

SECTION 205

EXCAVATION, ~~BACKFILL,~~ AND FOUNDATION-FILL FOR MAJOR STRUCTURES

205-1.01 DESCRIPTION. Excavate and backfill for ~~the foundations of~~ bridges, retaining walls, concrete box culverts, and other major structures.

Furnish all resources to place and remove cribbing or cofferdams. Perform all required sheeting, bracing, bailing, pumping, draining, and grouting.

Replace unsuitable material encountered below the elevation of the bottom of footings.

205-2.01 MATERIALS. Use materials that conform to the following:

Backfill and Foundation Fill	Subsection 703-2.07, Selected Material, Type A
Porous Backfill Material	Subsection 703-2.10
<u>Structural Fill</u>	<u>Subsection 703-2.13</u>

CONSTRUCTION REQUIREMENTS

205-3.01 EXCAVATION.

1. General. Clear and grub prior to starting excavation according to the requirements of Section 201.

Cut all rock or other hard foundation material to a firm surface, either level, stepped, or serrated, as directed, and remove all loose material.

~~When swell or subsidence results from driving piles, excavate the footing area or backfill with foundation fill material, to the grade of the bottom of the footing, as shown on the Plans. This work is subsidiary.~~

Do not disturb material below the bottom of footings, spread footings, unless otherwise noted in the Contract.

~~Utilize all excavated material for backfill or embankment when approved as suitable and dispose of any unsuitable or surplus excavated material as directed. Excavate to the bottom of footing prior to driving piles. Do not excavate below the footing elevation unless otherwise noted in the Contract. When swell results from driving piles, excavate the footing area, to the elevation of the bottom of the footing, as shown on the Plans. When subsidence results from driving piles, backfill with structural fill material, to the elevation of the bottom of the footing, as shown on the Plans.~~

Dispose of all necessary excavated material as provided in Subsection 203-3.01.

Do not alter streambed channel and do not place excavated materials in natural stream channels, unless shown on the Plans or approved in writing.

Give the Engineer in writing no less than 15 days written advance notification ~~ce~~ at least 15 days prior before to beginning excavation for spread footings, to allow for inspection of the excavated surface. With this notification, identify the location and specify a time period of no less than two days for the Department to inspect the excavated surface. Dewater and remove all debris from the ~~When the excavation is completed, obtain~~ surface prior to the Department's

inspection. Obtain the Engineer's approval of the ~~foundation bedding~~ excavated surface prior to the placement of any formwork or foundation materials. Account for the time required by the Department to perform the inspection in the progress schedule submitted under Subsection 108-1.03. Suspension of work to allow for inspection is not a suspension of work per Subsection 108-1.06 and additional contract time will not be allowed.

2. Foundations on Bedrock. Excavate for footings founded on bedrock, to the neat lines of the footings. Fill overbreak areas outside the neat lines of footings, with Class A concrete, ~~without extra compensation.~~ at no additional cost to the Department.
3. Cofferdams. Use suitable cofferdams as necessary wherever water-bearing strata are encountered above the elevation of the excavation. Construct foundation seals according to the requirements of ~~Subsection 501-3.08.~~ Section 501.

Submit detailed working drawings; showing proposed method of cofferdam construction. The working drawings must be designed by a person proficient in structural design. The working drawings must be stamped with the ~~and seal of~~ ed, dated by, and signed by a ~~p~~Professional ~~e~~Engineer ~~proficient in structural design and~~ registered in the State of Alaska, ~~showing proposed method of cofferdam construction.~~ The details and clearance of cofferdams, which affect the character of the finished work, is subject to approval but other details of the design are your responsibility. Submit drawings at least ~~3~~three weeks in advance of cofferdam construction.

Extend cofferdams to the required depth or to bedrock. Adequately brace cofferdams and make them as watertight as practical. Provide sufficient clearance inside cofferdams to permit construction of forms and permit pumping outside of the forms.

Right or enlarge cofferdams which are tilted or moved out of position by any cause during the sinking process, to provide the necessary clearance and proper pier location.

When no foundation seal is shown on the Plans and the cofferdam cannot be dewatered, place a seal if ~~permitted~~ the Engineer approves seal placement in writing.

Foundation seals, when shown on the Plans, may be eliminated as directed if the cofferdams can be dewatered without the seals when the excavation has been carried to the elevation of the bottom of the footing, ~~unless the Plans or Special Provisions specifically note that seals may not be eliminated.~~

~~Vent cofferdams at low water, if foundation seals are required, in order to prevent damage to green concrete from~~ Construct cofferdams to protect concrete against damage from a sudden rising of the water and to prevent damage by erosion by venting cofferdams at low water or by other means that limit differential hydrostatic head.

No timber may extend into the completed substructure.

After substructure completion, remove sheet piling and other temporary structural materials in such a manner as to avoid disturbing the finished structure. Steel or concrete sheeting or bracing may be permitted to remain in the completed structure, subject to approval.

205-3.02 FOUNDATION STRUCTURAL FILL. Remove material that is unsuitable for supporting foundations, ~~to the depth below~~ from the bottom of the footing to the depth as shown on the Plans. ~~Replace the unsuitable material with foundation fill~~ Remove material that is unsuitable for approach slabs shown on the Plans. Place Structural Fill in 6-inch layers, compacted to meet Subsection ~~205-3.05~~ 203-3.04. Place Structural Fill as uniformly as possible on all sides of structural units as shown on the Plans. Avoid unbalanced loading of Structural Fill material which

could damage the structure. When placed against concrete, place Structural Fill in accordance with Section 501.

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205-3.03 BACKFILL. ~~Place backfill materials in 8-inch layers, compacted as required for foundation fill.~~ Unless otherwise noted, reuse excavated material for backfill where shown on the Plans. If additional backfill is required, use material meeting Selected Material, Type C (Subsection 703-2.07), or as approved by the Engineer. Place backfill material in layers, and compact to the satisfaction of the Engineer. Bench slopes within the area to be filled.

Place underwater backfill in natural stream channels without compaction or layer requirements.

Place backfill as uniformly as possible on all sides of structural units. Avoid unbalanced loading of backfill which could damage the structure. When placed against ~~green concrete or retaining type walls, prevent pressures which would damage the structure.~~ concrete, place backfill according to the requirements of Section 501.

No ponding or jetting of backfill is allowed.

205-3.04 POROUS BACKFILL. Place porous backfill material continuously within a vertical plane 1 foot behind retaining walls and abutments, unless otherwise shown on the Plans.

Where weep holes are shown on the Plans or required by the Specifications, place not less than 1 cubic foot of ~~porous backfill~~ Porous Backfill material in the ~~backfill~~ at each hole, securely tied in a burlap bag, or wrapped with an acceptable geotextile fabric. Extend the wrapped ~~porous backfill~~ Porous Backfill material at least 6 inches above the hole.

205-3.05 COMPACTION. Compact material to ~~in conformance~~ with the following, using moisture and density control unless the Engineer determines that such controls are not feasible.:

1. Compaction With Moisture and Density Control. The maximum density will be determined by WAQTC FOP for AASHTO T 180 or ATM 212.

Water or aerate as necessary to provide the approximate optimum moisture content for compaction. Compact each layer to not less than 98% of the maximum density. Acceptance densities will be determined by WAQTC FOPs for AASHTO T 310 and T 224.

2. Compaction Without Moisture and Density Control. Compact by routing construction equipment and/or rollers uniformly over the entire surface of each layer before the next layer is placed. Compact until the material does not rut under the loaded hauling equipment.

Keep dumping and rolling areas separate. Do not cover any lift by another until the Engineer has determined the required compaction is obtained.

205-4.01 METHOD OF MEASUREMENT. Section 109 ~~using neat line method~~ and the following:

1. Excavation. By the actual volume of material removed, excluding the following:
 - a. Material removed prior to measurement of the original ground surface.
 - b. Material outside of the vertical planes 18 inches outside of and parallel to the neat lines of the footings, except that the limit will be vertical planes ~~coincident~~ coinciding with the neat lines of the seals when seals are shown on the Plans.
 - c. Material outside of vertical planes ~~coincident~~ coinciding with the neat lines of footings excavated in solid rock.

- d. Embankment material placed above the elevation of the bottom of footings.
- e. Material within the staked limits of other types of excavation for which payment is otherwise provided.

2. ~~Foundation~~Structural Fill. By the actual volume of material accepted in final position.

3. Porous Backfill Material. ~~Volume~~By the actual volume of material accepted in final ~~position~~calculated from the minimum dimensions shown on the Plans.position.

4. Backfill. Material for Backfill will not be measured for payment.

205-5.01 BASIS OF PAYMENT. ~~Backfill material, obtained from within the limits of structure excavation, is subsidiary to item 205(1). Any backfill material from sources other than excavation for structures will be paid for at the contract unit price for the material being used, or as extra work if no unit price has been established.~~Material for backfill is subsidiary. Clearing and grubbing within the excavation limits is subsidiary. Excavation, removal, and disposal of material unsuitable for Structural Fill is subsidiary.

Porous Backfill Material includes all materials and construction operations for making weep holes. When item 205(4), Porous Backfill Material, does not appear in the bid schedule, porous backfill is subsidiary.

~~Excavation, removal, and disposal of material unsuitable for Structural Fill is subsidiary.~~

Excavation for footings ordered by the Engineer, at a depth greater than 3 feet below the bottom of such footings shown on the Plans will be paid for as extra work under Subsection 109-1.05.

Where a bid item for cofferdams does not appear in the bid schedule, the work necessary to protect the excavation and control water is subsidiary.

Payment will be made under:

Pay Item	Pay Unit
205(1) Excavation for Structures	Cubic Yard
205(2) Cofferdam	Lump Sum
205(3) Foundation <u>Structural</u> Fill	Cubic Yard
205(4) Porous Backfill Material	Cubic Yard