

3.12 NOISE

The *CEQR Technical Manual* requires a detailed technical assessment of potential mobile noise impacts if a proposed action would double traffic volumes at any location, or if a substantial generator of noise (which includes a playground) is proposed to be located near a sensitive receptor. If stationary noise levels increase less than 5 dBA, below the SCA noise impact threshold, no impact is predicted.

The noise assessment considered the following three factors: 1) existing noise levels in the area, 2) the project's noise generation characteristics (principally from the proposed outdoor recreation space and project-induced traffic) and their effects on adjacent sensitive receptors, and 3) the inherent sensitivity of the proposed school site to existing and future noise sources in the vicinity.

3.12.1 Noise Descriptors

The A-weighted sound level (dBA) was used in the measurements and analysis of the noise effects in the project area as it correlates well with the human perception of noise. The one-hour equivalent continuous noise level (L_{eq} in dBA), and the noise level exceeded 10 percent of the time (L_{10} in dBA) were selected as the noise descriptors. The L_{eq} is the equivalent steady state noise level that contains the same amount of acoustic energy as the fluctuating noise during the period of measurement. The L_{10} descriptor provides an indication of existing average maximum noise levels and permits direct comparison with the CEQR External Noise Exposure Standards, set by NYCDEP, Division of Noise Abatement. CEQR guidelines were used in this analysis (Table 14).

As indicated in Table 14, external noise exposure at sensitive receptor sites is classified into four main categories: “acceptable”, “marginally acceptable”, “marginally unacceptable”, and “clearly unacceptable”.

3.12.2 Criteria

The *CEQR Technical Manual* provides guidance for determining applicable noise levels used to determine noise exposure in outdoor areas near noise-sensitive uses such as schools, residences etc. Indoor noise levels in schools are required to be 45 dBA or less. Therefore, for schools located in areas with “marginally unacceptable” noise levels (70–80 dBA), a minimum 30–35 dBA reduction of outdoor noise would be specified.

3.12.3 Existing Noise Measurements

3.12.3.1 Noise Monitoring Locations

Four representative noise monitoring sites were selected based on the schematic site plan for the proposed school facility. All four monitoring sites are located at sensitive receptors near the existing school or the proposed new school building. (The selected noise monitoring sites are depicted in Figure 23.) Site 1 is the new 10-story apartment building on the west side of Fourth Avenue, across the street from the existing schoolyard; Site 2 is a single-family residential property on Baltic Street, across the street from the playground; Site 3 is a single residential property on Butler Street, across the street from the existing schoolyard; and Site 4 is located at the eastern boundary of the school property nearest to the rear yards of two homes fronting on Butler and Baltic Streets.

**TABLE 14:
NOISE EXPOSURE STANDARDS FOR USE IN CITY ENVIRONMENTAL IMPACT REVIEWS¹**

Receptor Type	Time Period	Acceptable General External Exposure	Airport ³ Exposure	Marginally Acceptable General External Exposure	Airport ³ Exposure	Marginally Unacceptable General External Exposure	Airport ³ Exposure	Clearly Unacceptable General External Exposure	Airport ³ Exposure
1. Outdoor area requiring serenity and quiet ²		$L_{10} \leq 55$ dBA							
2. Hospital, nursing home		$L_{10} \leq 55$ dBA	— $L_{dn} \leq 60$ dBA —	$55 < L_{10} \leq 65$ dBA	— $60 < L_{dn} \leq 65$ dBA —	$65 < L_{10} \leq 80$ dBA	(I) $65 < L_{dn} \leq 70$ dBA, (II) $70 < L_{dn}$	$L_{10} > 80$ dBA	— $L_{dn} \leq 75$ dBA —
3. Residence, residential hotel or motel	7 AM–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–7 AM	$L_{10} \leq 55$ dBA		$55 < L_{10} \leq 70$ dBA		$70 < L_{10} \leq 80$ dBA		$L_{10} > 80$ dBA	
4. School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, out-patient public health facility		Same as Residential Day (7 AM–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)	
5. 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)	
6. Industrial, public areas only ⁴	Note 4	Note 4	Note 4	Note 4	Note 4				

Source: New York Department of Environmental Protection (adopted policy 1983).

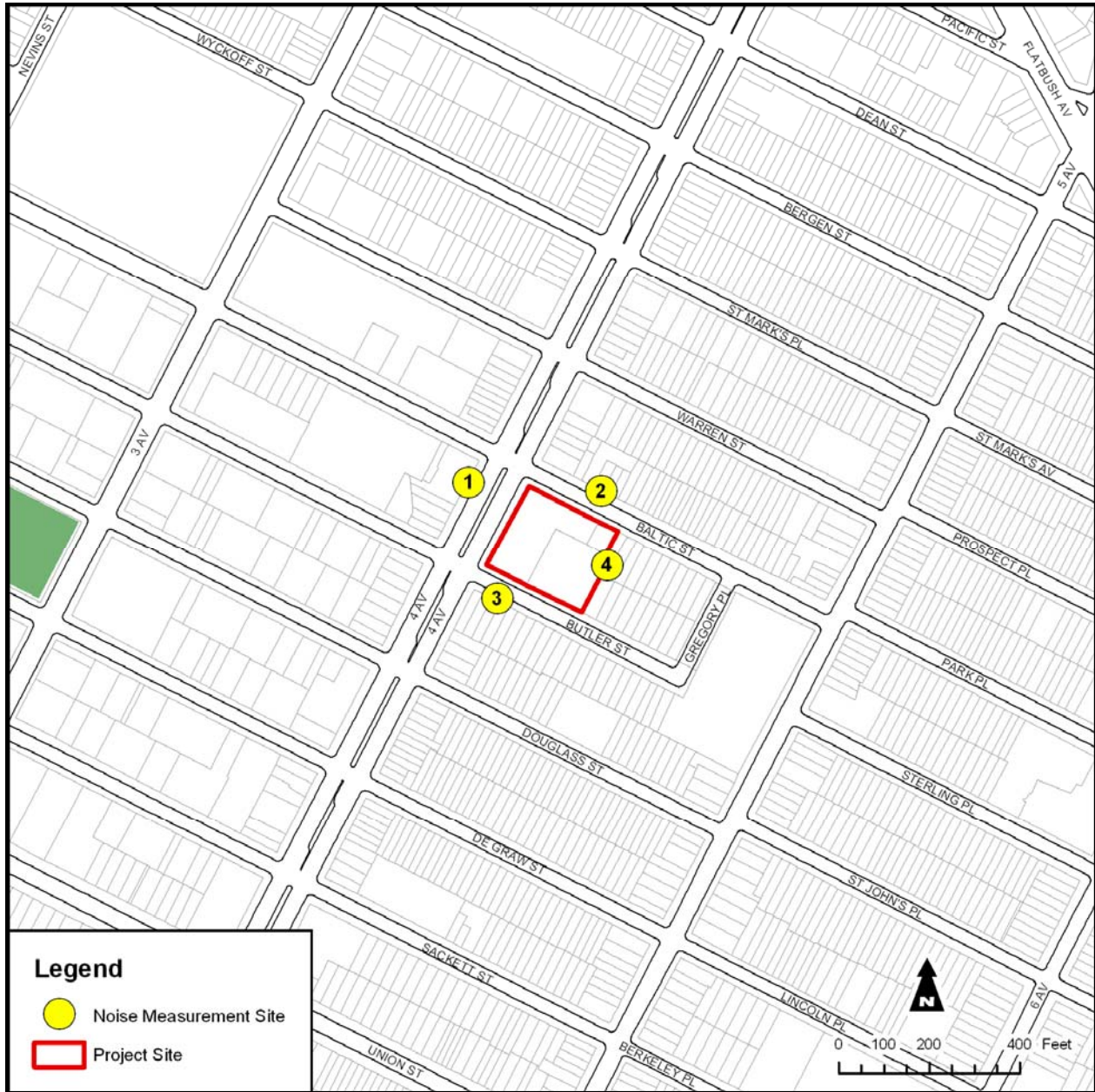
Notes:

- (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 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 amphitheatres, 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 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 the FAA-approved L_{dn} contours supplied by the Port Authority, or the noise contours may be computed from the federally approved INM Computer Model using flight data supplied by the Port Authority of New York and New Jersey.
- ⁴ External Noise Exposure standards for industrial areas of sounds produced by industrial operations other than operating motor vehicles or other transportation facilities are spelled out in the New York City Zoning Resolution, Sections 42-20 and 42-21. The referenced standards apply to M1, M2, and M3 manufacturing districts and to adjoining residence districts (performance standards are octave band standards).

FIGURE 23: SHORT-TERM NOISE MONITORING LOCATIONS



Existing noise exposure levels were collected at these four sites on January 21, 2009 during school hours for duration of 20 minutes per reading. The noise measurement time periods were 8:00 to 10:00 AM; 11:30 AM to 1:30 PM; and 2:00 to 3:30 PM. Measured noise levels were used to evaluate future noise impacts at nearby receptors, potential noise generated from other noise sources on the proposed new school facility, noise impacts from the operation of the proposed school building itself (e.g., generated in the outdoor play areas), and impacts of project-related traffic on nearby sensitive land uses. Noise sources near the school site included automobiles, trucks, commuter buses, school buses, distant aircraft, playground noise and other intermittent noise sources in the area generated by human activities. Of all these sources, the dominant noise source is road traffic.

3.12.3.2 Equipment Used in Noise Monitoring

Two sets of calibrated sound level meters with calibrated condenser microphones and wind shields were used in noise monitoring. The measurement microphones were mounted on tripods, at approximately 5.5 feet above the ground level. At the end of the preset time period of twenty minutes, the L₁₀ and the L_{eq} noise levels were read on the digital display of the sound level meters. During the monitoring periods, weather conditions and road surface conditions were acceptable: wind speeds were low (less than 20 km per hour) and the road surface was dry.

3.12.3.3 Existing Noise Levels

As shown on Table 15 below, measured noise levels ranged from an Leq (1hr) of 54 dBA to 70 dBA, which is considered typical of ambient conditions in residential areas near busy roadways. The wide range in noise levels is largely due to each site’s distance to Fourth Avenue (and other busy streets). Of the four monitoring locations, Site 1 (located on Fourth Avenue and Baltic Street) registered the highest measured Leq (1hr), where peak noise levels reached 70 dBA during the morning AM period; this was primarily attributable to high traffic volumes on Fourth Avenue. The lowest Leq (1hr) noise levels were recorded at Site 4, which is located at the easternmost boundary of the school property, near the rear yards of home fronting on Butler and Baltic Streets. Noise levels measured at Site 4 throughout the day were in the 54 to 59 dBA range. With the exception of Site 1, whose L₁₀ noise levels are considered “marginally unacceptable”, the other three sites experienced L₁₀ noise levels within the “marginally acceptable” range, according to the CEQR external noise exposure standards (presented in Table 14).

**TABLE 15:
SHORT-TERM NOISE MONITORING SITE RESULTS**

Site Number	Land Use Description	Monitoring Site Location	Hourly Leq (dBA)			Hourly L ₁₀ (dBA)		
			AM	Midday	PM	AM	Midday	PM
1	Multi-Family Residential	126 Fourth Avenue @ Baltic Street	70	68	68	73	70	71
2	Residential	621 Baltic Street	64	62	60	66	64	63
3	Residential	366 Butler Street	64	56	61	65	59	63
4	Rear yard of Baltic and Butler Street Residences	Eastern edge of site	54	56	59	56	59	62

Note: Baseline noise monitoring was completed on January 21, 2009 (during the time periods 8:00 AM–9:30 AM, 11:30 AM–1:30 PM and 2:00–3:30 PM.)

3.12.4 Potential Impacts of the Project

3.12.4.1 Mobile Sources

Estimated future noise levels at noise sensitive properties are based on a calculation using measured existing noise levels and predicted changes in traffic volumes through passenger car equivalent (PCE) calculations described in the *CEQR Technical Manual*. The project-generated increase in vehicle volumes on Fourth Avenue, Baltic Street, and Butler Street are expected to cause less than a 2-dBA increase in noise levels. Noise level increases on the order of 1.5 dBA are projected to occur on both Butler and Baltic Streets due to the additional bus and other vehicle movements projected on these streets. (This analysis considered a new bus drop-off/pick-up location on Baltic Street and the continuation of some bus drop-offs/pick-ups on Butler Street.) Noise levels along Fourth Avenue, the noisiest traffic corridor in the area, are expected to increase by less than 0.5 dBA. Overall, project-related increases in noise levels on the surrounding blocks would be well below the 3-dBA impact threshold that results from a doubling of the PCEs. Noise level changes of less than 2 dBA are considered below the level of human perceptibility and are within the CEQR acceptable limits. Therefore, no significant adverse mobile source noise impacts would result with the proposed action.

3.12.4.2 Stationary Source: Playground Noise

Based on preliminary schematic plans, once the construction of the new school facility is completed and the existing PS 133 building is removed, reconfigured outdoor play areas will face the Butler Street residences (Site 3) and the sides of two residential buildings on Butler and Baltic Streets at the eastern boundary of the school property (Site 4). According to a 1992 SCA noise study, playground activity generates a worst-case L_{eq} (1-hr) level of 71.5 dBA and a worst-case L_{10} level of 74.5 dBA at the playground boundary. Assuming this noise level at the boundary, the additional noise generated by playground activities would be below the 5 dBA impact threshold at Site 3. At Site 4, however, because measured existing noise levels are below 60 dBA, and the residences adjacent to the site's eastern boundary are 25 feet (or less) from the school property, playground noise levels would reach 69 dBA in the rear yards. This would exceed the 5-dBA impact threshold limit set for SCA projects, resulting in a significant noise impact. These two homes do not have windows facing the proposed playground areas; therefore, the projected playground noise impacts would be limited to the exterior spaces of the rear yards of the residences located at 632 Baltic Street (Block 940, Lot 117) and 391 Butler Street (Block 940, Lot 63). The project's noise impact would not be expected to extend beyond the rear yards of these two residences. The noise impact would also be limited to intermittent times of the day and year when the playground would be used by the students, which would be during recess periods on weekdays (generally between 8:30 AM to 4:30 PM) during the school year (September to late June).

3.12.5 Interior Noise Levels

The new school facility would be designed to provide sufficient window-wall attenuation features as described in Table 16 to ensure that the future interior noise levels within the building would be 45 dBA or less. For this study, the acceptability evaluation only considers noise generated from vehicular traffic movements. The greatest noise exposure for the proposed school building can be expected to occur along Fourth Avenue where peak L_{10} levels are projected to reach 73 dBA. Noise exposure along Baltic and Butler Streets can be expected to be lower reaching L_{10} levels of 66 to 67 dBA. Noise level exposures above L_{10} level of 70 dBA are characterized as "marginally unacceptable". In order to maintain an acceptable interior noise environment inside school buildings where classroom learning and speech intelligibility is critical, interior noise levels should not exceed 45 dBA. To satisfy this requirement, it would be necessary to provide a minimum of 30 dBA window-wall attenuation for the exterior walls of the new school facility. This would be achieved either with ½" thick single-glazed windows or with double-glazed windows with two panes, each ⅛" thick with ¾" air space between them. These windows would be effective only under closed window

conditions. Under the closed window conditions, it would be necessary to provide forced air circulation for the interior spaces of school classrooms.

**TABLE 16:
REQUIRED ATTENUATION VALUES TO ACHIEVE ACCEPTABLE INTERIOR NOISE LEVELS**

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

Source: New York City Department of Environmental Protection (DEP)

Note: 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 alternative means of ventilation.