**Boral Material Technologies Inc.**
**45 Northeast Loop 410, Suite 700**
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# SECTION 03050
# FLY ASH

**Product Guide Specification**

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) Format, including MasterFormat, SectionFormat, and PageFormat, contained in the CSI Manual of Practice.

The section must be carefully reviewed and edited by the Engineer to meet the requirements of the project and local building code. Coordinate this section with the concrete section.

This section covers Boral Material Technologies' Boral Fly Ash Class F and Boral Fly Ash Class C for concrete.

Fly ash is a finely divided residue that results from the combustion of ground or powdered coal. As a pozzolan, fly ash reacts chemically with calcium hydroxide produced by the hydration of portland cement to form additional cementitious compounds.

Consult Boral Material Technologies for assistance in editing this section for the specific application.

Delete All "Specifier Notes" when editing this section

## PART 1 GENERAL

### 1.1 SECTION INCLUDES

A. Fly ash for concrete.

### 1.2 RELATED SECTIONS

Specifier Notes: Edit the following list of related sections as required for the project. List other sections with work directly related to the fly ash.

A. Section 03300 - Cast-in-Place Concrete.

B. Section 03400 - Precast Concrete.

C. Section 03700 - Mass Concrete.

### 1.3 REFERENCES

Specifier Notes: List standards referenced in this section, complete with designations and titles. This article does not require compliance with standards, but is merely a listing of those used.

A. ACI 201.2R - Guide to Durable Concrete.

B. ASTM C 94 - Ready-Mixed Concrete.

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C. ASTM C 227 - Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method).

D. ASTM C 311 - Sampling and Testing Fly Ash or Natural Pozzolans for Use as a Mineral Admixture in Portland-Cement Concrete.

E. ASTM C 441 - Effectiveness of Pozzolans or Ground Blast-Furnace Slag in Preventing Excessive Expansion of Concrete Due to the Alkali-Silica Reaction.

F. ASTM C 618 - Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use as a Mineral Admixture in Concrete.

G. ASTM C 1012 - Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution.

H. ASTM C 1202 - Electrical Indication of Concrete's Ability to Resist Chloride Ion Penetration.

I. ASTM C 1260 - Potential Alkali Reactivity of Aggregates (Mortar-Bar Method).

J. ASTM C 1293 - Concrete Aggregates by Determination of Length Change of Concrete Due to Alkali-Silica Reaction.

K. ASTM G 109 - Determining the Effects of Chemical Admixtures on the Corrosion of Embedded Steel Reinforcement in Concrete Exposed to Chloride Environments.

## 1.4 SUBMITTALS

A. Comply with Section 01330 - Submittal Procedures.

B. Product Data: Submit supplier's product data.

C. Test Reports: Submit recent supplier's test reports from testing performed by an accredited laboratory indicating compliance of fly ash with specified requirements.

D. Mill Certification: Submit monthly mill certification from fly ash source indicating fly ash complies with chemical and physical requirements of ASTM C 618, Class F or C.

E. Supplier's Quality Assurance: Submit supplier's certification that fly ash complies with ASTM C 618, Class F or C, is sampled and tested in accordance with ASTM C 311, and is suitable for intended application.

## 1.5 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver fly ash to concrete batch plant in bulk shipment protected from contamination and moisture, with documentation clearly identifying:

1. Product description.
2. Supplier.
3. Weight of material.
4. Source.

B. Storage: Store fly ash in a clean dry storage silo in accordance with supplier's instructions.

C. Handling: Protect fly ash during handling, batching, and mixing to prevent damage or contamination.

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## PART 2 PRODUCTS

### 2.1 SUPPLIER

A. Boral Material Technologies Inc., 45 Northeast Loop 410, Suite 700, San Antonio, Texas 78216. Toll Free (800) 964-0951. Phone (210) 349-4069. Fax (210) 979-6110. Web Site www.boralmti.com.

### 2.2 FLY ASH

Specifier Notes: Specify either Boral Fly Ash Class F or Fly Ash Class C. Consult Boral Material Technologies for assistance in determining the required fly ash class for the specific application.

A. Fly Ash: Boral Fly Ash Class F.

1. Compliance: ASTM C 618, Class F.

B. Fly Ash: Boral Fly Ash Class C.

1. Compliance: ASTM C 618, Class C.

C. Fly Ash Substitution: Substitution of source or class of fly ash during the Work may be accepted with sufficient historical performance data, comparative test reports, or by trial batch.

Specifier Notes: Indicate the concrete to contain fly ash. Edit the following as required for the project.

D. Use fly ash in all concrete.

### 2.3 MIX DESIGN

Specifier Notes: Specify Section 03300 for cast-in-place concrete, Section 03400 for precast concrete, or Section 03700 for mass concrete.

A. Concrete Mix Design: As specified in Section [03300] [03400] [03700].

B. Fly Ash Content: Provide fly ash content in concrete mix in accordance with 1 of the following:

1. Minimum of 15 percent of total cementitious content as fly ash.
2. Follow ACI 201.2R for durable concrete.
3. Minimum of 15 percent replacement of cement as required by local conditions or verified by appropriate test methods.
    a. Sulfate Conditions: ASTM C 1012.
    b. Alkali-Silica Reactivity: ASTM C 1260, C 227, C 441, or C 1293.
    c. Corrosion: ASTM G 109.
    d. Impermeability: ASTM C 1202.
4. Mass Concrete: Minimum of 30 percent of total cementitious content as fly ash.

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C. Constant Fly Ash Content: Provide constant fly ash content throughout duration of project, unless approved by Engineer.

D. Concrete Materials: Evaluate concrete mix design with fly ash mixed with concrete materials representative of those proposed for use.

E. Compatibility of Materials: Verify compatibility of fly ash with cement and with admixtures in concrete mix.

Specifier Notes: Specify the following if Boral Fly Ash Class C is to be used in a moderately to extremely aggressive sulfate environment.

F. Sulfate Resistance: Test mix design in accordance with ASTM C 1012 to verify sulfate resistance when Class C fly ash is used in a moderately to extremely aggressive sulfate environment.

## PART 3 EXECUTION

### 3.1 BATCHING AND MIXING

A. Add fly ash to concrete at dosage rate in accordance with supplier's instructions and as determined by concrete mix design.

B. Batch and mix fly ash in accordance with supplier's instructions and ASTM C 94.

C. Add each admixture separately to concrete mix.

D. Add fly ash to concrete materials during batching procedure at batch plant. Weigh cement and fly ash cumulatively in accordance with ASTM C 94, with cement before fly ash.

Specifier Notes: Specify Section 03300 for cast-in-place concrete, Section 03400 for precast concrete, or Section 03700 for mass concrete.

E. Measuring, Batching, Mixing, and Delivering Concrete: As specified in Section [03300] [03400] [03700].

### 3.2 PLACING, FINISHING, AND CURING

A. Placing, Finishing, and Curing Concrete: As specified in Section [03300] [03400] [03700].

### 3.3 FIELD QUALITY CONTROL

A. Inspection and Testing of Concrete: As specified in Section [03300] [03400] [03700].

B. Supplier's Field Services: Supplier's representative shall provide technical assistance as required.

**END OF SECTION**