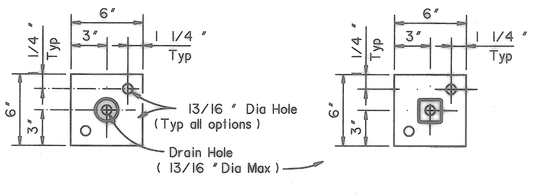
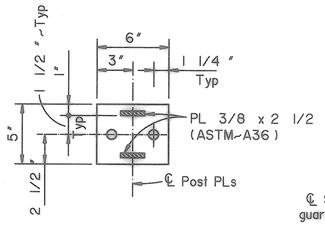
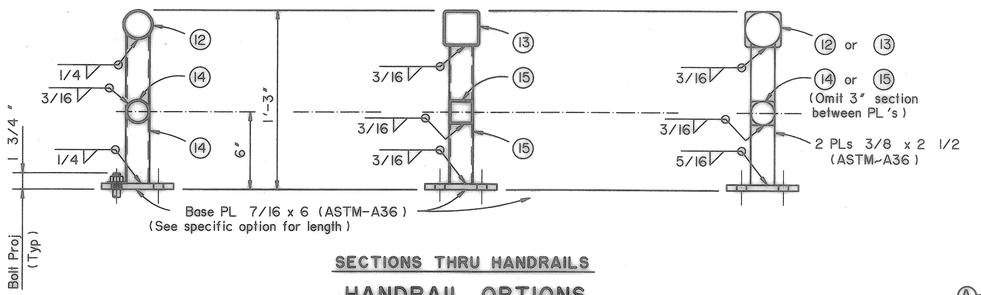




SECTIONS THRU HANDRAIL POSTS



SECTIONS THRU HANDRAILS

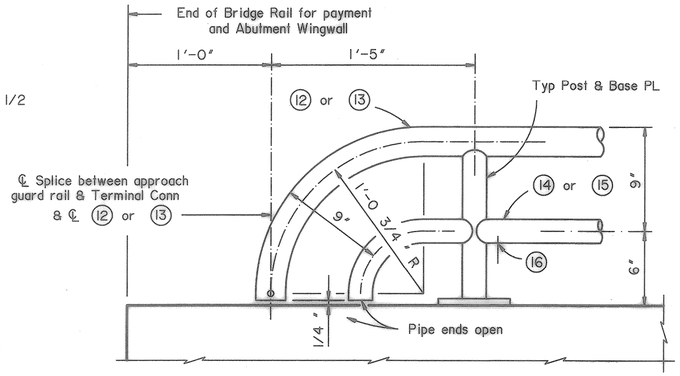
HANDRAIL OPTIONS

(12) 2 1/2 " Std Pipe (ASTM-A53)(E or S, Gr A or B) or
2 7/8 " OD x .125" (API-5LX42) or
2 7/8 " OD x .109" (API-5LX52)

(13) TS 3 x 3 x .120" (A36 or A500 Gr B)

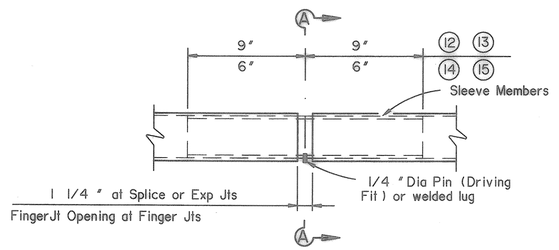
(14) 2" Std Pipe (ASTM-A53)(E or S, Gr A or B) or
2 3/8 " OD x .125" (API-5LX42) or
2 3/8 " OD x .109" (API-5LX52)

(15) TS 2 x 2 x .120" (A36 or A500 Gr B)



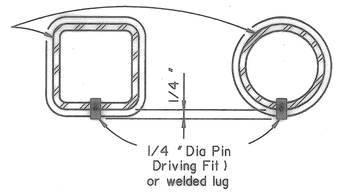
HANDRAIL TERMINAL DETAIL

(16) 3/8 " Dia Hole in bottom of pipe or tube
(Minimum of 1 hole between posts ~ Typ)

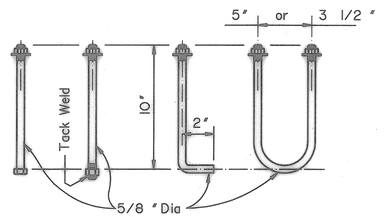


HANDRAIL SPLICE DETAIL

Note: The difference between the outside dimension of sleeve and inside dimension of rail member shall not exceed .167" before galvanizing. Minimum wall thickness of sleeve shall be .120".



SECTIONS A-A



HANDRAIL ANCHOR BOLT OPTIONS

Note: Threaded rods with a minimum diameter of .557" and rolled threads may be used in lieu of bolts.

RAIL DATA FOR HORIZONTAL CURVES

	RADIUS TO FACE OF RAIL	MAX CHORD LENGTH	CONSTRUCT OR FABRICATE
Handrail	Over 2800'	29'-0"	Straight rail sections
	Over 1400' thru 2800'	14'-6"	(17) To required radius or to chords shown
	Over 700' thru 1400'	7'-3"	
	Thru 700'	Zero	(17) To required radius

(17) Shop drawings required (may be submitted as 11" x 17" prints provided they are clearly legible).

For railing not requiring shop drawings, erection drawings showing handrail section lengths, post spacing, and anchor bolt setting shall be submitted to the Area Engineer for approval. If handrail requires shop and erection drawings, these drawings shall be submitted to the Bridge Engineer for approval.

GENERAL NOTES:

This rail has been structurally evaluated without handrail to equal the strength of railings with like geometry which have been crash tested to NCHRP Report 230 SL-2 criteria.

Rail Type C201 is comprised of the following parts: concrete parapet including concrete above wingwall, all reinforcing shown, including that embedded in the slab or wingwalls, Terminal Connector, hand rail, and all anchorage provisions including bolts, nuts and washers. All these parts are included in price bid per linear foot of rail.

All steel components except reinforcing shall be galvanized unless otherwise shown on plans.

All concrete shall be Class C. Chamfer all exposed corners. Epoxy coat Bars V, W, S and U if slab bars are epoxy coated.

All reinforcing shall be grade 60.

Anchor bolts shall be 5/8 " Dia ASTM A307 Grade A bolts (or A36 threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer at each bolt. Threaded rods may be 0.557" minimum diameter with rolled threads. Nuts shall conform to A563 requirements. The untapped blanks shall be galvanized prior to cutting the threads. Threads for bolts and nuts shall have Class 2A and 2B fit tolerances in accordance with ANSI B1.1.

Face of rail, post and parapet shall be vertical transversely unless otherwise approved by the Engineer. Handrail posts shall be perpendicular to top of adjacent concrete parapet grade. Grout may be used under handrail post base plates if necessary.

Only one handrail option shall be used throughout an entire project.

Handrail sections shall include not less than two posts nor more than four (except at Abutments).

Exposed edges of handrail and handrail posts shall be rounded or chamfered to approximately 1/16 " by grinding.

Average weight of railing: 238 plf ~ Conc (with no Overlay)
10 plf ~ Steel (Std Pipe option)

ACC:
(LV=1,2 for English, 1,3 for Metric)
LEVELS DISPLAYED
1 2

RECORD PLANS
12-17-2002

Texas Department of Transportation
Design Division (Bridge)

COMBINATION RAIL

TYPE C201

FILE: Rlstd27B.dwg	DN: JJP	CK: RLR	DW: DRG	CK: LDS	STD: BS82
ORIG DATE: JANUARY 1996	DIST	FED RDS	FEDERAL AID PROJECT		SHEET
REVISIONS		6			50B
	COUNTY		CONTROL	SECT	JOB	HIGHWAY