

**RULE NO.: R161-23.01**

**NOTICE OF RULE ADOPTION**

**ADOPTION DATE: 4/13/22**

By: Richard Mendoza, Director  
Public Works Department

The Director of the Department of Public Works has adopted the following rule. Notice of the proposed rule was posted on February 3, 2023. Public comment on the proposed rule was solicited in the February 3, 2023 notice. This notice is issued under Chapter 1-2 of the City Code. The adoption of a rule may be appealed to the City Manager in accordance with Section 1-2-10 of the City Code as explained below.

**EFFECTIVE DATE OF ADOPTED RULE**

A rule adopted by this notice is effective on April 13, 2023.

**TEXT OF ADOPTED RULE**

A copy of the complete text of the adopted rule is attached to this notice. A summary of the adopted rule is below.

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ITEM NO. 407S – FIBROUS CONCRETE: The specification includes requirements that are outdated as compared to current ASTM or industry standards; the cross references are not updated; there are various inconsistencies and duplicate information that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standard; update cross references to current standard; added Trial batch & batching and mixing section; clean-up the outdated information; update specific as well as related cross reference material.**

**SUMMARY OF COMMENTS**

The Department of Public Works did not receive comments regarding Rule R161-23.01.

**AUTHORITY FOR ADOPTION OF 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 is established in Section 25-6-267 and Section 25-6-268 of the City Code.

**APPEAL OF ADOPTED RULE TO CITY MANAGER**

A person may appeal the adoption of a rule to the City Manager. **AN APPEAL MUST BE FILED WITH THE CITY CLERK NOT LATER THAN THE 30TH DAY**

**AFTER THE DATE THIS NOTICE OF RULE ADOPTION IS POSTED. THE POSTING DATE IS NOTED ON THE FIRST PAGE OF THIS NOTICE.** If the 30th day is a Saturday, Sunday, or official city holiday, an appeal may be filed on the next day which is not a Saturday, Sunday, or official city holiday.

An adopted rule may be appealed by filing a written statement with the City Clerk. A person who appeals a rule must (1) provide the person's name, mailing address, and telephone number; (2) identify the rule being appealed; and (3) include a statement of specific reasons why the rule should be modified or withdrawn.

Notice that an appeal was filed will be posted by the city clerk. A copy of the appeal will be provided to the City Council. An adopted rule will not be enforced pending the City Manager's decision. The City Manager may affirm, modify, or withdraw an adopted rule. If the City Manager does not act on an appeal on or before the 60th day after the date the notice of rule adoption is posted, the rule is withdrawn. Notice of the City Manager's decision on an appeal will be posted by the city clerk and provided to the City Council.

On or before the 16th day after the city clerk posts notice of the City Manager's decision, the City Manager may reconsider the decision on an appeal. Not later than the 31st day after giving written notice of an intent to reconsider, the City manager shall make a decision.

#### **CERTIFICATION BY CITY ATTORNEY**

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

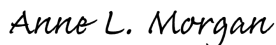
#### **REVIEWED AND APPROVED**



for

Richard Mendoza, Director  
Department

Date: 4/3/23



Anne L. Morgan  
City Attorney

Date: 4/3/2023

**ITEM NO. 407S ~~FIBROUS~~ FIBER-REINFORCED CONCRETE ~~7-1-09~~ 4-13-22****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

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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.

#### **407.6S.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 401S, "Structural Excavation and Backfill", and Standard Specification Item Number 410S, "Concrete Structures".

#### **407.7S.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.

#### 407.85.6 Payment

When included as a contract pay item, 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. 407S.CY:	Fibrous Fiber-reinforced Concrete, (Class ____)	Per Cubic Yard.
Pay Item No. 407S.SF:	Fibrous Fiber-reinforced Concrete, (Class ____)	Per Square Foot.
Pay Item No. 407S.LF	Fibrous Fiber reinforced Concrete, (Class ____)	Per Linear Foot.

END

SPECIFIC CROSS REFERENCE MATERIALS	
Specification Item 407S, "Fibrous Fiber-reinforced Concrete"	
City of Austin Standard Specifications	
Designation	Description
Item 401S	Structural Excavation and Backfill
Item 403S	Concrete for Structures
Item 410S	Concrete Structures
American Society for Testing and Materials, ASTM	
Designation	Description
ASTM C 1116	Standard Specification 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 GFRP 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 407S, "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	
<u>Designation</u>	<u>Description</u>
ACI 211.1	Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete
American Society for Testing and Materials, ASTM	
<u>Designation</u>	<u>Description</u>
ASTM <del>C 94</del> C94	Specification <del>for For</del> Ready-Mixed Concrete
ASTM <del>C 150</del> C150	Specification <del>for For</del> Portland Cement
ASTM C1399	Standard Test Method for Obtaining Average Residual-Strength of Fiber-Reinforced Concrete
Texas Department of Transportation: Manual of Testing Procedures	
<u>Designation</u>	<u>Description</u>
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 <del>T</del> the Los Angeles Machine
TEX-411-A	Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
TEX-413-A	Determin <del>ing</del> ation of Deleterious Materials in Mineral Aggregate
TEX-415-A	Slump of <del>Portland</del> Hydraulic Cement Concrete
TEX-418-A	Compressive Strength of Cylindrical Concrete Specimens
TEX-612-J	Acid Insoluble Residue <del>for Fine Aggregate</del>
Texas Department of Transportation: Publications	
<u>Designation</u>	<u>Description</u>
Bulletin C 11	Construction Bulletin
Texas Department of Transportation: Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges	
<u>Designation</u>	<u>Description</u>
Item 421	Hydraulic Cement Concrete
Item 427	Surface Finishes for Concrete
Item 431	Pneumatically Placed Concrete
Texas Department of Transportation: Departmental Material Specifications	
<u>Designation</u>	<u>Description</u>
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