

# Special Specification 8034

## Safety End Treatment (Materials Only)



### 1. DESCRIPTION

Furnish safety end treatments for drainage structures.

### 2. MATERIALS

2.1. General. Furnish materials in accordance with the following:

- Item 420, "Concrete Substructures"
- Item 421, "Hydraulic Cement Concrete"
- Item 432, "Riprap"
- Item 440, "Reinforcement for Concrete"
- Item 442, "Metal for Structures"
- Item 445, "Galvanizing"
- Item 460, "Corrugated Metal Pipe"
- Item 464, "Reinforced Concrete Pipe"

Use Class C concrete for precast concrete units unless otherwise shown on the plans. Furnish precast safety end treatments unless otherwise shown on the plans. Provide galvanized steel for prefabricated metal end sections in accordance with Item 460, "Corrugated Metal Pipe."

Furnish pipe runners in accordance with the following:

- ASTM A1085
- ASTM A53, Type E or S, Grade B
- ASTM A500, Grade B
- API 5L, Grade X42

Furnish plates and angles in accordance with ASTM A36. Furnish nuts and bolts in accordance with ASTM A307. Galvanize pipes, plates, angles, nuts, and bolts in accordance with Item 445, "Galvanizing."

2.2. **Fabrication.** Fabricate cast-in-place concrete units and precast units in accordance with Item 420, "Concrete Substructures." Provide either prefabricated metal end sections or mitered CMP when specified for the pipe structure unless otherwise shown on the plans.

Provide one of the following when reinforced concrete pipe (RCP) is specified for the pipe structure, unless otherwise shown on the plans:

- mitered RCP or
- precast safety end treatment (SET) units.

2.2.1. **SET Types.**

2.2.1.1. **Type II.** Provide Type II SET in accordance with the details shown on the plans consisting of the following:

- CMP or RCP mitered to the proper slope, concrete riprap and pipe runners, when required;
- prefabricated metal end sections, concrete riprap and pipe runners, when required; or
- precast SET units, concrete riprap, when required, and pipe runners, when required.

- 2.2.2. **Lifting Holes.** Provide no more than four lifting holes in each section for precast units. Lifting holes may be cast, cut into fresh concrete after form removal, or drilled. Provide lifting holes large enough for adequate lifting devices based on the size and weight of the section. The maximum hole diameter is 3 in. at the inside surface of the wall and 4 in. at the outside surface. Cut no more than one longitudinal wire or two circumferential wires per layer of reinforcing steel when locating lift holes. Repair spalled areas around lifting holes.
- 2.2.3. **Marking.** Clearly mark the following on each precast unit, mitered CMP, mitered RCP, or metal end section before shipment from the casting or fabrication yard:
- the date of manufacture,
  - the name or trademark of the manufacturer, and
  - the type and size designation.
- 2.2.4. **Storage and Shipment.** Store precast units on a level surface. Do not place any loads on precast units until the design strength is reached. Do not ship units until design strength requirements have been met.
- 2.2.5. **Causes for Rejection.** Precast units may be rejected for not meeting any one of the specification requirements. Individual units may also be rejected for fractures or cracks passing through the wall or surface defects indicating honeycombed or open texture surfaces. Remove rejected units from the project and replace with acceptable units meeting the requirements of this Item.
- 2.2.6. **Defects and Repairs.** Occasional imperfections in manufacture or accidental damage sustained during handling may be repaired. The repaired units will be acceptable if they conform to the requirements of this Item and the repairs are sound and properly finished and cured in conformance with pertinent specifications. Repair damaged galvanizing in accordance with Section 445.3.5., "Repairs."

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### 3. MEASUREMENT

SETs of all types will be measured by each barrel of each structure end.

Pipe runners or pipe runner assemblies installed or replaced on existing structure will be measured by each installed or replaced on each structure end.

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### 4. PAYMENT

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for the various designations of "Safety End Treatment" specified as follows:

- SET (Type II) (Pipe Diameter or Design) (Pipe Material) (Slope, Horizontal:Vertical) (Orientation, Cross or Parallel);
- SET (Pipe Runner); and
- SET (Pipe Runner Assembly)

This price is full compensation for fabricating, furnishing and transporting the end treatments; pipe runners, or pipe runner assemblies.

The mitered length of CMP or RCP that is a part of the SET (Type II) will not be paid for directly but will be considered subsidiary to this Item. The limits for payment for pipe will be as shown on the plans and paid for in accordance with the pertinent bid item.