RULE NO.: R161-22.07

NOTICE OF RULE ADOPTION **ADOPTION DATE: 9/13/22**

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 July 6, 2022. Public comment on the proposed rule was solicited in the July 6, 2022 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 September 13, 2022.

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.

R161-22.07: Proposed revisions to the Standard Specification Manual 402 & 405:

ITEM NO. 402 - CONTROLLED LOW STRENGTH MATERIAL: The specification includes requirements that are outdated in compared to current ASTM or industry standards; the cross references are not updated; there are various inconsistencies and duplicate information that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 402S.3 to align with ASTM or TxDOT Spec; update cross references to current standard; update mix design requirement in section 402S.4; add delivery ticket information; clean-up the duplicate information; update specific as well as related cross reference material.**

ITEM NO. 405 - CONCRETE ADMIXTURES: The specification does not include all the admixtures that are being used; Section 405S.3 (6) Fly Ash does not fall under this specification; includes various inconsistencies and duplicate information, cross references are outdated. **Add all the admixtures that can be used in city projects, remove section 405S.3 (6) Fly Ash; update Section 405S. 5 Construction Use of Admixture; remove S designation; clean up duplicates, update specific as well as related cross reference material.**

SUMMARY OF COMMENTS

The Department of Public Works did not receive comments regarding Rule R161-22.07.

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.

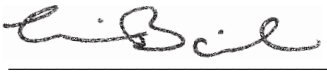
Notice that an appeal was filed will be posted by the city clerk. A copy of the appeal will be provided to the City Council. An adopted rule will not be enforced pending the City Manager's decision. The City Manager may affirm, modify, or withdraw an adopted rule. If the City Manager does not act on 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 R161-22.07, 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

Date: 8/26/22

Richard Mendoza, Director
Department

Anne Morgan

Digitally signed by Anne Morgan
DN: cn=Anne Morgan, o=City of Austin, ou=Law Department, email=anne.morgan@austintexas.gov, c=US
Date: 2022.08.30 16:24:26 -05'00'

Date: 8/30/22

Anne L. Morgan
City Attorney

ITEM NO. 402~~S~~ CONTROLLED LOW STRENGTH MATERIAL ~~11-13-07~~ 09-13-22

402~~S~~.1 Description

This item governs Controlled Low Strength Material (CLSM) used for trench backfill and for filling abandoned culverts, pipes, other enclosures, and for other uses as indicated on the drawings, Standard Details or as approved by the Engineer or designated City of Austin (COA) representative. CLSM is a low strength, self-compacting, flowable, cementitious material used in lieu of soil backfill. It is intentionally prepared at low strength to allow for future removal using conventional excavation equipment.

The CLSM shall be composed of Portland cement or fly ash, or both, filler aggregate, admixtures (if needed), and water. The CLSM, specified for use in filling abandoned culverts, pipes, or other enclosures, shall contain a settlement compensator, in addition to the other ingredients, to minimize settlement of the CLSM within the enclosure.

Normal Set CLSM shall be specified whenever the material will remain uncovered or will not be subjected to traffic or other loads within 24 hours after placement. Fast Set CLSM shall be specified whenever the material will be covered, subjected to traffic or other loads within 24 hours, or needed to expedite construction.

CLSM can be used for permanent subgrade repairs below the base layer, but shall not be used for permanent pavement repairs. For temporary traffic applications, a minimum 2-inch ~~(50 mm)~~ cap composed of Hot Mix-Cold Laid Asphaltic Concrete (~~TxDoT~~ TxDOT Standard Specification Item 334) shall be placed on the CLSM.

~~This specification is applicable for projects or work involving either inch-pound or SI units. Within the text and accompanying tables, the inch-pound units are given preference followed by SI units shown within parentheses.~~

402~~S~~.2 Submittals

The submittal requirements of this specification item include:

A. A mix design submittal including mix constituents and proportions, and the results of unconfined compressive strength tests, air entrainment (if applicable), flow consistency, ~~hardened~~ unit weight, and timed Ball Drop and corresponding Penetrometer tests.

B. Sources, ~~C~~certifications and test results for the cement, fly ash, and admixtures.

C. Particle-size gradation and specific gravity tests on the filler aggregate.

402~~S~~.3 Materials

A. Cement.

Portland cement shall conform to ASTM ~~C 150~~ C150, Type I ~~(General Purpose)~~, or ASTM C595, Type IL or IP.

Portland cement manufactured in a cement kiln fueled by hazardous waste shall be considered as an approved product if the production facility is authorized to operate under regulation of the Texas ~~Natural Resource Conservation~~Commission on Environmental Quality (~~TNRCC~~TCEQ) and the U. S. Environmental Protection Agency (EPA). Supplier shall provide current TCEQ~~TNRCC~~ and EPA authorizations to operate the facility.

B. Fly Ash

Fly ash shall conform to the requirements of ~~Standard Specification Item No. 405, "Concrete Admixtures" and TxDOT Specification Item 437~~ TxDOT DMS-4610, Fly Ash.

C. Filler Aggregate.

Filler aggregate shall consist of sand, stone screenings, pavement milling cuttings or other granular material that is compatible with the other mixture components. The filler aggregate shall be fine enough to stay in suspension to the extent required for proper flow without segregation, and, in the case of filling of enclosures, for minimal settlement. Filler aggregate shall have a Plasticity Index (TxDOT Test Method Tex-106-E) less than ~~15~~ 6 and shall conform to the following gradation:

	Table 1: Aggregate Gradation		
~~Sieve Designation~~	~~US~~ **Sieve Size**	~~(SI)~~	Percent Passing
-	3/8"	-	100
-	~~No. 200~~	~~(75µm)~~	0—10

Particle-size gradation shall be determined using a series of sieves that gives no fewer than five uniformly spaced points for graphing the entire range of particle sizes larger than a No. 200 sieve.

D. Mixing Water.

Mixing water shall conform to the requirements of Standard Specification Item No. 403, "Concrete for Structures".

E. Settlement Compensator

An air entraining admixture with a higher than usual dosage, which meets the requirements of Standard Specification Item No. 405, "Concrete Admixtures", shall be used as a settlement compensator. The settlement compensator may be introduced to the CLSM at the job site by placement of prepackaged admixture in capsules or bags in the mixing drum in accordance with the admixture manufacturer's recommendations.

E. Chemical Admixtures.

Accelerating admixtures, which meets the requirements of Standard Specification Item No. 405, "Concrete Admixtures", may be used to accelerate the rate of hardening. Chemical admixtures shall be used and proportioned in accordance with the manufacturer's recommendations.

402~~S~~.4 Mix Design

The proportioning of CLSM shall be the responsibility of the Contractor. The Contractor shall furnish a mix design conforming to the requirements herein, for review and ~~approval~~ acceptance by the Engineer or designated COA representative. The mix design shall be prepared by ~~a qualified commercial~~ an accredited laboratory and then reviewed and signed by a registered Professional Engineer licensed in the State of Texas.

Test results for unconfined compressive strength, air entrainment, flow consistency, and unit weight shall meet the requirements of Table 2, unless otherwise shown on the plans or specified by the Engineer or designated COA representative.

Table 2: CLSM Mix Design Requirements			
Property	Normal Set CLSM	Fast Set CLSM	Test Method
Unconfined Compressive Strength, 3 hours, psi	—	35 minimum	ASTM D4832
Unconfined Compressive Strength, 24 hours, psi	35 minimum	—	
Unconfined Compressive Strength, 28 days, psi	300 maximum	300 maximum	
Air Content (%)	15 to 25		ASTM D6023

Flow Consistency[1,2], min, in.	8	ASTM D6103
Unit Weight, pcf	90 to 125	ASTM D6023

Notes
1. Average diameter of spread
2. Mixture must not segregate.

The submittal shall include Penetrometer tests (ASTM D6024) performed every thirty minutes until the Ball Drop test shows a 2-inch indentation, as well as the predicted Penetrometer reading that corresponds to a 3-inch Ball Drop indentation.

~~The Mix Design submittal must include:~~

~~A. Test results for unconfined compressive strength, air entrainment (if applicable), flow consistency, hardened unit weight, and timed Ball Drop (ASTM C 360) and corresponding Penetrometer tests (with a concrete pocket penetrometer),~~

~~B. Certifications and test results for the cement, fly ash, and admixtures, and~~

~~C. Results of particle-size gradation and specific gravity tests on the filler aggregate. The submittal shall include Penetrometer tests performed every thirty minutes until the Ball Drop test shows a 2-inch (50 mm) indentation, as well as the predicted Penetrometer reading that corresponds to a 3-inch (75 mm) Ball Drop indentation. Particle-size gradation shall be determined using a series of sieves that gives no fewer than five uniformly spaced points for graphing the entire range of particle sizes larger than a No. 200 sieve (75 µm).~~

~~The Contractor shall perform the work required to substantiate the design at no cost to the City, including all testing. Approved mix designs shall be valid for one year, provided there are no changes in the type, source, or characteristics of the materials during that year.~~

The Contractor shall perform the work required to substantiate the design at no cost to the City, including all testing. Approved mix designs shall be valid for one year, provided there are no changes in the type, source, or characteristics of the materials during that year.

At the end of one year, the mix design may be submitted for renewal, provided that:

A. field tests of the CLSM during the year have been satisfactory,

B. there have been no changes in type or source of the materials of the mix, and

C. the characteristics of the materials have not changed significantly since the original submittal.

The Contractor shall also submit certifications and test results for the cement, fly ash and admixtures, and particle-size gradation and specific gravity test results for the filler aggregate. The Contractor shall compare results of tests made on the filler aggregate at the end of the year to the results of tests reported in the original submittal. Gradation changes less than ten percent in percent passing any sieve and specific gravity changes less than five percent shall not be considered significant.

~~402S.5 Strength~~

~~The CLSM mix designs shall meet the unconfined compressive strength requirements outlined in the table below. The compression tests shall be conducted in accordance with TxDOT Method Tex-418-A, using approved unbonded caps on specimens with four-inch (100 mm) diameter and eight-inch (200 mm) height [or three-inch (75 mm) diameter by six-inch (150 mm) high specimens if a smaller capacity loading device gives more accurate results].~~

~~Unconfined Compressive Strength, psi (mPa)~~		
~~Age~~	~~Normal Set CLSM~~	~~Fast Set CLSM~~
~~3 hours~~	~~—~~	~~35 (0.24) minimum~~

24 hours	35 (0.24) minimum	—
28 days	300 (2.1) maximum	300 (2.1) maximum

402S.6 Flow Consistency

Flow consistency shall be established in tests involving the use of a six-inch (150 mm) length by three-inch (75 mm) diameter open-ended straight tubing made of steel, plastic or other non-absorbent material that is non-reactive with cement or fly ash. The tube shall be placed with one end on a horizontal flat surface and held in a vertical position. The tube shall then be filled to the top with CLSM. The top surface shall be struck off with a suitable straight edge and any spillage shall be removed from the base of the tube. Within five seconds thereafter the tube shall be raised carefully, using a steady upward lift with no lateral or torsional motion. The entire test, from the start of filling until removal of the tube, shall be completed within 1½ minutes without interruption.

After removal of the tube, the spread of the CLSM shall be measured immediately along two diameters that are perpendicular to one another. The average of those two measurements is defined as the flow consistency of the mix. The flow consistency of the CLSM shall be considered satisfactory if a circular-type spread of the mix occurs without segregation and a flow consistency (average diameter of spread) of 8 inches (200 mm) or more is achieved.

402S.7 Air Entrainment

Air entraining admixture shall be added as a settlement compensator, whenever the CLSM will be used to fill an enclosure (Section 402S-1). The dosage shall be sufficient to result in an air content of 15 to 25 percent (as determined by TxDOT Method Tex-416-A) at the time of placement of the CLSM.

402S.8 402.5 Field Strength Tests

Ball Drop or Penetrometer tests shall be used to determine, when the CLSM has developed sufficient strength to be covered or subjected to traffic or other loads as approved by the Engineer or designated COA representative.

The Ball Drop test shall be performed according to the latest version of ASTM C-360. An indentation diameter of three inches (75 mm) or less, and the absence of a sheen or any visible surface water in the indentation area shall indicate that the CLSM has achieved the desired strength. Because trench width and depth may affect the test results, the Contractor may perform this test on a control sample of CLSM in a two-foot (600 mm) square by six-inch (150 mm) deep container.

Penetrometer tests using a hand-held, spring reaction-type device commonly called a concrete pocket penetrometer, shall be performed on the surface of the CLAMS CLSM. A Penetrometer reading, equal to or greater than the value established in the mix design (Section 402S.4) for a Ball Drop test indentation of 3-inches (75 mm), shall indicate that the CLSM has achieved the desired strength.

402.6 Delivery Tickets

Delivery tickets shall contain the following information:

1. Project designation
2. Date and time of batch
3. Mix design designation and quantity of CLSM
4. Actual batch proportions
5. Moisture content of aggregate

A copy of ticket shall be provided to COA inspector in the field at the time of delivery. Any item missing or incomplete on ticket may cause rejection of CLSM.

~~402S.9~~ 402.7 Construction Methods

A. General

The height of free fall placement of the CLSM shall not exceed four feet ~~(1.2 meters)~~. Since CLSM is considered to be self-compacting, a vibrator shall not be allowed. The CLSM shall not be covered with any overlying materials or subjected to traffic or other loads until the Ball Drop test, or the Penetrometer test shows acceptable results (Section ~~402S.8~~402.5) or until the CLSM has been in place a minimum of 24 hours for Normal Set CLSM and a minimum of 3 hours for Fast Set CLSM. Curing of the CLSM will not be required.

B. Utility Line Backfill

After the utility pipe has been placed and the proper bedding material placed in accordance with the details on the drawings, the trench may be immediately backfilled with the CLSM to the subgrade level shown on the drawings, Standard Details 1100S-6A, B, C & D, 430S-4, 511S-13A and 511S-13B or as directed by the Engineer or designated COA representative.

C. Culvert Backfill

Care shall be taken to prevent movement of the structure. If the pipe or structure moves either horizontally or vertically, the CLSM and the structure shall be immediately removed, and the pipe or structure re-laid to proper line and grade.

D. Other Backfill

CLSM may be used for backfill material in lieu of soil as shown on the drawings, Standard Details or as approved by the Engineer or designated COA representative.

E. Filling Abandoned Culverts, Pipe, or other Enclosures

The CLSM shall be placed in a manner that allows all air or water, or both, to be displaced readily as the CLSM fills the enclosure.

~~402S.10~~ 402.8 Acceptance Testing During Construction

The Engineer or designated COA representative may perform flow consistency, air entrainment, and unconfined compressive strength tests to determine if the CLSM meets the specification requirements. The number and frequency of acceptance tests will be determined by the Engineer or designated COA representative.

~~402S.11~~ 402.9 Measurement and Payment

The work and materials presented herein will generally not be paid for directly, but shall be included in the unit price bid for the item of construction in which this item is used.

When specified in the contract bid form as a separate pay item, the item will be paid for at the contract unit bid price(s) for "Controlled Low Strength Material". The bid prices shall include full compensation for all Work herein specified, including the furnishing of all materials, equipment, tools, labor, and incidentals necessary to complete the Work.

Payment will be made under the following:

Pay Item No. 402~~S~~-A:	Controlled Low Strength Material	Per Cubic Yard

End

SPECIFIC CROSS REFERENCE MATERIALS	
Standard Specification Item 402~~S~~, "Controlled Low Strength Material"	
City of Austin Standard Details	
Designation	Description
430S-4	Concrete Backfill Under Curb & Gutter
~~506S-14~~	~~Control or Mini Manhole~~
506-AW-04	Large Diameter Cleanout
506S-15	Abandoned Manhole
506S-15A	Abandoned Line at Active Manhole
511-AW-01	Typical Gate Valve 4" - 16"
511-AW-04	Air Release and Air/Vacuum Valve
~~511S-13A~~	~~Water Valve Box Adjustment to Grade W/Full Depth Concrete~~
~~511S-13B~~	~~Water Valve Box Adjustment to Grade W/Concrete and H.M.A.C.~~
1100S-2	Flexible Base with Asphalt Surface Trench Repair -Existing Pavement
1100S-3	Asphalt Overlay of Reinforced and Non-Reinforced PC PVT-Trench Repair
1100S-3A	Asphalt Overlay of Non-Reinforced PC Pavement-Trench Repair
1100S-4	Temporary Trench Repair-Asphalt Surface
1100S-5	Full Depth Asphaltic Concrete Pavement Trench Repair
~~1100S-6A~~	~~Narrow Excavation Next to C&G - Trench Width 0.3 M (12") & Less~~
1100S-6B	~~Narrow Excavations - Trench Width 0.3 M (12") & Less~~ Excavation Parallel to the Curb
~~1100S-6C~~	~~Excavation Next to C&G - Trench Width Greater than 0.3 M (12")~~
1100S-6D	~~Excavations - Trench Width Greater than 0.3 M (12")~~ Transverse Excavations
1100S-8A	Traffic Lane Replacement for Outer Lane Excavations
1100S-8B	Traffic Lane Replacement for Interior Lane Excavations
City of Austin Standard Specification Items	
Designation	Description
Item No 403S	Concrete for Structures
Item No 405S	Concrete Admixtures
Texas Department of Transportation: Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges	
Designation	Description
Item No. 334	Hot-Mix-Cold-Laid Asphaltic Concrete Pavement
~~Item No. 420~~	~~Concrete Structures~~
~~Item No. 421~~	~~Portland Cement Concrete~~
~~Item No. 437~~	~~Concrete Admixtures~~
Texas Department of Transportation: Departmental Material Specifications	
Designation	Description
DMS-4610	Fly Ash

RELATED CROSS REFERENCE MATERIALS	
Standard Specification Item 402~~S~~, "Controlled Low Strength Material"	
Texas Department of Transportation: Manual of Testing Procedures	
Designation	Description
Tex-106-E	Method Of Calculating the Plasticity Index of Soils
~~Tex-416-A~~	~~Air Content of Freshly Mixed Concrete By The Pressure Method~~
~~Tex-418-A~~	~~Compressive Strength of Cylindrical Concrete~~

American Society for Testing and Materials (ASTM)	
Designation	Description
ASTM ~~C 150~~ C150	Portland Cement
ASTM C595	Blended Hydraulic Cements
ASTM D4832	Preparation and Testing of Controlled Low Strength Material (CLSM) Test Cylinders
ASTM D 6023	Density (Unit Weight), Yield, Cement Content, and Air Content (Gravimetric) of Controlled Low-Strength Material (CLSM)
ASTM D6024	Ball Drop on Controlled Low Strength Material (CLSM) to Determine Suitability for Load Application
ASTM D6103	Flow Consistency of Controlled Low Strength Material (CLSM)
~~ASTM C 360~~	~~Ball Penetration in Fresh Portland Cement Concrete~~
~~ASTM C 403~~	~~Time of Setting of Concrete Mixtures by Penetration Resistance~~
City of Austin Standard Specification Items	
Designation	Description
~~Item No. 504S~~	~~Adjusting Structures~~
Item No. 506S	Manholes
~~Item No. 508S~~	~~Miscellaneous Structures and Appurtenances~~
Item No. 510	Pipe

ITEM NO. 405~~S~~ CONCRETE ADMIXTURES ~~11-13-07~~ 09-13-22

405~~S~~.1 Description

This item shall govern material requirements of admixtures for Portland cement concrete.

~~This specification is applicable for projects or work involving either inch-pound or SI units. Within the text and accompanying tables, the inch-pound units are given preference followed by SI units shown within parentheses.~~

405~~S~~.2 Submittals

The submittal requirements of this specification item include:

A. Type and manufacturer of any proposed admixture.

B. Certification that proposed admixtures meet the requirements of this specification, ASTM C260 and ASTM C494.

C. For a specific mix design, a statement of compatibility of products shall be submitted when admixtures from multiple manufacturers are proposed.

405~~S~~.3 Materials

All admixture submittals must be approved by the Engineer or designated from the City of Austin (COA) representative. No admixture shall be chloride-based or have chloride(s) added in the manufacturing process. Admixtures must be pretested by the Texas Department of Transportation (T~~X~~xDOT) Materials and Tests Engineer and be included in the State's current approved admixture list. All admixtures must retain an approved status through the duration of a mix design's one-year approval period.

(1) **Air Entraining Admixture:**

An "Air Entraining Admixture" is defined as a material which, when added to a concrete mixture in the proper quantity, will entrain uniformly dispersed microscopic air bubbles in the concrete mix. The admixture shall meet the requirements of ASTM ~~Designation:~~ C 260 ~~modified as follows:~~ .

~~(a) The cement used in any series of test shall be either the cement proposed for the specific work or a "reference" Type I cement from one mill.~~

~~(b) The air-entraining admixture used in the reference concrete shall be Neutralized Vinsol Resin~~.

(2) **Water-reducing Admixture:**

A "Water-reducing Admixture" is defined as a material which, when added to a concrete mixture in the correct quantity, will reduce the quantity of mixing water required to produce concrete of a given consistency and required strength. This admixture shall conform to ASTM C 494, Type A.

(3) **Retarding Admixture:**

A "Retarding Admixture" is defined as a material which, when added to a concrete mixture in the correct quantity, will retard the initial set of the concrete. This admixture shall conform to ASTM C 494, Type B.

(~~3~~ 4) **Accelerating Admixture:**

An "Accelerating Admixture" is defined as an admixture that accelerates the setting time and the early strength development of concrete. This admixture shall conform to ASTM C 494, Type C. The accelerating admixture will contain no chlorides.

(~~4~~ 5) **Water-reducing, Retarding Admixture:**

A "Water-reducing, Retarding Admixture" is defined as ~~a material~~ an admixture which, when added to a concrete mixture in the correct quantity, will reduce the quantity of mixing water required to produce concrete of a given consistency and retard the initial set of the concrete. This admixture shall conform to ASTM C 494, Type D.

(6) **Water Reducing, Accelerating Admixture:**

A "Water Reducing, Accelerating Admixture" is defined as an admixture which, when added to a concrete mixture in the correct quantity, will reduce the quantity of mixing water required to produce concrete of a given consistency and accelerates setting time and the early strength development of concrete. This admixture shall conform to ASTM C 494, Type E.

(~~5~~ 7) **High-range Water Reducing Admixture~~s~~:**

A "High-range Water Reducing Admixture", referred to as a superplasticizer, is defined as a synthetic polymer material which, when added to a low slump concrete mixture increases the slump without adversely affecting segregation, impermeability or durability of the mix. This admixture shall conform to ASTM C 494, Type F ~~or G~~.

(8) **High-range Water Reducing, Retarding Admixture:**

A "High-range Water Reducing, Retarding Admixture " is defined as an admixture that reduces the quantity of mixing water required to produce concrete of a given consistency and retards the initial set of concrete. This admixture shall conform to ASTM C 494, Type G.

~~(6) **Fly Ash:**~~

~~Fly ash used in Portland cement concrete as a substitute for Portland cement or as a mineral filler shall comply with TXDOT Materials Specification D-9-8900 and be listed on TXDOT's current list of approved fly ash sources. Fly ash obtained from a source using a process fueled by hazardous waste (30 Texas Administrative Code, Section 335.1) shall be prohibited. This applies to any other specification concerning the use of fly ash. Contractor shall maintain a record of source for each batch. Supplier shall certify that no hazardous waste is used in the fuel mix or raw materials.~~

405~~S~~.4 Certification and Product Information

The Contractor shall submit the name of the admixture proposed and manufacturer's certification that the selected admixtures meet the requirements of this item and of ASTM C 260 and C 494 as applicable. Admixtures for a mix design shall be of the same brand. If more than one admixture brand is proposed in the concrete mix, a statement of compatibility of components shall accompany certification. Manufacturer's product literature shall specify when in the batching/mixing operation the admixture must be added.

The Engineer or designated COA representative may request additional information such as infrared spectrophotometry scan, solids content, pH value, etc., for further consideration. Any unreported changes in formulation discovered by any of the tests prescribed herein may be caused to permanently bar the manufacturer from furnishing admixtures for Owner's work.

405~~S~~.5 Construction Use of Admixtures

~~All admixtures used shall be liquid except high-range water reducers which may be a powder.~~ Admixture may be in the form of either powder or liquid. Liquid admixtures shall be agitated as needed according to the manufacturer's recommendations to prevent separation or sedimentation of solids~~; however, air agitation of Neutralized Vinsol Resin will not be allowed~~.

No admixture shall be dispensed on dry aggregates. Admixtures shall be dispensed at the batching site separately, but at the same time as the mixing water. Only high range water reducers may be introduced into the mix at the job site.

When other admixtures are used with fly ash, the amount of the other admixture to be used shall be based on the amount of ~~Portland cement only and not the amount of Portland cement and fly ash~~ total cementitious material.

When high-range water reducers are to be added at the job site, transit mixers shall be used. Admixture manufacturer literature shall indicate recommended mixing methods and time for the specific equipment and mix design used. The transit mix equipment shall not be loaded in excess of 63 percent of its rated capacity to ensure proper mixing of the admixture at the site. If during discharging of concrete a change in slump in excess of 30% is noted, the remaining concrete shall be rejected unless prior approval was given by the Engineer or designated COA representative to retemper a load with a second charge of admixture. Retempering with water shall not be allowed.

Accelerating admixtures will not be permitted in combination with Type II cement.

~~All mixes with air entrainment shall have a minimum relative durability factor of 80 in accordance with ASTM C 260. Dosage of air entrainment admixtures may be adjusted by the Contractor to stay within the specified tolerances for air entrainment of Standard Specification Item No. 403S, "Concrete for Structures".~~

405~~S~~.6 Measurement and Payment

The requirements of this specification~~s~~ shall not be measured and paid for directly, but shall be included in the unit price bid for the item of construction in which this item is used.

End

SPECIFIC CROSS REFERENCE MATERIALS	
Specification Item No. 405~~S~~, "Concrete Admixtures"	
City of Austin Standard Specifications	
Designation	Description
Item No. 360S	Concrete Pavement
Item No. 403S	Concrete for Structures
American Society for Testing and Materials, ASTM	
Designation	Description
ASTM C260	Air-Entraining Admixtures for Concrete
ASTM C49~~5~~4	Chemical Admixtures for Concrete
Texas Department of Transportation: Department Material Specification	
Designation	Description
DMS-~~8900~~4610	Fly Ash

RELATED CROSS REFERENCE MATERIALS	
Specification Item No. 405~~S~~, "Concrete Admixtures"	
City of Austin Standard Specifications	
Designation	Description
Item No. 401S	Concrete Structure and Miscellaneous Concrete
Item No. 404S	Pneumatically Placed Concrete
Item No. 434S	P.C. Concrete Medians and Islands

Item No. 559S	Portland Cement Concrete Box Culverts
Texas Department of Transportation: Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges	
Designation	Description
Item 360	Concrete Pavement
Item 420	Concrete Sub~~S~~structures
Item 421	~~Portland~~ Hydraulic Cement Concrete
Item 427	Surface Finishes for Concrete
Item 431	Pneumatically Placed Concrete
~~Item 437~~	~~Concrete Admixtures~~
Item 520	Weighing and Measuring Equipment
~~Item 522~~	~~Portland Cement Concrete Plants~~
~~Item 524~~	~~Hydraulic Cement~~