Specification for Unbonded Single-Strand Tendons and Commentary

Reported by ACI Committee 423

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This specification provides specific performance criteria for materials for unbonded single strand tendons and detailed recommendations for fabrication and installation of unbonded single strand tendons. Specifications are presented for tendons in non-aggressive environments and for tendons in aggressive environments. The more restrictive material, fabrication, and construction requirements for tendons used in aggressive environments are essential to the long-term durability of tendons used in such circumstances.

Notes to Specifier: This specification is incorporated by reference in the project specifications using the wording in P4 of the preface and including the information from the mandatory, optional, and submittal checklists following the specification.

ACI Specification 423.6-01 and Commentary 423.6R-01 are presented in a side-by-side column format, with specification text placed in the left-hand column and the corresponding commentary text aligned in the right column. Commentary section numbers are preceded by the letter "R." The Commentary is not a part of this specification.

Keywords: anchorage; construction joint; contractor; coupler; deicer; post-tensioning; prestress; prestressing steel; sheathing; specification; strand; unbonded tendon.

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PREFACE TO ACI SPECIFICATION 423

P1. ACI Specification 423 is intended to be used by reference or incorporation in its entirety in the project specifications. Do not copy individual sections, articles, or paragraphs into the project specifications, because taking them out of context may change their meaning.

P2. If sections or parts of ACI Specification 423 are copied into project specifications or any other document, do not refer to them as an ACI Specification, because the specification has been altered.

P3. Each technical section of ACI Specification 423 is written in the three-part section format of the Construction Specifications Institute, as adapted for ACI requirements. The language is imperative and terse.

P4. A statement such as the following will serve to make ACI Specification 423 a part of the project specifications:

Work on (Project Title) shall conform to all requirements of ACI (Specification number with date suffix and title) published by the American Concrete Institute, Farmington Hills, Michigan, except as modified by these contract documents.

P5. *Units* — The values stated in inch-pound units are to be regarded as the standard. The values in SI units given in parentheses are for information only.

PART 1 — GENERAL

SPECIFICATION

1.1 — Scope

This specification provides specific performance criteria for materials for unbonded single strand tendons and detailed recommendations for fabrication and installation of unbonded single strand tendons. Specifications are presented for tendons in non-aggressive environments and for tendons in aggressive environments.

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COMMENTARY

R1.1 — Scope

The intent of this document is to provide detailed specifications for all common structural uses of unbonded post-tensioning tendons. It is not intended to apply to tendons used in ground-supported post-tensioned slabs for light residential construction. There are certain special structures or applications that either because of their service requirements or structural behavior might impose additional requirements on the post-tensioning system that exceed the minimum requirements of this specification. In such cases, a special specification should be developed.

Structures exposed to aggressive environments include all structures subjected to direct or indirect applications of deicing chemicals, seawater, brackish water, or spray from these sources; structures in the immediate vicinity of seacoasts exposed to salt-laden air; and structures where anchorage areas are in direct contact with soil. Stressing pockets that are not maintained in a normally dry condition after construction should also be considered exposed to an aggressive environment. Nearly all enclosed buildings (office buildings, apartment buildings, warehouses, manufacturing facilities) are considered to be non-aggressive environments. The engineer should decide if the structure, or a part of the structure, is exposed to an aggressive environment. Attention should be paid to such areas as the location of stressing-end and intermediate anchors, construction joints, locations of planters, balconies and swimming pools.

The durability of prestressed structures in aggressive environments requires the use of consistently higher quality concrete, and superior construction practices than required in non-aggressive environments.

This specification is not intended to apply to nonstructural applications, which might include topping slabs, waterproofing slabs on fill, and post-tensioning used only for control of cracking or deflection. For nonflexural or membrane type structures primarily under tensile forces, the provisions, where appropriate, are intended to apply.

This specification should be considered a minimum standard and, due to experience or project considerations, may be made more restrictive by the engineer.