

Payment will be made under:

| <b>Pay Item</b> | <b>Unit of Quantity</b> | <b>Units of Distance</b> | <b>Pay Units</b>    |
|-----------------|-------------------------|--------------------------|---------------------|
| Overhaul        | Cubic Yard              | Stations of 100 ft.      | Cubic Yard Stations |

The item of average haul will not be paid directly, as it is included in the other earth-work items.

Haul items will not be measured and paid if the material can be secured and used as shown on the Plans. If the Engineer directs hauling of materials beyond the specified or average haul limits, haul will be paid at the rate specified in the Price Schedule (PS-1).

This payment will be full compensation for all labor, equipment, and materials necessary to complete the work.

## **SECTION 210 STRUCTURAL EXCAVATION, STRUCTURAL FILL, AND FOUNDATION PREPARATION**

### **210.01 DESCRIPTION.**

Structural Excavation consists of the excavation and ordinary backfill required for installation of pipe culverts, conduits, storm drains, box culverts, and bridges.

Structural Fill shall consist of furnishing and placing foundation fill and select backfill material as shown on the Plans or as otherwise directed.

Foundation Preparation consists of site preparation for installation of a box culvert or bridge.

### **210.02 MATERIALS.**

A. **Ordinary Backfill.** Material for ordinary backfill shall be approved compactible soil selected from structure or roadway excavation. Any additional material needed shall be approved material obtained from borrow excavation.

#### **B. Structural Fill.**

1. **Select Backfill.** Select backfill shall be a well-graded mixture of stone fragments or gravel, coarse sand, and fine sand, excluding scoria and shale. Maximum size and gradation shall be as specified.
2. **Foundation Fill.** Foundation fill material shall be any granular material, other than scoria or shale, with less than 35% passing the No. 200 sieve.

**210.03 CONSTRUCTION REQUIREMENTS.**

The excavating, shoring, cofferdamming, sealing, and pumping for box culverts and bridges shall be done so the concrete is placed in a dry area free from standing or flowing water.

When a footing is placed on an excavated surface, the bottom of the excavation shall not be disturbed. If disturbed, the area shall be scarified and recompacted with a mechanical tamper. Final preparation of the foundation bed shall be made just before concrete placement. When foundation piles are used, the bottom of the excavation may extend below the bottom of the footing to allow for heaving and placing backfill after the piles are driven. This extra excavation and backfill shall be at the Contractor's expense.

All suitable excavated material shall be used for backfilling, and the balance shall be stockpiled or disposed of at locations acceptable to the Engineer. All unsuitable material shall be disposed of and paid for according to Section 203.02 D.

After the unsuitable material has been excavated, foundation fill shall be placed in uniform layers to the required elevation. Each layer shall be thoroughly compacted with mechanical tamping equipment. Water may be required to achieve satisfactory compaction and stability.

Backfill shall not be placed to a higher elevation on one side than on the other side of a wall until the concrete has attained at least 70% of its design strength. If a wall depends on a superstructure for support, backfill shall not be placed until the falsework for the superstructure has been released. Concrete box culverts shall not be backfilled until the concrete has attained at least 70% of its design strength.

A mound of broken rock or coarse sand and gravel, of at least a 1/2 cubic yard, shall be placed at the inlet end of each drain hole in a wing, abutment, culvert wall, or retaining wall. Form boards or other obstructions shall be removed from the drain holes, and the backfill shall be placed to the level of the drain hole inlet before the granular material is in place.

When there are separate structural and grading contracts, the Structural Contractor shall backfill box culverts to an elevation of 2 feet above the top of the box culvert, and shall backfill bridges to the elevation shown on the Plans. The horizontal limits of the backfill shall be as shown on the Plans. The Grading Contractor shall complete the remaining backfill in conjunction with grading operations.

When a specified density is required, backfill shall be placed in horizontal layers not exceeding 12 inches loose measurement and be uniformly compacted with mechanical tamping equipment to the specified density.

In non-load carrying areas where specified density is not required, the backfill shall be placed in layers of not more than 6 inches, moistened or dried as required, and thoroughly compacted with mechanical tamping equipment.

Special care shall be taken to prevent any wedging action against the structure. The use of drop pile hammers, loaded or unloaded clam shells, or other similar equipment is prohibited for compacting backfill.

Backfill material deposited in water or adjacent to piers within the waterway shall be deposited and compacted in a manner acceptable to the Engineer.

Sheet piling, bracing, forms, and rubbish shall be removed from the excavation before the backfill is started.

#### **210.04 METHOD OF MEASUREMENT.**

A. **Excavation for Box Culverts and Bridges.** The unit of measure will be either by Cubic Yard or Lump Sum, as specified on the Plans.

1. **Channel Excavation.** All excavation designated on the Plans as channel excavation, including the excavation necessary to place riprap and aggregate cushion, and excavation necessary to flatten and shape the slopes to and beyond the abutment locations.

When Class 1 or Class 2 Excavation is measured and paid for by the Cubic Yard, the volume to be paid for will be that volume bounded by vertical planes located at either 1 1/2 feet outside of the footing, or 2 1/2 feet outside of and parallel to the wall, whichever is greater, and the following:

- a. Class 1 Excavation. All excavation above the datum line and outside the limits of channel excavation, as designated on the Plans.
- b. Class 2 Excavation. All excavation below the datum line and outside the limits of channel excavation, as designated on the Plans.

B. **Foundation Preparation.** The Unit of Measure will be Each for each structural site and, unless specified as separate pay items, will include the cost of performing the following work items:

- Clearing and Grubbing
- Excavation
- Removal of Old Structures (or parts thereof as required)
- Construction and Removal of Shoring, Cribs, Cofferdams
- Dewatering the Excavation
- Concrete Seal
- Backfilling
- Disposal of Surplus Material

Dewatering consists of removing water as needed to facilitate construction, and may require intermittent or continuous operation of pumping equipment until the affected construction activities in the dewatered area are completed.

C. **Structural Fill.**

1. **Ordinary Backfill.** Ordinary backfill will not be measured, but is incidental to excavation.
2. **Select Backfill.** This item will be measured by the Cubic Yard in place. This measured volume will be increased by 25% to allow for shrinkage and to obtain the pay quantity. When select backfill is placed beyond the excavation

limits, the pay quantity will be determined by computation using plan dimensions and adding 25% for shrinkage.

- 3. **Foundation Fill.** This item will be measured by the Cubic Yard in place. The measured volume will be increased by 25% to allow for shrinkage and to obtain the pay quantity.

**210.05 BASIS OF PAYMENT.**

Payment will be made at the Contract Unit Price for the following:

| <b>Pay Item</b>        | <b>Pay Unit</b>      |
|------------------------|----------------------|
| Channel Excavation     | Lump Sum, Cubic Yard |
| Class 1 Excavation     | Lump Sum, Cubic Yard |
| Class 2 Excavation     | Lump Sum, Cubic Yard |
| Foundation Preparation | Each                 |
| Foundation Fill        | Cubic Yard           |
| Select Backfill        | Cubic Yard           |

This payment will be full compensation for all labor, equipment, and materials necessary to complete the work.

**SECTION 216  
WATER**

**216.01 DESCRIPTION.**

This item consists of applying water to materials being incorporated into construction of items covered by the Contract.

Provisions of this Specification shall not apply to Portland Cement mixing water or for watering seeded or sodded areas.

**216.02 MATERIALS.**

Water shall be furnished by the Contractor and shall be free of any material which impedes its flow through the spraying device.

**216.03 EQUIPMENT.**

Equipment shall meet Section 151.03 A. Hauling units shall not exceed their licensed legal weight limits.

**216.04 CONSTRUCTION REQUIREMENTS.**

Water shall be applied to the embankment, to construction materials on the roadbed, to haul roads, and to plant sites in sufficient quantity to secure and maintain proper moisture content or dust control.