



PORT CHESTER GATEWAY

Noise Assessment

**Prepared for
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1.0 PROJECT DESCRIPTION

The Proposed Action is the redevelopment of the former United Hospital site with 762 residential units varying from studio to two-bedroom units and ±254,000 square feet of commercial and retail space with parking to serve these uses. The Proposed Action is located at 406 Boston Post Road in Port Chester, Westchester County, New York. The project is bounded on the south by Boston Post Road and High Street, on the west by High Street and Interstate 287, on the north by Abendroth Park, and on the east by Boston Post Road. Within close proximity to the Project Site are Interstate 95 and Interstate 287, both to the east-southeast-south of the Project Site. The Project Site is approximately 15.4 acres of previously developed hospital and accessory use.

The land uses in the immediate vicinity of the project are diverse. Along Boston Post Road, to the south and east of the Project Site, is a commercial corridor with retail and automotive uses. To the south of the Site is nursing home with 160 residents. North of the site is Abendroth Park, which has a community baseball field and soccer field, and residential uses.

The Project Site's topography is relatively flat with elevations ranging from 70 feet in the northeast corner to 100 feet in the center of the site. The majority of the site area ranges between 90 and 100 feet.

2.0 GENERAL INFORMATION ON NOISE

Noise is defined as unwanted sound resulting from vibrations in the air. The range of pressures that cause the vibrations that create noise is large. Noise is therefore measured on a logarithmic scale, expressed in decibels (dB). The frequency of a sound is the “pitch” (high or low). The unit for frequency is hertz (Hz). Most sounds are composed of a composite of frequencies. The normal human ear can usually distinguish frequencies from 20 Hz (low frequency) to about 20,000 Hz (high frequency), although people are most sensitive to frequencies between 500 Hz and 4000 Hz. The individual frequency bands can be combined into one overall dB level.

Noise is typically measured on the A-weighted scale (dBA). The A-weighting scale was developed and has been shown to provide a good correlation with the human response to sound and is the most widely used descriptor for community noise assessments. (Harris, 1991). The faintest sound that can be heard by a healthy ear is about 0 dBA, while an uncomfortably loud sound is about 120 dBA. In order to provide a frame of reference, some common sound levels are listed below.

- Chainsaw at 30 feet 90 dBA
- Truck at 100 feet 85 dBA
- Noisy Urban Environment 75 dBA
- Lawn Mower at 100 feet 65 dBA
- Average Speech 60 dBA
- Typical Suburban Daytime 50 dBA
- Quiet Office 40 dBA
- Quiet Suburban nighttime 35 dBA
- Soft Whisper at 15 feet 30 dBA

Common terms used in this noise analysis are defined below.

L_{eq} —The equivalent noise level over a specified period of time (i.e., 1-hour). It is a single value of noise that includes all of the varying noise energy in a given duration.

3.0 APPLICABLE STANDARDS

3.1 Village of Port Chester

The Village of Port Chester has nuisance type noise ordinance (Chapter 224 of the Zoning Code). The ordinance prohibits unreasonable noise such as car horns and stereo, but does not contain any numerical limits applicable to the proposed Project.

Noise from construction activities is exempted from the standard, but is only permitted between the hours of 8 a.m. and 8 p.m. on weekdays, and between the hours of 10 a.m. and 7 p.m. on weekends and legal holidays.

3.2 New York State Department of Environmental Conservation (NYSDEC)

The NYSDEC issued a program guidance document entitled “Assessing and Mitigating Noise Impacts” on October 6, 2000. The guidance discusses various aspects of noise and suggested steps for performing noise assessments (DEC Policy DEP-001). Further, it provides suggestions on evaluating significant increases in noise levels.

The guidance notes that an increase in ambient noise of 10 dBA is perceived by the majority of people to be a doubling of the loudness of a sound. For example, if the ambient sound level is 50 dBA, and is then increased to 60 dBA, most people would perceive the new noise level as twice as loud. The guidance recommends that for non-industrial settings, the SPL (Sound Pressure Level) should probably not exceed ambient noise levels by more than 6 dBA at a given receptor. The addition of any noise source, in a non-industrial setting, should not raise the total future ambient noise level above a maximum of 65 dBA. This would be considered the “upper end” limit since 65dBA allows for undisturbed speech at a distance of approximately three feet. Noise levels in industrial or commercial areas should not exceed 79 dBA.

The NYSDEC guidance explicitly states that the 6 dBA increase is to be used as a general guideline. There are other factors which should also be considered. For example, in settings with very low ambient sound levels, a greater increase may be acceptable since sound levels are so low.

There are no known Federal noise standards applicable to this project.

4.0 EXISTING NOISE LEVELS

TRC conducted an ambient noise monitoring program in the vicinity of the proposed Project site on May 7, 2010. The ambient noise monitoring program was conducted in order to establish baseline conditions in the area and was conducted in accordance with industry accepted ANSI standards.

4.1 Measurement Locations

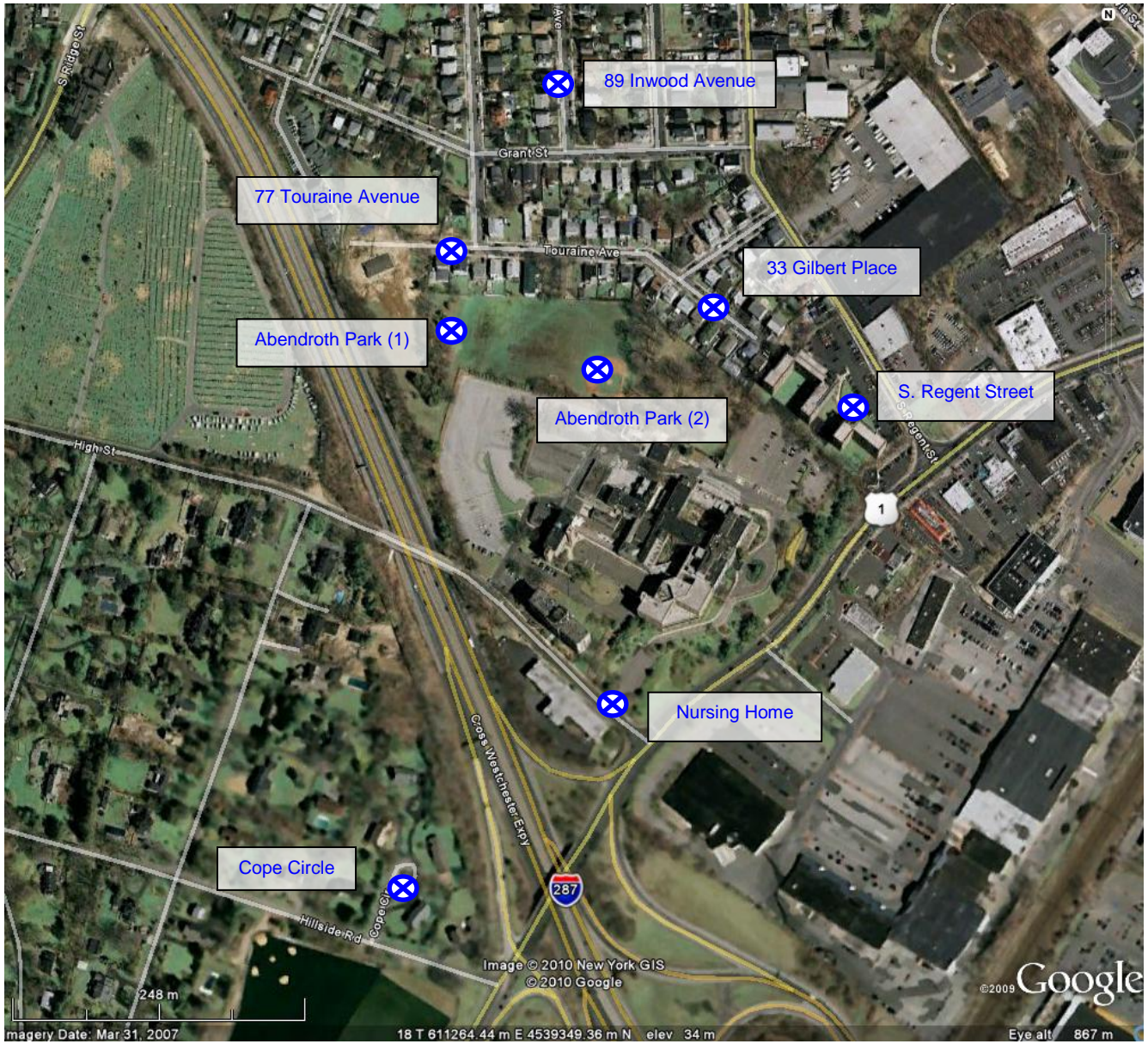
The proposed Project will include construction work in the Project area itself, as well as increased truck traffic associated with debris removal. The area in the vicinity of the Project consists of residential, commercial and recreational land uses. Noise sensitive areas in the vicinity were identified and noise monitoring locations were selected in order to obtain ambient data representative of these general locations.

The selected noise monitoring locations have the potential of being impacted by noise from construction equipment. The noise monitoring locations, depicted on Figure 1, include the following:

- 89 Inwood Avenue
- 77 Touraine Avenue (Touraine Avenue West)
- 33 Gilbert Place (Touraine Avenue East)
- Abendroth Park 1
- Abendroth Park 2
- South Regent Street
- Port Chester Nursing Home and Rehabilitation Center
- Cope Circle

Meteorological conditions during the monitoring program included temperatures that ranged from 55 degrees F to 77 degrees F, and clear to partly cloudy skies. No strong winds were observed at the measurement locations while noise monitoring was being conducted. Meteorological measurements were taken periodically using a Kestrel Model 3500 hand held weather meter. The meter was used to measure temperature and wind speed.

Figure 1 – Monitoring Locations



4.2 Measurement Methodology

The noise monitoring program included short-term monitoring (15 minutes in duration at each location) throughout the hours when construction may occur (8 a.m. to 8 p.m.). Short term monitoring was conducted at a total of eight locations in the vicinity of the Project. Measurements were repeated at all locations throughout the day on a rotating basis, resulting in a total of four measurements for each location, except that a soccer game being conducted in Abendroth Park resulted in only three measurements for the second Abendroth Park location.

Monitoring was conducted with a RION NA-27 precision Type 1 octave band analyzer. The microphone was fitted with a windscreen to reduce wind generated noise and mounted on a tripod at a height of approximately five feet above the ground. The instrument was set to “fast” response and configured to measure and store the L_{eq} , L_{90} and L_{10} one-third octave band levels, although the L_{eq} descriptor was used herein to characterize ambient conditions.

4.3 Measurement Results

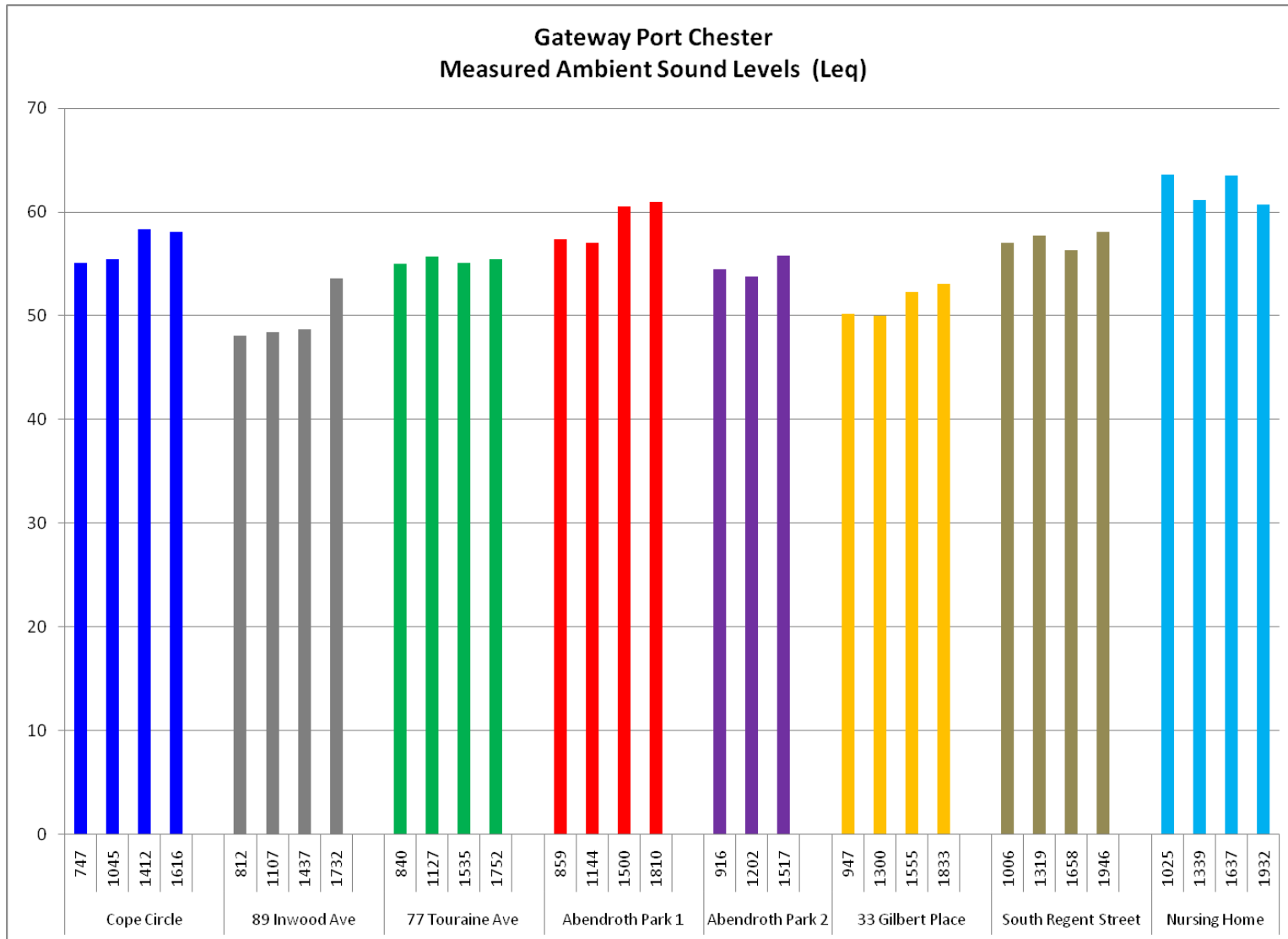
The existing noise environment in the area is dominated by vehicular traffic noise from the major roadways in the area that include I-287 and Route 1, and the major local roadways. Natural sounds (birds and insects), and some intrusive sounds such as aircraft overflights and train horns were also present. Traffic noise was most pronounced at the South Regent Street and Nursing Home locations, as well as the Abendroth Park locations.

An overall summary of the A-weighted L_{eq} sound levels measured at all locations is presented in tabular form in Table 1, and graphically in Figure 2. The data reveal that the highest existing noise levels were measured at the locations most affected by existing vehicular traffic, including the Nursing Home and Abendroth Park locations. The lowest sound levels were measured at the 89 Inwood Ave and 33 Gilbert Place locations. Measured noise levels at each individual location were very consistent throughout the day, ranging only 3-4 dBA for most locations. All measurements fell within a 48 dBA to 64 dBA range, typical for mixed residential and commercial areas.

Table 1 – Measured Ambient Sound Levels

Gateway Port Chester Measured Ambient Sound Levels (dBA) May 7, 2010					
Cope Circle	Time	747	1045	1412	1616
	Leq	55.1	55.4	58.3	58.1
89 Inwood Ave	Time	812	1107	1437	1732
	Leq	48.1	48.4	48.7	53.6
77 Touraine Ave	Time	840	1127	1535	1752
	Leq	55	55.7	55.1	55.4
Abendroth Park 1	Time	859	1144	1500	1810
	Leq	57.4	57	60.5	61
Abendroth Park 2	Time	916	1202	1517	---
	Leq	54.5	53.8	55.8	---
33 Gilbert Place	Time	947	1300	1555	1833
	Leq	50.2	50	52.3	53.1
South Regent Street	Time	1006	1319	1658	1946
	Leq	57	57.7	56.3	58.1
Nursing Home	Time	1025	1339	1637	1932
	Leq	63.6	61.1	63.5	60.7

Figure 2 – Measured Ambient Sound Levels



5.0 FUTURE CONDITIONS WITHOUT THE PROJECT

Without the project, the noise levels around the project site would likely remain essentially unchanged, with no additional traffic or other noise generated by the site.

6.0 POTENTIAL IMPACTS OF THE PROJECT

Potential noise impacts from the proposed project could be caused by increases in noise levels associated with increases in vehicular traffic, new HVAC units, and, for the short-term, increases in noise during project construction.

This noise assessment consisted of both a background noise monitoring program and a noise impact evaluation. Background noise monitoring was conducted in order to quantify the existing noise environment during peak traffic hours and at other hours of the day when construction activities are expected to occur. The noise impact evaluation was performed by calculating expected increases in noise associated with the "Build" condition over the "No-Build" condition traffic volumes, and by estimating project construction noise levels. The expected increases in vehicular noise levels were then compared to the project impact criterion.

Noise Impact Criteria

The NYSDEC guidance recommends that for non-industrial settings, the SPL (Sound Pressure Level) due to a permanent source should probably not exceed ambient noise levels by more than 6 dBA at a given receptor in order to avoid noise impacts. The addition of any noise source, in a non-industrial setting, should not raise the total future ambient noise level above a maximum of 65 dBA.

The NYSDEC guidance explicitly states that the 6 dBA increase is to be used as a general guideline. There are other factors which should also be considered. For example, in settings with very low ambient sound levels, a greater increase may be acceptable since sound levels are so low.

6.1 Operational Noise - Traffic

A noise impact evaluation was performed by calculating expected noise level increases associated with traffic volumes. Traffic noise was evaluated by obtaining traffic count data for the No-Build and Build scenarios. Noise levels associated with vehicular traffic are a function mainly of traffic speed, vehicle mix (automobiles, medium trucks, heavy trucks) and volume.

Posted vehicle traffic speeds will not be affected by the project. Vehicle mixes are also anticipated to be essentially the same. Therefore, any changes in traffic related noise will be a function of the change in volume. For example, a doubling of traffic volume (assuming speeds and vehicle mixes do not change) equates to an increase in noise of 3 dBA.

Traffic volumes for each of the intersections evaluated for the traffic study, for each scenario, were tabulated and are presented in Table 2. The increase in noise over the No-Build scenario for each time period is also presented.

Table 2 - Traffic Volume Noise Analysis

Gateway Port Chester Traffic Noise Analysis							
Intersection	No-Build	Build	Sound Level Increase over	Intersection	No-Build	Build	Sound Level Increase over
High Street & Site Driveway	Traffic Volumes			High Street & Ridge Street	Traffic Volumes		
AM Peak	409	692	2.3	AM Peak	882	941	0.3
PM Peak	510	906	2.5	PM Peak	1189	1271	0.3
Saturday Peak	574	1066	2.7	Saturday Peak	1147	1248	0.4
Slater Street & Route 1				High Street & Grandview Avenue			
AM Peak	1358	1487	0.4	AM Peak	420	479	0.6
PM Peak	1604	1783	0.5	PM Peak	511	592	0.6
Saturday Peak	1864	2087	0.5	Saturday Peak	554	656	0.7
Pearl Street & Route 1				High Street & Evergreen Avenue			
AM Peak	1941	2096	0.3	AM Peak	404	463	0.6
PM Peak	2312	2534	0.4	PM Peak	517	598	0.6
Saturday Peak	2582	2865	0.5	Saturday Peak	541	643	0.8
S. Regent Street & Route 1				Cedar Street & Route 1			
AM Peak	2347	2533	0.3	AM Peak	1466	1533	0.2
PM Peak	2614	2884	0.4	PM Peak	1499	1589	0.3
Saturday Peak	2709	3055	0.5	Saturday Peak	1345	1463	0.4
Kohl's/Site & Route 1				Peck Avenue & Route 1			
AM Peak	2168	2531	0.7	AM Peak	1647	1715	0.2
PM Peak	2729	3115	0.6	PM Peak	1755	1844	0.2
Saturday Peak	3053	3817	1.0	Saturday Peak	1674	1790	0.3
High Street & Route 1				Peck Avenue & Midland Avenue			
AM Peak	2346	2738	0.7	AM Peak	1084	1124	0.2
PM Peak	2774	3259	0.7	PM Peak	1111	1157	0.2
Saturday Peak	2914	3495	0.8	Saturday Peak	1180	1236	0.2
I-95 Off-Ramp & Route 1 NB				Hillside Avenue & Purchase Street			
AM Peak	1026	1241	0.8	AM Peak	764	781	0.1
PM Peak	1185	1392	0.7	PM Peak	870	894	0.1
Saturday Peak	1307	1614	0.9	Saturday Peak	875	906	0.2
I-95 On-Ramp/I-287 EB Off-Ramp & Route 1				Grandview Avenue & Hillside Road			
AM Peak	1991	2220	0.5	AM Peak	242	242	0.0
PM Peak	2086	2364	0.5	PM Peak	145	145	0.0
Saturday Peak	2053	2399	0.7	Saturday Peak	128	128	0.0
Hillside Road & Route 1				Route 1 and Grace Church/South Main Street			
AM Peak	1199	1266	0.2	AM Peak	1418	1509	0.3
PM Peak	1243	1333	0.3	PM Peak	1610	1734	0.3
Saturday Peak	1270	1388	0.4	Saturday Peak	1742	1896	0.4

A review of the data in Table 2 reveals that negligible increases over the no-build scenario will be experienced at any of the intersections due to vehicular traffic. The greatest calculated increase is only 2.7 dBA. Most increases are limited to less than 1 dBA, which is an essentially imperceptible increase. Using the NYSDEC impact criterion discussed previously, no significant adverse noise impacts would be expected from increased vehicular traffic associated with the project. A more detailed assessment of traffic noise would not be warranted.

6.1.1 Mitigation

No mitigation measures will be required for vehicular traffic noise as no noise impacts are expected as a result of future traffic volumes associated with the project.

6.2 Construction Noise

The construction process for this Project will generally include the following phases:

- Demolition
- Excavation
- Foundation Construction
- Building Construction
- Restoration/Finishing

Construction equipment utilized differs in each phase, but in general, heavy equipment (bulldozers, loaders, dump trucks) is used during the excavation phase. Noise is generated during construction primarily from diesel engines that power the equipment. Exhaust noise is usually the predominant source of diesel engine noise, which is the reason that maintaining functional mufflers on all equipment will be a requirement of the Project.

Noise levels of construction equipment likely to be used for the Project are summarized in Table 3 (BBN, 1971; NYSDEC, 1974, MaDEP, 2002). Noise levels in the table are presented for a reference distance of 50 feet. Typical site average sound levels for each phase of construction with the minimum and maximum required equipment in operation are presented in Table 4 (BBN, 1971). The calculated site average sound levels for each monitoring location area, along with the range of measured ambient sound levels, are provided in Table 5.

Table 3 – Noise Levels of Major Construction Equipment

Equipment Type	Noise Level at 50 Feet (dBA)
Cement Trucks	85
Front Loaders	79
Graders	85
Bulldozers	85
Pickup Trucks	55
Backhoes	80
Concrete Mixers	85
Excavator	85

Sources (BBN, 1971; NYSDEC, 1974; MADEP, 2002)

Table 4 – Typical Site Average Noise Levels by Construction Phase

Construction Phase	Noise Level at 50 Feet (dBA)	
	Minimum Equipment in Operation	Maximum Equipment in Operation
Demolition	72	87
Excavation	71	89
Foundation Construction	77	78
Building Construction	72	87
Restoration/Finishing	74	89

Note: Demolition noise sources are anticipated to be similar to those associated with the building construction phase

Source (BBN, 1971)

Table 5 – Typical Site Average Construction Noise Levels Compared to Ambient Sound Levels

Location	Distance from Site Center (ft)	Ambient Sound Levels (dBA)	Demolition (dBA)	Excavation (dBA)	Foundations (dBA)	Building Construction (dBA)	Restoration/Finishing (dBA)
Cope Circle	1000	55-59	44-59	43-61	49-50	44-59	46-61
89 Inwood Avenue	1200	48-54	42-57	41-59	47-48	42-57	44-59
77 Touraine Avenue	900	55-56	45-60	44-62	50-51	45-60	47-62
Abendroth Park 1	800	57-61	47-62	46-64	52-53	47-62	49-64
Abendroth Park 2	500	53-56	51-66	50-68	56-57	51-66	53-68
33 Gilbert Place	500	50-54	51-66	50-68	56-57	51-66	53-68
South Regent Street	500	56-59	51-66	50-68	56-57	51-66	53-68
Nursing Home	400	60-64	53-68	52-70	58-59	53-68	55-70

The project site covers a fairly large area. The actual sound levels which will be experienced by existing off-site residential uses surrounding the site will be a function of distance. As such, no one existing residential use will be exposed to the same sound levels over an extended period of time, as construction progresses through the site. The approximate center of the site was used as a baseline in order to calculate average construction noise levels for each receptor area.

The calculated levels above were arrived at by considering the reduction in noise with distance (e.g., a 6 dBA reduction with doubling of distance) and the effects of sound absorption by the air. The noise levels above do not account for any vegetation or intervening structures, both on and off the property site, which will act as effective noise barriers to further reduce offsite noise levels.

The data presented in Table 5 reflect the sound level occurring for both the minimum and maximum amount of construction equipment operating at the site. This results in a range of sound levels, which is then compared to the range of ambient sound levels measured at each location. Construction noise levels are never steady in nature, but rather fluctuate depending on which equipment pieces and how many are in use at any given time.

A review of the data provided in Table 5 reveals that when the minimum required equipment are in use, construction noise levels will mostly be below the minimum measured ambient at all locations. There will be times, however, when more equipment is in use and construction noise levels will be greater than existing ambient levels. The calculated noise levels are for the most proximate receivers in any given

direction. Lower sound levels would be experienced by other, more distant receivers due to increased distance and shields provided by existing structures. A few of the nearest residences to the edge of the Project property could experience higher sound levels, but only for brief periods when the equipment are operating at the edge of the Project property..

Construction noise and equipment will not be unusual, as they will be typical of those associated with any residential and commercial development. It is important to note that the equipment presented is not used in each phase of construction. Further, equipment used is not generally operated continuously, nor is all of the equipment always operated simultaneously. There will therefore be times when no equipment is operating and noise will be at ambient levels. Construction activities are also scheduled to occur mostly during daytime hours, when many people are at work and away from home.

The construction noise levels presented above are those that would be experienced for people outdoors. A building (house) will provide significant attenuation for those who are indoors. Sound levels can be expected to be up to 27 dBA lower indoors with the windows closed. Even in homes with the windows open, indoor sound levels can be reduced by up to 17 dBA (USEPA, 1978). Construction noise will also be temporary in nature.

Potential Nursing Home Noise Impacts

The Port Chester Nursing Home and Rehabilitation Center is the most proximate noise sensitive receptor to the site. As discussed above, this location was included in the noise analysis. Further review of the data in Figure 2 reveals that the nursing home location currently experiences the highest ambient noise levels in the area due to its proximity to I-287 and Route 1, roadways that border the nursing home and have high levels of existing truck and other vehicular traffic. As was provided in Table 5, construction noise levels will vary according to the equipment in use, and the construction phase. In general, it is shown that construction noise levels will be in the range of existing ambient noise levels. Further, as also discussed, noise generated during construction is primarily from diesel engines that power the equipment. Diesel engine noise from area truck traffic is currently part of the noise environment. As such, the introduction of construction noise will not alter the noise environment in the area. Accordingly, no significant or permanent noise impacts due to construction are anticipated at the nursing home.

6.2.1 Mitigation

The Village of Port Chester noise ordinance is designed to minimize potential noise impacts due to construction by limiting construction activities to between the weekday hours of 8:00 a.m. and 8:00 p.m. and between the hours of 10 a.m. and 7 p.m. on weekends and legal holidays. It is therefore considered to be a practical mitigation measure, and project construction hours will be in compliance with the ordinance.

The short-term nature of construction activities does not warrant any mitigation measures. However, as a general good construction practice to reduce construction noise to the greatest extent possible and practical, functional mufflers will be maintained on all construction equipment. Accordingly, no long term or permanent noise impacts are anticipated due to Project construction activities.

6.3 HVAC Related Noise

The Project itself will not contain any noise generating sources, other than HVAC systems. The proposed action includes low and high rise residential buildings, and commercial space. The surrounding area

currently includes these types of structures. The HVAC requirements for the Project buildings have not been defined at this stage of the design process. However, the HVAC units would be typical of those used on any other residential low or high rise structure and commercial buildings in the area. Further, the HVAC units will likely be located on the rooftops of each building. Their location on the roofs will act to partially block sound transmitted to offsite ground level residences. Project HVAC systems would not be anticipated to result in any significant impacts to future Project residents, and as such, would not be expected to result in any significant impacts to offsite residents.

6.3.1 Mitigation

No noise mitigation measures are anticipated to be required for Project HVAC noise sources.

7.0 COMPLIANCE WITH STANDARDS AND GUIDELINES

The Village of Port Chester noise ordinance does not address vehicular traffic noise directly, and as such, is not applicable to any increase in traffic associated with the Project. The ordinance limits construction activities to the hours of 8:00 a.m. and 8:00 p.m. on weekdays, and between the hours of 10 a.m. and 7 p.m. on weekends and legal holidays. The Project construction schedule will be in compliance with the Village noise ordinance. No noise generating sources, other than those normally associated with commercial and residential developments, are proposed for the project. Using the NYSDEC impact criterion, no significant adverse noise impacts would be expected from increased vehicular traffic associated with the project.

8.0 REFERENCES

Bolt, Beranek and Newman, Inc. 1971. Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances.

Big Dig Project. Commonwealth of Massachusetts, Construction Noise Control. 310 CMR 721.560

Harris, 1991. Handbook of Acoustical Measurements and Noise Control, Third Edition. McGraw-Hill, Inc.

New York State Department of Environmental Conservation. 2001. Assessing and Mitigating Noise Impacts.

New York State Department of Environmental Conservation. 1974. Construction Noise Survey.

United States Environmental Protection Agency, 1978. Protective Noise Levels. Office of Noise Abatement & Control. Report Number EPA 550/9-79-100. Washington, D. C. 20460.

Village of Port Chester, New York. Zoning Code. Chapter 224