

514 Floor Drains, Deck Drains, and Downspouts

514.1 Description

- (1) The section describes providing drainage components for highway structures and drainage systems for railroad structures.

514.2 Materials

514.2.1 General

- (1) Furnish materials conforming to the following:

Structural carbon steel.....	506.2
Miscellaneous metals	506.2
Paint	517
Corrugated steel pipe	521
Cast Iron	ASTM A48 , class 30

514.2.2 Highway Structures

- (1) Use structural carbon steel or cast iron, whichever the plans show, for floor drain frames and grates. After fabrication, blast clean and galvanize steel components according to [ASTM A123](#) as follows:
 - Structural steel frames and grates.
 - Steel pipes, clamps, fittings, and brackets for lateral piping.
- (2) Furnish UV-resistant reinforced thermosetting resin pipe (RTRP) and pipe fittings for downspouts conforming to [ASTM D2996](#), designation code RTRP-12EA1-2122 or RTRP-11AQ2-2112. Furnish stainless steel brackets for attaching RTRP to the structure.
- (3) Furnish adhesive anchors as specified in [502.2.12](#) with stainless steel anchor bolts, nuts, and washers conforming to [513.2.1](#). Unless the plans show otherwise, use 1/2-inch diameter anchor bolts.
- (4) Furnish grade A concrete conforming to [501](#) as modified in [716](#) for concrete used in aprons for downspouts. Provide QMP for class II ancillary concrete as specified in [716](#).

514.2.3 Railroad Structures

- (1) Furnish perforated half-round corrugated steel pipe, drainage pans with end closure plates, and unperforated outlet stubs and downspouts of the sizes and gauges the plans show. Ensure that these components are galvanized and fully coated with asphalt according to [AASHTO M190](#).
- (2) Furnish galvanized pipe clamps and hardware the plans show.

514.3 Construction

514.3.1 Floor Drains

- (1) Set floor drains with the grate at the elevation, relative to the top of the deck, the plans show.

514.3.2 Adjusting Floor Drains

- (1) If the plans show or contract specifies, provide new drain frames and inserts. Fabricate, blast clean, and apply a shop coat of primer. Touch up areas of damaged primer after installation with a department-approved organic zinc-rich primer.
- (2) After placing and curing adjacent concrete, paint exposed surfaces of inserts and frames with a coat of department-approved ready-mixed leafing aluminum paint. Brush clean existing drain grates and apply a similar coat of leafing aluminum paint.

514.3.3 Railroad Structure Deck Drain Systems

- (1) Develop and submit shop drawings conforming to [107.17.1](#). Fabricate and install deck drain systems conforming to the shop drawings and as the plans show.
- (2) Set the deck drains in a thick coat of hot asphalt mopped on asphalt panels to anchor the drains in place. Ensure that pipe perforations are not plugged with asphalt. Clear plugged holes without exposing bare metal using engineer-approved methods.

514.3.4 Downspouts

- (1) Fabricate and install downspouts according to the plan details. Make RTRP connections using an epoxy adhesive following the RTRP pipe manufacturer's installation recommendations. Make connections to steel or cast iron components as the plans show.
- (2) If the plans require color matching, paint steel components conforming to [517.3](#) and use RTRP pipe and pipe fittings either pigmented throughout or that have a resin-rich pigmented exterior coat specifically designed for overcoating fiberglass, as the RTRP manufacturer recommends.

- (3) Space brackets every 12 feet on center or closer. Place at least one bracket at each elbow and 2 brackets, one on each side, at each lateral joint connection. Attach to concrete piers, abutments, and decks using adhesive anchor bolts.
- (4) Construct concrete aprons as the plans show.

514.4 Measurement

- (1) The department will measure the Floor Drains and Adjusting Floor Drains bid items as each individual drain acceptably completed.
- (2) The department will measure the Railroad Deck Drain System bid items as each individual railroad structure acceptably completed.
- (3) The department will measure the Downspout bid items by the linear foot acceptably completed, measured in place along the centerline of pipe, from end to end through all fittings.

514.5 Payment

- (1) The department will pay for measured quantities at the contract unit price under the following bid items:

<u>ITEM NUMBER</u>	<u>DESCRIPTION</u>	<u>UNIT</u>
514.0400 - 0499	Floor Drains (type)	EACH
514.0900	Adjusting Floor Drains	EACH
514.1001	Railroad Deck Drain System (railroad structure)	EACH
514.2600 - 2699	Downspout (inch)	LF

- (2) Payment for the Floor Drains bid items is full compensation for providing floor drains including the frames, grates, and lateral pipes.
- (3) Payment for Adjusting Floor Drains is full compensation for providing floor drain frames and inserts including new materials; and for required fabrication, cleaning, and painting.
- (4) Payment for the Railroad Deck Drain System bid items is full compensation for providing the deck drainage system; for shop drawings; and for asphalt coatings.
- (5) Payment for the Downspout bid items is full compensation for providing downspouts; for painting; for attachment hardware; and for providing concrete aprons.