa). These projects include the One Vanderbilt project (completed in the Fall 2020) which includes a new Transit Hall with street-level access to GCT and the subway from East 42nd and East 43rd Streets south of the Proposed Project, and the East Side Access project (expected completion in late 2022) which would introduce street-level access to GCT and the subway at East 47th and East 48th Streets north of the Proposed Project.

To manage such closures, an MPT plan will be developed for ~~NYCDOT~~NYC DOT review and approval. Implementation of the closures will also be coordinated with ~~NYCDOT~~NYC DOT and with NYCT if the closures affect bus operations along Madison Avenue. As with the Proposed Project, the proposed closures would also be needed for construction of the No-Action building. As noted above, the closures assumed are based on a reasonable worst-case framework and the actual location and timing of these potential closures will be ~~further explored~~coordinated between the Applicant and ~~NYCDOT between the DEIS and FEIS~~NYC DOT prior to construction.

Because existing buildings within the Project Site will be demolished under a different action, demolition is not considered under the Proposed Project. As part of both the Proposed Project and the No-Action building, excavators would be used for the task of digging the building's foundation. A perimeter support of excavation (SOE) would be installed in this stage and soil and rocks would be removed. A ramp for site access is proposed along East 44th Street. Any excavated soil to be removed from the Project Site would be loaded onto dump trucks for transport to a licensed disposal facility or for reuse elsewhere on the Project Site or on another construction site that needs fill.

As part of the foundation construction, concrete would be placed at footings and the foundation would be poured. A concrete pumping station would be installed on Madison Avenue, and concrete loading would occur along East 44th Street.

For construction of both the No-Action condition and the Proposed Project in the With-Action condition, site preparation, excavation and foundation work are anticipated to occur over a 14-month period, which is the shortest stage of the construction period.

Superstructure and Exterior Construction (Core and Shell)

Construction of the core and shell involves construction of the building's framework, core, and exterior. The superstructure is the building's framework (beams and columns) and floor decks. Construction of the core, or interior structure, includes construction of the building's elevator shafts; vertical risers for mechanical, electrical, and plumbing systems; electrical and mechanical equipment rooms; core stairs; and restroom areas. Construction of the exterior involves the installation of the façade (exterior walls, windows, and cladding and the roof).

During this stage steel is installed for the superstructure and concrete is poured for the core and the superstructure. An electric hoist is installed and operated to facilitate these activities, and there are various deliveries of materials to the site. During steel installation, a safety cocoon is erected around floors that are undergoing construction. A sidewalk shed is also installed along the curb edge around the site. In addition to the roof protection over the vent shaft building, protection would also be installed over the other adjacent buildings during this stage.

Equipment during this stage typically includes air compressors, generators, delivery and concrete trucks, concrete pumps, concrete trowels, welding equipment, and a variety of handheld tools. Temporary construction elevators (hoists) would also be constructed for the delivery of materials and vertical movement of workers when necessary. Superstructure activities would also require the use of mobile cranes, welders, and a variety of trucks.

In this stage, a crane loading zone would be placed alongside the concrete pumping station on Madison Avenue. At the beginning of this stage, one crane would be installed, with a second installed during the framing of the second floor. Up to three cranes would be used in this stage.

For construction of the Proposed Project, superstructure work is anticipated to occur over a 30-month period in the With-Action condition. The construction of the concrete core would begin in the second quarter of 2023 over a ten-month period, and structural steel work would overlap, beginning in the latter half of the second quarter of 2023 and last approximately 11 months. The curtainwall and façade work would begin in the third quarter of 2023 and last approximately 12 months with expected completion in quarter 3 of 2024. In the No-Action condition these activities would take place over shorter periods of time.

Interiors and Finishing

Interior fit-out activities include the construction of interior partitions, installation of lighting fixtures and interior finishes (i.e., flooring, painting, etc.); mechanical and electrical work; and lobby finishes. In addition, final cleanup and touchup of the proposed building and final building systems (i.e., electrical system, fire alarm, plumbing, etc.) testing and inspections are part of this stage of construction.

Equipment used during interior construction typically includes exterior hoists, compressors, delivery trucks, and a variety of small hand-held tools. This stage of construction is typically the quietest and does not generate fugitive dust since this work occurs within the building with the façades substantially complete.

This stage of construction is also when the construction protection measures (fencing, sidewalk enclosures, bridges, temporary sidewalks, remaining scaffolding, etc.) around the construction site would be removed. This stage of construction would also include punch list completion activities, which are typically small tasks that were not completely finished, and project commissioning to ensure compliance with contract requirements.

For construction of the Proposed Project, interior and finishing work is anticipated to occur over 26 months in the With-Action condition. It would begin in the third quarter of 2023 with mechanical, electrical and plumbing alongside other finishes and last through completion of construction. Interior elevators would be completed over five months starting in quarter three of 2024 and lasting through the end of construction. In the No-Action condition these activities would take place over shorter periods of time.

Assessment of Project Construction

In accordance with the guidelines of the *CEQR Technical Manual*, this preliminary assessment evaluates the effects associated with the Proposed Projects' construction related activities—including historic and cultural resources, transportation, air quality, noise, and vibration—on sensitive receptors located near the area of construction, as well as the construction related effects on the Project Site's existing nearby historic architectural resources. Hazardous materials are discussed in **Chapter 7, Hazardous Materials**.

Since the publication of the Draft Environmental Impact Statement (DEIS) for the Proposed Project, the DEIS was published for the 175 Park Avenue project (CEQR No. 21DCP057M) on May 17, 2021. Based on information in the Construction chapter of the *175 Park Avenue DEIS*, the construction period for the Proposed Project would overlap with some portion of the construction period for the 175 Park Avenue project. Therefore, this chapter has been revised since the DEIS to consider the potential for cumulative construction impacts in transportation, air quality, and noise from the construction of the Proposed Project and the 175 Park Avenue project.

Historic and Cultural Resources

A detailed assessment of potential impacts on cultural resources is described in **Chapter 5, Historic and Cultural Resources**. The section below summarizes the potential for the Proposed Project to result in significant adverse construction-period impacts on historic and cultural resources.

As discussed in **Chapter 5, Historic and Cultural Resources,** the Yale Club and Vanderbilt Concourse Building are located southeast of and adjacent to the Project Site. The Roosevelt Hotel is located to the north, and Brooks Brothers Store is located to the west, both within 90 feet of the Project Site. To avoid inadvertent construction-period damage to these historic resources, BP would develop and implement a CPP for the four structures in consultation with LPC and MTA. With these measures in place, construction would not be expected to result in significant adverse impacts on historic or cultural resources.

Transportation

Daily Workforce and Truck Deliveries

Construction of the Proposed Project would extend over a period of 42 months, would be completed and occupied by the year 2025, and would generate trips from construction workers traveling to and from the site as well as from the delivery of materials and equipment and the removal of debris. An evaluation of construction sequencing and projections of workers and trucks was undertaken to assess potential traffic-related impacts associated with construction. **Table 15-1** shows the estimated number of workers and truck deliveries to the Project Site per quarter (i.e., three-month period) of each calendar year for the duration of construction activities. These represent the average number of daily workers and trucks within each quarter. The average number of workers would be about 156 per day throughout the construction period. The peak number of workers would be 274 per day in the first quarter of 2024. For truck trips, the average number of trucks would be 6 per day, and the peak would occur in the fourth quarter of 2023 with 18 trucks per day.

Table 15-1 Average Daily Number of Workers and Trucks by Quarter – Proposed Project

Year	2022				2023					
Quarter	1st	2nd	3rd	4th	1st	2nd	3rd	4th		
Workers	0	20	27	33	30	36	110	238		
Trucks	0	7	7	2	2	13	17	18		
Year	**2024**				**2025**				**Project**	
Quarter	**1st**	**2nd**	**3rd**	**4th**	**1st**	**2nd**	**3rd**	**4th**	**Average**	**Peak**
Workers	274	264	250	239	239	222	199	0	156	274
Trucks	14	3	2	2	2	2	2	0	6	18

To provide context, **Table 15-2** shows the estimated daily numbers of workers and truck deliveries to the Project Site per quarter of each calendar year for the duration of the construction activities for the No-Action building. The average number of workers would be about 115 per day throughout the construction period. The peak number of workers would be 226 per day in the fourth quarter of 2024. For truck trips, the average number of trucks would be 5 per day, and the peak would occur in the third quarter of 2023, with 11 trucks per day.

Table 15-2 Average Daily Number of Workers and Trucks by Quarter – No-Action Building

Year	2022			2023				2024				Project	
Quarter	2nd	3rd	4th	1st	2nd	3rd	4th	1st	2nd	3rd	4th	Average	Peak
Workers	16	23	27	24	29	90	186	207	214	224	226	115	226
Trucks	7	7	2	2	9	11	7	3	3	3	2	5	11

Construction Worker Modal Splits

The average daily workforce and truck trip estimates in **Table 15-1** was then used to determine the peak quarter for potential traffic-related impacts during construction of the Proposed Project. The projections were further refined to account for the travel characteristics of construction workers including modal splits and vehicle occupancy rates. Based on survey data collected during construction of the New York Times Building in 2006, it is anticipated that construction workers would primarily take public transportation (approximately 71 percent) to the Project Site, with a smaller percentage of construction workers traveling via private auto (approximately 29 percent with an average auto occupancy of 2.04). Transit service within the study area includes the No. 4, 5, 6, 7 and S subway lines at the 42nd Street – Grand Central station, as well as the B, D, F, and M subway lines at Fifth Avenue – Bryant Park and 47th – 50th Streets Rockefeller Center stations. There are also a multitude of Manhattan and Queens local buses and express buses within the study area.

Based on the surveyed auto modal split and vehicle occupancy, the average daily construction auto trips and truck trips were determined for each quarter, as shown in **Table 15-3** for the Proposed Project construction and in **Table 15-4** for the No-Action building. The peak quarter with the maximum construction passenger-car equivalents [PCEs][1]) trips is expected to be approximately 104 daily vehicle trips (140 PCE trips) during the fourth quarter of 2023 for the Proposed Project, and 6 daily vehicle trips (80 PCE trips) during the fourth quarter of 2023 for the No-Action building.

Table 15-3 Average Daily Number of PCE Trips by Quarter – Proposed Project

Year	2022				2023			
Quarter	**1st**	**2nd**	**3rd**	**4th**	**1st**	**2nd**	**3rd**	**4th**
Auto Trips	0	6	8	10	8	10	32	68
Truck Trips	0	14	14	4	4	26	34	36
Vehicle Trip	0	20	22	14	12	36	66	104
PCE Trips	0	24	26	18	16	62	100	**140**
Year	**2024**				**2025**			
Quarter	**1st**	**2nd**	**3rd**	**4th**	**1st**	**2nd**	**3rd**	**4th**
Auto Trips	78	74	70	68	68	62	56	0
Truck Trips	28	6	4	4	4	4	4	0
Vehicle Trips	106	80	74	72	72	66	60	0
PCE Trips	134	86	78	76	76	70	64	0

Table 15-4 Average Daily Number of PCE Trips by Quarter – No Action Building

Year	2022			2023				2024			
Quarter	**2nd**	**3rd**	**4th**	**1st**	**2nd**	**3rd**	**4th**	**1st**	**2nd**	**3rd**	**4th**
Auto Trips	4	6	8	6	8	26	52	58	60	64	64
Truck Trips	14	14	4	4	18	22	14	6	6	6	4
Vehicle Trips	18	20	12	10	26	48	66	64	66	70	68
PCE Trips	32	34	16	14	44	70	**80**	70	72	76	72

Traffic

Peak Hour Construction Worker Vehicle and Truck Trips

Construction activities would be expected to occur on weekdays during the typical construction shift of 7 AM to 3:30 PM, with some activities extending until about 6 PM with a smaller group of workers. Construction truck trips would typically be distributed throughout the day – depending upon the specific types of construction activities taking place – and most trucks would remain in the area for short durations. Auto trips associated with

[1] Since larger vehicles such as trucks typically make up a significant portion of construction traffic, a passenger car equivalent factor is applied to these vehicles to account for their size difference. Per the *CEQR Technical Manual*, it is assumed that one truck is equivalent to two passenger cars.

construction worker travel would typically take place during the hours before and after the daily work shift. For analysis purposes, each worker vehicle was assumed to arrive in the morning and depart in the afternoon or evening and each truck delivery was assumed to result in one “in” trip and one “out” trip during the same hour.

The estimated daily vehicle trips for the peak quarter of construction traffic were distributed throughout the workday based on projected arrival/departure patterns of construction workers, and the projected pattern of truck deliveries based on the types of construction activities that would occur during the fourth quarter of 2023 for the Proposed Project, and the third quarter of 2023 for the No-Action building. For construction workers, typical arrival patterns show that most arrivals (approximately 80 percent) occur during the 6 AM to 7 AM hour (the hour before the beginning of a regular day shift) and the same percentage of departure trips occurs during the 3 PM to 4 PM hour (at the end of the shift). A small subset of workers (on average 15 workers during the peak quarter of construction of the Proposed Project, and 12 workers for the No-Action building) would work an extended shift departing during the hours 6 PM to 7 PM. For trucks, deliveries are usually spread throughout the day but the peak activity (approximately 25 percent) would occur during the 6 AM to 7 AM hour.

The estimated daily average number of construction workers and truck deliveries during the peak construction quarter, which is expected to be the fourth quarter of 2023, is approximately 238 construction workers and 18 trucks per day for the Proposed Project. The peak construction hourly trip projections for the peak construction quarter are summarized in **Table 15-5**.

Table 15-5 Proposed Project Construction Vehicle Trips by Hour – Fourth Quarter of 2023

	Auto Trips		Truck Trips		Total Vehicle Trips			Total PCE Trips		
Hour	In	Out	In	Out	In	Out	Total	In	Out	Total
6 AM – 7 AM	27	0	5	5	32	5	37	37	10	47
7 AM – 8 AM	7	0	2	2	9	2	11	11	4	15
8 AM – 9 AM	0	0	2	2	2	2	4	4	4	8
9 AM – 10 AM	0	0	2	2	2	2	4	4	4	8
10 AM – 11 AM	0	0	2	2	2	2	4	4	4	8
11 AM – 12 PM	0	0	2	2	2	2	4	4	4	8
12 PM – 1 PM	0	0	2	2	2	2	4	4	4	8
1 PM – 2 PM	0	0	1	1	1	1	2	2	2	4
2 PM – 3 PM	0	2	0	0	0	2	2	0	2	2
3 PM – 4 PM	0	26	0	0	0	26	26	0	26	26
4 PM – 5 PM	0	4	0	0	0	4	4	0	4	4
5 PM – 6 PM	0	0	0	0	0	0	0	0	0	0
6 PM – 7 PM	0	2	0	0	0	2	2	0	2	2

The estimated number of peak hour vehicle trips generated by construction activities during the peak quarter would be 37 vehicle trips (47 PCEs) during the AM construction peak hour (6 AM to 7 AM) and 26 vehicle trips (26 PCEs) during the PM construction peak hour (3 PM to 4 PM). Since construction vehicle trips generated by the Proposed Project would be below the *2020 CEQR Technical Manual* 50-vehicle trip analysis threshold, no further quantified analysis is warranted. To provide context, construction vehicle trips were projected using the same methodology for the No-Action building. The estimated daily average number of peak hour construction workers and truck deliveries during the peak construction quarter, which is expected to be the fourth quarter of 2023, is approximately 186 construction workers and 7 trucks per day for the No-Action building. The peak construction hourly trip projections for the peak construction quarter are summarized in **Table 15-6**.

Table 15-6 No-Action Building Construction Vehicle Trips by Hour – Fourth Quarter of 2023

Hour	Auto Trips		Truck Trips		Total Vehicle Trips			Total PCE Trips		
	In	Out	In	Out	In	Out	Total	In	Out	Total
6 AM – 7 AM	22	0	2	2	24	2	26	26	4	30
7 AM – 8 AM	5	0	1	1	6	1	7	7	2	9
8 AM – 9 AM	0	0	1	1	1	1	2	2	2	4
9 AM – 10 AM	0	0	1	1	1	1	2	2	2	4
10 AM – 11 AM	0	0	1	1	1	1	2	2	2	4
11 AM – 12 PM	0	0	1	1	1	1	2	2	2	4
12 PM – 1 PM	0	0	1	1	1	1	2	2	2	4
1 PM – 2 PM	0	0	1	1	1	1	2	2	2	4
2 PM – 3 PM	0	2	0	0	0	2	2	0	2	2
3 PM – 4 PM	0	20	0	0	0	20	20	0	20	20
4 PM – 5 PM	0	4	0	0	0	4	4	0	4	4
5 PM – 6 PM	0	0	0	0	0	0	0	0	0	0
6 PM – 7 PM	0	2	0	0	0	2	2	0	2	2

The estimated number of vehicle trips generated by construction activities during the peak quarter of the No-Action building would be 26 vehicles (30 PCEs) during the AM construction peak hour and 20 vehicles (20 PCEs) during the PM construction peak hour. The incremental construction trips in PCEs are presented in **Table 15-7**.

Compared with the construction of the No-Action building, construction activities associated with the Proposed Project would generate 17 more PCEs during the AM construction peak hour, and six more PCEs during the PM construction peak hour.

As noted above, the construction PCEs generated by the Proposed Project would be below the *2020 CEQR Technical Manual* 50-vehicle trip analysis threshold, and as a result, no further quantified analysis is warranted. An additional assessment is provided below comparing traffic operations between the Proposed Project's construction peak hours with the operational peak hours. Furthermore, although no further traffic analyses were needed, the construction generated trips were assigned to the surrounding network for purpose of other construction analyses (air quality and noise).

Table 15-7 Peak Hour Construction Vehicle Trip Increase (Proposed Project vs. No-Action Building)

	Auto Trips			Truck Trips			Total (PCE)		
Scenario	In	Out	Total	In	Out	Total	In	Out	Total
Peak Hour (6 AM to 7 AM)									
Proposed Project	27	0	27	5	5	10	37	10	47
No-Action Building	22	0	20	2	2	4	26	4	30
Increment	5	0	5	3	3	6	11	6	17
Peak Hour (3 PM to 4 PM)									
Proposed Project	0	26	26	0	0	0	0	26	26
No-Action Building	0	20	20	0	0	0	0	20	20
Increment	0	6	6	0	0	0	0	6	6

Comparison of Construction and Operational Trips

As noted above, the estimated number of vehicle trips generated by construction activities during the peak quarter would be 37 vehicle trips (47 PCEs) during the AM construction peak hour (6 AM to 7 AM) and 26 vehicle trips (26 PCEs) during the PM construction peak hour (3 PM to 4 PM) which is significantly less trips than trips generated by the Proposed Project increment. The Proposed Project would generate 103 operational vehicle trips (117 PCEs) during the AM peak hour and 84 operational vehicle trips (86 PCEs) during the PM peak hour.

The existing background volumes for the Proposed Project AM and PM peak hours were found to also be higher than during the construction peak hours. ATR volumes in the study area were reviewed and determined that for the AM peak hours, traffic volumes during the 6 AM to 7 AM construction peak hour are about 27 percent lower than those during the 8 AM – 9 AM Proposed Project operational peak hour. For the PM peak hours, traffic volumes during the 3 PM to 4 PM construction peak hour are about two percent lower than those during the 5 PM to 6 PM Proposed Project operational peak hour.

Traffic operation characteristics at the four analysis locations during the AM and PM construction peak hours would be consistent with the Proposed Project operational peak hours. At all three signalized intersections, signal timings were confirmed to be consistent between the 6 AM to 7 AM and 8 AM to 9 AM peak hours, as well as between the 3 PM to 4 PM and 5 PM to 6 PM peak hours. The roadway capacity conditions during the AM and PM construction peak hours would also remain unchanged from the operational peak hour conditions (no change in number of travel lanes).

For air quality and noise analysis purposes, vehicle trips generated by construction activities for the Proposed Project were assigned to the surrounding roadway network. **Table 15-8** below shows the total number of construction vehicle trips at the four traffic analysis locations during the AM and PM peak hours, compared to the total operational trips for the Proposed Project. Based on the assignments, the maximum number of vehicle trips at any intersection is at the intersection of Vanderbilt Avenue and East 45th Street in the AM construction peak hour, with a total of 11 vehicles, compared to 21 operational vehicle trips. Traffic volumes at the four analysis locations would be lower under construction as compared to operational conditions, and is further augmented when taking into consideration the lower existing background traffic volumes during the construction peak hours.

Table 15-8 Comparison of Construction and Operational Total Trips

	Construction Vehicle Trips		Operational Vehicle Trips	
Total Trips at Intersection	**AM**	**PM**	**AM**	**PM**
Madison Avenue at East 44th Street	7	0	25	14
Madison Avenue at East 45th Street	4	0	21	13
Vanderbilt Avenue at East 44th Street	8	1	16	8
Vanderbilt Avenue at East 45th Street	11	1	21	7

Cumulative Analysis with 175 Park Avenue

An assessment of the construction activities on the surrounding roadway network was conducted for the Proposed Project's construction peak quarter and determined that construction activities would only result in a modest increase in traffic volumes.

During the 6 – 7 AM construction peak hour, traffic volumes at the Project Site's four corner intersections would increase by 4 to 11 vehicle trips, and by no more than one vehicle trip per intersection during the 3 – 4 PM construction peak hour. This increase is well below the *CEQR Technical Manual* 50-vehicle trip threshold for which there is the potential for significant traffic impacts to occur.

Although the proposed 175 Park Avenue project would be a greater generator of construction traffic, the vast majority of construction vehicles associated with the 175 Park Avenue project would travel along 42nd Street, Lexington Avenue and Third Avenue and a minimal number of construction-related vehicle trips would be expected to travel along Madison Avenue and along East 45th Street near the Project Site. As a result, no significant adverse cumulative traffic impacts are anticipated from the overlap of construction of the Proposed Project and the 175 Park Avenue project.

Deliveries

Construction trucks would be required to use ~~NYCDOT~~NYC DOT-designated truck routes, including Lexington Avenue, Third Avenue, and 42nd Street. Trucks would then use local streets to access the construction site. Construction site deliveries would use the designated loading zone along East 44th Street.

Parking

Construction workers would generate an estimated maximum daily parking demand of 34 spaces during the peak construction quarter for the Proposed Project. This parking demand could be accommodated by the off- street parking facilities available within a quarter mile radius. Therefore, the construction for the Proposed Project would not result in significant adverse parking impacts.

Transit and Pedestrians

Based on construction survey data, it is anticipated that approximately 71 percent of construction workers would commute to the Project Site by public transportation. During the peak construction quarter, the Proposed Project would expect to generate 238 daily construction workers. It is expected that the majority of workers (80 percent) would arrive during the AM construction peak hour and depart during the PM construction peak hour, and they would generate approximately 135 construction worker trips by public transportation during the AM construction peak hour and approximately 130 construction worker trips during the PM construction peak hour. In comparison, the Proposed Project would generate 903 operational pedestrian trips during the AM peak hour, 812 operational pedestrian trips during the midday peak hour, and 822 operational pedestrian trips during the PM peak hour. The study area is well served by public transit, including the No. 4,5,6,7, and S subway lines at the 42nd Street – Grand Central station as well as B, D, F, and M subway lines at the Fifth Avenue – Bryant Park and 47th – 50th Streets Rockefeller Center stations. Several Manhattan and Queens local bus routes, and express bus routes, also serve the study area. These trips would be distributed to the different transit options and construction activities are not expected to result in transit or pedestrian impacts.

Air Quality

Introduction

Construction impacts on air quality levels may occur because of particulate matter (fugitive dust) created by excavation, earth moving operations, emissions from on-site fossil-fuel-fired construction equipment, and emissions from increased truck traffic to and from the construction site on local roadways. As discussed in the *CEQR Technical Manual,* the determination whether it is sufficient to conduct a qualitative analysis of these emissions or whether a quantitative analysis is required should take into account factors such as the location of the project site in relation to existing residential uses or other sensitive receptors, the intensity of the construction activity, and the extent to which the project incorporates commitments to appropriate emission control measures.

The most intense construction activities in terms of emissions are typically from excavation, and foundation stages since it is during these stages that the largest number of large, non-road diesel engines are employed, which combined with the fugitive dust from earth moving operations results in the highest levels of air emissions. The other stages of construction, including superstructure, exterior façades, interior finishes and site work, typically result in lower air emissions since they require fewer pieces of heavy-duty diesel equipment. Equipment used in the latter stages of construction generally has small engines, and electric tools are dispersed vertically throughout the building, resulting in very low concentration increments in adjacent areas. Additionally, the latter stages of construction do not involve soil disturbance activities and therefore result in significantly lower fugitive dust emissions. Interior finishes activities are better shielded from nearby sensitive receptors by the proposed structures themselves.

For the proposed project, the overall construction period would be approximately four years. While the most intense construction activities in terms of air pollutant emissions is anticipated to be less than two years, given the magnitude of construction and proximity to sensitive receptors, a detailed quantitative analysis of the potential for construction to result in air quality impacts was undertaken.

Air Quality Analysis Methodologies

On-Site and Off-Site Construction Impacts

Based on a conceptual construction schedule developed by the applicant, the peak cumulative short-term and annual $PM_{2.5}$ emissions were evaluated for a full construction process (excavation through finishing) during the 2022–2025 construction duration by each phase of construction. The phase with the highest $PM_{2.5}$ emissions was selected as the period with the highest potential $PM_{2.5}$ effects. This analysis, called the intensity assessment, was used to identify the critical construction month and year for the dispersion impact modeling analysis.

A dispersion analysis—considering the PM_{10}, $PM_{2.5}$, NO_x and CO emissions from on-site sources (e.g. construction equipment; fugitive dust; and trucks idling, loading, and unloading next to the site) was performed to determine potential air quality effects during the peak emission construction period for the proposed buildings.

The effects of the trucks (concrete, delivery, and dump trucks) approaching and departing the site along Madison Avenue and East 44th Street were also included in the dispersion analysis as line sources. The line sources represent the running exhaust and paved road truck fugitive emissions on Madison Avenue and East 44th Street. Impacts of construction traffic elsewhere on the City streets was assessed separately using the CEQR mobile source screening approach.

The following sections provide additional details relevant to the construction air quality analysis methodology. For a review of the applicable regulations, standards and criteria, and benchmarks for stationary and mobile source air quality analyses, refer to Chapter 10, Air Quality.

The analysis was performed following the EPA and *CEQR Technical Manual* suggested procedures and analytical tools, and NYCDCP recommendations to determine source emission rates. The estimated emission rates were then used as input to an air quality dispersion model to determine potential impacts.

Emission Estimation Process

The construction analyses used an emission estimation method and a modeling approach previously developed for evaluating air quality impacts of construction projects in New York City in consultation with DCP. Because the level and types of construction activities would vary from month to month, the approach includes a determination of the worst-case emission period based on an estimated monthly construction work schedule, the number of on-site construction equipment types and rated horsepower of each unit, quantities of materials to be excavated, and number of trucks arriving, working and leaving the site.

The worst-case short-term emissions (e.g., maximum daily emissions) and the maximum annual emissions (based on a 12-month rolling average) were determined based on the construction schedule activities and equipment projected to be required for the construction period. The assessment considered three main phases of construction: excavation-foundation, tower superstructure, tower enclosure and general building finishes.

The specific construction information used to calculate emissions generated from the construction process included, but is not limited to, the following:

- The number of units and fuel-type of construction equipment to be used; [2]
- Rated horsepower and load factors for each piece of equipment;
- Utilization rates for equipment;
- Hours of operation on-site;
- Excavation processing rates; and
- Average distance to approach the site and idling time by dump trucks, cement and boom trucks, box trucks and tractor-trailers.

Emissions Reduction Measures Considered

As discussed above, construction activities could affect air quality because of engine emissions from on-site construction equipment and dust-generating activities. In general, much of the heavy equipment used in construction has diesel-powered engines, which produce relatively high levels of nitrogen oxides and particulate matter. Gasoline engines produce relatively high levels of carbon monoxide. Construction activities also generate fugitive dust emissions. As a result, the air pollutants analyzed for construction activities include nitrogen dioxide (NO_2), particulate matter with an aerodynamic diameter of less than or equal to 10 micrometers (PM_{10}), particulate matter with an aerodynamic diameter of less than or equal to 2.5 micrometers ($PM_{2.5}$), and carbon monoxide (CO).

Since ultra-low-sulfur diesel (ULSD) will be used for all diesel engines related to construction activities due to federal and state mandates, sulfur dioxides (SO_2) emitted from those construction activities would be negligible, and an analysis of SO_2 emissions is not warranted. For more details on a description of air pollutants and standards, see Chapter 10, Air Quality.

As stated above, construction activity in general, and large-scale construction in particular, has the potential to adversely affect air quality as a result of diesel emissions. The main component of diesel exhaust that has been identified as having an adverse effect on human health is fine particulates. To ensure that the construction of the proposed project results in the lowest feasible diesel particulate (DPM) emissions, a series of emissions reduction strategies required by NYCDEP and state mandates would be implemented.

The evaluation performed in this section assumes a combination of emission reduction measures that are mandated by law and are common practice in large-scale New York City construction projects, and follow the requirements included in NYC Law 77 and the NYC Air Pollution Control Code. These include the following:

- Fugitive Dust Control Plans. In compliance with the NYC Air Pollution Control Code regarding control of fugitive dust, contractors would be required to ensure that all trucks

[2] For a more accurate representation of annual emissions, annual $PM_{2.5}$ and annual NOx emission rates accounted for the average of the monthly quantity of equipment used for the excavation/foundation and structural phases of construction as opposed to the peak monthly quantity of equipment used for the excavation/foundation and structural phases of construction.

carrying loose material use water as a dust suppression measure, that wheel-washing stations be established for all trucks exiting the construction site; that trucks hauling loose material be equipped with tight-fitting tailgates and their loads securely covered prior to leaving the site, that streets adjacent to the site be cleaned as frequently as needed by the construction contractor, and that water sprays be used for transfer of spoils to ensure that materials are dampened as necessary to avoid the suspension of dust into the air. These measures would be expected to reduce dust generation by more than 50 percent.

- Clean Fuel. Ultra-low sulfur diesel (ULSD) would be used exclusively for diesel engines related to construction activities under the proposed actions. This is a federal requirement since 2010, which enables the use of tailpipe reduction technologies that reduce diesel particulate matter and SO_2 emissions.
- Diesel Equipment Reduction. Hoists and small equipment, such as lifts, compressors, welders, and pumps would be expected to use electric engines that operate on grid power instead of diesel power engines, to the extent practical. This is a common practice that has been achieving wider use as technology improves.
- Restrictions on Vehicle Idling. This would be required in compliance with the local law restricting unnecessary idling. 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 otherwise required for the proper operation of the engine.
- Given the construction timeframe for the proposed actions (2022-2025), equipment meeting Tier 4 standards for diesel engines (model years 2011/12 and beyond) would be expected to be in wide use and comprise the majority of contractors' fleets. If contractors choose to use older diesel equipment; the use of diesel particulate filters (DPF) in Tier 3 emission standard for diesel engines (model years 2006-2011 for engine sizes between 100 and 600 hp)[3] will have to be implemented. Tier 3 with DPF achieves the same emission reductions as a newer Tier 4 emission standard for diesel engines. The combination of Tier 4 and Tier 3 engines with DPF would achieve DPM reductions of approximately 90 percent when compared to older uncontrolled engines.

Overall, these emissions control measures would be expected to significantly reduce DPM emissions, and as recommended in the CEQR Technical Manual, all the necessary measures would be implemented to ensure that the New York City Air Pollution Control Code regulating construction-related dust emissions is followed.

Engine Exhaust Emissions Estimation Process

Emission factors for NO_x, PM_{10}, $PM_{2.5}$, and CO from the combustion of fuel for on-site construction equipment were developed using the latest EPA MOVES2014b-NONROAD Emission Model.

The MOVES2014b-NONROAD model can generate unitary emission factors, in grams per horsepower/hour (g-hp/hr) by engine size (hp), equipment type, engine technology type, fuel type, and year of analysis. The model estimates emissions as the average emission factor

[3] See Table 2-1 of the USEPA's Exhaust and Crankcase Emission Factors for Nonroad Compression-Ignition Engines in MOVES2014b document

by year for the county fleet sorted by the above-mentioned parameters. As an example, if New York County and the year 2020 were selected for diesel engines, the output generates emissions (g-hp/hr) for each type of equipment from 3 hp to 3,000 hp rating for each one of the model years of the County fleet going back up to 40 years. The model calculates how many pieces of equipment for each engine technology group and model year are present in the County fleet and produces the yearly average emission factor. Because the model years of the actual construction equipment to be used for the proposed developments are unknown, emission factors for the different equipment types were estimated by using the weighted average (emission factor and activity level) of the model years 2008 to 2020 to account for the use of tier 4 engines (for model years 2012 to 2020) and tier 3 engines retrofitted with DPF to achieve a 90% removal rate of DPM (for model years 2008 to 2011).

Emission rates from combustion of fuel for on-site dump trucks, pickup trucks, and other heavy trucks, such as tractor-trailers, were developed using the EPA MOVES2014b Emission Model. New York City restrictions placed on idling times were applied for heavy trucks, with the exception of cement and boom trucks where one hour of idling was assumed. Short-term and annual emission rates were adjusted from the peak-hour emissions by applying usage factors for each equipment unit. Due to lack of data availability, usage factors similar to those used in the Greater East Midtown FEIS were applied.

Fugitive Emission Sources Estimation Process

Road dust (PM_{10} and $PM_{2.5}$) emissions from trucks moving inside the construction sites were calculated using equations from EPA's AP-42, Section 13.2.2 for unpaved roads. Average vehicle weights (i.e., unloaded going in and loaded going out) were used in the analysis and a reasonably conservative round-trip distance was estimated for on-site travel. Dust control measures (described previously) would provide at least a 50-percent reduction in PM_{10} and $PM_{2.5}$ emissions.

Particulate matter emissions could also be generated by material handling activities (i.e., transfer-loading/drop operations for debris and soil) during the excavation phase. Estimates of PM_{10} and $PM_{2.5}$ emissions from these activities were developed using EPA's AP-42 Sections 13.2.4.

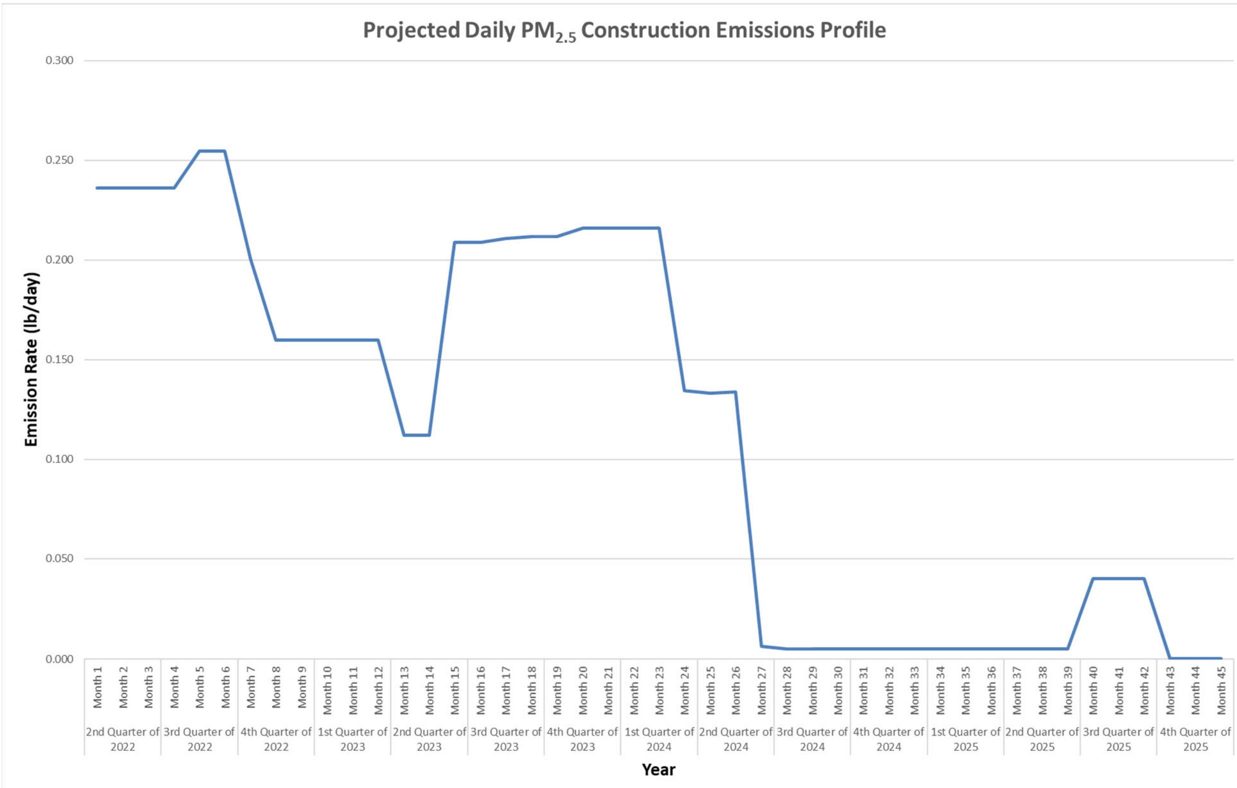
Construction Activity Emissions Intensity Assessment

To determine which construction phase constitutes the worst-case period for the pollutants of concern, construction-related emissions were calculated throughout the duration of construction on a monthly basis using peak daily emissions for short term $PM_{2.5}$, and average monthly usage for annual $PM_{2.5}$

$PM_{2.5}$ was selected as the worst-case pollutant because, as compared to other pollutants, $PM_{2.5}$ has the highest ratio of emissions-to-effects. Therefore, $PM_{2.5}$ was used for determining the worst-case periods for analysis of all pollutants. Generally, emission patterns of other pollutants would follow $PM_{2.5}$ emissions, since most pollutant emissions are proportional to diesel engines by horsepower. Based on the resulting multiyear profiles by month, the worst-case period was identified as mid 2022 (months 5-6) for the modeling of the short-term impacts, and months 1 to 12 (April 2022 to March 2023) for the annual impacts.

To determine the worst short-term emission and the worst annual emission, an emission intensity assessment (emission profiles) was conducted, and the excavations and foundations phase during months 5-6 of 2022 was identified as the worst phase (**Figure 15-2**).

Figure 15-2 Projected Peak Daily $PM_{2.5}$ Construction Emissions Profile



Impact Assessment

Off-Site Construction Impacts

Construction activities of the Proposed Project would result in a smaller number of the generated trips than under the operations. Overall, no more than 11 trips would be generated at any intersection (see Transportation section above, **Table 15-8**) compared to 25 trips when the proposed project is operational. As the screening analysis conducted under the operational phase assessment of the Proposed Project demonstrated no significant adverse air quality impacts from mobile sources, no significant adverse air quality impacts from mobile sources are anticipated from the construction of the Proposed Project.

On-Site Construction Impacts

The effects of construction emissions on the surrounding environment for the relevant air pollutants were quantified using dispersion computer model. The peak daily $PM_{2.5}$ emissions from the construction activities during months 5-6 of 2022 excavation-foundations phase for the project construction site were used as the worst-case modeling scenario to evaluate short-term air quality impact. The average $PM_{2.5}$ emissions from April of 2020 to March of 2023 were used as the worst-case modeling scenario to evaluate annual air quality impact.

Dispersion Modeling – Source simulation

Potential impacts from on-site construction equipment and off-site truck emissions were evaluated using the EPA's most current version of the AERMOD dispersion model (version 19191). AERMOD is a steady-state plume model that incorporates current concepts about flow and dispersion in complex terrain, including updated treatments of the boundary layer theory, understanding of turbulence and dispersion; it also includes handling of terrain interactions.

During construction, various types of construction equipment would be used throughout the site. Some of the equipment is mobile and would operate throughout the site, while some would remain stationary on-site at distinct locations during short-term periods (i.e., daily and hourly). Stationary emission sources include (but are not limited to) air compressors, cranes, and concrete pumps. Equipment such as excavators, bobcats, concrete trucks, and dump trucks would operate throughout the site.

The peak period falls on the excavation and foundations phase. All construction equipment sources for the peak period were simulated as an area source for the purpose of the modeling analysis; their emissions were distributed evenly across the construction site. Emissions from the trucks loading, unloading and idling adjacent to the site (Madison Ave and 44th Street cordoned areas), were also included as part of the construction area source, even these trucks will operate adjacent to the construction site perimeter fence (cordoned street areas).

The approaching and departing trucks (delivery, concrete, and dump trucks) along the Madison Avenue (between 44th and 45th Streets) and 44th Street (between Madison and Vanderbilt Avenues) were modeled for the same peak and annual periods as separate line sources.

Both the on-site sources (area source) and the off-site sources (line sources) were modeled using the AERMOD model. The on-site sources represented more than 90% of the total emissions of the most critical pollutants.

Receptor Locations

AERMOD was used to predict maximum pollutant concentrations at nearby locations of likely public exposure ("sensitive receptors") such as operable windows and air intakes. Discrete receptors were placed along nearby sensitive receptor locations, such as the internal courtyard of the Yale and Vanderbilt buildings within the same block, and entrances to buildings across the street in Madison Avenue, 44th, and 45th Streets. These sensitive receptors were located as low as the first floors and as high as the seventh floors of the building facades.

Meteorological Data

All analyses were conducted using five consecutive years of meteorological data (2015-2019). Surface data were obtained from La Guardia Airport and upper air data were obtained from Brookhaven station, New York.

Background Concentrations

Where needed to determine potential air quality impacts from the construction of the project, background ambient air quality data for criteria pollutants (See **Chapter 10, Air Quality, Table 10-2**) were added to the predicted site concentrations. The background data represent the latest available three years of data and were obtained from a nearby NYSDEC monitoring station that best represents the area surrounding the site. The latest three-year period (2017-2019) data were used for the 24-hour PM_{10} and for annual average NO_2 background concentration.

The 24-hour average $PM_{2.5}$ background concentration of 23.3 µg/m^3 from the latest three-year period (2017-2019) was used to establish the *de minimis* value, consistent with the guidance provided in the *2020 CEQR TM*. The annual average $PM_{2.5}$ impacts were assessed on an incremental basis and compared with the $PM_{2.5}$ *de minimis* criteria thresholds, without considering the annual background.

Cumulative Analysis with 175 Park Avenue

Contribution from the 175 Park Avenue project construction emissions to the concentrations of pollutants at receptors near the Proposed Project would be minimal due to the distance (more than 600 feet) and interference of buildings in between. In addition, the critical pollutant of concern from construction is fine, respirable particulate matter, $PM_{2.5}$. In accordance with the *2020 CEQR Technical Manual*, $PM_{2.5}$ is assessed by comparison to the *de minimis* criteria that does not consider contributions from background sources. As such, construction of the 175 Park Avenue project would not change the Proposed Project construction $PM_{2.5}$ impacts and would have small, negligent contribution to the concentrations of other pollutants.

The critical intersection for the off-site mobile source impacts was the corner of 44th Street and Madison Avenue. Although a minimal increase in auto vehicle trips along Madison Avenue would be expected as of result the 175 Park Avenue project construction-related traffic, construction-related truck traffic, which would be the key contributor to the PM emissions, would not reach this intersection. Therefore, insignificant contribution to the off-site construction impacts of the Proposed Project is expected from the 175 Park Avenue project construction traffic. As a result, no significant adverse cumulative air quality impacts are anticipated from the overlap of construction of the Proposed Project and 175 Park Avenue project.

Probable Impacts from Proposed Project Construction

This section provides a summary of the construction air quality results from the construction activities of the proposed project. The peak short-term emissions for CO, PM_{10} and $PM_{2.5}$ were predicted to occur during the excavation phase in 2022. The annual $PM_{2.5}$ and NO_2 emissions were based on the weighted average emissions for the four quarters starting in April 2022 through March of 2023.

Table 15-9 presents the maximum predicted total concentration (including background for appropriate pollutants) due to the proposed construction activities for the proposed project, including the on-site sources (construction equipment and activities) and off-site sources (construction trucks).

As indicated in **Table 15-9**, the maximum predicted total concentrations of 1-hour CO, 8-hour CO, annual NO_2, and 24-hour PM_{10} would not result in any concentrations that exceed the NAAQS. The maximum predicted 8-hour CO concentration is well below the City's *de minimis* criteria. The maximum predicted 24-hour and annual $PM_{2.5}$ incremental concentration (for a discrete receptor location) would not exceed the City's *de minimis* criteria of 5.8 μg/m^3 and 0.3 μg/m^3 respectively.

Table 15-9 Maximum Predicted Total Concentrations for Construction Activities

Pollutant	Averaging Period	Maximum Modeled Concentration	Background Concentration	Total Concentration	NAAQS/De Minimis
CO	1-Hour[1]	0.23 ppm	2.5 ppm	2.73 ppm	35 ppm
	8-Hour[1]	0.16 ppm	1.2 ppm	1.36 ppm	9 ppm/3.9 ppm
NO2	Annual[1]	2.4 ppb	14.6 ppb	17.0 ppb	53 ppb
PM10	24-Hour	12.3 μg/m^3	39 μg/m^3	51.3 μg/m^3	150 μg/m^3
PM2.5	24-Hour[2]	5.67 μg/m^3	---	5.67 μg/m^3	5.8 μg/m^3
	Annual[3]	0.22 μg/m^3	---	0.22 μg/m^3	0.3 μg/m^3
	Annual Neighborhood-Scale Grid[4]	0.009 μg/m^3	---	0.009 μg/m^3	0.1 μg/m^3

Notes:

[1] CO and NO_2 concentrations can be converted from ppm/ppb to μg/m^3 based on 1 ppm = 1145 μg/m^3 for CO and 1 ppb=1.88 μg/m^3 for NO_2.

[2] The 24-hour $PM_{2.5}$ background concentration is used to develop the *de minimis* criteria.

[3] Annual $PM_{2.5}$ impacts with discrete receptors modeling are compared with the $PM_{2.5}$ *de minimis* criteria of 0.3 μg/m^3, without considering the annual background.

[4] Annual $PM_{2.5}$ impacts with neighborhood-scale grid receptors modeling are compared with the $PM_{2.5}$ *de minimis* criteria of 0.1 μg/m^3, without considering the annual background.

The results of this quantitative analysis indicate that the proposed project would not result in any concentrations of NO_2, PM_{10}, and CO that exceed the NAAQS. In addition, the maximum predicted incremental concentrations of $PM_{2.5}$ would not exceed the City's *de minimis* criteria. Construction-related emissions from off-site mobile sources are not anticipated to have significant adverse air quality impacts. Therefore, no significant adverse air quality impacts are expected from the construction-related sources.

Noise

Construction activities have the potential to affect the noise conditions of receptors near the proposed development. Construction noise can vary widely depending on the phase of construction (e.g., excavation, foundation, steel and concrete erection, mechanical and interior fit out) and the specific equipment and methods being used. The most significant construction noise sources at a construction site are generally back-up alarms, and equipment such as excavators, pile drivers, line drillers, jackhammers, and cranes. The noisiest phase of construction is typically during excavation and foundation work. The superstructure phase of construction can also have higher noise levels associated with concrete trucks and cranes. Similar to air emissions, interior fit out typically results in lower noise emissions, since it requires fewer pieces of heavy-duty diesel equipment, but was still included in this construction noise analysis. The only predominant sources of sound during fit out include hoists and a boom truck.

As discussed in the *CEQR Technical Manual,* the need to conduct a qualitative analysis of construction noise emissions or a quantitative analysis is considered based on factors such as the location of the project site in relation to existing residential uses or other sensitive receptors, the intensity of the construction activity, and the extent to which the project incorporates commitments to appropriate noise control measures.

Noise from construction activities and some construction equipment is regulated by the NYCDEP Noise Control Code. The NYCDEP Noise Code (Section 24-228) limits noise from non-impulsive construction equipment to a maximum of 85 dBA as measured 50 feet from the source. The code also limits noise from paving breakers, such as jackhammers, to 95 dBA at a distance of 1 meter and requires that a pneumatic discharge muffler be used that provides an insertion loss of 5 dBA. Impulsive construction noise is considered unreasonable when it measures 15 dBA or above ambient noise levels at a receiving property. The NYCDEP Noise Code limits construction activities to weekdays between the hours of 7:00 AM and 6:00 PM and requires that a Construction Noise Mitigation Plan be implemented. Project-specific noise control measures would be described in the Construction Noise Mitigation Plan and could include a variety of source and path controls.

As required by the NYCDEP Noise Code, the following source controls to reduce construction noise would be implemented:

› The contractor will self-certify that all construction tools and equipment have been maintained to not generate excessive or unnecessary noise and that the noise emissions would not exceed the levels specified in the Federal Highway Administration's Roadway Construction Noise Model User's Guide, January 2006. **Table 15-10** shows the noise levels for typical construction equipment that would be used for the proposed project and the mandated noise levels for the equipment that would be used for construction of the proposed project.
› All construction equipment would be equipped with necessary noise reduction equipment including mufflers. All equipment with internal combustion engines would be operated with the doors closed including noise-insulating materials.
› Where feasible, practical and safe, the use of back-up alarms would be minimized and/or quieter back-up alarms would be installed in accordance with OSHA standards.
› Vehicles would not be allowed to idle more than three minutes in accordance with New York City Administrative Code §24-163.
› The contractor shall utilize a training program to inform workers on methods that can minimize construction noise.

The following path noise controls would be implemented as required by the NYCDEP Noise Code:

- The DOB regulations require a perimeter barrier or "construction noise barrier" and when the site is within 200 feet of a receptor, the barrier shall be constructed in a specific manner (as described in the New York City Noise Code) to provide sufficient sound attenuation. Section 3307.7 of the New York City Building Code requires a solid perimeter noise barrier made out of wood or other suitable material be constructed where a new building is being constructed or a building is being demolished to grade. For the proposed project, a perimeter noise barrier of at least 12 feet in height with an absorptive surface (noise reduction coefficient of 0.75 or greater) would be used. The absorption would be on the interior side (facing the ~~project site~~Project Site) along the Madison Avenue and East 44th Street sides.
- Should noise complaints occur during construction, as practicable, the contractor shall use path noise control measures such as temporary noise barriers and jersey barriers.
- The construction site will also include a protective platform above the ventilation building which will be effective at attenuating sound.
- Additional noise mitigation measures including acoustic enclosures on compressors and generators would be implemented as feasible and reasonable.

As discussed in the *CEQR Technical Manual*, Chapter 22 (Construction), Section 400, thresholds for significant construction noise impact are based on operational noise impact criteria. As described in Chapter 19 (Noise), Section 410, there would be significant noise impact from long-term operational conditions if ambient sound levels increase by 3 dBA (L_{eq}) or more and absolute levels would exceed 65 dBA L_{eq}, or, if No-Action ambient sound levels are 60 dBA L_{eq} or less, if noise levels would increase by 5 dBA (L_{eq}) or more. The significance of construction noise effects depends on the intensity and duration of construction activities. If construction noise levels would exceed the screening criteria for 24 months or more, a detailed construction noise analysis is warranted and there is a potential for significant adverse noise impact.

The detailed construction noise analysis evaluates the specific activities, types of equipment, duration of activities, and locations of nearby sensitive receptors. Based on the results of the detailed analysis, there would be significant adverse noise impact if construction noise due to the Proposed Project exceeds the screening criteria for a prolonged period of 24 months or more. A significant adverse noise impact would result if the maximum exterior noise level exceeds 85 dBA, as indicated in the *CEQR Technical Manual* Public Health chapter. Construction noise occurring for shorter durations would not typically result in significant impact unless there is a higher intensity of noise. For example, construction may cause significant impact if noise would increase by 15 dBA or more above existing background ambient conditions for a prolonged period of 12 months or more, or by 20 dBA or more for a prolonged period of 3 months or more.

The Proposed Project is near existing residential and commercial land uses. Based on the proximity of these noise-sensitive land uses, there is the potential for construction noise levels to exceed the screening criteria.

The No-Action construction condition would include 6 months of excavation and 6 months of foundation construction. Excavation and foundation for the Proposed Project would be of the same duration and include the same equipment as the No-Action resulting in the same construction noise levels. Superstructure construction for the No-Action condition would occur for 12 months (month 13 to month 24). Superstructure construction for the Proposed

Project would occur for 16 months (month 13 to month 28). Therefore, the Proposed Project would result in superstructure construction occurring for 4 months longer than the No-Action condition with slightly higher noise levels. Interior fitout construction for the No-Action condition would occur for 8 months (month 25 to month 32). Interior fitout construction for the Proposed Project would occur for 14 months (month 29 to month 42). Interior fitout for the Proposed Project would result in the same construction noise levels as the No-Action condition.

The detailed construction noise analysis is based on typical equipment used during the excavation, foundation, superstructure, and interior fitout phases of construction, as shown in **Table 15-10**. Construction of the superstructure would be followed by interior fit-outs and site cleanup. The later portion of superstructure, interior fit-out, and site cleanup construction phases generally do not require the use of large, sound-generating equipment and would not cause noise levels to exceed the screening criteria. **Table 15-10** presents the type of equipment, the maximum sound level at 50 feet, the utilization factors (percentage of time the equipment is operating at full power), and the number of each piece of equipment that is used during each phase of construction based on the *CEQR Technical Manual*. The mitigation measures that have been included in the analysis include the use of acoustic enclosures around compressors and generators.

Table 15-10 Equipment Sound Levels

Equipment	Maximum Sound Level at 50 feet (dBA, Lmax)	Project-Specific Maximum Sound Level at 50 feet (dBA, Lmax)	Utilization Factor (%)	Number of Construction Pieces of Equipment			
				Excavation Phase	Foundation Phase	Superstructure Phase	Interior Fitout Phase
Boom Truck	85	N/A	20%	0	0	1	1
Compressor	80	75[2]	40	2	2	5	0
Concrete Mixer Truck	85	N/A	40	0	10	10	0
Concrete Pump Truck	82	N/A	20	0	1	2	0
Crane	85	N/A	16	2	0	3	0
Drill Rig	85	N/A	20	4	4	0	0
Dump Truck[1]	84	N/A	40	8	10	0	0
Excavator/Backhoe	85	N/A	40	2	2	0	0
Front End Loader	80	N/A	40	1	0	0	0
Generator	82	77[2]	50	0	0	2	0
Hoist	75	N/A	50	0	0	4	4
Jackhammer	85	N/A	20	0	8	0	0
Mounted Impact Hammer	90	N/A	20	4	0	0	0
Spray-on Fire Protection Pump	77	N/A	50	0	0	2	0
Vibratory Concrete Mixer	80	N/A	20	0	6	0	0
Welder/Torch	73	N/A	40	0	0	17	0

Source: VHB, 2020

[1] Since dump trucks and pickup trucks are not allowed to idle more than three minutes in accordance with New York City Administrative Code §24-163, they have been excluded from the construction noise predictions.

[2] Portable noise enclosures typically provide 5 dBA of insertion loss according to the New York City Administrative Code §28-101 "Citywide Construction Noise Mitigation".

As shown in **Figure 15-3**, construction noise during the excavation and foundation phase, the superstructure phase and the interior fitout phase has been evaluated at 47 existing receptor locations near the Proposed Project. Receptors were modeled at each floor of the buildings.

Existing ambient sound levels at all receptor locations have been determined based on the measurement results presented in **Chapter 12, Noise** and Cadna-A modeling of traffic noise conditions in the study area. Ambient noise levels were modeled based on the existing AM peak traffic volumes on the roadway network including Madison Avenue, Vanderbilt Avenue, 44th Street and 45th Street. The ambient sound level at each receptor was then determined based on the measured sound level at the closest measurement location and an adjustment based on the difference in modeled sound levels at the closest measurement location and each specific receptor location. The minimum background sound level assumed for any receptor was 69.3 dBA which is the average L_{90} at all sites and all time periods. Based on this analysis, the existing ambient sound levels range from 69.3 to 76.3dBA (L_{eq}) (see **Table 15-11**).

For receptors which are farther from roadways compared to the measurement locations such as upper floor receptors, the estimated background sound levels were up to seven decibels quieter than the measurement. At a few receptors which are closer to roadways, the estimated existing ambient background sound levels were up to two decibels louder than the measurement.

Construction noise was predicted using the Cadna-A model. The construction noise predictions include the equipment described in **Table 15-10** and a 12-foot solid perimeter noise barrier with an absorptive surface along the Madison Avenue and 44th Street sides facing the ~~project site~~Project Site that would shield stationary construction equipment within the site as well as the construction trucks accessing the Proposed Project site for receptors at ground level and the first few floors. The construction site would also include a protection platform over the ventilation building on Lot 25 which would also be effective in attenuating sound. This solid platform has been included in the Cadna-A model.

The assessment results, shown in **Table 15-11**, present the range of construction noise levels at each building (or building façade) including the results at all floors. During excavation and foundation phases, construction noise levels would typically range from the high 60’s to low 80’s dBA (L_{eq}) at all receptor locations. Exterior construction noise levels would not exceed 15 dBA above existing ambient levels at any receptor during any phase of construction.

Figure 15-3 Construction Noise Receptor Locations

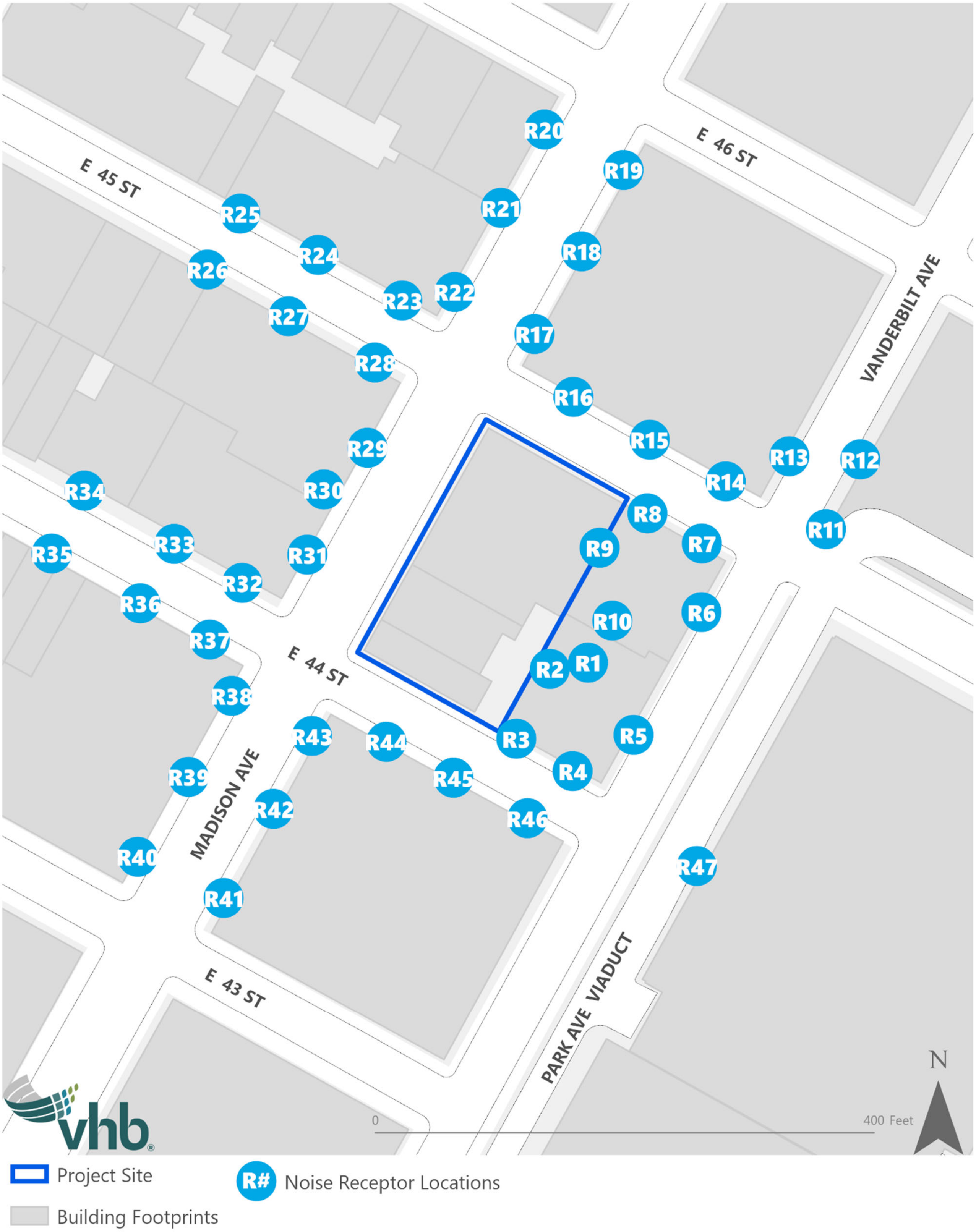


Table 15-11 Construction Sound Levels: Excavation & Foundation (No Action & With Action)

Receptor	Location	Existing Ambient Sound Level (dBA, Leq)	Excavation (No-Action & With-Action)			Foundation (No-Action & With-Action)		
			Construction Sound Level (dBA, Leq)	Future Sound Level (dBA, Leq)	Maximum Increase (dBA)	Construction Sound Level (dBA, Leq)	Future Sound Level (dBA, Leq)	Maximum Increase (dBA)
R1	Yale Club (Back Side)	69.3	76.3 - 79.8	77.1 - 80.2	10.9	76.1 - 80.6	76.9 - 80.9	11.6
R2	Yale Club (Corner)	69.3	68.4 - 81.5	71.9 - 81.8	12.5	68.3 - 83.2	71.8 - 83.4	14.1
R3	Yale Club (44th Street Side 1)	73.2 - 75.7	64.1 – 76.0	76.0 - 78.4	3.9	76.6 - 83.3	78.4 - 83.9	9.0
R4	Yale Club (44th Street Side 2)	73.7 - 75.3	60.6 – 73.0	75.5 - 76.7	2.5	75.7 - 79.8	77.9 - 80.9	6.7
R5	Yale Club (Vanderbilt Side)	69.3 - 70.8	54.0 – 66.0	69.8 - 71.2	1.7	64.0 - 69.3	70.7 - 72.5	3.1
R6	52 Vanderbilt (Vanderbilt Side)	69.3 - 69.3	54.0 - 63.4	69.6 - 70.4	1.1	59.6 - 67.7	69.9 - 71.7	2.4
R7	52 Vanderbilt (45th Side 1)	69.3 - 71.1	62.8 - 74.9	71.8 - 76.1	6.4	70.0 - 76.2	73.6 - 77.1	7.5
R8	52 Vanderbilt (45th Side 2)	69.3 - 71.1	64.1 - 76.2	71.9 - 77.1	7.5	69.7 – 78.0	73.5 - 78.6	9.2
R9	52 Vanderbilt (Corner)	69.3	64.9 - 83.4	70.6 - 83.6	14.3	66.0 - 83.5	71.0 - 83.7	14.4
R10	52 Vanderbilt (Back Side)	69.3	75.2 - 80.4	76.2 - 80.7	11.4	75.6 - 81.8	76.5 – 82.0	12.7
R11	230 Park Avenue	69.3	50.3 - 69.7	69.7 - 72.7	3.4	65.1 - 72.4	70.9 - 74.2	4.9
R12	230 Park Avenue (Vanderbilt Side)	69.3	52.5 - 72.5	69.7 - 74.3	5.0	66.5 - 73.9	71.3 - 75.3	6.0
R13	45 East 45th Street (Vanderbilt Side)	69.3	52.3 - 64.7	69.6 - 70.7	1.4	61.9 - 69.6	70.2 - 72.6	3.3
R14	45 East 45th Street (East Side)	69.3 - 70.3	63.9 - 76.2	71.3 – 77.0	7.7	69.8 - 77.4	73.1 – 78.0	8.7
R15	45 East 45th Street (Middle)	69.3 - 70.7	67.1 - 78.7	72.3 - 79.2	9.4	70.1 - 79.6	73.5 – 80.0	10.5
R16	45 East 45th Street (West Side)	69.5 - 71.5	67.4 - 80.1	73.0 - 80.5	10.3	72.2 - 81.7	74.9 – 82.0	11.8
R17	45 East 45th Street (Madison Side South)	72.8 - 74.5	58.3 - 74.8	74.6 - 77.2	4.0	77.8 - 81.2	79.0 - 81.9	8.3
R18	45 East 45th Street (Madison Side Mid)	72.7 - 74.3	55.8 - 70.7	73.9 - 75.1	2.0	74.6 - 76.4	76.8 - 78.2	4.8
R19	45 East 45th Street (Madison Side North)	73.6 - 74.9	62.9 - 73.7	75.1 - 76.9	2.9	76.2 - 77.5	78.1 - 79.2	5.0
R20	360 Madison Avenue (Madison Side North)	72.8 - 74.4	60.1 - 72.2	74.1 - 75.7	2.6	70.7 - 74.4	75.9 - 76.9	3.7
R21	360 Madison Avenue (Madison Side Mid)	73.0 - 74.6	62.6 - 74.3	74.8 - 76.9	3.4	73.7 - 76.3	77.0 - 78.2	4.6
R22	360 Madison Avenue (Madison Side South)	73.5 - 75.1	66.8 - 76.2	75.7 - 78.2	4.2	76.3 - 79.2	78.2 - 80.4	6.2
R23	360 Madison Avenue (45th Side East)	69.9 - 71.5	64.4 - 75.7	72.3 - 76.9	6.3	74.2 - 77.5	76.1 - 78.3	7.8
R24	360 Madison Avenue (45th Side Mid)	69.3 - 70.8	62.9 – 76.0	71.5 - 76.9	7.4	74.1 - 76.4	75.7 - 77.3	7.6

Table 15-11 Construction Sound Levels: Excavation & Foundation (No Action & With Action)

Receptor	Location	Existing Ambient Sound Level (dBA, Leq)	Excavation (No-Action & With-Action)			Foundation (No-Action & With-Action)		
			Construction Sound Level (dBA, Leq)	Future Sound Level (dBA, Leq)	Maximum Increase (dBA)	Construction Sound Level (dBA, Leq)	Future Sound Level (dBA, Leq)	Maximum Increase (dBA)
R25	360 Madison Avenue (45th Side West)	69.3	58.2 - 73.6	69.7 – 75.0	5.7	68.5 - 73.4	72.0 - 74.8	5.5
R26	352 Madison Avenue (45th Side West)	69.3	58.8 – 73.0	69.8 - 74.5	5.2	70.5 - 73.2	73.0 - 74.7	5.4
R27	352 Madison Avenue (45th Side Mid)	69.3	62.5 - 74.2	70.2 - 75.4	6.1	70.2 - 74.4	72.8 - 75.6	6.3
R28	352 Madison Avenue (45th Side East)	69.3	53.8 - 72.5	69.5 - 74.2	4.9	67.9 - 74.9	71.7 – 76.0	6.7
R29	352 Madison Avenue	69.3	66.5 - 79.3	71.1 - 79.7	10.4	72.9 - 82.2	74.5 - 82.4	13.1
R30	352 Madison Avenue (Inset)	69.3	65.9 - 78.8	70.9 - 79.3	10.0	72.9 - 81.9	74.5 - 82.1	12.8
R31	346 Madison Avenue	69.3	66.6 - 79.2	71.2 - 79.6	10.3	74.0 - 82.4	75.3 - 82.6	13.3
R32	346 Madison Avenue (44th Side East)	69.3	60.4 - 71.6	69.9 - 73.6	4.3	77.3 - 79.9	77.9 - 80.3	11.0
R33	346 Madison Avenue (44th Side Mid)	69.3	63.5 - 72.8	70.4 - 74.4	5.1	73.5 – 76.0	74.9 - 76.8	7.5
R34	346 Madison Avenue (44th Side West)	69.3	60.0 - 72.8	69.8 - 74.4	5.1	71.6 - 75.4	73.6 - 76.4	7.1
R35	340 Madison Avenue (44th Side West)	69.3	61.1 - 71.7	70.0 - 73.7	4.4	69.6 - 73.2	72.5 - 74.7	5.4
R36	340 Madison Avenue (44th Side Mid)	69.3	65.6 - 76.2	70.9 – 77.0	7.7	74.5 - 78.4	75.6 - 78.9	9.6
R37	340 Madison Avenue (44th Side East)	69.3	71.8 - 78.7	73.8 - 79.2	9.9	78.7 - 81.3	79.2 - 81.6	12.3
R38	340 Madison Avenue (Madison Side North)	69.3	72.8 - 79.3	74.5 - 79.7	10.4	79.2 – 82.0	79.6 - 82.2	12.9
R39	340 Madison Avenue (Madison Side Mid)	69.3	69.3 - 76.9	72.4 - 77.6	8.3	77.8 - 79.2	78.4 - 79.6	10.3
R40	340 Madison Avenue (Madison Side South)	69.3	64.9 - 72.2	70.7 – 74.0	4.7	73.1 - 74.6	74.6 - 75.7	6.4
R41	333 Madison Avenue (Madison Side South)	69.3	63.7 - 73.8	70.4 - 75.1	5.8	74.2 – 77.0	75.4 - 77.7	8.4
R42	333 Madison Avenue (Madison Side Mid)	69.3	64.6 - 74.6	70.6 - 75.7	6.4	74.7 - 80.5	75.8 - 80.8	11.5
R43	333 Madison Avenue (Madison Side North)	69.3	67.0 - 73.9	71.4 - 75.2	5.9	75.5 - 83.1	76.4 - 83.3	14.0
R44	333 Madison Avenue (44th Side West)	69.3	67.8 - 80.6	71.8 - 80.9	11.6	74.8 - 82.9	76.0 - 83.1	13.8
R45	333 Madison Avenue (44th Side Mid)	69.3	73.6 - 79.3	75.0 - 79.7	10.4	75.6 - 81.7	76.5 - 81.9	12.6
R46	333 Madison Avenue (44th Side East)	69.3	61.8 - 74.2	70.2 - 75.5	6.2	75.4 - 80.1	76.4 - 80.4	11.1
R47	MetLife Building	69.3	53.0 - 68.9	69.5 - 72.2	2.9	69.4 - 74.2	72.4 - 75.4	6.1

Source: VHB, 2020

Table 15-12 Construction Sound Levels: Superstructure (No Action & With Action)

Receptor	Location	Existing Ambient Sound Level (dBA, Leq)	Superstructure (No Action)			Superstructure (With Action)		
			Construction Sound Level (dBA, Leq)	Future Sound Level (dBA, Leq)	Maximum Increase (dBA)	Construction Sound Level (dBA, Leq)	Future Sound Level (dBA, Leq)	Maximum Increase (dBA)
R1	Yale Club (Back Side)	69.3	74.4 - 79.5	75.6 - 79.9	10.6	74.8 – 80.0	75.9 - 80.4	11.1
R2	Yale Club (Corner)	69.3	68.9 - 82.4	72.1 - 82.6	13.3	70.3 - 82.6	72.8 - 82.8	13.5
R3	Yale Club (44th Street Side 1)	73.2 - 75.7	75.7 - 82.7	77.8 - 83.4	8.6	76.0 - 83.2	78.0 - 83.9	8.9
R4	Yale Club (44th Street Side 2)	73.7 - 75.3	75.1 - 79.6	77.6 - 80.7	6.5	75.5 - 80.1	77.8 - 81.1	6.9
R5	Yale Club (Vanderbilt Side)	69.3 - 70.8	63.3 - 67.7	70.5 - 71.8	2.4	63.7 – 68.0	70.5 – 72.0	2.5
R6	52 Vanderbilt (Vanderbilt Side)	69.3 - 69.3	56.9 - 65.7	69.7 – 71.0	1.7	57.6 - 66.6	69.7 - 71.3	2.0
R7	52 Vanderbilt (45th Side 1)	69.3 - 71.1	68.9 - 74.7	73.2 – 76.0	6.4	69.2 - 75.2	73.3 - 76.3	6.7
R8	52 Vanderbilt (45th Side 2)	69.3 - 71.1	69.7 - 76.8	73.5 - 77.5	8.1	70.1 - 77.2	73.7 - 77.9	8.4
R9	52 Vanderbilt (Corner)	69.3	65.1 - 82.4	70.7 - 82.6	13.3	65.9 – 83.0	70.9 - 83.2	13.9
R10	52 Vanderbilt (Back Side)	69.3	75.1 - 80.9	76.1 - 81.2	11.9	74.6 - 80.9	75.7 - 81.2	11.9
R11	230 Park Avenue	69.3	64.6 - 70.8	70.8 - 73.2	3.9	65.2 - 71.4	71 - 73.6	4.3
R12	230 Park Avenue (Vanderbilt Side)	69.3	65.8 - 72.9	71.1 - 74.5	5.2	66.2 - 73.2	71.3 - 74.8	5.5
R13	45 East 45th Street (Vanderbilt Side)	69.3	62.8 - 68.3	70.4 – 72.0	2.7	63.5 - 69.1	70.5 - 72.3	3.0
R14	45 East 45th Street (East Side)	69.3 - 70.3	69.3 - 76.2	72.9 – 77.0	7.7	69.6 - 76.5	73.0 - 77.3	8.0
R15	45 East 45th Street (Middle)	69.3 - 70.7	70.1 - 78.5	73.5 – 79.0	9.3	70.6 - 78.9	73.7 - 79.4	9.7
R16	45 East 45th Street (West Side)	69.5 - 71.5	72.1 - 80.3	74.8 - 80.7	10.5	72.7 - 80.7	75.2 - 81.1	10.9
R17	45 East 45th Street (Madison Side South)	72.8 - 74.5	77.4 - 80.8	78.7 - 81.6	8.0	77.3 - 81.1	78.6 - 81.8	8.2
R18	45 East 45th Street (Madison Side Mid)	72.7 - 74.3	74.2 - 76.3	76.5 - 78.2	4.6	74.3 - 76.8	76.6 - 78.5	4.9
R19	45 East 45th Street (Madison Side North)	73.6 - 74.9	75.8 - 77.5	77.9 - 79.2	4.9	75.5 - 77.6	77.7 - 79.3	5.0
R20	360 Madison Avenue (Madison Side North)	72.8 - 74.4	70.0 - 73.4	75.6 - 76.5	3.2	70.1 – 74.0	75.7 - 76.7	3.4
R21	360 Madison Avenue (Madison Side Mid)	73.0 - 74.6	73.8 - 75.6	76.4 - 77.8	4.1	73.0 - 75.9	76.5 - 77.9	4.4
R22	360 Madison Avenue (Madison Side South)	73.5 - 75.1	75.4 - 78.3	77.6 - 79.7	5.5	75.6 - 78.5	77.7 - 79.8	5.8
R23	360 Madison Avenue (45th Side East)	69.9 - 71.5	74.4 - 76.9	75.7 - 77.8	7.1	74.7 – 77.0	76.0 - 77.9	7.2
R24	360 Madison Avenue (45th Side Mid)	69.3 - 70.8	73.9 - 75.7	75.2 - 76.8	6.7	73.8 - 75.9	75.3 - 76.9	7.0

Table 15-12 Construction Sound Levels: Superstructure (No Action & With Action)

Receptor	Location	Existing Ambient Sound Level (dBA, Leq)	Superstructure (No Action)			Superstructure (With Action)		
			Construction Sound Level (dBA, Leq)	Future Sound Level (dBA, Leq)	Maximum Increase (dBA)	Construction Sound Level (dBA, Leq)	Future Sound Level (dBA, Leq)	Maximum Increase (dBA)
R25	360 Madison Avenue (45th Side West)	69.3	69.5 - 72.2	72.5 – 74.0	4.7	70.0 – 73.0	72.7 - 74.5	5.2
R26	352 Madison Avenue (45th Side West)	69.3	69.6 - 72.3	72.5 - 74.1	4.8	70.4 - 72.8	73.0 - 74.4	5.1
R27	352 Madison Avenue (45th Side Mid)	69.3	71.9 - 74.6	73.8 - 75.7	6.4	71.9 - 74.8	73.8 - 75.9	6.6
R28	352 Madison Avenue (45th Side East)	69.3	66.7 - 74.2	71.3 - 75.4	6.1	66.9 - 74.1	71.3 - 75.3	6.0
R29	352 Madison Avenue	69.3	72.5 - 81.6	74.2 - 81.8	12.5	72.6 - 81.4	74.3 - 81.7	12.4
R30	352 Madison Avenue (Inset)	69.3	72.6 - 81.2	74.3 - 81.5	12.2	72.8 - 80.9	74.4 - 81.2	11.9
R31	346 Madison Avenue	69.3	73.9 - 81.7	75.2 - 81.9	12.6	74.1 - 81.7	75.3 - 81.9	12.6
R32	346 Madison Avenue (44th Side East)	69.3	77.5 - 80.1	78.1 - 80.4	11.1	77.2 - 79.7	77.9 - 80.1	10.8
R33	346 Madison Avenue (44th Side Mid)	69.3	72.0 - 75.3	73.9 - 76.3	7.0	71.9 - 75.2	73.8 - 76.2	6.9
R34	346 Madison Avenue (44th Side West)	69.3	69.6 - 74.9	72.5 – 76.0	6.7	70.2 - 75.6	72.8 - 76.5	7.2
R35	340 Madison Avenue (44th Side West)	69.3	68.8 - 72.9	72.1 - 74.5	5.2	68.9 - 73.2	72.2 - 74.7	5.4
R36	340 Madison Avenue (44th Side Mid)	69.3	74.1 - 77.8	75.3 - 78.4	9.1	74.2 - 77.9	75.4 - 78.5	9.2
R37	340 Madison Avenue (44th Side East)	69.3	77.8 - 80.8	78.4 - 81.1	11.8	78.1 - 81.1	78.6 - 81.4	12.1
R38	340 Madison Avenue (Madison Side North)	69.3	78.4 - 81.9	78.9 - 82.1	12.8	78.5 - 81.3	79.0 - 81.6	12.3
R39	340 Madison Avenue (Madison Side Mid)	69.3	75.2 - 78.8	76.2 - 79.3	10.0	74.4 - 78.2	75.6 - 78.7	9.4
R40	340 Madison Avenue (Madison Side South)	69.3	71.3 - 73.7	73.5 – 75.0	5.7	71.5 - 73.8	73.6 - 75.1	5.8
R41	333 Madison Avenue (Madison Side South)	69.3	72.1 - 77.2	73.9 - 77.9	8.6	71.7 - 76.8	73.7 - 77.5	8.2
R42	333 Madison Avenue (Madison Side Mid)	69.3	74.4 - 80.5	75.6 - 80.8	11.5	74.4 - 80.3	75.6 - 80.6	11.3
R43	333 Madison Avenue (Madison Side North)	69.3	74.8 – 83.0	75.9 - 83.2	13.9	75.0 – 83.0	76.0 - 83.2	13.9
R44	333 Madison Avenue (44th Side West)	69.3	74.5 - 82.3	75.6 - 82.5	13.2	74.6 - 82.3	75.7 - 82.5	13.2
R45	333 Madison Avenue (44th Side Mid)	69.3	74.6 - 81.3	75.8 - 81.6	12.3	74.7 - 81.4	75.9 - 81.7	12.4
R46	333 Madison Avenue (44th Side East)	69.3	74.4 - 79.8	75.6 - 80.2	10.9	74.8 - 79.8	76.0 - 80.2	10.9
R47	MetLife Building	69.3	68.9 - 74.9	72.2 – 76.0	6.7	68.8 - 74.2	72.1 - 75.4	6.1

Source: VHB, 2020

Table 15-13 Construction Sound Levels: Interior Fitout (No Action & With Action)

Receptor	Location	Existing Ambient Sound Level (dBA, Leq)	Interior Fitout (No Action)		
			Construction Sound Level (dBA, Leq)	Future Sound Level (dBA, Leq)	Maximum Increase (dBA)
R1	Yale Club (Back Side)	69.3	57.7 - 68.3	69.6 - 71.8	2.5
R2	Yale Club (Corner)	69.3	57.0 - 67.7	69.5 - 71.6	2.3
R3	Yale Club (44th Street Side 1)	73.2 - 75.7	65.7 - 73.4	74.1 - 77.7	2.4
R4	Yale Club (44th Street Side 2)	73.7 - 75.3	65.1 - 70.1	74.5 - 75.9	1.4
R5	Yale Club (Vanderbilt Side)	69.3 - 70.8	53.1 - 59.7	69.7 – 71.0	0.6
R6	52 Vanderbilt (Vanderbilt Side)	69.3 - 69.3	48.6 - 55.7	69.5 - 69.7	0.4
R7	52 Vanderbilt (45th Side 1)	69.3 - 71.1	56.3 - 63.8	70.1 - 71.3	1.1
R8	52 Vanderbilt (45th Side 2)	69.3 - 71.1	60.0 - 67.5	70.5 - 72.1	2.0
R9	52 Vanderbilt (Corner)	69.3	54.7 - 71.9	69.5 - 73.8	4.5
R10	52 Vanderbilt (Back Side)	69.3	65.5 - 68.4	70.8 - 71.9	2.6
R11	230 Park Avenue	69.3	53.6 - 60.5	69.7 - 70.1	0.8
R12	230 Park Avenue (Vanderbilt Side)	69.3	52.5 - 61.3	69.7 - 70.2	0.9
R13	45 East 45th Street (Vanderbilt Side)	69.3	52.8 - 59.2	69.6 - 69.9	0.6
R14	45 East 45th Street (East Side)	69.3 - 70.3	57.9 - 65.5	70.2 - 70.9	1.6
R15	45 East 45th Street (Middle)	69.3 - 70.7	60.0 - 68.1	70.5 - 72.1	2.3
R16	45 East 45th Street (West Side)	69.5 - 71.5	61.5 - 69.8	71.0 - 73.3	2.6
R17	45 East 45th Street (Madison Side South)	72.8 - 74.5	58.3 - 65.7	73.4 - 74.6	0.7
R18	45 East 45th Street (Madison Side Mid)	72.7 - 74.3	52.6 - 60.9	72.9 - 74.3	0.3
R19	45 East 45th Street (Madison Side North)	73.6 - 74.9	58.5 - 62.8	73.9 – 75.0	0.3
R20	360 Madison Avenue (Madison Side North)	72.8 - 74.4	58.5 - 62.4	73.1 - 74.5	0.4
R21	360 Madison Avenue (Madison Side Mid)	73.0 - 74.6	63.0 - 64.7	73.4 - 74.9	0.5
R22	360 Madison Avenue (Madison Side South)	73.5 - 75.1	62.0 - 65.8	73.9 - 75.3	0.6
R23	360 Madison Avenue (45th Side East)	69.9 - 71.5	60.4 - 65.2	70.7 - 71.9	1.2
R24	360 Madison Avenue (45th Side Mid)	69.3 - 70.8	56.9 - 63.5	70.1 – 71.0	1.0
R25	360 Madison Avenue (45th Side West)	69.3	54.5 - 61.4	69.5 – 70.0	0.7
R26	352 Madison Avenue (45th Side West)	69.3	53.2 - 59.8	69.5 - 69.8	0.5
R27	352 Madison Avenue (45th Side Mid)	69.3	56.0 - 62.9	69.6 - 70.3	1.0
R28	352 Madison Avenue (45th Side East)	69.3	56.1 - 63.6	69.6 - 70.4	1.1
R29	352 Madison Avenue	69.3	60.1 – 69.0	69.8 - 72.2	2.9
R30	352 Madison Avenue (Inset)	69.3	62.2 - 70.6	70.1 – 73.0	3.7
R31	346 Madison Avenue	69.3	62.4 - 70.3	70.1 - 72.8	3.5
R32	346 Madison Avenue (44th Side East)	69.3	66.7 - 69.3	71.2 - 72.4	3.1
R33	346 Madison Avenue (44th Side Mid)	69.3	63.3 - 66.5	70.3 - 71.2	1.9
R34	346 Madison Avenue (44th Side West)	69.3	60.5 - 66.4	69.9 - 71.1	1.8
R35	340 Madison Avenue (44th Side West)	69.3	59.3 - 64.7	69.8 - 70.7	1.4
R36	340 Madison Avenue (44th Side Mid)	69.3	66.7 – 70.0	71.3 - 72.7	3.4
R37	340 Madison Avenue (44th Side East)	69.3	67.1 - 71.1	71.4 - 73.4	4.1
R38	340 Madison Avenue (Madison Side North)	69.3	66.9 - 70.9	71.3 - 73.2	3.9

Table 15-13 Construction Sound Levels: Interior Fitout (No Action & With Action)

Receptor	Location	Existing Ambient Sound Level (dBA, Leq)	Interior Fitout (No Action) Construction Sound Level (dBA, Leq)	Future Sound Level (dBA, Leq)	Maximum Increase (dBA)
R39	340 Madison Avenue (Madison Side Mid)	69.3	63.5 - 68.8	70.4 - 72.1	2.8
R40	340 Madison Avenue (Madison Side South)	69.3	59.5 - 62.2	69.8 - 70.1	0.8
R41	333 Madison Avenue (Madison Side South)	69.3	57.6 - 64.3	69.7 - 70.5	1.2
R42	333 Madison Avenue (Madison Side Mid)	69.3	60.9 - 66.3	70.0 - 71.1	1.8
R43	333 Madison Avenue (Madison Side North)	69.3	59.8 - 65.8	69.8 – 71.0	1.7
R44	333 Madison Avenue (44th Side West)	69.3	63.4 - 74.1	70.4 - 75.4	6.1
R45	333 Madison Avenue (44th Side Mid)	69.3	63.3 - 71.4	70.4 - 73.5	4.2
R46	333 Madison Avenue (44th Side East)	69.3	63.7 - 69.2	70.5 - 72.4	3.1
R47	MetLife Building	69.3	57.8 - 65.9	69.6 – 71.0	1.7

Source: VHB, 2020

Buildings surrounding the Proposed Project are primarily commercial or hotel use. Based on street-level field observations, they appear to have insulated glass windows and central air-conditioning. For buildings with insulated glass windows and central air conditioning, interior noise levels would be approximately 30 dBA less than exterior noise levels. As exterior sound levels are expected to exceed 75 dBA, interior noise levels would likely exceed 45 dBA L_{10} during portions of construction at adjacent receptors. The *2020 CEQR Technical Manual* defines 45 dBA L_{10} as an acceptable interior noise level limit for residential and community facility spaces, as discussed in **Chapter 12**, **Noise**. Interior noise levels of 50 dBA L_{10} is typically considered to be an acceptable interior noise level limit for office spaces. The L_{10} metric is calculated by adding a 3-dBA adjustment factor to the calculated L_{eq} in conformance with FHWA's Roadway Construction Noise Model (RCNM) guidance.

The following summarizes the results of the construction noise assessment at the closest receptors surrounding the Proposed Project:

- **The Yale Club (R1 – R5):** This 22-story commercial/institutional building is located adjacent to the Proposed Project ~~site~~Site at 50 Vanderbilt Avenue. The inset western façade (R1), closest western façade (R2), 44th Street façade (R3-R4), and Vanderbilt Avenue façade (R5) were assessed for potential noise impacts.

  In both the No-Action and With-Action conditions, exterior future noise levels would be up to 81.8, 83.9 and 77.7 dBA (Leq) during the excavation, foundation and interior fitout phases of construction and noise levels would increase by up to 12.5, 14.1 and 2.4 dBA during those phases respectively. During superstructure construction, the No-Action exterior future noise levels would be up to 83.4 dBA (Leq) and noise levels would increase by up to 13.3 dBA. Under the With-Action condition, superstructure exterior future noise levels would be up to 83.9 dBA (Leq) and noise levels would increase by up to 13.5 dBA. In both the No-Action and With-Action conditions during interior fitout, exterior future noise levels would be up to 77.7 dBA (Leq) and would increase up to 2.5 dBA.

  The Yale Club building has function spaces in the first 6 floors and hotel-like rooms in the upper floors. Based on street-level field observations, this building is assumed to have insulated glass windows and central air conditioning, which would be expected to provide 30 dBA window/wall attenuation.

For both the No-Action and With-Action conditions, interior construction noise levels would be up to 54.8 dBA (L_{10}) during the excavation phase and up to 56.9 dBA (L_{10}) during the foundation phase. Interior noise levels would exceed the interior noise criterion for commercial spaces (50 dBA L_{10}) by up to 4.8 dBA during excavation and up to 6.9 dBA during foundation and exceed the interior noise criterion for residential spaces (45 dBA L_{10}) by up to 9.8 dBA during excavation and 11.9 dBA during foundation.

Under the No-Action condition, interior construction noise levels would be up to 56.4 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion l for commercial spaces (50 dBA L_{10}) by up to 6.4 dBA and the interior noise criterion for hotels (45 dBA L_{10}) by up to 11.4 dBA. Under the With-Action condition, interior construction noise levels would be up to 56.9 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for commercial spaces by up to 6.9 dBA and the interior noise criterion for hotels (45 dBA L_{10}) by up to 11.9 dBA.

Under both the No-Action and With-Action, interior construction noise levels during interior fitout would be up to 50.7 dBA (L_{10}) and would exceed the interior noise criterion for commercial spaces (50 dBA L_{10}) but up to 0.7 dBA and the interior noise criterion for hotel spaces (45 dBA L_{10}) by up to 5.7 dBA, but exterior noise levels would not increase by 3 dBA or more.

Increases in exterior noise of 3 dBA or more and exceedances of the interior noise criterion would occur at three facades (R1-R3) during the excavation, foundation and superstructure phases for a total of 24 months during the No-Action condition and during the excavation, foundation and superstructure phases for a total of 28 months during the With-Action condition. The With-Action superstructure phase would extend 4 months longer than the No-Action. Construction would then transition to the interior fitout phase during which exterior future construction noise levels would not increase by 3 dBA or more at any facade.

Since exterior construction noise levels would exceed ambient conditions by 3 dBA or more and exceed the interior noise criteria for 24 months or more for both the No-Action and With-Action conditions, there would not be significant noise impact due to the Proposed Action.

› **52 Vanderbilt (R6 – R10):** 52 Vanderbilt Avenue is a commercial 20-story building that directly abuts the Project Site to the east. The Vanderbilt Avenue façade (R6), 45th Street façade (R7-R8), and closest western backside facades (R9-R10) were assessed for noise impact.

  In both the No-Action and With-Action conditions, exterior future noise levels would be up to 83.6, 83.7 and 73.8 dBA (L_{eq}) during the excavation, foundation and interior fitout phases of construction and noise levels would increase by up to 14.3, 14.4 and 4.5 dBA, respectively. During superstructure construction under the No-Action condition, exterior future noise levels would be up to 82.6 dBA (L_{eq}) and noise levels would increase by up to 13.3 dBA. Under the With-Action condition, superstructure exterior future noise levels would be up to 83.2 dBA (L_{eq}) and noise levels would increase by up to 13.9 dBA. In both the No-Action and With-Action condition during interior fitout, exterior future noise levels would be up to 73.8 dBA (Leq) and would increase up to 4.5 dBA.

52 Vanderbilt Avenue is primarily a commercial office building and units are assumed to have insulated glass windows and central air conditioning based on street-level field observations. This building is assumed to provide 30 dBA window/wall attenuation.

For both the No-Action and With-Action conditions, interior construction noise levels would be up to 56.6 dBA (L_{10}) during the excavation phase and up to 56.7 dBA (L_{10}) during the foundation phase. Interior noise levels would exceed the interior noise criterion for commercial spaces (50 dBA L_{10}) by up to 6.6 dBA during excavation and up to 6.7 dBA during foundation.

Under the No-Action condition, interior construction noise levels would be up to 55.6 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for commercial spaces by up to 5.6 dBA. Under the With-Action condition, interior construction noise levels would be up to 56.2 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for commercial spaces by up to 6.2 dBA (L_{10}). Under both the No-Action and With-Action, interior construction noise levels during interior fitout would be up to 46.8 dBA (L_{10}) and would not exceed the interior noise criterion for commercial spaces.

Increases in exterior noise of 3 dBA or more and exceedances of the interior noise criterion would occur at three facades (R8-R10) during the excavation, foundation and superstructure phases for a total of 24 months during the No-Action condition and during the excavation, foundation and superstructure phases for a total of 28 months during the With-Action condition. The With-Action superstructure phase would extend 4 months longer than the No-Action. Construction would then transition to the interior fitout phase during which construction noise levels would not exceed the commercial interior noise criterion at any façade.

Since exterior construction noise levels would increase ambient conditions by 3 dBA or more and exceed the interior noise criteria for 24 months or more for both the No-Action and With-Action conditions, there would not be significant noise impact due to the Proposed Action.

- **230 Park Avenue (R11 - R12):** This is a 34-story commercial office building located across the intersection of Vanderbilt Avenue and 45th Street, northeast of the construction area. The corner of Vanderbilt Avenue and 45th Street (R11) and the Vanderbilt façade (R12) were assessed for noise impact.

  In both the No-Action and With-Action conditions, exterior future noise levels would be up to 74.3, 75.3 and 70.2 dBA (L_{eq}) during the excavation, foundation and interior fitout phases of construction and noise levels would increase by up to 5.0, 6.0 and 0.9 dBA, respectively. During superstructure construction, the No-Action exterior future noise levels would be up to 74.5 dBA (L_{eq}) and noise levels would increase by up to 5.2 dBA. Under the With-Action condition, superstructure exterior future noise levels would be up to 74.8 dBA (Leq) and noise levels would increase by up to 5.5 dBA. In both the No-Action and With-Action condition during interior fitout, exterior future noise levels would be up to 70.2 dBA (Leq) and would increase up to 0.9 dBA.

  230 Park Avenue is a commercial office building and units appear to have insulated glass windows and central air conditioning based on street-level field observations, which would be expected to provide 30 dBA window/wall attenuation.

  For both the No-Action and With-Action conditions, interior construction noise levels would be up to 47.3 dBA (L_{10}) during the excavation phase and up to 48.3 dBA (L_{10})

during the foundation phase. During the superstructure phase, interior construction noise levels would be up to 47.5 dBA (L_{10}) during the No-Action and interior construction noise levels would be up to 47.8 dBA (L_{10}) during the With-Action. During the interior fitout phase, interior construction noise levels would be up to 43.2 dBA (L_{10}).

Interior noise levels would not exceed the interior noise criterion for commercial spaces (50 dBA L_{10}) during any phase of construction during either the No-Action or With-Action condition. Therefore, there would not be significant adverse construction noise impact.

› **The Roosevelt (R13 - R19):** This is a 19-story hotel located across from the ~~project site~~Project Site at 45 East 45th Street north of the construction. The Vanderbilt façade (R13), the 45th Street façade (R14-R16), and the Madison Avenue façade (R17-R19) were all assessed for noise impact.

In both the No-Action and With-Action conditions, exterior future noise levels would be up to 80.5, 82.0 and 75.0 dBA (L_{eq}) during the excavation, foundation and interior fitout phases of construction and noise levels would increase by up to 10.3, 11.8 and 2.6 dBA, respectively. During superstructure construction, the No-Action exterior future noise levels would be up to 81.6 dBA (L_{eq}) and noise levels would increase by up to 10.5 dBA. Under the With-Action condition, superstructure exterior future noise levels would be up to 81.8 dBA (L_{eq}) and noise levels would increase by up to 10.9 dBA. In both the No-Action and With-Action condition during interior fitout, exterior future noise levels would be up to 75.0 dBA (L_{eq}) and would increase up to 2.6 dBA.

The Roosevelt is a hotel building and units appear to have insulated glass windows and PTAC units based on street-level field observations, which would be expected to provide up to 30 dBA window/wall attenuation.

For both the No-Action and With-Action conditions, interior construction noise levels would be up to 53.5 dBA (L_{10}) during the excavation phase and up to 55.0 dBA (L_{10}) during the foundation phase. Interior noise levels would exceed the interior noise criterion for hotel spaces (45 dBA L_{10}) by up to 8.5 dBA during excavation and up to 10.0 dBA during foundation.

Under the No-Action condition, interior construction noise levels would be up to 54.6 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for hotel spaces by up to 9.6 dBA. Under the With-Action condition, interior construction noise levels would be up to 54.8 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for hotel spaces by up to 9.8 dBA (L_{10}). Under both the No-Action and With-Action, interior construction noise levels during interior fitout would be up to 48.0 dBA (L_{10}) and would exceed the interior noise criterion for hotel spaces by up to 3 dBA (L_{10}).

Increases in exterior noise of 3 dBA or more and exceedances of the interior noise criterion would occur at four facades (R14-R17) during the excavation, foundation and superstructure phases for a total of 24 months during the No-Action condition and during the excavation, foundation and superstructure phases for a total of 28 months during the With-Action condition. The With-Action superstructure phase would extend 4 months longer than the No-Action. Construction would then transition to the interior fitout phase during which construction noise levels would not exceed the hotel interior noise criterion and increase by 3 dBA (L_{eq}) or more at any façade.

Since exterior construction noise levels would exceed ambient conditions by 3 dBA or more and exceed the interior noise criteria for 24 months or more for both the No-Action and With-Action conditions, there would not be significant noise impact due to the Proposed Action.

- **360 Madison Avenue (R20 - R25):** This is an existing 24-story building located across the intersection of Madison Avenue and 45th Street, northwest of the construction area. The Madison Avenue façade (R20-R22) and the 45th Street façade (R23-R25) were assessed for noise impact

  In both the No-Action and With-Action conditions, exterior future noise levels would be up to 78.2, 79.2 and 75.3 dBA (Leq) during the excavation, foundation and interior fitout phases of construction and noise levels would increase by up to 7.4, 7.8 and 1.2 dBA, respectively. During superstructure, the No-Action exterior future noise levels would be up to 79.7 dBA (Leq) and noise levels would increase by up to 7.1 dBA. Under the With-Action condition, superstructure exterior future noise levels would be up to 79.8 dBA and would increase by up to 7.2 dBA. In both the No-Action and With-Action condition during interior fitout, exterior future noise levels would be up to 75.3 dBA (Leq) and would increase up to 1.2 dBA.

  360 Madison Avenue is a commercial office building and units appear to have insulated glass windows and central air conditioning based on street-level field observations, which would be expected to provide 30 dBA window/wall attenuation.

  For both the No-Action and With-Action conditions, interior construction noise levels would be up to 51.2 dBA (L_{10}) during the excavation phase and up to 52.2 dBA (L_{10}) during the foundation phase. Interior noise levels would exceed the interior noise criterion for commercial spaces (50 dBA L_{10}) by up to 1.2 dBA during excavation and up to 2.2 dBA during foundation.

  Under the No-Action condition, interior construction noise levels would be up to 52.7 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for commercial spaces by up to 2.7 dBA. Under the With-Action condition, interior construction noise levels would be up to 52.8 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for commercial spaces by up to 2.8 dBA (L_{10}).

  Under both the No-Action and With-Action, interior construction noise levels during interior fitout would be up to 48.3 dBA (L_{10}) and would not exceed the interior noise criterion for commercial spaces.

  Increases in exterior noise of 3 dBA or more and exceedances of the interior noise criterion would occur at one facade (R22) during the excavation, foundation and superstructure phases for a total of 24 months during the No-Action condition and during the excavation, foundation and superstructure phases for a total of 28 months during the With-Action condition. The With-Action superstructure phase would extend 4 months longer than the No-Action. Construction would then transition to the interior fitout phase during which construction noise levels would not exceed the commercial interior noise criterion at any façade.

  Since exterior construction noise levels would not exceed the interior noise criteria for 24 months or more during the With-Action conditions, there would not be significant noise impact due to the Proposed Action.

- **352 Madison Avenue (R26 - R30):** This is an existing 25-story building located across Madison Avenue, west of the construction area. The 45th Street façade (R26-R28) and the Madison Avenue façade (R29-R30) were assessed for noise impact.

  In both the No-Action and With-Action conditions, exterior future noise levels would be up to 79.7, 82.4 and 73.0 dBA (L_{eq}) during the excavation, foundation and interior fitout phases of construction and noise levels would increase by up to 10.4, 13.1 and 3.7 dBA, respectively. During superstructure construction, the No-Action exterior future noise levels would be up to 81.8 dBA (L_{eq}) and noise levels would increase by up to 12.5 dBA. Under the With-Action condition, exterior future noise levels would be up to 81.7 dBA (L_{eq}) and noise levels would increase by up to 12.4 dBA. In both the No-Action and With-Action conditions during interior fitout, exterior future noise levels would be up to 73.0 dBA (Leq) and would increase up to 3.7 dBA.

  352 Madison Avenue is a commercial office building and units appear to have insulated glass windows and central air conditioning based on street-level field observations, which would be expected to provide 30 dBA window/wall attenuation.

  For both the No-Action and With-Action conditions, interior construction noise levels would be up to 52.7 dBA (L_{10}) during the excavation phase and up to 55.4 dBA (L_{10}) during the foundation phase. Interior noise levels would exceed the interior noise criterion for commercial spaces (50 dBA L_{10}) by up to 2.7 dBA during excavation and up to 5.4 dBA during foundation.

  Under the No-Action condition, interior construction noise levels would be up to 54.8 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for commercial spaces by up to 4.8 dBA. Under the With-Action condition, interior construction noise levels would be up to 54.7 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for commercial spaces by up to 4.7 dBA (L_{10}).

  Under both the No-Action and With-Action, interior construction noise levels during interior fitout would be up to 46.0 dBA (L_{10}) and would not exceed the interior noise criterion for commercial spaces.

  Increases in exterior noise of 3 dBA or more and exceedances of the interior noise criterion would occur at two facades (R29-R30) during the excavation, foundation and superstructure phases for a total of 24 months during the No-Action condition and during the excavation, foundation and superstructure phases for a total of 28 months during the With-Action condition. The With-Action superstructure phase would extend 4 months longer than the No-Action. Construction would then transition to the interior fitout phase during which construction noise levels would not exceed the commercial interior noise criterion at any façade.

  Since exterior construction noise levels would exceed ambient conditions by 3 dBA or more and exceed the interior noise criteria for 24 months or more for both the No-Action and With-Action conditions, there would not be significant noise impact due to the Proposed Action.

- **346 Madison Avenue (R31 – R34):** This is an existing 11-story building located across Madison Avenue, west of the construction area. The Madison Avenue façade (R31) and the 44th Street façade (R32-R34) were assessed for noise impact

  In both the No-Action and With-Action conditions, exterior future noise levels would be up to 79.6, 82.6 and 72.8 dBA (L_{eq}) during the excavation, foundation and interior fitout phases of construction and noise levels would be up to 10.3, 13.3 and 3.5 dBA, respectively. During superstructure construction, both the No-Action and With-Action exterior future noise levels would be up to 81.9 dBA (L_{eq}) and noise levels would increase by up to 12.6 dBA. In both the No-Action and With-Action conditions during interior fitout, exterior future noise levels would be up to 72.8 dBA (Leq) and would increase up to 3.5 dBA.

346 Madison Avenue is a commercial office building and units appear to have insulated glass windows and central air conditioning based on street-level field observations, which would be expected to provide 30 dBA window/wall attenuation.

For both the No-Action and With-Action conditions, interior construction noise levels would be up to 52.6 dBA (L_{10}) during the excavation phase and up to 55.6 dBA (L_{10}) during the foundation phase. Interior noise levels would exceed the interior noise criterion for commercial spaces (50 dBA L_{10}) by up to 2.6 dBA during excavation and up to 5.6 dBA during foundation.

For both the No-Action and With-Action conditions, interior construction noise levels would be up to 54.9 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for commercial spaces by up to 4.9 dBA.

Under both the No-Action and With-Action, interior construction noise levels during interior fitout would be up to 45.8 dBA (L_{10}) and would not exceed the interior noise criterion for commercial spaces.

Increases in exterior noise of 3 dBA or more and exceedances of the interior noise criterion would occur at one facade (R31) during the excavation, foundation and superstructure phases for a total of 24 months during the No-Action condition and during the excavation, foundation and superstructure phases for a total of 28 months during the With-Action condition. The With-Action superstructure phase would extend 4 months longer than the No-Action. Construction would then transition to the interior fitout phase during which construction noise levels would not exceed the commercial interior noise criterion at any façade.

Since exterior construction noise levels would exceed ambient conditions by 3 dBA or more and exceed the interior noise criteria for 24 months or more for both the No-Action and With-Action conditions, there would not be significant noise impact due to the Proposed Action.

› **340 Madison Avenue (R35 – R40):** This is an existing 22-story building located across the intersection Madison Avenue and 44th Street, southwest of the construction area. The 44th Street façade (R35-R37) and the Madison Avenue façade (R38-R40) were assessed for noise impact.

In both the No-Action and With-Action conditions, exterior future noise levels would be up to 79.7, 82.2 and 73.4 dBA (L_{eq}) during the excavation, foundation and interior fitout phases of construction and noise levels would increase by up to 10.4, 12.9 and 4.1 dBA, respectively. During superstructure construction, the No-Action exterior future noise levels would be up to 82.1 dBA (L_{eq}) and noise levels would increase by up to 12.8 dBA. Under the With-Action condition, superstructure exterior future noise levels would be up to 81.6 dBA (L_{eq}) and noise levels would increase by up to 12.3 dBA. In both the No-Action and With-Action conditions during interior fitout, exterior future noise levels would be up to 73.4 dBA (Leq) and would increase up to 4.1 dBA.

340 Madison Avenue is a commercial office building and units appear to have insulated glass windows and central air conditioning based on street-level field observations, which would be expected to provide 30 dBA window/wall attenuation.

For both the No-Action and With-Action conditions, interior construction noise levels would be up to 52.7 dBA (L_{10}) during the excavation phase and up to 55.2 dBA (L_{10}) during the foundation phase. Interior noise levels would exceed the interior noise criterion for commercial spaces (50 dBA L_{10}) by up to 2.7 dBA during excavation and up to 5.2 dBA during foundation.

Under the No-Action condition, interior construction noise levels would be up to 55.1 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for commercial spaces by up to 5.1 dBA. Under the With-Action condition, interior construction noise levels would be up to 54.6 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for commercial spaces by up to 4.6 dBA (L_{10}).

Under both the No-Action and With-Action, interior construction noise levels during interior fitout would be 46.4 dBA (L_{10}) and would not exceed the interior noise criterion for commercial spaces.

Increases in exterior noise of 3 dBA or more and exceedances of the interior noise criterion would occur at three facades (R37-R39) during the excavation, foundation and superstructure phases for a total of 24 months during the No-Action condition and during the excavation, foundation and superstructure phases for a total of 28 months during the With-Action condition. The With-Action superstructure phase would extend 4 months longer than the No-Action. Construction would then transition to the interior fitout phase during which construction noise levels would not exceed the commercial interior noise criterion at any façade.

Since construction noise levels would exceed ambient conditions by 3 dBA or more and exceed the interior noise criteria for 24 months or more for both the No-Action and With-Action conditions, there would not be significant noise impact due to the Proposed Action.

› **333 Madison Avenue (R41 – R46):** This is an existing 26-story building located across 44th Street, south of the construction area. The Madison Avenue façade (R41-R43) and the 44th Street façade (R44-R46) were assessed for noise impact

In both the No-Action and With-Action conditions, exterior future noise levels would be up to 80.9, 83.3 and 75.4 dBA (L_{eq}) during the excavation, foundation and interior fitout phases of construction and noise levels would increase by up to 11.6, 14.0, and 6.1 dBA, respectively. During superstructure construction, the No-Action exterior future noise levels would be up to 83.2 dBA (L_{eq}) and noise levels would increase by up to 13.9 dBA. Under the With-Action condition, superstructure exterior future noise levels would be up to 83.2 dBA (L_{eq}) and noise levels would increase by up to 13.9 dBA. In both the No-Action and With-Action conditions during interior fitout, exterior future noise levels would be up to 75.4 dBA (Leq) and would increase up to 6.1 dBA.

333 Madison Avenue is a commercial office building and units appear to have insulated glass windows and central air conditioning based on street-level field observations, which would be expected to provide 30 dBA window/wall attenuation.

For both the No-Action and With-Action conditions, interior construction noise levels would be up to 53.9 dBA (L_{10}) during the excavation phase and up to 56.3 dBA (L_{10})

during the foundation phase. Interior noise levels would exceed the interior noise criterion for commercial spaces (50 dBA L_{10}) by up to 3.9 dBA during excavation and up to 6.3 dBA during foundation.

Under the No-Action condition, interior construction noise levels would be up to 56.2 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for commercial spaces by up to 6.2 dBA. Under the With-Action condition, interior construction noise levels would be up to 56.2 dBA (L_{10}) during the superstructure phase and exceed the interior noise criterion for commercial spaces by up to 6.2 dBA (L_{10}).

Under both the No-Action and With-Action, interior construction noise levels during interior fitout would be 48.4 dBA (L_{10}) and would not exceed the interior noise criterion for commercial spaces.

Increases in exterior noise of 3 dBA or more and exceedances of the interior noise criterion would occur at two facades (R44-R45) during the excavation, foundation and superstructure phases for a total of 24 months during the No-Action condition and during the excavation, foundation and superstructure phases for a total of 28 months during the With-Action condition. The With-Action superstructure phase would extend 4 months longer than the No-Action. Construction would then transition to the interior fitout phase during which construction noise levels would not exceed the commercial interior noise criterion at any façade.

Since construction noise levels would exceed ambient conditions by 3 dBA or more and exceed the interior noise criteria for 24 months or more for both the No-Action and With-Action conditions, there would not be significant noise impact due to the Proposed Action.

› **Metlife Building (R47):** This is an existing 59-story building located across the intersection of Vanderbilt Avenue and 44th Street, southeast of the construction area above Grand Central Terminal

In both the No-Action and With-Action conditions, exterior future noise levels would be up to 72.2, 75.4 and 71.0 dBA (Leq) during the excavation, foundation and interior fitout phases of construction and noise levels would increase by up to 2.9, 6.1 and 1.7 dBA, respectively. During superstructure construction, the No-Action exterior future noise levels would be up to 76.0 dBA (Leq) and noise levels would increase up to 6.7 dBA. Under the With-Action condition, superstructure exterior future noise levels would be up to 75.4 dBA (Leq) and noise levels would increase by up to 6.1 dBA. In both the No-Action and With-Action conditions during interior fitout, exterior future noise levels would be up to 71.0 dBA (Leq) and would increase up to 1.7 dBA.

The Metlife Building is a commercial office building and units appear to have insulated glass windows and central air conditioning based on street-level field observations, which would be expected to provide 30 dBA window/wall attenuation.

For both the No-Action and With-Action conditions, interior construction noise levels would be up to 45.2 dBA (L_{10}) during the excavation phase and up to 48.4 dBA (L_{10}) during the foundation phase. During the superstructure phase, interior construction noise levels would be up to 49.0 dBA (L_{10}) during the No-Action and up to 48.4 dBA (L_{10}) during the With-Action. During the interior fitout phase, interior construction noise levels would be up to 44.0 dBA (L_{10}). Interior noise levels would not exceed the interior noise criterion for commercial spaces (50 dBA L10) during any phase of construction during either the No-Action or With-Action condition. Therefore, there would not be significant adverse construction noise impact.

Excavation and foundation for the Proposed Project would be of the same duration and include the same equipment as the No-Action resulting in the same construction noise levels. Construction noise levels would increase ambient conditions by 3 dBA or more and exceed the interior noise criteria at 19 receptor locations during the excavation, foundation and superstructure phases for 24 months during the No-Action condition and 28 months during the With-Action condition. Exceedances of the interior noise criterion in the With-Action would occur for 4 months longer than the No-Action condition. After the superstructure phase, construction would transition to the interior fitout phase. Interior noise levels during the fitout would not increase by 3 dBA or more and exceed the interior noise criteria at any receptor surrounding the Project Site. Therefore, there would be no significant adverse construction noise impact at any receptor.

Figure 15-4 through **Figure 15-7** show the noise level contour maps at a height of 5 feet above ground for each phase of construction as well as the location of noise receptors.

Figure 15-4 Excavation Phase Noise Level Contours

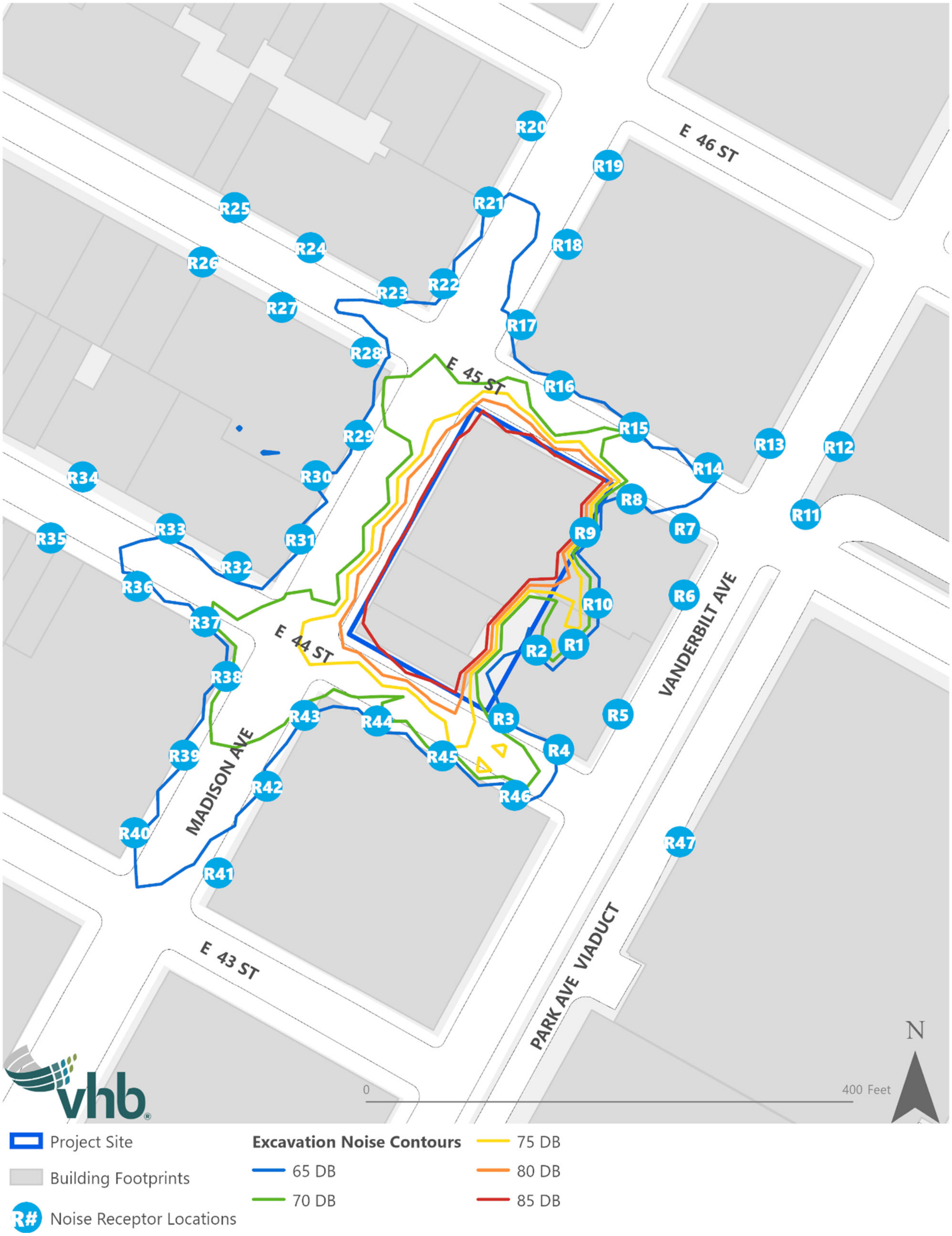


Figure 15-5 Foundation Phase Noise Level Contours

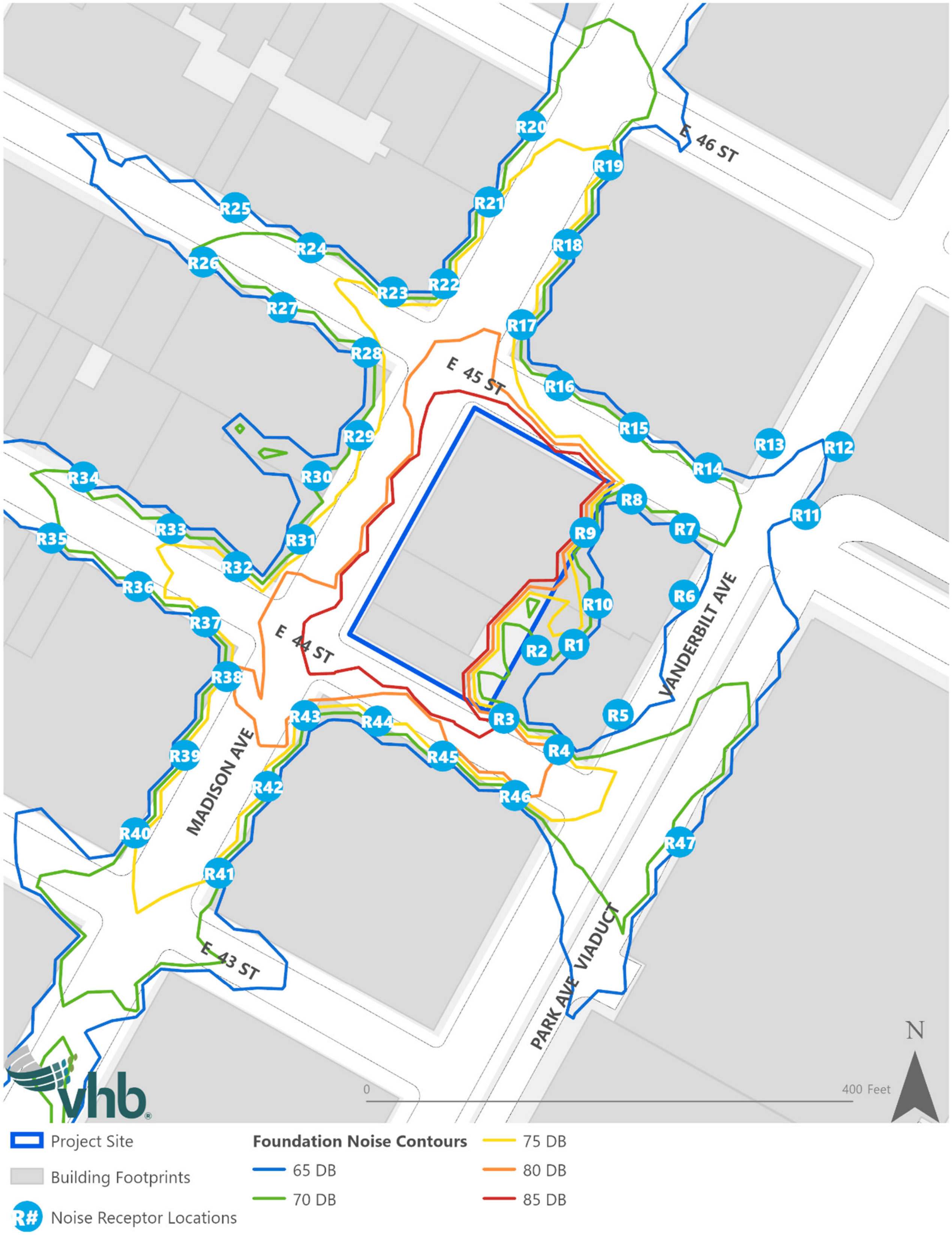


Figure 15-6 Superstructure Phase Noise Level Contours

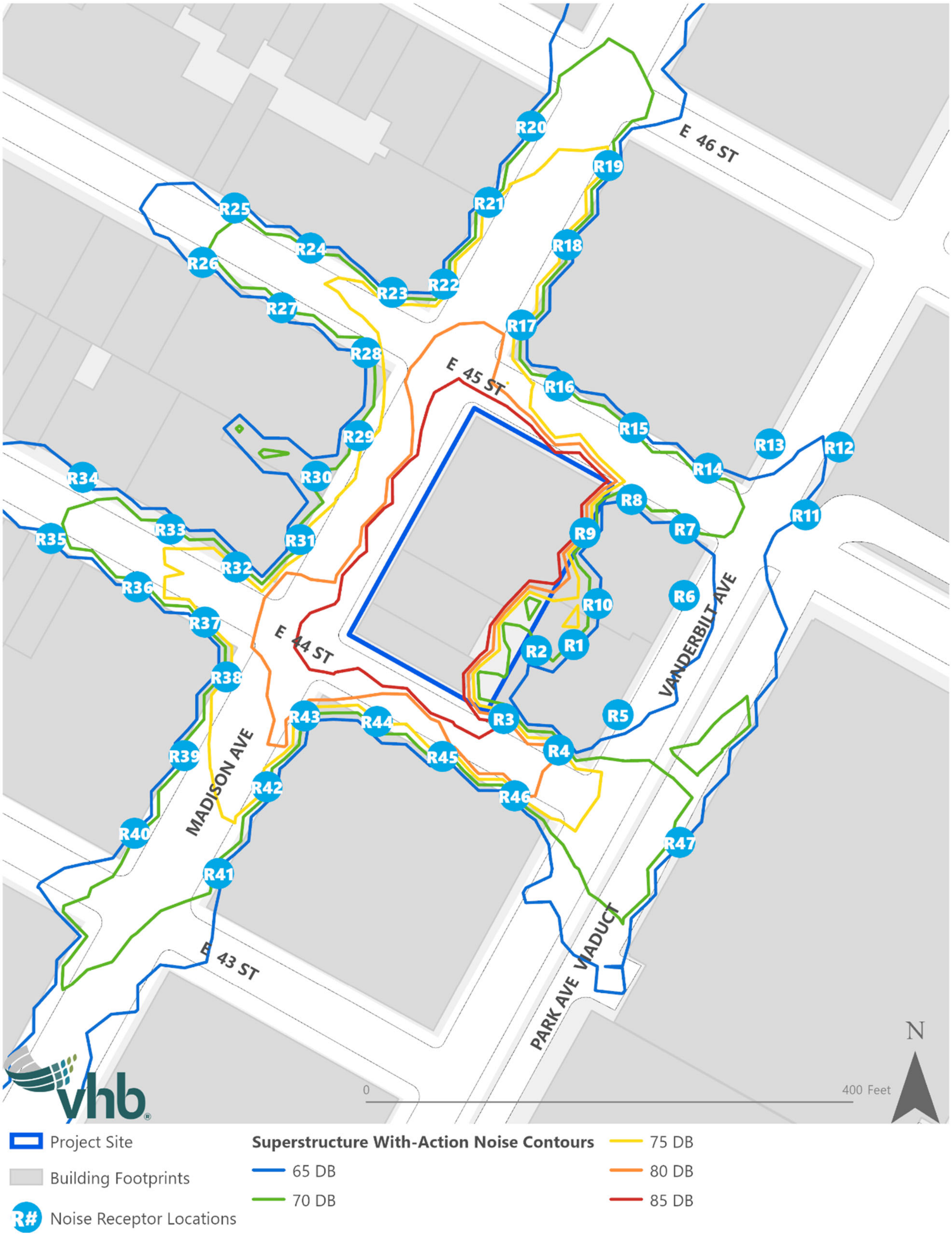
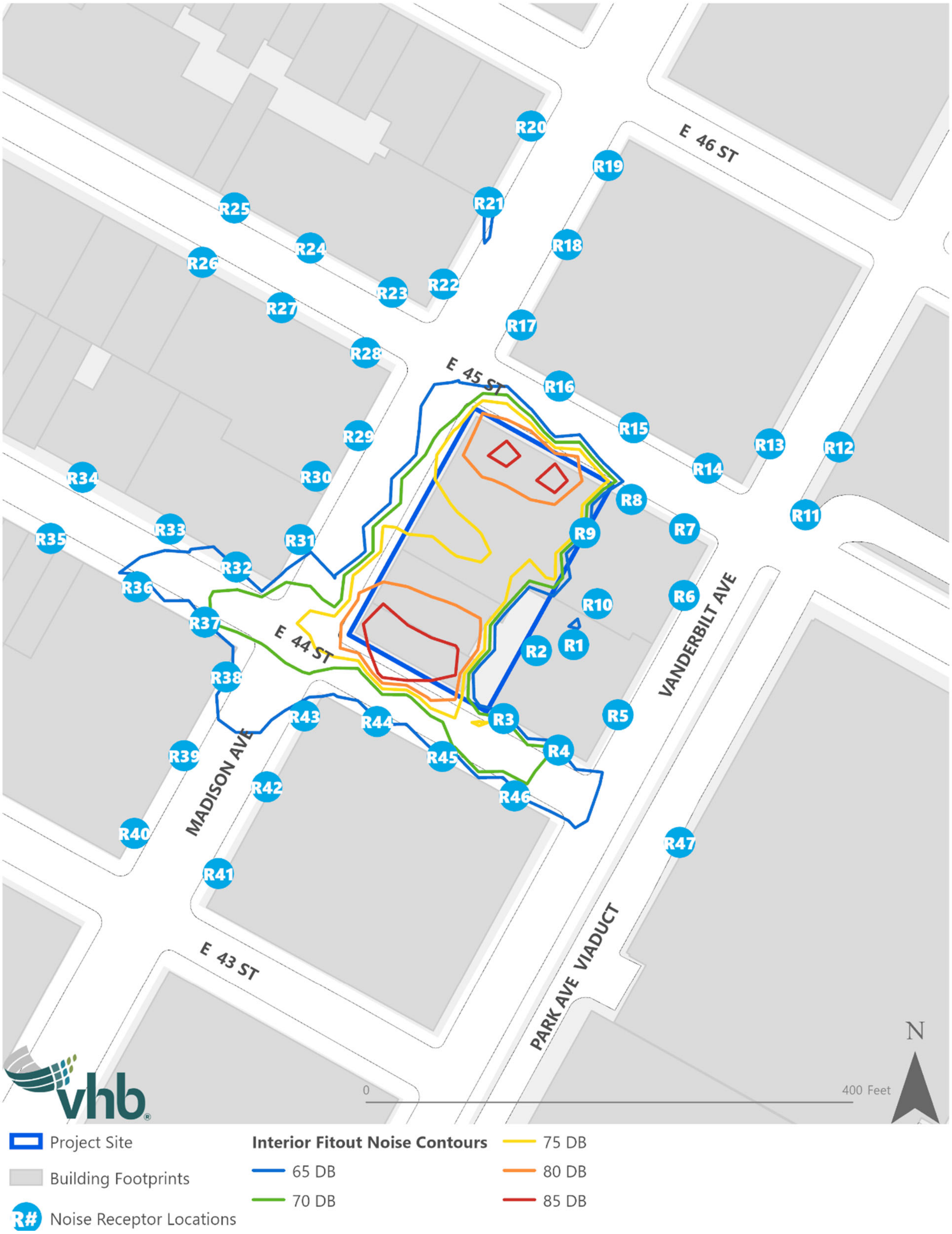


Figure 15-7 Interior Fitout Phase Noise Level Contours



With the adherence to existing construction noise regulations and the implementation of a Construction Noise Mitigation Plan, as required by the New York City Noise Code, as well as the use of a 12-foot perimeter construction noise barrier and acoustic enclosures around compressors and generators, construction noise would be reduced below the level of significant adverse noise impact. Therefore, construction of the Proposed Project is not anticipated to result in significant adverse construction noise impact at receptors near the Project Site.

Cumulative Analysis with 175 Park Avenue

Noise from the simultaneous construction of the Proposed Project and the 175 Park Avenue project has the potential to increase construction vehicles and stationary equipment at each site. Noise from mobile sources would increase by less than 0.5 dBA at all locations in the study area around both Project Sites and cumulatively would be well below the 3 dBA noise increase threshold for potential significant adverse noise impact due to mobile sources.

Figures 15-4 to 15-7 above and Figures 15-5 to 15-14 of the *175 Park Avenue DEIS* show construction noise levels due to mobile and stationary sources during each phase of construction of the two projects. The greatest potential for construction noise impact due to simultaneous construction of the two projects would be at buildings between the two project sites such as the Metlife Building. However, the combined noise from simultaneous construction of the two projects would have a minimal effect on the future construction sound levels and would not result in any additional impacts. As a worst-case example in the study area around both project sites, construction noise at the west façade of the Metlife Building would be up to 75.4 dBA (Leq) during the foundation phase of construction for the Proposed Project With-Action condition. As shown in Figure 15-5 of the *175 Park Avenue DEIS*, construction noise at this location would be up to 60 to 65 dBA during the demolition/excavation/foundation phase of construction for the 175 Park Avenue With-Action condition. Since the construction noise from the 175 Park Avenue project would be 10 decibels or more below the construction noise from the Proposed Project, it would not cause an increase in future construction noise conditions and would not result in new or additional noise impact. As a result, no significant adverse cumulative noise impacts are anticipated from the overlap of construction of the Proposed Project and 175 Park Avenue project.

Vibration

Construction activities have the potential to generate ground-borne vibration that can potentially cause structural or architectural damage or annoy people in nearby vibration-sensitive spaces, such as residences. The most substantial sources of construction vibration are equipment associated with the excavation and foundation phase, such as drill rigs, bulldozers, and jack hammers. Vehicles such as trucks typically do not exceed the thresholds for potential structural damage even for the most fragile structures susceptible to vibration.

Buildings within 90 feet of the Project Site, where there is the greatest potential for vibration impact, include 50 Vanderbilt Avenue (Yale Club) an individual landmark, 52 Vanderbilt Avenue, 47 East 44th Street (MTA Ventilation Building), 45 East 45th Street, 352 Madison Avenue, 346 Madison Avenue, and 333 Madison Avenue. 50 Vanderbilt Avenue is approximately 25 feet away from the Project Site. 52 Vanderbilt Avenue is adjacent to the Project Site. Other buildings, which are across the street from the Project Site, are 60 feet or farther away.

The criteria used by LPC to evaluate potential construction vibration impacts is a peak-particle velocity (PPV) level of 0.5 inches per second or greater. For non-fragile buildings, vibration levels below 0.6 inches per second are not expected to substantially increase the risk of structural damage. **Table 15-14** presents the reference vibration levels from typical equipment at a distance of 25 feet and the distance to potential structural damage for buildings with a criterion of 0.5 inches per second and 0.6 inches per second. This table shows that structural damage may occur from drilling within eight feet. Other sources of vibration, such as bulldozers and jackhammers, may cause potential structural damage when in very close proximity to buildings. Since no construction activities would generate vibration levels in excess of the LPC vibration criteria, there is no potential for significant adverse construction vibration impact.

Since 50 Vanderbilt Avenue (Yale Club) is an individual landmark, the NYCDOB Technical Policy and Protection Notice (TPPN) #10/88 would apply, which requires a vibration monitoring program to reduce the likelihood of construction damage to adjacent New York City Landmarks and NR-listed properties within 90 feet. The applicant would employ means/methods that meet acceptable vibration levels as mandated by NYCDOB.

Table 15-14 Vibration Levels and Distances to Potential Effects

Equipment	Vibration Level at 25 feet (PPV, in/s)	Distance to Potential Structural Damage (feet)	
		(0.5 in/s) Criterion	(0.6 in/s) Criterion
Drilling	0.089	8	7
Large Bulldozer	0.089	8	7
Small Bulldozer	0.003	1	1
Jackhammer	0.035	4	4

Source: VHB 2020, Federal Transit Administration, 2018.

In terms of construction vibration causing potential annoyance, the threshold for potential annoyance is 65 VdB inside buildings. Assuming a 10 VdB outdoor to indoor vibration attenuation for large masonry buildings, there is potential for human annoyance within 65 feet of most other equipment, such as drilling, bulldozers, and jackhammers. These construction activities would only occur for limited periods of time at any particular location. Therefore, there would be no significant adverse impacts as a result of construction vibration.