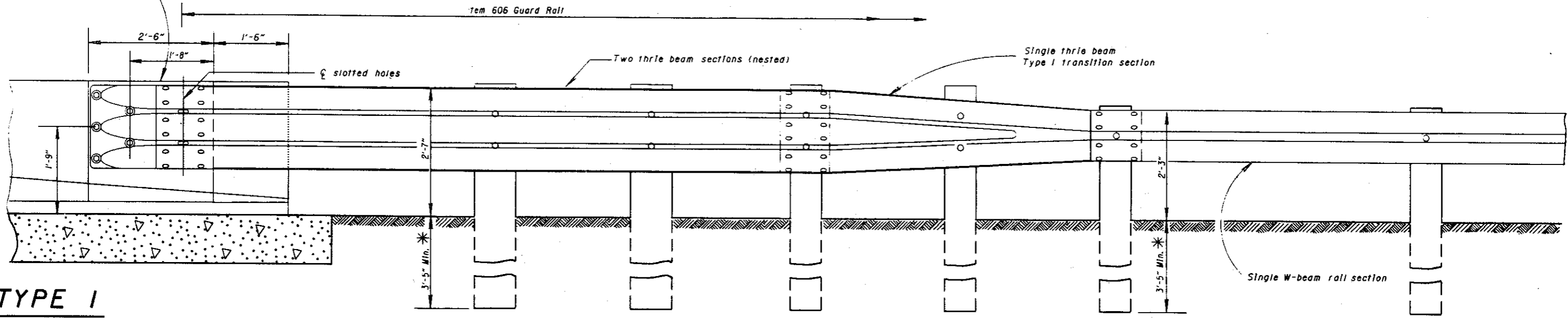
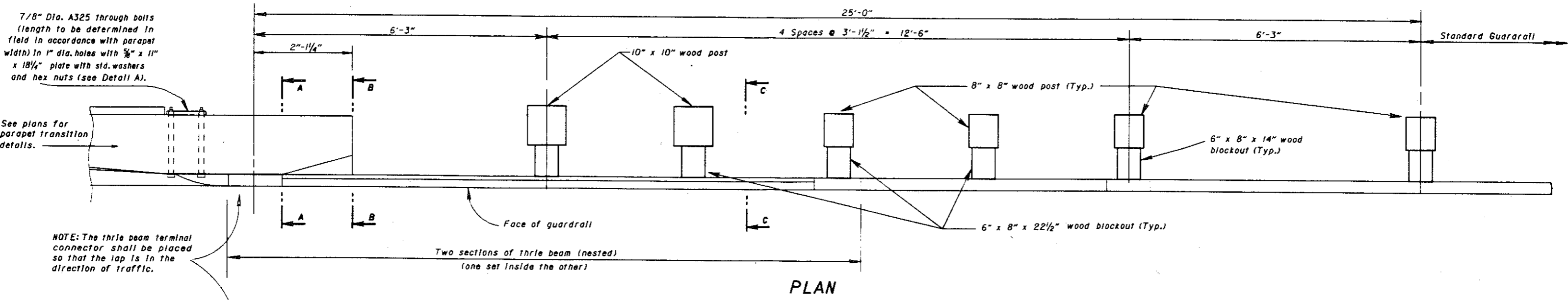


7/8" Dia. A325 through bolts
(length to be determined in
field in accordance with parapet
width) in 1" dia. holes with 5/8" x 11"
x 18 1/4" plate with std. washers
and hex nuts (see Detail A).

See plans for
parapet transition
details.

NOTE: The thrie beam terminal
connector shall be placed
so that the lap is in the
direction of traffic.



* See Std. Const. Dwg. GR-1.2 for additional post embedment details.

NOTES

GENERAL
For additional details, see Std. Const. Dwgs. GR-1.1, GR-1.2
and other Standard Drawings pertaining to design
of specific guardrail types.

APPLICATION
The Type I Bridge Terminal Assembly shall be used to
connect guardrail runs to bridges having concrete
deflector parapet railing. It shall be used to connect
guardrail runs to the approach end of bridge parapets
or other concrete barrier installations and to
anchor guardrail runs to the trailing end of
bridge parapets or other concrete barrier
installations on undivided, bi-directional highways.

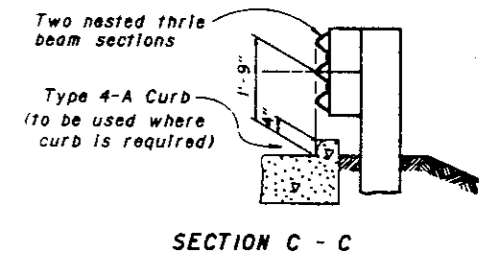
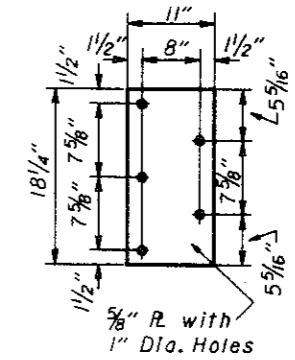
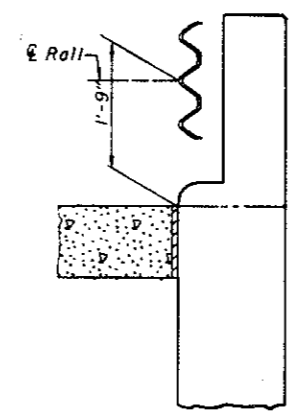
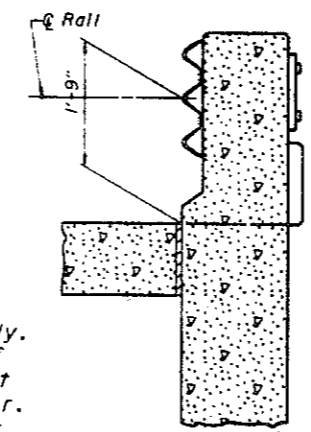
POSTS
GENERAL- Posts may be set in drilled holes or driven
to grade.

WOOD POSTS shall be square-sawed pressure treated
wood as per 710.14 and fabricated with square ends.
Bolt holes shall be bored and tops of posts trimmed.
If required, after posts are set.

STEEL POSTS and blockouts for Type I Bridge
Terminal Assemblies may be furnished as an
alternate. The steel alternates for the wood posts
are listed below.

WOOD	10"X10"	8"X8"	6"X8"
STEEL	W8X24	W6X25	W6X9

PAYMENT
Payment for Item 606 - Each Bridge Terminal Assembly,
Type I, shall include the extra cost, in excess of
normal guardrail cost, for additional and different
type posts, nested thrie beam sections, terminal connector,
thrie beam transition section, steel plate, bolts, hex
nuts, washers, and other hardware.



BUREAU OF LOCATION AND DESIGN
OHIO DEPARTMENT OF TRANSPORTATION

**BRIDGE TERMINAL
ASSEMBLY, TYPE I**

DATE 5-6-9

STANDARD
CONSTRUCTION
DRAWING

GR-3.1

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

22 mm dia. ASTM A 325 through bolts (length to be determined in field in accordance with parapet width) in 25 mm dia. holes with 16 x 280 x 464 mm plate with standard washers and hex nuts (see Detail A)

See plans for parapet transition details

NOTE: The Thrie-Beam terminal connector shall be placed so that the lap is in the direction of traffic.

* See Std. Constr. Dwg. GR-1.2M for additional post embedment details.

16 mm ϕ with 25 mm dia. holes

Single W-Beam rail section

All dimensions are in millimeters unless otherwise noted.

GENERAL:

For additional details, see Std. Constr. Dwgs. GR-1.1M, GR-1.2M and other Drawings pertaining to design of specific guardrail types.

APPLICATION:

The Type I Bridge Terminal Assembly shall be used to connect guardrail runs to bridges having concrete deflector parapet railing. It shall be used to connect guardrail runs to the approach end of bridge parapets or other concrete barrier installations and to anchor guardrail runs to the trailing end of bridge parapets or other concrete barrier installations on undivided, bidirectional highways.

POSTS:

GENERAL - Posts may be set in drilled holes or driven to grade.

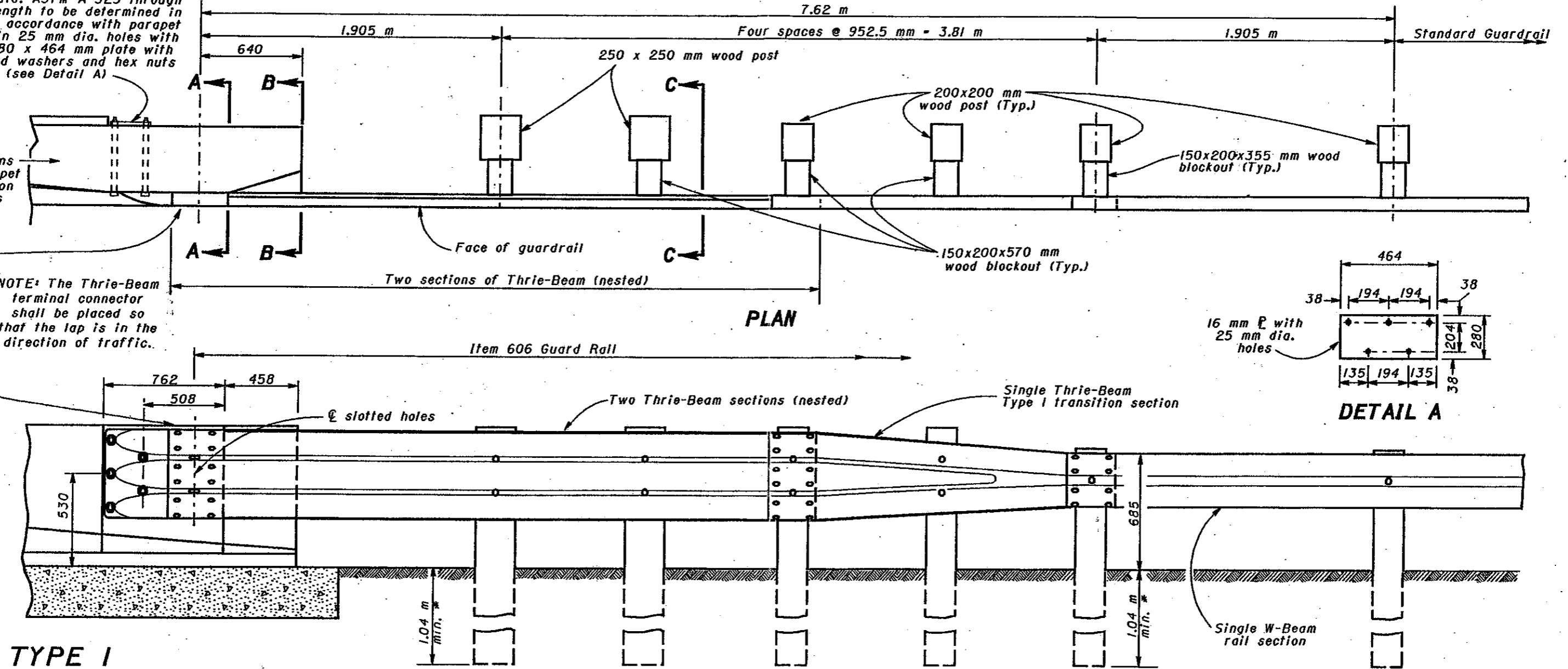
WOOD POSTS - shall be square-sawed pressure treated wood as per CMS 710.14 and fabricated with square ends. Bolt holes shall be bored and tops of posts trimmed, if required, after posts are set.

STEEL POSTS - and blockouts for Type I Bridge Terminal Assemblies may be furnished as an alternate. The steel alternates for the wood posts are listed below.

WOOD	250x250 mm	200x200 mm	150x200 mm
STEEL	W200x35.9	W150x37.1	W150x13.5

PAYMENT:

Payment for Item 606 - Each, Bridge Terminal Assembly, Type I, shall include the extra cost, in excess of normal guardrail cost, for additional and different type posts, nested Thrie-Beam sections, terminal connector, Thrie-Beam transition section, steel plate, bolts, hex nuts, washers, and other hardware.

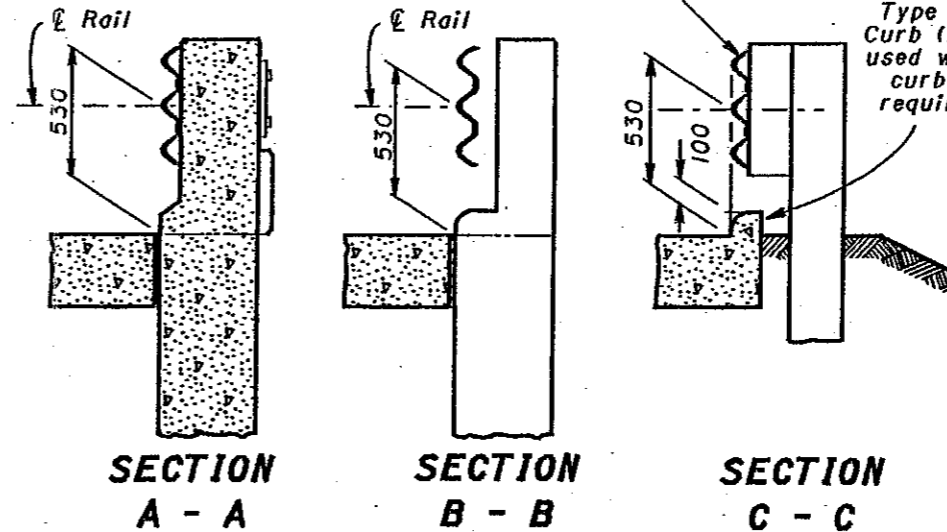


TYPE I

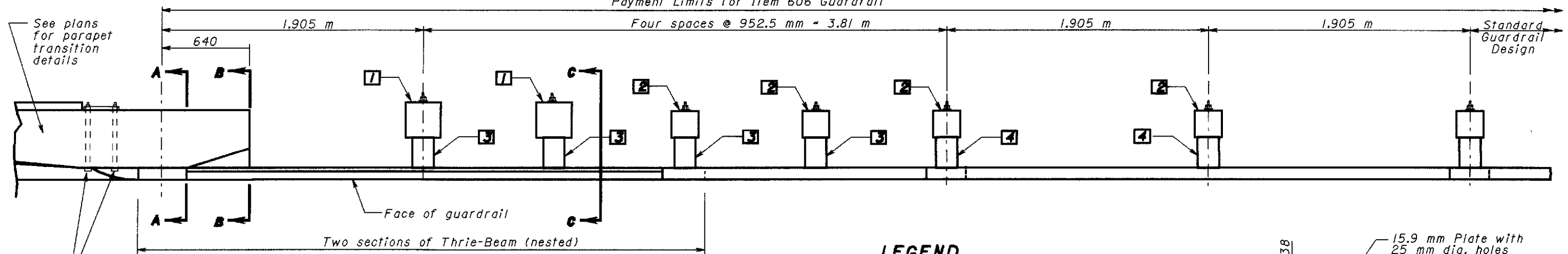
ELEVATION

DETAIL A

NOTES

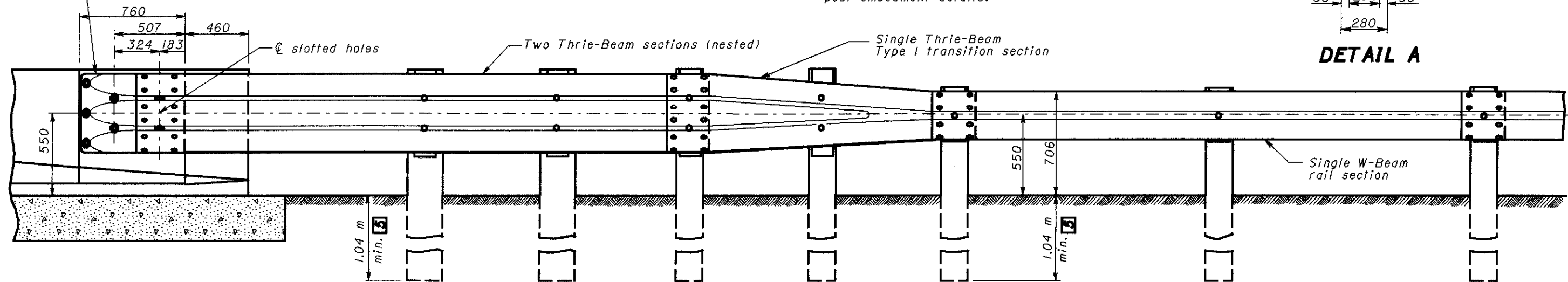


BUREAU OF LOCATION AND DESIGN OHIO DEPARTMENT OF TRANSPORTATION	
BRIDGE TERMINAL ASSEMBLY, TYPE 1	DATE 11-30-94
STANDARD CONSTRUCTION DRAWING GR-3.1M	APPROVED <i>R.K. Hullman</i> ENGR., L & D



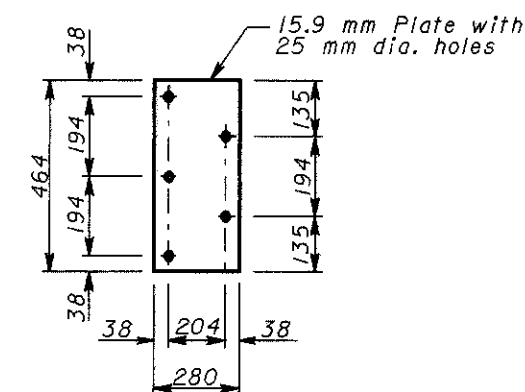
22 mm dia. ASTM A 325M through bolts (length to be determined in field in accordance with parapet width) in 25 mm dia. holes with 464 x 280 x 15.9 mm plate with standard washers and hex nuts (See Detail A)

NOTE: The Thrie-Beam terminal connector shall be placed so that the lap is in the direction of traffic.



LEGEND

- 1 250 x 250 mm wood post
- 2 200 x 200 mm wood post
- 3 150 x 200 x 570 mm wood blackout (See ALTERNATE POSTS AND BLOCKOUTS note)
- 4 150 x 200 x 355 mm wood blackout (See ALTERNATE POSTS AND BLOCKOUTS note)
- 5 See SCD GR-1.2M for additional post embedment details.



All dimensions are in millimeters unless otherwise noted.

NOTES

GENERAL:

For additional details, see SCD's GR-1.1M, GR-1.2M and other drawings pertaining to the design of specific guardrail types.

APPLICATION:

The Type I Bridge Terminal Assembly shall be used to connect guardrail runs to bridges having concrete deflector parapet railing. It shall be used to connect guardrail runs to the approach end of bridge parapets or other concrete barrier installations and to anchor guardrail runs to the trailing end of bridge parapets or other concrete barrier installations on undivided, bidirectional highways.

POSTS:

GENERAL - Posts may be set in drilled holes or driven to grade.

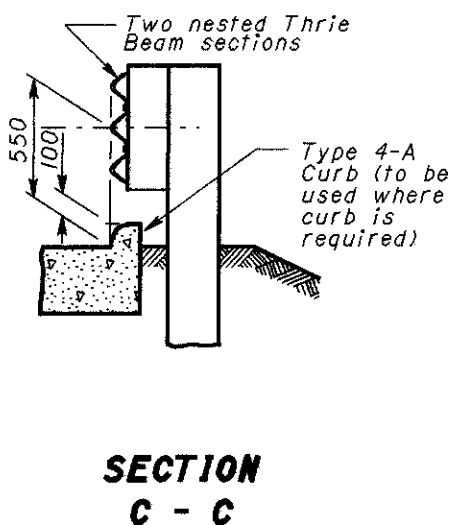
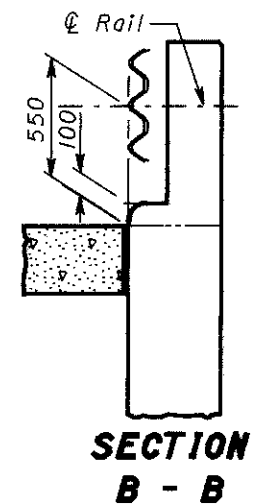
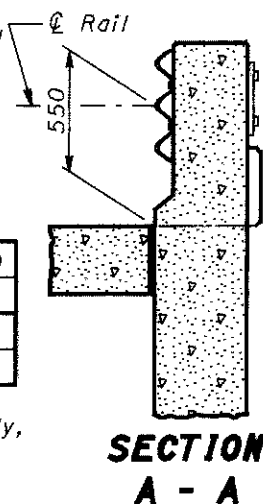
WOOD POSTS - shall be square sawed pressure treated wood as per CMS 710.14 and fabricated with square ends. Bolt holes shall be bored and tops of posts trimmed, if required, after posts are set.

ALTERNATE POSTS AND BLOCKOUTS for Type I Bridge Terminal Assemblies may be furnished according to the following chart. Plastic blockouts shall not be permitted for Type I Bridge Terminal Assemblies.

Wood Posts & Blockouts	250x250 mm	200x200 mm
Steel Posts	W200x35.9	W150x37.1
Wood Blockouts	150x200 mm	
Steel Blockouts	W150x13.5	

PAYMENT:

Payment for Item 606 - Each, Bridge Terminal Assembly, Type I, shall include the extra cost, in excess of normal guardrail cost, for additional and different type posts and blockouts, nested Thrie-Beam sections, terminal connector, Thrie-Beam transition section, steel plate, bolts, hex nuts, washers, and other hardware.



This Drawing Replaces GR-3.1.

OHIO DEPARTMENT OF TRANSPORTATION

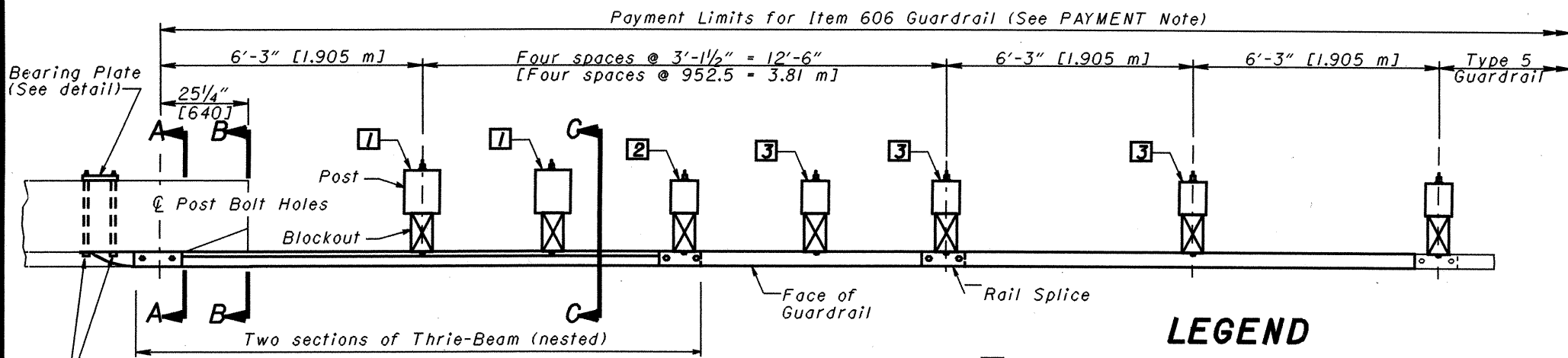
BRIDGE TERMINAL ASSEMBLY, TYPE 1

STANDARD CONSTRUCTION DRAWING GR-3.1M

APPROVED [Signature]

DATE

11-30-94
10-21-97

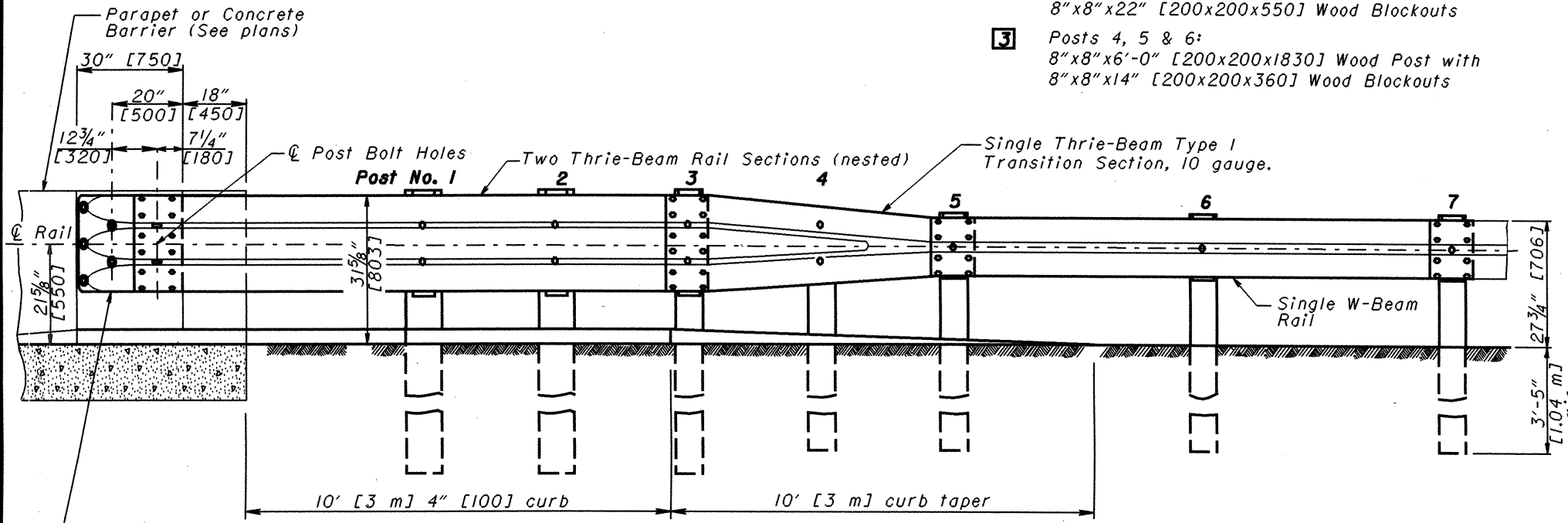


PLAN

LEGEND

- 1 Posts 1 & 2:
10"x10"x8'-0" [250x250x2440] Wood Post with
8"x8"x22" [200x200x550] Wood Blockouts
- 2 Post 3:
8"x8"x8'-0" [200x200x2440] Wood Post with
8"x8"x22" [200x200x550] Wood Blockouts
- 3 Posts 4, 5 & 6:
8"x8"x6'-0" [200x200x1830] Wood Post with
8"x8"x14" [200x200x360] Wood Blockouts

7/8" [22] dia. ASTM A 325 through bolts (length to be determined in field in accordance with Parapet width) into Bearing Plate with standard washers and hex nuts.



ELEVATION

NOTES

GENERAL: For additional details, see **SCD GR-1.1**.

APPLICATION: Use Type 1 Bridge Terminal Assembly to connect guardrail runs to bridges having Deflector Parapet type Bridge Railing (see **Structural Engineering's SCD BR-1**). It may also be used to connect guardrail runs to the approach ends of Concrete Barrier (see **SCD RM-4.6**).
On undivided, bi-directional roadways, Type 1's may be used to anchor guardrail runs to the trailing end of Deflector Parapets or Concrete Barrier installations.

THRIE BEAM TRANSITION: Symmetrical W-Beam to Thrie Beam transition panel shall be 10 gauge.

POSTS: Posts may be set in drilled holes or driven to grade. See **SCD GR-1.1** for additional Post embedment details.

WOOD POSTS - Use square sawed pressure treated wood as per CMS 710.14 and fabricate with square ends. Bore bolt holes and trim the tops of posts, if required, after the posts are set.

STEEL POSTS - are allowed as an alternate. Use W8x24 [W200x35.9] for 10"x10" [250x250] wood posts and use W6x25 [W150x37.1] for 8"x8" [200x200] posts. Use same post material throughout assembly.

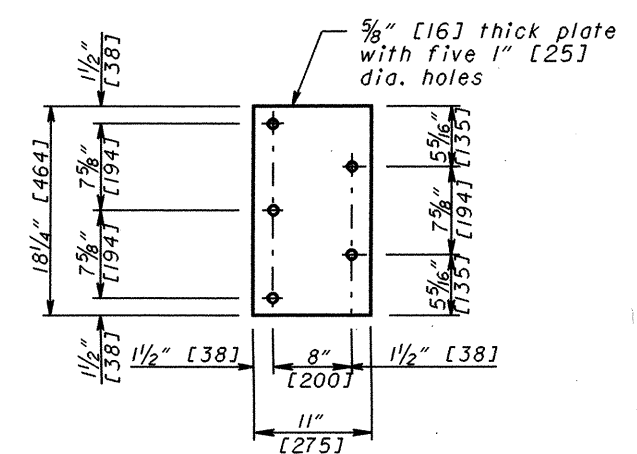
BLOCKOUTS: Use wood blockouts only, steel or plastic blockouts are not permitted. Use routed blockouts with steel posts.

CURB: Provide a Type 4-A or 4-C concrete curb minimum of 20' [6 m], or longer as shown on plans, including a 10' [3 m] taper (from curb height to flush). Front of curb to be flush with face of guardrail.

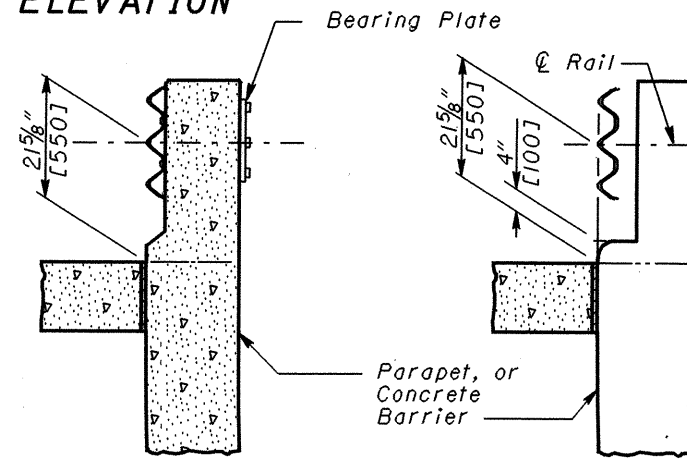
FLARED GUARDRAIL: Begin Standard Guardrail Flares as shown on **SCD GR-5.1** preferably at or beyond Post No. 7; however, the flare may begin at Post No. 5.

PAYMENT: Item 606 - Bridge Terminal Assembly, Type 1, Each, includes the cost of extra components, in excess of normal guardrail, for additional and different size of posts and blockouts, nested Thrie-Beam, transition and connector sections, Bearing Plate, bolts, washers, nuts, other hardware, and curbs.

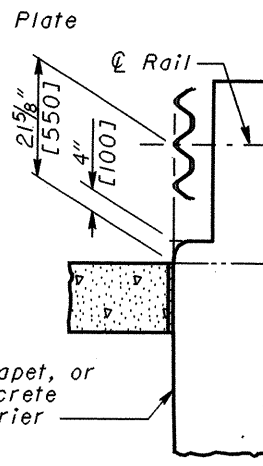
Lap Thrie-Beam Terminal Connector in the direction of traffic.



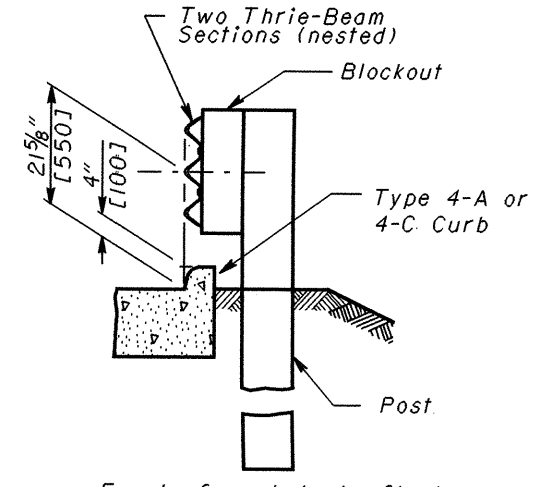
BEARING PLATE



SECTION A-A



SECTION B-B



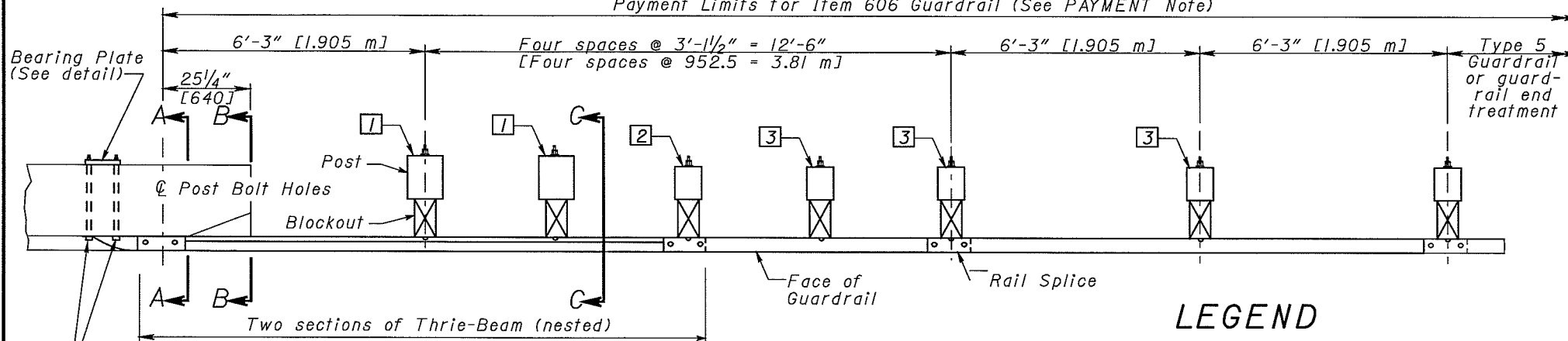
SECTION C-C

Front of curb to be flush with face of guardrail.

THIS DRAWING REPLACES GR-3.1M DATED 10-21-97.

NUMBER	GR-3.1	DATE	4-18-03
STANDARD ROADWAY CONSTRUCTION DRAWING		ROADWAY DESIGN ENGINEER	
ROADWAY ENGINEERING SERVICES		D. Focke	
BRIDGE TERMINAL ASSEMBLY, TYPE 1		D. Focke	
ROADWAY ENGINEERING SERVICES		D. Focke	
ROADWAY ENGINEERING SERVICES		D. Focke	

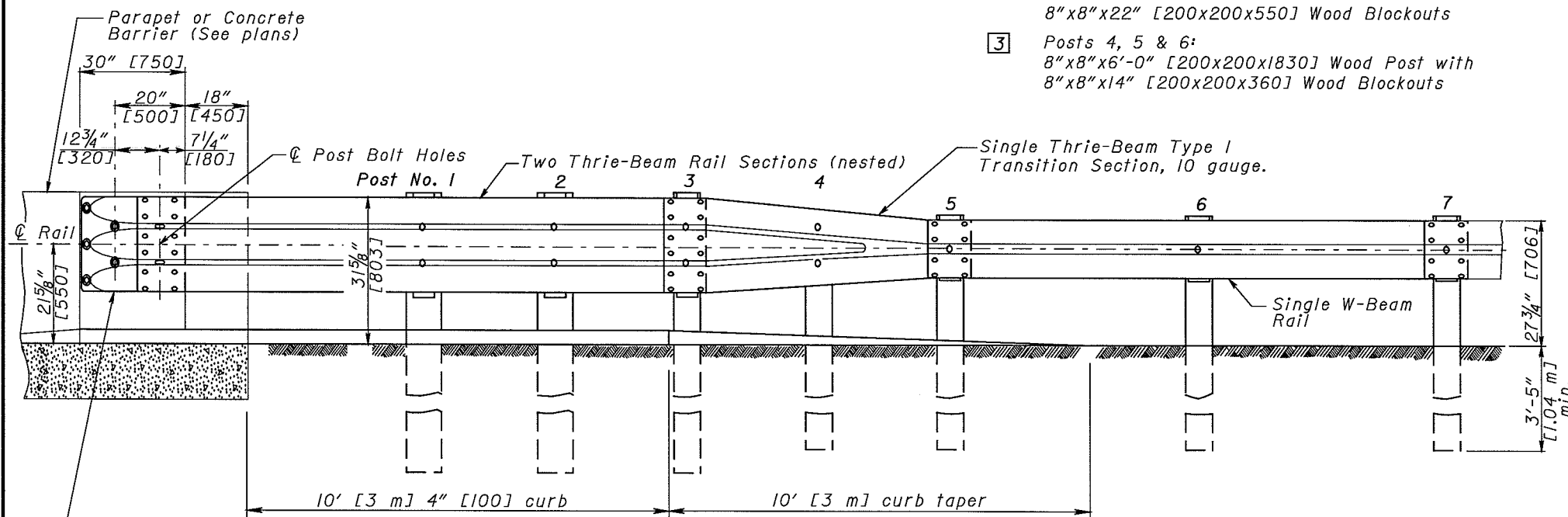
Payment Limits for Item 606 Guardrail (See PAYMENT Note)



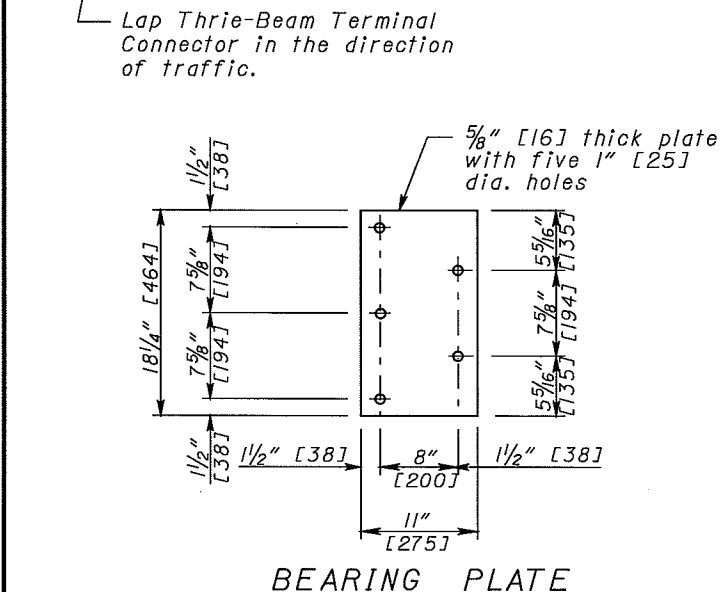
PLAN

LEGEND

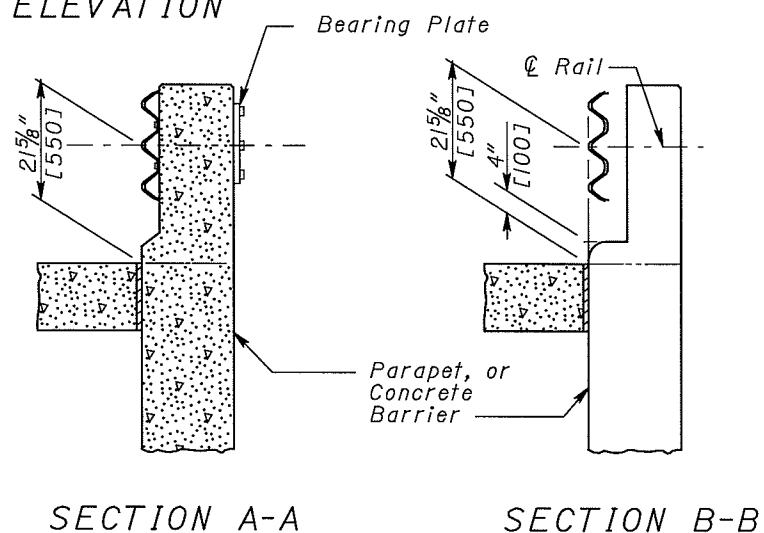
- [1] Posts 1 & 2:
10"x10"x8'-0" [250x250x2440] Wood Post with
8"x8"x22" [200x200x550] Wood Blockouts
- [2] Post 3:
8"x8"x8'-0" [200x200x2440] Wood Post with
8"x8"x22" [200x200x550] Wood Blockouts
- [3] Posts 4, 5 & 6:
8"x8"x6'-0" [200x200x1830] Wood Post with
8"x8"x14" [200x200x360] Wood Blockouts



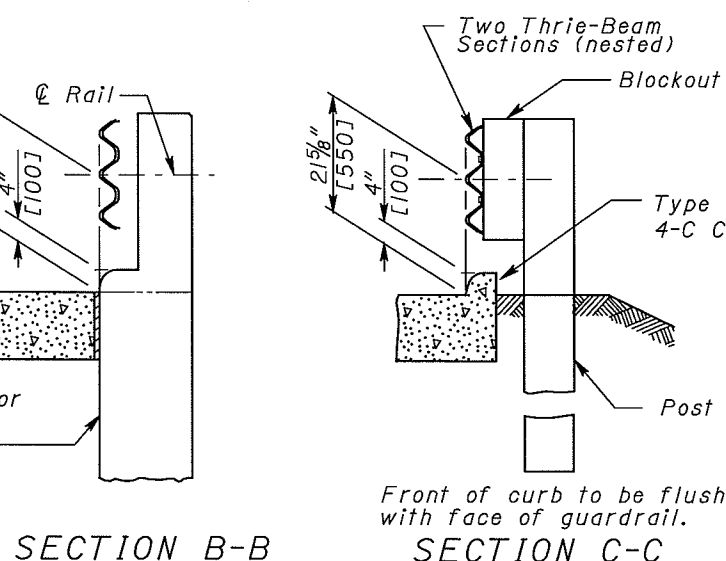
ELEVATION



BEARING PLATE



SECTION A-A



SECTION B-B

SECTION C-C

NOTES

GENERAL: For additional details, see SCD GR-1.1.

APPLICATION: Use Type 1 Bridge Terminal Assembly to connect guardrail runs to bridges having Deflector Parapet type Bridge Railing (see Structural Engineering's SCD BR-1). It may also be used to connect guardrail runs to the approach ends of Concrete Barrier (see SCD RM-4.6).

On undivided, bi-directional roadways, Type 1's may be used to anchor guardrail runs to the trailing end of Deflector Parapets or Concrete Barrier installations.

THRIE BEAM TRANSITION: Symmetrical W-Beam to Thrie Beam transition panel shall be 10 gauge.

POSTS: Posts may be set in drilled holes or driven to grade. See SCD GR-1.1 for additional Post embedment details.

WOOD POSTS - Use square sawed pressure treated wood as per CMS 710.14 and fabricate with square ends. Bore bolt holes and trim the tops of posts, if required, after the posts are set.

STEEL POSTS - are allowed as an alternate. Use W8x24 [W200x35.9] for 10"x10" [250x250] wood posts and use W6x25 [W150x37.1] for 8"x8" [200x200] posts. Use same post material throughout assembly.

BLOCKOUTS: Use wood blockouts only, steel or plastic blockouts are not permitted. Use routed blockouts with steel posts.

CURB: Provide a Type 4A or 4C concrete curb minimum of 20' [6 m], or longer as shown on plans, including a 10' [3 m] taper (from curb height to flush). Front of curb to be flush with face of guardrail.

FLARED GUARDRAIL: Begin Standard Guardrail Flares as shown on SCD GR-5.1 preferably at or beyond Post No. 7; however, the flare may begin at Post No. 5.

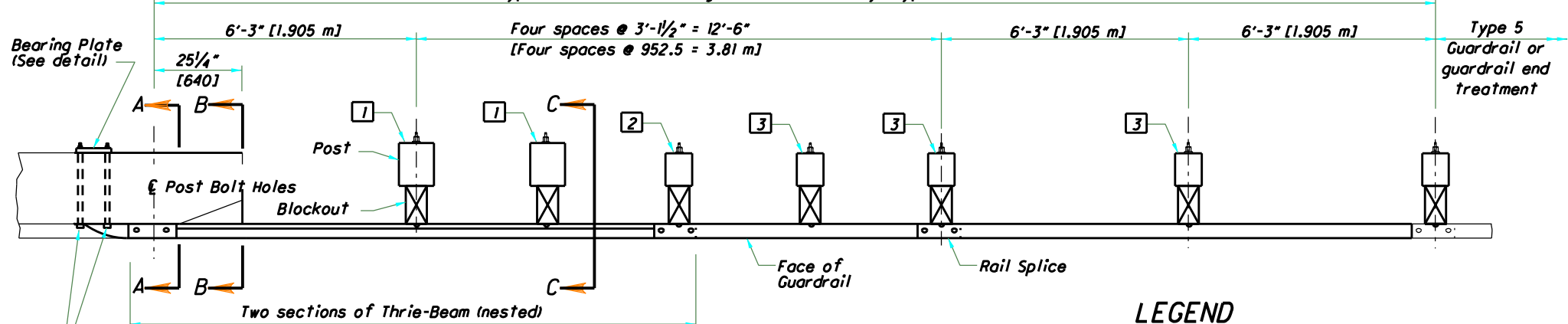
PAYMENT: Item 606 - Bridge Terminal Assembly, Type 1, Each, includes the cost of extra components, in excess of normal guardrail, for additional and different size of posts and blockouts, nested Thrie-Beam, transition and connector sections, Bearing Plate, bolts, washers, nuts, other hardware.

The curb is required in this design, and is paid separately under Item 609 - Curb, Type 4A (or 4C), per Foot, for the curb and taper sections, including materials, forming and labor needed to construct as shown.

THIS DRAWING REPLACES GR-3.1 DATED 4-18-03.

DATE	1-19-07
OHIO DEPARTMENT OF TRANSPORTATION	
ROADWAY DESIGN ENGINEER	<i>Dick Green</i>
STDS. ENGR.	D. Focke
All metric dimensions (in brackets []) are in millimeters unless otherwise noted.	
ROADWAY ENGINEERING SERVICES	
BRIDGE TERMINAL ASSEMBLY, TYPE 1	
NUMBER	GR-3.1
	1/1

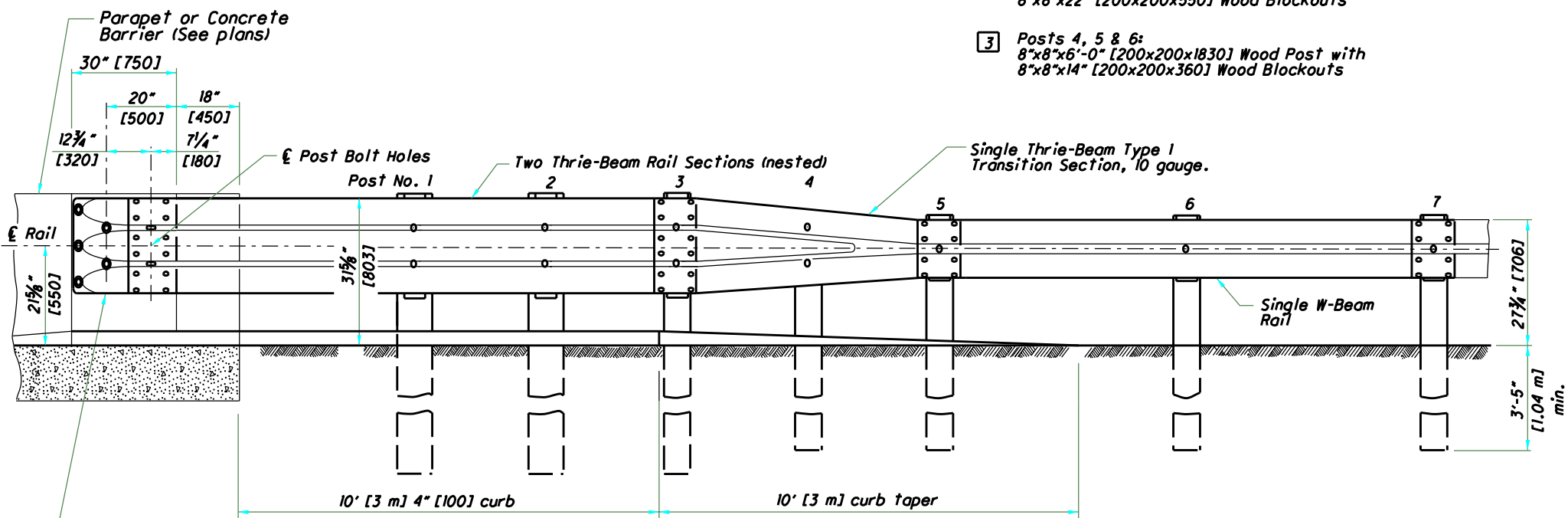
Item 606 Guardrail Type 5 and Item 606 Bridge Terminal Assembly, Type 1 (See PAYMENT Note)



1/8" [22] dia. ASTM A 325 through bolts (length to be determined in field in accordance with Parapet width) into Bearing Plate with standard washers and hex nuts.

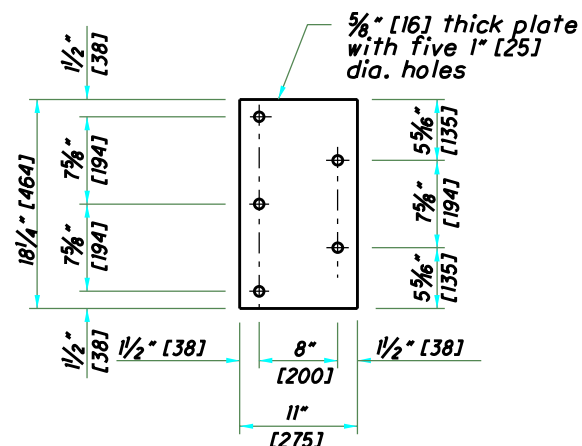
LEGEND

- 1 Posts 1 & 2:
10"x10"x8'-0" [250x250x2440] Wood Post with
8"x8"x22" [200x200x550] Wood Blockouts
- 2 Post 3:
8"x8"x8'-0" [200x200x2440] Wood Post with
8"x8"x22" [200x200x550] Wood Blockouts
- 3 Posts 4, 5 & 6:
8"x8"x6'-0" [200x200x1830] Wood Post with
8"x8"x14" [200x200x360] Wood Blockouts

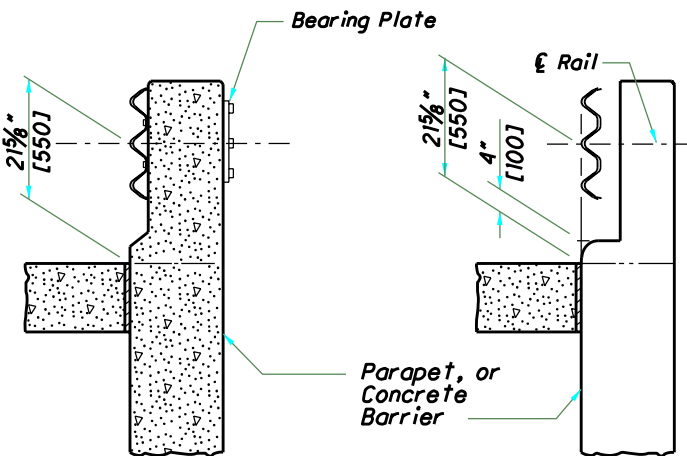


Lap Thrie-Beam Terminal Connector in the direction of traffic.

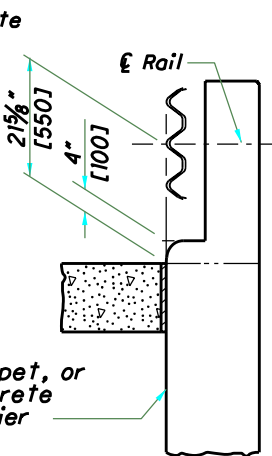
ELEVATION



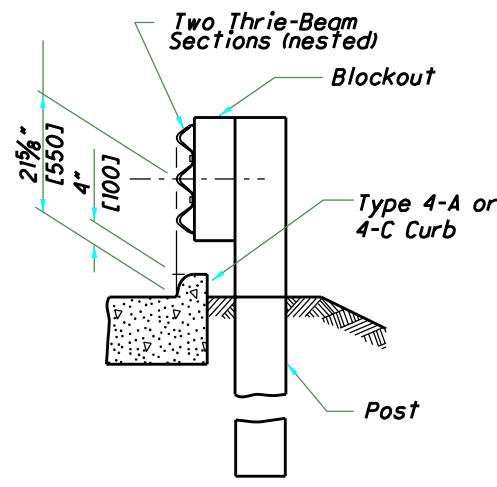
BEARING PLATE



SECTION A-A



SECTION B-B



Front of curb to be flush with face of guardrail.

SECTION C-C

NOTES

GENERAL: For additional details, see SCD GR-1.1.

APPLICATION: Use Type 1 Bridge Terminal Assembly to connect guardrail runs to bridges having deflector Parapet Type Bridge Railing (see Structural Engineering's SCD BR-11). It may also be used to connect guardrail runs to the approach ends of Concrete Barrier (see SCD RM-4.6).

On undivided, bi-directional roadways, Type 1's may be used to anchor guardrail runs to the trailing end of Deflector Parapets or Concrete Barrier installations.

THRIE BEAM TRANSITION: Symmetrical W-Beam to Thrie Beam transition panel shall be 10 gauge.

POSTS: Posts may be set in drilled holes or driven to grade. See SCD GR-1.1 for additional Post embedment details.

WOOD POSTS - Use square sawed pressure treated wood as per CMS 710.14 and fabricate with square ends. Bore bolt holes and trim the tops of posts, if required, after the posts are set.

STEEL POSTS - are allowed as an alternate. Use W8x24 [W200x35.9] for 10"x10" [250x250] wood posts and use W6x25 [W150x37.1] for 8"x8" [200x200] posts. Use same post material throughout assembly.

BLOCKOUTS: Use wood blockouts only, steel or plastic blockouts are not permitted. Use notched blockouts with steel posts.

CURB: Provide a Type 4A or 4C concrete curb minimum of 20' [6 m], or longer as shown on plans, including a 10' [3 m] taper (from curb height to flush). Front of curb to be flush with face of guardrail.

FLARED GUARDRAIL: Begin Standard Guardrail Flares as shown on SCD GR-5.1 preferably at or beyond Post No. 7; however, the flare may begin at Post No. 5.

PAYMENT: Item 606 - Bridge Terminal Assembly, Type 1, Each, includes the cost of extra components, in excess of normal guardrail, for additional and different size of posts and blockouts, nested Thrie-Beam, transition and connector sections, Bearing Plate, bolts, washers, nuts, and other hardware.

The curb is required in this design, and is paid separately under Item 609 - Curb, Type 4A (or 4C), per Foot, for the curb and taper sections, including materials, forming and labor needed to construct as shown.

THIS DRAWING REPLACES GR-3.1 DATED 1-19-07.

SCD NUMBER GR-3.1

BRIDGE TERMINAL ASSEMBLY, TYPE 1

OFFICE OF ROADWAY ENGINEERING

ALL METRIC DIMENSIONS (IN BRACKETS []) ARE IN MILLIMETERS UNLESS OTHERWISE NOTED.

STATE ENGINEER

M. Blime

DATE 10-16-09

ADMINISTRATOR

STATE OF OHIO DEPARTMENT OF TRANSPORTATION

Diid B. Swan

1/1

