

Installation of posts and spacer blocks shall be at 3'-1 1/2" c/c when Type 5A guardrail is specified.

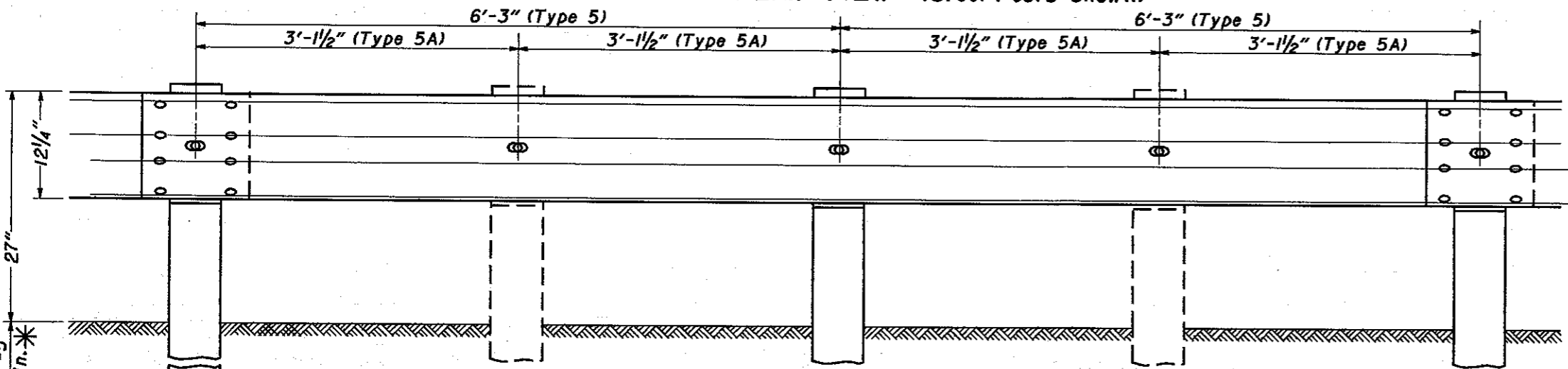
Spacer block

Place a 12" back-up plate between the guardrail and post at each post where a rail splice does not occur. Steel posts only.

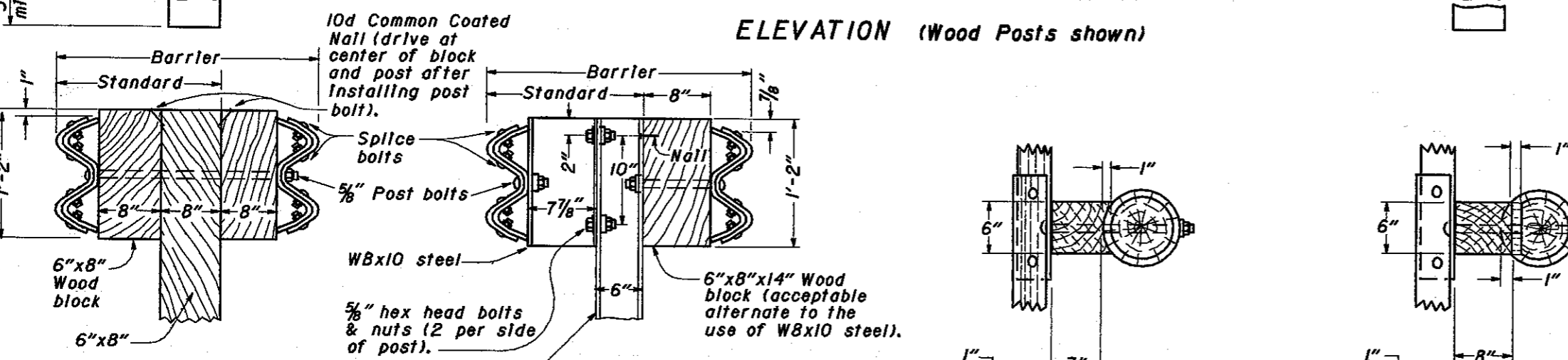
Rail splice (lap in the direction of traffic)

PLAN VIEW (Steel Posts shown)

2" 1/4" 1/4" 2"

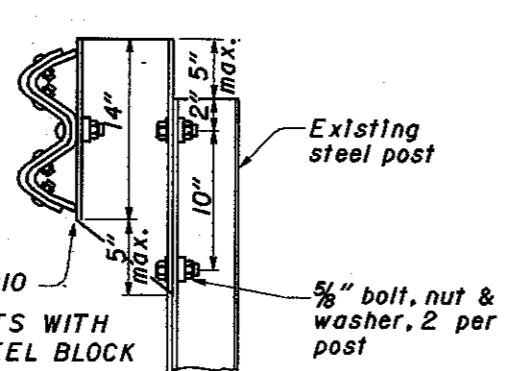
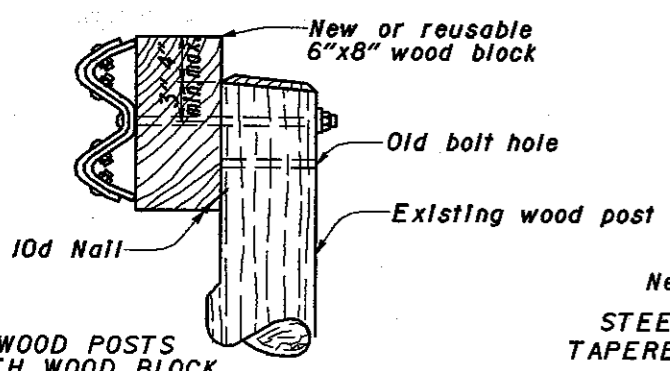


ELEVATION (Wood Posts shown)



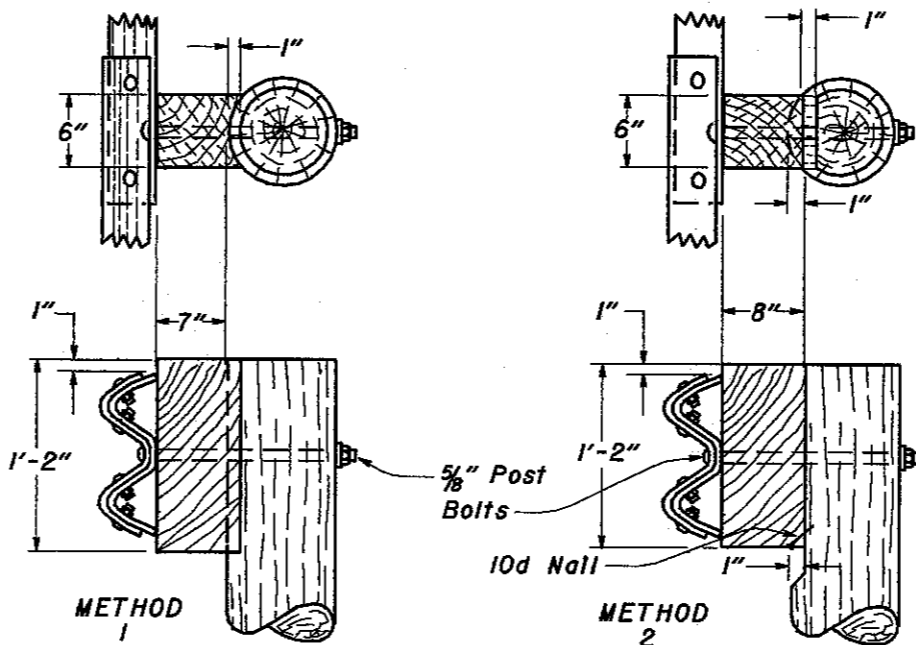
SQUARE WOOD POST

STEEL POST



RAISING EXISTING GUARDRAIL HEIGHT

When the guardrail height is to be raised, wood blocks shall not be used on existing steel post.



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

ROUND WOOD POSTS

NOTES

**POSTS:** Post may be round (single rail only) or 6"x8" square-sawed pressure-treated wood or W6x9 galvanized steel. The same type post shall be used throughout the length of project unless otherwise required by the plans or permitted by the Engineer. Round posts shall be 8" plus or minus 1" in diameter at the top and not more than 3" larger at the butt with a uniform taper.

Post may be set in drilled holes or may be driven to grade.

Wood posts shall be fabricated with square ends. Posts and spacer blocks shall be pressure-treated as per 710.14. Bolt holes shall be bored and tops of posts trimmed as shown, if required, after posts are set.

**SPACER BLOCKS:** When wood spacer blocks are used with the steel post, a 10d nail shall be driven through the hole in the adjacent flange to prevent blocks from turning.

**WASHERS:** All washers indicated are standard galvanized steel of the appropriate size.

**WELDED BEAMS:** Welded beam guardrail posts and spacer blocks may be used for Item 606, Guardrail, provided the web and flange sizes are as shown hereon. Welding of the web to the flanges shall conform to ASTM A769, Class 1 using Grade 36 steel with the following exceptions:

- 7.2 Test reports of tensile properties for each lot shall accompany each shipment.
- 12. Beams which have imperfections repaired by welding shall not be accepted for use in Item 606.
- 13. Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

\* FOR SPECIFIC POST embedment depth requirements see Std. Const. Dwg. GR-1.2.

STEEL BEAM POSTS & BLOCKS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W 6x8.5	5.83"	3.94"	.194"	.170"
Rolled W 6x9	5.90"	3.94"	.215"	.170"
Rolled W 8x10	7.89"	3.94"	.205"	.170"
Welded 6x8.5	6.0"	3.94"	.194"	.170"
Welded 6x9	6.0"	3.94"	.215"	.170"
Welded 8x10	8.0"	3.94"	.205"	.170"

**MISCELLANEOUS:** For details not shown see Standard Construction Drawings GR-1.1 and GR-1.2.

1990

BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF TRANSPORTATION

**GUARDRAIL  
TYPE 5 & 5A**

STANDARD CONSTRUCTION DRAWING  
**GR-2.1**

APPROVED ENGR., L. & D.

DATE  
2-15-68  
1-1-71  
11-9-71  
12-6-76  
2-5-82  
9-10-90

# NOTES

**POSTS:** Post may be round (single rail only) or 6"x8" square-sawn pressure-treated wood or W6x9 galvanized steel. The same type post shall be used throughout the length of project unless otherwise required by the plans or permitted by the Engineer. Round posts shall be 8" plus or minus 1" in diameter at the top and not more than 3" larger at the butt with a uniform taper.

Post may be set in drilled holes or may be driven to grade.

Wood posts shall be fabricated with square ends. Posts and spacer blocks shall be pressure-treated as per 710.14. Bolt holes shall be bored and tops of posts trimmed as shown, if required, after posts are set.

**SPACER BLOCKS:** When wood spacer blocks are used with the steel post, a 10d nail shall be driven through the hole in the adjacent flange to prevent blocks from turning.

**WASHERS:** All washers indicated are standard galvanized steel of the appropriate size.

**WELDED BEAMS:** Welded beam guardrail posts and spacer blocks may be used for Item 606, Guardrail, provided the web and flange sizes are as shown hereon. Welding of the web to the flanges shall conform to ASTM A769, Class I using Grade 36 steel with the following exceptions:

7.2 Test reports of tensile properties for each lot shall accompany each shipment.

12. Beams which have imperfections repaired by welding shall not be accepted for use in Item 606.

13. Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

\* **FOR SPECIFIC POST** embedment depth requirements see Std. Const. Dwg. GR-1.2.

STEEL BEAM POSTS & BLOCKS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W 6x8.5	5.83"	3.94"	.194"	.170"
Rolled W 6x9	5.90"	3.94"	.215"	.170"
Rolled W 8x10	7.89"	3.94"	.205"	.170"
Welded 6x8.5	6.0"	3.94"	.194"	.170"
Welded 6x9	6.0"	3.94"	.215"	.170"
Welded 8x10	8.0"	3.94"	.205"	.170"

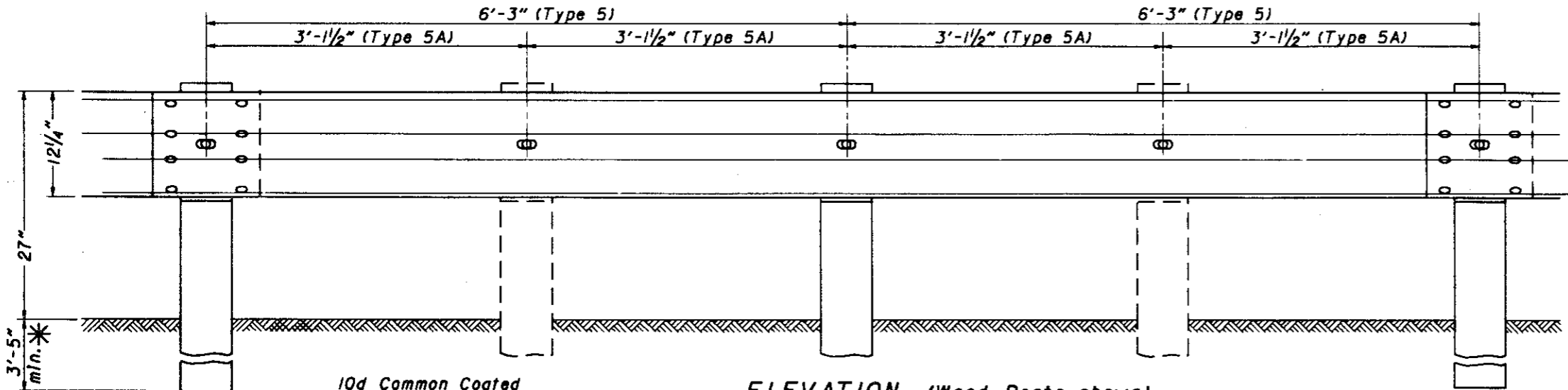
**MISCELLANEOUS:** For details not shown see Standard Construction Drawings GR-1.1 and GR-1.2.

Installation of posts and spacer blocks shall be at 3'-1/2" c/c when Type 5A guardrail is specified.

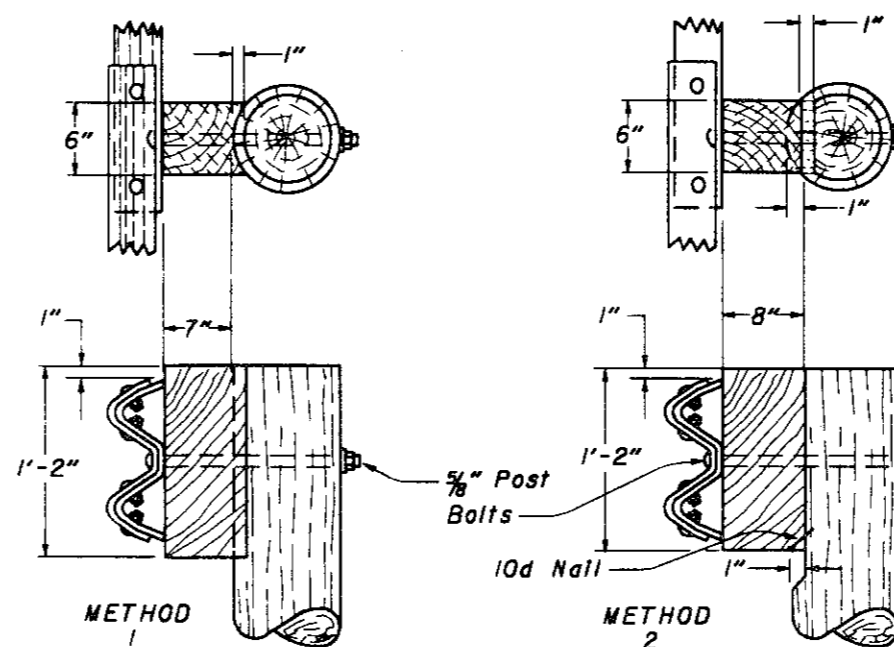
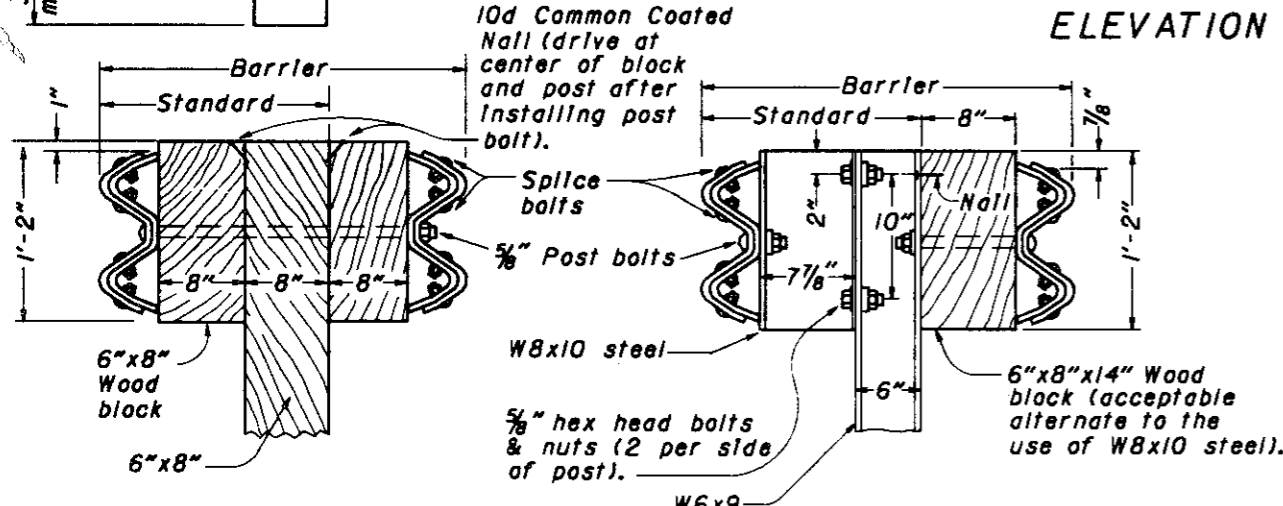
Place a 12" back-up plate between the guardrail and post at each post where a rail splice does not occur. Steel posts only.

Rail splice (lap in the direction of traffic)

PLAN VIEW (Steel Posts shown)



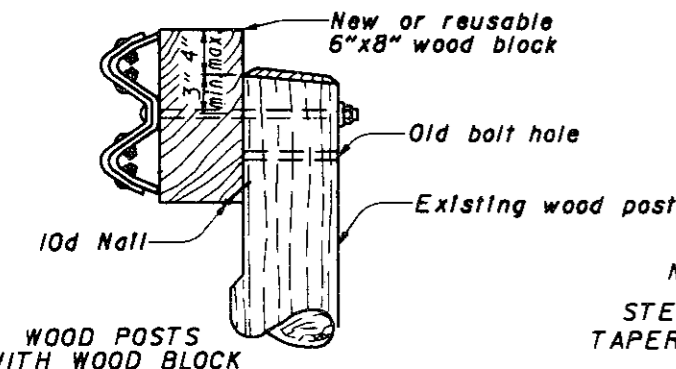
ELEVATION (Wood Posts shown)



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

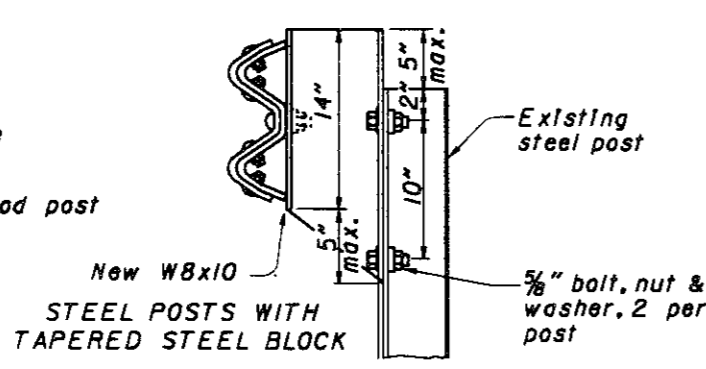
SQUARE WOOD POST

STEEL POST



WOOD POSTS WITH WOOD BLOCK

When the guardrail height is to be raised, wood blocks shall not be used on existing steel post.



STEEL POSTS WITH TAPERED STEEL BLOCK

RAISING EXISTING GUARDRAIL HEIGHT

ROUND WOOD POSTS

BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF TRANSPORTATION

GUARDRAIL  
TYPE 5 & 5A

DATE  
5-6-91

STANDARD  
CONSTRUCTION  
DRAWING  
GR-2.1

APPROVED *R.K. Hulman* ENGR., L. & D.

# NOTES

**POSTS:** Post may be round (single rail only) or 150x200 mm square-sawn pressure-treated wood or W150x13.5 galvanized steel. The same type post shall be used throughout the length of project unless otherwise required by the plans or permitted by the Engineer. Round posts shall be 200 mm ± 25 mm in diameter at the top and not more than 75 mm larger at the butt with a uniform taper. Post may be set in drilled holes or may be driven to grade.

Wood posts shall be fabricated with square ends. Posts and spacer blocks shall be pressure-treated as per CMS 710.14. Bolt holes shall be bored and tops of posts trimmed as shown, if required, after posts are set.

**SPACER BLOCKS:** When wood spacer blocks are used with the steel post, a 10d nail shall be driven through the hole in the adjacent flange to prevent blocks from turning.

**WASHERS:** All washers indicated are standard galvanized steel of the appropriate size.

**WELDED BEAMS:** Welded beam guardrail posts and spacer blocks may be used for Item 606, Guardrail, provided the web and flange sizes are as shown hereon. Welding of the web to the flanges shall conform to ASTM A 769, Class 1 using Grade 36 steel (250 MPa yield point) with the following exceptions:

- 7.2 Test reports of tensile properties for each lot shall accompany each shipment.
- 12. Beams which have imperfections repaired by welding shall not be accepted for use in Item 606.
- 13. Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

**POST EMBEDMENT DEPTH:** For specific depth requirements, see Std. Constr. Dwg. GR-1.2M.

STEEL BEAM POSTS & BLOCKS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W150x12.8	148 mm	100 mm	4.9 mm	4.3 mm
Rolled W150x13.5	150 mm	100 mm	5.5 mm	4.3 mm
Rolled W200x15.0	200 mm	100 mm	5.2 mm	4.3 mm
Welded 150x12.8	152 mm	100 mm	4.9 mm	4.3 mm
Welded 150x13.5	152 mm	100 mm	5.5 mm	4.3 mm
Welded 200x15.0	203 mm	100 mm	5.2 mm	4.3 mm

**MISCELLANEOUS:** For details not shown see GR-1.1M and GR-1.2M.

All dimensions are in millimeters unless otherwise noted.



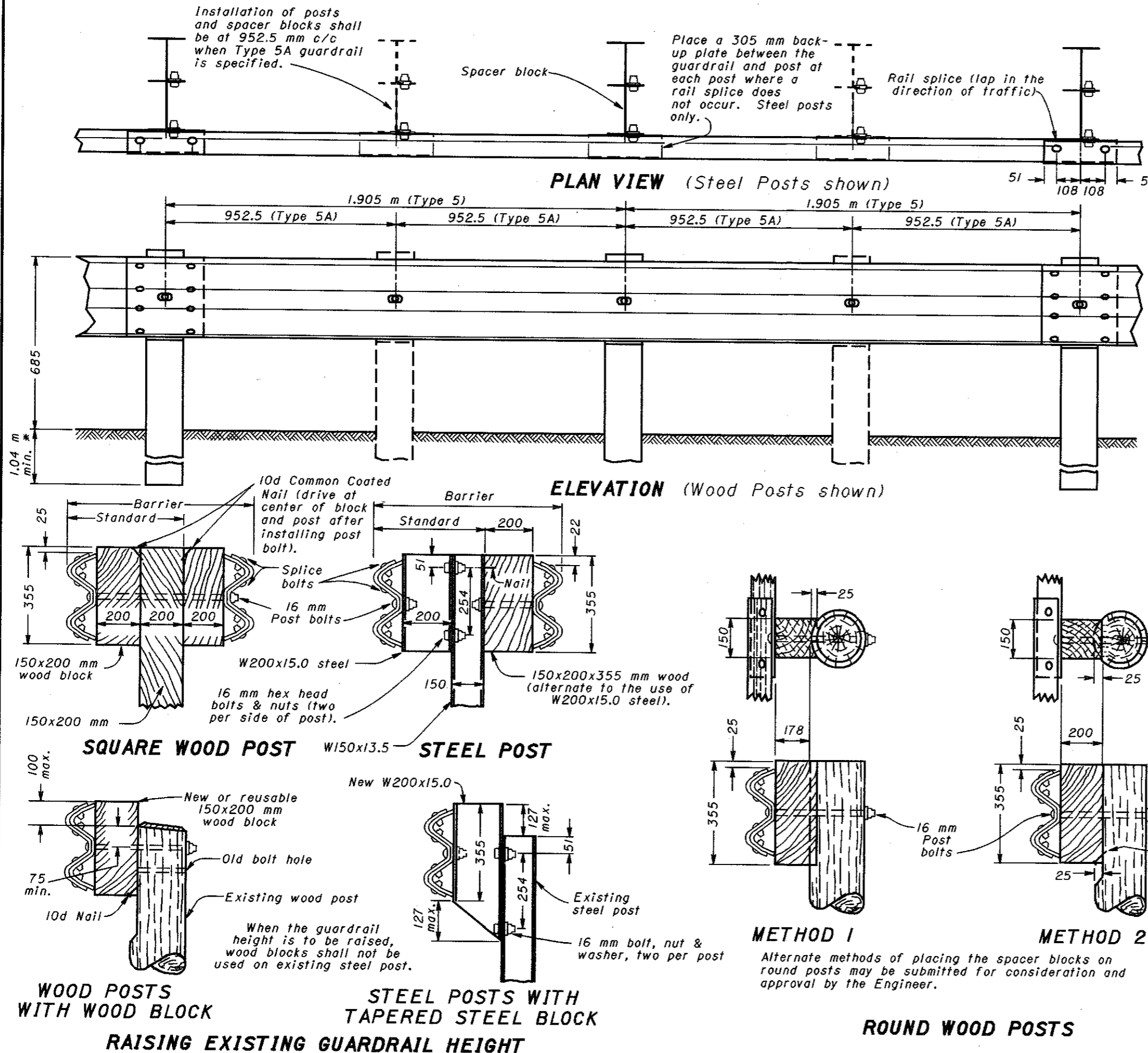
BUREAU OF LOCATION AND DESIGN  
OHIO DEPARTMENT OF TRANSPORTATION

**GUARDRAIL  
TYPE 5 & 5A**

DATE  
11-30-94

STANDARD CONSTRUCTION DRAWING  
**GR-2.1M**

APPROVED *R.K. Hulman*  
ENGR., L & D



# NOTES

**POSTS:** Posts may be round (standard single rail only) or 150x200 mm square-sawn pressure-treated wood or W150x13.5 galvanized steel. The same type post shall be used throughout the length of the project unless otherwise required by the plans or permitted by the Engineer. Round posts shall be 200 mm ± 25 mm in diameter at the top and not more than 75 mm larger at the butt with a uniform taper. Post may be set in drilled holes or may be driven to grade.

Wood posts shall be fabricated with square ends. Posts and blockouts shall be pressure-treated per CMS 710.14. Bolt holes shall be bored and the tops of posts shall be trimmed as shown, if required, after posts are set.

**ALTERNATE BLOCKOUTS:** Approved plastic blockouts may be used in lieu of the wood blockouts shown. The approved list is maintained by the Office of Materials Management.

**WASHERS:** Standard galvanized steel washers of the appropriate size shall be installed on the nut side of bolts through wood posts.

**WELDED BEAMS:** Welded beam guardrail posts and blockouts may be used for Item 606, Guardrail, provided the web and flange sizes are as shown hereon. Welding of the web to the flanges shall conform to ASTM A 769M, Class 1 using Grade 36 steel (250 MPa yield point) with the following exceptions:

Sec. 7.2 Test reports of tensile properties for each lot shall accompany each shipment.

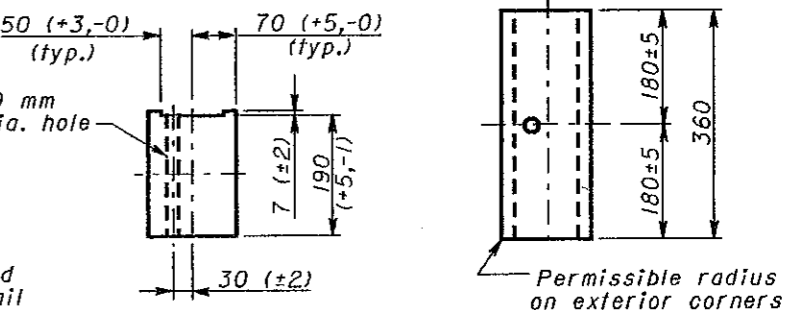
Sec. 12 Beams that have imperfections repaired by welding shall not be accepted for use in Item 606.

Sec. 13 Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

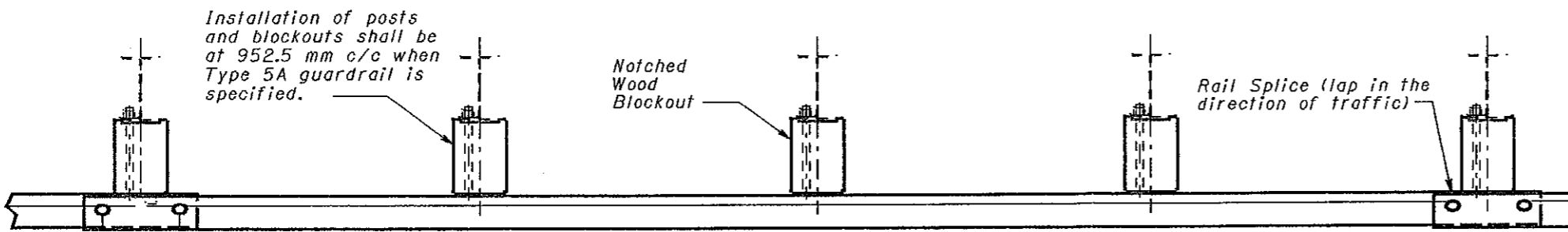
**\* POST EMBEDMENT DEPTH:** For specific depth requirements, see SCD GR-1.2M.

STEEL BEAM POSTS & BLOCKS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W150x13.5	150 mm	100 mm	5.5 mm	4.3 mm
Welded 150x13.5	152 mm	100 mm	5.5 mm	4.3 mm

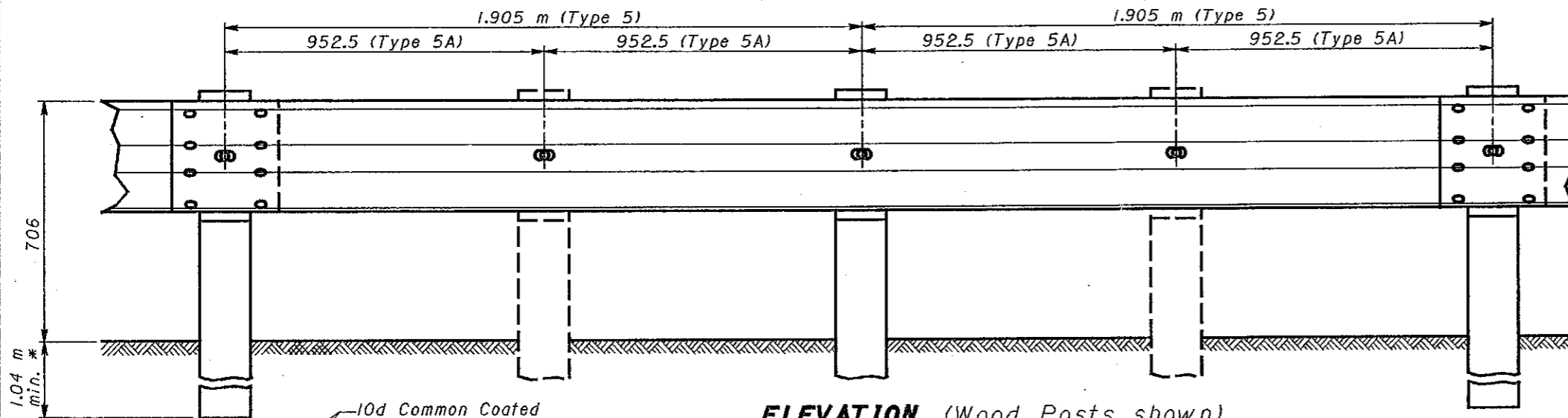
**MISCELLANEOUS:** For details not shown see SCD's GR-1.1M and GR-1.2M.



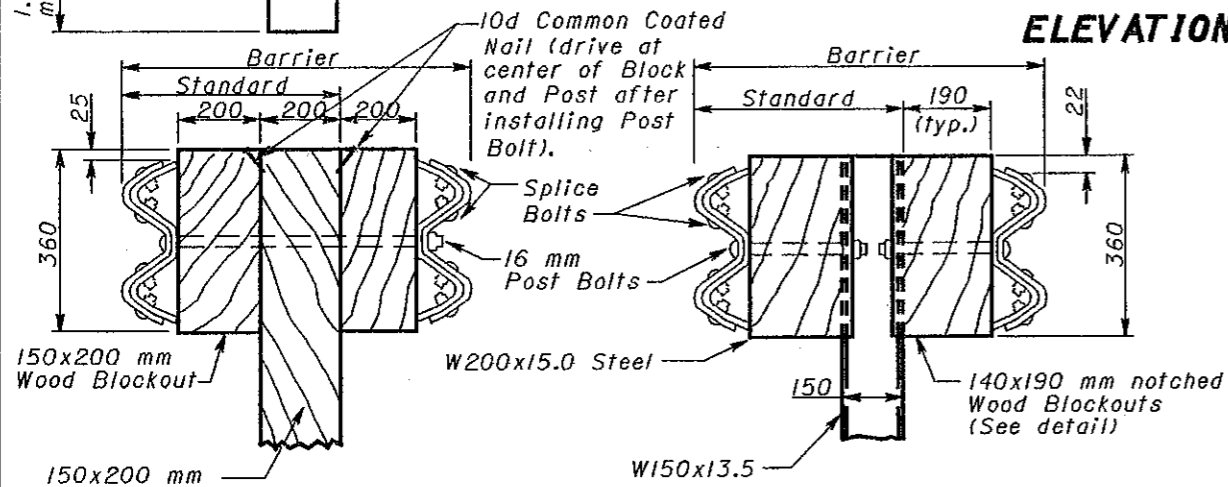
**PLAN ELEVATION NOTCHED BLOCKOUTS FOR STEEL POSTS**



**PLAN VIEW (Steel Posts shown)**

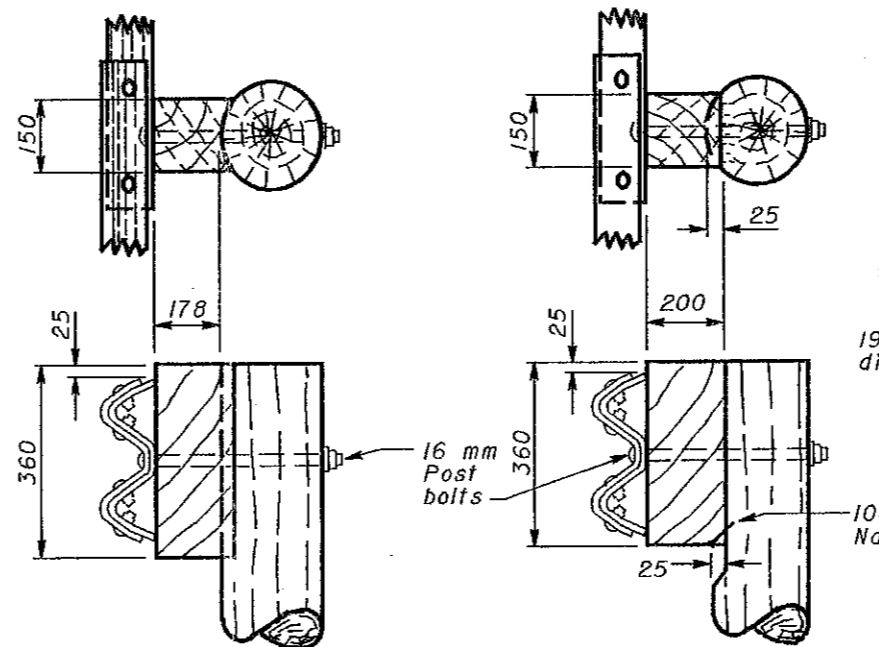


**ELEVATION (Wood Posts shown)**



**SQUARE WOOD POST**

**STEEL POST**

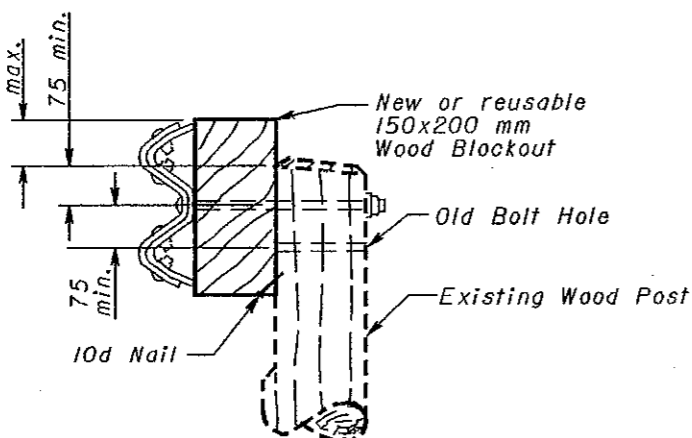


**METHOD 1**

**METHOD 2**

Alternate methods of placing the blockouts on round posts may be submitted for consideration and approved by the Engineer.

**ROUND WOOD POSTS**



**WOOD POSTS WITH WOOD BLOCK RAISING EXISTING GUARDRAIL HEIGHT**

All dimensions are in millimeters unless otherwise noted.



OHIO DEPARTMENT OF TRANSPORTATION

**GUARDRAIL TYPE 5 & 5A**

DATE  
11-30-94  
10-21-97

STANDARD CONSTRUCTION DRAWING **GR-2.1M**

APPROVED *[Signature]*

# NOTES

**POSTS:** Posts may be round (standard single rail only) or 150x200 mm square-sawn pressure-treated wood or W150x13.5 galvanized steel. The same type post shall be used throughout the length of the project unless otherwise required by the plans or permitted by the Engineer. Round posts shall be 200 mm ± 25 mm in diameter at the top and not more than 75 mm larger at the butt with a uniform taper. Post may be set in drilled holes or may be driven to grade.

Wood posts shall be fabricated with square ends. Posts and blockouts shall be pressure-treated per CMS 710.14. Bolt holes shall be bored and the tops of posts shall be trimmed as shown, if required, after posts are set.

**ALTERNATE BLOCKOUTS:** Approved plastic blockouts may be used in lieu of the wood blockouts shown. The approved list is maintained by the Office of Materials Management.

**WASHERS:** Standard galvanized steel washers of the appropriate size shall be installed on the nut side of bolts through wood posts.

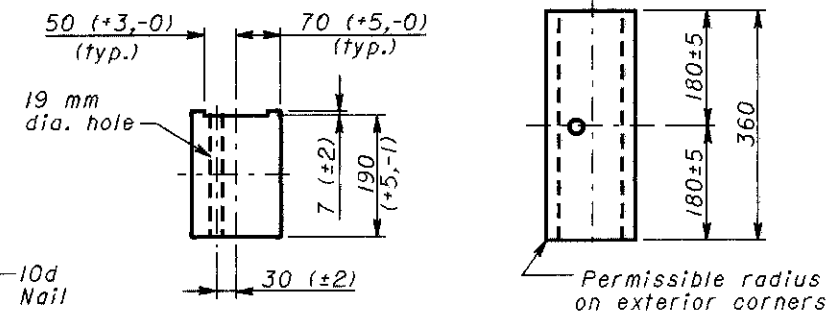
**WELDED BEAMS:** Welded beam guardrail posts may be used for Item 606, Guardrail, provided the web and flange sizes are as shown hereon. Welding of the web to the flanges shall conform to ASTM A 769M, Class I using Grade 36 steel (250 MPa yield point) with the following exceptions:

- Sec. 7.2 Test reports of tensile properties for each lot shall accompany each shipment.
- Sec. 12 Beams that have imperfections repaired by welding shall not be accepted for use in Item 606.
- Sec. 13 Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

\* **POST EMBEDMENT DEPTH:** For specific depth requirements, see SCD GR-1.2M.

STEEL BEAM POSTS				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W150x12.6	148 mm	100 mm	4.9 mm	4.3 mm
Rolled W150x13.5	150 mm	100 mm	5.5 mm	4.3 mm
Welded 150x12.6	152 mm	100 mm	4.9 mm	4.3 mm
Welded 150x13.5	152 mm	100 mm	5.5 mm	4.3 mm

**MISCELLANEOUS:** For details not shown see SCD's GR-1.1M and GR-1.2M.



## PLAN ELEVATION NOTCHED BLOCKOUTS FOR STEEL POSTS

OHIO DEPARTMENT OF TRANSPORTATION

**GUARDRAIL TYPE 5 & 5A**

**DATE**  
11-30-94  
10-21-97  
4-14-98

STANDARD CONSTRUCTION DRAWING **GR-2.1M**

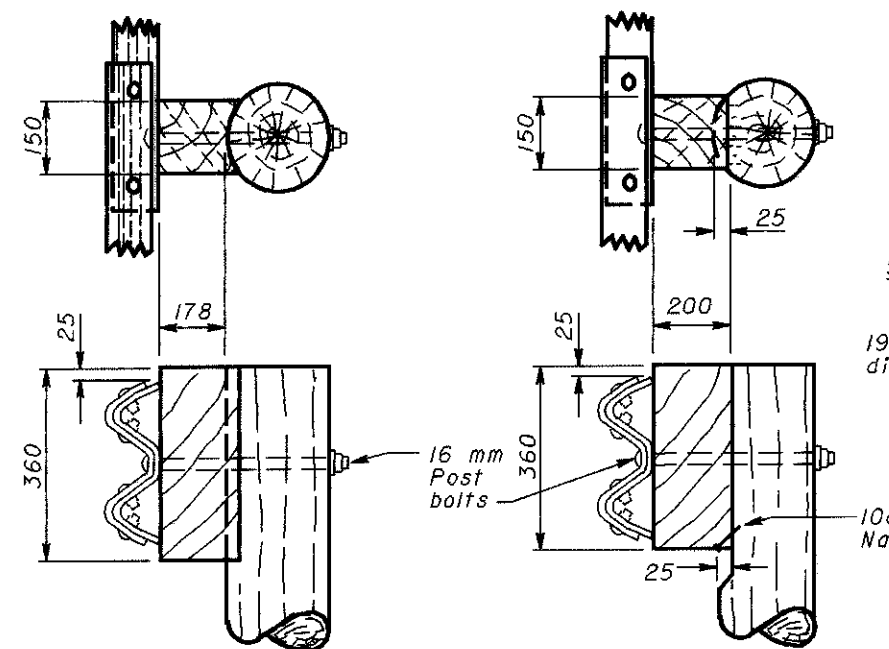
APPROVED *Louise F. Sutherland*



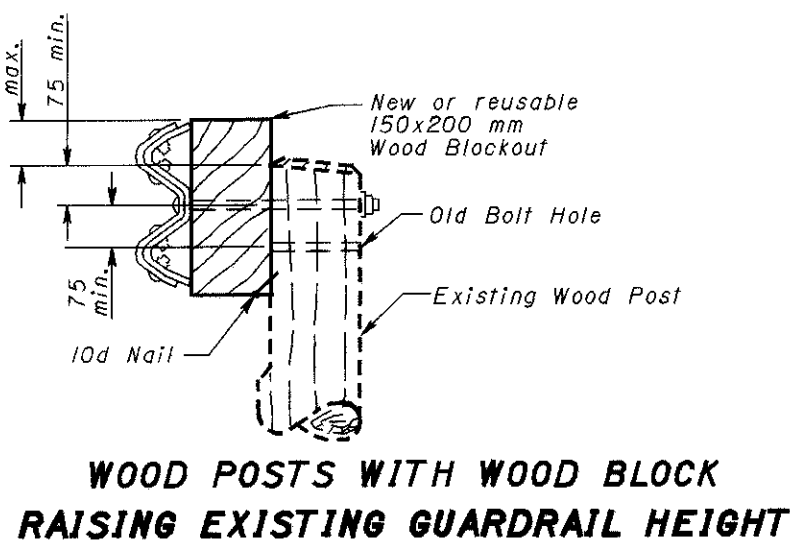
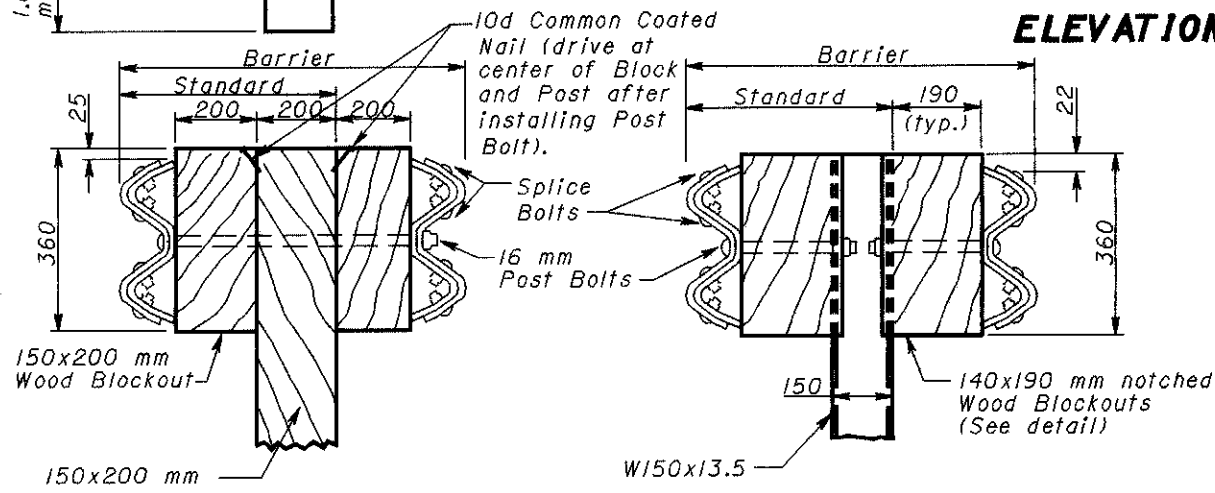
All dimensions are in millimeters unless otherwise noted.

## ROUND WOOD POSTS

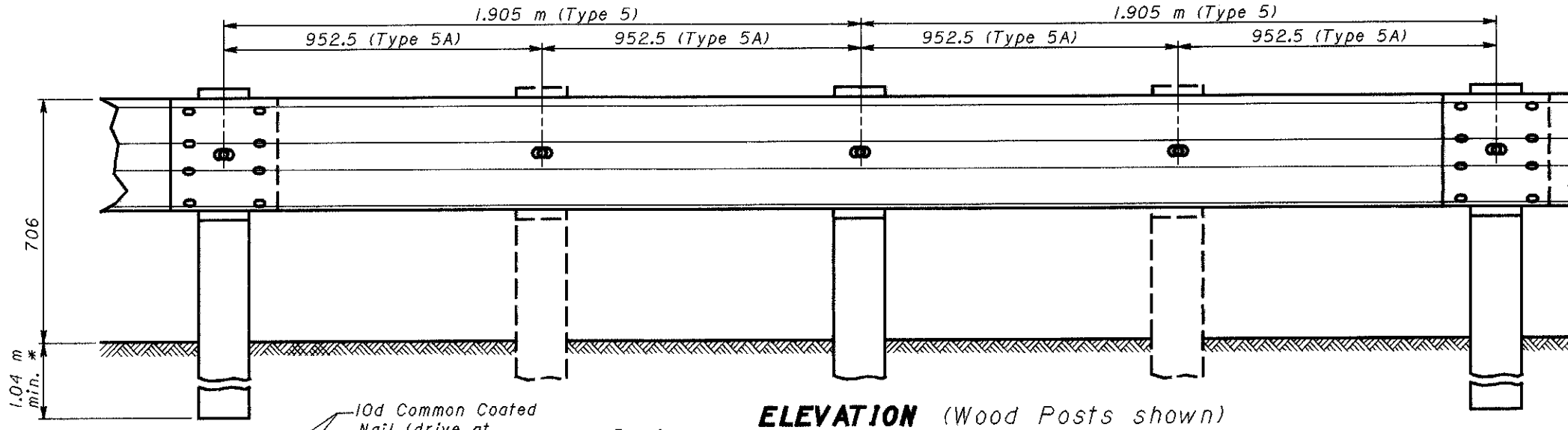
Alternate methods of placing the blockouts on round posts may be submitted for consideration and approved by the Engineer.



## ELEVATION (Wood Posts shown)



## PLAN VIEW (Steel Posts shown)



Installation of posts and blockouts shall be at 952.5 mm c/c when Type 5A guardrail is specified.

Notched Wood Blockout

Rail Splice (lap in the direction of traffic)

# NOTES

**RAIL:** Use W-Beam rail meeting AASHTO M 180 Type II Class A, as specified in CMS 606.

**POSTS:** Posts may be constructed of wood or steel. Wood posts may be round or 6"x8" [150x200] square-sawed.

Use round wood posts on runs of single-sided rail. The round posts shall be 8"±1 [200±25] in diameter at the top and not more than 3" [75] larger at the butt with a uniform taper.

Fabricate wood posts with square ends. Posts shall be pressure-treated as per CMS 710.14. Bore bolt holes and, if required, trim the tops of posts after the posts are set.

Steel posts are to be W6x9 [W150x13.5] or W6x8.5 [W150x12.8] galvanized steel. Use the same type of post throughout the length of the project unless otherwise specified in the plans or permitted by the Engineer.

All posts are 6'-0" [1830] long unless specified otherwise in the Contract Document. Posts may be set in drilled holes or may be driven to grade.

**WELDED BEAM POSTS:** Welded beam guardrail posts may be used for Item 606, Guardrail, provided the web and flange sizes are as shown here. Welding of the web to the flanges must comply with ASTM A 769, Class 1, using Grade 36 steel [250 MPa yield point] with the following exceptions:

- Sec. 7.2 Test reports of tensile properties for each lot shall accompany each shipment.
- Sec. 12 Beams that have imperfections repaired by welding shall not be accepted for use in Item 606.
- Sec. 13 Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

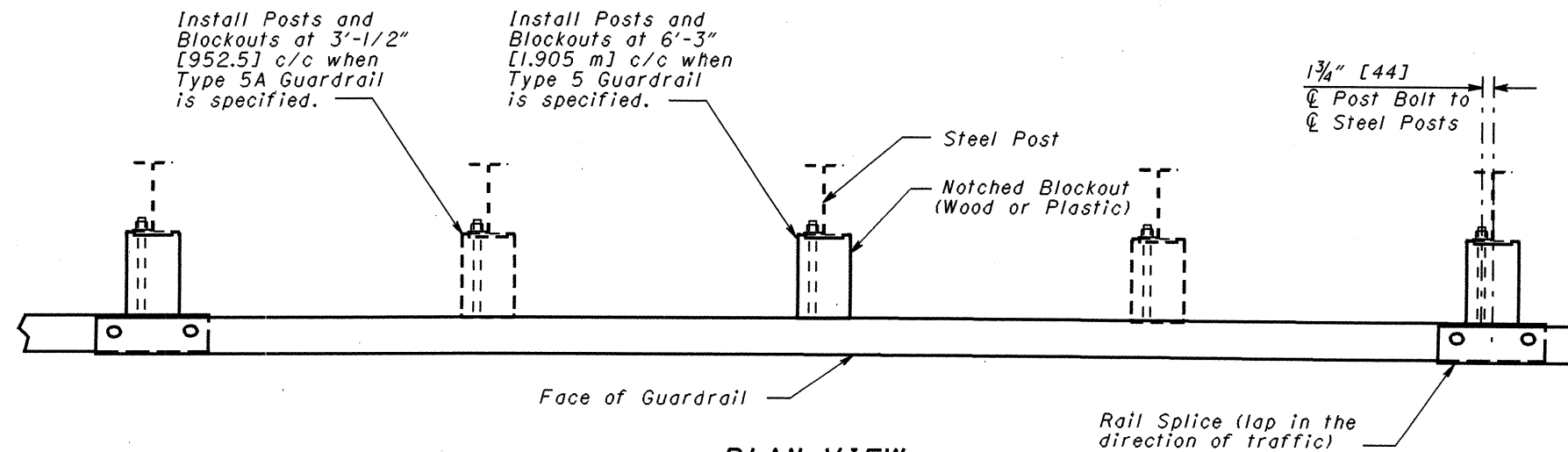
**ALTERNATE POSTS:** Engineered guardrail posts having met NCHRP 350 criteria, and listed on the **Office of Materials Management's** Approved List are permitted as an equal alternate when installed according to the Manufacturer's instructions and within the limitations shown on the Approved List.

**BLOCKOUTS:** Blockout dimensions are dependent on post used. Wood Blockouts are to be pressure treated as specified in CMS 710.14. Bore bolt holes. Approved plastic blockouts may be used in lieu of the wood blockouts shown. The approved list is maintained by the **Office of Materials Management**.

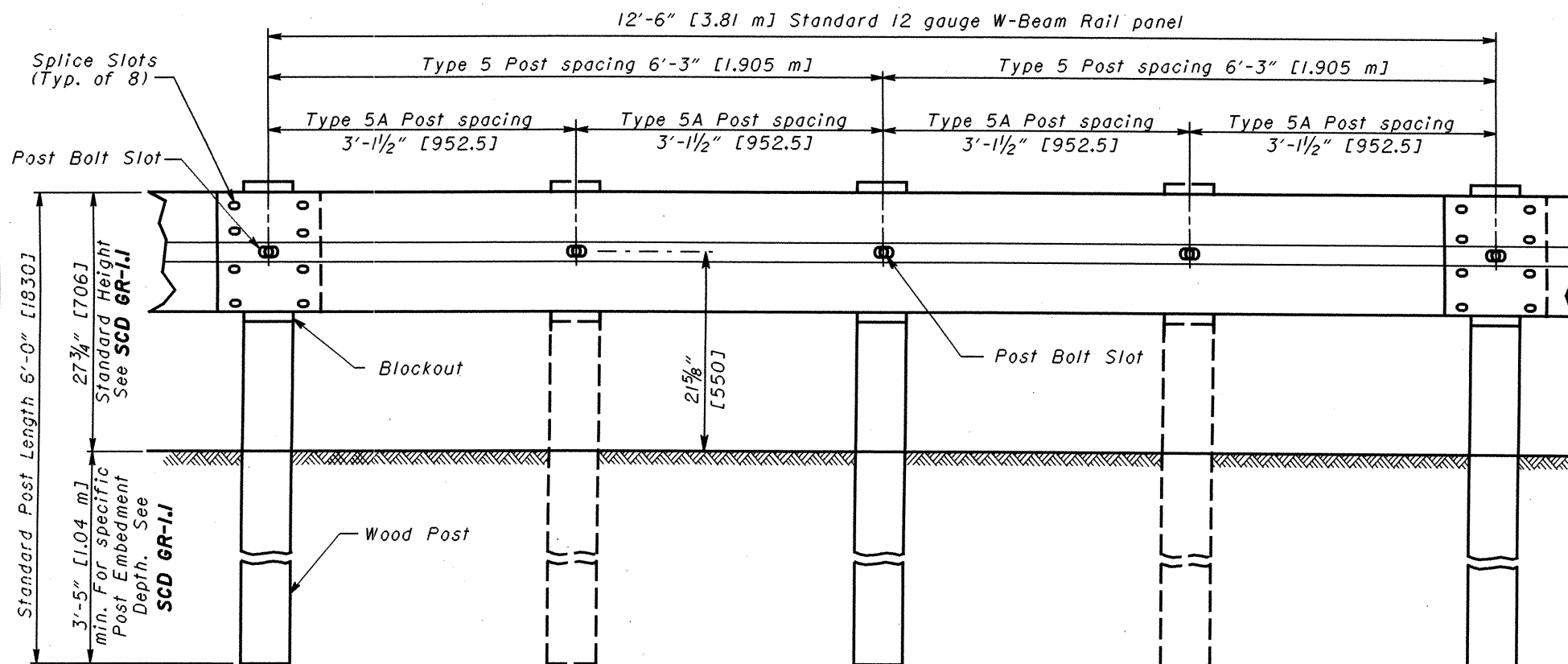
**WASHERS:** Install appropriate sized standard galvanized steel washers on the nut side of bolts installed on wood posts.

**DELINEATION:** For barrier reflectors, see CMS 626.

**MISCELLANEOUS:** For other guardrail details, see SCD GR-1.J.



**PLAN VIEW**  
(Steel Posts shown)



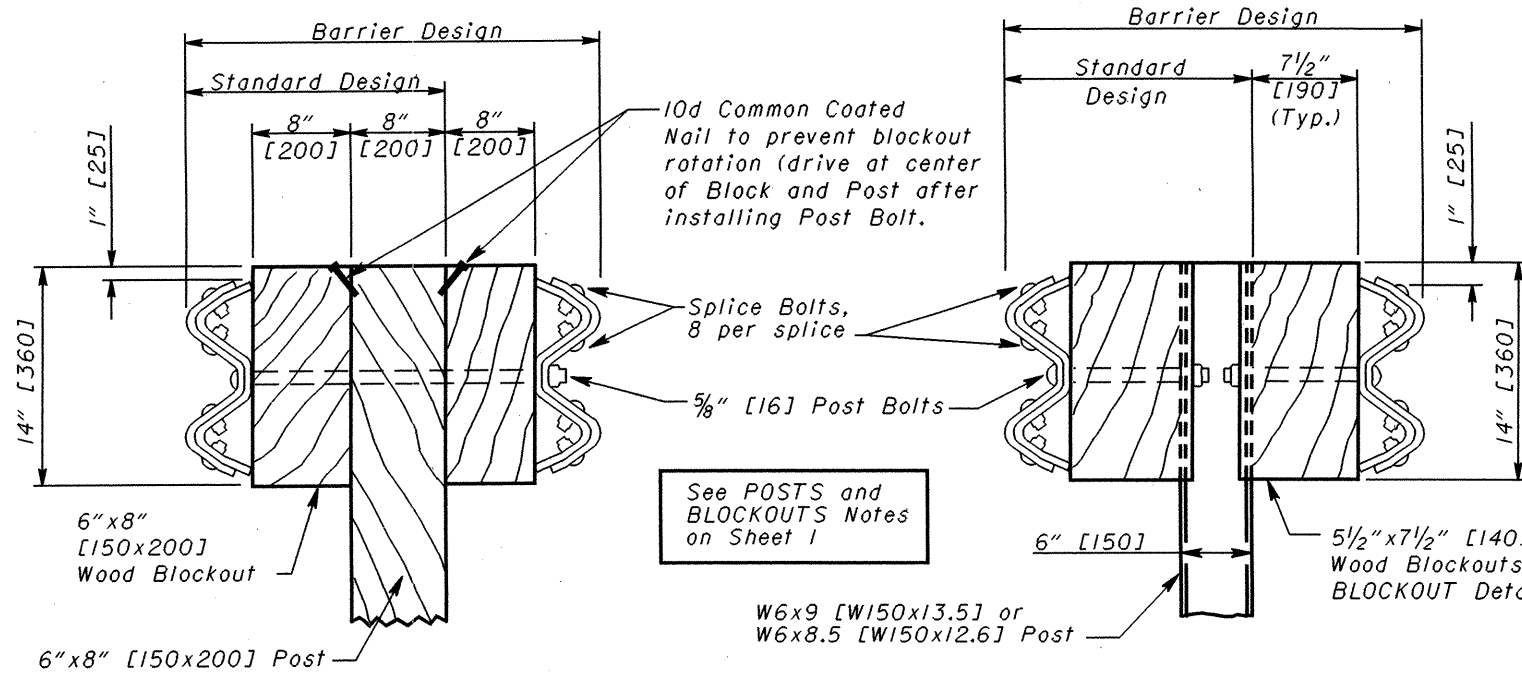
**ELEVATION**  
(Wood Posts shown)

STEEL BEAM POSTS (English)				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W6x8.5	5.8"	3.94"	0.193"	0.170"
Rolled W6x9	5.9"	3.94"	0.215"	0.170"
Welded 6x8.5	6.0"	3.94"	0.193"	0.170"
Welded 6x9	6.0"	3.94"	0.215"	0.170"

STEEL BEAM POSTS (Metric)				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W150x12.6	148 mm	100 mm	4.9 mm	4.3 mm
Rolled W150x13.5	150 mm	100 mm	5.5 mm	4.3 mm
Welded 150x12.6	152 mm	100 mm	4.9 mm	4.3 mm
Welded 150x13.5	152 mm	100 mm	5.5 mm	4.3 mm

THIS DRAWING REPLACES GR-2.IM DATED 4-18-98.

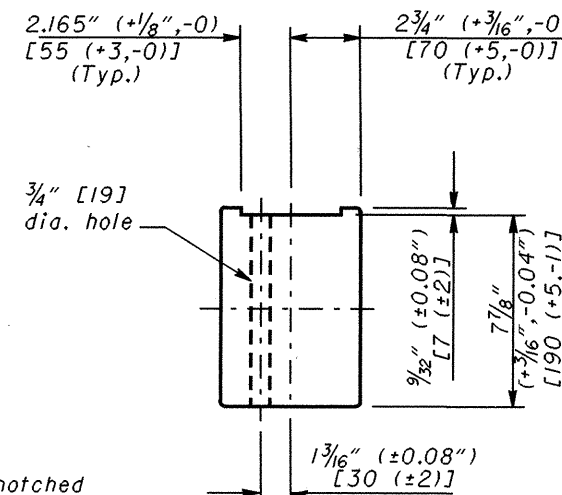
OHIO DEPARTMENT OF TRANSPORTATION  
 ROADWAY DESIGN ENGINEER  
 D. Focke  
 STDS. ENGR.  
 ROADWAY ENGINEERING SERVICES  
 GUARDRAIL TYPE 5 & 5A  
 NUMBER GR-2.1  
 4-18-03 DATE  
 1/2



**SQUARE WOOD POST**

**STEEL POST**

See POSTS Note, Sheet 1

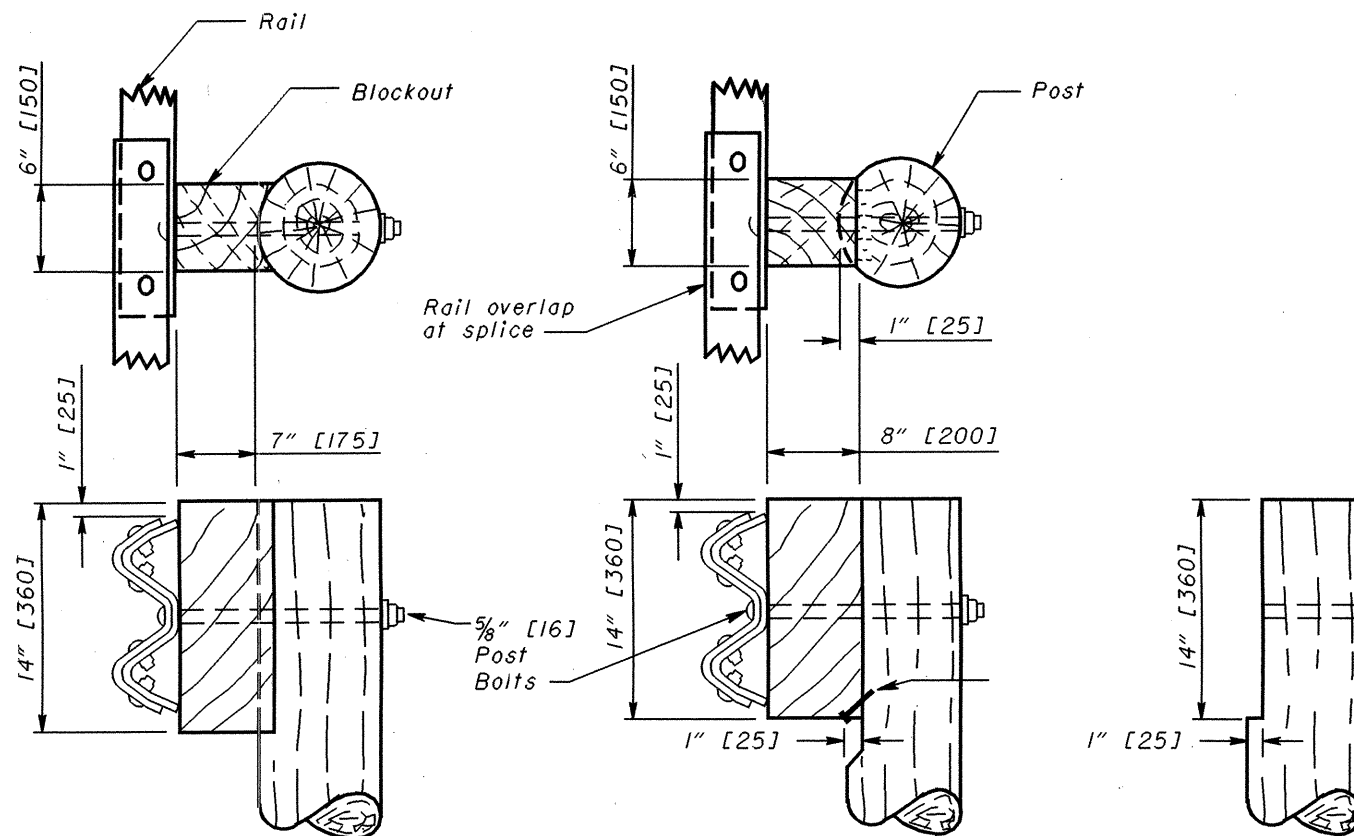


**PLAN**

**ELEVATION**

**NOTCHED BLOCKOUTS FOR STEEL POSTS**

See BLOCKOUTS Note on Sheet 1



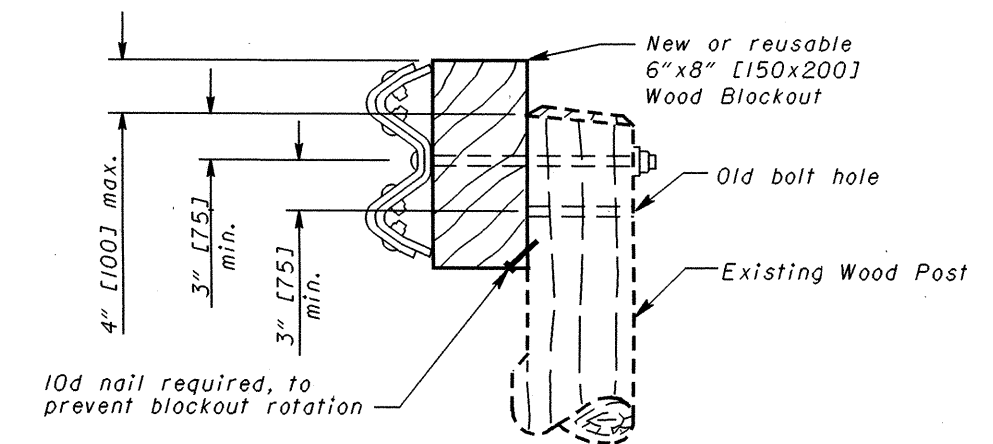
**METHOD 1  
Routed Blockout**

**METHOD 2  
Notched Post**

Alternate methods of placing the Blockouts on round Posts may be submitted for consideration and approved by the Engineer.

**ROUND WOOD POSTS**

Single Sided runs only (Standard Design)



**WOOD POSTS WITH WOOD BLOCK  
RAISING EXISTING GUARDRAIL HEIGHT**

THIS DRAWING REPLACES GR-2.IM DATED 4-18-98.

NUMBER  
**GR-2/1**

STANDARD ROADWAY CONSTRUCTION DRAWING  
**GUARDRAIL TYPE 5 & 5A**

**ROADWAY  
ENGINEERING  
SERVICES**

All metric dimensions  
(in brackets [ ]) are  
in millimeters unless  
otherwise noted.

STDS. ENGR.  
D. Focke

ROADWAY DESIGN ENGINEER  
*Raymond J. Focke*

DATE  
4-18-03

4-18-03

# NOTES

**RAIL:** Use W-Beam rail meeting AASHTO M 180 Type II Class A, as specified in CMS 606.

**POSTS:** Posts may be constructed of wood or steel. Wood posts may be round or 6"x8" [150x200] square-sawed.

Use round wood posts on runs of single-sided rail. The round posts shall be 8"±1 [200±25] in diameter at the top and not more than 3" [75] larger at the butt with a uniform taper.

Fabricate wood posts with square ends. Posts shall be pressure-treated as per CMS 710.14. Bore bolt holes and, if required, trim the tops of posts after the posts are set.

Steel posts are to be W6x9 [W150X13.5] or W6x8.5 [W150X12.8] galvanized steel. Use the same type of post throughout the length of the project unless otherwise specified in the plans or permitted by the Engineer.

All posts are 6'-0" [1830] long unless specified otherwise in the Contract Document. Posts may be set in drilled holes or be driven to grade.

**WELDED BEAM POSTS:** Welded beam guardrail posts may be used for Item 606, Guardrail, provided the web and flange sizes are as shown here. Welding of the web to the flanges must comply with ASTM A 769, Class I, using Grade 36 steel [250 MPa yield point] with the following exceptions:

- Sec. 7.2 Test reports of tensile properties for each lot shall accompany each shipment.
- Sec. 12 Beams that have imperfections repaired by welding shall not be accepted for use in Item 606.
- Sec. 13 Random samples shall be tested by the Department from materials delivered to the project site or other locations designated by the Laboratory.

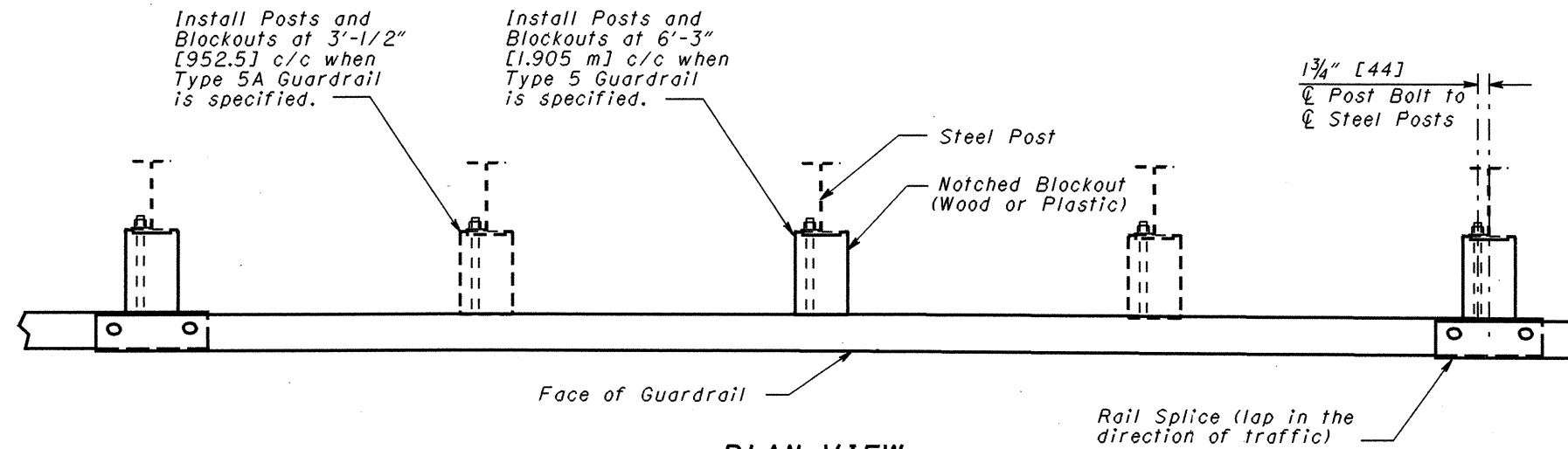
**ALTERNATE POSTS:** Engineered guardrail posts having met NCHRP 350 criteria, and listed on the **Office of Materials Management's** Approved List are permitted as an equal alternate when installed according to the Manufacturer's instructions and within the limitations shown on the Approved List.

**BLOCKOUTS:** Blockout dimensions are dependent on post used. Wood Blockouts are to be pressure treated as specified in CMS 710.14. Bore bolt holes. Approved alternate blockouts may be used in lieu of the wood blockouts shown. The approved list is maintained by the **Office of Materials Management.**

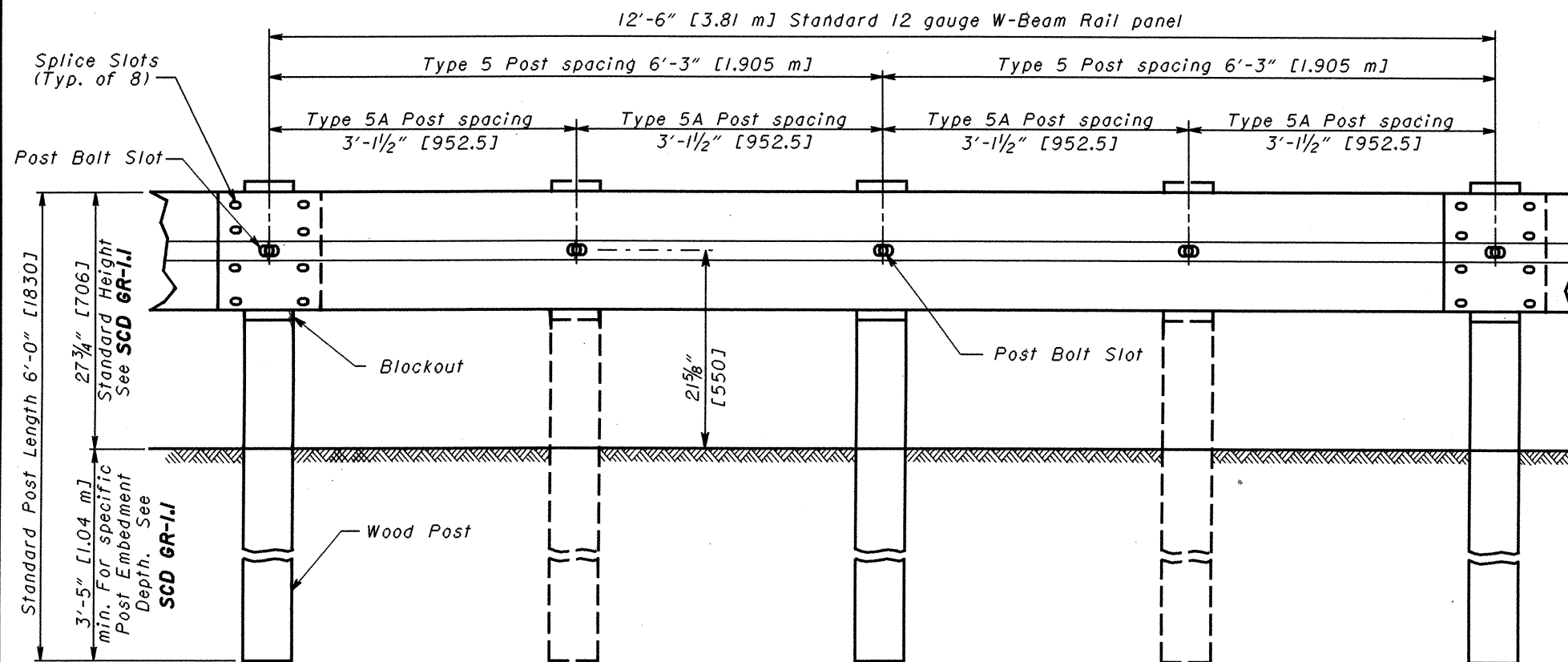
**WASHERS:** Install appropriate sized standard galvanized steel washers on the nut side of bolts installed on wood posts.

**DELINEATION:** For barrier reflectors, see CMS 626.

**MISCELLANEOUS:** For other guardrail details, see **SCD GR-1.1.**



**PLAN VIEW**  
(Steel Posts shown)



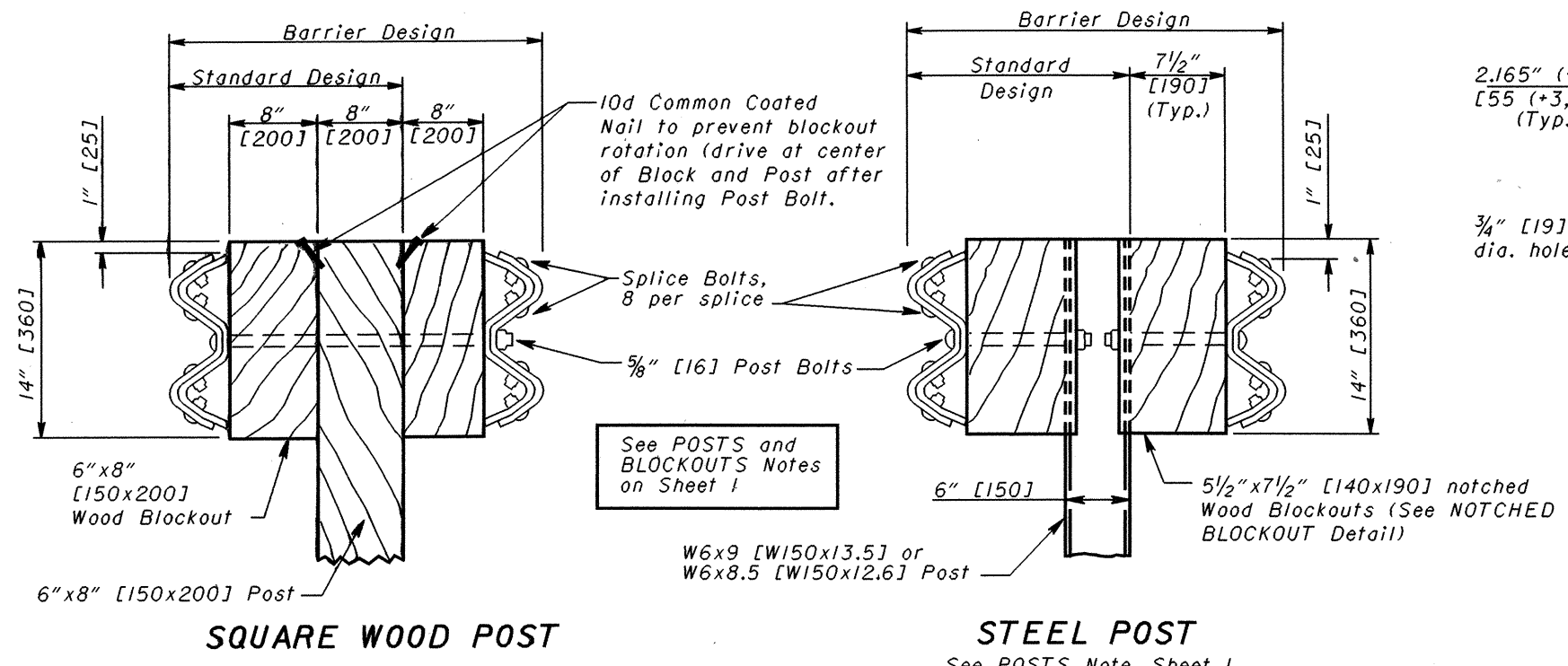
**ELEVATION**  
(Wood Posts shown)

STEEL BEAM POSTS (English)				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W6x8.5	5.8"	3.94"	0.193"	0.170"
Rolled W6x9	5.9"	3.94"	0.215"	0.170"
Welded 6x8.5	6.0"	3.94"	0.193"	0.170"
Welded 6x9	6.0"	3.94"	0.215"	0.170"

STEEL BEAM POSTS (Metric)				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W150x12.6	148 mm	100 mm	4.9 mm	4.3 mm
Rolled W150x13.5	150 mm	100 mm	5.5 mm	4.3 mm
Welded 150x12.6	152 mm	100 mm	4.9 mm	4.3 mm
Welded 150x13.5	152 mm	100 mm	5.5 mm	4.3 mm

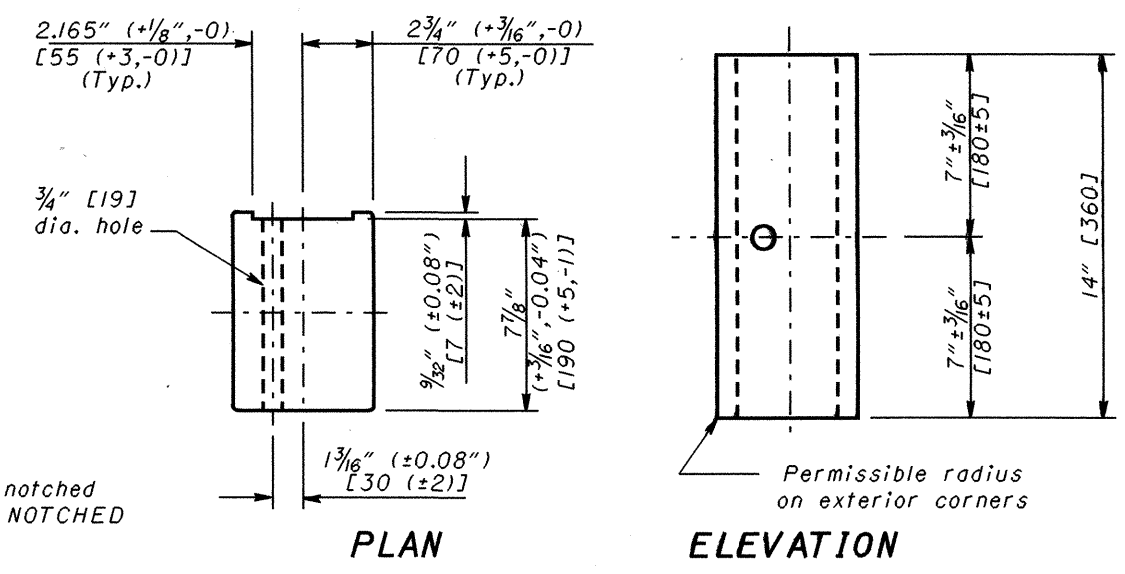
THIS DRAWING REPLACES GR-2.1 DATED 4-18-03.  
 STANDARD ROADWAY CONSTRUCTION DRAWING  
**GUARDRAIL TYPE 5 & 5A**  
 NUMBER **GR-2.1**  
 DATE **1-16-04**  
 ROADWAY DESIGN ENGINEER  
 STOS. ENGR. **D. Focke**  
 OHIO DEPARTMENT OF TRANSPORTATION





**SQUARE WOOD POST**

**STEEL POST**

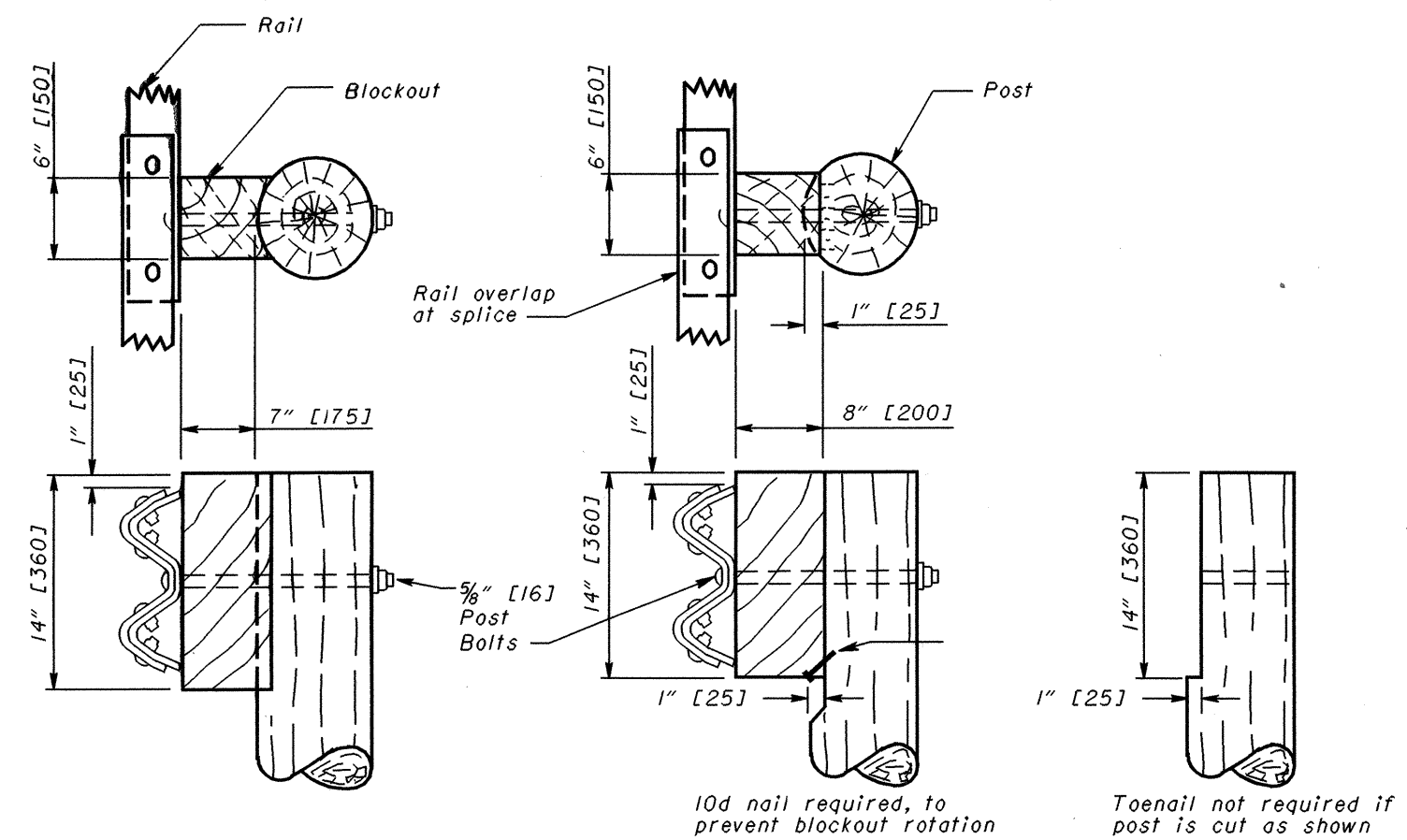


**PLAN**

**ELEVATION**

**NOTCHED BLOCKOUTS FOR STEEL POSTS**

See BLOCKOUTS Note on Sheet 1

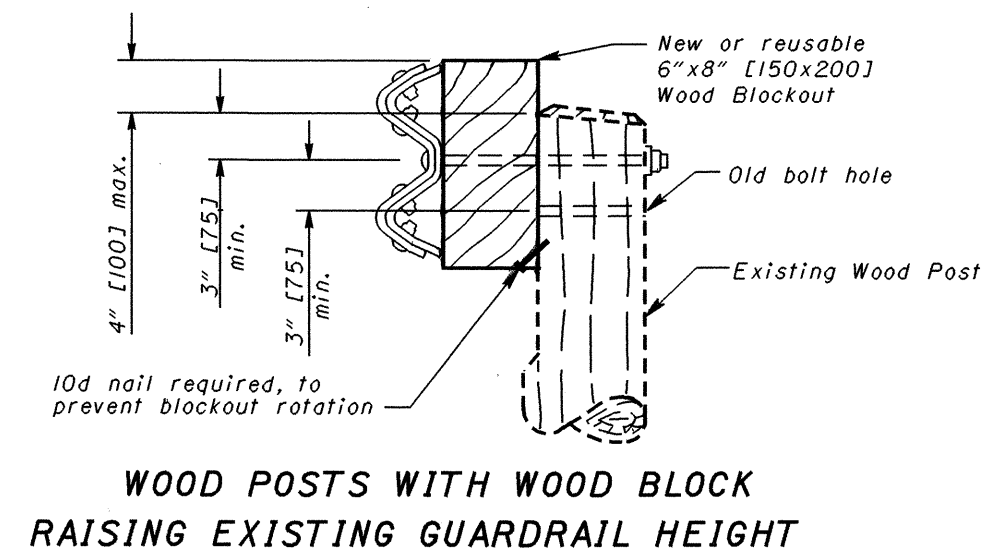


**METHOD 1 Routed Blockout**

**METHOD 2 Notched Post**

Alternate methods of placing the Blockouts on round Posts may be submitted for consideration and approved by the Engineer.

**ROUND WOOD POSTS**  
Single Sided runs only (Standard Design)



**WOOD POSTS WITH WOOD BLOCK RAISING EXISTING GUARDRAIL HEIGHT**

THIS DRAWING REPLACES GR-2.1 DATED 4-18-03.

NUMBER  
**GR-2.1**

STANDARD ROADWAY CONSTRUCTION DRAWING  
**GUARDRAIL TYPE 5 & 5A**

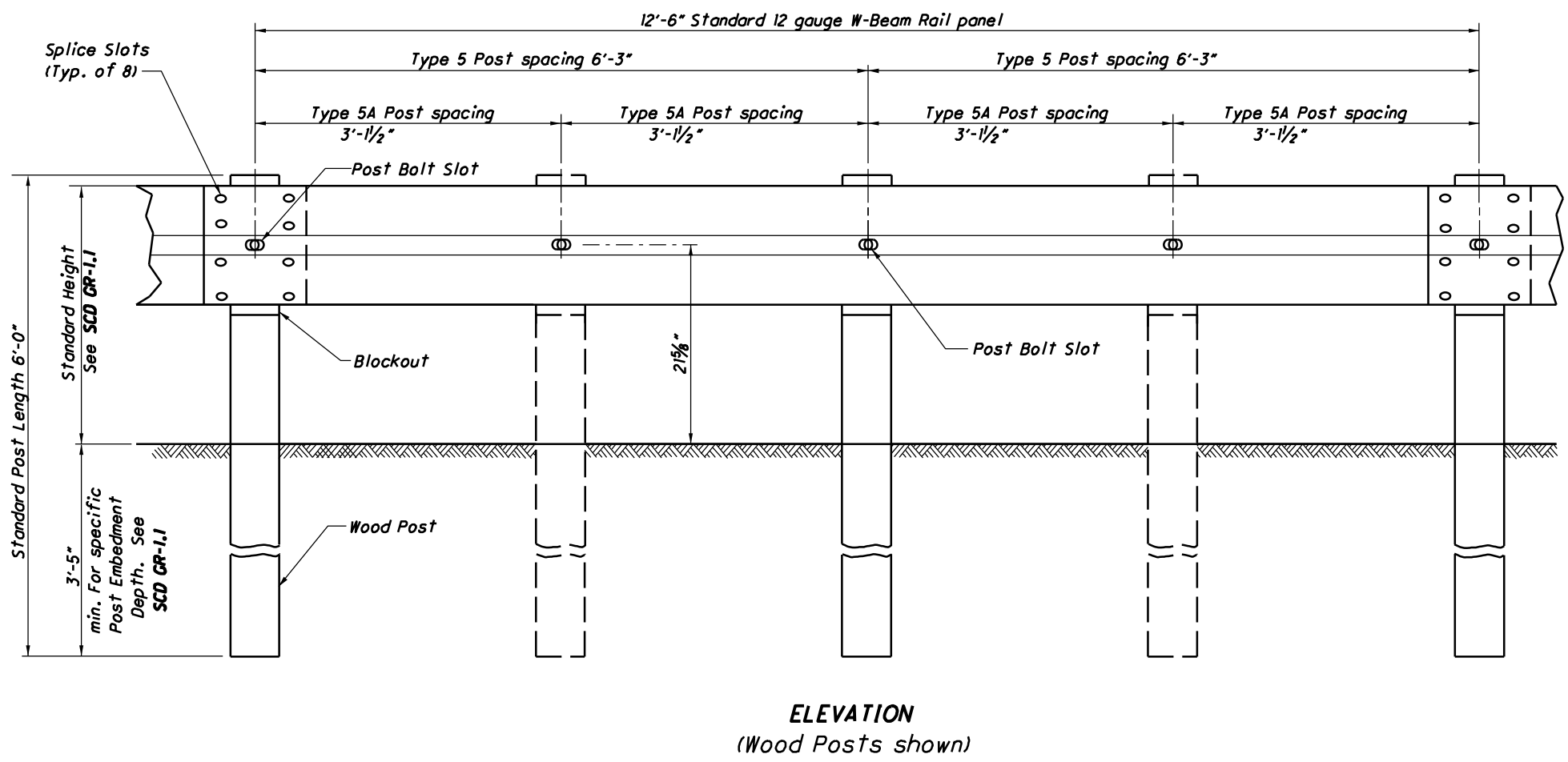
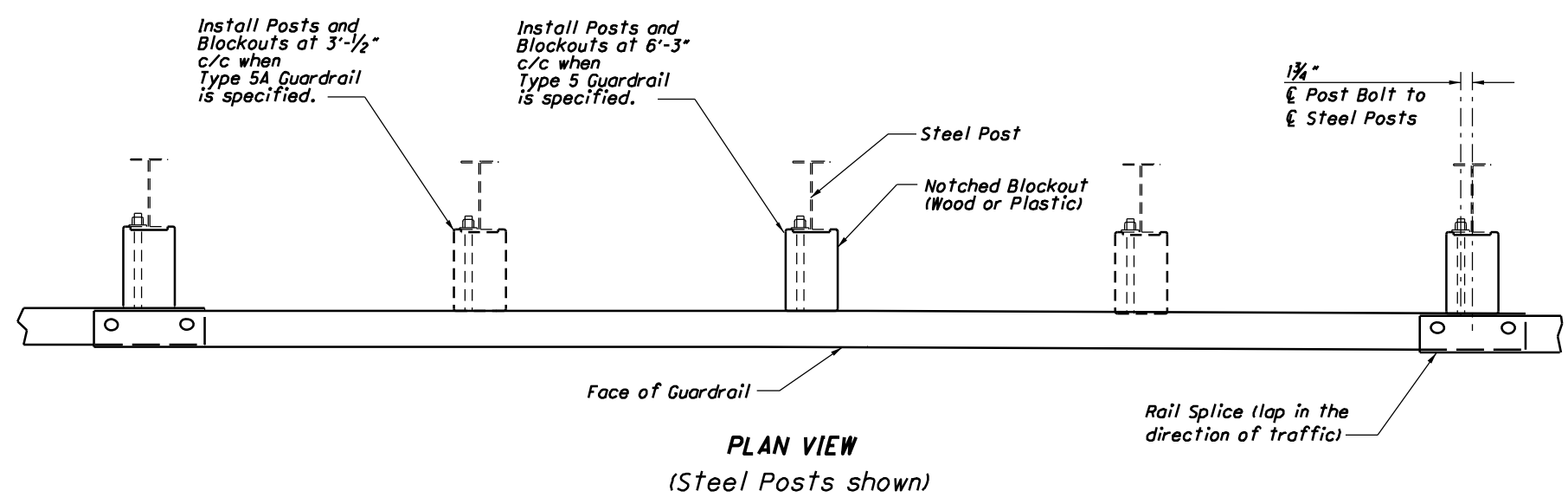
**ROADWAY ENGINEERING SERVICES**

All metric dimensions (in brackets [ ]) are in millimeters unless otherwise noted.

STDS. ENGR.  
**D. Focke**

OHIO DEPARTMENT OF TRANSPORTATION  
**Raymond J. Stubbard**  
ROADWAY DESIGN ENGINEER

DATE  
1-16-04



**NOTES**

**RAIL:** Use W-Beam rail meeting AASHTO M 180 Type II Class A, as specified in CMS 606.

**POSTS:** Posts may be constructed of wood or steel. Wood posts may be round or 6"x8" square-sawed.

Use round wood posts on runs of single-sided rail. The round posts shall be 8"x1 in diameter at the top and not more than 3" larger at the butt with a uniform taper.

Fabricated wood posts with square ends. Posts shall be pressure-treated as per CMS 710.14. Bore bolt holes and, if required, trim the tops of posts after the posts are set.

Steel posts are to be W6x9 or W6x8.5 galvanized steel. Use the same type of post throughout the length of the project unless otherwise specified in the plans or permitted by the Engineer.

All posts are 6'-0" long unless specified otherwise in the Contract Document. Posts may be set in drilled holes or may be driven to grade.

**WELDED BEAM POSTS:** Welded beam guardrail posts may be used for Item 606, Guardrail, provided the web and flange sizes are as shown here. Welding of the web to the flanges must comply with ASTM A 769, Class 1, using Grade 36 steel [250 MPa yield point] with the following exceptions:

- Sec. 7.2 Test reports of tensile properties for each lot shall accompany each shipment.
- Sec. 12 Beams that have imperfections repaired by welding shall not be accepted for use in Item 606.
- Sec. 13 Random samples shall be tested by the Department from materials delivered to the project site, or other locations designated by the Laboratory.

**ALTERNATE POSTS:** Engineered guardrail posts having met NCHRP 350 criteria, and listed on the **Office of Materials Management's** Approved List are permitted as an equal alternate when installed according to the Manufacturer's instructions and within the limitations shown on the Approved List.

**BLOCKOUTS:** Blockout dimensions are dependent on post used. Wood Blockouts are to be pressure treated as specified in CMS 710.14. Bore bolt holes. Approved alternate blockouts may be used in lieu of the wood blockouts shown. The approved list is maintained by the **Office of Roadway Engineering**.

**WASHERS:** Install appropriate sized standard galvanized steel washers on the nut side of bolts installed on wood posts.

**DELINEATION:** For barrier reflectors, see CMS 626.

**MISCELLANEOUS:** For other guardrail details, see SCD GR-1.1.

STEEL BEAM POSTS (English)				
Size	Beam depth	Flange width	Flange thickness	Web thickness
Rolled W6x8.5	5.8"	3.94"	0.193"	0.170"
Rolled W6x9	5.9"	3.94"	0.215"	0.170"
Welded 6x8.5	6.0"	3.94"	0.193"	0.170"
Welded 6x9	6.0"	3.94"	0.215"	0.170"

THIS DRAWING REPLACES GR-2.1 DATED 1-16-04.

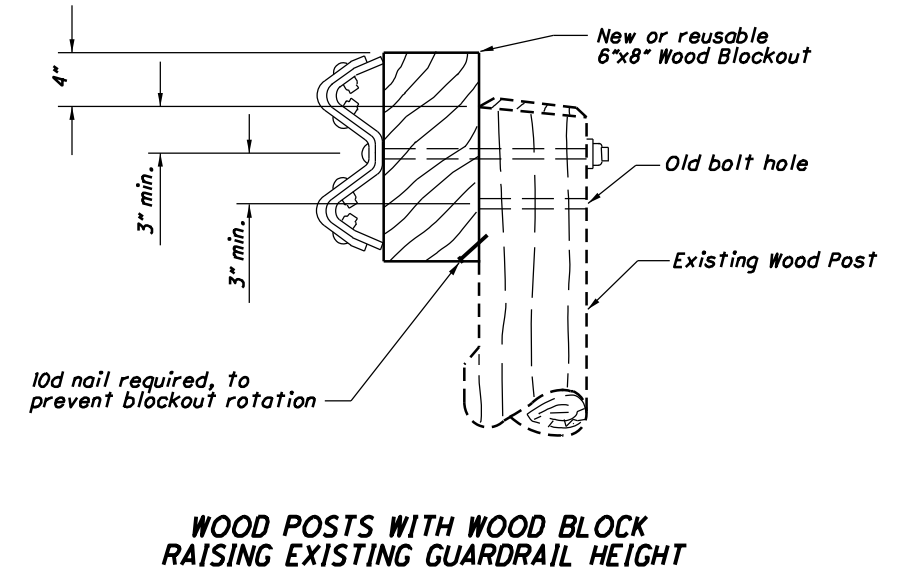
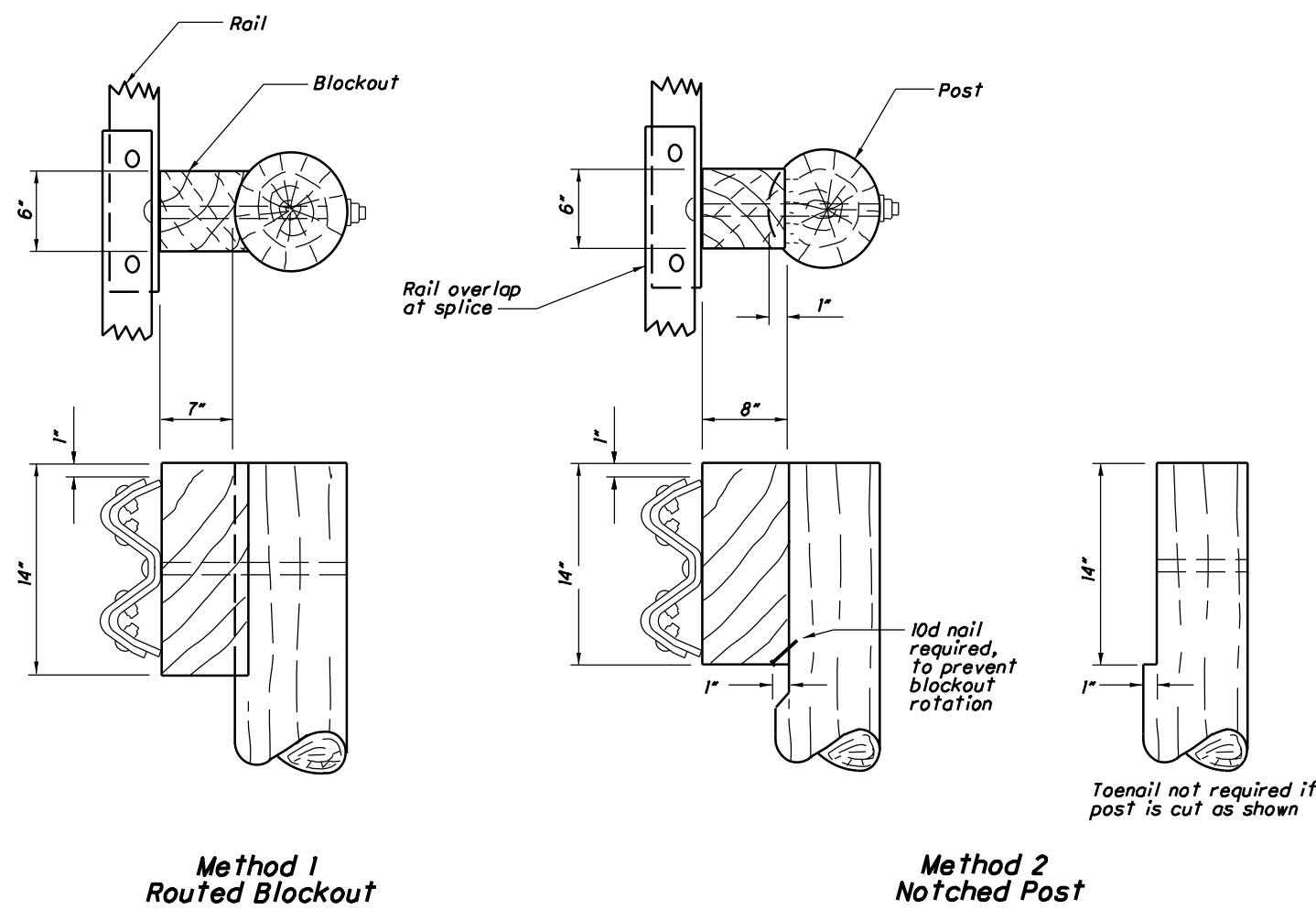
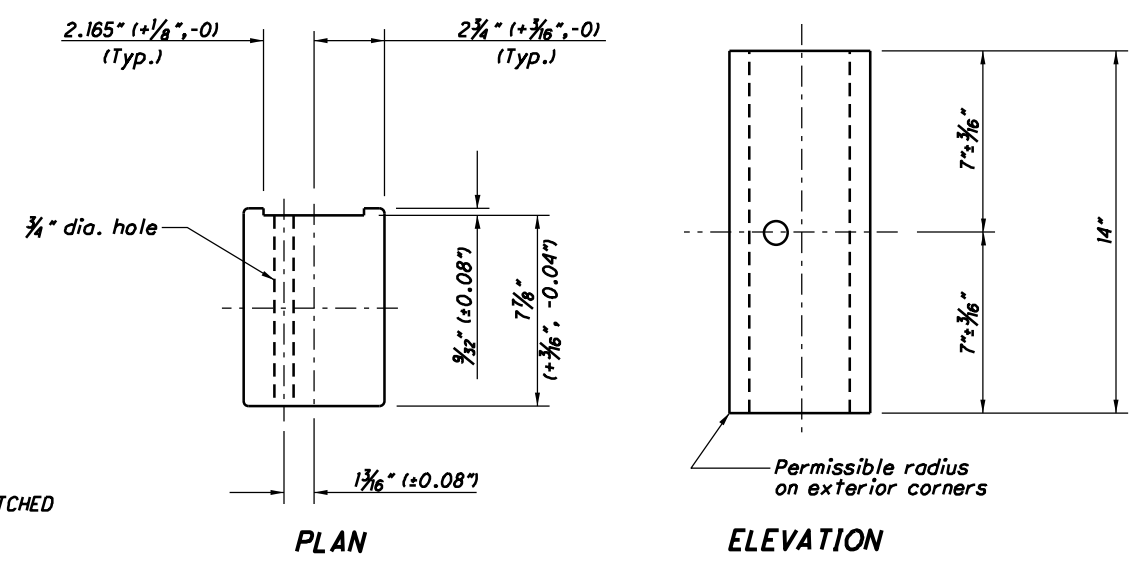
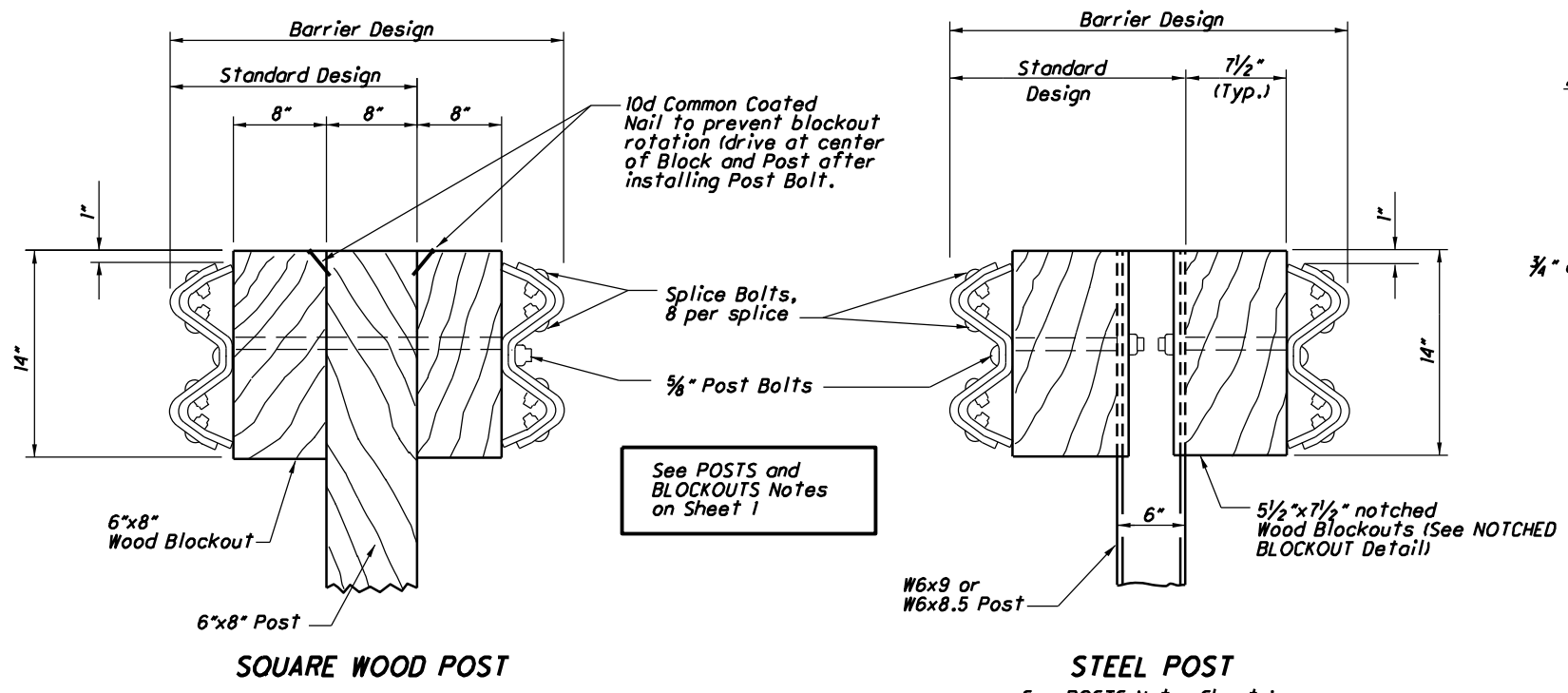
STANDARD ROADWAY CONSTRUCTION DRAWING

OFFICE OF ROADWAY ENGINEERING

STATE ENGINEER  
M. Ruppe

STATE OF OHIO DEPARTMENT OF TRANSPORTATION  
Michael Blune  
ADMINISTRATOR  
7-20-12  
DATE

SCD NUMBER  
GR-2.1



Alternate methods of placing the Blockouts on round Posts may be submitted for consideration and approved by the Engineer.

**ROUND WOOD POSTS**  
Single Sided runs only (Standard Design)