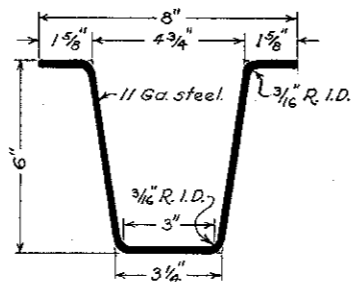
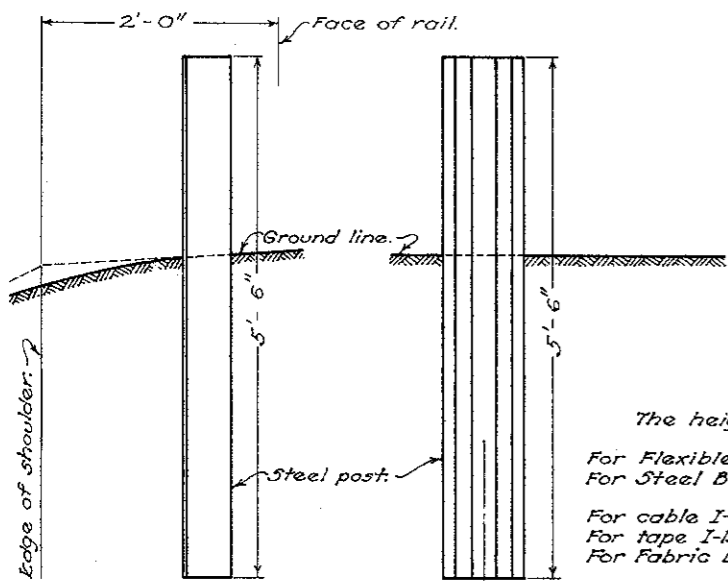


STANDARD GUARD RAIL

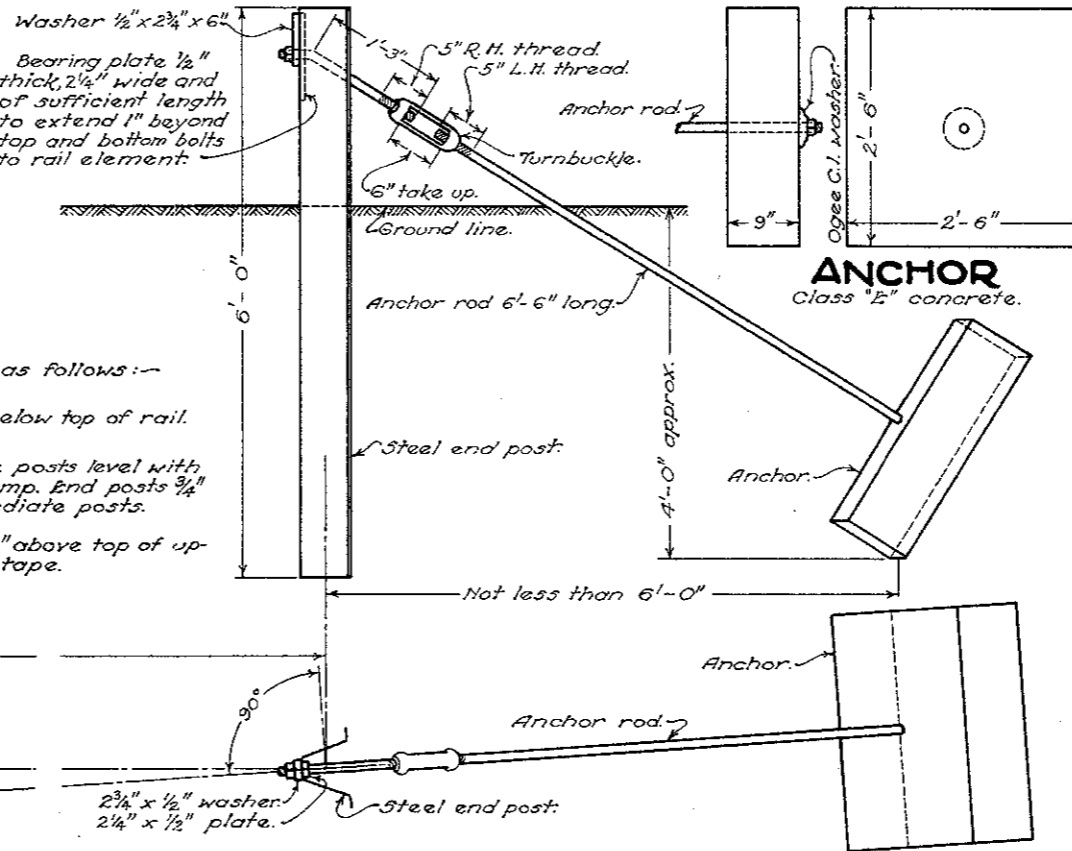
TWO END POSTS WITH ANCHOR



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
- For tape I-15.06 or I-15.06 A } top of bracket or clamp. End posts 3/4"
- For Fabric Band I-15.06 B } higher than intermediate posts.
- For cable or tape fastened } Top of all posts 1 1/2" above top of up-
- with 3/8" "U" bolts. } permost cable or tape.

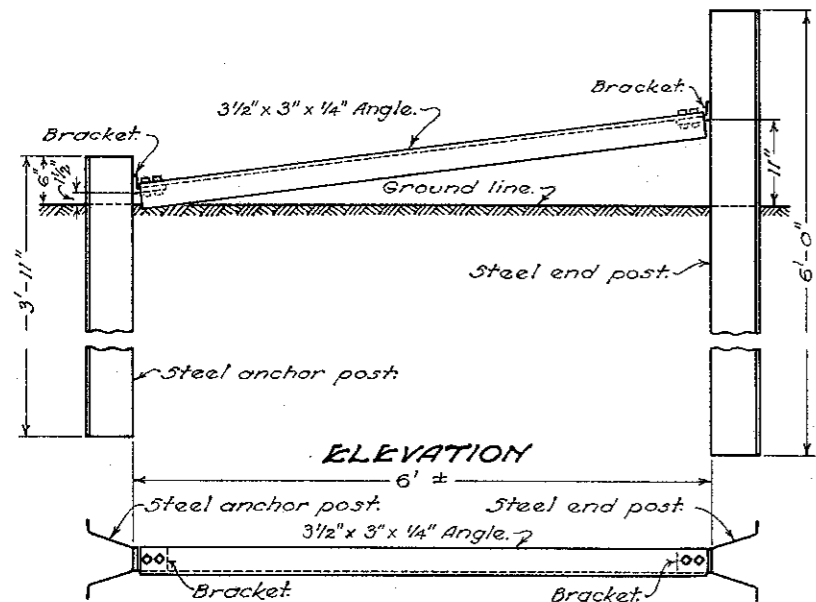


ELEVATION

PLAN

- 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"

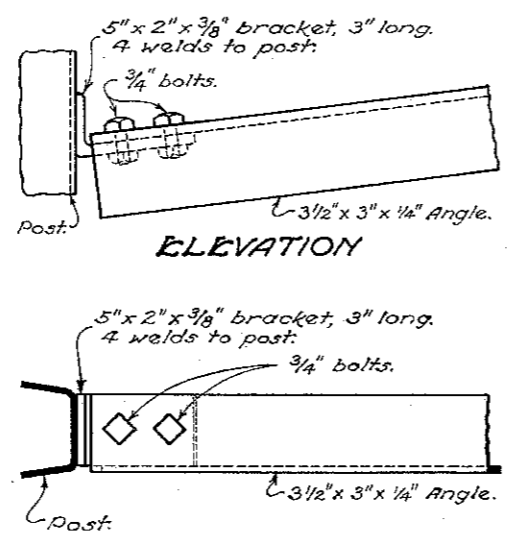
END POST WITH BRACK



ELEVATION

PLAN

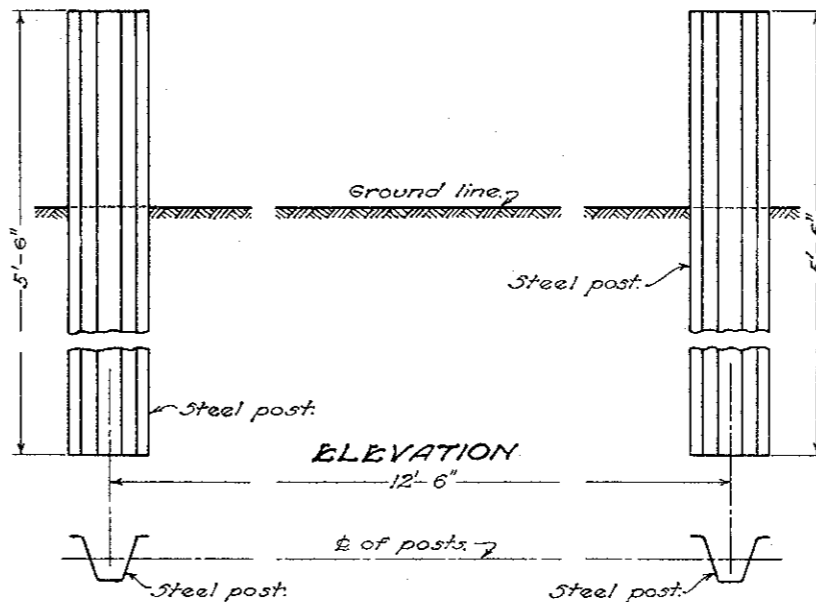
BRACE AND BRACKET



ELEVATION

PLAN

TWO END POSTS FOR BEAM TYPE RAIL



ELEVATION

PLAN

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 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. 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 3 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 posts shall have a paint shop coat in accordance with either Method (a) or Method (b).

- (a) The posts shall have a bonderized finish with one coat of baked or rust resistant enamel.
- (b) The posts shall have a shop coat as specified under Item I-15.08.

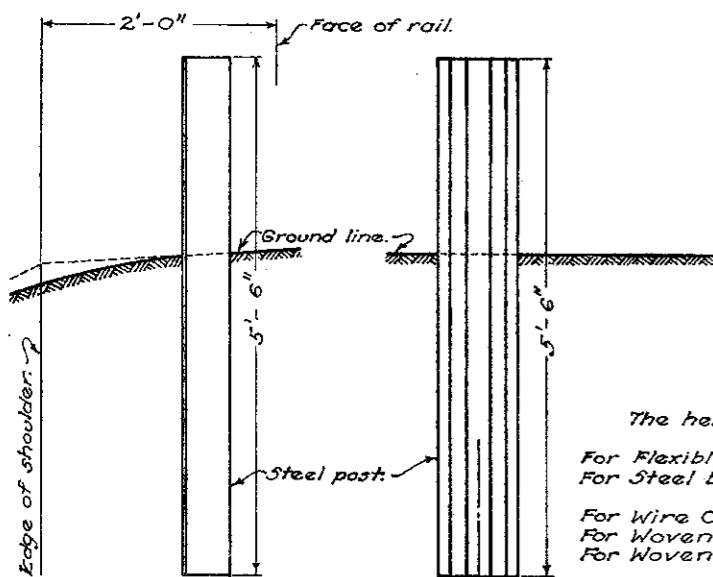
After the prime coat is thoroughly dry the upper three feet of the posts shall be given two shop coats of white paint meeting the requirements of Sec. M-9.6.

BUREAU OF LOCATION & RIGHT OF WAY OHIO DEPARTMENT OF HIGHWAYS	
GUARD RAIL	
STANDARD CONSTRUCTION DRAWING	I-15 No. 9
APPROVED <u>M.D.S.</u> CHIEF ENGINEER.	

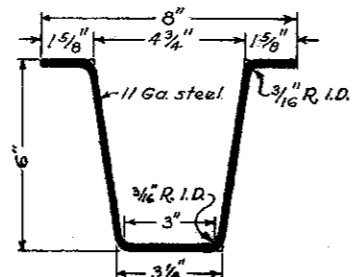
DATE 10-1-45

STANDARD METAL GUARD RAIL POSTS

TWO END POSTS WITH ANCHOR



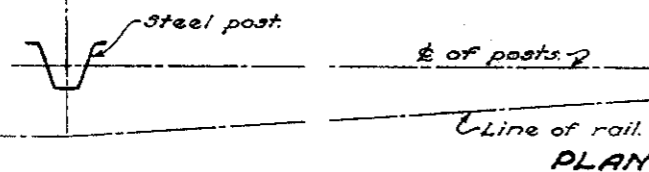
SIDE VIEW



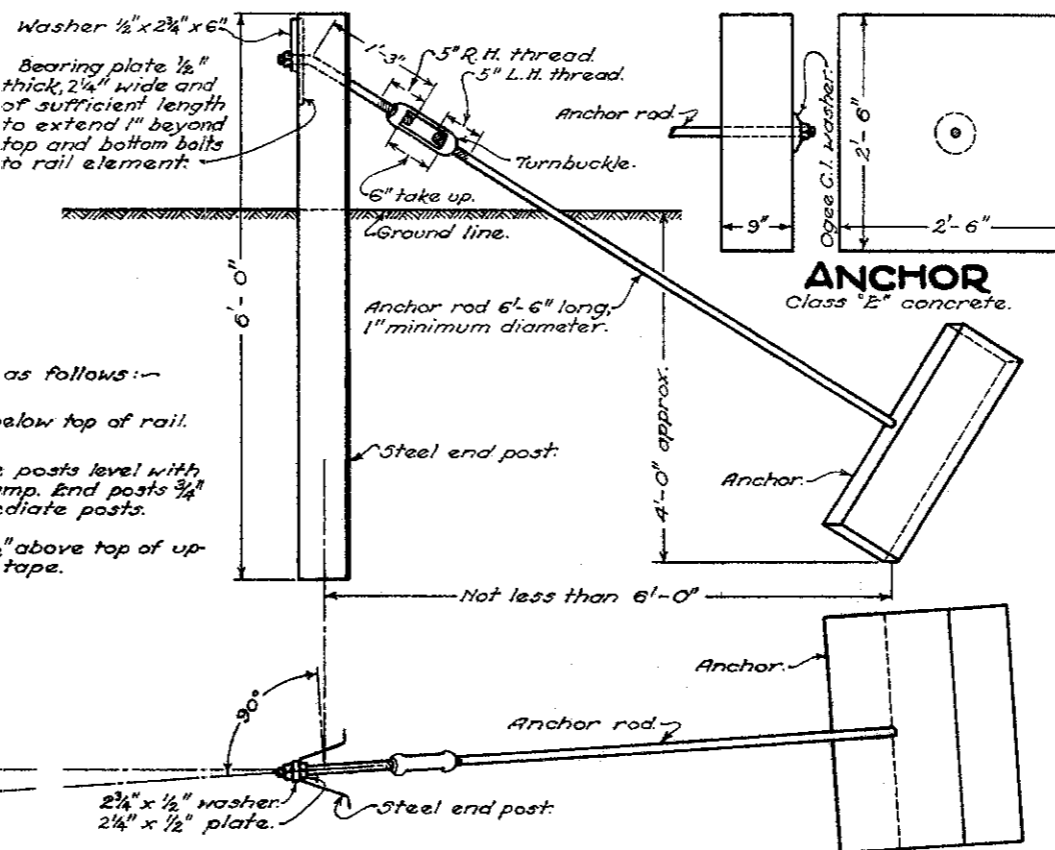
SECTION OF STEEL POST

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

- For Flexible Steel Plate } 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 1/2" above top of uppermost cable or tape.
- For Woven Wire Tape } Top of all posts 1 1/2" above top of uppermost cable or tape.
- For Woven Wire Band } 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.



PLAN



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.

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	0.75 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.

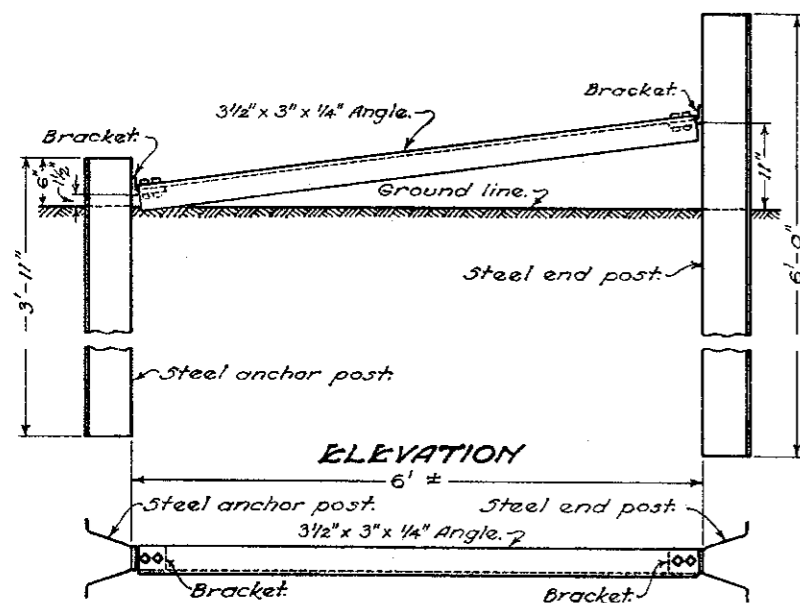
Posts shall be spaced 16 feet on centers for all types of rail except steel beam, measured along the center line of the rail except where otherwise noted in the Specifications for curves. Posts for steel beam type shall be spaced 12'-6" on centers measured along the center line of the rail.

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.

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"x30" bituminous coated metal anchor made of 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"x3/8 gage bearing plate shall be used on the anchor rod.

PAINTING:- The entire length of the post and angle 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.

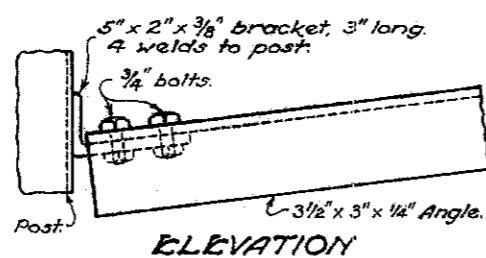
END POST WITH BRACE



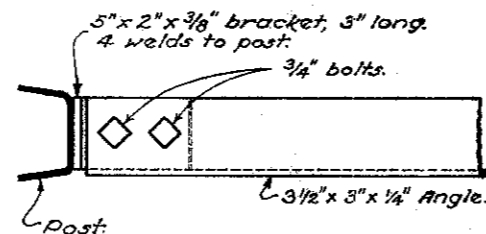
ELEVATION

PLAN

BRACE AND BRACKET

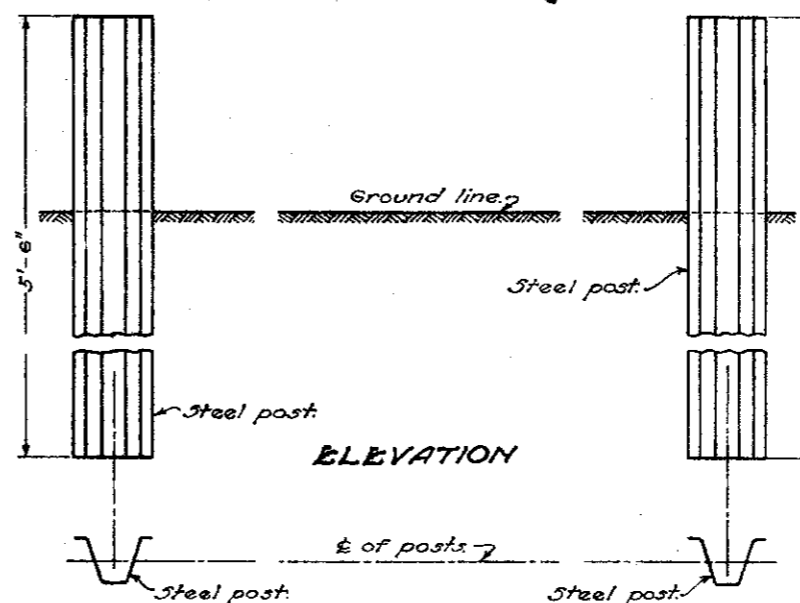


ELEVATION



PLAN

TWO END POSTS FOR BEAM TYPE RAIL



ELEVATION

PLAN

BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

GUARD RAIL

STANDARD CONSTRUCTION DRAWING

I-15
No. 9

APPROVED: *[Signature]* CHIEF ENGINEER

DATE
10-1-45
2-1-47