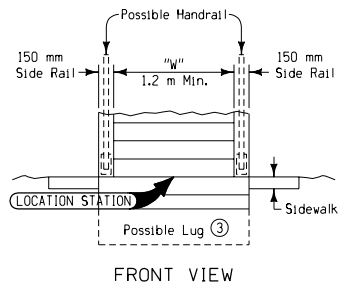
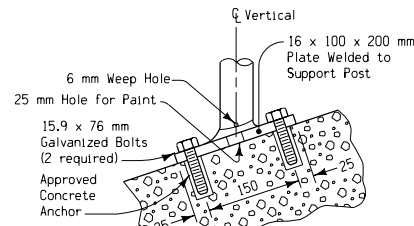


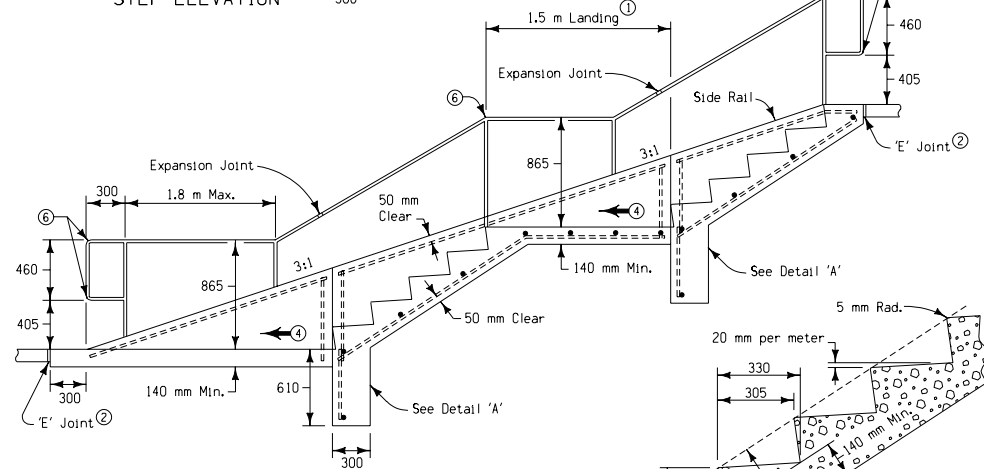
STEP ELEVATION



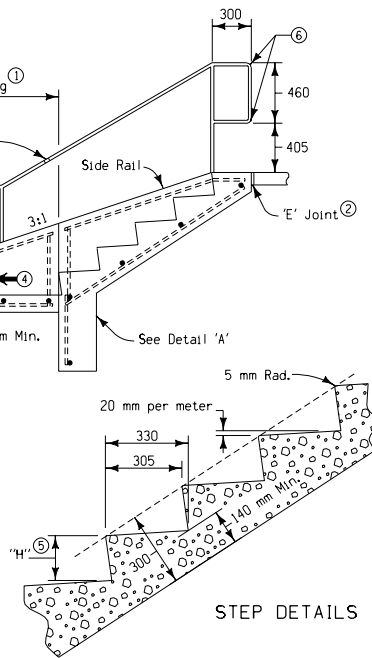
FRONT VIEW



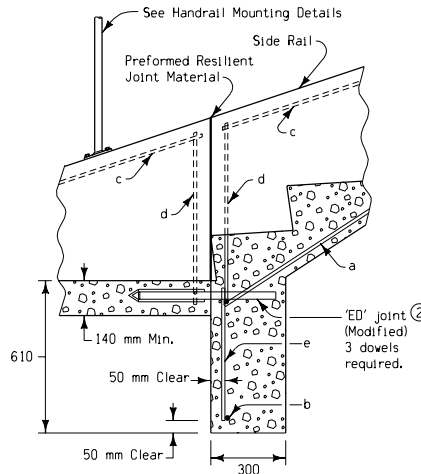
Alternate designs may be submitted for approval.
HANDRAIL MOUNTING DETAILS



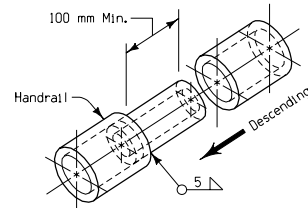
STEPS AND LANDING ELEVATION



STEP DETAILS



DETAIL 'A'



HANDRAIL FABRICATION AND EXPANSION JOINT DETAILS

GENERAL NOTES:

Materials and methods of construction shall be in accordance with current Standard and Supplemental Specifications.

Details for construction of concrete steps and handrails shown hereon are typical only and are not intended to depict specific installations. Refer to project plans for requirements of individual locations. Alternate design details may be submitted for approval, including aluminum handrail installations.

All concrete for steps shall be Class 'C' structural concrete. All concrete shall be thoroughly tamped and spaded against forms to leave a smooth surface without honeycomb. Finish of step treads and top of side rails to be steel troweled and then brush finished with brush strokes on treads at right angles to width and on the side rails parallel to the handrail.

All reinforcing used in construction of steps shall be #15 bars placed as shown. Reinforcing is required only when four or more steps (risers) are constructed.

The price bid per cubic meter for "Steps, P.C. Concrete" shall be considered full compensation for the construction of steps including handrail and all appurtenances, excavation, backfill, and reinforcing steel, as well as all other work and materials necessary for construction described hereon.

Special Note: (Steel Handrail)

Details shown are typical. Alternate designs may be submitted for approval. Rail shall be standard 48.3 millimeter round black pipe with all welded connections ground smooth. Railings shall not rotate within their fittings. Railings shall be painted with one shop coat and two field coats of aluminum paint or approved equivalent. Any exposed ends of railing shall be capped. Maximum length of rail segment between support posts is 1.8 meters. Supports shall be evenly spaced for the length of railing required. Bolts and hardware used in construction of railing required shall be galvanized. Handrail is required on both sides when three or more steps are constructed.

Special Note: (Extra Concrete)

Landing shall be used where change in direction of steps is required or where desired for lengthy installations. In general, a maximum of 10 steps may be provided without a landing. Where more than 10 steps are required and room is available, a landing may be provided at regular intervals. Landing shall be 1.5 meters maximum (including 330 millimeters of tread length) unless specified otherwise.

- ① Landing length includes 330 millimeters of step tread for overall measurement.
- ② See Standard Road Plan RH-52.
- ③ Lug, as indicated, is required only where 4 or more steps are constructed. One lug shall be required for each connecting series of steps after a landing.
- ④ 20 millimeters per meter.
- ⑤ "H" is 180 millimeters for slope of 3:1. "H" may range from 140 millimeters to 190 millimeters for slopes other than 3:1 so risers are equal height.
- ⑥ Edges shall be free of sharp or abrasive elements. Edges shall have a minimum radius of 3.2 mm.

All dimensions given in millimeters unless noted.

SCHEDULE FOR CONCRETE STEPS "W" = 1.2 m										
No. of Steps	1	2	3	4	5	6	7	8	9	10
Concrete (m ³)	0.3	0.5	0.7	0.9	1.2	1.4	1.7	1.9	2.2	2.5

One 1.5 m Lug = 0.3 m³. One 1.2 x 1.5 m Landing = 0.4 m³.
Landing quantity excludes 330 mm of step tread in the calculations.
⑧ Quantities shown are computed up to the dashed line shown in 'STEP DETAILS'.

REINFORCING SCHEDULE				
Mark	Size	Length	Spacing	No. Req.
a	#15	Varies	275	5 ⑥
b	#15	"W" + 200	600 Max.	Varies
c	#15	Varies	Shown	4
d	#15	Varies	Shown	⑦
e	#15	510	280	5 ⑥

⑥ One required for each additional 300 mm of "W" over 1.2 m
⑦ Two for each landing.

METRIC VERSION	M Iowa Department of Transportation Project Development Division	
	STANDARD ROAD PLAN	RB-1
	REVISION: Add radius dimension to Step Elevation Detail.	REVISION NO. 8
	APPROVED: <i>[Signature]</i> DESIGN METRICS ENGINEER 11-05-99	REVISION DATE 02-11-00
CONCRETE STEP DETAILS		