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RULE NO.: R161-23.01

NOTICE OF PROPOSED RULE **POSTING DATE:** February 3, 2023

The Director of the Department of Public Works proposes to adopt the following rule on or after March 7, 2023.

Comments on the proposed rule are requested from the public. A summary of the written comments received will be included in the notice of rule adoption that must be posted for the rule to become effective.

An affordability impact statement regarding the proposed rule has been obtained and is available for inspection or copying by contacting Kristie Sandoval at Kristie.Sandoval@austintexas.gov.

EFFECTIVE DATE OF PROPOSED RULE

A rule proposed in this notice may not become effective before the effective date established by a separate notice of rule adoption. A notice of rule adoption may not be posted before March 7, 2023 (the 32nd day after the date of this notice) or not after April 14, 2023 (the 70th day after the date of this notice).

If a proposed rule is not adopted on or before April 14, 2023 it is automatically withdrawn and cannot be adopted without first posting a new notice of a proposed rule.

REQUEST FOR COMMENTS ON PROPOSED RULES

The City requests comments from the public with respect to the proposed rules included in this Notice. Comments must be submitted and received to the contact person below no later than March 7, 2023 (the 32nd day after the date of this notice).

Contact Person:
Kristie Sandoval, Public Works Rules Posting Manager
Public Works, Quality Management Division
6800 Burleson Rd, BLDG 312 STE 250
Austin, TX 78744
kristie.sandoval@austintexas.gov
512-974-7992

TEXT OF PROPOSED RULE

The text of the proposed rule, indicating changes from the current text, is attached to this notice.

BRIEF EXPLANATION OF PROPOSED RULE

R161-23.01: Proposed revisions to the Standard Specification Manual 407S:

ITEM NO. 407S – FIBROUS CONCRETE: The specification includes requirements that are outdated as compared to current ASTM or industry standards; the cross references are not updated; there are various inconsistencies and duplicate information that requires clean up. **Remove S designation, update requirement in section 407S.3 to align with ASTM standard; update cross references to current standard; added Trial batch & batching and mixing section; clean-up the outdated information; update specific as well as related cross reference material.**

AUTHORITY FOR ADOPTION OF PROPOSED RULE

The authority and procedure for adoption of a rule to assist in the implementation, administration, or enforcement of a provision of the City Code is provided in Chapter 1-2 of the City Code. The authority to regulate construction requirements is established in Sections 25-6-267 and 25-6-268 of the City Code.

CERTIFICATION BY CITY ATTORNEY

By signing this Notice of Proposed Rule (R161-23.01), the City Attorney certifies the City Attorney has reviewed the rule and finds that adoption of the rule is a valid exercise of the Director's administrative authority.

REVIEWED AND APPROVED

_____ for _____ Date: 1/4/23
Richard Mendoza, Director
Public Works

Deborah Thomas for _____ Date: 2/1/2023
Anne L. Morgan, City Attorney

ITEM NO. 407S ~~FIBROUS~~FIBER-REINFORCED CONCRETE ~~7-1-09~~XX-XX-22

407S.1 Description

This item shall govern furnishing and placing of fiber-reinforced concrete ~~concrete reinforced with fibers~~ (also known as fibrous concrete) in accordance with this specification Item and with details as shown on the Drawings.

407S.2 Submittal Requirements

The submittal requirements of this specification item include:

A. Concrete Type, Supplier and Mix ~~D~~design.

B. Fiber Type, Supplier, and product properties.

C. Proposed proportioning of material, including adjustment for slump requirements.

D. Fiber documentation of compliance with this specification item, and ASTM C-1116~~/C 1116 M-08~~.

E. Fiber manufacturer's evidence of satisfactory performance history and compliance with applicable codes.

F. Fiber manufacturer's batching and mixing instructions for the proposed fiber-reinforced concrete.

407S.3 Materials

A. Concrete

All concrete shall conform to the requirements of Standard Specification Item Number 403S, "Concrete for Structures".

The concrete shall be Class A concrete unless otherwise shown on the drawings or as approved by the Engineer or designated representative from the City of Austin (COA). ~~Indicated otherwise in the Pay item of this document.~~

~~Since the slump of a fiber-reinforced concrete is less than the slump of an otherwise identical concrete without fiber and since the magnitude of difference depends upon the amount and type of fibers, trial mixtures representing the amount and type of fibers to be used for the work shall be prepared and tested to insure that the specified slump requirements are met.~~

B. Reinforcement

Reinforcement shall be in accordance with ASTM ~~C 1116/C 1116 M-08~~C1116. Fibers shall conform to ASTM section 4.1.1 Type I Steel Fiber-Reinforced Concrete, or 4.1.2 Type ~~2~~ II Glass Fiber-Reinforced Concrete, or 4.1.3 Type ~~3~~ III Synthetic Fiber-Reinforced Concrete, or 4.1.4 Type IV Natural Fiber-Reinforced Concrete.

~~Reinforcement shall be 100% virgin polypropylene fibrillated fibers specially manufactured for use as concrete reinforcement and meeting the requirements of ASTM C-1116 (Fiber-Reinforced Concrete and Shotcrete). The fibrous material shall not contain reprocessed olefin. Each container of fibrous material shall bear the manufacturer's name and/or trademark and the net weight (mass) of fibrous material in the package.~~

Steel fibers shall conform to ASTM A820, alkali-resistant (AR) glass fibers shall conform to ASTM C1666, and cellulose fibers shall conform to ASTM D7357. When Type III fiber-reinforced concrete contains polyolefin

fibers, they shall conform to ASTM D7508. Fibers shall be listed on TXDOT's Material Producer List (MPL) for pre-qualified fibers for concrete and shall meet minimum dosage and length specified.

The fiber manufacturer shall provide documentation of a minimum of 5-year performance history of the fiber and confirm compliance with applicable building codes, this specification item and ASTM C-1116.

~~The specific gravity of the fibrous material shall be 0.91 plus or minus .05. The tensile strength shall be 80 to 110 ksi (550 to 750 MPa). The lengths of the fibrous material shall be ½, ¾, 1½ and 2 inches (12.7, 19, 38 and 51 mm) in length.~~

~~Unless otherwise shown on the drawings, each cubic yard of concrete shall contain no less than 1½ pounds of fibrous material (0.9 kg per cubic meter). The fibrous material shall be added to the concrete mix at the time the mix is batched~~

407.4 Trial Batch

Fiber-reinforced concrete shall conform to the requirements for each type and class of concrete required, as indicated on the drawings and as specified in Standard Specification Item No. 403, "CONCRETE FOR STRUCTURES".

The slump of a Fiber-reinforced concrete is less than the slump of an otherwise identical concrete without fibers. The magnitude of difference depends strongly on the amount and type of fibers. Therefore, trial mixtures representing the amount and type of fibers to be used for the work shall be prepared and tested to ensure that the specified slump requirements in Item No. 403 are met.

Trial batches shall be prepared at least 2 months prior to construction (and no more than 6 months prior to construction) using the proposed material and equipment to demonstrate fiber-reinforced concrete can be mixed and placed properly. Necessary testing shall be conducted to ensure the proposed reinforced concrete meets the workability and compressive strength requirements.

The Concrete Producer shall perform, at their own expense, all necessary trial batches and submit documentation including mix design, material proportions, and test results to the Engineer or designated representative from the City of Austin for review and acceptance.

407.5 Batching and Mixing

Concrete shall be mixed in strict accord with the fiber manufacturer's instructions and recommendations to ensure uniform and complete dispersion. The dosage shall conform to approved submittals for each type of concrete required.

407.6~~S.4~~ Excavation, Placing of Concrete, Finishing, Curing and Backfill

All excavation, placing of concrete, finishing, curing and backfilling shall be in accordance with Standard Specification Item Number 401~~S~~, "Structural Excavation and Backfill", and Standard Specification Item Number 410~~S~~, "Concrete Structures".

407.7~~S.5~~ Measurement

The quantities of concrete of the various classes which constitute the completed and accepted work in place will be measured per cubic yard, square foot or linear foot as indicated in the Project Manual. Measurement will be as follows:

A. Plan Quantity. For those items measured for plan quantity payment, adequate calculations have been made. No additional measurements or calculations will be made.

B. Measured in Place. For those items not measured for Plan Quantity payment, measurement will be made in place. However, field measured dimensions shall not exceed those indicated on the drawings or as may have been directed by the Engineer or designated representative from City of Austin in writing.

407.8~~S.6~~ Payment

When included as a contract pay item, ~~T~~the work performed and materials furnished as prescribed by this item and measured as provided under "Measurement" will be paid for at the unit bid price for ~~Fibrous~~ Fiber-reinforced Concrete of the class specified. The unit bid price shall include full compensation for furnishing, hauling and mixing all materials; placing, finishing and curing all concrete; and for all forms, labor, tools, equipment and incidentals necessary to complete the work.

Pay Item No. 407~~S~~.CY:	~~Fibrous~~ Fiber-reinforced Concrete, (Class ___)	Per Cubic Yard.
Pay Item No. 407~~S~~.SF:	~~Fibrous~~ Fiber-reinforced Concrete, (Class ___)	Per Square Foot.
Pay Item No. 407~~S~~.LF	~~Fibrous~~ Fiber reinforced Concrete, (Class ___)	Per Linear~~l~~ Foot.

END

SPECIFIC CROSS REFERENCE MATERIALS	
Specification Item 407~~S~~, "~~Fibrous~~ Fiber-reinforced Concrete"	
City of Austin Standard Specifications	
Designation	Description
Item 401~~S~~	Structural Excavation and Backfill
Item 403~~S~~	Concrete for Structures
Item 410~~S~~	Concrete Structures
American Society for Testing and Materials, ASTM	
Designation	Description
ASTM C-1116	Standard Specification ~~F~~for Fiber-Reinforced Concrete ~~and Shotcrete~~
ASTM A820	Standard Specification for Steel Fibers for Fiber-Reinforced Concrete
ASTM C1666	Standard Specification for Alkali Resistant (AR) Glass Fiber for GFRC and Fiber-Reinforced Concrete and Cement
ASTM D7508	Standard Specification for Polyolefin Chopped Strands for Use in Concrete
ASTM D7357	Standard Specification for Cellulose Fibers for Fiber-Reinforced Concrete
Texas Department of Transportation: Departmental Material Producer List	
Designation	Description
TxDOT's MPL of pre-qualified fibers for concrete	Fibers for Class A and Class B Concrete Applications

RELATED CROSS REFERENCE MATERIALS	
Specification Item 407~~S~~, "~~Fibrous~~ Fiber-reinforced Concrete"	
American Association of State Highway & Transportation Officials, AASHTO	
Designation	Description

Method T 26	Quality of Water to be Used in Concrete
American Concrete Institute, ACI	
Designation	Description
ACI 211.1	Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
American Society for Testing and Materials, ASTM	
Designation	Description
ASTM ~~C 94~~C94	Specification for ~~For~~ Ready-Mixed Concrete
ASTM ~~C 150~~C150	Specification for ~~For~~ Portland Cement
ASTM C1399	Standard Test Method for Obtaining Average Residual-Strength of Fiber-Reinforced Concrete
Texas Department of Transportation: Manual of Testing Procedures	
Designation	Description
TEX-203-F	Sand Equivalent Test
Tex-401-A	Sieve Analysis of Fine and Coarse Aggregate
TEX-406-A	Mineral Finer than 75 µm (No. 200) Sieve in Mineral Aggregates (Decantation Test for Concrete Aggregates)
TEX-408-A	Organic Impurities in Fine Aggregate for Concrete
TEX-410-A	Abrasion of Coarse Aggregate Using ~~T~~the Los Angeles Machine
TEX-411-A	Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
TEX-413-A	Determining~~ation~~ ~~of~~ Deleterious Materials in Mineral Aggregate
TEX-415-A	Slump of ~~Portland~~ Hydraulic Cement Concrete
TEX-418-A	Compressive Strength of Cylindrical Concrete Specimens
TEX-612-J	Acid Insoluble Residue for Fine Aggregate
~~Texas Department of Transportation: Publications~~	
~~Designation~~	~~Description~~
~~Bulletin C-11~~	~~Construction Bulletin~~
Texas Department of Transportation: Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges	
Designation	Description
Item 421	Hydraulic Cement Concrete
Item 427	Surface Finishes for Concrete
Item 431	Pneumatically Placed Concrete
Texas Department of Transportation: Departmental Material Specifications	
Designation	Description
DMS-4550	Fibers for Concrete
DMS-4640	Chemical Admixtures for Concrete
DMS-4650	Hydraulic Cement Concrete Curing Materials and Evaporation Retardants~~"~~
DMS-6310	Joint Materials and Fillers