DSA IR 18-1

CONTROLLED LOW-STRENGTH MATERIAL: 2025 CBC

Disciplines: Structural

History: Revised 07/15/25 Under 2025 CBC
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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 design, inspection, and testing requirements for controlled low-strength material (CLSM) used on construction projects under DSA jurisdiction.

SCOPE

This IR is applicable to the use of CLSM as fill material in lieu of compacted soil below foundations, within building pads, or adjacent to retaining walls and other structures. This IR does not apply to the use of CLSM as trench backfill in locations remote from such structures.

BACKGROUND

CLSM is defined in Chapter 2 of the California Building Code (CBC) as "a self-compacted, cementitious material used primarily as backfill in place of compacted fill." CLSM commonly consists of cement, fine aggregate, and water, but may include other components (e.g., admixtures). Cured CLSM typically achieves a compressive strength between 50 pounds per square inch (psi) and 1,200 psi. Additional information is available in the American Concrete Institute (ACI) publication Report on Controlled Low-Strength Materials (ACI PRC-229R).

1. GENERAL

As defined by the CBC, CLSM is not concrete and shall not be considered part of the structural foundation or slab system supporting buildings or similar structures. Leftover concrete from an earlier placement or other construction waste materials shall not be used as CLSM.

1.1 Geotechnical Report

Per CBC Section 1803A.7, Item #10, the use of CLSM under or adjacent to foundations shall be addressed in the site-specific geotechnical engineering report prepared by a California registered geotechnical engineer. In addition to the requirements of CBC Section 1803A.5.9, the geotechnical report must address any effects of CLSM on the foundation design such as bearing capacity, friction coefficient, drainage, etc.

1.2 Contractor Request for CLSM

If the construction documents do not specify CLSM per Section 2 below, then its use requires DSA review and approval as a construction change document (CCD). Refer to *IR A-6: Construction Change Document Submittal and Approval Process*. If the geotechnical report does not address CLSM, then the CCD must be supported by a supplemental letter signed by the geotechnical engineer of record, approving the use of CLSM, providing all information required by CBC Section 1803A.5.9 and Section 1.1 above, and stating any limitations of use.

2. CONSTRUCTION DOCUMENTS

The DSA-approved construction documents shall specify the CLSM requirements including but not limited to locations, approximate depths, site preparation, CLSM materials and properties, and CLSM testing and inspection.

2.1 Specifications

Specifications for CLSM shall include all the following:

2.1.1 Site preparation requirements including, but not limited to, minimum soil compaction beneath CLSM and minimum and maximum soil moisture content. Site preparation requirements shall be in accordance with the geotechnical report.

2.1.2 Required properties of CLSM including minimum compressive strength, consistency (i.e., slump or flow), and any other relevant properties specified in the geotechnical report.

2.1.2.1 Other relevant properties may include, but are not limited to, unit weight or time to reach the specified strength.

2.1.2.2 If excavation of the CLSM is anticipated, it is recommended to limit the compressive strength to a maximum of 100 psi. Refer to ACI PRC-229R for additional information.

2.1.3 Mix design requirements including relative proportions by weight of cementitious materials, aggregates (i.e., maximum aggregate size), water, and any admixtures.

2.1.4 Relevant requirements regarding mixing, conveying, placement, and curing.

2.2 Drawings

Location, approximate depth, and dimensions (including minimum and maximum thickness) of CLSM placement shall be shown on the DSA-approved documents. Because CLSM is not reinforced concrete, the minimum reinforcing requirements of ACI 318: Building Code Requirements for Structural Concrete are not applicable.

3. TESTING AND INSPECTION

Inspection and testing requirements shall be in accordance with CBC Chapter 17A.

3.1 Inspection

Placement of CLSM shall be inspected by the project inspector and the geotechnical engineer (or their qualified representative) in accordance with CBC Section 1705A.6. Per CBC Section 1705A.3.3.2, Item #3 batch plant inspection is not required provided that the requirements listed therein are met.

3.2 Testing

CLSM shall be tested as required by the geotechnical engineer per CBC Section 1803A.5.9, Items #3 and #4.

3.2.1 CLSM shall be sampled in accordance with ASTM D5971.

3.2.2 Unless more frequent sampling is required by the geotechnical report per CBC Section 1803A.5.9, Item #5, a set of cylinders shall be taken for each 150 cubic yards, or fraction thereof, of CLSM placed.

3.2.3 Compressive strength testing shall comply with ASTM D4832.

3.2.4 Field testing for unit weight, air content, or other properties may also be required by the geotechnical engineer per CBC Section 1803A.5.9, Items #3 and #4.

REFERENCES:

2025 California Code of Regulations (CCR) Title 24
Part 2: California Building Code (CBC), Sections 1705A.3.3.2, 1705A.6, 1803A.5.9, 1803A.7.