

SECTION 02230

ROCK EXCAVATION

PART ONE - GENERAL

1.1 DESCRIPTION

- A. Work included: Furnish all labor, material and equipment to excavate and dispose of rock as specified herein.
- B. Related work specified elsewhere:
 - 1. Erosion and Sediment Control - Section 02110
 - 2. Stream and/or Highway Crossings – Section 02310
 - 3. Water Distribution Lines – Section 02665
 - 4. Sanitary Sewer Collector Lines and Force Main – Section 02731

1.2 DEFINITION

- A. The word "rock," wherever used as the name of excavated material or material to be excavated, shall mean boulders and pieces of concrete or masonry exceeding 1/2 cubic yard in volume; or solid ledge rock which, in the opinion of the OWNER, requires, for its removal drilling and blasting, wedging, sledging, barring, or breaking up with power-operated tools.
- B. No soft or disintegrated rock which can be removed with a hand pick or power-operated excavator and/or loader; no loose, shaken, or broken stone in rock fillings or elsewhere; no frozen earth or existing paving; and no rock exterior to the maximum limits of measurement allowed, which may fall into the excavation, will be measured or allowed.

1.3 REQUIREMENTS OF REGULATORY AGENCIES

- A. Observe all municipal ordinances and State and Federal laws relating to the transportation, storage, handling and use of explosives.
- B. The licensed blaster(s) shall at all times have his license on the work site and shall permit examination thereof by officials having jurisdiction.

PART TWO - MATERIALS

2.1 EXPLOSIVES

- A. Where blasting is permitted, explosives shall be kept on the site only in such quantity as may be needed for the work under way and only during such times as they are

being used.

- B. Explosives shall be stored in a secure manner, separate from all tools and flammable substances.
- C. Caps or detonators shall be safely stored at least a distance of 100-feet from explosives.
- D. When need for explosives has ended, all such materials remaining at site shall be promptly removed from the premises.

PART THREE - EXECUTION

3.1 GENERAL

- A. Excavate rock (as defined above), if encountered, to the lines and grades indicated on the Drawings or as required and dispose of the excavated material.
- B. Rock in pipe trenches shall be excavated so as to be not less than 6-inches from the invert of the pipe.
- C. Rock in structure excavations shall be excavated to the bottom of the foundation.

3.2 BLASTING

- A. All operations involving explosives shall be conducted by experienced personnel only, with all possible care to avoid injury to persons and damage to property.
- B. Blasting shall be done only with such quantities and strengths of explosives and in such manner as will break the rock approximately to the intended line and grades and yet will leave the rock not to be excavated in an unshattered condition.
- C. Care shall be taken to avoid excessive cracking of the rock upon or against which any structure will be built, and to prevent damage to existing pipes or other structures and property above or below ground. The responsibility for accurately locating and for the complete protection of such items in the event of blasting for rock excavation and all repair to and/or replacement of same shall be the full obligation of the CONTRACTOR. In all cases of blasting, the prepared blast shall be carefully covered with an approved blasting mat so placed that the area affected by the explosion is positively confined.
- D. Rock shall be well covered with logs, blasting mats, or both, where required.
- E. Sufficient warning shall be given to all persons in the vicinity of the work before a charge is exploded. Flagmen shall be employed to direct traffic as required.

3.3 MEASUREMENT FOR PAYMENT

All rock excavation shall be paid for as an incidental part of the item on which the work is done except where a separate, unqualified item for rock excavation is indicated in the proposal or where rock excavation is ORDERED as an EXTRA by the OWNER, by WRITTEN ORDER. Where payment for rock excavation is established by the proposal or ORDERED as an EXTRA by the OWNER, CONTRACTOR shall be paid only for the quantity of rock removed, measured as follows:

- A. For all masonry structures such as buildings, tanks, vaults, catch basins, manholes and the like, the horizontal rock measurement shall be made to include 2-1/2 feet from the outside face of finished vertical sidewall of such structure and the vertical rock measurement shall be made from the top elevation of the rock, before disturbed or removed, to the elevation of the under or lower side of the bottom concrete slab of the structure. Any projection below the bottom slab of any structure required for sump, well, or other pertinent construction shall be measured separately.
- B. For installation of pipe lines and fittings the horizontal rock measurement shall be the nominal outside diameter of the pertinent pipe plus 16-inches, except, however, that no horizontal measurement shall be considered to be less than 27-inches; the vertical rock measurement shall be made from the top elevation of the rock, before disturbance or removal, to an elevation of 9-inches below the bottom outside surface of the pipe for pipe having a diameter of 8-inches through 24-inches, and to an elevation of 12-inches below the bottom outside surface of the pipe for all pipe having a diameter greater than 24-inches.

3.4 EXCESS ROCK EXCAVATION

If rock excavated beyond the limits of payment indicated on the Drawings, specified, or authorized in writing by the OWNER, the excess excavation whether resulting from overbreakage or other causes, shall be backfilled, by and at the expense of the CONTRACTOR, as specified below:

- A. In pipe trenches, excess excavation above and below the elevation of the pipe bedding shall be filled with earth as specified in Section 02731 - SANITARY SEWER COLLECTION LINES.
- B. In excavations for structures, excess excavation in rock beneath foundations shall be filled with concrete, which shall be Class A or B, at CONTRACTOR'S option.
- C. Quantity of rock for which payment will be made for installation of each fire hydrant will be limited to a rectangular area, top of which is upper surface of the rock, bottom of which is 2-feet below bottom-most point of the hydrant, in place, and of a square measurement of 3-feet on each of the four sides. Rock

section excavation required for installation of fire hydrants shall not be less than stipulated above.

3.5 SHATTERED ROCK

If rock below normal depth is shattered due to drilling or blasting operations and such shattered rock is unfit for foundations, the shattered rock shall be removed and the excavation shall be backfilled as described above in EXCESS ROCK EXCAVATION. All such removal and backfilling shall be done at the expense of the CONTRACTOR.

3.6 BLASTING RECORDS

Keep and submit to the OWNER an accurate record of each blast. The record shall show the general location of the blast, the depth and number of drill-holes, the kind and quantity of explosive used, and other data required for a complete record.

3.7 PROTECTION OF EXISTING UTILITIES AND STRUCTURES

Attention of CONTRACTOR is specifically called to the fact that certain sections of the sewer line extension in this Project may be constructed in close proximity to existing buildings, storm sewers, gas lines, underground telephone cables, and private water mains. The responsibility for accurately locating and for the complete protection of such items in the event of blasting for rock excavation and all repair to and/or replacement of same shall be the full obligation of the CONTRACTOR. In all cases of blasting, the prepared blast shall be carefully covered with an approved blasting mat so placed that the area affected by the explosion is positively confined.

END OF SECTION