## A. INTRODUCTION

The proposed actions would allow for the development of three new buildings in the Rockefeller University Large Scale Community Facility Development (LSCFD): a new two-story, approximately 157,251-gross-square-foot (gsf) laboratory building with two one-story pavilions on its roof; a one-story approximately 3,353-gsf Interactive Conference Center (ICC), which would both be constructed on a platform structure largely in air space over the Franklin Delano Roosevelt (FDR) Drive; and a new one-story, approximately 20,498-gsf fitness center which would be built at the northwest corner of the campus near demapped East 68th Street and York Avenue. In addition, an eight five-foot-tall barrier would be constructed along the eastern edge of the FDR Drive between the FDR Drive and the East River Esplanade that would extend the entire length of the proposed platform structure.[1]

The proposed project would not result in an increase to the Rockefeller residential, user, or worker populations as the laboratory building, the ICC, and the fitness center would provide new facilities that would allow for the spatial decompression of existing campus buildings. Therefore, operation of the proposed new buildings would not result in any additional vehicular trips on roadways near the project site. Consequently, the proposed project would not have the potential to increase traffic and result in a significant mobile source noise impact due to project-generated traffic (i.e., it would not result in an increase in Noise Passenger Car Equivalents [Noise PCEs] which would cause an increase in noise levels of 3 dBA or more). The proposed laboratory building and ICC would be constructed on a platform over a portion of the FDR Drive, which could result in elevated noise levels along the East River Esplanade adjacent to the FDR Drive as a result of additional reflections of noise from vehicles travelling on the FDR Drive. Consequently, the noise analysis for the proposed actions focuses on the potential noise increase associated with additional reflections resulting from the platform over the FDR Drive and also examines the level of building attenuation necessary to satisfy City Environmental Quality Review (CEQR) noise abatement requirements for the three buildings proposed as part of the project.

### PRINCIPAL CONCLUSIONS

The proposed design for the laboratory platform and ICC includes the construction of an eight five-foot-tall barrier along eastern side of the FDR Drive between the FDR Drive and the East River Esplanade. This barrier would reduce noise levels on the esplanade and would result in noise levels on the esplanade that, depending upon the distance from the FDR Drive, would be

[1] The Draft Environmental Impact Statement (DEIS) analyzed a five-foot-tall barrier for the Build condition. Based on comments received from the Community Board between the DEIS and Final Environmental Impact Statement (FEIS), the analysis was revised to account for an eight-foot-tall barrier instead of a five-foot-tall barrier. It should be noted that with the five-foot-tall barrier analyzed in the DEIS, no significant adverse noise impacts would occur on the esplanade as a result of the proposed project.

less than ~~or comparable to~~ existing noise levels. Therefore, no significant adverse noise impacts would occur on the esplanade as a result of the proposed project.

Based on noise level measurements at the project site, noise levels at the locations of the proposed buildings fall below the level that would require specific noise attenuation requirements, according to *CEQR Technical Manual* noise exposure guidelines.

## B. 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 speed, or "frequency," 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 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 9-1**, 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 9-1**
**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.

### 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 actions, 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.

## C. NOISE STANDARDS AND CRITERIA

### NEW YORK CEQR NOISE CRITERIA

The *CEQR Technical Manual* defines attenuation requirements for buildings based on exterior noise level (see **Table 9-2**). Recommended noise attenuation values for buildings are designed to maintain interior noise levels of 45 dBA or lower for noise sensitive uses and 50 dBA or lower for commercial/office uses and are determined based on exterior $L_{10(1)}$ noise levels.

**Table 9-2**
**Required Attenuation Values to Achieve Acceptable Interior Noise Levels**

| | Marginally Unacceptable | | | | Clearly Unacceptable |
|---|---|---|---|---|---|
| Noise Level With the Proposed Project | $70 < L_{10} \leq 73$ | $73 < L_{10} \leq 76$ | $76 < L_{10} \leq 78$ | $78 < L_{10} \leq 80$ | $80 < L_{10}$ |
| 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 and community facility 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 (DEP).

### IMPACT DEFINITION

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

- If the No Build levels are less than or equal to 60 dBA $L_{eq(1)}$ and the analysis period is not a nighttime period, an increase of 5 dBA, or more, in Build $L_{eq(1)}$ noise levels at sensitive receptors (including residences, play areas, parks, schools, libraries, and houses of worship) over those in the No Build condition.
- If the No Build levels are greater than 60 dBA $L_{eq(1)}$ and less than 62 dBA, and the analysis period is not a nighttime period, Build $L_{eq(1)}$ noise levels at sensitive receptors greater than 65 dBA $L_{eq(1)}$.
- If the No Build levels are greater than or equal to 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 over those in the No Build condition.
- If the analysis period is a nighttime period (defined by the *CEQR Technical Manual* criteria as being between 10 PM and 7 AM), an increase of 3 dBA, or more, in Build $L_{eq(1)}$ noise levels at sensitive receptors over those in the No Build condition.

## D. EXISTING CONDITIONS

Existing noise levels at the project site were measured at eight (8) locations. Site 1 was located on the east platform of the Rockefeller Research Building (RRB) over the FDR Drive, Site 2 was located on York Avenue between East 67th and demapped East 68th Streets, Site 3 was located on the north side of the CRC Building, Site 4 was located on demapped East 68th Street between York Avenue and the FDR Drive, Site 5 was located on the west side of the Collaborative Research Center (CRC) Building, Site 6 was located on the East River Esplanade between East 64th and East 65th Streets, Site 7 was located along the East River Esplanade at East 70th Street, and Site 8 was located along the East River Esplanade at East 68th Street (see **Figure 9-1**).

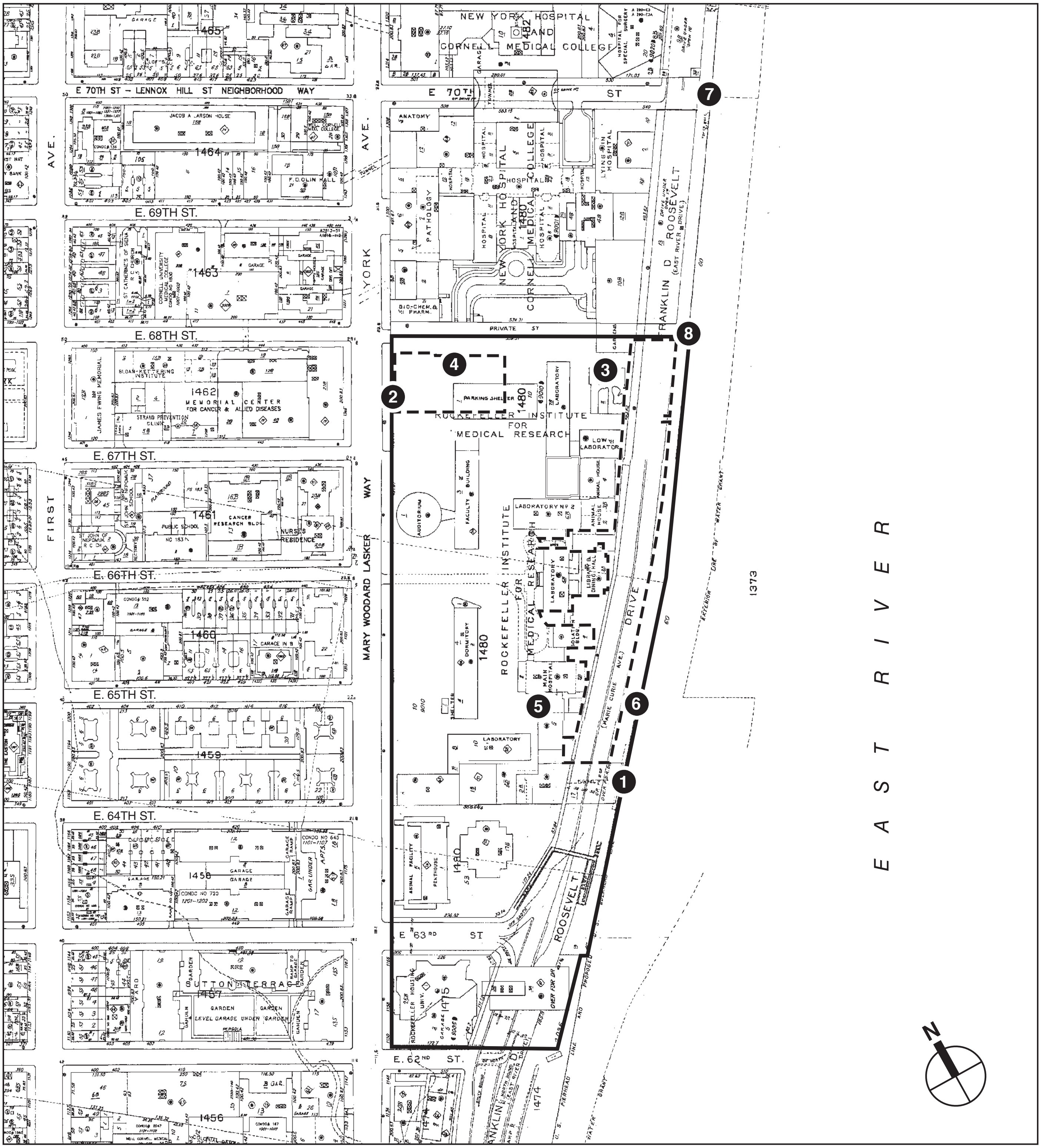
Sites 1 through 5 were used to determine building attenuation requirements and Sites 6 through 8 were used to determine potential impacts.

At receptor Site 1, a 24-hour continuous noise measurement was performed to determine existing noise levels taken on June 19 and 20, 2013. At all other receptor sites, noise measurements were performed for 20-minute periods during the three weekday peak periods—AM (8:00 AM to 9:00 AM), midday (MD) (12:00 PM to 1:00 PM), and PM (5:00 PM to 6:00 PM). These measurements were taken on September 20 and 21, 2012; October 2 and 11, 2012; and June 18, 19, and 25, 2013.

### EQUIPMENT USED DURING NOISE MONITORING

Continuous noise measurement was performed using a Brüel & Kjær Sound Level Meter (SLM) Type 2270, a Brüel & Kjær ½-inch microphone Type 4189, and a Brüel & Kjær Sound Level Calibrator Type 4231. Spot noise measurements were performed using a Brüel & Kjær Sound Level Meter (SLM) Type 2260, a Brüel & Kjær ½-inch microphone Type 4189), and a Brüel & Kjær Sound Level Calibrator Type 4231. The SLMs are Type 1 instruments according to ANSI Standard S1.4-1983 (R2006). For each measurement, the microphone was mounted on a tripod at a height of approximately 5 feet above the ground and was mounted approximately more than 5 feet away from any large reflecting surfaces. The SLM's calibration was field checked before and after readings with a Brüel & Kjær Type 4231 Sound Level Calibrator using the appropriate

3.18.14




*Large Scale Community Facility Development (LSCFD) (Rockefeller University Campus)*

*Development Sites*

❶ *Noise Receptor Location*

0 — 400 FEET

**SCALE**

**ROCKEFELLER**
UNIVERSITY

Noise Receptor Locations
**Figure 9-1**

adaptor. Measurements at each location were made in dBA. The data were digitally recorded by the SLM and displayed at the end of the measurement period in units of dBA. Measured quantities included $L_{eq}$, $L_1$, $L_{10}$, $L_{50}$, $L_{90}$, 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.

The results of the existing noise level measurements for Site 1 are summarized in **Table 9-3** and for Sites 2 through 6 are summarized in **Table 9-4**.

**Table 9-3**
**Receptor Site 1—Existing Noise Levels (in dBA)**

| Start Time | Measurement Location | Leq | $L_1$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
|---|---|---|---|---|---|---|
| 8:00 AM | East platform of RRB Building over the FDR Drive | 66.4 | 72.2 | 67.4 | 65.9 | 64.6 |
| 9:00 AM | | 66.1 | 71.5 | 67.3 | 65.5 | 64.4 |
| 10:00 AM | | 65.2 | 70.8 | 66.0 | 64.8 | 63.9 |
| 11:00 AM | | 65.1 | 69.2 | 66.0 | 64.8 | 63.8 |
| 12:00 PM | | 65.8 | 70.6 | 66.8 | 65.3 | 64.3 |
| 1:00 PM | | 64.9 | 69.2 | 65.7 | 64.6 | 63.7 |
| 2:00 PM | | 66.0 | 73.4 | 67.4 | 65.1 | 64.0 |
| 3:00 PM | | 64.4 | 70.9 | 65.4 | 63.5 | 61.5 |
| 4:00 PM | | 65.4 | 75.5 | 66.7 | 62.6 | 61.0 |
| 5:00 PM | | 62.9 | 71.4 | 64.1 | 61.0 | 59.5 |
| 6:00 PM | | 64.3 | 69.5 | 65.4 | 63.8 | 61.5 |
| 7:00 PM | | 65.4 | 71.5 | 66.2 | 64.7 | 63.8 |
| 8:00 PM | | 65.6 | 70.1 | 66.7 | 65.0 | 64.1 |
| 9:00 PM | | 65.2 | 70.8 | 65.8 | 64.7 | 63.9 |
| 10:00 PM | | 65.0 | 69.0 | 65.8 | 64.7 | 63.8 |
| 11:00 PM | | 63.7 | 69.4 | 65.5 | 63.0 | 60.9 |
| 12:00 AM | | 61.5 | 66.0 | 62.7 | 61.1 | 59.7 |
| 1:00 AM | | 62.0 | 66.4 | 63.2 | 61.5 | 60.0 |
| 2:00 AM | | 61.3 | 64.9 | 62.6 | 61.0 | 59.4 |
| 3:00 AM | | 61.4 | 65.9 | 62.8 | 61.0 | 59.4 |
| 4:00 AM | | 62.6 | 65.5 | 64.1 | 62.3 | 60.6 |
| 5:00 AM | | 64.8 | 68.8 | 65.9 | 64.6 | 63.0 |
| 6:00 AM | | 66.2 | 71.9 | 66.9 | 65.7 | 64.8 |
| 7:00 AM | | 66.2 | 73.0 | 68.0 | 65.2 | 64.2 |

**Note:** Field measurements were performed by AKRF, Inc. on June 19 and 20, 2013.

**Table 9-4**
**Receptor Sites 2 through 8—Existing Noise Levels (in dBA)**

| Site | Measurement Location | Time | $L_{eq}$ | $L_1$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
|---|---|---|---|---|---|---|---|
| 2 | York Avenue between East 67th and East 68th Streets | AM | 67.8 | 75.0 | 70.2 | 66.1 | 63.0 |
| | | MD | 67.8 | 76.3 | 70.5 | 65.9 | 62.4 |
| | | PM | 69.2 | 75.4 | 72.1 | 67.9 | 64.2 |
| 3 | North side of the new lab building | AM | 65.7 | 67.1 | 66.4 | 65.6 | 64.8 |
| | | MD | 63.7 | 66.0 | 64.9 | 63.5 | 62.0 |
| | | PM | 63.1 | 66.5 | 64.5 | 63.4 | 60.5 |
| 4 | East 68th Street between York Avenue and the FDR Drive | AM | 66.9 | 72.8 | 68.5 | 66.4 | 64.4 |
| | | MD | 68.1 | 74.3 | 70.3 | 66.6 | 64.9 |
| | | PM | 66.8 | 74.5 | 68.3 | 65.2 | 63.1 |
| 5 | West side of the Collaborative Research Center (CRC) Building | AM | 62.7 | 63.7 | 63.1 | 62.6 | 62.2 |
| | | MD | 62.5 | 64.4 | 62.9 | 62.3 | 61.9 |
| | | PM | 62.4 | 63.0 | 62.7 | 62.4 | 62.1 |
| 6 | East River Esplanade between East 64th and East 65th Street | AM | 77.0 | 79.7 | 78.4 | 76.8 | 75.4 |
| | | MD | 71.1 | 75.4 | 72.5 | 70.6 | 69.3 |
| | | PM | 78.4 | 80.8 | 79.6 | 78.3 | 76.9 |
| 7 | East River Esplanade at East 70th Street | AM | 87.8 | 90.6 | 88.9 | 87.8 | 86.8 |
| | | MD | 85.8 | 88.6 | 87.2 | 85.7 | 83.4 |
| | | PM | 84.6 | 88.1 | 86.0 | 84.3 | 82.4 |
| 8 | East River Esplanade at East 68th Street | AM | 80.4 | 82.7 | 81.7 | 80.4 | 78.8 |
| | | MD | 80.4 | 82.8 | 81.6 | 80.3 | 78.8 |
| | | PM | 78.5 | 83.0 | 79.6 | 77.8 | 75.9 |

**Note:** Measurements were conducted by AKRF Acoustics Department on September 20 and 21, 2012; October 2 and 11, 2012; and June 18, 19, and 25, 2013.

At all receptor sites vehicular traffic noise was the dominant noise source. In terms of the CEQR criteria, the existing noise levels (i.e., $L_{10}$ values) at Sites 1, 3 and 5 are in the "marginally acceptable" category, existing noise levels at Sites 2, 4, and 6 are in the "marginally unacceptable" category, and existing noise levels at Sites 7 and 8 are in the "clearly unacceptable" category.

## E. CHANGES IN NOISE LEVEL RESULTING FROM PROPOSED PLATFORM OVER THE FDR DRIVE

Noise level increases associated with reflections resulting from the proposed platform over the FDR were predicted based on a program of noise level measurements along the FDR Drive at locations with and without platforms over the roadway, and modeling performed using the CadnaA model.

Specifically, the noise impact analysis consisted of the following:

- Select representative noise measurement locations on the East River Esplanade at locations in the project area where the FDR Drive is both covered by a platform and not covered with a platform;
- Measure noise levels at the selected locations simultaneously during heavy/peak traffic flow conditions;
- Use the results of the measurements to determine the increase in noise levels that occur due to reflections from the platform;
- Use the CadnaA model to calculate the decrease in noise levels at receptor locations on the East River Esplanade if the existing ~~2~~two-foot-tall barrier along the FDR Drive is replaced with an ~~5~~ eight-foot-tall barrier (separating the FDR Drive from the East River Esplanade);
- Compare the measured noise levels at the East River Esplanade with a ~~2~~two-foot-tall barrier in the existing condition to noise levels with the proposed project which includes an ~~5~~ eight-foot-tall barrier; and
- Compare the project-generated noise level increment to applicable impact criteria.

The CadnaA model was used to determine the additional attenuation that would be achieved using an ~~5~~ eight-foot-tall barrier (between the FDR Drive and the East River Esplanade), rather than the existing ~~2~~ two-foot-tall barrier. The CadnaA model is a state-of-the-art tool for acoustical analysis. The model is an approved computerized three-dimensional model developed by DataKustik for sound prediction and assessment. The CadnaA model allows the user to model several different sound source types, including point sources, line sources, and area sources. The model can be used for the analysis of a wide variety of sound sources, including stationary sources (e.g., construction equipment, industrial equipment, power generation equipment, etc.), transportation sources (e.g., roads, highways, railroad lines, busways, airports, etc.), and other specialized sources (e.g., sporting facilities, etc.). The model takes into account the sound power levels of the sound sources, attenuation with distance, ground contours, reflections from barriers and structures, surface absorption, attenuation due to shielding, etc. The CadnaA model is based on the acoustic propagation standards promulgated in International Standard ISO 9613-2.

Existing noise levels were measured simultaneously at three locations on the East River Esplanade adjacent to the FDR Drive. Site A was located on the esplanade between East 64th and East 65th Streets; Site B was located on the esplanade at East 66th Street; and Site C was located on the esplanade between East 70th and East 71st Streets. Since there are no entrances/exits to the FDR Drive at these locations, traffic volumes at all three locations are exactly the same. At each receptor site, measurements were taken simultaneously at distances of 5 feet and 15 feet from the FDR Drive.

The results of these noise level measurements are shown in **Table 9-5**.

As shown in **Table 9-5** at a distance of 5 feet from the FDR Drive noise levels on the East River Esplanade are approximately 5.1 dBA higher at locations where there is a platform over the FDR Drive compared to the locations where there is no platform over the FDR Drive (such as Site B), and at a distance of 15 feet from the FDR Drive noise levels on the East River Esplanade are an average of approximately 6.5 dBA higher at locations where there is a platform over the FDR Drive compared to locations where there is no platform over the FDR Drive.

**Table 9-6** shows the combined covered roadway/barrier analysis results which include the measured increases due to the added reflections from the platform over the roadway and the added attenuation provided by the ~~5~~ eight-foot-tall ~~high~~ barrier between the FDR Drive and the East River Esplanade. (The barrier results are based upon the CadnaA barrier modeling.)

**Table 9-5**
**Measured Existing Noise Levels Adjacent to FDR Drive (in dBA)**

| Site | Location | Decking Condition | Distance | $L_{eq(1)}$ | $L_1$ | $L_{10}$ | $L_{50}$ | $L_{90}$ |
|---|---|---|---|---|---|---|---|---|
| A | East River Esplanade between East 64th and East 65th Streets | Covered | 5ft | 84.4 | 94.1 | 84.6 | 82.4 | 79.7 |
| | | | 15ft | 81.2 | 90.2 | 81.5 | 79.6 | 77.5 |
| B | East River Esplanade at East 66th Street | Uncovered | 5ft | 79.3 | 88.6 | 80.5 | 76.7 | 72.0 |
| | | | 15ft | 75.0 | 84.4 | 75.6 | 72.0 | 68.5 |
| C | East River Esplanade between East 70th and East 71st Streets | Covered | 5ft | 84.4 | 90.4 | 85.7 | 83.8 | 82.1 |
| | | | 15ft | 81.8 | 87.6 | 83.2 | 81.2 | 79.7 |

**Note:** Field measurements were performed by AKRF, Inc. on May 3, 2013

**Table 9-6**
**Combined Covered Roadway/Barrier Analysis Results**

| Distance from Roadway | Existing $L_{eq(1)}$ Noise Levels without Decking and with 2-Foot Barrier | $L_{eq(1)}$ Noise Levels with Decking and 2-Foot Barrier | ~~5~~ 8-Foot Barrier | | |
|---|---|---|---|---|---|
| | | | $L_{eq(1)}$ Noise Levels with Decking and ~~5~~ 8-Foot Barrier | $L_{eq(1)}$ Noise Level Change Due to ~~5~~ 8-Foot Barrier (i.e., 2-Foot vs. ~~5~~ 8-Foot Barrier) | $L_{eq(1)}$ Noise Level Change compared to Existing (i.e., with ~~5~~ 8-Foot Barrier compared to Existing) |
| 5ft | 79.3 dBA | 84.4 dBA | ~~79.0~~ 72.5 dBA | -~~5.4~~ 11.9 dBA | -~~0.3~~ 6.8 dBA |
| 15ft | 75.0 dBA | 81.2 dBA | ~~76.5~~ 71.6 dBA | -~~4.7~~ 9.6 dBA | ~~1.5~~-3.4 dBA |

**Note:** The DEIS analyzed a 5-foot barrier for the Build condition. Based on comments received from the Community Board between the Draft and Final EIS, the analysis was revised to account for an 8-foot barrier instead of a 5-foot barrier.

As shown in **Table 9-6**, at a distance of 5 feet from the roadway an ~~5~~eight-foot-tall barrier would reduce noise levels by approximately ~~5.4~~ 11.9 dBA and at a distance of 15 feet from the roadway an ~~5~~eight-foot-tall barrier would reduce noise levels by approximately ~~4.7~~ 9.6 dBA, comparing $L_{eq(1)}$ noise levels with a decked roadway to $L_{eq(1)}$ noise levels with a decked roadway and a 2-foot barrier. More importantly, noise levels with an ~~5~~eight-foot-tall barrier would ~~remain comparable~~ reduce noise levels compared to existing $L_{eq(1)}$ noise levels without a decked roadway. The predicted decrease in noise levels between the proposed project with a decked roadway and an eight-foot-tall barrier and existing noise levels is up to approximately 6.8 dBA, which would be a readily noticeable decrease in noise levels. ~~The maximum predicted increase in noise levels between the proposed project with a decked roadway and 5-foot barrier and existing noise levels is approximately 1.5 dBA, which would be considered imperceptible and insignificant according to CEQR criteria.~~

**Table 9-7** shows the noise levels at Sites 6 through 8 on the East River Esplanade, both with and without the proposed project. As shown above at locations where the proposed project would result in a platform (decking) over the FDR Drive (i.e., Sites 6 and 8), noise levels would be expected to change by between approximately ~~-0.3~~3.4 and ~~1.5~~-6.8 dBA (depending upon the distance from the FDR Drive). Noise level decreases of 6.8 dBA would be considered readily noticeable. ~~Noise levels increases of 1.5 dBA would be considered imperceptible and insignificant according to CEQR criteria.~~ Consequently, the proposed platform over the FDR Drive, constructed with an ~~5~~eight-foot-tall barrier along the FDR Drive between the FDR Drive and the East River Esplanade, would result in noise levels at locations along the East River Esplanade that will be ~~comparable to~~ less than existing noise levels. Thus, with the ~~5~~eight-foot-tall barrier, no significant adverse noise impact would occur at the East River Esplanade as a result of the proposed project.

**Table 9-7**
**Receptor Sites 6 through 8—Future Noise Levels (in dBA)**

| Site | Measurement Location | Time | Existing $L_{eq}$ | Existing $L_{10}$ | ~~Maximum~~ Minimum Predicted ~~Increase~~ Decrease | Build $L_{eq}$ | Build $L_{10}$ |
|---|---|---|---|---|---|---|---|
| 6 | East River Esplanade between East 64th and 65th Streets | AM | 77.0 | 78.4 | -3.4 ~~1.5~~ | 73.6 ~~78.5~~ | 75.0 ~~79.9~~ |
| | | MD | 71.1 | 72.5 | -3.4 ~~1.5~~ | 67.7 ~~72.6~~ | 69.1 ~~74.0~~ |
| | | PM | 78.4 | 79.6 | -3.4 ~~1.5~~ | 75.0 ~~79.9~~ | 76.2 ~~81.1~~ |
| 7 | East River Esplanade at East 70th Street | AM | 87.8 | 88.9 | -3.4 ~~1.5~~ | 84.4 ~~89.3~~ | 85.5 ~~90.4~~ |
| | | MD | 85.8 | 87.2 | -3.4 ~~1.5~~ | 82.4 ~~87.3~~ | 83.8 ~~88.7~~ |
| | | PM | 84.6 | 86.0 | -3.4 ~~1.5~~ | 81.2 ~~86.1~~ | 82.6 ~~87.5~~ |
| 8 | East River Esplanade at East 68th Street | AM | 80.4 | 81.7 | -3.4 ~~1.5~~ | 77.0 ~~81.9~~ | 78.3 ~~83.2~~ |
| | | MD | 80.4 | 81.6 | -3.4 ~~1.5~~ | 77.0 ~~81.9~~ | 78.2 ~~83.1~~ |
| | | PM | 78.5 | 79.6 | -3.4 ~~1.5~~ | 75.1 ~~80.0~~ | 76.2 ~~81.1~~ |

## F. NOISE LEVELS AT THE LANDSCAPED AREAS OF THE PROPOSED LABORATORY BUILDING ROOFTOP AND NORTH TERRACE

Based on predicted noise levels at Site 1, noise levels within the proposed laboratory building's rooftop landscaping and North Terrace landscaping, which would be privately accessible open space within the Rockefeller University campus, are expected to be above 55 dBA $L_{10(1)}$. This exceeds the recommended noise level for outdoor areas requiring serenity and quiet contained in the *CEQR Technical Manual* noise exposure guidelines. In the future with the proposed project, $L_{10(1)}$ values and $L_{dn}$ values at these proposed campus level landscaped areas would be in the mid- to high-60s dBA. Although noise levels in these areas would be above the guideline noise levels, they would be comparable to noise levels in a number of existing open space areas that are located adjacent to roadways, including Hudson River Park, Riverside Park, Bryant Park, Fort Greene Park, and other urban open spaces and would not constitute a significant adverse noise impact to the privately accessible open space within the proposed campus level landscaped areas.

## G. NOISE ATTENUATION MEASURES

As shown in **Table 9-2**, the *CEQR Technical Manual* has set noise attenuation quantities for buildings based on exterior $L_{10(1)}$ noise levels in order to maintain interior noise levels of 45 dBA or lower for noise sensitive uses and 50 dBA or lower for commercial/office uses. The results of the building attenuation analysis are summarized in **Table 9-8**.

**Table 9-8**
**CEQR Attenuation Requirements**

| Façade Location | Applicable Noise Receptor | Maximum Measured $L_{10}$ (in dBA) | Attenuation Required (in dBA)[(1)(3)] |
|---|---|---|---|
| **New Laboratory Building** | | | |
| North, South, East | 1 | 68.0 | N/A[(2)] |
| West | 3 | 66.4 | N/A[(2)] |
| **New Fitness Center** | | | |
| North, South | 4 | 70.3 | N/A[(2)] |
| East | 3 | 66.4 | N/A[(2)] |
| West | 2 | 72.1 | N/A[(2)] |

**Notes:**
(1) CEQR attenuation requirements do not apply to mechanical space uses.
(2) "N/A" indicates that the $L_{10}$ value below the value where the *CEQR Technical Manual* has no minimum attenuation guidance.
(3) The above composite window-wall attenuation values are for residential development. Commercial uses would be 5 dB(A) less.

**Table 9-6** shows the highest measured $L_{10(1)}$ noise levels (for any time period) at proposed buildings within the project site and the minimum amount of building attenuation that would be required to achieve acceptable interior noise levels at each location. The measured $L_{10(1)}$ noise levels are based on measurements at receptor sites 1 through 5, which are located adjacent to the project site.

The attenuation of a composite structure is a function of the attenuation provided by each of its component parts and how much of the area is made up of each part. Normally, a building façade consists of wall, glazing, and any vents or louvers associated with the building mechanical systems in various ratios of area. Currently, the proposed building designs include acoustically rated windows and an alternate means of ventilation (i.e., air conditioning). Based on the maximum $L_{10}$ noise levels shown in **Table 9-7**, the proposed buildings' façades, including these elements, would be designed to provide a composite Outdoor-Indoor Transmission Class (OITC) rating sufficient to maintain interior noise levels of 45 dBA or lower for noise sensitive uses and 50 dBA or lower for commercial/office uses. As noted in the table the maximum measured $L_{10}$ noise levels are below the values where the proposed uses have *CEQR Technical Manual* attenuation requirements. The OITC classification is defined by the ASTM International (ASTM E1332-10) 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. By adhering to these design specifications, the proposed buildings will thus provide sufficient attenuation to achieve the CEQR interior noise level guideline.

In addition, the building mechanical systems (i.e., heating, ventilation, and air conditioning systems [HVAC]) would be designed to meet all applicable noise regulations (i.e., Subchapter 5, §24-227 of the New York City Noise Control Code and Section MC 926 of the New York City Department of Buildings [DOB] Code) and to avoid producing levels that would result in any significant increase in ambient noise levels. ✷