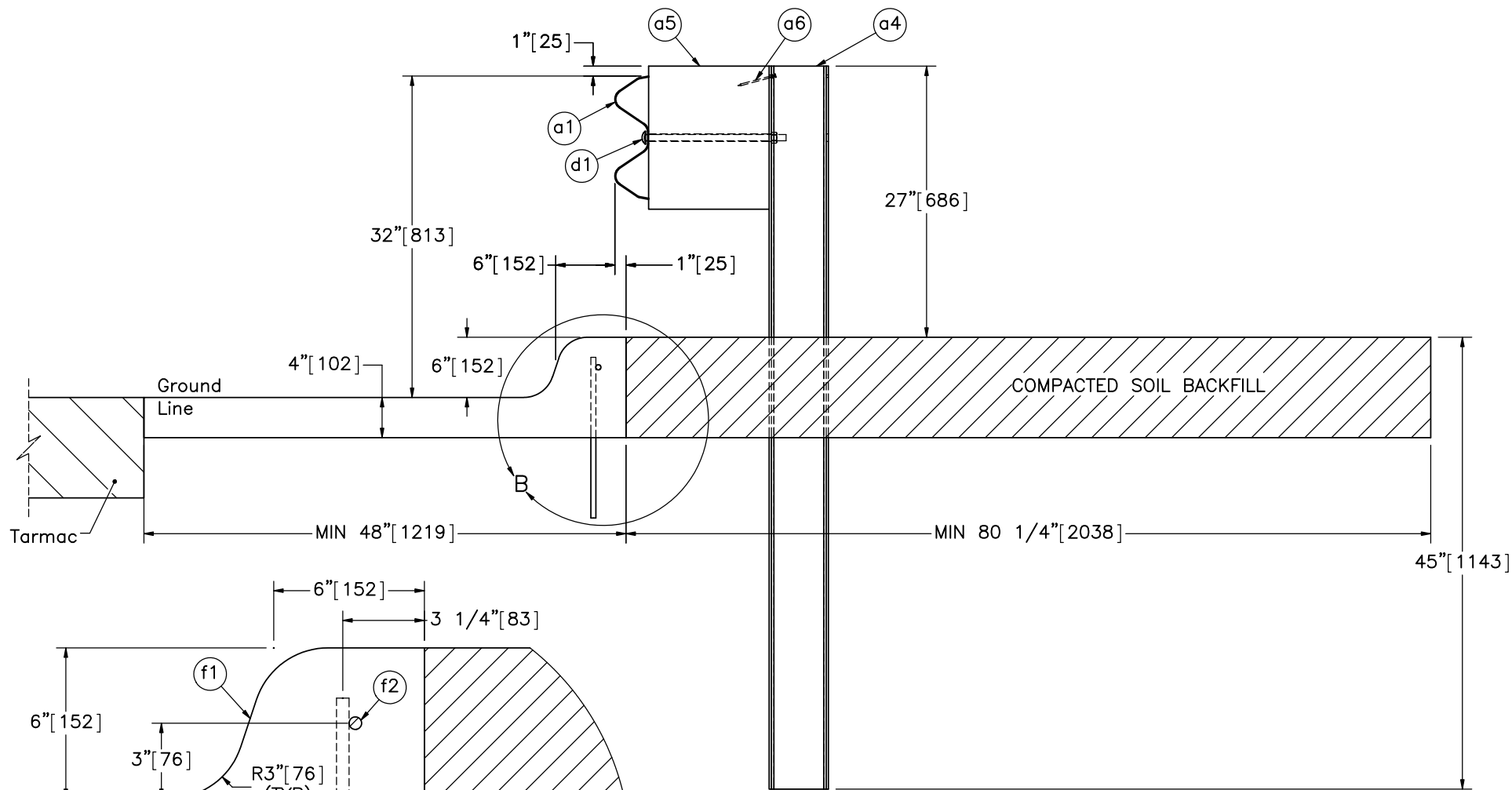
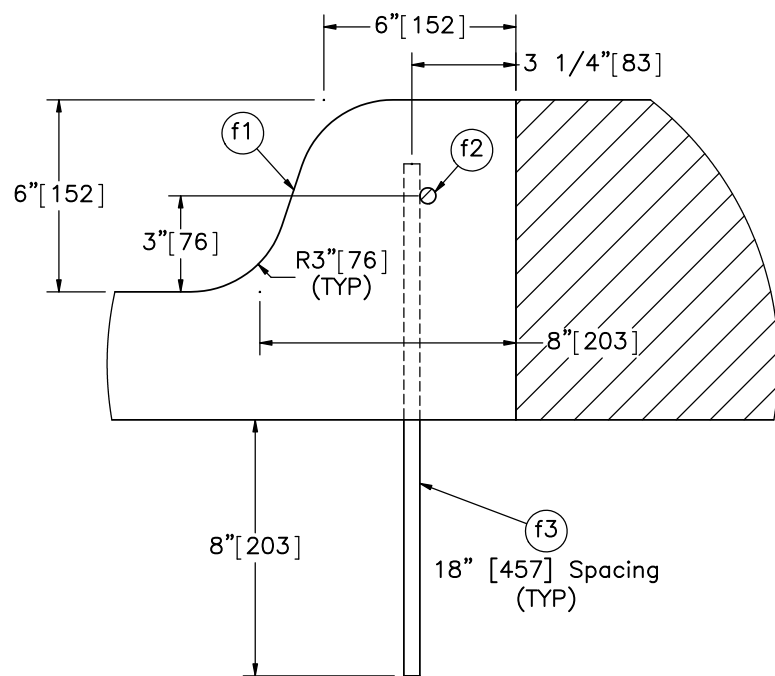


	MGS with Curb and Omitted Post Test No. MGSCO-1		SHEET: 1 of 13
	System Layout		DATE: 6/8/2017
Midwest Roadside Safety Facility	DWG. NAME. OmitPost-Curb-1_R6	SCALE: 1:220 UNITS: In.[mm]	DRAWN BY: JEK/MES/ DTM REV. BY: SKR/KAL/ RKF/JCH



SECTION A-A



DETAIL B
SCALE 1 : 6



Midwest Roadside
Safety Facility

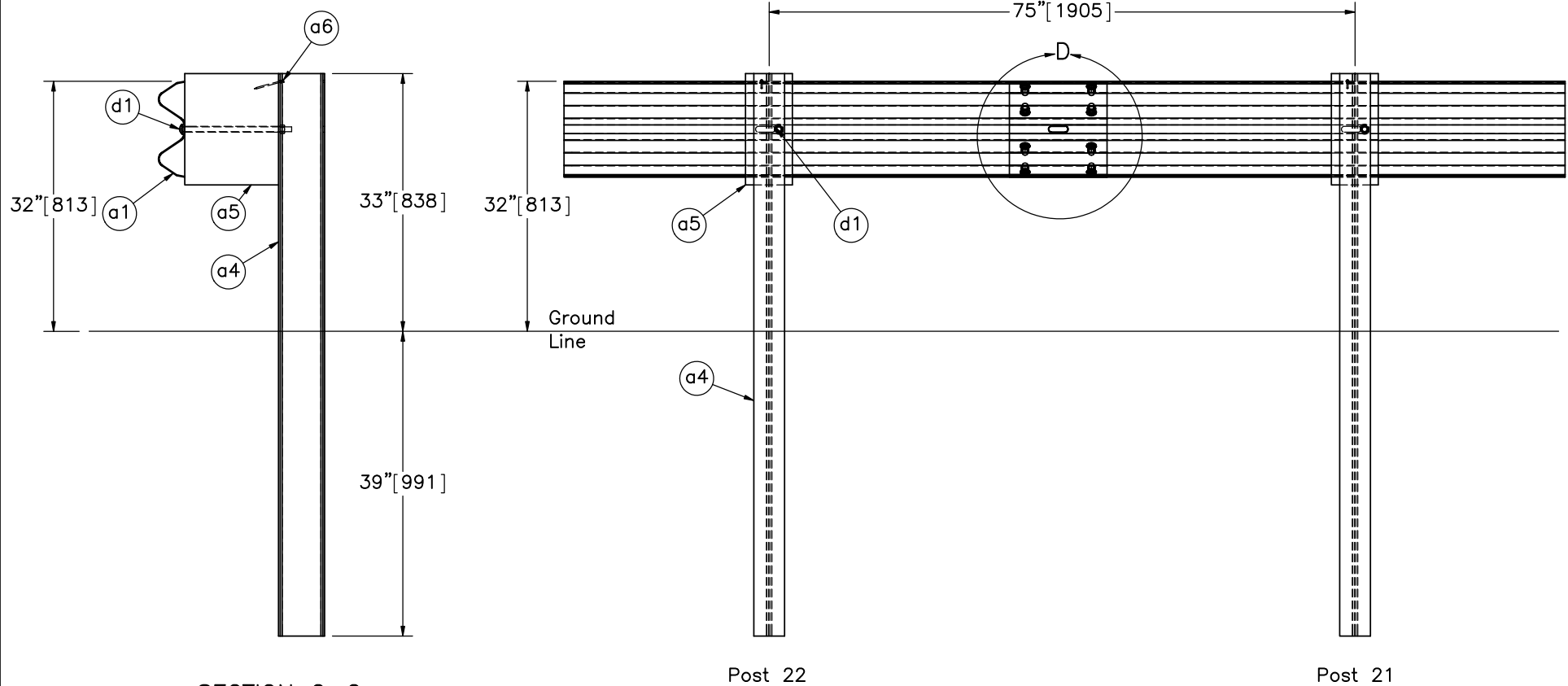
MGS with Curb and
Omitted Post
Test No. MGSCO-1

Post Detail

DWG. NAME.
OmitPost-Curb-1_R6

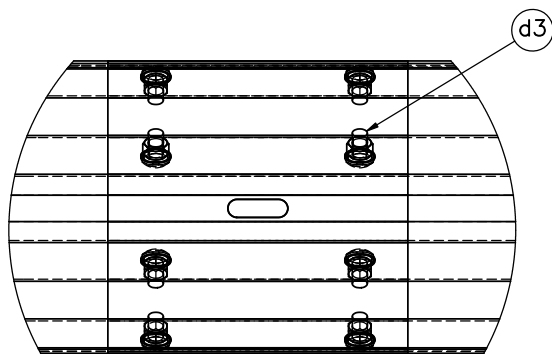
SCALE: 1:15
UNITS: In.[mm]

SHEET:
2 of 13
DATE:
6/8/2017
DRAWN BY:
JEK/MES/
DTM
REV. BY:
SKR/KAL/
RKF/JCH



SECTION C-C

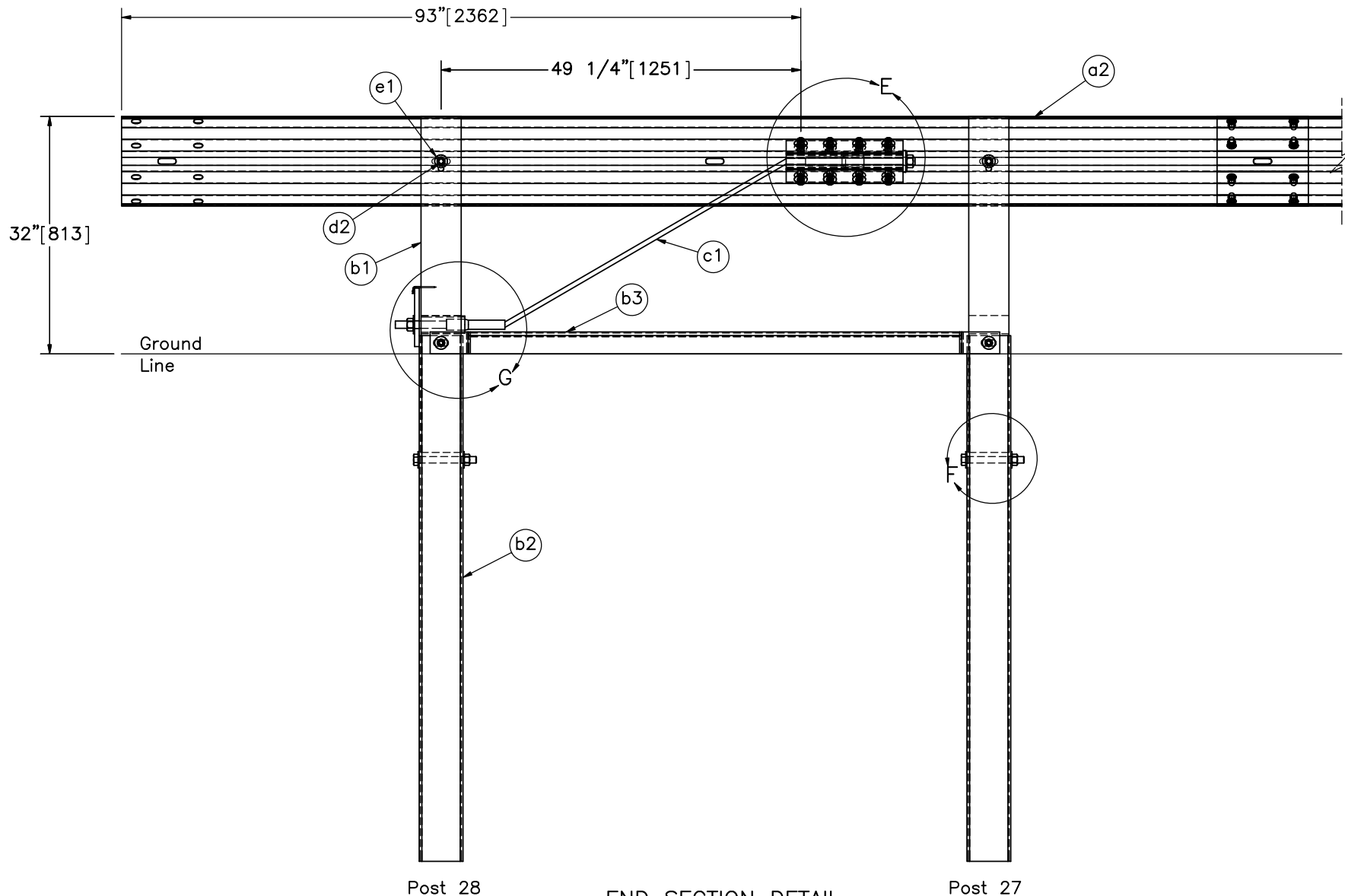
SPLICE DETAIL
BACKSIDE



DETAIL D
SCALE 1 : 8

Note: (1) Guardrail bolts (part d1) on the upstream side of the web.

	MGS with Curb and Omitted Post		SHEET: 3 of 13
	Test No. MGSCO-1		DATE: 6/8/2017
Midwest Roadside Safety Facility	Splice and Post Detail		DRAWN BY: JEK/MES/DTM
	DWG. NAME: OmitPost-Curb-1_R6	SCALE: 1:20 UNITS: In./mm	REV. BY: SKR/KAL/RKF/JCH



Post 28

END SECTION DETAIL
BACKSIDE (TYP)

Post 27

Note: (1) Downstream end section (post nos. 1 & 2) is mirrored.



Midwest Roadside
Safety Facility

MGS with Curb and
Omitted Post
Test No. MGSCO-1

End Section Detail

DWG. NAME.
OmitPost-Curb-1_R6

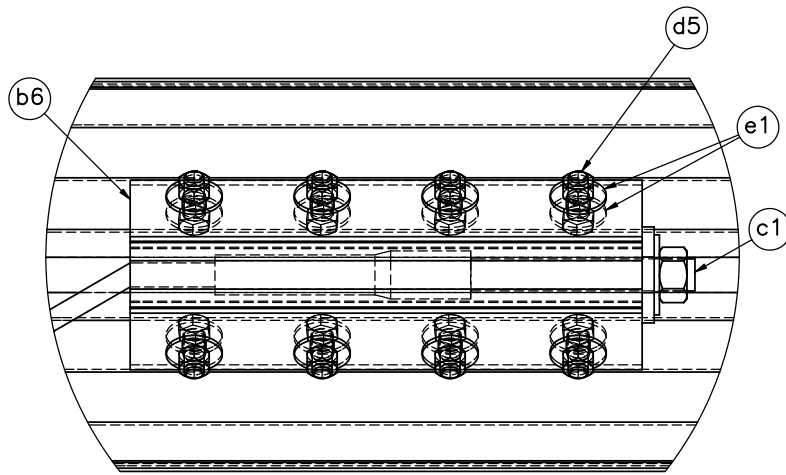
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UNITS: In./mm

SHEET:
4 of 13

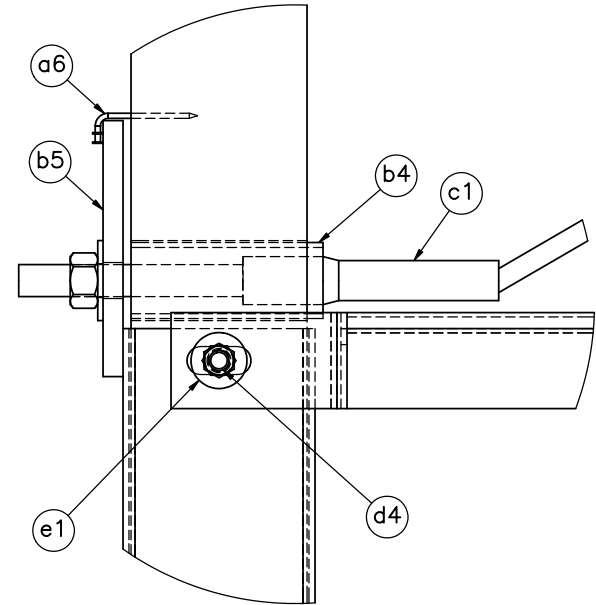
DATE:
6/8/2017

DRAWN BY:
JEK/MES/
DTM

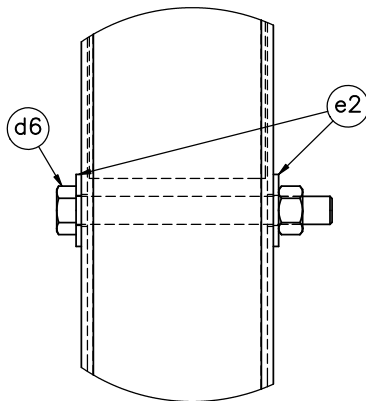
REV. BY:
SKR/KAL/
RKF/JCH



DETAIL E



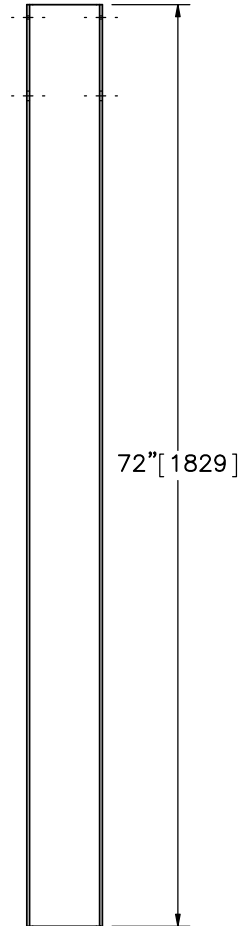
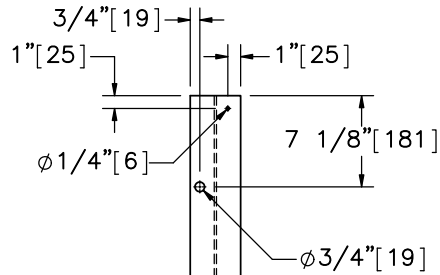
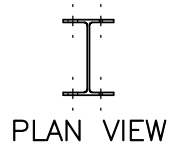
DETAIL G



DETAIL F

Note: (1) Additional washer (part e1) on the opposite side under the head of bolt (part d4).

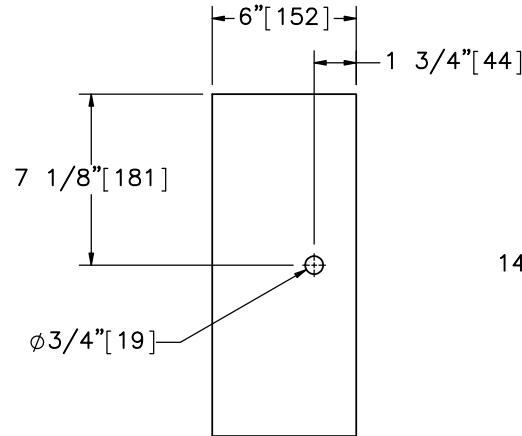
	MGS with Curb and Omitted Post Test No. MGSCO-1		SHEET: 5 of 13
	BCT Anchor Detail		DATE: 6/8/2017
Midwest Roadside Safety Facility	DWG. NAME: OmitPost-Curb-1_R6		DRAWN BY: JEK/MES/ DTM
	SCALE: 1:6 UNITS: In./mm		REV. BY: SKR/KAL/ RKF/JCH



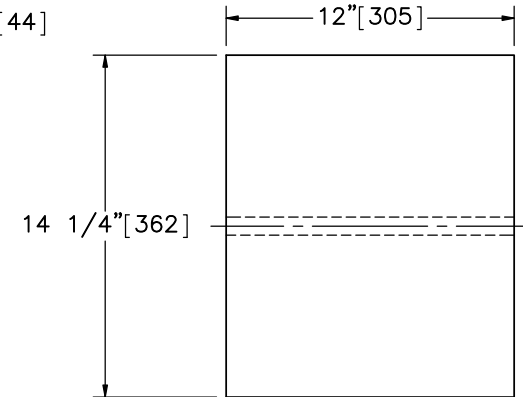
ELEVATION VIEW

PROFILE VIEW

Part a4

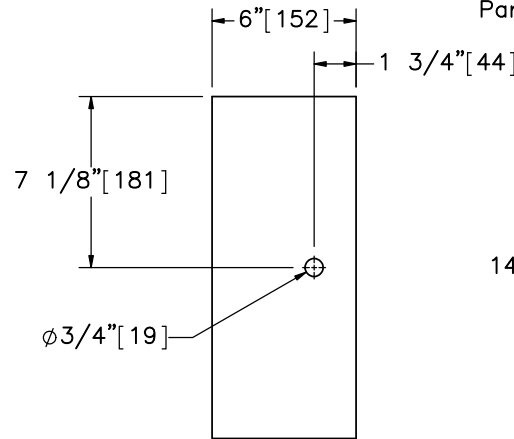


ELEVATION VIEW

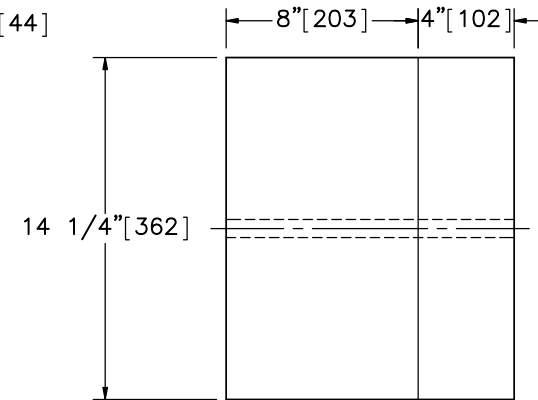


PROFILE VIEW

SCALE 1:8
Part a5



ELEVATION VIEW



PROFILE VIEW

SCALE 1:8

Alternate Blockout Option -
6"x4"x14 1/4" [152x102x362] Blockout
with 6"x8"x14 1/4" [152x203x362] Blockout



Midwest Roadside
Safety Facility

MGS with Curb and
Omitted Post
Test No. MGSCO-1

Post Nos. 3-27 Components

DWG. NAME.
OmitPost-Curb-1_R6

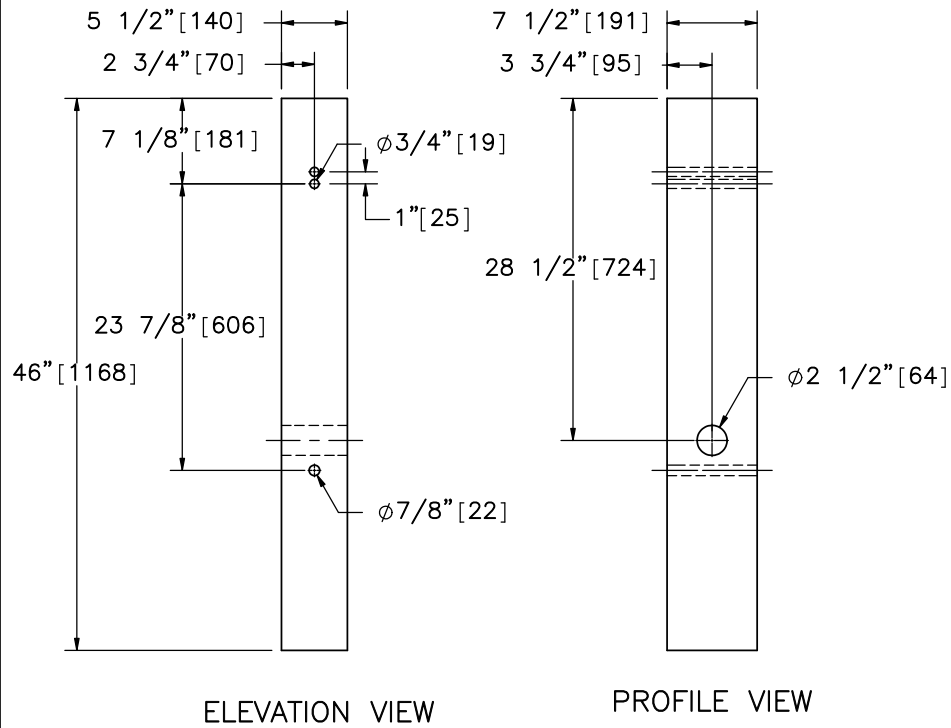
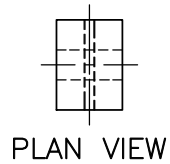
SCALE: 1:20
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SHEET:
6 of 13

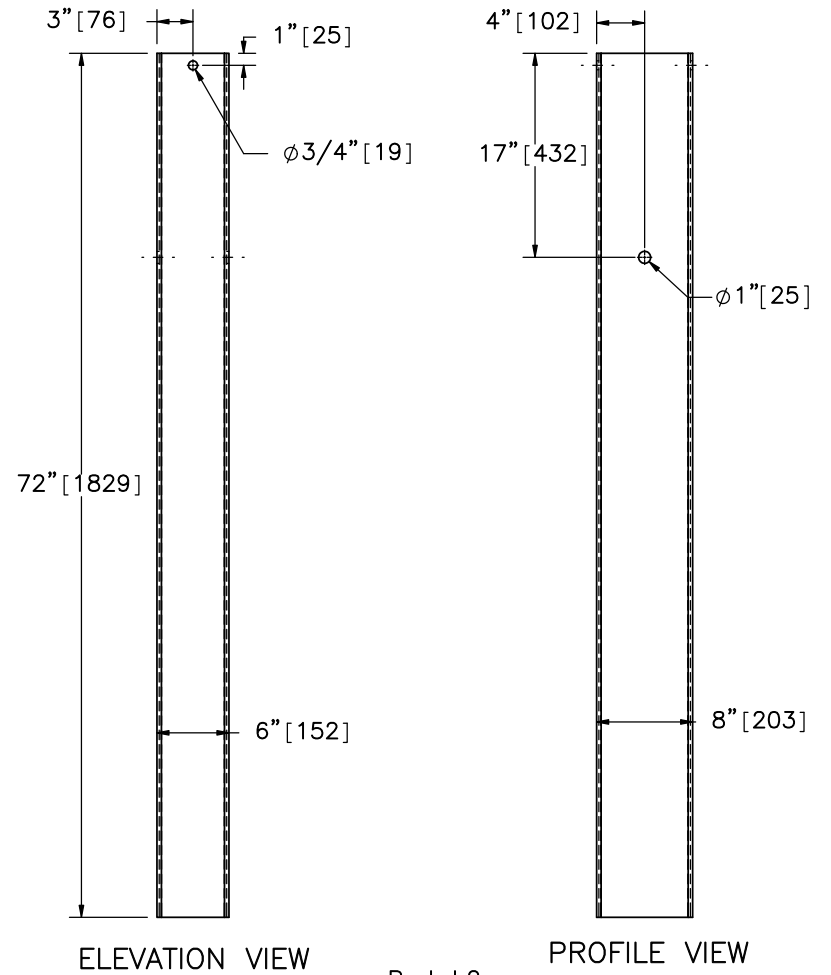
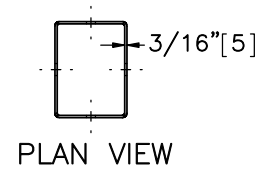
DATE:
6/8/2017

DRAWN BY:
JEK/MES/
DTM

REV. BY:
SKR/KAL/
RKF/JCH



Part b1



Part b2



Midwest Roadside
Safety Facility

MGS with Curb and
Omitted Post
Test No. MGSCO-1

BCT Timber Post &
Foundation Tube Detail

DWG. NAME.
OmitPost-Curb-1_R6

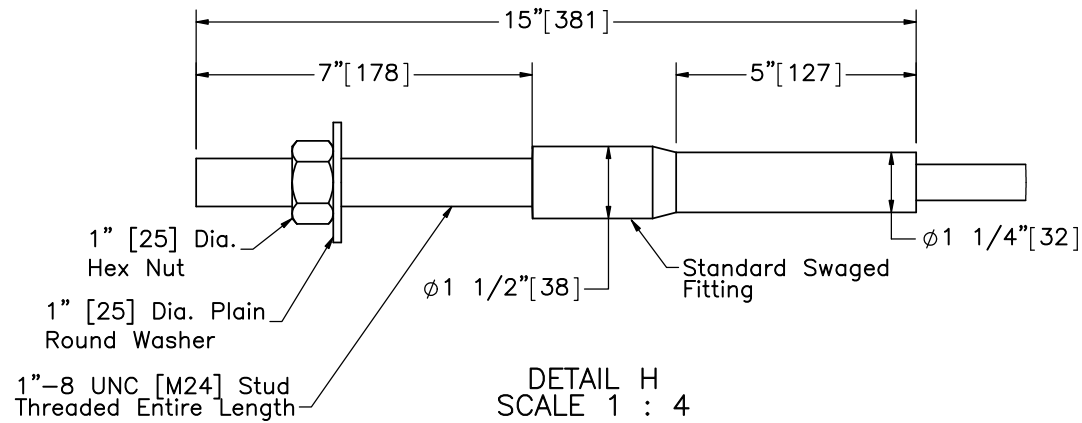
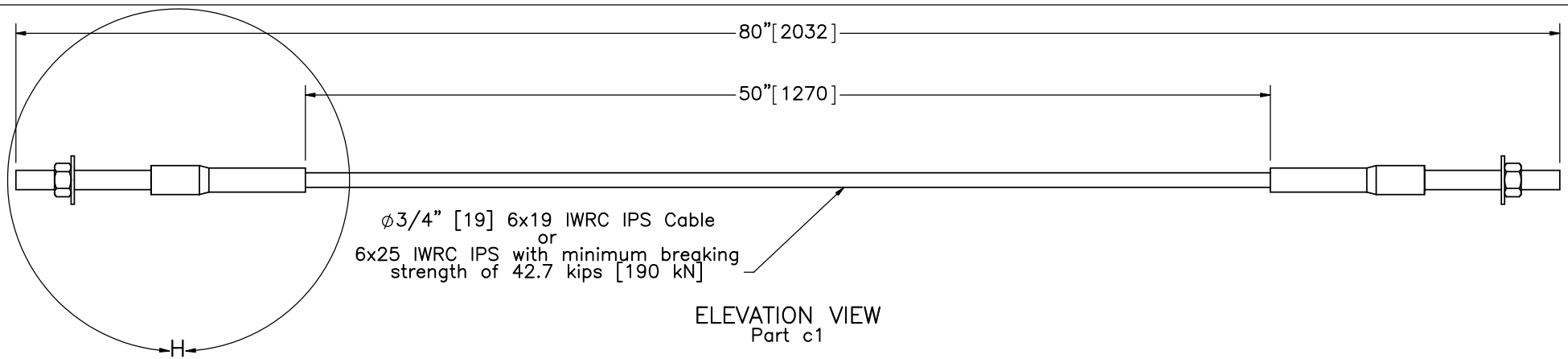
SCALE: 1:16
UNITS: In./mm

SHEET:
7 of 13

DATE:
6/8/2017

DRAWN BY:
JEK/MES/
DTM

REV. BY:
SKR/KAL/
RKF/JCH



Midwest Roadside
Safety Facility

MGS with Curb and
Omitted Post
Test No. MGSCO-1

BCT Anchor Cable

DWG. NAME.
OmitPost-Curb-1_R6

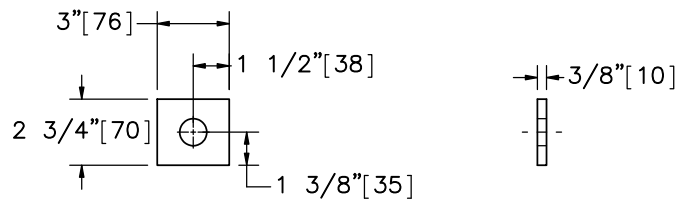
SCALE: 1:8
UNITS: In.[mm]

SHEET:
8 of 13

DATE:
6/8/2017

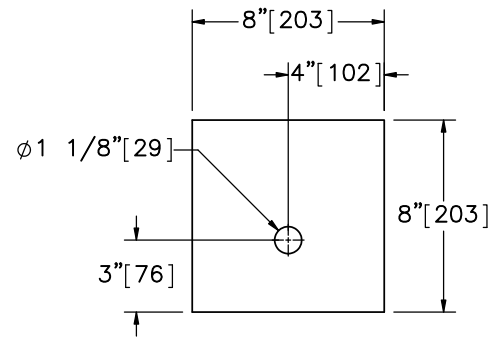
DRAWN BY:
JEK/MES/
DTM

REV. BY:
SKR/KAL/
RKF/JCH



ELEVATION VIEW PROFILE VIEW

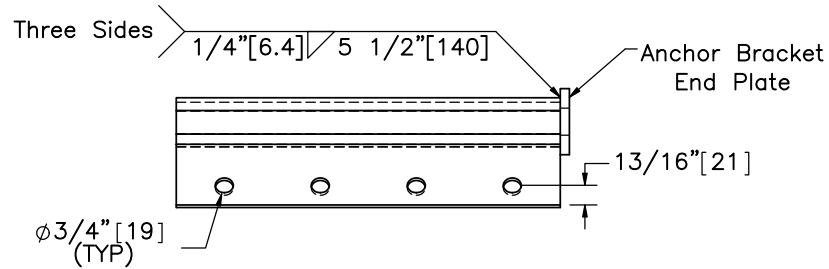
Anchor Bracket End Plate



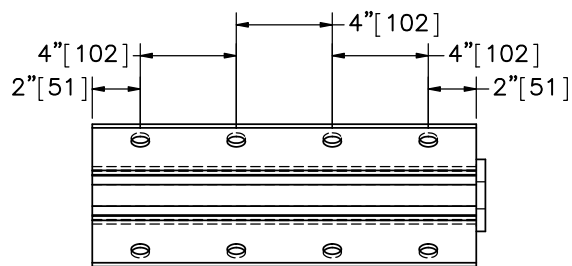
ELEVATION VIEW

PROFILE VIEW

Part b5



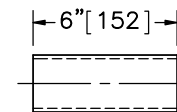
PLAN VIEW



ELEVATION VIEW

PROFILE VIEW

Part b6



ELEVATION VIEW

PROFILE VIEW

Part b4



Midwest Roadside
Safety Facility

MGS with Curb and
Omitted Post
Test No. MGSCO-1

BCT Post Components &
Anchor Bracket

DWG. NAME.
OmitPost-Curb-1_R6

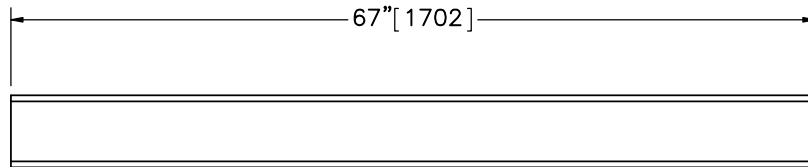
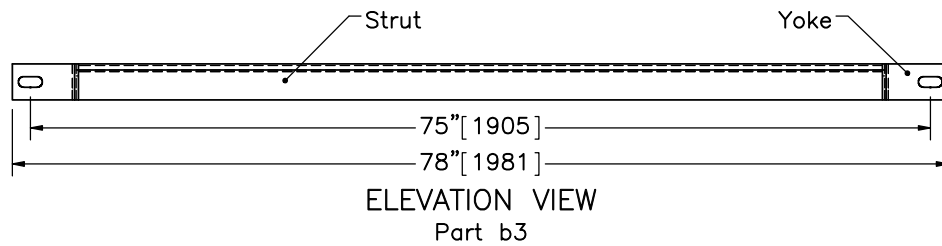
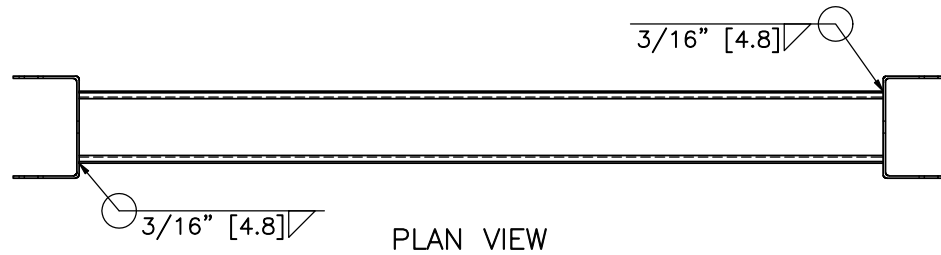
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UNITS: In.[mm]

SHEET:
9 of 13

DATE:
6/8/2017

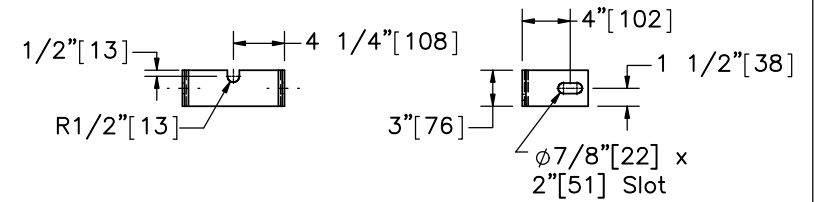
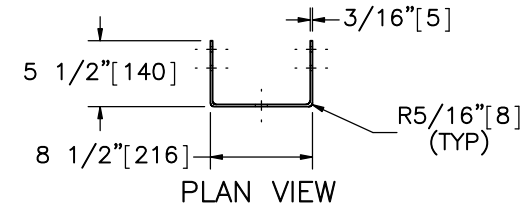
DRAWN BY:
JEK/MES/
DTM

REV. BY:
SKR/KAL/
RKF/JCH



ELEVATION VIEW

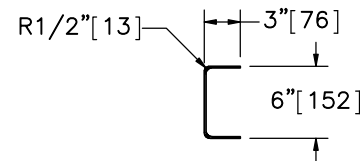
6"x3" [152x76] 10 Gauge [3.4] Strut



ELEVATION VIEW

PROFILE VIEW

Yoke



PROFILE VIEW



Midwest Roadside
Safety Facility

MGS with Curb and
Omitted Post
Test No. MGSCO-1

Ground Strut Details

DWG. NAME.
OmitPost-Curb-1_R6

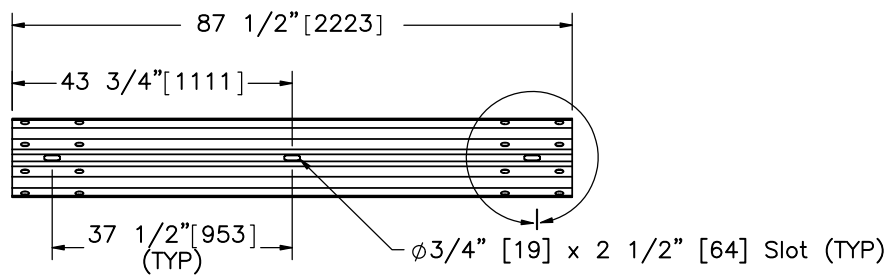
SCALE: 1:16
UNITS: In.[mm]

SHEET:
10 of 13

DATE:
6/8/2017

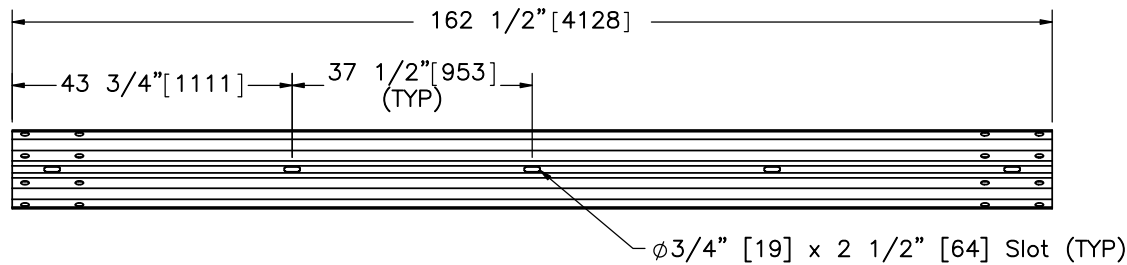
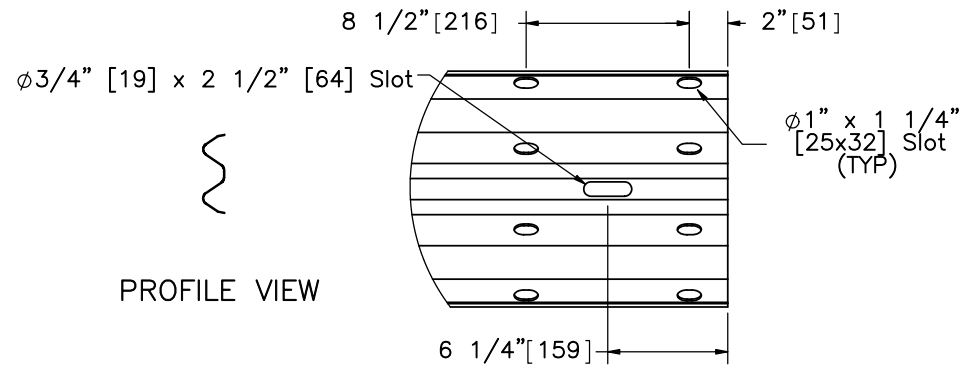
DRAWN BY:
JEK/MES/
DTM

REV. BY:
SKR/KAL/
RKF/JCH

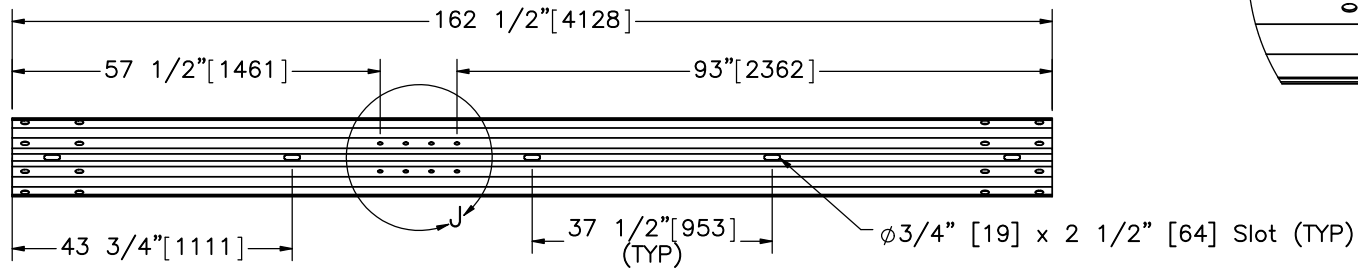
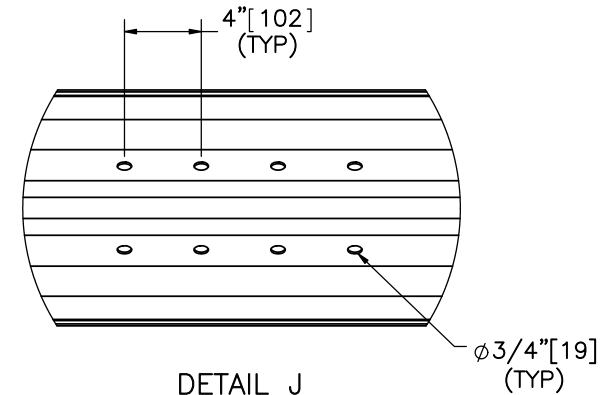


ELEVATION VIEW

Part a3



ELEVATION VIEW
 Part a1



ELEVATION VIEW
 Part a2



Midwest Roadside
 Safety Facility

MGS with Curb and
 Omitted Post
 Test No. MGSCO-1

Rail Section Details

DWG. NAME.
 OmitPost-Curb-1_R6

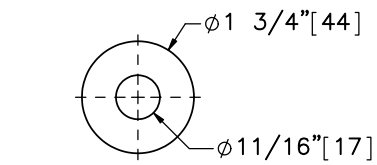
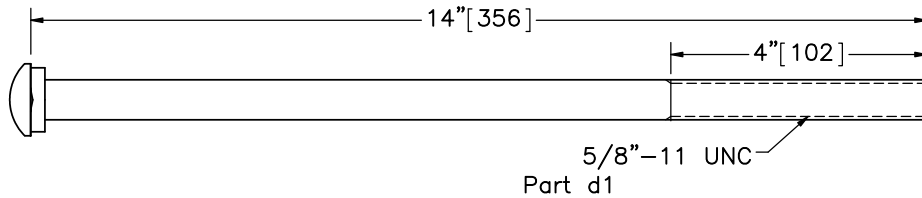
SCALE: 1:30
 UNITS: In./mm

SHEET:
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DATE:
 6/8/2017

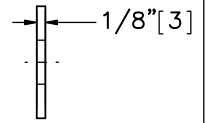
DRAWN BY:
 JEK/MES/
 DTM

REV. BY:
 SKR/KAL/
 RKF/JCH

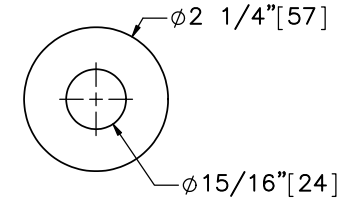
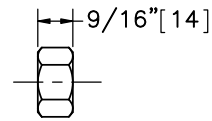
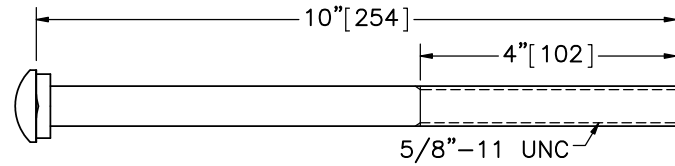


ELEVATION VIEW

Part e1

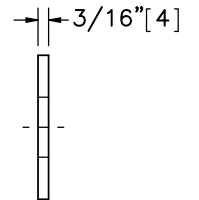


PROFILE VIEW

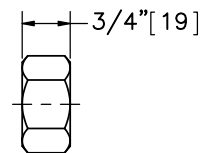
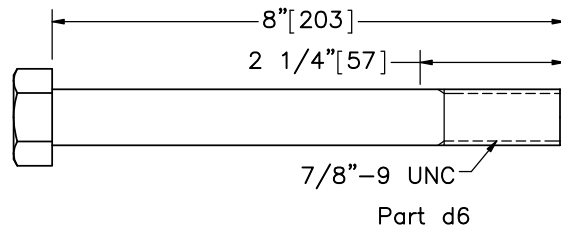
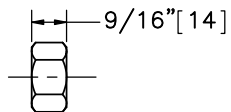
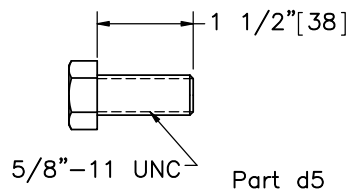
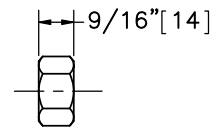
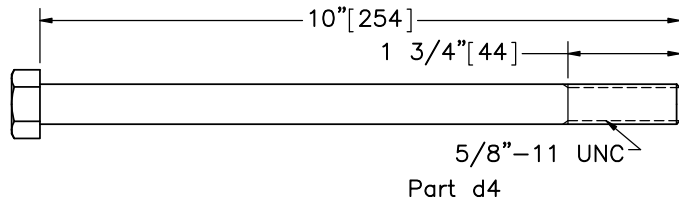
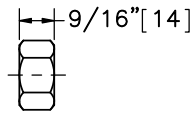
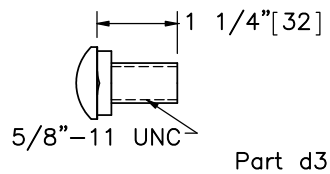


ELEVATION VIEW

Part e2



PROFILE VIEW



Midwest Roadside
Safety Facility

MGS with Curb and
Omitted Post
Test No. MGSCO-1

Hardware

DWG. NAME.
OmitPost-Curb-1_R6

SCALE: 1:3
UNITS: In./mm

SHEET:
12 of 13
DATE:
6/8/2017
DRAWN BY:
JEK/MES/
DTM
REV. BY:
SKR/KAL/
RKF/JCH

Item No.	QTY.	Description	Material Spec	Galvanization Spec	Hardware Guide
a1	12	12'-6" [3,810] 12 gauge [2.7] W-Beam MGS Section	AASHTO M180	ASTM A123 or A653	RWM04a
a2	2	12'-6" [3,810] 12 gauge [2.7] W-Beam MGS End Section	AASHTO M180	ASTM A123 or A653	RWM14a
a3	1	6'-3" [1,905] 12 gauge [2.7] W-Beam MGS Section	AASHTO M180	ASTM A123 or A653	RWM04a
a4	24	W6x8.5 [W152x12.6] or W6x9 [W152x13.4], 72" Long [1,829] Steel Post	ASTM A992 Min. 50 ksi [345 MPa]	ASTM A123	PWE06
a5	24	6"x12"x14 1/4" [152x305x368] Timber Blockout for Steel Posts	SYP Grade No.1 or better	—	PDB10a
a6	26	16D Double Head Nail	—	—	—
b1	4	BCT Timber Post — MGS Height	SYP Grade No. 1 or better (No knots 18" [457] above or below ground tension face)	—	PDF01
b2	4	72" [1829] Long Foundation Tube	ASTM A500 Gr. B	ASTM A123	PTE06
b3	2	Ground Strut Assembly	ASTM A36	ASTM A123	PFP02
b4	2	2 3/8" [60] O.D. x 6" [152] Long BCT Post Sleeve	ASTM A53 Gr. B Schedule 40	ASTM A123	FMM02
b5	2	8"x8"x5/8" [203x203x16] Anchor Bearing Plate	ASTM A36	ASTM A123	FPB01
b6	2	Anchor Bracket Assembly	ASTM A36	ASTM A123	FPA01
c1	2	BCT Anchor Cable	—	—	FCA01
d1	24	5/8" [16] Dia. UNC, 14" [356] Long Guardrail Bolt and Nut	Bolt — ASTM A307 Gr. A Nut — ASTM A563A	ASTM A153 or B695 Class 55 or F2329	FBB06
d2	4	5/8" [16] Dia. UNC, 10" [254] Long Guardrail Bolt and Nut	Bolt — ASTM A307 Gr. A Nut — ASTM A563A	ASTM A153 or B695 Class 55 or F2329	FBB03
d3	112	5/8" [16] Dia. UNC, 1 1/4" [32] Long Guardrail Bolt and Nut	Bolt — ASTM A307 Gr. A Nut — ASTM A563A	ASTM A153 or B695 Class 55 or F2329	FBB01
d4	4	5/8" [16] Dia. UNC, 10" [254] Long Hex Head Bolt and Nut	Bolt — ASTM A307 Gr. A Nut — ASTM A563A	ASTM A153 or B695 Class 55 or F2329	FBX16a
d5	16	5/8" [16] Dia. UNC, 1 1/2" [38] Long Hex Head Bolt and Nut	Bolt — ASTM A307 Gr. A Nut — ASTM A563A	ASTM A153 or B695 Class 55 or F2329	FBX16a
d6	4	7/8" [22] Dia. UNC, 8" [203] Long Hex Head Bolt and Nut	Bolt — ASTM A307 Gr. A Nut — ASTM A563A	ASTM A153 or B695 Class 55 or F2329	—
e1	44	5/8" [16] Dia. Plain Round Washer	ASTM F844	ASTM A123 or A153 or F2329	FWC16a
e2	8	7/8" [22] Dia. Plain Round Washer	ASTM F844	ASTM A123 or A153 or F2329	—
f1	1	Curb	f'c = 4,000 psi [27.6 MPa]	—	—
f2	1	#4 Rebar 819" [20,803] Long	ASTM A615 Gr. 60	—	—
f3	45	#4 Rebar 16" [406] Long	ASTM A615 Gr. 60	—	—



Midwest Roadside
Safety Facility

MGS with Curb and
Omitted Post
Test No. MGSCO-1

Bill of Materials

DWG. NAME.

OmitPost-Curb-1_R6

SCALE: None

UNITS: In.[mm]

SHEET:
13 of 13

DATE:
6/8/2017

DRAWN BY:
JEK/MES/
DTM

REV. BY:
SKR/KAL/
RKF/JCH

REV.	DATE OF ISSUE	Page	NATURE OF CHANGES	REVIEWER	REVISED BY
0	2/28/2017	–	Original Drawing.	–	JEK
1	4/5/2017	–	Curb extended. Test name added to title. Section/detail naming.	SKR	JEK
		1	Curb and soil fill extended. Impact added. Note 2, 4 edit. Note 6 add. Section add (page 3).		
		2	Curb min width added. Tarmac added. Soil backfill minimum edit. Dim edits.		
		3	Section added. Note added. General shift.		
		7	Dim add.		
		13	Part no: f1 (curb). Material: a4. Metric-eng swap, applicable galv specs.		
2	4/10/2017	–	Bent nails added over bearing plates. Title edit.	KAL	JEK
		1	Note 3 edit. Note edit. Dim add.		
		2	Soil note edit. Min soil dist edit. Bubble shift.		
		3	Note edit. Bubble shift.		
		4	Nail a6 add.		
		5	Nail a6 add.		
		6	View edits – all parts.		
		13	Qty: a6.		
3	4/20/2017	–	Rebar added to curb. Curb minimum width increased.	RKF	JEK
		1	Dim add. General shift.		
		2	Curb minimum width change. Rebar added. General shift.		
		13	New: f2, f3.		
4	5/12/2017	1	Note 5 removed.	SKR	JEK
		2	Soil label edit.		
		4	Note 2 removed.		
5	5/24/2017	–	Reversed barrier.	JCH	MES
		1	Reordered posts and corrected impact angle.		
		4	Edited post number notes.		
6	6/8/2017	–	Altered barrier system to allow post bolts to be on upstream side of blockouts.	KAL	DTM