

SPECIAL INSPECTIONS/TESTING/REQUIRED SUBMITTALS

STATEMENT OF SPECIAL INSPECTIONS

THE CONTRACTOR SHALL EMPLOY A QUALIFIED, INDEPENDENT TESTING LABORATORY TO PROVIDE "SPECIAL INSPECTIONS" DURING CONSTRUCTION. THE "SPECIAL INSPECTIONS" - REQUIRED IN ACCORDANCE W/ THE 2006 IBC, SECTION 1704 - ARE SUMMARIZED BELOW FOR THE SHELL BUILDING STRUCTURE.

THE SPECIAL INSPECTOR/TESTING LABORATORY SHALL USE THE LATEST ISSUE OF THE STRUCTURAL RECORD DRAWINGS FOR THE INSPECTION OF THE STRUCTURE. DO NOT USE THE SHOP DRAWINGS FOR INSPECTION PURPOSES.

TABLE 1704.3 REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

| VERIFICATION AND INSPECTION | CONTINUOUS | PERIODIC | REFERENCE STANDARD | IBC | YES | NO | N/A |
|---|------------|----------|------------------------------|-----------|-----|----|-----|
| 1. Material verification of high-strength bolts, nuts, and washers: | | | | | | | |
| a. Identification markings to conform to ASTM standards specified in the approved contract documents. | — | X | ASTM, AISC 360, Section A3.3 | | X | | |
| b. Manufacturer's certificate of compliance required. | — | X | — | | X | | |
| 2. Inspection of high-strength bolting: | | | | | | | |
| a. Bearing-type connections. | — | X | AISC 360, Section M2.5 | 1704.3 .3 | | | |
| b. Slip Critical Connections. | — | X | AISC 360, Section M2.5 | 1704.3 .3 | | | X |
| 3. Material verification of structural steel: | | | | | | | |
| a. Identification markings to conform to ASTM standards specified in the approved contract documents. | — | — | ASTM A 6 or ASTM A 568 | 1708.4 | X | | |
| b. Manufacturers' certified mill test reports | — | — | ASTM A 6 or ASTM A 568 | 1708.4 | X | | |
| 4. Material verification of weld filler materials: | | | | | | | |
| a. Identification markings to conform to AWS standards specified in the approved contract documents. | — | — | ASTM 360, Section M2.5 | | X | | |
| b. Manufacturer's certificate of compliance required. | — | — | — | | X | | |
| 5. Inspection of welding: | | | | | | | |
| a. Structural Steel | | | | | | | |
| 1) Complete and partial penetration groove welds. | X | — | AWS D1.1 | 1704.3 .1 | | | |
| 2) Multi-pass fillet welds | X | — | AWS D1.1 | 1704.3 .1 | | | X |
| 3) Single pass fillet welds > 5/16" | X | — | AWS D1.1 | 1704.3 .1 | | | |
| 4) Single pass fillet welds ≤ 5/16" | — | — | AWS D1.1 | 1704.3 .1 | X | | |
| 5) Floor and roof deck welds | — | X | AWS D1.3 | | | | X |
| b. Reinforcing Steel | | | | | | | |
| 1) Verification of weldability of reinforcing steel other than ASTM A706 | — | X | AWS D1.4 ACI 318.3.5.2 | | | | X |
| 2) Reinforcing steel-resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special reinforced concrete shear walls and shear reinforcement. | X | — | AWS D1.4 ACI 318.3.5.2 | | | | X |
| 3) Shear Reinforcement | X | — | AWS D1.4 ACI 318.3.5.2 | | | | X |
| 4) Other reinforcing steel | — | X | AWS D1.4 ACI 318.3.5.2 | | | | X |
| 6. Inspection of steel frame joint details for compliance with approved construction documents: | | | | | | | |
| a. Details such as bracing and stiffening. | — | X | — | 1704.3 .2 | | | X |
| b. Member locations. | — | X | — | 1704.3 .2 | | | X |
| c. Application of joint details to steel-concrete | — | X | — | 1704.3 .2 | | | X |

TABLE 1704.4 REQUIRED VERIFICATION AND INSPECTION OF CONCRETE CONSTRUCTION

| VERIFICATION AND INSPECTION | CONTINUOUS | PERIODIC | REFERENCE STANDARD | IBC | YES | NO | N.A. |
|---|------------|----------|--|--------------------------|-----|----|------|
| 1. Inspection of reinforcing steel, including prestressing tendons, and placement. | — | X | ACI 318: 3.5, 7.1–7.7 | 1913.4 | X | | |
| 2. Inspection of reinforcing steel welding in accordance with Table 1704.3, Item 5b. | — | — | AWS D1.4 ACI 318:3.5.2 | — | | | X |
| 3. Inspect balls to be installed in concrete prior to and during placement of concrete where allowable loads have been increased. | X | — | — | 1911.5 | | | X |
| 4. Verifying use of required design mix. | — | X | ACI 318: Ch. 4, 5.2–5.4 | 1904.2.2, 1913.2, 1913.3 | X | | |
| 5. At the time fresh concrete is sampled to fabricate specimens for strength tests, perform slump, and air content tests, and determine the temperature of the concrete. | X | — | ASTM C 172 ASTM C 31 ACI 318: 5.6, 5.8 | 1913.10 | X | | |
| 6. Inspection of concrete and shotcrete placement for proper application techniques. Exclusions: - Isolated concrete spread footings - Slab-on-grade | X | — | ACI 318: 5.9–5.10 | 1913.6, 1913.7, 1913.8 | X | | |
| 7. Inspection for maintenance of specified curing temperature and techniques. | — | X | ACI 318: 5.11–5.13 | 1913.9 | X | | |
| 8. Inspection of prestressed concrete: | | | | | | | |
| a. Application of prestressing forces. | X | — | ACI 318: 18.20 | — | | | X |
| b. Grouting of bonded prestressing tendons in the seismic-force-resisting system. | X | — | ACI 318: 18.18.4 | — | | | X |
| 9. Erection of precast concrete members. | — | X | ACI 318: Ch. 16 | — | | | X |
| 10. Verification of in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs. | — | X | ACI 318: 6.2 | — | | | X |
| 11. Inspect formwork for shape, location and dimensions of the concrete member before formed. | — | X | ACI 318: 6.1.1 | — | X | | |

TABLE 1704.5.1 LEVEL 1 SPECIAL INSPECTION FOR MASONRY

| VERIFICATION AND INSPECTION | CONTINUOUS | PERIODIC | IBC REF. | ACI 530 REF | ACI 530.1 REF | YES | NO | N.A. |
|--|------------|----------|------------------------|------------------------------|-----------------|-----|----|------|
| 1. As masonry construction begins, the following shall be verified to ensure compliance: | | | | | | | | |
| a. Proportions of site-prepared mortar. | — | X | — | — | Art. 2.6A | X | | |
| b. Construction of mortar joints. | — | X | — | — | Art. 3.3B | X | | |
| c. Location of reinforcement, connectors, prestressing tendons and anchorage. | — | X | — | — | Art. 3.4, 3.6A | X | | |
| d. Prestressing technique. | — | X | — | — | Art. 3.6B | | | X |
| e. Grade and size of prestressing tendons and anchorages. | — | X | — | — | Art. 2.4B, 2.4H | | | X |
| 2. The inspection program shall verify: | | | | | | | | |
| a. Size and location of structural elements. | — | X | — | — | Art. 3.3G | X | | |
| b. Type, size, and location of anchors, including other details of anchorage of masonry to structural members, frames or other construction. | — | X | — | Sec. 1.2.2(e), 2.1.4, 3.1.6. | — | X | | |
| c. Specified size, grade and type of reinforcement. | — | X | — | Sec. 1.13 | Art. 2.4, 3.4. | X | | |
| d. Welding of reinforcing bars. | X | — | — | Sec. 2.1.10.7.2, 3.5.3.4(b) | — | | | X |
| e. Protection of masonry during cold weather (below 40 F) or hot weather (temps above 90 F). | — | X | Section 2104.3, 2104.4 | — | Art. 1.8C, 1.8D | X | | |
| f. Application and measurement of prestressing force. | — | X | — | — | Art. 3.6B | | | X |
| 3. Prior to grouting, the following shall be verified to ensure compliance: | | | | | | | | |
| a. Grout space is clean. | — | X | — | — | Art. 3.2D | X | | |
| b. Placement of reinforcement and connectors and prestressing tendons and anchorages. | — | X | — | Sec. 1.13 | Art. 3.4 | X | | |
| c. Proportions of site-prepared grout and prestressing grout for bonded tendons. | — | X | — | — | Art. 2.6B | X | | |
| d. Construction of mortar joints. | — | X | — | — | Art. 3.3B | X | | |
| 4. Grout placement shall be verified to ensure compliance with code and construction document provisions. | X | — | — | — | Art. 3.5 | X | | |
| a. Grouting of prestressing bonded tendons. | X | — | — | — | Art. 3.6C | | | X |
| 5. Preparation of any required grout specimens, mortar specimens and/or prisms shall be observed. | | | | | | | | |
| | X | — | Sec. 2105.2.2, 2105.3 | — | Art. 1.4 | X | | |
| 6. Compliance with required inspection provisions of construction documents and the approved submittal shall be verified. | | | | | | | | |
| | — | X | — | — | Art. 1.5. | X | | |

TABLE 1704.7 REQUIRED VERIFICATION AND INSPECTION OF SOILS

| VERIFICATION AND INSPECTION | CONTINUOUS DURING TASK LISTED | PERIODICALLY DURING TASK LISTED | YES | NO | N/A |
|--|-------------------------------|---------------------------------|-----|----|-----|
| 1. Verify materials below footings are adequate to achieve the design bearing capacity. | — | X | X | | |
| 2. Verify excavations are extended to proper depth and have reached proper materials. | — | X | X | | |
| 3. Perform classification and testing of controlled fill materials. | — | X | X | | |
| 4. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of controlled fill. | X | — | X | | |
| 5. Prior to placement of controlled fill, observe subgrade and verify that site has been prepared to receive temporary | — | X | X | | |

TABLE 1704.13 SPECIAL CASES

| VERIFICATION AND INSPECTION | CONTINUOUS DURING TASK LISTED | PERIODICALLY DURING TASK LISTED | YES | NO | N/A |
|-----------------------------|-------------------------------|---------------------------------|-----|----|-----|
| 1. | — | X | | | X |
| 2. | — | X | | | X |
| 3. | — | X | | | X |
| 4. | — | X | | | X |

STATEMENT OF TESTING

THE CONTRACTOR SHALL EMPLOY A QUALIFIED, INDEPENDENT TESTING LABORATORY TO PROVIDE STRUCTURAL TESTING DURING CONSTRUCTION. THE MINIMUM STRUCTURAL TESTING FOR THE SHELL BUILDING STRUCTURE - REQUIRED IN ACCORDANCE W/ THE 2006 IBC, SECTION 1704 - IS SUMMARIZED BELOW.

TABLE 1 - SUMMARY OF REQUIRED STRUCTURAL TESTS

| VERIFICATION AND INSPECTION | CONTINUOUS | PERIODIC | REFERENCE STANDARD | IBC | YES | NO | N/A |
|---|------------|----------|--------------------|--------------|-----|----|-----|
| 1. CONCRETE | | | | | | | |
| a. Cylinder Compression Testing | — | X | ASTM C 39 | Section 1905 | X | | |
| b. Preconstruction testing of shotcrete | — | X | — | Section 1913 | | | X |
| 2. MASONRY | | | | | | | |
| a. Hollow Unit Block Compression Tests (Unit Strength Method) | — | X | ASTM C 90 | Section 2105 | X | | |
| 3. POST-INSTALLED CONCRETE ANCHORS ** | | | | | | | |
| a. Expansion anchors | — | X | ICC – E-3 AC 193 | Section 1912 | X | | |
| b. Adhesive anchors | — | X | ICC – E-3 AC 308 | Section 1912 | X | | |

** WHEN DIRECTED BY THE DRAWINGS TO PROVIDE POST-INSTALLED ANCHORAGES, THE FOLLOWING GUIDELINES SHALL BE FOLLOWED:

1. THE BASIS OF DESIGN FOR POST-INSTALLED ANCHORAGE OF SILL COMPONENTS TO CMU WALLS IS THE SIMPSON TITEN HD SCREW ANCHOR AS INDICATED IN THE DETAILS. ALTERNATE ANCHORS ARE ACCEPTABLE PROVIDED THAT STRUCTURAL CALCULATIONS ARE SUBMITTED FOR EACH CONDITION THE ANCHORS ARE USED IN AND CLEARLY DEMONSTRATE THE STRUCTURAL EQUIVALENCY. EQUIVALENCY INCLUDES CONSIDERATION OF SPACING, EDGE DISTANCES, EMBEDMENT DEPTHS, AND ANY OTHER PERTINENT CONSTRAINTS AS REQUIRED BY THE ANCHOR MANUFACTURER. THE CALCULATIONS MUST SHOW A DIRECT COMPARISON BETWEEN THE PROPOSED ANCHORS AND THE TESTED ANCHOR. IF AN ALTERNATE BEING PROPOSED, THE CALCULATIONS SHALL BE SIGNED AND CERTIFIED BY A PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF THE PROJECT AND SUBMITTED AS REQUIRED BELOW.
2. A REPRESENTATIVE OF THE ANCHOR MANUFACTURER OR PROJECT SPECIAL INSPECTOR SHALL BE ON SITE TO OVERSEE THE INSTALLATION OF THE FIRST FOUR ANCHORS FOR EACH ANCHOR TYPE FOR EACH ANCHOR INSTALLED. THIS MEASURE SHALL BE TAKEN FOR EACH INSTALLER OF THE ANCHORS.
3. THE FIRST FOUR ANCHORS SHALL BE TENSION TESTED ONCE INSTALLATION IS COMPLETE FOR 100% OF THE SERVICE LEVEL LOAD CAPACITY.

REQUIRED STRUCTURAL SUBMITTALS

THE ITEMS BELOW SHALL BE PROVIDED FOR REVIEW PRIOR TO FABRICATION.

TABLE 1. LIST OF REQUIRED STRUCTURAL SUBMITTALS

| CATEGORY | ITEM | COMMENTS |
|------------------------|---|----------|
| SITE WORK | | |
| | GRADING PLAN | |
| CONCRETE | | |
| | FOUNDATION REINFORCING | |
| | INT. AND EXT. SLAB REINFORCING | |
| | MIX DESIGNS FOR ALL CLASSES OF CONCRETE | |
| | MILL. CERTS. FOR REINFORCING | |
| MASONRY | | |
| | STEEL REINFORCING | |
| | GROUT MIX DESIGN | |
| | MILL. CERTS. FOR REINFORCING | |
| STEEL | | |
| | STRUCTURAL STEEL | |
| | STRUCTURAL STEEL EMBEDS | |
| | MILL. CERTS. FOR STRUCTURAL STEEL | |
| WOOD | | |
| | TRUSS SHOP DRAWINGS | |
| POST-INSTALLED ANCHORS | | |
| | CALCULATIONS FOR ALTERNATES TO BASIC DESIGN | |

BID DOCUMENTS 7/1/2011

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