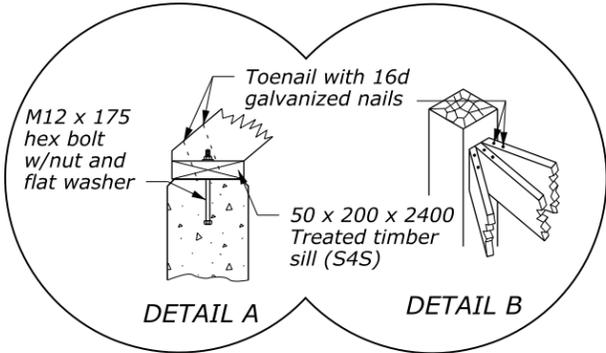
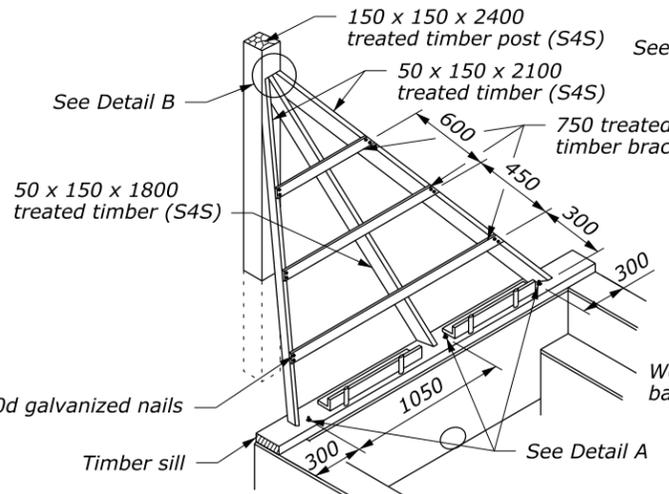
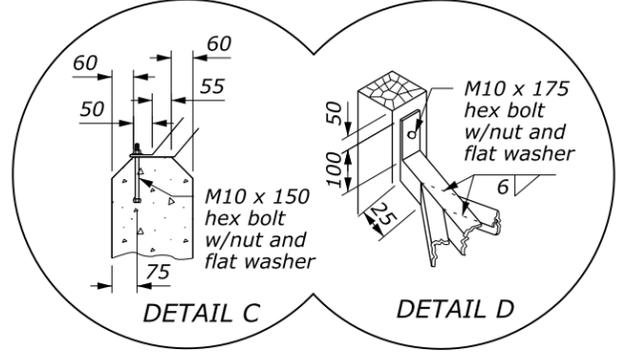
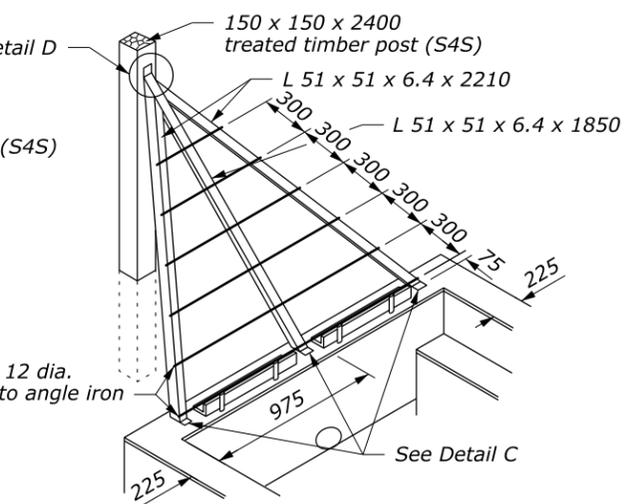


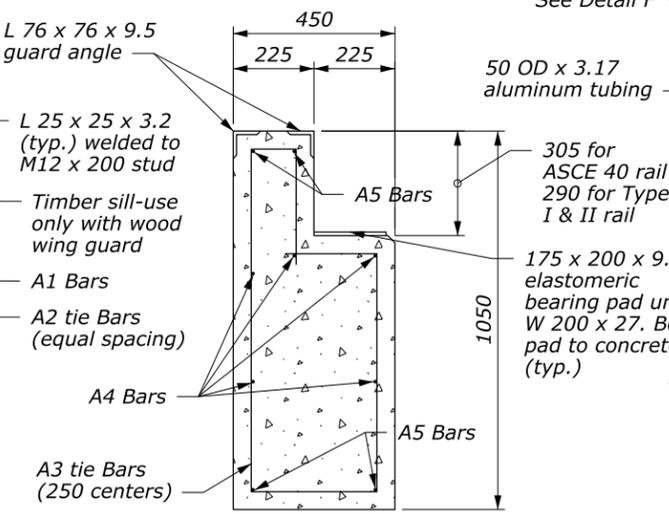
**ACCEPTABLE ALTERNATE RAIL**



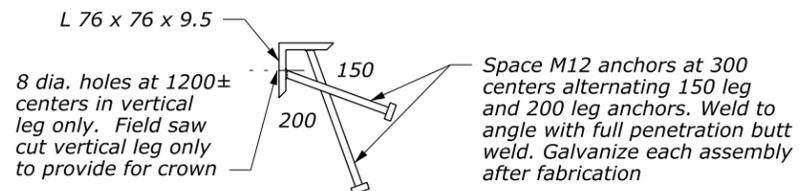
**WOOD WING GUARD**



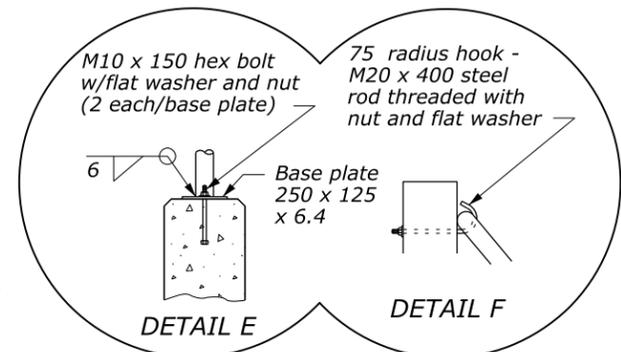
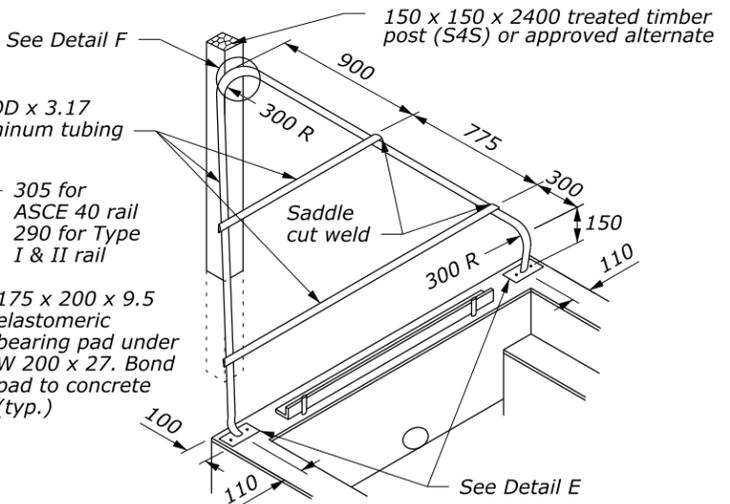
**ANGLE IRON WING GUARD**



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



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



**ALUMINUM TUBING WING GUARD**

**NOTE:**

- LOADING: AASHTO MS18.
- CONCRETE: Chamfer exposed edges 20 mm unless otherwise shown. Give all concrete surfaces a Class 1 finish.
- STRUCTURAL STEEL: Rails conform to the requirements for ASCE 40 crane rail. Structural steel for alternate sections conforms 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 painted.
- The minimum concrete cover to the face of any bar is 50 mm 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. Conform all welding to Section 555.
- Use aluminum alloy 6061-T6 or 6063-T6 for aluminum tubing.
- All timber conforms 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.
- Place one object marker at each corner of the cattle guard as shown. Mount object markers on 100 x 100 x 1950 posts with the reflector located 1050 mm above the elevation of the lateral support concrete.
- Install drain pipe as shown where required. Drain pipe is included in cattle guard unless otherwise shown.
- Unless otherwise shown in the Special Contract Requirements, shop apply paint system 2 according to Section 555 and color the top coat according to Federal Standard 595B, Gray, 36231. Repair any damage to the paint system during 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.
- Dimensions without units are millimeters.

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION FEDERAL LANDS HIGHWAY	
METRIC STANDARD	
<b>CATTLE GUARD</b>	
STANDARD APPROVED FOR USE 3/1996	STANDARD
REVISED: 6/1997 6/2005	M619-1
DRAFT: 6/2008	

NO SCALE

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