# Chapter 17: Noise

## A. INTRODUCTION

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

The noise analysis for this action consists of two parts—a screening analysis to determine whether traffic generated by the proposed action would have the potential to result in significant noise impacts, and an analysis to determine the level of building attenuation necessary to ensure that the proposed project's and projected development site's interior noise levels satisfy applicable interior noise criteria.

Based on the screening analysis, increases in traffic volumes resulting from the proposed action would not result in noise level increases that would be significant or perceptible. In addition, with the inclusion of (E) designations for noise requiring that the specified attenuation measures are incorporated into the project design, the proposed project would not have any significant adverse noise impacts, and would comply with all CEQR requirements.

## B. NOISE FUNDAMENTALS

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

### "A"-WEIGHTED SOUND LEVEL (dBA)

Noise is typically measured in units called decibels (dB), which are 10 times the logarithm of the ratio of the sound pressure squared to a standard reference presence squared. Because loudness is important in the assessment of the effects of noise on people, the dependence of loudness on frequency must be taken into account in the noise scale used in environmental assessments. One of the simplified scales that accounts for the dependence of perceived loudness on frequency is the use of a weighting network, known as "A"-weighting, in the measurement system, to

simulate the response of the human ear. For most noise assessments, the A-weighted sound pressure level in units of dBA is used in view of its widespread recognition and its close correlation with perception. In the current study, all measured noise levels are reported in dBA or A-weighted decibels. Common noise levels in dBA are shown in Table 17-1.

**Table 17-1**
**Common Noise Levels**

| Sound Source | (dBA) |
|---|---|
| Military jet, air raid siren | 130 |
| Amplified rock music | 110 |
| Jet takeoff at 500 meters | 100 |
| Train horn at 30 meters | 90 |
| Busy city street, loud shout | 80 |
| Highway traffic at 15 meters, train | 70 |
| Predominantly industrial area | 60 |
| Background noise in an office | 50 |
| Public library | 40 |
| Soft whisper at 5 meters | 30 |
| Threshold of hearing | 0 |

**Note:** A 10 dBA increase in level appears to double the loudness, and a 10 dBA decrease halves the apparent loudness.

**Sources:**

Cowan, James P. *Handbook of Environmental Acoustics,* Van Nostrand Reinhold, New York, 1994.

Egan, M. David, *Architectural Acoustics*. McGraw-Hill Book Company, 1988.

## COMMUNITY RESPONSE TO CHANGES IN NOISE LEVELS

The average ability of an individual to perceive changes in noise levels is well documented (see Table 17-2). Generally, changes in noise levels less than 3 dBA are barely perceptible to most listeners, whereas 10 dBA changes are normally perceived as doublings (or halvings) of noise loudness. These guidelines permit direct estimation of an individual's probable perception of changes in noise levels.

**Table 17-2**
**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.

It is also possible to characterize the effects of noise on people by studying the aggregate response of people in communities. The rating method used for this purpose is based on a

statistical analysis of the fluctuations in noise levels in a community, and integrating the fluctuating sound energy over a known period of time, most typically during 1 hour or 24 hours.

Various government and research institutions have proposed criteria that attempt to relate changes in noise levels to community response. One commonly applied criterion for estimating response is incorporated into the community response scale proposed by the International Standards Organization (ISO) of the United Nations (see Table 17-3). This scale relates changes in noise level to the degree of community response and permits direct estimation of the probable response of a community to a predicted change in noise level.

**Table 17-3**
**Community Response to Increases in Noise Levels**

| Change (dBA) | Category | Description |
|---|---|---|
| 0 | None | No observed reaction |
| 5 | Little | Sporadic complaints |
| 10 | Medium | Widespread complaints |
| 15 | Strong | Threats of community action |
| 20 | Very strong | Vigorous community action |

**Source:** International Standards Organization, *Noise Assessment with Respect to Community Responses*, ISO/TC 43. (New York: United Nations, November 1969).

*NOISE DESCRIPTORS USED IN IMPACT ASSESSMENT*

Because the sound pressure level unit of dBA describes a noise level at just one moment and very few noises are constant, other ways of describing noise over more extended periods have been developed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific period as if it had been a steady, unchanging sound. For this condition, a descriptor called the "equivalent sound level," $L_{eq}$, can be computed. $L_{eq}$ is the constant sound level that, in a given situation and period (e.g., 1 hour, denoted by $L_{eq(1)}$, or 24 hours, denoted 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 $L_{01}$ 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 relationship between $L_{eq}$ and exceedance levels has been used in this analysis to characterize the noise sources and to determine the nature and extent of their impact at all receptor locations.

For purposes of the proposed action, the maximum 1-hour equivalent sound level ($L_{eq(1)}$) has been selected as the noise descriptor to be used in the noise impact evaluation. $L_{eq(1)}$ is the noise descriptor recommended for use in the *City Environmental Quality Review (CEQR) Technical*

*Manual* (October 2001) for vehicular traffic noise impact evaluation, and is used to provide an indication of highest expected sound levels. $L_{10(1)}$ is the noise descriptor used in the CEQR noise exposure guidelines for City environmental impact review classification.

## C. NOISE STANDARDS AND CRITERIA

Noise levels associated with the construction and operation of the proposed action are subject to the emission source provisions of the New York City Noise Control Code and to Noise Standards set for the CEQR process. Other standards and guidelines promulgated by Federal agencies do not apply to project noise control, but are useful to review in that they establish measures of impacts. Construction equipment is regulated by the Noise Control Act of 1972.

### NEW YORK CITY NOISE CODE

The New York City (NYC) Noise Control Code promulgates sound-level standards for motor vehicles, air compressors, and paving breakers; requires that all exhausts be muffled; prohibits all unnecessary noise adjacent to schools, hospitals, or courts; and limits construction activities to weekdays between 7 AM and 6 PM. The NYC Noise Control Code contains ambient noise quality criteria and standards based on existing land use zoning designations.

Conformance with the noise level values contained in the law is determined by considering noise emitted directly from stationary activities within the boundaries of a project. Construction activities and noise sources outside the boundaries of a project are not included within the provisions of this Code. Table 17-4 summarizes the ambient noise quality criteria contained in the NYC Noise Control Code.

**Table 17-4**
**City of New York Ambient Noise Quality Zone Criteria (dBA)**

| Ambient Noise Quality Zone (ANQZ) | Daytime Standards* (7AM–10PM) | Nighttime Standards* (10PM–7AM) |
|---|---|---|
| Low-Density Residential (R1 to R3) Land Uses (N1) | 60 | 50 |
| High-Density Residential (R4 to R10) Land Uses (N2) | 65 | 55 |
| Commercial (C1 to C8) and Manufacturing (M1 to M3) Land Uses (N3) | 70 | 70 |

**Note:** * $L_{eq(1\ hour)}$.
**Source:** City of New York Local Law No. 64.

### NEW YORK CEQR NOISE STANDARDS

The *CEQR Technical Manual* contains noise exposure guidelines for use in city environmental impact review, as well as required attenuation values to achieve acceptable interior noise levels. These values are shown in Tables 17-5 and 17-6. Noise exposure is classified into four categories—acceptable, marginally acceptable, marginally unacceptable, and clearly unacceptable. The standards are based on maintaining an interior noise level for the worst-case hour $L_{10}$ of less than or equal to 45 A-weighted decibels (dBA).

## Table 17-5
## 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 ---------- | | ---------- 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 | |

**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).

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

## Table 17-6
## Required Attenuation Values to Achieve Acceptable Interior Noise Levels

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

**Note:** The above composite window-wall attenuation values are for residential dwellings. Commercial office spaces and meeting rooms would be 5 dB(A) less in each category. All the above categories require a closed window situation and hence an alternate means of ventilation.

**Source:** New York City Department of Environmental Protection

## D. IMPACT DEFINITION

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

- An increase of 5 dBA, or more, in Build $L_{eq(1)}$ noise levels at sensitive receptors to those calculated for the No Build condition, if the No Build levels are less than 60 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 4 dBA, or more, in Build $L_{eq(1)}$ noise levels at sensitive receptors to those calculated for the No Build condition, if the No Build levels are 61 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 3 dBA, or more, in Build $L_{eq(1)}$ noise levels at sensitive receptors to those calculated for the No Build condition, if the No Build levels are greater than 62 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period.
- An increase of 3 dBA, or more, in Build $L_{eq(1)}$ noise levels at sensitive receptors to those calculated for the No Build condition, if the analysis period is a nighttime period (defined by the CEQR standards as being between 10 PM and 7 AM).

## E. NOISE SCREENING METHODOLOGY AND RESULTS

For the proposed action, the future noise level would consist of the combined effect of future traffic (both action- and non-action-generated) and ambient noise levels. Proportional modeling techniques were used to identify whether there are any roadways with traffic volume increases generated by the proposed action that could potentially result in a significant noise impact.

Using this technique, typically, future traffic noise levels are estimated using the changes in traffic volumes to predict changes between No Build and Build levels. Vehicular traffic volumes can be converted into Passenger Car Equivalent (PCE) values, for which one medium-duty truck (having a gross weight between 9,900 and 26,400 pounds) is assumed to generate the noise equivalent of 13 cars, one bus (carrying more than nine passengers) is assumed to generate the noise equivalent of 18 cars, and one heavy-duty truck (having a gross weight of more than 26,400 pounds) is assumed to generate the noise equivalent of 47 cars. The change in future noise levels are calculated using the following equation:

$$F\ NL = E\ NL + 10 * \log_{10} (FPCE / EPCE)$$

where:

F NL = Future noise level

E NL = Existing noise level

F PCE = Future PCEs

E PCE = Existing PCEs

Because sound levels use a logarithmic scale, this model proportions logarithmically with traffic change ratios. For example, assume that traffic is the dominant noise source at a particular location. If the existing traffic volume on a street is 100 PCE and if the future traffic volume were increased by 50 PCE to a total of 150 PCE, the noise level would increase by 1.8 dBA. If the future traffic were increased by 100 PCE, or doubled to a total of 200 PCE, the noise level would increase by 3.0 dBA.

This screening procedure was used to identify whether there were any locations in the vicinity of the proposed action where action-generated PCE values result in an increase of 3 dBA or more in vehicle-related noise levels from No Build to Build conditions, and consequently where there is the potential for significant noise impacts. The screening analysis used the information regarding existing and action-generated traffic. Existing and No Build traffic volumes near the project area are relatively high, and in general, action-generated traffic volumes are relatively low. There are no locations where action-generated traffic would result in a doubling of PCEs. Consequently, there are no locations where there would be the potential for significant increases in noise level due to the proposed action, and therefore a detailed noise analysis is not necessary. However, for purposes of determining appropriate building attenuation values, future noise levels resulting from traffic increases have been projected at the noise receptor sites. The result of that analysis is included in the section below.

## F. BUILDING ATTENUATION FOR THE PROPOSED PROJECT

### SITE DESCRIPTION

The project site is located at a mid-block site between West 60th and 61st Streets and Amsterdam and West End Avenue. The western portion of the project site is zoned M1-6, which is within an N3 Ambient Noise Quality Zone (ANQZ), and the eastern portion is zoned R8, which is within N2 Ambient Noise Quality Zone (ANQZ). $L_{eq(1)}$ noise level limits for an N3 zone are 70 dBA for both daytime (7 AM to 10 PM) and nighttime (10 PM to 7 AM) hours, and $L_{eq(1)}$ noise level limits for an N2 zone are 65 dBA for daytime (7 AM to 10 PM) and 55 dBA for nighttime (10 PM to 7 AM) hours. Traffic is the dominant noise source.

### SELECTION OF NOISE RECEPTOR LOCATIONS

Two noise receptor locations immediately adjacent to the project site were selected for building attenuation purposes. Site 1 was located on 60th Street between Amsterdam and West End Avenues, and Site 2 was located on 61st Street between Amsterdam and West End Avenues. A third receptor site, on West End Avenue, was also selected to assist in determining appropriate building attenuation for the reasonable worst-case development scenario on that avenue (see Figure 17-1). Site 3, located on West End Avenue between 59th and 60th Streets was monitored for another project that was being developed in the area (Two West End Avenue Rezoning – CEQR #03DCP037M), and is representative of noise levels on West End Avenue for the rezoning project considered in this EIS.

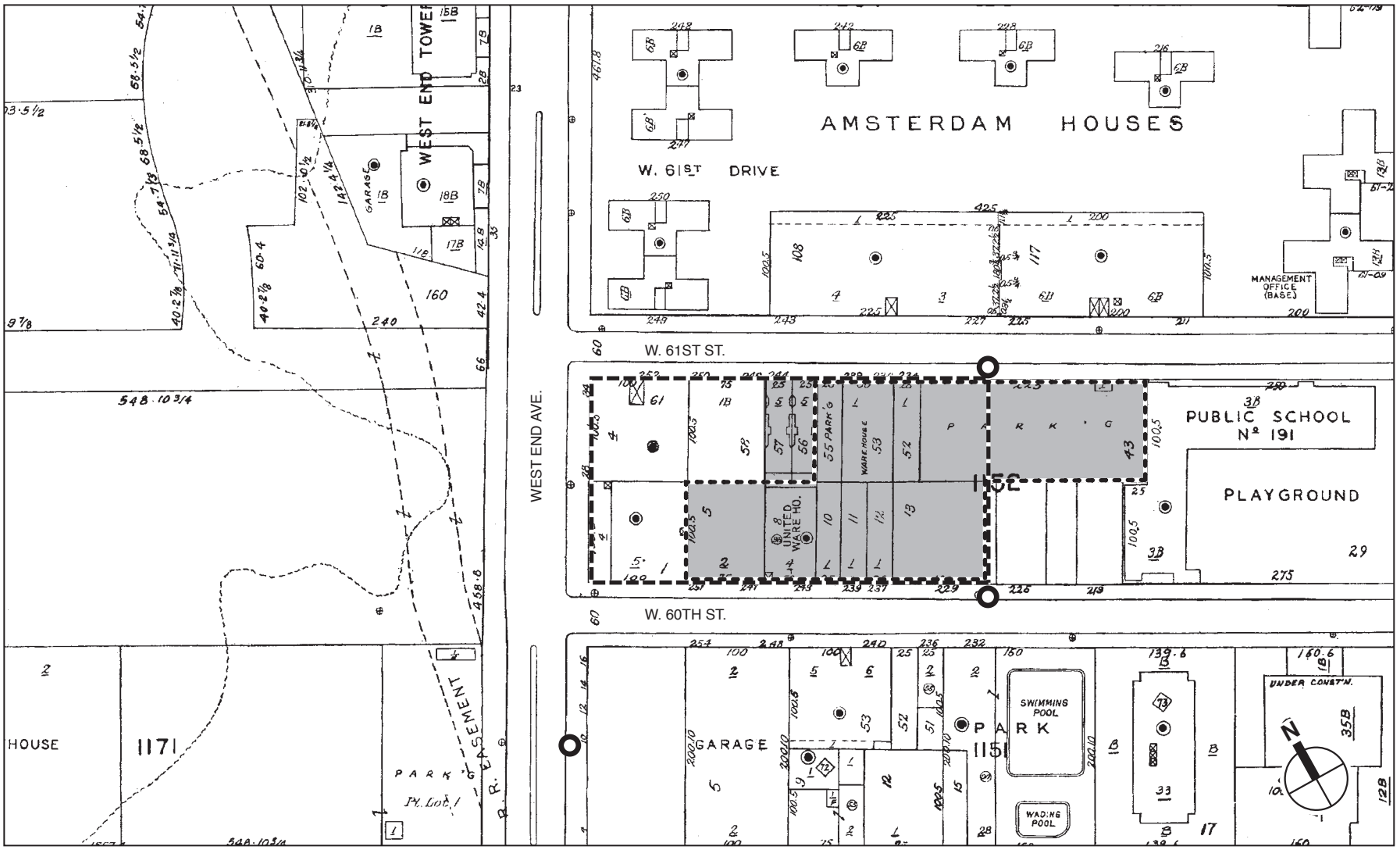
### NOISE MONITORING

Noise monitoring at the three receptor locations was performed on December 4, 2002. Twenty-minute measurements were made during three weekday time periods—the AM (8 to 9 AM), midday (Noon to 1 PM), and PM (5 to 6 PM) peak time periods. Weather conditions were noted to ensure a true reading as followed: wind speed under 12 mph; relative humidity under 90 percent; and temperature above $14^{o}$F and below $122^{o}$F.

### EQUIPMENT USED DURING NOISE MONITORING

The instrumentation used for the noise measurements was a Brüel & Kjær Noise Level Analyzer Type 4427, a Brüel & Kjær Sound Level Calibrator Type 4231, a Brüel & Kjær ½-inch microphone Type 4189, and a Brüel & Kjær microphone preamplifier Type 2669. The Analyzer

8.1.06




Proposed Rezoning Area Boundary

Project Site Boundary

Zoning Lot/Proposed General Large-Scale Development

Noise Monitoring Location

**West 61st Street Rezoning**
Project and Citywide GLSD Text Amendment

## Noise Monitoring Locations

Figure 17-1

was calibrated before and after readings with a Brüel & Kjær Type 4231 sound-level calibrator using the appropriate adaptor. Measurements at the location were made on the A-scale (dBA). The data were digitally recorded by the Analyzer and displayed at the end of the measurement period (i.e., 20 minutes) 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 was measured; noise from other sources (e.g., aircraft flyovers, etc.) was excluded from the measured noise levels. This procedure was used in all noise monitoring, and acoustical data were obtained under acceptable weather and street surface conditions. All measurement procedures conformed to the requirements of ANSI Standard S1.13-1971 (R1976).

## RESULTS OF BASELINE MEASUREMENTS

Existing measured noise levels at the two receptor sites are shown in Table 17-7. In terms of the New York City CEQR guideline level, existing noise levels at Site 1 are in the "marginally acceptable" category, and existing noise levels at Sites 2 and 3 are in the "marginally unacceptable" category.

**Table 17-7**
**Existing Noise Levels (dBA)**

| Site | Location | Time | $L_{eq}$ | $L_1$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
|---|---|---|---|---|---|---|---|
| 1 | 60th Street between Amsterdam and West End Avenues | AM | 67.5 | 81.5 | 68.5 | 60.5 | 57.0 |
| | | MD | 66.8 | 77.7 | 69.3 | 61.9 | 58.9 |
| | | PM | 66.8 | 77.5 | 67.9 | 61.3 | 58.7 |
| 2 | 61st Street between Amsterdam and West End Avenues | AM | 67.9 | 76.5 | 70.0 | 65.5 | 61.5 |
| | | MD | 67.9 | 78.5 | 66.9 | 61.9 | 59.7 |
| | | PM | 68.9 | 78.5 | 70.3 | 62.7 | 59.3 |
| 3 | West End Avenue between 59th and 60th Streets | AM | 75.8 | 85.0 | 77.0 | 71.5 | 67.5 |
| | | MD | 73.2 | 81.9 | 76.3 | 71.3 | 66.5 |
| | | PM | 75.4 | 83.1 | 77.9 | 73.9 | 69.1 |

**Note:** Field measurements were performed by AKRF, Inc., on December 4, 2002.

## FUTURE NOISE LEVELS

Table 17-8 shows the future noise levels without and with the proposed action at the receptor locations resulting from traffic increases, using the methodology previously described, in section E, above. Compared to the No Build noise levels, the Build noise levels at all sites would increase by less than 1 dBA (see Appendix C, "Noise"). Changes of this magnitude would be imperceptible and insignificant.

**Table 17-8**
**Future Noise Levels (dBA)**

| Site | Location | Time | Existing | No Build | Build | |
|---|---|---|---|---|---|---|
| | | | $L_{eq}$ | $L_{eq}$ | $L_{eq}$ | $L_{10}$ |
| 1 | 60th Street between Amsterdam and West End Avenues | AM | 67.5 | 69.2 | 69.7 | 70.7 |
| | | MD | 66.8 | 67.9 | 68.5 | 71.0 |
| | | PM | 66.8 | 68.2 | 68.4 | 69.5 |
| 2 | 61st Street between Amsterdam and West End Avenues | AM | 67.9 | 68.7 | 69.3 | 71.4 |
| | | MD | 67.9 | 68.6 | 69.2 | 68.2 |
| | | PM | 68.9 | 69.7 | 70.2 | 71.6 |
| 3 | West End Avenue between 59th and 60th Streets | AM | 75.8 | 77.2 | 77.3 | 78.5 |
| | | MD | 73.2 | 74.1 | 74.1 | 77.2 |
| | | PM | 75.4 | 77.5 | 77.5 | 80.0 |

## ATTENUATION REQUIREMENTS

As shown in Table 17-6, the *CEQR Technical Manual* has set noise attenuation quantities for buildings, based on exterior noise levels. Recommended noise attenuation values for buildings are designed to maintain interior noise levels of 45 dBA or lower, and are determined based on exterior $L_{10(1)}$ noise levels.

*PROJECT SITE*

Based on the Build $L_{10(1)}$ noise levels shown in Table 17-8, a building at the project site would require 30 dBA of attenuation on both the West 60th Street and the West 61st Street sides of the building to satisfy CEQR attenuation requirements (achieve an interior noise level of 45 dBA, or less in residential units). Therefore, as part of the proposed action, an (E) designation for noise would be placed on the project site (Block 1152, Lots 5, 8, 10-13, 43, 52, 53, and 55) to ensure that this interior noise level is achieved. The text of the (E) designation is as follows:

> **In order to ensure an acceptable interior noise environment, any future residential, community facility, and/or commercial uses on Lots 5, 8, 10-13, 43, 52, 53, and 55 of Block 1152 (the "project site"), must be designed to provide a closed window condition with a minimum of 30 dBA window/wall attenuation on all facades in order to maintain an interior noise level of 45 dBA. In order to maintain a closed-window attenuation, an alternate means of ventilation must also be provided. Alternate means of ventilation include, but are not limited to, central air conditioning or air conditioning sleeves containing air conditioners or fans approved by the United States' Department of Housing and Urban Development (HUD).**

With these design measures, the window/wall attenuation would be more than 30 dBA for all façades of the building. Based on the Build $L_{10(1)}$ values, these design measures would provide sufficient attenuation to satisfy CEQR requirements. With the specified attenuation measures, the proposed project would not have any significant adverse noise impacts, and would comply with all CEQR requirements.

*PROJECTED DEVELOPMENT SITES*

Based on the Build $L_{10(1)}$ noise levels shown in Table 17-8, any proposed residential or community facility development on Lot 58 would be required to provide a closed window condition with a minimum window/wall attenuation of 30 dBA, and residential or school development on Lot 61 would be required to provide a closed window condition with a minimum window/wall attenuation of 35 dBA, to satisfy CEQR attenuation requirements (achieve an interior noise level of 45 dBA, or less in residential units). Therefore, as part of the proposed action, (E) Designations for noise would be placed on Lots 58 and 61 (the projected development sites) to ensure that the building design for any subsequent redevelopment of these sites incorporates adequate measures to ensure that CEQR requirements for building attenuation are met.

The text of the (E) designation for the projected development located on Block 1152, Lot 58, is as follows:

> **In order to ensure an acceptable interior noise environment, any future residential, community facility, and/or commercial uses on Lot 58 of Block 1152, must be designed to provide a closed window condition with a minimum of 30 dBA window/wall attenuation on all facades in order to maintain an interior noise level of 45 dBA. In order to maintain a closed-window attenuation, an alternate means of ventilation must also be provided. Alternate means of ventilation include, but are not limited to, central air conditioning or air conditioning sleeves containing air conditioners or fans approved by the United States' Department of Housing and Urban Development (HUD).**

With these design measures, the window/wall attenuation at the projected development site on Lot 58, would be more than 30 dBA for all façades of the building. Based on the Build $L_{10(1)}$ values, these design measures would provide sufficient attenuation to satisfy CEQR requirements.

The text of the (E) designation for the projected development located on Block 1152, Lot 61, is as follows:

> **In order to ensure an acceptable interior noise environment, any future residential, community facility, and/or commercial uses on Lot 61 of Block 1152, must be designed to provide a closed window condition with a minimum of 35 dBA window/wall attenuation on all facades in order to maintain an interior noise level of 45 dBA. In order to maintain a closed-window attenuation, an alternate means of ventilation must also be provided. Alternate means of ventilation include, but are not limited to, central air conditioning or air conditioning sleeves containing air conditioners or fans approved by the United States' Department of Housing and Urban Development (HUD).**

With these design measures, the window/wall attenuation at the projected development site on Lot 61, would be more than 35 dBA for all façades of the building. Based on the Build $L_{10(1)}$ values, these design measures would provide sufficient attenuation to satisfy CEQR requirements.

*Projected Enlargement Sites*

Based on the Build $L_{10(1)}$ noise levels shown in Table 17-8, any proposed enlargement of the residential buildings on Lots 56 or 57 would be required to provide a closed window condition

with a minimum window/wall attenuation of 30 dBA, to satisfy CEQR attenuation requirements (achieve an interior noise level of 45 dBA, or less in residential units). Therefore, as part of the proposed action, (E) Designations for noise would be placed on Lots 56 and 57 (the projected enlargement sites) to ensure that the building design for any subsequent development that would enlarge these sites (the anticipated addition of a penthouse floor to each building) incorporates adequate measures to ensure that CEQR requirements for building attenuation for the enlarged portions of these buildings are met.

The text of the (E) designation for the projected enlargement of the building located on Block 1152, Lot 56, is as follows:

> **In order to ensure an acceptable interior noise environment, any future enlargements of residential uses on Lot 56 of Block 1152, must be designed to provide a closed window condition with a minimum of 30 dBA window/wall attenuation on all facades in order to maintain an interior noise level of 45 dBA. In order to maintain a closed-window attenuation, an alternate means of ventilation must also be provided. Alternate means of ventilation include, but are not limited to, central air conditioning or air conditioning sleeves containing air conditioners or fans approved by the United States' Department of Housing and Urban Development (HUD).**

With these design measures, the window/wall attenuation at the projected enlargement site on Lot 56, would be more than 30 dBA for all façades of the building. Based on the Build $L_{10(1)}$ values, these design measures would provide sufficient attenuation to satisfy CEQR requirements.

The text of the (E) designation for the projected enlargement of the building located on Block 1152, Lot 57, is as follows:

> **In order to ensure an acceptable interior noise environment, any future enlargements of residential uses on Lot 57 of Block 1152, must be designed to provide a closed window condition with a minimum of 30 dBA window/wall attenuation on all facades in order to maintain an interior noise level of 45 dBA. In order to maintain a closed-window attenuation, an alternate means of ventilation must also be provided. Alternate means of ventilation include, but are not limited to, central air conditioning or air conditioning sleeves containing air conditioners or fans approved by the United States' Department of Housing and Urban Development (HUD).**

With these design measures, the window/wall attenuation at the projected enlargement site on Lot 57, would be more than 30 dBA for all façades of the building. Based on the Build $L_{10(1)}$ values, these design measures would provide sufficient attenuation to satisfy CEQR requirements.

*CONCLUSIONS*

The (E) designations for noise on the project site and projected development and enlargement sites would comply with all CEQR requirements, and would preclude the potential for the proposed action to result in significant adverse noise impacts.

## G. MECHANICAL SYSTEMS

Design and specifications for the mechanical equipment and systems (i.e., heating, ventilation, and air conditioning [HVAC] systems, and elevator motors) for the proposed project are

currently underway, but are not yet finalized. However, this equipment would be designed to incorporate sufficient noise reduction devices to comply with applicable noise regulations and standards, and to ensure that this equipment does not result in any significant increases in noise levels by itself or cumulatively with other project noise sources. Similarly, the associated mechanical systems for the projected development sites have not been designed; however, the equipment for these sites would also be designed to incorporate sufficient noise reduction devices to comply with applicable noise regulations and standards, and to ensure that this equipment does not result in any significant increases in noise levels by itself or cumulatively with other project noise sources.

The applicable Ambient Noise Quality Zone (ANQZ) standards for the proposed action (from noise emitted directly from stationary activities within the boundaries of the project) are for High-Density Residential (R4 to R10) Land Uses (as indicated in Table 17-4, above). The daytime (7 AM – 10 PM) standards are 65 dBA, and the nighttime (10 PM – 7 AM) standards are 55 dBA. Therefore, since these HVAC systems for the proposed action would all be designed to avoid producing levels that would result in any significant increases in ambient noise levels and to meet the ANQZ criteria, the proposed action would not be expected to result in any significant noise impacts from the various building's associated mechanical systems. ✷