

**Item No. 508S**  
**Miscellaneous Structures and Appurtenances**

**508S.1 Description**

This item governs the construction of miscellaneous structures and appurtenances, complete in place or to the stage detailed and/or indicated in the Drawings, using the materials specified herein, including the excavation, installation, backfilling, placement of the concrete and when required, the furnishing and installation of frames, grates, rings, covers, safety end treatment and any concrete curb and gutter indicated on the Drawings.

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

**508S.2 Submittals**

The submittal requirements of this specification item include:

- A. Type of structure and appurtenances (inlets, headwalls, frames, grates, energy dissipators, etc.), construction methods and sequence (precast, cast in place), materials (bolts, nuts, plates, angles, etc.)
- B. Aggregate types, gradations and physical characteristics for the Portland cement concrete mix.
- C. Proposed proportioning of materials for the mortar mix.
- D. Analysis and thickness calculations for temporary steel covers.

**508S.3 Types**

The various types of structures and appurtenances such as inlets, headwalls, energy dissipators, etc., are designated on the Drawings by letter or by number for the particular design of structure to be constructed in accordance with the details indicated on the Drawings. Unless otherwise indicated on the Drawings, the Contractor may have the option of furnishing cast in place or precast structures.

**508S.4 Materials**

A. Portland Cement Concrete

The Portland cement concrete shall conform to Item No. 403S, "Concrete For Structures", with the following classes:

|                        |         |
|------------------------|---------|
| Cast in Place Concrete | Class A |
| Precast Concrete       | Class C |

B. Mortar

Mortar shall be composed of 1 part Portland cement and 2 parts clean, sharp mortar sand suitably graded for the purpose by conforming in other respects to the provisions

of Standard Specification Item No. 403S, "Concrete for Structures" for fine aggregate. Hydrated lime or lime putty may be added to the mix, but in no case shall it exceed 10 percent by weight (mass) of the total dry mix.

#### C. Reinforcement and Steel

Reinforcing Steel shall conform to Standard Specification Item No. 406S, "Reinforcing Steel".

Structural Steel shall conform to Standard Specification Item No. 720S, "Metal for Structures".

#### D. Frames, Grates, Rings and Covers

Frames, grates, rings and covers shall conform to City of Austin Standard Specification Item No. 503S, "Frames, Grates, Rings and Covers".

#### E. Safety End Treatment for Structures

The safety end treatment for structures shall conform to TxDOT Specification Item No. 467, "Safety End Treatment".

1. Bolts and Nuts. All bolts, nuts and associated hardware shall meet the specifications of ASTM A 307.
2. Plates and Angles. All plates and similar angles and brackets shall meet the specifications of ASTM A 36.
3. Pipe Runners. Pipe Runners shall conform to the requirements of ASTM A53, Grade B.
4. Galvanizing. All hardware including nuts, bolts and plates listed above shall be galvanized conforming to ASTM A 123 or A 153.

#### F. Miscellaneous Items

Cast iron for supports, steps and inlet units shall conform to the shape and dimensions indicated on the Drawings. The casting shall be clean and perfect, free from sand or blowholes or other defects. Cast iron castings shall meet the requirements of ASTM A 48, Class 30. Steel for temporary covers when used with stage construction shall be adequate for the loads imposed.

### **508S.5 Construction Methods**

All concrete work shall be performed in accordance with Standard Specification Item No.410S, "Concrete Structures". Forms will be required for all cast-in-place concrete walls, except where the nature of the surrounding material is such that it can be trimmed to a smooth vertical face (the outside form for concrete bases). Where cast in place concrete is used in wall construction of storm sewers, the steps shall be cast into the wall when the concrete is placed.

The construction inlets shall be completed, as soon as is practicable after installation is complete of the sewer lines in the inlet. All sewer line shall be cut neatly at the inside face of the walls of the inlet and pointed up with mortar.

Bases for cast in place inlets may be placed prior to or at the Contractor's option after the sewer is constructed.

Bases for box sewers shall be cast as an integral part of the sewer. The manholes may be constructed prior to backfilling or if the Contractor so elects, the manhole opening may be covered temporarily with a steel plate to facilitate the compaction of backfill for the sewer as a whole. Thereafter, required excavation for the inlet shall be made and the inlet constructed and backfilled.

The inverts passing out or through an inlet shall be shaped and grouted across the floor of the inlet as indicated on the Drawings. This shaping may be accomplished by adding shaping mortar or concrete after the base is cast or by placing the required additional material with the base.

All miscellaneous structures shall be completed in accordance with the details indicated on the Drawings. Backfilling to original ground elevation shall be in accordance with the provisions of the appropriate items and as directed by the Engineer or designated representative.

Energy dissipators and headwalls shall be constructed in accordance with City of Austin Standard Detail 508S-13.

\* See Modifications for additional information

#### **508S.6 Measurement**

All miscellaneous structures and safety end treatments satisfactorily completed as indicated on the Drawings will be measured as completed units per each.

Concrete removal, excavation and backfill, riprap, pipe, headwalls, wing walls, collars and apron slabs will not be measured under this item but will be included in the unit price bid for the item of construction in which this item is used.

Frames, grates, rings, covers, safety end treatment and any concrete curb and gutter indicated will not be measured and paid for but shall be included in the unit price bid of one of the pay items identified in the contract bid form.

#### **508S.7 Payment**

##### **A . Inlets**

Payment for Inlets of the type indicated in place in accordance with these specifications and measured as prescribed above will be made at the unit bid price for each Inlet, of the type specified.

##### **B. Energy Dissipators and Headwalls**

Payment for special complete structures will be made at the unit price bid per each.

##### **C Safety End Treatment**

Payment for Safety End Treatment, complete in place, will be made at the unit bid price for each unit of the type indicated on the Drawings.

Payment will be made under one of the following:

|                                |   |           |
|--------------------------------|---|-----------|
| <b>Pay Item No. 508S-E:</b>    | Energy Dissipators, _____ In. Dia. -        | Per Each. |
| <b>Pay Item No. 508S-H:</b>    | Headwalls, Type _____, ____ In. Dia. Pipe - | Per Each. |
| <b>Pay Item No. 508S-IG:</b>   | Inlet, Grated -                             | Per Each. |
| <b>Pay Item No. 508S-SET</b>   | Safety End Treatment, Type ____ Size ____   | Per Each  |
| <b>Pay Item No. 508S-I5R:</b>  | Inlet, Recessed -                           | Per Each. |
| <b>Pay Item No. 508S-I10R:</b> | Inlet, Recessed -                           | Per Each. |
| <b>Pay Item No. 508S-I15R:</b> | Inlet, Recessed -                           | Per Each. |
| <b>Pay Item No. 508S-I20R:</b> | Inlet, Recessed -                           | Per Each. |
| <b>Pay Item No. 508S-I5S:</b>  | Inlet, Recessed -                           | Per Each. |
| <b>Pay Item No. 508S-I10S:</b> | Inlet, Standard -                           | Per Each. |
| <b>Pay Item No. 508S-I15S:</b> | Inlet, Standard -                           | Per Each. |
| <b>Pay Item No. 508S-I20S:</b> | Inlet, Standard -                           | Per Each. |

End

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| <b><i>SPECIFIED</i></b> Cross Reference Materials                                  |
| Standard Specification Item No. 508S, "Miscellaneous Structures and Appurtenances" |

City of Austin Standard Specification Items

| <u>Designation</u> | <u>Description</u>               |
|--------------------|----------------------------------|
| Item No. 403S      | Concrete For Structures          |
| Item No. 406       | Reinforcing Steel                |
| Item No. 410       | Concrete Structures              |
| Item No. 720       | Structural Steel                 |
| Item No. 503S      | Frames, Grates, Rings and Covers |

TxDOT Standard Specifications For Construction And Maintenance  
 Of Highways, Streets, And Bridges

| <u>Designation</u> | <u>Description</u>   |
|--------------------|----------------------|
| Item 467           | Safety End Treatment |

American Society for Testing and Materials (ASTM)

| <u>Designation</u> | <u>Description</u>  |
|--------------------|---|
| ASTM A36/36M       | Specification for Structural Steel  |
| ASTM A48           | Specification for Gray Iron Castings  |
| ASTM A53           | Specification for Pipe, Steel, Black and Hot-Dipped, Zinc Coated<br>Welded and Seamless |
| ASTM A123          | Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and<br>Steel Products      |
| ASTM A153          | Specification for Zinc Coating (Hot-Dip) on Iron and Steel<br>Hardware                  |
| ASTM A307          | Specifications for Carbon Steel Externally Threaded Standard<br>Fasteners               |
| ASTM C913          | Specifications for Precast Concrete Water and Wastewater<br>Structures                  |

|   |
|---|
| <b><u>RELATED</u></b> Cross Reference Materials |
|---|

City of Austin Drainage Criteria Manual

| <u>Designation</u> | <u>Description</u> |
|--------------------|--------------------|
| Section 6.6.0      | Energy Dissipators |

City of Austin Standard Specification Items

| <u>Designation</u> | <u>Description</u>     |
|--------------------|------------------------|
| Item No. 501S      | Jacking or Boring Pipe |
| Item No. 504S      | Adjusting Structures   |
| Item No. 506       | Manholes               |
| Item No. 507S      | Bulkheads              |
| Item No. 510       | Pipe                   |

City of Austin Standard Details

| <u>Designation</u> | <u>Description</u>                       |
|--------------------|--|
| 508S-13            | Standard Headwall and Energy Dissipators |
| 510S-1             | Concrete Trench Cap                      |

TxDOT Specifications

| <u>Designation</u> | <u>Description</u>                                 |
|--------------------|--|
| Item 420           | Concrete Structures                                |
| Item 421           | Portland Cement Concrete                           |
| Section 421.2(5)   | Fine Aggregate                                     |
| Item 424           | Precast Concrete Structures (Fabrication)          |
| Item 440           | Reinforcing Steel                                  |
| Item 466           | Headwalls and Wingwalls                            |
| Item 467           | Safety End Treatment                               |
| Item 471           | Frames, Grates, Rings and Covers                   |
| Item 529           | Concrete Curb, Gutter and Combined Curb and Gutter |