Chapter 18: Noise

A. INTRODUCTION

This chapter assesses potential noise effects that could result from the Phased Redevelopment of Governors Island (the Proposed Project). In accordance with the *City Environmental Quality Review (CEQR) Technical Manual*, a noise analysis determines whether a proposed project would result in increases in noise level that could have a significant adverse impact on nearby sensitive receptors, and also considers the effect of existing noise levels at the project site on the proposed uses.

Phase 1 would not be expected to result in any significant increase in visitor or worker trips to Governors Island (the Island) and therefore, would not result in any significant increase in stationary noise. Therefore, Phase 1 would not have the potential to affect the noise environment on or around the Island or any of the ferry embarkment points in Brooklyn or Manhattan. Phase 1 would open new areas of the Island to public access, which are examined in this chapter to determine whether they would meet CEQR's noise level guidelines for open space.

Full development of the Proposed Project could potentially result in increased vehicular trips on roadways approaching the ferry embarkment points and increases in ferry trips to and from the Island. While the Later Phases of the Proposed Project are not expected to generate sufficient roadway traffic to have the potential to cause a significant noise impact (i.e., it would not result in a doubling of noise passenger car equivalents [PCEs] which would be necessary to cause a 3 dBA increase in noise levels), not all the specifics of future development, including the future level of ferry service, are not known at this time. Since the Later Phases-Island Redevelopment will require future rezoning actions, potential mobile source noise impacts resulting from increases in ferry service associated with this development would be analyzed in further environmental reviews. The Later Phases-Island Redevelopment could also potentially include a public school playground and the Later Phases-Park and Public Spaces would result in new areas of open space that would constitute a sensitive noise receptor. Consequently, the following noise analysis for the full development of the Proposed Project is focused on the potential for impacts resulting from noise generated by the school playground, whether the publicly accessible open space provided by the Proposed Project would meet CEQR's noise level guidelines for open space, and the CEQR noise abatement requirements for future buildings associated with the Later Phases-Island Redevelopment.

B. PRINCIPAL CONCLUSIONS

PHASE 1

Phase 1 of the Proposed Project would not result in noise level increases at any sensitive noise receptors. Noise levels at the new, publicly accessible open space included in Phase 1 would be expected to exceed the CEQR 55 dBA $L_{10(1)}$ guideline for outdoor areas requiring serenity and quiet, as is also the case at these areas under existing conditions and conditions in the future without the Proposed Project. However, such noise levels would be comparable to or less than

noise levels in other open space areas in New York City. Consequently, Phase 1 of the Proposed Project would not result in any significant adverse noise impacts.

LATER PHASES

Full development of the Proposed Project could potentially include a new public school (and associated playground) as part of the Later Phases-Island Redevelopment. Noise generated by the proposed school playground may result in substantial noise level increases at some open space areas on the Island, depending on the specific location of the proposed school. Consequently, the school playground could potentially result in a significant adverse noise impact if it is located immediately adjacent to an open space area. The specific future uses for the Later Phases-Island Redevelopment have not yet been proposed, defined, or designed at this time. Therefore, these potential noise impacts will be analyzed in greater detail in further environmental reviews associated with any future rezoning actions. Buildings associated with the Later Phases-Island Redevelopment located within 20 feet of the proposed school playground would require up to 31 dBA of window/wall attenuation depending on the specific location and land uses of the buildings. These attenuation requirements would be analyzed in greater detail in further environmental reviews. Noise levels at the new, publicly accessible open space included the Later Phases-Park and Public Spaces would be expected to exceed the CEQR 55 dBA $L_{10(1)}$ guideline for outdoor areas requiring serenity and quiet, as is also the case at these areas under existing conditions and conditions in the future without the Proposed Project. However, such noise levels would be comparable to or less than noise levels in other open space areas in New York City.

C. METHODOLOGY

ACOUSTICAL FUNDAMENTALS

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 "frequency," which is the speed at which the air pressure fluctuates, or "oscillates." Frequency defines the oscillation of sound pressure in terms of cycles per second. One cycle per second is known as 1 Hertz ("Hz"). People can hear over a relatively limited range of sound frequencies, generally between 20 Hz and 20,000 Hz, and the human ear does not perceive all frequencies equally well. High frequencies (e.g., a whistle) are more easily discernable 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 18-1**, 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 130 dBA.

Table 18-1
Common Noise Levels

Sound Source	(dBA)
Military jet, air raid siren	130
Amplified rock music	110
Jet takeoff at 500 meters	100
Freight train at 30 meters	95
Train horn at 30 meters	90
Heavy truck at 15 meters	80–90
Busy city street, loud shout	80
Busy traffic intersection	70–80
Highway traffic at 15 meters, train	70
Predominantly industrial area	60
Light car traffic at 15 meters, city or commercial areas, or residential areas close to industry	50–60
Background noise in an office	50
Suburban areas with medium-density transportation	40–50
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.

In considering these values, it is important to note that the dBA scale is logarithmic, meaning that each increase of 10 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 3 dBA. At 5 dBA, the change will be readily noticeable.

EFFECTS OF DISTANCE ON SOUND

Sound varies with distance. For example, highway traffic 50 feet away from a receptor (such as a person listening to the noise) typically produces sound levels of approximately 70 dBA. The same highway noise measures 66 dBA at a distance of 100 feet, assuming soft ground conditions. This decrease is known as "drop-off." The outdoor drop-off rate for line sources, such as traffic, is a decrease of approximately 4.5 dBA (for soft ground) for every doubling of distance between the noise source and receiver (for hard ground the outdoor drop-off rate is 3 dBA for line sources). Assuming soft ground, for point sources, such as amplified rock music, the outdoor drop-off rate is a decrease of approximately 7.5 dBA for every doubling of distance between the noise source and receiver (for hard ground the outdoor drop-off rate is 6 dBA for point sources).

SOUND LEVEL DESCRIPTORS

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 that fluctuates over extended periods have been developed. One way is to describe the fluctuating sound 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 by $L_{eq(24)}$),

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 used to indicate noise levels that are exceeded 1, 10, 50, 90, and x percent of the time, respectively.

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}.

For purposes of the Proposed Project, the L_{10} descriptor has been selected as the noise descriptor to be used in this noise impact evaluation. The 1-hour L_{10} is the noise descriptor used in the *CEQR Technical Manual* noise exposure guidelines for City environmental impact review classification.

NOISE STANDARDS AND CRITERIA

NEW YORK CEQR NOISE CRITERIA

The *CEQR Technical Manual* sets external noise exposure standards, shown in **Table 18-2** below. Noise exposure is classified into four categories: acceptable, marginally acceptable, marginally unacceptable, and clearly unacceptable. The noise level specified for outdoor areas requiring serenity and quiet is 55 dBA $L_{10(1h)}$.

The *CEQR Technical Manual* also defines attenuation requirements for buildings based on exterior noise level (see **Table 18-3**). Recommended noise attenuation values for buildings are designed to maintain interior noise levels of 45 dBA for residential and classroom uses and 50 dBA or lower for commercial uses and are determined based on exterior $L_{10(1)}$ noise levels.

SCHOOL PLAYGROUND METHODOLOGY

The maximum hourly playground boundary noise levels for different types of school playgrounds during the AM and PM peak hours, are shown in **Table 18-4**. These values are based upon measurements made at a series of New York City school playgrounds for the New York City School Construction Authority (SCA).[1] Since the particular age range for any school that may be included in the Later Phases-Island Redevelopment is not known at this time, the maximum $L_{eq(1)}$ values of 69.3 dBA during the AM and 64.3 dBA during the PM will be used as reference levels for this analysis. As specified in the SCA Playground Noise Study, $L_{10(1)}$ values are assumed to be 3 dBA greater than $L_{eq(1)}$ values.

[1] SCA Playground Noise Study, AKRF, Inc., October 23, 1992.

Table 18-2
Noise Exposure Guidelines For Use in City Environmental Impact Review[1]

Receptor Type	Time Period	Acceptable General External Exposure	Airport[3] Exposure	Marginally Acceptable General External Exposure	Airport[3] Exposure	Marginally Unacceptable General External Exposure	Airport[3] Exposure	Clearly Unacceptable General External Exposure	Airport[3] Exposure
Outdoor area requiring serenity and quiet[2]		$L_{10} \leq 55$ dBA	---- Ldn ≤ 60 dBA ----	NA	---- 60 < Ldn ≤ 65 dBA ----	NA	(i) 65 < Ldn ≤ 70 dBA, (II) 70 ≤ Ldn	NA	---- Ldn ≤ 75 dBA ----
Hospital, nursing home		$L_{10} \leq 55$ dBA		55 < $L_{10} \leq$ 65 dBA		65 < $L_{10} \leq$ 80 dBA		L_{10} > 80 dBA	
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	
School, museum, library, court, house of worship, transient hotel or motel, public meeting room, auditorium, outpatient public health facility		Same as Residential Day (7 AM-11 PM)		Same as Residential Day (7 AM-11 PM)		Same as Residential Day (7 AM-11 PM)		Same as Residential Day (7 AM-11 PM)	
Commercial or office		Same as Residential Day (7 AM-11 PM)		Same as Residential Day (7 AM-11 PM)		Same as Residential Day (7 AM-11 PM)		Same as Residential Day (7 AM-11 PM)	
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; (ii) *CEQR Technical Manual* noise criteria for train noise are similar to the above aircraft noise standards: the noise category for train noise is found by taking the L_{dn} value for such train noise to be an L^{y}_{dn} (L_{dn} contour) value.

Table Notes:

[1] Measurements and projections of noise exposures are to be made at appropriate heights above site boundaries as given by American National Standards Institute (ANSI) Standards; all values are for the worst hour in the time period.

[2] Tracts of land where serenity and quiet are extraordinarily important and serve an important public need, and where the preservation of these qualities is essential for the area to serve its intended purpose. Such areas could include amphitheaters, particular parks or portions of parks, or open spaces dedicated or recognized by appropriate local officials for activities requiring special qualities of serenity and quiet. Examples are grounds for ambulatory hospital patients and patients and residents of sanitariums and nursing homes.

[3] One may use 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 18-3
Required Attenuation Values to Achieve Acceptable Interior Noise Levels

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

Notes:

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

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

Source: New York City Department of Environmental Protection.

Table 18-4
Maximum Hourly Playground Boundary $L_{eq(1)}$ Noise Levels (dBA)

Time Period	Elementary Schools	Intermediate Schools	High Schools
AM	69.3	64.9	68.2
PM	62.9	64.3	64.3
Sources: SCA Playground Noise Study, Allee King Rosen & Fleming, Inc., October 23, 1992			

Geometric spreading and the consequent dissipation of sound energy with increasing distance from the playground decreases noise levels at varying distances from the playground boundary. Based upon measurements and acoustical principles, hourly noise levels were assumed to decrease by the following values at the specified distances from the playground boundary: 4.8 dBA at 20 feet, 6.8 dBA at 30 feet, and 9.1 dBA at 40 feet. For all distances between 40 and 300 feet, a 4.5-dBA drop-off per doubling of distances from the playground boundary was assumed.

D. EXISTING NOISE LEVELS

NOISE RECEPTOR LOCATIONS

Existing noise levels at the project site were measured at four (4) locations (see **Figure 18-1**). The measurement locations were selected to provide geographical coverage of the Island as well as capture the loudest existing noise levels for comparison with CEQR noise guidelines for open space. **Table 18-5** lists the receptor site locations.

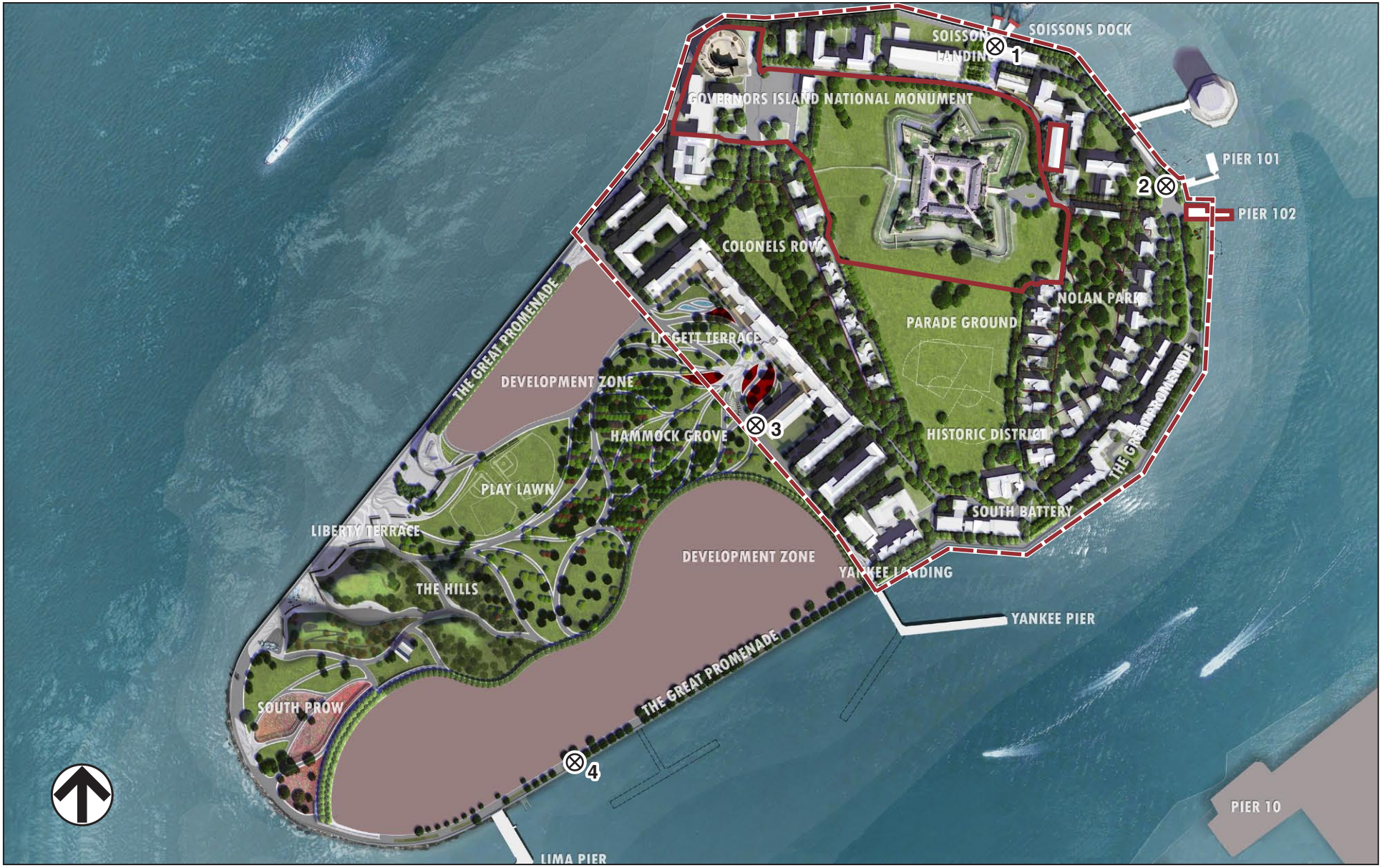
Table 18-5
Noise Receptor Locations

Receptor	Locations
1	Adjacent to Soissons Landing
2	Adjacent to Pier 101
3	Division Road between Hay Road and Enright Road
4	Craig Road South between Yeaton Road and Half Moon Road

At Receptor Sites 1 through 4, existing noise levels were measured for 20-minute periods during three weekday peak periods—AM (8:15 AM to 10:15 AM), midday (MD) (1:00 PM to 2:30 PM), PM (4:00 to 5:30 PM), and Saturday midday (MD) 3:00 PM to 5:00 PM). These time periods correspond with the peak hours of trips to and from The Island and the time periods analyzed in Chapter 15, "Transportation." Measurements were taken on June 2 and 4, 2011.

EQUIPMENT USED DURING NOISE MONITORING

Measurements were performed using a Brüel & Kjær Sound Level Meter (SLM) Type 2260 (S/N 2375602), a Brüel & Kjær ½-inch microphone Type 4189 (S/N 2378182), and a Brüel & Kjær Sound Level Calibrator Type 4231 (S/N 1800102). The SLM has a laboratory calibration date of July 30, 2010, which is valid through July of 2011. The Brüel & Kjær SLM is a Type 1 instrument according to ANSI Standard S1.4-1983 (R2006). For all receptor sites the instrument/microphone was mounted on a tripod at a height of approximately 5 feet above the ground. Microphones were mounted 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 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},



National Monument Boundary (Owned by the National Park Service)

North Island Coterminous Historic Districts

⊗ *Noise Receptor Location*

0 400 800 FEET

SCALE

PROPOSED PHASED REDEVELOPMENT OF
GOVERNORS ISLAND

Noise Receptor Locations
Figure 18-1

L_{50}, 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.

NOISE MEASUREMENT RESULTS

The results of the existing noise level measurements are summarized in **Table 18-6**.

Table 18-6
Existing Noise Levels (in dBA)

Site	Measurement Location	Time		L_{eq}	L_1	L_{10}	L_{50}	L_{90}
1	Adjacent to Soissons Landing	Weekday	AM	68.4	74.6	66.5	61.4	59.4
			MD	65.5	75.4	67.9	62.6	60.3
			PM	67.2	77.8	69.8	62.7	60.8
		Saturday	MD	67.4	77.6	69.5	63.6	60.7
2	Adjacent to Pier 101	Weekday	AM	61.3	73.9	64.3	54.7	52.2
			MD	64.4	74.0	68.4	59.5	54.9
			PM	65.3	75.8	68.9	59.5	55.5
		Saturday	MD	64.5	72.7	68.5	60.7	57.2
3	Division Road between Hay Road and Enright Road	Weekday	AM	53.2	63.7	54.6	51.1	48.8
			MD	58.0	65.0	61.1	56.2	53.0
			PM	60.5	70.7	62.9	58.1	54.6
		Saturday	MD	60.1	70.7	62.7	56.4	51.7
4	Craig Road South between Yeaton Road and Half Moon Road	Weekday	AM	62.4	71.7	66.7	57.9	53.3
			MD	61.7	71.8	64.6	58.5	54.2
			PM	62.6	69.2	66.1	61.1	56.2
		Saturday	MD	62.2	70.0	66.2	59.2	54.5

Note: Measurements were conducted by AKRF Acoustics Department on June 2 and 4, 2011.

Noise at all monitoring sites consisted of noise from helicopter flights over the Island and over adjacent bodies of water, boats, and people using open space on the Island, with the helicopter noise being the dominant noise source. There is no roadway traffic allowed on the Island, with the exception of a small number of service and construction vehicles, and consequently the traffic was not a substantial contributor to noise levels. Measured noise levels are moderate and reflect the level of helicopter activity in the skies above. In terms of the *CEQR* criteria, the existing noise levels at Sites 1 through 4 would be in the "acceptable" category.

E. THE FUTURE WITHOUT THE PROPOSED PROJECT

In the future without the Proposed Project, the Island will continue to operate as it does today. There will be no increase in noise from transportation to and from the Island, including roadway traffic and ferries. Noise levels in the future without the Proposed Project will likely be identical to existing noise levels, or only slightly increased due to any growth in the amount of helicopter traffic overhead.

F. PROBABLE IMPACTS OF THE PROPOSED PROJECT

PHASE 1

As described in Chapter 2, "Analytical Framework," Phase 1 would not be expected to result in any significant increase in visitor or worker trips to the Island. Therefore, Phase 1 of the Proposed Project would not result in noise level increases at any sensitive noise receptors.

As discussed above, the *CEQR Technical Manual* includes noise exposure guidelines for open space, based on $L_{10(1)}$ noise levels. Noise levels throughout the Phase 1 open space areas were determined by measurements of existing noise levels on the Island.

The new, publicly accessible open space included in Phase 1 would experience L_{10} values up to the high 60s of dBA. These noise levels would be above the CEQR 55 dBA $L_{10(1)}$ guideline for outdoor areas requiring serenity and quiet. Because so much of the noise at the project site results from helicopter activity, there are no practical and feasible mitigation measures[1] that could be implemented to reduce noise levels to below 55 dBA within the passive open space areas. Although noise levels in the Phase 1 publicly accessible open spaces are expected to be above the CEQR 55 dBA $L_{10(1)}$ guideline, these levels are comparable to or lower than noise levels in a number of open space areas that are within a range of substantial noise sources (e.g., roadways, aircraft, etc.), including Hudson River Park, Riverside Park, and Bryant Park. The 55 dBA $L_{10(1)}$ guideline is a worthwhile goal for outdoor areas requiring serenity and quiet; however, due to the level of activity present at most open space areas and parks throughout the City (except for areas far away from traffic and other typical urban activities), this relatively low noise level is often not achieved. Consequently, noise levels in the Phase 1 publicly accessible open space areas, while exceeding the 55 dBA $L_{10(1)}$ CEQR guideline value, would not result in a significant adverse noise impact.

LATER PHASES

SCHOOL PLAYGROUND

Noise levels resulting from the school playground that could potentially be included in the Later Phases-Island Redevelopment were predicted using the methodology described above. During the hours that the school playground would be in operation, noise levels immediately adjacent to the proposed playground could potentially range from the mid 60s to low 70s of dBA depending on the time of day and the specific location of the playground, and the existing background noise levels at that location. The maximum playground-generated noise level would occur immediately adjacent to the playground, and would decrease with distance away from the playground.

Noise level increases adjacent to the proposed playground could range from 3.9 dBA to 16.2 dBA depending on the specific location of the playground. Consequently, the school playground could potentially result in a significant noise impact if it is located immediately adjacent to an open space area. The school playground would be analyzed in greater detail in subsequent environmental reviews, when the plans and design for the Later Phases-Island Redevelopment are proposed.

OPEN SPACE AREAS

As discussed above, the *CEQR Technical Manual* includes noise exposure guidelines for open space, based on $L_{10(1)}$ noise levels. Noise levels throughout the Later Phases-Park and Public Spaces open space areas were determined by measurements of existing noise levels on the Island and accounting for potential noise from the proposed school playground.

[1] The only mitigation measure that could reduce noise levels to below 55 dBA within the passive open space areas would be to ban helicopter flights over the Island and over adjacent bodies of water, which is outside the purview of the project sponsor.

The newly opened publicly accessible open space included in the Later Phases-Park and Public Spaces would experience L_{10} values up to the high 60s of dBA at locations that are not in proximity to the proposed school playground, and up to the low 70s of dBA immediately adjacent to the school playground. These noise levels would be above the CEQR 55 dBA $L_{10(1)}$ guideline for outdoor areas requiring serenity and quiet. Because so much of the noise at the project site results from helicopter activity, there are no practical and feasible mitigation measures[1] that could be implemented to reduce noise levels to below 55 dBA within the passive open space areas. Although noise levels in the Later Phases-Park and Public Spaces publicly accessible open spaces are expected to be above the CEQR 55 dBA $L_{10(1)}$ guideline, these levels are comparable to or lower than noise levels in a number of open space areas that are within a range of substantial noise sources (e.g., roadways, aircraft, etc.), including Hudson River Park, Riverside Park, and Bryant Park. The 55 dBA $L_{10(1)}$ guideline is a worthwhile goal for outdoor areas requiring serenity and quiet; however, due to the level of activity present at most open space areas and parks throughout the city (except for areas far away from traffic and other typical urban activities), this relatively low noise level is often not achieved. Consequently, noise levels in the Later Phases-Park and Public Spaces publicly accessible open space areas, while exceeding the 55 dBA $L_{10(1)}$ CEQR guideline value, would not result in a significant adverse noise impact.

BUILDING ATTENUATION FOR PROJECT BUILDINGS

As described above and noted in Table 18-3, the *CEQR Technical Manual* includes noise attenuation values for buildings associated with new uses included in the Proposed Project, based on exterior noise levels. Recommended noise attenuation values for residential and school buildings are designed to maintain interior noise levels of 45 dBA $L_{10(1)}$ (50 dBA $L_{10(1)}$ for commercial uses) or lower and are determined based on exterior $L_{10(1)}$ noise levels.

Based on the measured L_{10} values at the various receptor locations on the Island, which are all less than 70 dBA, buildings that are not in close proximity to the proposed school playground would not require any specific amount of window/wall attenuation according to CEQR interior noise level criteria. Buildings close or immediately adjacent to the proposed school playground may experience L_{10} values up to 73.3 dBA, which would require 31 dBA of attenuation for residential or school uses or 26 dBA of attenuation for commercial use. The attenuation required by buildings in proximity to the school playground would be analyzed in greater detail in further environmental reviews when the plans and design for the Later Phases-Island Redevelopment are proposed.

PROJECT BUILDING MECHANICAL EQUIPMENT

The mechanical systems (i.e., heating, ventilation, and air conditioning systems) of any buildings associated with the Later Phases-Island Redevelopment would be designed to meet all applicable noise regulations (i.e., Subchapter 5, §24-227 of the New York City Noise Control Code addressing circulation devices and the New York City Department of Buildings and Mechanical Codes) to avoid a significant increase in ambient noise levels. ✷

[1] The only mitigation measure that could reduce noise levels to below 55 dBA within the passive open space areas would be to ban helicopter flights over the Island and over adjacent bodies of water, which is outside the purview of the project sponsor.