19.0 NOISE

19.1 Noise Fundamentals and Methodology

Noise pollution in an urban environment comes from numerous sources. Some are activities essential to the health, safety, and welfare of the city's inhabitants: noise from emergency vehicle sirens, from garbage collection operations, and from 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 evidence that excessive noise represents a threat to public health.

A number of factors affect sound as it is perceived by the human ear. These include the actual level of the sound (or noise), the frequencies involved, the period of exposure to the noise, and changes or fluctuations in the noise levels during exposure. Levels of noise are measured in units called decibels. Since the human ear cannot perceive all pitches or frequencies equally well, these measures are adjusted or weighted to correspond to human hearing. This adjusted unit is known as the A-weighted decibel, or dBA.

Since dBA describes a noise level at just one moment, and very few noises are constant, other ways of describing noise over extended periods are needed. 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, Leq, can be computed. Leq is the constant sound level that, in a given situation and time period (e.g. one hour, Leq[1], or twenty-four hours Leq[24]) conveys the same sound energy as the actual time-varying sound. Statistical sound level descriptors such as L1, L5, L10, L50, L90, and Lx are also sometimes used to indicate noise levels which are exceeded 1, 5, 10, 50, 90, and x percent of the time, respectively.

Alternatively, it is often useful to account for the difference in response of people in residential areas to noises that occur during sleeping hours as compared to waking hours. A descriptor, the day-night noise level, Ldn, defined as the A-weighted average sound level in decibels during a 24-hour period with a 10dB weighting applied to nighttime sound levels, is a widely used indicator for such evaluations. Ldn has been proposed by the United States Department of Housing and Urban Development (HUD) as an appropriate criterion for estimating the degree of nuisance or annoyance in residential neighborhoods. The Environmental Protection Agency has proposed that Leq could be an appropriate noise descriptor, while the Federal Highway Administration has proposed L10. Currently Ldn is used primarily as the descriptor for noise in the vicinity of airports, and for HUD funded projects. The HUD criterion that an Ldn greater than 75 dBA is "unacceptable" could potentially be a severe restriction in New York City.

19.2 Existing Conditions

The HSS existing buildings are in compliance with the New York City Noise Code. The expansion that was completed in 2007 was also built in compliance with the New York City Noise Code and Building Code noise requirements for noise attenuation.

19.3 Ambient Noise Survey

CEQR requires that indoor noise levels for residential buildings should not exceed 45 dBA. An ambient noise level survey was conducted at sidewalk receptors at the three site locations in the HSS study area by Ethan C. Eldon Associates, Inc. to determine if there are potential significant adverse impacts from traffic noise. The survey consisted of 20-minute noise readings at three (3) locations during the Morning (7-9 AM), Midday (12-2 PM), and Evening (4-6 PM) Peak Hours. The ambient noise levels at the sidewalk receptors are presented in Table 19-1. The survey for the fourth location on the roof of the existing building above the FDR was monitored for a 24-hour period. The ambient noise levels at the sidewalk receptors are presented below for eleven hours from 7 AM to 6 PM. The ambient noise levels at the roof-top receptor are presented in Table 19-2.

Table 19-1. Ambient Noise Survey Results on Sidewalks.

Site Location	Morning Peak Hour (dBA, L_{10})	Midday Peak Hour (dBA, L_{10})	Evening Peak Hour (dBA, L_{10})
Along E. 71st Street between FDR Drive andYork Ave. (N edge of site)	71	71	71
Along E. 70th Street between FDR Drive and York Ave. (S edge of site)	72	69	70
Along York Ave. between E. 70th Street and E. 71st Street (east edge of site)	72	70	68

Table 19-2. Ambient Noise Survey Results on Roof-top.

Time	Noise Level, L10
7-8 AM	67
8-9 AM	67
9-10 AM	67
10-11 AM	67
11 AM-12 PM	68
12-1 PM	68
1-2 PM	68
2-3 PM	68
3-4 PM	70
4-5 PM	69
5-6 PM	67

Time	Noise Level, L10
6-7 PM	67
7-8 PM	67
8-9 PM	67
9-10 PM	67
10-11PM	67
11PM-12AM	66
12-1AM	65
1-2AM	65
2-3AM	65
3-4AM	66
4-5AM	66
5-6AM	68
6-7AM	68
7-8AM	67

All nine (9) noise readings on the sidewalks were in the "Marginally Unacceptable" category. The 24-hour noise readings on the roof-top were in the "Marginally Unacceptable" category with the exception of the noise readings between 12am and 3am which were "Marginally Acceptable." According CEQR Noise Exposure Standards, the readings indicate that both the River Building and the addition to the East Wing would require window/wall attenuation of 30 dBA. However, a noise survey was also conducted for the proposed SMART Building at New York Presbeterian Hospital which indicated that a window/wall attenuation of 35 dBA would be required. Therefore, both the River Building and the addition to the East Wing would be constructed with a window wall attenuation of 35 dBA in order to achieve an interior closed window noise level of 45 dBA or lower, the requirements for which are indicated on the site plans.

19.4 The Future Without the Proposed Project - 2010

If the proposed project were not approved, HSS is expected to continue with the renovation of approximately 75,000 SF in the East Wing and West Wing of its existing Main Hospital Building (355,901 SF), Caspary Building (66,631 SF), and Belaire Building (113,917 SF on floors 1-14), and there would be no change in the number of certified beds. HSS would also complete construction of additions allowable under the 1973 Agreement as amended and the Previous Approvals. The additions include an 8th Floor to the Main Hospital-East Wing as proposed (11,320 SF), as well as the partial addition to the 5-8th Floors, entire addition of a 9th Floor, and addition of a 10th Floor mechanical room of the Main Hospital-West Wing as proposed (49,494 SF). The new construction, which was completed in 2007, added 60,814 SF to the existing 536,449 SF for a total floor area of 597,263 SF.

19.4.1 Stationary Sources

There are no stationary noise sources at HSS not in compliance with noise regulations.

19.4.2 Mobile Sources

HSS is in compliance with all noise regulations for mobile sources.

19.5 The Future With the Proposed Project - 2010

The proposed project would add a net gain of twenty-six (26) new certified beds and approximately 137,869 SF of floor space.

19.5.1 Stationary Sources

There would be no stationary sources introduced by the proposed project that would generate significant noise.

19.5.2 Mobile Sources

The results of the traffic study (see Chapter 16) indicate that there would be no doubling of passenger car equivalents (PCE's) and therefore there would be no significant increase in mobile source noise from the proposed project.

19.5.3 Mobile Sources

The CEQR Technical Manual states that significant noise impacts due to construction would occur "only at sensitive receptors that would be subjected to high construction noise levels for an extensive period time." In general, this has been interpreted to mean that such impacts would occur only at sensitive receptors where high noise levels would occur for two years or longer. Given that the construction timeframe is estimated at a maximum of 6 months, any elevated noise levels due to construction would be considered temporary in nature and not significant.

Impact on community noise levels during construction of the proposed project would include noise from construction equipment and noise from construction and delivery vehicles traveling to and from the project site. The level of impact of these noise sources depends on the noise characteristics of the equipment and activities involved, the construction schedule, and the location of sensitive noise receptors.

Noise levels at a given location are dependent on the type and number of pieces of construction equipment being operated as well as the distance from the construction site. Typical noise levels from construction equipment are shown in Table 19-5. Noise levels due to construction activities would vary widely, depending on the phase of construction (excavations, foundation, erection of structural steel and concrete, construction of exterior walls…), and the specific task being undertaken.

Construction noise generated by the project is expected to be similar to noise generated by other construction projects in Manhattan. Increased noise levels can be expected to be most significant during the foundation phase of the construction. There would be no blasting conducted for the construction of the proposed project.

The noise impacts would last as long as the project is under construction, estimated to be a maximum of 18 months, and would vary in intensity, depending upon the nature of the construction phase. However, these effects would be temporary in nature, and would not be

considered significant adverse impacts. The construction would comply with the general city, state, and federal guidelines for noise levels during construction.

Any noise impacts would be temporary and short-term. After erection of the framework and shell, the majority of the buildings would be enclosed and noise levels related to on-site construction activities would be significantly reduced. Therefore, no significant negative noise adverse impacts are expected from the construction of the proposed project.

Table 19-3. Average Ability to Perceive Noise Level Changes.

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.

Table 19-4. Community Reaction to Increased 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).

Table 19-5. Typical Noise Emission Levels for Construction Equipment.

Equipment Item	Noise Level at 50 ft (dBA)
Equipment	SPL Range
Compactors	72-88
Front Loaders	72-97
Backhoes	72-93
Tractors	73-96
Scrapers, Graders	77-95
Pavers	82-92
Trucks	70-96
Cement Mixers	71-90
Cement Pumps	75-84
Cranes	76-95
Pumps	70-80
Generators	70-82
Compressors	68-86
Pneumatic Wrenches	82-88
Jackhammers, Drills	76-98
Pile Drivers (Peak levels)	89-104
Vibrators	70-81
Saws	67-93
Tamper (at 1 meter)	94-100

Source: Harris, C., Handbook of Noise Control, Second Edition. New York: McGraw-Hill Book Company, 1979.

Table 19-6. Noise Exposure Guidelines[1]

Receptor Type	Time Period	Acceptable General external Exposure	Marginally Acceptable General External Exposure	Marginally Unacceptable General External Exposure	Clearly Unacceptable General External Exposure
1. Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ 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-10 PM)	$L_{10} \leq 65$ dBA	$65 < L_{10} \leq 70$ dBA	$70 < L_{10} \leq 80$ dBA	$L_{10} > 80$ dBA
	(7 AM-10 PM)	$L_{10} \leq 55$ 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[3]	Note 4	Note 4	Note 4	Note 4	Note 4

Notes: In addition, any new activity shall not increase the ambient noise level by 3 dB(A) 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] 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 19-7. Required Attenuation Values to Achieve Acceptable Interior Noise Levels.

	Marginally Acceptable	Marginally Unacceptable		Clearly Unacceptable		
Noise level with proposed action	65<L10<70	70<L10<75	75<L10<80	80<L10<85	85<L10<90	90<L10<95
Attenuation	25 dBA	(I) 30 dBA	(II) 35 dBA	(I) 40 dBA	(II) 45 dBA	(III) 50 dBA
Source: New York City Department of Environmental Protection						