Earthwork – Structure Excavation and Backfill – General – Summary

Revision and Approval

Revision	Date	Nature of Changes	Approved By
1	06-30-2022	Updated references	Richard Foley
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Background

This process establishes Structure Construction (SC) responsibilities and procedures for:

- Identifying structure excavation and structure backfill types and quantities, and contractor notification of any footing or seal course revisions.
- Payment and any quantity changes and adjustments that may be necessary for structure excavation and backfill and procedures specific to spread footing elevations and changes in seal course quantity.

Prior to reviewing this Bridge Construction Memo (BCM), it is essential to review the *Contract Specifications*, Section 19-3.01A, *Earthwork – Structure Excavation and Backfill – General – Summary* that this BCM is based on as identified in the title block above. The information in the contract specification(s) typically will not be repeated in the text of this BCM.

Process Inputs

1. Contract work requiring structure excavation and/or backfill
2. Contract documents, specifically contract pay items and quantities related to structure backfill and structure excavation

3. Contractor inquiry about quantities for structure excavation and backfill contract items
4. Existing field conditions
5. As-built plans of existing facilities (if applicable)
6. Foundation Report in the *Informational Handout*

Procedure

1. All work associated with this process is charged as Project Direct Construction.
2. Inspection of field work for this process is:
   a. Intermittent for structure excavation
   b. Benchmark for placement of structure backfill
   c. Intermittent for sampling and testing of material and compaction measurement
3. Before construction begins:
   a. Review the contract documents, Resident Engineer (R.E.) Pending file, foundation reports, as-built plans.
   b. Review the site to verify and document existing field conditions, taking note in particular of any nearby or conflicting utilities. Obtain photo and/or video documentation of the existing site conditions and include relevant notes for the project files.
   c. Verify the sum of the quantities listed for each structure matches the Bid Item Quantity.
   d. Verify if the excavation and backfill quantity is already included in the payment for some structure and culvert items.
   e. If pay limits are not shown on the contract plans, calculate the quantities for structure excavation and structure backfill as required per other contract documents. Use of quantities (if available) in the R.E. Pending file is usually sufficient for estimating quantity payments.
   f. Review the *Contract Specifications*, Section 19-3.04, *Earthwork – Structure Excavation and Backfill – Payment,* regarding that the planned footing elevations and seal course thickness are approximate. Additional information on seal courses is contained in the *Foundation Manual*:
      i. Chapter 3, *Contract Administration*, Section 3-3, *Change Orders*
      ii. Chapter 12, *Cofferdams and Seal Courses*:
         1. Section 12-4, *Seal Course*

2. Section 12-4.3, *Thickness of Seal Course*
3. Section 12-6, *Engineer's Responsibility*

g. Advise the contractor in writing about ordering material prematurely. Refer to the first sample letter titled, *Bottom of Footing Elevation Sample Letter*, in Attachment 1, *Sample Letters to the Contractor Regarding Spread Footings and Seal Courses.*

h. As necessary or based on the contractor's inquiry, hold a meeting with the contractor to confirm their understanding of what is required for each type of structure excavation and backfill, and what is included in the payment; document agreements in a letter to the contractor.

   i. Write a Change Order (C.O.) if warranted based on a quantity check.

i. When the contract plans include a spread footing and/or seal course, the Structure Representative issues a letter to the contractor containing the following as appropriate:

   i. A reminder stating that per the *Contract Specifications,* Section 51-1.03C(1), *Concrete Structures – General – Construction – Preparations – General,* the "Bottom of footing elevations shown are approximate."

   ii. A reminder that, per the contract, the engineer determines whether seal courses shown on the plans must be used as shown, changed in thickness, or eliminated, depending upon the water conditions existing at the time.

   iii. A statement that the engineer will establish final footing elevations, and/or determine the need for seal courses at the earliest time possible consistent with progress of the work, and that the contractor will be informed in writing of the engineer's decision.

   iv. A closing statement to caution the contractor that should they elect to do any work or order any materials before receiving the engineer's decision regarding spread footing elevations, pile footing elevations where seal courses are involved, and revision or elimination of the seal course; they do so at their own risk and assume the responsibility for the cost of alterations to such work or materials in the event that revisions are required.

j. For sample letters, See Attachment 1, *Sample Letters to the Contractor Regarding Spread Footings and Seal Courses.*

4. During construction:

   a. Evaluate the conditions at the time of excavation and the foundation material being excavated to determine final footing elevation and/or the use of seal course.

b. Request assistance from the Bridge Design Project Engineer and Geotechnical Services Geoprofessional, if needed, to evaluate the need for:
    i. Bottom of footing elevation changes:
        1. If a bottom of footing elevation change is determined to be necessary, request revised plan sheets so a C.O. may be issued.
    ii. Use of a seal course, need for a change in planned thickness, or its elimination:
        1. Determine the need for seal course use or a quantity and/or changes to planed seal course thickness.
c. As soon as a determination can be made, follow up with a letter to the contractor confirming:
    i. The bottom of footing elevation to be used, and if applicable, the revised elevation.
    ii. If a seal course is needed and/or if the thickness has changed.
    iii. See Attachment 1 for sample letters regarding the confirmation of the spread footing elevation and seal course thickness.
d. Write a C.O. when item quantities need to be increased, reduced, or deleted for changes to the footing elevation and/or the use of a seal course.
e. Verify and track the contractor's quantity of structure excavation and placement of backfill per the contract documents including C.O. work.
f. Make monthly progress payment of quantities consistent with the actual amount excavated or the backfill placed per the contract documents including C.O. work.
    i. When there is a discrepancy between the actual and planned item quantities for either structure excavation or backfill, remember that these items are generally Final Pay quantities:
        1. Thus, unless there is an ordered change by the engineer, the Final Pay quantity listed in the Bid Book/Special Provisions is the amount paid regardless of discrepancies.
        2. When there is an ordered change, only that quantity is used in the C.O. for payment, regardless of potential discrepancy between the C.O. and actual quantity.
        3. Be aware of thresholds for limits of unit price adjustment and C.O. work if necessary when adjusting the footing elevation or seal course thicknesses.

g. Document all inspection, construction, and quality assurance activities, pertinent to this BCM, in the Daily Reports per BCM C-7, *Daily and Weekly Reports.*

5. Following construction:

   a. Document all changes on the as-built plans.

6. File all materials acceptance documentation and Daily Reports in the appropriate category in the project records as specified in the *Construction Manual*, 5-102, *Organization of Project Documents*.

Process Outputs

1. Written agreement on types and quantities of structure excavation and backfill
2. Monthly progress payments
3. Letter to the contractor advising final spread footing and/or seal course
4. Letter to contractor confirming need for seal course and/or footing elevation revision
5. Change Orders if needed

Attachments

Attachment 1, *Sample Letters to the Contractor Regarding Spread Footings and Seal Courses*