

BLASTING STANDARDS

Standards:

1. Blasting shall be performed by a qualified specialist, employed by the Contractor.
2. Blasting shall be done in accordance with the Tennessee Blasting Standards Act of 1975 and as specified herein.
3. The Contractor shall have a Registration Certificate and each employee engaged in the blasting activity shall carry a valid ID card issued by the Division of Fire Prevention.
4. The Contractor shall retain a consultant to prepare the blasting program and to supervise and assist in monitoring the blasting. The consultant shall be a geotechnical engineer registered in the state of Tennessee, experienced in the use of explosives.

Contractor Submittals:

1. Consultant's name and qualifications.
2. Results of the pre-blast survey.
3. Blasting program and supporting data.
4. Blasting log and reports.

Damage from Use of Explosives:

1. Take all precautions necessary to prevent personal injury or damage to real or personal property. These precautions shall include, but are not limited to, investigations by the Contractor to limit the size and nature of individual blasts which may be safely accomplished without damage or interference with use of the property.
2. Immediately inform the A/E of all matters concerning complaints and claims between the public or government and the Contractor. Contractor hereby assumes all liability for all personal injury and damage to real or personal property, or interference with the use or enjoyment of any property by reason of blasting or the resulting vibration or concussion.

Pre-Blast Survey

1. The Contractor consultant will conduct a pre-blast survey of the surrounding structures within 300 feet of any blasting operation and document their condition before any blasting begins. The documentation will include written descriptions, photographs of the structures, and measures of obvious signs of structural distress.
2. Gauge marks will be located over existing cracks at selected locations to be measured before and after blasting to determine if widening or displacement has taken place.
3. Inform Owner of the buildings or structures included in the pre-blast survey. Confirm that pre-blast survey meets Metro's requirements.

Blasting Program:

1. Contractor's consultant shall submit a blasting program that prevents damage to existing structures or interruption of their services.
2. The blasting program shall include, but not be limited to, data on the locations, hole size, depth, over depth, pattern and inclination of the blast holes, the type, strength, amount, distribution, and powder factor for the explosives used, per hole and per blast, the sequence and pattern of delays, maximum amount of explosives in any 1 delay period, depth of rock, and depth of overburden, if any, and the description and purpose of special methods to be used. This data shall be reviewed and approval in writing by the Contractor's consultant before being submitted to the A/E.

3. Explosion and firing devices shall be of a type that is commercially available, suitable for the use intended, and in a condition reflecting proper storage and maintenance.
4. Blasting mat shall be of a suitable size and type.

Trial Blasting:

1. Conduct a trial blasting program as directed by the Contractor's consultant. Data shall be used as a basis for controlling the blasting program.

General Blasting Procedures:

1. Blast Vibration Limits as recorded adjacent to the foundation of the nearest above ground structure shall be limited as follows:
 - a. Peak particle velocity of 1.5 inch/second for structures less than 100 feet from the blast, 1 inch/second for structures 101 to 200 feet from the blast, and 5 inch/second for structures 201 to 300 feet from the blast.
 - b. A relative velocity of 1 inch/second (within the 4 to 12 Hz range of natural frequencies for low rise structures) as determined from a response spectra.
 - c. Modification of the blasting method and reduction of explosive charge weight per delay shall be used to ensure the (1) of the above limits is met.
 - d. A/E and/or Metro reserves the right to reduce explosive amounts, charge blasting patterns, or eliminate blasting in certain areas should conditions warrant.
2. Maximum peak particle velocity may be increased with the written approval of project A/E and Metro General Services.
3. The Contractor shall provide for communication between the blasting foreman and the A/E such that verbal contact can be made within the specified 10 minute interval between blasts. The interval between blasts may be decreased at the discretion of the A/E.

Air Blast Limits:

1. The maximum allowable air blast at any inhabited structure resulting from blasting operations shall not exceed 130 decibels peak when measured by an instrument having a flat response over the range of at least 6 to 200 Hz.
2. The maximum allowable air blast at any construction resulting from blasting operations shall not exceed 140 decibels peak when measured by an instrument having a flat response over the range of at least 6 to 200 Hz.
3. Air blasts shall be monitored with an approved instrument having the required frequency response and capable of providing permanent record of the air blast effects. These records shall be made available to the A/E and Metro.

Control of Fly Rock:

1. All blasts shall be designed to prevent fly rock. The Contractor shall use adequate, food quality stemming material and the covering of blasts with blasting mats.

Clean Up:

1. Remove material and restore site.
2. Repair or replace items, structures, and facilities damaged by blasting.

Quality Assurance:

1. Seismographic monitoring shall be done by the Contractor's consultant during the trial program and general excavation blasting and a record made of the peak particle velocities caused by the blasting. This data is to be included in the blasting report.
2. Contractor to maintain a daily log and a completed blasting report shall be submitted to the A/E at the conclusion of all blasting.

3. Nothing present in the preceding in any way relieves the Contractor of any responsibilities for any damage to the existing structure or utilities in the area of blasting.