



PROCESS
INDUSTRY
PRACTICES

COMPLETE REVISION
May 2017

Structural

PIP STS03001
Plain and Reinforced Concrete Specification

PURPOSE AND USE OF PROCESS INDUSTRY PRACTICES

In an effort to minimize the cost of process industry facilities, this Practice has been prepared from the technical requirements in the existing standards of major industrial users, contractors, or standards organizations. By harmonizing these technical requirements into a single set of Practices, administrative, application, and engineering costs to both the purchaser and the manufacturer should be reduced. While this Practice is expected to incorporate the majority of requirements of most users, individual applications may involve requirements that will be appended to and take precedence over this Practice. Determinations concerning fitness for purpose and particular matters or application of the Practice to particular project or engineering situations should not be made solely on information contained in these materials. The use of trade names from time to time should not be viewed as an expression of preference but rather recognized as normal usage in the trade. Other brands having the same specifications are equally correct and may be substituted for those named. All Practices or guidelines are intended to be consistent with applicable laws and regulations including OSHA requirements. To the extent these Practices or guidelines should conflict with OSHA or other applicable laws or regulations, such laws or regulations must be followed. Consult an appropriate professional before applying or acting on any material contained in or suggested by the Practice.

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PUBLISHING HISTORY

<i>December 1995</i>	<i>Issued</i>
<i>July 2001</i>	<i>Complete Revision</i>
<i>May 2007</i>	<i>Complete Revision</i>
<i>May 2017</i>	<i>Complete Revision</i>

Not printed with State funds



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1. Scope

This Practice provides requirements for cast-in-place concrete construction.

This Practice describes technical requirements for furnishing and installing materials and for proportioning, mixing, placing, testing, and curing of plain and reinforced concrete.

This Practice supplements ACI 301-16, *Specifications for Structural Concrete*, and ACI 301M-16, *Specifications for Structural Concrete (Metric)*.

2. References

Applicable parts of the following Practices, industry codes and standards, and references shall be considered an integral part of this Practice. The edition of references shall be as shown in *ACI 301-16 / ACI 301M-16* Section 1.4 or, if not listed in *ACI 301-16 / ACI 301M-16*, shall be the edition in effect on the date of contract award, except as otherwise noted. Short titles are used herein where appropriate.

2.1 Process Industry Practices (PIP)

- PIP STF05121 - *Anchor Fabrication and Installation into Concrete*

2.2 Industry Codes and Standards

- American Concrete Institute (ACI)
 - ACI 117 - *Specification for Tolerances for Concrete Construction and Materials and Commentary*
 - ACI 117M - *Specification for Tolerances for Concrete Construction and Materials and Commentary (Metric)*
 - ACI 237R - *Self-Consolidating Concrete*
 - ACI 301-16 - *Specifications for Structural Concrete*
 - ACI 301M-16 - *Specifications for Structural Concrete (Metric)*
 - ACI 304R - *Guide for Measuring, Mixing, Transporting, and Placing Concrete*
 - ACI 305.1 - *Specification for Hot Weather Concreting*
 - ACI 306.1 - *Standard Specification for Cold Weather Concreting*
 - ACI 350.1 - *Specification for Tightness Testing of Environmental Engineering Concrete Containment Structures*
 - ACI 350.1M - *Specification for Tightness Testing of Environmental Engineering Concrete Containment Structures (Metric)*
 - ACI 350.5 - *Specifications for Environmental Concrete Structures*
 - ACI 350.5M - *Specifications for Environmental Concrete Structures (Metric)*
 - ACI SP-66 - *ACI Detailing Manual*
- ASTM International (ASTM)
 - ASTM A615/A615M - *Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement*
 - ASTM A1064/A1064M - *Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete*

- ASTM C33/C33M - *Standard Specification for Concrete Aggregates*
- ASTM C150/C150M - *Standard Specification for Portland Cement*
- ASTM C618 - *Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete*
- ASTM C920 - *Standard Specification for Elastomeric Joint Sealants*
- ASTM C989/C989M - *Standard Specification for Slag Cement for Use in Concrete and Mortars*
- ASTM C1602/C1602M - *Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete*
- ASTM C1610/C1610M - *Standard Test Method for Static Segregation of Self-Consolidating Concrete Using Column Technique*
- ASTM C1611/C1611M - *Standard Test Method for Slump Flow of Self-Consolidating Concrete*
- ASTM C1621/C1621M - *Standard Test Method for Passing Ability of Self-Consolidating Concrete by J-Ring*
- ASTM C1712 - *Standard Test Method for Rapid Assessment of Static Segregation Resistance of Self-Consolidating Concrete Using Penetration Test*
- ASTM D1751 - *Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types)*
- ASTM D5249 - *Standard Specification for Backer Material for Use with Cold- and Hot-Applied Joint Sealants in Portland-Cement Concrete and Asphalt Joints*
- ASTM E1745 - *Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs*
- Concrete Reinforcing Steel Institute (CRSI)
 - *Manual of Standard Practice*
- National Ready Mixed Concrete Association (NRMCA)
 - *Quality Control Manual - Section 3, Certification of Ready Mixed Concrete Production Facilities – Plant Certification Check List*

3. Definitions

constructor: Party responsible for supplying materials, equipment, tools, supervision, and labor for installation of concrete materials in accordance with contract documents. The term constructor shall apply also to constructor's subcontractor(s) and vendor(s).

contract documents: Any and all documents, including codes, studies, design drawings, specifications, sketches, practices, and data sheets, that purchaser or engineer of record has transmitted or otherwise communicated, either by incorporation or reference, and made part of the legal contract agreement or purchase order between purchaser and constructor.

engineer of record: Purchaser's authorized representative with overall authority and responsibility for engineering design, quality, and performance of civil works, structure, foundations, materials, and appurtenances described in contract documents. Engineer of record shall be licensed as defined by laws of the locality in which the work is to be constructed, and be