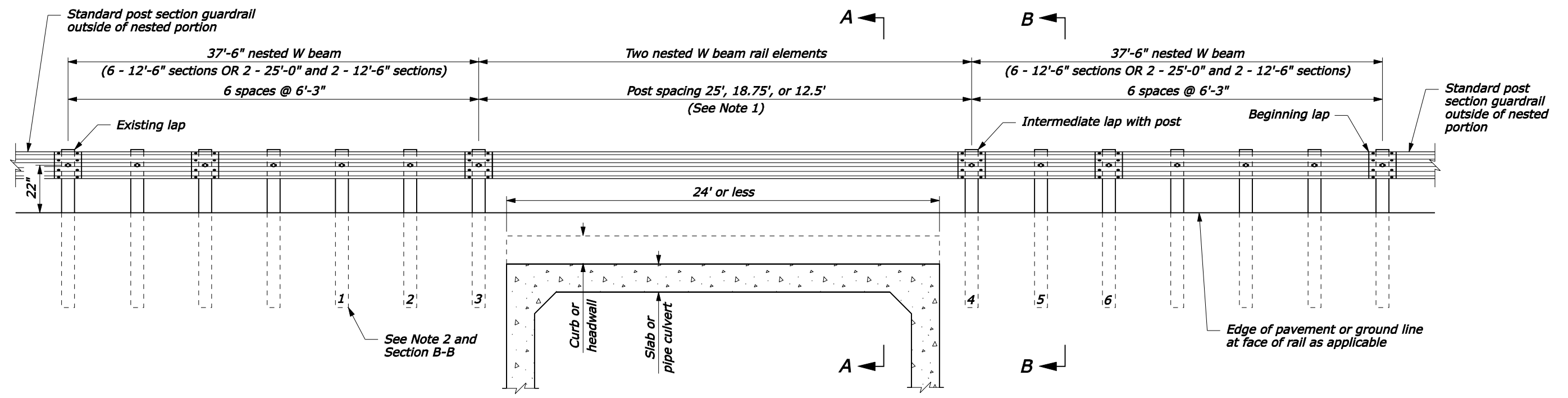
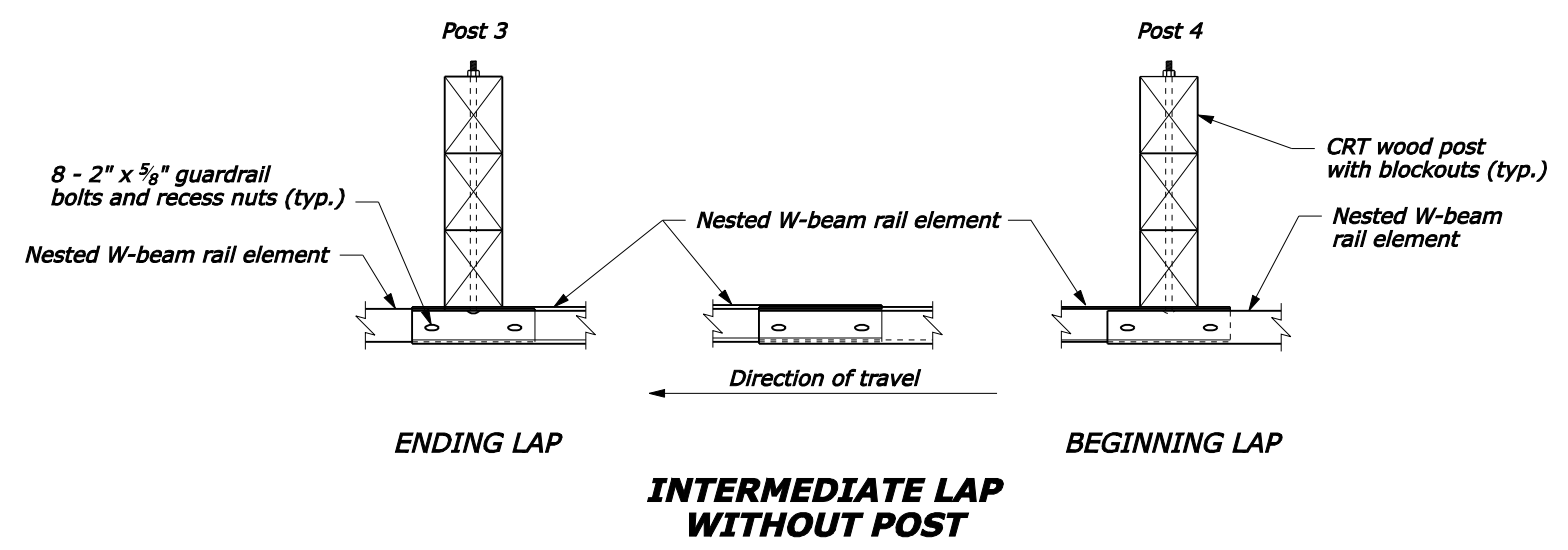
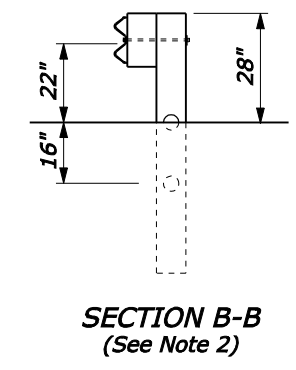
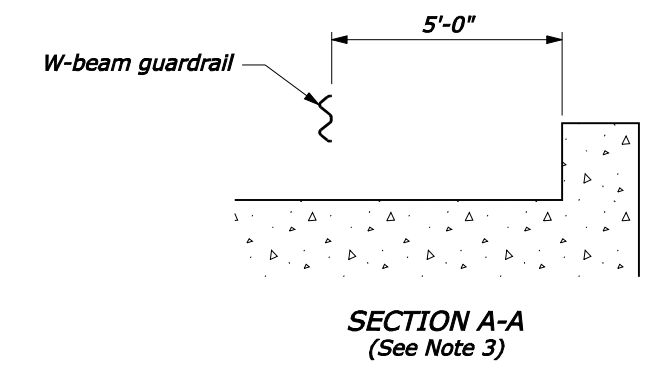


**NOTE:**

- 25'-0" rail lengths may be used to eliminate the intermediate lap without a post. Do not place a lap without a post unless needed due to length of gap.
- Posts 1 thru 6 are CRT posts with two blockouts. See Section B-B for details.
- Install the back face of the nested guardrail a minimum of 5'-0" from the face of the curb-like headwall.



**ELEVATION**



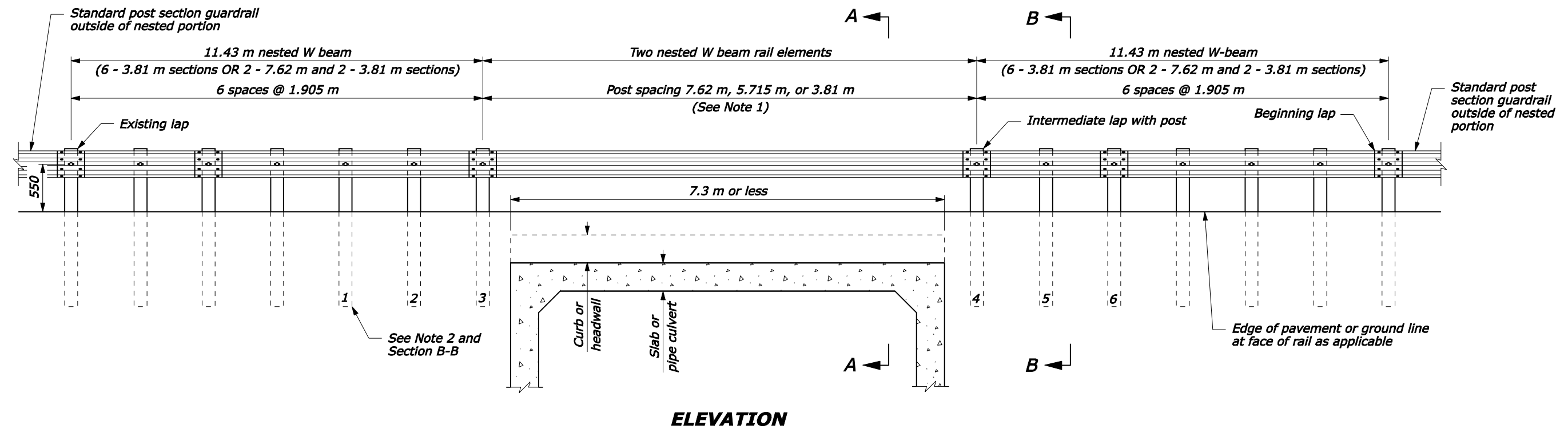
NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION FEDERAL LANDS HIGHWAY	
U.S. CUSTOMARY STANDARD	
<b>G4 W-BEAM GUARDRAIL LONG SPAN, DOUBLE-NESTED GUARDRAIL SYSTEM</b>	
STANDARD APPROVED FOR USE 1/1994	STANDARD
REVISED: 4/1994 6/2005	617-24

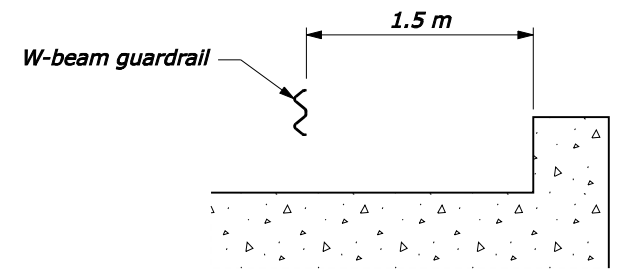
06-Nov-2007 07:57 AM P:\198.145.186.2\std. plan\std. plan\std61724.dgn [US Customary]

**NOTE:**

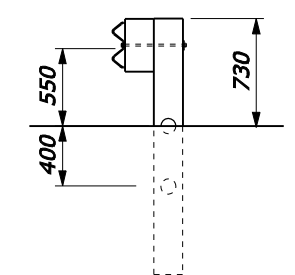
1. 7.62 m rail lengths may be used to eliminate the intermediate lap without a post. Do not place a lap without a post unless needed due to length of gap.
2. Posts 1 thru 6 are CRT posts with two blockouts. See Section B-B for details.
3. Install the back face of the nested guardrail a minimum of 1.5 m from the face of the curb-like headwall.
4. Dimensions without units are millimeters.



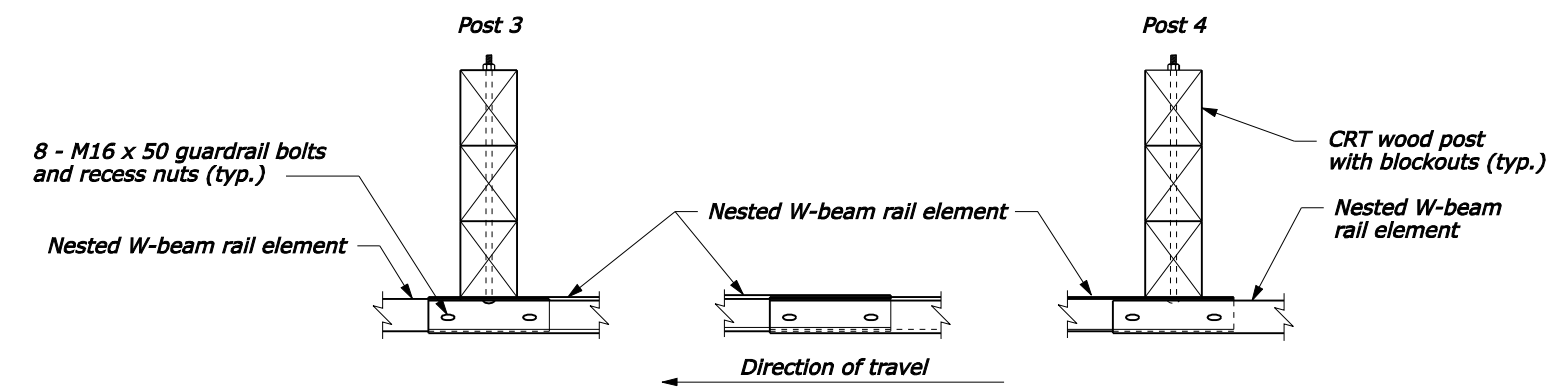
**ELEVATION**



**SECTION A-A**  
(See Note 3)



**SECTION B-B**  
(See Note 2)



**ENDING LAP**

**INTERMEDIATE LAP WITHOUT POST**

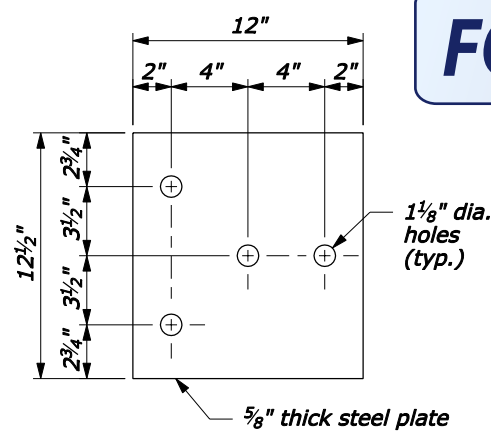
**BEGINNING LAP**

NO SCALE

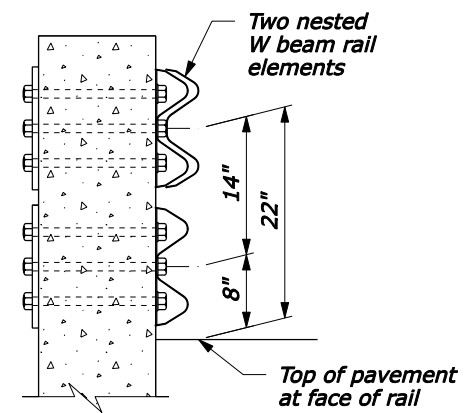
U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION FEDERAL LANDS HIGHWAY	
METRIC STANDARD	
<b>G4 W-BEAM GUARDRAIL LONG-SPAN, DOUBLE-NESTED GUARDRAIL SYSTEM</b>	
STANDARD APPROVED FOR USE 3/1996	STANDARD
REVISED: 8/1997 6/2005	<b>M617-24</b>

06-Nov-2007 07:56 AM  
fp://196.145.188.2/scd\_plan/s61724.dgn [Metric]

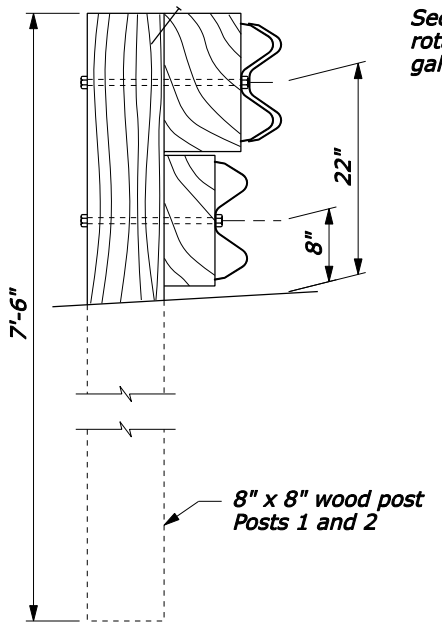
**FOR COMMENT**



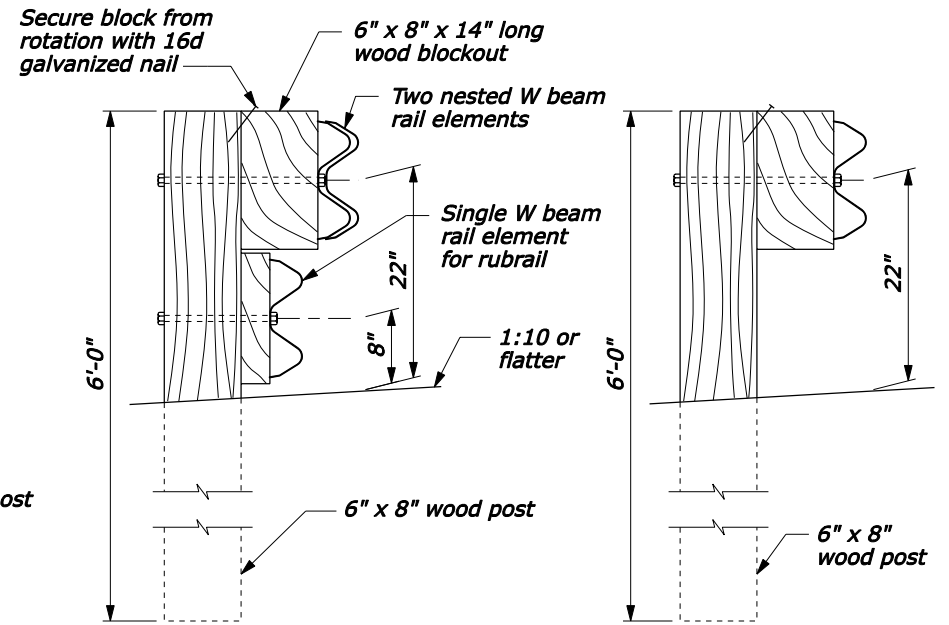
**BEARING PLATE**



**SECTION A-A**



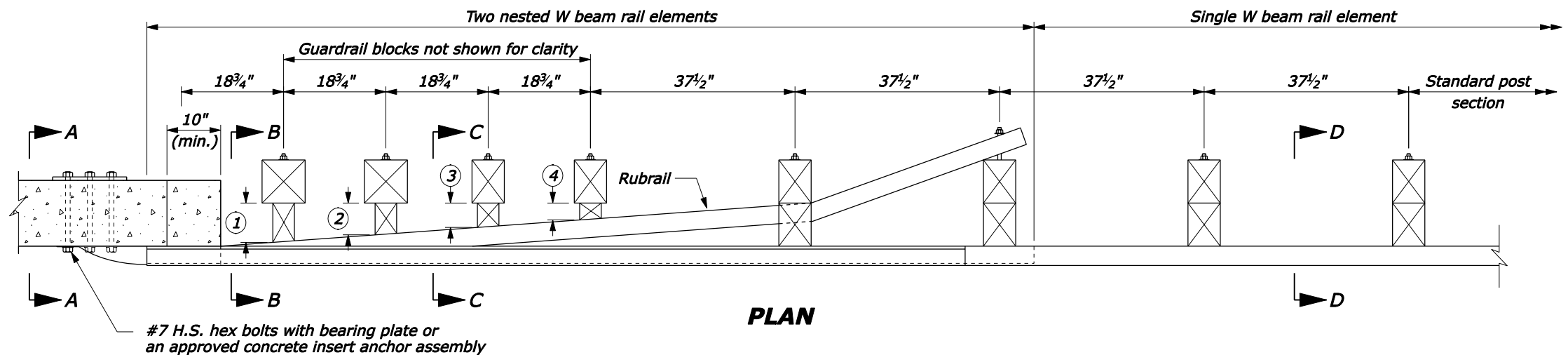
**SECTION B-B**



**SECTION C-C**

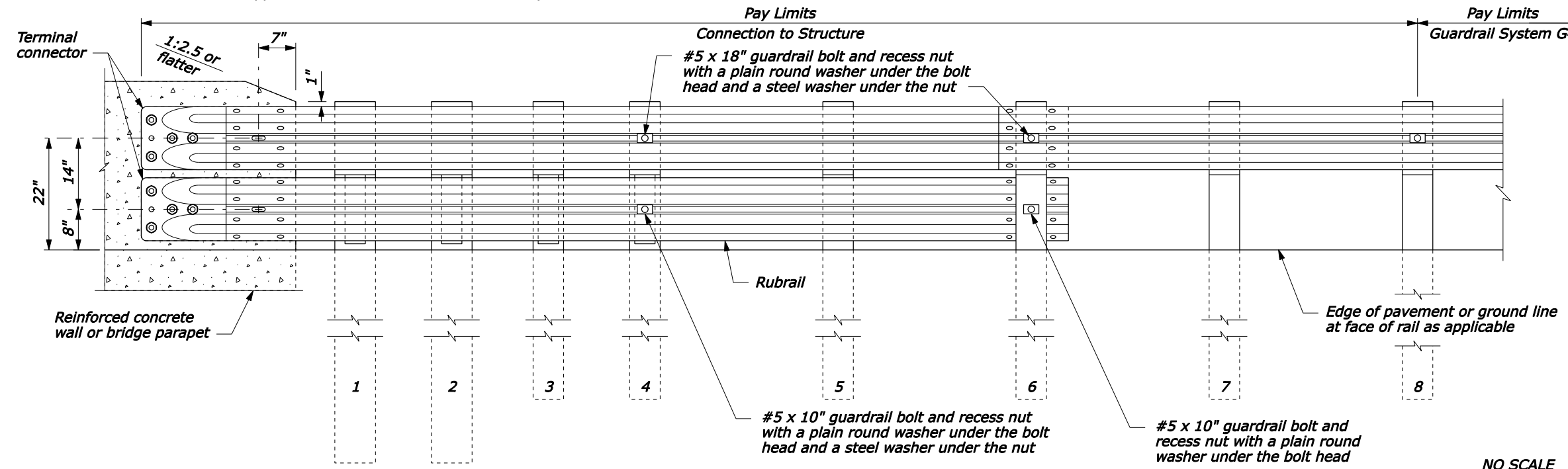
**SECTION D-D**

- NOTE:**
1. The rubrail may be shop bent in the last 37 1/2" to facilitate installation.
  2. CENTER drill wood blocks for rubrail located on posts 1 through 4. Secure blocks to post 1 through 3 with M16 carriage bolts.
  3. Posts 1, 2, 3, 4 and 6 require an additional hole to attach lower wood blocks and/or the rubrail.
  4. Do not bolt nested W beam or rubrail W beam to posts and blocks on posts 1, 2, 3 and 5. Bolt blocks directly to posts.
  5. Reinforced concrete wall or bridge parapet must be capable of developing a 59.6 kip pull out strength.



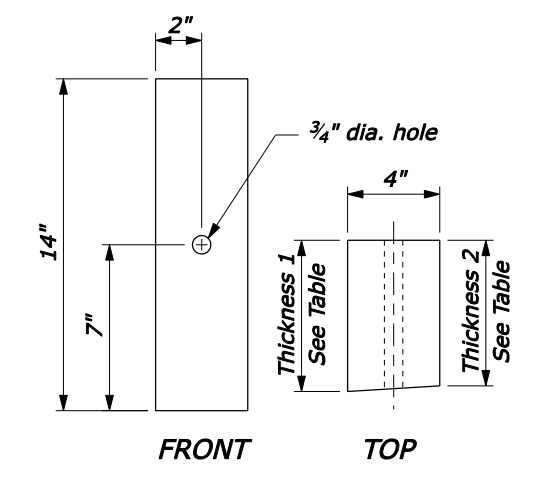
**PLAN**

WOOD BLOCKS FOR RUBRAIL		
POST	THICKNESS 1	THICKNESS 2
①	6 1/2"	6 1/4"
②	5 3/8"	5"
③	4"	3 5/8"
④	2 5/8"	2 7/16"
⑤	NO BLOCK	NO BLOCK



**ELEVATION**

NO SCALE



**WOOD BLOCK FOR RUBRAIL**

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD  
**G4 W-BEAM GUARDRAIL CONNECTION TO VERTICAL FACE STRUCTURE WOOD POSTS**

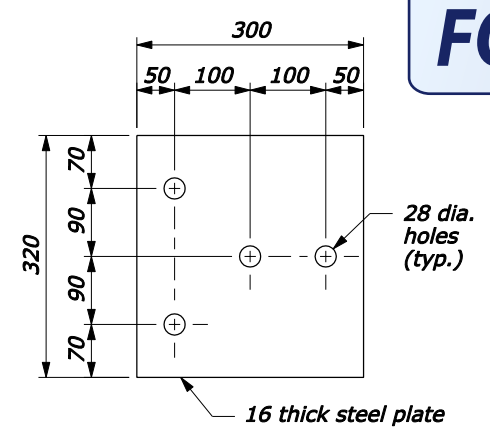
STANDARD APPROVED FOR USE --/----

REVISED: DRAFT: 5/2005

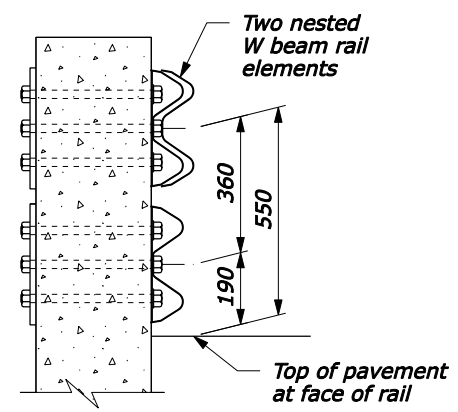
STANDARD 617-25

5/2/2005 F:\StanDraw\Draft\18\181725.dgn [US Customary]

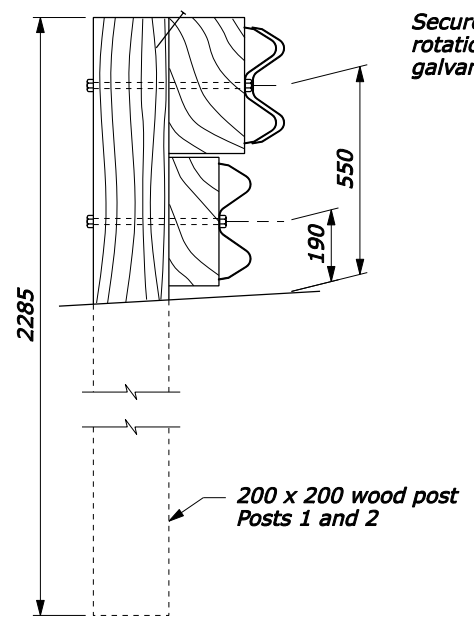
**FOR COMMENT**



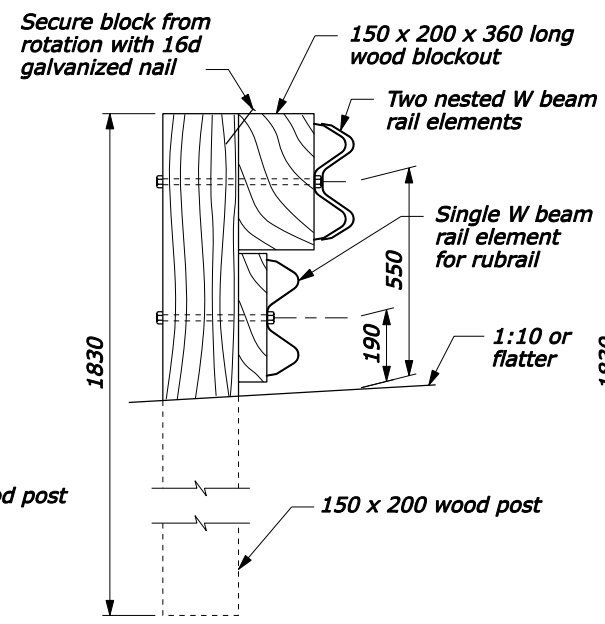
**BEARING PLATE**



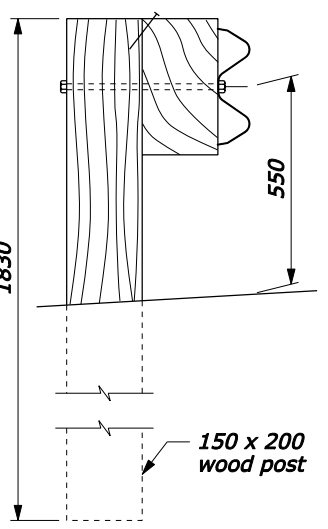
**SECTION A-A**



**SECTION B-B**

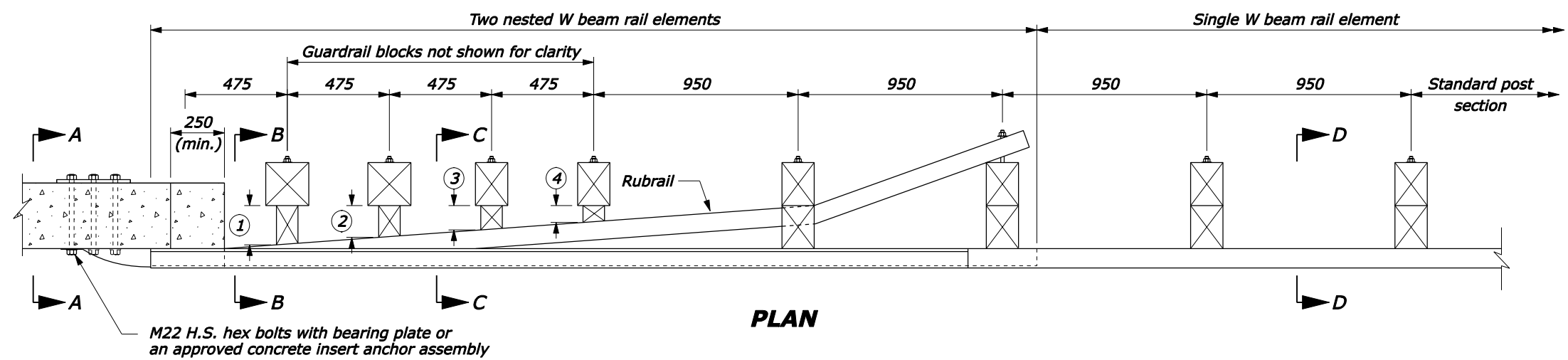


**SECTION C-C**



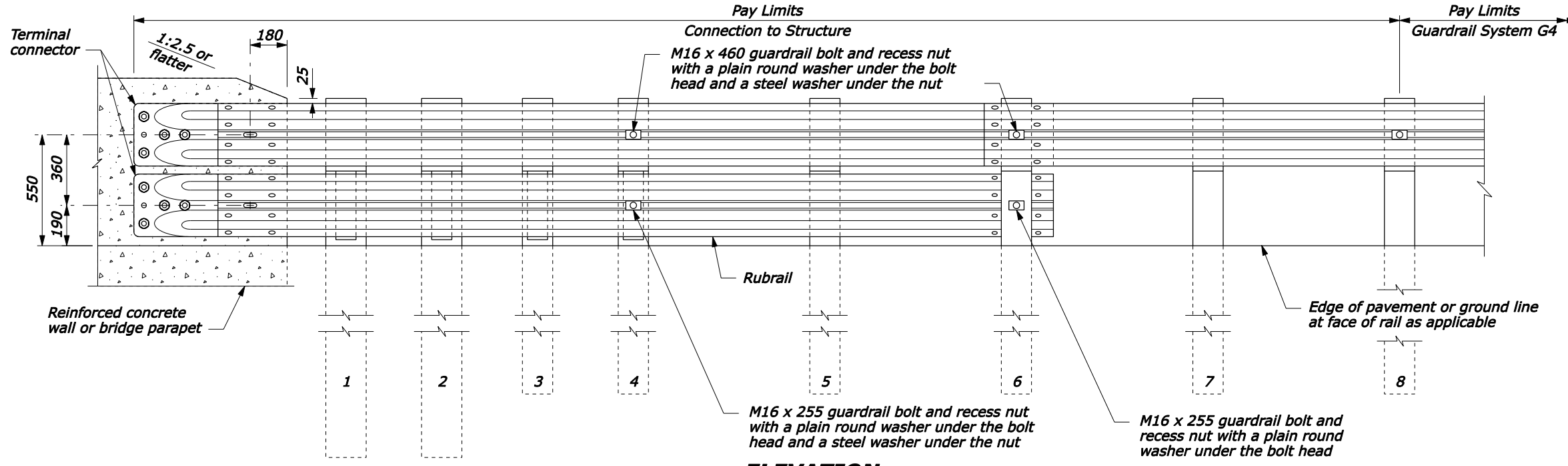
**SECTION D-D**

- NOTE:**
- The rubrail may be shop bent in the last 950 mm to facilitate installation.
  - CENTER drill wood blocks for rubrail located on posts 1 through 4. Secure blocks to post 1 through 3 with M16 carriage bolts.
  - Posts 1, 2, 3, 4 and 6 require an additional hole to attach lower wood blocks and/or the rubrail.
  - Do not bolt nested W beam or rubrail W beam to posts and blocks on posts 1, 2, 3 and 5. Bolt blocks directly to posts.
  - Reinforced concrete wall or bridge parapet must be capable of developing a 265 kN pull out strength.
  - Furnish hardware in the metric sizes shown. Equivalent US Customary sizes may be used when metric sizes are not available.
  - Dimensions without units are millimeters.

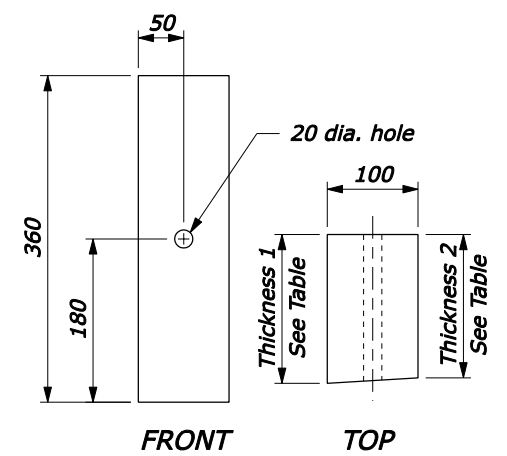


**PLAN**

WOOD BLOCKS FOR RUBRAIL		
POST	THICKNESS 1	THICKNESS 2
①	164	158
②	131	125
③	99	93
④	67	61
⑤	NO BLOCK	NO BLOCK



**ELEVATION**



**WOOD BLOCK FOR RUBRAIL**

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
FEDERAL LANDS HIGHWAY

**METRIC STANDARD  
G4 W-BEAM GUARDRAIL  
CONNECTION TO  
VERTICAL FACE STRUCTURE  
WOOD POSTS**

STANDARD APPROVED FOR USE 3/1996

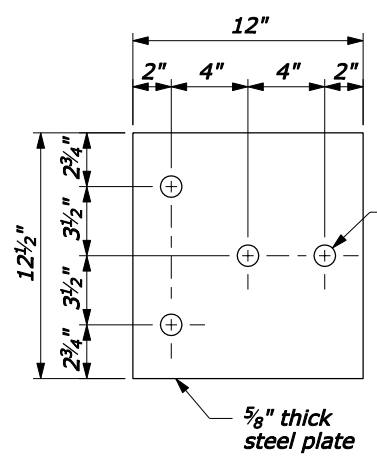
REVISOR: DRAFT: 5/2005

STANDARD M617-25

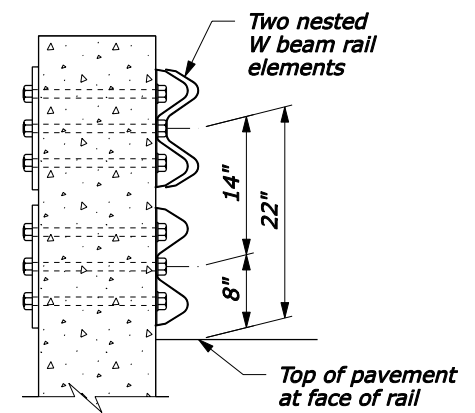
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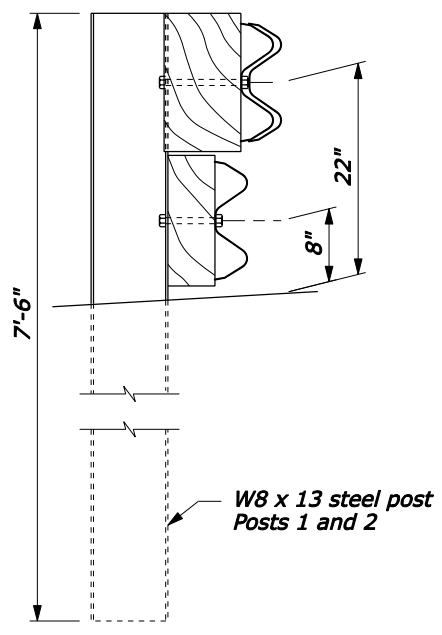
**FOR COMMENT**



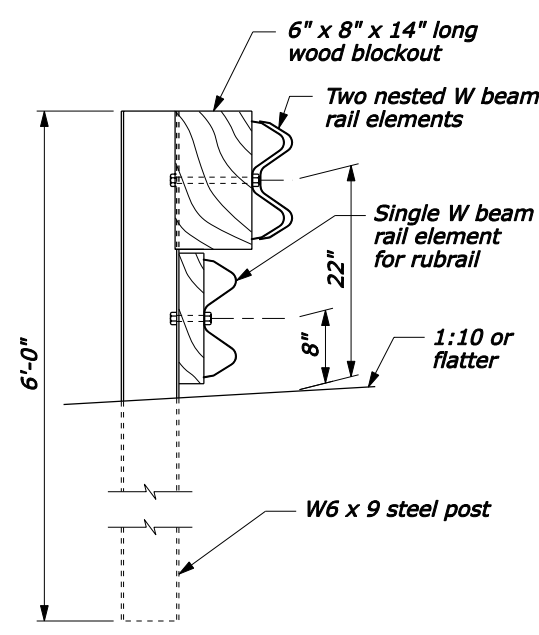
**BEARING PLATE**



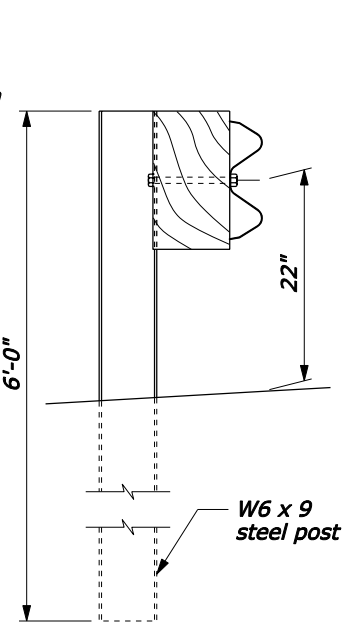
**SECTION A-A**



**SECTION B-B**



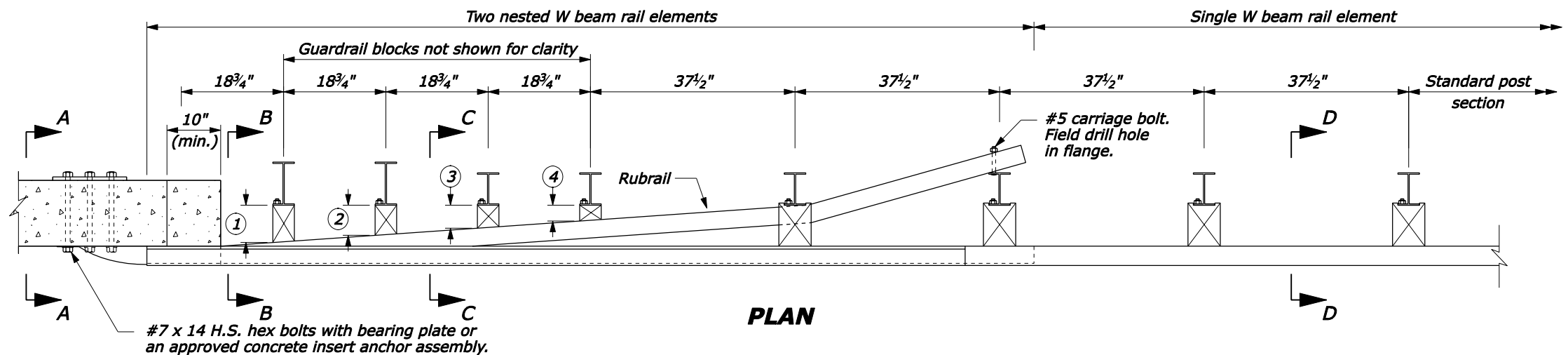
**SECTION C-C**



**SECTION D-D**

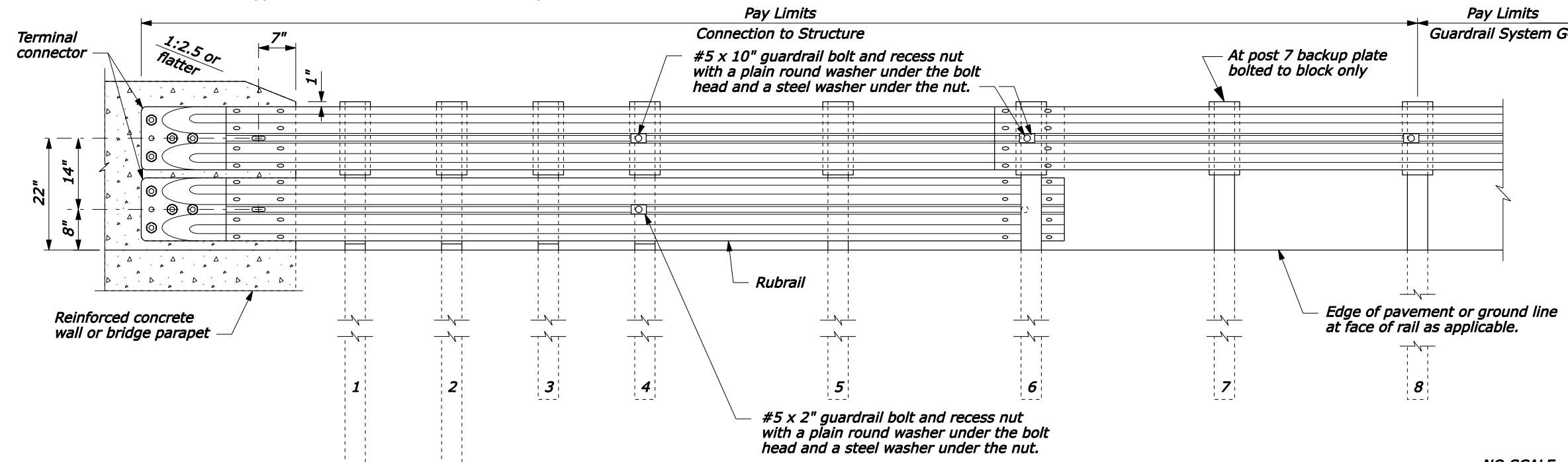
**NOTE:**

1. The rubrail may be shop bent in the last 37 1/2" to facilitate installation.
2. Offset drill wood blocks for rubrail to sit squarely on the post flange posts 1 through 4. Secure blocks to post 1 through 3 with #5 carriage bolts.
3. Posts 1, 2, 3, 4 and 6 require an additional hole to attach lower wood blocks and/or the rubrail.
4. Do not bolt nested W beam or rubrail W beam to posts and blocks on posts 1, 2, 3 and 5. Bolt blocks directly to posts.
5. Reinforced concrete wall or bridge parapet must be capable of developing a 59.6 kip pull out strength.

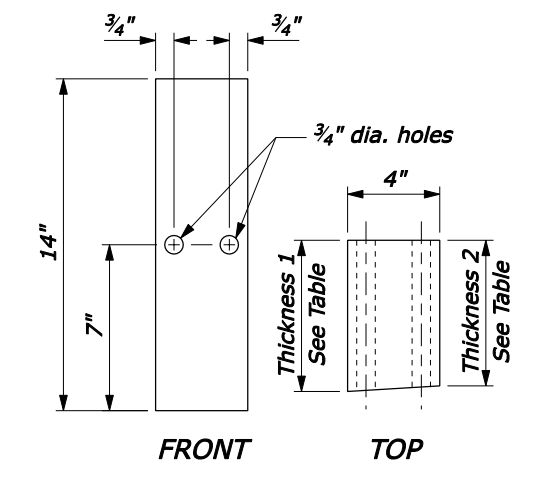


**PLAN**

WOOD BLOCKS FOR RUBRAIL		
POST	THICKNESS 1	THICKNESS 2
①	6 1/2"	6 1/4"
②	5 3/8"	5"
③	4"	3 5/8"
④	2 5/8"	2 7/16"
⑤	NO BLOCK	NO BLOCK



**ELEVATION**



**WOOD BLOCK FOR RUBRAIL**

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
FEDERAL LANDS HIGHWAY

U.S. CUSTOMARY STANDARD  
**G4 W-BEAM GUARDRAIL CONNECTION TO VERTICAL FACE STRUCTURE STEEL POSTS**

STANDARD APPROVED FOR USE --/----

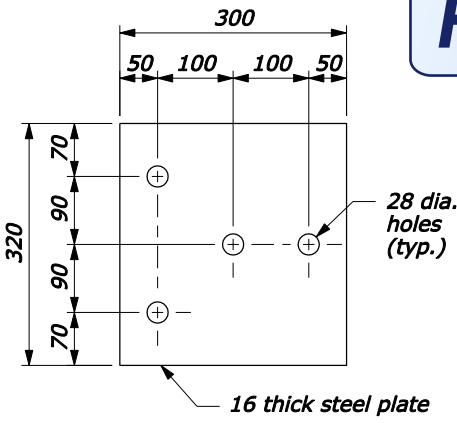
REVISID: 5/2005

STANDARD 617-26

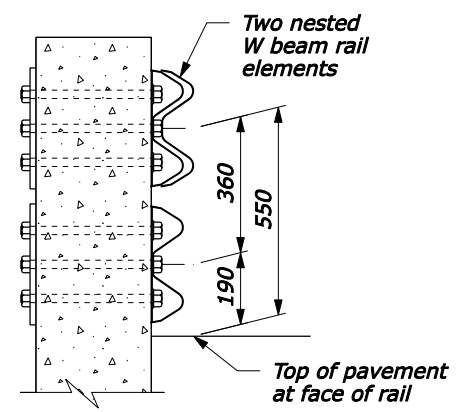
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5/2/2005 F:\StdDraw\Draft\18161726.dgn [US Customary]

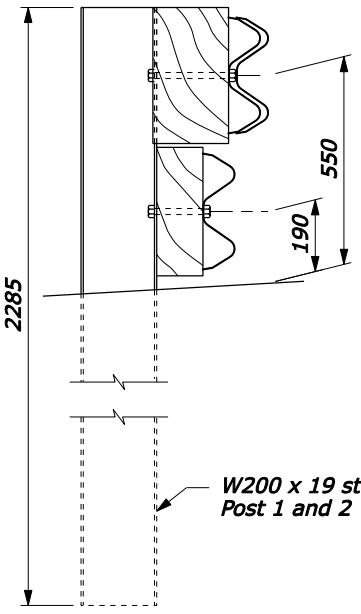
**FOR COMMENT**



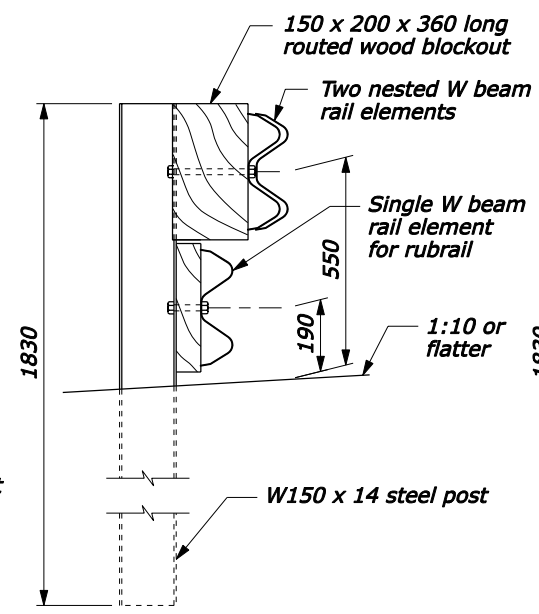
**BEARING PLATE**



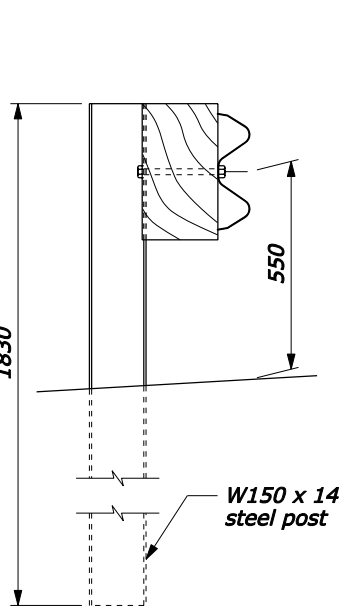
**SECTION A-A**



**SECTION B-B**



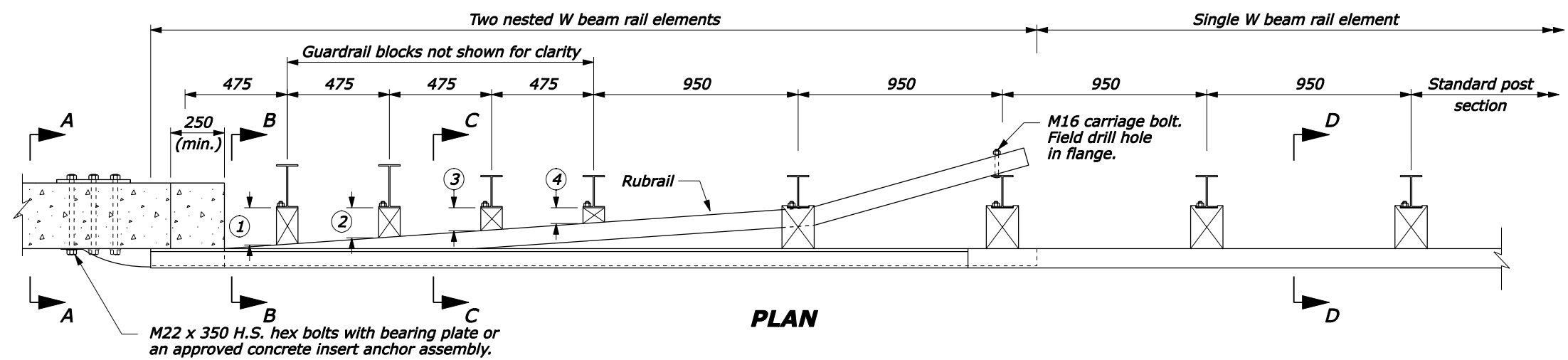
**SECTION C-C**



**SECTION D-D**

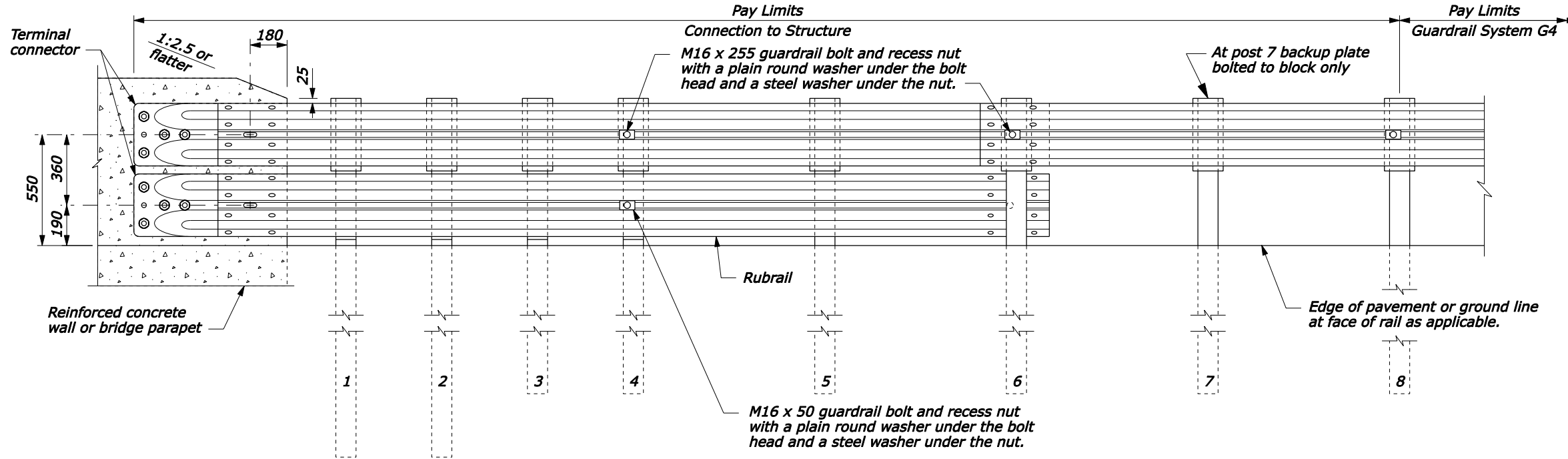
**NOTE:**

1. The rubrail may be shop bent in the last 950 mm to facilitate installation.
2. Offset drill wood blocks for rubrail to sit squarely on the post flange posts 1 through 4. Secure blocks to post 1 through 3 with M16 carriage bolts.
3. Posts 1, 2, 3, 4 and 6 require an additional hole to attach lower wood blocks and/or the rubrail.
4. Do not bolt nested W beam or rubrail W beam to posts and blocks on posts 1, 2, 3 and 5. Bolt blocks directly to posts.
5. Reinforced concrete wall or bridge parapet must be capable of developing a 265 kN pull out strength.
6. Furnish hardware in the metric sizes shown. Equivalent US Customary sizes may be used when metric sizes are not available.
7. Dimensions without units are millimeters.

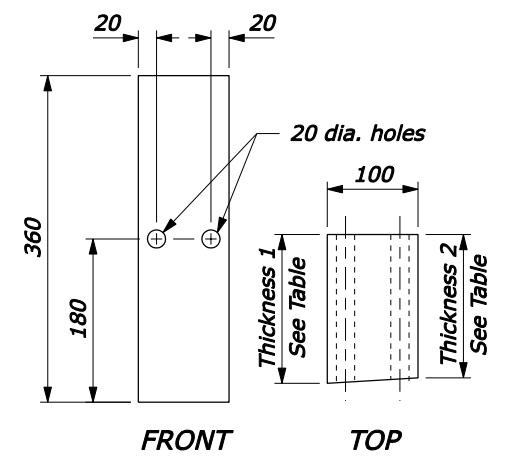


**PLAN**

WOOD BLOCKS FOR RUBRAIL		
POST	THICKNESS 1	THICKNESS 2
①	164	158
②	131	125
③	99	93
④	67	61
⑤	NO BLOCK	NO BLOCK



**ELEVATION**



**WOOD BLOCK FOR RUBRAIL**

U.S. DEPARTMENT OF TRANSPORTATION  
 FEDERAL HIGHWAY ADMINISTRATION  
 FEDERAL LANDS HIGHWAY

**METRIC STANDARD  
 G4 W-BEAM GUARDRAIL  
 CONNECTION TO  
 VERTICAL FACE STRUCTURE  
 STEEL POSTS**

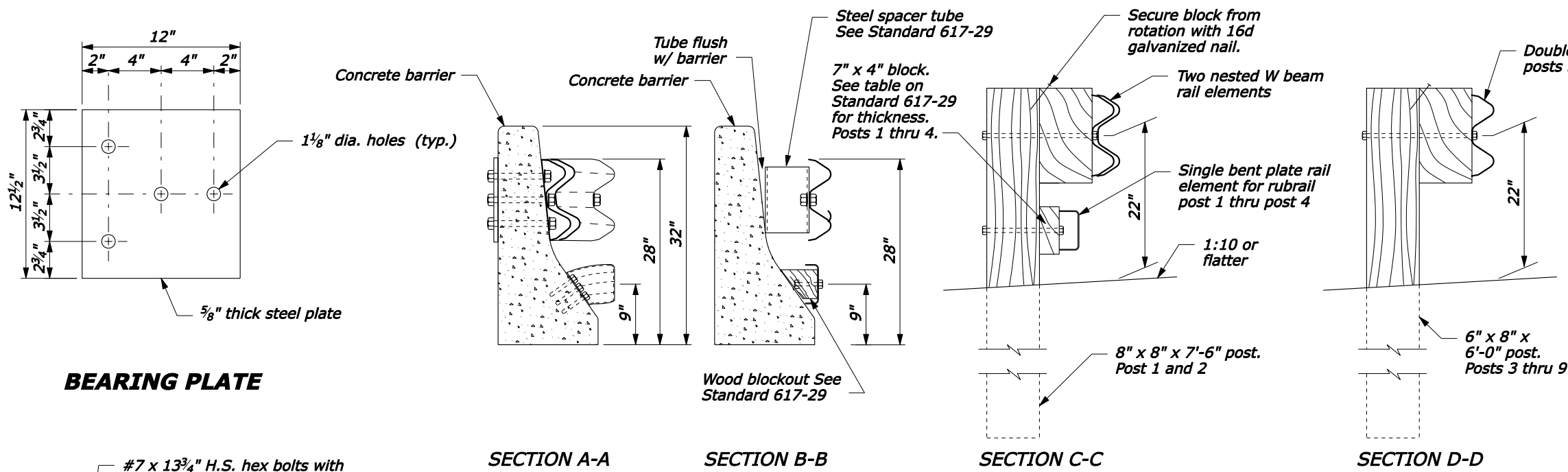
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REVISOR: 5/2005

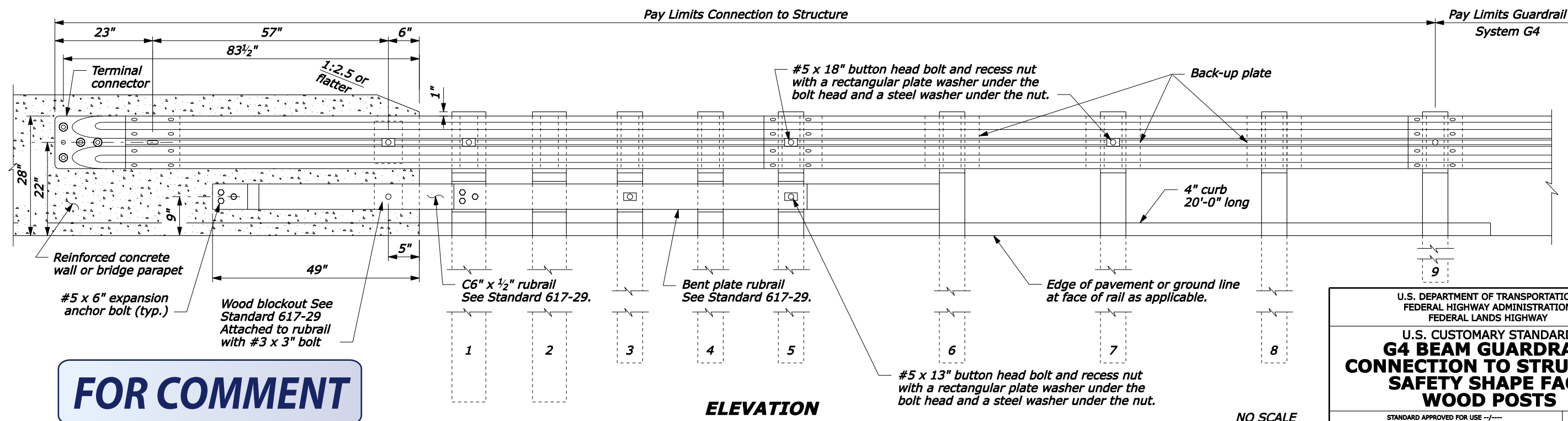
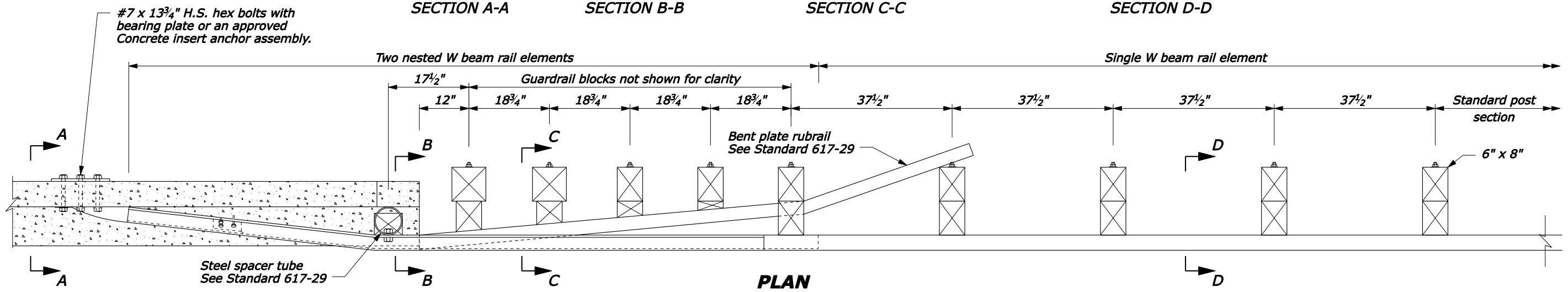
STANDARD M617-26

NO SCALE

5/2/2005 F:\StanDraw\Draft\08\061726.dgn [Metric]



- NOTE:**
- Posts 1 through 5 require an additional hole to attach lower wood blocks and/or rubrail.
  - Center drill wood blocks for rubrail located on posts 1 through 4. Secure blocks to posts 2 and 4. Secure rubrail and blocks to posts 1, 3, and 5 using M16 carriage bolts.
  - Do not bolt W beam to posts and blocks at posts 2 and 4.
  - Reinforced concrete wall or bridge parapet must be capable of developing a 59.6 kip pull out strength.



**FOR COMMENT**

U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
FEDERAL LANDS HIGHWAY

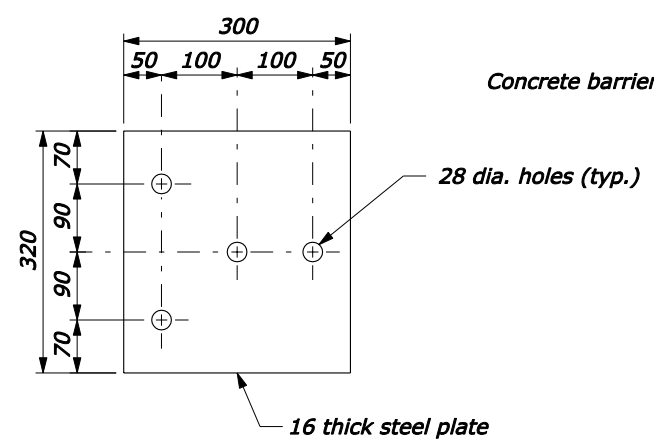
**U.S. CUSTOMARY STANDARD  
G4 BEAM GUARDRAIL  
CONNECTION TO STRUCTURE  
SAFETY SHAPE FACE  
WOOD POSTS**

STANDARD APPROVED FOR USE --/--

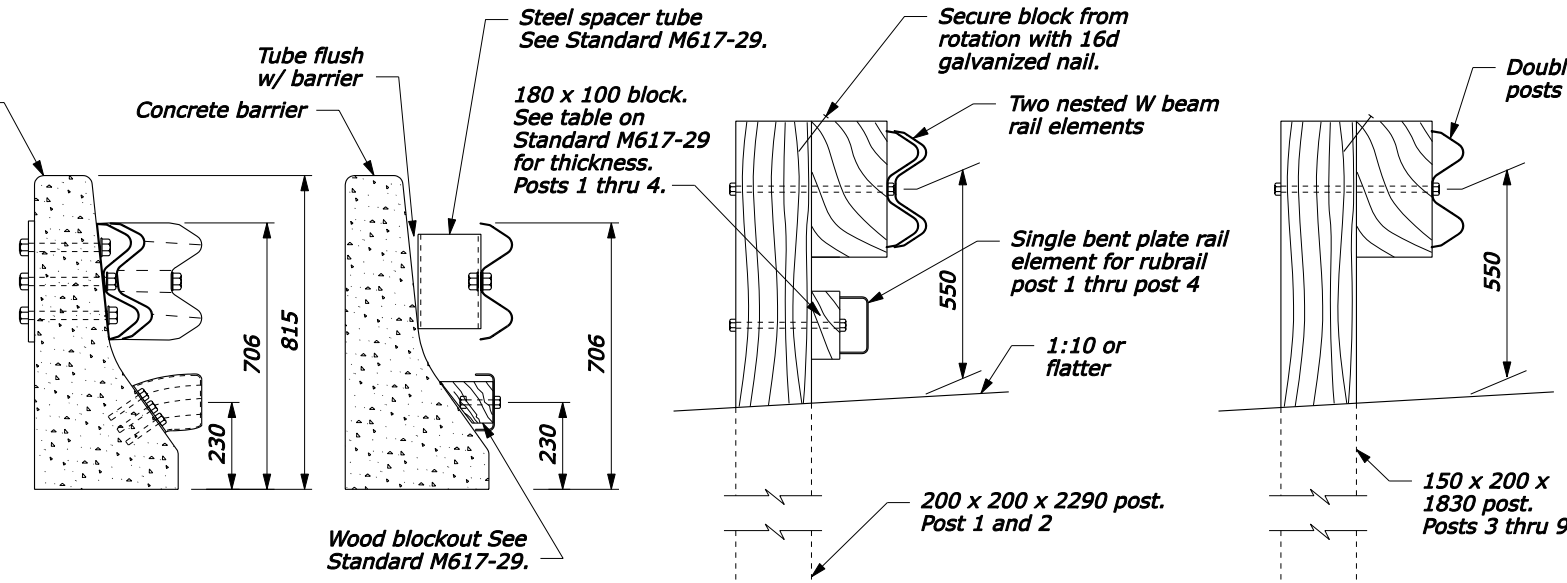
REVIS: 6/2004  
DRAFT: 6/2004

STANDARD  
617-27

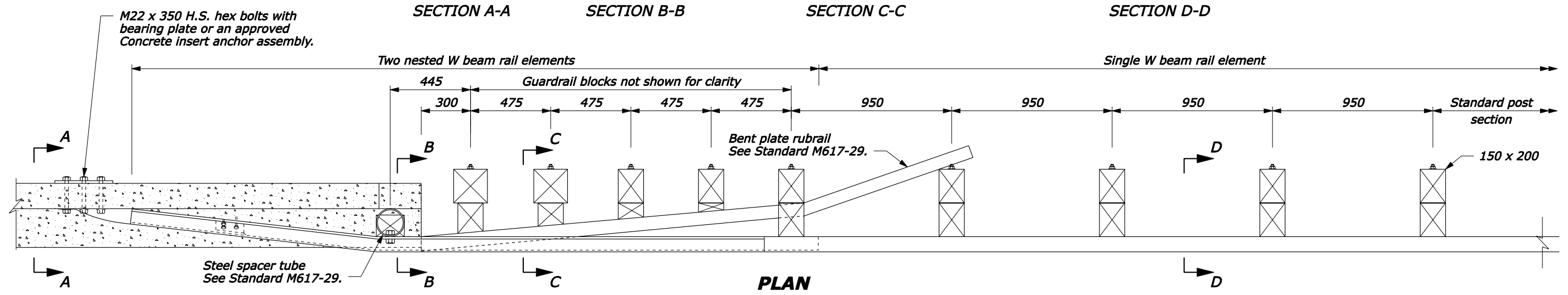
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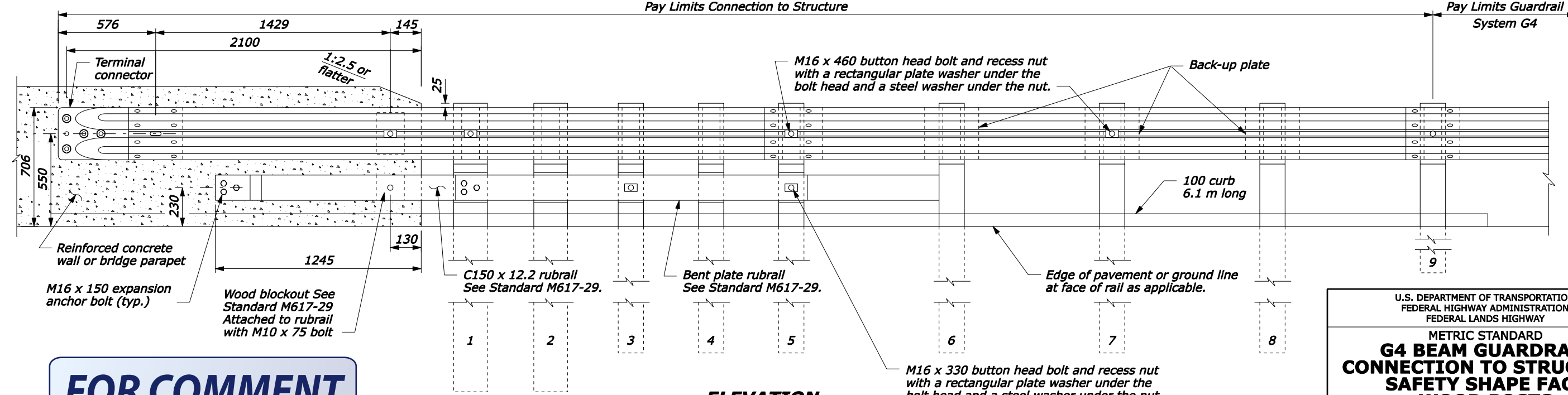
**BEARING PLATE**



- NOTE:**
1. Posts 1 through 5 require an additional hole to attach lower wood blocks and/or rubrail.
  2. Center drill wood blocks for rubrail located on posts 1 through 4. Secure blocks to posts 2 and 4. Secure rubrail and blocks to posts 1, 3, and 5 using M16 carriage bolts.
  3. Do not bolt W beam to posts and blocks at posts 2 and 4.
  4. Reinforced concrete wall or bridge parapet must be capable of developing a 265 kN pull out strength.
  5. Furnish hardware in the metric sizes shown. Equivalent U.S. Customary sizes may be used when metric sizes are not available.
  6. Dimensions without units are millimeters.



**PLAN**



**ELEVATION**

**FOR COMMENT**

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION  
 FEDERAL HIGHWAY ADMINISTRATION  
 FEDERAL LANDS HIGHWAY

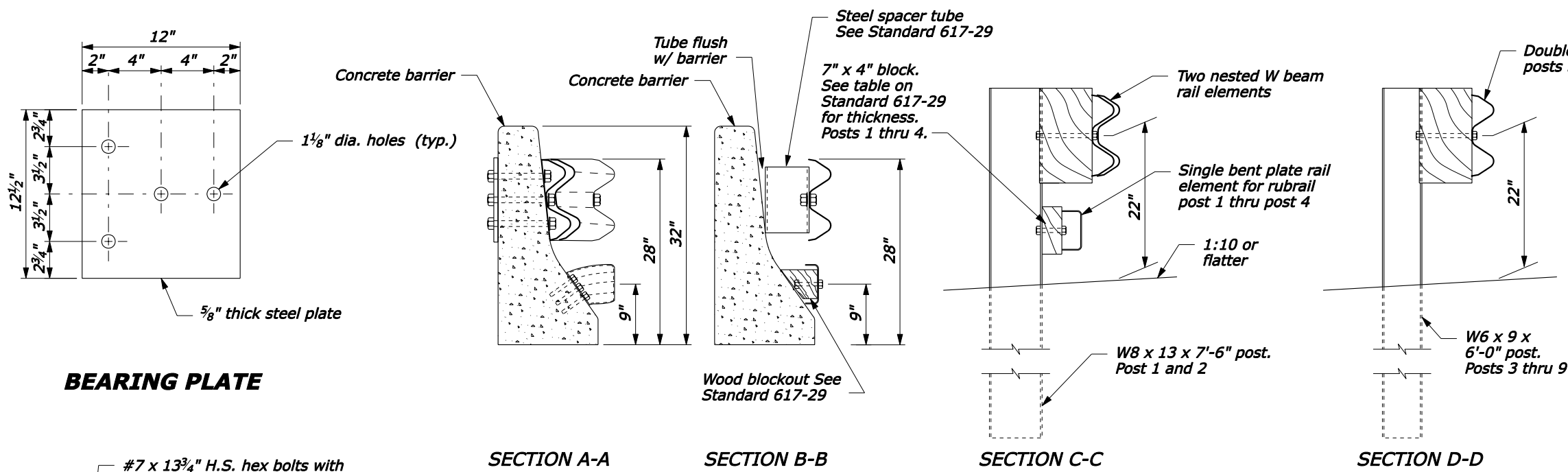
**METRIC STANDARD  
 G4 BEAM GUARDRAIL  
 CONNECTION TO STRUCTURE  
 SAFETY SHAPE FACE  
 WOOD POSTS**

STANDARD APPROVED FOR USE 3/1996  
 REVISED: 1/1998  
 DRAFT: 6/2004

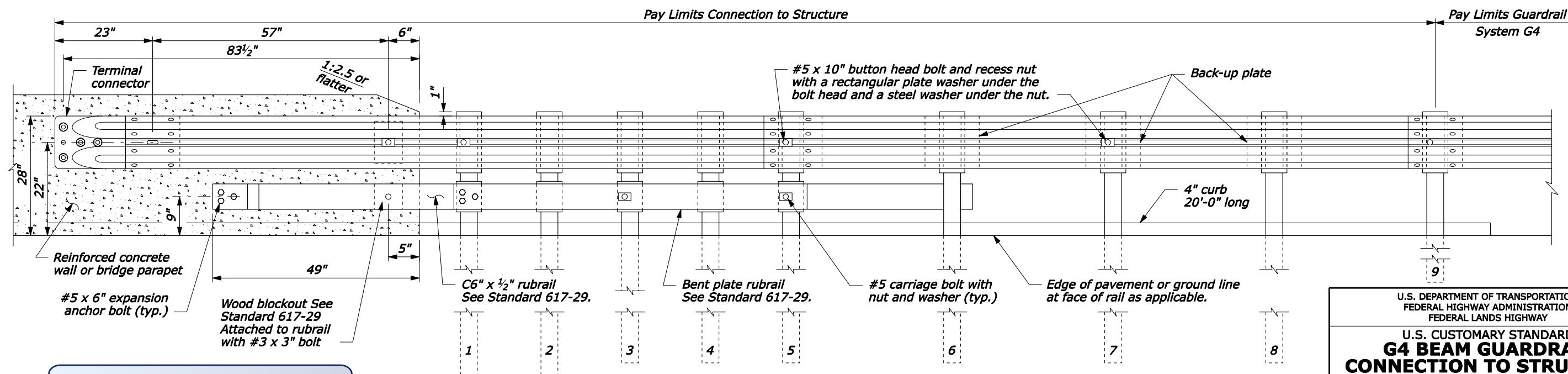
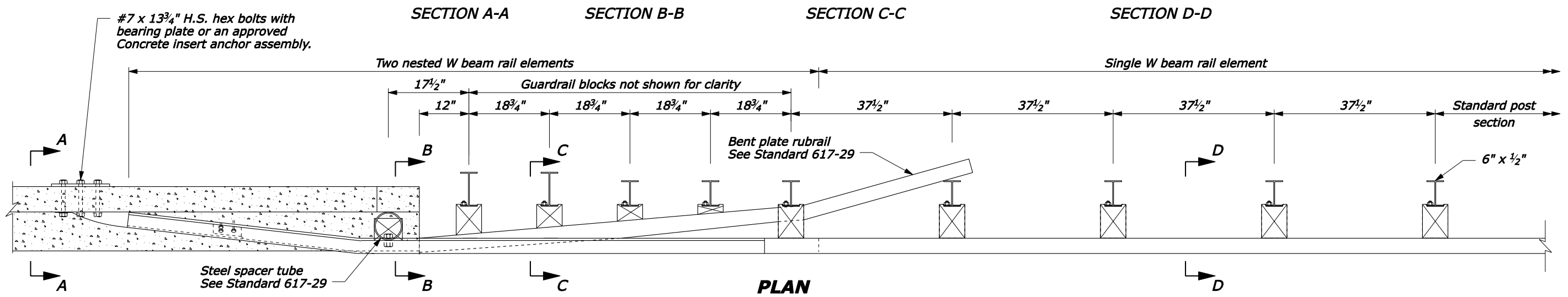
STANDARD  
**M617-27**

23-Jun-2004 04:11 PM  
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- NOTE:**
- Posts 1 through 5 require an additional hole to attach lower wood blocks and/or rubrail.
  - Offset drill wood blocks for rubrail to sit squarely on the post flange on posts 1 through 4. Secure blocks to posts 2 and 4. Secure rubrail and blocks to post flange on posts 1, 3, and 5 using #5 carriage bolts.
  - Do not bolt W beam to posts and blocks at posts 2 and 4.
  - Reinforced concrete wall or bridge parapet must be capable of developing a 59.6 kip pull out strength.



**FOR COMMENT**

**ELEVATION**

NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION  
 FEDERAL HIGHWAY ADMINISTRATION  
 FEDERAL LANDS HIGHWAY

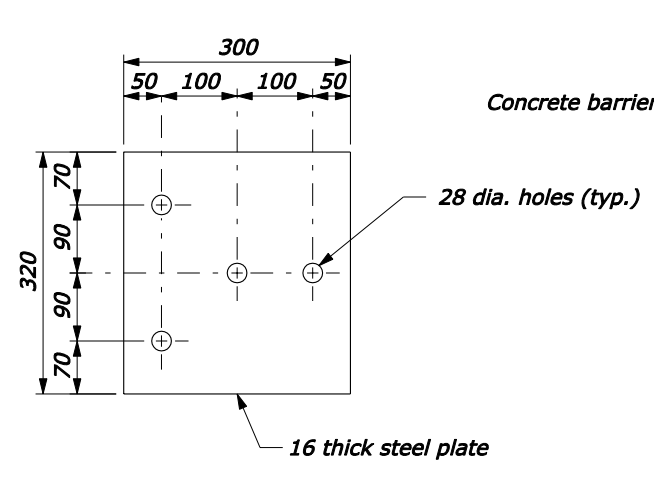
**U.S. CUSTOMARY STANDARD  
 G4 BEAM GUARDRAIL  
 CONNECTION TO STRUCTURE  
 SAFETY SHAPE FACE  
 STEEL POSTS**

STANDARD APPROVED FOR USE --/---

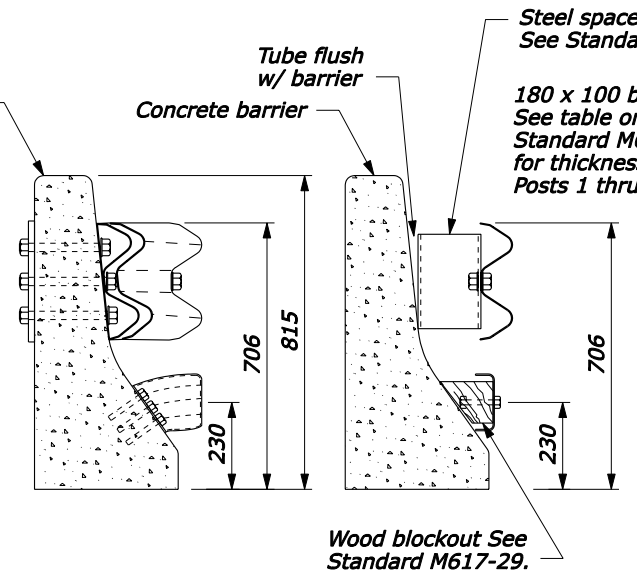
REVISED: 6/2004  
 DRAFT: 6/2004

STANDARD  
 617-28

F:\StanDraw\Draw\18\1728.dgn [US Customary] 22-Jun-2004 03:57 PM

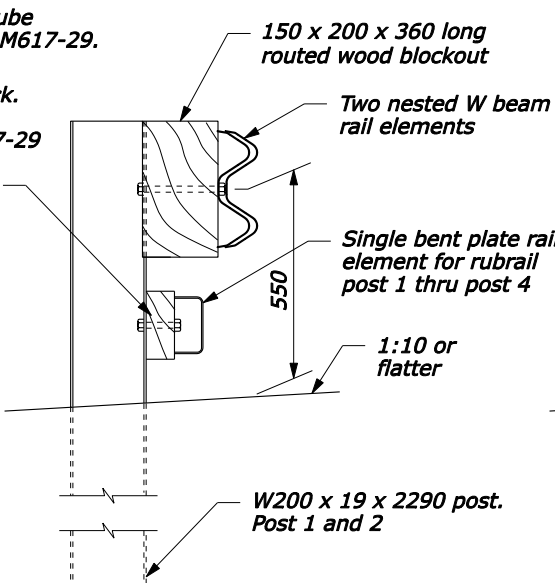


**BEARING PLATE**

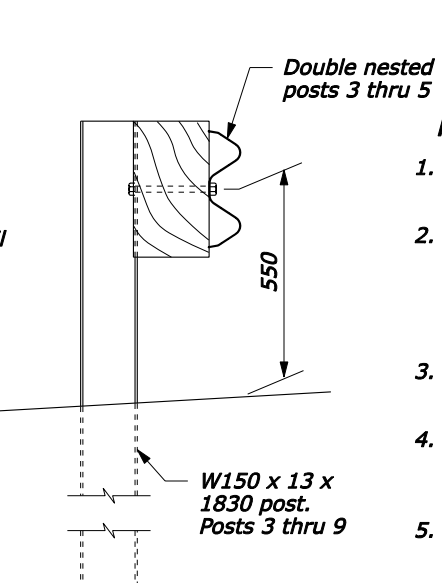


SECTION A-A

SECTION B-B

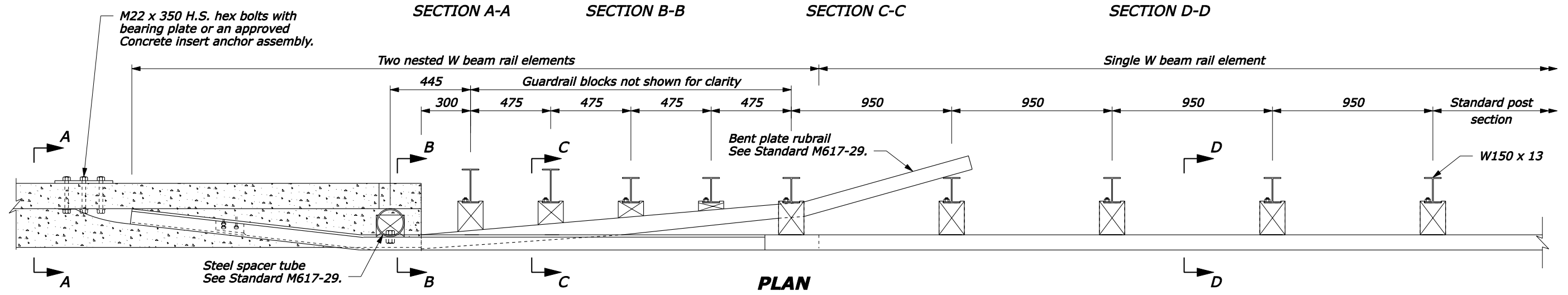


SECTION C-C

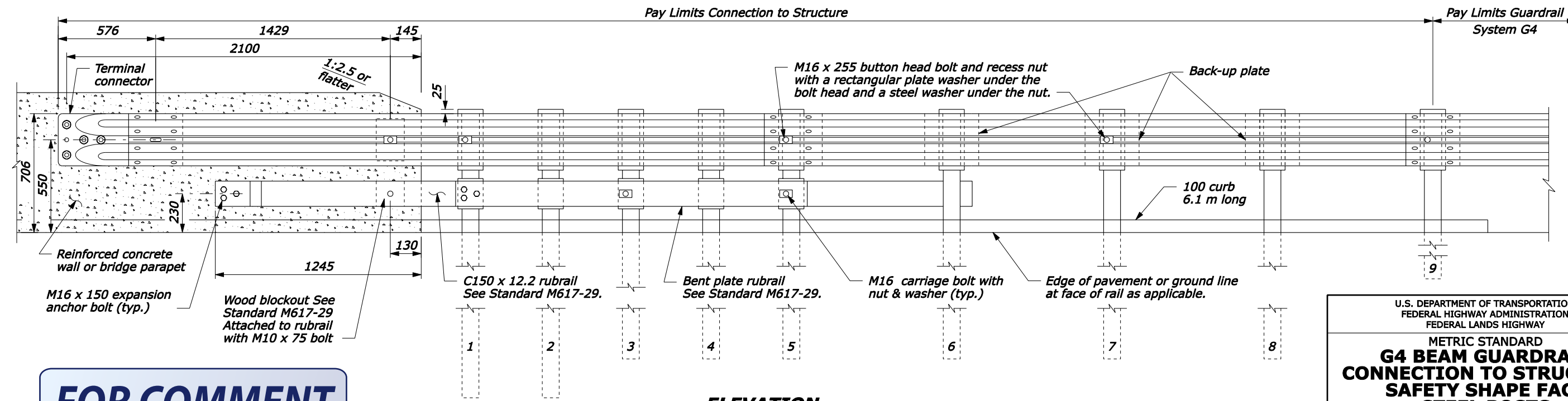


SECTION D-D

- NOTE:**
1. Posts 1 through 5 require an additional hole to attach lower wood blocks and/or rubrail.
  2. Offset drill wood blocks for rubrail to sit squarely on the post flange on posts 1 through 4. Secure blocks to posts 2 and 4. Secure rubrail and blocks to post flange on posts 1, 3, and 5 using M16 carriage bolts.
  3. Do not bolt W beam to posts and blocks at posts 2 and 4.
  4. Reinforced concrete wall or bridge parapet must be capable of developing a 265 kN pull out strength.
  5. Furnish hardware in the metric sizes shown. Equivalent U.S. Customary sizes may be used when metric sizes are not available.
  6. Dimensions without units are millimeters.



**PLAN**



**ELEVATION**

**FOR COMMENT**

NO SCALE

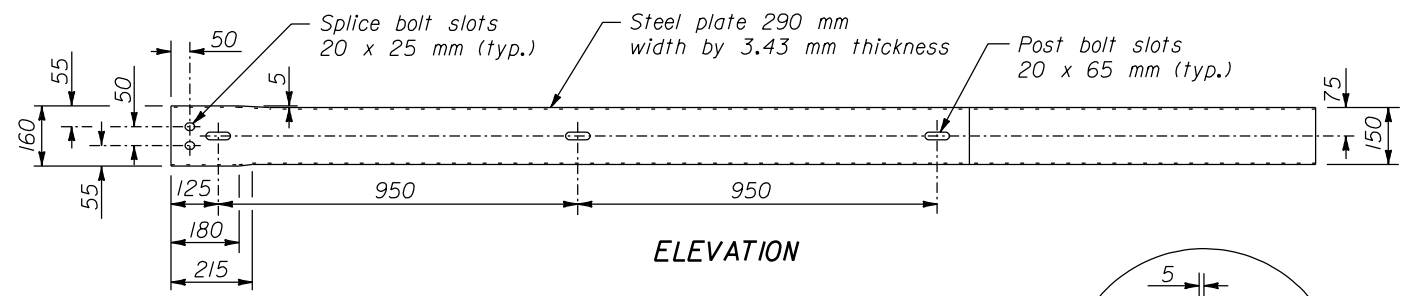
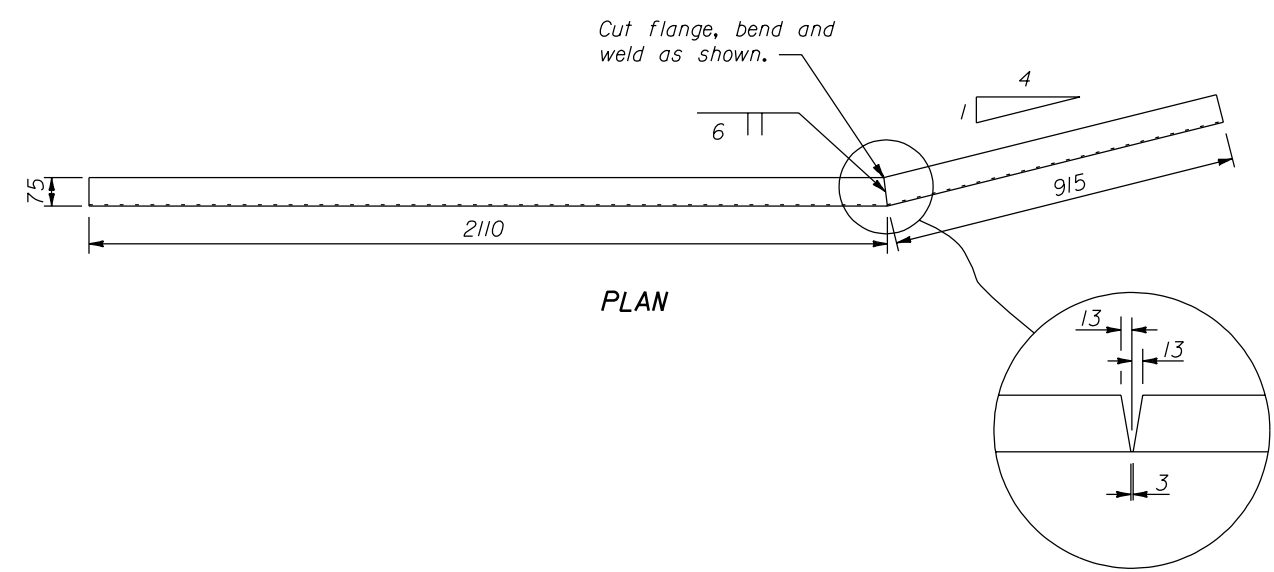
U.S. DEPARTMENT OF TRANSPORTATION  
 FEDERAL HIGHWAY ADMINISTRATION  
 FEDERAL LANDS HIGHWAY

**METRIC STANDARD  
 G4 BEAM GUARDRAIL  
 CONNECTION TO STRUCTURE  
 SAFETY SHAPE FACE  
 STEEL POSTS**

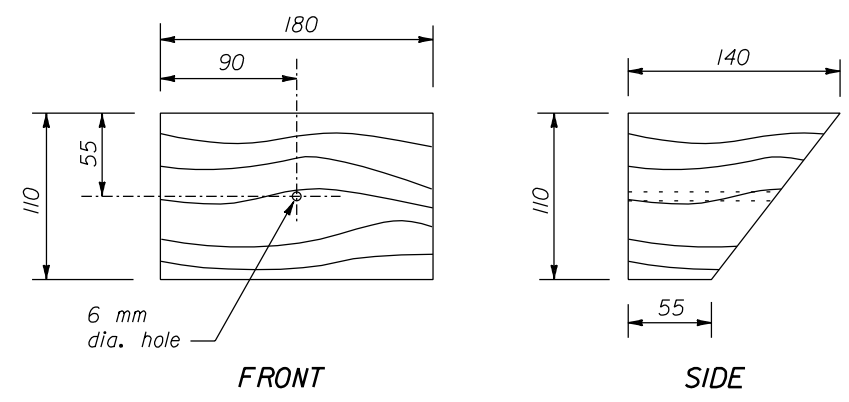
STANDARD APPROVED FOR USE 3/1996  
 REVISÉD: 1/1998  
 DRAFT: 6/2004

STANDARD  
**M617-28**

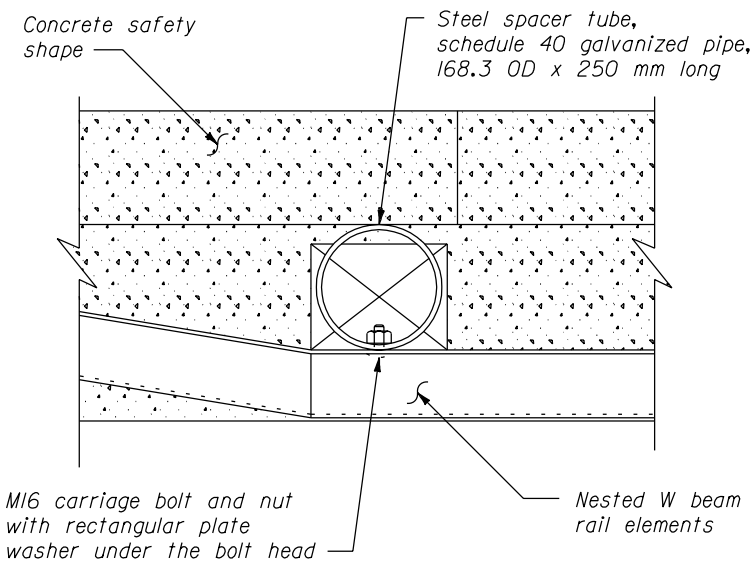
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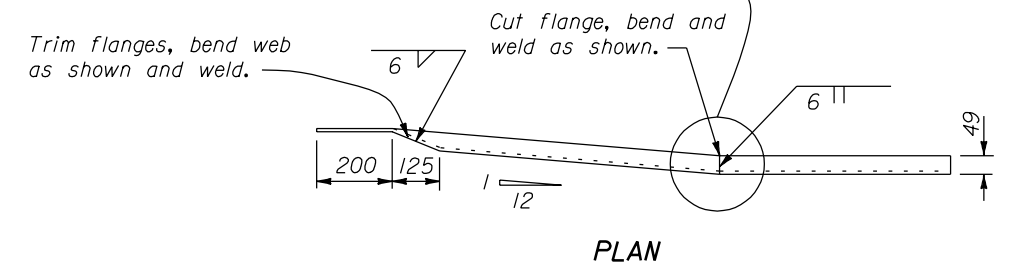
BENT PLATE RUBRAIL



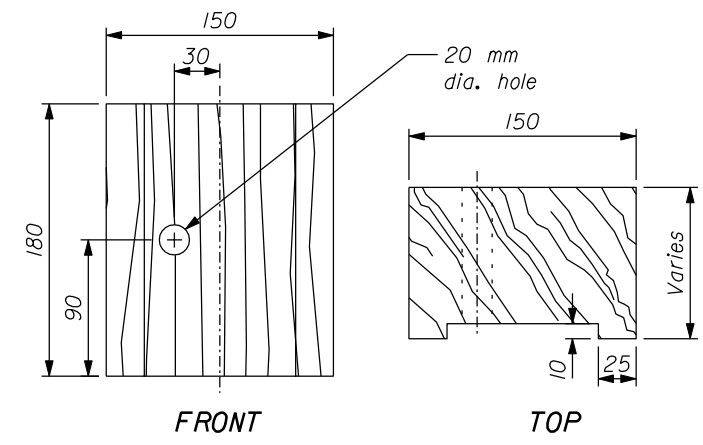
WOOD BLOCKOUT FOR RUBRAIL ON CONCRETE SAFETY SHAPE



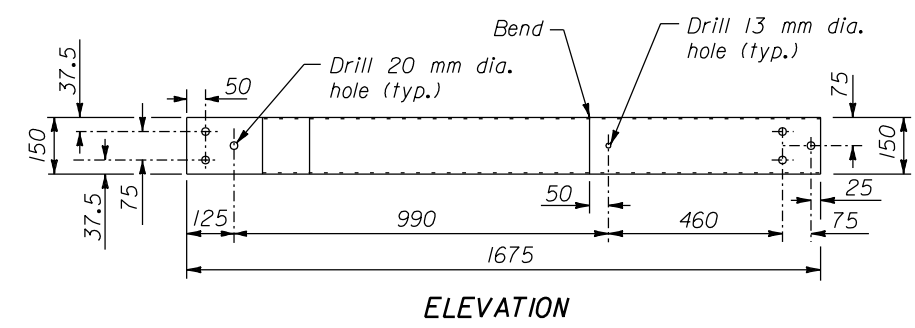
STEEL SPACER BLOCK



PLAN



WOOD BLOCKOUT FOR RUBRAIL ON STEEL POSTS



ELEVATION

C150 X 12.2 RUBRAIL

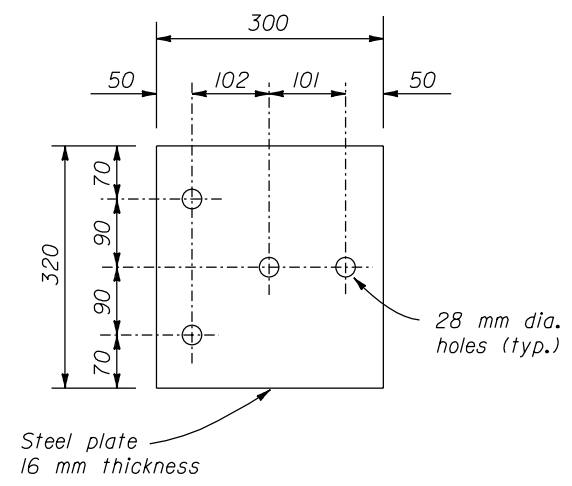
**NOTE:**

1. Dimensions not labeled are in millimeters.
2. Attach rubrail end flush with sloped toe of safety shape. Shop fabricate the C150 x 12.2 rubrail end to be consistent with the slope of safety shape. Both clockwise and counterclockwise fabrications may be required.
3. Dimensional tolerances not shown or implied are intended to be those consistent with the proper functioning of the part, including its appearance, and accepted manufacturing practices.

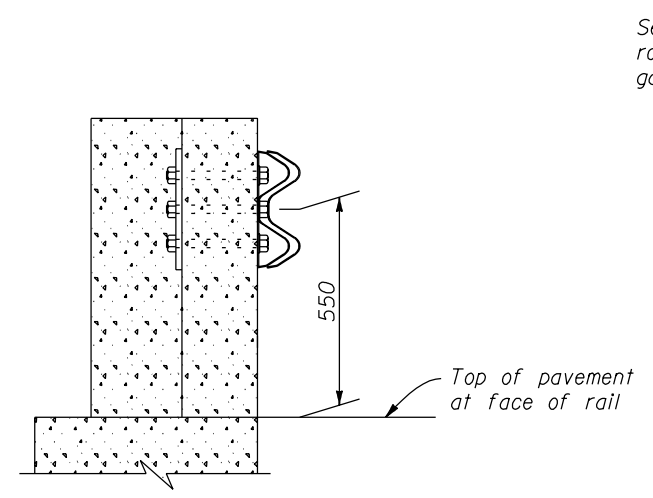
NO SCALE

U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION FEDERAL LANDS HIGHWAY	
METRIC STANDARD G4 W BEAM GUARDRAIL CONNECTION TO STRUCTURE SAFETY SHAPE FACE RUBRAIL	
STANDARD APPROVED FOR USE 3/1996 REVISED: 1/1998	STANDARD M617-29

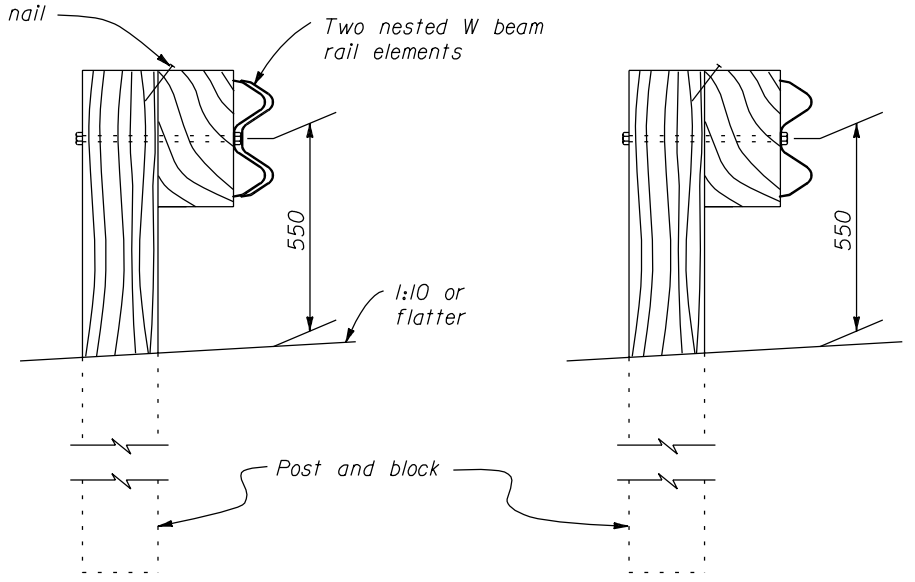
22 NOV 2000 f:\standrow\metric\m61729.dgn



BEARING PLATE



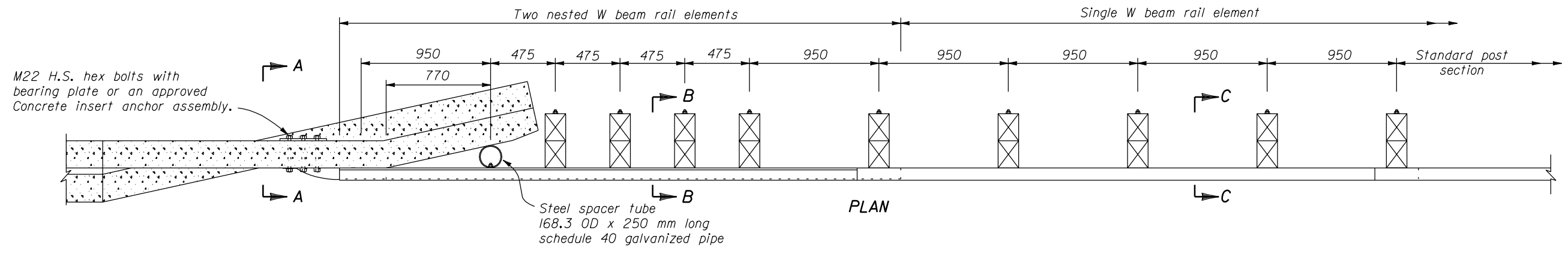
SECTION A-A



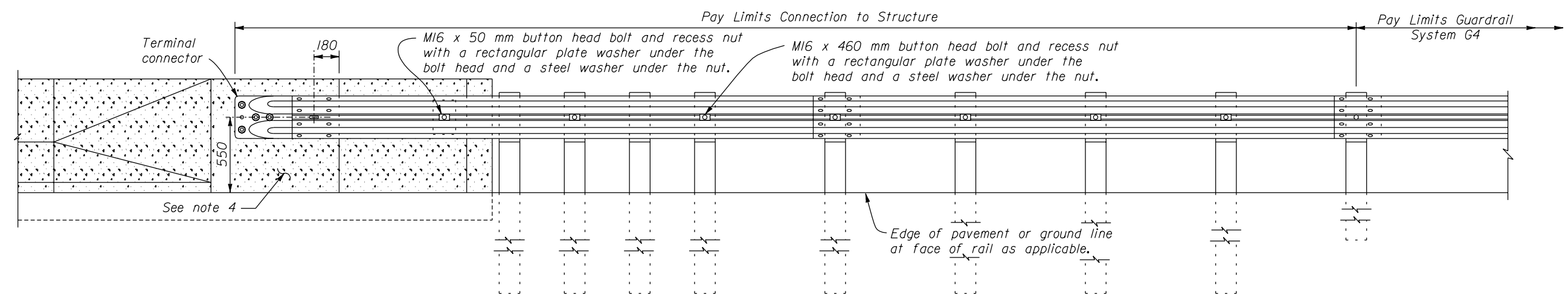
SECTION B-B

SECTION C-C

- NOTE:**
- Dimensions not labeled are in millimeters.
  - Reinforced concrete wall or bridge parapet must be capable of developing a 265 kN pull out strength.
  - Connect steel spacer tube to rail element only.
  - Where reinforced concrete flare back transition section is required, See Standard M617-32 or plan sheets, as appropriate, for details.



PLAN



ELEVATION

NO SCALE

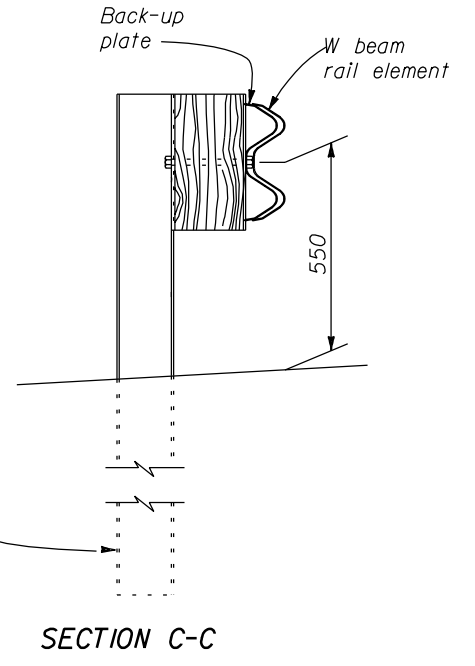
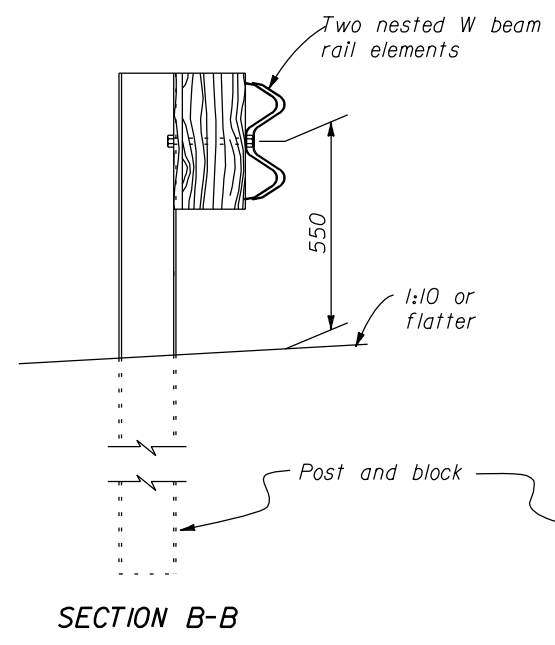
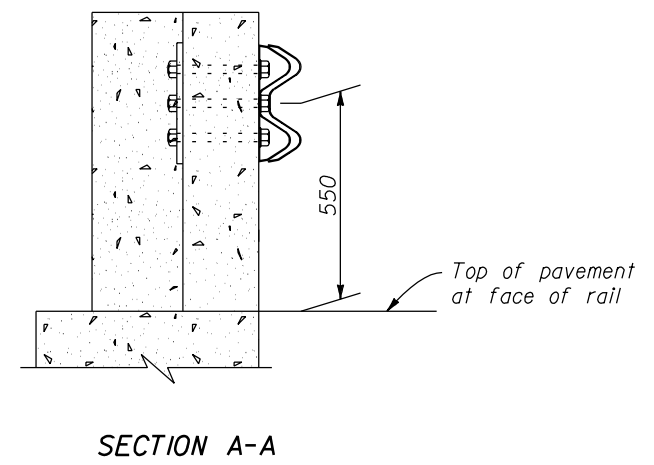
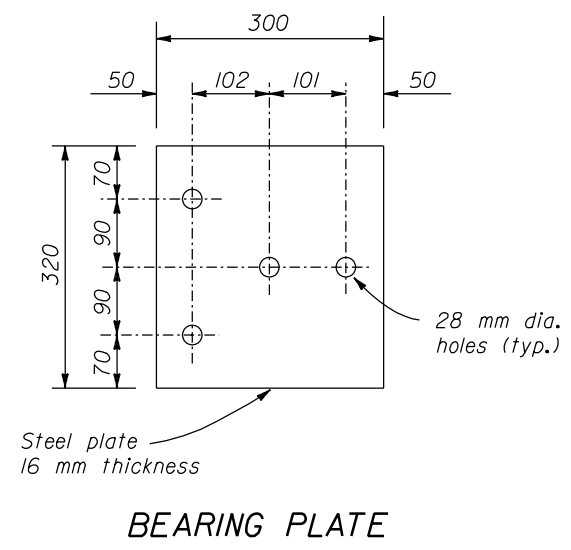
U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
FEDERAL LANDS HIGHWAY

**METRIC STANDARD**  
**G4 W BEAM GUARDRAIL**  
**CONNECTION TO STRUCTURE**  
**VERTICAL FLARED BACK**  
**WOOD POSTS**

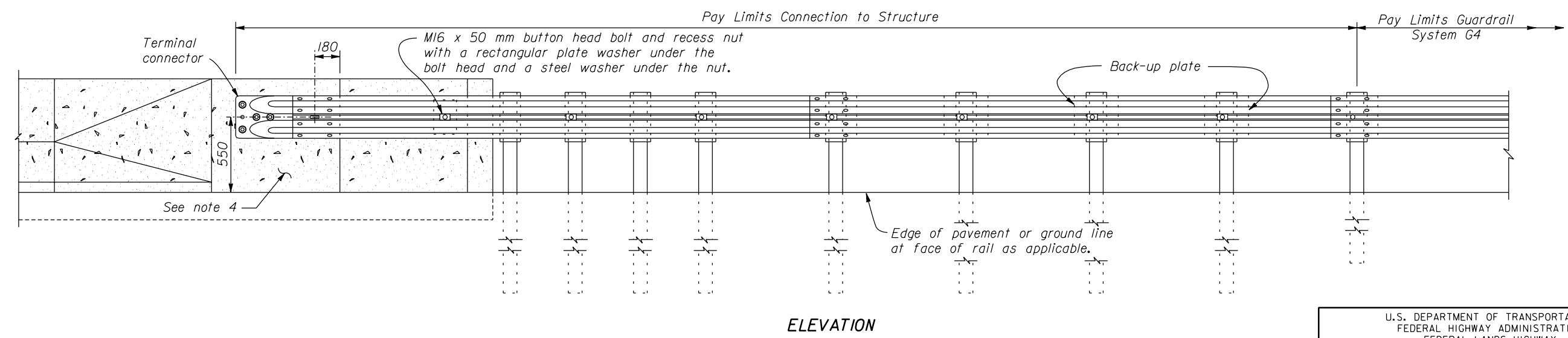
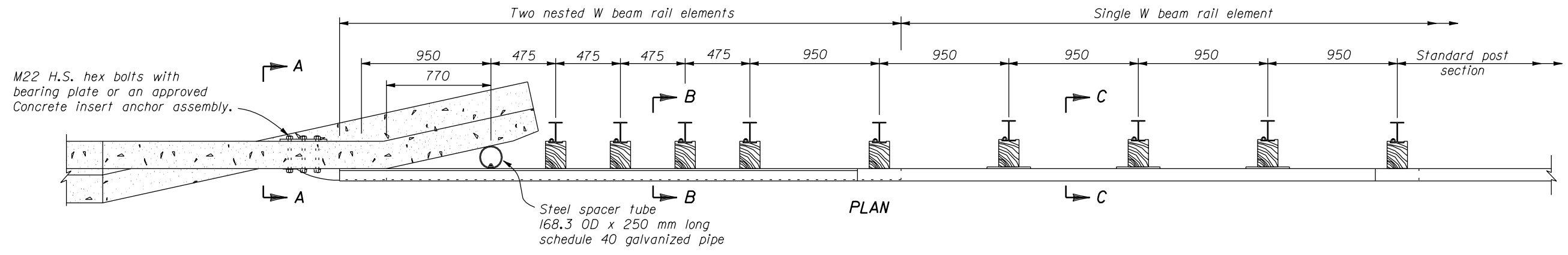
STANDARD APPROVED FOR USE 3/1996

REVISOR: STANDARD  
M617-30

22 NOV 2000 f:\standrow\metric\mst61730.dgn



- NOTE:**
1. Dimensions not labeled are in millimeters.
  2. Reinforced concrete wall or bridge parapet must be capable of developing a 265 kN pull out strength.
  3. Connect steel spacer tube to rail element only.
  4. Where reinforced concrete flare back transition section is required, See Standard M617-32 or plan sheets, as appropriate, for details.



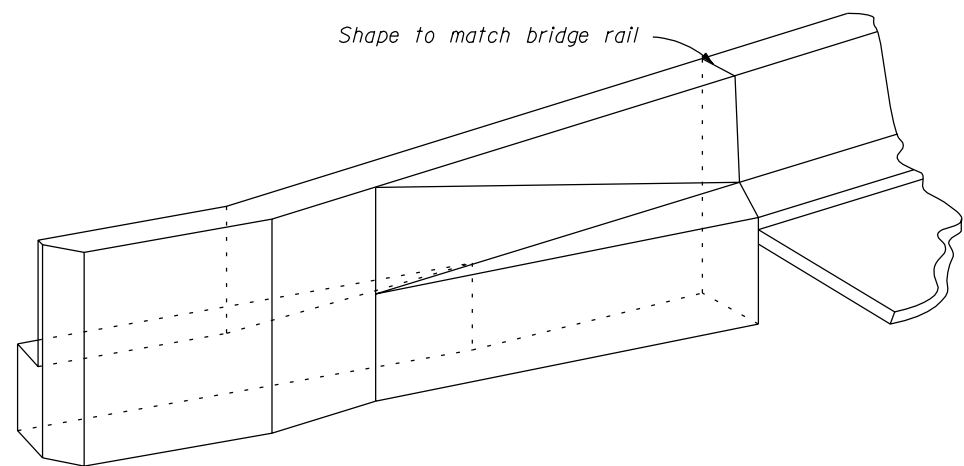
U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
FEDERAL LANDS HIGHWAY

**METRIC STANDARD**  
**G4 W BEAM GUARDRAIL**  
**CONNECTION TO STRUCTURE**  
**VERTICAL FLARED BACK**  
**STEEL POSTS**

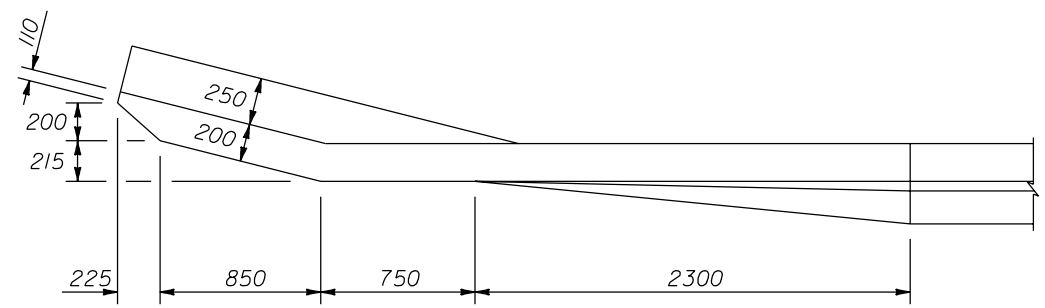
STANDARD APPROVED FOR USE 3/1996  
REVISED: 12/1997

STANDARD  
**M617-31**

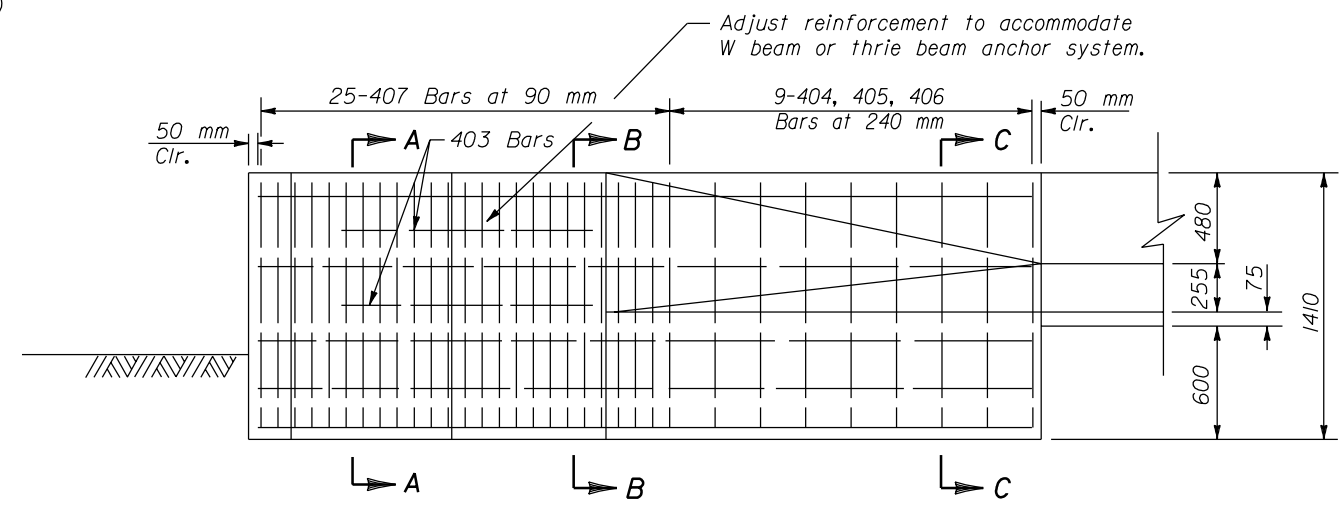
NO SCALE



WINGWALL ISOMETRIC



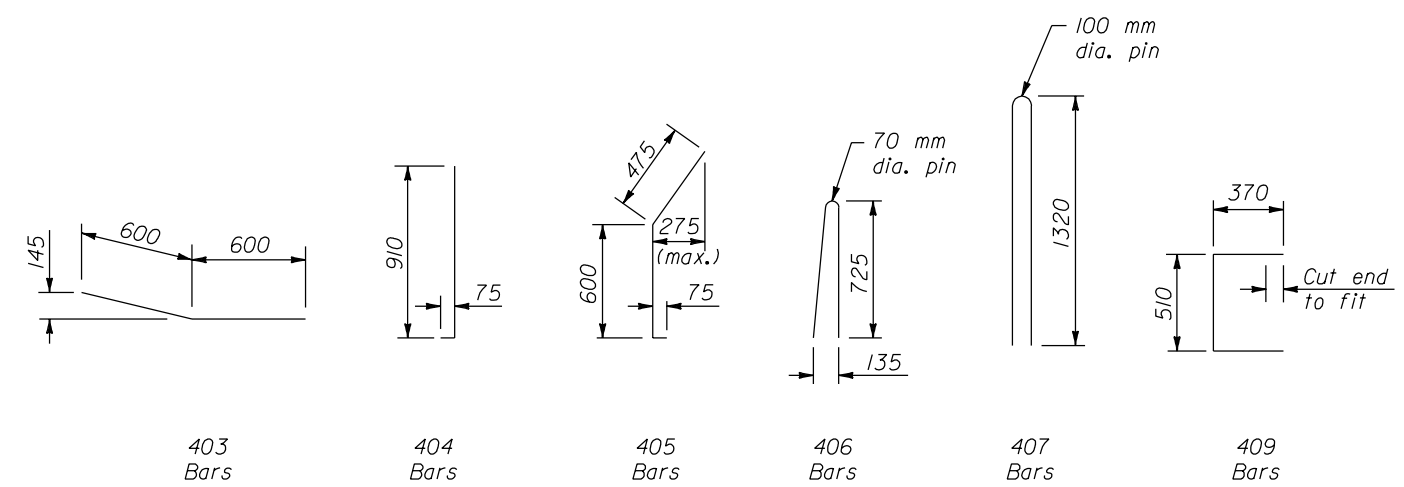
PLAN



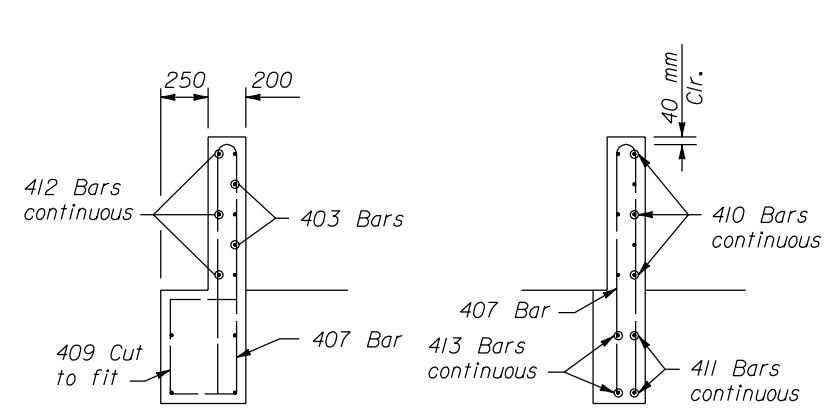
ELEVATION

**NOTE:**

1. Dimensions not labeled are in millimeters.
2. CONCRETE: Structural concrete Class A(AE), with a specified minimum 28-day compressive strength  $F'c=30$  MPa. Vibrate all concrete. Chamfer exposed edges 20 mm unless otherwise shown. Do not use calcium chloride additives in the concrete.
3. The minimum concrete covering to the face of any bar is 40 mm unless otherwise shown. All bars are #13.
4. FINISHING CONCRETE: Give all concrete surfaces a Class I finish except as specified in the Special Contract Requirements.

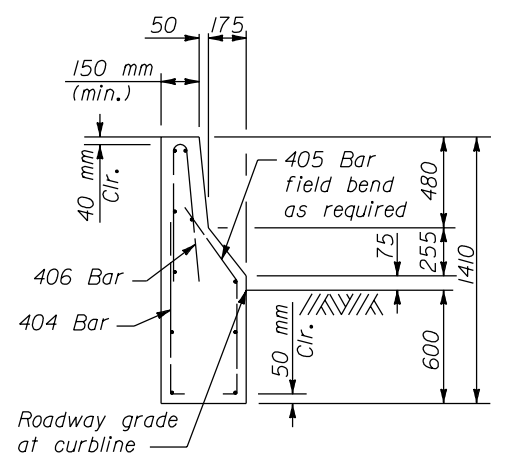


REINFORCING BAR DETAILS

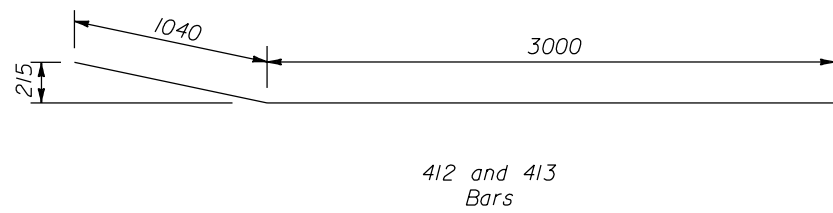
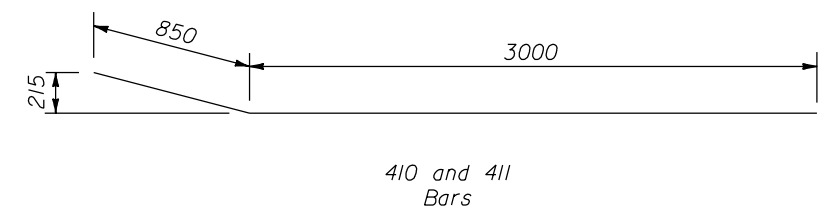


SECTION A-A

SECTION B-B



SECTION C-C



U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL HIGHWAY ADMINISTRATION  
FEDERAL LANDS HIGHWAY

**METRIC STANDARD**  
**G4 W BEAM GUARDRAIL**  
**FLARED BACK**  
**PARAPET WALL AND**  
**SAFETY SHAPE TRANSITION**

STANDARD APPROVED FOR USE 3/1996  
REVISED: 5/1997

STANDARD  
**M617-32**

NO SCALE

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