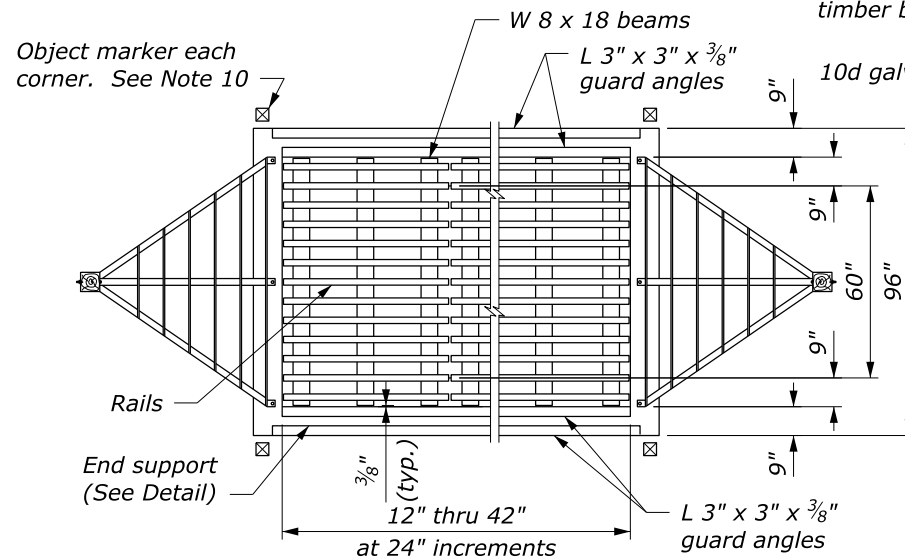
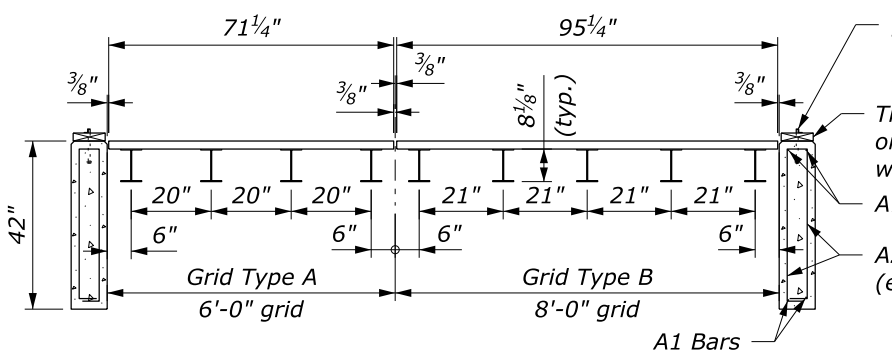


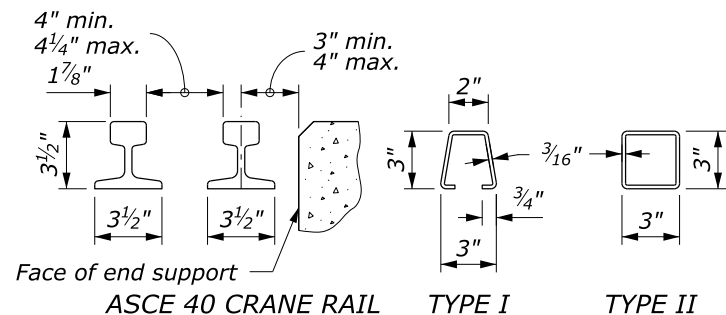
SECTION VIEW



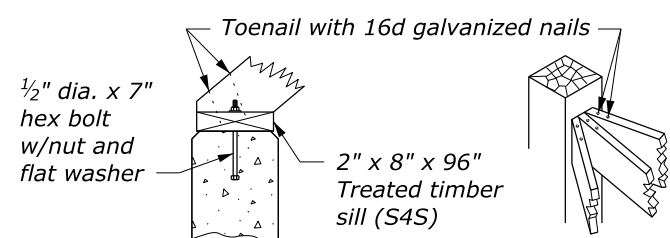
PLAN



STANDARD GRID UNIT TYPES

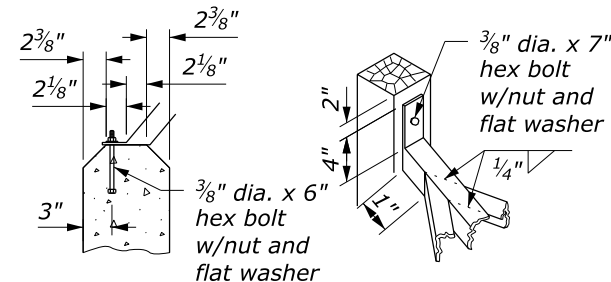


ACCEPTABLE ALTERNATE RAIL



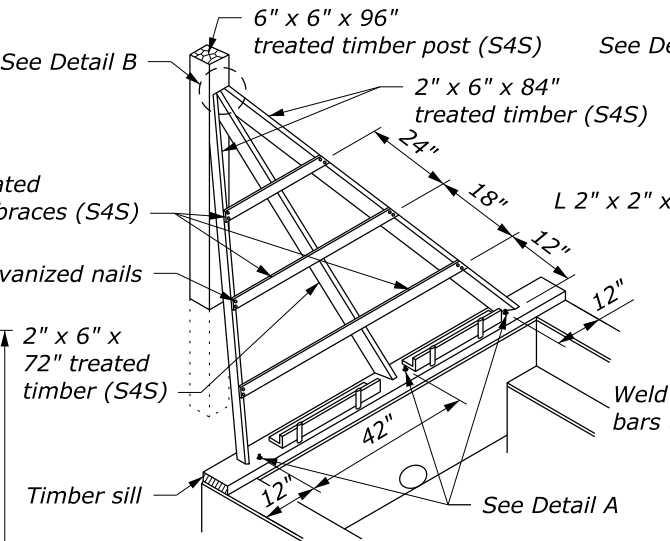
DETAIL A

DETAIL B

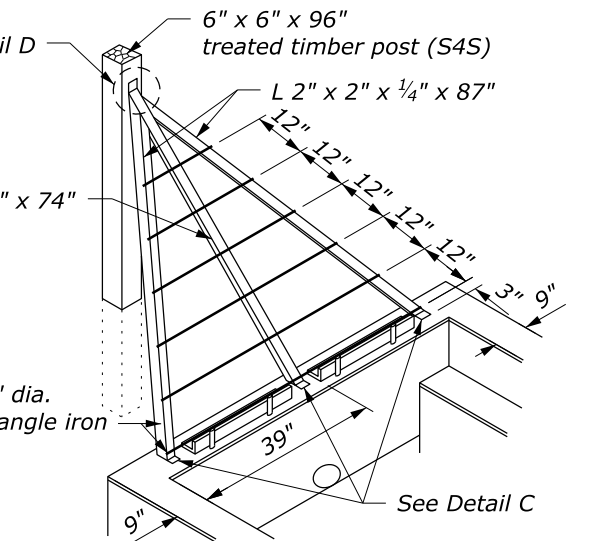


DETAIL C

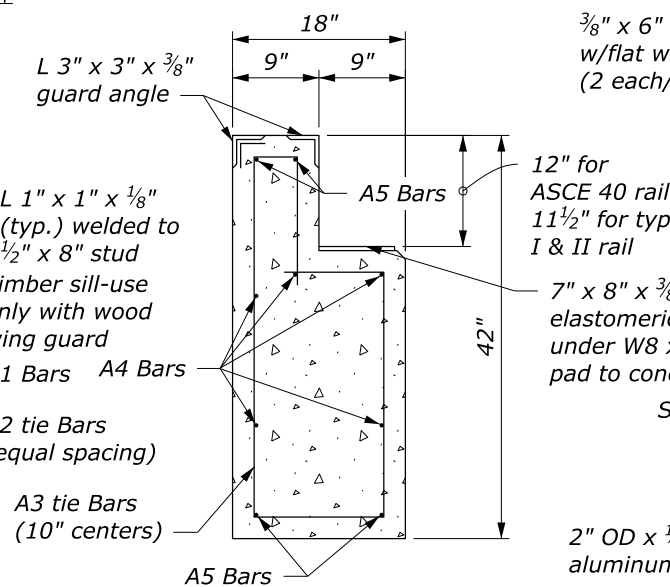
DETAIL D



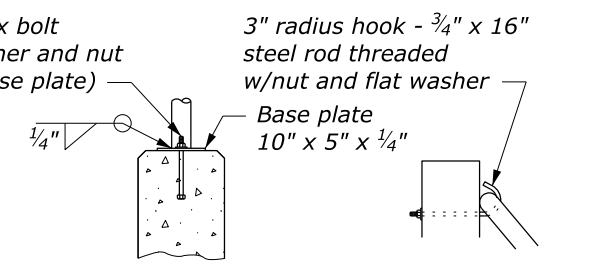
WOOD WING GUARD



ANGLE IRON WING GUARD

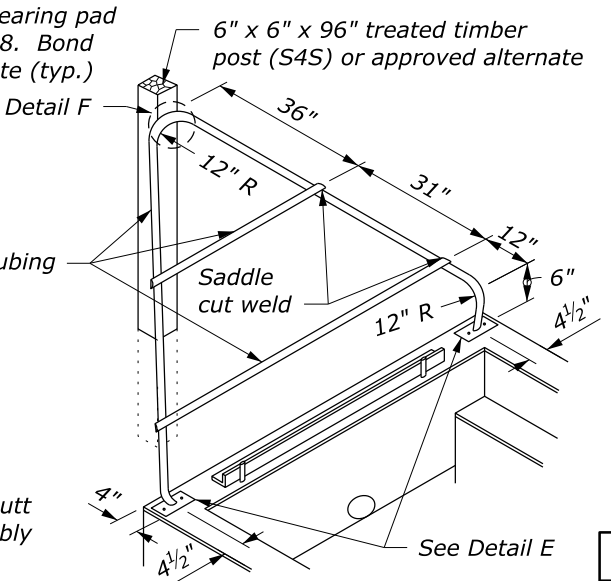


END SUPPORT DETAIL (#4 Reinforcing Bars)



DETAIL E

DETAIL F



ALUMINUM TUBING WING GUARD

NO SCALE

**NOTE:**

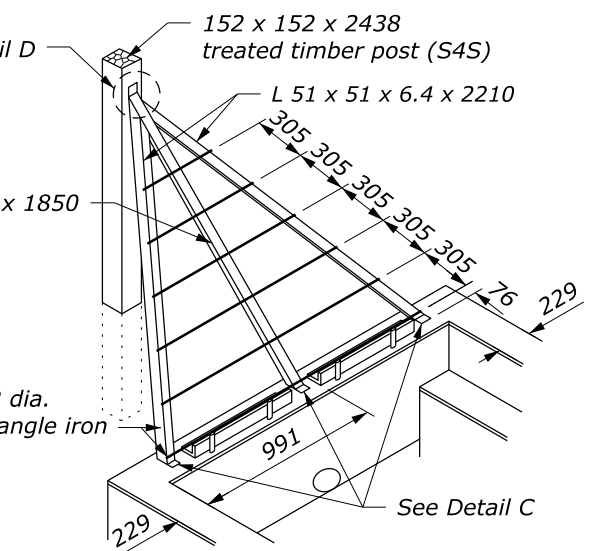
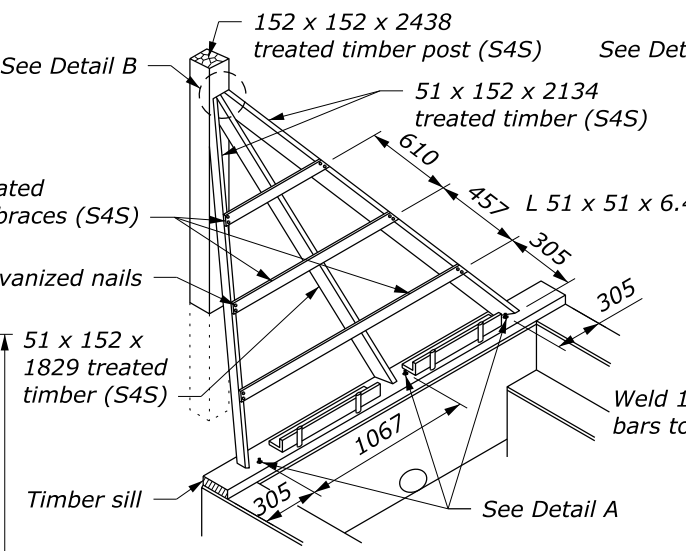
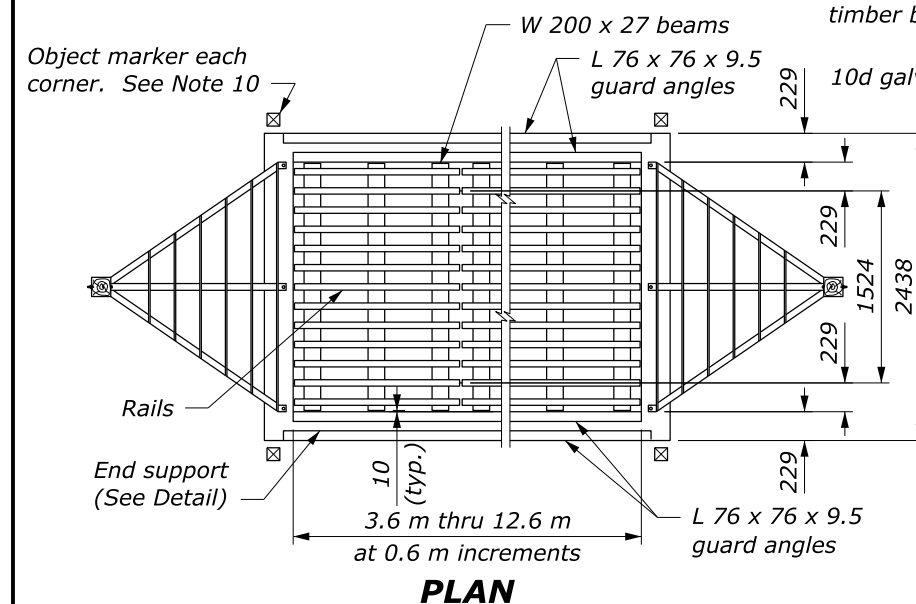
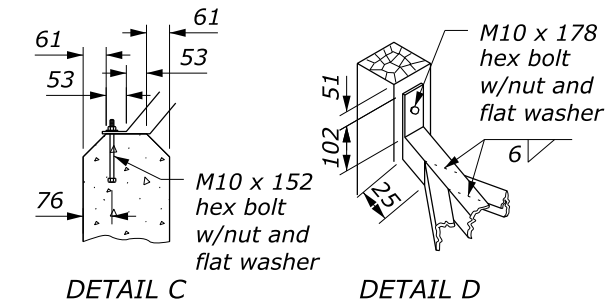
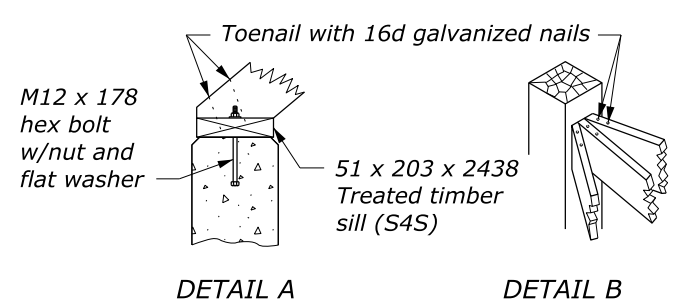
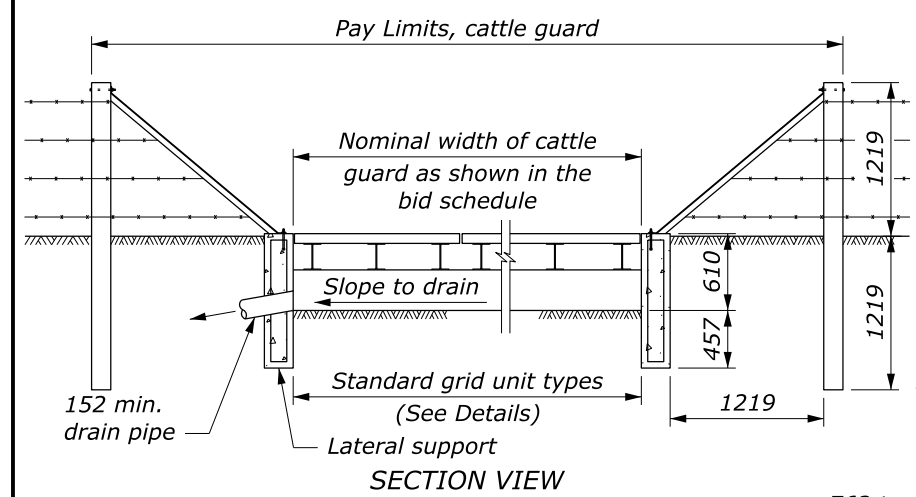
- LOADING: AASHTO HL-93.
- CONCRETE: Chamfer exposed edges 3/4" unless otherwise shown. Give all concrete surfaces a Class 1 finish.
- STRUCTURAL STEEL: Provide rails conforming to the requirements for ASCE 40 crane rail. Provide structural steel for alternate sections conforming to ASTM A 500, Grade B, Copper Steel or ASTM A 618, Grade 2. If the steel does not contain a minimum of 0.2 percent copper, galvanize the alternate sections. All other structural steel conforms to AASHTO ASTM A36 and is coated.
- Provide 2" minimum concrete cover to the face of any bar unless otherwise shown. All bars are #4.
- All welds are continuous 1/4" fillet shop welds. Weld rail or alternate sections on both sides to the W 8 x 18 beams at each intersection. Weld according to Section 555.
- Use aluminum alloy 6061-T6 or 6063-T6 for aluminum tubing.
- Provide timber conforming to AASHTO M 168. Treat timber with chromated copper arsenate according to AASHTO M 133.
- Galvanize all hardware according to AASHTO M 111.
- Construct the cattle guard to conform with the finished roadway grade and template.
- Mount object markers on posts with a minimum height of 48 inches, measured from the bottom of the object marker to the elevation of the nearest edge of the traveled way.
- Install drain pipe as shown where required. Include drain pipe with cattle guard unless otherwise shown.
- Unless otherwise shown in the special contract requirements, shop apply coating according to Section 563. Use SAE-AMS-STD-595, Gray, 36231 for the top coat. Repair any damage to the coating installation.
- Install channels and wood blocking on cattle guards wider than 16 feet to maintain grate spacing as shown on Standard 619-2.
- See Standard 619-3 for optional precast foundation details.

U.S. DEPARTMENT OF TRANSPORTATION, FHWA  
OFFICE OF FEDERAL LANDS HIGHWAY

FLH STANDARD  
619-1

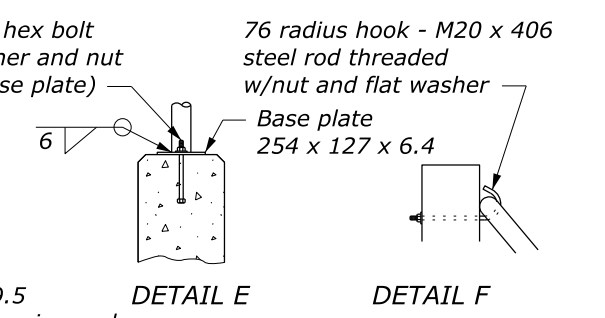
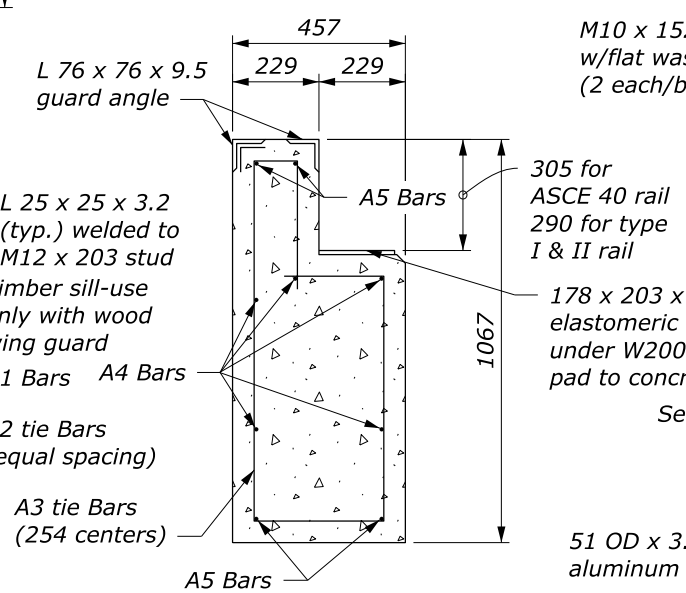
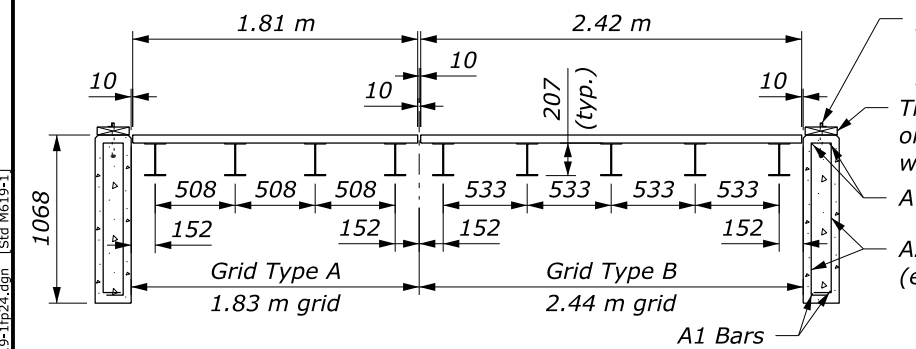
**CATTLE GUARD**

SPECIFICATION  
FP-24  
APPROVED FOR USE  
2/2026

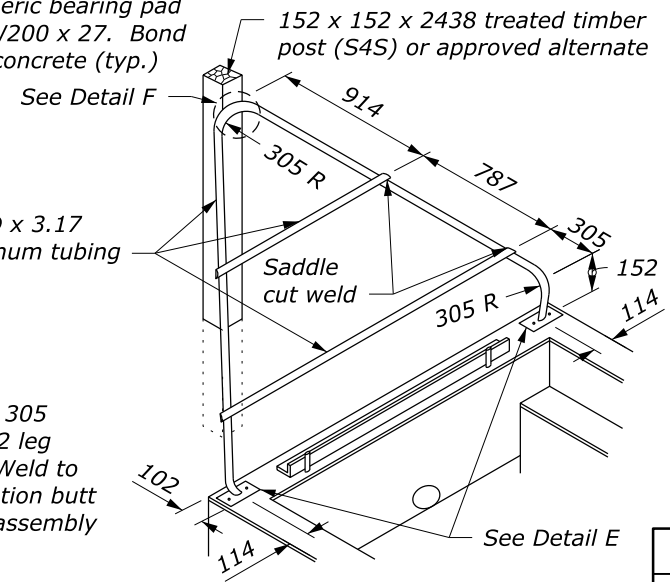


**WOOD WING GUARD**

**ANGLE IRON WING GUARD**

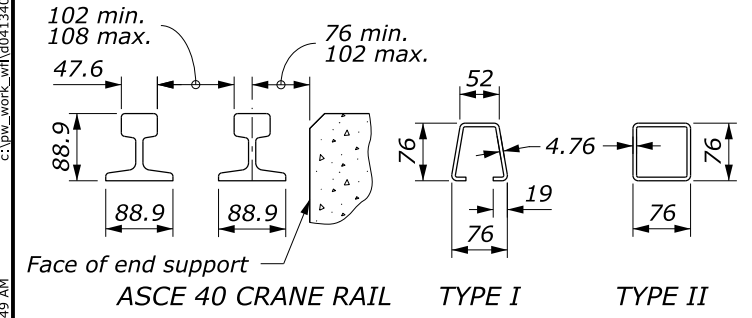


**END SUPPORT DETAIL (#13 Reinforcing Bars)**



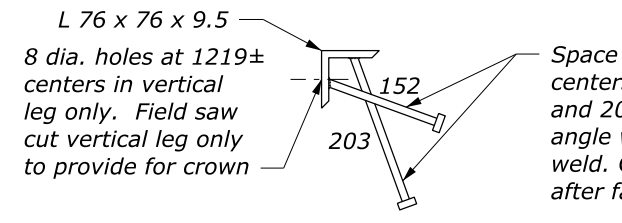
**ALUMINUM TUBING WING GUARD**

**STANDARD GRID UNIT TYPES**



**ACCEPTABLE ALTERNATE RAIL**

**GUARD ANGLE DETAIL (4 required per cattle guard)**



**NOTE:**

- LOADING: AASHTO HL-93.
- CONCRETE: Chamfer exposed edges 19 mm unless otherwise shown. Give all concrete surfaces a Class 1 finish.
- STRUCTURAL STEEL: Provide rails conforming to the requirements for ASCE 40 crane rail. Provide structural steel for alternate sections conforming to ASTM A 500, Grade B, Copper Steel or ASTM A 618, Grade 2. If the steel does not contain a minimum of 0.2 percent copper, galvanize the alternate sections. All other structural steel conforms to AASHTO ASTM A36 and is coated.
- Provide 51 mm minimum concrete cover to the face of any bar unless otherwise shown. All bars are #13.
- All welds are continuous 6 mm fillet shop welds. Weld rail or alternate sections on both sides to the W 200 x 27 beams at each intersection. Weld according to Section 555.
- Use aluminum alloy 6061-T6 or 6063-T6 for aluminum tubing.
- Provide timber conforming to AASHTO M 168. Treat timber with chromated copper arsenate according to AASHTO M 133.
- Galvanize all hardware according to AASHTO M 111.
- Construct the cattle guard to conform with the finished roadway grade and template.
- Mount object markers on posts with a minimum height of 1220 mm, measured from the bottom of the object marker to the elevation of the nearest edge of the traveled way.
- Install drain pipe as shown where required. Include drain pipe with cattle guard unless otherwise shown.
- Unless otherwise shown in the special contract requirements, shop apply coating according to Section 563. Use SAE-AMS-STD-595, Gray, 36231 for the top coat. Repair any damage to the coating installation.
- Install channels and wood blocking on cattle guards wider than 4.8 m to maintain grate spacing as shown on Standard M619-2.
- See Standard M619-3 for optional precast foundation details.

This drawing contains **Metric** units of measure. Dimensions without units are millimeters.

U.S. DEPARTMENT OF TRANSPORTATION, FHWA OFFICE OF FEDERAL LANDS HIGHWAY	FLH STANDARD M619-1
	SPECIFICATION FP-24
	APPROVED FOR USE 2/2026

**CATTLE GUARD**

NO SCALE

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