

# INFORMATION HANDOUT

**For Contract No. 10-0W1901**

**At 10-SJ-99-22.9/38.8**

**Identified by**

**Project ID 1000020456**

## **MATERIALS INFORMATION**

Utility Variance

Alternative In-Line Terminal Systems

Alternative Flared Terminal Systems

## Memorandum

*Flex your power!  
Be energy efficient!*

To: DAVID SANGHA - 06  
Senior Design Engineer, Design IV, Branch X  
Central Region – Project Development Division

Date: February 19, 2014

File: 10-0W1901  
EFIS 1000020456  
10-SJ-99  
PM 22.9/38.8  
617

  
From: LINDA FONG, Chief  
Encroachment Exceptions  
Division of Design  
MS 28

Subject: **REQUEST FOR EXCEPTION – VARIANCE TO “POLICY ON HIGH AND LOW RISK UNDERGROUND FACILITIES WITHIN HIGHWAY RIGHTS OF WAY”**

Your request for a variance to policy dated February 13, 2014 (received February 17, 2013), to allow existing facilities to be located concurrent with construction, is conditionally approved.

This \$32 million Capital Preventative Maintenance project is located in and near Lodi from Hammer Lane Overcrossing to the Sacramento County Line. The primary work consists of a pavement overlay, placing rumble strip, replacing asphalt concrete dike and upgrading metal beam guardrail adjacent to the highway. The existing pavement surface will receive grinding where pavement transitions or other features require grinding.

Current policy requires that underground utility facilities be presented on the project plans. No utility conflicts were identified from as-built plans, permit records, field reviews or other sources. This exception allows the proposed plans to be advertised without the presentation of any utilities.

Metal beam guardrail installation is flexible and no relocation of existing utilities would be required. Field mark-outs prior to any excavation will allow MBGR post to be set away from any subsurface hazards. No adverse operational, or maintenance issues are introduced with the proposed work.

### Conditions of approval:

1. This approval shall not set any precedents.
2. This approval is a variance to the policy requiring the presentation of existing utilities on the plans and does not remove other requirements of the “Policy on High and Low Risk Underground Facilities Within Highway Rights of Way.”
3. The plan sheets must include the note, “EXISTING UTILITY FACILITIES HAVE NOT BEEN INCLUDED ON THESE PLANS.”
4. A copy of this variance must be provided to the Resident Engineer.
5. Paragraph 8 of the nonstandard special provision 5-1.36D (attached) must be provided to the Office Engineer and incorporated into the contract plans.

Attachment

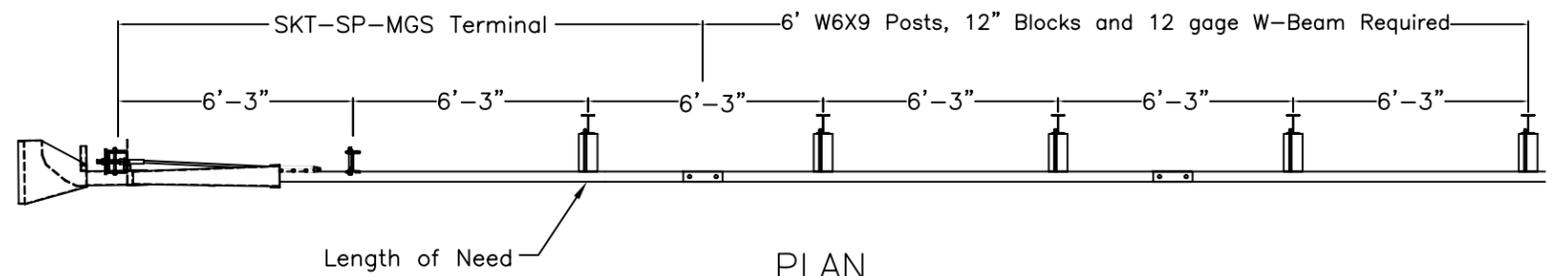
DAVID SANGA – 06  
February 19, 2014  
Page 2

cc: PJDickinson – HQ Maintenance  
TFranklin – HQ Traffic Operations  
RWeaver – HQ Environmental  
LBrownell – HQ Right of Way  
AClark – HQ Design  
LFong  
LKrichevsky  
Design Files

LFong/PReilly:

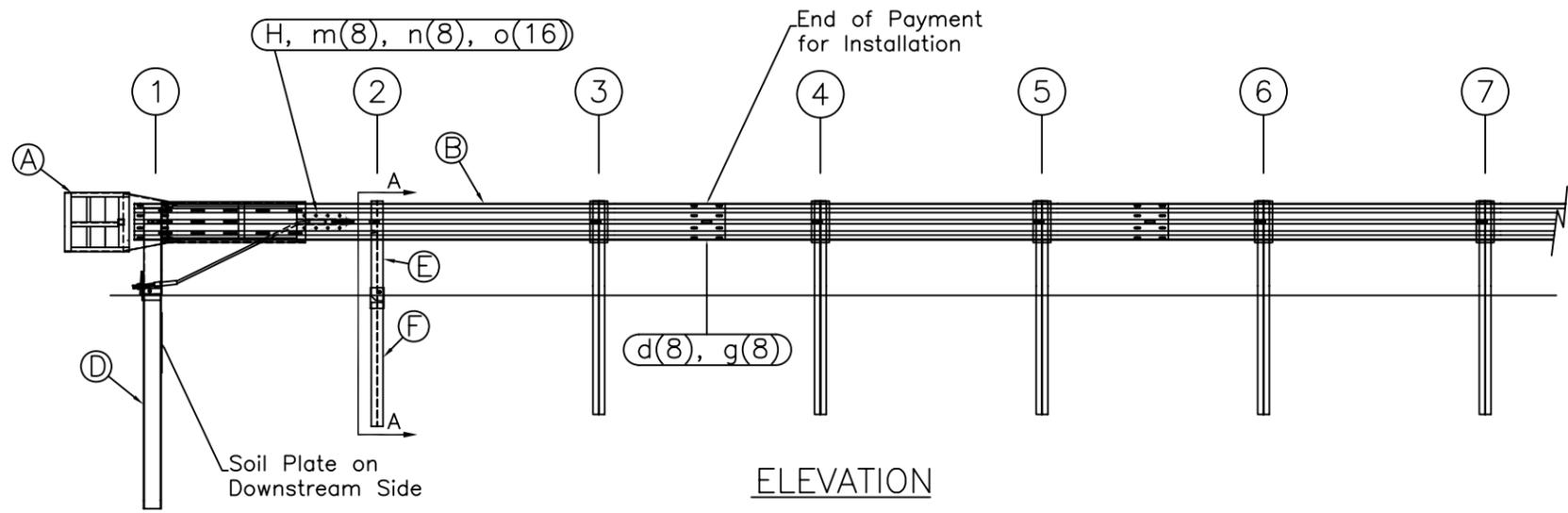
## Reason of this Variance

This project is CAPM, so mainly cold plane asphalt concrete and overlay HMA. There are some MGS installation besides asphalt work. During construction activities if there are utility conflicts with MGS post then the MGS post(s) will be relocated to accommodate the underground utilities.

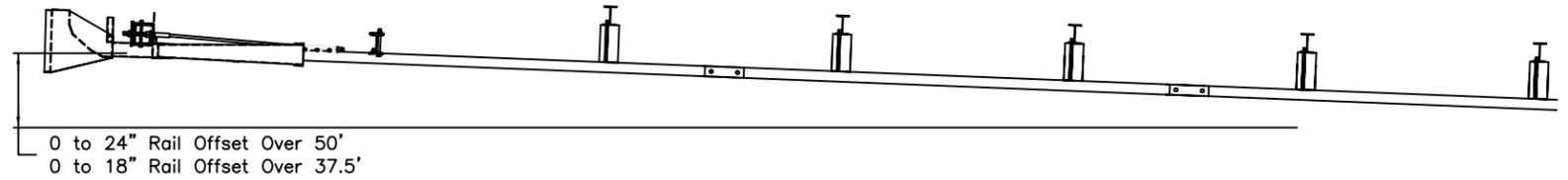


PLAN

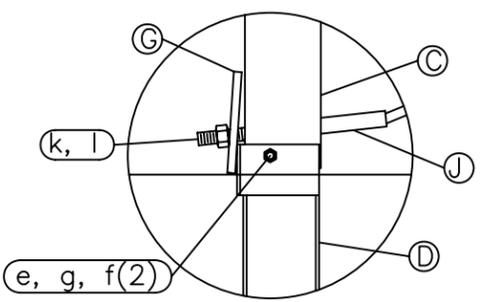
TRAFFIC →



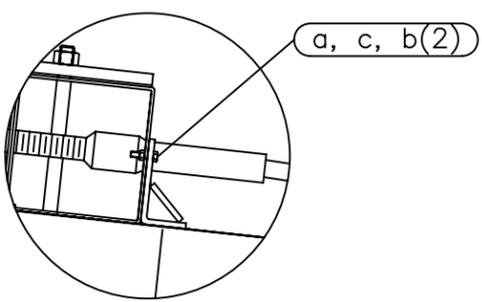
ELEVATION



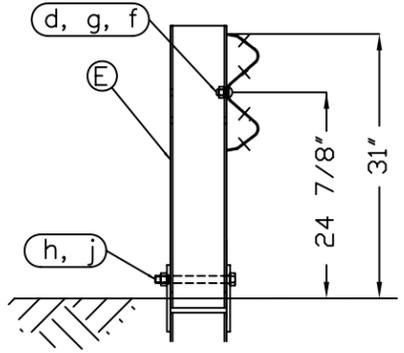
OPTIONAL FLARED INSTALLATION  
25:1 maximum flare rate



Post #1 Connection Detail



Impact Head Connection Detail



SECTION A-A  
Post #2

ITEM	QTY	BILL OF MATERIALS	ITEM NO.
A	1	IMPACT HEAD	S3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	MGS-SF1303
C	1	FIRST POST TOP (6X6X1/2 Tube)	TPHP1A
D	1	FIRST POST BOTTOM (6' W6X15)	TPHP1B
E	1	SECOND POST ASSEMBLY TOP	UHP2A
F	1	SECOND POST ASSEMBLY BOTTOM	HP3B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770

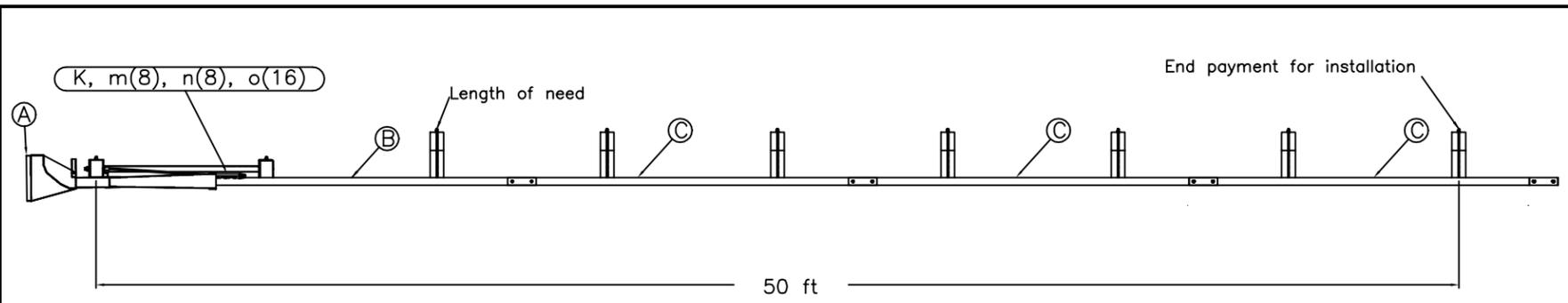
HARDWARE (ALL DIMENSIONS IN INCHES)			
a	2	5/16 x 1 HEX BOLT GRD 5	B5160104A
b	4	5/16 WASHER	W0516
c	2	5/16 HEX NUT	N0516
d	9	5/8 Dia. x 1 1/4 SPLICE BOLT (POST #2)	B580122
e	1	5/8 Dia. x 9 HEX BOLT GRD 5	B580904A
f	3	5/8 WASHER	W050
g	10	5/8 Dia. H.G.R NUT	N050
h	1	3/4 Dia. x 8 1/2 HEX BOLT GRD A449	B340854A
j	1	3/4 Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	CABLE ANCHOR BOX SHOULDER BOLT	SB58A
n	8	1/2 A325 STRUCTURAL NUT	N055A
o	16	1 1/16 OD x 9/16 ID A325 STR. WASHER	W050A

GENERAL NOTES:

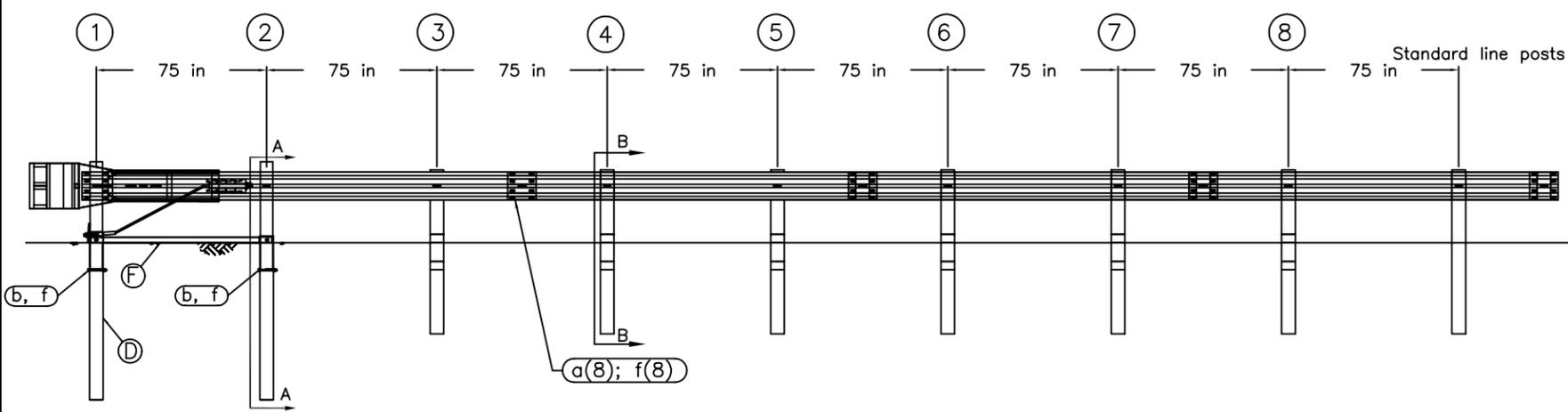
- All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
- The lower sections of the Posts 1&2 shall not protrude more than 4 in above the ground (measured along a 5' cord). Site grading may be necessary to meet this requirement.
- The lower sections of the hinged posts should 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 competent rock is encountered, a 12" Ø post hole, 20 in. deep cored into the rock surface may be used if approved by the engineer for post 1. Granular material will be placed in the bottom of the hole, approximately 2.5" deep to provide drainage. The first post can be field cut to length, placed in the hole and backfilled with suitable backfill. The soil plate may be trimmed if required.
- A site evaluation should be considered if there is less than 25' between the outlet side of the terminal and any adjacent driving lane.
- 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 nuts.



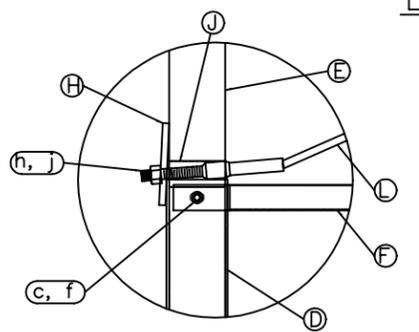
<b>SKT-SP-MGS Terminal Midwest Guardrail System 31" Top of Rail</b>		Sheet:	1
		Date:	02/24/10
Drawing Name: SKT-SP-S-MGS		By:	JRR
		Scale:	None
		Rev:	0



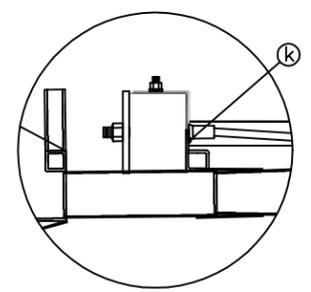
TRAFFIC → PLAN



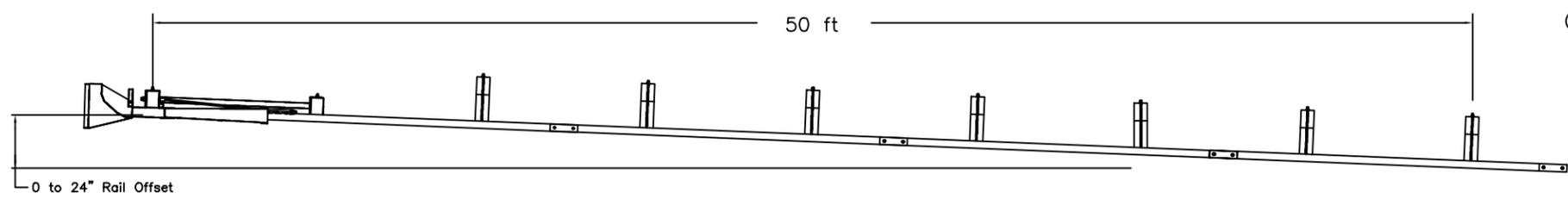
ELEVATION



POST #1 CONNECTION DETAIL



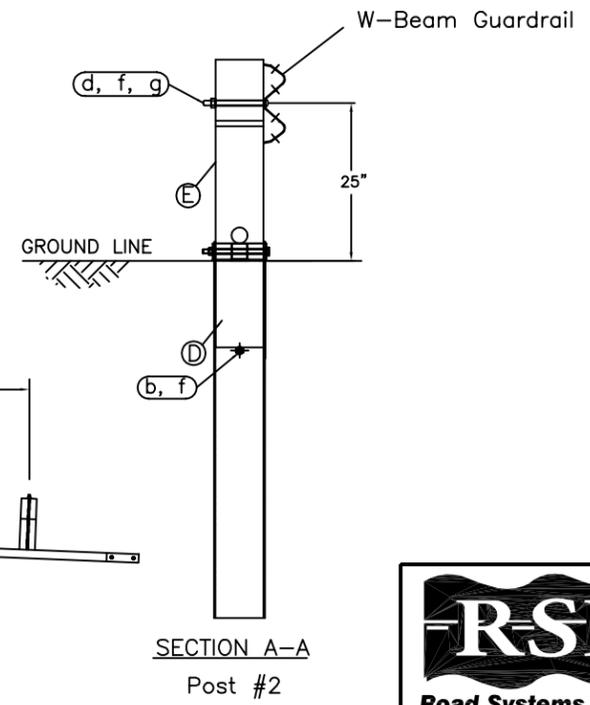
IMPACT HEAD CONNECTION DETAIL



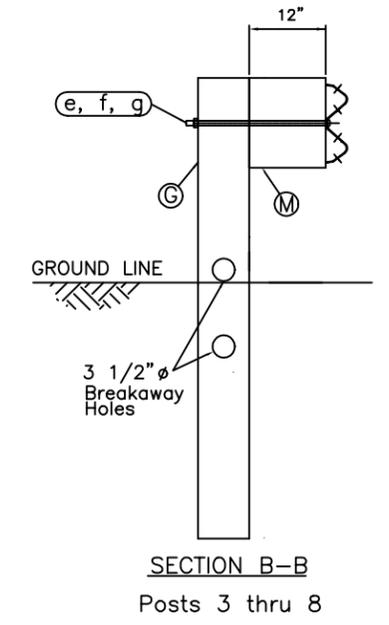
OPTIONAL FLARED INSTALLATION  
25:1 maximum flare rate

- GENERAL NOTES:
1. Breakaway posts are required with the SKT.
  2. All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
  3. The SKT can be flared at a rate of up to 25:1 to prevent the impact head from encroaching on the shoulder.
  4. The foundation tubes shall not protrude more than 4" above the ground (measured along a 5' cord). Site grading may be necessary to meet this requirement.
  5. When rock is encountered, a 12" Ø post hole, 20" into the rock surface may be used if approved by the engineer. Granular material will be placed in the bottom of the hole, approximately 2.5" deep to provide drainage. The first two posts can be field cut to length, placed in the hole and backfilled with adequately compacted material excavated from the hole.
  6. 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 nuts.
  7. A site evaluation should be considered if there is less than 25' between the outlet side of the terminal and any adjacent driving lane.
  8. The soil tubes may be driven with an approved driving head. They shall not be driven with the post in the tube.
  9. The wood blockouts should be "toe-nailed" to the rectangular wood posts to prevent them from turning when the wood shrinks.

ITEM	QTY	BILL OF MATERIALS	ITEM NO.
A	1	IMPACT HEAD	S3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	S1303 MGS
C	3	W-BEAM GUARDRAIL, 12 Ga.	G1203 MGS
D	2	FOUNDATION TUBE	E731
E	2	BCT WOOD POST	P650 MGS
F	1	GROUND STRUT	E780
G	6	CRT WOOD POST	P671 MGS
H	1	BEARING PLATE	E750
J	1	PIPE SLEEVE	E740
K	1	CABLE ANCHOR BOX	S760
L	1	BCT CABLE ANCHOR ASSEMBLY	E770
M	6	MGS TIMBER BLOCKOUT OR EQUIV.	P618
HARDWARE (ALL DIMENSIONS IN INCHES)			
a	24	5/8Ø x 1 1/4 SPLICE BOLT	B580122
b	2	5/8Ø x 7 1/2 HEX BOLT	B580754
c	2	5/8Ø x 10 HEX BOLT	B581004
d	1	5/8Ø x 10 H.G.R. BOLT	B581002
e	6	5/8Ø x 22 H.G.R. BOLT	B582202
f	35	5/8Ø H.G.R. NUT	N050
g	7	H.G.R. WASHER	W050
h	2	1 ANCHOR CABLE HEX NUT	N100
j	2	1 ANCHOR CABLE WASHER	W100
k	2	3/8 x 3 LAG SCREW	E350
m	8	CABLE ANCHOR BOX SHOULDER BOLT	SB58A
n	8	1/2 A325 STRUCTURAL NUT	N055A
o	16	1 1/16 OD x 9/16 ID A325 STR. WASHER	W050A



SECTION A-A  
Post #2



SECTION B-B  
Posts 3 thru 8

**RSI**  
Road Systems, Inc.  
Big Spring, TX  
Phone: 432-263-2435  
or Phone: 330-346-0721

Sequential Kinking Terminal  
SKT - Assembly

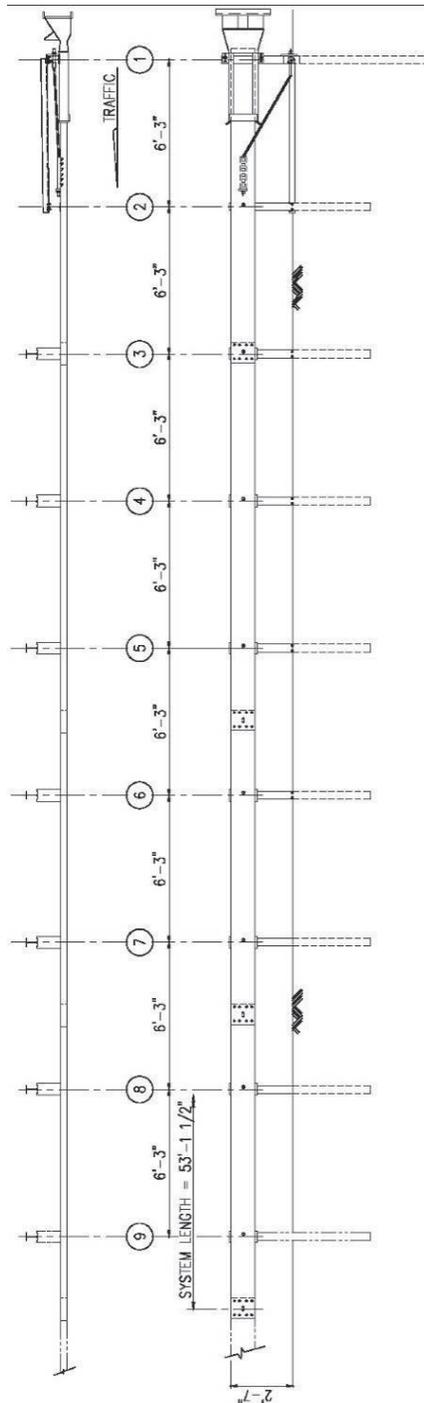
Midwest Guardrail System  
Wood Post System

Drawing Name: SKT-MGS-W-US Scale: NONE

Sheet: A1  
Date: 12/01/04  
By: JRR  
Rev: 0

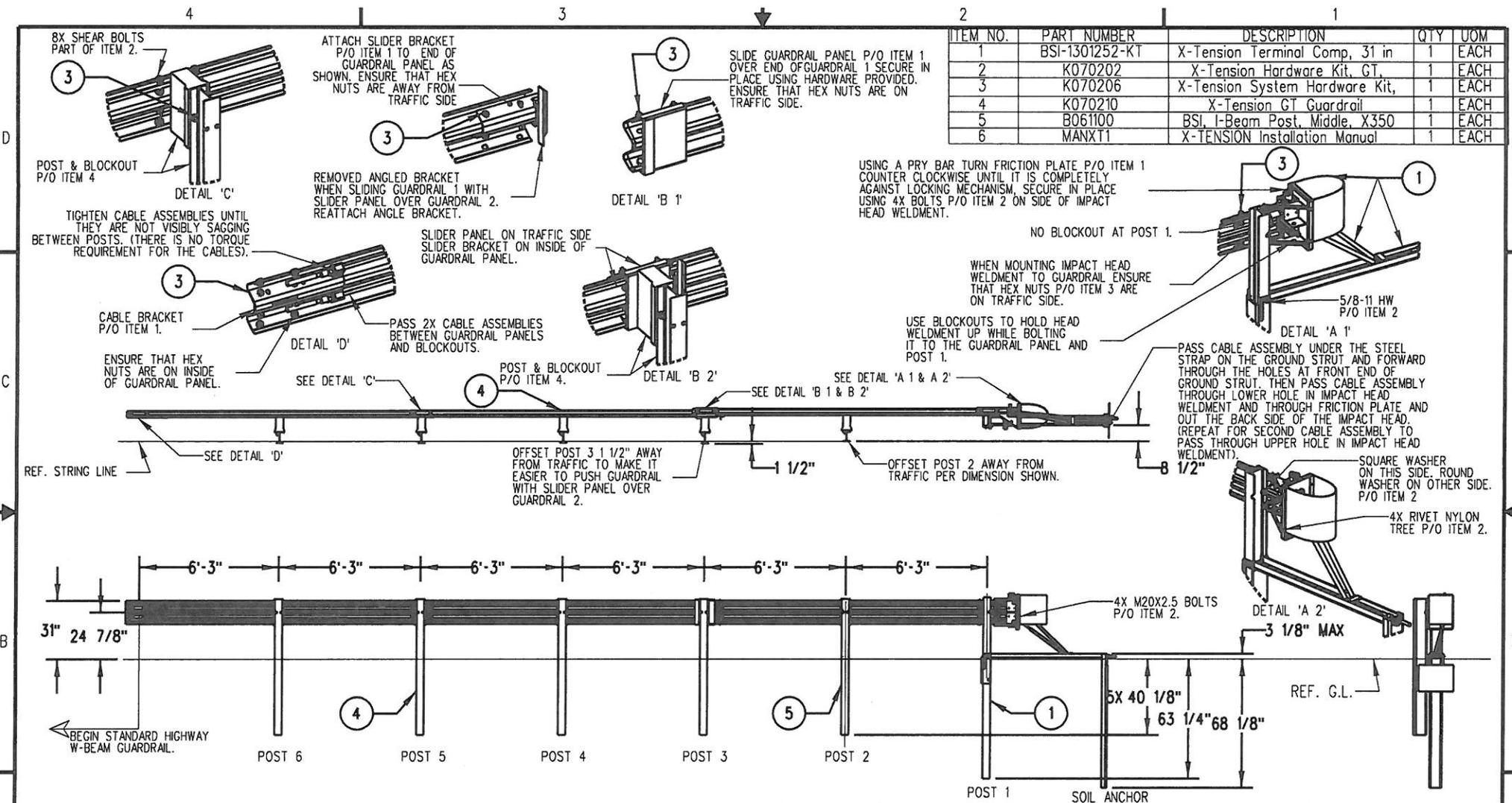
**ET-31™ Guardrail End Treatment  
NCHRP Report 350 Test Level 3  
System Length 53'-1 1/2" (16.19 m)**

For specific assembly, maintenance, or repair details refer to the state or specifying agency's standard drawings and/or Trinity standard layout drawings.



**Figure 4 (TL-3)**

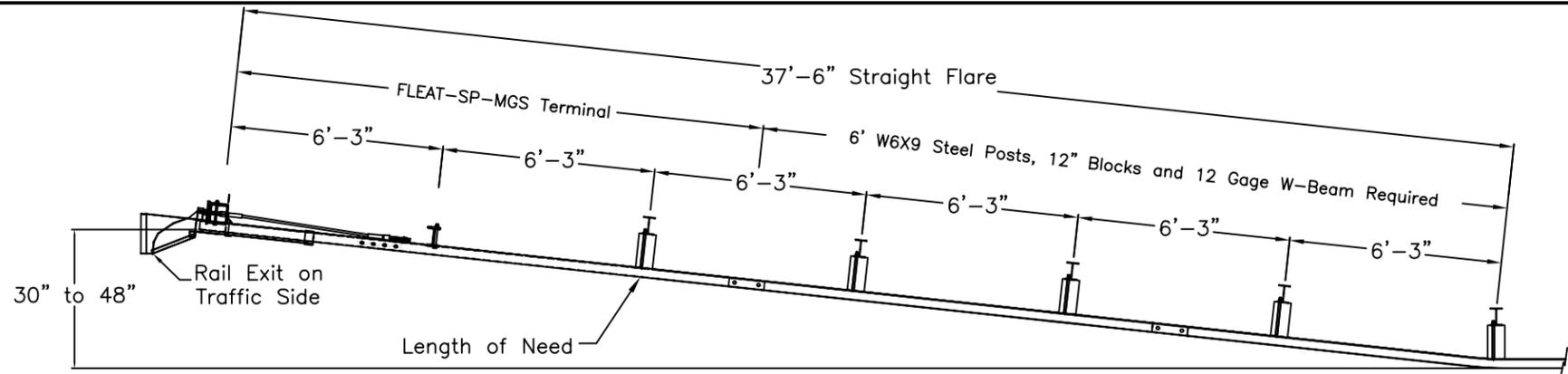
[This drawing represents one version of the 53'-1 1/2" (16.19 m) system]



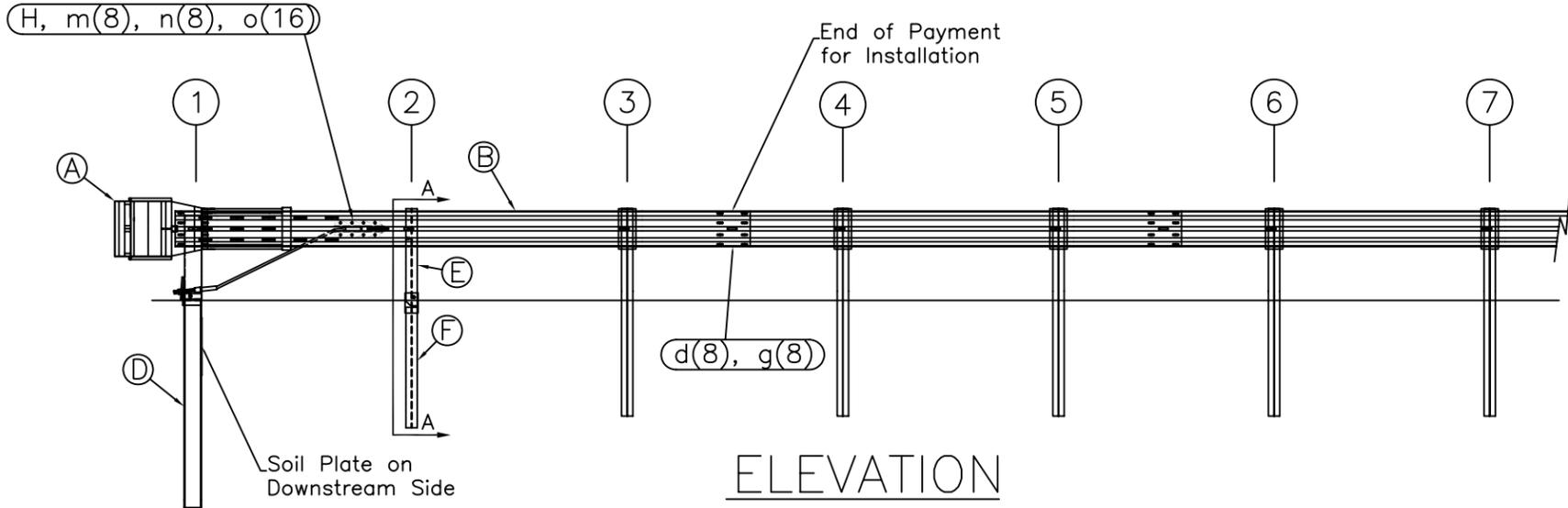
ITEM NO.	PART NUMBER	DESCRIPTION	QTY	UOM
1	BSI-1301252-KT	X-Tension Terminal Comp, 31 in	1	EACH
2	K070202	X-Tension Hardware Kit, GT.	1	EACH
3	K070206	X-Tension System Hardware Kit,	1	EACH
4	K070210	X-Tension GT Guardrail	1	EACH
5	B061100	BSL I-Beam Post, Middle, X350	1	EACH
6	MANXT1	X-TENSION Installation Manual	1	EACH

- NOTES: UNLESS OTHERWISE SPECIFIED.
- SYSTEM TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS.
  - ONLY TIGHTEN THE CABLE ASSEMBLIES USING THE NUTS AT THE CABLE BRACKET (SEE DETAIL 'D'). DO NOT TIGHTEN THE CABLES AT THE FRONT OF THE GROUND ANCHOR.
  - WHEN DRIVING STEEL POST, ENSURE THAT A DRIVING CAP WITH TIMBER OR PLASTIC INSERT IS USED TO PREVENT DAMAGE TO THE GALVANIZING TO THE TOP OF THE POST.

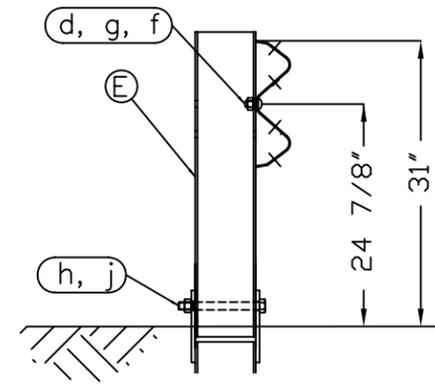
<small>© 2012 BARRIER SYSTEMS INC. THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BARRIER SYSTEMS INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF BARRIER SYSTEMS INC. IS PROHIBITED.</small>		<small>UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS DECIMAL ANGLES ± 1/16 .XX ± .03 ± 1/2° .XXX ± .010</small>				<small>BARRIER SYSTEMS INC. 3333 Voco Valley Parkway, Ste 800 Yonkers, CA 95688 Tel: 800-800-5691 www.barriersystemsinc.com</small>	
<b>APPROVALS</b>				<b>TITLE</b> X-TENSION GUARDRAIL TERMINAL SYSTEM STEEL POST WITH COMPOSITE BLOCKOUT 31" RAIL HEIGHT			
<small>DRAWN BY:</small> NMV <small>DRAWN DATE:</small> 2/08/13 <small>APPR'D BY:</small> JMT <small>APPR'D DATE:</small> 2/08/13	<small>THRD ANGLE PROJECTION</small> 	<small>REV</small> 2067 2022	<small>DATE</small> 03/02/13 2/08/13	<small>SIZE</small> B	<small>DWG NO.</small> XTGTSS5	<small>SCALE</small> 1:50	<small>REV.</small> B <small>SHEET</small> 1 OF 1



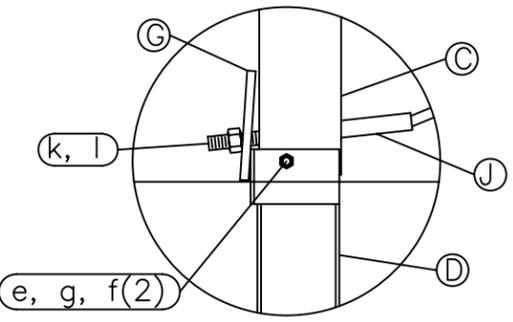
PLAN



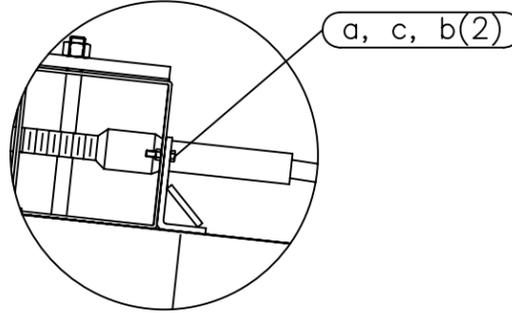
ELEVATION



SECTION A-A  
Post #2



Post #1 Connection Detail



Impact Head Connection Detail

ITEM	QTY	BILL OF MATERIALS	ITEM NO.
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D	1	FIRST POST BOTTOM (6' W6X15)	TPHP1B
E	1	SECOND POST ASSEMBLY TOP	UHP2A
F	1	SECOND POST ASSEMBLY BOTTOM	HP3B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770

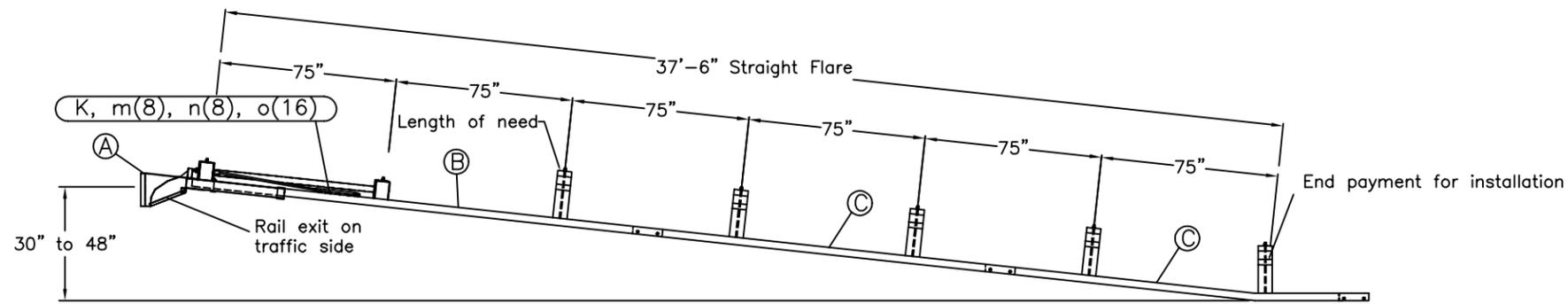
HARDWARE (ALL DIMENSIONS IN INCHES)			
a	2	5/16 x 1 HEX BOLT GRD 5	B5160104A
b	4	5/16 WASHER	W0516
c	2	5/16 HEX NUT	N0516
d	9	5/8 Dia. x 1 1/4 SPLICE BOLT (POST #2)	B580122
e	1	5/8 Dia. x 9 HEX BOLT GRD 5	B580904A
f	3	5/8 WASHER	W050
g	10	5/8 Dia. H.G.R NUT	N050
h	1	3/4 Dia. x 8 1/2 HEX BOLT GRD A449	B340854A
j	1	3/4 Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	CABLE ANCHOR BOX SHOULDER BOLT	SB58A
n	8	1/2 A325 STRUCTURAL NUT	N055A
o	16	1 1/16 OD x 9/16 ID A325 STR. WASHER	W050A

GENERAL NOTES:

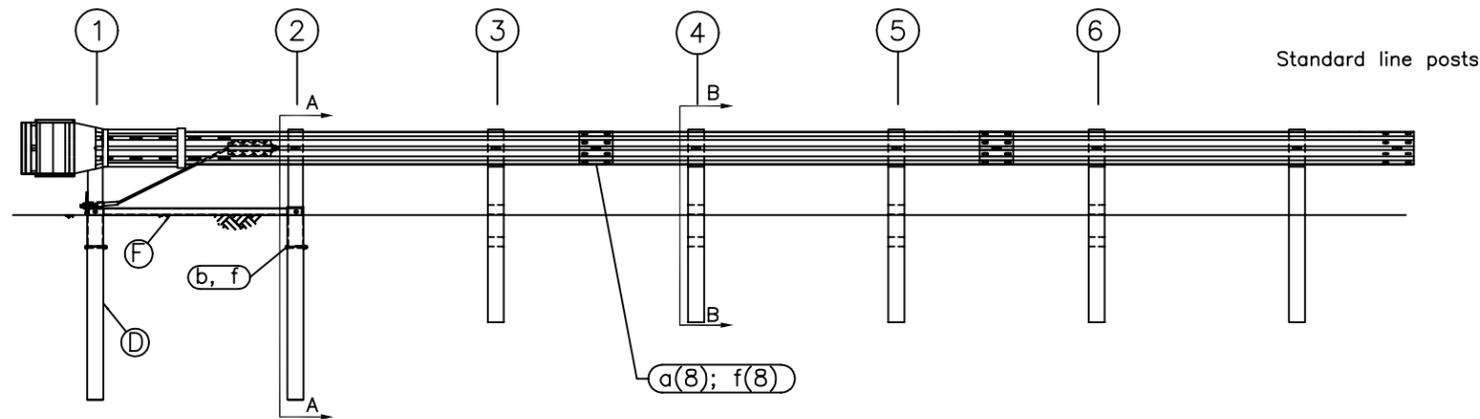
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Big Spring, TX  
Phone: 432-263-2435  
or Phone: 330-346-0721

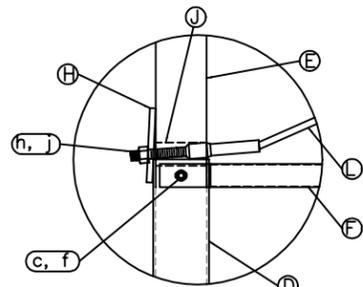
<b>FLEAT-SP-MGS Terminal Midwest Guardrail System 31" Top of Rail</b>		Sheet:	1
		Date:	02/24/10
Drawing Name: <b>FLT-SP-S-MGS</b>		By:	JRR
		Scale:	None
		Rev:	0



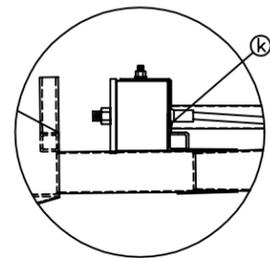
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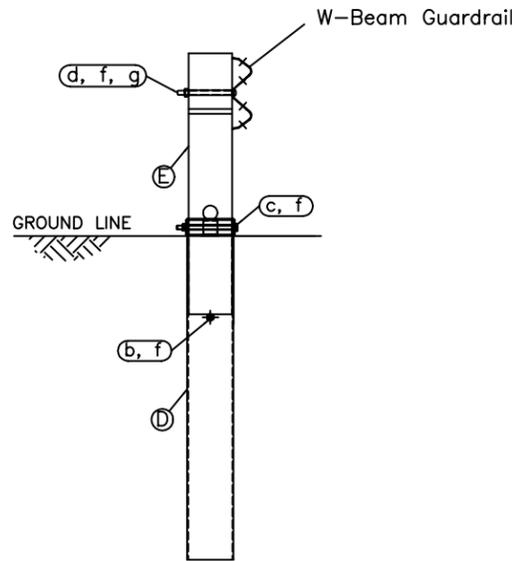
ELEVATION



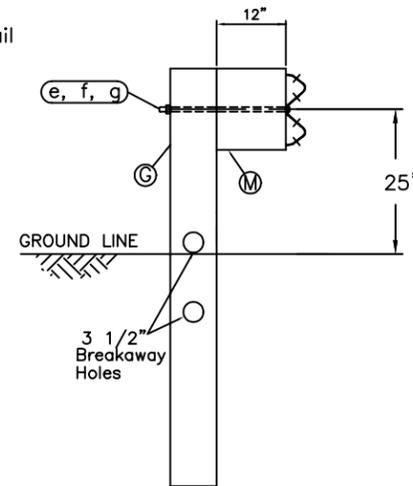
POST #1 CONNECTION DETAILS



IMPACT HEAD CONNECTION DETAIL



SECTION A-A  
Post #2



SECTION B-B  
Posts 3 thru 6

ITEM	QTY	BILL OF MATERIALS	ITEM NO.
A	1	IMPACT HEAD	F3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	F1303 MGS
C	2	W-BEAM GUARDRAIL, 12 Ga.	G1203 MGS
D	2	FOUNDATION TUBE	E731
E	2	BCT WOOD POST	P650 MGS
F	1	GROUND STRUT	E780
G	4	CRT WOOD POST	P671 MGS
H	1	BEARING PLATE	E750
J	1	PIPE SLEEVE	E740
K	1	CABLE ANCHOR BOX	S760
L	1	BCT CABLE ANCHOR ASSEMBLY	E770
M	4	MGS TIMBER BLOCKOUT OR RECYC. EQUIV.	P618
HARDWARE (ALL DIMENSIONS IN INCHES)			
a	16	5/8 $\phi$ x 1 1/4 SPLICE BOLT	B580122
b	2	5/8 $\phi$ x 7 1/2 HEX BOLT	B580754
c	2	5/8 $\phi$ x 10 HEX BOLT	B581004
d	1	5/8 $\phi$ x 10 H.G.R. BOLT	B581002
e	4	5/8 $\phi$ x 22 H.G.R. BOLT	B582202
f	25	5/8 $\phi$ H.G.R. NUT	N050
g	5	H.G.R. WASHER	W050
h	1	ANCHOR CABLE HEX NUT	N100
j	2	ANCHOR CABLE WASHER	W100
k	2	3/8 x 3 LAG SCREW	E350
m	8	CABLE ANCHOR BOX SHOULDER BOLT	SB58A
n	8	1/2 A325 STRUCTURAL NUT	N055A
o	16	1 1/16 OD x 9/16 ID A325 STR. WASHER	W050A

GENERAL NOTES:

- Breakaway posts are required with the FLEAT.
- All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
- The foundation tubes shall not protrude more than 4 in above the ground (measured along a 5' cord). Site grading may be necessary to meet this requirement.
- When rock is encountered, a 12"  $\phi$  post hole, 20 in into the rock surface may be used if approved by the engineer. Granular material will be placed in the bottom of the hole, approximately 2.5" deep to provide drainage. The first two posts can be field cut to length, placed in the hole and backfilled with adequately compacted material excavated from the hole.
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- The wood blockouts should be "toe-nailed" to the rectangular wood posts to prevent them from turning when the wood shrinks.



**Road Systems, Inc.**

Big Spring, TX  
Phone: 432-263-2435  
or Phone: 330-346-0721

Flared Energy Absorbing  
Terminal - FLEAT Assembly  
Midwest Guardrail System

Wood Post System

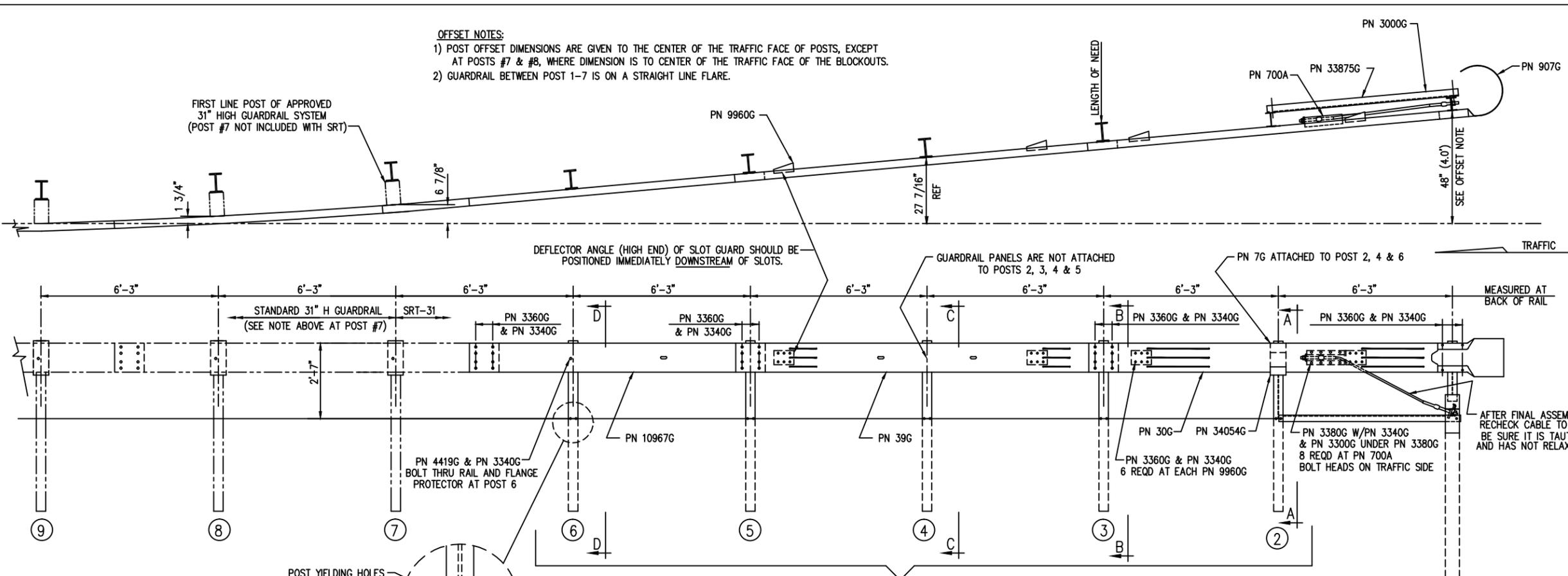
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Scale:  
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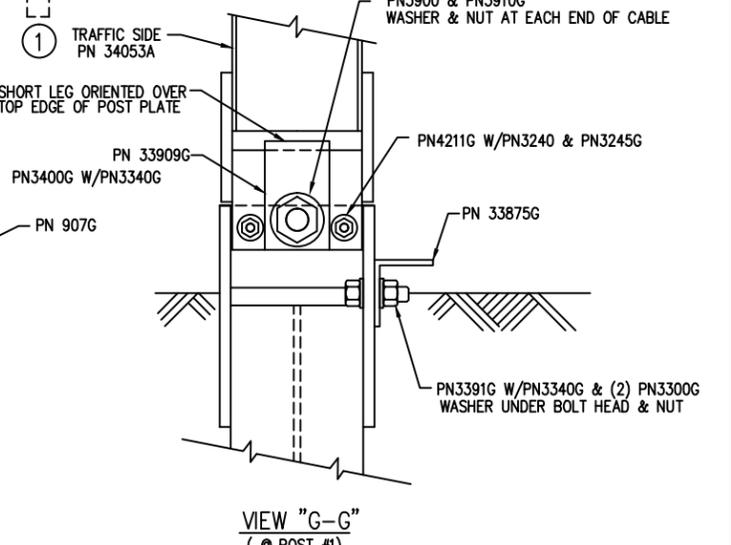
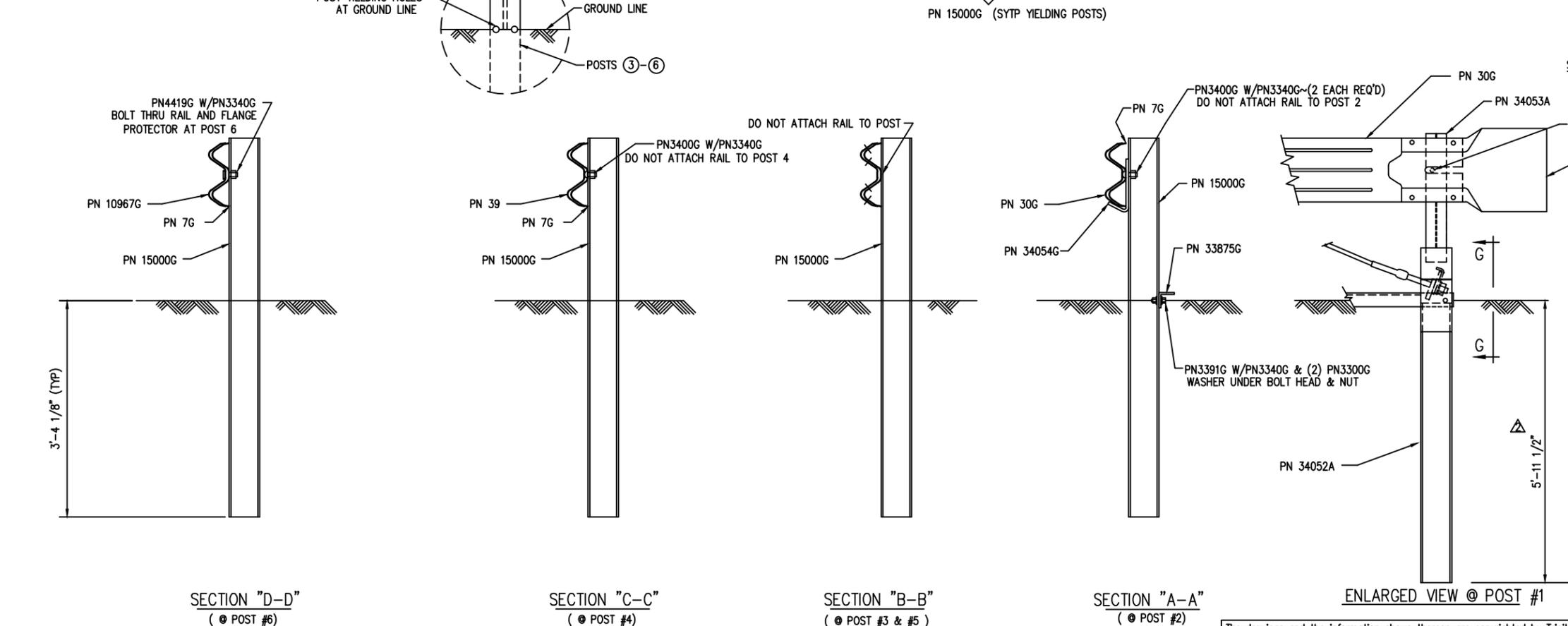
Sheet:  
A1  
Date:  
12/01/2004  
By:  
JRR  
Rev:  
0

**OFFSET NOTES:**  
 1) POST OFFSET DIMENSIONS ARE GIVEN TO THE CENTER OF THE TRAFFIC FACE OF POSTS, EXCEPT AT POSTS #7 & #8, WHERE DIMENSION IS TO CENTER OF THE TRAFFIC FACE OF THE BLOCKOUTS.  
 2) GUARDRAIL BETWEEN POST 1-7 IS ON A STRAIGHT LINE FLARE.

FIRST LINE POST OF APPROVED 31" HIGH GUARDRAIL SYSTEM (POST #7 NOT INCLUDED WITH SRT)



BILL OF MATERIAL		
PN	QTY	DESCRIPTION
7G	3	12/6"/FLG PROTECTOR (AT POST 2, 4 & 6)
30G	1	12/12/6"/S SRT-1 (GUARDRAIL)
39G	1	12/12/6"/S SRT-2 (GUARDRAIL)
700A	1	CABLE ANCHOR BRACKET
907G	1	12/BUFFER/ROLLED (TERMINAL)
3000G	1	3/4 x 6'-6" CABLE
<b>HARDWARE</b>		
3240G	2	5/16" WASHER (AT POST 1)
3245G	2	5/16" HEX NUT (AT POST 1)
3300G	12	5/8" WASHER
3340G	67	5/8" HEX HGR NUT
3360G	52	5/8" x 1 1/4" HGR SPLICE BOLT
3380G	8	5/8" x 1 1/2" HEX HD BOLT
3400G	4	5/8" x 2" HGR POST BOLT (AT POSTS 1, 2 & 4)
3391G	2	5/8" x 1 3/4" HEX BOLT (A325) (AT STRUT)
3900G	2	1" WASHER (AT CABLE)
3910G	2	1" HEX NUT (AT CABLE)
4211G	2	5/16" x 1 3/4" HEX BOLT (AT POST 1)
4419G	1	5/8" x 1 3/4" COUNTERSUNK HD BOLT (AT POST 6)
9960G	4	SLOT GUARD BRACKET
10967G	1	12/9/4.5/31.5/S SRT-3 (GUARDRAIL)
15000G	5	6'-0" SYT POST (W6 X 8.5)
33909G	1	CABLE ANCHOR BRACKET (AT POST 1)
33875G	1	ANGLE STRUT 3 x 3 x 1/4
34052A	1	CR POST 1 BOT (W6 X 15)
34053A	1	CR POST 1 TOP (W6 X 8.5)
34054G	1	POST SHELF ANGLE (AT POST 2)



REV.	CHK'D	BY	DATE	REMARKS
4	BT	LH	10/6/10	OFFSET POSTS #7 & #8
3	BT	LH	2/26/09	REVISED HARDWARE
2	SG	LH	7/28/08	REVISED POST #1 LENGTH IN GROUND
1	SG	LH	1/16/08	REVISED HARDWARE QUANTITY IN BILL OF MATERIAL

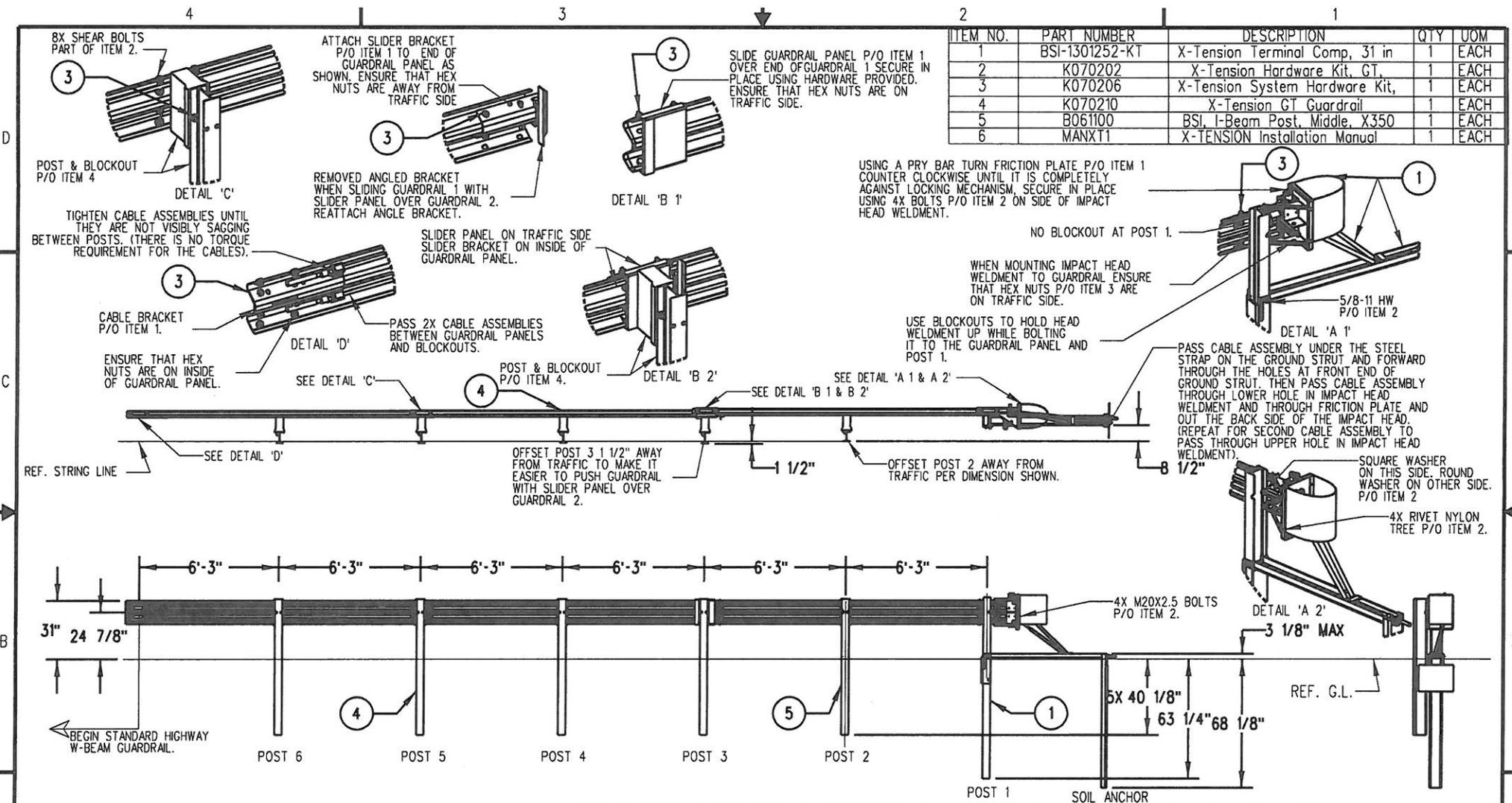
**SRT-31**

SLOTTED RAIL TERMINAL SRT-31 (31" H)  
ERECTION DETAILS  
(3 PANELS, CR AND SYT POSTS)

DRAWN	BT
CHECKED	SG
SCALE	NTS
DATE	10/30/07
ENG. FILE #	SS436-01E
SHT.No.	E1 OF 1
DRAWING NO.	SS 436
REV.	4

TRINITY HIGHWAY PRODUCTS, LLC.  
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- NOTES: UNLESS OTHERWISE SPECIFIED.
1. SYSTEM TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS.
  2. ONLY TIGHTEN THE CABLE ASSEMBLIES USING THE NUTS AT THE CABLE BRACKET (SEE DETAIL 'D'). DO NOT TIGHTEN THE CABLES AT THE FRONT OF THE GROUND ANCHOR.
  3. WHEN DRIVING STEEL POST, ENSURE THAT A DRIVING CAP WITH TIMBER OR PLASTIC INSERT IS USED TO PREVENT DAMAGE TO THE GALVANIZING TO THE TOP OF THE POST.

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<b>APPROVALS</b>			
DRAWN BY:	NMV	THIRD ANGLE PROJECTION	
DATE:	2/08/13		
APPRO'D BY:	JMT		
DATE:	2/08/13		

		<small>BARRIER SYSTEMS INC. 3333 Voco Valley Parkway, Ste 800, Vacoala, CA 95688, Tel: 800-800-5691, www.barriersystemsinc.com</small>	
<b>TITLE</b> X-TENSION GUARDRAIL TERMINAL SYSTEM STEEL POST WITH COMPOSITE BLOCKOUT 31" RAIL HEIGHT			
SIZE	DWG NO.	REV.	
B		B	
SCALE	1:50	SHEET	1 OF 1