

SECTION 12

ROADWAY AND DRAINAGE EXCAVATION

12.1 DESCRIPTION

A. General:

This work consists of excavation and disposal of material within the limits of the work necessary for the construction of the roadway and not being removed under some other item.

Unclassified Excavation material is the property of the Owner. Unclassified Excavation materials, designated as waste on the particular Contract may, at the direction of the Engineer, be utilized by the Owner at a different location. Unclassified Excavation material determined to be of no use to the Owner shall be disposed of at a Contractor provided waste site. The Engineer shall approve such site. Authority to designate what is usable or unusable shall be vested solely in the Engineer. See [also](#) Section 15.

B. Related Work Items:

- Section 10 - Clearing and Grubbing
- Section 11 - Utility Excavation [and](#) Backfill
- Section 13 - Removal Items
- Section 14 - Embankment
- Section 15 - Disposal of Surplus Excavation and Waste
- Section 16 - Optioned Borrow Excavation
- Section 17 - Salvaging, Stockpiling, and Placing Topsoil
- Section 18 - Erosion and Water Pollution Control
- [Section 190](#) - [Watering](#)

12.2 MATERIALS

A. Unclassified Excavation:

Materials, except those, which fall within the classification of Rock Excavation, or Muck Excavation encountered during the construction of the work, regardless of their nature or manner in which they are removed, will be considered as Unclassified Excavation.

B. Rock Excavation:

Rock Excavation shall consist of removal and disposal of a sound and solid mass of mineral matter in place and of such hardness and texture that it cannot be loosened or broken down by ripping in a single pass with a tractor mounted hydraulic ripper

equipped with one digging point of standard manufacturer's design adequately sized and used with a crawler-type tractor rated between 370 and 460 net fly wheel horsepower, operating in low gear, with sufficient downward force on the ripper.

The Contractor shall keep accurate daily records of the quantity of rock removed so that a comparison can be made with the City's records.

The Contractor shall furnish, at no extra cost, an approved backfill material to fill the void left by rock excavation. He shall also provide, at no extra cost, a modified proctor (AASHTO T-180) moisture-density relationship curve for the furnished backfill.

C. Muck Excavation:

Muck excavation consists of the removal and disposal of saturated organic mixtures of soils and organic matter, which requires additional work or equipment not normally required for unclassified excavation.

D. Unclassified Excavation-Digouts:

This excavation consists of the removal and disposal of unstable material below an existing surface on which surfacing material is to be placed. When granular material is used for backfill, the excavated area shall extend to a daylight point or points such that lateral drainage is provided. The exposed undercut surface shall be satisfactorily compacted prior to backfilling. Unless otherwise permitted by the Engineer, existing surface gravel shall be salvaged before and replaced after the unsatisfactory material has been removed.

E. Water:

Water for compaction shall be furnished by the Contractor and shall be free from injurious matter. See also Section 190.

12.3 CONSTRUCTION REQUIREMENTS

A. Classification of Excavation:

Roadway and drainage excavation will be designated as Unclassified Excavation, Rock Excavation, Muck Excavation, or Unclassified Excavation-Digouts. Authority to identify and define the physical characteristics, which determine classification, shall be vested solely in the Engineer.

B. General:

Prior to beginning excavation, grading, and embankment operations in any area, all necessary clearing and grubbing in that area shall have been performed in accordance with Section 10.

The excavation and embankments for the roadway, intersections, and entrances shall be finished to smooth and uniform surfaces. Excavation operations shall be conducted so that material outside of the limits of slopes will not be disturbed.

Embankment construction shall be performed in accordance with Section 14.

Borrow material shall not be placed until after all usable excavated project material has been placed. Materials shall not be wasted without written permission of the Engineer. If the Contractor places more borrow than is required and causes a waste of excavation, the amount of waste shall be deducted from the volume as measured in the borrow area.

Where excavation to the finished graded section results in a subgrade or slopes of unsuitable soil, the Contractor shall remove the unsuitable materials and backfill to the finished graded section with approved material. Unsuitable material shall be disposed of as directed. The Contractor shall conduct operations in such a way that the Engineer can take the necessary cross-sectional measurements before the backfill is placed.

C. Salvage of Topsoil:

Topsoil that is to be used in topping the back slopes and other newly graded areas shall be removed from designated areas in accordance with Section 17. Topsoil that is not designated to be used as topping shall be salvaged to the location designated by the Engineer, or placed in the embankment in accordance with section 14.3, ~~sub-section C.~~

D. Undercutting, Undercut Excavation and Material Selection:

When specified, select materials shall be utilized to improve the roadbed. The work shall be performed in such manner that suitable materials may be selected, removed separately, and deposited in the roadbed within the limits required.

On specified density projects, the Contractor shall undercut to the limits shown on the plans. Scarifying of the exposed surface will not be required. Undercutting excavation may include unclassified, rock or muck excavation as described on the plans.

Where shown on the plans, selected materials shall be utilized to improve the roadbed. The work shall be performed in such manner and sequence that suitable materials may be selected, removed separately, and deposited in the roadbed within the limits and elevations required.

On ordinary compaction projects, the Contractor shall, in order to obtain uniform compaction, do the following:

In cut sections, scarify or uniformly loosen with a disc or multi-toothed hydraulic ripper for the width of the subgrade, to a depth six (6) inches below the subgrade and re-compact to the required density. In shallow embankment sections (fills

less than one and one-half (1 1/2) feet, not including subbase gravel), scarify for the width of the subgrade six (6) inches below the existing ground surface. Sod existing in the top six (6) inches of subgrade shall be removed and replaced with satisfactory material.

E. Dirt/Dust Control

All activities associated with this contract shall conform to Rapid City Municipal Ordinance Chapters 8.34 through 8.44 and/or Pennington County Ordinance No. 12. The Contractor shall make every reasonable effort to minimize fugitive dirt or dust from construction activities. The Engineer may require the Contractor to water or take other actions necessary to prevent blowing dirt and/or dust and other nuisance conditions.

12.4 METHOD OF MEASUREMENT

When stipulated in the contract, the quantities of excavation for which payment will be made will be those shown in the contract (ie: plans quantity basis), provided the project is constructed to the lines and grades shown on the plans.

When no provisions are stipulated in the contract for payment of excavation as a plans quantity, final settlement may be made on a plans quantity basis, provided a written agreement between the Contractor and the City is executed prior to final measurement.

When payment is to be made on a plans quantity basis, whether provided in the contract or by written agreement, measurements will not be made except those necessary to determine that the work has been performed in conformance with the plans and to measure changes in plans or borrow pits which increase or decrease quantities of excavation.

When payment is to be made on a basis other than plans quantity, accepted quantities of various types of excavation will be measured in their original and excavated position by cross sectioning. Quantities of excavation, which conform to the staked lines and grades, may be computed using the original cross-sections and the staked section. Quantities of excavation that do not conform to the original plans lines and grades due to: changes in plans and grades, as directed by the Engineer; or over-breakage or slides not attributable to carelessness of the Contractor, will be measured separately and added to the area of the excavation.

The plan-shown quantity of undercutting excavation as described in Section 12.3D, first paragraph, with deductions made for portions not accomplished and with additions for portions not shown on the plans and ordered by the Engineer, will be measured separately for each class of excavation involved.

Measurement of excavation will include unsuitable material excavated and removed to obtain proper compaction in cut sections and in foundations for fill sections. Suitable material temporarily removed and replaced to facilitate compaction, except that removed

for undercutting as required in Section 12.3D, first paragraph, will not be measured for payment.

Such affected areas will be measured, differences in quantities computed, and deductions or additions made as determined by the Engineer. Volume will be computed in cubic yards by the average end area method.

Where it is impractical to measure material by the cross-section method, acceptable methods involving three-dimensional measurements or measurement in the hauling vehicle may be used.

Unclassified Excavation to be performed in connection with box culvert construction will be limited to that within the right-of-way limits unless otherwise set forth in the plans. The measured quantity for this Unclassified Excavation will be the plan shown quantity.

12.5 BASIS OF PAYMENT

A. General:

Plans quantity will be the basis of payment unless otherwise shown. Completed and accepted work will be paid for at the contract unit price per cubic yard calculated to the nearest even cubic yard completed for the class of excavation involved.

Such payment will be full compensation for excavation, construction, and compaction of cuts and embankments, shaping of slopes, finishing of surface, disposal of surplus materials, preparation and completion of subgrade, shoulders, and roadway, and maintenance as specified herein. Such payment will also include the furnishing of equipment, tools, labor, supplies, and incidentals necessary to complete work included under Excavation.

Scarifying, shaping, and re-compacting, as required under Section 12.3, ~~sub-section~~ .D, third paragraph, shall be absorbed and included in the unit price for excavation. Separate payment for this work will not be made.

B. Unclassified Excavation:

All excavation will be paid for at the contract unit price for Unclassified Excavation unless contract items provide for other classes of excavation.

When no bid item or other mention of Rock Excavation is shown on the plans and rock is encountered, such rock excavation as defined in Section 12.2, ~~sub-section~~ .B will be paid for at a negotiated price. Notification shall be given to the Engineer far enough in advance to enable him to ascertain the extent and nature of the rock formation before removal of such rock is begun. Payment as rock excavation will not be made unless such notification is given.

When a mention of rock excavation is shown on the plans, and no item is provided, payment for such excavation will be made at the contract price for Unclassified

Excavation, regardless of whether or not rock excavation is encountered at locations other than those shown or if the total rock removed is greater than the estimated amount.

C. Rock Excavation:

When an item for Rock Excavation is provided in the contract, payment for such excavation will be made at the contract unit price for Rock Excavation.

D. Muck Excavation:

When an item for Muck Excavation is provided in the contract, payment for such excavation will be made at the contract unit price for Muck Excavation.

E. Unclassified Excavation-Digouts:

When an item for Unclassified Excavation Digouts is provided in the contract, payment for such excavation will be made at the contract unit price for Unclassified Excavation-Digouts.

F. Undercutting:

When an item for Undercutting is provided, payment for such will be at the contract unit price for Undercutting. Payment will be full compensation for work over and above that normally required for Unclassified Excavation.

G. Undercut Excavation:

When an item for Undercut Excavation is provided, payment for such will be made at the unit bid price for Undercut Excavation. Payment will be full compensation for excavating, replacing and compacting the material immediately below the finished subgrade surface and to the depth specified.

END OF SECTION