



# Iowa Department of Transportation

## SPECIAL PROVISIONS FOR C-STONE SUBGRADE

Woodbury County  
STP-U-7057(689)--70-97

Effective Date  
May 19, 2015

THE STANDARD SPECIFICATIONS, SERIES 2012, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

### PART 1 – GENERAL

#### 1.01 SECTION INCLUDES

Place material as indicated on the plans.

#### 1.02 SUBMITTALS

- A. Results of Standard Proctor moisture-density relationships and In-Place Density Tests.
- B. The Contractor shall provide material certifications to the Engineer.

### PART 2 – PRODUCTS

#### 2.01 MATERIALS

##### A. C-STONE

C-Stone shall be manufactured aggregate made from Class C Flyash. Compacted unit weight of C-Stone is estimated at 135 pounds per cubic foot.

##### B. Fly Ash

Fly ash shall meet ASTM C 618, Section 4.3 when sampled and tested in accordance with ASTM C 618, Sections 5, 6, and 8, unless otherwise shown on the plans. Note 2 of Section 3.1.2 of ASTM C 618 will not apply. Fly ash shall be Class C containing a minimum of 22% CaO. The source of the ash shall be identified and approved in advance of stabilization operations in order that laboratory test can be completed prior to commencing work.

Fly ash shall be stored and handled in closed weatherproof containers until immediately before distribution. Fly ash exposed to moisture prior to mixing with soils shall be discarded.

**C. Water**

Water used for mixing or curing shall be reasonably clean and free of oil, salt acid, alkali, sugar, vegetable, or other substances injurious to the finished product. Water shall meet the requirements of AASHTO T 26. Water known to be of potable quality may be used without testing.

**D. Soil**

Soil for this work consists of materials on the site or selected materials from other sources and shall be uniform in quality and gradation, and shall be approved by the Engineer. The soil shall be free of roots, sod, weeds, and stones larger than 1.5 inches.

**2.02 COMPOSITION**

**A. Tolerances**

At final compaction, C-Stone moisture content for each course of subgrade treatment shall conform to the following tolerances:

<u>Material</u>	<u>Tolerance</u>
C-STONE	+2%, -3%

**PART 3 – EXECUTION**

**3.01 WEATHER LIMITATIONS**

The fly ash-treated subgrade shall not be mixed while the atmospheric temperature is below 40°F or when conditions indicate that temperatures may fall below 40°F within 24 hours, when it is foggy, rainy, or when soil or subgrade is frozen.

**3.02 EQUIPMENT**

The equipment required shall include all equipment necessary to complete this item such as: grading and scarifying equipment, a spreader for the fly ash, mixing or pulverizing equipment, sheepsfoot and pneumatic or vibrating rollers, sprinkling equipment, and trucks.

**3.03 CONSTRUCTION METHODS**

C-stone stabilization should consist of placing a minimum of 12 inches of C-stone in the soft area in two 6 inch lifts and moisture conditioning the C-stone to within a -3% to a +2% of optimum moisture content as determined by ASTM D698. The C-stone should be compacted to a minimum density of 95% of ASTM D698. The depth of stabilization material needed will depend on the actual subgrade conditions encountered in the field at the time of construction. C-stone stabilization will only be performed where approved by the Engineer.

**3.04 TESTING REQUIREMENTS**

ASTM D 698 Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 5.5 lb Rammer and 12 inch Drop

**PART 4 – METHOD OF MEASUREMENT**

**4.01 C-STONE**

The volume under the proposed pavement under which C-stone is to be placed, plus 2 feet on each side, will be measured in cubic yards.

**PART 5 – BASIS OF PAYMENT**

**5.01 C-STONE**

Payment will be at the unit price per cubic yard. Work includes, but is not limited to, furnishing, placing, adding moisture needed for compaction, compacting C-Stone, and removing and disposing of the unsuitable soils that the C-stone is replacing.