

# **SPECIAL INSPECTIONS CATAWBA COUNTY**

**(SICC-2009)**

**2009 Edition**

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**Administered by**

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## CHAPTER 11 SOILS AND FOUNDATIONS

### SICC-1101 GENERAL

**SICC-1101.1 Scope.** The requirements of this chapter and NCBC-1704.7, NCBC-1704.8, and NCBC-1704.9 shall apply when construction includes soil-related conditions or foundation systems as listed in SICC-302.7.

**SICC-1101.2 Soils report.** The soils report as required by NCBC-1802.2 and NCBC-1802.6 shall be prepared, signed and sealed by the **GER** and shall be submitted to the **CCBSD** for review and approval with the construction documents. The **GER** approved soils report shall be used by the **SIER** to conduct special inspections during construction.

### SICC-1102 FABRICATION AND ERECTION DOCUMENTS

**SICC-1102.1 Review and approval.** The soils and foundations fabrication and erection documents shall be submitted to the **GER**, **SER** for review and approval prior to construction, as appropriate. The **GC** shall provide **GER/SER**-approved fabrication and erection documents for use by the **SIER** to conduct special inspections during construction.

**SICC-1102.2 Preparation of fabrication and erection documents.** A **RDP** with experience in the design of deep foundation elements shall prepare, sign and seal fabrication and erection documents for pile and pier foundations. The fabrication and erection documents for cast-in-place concrete shallow foundations shall be prepared as required in SICC-2009 Chapter 7.

### SICC-1103 SOILS-RELATED DEVIATIONS AND REVISIONS

**SICC-1103.1 Review and approval.** Three sets of revisions to the County approved soils report and/or the County approved construction documents that bear the seal and signature of the appropriate **RDPs** and shall be submitted to the **CCBSD**, as appropriate, for review and approval prior. The **CCBSD** shall determine if the construction can proceed pending approvals.

**SICC-1103.2 Preparation of revisions.** The **GER** shall prepare, sign and seal revisions to the County approved soils report if on-site soil and/or ground water conditions vary materially from those presumed to exist based on the initial subsurface exploration and as indicated in the approved soils report. The **GER** shall coordinate revisions to the County approved construction documents with the **SER** responsible for structural design of foundations and the **RDP** responsible for deep foundations, if applicable. The **SER** and/or the **RDP** responsible for deep foundations, if applicable, shall prepare, sign and seal revisions to the County approved construction documents. The **GC** shall provide **GER/SER**-approved revisions to the fabrication and erection documents for use by the **SIER** to conduct special inspections during construction.

### SICC-1104 SPECIAL INSPECTIONS

**SICC-1104.1 Soils.** Special inspections as specified in the County approved Statement of Special Inspections shall be conducted to determine compliance with the **GER** approved soils report and the approved construction documents. The **SIER or GER** shall perform special inspections of soils in accordance with NCBC-1704.7 and NCBC-1803. Special inspections shall include:

- a. **Subgrade.** Subgrade for compatibility of bearing material and ground water conditions with the County

approved soils report, prior to construction of footings and slabs.

- b. Fill material.** Fill material for compliance with County approved structural fill specifications, prior to, during, and following its placement in each lift, for structural fill 12 inches (3658 mm) or greater in total depth.
- c. Compaction.** Compaction process to determine that materials' quality and in-place density tests comply with the County approved specifications and geotechnical notes.

**NCBC-1704.7 Soils.** The special inspections for existing site soil conditions, fill placement and load-bearing requirements shall be as required by this section and Table 1704.7. The approved soils report, required by Section 1802.2, and the documents prepared by the registered design professional in responsible charge shall be used to determine compliance. During fill placement, the special inspector shall determine that proper materials and procedures are used in accordance with the provisions of the approved soils report, as specified in Section 1803.5.

| <b>TABLE 1704.7<br/>REQUIRED VERIFICATION AND INSPECTION OF SOILS</b>   |                               |                                 |
|---|-------------------------------|---------------------------------|
| Verification & Inspection Task  | Continuous During Task Listed | Periodically During Task Listed |
| 1. Verify materials below footings are adequate to achieve the design bearing capacity.                               | —                             | X                               |
| 2. Verify excavations are extended to proper depth and have reached proper material.                                  | —                             | X                               |
| 3. Perform classification and testing of controlled fill materials  | —                             | X                               |
| 4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of controlled fill. | X                             | —                               |
| 5. Prior to placement of controlled fill, observe subgrade and verify that sit has been prepared properly.            | —                             | X                               |

**SICC-1104.2 Deep foundations.** The **SIER** or **GER** shall perform special inspections of deep foundations to determine their in-place loadbearing capacity.

**NCBC-1704.8 Pile foundations.** Special inspections shall be performed during installation and testing of pile foundations as required by Table 1704.8. The approved soils report, required by Section 1802.2, and the documents prepared by the registered design professional in responsible charge shall be used to determine compliance.

| <b>Table 1704.8<br/>Required Verification and Inspection of Pile Foundations</b>  |                               |                                 |
|---|-------------------------------|---------------------------------|
| Verification & Inspection Task  | Continuous during Task Listed | Periodically During Task Listed |
| Verify Pile materials, sizes and lengths comply with the requirements.            | X                             | —                               |
| Determine capacities of test piles and conduct additional load test, as required. | X                             | —                               |
| Observe driving operations and maintain complete                                  | X                             | —                               |

|   |   |   |
|---|---|---|
| and accurate records for each pile.   |   |   |
| Verify placement locations and plumbness, confirm type and size of hammer, record number of blows per foot of penetration, determine required penetrations to achieve design capacity, record tip and butt elevations and document any pile damage. | X | — |
| For steel piles, perform additional inspections in accordance with Section 1704.3.  | — | — |
| For concrete piles and concrete filled piles, perform additional inspections in accordance with Section 1704.4.   | — | — |
| For specialty piles, perform additional inspections as determined by the registered design professional in responsible charge.  | — | — |
| For augered uncased piles and caisson piles, perform inspections in accordance with Section 1704.9.   | — | — |

**NCBC-1704.9 Pier foundations.** Special inspections shall be performed during installation and testing of pier foundations as required by Table 1704.9. The approved soils report, required by Section 1802.2, and the documents prepared by the registered design professional in responsible charge shall be used to determine compliance.

| <b>TABLE 1704.9<br/>Required Verification and Inspection of Pier Foundations</b>  |                               |                                 |
|---|-------------------------------|---------------------------------|
| Verification and Inspection Task  | Continuous During Task Listed | Periodically During Task Listed |
| Observe drilling operations and maintain complete and accurate records for each pier.   | X                             | —                               |
| Verify placement locations and plumbness, confirm pier diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable) and adequate end bearing strata capacity. | X                             | —                               |
| For concrete piers, perform additional inspections in accordance with Section 1704.4  | —                             | —                               |
| For masonry piers, perform additional inspections in accordance with Section 1704.5.  | —                             | —                               |

Special inspections shall include:

- a. **Piling.** Special inspections as required by NCBC-1704.8 and NCBC-1808, NCBC-1809, NCBC-1810, or NCBC-1811 as appropriate, and shall include inspection of piles before, during, and after driving. Inspection reports shall contain an evaluation of the pile capacity based on driving resistance, and dynamic or static pile testing. Pile driving records shall be submitted to **CCBSD** prior to placement of pile caps.
- b. **Piers.** Special inspections as required by NCBC-1704.9 and NCBC-1808 or NCBC-1812 as appropriate, and shall include concrete strength, steel reinforcement, orientation and shape of caissons, and bearing capacity at the base of the caisson. Inspection reports shall be submitted to **CCBSD** prior to the placement of grade beams.

**SICC-1104.3 Shallow footings and foundations.** The **SIER** or **GER** shall perform structural inspections of footings and foundation systems, including shallow foundations, foundation walls, mats, slabs, etc., as specified in the County approved Statement of Special Inspections. Special inspections of cast-in-place concrete shall be performed in accordance with SICC-2009 Chapter 7, to include monitoring the placement of concrete, concrete reinforcement, and the dimensions, shapes and locations of footings, slabs, and foundation walls.

**SICC-1104.4 Revisions and deviations.** In the event that field conditions vary materially from the County approved soils report and the County approved construction documents, the **SIER** or **GER** shall notify the **GC** and the requirements of SICC-1103 shall apply.

### **SICC-1105 COMPLETION OF SOILS AND FOUNDATIONS CONSTRUCTION**

**SICC-1105.1 Soils.** Upon completion of soil-related special inspections, the **SIER or GER** as applicable shall submit a completion letter to **CCBSD**. The **SIER** shall also indicate the date of completion on the final report of special inspections of soils.

**SICC-1105.2 Deep foundations.** Upon completion of all piling and caisson deep foundations, the **SIER or GER** as applicable shall submit a completion letter to **CCBSD**. The **SIER** shall also indicate the date of completion on the final report of special inspections for deep foundations.

**SICC-1105.3 Shallow footings and foundations.** Upon completion of structural special inspections of footings and foundations, the **SIER or GER** as applicable shall submit a completion letter to **CCBSD**. The **SIER** shall also indicate the date of completion on the final report of special inspections for footings & foundations.