

Specifications for Structural Concrete

An ACI Standard

Reported by ACI Committee 301

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This specification is a Reference Specification that the Engineer or Architect can make applicable to any construction project by citing it in the Project Specifications. The Architect/Engineer supplements the provisions of this Reference Specification as needed by designating or specifying individual project requirements.

The document covers materials and proportioning of concrete; reinforcing and prestressing steels; production, placing, finishing, and curing of concrete; and formwork design and construction. Methods of treatment of joints and embedded items, repair of surface defects, and finishing of formed and unformed surfaces are specified. Separate sections are devoted to architectural concrete, lightweight concrete, mass concrete, prestressed concrete, and shrinkage-compensating concrete. Provisions governing testing, evaluation, and acceptance of concrete as well as acceptance of the structures are included.

Keywords: admixture; aggregate; air entrainment; architectural concrete; cement; cementitious materials; cold weather; compressive strength; concrete; concrete construction; concrete durability; concrete slab; consolidation; conveyor; curing; density; exposed-aggregate finish; finish; floors; formwork; grout; grouting; hot-weather; inspection; joint (construction, contraction, and isolation); lightweight concrete; mix; mixture proportion; placing; prestressed concrete; prestressing steel; reinforced concrete; reinforcement; repair; reshoring; shoring; shrinkage-compensating concrete; specification; subgrade; temperature; test; tolerance; water-cementitious material ratio; welded wire reinforcement.

NOTES TO SPECIFIER

This specification is incorporated by reference in the project specifications using the wording in P3 of the preface and including the information from the mandatory, optional, and submittal checklists following the specification.

PREFACE

P1. ACI Specification 301 is intended to be used by reference or incorporation in its entirety in the Project Specification. Do not copy individual Parts, Sections, Articles, or Paragraphs into the Project Specification, because taking them out of context may change their meaning.

P2. If Sections or Parts of ACI Specification 301 are copied into the Project Specification or any other document,

ACI 301-05 supersedes ACI 301-99 and became effective April 20, 2005.
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ACI 318-05	Building Code Requirements for Structural Concrete
ACI CP1-04	ACI Certification Concrete Field Testing Technician—Grade I
ACI CP10-95	ACI Certification Flatwork Technician and Flatwork Finisher
ACI SP-15	Field Reference Manual: Specifications for Structural Concrete (ACI 301-05) with Selected ACI and ASTM References
CRSI MSP-2-01	Manual of Standard Practice, 27th Edition, Voluntary Certification Program for Fusion-Bonded Epoxy Coating Applicator Plants

1.3.3 Field references—Keep in Contractor's field office a copy of the following reference:

ACI SP-15 Field Reference Manual: Specifications for Structural Concrete (ACI 301-05) with Selected ACI and ASTM References.

1.4—Standards-producing organizations

Abbreviations for and complete names and addresses of organizations issuing documents referred to in this Specification are listed:

American Concrete Institute (ACI)
P.O. Box 9094
Farmington Hills, MI 48333-9094

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428

American Welding Society (AWS)
550 Northwest 42nd Avenue
Miami, FL 33126

Concrete Reinforcing Steel Institute (CRSI)
933 N. Plum Grove Road
Schaumburg, IL 60173

U.S. Army Corps of Engineers [COE(CRD)]
Waterways Experiment Station
3909 Halls Ferry Road
Vicksburg, MS 39180

National Ready Mixed Concrete Association (NRMCA)
900 Spring Street
Silver Spring, MD 20910

1.5—Submittals

1.5.1 General—Unless otherwise specified, submittals required in this Specification shall be submitted for review and acceptance.

1.5.2 Testing agency reports—Testing agencies will report results of concrete and concrete materials tests and inspections performed during the course of the Work to the Owner, Architect/Engineer, Contractor, and the concrete supplier. Strength test reports will include location in the

Work where the batch represented by test was deposited and the batch ticket number. Reports of strength tests will include detailed information of storage and curing of specimens before testing. Final reports will be provided within seven days of test completion.

1.6—Quality assurance

1.6.1 General—Concrete materials and operations may be tested and inspected by the Owner as work progresses. Failure to detect defective work or material will not prevent rejection if a defect is discovered later nor shall it obligate the Architect/Engineer for final acceptance.

1.6.2 Testing agencies—Agencies that test concrete materials shall meet the requirements of ASTM C 1077. Testing agencies that test reinforcing steel shall meet the requirements of ASTM E 329. Testing agencies shall be accepted by the Architect/Engineer before performing any work. Field tests of concrete required in 1.6.3 and 1.6.4 shall be made by an ACI Concrete Field Testing Technician Grade 1 certified in accordance with ACI CP1 or equivalent. Equivalent certification programs shall include requirements for written and performance examinations as stipulated in ACI publication CP1.

1.6.3 Testing responsibilities of Contractor

1.6.3.1 Submit data on qualifications of proposed testing agency for acceptance. Use of testing services will not relieve the Contractor of the responsibility to furnish materials and construction in compliance with the Contract Documents.

1.6.3.2 Duties and responsibilities—Unless otherwise specified in the Contract Documents, the Contractor shall assume the duties and responsibilities given in 1.6.3.2.a through 1.6.3.2.g:

1.6.3.2.a Qualify proposed materials and establish mixture proportions.

1.6.3.2.b Allow access to the project site or to the source of materials and assist Owner's testing agency in obtaining and handling samples at the project site or at the source of materials.

1.6.3.2.c Advise Owner's testing agency at least 24 h in advance of operations to allow for completion of quality tests and for assignment of personnel.

1.6.3.2.d Provide and maintain adequate facilities on the project site for safe storage and initial curing of concrete test specimens as required by ASTM C 31/C 31M for the sole use of the testing agency.

1.6.3.2.e Submit test data and documentation on concrete ingredient materials and mixture proportions.

1.6.3.2.f Submit quality-control program of the concrete supplier and provide copies of test reports pertaining to the Work.

1.6.3.2.g When specified or permitted to base concrete acceptance on accelerated strength testing, submit correlation data for the standard 28-day compressive strength based on at least 15 sets of test data in accordance with 1.6.4.2.e with concrete made with the same materials encompassing a range of at least the required average strength f'_{cr} , plus or minus 1000 psi.

1.6.3.3 Tests required of Contractor's testing agency—Unless otherwise specified in the Contract Documents, the