RIVER RING
Chapter 15: Noise

A. INTRODUCTION

This chapter assesses the potential for the Proposed Actions to result in significant adverse noise impacts. As described in Chapter 1, "Project Description," the Proposed Actions include a City map change, and landfill action, a zoning map amendment, a zoning text amendment, a zoning authorization, a zoning certification, and zoning Special Permits to reduce parking requirements and for a large scale general development (LSGD) for the seaward portion of the zoning lot comprising the Proposed Development Site (Brooklyn Block 2355, Lots 1 and 20; Block 2361, Lots 1, 20, and 21; Block 2376, Lot 50; and portions of Metropolitan Avenue and North 1st Street) in the Williamsburg neighborhood of Brooklyn Community District (CD) 1. The Proposed Actions would facilitate the construction of an approximately 1.336 million gross square foot ("gsf") mixed-use development (the "Proposed Development"), consisting of two mixed residential, commercial, and community facility buildings. The North Tower would comprise 49 stories and rise to a height of approximately 560 feet, and the South Tower would comprise 64 stories and rise to a height of approximately 710 feet. The Proposed Development would comprise of approximately 1.12 million gsf of residential space[1] (approximately 1,250 dwelling units, of which 313 units (25%) would be affordable pursuant to MIH), 50,000 gsf of community facility space, 83,000 gsf of commercial space (including 60,000 gsf of office and 23,000 gsf of local retail), and approximately 83,000 gsf of below-grade parking (up to 250 accessory attended parking spaces), for a total of approximately 1.336 million gsf. Additionally, the Proposed Development would also include approximately 126,308 sf (2.9 acres) of new public open space (plus 2.32 acres of secondary contact accessible in-river space and 0.86 acres of intertidal area), which would establish a continuous public waterfront experience spanning from Bushwick Inlet Park to the north, to Grand Ferry Park and Domino Park to the south. As described above, the proposed waterfront public spaces would be designed to promote resiliency and programmed for in-water activities, passive recreation, and educational programs for the community.[2] The beach is designed to provide secondary-contact recreation access, and per NYS Department of Health regulations, swimming will be prohibited.

In addition, the Proposed Actions would also facilitate the redevelopment of a non-Applicant-owned site ("Projected Development Site") at 230 Kent Avenue (Block 2362; Lot 1). As described in Chapter 1, "Project Description," it is assumed that the Projected Development Site would be comprised of a three-story (approximately 45-foot high) mixed-use building with approximately 6,741 gsf of local retail space, 6,741 gsf of light industrial (warehouse) space, and 6,741 gsf of community facility space.

[1] Residential gsf includes approximately 70,000 sf of amenity space as a combined total for both towers.

[2] Although the proposed open space design is still not finalized, it may include waterfront recreation activities for children, such as a largely passive natural space with play features. However, as this largely passive space would not meet the CEQR definition of a stationary source (e.g., crowd noise related to playgrounds or spectator events), a playground noise analysis is not warranted for the Proposed Actions. Should the Applicant consider the addition of active play areas as the designs evolve, a playground noise analysis may be warranted.

Both the Proposed Development Site and Projected Development Site are expected to be completed and fully operational by 2027.

As discussed in Chapter 12, "Transportation," approval of the Proposed Actions would change traffic volumes in the general vicinity of the Project Area. However, compared to No-Action conditions, the Proposed Actions would not result in more than 50 incremental peak hour vehicle trips through any given intersection, and therefore, it is considered unlikely that project-generated traffic would have the potential to result in significant adverse noise impacts due to mobile sources. However, as the Proposed Actions would create new noise-sensitive uses within the Project Area, a detailed noise analysis was conducted in order to determine the level of building attenuation required to ensure that future interior noise levels would satisfy applicable noise criteria.

B. PRINCIPAL CONCLUSIONS

An analysis was conducted based on the methodology set forth in the *CEQR Technical Manual*, and determined that the Proposed Actions would not result in a significant adverse impact related to noise. The analysis finds that increased traffic volumes generated by the Proposed Actions would not result in significant adverse noise impacts as the relative increases in noise levels would fall well below the applicable *CEQR Technical Manual* significant adverse impact threshold (3.0 dBA).

Based on the calculated With-Action L_{10} noise levels, the projected peak period L_{10} noise values at Receptor Locations 1 through 4 would range from a minimum of 58.1 dBA to a maximum of 66.3 dBA and would remain below the 70 dBA CEQR threshold. Thus, no special noise attenuation measures beyond standard construction practices would be required for the proposed residential, community facility, or commercial office uses on any of the Proposed Development's frontages in order to achieve interior noise levels of 45 dBA or lower for residential and community facility uses or 50 dBA or lower for commercial office uses, as is consistent with *CEQR Technical Manual* guidance. However, as maximum With-Action noise levels at Receptor Location 5 would be 73.9 dBA, special attenuation measures beyond standard construction practices would be required for the Projected Development Site's future community facility uses on the eastern (Kent Avenue), southern (North 1st Street), and northern (facing Metropolitan Avenue) frontages of the Development Site in order to achieve the required interior noise level of 45 dBA or lower for community facility uses. In order to satisfy CEQR interior noise level requirements and ensure acceptable interior noise levels for community facility uses, a minimum composite window/wall attenuation rating of 31 dBA for all facades fronting and within 50 feet of Kent Avenue would be required.

The composite window/wall noise attenuations described above would be required through the assignment of an (E) Designation (E-636). With implementation of the attenuation levels outlined above and described in **Table 15-9**, below, the Projected Development Site would provide sufficient attenuation to achieve the *CEQR Technical Manual* interior noise level guidelines. Therefore, the Proposed Actions would not result in any significant adverse noise impacts related to noise attenuation.

C. NOISE FUNDAMENTALS

Noise is considered unwanted sound. Sound is a fluctuation in air pressure. Sound pressure levels are measured in units called "decibels" (dB). The particular character of the sound that we hear (a whistle compared with a French horn, for example) is determined by the speed, or "frequency," at which the air pressure fluctuates or "oscillates." Frequency defines the oscillation of sound pressure in terms of cycles

per second (cps). One cycle per second is known as 1 Hertz (Hz). People can hear sound over a relatively limited range of frequencies, generally between 20 Hz and 20,000 Hz. Furthermore, the human ear does not perceive all frequencies equally well. High frequencies (e.g., a whistle) are more easily discernible and therefore more intrusive than many of the lower frequencies (e.g., the lower notes on the French horn).

"A"-Weighted Sound Level (dBA)

In order to establish a uniform noise measurement that simulates people's perception of loudness and annoyance, the decibel measurement is weighted to account for those frequencies most audible to the human ear. This is known as the A-weighted sound level, or "dBA," and it is the descriptor of noise levels most often used for community noise. As shown in **Table 15-1**, the threshold of human hearing is defined as 0 dBA; very quiet conditions (as in a library, for example) are approximately 40 dBA; levels between 50 dBA and 70 dBA define the range of noise levels generated by normal daily activity; levels above 70 dBA would be considered noisy, and then loud, intrusive, and deafening as the scale approaches 120 dBA.

TABLE 15-1
Common Noise Levels

Sound Source	(dBA)
Air Raid Siren at 50 feet	120
Maximum Levels at Rock Concerts (Rear Seats)	110
On Platform by Passing Subway Train	100
On Sidewalk by Passing Heavy Truck or Bus	90
On Sidewalk by Typical Highway	80
On Sidewalk by Passing Automobiles with Mufflers	70
Typical Urban Area	60-70
Typical Suburban Area	50-60
Quiet Suburban Area at Night	40-50
Typical Rural Area at Night	30-40
Public Library	40
Soft Whisper at 5 meters	30
Isolated Broadcast Studio	20
Audiometric (Hearing Testing) Booth	10
Threshold of Hearing	0

Source: *2020 CEQR Technical Manual* / Cowan, James P. Handbook of Environmental Acoustics. Van Nostrand Reinhold, New York, 1994. Egan, M. David, Architectural Acoustics. McGraw-Hill Book Company, 1988.
Note: A 10 dBA increase appears to double the loudness, and a 10 dBA decrease appears to halve the apparent loudness.

In considering these values, it is important to note that the dBA scale is logarithmic, meaning that each increase of ten dBA describes a doubling of perceived loudness. Thus, the background noise in an office, at 50 dBA, is perceived as twice as loud as a library at 40 dBA. For most people to perceive an increase in noise, it must be at least three dBA. At five dBA, the change will be readily noticeable.

Community Response to Changes in Noise Levels

Table 15-2 shows the average ability of an individual to perceive changes in noise. Generally, changes in noise levels less than 3 dBA are barely perceptible to most listeners. However, as illustrated in **Table 15-2**, 5 dBA changes are readily noticeable. 10 dBA changes are normally perceived as doublings (or halvings)

of noise levels. These guidelines permit direct estimation of an individual's probable perception of changes in noise levels.

TABLE 15-2
Average Ability to Perceive Changes in Noise Levels

Change (dBA)	Human Perception of Sound
2-3	Barely perceptible
5	Readily noticeable
10	A doubling or halving of the loudness of sound
20	A dramatic change
40	Difference between a faintly audible sound and a very loud sound

Source: Bolt Beranek and Neuman, Inc., Fundamentals and Abatement of Highway Traffic Noise, Report No. PB-222-703. Prepared for Federal Highway Administration, June 1973.

Noise Descriptors Used In Impact Assessment

Because the sound pressure level unit, dBA, describes a noise level at just one moment, and very few noises are constant, other ways of describing noise over extended periods have been developed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific time period as if it had been a steady, unchanging sound. For this condition, a descriptor called the "equivalent sound level", L_{eq}, can be computed. L_{eq} is the constant sound level that, in a given situation and time period (e.g., 1 hour, denoted by $L_{eq(1)}$, or 24 hours, denoted as $L_{eq(24)}$), conveys the same sound-energy as the actual time-varying sound. Statistical sound level descriptors such as L_1, L_{10}, L_{50}, L_{90}, and L_x, are sometimes used to indicate noise levels that are exceeded 1, 10, 50, 90 and x percent of the time, respectively. Discrete event peak levels are given as L_1 levels. L_{eq} is used in the prediction of future noise levels, by adding the contributions from new sources of noise (i.e., increases in traffic volumes) to the existing levels and in relating annoyance to increases in noise levels.

The relationship between L_{eq} and levels of exceedance is worth noting. Because L_{eq} is defined in energy rather than straight numerical terms, it is not simply related to the levels of exceedance. If the noise fluctuates very little, L_{eq} will approximate L_{50} or the median level. If the noise fluctuates broadly, the L_{eq} will be approximately equal to the L_{10} value. If extreme fluctuations are present, the L_{eq} will exceed L_{90} or the background level by 10 or more decibels. Thus the relationship between L_{eq} and the levels of exceedance will depend on the character of the noise. In community noise measurements, it has been observed that the L_{eq} is generally between L_{10} and L_{50}.

The one-hour equivalent continuous noise level ($L_{eq\,(1h)}$ in dBA), the tenth percentile level L_{10} and the day-night average sound level L_{dn} were selected as the noise descriptors for the purposes of this analysis. Hourly statistical noise levels (particularly L_{10} and L_{eq} levels) were used to characterize the relevant noise sources and their relative importance at each receptor location. These are the descriptors recommended by the *CEQR Technical Manual* for City environmental impact review classification. The L_{dn} is the noise descriptor used in the *HUD Noise Guidebook* and sets exterior noise standards for housing construction projects receiving federal funds.

Applicable Noise Codes and Impact Criteria

New York City Noise Code

The New York City Noise Control Code, amended in December 2005, contains prohibitions regarding unreasonable noise and specific noise standards, including plainly audible criteria for specific noise sources. In addition, the amended code specifies that no sound source operating in connection with any commercial or business enterprise may exceed the decibel levels in the designated octave bands at specified receiving properties. The New York City Department of Environmental Protection (DEP) has set external noise exposure standards. These standards are shown on the following page in **Table 15-3**.

TABLE 15-3
Noise Exposure Guidance for Use in City Environmental Impact Review

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 ----------		---------- 60 < Ldn ≤ 65 dBA ----------		(1) 65 < Ldn ≤ 70 dBA, (II) 70 ≤ Ldn		---------- 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	$L_{10} \leq 55$ 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-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	

Source: New York City 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;

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 old-age 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).

The *CEQR Technical Manual sets* Noise Exposure standards and classifies noise exposure into four categories: acceptable, marginally acceptable, marginally unacceptable, and clearly unacceptable. The

standards shown are based on maintaining an interior noise level for the worst-case hour L_{10} of less than or equal to 45 dBA. Attenuation requirements are shown on the following page in **Table 15-4**.

TABLE 15-4
Required Attenuation Values to Achieve Acceptable Interior Noise Levels

	Marginally Unacceptable				Clearly Unacceptable
Noise level with proposed development	$70<L_{10}\leq73$	$73<L_{10}\leq76$	$76<L_{10}\leq78$	$78<L_{10}\leq80$	$80<L_{10}$
Attenuation	(I) 28 dB(A)	(II) 31 dB(A)	(III) 33 dB(A)	(IV) 35 dB(A)	$36 + (L_{10} - 80)^B$ dB(A)

Note: [A] The above composite window-wall attenuation values are for residential dwellings. Commercial office spaces and meeting rooms would be 5 dB(A) less in each category. All the above categories require a closed window situation and hence an alternate means of ventilation.
[B] Required attenuation values increase by 1 dB(A) increments for L_{10} values greater than 80 dBA.
Source: New York City Department of Environmental Protection / 2020 *CEQR Technical Manual*

D. NOISE PREDICTION METHODOLOGY

Future No-Action and With-Action noise levels were calculated using either the proportional modeling technique or the Federal Highway Administration (FHWA) Traffic Noise Model (TNM) version 2.5. As stated in the *CEQR Technical Manual*, the proportional modeling technique may be employed for most projects. However, TNM modeling should be used when: (a) conditions result in new or significant changes in roadway or street geometry; (b) roadways currently carry no or very low traffic volumes; (c) ambient noise is the result of multiple sources including traffic; or (d) a detailed analysis of changes due to the traffic component of the total ambient noise levels is necessary. As River Street and North 3rd Street each carry very low traffic volumes under existing conditions, TNM modeling was used at Receptor Locations 1 and 2 to account for noise associated with the additional project-generated traffic along River Street between North 1st Street and North 3rd Street, and North 3rd Street between River Street and the East River.

Analyses for the Proposed Actions were conducted for three typical time periods: the weekday AM peak hour (7:30 AM to 8:30 AM), the weekday midday peak hour (12 PM to 1 PM), and the weekday PM peak hour (5 PM to 6 PM). These time periods are the hours when the maximum traffic generation is expected (based on the traffic studies presented in Chapter 12, "Transportation") and, therefore, the hours when future conditions with the Proposed Actions are most likely to result in maximum noise impacts for the receptor locations.

For this analysis, during the noise recording, vehicles were counted and classified. To calculate the 2027 No-Action PCE values at the Project Area, an annual background growth rate of 0.50 percent for years 1 through 5 and 0.25 percent for year 6 and beyond, plus the estimated incremental travel demand from new development within the vicinity of the Project Area, was applied to the PCE noise values based on the existing vehicle volumes presented in in **Appendix G.**[3] In order to obtain the necessary With-Action PCE values to calculate the With-Action noise levels, the 2027 With-Action traffic increment assignments presented in **Appendix G** were converted into PCE values and added to the calculated No-Action PCE values.

[3] Background growth rate calculations based on information provided in Table 16-4 of the *CEQR Technical Manual.*

The TNM procedure used for the noise analysis is described below.

Traffic Noise Modeling (TNM)

As the existing traffic volumes along River Street (Receptor Location 1) and North 3rd Street (Receptor Location 2) at the Project Area's eastern and northern frontages, respectively, are very low, a preliminary assessment using the proportional modeling technique indicated that the future traffic along these roads may have the potential to cause noticeable increases in noise levels. Therefore, to more accurately forecast noise at these locations, a refined analysis was performed using TNM.

TNM is a computerized model developed for the FHWA that calculates the noise contribution of each roadway segment to a given noise receptor. The noise from each vehicle type is determined as a function of the reference energy-mean emission level, corrected for vehicle volume, speed, roadway grade, roadway segment length, and source-receptor distance. Further considerations in modeling the propagation path include identifying the shielding provided by rows of buildings, analyzing the effects of different ground types, identifying source and receptor elevations, and analyzing the effects of any intervening noise barriers. The less refined proportional modeling technique could not account for the noise contributions from adjacent roadways, and thus, over-predicts the project-generated traffic noise levels by attributing all noise due to traffic and traffic changes to the immediately adjacent street. As such, TNM provided more accurate results than proportional modeling for Receptor Locations 1 and 2.

The existing TNM noise levels were logarithmically subtracted from the measured existing noise levels and logarithmically added to the predicted TNM No-Action and With-Action noise levels to account for other dominant noise included in the background noise not attributable to vehicular traffic, such as skateboarding noise, pedestrian activity at Grand Ferry Park, NYC Ferry activity on the East River adjacent to the project site, and the sound of water crashing into the breakwaters.

Impact Significance Criteria

According to *CEQR Technical Manual*, for the purposes of determining a significant impact during daytime hours, it is reasonable to consider a L_{eq} noise level of 65 dBA as an absolute noise level that should not be significantly exceeded. Therefore, a significant noise impact would occur at a sensitive noise receptor (i.e., residences, play areas, parks, schools, libraries and houses of worship) during daytime hours under the following circumstances:

- A noise increase of 3 dBA or greater is predicted in the future as a result of the Proposed Actions (the With-Action condition), when the future noise levels without the Proposed Actions (the No-Action condition) are at 62 dBA or greater; or

- When the No-Action noise level is below 62 dBA, a predicted noise increase with the Proposed Actions exceeds the difference between 65 dBA and the No-Action noise level. For example, if the No-Action noise level is 61 dBA, then the maximum noise increment with the Proposed Actions would be 4 dBA, since an increase higher than 4 dBA would result in a noise level that exceeds the 65 dBA L_{eq} significant impact threshold.

- Additionally, an increase of With-Action noise levels by 5 dBA over a No-Action noise level that is below 60 dBA would be considered significant.

E. EXISTING CONDITIONS

As shown in **Figure 15-1**, the Project Area is bounded to the north by North 3rd Street, to the east by Kent Avenue and property owned by New York Power Authority (NYPA), to the south partially by North 1st Street and partially by Grand Ferry Park, and to the west by the US Pierhead Line in the East River. The Project Area comprises portions of three waterfront blocks and two inland blocks with a total lot area of approximately 441,660 sf. This includes the upland lot portion of the Applicant's Proposed Development Site, which has a lot area of approximately 143,613 sf, the seaward lot portion of the Proposed Development Site, which has a lot area of approximately 229,677 sf and includes 28,454 sf of existing seaward structures, an approximately 23,116 sf area of Metropolitan Avenue and an approximately 3,374 sf area of North 1st Street proposed to be demapped, as well as the two non-Applicant-controlled inland tax blocks, which have a total lot are of 41,880 sf.

River Street is a 50-foot-wide, two-way local roadway with two-lanes carrying traffic north and south with a parking lane on the east side of the street south of North 1st Street and on both sides of the street north of North 1st Street; for the portion of River Street south of Grand Street, the roadway only carries southbound traffic. North 3rd Street is a 50-foot-wide, two-way local roadway carrying traffic east and west with a parking lanes on the north side of the street; the portion of North 3rd Street fronting the Project Area between River Street and the East River is a dead-end roadway. North 1st Street is also a 50-foot-wide, local roadway carrying traffic westbound with parking lanes on both sides; the portion of North 1st Street fronting the Project Area between River Street and the East River is a dead-end roadway that carries two-way traffic. Kent Avenue is a 60-foot-wide, one-way local roadway carrying a single lane of traffic northbound with parking lanes on both sides of the street and a protected bike lane on the west side of the street. Under existing conditions, each of the roadways fronting the Project Area – with the exception of Kent Avenue – generally experience low traffic volumes due to the unique characteristic of each roadway (e.g., North 3rd and North 1st streets are dead-ends, and River Street stretches a short distance for approximately six blocks). Kent Avenue, which also serves as a designated truck route, experiences significantly higher traffic volumes compared to the other roadways within the vicinity of the Project Area.

Selection of Noise Receptor Locations

As discussed above, local traffic is the dominant source of noise in the vicinity of the Project Area. In general, the levels of existing noise in the vicinity of the Project Area are primarily influenced by the amount of traffic on immediately adjacent or nearby roadways; there are no elevated train lines or nearby stationary noise sources that could significantly contribute to the area's ambient noise levels.[4] As such, a total of five noise receptor locations were selected to be along the perimeter of the future buildings and proposed public open spaces under the Proposed Actions for evaluation of potential noise impacts and

[4] While the New York Power Authority (NYPA) facility at 49 Kent Avenue (located directly south of the Proposed Development Site) is considered a stationary noise source, the stationary noise generated by the facility is very low and not considered to be significant. As such, ambient noise within the vicinity of the Project Area is primarily influenced by traffic on the adjacent roadways.

noise attenuation requirements, in consultation with DCP.[5] The five selected receptor locations surrounding the Project Area are presented in **Table 15-5** and shown in **Figure 15-1**.

TABLE 15-5
Noise Receptor Locations

Receptor Location / Map ID[1]	Receptor Location
1	Approximate midpoint of the Proposed Development Site's eastern frontage along River Street (approximately 250 feet south of North 3rd Street)
2	Approximate midpoint of the Project Area's northern frontage along North 3rd Street (approximately 140 feet west of River Street)
3	Approximate midpoint of the Project Area's western frontage along the East River (approximately 250 feet south of North 3rd Street)
4	Southernmost point of the Project Area's southern frontage along North 1st Street/Grand Ferry Park and directly west of the NYPA facility (approximately 200 feet west of River Street)
5	Northwest corner of the intersection at Kent Avenue and North 1st Street, adjacent the Projected Development Site

Notes: [1] Refer to **Figure 15-1** for noise receptor locations.

Noise Monitoring

At Receptor Locations 1 through 4, 20-minute spot measurements of existing noise levels were performed for each of the three noise analysis time periods – weekday AM peak hour (7:30 AM to 8:30 AM, weekday midday peak hour (12:00 PM to 1:00PM), and weekday PM (5:00 PM to 6:00 PM). Noise monitoring was performed on Tuesday, November 17, 2020. The weather on November 17, 2020 was overcast and in the mid-40s °F with an average wind speed of approximately 10 mph.

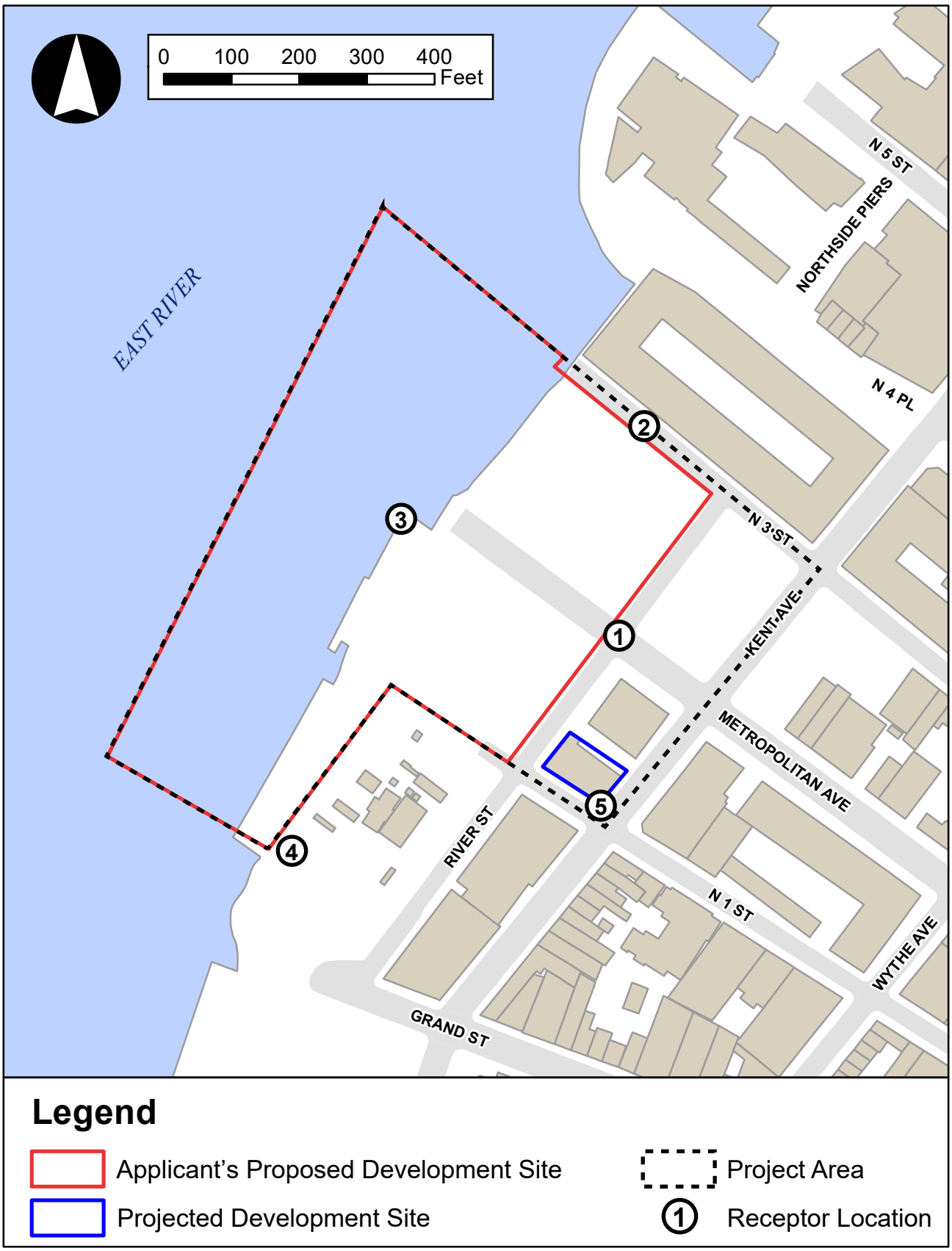
As per DCP guidance, noise measurements from Receptor Location 5 were based on noise measurements collected at receptor site 2 presented in Chapter 7, "Noise," of the *307 Kent Avenue Rezoning DEIS (2021)* (CEQR No. 20DCP100K). At receptor site 2 (see **Figure 15-2**), noise monitoring was performed on Thursday, September 13 and Wednesday, October 3, 2018 during the weekday AM (8:00 AM- 9:00 AM), midday (12:00 PM – 1:00 PM), and PM (4:30 PM – 5:30 PM) peak periods.

Equipment Used During Noise Monitoring

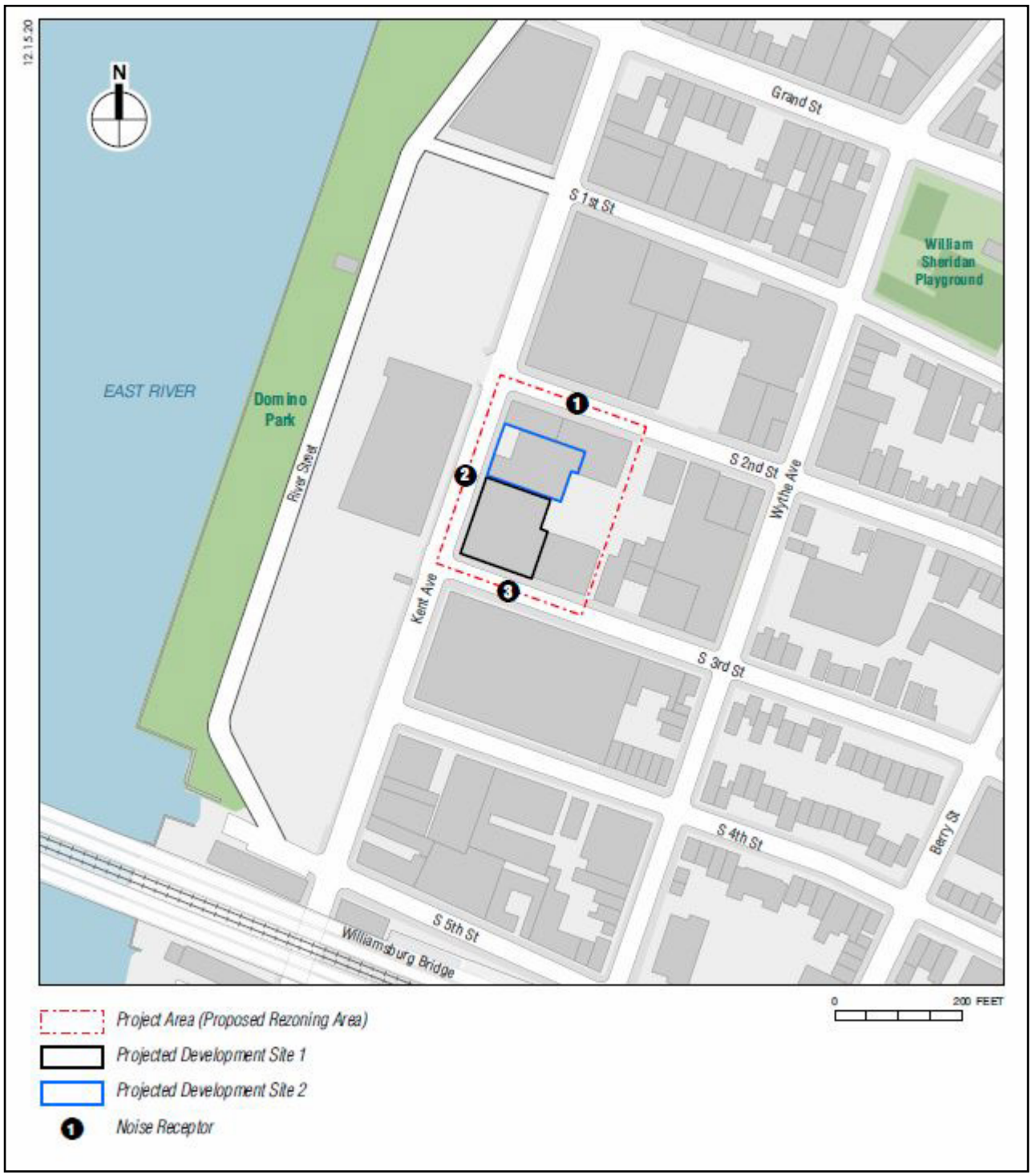
The instrumentation used for the measurements at Receptor Locations 1 through 4 was a Brüel & Kjær Type 4189 ½-inch microphone connected to a Brüel & Kjær Model 2250 Type 1 (as defined by the American National Standards Institute) sound level meter. This assembly was mounted at a height of 5 feet above the ground surface on a tripod and at least 6 feet away from any sound-reflecting surfaces to avoid major interference with source sound level that is being measured. The meter was calibrated before

[5] It should be noted that the NYC Ferry operates in close proximity to the Project Area with the North Williamsburg ferry terminal, which services the East River Ferry route, being located approximately 750 feet to the north. As such, north- and southbound ferries travel past the Project Area at a distance of approximately 500 feet west of the US Pierhead Line in the East River. While not the dominant noise source in the vicinity of the Project Area, any noise generated by ferry traffic would not be removed from the existing noise measurements so as to ensure that any potential recommended attenuation levels within the study area take ferry traffic noise into account in order to determine acceptable interior noise levels.

Figure 15-1
Noise Receptor Locations



Noise Receptor Sites from *307 Kent Avenue Rezoning DEIS*



**Noise receptor figure pulled directly from Chapter 7, "Noise" of the 307 Kent Avenue Rezoning DEIS (20DCP100K)*

and after readings with a Brüel & Kjær Type 4231 sound-level calibrator using the appropriate adaptor. Measurements at each location were made on the A-scale (dBA). The data were digitally recorded by the sound level meter and displayed at the end of the measurement period in units of dBA. Measured quantities included L_{eq}, L_1, L_{10}, L_{50}, and L_{90}. A windscreen was used during all sound measurements except for calibration. Only traffic-related noise and background noise from the Project Area's current operations were measured; noise from other sources (e.g., emergency sirens, aircraft flyovers, etc.) was excluded from the measured noise levels. Weather conditions were noted to ensure a true reading as follows: wind speed under 12 mph; relative humidity under 90 percent; and temperature above 14°F and below 122°F (pursuant to ANSI Standard S1.13-2005).

As described in the *307 Kent Avenue Rezoning DEIS*, measurements at Receptor Location 5 were performed using a Brüel & Kjær Sound Level Meter (SLM) Type 2250, Brüel & Kjær SLM Type 2260, Brüel & Kjær ½-inch microphone Type 4189, and a Brüel & Kjær Sound Level Calibrator Type 4231. The Brüel & Kjær SLM is a Type 1 instrumentation according to ANSI Standard S1.4-1983 (R2006). The SLM had a laboratory calibration date within 1 year of the date of the measurement, as is standard practice. The microphone was mounted at a height of approximately 5 feet above the ground surface on a tripod and at least approximately 5 feet away from any large reflecting surfaces. The SLM was calibrated before and after readings with a Brüel & Kjær Type 4231 Sound Level Calibrator using the appropriate adaptor. Measurements were made on the A-scale (dBA). The data were digitally recorded by the sound level meter and displayed at the end of the measurement period in units of dBA. Measured quantities included L_{eq}, L_1, L_{10}, L_{50}, and L_{90} and 1/3 octave band levels. A windscreen was used during all sound measurements except for calibration. All measurement procedures were based on the guidelines outlined in ANSI Standard S1.13-2005.

Existing Noise Levels at the Noise Receptor Locations

The existing noise levels at each of the receptor locations are shown below in **Table 15-6**. As noted above, area traffic is the dominant source of noise at the receptor locations. The existing noise levels reflect the low level of vehicular activity on the roadways in the vicinity of the Project Area – with exception to Kent Avenue which experiences comparatively higher levels of vehicular activity. As shown in **Table 15-6**, noise levels are generally highest during the weekday midday and PM peak periods. The highest L_{10} noise value, measuring 71.8 dBA occurs in the weekday PM peak period at Receptor Location 5. In terms of *CEQR Technical Manual* criteria, existing noise levels at Receptor Locations 1, 3, and 4 are each in the "Acceptable" CEQR Noise Exposure category, existing noise levels at Receptor Location 2 are in the "Marginally Acceptable" CEQR Noise Exposure category, and existing noise levels at Receptor Location 5 are in the "Marginally Unacceptable (I)" CEQR Noise Exposure category.

TABLE 15-6
Existing Noise Levels (in dBA) at the Monitoring Locations

Receptor Location	Time	L_{max}	L_{min}	L_{eq}	L_1	L_{10}[2]	L_{50}	L_{90}	CEQR Noise Exposure Category
1	AM	76.0	51.6	59.8	71.3	**61.6**	55.5	53.3	Acceptable
	MD	79.3	48.8	58.0	69.1	58.4	53.0	50.2	
	PM	69.5	54.1	58.0	65.0	59.7	56.8	55.6	
2	AM	77.5	51.6	56.6	64.5	56.9	54.9	53.2	Marginally Acceptable
	MD	77.4	53.8	62.9	72.9	**66.1**	59.5	56.2	
	PM	71.4	54.6	58.4	65.9	60.5	57.0	55.7	
3	AM	71.7	54.5	59.9	66.7	62.1	58.5	56.5	Acceptable
	MD	67.6	57.8	61.4	65.3	**63.1**	61.0	59.4	
	PM	66.3	56.6	60.3	64.4	62.4	59.6	58.1	
4	AM	76.1	57.5	62.8	72.8	64.0	61.3	59.2	Acceptable
	MD	68.5	54.9	60.5	66.0	62.9	59.5	57.3	
	PM	83.2	59.2	63.9	72.6	**64.0**	62.1	60.6	
5	AM	NA	NA	68.5	78.0	71.6	65.2	62.0	Marginally Unacceptable (I)
	MD	NA	NA	69.9	83.1	71.1	63.8	59.5	
	PM	NA	NA	70.0	81.0	**71.8**	64.8	59.4	

Notes: Field measurements at Receptor Locations 1 through 4 were performed by Philip Habib & Associates on Tuesday, November 17, 2020. Field measurements at Receptor Location 5 were performed by AKRF, Inc. on Thursday, September 13, 2018 and Wednesday, October 3, 2018.
[1] Refer to **Figure 15-1** for noise monitoring receptor location.
[2] The highest L_{10} noise levels at each monitoring location are shown in **bold**.

F. FUTURE WITHOUT THE PROPOSED ACTION (NO-ACTION)

As described in Chapter 1, Project Description, the Development Site would be developed on an as-of-right basis pursuant to the existing M3-1 zoning district under the No-Action Scenario. There would be no mapping action to de-map a segment of Metropolitan Avenue or a portion of North 1st Street, and they would remain as mapped City streets that would be opened to traffic and would have public sidewalks. In the No-Action scenario, the Applicant would construct two buildings, with a combined total floor area of approximately 621,500 gsf, including approximately 54,000 gsf of office uses, 83,100 gsf of retail uses (60,500 gsf of destination retail and 23,000 gsf of local retail), approximately 68,000 gsf of light manufacturing maker space, an approximately 102,100 gsf last-mile distribution facility (Use Group 16D), and 94,750 gsf of warehouse uses, as well as approximately 579 accessory parking spaces (202,550 gsf) and 16,500 sf of mechanical space. For the non-Applicant-owned Projected Development Site, it is assumed that the site would be redeveloped with an approximately two-story (approximately 30-foot tall), 13,482 gsf mixed-use building comprised of approximately 6,741 gsf of commercial (local retail) space and 6,741 gsf of light industrial (warehouse) space. Twenty accessory parking spaces would be provided in accordance with zoning requirements,

Using the noise prediction methodology and TNM previously described in Section D above, future noise levels in the No-Action condition were calculated for the three analysis periods for the 2027 Analysis Year. **Table 15-7** shows the measured existing noise levels and the projected No-Action noise levels at each of the receptor locations.

Comparing future No-Action noise levels with existing noise levels, the increases in L_{eq} noise level would range from approximately 0.21 to 4.44 dBA at each of the receptor locations. As described in Table 15-2,

increases between 3.0 dBA and 5.0 dBA would be perceptible. As such, the increases in L_{eq} in noise levels between existing and No-Action conditions at Receptor Location 1 during the weekday AM (3.18 dBA), midday (3.9 dBA) and PM (4.44 dBA) peak periods would be readily noticeable. For all other noise levels at the receptor locations, changes in L_{eq} noise level less than 3.0 dBA are not considered significant and would not be perceptible. No-Action noise levels at Receptor Locations 1, 3, and 4 would each remain in the "Acceptable" CEQR Noise Exposure category, and No-Action noise levels at Receptor Location 2 would remain in the "Marginally Acceptable" CEQR Noise Exposure category, as under existing conditions; however, No-Action noise levels at Receptor Location 5 would now fall in the "Marginally Unacceptable (II)" CEQR Noise Exposure category.

TABLE 15-7
2027 No-Action Noise Levels at Receptor Locations (in dBA)

Noise Receptor Location[1]	Time	Existing L_{eq}	No-Action L_{eq}	Change[2]	No-Action L_{10}[3]	CEQR Noise Exposure Category
1	AM	59.8	62.9	3.18	**64.8**	Acceptable
	MD	58.0	62.0	3.92	62.3	
	PM	58.0	62.4	4.44	64.1	
2	AM	56.6	57.8	1.23	58.1	Marginally Acceptable
	MD	62.9	63.2	0.29	**66.4**	
	PM	58.4	59.3	0.86	61.4	
3	AM	59.9	60.3	0.42	62.5	Acceptable
	MD	61.4	61.7	0.31	**63.4**	
	PM	60.3	60.7	0.41	62.8	
4	AM	62.8	63.0	0.27	**64.2**	Acceptable
	MD	60.5	61.0	0.47	63.4	
	PM	63.9	64.1	0.21	64.2	
5	AM	68.5	70.7	2.24	**73.8**	Marginally Unacceptable (II)
	MD	69.9	71.8	1.94	73.0	
	PM	70.0	71.7	1.67	73.5	

Notes: Future No-Action noise levels at Receptor Locations 1 through 5 were calculated using TNM.
[1] Refer to **Figure 15-1** for noise monitoring receptor locations.
[2] No-Action Leq - Existing Leq
[3] The highest L_{10} noise levels at each monitoring location are shown in **bold**.

G. FUTURE WITH THE PROPOSED ACTION (WITH-ACTION)

As described in **Chapter 1, "Project Description,"** under the With-Action scenario, the Proposed Development Site would be redeveloped with a total of 1,336,000 gsf, including 1,120,000 gsf of residential floor area (including approximately 70,000 gsf of amenity space), 83,000 gsf of commercial floor area (including office and retail), 50,000 gsf of community facility floor area (community center), and 83,000 gsf of below-grade parking (up to 250 accessory attended parking spaces). The Proposed Development would be comprised of two towers: the North Tower would comprise 49 stories and rise to a height of approximately 560 feet, and the South Tower would comprise 64 stories and rise to a height of approximately 710 feet. In addition, approximately 126,308 gsf (2.9 acres) of new waterfront public space (plus 2.32 acres of secondary contact accessible in-river space and 0.86 acres of intertidal area) would be created on the Proposed Development Site under the With-Action scenario. The Applicant is also proposing to demap approximately 23,000 sf of Metropolitan Avenue and approximately 6,000 sf of North 1st Street between River Street and the US Bulkhead line.

In addition, the Proposed Actions would also facilitate the redevelopment of a non-Applicant-owned site (the "Projected Development Site") at 230 Kent Avenue (Block 2362; Lot 1). Based on the RWCDS, it is assumed that the Projected Development Site would be comprised of a three-story (approximately 45-foot high) mixed-use building with approximately 6,741 gsf of local retail space, 6,741 gsf of light industrial (warehouse) space, and 6,741 gsf of community facility space, representing a net increment of 6,741 sf of community facility space compared to No-Action conditions.

TABLE 15-8
2027 With-Action Noise Levels at Receptor Locations (in dBA)

Receptor Location[1]	Time	No-Action L_{eq}	With-Action L_{eq}	Change[2]	With-Action L_{10}[3]	CEQR Noise Exposure Category
1	AM	62.9	62.5	-0.44	**64.4**	Acceptable
	MD	62.0	61.1	-0.83	61.5	
	PM	62.4	61.7	-0.73	63.4	
2	AM	57.8	57.7	-0.07	58.1	Marginally Acceptable
	MD	63.2	63.1	-0.03	**66.3**	
	PM	59.3	59.2	-0.09	61.3	
3	AM	60.3	60.2	-0.07	62.4	Acceptable
	MD	61.7	61.6	-0.06	**63.3**	
	PM	60.7	60.6	-0.07	62.7	
4	AM	63.0	63.0	-0.01	**64.2**	Acceptable
	MD	61.0	60.9	-0.05	63.3	
	PM	64.1	64.1	0.00	64.2	
5	AM	70.7	70.8	0.04	**73.9**	Marginally Unacceptable (II)
	MD	71.8	71.9	0.07	73.1	
	PM	71.7	71.8	0.17	73.6	

Notes: Future With-Action noise levels at Receptor Locations 1 through 5 were calculated using TNM.
[1] Refer to **Figure 15-1** for noise monitoring receptor locations.
[2] With-Action Leq – No-Action Leq
[3] The highest L_{10} noise levels at each monitoring location are shown in **bold**.

Using the methodology described in Section D, future noise levels in the With-Action condition were calculated for the three analysis periods for the 2027 Analysis Year. As shown in **Table 15-8** above, after accounting for the changes to the traffic network in the vicinity of the Project Area as a result of the Proposed Actions, the maximum projected L_{10} noise level under the With-Action condition would be 73.9 dBA during the weekday AM peak hour at Receptor Location 5. With-Action noise levels at Receptor Location 5 would remain in the "Marginally Unacceptable (II)" CEQR Noise Exposure category, as under No-Action conditions. With-Action noise levels at Receptor Location 2 would remain in the "Marginally Acceptable" CEQR Noise Exposure category and With-Action noise levels at Receptor Locations 1, 3, and 4 would each remain in the "Acceptable" CEQR Noise Exposure category, as under Existing and No-Action conditions.

Comparing the future With-Action noise levels with No-Action noise levels, increases in noise levels at Receptor Locations 5 would be minimal, ranging from 0.00 to 0.17 dBA, whereas Receptor Locations 1, 2, 3, and 4 would experience decreases in noise levels ranging from -0.01 to -0.83 dBA. Increases of these magnitudes would not be perceptible as they are less than 3.0 dBA, and based upon CEQR impact criteria would not be significant. As the noise levels at all receptor locations would experience changes of less than 3.0 dBA in all peak hours, the overall changes to noise levels as a result of the Proposed Actions would not result in any significant adverse impacts.

H. ATTENUATION REQUIREMENTS

As shown earlier in Table 15-4, the *CEQR Technical Manual* has set noise attenuation requirements for buildings based on L_{10} noise levels. Recommended composite window/wall attenuation values for buildings are designed to maintain interior noise levels of 45 dBA or lower for residential and community facility uses and 50 dBA or lower for commercial office uses, and are determined based on L_{10} noise levels.

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. Typically, a building façade is composed of the wall, windows, and any vents or louvers for HVAC systems in various ratios of area. Since the Proposed Project would most likely be of masonry construction, which typically provides a high level of sound attenuation, the attenuation requirements for HUD or CEQR purposes apply primarily to the windows, but may also represent a composite window/wall attenuation value. Window/wall attenuation can be described in terms of sound transmission class (STC), transmission loss (TL), and outdoor-indoor transmission class (OITC). Although these terms are sometimes used interchangeably, they are unique from each other. Transmission loss refers to how many decibels of sound a façade (wall) or façade accessory (window or door) can stop at a given frequency. The TL for a given construction material varies with the individual frequencies of the noise.

To simplify the noise attenuation properties of a wall, the STC rating was developed. It is a single number that describes the sound isolation performance of a given material for the range of test frequencies between 125 and 4,000 Hz. These frequencies sufficiently cover the range of human speech. Higher STC values reflect greater efficiencies to block airborne sound. HUD uses the STC when identifying the required sound attenuation for a façade.

The OITC is similar to the STC, except that it is weighted more towards the lower frequencies associated with aircraft, rail, and truck traffic. 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. NYCDEP uses the OITC when identifying the required sound attenuation for a façade.

All facades that would experience an L_{10} of 70.0 dBA or greater must provide an alternate means of ventilation (AMV) permitting a closed window condition during warm weather. This can be achieved by installing double-glazed windows on a heavy frame for masonry structures or windows consisting of laminated glass, along with AMV such as central air conditioning, through-wall sleeve-fitted air conditioners, packaged terminal air conditioning (PTAC) units, trickle vents integrated into window frames, or other approved means. 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 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.

Based on existing exterior noise levels and *CEQR Technical Manual* criteria, existing noise levels at the four noise receptor locations would remain below the 70 dBA CEQR threshold, and no special noise attenuation measures beyond standard construction practices would be required for residential or community facility uses on any of the Proposed Development's frontages in order to achieve interior noise levels of 45 dBA or lower for residential and community facility uses. As such, the Proposed Development would provide sufficient attenuation to achieve the *CEQR Technical Manual* interior noise level guidelines, and thus, the

Proposed Actions would not result in any significant adverse noise impacts related to building attenuation requirements.

Noise Attenuation Measures

As maximum With-Action noise levels at Receptor Location 5 would be 73.9 dBA, special attenuation measures beyond standard construction practices would be required for the Projected Development Site's future residential/community facility, and/or commercial office uses on the eastern (Kent Avenue), southern (North 1st Street), and northern (facing Metropolitan Avenue) frontages of the Development Site in order to achieve the required interior noise level of 45 dBA or lower for residential/community facility uses and 50 dBA or lower for commercial office uses.

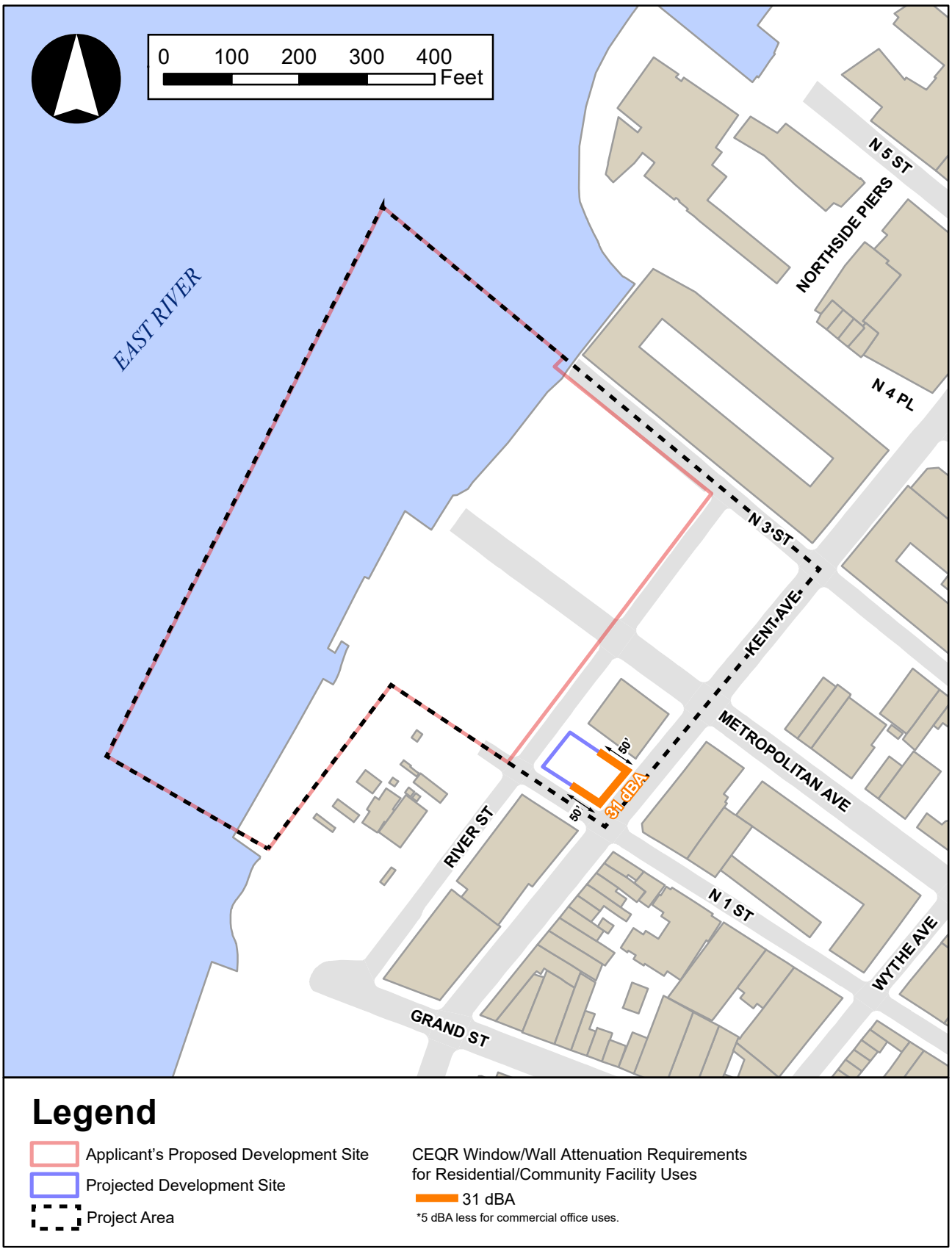
As maximum With-Action L_{10} noise levels at Receptor Locations 1 through 4 would be less than 70 dBA, no special noise attenuation measures beyond standard construction practices would be required for any of the Proposed Development Site's northern (North 3rd Street), southern (facing North 1st Street/Grand Ferry Park), eastern (River Street), and western (East River) frontages in order to achieve the required interior noise level of 45 dBA or lower for residential/community facility uses and 50 dBA or lower for commercial office uses.

Table 15-9 shows the minimum window/wall attenuation necessary to meet *CEQR Technical Manual* requirements for internal noise levels at each of the noise measurement locations based on the predicted With-Action L_{10} noise levels discussed above. As presented in **Table 15-9** and shown in **Figure 15-3**, to satisfy CEQR interior noise level requirements and ensure acceptable interior noise levels for residential/community facility uses, a minimum composite window/wall attenuation rating of 31 dBA for all facades fronting and within 50 feet of Kent Avenue would be required.

TABLE 15-9
Required Attenuation Values for the Projected Development Site

Site	Frontage	Associated Receptor Location	Maximum With-Action L_{10}	CEQR Noise Exposure Category	Required Attenuation for Residential/Community Facility Uses (OITC)[1]
Projected Development Site (Block 2362, Lot 1)	Northern (Metropolitan Avenue; ≤50 feet from Kent Avenue)	5	73.9	Marginally Unacceptable (II)	31
	Southern (North 1st Street; ≤50 feet from Kent Avenue)				31
	Eastern (Kent Avenue)				31

Notes:
[1] The above attenuation values would be required to maintain interior noise levels of 45 dBA or lower for residential/community facility uses. Future commercial office uses would be required to provide an attenuation rating of 5 dBA less than the residential/community facility requirement to maintain interior noise levels of 50 dBA or lower for commercial office uses.


0 100 200 300 400
Feet
EAST RIVER
N 5 ST
NORTHSIDE PIERS
N 4 PL
N 3 ST
KENT AVE
METROPOLITAN AVE
RIVER ST
N 1 ST
WYTHE AVE
GRAND ST
50'
50'
31 dBA
Legend
Applicant's Proposed Development Site
Projected Development Site
Project Area
CEQR Window/Wall Attenuation Requirements
for Residential/Community Facility Uses
31 dBA
*5 dBA less for commercial office uses.

(E) Designation

An (E)-Designation for noise provides a notice of the presence of an environmental requirement pertaining to high ambient noise levels on a particular tax lot. If an environmental analysis indicates that a development on a property may be adversely affected by noise, then an (E)-Designation for window/wall attenuation and alternate means of ventilation may be placed on the property by the lead agency in order to address such issues in conjunction with any new development or new use of the property. For new developments, enlargements of existing buildings, or changes in use, the NYC Department of Buildings will not issue a building permit until the environmental requirements of the (E)-Designation are satisfied. The Office of Environmental Remediation (OER) administers the (E)-Designation Environmental Review Program.

The composite window/wall noise attenuations described above would be required through the assignment of an (E)-Designation for noise to the non-applicant-owned Projected Development Site (Block 2362, Lot 1) in conjunction with the Proposed Actions. With the implementation of this composite window/wall noise attenuation, no significant adverse noise impacts would occur as a result of the Proposed Actions. The text for the (E)-Designation (E-636) is as follows:

> **Block 2362, Lot 1 (Projected Development Site)**
>
> **To ensure an acceptable interior noise environment, future community facility uses must provide a closed-window condition with a minimum of 31 dBA window/wall attenuation on all facades facing Kent Avenue and the facades facing North 1st Street within 50 feet of Kent Avenue and the facades facing Metropolitan Avenue within 50 feet of Kent Avenue to maintain an interior noise level not greater than 45 dBA for community facility uses, as illustrated in the EIS. 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.**

With implementation of the attenuation levels outlined above and described in **Table 15-9** and illustrated in **Figure 15-3**, the Projected Development Site would provide sufficient attenuation to achieve *CEQR Technical Manual* interior noise level guidance of 45 dBA or lower for community facility uses. Therefore, the Proposed Actions and associated RWCDS would not result in any significant adverse noise impacts.

I. OTHER NOISE CONCERNS

Mechanical Equipment

No detailed designs of the building's mechanical systems (i.e., heating, ventilation, and air conditioning systems) are available at this time. However, those systems will be designed to meet all applicable noise regulations and requirements and would be designed to produce noise levels that would not result in any significant increase in ambient noise levels. In addition, the building mechanical systems would be designed with enclosures where necessary to meet all applicable noise regulations (i.e., Subchapter 5 §24-227 of the New York City Noise Control Code and the NYC DOB Building Code) and to avoid producing levels that would result in any significant increase in ambient noise levels.

Train Noise

An initial train noise impact screening analysis would be warranted if a new receptor would be located within 1,500 feet of existing rail activity and have a direct line of sight to that activity. As the Project Area is not within 1,500 of an existing rail line nor does the site have a direct line of sight to a rail activity, no initial train noise impact screening analysis is warranted.

Aircraft Noise

An initial aircraft noise impact screening analysis would be warranted if the new receptor would be located within one mile of an existing flight path, or cause aircraft to fly through existing or new flight paths over or within one mile of a receptor. As the Project Area is not within one mile of an existing flight path, no initial aircraft noise impact screening analysis is warranted.