I. INTRODUCTION

This chapter assesses the potential for the Proposed Actions to result in significant adverse noise impacts. As described in **Chapter 1, "Project Description,"** the Proposed Actions include zoning map and text amendments, a City Map amendment, a waterfront special permit, waterfront authorizations, and a waterfront certification by the New York City Planning Commission (CPC) (collectively, the "Proposed Actions") to facilitate the development of a new approximately 1,154,987 gross square foot (gsf) mixed-use development (the "Proposed Project") on approximately 164,392 sf of lot area ("Projected Development Site 1") in the Astoria neighborhood of Queens Community District 1. The Proposed Project would be comprised of approximately 1,400 dwelling units (DUs) (of which 350 DUs would be affordable), approximately 1,887 gsf of local retail space, approximately 22,638 gsf of community facility space, 525 accessory parking spaces, and 41,363 sf of publicly accessible open space. In addition to the Applicant-owned Projected Development Site 1 (Queens Block 911, Lot 1), the proposed zoning map amendment would rezone one additional site not under the control of the Applicant (Block 911, Lot 49; "Projected Development Site 2"), which is anticipated to be redeveloped with a 219,296 gsf building containing approximately 265 DUs (of which 66 would be affordable), approximately 15,000 gsf of commercial retail uses, and 115 accessory parking spaces.

As discussed in **Chapter 11, "Transportation,"** approval of the Proposed Actions would change traffic patterns and volumes in the general vicinity of the Project Area (Block 911, Lots 1 and 49). As local vehicular traffic is a major source of ambient noise in the area, this could lead to changes in the ambient noise levels. According to the 2020 *CEQR Technical Manual*, if existing noise passenger car equivalent (PCE) values are increased by 100 percent or more due to a proposed action (which is equivalent to an increase of 3.0 dBA or more) a detailed analysis is generally warranted. Conversely, if existing noise PCE values are not increased by 100 percent or more it is likely that a proposed action would not cause a significant adverse vehicular noise impact, and therefore no further vehicular noise analysis is needed.

The noise analysis for the Proposed Actions was carried out in compliance with *CEQR Technical Manual* guidelines and has two components:

1. A screening analysis to determine whether traffic generated by the Proposed Actions would have the potential to result in significant adverse noise impacts on sensitive receptors;

2. An analysis to determine the level of building attenuation necessary to ensure that interior noise levels for the projected developments satisfy applicable interior noise criteria. This attachment does not include an analysis of mechanical equipment because such mechanical equipment would be designed to meet all applicable noise regulations and, therefore, would not result in adverse noise impacts.

II. PRINCIPAL CONCLUSIONS

Noise from the increased traffic volumes generated by the Proposed Actions and resultant reasonable worst-case development scenario (RWCDS) would cause significant adverse noise impacts as the relative increase in noise levels would be above the applicable *CEQR Technical Manual* significant adverse impact threshold (3.0 dBA). Mitigation measures to address the noise impacts on these sensitive receptors are discussed in **Chapter 18, "Mitigation."**

Additionally, as the maximum With-Action L_{10} noise levels at Projected Development Site 1 and Projected Development Site 2 would be greater than 70 dBA, attenuation of 33 dBA would be required along Projected Development Site 1's 26th Avenue frontage within 140 feet of 3rd Street and the facades facing 2nd Street within 50 feet of 26th Avenue, and 31 dBA on the Projected Development Site 1's facades facing 9th Street within 50 feet of 26th Avenue; and attenuation of 31 dBA along Projected Development Site 2's 26th Avenue frontage and all other facades within 50 feet of 26th Avenue. The (E) Designation will require alternate means of ventilation for facades with an exterior noise level of 70 dBA or higher. With implementation of the attenuation levels required pursuant to the (E) designation (E-671), the projected developments would provide sufficient attenuation to achieve the *CEQR Technical Manual* interior noise level guidelines of 45 dBA or lower for residential and community facility uses. Therefore, the Proposed Actions would not result in any significant adverse noise impacts related to building interior noise level requirements at Projected Development Sites 1 and 2.

III. ACOUSTICAL FUNDAMENTALS

Sound is a fluctuation in air pressure. Sound pressure levels (SPLs) are measured in units called "decibels" ("dB"). The particular character of the sound that we hear (a whistle compared with a French horn, for example) is determined by the speed, or "frequency," at which the air pressure fluctuates, or "oscillates." Frequency defines the oscillation of sound pressure in terms of cycles per second. One cycle per second is known as one Hertz ("Hz"). People can hear over a relatively limited range of sound frequencies, generally between 20 Hz and 20,000 Hz, and the human ear does not perceive all frequencies equally well. High frequencies (e.g., a whistle) are more easily discernible and, therefore, more intrusive than many of the lower frequencies (e.g., the lower notes on the French horn).

"A"-Weighted Sound Level (dBA)

In order to establish a uniform noise measurement that simulates people's perception of loudness and annoyance, the decibel measurement is weighted to account for those frequencies most audible to the human ear. This is known as the A-weighted sound level, or "dBA," and it is the descriptor of noise levels most often used for community noise. As shown in **Table 14-1**, the threshold of human hearing is defined as 0 dBA; very quiet conditions (as in a library, for example) are approximately 40 dBA; levels between 50 dBA and 70 dBA define the range of noise levels generated by normal daily activity; levels above 70 dBA would be considered noisy, and then loud, intrusive, and deafening as the scale approaches 130 dBA.

In considering these values, it is important to note that the dBA scale is logarithmic, meaning that each increase of ten dBA describes a doubling of perceived loudness. Thus, the background noise in an office, at 50 dBA, is perceived as twice as loud as a library at 40 dBA. For most people to perceive an increase in noise, it must be at least three dBA. At five dBA, the change will be readily noticeable.

Noise Descriptors Used In Impact Assessment

As the SPL unit of dBA describes a noise level at just one moment and very few noises are constant, other ways of describing noise over extended periods have been developed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific time period as if it had been a steady, unchanging sound. For this condition, a descriptor called the "equivalent sound level," L_{eq}, can be computed. L_{eq} is the constant sound level that, in a given situation and time period (e.g., one hour, denoted by $L_{eq(1)}$, or 24 hours, denoted as $L_{eq(24)}$), conveys the same sound energy as the actual time-varying sound. The Day-Night Sound Level (L_{dn}) refers to a 24-hour average noise level with a ten dB penalty applied to the noise levels during the hours between 10 PM and 7 AM, due to increased sensitivity to noise levels during these hours. Statistical sound level descriptors such as L_1, L_{10}, L_{50}, L_{90}, and L_x, are used to indicate noise levels that are exceeded one, ten, 50, 90, and x percent of the time, respectively.

Table 14-1
Common Noise Levels

Sound Source	Noise Level (dBA)
Military jet, air raid siren	130
Amplified rock music	110
Jet takeoff at 500 meters	100
Freight train at 30 meters	95
Train horn at 30 meters	90
Heavy truck at 15 meters	80–90
Busy city street, loud shout	80
Busy traffic intersection	70–80
Highway traffic at 15 meters, train	70
Predominantly industrial area	60
Light car traffic at 15 meters, city or commercial areas, or residential areas close to industry	50–60
Background noise in an office	50
Suburban areas with medium-density transportation	40–50
Public library	40
Soft whisper at 5 meters	30
Threshold of hearing	0

Note: A ten dBA increase in level appears to double the loudness, and a ten dBA decrease halves the apparent loudness.
Source: Cowan, James P. *Handbook of Environmental Acoustics,* Van Nostrand Reinhold, New York, 1994. Egan, M. David, Architectural Acoustics. McGraw-Hill Book Company, 1988.

The relationship between L_{eq} and levels of exceedance is worth noting. Because L_{eq} is defined in energy rather than straight numerical terms, it is not simply related to the levels of exceedance. If the noise fluctuates very little, L_{eq} will approximate L_{50} or the median level. If the noise fluctuates broadly, the L_{eq} will be approximately equal to the L_{10} value. If extreme fluctuations are present, the L_{eq} will exceed L_{90} or the background level by ten or more decibels. Thus the relationship between L_{eq} and the levels of exceedance will depend on the character of the noise. In community noise measurements, it has been observed that the L_{eq} is generally between L_{10} and L_{50}.

For purposes of the Proposed Actions and resultant RWCDS, the maximum one-hour equivalent sound level ($L_{eq(1)}$) has been selected as the noise descriptor to be used in this noise impact evaluation. $L_{eq(1)}$ is the noise descriptor recommended for use in the *CEQR Technical Manual* for vehicular traffic and is used to provide an indication of highest expected sound levels. The one-hour L_{10} is the noise descriptor used in the *CEQR Technical Manual* noise exposure guidelines for city environmental impact review classification. The L_{dn} is the noise descriptor used in the *HUD Noise Guidebook* and sets exterior noise standards for housing construction projects receiving federal funds. As the Proposed Project and non-

Applicant-owned projected development sites are not anticipated to include federal sources of funding in the future, only the required attenuation levels to meet CEQR noise guidelines are provided in this chapter.

IV. APPLICABLE NOISE CODES AND NOISE STANDARDS AND CRITERIA

New York City Noise Code

The New York City Noise Control Code, which was enacted in December 2005 and became effective July 2007, defines "unreasonable and prohibited noise standards and decibel levels" for the City of New York. The Noise Code generally seeks to reduce ambient noise, prohibiting all unreasonable and unnecessary noise and addressing construction hours and activities. It also (1) establishes sound level standards for specific noise sources, such as motor vehicles, air compressors, and construction activities; (2) requires that all exhausts be muffled; and (3) prohibits all unnecessary noise adjacent to schools, hospitals, or courts. It specifies maximum allowable SPLs for designated octave bands emanating from a commercial or business enterprise as measured within a receiving property (such as a mixed-use and residential property). The Noise Code's enforcement is driven by complaints of violations.

New York CEQR Technical Manual Noise Standards

The *CEQR Technical Manual* sets external noise exposure standards, which are shown in **Table 14-2** below. Noise exposure is classified into four categories based on the L_{10}: Acceptable, Marginally Acceptable, Marginally Unacceptable, and Clearly Unacceptable. The *CEQR Technical Manual* Noise Exposure Guidelines shown in **Table 14-2** are guidelines, not a law. However, City reviewing agencies use the guidelines in determining potential impacts when a project comes under their review.

The *CEQR Technical Manual* also defines attenuation requirements for buildings based on exterior noise levels (see **Table 14-3**). Recommended noise attenuation values for buildings are designed to maintain interior noise levels of 45 dBA or lower for residential, hotel, or community facility uses and interior noise levels of 50 dBA or lower for commercial office uses, and are determined based on exterior $L_{10(1)}$ noise levels.

Table 14-2
Noise Exposure Guidelines for Use in City Environmental Impact Review[1]

Receptor Type	Time Period	Acceptable General External Exposure	Airport[3] Exposure	Marginally Acceptable General External Exposure	Airport[3] Exposure	Marginally Unacceptable General External Exposure	Airport[3] Exposure	Clearly Unacceptable General External Exposure	Airport[3] Exposure
1. Outdoor area requiring serenity and quiet[2]		L_{10} £ 55 dBA	---------- Ldn £ 60 dBA ----------		---------- 60 < Ldn £ 65 dBA ----------		(1) 65 < Ldn £ 70 dBA, (II) 70 £ Ldn		---------- Ldn £ 75 dBA ----------
2. Hospital, Nursing Home		L_{10} £ 55 dBA		55 < L_{10} £ 65 dBA		65 < L_{10} £ 80 dBA		L_{10} > 80 dBA	
3. Residence, residential hotel or motel	7 AM to 10 PM	L_{10} £ 65 dBA		65 < L_{10} £ 70 dBA		70 < L_{10} £ 80 dBA		L_{10} > 80 dBA	
	10 PM to 7 AM	L_{10} £ 55 dBA		55 < L_{10} £ 70 dBA		70 < L_{10} £ 80 dBA		L_{10} > 80 dBA	
4. School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, out-patient public health facility		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)	
5. Commercial or office		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10 PM)		Same as Residential Day (7 AM-10PM)	
6. Industrial, public areas only[4]	Note 4	Note 4		Note 4		Note 4		Note 4	

Source: New York City Department of Environmental Protection (DEP); adopted policy 1983.
Notes:
(i) In addition, any new activity shall comply with the Impact Thresholds detailed in Section 410 of Chapter 19, "Noise," of the *CEQR Technical Manual*.
[1] Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries as given by American National Standards Institute (ANSI) Standards; all values are for the worst hour in the time period.
[2] Tracts of land where serenity and quiet are extraordinarily important and serve an important public need and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients and residents of sanitariums and old-age homes.
[3] One may use the FAA-approved L_{dn} contours supplied by the Port Authority, or the noise contours may be computed from the federally approved INM Computer Model using flight data supplied by the Port Authority of New York and New Jersey.
[4] External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the New York City Zoning Resolution, Sections 42-20 and 42-21. The referenced standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are octave band standards).

Table 14-3
Required Attenuation Values to Achieve Acceptable Interior Noise Level

	Marginally Unacceptable				Clearly Unacceptable
Noise level with proposed development	70<L_{10}≤73	73<L_{10}≤76	76<L_{10}≤78	78<L_{10}≤80	80<L_{10}
Attenuation[A]	(I) 28 dB(A)	(II) 31 dB(A)	(III) 33 dB(A)	(IV) 35 dB(A)	36 + (L_{10} - 80)[B] dB(A)

Source: DEP; 2020 *CEQR Technical Manual*, Table 19-3.
Notes:
[A] The above composite window-wall attenuation values are for residential dwellings. Commercial office spaces and meeting rooms would be 5.0 dB(A) less in each category. All the above categories require a closed window situation and, hence, an alternate means of ventilation.
[B] Required attenuation values increase by 1.0 dB(A) increments for L_{10} values greater than 80 dBA.

V. NOISE PREDICTION METHODOLOGY

Future No-Action and With-Action noise levels can be calculated using either the proportional modeling technique or the Federal Highway Administration (FHWA) Traffic Noise Model (TNM) version 2.5. As stated in the *CEQR Technical Manual*, the proportional modeling technique may be employed for most projects. However, TNM modeling should be used when: (a) conditions result in new or significant changes in roadway or street geometry; (b) roadways currently carry no or very low traffic volumes; (c) ambient noise is the result of multiple sources including traffic; or (d) a detailed analysis of changes due to the traffic component of the total ambient noise levels is necessary. As 26th Avenue carries very low traffic volumes under existing conditions, TNM modeling was used at Receptor Locations 1 and 3 to account for noise associated with the additional project-generated traffic along 26th Avenue. As there is no roadway adjacent to Receptor Location 2, TNM modeling was used at Receptor Location 2 to estimate future noise levels.

Analyses for the Proposed Actions were conducted for 4 typical time periods: the weekday AM peak hour (8:00 AM to 9:00 AM), the weekday midday peak hour (12 PM to 1 PM), the weekday PM peak hour (5 PM to 6 PM) and the Saturday peak hour (2 PM to 3 PM). These time periods are the hours when the maximum traffic generation is expected (based on the traffic studies presented in **Chapter 11, "Transportation"**) and, therefore, the hours when future conditions with the Proposed Actions are most likely to result in maximum noise impacts for the receptor locations.

For this analysis, during the noise recording, vehicles were counted and classified. To calculate the 2031 No-Action PCE values at the Project Area, an annual background growth rate of 0.50 percent for years 1 through 5, and 0.25 for years 6 and beyond, plus the estimated incremental travel demand from new development within the vicinity of the Project Area (refer to **Table 2-4** and **Figure 2-5** in **Chapter 2, "Land Use, Zoning, and Public Policy"**) was applied to the PCE noise values based on the existing vehicle volumes presented in **Chapter 11, "Transportation."**[1] In order to obtain the necessary With-Action PCE values to calculate the With-Action noise levels, the 2031 With-Action traffic increment assignments presented in **Chapter 11, "Transportation,"** were converted into PCE values and added to the calculated No-Action PCE values.

The proportional modeling and TNM procedures used for the noise analysis are described below.

Proportional Modeling

Future No-Action and With-Action noise levels can be calculated using a proportional modeling technique, which can be used as a screening tool to estimate changes in noise levels. The proportional modeling technique is an analysis methodology recommended for analysis purposes in the *CEQR Technical Manual.*

Using the proportional modeling technique, the prediction of future noise levels where traffic is the dominant noise source is based on a calculation using measured existing noise levels and predicted changes in traffic volumes to determine noise levels in the future without the Proposed Actions (the No-Action condition) and with the Proposed Actions (the With-Action condition). Vehicular traffic volumes are converted into noise PCE values, for which one medium-duty truck (cargo vehicles with two axles and six tires) is assumed to generate the noise equivalent of 13 cars, one heavy-duty truck (cargo vehicles with three or more axles) is assumed to generate the noise equivalent of 47 cars, and one bus (vehicles having

[1] Background growth rate calculations based on information provided in Table 16-4 of the *CEQR Technical Manual.*

two or three axles and designed to carry more than nine passengers) is assumed to generate the noise equivalent of 18 cars. Future noise levels are calculated using the following equation:

F NL - E NL = 10 * log10 (F PCE / E PCE)

where:

F NL = Future Noise Level
E NL = Existing Noise Level
F PCE = Future PCEs
E PCE = Existing PCEs

Sound levels are measured in decibels and, therefore, increase logarithmically with sound source strength. In this case, the sound source is traffic volumes measured in PCEs. For example, assume that traffic is the dominant noise source at a particular location. If the existing traffic volume on a street is 100 PCEs and if the future traffic volume were increased by 50 PCEs (to a total of 150 PCEs), the noise level would increase by 1.8 dBA. Similarly, if the future traffic were increased by 100 PCEs, or doubled to a total of 200 PCEs, the noise level would increase by 3.0 dBA.To account for the differences between the number of PCE counted during the noise monitoring period and the number of existing traffic volumes presented in Chapter 11, "Transportation," an adjustment factor was created for Receptor Locations 1 and 3 to estimate the existing noise levels using the traffic volumes from the traffic analysis.

Traffic Noise Modeling (TNM)

As the existing traffic volumes along 26th Avenue (Receptor Locations 1 and 3) at the Projected Development Sites' southern frontages are very low, a preliminary assessment using the proportional modeling technique indicated that the future traffic along these roads may have the potential to cause noticeable increases in noise levels. Therefore, to more accurately forecast noise at these locations, a refined analysis was performed using TNM.

TNM is a computerized model developed for the FHWA that calculates the noise contribution of each roadway segment to a given noise receptor. The noise from each vehicle type is determined as a function of the reference energy-mean emission level, corrected for vehicle volume, speed, roadway grade, roadway segment length, and source-receptor distance. Further considerations in modeling the propagation path include identifying the shielding provided by rows of buildings, analyzing the effects of different ground types, identifying source and receptor elevations, and analyzing the effects of any intervening noise barriers. The less refined proportional modeling technique could not account for the noise contributions from adjacent roadways, and thus, over-predicts the project-generated traffic noise levels by attributing all noise due to traffic and traffic changes to the immediately adjacent street. As such, TNM provided more accurate results than proportional modeling for Receptor Locations 1 and 3.

An adjustment factor between the adjusted monitored noise levels and the TNM noise levels was created. This adjustment was arithmetically added to the TNM No-Action and With-Action noise levels to account for modeling limitations and to calibrate modeled noise levels.

Play Area Noise

While people are not usually thought of as stationary noise, children in playgrounds or spectators at outdoor sporting events or concerts can introduce additional sources of noise within communities. According to the *CEQR Technical Manual*, noise generated by children in playgrounds or people using parks is considered a stationary source of noise. As detailed in the *Astoria Cove Development FEIS (2013)*

(ULURP No. C140322 ZMO; N140329 ZRO; C140323 ZSO; C140324 ZSO; N140325 ZAQ; N140326 ZAQ; N140327 ZAQ; C130284 MMO), a publicly accessible play area is planned for development at the northwestern corner of the Astoria Cove site (Block 907, Lot 8) adjacent to Projected Development Site 1 (see **Figure 14-1**). As such, a play area noise analysis was conducted to determine the need for additional attenuation requirements for the building facades with frontage on the planned play area.

Potential noise impacts on the projected development sites due to the use of the planned play area were determined using methodology based on the measurements and procedures outlined in a study entitled, "Development of Noise Assessment Method for School Playground Noise" (2006).[2] To predict potential noise impacts at a given distance from a play area boundary, the study suggests a 4.5 dBA reduction in L_{eq} noise levels per doubling of distance at a distance between 40 and 300 feet, with initial reductions of 4.8 dBA at 20 feet, 6.8 dBA at 30 feet, and 9.1 dBA at 40 feet. Noise levels can be estimated with the following equation at sensitive receptor with a direct line of sight to the play area between 40 to 300 feet:

$$Lp1 = Lp2 - 15*\log(d/10)$$

Where:

Lp1 = the predicted noise level at a specific distance.

Lp2 = the maximum L_{eq} at the boundary of the school play area.

d = the distance from the play area boundary to the sensitive receptor in feet.

In certain situations these values may overstate play area noise levels.

Projected Development Site 1 would have the greatest potential for noise level impacts due to noise from the planned play area on the adjacent Block 907, Lot 8. Specifically, the eastern- and northern-facing façades on the northern portions of Projected Development Site 1 would be the most likely to experience noticeable noise level increases during certain limited periods due to the planned play area, as they are adjacent to the play space and would have a direct line of sight.

Table 14-4 shows the results of the playground noise assessment at these receptors using the methodology described above for predicting play area-generated noise levels. As indicated in the table, the maximum predicted L_{eq} noise levels along the eastern and northern façades of Projected Development Site 1 due to the planned publicly accessible play area would be 61.0 dBA. The predicted play area noise levels presented in **Table 14-4** will be utilized to determine the maximum predicted L_{eq} and L_{10} noise levels by combining the predicted play area noise values with predicted With-Action noise values based on the proportional modeling methodology, further detailed in Section VIII below. Further, in order to more accurately calculate future noise levels at the receptors closest to the planned play area at Block 907, Lot 8 (Receptor Location 2; see Section VI below), the existing TNM noise levels were logarithmically subtracted from the measured existing noise levels and logarithmically added to the predicted TNM No-Action and With-Action noise levels to account for background noise not attributable to vehicular traffic.

[2] Wu, Weixiong, AKRF Inc. "Development of Noise Assessment Method for School Playground Noise," Inter-Noise 2006, Volume 6.

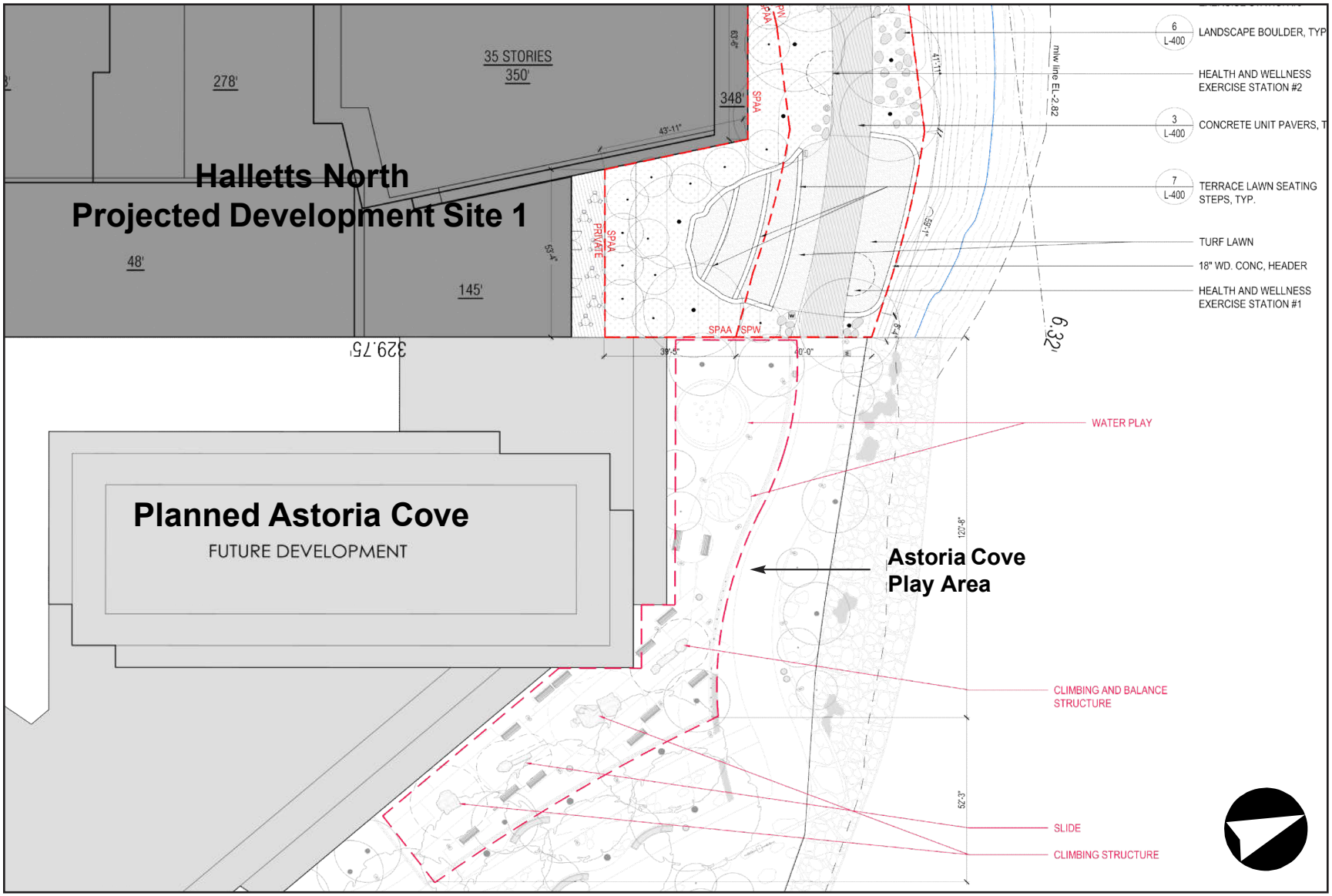


Figure 14-1
Location of Proposed Astoria Cove Play Area

TABLE 14-4
Highest Predicted Noise Levels due to the Planned Publicly Accessible Play Area Only (in dBA)

Receptor Location		Approximate Distance (feet) to Proposed Play Area	Play Area L_{eq} at Receptor (in dBA)
Building	**Façade**		
Projected Development Site 1	Eastern (≤ 100 feet of the US Bulkhead line)	50	61.0
	Northern (≥100 feet of the US Bulkhead line)	50	61.0

Notes: Play Area L_{eq} noise levels presented in this table do not factor in background noise levels.

Building Attenuation Analysis Procedure

In general, the following procedure was used in performing the *CEQR Technical Manual* building attenuation analysis:

- Noise-sensitive receptor locations that have the greatest potential for being adversely affected by action-generated noise in the 2031 analysis year and the location of dominant sources of ambient noise were identified;
- Noise receptor locations were selected based on the following criteria: (1) locations where the highest noise levels are likely to occur based upon the consideration of land use patterns (e.g., locations near major commercial roadways, industrial uses, or stationary sources, etc.); and (2) along future street frontages of the projected development sites;
- Existing noise levels were determined through field measurements of ambient noise adjacent to the projected development sites; however, to account for the differences between the number of PCE counted during the noise monitoring period and the number of existing traffic volumes presented in Chapter 11, "Transportation," for consistency purposes existing noise levels were adjusted using the traffic volumes from the traffic analysis;
- Future (2031) noise levels without the Proposed Actions were predicted using the PCE-based proportionality equation or TNM (per *CEQR Technical Manual* guidelines) for all locations where local traffic is the dominant source of noise and were based on the 2031 No-Action vehicle trip assignments presented in **Chapter 11, "Transportation**";
- Future (2031) noise levels with the Proposed Actions were predicted using the PCE-based proportionality equation or TNM (per *CEQR Technical Manual* guidelines) based on the 2031 With-Action vehicle trip assignments presented in **Chapter 11 "Transportation"**;
- Future (2031) noise levels with the Proposed Actions were compared with future noise levels without the Proposed Actions to determine, by applying *CEQR Technical Manual* impact criteria, whether the Proposed Actions and resultant RWCDS would have the potential to result in a significant adverse impact;

- Estimated noise levels from the nearby play area were added logarithmically to With-Action noise levels to determine the level of attenuation needed to provide acceptable interior space noise levels;
- Noise levels were determined for exterior building façades at the projected development sites; and
- In compliance with CEQR requirements to determine an acceptable interior space noise environment, façade-based composite window/wall attenuation specifications for the Projected Development Sites were estimated based on future projected maximum exterior noise exposure at the Projected Development Sites; CEQR requirements are based on the maximum L_{10} values.

VI. EXISTING NOISE LEVELS

According to the RWCDS, two Projected Development Sites have been identified within the Project Area and no other development is anticipated. Projected Development Site 1 (Block 911, Lot 1) is an Applicant-owned waterfront lot with frontage on two streets, including approximately 129 feet along 26th Avenue to the south and approximately 581 feet along 3rd Street to the west, as well as approximately 306 feet of frontage along the East River to the north (see **Figure 14-2**). The approximately 164,392-sf Projected Development Site 1 is currently vacant and unimproved. The portion of 3rd Street north of 26th Avenue is a privately-owned mapped street but currently unbuilt and is considered part of Projected Development Site 1.

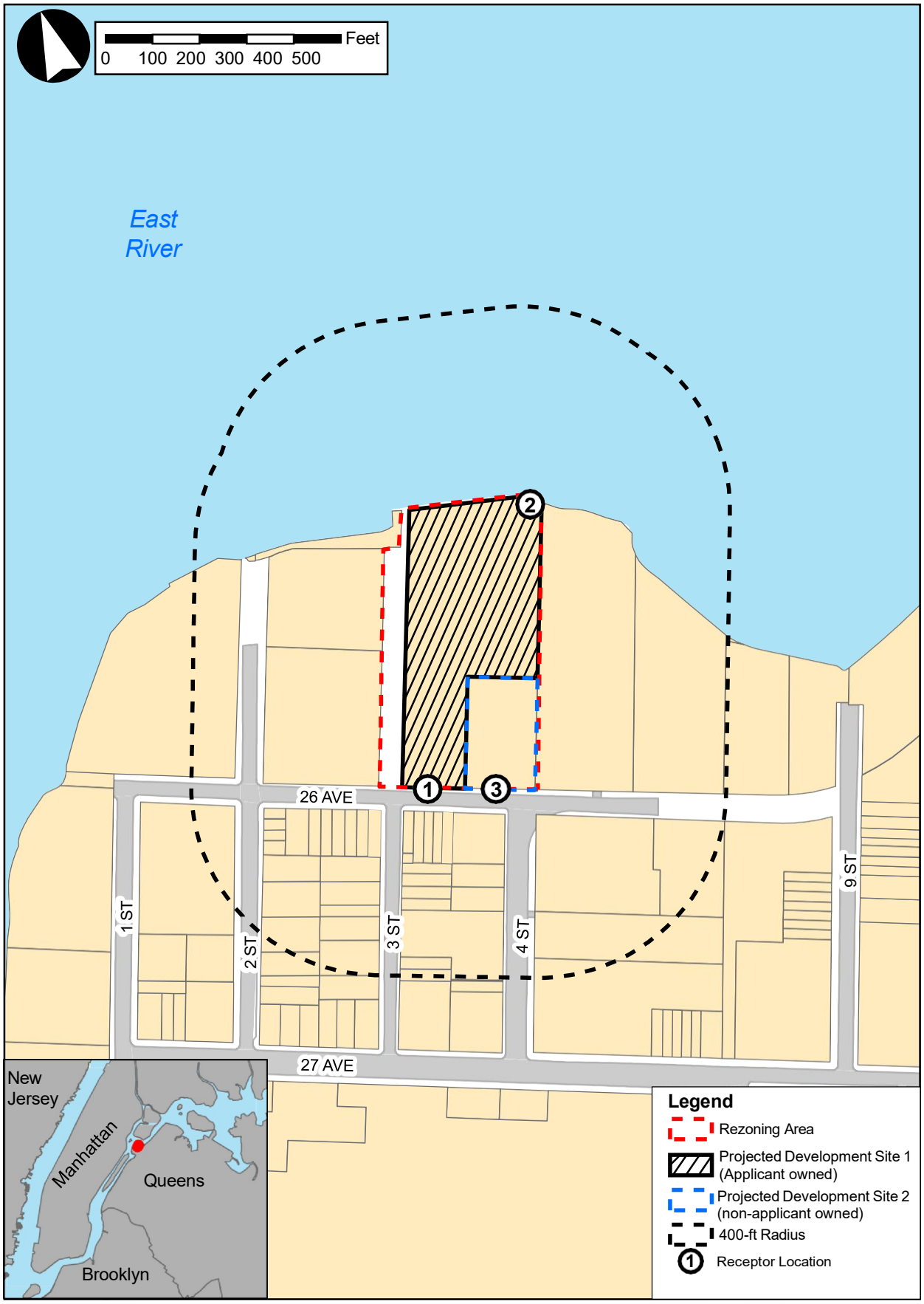
As shown in **Figure 14-2**, Projected Development Site 2 (Block911, Lot 49) is a 34,853-sf lot located directly east of Projected Development Site 1 and is not owned or controlled by the Applicant. The lot contains approximately 151 feet of frontage along 26th Avenue and is currently occupied by a vacant, two-story former warehouse building containing 28,750 gsf of former industrial space.

Noise Monitoring Locations

As traffic along 26th Avenue is the dominant source of noise in the vicinity of the Project Area, the noise receptor locations were selected based upon the assumption that the future developments within the Project Area would be built to their respective lot lines. As such, existing noise levels at the Project Area were measured at two locations along 26th Avenue. In addition, due to the planned play area on the adjacent site (Block 907, Lot 8), existing noise levels at a third location were measured in the northeastern portion of the Project Area closest and with a direct line of site to the future play area. These locations are shown in **Figure 14-1** and described below:

- Receptor Location 1 – Future southern frontage of Applicant-owned Projected Development Site 1 (26thAvenue); approximately 70 feet east of 3rd Street;
- Receptor Location 2 – Future northern/eastern frontage of Applicant-owned Projected Development Site 1; northeast corner of Project Area (approximately 590 feet north of 26th Avenue and 240 feet east of 3rd Street, adjacent to the East River and future play area site on adjacent Block 907); and
- Receptor Location 3 – Future southern frontage of non-Applicant-owned Projected Development Site 2 (26th Avenue); approximately 205 feet east of 3rd Street.

Figure 14-2
Noise Receptor Locations



At all receptor locations, 20-minute spot noise measurements were performed during the weekday AM (8:00 – 9:00 AM), midday (12:00 – 1:00 PM), PM (5:00 – 6:00 PM), and Saturday (2:00 – 3:00 PM) peak periods. The noise monitoring occurred on Thursday, November 19, 2020, Tuesday, April 6, 2021, and Saturday, June 5, 2021. The weather was partly cloudy and in the mid-40s°F on November 19, with a wind speed average of 10 miles per hour; the weather was fair and in the high-50s°F on April 6, with a wind speed average of 10 miles per hour; and the weather was fair and in the low-80s°F on June 5, with a wind speed average of 9 miles per hour. Additionally, vehicle classification counts were conducted during the 20-minute measurements, which were used in the proportional modeling analysis.

Equipment Used During Noise Monitoring

Measurements were performed using Brüel & Kjær Sound Level Meters (SLM) Type 2250 and 2260, Brüel & Kjær ½-inch microphones Type 4189, and Brüel & Kjær Sound Level Calibrators Type 4231. The Brüel & Kjær SLMs are Type 1 instruments according to ANSI Standard S1.4- 1983 (R2006). The SLMs had a laboratory calibration date within one year of the time of use. For the three receptor locations, the microphones were mounted at a height of approximately five feet above the ground surface on a tripod and approximately six feet or more away from any large sound-reflecting surface to avoid major interference with sound propagation. The SLMs were calibrated before and after readings with a Brüel & Kjær Type 4231 Sound Level Calibrator using the appropriate adaptor. Measurements at each location were made on the A-scale (dBA). The data were digitally recorded by the SLMs and displayed at the end of the measurement period in units of dBA. Measured quantities included the L_{eq}, L_1, L_{10}, L_{50}, and L_{90} values, as well as ⅓-octave bands. A windscreen was used during all sound measurements except for calibration. All measurement procedures were based on the guidelines outlined in ANSI Standard S1.13-2005.

Existing Noise Levels At Noise Receptor Locations

Measured Noise Levels

Noise monitoring results for Receptor Locations 1 through 3 are summarized in **Table 14-5**. Traffic was the dominant noise source at Receptor Location 1 and 3 and the values shown reflect the level of vehicular activity on the respective thoroughfares adjacent to the Project Area. Vehicular traffic volumes were counted during the noise recording for each peak period and converted into hourly PCE values.

As described above, for Receptor Locations 1 and 3, existing noise measurements were adjusted based on the difference between the vehicle counts conducted during noise measurement and the existing vehicle counts collected and summarized in **Chapter 11, "Transportation".**

As shown in **Table 14-5**, the results of the monitoring indicated that noise levels are generally highest during the weekday AM and Saturday peak periods. The highest L_{10} noise levels were observed at Receptor Location 1, measuring 67.96 dBA in the weekday AM peak period. Existing L_{10} noise levels at Receptor Location 1 ranged from 62.52 dBA to 67.96 dBA, placing it in the "Marginally Acceptable" CEQR Noise Exposure category. Existing L_{10} noise levels at Receptor Location 2 ranged from 52.48 dBA to 56.66 dBA, placing it in the "Acceptable" CEQR Noise Exposure category. Existing L_{10} noise levels at Receptor Location 3 ranged from 58.52 dBA to 61.64 dBA, placing it in the "Acceptable" CEQR Noise Exposure category.

Table 14-5
Existing Noise Levels (dBA)

Receptor[1]	Measurement Location	Time[2]	L_{eq}	L_1	L_{10}[3]	L_{50}	L_{90}	CEQR Noise Exposure Category[4]
1	26th Avenue (fronting Projected Development Site 1)	AM	65.39	72.19	**67.96**	64.50	60.42	Marginally Acceptable
		MD	64.59	71.15	66.92	63.26	62.01	
		PM	59.33	69.12	62.52	55.88	53.39	
		SAT	60.88	71.64	62.56	58.91	52.96	
2	East River (adjacent future Astoria Cove Play Area)	AM	53.91	56.53	54.93	53.73	52.78	Acceptable[5]
		MD	57.09	70.26	55.27	53.87	52.31	
		PM	54.32	67.36	52.48	49.53	48.46	
		SAT	54.71	62.48	**56.66**	52.55	50.20	
3	26th Avenue (fronting Projected Development Site 2)	AM	60.41	73.05	**61.64**	53.94	52.12	Acceptable
		MD	58.57	72.47	58.52	52.04	49.38	
		PM	58.05	70.41	58.95	49.95	45.08	
		SAT	57.75	67.63	60.15	54.54	50.72	

Notes: Field measurements were performed by Philip Habib & Associates on Thursday, November 19, 2020, Tuesday, April 6, 2021, and Saturday, June 5, 2021.

[1] Receptor locations shown in **Figure 14-2**.

[2] AM = weekday AM peak period; MD = weekday midday peak period; PM = weekday PM peak period; SAT = Saturday peak period.

[3] The highest measured noise level at each receptor is indicated in **bold.**

[4] For consistency purposes, the CEQR noise exposure categories for existing, No-Action, and With-Action conditions are based on the residential and community facility noise exposure guidelines; reflects the worst-case peak hour noise levels.

[5] As the highest existing L_{eq} noise levels at Receptor Location 2 (57.09 dBA) during the weekday midday peak period exceeds that of the corresponding highest existing L_{10} noise level (56.66 dBA), the higher L_{eq} noise levels were used in place of the highest L_{10} noise levels to determine the appropriate CEQR Noise Exposure category, and thus, any relevant noise attenuation requirements.

As described above, the observed noise levels and traffic volumes were adjusted to conform to observed traffic volumes and vehicular classifications for existing conditions that were provided by the traffic study in **Chapter 11, "Transportation".** The adjustments were made using the proportionality equation described in the Methodology section above. Table 14-6 shows the one-hour traffic volumes and noise PCEs for existing conditions.

Table 14-6
Adjusted Existing Noise Levels (dBA)

Receptor	Time	L_{eq}	L_{10}	Autos	Bus	Heavy Trucks	Medium Trucks	Light Trucks	Total	Total PCES
1	AM	68.31	70.88	59	0	6	12	24	100	512
	MD	65.94	68.27	74	8	0	4	4	90	278
	PM	62.80	65.99	93	0	0	0	7	100	100
	SAT	62.48	64.16	56	0	0	0	9	65	65
3	AM	63.33	64.56	53	0	0	29	18	100	453
	MD	62.20	62.15	69	0	0	14	7	90	256
	PM	59.66	60.56	96	0	0	4	0	100	152
	SAT	57.31	59.71	57	0	0	5	3	65	130

VII. THE FUTURE WITHOUT THE PROPOSED ACTIONS (NO-ACTION CONDITION)

Mobile Source Noise Screening Analysis

In the 2031 future without the Proposed Actions (the No-Action condition), it is assumed that Projected Development Site 1 would be developed as a warehouse use. As the existing M1-1 zoning permits 1.0 FAR for manufacturing and commercial uses, it is assumed that Projected Development Site 1 would be

developed with a 2-story 172,612 gsf warehouse and 82 accessory parking spaces. In addition, is assumed that the existing vacant warehouse building on Projected Development Site 2 would be re-occupied with 28,750 gsf of warehouse uses and 14 accessory parking spaces. No other changes to the remaining Project Area lots are anticipated in the future without the Proposed Actions. As vehicle noise emissions on adjacent roadways are the dominant source of noise at Receptor Locations 1 through 3, the change in traffic patterns is expected to affect the levels of ambient noise at those locations. Using the noise prediction methodology described in Section V above, future noise levels in the No-Action condition were calculated for the four analysis periods for the 2031 analysis year. **Table 14-7** shows the measured existing noise levels and calculated future No-Action condition noise levels at the receptor locations.

Comparing future No-Action noise levels with existing noise levels, the increases in L_{eq} noise levels would range from 0.88 dBA to 11.30 dBA at the three receptor locations during all four analysis peak periods over existing conditions. According to *CEQR Technical Manual* guidelines, increases of less than 3.0 dBA would be barely perceptible. Therefore, the increase under No-Action conditions at Receptor Locations 1 and 3 would be perceptible. The projected No-Action L_{10} noise levels at Receptor Location 1 would range from 70.76 dBA to 76.48 dBA and would move to the "Marginally Unacceptable (III)" CEQR Noise Exposure category; projected L_{10} noise levels at Receptor Location 2 would range from 54.23 dBA to 58.28 dBA and would remain in the "Acceptable" CEQR Noise Exposure category; and projected L_{10} noise levels at Receptor Location 3 would range from 71.15 dBA to 73.46 dBA and would move to the "Marginally Unacceptable (II)" CEQR Noise Exposure category under No-Action conditions.

Table 14-7
2031 No-Action Condition Noise Levels (dBA)

Noise Receptor Location[1]	Time[2]	Existing L_{eq}	No-Action L_{eq}	Change in L_{eq}[3]	No-Action L_{10}[4]	CEQR Noise Exposure Category
1	AM	68.31	73.91	5.60	**76.48**	Marginally Unacceptable (III)
	MD	65.94	70.54	4.60	72.87	
	PM	62.80	67.70	4.90	70.89	
	SAT	62.48	69.08	6.60	70.76	
2	AM	53.91	56.37	2.46	57.39	Acceptable
	MD	57.09	57.97	0.88	56.15	
	PM	54.32	56.07	1.75	54.23	
	SAT	54.71	56.33	1.62	**58.28**	
3	AM	63.33	72.23	8.90	**73.46**	Marginally Unacceptable (II)
	MD	62.20	71.20	9.00	71.15	
	PM	59.66	70.96	11.30	71.86	
	SAT	57.75[5]	69.05	11.30	71.45	

Notes: Future No-Action noise levels at Receptor Locations 1 through 3 were calculated using TNM and were adjusted based on the difference between the adjusted measured noise levels from Table 14-6 and TNM modeled values.

[1] Receptor locations shown in **Figure 14-2**.

[2] AM = weekday AM peak period; MD = weekday midday peak period; PM = weekday PM peak period; SAT = Saturday peak period.

[3] Change in L_{eq} = No-Action L_{eq} – Existing L_{eq}.

[4] The highest No-Action noise level at each receptor is indicated in **bold.**

[5] Since the measured noise level is higher than the adjusted existing noise level for Receptor Location 3 during the Saturday peak period, the measured noise level was used to represent existing Saturday peak hour noise levels for conservative analysis purposes.

VIII. THE FUTURE WITH THE PROPOSED ACTIONS (WITH-ACTION CONDITION)

In the 2031 future with the Proposed Actions (the With-Action scenario), the proposed zoning map amendment and zoning text amendment would be approved, allowing the Applicant to construct the Proposed Project (6.0 FAR) at Projected Development Site 1.

In addition, it is assumed that Projected Development Site 2 (Lot 49) would also be redeveloped in the 2031 With-Action scenario. It is anticipated that Projected Development Site 2 would be redeveloped with a 219,296 gsf building containing 265 DUs (of which 66 would be affordable), approximately 15,000 gsf of commercial retail uses, and 115 accessory parking spaces. As a result, the total With-Action RWCDS development for the Project Area would include approximately 1,334,758 gsf of residential space, 16,887 gsf of commercial retail space, and 22,638 gsf of community facility space. The Proposed Actions would result in 1,665 DUs on the Projected Development Sites, of which 416 would be affordable units. In addition, the Proposed Actions would result in a total of 640 accessory parking spaces.

Mobile Source Noise Screening Analysis

Using the methodology described in Section V, future noise levels in the With-Action condition were calculated for the four analysis periods for the 2031 analysis year, which are presented in **Table 14-8**. As presented in the table, after accounting for additional traffic introduced by the Proposed Actions, the maximum projected L_{10} noise level in the With-Action condition would be 77.88 dBA during the weekday AM peak period at Receptor Location 1. Therefore, the highest noise level would be classified in the "Marginally Unacceptable (III)" CEQR Noise Exposure category. The maximum projected L_{10} noise levels in the With-Action condition at Receptor Location 2 would be 58.80 dBA, and thus, would remain in the "Acceptable" CEQR Noise Exposure category, as under existing and No-Action conditions. The maximum projected L_{10} noise levels in the With-Action condition at Receptor Location 3 would be 74.16 dBA, and would remain in the "Marginally Unacceptable (II)" CEQR Noise Exposure category, as under No-Action conditions.

Table 14-8
2031 With-Action Condition Noise Levels (dBA)

Noise Receptor Location[1]	Time[2]	No-Action L_{eq}	With-Action L_{eq}	Change in L_{eq}[3]	With-Action L_{10}[4]	CEQR Noise Exposure Category
1	AM	73.91	75.31	1.40	**77.88**	Marginally Unacceptable (III)
	MD	70.54	72.74	2.20	75.07	
	PM	67.70	71.80	4.10	74.99	
	SAT	69.08	72.08	3.00	73.76	
2	AM	56.37	56.93	0.57	57.95	Acceptable
	MD	57.97	58.24	0.27	56.42	
	PM	56.07	56.74	0.67	54.90	
	SAT	56.33	56.85	0.51	**58.80**	
3	AM	72.23	72.93	0.70	**74.16**	Marginally Unacceptable (II)
	MD	71.20	72.40	1.20	72.35	
	PM	70.96	73.06	2.10	73.96	
	SAT	69.05	70.55	1.50	72.95	

Notes: Future With-Action noise levels at Receptor Locations 1 through 3 were calculated using TNM and were adjusted based on the difference between the adjusted measured noise levels from Table 14-6 and TNM modeled values.

[1] Receptor locations shown in **Figure 14-2**.

[2] AM = weekday AM peak period; MD = weekday midday peak period; PM = weekday PM peak period; SAT = Saturday peak period.

[3] Change in L_{eq} = With-Action L_{eq} – No-Action L_{eq}.

[4] The highest With-Action noise level at each receptor is indicated in **bold.**

Furthermore, comparing the future With-Action noise levels with No-Action noise levels, increases in L_{eq} noise levels would vary at the three receptor locations, ranging from 0.27 to 4.10 dBA. The results of the impact assessment indicate that without mitigation, potential significant adverse noise impacts are projected to occur as a consequence of traffic associated with the Proposed Project at Receptor Location 1.[3]

Off-Site Mobile Source Impacts

The noise impact criteria described above and in Chapter 19, Section 410 of the *CEQR Technical Manual* serve as a screening-level threshold for potential noise impacts. If the Proposed Actions would not result in any exceedances of these criteria at any given receptor, then that receptor would not have the potential to experience a project-generated noise impact. However, if the Proposed Actions would result in exceedances of these noise impact criteria, then further consideration of the noise impact is warranted at that receptor.

Sensitive Receptors

A detailed receptor network was developed for a study area consisting of a 400-ft radius around the Rezoning Area, which would encompass the locations where the maximum project effects related to noise would be expected. Sensitive receptor locations, such as residential properties, open space resources, and community facilities close to the Rezoning Area were selected as noise receptor sites. **Figure 14-3** provides an overview of the receptor locations located within 400 feet of the Rezoning Area.

Impact Analysis Procedure

The following steps were undertaken as part of the operational noise impact assessment process:

1. As a screening measure, CEQR noise criteria were assessed. The 2031 predicted noise level for each receptor was used to identify the appropriate impact criterion.
2. For each receptor resulting in a noise impact based on CEQR criteria, further consideration of the magnitude of impact was conducted by considering:
    a. Significance thresholds established for this project (operational L_{eq} noise increment of 3 dBA or);
    b. Geographic extent of the impact; and
    c. Nature of the land uses affected and their typical hours of operation in comparison to the peak operational hours of the Proposed Project.
3. Mitigation options were considered for those locations determined to have a potentially significant adverse impact.

Off-Site Mobile Source Noise Analysis Results

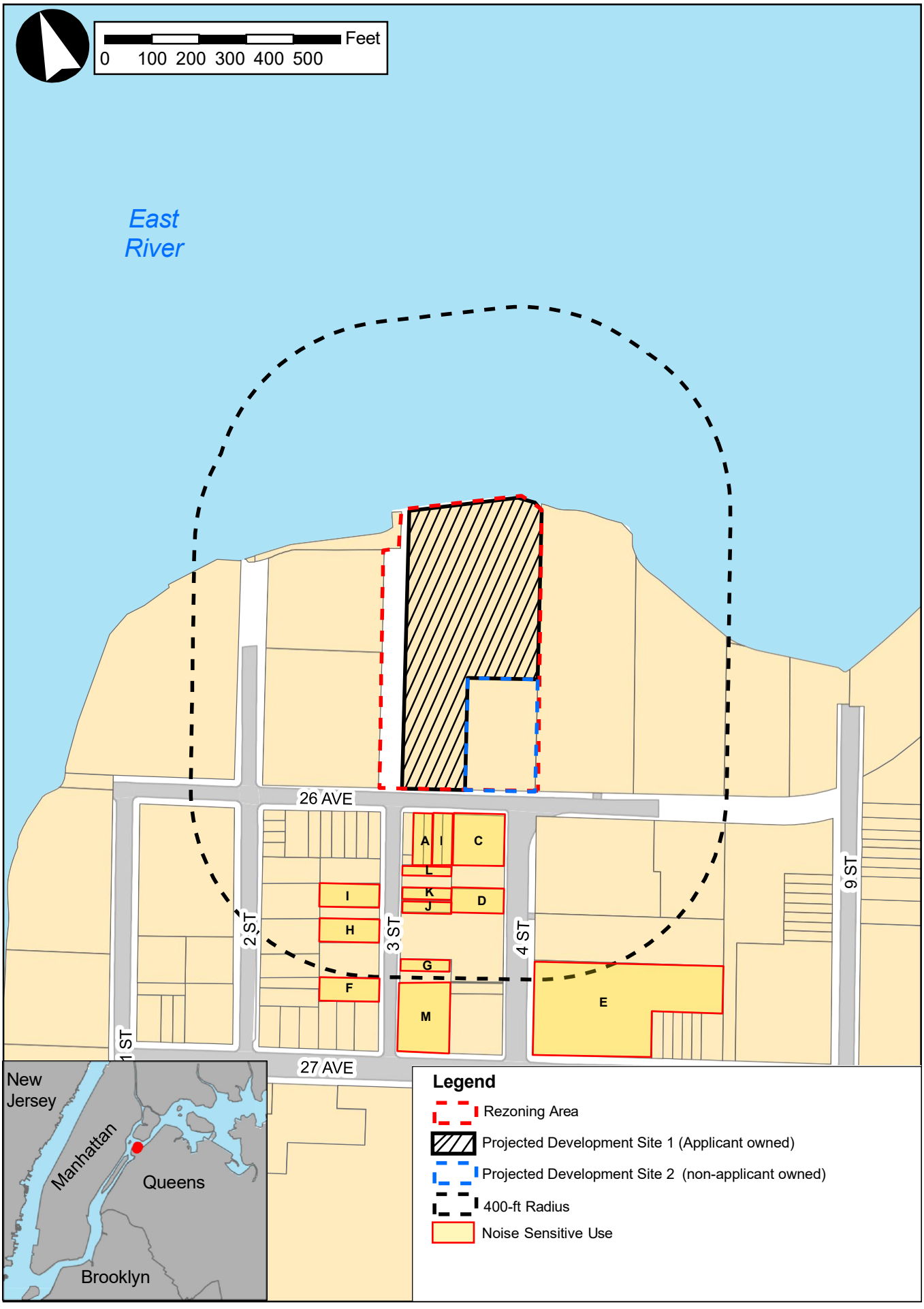
Using the methodology and considering the noise abatement measures described above, noise analyses using TNM were performed to determine the maximum L_{eq} and L_{10} noise levels that would be expected at the sensitive noise receptors that were observed as during each of the four analyzed peak periods (see **Figure 14-3**). The results of the detailed off-site mobile source noise analysis are summarized by address/location in **Table 14-9.**

[3] Additional work will be conducted between the DEIS and FEIS for a more detailed and refined noise analysis.

Table 14-9
Off-Site Mobile Source Noise Analysis Results in dBA

Sensitive Receptor[1]	Location	Land Use	Time[2]	No-Action L_{eq}	With-Action L_{eq}	Change in L_{eq}[3]	With-Action L_{10}
A	3-04 – 3-06 26th Avenue	Residential	AM	73.31	75.91	2.6	**78.48**
			MD	70.14	73.54	3.4	75.87
			PM	67.00	72.10	5.1	75.29
			SAT	67.78	72.18	4.4	73.86
B	3-08 – 3-10 26th Avenue	Residential	AM	74.41	76.01	1.6	**78.58**
			MD	70.94	73.44	2.5	75.77
			PM	68.40	72.30	3.9	75.49
			SAT	68.68	71.98	3.3	73.66
C	26-02 4th Street	Residential	AM	71.13	72.03	0.9	**73.26**
			MD	69.60	70.90	1.3	70.85
			PM	68.56	70.86	2.3	71.76
			SAT	66.21	68.01	1.8	70.41
D	26-18 4th Street	Residential	AM	71.63	71.83	0.2	**73.06**
			MD	69.86	70.46	0.6	70.41
			PM	68.69	69.79	1.1	70.69
			SAT	67.87	68.57	0.7	70.97
E	4-21 27th Avenue	Residential	AM	73.13	72.93	-0.2	**74.16**
			MD	71.26	71.36	0.1	71.31
			PM	69.79	70.79	1.0	71.69
			SAT	68.57	68.97	0.4	71.37
F	26-38 3rd Street	Residential	AM	67.59	73.19	5.6	**75.76**
			MD	66.22	72.22	6.0	74.55
			PM	65.28	72.28	7.0	75.47
			SAT	62.64	69.44	6.8	71.12
G	26-31 3rd Street	Commercial	AM	67.99	72.49	4.5	75.06
			MD	66.92	72.02	5.1	74.35
			PM	66.48	72.68	6.2	**75.87**
			SAT	64.34	70.24	5.9	71.92
H	26-24 3rd Street	Residential	AM	67.69	73.19	5.5	75.76
			MD	66.42	72.42	6.0	74.75
			PM	65.68	72.88	7.2	**76.07**
			SAT	64.44	71.24	6.8	72.92
I	26-18 3rd Street	Residential	AM	67.59	73.19	5.6	75.76
			MD	66.42	72.32	5.9	74.65
			PM	65.68	72.88	7.2	**76.07**
			SAT	64.84	71.54	6.7	73.22
J	26-19 3rd Street	Residential	AM	68.19	71.89	3.7	74.46
			MD	67.12	71.92	4.8	74.25
			PM	66.68	72.88	6.2	**76.07**
			SAT	65.84	71.44	5.6	73.12
K	26-15 3rd Street	Residential	AM	68.09	72.29	4.2	74.86
			MD	67.02	71.82	4.8	74.15
			PM	66.78	72.88	6.1	**76.07**
			SAT	65.84	71.64	5.8	73.32
L	26-11 3rd Street	Residential	AM	68.09	72.09	4.0	74.66
			MD	66.92	71.82	4.9	74.15
			PM	66.88	72.98	6.1	**76.17**
			SAT	66.04	71.64	5.6	73.32
M	26-35 3rd Street	Mixed Residential/ Commercial	AM	67.69	72.29	4.6	74.86
			MD	66.72	71.92	5.2	74.25
			PM	65.98	72.28	6.3	75.47
			SAT	62.14	68.14	6.0	69.82

Figure 14-3
Nearby Noise Sensitive Uses



Notes: Future No-Action and With-Action noise levels at the sensitive receptors were calculated using TNM and were adjusted based on the difference between the adjusted measured noise levels and TNM modeled values.
[1] Sensitive receptor locations shown in **Figure 14-3**.
[2] AM = weekday AM peak period; MD = weekday midday peak period; PM = weekday PM peak period; SAT = Saturday peak period.
[3] Change in L_{eq} = With-Action L_{eq} – No-Action L_{eq}.
[4] The highest With-Action noise level at each receptor is indicated in **bold.**

Receptor A: 3-04 – 3-06 26th Avenue

This brick residential building is located directly across from the Rezoning Area, with street frontage along the south side of 26th Avenue. This building is predicted to exceed the CEQR noise impact screening criteria with a maximum L_{eq} noise increment of 5.1 dBA during the weekday PM peak period (see **Table 14-9**). In addition, the highest L_{10} noise level during the significantly impacted peak hour would be 75.87 dBA during the weekday midday peak period. The change in noise levels at this receptor would be noticeable and potentially intrusive. Therefore, considering the magnitude of the impact, the project-generated noise impact on 3-04 – 3-06 26th Avenue is considered a significant adverse noise impact. Refer to **Chapter 18, "Mitigation,"** for a discussion of mitigation considered for this significant adverse impact.

Receptor B: 3-08 – 3-10 26th Avenue

This residential building is located directly across from the Rezoning Area, with street frontage along the south side of 26th Avenue. This building is predicted to exceed the CEQR noise impact screening criteria with a maximum L_{eq} noise increment of 3.9 dBA during the weekday PM peak period (see **Table 14-9**). In addition, the highest L_{10} noise level during the significantly impacted peak hour would be 75.49 dBA during the weekday PM peak period. The change in noise levels at this receptor would be noticeable and potentially intrusive. Therefore, considering the magnitude of the impact, the project-generated noise impact on 3-08 – 3-10 26th Avenue is considered a significant adverse noise impact. Refer to **Chapter 18, "Mitigation,"** for a discussion of mitigation considered for this significant adverse impact.

Receptor C: 26-02 4th Street

This residential building is located directly across from the Rezoning Area, with street frontage along the south side of 26th Avenue and west side of 4th Street. This building would experience a maximum L_{eq} noise increment of 2.3 dBA during the weekday PM peak period (see **Table 14-9**). Therefore, this building would not exceed the CEQR screening thresholds, and thus, the effects of project-generated noise on 26-02 4th Street are not considered to be a significant adverse noise impact.

Receptor D: 26-18 4th Street

This residential building is located on the block directly south of the Rezoning Area, with street frontage along the west side of 4th Street. This building would experience a maximum L_{eq} noise increment of 1.1 dBA during the weekday PM peak period (see **Table 14-9**). Therefore, this building would not exceed the CEQR screening thresholds, and thus, the effects of project-generated noise on 26-18 4th Street are not considered to be a significant adverse noise impact.

Receptor E: 4-21 27th Avenue

This residential building is located one block southeast of the Rezoning Area, with street frontage along the east side of 4th Street and the north side of 27th Avenue. This building would experience a maximum L_{eq} noise increment of 1.0 dBA during the weekday PM peak period (see **Table 14-9**). Therefore, this

building would not exceed the CEQR screening thresholds, and thus, the effects of project-generated noise on 4-21 27th Avenue are not considered to be a significant adverse noise impact.

Receptor F: 26-38 3rd Street

This residential building is located one block southwest of the Rezoning Area, with street frontage along the west side of 3rd Street. This building is predicted to exceed the CEQR noise impact screening criteria with a maximum L_{eq} noise increment of 7.0 dBA during the weekday PM peak period (see **Table 14-9**). In addition, the highest L_{10} noise level would be 75.76 dBA during the weekday AM peak period. The change in noise levels at this receptor would be noticeable and potentially intrusive. Therefore, considering the magnitude of the impact, the project-generated noise impact on 26-38 3rd Street is considered a significant adverse noise impact. Refer to **Chapter 18, "Mitigation,"** for a discussion of mitigation considered for this significant adverse impact.

Receptor G: 26-31 3rd Street

The site, located on the block directly south of the Rezoning Area, is currently being redeveloped with a six-story commercial building. Once completed (anticipated completion is summer 2022), the new commercial building will contain street frontage along the east side of 3rd Street. This building is predicted to exceed the CEQR noise impact screening criteria with a maximum L_{eq} noise increment of 6.2 dBA during the weekday PM peak period (see **Table 14-9**). In addition, the highest L_{10} noise level would be 75.87 dBA, also during the weekday PM peak period. The change in noise levels at this receptor would be noticeable and potentially intrusive. Therefore, considering the magnitude of the impact, the project-generated noise impact on 26-31 3rd Street is considered a significant adverse noise impact. Refer to **Chapter 18, "Mitigation,"** for a discussion of mitigation considered for this significant adverse impact.

Receptor H: 26-24 3rd Street

This residential building is located one block southwest of the Rezoning Area, with street frontage along the west side of 3rd Street. This building is predicted to exceed the CEQR noise impact screening criteria with a maximum L_{eq} noise increment of 7.2 dBA during the weekday PM peak period (see **Table 14-9**). In addition, the highest L_{10} noise level would be 76.07 dBA, also during the weekday PM peak period. The change in noise levels at this receptor would be noticeable and potentially intrusive. Therefore, considering the magnitude of the impact, the project-generated noise impact on 26-24 3rd Street is considered a significant adverse noise impact. Refer to **Chapter 18, "Mitigation,"** for a discussion of mitigation considered for this significant adverse impact.

Receptor I: 26-18 3rd Street

This residential building is located one block southwest of the Rezoning Area, with street frontage along the west side of 3rd Street. This building is predicted to exceed the CEQR noise impact screening criteria with a maximum L_{eq} noise increment of 7.2 dBA during the weekday PM peak period (see **Table 14-9**). In addition, the highest L_{10} noise level would be 76.07 dBA, also during the weekday PM peak period. The change in noise levels at this receptor would be noticeable and potentially intrusive. Therefore, considering the magnitude of the impact, the project-generated noise impact on 26-18 3rd Street is considered a significant adverse noise impact. Refer to **Chapter 18, "Mitigation,"** for a discussion of mitigation considered for this significant adverse impact.

Receptor J: 26-19 3rd Street

This three-story, brick residential building is located one block south of the Rezoning Area, with street frontage along the east side of 3rd Street. This building is predicted to exceed the CEQR noise impact screening criteria with a maximum L_{eq} noise increment of 6.2 dBA during the Saturday peak period (see **Table 14-9**). In addition, the highest L_{10} noise level would be 76.07 dBA during the weekday PM peak period. The change in noise levels at this receptor would be noticeable and potentially intrusive. Therefore, considering the magnitude of the impact, the project-generated noise impact on 26-19 3rd Street is considered a significant adverse noise impact. Refer to **Chapter 18, "Mitigation,"** for a discussion of mitigation considered for this significant adverse impact.

Receptor K: 26-15 3rd Street

This three-story, brick residential building is located one block south of the Rezoning Area, with street frontage along the east side of 3rd Street. This building is predicted to exceed the CEQR noise impact screening criteria with a maximum L_{eq} noise increment of 6.1 dBA during the weekday PM peak period (see **Table 14-9**). In addition, the highest L_{10} noise level would be 76.07 dBA, also during the weekday PM peak period. The change in noise levels at this receptor would be noticeable and potentially intrusive. Therefore, considering the magnitude of the impact, the project-generated noise impact on 26-15 3rd Street is considered a significant adverse noise impact. Refer to **Chapter 18, "Mitigation,"** for a discussion of mitigation considered for this significant adverse impact.

Receptor L: 26-11 3rd Street

This brick residential building is located directly south of the Rezoning Area, with street frontage along the east side of 3rd Street. This building is predicted to exceed the CEQR noise impact screening criteria with a maximum L_{eq} noise increment of 6.1 dBA during the weekday PM peak period (see **Table 14-9**). In addition, the highest L_{10} noise level would be 76.17 dBA, also during the weekday PM peak period. The change in noise levels at this receptor would be noticeable and potentially intrusive. Therefore, considering the magnitude of the impact, the project-generated noise impact on 26-11 3rd Street is considered a significant adverse noise impact. Refer to **Chapter 18, "Mitigation,"** for a discussion of mitigation considered for this significant adverse impact.

Receptor M: 26-35 3rd Street

This site, located on the northeast corner of 27th Avenue and 3rd Street one block south of the Rezoning Area, is currently being redeveloped with a seven-story mixed-use residential building with ground floor retail. Once completed, the new building will contain street frontages along the north side of 27th Avenue and the east side of 3rd Street. The building at 26-35 3rd Street would experience a maximum L_{eq} noise increment of 6.3 dBA during the weekday PM peak period (see **Table 14-9**). Therefore, considering the magnitude of the impact, the project-generated noise impacts on 26-35 3rd Street is considered a significant adverse noise impact. Refer to **Chapter 18, "Mitigation,"** for a discussion of mitigation considered for this significant adverse impact.

Play Area Noise

As described above in Section V, due to the location of the nearby planned play area on the adjacent Block 907, Lot 8, the play area noise assessment will utilize the maximum playground boundary noise level presented in **Table 14-4**. Therefore, the referenced noise levels in L_{eq} from the neighboring planned play area is assumed to be:

- 61.0 dBA along the eastern façades of the Proposed Project with a direct line of site to the planned play area on Block 907, Lot 8.[4]

As presented in **Table 14-9**, due to the location of the planned play area, Projected Development Site 1 would experience combined L_{eq} play area noise levels of up to 62.86 dBA at the eastern and northern facades of Projected Development Site 1 within 100 feet of the US Bulkhead line with a direct line of the site to the neighboring planned play area. After calculating the predicted L_{10} noise levels due to the nearby stationary noise source (refer to **Table 14-10**), eastern and northern façades of Projected Development Site 1 fronting the planned play area would both fall in the "Marginally Acceptable" CEQR Noise Exposure category.

TABLE 14-10
Predicted Noise Levels on the Proposed Project due to the Proposed Play Area (in dBA)

Sensitive Receptor		Time	Approximate Distance (feet) to Planned Play Area on Block 907, Lot 8	Playground L_{eq} at Receptor	Predicted Combined L_{eq} at Receptor	Predicted Combined L_{10} at Receptor[1]
Building	Façade					
Projected Development Site 1	Eastern	AM	50	61.0	62.45	65.45
		MD			62.86	65.86
		PM			62.39	65.39
		SAT			62.42	65.42
	Northern	AM	50	61.0	62.45	65.45
		MD			62.86	65.86
		PM			62.39	65.39
		SAT			62.42	65.42

Notes:
[1] For conservative purposes, predicted L_{10} play area noise levels calculated by adding 3 dBA to the predicted playground L_{eq} under future conditions.

IX. NOISE ATTENUATION REQUIREMENTS

As shown in **Table 14-3**, the *CEQR Technical Manual* has noise attenuation guidance for buildings based on exterior noise levels. Recommended noise attenuation values for buildings are designed to maintain a maximum interior noise level of 45 dBA or lower for residential/community facility uses and 50 dBA or lower for commercial office uses, and are determined based on exterior L_{10} noise levels.

[4] Wu, Weixiong, AKRF Inc. "Development of Noise Assessment Method for School Playground Noise," Inter-Noise 2006, Volume 6.

The attenuation of a composite structure is a function of the attenuation provided by each of its component parts and how much of the area is made up of each part. Typically, a building façade is composed of the wall, windows, and any vents or louvers for HVAC systems in various ratios of area. Since the projected developments would most likely be of masonry construction, which typically provides a high level of sound attenuation, the attenuation requirements for CEQR purposes apply primarily to the windows, but may also represent a composite window/wall attenuation value. Window/Wall attenuation can be described in terms of sound transmission class (STC), transmission loss (TL), and outdoor-indoor transmission class (OITC). Although these terms are sometimes used interchangeably, they are unique from each other. Transmission loss refers to how many decibels of sound a façade (wall) or façade accessory (window or door) can stop at a given frequency. The TL for a given construction material varies with the individual frequencies of the noise.

To simplify the noise attenuation properties of a wall, the STC rating was developed. It is a single number that describes the sound isolation performance of a given material for the range of test frequencies between 125 and 4,000 Hz. These frequencies sufficiently cover the range of human speech. Higher STC values reflect greater efficiencies to block airborne sound. HUD uses the STC when identifying the required sound attenuation for a façade.

The OITC is similar to the STC, except that it is weighted more towards the lower frequencies associated with aircraft, rail, and truck traffic. The OITC classification is defined by the American Society of Testing and Materials (ASTM E1332-90 (Reapproved 2003)) and provides a single-number rating that is used for designing a building façade including walls, doors, glazing, and combinations thereof. The OITC rating is designed to evaluate building elements by their ability to reduce the overall loudness of ground and air transportation noise. NYCDEP uses the OITC when identifying the required sound attenuation for a façade.

Based on predicted future With-Action exterior noise levels and *CEQR Technical Manual* criteria, maximum With-Action L_{10} noise levels at Receptor Location 2 would be less than 70 dBA, and, as noted above, would not require special noise attenuation measures beyond standard construction practices for residential/community facility uses on any of the Projected Development Sites' building frontages facing the planned play area on the adjacent Block 907, Lot 8 in order to maintain an interior noise level of 45 dBA or lower for residential/community facility uses. However, Receptor Locations 1 and 3 would experience maximum L_{10} noise levels above 70 dBA (77.88 dBA and 74.16 dBA, respectively), placing each Receptor Location in the "Marginally Unacceptable (III)" and "Marginally Unacceptable (II)" CEQR Noise Exposure categories, respectively. Therefore, attenuation of 33 dBA would be required along Projected Development Site 1's 26th Avenue frontage within 140 feet of 3rd Street and the facades facing 2nd Street within 50 feet of 26th Avenue, and 31 dBA along Projected Development Site 1's facades facing 9th Street within 50 feet of 26th Avenue for residential and community facility uses; and attenuation of 31 dBA would be required along Projected Development Site 2's 26th Avenue frontage and all other facades within 50 feet of 26th Avenue for residential and community facility uses (refer to **Figure 14-4**). Accordingly, Projected Development Sites 1 and 2 would be mapped with an (E)-designation.

E-Designation

The analysis determined that the 26th Avenue frontage and all other facades within 50 feet of 26th Avenue at Projected Development Sites 1 and 2 would require an (E) Designation that would specify the amount of noise attenuation to be provided by the buildings' windows and walls. Attenuation of 33 dBA and 31 dBA at Projected Development Site 1 and 31 dBA at Projected Development Site 2 would be required. The

following (E) Designation, E-671, will be mapped on Projected Development Site 1 (Block 911, Lot 1) and Projected Development Site 2 (Block 911, Lot 49):

> **Block 911, Lot 1 (Projected Development Site 1): In order to ensure an acceptable interior noise environment, future residential/community facility uses must provide a closed window condition with a minimum of 33 dBA window/wall attenuation on the facades facing 26th Avenue within 140 feet of 3rd Street and the facades facing 2nd Street within 50 feet of 26th Avenue, and 31 dBA windown/wall attenuation on the facades facing 9th Street within 50 feet of 26th Avenue in order to ensure an interior noise level not greater than 45 dBA for residential and community facility uses as illustrated in the EIS. To maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, central air conditioning**
>
> **Block 911, Lot 49 (Projected Development Site 2): In order to ensure an acceptable interior noise environment, future residential uses must provide a closed window condition with a minimum of 31 dBA window/wall attenuation on the facades facing 26th Avenue and any other facades within 50 feet of 26th Avenue in order to ensure an interior noise level not greater than 45 dBA for residential uses as illustrated in the EIS. To maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, central air conditioning**

Per the (E) designation requirements, in order to receive a Certificate of Occupancy from the NYC Department of Buildings (DOB) the Proposed Actions must comply with these required composite window/wall attenuation values in order to maintain proper interior noise levels. With this institutional control in place, the Proposed Project would not result in any significant adverse noise impacts related to building attenuation and no further analysis is necessary.

X. OTHER NOISE CONCERNS

Mechanical Equipment

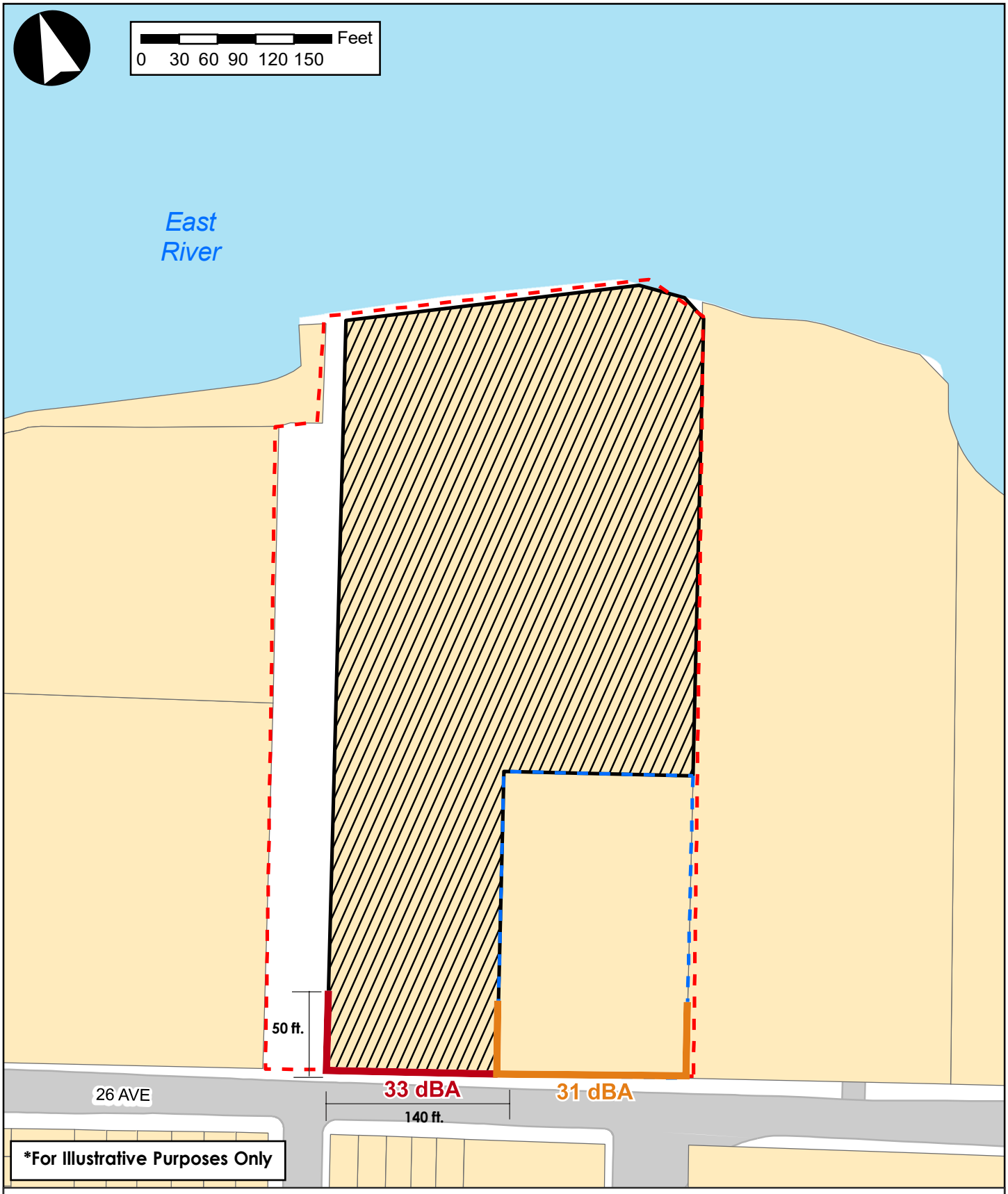
The Proposed Actions would not include any unenclosed mechanical equipment for building ventilation purposes, and would not include any active outdoor recreational space that could result in stationary source noise impacts to the surrounding area. All mechanical equipment would be located either inside the building or would be enclosed on the roof of the structures, and should be designed to meet all applicable noise regulations and requirements. Therefore, the Proposed Actions would not result in any significant increase in ambient noise levels in the vicinity of the Applicant-owned Development Site, the Project Area, or the surrounding study area.

Train Noise

An initial train noise impact screening analysis could be warranted if a new receptor would be located within 1,500 feet of existing rail activity and have a direct line of sight to that activity. As the Project Area is not within 1,500 feet of an existing rail line nor does the site have a direct line of sight to a rail activity, no initial train noise impact screening analysis is warranted.

Figure 14-4

Noise Attenuation Requirements



Aircraft Noise

An initial aircraft noise impact screening analysis would be warranted if the new receptor would either generate or reroute aircraft or introduce a new receptor that is within a 65 dBA DNL contour. Since the Proposed Actions would not generate or reroute aircraft, and as the Project Area is not within a 65 dBA DNL contour, no initial aircraft noise impact screening analysis is warranted.