2.P NOISE

INTRODUCTION

The purpose of a noise assessment under CEQR is to determine whether an action would (1) raise noise levels significantly at existing or anticipated sensitive noise receptors (such as residences or schools) or (2) introduce new sensitive uses (such as residential buildings or schools) at locations subject to unacceptably high ambient noise levels.

The assessment is concerned with both mobile and stationary noise sources. Mobile sources are those that move in relation to a noise-sensitive receptor. They include automobiles, buses, trucks, aircraft, and trains. Stationary sources of noise do not move in relation to a noise-sensitive receptor. Typical stationary noise sources of concern include machinery or mechanical equipment associated with industrial and manufacturing operations; building heating, ventilating, and air conditioning (HVAC) systems; speakers for public address and concert systems; playground noise; and spectators at concerts or sporting events. An action could raise noise levels either by introducing new stationary noise sources (such as outdoor playgrounds or rooftop air conditioning compressors) or by increasing mobile source noise (generally by generating additional traffic). Similarly, an action could introduce new residences or other sensitive receptors that would be subject to noise from either stationary or mobile sources.

The Proposed Action would replace generally low intensity light industrial and automotive uses, and vacant formerly industrial space, in buildings of mostly one and two stories with seven- to fifteen-story residential buildings, some of which would have ground floor commercial or community facility space. Under the reasonable worst-case development scenario (RWCDS) described in Chapter 1, Project Description, the anticipated development would add 2,635 housing units, 93,000 square feet of commercial space, a child care center, and an outdoor children's playground. It would do so in an area of 11 blocks, parts of which would be in close proximity to two arterial highways (the Cross Bronx Expressway and the Sheridan Expressway) and an elevated subway trestle. The Proposed Action would thus add both stationary noise sources (the playground and the HVAC systems of the new apartment buildings) and mobile noise sources (increased vehicular traffic) and would introduce noise-sensitive uses in an area with prominent mobile source noise generators.

Between the Draft and Final EIS, a number of additional activities were undertaken to provide further clarification to this chapter. These activities included:

1. A supplemental noise monitoring program for the LSGD sites,
2. The inclusion of HUD guidelines and L_{dn} noise levels,
3. The inclusion of more specific noise level calculations associated with the proposed new playground on Site 2S,
4. The calculation of required noise attenuation by floor level and facades for the LSGD sites, and
5. The recalculation of mobile source noise levels due to refinements in the traffic data.

Discussions of these items have been inserted into the text below. To improve readability, notations have been made where this text is inserted, rather than black-lining the entire text.

PRINCIPAL CONCLUSIONS

Mobile Sources

A screening analysis based on action-generated increases in traffic showed no potential for noise increases of 3.0 dBA or more to the L_{eq} or L_{10}, relative to future no-action conditions, at any of the studied intersections. Because

redevelopment of industrial sites under the RWCDS would reduce the number of truck trips, the Proposed Action would result in slightly lower noise levels at many locations and a significant lowering of noise levels, by 3.1 dBA, at the intersection of Boone Avenue and East 173rd Street.

The northernmost block of the proposed rezoning area is adjacent to an elevated subway trestle above Boston Road. Because of this, the noise levels at Projected Development Site 9C and Potential Development Sites 9A and 9B would be in the Clearly Unacceptable category of the NYCDEP Noise Exposure Guidelines. The highest noise levels, up to an L_{10} of 86.1 dBA, are based on monitored noise levels at ground level and are partially due to the reverberation of rail noise on the elevated metal structure. Under guidelines in the *CEQR Technical Manual,* the development of new residential units at locations subject to these Clearly Unacceptable noise levels would ordinarily constitute a significant adverse impact because indoor noise levels could exceed the maximum acceptable level of 45 dBA. However, the Proposed Action would include the mapping of (E) designations on Sites 9A (Block 3016, Lots 33 and 35), 9B (Block 3016, Lots 36 and 37), and 9C (Block 3016, Lots 38 and 42) that would require (1) specified levels of window/wall noise attenuation and (2) air conditioning or other alternative means of ventilation so that residents can maintain a closed window condition at all times of the year. The specified attenuation levels would be at least 42 dBA on the affected lower floors of the buildings. That level of exterior-to-interior noise attenuation would ensure that indoor noise levels would be below 45 dBA, avoiding the potential significant adverse noise impact. A lesser noise attenuation requirement may be appropriate for floors above the second floor because noise levels above the elevated rail structure may be substantially lower. Since these buildings are not controlled by the applicant, any refinements to the required attenuation for the upper floors would be the responsibility of the developer.

Other projected and potential development sites would be subject to noise levels in the marginally unacceptable categories because of highway and other traffic noise. If an action would introduce noise-sensitive uses at a location where the noise levels would exceed the marginally acceptable levels, the *CEQR Technical Manual* specifies that a significant impact would occur unless the building design provides a composite building attenuation that would be sufficient to reduce these levels to an acceptable interior noise level. Except at Sites 9A, 9B, and 9C, attenuation levels of from 28 to 33 dBA would be required to ensure acceptable indoor noise levels at sites where traffic noise is the only significant noise source. Additional noise monitoring and analysis were carried out between Draft and Final to refine the projected noise levels at the LSGD sites.

The Proposed Action would include the mapping of (E) designations for non-applicant-controlled projected and potential development sites and the recording of restrictive declarations for Proposed Project sites. The provisions of both the (E) designations and the restrictive declarations would mandate the required attenuation rating levels to ensure that interior noise levels would be at 45 dBA or less for residential uses and 50 dBA or less for commercial uses. Where the projected L_{10} noise levels would be 70 dBA or more, the (E) designation and restrictive declaration provisions also would require alternate means of ventilation to permit a closed-window condition during warm weather. Although the projected noise levels would be high enough to result in significant adverse noise impacts, the potential impacts would be avoided through the mapping of (E) designations and recording of restrictive declarations that would mandate the requisite noise attenuation levels and, where necessary, require alternate means of ventilation.

Stationary Sources

No existing stationary sources of noise were identified during field observations. Stationary sources of noise under the Proposed Action would include HVAC units on the rooftops of buildings. No impacts from new stationary sources are anticipated due to the distances from buildings of similar height and the design of the units.

The Proposed Project would include both an outdoor children's playground (a new stationary noise source) and wings of a residential building (new sensitive noise receptors) along the southern part of the Boone Avenue frontage between East 172nd and 173rd Streets, on Site 2S. One building wing would

directly abut the playground's northern edge. For ground floor windows facing the playground, the total L_{10} would be 78.5 dBA, which would be in the Marginally Unacceptable IV category, requiring window/wall noise attenuation of 35 dBA. A façade of another wing would be about 15 feet from the playground's southern edge. For ground floor windows facing the playground, the total L_{10} would be 78.5 dBA, which would be in the Marginally Unacceptable IV category, requiring window/wall noise attenuation of 35 dBA.

Under guidelines in the *CEQR Technical Manual,* these increases would constitute potential significant adverse impacts to the residential windows that would face the playground. However, the restrictive declaration associated with the LSGD would require window/wall noise attenuation of at least 35 dBA on the affected lower floors of the two building wings. A lesser noise attenuation requirement would be appropriate for floors above the second floor as both traffic noise and playground noise decrease with distance. Additional analysis was carried out between the Draft and Final EIS to determine the appropriate noise attenuation levels for the higher floors. The restrictive declaration provisions to ensure that interior noise levels remain at 45 dBA or less for residential uses would avoid the potential significant adverse noise impacts.

NOISE FUNDAMENTALS

Noise is measured in sound pressure level (SPL), which is converted to a decibel scale. The decibel is a relative measure of the sound level pressure with respect to a standardized reference quantity. Decibels on the A-weighted scale are termed "dBA." The A-weighted scale is used for evaluating the effects of noise in the environment because it most closely approximates the response of the human ear. On this scale, the threshold of discomfort is 120 dB, and the threshold of pain is about 140. Table P-1 shows the range of noise levels for a variety of indoor and outdoor noise levels.

Because the scale is logarithmic, a relative increase of 10 decibels represents a sound pressure level that is 10 times higher. However, humans do not perceive a 10 dBA increase as 10 times or louder; they perceive it as twice as loud. The following is typical of human response to relative changes in noise level:

- 3 dBA change is the threshold of change detectable by the human ear;
- 5 dBA change is readily noticeable; and
- 10 dBA increase is perceived as a doubling of noise level.

The sound pressure level that humans experience typically varies from moment to moment. Therefore, a variety of descriptors are used to evaluate environmental noise levels over time. Some typical descriptors are defined below:

- L_{eq} is the continuous equivalent sound level. The sound energy from the fluctuating sound pressure levels is averaged over time to create a single number to describe the mean energy or intensity level. High noise levels during a monitoring period will have greater effect on the L_{eq} than low noise levels. The L_{eq} has an advantage over other descriptors because L_{eq} values from different noise sources can be added and subtracted to determine cumulative noise levels.
- L_{max} is the highest SPL measured during a given period of time. It is useful in evaluating L_{eq}s for time periods that have an especially wide range of noise levels.
- L_{10} is the SPL exceeded 10% of the time. Similar descriptors are the L_{50}, L_{01}, and L_{90}.
- L_{dn} is the day-night equivalent sound level. It is similar to a 24-hour L_{eq}, but with 10 dBA added to SPL measurements between 10 pm and 7 am to reflect the greater intrusiveness of noise experienced during these hours. L_{dn} is also termed DNL.

Table P-1: Sound Pressure Level and Loudness of Typical Noises in Indoor and Outdoor Environments

Noise Level (dBA)	Subjective Impression	Typical Sources		Relative Loudness (Human Response)
		Outdoor	Indoor	
120-130	Uncomfortably Loud	Air raid siren at 50 feet (threshold of pain)	Oxygen torch	32 times as loud
110-120	Uncomfortably Loud	Turbo-fan aircraft at take-off power at 200 feet	Riveting machine Rock band	16 times as loud
100-110	Uncomfortably Loud	Jackhammer at 3 feet		8 times as loud
90-100	Very Loud	Gas lawn mower at 3 feet Subway train at 30 feet Train whistle at crossing Wood chipper shredding trees Chain saw cutting trees at 10 feet	Newspaper press	4 times as loud
80-90	Very Loud	Passing freight train at 30 feet Steamroller at 30 feet Leaf blower at 5 feet Power lawn mower at 5 feet	Food blender Milling machine Garbage disposal Crowd noise at sports event	2 times as loud
70-80	Moderately Loud	NJ Turnpike at 50 feet Truck idling at 30 feet Traffic in downtown urban area	Loud stereo Vacuum cleaner Food blender	Reference loudness (70 dBA)
60-70	Moderately Loud	Residential air conditioner at 100 feet Gas lawn mower at 100 feet Waves breaking on beach at 65 feet	Cash register Dishwasher Theater lobby Normal speech at 3 feet	2 as loud
50-60	Quiet	Large transformers at 100 feet Traffic in suburban area	Living room with TV on Classroom Business office Dehumidifier Normal speech at 10 feet	1/4 as loud
40-50	Quiet	Bird calls, Trees rustling, Crickets, Water flowing in brook	Folding clothes Using computer	1/8 as loud
30-40	Very quiet		Walking on carpet Clock ticking in adjacent room	1/16 as loud
20-30	Very quiet		Bedroom at night	1/32 as loud
10-20	Extremely quiet		Broadcast and recording studio	
0-10	Threshold of hearing			

Sources: Noise Assessment Guidelines Technical Background, by Theodore J. Schultz, Bolt Beranek and Newman, Inc., prepared for the US Department of Housing and Urban Development, Office of Research and Technology, Washington, D.C., undated; Sandstone Environmental Associates, Inc.; Highway Noise Fundamentals, prepared by the Federal Highway Administration, US Department of Transportation, September 1980; Handbook of Environmental Acoustics, by James P. Cowan, Van Nostrand Reinhold, 1994.

For mobile source noise from vehicular traffic, passenger car equivalents (PCEs) are the number of autos that would generate the same noise level as the observed vehicular mix of autos, medium trucks, and heavy trucks. PCEs are useful for comparing the effects of traffic noise on different roadways or for different future scenarios. The *CEQR Technical Manual* uses the following formulas for converting motor vehicles into PCEs:

- auto and light trucks = 1 passenger car
- medium trucks = 13 passenger cars
- heavy trucks = 47 passenger cars
- buses = 18 passenger cars

METHODOLOGY

The methodology used for the analyses in this chapter is based on guidance in the *CEQR Technical Manual*, as revised in 2010.

Noise Monitoring

Noise levels were monitored according to the *NYC CEQR Technical Manual* ANSI Standard S1.13-1971 (R1976) using a Brüel & Kjær Sound Level Meter Type 2250, an ANSI Type I instrument. It was mounted on a tripod at a height of 5 feet above the ground, and it was calibrated before and after use. A wind screen was used during all sound measurements except for calibration. No measurements were taken during periods of precipitation or winds of 12 mph or more.

Noise monitoring was carried out at multiple locations and time periods to determine the noise levels in the rezoning area. Eight monitoring locations were chosen to evaluate the potential increases in noise level associated with increased traffic. Traffic noise levels were monitored for 20 minutes during the peak AM (8:00-9:00 a.m.), Midday (12:00-1:00 p.m.), and PM (5:00-6:00 p.m.) periods. Traffic classification counts were taken concurrently with the sound measurements.

Modeling of Future Noise Levels

To project future no-action condition noise levels at the monitoring locations, proportional modeling techniques, as described in the *CEQR Technical Manual*, were used to determine anticipated incremental changes in noise levels resulting from the expected increases in traffic volumes. This technique was also used to project the differences in noise levels between the future no-action and action conditions that would result from the changes in traffic volumes caused by the proposed project's anticipated trip generation. The change in future noise levels is calculated using the following equation:

$$FNL = ENL + 10 \times \log_{10} (FPCE/EPCE),$$

where:

FNL = Future Noise Level

ENL = Existing Noise Level

FPCE = Future PCEs

EPCE = Existing PCEs

Because sound levels use a logarithmic scale, this model proportions logarithmically with traffic change ratios. For example, at a location where traffic is the dominant noise source, if the existing traffic volume on a street is 100 PCEs and the future traffic volume would increase to 150 PCEs, the noise level would increase by 1.8 dBA. If the future traffic would instead double to 200 PCEs, the noise level would increase by 3.0 dBA.

Impact Determination and Noise Standards and Guidelines

In 1983, the New York City Department of Environmental Protection (NYCDEP) adopted the City Environmental Protection Order-City Environmental Quality Review (CEQR) noise standards for exterior noise levels. These Noise Exposure Guidelines are the basis for classifying noise exposure into four categories based on the L_{10}: Acceptable, Marginally Acceptable, Marginally Unacceptable, and Clearly Unacceptable, as shown in Table P-2.

Table P-2: Noise Exposure Guidelines for Use in City Environmental Impact 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
1.Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ dBA	Ldn ≤ 60 dBA		Ldn ≤ 60 dBA		Ldn ≤ 60 dBA		Ldn ≤ 75 dBA
2. Hospital, Nursing Home		$L_{10} \leq 55$ dBA		$55<L_{10}\leq 65$ dBA		$65<L_{10}\leq 80$ dBA		$L_{10}> 80$ dBA	
3. 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	L10≤ 55dBA		$55<L_{10}\leq 70$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-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)	
5. 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)	
6. Industrial, public areas only[4]	Note 4	Note 4		Note 4		Note 4		Note 4	

Notes:

(i) In addition, any new activity shall not increase the ambient noise level by 3 dBA or more;

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 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).

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

For sensitive receptors introduced by the Proposed Action, With-Action noise levels in dB(A) $L_{10(1)}$ are compared to the values contained in the Noise Exposure Guidelines. If these noise levels would exceed the marginally acceptable levels, a significant impact would occur unless the building design provides a composite building attenuation that would be sufficient to reduce these levels to an acceptable interior noise level. These values are shown in Table P-3.

Table P-3: 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 dBA	(II) 31 dBA	(III) 33 dBA	(IV) 35 dBA	$36 + (L_{10} - 80)^B$ dBA

Note: [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 dBA less in each category. All the above categories require a closed window situation and hence alternate means of ventilation.

[B]Required attenuation values increase by 1 dBA increments for L_{10} values greater than 80 dBA.

Source: New York City Department of Environmental Protection.

For noise increases caused by action-induced traffic, or for stationary noise sources introduced by the Proposed Action, if the No-Action levels are less than 60 dB(A) $L_{eq(1)}$ and the analysis period is not at nighttime, an increase of 5 dB(A) $L_{eq(1)}$ or more in the future with the project would be considered a significant impact. In order for the 5 dB(A) threshold to be valid, the resultant With-Action condition noise level would have to be equal to or less than 65 dB(A). If the No-Action noise level is equal to or greater than 62 dB(A) $L_{eq(1)}$, or if the analysis period is a nighttime analysis period, the incremental significant impact threshold would be 3 dB(A) $L_{eq(1)}$. If the No-Action noise level is 61dB(A) $L_{eq(1)}$, the maximum incremental increase would be 4 dB(A), since an increase higher than this would result in a noise level higher than the 65 dB(A) $L_{eq(1)}$ threshold and be considered significant.

The following section is entirely new to the FEIS. Based on EPA reports, the Department of Housing and Urban Development published regulations establishing standards for HUD-assisted projects in 1979. HUD categorized noise levels for proposed residential development as acceptable, normally unacceptable, and unacceptable, as shown in Table P-4. HUD assistance for construction of new noise sensitive uses is generally prohibited for projects with unacceptable noise exposures and is discouraged for projects with normally unacceptable noise exposure. The assumption is that standard construction provides an average of 20 dBA of attenuation from exterior noise levels. For an exterior L_{dn} of 65 dBA or below, this amount of attenuation would be sufficient to meet an interior L_{dn} level of 45 dBA. HUD-financed buildings constructed in Normally Unacceptable or Unacceptable areas must provide sufficient sound attenuation, as specified by HUD, to reduce interior noise levels to an L_{dn} of 45 dBA.

Table P-4: HUD Acceptability Standards for Noise

Category	Noise Level (L_{dn})
Acceptable	$\leq$ 65 dBA
Normally Unacceptable	>65 dBA $\leq$ 75 dBA
Unacceptable	> 75 dBA

Source: U.S. Department of Housing and Urban Development, March 1985

The Noise Guidebook, published by HUD in 1985, states that sites in the vicinity of federally funded highways are subject to the noise analysis procedures of the Federal Highway Administration (FHWA). To convert the FHWA analyses to relevant HUD criteria, the Guidebook recommended the following rules of thumb:

- $L_{dn} \approx$ the peak-hour L_{eq}, or
- $L_{dn} \approx$ the peak-hour L_{10} - 3 decibels

These formulas assume that off-peak noise levels are lower than peak noise levels and that nighttime noise levels are lower than daytime noise levels. In addition, heavy trucks must not exceed 10% of the 24-hour traffic volume, and traffic flow between 10 pm and 7 am must not exceed 15% of the average daily traffic flow. Another rule of thumb used in analyzing environmental noise levels is that nighttime noise levels are approximately 10 dBA lower than daytime noise levels.

EXISTING CONDITIONS

Traffic Intersections

Noise monitoring was conducted at the following eight intersection locations, which are shown in Figure P-1:

- (T-1) on the southeast corner of Boone Avenue and E. 174th Street;
- (T-2) the southwest corner of W. Farms Road and E. 174th Street;
- (T-3) the southeast corner of Boone Avenue and E. 173rd Street;
- (T-4) the southwest corner of W. Farms Road and E. 173rd Street;
- (T-5) the southeast corner of Boone Avenue and 172nd Street;
- (T-6) the southwest corner of W. Farms Road and 172nd Street;

- (T-7) the northwest corner of Boone Avenue and E. 176th Street-Service Road, and
- (T-8) the southeast corner of Rodman Place and West Farms Road

Figure P-1: Traffic Noise Monitoring Locations



★ = Traffic Noise Monitoring Locations.

Table P-5 shows the Existing noise levels monitored during peak commuter traffic periods for the traffic intersection, rail and highway locations. The L_{10} noise levels for the traffic intersections range from 67.3 dBA at Boone Avenue and E. 173rd Street to 76.5 dBA at West Farms Road and E. 174th Street. Traffic noise levels at the intersections range from Acceptable to Marginally Unacceptable III.

Table P-5: Monitored Noise Levels (dBA)

ID	Site	Period	L_{eq}	L_{10}	L_{01}	L_{90}	CEQR Noise Category
T-1	Boone Ave. & E. 174th St.	AM	71.0	73.4	80.7	65.3	Marginally Unacceptable II
T-1		MD	74.9	72.4	82.6	61.7	
T-1		PM	70.9	73.1	80.7	63.1	
T-2	W. Farms Rd. & E. 174th St.	AM	72.7	74.9	78.3	67.7	Marginally Unacceptable III
T-2		MD	72.9	74.8	82.2	67.5	
T-2		PM	74.4	76.5	83.4	67.6	
T-3	Boone Ave. & E. 173rd St.	AM	69.5	71.2	80.1	63.0	Marginally Unacceptable I
T-3		MD	66.1	67.3	75.6	62.3	
T-3		PM	67.2	68.9	77.7	61.7	
T-4	W. Farms Rd. & E. 173rd St.	AM	75.5	75.3	82.1	69.4	Marginally Unacceptable III
T-4		MD	73.4	76.1	81.4	68.4	
T-4		PM	72.4	74.5	80.3	62.3	
T-5	Boone Ave. & E. 172nd St.	AM	72.3	74.0	83.4	65.0	Marginally Unacceptable II
T-5		MD	68.6	70.8	78.8	62.2	
T-5		PM	68.5	69.2	80.3	62.3	
T-6	W. Farms Rd. & E. 172nd St.	AM	74.4	76.2	80.4	71.0	Marginally Unacceptable III
T-6		MD	74.4	75.9	83.8	68.7	
T-6		PM	73.0	74.5	82.1	67.4	
T-7	Boone Ave. & E. 176th St. Service Rd	AM	69.9	72.1	78.4	65.0	Marginally Unacceptable I
T-7		MD	70.6	71.4	78.3	67.0	
T-7		PM	66.8	69.4	74.1	62.8	
T-8	W. Farms Rd & Rodman Pl.	AM	68.4	71.6	76.3	61.5	Marginally Unacceptable I
T-8		MD	68.6	71.6	76.9	63.2	
T-8		PM	65.4	68.7	71.3	54.9	
R-1	W. Farms Rd. / Boston Rd.	AM	81.1	86.1	90.7	69.0	Clearly Unacceptable
R-1		MD	80.4	84.6	89.7	68.8	
R-1		PM	81.2	85.8	90.3	68.8	
R-2	Boone Ave. / Whitlock Ave.	AM	70.4	73.3	77.7	65.6	Marginally Unacceptable
R-2		MD	71.0	73.7	80.0	65.0	

R-2		PM	70.8	74.4	77.6	65.7	II
R-3	W. Farms Sq. / E. Tremont Ave. station northbound platform	AM	76.1	78.1	88.0	67.3	Marginally Unacceptable IV
R-3		MD	76.1	78.7	87.7	66.9	
R-3		PM	74.3	78.0	85.4	63.8	
H-1	Longfellow Ave. / Cr. Bronx Expresway.	AM	76.1	78.0	81.6	73.2	Marginally Unacceptable III
H-1		MD	74.8	75.7	84.9	69.3	
H-1		PM	69.2	71.9	75.2	64.6	
H-2	West Farms Rd. / Cr. Bronx Expressway.	AM	70.7	73.1	76.7	67.1	Marginally Unacceptable II
H-2		MD	70.7	73.2	76.7	66.8	
H-2		PM	69.3	72.1	75.3	62.7	

Source: Sandstone Environmental Associates, Inc..

Highways

Figure P-2 illustrates the noise monitoring locations (H-1, H-2) for elevated highway noise on the Cross Bronx Expressway (Interstate 95) northern service road and Longfellow Avenue as well as at West Farms Road. Noise from the elevated highways was monitored for 20-minute periods during the weekday traffic peak periods. Noise levels at the highway sites are in the Marginally Unacceptable IV category for location H-1 and the Marginally Unacceptable II category for location H-2.

Figure P-2: Rail and Elevated Highway Noise Monitoring Locations (Northern End of the Proposed Rezoning Area)

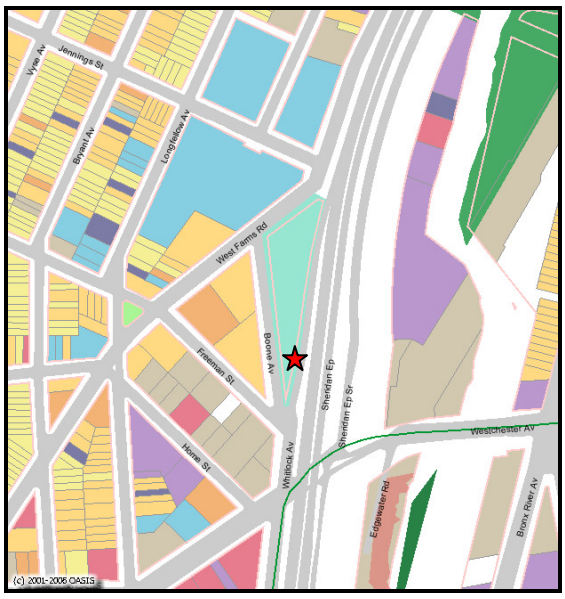


Rail

For rail noise, three locations (R-1, R-2 and R-3) were chosen at the northern and southern ends of the rezoning area to establish existing noise levels from the elevated IRT White Plains Road line and the IRT

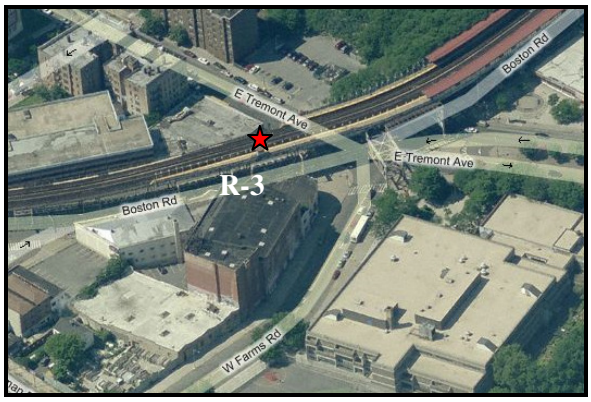
Pelham Line, respectively. Figures P-3 and P-4 show these locations. Location R-3 is at the south end of the northbound platform on the IRT White Plains Road line. Rail noise at each of the three locations was monitored for one hour during the following peak periods: AM (8:00-9:00 a.m.), Midday (12:00-1:00 p.m.), and PM (5:00-6:00 p.m.). As was shown in Table P-4, rail noise is in the Marginally Unacceptable I category for location R-2 at the southern end of the rezoning area. At monitoring locations R-1 and R-3 at the northern point of the rezoning area, the noise levels were in the Marginally Unacceptable III and IV categories.

Figure P-3: Rail Noise Monitoring Locations (Southern End of Rezoning Area)



= Noise Monitoring Locations

Figure P-4: Elevated Rail Noise at West Farms Sq. and E. Tremont Ave. subway platform



Source: Bing Maps

FUTURE CONDITIONS WITHOUT THE PROPOSED ACTION

In the absence of the Proposed Action, the current development scale and mixture of land uses would remain, and no significant new development is anticipated with the exception of Block 3016, Lot 42, at the northern end of the rezoning area. Currently developed with industrial and commercial uses, it would be redeveloped with residential and commercial uses.

Traffic volumes for the Future without the Proposed Action were used with the observed vehicular mixes to project future PCEs. The PCEs were then used with the proportionality equation to project future traffic noise levels at all intersections. Table P-6 shows the projected noise levels for intersection traffic, highway locations, and the rail sites. In comparison to Existing Conditions, noise levels would increase by 0.1 to 0.4 dBA. At the H-1 highway noise monitoring location, the growth in highway traffic would result in a negligible increase in noise levels. Rail noise dominates locations R-1 through R-3, and these noise levels would be substantially similar to those for Existing Conditions.

Table P-6: Intersection, Rail, and Highway Noise (dBA), No Action Conditions

ID	Site	Period	No Build L_{eq}	No Build L_{10}	CEQR Noise Exposure Category
T-1	Boone Ave. & E. 174th St.	AM	71.1	73.5	Marginally Unacceptable II
		MD	75.1	72.6	
		PM	71.1	73.3	
T-2	W. Farms Rd. & E. 174th St.	AM	72.8	75.0	Marginally Unacceptable III
		MD	73.1	75.0	
		PM	74.5	76.6	
T-3	Boone Ave. & E. 173rd St.	AM	69.6	71.3	Marginally Unacceptable I
		MD	66.4	67.6	
		PM	67.4	69.1	
T-4	W. Farms Rd. & E. 173rd St.	AM	75.6	75.4	Marginally Unacceptable III
		MD	73.5	76.2	
		PM	72.5	74.6	
T-5	Boone Ave. & E. 172nd St.	AM	72.3	74.0	Marginally Unacceptable II
		MD	68.7	70.9	
		PM	68.6	69.3	
T-6	W. Farms Rd. & E. 172nd St.	AM	74.5	76.3	Marginally Unacceptable III
		MD	74.5	76.0	
		PM	73.1	74.6	
T-7	Boone Ave. & E. 176th St. Service Rd	AM	70.0	72.2	Marginally Unacceptable I
		MD	70.7	71.5	
		PM	67.0	69.6	
T-8	W. Farms Rd & Rodman Pl	AM	68.5	71.7	Marginally Unacceptable I
		MD	68.8	71.8	
		PM	65.5	68.8	
R-1	W. Farms Rd. / Boston Rd.	AM	81.1	86.1	Clearly Unacceptable
		MID	80.4	84.6	
		PM	81.2	85.8	

R-2	Boone Ave. / Whitlock Ave.	AM MID PM	70.4 71.0 70.8	73.3 73.7 74.4	Marginally Unacceptable II
R-3	W. Farms Sq. / E. Tremont Ave. station northbound platform	AM MD PM	76.1 76.1 74.3	78.1 78.7 78.0	Marginally Unacceptable IV
H-1	Longfellow Ave. / Cr. Bronx Expwy.	AM MID PM	76.2 74.9 69.3	78.1 75.8 72.0	Marginally Unacceptable IV
H-2	West Farms Rd. / Cr. Bronx Expwy	AM MID PM	70.8 70.8 69.4	73.2 73.3 72.2	Marginally Unacceptable II

Source: Sandstone Environmental Associates, Inc.

Note: The values in this table have been adjusted to address rounding errors.

FUTURE CONDITIONS WITH THE PROPOSED ACTION

Intersection and Highway Noise

The action-generated traffic increments at all 20 intersections studied for traffic purposes were evaluated for potential noise impacts. Table P-7 shows the traffic volumes for No Action and Action Conditions at these intersections. If the net increase in passenger vehicles would cause intersection volumes to double, it could cause a noise level increase of 3 dBA, depending on the proportions of trucks and buses in the vehicular mix for No Action and With Action Conditions. In that case, a more detailed analysis based on vehicular mix and the calculation of PCEs would be carried out. For the Proposed Action, all net increases in volume are due to passenger cars because redevelopment of industrial sites would reduce the volume of trucks. As shown in Table P-7, the growth increments do not cause volumes to double at any intersection. Therefore, the addition of the project-generated autos to a No Action volume composed of a mixture of autos, trucks, and buses would not cause PCEs to double, and all potential noise level increases would be below 3 dBA.

Table P-7: Mobile Source Noise Screen, 2022 Traffic Volumes

Intersection List	No Action			Action			Incremental Change		
	AM	MD	PM	AM	MD	PM	AM	MD	PM
East Tremont Ave at East 177th St.	2,520	2,176	2,740	2,785	2,274	2,838	265	98	98
West Farms Road at Boston Rd, East Tremont Ave, Dawson Rd	2,160	1,809	2,421	2,441	1,931	2,569	281	122	148
West Farms Road at Rodman Place	533	327	483	760	423	595	227	96	112
E. 177th St. @ E. 177th St.	3,212	2,685	2,593	3,471	2,780	2,684	259	95	91
West Farms Road at Cross Bronx Expressway North Service Rd	533	342	498	731	395	569	198	53	71
Bronx River Ave at East 174th St.	1,671	1,304	1,865	1,645	1,342	1,988	(26)	38	123
Boone Ave at East 174th St.	1,255	952	1,340	1,250	994	1,488	(5)	42	148
Longfellow Ave at East 174th St.	904	903	1,313	882	918	1,372	(22)	15	59
West Farms Road at East 173rd St.	586	378	550	803	431	667	217	53	117
Boone Ave at East 173rd St.	476	246	326	526	265	426	50	19	100
Longfellow Ave at East 173rd St.	350	326	397	341	341	456	(9)	15	59
West Farms Road at East 172nd St.	560	374	513	666	430	667	106	56	154
Boone Ave at East 172nd St.	373	165	210	382	172	253	9	7	43
West Farms Road at Jennings St.	443	296	430	639	428	664	196	132	234
West Farms Road at Boone Ave	550	367	528	567	402	654	17	35	126
Boone Ave at Freeman St., Sheridan Expressway Ramp	1,113	955	787	1,115	967	841	2	12	54
Westchester Ave at Boone St., Home St.	2,829	2,258	2,204	2,823	2,281	2,306	(6)	23	102
West Farms Road at Home St., Longfellow Ave	613	479	682	610	512	806	(3)	33	124
West Farms Road at Freeman St.	493	347	519	497	380	643	4	33	124
Westchester Ave. at Sheridan Expressway Ramp/Edgewater Rd.	2,145	1,760	2,094	2,150	1,773	2,144	5	13	50

A more detailed analysis was carried out for the locations where noise levels were monitored. At these locations, future noise from traffic was projected using the proportionality equation described under Methodology. Table P-8 shows the changes in noise levels at the monitored sites. In most cases, they are negative due to the reduction in truck traffic. The increases in noise level that are projected are small and would be imperceptible. As the table shows, all of the intersection and highway noise monitoring locations would be in the Marginally Unacceptable categories. Of the three sites monitored for rail noise, two would be in the Marginally Unacceptable category and one would be in the Clearly Unacceptable category.

Table P-8: Noise Levels (dBA), Future Conditions with the Proposed Action

ID	Site	Period	No Action		Proposed Action		Increment	Noise Exposure CEQR Guidelines Category	L_{dn}
			L_{eq}	L_{10}	L_{eq}	L_{10}			
T-1	Boone Ave. & E. 174th St.	AM	71.1	73.5	70.9	73.3	-0.2	Marginally Unacceptable II	70.9
		MID	75.1	72.6	75.0	72.5	-0.1		75.0
		PM	71.1	73.3	71.2	73.4	0.0		71.2
T-2	W. Farms Rd. & E. 174th St.	AM	72.8	75.0	72.7	74.9	-0.1	Marginally Unacceptable III	72.7
		MID	73.1	75.0	73.1	75.0	0.0		73.1
		PM	74.5	76.6	74.7	76.8	0.1		74.7
T-3	Boone Ave. & E. 173rd St.	AM	69.6	71.3	69.1	70.8	-0.5	Marginally Unacceptable I	69.1
		MID	66.4	67.6	63.2	64.4	-3.1		63.2
		PM	67.4	69.1	67.3	69.0	-0.1		67.3
T-4	W. Farms Rd. & E. 173rd St.	AM	75.6	75.4	75.7	75.5	0.1	Marginally Unacceptable II	75.7
		MID	73.5	76.2	73.2	75.9	-0.4		73.2
		PM	72.5	74.6	72.2	74.3	-0.3		72.2
T-5	Boone Ave. & E. 172nd St.	AM	72.3	74.0	72.2	73.9	-0.2	Marginally Unacceptable II	72.2
		MID	68.7	70.9	68.5	70.7	-0.2		68.5
		PM	68.6	69.3	68.4	69.1	-02		68.4
T-6	W. Farms Rd. & E. 172nd St.	AM	74.5	76.3	74.5	76.3	0.1	Marginally Unacceptable III	74.5
		MID	74.5	76.0	74.4	75.9	-0.2		74.4
		PM	73.1	74.6	73.2	74.7	0.1		73.2
T-7	Boone Ave. & E. 176th St. Service Rd	AM	70.0	72.2	70.0	72.2	0.0	Marginally Unacceptable I	70.0
		MID	70.7	71.5	70.6	71.4	-0.1		70.6
		PM	67.0	69.6	66.4	69.0	-0.6		66.4
T-8	W. Farms Rd & Rodman Pl.	AM	68.5	71.7	68.7	71.9	0.2	Marginally Unacceptable I	68.9
		MID	68.8	71.8	68.7	71.7	-0.1		68.7
		PM	65.5	68.8	65.3	68.6	-0.2		65.6
R-1	W. Farms Rd. / Boston Rd.	AM	81.1	86.1	81.1	86.1	0.0	**Clearly Unacceptable**	83.1
		MID	80.4	84.6	80.4	84.6	0.0		81.6
		PM	81.2	85.8	81.2	85.8	0.0		82.8
R-2	Boone Ave. / Whitlock Ave.	AM	70.4	73.3	70.4	73.3	0.0	Marginally Unacceptable II	70.4
		MID	71.0	73.7	71.0	73.7	0.0		71.0
		PM	70.8	74.4	70.8	74.4	0.0		71.4
R-3	W. Farms Sq. / E. Tremont Ave. station NB platform	AM	76.1	78.1	76.1	78.1	0.0	Marginally Unacceptable IV	76.1
		MD	76.1	78.7	76.1	78.7	0.0		76.1
		PM	74.3	78.0	74.3	78.0	0.0		75.0
H-1	Longfellow Ave. /	AM	76.2	78.1	76.3	78.2	0.1	Marginally	76.3

	Cr. Bronx Expwy.	MID	74.9	75.8	74.9	75.8	0.0	Unacceptable IV	74.9
		PM	69.3	72.0	69.3	72.0	0.0		69.3
H-2	West Farms Rd. / Cr. Bronx Expwy	AM	70.8	73.2	70.9	73.3	0.1	Marginally Unacceptable II	70.9
		MID	70.8	73.3	70.8	73.3	0.0		70.8
		PM	69.4	72.2	69.4	72.2	0.0		69.4

Source: Sandstone Environmental Associates, Inc.

Note: The values in this table have been adjusted to address rounding errors.

Table P-8 also shows the Noise Exposure Guidelines categories into which the anticipated noise levels at these locations would fall in the future with the Proposed Action, because of their proximity to projected and potential development sites. As the table shows, all of the intersection and highway noise monitoring locations, as well as two of the rail monitoring locations, would be in the Marginally Unacceptable categories. One of the rail monitoring locations would be in the Clearly Unacceptable category. The implications for the nearby projected and potential development sites are addressed later in this chapter, under Required Attenuation. The noise levels at the rail noise monitoring locations are discussed in the next section.

In reference to the results in Table P-8, the L_{dn} column is used to determine the appropriate HUD category at each location. Below is a listing of the given category each observation site falls under, based upon the highest L_{dn} noted over the three peak periods.

- T-1: Normally Unacceptable
- T-2: Normally Unacceptable
- T-3: Normally Unacceptable
- T-4: **Unacceptable**
- T-5: Normally Unacceptable
- T-6: Normally Unacceptable
- T-7: Normally Unacceptable
- T-8: Normally Unacceptable
- R-1: **Unacceptable**
- R-2: Normally Unacceptable
- R-3:**Unacceptable**
- H-1: **Unacceptable**
- H-2: Normally Unacceptable

Rail Noise

As was shown in Table P-8, rail noise would be the same under the Proposed Action as under No Action Conditions. At noise monitoring location R-1 (and thus at Projected Development Site 9C and Potential Development Sites 9A and 9B), the noise levels would be in the Clearly Unacceptable category of the NYCDEP Noise Exposure Guidelines and Unacceptable under HUD noise guidelines, except for R-2, which received a Normally Unacceptable rating. The highest noise levels, up to an L_{10} of 86.1 dBA, are based on monitored noise levels at ground level and are partially due to the reverberation of rail noise on the elevated metal structure. Under guidelines in the *CEQR Technical Manual,* the development of new residential units at locations subject to these Clearly Unacceptable noise levels would constitute a significant adverse impact unless the building design provides a composite building attenuation sufficient to reduce these levels to indoor noise levels that would not exceed the maximum acceptable level of 45 dBA. However, the Proposed Action would include the mapping of (E) designations on Sites 9A (Block 3016, Lots 33 and 35), 9B (Block 3016, Lots 36 and 37), and 9C (Block 3016, Lots 38 and 42) that would require (1) specified levels of window/wall noise attenuation and (2) air conditioning or other alternative means of ventilation so that residents can maintain a closed window condition at all times of the year. The specified attenuation levels for windows would be at least 42 dBA on the affected lower floors of the buildings. That level of exterior-to-interior noise attenuation would ensure that indoor noise levels would

be below 45 dBA, avoiding the potential significant adverse noise impact. A lesser noise attenuation requirement may be appropriate for floors above the second floor because noise levels above the elevated rail structure may be substantially lower when comparing this location with the nearby subway platform readings. Since these buildings are not controlled by the applicant, any refinements to the required window attenuation for the upper floors are the responsibility of the developer. Additional monitoring at street level and building rooftops and noise analysis will be carried out between the Draft and Final EIS to determine the noise levels at higher elevations in the projected buildings.

Playground Noise

The Proposed Project would include both an outdoor children's playground (a new stationary noise source) and wings of a residential building (new sensitive noise receptors) along the southern part of the Boone Avenue frontage between East 172nd and 173rd Streets, on Site 2S. The playground would abut the southern facade of Building 2B, and it would be about 15 feet from the northern facade of Building 2A. (See Figure P-5 below.)

According to the *CEQR Technical Manual*, $L_{eq(1)}$ noise levels would be 75 dBA at the boundary of the playground, 73 dBA 15 feet from the boundary, and 70 dBA 30 feet from the boundary. Beyond 30 feet, the noise level would attenuate at a rate of 4.5 dBA per distance doubling. Based on noise calculations at supplemental monitoring location B, traffic noise levels along this segment of Boone Avenue would be highest during the peak Midday period.

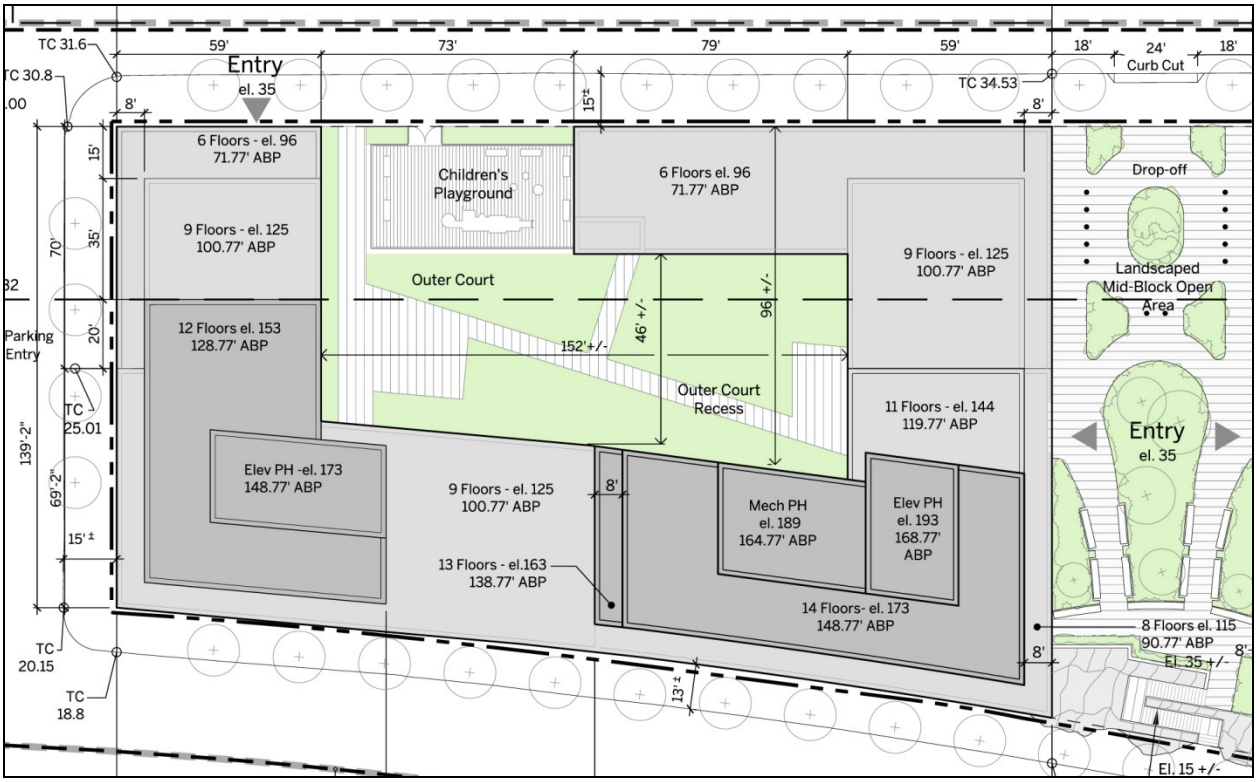
The L_{eq} noise levels from traffic would be 69.0 dBA for No Action conditions and 68.6 dBA at ground level with the Proposed Action. For ground floor windows in Building 2B facing the playground, the addition of 75.0 dBA from the playground, when added to the peak Midday noise level, would result in a total L_{eq} of 75.9 dBA and an L_{10} of 78.5 dBA, which would be in the Marginally Unacceptable IV category, requiring window/wall noise attenuation of 35 dBA. For ground floor windows in Building 2a facing the playground, the total L_{eq} would be 75.9 dBA and the L_{10} would be 78.5 dBA, which would be in the Marginally Unacceptable IV category, requiring window/wall noise attenuation of 35 dBA.

The following section has been redrafted to reflect the more refined playground noise calculations.

The CEQR noise rating and subsequent noise attenuation required for the windows on each floor of Building 2a and Building 2b is discussed under Required Noise Attenuation and shown in Table P-10.

Under guidelines in the *CEQR Technical Manual,* for noise increases caused by stationary noise sources introduced by the Proposed Action, if the No-Action levels would be at least 62 dBA L_{eq}, an increase of 3 dBA or more would constitute a significant impact. For sensitive receptors introduced by the Proposed Action, if the With-Action noise levels would exceed the marginally acceptable levels in the Noise Exposure Guidelines (that is, if the L_{10} would exceed 70 dBA), a significant impact would occur unless the building design provides a composite building attenuation that would be sufficient to reduce these levels to an acceptable interior noise level. The restrictive declaration provisions would ensure that interior noise levels remain at 45 dBA or less for residential uses and 50 dBA for commercial uses would avoid the potential significant adverse noise impact.

Figure P-5: Playground Location at Parcel 2 South



Note: This graphic is new to the FEIS.

HVAC Noise

It is assumed that the building mechanical system (i.e., rooftop HVAC and mechanical systems) would be designed to meet all applicable noise regulations (i.e., Subchapters 5, §24-227 of the New York City Noise Control Code, the New York City Department of Buildings Code) and to avoid producing levels that would result in any significant increase in ambient noise levels.

Supplemental Noise Monitoring for Window/Wall Attenuation

Note that this section is entirely new to the FEIS.

Between the DEIS and FEIS, supplemental noise measurements were carried out at locations directly adjacent to land parcels designated under the DEIS as the Large Scale General Development area (LSGD). The purpose of the additional measurements was to establish more finely the necessary minimum attenuation required for street-facing facades located on Parcel 1, Parcel 2N, and Parcel 2S of the project area.

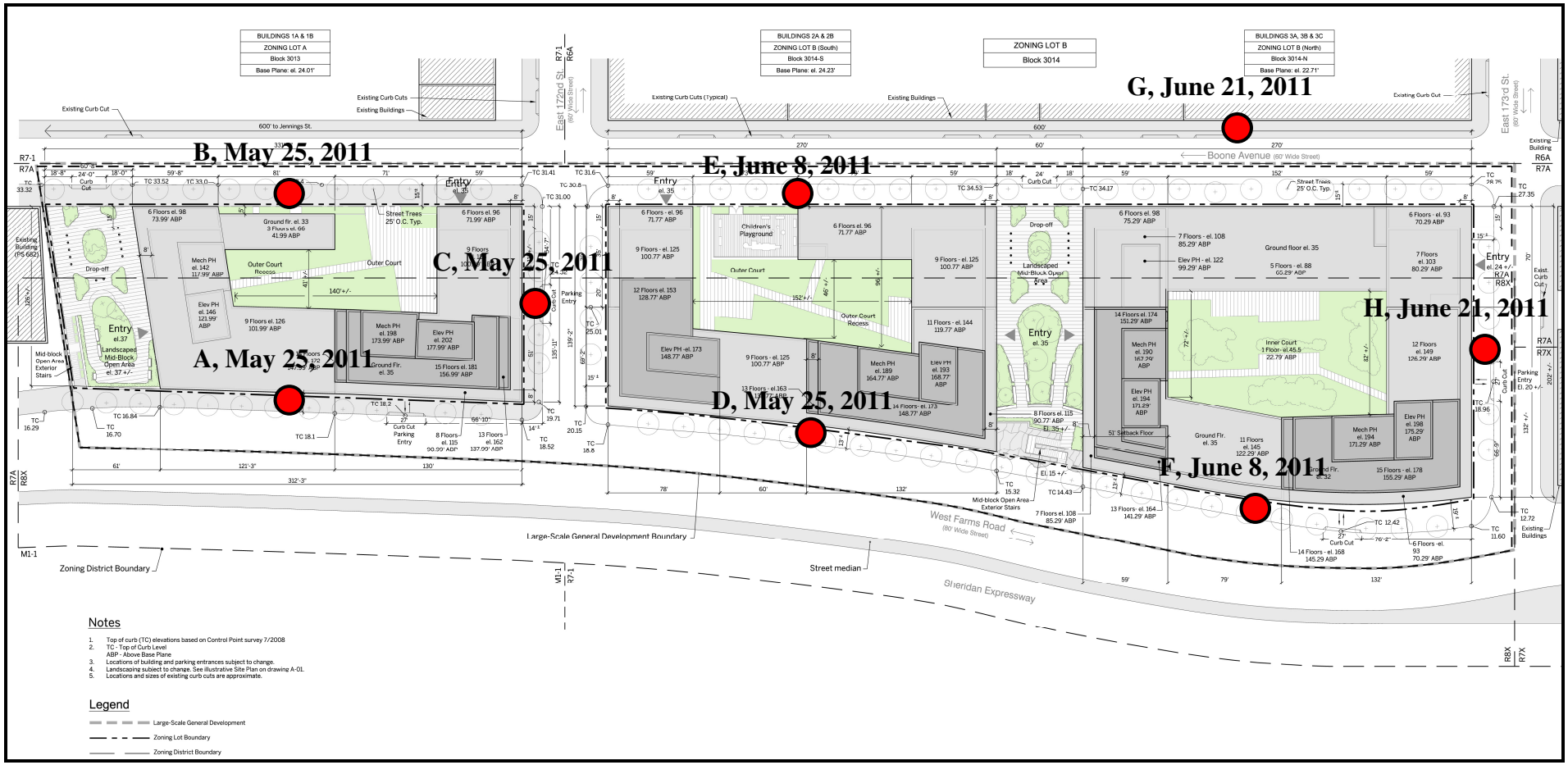
To refine the attenuation required for the facades in the LGSD development, measured mid-block noise monitoring sites are listed below. Figure P-6 graphically shows the locations of the sites in relation to the proposed action's buildings and to each other.

A. 170 feet south along West Farms Road from the intersection of E. 172nd Street on the western sidewalk (Building 1a eastern and southern façades);
B. 170 feet south along Boone Avenue from the intersection of E. 172nd Street on the eastern sidewalk (Building 1a western façade);

C. E. 172nd Street, midblock between Boone Avenue and West Farms Road on the southern sidewalk (Building 1b northern façade and Building 2a southern façade);
D. 140 feet north along West Farms Road from the intersection of E. 172nd Street and West Farms Road on the western sidewalk (Buildings 2a & 2b eastern façades);
E. 140 feet north along Boone Avenue from the intersection of E. 172nd Street and Boone Avenue on the eastern sidewalk (Buildings 2a & 2b western façades);
F. 130 feet south along West Farms Road from the intersection of E. 173rd Street and West Farms Road on the western sidewalk (Buildings 3a & 3b eastern façades);
G. 130 feet south along Boone Avenue from the intersection of E. 173rd Street and Boone Avenue on the western sidewalk (near Building 3c western façade);
H. E. 173rd Street, midblock between Boone Avenue and West Farms Road on the southern sidewalk (Building 3b northern façade).

Measurements were conducted during the peak AM (8:00-9:00 a.m.), Midday (12:00-1:00 p.m.), and PM (5:00-6:00 p.m.) periods, coinciding with typical rush-hour automobile traffic patterns. The supplemental noise monitoring was carried out in May and June of 2011. Figure P-6 shows the sites and Table P-9 shows the monitored noise levels as well as projections for 2022 No Action and Action Conditions.

Figure P-6
Noise Monitoring Locations and Measurement Dates, Large Scale General Development Area



Source: Sandstone Environmental Associates, Inc.

● = *Noise Monitoring Locations.*

Table P-9
Noise Levels at Supplemental Sites

ID	Site Intersection	Period	Existing		No Action		Action	
			L_{eq}	L_{10}	L_{eq}	L_{10}	L_{eq}	L_{10}
A	West Farms Road (bet. E. 172nd St & Jennings St)	AM.	74.4	76.9	77.2	79.7	77.1	79.6
		Midday	73.2	75.6	74.5	76.9	74.3	76.7
		PM	73.9	76.0	74.7	76.8	74.9	77.0
B	Boone Avenue (bet. E. 172nd St & Jennings St)	AM.	62.6	64.1	68.7	70.2	68.7	70.2
		Midday	62.9	65.0	61.1	63.2	61.1	63.2
		PM	64.3	65.4	67.4	68.5	67.4	68.5
C	E. 172nd St (bet. West Farms Rd & Boone Ave)	AM.	70.7	72.0	75.9	77.2	75.8	77.1
		Midday	69.4	71.5	70.6	72.7	69.8	71.9
		PM	69.7	69.9	68.7	68.9	68.1	68.3
D	West Farms Road (bet. E. 173rd St & E. 172nd St, S side)	AM.	76.4	78.7	75.6	77.9	76.3	78.6
		Midday	75.7	78.0	75.3	77.6	75.4	77.7
		PM	76.0	78.2	74.4	76.6	74.5	76.7
E	Boone Avenue (bet. E. 173rd St & E. 172nd St, S side)	AM.	64.9	66.3	63.0	64.4	62.4	63.8
		Midday	67.1	64.5	63.9	61.3	63.5	60.9
		PM	62.7	63.5	59.8	60.6	59.1	59.9
F	West Farms Road (bet. E. 173rd St & E. 172nd St, N side)	AM.	75.1	77.5	73.8	76.2	74.4	76.8
		Midday	74.8	77.3	73.8	76.3	73.9	76.4
		PM	74.0	76.2	72.8	75.0	73.0	75.2
G	Boone Avenue (bet. E. 173rd St & E. 172nd St, N side)	AM.	66.4	69.0	64.6	67.2	63.7	66.3
		Midday	73.0	75.6	69.0	71.6	68.6	71.2
		PM	67.6	67.8	64.4	64.6	63.7	63.9
H	E. 173rd St (bet. West Farms Rd & Boone Ave)	AM.	65.3	66.7	67.5	68.9	66.3	67.7
		Midday	65.4	67.1	64.6	66.3	58.5	60.2
		PM	66.5	68.6	67.1	69.2	66.3	68.4

Source: Sandstone Environmental Associates.

Required Noise Attenuation

The attenuation of a composite structure is a function of the attenuation provided by each of its component parts and how much of the area is made up of each part. Normally, a building façade is composed of the wall, glazing, and any vents or louvers for HVAC systems in various ratios of area. To avoid significant adverse noise impacts, all new buildings to be located on projected or potential development sites would need to provide composite Outdoor-Indoor Transmission Class (OITC) ratings greater than or equal to the attenuation requirements listed in Table 6 in Appendix 6. The OITC classification is defined by the American Society of Testing and Materials (ASTM E1332-90 [Reapproved 2003]) and provides a single-number rating that is used for designing a building façade

including walls, doors, glazing, and combinations thereof. The OITC rating is designed to evaluate building elements by their ability to reduce the overall loudness of ground and air transportation noise.

Projected noise levels for the exteriors of buildings at projected and potential development sites were projected for future No Action conditions. The observed noise levels and traffic volumes were adjusted using the proportionality equation in conjunction with traffic volumes with the Proposed Action. Tables P-10 and P-11 indicates the requisite levels of window/wall attenuation given the development sites' locations and future noise projections. Tables P-10 and P-11 refer to locations by development site number and, for the Proposed Project, by building number. These are shown in Figures P-7 through P-12.

Where the required window/wall attenuation is above 40 dBA, special design features may be necessary that go beyond the normal double-glazed window and central air conditioning. These may include specially designed windows (e.g., windows with small sizes, windows with air gaps, windows with thicker glazing, etc.) and additional building insulation.

The Proposed Action would include the mapping of (E) designations (E-277) for non-applicant-controlled projected and potential development sites and the recording of restrictive declarations for Proposed Project sites. The provisions of both the (E) designations and the restrictive declarations would mandate the required attenuation levels to ensure that interior noise levels would be at 45 dBA or less for residential uses and 50 dBA or less for commercial uses. Where the projected L_{10} noise levels would be 70 dBA or more, the (E) designation and restrictive declaration provisions also would require alternate means of ventilation to permit a closed-window condition during warm weather.

There are four levels of required noise attenuation. Depending on the ambient noise levels they would require attenuation of 28, 31, 33, 35, or 42 dBA of window/wall attenuation. For applicant-controlled sites requiring 28 dBA of attenuation, the text for the restrictive declarations is as follows.

> "To ensure an acceptable interior noise environment, future residential/commercial uses must provide a closed-window condition with a minimum of 28 dBA window/wall attenuation on all facades to maintain an interior noise level of 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."

The non-applicant projected and potential development sites where the 28 dBA level of noise attenuation would be required are shown in Table P-11.

For sites requiring 31 dBA of attenuation, the text for the restrictive declarations is as follows:

> "To ensure an acceptable interior noise environment, future residential/commercial uses must provide a closed-window condition with a minimum of 31 dBA window/wall attenuation on all facades to maintain an interior noise level of 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."

The non-applicant projected and potential development sites where the 31 dBA level of noise attenuation would be required are shown in Table P-11.

For sites requiring 33 dBA of attenuation, the text for the restrictive declarations is as follows:

> "To ensure an acceptable interior noise environment, future residential/commercial uses must provide a closed-window condition with a minimum of 33 dBA window/wall attenuation on all facades to maintain an interior noise level of 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."

The non-applicant projected and potential development sites where the 33 dBA level of noise attenuation would be required are shown in Table P-11.

For sites requiring 35 dBA of attenuation, the text for the restrictive declarations is as follows:

> "To ensure an acceptable interior noise environment, future residential/commercial uses must provide a closed-window condition with a minimum of 35 dBA window/wall attenuation on all facades to maintain an interior noise level of 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."

The non-applicant projected and potential development sites where the 35 dBA level of noise attenuation would be required are shown in Table P-11.

For sites requiring 42 dBA of attenuation, the text for the (E) designations is as follows:

> "To ensure an acceptable interior noise environment, future residential/commercial uses must provide a closed-window condition with a minimum of 42 dBA window/wall attenuation on all facades to maintain an interior noise level of 45 dBA. To achieve 40 dBA of building attenuation, special design features that go beyond the normal double-glazed windows are necessary and may include using specially designed windows (i.e., windows with small sizes, windows with air gaps, windows with thicker glazing, etc.), and additional building attenuation. 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 projected and potential development sites where the 42 dBA level of noise attenuation would be required are shown in Table P-10. They are based on the assumption that each floor would be occupied by sensitive receptors such as residences, schools, a daycare center, etc. Some first-floor uses may, instead, be occupied by commercial uses. In these cases, the required attenuation shown in the tables would be adjusted to achieve an interior L_{10} noise level of 50 dBA instead of 45 dBA.

With the attenuation measures specified above, the Proposed Action would not result in any significant adverse noise impacts and would meet CEQR guidelines.

Table P-10: Required Attenuation Values for Projected and Potential Development Sites (Applicant-Controlled)

Site/Building	Block	Lot(s)	Maximum Noise Level at Nearest Monitoring Site		CEQR Categories	Required Attenuation (dBA)
			L_{eq} (dBA)	L_{10} (dBA)		
1 (1A)	3013	12, 46, 29				
Facing north			68.7 (B)	70.2 (B)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 2nd Fl., 25 all other floors
Facing south			68.7 (B)	70.2 (B)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 2nd Fl., 25 all other floors
Facing east			77.1 (A)	79.6 (A)	Marginally Unacceptable IV, Marginally Unacceptable III, Marginally Unacceptable II	35 1st Fl. to 4th Fl., 33 5th-8th Fl., 31 9th Fl.
Facing west			68.7 (B)	70.2 (B)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 2nd Fl., 25 all other floors
1 (1B)	3013	31,35, 37				
Facing north			75.8 (C)	77.1 (C)	Marginally Unacceptable III, Marginally Unacceptable II, Marginally Unacceptable I	33 1st Fl. to 4th Fl., 31 5th Fl. to 8th Fl., 28 all other floors
Facing south			68.7 (B)	70.2 (B)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 3rd Fl., 25 all other floors
Facing east			77.1 (A)	79.6 (A)	Marginally Unacceptable IV, Marginally Unacceptable III, Marginally Unacceptable II, Marginally Unacceptable I	35 1st Fl. to 4th Fl., 33 5th Fl. to 7th Fl., 31 8th Fl. to 14th Fl., 28 15th Fl.
Facing west			72.3 (T5)	74.0 (T5)	Marginally Unacceptable II, Marginally Unacceptable I, Acceptable	31 1st Fl. to 4th Fl., 5th Fl. to 8th Fl., 25 all other floors
2S (2A)	3014S	9 (part)				
Facing north			68.6 (G)	71.2 (G)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 6th Fl., 25 all other floors
Facing south			75.8 (C)	77.1 (C)	Marginally Unacceptable III, Marginally Unacceptable II	33 1st Fl. to 6th Fl., 31 all other floors
Facing east			76.3 (D)	78.6 (D)	Marginally Unacceptable IV, Marginally Unacceptable III, Marginally Unacceptable II	35 1st Fl. to 4th Fl., 33 5th Fl. to 8th Fl., 31 all other floors
Facing west			68.6 (G)	71.2 (G)	Marginally Unacceptable (I), Acceptable	28 1st Fl. to 6th Fl., 25 all other floors
Facing playground			75.9 (G)*	78.5 (G)*	Acceptable, Marginally Unacceptable I, Marginally Unacceptable II, Marginally Unacceptable III, Marginally Unacceptable IV	35 1st floor, 33 2nd and 3rd floor, 31 4th floor, 28 all other floors
2S (2B)	3014S	9 (part), 45				
Facing north			68.6 (G)	71.2 (G)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 6th Fl., 25 all other floors
Facing south			68.6 (G)	71.2 (G)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 6th Fl., 25 all other floors

Facing east			76.3 (D)	78.6 (D)	Marginally Unacceptable IV, Marginally Unacceptable III, Marginally Unacceptable II	35 1st Fl. to 4th Fl., 33 5th Fl. to 8th Fl., 31 all other floors
Facing west			68.6 (G)	71.2 (G)	Marginally Unacceptable (I), Acceptable	28 1st Fl. to 6th Fl., 25 all other floors
Facing playground			75.9 (G)*	78.5 (G)*	Marginally Unacceptable I, Marginally Unacceptable II, Marginally Unacceptable III, Marginally Unacceptable IV	35 1st and 2nd floors, 33 3rd floor, 28 4th through 6th floors, 25 all other floors
2N (3A)	3014N	15 (part)				
Facing north			68.6 (G)	71.2 (G)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 5th Fl., 25 all other floors
Facing south			68.6 (G)	71.2 (G)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 5th Fl., 25 all other floors
Facing east			74.4 (F)	76.8 (F)	Marginally Unacceptable III, Marginally Unacceptable II, Marginally Unacceptable I	33 1st Fl. to 4th Fl., 31 5th Fl. to 10th Fl., 28 all other floors
Facing west			68.6 (G)	71.2 (G)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 5th Fl., 25 all other floors
2N (3B)	3014N	15 (part)				
Facing north			73.2 (T4)	75.9 (T4)	Marginally Unacceptable II, Marginally Unacceptable I	31 1st Fl. to 9th Fl., 28 all other floors
Facing south			68.6 (G)	71.2 (G)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 6th Fl., 25 all other floors
Facing east			74.4 (F)	76.8 (F)	Marginally Unacceptable III, Marginally Unacceptable II, Marginally Unacceptable I	33 1st Fl. to 4th Fl., 31 5th Fl. to 11th Fl., 28 all other floors
Facing west			68.6 (G)	71.2 (G)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 6th Fl., 25 all other floors
2N (3C)	3014N	15 (part)	75.9 (T4)	75.9 (T4)	Marginally Unacceptable III	31
Facing north			69.2 (T3)	70.9 (T3)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 3rd Fl., 25 all other floors
Facing south			68.6 (G)	71.2 (G)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 4th Fl., 25 all other floors
Facing east			74.4 (F)	76.8 (F)	Marginally Unacceptable III, Marginally Unacceptable II	33 1st Fl. to 3rd Fl., 31 all other floors
Facing west			68.6 (G)	71.2 (G)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 4th Fl., 25 all other floors
3B (4)	3009	33	69.2 (T3)	70.9 (T3)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 5th Fl., 25 all other floors
8 (5)	3016	11, 13, 21	68.7 (T8), 76.3 (H1)	71.9 (T8), 78.2 (H1)	Marginally Unacceptable I, IV	31 North, 35 all others
9D	3016	60, 66	68.7 (T8)	71.9 (T8)	Marginally Unacceptable I, Acceptable	28 1st Fl. to 7th Fl., 25 all other floors

** Includes addition of playground noise levels*

Source: Sandstone Environmental Associates.

Note: This table has been completely revised based on the supplemental noise monitoring program and the refined playground noise calculations.

Table P-11: Required Attenuation Values for Projected and Potential Development Sites (Non-applicant-Controlled)

Site/Building	Block	Lot	Maximum Noise Level at Nearest Monitoring Site		CEQR Categories	Required Attenuation (dBA)
			L_{eq} (dBA)	L_{10} (dBA)		
7A	2998	97	70.0 (T7)	72.3 (T7)	Marginally Unacceptable I	28
7B	2998	104, 113, 124	71.2 (T1)	73.4 (T1)	Marginally Unacceptable II	31
3A	3009	25	69.1 (T3)	70.9 (T3)	Marginally Unacceptable I	28
3C	3009	37	72.2 (T5)	73.9 (T5)	Marginally Unacceptable II	31
3D	3009	38	72.2 (T5)	73.9 (T5)	Marginally Unacceptable II	31
3E	3009	44	72.2 (T5)	73.9 (T5)	Marginally Unacceptable II	31
5A	3010	26	71.2 (T1)	73.4 (T1)	Marginally Unacceptable II	31
5B	3010	29	71.2 (T1)	73.4 (T1)	Marginally Unacceptable II	31
5C	3010	33	71.2 (T1)	73.4 (T1)	Marginally Unacceptable II	31
5D	3010	40	69.0 (T3)	70.9 (T3)	Marginally Unacceptable I	28
5E	3010	46	73.2 (T4)	75.9 (T4)	Marginally Unacceptable II	31
4A	3015S	1	73.2 (T4)	75.9 (T4)	Marginally Unacceptable II	31
4B	3015S	3, 5	73.2 (T4)	75.9 (T4)	Marginally Unacceptable II	31
4C	3015S	17, 18	73.2 (T4)	75.9 (T4)	Marginally Unacceptable II	31
4D	3015S	19	71.2 (T1)	73.4 (T1)	Marginally Unacceptable II	31
4E	3015S	25, 26	74.7 (T2)	76.8 (T2)	Marginally Unacceptable III	33
4F	3015S	34	74.7 (T2)	76.8 (T2)	Marginally Unacceptable III	33
6A	3015N	50,56, 110	71.2 (T1)	73.4 (T1)	Marginally Unacceptable II	31
6B	3015N	62, 87, 89	71.2 (T1)	73.4 (T1)	Marginally Unacceptable II	31
6C	3015N	67, 83, 84, 85	70.0 (T7)	72.3 (T7)	Marginally Unacceptable I	28
6D	3015N	81	70.0 (T7)	72.3 (T7)	Marginally Unacceptable I	28
6E	3015N	95	74.7 (T2)	76.8 (T2)	Marginally Unacceptable III	33
6F	3015N	96	74.7 (T2)	76.8 (T2)	Marginally Unacceptable III	33
6G	3015N	97	74.7 (T2)	76.8 (T2)	Marginally Unacceptable III	33
9A	3016	33, 35	81.1 (R1)	86.1 (R1)	Clearly Unacceptable	42
9B	3016	36, 37	811 (R1)	86.1 (R1)	Clearly Unacceptable	42
9C	3016	38, 42	81.1 (R1)	86.1 (R1)	Clearly Unacceptable	42
9E	3016	71	68.7 (T8)	71.9 (T8)	Marginally Unacceptable I	28

Note: Commercial uses would require 5 dBA less of attenuation

Source: Sandstone Environmental Associates.

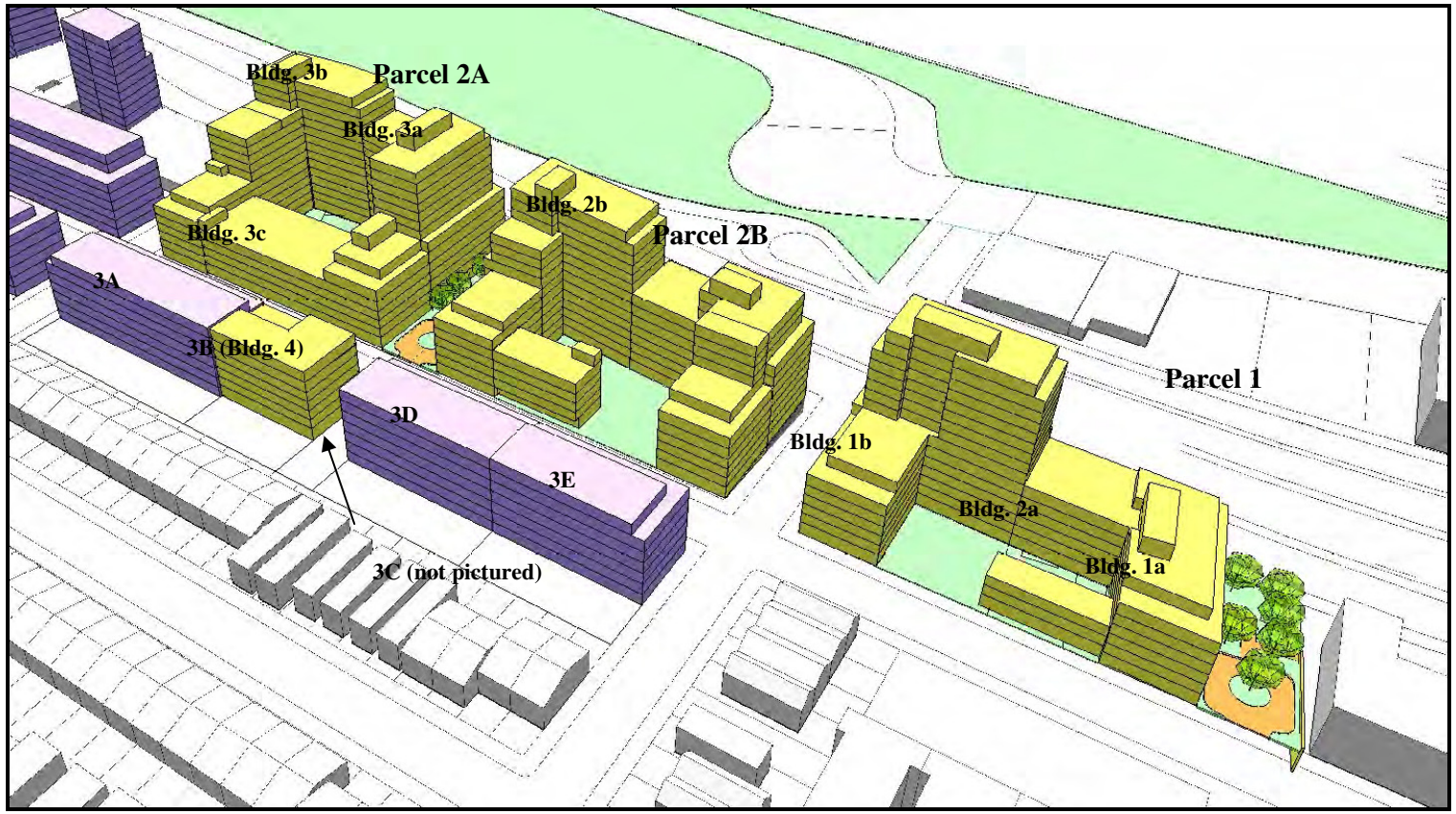
Note: This table has been completely revised based on refined noise calculations conducted between the Draft and Final EIS.

Figure P-6: Blocks 3013, 3014, & 3009



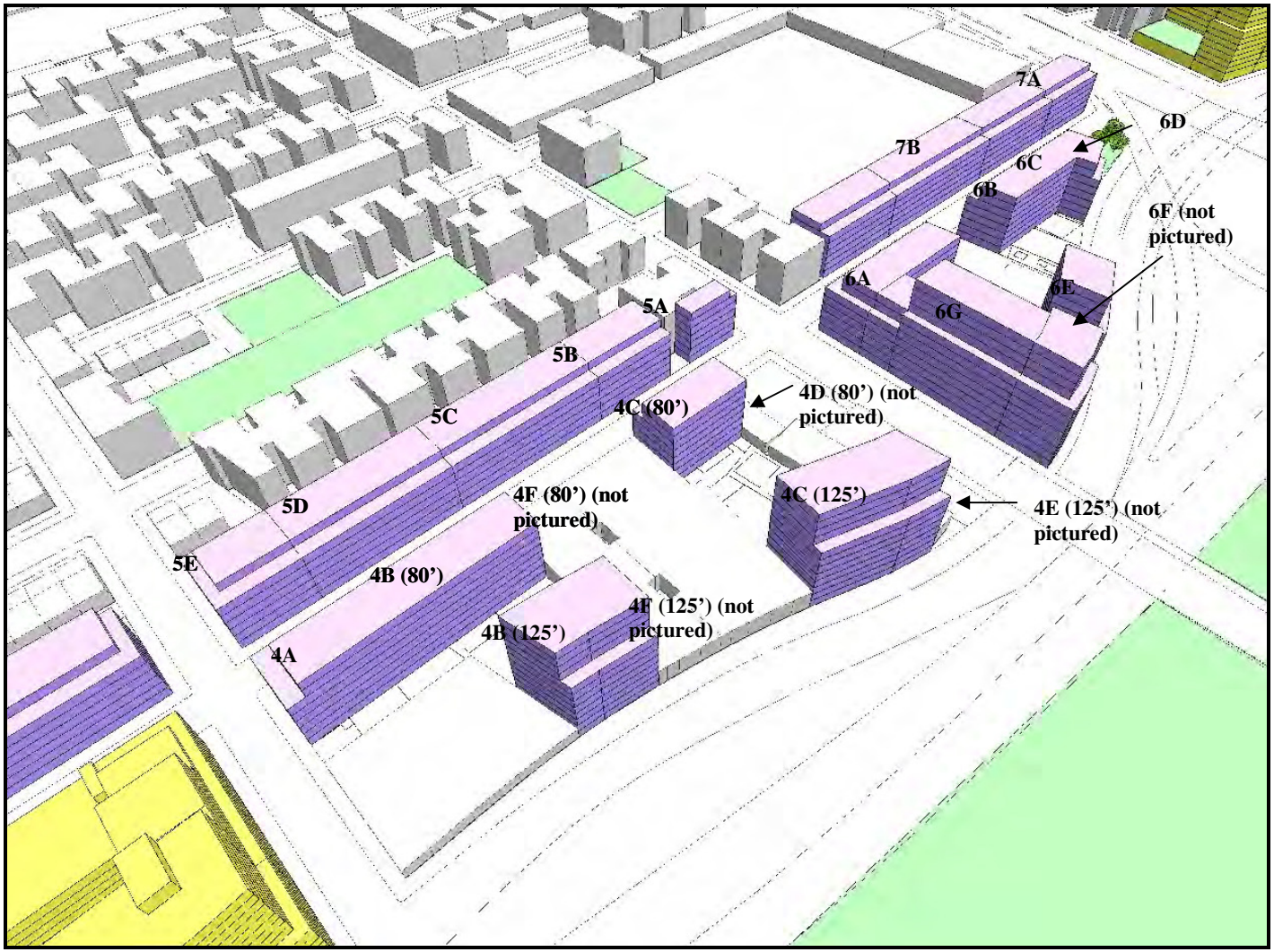
*Source: Dattner Archit*ects. Parcel 2A=2N; Parcel 2B=2S

Figure P-7: Blocks 3013, 3014, & 3009



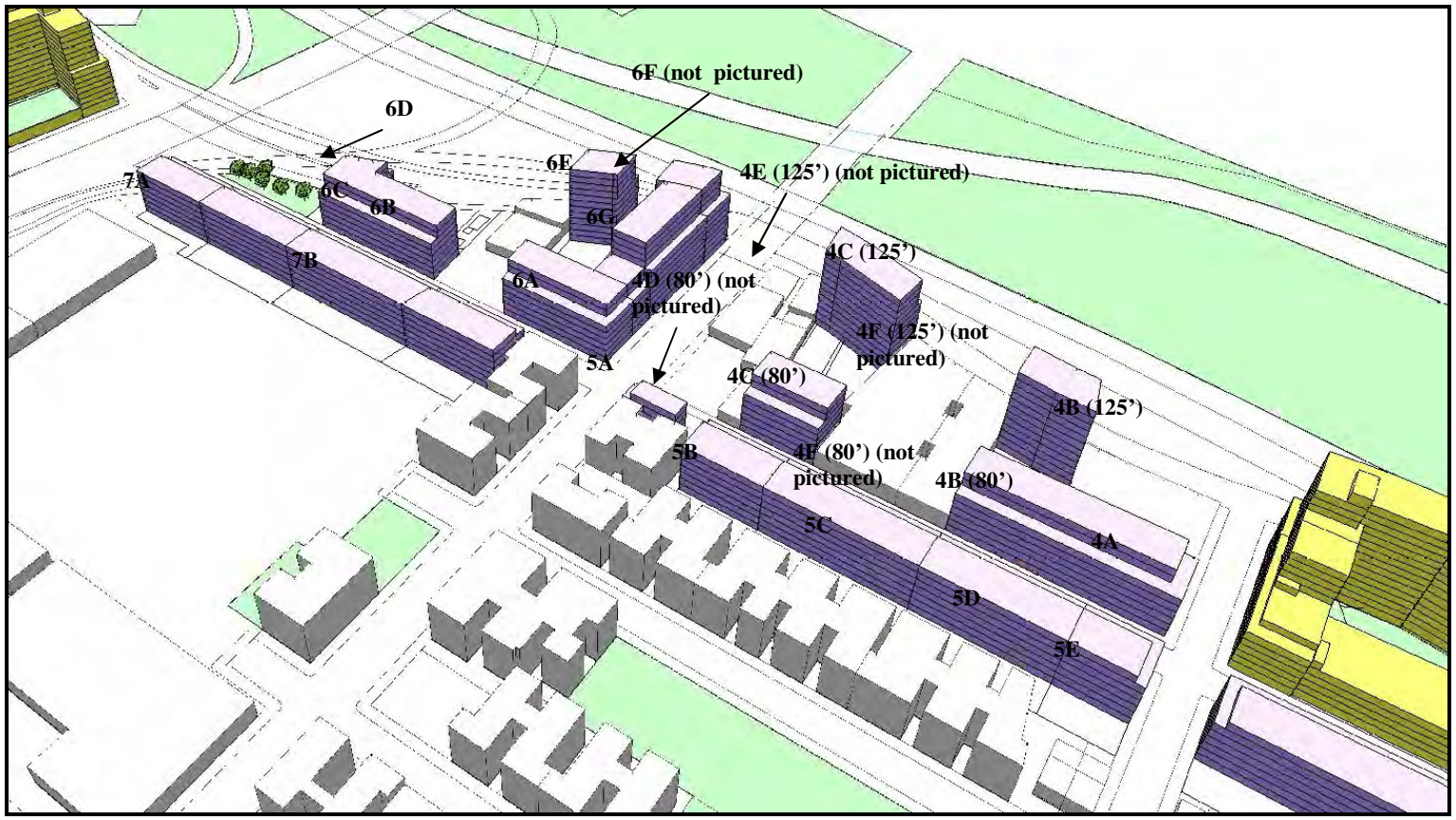
*Source: Dattner Archi*tects. Parcel 2A=2N; Parcel 2B=2S

Figure P-8: Blocks 3015, 3010 & 2998



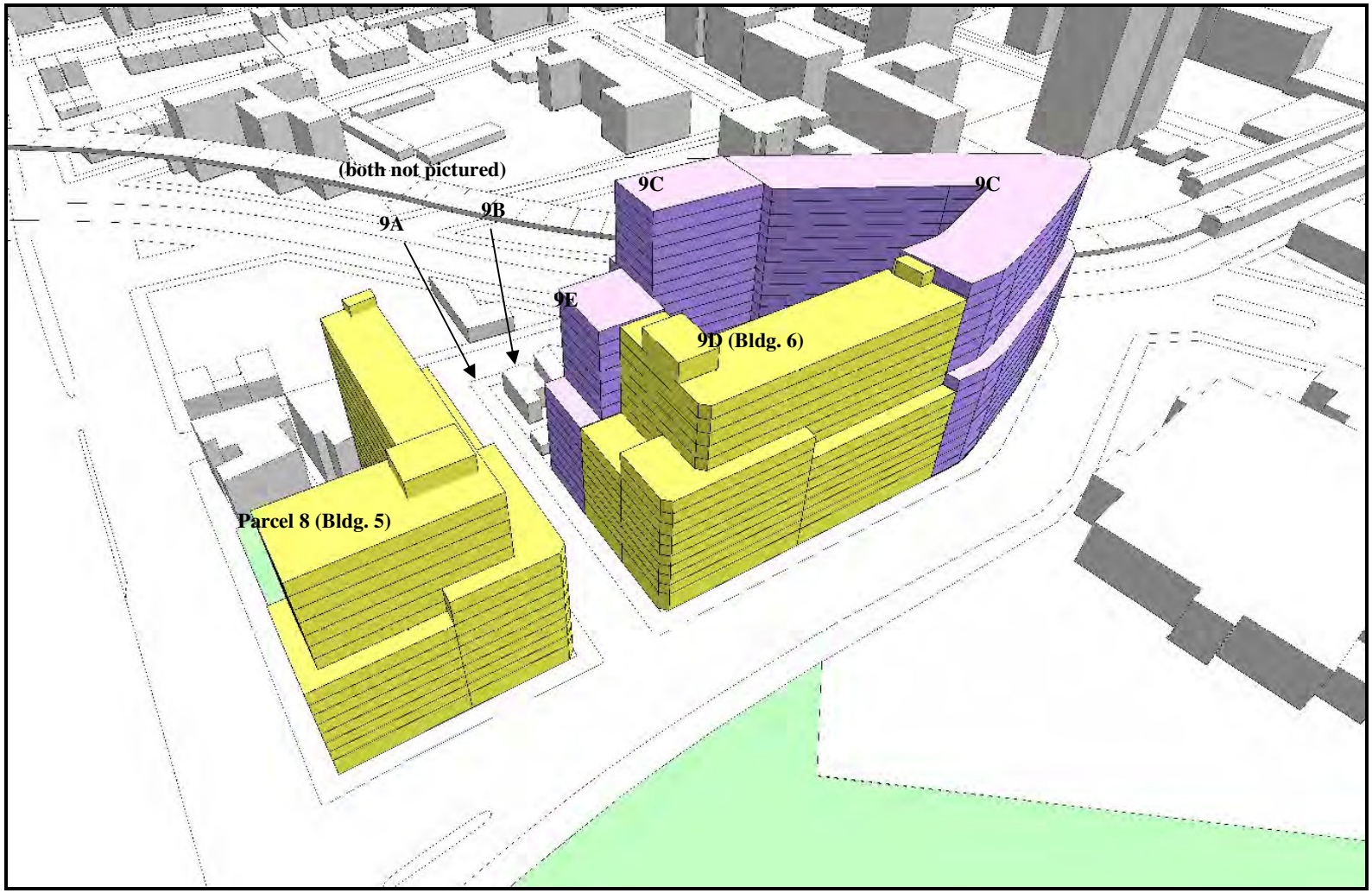
*Source: Dattner Archit*ects.

Figure P-9: Blocks 3015, 3010 & 2998



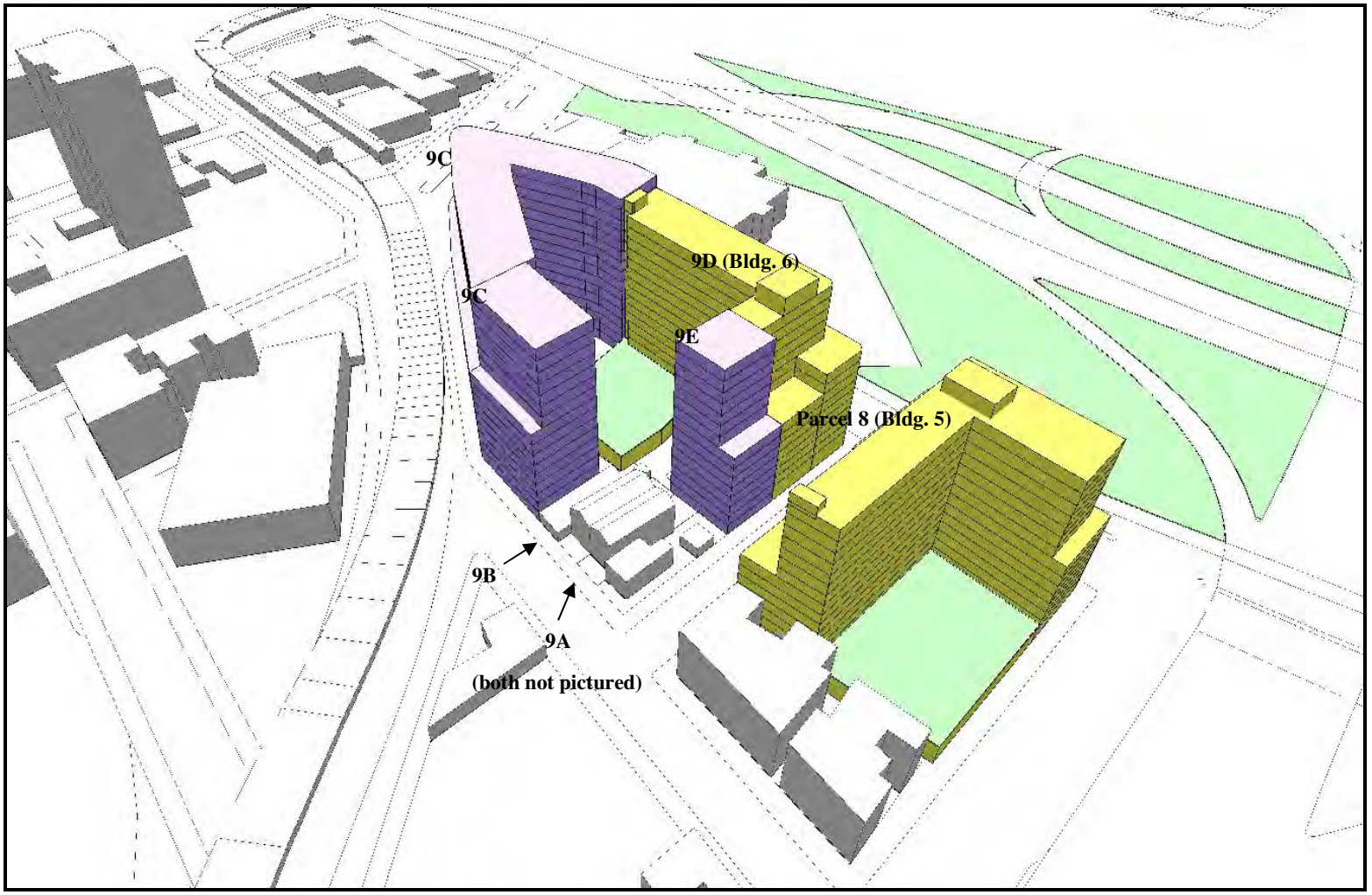
Source: Dattner Architects.

Figure P-10: Block 3016



*Source: Dattner Archit*ects.

Figure P-11: Block 3016



*Source: Dattner Archi*tects