

576.3.02

**576.3.02 Equipment**

General Provisions 101 through 150.

**576.3.03 Preparation**

Before placing the pipe, compact the foundation until firm and stable.

**576.3.04 Fabrication**

General Provisions 101 through 150.

**576.3.05 Construction**

Place slope drain pipe in an open trench, excavated to the line and grade shown on the Plans or as directed.

Lay pipe sections that have circumferential joints with the outside laps of the circumferential joints uphill.

After installing the pipe:

1. Immediately backfill the trench with excavated materials or other approved material.
2. Place backfill in layers 8 in (200 mm) thick or less.
3. Compact each layer until firm and stable.

**576.3.06 Quality Acceptance**

General Provisions 101 through 150.

**576.3.07 Contractor Warranty and Maintenance**

General Provisions 101 through 150.

**576.4 Measurement**

Slope drain pipe is measured by the actual number of linear feet (meters) of the size installed and accepted.

**576.4.01 Limits**

General Provisions 101 through 150.

**576.5 Payment**

Accepted slope drain will be paid for at the Contract Price per linear foot (meter) for the size specified. This price includes full compensation for labor and incidentals necessary to complete the Item.

Payment will be made under:

Item No. 576	Slope drain pipe ___ in (mm)	Per linear foot (meter)
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**576.5.01 Adjustments**

General Provisions 101 through 150.

**Section 577—Metal Drain Inlets**

**577.1 General Description**

This work includes installing metal drain inlets according to the Specifications and Plan details.

On Projects where the grading and paving are let simultaneously, the Item will be designated as “Metal Drain Inlets—Complete Assembly.” For this type of construction, complete the Work in two stages. Perform Stage 1 Construction immediately after completing an embankment. Perform Stage 2 Construction progressively as the paved shoulders are completed.

On grading Projects where no paving is involved, limit the installations to Stage 1 Construction.

On paving Projects where the grading has been completed and metal drain inlets are in place under Stage 1 Construction, complete each assembly as specified under Stage 2 Construction.

**577.1.01 Definitions**

General Provisions 101 through 150.

**577.1.02 Related References****A. Standard Specifications**

Section 400—Hot Mix Asphalt Concrete Construction

Section 436—Asphaltic Concrete Curb

Section 441—Miscellaneous Concrete

Section 576—Slope Drain Pipe

Section 603—Rip Rap

Section 645—Repair of Galvanized Coatings

Section 844—Steel Pipe

**B. Referenced Documents**

General Provisions 101 through 150.

**577.1.03 Submittals**

General Provisions 101 through 150.

**577.2 Materials**

Ensure that materials meet the requirements of the following Specifications:

Material	Specification
Concrete Aprons	441
Sand-Cement Bag Rip Rap	603
Slope Drain Pipe	576
Asphaltic Concrete Curb	436
Metal Sheeting and Spelter Coating	844.2.03

For asphaltic concrete spillways, use the mixture for asphaltic concrete curb.

**577.2.01 Delivery, Storage, and Handling**

General Provisions 101 through 150.

**577.3 Construction Requirements****577.3.01 Personnel**

General Provisions 101 through 150.

**577.3.02 Equipment**

General Provisions 101 through 150.

**577.3.03 Preparation**

General Provisions 101 through 150.

**577.3.04 Fabrication**

Fabricate metal inlets as integral units to the shape and dimensions shown on the Plans. The end section and reducer shall not be corrugated or perforated.

**577.3.05 Construction**

Install metal inlet drainage assemblies at locations shown on the Plans or where directed by the Engineer. Locate inlets to avoid future installations such as guard rail posts and lighting standards.

**A. Repair**

Repair damaged galvanized coating according to Section 645.

**B. Stage Construction**

On combination grading and paving Projects, install metal drain inlet assemblies in two construction stages as follows:

## 1. Stage 1 Construction

As soon as the initial grading of an embankment is completed:

- a. Install metal drain inlets where shown on the Plans or as directed by the Engineer. Each installation includes:
  - Metal inlet
  - Necessary slope drain pipe
  - Concrete aprons or rip rap as required by the Engineer, to control erosion at the outlet end
- b. To direct the water to the inlets, crown the roadbed and construct a roll of embankment material at the shoulder line. Protect and maintain this drainage system to prevent leakage, erosion, and scouring. Keep gutters, pipes, and inlets open.

## 2. Stage 2 Construction

Complete this second stage operation immediately after paving shoulders to provide a complete drainage installation and prevent erosion of the embankment slopes.

As soon as a section of paved shoulder is completed:

- a. Remove each adjacent inlet from its position placed under Stage 1 Construction and place it in its final position as shown on the Plans.
- b. Field cut a section of slope drain pipe to the required length to connect the existing slope drain pipe to the metal inlet in its new position.
- c. Thoroughly compact the embankment material around the inlet, including the subgrade under the asphaltic concrete spillway. Finish to a smooth, firm surface.
- d. Place the asphaltic concrete mixture for the spillway on the prepared subgrade within the temperature limits set by the Engineer. Thoroughly compact by rolling. Use a hand-operated roller weighing 300 lbs (135 kg) or more or a small power roller satisfactory to the Engineer.  
When areas cannot be reached with rollers, compact them with vibratory tampers or hand tampers approved by the Engineer.
- e. After compaction, ensure that the surface and texture is smooth, even, and dense. Shape and complete the shoulders and slopes to conform to the required finished section.
- f. As soon as each drainage assembly is completed, place the asphaltic curb at the edge of the paved shoulder and connect it to the inlet as shown on the Plans.

## 3. Metal Drain Inlet

Complete assembly construction of each metal drain inlet shall include both Stage 1 Construction and the Stage 2 Construction specified above.

**577.3.06 Quality Acceptance**

General Provisions 101 through 150.

**577.3.07 Contractor Warranty and Maintenance**

General Provisions 101 through 150.

**577.4 Measurement**

Each of the three different types of metal drain inlet installations is measured separately for payment, complete in place and accepted. In each instance, the 2 ft (600 mm) section of corrugated pipe (which is an integral part of each Unit) is included in the measurement.

Measurement of each Metal Drain Inlet—Complete Assembly and each Metal Drain Inlet—Stage 2 Construction includes the asphaltic concrete spillway and the portion of asphaltic concrete curb included, within the limits of each inlet assembly, as shown on the Plans.

Measurement of each Metal Drain Inlet—Stage 1 Construction includes the integral drain unit and rip rap, earth roll, or other incidental construction necessary to direct water into the Inlet.

Other items of construction required in the work and eligible for payment such as slope drain pipe, asphaltic concrete curb, rip rap, and concrete aprons are measured for payment according to the applicable Specification for such items.

**577.4.01 Limits**

General Provisions 101 through 150.

**577.5 Payment**

Each of the three types of metal drain inlet installation, measured for payment as described above, will be paid for at the Contract Unit Price per each.

Payment of each Metal Drain Inlet—Complete Assembly will include both the First Stage and Second Stage Construction outlined above.

When First Stage Construction is completed and the installation is satisfactory to the Engineer, 50 percent of the bid price for each such Unit will be included for payment on the next statement.

When the Second Stage Construction is completed and the installation is satisfactory to the Engineer, the remaining 50 percent of the Bid Price for each Unit will be included for payment on the next statement.

All other Items needed to complete the installation and that are eligible for payment will be paid for according to the applicable Specification for such items.

Payment will be made under:

Item No. 577	Metal drain inlet—complete assembly	Per each
Item No. 577	Metal drain inlet—stage 1 construction	Per each
Item No. 577	Metal drain Inlet—stage 2 construction	Per each

**577.5.01 Adjustments**

General Provisions 101 through 150.

**Section 581—Pot Bearings****581.1 General Description**

This work includes furnishing and installing pot bearings (fixed and expansion types). Use the quality, type, and size designated in this Specification, on the Plans, or ordered by the Engineer.

**581.1.01 Definitions**

General Provisions 101 through 150.

**581.1.02 Related References****A. Standard Specifications**

Section 501—Steel Structures

Section 506—Expanded Mortar

Section 535—Painting Structures

Section 851—Structural Steel

Section 852—Miscellaneous Steel Materials

Section 885—Elastomeric Bearing Pads

Section 886—Epoxy Resin Adhesives

Section 887—Bearing Plates with Polytetrafluoroethylene Surfaces

**B. Referenced Documents**

ASTM A 709 Grade 36 (ASTM A 709M Grade 250)

A 709 Grade 50 (A 709M Grade 345)