8 NOISE

8.1 Introduction

This chapter assesses the potential noise effects associated with the Proposed Actions. The Proposed Actions would introduce new noise-sensitive receptors to the Project Area, consisting of residential, and commercial. According to the 2020 *CEQR Technical Manual*, the purpose of a CEQR noise assessment is to determine if:

1. a proposed project's potential effects on sensitive noise receptors, including the effects on the level of noise inside residential, commercial, and institutional facilities (if applicable), and at open spaces; and
2. the effects of ambient noise levels on new sensitive uses introduced by a proposed project. If significant adverse impacts are identified, CEQR requires such impacts to be mitigated or avoided to the greatest extent practicable.

This noise analysis was conducted to establish the effects of ambient noise levels and to determine the level of building attenuation required to ensure that interior noise levels within the proposed project would satisfy applicable interior noise criteria. For this project, noise assessment was warranted in both the areas of stationary and mobile sources.

8.2 Principal Conclusions

The Proposed Actions would not result in significant adverse noise impacts. The Proposed Actions would not generate sufficient traffic to generate a significant noise impact. The mechanical systems (i.e., HVAC systems) of new buildings would be designed to meet all applicable noise regulations and would avoid producing noise that would result in any significant increase in ambient noise levels. Therefore, the Proposed Actions would not result in significant adverse noise impacts related to building mechanical equipment (stationary sources).

The Project Area is proximate to the Richmond County Bank Ballpark, and the ambient noise sources in the area include traffic along Richmond Terrace, Stuyvesant Place, and mechanical

equipment on the roof of the Castleton Park Apartments parking garage. An (E)-Designation would be mapped on Projected Development Sites 1 and 2. To achieve the CEQR interior noise criteria, the proposed buildings on Projected Development Site 1 would be designed to include acoustically rated windows and an alternate means of ventilation (i.e., air conditioning) that does not degrade the acoustical performance of the façade. On Projected Development Site 2, which is not under the Applicant's control, building attenuation would be required by a noise (E)-Designation to ensure that interior noise levels for a new building meet the CEQR criteria through requirements pertaining to window/wall attenuation and alternate means of ventilation. Complying with the interior noise level criteria set forth in the proposed (E)-Designation would be achieved by incorporating the minimum attenuation requirements specified.

8.3 Methodology

The assessment has been conducted in accordance with the guidelines set forth in the *CEQR Technical Manual*. An initial impact screening assessment considers whether a proposed project would:

1. generate any mobile or stationary sources of noise; or
2. be located in an area with existing high ambient noise levels. For a mobile source analysis to be triggered, a project must impact vehicular traffic noise, aircraft noise, and/or train noise.

Stationary noise sources do not move in relation to a noise-sensitive receptor. Typical stationary noise sources of concern include machinery or mechanical equipment, such as those associated with a building's heating, ventilating, and air-conditioning (HVAC) system. The Proposed Actions would facilitate the development of new stationary sources due to mechanical equipment, and therefore a stationary source assessment is provided.

Mobile noise sources are those that move in relation to receptors. The mobile source screening assessment addresses potential noise impacts associated with vehicular traffic generated by the Proposed Actions.

According to the *CEQR Technical Manual*, if existing passenger car equivalent (PCE) values are increased by 100 percent or more due to a proposed action, a detailed analysis is generally performed. Because the With-Action scenario would not double the passenger car equivalents (PCEs), the Proposed Actions would not have the potential to generate a 3 dB(A) or greater increase in noise levels per the *CEQR Technical Manual*. The increase in traffic would result in a maximum noise level increase of 2.4 dB(A). Therefore, the proposed project would not cause a significant adverse mobile source noise impact due to traffic.

According to the *CEQR Technical Manual*, the acceptable interior noise level is 45 dB(A) or lower for residential uses and 50 dB(A) or lower for commercial office uses. Noise survey locations were selected by examining the Projected Development Sites' location and the location of the dominant sources of ambient noise. Existing noise levels were determined at each location by performing field measurements. The measured noise levels were used to determine minimum window/wall attenuation requirements to satisfy CEQR interior noise level criteria.

Ambient Noise Measurements

Measurements were performed using NTi XL2 and Bruel & Kjaer 2250 sound level meters (SLM). The SLMs are a Type 1 instrument according to ANSI Standard S1.4-1983 (R2006). For

each measurement, the microphone was mounted on a tripod at a height of 5 feet above the ground or roof level, and was mounted at least approximately 5 feet away from any large reflecting surfaces. The SLM's calibration was field checked before and after readings. Measurements at each location were made on the A-scale (dB(A)). The data were digitally recorded by the SLMs and displayed at the end of the measurement period in units of dB(A). Measured quantities included L_{eq}, L_1, L_{10}, L_{50}, L_{90}, and 1/3 octave band levels. A windscreen was used during all sound measurements except for calibration. Noise levels were measured on March 4, 5, 7, and 11, 2020 at each receptor site over 20-minute periods during the weekday AM (7:30am – 9:30am) Midday (11:30am – 1:30pm) and PM (4:00pm – 6:00pm) peak periods.

Survey Locations

The Project Area is near Richmond County Bank Ballpark, and noise measurements were captured on non-game day activity. The Seaside Park and Community Arts Center FEIS (13DME014K) conducted a noise study that monitored noise levels during the pre-event and post-event periods on baseball game nights at MCU Park. On a weekday game night, monitoring was conducted during the PM (5:30 - 7:30 pm) and evening (9-11 pm) time periods. On Saturday game nights, monitoring was conducted during the PM (4:30– 6:30 pm) and the Evening (8 -10 pm) periods. To account for gameday-generated noise at the Richmond County Bank Ballpark, noise levels at monitoring locations B and C were compared to the peak game day activity noise levels using the data obtained from Monitoring Location 7 of the Seaside Park and Community Arts Center FEIS (13DME014K), shown in Table 8-1. Attenuation values for façades at survey locations B and C that face Richmond Terrace are based on game day level.

Table 8-1: Seaside Park and Community Arts Center Monitoring Location 7

Site	Date and Time		CEQR Noise Category	Leq	L10	Lmin	Lmax	L1	L50	L90
Surf Ave Midblock, between 21st St and 22nd St	6/20/2013	5:51 pm - 6:11 pm	M.U. (I)	73.6	70.9	57.0	96.1	81.1	64.6	59.5
	7/17/2013	9:00 pm - 9:20 pm	M.A.	66.9	68.1	52.6	88.6	77.3	61.3	55.6
	6/29/2013	5:03 pm - 5:23 pm	M.A.	66.1	67.8	57.8	85.1	75.1	63.7	60.3
		8:05 pm - 8:25 pm	M.A.	64.6	66.0	54.7	83.8	76.5	61.1	58.0

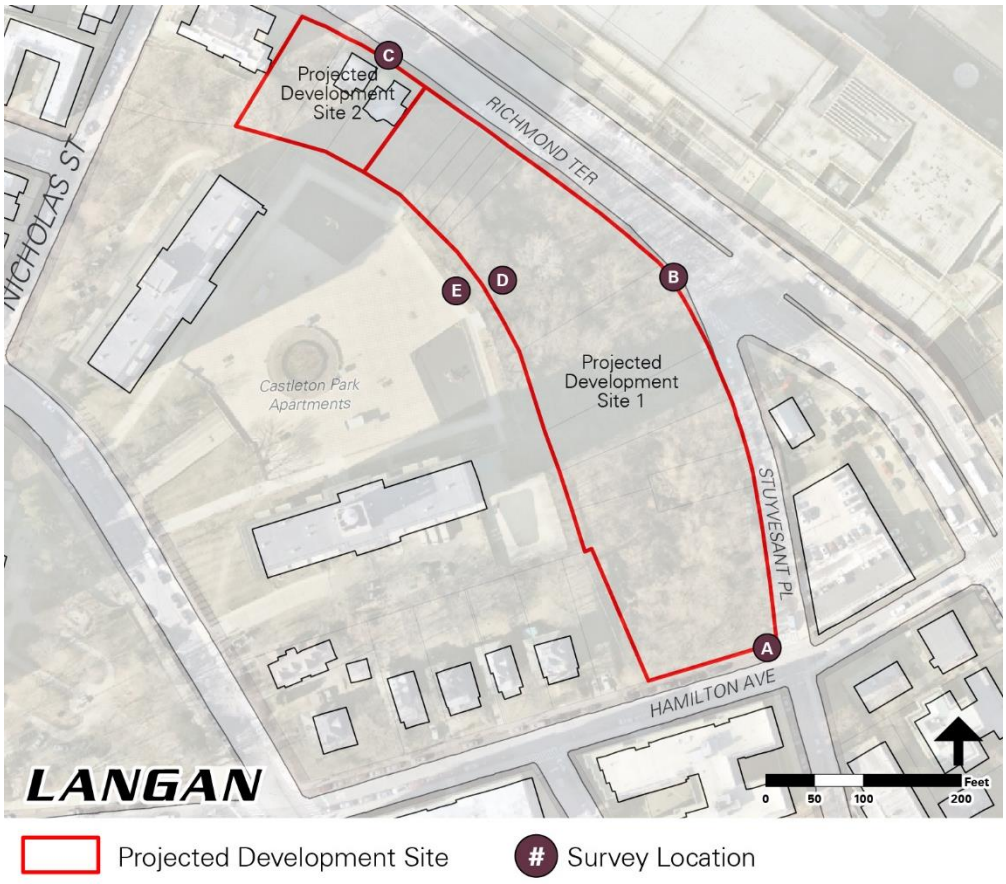
Source: Seaside Park and Community Arts Center FEIS (13DME014K)

The Project Area is near two playground equipment areas on the Castleton lot. These equipment areas are only accessible to tenants of the Castleton Park Apartments. Because the playgrounds were unoccupied at the time of the existing noise level measurements, a noise level of 75 dB(A) (Leq) was assumed at the playgrounds per *CEQR Technical Manual* guidance.

The survey locations were selected to account for the noise conditions of the surrounding area, including ventilation mechanical equipment and playground equipment at the Castleton lot, and to capture ambient noise generated by existing traffic volumes. The survey locations selected are shown in Figure 8-1 and include:

- Survey Location A – Ground level at intersection of Stuyvesant Place and Hamilton Avenue
- Survey Location B – Ground level at intersection of Stuyvesant Place and Richmond Terrace
- Survey Location C – Ground level on Richmond Terrace
- Survey Location D – Ground level set back from Richmond Terrace
- Survey Location E – Elevated open space above Castleton Park Apartments parking garage

Figure 8-1: Site Map and Survey Locations



To account for noise generated at the playground equipment on the Castleton lot, where measured noise levels along the rear of the Project Area are lower than assumed noise levels from the playground, the higher noise level will be applied. Based on the distance of 30 feet between the playgrounds and the rear façade of the Projected Development Sites, a noise level of 69 dB(A) Leq was applied at the rear façades.

Noise Standards and Criteria

CEQR-recommended noise attenuation values for buildings are designed to maintain interior noise levels of 45 dB(A) or lower for residential uses and 50 dB(A) or lower for commercial office uses and are determined based on exterior $L_{10(1)}$ noise levels. The *CEQR Technical Manual* provides attenuation requirements for buildings to achieve these interior noise environments based on exterior noise levels, as shown in Table 8-2.

Table 8-2: Required Attenuation Values to Achieve Acceptable Interior Noise Levels

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

[A] The above composite window-wall attenuation values are for residential dwellings and community facility development. 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.
[B] Required attenuation values increase by 1 dB(A) increments for L_{10} values greater than 80 dB(A).
Source: New York City Department of Environmental Protection.

8.4 Existing Noise Levels

The results of the existing noise level measurements are presented in Table 8-3.

Table 8-3: Measured Existing Noise Levels

Location	Measurement Location	Day	Time	Leq	L1	L10	L50	L90
A	Ground Level of Stuyvesant Pl and Hamilton Ave	Weekday	AM	61.2	72.0	63.9	55.3	49.9
			MD	61.2	71.5	62.6	54.7	49.8
			PM	58.3	68.5	61.5	52.6	48.4
		Weekend	MD	62.0	71.9	59.4	53.3	50.7
B	Ground Level of Stuyvesant Pl and Richmond Terrace Ave	Weekday	AM	66.5	73.4	70.5	64.7	51.1
			MD	63.9	73.1	67.6	59.6	46.6
			PM	62.0	71.4	62.9	58.2	50.3
		Weekend	MD	63.6	72.4	67.9	59.3	49.1
C	Ground level of Richmond Terrace	Weekday	AM	66.5	73.3	70.5	64.4	54.7
			MD	64.6	74.6	68.4	59.7	49.1
			PM	64.6	73.1	68.9	60.8	51.8
		Weekend	MD	63.5	72.7	68.0	58.6	51.8
D	Ground Level Set Back of Richmond Terrace	Weekday	AM	57.1	63.9	60.8	55.3	47.5
			MD	54.5	60.9	57.6	52.9	47.8
			PM	56.9	62.4	60.0	56.2	49.0
		Weekend	MD	57.1	63.3	59.9	56.3	50.7
E	Elevated Open Space above Parking Garage	Weekday	AM	60.4	65.4	63.4	59.8	54.6
			MD	58.5	67.3	61.2	56.6	51.1
			PM	52.4	59.5	54.3	51.4	49.3
		Weekend	MD	56.3	61.8	59.1	55.1	50.9

At locations B, C, and D, the ambient noise environment was controlled by traffic noise along Richmond Terrace. At location A, ambient noise levels were controlled local traffic on Stuyvesant Place and Hamilton Avenue. At location E, the ambient noise levels were mostly controlled by mechanical noise and occasional vehicular activity on Richmond Terrace.

In accordance with *CEQR Technical Manual* guidelines, the existing noise levels at sites A, D, and E are in the "acceptable"category. The existing noise levels at locations B and C are in the "marginally unacceptable" category.

8.5 No-Action Noise Levels

Based on the traffic data, the No-Action noise levels are projected to increase by 0.0 to 2.8 dB(A) from the existing noise levels. The results of the No-Action noise level predictions are presented in Table 8-4.

Table 8-4: No-Action Noise Levels

Location	Measurement Location	Day	Time	Existing Leq	No-Action Leq	Leq Change	No-Action L10
A	Ground Level of Stuyvesant Pl and Hamilton Ave	Weekday	AM	61.2	61.2	0.0	64.0
			MD	61.2	62.1	0.9	63.6
			PM	58.3	59.4	1.1	62.6
		Weekend	MD	62	63.0	1.0	60.3
B	Ground Level of Stuyvesant Pl and Richmond Terrace	Weekday	AM	66.5	67.5	1.0	71.5
			MD	63.9	66.0	2.1	69.7
			PM	62	64.0	2.0	64.9
		Weekend	MD	63.6	66.4	2.8	70.7
C	Ground level of Richmond Terrace	Weekday	AM	66.5	67.2	0.7	71.2
			MD	64.6	66.7	2.1	70.5
			PM	64.6	66.5	1.9	70.8
		Weekend	MD	63.5	66.2	2.7	70.6
D	Ground Level Set Back of Richmond Terrace[1]	Weekday	AM	57.1	57.8	0.7	61.6
			MD	54.5	56.6	2.1	59.4
			PM	56.9	58.8	1.9	61.8
		Weekend	MD	57.1	59.8	2.7	62.3
E	Elevated Open Space above Parking Garage[2]	Weekday	AM	60.4	60.4	0.0	63.4
			MD	58.5	58.5	0.0	61.2
			PM	52.4	52.4	0.0	54.3
		Weekend	MD	56.3	56.3	0.0	59.1

[1] This receptor has been set back from the street, the same traffic increases as Site C has been applied, as Site C was at to street level.

[2] This receptor is shielded from the street and controlled by mechanical noise from the garage exhaust louvers as opposed to traffic related noise, as a result, the sound levels shown in Table 8-4 have been carried over from Table 8-3.

In accordance with *CEQR Technical Manual* guidelines, the No-Action noise levels at sites A, D, and E are in the "acceptable" category, site B and C are in the "marginally unacceptable" category.

8.6 With-Action Noise Levels

Based on the traffic data, the With-Action traffic is expected to result in increases from 0.1 to 2.4 dB(A) over No-Action noise levels. The results of the With-Action noise level measurements are presented in Table 8-5.

Table 8-5: With-Action Noise Levels

Location	Measurement Location	Day	Time	No-Action Leq	With-Action Leq	Leq Change	With-Action L10
A	Ground Level of Stuyvesant Pl and Hamilton Ave	Weekday	AM	61.2	62.3	1.1	65.0
			MD	62.1	63.7	1.5	65.1
			PM	59.4	61.8	2.4	65.0
		Weekend	MD	63.0	65.4	2.4	62.7
B	Ground Level of Stuyvesant Pl and Richmond Terrace	Weekday	AM	67.5	67.7	0.2	71.7
			MD	66.0	66.2	0.2	69.9
			PM	64.0	64.1	0.1	65.0
		Weekend	MD	66.4	66.7	0.2	70.9
C	Ground level of Richmond Terrace	Weekday	AM	67.2	67.3	0.1	71.3
			MD	66.7	66.8	0.2	70.7
			PM	66.5	66.7	0.2	71.0
		Weekend	MD	66.2	66.4	0.3	70.9
D	Ground Level Set Back of Richmond Terrace[1]	Weekday	AM	58.3	58.5	0.1	61.9
			MD	57.6	57.9	0.2	59.7
			PM	59.4	59.7	0.2	62.1
		Weekend	MD	60.4	60.7	0.3	62.7
E	Elevated Open Space above Parking Garage[2]	Weekday	AM	60.4	60.4	0	63.4
			MD	58.5	58.5	0	61.2
			PM	52.4	52.4	0	54.3
		Weekend	MD	56.3	56.3	0	59.1

[1] This receptor has been set back from the street, the same traffic increases as Site C has been applied, as Site C was at to street level.
[2] This receptor is shielded from the street and controlled by mechanical noise from the garage exhaust louvers as opposed to traffic related noise, as a result, the sound levels shown in Table 8-5 have been carried over from Table 8-4.

Based on the projected With-Action noise levels, the rear (St. Marks Place) facades are expected to see maximum noise levels of 62.7 dB(A) and 63.4 dB(A). To determine the playground noise contribution to the rear façade of the project, an L_{10} noise level was conservatively predicted by combing the playground L_{eq} (69 dB(A)) and the difference between the L_{eq} and L_{10} monitored noise levels at Location E. The largest delta at Location E was 3 dB, therefore the predicted L_{10} at this location is 69 dB(A). When logarithmically added to the measured mechanical equipment, the noise levels range from 71 dB(A) to 72 dB(A). A level of 72 dB(A) will be applied as the maximum L_{10} for Locations D and E.

Per the Seaside Park and Community Arts Center FEIS (13DME014K), the highest noise level near the project site is a weekday pre-game level of 73.6 dB(A) (Leq). As this is louder than the predicted L_{10} values for Locations B and C, it will be used to determine façade attenuation requirements.

In accordance with *CEQR Technical Manual* guidelines, the With-Action noise levels at site A are in the "marginally acceptable" category. When accounting for Game-Day and playground noise, the With-Action noise levels at locations B, C, D and E are in the "marginally unacceptable" category.

8.7 Assessment

Attenuation Requirements

As shown in Table 8-2, the *CEQR Technical Manual* has set noise attenuation values for building facades, based on exterior $L_{10(1)}$ noise levels. These recommended noise attenuation values are

designed to maintain interior noise levels of 45 dB(A) or lower for residential uses and 50 dB(A) for commercial office uses.

Table 8-6 lists the required building attenuation values for each façade of the proposed development. The attenuation of a composite structure is a function of the attenuation provided by each of its component parts and how much of the area is made up of each part. Normally, a building façade consists of a wall, glazing, and any vents or louvers associated with the building mechanical systems in various ratios of area. The proposed buildings on Projected Development Sites 1 will be designed to include acoustically rated windows and an alternate means of ventilation (i.e., air conditioning) that does not degrade the acoustical performance of the façade. Similar design measures would be required for Projected Development Site 2, which is not under control of the Applicant.

Table 8-6: CEQR Building Attenuation Analysis Summary

Building	Building Façades On	Associated Location	Maximum L_{10} (in dB(A))	Attenuation Requirement
Projected Development Site 1				
1	Hamilton Avenue	A	65.1	N/A[3]
	Stuyvesant Place & North Facade	B	71.7	28 dB(A)
	Rear (St. Marks Place) Facade	D	72.0[2]	28 dB(A)
2 & 3	Richmond Terrace	B	73.6[1]	31 dB(A)
	North & South Facades	B	73.6[1]	31 dB(A)
	Rear (St. Marks Place) Facade	E	72.0[2]	28 dB(A)
Projected Development Site 2				
4	Richmond Terrace	C	73.6[1]	31 dB(A)
	North & South Facades	C	73.6[1]	31 dB(A)
	Rear (St. Marks Place) Facade	D	72.0[2]	28 dB(A)

Notes:
[1] Based on Game Day Leq of 73.6 dB(A) from 13DME014K.
[2] Based on predicted playground noise
[3] Maximum noise level is below the threshold of CEQR Table 19-3, therefore no attenuation is required

Based on the With-Action projected noise levels (that account for noise during game day activity at Richmond County Bank Ballpark and playground noise), Buildings 2, 3 on Projected Development Site 1 and any new building on Projected Development Site 2 will require 28 dB(A) of attenuation along the north and south facades, and 31 dB(A) of attenuation along Richmond Terrace. An (E)-Designation is proposed to require façade attenuation as well as require an alternate means of ventilation. The text for the (E)-Designation would be as follows:

> **Block 13, Lot 100 (Proposed Building 1): To ensure an acceptable interior noise environment, future residential uses must provide a closed-window condition with a minimum of 28 dBA window/wall attenuation on the facades facing Stuyvesant Place, Richmond Terrace, and the North facing facade to maintain an interior noise level not greater than 45 dBA. To maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, air conditioning.**
>
> **Block 13, Lot 92 (Proposed Building 2): To ensure an acceptable interior noise environment, future residential uses must provide a closed-window condition with a minimum of 28 dBA window/wall attenuation on facades facing St. Marks Place and 31 dBA of attenuation on all other facades to maintain an interior noise level not greater than 45 dBA for residential uses. To maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, air conditioning.**

Block 13, Lot 82 (Proposed Building 3): To ensure an acceptable interior noise environment, future residential uses must provide a closed-window condition with a minimum of 28 dBA window/wall attenuation on facades facing St. Marks Place and 31 dBA of attenuation on all other facades to maintain an interior noise level not greater than 45 dBA for residential uses. To maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, air conditioning.

Block 13, Lots 68, 71, and 73 (Projected Development Site 2): To ensure an acceptable interior noise environment, future residential uses must provide a closed-window condition with a minimum of 28 dBA window/wall attenuation on facades facing St. Marks Place and 31 dBA of attenuation on all other facades to maintain an interior noise level not greater than 45 dBA for residential uses. To maintain a closed-window condition, an alternate means of ventilation must also be provided. Alternate means of ventilation includes, but is not limited to, air conditioning.

The proposed building facades would be designed to provide a composite OITC rating greater than or equal to the attenuation requirements listed in Table 8-6. By designing the buildings to provide a composite OITC rating greater than or equal to the attenuation requirements listed in Table 8-6, the Projected Development Sites would provide sufficient attenuation to achieve the CEQR interior noise level guideline of 45 dB(A) or lower for residential uses. Therefore, the Proposed Actions would not result in significant adverse noise impacts, and no further analysis is warranted.

Mechanical Systems

The design of and specification for building mechanical systems, such as heating, ventilation, and air conditioning (HVAC), should be designed to meet all applicable noise regulations (i.e., Subchapter 5, §24-227 of the New York City Noise Control Code and the New York City Department of Buildings Mechanical Code) to ensure that the equipment does not result in any significant increase in ambient noise levels.