

A. INTRODUCTION

Noise pollution in an urban area comes from many sources. Some sources are activities essential to the health, safety, and welfare of a city's inhabitants, such as noise from emergency vehicle sirens, garbage collection operations, and construction and maintenance equipment. Other sources, such as traffic, stem from the movement of people and goods, activities that are essential to the viability of a city as a place to live and do business. Although these and other noise-producing activities are necessary to a city, the noise they create is, at times, undesirable. Urban noise detracts from the quality of the living environment, and there is increasing evidence that excessive noise may represent a threat to public health.

The noise analysis of the proposed project consisted of three parts:

- A screening analysis to determine whether there are any noise sensitive locations where project-generated traffic travelling to and from the proposed project would have the potential to result in significant noise impacts;
- A detailed analysis to determine the magnitude of noise level increases, at locations identified in the screening analysis, where traffic generated by the proposed project would have the potential to result in significant noise impacts; and
- An analysis to determine the level of building attenuation necessary to ensure that interior noise levels within the Armory would satisfy applicable interior noise criteria.

As described below, the noise analysis concluded that the proposed project would not result in a significant noise impact (i.e., would not have any predicted exceedances of *CEQR Technical Manual* impact criteria). In addition, with the proposed building design measures, noise levels within the renovated Armory structure would comply with CEQR building attenuation requirements. Therefore, the proposed project would not result in any significant adverse noise impacts.

B. NOISE FUNDAMENTALS

Quantitative information on the effects of airborne noise on people is well documented. If sufficiently loud, noise may interfere with human activities such as sleep, speech communication, and tasks requiring concentration or coordination. It may also cause annoyance, hearing damage, and other physiological problems. Several noise scales and rating methods are used to quantify the effects of noise on people, taking into consideration such factors as loudness, duration, time of occurrence, and changes in noise level with time. However, it must be noted that all the stated effects of noise on people vary greatly with each individual.

“A”-WEIGHTED SOUND LEVEL (dBA)

Noise is typically measured in units called decibels (dB), which are 10 times the logarithm of the ratio of the sound pressure squared to a standard reference pressure squared. Because loudness

is important in the assessment of the effects of noise on people, the dependence of loudness on frequency must be taken into account in the noise scale used in environmental assessments. One of the simplified scales that accounts for the dependence of perceived loudness on frequency is the use of a weighting network, known as “A”-weighting, in the measurement system to simulate the response of the human ear. For most noise assessments, the A-weighted sound pressure level in units of dBA is used in view of its widespread recognition and its close correlation with perception. In this study, all measured noise levels are reported in A-weighted decibels (dBA). Common noise levels in dBA are shown in **Table 16-1**.

**Table 16-1
Common Noise Levels**

Sound Source	(dBA)
Military jet, air raid siren	130
Amplified rock music	110
Jet takeoff at 500 meters	100
Freight train at 30 meters	95
Train horn at 30 meters	90
Heavy truck at 15 meters	80–90
Busy city street, loud shout	80
Busy traffic intersection	70–80
Highway traffic at 15 meters, train	70
Predominantly industrial area	60
Light car traffic at 15 meters, city or commercial areas, or residential areas close to industry	50–60
Background noise in an office	50
Suburban areas with medium-density transportation	40–50
Public library	40
Soft whisper at 5 meters	30
Threshold of hearing	0
<p>Note: A 10 dBA increase in level appears to double the loudness, and a 10 dBA decrease halves the apparent loudness.</p> <p>Sources: Cowan, James P. <i>Handbook of Environmental Acoustics</i>, Van Nostrand Reinhold, New York, 1994. Egan, M. David, <i>Architectural Acoustics</i>. McGraw-Hill Book Company, 1988.</p>	

ABILITY TO PERCEIVE CHANGES IN NOISE LEVELS

The average ability of an individual to perceive changes in noise levels is well documented (see **Table 16-2**). Generally, changes in noise levels of less than 3 dBA are barely perceptible to most listeners, whereas changes in noise levels of 10 dBA are normally perceived as doubling (or halving) of noise loudness. These guidelines permit direct estimation of an individual’s probable perception of changes in noise levels.

NOISE DESCRIPTORS USED IN IMPACT ASSESSMENT

Because the sound pressure level unit of dBA describes a noise level at just one moment, and because very few noises are constant, other ways of describing noise over more extended periods have been developed. One way is to describe the fluctuating noise heard over a specific 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 period (e.g., 1 hour, denoted by $L_{eq(1)}$, or 24 hours, denoted by $L_{eq(24)}$), 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 sometimes used to indicate noise levels that are exceeded 1, 10, 50, 90, and x percent of the time, respectively. Discrete event peak levels are given as L_{01} levels.

Table 16-2
Average Ability to Perceive Changes in Noise Levels

Change (dBA)	Human Perception of Sound
2-3	Barely perceptible
5	Readily noticeable
10	A doubling or halving of the loudness of sound
20	A "dramatic change"
40	Difference between a faintly audible sound and a very loud sound
Source: Bolt, Beranek and Newman, Inc., <i>Fundamentals and Abatement of Highway Traffic Noise</i> , Report No. PB-222-703. Prepared for Federal Highway Administration, June 1973.	

The maximum 1-hour equivalent sound level ($L_{eq(1)}$) has been selected as the noise descriptor to be used in this noise impact evaluation of the proposed project. $L_{eq(1)}$ is the noise descriptor recommended for use in the *CEQR Technical Manual* for vehicular traffic noise impact evaluation, and is used to provide an indication of highest expected sound levels. The 1-hour L_{10} is the noise descriptor used in the *CEQR Technical Manual* noise exposure guidelines for City environmental impact review classification.

C. NOISE STANDARDS AND CRITERIA

Noise levels associated with the construction and operation of the proposed project would be subject to the emission source provisions of the New York City Noise Control Code and to noise criteria set for the CEQR process. Other standards and guidelines promulgated by Federal agencies do not apply to project noise control, but are useful to review in that they establish measures of impacts.

NEW YORK CITY NOISE CONTROL CODE

The New York City Noise Control Code, amended in December 2005, contains prohibitions regarding unreasonable noise and specific noise standards, including plainly audible criteria for specific noise sources. In addition, the amended code specifies that no sound source operating in connection with any commercial or business enterprise may exceed the decibel levels in the designated octave bands shown in **Table 16-3** at the specified receiving properties.

NEW YORK CEQR NOISE CRITERIA

The *CEQR Technical Manual* contains noise exposure guidelines for use in City environmental impact review and required attenuation values to achieve acceptable interior noise levels. These values are shown in **Tables 16-4** and **16-5**. Noise exposure is classified into four categories: "acceptable," "marginally acceptable," "marginally unacceptable," and "clearly unacceptable." The *CEQR Technical Manual* criteria are based on maintaining an interior noise level for the worst-case hour $L_{10(1)}$ less than or equal to 45 A-weighted decibels (dBA) (for commercial uses it would be the worst-case hour $L_{10(1)}$ less than or equal to 50 dBA).

Table 16-3
New York City Noise Codes

Octave Band Frequency (Hz)	Maximum Sound Pressure Levels (dB) as Measured Within a Receiving Property	
	Residential receiving property for mixed-use building and residential buildings ¹	Commercial receiving property ²
31.5	70	74
63	61	64
125	53	56
250	46	50
500	40	45
1000	36	41
2000	34	39
4000	33	38
8000	32	37

Notes:
 1. As measured within any room of the residential portion of the building with windows open, if possible.
 2. As measured within any room containing offices within the building with windows open, if possible.
Source: Section §24-232 of the Administrative Code of the City of New York, as amended December 2005.

Table 16-4
Noise Exposure Guidelines For Use in City Environmental Impact Review¹

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	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-11 PM)		Same as Residential Day (7 AM-11 PM)	Same as Residential Day (7 AM-11 PM)	Same as Residential Day (7 AM-11 PM)	Same as Residential Day (7 AM-11 PM)	Same as Residential Day (7 AM-11 PM)	
Commercial or office		Same as Residential Day (7 AM-11 PM)		Same as Residential Day (7 AM-11 PM)	Same as Residential Day (7 AM-11 PM)	Same as Residential Day (7 AM-11 PM)	Same as Residential Day (7 AM-11 PM)	Same as Residential Day (7 AM-11 PM)	
Industrial, public areas only ⁴	Note 4	Note 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}^y (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 16-5

Required Attenuation Values to Achieve Acceptable Interior Noise Levels

	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 ¹	25 dB(A)	30dB(A)	35 dB(A)	40 dB(A)	45 dB(A)	50 dB(A)
Note:	¹ The above composite window-wall attenuation values are for residential dwellings. Commercial office spaces and meeting rooms would be 5 dB(A) less in each category. All the above categories require a closed window situation and hence an alternate means of ventilation.					
Source:	New York City Department of Environmental Protection.					

D. NOISE PREDICTION METHODOLOGY

GENERAL METHODOLOGY

The noise analysis for the proposed project used both proportional modeling techniques and the Federal Highway Administration's [FHWA] *Traffic Noise Model* (TNM) version 2.5. Proportional modeling was used for the screening analysis to identify noise sensitive locations where there would be the potential for significant noise impacts due to project-generated traffic travelling to and from the proposed project. To calculate noise from traffic on adjacent and nearby streets and roadways, the TNM was used. The proportional modeling technique, the TNM, and the methodology used for analysis are described below.

PROPORTIONAL MODELING

The screening analysis used a proportional modeling technique to determine noise sensitive locations where there would be the potential for significant noise impacts due to project-generated traffic travelling to and from the proposed project. Proportional modeling is one of the techniques recommended in the *CEQR Technical Manual* for mobile source (i.e., vehicular traffic) analysis.

Using proportional modeling, 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 Build (i.e., future without the proposed project) and Build (i.e., future with the proposed project) levels. Using this methodology, vehicular traffic volumes were converted into Passenger Car Equivalent (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; 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 PCEs

E PCE = Existing PCEs

With this methodology, assuming 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 was increased by 50 PCE to a total of 150 PCE, the noise level would increase by 1.8 dBA. Similarly, if the future traffic was increased by 100 PCE, or doubled to a total of 200 PCE, the noise level would increase by 3.0 dBA.

TRAFFIC NOISE MODEL

The TNM is a computerized model developed for the FHWA that calculates the vehicular traffic noise contribution of each modeled roadway segment at a specified receptor location. The noise from each vehicle type is determined as a function of the reference energy-mean emission level, corrected for vehicle volume, speed, roadway grade, roadway segment length, and source-receptor distance. Further considerations included in modeling the propagation path include identifying the shielding provided by rows of buildings, analyzing the effects of different ground types, identifying source and receptor elevations, and analyzing the effects of any intervening noise barriers.

ANALYSIS PROCEDURE

At all of the receptor sites the following analysis procedure was used to determine the potential for noise impacts associated with project-generated traffic:

- Noise sensitive receptors were identified along routes that project generated traffic would use to access/egress the proposed project. These are the locations where maximum project-generated noise levels would be expected to occur;
- At the receptor locations identified above, noise measurements were performed for each analysis time period to determine existing noise levels;
- At locations where the screening analysis indicated the potential for a significant increase in noise levels, existing noise levels were calculated at each receptor site, for each analysis time period, using the TNM and traffic data for existing conditions. The calculated TNM existing noise levels, at each site for each analysis time period, was subtracted from the measured existing noise levels. At Sites 1 through 4 and 6, the remainder was assumed to be a correction factor (to account for noise from parking lots, street noise, model inaccuracies, etc.), and at Site 5¹ the remainder was assumed to be noise associated with the elevated No. 4 train line;
- Future noise levels for the No Build and Build conditions, for each receptor site and for each analysis time period, were determined using the sum of the calculated TNM results based on projected traffic conditions and the calculated correction factor (e.g., the calculated correction factor for Site 5 represented noise associated with the elevated No. 4 train line); and
- The level of building attenuation to achieve acceptable interior noise levels was determined for the proposed project based on the noise monitoring and TNM results.

Summary tables showing the specific components of the noise analysis are provided in **Appendix D**.

¹ Site 5, located at Jerome Avenue between West Kingsbridge Road and West 195th Street, is adjacent to the elevated No. 4 train line. Consequently, ambient noise levels are a combination of noise from the elevated train and noise from vehicular traffic on the adjacent streets.

SELECTION OF NOISE RECEPTOR LOCATIONS

Six receptor sites in the project study area were selected for the analysis. **Table 16-6** presents the location of each noise receptor site and its associated existing land use(s). **Figure 16-1** shows the locations of the receptor sites. The receptor sites are representative noise-sensitive locations—principally locations with residential and commercial land uses—as well as locations where maximum project impacts would be expected. At other locations, particularly farther from the project site, project-generated traffic would be less and/or would constitute a small portion of the existing and/or No Build traffic volume and, consequently, would not have the potential to cause a significant increase in noise levels.

Table 16-6
Noise Receptor Locations

Receptor	Location	Associated Land Use
1	University Avenue between West 192nd Street and West Kingsbridge Road	Residential
2	West Kingsbridge Road between Sedgwick Avenue and Kingsbridge Terrace	Residential with Commercial Below
3	West Kingsbridge Road between University and Reservoir Avenues	Residential with Commercial Below
4	Reservoir Avenue between West 195th and Strong Streets	Residential
5	Jerome Avenue between West Kingsbridge Road and West 195th Street	Commercial, Office, and Public Facilities and Institutions
6	West Kingsbridge Road between Morris and Creston Avenues	Residential with Commercial Below

SELECTION OF NOISE ANALYSIS CONDITIONS

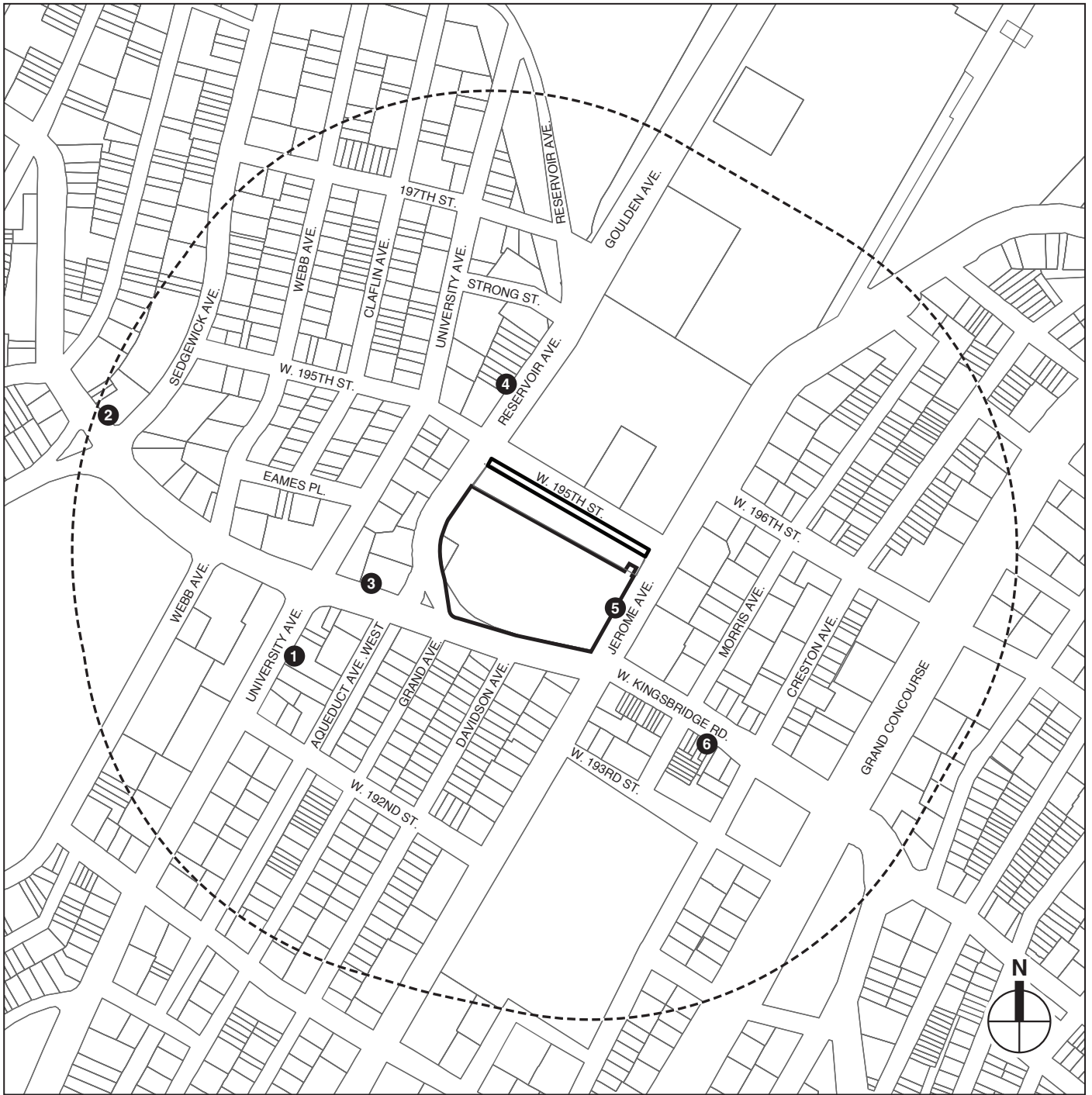
The noise analysis examined six conditions: the weekday and Saturday midday, PM, and late night time periods. The weekday AM time period was not included in the noise analysis because the increases in noise levels from project-generated traffic during this time period would be small in comparison to the other analysis time periods. The selected time periods are when the proposed project would be expected to result in maximum traffic generation (i.e., the maximum potential for significant adverse noise impacts) based on the traffic studies presented in Chapter 13, “Traffic.”




NOISE MONITORING

At each receptor location, 20-minute noise measurements were made during the six analysis periods (weekday and Saturday midday, pm, and late night) to determine existing noise levels. Measurements were taken on June 12 and 21, 2008 and September 3, 4, 13, and 20, 2008.

EQUIPMENT USED DURING NOISE MONITORING

Measurements were performed using Brüel & Kjær Noise Level Meters Type 2260, Brüel & Kjær Sound Level Calibrators Type 4231, and Brüel & Kjær ½-inch microphones Type 4189. The Brüel & Kjær meters are Type 1 noise meters. The instruments were mounted on a tripod at a height of 5 feet above the ground. The meters were calibrated before and after readings using Brüel & Kjær Type 4231 sound level calibrators with the appropriate adaptors. The data were digitally recorded by the sound meters and displayed at the end of the measurement period in units of dBA. Measured quantities included L_{eq} , L_1 , L_{10} , L_{50} , and L_{90} . Windscreens were used during all sound measurements except for calibration. All measurement procedures conformed to the requirements of ANSI Standard S1.13-2005.



-  Project Site
-  Study Area Boundary (1/4-Mile Perimeter)
-  Noise Receptor Location



E. IMPACT DEFINITION

As recommended in the *CEQR Technical Manual*, this analysis uses the following criteria to define a significant adverse noise impact:

- An increase of 5 dBA or more in Build $L_{eq(1)}$ noise levels at sensitive receptors (including residences, play areas, parks, schools, libraries, and houses of worship) over those calculated for the No Build condition, if the No Build levels are less than 60 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 4 dBA or more in Build $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No Build condition, if the No Build levels are 61 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 3 dBA or more in Build $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No Build condition, if the No Build levels are greater than 62 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 3 dBA or more in Build $L_{eq(1)}$ noise levels at sensitive receptors over those calculated for the No Build condition, if the analysis period is a nighttime period (defined by the *CEQR Technical Manual* criteria as being between 10 PM and 7 AM).

F. EXISTING CONDITIONS

SITE DESCRIPTION

As described in detail in Chapter 1, “Project Description,” the project site is located in the Kingsbridge Heights neighborhood of the Bronx, New York. The site is generally bounded by West 195th Street to the north, Jerome Avenue to the east, West Kingsbridge Road to the south, and Reservoir Avenue to the west. This site is currently occupied by the largely vacant Kingsbridge Armory structure.

RESULTS OF BASELINE MEASUREMENTS

Table 16-7 summarizes the results of the baseline measurements for the six analysis periods. In general, noise levels are moderate to relatively high and reflect the level of vehicular activity on the adjacent streets. The dominant operational noise source at all receptor sites in the study area, excepting Site 5, is vehicular traffic on adjacent and nearby streets and roadways. The noise levels at receptor Site 5 are high due to the elevated No. 4 train line on Jerome Avenue. Noise from other sources, including local commercial uses, is limited and does not contribute significantly to local ambient noise levels.

In terms of CEQR noise exposure guidelines, during the hour with the highest measured noise levels, existing noise levels at receptor sites 1, 2, 3, 4, and 6 are in the “marginally unacceptable” category, and existing noise levels at receptor site 5 are in the “clearly unacceptable” category. These values are based on the measured $L_{10(1)}$ values.

Table 16-7
Existing Noise Levels (in dBA)

Receptor	Location	Day	Time	L _{eq(1)}	L ₁	L ₁₀	L ₅₀	L ₉₀
1	University Avenue between West 192nd Street and West Kingsbridge Road	Weekday	MD	69.5	79.7	72.4	66.2	60.5
			PM	68.6	79.4	71.0	65.1	60.0
			LN	72.2	83.0	73.7	67.4	58.1
		Saturday	MD	65.7	72.5	68.1	64.6	60.6
			PM	66.0	76.1	68.6	63.1	60.2
2	West Kingsbridge Road between Sedgwick Avenue and Kingsbridge Terrace	Weekday	MD	72.6	82.1	75.9	69.7	63.5
			PM	69.8	79.6	72.6	67.2	60.0
			LN	74.1	82.7	77.7	71.8	64.7
		Saturday	MD	72.7	85.0	74.4	68.2	62.3
			PM	70.4	80.9	72.9	67.5	61.1
3	West Kingsbridge Road between University and Reservoir Avenues	Weekday	MD	71.4	81.9	73.5	67.9	63.5
			PM	70.2	79.6	73.2	67.1	64.1
			LN	70.4	81.2	73.3	65.8	61.9
		Saturday	MD	68.7	78.0	71.6	66.1	61.2
			PM	72.3	82.4	73.5	67.9	64.4
4	Reservoir Avenue between West 195th and Strong Streets	Weekday	MD	67.6	76.7	71.1	63.9	57.1
			PM	63.9	73.5	67.0	60.9	55.0
			LN	61.1	70.8	64.8	56.9	52.5
		Saturday	MD	64.2	71.9	68.1	61.0	56.1
			PM	63.5	70.5	67.2	61.3	55.6
5	Jerome Avenue between West Kingsbridge Road and West 195th Street	Weekday	MD	81.2	93.3	83.7	68.2	62.6
			PM	78.9	91.6	81.8	67.8	63.0
			LN	77.4	89.6	80.1	65.9	60.1
		Saturday	MD	78.4	91.9	81.4	66.1	59.8
			PM	77.2	91.3	79.0	65.0	60.2
6	East Kingsbridge Road between Morris and Creston Avenues	Weekday	MD	67.7	76.0	70.2	66.0	60.9
			PM	70.4	78.7	73.1	68.2	63.5
			LN	70.4	81.8	72.4	66.7	62.3
		Saturday	MD	69.5	78.4	71.9	67.7	63.0
			PM	67.9	75.6	70.4	66.2	62.5
			LN	67.9	76.3	71.1	64.9	58.8

Notes: Field measurements were performed by AKRF, Inc. on June 12 and 21, 2008 and September 3, 4, 13 and 20, 2008.

G. THE FUTURE WITHOUT THE PROPOSED PROJECT

Using the methodology previously described, noise levels were calculated for the six receptors for the future without the proposed project. These 2013 No Build values are shown in **Table 16-8**.

**Table 16-8
2013 No Build Noise Levels (in dBA)**

Receptor	Location	Day	Time	Existing L _{eq(1)}	No Build L _{1eq(1)}	L _{eq(1)} Change	No Build L ₁₀₍₁₎
1	University Avenue between West 192nd Street and West Kingsbridge Road	Weekday	MD	69.5	69.7	0.2	72.6
			PM	68.6	68.8	0.2	71.2
			LN	72.2	72.4	0.2	73.9
		Saturday	MD	65.7	65.9	0.2	68.3
			PM	66.0	66.2	0.2	68.8
2	West Kingsbridge Road between Sedgwick Avenue and Kingsbridge Terrace	Weekday	MD	72.6	72.9	0.3	76.2
			PM	69.8	70.8	1.0	73.6
			LN	74.1	74.3	0.2	77.9
		Saturday	MD	72.7	72.9	0.2	74.6
			PM	70.4	70.6	0.2	73.1
3	West Kingsbridge Road between University and Reservoir Avenues	Weekday	MD	71.4	71.9	0.5	74.0
			PM	70.2	70.9	0.7	73.9
			LN	70.4	71.0	0.6	73.9
		Saturday	MD	68.7	69.4	0.7	72.3
			PM	72.3	72.9	0.6	74.1
4	Reservoir Avenue between West 195th and Strong Streets	Weekday	MD	67.6	67.7	0.1	71.2
			PM	63.9	64.1	0.2	67.2
			LN	61.1	61.4	0.3	65.1
		Saturday	MD	64.2	64.4	0.2	68.3
			PM	63.5	63.7	0.2	67.4
5	Jerome Avenue between West Kingsbridge Road and West 195th Street	Weekday	MD	81.2	81.3	0.1	83.8
			PM	78.9	79.1	0.2	82.0
			LN	77.4	77.6	0.2	80.3
		Saturday	MD	78.4	78.6	0.2	81.6
			PM	77.2	77.4	0.2	79.2
6	East Kingsbridge Road between Morris and Creston Avenues	Weekday	MD	67.7	67.8	0.1	70.3
			PM	70.4	70.6	0.2	73.3
			LN	70.4	70.6	0.2	72.6
		Saturday	MD	69.5	70.3	0.8	72.7
			PM	67.9	68.2	0.3	70.7
			LN	67.9	68.1	0.2	71.3

In 2013, the increase in L_{eq(1)} noise levels without the proposed project would be 1.0 dBA or less at all receptor sites. Changes of these magnitudes would be barely perceptible and would be below the CEQR threshold for a significant impact. In terms of CEQR noise exposure guidelines, noise levels at receptor sites 1, 2, 3, 4, and 6 would remain in the “marginally unacceptable” category, and noise levels at receptor site 5 would remain in the “clearly unacceptable” category. These values are based on the predicted L₁₀₍₁₎ values.

H. PROBABLE IMPACTS OF THE PROPOSED PROJECT

Using the methodology previously described, future noise levels with the proposed project were calculated for the six receptor sites. These 2013 Build values are shown in **Table 16-9**.

Table 16-9
2013 Build Noise Levels (in dBA)

Receptor	Location	Day	Time	No Build $L_{1eq(1)}$	Build $L_{1eq(1)}$	$L_{eq(1)}$ Change	Build $L_{10(1)}$
1	University Avenue between West 192nd Street and West Kingsbridge Road	Weekday	MD	69.7	70.3	0.6	73.2
			PM	68.8	69.3	0.5	71.7
			LN	72.4	72.8	0.4	74.3
		Saturday	MD	65.9	66.8	0.9	69.2
			PM	66.2	67.0	0.8	69.6
2	West Kingsbridge Road between Sedgwick Avenue and Kingsbridge Terrace	Weekday	MD	72.9	73.4	0.5	76.7
			PM	70.8	71.0	0.2	73.8
			LN	74.3	74.5	0.2	78.1
		Saturday	MD	72.9	73.3	0.4	75.0
			PM	70.6	70.9	0.3	73.4
3	West Kingsbridge Road between University and Reservoir Avenues	Weekday	MD	71.9	72.8	0.9	74.9
			PM	70.9	71.4	0.5	74.4
			LN	71.0	71.5	0.5	74.4
		Saturday	MD	69.4	70.3	0.9	73.2
			PM	72.9	73.9	1.0	75.1
4	Reservoir Avenue between West 195th and Strong Streets	Weekday	MD	67.7	68.2	0.5	71.7
			PM	64.1	64.5	0.4	67.6
			LN	61.4	61.8	0.4	65.5
		Saturday	MD	64.4	65.3	0.9	69.2
			PM	63.7	64.5	0.8	68.2
5	Jerome Avenue between West Kingsbridge Road and West 195th Street	Weekday	MD	81.3	81.3	0.0	83.8
			PM	79.1	79.1	0.0	82.0
			LN	77.6	77.6	0.0	80.3
		Saturday	MD	78.6	78.6	0.0	81.6
			PM	77.4	77.5	0.1	79.3
6	East Kingsbridge Road between Morris and Creston Avenues	Weekday	MD	67.8	68.2	0.4	70.7
			PM	70.6	71.1	0.5	73.8
			LN	70.6	71.2	0.6	73.2
		Saturday	MD	70.3	70.5	0.2	72.9
			PM	68.2	69.0	0.8	71.5
			LN	68.1	68.8	0.7	72.0

In 2013, the increase in $L_{eq(1)}$ noise levels with the proposed project would be 1.0 dBA or less at all six receptor sites. Changes of these magnitudes would be barely perceptible and would be below the CEQR threshold for a significant impact. In terms of CEQR noise exposure guidelines, noise levels at receptor sites 1, 2, 3, 4, and 6 would remain in the “marginally unacceptable” category, and noise levels at receptor site 5 would remain in the “clearly unacceptable” category. These values are based on the predicted $L_{10(1)}$ values.

I. ATTENUATION REQUIREMENTS

As shown in **Table 16-5**, the *CEQR Technical Manual* has set noise attenuation values for buildings, based on exterior $L_{10(1)}$ noise levels. These recommended noise attenuation values are

designed to maintain interior noise levels of 45 dBA or lower for residential, hotel, etc. uses and 50 dBA for commercial uses.

Table 16-10 lists the required building attenuation values for each façade of the Armory. The renovated Armory structure would include central air conditioning (i.e., alternative ventilation) and all existing windows to be replaced would be replaced with well-sealed windows. All single-paned windows to remain would be repaired/resealed to be weather-tight. The Applicant would work with an acoustical consultant to ensure that the proposed project’s design would provide sufficient building attenuation measures (i.e., double-glazed windows, storm windows, etc.) to satisfy the building attenuation requirements listed in **Table 16-10**. With these measures, interior noise levels within all habitable spaces in the building would be expected to satisfy CEQR requirements. In addition, any window replacements would be subject to approval by the New York City Landmarks Preservation Commission (LPC) and the New York State Office of Parks, Recreation, and Historic Preservation (ORPHP).

Table 16-10
Building Attenuation (in dBA): Year 2013

Building Façades on	CEQR Interior Limit	Build L₁₀₍₁₎	Attenuation
Jerome Avenue	50	83.8	35
W. Kingsbridge Rd & W. 195th Street	50	79.3	30
Reservoir Avenue	50	71.7	25

J. MECHANICAL SYSTEMS

The design of and specifications for mechanical equipment, such as heating, ventilation, and air conditioning (HVAC), and elevator motors, are currently under way. However, this equipment would be designed to incorporate sufficient noise reduction devices to comply with applicable noise regulations and standards (including the standards contained in the revised New York City Noise Control Code), and to ensure that this equipment does not result in any significant increases in noise levels by itself or cumulatively with other project noise sources.

K. CONCLUSIONS

Based on the analyses presented above, the proposed project would not result in any predicted exceedances of *CEQR Technical Manual*-suggested incremental thresholds at noise receptor locations. Therefore, the project would not have any significant adverse noise impacts. *