

DEPARTMENT OF TRANSPORTATION

STATE OF GEORGIA

SUPPLEMENTAL SPECIFICATION

Section 600—Controlled Low Strength Flowable Fill

Delete Section 600 and substitute the following:

600.1 General Description

This work consists of furnishing and placing ready-mixed or volumetric mixed Flowable Fill as an alternate to compacted soil as approved by the Engineer. Applications for this material include beddings, encasements, and closures for tanks and pipe, and general backfill for trenches and abutments.

600.1.01 Definitions

General Provisions 101 through 150.

600.1.02 Related References

A. Standard Specifications

[Section 500—Concrete Structures](#)

[Section 801—Fine Aggregate](#)

[Section 830—Portland Cement](#)

[Section 831—Admixtures](#)

[Section 880—Water](#)

B. Referenced Documents

SOP-10

General Provisions 101 through 150.

600.1.03 Submittals

Mix designs for flowable fill and other documentation listed in [Subsection 500.1.03](#).

600.2 Materials

All materials shall meet the requirements of the following Specifications:

Material	Section
*Fine Aggregate	Subsection 801.2.02
Portland Cement	Subsection 830.2.01
**Fly Ash	Subsection 831.2.03
***Air-Entraining Admixtures	Subsection 831.2.01
Water	Subsection 880.2.01

*Note—Gradation requirement is waived.

**Note—The requirements of [Subsection 831.2.03](#) will be waived for fly ash.

***Note—High air generators or foaming agents may be used in lieu of conventional air entraining admixtures and may be added at the job site and mixed according to the manufacturer’s recommendation.

600.2.01 Delivery, Storage, and Handling

General Provisions 101 through 150.

600.3 Construction Requirements

600.3.01 Personnel

General Provisions 101 through 150.

600.3.02 Equipment

General Provisions 101 through 150.

600.3.03 Preparation

A. Mix Design

Flowable fill can be batched by ready-mix or volumetrically mixed on site.

Ready-mixed flowable fill is a mixture of Portland cement, fly ash, fine aggregate, air entraining admixture, and water. Ready-mixed flowable fill contains a low cement content for reduced strength development.

Volumetric mixed flowable fill is a mixture of Class C fly ash or Portland cement, Class F fly ash, and water mixed on site.

1. Submit mix designs for flowable fill to the Engineer for approval by the Office of Materials and Research. The following table lists mix design proportion ranges for excavatable and non-excavatable flowable fill:

*Table 1—Mix Designs for Flowable Fill				
	Ready-Mixed		Volumetric Mixed	
	Excavatable	Non-Excavatable	Excavatable	Non-Excavatable
Cement, Type I	75-100 lbs/yd ³ (45-60 kg/m ³)	75-150 lbs/yd ³ (45-90 kg/m ³)	90 lbs/yd ³ (53 kg/m ³)	150 lbs/yd ³ (90 kg/m ³)
Class C Fly Ash	-	-	735-840 lbs/yd ³ (333-381 kg/m ³)	841-1045 lbs/yd ³ (381-474 kg/m ³)
Class F Fly Ash	-	150-600 lbs/yd ³ (90-355 kg/m ³)	1250-2000 lbs/yd ³ (567-1186 kg/m ³)	1045-1940 lbs/yd ³ (474-1150 kg/m ³)
Water	**	**	**	**
***Air	15 to 35%	5-15%	NA	NA
***28-Day Compressive Strength	Maximum 100 psi (690 kPa)	Minimum 125 psi (860 kPa)	Maximum 100 psi (690 kPa)	Minimum 125 psi (860 kPa)
***Unit Weight (Wet)	90-100 lbs/ft ³ (1440-1600 kg/m ³)	100-125 lbs/ft ³ (1600-2000 kg/m ³)	90-100 lbs/ft ³ (1440-1600 kg/m ³)	100-125 lbs/ft ³ (1600-2000 kg/m ³)

*Amounts singly or in combination to make the mix yield one cubic yard (meter).

**Mix designs shall produce a consistency that will result in a flowable self-leveling product at time of placement.

***The requirements for percent air, compressive strength, and unit weight are for laboratory designs only and are not intended for jobsite acceptance requirements.

600.3.04 Fabrication

A. Ready-Mixed

Ensure ready-mixed flowable fill is manufactured at plants that qualify as approved sources according to the Standard Operating Procedure for Quality Assurance for Ready-Mix Concrete Plants in Georgia (SOP-10). Mix and deliver according to [Subsection 500.2.01](#) of the Specifications or other methods approved by the Engineer. Revolution counter requirements are waived.

B. Volumetric Mixed

Ensure volumetric mixed flowable fill is manufactured through the use of volumetric mixers according to [Subsection 500.3.02](#) of the Specifications or other methods approved by the Engineer.

600.3.05 Construction

When using as backfill for pipe, where flotation or misalignment may occur, assure correct alignment of the pipe by using straps, soil anchors, or other approved means of restraint.

Protect flowable fill from freezing for 36 hours after placement.

600.3.06 Quality Acceptance

A. Jobsite Acceptance

Acceptance of flowable fill is based on documentation as outlined in [Subsection 500.1.03](#) of the Specifications and a minimum temperature of flowable fill at the point of delivery of 50 °F (10 °C).

600.3.07 Contractor Warranty and Maintenance

General Provisions 101 through 150.

600.4 Measurement

Flowable fill will be measured for payment in cubic yards (meters) in place and accepted when shown as a pay item in the Contract. When flowable fill is not shown as a pay item, include the cost of the work in the bid price for the appropriate item.

600.4.01 Limits

General Provisions 101 through 150.

600.5 Payment

When shown as a pay item in the Contract, flowable fill complete, in place and accepted will be paid for per cubic yard (meter).

Payment will be made under:

Item No. 600	Flowable fill	Per cubic yard (meter)
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600.5.01 Adjustments

General Provisions 101 through 150.