



I. General

The purpose of this newsletter is to explain special inspection and testing requirements as specified by the Building Code Section 1701.5.1 for concrete and Section 1701.5.12 for shotcrete. For design and construction standards and testing and inspection requirements for shotcrete, refer to the California Building Code (Building Code), Chapter 19, Division IV.

II. Definitions

For the purpose of this newsletter the following definitions will apply:

1. **Erosion Control Device** - An erosion control device is a piece of work artificially built up or composed of parts other than a building, shoring, retaining wall or planting material, that is designed and installed to control soil erosion on the face of a cut, fill or natural gradient.

Structures other than buildings in surface contact with a cut, fill or natural gradient with a slope greater than one and one-half (1.5) horizontal to one (1.0) vertical shall be considered to be retaining walls or shoring unless a preliminary soils report prepared by a Geotechnical Engineer, or a Civil Engineer registered in the State of California demonstrate satisfactorily that the structure is an Erosion Control Device.

2. **Fully Supported on Earth** - Concrete or shotcrete that is supported by earth with a surface slope not exceeding one and one-half (1.5) horizontal to one (1.0) vertical (34 degrees) is considered to be fully supported on earth.
3. **Minor Repair**
 - a. Repairs that do not require the replacement, removal or addition of any embedments, reinforcing steel bars, prestressed strands or tendons.
 - b. Repairs that do not exceed 1 cubic yard or 10% of the volume of an individual structural member, whichever is less, if so specified on the plans.
 - c. Repairs specified as minor repairs by the engineer of record on the plans and approved by the Building Official.
4. **Shotcrete** - is mortar or concrete pneumatically projected at high velocity onto a surface. The process is also known by other proprietary names such as Gunite, Guncrete, Pneucete, Blastcrete, Blocrete and Jetcrete.

It is applicable to the dry-mix and wet-mix processes

using both fine and coarse aggregates. For design and construction standards and testing and inspection requirements for shotcrete, refer to the Building Code, Chapter 19, Division IV.

5. **Site Work** - is work that is part of the improvement of the site.
6. **Special Hazard** - Any condition to the extent that, in the opinion of the Building Official, may be a cause to threaten

III. Preconstruction Tests For Shortcrete Work

1. A preconstruction test panel must be designed, constructed, shot, cured, cored or sawn, examined, tested and approved prior to commencing the project when:
 - a. Reinforcing steel bars larger than #5 are specified or
 - b. Contact lap splicing of reinforcing bars are specified or
 - c. The minimum clearance between parallel bars as required by the Building Code Section 1924.4 is not provided and
 - d. When required by the Building Official.
2. The panel thickness and reinforcing shall reproduce the thickest and most congested area specified in the structural design. It shall be shot at the same angle, using the same nozzle man and with the same concrete mix design that will be used on the project.

It is the responsibility of the engineer or architect of record to provide a detailed drawing of the test panel that complies with the Building Code Section 1924.5.

Exception:

When the specified design compressive strength (f'_c) of the shotcrete is 2500 psi or less, the engineer or architect of record may, at his/her discretion, specify on the plans that preconstruction tests are not required.

IV. Compressive Strength Test

Compressive strength tests for concrete and shotcrete must be performed by a construction materials testing laboratory approved by Inspection Services. Concrete cylinder and/or test specimen for the purpose of compressive strength testing must be obtained by a special inspector certified by Inspection Services in the category of Reinforced Concrete.

In the alternative, such cylinder and/or test specimens may be obtained by a laboratory technician certified by the American Concrete Institute in the category of Field Testing as a Grade I-Technician provided that

the certification card is current and valid and the certified special inspector is on the job site supervising the technician while samples are being taken. A list of approved construction materials testing laboratories and special inspection agencies is available upon request from Inspection Services.

V. Special Inspection Requirements

A. Continuous special inspection is required for concrete or shotcrete construction during the taking of test specimens, placing of steel reinforcing bars, concrete and shotcreting. The special inspector is required to be on the job site at all times observing the work requiring special inspection.

Examples of such structures are: retaining walls and cast-in-place drilled piles or caissons.

B. Exceptions: In addition to the exceptions to special inspection requirements listed under Building Code Sections 1701.5.1 and 1701.5.12, special inspection is not required for the following types of work:

1. Site work concrete or shotcrete fully supported on earth such as construction of paving, walkways, drainage swales, erosion control and non-structural slabs on grade.
2. Minor Repairs, if so specified on plans by the engineer of record and approved by the Building Official.
3. When in the opinion of the building official, no special hazard exists.
4. When specified by the engineer of record and approved by the building official.

Examples of work which may qualify under these exceptions are; swimming pools, shoring, site work supported by earth.

C. Visual Examination of In-Place Shotcrete for Structural Soundness.

Completed shotcrete work shall be checked visually for reinforcing bar embedment, voids, rock pockets, sand streaks and similar deficiencies by examining a minimum of three 3-inch (76 mm) cores taken from three areas chosen by the engineer of record which represent the worst congestion of reinforcing bars occurring in the project. Extra reinforcing bars may be added to non-congested areas and cores may be taken from these areas. The cores shall be examined by the special inspector and a report submitted to the building official prior to final approval of the shotcrete.

D. Special inspections must be performed by special inspectors certified by the Inspection Services Division of the Planning and Development Review Department. A list of approved Construction Materials Testing Laboratories and Special Inspection Agencies is available upon request from the Inspection Services Division.

VI. Concrete in members resisting earthquake-induced forces

Compressive strength f'_c shall not be less than 3,000 psi. Building Code Section 1921.2.4.

Exception:

Footings of buildings three stories or less may have concrete with f'_c of not less than 2,500 psi.

VII. Other Information

For other related information see Building Newsletter 17-1. For questions regarding special inspection, construction materials testing, structural observation or off-site fabrication of building components you may contact Inspection Services at 858-492-5070.