

BLASTING PROTOCOL

Artis Senior Living Project October 24, 2016

Where bedrock removal is required, the Applicant will first attempt to remove the rock through mechanical means (i.e., ripping or chipping), provided that if mechanical methods are infeasible due to natural factors including the hardness and/or density of the rock, blasting may be utilized in strict and full compliance with the provisions of the Town's blasting law (Chapter 89 of the Town Code). Notwithstanding any provision of Town Code, the following measures shall be implemented:

- (a) All drilling and blasting for roadways, utility trenches, service trenches and/or structures, whenever they are built, will be carried out in strict compliance with all applicable federal, State and Town blasting laws and regulations. The selected blasting contractor will be acceptable to both the Applicant and the Town Engineer. It is understood that the qualifications of the blasting contractor will be reviewed by a qualified independent geotechnical blasting consultant under contract to the Town of Ossining Planning Board, at the Applicant's expense. The Town's consultant also will review the blasting plan prepared by the blasting contractor, check the calibration of the seismograph monitors, approve the location and installation of the seismograph monitors, provide ongoing review of blasting procedures and blast vibration and air blast overpressure data, and shall consult with the Town on an as-needed basis throughout the blasting period.
- (b) A pre-blast survey shall be performed for the interior and exterior of all structures on properties that abut the project site or are within 500 feet of the anticipated blasting areas. The Applicant shall be liable for, and shall at its expense repair, any damage to structures for which a pre-blast survey has been performed resulting from blasting activities. In addition, the blasting contractor shall carry and maintain until blasting has been completed a minimum of \$2,000,000 in comprehensive liability insurance covering damage to structures caused by underground explosion and collapse hazard. A certificate of this insurance shall be submitted to the Town by the contractor.
- (c) Peak particle velocity (PPV) of ground vibration at the residence(s) immediately abutting to the site shall be kept within the limits provided in USBM RI 8507, Appendix B. Airblast overpressure at the residence(s) immediately abutting the site shall be kept within 133 dB peak (0.013 psi).

Not less than 72 hours prior to the commencement of any blasting, the Applicant shall deliver by hand written notification to the owners of properties for which a pre-blast survey was performed. Such notification will state when the blasting period will begin and shall include an explanation of the warning procedures for blasting including soundings. In addition, verbal notification will be provided to the same owners at least 24 hours prior to each individual blasting session. The Applicant will send a letter to the same owners when blasting has been completed.

Any necessary closures of adjacent streets shall be kept to a minimum and any needed closure shall be coordinated with the Police Department, Fire Department, and Town Engineer.

A detailed Blast Plan shall be provided by the blasting contractor to the Town prior to blasting at the site, detailing the procedures to be used, including hole diameter, depth, spacing, loading, and delay sequence; as well as predictions of maximum vibrations at the residence(s) immediately abutting the site. The blast plan shall indicate the location of the initial blasts, and the initial location of seismographs. The Blast Plan shall also contain a blast site security plan showing the locations of sentries to be provided prior to each blast round to keep unauthorized personnel from entering the blast area, and the means of communication from the blaster to the sentry to ensure the area is clear prior to detonation. The Blast Plan shall be submitted a minimum of 2 weeks prior to commencing any blasting at the site.

Blast vibration and airblast monitoring shall be performed and reported for each round by a qualified firm under contract to the Applicant or blasting contractor, at a minimum of four locations around the blast area. Monitoring reports shall be sent via email to the Town and the Town's blasting consultant the day of blasting, and shall be kept on file at the project site for review by the Town and the blasting contractor, and the Town and the Town's blasting consultant shall be notified immediately if any vibrations exceed the regulatory limits.

Drilling of blast holes and detonation shall be limited to the hours of 9:00a.m to 4:00 p.m., Monday through Friday. A system of warning signals shall be used by the blasting contractor to warn personnel at the project site and nearby residents prior to each blast. The warning signals shall be audible at least 500 feet from the blasting area.

The following controls shall be implemented to reduce the potential for flyrock:

- i) Blasting mats shall be used to fully cover the blast area for every blast.
- ii) Drillers logs shall be kept for all blast holes drilled, documenting open joints, seams and other anomalies; and the logs shall be reviewed by the blaster prior to each blast.
- iii) Ammonium Nitrate Fuel Oil (ANFO) shall not be used.
- iv) Videotaping shall be performed of each blast detonated at the site and be available for review by the blasting contractor and Town immediately after each blast.

Noise from the drilling operations shall be minimized through the use of appropriate mufflers. Noise levels at the project site shall comply with Chapter 130 of the Town Code. In addition, noise levels from rock drills at the residence(s) immediately abutting the site shall be kept to 86 dBA. Noise levels from various noise producing drilling and other equipment shall be periodically measured using Type I or II A-weighted sound level meters, and submitted daily along with vibration and airblast monitoring reports. If noise levels exceed

the specified levels, they will be reported to appropriate Town departments, along with steps being taken to reduce the noise levels.

The blasting contractor will take appropriate steps to minimize dust generation during drilling of blast holes and other excavation and construction operations including but not limited to wetting down materials when appropriate, dust collectors on all drill rigs, and stone mats as appropriate, and shall require covers to be placed over any open trucks transporting debris or fill from the site.