



U.S. Department
of Transportation
**Federal Highway
Administration**

November 21, 2006

400 Seventh St., S.W.
Washington, D.C. 20590

In Reply Refer To:
HSA-10/B-151

Mr. William B. Wilson, P.E.
Standards Engineer
Wyoming Department of Transportation
3500 Bishop Blvd
Cheyenne, WY 82009

Dear Mr. Wilson:

Thank you for your letter of March 17, 2006, requesting the Federal Highway Administration's (FHWA) acceptance of your State's w-beam to thrie beam transitions to the Wyoming test level 3 (TL-3) and TL-4 bridgerails for use on the National Highway System (NHS). Accompanying your letter were drawings and a discussion of the proposed transition designs. Based on the similarity of these designs to the crash-tested Alaska transition, you requested that we find the Wyoming designs acceptable as TL-3 or TL-4 transition, respectively, for use on the NHS under the provisions of National Cooperative Highway Research Program (NCHRP) Report 350 "Recommended Procedures for the Safety Performance Evaluation of Highway Features."

Introduction

The FHWA guidance on crash testing of roadside safety hardware is contained in a memorandum dated July 25, 1997, titled "INFORMATION: Identifying Acceptable Highway Safety Features." A brief description of the transition designs follows:

As shown in detail in the enclosed drawings, both transitions consist of two nested 12-gauge thrie-beam panels connected to a TL-3 or TL-4 Wyoming Two-Rail Bridge Rail with a standard thrie-beam terminal connector and a fabricated steel connection plate. The connection plate was designed to attach to either the TL-3 or TL-4 versions of the bridge rail. A 12-gauge thrie-beam to w-beam transition piece is used from posts 1 through 3. Posts 1 through 9 are W6 x 9, with post 1 having a 6" x 8" x 14" wood blockout, post 2 having a 6" x 8" x 19" wood blockout, and posts 3 through 9 each having W8x15 steel blockouts. Post 9, immediately adjacent to the bridge, is offset 47.5" from the first bridge rail post. The concrete curb is flared back 4.5" over its last 18" to minimize wheel snagging at that point.



As noted above, this transition design is based on the Alaska transition, originally found acceptable in the FHWA acceptance letter B-55A dated September 2, 1999, except for minor connection details, including:

- Different dimensions for the transition plates to account for variations in heights and widths of bridge rail elements.
- Extending the transition plates beyond the back of the bridge rail elements.
- Different bolt locations on the thrie beam end plate to account for variations in heights and widths of bridge rail elements.

Findings

Based on staff review of the Wyoming designs compared to the Alaska transition, I concur that the Wyoming thrie-beam transition design to your TL-3 and TL-4 bridge rails may be used on the NHS when such use is requested by a transportation agency. I understand that the design, like the bridge rail, is non-proprietary and that copies of detailed plans and specifications can be obtained from your office.

Please note the following standard provisions that apply to the FHWA letters of acceptance:

- Our acceptance is limited to the crashworthiness characteristics of the devices.
- Any changes that may adversely influence the crashworthiness of the device will require a new acceptance letter.
- Should the FHWA discover that the qualification testing was flawed, that in-service performance reveals unacceptable safety problems, or that the device being marketed is significantly different from the version that was crash tested, it reserves the right to modify or revoke its acceptance.
- You will be expected to supply potential users with sufficient information on design and installation requirements to ensure proper performance.
- You will be expected to certify to potential users that the hardware furnished has essentially the same chemistry, mechanical properties, and geometry as that submitted for acceptance, and that they will meet the crashworthiness requirements of the FHWA and the NCHRP Report 350.
- To prevent misunderstanding by others, this letter of acceptance, designated as number B-151 shall not be reproduced except in full. This letter, and the test documentation upon which this letter is based, is public information. All such letters and documentation may be reviewed at our office upon request.
- This acceptance letter shall not be construed as authorization or consent by the FHWA to use, manufacture, or sell any patented device for which the applicant is not the patent holder. The acceptance letter is limited to the crashworthiness characteristics of the

candidate device, and the FHWA is neither prepared nor required to become involved in issues concerning patent law. Patent issues, if any, are to be resolved by the applicant.

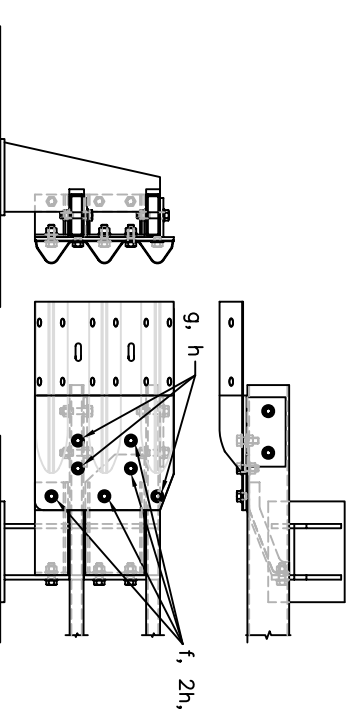
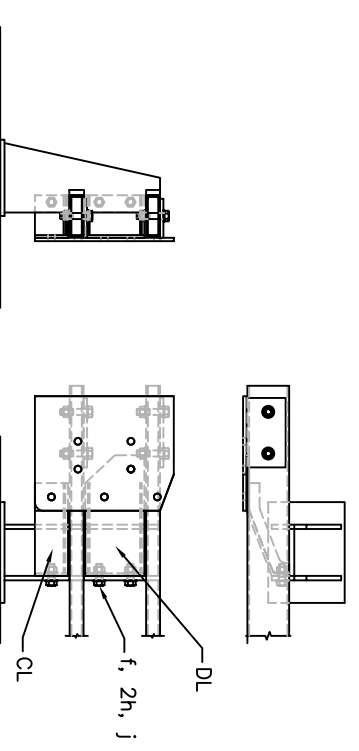
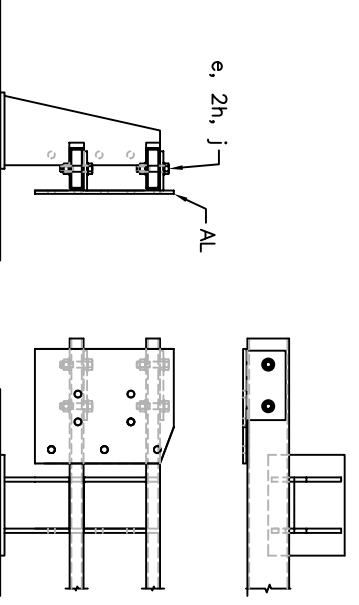
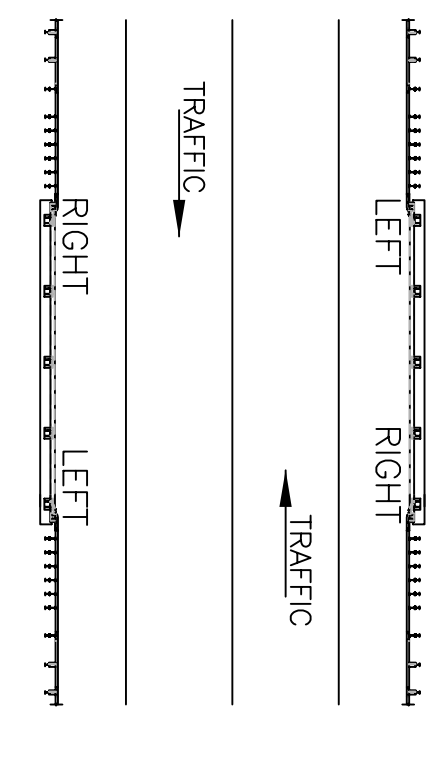
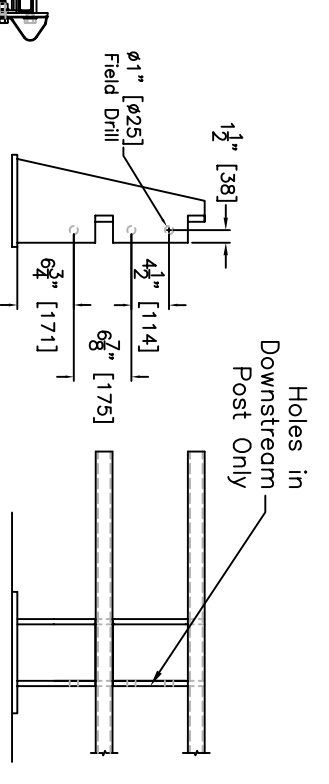
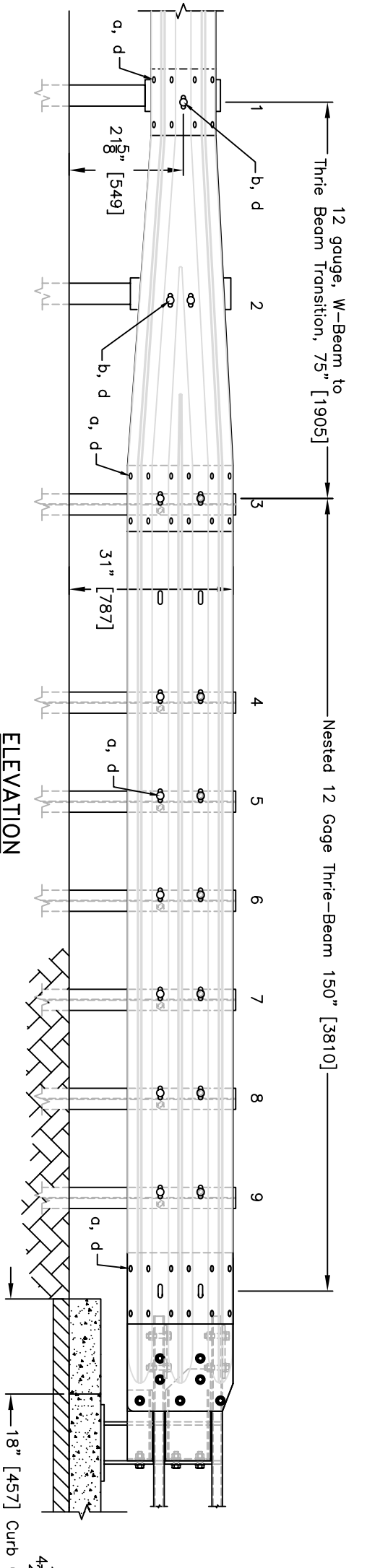
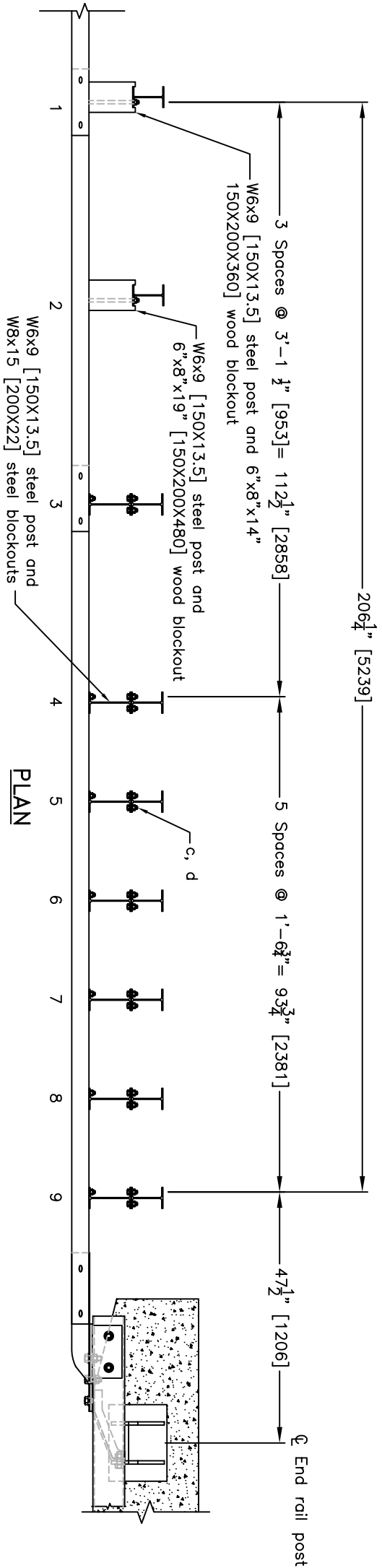
Sincerely yours,

/original signed by/

John R. Baxter, P.E.
Director, Office of Safety Design
Office of Safety

FHWA:HSA-10:NArtimovich:tb:x61331:11/17/06
File: s://directory folder/artimovich/B151-Wyoming.doc
cc: HSA-10 (Reader, HSA-1; Chron File, HSA-10;
N.Artimovich, HSA-10)


ITEM	QTY	DESCRIPTION
AL/AR	1	Three-beam End Shoe
BL/BR	1	Mounting Plate
CL/CR	1	Lower Angle Assembly
DL/DR	1	Upper Angle Assembly
a	46	$\frac{3}{8}$ " X 1 $\frac{1}{4}$ " [16X32] Splice Bolt
b	3	$\frac{5}{8}$ " X 10" [16X254] Post Bolt
c	14	$\frac{5}{8}$ " X 1 $\frac{1}{2}$ " [16X38] Hex Bolt
d	63	$\frac{3}{8}$ " [16] Recessed Guardrail Nut
e	4	$\frac{7}{8}$ " X 4" [22X100] Hex Bolt
f	7	$\frac{7}{8}$ " X 2 $\frac{1}{2}$ " [22X64] Hex Bolt
g	3	$\frac{7}{8}$ " X $\frac{3}{4}$ " [22X19] Hex Bolt
h	21	$\frac{7}{8}$ " [22] Washer
j	11	$\frac{7}{8}$ " [22] Hex Nut



INSTALLATION OF MOUNTING PLATE

INSTALLATION OF ANGLE PLATES

INSTALLATION OF THREE-BEAM END SHOE



Midwest Roadside Safety Facility

Wyoming TL-3 Transition

Assembly

Sheet: 1 OF 5

Date: 03/13/06

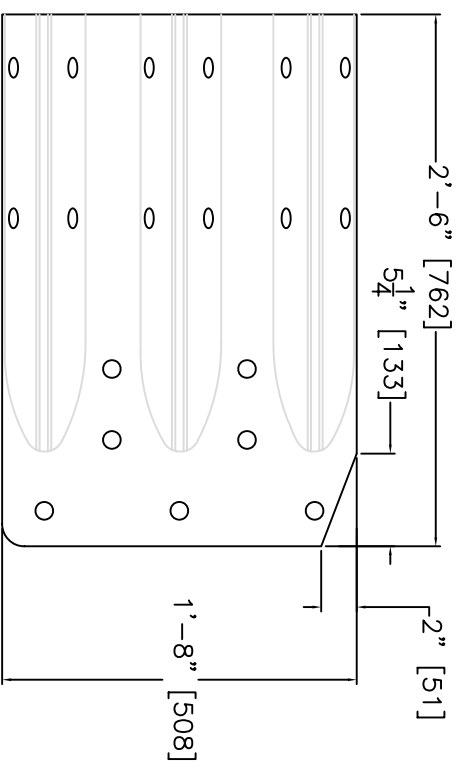
By: JRR

Rev:

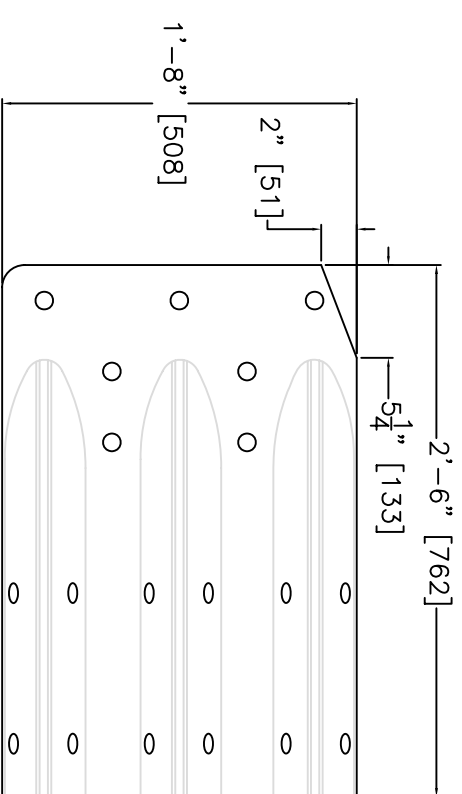
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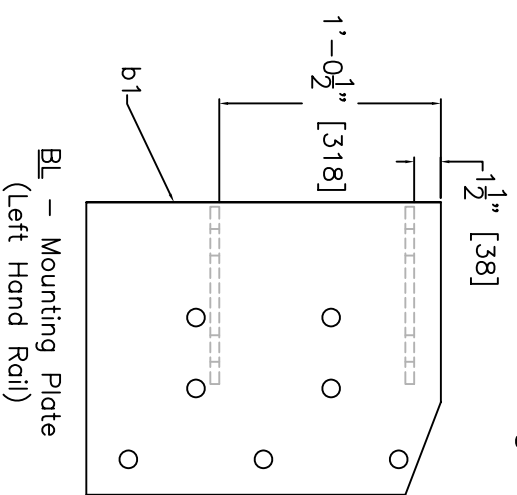
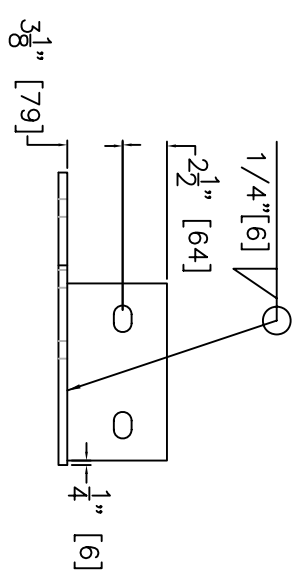
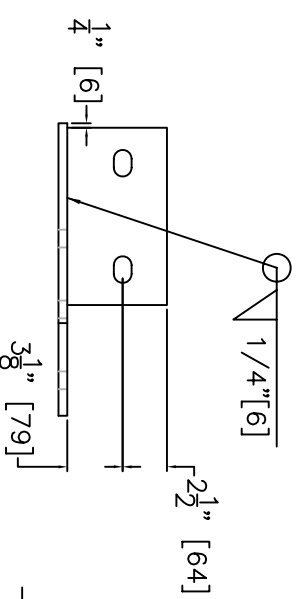
ITEM	QTY	DESCRIPTION	MATERIAL
AL/AR	1	Thrie-beam End Shoe	10 Gage
BL/BR	1	Mounting Plate	
b1	1	Face Plate	1/2" [13] A36 Plate
b2	2	Back Plate	1/2" [13] A36 Plate



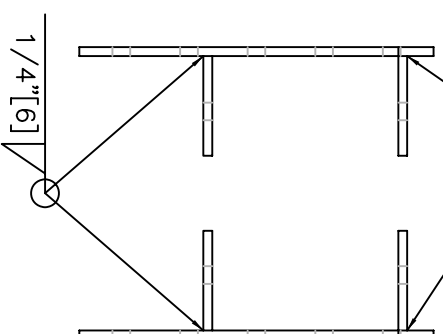
AL - Thrie-Beam End Shoe (Left Hand Rail)



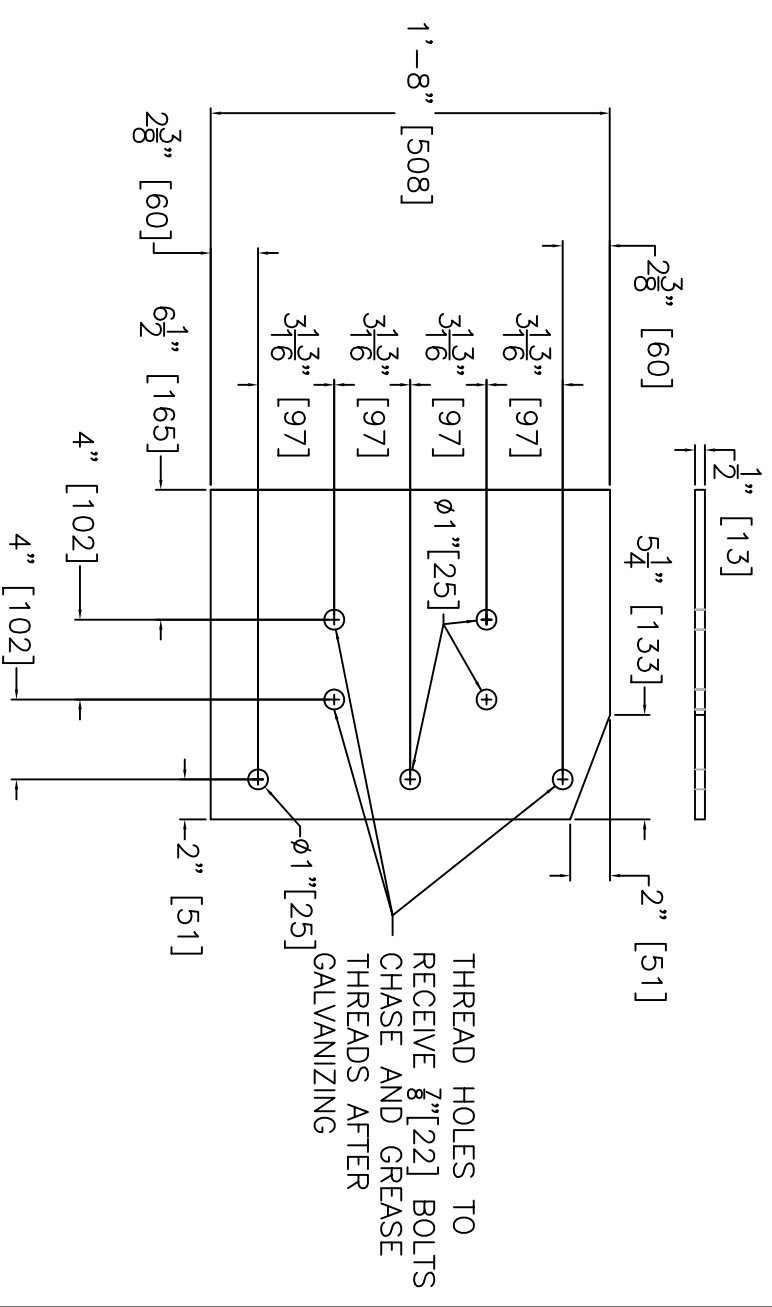
AR - Thrie-Beam End Shoe (Right Hand Rail)



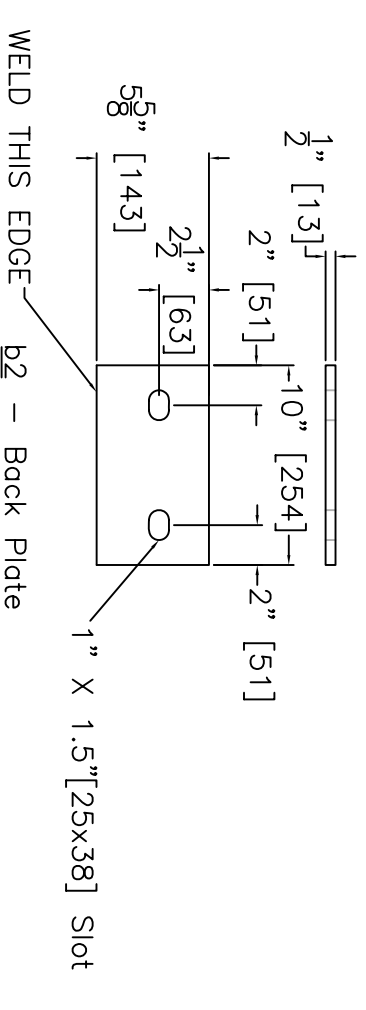
BL - Mounting Plate (Left Hand Rail)



BR - Mounting Plate (Right Hand Rail)



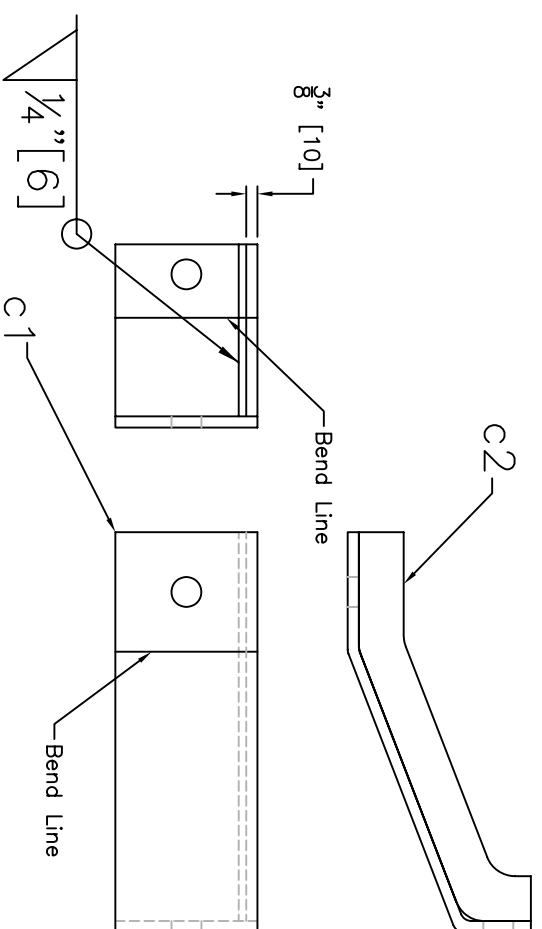
b1 - Face Plate



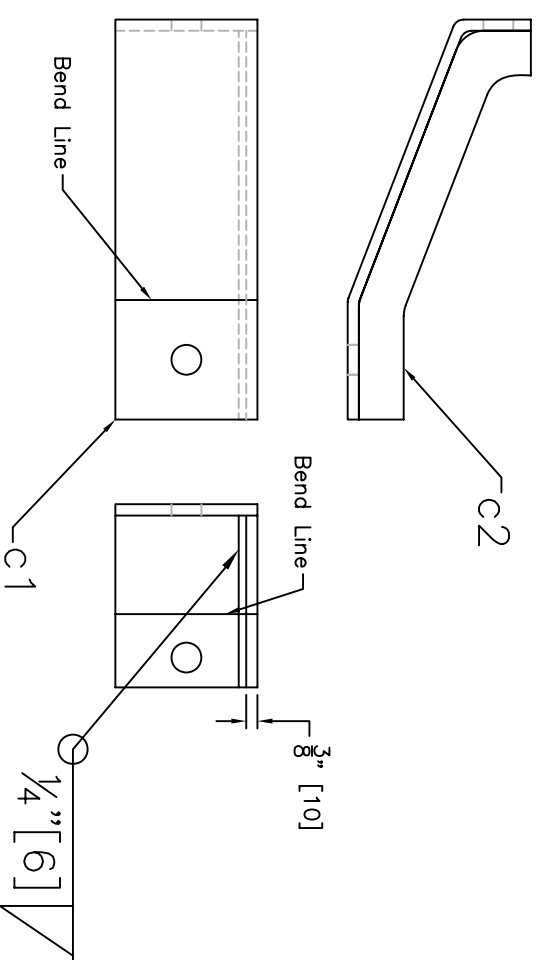
WELD THIS EDGE - b2 - Back Plate

		Wyoming TL-3 Transition	
		Part Details	
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Sheet: 2 OF 5	Date: 03/13/06	By: JRR	Rev:

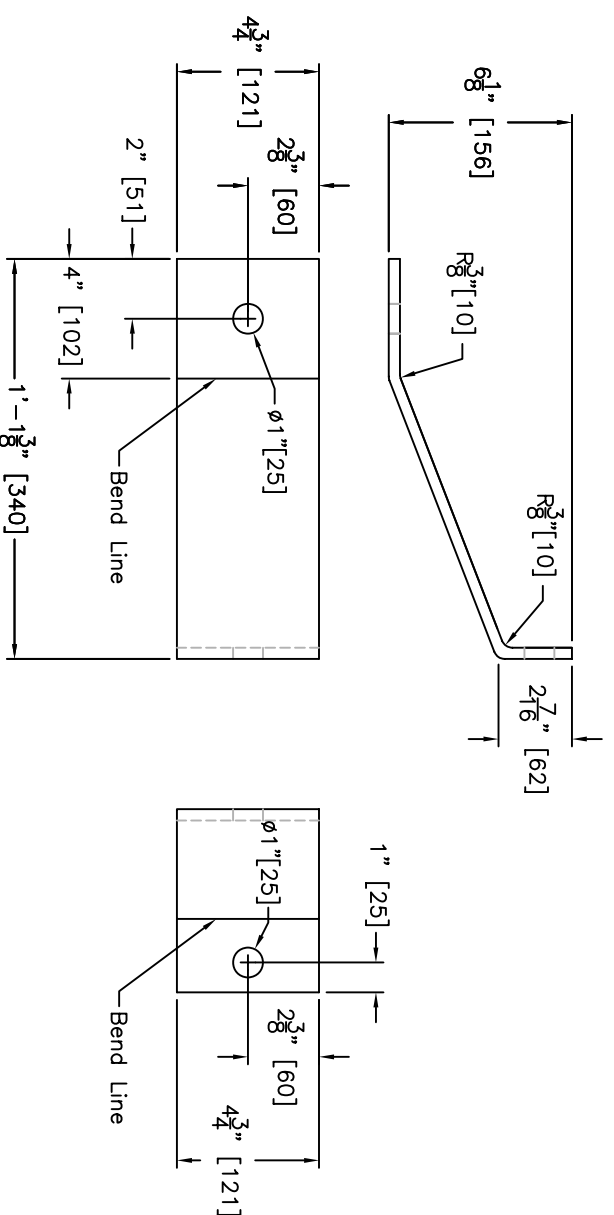
ITEM	QTY	DESCRIPTION	MATERIAL
CL/CR	1	Lower Angle Assembly	
c1	1	Lower Angle Plate	$\frac{3}{8}$ " [10] A36 Plate
c2	3	Gusset	$\frac{1}{4}$ " [6] A36 Plate



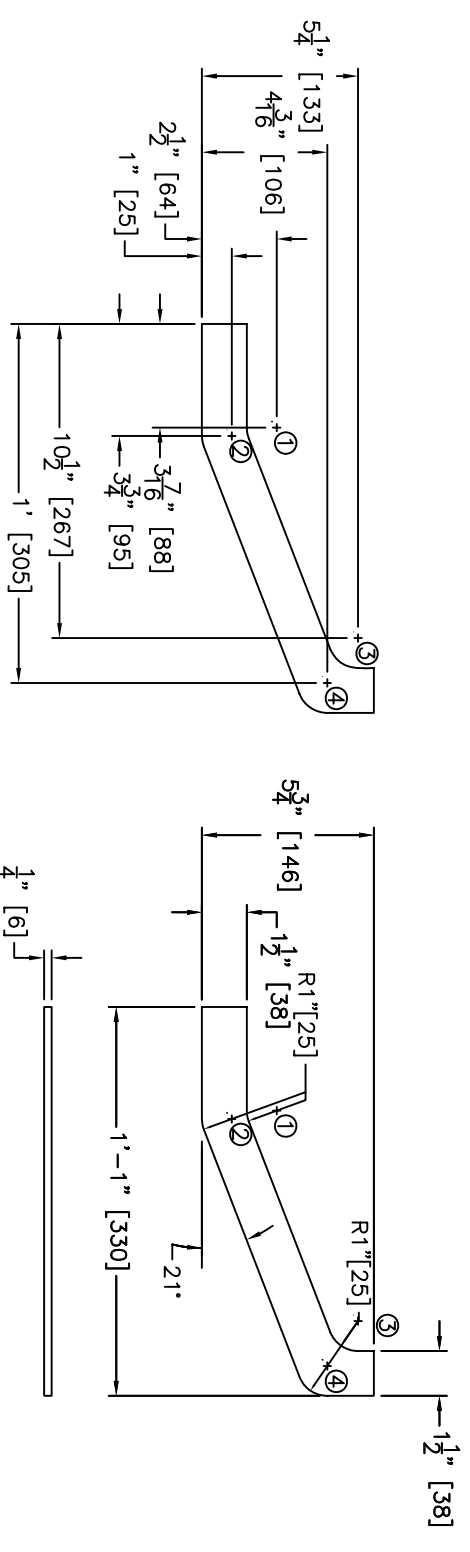
CL – Lower Angle Assembly
(Left Hand Rail)




CR – Lower Angle Assembly
(Right Hand Rail)



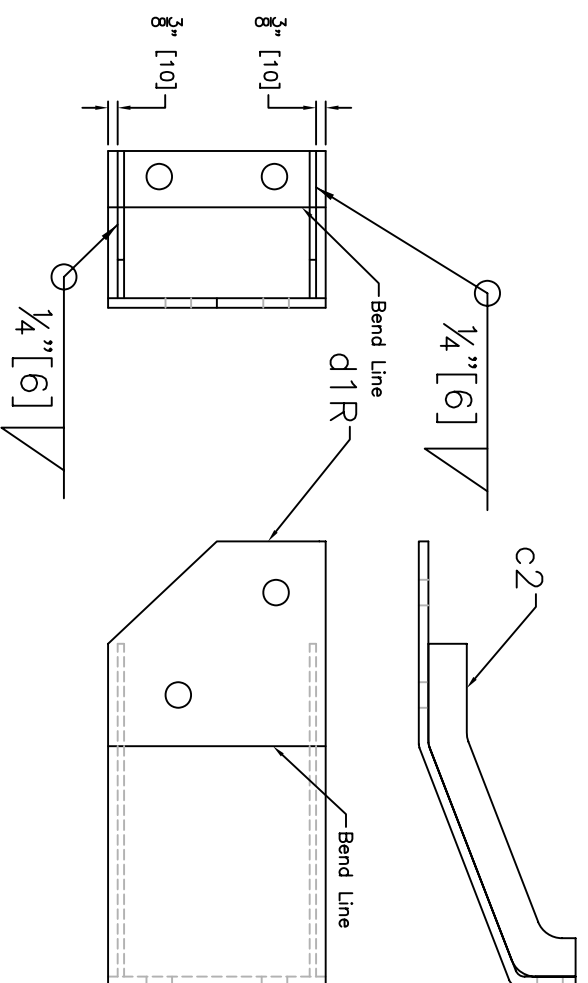
c1 – Lower Angle Plate



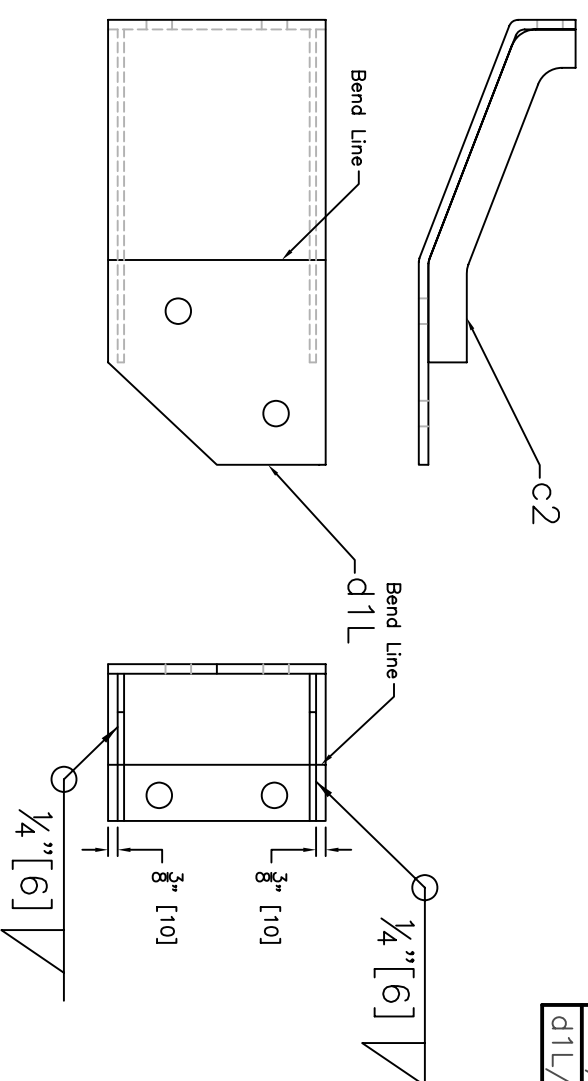
c2 – Gusset

	Wyoming TL-3 Transition		Sheet: 3 OF 5
	Part Details		Date: 03/13/06
Midwest Roadside Safety Facility	Drawing Name: WY Three-Beam Transition	Scale: NONE	By: JRR
			Rev:

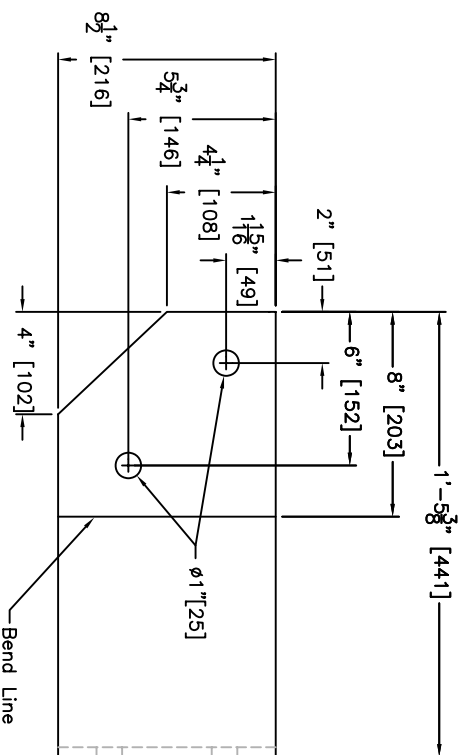
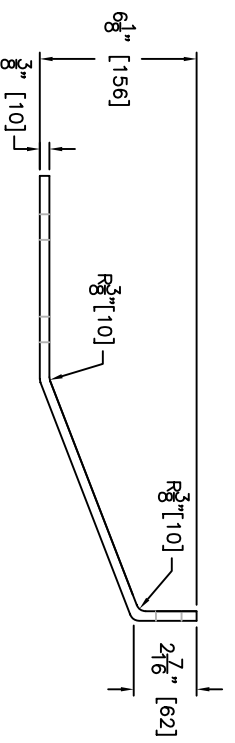
ITEM	QTY	DESCRIPTION	MATERIAL
c2	See Sheet #3		
DL/DR	1	Upper Angle Assembly	
d1L/d1R	1	Upper Angle Plate	3/8" [10] A36 Plate



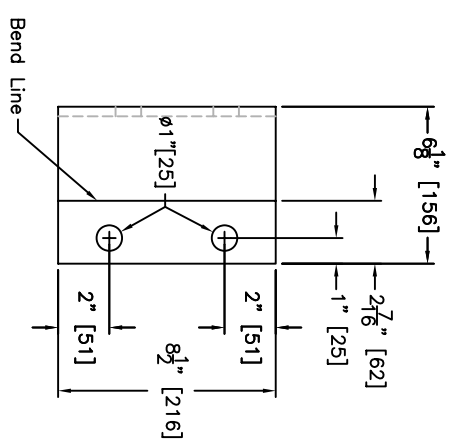
DL – Upper Angle Assembly
(Left Hand Rail)



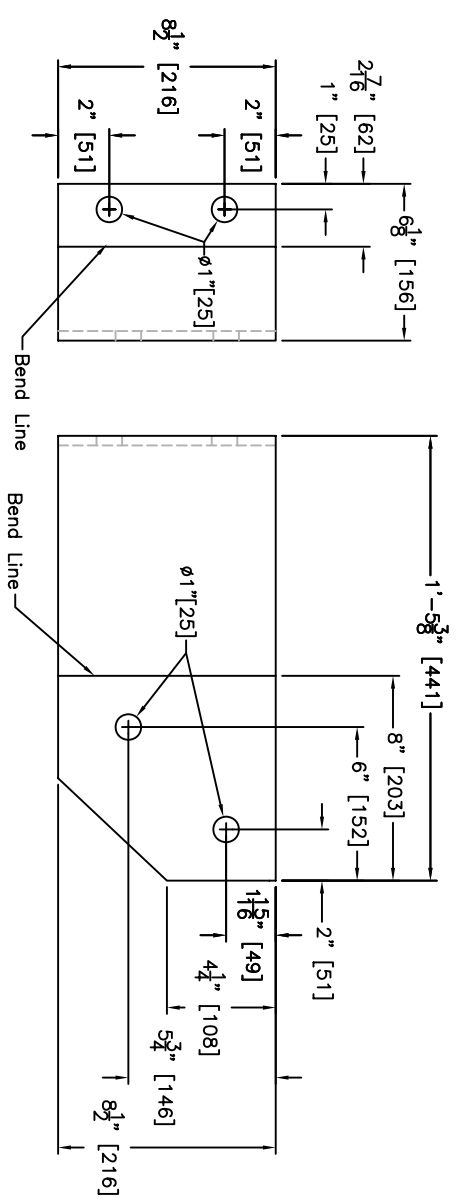
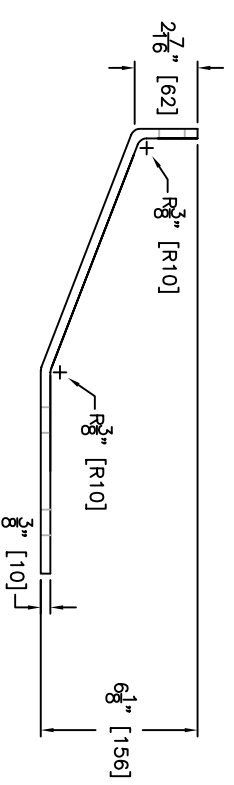
DR – Upper Angle Assembly
(Right Hand Rail)



d1L – Upper Angle Plate (Left Hand Rail)



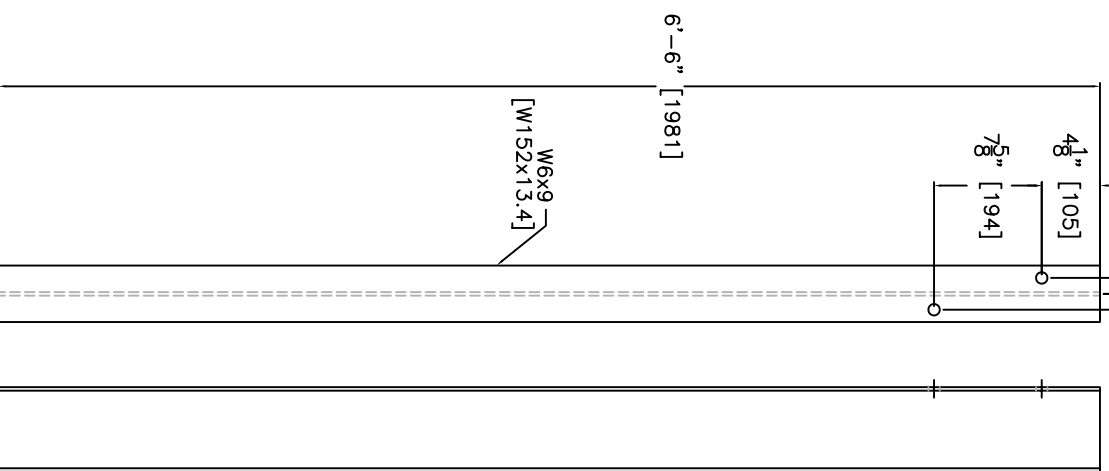
d1R – Upper Angle Plate (Right Hand Rail)



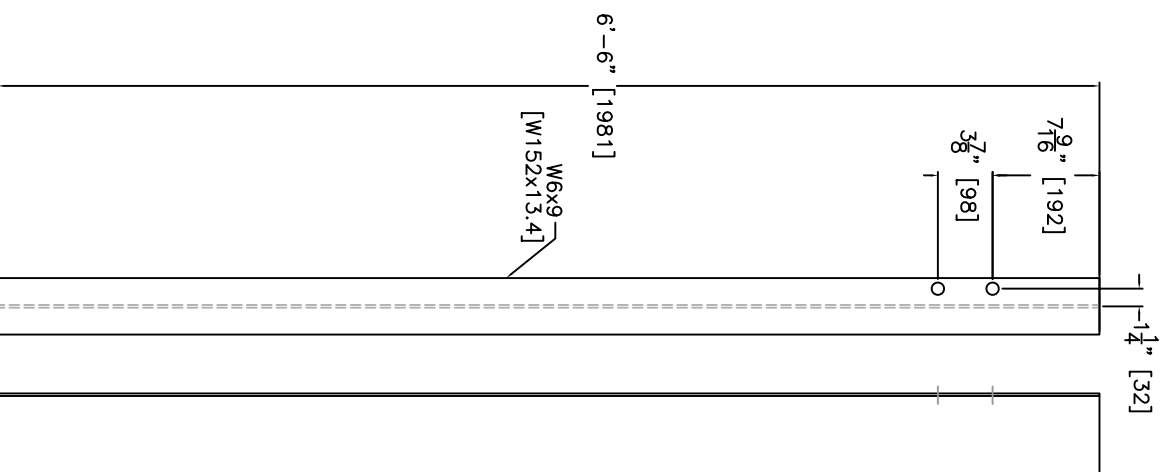
	Wyoming TL-3 Transition		Sheet: 4 OF 5
	Part Details		Date: 03/13/06
Midwest Roadside Safety Facility	Drawing Name: WY Three-Beam Transition	Scale: NONE	By: JRR
			Rev:

QTY	DESCRIPTION	MATERIAL
7	Thrie Beam Posts	W6x9
7	Thrie Beam Spacer	W8x15
1	Transition Mid-Post	W6x9
1	Trans. M.P. Blockout	6x8x19"
1	W Beam Posts	W6x9
1	W Beam Blockout	6x8x14 $\frac{1}{2}$ "

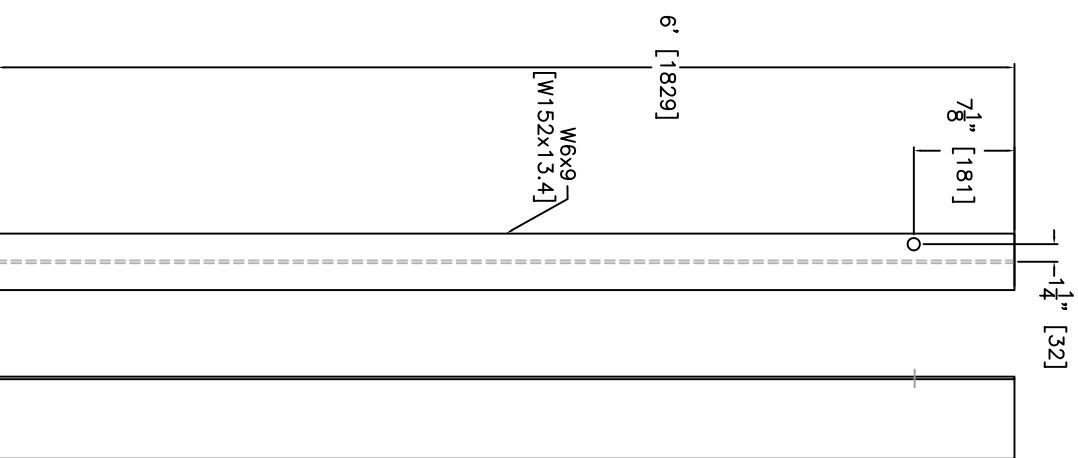
THRIE BEAM POSTS
(Post No. 3-9)



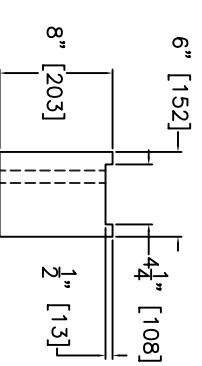
W-BEAM TO THRIE BEAM
MID-POST (Post No. 2)



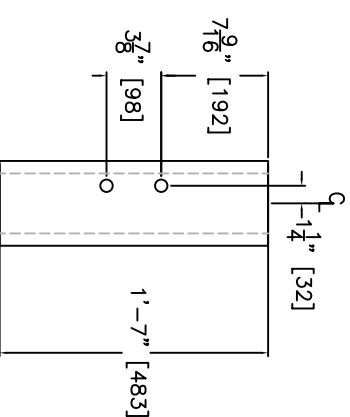
W-BEAM POST
(Post No. 1)



W-BEAM TO THRIE BEAM
MID-POST SPACER

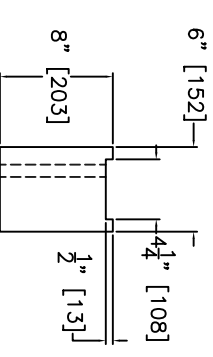


TOP VIEW

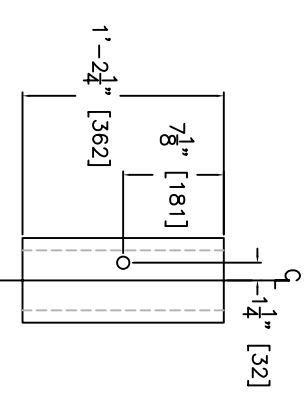


FRONT VIEW

W-BEAM SPACER

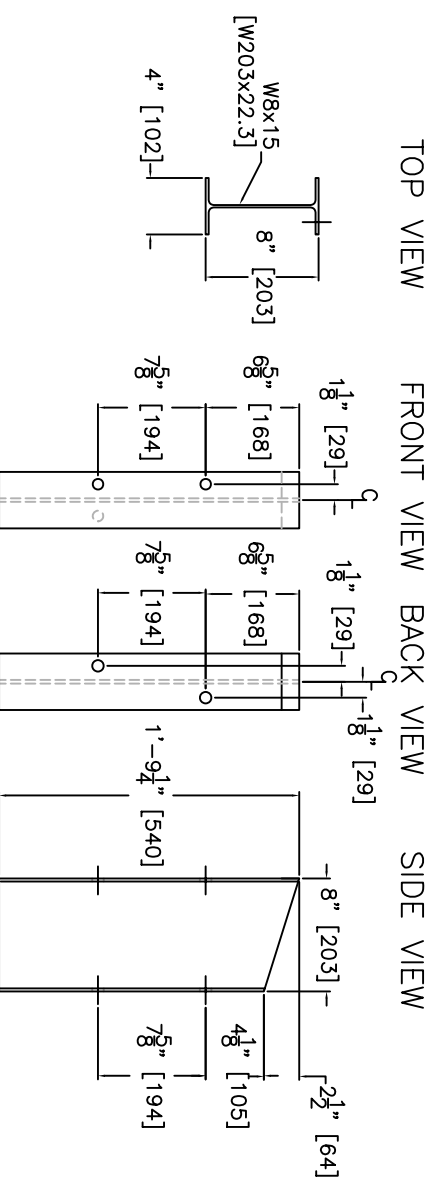


TOP VIEW



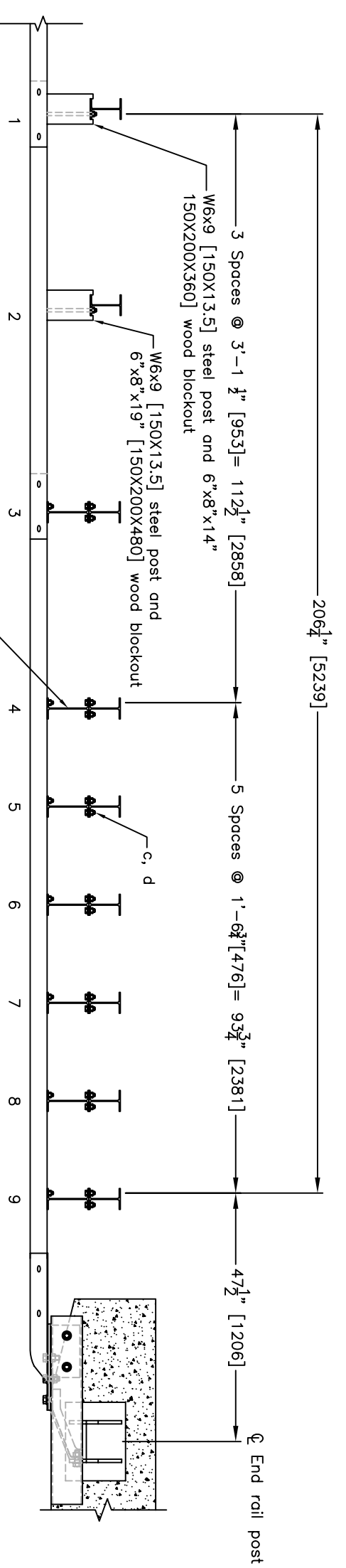
FRONT VIEW

THRIE BEAM SPACER

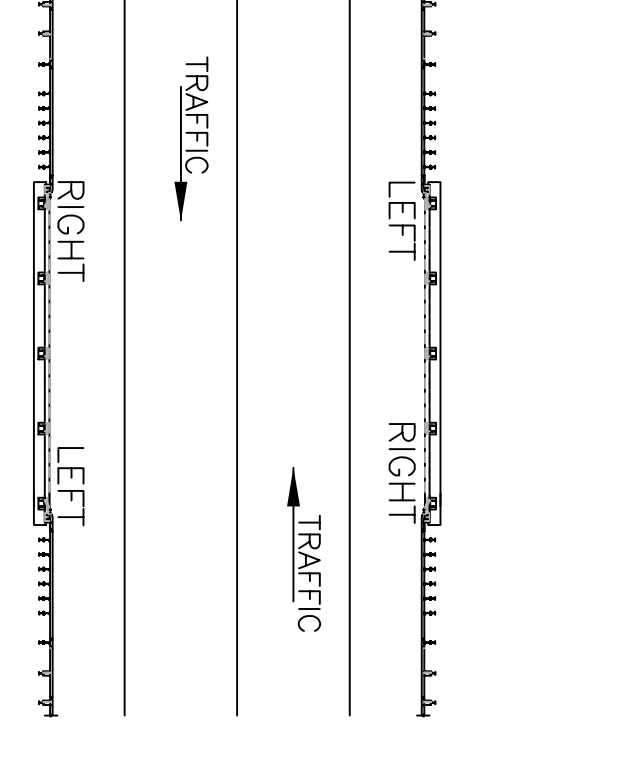
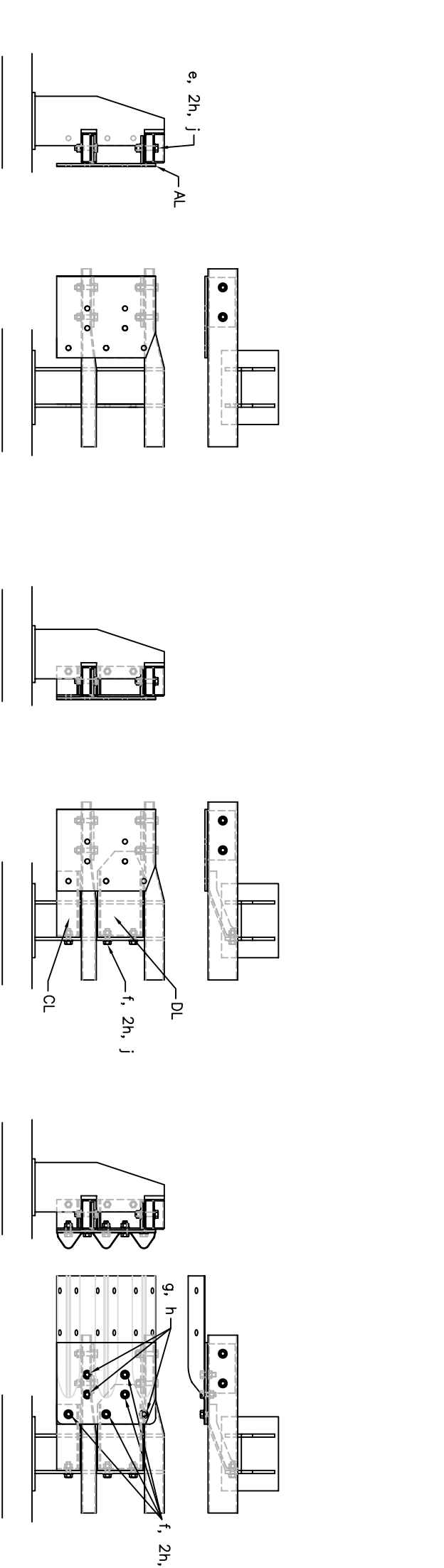
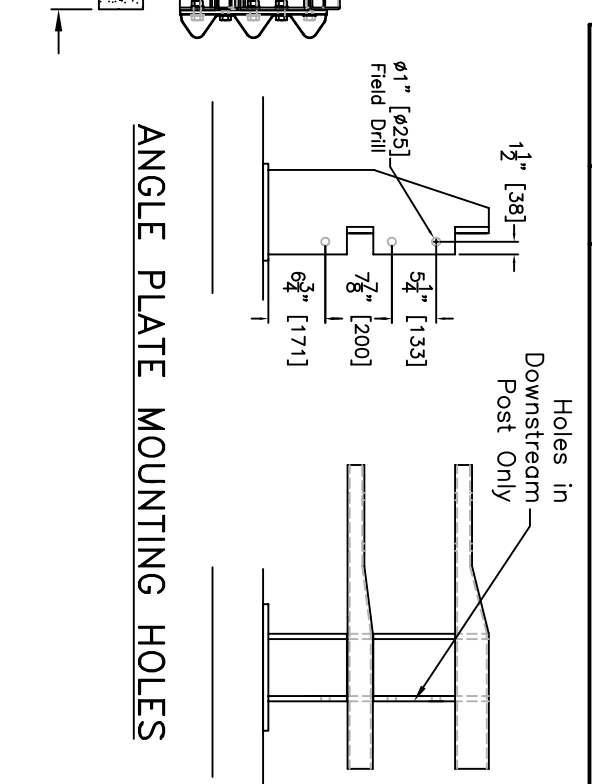
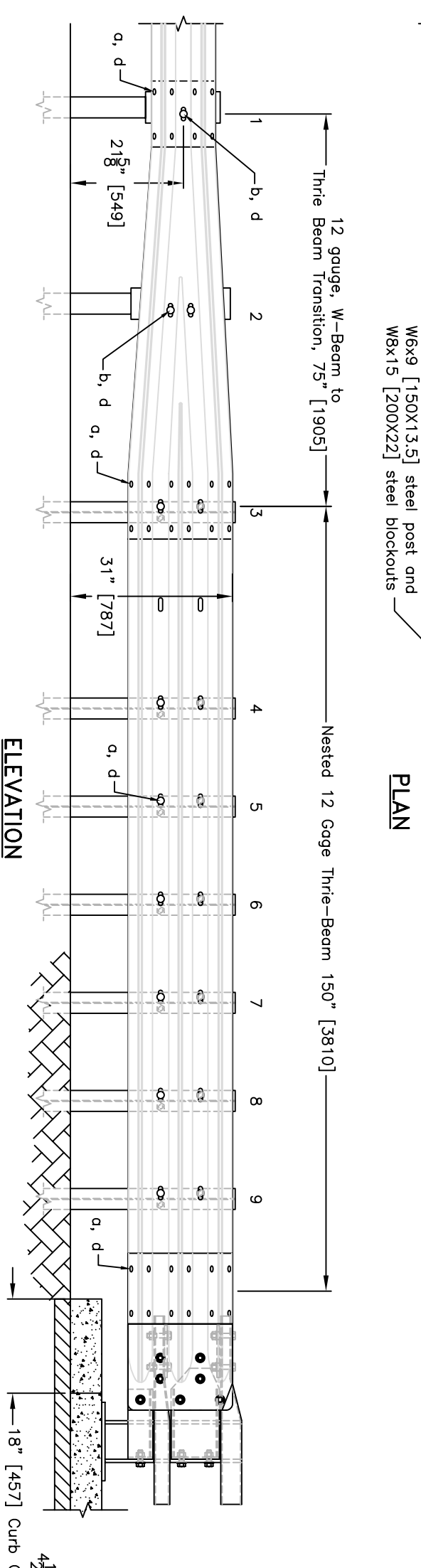


- NOTES:
- (1) Steel for wide-flange shall meet ASTM A36.
 - (2) All holes drilled or punched to $\frac{3}{4}$ " [19] diameter.
 - (3) All bolts are $\frac{5}{8}$ " [16] diameter.

	Wyoming TL-3 Transition	Sheet: 5 OF 5
	Post Details	Date: 03/13/06
Midwest Roadside Safety Facility	Drawing Name: WY Thrie-Beam Transition	By: JRR
	Scale: NONE	Rev:



ITEM	QTY	DESCRIPTION
AL/AR	1	Three-beam End Shoe
BL/BR	1	Mounting Plate
CL/CR	1	Lower Angle Assembly
DL/DR	1	Upper Angle Assembly
a	46	3/8" X 1 1/4" [16X32] Splice Bolt
b	3	5/8" X 10" [16X254] Post Bolt
c	14	5/8" X 1 1/2" [16X38] Hex Bolt
d	63	3/8" [16] Recessed Guardrail Nut
e	4	7/8" X 4" [22X100] Hex Bolt
f	7	7/8" X 2 1/2" [22X64] Hex Bolt
g	3	7/8" X 3/4" [22X19] Hex Bolt
h	21	7/8" [22] Washer
j	11	7/8" [22] Hex Nut



INSTALLATION OF MOUNTING PLATE

INSTALLATION OF ANGLE PLATES

INSTALLATION OF THREE-BEAM END SHOE

Midwest Roadside Safety Facility

Wyoming TL-4 Transition

Assembly

Sheet: 1 OF 5

Date: 03/13/06

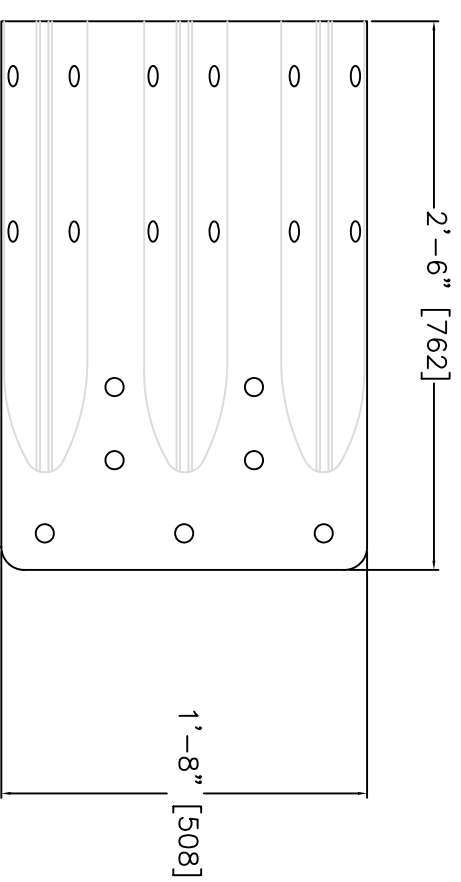
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Rev:

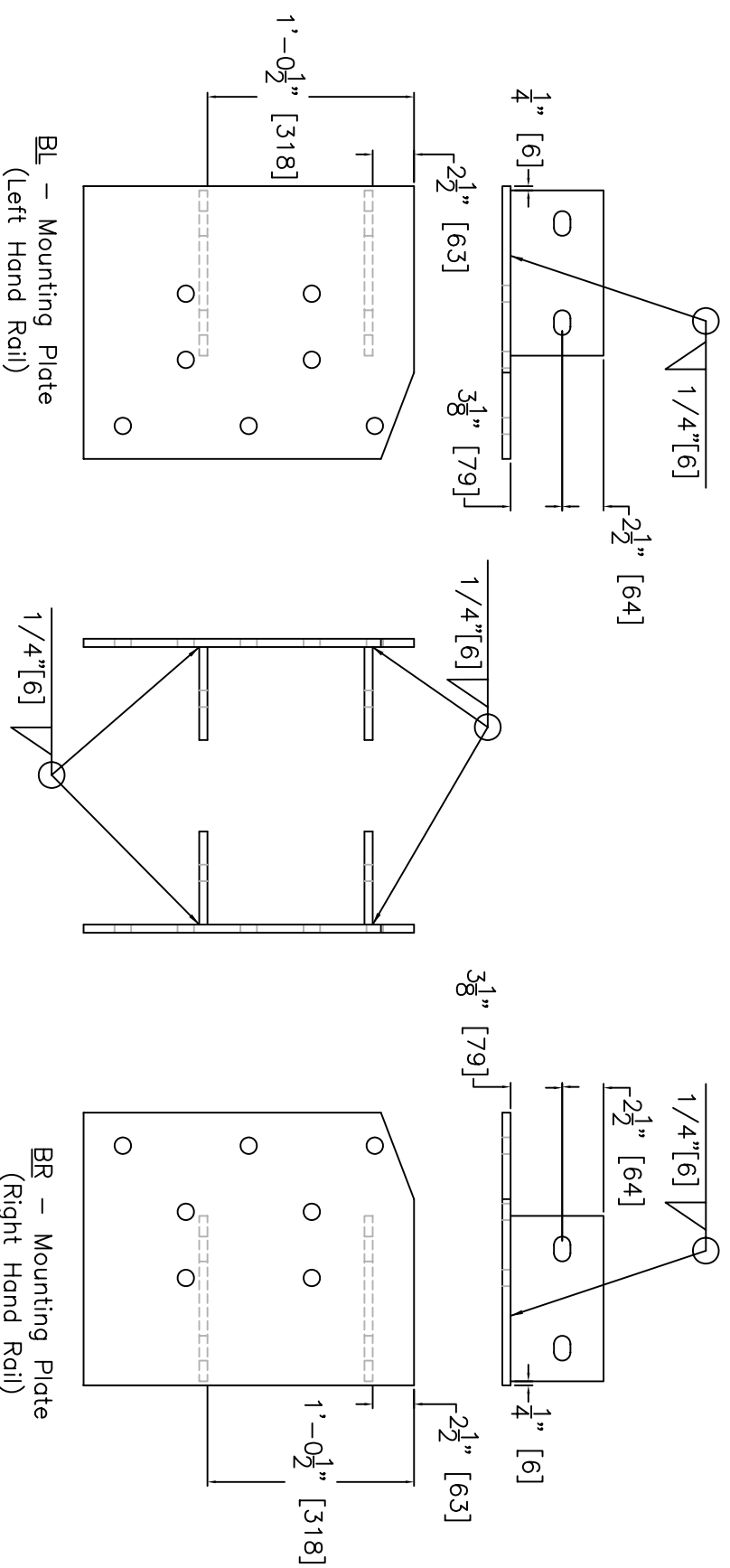
Drawing Name: WY Three-Beam Transition

Scale: NONE

ITEM	QTY	DESCRIPTION	MATERIAL
A	1	Thrie-beam End Shoe	10 Gage
BL/BR	1	Mounting Plate	
b1	1	Face Plate	$\frac{1}{2}$ " [13] A36 Plate
b2	2	Back Plate	$\frac{1}{2}$ " [13] A36 Plate

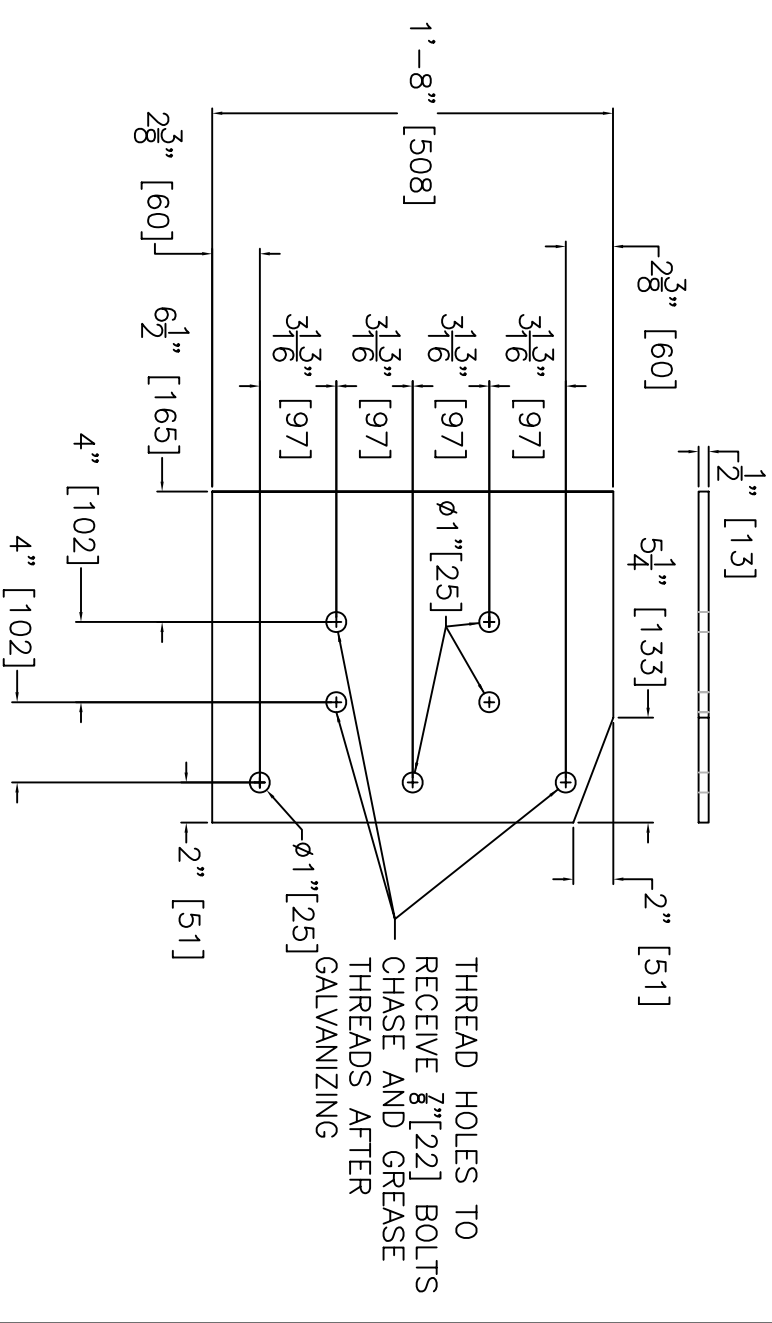


A - Thrie-Beam End Shoe

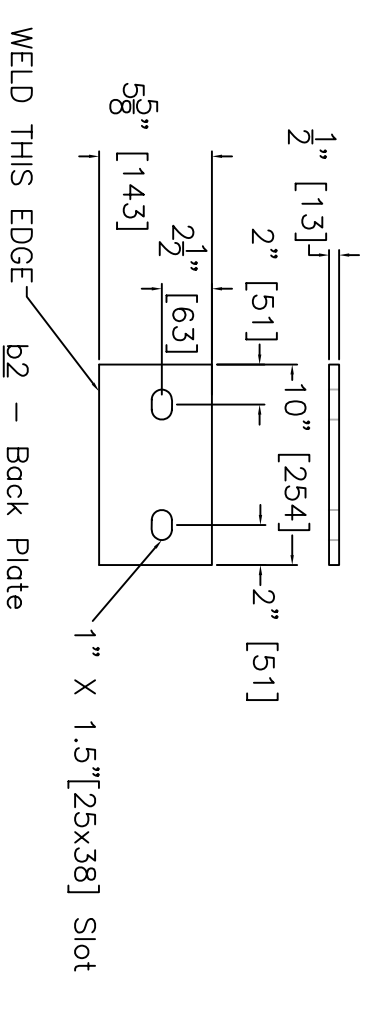


BL - Mounting Plate
(Left Hand Rail)


BR - Mounting Plate
(Right Hand Rail)



b1 - Face Plate



WELD THIS EDGE
b2 - Back Plate



**Midwest Roadside
Safety Facility**

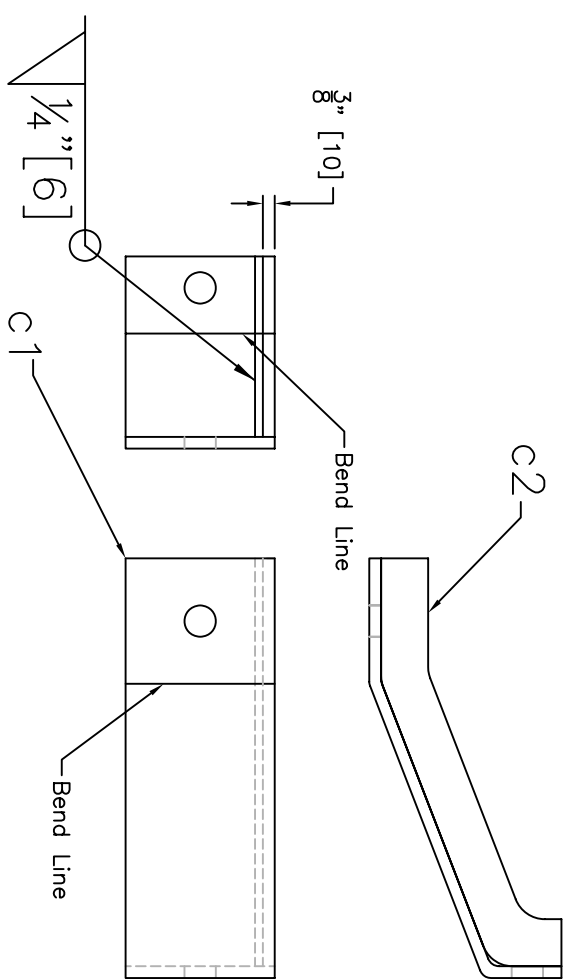
Wyoming TL-4 Transition

Part Details

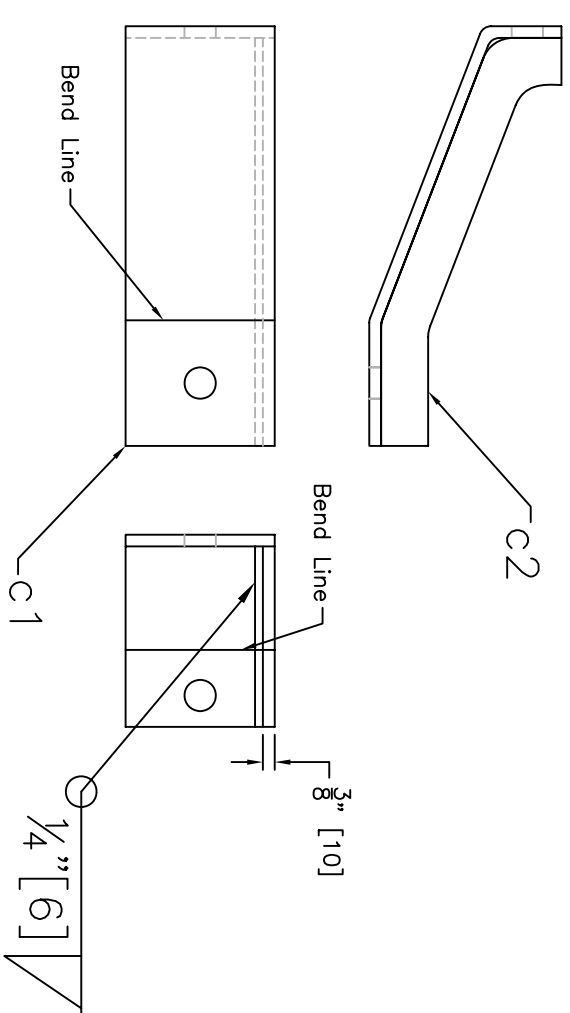
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Date: 03/13/06
By: JRR
Rev:

Drawing Name: WY Thrie-Beam Transition
Scale: NONE

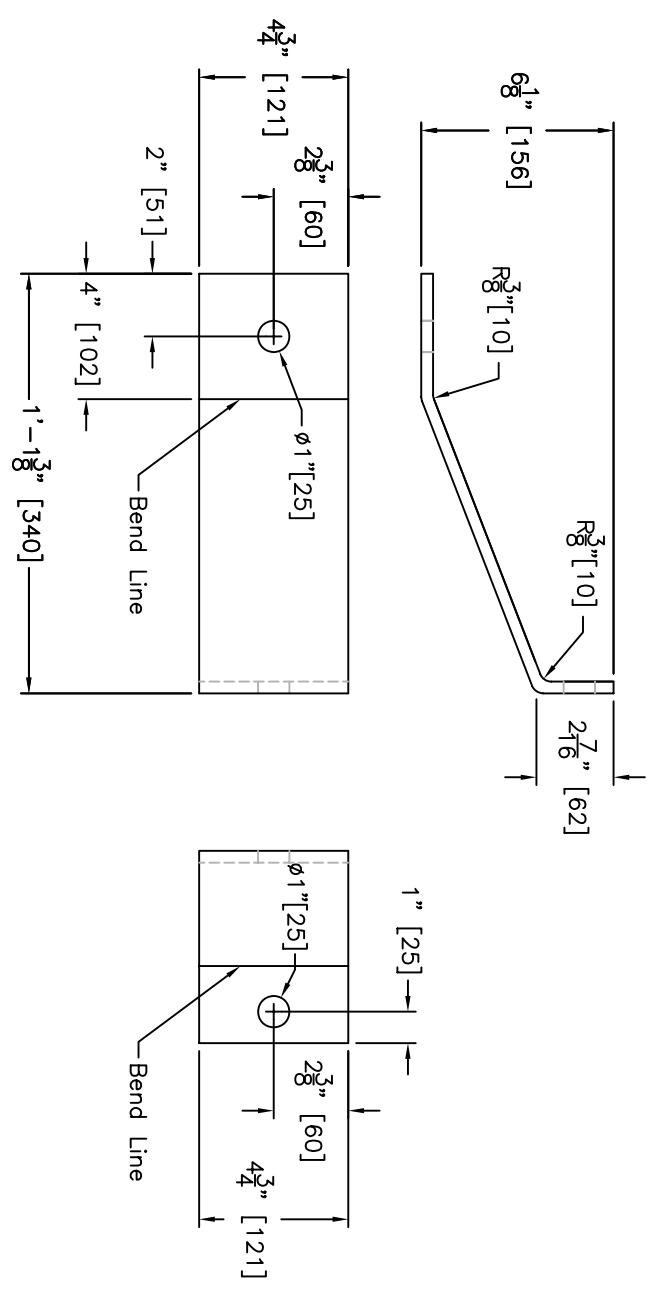
ITEM	QTY	DESCRIPTION	MATERIAL
CL/CR	1	Lower Angle Assembly	
c1	1	Lower Angle Plate	$\frac{3}{8}$ " [10] A36 Plate
c2	3	Gusset	$\frac{1}{4}$ " [6] A36 Plate



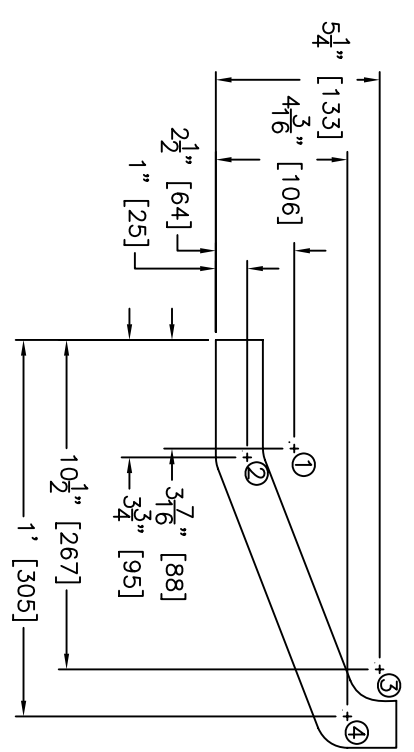
CL – Lower Angle Assembly
(Left Hand Rail)



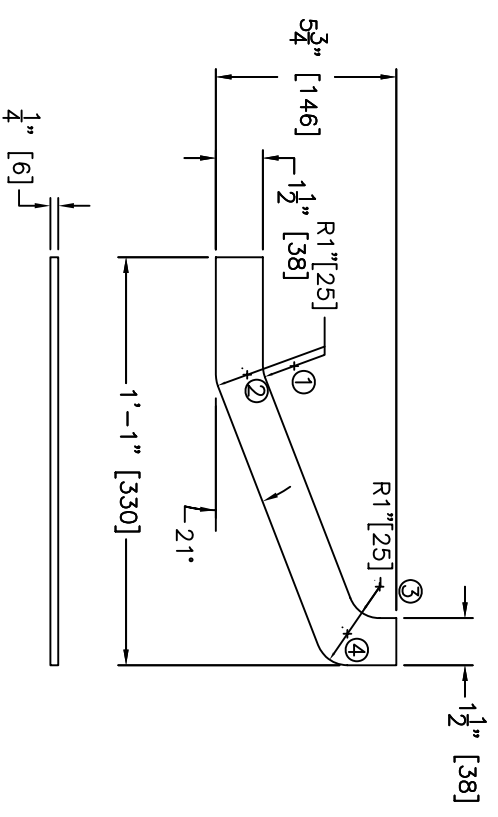
CR – Lower Angle Assembly
(Right Hand Rail)




c1 – Lower Angle Plate

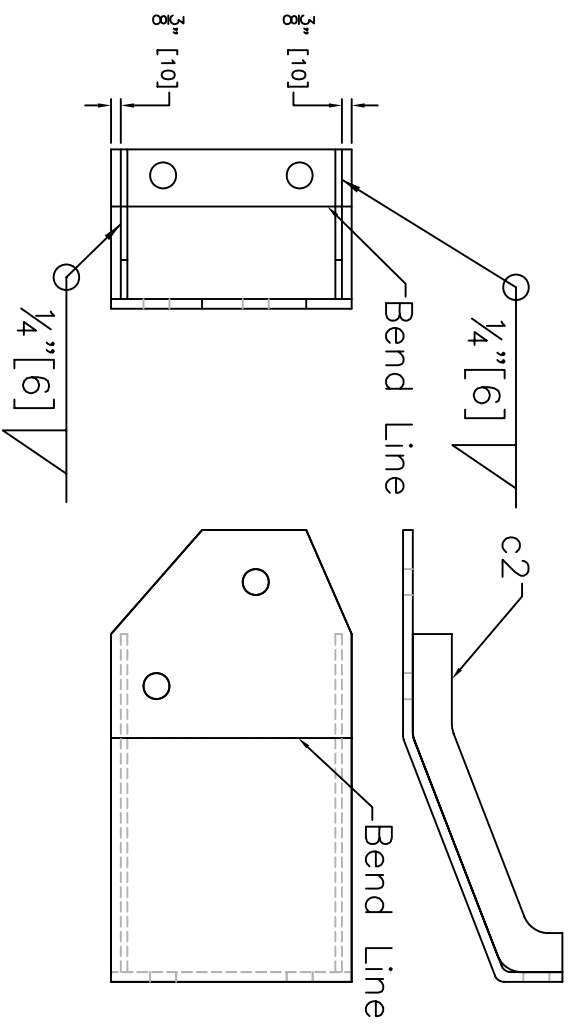


c2 – Gusset

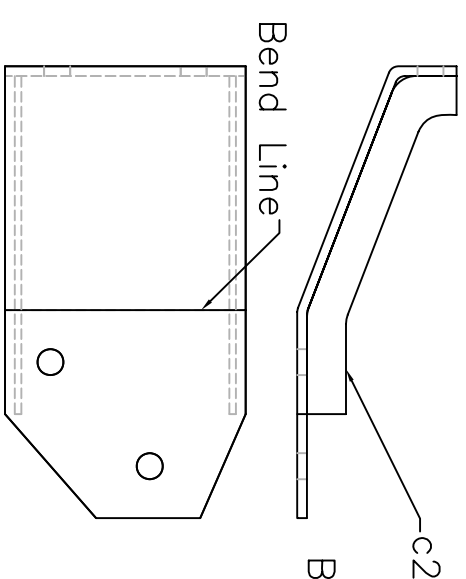


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	Part Details		Date: 03/13/06
Midwest Roadside Safety Facility	Drawing Name: WY Three-Beam Transition	Scale: NONE	By: JRR
			Rev:

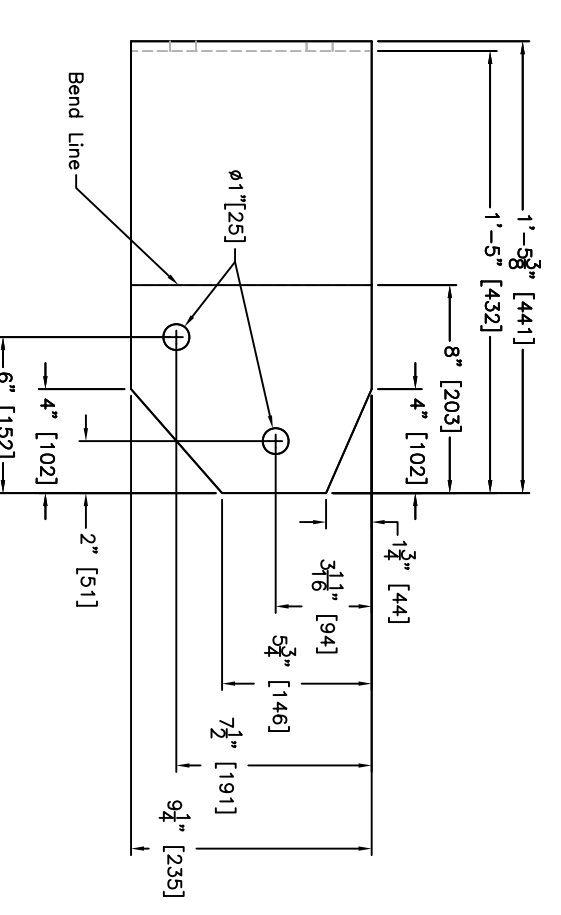
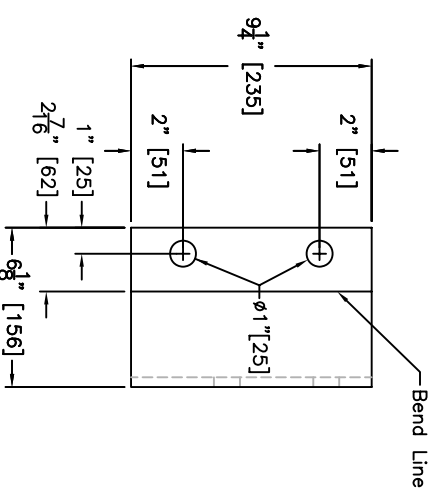
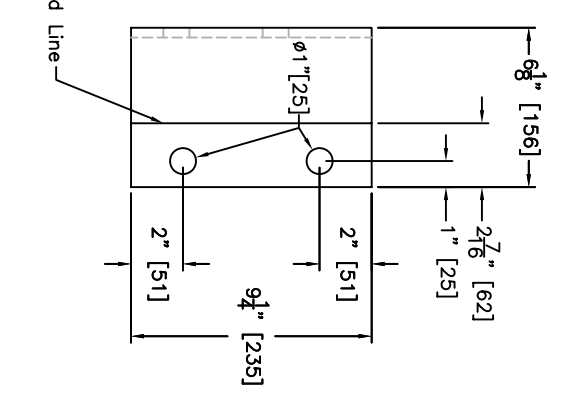
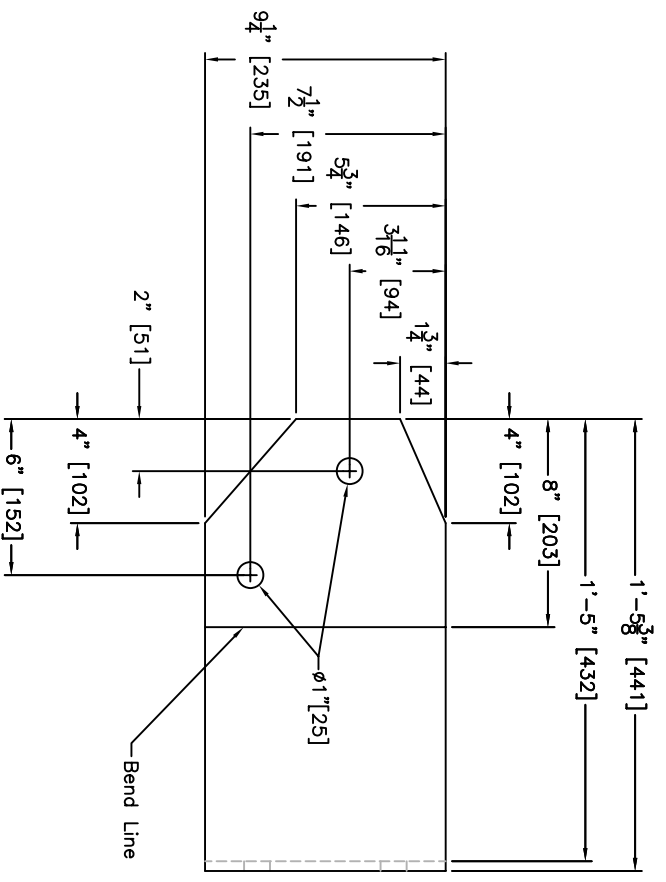
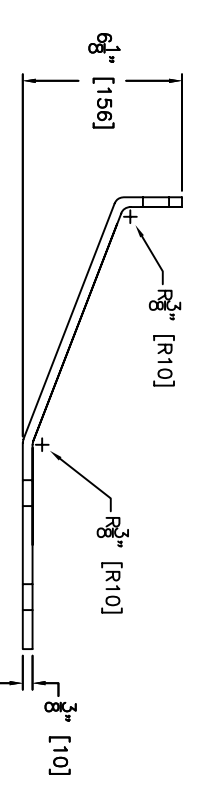
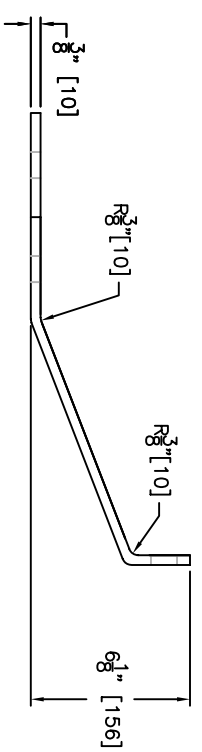
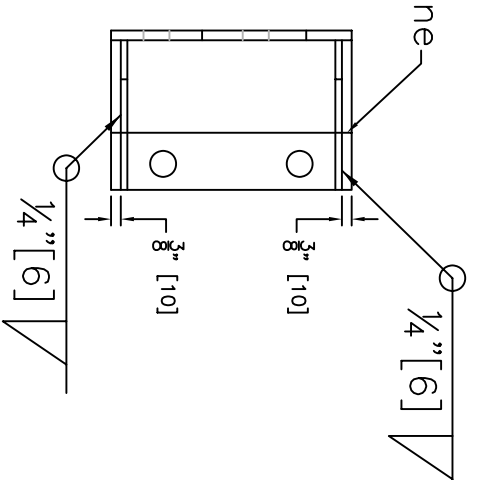
ITEM	QTY	DESCRIPTION	MATERIAL
c2	See Sheet #3		
DL/DR	1	Upper Angle Assembly	
d1L/d1R	1	Upper Angle Plate	3/8" [10] A36 Plate



DL – Upper Angle Assembly
(Left Hand Rail)




DR – Upper Angle Assembly
(Right Hand Rail)



d1L – Upper Angle Plate (Left Hand Rail)

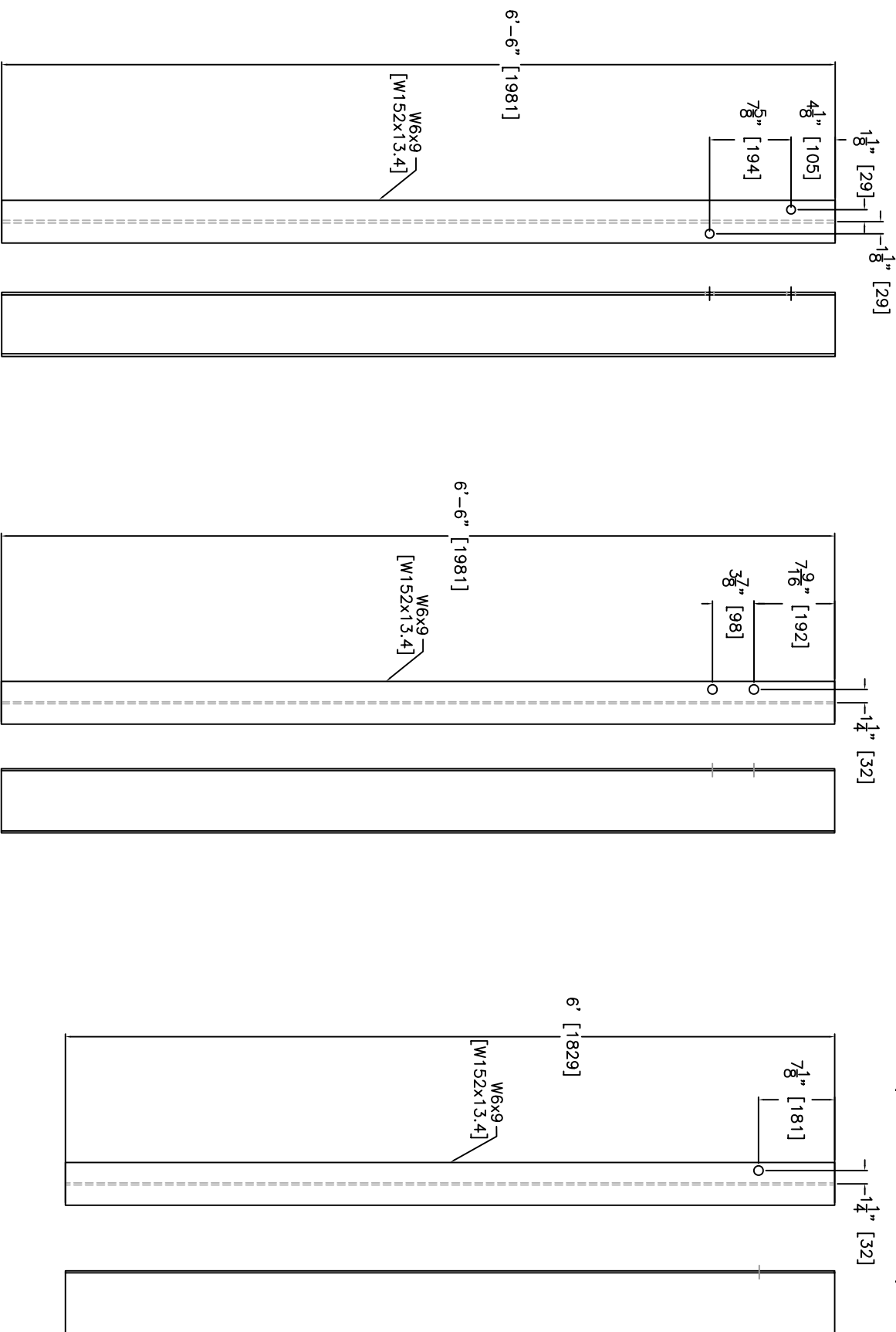
d1R – Upper Angle Plate (Right Hand Rail)

	Wyoming TL-4 Transition		Sheet: 4 OF 5
	Part Details		Date: 03/13/06
Midwest Roadside Safety Facility	Drawing Name: WV Thrie-Beam Transition	Scale: NONE	By: JRR
			Rev:

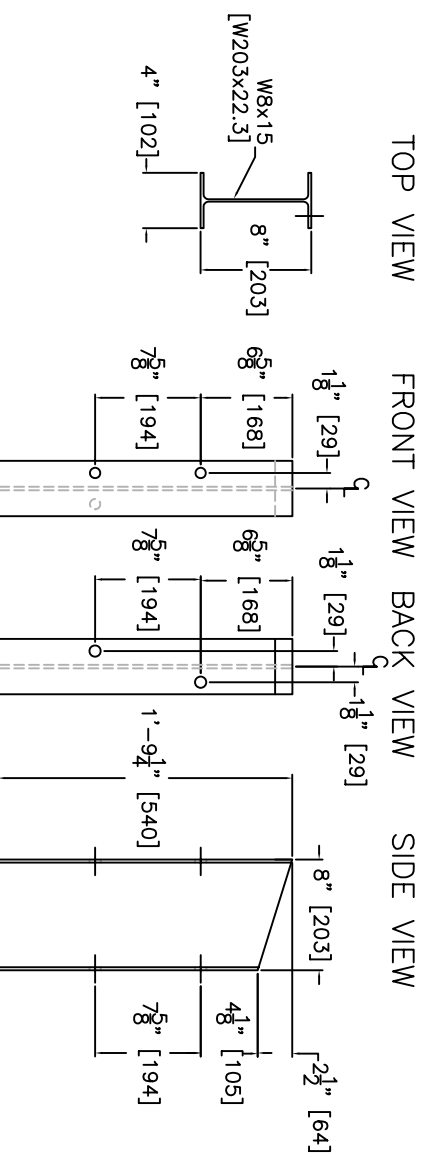
THREE BEAM POSTS
(Post No. 3-9)

W-BEAM TO THREE BEAM
MID-POST (Post No. 2)

W-BEAM POST
(Post No. 1)

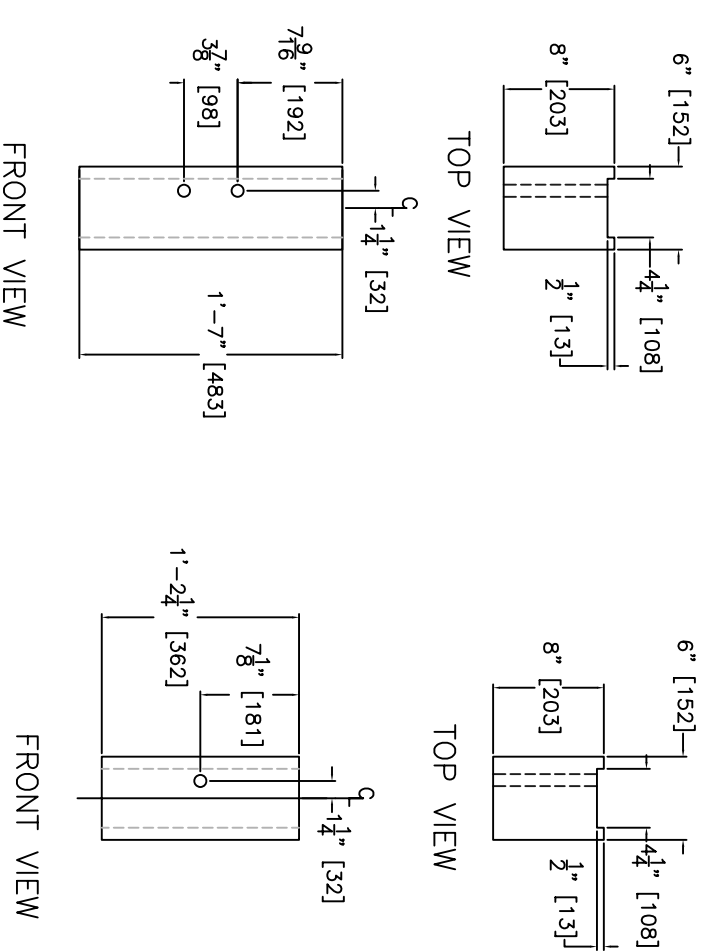


THREE BEAM SPACER




W-BEAM TO THREE BEAM
MID-POST SPACER

W-BEAM SPACER



- NOTES:
- (1) Steel for wide-flange shall meet ASTM A36.
 - (2) All holes drilled or punched to $\frac{3}{4}$ " [19] diameter.
 - (3) All bolts are $\frac{5}{8}$ " [16] diameter.

QTY	DESCRIPTION	MATERIAL
7	Three Beam Posts	W6x9 [W152x13.4]
7	Three Beam Spacer	W8x15 [W203x22.3]
1	Transition Mid-Post	W6x9 [W152x13.4]
1	Trans. M.P. Blockout	6x8x19" (Wood) [152x203x483]
1	W Beam Posts	W6x9 [W152x13.4]
1	W Beam Blockout	6x8x14 1/2" (Wood) [152x203x362]



**Midwest Roadside
Safety Facility**

Wyoming TL-4 Transition

Post Details

Sheet:
5 OF 5

Date:
03/13/06

By:
JRR

Rev:

Drawing Name:
WY Three-Beam Transition

Scale:
NONE