H. Noise

1. Introduction

Noise detracts from the quality of the living environment, and there is increasing evidence that excessive noise represents a threat to public health. The proposed project is a mixed-use development that would result in residential, hotel, office, commercial, and outdoor open space uses located in an area that is currently occupied by industrial, manufacturing and commercial uses, vacant land and outdoor recreation areas. The proposed project has the potential to generate noise primarily as a result of vehicular traffic and construction activities associated with the proposed project. Specifically, the noise analysis presented in this chapter addresses:

- Traffic-generated changes in noise that would result from the operation of the proposed project (i.e., when construction of the proposed project's buildings and other features on the project site are completed in 2016);
- The required level of building attenuation to be incorporated in the proposed project's building designs to achieve acceptable interior noise levels;
- Noise emanating from stationary sources within the proposed project (i.e., music associated with the proposed restaurant); and
- Construction of the proposed project.

Background information on noise fundamentals, a discussion of the impact criteria used for the evaluation, the analysis methodology, the results of the noise measurement program, and the analysis results are contained in the chapter.

a) Noise Fundamentals

General Effects

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. Although it is possible to study these effects on people on an average or statistical basis, it must be remembered that all the stated effects of noise on people vary greatly with the individual. 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.

"A"-Weighted Sound-Levels (dBA)

Noise is typically measured in units called decibels (dB), which are ten times the logarithm of the ratio of the sound pressure squared to a standard reference pressure 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. Frequency is the rate at which sound pressures fluctuate in a cycle over a given quantity of time, and is measured in Hertz (Hz), where 1 Hz equals 1 cycle per second. Frequency defines sound in terms of pitch components. In the measurement system, 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—that simulate 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 this analysis, all measured noise levels are reported in dBA or A-weighted decibels. Common noise levels in dBA are shown in **Table III.H-1**.

Table III.H-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	
Busy city street, loud shout	80
Busy traffic intersection	
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	
Background noise in an office	50
Suburban areas with medium density transportation	
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 III.H-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 levels. These guidelines permit direct estimation of an individual's probable perception of changes in noise levels.

Table III.H-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 Newman, 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 integrates 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 this response is incorporated into the community response scale proposed by the International Standards Organization (ISO) of the United Nations (see **Table III.H-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 III-H-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 extended periods have been developed. One way of describing fluctuating sound is to describe the fluctuating noise heard over a specific time period as if it had been a steady, unchanging sound. For this condition, a descriptor called the "equivalent sound level," L_{eq}, can be computed. L_{eq} is the constant sound level that, in a given situation and time period (e.g., 1 hour, denoted by $L_{eq(1)}$, or 24 hours, denoted as $L_{eq(24)}$), conveys the same sound energy as the actual time-varying sound. Statistical sound level descriptors such as L_1, L_{10}, L_{50}, L_{90}, and L_x, are sometimes used to indicate noise levels that are exceeded 1, 10, 50, 90 and x percent of the time, respectively. Discrete event peak levels are given as L_1 levels. L_{eq} is used in the prediction of future noise levels, by adding the contributions from new sources of noise (i.e., increases in traffic volumes) to the existing levels and in relating annoyance to increases in noise levels.

The relationship between L_{eq} and levels of exceedance is worth noting. Because L_{eq} is defined in energy rather than straight numerical terms, it is not simply related to the levels of exceedance. If the noise fluctuates very little, L_{eq} would approximate L_{50} or the median level. If the noise fluctuates broadly, the L_{eq} would be approximately equal to the L_{10} value. If extreme fluctuations are present, the L_{eq} would exceed L_{90} or the background level by 10 or more decibels. Thus the relationship between L_{eq} and the levels of exceedance would 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 the purposes of this assessment, the equivalent sound level (L_{eq}) has been selected as the noise descriptor to be used in the noise impact evaluation. L_{eq} is the noise descriptor used by most governmental agencies for noise impact evaluation, and is used to provide an indication of highest expected sound levels.

b) Noise Impact Criteria

There are a variety of noise standards and guidelines that have been promulgated by various local, state, and federal agencies. Most criteria are not directly applicable to the proposed project. Two criteria that have applicability to the proposed project are Chapter 196 of the City of Glen Cove Noise Code and impact criteria of the New York State Department of Environmental Conservation (DEC). These are discussed below.

City of Glen Cove Noise Code

The City of Glen Cove Noise Code contains sections that would be applicable to the construction activities associated with the proposed project and outdoor music associated with the proposed restaurant. These sections are stated below.

Construction

As per §196-4(H) of the Code, "Pile Drivers, hammers and heavy construction equipment. The operation between the hours of 6:00 p.m. and 7:00 a.m. on weekdays and all day Saturday, Sunday and holidays of any pile drivers, steam shovels, pneumatic hammer, derrick, hoist or any heavy construction equipment, the use of which is attended by loud or unusual noise, is prohibited except in the case of an emergency and then only with a permit for three days from the Building Department Administrator, which permit may be renewed for a period of three days or less while the emergency continues."

As per §196-4(O) of the Code, "Construction, alterations or demolition of buildings. Any erection, excavation, alternations or demolition of any building which is attended by loud and unusual noise is prohibited between the hours of 6:00 p.m. and 7:00 a.m. on weekdays, Saturdays and all day Sundays and holidays except in the case of an urgent necessity in the interest of public safety, and then only with a permit for three days from the Building Department Administrator, which permit may be renewed for a period of three days or less while the emergency continues."

Outdoor Music Associated With the Proposed Restaurant

As per §196-4(Q) of the Code, "Loudspeakers. The operation of any loudspeakers or speaker system or any device for the production or reproduction of sound in a manner that creates public annoyance, alarm or inconvenience, of which a reasonable person of normal sensitivities would not tolerate at the time, place and under the circumstances that the noise is made."

The maximum allowable decibel limits that would be applied for outdoor music associated with the proposed restaurant are defined in section §196-12. "Maximum permissible continuous sound levels." These maximum allowable decibel limits for sound emanating from a commercial property to a residential/public place receiving property are summarized below:

- 50 dBA when measured between the hours of 10:00 p.m. and 7:00 a.m.
- 65 dBA when measured between the hours of 7:00 a.m. and 10:00 p.m.

New York State DEC Noise Impact Criteria

In 2000, the New York State DEC published a guidance document titled *Assessing and Mitigating Noise Impacts* (October 6, 2000). This document states that increases from 0-3 dBA should have no appreciable effect on receptors, increases of 3-6 dBA may have the potential for adverse impact only in cases where the most sensitive of receptors are present, increases of more than 6 dBA may require a closer analysis of impact potential depending on existing noise levels and the character of surrounding land use and receptors, and increase of 10 dBA or more deserve consideration of avoidance and mitigation measures in most cases. It also states that in terms of threshold values, the addition of any noise source, in a non-industrial setting, should not raise the ambient noise level above a maximum of 65 dBA, and ambient noise levels in industrial or commercial areas may exceed 65 dBA with a high end of approximately 79 dBA. Projects which exceed these guidance levels should explore the feasibility of implementing mitigation.

Project Impact Criteria

The New York State DEC criteria summarized above represents a reasonable criteria for project evaluation. It provides a reasonable basis for determining what constitutes a significant increase in noise levels (i.e., more than 6 dBA), and then for concluding that though there may be a significant increase in noise levels, because the magnitude of the resulting noise level is low, the total noise level is acceptable (i.e., 65 dBA or less for residential uses). No mitigation is therefore required, and the project would not result in a significant impact.

The City of Glen Cove Noise Code would be addressed regarding the discussion of construction noise and outdoor music associated with the proposed restaurant.

2. Existing Conditions

Site Description

The project site is located along the Glen Cove Creek waterfront, in Glen Cove, New York. The site is generally bounded by the Garvies Point Preserve to the north, Charles Street to the east, Glen Cove Creek to the south, and Hempstead Harbor to the west. The site is currently occupied by industrial, manufacturing and commercial uses, vacant land and outdoor recreation areas.

Selection of Noise Receptor Locations

Ten receptor locations were selected for the noise analysis. The selected receptors are located adjacent to the project site and/or along major feeder streets to and from the

project site. At all receptors, except for Site 8[1], 9[2] and 10[3], these locations are where the maximum increases in the project-generated traffic would be expected to occur. Consequently, these receptor locations have the highest potential for noise impacts from the project-generated traffic. **Table III.H-4** presents the locations of each noise receptor site and their associated existing surrounding land uses. **Exhibit III.H-1** shows the receptor site locations. All receptor sites include representative noise-sensitive locations, principally locations with residential and open space land uses, and locations where maximum project impacts would be expected. At other locations, particularly locations farther from the project site, project-generated traffic would be less and/or would constitute a small portion of the existing and /or the Future No Action traffic volume and, consequently, would not have the potential to cause a significant increase in noise levels.

Noise Monitoring

The noise monitoring program consisted of two types of measurements—continuous 24-hour measurements and short-term measurements. Short-term measurements were performed at Sites 1, 2, 3, 4, and 8 during the weekday AM (7:00 to 9:30 AM) and PM (3:30 to 6:00 PM) and Saturday midday (MD [11:00 AM to 2:00 PM]) peak time periods. At Sites 5, 6, and 7 continuous 24-hour measurements were conducted during a typical weekday and short-term measurements were conducted during the Saturday MD peak time period. At Sites 9 and 10, continuous 24-hour measurements were conducted during a typical weekday and a Saturday/Sunday. The purpose of the continuous 24-hour measurement was to provide some indication of the temporal variation of noise levels throughout a typical day and night. At the continuous long-term measurement locations, one-hour values of L_{eq}, L_1, L_{10}, L_{50}, $L_{90,}$ L_{min}, and L_{max} were recorded. The short-term measurements consisted of 20-minute spot measurements, and values of L_{eq}, L_1, L_{10}, L_{50}, $L_{90,}$ L_{min}, and L_{max} were recorded. Measurements were made on Tuesday, October 14, Wednesday, October 15, Saturday, October 18, Wednesday, October 22, and Thursday, October 23, 2008, and on Tuesday, January 20, Wednesday, January 21, Saturday, January 24, Sunday, January 25, and Monday, January 26, 2009.

Equipment Used

Each short-term noise monitoring instrument set-up included a Brüel & Kjær Type 4189 ½-inch microphone connected to a Brüel & Kjær Model 2260 Type 1 (according to ANSI Standard S1.4-1983) sound level meter. This assembly was

[1] Site 8 was used for the assessment of noise generated by the asphalt plant on the proposed project.

[2] The analysis at Site 9 was used primarily for the assessment of construction noise and music associated with the proposed restaurant.

[3] The analysis at Site 10 was used primarily for the assessment of construction noise and music associated with the proposed restaurant.

mounted at a height of approximately five feet above the ground surface on a tripod and at least five feet away from any large sound-reflecting surface to avoid major interference with sound propagation. The 24-hour continuous measurements also involved the use of a Brüel & Kjær Type 1404 Outdoor Microphone Kit. The meter 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}, L_{50}, L_{90}, L_{min}, and L_{max}. A windscreen was used during all sound measurements except for calibration. Weather conditions were noted to ensure a true reading, as follows: wind speed under 12 mph; relative humidity under 90 percent; and temperature above 14°F and below 122°F. All measurement procedures conformed to the requirements of ANSI Standard S1.13-2005.

Table III.H-4
Noise Monitoring Locations

Site	Location	Weekday Measurement	Saturday Measurement	Adjacent Land Use
1	Pratt Boulevard between Continental Place and Pulaski Street	20-minute short-term	20-minute short-term	Residential
2	Herb Hill Road between Charles and Brewster Streets	20-minute short-term	20-minute short-term	Residential, Open Space and Outdoor Recreation
3	Pratt Park between Charles Street and Glen Cove Avenue	20-minute short-term	20-minute short-term	Open Space and Outdoor Recreation
4	Herb Hill Road between Dickson and Charles Streets	20-minute short-term	20-minute short-term	Residential
5	Dickson Street between The Place and Herb Hill Road	Continuous 24-hour	20-minute short-term	Future Residential Property, Adjacent to Garvies Point Preserve
6	Pedestrian Walkway Adjacent to Regina Maris	Continuous 24-hour	20-minute short-term	Open Space and Outdoor Recreation, Future Residential Property
7	Parking Lot at end of Garvies Point Road	Continuous 24-hour	20-minute short-term	Open Space and Outdoor Recreation, Garvies Point Preserve, Future Residential Property
8	Morris Avenue Across from Asphalt Plant	20-minute short-term	20-minute short-term	Industrial, Open Space and Outdoor Recreation
9	Shore Road at Albin Street	Continuous 24-hour	Continuous 24-hour	Residential
10	Cliff Way at The Boulevard	Continuous 24-hour	Continuous 24-hour	Residential, Open Space and Outdoor Recreation

Source: AKRF, INC.

INSERT EXHIBIT

III.H-1

Noise Monitoring LOCATIONS

Results of Baseline Measurements

Table III.H-5 shows the results of the noise monitoring program (more details of the noise monitoring program can be found in the **Appendix**). In general, the area adjacent to Sites 1, 2, 3, 9, and 10 is fairly suburban and the area adjacent to Site 4 is a mix of residential and commercial/industrial/manufacturing uses, and the measured noise levels reflect the level of traffic activity on adjacent roadways. The area adjacent to Sites 8, 5, and 7 is fairly industrial, and the measured noise levels reflect the level of traffic activity on adjacent roadways and noise from the adjacent industrial/manufacturing/commercial uses. At Site 8, the dominant noise source, when the asphalt plant was operational and the adjacent baseball fields were in use, was a combination of noise from the asphalt plant, vehicular traffic, and noise from the adjacent baseball fields; when the asphalt plan was not in operation and the adjacent baseball fields were not in use the dominant noise source was vehicular traffic. The area adjacent to Site 6 is a mix of waterfront open space and vacant land, and the measured noise levels reflect the level of activity at the adjacent industrial/manufacturing/commercial uses, maritime sounds, and distant traffic noise. As shown in Table III-H-5, noise levels at Sites 2, 6, 7, and 10 (during the weekday) with average L_{eq} values in the 50 to 60 dBA range, are low to moderate, noise levels at Sites 3, 4, 5, 8, 9, and 10 (during the Saturday midday) with average L_{eq} values in the 60 to 70 dBA range are moderate to high, and noise levels at Site 1 with L_{eq} values in the mid 70 dBA range relatively high.

Table III-H-5
Measured Existing Noise Levels (in dBA)

Site	Location	Time	$L_{eq(1)}$	L_1	L_{10}	L_{50}	L_{90}
1	Pratt Boulevard between Continental Place and Pulaski Street	Weekday AM	73.2	81.8	76.9	70.3	59.4
		Weekday PM	72.5	79.8	76.3	69.8	58.1
		Saturday MD	74.2	85.7	76.1	68.9	60.1
2	Herb Hill Road between Charles and Brewster Streets	Weekday AM	54.6	61.5	57.6	52.7	49.3
		Weekday PM	52.7	59.4	55.4	51.3	49.1
		Saturday MD	55.4	65.2	56.4	52.2	50.4
3	Pratt Park between Charles Street and Glen Cove Avenue	Weekday AM	62.3	69.4	65.2	60.9	57.1
		Weekday PM	60.6	65.7	62.8	59.9	56.7
		Saturday MD	62.6	74.9	62.8	57.4	54.5
4	Herb Hill Road between Dickson and Charles Streets	Weekday AM	64.0	75.1	66.8	59.0	52.8
		Weekday PM	59.9	70.6	63.2	56.0	48.9
		Saturday MD	62.2	72.1	60.9	55.7	51.8
5	Dickson Street between The Place and Herb Hill Road	Weekday AM	64.3	76.4	67.5	52.0	49.3
		Weekday PM	60.6	73.8	62.2	45.5	39.2
		Saturday MD	60.1	72.8	61.2	52.6	49.1
6	Pedestrian Walkway Adjacent to Regina Maris	Weekday AM	51.9	59.3	55.7	49.5	47.1
		Weekday PM	49.7	58.8	52.9	47.4	41.2
		Saturday MD	50.1	56.9	52.2	49.1	46.7
7	Parking Lot at end of Garvies Point Road	Weekday AM	57.1	69.5	62.1	52.0	47.4
		Weekday PM	48.5	59.2	52.4	41.6	36.8
		Saturday MD	60.0	69.7	63.6	54.9	48.5
8	Morris Avenue Across from Asphalt Plant	Weekday AM	69.5	82.4	70.3	60.8	56.5
		Weekday PM	63.6	75.9	66.1	54.8	51.3
		Saturday MD	59.1	66.1	60.7	58.1	56.6
9	Shore Road at Albin Street	Weekday AM	63.5	73.9	66.7	54.7	42.7
		Weekday PM	62.1	71.4	65.9	55.8	43.3
		Saturday MD	61.2	71.3	63.9	56.7	49.7
10	Cliff Way at The Boulevard	Weekday AM	57.3	67.8	58.5	48.3	43.4
		Weekday PM	57.0	68.0	59.8	50.5	46.1
		Saturday MD	63.1	71.1	65.1	61.7	59.8

Notes: 1) The peak time periods for traffic were approximately 7 to 9:30 AM for the weekday AM, 3:30 to 6 PM for the weekday PM, and 11 AM to 2 PM for the Saturday MD analysis time periods. To be conservative, the lowest measured hourly values that occurred during the traffic peak hours for Sites 5, 6, 7, 9, and 10 were used for analysis purposes. See Appendix for more details of the 24-hour continuous measurement results.

2) Noise monitoring was performed by AKRF, Inc. on Tuesday, October 14, Wednesday, October 15, Saturday, October 18, Wednesday, October 22, and Thursday, October 23, 2008 and on Tuesday, January 20, Wednesday, January 21, Saturday, January 24, Sunday, January 25, and Monday, January 26, 2009.

Source: AKRF, Inc.

3. Potential Impacts

a) Noise Prediction Methodology

General Methodology

At Sites 1, 2, 3, 4, 9, and 10 the dominant noise source is vehicular traffic on adjacent and nearby streets and roadways. At Site 5 the dominant noise source is a mix of local ambient sounds from the industrial/manufacturing/commercial uses and traffic noise. At Sites 6 and 7 the dominant noise source is a mix of local ambient sounds from the industrial/manufacturing/commercial uses, traffic noise, and maritime sounds. As was previously discussed, at Site 8 the dominant noise source, when the asphalt plant was operational and the adjacent baseball fields were in use, was a combination of noise from the asphalt plant, vehicular traffic, and noise from the adjacent baseball fields; when the asphalt plan was not in operation and the adjacent baseball fields were not in use the dominant noise source was vehicular traffic. Future noise levels were calculated using either a proportional modeling technique or the Federal Highway Administration (FHWA) *Traffic Noise Model* (TNM) Version 2.5. The proportional modeling technique was used as a screening tool to estimate changes in noise levels. At locations where proportional modeling indicated the potential for significant noise impacts the TNM was used to obtain more detailed results. The noise analysis primarily examined the weekday AM and PM, and Saturday MD peak hours. The selected time periods are when the proposed actions would result in maximum traffic generation and/or the maximum potential for significant adverse noise impacts, based on the traffic studies presented in **Section III.F** and included in their entirety in the **Appendix.** The proportional modeling and TNM procedures used for analysis are described below.

Proportional Modeling

Proportional modeling was used to determine locations with the potential for having significant noise impacts.

Using this technique, the prediction of future noise levels, where traffic is the dominant noise source, is based on a calculation using measured existing noise levels and predicted changes in traffic volumes to determine Future No Action and Build levels. Vehicular traffic volumes are 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, 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, and one bus (vehicles designed to carry more than nine passengers) is assumed to generate the noise equivalent of 18 cars. Future noise levels are calculated using the following equation:

$F\ NL - E\ NL = 10 * \log_{10} (F\ PCE / E\ PCE)$

where:

F NL = Future Noise Level
E NL = Existing Noise Level
F PCE = Future PCEs
E PCE = Existing PCEs

Sound levels are measured in decibels and therefore increase logarithmically with sound source strength. In this case, the sound source is traffic volumes measured in PCEs. 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. Similarly, 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.

At Site 4 (i.e., Herb Hill Road between Dickson and Charles Streets), 5 (i.e., Dickson Street between The Place and Herb Hill Road), and 7 (i.e., Parking Lot at the End of Garvies Point Road), preliminary modeling studies using proportional modeling techniques indicated that the future traffic may have the potential to cause significant increases in noise levels because a large amount of project-generated traffic would use the adjacent roads, which are lightly traveled in the existing and No Action conditions, to access/egress the project site. Therefore, at these receptor locations, a refined analysis was performed using the TNM to calculate noise levels.

Traffic Noise Model

The TNM is a computerized model developed for the FHWA that calculates the noise contribution of each roadway segment to a given noise receptor. The noise from each vehicle type is determined as a function of the reference energy-mean emission level, corrected for vehicle volume, speed, roadway grade, roadway segment length, and source-receptor distance. Further considerations included in modeling the propagation path include identifying the shielding provided by rows of buildings, analyzing the effects of different ground types, identifying source and receptor elevations, and analyzing the effects of any intervening noise barriers. The TNM provided more accurate results than proportional modeling for Sites 5 and 7 because their adjacent roads are lightly traveled in the existing and No Action conditions. The TNM provided more accurate results than proportional modeling for Site 4 due its proximity to the intersection of Herb Hill Road and Charles Street and consequently a significant amount of noise is due to the volume of traffic using the two adjacent roadways that meet at this traffic intersection. The less refined proportional modeling technique could not account for the noise contributions from the multiple roadways and acceleration/deceleration due to the traffic signal, and thus, over predicts the project-generated traffic noise levels by attributing all of the noise due to traffic and

traffic changes to the immediately adjacent street. The TNM provided more accurate results than proportional modeling for Site 6 since the primary source of ambient noise levels are non-vehicular sources in the existing condition.

Analysis Procedure

The following procedure was used in performing the noise analysis:

- Noise monitoring locations (receptor sites) were selected at noise-sensitive land uses (i.e., residential, open space, etc.) located on the predicted traffic routes that project-generated traffic would use to access and egress the project site.
- Noise monitoring locations were selected adjacent to and on the proposed project site to determine the appropriate level of building attenuation required to satisfy acceptable interior noise level criteria and to predict noise levels in the proposed project's newly created open spaces.
- A noise monitoring location (i.e., Site 8) was selected to assess the noise effects of the asphalt plant's operations.
- Noise monitoring locations (i.e., Sites 9 and 10) were selected adjacent to noise-sensitive land uses (i.e., residential, open spaces, etc.) south of the Glen Cove Creek in the Village of Sea Cliff and the City of Glen Cove to address noise due to: 1) vehicles travelling to and from the proposed project site, 2) construction of the proposed project, and 3) outdoor music associated with the proposed restaurant.
- Existing noise levels were determined at receptor sites listed above, for each analysis time period, by performing field measurements.
- Using the results of the traffic studies presented in Section III.F, a screening analysis was performed using the proportional model to identify locations that had the potential for a significant increase in noise levels due to project-generated traffic.
- At locations where the screening analysis indicated the potential for a significant increase in noise levels, existing noise levels were calculated at each receptor site, for each analysis time period, using the TNM and traffic data for existing conditions.
- At locations where the screening analysis indicated the potential for a significant increase in noise levels (i.e., Sites 4, 5, and 7) the calculated TNM existing noise level at these sites, for each analysis time period, was subtracted from the measured existing noise level. The remainder was assumed to be a correction factor (to account for noise from parking lots, street noise, noise from manufacturing operations, model inaccuracies, etc.).
- The Federal Transit Administration (FTA) model was used to calculate noise levels due to ferry traffic associated with the Glen Cove Ferry Terminal.
- Future noise levels for the Future No Action and Build conditions, for each receptor site and for each analysis time period, were determined using either the proportional model or the sum of calculated TNM results and the calculated correction factor based on projected traffic conditions.

- The level of building attenuation to achieve acceptable interior noise levels was determined for the proposed project's buildings based on the noise monitoring and TNM results.
- Future noise levels were determined for the proposed project's newly created open spaces based on the noise monitoring and TNM results.
- Outdoor music associated with the proposed project's restaurant was analyzed at Sites 9 and 10 based on the noise monitoring results, a literature search, and acoustical fundamentals.

Summary tables showing the specific components of the noise analysis are provided in the Appendix.

b) 2016 Future No Action Condition

Using the methodology previously described Future No Action noise levels were calculated at seven sites (1, 2, 3, 4, 5, 6 and 7) for the 2016 analysis year. These Future No Action values are shown in Table III-H-6. The proportional model was used to calculate noise levels at Sites 1, 2 and 3. The TNM was used to calculate noise levels at Site 4. A combination of the TNM and the FTA model was used to calculate noise levels at Sites 5, 6, and 7 for vehicular traffic and ferry terminal noise, respectively.

In 2016, the maximum increase in $L_{eq(1)}$ noise levels at Sites 1, 2, 3, 5, 6, and 7, when comparing the No Action noise levels to the existing noise levels, would be 1.8 dBA. This would occur at Site 2 during the weekday PM peak hour. A change of this magnitude would be considered imperceptible and would fall below the New York State DEC threshold of 6 dBA for a significant impact. In 2016, the maximum increase in noise levels at the remaining sites, when comparing the No Action noise levels to the existing noise levels, would be 1.2 dBA or less (an imperceptible change.)

In 2016, the maximum increase in $L_{eq(1)}$ noise levels at Site 4, when comparing the No Action noise levels to the existing noise levels, would be 3.9 dBA at during the weekday AM peak hour. The increase in noise levels at Site 4 is due to the construction and operation of the Glen Cove Ferry Terminal and its associated vehicular trips. In comparison to the existing traffic volumes, a large volume of vehicles would use Herb Hill Road to access/egress the ferry terminal. A change of this magnitude would be perceptible but would fall below the New York State DEC threshold of 6 dBA for a significant impact. Consequently, the No Action alternative would not result in any significant noise impacts at any of the receptor sites analyzed.

Table III-H-6
2016 Future No Action Noise Levels

Site	Location	Time	Existing $L_{eq(1)}$	No Build $L_{eq(1)}$	$L_{eq(1)}$ Change
1	Pratt Boulevard between Continental Place and Pulaski Street	Weekday AM	73.2	73.6	0.4
		Weekday PM	72.5	72.9	0.4
		Saturday MD	74.2	74.6	0.4
2	Herb Hill Road between Charles and Brewster Streets	Weekday AM	54.6	56.1	1.5
		Weekday PM	52.7	54.5	1.8
		Saturday MD	55.4	56.9	1.5
3	Pratt Park between Charles Street and Glen Cove Avenue	Weekday AM	62.3	63.5	1.2
		Weekday PM	60.6	61.8	1.2
		Saturday MD	62.6	63.6	1.0
4	Herb Hill Road between Dickson and Charles Streets	Weekday AM	64.0	67.9	3.9
		Weekday PM	59.9	62.2	2.3
		Saturday MD	62.2	64.7	2.5
5	Dickson Street between The Place and Herb Hill Road	Weekday AM	64.3	64.7	0.4
		Weekday PM	60.6	60.9	0.3
		Saturday MD	60.1	60.3	0.2
6	Pedestrian Walkway Adjacent to Regina Maris	Weekday AM	51.9	52.1	0.2
		Weekday PM	49.7	50.1	0.4
		Saturday MD	50.1	50.4	0.3
7	Parking Lot at end of Garvies Point Road	Weekday AM	57.1	57.1	0.0
		Weekday PM	48.5	48.5	0.0
		Saturday MD	60.0	60.0	0.0

Notes: Noise levels at Sites 1, 2, and 3 were calculated using proportional modeling. Noise levels at Site 4 were calculated using the TNM. Noise levels at Sites 5, 6, and 7 were calculated using the TNM and the FTA model.
Source: AKRF, Inc.

c) Build Out Condition

Using the methodology previously described, Build noise levels were calculated at seven sites (1, 2, 3, 4, 5, 6 and 7) for the 2016 analysis year. These Build values are shown in Table III-H-7. The proportional model was used to calculate noise levels at Sites 1, 2 and 3. The TNM was used to calculate noise levels at Site 4. A combination of the TNM and the FTA model was used to calculate noise levels at Sites 5, 6, and 7 for vehicular traffic and ferry terminal noise, respectively.

In 2016, the maximum increase in $L_{eq(1)}$ noise levels at Site 1 when comparing the Build noise levels to the No Action noise levels, would be 1.1 dBA. This would occur during the weekday PM peak hour. A change of this magnitude would not be perceptible and would fall well below the New York State DEC threshold of 6 dBA for a significant impact. In 2016 during other times, the maximum increase in noise

levels at Site 1, when comparing the Build noise levels to the No Action noise levels, would be 0.9 dBA or less.

In 2016, the maximum increase in $L_{eq(1)}$ noise levels at Site 5 when comparing the Build noise levels to the No Action noise levels would be 2.0 dBA. This would occur during the Saturday MD peak hour. A change of this magnitude would be considered imperceptible and would fall well below the New York State DEC threshold of 6 dBA for a significant impact. In 2016 during other times, the maximum increase in noise levels at Site 5, when comparing the Build noise levels to the No Action noise levels, would be 1.7 dBA or less.

In 2016, the maximum increase in $L_{eq(1)}$ noise levels at Sites 2 and 3, when comparing the Build noise levels to the No Action noise levels, would be 3.1 dBA. This would occur at Site 2 during the Saturday MD peak hour and at Site 3 during the weekday PM hour. A change of this magnitude would be perceptible but would fall below the New York State DEC threshold of 6 dBA for a significant impact. In 2016 during other times, the maximum increase in noise levels at Sites 2 and 3, when comparing the Build noise levels to the No Action noise levels, would be 2.4 dBA or less (an imperceptible change.)

Table III-H-7
2016 Build Noise Levels

Site	Location	Time	No Build $L_{eq(1)}$	Build $L_{eq(1)}$	$L_{eq(1)}$ Change
1	Pratt Boulevard between Continental Place and Pulaski Street	Weekday AM	73.6	74.0	0.4
		Weekday PM	72.9	74.0	1.1
		Saturday MD	74.6	75.5	0.9
2	Herb Hill Road between Charles and Brewster Streets	Weekday AM	56.1	58.1	2.0
		Weekday PM	54.5	56.8	2.3
		Saturday MD	56.9	60.0	3.1
3	Pratt Park between Charles Street and Glen Cove Avenue	Weekday AM	63.5	65.1	1.6
		Weekday PM	61.8	64.9	3.1
		Saturday MD	63.6	66.0	2.4
4	Herb Hill Road between Dickson and Charles Streets	Weekday AM	67.9	69.3	1.4
		Weekday PM	62.2	67.3	5.1
		Saturday MD	64.7	71.8	**7.1**
5	Dickson Street between The Place and Herb Hill Road	Weekday AM	64.7	65.3	0.6
		Weekday PM	60.9	62.6	1.7
		Saturday MD	60.3	62.3	2.0
6	Pedestrian Walkway Adjacent to Regina Maris	Weekday AM	52.1	52.1	0.0[a]
		Weekday PM	50.1	50.0	-0.1[a]
		Saturday MD	50.4	50.4	0.0[a]
7	Parking Lot at end of Garvies Point Road	Weekday AM	57.1	61.4	4.3
		Weekday PM	48.5	61.7	**13.2**
		Saturday MD	60.0	62.9	2.9

Notes: 1) Noise levels at Sites 1, 2, and 3 were calculated using proportional modeling. Noise levels at Site 4 were calculated using the TNM. Noise levels at Sites 5, 6, and 7 were calculated using the TNM and the FTA model.

2) [a] No increase / slight decrease in noise levels due to the proposed buildings shielding the vehicular traffic on Garvies Point Road from Site 6.

3) Values that exceed the impact criteria are shown in **bold**.

Source: AKRF, Inc.

In 2016, $L_{eq(1)}$ noise levels at Site 6, when comparing the Build noise levels to the No Action noise levels, would be expected to stay the same or slightly decrease. This is due to the proposed project's buildings shielding the vehicular traffic on Garvies Point Road from Site 6.

In 2016, the maximum increase in $L_{eq(1)}$ noise levels at Site 4, when comparing the Build noise levels to the No Action noise levels, would be 7.1 dBA during the Saturday MD peak hour. The increase in noise levels at Site 4 is due to project-generated vehicles using Herb Hill Road to access/egress the project site. Herb Hill Road is the main point of access/egress to the project site for vehicles traveling from/to the east. A large percentage of the project-generated vehicles would pass through this intersection, and consequently, there is a large increase in traffic volume on Herb Hill Road. A change of this magnitude would be readily perceptible and

would exceed the NYS DEC threshold of 6 dBA for a significant impact (at other time periods a significant impact would not be expected to occur). However, it should be noted that while the increase exceeds the threshold, there currently exists only one residential structure at this receptor location that could be impacted. The feasibility and practicability of implementing various types of mitigation measures is being evaluated. At Site 4, both traffic and façade treatment (i.e., storm windows and air conditioners for alternative ventilation) mitigation options, where feasible and practicable, would be explored between the Draft and Final EIS. Without the implementation of mitigation measures, the proposed project would result in a significant noise impact at Site 4 during the Saturday MD peak hour.

In 2016, the maximum increase in $L_{eq(1)}$ noise levels at Site 7, when comparing the Build noise levels to the No Action noise levels, would be 13.2 dBA during the weekday PM peak hour. The expected increase in noise levels is due to project-generated vehicles using Garvies Point Road to access/egress the western half of the project site. Similar to existing conditions, Garvies Point Road is expected to be lightly trafficked in the No Action condition and, consequently, the background noise levels are low (i.e., in the high 40's dBA) during the weekday PM peak hour. The volume of vehicles that would use Garvies Point Road to access/egress the western half of the project site is a significant increase over traffic volumes in the No Action condition. However, it should be noted that this increase is based on an existing condition that is highly underutilized and therefore is seldom visited. A change of this magnitude would be readily perceptible and would exceed the NYS DEC threshold of 6 dBA for a significant impact (but the noise levels in the Build condition at Site 7 and the adjacent Garvies Point Preserve would remain within the NYSDEC's acceptable range for residential uses (below $L_{eq(1)}$ 65 dBA). At other time periods, such as weekday AM and Saturday mid-day hours, a significant impact would not be expected to occur.

The significant increase in noise level of 13.2 dBA may have potential adverse impacts to Garvies Point Preserve. A screening level analysis of the spatial extent of the increased noise levels associated with the project-generated vehicles indicates that significant increases in noise are expected to occur at approximately 200 feet from Garvies Point Road. This increased noise may reduce the quality of wildlife habitat provided by the adjacent woodlands of Garvies Point Preserve. For example, increased noise levels may result in lower breeding densities of songbirds by increasing stress levels and interfering with bird songs (Reijnen et al. 1995; Habib et al. 2007). Therefore, decreasing bird breeding activity may occur within the woodlands located within approximately 200 feet of Garvies Point Road. Since the predicted increase in noise levels is primarily a function of traffic noise (i.e., continuous, or non-impulsive noise), it has been shown that birds can become acclimated to continuous noise sources.

In addition to analyzing the sites discussed above, an additional study was conducted to determine whether traffic mitigation measures proposed for the intersection of Herb Hill Road and Garvies Point Road/Dickson Street would affect noise levels at adjacent receptors. This intersection is currently controlled by a stop sign on Herb Hill Road for traffic traveling westbound (traffic on Garvies Point Road and Dickson Street have no traffic control measures). In the future with the proposed project, three traffic control options were analyzed at this intersection:

- Stop sign on Herb Hill Road for traffic traveling westbound (traffic on Garvies Point Road and Dickson Street have no traffic control measures),
- Three-way traffic signal, and
- Roundabout/Rotary option.

Based on an analysis using the TNM, noise levels at the receptor locations closest to the intersection of Herb Hill Road and Garvies Point Road/Dickson Street (i.e., Sites 4 and 5) would be expected to be within 0.5 dBA or less for each of the three traffic control options listed above. A difference in noise levels of this magnitude is imperceptible. Consequently, each of the three traffic control options listed above are expected to produce comparable noise levels.

Stationary Sources

Mechanical Systems

Design and specifications for mechanical equipment, such as heating, ventilation, and air conditioning (HVAC), and elevator motors, are not yet determined. However, this equipment would be provided with an adequate buffer (ex: located on a building rooftop) to noise sensitive locations (i.e., residences, Garvies Point Preserve) and 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.

Outdoor Music Associated with the Proposed Restaurant

The proposed project would include a restaurant located at the end of Garvies Point Road, southwest of Block A. The proposed restaurant would include an outdoor patio area for dining patrons. Live music, at a sound level such that can be heard by patrons dining outdoors but not interfere with their conversations, would occur at the restaurant's outdoor seating area. To evaluate this issue, particularly the effects on residences south of Glen Cove Creek, a noise study was performed. The following is a summary of the noise study's methodology:

- Continuous 24-hour noise measurements were made at residential locations south of Glen Cove Creek (i.e., Sites 9 and 10) for a weekday and a weekend;

- A literature search was performed to determine a range of sound levels considered typical for the restaurant's proposed outdoor music operations;
- Noise levels due to the restaurant's proposed outdoor music operations were predicted at residential locations south of Glen Cove Creek, including Sites 9 and 10;
- The results of the analysis were compared to section §196-12 of the Glen Cove Noise Code and the NYS DEC impact criteria; and
- Where necessary, noise control measures were investigated to reduce any intrusive noise effect resulting from the restaurant's proposed outdoor music operations.

A literature search was performed to determine the range of noise levels that would be considered typical of the proposed outdoor music. A large majority of the literature that addresses noise levels from live music pertains to outdoor amphitheaters, stadium sized rocks concerts, indoor clubs, etc; all of these are very different from the proposed outdoor music operations at the project's restaurant (i.e., the restaurant is anticipated to have the type of music that is conducive for dining background music). The following sound data[1] for activities comparable to the proposed outdoor music operations was considered for use in the analysis:

Group 1- Unamplified light music, including small string assemblies, piano duets, and light jazz music without heavy percussion instruments. Group 1 type activities are envisioned as background music played at a level of intensity acceptable to accompany a patron's dining experience.

Estimated dBA range: Instantaneous noise levels less than 65 dBA at 100 Feet.

Group 2- Larger unamplified musical groups, partly amplified musical performances, amplified speech associated with oral presentations.

Estimated dBA range: Instantaneous noise levels from 65 to 75 dBA at 100 Feet.

The analysis was performed at three locations: 1) Site 9, located at Shore Road and Albin Street, 2) Site 10, located at The Boulevard at Cliff Way, and 3) the closest residential location to the proposed restaurant, located at 158 Shore Road. Two analysis time periods were examined: 1) Daytime (7 AM to 10 PM), and 2) Nighttime[2] (10 PM to Midnight). The analysis is conservative for the following reasons:

- The lowest measured 1-hour L_{eq} for both of the analysis time periods was used to calculate potential impacts at the three locations;

[1] Sound data from the, "American Museum of Natural History Planetarium and North Side Project" FEIS, AKRF, Inc., 1996.

[2] Generally it is not anticipated that music would be performed after midnight.

- The maximum instantaneous sound level for music type Group 1 (65 dBA at 100 feet) and Group 2 (75 dBA at 100 feet) was assumed;
- The analysis assumes a conventional sound system for the proposed restaurant;
- No acoustical benefit from shielding/intervening structures was accounted for; and
- No attenuation due to ground or air absorption was assumed.

Consequently, the outdoor music noise analysis was prepared using the results of noise monitoring program, sound data for Groups 1 and 2, and acoustical fundamentals. The results of the analysis are shown in Table III.H-8.

At the closest residence, located at 158 Shore Road, outdoor music type Group 1 would not be expected to exceed the Glen Cove Noise Code during the weekday or weekend at any time, and outdoor music type Group 2 would not be expected to exceed the Glen Cove Noise Code during the weekday or weekend daytime hours [7 AM to 10 PM]). Absent the implementation of the design measures discussed below, which the developer is committed to abide by, during the weekday and weekend nighttime hours of 10 PM to midnight, an outdoor event of music type Group 2 may exceed the Glen Cove Noise Code at residential locations adjacent to 158 Shore Road. Design measures developed to avoid these potential exceedances are discussed below.

At Site 9, located at Shore Road and Albin Street, outdoor music type Group 1 would not be expected to exceed the Glen Cove Noise Code during the weekday or weekend at any time, and outdoor music type Group 2 would not be expected to exceed the Glen Cove Noise Code during the weekday or weekend daytime hours [7 AM to 10 PM]). Absent the implementation of the design measures discussed below, which the developer is committed to abide by, during the weekday and weekend nighttime hours of 10 PM to midnight, an outdoor music type Group 2 may exceed the Glen Cove Noise Code at residential locations adjacent to Site 9.

At Site 10, located at The Boulevard at Cliff Way, outdoor music type Group 1 or Group 2 would not be expected to exceed the Glen Cove Noise Code during the weekday or weekend at any time.

At all three locations (i.e., Site 9, Site 10, and 158 Shore Road) during all analysis time periods (i.e., weekday and weekend daytime and nighttime), for both outdoor music type Group 1 or Group 2, the project impact criteria would not be expected to be exceeded.

Project Design Improvements

Because outdoor music of type Group 2 may exceed the Glen Cove Noise Code at residential locations adjacent to Site 9 and 158 Shore Road during the weekday and weekend nighttime hours of 10 PM to midnight, project design measures have been developed to avoid the potential exceedances identified in the analyses. The developer is committed to abide by and include the design measures discussed below. To avoid these potential impacts, the project's sponsor will install a dedicated sound system (i.e., a distributed sound system that would control speaker type, orientation, layout, directivity, and sound emissions so as to control noise levels at sensitive receptors, particularly residential locations south of Glen Cove Creek) at the proposed restaurant. The sound system will be designed so that noise levels due to the proposed outdoor music at the project's restaurant would not exceed the Glen Cove Noise Code at any of the analyzed receptor locations during any time period. Consequently, a significant impact is not predicted to occur due to outdoor music operations at the proposed restaurant.

Table III.H-8
Proposed Restaurant Outdoor Music Analysis Results (in dBA)

				Sound Level of Music Only at Receptor							Music Type Group 1 Results			Music Type Group 2 Results		
Site	Location	Day	Condition[1]	Lowest Measured 1-Hour L_{eq}	Music Type Group 1	Without Project Design Improvements, Exceed Glen Cove Noise Code Section §196-12	With Project Design Improvements, Exceed Glen Cove Noise Code Section §196-12	Music Type Group 2	Without Project Design Improvements, Exceed Glen Cove Noise Code Section §196-12	With Project Design Improvements, Exceed Glen Cove Noise Code Section §196-12	Total (Background + Music)	Increase Over Existing	Exceed DEC Impact Criteria[4]	Total (Background + Music)	Increase Over Existing	Exceed DEC Impact Critiera[4]
9	Shore Road at Albin Street	Weekday	Daytime	56.4	40.7	No	No	50.7	No	No	56.5	0.1	No	57.5	1.1	No
			Nighttime	53.5	40.7	No	No	50.7	Yes	No	53.7	0.2	No	55.3	1.8	No
		Saturday	Daytime	55.7	40.7	No	No	50.7	No	No	55.8	0.1	No	56.9	1.2	No
			Nighttime	53.1	40.7	No	No	50.7	Yes	No	53.4	0.3	No	55.1	2.0	No
		Sunday	Daytime	53.7	40.7	No	No	50.7	No	No	53.9	0.2	No	55.5	1.8	No
			Nighttime	49.2	40.7	No	No	50.7	Yes	No	49.8	0.6	No	53.0	3.8	No
10[2]	The Boulevard at Cliff Way	Weekday	Daytime	55.7	37.7	No	No	47.7	No	No	55.8	0.1	No	56.4	0.7	No
			Nighttime	55.0	37.7	No	No	47.7	No	No	55.1	0.1	No	55.8	0.8	No
		Saturday	Daytime	59.1	37.7	No	No	47.7	No	No	59.2	0.1	No	59.4	0.3	No
			Nighttime	57.6	37.7	No	No	47.7	No	No	57.7	0.1	No	58.1	0.5	No
		Sunday	Daytime	50.7	37.7	No	No	47.7	No	No	50.9	0.3	No	52.4	1.8	No
			Nighttime	51.9	37.7	No	No	47.7	No	No	52.1	0.2	No	53.3	1.4	No
Closest[3] Residence	158 Shore Road	Weekday	Daytime	56.4	44.6	No	No	54.6	No	No	56.7	0.3	No	58.6	2.2	No
			Nighttime	53.5	44.6	No	No	54.6	Yes	No	54.0	0.5	No	57.1	3.6	No
		Saturday	Daytime	55.7	44.6	No	No	54.6	No	No	56.0	0.3	No	58.2	2.5	No
			Nighttime	53.1	44.6	No	No	54.6	Yes	No	53.7	0.6	No	56.9	3.8	No
		Sunday	Daytime	53.7	44.6	No	No	54.6	No	No	54.2	0.5	No	57.2	3.5	No
			Nighttime	49.2	44.6	No	No	54.6	Yes	No	50.5	1.3	No	55.7	6.5	No

Notes: [1] Daytime is from 7 AM to 10 PM; Nighttime is from 10 PM to Midnight.
[2] Site 10 is located in the town of Sea Cliff; as per definition (3) of "Residential Occupancy" in the Glen Cove Noise Code, the Glen Cove Noise Code is applicable at Site 10.
[3] Existing noise levels at 158 Shore Road were assumed to be the same as Site 9.
[4] As defined on page 6, a significant impact would occur if an increase of 6 dBA or greater occurred and the resulting total noise level was greater than 65 dBA at a residence.

Sources: AKRF, Inc.

Interior Noise Levels Within the Proposed Buildings

A building attenuation analysis was performed for the new buildings (i.e., Building Blocks A through J) that are to be constructed as part of the proposed project. The building attenuation analysis for the new buildings is based on exterior noise levels and the building design. For residential uses an interior noise level of 45 dBA $L_{eq(1\text{-}hour)}$ is recommended, and for non-residential (i.e., commercial, office, etc.) uses an interior noise level of 50 dBA $L_{eq(1\text{-}hour)}$ is recommended. The results of the noise monitoring and the detailed analysis using the TNM were used to determine whether the proposed building designs would have the appropriate level of building attenuation to provide interior noise levels that would be considered acceptable for each building's intended use.

The proposed project study area currently includes a mix of uses: industrial, manufacturing and commercial uses, vacant land and outdoor recreation areas. Currently, the ambient noise levels are primarily a function of traffic on the adjacent streets, activity at the industrial/manufacturing/commercial uses, and maritime activity. In general, in the future with the proposed project, vehicular traffic would be expected to be the dominant noise source throughout the study area. The results of the building attenuation analysis are presented in **Table III.H-9**. The table includes the type of window (i.e., single or double-glazed), type of alternate ventilation (e.g., central air-conditioning, PTAC units), and the amount of window/wall attenuation that would be associated with the proposed design of each building.

Based on the results of the analysis, the building design window/wall attenuation measures for the proposed buildings at Building Blocks A through J would be expected to be sufficient to achieve acceptable interior noise levels for each building's intended use.

Table III.H-9
Building Attenuation Analysis Results

Building Block	Use	Build $L_{eq(1)}$	Window Type*	Alternate Ventilation*	Attenuation[1]	Estimated Interior $L_{eq(1)}$	Acceptable
A	Residential	56.5	Double-Glazed	Central A/C	35	21.5	Yes
B	Residential	57.7	Double-Glazed	Central A/C	35	22.7	Yes
C[2]	Hotel	58.6	Double-Glazed	Central A/C	35	23.6	Yes
D[3]	Office	64.7	Double-Glazed	Central A/C	35	29.7	Yes
E	Residential	64.4	Double-Glazed	PTAC	30	34.4	Yes
F	Residential	54.9	Double-Glazed	PTAC	30	24.9	Yes
G	Residential	58.4	Double-Glazed	PTAC	30	28.4	Yes
H	Residential	66.4	Double-Glazed	PTAC	30	36.4	Yes
I[3]	Residential	64.8	Double-Glazed	Central A/C	35	29.8	Yes
J	Commercial	67.2	Double-Glazed	Central A/C	35	32.2	Yes

Notes: [1] As per the New York State Department of Transportation Environmental Procedures Manual (page 3.1-13)

[2] Based on an analysis using the FTA model for the ferry terminal noise, Building Block C would have sufficient design measures included for facades that have a direct line-of-sight to the ferry terminal to achieve acceptable interior noise levels.

[3] Based on an analysis (using the noise monitoring results of Site 8 and acoustical fundamentals) of the noise generated by the asphalt plant, located on the south side of Glen Cove Creek, Building Block D and I would have sufficient design measures included for facades that have a direct line-of-sight to the asphalt plant to achieve acceptable interior noise levels.

Sources: AKRF, Inc.

* RXR-Glen Isle Partners, LLC

The Proposed Project's Newly Created Open Spaces

The proposed project would create public open space along the Glen Cove Creek and Hempstead Harbor waterfront. One-hour L_{eq} noise levels are due to a combination of vehicular traffic and, for some locations, noise from the asphalt plant and/or ferry terminal. For passive recreation activities it is desirable for noise levels in open spaces to be below 55 dBA $L_{eq(1)}$, and for active recreation activities it is desirable for noise levels to typically not exceed the low 60s dBA $L_{eq(1)}$. Noise levels at most locations in these newly created open spaces would vary, depending on location and time of day, and are expected to be in the range in of 40 to 55 dBA $L_{eq(1)}$. Noise levels in the newly created open spaces on the eastern portion of the project site that are located directly across the Glen Cove Creek from the existing asphalt plant would be in the high 50s to low 60s dBA $L_{eq(1)}$ when the asphalt plant is in operation and in the high 40s to mid 50s when the asphalt plant is not in operation. Noise levels in the newly created open spaces

adjacent to the ferry terminal would be in the mid 50s dBA $L_{eq(1)}$. Noise levels at open space locations immediately adjacent to vehicular roadways would vary, depending on location, proximity to the roadway and time of day, and are expected to be in the low 60s to low 70s dBA $L_{eq(1)}$. As the distance from a roadway is increased, noise levels due to vehicular traffic would also decrease. It is also noted that the proposed buildings would provide shielding and consequently reduce vehicular traffic noise emanating from Garvies Point and Herb Hill Road at various locations within the newly created open spaces. In general, noise levels in the majority of the newly created open spaces would be considered acceptable. At those locations directly opposite the asphalt plant, noise levels during operation of the asphalt plant in the newly created open spaces would be above the recommended level for open spaces (and comparable to noise levels at the existing City recreational facilities and open spaces directly south of the asphalt plant), but would be considered acceptable when the asphalt plant is not in operation (as discussed in the Land use Chapter, the draft Master Plan envisions the expansion of recreational uses in the area and the eventual relocation of industrial type uses). At some locations in the newly created open spaces, the noise levels may be above what is desirable, but this would not be considered a significant impact. Noise levels in many parks and open space areas that are adjacent to moderately or heavily trafficked roadways exceed these values, and still function quite well/serve their purpose. Consequently, noise levels within the proposed project's newly created open spaces would not result in a significant noise impact on the users of the open spaces.

d) Construction

Impacts on community noise levels during construction can result from noise from construction equipment operation, and from construction vehicles and delivery vehicles traveling to and from the site. Noise and vibration levels at a given location are dependent on the type and quantity of construction equipment being operated, the acoustical utilization factor of the equipment (i.e., the percentage of time a piece of equipment is operating), the distance from the construction site, and any shielding effects (from structures such as buildings, walls, or barriers). Typical noise levels of construction equipment are shown in **Table III.H-10**. Noise levels caused by construction activities would vary widely, depending on the phase of construction and the location of the construction activities relative to noise sensitive receptor locations. Noise sensitive receptors in the vicinity of the project sites include the Garvies Point Preserve, residential neighborhoods to the north and east of the project site, and residential neighborhoods south of the Glen Cove Creek and project site.

Table III.H-10
Typical Noise Emission Levels for Construction Equipment

Equipment Item	Noise Level at 50 ft. (dBA)
Air compressor	81
Backhoe	80
Ballast Equalizer	82
Ballast Tamper	83
Compactor	82
Concrete Mixer	85
Concrete Pump	82
Concrete Vibrator	76
Crane, Derrick	88
Crane, Mobile	83
Dozer	85
Generator	81
Grader	85
Impact Wrench	85
Jack Hammer, Drills	88
Loader	85
Mounted Impact Hammer (Hoe Ram)	90
Paver	89
Pile Driver (Impact)	101
Pile Driver (Sonic)	96
Pneumatic Tool	85
Pump	76
Rail Saw	90
Rock Drill	98
Roller	74
Saw	76
Scarifier	83
Scraper	89
Shovel	82
Spike Driver	77
Tie Cutter	84
Tie Handler	80
Tie Inserter	85
Truck	88

Sources: 1) Transit Noise and Vibration Impact Assessment, Federal Transit Administration (FTA), May 2006.
2) Federal Highway Administration (FHWA) Roadway Construction Noise Model (RCNM)

Construction noise is regulated by the EPA's noise emission standards and the City of Glen Cove Noise Code [sections §196-4(H) and §196-4(O)]. These local and federal requirements mandate that specific construction equipment meet specified noise emission standards; that construction activities be limited to weekdays between the hours of 7 AM and 6 PM.

A screening level analysis was performed to assess noise due to construction activities using a methodology developed by the Federal Transit Administration (Transit Noise and Vibration Impact Assessment, FTA, May 2006). This methodology conservatively predicts construction noise values based on the following:

- The two noisiest pieces of construction equipment are examined;
- The equipment is assumed to be operating at the center of each construction site;
- For each piece of construction equipment, full power operation (i.e., acoustical utilization factor of 1) for a time period of one hour is assumed;
- Free-field conditions (i.e., no shielding) are assumed; and

- Ground effects are ignored (i.e., G = 0).

Using this procedure, construction activities are assumed to have the potential to result in a significant impact at residential receptors if the 1-hour L_{eq} exceeds 90 dBA during the daytime hours.

Table III.H-11 shows the results of the construction noise analysis. While construction activities would produce noise levels that may be noisy and intrusive, they would not be expected to result in significant noise impacts. All of the predicted noise levels shown below in Table III-H-10 would be less than the 90 dBA guideline and consequently construction activity would not have the potential to significantly impact adjacent noise sensitive uses.

Table III-H-11
Construction Noise Analysis Results

Receiving Property	Associated Land Use	Construction Equipment Location	Approximate Distance to Receiver (feet)	1-Hour L_{eq} (dBA)
South of Project Site / Glen Cove Creek	Residential / Open Space	Building Block B	1600	71.2
East of Project Site	Residential / Open Space	Building Block J	140	88.2*
Garvies Point Preserve	Wildlife Preserve	Building Block B	215	88.7
North of Project Site	Residential	Building Block G	240	87.7
Site 9 (Shore Road at Albin Street)	Residential	Building Block C	1220	73.6
Site 10 (Cliff Way at the Boulevard)	Residential / Open Space	Building Block A	2795	66.4

Notes: The two noisiest pieces of construction equipment assumed to be operating onsite were the impact pile driver and the hoe ram.

* Vibratory pile drivers were assumed for the construction of Block J; impact pile drivers were assumed for other blocks.

Source: AKRF, Inc.

In general, for Building Blocks A through J, the noisiest activities (demolition, excavation, and foundation/superstructure) would take place for a limited period of time (approximately 18 to 24 consecutive months). Typical noise levels due to construction activities during the other phases would be less than those during the demolition, excavation, and foundation/superstructure phases. Construction activities would commence on the eastern portion of the project site at Building Blocks E and H in the first quarter of 2010. As work progresses, the construction activities and their associated noise would gradually move along the project site, from east to west, terminating at Building Block A in the fourth quarter of 2016. Therefore, no long-term, significant noise impacts at adjacent noise sensitive receptors are expected from construction activities.

While the construction period would be approximately seven years in total, the level of noisy and intrusive activity would vary and move throughout the project

site, and no one area would experience the effects of the project's construction activities for the full seven-year duration. Construction adjacent to each of the new project buildings would last between 6 and 24 consecutive months, depending on the location, and would typically consist of a short period of demolition (1 month), excavation (1 to 2 months), foundations/superstructure (3 months), some exterior work (3 months), and interior work, but the noisiest adjacent activities for each of the new project buildings would take place for a limited period of time (less than 24 consecutive months). Therefore, no long-term, significant noise impacts on the project buildings to be constructed as part of the proposed project are expected from construction activities.

4. Mitigation Measures

A wide variety of measures (source controls, path control, and receptor controls) can be used to minimize construction noise and reduce potential noise impacts. During each phase of construction at the project site, measures would be implemented to reduce construction noise and vibration levels to within the limits required by applicable codes and regulations. During periods of extensive excavation activity, measures would be taken to ensure that no structural damage to adjacent structures would occur. For example, if deemed necessary: 1) the use of on-site vibration monitoring equipment and crack measurements; 2) the excavation contractor may install soldier piles and bracing to stabilize the foundations of the adjacent buildings and structures; and 3) in more extreme cases, the entire foundation of the adjacent building can be braced with horizontal members held in place with vertical and batter piles.

In terms of source controls (i.e., reducing noise emission levels at the source or during the most noise sensitive time periods), all contractors and subcontractors would be required to properly maintain their equipment and have the appropriate manufacturer's noise reduction devices, including, but not limited to, a quality muffler that is free of rust, holes, and exhaust leaks installed.

In terms of path controls (e.g., placement of equipment, implementation of barriers between equipment and noise sensitive receptors), the following measures for construction would be implemented to the extent feasible and practicable:

- Noisy equipment, such as generators, cranes, trailers, concrete pumps, concrete trucks, and dump trucks, would be located away from and shielded from noise sensitive receptor locations.
- During the construction of Building Block J, either vibratory pile drivers or a shroud/noise bellows system would be used in conjunction with impact pile drivers to reduce noise levels from pile driving activity at adjacent noise sensitive locations (i.e., residences and parks/open space).