

CHAPTER 16 ARCHITECTURAL, MECHANICAL, ELECTRICAL COMPONENTS

SICC-1601 GENERAL

For buildings assigned to Seismic Design Category C, D, E, or F, architectural, mechanical, electrical and plumbing components shall have a quality assurance plan, and be specially inspected and tested, in accordance with NCSBC-1705.1, NCSBC-1707.1, 1707.6, 1707.7, NCSBC-1708.2, and 1708.5.

NCSBC-1705.1 Scope. A quality assurance plan for seismic requirements shall be provided in accordance with Section 1705.2 for the following:

2. Designated seismic systems in structures assigned to Seismic Design Category D, E, or F.
3. The following additional systems in structures assigned to Seismic Design Category C:
 - 3.1. HVAC ductwork containing hazardous materials, and anchorage of such ductwork
 - 3.2. Piping systems and mechanical units containing flammable, combustible or highly toxic materials
 - 3.3. Anchorage of electrical equipment used for emergency or standby power systems.
4. The following additional systems in structures assigned to Seismic Design Category D:
 - 4.1 Systems required for Seismic Design Category C.
 - 4.2 Exterior Wall panels and their anchorage.
 - 4.3 Suspended Ceiling systems and their anchorage.
 - 4.4 Access Floors and their anchorage.
 - 4.5 Steel storage racks & anchorage, where the factor I_p , determined in Section 9.6.1.5 of ASCE 7, is equal to 1.5.

Exceptions:

1. A QA plan is not required for structures designed and constructed in accordance with the conventional construction provisions of Section 2308.
2. A QA plan is not required for structures constructed of light wood framing or light framed cold-formed steel; the S_{DS} as determined in Section 1615.1 does not exceed 0.5g, and the height of the structure does not exceed 35 feet above grade plane.
3. A QA plan is not required if the structure is constructed using a reinforced masonry structural system or reinforced concrete structural system; the S_{DS} as determined in Section 1615.1 does not exceed 0.5g, and the height of the structure does not exceed 25 feet above grade plane.

SICC-1602 INSPECTIONS AND TESTS

NCSBC-1707.1 Special inspections for seismic resistance. Special inspection as specified in this section is required for the following, where required in Section 1704.1. Special inspections itemized in Sections 1707.2 through 1707.8 are required for the following:

3. Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F that are required in Sections 1707.5, 1707.6 and 1707.7.

NCSBC-1707.5 Storage racks and access floors. Periodic special inspection during the anchorage of access floors & storage racks 8 feet or greater in height in structures assigned to Seismic Design Category D, E, or F.

NCSBC-1707.6 Architectural components. Periodic Special inspection during the erection and fastening of exterior cladding, interior and exterior nonbearing walls and interior and exterior veneer in structures assigned to Seismic Design Category D, E, or F.

Exceptions:

1. Special inspection is not required for architectural components in structures 30 feet or less in height.
2. Special inspection is not required for cladding and veneer weighing 5 psf or less.
3. Special inspection is not required for interior nonbearing walls weighing 15 psf or less.

NCSBC-1707.7 Mechanical and electrical components. Periodic special inspection during the anchorage of

electrical equipment for emergency or standby power systems in structures assigned to Seismic Design Category C, D, E or F. Periodic special inspection during the installation of anchorage of other electrical equipment in structures assigned to Seismic Design Category E or F. Periodic special inspection during installation of piping systems intended to carry flammable, combustible, or highly toxic contents and their associated mechanical units in structures assigned to Seismic Design Category C, D, E or F. Periodic special inspection during the installation of HVAC ductwork that will contain hazardous materials in structures assigned to Seismic Design Category C, D, E or F.

NCSBC-1707.7.1 Component inspection. Special inspection is required for the installation of the following components where the component has a Component Importance Factor of 1.0 or 1.5 in accordance with Section 9.6.1.5 of ASCE 7.

1. Equipment using combustible energy sources.
2. Electrical motors, transformers, switchgear unit substations and motor control centers.
3. Reciprocating and rotating-type machinery.
4. Piping distribution systems 3 inches (76 mm) and larger.
5. Tanks, heat exchangers and pressure vessels.

NCSBC-1707.7.2 Component and attachment testing. The component manufacturer shall test or analyze the component and the component mounting system or anchorage for the design forces in Chapter 16 for those components having a Component Importance Factor of 1.0 or 1.5 in accordance with Chapter 16. The manufacturer shall submit a certificate of compliance for review and acceptance by the registered design professional responsible for the design, and for approval by the building official. The basis of certification shall be by test on a shaking table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces from Chapter 16 or by more rigorous analysis. The special inspector shall inspect the component and verify that the label, anchorage or mounting conforms to the certificate of compliance.

NCSBC-1707.7.3 Component manufacturer certification. Each manufacturer of equipment to be placed in a building assigned to Seismic Design Categories E and F, in accordance with Chapter 16, where the equipment has a Component Importance Factor of 1.0 or 1.5 in accordance with Chapter 16, shall maintain an approved quality control program. Evidence of the quality control program shall be permanently identified on each piece of equipment by a label.

NCSBC-1708.2 Testing for seismic resistance. The tests specified in Sections 1708.3 through 1708.6 are required for the following:

3. Architectural, mechanical and electrical components in structures assigned to Seismic Design Category C, D, E or F that are required in Section 1708.5.

NCSBC-1708.5 Mechanical and electrical equipment. Each manufacturer of designated seismic system components shall test or analyze the component and its mounting system or anchorage and shall submit a certificate of compliance for review and acceptance by the registered design professional in responsible charge of the design of the designated seismic system and for approval by the building official. The evidence of compliance shall be by actual test on a shake table, by three-dimensional shock tests, by an analytical method using dynamic characteristics and forces, by the use of experience data (i.e., historical data demonstrating acceptable seismic performance), or by more rigorous analysis providing for equivalent safety. The special inspector shall examine the designated seismic system and shall determine whether the anchorages and label conform with the evidence of compliance.

SICC-1603 COMPLETION OF ARCHITECTURAL, MECHANICAL AND ELECTRICAL COMPONENTS

Upon completion, the **SIER** shall submit a completion letter to **CCBSD**. The **SIER** shall also indicate the date of completion on the final report of special inspections for architectural, mechanical, and electrical components.