

SECTION 02229

ROCK REMOVAL

PART 1 GENERAL

1.01 WORK INCLUDED

- A. Rock removal by blasting or mechanical means

1.02 RELATED WORK

- A. Section 02215 - Excavation
- B. Section 02221 – Trenching
- C. Drawings, Contract Documents applicable to this section

1.03 BID PRICE – MEASUREMENT AND PAYMENT

- A. Rock removal performed at the written direction of the ENGINEER will be paid for at the appropriate bid price included in the Contract. Payment will be made for the actual number of cubic yards removed, not to exceed the quantity required for the depths and widths specified or shown. Payment will not be made for over removed work or for replacement materials.
- B. Restrict measurement for rock removal as follows:
  - 1. Trenches: Confine to the depth to provide for the specified cushioning layer of bedding material and to the width specified or shown for the respective trenches. Trench walls shall be assumed to be vertical based on the actual trench width used, as measured at the top of the pipe, duct, conduit, or cable, but not exceeding the width specified or shown for the respective trenches.
  - 2. Structures: Confine to a plane 4 inches below the underside of the concrete foundations and to vertical planes 2 feet beyond the outside of such foundations.

1.04 DEFINITIONS

- A. Rock removal: The removal of such material which cannot be broken and removed by ordinary excavating equipment. Ordinary excavating equipment includes any bucket mounted attachments. Disintegrated, weathered, rotten and loose rock particles capable of removal by ordinary methods are not included within the scope of rock removal.

1.05 QUALITY ASSURANCE

- A. Seismic Survey Firm: Company specializing in seismic surveys with five years documented experience. Submit written confirmation of experience to ENGINEER.
- B. The transporting, handling, and firing of explosives shall be performed by someone thoroughly familiar, experienced and, if applicable, licensed in this type of work, preferably a representative of the explosive manufacturer.

1.06 REGULATORY REQUIREMENTS

SOUTHWEST REGIONAL WATER DISTRICT

- A. Comply with Laws and Regulations for explosive disintegration of rock.
- B. Secure all required permits well in advance of explosive operations.

1.07 PROJECT CONDITIONS

- A. Conduct survey and document conditions of buildings near locations of rock removal prior to and just following blasting, including photographing conditions identifying irregularities. This shall be done to avoid fraudulent damage claims.
- B. Advise owners of adjacent buildings or structures in writing, prior to executing seismographic survey. Explain planned blasting and seismic operations. Notify all public and private utility companies having facilities in the vicinity of the location and time of contemplated detonation in sufficient time to allow them to protect their facilities. Likewise, where operations are to be carried on in any location where traffic on streets or highways may be affected, give proper notice to the local Police Department.
- C. Obtain a seismic survey prior to rock removal to determine maximum charges that can be used at different locations in area of removal without damaging adjacent properties or other work.
- D. Should permit limitations or the nearness of existing structures and utilities prohibit the use of explosives, perform rock removal by an approved alternate method.
- E. CONTRACTOR shall be responsible for all damage to existing structures, piping, sewers, drains, cables, conduits, equipment, and appurtenances resulting from his rock removal operations, and shall repair same to the satisfaction of OWNER and ENGINEER.

1.08 SCHEDULING

- A. Schedule Work to avoid disruption to occupied buildings nearby.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Explosives: Type recommended by explosive firm following seismic survey and approved by authorities having jurisdiction

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify site conditions and note subsurface irregularities affecting Work of the Section.

3.02 PREPARATION

- A. Identify required lines, levels, contours, and datum.

3.03 ROCK REMOVAL - GENERAL

- A. Excavate trench to sufficient depth to provide for cushioning layer of bedding material as specified for type of pipe or utility being installed. Width of trench shall not be more than specified for the respective type of pipe or utility.
- B. Extend excavation for structures to a plane 4 inches below the underside of the concrete foundations and confine to limits two feet beyond the outside of such foundations.
- C. Remove rock at bottom of excavation to form level bearing.
- D. Remove shaled layers to provide sound and unshattered excavation bottom.
- E. Necessary bedding and backfill for trenches and other excavations in rock removal shall be provided by CONTRACTOR; see Sections 02220 and 02221 and Detail Drawings.

3.04 ROCK REMOVAL BY MECHANICAL METHOD

- A. Excavate and remove rock by the mechanical method.
- B. Drill holes and utilize expansive tools, wedges, and mechanical disintegration compound as necessary to fracture rock.

3.05 ROCK REMOVAL BY EXPLOSIVE METHODS

- A. If rock is uncovered that requires explosives method for rock disintegration, notify ENGINEER and execute as follows:
- B. Provide seismographic monitoring during progress of blasting operations.
- C. Prior to removing rock in any area, determine the type of explosives to be used, the number, depth and loading of holes to the detonated at any one time; and any special precautions to be observed at a conference between representatives of OWNER, ENGINEER, CONTRACTOR, CONTRACTOR'S Insurance Company and the person directly responsible for detonation. The procedure thereafter followed in that area shall conform to the decisions reached, subject to any modifications which may be required because of unsatisfactory or unsafe results of the procedure agreed upon.
- D. Provide suitable timber mats or other coverings to confine all materials lifted by blasting within excavation limits.
- E. Disintegrate rock and remove from excavation.
- F. For purpose of protecting the general public, CONTRACTOR AND OWNER, and utmost cooperation will be required between CONTRACTOR and all other interested parties. All safety precautions shall be strictly enforced.

END OF SECTION