

**DEPARTMENT OF ENVIRONMENTAL PROTECTION  
NOTICE OF ADOPTION OF RULES FOR  
CITYWIDE CONSTRUCTION NOISE MITIGATION**

NOTICE IS HEREBY GIVEN PURSUANT TO THE AUTHORITY VESTED IN THE Department of Environmental Protection by section 1043 of the New York City Charter and section 24-219 of the Administrative Code of the City of New York, and after a duly advertised public hearing held on January 18<sup>th</sup>, 2007, that the Department of Environmental Protection has promulgated rules concerning citywide construction noise mitigation.

STATEMENT OF BASIS AND PURPOSE

On December 29<sup>th</sup>, 2005, Mayor Michael Bloomberg signed Local Law 113 for the year 2005. The law amended the Administrative Code of the City of New York in relation to the Noise Control Code. Specifically, the law established standards and procedures to reduce noise levels from construction, and established sound level standards for specific noise sources. The law also mandated the adoption of rules in section 24-219 of the Administrative Code. Pursuant to that section, these rules prescribe the methods, procedures and technology that shall be used at construction sites to achieve noise mitigation whenever any one or more of certain construction devices or activities set forth in the rules are employed or performed.

The rules are authorized by section 1043 of the Charter of the City of New York as well as section 24-219 of the Administrative Code of the City of New York.

The text of the rules follow. New matter is underlined.

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Title 15 of the Rules of the City of New York is amended by adding a new Chapter 28 to read as follows:

**CHAPTER 28**

**CITYWIDE CONSTRUCTION NOISE MITIGATION**

- §28-100 General Construction Noise Mitigation Plan.**
- §28-101 Required Noise Mitigation Measures for General Construction.**
- §28-102 Construction Devices and Activities.**
- §28-103 Authorized Work Hours.**
- §28-104 Alternative Noise Mitigation Plan.**
- §28-105 Utility Noise Mitigation Plan.**
- §28-106 Required Noise Mitigation Measures for Utilities.**
- §28-107 Perimeter Noise Barriers.**
- §28-108 Temporary or Portable Noise Barriers.**
- §28-109 Definitions.**
- Appendix Federal Highway Administration Roadway Construction Noise Model User's Guide, Jan. 2006.**

**§ 28-100 General Construction Noise Mitigation Plan.**

In accordance with §24-219 of the New York City Noise Code, every construction site where construction activities take place shall have, conspicuously posted, a complete and accurate Construction Noise Mitigation Plan. So long as the plan complies with this chapter, it need not be filed with the Department of Environmental Protection (DEP); however, such plan must be readily available for inspection at the construction site. The Construction Noise Mitigation Plan Form is available at: <http://www.nyc.gov/dep> or at DEP's Offices at:

New York City Department of Environmental Protection  
Bureau of Environmental Compliance, 9th Floor  
59-17 Junction Blvd.  
Flushing, NY 11373.

**§28-101 Required Noise Mitigation Measures for General Construction.**

a. The responsible party shall self-certify in its Construction Noise Mitigation Plan that all construction tools and equipment have been maintained so that they operate at normal manufacturer's operating specifications, including at peak loading. Such self-certification shall be indicated on the Construction Noise Mitigation Plan form required by §28-100 of this chapter. Upon a DEP inspection of the work site, DEP shall use the noise level guidelines in the Federal Highway Administration Roadway Construction Noise Model User's Guide, Jan. 2006, page 3, located in the Appendix to this chapter, as a means of identifying equipment that may be the cause of a noise complaint. If an individual piece of equipment is identified by DEP as exceeding the level specified in such Guide located in the Appendix to this chapter, upon notification by DEP, the responsible party shall have the option of: (i) performing maintenance

to demonstrate a good faith effort, notwithstanding the model year of the equipment, to mitigate the noise by a measurable level acceptable to the Department, (ii) replacing the equipment with equipment that complies with said level, or (iii) filing an Alternative Noise Mitigation Plan pursuant to §28-104 of this chapter, within five business days of said inspection. If the responsible party elects to perform maintenance pursuant to option (i), but cannot demonstrate within five business days a reduction in noise by a measurable level acceptable to the Department, such party shall pursue one of the other two options to the satisfaction of the Department. The failure to exercise and complete one of such three options within five business days of said inspection shall be a violation of this rule.

b. All construction equipment being operated on site must be equipped with the appropriate manufacturer's noise reduction device(s), including, but not limited to, a manufacturer's muffler (or equivalently rated material) that is free of rust, holes and exhaust leaks.

c. The responsible party shall mitigate noise from construction devices with internal combustion engines by ensuring that the engine's housing doors are kept closed, and by using noise-insulating material mounted on the engine housing that does not interfere with the manufacturer's guidelines for engine operation or exhaust. The responsible party shall further reduce noise by operating the device at lower engine speeds during the work to the maximum extent possible.

d. Portable compressors, generators, pumps and other such devices shall be covered with noise-insulating fabric to the maximum extent possible that does not interfere with the manufacturer's guidelines for engine operation or exhaust, and shall further reduce noise by operating the device at lower engine speeds during the work to the maximum extent possible.

e. Vehicle engine idling on site shall be prevented in accordance with New York City Administrative Code §24-163.

f. Quieter back-up alarms shall be used in pre-2008 model year vehicles when practicable for the job site. 2008 model year or newer vehicles shall be equipped with a quieter back-up warning device in accordance with OSHA standards, as set forth in paragraph 4 of subdivision d of §28-102 of this chapter.

g. When DOB regulations require a perimeter barrier, or "construction fence," and the site is within 200 feet of a receptor or a receiving property as defined in §28-109 of this chapter, perimeter noise barriers shall be fabricated in accordance with the standards set forth in subdivision e of §28-107 of this chapter and lined with material set forth in subdivisions c and e of §28-107 of this chapter. Further, the responsible party shall fill in any gaps and holes in adjacent panels of noise barriers with noise attenuation material, so as to maximize the effectiveness of such barriers. Such noise attenuation material shall include noise curtain material, additional plywood, or similar material. When viewing ports are required in the curtain material, they shall be filled in with clear plastic attached to the curtain.

h. The contractor shall create and utilize a noise mitigation training program, which shall be implemented for all field-worker supervisory personnel including sub-contractor supervisors.

Supervisory personnel shall field-train all field workers to minimize construction noise. Such training program shall be developed in consultation with DEP.

i. When work is planned near sensitive receptors, including but not limited to facilities such as schools, hospitals, places of worship, and homes for the aging, the responsible party shall cooperate with the facility owner or operator to coordinate the work schedule so as to minimize the noise impact on the facility.

j. A DEP inspector may visit a construction site to examine the Noise Mitigation Plan upon receiving a complaint, or as a matter of routine inspection, to ensure that the responsible party is complying with such Plan. A responsible party found not to be complying with such Plan shall be provided a cure period of three business days to correct the condition or to file an Alternative Noise Mitigation Plan under §28-104 of this chapter. If the condition is not corrected nor an Alternative Noise Mitigation Plan filed with DEP within three business days, then a Notice of Violation shall be issued against the responsible party. Said violations may be issued on-site or by mail. Notwithstanding the preceding sentences in this subdivision, there shall be no cure period afforded with respect to compliance with §§28-100, 28-101(a), (b), (e), (f), (h); §28-104; §28-105; and §§28-106(a), (b), (d) (g) & (i) of this chapter.

k. Construction activities may take place during the hours of 7:00 a.m. to 6:00 p.m. on weekdays. At all other times, the permittee shall obtain after-hours authorization, pursuant to §28-103 of this chapter.

l. Where construction projects are of shorter duration of less than 15 days and within the property line and do not require Department of Buildings (DOB) perimeter barriers (“construction fences”), and where the work site is within 75 feet of a residential receptor, a temporary or portable (i.e. unanchored) noise barrier shall be fabricated in accordance with the specifications in §28-108 of this chapter. For long-term street work, defined as 15 days or longer, that is outside the property line and within 75 feet of a residential receptor and where there is a dedicated lane available, a temporary barrier in accordance with the specifications in §28-108 of this chapter shall be required.

m. Whenever a responsible party is engaged in sandblasting operations that require a perimeter or other barrier during sandblasting, said barrier shall be lined with noise barrier material as set forth in subdivision e of §28-107 of this chapter.

n. Responsible parties conducting construction and roadway work that will commence and be completed within a continuous period of no longer than 24 hours, that occurs between the hours of 7:00 a.m. and 6:00 p.m. on weekdays, need not post or file with DEP a Construction Noise Mitigation Plan. However, the responsible party for such construction work shall not create unreasonable noise. In addition, if the work occurs near or adjacent to a sensitive receptor as defined in §28-101(i) of this chapter, then the responsible party shall make modifications including scheduling changes or employing additional noise mitigation methods listed in §§28-102, 28-107, and 28-108. This subdivision shall not apply to construction work that occurs after hours.

o. Technical terms in these rules are defined in the Noise Code or in §28-109 of this chapter.

**§28-102 Construction Devices and Activities.**

The devices listed in this section require additional noise mitigation. A responsible party using any of these devices shall mitigate the noise by following the rules set forth in this section for the specific device. There are five categories of devices:

- a. Impact Equipment: Pile Drivers, Jackhammers, Hoe Rams, Blasting.
- b. Earth Moving Devices: Vacuum Excavators.
- c. Construction Trucks: Dump Trucks.
- d. Stationary Devices: Cranes, Auger Drills, Street Plates, Backup Alarms.
- e. Manual Devices: Concrete Saws.

If the responsible party cannot in good faith comply with the noise mitigation rules for each device, the responsible party shall file with DEP an Alternative Noise Mitigation Plan in accordance with §28-104 of this chapter.

**a. Impact Equipment.**

**1. Pile Drivers.** This rule provides noise mitigation strategies that responsible parties shall utilize in order to reduce the noise emissions from pile driving and related equipment. Pile drivers for sheet piles and/or column piles are a common necessity on a construction project. Piles can be used to stabilize trench walls during excavation, create coffer dams to hold back water, or to provide an anchored platform upon which structures can be built. There are two basic types of pile drivers - impact hammers and vibratory drivers. Noise emission levels from pile drivers can vary widely based on the type of driver, the type of pile (steel, concrete, wood), and the underlying ground conditions.

**A. GENERAL RULES OF OPERATION**

i. The hours of operation shall be in accordance with §28-103 of this chapter.

**B. SOURCE CONTROLS: QUIETER MODELS & MUFFLERS**

i. The quietest pile driving method shall be selected that allows the work to be performed based on structural, geotechnical, and pile friction requirements and ground conditions. The following list or their equivalent are acceptable pile-driving methods to the Department: a hydraulic pile pushing system, a vibratory

pile driver; a hydraulic impact pile driver; a drop hammer, a diesel impact pile driver.

ii. Hydraulic pushing method pile drivers, including the Ken-Jet Still Worker, the Giken Silent Piler, or the SERF Pilemaster, or equivalent, shall be utilized rather than louder impact or vibratory pile drivers when ground conditions permit such use. Further, such quieter pile drivers shall be utilized whenever a responsible party is working within 100 feet of a receptor.

iii. In accordance with the noise mitigation criteria outlined in §28-101(b) of this chapter, an impact pile driver shall be equipped with a well maintained exhaust muffler in order to mitigate the amount of noise escaping out with the diesel exhaust.

iv. The responsible party shall select the type of pile being driven based on structural and/or geotechnical performance requirements. In order of loudness, wooden piles shall be preferred first, followed by concrete piles, and then steel piles.

v. The responsible party shall pre-auger or pre-trench the pile holes to soften the underlying ground, reduce ground resistance, and thus reduce pile driving noise based upon geotechnical conditions at the location. Auger drill rigs may be mounted to the same crane as the pile driver or alternatively, an excavator with a long bucket arm may pre-trench as deep as 25 feet below grade.

vi. A properly secured impact cushion shall be installed on top of piles that are being driven by an impact hammer. Commercially available pile cushions or those fabricated on the job site, out of scrap wood, leather or rubber, may be utilized.

vii. Quieter alternative methods to pile driving, including the use of drilled caissons filled with concrete, or slurry walls dug out initially with a milling machine, shall be used whenever possible, depending on structural and geotechnical performance requirements.

viii. Noise bellows systems such as the IHC Hydrohammer, or an equivalent bellows device, may be used to provide further noise attenuation. Bellows enclosures accompany the pile down to the ground and collapse accordion style as the pile reaches the ground.

ix. When the responsible party uses a vibratory pile driver or a hydraulic impact pile driver as set forth in clause (ii) of this subparagraph and/or noise bellows as set forth in clause (viii) of this subparagraph, between the hours of 7:00 a.m. to 6:00 p.m. on weekdays, the responsible party need not utilize additional pathway controls listed in subparagraph C of this paragraph, unless the responsible party is performing work within 35 feet of an indoor receptor and

with the exception of any required perimeter barriers as specified in §28-101(g) of this chapter.

x. No violation shall be issued to the responsible party if the bellows in clause (viii) of this subparagraph B or the barriers listed in subparagraph C of this paragraph are adjusted such that the operator can view the end of the hammer for safety purposes.

C. NOISE PATHWAY CONTROLS: NOISE BARRIERS & ENCLOSURES. The responsible party shall utilize one of the following pathway controls. However, if the Department receives noise complaints concerning the site, the responsible party shall utilize additional pathway controls listed in this subparagraph as required by DEP.

i. The responsible party shall construct a portable noise barrier that shall be free from gaps and holes and constructed of a sufficiently massive material to achieve a Sound Transmission Class rating of STC 30 or greater. It shall be positioned as close as possible to the pile driver. A portable (i.e. unanchored) noise barrier can be made, for example, of concrete jersey bases with ¾-inch plywood panels attached to fence posts extending upwards to an overall height of 15 feet. This shall be the maximum height for a free-standing barrier in order to avoid it tipping over from wind load. Multiple jersey bases and plywood panels shall be positioned adjacent to one another to form a barrier of any desired length. The gaps between adjacent panels shall be filled-in with noise curtain material, additional plywood, or similar material when practicable. A properly balanced canted panel, not susceptible to windy conditions, may be placed on top of the barrier in order to provide better shielding for multi-story receptors. However, said barrier's height shall not exceed 15 feet including the balanced canted portion.

ii. The noise barrier shall be long and tall enough to completely block the line of sight between the pile driver and any indoor receptor within 200 feet and that is a maximum of 20 feet above grade level, when work occurs. The barrier should be placed as close to the actual pile driving work as feasible. Greater noise attenuation occurs when barriers are placed as close as possible to the noise source.

iii. Where applicable, portable noise shields made of steel frames wrapped with noise curtain material, such as SoundSeal model BBC-13-2, or equivalently rated material, shall be hoisted up into position on the crane's second cable to form a noise barrier in the direction of sensitive receptors. The shield shall be large enough to completely block the line of sight between the receptors and the pile driver, and shall be lowered to the ground as the pile is being driven in order to maintain the shielding effect. Such portable noise shield shall be utilized when the pile driver is higher than any barrier at the site required under §28-101(g) of this chapter.

iv. Alternative barriers may be utilized in accordance with site-specific conditions. For example, shipping container (Conex) boxes or truck trailers may be positioned along the edge of the work site to form an effective semi-permanent noise barrier. Sufficient space at the site is necessary, as these containers are generally 8 feet wide by 8 feet tall and can be double-stacked to form a noise barrier 16 feet in height. The gaps between and/or under container boxes shall be filled-in with heavy vinyl noise curtains or similar materials. It should be noted that gaps and spaces are one of the primary contributors to degrading a noise barrier's performance.

**2. Jackhammers/Pavement Breakers.** This rule shall provide noise mitigation strategies that the responsible party shall utilize in order to reduce the noise emissions from jackhammers and pavement breakers. These devices are defined as manually-operated, powered (pneumatic or other) devices, consisting of chisel-hammers or bits used to cut or break through pavement, concrete, or street surfaces. Jackhammers can be very loud as the steel chisel or bit hits the target object.

A. GENERAL RULES OF OPERATION

i. The hours of operation shall be in accordance with the rules as set forth in §28-103 of this chapter.

B. SOURCE CONTROLS: QUIETER MODELS & MUFFLERS

i. Quieter makes and models of jackhammers such as the Copco model TEX P90S or equivalent model with an elongated effective muffler casing or bellows measuring a total of greater than 15 inches in length, shall be used whenever practicable.

ii. The quietest jackhammer suitable to perform the given work shall be selected for use. The quieter jackhammers, including the jackhammer specified in clause (i) of this subparagraph or the Chicago Pneumatic CP1240, with a model F-814004 muffler, or equivalent, shall be used when suitable and whenever a responsible party is working in close proximity to receptors, whenever a responsible party is using multiple jackhammers, and whenever jackhammer operations are occurring during after hours as set forth in §24-223 of the Administrative Code.

iii. In all cases, jackhammers shall be equipped with an effective muffler, provided either from the manufacturer or from an aftermarket vendor, which effectively reduces noise from the exhaust air by about 4 dBA or more. In accordance with §28-101(b) of this chapter, an effective muffler shall be properly fitted to the jackhammer to insure against air or noise leakage.

iv. If appropriate to the size of the job, smaller jackhammers shall be used, as they tend to be quieter.

v. When the responsible party uses a device described in clause (i) of this subparagraph between the hours of 7:00 a.m. to 6:00 p.m. on weekdays, the responsible party need not utilize additional pathway controls listed in subparagraph C of this paragraph, unless the responsible party is performing work within 35 feet of an indoor receptor and with the exception of any required perimeter barriers as specified in §28-101(g) of this chapter.

C. NOISE PATHWAY CONTROLS: NOISE BARRIERS & ENCLOSURES. The responsible party shall utilize one of the following pathway controls for jackhammers or pavement breaker operations within a property line or for long-term work when outside of the property line as specified in §28-106(p) or §28-101(l) of this chapter. However, if the Department receives noise complaints concerning the site, the responsible party shall utilize additional pathway controls listed in this subparagraph as required by DEP. The pathway controls are set forth as follows: jersey barriers, tents, or other portable noise barriers.

i. The responsible party shall construct a portable noise barrier that shall be free from gaps and holes and constructed of a sufficiently massive material to achieve a Sound Transmission Class rating of STC 30 or greater and that shall be positioned as close as possible to the jack hammer. The noise barrier shall be long and tall enough to completely block the line of sight between the jackhammer and any indoor receptor within 200 feet and that is a maximum of 20 feet above grade level, when work occurs. The barrier shall be placed as close to the actual jackhammering work as feasible. Greater noise attenuation occurs when barriers are placed as close as possible to the noise source. A balanced canted panel, not susceptible to high winds shall be placed, when feasible, on top of the barrier in order to provide better shielding for multi-story receptors. However, said barrier's height shall not exceed 15 feet including the balanced canted portion.

ii. Jersey barriers. A portable (i.e. unanchored) noise barrier can be made, for example, of concrete jersey bases with 3/4-inch plywood panels attached to fence posts extending upwards to an overall height of 15 feet. This shall be the maximum height for a free-standing barrier in order to avoid it tipping over from wind load. Multiple jersey bases and plywood panels can be positioned adjacent to one another to form a barrier of any desired length. The gaps between adjacent panels should be filled-in with noise curtain material, additional plywood, or similar material. All jersey barriers shall comply with the requirements in clause (i) of this subparagraph, including a Sound Transmission Class rating of STC 30 or greater.

iii. Portable noise enclosures.

(a) Portable noise enclosures (so-called "noise tents") made of steel frames wrapped with noise curtain material, such as SoundSeal model BBC-13-2, or equivalently rated material, may be built to surround the jackhammer (on the top and 3 sides) and the operator. A properly constructed enclosure, using curtain material with a Sound Transmission Class rating of STC 30 or greater, generally provides a 5 dBA insertion loss. Such barrier shall meet OSHA standards for worker exposure to particulate matter.

(b) The responsible party shall utilize multiple tents for multiple jackhammers. For example, when two jackhammers are being utilized and they cannot fit under the same noise tent, the responsible party shall provide an additional noise tent.

(c) The noise tent shall be moved as the jackhammer work progresses in order to maintain the tent's ability to block the line of sight between the jackhammer and the receptors.

(d) In accordance with §24-223 of the Administrative Code, when emergency jackhammering occurs after normal working hours within 500 feet of any residential receptor, the responsible party shall use noise tents with double thick noise curtain material or a noise tent augmented with a portable noise barrier to form a double layer of mitigation. See section §28-108 of this chapter. Quieter jackhammers and compressor vehicles shall also be utilized during after hours work whenever feasible.

(e) Where there are receptors surrounding the jackhammer work site on all sides, two tents shall be used on either side of the jackhammer to form a complete enclosure as close to the jackhammer as practicable.

**3. Hoe Rams.** This rule shall provide noise mitigation strategies that the responsible party shall utilize in order to reduce the noise emissions from hoe rams. Hoe rams, and hoe ram-like devices, are used to cut through roadway pavement or concrete walls and for demolition of large concrete or steel structures. They are typically large hydraulic chisel-hammers attached on the end of a backhoe or excavator arm that can be very loud as the steel chisel hits the target object.

A. GENERAL RULES OF OPERATION

i. The hours of operation shall be in accordance with the rules as set forth in §28-103 of this chapter.

B. SOURCE CONTROLS: QUIETER MODELS & MUFFLERS

i. Quieter makes and models of hoe rams, such as the Bosma Hammer-Head or equivalent quieter devices, shall be used whenever feasible, especially near receptors.

ii. The smallest hoe ram necessary shall be selected to perform the task, as smaller devices tend to produce less noise.

iii. A noise shroud enclosure shall be wrapped around the head (i.e. chisel) of the hoe ram whenever working within 200 feet of a receptor. Shrouds may be selected from various manufacturers such as Krupp Industries, Allied Hi-Ram, Montabert, or Rammer Inc. with steel shrouds to attach to the hoe ram head. Alternatively, a shroud may be fabricated on-site by wrapping the chisel head with a heavy vinyl noise curtain

material, such as SoundSeal BBC-13-2, or equivalently rated material, and securing it with tie wire.

iv. A skilled hoe ram operator can significantly affect the amount of noise produced during the work. In accordance with §28-101(h) of this chapter, responsible party and sub-contractor personnel shall be trained on the proper angle or position when the hoe ram chisel is placed against the work. The operator shall position and operate the device in such a manner as to minimize its noise output. A violation shall only be issued for failure to train the operator as set forth in subdivision (h) of section 28-101 of this chapter.

v. Alternative methods to hoe ramming concrete, including hydraulic jacks or chemical splitting (use of expansive demolition agents), shall be utilized whenever feasible. For steel demolition, alternative quieter methods may include the use of hydraulic shears and grapples, or the use of torches to cut the steel into more manageable pieces, which can then be trucked off-site for further demolition.

vi. When the responsible party uses specific makes and models as set forth in clause (i) of this subparagraph or a noise shroud as set forth in clause (iii) of this subparagraph, between the hours of 7:00 a.m. to 6:00 p.m. on weekdays, then the responsible party need not utilize additional pathway controls listed in subparagraph C. of this paragraph, unless the responsible party is performing work within 35 feet of an indoor receptor and with the exception of any required perimeter barriers as specified in §28-101(g) of this chapter.

vii. No violation shall be issued to the responsible party if any of the shrouds in clause (iii) of this subparagraph are adjusted such that the operator can view the end of the bit for safety purposes.

C. NOISE PATHWAY CONTROLS: NOISE BARRIERS & ENCLOSURES. The responsible party shall utilize one of the following pathway controls below. However, if the Department receives noise complaints concerning the site, the responsible party shall utilize additional pathway controls listed in this subparagraph as required by DEP.

i. The responsible party shall construct a portable noise barrier that shall be free from gaps and holes and constructed of sufficiently massive material to achieve a Sound Transmission Class rating of STC 30 or greater and shall be positioned as close as possible to the hoe ram. A portable (i.e. unanchored) noise barrier can be made, for example, of concrete jersey bases with ¾-inch plywood panels attached to fence posts extending upwards to a overall height of 15 feet. This shall be the maximum height for a free-standing barrier in order to avoid it tipping over from wind load. Multiple jersey bases and plywood panels can be positioned adjacent to one another to form a barrier of any desired length. The gaps between adjacent panels should be filled-in with noise curtain material, additional plywood, or similar material. A balanced canted panel, not susceptible to high winds shall be placed, when feasible, on top of the barrier in order to

provide better shielding for multi-story receptors. However, said barrier's height shall not exceed 15 feet including the balanced canted portion.

ii. The noise barrier shall be long and tall enough to completely block the line of sight between the hoe ram and any indoor receptor within 200 feet and that is a maximum of 20 feet above grade level, when work occurs. The barrier should be placed as close to the actual hoe ram work as feasible. Greater noise attenuation occurs when barriers are placed as close as possible to the noise source.

iii. Alternative barriers may be utilized in accordance with site-specific conditions. For example, shipping container (Conex) boxes or truck trailers may be positioned along the edge of the work site to form a semi-permanent noise barrier. Sufficient space must be available since containers are generally 8 feet wide by 8 feet tall and can be double-stacked to form a noise barrier 16 feet in height. The gaps between and/or under container boxes should be filled-in with heavy vinyl noise curtains or similar material.

iv. Where there are receptors surrounding the hoe ram work site on all sides, several noise barriers shall be used to form a complete enclosure around the hoe ram.

**4. Blasting.** This rule shall provide noise mitigation strategies that the responsible party shall utilize in order to reduce the noise emissions from blasting. The controlled use of explosives is occasionally necessary on a construction site, primarily to loosen hard rock ledges or to demolish large concrete structures. This rule does not apply to tunneling activities subject to the regulations set forth in §24-246 of the Administrative Code.

A. GENERAL RULES OF OPERATION

i. The hours of operation shall be in accordance with the rules as set forth in §28-103 of this chapter.

ii. The necessary and FDNY-regulated use of blasting shall be done in close coordination with the affected public in order to minimize potential disturbance.

B. SOURCE CONTROLS:

i. The smallest appropriate blasting charge possible shall be used in order to minimize blasting noise at its source. The quietest explosive material possible shall also be selected. Relatively slow-burning explosives produce quieter noise emissions as compared to faster-burning explosives.

C. NOISE PATHWAY CONTROLS: BLAST MATS AND BARRIERS

i. Blast mats made of heavy rubber shall be laid over the blast site.

ii. When blasting occurs close to receptors, the responsible party shall construct a portable noise barrier that shall be free from gaps and holes, constructed of a sufficiently massive material to achieve a Sound Transmission Class rating of STC 30 or greater, and positioned as close as possible to the blast site.

iii. The noise barrier shall be long and tall enough to completely block the line of sight between the blasting and any indoor receptor within 200 feet and that is a maximum of 20 feet above grade level, when work occurs. A portable (i.e. unanchored) noise barrier can be made, for example, of concrete jersey bases with 3/4-inch plywood panels attached to fence posts extending upwards to a maximum height of 15 feet.

**b. Earth Moving Equipment.**

**1. Vacuum Excavators.** This rule shall provide noise mitigation strategies the responsible party shall utilize when working with a vacuum excavator, or vac-truck. A vac-truck is a vehicle equipped with a low pressure suction hose leading to an on-board storage tank. Vac-trucks are generally used when removing dirt to avoid disrupting underground utility services such as telecommunications cables, water and sewer pipes, gas lines, or electrical cables.

A. GENERAL RULES OF OPERATION

i. The hours of operation shall be in accordance with the rules as set forth in §28-103 of this chapter.

B. SOURCE CONTROLS: QUIETER MODELS & SILENCERS

i. Smaller capacity (lower suction) vac-trucks tend to be quieter and shall be used whenever practicable. Listed from the quietest to the loudest order, examples include GapVac, BSI Dewitz, BoVac and Guzzler.

ii. Vac-trucks shall be run in their lower power setting whenever practicable. While suction capacity is reduced with lower engine speeds, there remains adequate suction to perform almost any job.

iii. Several manufacturers do provide silencers on the air intake and exhaust sides of the blower. Heavier duty silencers including Universal, Industrial Acoustics, McGill and Burgess-Manning, or equivalent, shall be used whenever practicable.

iv. The vac-truck's suction creating component (i.e. blower) shall be covered with a noise-reducing housing or enclosure.

v. When the responsible party uses a specific vac-truck as set forth in clause (i) of this subparagraph and/or silencers specifically set forth in clause (iii) of this subparagraph between the hours of 7:00 a.m. to 6:00 p.m. on weekdays, then the responsible party need not utilize additional pathway controls listed in subparagraph C of this paragraph, unless the responsible party is performing work within 35 feet of an

indoor receptor and with the exception of any required perimeter barriers as specified in §28-101(g) of this chapter.

C. NOISE PATHWAY CONTROLS: NOISE BARRIERS & CURTAINS

The responsible party shall utilize one of the following pathway controls below. However, if the Department receives noise complaints concerning the site, the responsible party shall utilize additional pathway controls listed in this subparagraph as required by DEP.

i. The responsible party shall construct a portable noise barrier that shall be free of gaps and holes and constructed of a sufficiently massive material to achieve a Sound Transmission Class rating of STC 30, or greater, and shall be positioned as close as possible to the vac-truck. A portable (i.e. unanchored) noise barrier can be made, for example, of concrete jersey bases with ¾-inch plywood panels attached to fence posts extending upwards to an overall height of 15 feet. This shall be the maximum height for a free-standing barrier in order to avoid it tipping over from wind load. Multiple jersey bases and plywood panels shall be positioned adjacent to one another to form a barrier of any desired length. The gaps between adjacent panels should be filled-in with noise curtain material, additional plywood, or similar material. A properly balanced canted panel, not susceptible to windy conditions, may be placed on top of the barrier in order to provide better shielding for multi-story receptors. However, such barrier's height shall not exceed 15 feet including the balanced canted portion.

ii. The noise barrier shall be long and tall enough to completely block the line of sight between the vac-truck and any indoor receptor within 200 feet and that is a maximum of 20 feet above grade level, when work occurs. The barrier should be placed as close to the actual vac-truck work as feasible. Greater noise attenuation occurs when barriers are placed as close as possible to the noise source.

iii. Portable noise shields made of steel frames wrapped with noise curtain material, such as SoundSeal model BBC-13-2, or equivalently rated material, shall be used to form a noise barrier in the direction of sensitive receptors and completely block the line of sight between the receptors and vac-truck. Noise curtains are typically made out of a ¼-inch thick heavy vinyl material, often with a noise absorptive quilt attached to one side. These noise curtains generally weigh 1.5 lbs/sq. ft., have an STC rating of about 32, and come in 4-foot wide sheets complete with grommets and Velcro edges to aid in hanging the curtains and sealing the sheets side-by-side.

iv. Alternative barriers may be utilized in accordance with site-specific conditions. For example, shipping container (Conex) boxes or truck trailers can be positioned along the edge of the work site to form a semi-permanent noise barrier. Sufficient space at the site is necessary as these containers are typically 8 feet wide by 8 feet tall and can be double-stacked to form a noise barrier 16 feet in height. The gaps between and/or under container boxes should be filled-in with heavy vinyl noise curtains or similar materials.

v. Whenever possible, vac-truck exhaust shall be positioned and directed away from receptors.

**c. Construction Trucks and Vehicles.**

**1. Dump Trucks.** This paragraph shall provide noise mitigation strategies that the responsible party shall utilize in order to reduce the noise emissions from dump trucks. Dump trucks are commonly used on construction sites in order to deliver construction materials, remove and excavate debris, or transfer materials around the job site. However they can produce loud noises when their tailgates are slammed when dumping a load, when their engines are revved with inadequate exhaust mufflers, when the first shovel-full is dropped into the bed, or due to use of their backup alarms.

**A. GENERAL RULES OF OPERATION**

i. The hours of operation shall be in accordance with the rules as set forth in §28-103 of this chapter.

**B. SOURCE CONTROLS**

i. The smallest sized and quietest dump truck that is adequate for a particular job shall be selected.

ii. A bed liner made of thick rubber, spray-on liner, plywood, sand or gravel shall be installed to mitigate the noise of the first load being dropped into the dump truck.

iii. Though not required for use in the United States (US), most US dump truck manufacturers produce quieter models for use in Europe. European Environmental Label (i.e. Blue Angel) low noise emission construction equipment, which is required for import and use in European Union (EU) nations in accordance with Quality Assurance Publication RAL UZ 53 and the Treaty on European Union 992-02-07 Journal C224, shall be used whenever feasible if it meets the US Environmental Protection Agency's emission requirements and/or regulations. These models are generally 10 dBA quieter than similar equipment used in the US.

iv. The positioning of the dump truck shall be carefully selected in order to minimize operation near receptors. Responsible parties shall attempt to reduce the necessity of backing-up by selecting a straight drive-through truck route. If a backup alarm is used, a quieter warning device shall be installed in accordance with §28-101(f) of this chapter.

v. The truck shall be equipped with an effective muffler in accordance with §28-101(b) of this chapter, which shall be well-maintained to ensure maximum noise reduction.

vi. Slamming a tail gate shall be avoided to the extent possible to prevent unreasonable noise. Alternately, a pad made of heavy rubber, leather or wood, when practicable, shall be used under the tail gate to prevent metal contact.

vii. The engine housing doors shall be kept closed while the engine is in operation.

viii. When the responsible party uses quieter dump truck models as set forth in clause (iii) of this subparagraph, between the hours of 7:00 a.m. to 6:00 p.m. on weekdays, the responsible party need not utilize additional pathway controls listed in subparagraph C of this paragraph, unless the responsible party is performing work within 35 feet of an indoor receptor and with the exception of any required perimeter barriers as specified in §28-101(g) of this chapter.

### C. NOISE PATHWAY CONTROLS: NOISE BARRIERS & CURTAINS

The responsible party shall utilize one of the following pathway controls. However, if the Department receives noise complaints concerning the site, the responsible party shall utilize additional pathway controls listed in this subparagraph as required by DEP.

i. The responsible party shall construct a portable noise barrier that shall be free from gaps and holes and constructed of a sufficiently massive material to achieve a Sound Transmission Class rating of STC 30, and shall be positioned as close as possible to the vehicle, in order to provide the greatest insertion loss. A portable (i.e. unanchored) noise barrier can be made, for example, of concrete jersey bases with ¾-inch plywood panels attached to fence posts extending upwards to an overall height of 15 feet. This shall be the maximum height for a free-standing barrier in order to avoid it tipping over from wind load. Multiple jersey bases and plywood panels may be positioned adjacent to one another to form a barrier of any desired length. The gaps between adjacent panels shall be filled-in with noise curtain material, additional plywood, or similar material. A canted panel may be placed on top of the barrier in order to provide better shielding for multi-story receptors; however care must be taken to avoid having the barrier tip over from unbalanced loading. Further, said barrier's height shall not exceed 15 feet including the balanced canted portion.

ii. The noise barrier shall be long and tall enough to completely block the line of sight between the dump truck and any indoor receptor within 200 feet and that is a maximum of 20 feet above grade level, when work occurs. The barrier shall be placed as close to the actual dump truck work as feasible. Greater noise attenuation occurs when barriers are placed as close as possible to the noise source.

iii. Noise curtain material, such as SoundSeal model BBC-13-2, or equivalently rated material, shall be used to form a noise barrier in the direction of sensitive receptors and completely block the line of sight between the receptors and dump truck. It shall also be draped over the dump truck to augment the engine housing and exhaust stack. Noise curtains are typically made out of a ¼-inch thick heavy vinyl material, often with a noise absorptive quilt attached to one side. These noise curtains

generally weigh 1.5 lbs/sq. ft., have an STC rating of about 32, and come in 4-foot wide sheets complete with grommets and Velcro edges to aid in hanging the curtains and sealing the sheets side-by-side.

iv. Conveyor belts shall be used whenever practicable, as they may allow the dump trucks to operate much farther away from receptors.

v. Alternative barriers may be utilized in accordance with site-specific conditions. For example, shipping container (Conex) boxes or truck trailers may be positioned along the edge of the work site to form a semi-permanent noise barrier. Sufficient space at the site is necessary as these containers are generally 8 feet wide by 8 feet tall and can be double-stacked to form a noise barrier 16 feet in height. The gaps between and/or under container boxes shall be filled-in with heavy vinyl noise curtains or similar material.

#### **d. Stationary Equipment.**

**1. Cranes.** This rule shall provide noise mitigation strategies that the responsible party shall utilize in order to reduce the noise emissions from cranes. Cranes are an essential piece of equipment on most large construction sites in order to load and unload delivery trucks, lift building materials to required heights, lift excavated materials out of tunnels and for other sub-surface excavations, and move other equipment and personnel around the job site. Cranes come in many varieties and sizes, including tracked or wheeled mobile cranes, fixed or floating derricks, and tower cranes.

##### **A. GENERAL RULES OF OPERATION**

i. The hours of operation shall be in accordance with the rules set forth in §28-103 of this chapter.

##### **B. SOURCE CONTROLS: QUIETER MODELS**

i. There are various makes and models that are inherently quieter than others. Smaller, quieter cranes, including rubber-tired mobile cranes, shall be used whenever possible based on load lifting requirements.

ii. New modern hydraulic cranes shall be used whenever possible to avoid the squeal produced by cable drum brakes on mechanical cranes.

iii. Though not required for use in the United States, most US crane manufacturers produce quieter models for use in Europe. European Environmental Label (i.e. Blue Angel) low noise emission construction equipment, which is required for import and use in European Union (EU) nations in accordance with Quality Assurance Publication RAL UZ 53 and the Treaty on European Union 992-02-07 Journal C224, shall be used whenever feasible and if it meets the US Environmental Protection

Agency's emission requirements and/or regulations. These cranes are about 10 dBA quieter than similar models sold in the US.

iv. The positioning of the crane shall be carefully selected in order to minimize the need to relocate it around the job site. Whenever possible, tower cranes shall be used, as they essentially produce no noise at ground level.

v. The crane shall be equipped with an effective muffler in accordance with §28-101(b) of this chapter, which shall be well maintained to ensure maximum noise reduction.

vi. When the responsible party uses new modern hydraulic cranes as set forth in clause (ii) of this subparagraph and/or additional source controls set forth in clause (iii) of this subparagraph, between the hours of 7:00 a.m. to 6:00 p.m. on weekdays, the responsible party need not utilize additional pathway controls listed in subparagraph C of this paragraph, unless the responsible party is performing work within 35 feet of an indoor receptor and with the exception of any required perimeter barriers as specified in §28-101(g) of this chapter.

#### C. NOISE PATHWAY CONTROLS: NOISE BARRIERS & CURTAINS

The responsible party shall utilize one of the following pathway controls. However, if the Department receives noise complaints concerning the site, the responsible party shall utilize additional pathway controls listed in this subparagraph as required by DEP.

i. The responsible party shall construct a portable noise barrier that shall be free from gaps and holes constructed of a sufficiently massive material to achieve a Sound Transmission Class rating of STC 30 or greater, and shall be positioned as close as possible to the crane. A portable (i.e. unanchored) noise barrier can be made, for example, of concrete jersey bases with ¾-inch plywood panels attached to fence posts extending upwards to an overall height of 15 feet. This shall be the maximum height for a free-standing barrier in order to avoid it tipping over from wind load. Multiple jersey bases and plywood panels shall be positioned adjacent to one another to form a barrier of any desired length. The gaps between adjacent panels shall be filled-in with noise curtain material, additional plywood, or similar material. A properly balanced canted panel, not susceptible to windy conditions, may be placed on top of the barrier in order to provide better shielding for multi-story receptors. However, said barrier's height shall not exceed 15 feet including the balanced canted portion.

ii. The noise barrier shall be long and tall enough to completely block the line of sight between the crane and any indoor receptor within 200 feet and that is a maximum of 20 feet above grade level, when work occurs. The barrier shall be placed as close to the actual crane work as feasible. Greater noise attenuation occurs when barriers are placed as close as possible to the noise source.

iii. Portable noise shields made of steel frames wrapped with noise curtain material, such as SoundSeal model BBC-13-2, or equivalently rated material, shall be

used to form a noise barrier in the direction of sensitive receptors and completely block the line of sight between the receptors and crane. Noise curtains are typically made out of a ¼-inch thick heavy vinyl material, often with a noise absorptive quilt attached to one side. These noise curtains generally weigh 1.5 lbs/sq. ft., have an STC rating of about 32, and come in 4-foot wide sheets complete with grommets and Velcro edges to aid in hanging the curtains and sealing the sheets side-by-side.

iv. Alternative barriers may be utilized in accordance with site-specific conditions. For example, shipping container (Conex) boxes or truck trailers may be positioned along the edge of the work site to form a semi-permanent noise barrier. Sufficient space at the site is necessary as these containers are generally 8 feet wide by 8 feet tall and can be double-stacked to form a noise barrier 16 feet in height. The gaps between and/or under container boxes shall be filled-in with heavy vinyl noise curtains or similar material.

**2. Auger Drill Rigs.** This rule shall provide mitigation strategies the responsible party shall utilize when using auger drill rigs. Auger drill rigs are typically mounted to cranes or they can be built as dedicated machines as well. Auger drill rigs are used to drill shafts into the ground, which are then filled with cement form concrete piles, to loosen underlying soil and allow solid piles to be driven more easily, or used in multiple configuration to “mix” grout into the soil and change the soil’s properties (i.e. strengthen it and reduce its water content).

#### A. GENERAL RULES OF OPERATION

i. The hours of operation shall be in accordance with the rules set forth in §28-103 of this chapter.

#### B. SOURCE CONTROLS: QUIETER MODELS & SILENCERS

i. The auger drill rig or crane shall be equipped with an effective muffler in accordance with §28-101(b) of this chapter, which shall be well- maintained to ensure maximum noise reduction.

ii. All moving parts shall be well lubricated for proper drilling performance and to avoid unnecessary noise from squeaking parts.

iii. Debris on the drill bit shall be removed without quick twisting, jerking or hammering the bit, unless geotechnical conditions at the location so require. Alternative quieter methods include use of a high pressure water hose where debris is not contaminated or a laborer using a hand shovel.

#### C. PATHWAY CONTROLS: NOISE BARRIERS & CURTAINS

The responsible party shall utilize one of the following pathway controls. However, if the Department receives noise complaints concerning the site, the responsible party shall utilize additional pathway controls listed in this subparagraph as required by DEP.

i. The responsible party shall construct a portable noise barrier that shall be free from gaps and holes and constructed of a sufficiently massive material to achieve a Sound Transmission Class rating of STC 30, or greater, and shall be positioned as close as possible to the auger drill rig. A portable (i.e. unanchored) noise barrier may be made, for example, of concrete jersey bases with 3/4-inch plywood panels attached to fence posts extending upwards to an overall height of 15 feet. This shall be the maximum height for a free-standing barrier in order to avoid it tipping over from wind load. Multiple jersey bases and plywood panels shall be positioned adjacent to one another to form a barrier of any desired length. The gaps between adjacent panels shall be filled-in with noise curtain material, additional plywood, or similar material. A properly balanced canted panel, not susceptible to windy conditions, may be placed on top of the barrier in order to provide better shielding for multi-story receptors. However, said barrier's height shall not exceed 15 feet including the balanced canted portion.

ii. The noise barrier shall be long and tall enough to completely block the line of sight between the auger drill rig and any indoor receptor within 200 feet and that is a maximum of 20 feet above grade level, when work occurs. The barrier should be placed as close to the actual auger drill rig work as feasible. Greater noise attenuation occurs when barriers are placed as close as possible to the noise source.

iii. Noise curtain material, such as SoundSeal model BBC-13-2, or equivalently rated material, shall be used to form a noise barrier in the direction of sensitive receptors and completely block the line of sight between the receptors and auger drill rig. Noise curtains are typically made out of a 1/4-inch thick heavy vinyl material, often with a noise absorptive quilt attached to one side. These noise curtains generally weigh 1.5 lbs/sq. ft., have an STC rating of about 32, and come in 4-foot wide sheets complete with grommets and Velcro edges to aid in hanging the curtains and sealing the sheets side-by-side.

iv. Alternative barriers may be utilized in accordance with site-specific conditions. For example, shipping container (Conex) boxes or truck trailers may be positioned along the edge of the work site to form a semi-permanent noise barrier. Sufficient space at the site is necessary as these containers are generally 8 feet wide by 8 feet tall and can be double-stacked to form a noise barrier 16 feet in height. The gaps between and/or under container boxes shall be filled-in with heavy vinyl noise curtains or similar material.

**3. Street Plates.** In addition to the Department of Transportation rules set forth in 34 RCNY §2-11(10), the responsible party shall follow one or more of the following methods to reduce noise emissions from loose or rattling street plates.

A. SOURCE CONTROLS:

i. The street plates shall be installed in the street surface in accordance with 34 RCNY §2-11(10) in order to have a level and smooth transition from pavement to plate surface and to keep the plates firmly in place.

ii. Asphalt cold-patch shall be applied when feasible around the edges of the street plate to minimize vehicular tire impact on the plate and to help keep the plate in place.

B. NOISE PATHWAY CONTROLS:

i. Whenever feasible, traffic shall be routed around the street plates by placing traffic cones, barrels, and/or warning tape around the plated area.

**4. Backup Alarms.** In accordance with §28-101(f) of this chapter, all existing vehicles that enter a work site shall be equipped with OSHA-approved, and OEM manufacturer-approved (if necessary), quieter backup alarms by January 1, 2008. All new vehicles that enter the work site shall be equipped with OSHA-approved quieter backup alarms by January 1, 2008. All on-road vehicles that do not enter the work site, but are in operation after hours pursuant to §28-103 of this chapter, shall also be equipped with OSHA-approved, and OEM manufacturer-approved (if necessary), quieter backup alarms by January 1, 2008. The work site referenced in this paragraph shall mean construction sites within the property line. Subparagraph A of this paragraph contains a list of quieter OSHA-approved backup alarms pursuant to OSHA Regulations, 29 CFR Part 1926, Subpart "O", 1926.601.b.4 and 1926.602.a.9. If the responsible party cannot reasonably comply with the requirements of this paragraph, such person shall file an Alternative Noise Mitigation Plan in accordance with §28-104 of this chapter.

A. SOURCE CONTROLS: QUIETER MAKES & MODELS

i. Quieter alarms or similar backup devices that meet OSHA requirements may be selected from the list below or from equivalent quieter alarms.

(a) Examples of manually-adjustable backup alarms include:

- Preco Model 45AA
- Ecco Model 820

(b) Examples of automatically-adjustable backup alarms include:

- Preco Model 1048
- Ecco Model SA907
- Grote Model 73100

(c) Examples of community sensitive backup alarms include:

- BBS-TEK Brigade Model BBS-92

ii. When the responsible party uses quieter backup alarms as described in clause (i) of this subparagraph, the responsible party need not utilize additional pathway controls listed in subparagraph B of this paragraph, unless the responsible party is performing work within 35 feet of an indoor receptor and with the exception of any required perimeter barriers as specified in §28-101(g) of this chapter.

B. NOISE PATHWAY CONTROLS. If it is not feasible to select one of the OSHA-approved alarms in subparagraph A of this paragraph, responsible parties shall utilize one of the following pathway controls. However, if the Department receives noise complaints concerning the site, the responsible party shall utilize additional pathway controls listed in this subparagraph as required by DEP.

i. Responsible parties shall attempt to reduce the necessity of backing-up by selecting a straight drive-through truck route.

ii. The responsible party shall construct a portable noise barrier that shall be free from gaps and holes and constructed of a sufficiently massive material to achieve a Sound Transmission Class rating of STC 30 or greater. It shall be positioned as close as possible to the vehicle, in order to provide the greatest insertion loss. A portable (i.e. unanchored) noise barrier may be made, for example, of concrete jersey bases with 3/4-inch plywood panels attached to fence posts extending upwards to an overall height of 15 feet. This shall be the maximum height for a free-standing barrier in order to avoid it tipping over from wind load. Multiple jersey bases and plywood panels may be positioned adjacent to one another to form a barrier of any desired length. The gaps between adjacent panels shall be filled-in with noise curtain material, additional plywood, or similar material. A canted panel may also be built on top of the barrier in order to provide better shielding for multi-story receptors; however care must be taken to avoid having the barrier tip over from unbalanced loading. Further, said barrier's height shall not exceed 15 feet including the balanced canted portion.

iii. The noise barrier shall be long and tall enough to completely block the line of sight between the backup alarm and any indoor receptor within 200 feet and that is a maximum of 20 feet above grade level, when work occurs. The barrier should be placed as close to the actual backup alarm as feasible. Greater noise attenuation occurs when barriers are placed as close as possible to the noise source.

iv. Alternative barriers may be utilized in accordance with site specification. Conex containers are likely already available to the responsible party. For example, where sufficient work site space exists, container (Conex) boxes or truck trailers may be positioned along the edge of the work site to form a semi-permanent noise barrier. These containers are typically 8 feet wide by 8 feet tall and can be double-stacked to form a noise barrier 16 feet in height. The gaps between and/or under container boxes shall be filled-in with heavy vinyl noise curtains or similar material.

**e. Manually Operated Equipment.**

**1. Concrete Saws.** This rule shall provide noise mitigation strategies that the responsible party shall utilize in order to reduce the noise emissions from concrete saws. Concrete saws are used on construction projects primarily for demolition purposes, but can also be used for opening access holes, cutting stress relief channels, and finishing off new construction.

**A. GENERAL RULES OF OPERATION**

i. The hours of operation shall be in accordance with the rules as set forth in §28-103 of this chapter.

B. SOURCE CONTROLS: QUIETER MODELS

i. Smaller saws shall be used, based on the power and cutting depth necessary to perform the job, as they tend to be quieter.

ii. A quieter-type saw blade, including a grinding saw blade or one made of ceramic or special-tipped cutting teeth, shall be chosen whenever practicable.

C. NOISE PATHWAY CONTROLS: NOISE BARRIERS & ENCLOSURES. The responsible party shall utilize one of the following pathway controls. However, if the Department receives noise complaints concerning the site, the responsible party shall utilize additional pathway controls listed in this subparagraph as required by DEP.

i. The responsible party shall construct a portable noise barrier that shall be free from gaps and holes and constructed of a sufficiently massive material to achieve a Sound Transmission Class rating of STC 30 or greater, and is positioned as close as possible to the saw. A portable (i.e. unanchored) noise barrier may be made, for example, of concrete jersey bases with 3/4-inch plywood panels attached to fence posts extending upwards to an overall height of 15 feet. This shall be the maximum height for a free-standing barrier in order to avoid it tipping over from wind load. Multiple jersey bases and plywood panels shall be positioned adjacent to one another to form a barrier of any desired length. The gaps between adjacent panels shall be filled-in with noise curtain material, additional plywood, or similar material. A properly balanced canted panel, not susceptible to windy conditions, may be placed on top of the barrier in order to provide better shielding for multi-story receptors. However, said barrier's height shall not exceed 15 feet including the balanced canted portion.

ii. The noise barrier shall be long and tall enough to completely block the line of sight between the saw and any indoor receptor within 200 feet and that is a maximum of 20 feet above grade level, when work occurs. The barrier shall be placed as close to the actual saw work as feasible. Greater noise attenuation occurs when barriers are placed as close as possible to the noise source.

iii. Portable noise enclosures made of steel frames wrapped with noise curtain material, such as SoundSeal model BBC-13-2, or equivalently rated material, shall be built to surround (top and 3 sides) the concrete saw and the operator. A well made enclosure, using curtain material with a Sound Transmission Class rating of STC 30 or greater, can generally provide a 5 dBA insertion loss providing there are no gaps in the enclosure. Noise tents may be reused at other sites with proper care and maintenance.

iv. There shall be multiple tents for multiple concrete saws. For example, when two saws are being utilized and they cannot fit under the same noise tent, the responsible party shall provide an additional noise tent.

v. The noise tent shall be moved as the concrete saw work progresses in order to maintain the tent's ability to block the line-of-sight between the saw and the receptors.

vi. Emergency concrete sawing that occurs on any public right-of-way after normal working hours as set forth in §28-103 of this chapter, within 500 feet of any residential receptor, shall require noise tents with double-thick noise curtain material, or a noise tent augmented with a portable noise barrier to form a double layer of mitigation.

vii. Where there are receptors surrounding the concrete saw work site on all sides, two tents shall be used whenever practicable, on either side of the saw, to form a complete enclosure.

#### **§28-103 Authorized Work Hours.**

a. Equipment shall be used only during the hours of 7:00 a.m. and 6:00 p.m. on weekdays, unless the responsible party obtains an after hours work authorization, in which case the equipment shall be used in accordance with the hours specified in the permit and in the after hours work authorization, as set forth in §24-223 of the Administrative Code.

b. When work occurs after hours in accordance with §24-223 of the Administrative Code, or falls within one of the exceptions to limits on after hours and weekend construction work set forth in §24-222 of such Code, additional noise mitigation measures and/or techniques shall be implemented when required by DEP.

#### **§28-104 Alternative Noise Mitigation Plan.**

When required by §24-221 of the Administrative Code or this chapter, a complete and accurate Alternative Noise Mitigation Plan shall be filed with DEP in accordance with §24-221 of such Code. If and when approved by DEP, such plan shall be conspicuously posted at the job site. When an Alternative Noise Mitigation Plan is required, no construction activities shall take place until said plan is filed with and approved by DEP. The Alternative Noise Mitigation Plan Form is available at: <http://www.nyc.gov/dep> or at DEP's Offices at:

New York City Department of Environmental Protection  
Bureau of Environmental Compliance, 9th Floor  
59-17 Junction Blvd.  
Flushing, NY 11373

#### **§28-105 Utility Noise Mitigation Plan.**

Pursuant to §24-219 of the Administrative Code, every authorized publicly franchised New York City utility company that provides gas, electric, steam and telecommunication services shall have conspicuously posted a complete and accurate Utility Noise Mitigation Plan at all sites

where construction activities take place. Although the plan need not be filed with DEP, it shall be readily available for inspection should a complaint be filed or during a routine inspection. The Utility Noise Mitigation Plan Form is available at: <http://www.nyc.gov/dep> or at DEP's Offices at:

New York City Department of Environmental Protection  
Bureau of Environmental Compliance, 9th Floor  
59-17 Junction Blvd.  
Flushing, NY 11373

#### **§28-106 Required Noise Mitigation Measures for Utilities.**

a. A utility company conducting construction activity shall self-certify in its Construction Noise Mitigation Plan that all construction tools and equipment have been maintained so that they operate at normal manufacturer's operating specifications, including at peak loading. Such self-certification shall be indicated on the Construction Noise Mitigation Plan form required by §28-100 of this chapter. Upon a DEP inspection of the work site, DEP shall use the noise level guidelines in the Federal Highway Administration Roadway Construction Noise Model User's Guide, Jan. 2006, page 3, located in the Appendix to this chapter, as a means of identifying equipment that may be the cause of a noise complaint. If an individual piece of equipment is identified by DEP as exceeding the level specified in such Guide located in the Appendix to this chapter, upon notification by DEP, the responsible party shall have the option of: (i) performing maintenance to demonstrate a good faith effort, notwithstanding the model year of the equipment, to mitigate the noise by a measurable level acceptable to the Department, (ii) replacing the equipment with equipment that complies with said level, or (iii) filing an Alternative Noise Mitigation Plan pursuant to §28-104 of this chapter, within five business days of said inspection. If the responsible party elects to perform maintenance pursuant to option (i), but cannot demonstrate within five business days a reduction in noise by a measurable level acceptable to the Department, such party shall pursue one of the other two options to the satisfaction of the Department. The failure to exercise and complete one of such three options within five business days of said inspection shall be a violation of this rule.

b. All tools and equipment being operated on site must be equipped with the appropriate manufacturer's noise reduction device. These devices, including but not limited to portable compressors and other such pneumatic tools, such as jackhammers/pavement breakers, shall be equipped with a standard muffler and jacket, free from air or exhaust leaks.

c. Specialized vehicles, including but not limited to compressor trucks, vacuum excavators, pavement-coring, power-rodging, flush trucks, and other vehicles with internal combustion motors, shall require additional noise mitigation measures as specified by DEP, such as the use of noise-insulating material that does not interfere with the engine operation and/or other techniques to reduce noise.

d. Portable compressors, generators, pumps and other such devices shall be covered with noise-insulating fabric, which is not to interfere with engine operations, and/or shall employ other techniques to reduce noise.

e. The time of day that work is in progress shall also determine the technology that provides the appropriate noise mitigation. All work that occurs after the hours of 7:00 a.m. to 6:00 p.m. on weekdays shall require an after hours work authorization in accordance with §24-223 of the Administrative Code. From the hours of 6:00 p.m. to 10:00 p.m. on weekdays, the utility shall use daytime noise mitigation controls. However, work between the hours of 10:00 p.m. and 7:00 a.m. on weekdays and between 7:00 p.m. and 7:00 a.m. on weekends may be required by DEP to employ additional techniques, including noise blankets and barriers to reduce the level of noise for receptors within 200 feet.

f. Quieter jackhammers, compressors, and other such construction devices shall be used when available and/or may be required by DEP. A program shall be initiated between DEP and the utilities to perform additional noise-testing of construction devices and to make recommendations to DEP for future rules and use of devices.

g. All unnecessary vehicle engine-idling on site shall be prevented in accordance with §24-163 of the Administrative Code.

h. All steel traffic plates are to be properly installed and secured to the roadway surface in compliance with 34 RCNY §2-11(10)(e). Within 24 hours after a call to the utility from DEP, plates shall be re-set and secured properly.

i. Notification shall be given to residents within 200 feet of the construction when work is scheduled for longer than 3 days. Such notification shall include information on construction work schedules and locations.

j. The permit-holder shall respond to all noise complaints and/or official notice from DEP the same day as received or the next day if received after regular utility work hours or as may be required by DEP.

k. All new vehicles will be phased in with the installation of quieter backup warning devices in accordance with paragraph 4 of subdivision d of §28-102 of this chapter.

l. A formal noise mitigation training program shall be established and implemented for all field-worker supervisory personnel including sub-contractor supervisors. Supervisory personnel shall field-train all field workers in an effort to minimize construction noise.

m. When work is planned near sensitive receptors, including but not limited to schools, hospitals, places of worship, homes for the aging, etc., the permit-holder shall cooperate with the facility owner/operator to coordinate the work whenever possible so as to minimize the impact on the facility and the utility shall use quieter devices and other noise mitigation methods, such as blankets and barriers.

n. A DEP Inspector may visit the site to examine the Utility Noise Mitigation Plan upon receiving a complaint and may require further action to reduce the level of noise. The responsible party will be provided a 24-hour cure period to correct the condition or to file an Alternative

Noise Mitigation Plan under §28-104 of this chapter. If the condition is not corrected after 24 hours or if an Alternative Noise Mitigation Plan is not filed with DEP, a Notice of Violation shall be issued. However, there shall be no 24-hour cure period with respect to compliance with §§28-100, 28-101(a), (b), (f), or (h); §28-104; §28-105; and §§28-106(a), (b), (d), (g), or (i) of this chapter.

o. Perimeter noise barriers shall be used as set forth in §28-101(g) of this chapter. All gaps and spaces in the semi-permanent or temporary barriers shall be filled with noise attenuation material, and such barriers shall be placed as close as possible to the noise source to promote greater noise attenuation.

p. Utilities that engage in non-emergency, long-term projects, defined as continuous work that cannot be completed within 15 calendar days when there is a dedicated lane, shall be required to comply with §§28-100 to 28-104 of this chapter. Work shall be considered continuous even though there may be a cessation of activities for 24 hours or less during the project.

#### **§28-107 Perimeter Noise Barriers.**

a. Perimeter Noise Barriers – Noise barriers, positioned between construction equipment and receptors, shall be used whenever practicable for all construction projects. Such barriers may be semi-permanent given the time and space requirements of the job site. They may be made of wood, plastic, Plexiglas, precast concrete or steel panels, or where work site space permits, natural materials, such as dirt piles or earthen berms.

b. Noise barriers shall be used to reduce noise affecting pedestrians. Being relatively tall and solid, noise barriers form an excellent perimeter and/or security fence around a job site in addition to reducing noise at street level. Greater noise attenuation occurs when barriers are placed as close as possible to the noise source.

c. When the work site is within 200 feet of a residential receptor, the responsible party that is required to use a work site perimeter noise barrier (or “construction fence”) under DOB rules and regulations shall ensure that noise-resistant material fully lines the interior face (facing the work site) of the perimeter barrier, and shall ensure that:

1. the barrier breaks the line-of-sight between the noise source and indoor receptors within 200 feet and a maximum of 20 feet above grade level where practicable; however, said barrier’s height shall not exceed 15 feet, including the balanced canted portion;

2. the barrier is made of a material sufficiently resistant to noise in accordance with subdivision e of this section; and

3. there are no leaks or gaps that will allow noise to pass through the barrier.

d. Noise Barrier Design Options.

1. Semi-permanent noise barriers are barriers that, due to their height, will require some form of anchoring system. Typically, semi-permanent barriers are intended for long term continuous use. Thus they are built out of materials suitable to withstand weather conditions for several years. Materials such as tongue and groove wooden timbers, vertical I-beam posts and lagging, or precast concrete panels, serve very well as semi-permanent noise barriers. Being anchored, semi-permanent barriers can easily extend to heights of 15 feet and must be in accordance with DOB and FDNY rules and regulations.

2. Where practicable, the responsible party shall build a pitched panel on top of the barrier in order to provide better shielding for multi-story receptor buildings, however care must be taken to avoid having the barrier tip over from unbalanced loading.

3. Alternative barriers may be utilized in accordance with site-specific conditions. For example, shipping container (Conex) boxes are likely already available to the responsible party. For example, where work site space permits, these container boxes or truck trailers may be positioned along the edge of the work site to form a semi-permanent noise barrier. These containers are typically 8 feet wide by 8 feet tall and can be double-stacked to form a noise barrier 16 feet in height. The gaps between and/or under container boxes shall be filled-in to avoid having noise flank around or under the container boxes.

4. There are also several product vendors that design and manufacture noise barrier materials and barrier systems. These special purpose products are available in various colors and materials including wood, plastic, Plexiglas, precast concrete or steel panels. They are available with or without anchoring systems, as needed.

e. Noise Barrier Specifications. Noise barriers shall be made of noise-resistant material sufficient to achieve a Sound Transmission Class (STC) rating of STC 30 or greater, based on sound transmission loss data taken according to ASTM Test Method E90. Such a barrier can provide as much as a 10 dBA insertion loss providing it is positioned as close as possible to the noise source or to the receptors. To be at all effective, the barrier must be long and tall enough to completely block the line-of-sight between the noise source and the receptors. The gaps between adjacent panels must be filled-in to avoid having noise penetrate directly through the barrier.

#### **§28-108 Temporary or Portable Noise Barriers.**

a. Where there is a dedicated lane for such barrier, temporary or portable (i.e. unanchored) noise barriers shall be used for street work lasting longer than 15 days as set forth in this section. All such barriers shall be placed as close as possible to the noise source in order to maximize noise attenuation.

b. Where construction projects are of shorter duration than 15 days and within the property line and do not require perimeter barriers and are within 75 feet of a residential receptor, a temporary or portable (i.e. unanchored) noise barrier shall be made in accordance with this section.

c. Construction of temporary barrier. Noise barriers shall be made of noise-resistant material sufficient to achieve a Sound Transmission Class (STC) rating of STC 30 or greater, based on sound transmission loss data taken according to ASTM Test Method E90. Such a barrier may provide as much as a 10 dBA insertion loss, provided it is positioned as close as possible to the noise source or to the receptors. To be at all effective, the barrier must be long and tall enough to completely block the line-of-sight between the noise source and the receptors. The gaps between adjacent panels must be filled-in to avoid having noise penetrate directly through the barrier.

i. Temporary or portable noise barriers, where required, may be made, for example, of concrete jersey bases with ¾-inch plywood panels attached to fence posts extending upwards to an overall height of 15 feet and must be in accordance with DOB and FDNY rules and regulations. This shall be the maximum height for a free-standing barrier in order to avoid it tipping over from wind load. Multiple jersey bases and plywood panels may be positioned adjacent to one another to form a barrier of any desired length. The gaps between adjacent sections shall be filled-in to form a continuous solid barrier surface.

ii. Wherever practicable, a pitched panel shall be built on top of the barrier in order to provide better shielding for multi-story receptor buildings; however care must be taken to avoid having the barrier tip over from unbalanced loading. Further, the barrier shall not exceed 15 feet in height including the pitched panel.

d. Noise curtains. Noise curtain material may be mounted or hung over perimeter chain link fences, or draped over small noise sources, to form a flexible noise barrier. The chain link fences can also be attached to the top of jersey bases.

i. Noise curtains shall be made of a ¼-inch thick heavy vinyl material, with a noise absorptive quilt attached to one side (the side facing the noise source).

ii. Noise control curtains shall have a Sound Transmission Class (STC) rating of STC 30 or greater, based on sound transmission loss data according to ASTM Test Method E90. The noise absorptive face of the curtains shall have a Noise Reduction Coefficient (NRC) rating of 0.85 or greater, based on sound absorption coefficient data taken according to ASTM Test Method C423.

iii. Noise curtains of this sort, such as SoundSeal model BBC-13-2, or equivalently rated material, generally weigh about 1.5 lbs/sq. ft. They come in 4-foot wide sheets complete with grommets and Velcro edges to aid in hanging the curtains and sealing the sheets side-by-side.

e. Noise Tents. A noise tent may be used within the property line.

i. Noise curtain material may be attached to a metal frame to form a portable enclosure (known as a “noise tent”). The noise tent shall have noise curtain material attached on three sides and on top of the frame, with the remaining side of the frame left open for work access and ventilation.

ii. A frame size of 8 feet tall by 6 feet wide by 6 feet deep shall allow the tent to be positioned over small noise sources, such as pumps, generators or compressors. The tent may also be used to cover a laborer using hand-held power tools, such as jackhammers, saws or grinders. Caster wheels may be placed under the frame for mobility, or the tent may be picked up and moved with the arm of a backhoe, for example.

#### **§28-109 Definitions.**

For the purpose of this chapter, the meaning of terms shall be as follows (unless the context specifically indicates otherwise):

**Canted Panel.** “Canted Panel” shall mean a tilted panel of noise mitigation material that extends a noise barrier to protect upper floor receptors from noise sources.

**Insertion Loss.** “Insertion Loss” shall mean the reduction in noise level at the receptor’s location attributable to the introduction of a noise barrier, muffler, or other mitigation measure.

**Jersey Bases.** “Jersey Bases,” also known as concrete traffic dividers or jersey barriers, shall mean movable concrete bases used in construction that can accommodate fencing poles to which noise curtain material can be attached.

**Noise absorptive quilt.** “Noise absorptive quilt” shall mean padded light-weight porous material sewn together into a quilt-like pattern and then attached to one side of a vinyl sheet.

**Noise Barrier.** “Noise Barrier” shall mean a structure used for the purpose of placing near a noise source to reduce the noise level measurable at a receptor location. This can consist of noise resistant materials such as plywood, timbers, trailer containers, or noise curtains.

**Noise curtain.** “Noise curtain” shall mean noise control product comprised of (typically) ¼-inch thick vinyl sheet, to act as a noise resistant material, with some noise absorptive quilt material attached on one side of the vinyl as well.

**Noise Pathway Controls.** “Noise Pathway Controls” shall mean noise mitigation techniques placed between the source of noise and the receptor.

**Noise-resistant material.** “Noise-resistant material” shall mean material that has sufficient mass and stiffness to resist noise from transmitting through the material.

**Receptor.** “Receptor,” also known as receiving property, shall mean real property, including but not limited to buildings, grounds, offices and dwelling units, from which sound levels from sound sources outside such property may be measured.

**Responsible party.** “Responsible party” shall mean, with respect to any activity regulated or covered by these rules, the owner of the premises on or where such activity occurs, and any agent of the owner engaged in such activity or any participant in such activity, including

contractors and subcontractors. Any agency of the City of New York may also be a responsible party.

**Sound Transmission Class (STC).** The “Sound Transmission Class”, or “STC rating”, shall mean a single index number used to describe a solid panel or material’s ability to prevent noise from transferring directly through it. Determination of a material’s STC is done in accordance with ASTM Test Method E90.

**§28-109 Appendix - Federal Highway Administration Roadway Construction Noise Model User’s Guide, Jan. 2006.**

**CA/T Equipment 50 ft Noise Emission Reference Levels and Usage Factors**

- All noise levels expressed in A-weighted decibels with RMS "slow" time constant

<u>Label ID</u>	<u>Equipment Description</u>	<u>Impact Device?</u>	<u>Usage Factor (%)</u>	<u>Spec 721.560 Lmax @ 50ft (dBA, slow)</u>	<u>Actual Measured Lmax @ 50ft (dBA, slow)</u>
A	All Other Equipment > 5 HP	No	50	85	n/a
B	Auger Drill Rig	No	20	85	84
C	Backhoe	No	40	80	78
D	Bar Bender	No	20	80	80
E	Blasting	Yes	N/A	94	n/a
F	Boring Jack Power Unit	No	50	80	83
G	Chain Saw	No	20	85	84
H	Clam Shovel (dropping)	Yes	20	93	87
I	Compactor (ground)	No	20	80	83
J	Compressor (air)	No	40	80	78
K	Concrete Batch Plant	No	15	83	83
L	Concrete Mixer Truck	No	40	85	79
M	Concrete Pump Truck	No	20	82	81
N	Concrete Saw	No	20	90	90
O	Crane	No	16	85	81
P	Dozer	No	40	85	82
Q	Drill Rig Truck	No	20	84	79
R	Drum Mixer	No	50	80	80
S	Dump Truck	No	40	84	76
T	Excavator	No	40	85	81
U	Flat Bed Truck	No	40	84	74
V	Front End Loader	No	40	80	79
W	Generator	No	50	82	81

X	Generator (<25KVA, VMS signs)	No	50	70	73
Y	Gradall	No	40	85	83
Z	Grader	No	40	85	85
AA	Grapple (on backhoe)	No	40	85	87
AB	Horizontal Boring Hydr. Jack	No	25	80	82
AC	Hydra Break Ram	Yes	10	90	90
AD	Impact Pile Driver	Yes	20	95	101
AE	Jackhammer	Yes	20	85	89
AF	Man Lift	No	20	85	75
AG	Mounted Impact Hammer (hoe ram)	Yes	20	90	90
AH	Pavement Scarafier	No	20	85	90
AI	Paver	No	50	85	77
AJ	Pickup Truck	No	40	55	75
AK	Pneumatic Tools	No	50	85	85
AL	Pumps	No	50	77	81
AM	Refrigerator Unit	No	100	82	73
AN	Rivet Buster/chipping gun	Yes	20	85	79
AO	Rock Drill	No	20	85	81
AP	Roller	No	20	85	80
AQ	Sand Blasting	No	20	85	96
AR	Scraper	No	40	85	84
AS	Shears (on backhoe)	No	40	85	96
AT	Slurry Plant	No	100	78	78
AU	Slurry Trenching Machine	No	50	82	80
AV	Soil Mix Drill Rig	No	50	80	80
AW	Tractor	No	40	84	84
AX	Vacuum Excavator (Vac-truck)	No	40	85	85
AY	Vacuum Street Sweeper	No	10	80	82
AZ	Ventilation Fan	No	100	85	79
BA	Vibrating Hopper	No	50	85	87
BB	Vibratory Concrete Mixer	No	20	80	80
BC	Vibratory Pile Driver	No	20	95	101
BD	Warning Horn	No	5	85	83
BE	Water Jet deleading	No	20	85	92
BF	Welder / Torch	No	40	73	74