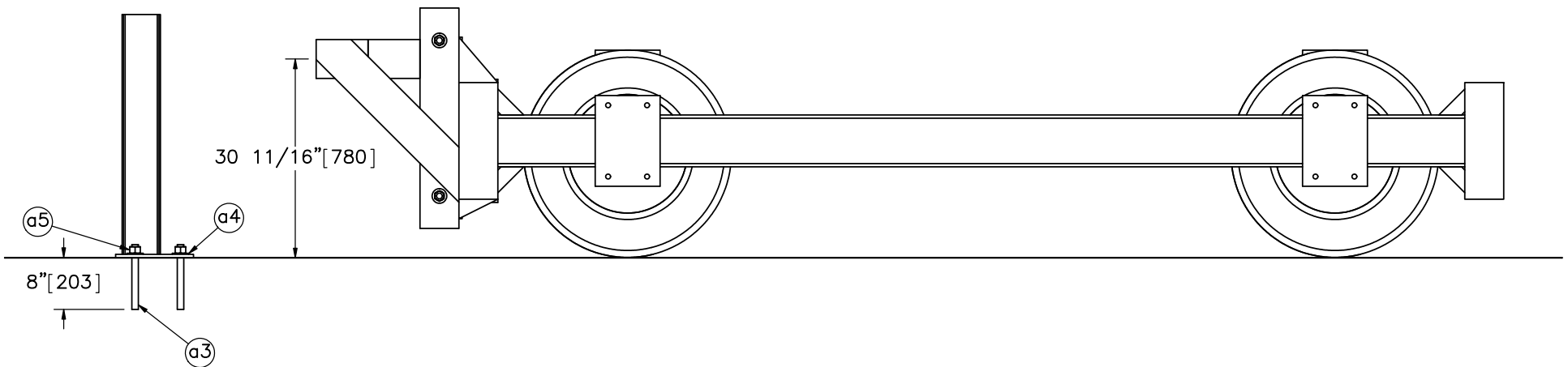


Number of Tests	Impact Speed mph [km/h]	Bogie No.	Weld, "X" in. [mm] (See Sheet 2)	Weld, "Y" in. [mm] (See Sheet 2)
1	10 [16.1]	2	1/4" [6.4] – Single Pass	5/16" [7.9] – Triple Pass



- Notes: (1) 10" [254] long, 1" [25] dia. threaded rods are to be epoxied in the tarmac at a depth of 8" [203] with Hilti-HIT-RE 500-SD epoxy or an equivalent epoxy with a minimum bond strength of 1,800 psi [12.4 MPa].
- (2) Use a triple pass, 5/16" [7.9] fillet weld on the front flange ("Y" weld location) and a single pass 1/4" [6.4] fillet weld everywhere else.



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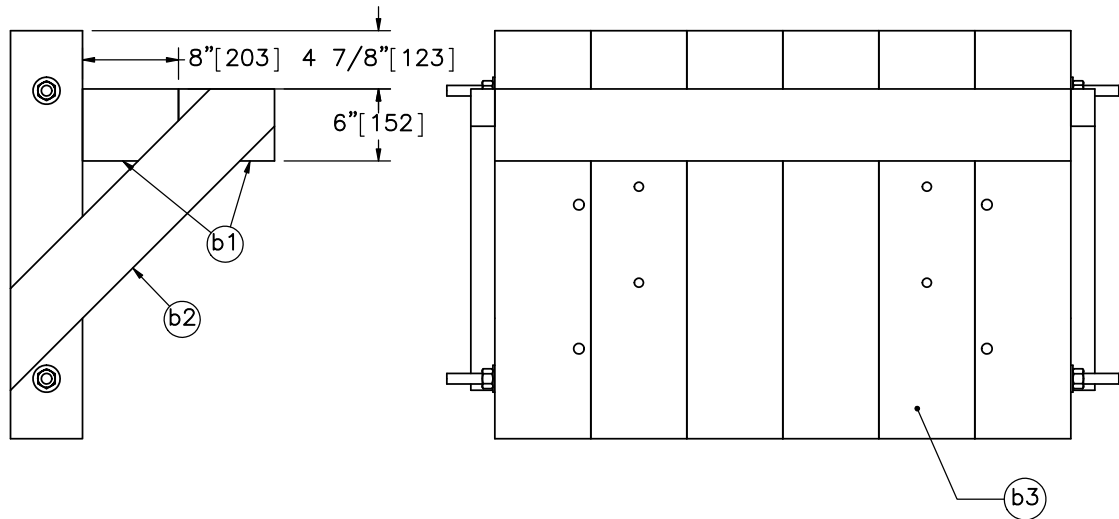
Culvert Guardrail
System Attachment
Round 3

Bogie Setup

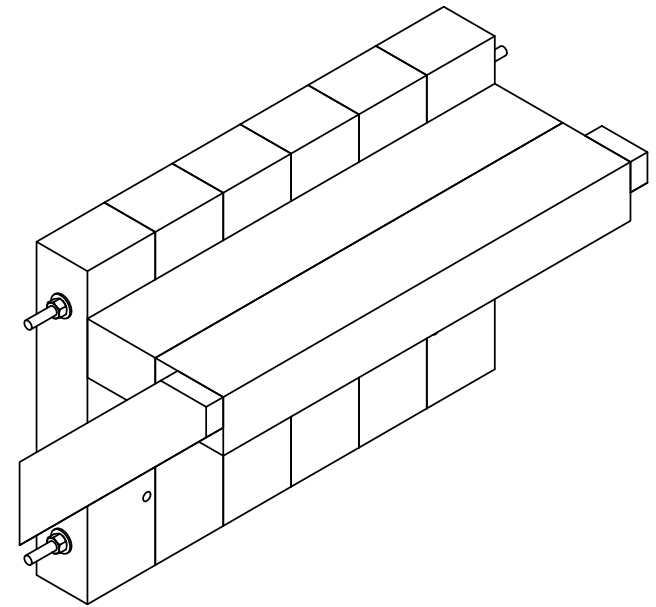
DWG. NAME.
CulvertGuardrailSystem-Round3_R0

SCALE: 1:24
UNITS: In.[mm]

SHEET:
1 of 5
DATE:
3/20/2012
DRAWN BY:
RJT
REV. BY:
SKR/KAL/
RKF



Modified Impact Head



- Notes: (1) The pre-existing impact head shall be modified to have an impact height of 30 11/16 in. [779].
 (2) The attachment and assembly of the modified impact head components shall be done in field as seen fit.



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Culvert Guardrail
System Attachment
Round 3

Bogie Impact Head Details

DWG. NAME.
CulvertGuardrailSystem-Round3_R0

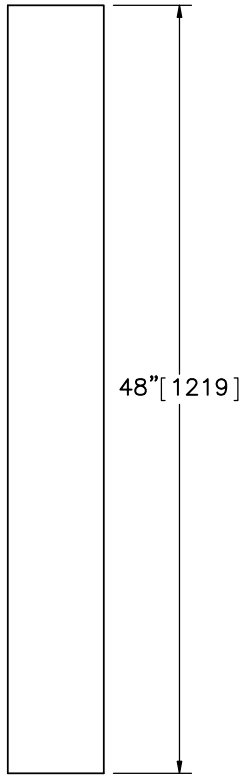
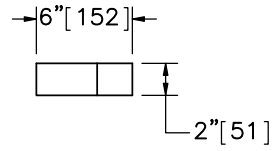
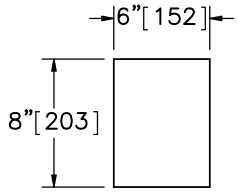
SCALE: 1:16
UNITS: In.[mm]

REV. BY:
SKR/KAL/
RKF

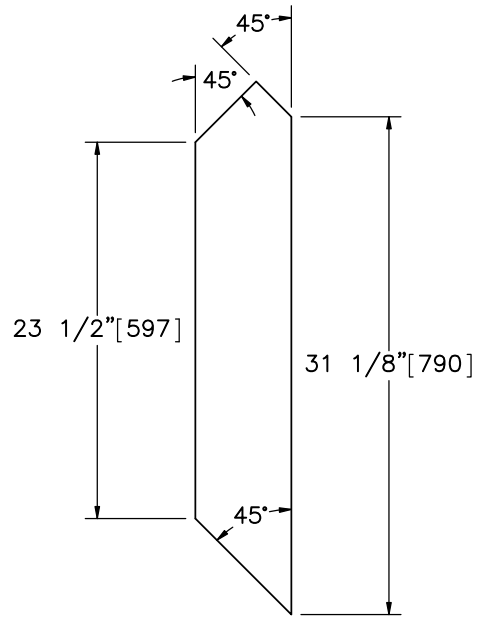
SHEET:
3 of 5

DATE:
3/20/2012

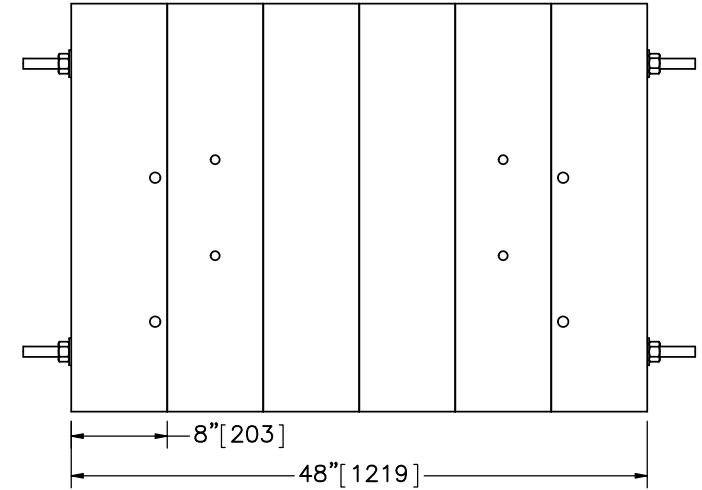
DRAWN BY:
RJT



Horizontal Beam
Part b1



Supporting Board
Part b2



Impact Head
Part b3



Midwest Roadside
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Culvert Guardrail
System Attachment
Round 3

Impact Head Component Details

DWG. NAME.
CulvertGuardrailSystem-Round3_R0

SCALE: 1:12
UNITS: In.[mm]

SHEET:
4 of 5

DATE:
3/20/2012

DRAWN BY:
RJT

REV. BY:
SKR/KAL/
RKF

Item No.	QTY.	Description	Material Specification	Hardware Guide
b1	2	6" x 8" x 48" [152x203x1219] Horizontal Beam	Wood	—
b2	2	2" x 6" x 34" [51x152x864] Supporting Board	Wood	—
b3	1	Impact Head	Wood	—
a1	1	37" [940] Long, W6x8.5 [W152x12.6] or W6x9 [W152x13.4] Post	ASTM A992 Min. 50 ksi [345 MPa]	PWE06
a2	1	1/2" x 8 1/2" x 12" [13x216x305] Top Base Plate	ASTM A529 Gr. 50 or ASTM A572 Gr. 50 Depending on Availability	—
a4	4	1" [25] Dia. Flat Washer	ASTM F844	—
a5	4	1" [25] Dia. — 8 UNC Nut	ASTM A563A	—
a3	4	1" [25] Dia. — 8 UNC x 10" [254] Threaded Rod	ASTM A307 Gr. A	—



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Culvert Guardrail System Attachment Round 3	SHEET: 5 of 5
	DATE: 3/20/2012
	DRAWN BY: RJT
Bill of Materials	
DWG. NAME: CulvertGuardrailSystem—Round3_R0	SCALE: None UNITS: In.[mm]
	REV. BY: SKR/KAL/ RKF