**Construction Notes:**

This rail may be slip-formed if approved by the Engineer when epoxy adhesive is used. Do not use this railing on bridges with expansion joints providing more than 3" movement.

Slip-forming parapets are not allowed if anchor bolts are cast with parapet wall. If rail is slip-formed, apply an epoxy heavy bead 3" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a 1/2" rail heavy epoxy bead with Type VJ, Class C or Type II epoxy when field painting. Item 464, "Field Cleaning and Painting Steel". Sleeve members and anchor bolts must receive galvanization prior to installation and when field painted after installation unless directed otherwise by Engineer. Anchor bolts must be 5/8" dia. ASTM A307 or A563 Grade B with one hex nut and one hardened steel washer (ASTM F468). Nuts must conform to ASTM A563 requirements. Field threaded rods to parapet using a Type III, Class C, D, E or F anchor adhesive. Minimum adhesive anchor embedment depth is 3". Anchor adhesive chosen must be able to achieve a nominal bond strength in tension of 8.5 kips (edge distance must be accounted for). Systems signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hex size, driving, and clean up, must be in accordance with Item 450, "Hauling".

Optional cast-in-place anchor bolts must be 5/8" dia. ASTM A307 or A5 with one hardened steel washer (ASTM F468) placed under each hex nut or ASTM A307 or A5 threaded rods with one tack welded hex nut each and with one hex nut and one hardened steel washer (ASTM F468) each. Nuts must conform to ASTM A563 requirements. "Unless otherwise required by the Engineer for approval prior to use. Anchor bolts must be specified Class "D" (HPC) if required elsewhere. Epoxy coated or galvanized all reinforcing if slab bars are epoxy coated or galvanized. Provide Grade 60 reinforcing steel. Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U, and V unless noted otherwise. Provide bar laps, where required, as follows:

- 4 bar lap = 12" uncoupled or galvanized
- 8 bar lap = 7" uncoupled or galvanized
- Epoxy coated = 24"

**General Notes:**

Designed according to AASHTO LRFD Specifications. No test on this railing on bridges with expansion joints providing more than 3" movement. Provide all reinforcement details shown on this standard.業務细节 used in this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications. For all rails, submit erection drawings showing section (lengths, splice locations, rail post spacing and anchor bolt setting for approval). Average weight of railing 146 psf = total 122 psf = Conc. with no Overlay

24 psf = Steel

Lower dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are cut-to-out-of-bar.