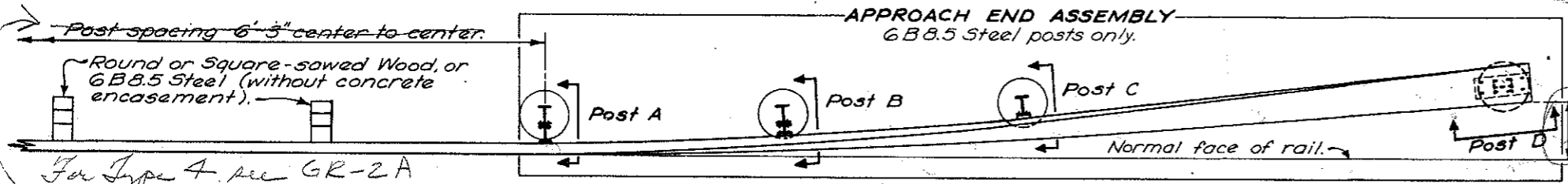


FED. RD. DIVISION	STATE	PROJECT
2	OHIO	

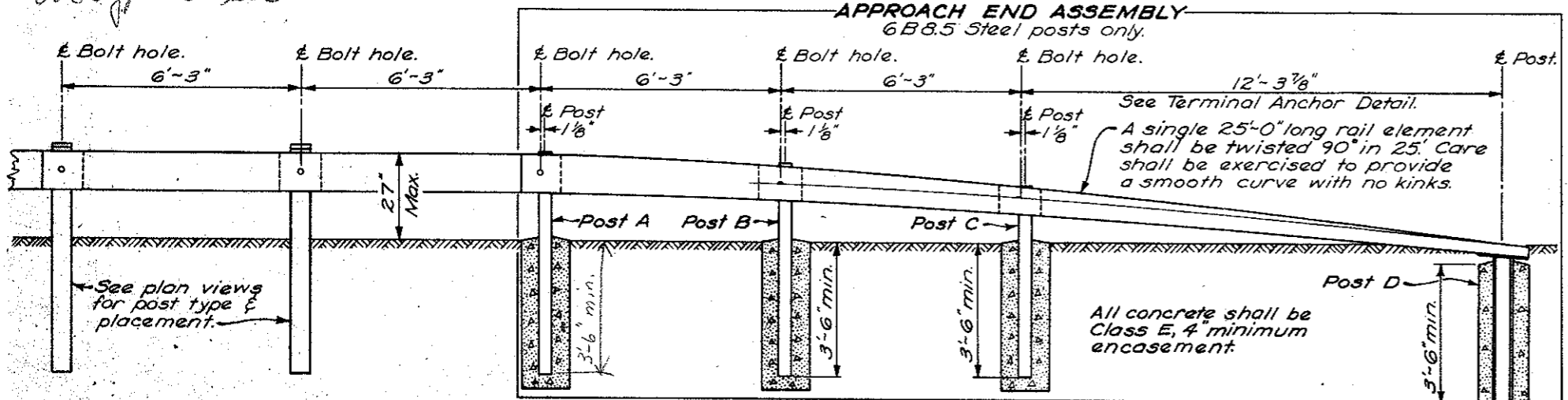
NOTES GR-4

For details not shown, see Standard Drawings GR-1 and GR-2A.
 All steel parts shall be galvanized in accordance with ASTM A123, A153 or A525, whichever may apply.
 This drawing shall govern where a conflict arises.

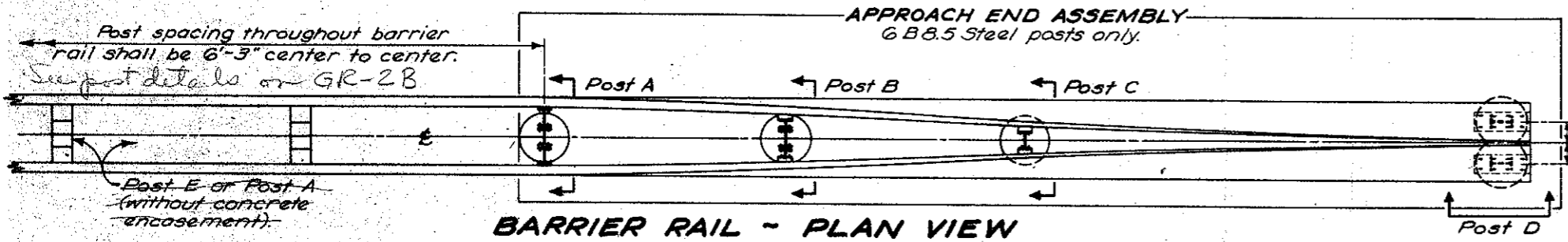
The lower edge of rail at the approach terminal shall be aligned with the normal face of rail when the approach end assembly is used at the beginning of a standard guardrail flare.



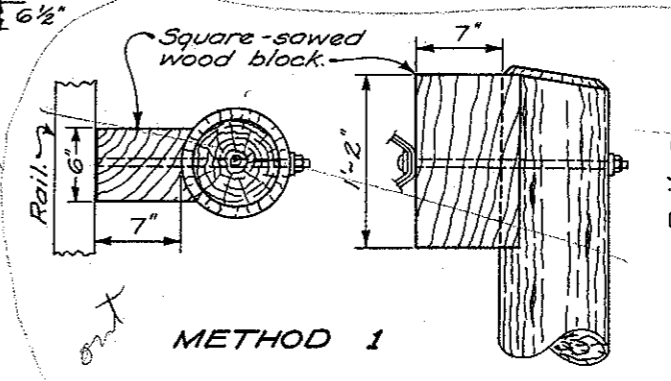
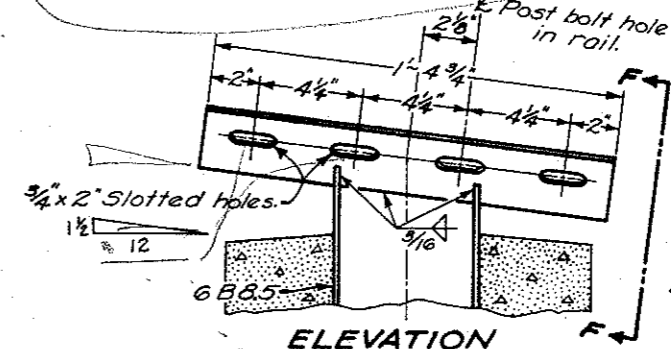
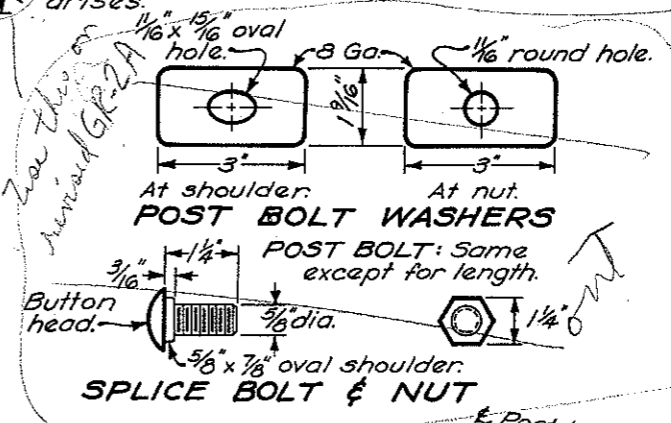
SINGLE RAIL - PLAN VIEW



SINGLE & BARRIER RAIL - ELEVATION

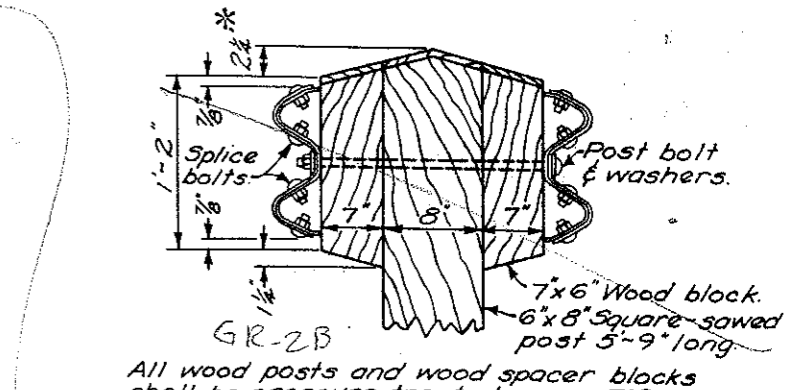
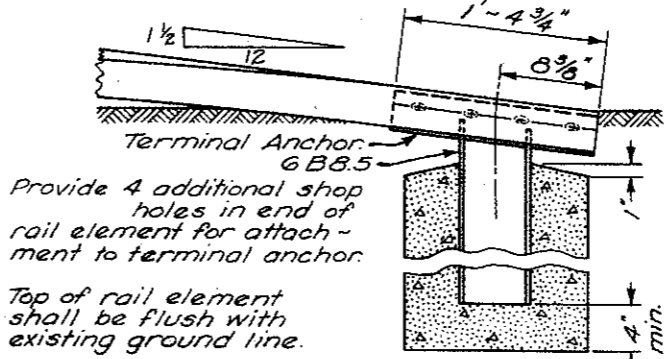
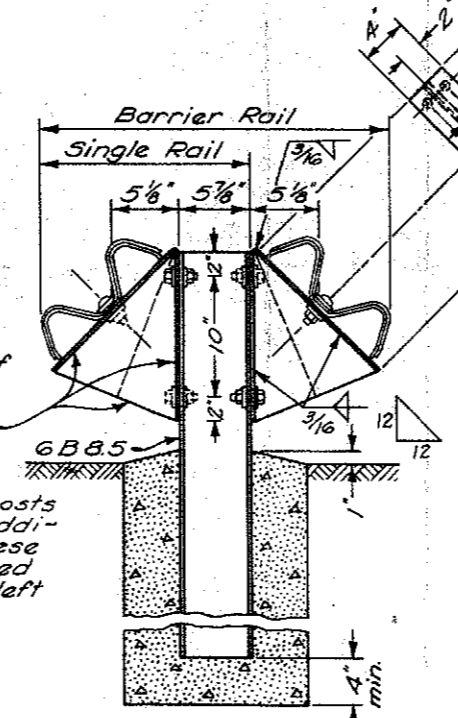
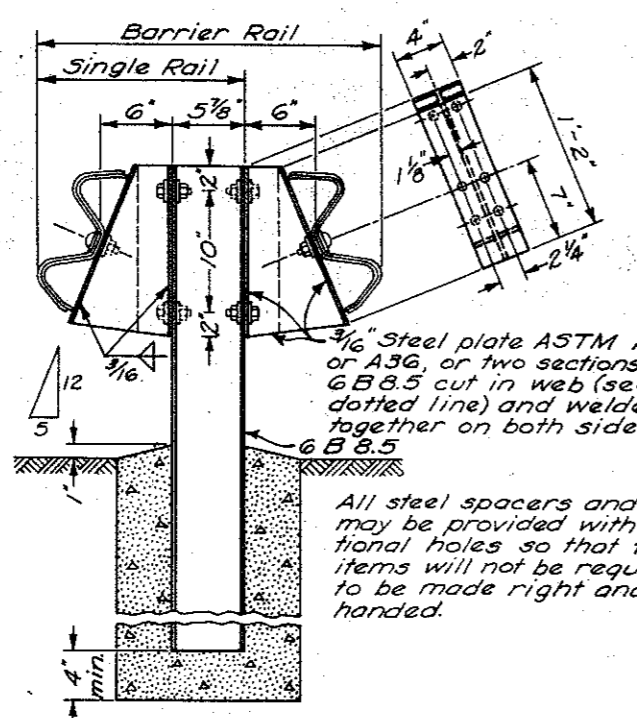
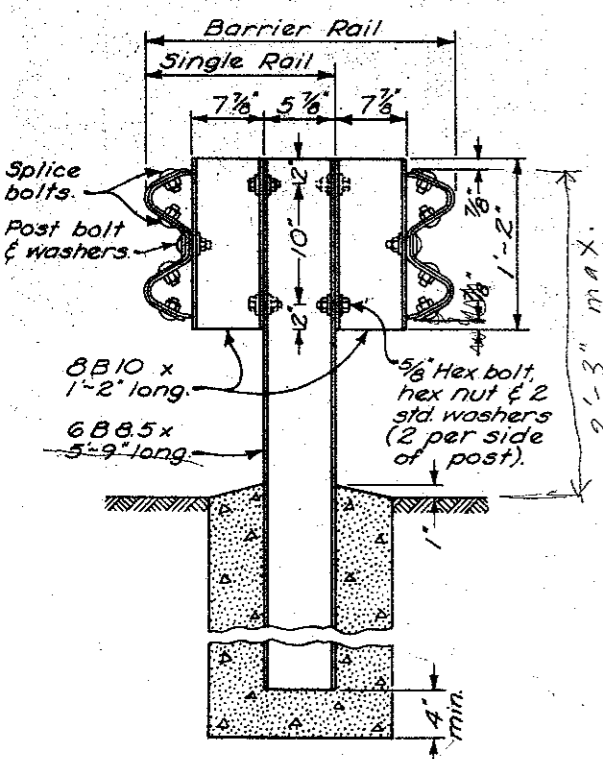


BARRIER RAIL - PLAN VIEW



ROUND WOOD POSTS*

Alternate methods of placing the spacer blocks on the round posts may be submitted for consideration and approval by the Engineer.

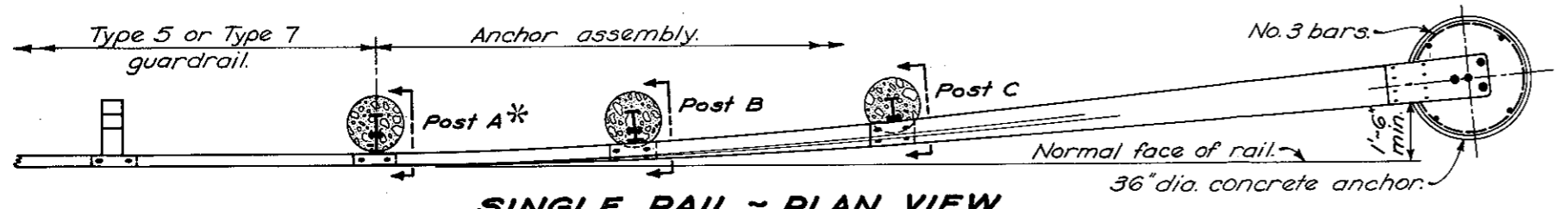


All steel spacers and posts may be provided with additional holes so that these items will not be required to be made right and left handed.

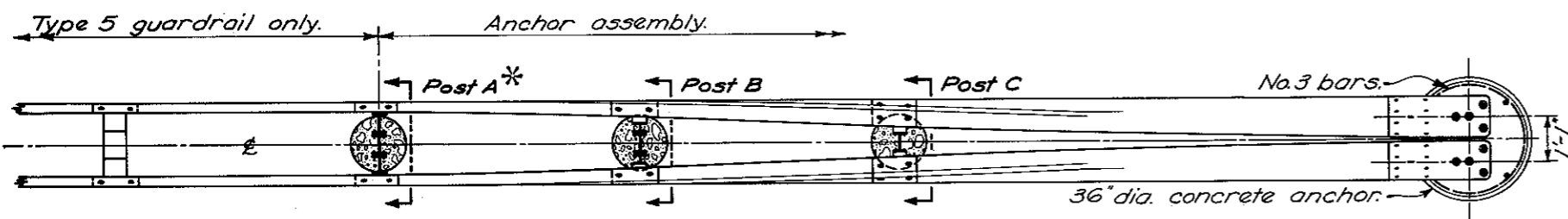
Provide 4 additional shop holes in end of rail element for attachment to terminal anchor.
 Top of rail element shall be flush with existing ground line.

All wood posts and wood spacer blocks shall be pressure treated as per 710.14.

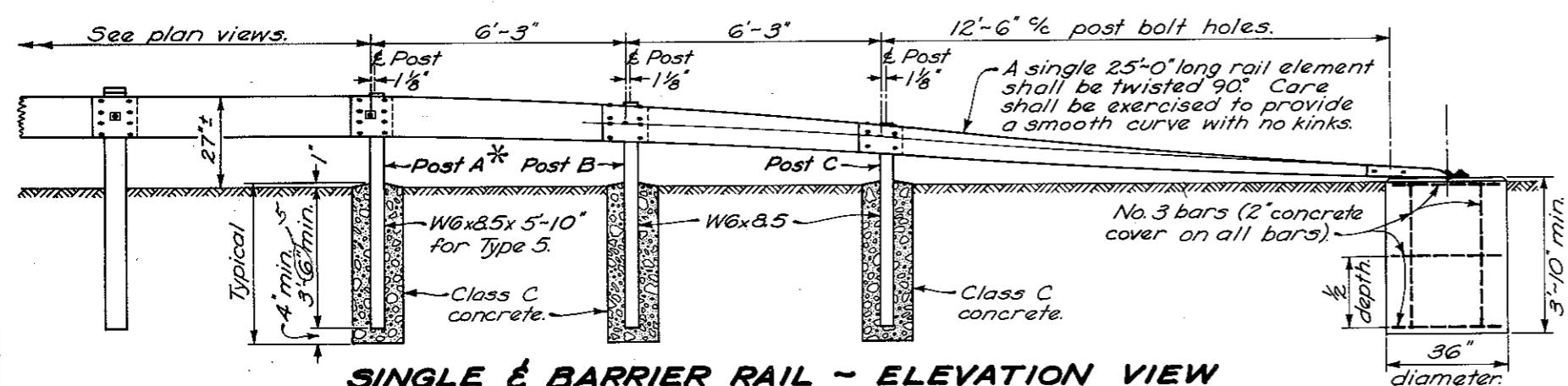
* Tops of driven posts need not be trimmed.



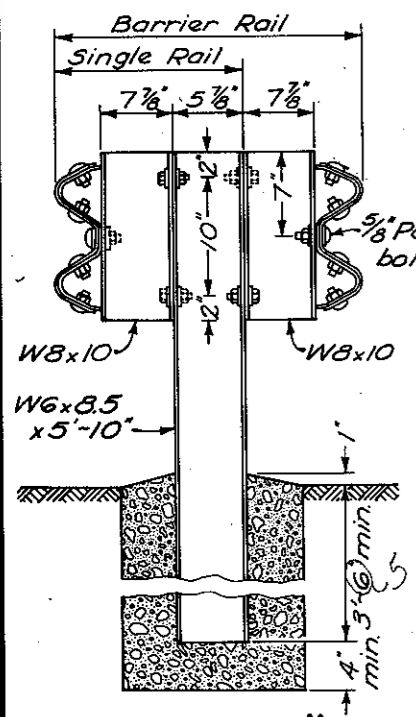
SINGLE RAIL - PLAN VIEW



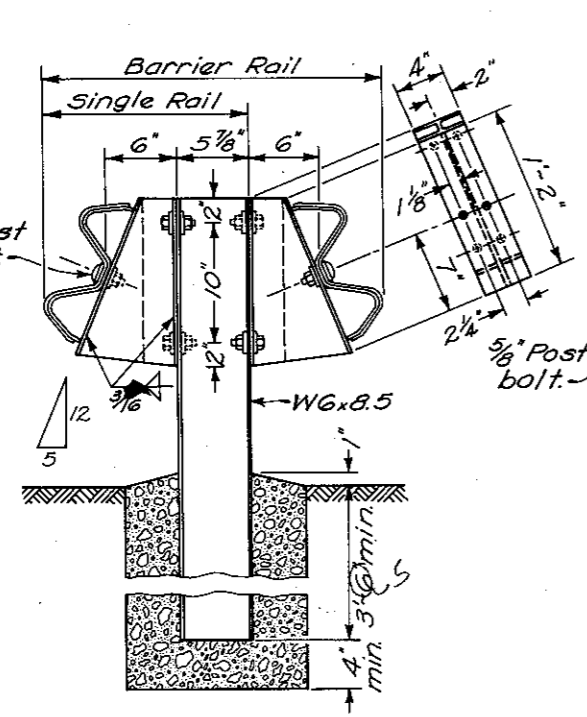
BARRIER RAIL - PLAN VIEW



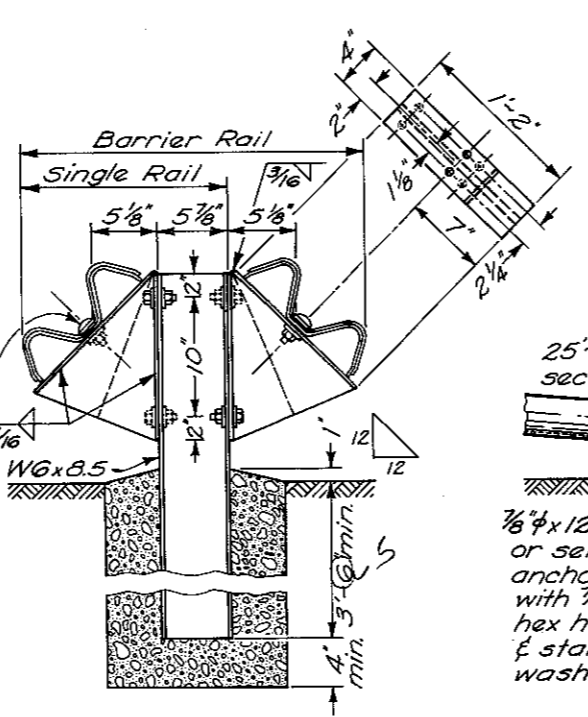
SINGLE & BARRIER RAIL - ELEVATION VIEW



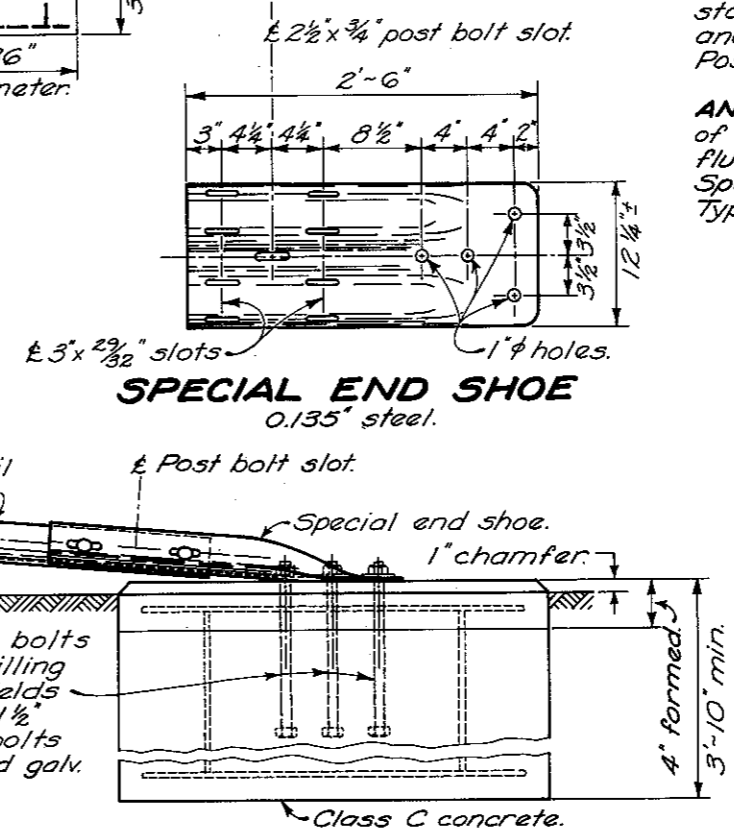
POST A*



POST B



POST C



SPECIAL END SHOE
0.135" steel.

CONCRETE ANCHOR

NOTES

GENERAL: For details not shown, see Standard Drawings GR-2A or GR-2B. All steel parts shall be galvanized in accordance with 710.06 or 710.10, whichever may apply.

ANCHOR ASSEMBLY shall be used at each free end of either Type 5 or Type 7 guardrail or barrier rail.

The 1'-6" flare offset from normal face of rail, shown in the plan view (for single rail installations), will be utilized only where shoulder width is insufficient for providing standard offsets shown on GR-5 and GR-6. Use of the 1'-6" offset will generally be limited to upgrading existing highways for safety or the construction or reconstruction of highways with design traffic less than 1000 ADT or design speeds less than 50 mph.

SPACERS for Posts B and C shall be made of 3/16" steel plate 710.15, or two sections of W6x8.5 or W8x10 cut in the web (see dashed line) and welded together on both sides.

All steel spacers and posts may be provided with additional bolt holes so that these items will not be required to be made right and left handed.

Spacers shall be fastened to their posts with two 5/8" hexhead bolts and nuts with standard washers on both sides.

POST BOLT WASHERS: Place one rectangular washer (see GR-2B for detail) between post bolt head or nut and the face of rail.

All other washers indicated on this drawing are standard galvanized steel of the appropriate size.

CONCRETE ANCHOR: Form top 4" of anchor and slope the top to conform to slope of the adjacent ground. The 36" diameter anchor may be replaced by a 2'-6" square anchor at the contractor's option.

CONCRETE: All concrete shall be Class C. Minimum post encasement shall be 4".

* Single rail details are shown for Type 5 guardrail. Where anchor assembly is attached to Type 7 guardrail, Post A shall be a standard Type 7 line post set in concrete, and the spacer block shall be omitted. Post bolt shall be 5/8" phi.

ANCHORS: Self-drilling anchors may be of the snap-off chuck-end type or the flush-end type conforming to Federal Specification No. FF-S-325, Group III, Type 1(a) or (c).

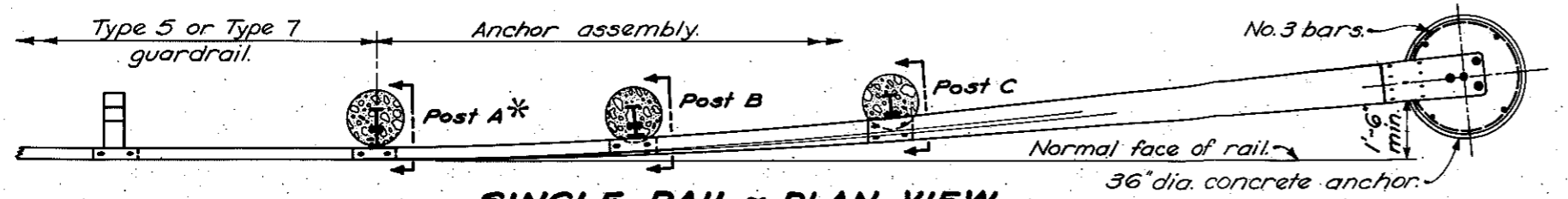
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

ANCHOR ASSEMBLY

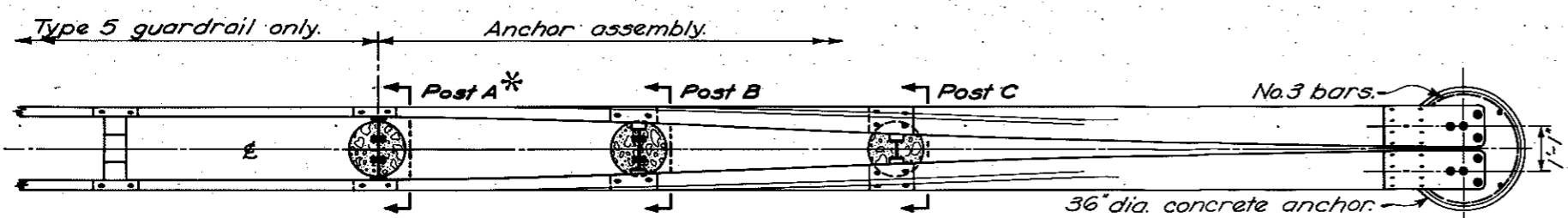
STANDARD CONSTRUCTION DRAWING **GR-4**

APPROVED *R.E. Galt* ENGR, L. & D.

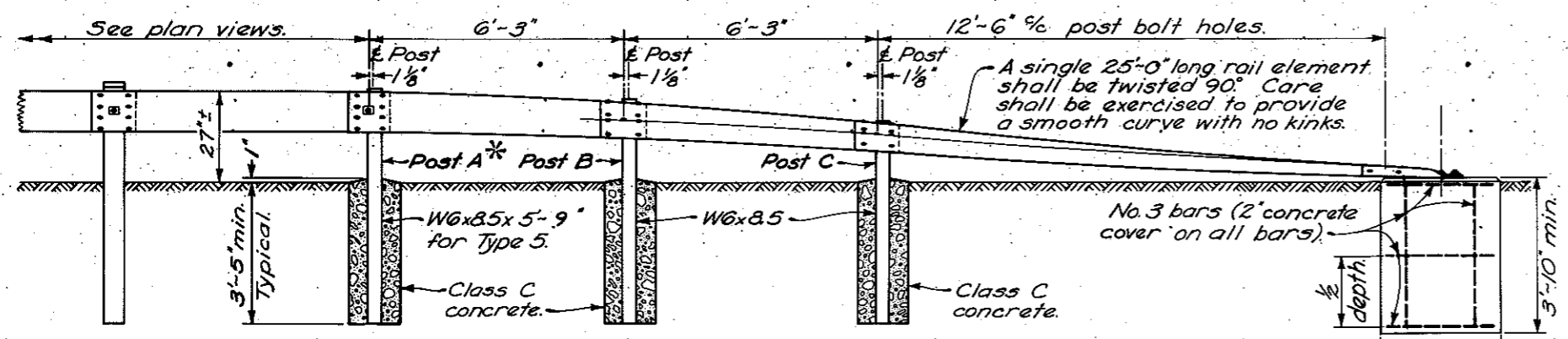
DATE 1-1-71



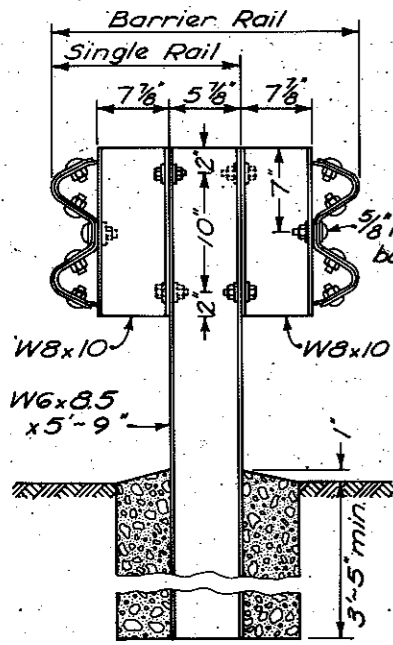
SINGLE RAIL - PLAN VIEW



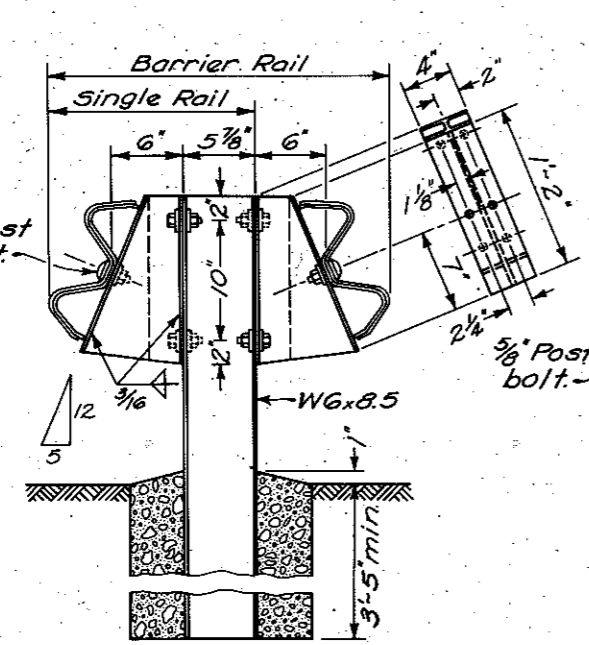
BARRIER RAIL - PLAN VIEW



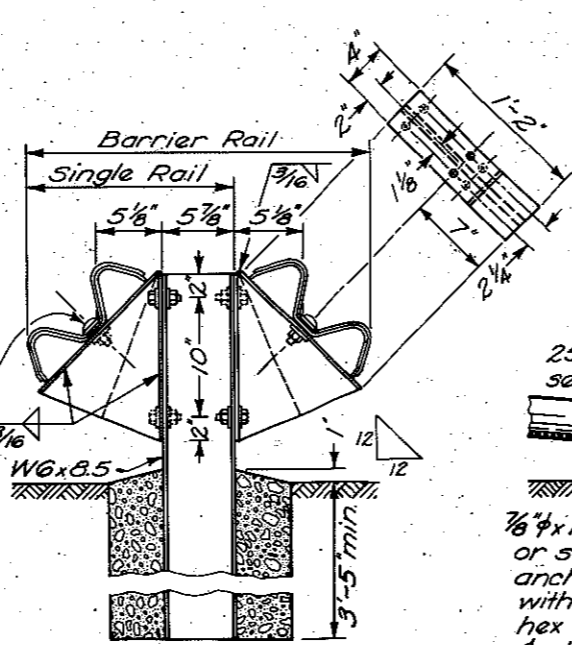
SINGLE & BARRIER RAIL - ELEVATION VIEW



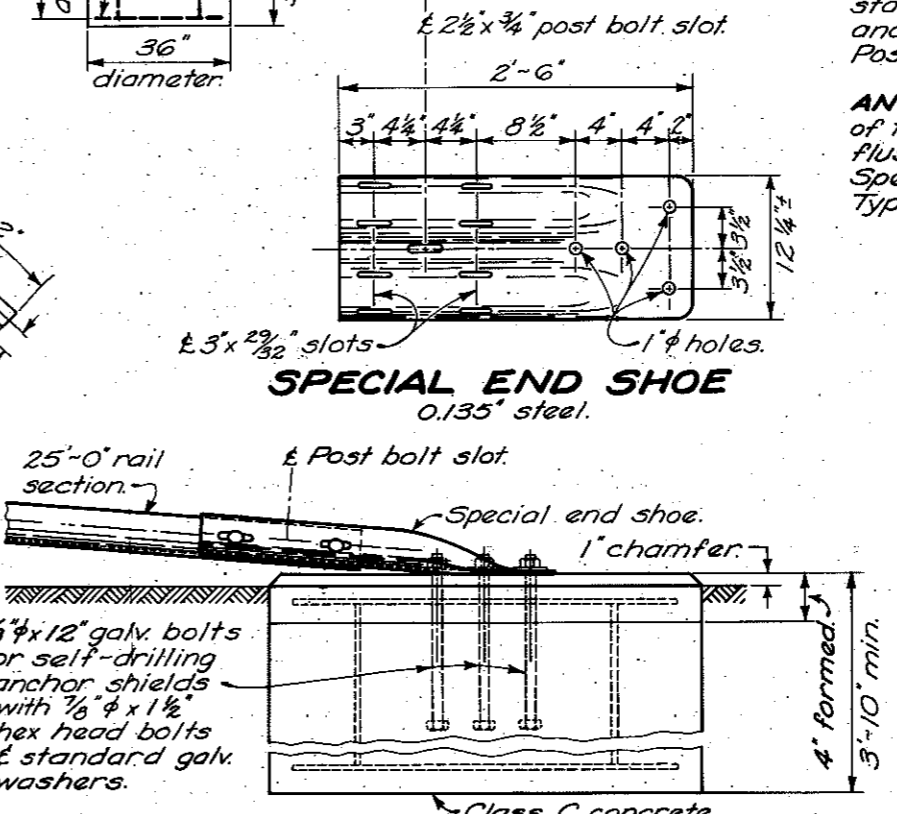
POST A*



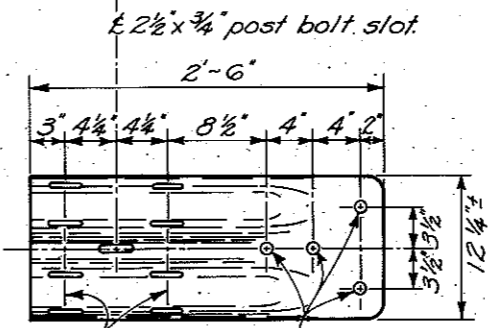
POST B



POST C



CONCRETE ANCHOR



SPECIAL END SHOE
0.135" steel.

NOTES

GENERAL: For details not shown, see Standard Drawings GR-2A or GR-2B. All steel parts shall be galvanized in accordance with 710.06 or 710.10, whichever may apply.

ANCHOR ASSEMBLY shall be used at each free end of either Type 5 or Type 7 guardrail or barrier rail.

The 1'-6" flare offset from normal face of rail, shown in the plan view (for single rail installations), will be utilized only where shoulder width is insufficient for providing standard offsets shown on GR-5 and GR-6. Use of the 1'-6" offset will generally be limited to upgrading existing highways for safety or the construction or reconstruction of highways with design traffic less than 1000 ADT or design speeds less than 50 mph.

SPACERS for Posts B and C shall be made of 3/16" steel plate 710.15, or two sections of W6x8.5 or W8x10 cut in the web (see dashed line) and welded together on both sides.

All steel spacers and posts may be provided with additional bolt holes so that these items will not be required to be made right and left handed.

Spacers shall be fastened to their posts with two 5/8" hexhead bolts and nuts with standard washers on both sides.

POST BOLT WASHERS: Place one rectangular washer (see GR-2B for detail) between post bolt head or nut and the face of rail.

All other washers indicated on this drawing are standard galvanized steel of the appropriate size.

CONCRETE ANCHOR: Form top 4" of anchor and slope the top to conform to slope of the adjacent ground. The 36" diameter anchor may be replaced by a 2'-6" square anchor at the contractor's option.

CONCRETE: All concrete shall be Class C. Minimum post encasement shall be 4".

* Single rail details are shown for Type 5 guardrail. Where anchor assembly is attached to Type 7 guardrail, Post A shall be a standard Type 7 line post set in concrete, and the spacer block shall be omitted. Post bolt shall be 3/8" φ.

ANCHORS: Self-drilling anchors may be of the snap-off chuck-end type or the flush-end type conforming to Federal Specification No. FF-S-325, Group III, Type 1(a) or (c).

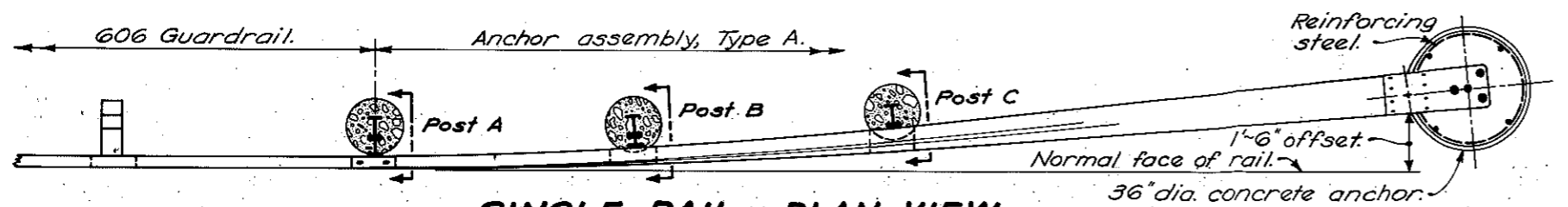
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF HIGHWAYS

ANCHOR ASSEMBLY

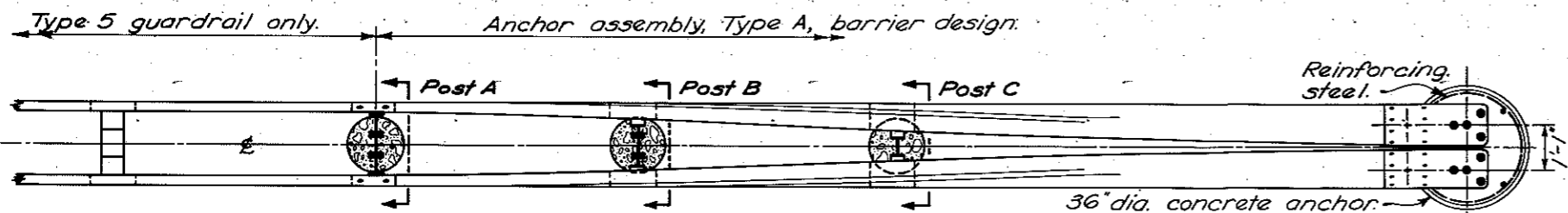
DATE 1-1-71
11-9-71

STANDARD CONSTRUCTION DRAWING **GR-4**

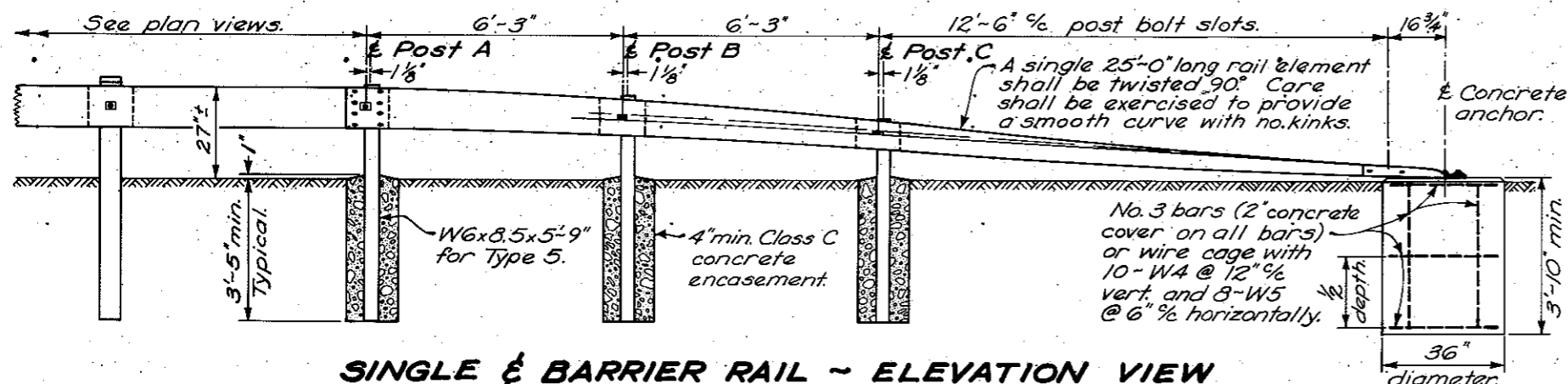
APPROVED *E. J. Hayes* ENGR., L. & D.



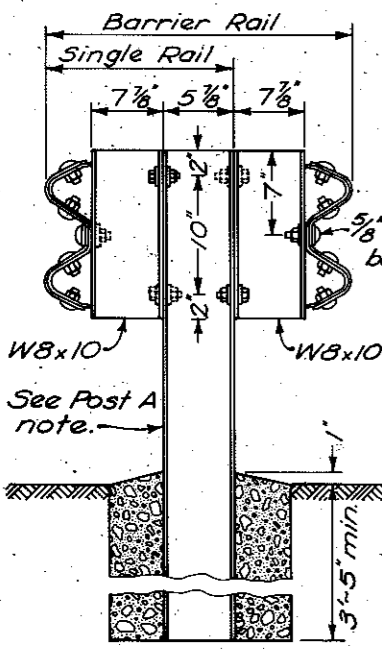
SINGLE RAIL - PLAN VIEW



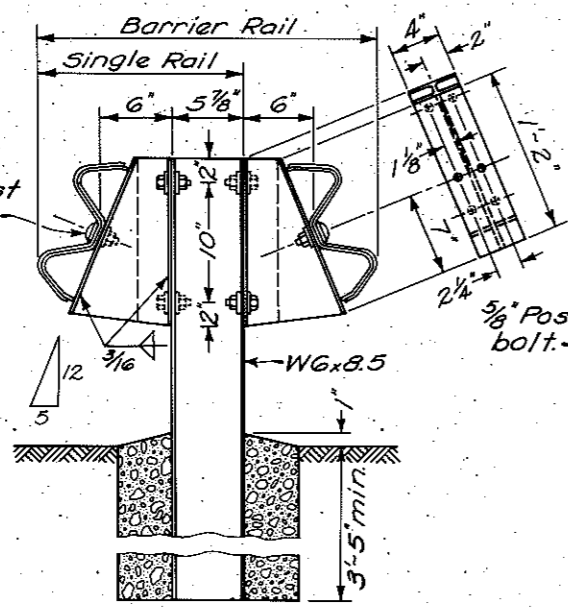
BARRIER RAIL - PLAN VIEW



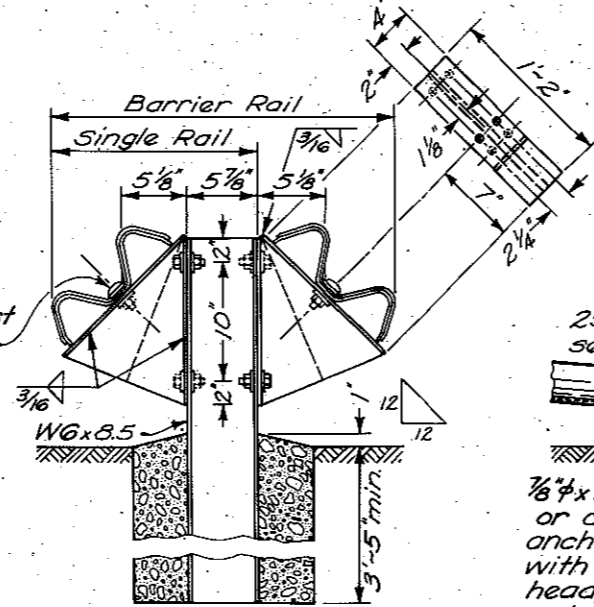
SINGLE & BARRIER RAIL - ELEVATION VIEW



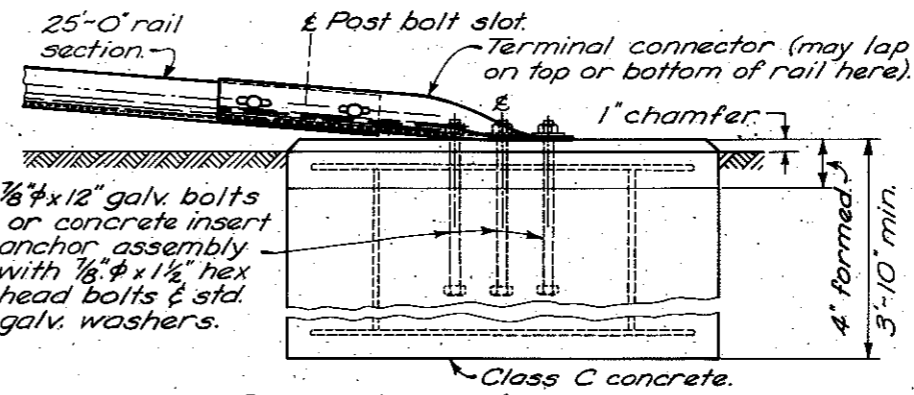
POST A



POST B



POST C



CONCRETE ANCHOR

NOTES

GENERAL: For details not shown, see GR-1 and other Standard Construction Drawings pertaining to specific guardrail type. All steel parts shall be galvanized.

ANCHOR ASSEMBLY TYPE A can be used at each free end of Type 4, 5 or 7 guardrail or barrier rail. It is primarily an approach end.

The 1'-6" flare offset from normal face of rail, shown in the plan view (for single rail installations), will be utilized only where shoulder width is insufficient for providing standard offsets shown on GR-5 and GR-6. Use of the 1'-6" offset will generally be limited to upgrading existing highways for safety or the construction or reconstruction of highways with design traffic less than 1000 ADT or design speeds less than 50 mph.

SPACERS for Posts B and C shall be made of 3/16" steel plate 710.15, or two sections of W6x8.5 or W8x10 cut in the web (see dashed line) and welded together on both sides.

All steel spacers and posts may be provided with additional bolt holes so that these items will not be required to be made right and left handed.

Spacers shall be fastened to their posts with two 5/8" hexhead bolts and nuts with standard washers on both sides.

POST BOLT WASHERS: Place one rectangular washer (see GR-1 for detail) between post bolt head or nut and the face of rail.

All other washers indicated on this drawing are standard galvanized steel of the appropriate size.

CONCRETE ANCHOR: Form top 4" of anchor and slope the top to conform to slope of the adjacent ground. The 36" diameter anchor may be replaced by a 2'-6" square anchor at the contractor's option.

CONCRETE: All concrete shall be Class C. Minimum post encasement shall be 4".

POST A: Rail details are shown for Type 5 guardrail. Where anchor assembly is attached to Type 4 or 7 guardrail, Post A shall be a standard Type 4 or 7 line post set in concrete, and the spacer block shall be omitted. Post bolt shall be 5/8" φ.

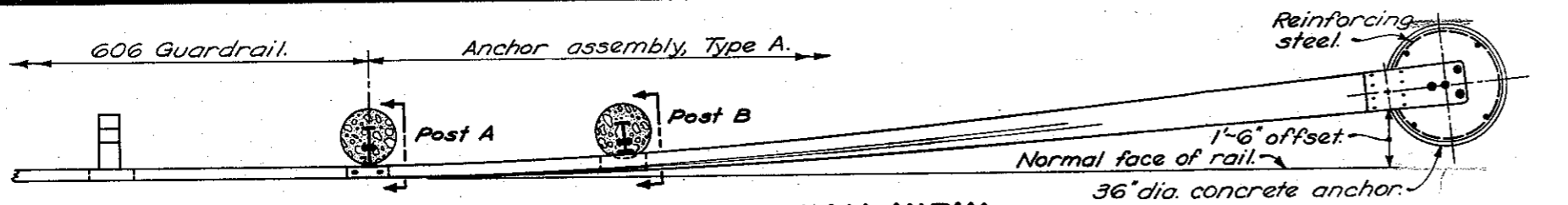
BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

ANCHOR ASSEMBLY

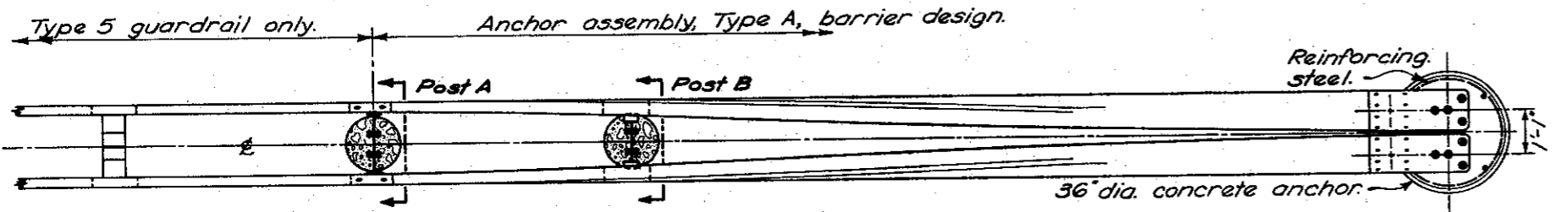
DATE
1-1-71
11-9-71
12-6-76

STANDARD CONSTRUCTION DRAWING
GR-4

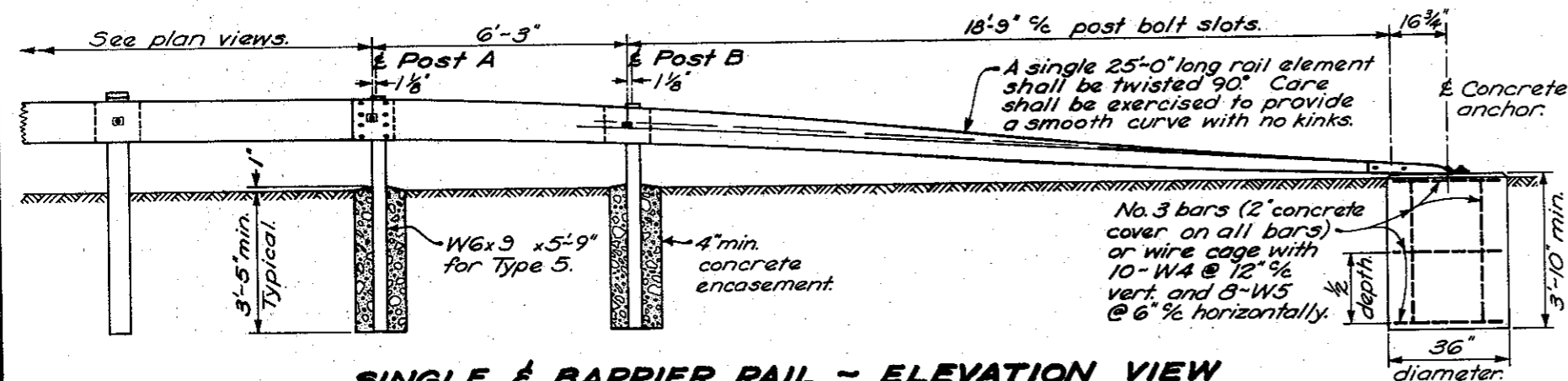
APPROVED: *W. J. Cunningham* ENGR., L.S.D.



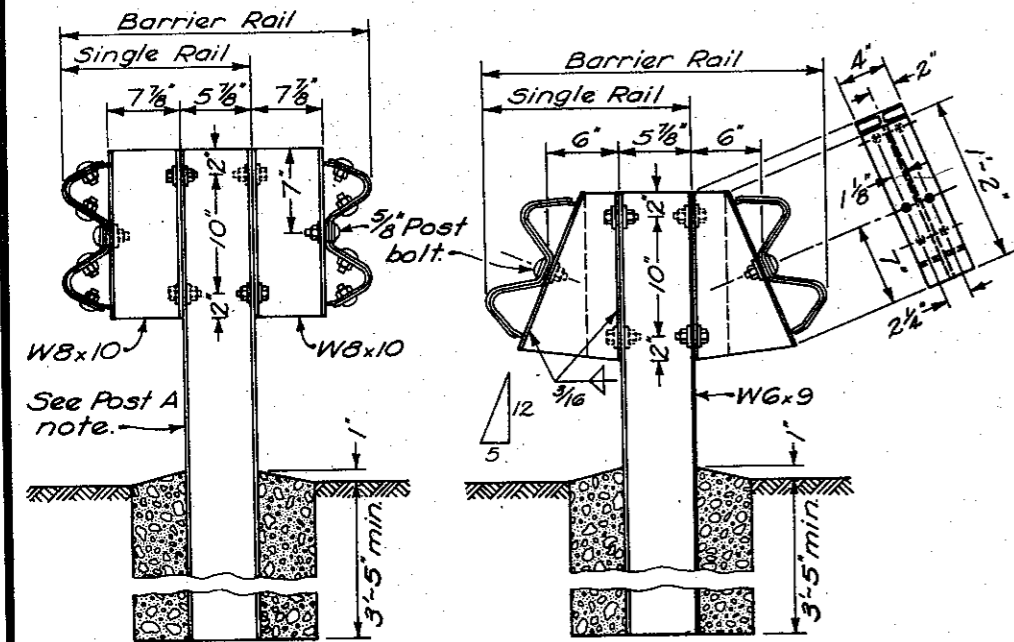
SINGLE RAIL - PLAN VIEW



BARRIER RAIL - PLAN VIEW

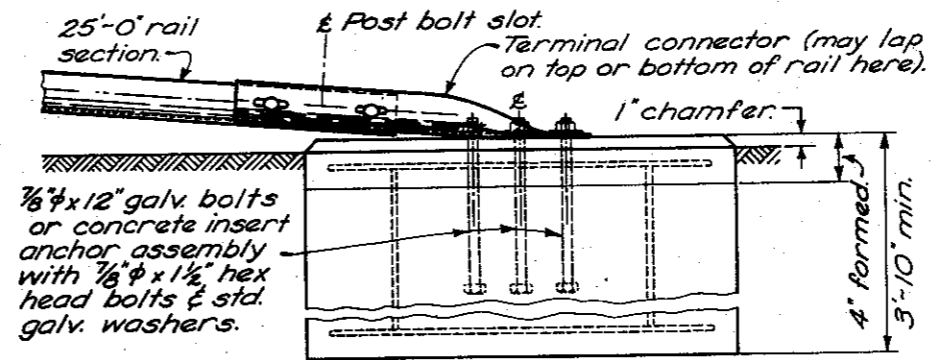


SINGLE & BARRIER RAIL - ELEVATION VIEW



POST A

POST B



CONCRETE ANCHOR

NOTES

GENERAL: For details not shown, see GR-1 and other Standard Construction Drawings pertaining to specific guardrail type. All steel parts shall be galvanized.

ANCHOR ASSEMBLY TYPE A can be used at each free end of Type 4, 5 or 7 guardrail or barrier rail. It is primarily an approach end.

The 1'-6" flare offset from normal face of rail, shown in the plan view (for single rail installations), will be utilized only where shoulder width is insufficient for providing standard offsets shown on GR-5 and GR-6. Use of the 1'-6" offset will generally be limited to upgrading existing highways for safety or the construction or reconstruction of highways with design traffic less than 1000 ADT or design speeds less than 50 mph.

SPACERS for Post B shall be made of 3/16" steel plate 710.15, or two sections of W6x9 or W8x10 cut in the web (see dashed line) and welded together on both sides.

All steel spacers and posts may be provided with additional bolt holes so that these items will not be required to be made right and left handed.

Spacers shall be fastened to their posts with two 3/8" hexhead bolts and nuts with standard washers on both sides.

POST BOLT WASHERS: Place a rectangular plate washer between the face of rail and post bolt head.

All other washers indicated on this drawing are standard galvanized steel of the appropriate size.

CONCRETE ANCHOR: Form top 4" of anchor and slope the top to conform to slope of the adjacent ground. The 36" diameter anchor may be replaced by a 2'-6" square anchor at the contractor's option.

POST A: Rail details are shown for Type 5 guardrail. Where anchor assembly is attached to Type 4 or 7 guardrail, Post A shall be a standard Type 4 or 7 line post set in concrete, and the spacer block shall be omitted. Post bolt shall be 3/8" φ.

BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
TYPE A ANCHOR ASSEMBLY	
STANDARD CONSTRUCTION DRAWING	GR-4
APPROVED: <i>[Signature]</i>	ENGR., L.&D.

DATE
1-1-71
11-9-71
12-6-76
2-5-82