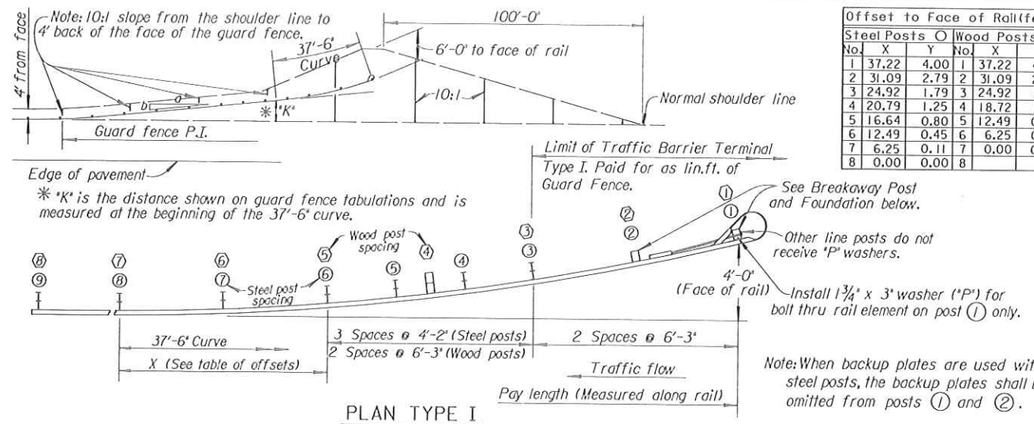
Guardrail End Terminal Standard Drawing Packet (Historical)

This packet contains the historic drawings for KDOT End Terminals used over the years and includes the current drawings as well.

Please refer to KART at the KDOT website for the current End Terminal Standard Drawings.

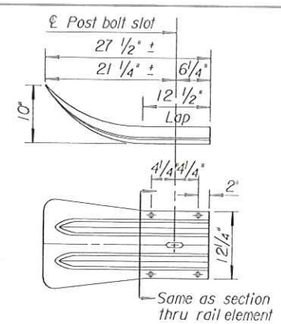
Posted May 2018

Offset to Face of Rail (feet)					
Steel Posts ○			Wood Posts ○		
No.	X	Y	No.	X	Y
1	37.22	4.00	1	37.22	4.00
2	31.09	2.79	2	31.09	2.79
3	24.92	1.79	3	24.92	1.79
4	20.79	1.25	4	18.72	1.01
5	16.64	0.80	5	12.49	0.45
6	12.49	0.45	6	6.25	0.11
7	6.25	0.11	7	0.00	0.00
8	0.00	0.00	8		



PLAN TYPE I

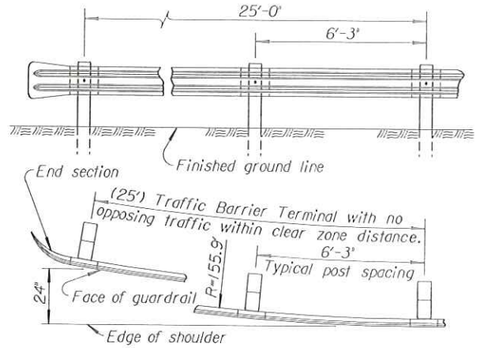
Note: When backup plates are used with steel posts, the backup plates shall be omitted from posts (1) and (2).



STANDARD END SECTION

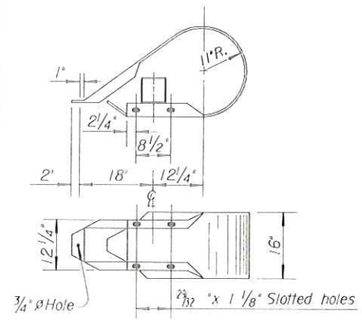
(1 each)

(Subsidiary to Steel Plate Guard Fence)



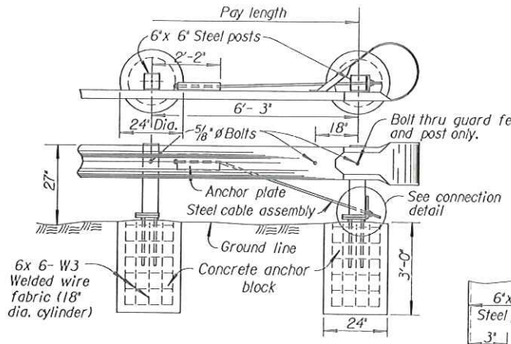
PLAN TYPE II

FHWA REGION NO.	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
7	KANSAS		19		

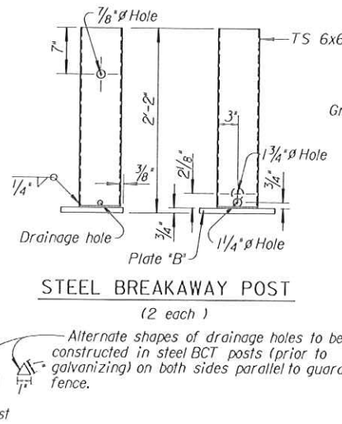


NOSE (1 each)

Nose may be one or two piece assembly and is subsidiary to Steel Plate Guard Fence.

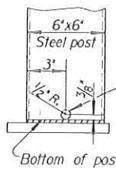


STEEL BREAKAWAY POSTS -CONCRETE FOUNDATIONS

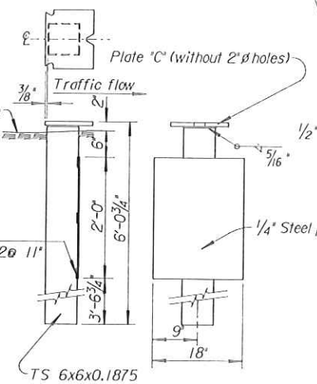


STEEL BREAKAWAY POST

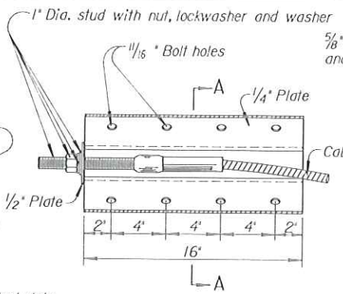
(2 each)



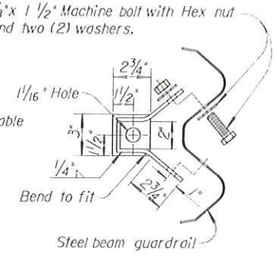
Alternate shapes of drainage holes to be constructed in steel BCT posts (prior to galvanizing) on both sides parallel to guard fence.



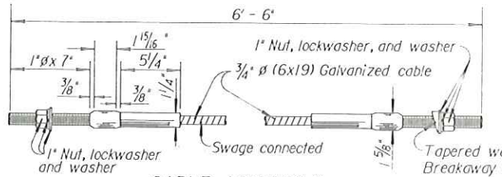
MODIFIED STEEL-POST BCT DESIGNS



ANCHOR PLATE

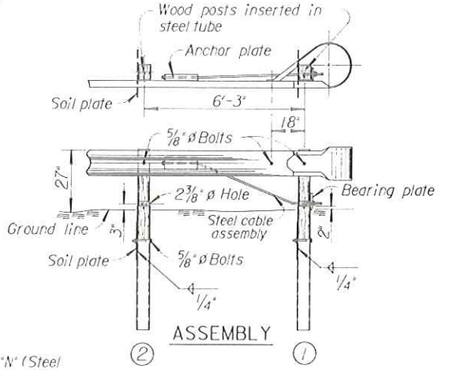


MODIFIED SECTION A-A



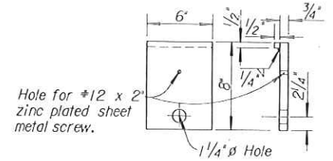
CABLE ASSEMBLY (1 each)

(40,000 lbs. min. breaking strength)
Tighten cable to taut tension.



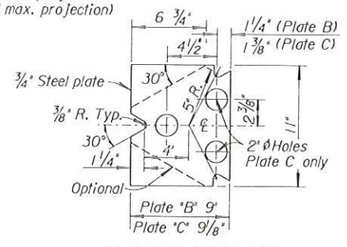
ASSEMBLY

CONNECTION DETAIL



BEARING PLATE 'L'

(1 each)



PLATES "B" & "C"

(2 each 'B')
(2 each 'C')

TAPERED WASHER "N"

(1 each)

FLAT PLATE WASHER "P"

(13 each)

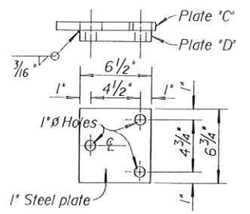


PLATE "D"

(2 each)

STEEL TUBE

SOIL PLATE

Fasten plate to wood post with #12x 2" zinc plated screw similar to detail shown on steel breakaway post.

BEARING PLATE

WOOD BREAKAWAY POST

Notes: See Std. No. 611 & 613 for details of guard rail not shown.

All steel parts shall be galvanized after fabrication.

Base plate bolts for steel breakaway posts shall conform to ASTM A-325 and shall be torqued to 155-170 ft.-lbs. As an alternate to the nut torqued to 155-170 ft.-lbs. the Contractor may use a controlled torque nut system utilizing a torque-off groove concept with double hex configuration and elliptically deformable thread section meeting the approval of the Engineer.

Posts at locations (1) & (2) may be steel or wood as shown in the details above. If standard wood posts are used, one post shall be located midway between and in lieu of posts (4) & (5) of the steel post option.

Steel post with plate as shown in alternate design may be used in lieu of concrete footings on terminal barrier breakaway posts.

All guard fence splices, including special end shoes, shall be lapped in the direction of Traffic.

When a rock formation is encountered that in the opinion of the Engineer is sound, the concrete foundation must be keyed a minimum of 6" into the rock and the minimum overall depth of the concrete foundation shall be 24'.

The concrete anchor block shall be Class 'A' Concrete, Commercial Grade Concrete, or mix used in concrete pavement. Concrete shall be subsidiary to the bid item 'Steel Plate Guard Fence'.

NO.	DATE	REVISIONS	BY	APP'D
12	6- 6-89	Washer 'N' steel post only	R.J.S.	J.O.B.
11	12-22-88	Del. Plate 'A', added Std. End Sect.	R.J.S.	J.O.B.
10	8-15-87	Rev. distance to hinge point 10:1 slope	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

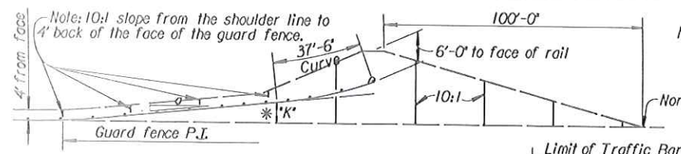
BARRIER TERMINAL TYPES I & II

STD. NO. 608.5 D

F.H.W.A. APPROVAL	6-23-89	APP'D James O. Brewer	
DESIGNED	DETAILED Bowser	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK. Hecht	QUAN.CK.	TRACE CK. Seitz

Void 3-15-90

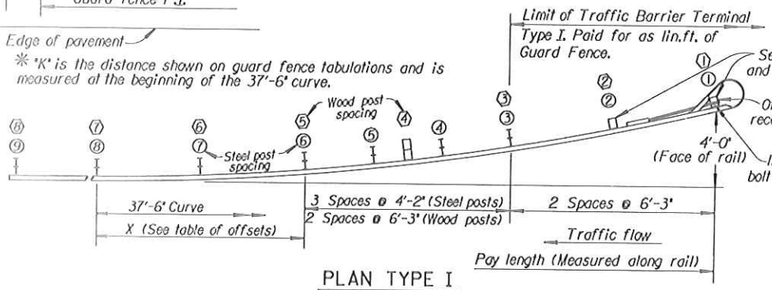
FHWA REGION NO.	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
7	KANSAS		19		



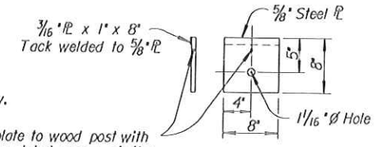
Note: When backup plates are used with steel posts, the backup plates shall be omitted from posts ① and ②.

Offset to Face of Rail (feet)					
Steel Posts ○			Wood Posts ◯		
No.	X	Y	No.	X	Y
1	37.22	4.00	1	37.22	4.00
2	31.09	2.79	2	31.09	2.79
3	24.92	1.79	3	24.92	1.79
4	20.79	1.25	4	18.72	1.01
5	16.64	0.80	5	12.49	0.45
6	12.49	0.45	6	6.25	0.11
7	6.25	0.11	7	0.00	0.00
8	0.00	0.00	8		

Notes: See Std. No. 611 & 613 for details of guard rail not shown.
All steel parts shall be galvanized after fabrication.
Base plate bolts for steel breakaway posts shall conform to ASTM A-325 and shall be torqued to 155-170 ft.-lbs. As an alternate to the nut torqued to 155-170 ft.-lbs. the Contractor may use a controlled torque nut system utilizing a torque-off groove concept with double hex configuration and elliptically deformable thread section meeting the approval of the Engineer.
Posts at locations ① & ② may be steel or wood as shown in the details above. If standard wood posts are used, one post shall be located midway between and in lieu of posts ④ & ⑤ of the steel post option.
Steel post with plate as shown in alternate design may be used in lieu of concrete footings on terminal barrier breakaway posts.
All guard fence splices, including special end shoes, shall be lapped in the direction of Traffic.
When a rock formation is encountered that in the opinion of the Engineer is sound, the concrete foundation must be keyed a minimum of 6" into the rock and the minimum overall depth of the concrete foundation shall be 24".
The concrete anchor block shall be Class 'A' Concrete, Commercial Grade Concrete, or mix used in concrete pavement. Concrete shall be subsidiary to the bid item 'Steel Plate Guard Fence'.
The soil plate and steel tube shall be set in place prior to the installation of the wood anchor assembly post.

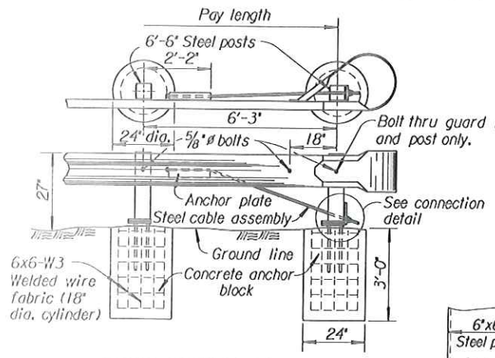


PLAN TYPE I

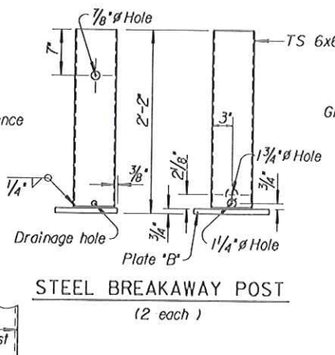


Fasten plate to wood post with #12x 2" zinc plated screw similar to detail shown on steel breakaway post.

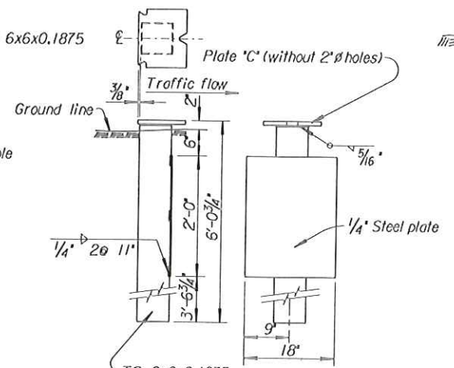
BEARING PLATE



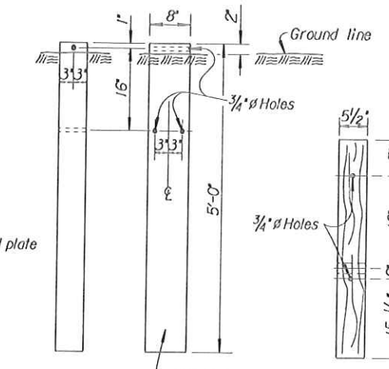
STEEL BREAKAWAY POSTS -CONCRETE FOUNDATIONS



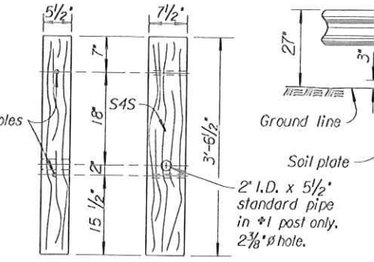
STEEL BREAKAWAY POST (2 each)



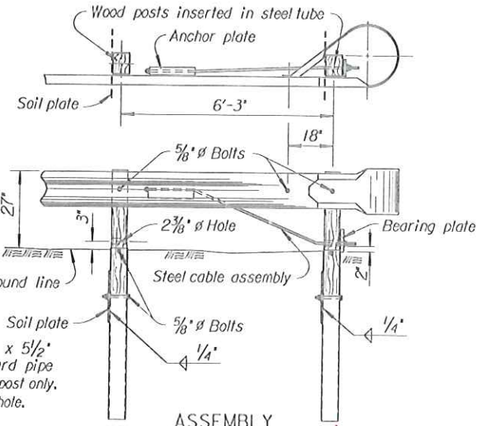
MODIFIED STEEL-POST BCT DESIGNS



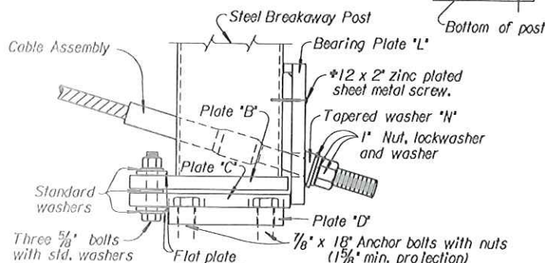
STEEL TUBE



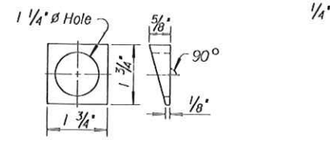
WOOD BREAKAWAY POST



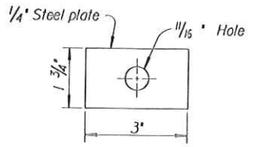
ASSEMBLY ② ①



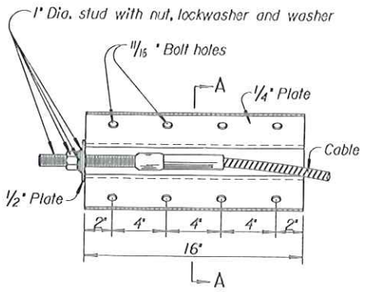
CONNECTION DETAIL



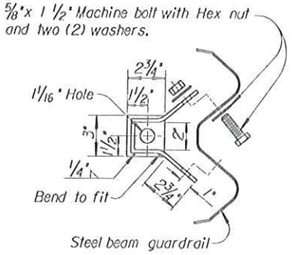
TAPERED WASHER "N"
(1 req'd. for steel breakaway post option.)



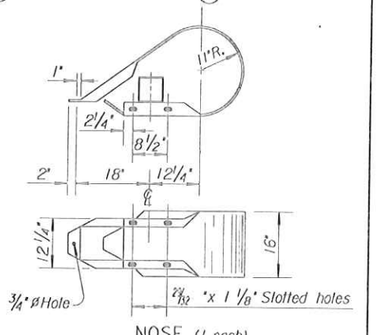
FLAT PLATE WASHER "P"
(13 req'd. for steel breakaway post option.)
(1 req'd. for wood breakaway post option.)



ANCHOR PLATE

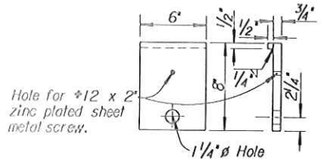


MODIFIED SECTION A-A

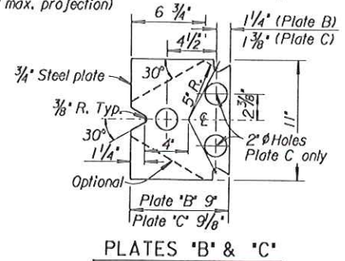


NOSE (1 each)

Nose may be one or two piece assembly and is subsidiary to Steel Plate Guard Fence.



BEARING PLATE "L"
(1 each)



PLATES "B" & "C"
(2 each "B")
(2 each "C")

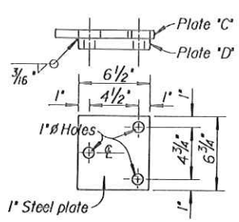
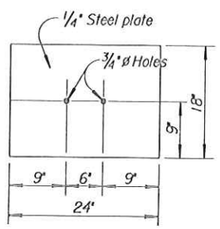
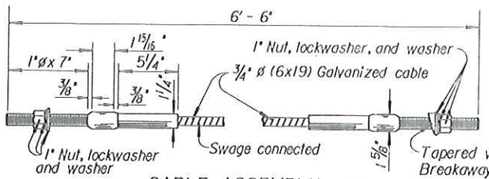


PLATE "D"
(2 each)



SOIL PLATE



CABLE ASSEMBLY (1 each)
(40,000 lbs. min. breaking strength)
Tighten cable to taut tension.

NO.	DATE	REVISIONS	BY	APP'D
14	9-18-90	Rev. Steel Tube detail & General Note	R.J.S.	J.O.B.
13	1- 5-90	Deleted Type II, Separate Standard	R.J.S.	J.O.B.
12	6- 6-89	Washer 'N' steel post only	R.J.S.	J.O.B.
11	12-22-88	Del. Plate 'A', added Std. End Sect.	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

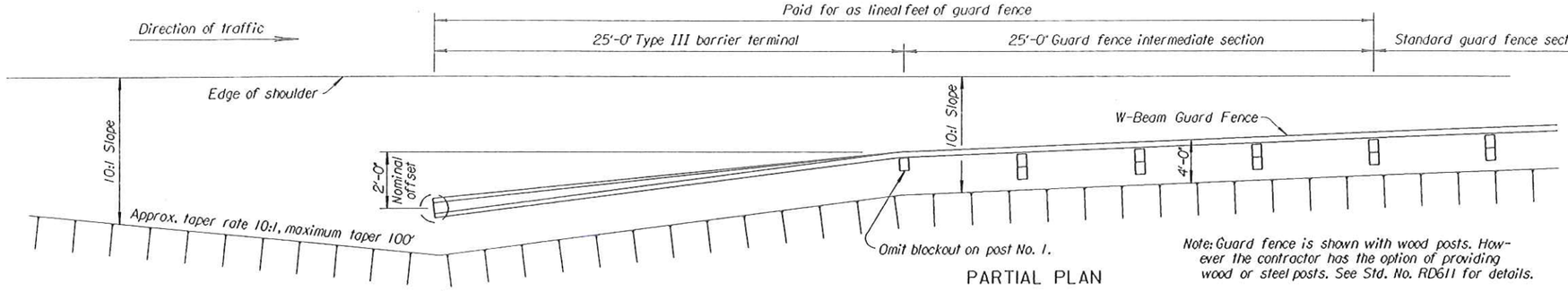
BARRIER TERMINAL TYPE I

STD. NO. 608.5 D

F.H.W.A. APPROVAL	10-19-90	APP'D James O. Brewer	
DESIGNED	DETAILED Bowser	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK. Hachl	QUAN. CK.	TRACE CK. Seitz

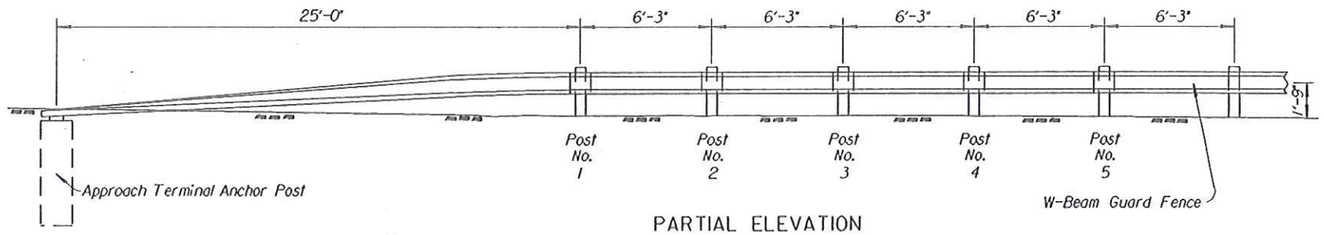
Not in RD set 9-21-95

FHWA REGION NO.	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
7	KANSAS		19		

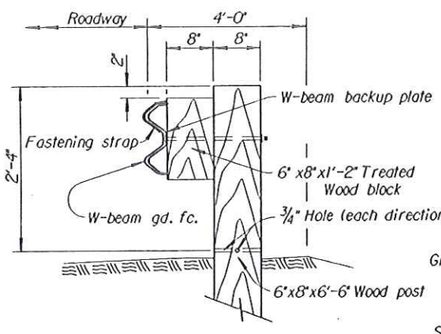


PARTIAL PLAN

Note: Guard fence is shown with wood posts. However the contractor has the option of providing wood or steel posts. See Std. No. RD611 for details.

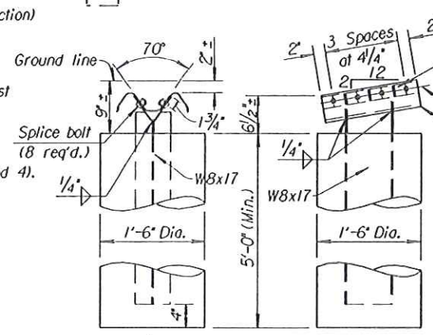


PARTIAL ELEVATION



SECTION

Line posts without rail element splices (posts no. 2,3, and 4).

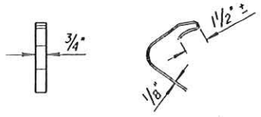


Note: Provide 4 additional shop or field drilled holes in end of guard fence for attachment to terminal anchor post.

Rail members may be bolted to the terminal anchor assembly and positioned to proper alignment prior to placing concrete around W8x17 post.

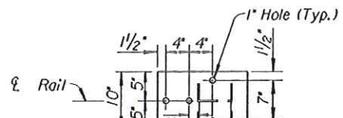
Galvanize upper 15" of anchor post and anchor assembly.

DETAIL OF TERMINAL ANCHOR POST

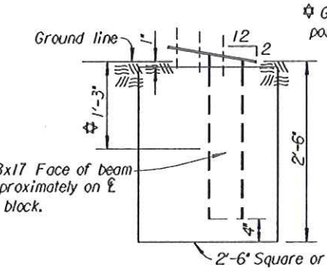


1/8"X3/4"X9" A36 steel plate field bent with hammer for tight fit. Hook fits over backup plate and rail element to form weak connection.

FASTENING STRAP



PLAN



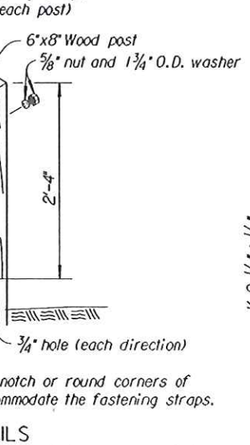
✡ Galvanize upper 15' of anchor post and anchor assembly.

ELEVATION

PROCEDURE

1. Locate & excavate for anchor block.
2. Bolt shoe & anchor to end of rail.
3. Twist rail end 90° & stake to ground.
4. Place concrete.

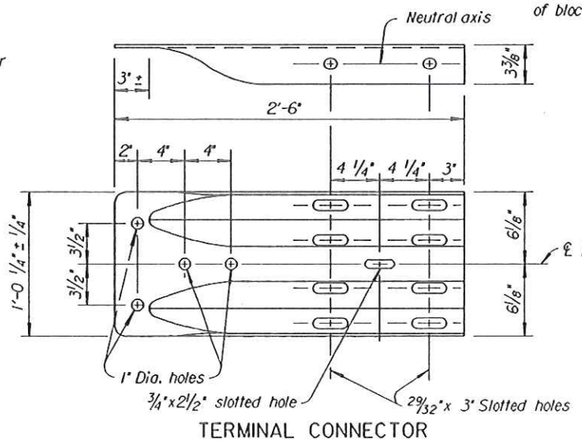
OPTIONAL TERMINAL ANCHOR POST



Note: When necessary notch or round corners of the blockout to accommodate the fastening straps.

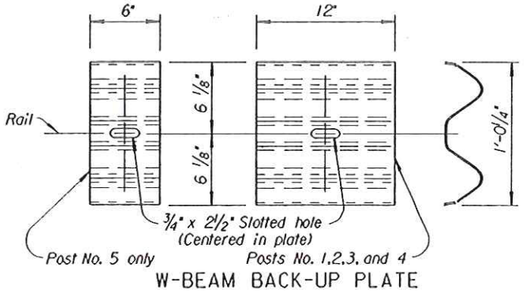
ASSEMBLY DETAILS

Wood line post with rail element splice at post no. 1 is shown. Splice at post no. 5 is similar except splice bolts are inserted from the front of the rail.



TERMINAL CONNECTOR

Note: Four 7/8" hex head bolts with nuts and washers required for terminal anchor connection.



W-BEAM BACK-UP PLATE

GENERAL NOTE

The rail elements for the 25' Type III Barrier terminal and the first 25' of guard fence (intermediate section) each shall be nominal 25' length (12'-6" section lengths not permitted).

All guard fence splices, including special end shoes, shall be lapped in the direction of traffic.

For post, rail, blockout spacer, splice bolt and post bolt details see guard fence Standards No. RD611 & RD613.

Backup plates and fastening strap shall be required at posts No. 1 through 5.

Backup plates shall be 12-gauge galvanized steel W-beam bolted directly to post. For post No. 5 the backup plate shall be 6" wide and for post No's. 1,2,3, and 4 the width shall be 12".

The rail element shall not be bolted to posts No. 1 through No. 5. Rail element shall be fastened to backup plates using steel fastening straps.

Bolts shall be of sufficient length to extend through the full thickness of the nut and no more than 3/4" beyond it.

The rail elements at post No. 1 shall be spliced with 5/8"x 1 1/4" oval shoulder button head bolts inserted from the back of the rail with hex nuts mounted on the front (traffic) side. For the splice at post No. 5 the hex nuts shall be mounted on the rear side of the rail elements.

Omit blockout on post No. 1 and install post in line with blockouts.

Where turndown sections are located more than 30' from all approach travel lane edges, guard fence may be bolted directly to the post block. See Std. No. RD611 for details.

The top of the terminal anchor post assembly and all steel fittings thereon shall be galvanized as shown.

The terminal anchor post shall be set in Class "A" Concrete, Commercial Grade Concrete, or mix used in concrete pavement. Concrete shall be subsidiary to the bid item Steel Plate Guard Fence.

An anchor other than to a terminal anchor post shall consist of a connection similar to the rail splice or similar to the special end shoe.

The special end shoe anchor may be used with the 18"x 5'-0" concrete footing or the angle anchor may be used with the 2'-6" square or equivalent round concrete footing.

NO.	DATE	REVISIONS	BY	APP'D
5	5-14-91	Revised post length & General note	R.J.S.	J.O.B.
4	12-28-88	Entered on CADD	R.J.S.	J.O.B.
3	11-10-86	Splices lapped in dir. of traffic	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

DETAILS OF GUARD FENCE TERMINAL TYPE III

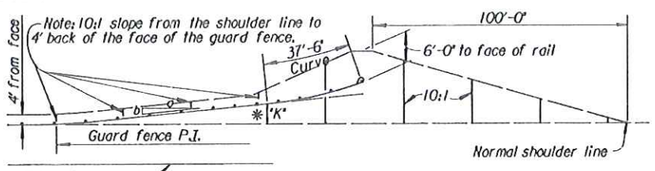
RD608E

FHWA APPROVAL	6-7-91	APP'D James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED B.N.B.
DESIGN CK.	DETAIL CK.	QUANTK.	TRACE CK. R.J.S.

Drawn By: road Plotted: 23-AUG-1995 10:56
File: /usr7/road/us/rd608e.dgn

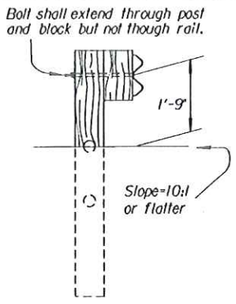
Void 12-12-95

FHWA REGION NO.	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
7	KANSAS		19		

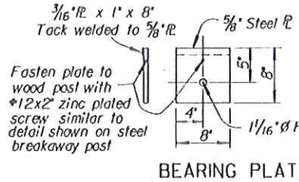


* 'K' is the distance shown on guard fence tabulations and is measured at the beginning of the 37'-6" curve.

Offset to Face of Rail (feet)		
No.	X	Y
1	37.09	4.0
2	31.13	2.1
3	24.95	1.2
4	20.81	0.7
5	16.66	0.3
6	12.50	0.2
7	6.25	0.1
8	0.00	0.0

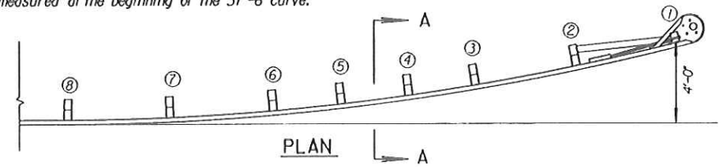


SECTION A-A
Breakaway Line Post and Block



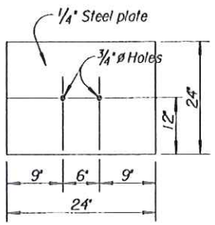
BEARING PLATE

Notes: See Std. No. RD611 & RD613 for details of guard rail not shown.
All steel parts shall be galvanized after fabrication.
All guard fence splices, including special end shoes, shall be lapped in the direction of Traffic.
The soil plate and steel tube shall be set in place prior to the installation of the wood anchor assembly post.
The 37'-6" curved rail section shall be shop bent.

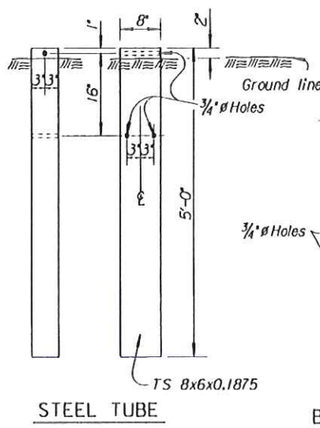


PLAN

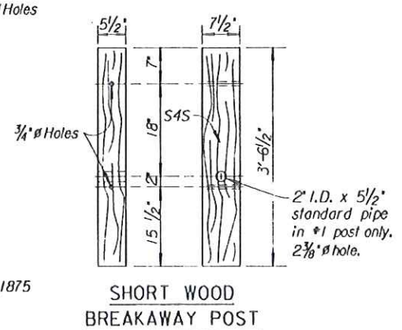
ELEVATION



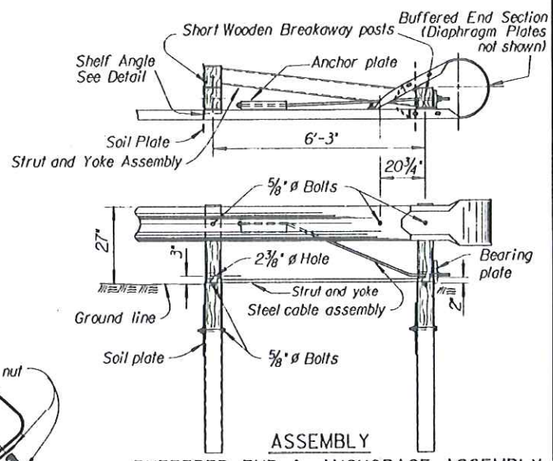
SOIL PLATE



STEEL TUBE

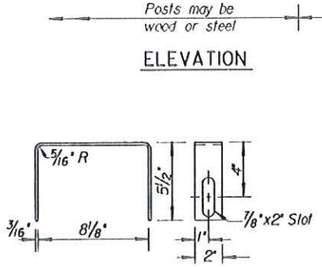


SHORT WOOD BREAKAWAY POST

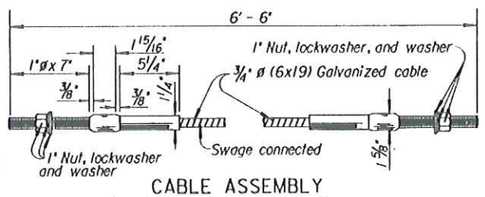


ASSEMBLY

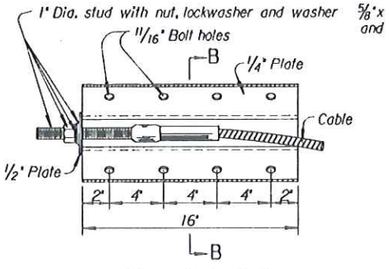
BUFFERED END & ANCHORAGE ASSEMBLY



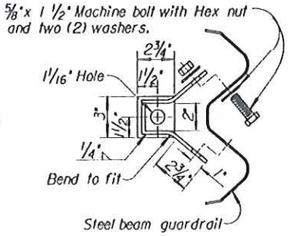
YOKE DETAILS



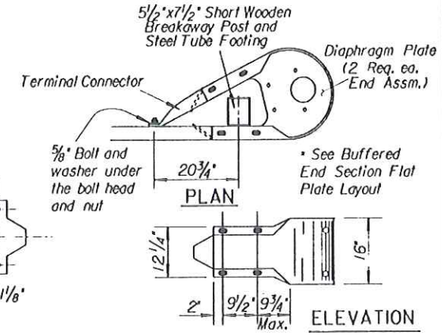
CABLE ASSEMBLY
(40,000 lbs. min. breaking strength)
Tighten cable to taut tension. (1 each)



ANCHOR PLATE



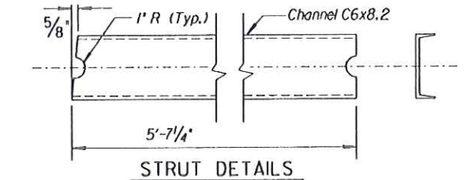
MODIFIED SECTION B-B



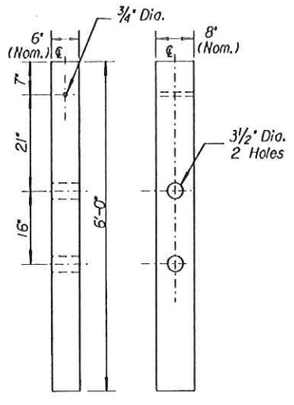
PLAN

ELEVATION

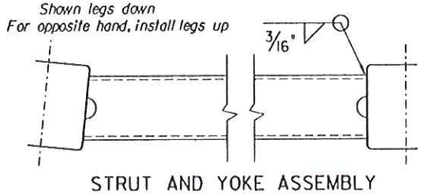
BUFFERED END SECTION



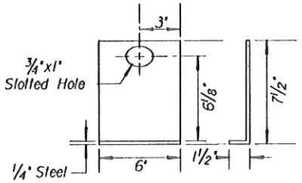
STRUT DETAILS



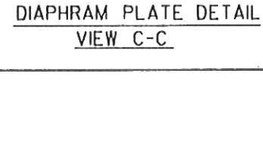
BREAKAWAY LINE POST



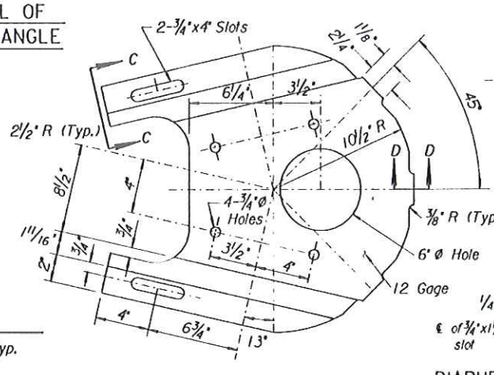
STRUT AND YOKE ASSEMBLY



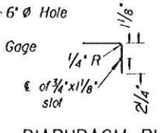
DETAIL OF SHELF ANGLE



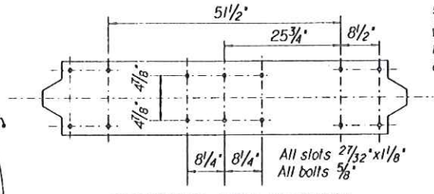
DIAPHRAM PLATE DETAIL
VIEW C-C



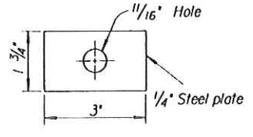
DIAPHRAGM PLATE DETAIL
(2 Required each Terminal)



DIAPHRAGM PLATE DETAIL
VIEW D-D



BUFFERED END SECTION
FLAT PLATE LAYOUT



FLAT PLATE WASHER "P"

NO.	DATE	REVISIONS	BY	APP'D
2	9-12-95	Rev. Gen. Note, Del. weld on Soil Plate	R.J.S.	J.O.B.
1	4-26-95	Revised Post Offsets	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARD FENCE TERMINAL (MELT)

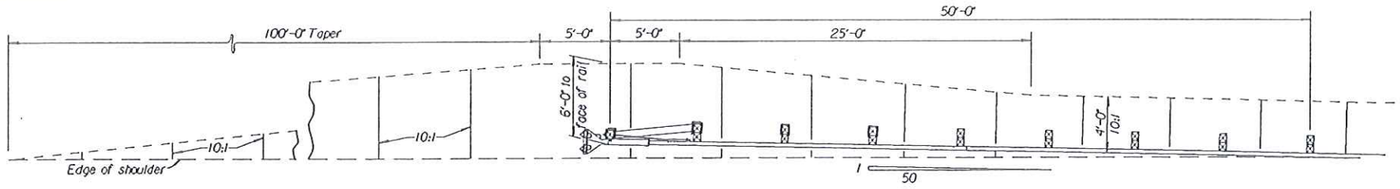
RD609

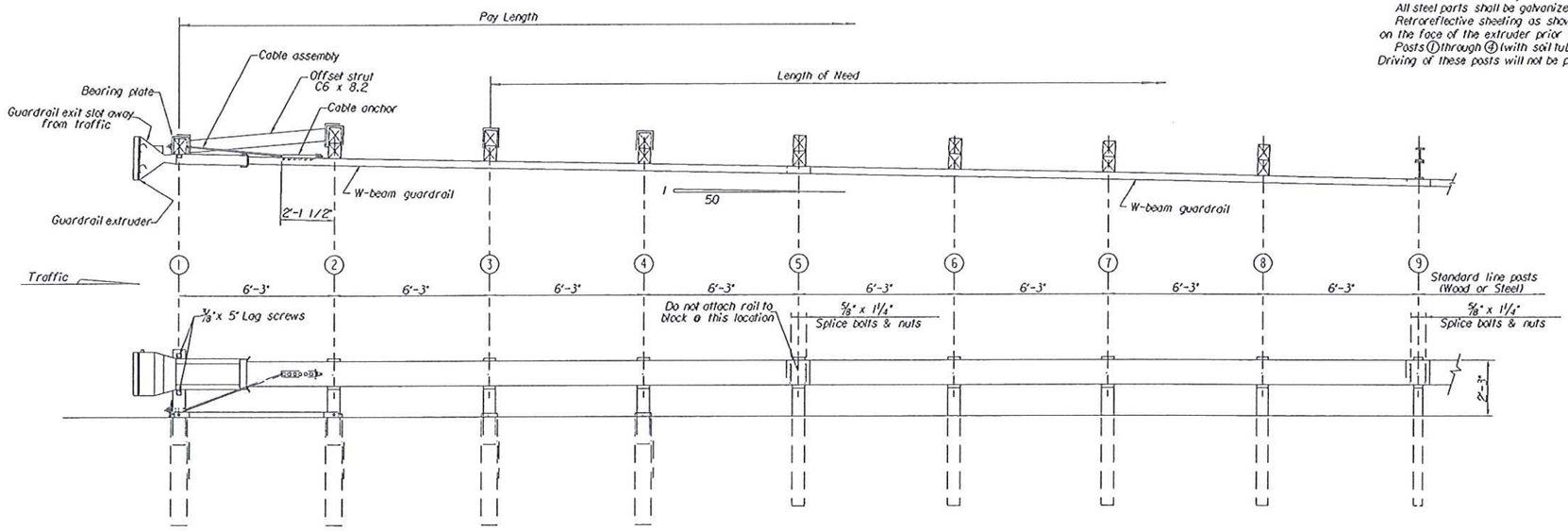
F.H.W.A. APPROVAL	9-18-95	APP'D. James O. Brewer
DESIGNED	DETAILED	QUANTITIES
DESIGN CK.	DETAIL CK.	QUAN.CK.
		TRACED Wolfe
		TRACE CK. Seitz

Drawn By : road
Plotted : 29-NOV-1995 10:56
File : /usr/road/us/rd609.dgn

Voided 12/12/95

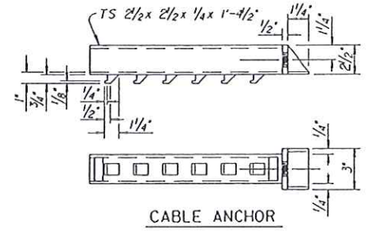
FHWA RECDN NO.	STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
7	KANSAS		19		



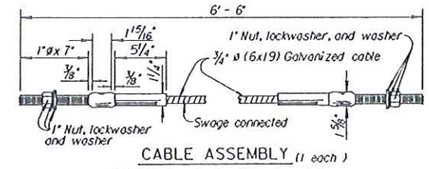


GENERAL NOTE

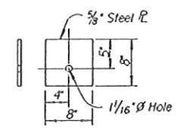
See RD611 & RD613 for details of guard rail not shown.
Posts ① through ⑧ on the Extruder Terminal shall be wood, regardless of post material used on remainder of the installation.
All guard fence splices shall be lapped in the direction of Traffic.
All work and accessory materials required for installation of this terminal shall be subsidiary to the bid item "Steel Plate Guard Fence".
All steel parts shall be galvanized after fabrication.
Retroreflective sheeting as shown in the detail shall be provided on all installations. The retroreflective sheeting should be installed on the face of the extruder prior to installation. Extruder should be thoroughly cleaned and dried prior to application.
Posts ① through ④ (with soil tubes) shall be installed by predrilling holes and backfilling after placement of the post/tube assembly. Driving of these posts will not be permitted.



CABLE ANCHOR

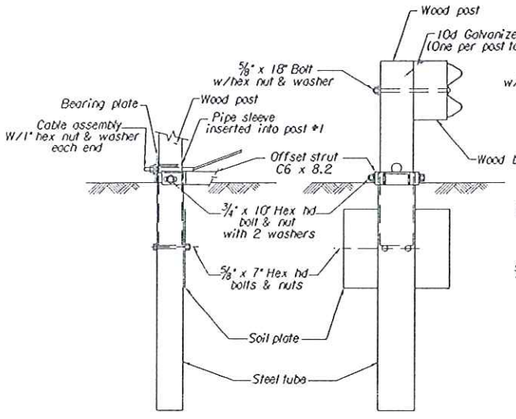


CABLE ASSEMBLY (1 each)
(40,000 lbs. min. breaking strength)
Tighten cable to taut tension.



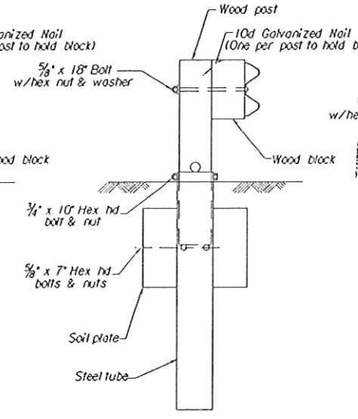
Fasten plate to wood post with 2- 16d galvanized nails bent over top edge to prevent rotation.

BEARING PLATE

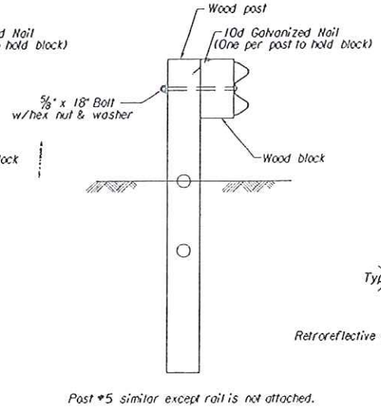


PARTIAL VIEW OF POST #1

DETAIL OF POST #2

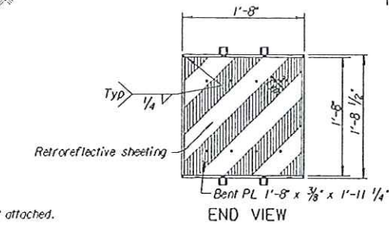


DETAIL OF POSTS #3 & #4

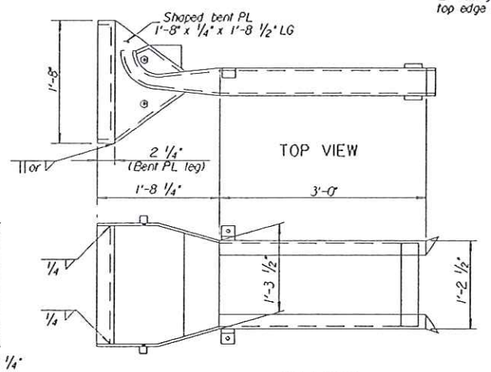


Post #5 similar except rail is not attached.

DETAIL OF POSTS #6, #7 & #8



END VIEW



SIDE VIEW

DETAILS OF GUARDRAIL EXTRUDER

NO.	DATE	REVISIONS	BY	APP'D
3	2-20-97	Add Pay Length Dimension	R.J.S.	J.O.B.
2	10-23-95	Revised layout, Cable Anchor	R.J.S.	J.O.B.
1	6-1-95	Rev. tape to retroreflective sheet.	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

EXTRUDER END TERMINAL

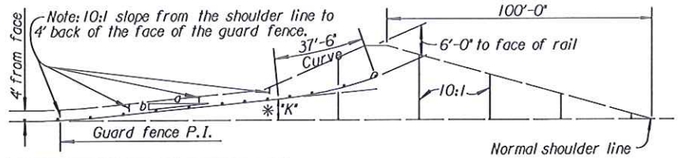
RD606

FHWA APPROVAL	6-3-97	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

Drawn By: :Perf
File: W:\sv\rd606.dgn
Plotted: 13-JUN-1997 08:12

Void 10-24-97

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				



* "K" is the distance shown on guard fence tabulations and is measured at the beginning of the 37'-6" curve.

Post Offsets	
Post	Offset from Tangent
1	4.00'
2	2.80'
3	1.80'
4	1.40'
5	1.00'
6	0.70'
7	0.50'
8	0.20'
9	0.05'

GENERAL NOTE

See RD611 & RD613 for details of guard rail not shown.

Posts ① through ⑨ on the Slotted Rail Terminal shall be wood, regardless of post material used on remainder of the installation.

All guard fence splices shall be lapped in the direction of Traffic. Where traffic is temporarily carried in the direction opposite of the final configuration, the rail splices shall be lapped in the direction of the permanent traffic.

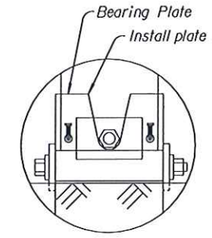
All work and materials required for installation of this terminal shall be paid under to the bid item "Guard Fence End Terminal (SRT)".

All steel parts shall be galvanized after fabrication.

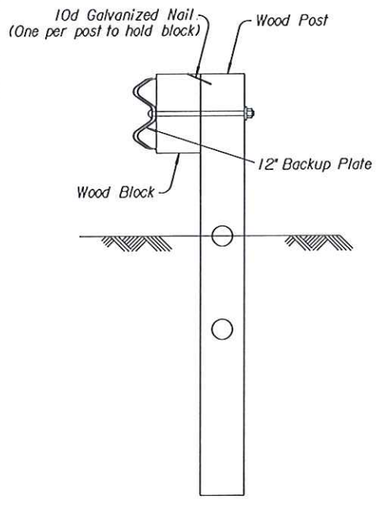
The post offset dimensions are given to the center of the traffic face of the blockouts. Except at the first two posts, where dimension is to the center of the traffic face of the post. Offset points are to be located by chord measurements at the back of the rail equal to the nominal post spacings shown. Posts are to be set approximately radial to the railing at each post location.

Terminal shown with 3-12.5' long sections of rail. Optional designing utilizing one 12.5' section of rail between posts ① and ③ and a 25' section of rail for the remainder of the terminal is considered acceptable. When this optional design is provided, an additional backup plate is required at post 7.

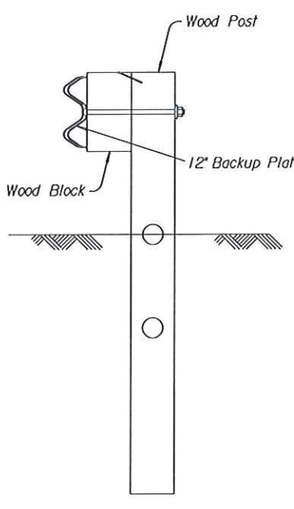
Standard splices, standard hardware connections (bolts, nuts, & washers) are used except where noted. See RD611 for additional details.



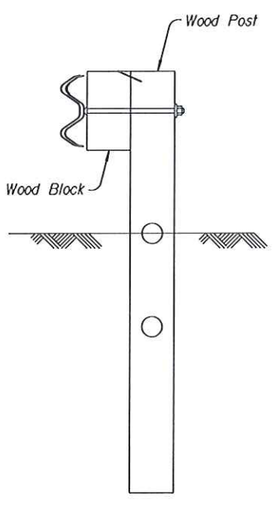
BEARING PLATE ORIENTATION



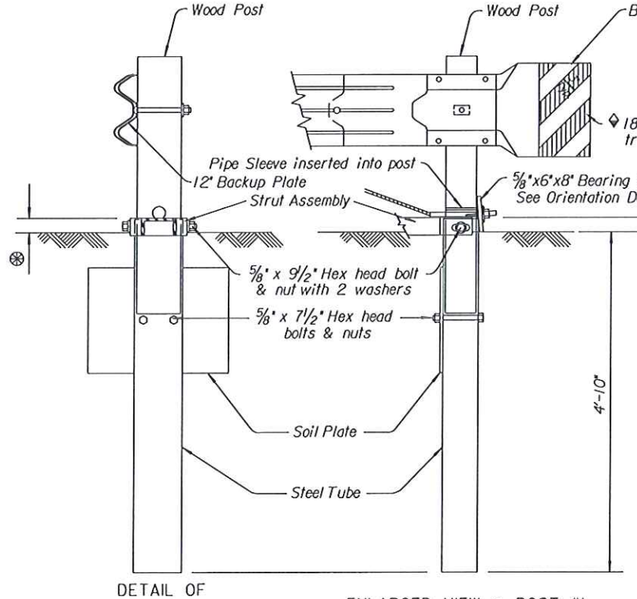
DETAIL OF POST #5



DETAIL OF POSTS #4, #6, #8 & #9



DETAIL OF POSTS #3 & #7

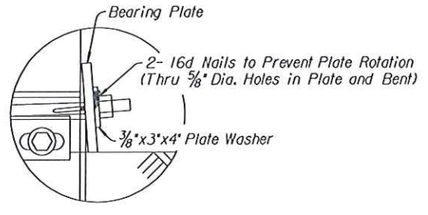


DETAIL OF POST #2

ENLARGED VIEW @ POST #1

◈ Note: Retroreflective sheeting shall be applied to the buffer end terminal after installation. The sheeting shall be located to provide maximum visibility to approach traffic.

◈ 18" x 18" Retroreflective sheeting trim to size after installation.



⊛ 4" maximum projection of the steel tube above the 10:1 surface slope.

NO.	DATE	REVISIONS	BY	APP'D
4	5-18-00	Added note for temporary traffic	R.J.S.	J.O.B.
3	5-12-98	Backup plate for optional design	R.J.S.	J.O.B.
2	1-5-98	4" Steel tube projection	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARD FENCE END TERMINAL (SRT)

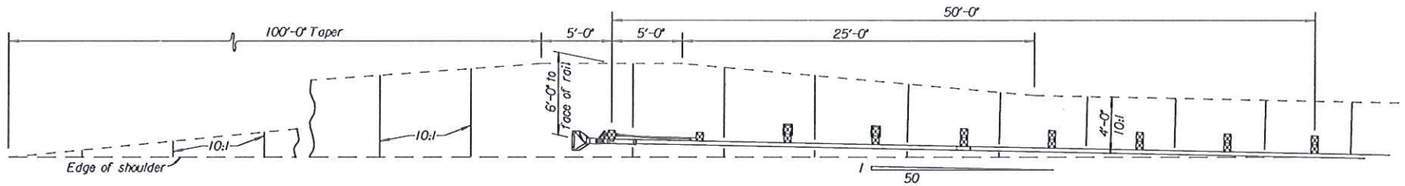
RD621

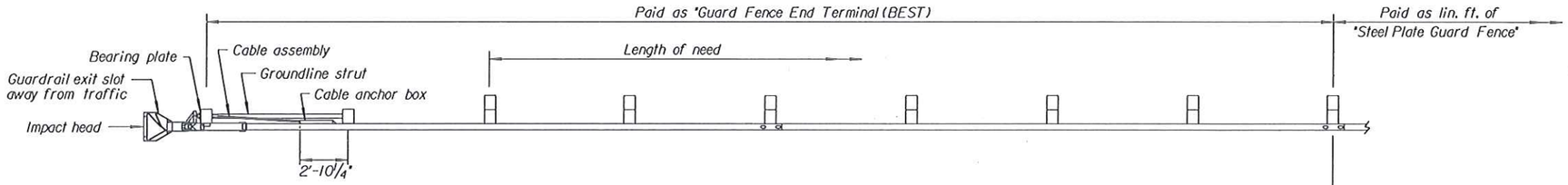
FHWA APPROVAL	6-15-00	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Seitz

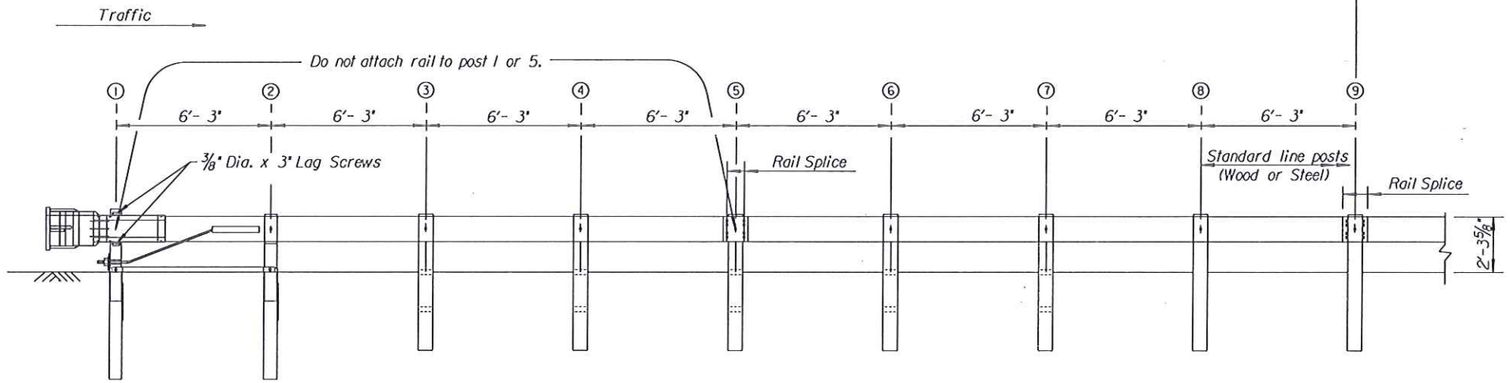
Void 2-28-06

Drawn By : bert
File : S:_us_published\rd621OLD.dgn
Plotted : 18-JUL-2005 11:11

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				







GENERAL NOTE

Posts ① through ⑧ on the BEST shall be wood regardless of post material on remainder of the installation.

All guard fence shall be lapped in the direction of traffic. Where traffic is temporarily carried in the direction opposite of the final configuration, the rail splices shall be lapped in the direction of the permanent traffic.

All work and materials required for installation of this terminal shall be paid under to the bid item "Guard Fence End Terminal (BEST)".

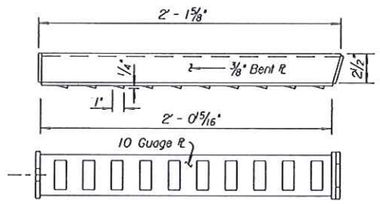
All steel posts shall be galvanized after fabrication.

See RD611 & RD613 for details of guard rail not shown.

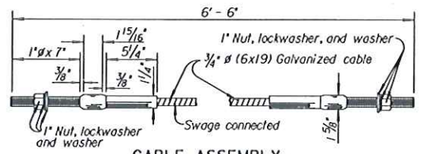
The steel tubes may be driven with an approved driving head. They shall not be driven with the wood post in the tube. If the steel tubes are placed in drilled holes, the backfill material must be satisfactorily compacted to prevent tube settlement.

When rock is encountered during excavation, a 12 inch diameter post hole, 20 inches deep may be used if approved by the engineer. Granular material will be placed in the bottom of the hole approximately 2 1/2" deep to provide drainage. The steel tube sleeves will be field cut to length, placed in the hole and backfilled with adequately compacted material excavated from the hole.

The breakaway cable assembly must be taut. A locking device, (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening the nuts.

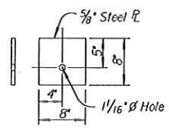


CABLE ANCHOR



CABLE ASSEMBLY (1 each)

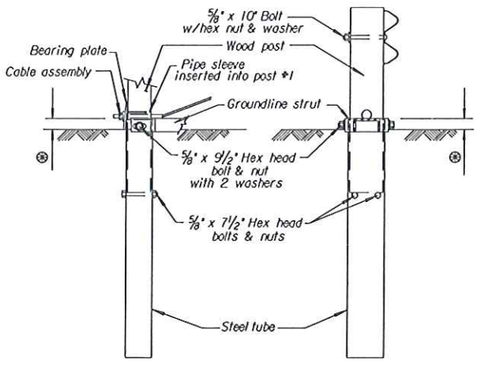
(40,000 lbs. min. breaking strength)
Tighten cable to taut tension.



Fasten plate to wood post with 2- 16d galvanized nails bent over top edge to prevent rotation.

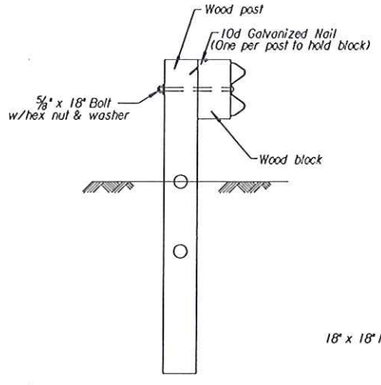
BEARING PLATE

The bearing plate shall be oriented as shown with the hole located 5" from the top.



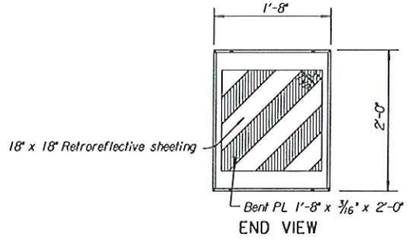
PARTIAL VIEW OF POST #1

DETAIL OF POST #2

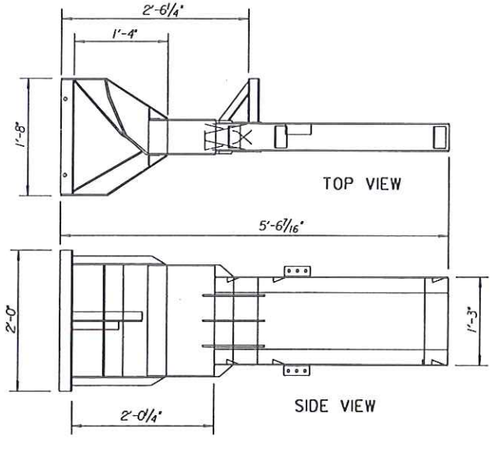


Post #5 similar except rail is not attached.

DETAIL OF POSTS #3 Through #7



END VIEW



DETAILS OF GUARDRAIL EXTRUDER

NO.	DATE	REVISIONS	BY	APP'D
3	5-19-00	Added note for temporary traffic	R.J.S.	J.O.B.
2	1- 5-98	Steel tube proj. & bearing pl. orient.	R.J.S.	J.O.B.
1	11-25-97	Revised Pay Item	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARD FENCE END TERMINAL (BEST)

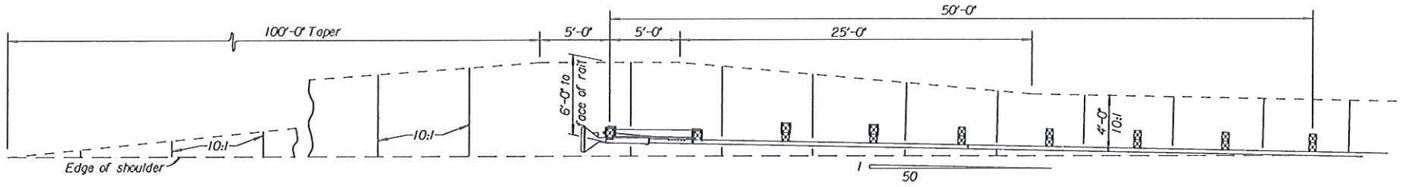
RD606A

FHWA APPROVAL	6-15-00	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Seltz

Void 2-28-06

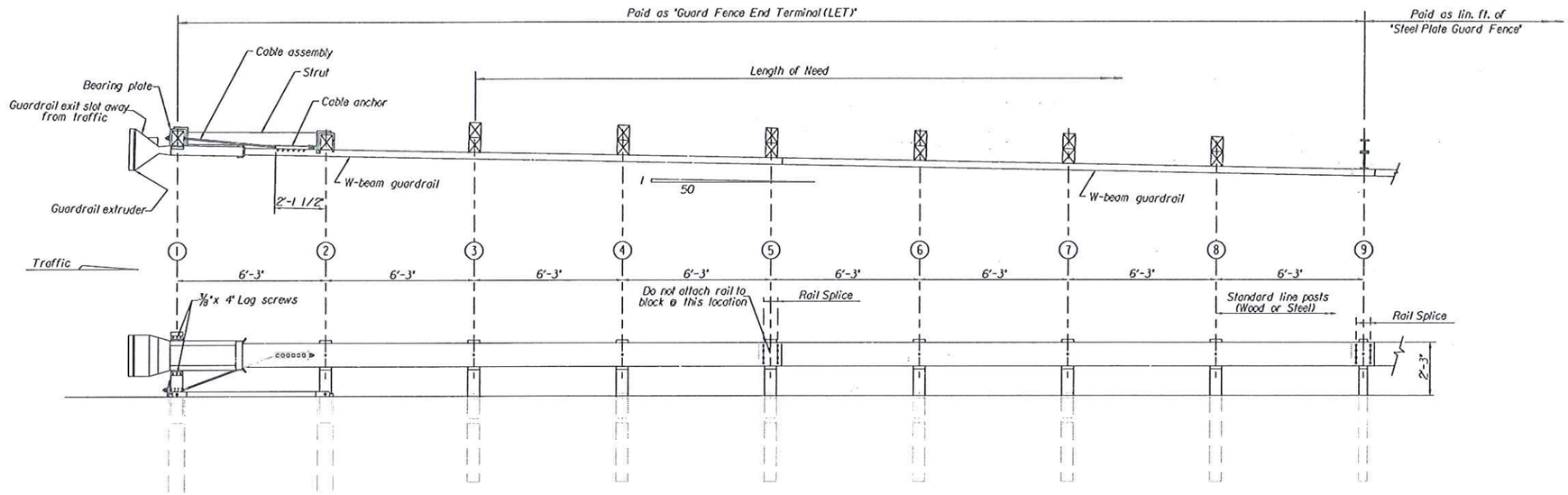
Drawn By : bert Plotted : 16-FEB-2006 13:58
File : S:_us_publishedtrd606aOLD.dgn

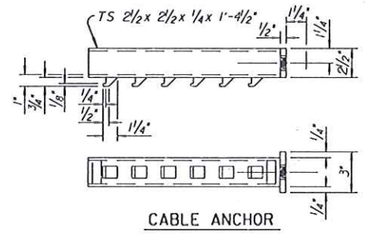
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				



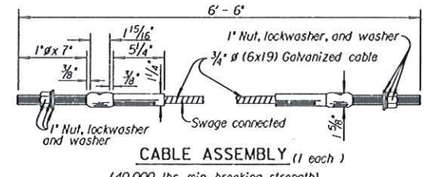
GENERAL NOTE

See RD611 & RD613 for details of guard rail not shown.
Posts ① through ⑦ on the LET shall be wood, regardless of post material used on remainder of the installation.
All guard fence splices shall be lapped in the direction of Traffic. Where traffic is temporarily carried in the direction opposite of the final configuration, the rail splices shall be lapped in the direction of the permanent traffic.
All work and materials required for installation of this terminal shall be paid under to the bid item 'Guard Fence End Terminal (LET)'.
All steel parts shall be galvanized after fabrication.
Retroreflective sheeting as shown in the detail shall be provided on all installations. The retroreflective sheeting should be installed on the face of the extruder prior to installation. Extruder should be thoroughly cleaned and dried prior to application.
The steel tubes may be driven with an approved driving head. They shall not be driven with the wood post in the tube. If the steel tubes are placed in drilled holes, the backfill material must be satisfactorily compacted to prevent tube settlement.
The breakaway cable assembly must be taut. A locking device, (vice grips or channel lock pliers) should be used to prevent the cable from twisting when tightening the nuts.



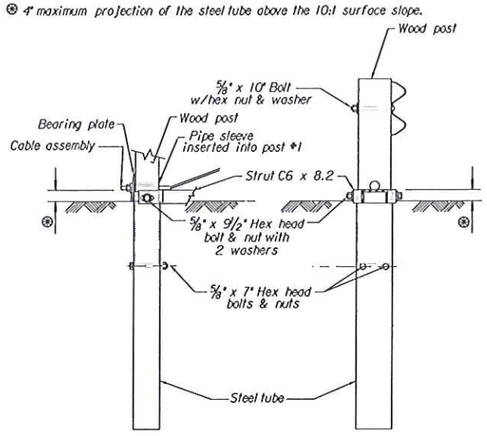


CABLE ANCHOR



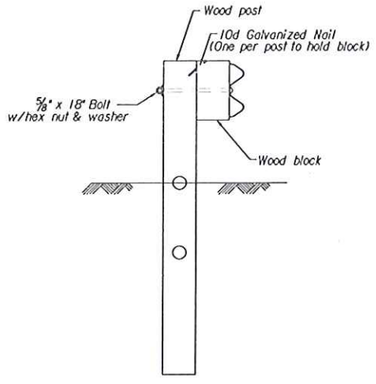
CABLE ASSEMBLY (1 each)
(40,000 lbs. min. breaking strength)
Tighten cable to taut tension.

⊗ 4" maximum projection of the steel tube above the 10:1 surface slope.



PARTIAL VIEW OF POST #1

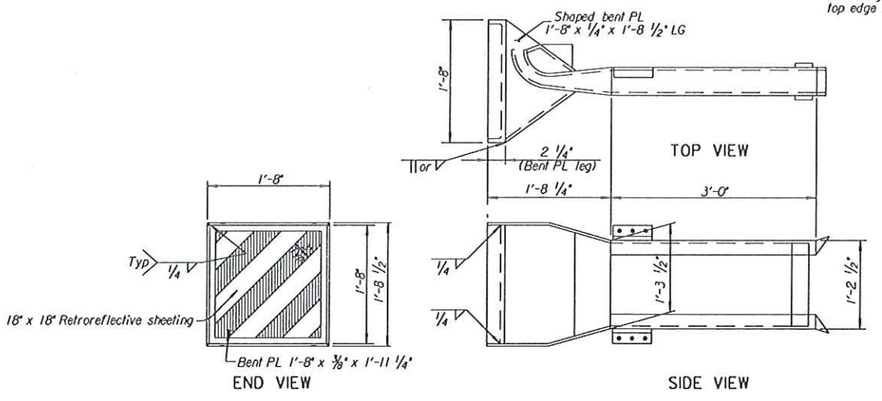
DETAIL OF POST #2



Post #5 similar except rail is not attached.

DETAIL OF POSTS #3 through #7

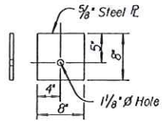
Note: At the contractor's option, 12'-6" long rail elements may be provided in lieu of the 25'-0" long rail elements shown



END VIEW

SIDE VIEW

DETAILS OF GUARDRAIL EXTRUDER



Fasten plate to wood post with 2- 16d galvanized nails bent over top edge to prevent rotation.

BEARING PLATE

The bearing plate shall be oriented as shown with the hole located 5" from the top.

NO.	DATE	REVISIONS	BY	APP'D
9	8-24-00	Added note Long Rail Element	R.J.S.	J.O.B.
8	5-13-00	Added note for temporary traffic	R.J.S.	J.O.B.
7	3-24-98	Revised hardware details	R.J.S.	J.O.B.
6	1-5-98	Steel tube proj. & bearing pl. orien.	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARD FENCE END TERMINAL (LET)

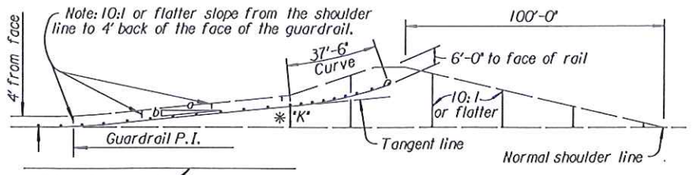
RD606

FHWA APPROVAL	9-15-00	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Seltz

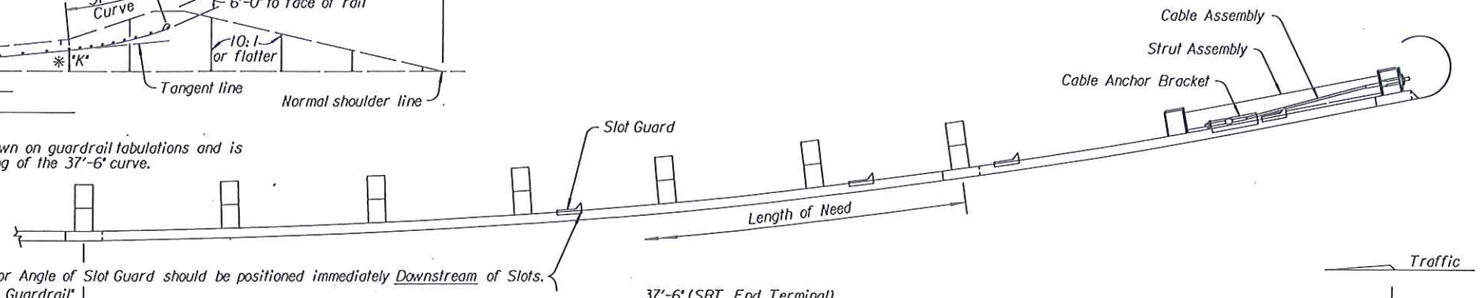
Void 2-28-06

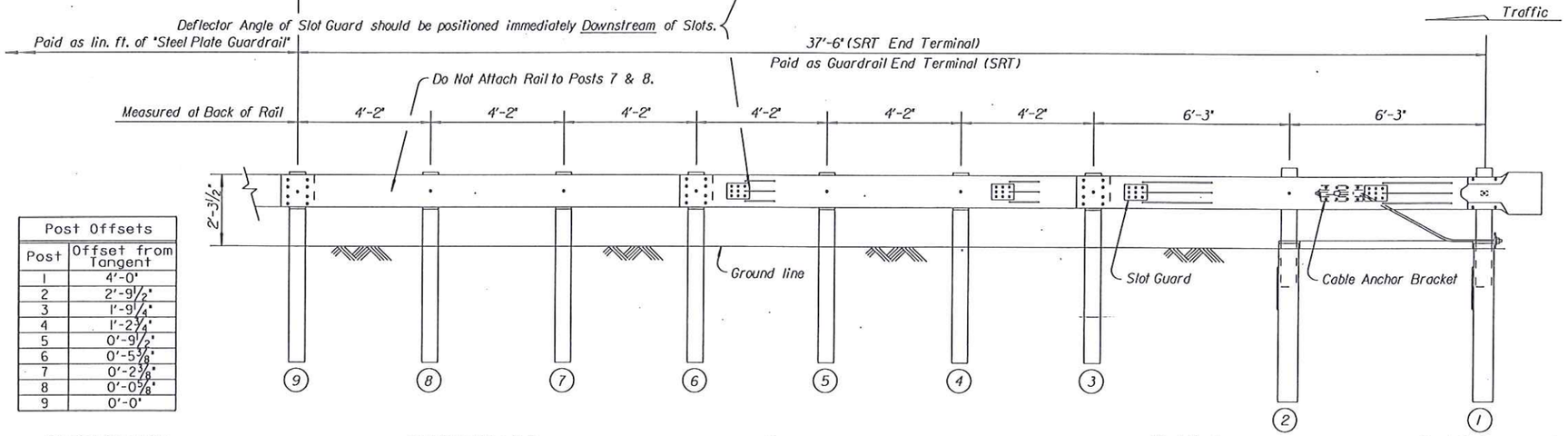
Drawn By : bert
File : S:_us_publishedrd606OLD.dgn
Plotted : 16-FEB-2006 13:59

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				



* "K" is the distance shown on guardrail tabulations and is measured at the beginning of the 37'-6" curve.





Post Offsets	
Post	Offset from Tangent
1	4'-0"
2	2'-9½"
3	1'-9¼"
4	1'-2¼"
5	0'-9½"
6	0'-5⅜"
7	0'-2⅜"
8	0'-0⅜"
9	0'-0"

GENERAL NOTE

See RD611 & RD613 for details of guardrail not shown.

Posts ① through ⑧ on the Slotted Rail Terminal shall be wood, regardless of post material used on remainder of the installation.

All guardrail splices shall be lapped in the direction of Traffic. Where traffic is temporarily carried in the direction opposite of the final configuration, the rail splices shall be lapped in the direction of the permanent traffic.

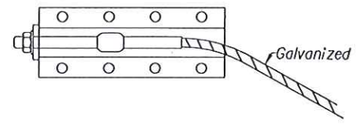
All work and materials required for installation of this terminal shall be paid under to the bid item "Guardrail End Terminal (SRT)".

All steel parts shall be galvanized after fabrication.

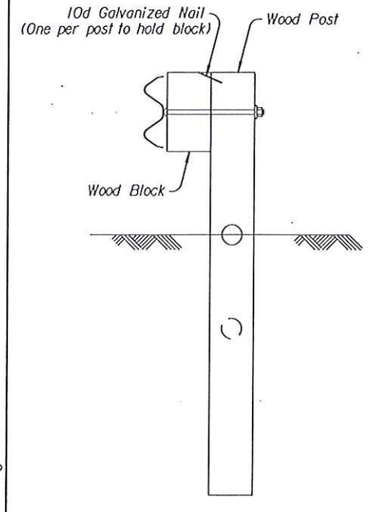
The post offset dimensions are given to the center of the traffic face of the blockouts. Except at the first two posts, where dimension is to the center of the traffic face of the post. Offset points are to be located by chord measurements at the back of the rail equal to the nominal post spacings shown. Posts are to be set approximately radial to the railing at each post location.

Standard splices, standard hardware connections (bolts, nuts, & washers) are used except where noted. See RD611 for additional details.

The cable anchor assembly must be taut. Restrain the cable with vise grip pliers at the end being tightened to avoid twisting the cable. Make sure the nuts are tight and the cable is taut.

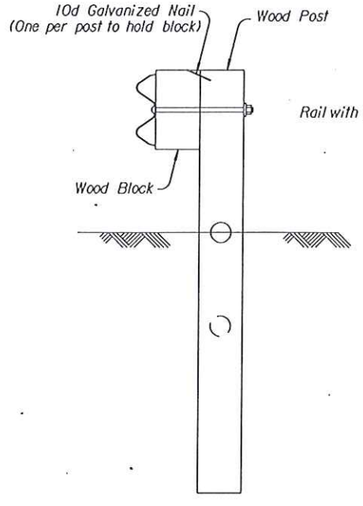


CABLE ANCHOR BRACKET

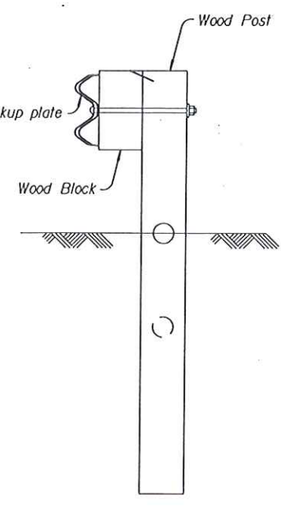


DETAIL OF POST #7 & #8

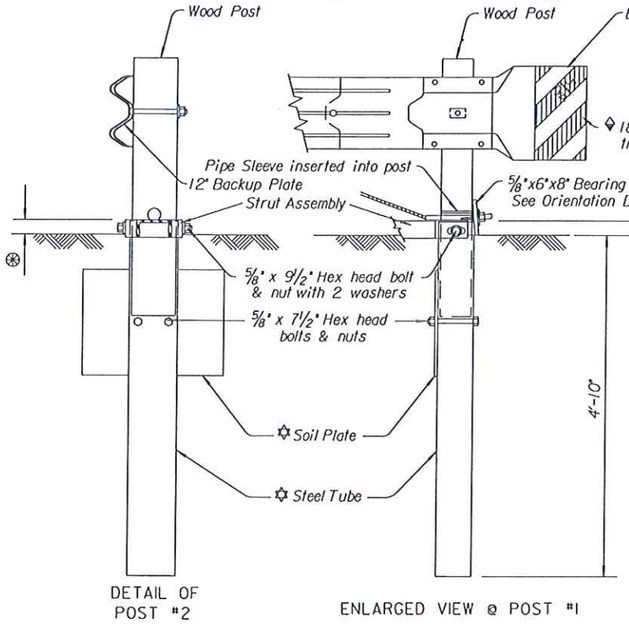
(Do not attach rail to post #7 & #8)



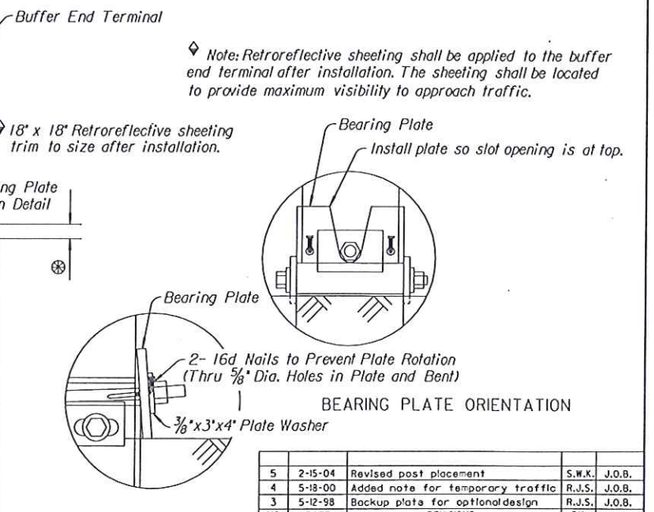
DETAIL OF POSTS #4 & #5



DETAIL OF POSTS #3 & #6



DETAIL OF POST #2



ENLARGED VIEW @ POST #1

♦ Note: Retroreflective sheeting shall be applied to the buffer end terminal after installation. The sheeting shall be located to provide maximum visibility to approach traffic.

BEARING PLATE ORIENTATION

✡ Manufacturer option of 6'-0" steel tube without soil plate.

⊛ 4" maximum projection of the steel tube above the 10:1 surface slope.

NO.	DATE	REVISIONS	BY	APP'D
5	2-15-04	Revised post placement	S.W.K.	J.O.B.
4	5-18-00	Added note for temporary traffic	R.J.S.	J.O.B.
3	5-12-98	Backup plate for optional design	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (SRT) (PARABOLIC)

RD621

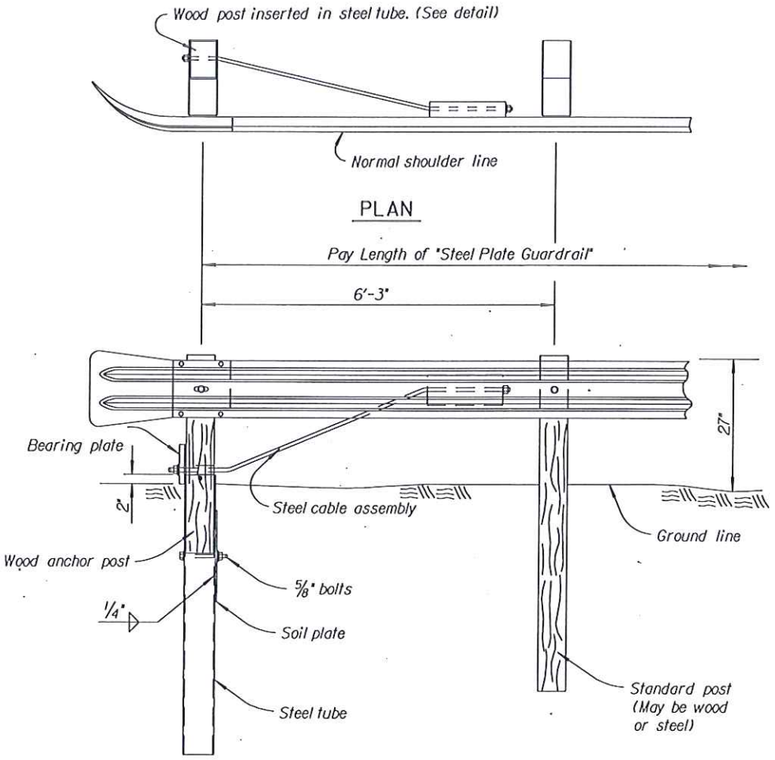
FHWA APPROVAL	11-02-04	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

Void 2-28-06

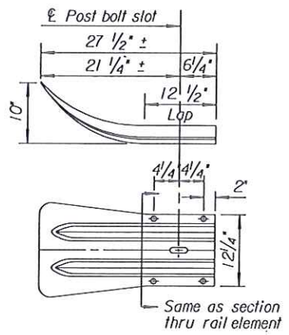
Drawn By: bert Plotted: 06-JUL-2005 10:29
File: s:_us_publishedrd621.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

Note to Designer: Guardrail End Terminal, Type II may generally be used on the traffic departing end of barriers where end on impacts are not a consideration and at the end of entrance return.



DETAIL OF ANCHOR ASSEMBLY



STANDARD END SECTION
(1 each)
(Subsidiary to Steel Plate Guardrail)

GENERAL NOTES

See other guardrail standard drawings for details of guardrail not shown.

All steel parts shall be galvanized after fabrication.

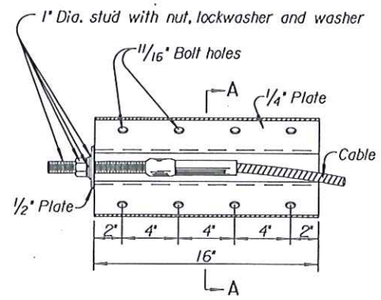
All guardrail splices, including special end shoes, shall be lapped in the direction of Traffic. Where traffic is temporarily carried in the direction opposite of the final configuration, the rail splices shall be lapped in the direction of the permanent traffic.

Terminal end posts shall consist of a wood post inserted in a steel tube as detailed on this sheet. Wood or steel may be used, at the Contractor's option, for the remainder of the posts except where specific material is required for features shown on other standard drawings, such as end terminals and intersecting roadways.

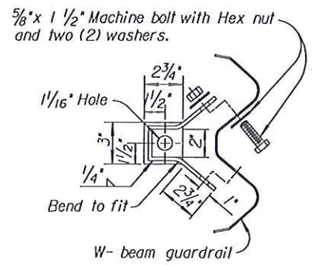
The Type II end terminal shall be included in the pay length of "Steel Plate Guardrail".

All material and labor required for the installation of Barrier Terminal Type II shall be considered subsidiary to the bid item "Steel Plate Guardrail".

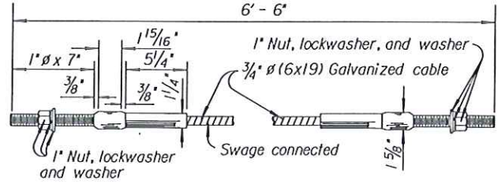
The soil plate and steel tube shall be set in place prior to the installation of the wood anchor assembly post.



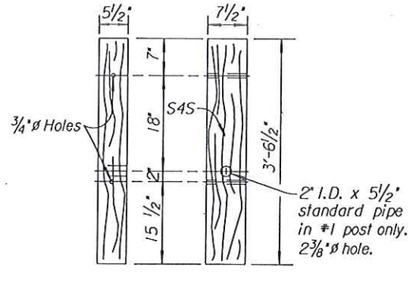
ANCHOR PLATE



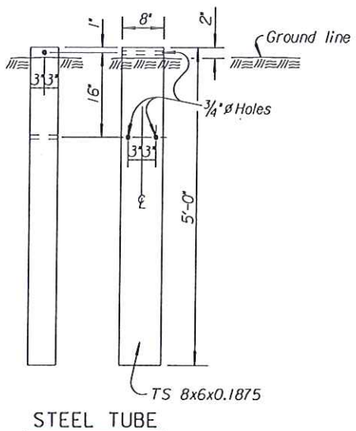
MODIFIED SECTION A-A



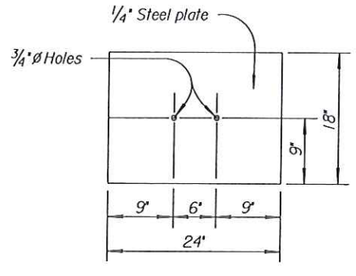
CABLE ASSEMBLY (1 each)
(40,000 lbs. min. breaking strength)
Tighten cable to taut tension.



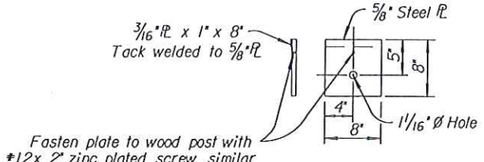
WOOD BREAKAWAY POST



STEEL TUBE



SOIL PLATE



BEARING PLATE

NO.	DATE	REVISIONS	BY	APP'D
5	7-20-04	Changed Guard fence to Guardrail	S.W.K.	J.O.B.
4	5-18-00	Added note for temporary traffic	R.J.S.	J.O.B.
3	11-26-97	Added pay length	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL TYPE II

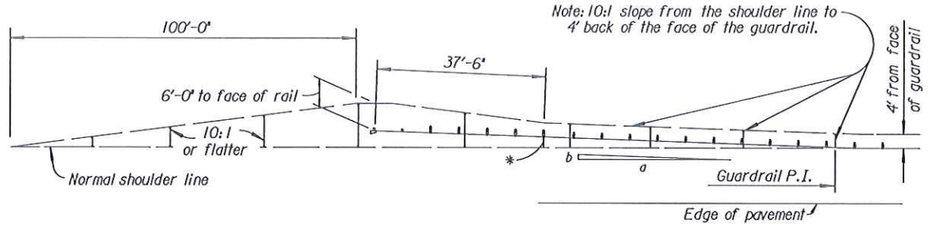
RD618

FHWA APPROVAL	11-02-04	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Seitz

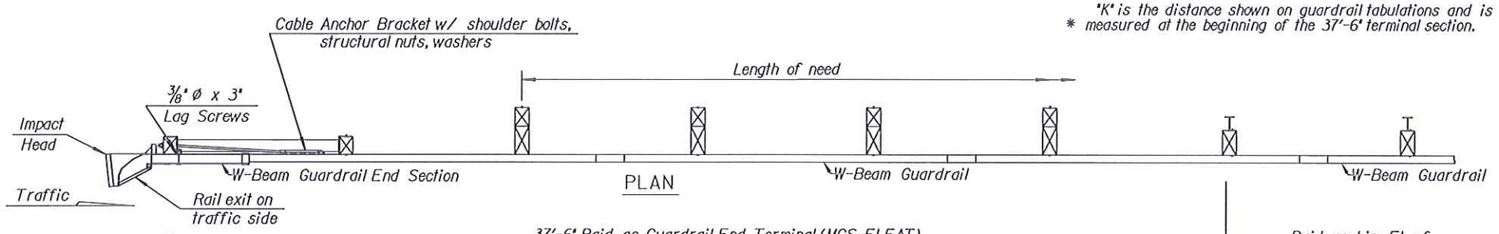
Void 2-3-11

Drawn By : bert
File : S:_us_publishedrd618.dgn
Plotted : 07-JUL-2005 12:57

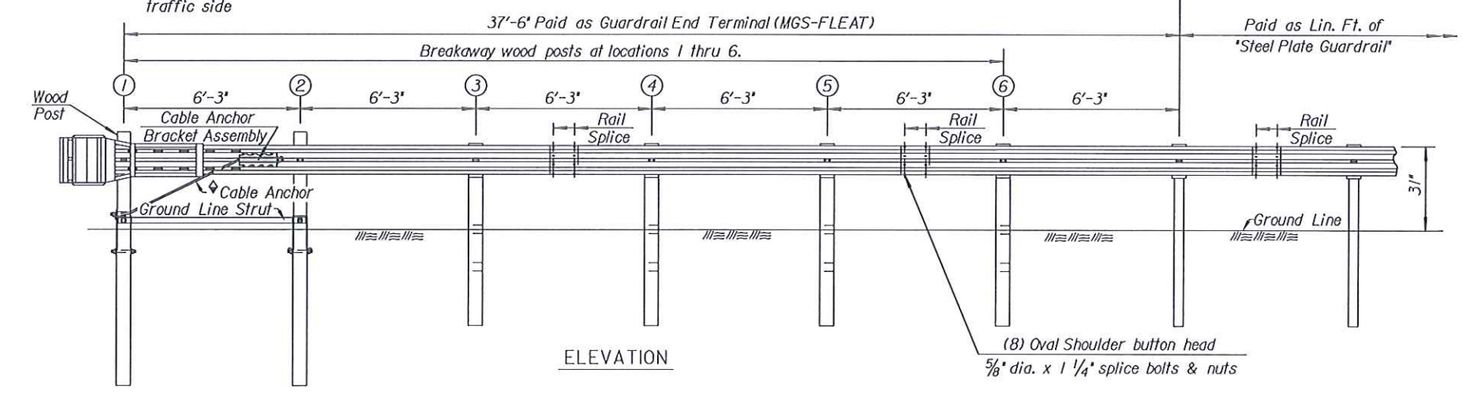
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				



'K' is the distance shown on guardrail tabulations and is * measured at the beginning of the 37'-6" terminal section.

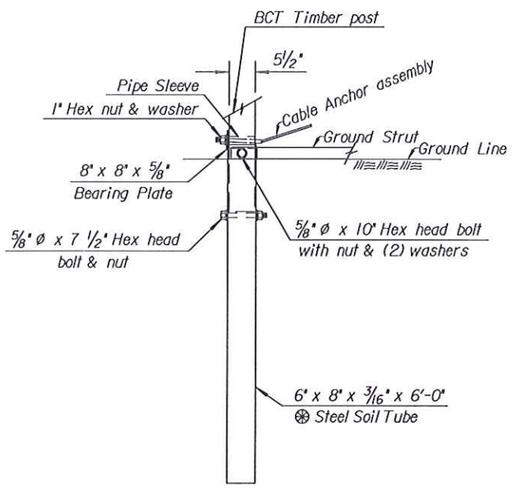


PLAN

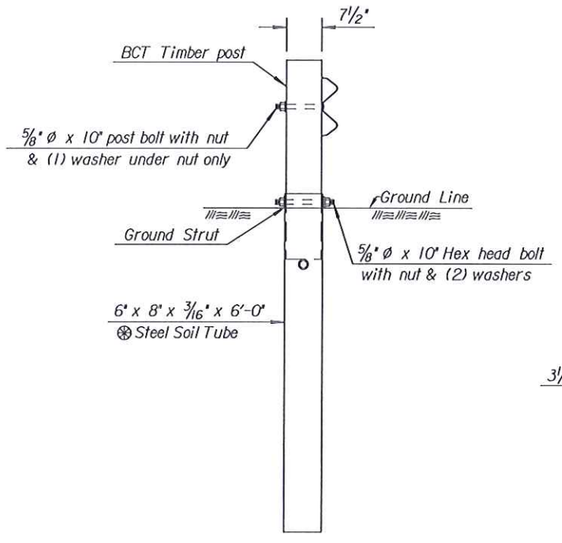


ELEVATION

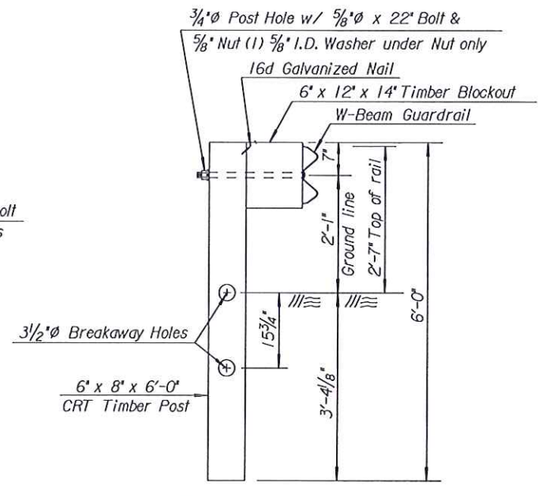
♢ After final assembly recheck cable to be taut.



PARTIAL VIEW OF POST 1



DETAIL OF POST #2



DETAIL OF CRT POST
(#3 through #6)

⊛ Optional 4'-6" or 5'-0" tube w/soil plate may be used as per the manufacturer's specifications.

GENERAL NOTES

Use approved wood (shown & described) or steel posts ① through ⑥ on the (MGS-FLEAT) provided by the manufacturer. Terminal post type used is independent of post type used on the remainder of the installation. No mixing of post types allowed in guard fence run.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

Drive the steel soil tubes with an approved driving head. Do not drive steel tubes with wood post in the tube. Backfill and satisfactorily compact around steel tubes placed in drilled holes to prevent tube settlement.

The soil tubes should not protrude more than 4" above ground (measured along a 5'-0" cord). If necessary grade the site to meet this requirement.

When rock is encountered during installation, see Manufacturer's Installation Manual for procedure.

The cable anchor assembly must be taut. Use a locking device, (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nuts.

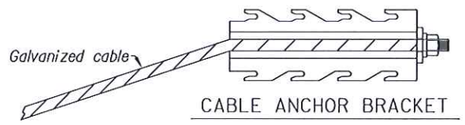
Apply retroreflective sheeting as shown on the face of the impact head prior to installation. Thoroughly clean and dry steel prior to applying sheeting.

Galvanize all steel parts after fabrication.

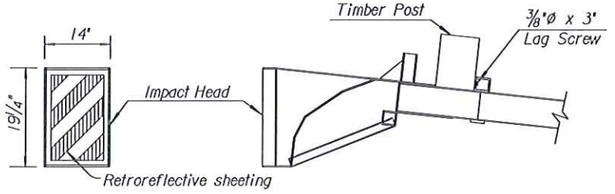
All work and materials required for installation of this terminal are paid under the bid item 'Guardrail End Terminal (MGS-FLEAT)'.

End Terminal (MGS-FLEAT) details shown on this sheet are for 'Information Only' and may not be an exact detail. See Manufacturer's Installation Manual (furnished to Engineer) for component details and installation instructions.

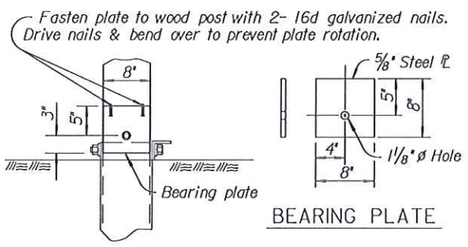
See Standard Drawings RD611A and RD613A for guardrail details not shown.



CABLE ANCHOR BRACKET



IMPACT HEAD CONNECTING DETAIL



BEARING PLATE

Orient bearing plate as shown with the hole 5" from the top.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1				

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (MGS-FLEAT)

RD606E

FHWA APPROVAL	9-29-11	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

KDOT Graphics Certified 10-05-2011

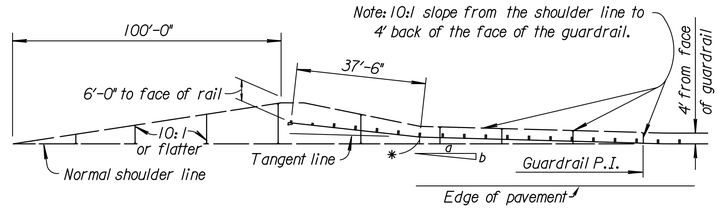
KDOT Graphics Certified

Plotted : 05-OCT-2011 11:26

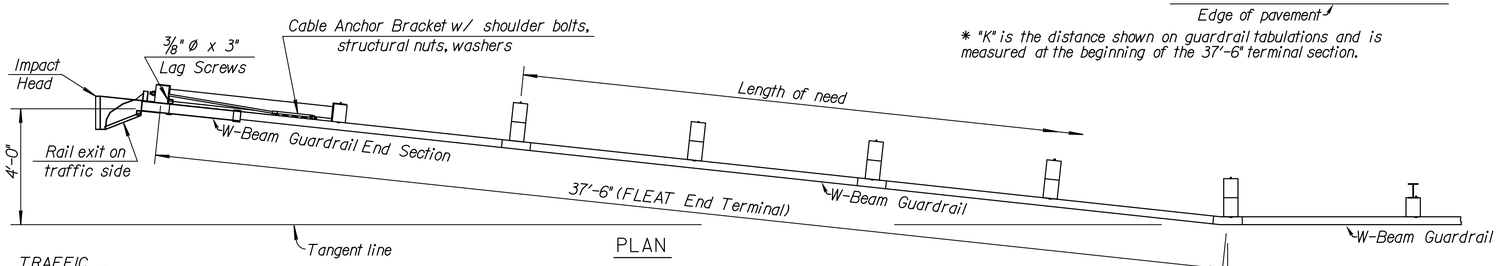
Drawn By : bert
File : rd606e.dgn (rd606e)

VOID 4/25/12

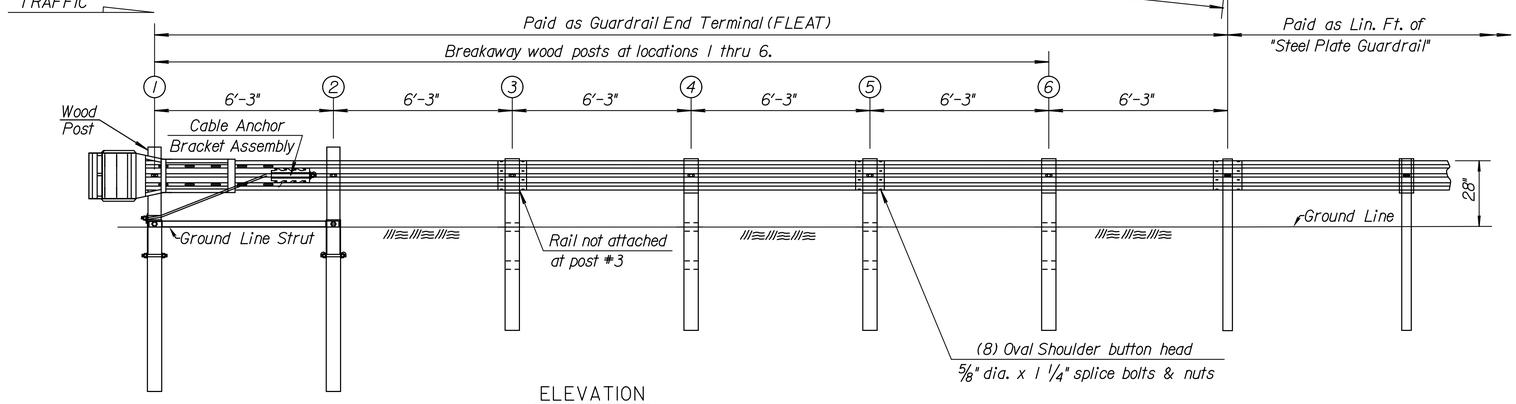
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				



* "K" is the distance shown on guardrail tabulations and is measured at the beginning of the 37'-6" terminal section.



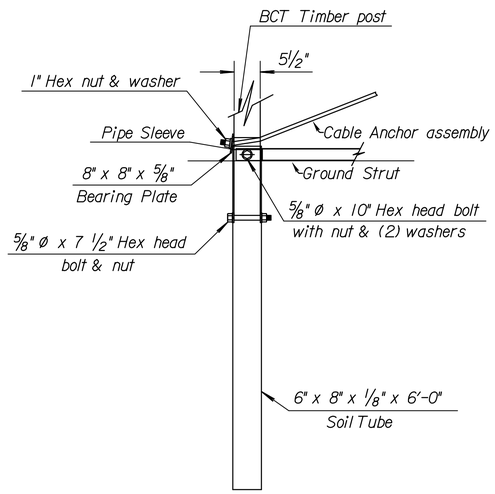
PLAN



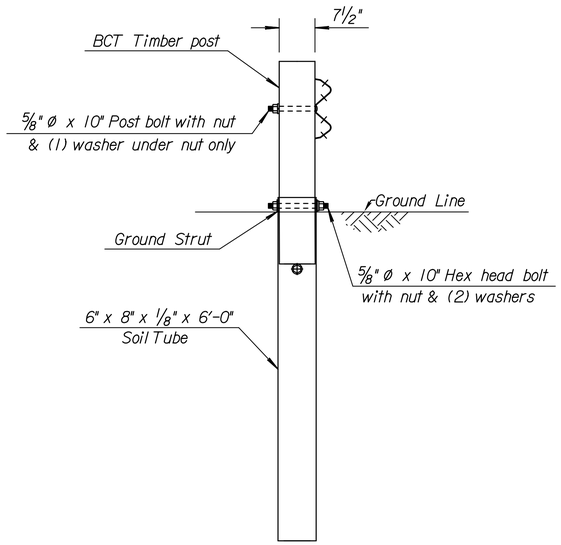
ELEVATION

CABLE ANCHOR BRACKET

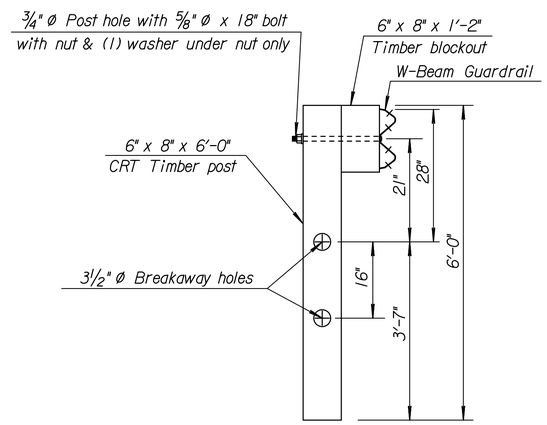
IMPACT HEAD CONNECTING DETAIL



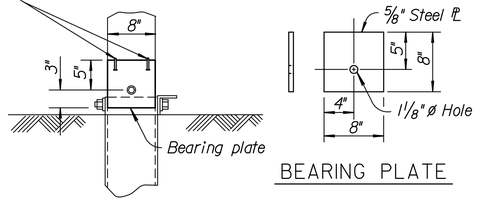
PARTIAL VIEW OF POST 1



DETAIL OF POST #2



DETAIL OF POSTS (#3 through #7)



BEARING PLATE

Orient bearing plate as shown with the hole 5" from the top.

GENERAL NOTES

Use approved wood (shown & described) or steel posts ① through ⑥ on the (FLEAT) provided by the manufacturer. Terminal post type used is independent of post type used on the remainder of the installation. No mixing of post types allowed in guard fence run.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

Drive the steel soil tubes with an approved driving head. Do not drive steel tubes with wood post in the tube. Backfill and satisfactorily compact around steel tubes placed in drilled holes to prevent tube settlement.

The soil tubes should not protrude more than 4" above ground (measured along a 5'-0" cord). If necessary grade the site to meet this requirement.

When rock is encountered during installation, see Manufacturer's Installation Manual for procedure.

The cable anchor assembly must be taut. Use a locking device, (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nuts.

Apply retroreflective sheeting as shown on the face of the impact head prior to installation. Thoroughly clean and dry steel prior to applying sheeting.

Galvanize all steel parts after fabrication.

All work and materials required for installation of this terminal are paid under the bid item "Guardrail End Terminal (FLEAT)".

End Terminal (FLEAT) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual (furnished to Engineer) for component details and installation instructions.

See Standard Drawings RD611or RD613 for guardrail details not shown.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1	12-15-10	Revised notes, 28" rail height	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL FLEAT

RD606B

FHWA APPROVAL	1-11-11	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

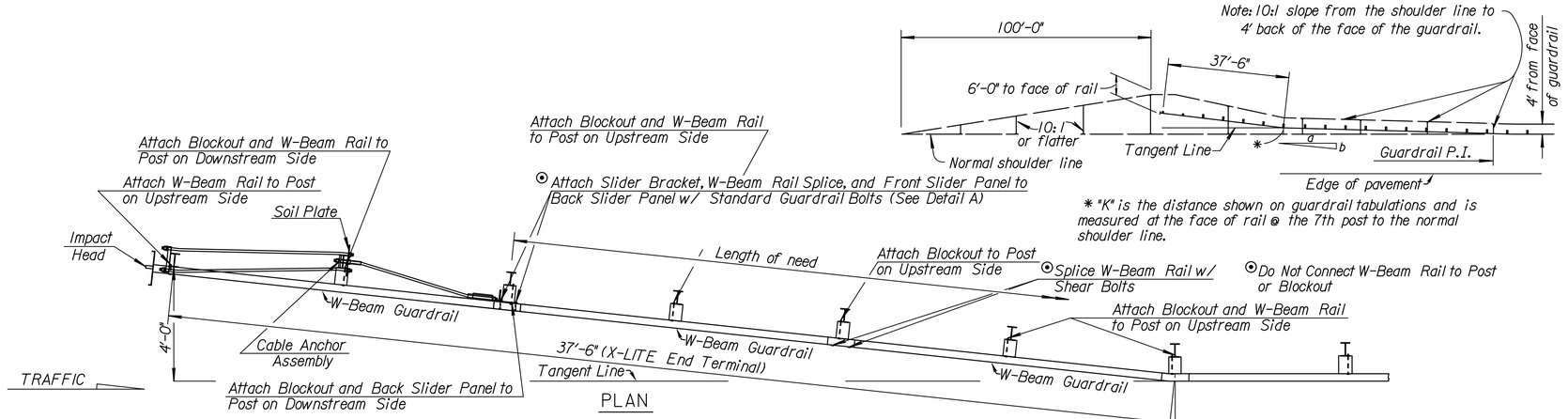
KDOT Graphics Certified 01-31-2011

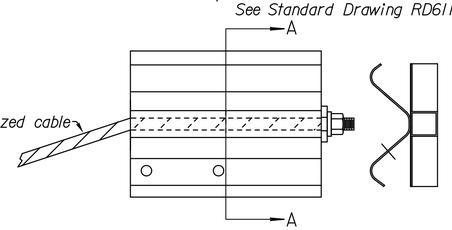
KDOT Graphics Certified

Plotted :03-FEB-2011 07:35

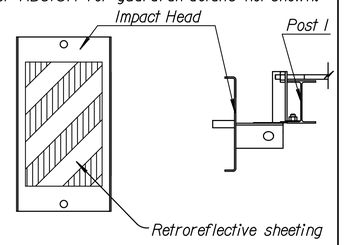
Drawn By: bert
File : rd606b.dgn (rd606b)

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

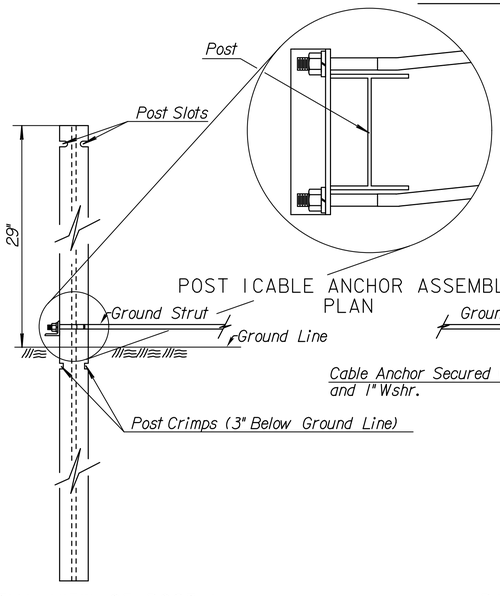




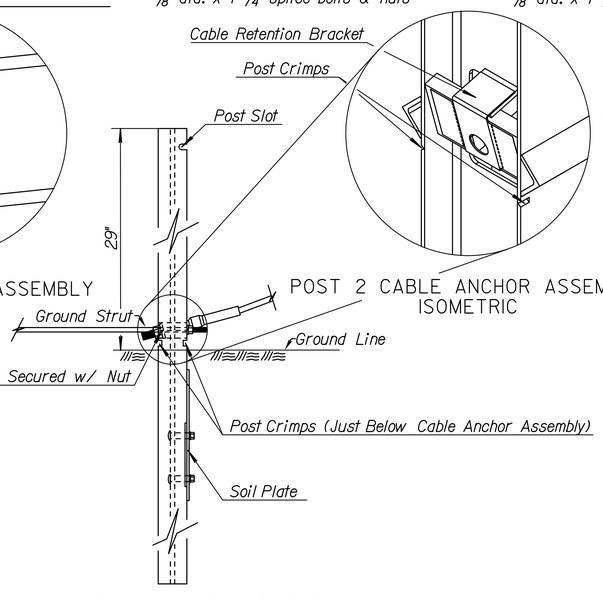
SLIDER BRACKET



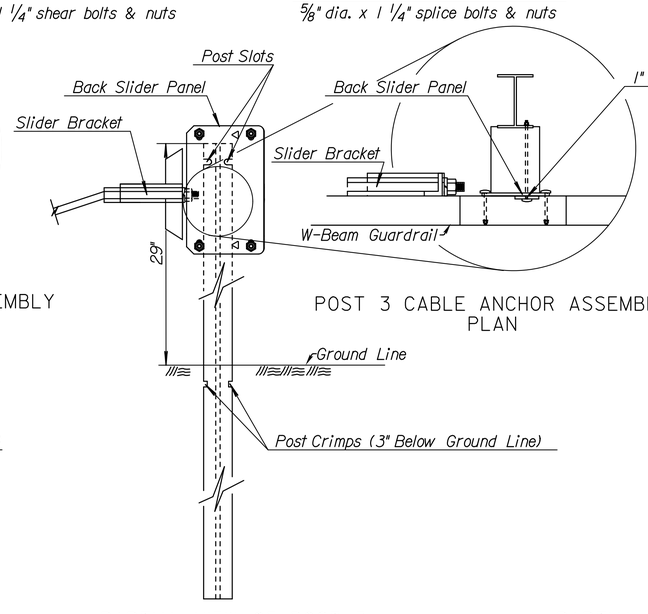
IMPACT HEAD DETAIL



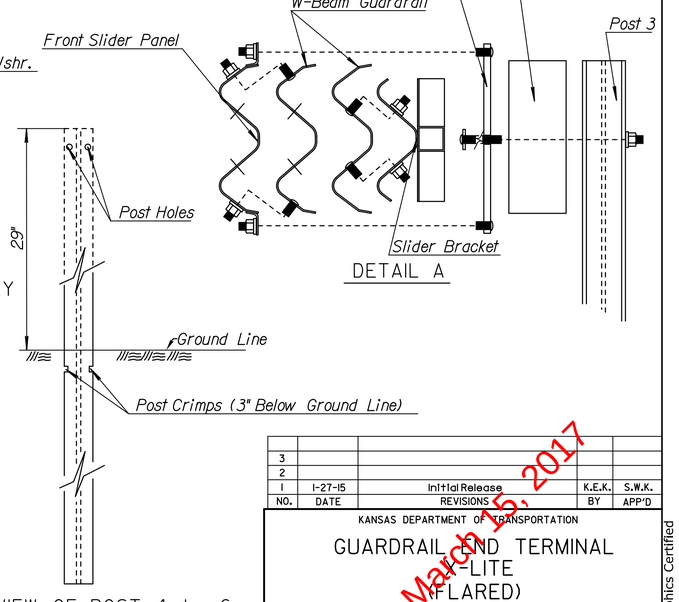
POST 1 CABLE ANCHOR ASSEMBLY PLAN



POST 2 CABLE ANCHOR ASSEMBLY ISOMETRIC



POST 3 CABLE ANCHOR ASSEMBLY PLAN



DETAIL A

PARTIAL VIEW OF POST 1 ELEVATION

PARTIAL VIEW OF POST 2 ELEVATION

PARTIAL VIEW OF POST 3 ELEVATION

PARTIAL VIEW OF POST 4 to 6 ELEVATION

GENERAL NOTES

Use approved steel posts ① through ⑥ on the (X-LITE) provided by the manufacturer. Terminal post type used is independent of the post type used on the remainder of the installation. No mixing of post types allowed.

Use approved 8 inch blockouts for posts ① through ⑥. The blockout size used in the end terminal may be independent of the size used in the remainder of the installation.

Lap guardrail splices, including terminal connector, in the direction of traffic for entrance installations. For exit installations, lap guardrail splices in the opposite direction of traffic at posts 3, 5, and 7. Where traffic is temporarily carried in the opposite direction of the final configuration, lap rail splices in the direction of permanent traffic for entrance installations only.

When rock is encountered during installation, see Manufacturer's Installation Manual, furnished to the Engineer, for procedure.

The cable anchor must be taught. Use a locking device (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nut.

Apply retroreflective sheeting as shown on the face of the impact head prior to installation. Thoroughly clean and dry steel prior to applying sheeting.

Galvanize all steel after fabrication.

All work and materials required for installation of this terminal are paid under the bid item "Guardrail End Terminal (X-LITE Flared)".

End Terminal (X-LITE) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual for component details and installation instructions.

See Standard Drawing RD611A or RD613A for guardrail details not shown.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1	1-27-15	Initial Release	K.E.K.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL X-LITE (FLARED)

RD606G

FHWA APPROVAL	10-6-15	APP'D. Scott W. King	
DESIGNED	DETAILED	QUANTITIES	TRACED Rhoads
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Keele

Void March 15, 2017

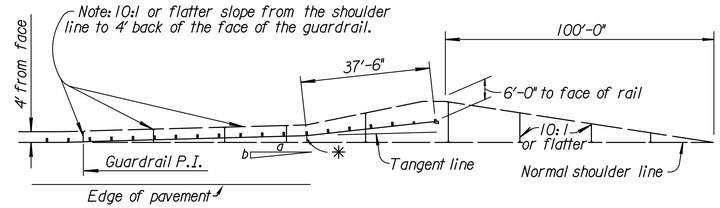
KDOT Graphics Certified 08-23-2016

KDOT Graphics Certified

Plotted : 23-AUG-2016 13:49

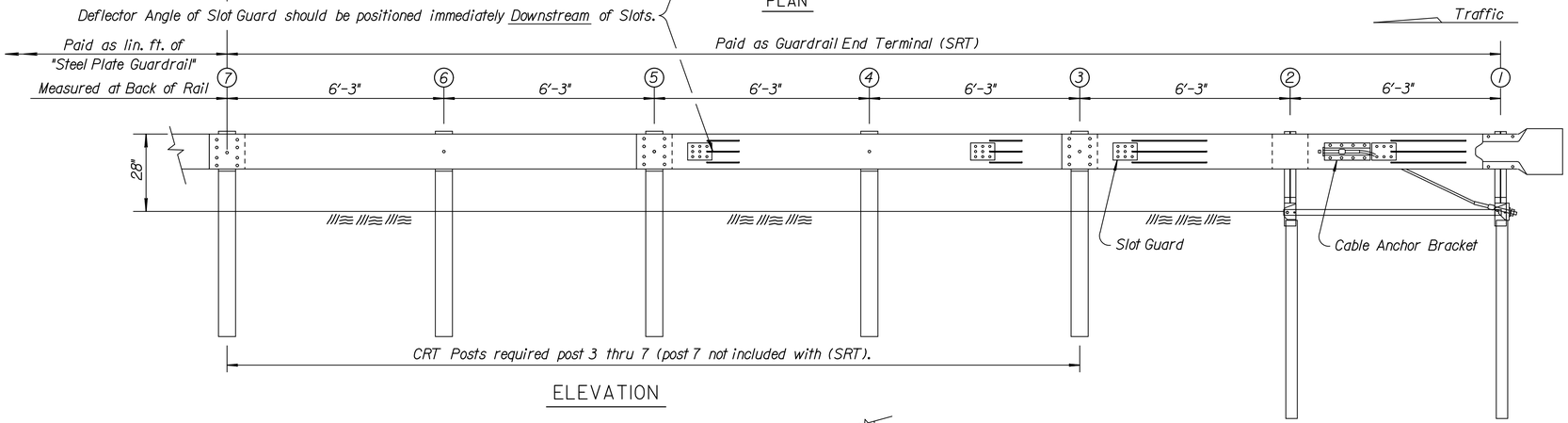
Drawn By : trhoads
File : rd606g.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				



* "K" is the distance shown on guardrail tabulations and is measured at the beginning of the 37'-6" terminal section.

PLAN



ELEVATION

GENERAL NOTE

Use approved wood (shown & described) or steel posts ① through ⑥ on the (SRT) provided by the manufacturer. Terminal post type used is independent of post type used on the remainder of the installation. No mixing of post types allowed in guard fence run.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

The cable anchor assembly must be taut. Use a locking device, (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nuts.

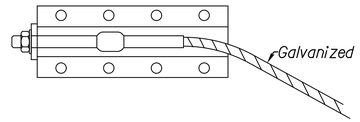
When rock is encountered during installation, see Manufacturer's Installation Manual for procedure.

End Terminal (SRT) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual (furnished to Engineer) for component details and installation instructions.

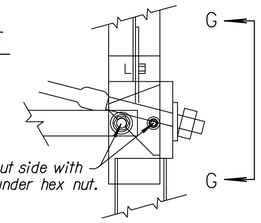
All work and materials required for installation of this terminal are paid under the bid item "Guardrail End Terminal (SRT)".

Galvanize all steel parts after fabrication.

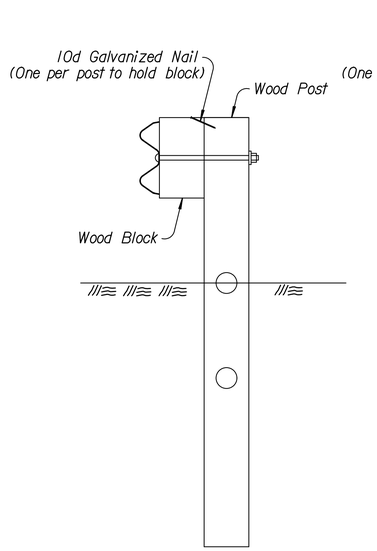
See Standard Drawings RD611 and RD613 for guardrail details not shown.



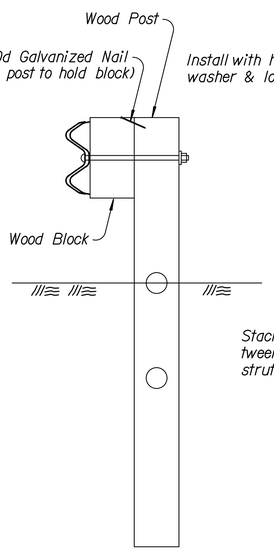
CABLE ANCHOR BRACKET



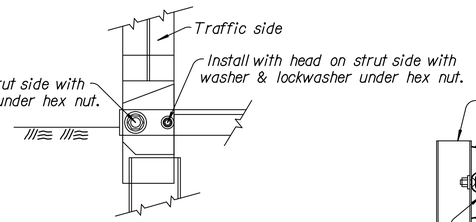
DETAIL "G" (Post #1)



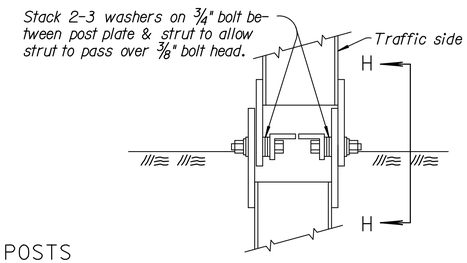
DETAIL OF CRT POSTS (Post #4 & 6)



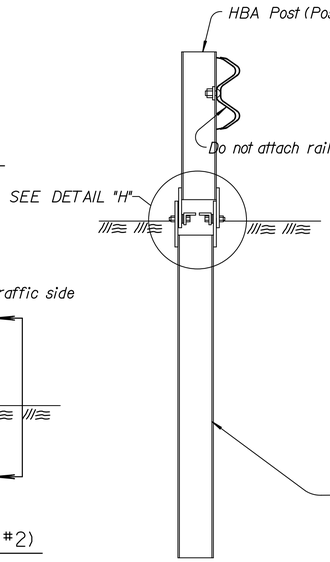
DETAIL OF CRT POSTS (Post #3,5 & 7)



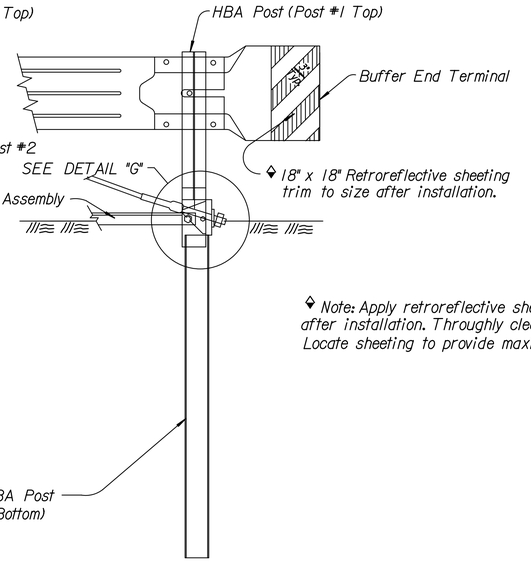
VIEW H-H (Post #2)



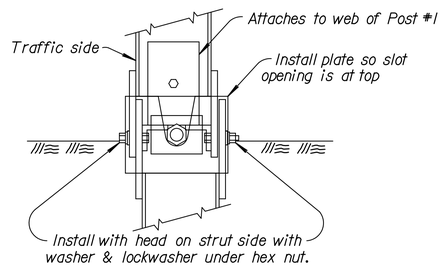
DETAIL "H" (Post #2)



DETAIL OF POST #2



ENLARGED VIEW @ POST #1



VIEW G-G (Post #1)

◆ Note: Apply retroreflective sheeting to the buffer end of terminal after installation. Throughly clean and dry steel prior to installation. Locate sheeting to provide maximum visibility to approaching traffic.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1	12-14-10	Rev. notes, details & 28" rail height	S.W.K	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (SRT) (FLARED)

RD621A

FHWA APPROVAL	1-11-11	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

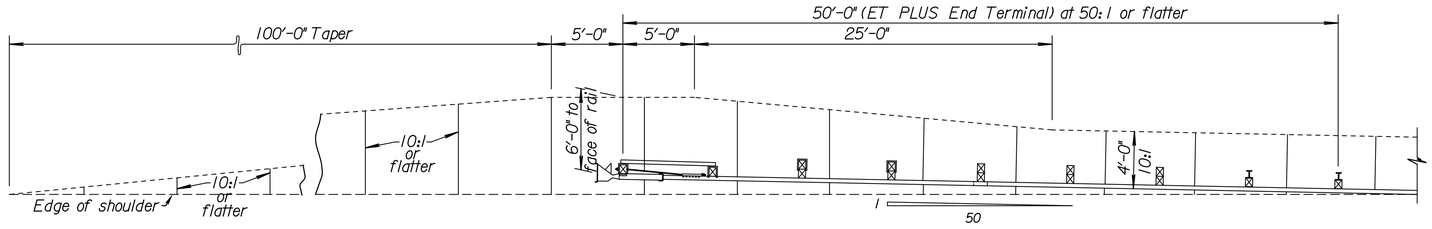
KDOT Graphics Certified 04-03-2014

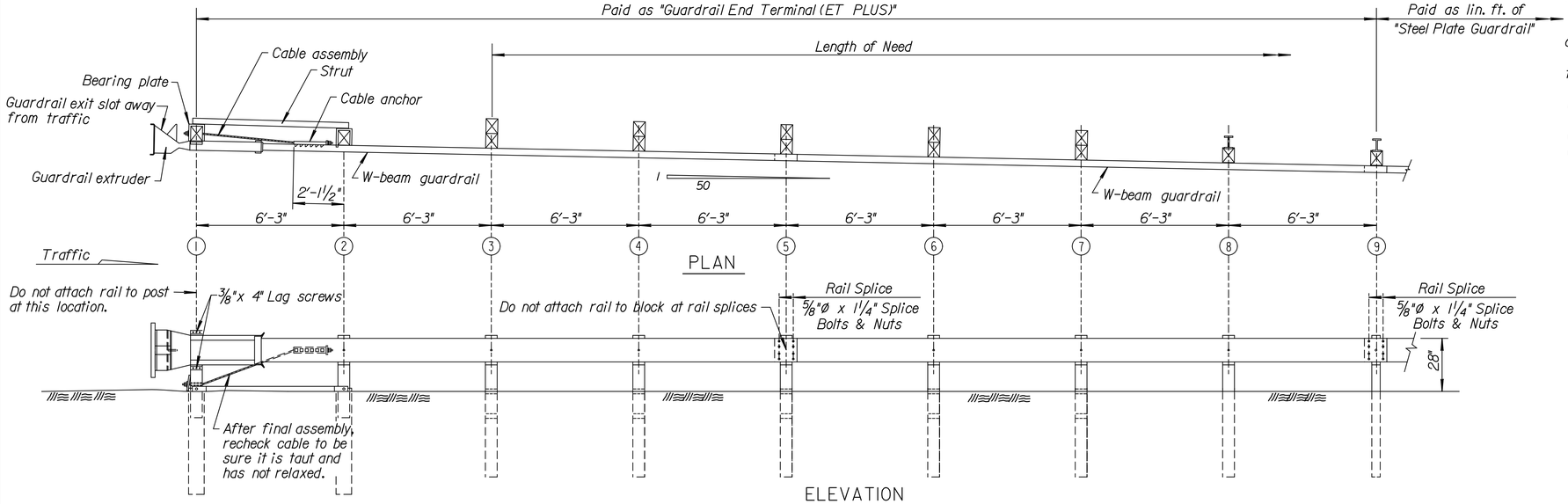
KDOT Graphics Certified

Plotted : 03-APR-2014 16:19

Drawn By: : tmoads
File : rd621a.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				





Note: Installation of 12'-6" rail elements (Contractor's option) instead of 25'-0" long rail elements are acceptable.

GENERAL NOTE

Use approved wood (shown & described) or steel posts ① through ⑦ on the (ET PLUS) provided by the manufacturer. Terminal post type used is independent of post type used on the remainder of the installation. No mixing of post types allowed in guard fence run.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

The steel tubes may be driven with an approved driving head. Do not drive steel soil tubes with wood post in the tube. Backfill and satisfactorily compact around steel soil tubes placed in drilled holes to prevent tube settlement.

Apply retroreflective sheeting as shown on the face of the extruder prior to installation. Thoroughly clean and dry extruder prior to applying sheeting.

Galvanize all steel parts after fabrication.

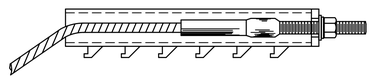
The cable anchor assembly must be taut. Use a locking device, (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nuts.

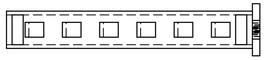
When rock is encountered during installation, see standard specifications for procedure.

All work and materials required for installation of this terminal are paid under the bid item "Guardrail End Terminal (ET PLUS)".

End Terminal (ET-PLUS) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual (furnished to Engineer) for component details and installation instructions.

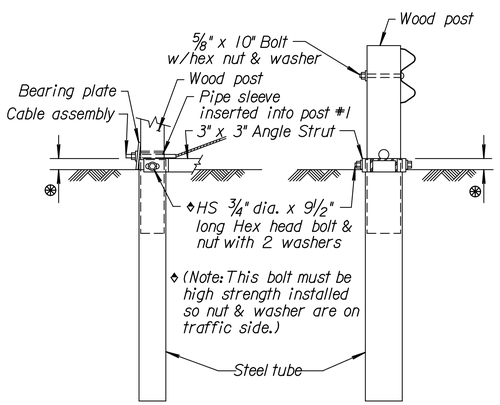
See RD611 & RD613 for details of guardrail not shown.





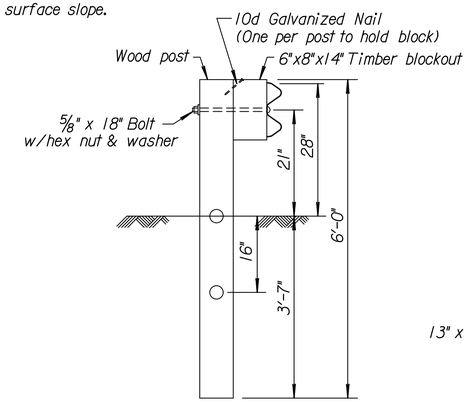
CABLE ANCHOR ASSEMBLY

❀ 4" maximum projection of the steel tube above the 10:1 or flatter surface slope.



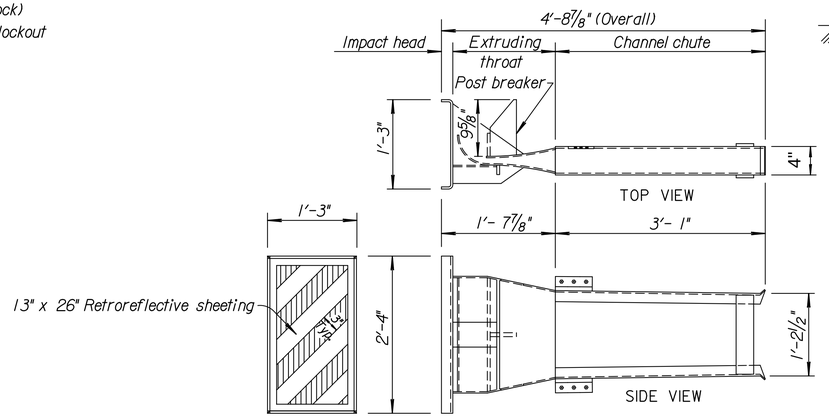
PARTIAL VIEW OF POST #1

DETAIL OF POST #2

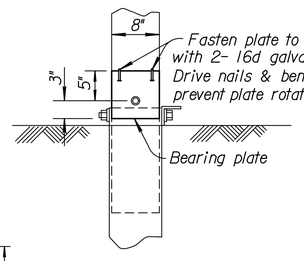


Post #5 similar except rail is not attached.

DETAIL OF POSTS #3 through #7



ET PLUS HEAD



BEARING PLATE

Orient bearing plate as shown with the hole 5" from the top.

NO.	DATE	REVISIONS	BY	APP'D
11	12-08-10	Revised notes, 28" rail height	S.W.K.	J.O.B.
10	5-10-04	Rev. term. from (LET to ET PLUS)	S.W.K.	J.O.B.
9	8-24-00	Added note Long Rail Element	R.J.S.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (ET PLUS)

RD606

FHWA APPROVAL	1-11-11	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

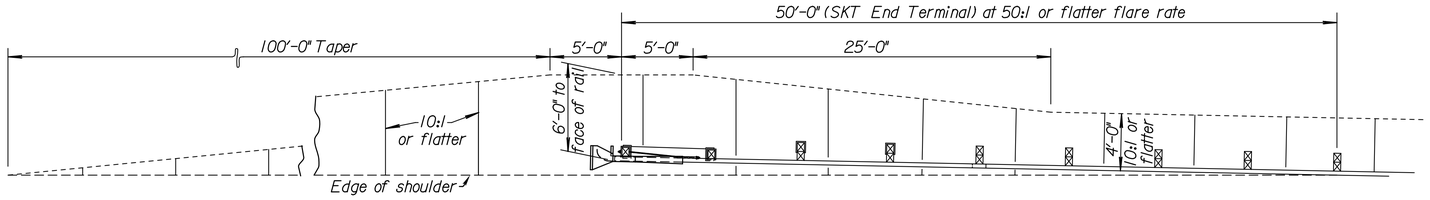
KDOT Graphics Certified 01-31-2011

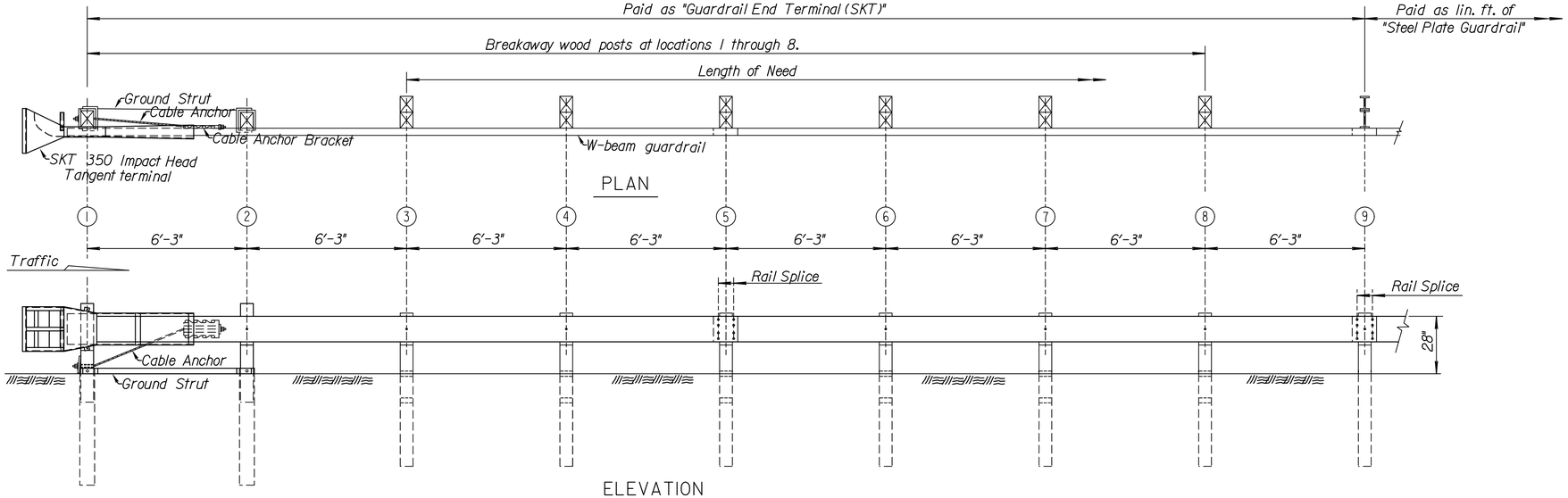
Work October 27 2017

KDOT Graphics Certified

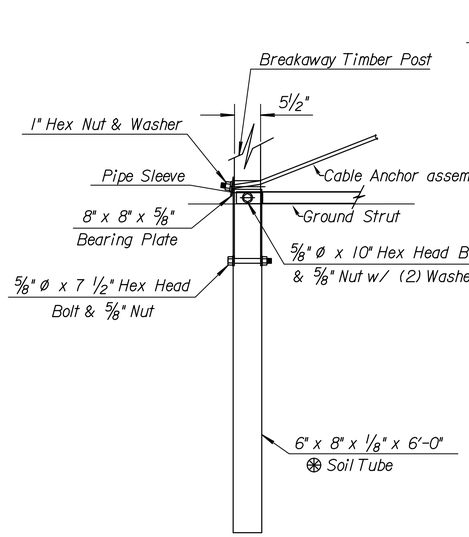
Drawn By: tmoads Plotted: 08-FEB-2017 14:56
File: rd606_Retired_10-27-14.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

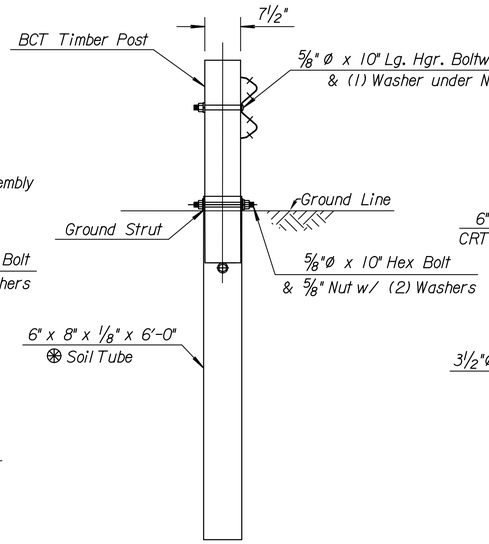




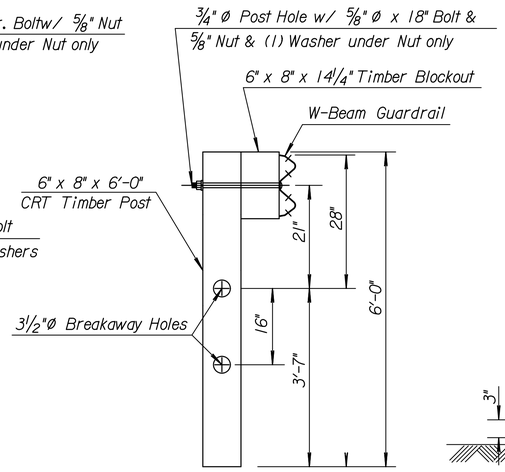
Note: Installation of 12'-6" rail elements (Contractor's option) instead of 25'-0" long rail elements are acceptable.



PARTIAL VIEW OF POST #1



DETAIL OF POST #2



DETAIL OF POSTS (#3 through #8)

⊛ Optional 4'-6" or 5'-0" tube w/soil plate may be used as per the manufacturer's specifications.

GENERAL NOTE

Use approved wood (shown & described) or steel posts ① through ⑦ on the (SKT) provided by the manufacturer. Terminal post type used is independent of post type used on the remainder of the installation. No mixing of post types allowed in guard fence run.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

All steel parts shall be galvanized after fabrication.

Install retroreflective sheeting as shown on the face of the extruder prior to installations. Thoroughly clean and dry extruder prior to applying sheeting.

The cable anchor assembly must be taut. Use a locking device, (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nuts.

The soil tubes should not protrude more than 4" above ground (measured along a 5'-0" cord). Site grading may be necessary to meet this requirement.

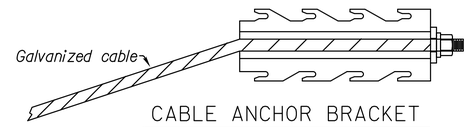
The steel tubes may be driven with an approved driving head. Do not drive steel tubes with wood post in the tube. Backfill and satisfactorily compact around steel tubes placed in drilled holes to prevent tube settlement.

When rock is encountered during installation, see standard specifications for procedure.

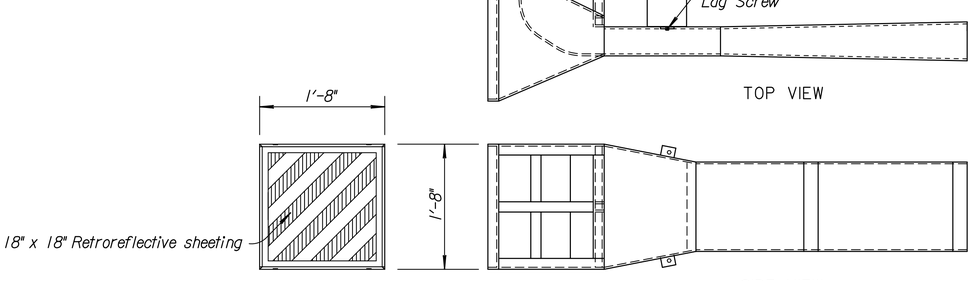
All work and materials required for installation of this terminal shall be paid under the bid item "Guardrail End Terminal (SKT)".

End Terminal (SKT) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual (furnished to Engineer) for component details and installation instructions.

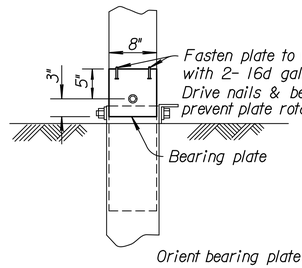
See RD611 & RD613 for details of guardrail not shown.

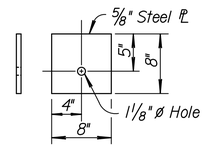


CABLE ANCHOR BRACKET



DETAILS OF IMPACT HEAD





BEARING PLATE

Orient bearing plate as shown with the hole 5" from the top.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1	12-14-10	Revised notes, 28" railheight	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (SKT)

RD606C

FHWA APPROVAL	1-11-11	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

KDOT Graphics Certified 02-14-2011

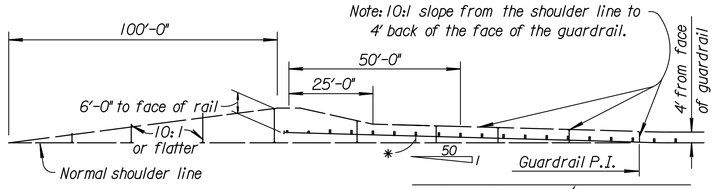
KDOT Graphics Certified

Plotted : 14-FEB-2011 06:34

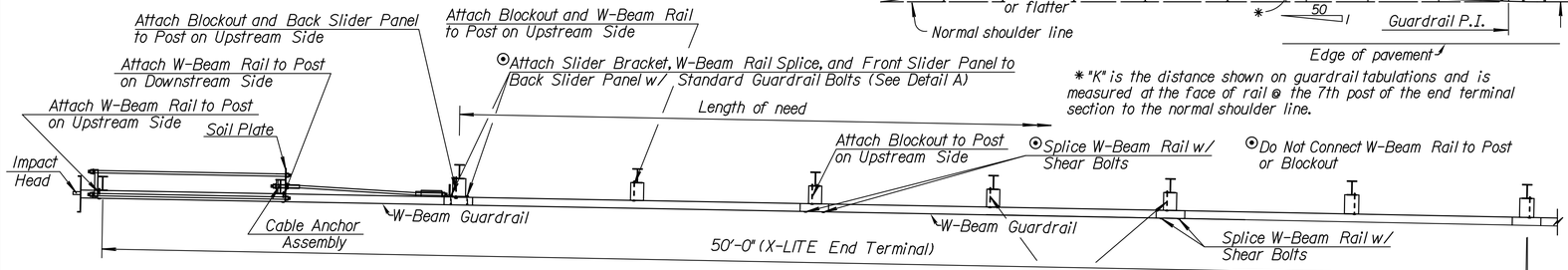
Drawn By : bert
File : rd606c.dgn (rd606c)

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

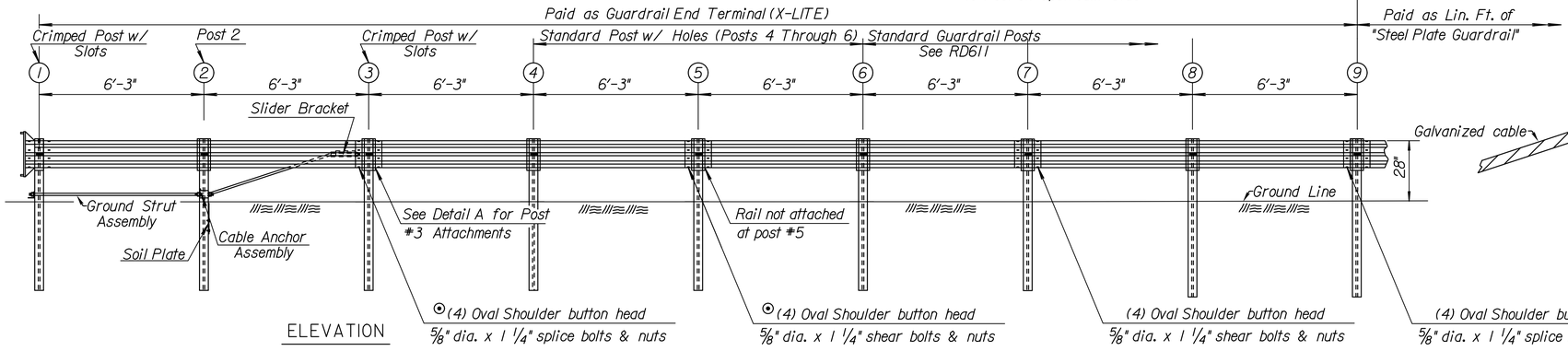
Note: The minimum length of w-beam guardrail required between the guardrail end terminal and any transition section, including the thrie-beam transition section, is 12'-6" for all installations.



* "K" is the distance shown on guardrail tabulations and is measured at the face of rail @ the 7th post of the end terminal section to the normal shoulder line.



PLAN



ELEVATION

GENERAL NOTES

Use approved steel posts ① through ③ on the (X-LITE) provided by the manufacturer. Terminal post type used is independent of the post type used on the remainder of the installation. No mixing of post types allowed.

Use approved 8 inch blockouts for posts ① through ⑥. The blockout size used in the end terminal may be independent of the size used in the remainder of the installation.

Lap guardrail splices, including terminal connector, in the direction of traffic for entrance installations. For exit installations, lap guardrail splices in the opposite direction of traffic at posts 3, 5, and 7. Where traffic is temporarily carried in the opposite direction of the final configuration, lap rail splices in the direction of permanent traffic for entrance installations only.

When rock is encountered during installation, see Manufacturer's Installation Manual, furnished to the Engineer, for procedure.

The cable anchor must be taught. Use a locking device (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nut.

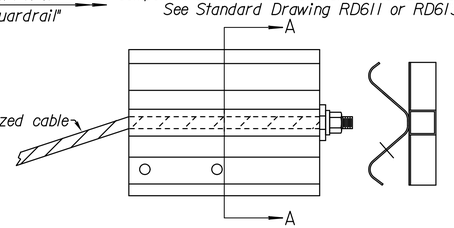
Apply retroreflective sheeting as shown on the face of the impact head prior to installation. Thoroughly clean and dry steel prior to applying sheeting.

Galvanize all steel after fabrication.

All work and materials required for installation of this terminal are paid under the bid item "Guardrail End Terminal (X-LITE Parallel)".

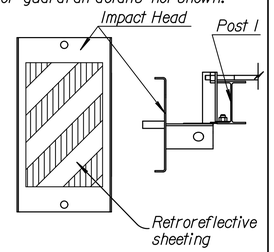
End Terminal (X-LITE) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual for component details and installation instructions.

See Standard Drawing RD611 or RD613 for guardrail details not shown.

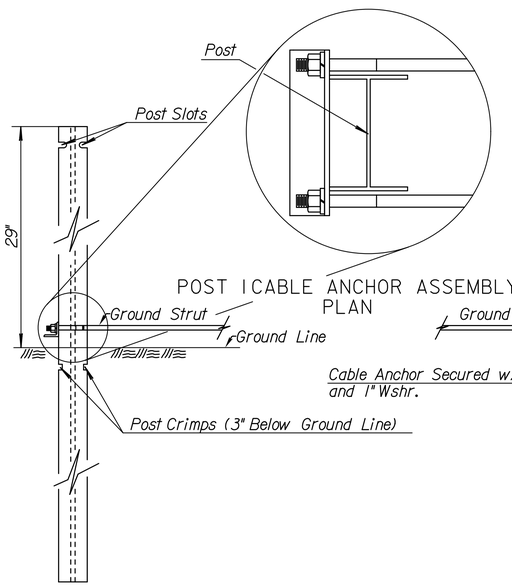


ELEVATION SECTION A-A

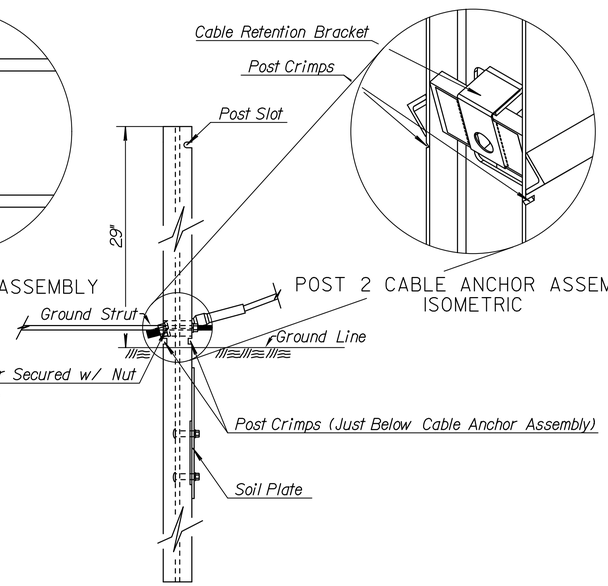
SLIDER BRACKET



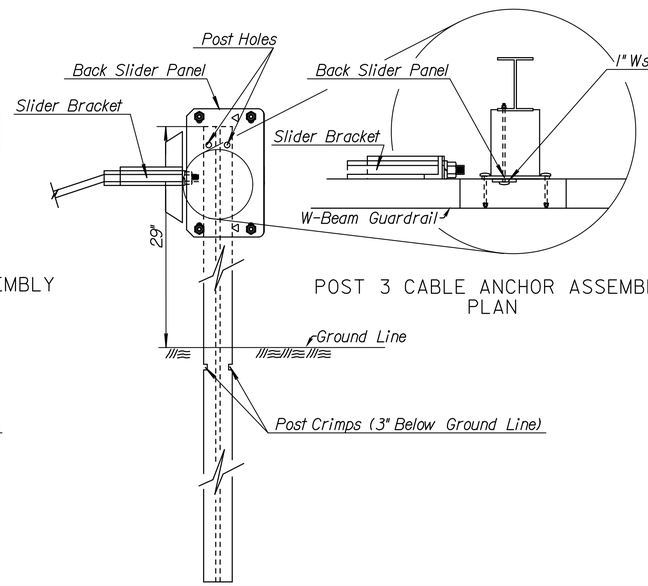
IMPACT HEAD DETAIL



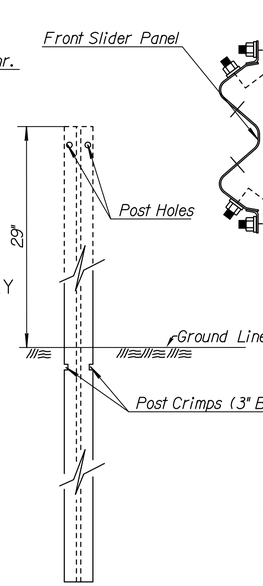
POST 1 CABLE ANCHOR ASSEMBLY PLAN

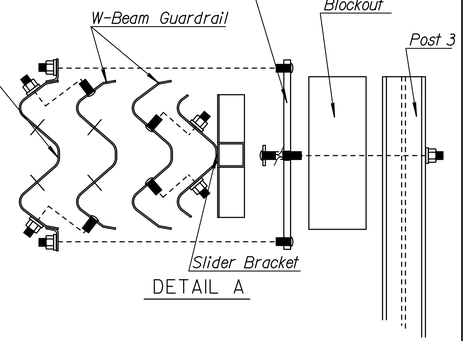


POST 2 CABLE ANCHOR ASSEMBLY ISOMETRIC



POST 3 CABLE ANCHOR ASSEMBLY PLAN





DETAIL A

PARTIAL VIEW OF POST 1 ELEVATION

PARTIAL VIEW OF POST 2 ELEVATION

PARTIAL VIEW OF POST 3 ELEVATION

PARTIAL VIEW OF POST 4 to 6 ELEVATION

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1	1-27-15	Initial Release	K.E.K.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL X-LITE (PARALLEL)

RD606H

FHWA APPROVAL	10-6-15	APP'D. Scott W. King	
DESIGNED	DETAILED	QUANTITIES	TRACED Rhoads
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Keele

Void March 15, 2017

KDOT Graphics Certified 08-23-2016

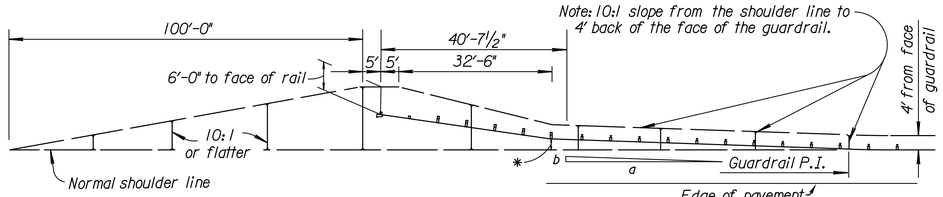
KDOT Graphics Certified

Plotted : 23-AUG-2016 13:51

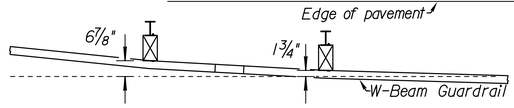
Drawn By : thoads
File : rd606h.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

Note: The minimum length of w-beam guardrail required between the thrie-beam transition and the guardrail end terminal is 12'-6" for all installations.

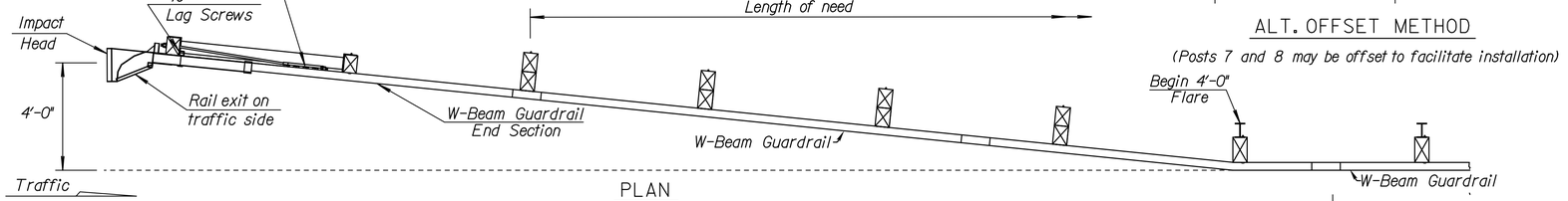


*"K" is the distance shown on guardrail tabulations and is measured at the face of rail @ the 7th post of the end terminal section to the normal shoulder line.

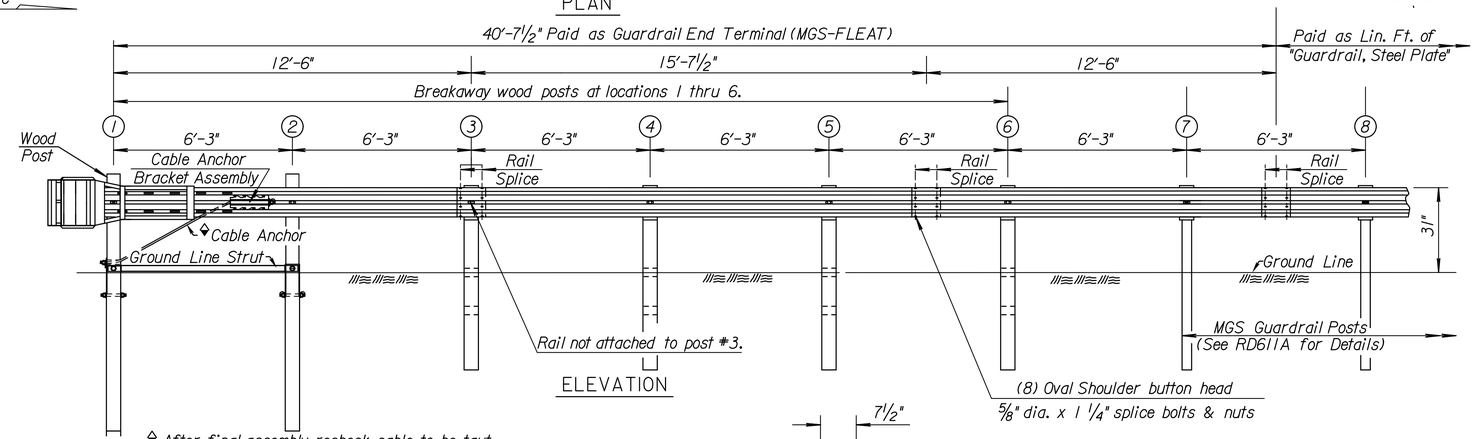


ALT. OFFSET METHOD

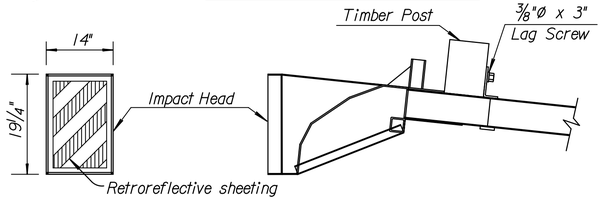
(Posts 7 and 8 may be offset to facilitate installation)



PLAN

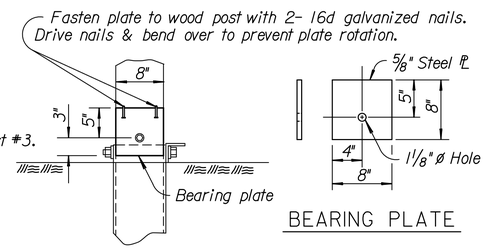


ELEVATION



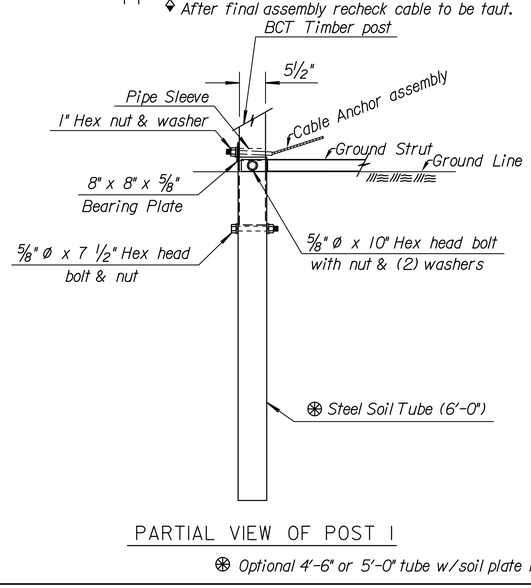
CABLE ANCHOR BRACKET

IMPACT HEAD CONNECTING DETAIL

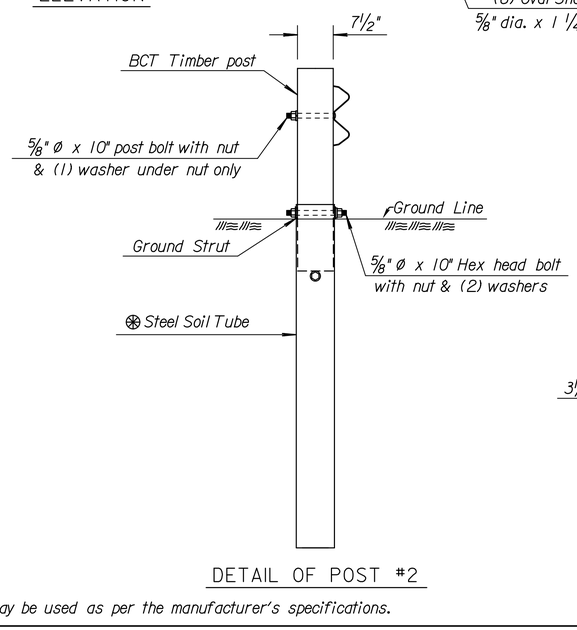


BEARING PLATE

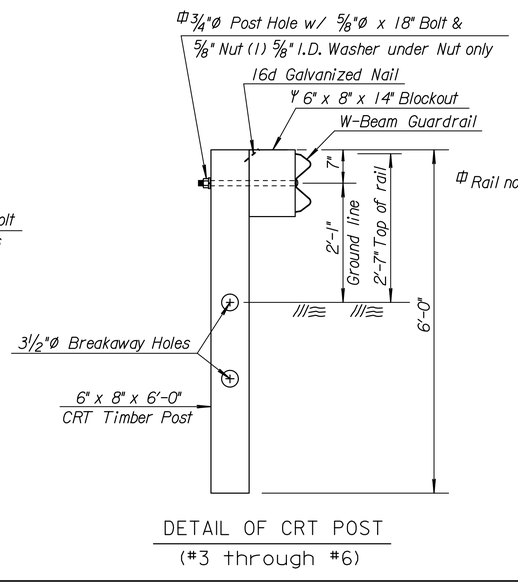
Orient bearing plate as shown with the hole 5" from the top.



PARTIAL VIEW OF POST 1



DETAIL OF POST #2



DETAIL OF CRT POST

(#3 through #6)

♦ Optional 4'-6" or 5'-0" tube w/soil plate may be used as per the manufacturer's specifications.

GENERAL NOTES

Use approved wood (shown & described) or steel posts ① through ⑥ on the (MGS-FLEAT) provided by the manufacturer. Terminal post type used is independent of post type used on the remainder of the installation. No mixing of post types allowed in guardrail run.

Use approved 8 inch (shown) or 12 inch blockouts for posts ① through ⑥. The blockout size used in the end terminal may be independent of the size used in the remainder of the installation.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

Drive the steel soil tubes with an approved driving head. Do not drive steel tubes with wood post in the tube. Backfill and satisfactorily compact around steel tubes placed in drilled holes to prevent tube settlement.

The soil tubes should not protrude more than 4" above ground (measured along a 5'-0" cord). If necessary grade the site to meet this requirement. When rock is encountered during installation, see Manufacturer's Installation Manual for procedure.

The cable anchor assembly must be taut. Use a locking device, (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nuts.

Apply retroreflective sheeting as shown on the face of the impact head prior to installation. Thoroughly clean and dry steel prior to applying sheeting.

Galvanize all steel parts after fabrication.

All work and materials required for installation of this terminal are paid under the bid item "Guardrail End Terminal (MGS-FLEAT)".

End Terminal (MGS-FLEAT) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual (furnished to Engineer) for component details and installation instructions.

See Standard Drawing RD611A for guardrail post details.

NO.	DATE	REVISIONS	BY	APP'D
3	8-26-15	Rev. Blockouts End Term. & Gen. Note	K.E.K.	S.W.K.
2	1-29-13	Revised Offset Method, End Term.	S.W.K.	J.O.B.
1	1-24-12	Revised Dimension, End Term.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (MGS-FLEAT) FLARED

RD606E

FHWA APPROVAL	10-6-15	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED Rhoads
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Keele

KDOT Graphics Certified 10-09-2015

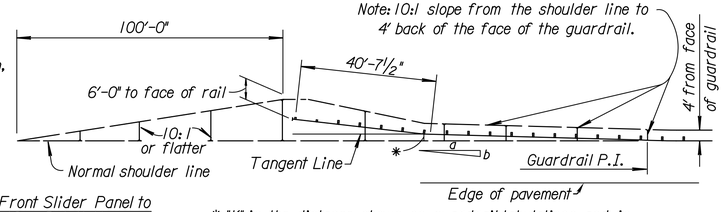
KDOT Graphics Certified

Plotted : 27-OCT-2015 14:53

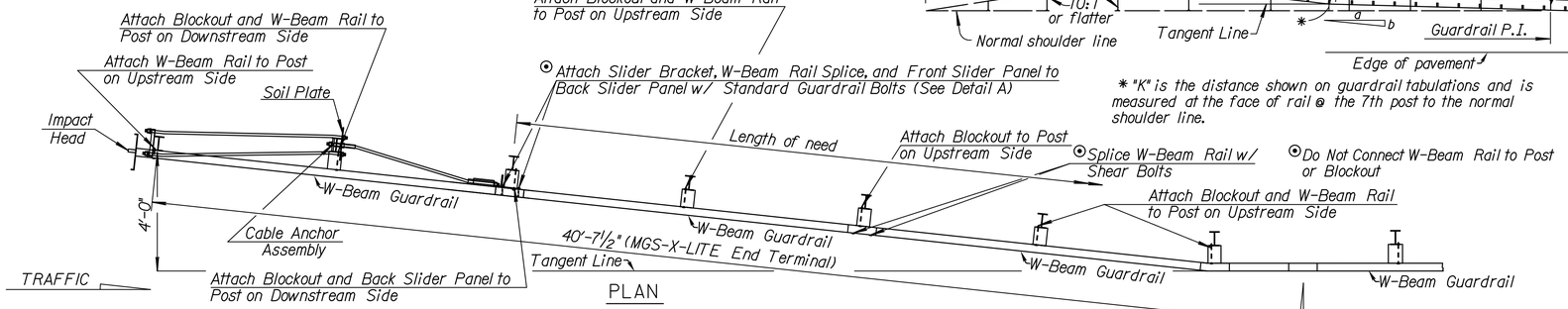
Drawn By : trhoads
File : rd606e.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

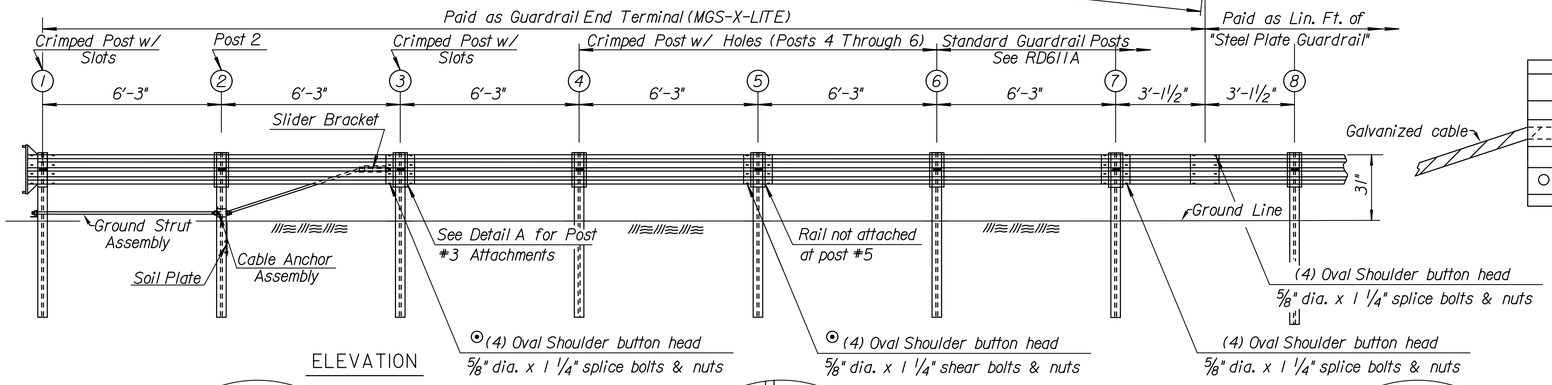
Note: The minimum length of w-beam guardrail required between the guardrail end terminal and any transition section, including the thrie-beam transition section, is 12'-6" for all installations.



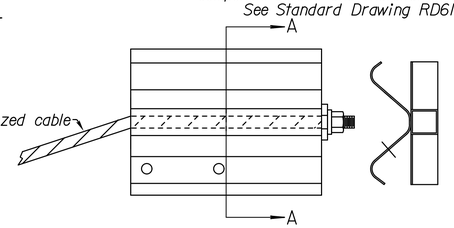
* "K" is the distance shown on guardrail tabulations and is measured at the face of rail @ the 7th post to the normal shoulder line.



PLAN

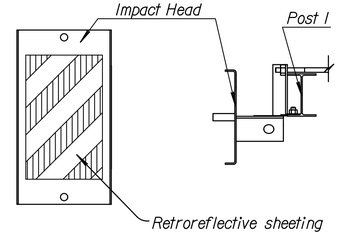


ELEVATION



ELEVATION SECTION A-A

SLIDER BRACKET



IMPACT HEAD DETAIL

GENERAL NOTES

Use approved steel posts ① through ⑥ on the (MGS-X-LITE) provided by the manufacturer. Terminal post type used is independent of the post type used on the remainder of the installation. No mixing of post types allowed.

Use approved 8 inch blockouts for posts ① through ⑥. The blockout size used in the end terminal may be independent of the size used in the remainder of the installation.

Lap guardrail splices, including terminal connector, in the direction of traffic for entrance installations. For exit installations, lap guardrail splices in the opposite direction of traffic at posts 3, 5, and 7. Where traffic is temporarily carried in the opposite direction of the final configuration, lap rail splices in the direction of permanent traffic for entrance installations only.

When rock is encountered during installation, see Manufacturer's Installation Manual, furnished to the Engineer, for procedure.

The cable anchor must be taught. Use a locking device (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nut.

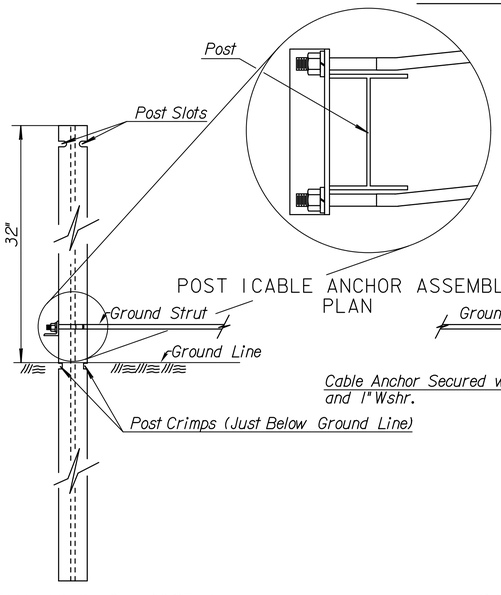
Apply retroreflective sheeting as shown on the face of the impact head prior to installation. Thoroughly clean and dry steel prior to applying sheeting.

Galvanize all steel after fabrication.

All work and materials required for installation of this terminal are paid under the bid item "Guardrail End Terminal (MGS-X-LITE Flared)".

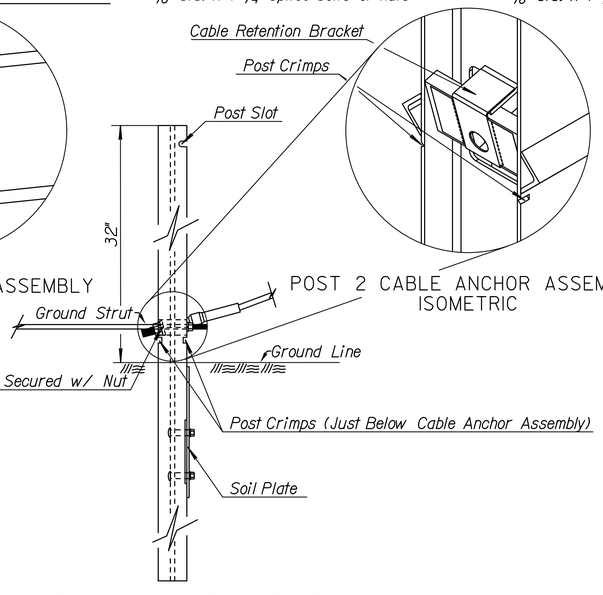
End Terminal (MGS-X-LITE) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual for component details and installation instructions.

See Standard Drawing RD611A or RD613A for guardrail details not shown.



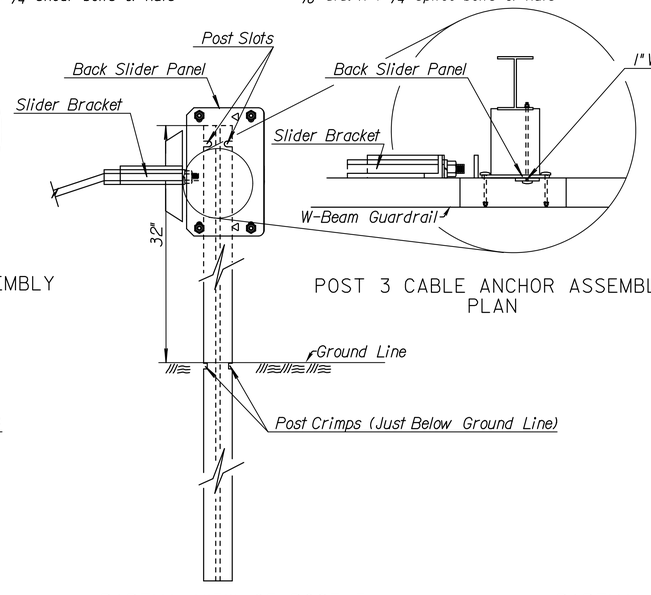
POST 1 CABLE ANCHOR ASSEMBLY PLAN

PARTIAL VIEW OF POST 1 ELEVATION



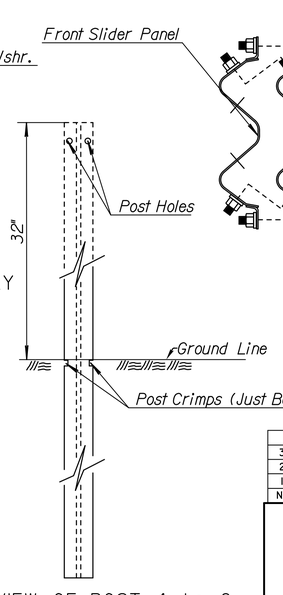
POST 2 CABLE ANCHOR ASSEMBLY ISOMETRIC

PARTIAL VIEW OF POST 2 ELEVATION

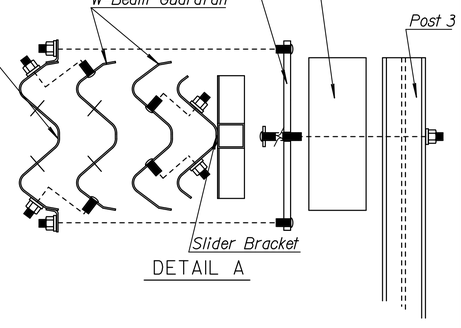


POST 3 CABLE ANCHOR ASSEMBLY PLAN

PARTIAL VIEW OF POST 3 ELEVATION



PARTIAL VIEW OF POST 4 to 6 ELEVATION



DETAIL A

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1	1-27-15	Initial Release	K.E.K.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL MGS-X-LITE (FLARED)

RD606I

FHWA APPROVAL	10-6-15	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED Rhoads
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Keele

Void March 15, 2017

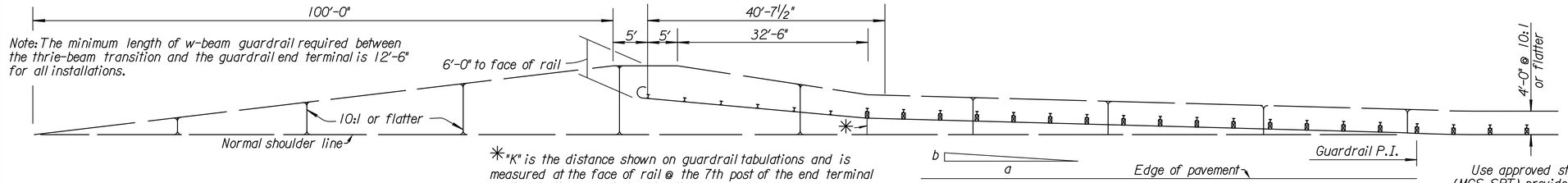
KDOT Graphics Certified 08-23-2016

KDOT Graphics Certified

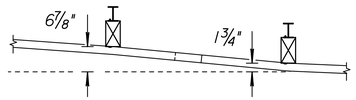
Plotted : 23-AUG-2016 13:52

Drawn By : trhoads
File : rd606i.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				



✳"K" is the distance shown on guardrail tabulations and is measured at the face of rail @ the 7th post of the end terminal section to the normal shoulder line.



ALT. OFFSET METHOD

(Posts 7 and 8 may be offset to facilitate installation)

GENERAL NOTE

Use approved steel (shown & described) or wood posts ① through ⑥ on the (MGS-SRT) provided by the manufacturer. Terminal post type used is independent of post type used on the remainder of the installation. No mixing of post types allowed in guardrail run.

When wood posts are used, use approved 8 inch or 12 inch blockouts for posts ① through ⑥. The blockout size used in the end terminal may be independent of the size used in the remainder of the installation.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

The cable anchor assembly must be taut. Use a locking device, (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nuts.

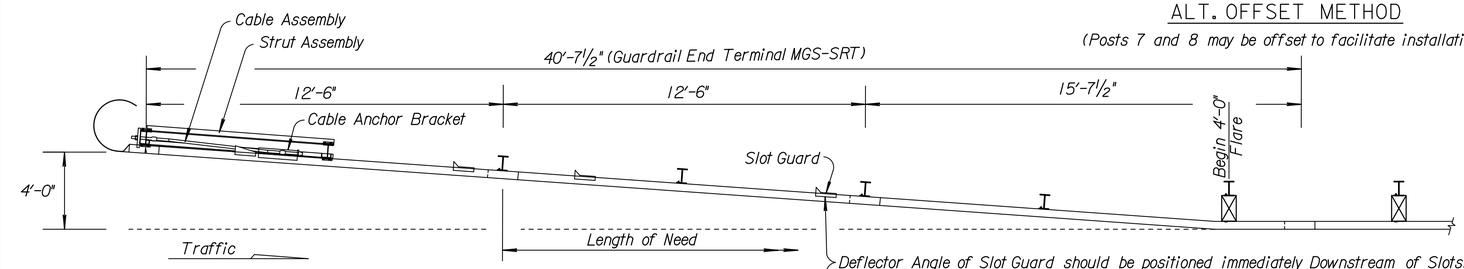
When rock is encountered during installation, see Manufacturer's Installation Manual for procedure.

End Terminal (MGS-SRT) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual (furnished to Engineer) for component details and installation instructions.

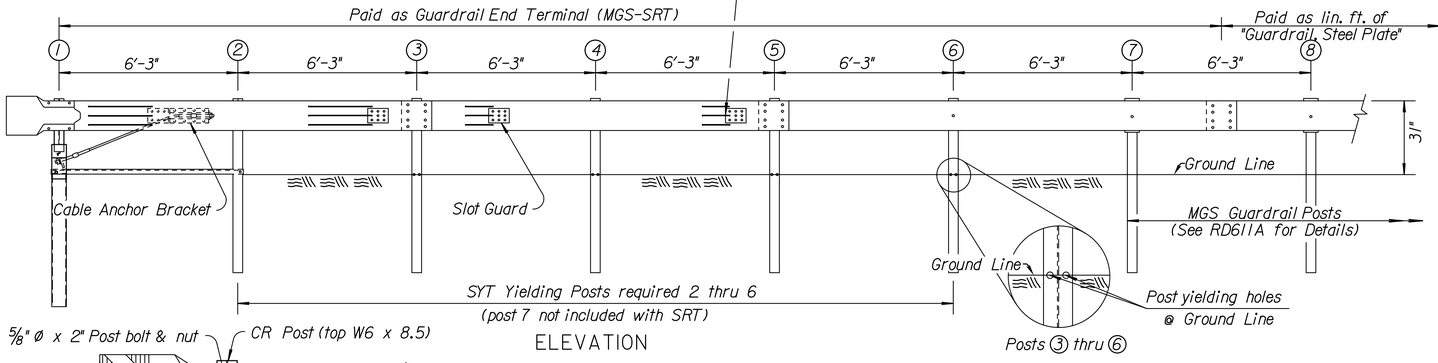
All work and materials required for installation of this terminal are paid under the bid item "Guardrail End Terminal (MGS-SRT)".

Galvanize all steel parts after fabrication.

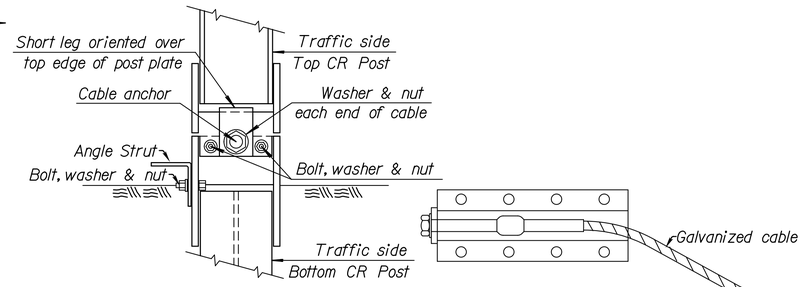
See Standard Drawing RD611A for guardrail post details.



PLAN

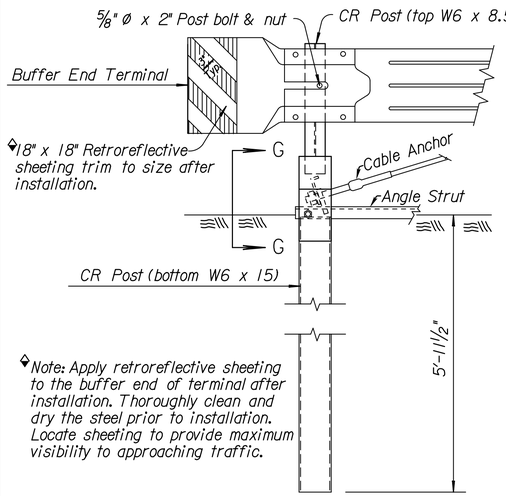


ELEVATION

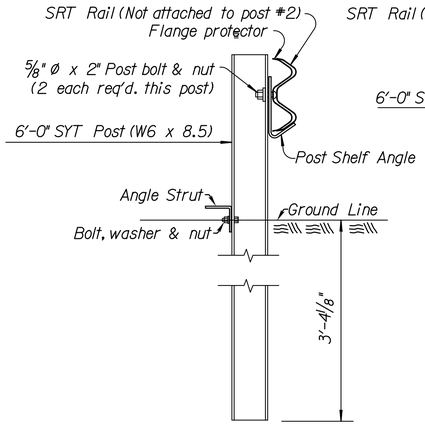


SECTION G-G
(Post #1)

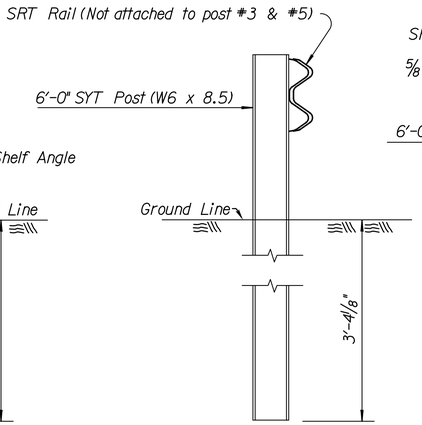
CABLE ANCHOR BRACKET



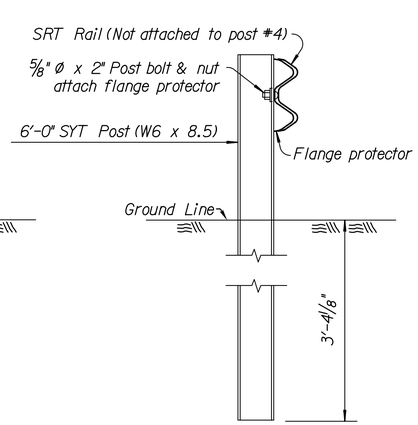
DETAIL of POST #1



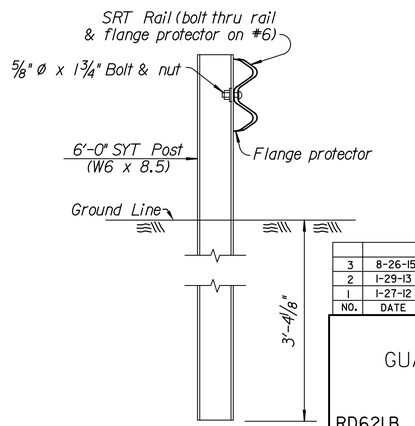
DETAIL OF POST #2



DETAIL OF POST #3 & #5



DETAIL OF POST #4



DETAIL OF POST #6

NO.	DATE	REVISIONS	BY	APP'D
3	8-26-15	Revised General Note	K.E.K.	S.W.K.
2	1-29-13	Revised Offset Method, End Term.	S.W.K.	J.O.B.
1	1-27-12	Revised Dimensions, End Term.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (MGS-SRT) FLARED

RD621B

FHWA APPROVAL		APP'D. Scott W. King	
DESIGNED	DETAILED	QUANTITIES	TRACED Rhoads
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Keele

KDOT Graphics Certified 10-27-2015

Plotted : 27-OCT-2015 15:40

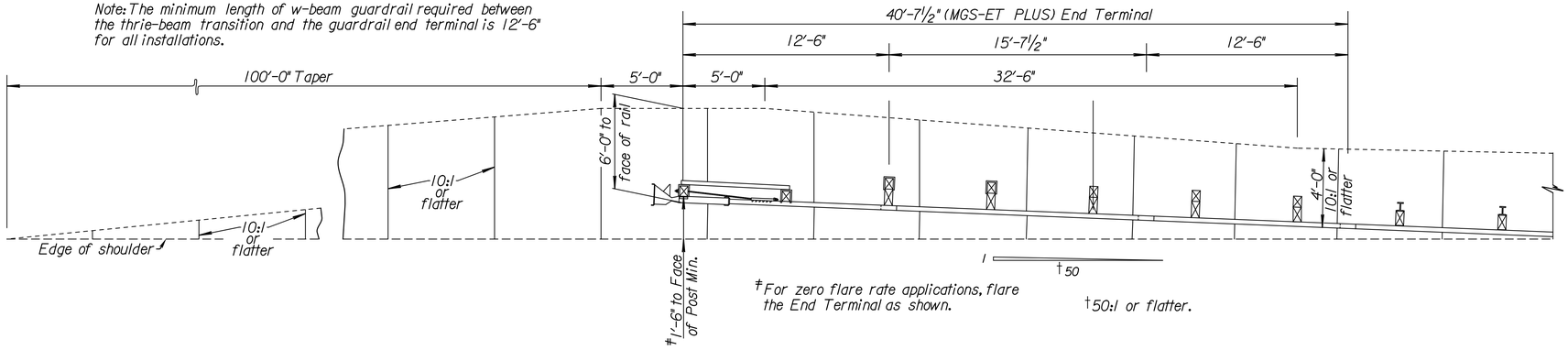
Drawn By : trhoads

File : rd621b.dgn

KDOT Graphics Certified

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

Note: The minimum length of w-beam guardrail required between the thrie-beam transition and the guardrail end terminal is 12'-6" for all installations.



‡For zero flare rate applications, flare the End Terminal as shown.

†50:1 or flatter.

GENERAL NOTE

Use approved wood (shown & described) or steel posts ① through ⑥ on the (MGS-ET PLUS) provided by the manufacturer. Terminal post type used is independent of post type used on the remainder of the installation. No mixing of post types allowed in guardrail run.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

Drive the steel soil tubes with an approved driving head. Do not drive steel tubes with wood post in the tube. Backfill and satisfactorily compact around steel tubes placed in drilled holes to prevent tube settlement.

The soil tubes should not protrude more than 4" above ground (measured along a 5'-0" cord). If necessary grade the site to meet this requirement.

Apply retroreflective sheeting as shown on the face of the extruder prior to installation. Thoroughly clean and dry extruder prior to applying sheeting.

Galvanize all steel parts after fabrication.

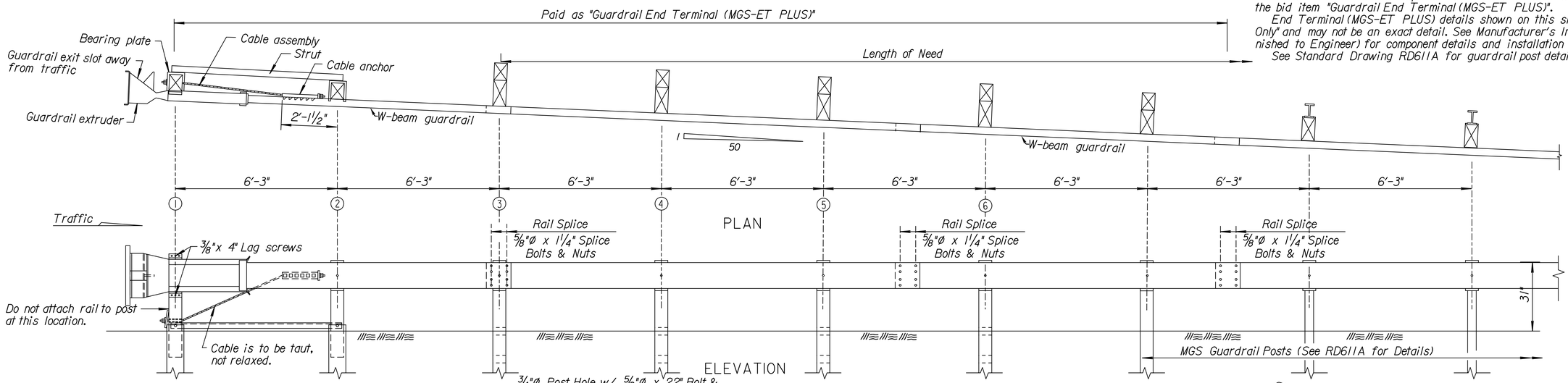
The cable anchor assembly must be taut. Use a locking device, (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nuts.

When rock is encountered during installation, see Manufacturer's Installation Manual for procedure.

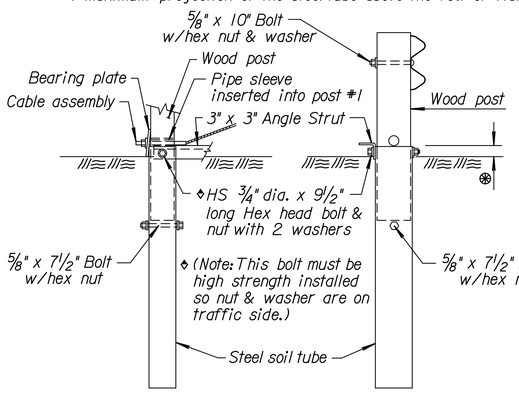
All work and materials required for installation of this terminal are paid under the bid item "Guardrail End Terminal (MGS-ET PLUS)".

End Terminal (MGS-ET PLUS) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual (furnished to Engineer) for component details and installation instructions.

See Standard Drawing RD611A for guardrail post details.

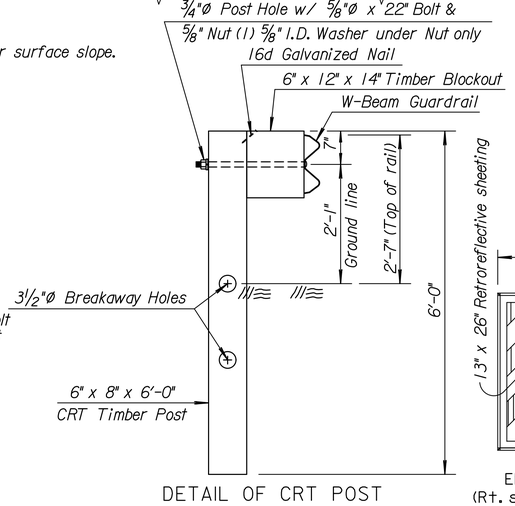


❀ 4" maximum projection of the steel tube above the 10:1 or flatter surface slope.

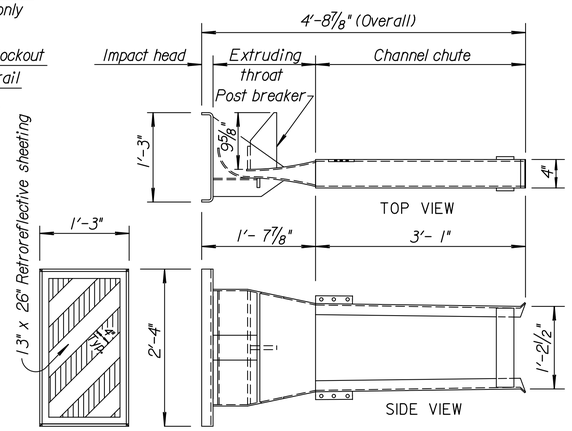


PARTIAL VIEW OF POST #1 (Front)

DETAIL OF POST #2 (Side)

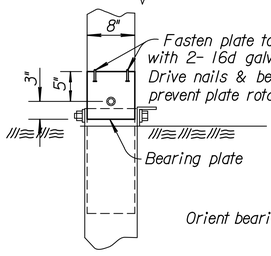


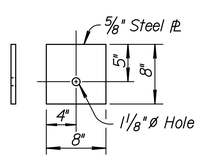
DETAIL OF CRT POST (#3 through #6)



END VIEW (Rt. side object marker shown)

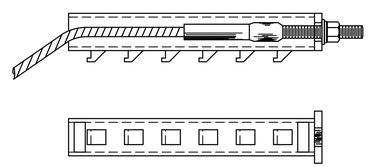
ET PLUS HEAD





BEARING PLATE

Orient bearing plate as shown with the hole 5" from the top.



CABLE ANCHOR ASSEMBLY

NO.	DATE	REVISIONS	BY	APP'D
3	6-13-13	Revised Post, Post No. 7	S.W.K.	J.O.B.
2	5-21-12	Revised Offset, End Term.	S.W.K.	J.O.B.
1	1-23-12	Revised Dimension, End Term.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (MGS-ET PLUS) PARALLEL

RD606D

FHWA APPROVAL	10-18-13	APP'D.	James O. Brewer
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Kling

Void October 1, 2017

KDOT Graphics Certified 10-28-2013

KDOT Graphics Certified

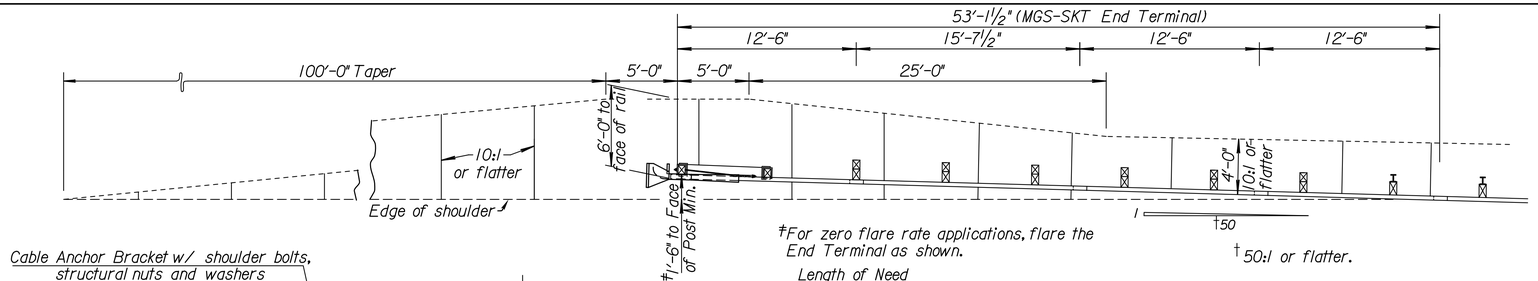
Note to Designer: 25:1 or flatter flare per manufacturer guidance can be used depending on design and site parameters. If a flare other than 50:1 or flatter (Typical) is used revise this sheet and all supporting sheets.

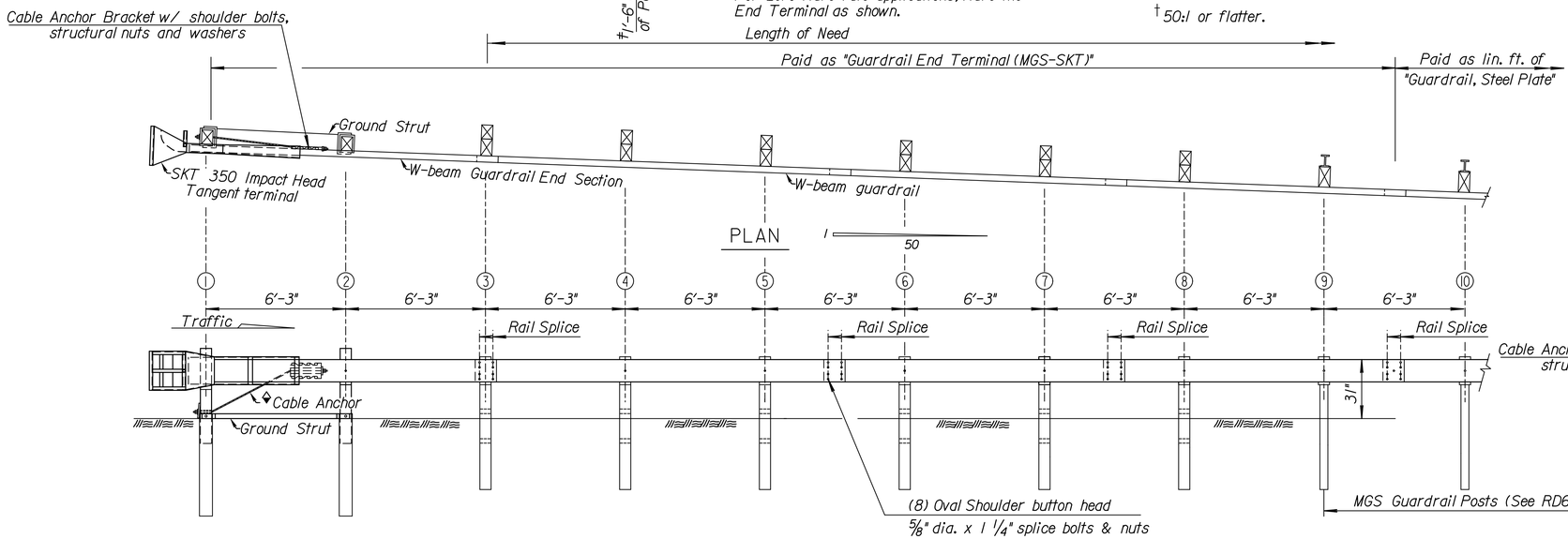
"Parallel" installations are flared at a rate of 50:1. "Zero Flare" installations follow the edge of shoulder.

Drawn By: trhoads Plotted: 08-FEB-2017 14:57
File: rd606d_Retired_10-27-14.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

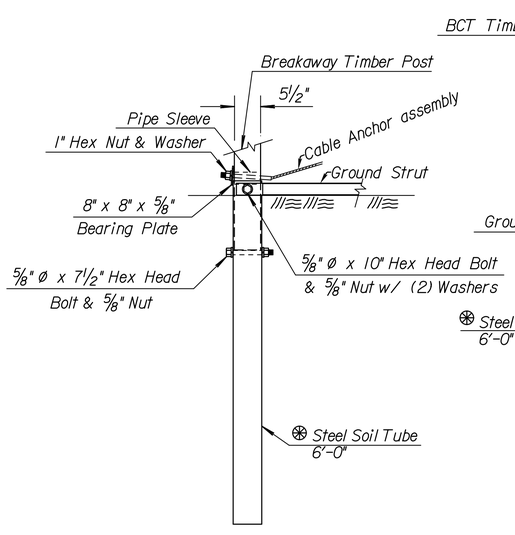
Note to Designer: 25:1 or flatter flare per manufacturer guidance can be used depending on design and site parameters. If a flare other than 50:1 or flatter (Typical) is used revise this sheet and all supporting sheets "Parallel" installations are flared at a rate of 50:1. "Zero Flare" installations follow the edge of shoulder.



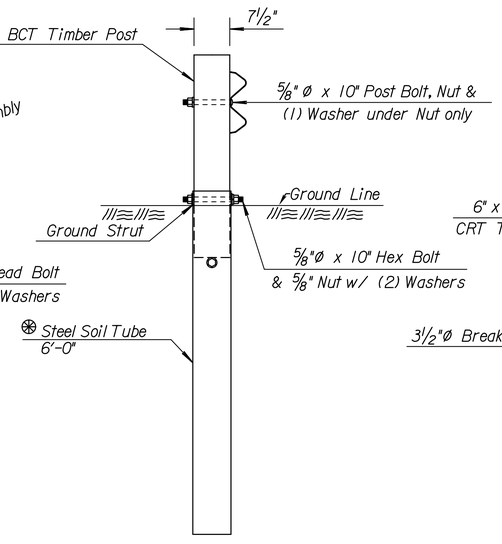


♦ After final assembly recheck cable to be taut.

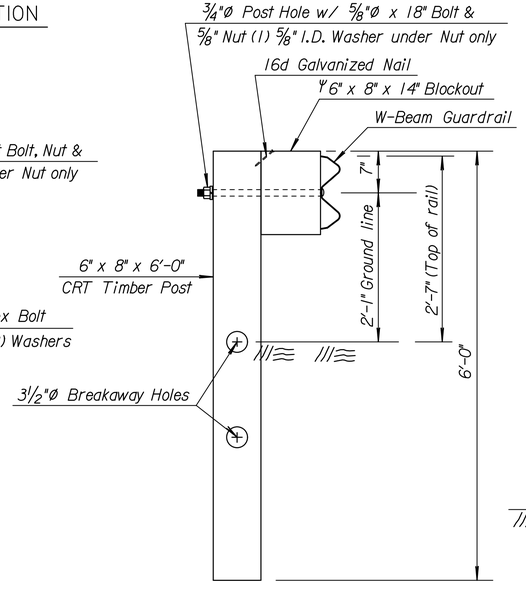
ELEVATION



PARTIAL VIEW OF POST #1



DETAIL OF POST #2



DETAIL OF CRT POST (#3 through #8)

◈ Optional 4'-6" or 5'-0" tube w/soil plate may be used as per the manufacturer's specifications.

Note: The minimum length of W-beam guardrail required between the guardrail end terminal and any transition section, including the thrie-beam transition, is 12'-6" for all installations.

GENERAL NOTES

Use approved wood (shown & described) or steel posts ① through ⑧ on the (MGS-SKT) provided by the manufacturer. Terminal post type used is independent of post type used on the remainder of the installation. No mixing of post types allowed in guardrail run.

Use approved 8 inch (shown) or 12 inch blockouts for posts ① through ⑧. The block-out size used in the end terminal may be independent of the size used in the remainder of the installation.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

Galvanize all steel parts after fabrication.

Apply retroreflective sheeting as shown on the face of the impact head prior to installation. Thoroughly clean and dry steel prior to applying sheeting.

The cable anchor assembly must be taut. Use a locking device, (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nuts.

The soil tubes should not protrude more than 4" above ground (measured along a 5'-0" cord). If necessary grade the site to meet this requirement.

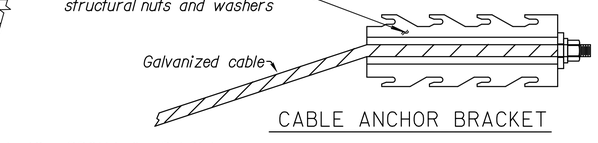
Drive the steel soil tubes with an approved driving head. Do not drive steel tubes with wood post in the tube. Backfill and satisfactorily compact around steel tubes placed in drilled holes to prevent tube settlement.

When rock is encountered during installation, see Manufacturer's Installation Manual for procedure.

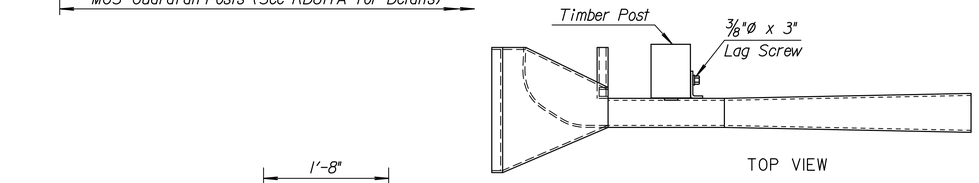
All work and materials required for installation of this terminal are paid under the bid item "Guardrail End Terminal (MGS-SKT)".

End Terminal (MGS-SKT) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual (furnished to Engineer) for component details and installation instructions.

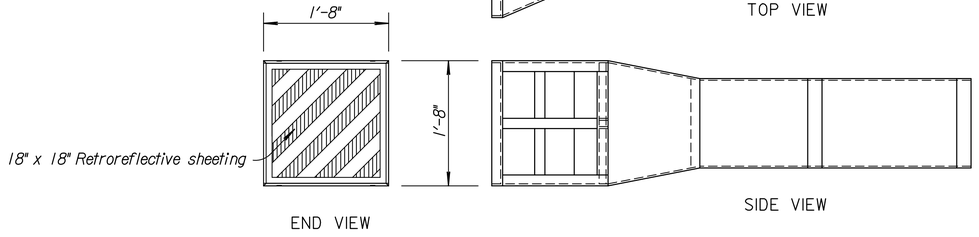
See Standard Drawing RD611A for guardrail post details.



CABLE ANCHOR BRACKET



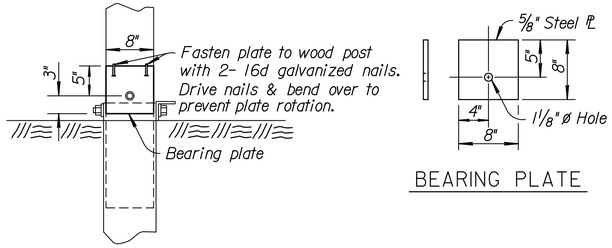
TOP VIEW



END VIEW

SIDE VIEW

DETAILS OF IMPACT HEAD



BEARING PLATE

Orient bearing plate as shown with the hole 5" from the top.

NO.	DATE	REVISIONS	BY	APP'D
3	8-26-15	Rev. End Terminal Layout	K.E.K.	S.W.K.
2	5-21-12	Revised Offset, End Term.	S.W.K.	J.O.B.
1	1-24-12	Revised Dimension, End Term.	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (MGS-SKT) PARALLEL

RD606F

FHWA APPROVAL	10-6-15	APP'D. Scott W. King	
DESIGNED	DETAILED	QUANTITIES	TRACED Rhoads
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Keele

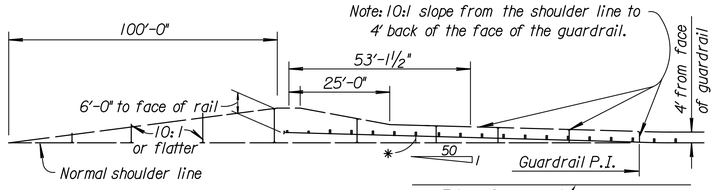
KDOT Graphics Certified 10-09-2015

KDOT Graphics Certified

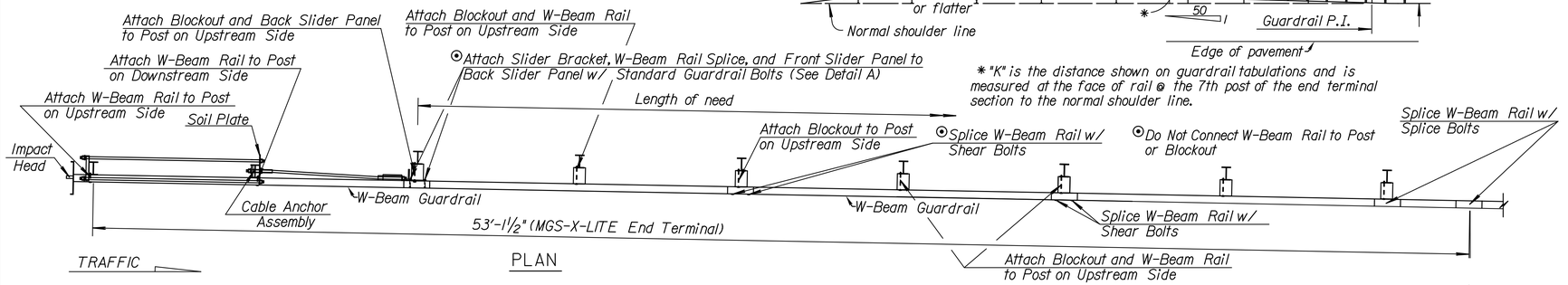
Drawn By : trhoads
File : rd606f.dgn
Plotted : 27-OCT-2015 14:56

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

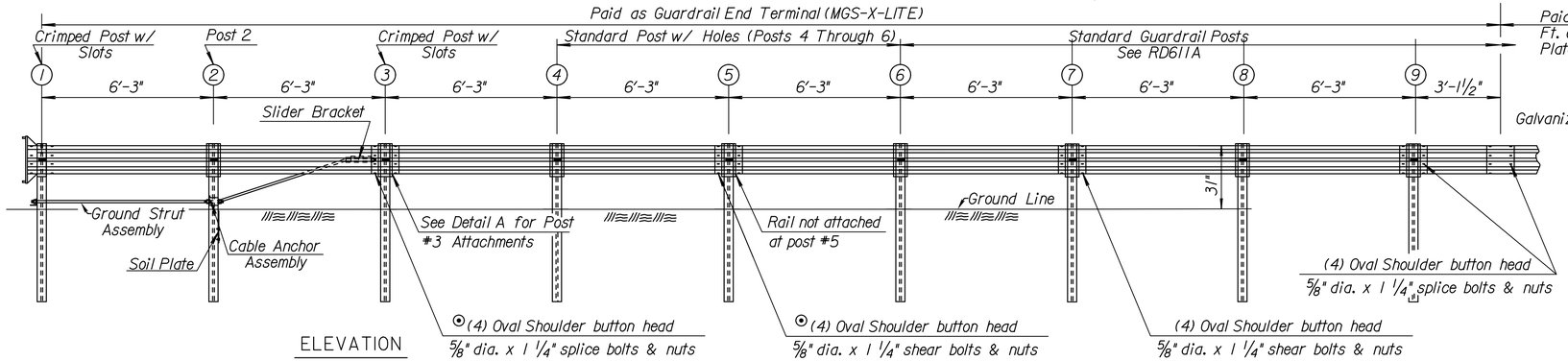
Note: The minimum length of w-beam guardrail required between the thrie-beam transition and the guardrail end terminal is 12'-6" for all installations.



* "K" is the distance shown on guardrail tabulations and is measured at the face of rail @ the 7th post of the end terminal section to the normal shoulder line.

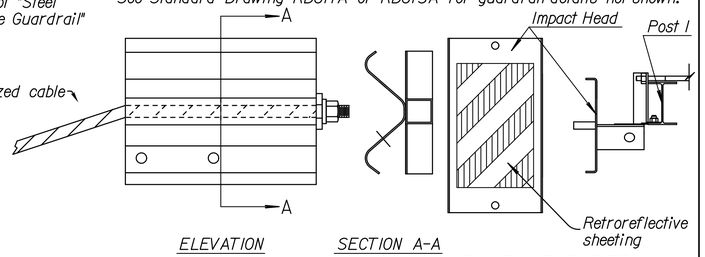


PLAN



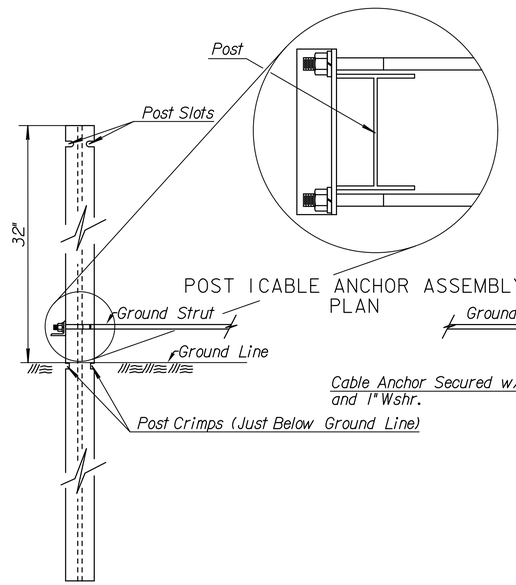
ELEVATION

Paid as Lin. Ft. of "Steel Plate Guardrail"

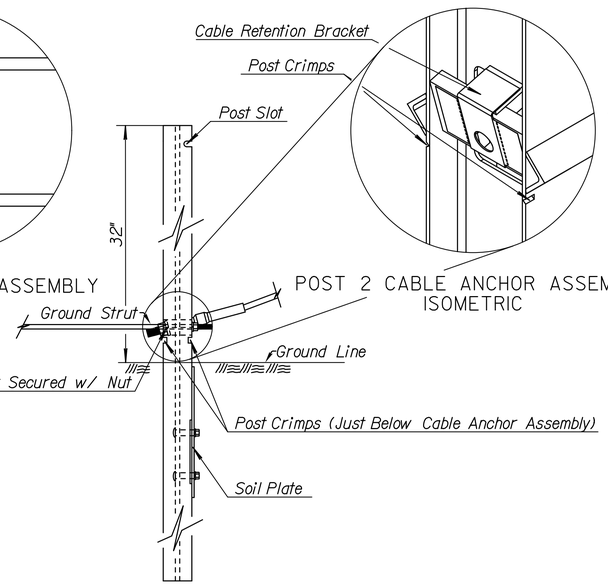


ELEVATION — SECTION A-A

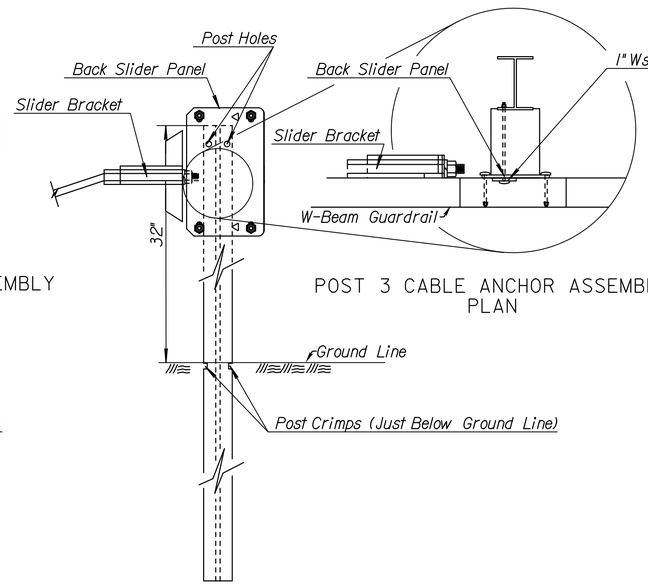
SLIDER BRACKET — IMPACT HEAD DETAIL



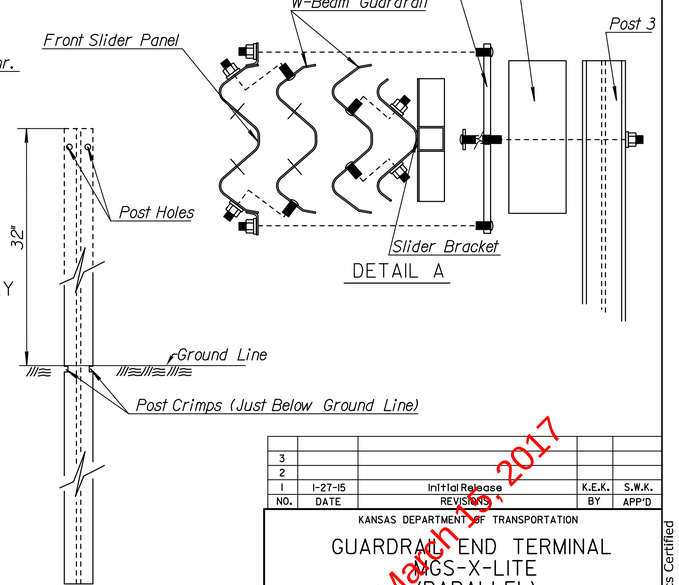
POST 1 CABLE ANCHOR ASSEMBLY
PLAN



POST 2 CABLE ANCHOR ASSEMBLY
ISOMETRIC



POST 3 CABLE ANCHOR ASSEMBLY
PLAN



DETAIL A

PARTIAL VIEW OF POST 1 ELEVATION

PARTIAL VIEW OF POST 2 ELEVATION

PARTIAL VIEW OF POST 3 ELEVATION

PARTIAL VIEW OF POST 4 to 6 ELEVATION

GENERAL NOTES

Use approved steel posts ① through ③ on the (MGS-X-LITE) provided by the manufacturer. Terminal post type used is independent of the post type used on the remainder of the installation. No mixing of post types allowed.

Use approved 8 inch blockouts for posts ① through ⑥. The blockout size used in the end terminal may be independent of the size used in the remainder of the installation.

Lap guardrail splices, including terminal connector, in the direction of traffic for entrance installations. For exit installations, lap guardrail splices in the opposite direction of traffic at posts 3, 5, and 7. Where traffic is temporarily carried in the opposite direction of the final configuration, lap rail splices in the direction of permanent traffic for entrance installations only.

When rock is encountered during installation, see Manufacturer's Installation Manual, furnished to the Engineer, for procedure.

The cable anchor must be taught. Use a locking device (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nut.

Apply retroreflective sheeting as shown on the face of the impact head prior to installation. Thoroughly clean and dry steel prior to applying sheeting.

Galvanize all steel after fabrication.

All work and materials required for installation of this terminal are paid under the bid item "Guardrail End Terminal (MGS-X-LITE Parallel)".

End Terminal (MGS-X-LITE) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual for component details and installation instructions.

See Standard Drawing RD611A or RD613A for guardrail details not shown.

NO.	DATE	REVISIONS	BY	APP'D
3				
2				
1	1-27-15	Initial Release	K.E.K.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL MGS-X-LITE (PARALLEL)

RD606J

FHWA APPROVAL	10-6-15	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED Rhoads
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. Keele

Void March 31, 2017

KDOT Graphics Certified 08-23-2016

KDOT Graphics Certified

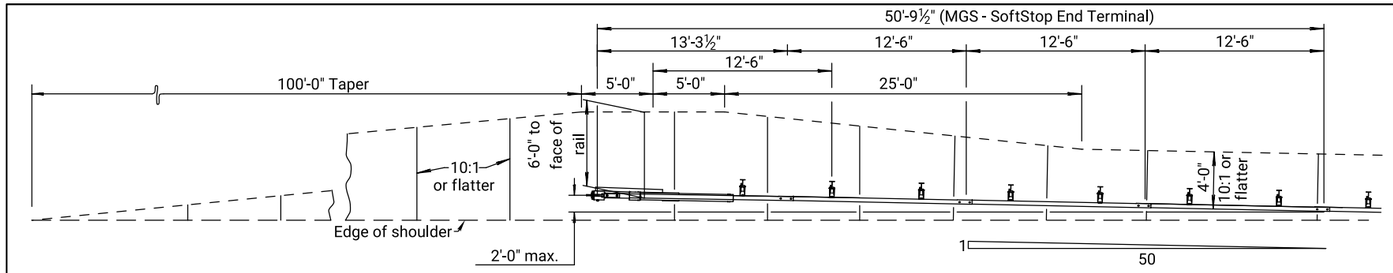
Plotted : 23-AUG-2016 13:53

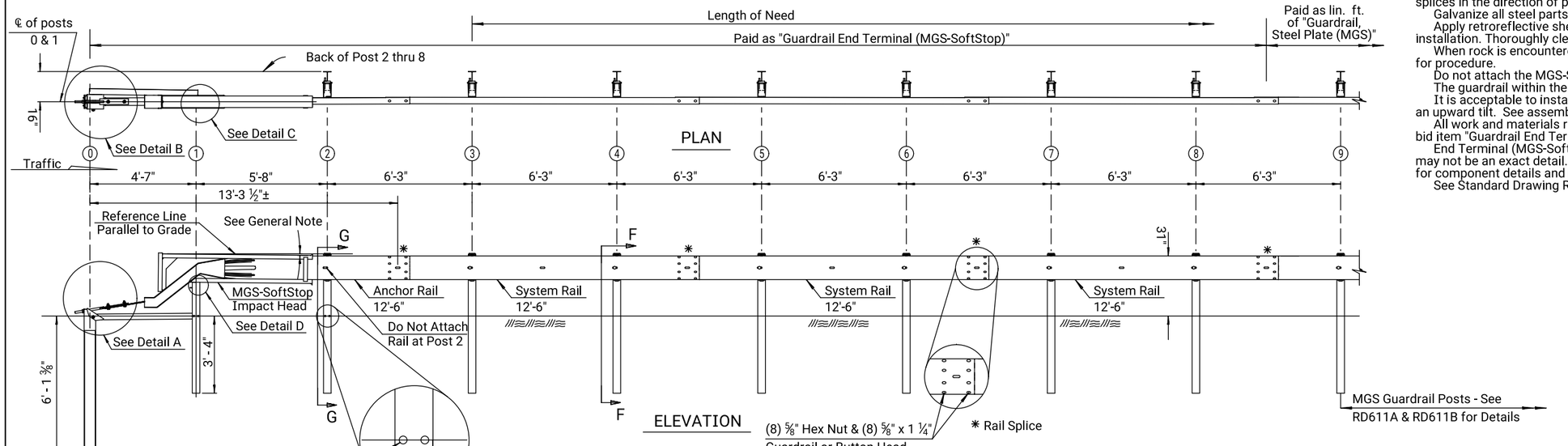
Drawn By : trhoads
File : rd606j.dgn

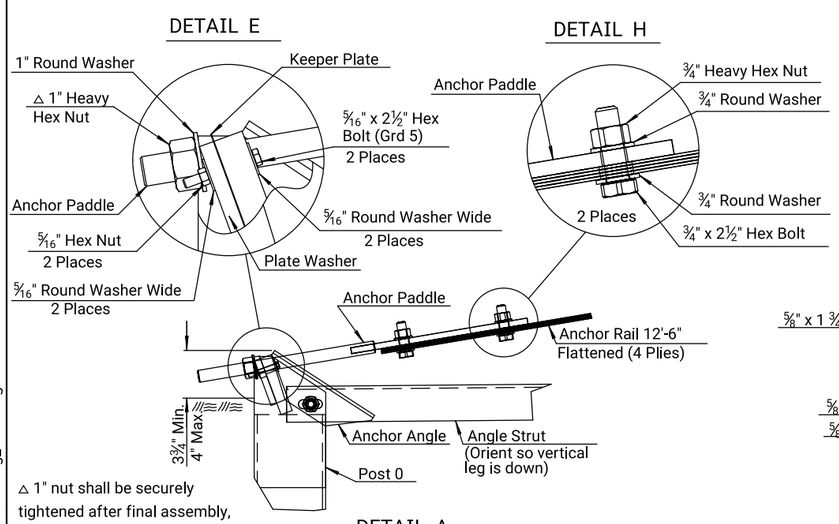
STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

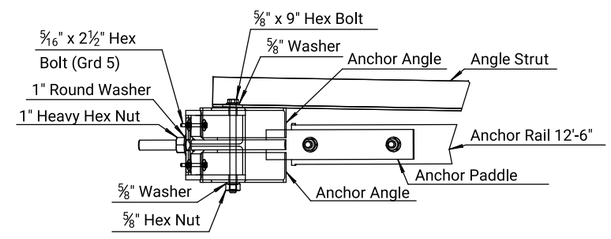
Note to Designer: Per the Manufacturer's Instruction Manual, the MGS-SoftStop may be flared at a rate up to 25:1 or flatter. Typical KDOT practice is to use a flare rate of 50:1 or flatter for parallel guardrail end terminals.

"Parallel" installations are flared at a rate of 50:1. "Zero Flare" installations follow the edge of the shoulder.

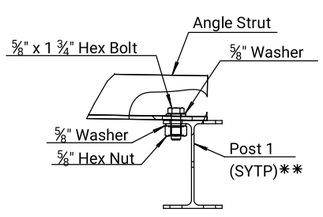




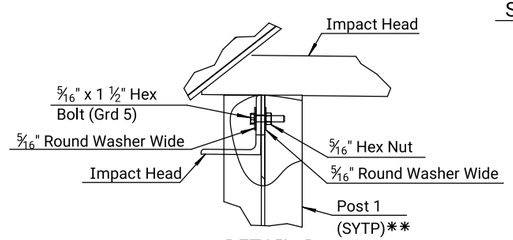




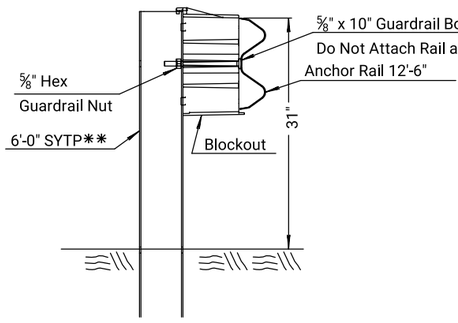
DETAIL B
(AT ANCHOR POST#0)



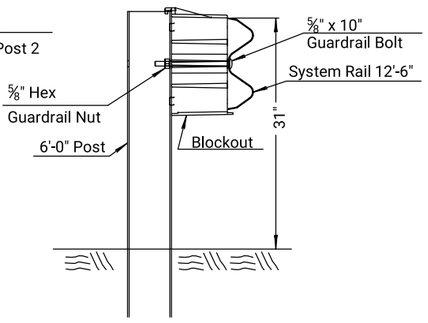
DETAIL C
(POST #1, SHOWN NEAR GROUND)



DETAIL D
(POST #1)



SECTION G-G
(POST #2)



SECTION F-F
(POST #3 - #8)

✱✱Steel Yielding Terminal Post (SYTP)

GENERAL NOTES

Use approved steel (shown & described) posts provided by the manufacturer for posts ⓪through⑧for the MGS-SoftStop End Terminal. Terminal post type used is independent of post type used on the remainder of the installation. No mixing of post types allowed in guardrail run.

Use approved 8 inch (shown) or 12 inch blockouts for posts②through⑧. The block-out size used in the end terminal may be independent of the size used in the remainder of the installation.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

Galvanize all steel parts after fabrication.

Apply retroreflective sheeting as shown on the face of the impact head prior to installation. Thoroughly clean and dry steel prior to applying sheeting.

When rock is encountered during installation, see Manufacturer's Installation Manual for procedure.

Do not attach the MGS-SoftStop End Terminal directly to rigid barrier.

The guardrail within the MGS-SoftStop End Terminal shall not be curved.

It is acceptable to install the MGS-SoftStop Impact head parallel to the grade line or with an upward tilt. See assembly manual for specific details.

All work and materials required for installation of this terminal are paid under the bid item "Guardrail End Terminal (MGS-SoftStop)".

End Terminal (MGS-SoftStop) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual (furnished to Engineer) for component details and installation instructions.

See Standard Drawing RD611A and RD611B for guardrail post details.

NO.	DATE	REVISIONS	BY	APP'D
1	5-15-17	Initial Release	A.L.R.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (MGS-SOFTSTOP) PARALLEL

RD606

FHWA APPROVAL 10-12-17		APP'D. Scott W. King	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

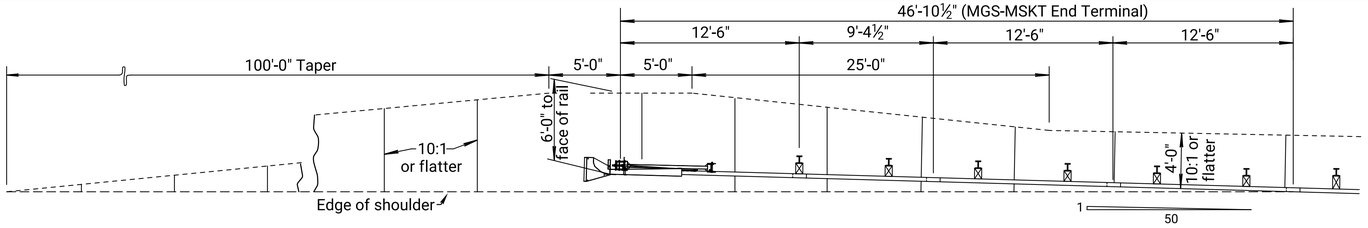
KDOT Graphics Certified 03-28-2018

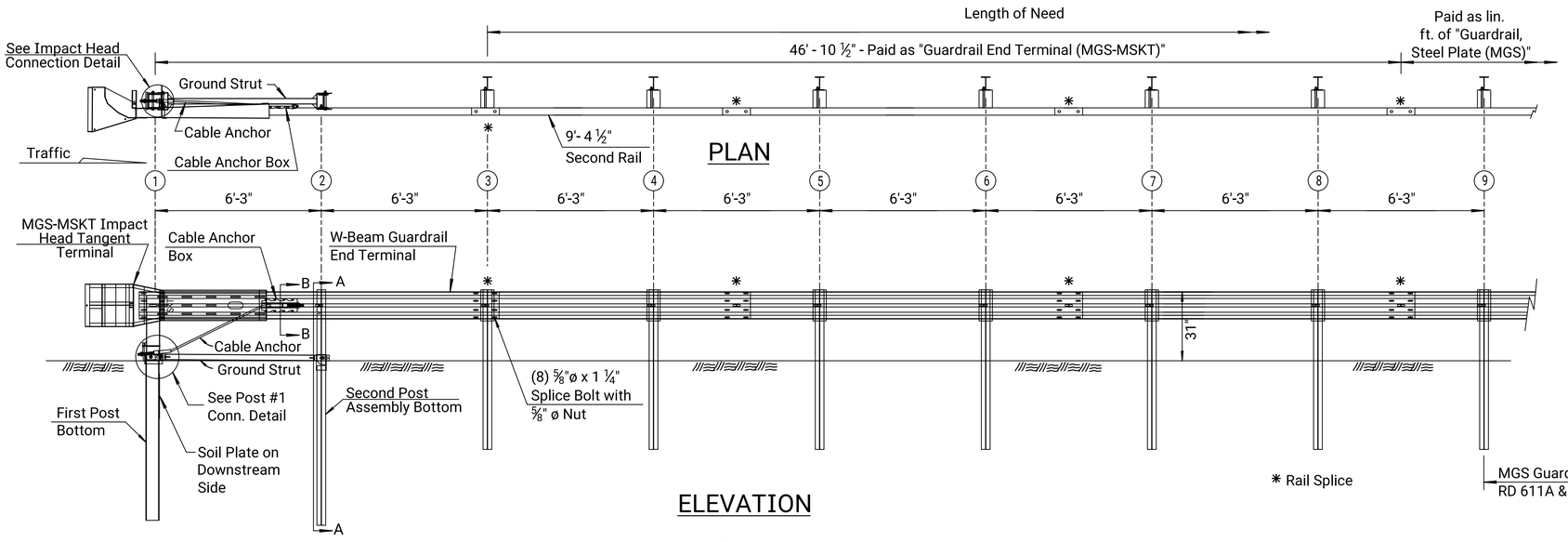
KDOT Graphics Certified

Plotted 28-MAR-2018 11:05

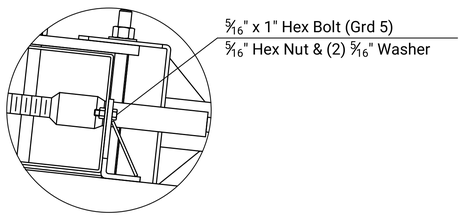
Drawn By : arockers
File : working_rd606.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

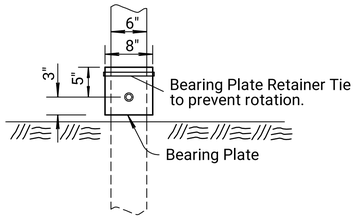


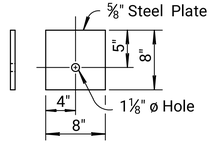


ELEVATION



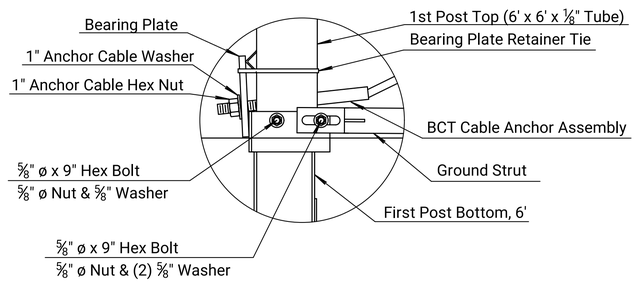
Impact Head Connection Detail



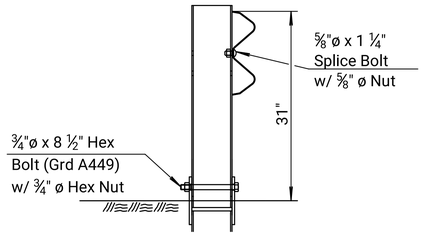


BEARING PLATE

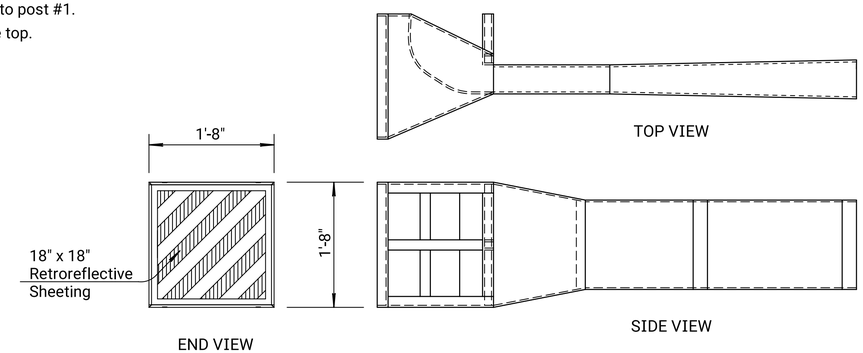
The bearing plate will rest on the angle spacer welded to post #1.
Orient bearing plate as shown with the hole 5" from the top.



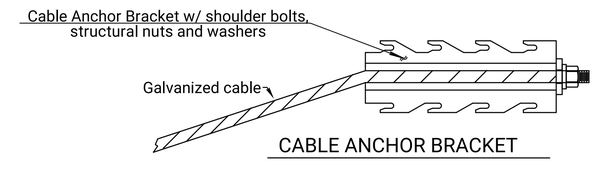
Post #1 Connection Detail



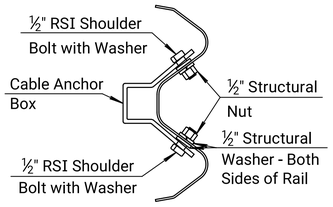
SECTION A-A
Post #2



DETAILS OF IMPACT HEAD



CABLE ANCHOR BRACKET



SECTION B-B
Cable Anchor Box

GENERAL NOTES

Use approved steel posts (shown & described) for posts① through⑧on the (MGS-MSKT) provided by the manufacturer. Approved wood posts provided by the manufacturer may be substituted for posts③through⑧. Terminal post type used is independent of post type used on the remainder of the installation. No mixing of post types allowed in guardrail run.

Use approved 8 inch (shown) or 12 inch blockouts for posts③through⑧. The blockout size used in the end terminal may be independent of the size used in the remainder of the installation.

Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of permanent traffic.

Galvanize all steel parts after fabrication.

Apply retroreflective sheeting as shown on the face of the impact head prior to installation. Thoroughly clean and dry steel prior to applying sheeting.

The cable anchor assembly must be taut. Use a locking device, (vice grips or channel lock pliers) to prevent the cable from twisting when tightening the nuts.

The bottom 6' of posts①and②should not protrude more than 4" above ground (measured along a 5'-0" cord). If necessary grade the site to meet this requirement.

The bottom 6' of posts①and②should not be driven with the upper post attached. If the post is placed in a drilled hole, the backfill material must be satisfactorily compacted to prevent settlement.

When rock is encountered during installation, see Manufacturer's Installation Manual for procedure.

All work and materials required for installation of this terminal are paid under the bid item "Guardrail End Terminal (MGS-MSKT)".

End Terminal (MGS-MSKT) details shown on this sheet are for "Information Only" and may not be an exact detail. See Manufacturer's Installation Manual (furnished to Engineer) for component details and installation instructions.

See Standard Drawing RD611A (Steel Posts) and RD 611B (Wood Posts) for guardrail post details.

NO.	DATE	REVISIONS	BY	APP'D
1	5-15-17	Initial Release	A.L.R.	S.W.K.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (MGS-MSKT) PARALLEL

RD606F

FHWA APPROVAL 10-12-17		APP'D. Scott W. King	
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 03-28-2018

KDOT Graphics Certified

Note to Designer: Per the Manufacturer's Instruction Manual, the MGS-MSKT may be flared at a rate up to 25:1 or flatter. Typical KDOT practice is to use a flare rate of 50:1 or flatter for parallel guardrail end terminals.

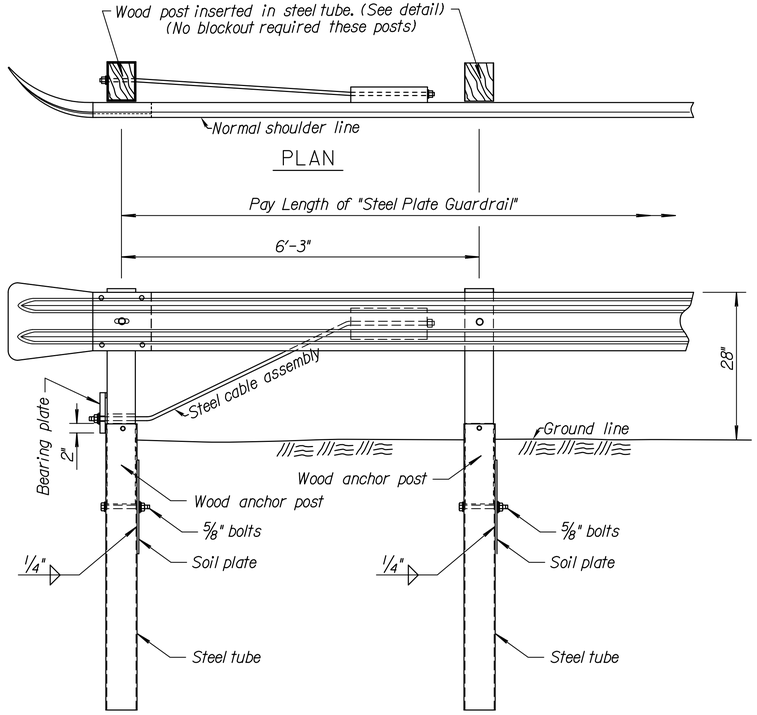
"Parallel" installations are flared at a rate of 50:1. "Zero Flare" installations follow the edge of the shoulder.

Plotted: 28-MAR-2018 13:42

Drawn By : arockers
File : working_rd606f.dgn

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				

Note to Designer: Use Guardrail End Terminal, Type II on the traffic departing end of barriers where end on impacts are not a consideration and at the end of entrance return.



DETAIL OF ANCHOR ASSEMBLY

GENERAL NOTE

Terminal end posts consist of a wood post inserted into a steel tube see details on this sheet.

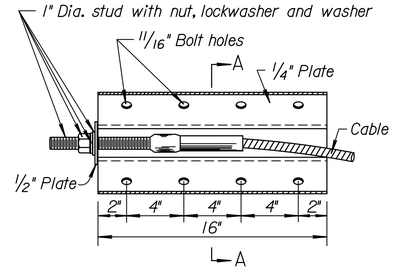
The steel soil tubes may be driven with an approved driving head. Set steel tube and soil plate before installing wood anchor post assembly. Do not drive steel soil tubes with wood post in the tube. Backfill and satisfactorily compact around steel soil tubes placed in drilled holes to prevent tube settlement.

Galvanize all steel parts after fabrication.

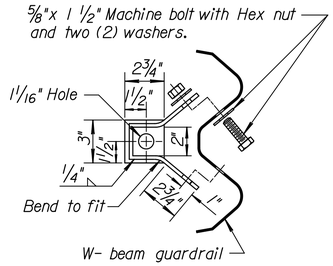
Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of the permanent traffic.

All work and materials required for the installation of Barrier Terminal Type II are considered subsidiary to the bid item "Steel Plate Guardrail".

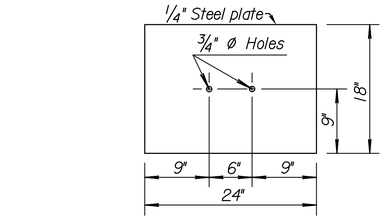
Include Type II end terminal in pay length of "Steel Plate Guardrail".



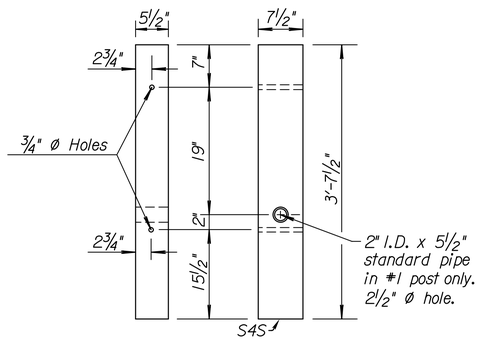
ANCHOR PLATE



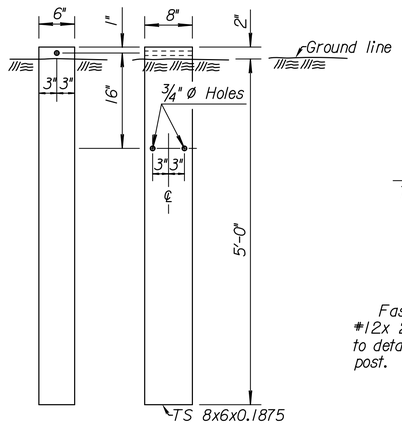
MODIFIED SECTION A-A



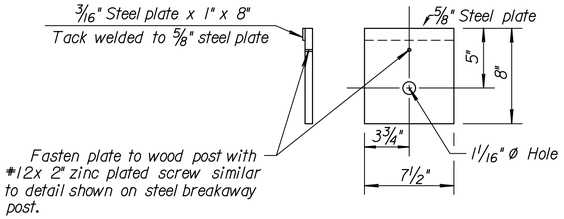
SOIL PLATE



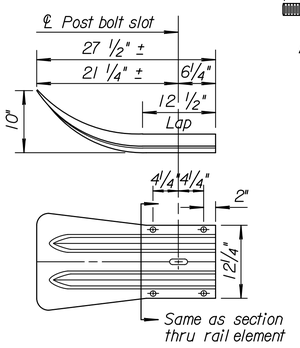
BCT WOOD POST



STEEL TUBE



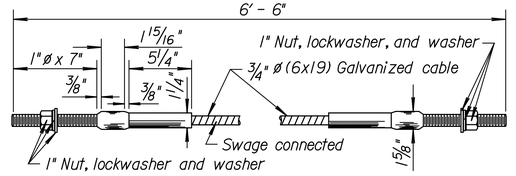
BEARING PLATE



STANDARD END SECTION

(1 each)

(Subsidiary to Steel Plate Guardrail)



CABLE ASSEMBLY *(1 each)*

(40,000 lbs. min. breaking strength)
Tighten cable to taut tension.

NO.	DATE	REVISIONS	BY	APP'D
6	12-14-10	Rev. notes, details & 28" rail height	S.W.K.	J.O.B.
5	7.20-04	Changed Guard Fence to Guardrail	S.W.K	J.O.B.
4	5-18-00	Added note for temporary traffic	R.J.S	J.O.B.
3	11-26-97	Added pay length	R.J.S	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL TYPE II

RD618

FHWA APPROVAL	1-11-11	APP'D. James O. Brewer	
DESIGNED	DETAILED	QUANTITIES	TRACED Bowser
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK. King

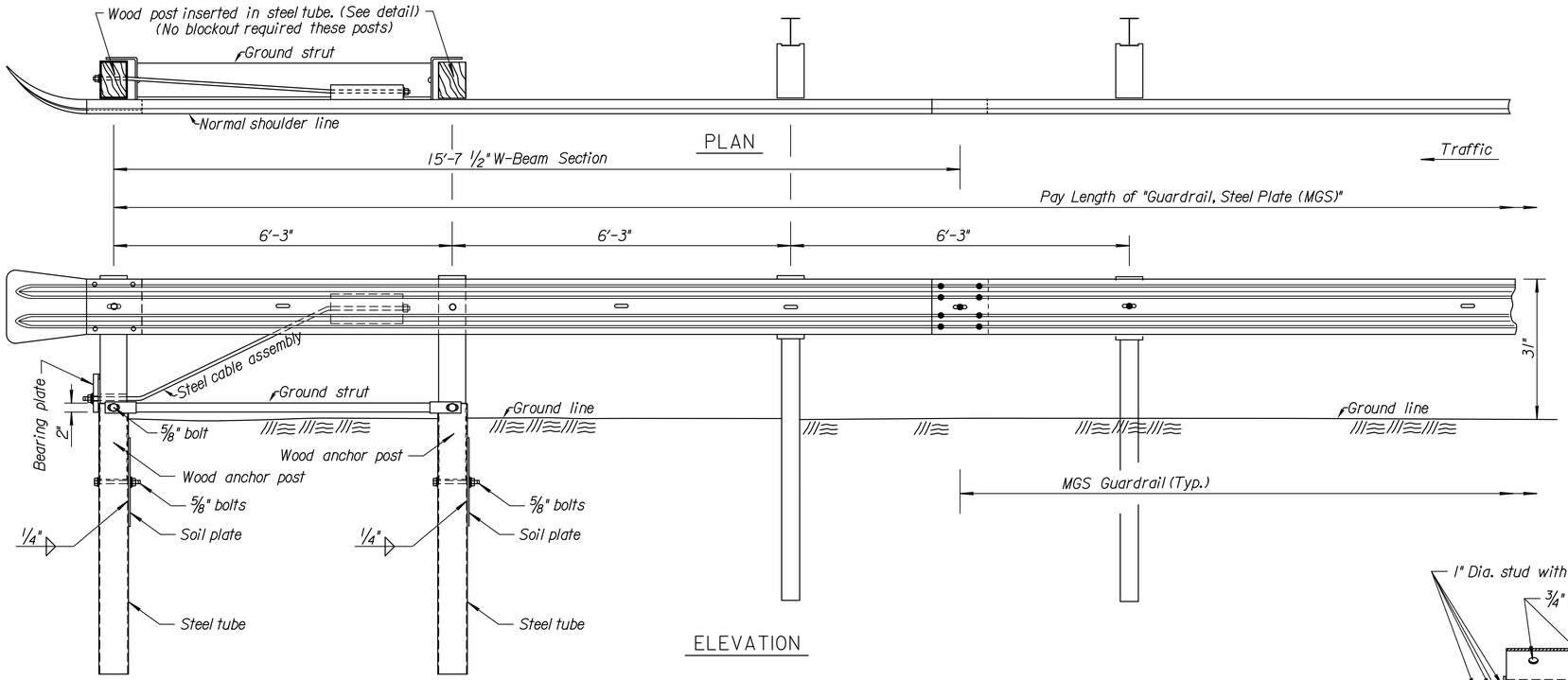
KDOT Graphics Certified 01-31-2011

KDOT Graphics Certified

Plotted :03-FEB-2011 07:59

Drawn By : bert
File : rd618.dgn (rd618)

STATE	PROJECT NO.	YEAR	SHEET NO.	TOTAL SHEETS
KANSAS				



GENERAL NOTE

Terminal end posts consist of a wood post inserted into a steel tube see details on this sheet.

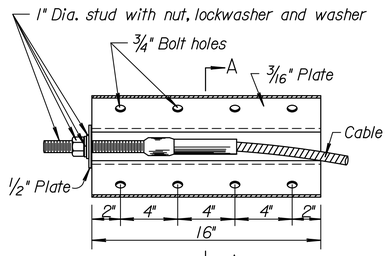
Steel soil tubes may be driven with an approved driving head. Set steel tube and soil plate before installing wood anchor post assembly. Do not drive steel soil tubes with wood post in the tube. Backfill and satisfactorily compact around steel soil tubes placed in drilled holes to prevent tube settlement.

Galvanize all steel parts after fabrication.

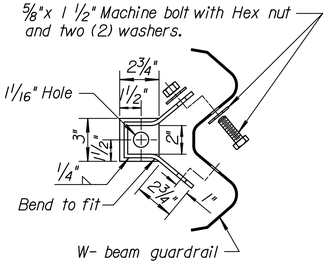
Lap guardrail splices, including terminal connector, in the direction of traffic. Where traffic is temporarily carried in the opposite direction of final configuration, lap rail splices in the direction of the permanent traffic.

All work and materials required for the installation of MGS Terminal Type II are considered subsidiary to the bid item "Guardrail, Steel Plate (MGS)".

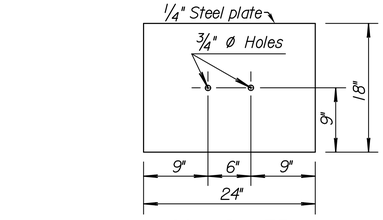
Include MGS Type II end terminal in pay length of "Guardrail, Steel Plate (MGS)".



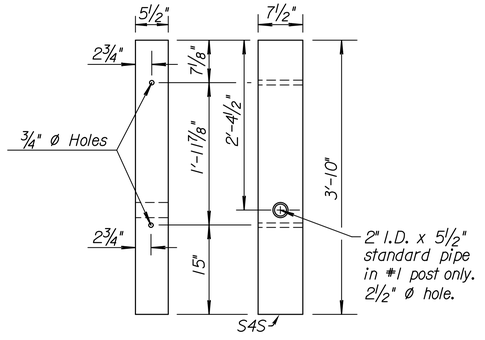
ANCHOR PLATE



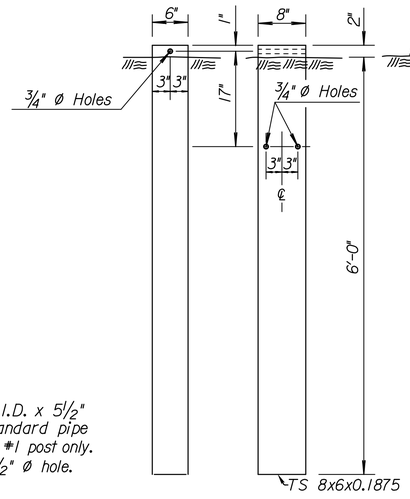
MODIFIED SECTION A-A



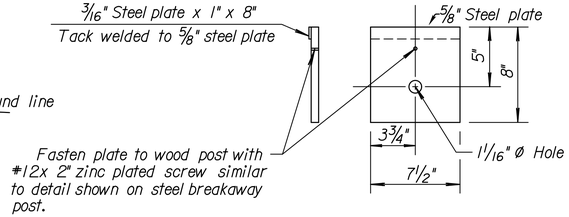
SOIL PLATE



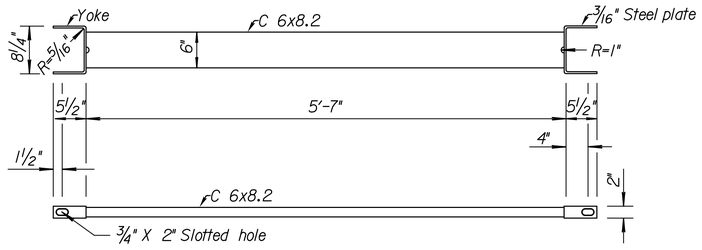
BCT (MGS) WOOD POST



STEEL TUBE

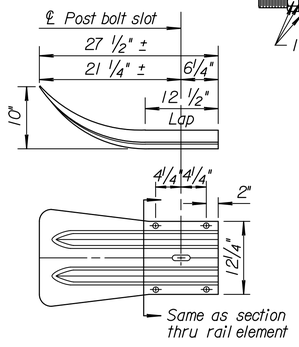


BEARING PLATE



GROUND STRUT

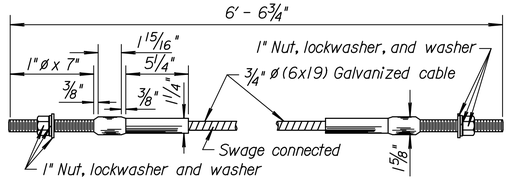
(Strut dimensions shown are typical)



STANDARD END SECTION

(1 each)

(Subsidiary to Steel Plate Guardrail)



CABLE ASSEMBLY (1 each)

(40,000 lbs. min. breaking strength)
Tighten cable to taut tension.

NO.	DATE	REVISIONS	BY	APP'D
2	1-5-16	Revised Layout, End Terminal	T.T.R.	S.W.K.
1	1-25-12	Revised Dimension, End Terminal	S.W.K.	J.O.B.

KANSAS DEPARTMENT OF TRANSPORTATION

GUARDRAIL END TERMINAL (MGS) TYPE II

RD618A

FHWA APPROVAL	1-6-16	APP'D.	Scott W. King
DESIGNED	DETAILED	QUANTITIES	TRACED
DESIGN CK.	DETAIL CK.	QUAN.CK.	TRACE CK.

KDOT Graphics Certified 01-06-2016

KDOT Graphics Certified

Notes to Designer: Use Guardrail End Terminal, MGS Type II on the traffic departing end of barriers where end on impacts are not a consideration and at the end of entrance return.

Plotted : 06-JAN-2016 09:52

Drawn By : trhoads
File : rd618a.dgn