



# Earthwork – Structure Excavation and Backfill – Construction – Ground Anchor and Soil Nail Walls

## Revision and Approval

Revision	Date	Nature of Changes	Approved By
0	04-29-2022	Original Issue	Richard Foley

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## Background

This process establishes Structure Construction (SC) responsibilities and procedures for construction of structure excavation work for ground anchor and soil nail walls.

Excavation of ground anchor and soil nail walls is typically performed in layers from the top down. Soil stability testing, if performed, is completed per the [Contract Specifications](#), Section 19-3.01D(2), *Earthwork – Structure Excavation and Backfill – General – Quality Assurance – Stability Test for Ground Anchor and Soil Nail Walls*.

Proper execution of structure excavations is critical for safety, and it is important for SC personnel to have all necessary authorized submittals required for worker and facility protection prior to the start of structure excavation work.

Prior to reviewing this Bridge Construction Memo (BCM), it is essential to review the *Contract Specifications*, Section 19-3.03K, *Ground Anchor and Soil Nail Walls*, that this BCM is based on as identified in the title block above. The information included in the contract specifications typically will not be repeated in the text of this BCM.

## Process Inputs

1. Authorized shop drawings for ground anchor and soil nail wall excavations

2. Authorized soil stability test as performed per *Contract Specifications*, Section 19-3.01D(2), *Earthwork – General – Quality Assurance – Stability Test for Ground Anchor and Soil Nail Walls*
3. Record of Underground Service Alert Ticket

## **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 ground anchor and soil nail wall excavation.
3. Before construction begins:
  - a. Review the authorized contractor submittals, such as excavation shop drawings and soil stability test results, when applicable.
  - b. Review the contract documents, and the *Foundation Manual*, [Appendix K-6](#), *Ground Anchor Wall Construction Checklist*, Section VIII. *Construction*, and [Appendix K-7](#), *Soil Nail Wall Construction Checklist* (as applicable).
  - c. Place copies of the checklists above in the field book for reference during wall construction operations.
  - d. Discuss the following with the contractor, the:
    - i. Excavation safety and contractor's responsibility to protect employees in excavations per [Cal/OSHA Title 8](#) of the *California Code of Regulations*.
    - ii. Requirement for underground service alert and providing record of notice.
    - iii. Use of the results of stability testing per *Contract Specifications*, Section 19-3.01D(2), *Earthwork – Structure Excavation and Backfill – General – Quality Assurance – Stability Test for Ground Anchor and Soil Nail Walls*.
    - iv. Contractor's competent person name and discuss required inspections per Cal/OSHA CSO [§ 1541](#), *General Requirements*.
    - v. Contingency plans for stabilization of unstable excavation face and procedures for review and authorization of remedial measures.
4. During construction:
  - a. Verify that the contractor is following authorized shop drawings for ground anchor and soil nail wall excavations and the requirements of the contract documents.
  - b. Utilize the *Foundation Manual*, [Appendix K-6](#), *Ground Anchor Wall Construction Checklist*, Section VIII. *Construction*, or [Appendix K-7](#), *Soil Nail Wall Construction Checklist*, as applicable.

- c. Visually observe excavated face and slopes for stability. Document observation in the Daily Report. Be aware that instability can occur at any time during wall construction:
  - i. The conditions below may contribute to instability:
    - 1. Water at the wall face/visible seepage
    - 2. Vibration caused by nearby activities (pile driving, train, etc.)
    - 3. Soil layers sloping (dipping) into the excavation
  - ii. If the exposed excavated face does not maintain its integrity:
    - 1. Immediately notify the contractor and the Structure Representative (SR) if there is observed instability. Stop construction in unstable areas and direct the contractor to stabilize the excavation face. Use the authorized contingency plan if applicable.
    - 2. Discuss conditions with the contractor and the SR:
      - a. The SR may request additional assistance from Geotechnical Services Geoprofessional to confirm conditions and discuss findings with the contractor.
    - 3. Discuss with the contractor whether modifications to the authorized excavation submittals will need to be made; including additional soil stability tests and submit for engineer's review.
  - iii. If the observed soil conditions of the excavated face and slope appear to be better than those assumed by the authorized shop drawings:
    - 1. Discuss conditions with the contractor and the SR:
      - a. The SR may request additional assistance from Geotech to confirm conditions and discuss findings with the contractor.
    - 2. The contractor may submit for review revisions to the authorized shop drawings to take advantage of the observed conditions.
- d. Document all inspection, construction, and quality assurance activities in the Daily Reports per [BCM C-7](#), *Daily and Weekly Reports*.
- e. File all project documentation (correspondence, materials acceptance documentation, Daily Reports, etc.) in the appropriate category in the project records as specified in the *Construction Manual*, [Section 5-102](#), *Organization of Project Documents*.

## **Process Outputs**

### Daily Reports

# **Attachments**

None