Chapter 16: Noise

A. INTRODUCTION

This chapter assesses the potential for the Proposed Actions to result in significant adverse noise impacts. The analysis determines whether the Proposed Actions would result in increases in noise levels that could have a significant adverse impact on nearby sensitive receptors and also considers the effect of existing and future noise levels on the projected developments that could result from the Proposed Actions.

As discussed in Chapter 1, "Project Description," the Applicant is seeking a series of land use actions, including zoning map amendments, zoning text amendments, and special permits (the Proposed Actions), to facilitate the Applicant's intended development and programming. The area subject to the Proposed Actions is the five city blocks bound by 35th Avenue to the north, 43rd Street/Northern Boulevard to the east, 36th Avenue to the south, and 37th Street to the west in the Astoria neighborhood of Queens in Community District 1. With the Proposed Actions, the Applicant-controlled lots would be controlled by a Large Scale General Development (LSGD) Special Permit and would contain the Proposed Development (also known as the Innovation QNS project), which includes a series of new mixed-use buildings and publicly accessible open space on Projected Development Sites A through E. The lots controlled by others which are not included in the Proposed Development, but will be rezoned with approval of the Proposed Actions, are referred to as the "Additional Affected Area" (Projected Development Sites F through K).

As discussed in Chapter 13, "Transportation," the Proposed Actions would change traffic volumes in the general vicinity of the Project Area. Therefore, a mobile source analysis was conducted to determine whether there are any noise-sensitive locations where project-generated traffic would have the potential to result in significant adverse noise impacts. In addition, as the Proposed Actions would introduce new playground areas, a playground and cumulative noise analysis was conducted to determine whether there are any noise sensitive locations where the Proposed Actions would have the potential to result in significant adverse noise impacts. Furthermore, because the Proposed Actions would introduce new noise-sensitive receptors, an analysis of cumulative noise exposure, including vehicular traffic and playground noise, at these receptors was conducted to determine the necessary level of window/wall attenuation at each proposed/projected development site and evaluate noise levels at newly introduced open space.

PRINCIPAL CONCLUSIONS

The Proposed Actions would not result in significant adverse noise impacts. A noise assessment was undertaken to determine the levels of noise attenuation that may be needed to achieve interior noise levels that are acceptable and in accordance with 2020 *CEQR Technical Manual* guidance. The *CEQR Technical Manual* has noise attenuation values for buildings based on exterior $L_{10(1)}$ noise levels for the purposes of achieving interior noise levels of 45 dBA or lower for residential and community facility uses and 50 dBA or lower for commercial office uses. The With Action Condition $L_{10(1)}$ noise levels were determined by adjusting the existing noise measurements to

account for future increases in traffic with the Proposed Actions based on the Noise Passenger Car Equivalent (PCE) proportional analysis results, including the noise contribution from vehicular traffic on adjacent roadways, and by calculating the cumulative noise level in the future condition based on the playground noise and future vehicular traffic noise on adjacent roadways.

Based on the projected noise levels, up to 33 dBA window/wall attenuation would be required to achieve acceptable interior noise levels per the *CEQR Technical Manual* noise exposure guideline at residential and community facility uses. Additionally, all dwelling units within the Special Mixed-Use District would require a minimum of 35 dBA window/wall attenuation per ZR Section 123-32. To implement the attenuation requirements at the development sites, an (E) Designation (E-675) or equivalent mechanism for noise would be applied specifying the appropriate window/wall attenuation. By meeting the design guidelines specified in ZR Section 123-32, the Noise (E) Designation or equivalent mechanism, buildings developed as a result of the Proposed Actions would provide sufficient attenuation to achieve the *CEQR Technical Manual* interior noise level guidelines of 45 dBA L_{10} for residential or community facility uses and 50 dBA L_{10} for commercial cinema and office uses.

Additionally, more refined analysis will be conducted between the Draft and Final EIS in consultation with DCP to ensure consistency between the Noise and Traffic analyses.

B. ACOUSTICAL FUNDAMENTALS

Sound is a fluctuation in air pressure. Sound pressure levels are measured in units called "decibels" ("dB"). The particular character of the sound that we hear 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 1 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., diesel truck engine).

"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 16-1**, 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.

Table 16-1
Noise Levels of Common Sources

Sound Source	SPL (dBA)
Air Raid Siren at 50 feet	120
Maximum Levels at Rock Concerts (Rear Seats)	110
On Platform by Passing Subway Train	100
On Sidewalk by Passing Heavy Truck or Bus	90
On Sidewalk by Typical Highway	80
On Sidewalk by Passing Automobiles with Mufflers	70
Typical Urban Area	60–70
Typical Suburban Area	50–60
Quiet Suburban Area at Night	40–50
Typical Rural Area at Night	30–40
Isolated Broadcast Studio	20
Audiometric (Hearing Testing) Booth	10
Threshold of Hearing	0
Source: 2020 *CEQR Technical Manual*	

In considering these values, it is important to note that the dBA scale is logarithmic, meaning that each increase of 10 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 3 dBA. At 5 dBA, the change will be readily noticeable.

NOISE DESCRIPTORS USED IN IMPACT ASSESSMENT

Because the sound pressure level 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., 1 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. 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 1, 10, 50, 90, and x percent of the time, respectively.

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 10 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, the L_{eq} descriptor has been selected as the noise descriptor to be used in this noise impact evaluation. The 1-hour L_{10} is the noise descriptor used in the *CEQR Technical Manual* noise exposure guidelines to determine the required attenuation values to achieve acceptable interior noise levels.

C. NOISE STANDARDS AND CRITERIA

NEW YORK *CEQR TECHNICAL MANUAL* NOISE STANDARDS

The *CEQR Technical Manual* sets external noise exposure standards; these standards are shown in **Table 16-2**. Noise exposure is classified into four categories: acceptable, marginally acceptable, marginally unacceptable, and clearly unacceptable.

The *CEQR Technical Manual* defines attenuation requirements for buildings based on exterior noise level (see **Table 16-3**). Recommended noise attenuation values for buildings are designed to maintain interior noise levels of 45 dBA or lower for residential or community facility uses and 50 dBA or lower for commercial cinema and office uses, and are determined based on exterior $L_{10(1)}$ noise levels.

Table 16-2
Noise Exposure Guidelines For Use in City Environmental Impact Review

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
Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ dBA	---------- Ldn ≤ 60 dBA ----------	**NA**	**NA**	**NA**	**NA**	**NA**	**NA**
Hospital, nursing home		$L_{10} \leq 55$ dBA		55 < $L_{10} \leq 65$ dBA	---------- 60 < Ldn ≤ 65 dBA ----------	65 < $L_{10} \leq 80$ dBA	(i) 65 < Ldn ≤ 70 dBA, (II) 70 ≤ Ldn	$L_{10} > 80$ dBA	---------- Ldn ≤ 75 dBA ----------
Residence, residential hotel, or motel	7 AM to 10 PM	$L_{10} \leq 65$ dBA		65 < $L_{10} \leq 70$ dBA		70 < $L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
	10 PM to 7 AM	$L_{10} \leq 55$ dBA		55 < $L_{10} \leq 70$ dBA		70 < $L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, outpatient 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)	
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-10 PM)	
Industrial, public areas only[4]	Note 4	Note 4		Note 4		Note 4		Note 4	

Notes:
(i) In addition, any new activity shall not increase the ambient noise level by 3 dBA or more; (ii) *CEQR Technical Manual* noise criteria for train noise are similar to the above aircraft noise standards: the noise category for train noise is found by taking the L_{dn} value for such train noise to be an L_{dn} (L_{dn} contour) value.

Table Notes:
[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 nursing homes.
[3] One may use 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).
Source: New York City Department of Environmental Protection (adopted policy 1983).

Table 16-3
Required Attenuation Values to Achieve Acceptable Interior Noise Levels

	Marginally Unacceptable				Clearly Unacceptable
Noise Level With Proposed Actions	$70 < L_{10} \leq 73$	$73 < L_{10} \leq 76$	$76 < L_{10} \leq 78$	$78 < L_{10} \leq 80$	$80 < L_{10}$
Attenuation[A]	(I) 28 dBA	(II) 31 dBA	(III) 33 dBA	(IV) 35 dBA	$36 + (L_{10} - 80)$[B] dBA

Notes:
[A] The above composite window-wall attenuation values are for residential dwellings and community facility uses. Commercial office spaces would be 5 dBA 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 dBA increments for L_{10} values greater than 80 dBA.
Source: New York City Department of Environmental Protection.

IMPACT SIGNIFICANCE CRITERIA

The determination of significant adverse noise impacts in this analysis is informed by the use of both absolute noise level limits and relative impact criteria. According to *CEQR Technical Manual*, for the purposes of determining a significant impact during daytime hours, it is reasonable to consider a L_{eq} noise level of 65 dBA as an absolute noise level that should not be significantly exceeded. Therefore, a significant noise impact would occur at a sensitive noise receptor (i.e., residences, play areas, parks, schools, libraries, and houses of worship) during daytime hours under the following circumstances:

- A noise increase of 3 dBA or greater is predicted in the future as a result of the proposed action (the With Action condition), when the future noise levels without the proposed action (the No Action condition) is at 62 dBA or greater; or
- When the No Action noise level is below 62 dBA, a predicted noise increase with the proposed action exceeds the difference between 65 dBA and the No Action noise level. For example, if the No Action noise level is 61 dBA, then the maximum noise increment with the proposed action would be 4 dBA, since an increase higher than 4 dBA would result in a noise level that exceeds the 65 dBA L_{eq} significant impact threshold.
- Additionally, an increase of With Action noise levels by 5 dBA over a No Action noise level that is at or below 60 dBA would be considered significant.

ENVIRONMENTAL CONDITIONS FOR BUILDINGS IN MX DISTRICTS

The Proposed Actions would change the zoning in the Project Area to a Special Mixed-Use District (MX) consisting of M1-4/R7-3, M1-4/R7X, M1-4/R9 and M1-5/R9-1 districts that allow manufacturing and residential uses. Zoning Resolution (ZR) Section 123-32−Environmental Conditions requires that all new dwelling units (DUs) in Special Mixed-Use Districts be provided with a minimum of 35 dBA window-wall attenuation to maintain an interior noise level of 45 dBA or less. The 35 dBA window-wall attenuation is for a closed-window condition; consequently, a means of alternate ventilation that does not degrade the acoustical performance of the building façade is required for all residential developments. However, it is possible to review and alter the minimum attenuation requirements via a process overseen by the New York City Mayor's Office of Environmental Remediation (OER), which could be undertaken at a later time.

D. EXISTING NOISE LEVELS

SELECTION OF NOISE RECEPTOR LOCATIONS

A total of twelve receptor locations within the Project Area were selected for evaluation of noise attenuation requirements. These locations are detailed below in **Table 16-4** and shown in **Figure 16-1**. The receptor locations were selected based on the following criteria: (1) locations near development sites; and (2) locations that provide comprehensive geographic coverage throughout the study area to get an accurate picture of the ambient noise environment. As discussed below, local traffic is the dominant source of noise in the vicinity of the Project Area. These receptors, due to their proximity to the projected development sites, provide an effective and conservative representation of existing ambient noise levels at the projected development sites.

Table 16-4
Noise Receptor Locations

Noise Receptor	Location
1	35th Avenue at intersection with 42nd Street
2	Northern Boulevard at intersection with 42nd Place
3	41st Street between 35th Avenue and 36th Avenue
4	Steinway Street between 35th Avenue and 36th Avenue
5	38th Street between 35th Avenue and 36th Avenue
6	36th Avenue between 37th Street and 38th Street
7	37th Street between 35th Avenue and 36th Avenue
8	35th Avenue at intersection with 38th Street
9	37th Street near intersection with 35th Avenue
10	36th Avenue at intersection with Steinway Street
11	Northern Boulevard near intersection with 42nd Street
12	42nd Street between 35th Avenue and Northern Boulevard

NOISE MONITORING

At each receptor location, existing noise levels were determined by field measurements. Noise monitoring was performed on June 12, 15, 16, 17, and 19, 2021. At all receptor locations, 20-minute duration measurements were conducted. All measurements were performed during the weekday a.m. (7:15 a.m.–9:15 a.m.), midday (12:00 p.m.–2:00 p.m.), PM (4:00 p.m.–6:00 p.m.), and weekend midday (12:00 p.m.–2:00 p.m.) peak periods. An additional measurement at receptor locations 7 and 9 was conducted during the weekday pre-PM` peak hour (2:30 p.m.to 3:30 p.m.) to account for the potential for playground noise associated with the nearby Our World Neighborhood Charter School and Kids School to influence noise levels at these locations. At all noise measurement 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.

EQUIPMENT USED DURING NOISE MONITORING

Measurements were performed using one Brüel & Kjær Type 2250 Sound Level Meter (SLM), two Brüel & Kjær Type 2270 SLMs, three Brüel & Kjær Type 4189 1/2-inch microphones, and two Brüel & Kjær Type 4231 Sound Level Calibrators. Additonally, one NTi Type XL2 SLM, one NTi Type M2230 1/2-inch microphone, and one NTi Class 1 calibrator were used during the measurements. The Brüel & Kjær and NTi SLMs are Class 1 instruments according to ANSI Standard S1.4-1983 (R2006). The SLMs have a laboratory calibration date within the past one year at the time of use. The SLM was calibrated before and after readings with either a Brüel &

12.1.21



Data source: ODA

INNOVATION QNS
ASTORIA, QUEENS
COMMUNITY DISTRICT 1

Noise Receptor Locations
Figure 16-1

Kjær Type 4231 or NTi Class 1 Sound Level Calibrator using the appropriate adaptor. 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}. Windscreens were 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

The results of the measurements of existing noise levels are summarized in **Table 16-5**. Roadway traffic was the dominant noise source for all receptor locations, with contribution from an auto repair shop near location 4 and playground activity near locations 7 and 9. In terms of *CEQR Technical Manual* criteria, measured noise levels at receptor locations 5 and 7 are categorized as "acceptable," measured noise levels at receptor locations 1, 3, 4, 6, 8, 9, 10, and 12 are categorized as "marginally acceptable," and noise levels measured at receptor locations 2 and 11 are categorized as "marginally unacceptable."

At some noise measurement locations during some of the time periods, traffic counts conducted simultaneously with the noise level measurements may differ substantially from the "existing condition" traffic volumes as determined by the Traffic analysis (See Chapter 13, "Transportation"). Adjustments to existing noise levels at these locations during these times will be considered further between the Draft and Final EIS to ensure consistency between the Noise and Traffic analyses.

Table 16-5
Measured Noise Levels (in dBA)

Receptor	Measurement Location	Time	L_{eq}	L_1	L_{10}	L_{50}	L_{90}
1	35th Avenue at intersection with 42nd Street	AM	62.7	73.9	65.2	58.0	52.1
		MD	65.5	76.6	68.3	60.3	53.3
		PM	66.2	76.5	67.3	61.1	56.1
		WE	66.9	77.5	67.7	60.3	54.5
2	Northern Boulevard at intersection with 42nd Place	AM	72.8	82.0	75.2	71.1	60.5
		MD	69.3	77.9	72.0	66.1	58.6
		PM	71.3	81.1	74.3	67.7	60.5
		WE	68.6	77.2	71.5	66.0	59.0
3	41st Street between 35th Avenue and 36th Avenue	AM	62.1	70.7	62.9	55.4	51.1
		MD	64.0	76.7	65.5	57.5	52.7
		PM	60.8	70.0	64.1	57.1	54.5
		WE	61.2	74.9	60.5	53.8	50.1
4	Steinway Street between 35th Avenue and 36th Avenue	AM	68.2	80.0	69.8	63.6	56.6
		MD	65.9	76.7	68.2	61.8	55.9
		PM	66.6	77.6	68.7	62.4	56.6
		WE	64.6	75.8	66.5	60.7	55.0
5	38th Street between 35th Avenue and 36th Avenue	AM	60.1	69.7	63.0	52.7	49.5
		MD	57.8	68.1	61.9	52.9	49.9
		PM	59.9	69.1	62.8	57.0	55.1
		WE	62.4	72.5	63.2	54.2	50.8
6	36th Avenue between 37th Street and 38th Street	AM	64.3	75.3	66.7	58.9	53.3
		MD	63.3	73.8	65.3	58.4	54.4
		PM	63.3	72.6	65.1	60.1	57.7
		WE	60.4	68.0	64.1	57.7	52.2
7	37th Street between 35th Avenue and 36th Avenue	AM	56.3	65.5	59.3	52.9	50.3
		MD	58.9	67.4	61.5	56.5	54.3
		SC	56.5	64.4	60.2	53.6	51.7
		PM	62.0	66.0	64.2	61.2	60.2
		WE	55.1	64.5	57.5	52.3	50.6
8	35th Avenue at intersection with 38th Street	AM	65.8	76.5	67.4	59.6	55.0
		MD	66.1	77.1	67.6	61.5	56.6
		PM	65.4	74.5	68.2	63.4	60.0
		WE	69.3	78.8	68.0	61.1	56.6
9	37th Street near intersection with 35th Avenue	AM	60.5	71.3	62.4	57.2	55.1
		MD	63.9	73.0	66.1	62.0	59.2
		SC	62.2	71.4	63.9	58.8	55.1
		PM	63.1	72.1	65.8	60.1	57.1
		WE	63.6	75.2	65.1	59.8	56.7
10	36th Avenue at intersection with Steinway Street	AM	66.6	76.8	69.3	62.5	58.3
		MD	67.4	79.0	69.2	63.1	57.8
		PM	67.4	78.1	69.7	62.6	57.9
		WE	66.0	77.5	67.4	60.4	57.2
11	Northern Boulevard near intersection with 42nd Street	AM	73.6	83.5	75.7	71.3	62.7
		MD	71.3	81.8	74.2	67.7	61.7
		PM	74.8	86.6	73.7	67.3	60.8
		WE	69.4	78.0	71.6	67.1	61.2
12	42nd Street between 35th Avenue and Northern Boulevard	AM	64.2	72.9	67.2	61.3	56.3
		MD	68.2	78.6	69.0	58.8	53.4
		PM	62.8	74.4	64.0	59.0	56.0
		WE	66.4	74.2	69.1	62.8	57.9

Note: Field measurements were performed by AKRF, Inc. on June 12, 15, 16, 17, and 19, 2021.

E. NOISE PREDICTION METHODOLOGY

GENERAL METHODOLOGY

Future noise levels (including in the future without the Proposed Actions and the future with the Proposed Actions) were calculated using a proportional modeling technique, which was 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*. The noise analysis examined the weekday AM, midday (MD), PM, and weekend midday peak hours at all receptor locations. The selected time periods are when the Proposed Actions would be expected to result in the maximum traffic generation (based on the traffic studies presented in Chapter 13, "Transportation"), and therefore result in the maximum potential for significant adverse noise impacts. The proportional modeling used for the noise analysis is described below.

PROPORTIONAL MODELING

Proportional modeling was used to determine locations with the potential for having significant noise impacts. Proportional modeling is one of the techniques recommended in the *CEQR Technical Manual* for mobile source analysis.

Using this 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 No Action condition and With Action condition noise levels. Vehicular traffic volumes are converted into Noise Passenger Car Equivalent (Noise PCE) values, for which one medium-duty truck (having a gross weight between 9,900 and 26,400 pounds) is assumed to generate the noise equivalent of 13 cars, and one heavy-duty truck (having a gross weight of more than 26,400 pounds) is assumed to generate the noise equivalent of 47 cars, and one bus (vehicles 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:

$$F\ NL - E\ NL = 10 * \log_{10} (F\ PCE / E\ PCE)$$

where:

F NL = Future Noise Level

E NL = Existing Noise Level

F PCE = Future Noise PCEs

E PCE = Existing Noise 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 Noise 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 PCE and if the future traffic volume were increased by 50 PCE to a total of 150 PCE, the noise level would increase by 1.8 dBA. Similarly, if the future traffic were increased by 100 PCE, or doubled to a total of 200 PCE, the noise level would increase by 3.0 dBA.

PLAYGROUND NOISE

At each of the noise receptor locations that has a direct line of sight to a playground, noise associated with that playground was estimated using the Early Childhood playground boundary noise level (to conservatively represent children of any age using the playground) and any applicable noise level reduction due to distance.

Table 16-6 shows measured maximum hourly playground boundary noise levels. These values are based upon measurements made at a series of New York City school playgrounds for the New York City School Construction Authority (SCA).[1] The noise associated with nearby playgrounds was estimated using the Early Childhood playground boundary noise level to conservatively represent children of any age using the playground. Playground L_{10} noise levels are assumed to be 3 dBA greater than projected L_{eq} values. At receptors with line of sight to existing or future playgrounds, cumulative noise levels including contribution from traffic on adjacent roadways and playground noise is calculated.

Table 16-6
Playground Boundary Noise $L_{eq(1)}$ Noise Levels (in dBA)

Early Childhood	Elementary Schools	Intermediate Schools	High Schools
71.5	71.4	71.0	68.2
Source: 2020 *CEQR Technical Manual*			

F. THE FUTURE WITHOUT THE PROPOSED ACTIONS

Using the methodology previously described, No Action condition noise levels were calculated at the 12 mobile source noise analysis receptors for the 2032 analysis year. These No Action values are shown in **Table 16-7**.

By 2032, the maximum increase in $L_{eq(1)}$ noise levels for the No Action condition would be 3.6 dBA or less at the mobile source noise analysis receptors. Changes of this magnitude would be just noticeable. In terms of CEQR noise exposure guidelines, noise levels at receptor location 5 are categorized as "acceptable," receptor locations 1, 3, 6, 7, 9, and 12 are categorized as "marginally acceptable," and noise levels at receptor locations 2, 4, 8, 10, and 11 are categorized as "marginally unacceptable."

[1] SCA Playground Noise Study, AKRF, Inc., October 23, 1992.

Table 16-7
2032 No Action Condition Noise Levels (in dBA)

Receptor	Measurement Location	Time	Existing $L_{eq(1)}$[1]	No Action $L_{eq(1)}$	$L_{eq(1)}$ Change	No Action $L_{10(1)}$
1	35th Avenue at intersection with 42nd Street	AM	63.4	63.7	0.3	66.2
		MD	65.6	66.1	0.5	68.9
		PM	66.4	66.9	0.5	68.0
		WE	67.4	68.0	0.6	68.8
2	Northern Boulevard at intersection with 42nd Place	AM	73.5	73.8	0.3	76.2
		MD	69.4	69.9	0.5	72.6
		PM	71.5	72.0	0.5	75.0
		WE	69.1	69.6	0.5	72.5
3	41st Street between 35th Avenue and 36th Avenue	AM	62.8	63.4	0.6	64.2
		MD	64.1	65.1	1.0	66.6
		PM	61.0	60.1	-0.9	63.4
		WE	61.7	62.9	1.2	62.2
4	Steinway Street between 35th Avenue and 36th Avenue	AM	68.9	69.3	0.4	70.9
		MD	66.0	66.6	0.6	68.9
		PM	66.8	67.5	0.7	69.6
		WE	65.1	65.8	0.7	67.7
5	38th Street between 35th Avenue and 36th Avenue	AM	60.8	61.2	0.4	64.1
		MD	57.9	58.4	0.5	62.5
		PM	60.1	60.9	0.8	63.8
		WE	62.9	63.8	0.9	64.6
6	36th Avenue between 37th Street and 38th Street	AM	65.0	65.6	0.6	68.0
		MD	63.4	64.1	0.7	66.1
		PM	63.5	64.2	0.7	66.0
		WE	60.9	61.5	0.6	65.2
7	37th Street between 35th Avenue and 36th Avenue	AM	57.0	57.7	0.7	60.7
		MD	59.0	60.6	1.6	63.2
		SC	56.6	58.2	1.6	61.9
		PM	62.2	64.9	2.7	67.1
		WE	55.6	59.2	3.6	61.6
8	35th Avenue at intersection with 38th Street	AM	66.5	67.0	0.5	68.6
		MD	66.2	67.0	0.8	68.5
		PM	65.6	66.8	1.2	69.6
		WE	69.8	71.3	1.5	70.0
9	37th Street near intersection with 35th Avenue	AM	61.2	61.9	0.7	63.8
		MD	64.0	65.6	1.6	67.8
		SC	62.3	63.9	1.6	65.6
		PM	63.3	66.0	2.7	68.7
		WE	64.1	67.7	3.6	69.2
10	36th Avenue at intersection with Steinway Street	AM	67.3	67.8	0.5	70.5
		MD	67.5	68.3	0.8	70.1
		PM	67.6	68.4	0.8	70.7
		WE	66.5	67.3	0.8	68.7
11	Northern Boulevard near intersection with 42nd Street	AM	74.3	74.6	0.3	76.7
		MD	71.4	71.9	0.5	74.8
		PM	75.0	75.5	0.5	74.4
		WE	69.9	70.4	0.5	72.6
12	42nd Street between 35th Avenue and Northern Boulevard	AM	64.9	65.1	0.2	68.1
		MD	68.3	68.6	0.3	69.4
		PM	63.0	63.3	0.3	64.5
		WE	66.9	67.2	0.3	69.9

Notes:
[1] Includes adjustment for COVID-19 pandemic conditions
Noise levels at all receptor locations were calculated by using proportional modeling.

G. THE FUTURE WITH THE PROPOSED ACTIONS

TRAFFIC NOISE

Using the methodology previously described, With Action condition noise levels were calculated at the 12 mobile source noise analysis receptors for the 2032 analysis year. These With Action values are shown in **Table 16-8**.

By 2032, the maximum increase in $L_{eq(1)}$ noise levels for the With Action condition would be less than 2 dBA at all noise analysis receptors except for receptor 3. Changes of this magnitude would be considered imperceptible and not significant according to *CEQR Technical Manual* noise impact criteria.

The maximum predicted noise level increment at receptor 3 of 4.2 dBA would be considered just noticeable according to *CEQR Technical Manual* guidance, but it would not represent a significant adverse noise impact since there are no existing noise-sensitive land uses along 41st Street between 35th and 36th Avenues, where this receptor is located. Noise exposure at receptors that would be introduced along this roadway segment as part of the Proposed Actions are discussed below in the "Noise Attenuation Measures" section.

In terms of CEQR noise exposure guidelines, With Action condition noise levels at receptor locations 1, 3, 5, 6, 7, and 9 are categorized as "marginally acceptable," and noise levels at receptor locations 2, 4, 8, 10, 11 and 12 are categorized as "marginally unacceptable."

PLAYGROUND NOISE

Development on Projected Development Site A (between Sites A.2 and A.3) may include passive open space with public seating and an active playscape for children, which would constitute a stationary source of noise. The nearest existing noise receptor with direct line of sight to the projected playscape is at minimum 365 feet away from the development site, at which distance playground noise levels would be less than 51 dBA and would not have the potential to result in an increase of 3 dBA or more over the minimum existing noise level at this receptor of 57.9 dBA (as established by measured levels at receptor location 5). Consequently, the potential playground on Projected Development Site A would not have the potential to result in a significant increase in noise levels.

Table 16-8
2032 With Action Condition Noise Levels (in dBA)

Receptor	Measurement Location	Time	No Action $L_{eq(1)}$	With Action $L_{eq(1)}$	$L_{eq(1)}$ Change	With Action $L_{10(1)}$
1	35th Avenue at intersection with 42nd Street	AM	63.7	64.4	0.7	66.9
		MD	66.1	66.7	0.6	69.5
		PM	66.9	67.5	0.6	68.6
		WE	68.0	68.7	0.7	69.5
2	Northern Boulevard at intersection with 42nd Place	AM	73.8	73.9	0.1	76.3
		MD	69.9	70.0	0.1	72.7
		PM	72.0	72.1	0.1	75.1
		WE	69.6	69.8	0.2	72.7
3	41st Street between 35th Avenue and 36th Avenue	AM	63.4	66.1	2.7	66.9
		MD	65.1	66.9	1.8	68.4
		PM	60.1	63.2	**3.1**	66.5
		WE	62.9	67.1	**4.2**	66.4
4	Steinway Street between 35th Avenue and 36th Avenue	AM	69.3	69.8	0.5	71.4
		MD	66.6	67.2	0.6	69.5
		PM	67.5	67.9	0.4	70.0
		WE	65.8	66.3	0.5	68.2
5	38th Street between 35th Avenue and 36th Avenue	AM	61.2	63.0	1.8	66.0
		MD	58.4	59.6	1.2	63.7
		PM	60.9	62.2	1.3	65.2
		WE	63.8	65.1	1.3	68.1
6	36th Avenue between 37th Street and 38th Street	AM	65.6	65.8	0.2	68.2
		MD	64.1	64.4	0.3	66.4
		PM	64.2	64.8	0.6	66.6
		WE	61.5	62.0	0.5	65.7
7	37th Street between 35th Avenue and 36th Avenue	AM	57.7	58.2	0.5	61.2
		MD	60.6	60.6	0.0	63.2
		SC	58.2	58.2	0.0	61.9
		PM	64.9	64.9	0.0	67.1
		WE	59.2	59.2	0.0	61.6
8	35th Avenue at intersection with 38th Street	AM	67.0	67.3	0.3	68.9
		MD	67.0	67.2	0.2	68.7
		PM	66.8	66.9	0.1	69.7
		WE	71.3	71.3	0.0	70.0
9	37th Street near intersection with 35th Avenue	AM	61.9	62.4	0.5	64.3
		MD	65.6	65.8	0.2	68.0
		SC	63.9	64.0	0.1	65.7
		PM	66.0	66.0	0.0	68.7
		WE	67.7	68.2	0.5	69.7
10	36th Avenue at intersection with Steinway Street	AM	67.8	68.2	0.4	70.9
		MD	68.3	68.8	0.5	70.6
		PM	68.4	68.9	0.5	71.2
		WE	67.3	67.9	0.6	69.3
11	Northern Boulevard near intersection with 42nd Street	AM	74.6	74.8	0.2	76.9
		MD	71.9	72.1	0.2	75.0
		PM	75.5	75.6	0.1	74.5
		WE	70.4	70.7	0.3	72.9
12	42nd Street between 35th Avenue and Northern Boulevard	AM	65.1	65.9	0.8	68.9
		MD	68.6	69.5	0.9	70.3
		PM	63.3	64.1	0.8	65.3
		WE	67.2	68.5	1.3	71.2

Note: Noise levels at all receptor locations were calculated by using proportional modeling, except site 5, at which the contribution of playground noise from the potential Site A playscape to the closest existing receptor (located 365 feet away) was added to the proportional modeling results.

H. NOISE ATTENUATION MEASURES

As shown in **Table 16-3**, the *CEQR Technical Manual* has set noise attenuation values for buildings based on exterior $L_{10(1)}$ noise levels in order to maintain interior noise levels of 45 dBA or lower for residential uses and 50 dBA or lower for commercial cinema and office uses. The cumulative exterior $L_{10(1)}$ noise levels were used to determine the building attenuation values for the proposed buildings for community facility and commercial cinema and office uses. As discussed above, the minimum 35 dBA of façade attenuation and the requirement for an alternate means of ventilation included in ZR Section 123-32, as enforced by the New York City Department of Buildings (DOB), would apply to all dwelling units. Further study under the purview of OER would be required to alter the attenuation requirements. Regardless of the final attenuation requirement, requirements of ZR Section 123-32 would be sufficient to ensure acceptable interior noise levels at all dwelling units.

The existing Playground Thirty-Five and Our World Neighborhood Charter School play yards, as well as the potential newly introduced playscape on Block A (between sites A.2 and A.3) would have the potential to contribute to noise exposure at the adjacent development sites. Cumulative noise levels from traffic on nearby roadways and noise due to activity at the nearby playgrounds was determined at the development sites with direct line of sight to the playgrounds.

Table 16-9 shows the minimum window/wall attenuation necessary to meet the *CEQR Technical Manual* and ZR 123-32 requirements for internal noise levels at each of the noise measurement locations. The projected future $L_{10(1)}$ noise levels include the noise contribution from vehicular traffic on adjacent roadways and nearby playgrounds, where applicable.

Table 16-9
Required Attenuation at Noise Measurement Locations (in dBA)

Receptor	Location	Highest Traffic-only With Action $L_{10(1)}$ Value	Highest With Action $L_{10(1)}$ Value Including Playground Noise[1]	Minimum Required CEQR Attenuation[2,3]	Minimum Required ZR 123-32 Attenuation[4]
1	35th Avenue at intersection with 42nd Street	69.5	N/A	N/A	35
2	Northern Boulevard at intersection with 42nd Place	76.3	N/A	33	35
3	41st Street between 35th Avenue and 36th Avenue	68.4	N/A	N/A	35
4	Steinway Street between 35th Avenue and 36th Avenue	71.4	73.1	31	35
5	38th Street between 35th Avenue and 36th Avenue	65.9	69.8[5]	N/A	35
6	36th Avenue between 37th Street and 38th Street	68.2	N/A	N/A	35
7	37th Street between 35th Avenue and 36th Avenue	67.1	69.6	N/A	35
8	35th Avenue at intersection with 38th Street	70.0	74.6	31	35
9	37th Street near intersection with 35th Avenue	69.7	72.1	28	35
10	36th Avenue at intersection with Steinway Street	71.2	N/A	28	35
11	Northern Boulevard near intersection with 42nd Street	76.9	N/A	33	35
12	42nd Street between 35th Avenue and Northern Boulevard	71.2	N/A	28	35

Notes:
[1] Includes noise from existing and newly introduced playgrounds.
[2] Attenuation values are shown for residential or community facility uses; commercial cinema and office uses would require 5 dBA less attenuation.
[3] "N/A" indicates that the highest calculated L_{10} is below 70 dBA. The *CEQR Technical Manual* does not specify minimum attenuation guidance for exterior L_{10} values below this level.
[4] 35 dBA required façade attenuation applies to dwelling units only.
[5] Refers to noise level on east side of 38th Street (i.e., location of Receptor 5 as shown in **Figure 16-1**); façades of buildings A.2, and A.3 adjacent to the Block A playscape would require 31 dBA attenuation due to playground noise, as shown in **Table 16-10**.

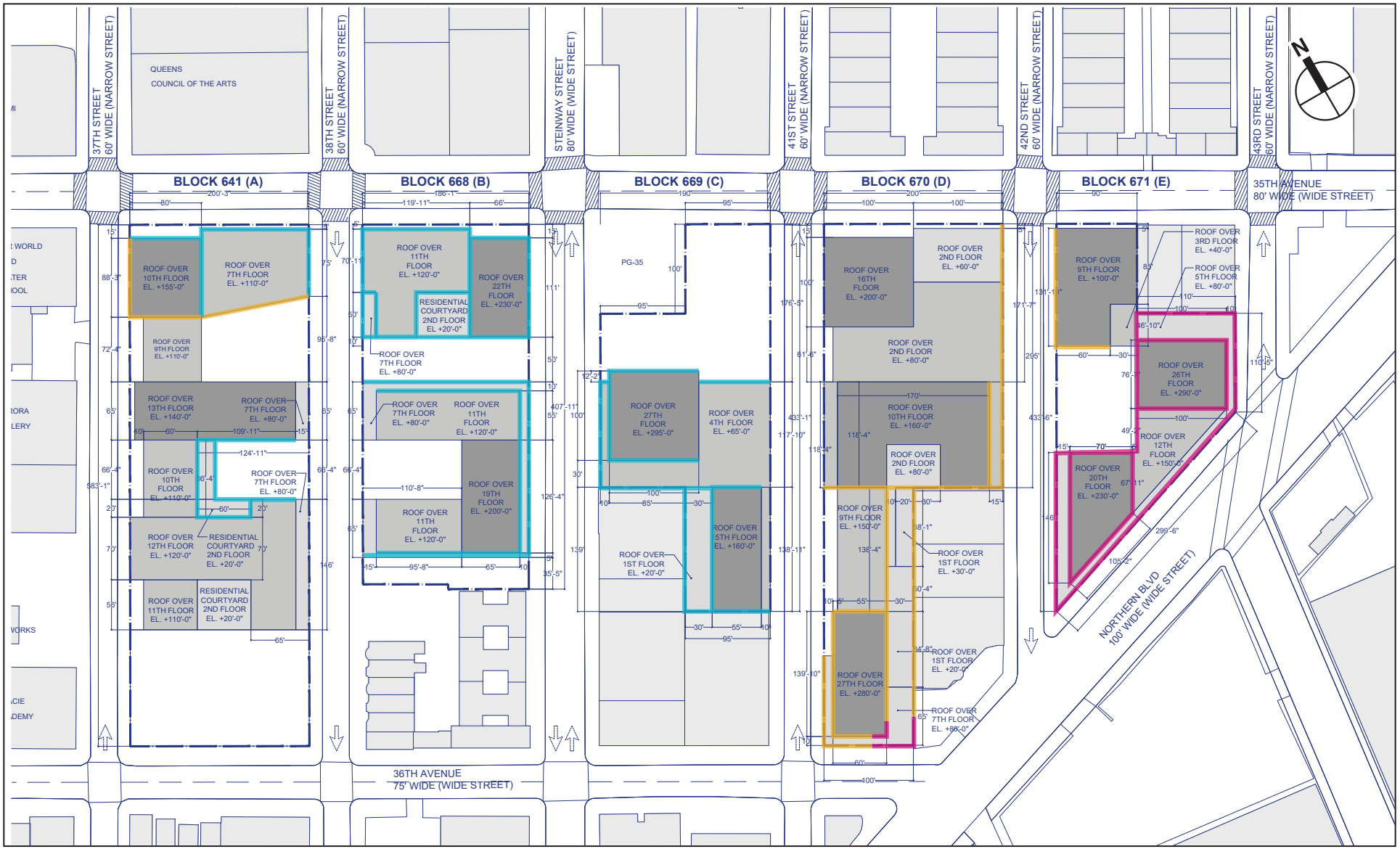
Based on the values shown in **Table 16-9**, required attenuation levels in order to provide an interior noise level of 45 dBA for residential or community facility uses and 50 dBA for commercial

cinema and office uses were determined for all projected development sites. These values are shown in **Table 16-10**. As shown in the table and in **Figure 16-2**, up to 33 dBA window/wall attenuation would be required to provide acceptable interior noise levels per Table 19-3 of the *CEQR Technical Manual* for residential, community facility, and cinema uses; all new dwelling units would be required to provide a minimum of 35 dBA window/wall attenuation per ZR 123-32. These noise levels account for noise from projected vehicular traffic in the future as well as contribution from existing and newly introduced playgrounds.

Table 16-10
Minimum Required Attenuation at Development Sites (in dBA)

Development Site	Block	Lot(s)	Façade	Representative Receptor Site(s)	CEQR Required Attenuation[1,2,3]	ZR 123-32 Attenuation[4]
Projected Development Sites						
A.1	641	p/o Lot 9	North	8	31	35
			East	5, 8	31	35
			South	5, 9	28	35
			West	9	28	35
A.2	641	p/o Lots 9 and 4	North, South	5, 7	N/A	35
			East	5	N/A	35
			Towards Playscape	N/A	31[3]	35
			West	7	N/A	35
A.3	641	p/o Lots 1, 4	North, South	5, 7	N/A	35
			East	5	N/A	35
			Towards Playscape	N/A	31[3]	35
			West	7	N/A	35
B.1	668	p/o Lot 5	North	8	31	35
			East	4, 8	31	35
			South	4, 5	31	35
			West	5, 8	31	35
B.2	668	p/o Lot 5	North, South	4, 5	31[3]	35
			East	4	31[3]	35
			West	5	N/A	35
C.1	669	Lot 13 and p/o Lot 16	North, South	3, 4	31	35
			East	3	N/A	35
			West	4	31	35
C.2	669	Lot 36	North, South	3, 4	31	35
			East	3	N/A	35
			West	4	31	35
D.1	670	p/o Lot 8	North, East	1	N/A	35
			South	3	N/A	35
			West	1, 3	N/A	35
D.2	670	p/o Lot 8, Lots 4, 20, 27, 30	North	1	N/A	35
			East	12	28	35
			South	3, 12	28	35
			West	3	N/A	35
D.3	670	Lots 4 and 47	North	3	N/A	35
			East (greater than 50 feet from Northern Boulevard)	12	28	35
			South, West (greater than 50 feet from Northern Boulevard)	10	28	35
			East or South within 50 feet of Northern Boulevard	11	33	35
E.1	671	Lot 12 and p/o Lot 8	North	1	N/A	35
			East	1	N/A	35
			South	12	28	35
			West	1, 12	28	35

4.20.22



Source: ODA

28 dBA Requirement

31 dBA Requirement

33 dBA Requirement

NOTE: Window/wall attenuation requirements shown are for community facility uses only; commercial office and commercial cinema uses would require 5 dBA less attenuation. Residential dwelling units must be provided 35 dBA window/wall attenuation per ZR 123-32. Attenuation requirements are not applied at retail uses or lobby, corridor, mechanical, or back-of-house areas.

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Noise (E) Designation Attenuation Requirements

Figure 16-2

Table 16-10 (cont'd)
Minimum Required Attenuation at Development Sites (in dBA)

Development Site	Block	Lot(s)	Façade	Representative Receptor Site(s)	CEQR Required Attenuation[1,2,3]	ZR 123-32 Attenuation[4]
Projected Development Sites (cont'd)						
E.2	671	Lots 1,20, and 23	North	2, 12	33	35
			East	2	33	35
			South	2, 11	33	35
			West	11, 12	33	35
Additional Affected Area[4]						
F	668	1, 2	All	5	N/A	35
G	669	7, 8	All	4	31	35
H	669	1, 3, 41	All	3, 4, 10	31	35
I	670	33, 36	All	12	28	35
J	670	39	All	11	33	35
K	671	16, 18	All	1	N/A	35

Notes:
[1] Attenuation values are shown for residential or community facility uses; commercial cinema and office uses would require 5 dBA less attenuation.
[2] "N/A" indicates that the highest calculated L_{10} is below 70 dBA. The *CEQR Technical Manual* does not specify minimum attenuation guidance for exterior L_{10} values below this level.
[3] Attenuation requirement based on cumulative noise level prediction including contribution from traffic on adjacent roadways and projected playground noise.
[4] As residential development is the only noise-sensitive use projected to be developed in the additional affected area as described in Chapter 1, "Project Description," and residential dwelling units would be required to provide a minimum of 35 dBA window/wall attenuation per ZR 123-32, specific noise (E) Designations would not be necessary for these sites.
[5] 35 dBA required façade attenuation applies to dwelling units only.

To require attenuation at the projected development sites, an (E) Designation (E-675) for noise would be applied, specifying the appropriate amount of window/wall attenuation. The text of the (E) Designation would be as follows:

PROJECTED DEVELOPMENT SITE A

Building A1 (Block 641, p/o Lot 9)

To ensure an acceptable interior noise environment, future community facility/commercial office uses must provide a closed-window condition with a minimum of 31 dBA window/wall attenuation on the façades facing 35th Avenue and the façades facing 38th Street and 28 dBA of attenuation on the façades facing 37th Street and the façades facing 36th Avenue in order to maintain an interior noise level not greater than 45 dBA for community facility uses or not greater than 50 dBA for commercial office uses as illustrated in this 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, air conditioning.

Building A2 (Block 641, Lot 4, p/o Lot 9)

To ensure an acceptable interior noise environment, future community facility uses must provide a closed-window condition with a minimum of 31 dBA window/wall attenuation on the façades facing the Block A Playscape in order to maintain an interior noise level not greater than 45 dBA for community facility uses as illustrated in this 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, air conditioning.

Building A3 (Block 641, Lots 1, 4, 9)

To ensure an acceptable interior noise environment, future community facility uses must provide a closed-window condition with a minimum of 31 dBA window/wall attenuation on the façades facing the Block A Playscape in order to maintain an interior noise level not greater than 45 dBA for community facility uses as illustrated in this 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, air conditioning.

PROJECTED DEVELOPMENT SITE B

Building B1 (Block 668, p/o Lot 5)

To ensure an acceptable interior noise environment, future community facility uses must provide a closed-window condition with a minimum of 31 dBA window/wall attenuation on all façades in order to maintain an interior noise level not greater than 45 dBA for community facility uses as illustrated in this 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, air conditioning.

Building B2 (Block 668, p/o Lot 5)

To ensure an acceptable interior noise environment, future community facility uses must provide a closed-window condition with a minimum of 31 dBA window/wall attenuation on the façades facing 35th Avenue and the façades facing 36th Avenue and the façades facing Steinway Street in order to maintain an interior noise level not greater than 45 dBA for community facility uses as illustrated in this 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, air conditioning.

PROJECTED DEVELOPMENT SITE C

Building C1 (Block 669, Lot 13, p/o Lot 16)

To ensure an acceptable interior noise environment, future community facility uses must provide a closed-window condition with a minimum of 31 dBA window/wall attenuation on the façades facing 35th Avenue and the façades facing 36th Avenue and the façades facing Steinway Street in order to maintain an interior noise level not greater than 45 dBA for community facility uses as illustrated in this 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, air conditioning.

Building C2 (Block 669, Lot 36)

To ensure an acceptable interior noise environment, future community facility uses must provide a closed-window condition with a minimum of 31 dBA window/wall attenuation on the façades facing 35th Avenue and the façades facing 36th Avenue and the façades facing Steinway Street in order to maintain an interior noise level not greater than 45 dBA for community facility uses as illustrated in this 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, air conditioning.

PROJECTED DEVELOPMENT SITE D

Building D2 (Block 670, p/o Lot 8, Lots 4, 20, 27, 30)

To ensure an acceptable interior noise environment, future community facility/commercial cinema uses must provide a closed-window condition with a minimum of 28 dBA window/wall attenuation on the façades facing 42nd Street and the façades facing 36th Avenue in order to maintain an interior noise level not greater than 45 dBA for community facility uses or not greater than 50 dBA for commercial cinema uses as illustrated in this 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, air conditioning.

Building D3 (Block 670, Lots 4, 47)

To ensure an acceptable interior noise environment, future community facility/commercial cinema uses must provide a closed-window condition with at minimum of 33 dBA window/wall attenuation on the façades facing 42nd Street or 36th Avenue within 50 feet of Northern Boulevard and 28 dBA of attenuation on the façades facing 41st Street, 42nd Street beyond 50 feet from Northern Boulevard, or 36th Avenue beyond 50 feet from Northern Boulevard in order to maintain an interior noise level not greater than 45 dBA for community facility uses or not greater than 50 dBA for commercial cinema uses as illustrated in this 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, air conditioning.

PROJECTED DEVELOPMENT SITE E

Building E1 (Block 671, Lot 12, p/o Lot 8)

To ensure an acceptable interior noise environment, future commercial office uses must provide a closed-window condition with a minimum of 23 dBA window/wall attenuation on the façades facing 42nd Street and southern façades facing Northern Boulevard in order to maintain an interior noise level not greater than 50 dBA for commercial office uses as illustrated in this 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, air conditioning.

Building E2 (Block 671, Lots 1,20, 23)

To ensure an acceptable interior noise environment, future commercial office uses must provide a closed-window condition with a minimum of 28 dBA window/wall attenuation on all façades in order to maintain an interior noise level not greater than 50 dBA for commercial office uses as illustrated in this 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, air conditioning.

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. Normally, a building façade is composed of the wall, glazing, and any vents or louvers for HVAC systems in various ratios of area. Buildings proposed to be located on the (E) Designated sites would be designed to provide composite window/wall attenuation greater than or equal to the attenuation requirements listed in **Table 16-10**.

By adhering to the requirements specified in ZR 123-32 and the (E) Designation described above, buildings to be developed as a result of the Proposed Actions would provide sufficient attenuation to achieve the *CEQR Technical Manual* interior noise level guidelines of 45 dBA L_{10} for residential or community facility uses and 50 dBA L_{10} for commercial cinema and office uses.

NEWLY INTRODUCED OPEN SPACE

The Proposed Development would include new publicly accessible open spaces, which are expected to be primarily passive spaces. In the With Action condition, predicted noise levels at the proposed open spaces would be in the high 60s to low 70s dBA, which would be above the 55 dBA $L_{10(1)}$ noise level recommended for outdoor areas in the *CEQR Technical Manual* noise exposure guidelines (see **Table 16-2**). As the existing $L_{10(1)}$ noise levels at this location are above 55 dBA, there are no practical and feasible mitigation measures that could be implemented to reduce noise levels to below the 55 dBA $L_{10(1)}$ guideline on the proposed new open spaces. Although noise levels in these areas would be above the guideline noise levels, they would be comparable to noise levels in a number of existing open space areas that are located adjacent to roadways, including Hudson River Park, Riverside Park, Bryant Park, Fort Greene Park, and other urban open space areas. The guidelines are a worthwhile goal for outdoor areas requiring serenity and quiet, such as passive open spaces. However, due to the mix of recreational activity and activity on the surrounding streets present at most New York City open space areas and parks, a relatively low noise level is often not achieved. Therefore, the future projected noise levels would not constitute a significant adverse noise impact to the Proposed Development's open space areas.

I. MECHANICAL EQUIPMENT

It is assumed that the building mechanical systems (i.e., HVAC systems) in all developments facilitated by the Proposed Actions would be designed to meet all applicable noise regulations (i.e., Subchapter 5, §24-227 of the New York City Noise Control Code, the New York City Department of Buildings Code) and to avoid producing levels that would result in any significant increase in ambient noise levels. Therefore, the Proposed Actions would not result in any significant adverse noise impacts related to building mechanical equipment. ✷