G. NOISE

a. Existing Conditions

1. Noise Standards

Sensitive land uses are those that would be adversely affected by loud noise levels. Examples include homes, hospitals, schools, parks, and churches. Existing land uses at off-site locations that would be sensitive to potential noise impacts from the project include:

- Columbus Elementary School at 580 Columbus Avenue;
- Homes on Stevens Avenue;
- Homes on West Lake Drive; and
- Playground and swimming pool at Town Community Center on Lozza Drive.

Mount Pleasant addresses noise in Chapter 138 of the Town Code, which is summarized here and reproduced in its entirety in the noise appendix. Article II of the code prohibits unnecessary noise, which is defined as "any excessive or unusually loud sound or ay sound which either annoys, disturbs, injuries [sic] or endangers the comfort, repose, health, peace or safety of a considerable number of persons or which causes injury to animal life or damage to property or business. Standards to be considered in determining whether a noise is unnecessary are listed. Among the activities specifically prohibited under this section of the noise code are domestic power tools and equipment (e.g., leaf blowers) used outdoors in a residentially zoned district during the hours of 10 pm to 8 am so as to create unnecessary noise.

Article III of the code sets sound level standards for specific sources such as refuse-collecting equipment, recreational vehicles, aircraft, HVAC equipment, air compressors, paving breakers, and places of public entertainment as summarized in Table III/G-1.

Table III/G-1

Mount Pleasant Sound Level Standards

Source	Maximum Sound Level	Comments
Refuse-collecting equipment	80 dBA	Measured 10 feet from the unit
Recreational vehicles	N/A	Prohibited between 7 pm and 9 am, prevailing time, or sunset
Aircraft	N/A	Must meet FAA certified noise levels
Air conditioning and air handling equipment	55 dBA	Continuous noise measured at property line unless the sound produces an increment of less than 5 dBA compared to background noise
Air compressors	N/A	Muffler must provide 20 dBA of insertion loss
Paving breakers	N/A	Muffler must provide 5 dBA of insertion loss
Places of public entertainment	95 dBA or receiving land use standards in Article IV	Measured for more than 30 seconds at location of spectators

Source: Town Code, Town of Mount Pleasant

Article IV of the code sets sound levels by receiving property. The standards for residential and commercial districts are summarized in Table III/G-2.

Table III/G-2

Maximum Permissible Continuous Sound Level Limits (dBA) Outdoors by Receiving Land Use

Land Use	Time Period			
	8 am – 6 pm		6 pm – 8 am	
	Max	L10	Max	L10
Residential	65	60	55	50
Commercial	65	60	65	60
Noise sensitive zone	55		55	

Source: Town Code, Town of Mount Pleasant, NY

In addition, Article IV sets limits for impulsive sounds and discrete tones. The ordinance defines impulsive sound as a sound of short duration, usually less than one second, and of high intensity, with an abrupt onset and rapid decay. Examples are explosions or discharge of firearms. Discrete tones are defined as a sound wave whose instantaneous sound pressure varies essentially as a simple sinusoidal function of time. Examples are back-up alarms and the constant hum from HVAC units or

other mechanical devices. According to the ordinance, sounds containing impulsive sounds and discrete tones must be 5 dBA lower than the standards shown in Table III/G-2.

Construction noise is addressed in Article IV as indicated in the following summary table.

Table III/G-3

Sound Level Limits (dBA) from Construction Noise Outdoors by Receiving Land Use

Zone	Location	L10 Noise Levels	
		Daytime Periods	Nighttime Periods
Residential	400' from construction site	70 (8am – 6 pm)	55 (6 pm – 8 am)
Other	400' from construction site	75 (normal business hours)	80 (other than normal business hours
All	N/A		Prohibited between 9 pm and 7 am unless urgent

Source: Town Code, Town of Mount Pleasant, NY

2. Baseline Noise Monitoring

The specific representative locations selected for noise monitoring are listed below. Locations of the four monitoring sites are found in the Noise Study Appendix.

- 2 Roberta Court (West Lake Drive @ Roberta Court, which is adjacent to the campus on the east and across from a proposed soccer field on the western side of the campus;
- 143 West Lake Drive (West Lake Drive @ Stevens Avenue), which is adjacent to the campus on the south and across from a proposed soccer field on the southern side of the campus;
- Town community center, pool, and branch library, which is adjacent to the campus on the west and across from the proposed soccer field on the southern side of the campus;

- Columbus Elementary School, which is northwest of the campus and in proximity to the proposed football field on the northwestern side of the campus.

Ambient noise levels were monitored at the site on April 18, 19, and 20, 2006, during the AM and PM peaks, as well as off-peak periods.

Field personnel focused on obtaining traffic-generated noise levels. The monitors were turned to standby during aircraft flyovers. Field personnel carried out traffic counts at selected locations during the monitoring period, classifying the vehicles into autos, medium trucks (6 tires, 2 axles), and heavy trucks (3+ axles). This was not possible at all sites because traffic was not visible or only partially visible at some locations.

Table III/G-4 shows the noise levels used to characterize Existing Conditions at each of the four sensitive receptor points in the vicinity of the Westchester University site. The peak AM and PM noise levels are based on the highest values monitored, while the off-peak noise levels are based on the lowest values monitored. The maximum values are based on the highest maximum value monitored. These noise levels will be used as baseline values for determining future No Build and Build noise levels.

Table III/G-4.

2006 Existing Leq Noise Levels (dBA)

Site	Location	Peak Period Leq (dBA)			Maximum Daytime Noise Level (dBA)
		AM	PM	Off-Peak	
1	2 Roberta Court & West Lake Dr	61.9	55.8	52.2	78.8
2	143 West Lake Dr & Stevens Ave	69.0	61.9	61.2	90.7
3	Playground/Community Center	51.0	51.8	50.9	73.6
6	Columbus Elementary School	60.2	54.8	53.0	73.8

Source: Potomac Hudson Engineering, Inc.

Significant noise sources included not only passing vehicles, but also chirping birds, school buses stopping, and children playing outside. Aircraft flyovers are also a significant source of background noise at this site.

b. Project Proposals/Impacts

The campus would include academic buildings with classrooms and offices, residences, a student union, a library, an athletic center, a physical plant and maintenance building, parking lots and 30 acres of multi-purpose playing fields (see Table III/G-5) all surrounding a campus green at the center of the site.

Project-generated noise is a source of concern due to increased traffic, HVAC units, and on-site construction activities. Traffic noise was reevaluated for the peak weekday AM and PM traffic periods. A screening analysis was carried out to determine whether affected roadways in the study area were likely to experience significant impacts from project-generated traffic. Based on the relative increase in noise that would occur with the additional traffic, no roadways would experience an increase of 3 dBA or more. Thus no impacts from traffic are anticipated.

Noise from school activities is also a source of concern for the project. The playing fields would include a football field and soccer field at the Athletic Facility, as well as two additional soccer fields: one near the a parking lot on the northern portion of the site and the other near a parking lot on the southern portion of the site. Principal athletic facilities are located at the far west extremity of the campus near Columbus Avenue. This includes a football field, soccer field and gymnasium (129,600 s.f.) intended both for intramural athletics for students and intercollegiate athletics. These principal facilities are located along Columbus Avenue for two primary reasons: first to minimize any noise and visual impact on neighboring residential neighborhoods and second to provide easy access to these facilities from the Columbus Avenue entrance. The athletic facilities on this portion of the site will be buffered from the development along Columbus Avenue by over four hundred feet (400') of existing vegetation. A second soccer field would be located on the southern portion of the site across from the intersection of East Stevens

Avenue and West Lake Drive. It would be buffered from the residential neighborhood by over 100 feet of vegetation. The third soccer field would be on the northeast portion of the site across from the intersection of West Lake Drive and Roberta Avenue. Several smaller multi-purpose playing fields are located throughout the interior sections of the proposed campus.

Table III/G-5

Proposed Playing Fields

Playing Field Location	Amenities	Size (acres)
Outside Loop Road		
West (Athletic Facility)	Football field, soccer field	8.1
South (East Stevens Ave./West Lake Drive)	Soccer field	6.0
Northeast (West Lake Drive/Roberta Avenue)	Soccer field	6.0
East (Building I,J)	None	0.5
Inside Loop Road		
North (Building I,J)	None	0.8
Northeast (North Lot)	None	1.9
South (South Lot)	None	1.4
West (Building G)	None	2.0
Campus Green	None	3.3
Total		**30.0**

Source: Richard Henry Behr, Architect, P.C.

1. Sound Levels from School Activities

   In order to project noise levels from these activities at the Westchester University campus, noise levels for representative activities at other locations were monitored. Manhattanville College in Purchase, NY and Mercy College in Dobbs Ferry, NY both have small campuses that would be representative of the proposed Westchester University. Since Manhattanville College did not provide permission for monitoring of noise levels on the campus, it was not included in the monitoring program. Mercy College permitted noise monitoring, as did Rumson-Fair Haven High School in Rumson, NJ, and Toms River High School in Toms River, NJ.

Table III/G-6 shows noise levels at these sites for various activities.

Table III/G-6

Noise (dBA) from Typical School Activities

Location	Date	Time	Activity	Leq	Min	Max	Comments
Mercy College (main hall)	4/20/06	1:55-2:20p	Open-air congregation of students	57.3	39.7	80.5	Lawn maintenance equipment, student singing into microphone
Mercy College (main hall)	4/20/06	2:21-2:41p	Open-air congregation of students	53.7	40.7	71.1	Pedestrian voices, worker watering lawn, back-up alarms, train whistle
Mercy College (main hall)	4/20/06	2:43-2:58p	Open-air congregation of students	52.7	40.7	70.6	Medium truck passing through parking lot, pedestrian voices, birds chirping
Mercy College (south property line)	4/19/06	2:30-2:50p	Warming up for baseball game	53.8	46.5	69.2	Loud radio on field and sounds from hitting and catching ball are dominant
100' from Mercy College property line	4/19/06	2:55-3:20p	Warming up for baseball game	50.2	42.5	70.6	Loud radio on field and sounds from hitting and catching ball are dominant, train passby, nearby wind chimes
Mercy College (south property line)	4/19/06	4:10-4:25p	Baseball game in progress	57.4	46.9	71.4	Players' voices and bat hitting ball are dominant; birds chirping, nearby joggers, train passby, aircraft
100' from Mercy College property line	4/19/06	3:45-4:05p	Baseball game in progress	51.5	41.4	70.9	Players' voices and bat hitting ball are dominant; birds chirping, train passbys, aircraft flyovers, pedestrians
200' from Mercy College property line	4/19/06	3:20-3:40p	Baseball game in progress	50.8	39.8	67.8	Players' voices and bat hitting ball are dominant; birds chirping, nearby joggers, train passby, aircraft
425' from Mercy College property line	4/19/06	4:30-4:45p	Baseball game in progress	49.2	42.8	61.1	Players' voices clapping are dominant; birds chirping, nearby pedestrians, train passbys, aircraft
Rumson - F.H., Site 1, 100' from field	4/20/06	4:47-4:57	Baseball game in progress	52.7	42.5	70.1	Fans cheering and applauding, balls hitting bats and mitts, distant traffic, aircraft flyover, bus air brakes
Rumson - F.H., Site 2, 200' from field	4/20/06	5:09-5:19	Baseball game in progress	52.0	43.4	71.8	Fans cheering, loud motorcycle, distant traffic, birds, balls hitting bats and mitts

Table III/G-6 (continued)

Rumson - F.H., Site 2, 200' from field	4/20/06	6:03-6:08	Baseball game in progress	51.2	43.6	64.2	Fans cheering, aircraft flyover, school bus engine, distant traffic, bat hitting balls
Rumson - F.H., Site 3, 400' from field	4/20/06	5:30-5:40	Baseball game in progress	49.0	43.2	68.0	Fans cheering, birds chirping, car horn, distant traffic, bat hitting balls
Rumson - F.H., Site 4, 700' from field	4/20/06	5:47-5:57	Baseball game in progress	48.4	41.2	60.3	Birds chirping, outdoor equipment, fans cheering traffic, local sources dominate noise levels
Toms River East HS, Site 1, 150' from lacrosse	4/21/06	7:15-7:25p	Baseball and lacrosse games in progress	51.2	43.7	74.2	Referee whistles, birds, ducks, distant traffic, also 500' from baseball game
Toms River East HS, Site 2, 300' from lacrosse	4/21/06	7:50-7:50p	Baseball and lacrosse games in progress	51.0	43.7	80.4	Referee whistles, birds, distant traffic, crowd cheering at baseball game 300' away, baseball game is dominant source
Toms River East HS, Site 3, 600' from baseball	4/21/06	8:18-8:28p	Baseball and lacrosse games in progress	45.3	40.0	58.3	Game inaudible except for loudest cheers and PA announcer, barking dogs, crickets, wind chimes, nearby traffic

Source: Potomac Hudson Engineering, Inc.

2. Traffic Noise under No Build Conditions

Under No build Conditions growth in traffic would increase noise levels slightly. Based on logarithmic computations that compare the relative increase in traffic projected for Existing and No Build Conditions, noise levels would increase by about 3 dBA at sites with light traffic and 0.5 dBA along Columbus Drive. This is shown in Appendix 4. Noise level increases of 3 dBA or less are not noticeable to most people, and this increase over a 4-year period would not be significant. Thus, noise levels under No Build Conditions would be substantially similar to noise level increases under Existing Conditions.

3. Build Traffic Conditions

Screening Analysis for Substantial Increases in Traffic Noise

The traffic study projected traffic for approximately 26 intersections. Those intersections that are closest to the site would receive the highest volumes of project-generated traffic and the greatest increases in noise. Appendix 4 shows the anticipated increases in traffic and the relative increases in noise level for Build Conditions. For most intersections and roadway segments, the volume of project-generated traffic would be too low to cause a noticeable increase in noise levels. In most cases, the potential increase in noise would be 0 to 1 dBA, and some locations would experience a slight decrease in noise level.

Traffic Noise

At Roberta Drive, Stevens Avenue. West Lake Drive, and the parking lot at the playground/community center, no increase in traffic noise is projected for Build Conditions. For Columbus Avenue, traffic-related increases in noise would be less than 1 dBA. This is shown in the Appendix 4.

Stationary Sources

Stationary sources of noise associated with the development would include fans associated with HVAC (heating, ventilation, and air conditioning) units. Typically such units are placed on a roof tops set back from the edge of the building, and they are designed to project noise upward. Noise from these units is rarely audible at ground level. Given the distance between the buildings in the development, as well as the distance of the development's buildings from nearby sensitive receptors, no noise impacts from HVAC units are anticipated.

Athletic Activities

The campus would have football and soccer fields. Monitored noise levels from the events at Mercy College, Rumson-Fair Haven High School, and Toms River East High School were used to evaluate potential noise levels at nearby residential areas. As a conservative measure, the noise levels for each receptor were calculated at the

Westchester University property line rather than the actual receptor location, which would be further from the noise source. The results are shown in Table III/G-7. The noise from the sports activities would attenuate at a rate of 6 dBA per distance doubling. At the property line of the Westchester University site, the noise levels would be at or below background levels. The increases in noise levels from traffic and sports activities range from 010 to 1.6 dBA. Therefore, based on the criteria previously discussed, no noise level impacts are anticipated.

Table III/G-7

Total Build Noise Levels (dBA)

Location	Per-iod	No Build	Build with Traffic	Sports Activities Noise Level	Total Build Conditions	Difference (Build – No Build)
2 Roberta Court & West Lake Dr	AM	62.2	62.2	48.9	62.4	0.2
143 West Lake Dr & Stevens Ave	AM	69.3	69.3	48.2	69.3	0.0
Playground/Community Center	AM	51.3	51.3	42.5	51.8	0.5
Columbus Elementary School	AM	60.2	60.8	37.8	60.8	0.6
2 Roberta Court & West Lake Dr	PM	56.1	56.1	48.9	56.9	0.8
143 West Lake Dr & Stevens Ave	PM	62.2	62.2	48.2	62.4	0.2
Playground/Community Center	PM	52.1	52.1	42.5	52.6	0.5
Columbus Elementary School	PM	55.3	56.0	37.8	56.1	0.8
2 Roberta Court & West Lake Dr	Off	52.5	52.5	48.9	54.1	1.6
143 West Lake Dr & Stevens Ave	Off	61.5	61.5	48.2	61.7	0.2
Playground/Community Center	Off	51.2	51.2	42.5	51.8	0.6
Columbus Elementary School	Off	53.5	54.1	37.8	54.2	0.7

Source: Potomac-Hudson Engineering

Construction Noise - Short Term Impacts

Table III/G-8 shows typical noise levels due to various types of construction equipment. Construction noise may temporarily increase noise levels due to construction-related traffic and on-site use of construction equipment. Construction is regulated by the Town of Mount Pleasant Town Code and by EPA noise emission standards for construction equipment. Contractors would adhere to the limits on impulse noise and pure tones stated in the Town of Mount Pleasant Town Code. The

duration and magnitude of any impacts will depend on the type of equipment in use and the particular phase of residential construction.

Table III/G-8

Typical Noise Levels for Various Types of Construction Equipment

Type of Equipment	Noise Level (dBA) at 50 Feet	Type of Equipment	Noise Level (dBA) at 50 Feet
Clearing		Grading and Compacting	
Bulldozer	80	Grader	80-93
Front end Loader	77-84	Roller	73-75
Dump Truck	83-94	Paving	
Jackhammer	81-98	Paver	86-88
Crane with ball	75-87	Truck	83-94
Excavation and Earth Moving		Tamper	74-77
Bulldozer	80	Landscaping and Clean-Up	
Backhoe	72-93	Bulldozer	80
Front end loader	73-84	Backhoe	72-93
Dump truck	83-94	Truck	83-94
Jackhammer	81-98	Front end loader	72-84
Scraper	80-93	Dump truck	83-94
		Paver	86-88
STRUCTURE CONSTRUCTION			
Crane	75-87	Pneumatic Tools	81-98
Welding generator	71-82	Bulldozer	80
Concrete mixer	74-88	Pile Driver	91-105
Concrete pump	81-84	Front end loader	72-84
Concrete vibrator	76	Dump truck	83-94
Cement and dump trucks	83-94	Paver	86-88
Air compressor	74-84		

Source: U.S. Environmental Protection Agency, "Noise from Construction Equipment and Operations, Building Equipment, and Home Appliances," NJID 300.1, December 31, 1971.
Note: Noise levels from equipment can vary according to the engine size. Thus, the table may show a different range of typical noise levels for some types of equipment during different construction phases,

Blasting activities are of particular concern. Over ten million pounds of explosives are used daily in the U.S. to excavate rock by blasting in mining and construction operations (Revey, 2005). Various forms of risk are present during the planning, execution, and closure phases of projects with rock blasting work. For construction work, specifications are usually developed to ensure blasting is done safely and in

conformance to the requirements of the project. Before blasting begins in new areas, it is important to define how blasting might impact neighbors, animals, structures, utilities and the environment in general.

Ground vibration is commonly viewed as the major concern for off-site damage resulting from blasting (ODOT, 2005). The measurement of ground vibration is Peak Particle Velocity (PPV), which is the maximum speed (measured in inches/second or mm/second) at which a particle in the ground is moving relative to its inactive state. Extensive research has been conducted over the last 40 years by the U.S. Bureau of Mines and the Office of Surface Mining (OSM) to develop acceptable vibration standards, vibration damage criteria, and techniques to predict and control blast vibrations that greatly reduce the risk of off-site impacts from blasting.

The principal factors that affect ground vibration levels at a given point are:

- Weight of the explosive fired per delay period
- Distance from blast to point of concern (house, well, etc.)
- Blast configuration (existence of a free face, trench, confined area, etc.)
- Geology (sites with a thick layer of soil have been known to produce vibrations 10 times as great as locations with a tin layer of soil over rock).

The first 2 factors are the most influential to ground vibration. The distance from the blast to the point of concern cannot be controlled by the blasting contractor, but the weight of the explosives fired per delay can be.

Some blasting may be required to loosen rock as part of the site preparation activities. Blasting and rock drilling can product noise levels greater than 90 dBA at the source. Blasting would occur on an intermittent basis over a relatively short period of the construction phase.

c. **Mitigation Measures**

No mitigation is required for noise associated with operational (long-term) noise sources, such as stationary sources (building equipment), school activities such as athletic events, or project-related traffic.

There would be unavoidable, short-term noise associated with construction. Noise during construction would be minimized to the extent practicable utilizing best management practices. Of particular concern is noise associated with blasting activities for rock removal. A preblast survey would be carried out to document the conditions prior to blasting. Coordination with local officials and residents would be carried out to alert residents in to blasting. This would include specifying the times of day when blasting activities would occur and a horn signal to alert the surrounding community of impending blasting activities. Recommended best management practices to minimize noise impacts for blasting operations could include:

- No blasting on Sundays, legal holidays and between the hours of 6 p.m. and 8 a.m;
- Notifying nearby residences whenever blasting work will be occurring; and
- Installing temporary or portable acoustic barriers around construction noise sources.