## SECTION 02227

## **ROCK REMOVAL**

## PART 1 GENERAL

## 1.01 SCOPE OF WORK

- A. Removal of all rock materials discovered during excavation for the purpose of construction. Removal shall include drilling and/or blasting incidental thereto and disposal of excavated materials.
- B. When necessary for prosecution of the WORK, the use of explosives to assist rock removal may be exercised by DEVELOPER provided this use is in compliance with all local, State, Federal and other Governmental regulations applying to transportation, storage, use and control of explosives.

## 1.02 RELATED WORK

A. Section 02225 - Earthwork for Utilities

#### 1.03 REFERENCES

- A. NFPA 495 Code for the Manufacture, Transportation, Storage, and Use of Explosive Materials.
- B. OSHA 2207 Construction Industry Standards, Subpart T Demolition.
- C. Rules and Regulations of Safety Fire Commissioner, Chapter 120-3-10.

## 1.04 QUALITY ASSURANCE

A. Explosives Firm: Company specializing in explosives for disintegration of subsurface rock with documented experience.

## 1.05 REGULATORY REQUIREMENTS

- A. Conform to applicable code, including Rules and Regulations of Safety Fire Commissioner, Chapter 120-3-10, for explosive disintegration of rock.
- B. Obtain permits from authorities having jurisdiction before explosives are brought to site or drilling is started.
- C. All explosives shall be stored securely in compliance with all laws and ordinances, and all such storage places shall be clearly marked DANGEROUS EXPLOSIVES. Blasting caps, electric blasting caps, detonating primers, and primed cartridges shall not be stored in the same magazine with other explosives or blasting agents. Locked storage shall be provided satisfactory to the TOWN OF BRASELTON, never closer than allowed by the Safety Fire Commissioner.

#### PART 2 PRODUCTS

## 2.01 MATERIALS

- A. Rock (Definition): Solid mineral material with a volume in excess of 1/2 cu yd that cannot be broken down and removed by use of heavy construction equipment, such as a Caterpillar 225 or equivalent, having a bucket curling force rated at not less than 25,700 pounds, bulldozer such as a Caterpillar D8K equipped with single tooth hydraulic ripper, 3/4 cu yd capacity power shovel, rooters, etc., and without drilling or blasting. Materials which can be loosened with a pick, hard pan, boulders less than 1/2 cu yd in volume, chert, clay, soft shale, soft and disintegrated rock and any similar material shall not be considered as rock. (All materials to be considered unclassified or common excavation)
- B. Explosives: Shall be suitable for intended purposes at the DEVELOPER's option subject to review by the TOWN.
- C. Delay Devices: Type recommended by explosives firm to be used as accessory to explosives. Subject to review by the TOWN.
- D. Blasting Mat: When the use of explosives is necessitated during prosecution of the WORK, DEVELOPER shall incorporate the use of blasting mats of type recommended by explosives firm to lessen the danger of projectiles occasionally resultant from blasting of rock.

## PART 3 EXECUTION

# 3.01 INSPECTION

A. Rock in utility trenches shall be excavated over the horizontal limits of excavation and to depths as follows:

Size of Pipeline (Inches)	Depth of Excavation Below Bottom of Pipe (Inches)
Less than 4	6
4 to 6	8
8 and over	12

Space below grade for pipe shall then be backfilled with 3/4-inch crushed rock or gravel or other approved materials and tamped to proper grade.

# 3.02 ROCK REMOVAL - MECHANICAL METHOD

A. Excavate for and remove rock by the mechanical method.

- B. Where pipes are constructed on concrete cradles, rock shall be excavated to bottom of cradle as shown on plans.
- C. Where rock foundation is obtained at grade for over 50 percent of area of any one structure, the portion of foundation that is not rock shall be excavated below grade to reach a satisfactory foundation of rock. The portion below grade shall be backfilled with Class C concrete.
- D. Where rock foundation is obtained at grade for less than fifty (50%) of any one structure and satisfactory rock cannot be found over the remaining area by reasonable additional excavation, the rock shall be removed for a depth of twelve (12) inches below grade and the space below grade shall be backfilled with crushed stone as specified for pipelines.
- E. Rock excavation near existing pipelines or other structures shall be conducted with utmost care to avoid damage. Injury or damage to other structures and properties shall be promptly repaired to the satisfaction of the TOWN and by DEVELOPER at his own expense.
- F. Remove excavated material from site.
- G. DEVELOPER shall correct excess rock removal by backfill to grade with Class C (3000 psi) concrete in accordance with backfilling and compaction requirements of Section 02225 (Earthwork for Utilities), at his own expense.

## 3.03 ROCK REMOVAL - EXPLOSIVE METHOD

- A. The DEVELOPER shall notify any owners of adjacent buildings or structures, and any public utility owners having structures or other installations above or below ground, in writing prior to use of explosives. Such notice shall be given sufficiently in advance so that they may take such steps as they may deem necessary to protect their property from injury and/or damage.
- B. Rock excavation by use of explosives shall be conducted with due regard for safety of persons and property in the vicinity and in strict conformance with requirements of local, State and Federal ordinance, laws and regulations of the Safety Fire Commissioner.
- C. Blasting shall be conducted so as not to endanger persons or property, and whenever required, the blast shall be covered with mats or otherwise satisfactorily confined. The DEVELOPER shall be held responsible for and shall make good any damage caused by blasting or accidental explosions.
- D. The DEVELOPER shall permit only authorized and qualified persons to handle and use explosives.
- E. Smoking, firearms, matches, open flame lamps, and other fires, flame or heat producing devices and sparks shall be prohibited in or near explosive magazines or while explosives are being handled, transported or used.
- F. No person shall be allowed to handle or use explosives while under the influence of intoxicating liquors, narcotics, or other dangerous drugs.

- G. All explosives shall be accounted for at all times. Explosives not being used shall be kept in a locked magazine, unavailable to persons not authorized to handle them. The DEVELOPER shall be held responsible for maintaining an inventory and use record of all explosives. Appropriate authorities shall be notified of any loss, theft, or unauthorized entry into a magazine.
- H. No explosives or blasting agents shall be abandoned.
- I. DEVELOPER's employees authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution including, but not limited to, visual and audible warning signals, flags, or barricades, to ensure safety.
- J. A seismograph shall be used at the nearest structure during blasting events that are within 750 feet of the nearest house, public building, school, church, commercial or institutional building and roadway. The velocity/shock wave shall not exceed the established limits of U.S. Bureau of Mines RI 8507; appendix (b).

Exception: Where all pedestrian and vehicular traffic on a roadway can be restricted to a distance of 750 feet or greater from the blast site at the time of the firing of the blast or where a variance is issued by the State Fire Marshal's Office.

- K. Disintegrate rock and remove from excavation.
- L. Cut away rock at excavation bottom to form level bearing.
- M. Remove shaled layers to provide sound and unshattered base for pipe foundations.
- N. Remove excavated material from site.
- O. Correct unauthorized rock removal or overbreak in accordance with backfilling and compaction requirements at his own expense.

# 3.04 FIELD QUALITY CONTROL

Provide for visual inspection of bearing surfaces and cavities formed by removed rock for inspection by the TOWN OF BRASELTON.

#### END OF SECTION