

CONSTRUCTION SPECIFICATION

21. EXCAVATION

1. SCOPE

The work shall consist of the excavation required by the drawings and specifications and disposal of the excavated materials.

2. CLASSIFICATION

Excavation will be classified as common excavation or rock excavation in accordance with the following definitions or will be designated as unclassified.

Common excavation shall be defined as the excavation of all materials that can be excavated, transported, and unloaded by the use of heavy ripping equipment and wheel tractor-scrappers with pusher tractors or that can be excavated and dumped into place or loaded onto hauling equipment by means of excavators having a rated capacity of one cubic yard or larger and equipped with attachments (such as shovel, bucket, backhoe, dragline or clam shell) appropriate to the material type, character, and nature of the materials.

Rock excavation shall be defined as the excavation of all hard, compacted or cemented materials that requires blasting or the use of ripping and excavating equipment larger than defined for common excavation. The excavation and removal of isolated boulders or rock fragments larger than one (1) cubic yard encountered in materials otherwise conforming to the definition of common excavation shall be classified as rock excavation. The presence of isolated boulders or rock fragments larger than one (1) cubic yard will not in itself be sufficient cause to change the classification of the surrounding material.

For the purpose of these classifications, the following definitions shall apply:

Heavy ripping equipment shall be defined as a rear-mounted, heavy duty, single-tooth, ripping attachment mounted on a track type tractor having a power rating of at least 250 flywheel horsepower unless otherwise specified in Section 11.

Wheel tractor-scraper shall be defined as a self-loading (not elevating) and unloading scraper having a struck bowl capacity of at least twelve (12) cubic yards.

Pusher tractor shall be defined as a track type tractor having a power rating of at least 250 flywheel horsepower equipped with appropriate attachments.

3. UNCLASSIFIED EXCAVATION

Excavation designated as "Unclassified Excavation" shall include all materials encountered regardless of their nature or the manner in which they are removed. When excavation is unclassified, none of the definitions or classifications stated in Section 2, CLASSIFICATION, shall apply.

4. BLASTING

The transportation, handling, storage, and use of dynamite and other explosives shall be directed and supervised by person(s) of proven experience and ability who are authorized and qualified to conduct blasting operations.

Blasting shall be done in such a manner as to prevent damage to the work or unnecessary fracturing of the foundation and shall conform to any special requirements in Section 11 of this specification. When specified in Section 11, the Contractor shall furnish the Engineer in writing, a blasting plan prior to blasting operations.

5. USE OF EXCAVATED MATERIALS

Method 1 To the extent they are needed, all suitable materials from the specified excavations shall be used in the construction of required permanent earthfill or rockfill. The suitability of materials for specific purposes will be determined by the Engineer. The Contractor shall not waste or otherwise dispose of suitable excavated materials.

Method 2 Suitable materials from the specified excavations may be used in the construction of required earthfill or rockfill. The suitability of materials for specific purposes will be determined by the Engineer.

6. DISPOSAL OF WASTE MATERIALS

Method 1 All surplus or unsuitable excavated materials will be designated as waste and shall be disposed of at the locations shown on the drawings.

Method 2 All surplus or unsuitable excavated materials will be designated as waste and shall be disposed of by the Contractor at sites of his own choosing away from the site of the work in an environmental acceptable manner and that does not violate local rules and regulations.

7. EXCAVATION LIMITS

Excavations shall comply with OSHA Construction Industry Standards (29CFR Part 1926) Subpart P, Excavations, Trenching, and Shoring. All excavations shall be completed and maintained in a safe and stable condition throughout the total construction phase. Structure and trench excavations shall be completed to the specified elevations and to the length and width required to safely install, adjust, and remove any forms, bracing, or supports necessary for the installation of the work. Excavations outside of the lines and limits shown on the drawings or specified herein required to meet safety requirements shall be the responsibility of the Contractor in constructing and maintaining a safe and stable excavation.

8. BORROW EXCAVATION

When the quantities of suitable materials obtained from specified excavations are insufficient to construct the specified earthfills and earth backfills, additional materials shall be obtained from the designated borrow areas. The extent and depth of borrow pits within the limits of the designated borrow areas shall be as specified in Section 11 or as approved by the Engineer.

Borrow pits shall be excavated and finally dressed to blend with the existing topography and sloped to prevent ponding and to provide drainage.

9. OVER-EXCAVATION

Excavation in rock beyond the specified lines and grades shall be corrected by filling the resulting voids with portland cement concrete made of materials and mix proportions approved by the Engineer. Concrete that will be exposed to the atmosphere when construction is completed shall meet the requirements of concrete selected for use under Construction Specification 31, Concrete for Major Structures, or 32, Structure Concrete, as appropriate.

Concrete that will be permanently covered shall contain not less than five (5) bags of cement per cubic yard. The concrete shall be placed and cured as specified by the Engineer.

Excavation in earth beyond the specified lines and grades shall be corrected by filling the resulting voids with approved compacted earthfill, except that, if the earth is to become the subgrade for riprap, rockfill, sand or gravel bedding, or drainfill, the voids may be filled with material conforming to the specifications for the riprap, rockfill, bedding or drainfill. Prior to correcting an over-excavation condition, the Contractor shall review the planned corrective action with the Engineer and obtain approval of the corrective measures.

10. MEASUREMENT AND PAYMENT

For items of work for which specific unit prices are established in the contract, the volume of each type and class of excavation within the specified pay limits will be measured and computed to the nearest cubic yard by the method of average cross-sectional end areas or by methods outlined in Section 11 of this specification. Regardless of quantities excavated, the measurement for payment will be made to the specified pay limits, except that excavation outside the specified lines and grades directed by the Engineer to remove unsuitable material will be included. Excavation required because unsuitable conditions result from the Contractor's improper construction operations, as determined by the Engineer, will not be included for measurement and payment.

Method 1 The pay limits shall be as designated on the drawings.

Method 2 The pay limits shall be defined as follows:

- a. The upper limit shall be the original ground surface as it existed prior to the start of construction operations except that where excavation is performed within areas designated for previous excavation or earthfill the upper limit shall be the modified ground surface resulting from the specified previous excavation or earthfill.
- b. The lower and lateral limits shall be the neat lines and grades shown on the drawings.

Method 3 The pay limits shall be defined as follows:

- a. The upper limit shall be the original ground surface as it existed prior to the start of construction operations except that where excavation is performed within areas designated for previous excavation or earthfill the upper limit shall be the modified ground surface resulting from the specified previous excavation or earthfill.
- b. The lower and lateral limits shall be the true surface of the completed excavation as directed by the Engineer.

Method 4 The pay limits shall be defined as follows:

- a. The upper limit shall be the original ground surface as it existed prior to the start of construction operations except that where excavation is performed within areas designated for previous excavation or earthfill the upper limit shall be the modified ground surface resulting from the specified previous excavation or earthfill.
- b. The lower limit shall be at the bottom surface of the proposed structure.
- c. The lateral limits shall be 18-inches outside of the outside surfaces of the proposed structure or shall be vertical planes 18-inches outside of and parallel to the footings, whichever gives the larger pay quantity, except as provided in d, below.
- d. For trapezoidal channel linings or similar structures that are to be supported upon the sides of the excavation without intervening forms, the lateral limits shall be at the under side of the proposed lining or structure.
- e. For the purposes of the definitions in b, c, and d, above, any specified bedding or drainfill directly beneath or beside the structure will be considered to be a part of the structure.

All Methods The following provisions apply to all methods of measurement and payment.

Payment for each type and class of excavation will be made at the contract unit price for that type and class of excavation. Such payment will constitute full compensation

for all labor, materials, equipment, and all other items necessary and incidental to the performance of the work, except that extra payment for backfilling over-excavation will be made in accordance with the following provisions:

Payment for backfilling over-excavation, as specified in Section 9 of this specification, will be made only if the excavation outside specified lines and grades is directed by the Engineer to remove unsuitable material and if the unsuitable condition is not a result of the Contractor's improper construction operations as determined by the Engineer.

Compensation for any item of work described in the contract but not listed in the bid schedule will be included in the payment for the item of work to which it is made subsidiary. Such items and the items to which they are made subsidiary are identified in Section 11 of this specification.