

Item 407S
Fibrous Concrete

407S.1 Description

This item shall govern furnishing and placing of concrete reinforced with fibers 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 Design.
- B. Fiber Type, Supplier and product properties.
- C. Proposed proportioning of material, including adjustment for slump requirements.
- D. Fiber documentation of compliance with applicable building codes, this specification item, and ASTM C 1116/ C 1116 M-08.

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 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/C1116 M-08. Fibers shall conform to section 4.1.2 Type 2 Glass Fiber Reinforced Concrete, or 4.1.3 Type 3 Synthetic Fiber-Reinforced Concrete, or 4.1.4 Natural Fiber Reinforced Concrete. Unless otherwise shown on the drawings, each cubic yard of concrete shall contain no less than 1 1/2 pounds of fibers (0.9 kg per cubic meter). The fibers shall be added to the concrete mix at the time the mix is batched.

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.

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 1/2, 3/4, 1 1/2 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 1 1/2 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.

407S.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".

407S.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 in writing.

407S.6 Payment

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 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 Concrete, (Class _____)	Per Cubic Yard.
Pay Item No. 407S.SF:	Fibrous Concrete, (Class _____)	Per Square Foot.
Pay Item No. 407S.LF	Fibrous Concrete, (Class _____)	Per Lineal Foot.

END

SPECIFIC CROSS REFERENCE MATERIALS
Specification Item 407S "Fibrous 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	Specification For Fiber-Reinforced Concrete and Shotcrete

RELATED CROSS REFERENCE MATERIALS
Specification Item 407S "Fibrous 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 Specification For Ready-Mixed Concrete
 ASTM C 150 Specification For Portland Cement

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 The Los Angeles Machine
 TEX-411-A Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate
 TEX-413-A Determination of Deleterious Materials in Mineral Aggregate
 TEX-415-A Slump of Portland Cement Concrete
 TEX-418-A Compressive Strength of Cylindrical Concrete Specimens
 TEX-612-J Acid Insoluble Residue

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-4640 Chemical Admixtures for Concrete
 DMS-4650 Hydraulic Cement Concrete Curing Materials and Evaporation Retardants"
 DMS-6310 Joint Materials and Fillers