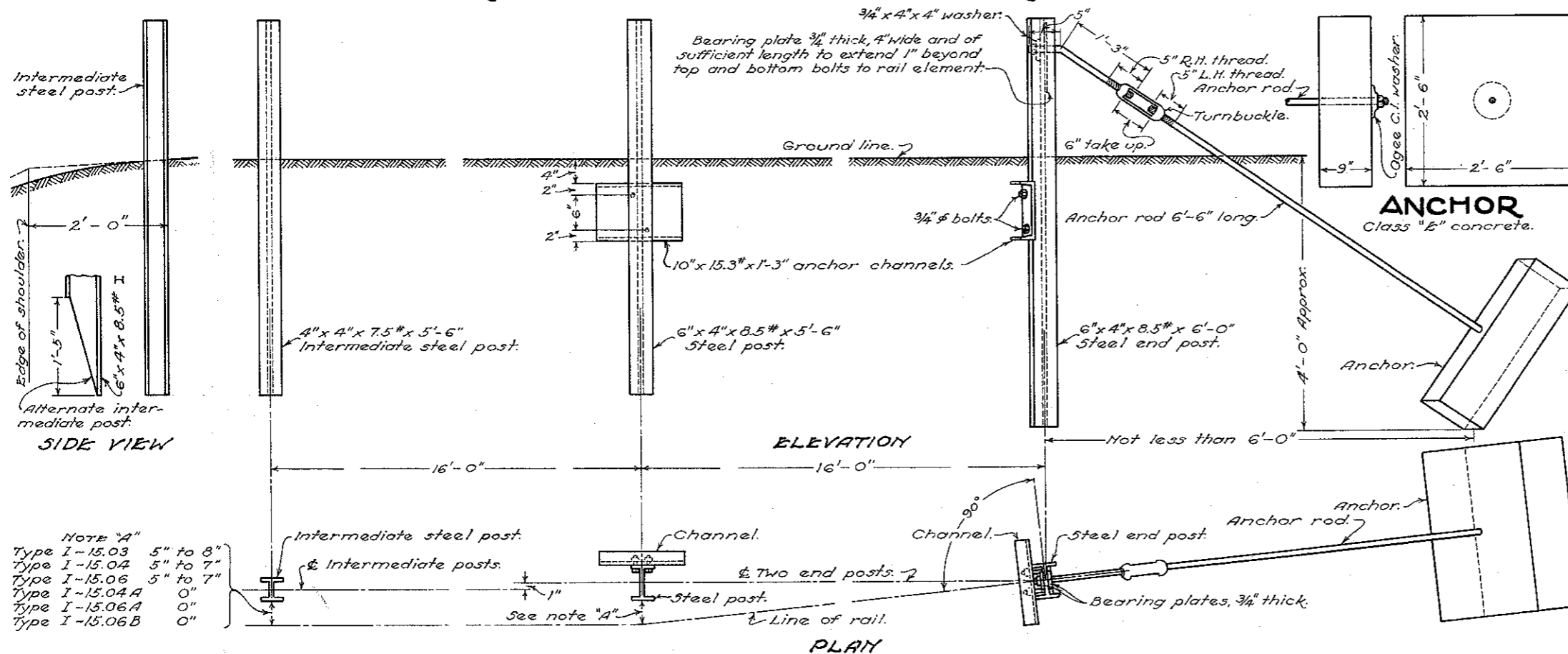


STANDARD GUARD RAIL

THREE END POSTS WITH ANCHOR



NOTES

GENERAL:—Guard rail details hereon are shown to depict various requirements of the Standard Construction and Material Specifications. These details and notes are to supplement the Specifications. In furnishing and erecting guard rail the drawings and the Specifications should be used together. The information hereon also supplements Standard Construction Drawings I-15 No. 2 and I-15 No. 3 which show the various types of guard rail.

POSTS:—Posts and braces shall conform to the requirements of Specifications shown hereon. Intermediate posts shall be 4"x4"x7.5 lb. per foot H beams or 6"x4"x8.5 lb. per foot I beams pointed as shown hereon. Steel for posts shall meet the requirements of Sec. M-7.4 (a), Structural Steel. Lateral analysis determination only will be required. Check analysis may be made by the Laboratory from the finished material.

All posts shall be driven or set in the ground. The height of posts above the ground shall be as follows:—
 For Flexible Steel Plates I-15.03 and Steel Beam I-15.05—Top of all posts 1/4" below top of rail.
 For cable I-15.04 or I-15.04 A, tape I-15.06 or I-15.06 A, and Fabric Band I-15.06 B — Top of intermediate posts level with top of bracket or clamp. End posts 3/4" higher than intermediate posts.
 For cable or tape fastened with 3/8" "U" bolts—Top of all posts 1 1/2" above top of uppermost cable or tape.
 3/8" "U" bolts or brackets must be used to fasten cable or tape to steel posts where the plans permit fastening with "J" or "L" bolts to wood posts.
 If cable, tape or fabric band is fastened with non-spring brackets a 1/4"x3"x1/4" steel plate is required between the rail elements and the post if either edge of the bracket fails to have bearing on the face of the post.
 Post spacing measured along the center line of the rails shall be as follows:—
 For Flexible plate 16'
 For cable, traffic tape and woven wire band 16'
 On curves having radii less than 600' they shall be spaced as called for in the Specifications.
 For steel beam type 12'-6".

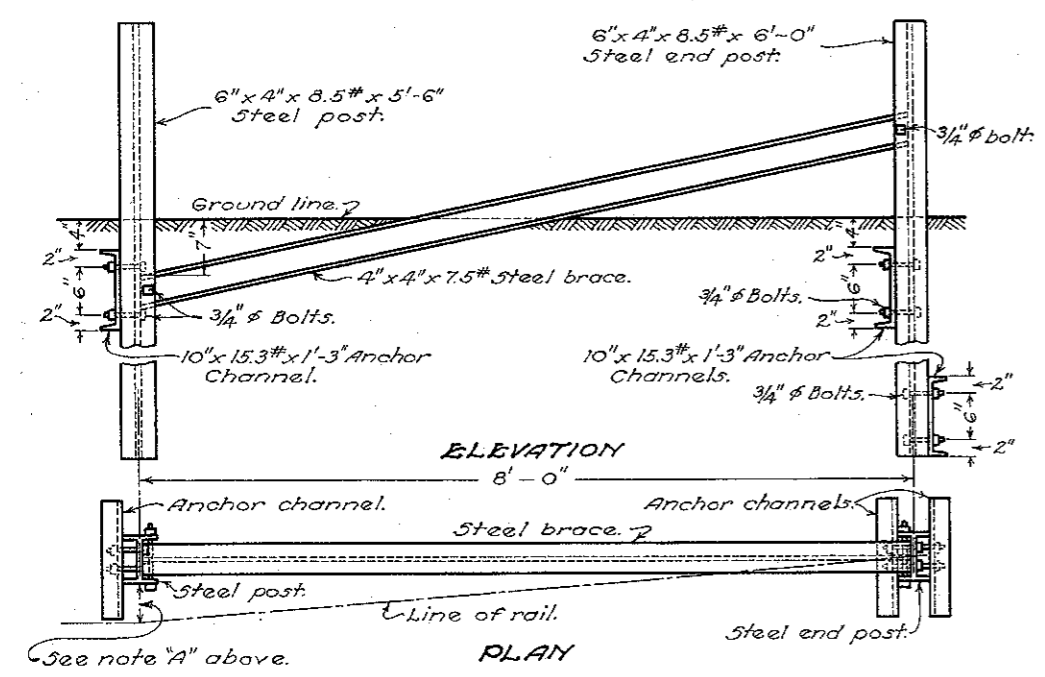
END ANCHORAGE:—Deadmen shall be used for end anchorage except where physical features such as bridges, drives, road intersections, etc. make this impractical, in which case the end anchorage shall be of the bracing type as shown hereon. In lieu of the concrete anchor shown a 30"x30" bituminous coated metal anchor made of two 10 gage (or thicker) corrugated metal plates with their corrugations at right angles and welded together may be used. The corrugations shall have a pitch of 5 3/4" to 6" and a depth of 1 1/2" to 2". A 4"x3"x8 gage bearing plate shall be used on the anchor rod. For runs of 160' or less the springs may be omitted from the tension assembly at one end.

FITTINGS:—Wedge connections, bolts, nuts, turnbuckles, anchor rods, brace rods, bearing plates and washers, except those of cast iron, shall be galvanized to conform with the requirements of the Material Details.

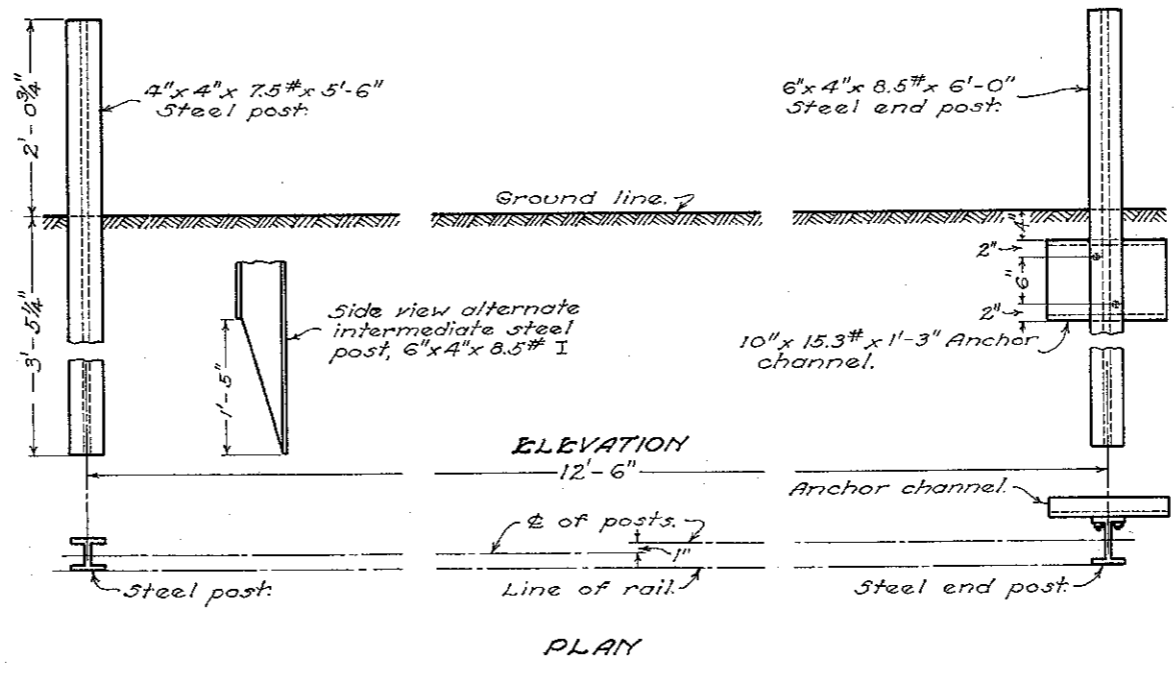
RAILS:—The various types of rail shall be erected and conform with the requirements of the Specifications and Material Details.

PAINTING:—Guard rail and appurtenances, except galvanized parts and posts, shall be painted with one shop coat as specified in Sec. I-15.08 and two field coats of white as specified in Sec. I-15.10.
 The entire length of the posts shall be given one shop coat of paint as specified in Sec. I-15.08 and the upper three feet of the posts shall be given two shop coats of white paint meeting the requirements of Sec. M-9.6.

TWO END POSTS WITH BRACING



TWO END POSTS FOR BEAM TYPE RAIL

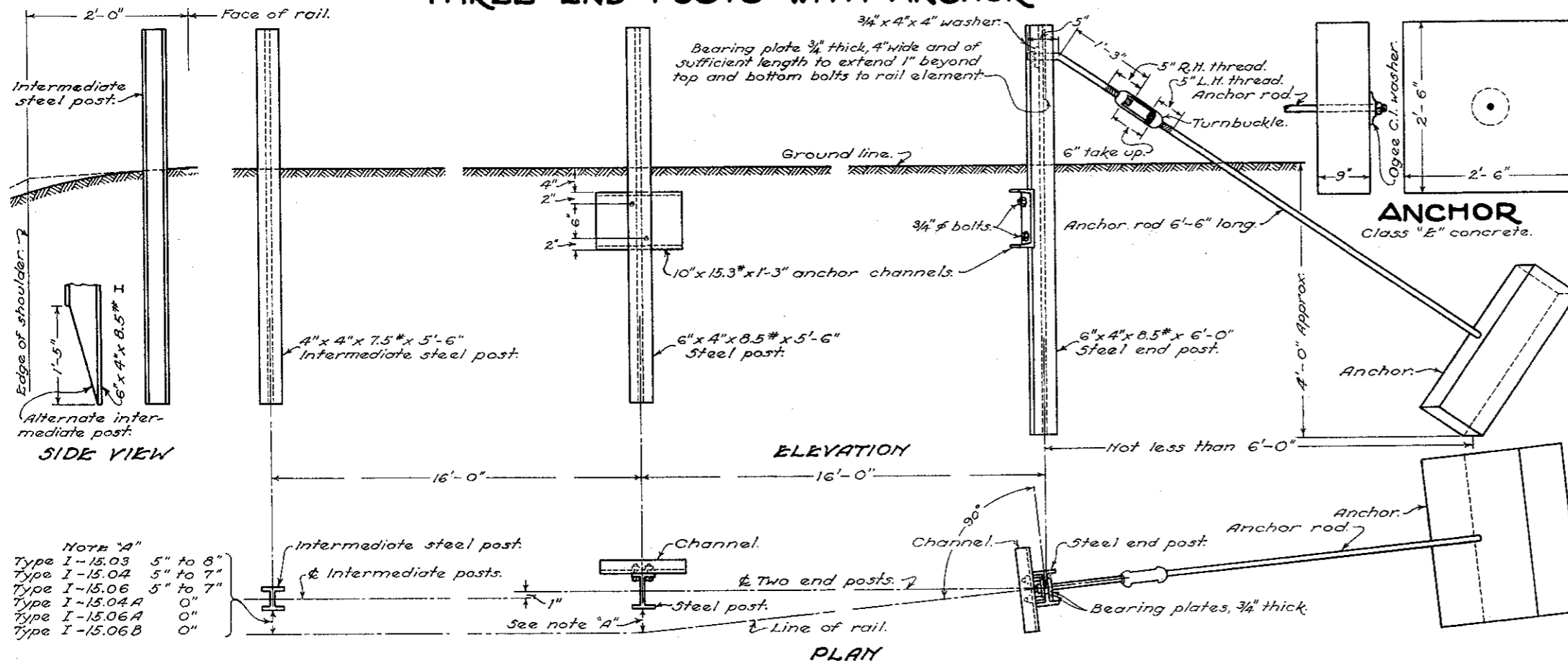


BUREAU OF LOCATION & RIGHT OF WAY OHIO DEPARTMENT OF HIGHWAYS	
GUARD RAIL	
STANDARD CONSTRUCTION DRAWING	I-15 No. 7
APPROVED <u>M.D.S.</u> CHIEF ENGINEER	

DATE:
6-16-'41

STANDARD GUARD RAIL

THREE END POSTS WITH ANCHOR



NOTES

GENERAL: Guard rail details hereon are shown to depict various requirements of the Standard Construction and Material Specifications. These details, and notes are to supplement the Specifications. In furnishing and erecting guard rail the drawings and the Specifications should be used together. The information hereon also supplements Standard Construction Drawings I-15 No. 2 and I-15 No. 3 which show the various types of guard rail.

POSTS: Posts and braces shall conform to the requirements of Specifications shown hereon. Intermediate posts shall be 4"x4"x 7.5 lb. per foot I beams or 6"x4"x 8.5 lb. per foot I beams pointed as shown hereon. Steel for posts shall meet the requirements of Sec. M-74 (a), Structural Steel. Lateral analysis determination only will be required. Check analysis may be made by the Laboratory from the finished material.

All posts shall be driven or set in the ground. The height of posts above the ground shall be as follows: For Flexible Steel Plates I-15.03 and Steel Beam I-15.05 - Top of all posts 1/4" below top of rail.

For cable I-15.04 or I-15.04 A, tape I-15.06 or I-15.06 A, and Fabric Band I-15.06 B - Top of intermediate posts level with top of bracket or clamp. End posts 3/4" higher than intermediate posts.

For cable or tape fastened with 3/8" U bolts - Top of all posts 1/2" above top of uppermost cable or tape.

3/8" U bolts or brackets must be used to fasten cable or tape to steel posts where the plans permit fastening with "J" or "L" bolts to wood posts.

If cable, tape or fabric band is fastened with non-spring brackets a 14"x3"x 1/4" steel plate is required between the rail elements and the post if either edge of the bracket fails to have bearing on the face of the post.

post spacing measured along the center line of the rails shall be as follows: For Flexible plate 16'.

For cable, traffic tape and woven wire band 16'. On curves having radii less than 600' they shall be spaced as called for in the Specifications.

For steel beam type 12'-6".

END ANCHORAGE: Deadmen shall be used for end anchorage except where physical features such as bridges, drives, road intersections, etc. make this impractical, in which case the end anchorage shall be of the bracing type as shown hereon. In lieu of the concrete anchor shown a 30"x30" bituminous coated metal anchor made of two 10 gage (or thicker) corrugated metal plates with their corrugations at right angles and welded together may be used. The corrugations shall have a pitch of 5/8" to 6" and a depth of 1/2" to 2". A 4"x3"x 8 gage bearing plate shall be used on the anchor rod. For runs of 160' or less the springs may be omitted from the tension assembly at one end.

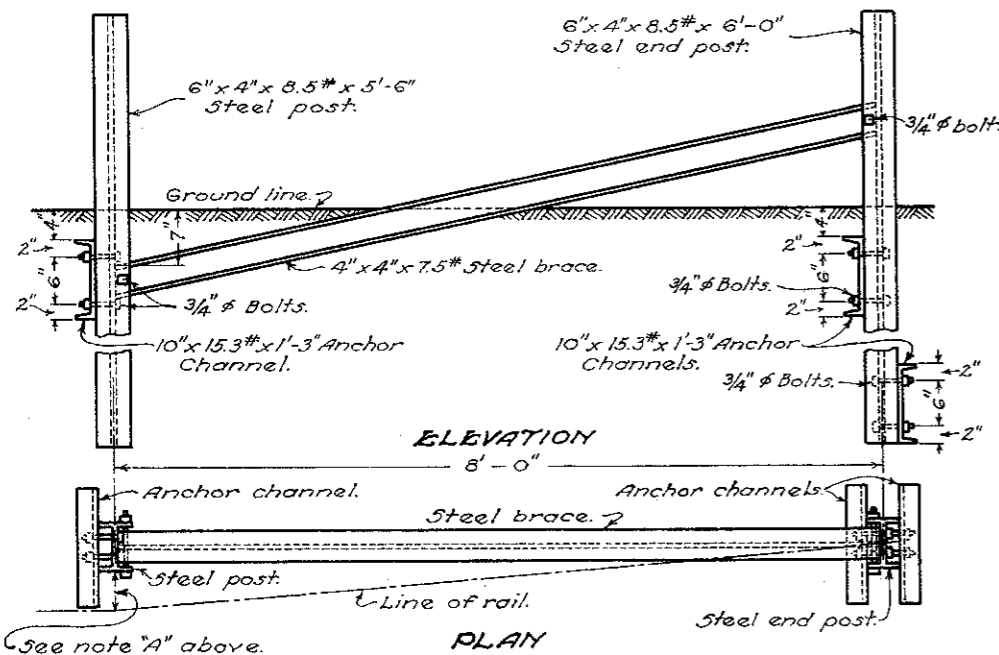
FITTINGS: Wedge connections, bolts, nuts, turnbuckles, anchor rods, brace rods, bearing plates and washers, except those of cast iron, shall be galvanized to conform with the requirements of the Material Details.

RAILS: The various types of rail shall be erected and conform with the requirements of the Specifications and Material Details.

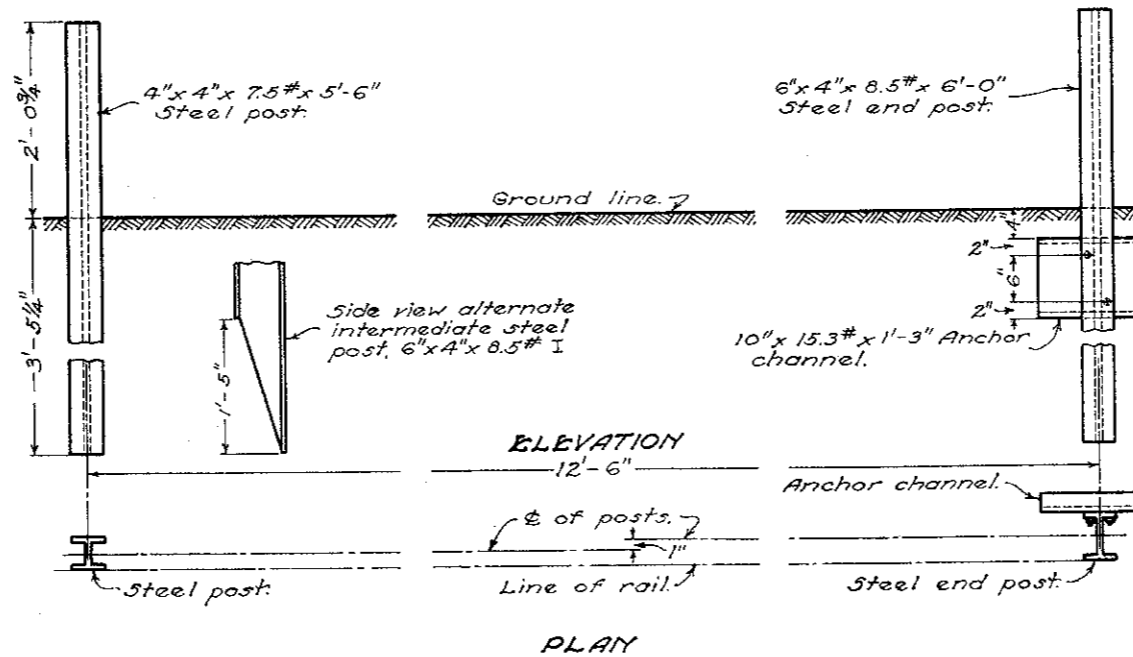
PAINTING: Guard rail and appurtenances, except galvanized parts and posts, shall be painted with one shop coat as specified in Sec. I-15.08 and two field coats of white as specified in Sec. I-15.10.

The entire length of the posts shall be given one shop coat of paint as specified in Sec. I-15.08 and the upper three feet of the posts shall be given two shop coats of white paint meeting the requirements of Sec. M-9.6.

TWO END POSTS WITH BRACING



TWO END POSTS FOR BEAM TYPE RAIL



BUREAU OF LOCATION & RIGHT OF WAY
OHIO DEPARTMENT OF HIGHWAYS

GUARD RAIL

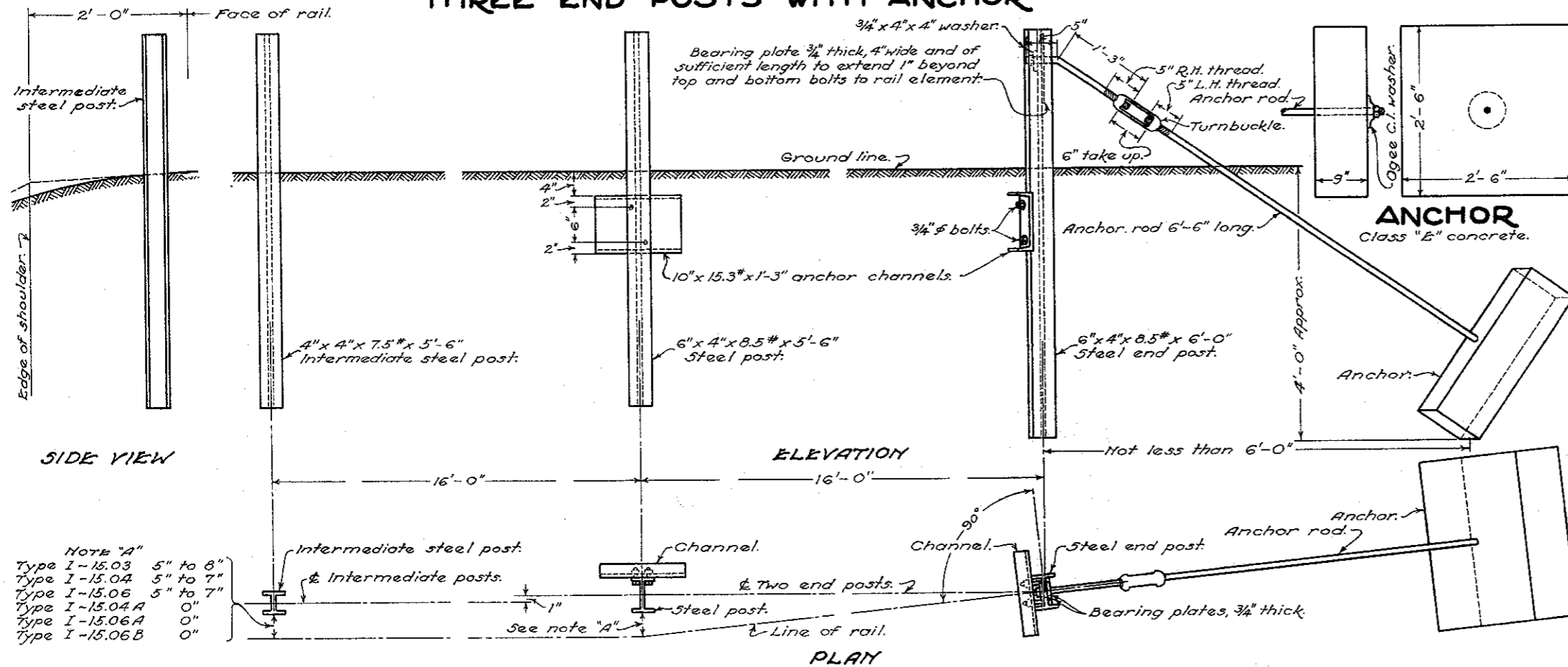
STANDARD CONSTRUCTION DRAWING I-15 No. 7
APPROVED M.D.S. CHIEF ENGINEER

DATE:
6-16-'41
11-1-41

STANDARD GUARD RAIL

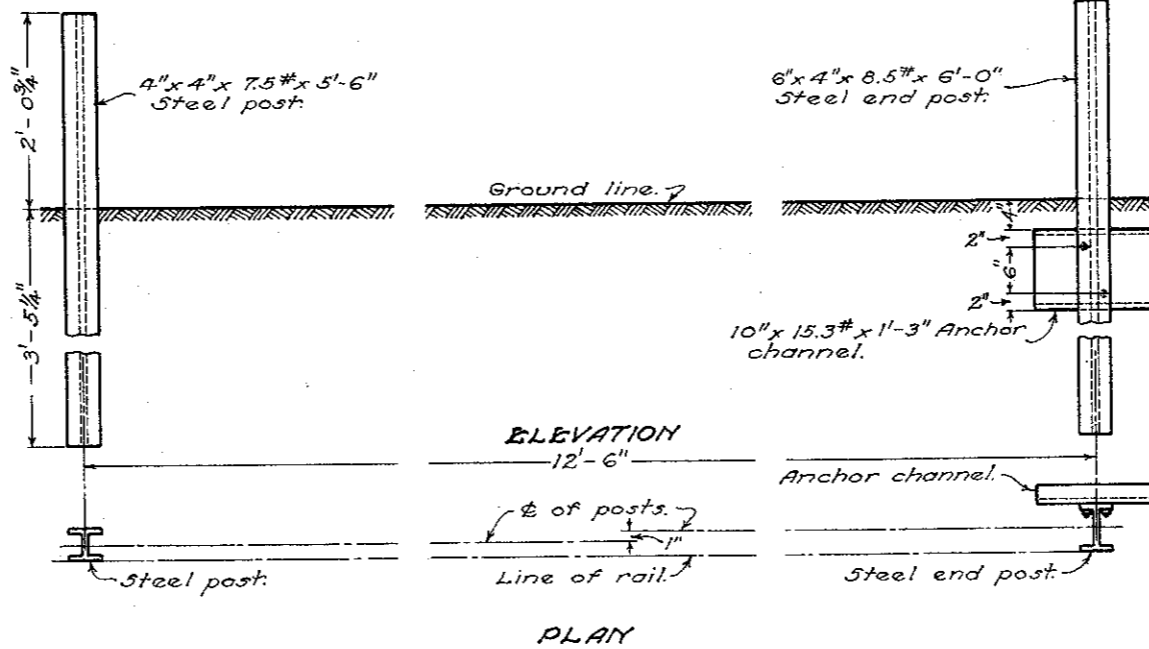
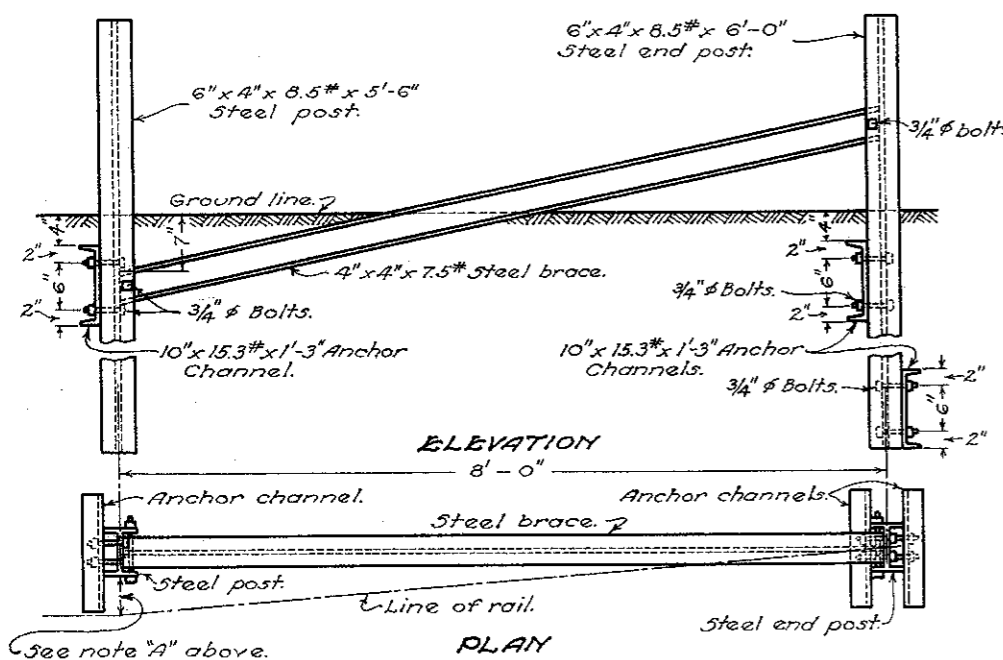
THREE END POSTS WITH ANCHOR

NOTES



TWO END POSTS WITH BRACING

TWO END POSTS FOR BEAM TYPE RAIL

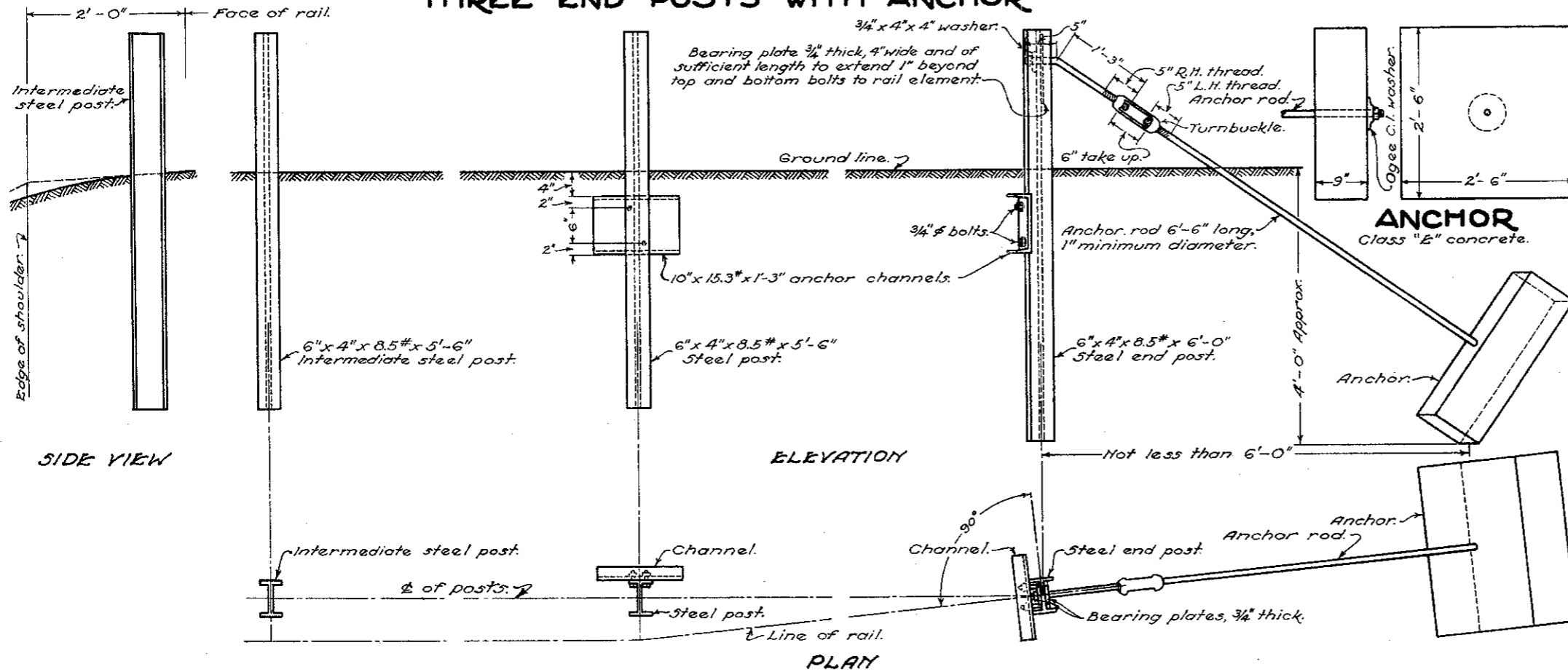


BUREAU OF LOCATION & RIGHT OF WAY OHIO DEPARTMENT OF HIGHWAYS	
GUARD RAIL	
STANDARD CONSTRUCTION DRAWING	I-15 No. 7
APPROVED <i>M.D.S.</i> CHIEF ENGINEER.	

DATE:
6-16-41
11-1-41
9-15-45

STANDARD METAL GUARD RAIL POSTS

THREE END POSTS WITH ANCHOR



NOTES

GENERAL: Standard Construction Drawings showing rail types shall be used in conjunction with this drawing.

POSTS and braces shall conform to the requirements of the specifications shown hereon.

All posts shall be 6" x 4" x 8.5 pounds per foot "I" beams. Steel for posts shall meet the requirements of Sec. M-7.4(a), Structural Steel. Ladle analysis determination only will be required. Check analysis may be made by the Laboratory from the finished material.

All posts shall be driven or set in the ground. The height of posts above the ground shall be as follows:

For Flexible Steel Plate and Steel Beam types - Top of all posts 1/4" below top of rail.

For Wire Cable, Woven Wire Tape and Woven Wire Band - Top of intermediate posts level with top of bracket or clamp. End posts 3/4" higher than intermediate posts.

For Wire Cable or Woven Wire Tape fastened with 3/8" "U" bolts - Top of all posts 1/2" above top of uppermost cable or tape.

Posts shall be spaced 16 feet on centers for all types of rail except steel beam, measured along the center line of the rail except where otherwise noted in the specifications for curves. Posts for steel beam type shall be spaced 12'-6" on centers measured along the center line of the rail.

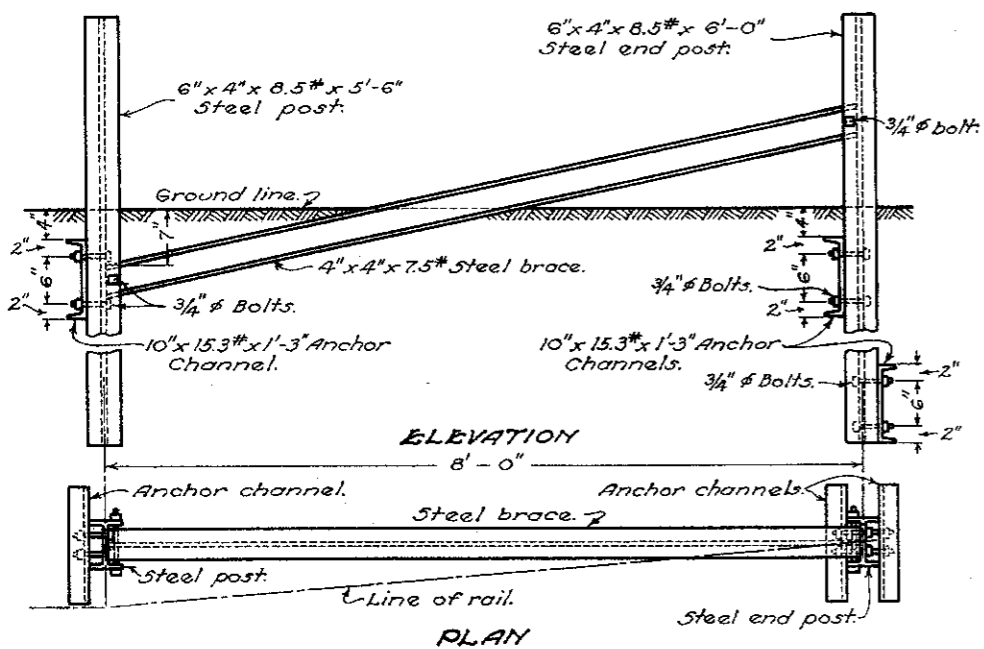
3/8" "U" bolts or brackets shall be used to fasten cable or tape to steel posts where the plans permit fastening with "J" or "L" bolts to wood posts.

If cable, tape or woven wire band is fastened with non-spring brackets a 14" x 3" x 1/2" steel plate is required between the rail elements and the posts if either edge of the bracket fails to have bearing on the face of the post.

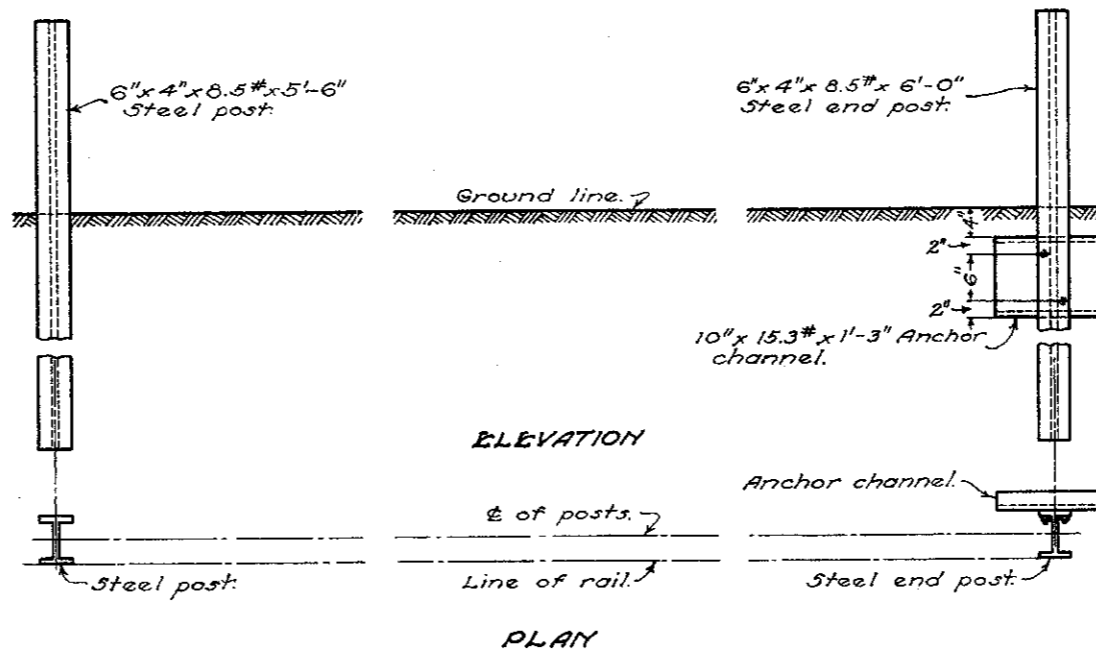
END ANCHORAGE: Where end anchorage is required deadmen shall be used except where physical features such as bridges, drives, road intersections, etc. make this impractical, in which case the end anchorage shall be of the bracing type as shown hereon. In lieu of the concrete anchor shown a 30" x 30" bituminous coated metal anchor made of two 10 ga. (or thicker) corrugated metal plates with their corrugations at right angles and welded together may be used. The corrugations shall have a pitch of 5/8" to 6" and a depth of 1/2" to 2". A 4" x 3" x 8 ga. bearing plate shall be used on the anchor rod.

PAINTING: The entire length of the post and steel brace, when used, shall be given one shop coat of paint. The portion of the post above the ground shall have two additional coats of paint. The paint below the lower edge of the rail shall be black and the paint above the lower edge of the rail shall be white.

TWO END POSTS WITH BRACING



TWO END POSTS FOR BEAM TYPE RAIL



BUREAU OF LOCATION AND DESIGN
 OHIO DEPARTMENT OF HIGHWAYS

GUARD RAIL

STANDARD
 CONSTRUCTION
 DRAWING

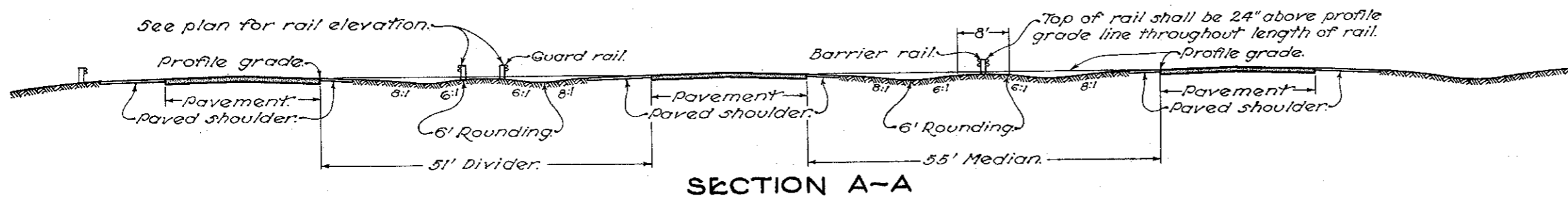
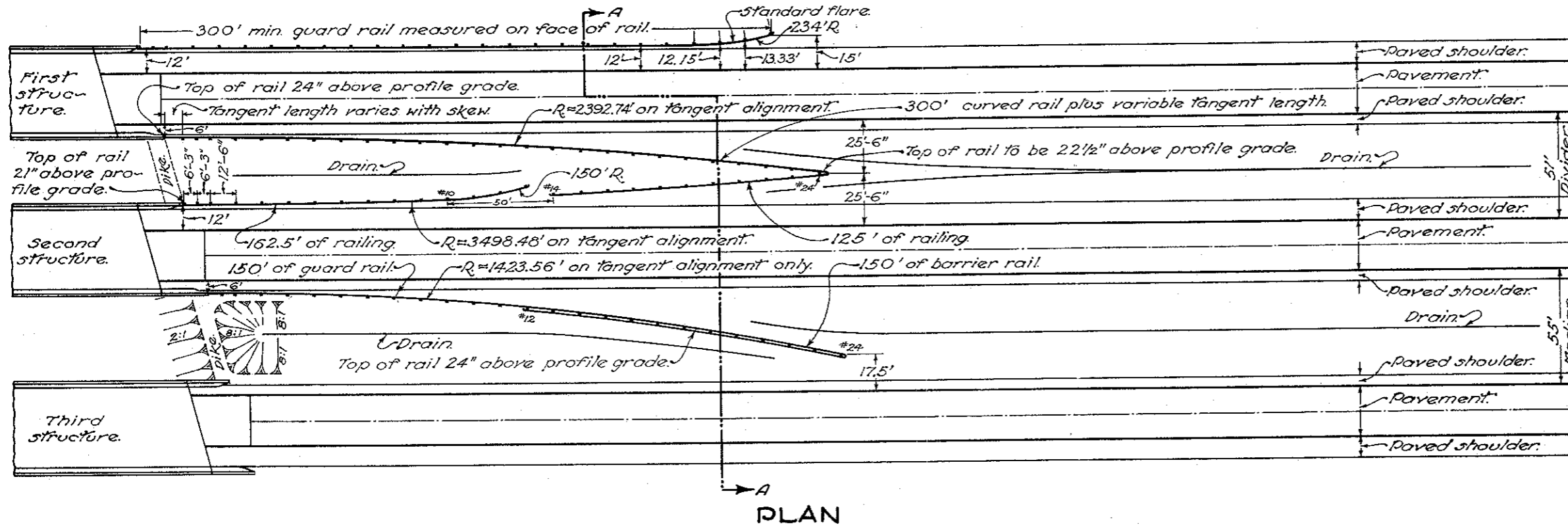
I-15
 No. 7

APPROVED [Signature] CHIEF ENGINEER

DATE:
 6-16-41
 11-1-41
 9-15-45
 2-1-47

GUARD RAIL PROTECTION

EIGHT LANE DUAL-DUAL HIGHWAY AT STRUCTURES

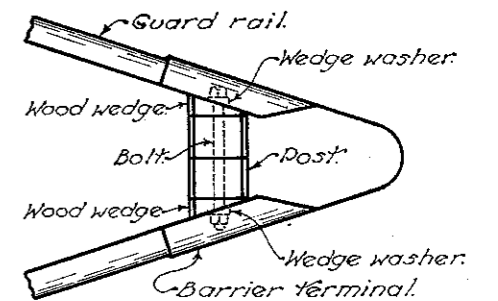


NOTES

GENERAL:— Design details shown hereon shall govern the construction of guard rail at structures unless otherwise shown on plans.

DIKE shall be provided at each end of each pair of structures.

OFFSETS for guard rail are based on the use of 6 ft. offset to median parapet and 15 ft. width outside shoulder. If other shoulder widths are used, the offsets shall be adjusted accordingly.



POST NO. 24 OF
DIVIDER GUARD RAIL

DISTANCES BETWEEN EDGES OF PAVEMENTS AND FACES OF DIVIDER GUARD RAILINGS											
POST	OFFSETS		POST	OFFSETS		POST	OFFSETS		POST	OFFSETS	
	6' SIDE	12' SIDE		6' SIDE	12' SIDE		6' SIDE	12' SIDE		6' SIDE	12' SIDE
1/2	6.00	12.00	8	8.11	13.43	16	14.40	17.74	24	24.83	24.84
1	6.03	12.03	9	8.66	13.82	17	15.48	18.47			
2	6.14	12.10	10	9.28	14.20	18	16.62	19.24			
3	6.29	12.21	11	9.97	15.21	19	17.82	20.08			
4	6.53	12.35	12	10.71	17.16	20	19.09	20.92			
5	6.81	12.56	13	11.55	20.18	21	20.43	21.83			
6	6.98	12.80	14	12.44	16.37	22	21.84	22.81			
7	7.60	13.08	15	13.37	17.00	23	23.30	23.79			

DISTANCE BETWEEN EDGE OF PAVEMENT AND FACE OF MEDIAN GUARD RAIL					
POST	OFFSET	POST	OFFSET	POST	OFFSET
1/2	6.01	9	10.44	18	23.74
1	6.06	10	11.49	19	25.76
2	6.23	11	12.63	20	27.89
3	6.50	12	13.90	21	30.14
4	6.88	13	15.27	22	32.48
5	7.37	14	16.73	23	34.94
6	7.98	15	18.33	24	37.50
7	8.68	16	20.02		
8	9.52	17	21.82		

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

GUARD RAIL

STANDARD CONSTRUCTION DRAWING
APPROVED: *[Signature]* ENGR. L. & D.

I-15
No. 7

DATE
12-9-57