

# STANDARD GUARD RAIL

## TWO 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. The posts shall be made of No. 11 gage steel unless otherwise specified. Steel for posts shall be new billet open hearth steel of the following chemical analysis as determined by the label test. Check analysis may be made by the Laboratory from the finished material.

Carbon 0.20 to 0.30 Aim for 0.25  
Manganese 0.75 to 1.05 Aim for 0.90 to 1.0  
Sulphur 0.05 Maximum  
Phosphorus 0.04 Maximum

All posts shall be driven or set in the ground. 3/8 inch "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.

Post spacing, measured along the center line of rail, 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.

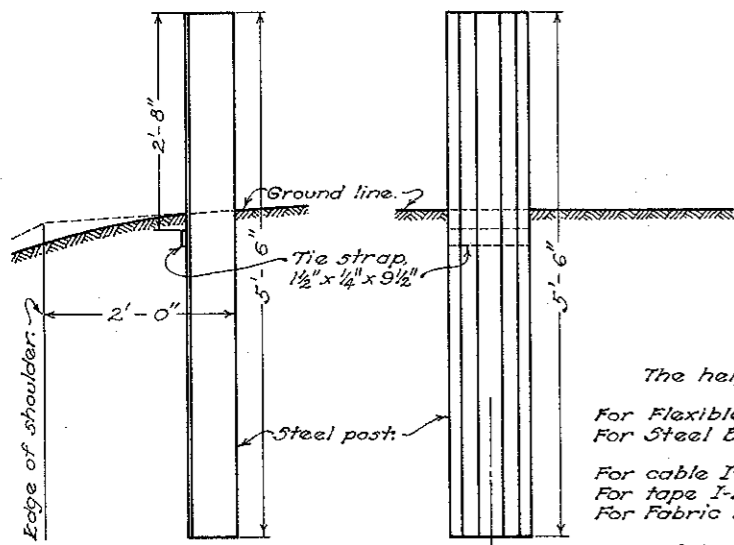
For steel beam type 12'-6".  
**END ANCHORAGE:**— Deadmen shall be used for end anchorage except where physical features such as bridges, drives, road intersections, etc. make this impractical, in which case the end anchorage shall be of the bracing type as shown hereon. In lieu of the concrete anchor 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.

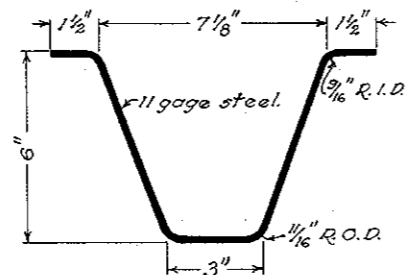
**RAILS:**— The various types of rail shall be erected and conform with the requirements of the Specifications and Material Details.

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



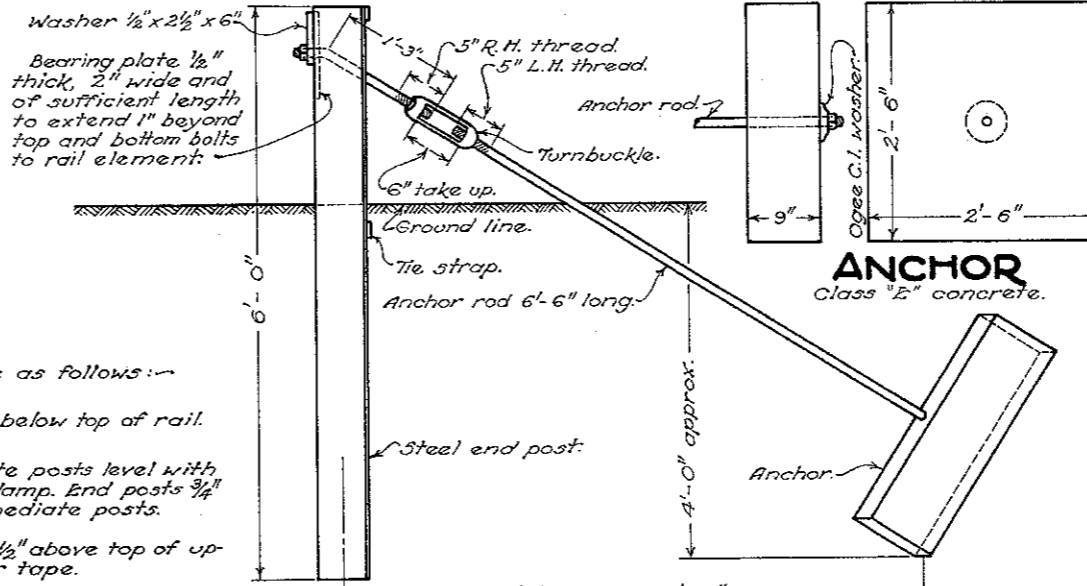
SIDE VIEW



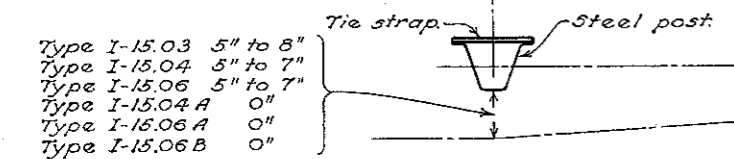
SECTION OF STEEL POST

The height of posts above the ground shall be as follows:—

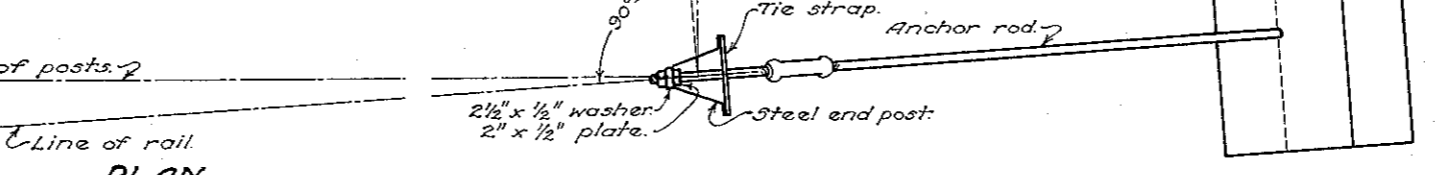
- For Flexible Steel Plate I-15.03 } Top of all posts 1/4" below top of rail.
- For Steel Beam I-15.05 } Top of all posts 1/4" below top of rail.
- For cable I-15.04 or I-15.04.A } Top of intermediate posts level with top of bracket or clamp. End posts 3/4" higher than intermediate posts.
- For tape I-15.06 or I-15.06.A } Top of intermediate posts level with top of bracket or clamp. End posts 3/4" higher than intermediate posts.
- For Fabric Band I-15.06 B } Top of all posts 1 1/2" above top of uppermost cable or tape.
- For cable or tape fastened with 3/8" "U" bolts. } Top of all posts 1 1/2" above top of uppermost cable or tape.



ELEVATION

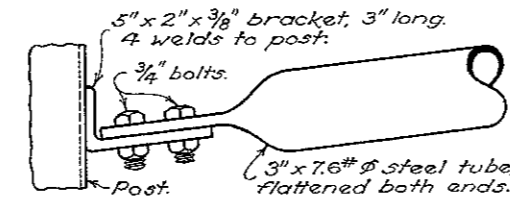


END POST WITH BRACE

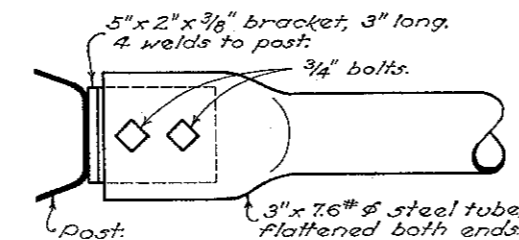


PLAN

TUBE BRACE AND BRACKET

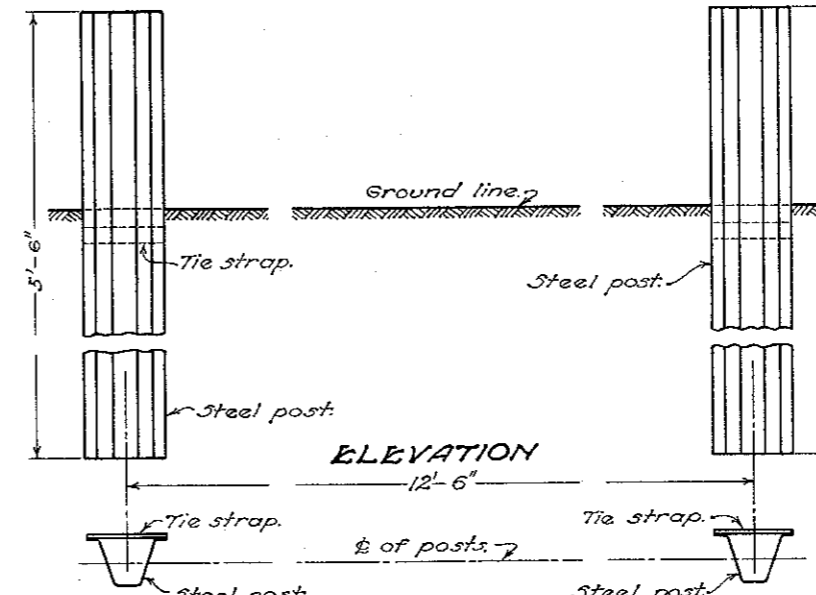


ELEVATION



PLAN

TWO END POSTS FOR BEAM TYPE RAIL



ELEVATION

PLAN

BUREAU OF LOCATION & RIGHT OF WAY  
OHIO DEPARTMENT OF HIGHWAYS

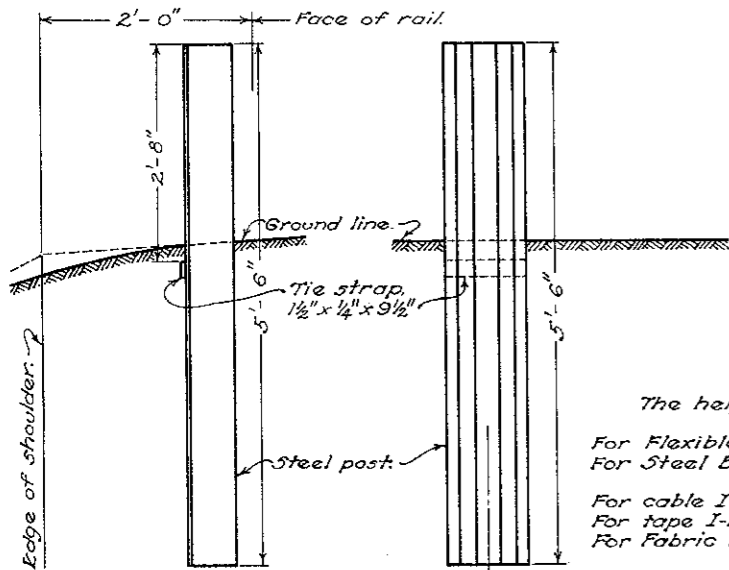
**GUARD RAIL**

DATE 6-16-'41

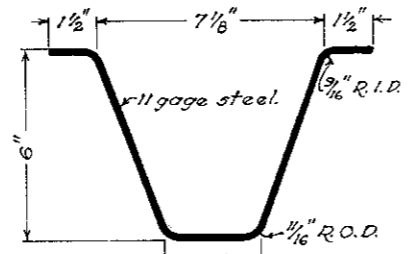
STANDARD CONSTRUCTION DRAWING I-15 No. 6  
APPROVED M.D.S. CHIEF ENGINEER

# STANDARD GUARD RAIL

## TWO END POSTS WITH ANCHOR



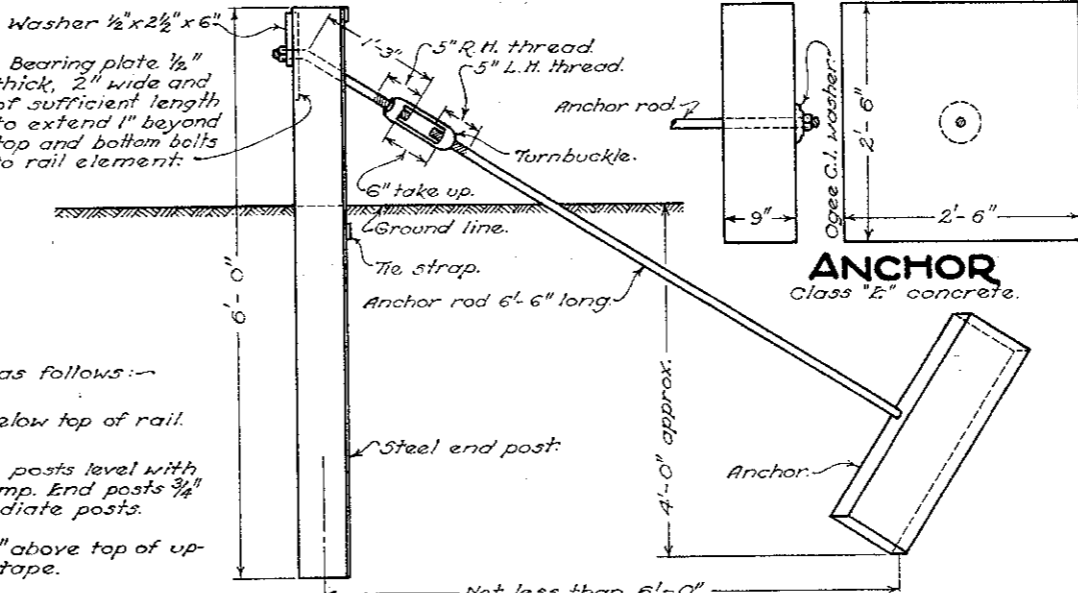
SIDE VIEW



SECTION OF STEEL POST

The height of posts above the ground shall be as follows:—

- For Flexible Steel Plate I-15.03 } Top of all posts 1/4" below top of rail.
- For 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 } Top of intermediate posts level with top of bracket or clamp. End posts 3/4" higher than intermediate posts.
- For tape I-15.06 or I-15.06 A } Top of intermediate posts level with top of bracket or clamp. End posts 3/4" higher than intermediate posts.
- For Fabric Band I-15.06 B } Top of all posts 1 1/2" above top of uppermost cable or tape.
- For cable or tape fastened with 3/8" "U" bolts. } Top of all posts 1 1/2" above top of uppermost cable or tape.

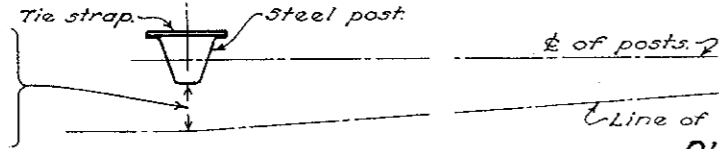


ANCHOR

Class "E" concrete.

ELEVATION

- Type I-15.03 5" to 8"
- Type I-15.04 5" to 7"
- Type I-15.06 5" to 7"
- Type I-15.04 A 0"
- Type I-15.06 A 0"
- Type I-15.06 B 0"



PLAN

**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. The posts shall be made of 11 gage steel unless otherwise specified. Steel for posts shall be new billet open hearth steel of the following chemical analysis as determined by the ladle test. Check analysis may be made by the Laboratory from the finished material.

Carbon 0.20 to 0.30 Aim for 0.25  
Manganese 0.15 to 1.05 Aim for 0.90 to 1.0  
Sulphur 0.05 Maximum  
Phosphorus 0.04 Maximum

All posts shall be driven or set in the ground. 3/8 inch "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. Post spacing, measured along the center line of rail, 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.

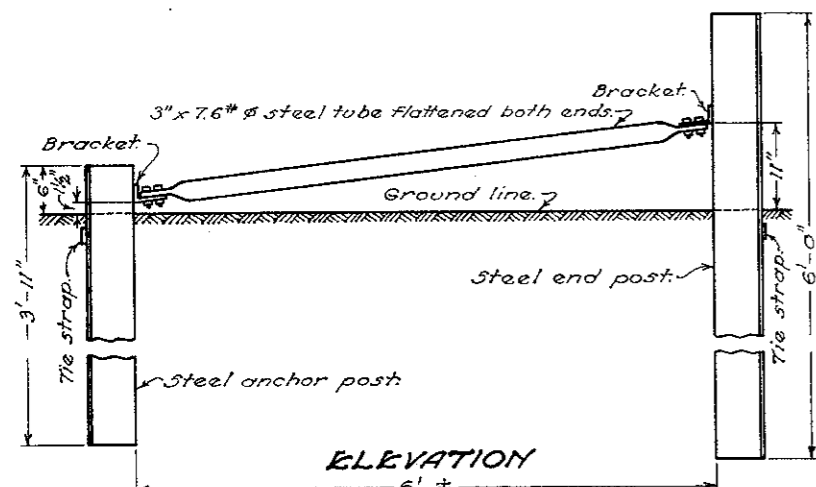
For steel beam type 12'-6".  
**END ANCHORAGE:**— Deadmen shall be used for end anchorage except where physical features such as bridges, drives, road intersections, etc. make this impractical, in which case the end anchorage shall be of the bracing type as shown hereon. In lieu of the concrete anchor shown a 30" x 30" 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" x 3" 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.

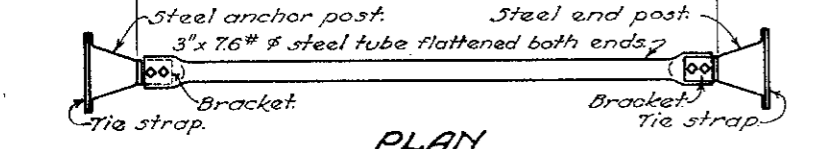
**RAILS:**— The various types of rail shall be erected and conform with the requirements of the Specifications and Material Details.

**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 post shall be given one shop coat of paint as specified in Sec. I-15.08 and the upper three feet of the post shall be given two shop coats of white paint meeting the requirements of Sec. I-9.6.

## END POST WITH BRACE

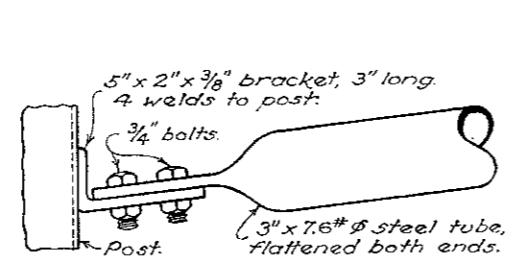


ELEVATION

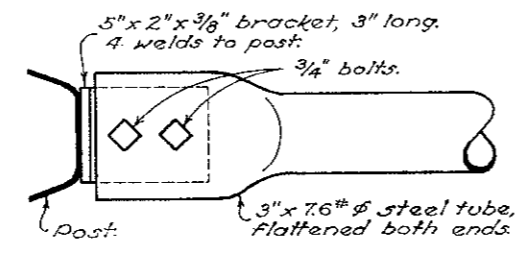


PLAN

## TUBE BRACE AND BRACKET

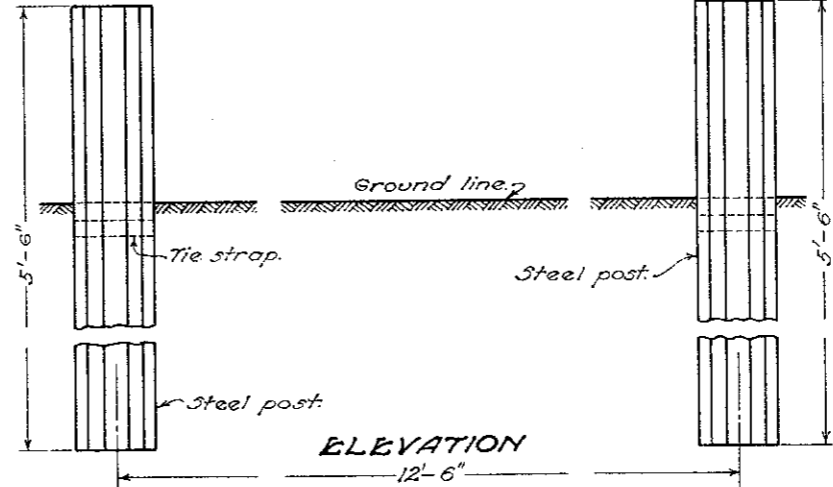


ELEVATION

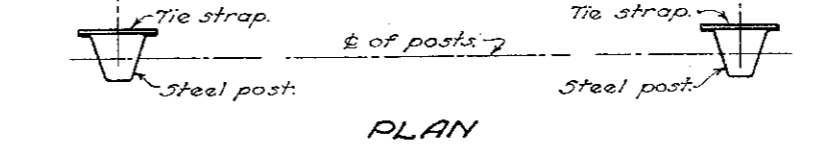


PLAN

## TWO END POSTS FOR BEAM TYPE RAIL



ELEVATION



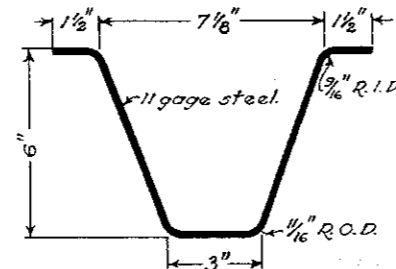
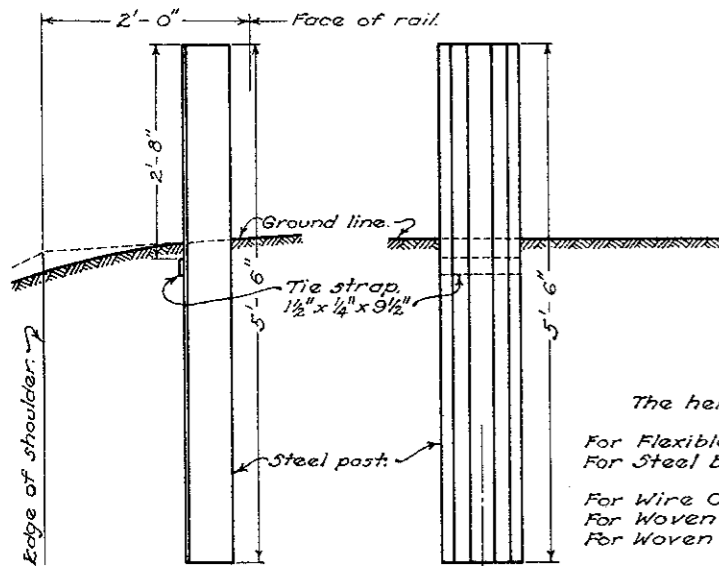
PLAN

BUREAU OF LOCATION & RIGHT OF WAY OHIO DEPARTMENT OF HIGHWAYS	
<b>GUARD RAIL</b>	
STANDARD CONSTRUCTION DRAWING	<b>I-15 No. 6</b>
APPROVED <u>M.D.S.</u> CHIEF ENGINEER	

DATE  
6-16-41  
11-1-41

# STANDARD METAL GUARD RAIL POSTS

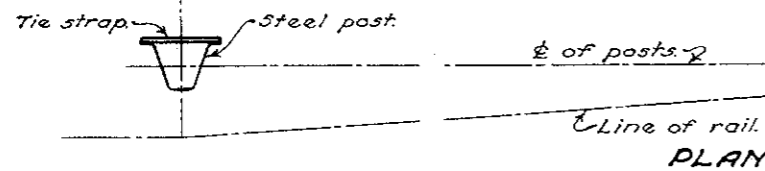
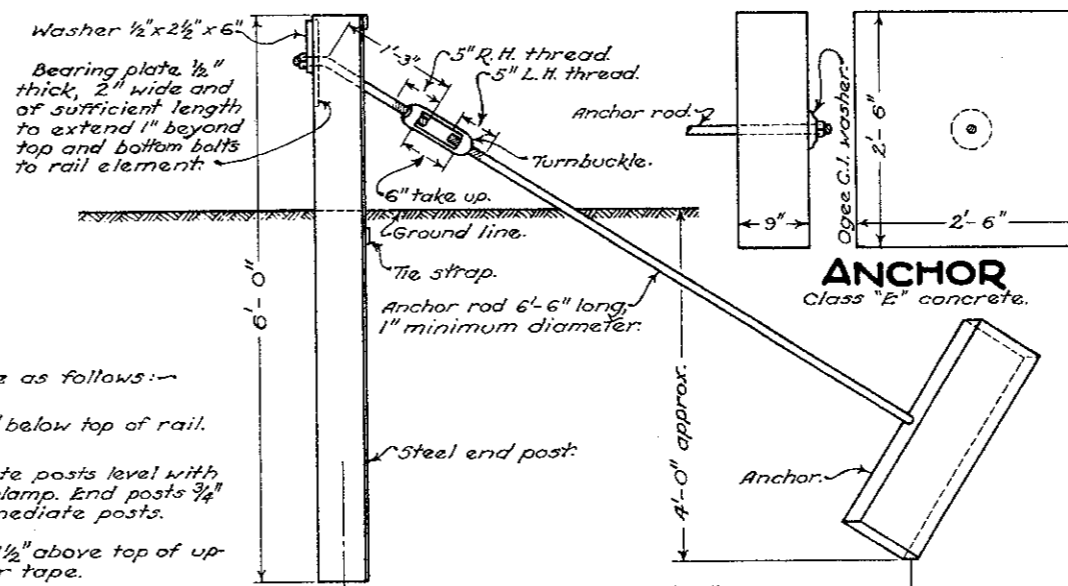
## TWO END POSTS WITH ANCHOR



### SECTION OF STEEL POST

The height of posts above the ground shall be as follows:—

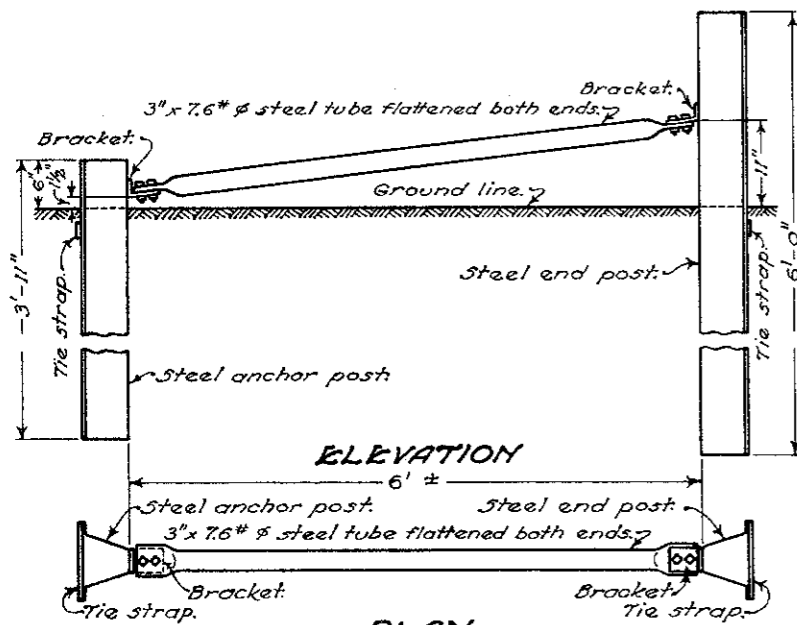
- For Flexible Steel Plate } Top of all posts 1/4" below top of rail.
- For Steel Beam } Top of intermediate posts level with top of bracket or clamp. End posts 3/4" higher than intermediate posts.
- For Wire Cable } Top of all posts 1/2" above top of uppermost cable or tape.
- For Woven Wire Tape } Top of all posts 1/2" above top of uppermost cable or tape.
- For Woven Wire Band } Top of all posts 1/2" above top of uppermost cable or tape.
- For cable or tape fastened with 3/8" U bolts } Top of all posts 1/2" above top of uppermost cable or tape.



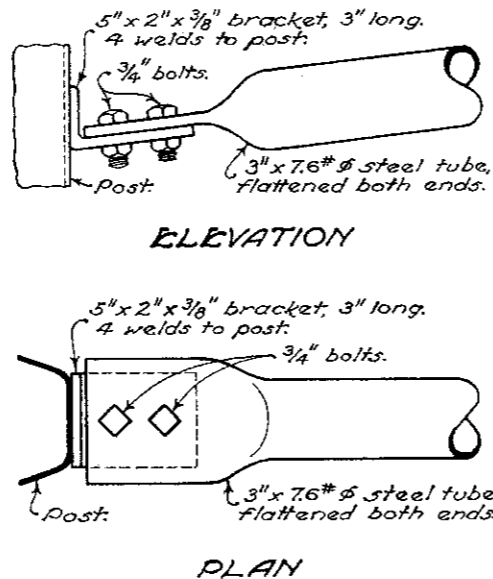
### ELEVATION

### PLAN

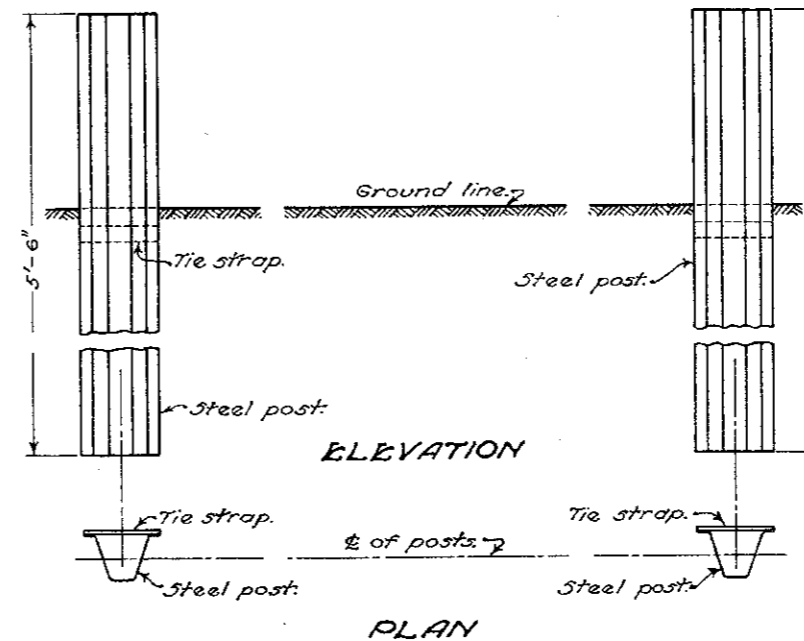
## END POST WITH BRACE



## TUBE BRACE AND BRACKET



## TWO END POSTS FOR BEAM TYPE RAIL



## 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.

The posts shall be made of No. 11 gage steel unless otherwise specified. Steel for posts shall be new billet open hearth steel of the following chemical analysis as determined by the ladle test. Check analysis may be made by the Laboratory from the finished material.

Carbon	0.20 to 0.30	Aim for 0.25
Manganese	0.75 to 1.05	Aim for 0.90 to 1.0
Sulphur	0.05	Maximum
Phosphorus	0.04	Maximum

All posts shall be driven or set in the ground. 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 types 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.

**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 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" x 3" x 8 gage bearing plate shall be used on the anchor rod.

**PAINTING:**—The entire length of the post and tube 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.

BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF HIGHWAYS

**GUARD RAIL**

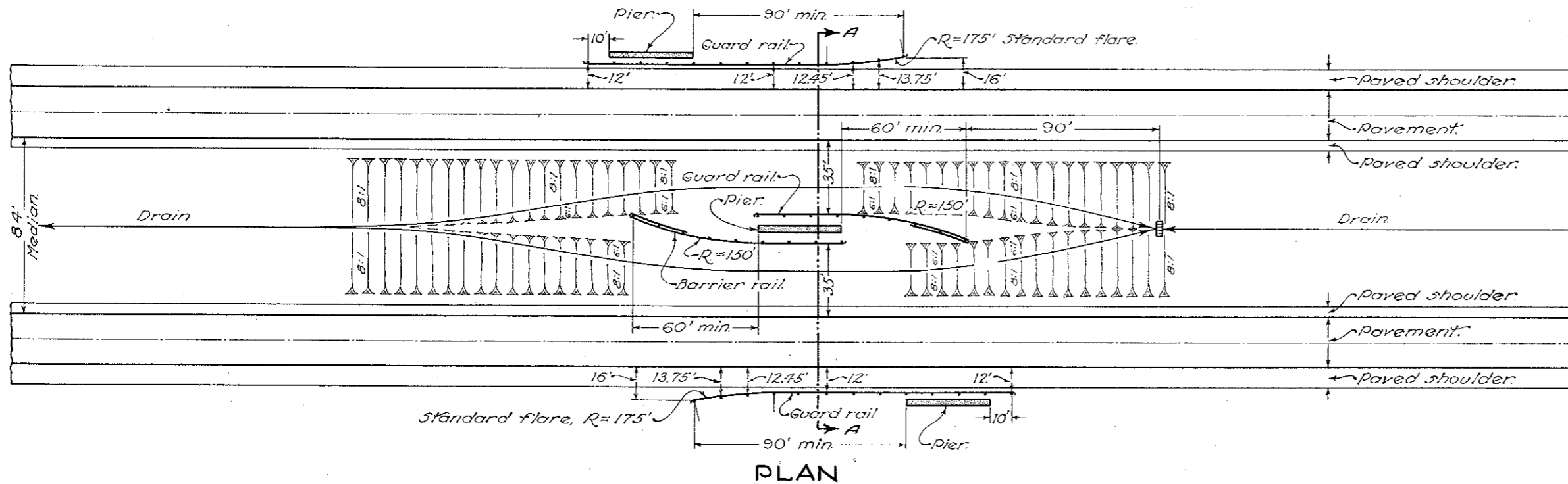
STANDARD CONSTRUCTION DRAWING  
APPROVED *[Signature]* CHIEF ENGINEER

I-15  
No. 6

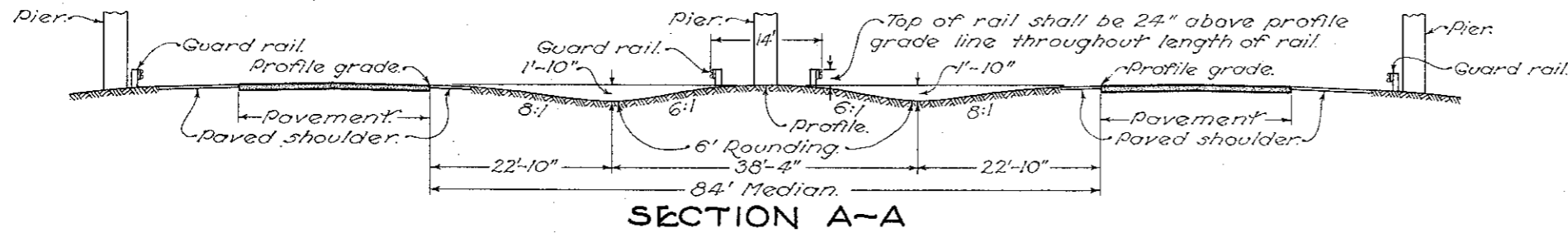
DATE  
6-16-41  
1-1-41  
2-1-47

# GUARD RAIL PROTECTION

FOUR LANE DIVIDED, 84' MEDIAN, AT PIERS

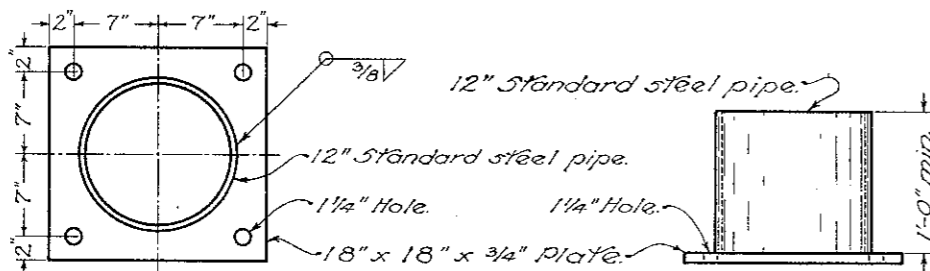


PLAN



SECTION A-A

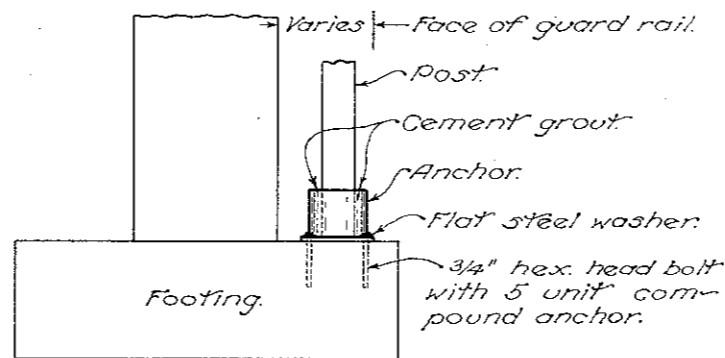
Footing anchor to be used where posts are over footings and less than 3'-0" of earth is provided above the top of footing.



PLAN

ELEVATION

FOOTING ANCHOR



FOOTING END VIEW

## NOTES

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

BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF HIGHWAYS

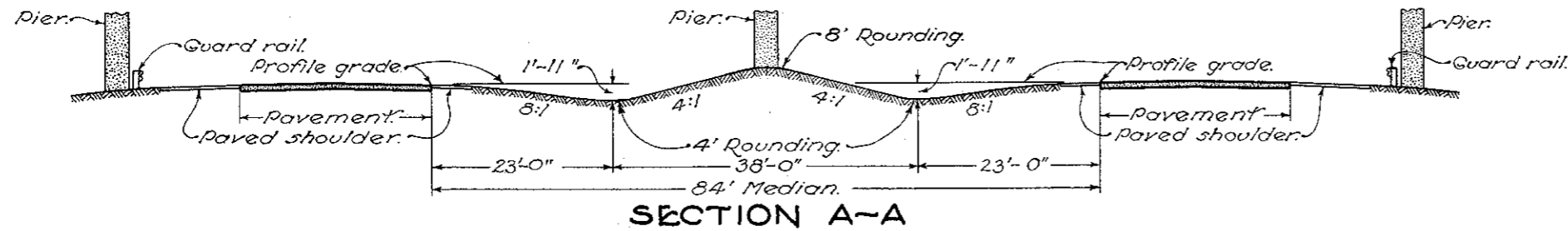
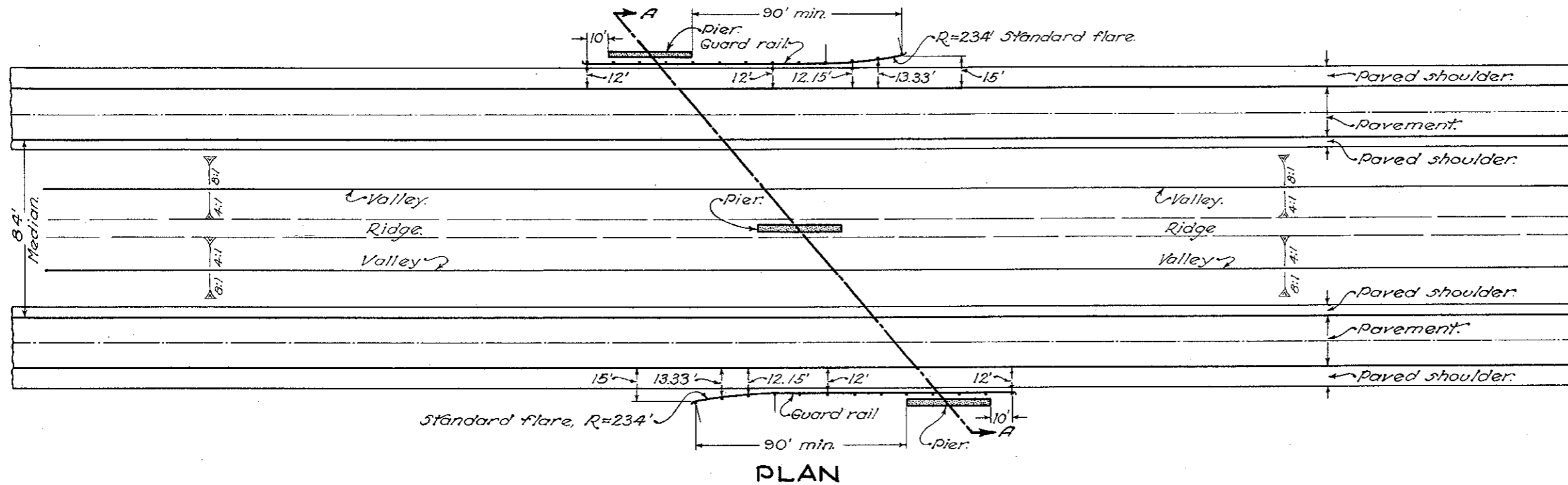
# GUARD RAIL

DATE: 12-9-57

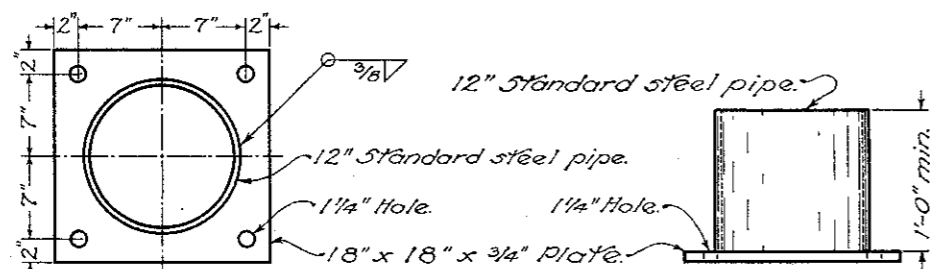
STANDARD CONSTRUCTION DRAWING I-15 No. 6  
APPROVED: *[Signature]* ENGR. L. & D.

# GUARD RAIL PROTECTION

## FOUR LANE DIVIDED, 84' MEDIAN, AT PIERS



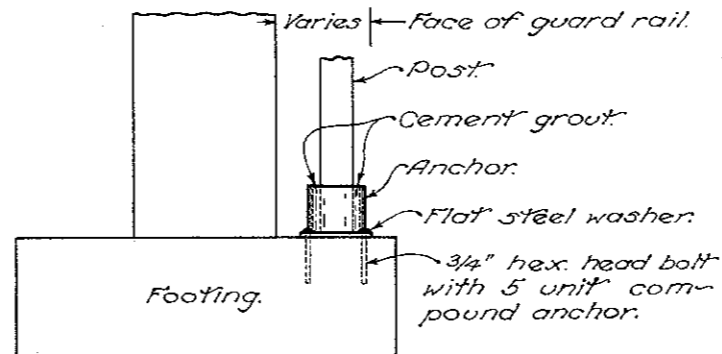
Footing anchor to be used where posts are over footings and less than 3'-0" of earth is provided above the top of footing.



PLAN

ELEVATION

FOOTING ANCHOR



FOOTING END VIEW

### NOTES

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

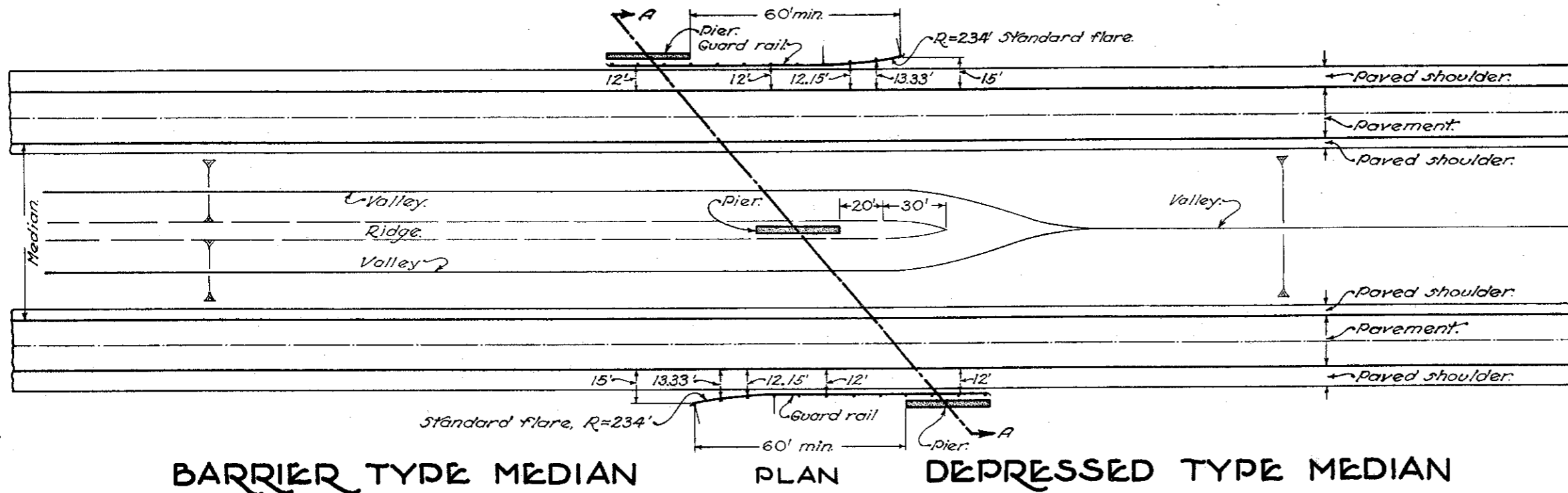
BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF HIGHWAYS

# GUARD RAIL

DATE  
12-9-57  
7-1-59

STANDARD CONSTRUCTION DRAWING I-15 No. 6  
APPROVED *[Signature]* ENGR. L. & D.

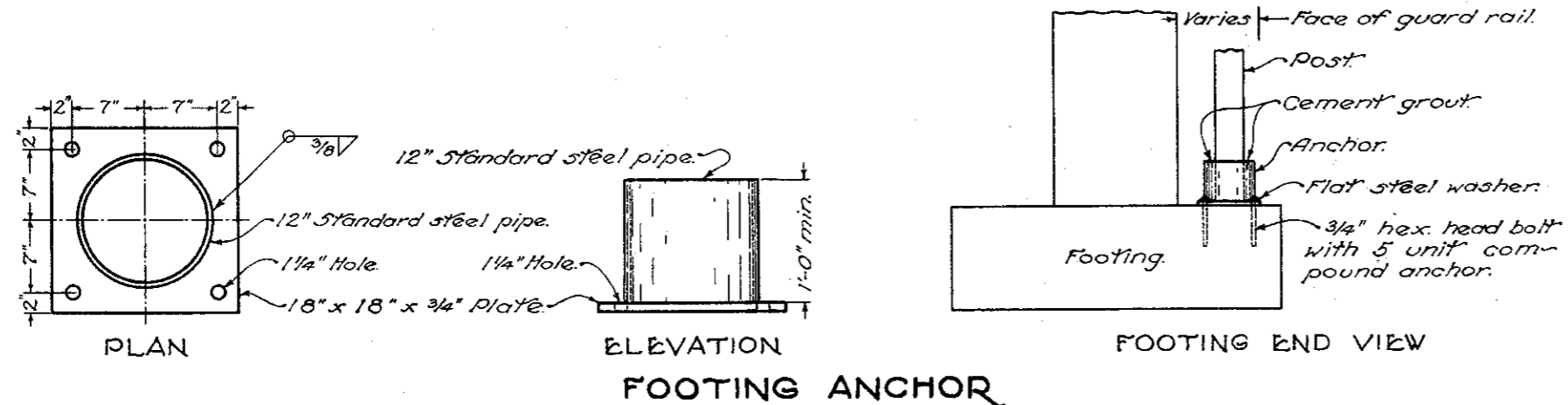
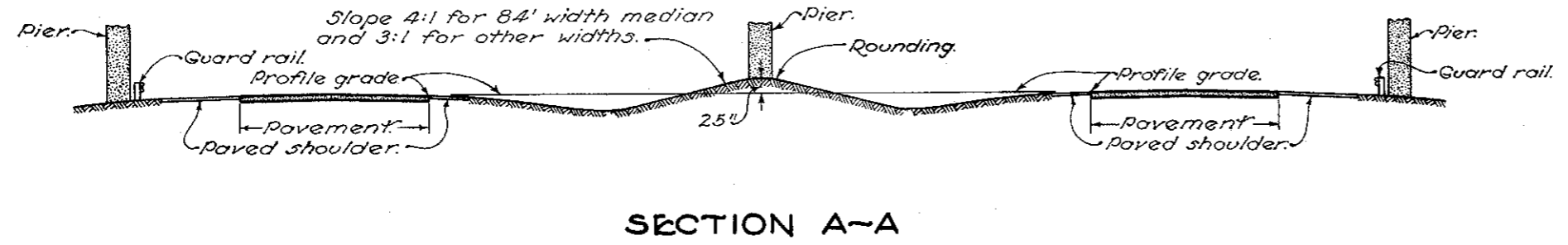
# GUARD RAIL PROTECTION AT PIERS



**NOTES**

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

**FOOTING ANCHOR:** to be used where posts are over footings and less than 3 feet of earth is provided above the top of footing. Cost of anchor, bolts, cement grout, etc. is included in cost of guard rail.



BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF HIGHWAYS	
GUARD RAIL	
STANDARD CONSTRUCTION DRAWING	I-15 No. 6
APPROVED: <i>[Signature]</i> ENGR. L. & D.	
DATE 2-1-63	

Revised and Number changed to GR-6 ; June 1, 1965