

# INFORMATION HANDOUT

For Contract No. 06-0R2304  
At 06-Fre-41, 99, 168, 180-Various

Identified by  
Project ID 0614000060

## MATERIALS INFORMATION

Water Source Information dated 01/29/2016

List of Existing Traffic Management System Elements

Type SKT-MGS Terminal System Manufacturer's Drawing

Type X-Lite Terminal System Manufacturer's Drawing

Type 31" X-Tension Terminal System Manufacturer's Drawing

Type Soft-Stop Terminal System Manufacturer's Drawing

Type FLEAT-MGS Terminal System Manufacturer's Drawing

Type SRT-31 Terminal System Manufacturer's Drawing

Type ABSORB 350 Temporary Crash Cushion Manufacturer's Drawing

Type ACZ-350 Temporary Crash Cushion Manufacturer's Drawing

Type Adiem Crash Cushion Manufacturer's Drawing

Type SLED End Treatment Manufacturer's Drawing

**From:** [Ahmad. Ahmad K@DOT](mailto:Ahmad.Ahmad.K@DOT)  
**To:** [Childress, James J@DOT](mailto:Childress.James.J@DOT)  
**Subject:** FW: Water Usage  
**Date:** Friday, January 29, 2016 9:38:54 AM  
**Attachments:** Extraction Well Water-Commercial-App-Revised.pdf

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Hi,

Below is the response from the City of Fresno. According to California drought map, the City of Fresno under Mandatory restrictions. In regard to the application that he mentioned, he indicated that this can done later at construction time in order access the water from the fill station.

Thank you

AHMAD K. AHMAD, PE  
CENTRAL REGION PROJECT DEVELOPEMENT  
DESIGN 1, BRANCH Z  
559-243-3596

-----Original Message-----

From: Conrad Braganza [<mailto:Conrad.Braganza@fresno.gov>]  
Sent: Friday, January 29, 2016 7:21 AM  
To: Ahmad, Ahmad K@DOT <[ahmad.ahmad@dot.ca.gov](mailto:ahmad.ahmad@dot.ca.gov)>  
Subject: RE: Water Usage

Good Morning Ahmad,

We have a non-potable fill station at the Wastewater Treatment Plant located at Jensen/Cornelia. It is set up for 2,000 to 4,000 gallon top fill tankers. (See attached picture).

If this will work for you, please complete the attached application and send it back to me. I will then issue you a badge that will give you access to the fill station gate.

Thanks,

Conrad Braganza Wastewater Reclamation Coordinator City of Fresno, Department of Public Utilities Wastewater Management Division  
(559) 621-5134  
[Conrad.Braganza@Fresno.Gov](mailto:Conrad.Braganza@Fresno.Gov)

Recycled Water - Making Every Drop Count

Name: Ahmad Ahmad  
Address: 2015 E. SHIELDS AVE. SUITE #100  
City: FRESNO  
State: California  
Zip: 93726  
Phone: 559-304-7980  
Email: [ahmad\\_ahmad@dot.ca.gov](mailto:ahmad_ahmad@dot.ca.gov)  
Fax:  
Preferred Method of Contact: Email, Phone

Comments:

Hi,

I am a Caltrans project Engineer. I am working on a project that will be constructed this summer in Fresno County in and near the City of Fresno on State Routes 41, 99, 168, 180.

Below are the locations of Construction:

State Route 41: on & off ramps from McKinley Ave. to Friant Road  
State Route 168: on ramps form West bound  
Bullard & Shaw  
State Route 180: Abby Street.  
South bound 99 connector from West bound 180.  
South bound 99 connector to East bound 180.

This project requires an estimated 20,640 gallons of water during construction.

Will the City of Fresno be able to provide non-potable water source for the contractor for the estimated water required?

Please email me back.

Thank you

AHMAD K. AHMAD, PE  
Caltrans  
CENTRAL REGION PROJECT DEVELOPEMENT  
DESIGN 1, BRANCH Z  
559-243-3596-office  
559-304-7980-cell

## Extraction Well Water Use Application and Agreement for Commercial Customers

### Customer Information

**Customer Name:**

**Customer Street Address:**

**City:**

**Zip Code:**

**Customer Phone:**

**Customer's Representative:**

**Phone:**

**Email:**

### Vehicle Information

Please provide the following information for all vehicles collecting extraction well water:

**1. Vehicle A** License Plate Number:

Does Vehicle A have valid insurance and registration?

What is the automobile insurance expiration date for Vehicle A?

**2. Vehicle B** License Plate Number:

Does Vehicle B have valid insurance and registration?

What is the automobile insurance expiration date for Vehicle B?

**3. Vehicle C** License Plate Number:

Does Vehicle C have valid insurance and registration?

What is the automobile insurance expiration date for Vehicle C?

## Extraction Well Water Use Information

**From the list below, select all applicable uses of Extraction well water:**

1. Dust control
2. Irrigation of trees, landscaping and gardens
3. Vehicle Washing
4. Soil compaction
5. Washing of hard surfaces such as paths, walls, windows
6. Other:

**Specify the street address, City and zip code where extraction well water will be used:**

Location A:

Location B:

Location C:

## Frequently Asked Questions about Extraction Well Water

### 1. What is the Extraction Well Water Fill Station Program?

The “Extraction Well Water Fill Station” program is a pilot initiative to provide free groundwater from the Fresno-Clovis Regional Wastewater Reclamation Facility (RWRF) for commercial customers to offset the use of drinking water for non-drinking uses.

### 2. What is extraction well water and is it safe?

Extraction well water is water that percolates from disposal ponds where treated wastewater is placed. The soil provides additional filtration treatment resulting in good quality water that is safe for non-drinking uses. Extraction well water is safe for human contact, except for drinking.

### 3. What can I use extraction well water for?

Extraction well water can be used for watering trees, lawns and gardens. It can also be used for dust control, soil compaction, washing vehicles and hard surfaces such as paths, walls and windows.

### 4. What is extraction well water **NOT** suitable for?

It is not suitable for drinking, cooking or use in the kitchen, bathing or showering, filling swimming pools or spas, children’s water toys and connecting it to the household domestic (drinking water) plumbing or irrigation system.

### 5. Do water use restrictions (conservation) apply to extraction well water?

No. Water use restrictions do not apply to extraction well water. However, it is a valuable resource and should not be wasted.

### 6. How much will extraction well water cost me?

The water is currently being provided at no cost.



**7. How much extraction well water can I pick up at a time?**

Commercial customers may collect 300 gallons or more per trip. **The City of Fresno is not liable for any damages to you or your vehicle(s) due to your participation in the commercial extraction well water fill station program.**

**8. Where and when can I use the Commercial Extraction Well Water Fill Station?**

The fill station is located at the RWRF, 5607 W. Jensen Avenue, Fresno, CA 93706. Hours of operation are Monday through Sunday, 7:00 am to 7:00 pm.

**Rules and Regulations of Extraction Well Water Use**

1. **DO NOT DRINK** extraction well water.
2. Extraction well water **shall not** be put into any piping or storage facility that has any connection to an on-site drinking water supply.
3. Distributor's vehicles used for bulk collection, transportation and distribution of extraction well water must have containers with capabilities of 300 gallons or greater.
4. Designated vehicles must have water tight valves and fittings, must not leak, and tanks must be cleaned of contaminants prior to use.
5. Hauling vehicles may be self-propelled or towed vehicles having an attached water tank, with or without pumps, hoses and accessory equipment for filling or distribution of extraction well water. Use of convertible trucks, dump trucks, or flat-bed trucks with detachable tanks is allowed if the tanks are securely attached.
6. Vehicles without a tank or detached tank are not approved for collecting extraction well water.
7. A truck or tank that has contained material from a septic tank or cesspool shall not be used to convey extraction well water.
8. Customers are required to label both sides of their water tanks with the words "**Non-potable water/Do not drink**" in letters of at least 4 inches in height. Labeling must be permanently attached to or painted on the vehicle and must be fully legible and visible at all times.

**Procedure to Obtain Extraction Well Water**

1. Read and understand the conditions of this Use Application/Agreement. Download and save the form to your Desktop. Type in your responses, Save, Print, and mail a signed form to the following address:

Attn: Reclamation Coordinator  
Fresno Clovis Regional Wastewater Reclamation Facility  
5607 W. Jensen Ave  
Fresno, CA 93706

A hard copy of the form can be mailed to you by calling (559) 621-5134.



2. Approved applicants will receive a brief one-on-one training on use requirements of extraction well water. Customers will be provided a badge to access the gate into the fill station site and activate the water supply. A City representative will direct participating customers to the fill station located inside the RWRP.
3. The badge holder is the primary party held accountable for accessing the fill station site. If the badge is misplaced or damaged, the primary badge holder shall pay \$25.00 to the Wastewater Management Division for a new badge.
4. All water tanks are required to be labeled with the words “**Non-potable water/Do not drink**”.
5. Access to the Commercial Extraction Well Water Fill Station is based on a first-come basis.
6. Haulers must ensure that tanks are sealed and secured for transport prior to leaving the facility.

### Certification Statement/Signature Section

- By checking this box, Customer, and if applicable, Customer’s organization’s officers, owners, personnel, employees, agents, contractors, invitees or volunteers agree, to the furthest extent allowed by law, Customer shall indemnify, hold harmless and defend CITY and each of its officers, officials, employees, agents and volunteers from any and all loss, liability, fines, penalties, forfeitures, costs and damages (whether in contract, tort or strict liability, including but not limited to personal injury, death at any time and property damage) incurred by CITY, Customer or any other person, and from any and all claims, demands and actions in law or equity (including attorney’s fees and litigation expenses), arising or alleged to have arisen directly or indirectly from the collection, transportation and distribution of recycled water. Customer’s obligations under the preceding sentence shall apply regardless of whether CITY or any of its officers, officials, employees, agents or volunteers are passively negligent, but shall not apply to any loss, liability, fines, penalties, forfeitures, costs or damages caused by the active or sole negligence, or the willful misconduct, of CITY or any of its officers, officials, employees, agents or volunteers.

If Customer should subcontract all or any portion of the work to be performed under this Contract, Customer shall require each subcontractor to indemnify, hold harmless and defend CITY and each of its officers, officials, employees, agents and volunteers in accordance with the terms of the preceding paragraph.

This section shall survive termination or expiration of this Contract.

- By checking this box, I assert that the information provided in this application is true and accurate to the best of my knowledge, and represent that I have read, understand, and agree to comply with the City’s Rules and Regulations for recycled water. Failure to comply with the conditions of this agreement may lead to termination of this agreement and the ability to obtain recycled water from the commercial/residential fill station.



**Name:**

\_\_\_\_\_

**Customer's Signature**

\_\_\_\_\_

**Date**





238460

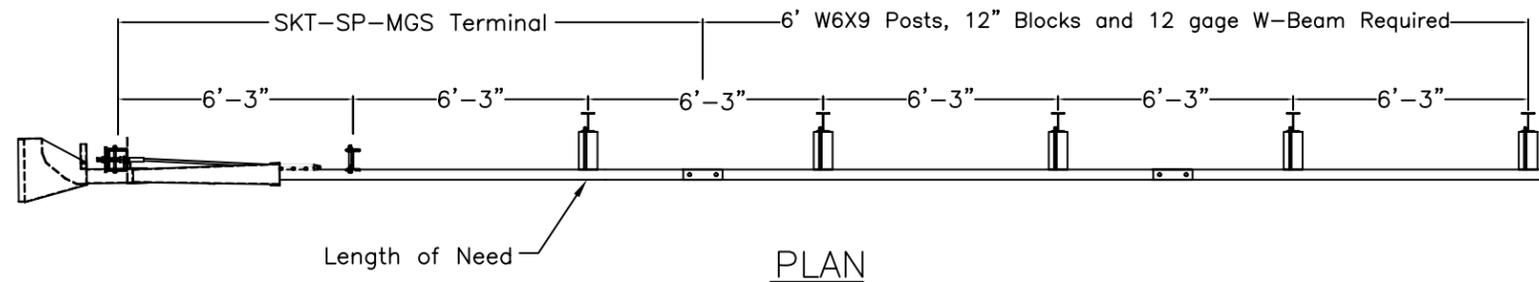
800-742-7246

City of  
**FRESNO**  
a culture of excellence  
where people get the best  
every day

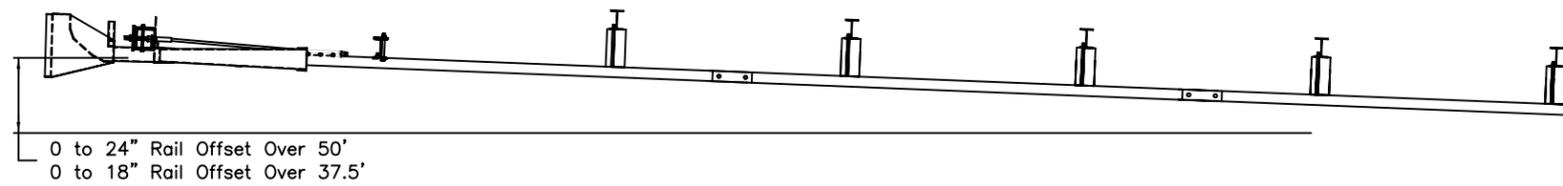
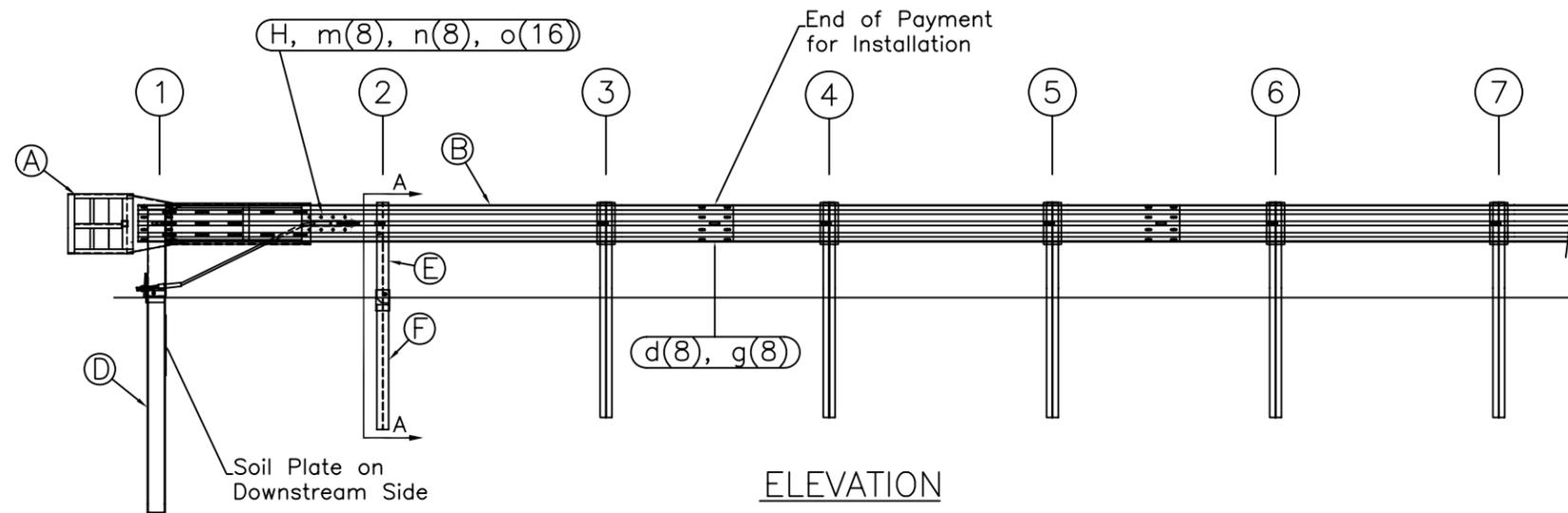
CA 48695

M-LELLAN

Element	ElementID	County	Route	PostMile	DetectorType	Location	Direction	OperationDate	Status
TCS	CE-4198	FRE	41	24.5	Loop	NB OFF TO WB RTE. 180	NB		EXISTING
TCS	CE-4201	FRE	41	25.214	Loop	NB OFF TO MCKINLEY AVE	NB		EXISTING
SIGNAL	SI-220	FRE	41	25.26		41 (NB) @ MCKINLEY E.		9/20/1982	EXISTING
RMS	RM-0023	FRE	41	25.34		MCKINLEY AVE DT	NB	10/5/1995	EXISTING
TCS	CE-4203	FRE	41	25.433	Loop	NB ON FR MCKINLEY AVE	NB		EXISTING
CCTV	CC-013	FRE	41	25.47		MCKINLEY AVE	NB	4/1/1995	EXISTING
TCS	CE-4206	FRE	41	26.312	Loop	SB ON FR EB SHIELDS AVE	SB		EXISTING
RMS	RM-0012	FRE	41	26.35		SHIELDS AVE DT	SB	6/23/2011	EXISTING
RMS	RM-0024	FRE	41	26.4		SHIELDS AVE LP	NB	10/5/1995	EXISTING
SIGNAL	SI-230	FRE	41	26.43		SHIELDS @ MANCHESTER		1/1/2000	EXISTING
SIGNAL	SI-223	FRE	41	26.5		41 (NB) @ SHIELDS E.		9/20/1982	EXISTING
TCS	CE-4217	FRE	41	28.323	Loop	SB ON FR EB SHAW AVE	SB		EXISTING
RMS	RM-0009	FRE	41	28.37		SHAW AVE DT	SB	9/1/1993	EXISTING
CCTV	CC-002	FRE	41	28.46		SHAW AVE	SB	3/22/1996	EXISTING
SIGNAL	SI-226	FRE	41	28.47		41 (SB) @ SHAW W.		9/29/1982	EXISTING
RMS	RM-0006	FRE	41	30.17		HERNDON AVE DT	SB	10/27/1994	EXISTING
SIGNAL	SI-232	FRE	41	30.27		41 (SB) @ HERNDON W.		1/22/1993	EXISTING
RMS	RM-0005	FRE	41	30.29		HERNDON AVE LP	SB	10/27/1994	EXISTING
CCTV	CC-003	FRE	41	30.48		HERNDON AVE	SB	9/27/1995	EXISTING
RMS	RM-0004	FRE	41	31.5		FRIANT RD DT	SB	10/27/1994	EXISTING
SIGNAL	SI-234	FRE	41	31.53		41 (SB) @ FRIANT RD. W.		11/22/1988	EXISTING
RMS	RM-0003	FRE	41	31.7		FRIANT RD LP	SB	10/27/1994	EXISTING
CCTV	CC-008	FRE	41	31.71		FRIANT RD	SB	9/5/1995	EXISTING
SIGNAL	SI-281	FRE	168	4.01		168 (WB) @ SHAW E.		6/26/2000	EXISTING
CCTV	CC-022	FRE	168	4.03		SHAW AVE	WB	7/3/2000	EXISTING
SIGNAL	SI-283	FRE	168	5.26		168 (WB) @ BULLARD W.		6/26/2000	EXISTING
CCTV	CC-023	FRE	168	5.33		BULLARD AVE	WB	7/27/2000	EXISTING
RMS	RM-0034	FRE	168	5.66		BULLARD AVE LP	WB	7/20/2000	EXISTING
RMS	RM-0063	FRE	180	57.71		ABBY AVE DT	EB	10/6/1995	EXISTING
SIGNAL	SI-317	FRE	180	57.9		ABBY @ WHITE		1/1/2000	EXISTING
TCS	CE-4275	FRE	180	58.032	Loop	EB ON FR N ABBY ST	EB		EXISTING



TRAFFIC →



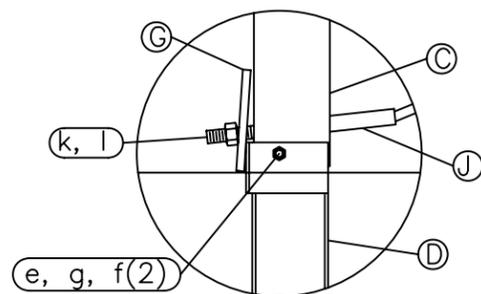
OPTIONAL FLARED INSTALLATION  
25:1 maximum flare rate

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 (6X6X $\frac{1}{2}$ " 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

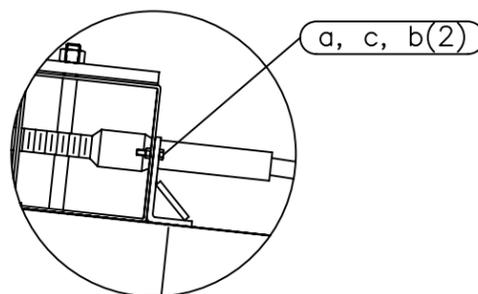
HARDWARE (ALL DIMENSIONS IN INCHES)			
a	2	5/16 x 1 HEX BOLT GRD 5	B5160104A
b	4	5/16 WASHER	W0516
c	2	5/16 HEX NUT	N0516
d	9	5/8 Dia. x 1 1/4 SPLICE BOLT (POST #2)	B580122
e	1	5/8 Dia. x 9 HEX BOLT GRD 5	B580904A
f	3	5/8 WASHER	W050
g	10	5/8 Dia. H.G.R NUT	N050
h	1	3/4 Dia. x 8 1/2 HEX BOLT GRD A449	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:

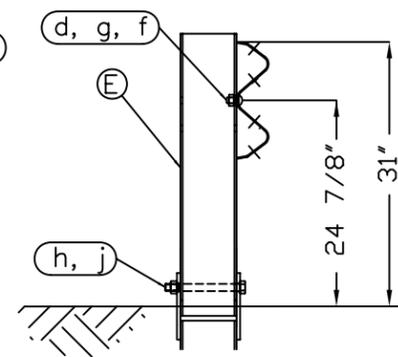
- All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
- The lower sections of the Posts 1&2 shall not protrude more than 4 in above the ground (measured along a 5' cord). Site grading may be necessary to meet this requirement.
- The lower sections of the hinged posts 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"  $\varnothing$  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.



Post #1 Connection Detail



Impact Head Connection Detail



SECTION A-A  
Post #2

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

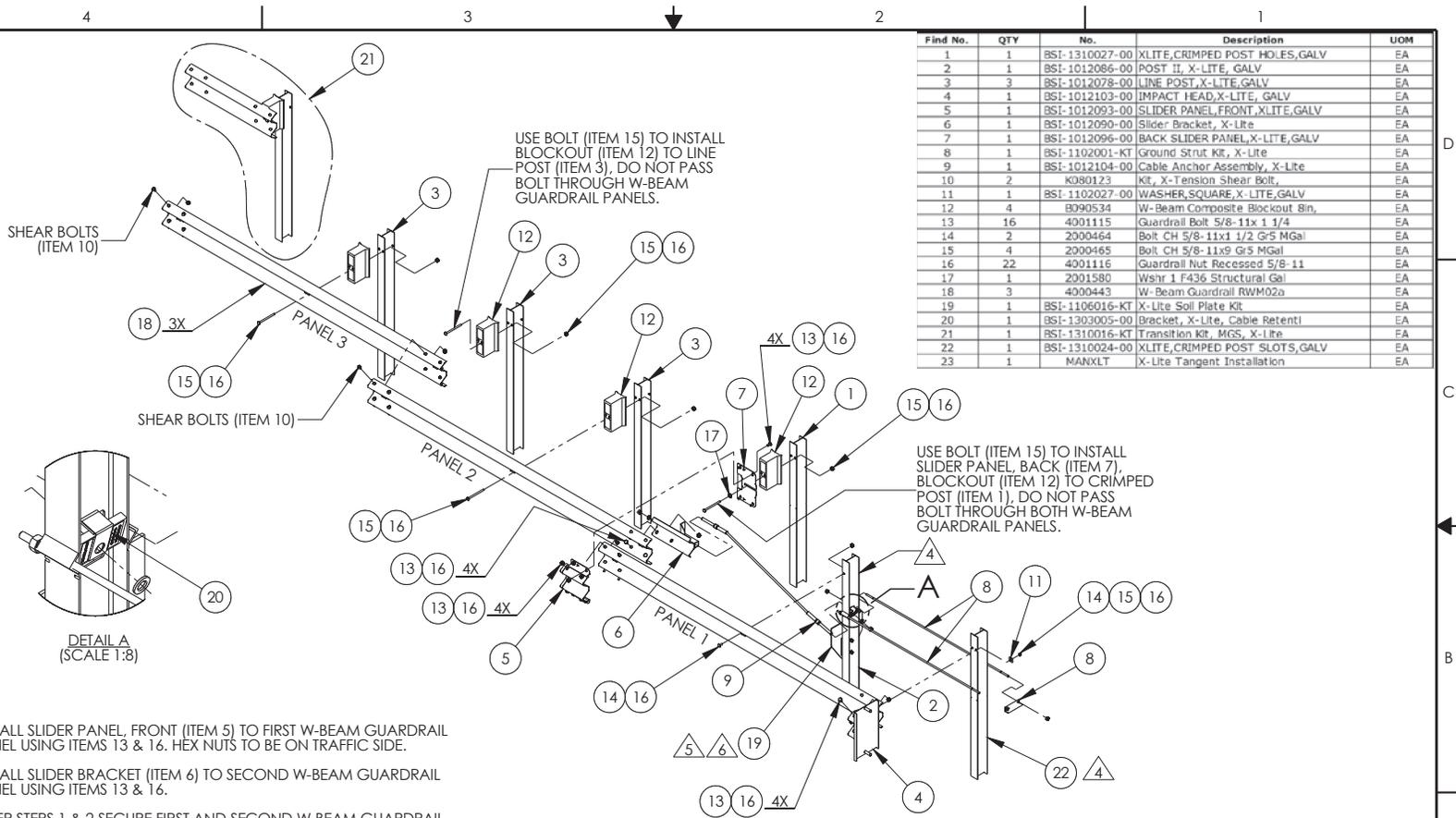
SKT-SP-MGS Terminal  
Midwest Guardrail System  
31" Top of Rail

Drawing Name:  
SKT-SP-S-MGS

Scale:  
None

Sheet:  
1  
Date:  
02/24/10  
By:  
JRR  
Rev:  
0

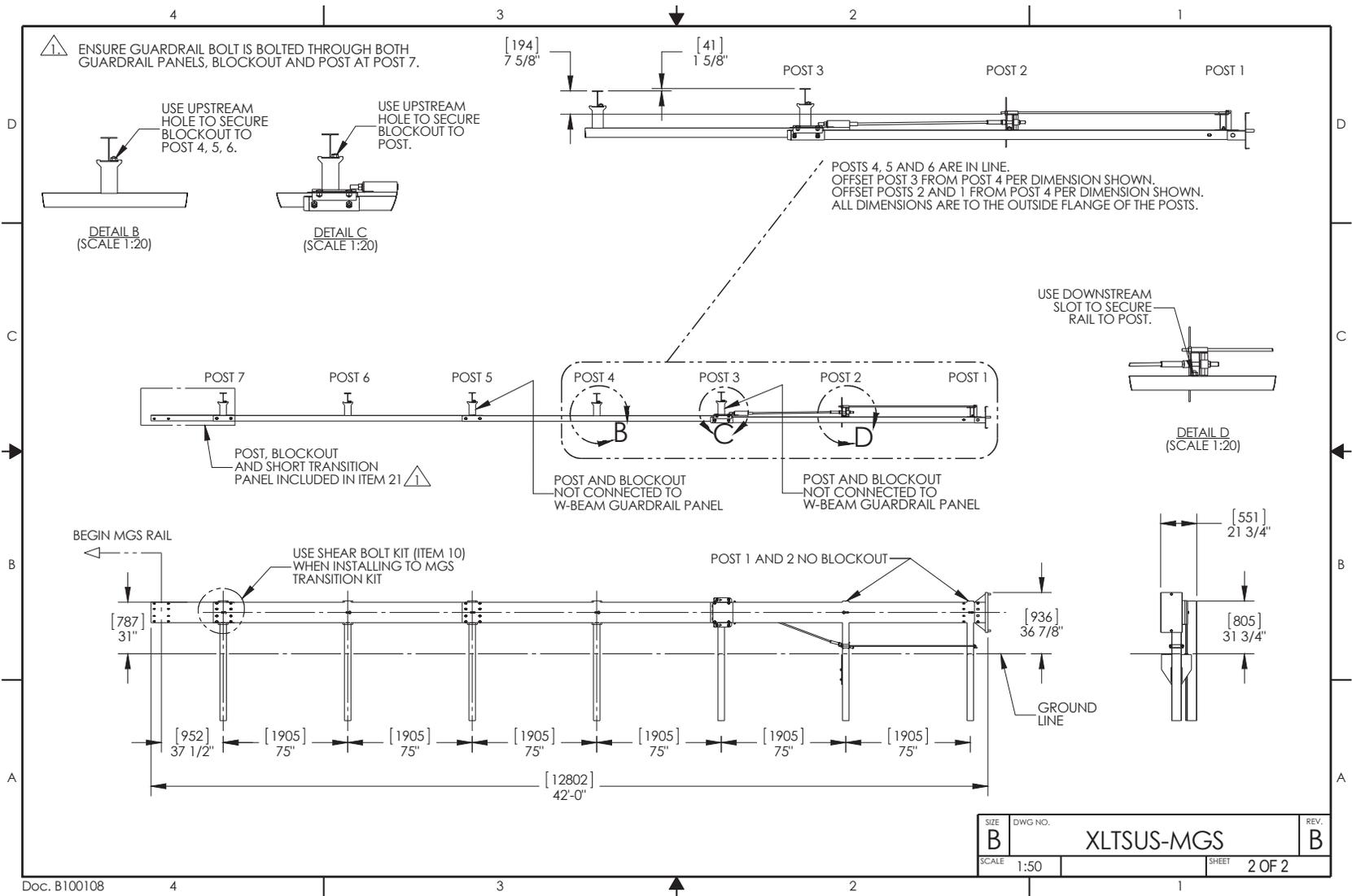
Find No.	QTY	No.	Description	UOM
1	1	BSI-1310027-00	XLITE, CRIMPED POST HOLES, GALV	EA
2	1	BSI-1012066-00	POST II, X-LITE, GALV	EA
3	3	BSI-1012078-00	LINE POST, X-LITE, GALV	EA
4	1	BSI-1012103-00	IMPACT HEAD, X-LITE, GALV	EA
5	1	BSI-1012093-00	SLIDER PANEL, FRONT, X-LITE, GALV	EA
6	1	BSI-1012090-00	Slider Bracket, X-Lite	EA
7	1	BSI-1012096-00	BACK SLIDER PANEL, X-LITE, GALV	EA
8	1	BSI-1102001-KT	Ground Strut Kit, X-Lite	EA
9	1	BSI-1012104-00	Cable Anchor Assembly, X-Lite	EA
10	2	KD80123	Kit, X-Tension Shear Bolt,	EA
11	1	BSI-1102027-00	WASHER, SQUARE, X-LITE, GALV	EA
12	4	B090534	W-Beam Composite Blockout Bin,	EA
13	16	4001115	Guardrail Bolt 5/8-11x 1 1/4	EA
14	2	2000464	Bolt CH 5/8-11x1 1/2 Gr5 MGal	EA
15	4	2000465	Bolt CH 5/8-11x9 Gr5 MGal	EA
16	22	4001116	Guardrail Nut Recessed 5/8-11	EA
17	1	2001580	Wshr 1 F436 Structural Gal	EA
18	3	4000443	W-Beam Guardrail RWM02a	EA
19	1	BSI-1106016-KT	X-Lite Soil Plate Kit	EA
20	1	BSI-1303005-00	Bracket, X-Lite, Cable Retenti	EA
21	1	BSI-1310016-KT	Transition Kit, MGS, X-Lite	EA
22	1	BSI-1310024-00	XLITE, CRIMPED POST SLOTS, GALV	EA
23	1	MANXLT	X-Lite Tangent Installation	EA



- INSTALL SLIDER PANEL, FRONT (ITEM 5) TO FIRST W-BEAM GUARDRAIL PANEL USING ITEMS 13 & 16. HEX NUTS TO BE ON TRAFFIC SIDE.
- INSTALL SLIDER BRACKET (ITEM 6) TO SECOND W-BEAM GUARDRAIL PANEL USING ITEMS 13 & 16.
- AFTER STEPS 1 & 2 SECURE FIRST AND SECOND W-BEAM GUARDRAIL PANEL USING ITEMS 7, 13 & 16. HEX NUTS TO BE ON TRAFFIC SIDE.
- SLOT ON POSTS 1 AND 2 TO FACE GUARDRAIL PANEL.
- IF ROCK OR STIFF SOIL IS ENCOUNTERED, THE POST AND SOIL PLATE MAY BE INSTALLED BY AUGERING AND BACKFILLING THE HOLE. EXTRA CARE MUST BE TAKEN TO PREVENT SETTLEMENT OR LATERAL DISPLACEMENT OF THE POST. BACKFILL MATERIAL SHALL BE COMPACTED TO OPTIMUM COMPACTION.
- IF ROCK IS ENCOUNTERED, THE SOIL PLATE MAY BE MODIFIED IF APPROVED BY THE PROJECT ENGINEER.

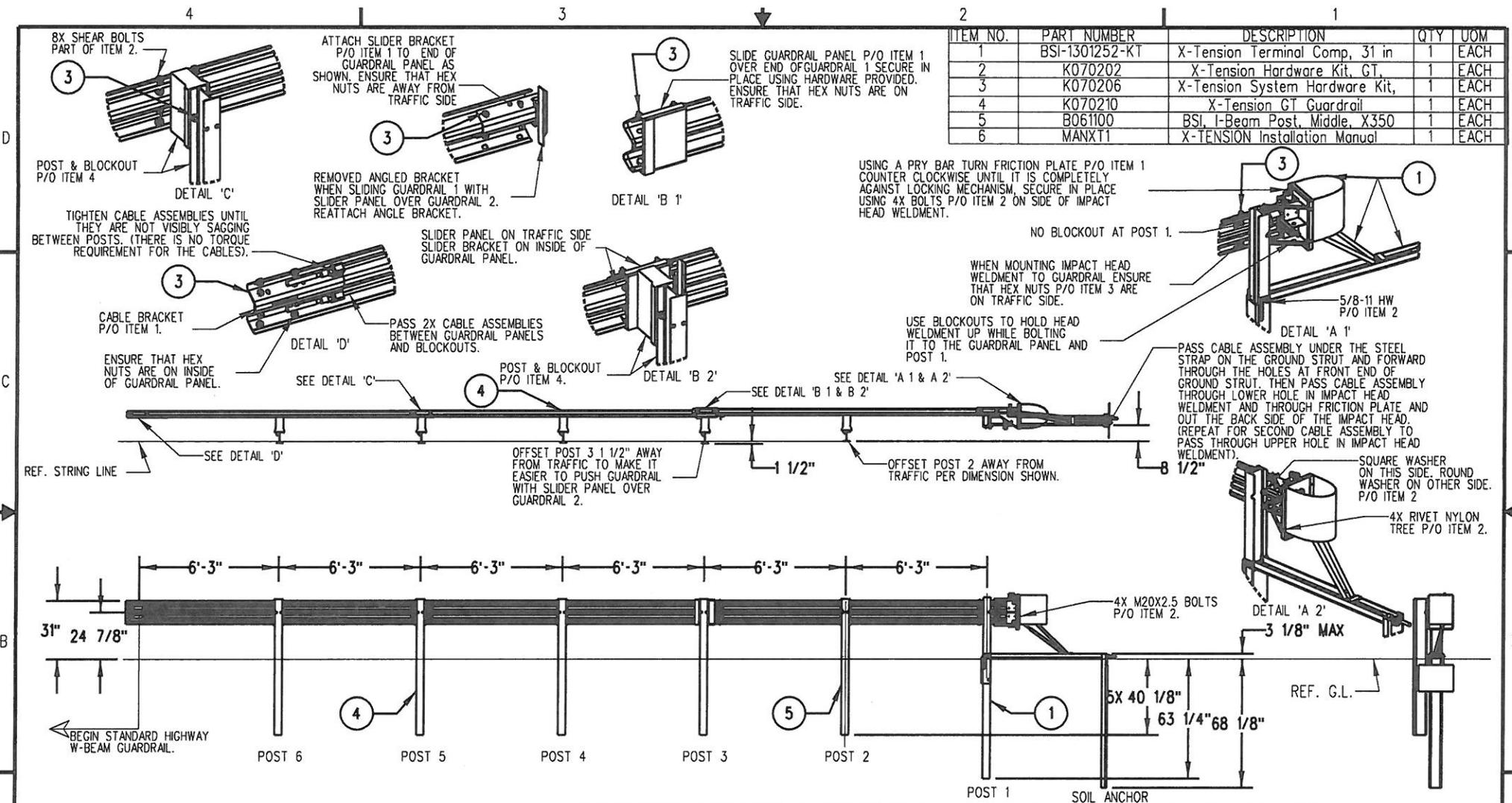
© 2010 BARRIER SYSTEMS INC. THE INFORMATION CONTAINED IN THIS DRAWING IS THE SOLE PROPERTY OF BARRIER SYSTEMS INC. ANY REPRODUCTION IN PART OR WHOLE WITHOUT THE WRITTEN PERMISSION OF BARRIER SYSTEMS INC. IS PROHIBITED.		UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCES ARE: FRACTIONS DECIMAL ANGLES ±1/16 .XX ±.03 ±1/2° .XXX ±.010		3333 Vaca Valley Parkway Ste 800 Vacaville, CA 95688 Tel: 888-800-3691 www.barriersystemsinc.com	
<b>APPROVALS</b> DRAWN BY: JMT DRAWN DATE: 10/09/2013 APPRD BY: GAD APPRD DATE: 10/09/13		INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5-1994 THIRD ANGLE PROJECTION DO NOT SCALE DRAWING		TITLE: X-LITE SYSTEM ASSEMBLY, TANGENT, TRANSITION TO MGS SIZE: B DWG NO.: XLTSUS-MGS SCALE: 1:40 SHEET: 1 OF 2	
				REV	B

Appendix A - System Configuration, 37' 6" MGS



## Appendix A -Bill of Materials - X-Lite Tangent, MGS 37' 6"

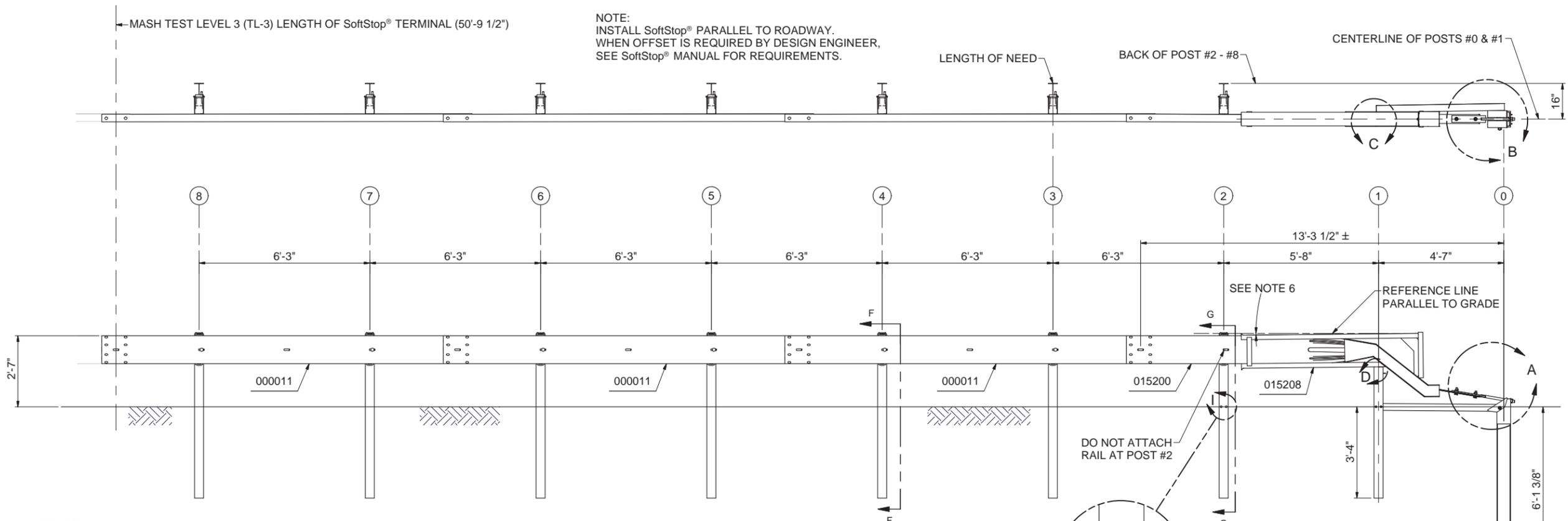
Item	Description	Full System	Kit Only
BSI-1310024-00	XLITE,CRIMPED POST SLOTS,GALV	1.00	1.00
BSI-1310027-00	XLITE,CRIMPED POST HOLES,GALV	1.00	1.00
BSI-1012086-00	POST II, X-LITE, GALV	1.00	1.00
BSI-1012078-00	LINE POST,X-LITE,GALV	3.00	-
BSI-1012103-00	IMPACT HEAD,X-LITE, GALV	1.00	1.00
BSI-1012093-00	SLIDER PANEL,FRONT,XLITE,GALV	1.00	1.00
BSI-1012090-00	Slider Bracket, X-Lite	1.00	1.00
BSI-1012096-00	BACK SLIDER PANEL,X-LITE,GALV	1.00	1.00
BSI-1012097-00	Ground Strut, X-Lite	2.00	2.00
BSI-1012098-00	Ground Strut Angle	1.00	1.00
BSI-1012104-00	Cable Anchor Assembly, X-Lite	1.00	1.00
K080123	Kit, X-Tension Shear Bolt,	2.00	2.00
BSI-1102027-00	WASHER,SQUARE,X-LITE,GALV	1.00	1.00
B090534	W-Beam Composite Blockout 8in,	4.00	-
4001115	Guardrail Bolt 5/8-11x 1 1/4	16.00	-
2000464	Bolt CH 5/8-11x1 1/2 Gr5 MGal	2.00	-
2000465	Bolt CH 5/8-11x9 Gr5 MGal	4.00	-
4001116	Guardrail Nut Recessed 5/8-11	26.00	-
2001580	Wshr 1" F436 Structural	1.00	-
4000443	W-Beam Guardrail RWM02a	3.00	-
BSI-1312100-00	Soil Plate	1.00	1.00
2000220	C-Scr HH 5/8-11x3 1/2 Gr5 MGal	2.00	2.00
2001636	Wshr 5/8 F436 Struct MGal	4.00	4.00
2000312	Nut HX 5/8-11 Gr5 Mgal	2.00	1.00
BSI-1303005-00	Bracket, X-Lite, Cable Retenti	1.00	1.00
BSI-1310016-KT	Transition Kit, MGS, X-Lite	1.00	1.00



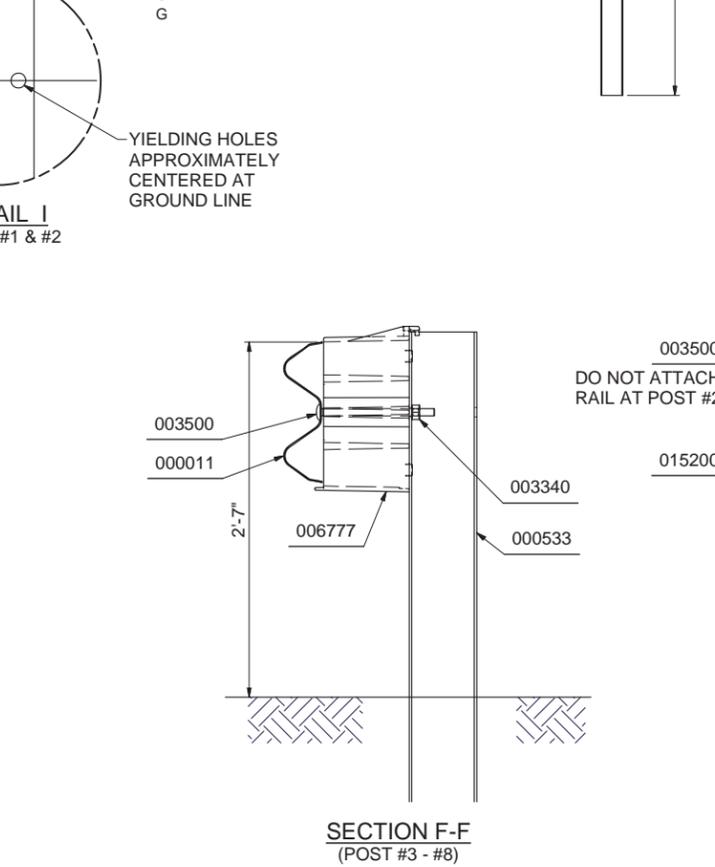
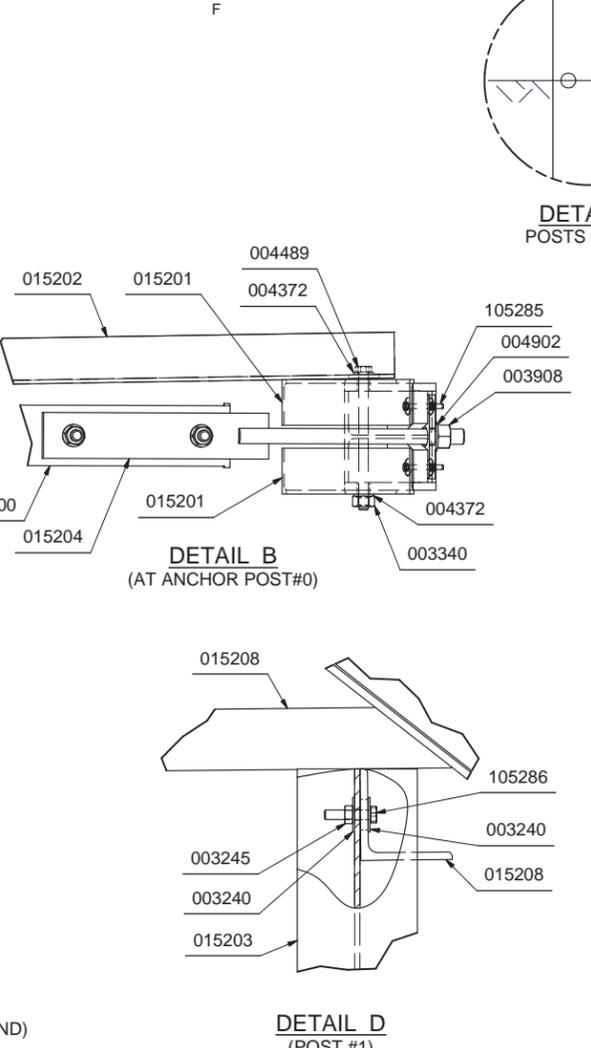
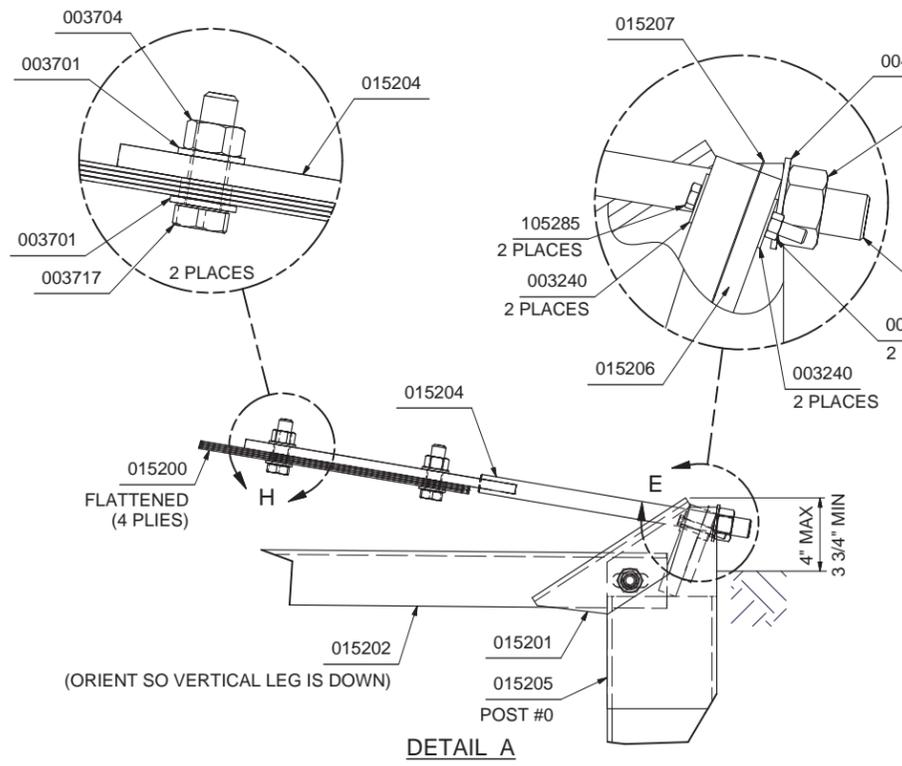
ITEM NO.	PART NUMBER	DESCRIPTION	QTY	UOM
1	BSI-1301252-KT	X-Tension Terminal Comp, 31 in	1	EACH
2	K070202	X-Tension Hardware Kit, GT,	1	EACH
3	K070206	X-Tension System Hardware Kit,	1	EACH
4	K070210	X-Tension GT Guardrail	1	EACH
5	B061100	BSL I-Beam Post, Middle, X350	1	EACH
6	MANXT1	X-TENSION Installation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

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<b>APPROVALS</b> DRAWN BY: NMV DRAWN DATE: 2/08/13 APPR'D BY: JMT APPR'D DATE: 2/08/13				<small>THIRD ANGLE PROJECTION</small> 		TITLE <b>X-TENSION GUARDRAIL TERMINAL SYSTEM</b> <b>STEEL POST WITH COMPOSITE BLOCKOUT</b> <b>31" RAIL HEIGHT</b>	
REV: B		DATE: 2/08/13		SCALE: 1:50		SHEET: 1 OF 1	

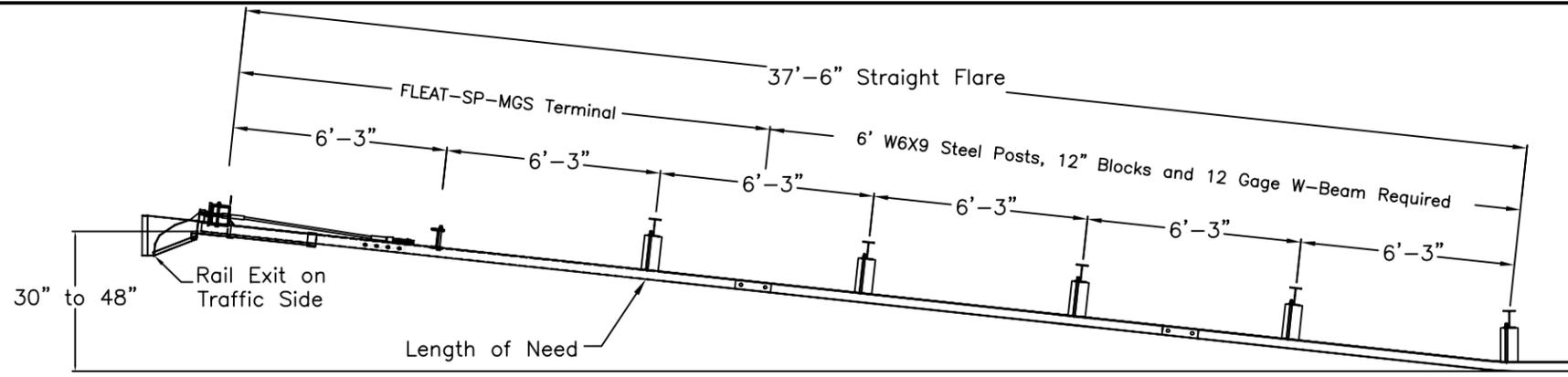


PARTS LIST		
PART NO.	QTY.	DESCRIPTION
000011	3	12/12/6/3/1.5/S
000533	6	6'0 POST - W6 x 8.5
006777	7	KING BLOCK
015000	1	6'0 SYT PST/8.5/31" GR HT
015200	1	SFST-ANCHOR G.RAIL 12'-6"
015201	2	SFST-ANCHOR ANGLE
015202	1	SFST-ANGLE STRUT
015203	1	SFST-POST#1 SYTP
015204	1	SFST-ANCHOR PADDLE
015205	1	SFST-POST#0
015206	1	SFST-PLATE WASHER
015207	1	SFST-KEEPER PLATE
015208	1	SFST-IMPACT HEAD
- HARDWARE -		
003240	6	5/16 ROUND WASHER WIDE
003245	3	5/16 HEX NUT
003340	41	5/8" GR HEX NUT
003360	32	5/8"X1.25" GR BOLT
003391	1	5/8"X1.75" HEX BOLT A325
003500	7	5/8 GUARD RAIL BOLT x 10"
003701	4	3/4" ROUND WASHER F436
003704	2	3/4" HVY HEX NUT A563 DH
003717	2	3/4"X2.5" HEX BOLT A325
003908	1	1" HVY HEX NUT A563 DH
004372	4	5/8" WASHER F436
004489	1	5/8"X9" HEX BOLT A325
004902	1	1" ROUND WASHER F436
105285	2	5/16"X2.5" HEX BOLT GRD 5
105286	1	5/16"X1.5" HEX BOLT GRD 5

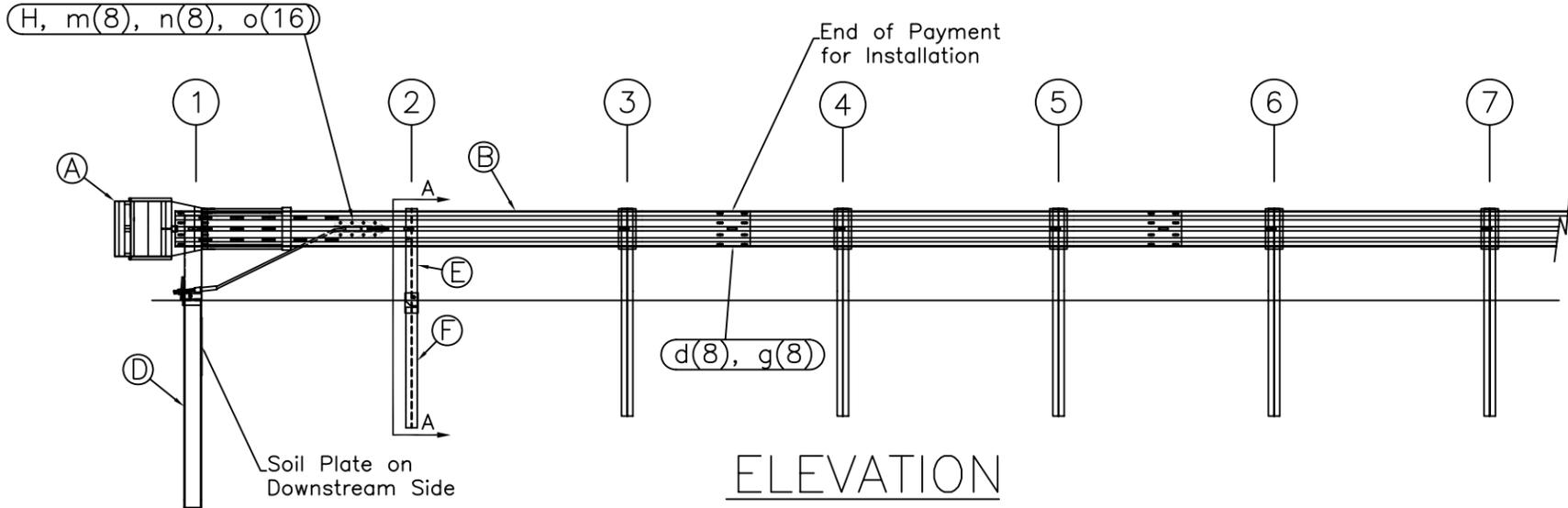


- NOTES:
- REFER TO SoftStop® ASSEMBLY MANUAL.
  - PROPER SITE GRADING SHOULD BE ACCOMPLISHED IN ACCORDANCE WITH LOCAL SPECIFYING AGENCY GUIDELINES AND THE AASHTO ROADSIDE DESIGN GUIDE.
  - DO NOT ATTACH THE SoftStop® DIRECTLY TO A RIGID BARRIER.
  - UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop® BE CURVED.
  - MANUFACTURER SUGGESTS CUSTOMER TO PROVIDE REFLECTORIZATION OF THE TERMINAL.
  - IT IS ACCEPTABLE TO INSTALL THE SoftStop® IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT. SEE SoftStop® ASSEMBLY MANUAL FOR SPECIFIC DETAILS.

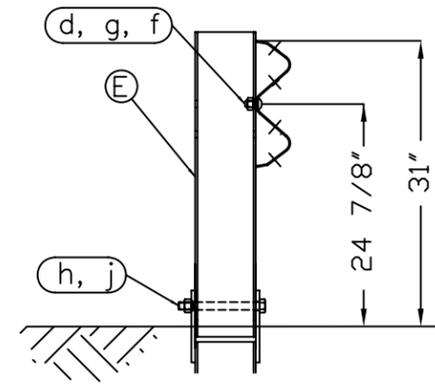
MATERIAL: SEE PARTS LIST	DRAWN: BT	DATE: 11/14/2012	TOLERANCES PER CEMC-THP-SF-001, UNLESS OTHERWISE SPECIFIED.  DO NOT SCALE DRAWING	SoftStop® TERMINAL (8" BLOCKS) PLAN, ELEVATION & SECTION MASH TEST LEVEL 3 (TL-3) P/N: 500646B	
FINISH: N/A	CHECKED: BS	DATE: 11/14/2012			
ESTIMATED WEIGHT: 1221.7 lbmass	UNLESS OTHERWISE NOTED, ALL DIMENSIONS ARE IN FEET/INCHES. DIMENSIONS ACCORDING TO ASME Y14.5M-1994 UNLESS OTHERWISE SPECIFIED.		DRIVING: SS 646	SHEET: 1 of 1	© 2012-2015 Trinity Highway Products, LLC. All rights reserved. CEMC-THP-FE-052 Rev B, 9/15/2015



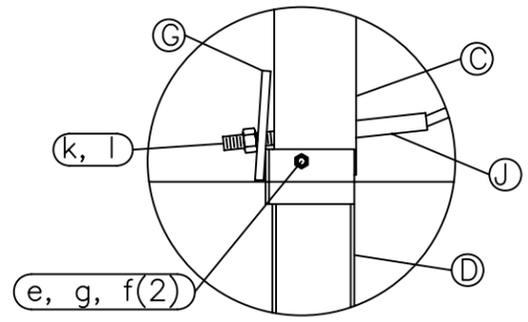
PLAN



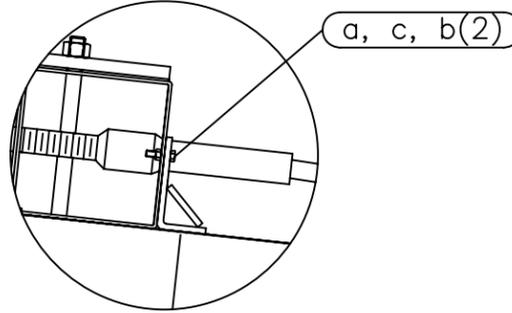
ELEVATION



SECTION A-A  
Post #2



Post #1 Connection Detail



Impact Head Connection Detail

ITEM	QTY	BILL OF MATERIALS	ITEM NO.
A	1	IMPACT HEAD	F3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	MGS-SF1303
C	1	FIRST POST TOP (6X6X $\frac{1}{8}$ " 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:

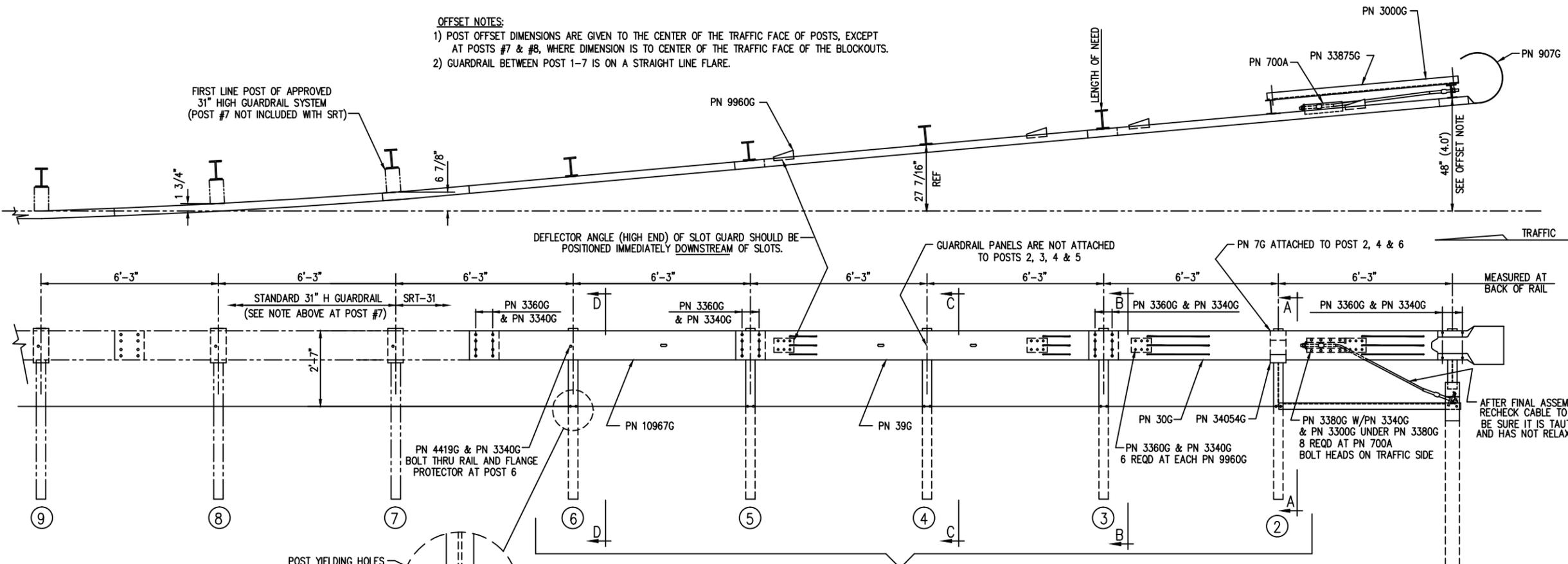
- All bolts, nuts, cable assemblies, cable anchors and bearing plates shall be galvanized.
- The lower sections of the Posts 1&2 shall not protrude more than 4 in above the ground (measured along a 5' cord). Site grading may be necessary to meet this requirement.
- The lower sections of the hinged posts 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.
- 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.

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

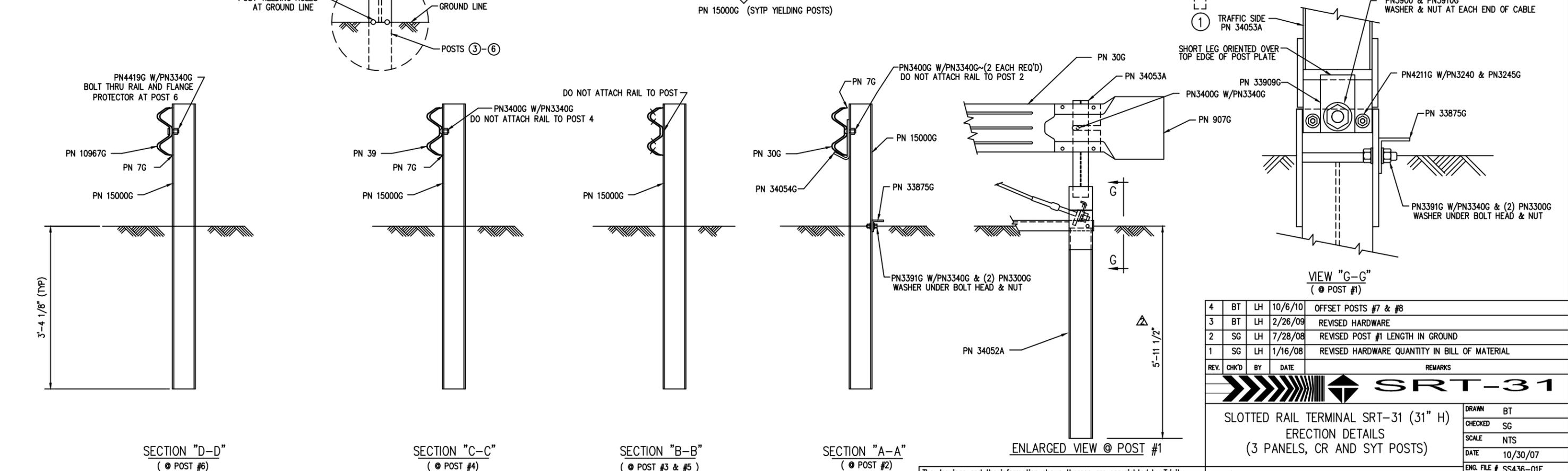
<b>FLEAT-SP-MGS Terminal Midwest Guardrail System 31" Top of Rail</b>		Sheet:	1
		Date:	02/24/10
Drawing Name: <b>FLT-SP-S-MGS</b>		By:	JRR
		Scale:	None
		Rev:	0

**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.  
2525 STEMMONS FREEWAY  
DALLAS, TX 75207

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**TECHNICAL  
BRIEF**

180 River Road • Rio Vista, CA 94571 • Tel 707-374-6800 • Fax 707-374-6801  
Email: info@barriersystemsinc.com • Website: barriersystemsinc.com

## Product Specification

# ABSORB 350<sup>TM</sup> TL-3 Non-Redirective, Gating, Crash Cushion Applied to Permanent and Portable Concrete Barrier

### I. General

The ABSORB 350<sup>TM</sup> TL-3 System is a Non-Redirective, Gating, Crash Cushion in accordance with the definitions in the National Cooperative Highway Research Program Report 350 (NCHRP 350). The system shall be tested and perform in an acceptable manner in accordance with the guidelines of NCHRP 350 at Test Level 3 (100 km/h).

### II. Performance

The ABSORB 350 is designed to absorb the impact energy of an errant vehicle in accordance with NCHRP 350 guidelines for Non-Redirective, Gating, Crash Cushions. The system is designed to be attached to Permanent Concrete Barrier and Portable Concrete Barrier with section lengths of at least 3.1 meters (10 feet). When attached in accordance with the manufacturers instructions, the ABSORB 350 system is capable of safely stopping a 2000 kg (4400 pound) pickup truck impacting the system at 100 km/h (62.3 mph) and 0 degrees and an 820 kg (1800 pound) compact vehicle impacting the system at 100 km/h (62.3 mph), 0 degrees and with an offset of the vehicle and system centerlines of one-fourth the vehicle width.

A. When properly installed according to the manufacturer's recommendations the ABSORB 350 system shall be fully tested to and meet the recommended structural adequacy, occupant risk, and vehicle trajectory criteria set forth in NCHRP 350 for Test Level 3 Non-Redirective, Gating Crash Cushions (NCHRP 350 TL-3):

1. Impact at 0 degrees at w/4 offset (centerline of vehicle offset 1/4 width of vehicle from centerline of system) at 100 km/h with an 820C vehicle. This is Test 3-40 of NCHRP 35.

2. Impact at 0 degrees into center nose of device (0 offset from centerline of vehicle) at 100 km/h with a 2000P vehicle. This is Test 3-41 of NCHRP 350.
3. Impact at 15 degrees into center nose of device (0 offset from centerline of vehicle) at 100 km/h with an 820C vehicle unless the Federal Highway Administration, due to acceptable performance in test 3-40, waives this test. This is Test 3-42 of NCHRP 350.
4. Impact at 15 degrees into center nose of device (0 offset from centerline of vehicle) at 100 km/h with a 2000P vehicle. This is Test 3-43 of NCHRP 350.
5. Impact at 20 degrees along the side of the unit (with the centerline of the vehicle aligned with the centerline of the attachment of the barrier and the ABSORB 350™) at 100 km/h with a 2000P vehicle. This is Test 3-44 of NCHRP 350 as modified by the Federal Highway Administration.

B. The impact velocity of a hypothetical front seat passenger against the vehicle interior as calculated from the longitudinal vehicle acceleration and 600 mm [23 5/8 in] forward displacement, and the lateral vehicle acceleration and 300 mm [1 ft] lateral displacement shall be less than 12 m/s (39.3 ft/s) and the highest 10 ms average vehicle acceleration in the longitudinal and lateral directions subsequent to the instant of hypothetical occupant impact shall be less than 20 g's in NCHRP 350 tests 3-40, 41, 42 and 43.

For TL-3 impacts detached debris shall not show potential for penetrating the vehicle occupant compartment or presenting a hazard to other traffic, pedestrians, or workers in a work zone. The vehicle shall remain upright during and after the collision although moderate roll, pitch and yaw may occur.

### **III. Description of System**

A. The ABSORB 350 system shall be made up of the following components and the system shall be fabricated from materials conforming to the following specifications:

1. ABSORB 350 Energy Absorbing Element – Each element of the system shall be composed of a plastic container, steel side bars, end plate/ hinge assemblies, an evaporation prevention cap with tether and appropriate fasteners. The overall dimensions of the assembled element are 610 mm (24 inches) wide, 812 mm (32 inches) tall and 1000 mm (39 1/2 inches) long, as shown in the attached drawing (B000524). Each element of the system shall weigh approximately 50 kg (110 pounds) when empty and 325 kg (717 pounds) when filled. The first element of the assembled system should always be empty of fluid with the evaporation prevention cap installed. All other elements of the system should be filled with fluid in accordance with the installation instructions and the evaporation prevention cap shall be securely installed. All elements shall be attached in accordance with the installation instructions and drawings supplied by the manufacturer.

- a. The plastic elements shall be molded from Linear Low Density Polyethylene.
  - b. All steel sidebars, end plate/hinge assemblies shall be fabricated from mild steel in conformance with ASTM A-36 specifications.
  - c. The evaporation prevention cap shall be molded from low density polyethylene
2. ABSORB 350 Nose Piece – Each ABSORB 350 system shall contain one Nose Piece at the front of the system. The Nose Piece is approximately 620 mm (24 3/8inches) wide, 825mm (32 1/2inches) tall and 610mm (24 inches) long, as shown in the attached drawing (B000526). The Nose Piece shall weigh approximately 60 kg (132 pounds) and shall be attached to the first Energy Absorbing Element in accordance with the installation instructions and drawings supplied by the manufacturer.
- a. The Nose Piece shall be fabricated from mild steel in conformance with ASTM A-36.
  - b. The Nose Piece shall also have an aluminum skin on the front portion to provide an aesthetic cover and a place for attaching traffic control signage, if needed. This skin shall be fabricated from 5052 H32 in conformance with ASTM B209 and shall be attached to the steel portion of the Nose Piece with adhesives and pop rivets.
3. ABSORB 350 Transition Hardware for PCB – The transition configuration is as shown in the attached drawing B000608.
- a. PCB Transition Hardware is fabricated from mild steel in conformance with ASTM A-36 as shown in the attached drawing (B000531). The steel components shall weigh approximately 80 kg (176 pounds).

B. Attachment of the ABSORB 350™ system to PCB systems shall require nine (9) Energy Absorbing Elements. Assembly should be in compliance with the manufactures drawings and written instructions.

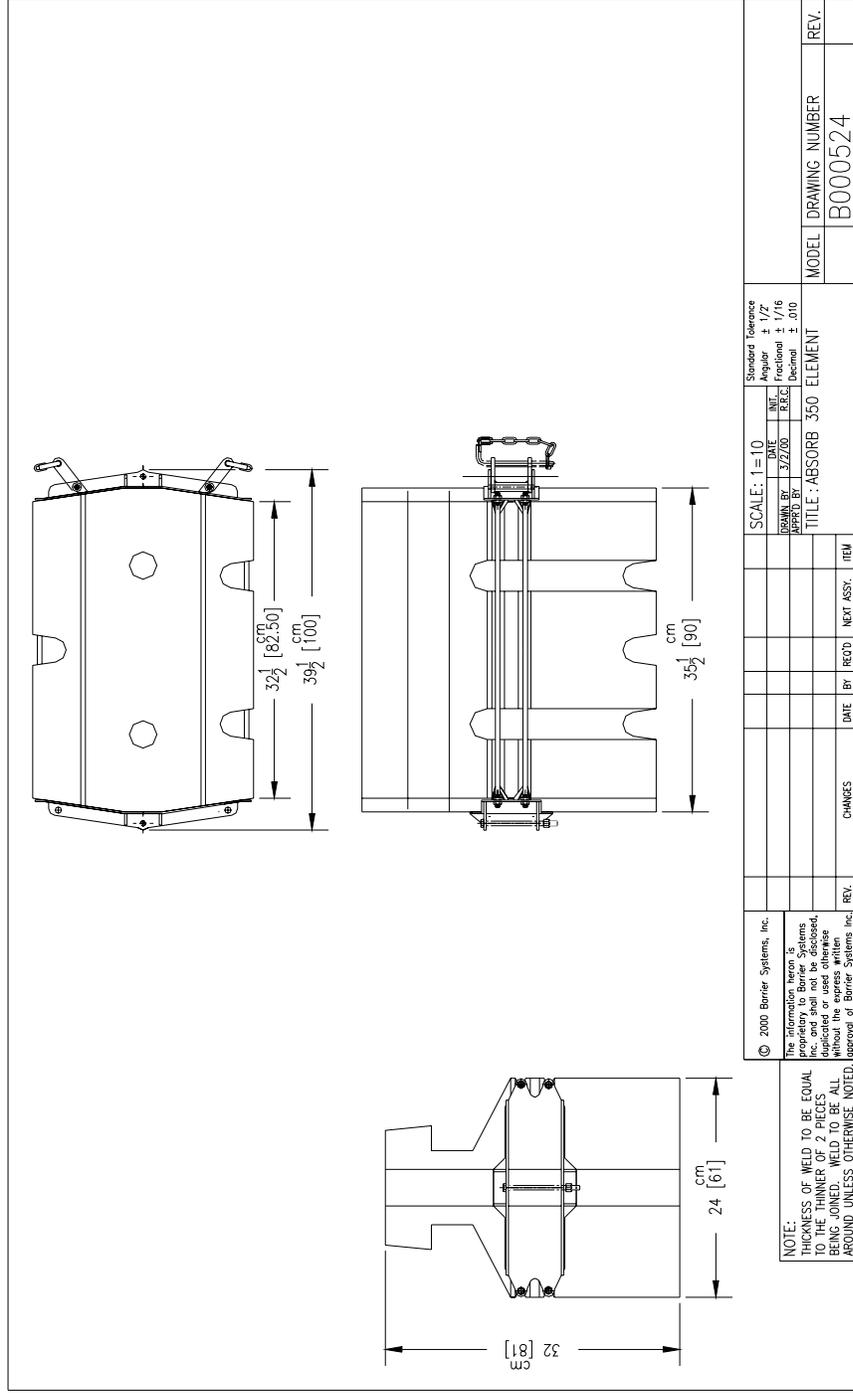
C. The ABSORB 350™ system shall be able to be refurbished after a NCHRP 350 type impact in less than 1 hour with two people, an adequate fluid supply and refurbishment materials.

D. The ABSORB 350™ system shall not require attachment to a foundation. Attachment to the PCB system will require attachment in accordance with the manufacturer's drawings and instructions.

E. The ABSORB 350™ system shall be assembled and filled with fluid in accordance with the manufacturers instructions. If there is a possibility that the fluid in the system could freeze due to low temperatures, proper antifreeze agents should be used in accordance with local standards and environmental regulations.

#### **IV. Application of Safety Appurtenances**

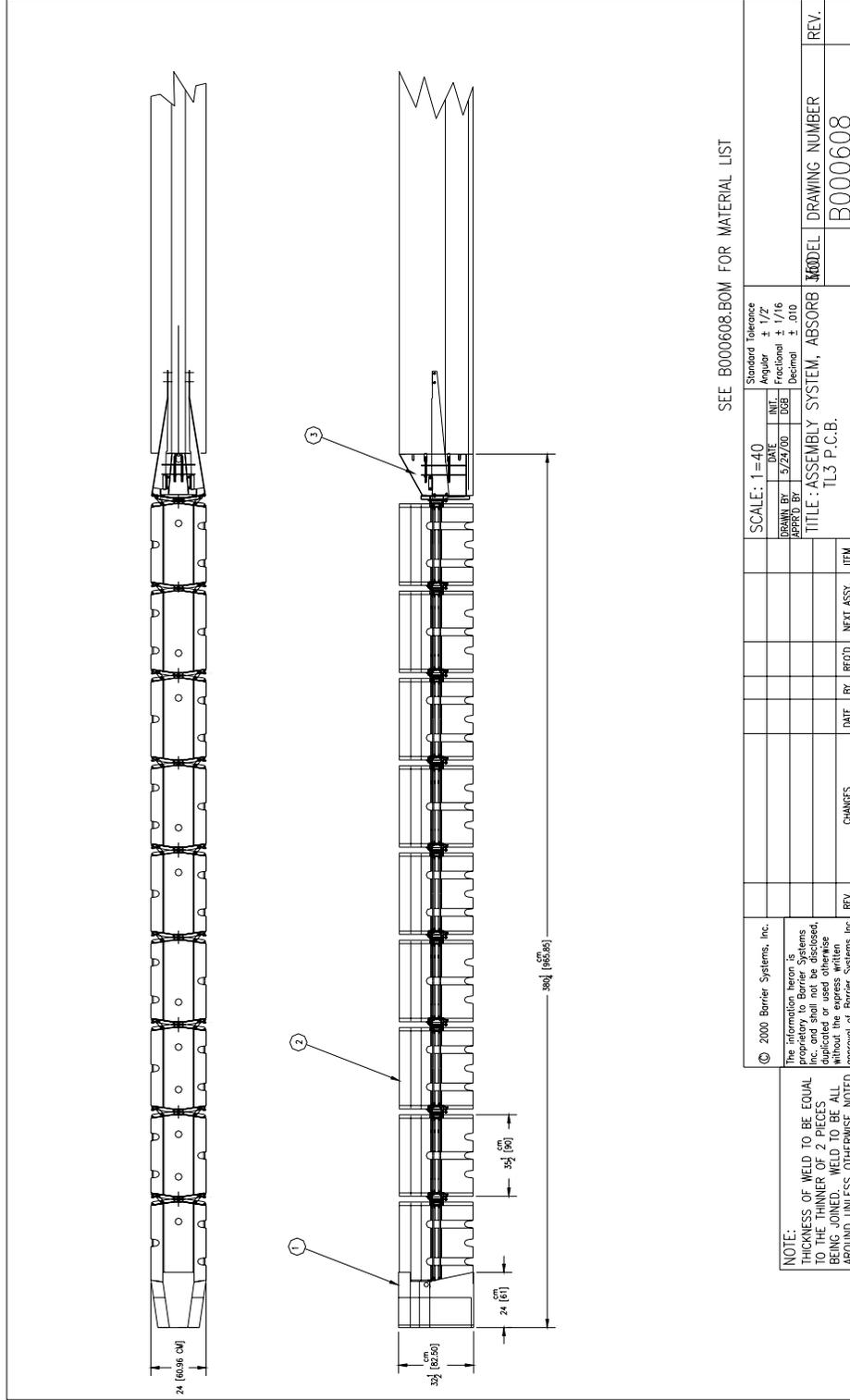
Highway safety appurtenances should be applied to hazardous sites in accordance with the guidelines and recommendations in the American Association of State Highway Transportation Officials (AASHTO), "Roadside Design Guide," 1989, and other Federal Highway Administration and State Department of Transportation requirements. Placement and use of the ABSORB 350 system should comply with these specifications and guidelines.



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DATE	DATE	DATE	DATE	DATE	DATE
BY	BY	BY	BY	BY	BY
3/2/00					
TITLE: ABSORB 350 ELEMENT		MODEL		DRAWING NUMBER	
		B000524		REV.	
CHANGES	DATE	BY	RECD	NEXT ASSY	ITEM

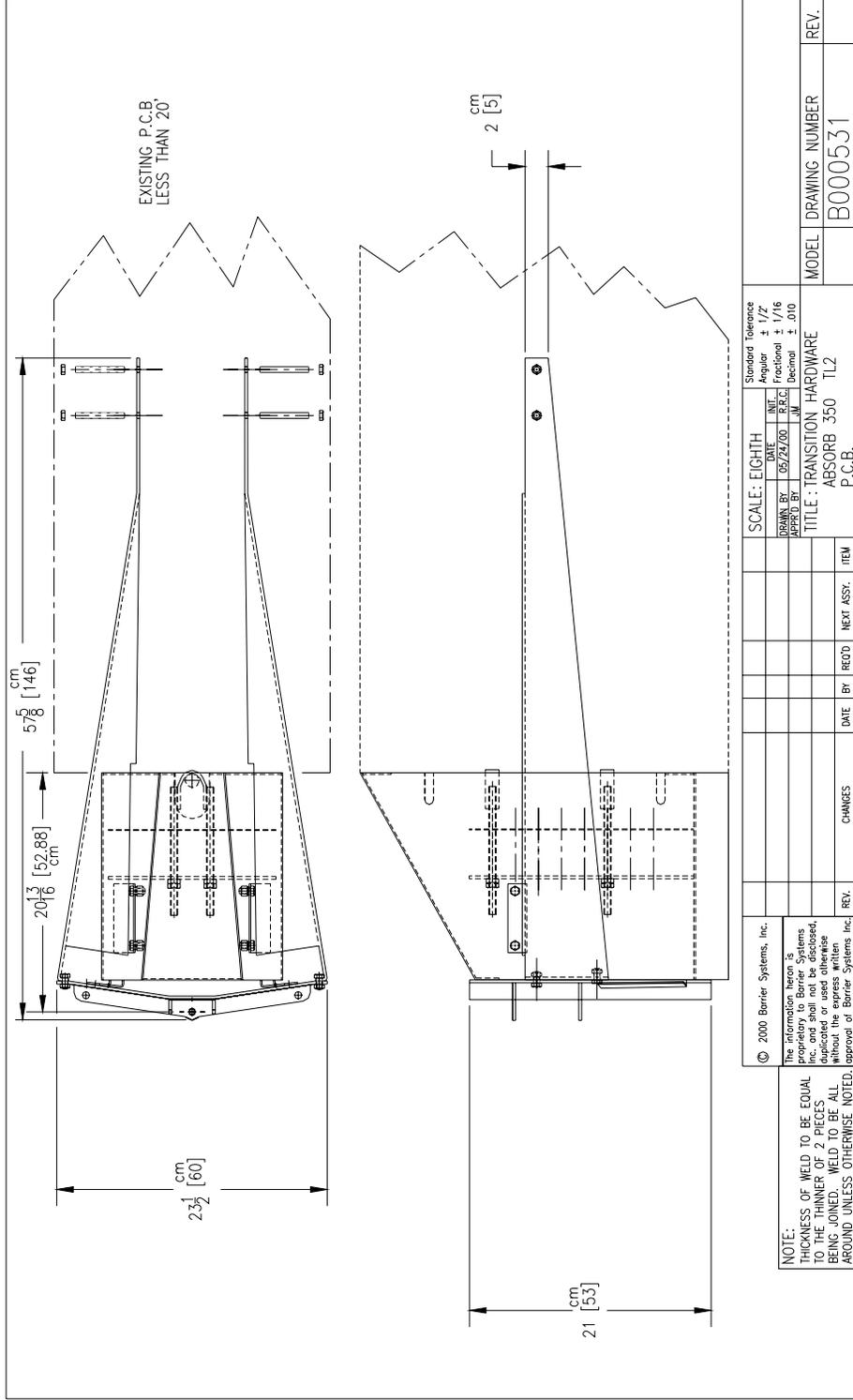
NOTE:  
THICKNESS OF WELD TO BE EQUAL  
TO THE THINNER OF 2 PIECES  
BEING JOINED. WELD TO BE ALL  
AROUND UNLESS OTHERWISE NOTED.





SEE B000608.BOM FOR MATERIAL LIST

<p>© 2000 Barrier Systems, Inc. The information herein is proprietary to Barrier Systems Inc. and shall not be disclosed, duplicated or used otherwise without the express written approval of Barrier Systems Inc.</p>		<p>SCALE: 1=40</p>	<p>Standard Tolerance Angular ± 1/2 Fractional ± 1/16 Decimal ± .010</p>
<p>NOTE: THICKNESS OF WELD TO BE EQUAL TO THE THICKNESS OF THE PIPES BEING JOINED. WELD TO BE ALL AROUND UNLESS OTHERWISE NOTED.</p>	<p>DATE</p>	<p>DATE</p>	<p>DATE</p>
<p>CHANGES</p>	<p>BY</p>	<p>REC'D</p>	<p>ITEM</p>
<p>REV.</p>	<p>DATE</p>	<p>REV.</p>	<p>REV.</p>
<p>TITLE: ASSEMBLY SYSTEM, ABSORB TL3 P.C.B.</p>	<p>MODEL</p>	<p>DRAWING NUMBER</p>	<p>REV.</p>
<p>B000608</p>	<p>B000608</p>	<p>B000608</p>	<p>B000608</p>



**ACZ-350 SYSTEM  
GENERAL SPECIFICATIONS**

**I. GENERAL**

- A. The ACZ-350 is especially suited for use with Portable Concrete Median Barrier (PCMB). When assembled as specified by the manufacturer, the components of the ACZ-350 shall provide an integral non-redirecting crashworthy end treatment.
  
- B. All elements, components, and subassemblies of the ACZ-350 shall be designed, manufactured, and/or supplied by Energy Absorption Systems, Inc., of Chicago, Illinois.

**II. DESCRIPTION OF THE SYSTEM**

- A. The ACZ-350 TL-3 system shall consist of a nose, four water filled barrier sections, and a transition.
  - 1. The nose segment shall be constructed of 14 ga steel, free of water and connect to the lead barrier sections.
  
  - 2. Barrier sections shall be composed of the following:
    - a) Each barrier section shall be constructed of a lightweight, recyclable, linear low density polyethylene plastic shell, with UV stabilizers and antioxidants, designed to accept water ballast.
  
    - b) The approximate physical dimensions and capacities of the barrier section shall be: length (pin to pin) 2019 mm [79.5 in.]; width: 546 mm [21 1/2 in.]; height: 826 mm [32 1/2 in.].
  
    - c) Barrier sections shall be constructed in yellow, white or workzone safety orange colors for high visibility.
  
    - d) Each barrier section shall be equipped with a bent 1/8" steel piece recess in the top of the section, for suitable tensioning and compressive characteristics.

- e) Each barrier section shall be constructed to interact with an impacting vehicle.
- f) The ends of each barrier section shall be constructed with vertically aligned knuckles which interlock with those of abutting sections and accept a 51 mm [2 in.] dia. hollow steel connecting pin. The connecting pin shall be constructed to securely connect adjoining sections and their respective bent 1/8" steel pieces. A galvanized bolt, lock washer, and 102mm [4 in.] washer will retain the pin for suitable impact performance.
- g) Each barrier section shall be constructed with elevated forklift openings to allow for mechanical lifting when empty or full.
- h) Each barrier section shall be constructed with two 127 mm [5 in.] diameter quick fill openings with covers, and a 38 mm [1 1/2 in.] diameter rapid release gate valve to allow quick draining of the water ballast. A reflectorized fill level indicator shall be constructed in the top of each section to allow quick verification that the section is adequately full of water ballast.
- i) The back two barrier sections shall include an internal galvanized steel framework and four strap assemblies recessed into the ribbed sidewalls to provide additional rigidity during impacts. Empty weight: 64 kg [140 lb.]; water ballast: 549 liters [145 gallons]. Weight when filled shall be approximately 612kg (1350 lbs). Weight does not include strap assemblies or connections.
- j) The front two barrier sections shall not include an internal galvanized steel framework or four strap assemblies recessed into the ribbed sidewalls to ensure proper performance during impacts. Empty weight: 45 kg [99 lb.]; water ballast: 549 liters [145 gallons]. Weight when filled shall be approximately 595kg (1312 lbs).

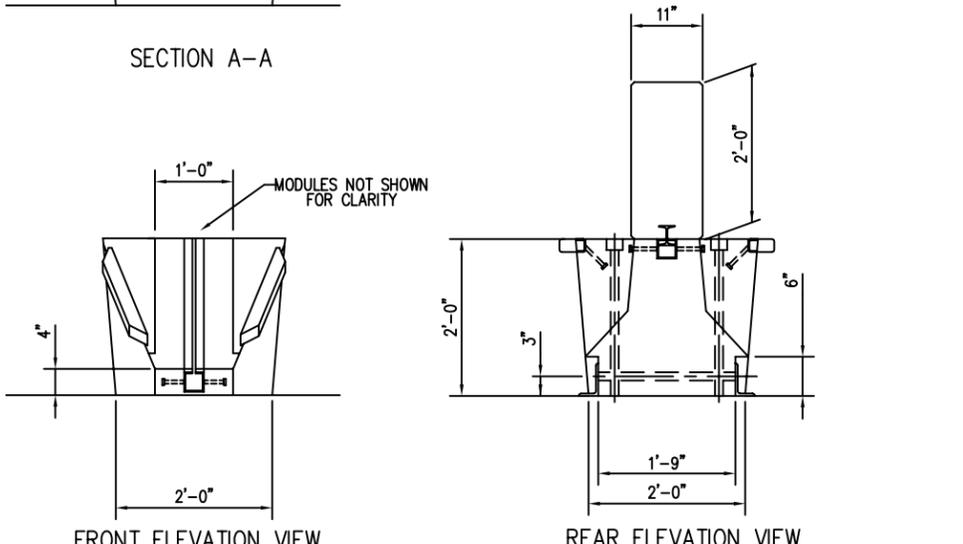
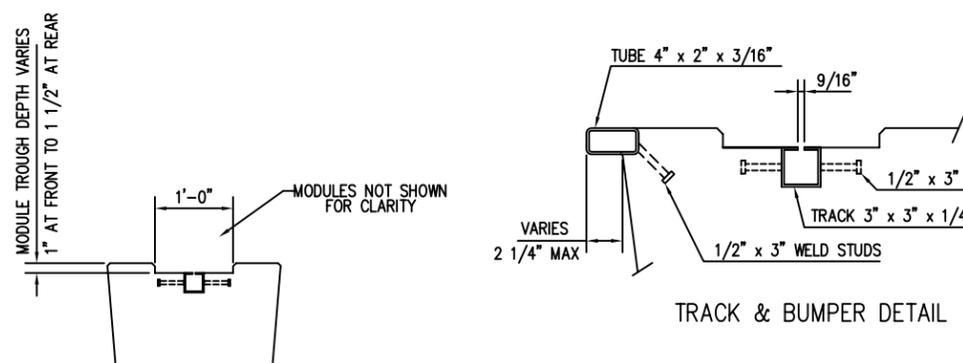
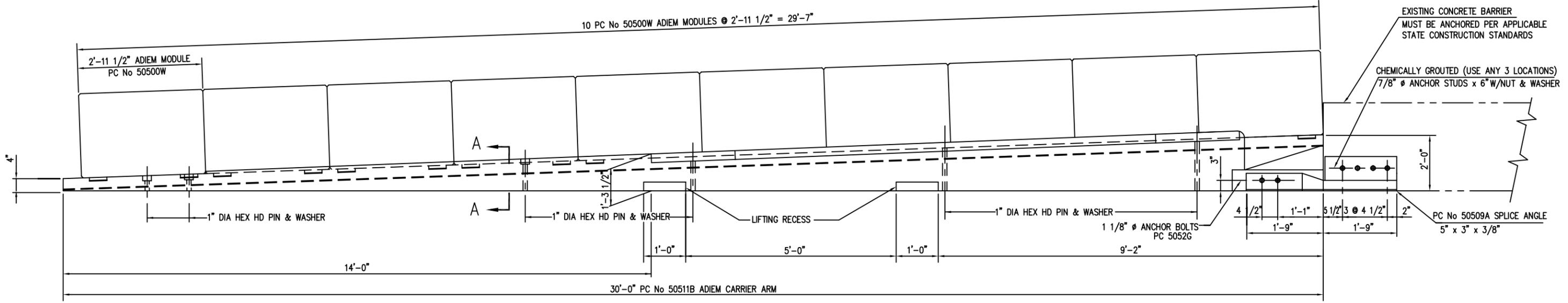
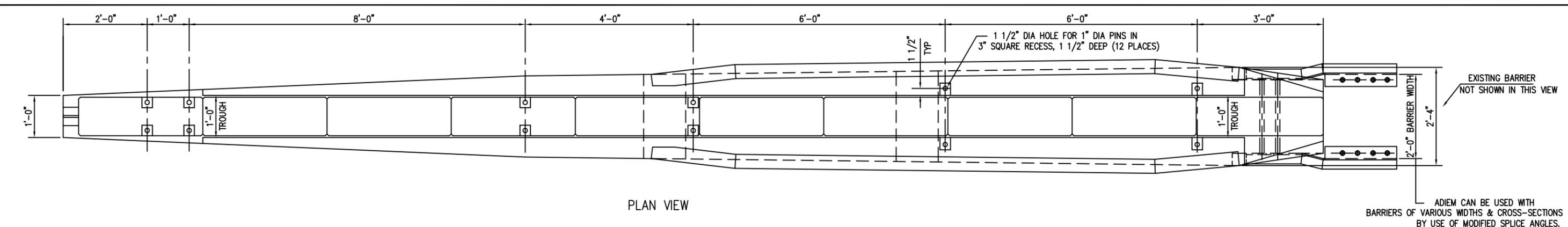
3. ACZ-350 Transition Section
  - a) The transition section shall be constructed of galvanized steel.
  - b) The approximate physical dimensions of the transition section shall be: length (pin to pin) 510 mm [20 in.]; width: 621 mm [24.5 in.]; height: 813 mm [32 in.];
  - c) The section shall attached to the PCMB with two  $\frac{3}{4}$ " B7 all thread rods, four flat washers, four lock washers, and four nuts, in addition to a connection pin and two threaded "U" shaped fasteners.

### **III. PERFORMANCE CRITERIA**

- A. The ACZ-350 System is a narrow, non-redirective, gating crash cushion and shall have been tested and evaluated per the criteria set forth in the National Cooperative Highway Research Program Report 350 (NCHRP-350) in accordance with TL-3 criteria. An FHWA acceptance letter shall be available authorizing its use on the National Highway System.

### **IV. DESIGN AND SELECTION CRITERIA**

- A. Design, selection, and placement of the ACZ-350 System should conform with applicable guidelines in:
  1. U.S. Department of Transportation, Federal Highway Administration, "Manual on Uniform Traffic Control Devices", Washington, D.C. U.S. Government Printing Office, 2003 and all subsequent revisions.
  2. American Association of State Highway and Transportation Officials, "Roadside Design Guide", Washington, D.C. AASHTO, January 2002 and all subsequent revisions.
- B. Installation of the ACZ-350 System shall be accomplished in accordance with the recommendations of Energy Absorption Systems, Inc., and the ACZ-350 manual.



BILL OF MATERIAL			
PRODUCT CODE	QTY	DESCRIPTION	REMARKS
50500W	10	MODULES x 2'-11 1/2"	
50511B	1	BASE x 30'-0"	
50508A	1	SPLICE ANGLE x 3'-6" RT	
50509A	1	SPLICE ANGLE x 3'-6" LT	
6549W	1	GARNA-THANE COATING (1 GAL)	
5052G	2	1 1/8" Ø x 25" HEX HD BOLT	
4963G	4	1 1/8" WASHER	
3976G	2	1 1/8" HEX NUT	
4616G	6	7/8" Ø STUD x 6" (FULL THD)	
3725G	6	7/8" WASHER	
3735G	6	7/8" HEX NUT	
★ 5206B	1	ADHESIVE HY150 CARTRIDGE	
3900G	12	1" WASHER	

- ADIEM INSTALLATION INSTRUCTIONS**
- The ADIEM base is to be placed on a smooth surface (the same horizontal plane as the concrete barrier) and parallel to the mainline or ramp traveled lane(s).
  - Install anchor rods for ADIEM base by driving in soil or soft asphalt or driving in pre-drilled holes for hard asphalt or concrete (no epoxy required). The base should not be moved after the holes are drilled. The holes should be drilled using, at a minimum, a 35# hammer and minimum 36 inch long drill bit. (A 50# hammer is recommended.)
  - Attach connection brackets to base with two (2) 1 1/8" X 25" hex head bolts provided. Then field drill holes in the existing barrier and attach connection brackets to it with chemically grouted hardware provided.
  - Oil the ADIEM base track. Slide the modules onto the base. Be careful not to damage edges of the modules while sliding onto the base.
  - If the modules are scuffed or nicked, apply GARNA-THANE coating to the affected area.

Recommended tools and equipment:

- 35/50# air hammer/drill
- 1 3/8" Ø x 36" rock drill
- 1 1/4" Ø x 12" rock drill
- Sledge hammer
- Oil
- Wrenches

OPTIONAL ANCHOR ITEMS	
PRODUCT CODE	DESCRIPTION
5205B	ADHESIVE DISPENSER
5207B	MIXER HIT HY150 (NOZZLE)
5208B	FILLER HIT HY150 (FILLER TUBE)
5209B	BIT TE-C+ 11/16-18 (11/16" Ø BIT)

- ★ EACH CARTRIDGE INCLUDES 1 EACH : MIXER HY 150 CARTDIDGE(NOZZLE) : FILLER HIT HY 150 (FILLER TUBE)
- ANCHOR PIN SCHEDULE PER SURFACE (SEE NOTES 1-5)**
- |       | PCC     | ACP | BASE |
|-------|---------|-----|------|
| 5665G | SEE SCH |     | 4    |
| 5642G |         |     | 4    |
| 5650G |         | 4   | 4    |
| 5641G |         |     | 4    |
| 5646G |         | 4   | 4    |
| 5643G |         | 4   |      |
- NOTES:**
- ANCHOR PINS ARE 1" DIA HEX HD, POINTED, GALV RODS (A307)
  - PORTLAND CEMENT CONCRETE (PCC)
  - ASPHALTIC CONCRETE (ACP)
  - BASE AND/OR COMPACTED SOIL (BASE)
  - ADIEM INSTALLATION NOT RECOMMENDED ON LOOSE SOIL.

- ALTERNATE ADIEM INSTALLATION INSTRUCTIONS**
- At a holding site, the modules are slid into the ADIEM base after oiling the base track. Be careful not to damage the edges of the modules while sliding them onto the base.
  - If the modules are scuffed or nicked, apply GARNA-THANE coating to the affected area.
  - The unit is then delivered to the job site. The unit is to be placed on a smooth surface (the same horizontal slope as the concrete barrier) and parallel to the mainline or ramp traveled lane (s).
  - The front module should be removed so the remaining modules can be shifted for easy access for drilling the anchor rod holes.
  - Install anchor rods for ADIEM base by driving in soil or soft asphalt or driving in predrilled holes for hard asphalt or concrete (no epoxy required). The base should not be moved after the holes are drilled. The holes should be drilled using, at a minimum, a 35# hammer and a minimum 36 inch long drilling bit. (A 50# hammer is recommended.)
  - Attach connection brackets to base with two (2) 1 1/8" X 25" hex head bolts provided. Then field drill holes in the existing barrier and attach connection brackets to it with chemically grouted hardware provided.

REV.	CHK'D	BY	DATE	REMARKS
6	B.T.	L.H.	12/10/03	REPLACED GROUT WITH HILTI, UPDATED DWG
5		L.H.	03/12/03	DELETED NOTE #7, REVISED NOTE #3
4	D.D.	L.H.	12/17/99	REVISED COATING, CHANGED TITLE BLOCK
3		BT	3-14-97	DELETED PC 5484, ADDED PC 5052, CHG QTY PC 3976
2		BT	2-14-97	GENERAL UPDATES

**ADIEM 30'**

**ERECTION DETAILS**

TRINITY INDUSTRIES, INC.  
HIGHWAY SAFETY PRODUCTS  
2525 STEMMONS FREEWAY, DALLAS, TX 75207

DRAWN	B.TAKACH
CHECKED	D.D.
APPROVED	
DATE	3/19/96
ENG. FILE #	SS349-01E
SHT.No.	E1 OF 1
DRAWING NO.	SS 349
REV.	6

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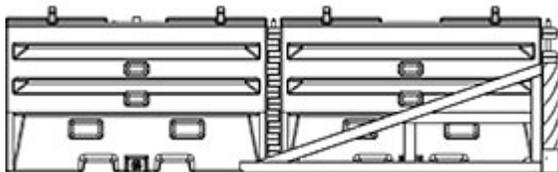
[Home \(https://www.traffixdevices.com/\)](https://www.traffixdevices.com/) / [Products \(https://www.traffixdevices.com/products\)](https://www.traffixdevices.com/products)  
/ [Attenuators \(https://www.traffixdevices.com/products/attenuators\)](https://www.traffixdevices.com/products/attenuators) / SLED

## SLED™ Sentry Longitudinal Energy Dissipater

The Sentry Longitudinal Energy Dissipater (SLED) is a narrow, non-redirective gating crash cushion. SLED is designed to shield the end of all permanent and temporary portable barrier shapes including concrete, steel and plastic. SLED's unique design incorporates four internal steel cables which help envelop the impacting vehicle, reducing the possibility of secondary accidents. The SLED End Treatment does not require foundation anchor bolts to be attached to the road or bridge deck. The complete crash cushion can be installed quickly, with as little as one pick up truck and two workers on compacted dirt, gravel, decomposed granite, asphalt or concrete.

Each SLED module is manufactured from a high visibility yellow polyethylene that is UV stabilized to minimize degradation. It is designed to deform and rupture on impact, absorbing the energy of the errant vehicle. SLED has the most versatile transition for shielding all permanent and temporary portable barriers. The combination of hinging and contouring, allows the transition panels of the SLED End Treatment to be attached to narrow, wide or other profile shapes with either converging, or diverging angles, up to 10 degrees.

### TL-1 Specifications



*SLED (US) TL-1 Diagram*

**Weight** Empty 675 lbs.  
Filled 2,505 lbs.

**Length** 12' 7"

**Width** 22 ½"

**Height** 42"

**Speed Rating** 31 mph

## TL-2 Specifications



*SLED (US) TL-2 Diagram*

**Weight** Empty 835 lbs.  
Filled 4,505 lbs.

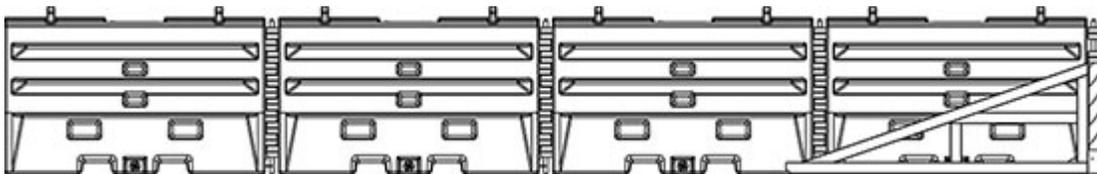
**Length** 18' 11"

**Width** 22 ½"

**Height** 42"

**Speed Rating** 45 mph

## TL-3 Specifications



*SLED (US) TL-3 Diagram*

**Weight** Empty 995 lbs.  
Filled 6,505 lbs.

**Length** 25' 3"

**Width** 22 ½"

**Height** 42"

**Speed Rating** 62 mph