
SAMPLING, TESTING AND TAGGING OF REINFORCING BARS

Disciplines: Structural

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Division of the State Architect (DSA) documents referenced within this publication are available on the [DSA Forms](#) or [DSA Publications](#) webpages.

PURPOSE

This Interpretation of Regulations (IR) clarifies requirements for sampling and testing of reinforcing bars (rebar) used in structural concrete and masonry construction on projects under DSA jurisdiction.

SCOPE

This IR is only applicable to reinforcing bars meeting the requirements of the ASTM International (ASTM) standard A615 and A706, used for either structural concrete or masonry construction.

Other types of steel reinforcement and mechanical couplers are outside the scope of this IR.

The scope of this IR is outlined as follows:

- Material identification including the use of the manufacturer's documentation
- Material sampling
- Laboratory testing
- Tagging of fabricated material

BACKGROUND

The California Building Code (CBC) requires sampling and physical testing of reinforcing bars used in concrete and (under certain circumstances) masonry construction. It describes, in general, rebar sampling frequencies for identifiable material vs. unidentifiable material and the tests required. In accordance with *IR A-8: Project Inspector and Assistant Inspector Duties and Performance*, the project inspector shall coordinate scheduling with the Laboratory of Record (LOR) to ensure material verification, sampling, testing and required reports of reinforcing bars occurs.

1. WAIVER OF TESTS

Reinforcing bar testing may be waived by the design professional in responsible charge of the project with the approval of DSA, in accordance with CBC Section 1910A.2.

Exception: Rebar testing may not be waived for Risk Category IV buildings, per CBC Table 1604A.5.

2. MATERIAL IDENTIFICATION

The project inspector shall monitor the LOR qualified representative's identification of reinforcing bars delivered to the jobsite. Unless waived as per Section 1 above, material identification (ID) of rebar shall be conducted by a qualified representative of the LOR at the place of fabrication (cutting and bending). A qualified individual shall possess basic knowledge of bar size, specification, grade and manufacturer's identification markings.

SAMPLING, TESTING AND TAGGING OF REINFORCING BARS

Identified rebar shall be sampled and tested per Sections 3, 4 and 5 below.

In order to be considered identified, the laboratory representative must verify that reinforcing bars meet all of the criteria in Sections 2.1 through 2.4 below; otherwise, they shall be considered unidentifiable and shall be sampled and tested accordingly per Sections 3, 4 and 5 below.

2.1 Reinforcing bars shall originate from whole, unbroken bundles or coils, wire wrapped by the manufacturer's mill.

2.2 The manufacturer's ID tag shall be attached by wire to each bundle or coil. Tags shall be legible and complete, with the mill name, heat number, bar size, material grade, ASTM designation and bundle or coil weight indicated.

2.3 The markings on a coil or each bar in a bundle shall match the affixed ID tags for mill, bar size, ASTM designation and grade.

2.4 Each bundle or coil shall be accompanied by the manufacturer's mill certification/material test report (MTR), which states that the material conforms to the appropriate ASTM designation as described in the project specifications.

3. REBAR SAMPLING

All reinforcing bar samples shall be selected by permitted individuals identified in California Administrative Code (CAC) Section 4-335(c). Each sample shall consist of two like bars, one for tension testing and one for bend testing. Specimen length shall be 28 in. $\pm$ 2 in. for both test bars (#11 and smaller). Bend specimens for #14 and #18 shall be 36 in. $\pm$ 2 in. Bars pre-cut by the fabricator are not acceptable.

Each pair of sampled bars shall be wire tied together at the time of sampling, and if identifiable, shall be accompanied by documentation in accordance with CBC Section 1910A.2.

Bend tests shall not be performed by the fabricator or on the project site. All tests shall be conducted in the LOR facility.

4. FREQUENCY

Reinforcing bars shall be sampled at the frequencies listed below unless specified otherwise by the DSA-approved construction documents.

4.1 Concrete Construction

4.1.1 For reinforcing bars found to be identifiable in accordance with Section 2 above, sample two (2) bars from every 10 tons (20,000 pounds), or fraction thereof, for each size of rebar.

4.1.2 For unidentifiable reinforcing bars or jobsite sampling, sample two (2) bars from every two and one-half tons (5,000 pounds), or fraction thereof, for each size of rebar.

4.2 Masonry Construction

4.2.1 For reinforcing bars found to be identifiable in accordance with Section 2 above, no sampling for testing is required.

4.2.2 For reinforcing bars found to be unidentifiable in accordance with Section 1 above, sampling shall be in accordance with CBC Section 2103A.4. Alternatively, the frequency of sampling for unidentifiable reinforcing bar specified in Section 4.1 above may be used.

5. TESTING

Testing of reinforcing bars shall be conducted by a laboratory accepted by DSA for this purpose (refer to DSA's webpage listing of [Accepted Laboratories](#)). Each pair of companion test bars sampled, as described in Section 3 above, shall be tested by the LOR in accordance with the applicable material standard (i.e., ASTM) for the following:

SAMPLING, TESTING AND TAGGING OF REINFORCING BARS

5.1 Tensile strength, yield strength and elongation requirements, including uniform elongation when required (1 each).

5.2 Bend requirements (1 each).

All reinforcing bars received by the laboratory for testing shall receive a distinguishing mark (stamp) or tag adequate to remain affixed and legible through the tension or bend test process. Tested tension and bend bars shall be wire tied together and remain clearly identifiable until removed from the test lab premises.

Tension and bend tests shall be performed by the LOR in an expeditious manner to allow for prompt tagging of tested material and to minimize delays in shipping by the fabricator.

6. TAGGING OF FABRICATED BARS

Before reinforcing bars are shipped to the project site they must meet the specific project requirements, as evidenced by sampling and testing in accordance with this IR. A qualified representative of the LOR shall attach an identifying tag to the rebar at the place of fabrication as follows:

Note: Tagging of reinforcing shall not occur unless test results indicate the sampled and tested bar(s) meet the requirements of the applicable material specification.

6.1 Lab ID tags shall be attached to bundles of like fabricated bars representing the material sampled and tested (e.g., mill, size and grade). A sufficient number of tags per load shall be attached for verification by the project inspector that each size was tested.

6.2 Lab ID tags shall be made of durable waterproof material, and shall include the project name, DSA file and application number, lab name, date, technician name, mill, heat number, bar size and material grade.

6.3 In the event that unidentified material is delivered to the project site, the material shall be sampled and tested as unidentifiable material. Tagging of this material is not required.

7. REPORTING

Test reports shall be provided and distributed in accordance with CAC, Sections 4-335(d) and (e). A sample test report form *DSA 203: Tension/Bend Test Report* is available on DSA's website.

8. FAILURE TO PERFORM

Failure to inspect the work or sample and test materials in a professional and competent manner, report defective work or materials, file all required reports in a truthful and timely manner, or fulfill any other duties defined by the code may result in withdrawal of the LOR's DSA acceptance (reference CAC 4-335.1[c]). This includes but is not limited to withdrawal of acceptance or approval to work on any current or future projects under DSA jurisdiction.

REFERENCES:

California Code of Regulations (CCR) Title 24
Part 1: California Administrative Code (CAC), Sections 4-335
Part 2: California Building Code (CBC), Sections 1910A.2 and 2103A.4

This IR is intended for use by DSA staff and by design professionals to promote statewide consistency for review and approval of plans and specifications as well as construction oversight of projects within the jurisdiction of DSA, which includes State of California public schools (K-12), community colleges and state-owned or state-leased essential services buildings. This IR indicates an acceptable method for achieving compliance with applicable codes and regulations, although other methods proposed by design professionals may be considered by DSA.

This IR is subject to revision at any time. Please check DSA's website for currently effective IRs. Only IRs listed on the webpage at <https://www.dgs.ca.gov/dsa/publications> at the time of project application submittal to DSA are considered applicable.