

SECTION 312315 – ROCK REMOVAL

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Front End Specifications, apply to this section.
- B. Specification Section - "Earthwork"

1.2 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 Contractor provided this use is in compliance with all local, State, Federal and other Governmental regulations applying to transportation, storage, use and control of explosives.
- C. Blasting as a method for rock removal shall be employed only with the approval of Owner and only after Contractor has exhausted alternate methods for removing rock such as ram-hammering, etc.

1.3 RELATED WORK

- A. Specification Section - "Earthwork"

1.4 REFERENCES

- A. NFPA 495 – Code for the manufacture, Transportation, Storage, and Use of Explosive Materials.
- B. OSHA 2207 – Construction Industry Standards, Subpart T – Demolition.

1.5 QUALITY ASSURANCE

- A. Geotechnical Firm – Geotechnical Engineer paid for in accordance with the requirements set forth in Specification Section "Quality Requirements" shall observe the testing of rock for compliance with definitions in Specification Section - "Earthwork." Geotechnical firm shall make report of all measurements of rock excavated in a written report format prior to submittal for payment by the Contractor.
- B. Explosives Firm – Company specializing in explosives for disintegration of subsurface rock with documented experience.

1.6 REGULATORY REQUIREMENTS

- A. Conform to applicable code 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 Engineer, never closer than 1,000 feet from any road, building, or camping area.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. Rock (Definition) – Rock is defined in Specification Section - "Earthwork."
- B. Explosives – Shall be suitable for intended purposes at the Contractor's option subject to review by Owner and Engineer.
- C. Delay Devices – Type recommended by explosives firm to be used as accessory to explosives. Subject to review by Engineer.
- D. Blasting Mat – When the use of explosives is necessitated during prosecution of the Work, Contractor 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

3.1 GENERAL

- A. Rock excavation near existing utility lines and mains 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 owner and by Contractor at his own expense.
- B. Rock excavation for all structures and adjacent trenches under this contract and any other rock excavation directed by Owner shall be completed before construction of any structure is started in the vicinity.
- C. Unless otherwise directed by Architect, excavated rock material shall be deposited onsite in non-structural areas and choked-in with soil and compacted. A minimum of 2' of compacted soil shall be spread over top of rocks.
- D. Contractor shall correct unauthorized rock removal by backfill to grade with compacted crushed stone.

3.2 INSPECTION

- A. Contractor shall coordinate potential rock removal and blasting with Owner to allow Owner to review site conditions prior to materials being classified as rock.
- B. Contractor shall verify site conditions and note irregularities affecting work of this Section prior to performing any operations involving explosives.
- C. Beginning work of this Section means acceptance of existing condition.

- D. Rock shall be excavated 6 inches beyond the horizontal limits of excavation and 6 inches below footing grades or trench depths.
- E. Space below grade for pipe shall then be backfilled with crushed rock or gravel or other approved materials and tamped to proper grade.

3.3 ROCK REMOVAL – MECHANICAL METHOD

- A. Excavate for and remove rock by the mechanical method using equipment that has the draw bar pulling power or bucket curling force greater than that outlined in Specification Section - "Earthwork."

3.4 ROCK REMOVAL – EXPLOSIVES METHODS

- A. If rock is uncovered requiring the explosives method for rock disintegration and removal, the Engineer shall be notified immediately so that the surface can be examined. (All materials removed shall be considered common excavation).
- B. The Contractor 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.
- C. 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 governing the use of explosives.
- D. Blasting shall be conducted so as not to endanger persons or property, and the blast shall be covered with mats or otherwise satisfactorily confined. The contractor shall be held responsible for and shall make good any damage caused by blasting or accidental explosions.
- E. The Contractor shall permit only authorized and qualified persons to handle and use explosives.
- F. 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.
- G. No person shall be allowed to handle or use explosives while under the influence of intoxicating liquors, narcotics, or other dangerous drugs.
- H. 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 Contractor shall maintain an inventory and use record of all explosives. Appropriate authorities shall be notified of any loss, theft, or unauthorized entry into a magazine.
- I. No explosives or blasting agents shall be abandoned.
- J. Contractor'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.
- K. It shall be contractor's responsibility to incorporate the use of seismic monitoring during rock

excavation, by use of explosives. Contractor shall maintain all seismic records and blasting logs to be furnished to Engineer upon request.

- L. Disintegrate rock and remove from excavation.
- M. Cut away rock at excavation bottom to form level bearing.
- N. Remove shaled layers to provide sound and unshattered base for pipe and footing foundations.
- O. Unless otherwise directed by Architect, excavated rock material shall be deposited onsite in non-structural areas and choked-in with soil and compacted. A minimum of 2' of compacted soil shall be spread over top of rocks.
- P. Contractor shall correct unauthorized rock removal or overbreak in accordance with backfilling and compaction requirements at his own expense.

3.5 FIELD QUALITY CONTROL

- A. Provide for visual inspection of bearing surfaces and cavities formed by removed rock for inspection by Architect or his representative prior to new construction.

3.6 MEASUREMENT OF ROCK REMOVAL

- A. All measurements for rock removal shall be made by the Geotechnical Engineer and reported to the Owner, Architect, and Engineer in written daily field reports submitted on a daily basis.
- B. Measurements for trench rock excavation for piping installation will be made to the width of the pipe plus six inches (6") on both sides of the pipe, but in no case shall the trench width be less than three feet (3'-00"). Vertical measurement of the excavated rock shall include only the area directly above the trench width to the top of the rock to include six inches below the invert of the pipe. No measurement for laying back sides of excavations or for additional excavation at concrete structures, junction boxes, manholes, inlets, etc. will be made. This excavation will be considered incidental to the installation.
- C. Elsewhere excavate rock to a depth of 8" below proposed concrete slabs and pavements, 24" outside of concrete work for which forms are required, 12" outside of perimeter footing, and 12" below finished grade in areas to receive landscaping and seeding. All measurements shall be based on these dimensions.
- D. Quantities shall be verified by the Architect and Engineer.

3.7 SUBMITTAL FOR PAYMENT FOR ROCK REMOVAL

- A. All submittals for payment for rock removal shall be made in the same month's or the next month's pay application. Application for payment for rock removal which exceeds the second pay application is subject to denial by Architect and Owner.

END OF SECTION 312315