12.0 Noise

A. INTRODUCTION

This chapter assesses the potential for the Proposed Action to significantly increase noise levels in the vicinity of the Project Site due to changes in the types, volumes and speeds of motor vehicles in the Study Area or due to the introduction of new on-site stationary noise sources, including on-site heating, ventilation and air conditioning systems. In addition, this evaluation considers the potential effect of introducing new noise-sensitive land uses (i.e., residences, commercial uses and community facilities) into an area characterized by elevated noise levels from nearby manufacturing uses and high volumes of motor vehicles. Since the Proposed Action would include the establishment of high rise towers adjacent to the Queensboro Bridge, the potential for traffic noise from bridge decks to significantly increase interior noise levels at elevated exposed areas of the residential towers was specifically evaluated. All television, movie and commercial production would occur within acoustically-treated interior spaces of the Proposed Action and would not result in any significant adverse noise impacts. The effect of construction activities on community noise levels is addressed in Chapter 19, "Construction Impacts."

Existing Noise Levels. Existing noise levels in the Study Area are first described based on field measurement and application of the Federal Highway Administration (FHWA) Traffic Noise Model (TNM 2.5), the state-of-the-art noise prediction model recommended for use under CEQR to assess the impacts of motor vehicle activity associated with the Proposed Action. TNM 2.5 takes into account traffic parameters affecting noise levels, including vehicle types (automobiles, trucks, etc.), volumes and speeds. In addition, it also allows for the consideration of the unique features of the study area affecting noise levels, including the effects of elevated noise sources (the adjacent Queensboro Bridge) and the acoustic shielding of intervening structures.

Mobile Source Analysis. TNM 2.5 is then applied to predict future changes in noise levels that would occur in the Study Area in the future (2009) with and without the Proposed Action. The potential for the Proposed Action to result in significant adverse noise impacts is assessed based on noise exposure levels and changes in noise levels outlined in the *CEQR Technical Manual*. The results of that analysis indicate that noise levels at all new residences on the Project Site would be in the "Marginally Acceptable" category, and would not require more than standard window/wall attenuation to achieve acceptable interior noise levels. While some noise levels at the proposed office tower in the North Complex would fall within the "Marginally Unacceptable" category, acceptable interior noise levels would be achieved by incorporation in the building construction of window/wall attenuation measures to be required pursuant to an (E) Designation to be mapped on the Project Site. Therefore, no significant adverse impact would occur and there would be no need for additional attenuation at these sites.

Stationary Source Analysis. The potential impact of new on-site stationary noise sources on noise sensitive off-site land uses is evaluated based on applicable New York City building and noise code requirements. The results of that analysis indicate that the HVAC and associated mechanical equipment would be designed and operated to satisfy the requirements of CEQR and the New York City Noise Control Code, Section 24-227. This would ensure that interior noise levels within the proposed structures would be less than the acceptable interior noise level of 45 dBA as required by the New York City Department of Environmental Protection. Therefore, no significant adverse noise

impact would occur as a consequence of stationary noise sources included as part of the Proposed Action.

Variations. An assessment is included of the potential that one or more of the variations to the Preferred Development Program would result in significant adverse noise impacts as a consequence of the different relative levels of residential, commercial and studio development that would occur with the variations compared to the Preferred Development Program. The results of that analysis indicate that, like the Preferred Development Program, none of the variations would result in significant adverse noise impacts.

B. NOISE ASSESSMENT

1. Noise Descriptors

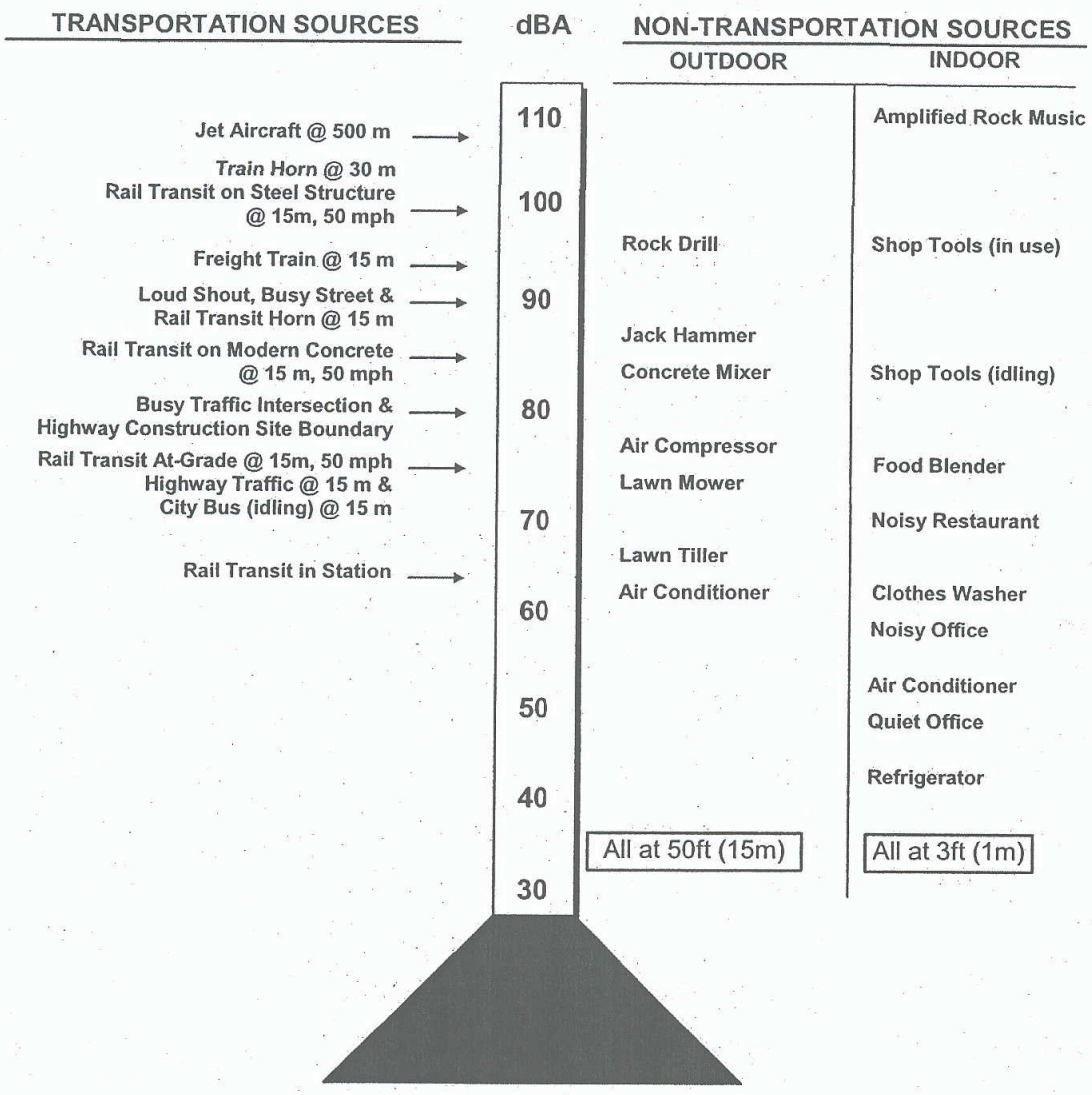
Noise is generally defined as unwanted sound and is typically measured in A-weighted decibels (dBA), which is the noise metric best correlated to human perception of noise. Changes in noise levels less than 3 dBA are barely perceptible to most listeners, whereas a 10 dBA change is normally perceived as doubling (or halving) loudness.

Since noise is composed of sounds from a broad range of natural, mobile and stationary sources, it can vary with time (Figure 12-1). As a consequence, a number of noise metrics that account for the variability of sound are used to quantify noise levels over a specified period. These noise descriptors include the L_1, L_{10}, L_{50}, and L_{90} percentile noise levels. The L_1 is the Sound Pressure Level (SPL) exceeded one percent of the time and is usually regarded as the average maximum noise level. The L_{10} is usually regarded as the intrusive noise level and is equivalent to the SPL exceeded ten percent of the time. The L_{50} is the median noise level, while the L_{90} is usually regarded as the residual or background noise level. The noise metrics adopted by CEQR for noise impact assessment and which are applied in the Silvercup West study are the Energy Equivalent Sound Level (L_{eq}) and the Tenth Percentile Sound Level (L_{10}). L_{eq}, or equivalent steady sound level, is the noise level that corresponds to the averaged sound energy over a given time period. L_{eq} and L_{10} usually differ by 3 dBA in noise dominated by traffic.

2. Analysis Approach

Significant adverse noise impacts from the Proposed Action may occur as a consequence of:

- The effect of motor vehicle activity associated with the Proposed Action on vehicular traffic on the Queensboro Bridge, Vernon Boulevard, Queens Plaza and other roads in the vicinity of the Project Site that may increase noise to a significant degree at new and existing sensitive receptors along travel routes;
- The potential for proposed new sensitive receptors to be introduced in an area with already unacceptable levels of exposure to noise due to motor vehicle activity on the Queensboro Bridge; and
- Significant increases in noise levels from proposed new on-site stationary noise sources.



m = meters; mph = miles per hour.

Sources: FTA Report DOT-T-95-16. "Transit Noise and Vibration Impact Assessment: Final Report", April 1995

Figure 12-1:
Common Indoor and Outdoor Noise Levels

The following procedures are used to assess these potential impacts:

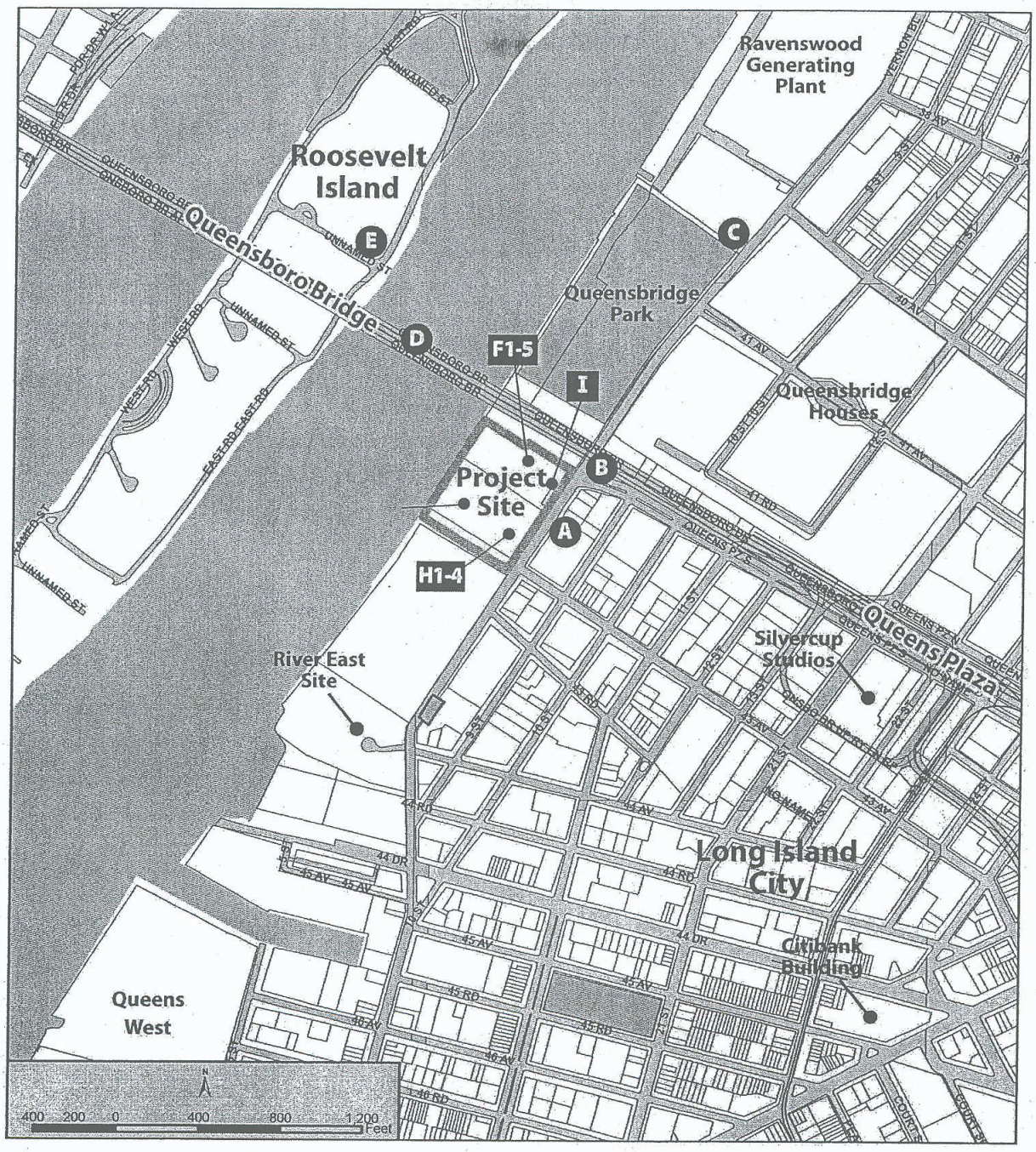
- Identification of noise-sensitive receptor locations that have the greatest potential for being adversely affected by the future project-generated noise from mobile and stationary sources including elevated receptors on the proposed towers and at sensitive land uses along Vernon Boulevard, including within Queensbridge Park;
- Determination of 24-hour existing noise levels at a location with clear line-of-sight to the Queensboro Bridge decks, and which is representative of conditions at the Project Site;
- Estimation of noise levels caused by vehicles traveling over the Queensboro Bridge by on-site monitoring (i.e., monitoring of noise levels at 50 feet from the Bridge);
- Determination of existing noise levels at noise-sensitive receptor sites through short-term field measurements (Figure 12-2);
- Prediction of future noise levels with and without the Proposed Action in 2009 during three time periods of the day (AM, Midday, and PM) corresponding to the peak periods used in the traffic analysis using TNM 2.5 and projected future traffic conditions for the Future with and without the Proposed Action;
- Prediction of future noise levels using TNM 2.5 at potential elevated residential receptors for the preferred development program and its three variations;
- Determination of whether the Proposed Action has the potential to result in significant adverse impacts by comparing predicted future noise levels with the Proposed Action with future noise levels without the Proposed Action, and comparison of projected changes in noise levels against impact criteria defined under CEQR;
- Where the potential for significant adverse impacts identified, evaluation of the adequacy of the window/wall attenuation of the new construction for achieving 45 dBA interior noise levels during the noisiest (worst-case) hour of the day; and
- Where necessary, recommendation of measures to avoid or eliminate potential significant adverse noise impacts.

3. Applicable Noise Codes and Impact Criteria

Potential changes in future noise attributable to the Proposed Action were evaluated on the basis of CEQR noise impact criteria provided in the *CEQR Technical Manual,* including exposure guidelines for assessing the impact of a proposed action that would introduce a noise-sensitive land use in an area with high existing noise levels, and impact criteria for evaluating the effect of project-related traffic and stationary sources of noise. Based on this guidance, the following impact criteria were applied to assess whether the Proposed Action would result in a significant adverse impact on noise levels.

a) CEQR Noise Exposure Criteria

The NYCDEP, Division of Noise Abatement, has set noise exposure guidelines for use in City Environmental Quality Review (Table 12-1). Under these guidelines, noise exposure is classified into four categories: Acceptable, Marginally Acceptable, Marginally Unacceptable, and Clearly Unacceptable. The guidelines are based on the need to maintain an interior noise level of 45 dBA at sensitive receptors for the "worst" exterior noise hour based on L_{10} values (i.e., the hour at which noise levels would be at their highest).



Noise Monitoring Locations

- **A** *42-25 Vernon Boulevard*
- **B** *Base of Queensboro Bridge at corner of Vernon Boulevard and Queens Plaza South*
- **C** *Queensbridge Park*
- **D** *Queensboro Bridge*
- **E** *Roosevelt Island*

Noise Analysis Locations (Based on Project Design)

- **F1-5** *Northern Face of Commercial Tower*
- **G1-5** *Northern Face of Western Residential Tower*
- **H1-4** *Northern Face of Eastern Residential Tower*
- **I** *Eastern Face of Commercial Tower*

Figure 12-2: Noise Monitoring and Analysis Locations

TABLE 12-1: NOISE EXPOSURE GUIDELINES FOR USE IN CITY ENVIRONMENTAL QUALITY 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
Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ dBA	---------- Ldn ≤ 60 dBA ----------		---------- 60 < Ldn ≤ 65 dBA ----------		(1) 65 < Ldn ≤ 70 dBA, (II) 70 ≤ Ldn		---------- Ldn ≤ 75 dBA ----------
Hospital, Nursing Home		$L_{10} \leq 55$ dBA		55 < L_{10} ≤ 65 dBA		65 < L_{10} ≤ 80 dBA		L_{10} > 80 dBA	
Residence, residential hotel or motel	7 AM to 10 PM	$L_{10} \leq 65$ dBA		65 < L_{10} ≤ 70 dBA		70 < L_{10} ≤ 80 dBA		L_{10} > 80 dBA	
	10 PM to 7 AM	$L_{10} \leq 55$ dBA		55 < L_{10} ≤ 70 dBA		70 < L_{10} ≤ 80 dBA		L_{10} > 80 dBA	
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)	
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	

Source: NYCDEP (adopted policy 1983).

Note:
1 In addition, any new activity shall not increase the ambient noise level by 3 dBA or more. 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 The FAA-approved L_{dn} contours supplied by the Port Authority may be used, 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 referenced 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 12-2: CEQR EXTERIOR NOISE STANDARDS AND ATTENUATION VALUES

Noise Category	Marginally Acceptable	Marginally Unacceptable		Clearly Unacceptable		
Noise level with proposed action	65<L_{10}≤70	70<L_{10}≤75	75<L_{10}≤80	80<L_{10}≤85	85<L_{10}≤90	90<L_{10}≤95
Attenuation	25 dBA	(I) 30 dBA	(II) 35 dBA	(I) 40 dBA	(II) 45 dBA	(III) 50 dBA

Source: New York City Department of Environmental Protection

b) Applicable CEQR Project Generated Noise Impact Criteria

The *CEQR Technical Manual* establishes criteria to determine whether a proposed action would result in a significant adverse noise impact, based on comparing noise levels at noise sensitive land uses in the Future with the Proposed Action (including the effects of traffic mitigation measures) against noise levels in the Future without the Proposed Action (Table 12-2). These criteria are applied both to mobile noise sources and stationary sources of noise that may be introduced by a project. Under these criteria, increases in daytime noise levels as a result of a proposed action are not considered significant unless the resulting daytime noise levels exceed 65 dBA. Where daytime noise levels exceed 65 dBA, an increase of 3 dBA above the existing noise level is considered a significant adverse impact.

In addition, the introduction of sensitive uses, such as residences or community facilities into an area with noise levels above 70 dBA constitutes a significant adverse impact unless interior noise levels for buildings containing these uses are attenuated to 45 dBA.

4. Existing Conditions

a) Existing Noise Monitoring Program

Field measurement and analysis locations were selected based on their noise sensitivity, and their potential to be significantly affected by project-generated noise. A detailed description and location of land uses in the Study Area is provided in Chapter 2, "Land Use, Zoning, and Public Policy." A review of this information indicates that the vast majority of uses in the Study Area can be characterized as not sensitive to noise. However, the following five locations were selected for short-term (20 to 30 minute) noise monitoring and analysis of noise levels in the Future with and without the Proposed Action (see Figure 12-2):

- **Vernon Boulevard/Queens Plaza South (Monitoring and Analysis Sites A and B)** – These sites were selected because they would be affected by the maximum number of project generated motor vehicle trips.

- **Queensbridge Park (Monitoring and Analysis Site C)** – This site is located immediately north of the project, and was selected to evaluate the effect of the Proposed Acton on Queensbridge Park and the adjacent Queensbridge Houses, both of which are located immediately north of the Project Site and the Queensboro Bridge. In addition to short-term monitoring, 24 hours of monitoring was also completed at this location using it as a surrogate for estimating existing noise levels at the Project Site. This site was used as a surrogate because existing noise levels at the Project Site are significantly affected by noise from the NYPA facility, and, consequently, these could not be used to assess future noise levels at the Project Site after relocation of the NYPA facility.

- **Queensboro Bridge (Monitoring and Analysis Site D)** – This site was selected because of its high traffic volumes and its proximity to elevated portions of proposed development. Monitoring was conducted at a distance of 50 feet from the median of the bridge using a boom-mounted microphone extending from the bridge to obtain bridge traffic noise measurements from both levels of the roadway decks of the Queensboro Bridge.

- **Roosevelt Island (Monitoring and Analysis Site E)** – This noise sensitive residential site was selected to assess the potential effect of Queensboro Bridge traffic that would result from the Proposed Action on noise sensitive land uses on Roosevelt Island.

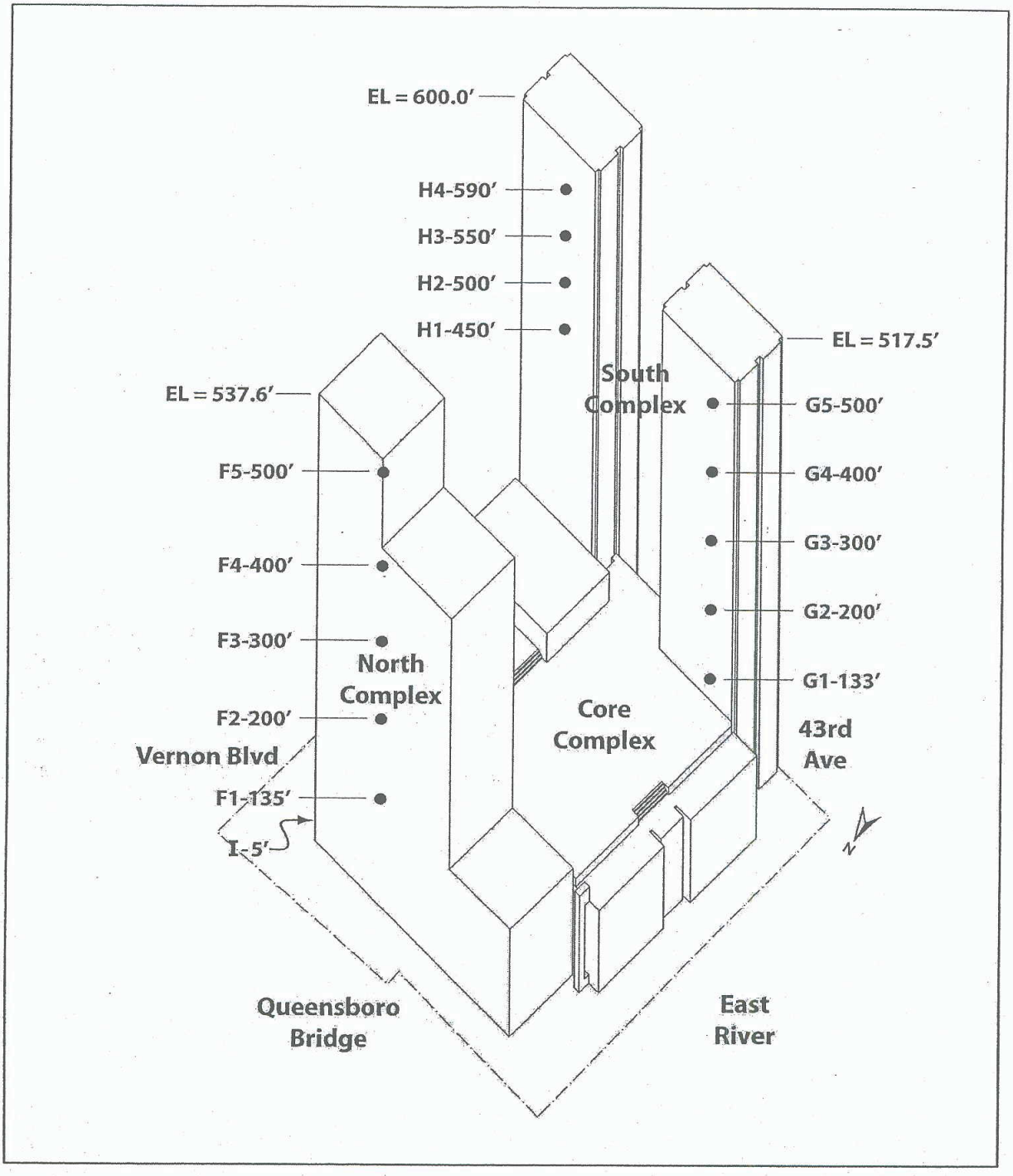


Figure 12-3:
Noise Receptors for Development Variations

In addition, future noise levels with and without the Proposed Action were estimated for 11 other locations within the proposed development (Analysis Sites F1 through F5, G1 through G5, H1 through H4, and I), including locations along the faces of the commercial and residential towers and the community facility that would be introduced on the Project Site as part of the Proposed Action (Figure 12-3). Monitoring of existing noise levels could not be accomplished at these locations since existing noise levels at these locations would be unduly influenced by noise generated by the NYPA facility, which will be relocated prior to development of the Proposed Action, and since there was no practical means of monitoring at the elevated locations of many of these receptors.

b) Monitoring Equipment and Conditions

A Brüel & Kjær (B&K) Type 2231 Sound Level Meter was used to measure A-weighted (dBA) sound levels at the four short-term monitoring sites (Sites A, B, D, and E). The B&K meter has the capability of performing statistical analysis of time varying noise levels and was used to measure equivalent continuous noise levels (L_{eq}) at each of the four monitoring sites over the short-term monitoring period.

A "01" dB Environmental Noise Monitor was used to monitor dBA sound levels during the 24 hour monitoring period at Site C (see Figure 12-2). Similar to the B&K meter, the "01" dB Environmental Noise Monitor has the capability of performing statistical analyses of time varying noise levels and was used to measure hourly 1, 10, 50, 90, and 95 percentile levels (L_1, L_{10}, L_{50}, L_{90}, L_{95}), hourly maximum and minimum noise levels (Lmax and Lmin) and hourly equivalent continuous noise levels (L_{eq}) for each hour of the 24 hour monitoring period.

Both the B&K and "01 dB" noise analyzers satisfy the requirements of Standard S1.4 of the American National Standards Institute (ANSI) for laboratory grade noise measuring instruments. Each piece of monitoring equipment was calibrated before and after each monitoring session using a sound level calibrator with its calibration traceable to the National Institute of Standards and Technology. Measurement microphones were mounted on a tripod at an approximate height of 5.5 feet above ground level (the approximate average height of the human ear above ground level). The microphones were fitted with windscreens to minimize the effect of noise generated by wind gusts. All measurements were performed under acceptable climatic and road surface conditions: low wind speed (less than 20 mph) and dry road surface.

c) TNM 2.5 Calibration and Estimation of Existing Noise Levels

The short-term noise measurements recorded at Monitoring and Analysis Sites A, B, D, and E and the 24-hour noise measurements recorded at Monitoring and Analysis Site C (Table 12-3) were used to calibrate TNM 2.5 for use in estimating future noise levels resulting from traffic along roadways in the Study Area with and without the Proposed Action. As specified in the *CEQR Technical Manual*, this was accomplished by comparing measured noise levels to existing noise levels predicted by TNM 2.5 using site specific geometries and traffic data, and applying corrections to predicted results to closely correspond to measured noise levels. At Sites A and B, this calibration was used for each peak traffic period because these sites were the closest to the proposed locations of the towers, thus providing a more accurate model for determining noise levels at those locations. At Sites C, D, and E the adjustment factor was calculated using the Midday peak hour measured levels.

TABLE 12-3: EXISTING 24-HOUR L_{eq} NOISE LEVELS AT SITE C (QUEENSBRIDGE PARK)

Percentile Noise Levels (L-levels) and Equivalent Continuous Noise Levels (L_{eq}-dBA)								
Start Time	L_{eq}	L_{min}	L_{max}	L_{95}	L_{90}	L_{50}	L_{10}	L_1
11:00 AM	63.5	55.8	84.4	57.9	58.3	59.9	63.4	75.0
12:00 PM	61.7	56.2	81.8	58.1	58.5	59.9	61.9	70.9
1:00 PM	65.5	58.1	88.0	59.7	60.1	61.6	64.5	76.7
2:00 PM	63.6	57.5	83.9	59.2	59.5	60.9	63.6	73.9
3:00 PM	62.8	55.5	93.3	57.6	58.1	59.6	61.9	72.1
4:00 PM	64.9	54.7	85.4	56.5	57.0	58.9	66.1	77.1
5:00 PM	63.3	54.1	86.8	56.8	57.2	58.8	63.5	75.3
6:00 PM	59.3	53.8	78.9	55.7	56.1	57.8	60.1	66.9
7:00 PM	59.2	55.3	80.9	56.9	57.3	58.6	60.2	62.2
8:00 PM	60.2	56.2	82.5	58.0	58.3	59.5	60.9	63.8
9:00 PM	59.3	55.5	69.1	57.3	57.6	59.0	60.4	62.2
10:00 PM	59.0	56.0	74.6	57.4	57.7	58.7	59.9	61.5
11:00 PM	57.0	53.2	68.2	54.8	55.2	56.6	58.2	60.6
12:00 AM	56.7	52.3	71.7	54.6	54.9	56.3	57.8	59.7
1:00 AM	57.1	53.0	66.9	55.2	55.5	56.8	58.1	59.9
2:00 AM	56.8	52.2	67.7	54.3	54.8	56.4	58.2	59.6
3:00 AM	57.6	51.9	68.7	54.7	55.3	57.1	59.1	62.0
4:00 AM	59.4	54.4	80.7	56.6	57.0	58.6	60.2	63.4
5:00 AM	59.8	56.5	68.9	58.0	58.2	59.4	60.9	63.9
6:00 AM	61.1	56.6	76.5	58.5	58.8	60.2	62.6	66.8
7:00 AM	62.0	55.9	82.3	58.0	58.4	59.9	62.2	72.3
8:00 AM	61.0	55.9	78.6	57.7	58.1	59.7	62.1	68.7
9:00 AM	61.8	55.8	81.2	57.9	58.2	59.7	62.2	71.2
10:00 AM	62.1	55.9	89.5	57.8	58.3	60.0	62.4	70.8

Source: On-site Monitoring. Parsons Brinckerhoff Quade & Douglas, Inc. March 30-31, 2005.

Note: Since the L_{10} levels are less than 65 dBA during all time periods, this level of exposure places this site under the CEQR defined "Marginally Acceptable" category.

Table 12-4 compares noise levels predicted by TNM 2.5 against noise levels measured during the peak traffic periods. Noise levels predicted by TNM 2.5 were lower than measured noise levels at all receptor locations. The differences can be attributed to the fluctuations in existing noise levels caused by other noise sources, including aircraft noise, the NYPA facility, ventilation noise and other non-vehicular noise sources within the Study Area unaccounted for by the model. Modeled noise level estimates were increased to more accurately represent measured noise levels. The calibrated TNM 2.5 was then used to estimate future noise levels with and without the Proposed Action for the AM, Midday and PM peak traffic periods.

Table 12-5 summarizes existing modeled noise levels at all receptor locations for which monitoring was completed. The results indicate that, based on the L_{eq} noise descriptor, noise levels ranged between a low of 60.9 dBA at Site C during the AM peak traffic period to a high of 79.6 dBA at Site D during the PM peak traffic period. These levels can be characterized, respectively, as "Marginally Acceptable" and "Marginally Unacceptable" based on NYCDEP Noise Exposure Guidelines (Table 12-1), and are typical of noise levels found in many developed areas throughout New York City.

TABLE 12-4: COMPARISON OF MEASURED AND TNM 2.5 LEVELS AT SITES A THROUGH E

Site	Location	Measured			TNM 2.5			Difference		
		AM	Midday	PM	AM	Midday	PM	AM	Midday	PM
A	42-25 Vernon Blvd.	72.3	71.3	70.4	70.5	69.6	68.8	1.8	1.7	1.6
B	Vernon Blvd. and Queens Plaza South	75.2	71.0	74.4	68.1	67.7	66.5	7.1	3.3	7.9
C	Queensbridge Park	+	61.7	+	+	59.6	+	*	-2.1	*
D	Queensboro Bridge	+	75.7	+	+	73.9	+	*	-1.8	*
E	Roosevelt Island	+	65.0	+	+	61.8	+	*	-3.2	*

Note: All levels given in dBA based on Leq noise descriptor
+ Sites C, D, and E were monitored for Midday Period only.
* Midday adjustment correction factors applied to Site C, D, E

TABLE 12-5: EXISTING AM, MIDDAY AND PM NOISE LEVELS AT SITES A THROUGH E

Site	Location	Existing Noise Level*						CEQR Noise Exposure Category
		AM		Midday		PM		
		L_{eq}	L_{10}	L_{eq}	L_{10}	L_{eq}	L_{10}	
A	42-25 Vernon Blvd.	72.3	75.0	71.3	72.1	70.5	73.5	Marginally Unacceptable
B	Vernon Blvd. and Queens Plaza South	75.2	74.4	71.0	73.6	69.8	72.8	Marginally Unacceptable
C	Queensbridge Park	64.5	67.5	61.7	61.9	62.9	65.9	Marginally Acceptable
D	Queensboro Bridge	76.2	79.2	75.7	77.6	76.6	79.6	Marginally Unacceptable
E	Roosevelt Island	65.4	68.4	65.0	66.1	66.1	69.1	Marginally Acceptable

Note: Sites A and B were monitored on June 25, 2005, February 2, 2006, and February 7, 2006; Site D was monitored on March 30, 2005; and Site E was monitored on March 31, 2005.
* Modeled TNM noise levels adjusted by the factors derived from monitoring as shown in Table 12-4.

5. Future Conditions without the Proposed Action

a) Traffic Related Noise

Future noise levels in 2009 without the Proposed Action were predicted using the calibrated TNM 2.5 and link-specific traffic data for the AM, Midday and PM peak traffic periods for Monitoring and Analysis Sites A, B, C, D, and E and for Analysis Sites F, G and H. The link-specific traffic data reflected projected changes in traffic conditions as documented in Chapter 9, "Traffic and Parking." All predictions assumed the removal of the NYPA facility from the Project Site.

Table 12-6 presents the predicted hourly L_{eq} and L_{10} noise levels in 2009 Future without the Proposed Action. Noise levels in the Future without the Proposed Action varied between a $L_{eq(1)}$ level of 76.8 dBA at Site D (adjacent to the Queensboro Bridge) during the PM peak traffic period to a $L_{eq(1)}$ level of 62.4 dBA at Site C (Queensbridge Park) during the Midday peak traffic period. Estimated noise levels based on the L_{10} descriptor varied between 79.8 dBA at Site D (adjacent to Queensboro Bridge) during the PM peak traffic period and 65.4 dBA at Site C (Queensbridge Park) during the Midday peak traffic period.

TABLE 12-6: FUTURE CONDITIONS WITHOUT THE PROPOSED ACTION: HOURLY EQUIVALENT (L_{EQ}) AND L_{10} NOISE LEVELS AT SITES A THROUGH E DURING THE AM, MIDDAY AND PM PEAK TRAFFIC PERIODS (DBA)

Site	Location	AM		Midday		PM	
		L_{eq}	L_{10}	L_{eq}	L_{10}	L_{eq}	L_{10}
A	42-25 Vernon Blvd.	73.2	76.2	71.5	74.5	71.1	74.1
B	Vernon Blvd. and Queens Plaza South	75.9	78.9	71.1	74.1	75.0	78.0
C	Queensbridge Park	66.8	69.8	62.4	65.4	64.5	67.5
D	Queensboro Bridge	76.4	79.4	75.9	78.9	76.8	79.8
E	Roosevelt Island	65.7	68.7	65.2	68.2	66.3	69.3

TABLE 12-7: FUTURE CONDITIONS WITHOUT THE PROPOSED ACTION: CEQR NOISE EXPOSURE CLASSIFICATIONS OF PROJECTED NOISE LEVELS AT SITES A THROUGH E

Site	Location	Receptor Type	Highest L_{10}	Classification
A	42-25 Vernon Blvd.	Residential	76.2	M.U.
B	Vernon Blvd. and Queens Plaza South	Motel	78.9	M.U.
C	Queensbridge Park	Non-residential	69.8	NA
D	Queensboro Bridge	Non-residential	79.8	NA
E	Roosevelt Island	Residential	69.3	M.A.

M.U. *Marginally Unacceptable*
M.A. Marginally Acceptable
NA Not applicable

b) Stationary Sources of Noise

Noise levels in the future without the Proposed Action in the vicinity of the Project Site will be less than existing noise levels due to the removal of the NYPA facility, noise emissions from which currently contribute substantially to noise levels at the Site.

6. Future Conditions with the Proposed Action

a) Traffic Related Noise

Future traffic-related 2009 noise levels with the Proposed Action were predicted using the same modeling techniques and methodologies as applied to predict future 2009 noise levels without the Proposed Action. The potential for significant adverse noise impacts due to the Proposed Action was estimated for the AM, Midday and PM peak traffic periods by comparing predicted noise levels in the Future with the Proposed Action against predicted noise levels in the future without the Proposed Action. The differences in these two noise levels were compared with the 3 dBA impact criterion defined in the *CEQR Technical Manual* as a basis for identifying significant adverse noise impacts.

As required by the *CEQR Technical Manual*, maximum noise levels predicted at the proposed residential towers were compared against window wall attenuation of standard construction (25 dBA) to determine whether a 45 dBA interior noise level was achievable.

Predicted future noise levels in the Study Area in 2009 for the AM, Midday, and PM peak traffic periods with the Proposed Action are summarized in Table 12-8. Future with the Proposed Action noise levels varied between a maximum $L_{eq(1)}$ of 73.7 dBA at Analysis Sites F3–F5 (Northern Complex Tower above the Queensboro Bridge) during the PM peak traffic period to a minimum $L_{eq(1)}$ of 62.3 dBA at Analysis Site C (Queensbridge Park) during the Midday peak traffic period. The L_{10} descriptor varied between 76.7 dBA at Sites F3–F5 and 65.3 dBA at Site C.

TABLE 12-8: FUTURE CONDITIONS WITH THE PROPOSED ACTION: HOURLY EQUIVALENT NOISE LEVELS (L_{EQ}) AND L_{10} AT SITES A THROUGH I DURING THE AM, MIDDAY, AND PM PEAK TRAFFIC PERIODS (DBA)

Receptor	Location	AM Peak Traffic Period		Midday Peak Traffic Period		PM Peak Traffic Period	
		$Leq_{(1h)}$	L_{10}	$Leq_{(1h)}$	L_{10}	$Leq_{(1h)}$	L_{10}
A	42-25 Vernon Boulevard	72.1	75.1	71.3	74.3	70.4	73.4
B	Vernon Boulevard and Queens Plaza South	71.7	74.7	71.2	74.2	70.5	73.5
C	Queensboro Park	65.8	68.8	62.3	65.3	63.7	66.7
D	Off Bridge Lower Deck WB	76.4	79.4	75.9	78.9	76.9	79.9
E	Roosevelt Island	65.6	68.6	65.2	68.2	66.4	69.4
F1	North Complex @ elevation 135 feet	71.8	74.8	71.7	74.7	72.8	75.8
F2	North Complex @ elevation 200 feet	72.6	75.6	72.5	75.5	73.6	76.6
F3	North Complex @ elevation 300feet	72.7	75.7	72.6	75.6	73.7	76.7
F4	North Complex @ elevation 400 feet	72.8	75.8	72.7	75.7	73.7	76.7
F5	North Complex @ elevation 500 feet	72.8	75.8	72.6	75.6	73.7	76.7
G1	South Complex @ elevation 133 feet	63.2	66.2	63.1	66.1	64.1	67.1
G2	South Complex @ elevation 200 feet	65.0	68.0	64.9	67.9	65.9	68.9
G3	South Complex @ elevation 300 feet	64.7	67.7	64.5	67.5	65.5	68.5
G4	South Complex @ elevation 400 feet	64.6	67.6	64.4	67.4	65.4	68.4
G5	South Complex @ elevation 500 feet	64.7	67.7	64.5	67.5	65.6	68.6
H1	South Complex @ elevation 450 feet	64.5	67.5	64.1	67.1	64.5	67.5
H2	South Complex @ elevation 500 feet	64.4	67.4	64.0	67.0	64.4	67.4
H3	South Complex @ elevation 550 feet	64.3	67.3	63.9	66.9	64.4	67.4
H4	South Complex @ elevation 590 feet	64.3	67.3	63.9	66.9	64.3	67.3
I	North Complex @ elevation 5 feet	67.2	70.2	65.8	68.8	65.1	68.1

Note: Residential receptors (F1–F5) in the North Complex were assessed for noise exposure in Variation 1.

Table 12-9 compares predicted noise levels in the Future with the Proposed Action with predicted noise levels in the Future without the Proposed Action. As indicated in Table 12-9, noise levels in the future with the Proposed Action would not increase by 3 dBA or more compared to noise levels in the future without the Proposed Action at any receptor location.

As summarized in Table 12-9, noise levels in the future with the Proposed Action are projected to decrease slightly compared to noise levels in the future without the Proposed Action during certain time periods at Analysis Sites A, B, C, and E. This was due to decreases in average vehicle speed that would occur along the roadways with the Proposed Action during the time periods of concern, and the effects of the structures that would be developed as part of the Proposed Action. For example, the hourly equivalent noise level in the future with the Proposed Action at Monitoring and Analysis Site A (Vernon Boulevard/Queens Plaza South) during the AM peak traffic period is projected to decrease by approximately 1.0 dBA compared to the hourly equivalent noise level in the future without the Proposed Action (73.1 dBA without the Proposed Action compared to 72.1 with the Proposed Action). Although AM peak traffic volumes in the future with the Proposed Action are greater than the AM peak traffic volumes in the future without the Proposed Action (an increase of

TABLE 12-9: FUTURE CONDITIONS WITH THE PROPOSED ACTION COMPARED TO 2009 FUTURE CONDITIONS WITHOUT THE PROPOSED ACTION L_{EQ}: CHANGE IN NOISE LEVELS

Receptor	Location	AM Peak Traffic Period			MD Peak Traffic Period			PM Peak Traffic Period		
		No Build	Build	Difference	No Build	Build	Difference	No Build	Build	Difference
A	42-25 Vernon Boulevard	73.2	72.3	-0.9	71.5	71.3	-0.2	71.1	70.3	-0.8
B	Vernon Boulevard and Queens Plaza South	75.9	75.5	-0.4	71.1	71.2	0.1	75.0	75.1	0.1
C	Queensboro Park	66.8	65.8	-1.0	62.4	62.3	-0.1	64.5	63.7	-0.8
D	Off Bridge Lower Deck WB	76.4	76.4	0.0	75.9	75.9	0.0	76.8	76.9	0.1
E	Roosevelt Island	65.7	65.6	-0.1	65.2	65.2	0.0	66.3	66.4	0.1
F1	North Complex @ elevation 135 feet	*	71.8	N/A	*	71.7	N/A	*	72.8	N/A
F2	North Complex @ elevation 200 feet	*	72.6	N/A	*	72.5	N/A	*	73.6	N/A
F3	North Complex @ elevation 300feet	*	72.7	N/A	*	72.6	N/A	*	73.7	N/A
F4	North Complex @ elevation 400 feet	*	72.8	N/A	*	72.7	N/A	*	73.7	N/A
F5	North Complex @ elevation 500 feet	*	72.8	N/A	*	72.6	N/A	*	73.7	N/A
G1	South Complex @ elevation 133 feet	*	63.2	N/A	*	63.1	N/A	*	64.1	N/A
G2	South Complex @ elevation 200 feet	*	65.0	N/A	*	64.9	N/A	*	65.9	N/A
G3	South Complex @ elevation 300 feet	*	64.7	N/A	*	64.5	N/A	*	65.5	N/A
G4	South Complex @ elevation 400 feet	*	64.6	N/A	*	64.4	N/A	*	65.4	N/A
G5	South Complex @ elevation 500 feet	*	64.7	N/A	*	64.5	N/A	*	65.6	N/A
H1	South Complex @ elevation 450 feet	*	64.5	N/A	*	64.1	N/A	*	64.5	N/A
H2	South Complex @ elevation 500 feet	*	64.4	N/A	*	64.0	N/A	*	64.4	N/A
H3	South Complex @ elevation 550 feet	*	64.3	N/A	*	63.9	N/A	*	64.4	N/A
H4	South Complex @ elevation 590 feet	*	64.3	N/A	*	63.9	N/A	*	64.3	N/A
I	North Complex @ elevation 5 feet	*	67.2	N/A	*	65.8	N/A	*	65.1	N/A

* No noise receptor in No Build condition

N/A Not applicable

Notes:

1. CEQR noise exposure classification is based on L_{10} which is usually 3 dBA higher than L_{eq}
2. Receptors in the North Complex (F1-F5) would be residential in Variation 1.

TABLE 12-10: BUILDING ATTENUATION RECOMMENDATION BASED ON PROJECTED NOISE EXPOSURE IN 2009

Receptor	Location	AM (L10)	Mid (L10)	PM (L10)	Noise Exposure Classification	Additional Window/Wall Attenuation Required/ Window Attenuation*
A	42-25 Vernon Boulevard	75.1	74.3	73.4	Marginally Unacceptable	No
B	Vernon Boulevard and Queens Plaza South	74.7	74.2	73.5	Marginally Unacceptable	No
C	Queensboro Park	68.8	65.3	66.7	Marginally Acceptable	No
D	Off Bridge Lower Deck WB	79.6	78.9	79.9	Marginally Unacceptable	No
E	Roosevelt Island	68.6	68.2	69.4	Marginally Unacceptable	No
F1	North Complex @ elevation 135 feet	74.1	74.7	75.8	Marginally Unacceptable	No**
F2	North Complex @ elevation 200 feet	75.6	75.5	76.6	Marginally Unacceptable	No**
F3	North Complex @ elevation 300feet	75.7	75.6	76.7	Marginally Unacceptable	No**
F4	North Complex @ elevation 400 feet	75.8	75.7	76.7	Marginally Unacceptable	No**
F5	North Complex @ elevation 500 feet	75.8	75.6	76.7	Marginally Unacceptable	No**
G1	South Complex @ elevation 133 feet	66.2	66.1	67.1	Marginally Acceptable	No**
G2	South Complex @ elevation 200 feet	68.0	67.9	68.9	Marginally Acceptable	No
G3	South Complex @ elevation 300 feet	67.7	67.5	68.5	Marginally Acceptable	No
G4	South Complex @ elevation 400 feet	67.6	67.4	68.4	Marginally Acceptable	No
G5	South Complex @ elevation 500 feet	67.7	67.5	68.6	Marginally Acceptable	No
H1	South Complex @ elevation 450 feet	67.5	67.1	67.5	Marginally Acceptable	No
H2	South Complex @ elevation 500 feet	67.4	67.0	67.4	Marginally Acceptable	No
H3	South Complex @ elevation 550 feet	67.3	66.9	67.4	Marginally Acceptable	No
H4	South Complex @ elevation 590 feet	67.3	66.9	67.3	Marginally Acceptable	No
I	North Complex @ elevation 5 feet	70.2	68.8	68.1	Marginally Unacceptable	No

* Standard window/wall attenuation in a Special Mixed Use District (123-32 NYC Zoning Resolution) is 35 dBA. Requirements above this amount are reported here.

** Variations that include a commercial office at this site will include 35 dBA window/wall attenuation as a result of (E) Designation requirements.

TABLE 12-10: BUILDING ATTENUATION RECOMMENDATION BASED ON PROJECTED NOISE EXPOSURE IN 2009

Receptor	Location	AM (L10)	Mid (L10)	PM (L10)	Noise Exposure Classification	Additional Window/Wall Attenuation Required/ Window Attenuation*
A	42-25 Vernon Boulevard	75.1	74.3	73.4	Marginally Unacceptable	No
B	Vernon Boulevard and Queens Plaza South	74.7	74.2	73.5	Marginally Unacceptable	No
C	Queensboro Park	68.8	65.3	66.7	Marginally Acceptable	No
D	Off Bridge Lower Deck WB	79.6	78.9	79.9	Marginally Unacceptable	No
E	Roosevelt Island	68.6	68.2	69.4	Marginally Unacceptable	No
F1	North Complex @ elevation 135 feet	74.1	74.7	75.8	Marginally Unacceptable	No**
F2	North Complex @ elevation 200 feet	75.6	75.5	76.6	Marginally Unacceptable	No**
F3	North Complex @ elevation 300feet	75.7	75.6	76.7	Marginally Unacceptable	No**
F4	North Complex @ elevation 400 feet	75.8	75.7	76.7	Marginally Unacceptable	No**
F5	North Complex @ elevation 500 feet	75.8	75.6	76.7	Marginally Unacceptable	No**
G1	South Complex @ elevation 133 feet	66.2	66.1	67.1	Marginally Acceptable	No**
G2	South Complex @ elevation 200 feet	68.0	67.9	68.9	Marginally Acceptable	No
G3	South Complex @ elevation 300 feet	67.7	67.5	68.5	Marginally Acceptable	No
G4	South Complex @ elevation 400 feet	67.6	67.4	68.4	Marginally Acceptable	No
G5	South Complex @ elevation 500 feet	67.7	67.5	68.6	Marginally Acceptable	No
H1	South Complex @ elevation 450 feet	67.5	67.1	67.5	Marginally Acceptable	No
H2	South Complex @ elevation 500 feet	67.4	67.0	67.4	Marginally Acceptable	No
H3	South Complex @ elevation 550 feet	67.3	66.9	67.4	Marginally Acceptable	No
H4	South Complex @ elevation 590 feet	67.3	66.9	67.3	Marginally Acceptable	No
I	North Complex @ elevation 5 feet	70.2	68.8	68.1	Marginally Unacceptable	No

* Standard window/wall attenuation in a Special Mixed Use District (123-32 NYC Zoning Resolution) is 35 dBA. Requirements above this amount are reported here.

** Variations that include a commercial office at this site will include 35 dBA window/wall attenuation as a result of (E) Designation requirements.

approximately 92 vehicles along Vernon Boulevard), average vehicular speed along this critical roadway link is projected to decrease significantly during this period from 32 mph to 24 mph due to this increase in traffic volume, resulting in a decrease in projected noise levels. In addition, the proposed commercial and residential towers would effectively block noise from vehicles traveling on the Queensboro Bridge. Decreases in noise levels at other locations and time periods were due to the same reasons as those of this example.

Noise levels at residential land uses that would be introduced as part of the Proposed Project would be in the "Marginally Acceptable" category, and would not require more than standard window/wall attenuation to achieve acceptable interior noise levels of 45 dBA. The maximum future noise level at the proposed commercial development (which would be residential in Variation 1) at Sites F1 through F5 would be 76.7 dBA (L_{10}), which falls into a "Marginally Unacceptable" noise exposure category. Since Special Mixed Use Districts require 35 dBA window/wall attenuation for dwelling units (123-32 ZRNYC), no additional window/wall attenuation would need to be provided to achieve acceptable noise levels of less than 45 dBA for the residential portions of the project. Because the Special Mix-Use District noise attenuation requirements apply only to residential uses, as a supplement to the regulations, an (E) Designation for noise will be mapped on the Project Site (Block 477, Lots, 13, 15, 20, and 24) to ensure that adequate noise attenuation would be provided for the commercial uses introduced as part of the Proposed Action. The text of the (E) Designation is as follows:

> **In order to ensure an acceptable interior noise environment, future commercial uses must provide a closed window condition with a minimum of 35 dB(A) window/wall attenuation in order to maintain an interior noise level of 45 dB(A). In order to maintain a closed-window condition, an alternate means of ventilation would also have to be provided. Alternative means of ventilation would include, but would not be limited to, central air conditioning or air conditioning sleeves containing air conditioners or HUD-approved fans.**

The residential noise attenuation requirements of the Special Mixed-Use District in conjunction with the (E) Designation for future commercial uses on the site would ensure that no significant adverse noise impacts would occur as a result of the Proposed Action.

b) Stationary Sources of Noise

Stationary noise sources with the Proposed Project would be limited to noise from HVAC operations in the proposed building. Noise from HVAC operations would be associated with ventilation fans and directly related mechanical equipment. The production of movies, television programs and commercials would occur entirely within enclosed acoustically treated interior areas of the Proposed Project and would have no effect on exterior noise levels. CEQR has established the following noise impact criteria regarding stationary sources of noise:

- CEQR guidelines specify that stationary noise sources not raise existing noise levels by 3 dBA or more;
- City of New York Ambient Noise Quality Zone Criteria, require that stationary activities within the boundaries of a project site not exceed established daytime and nighttime standards for three ambient noise quality zones, including for high-density residential land uses a "daytime" (i.e., 7 AM to 10 PM) limitation of 65 dBA and a "nighttime" limitation of 55 dBA, based on the Leq(1 hour) metric; and
- Interior noise levels within residential buildings must be maintained at an "acceptable" level of 45 dBA or less as specified by the New York City Department of Environmental Protection.

In the Future with the Proposed Project, stationary noise sources including HVAC and associated mechanical equipment would be designed and operated to satisfy Section 24-227 of the New York City Noise Control Code. This would assure that noise levels within the proposed structures would be less than the acceptable interior noise level of 45 dBA as required by the New York City Department of Environmental Protection, that noise levels at the boundaries of the Project Site would not exceed the City of New York Ambient Noise Quality Zone Criteria, and the operation of the HVAC systems would not result in an increase of 3 dBA compared to noise levels in the Future without the Proposed Action. As a consequence, there would be no significant adverse noise impact with the Proposed Action due to new stationary sources of noise.

C. CONCLUSIONS

The Proposed Action would not increase noise levels by 3 dBA or more at any location due to project generated traffic (Table 12-9). Noise code requirements would ensure that noise levels from HVAC equipment would not contravene CEQR impact thresholds. The Proposed Action would introduce additional noise-sensitive land uses to the Project Site, including a substantial amount of new residences, in an area with current noise levels influenced by the traffic from the Queensboro Bridge and other noise sources. However, acoustical treatment required for the Special Mixed Use District and pursuant to the (E) Designation would provide the necessary attenuation to achieve 45 dBA interior noise levels within all proposed structures. Consequently, there would be no significant adverse noise impacts from the Proposed Action.

D. VARIATIONS

As documented in Chapter 9, "Traffic and Parking," each of the variations would generate approximately the same number of vehicle trips or less compared to the Preferred Development Program during the AM, Midday and PM peak traffic periods. Consequently, as with the Preferred Development Program, none of the variations would increase noise levels by 3 dBA or more at any location due to project generated traffic. Also like the Preferred Development Program, compliance with New York City Noise Code requirements would ensure that noise levels from Project-related HVAC equipment would not contravene CEQR impact thresholds.

As a consequence, the analysis of potential significant adverse impacts of the variations was limited to an assessment of whether replacing the commercial uses in the Preferred Development Program with residential uses under Variations 1 (Residential) and 3 (Residential and Studio) would result in a significant adverse noise impact since, in both variations, the residential uses would be closer to the Queensboro Bridge than with the Preferred Development Program. To assess the potential that this would result in a significant adverse impact, TNM 2.5 was used to estimate noise levels at Analysis Sites I and F along the north face of the North Complex, and at a total of 9 locations along the north face of the South Complex (see Figure 12-3). The results of the analysis indicate that a maximum noise level of approximately 76.7 dBA would occur at the tower closest to the Queensboro Bridge, with both Variations 1 and 3. This noise level would fall into the "Marginally Unacceptable" category, as defined under CEQR guidelines. However, the level of window/wall attenuation required by the Special Mixed Use District is sufficient to achieve an interior noise level of 45 dBA within residential units located in the North Complex. Incorporating this enhanced level of attenuation at residential units closest to the Queensboro Bridge would eliminate the potential for significant adverse noise impacts.

Consequently, neither the Preferred Development Program or any of the variations would result in significant adverse noise impacts.