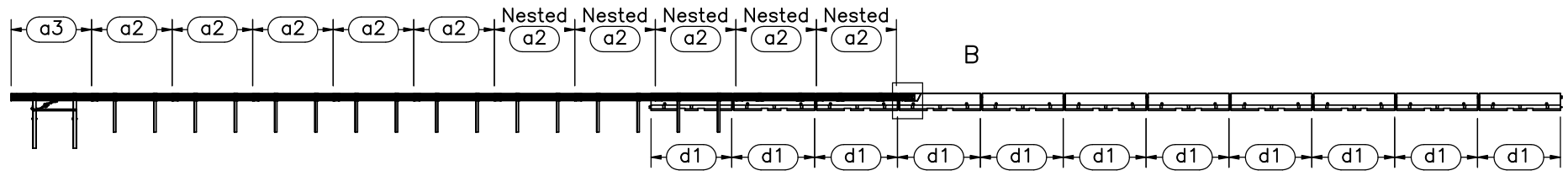



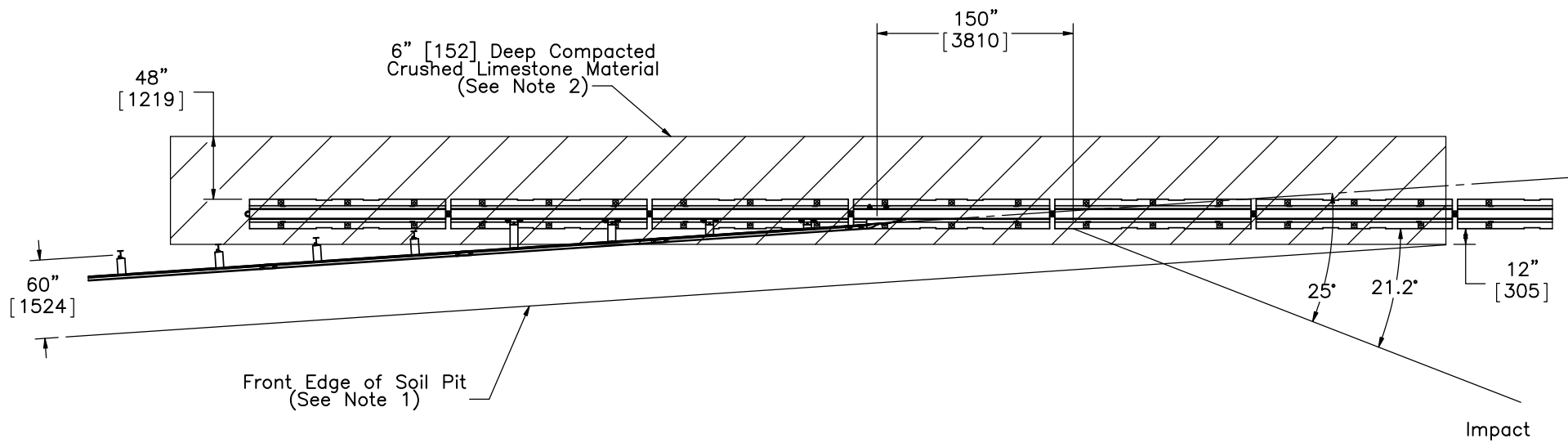
PLAN VIEW



ELEVATION VIEW

- Notes:
- (1) Test shall be performed according to test designation no. 3-21 of MASH criteria.
  - (2) The impact location is 12'6" [3810] upstream from the centerline of the end shoe. Centerline of the end shoe is taken as the center of the single bolt closest to the column of bolts. See Detail B for reference.
  - (3) The front edge of the soil pit should be at least 5' [1524] from the center of each post. The distance can be adjusted as long as the PCB system does not cross the front edge of the soil pit.
  - (4) Critical region is between post nos. 1 through 4 (ø3' holes).
  - (5) BCT anchors are placed in ø3' [914] holes, then backfilled and tamped with soil.
  - (6) Guardrail should be lapped such that upstream guardrail is behind downstream guardrail.

 <b>Midwest Roadside Safety Facility</b>	<b>NDOR PCB-MGS Transition</b>	SHEET: 1 of 36
	System Layout	DATE: 10/20/2016
DWG. NAME: PCB-MGS_Trans_R16	SCALE: 1:300 UNITS: in./mm	DRAWN BY: KLK/ALL/ JEK/TJD
		REV. BY: RWB/KAL/ JCH/JAH



- Notes: (1) The front edge of the soil pit should be at least 5' [1524] from the center of each post. The distance can be adjusted as long as the PCB system does not cross the front edge of the soil pit.
- (2) The compacted crushed limestone material must meet AASHTO Grade B soil specifications. The length of this limestone material pit is up to the discretion of the test site manager.



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

Soil Pit Detail

DWG. NAME.  
PCB-MGS\_Trans\_R16

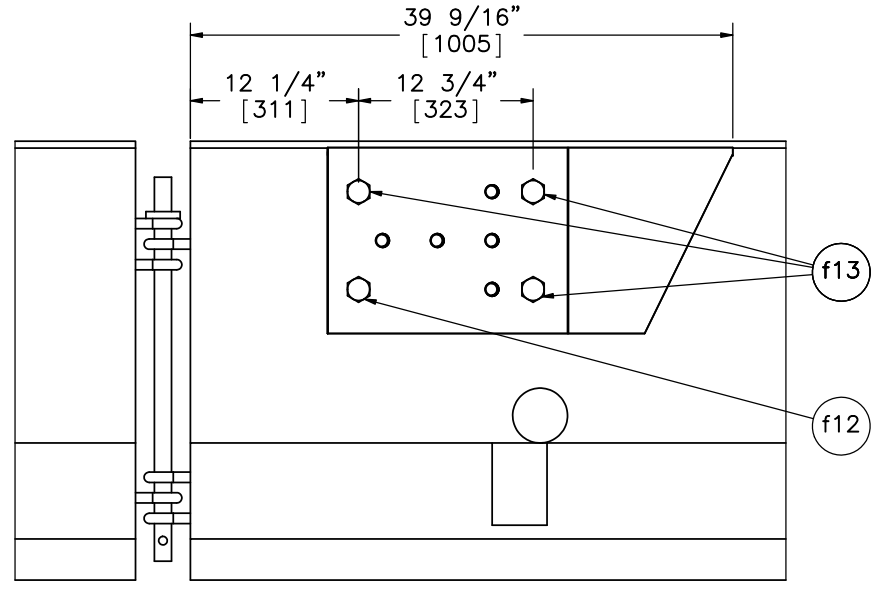
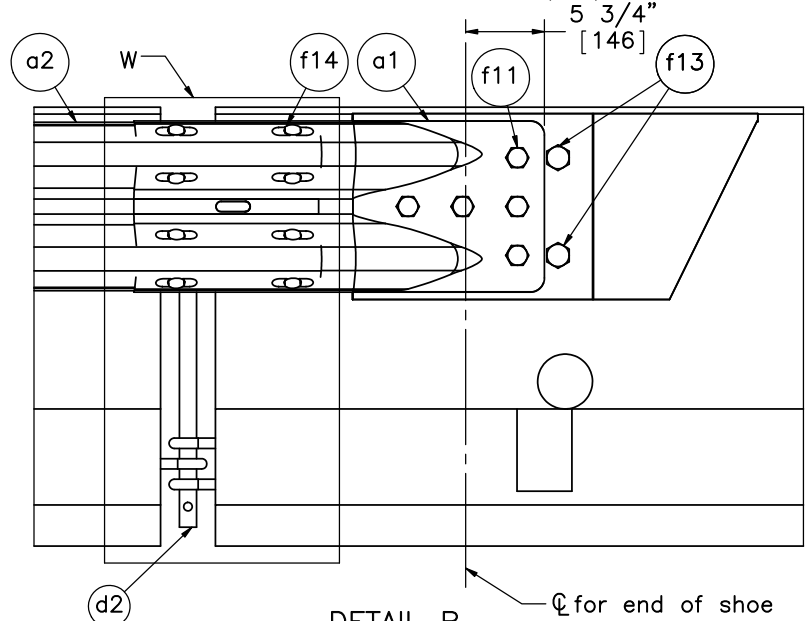
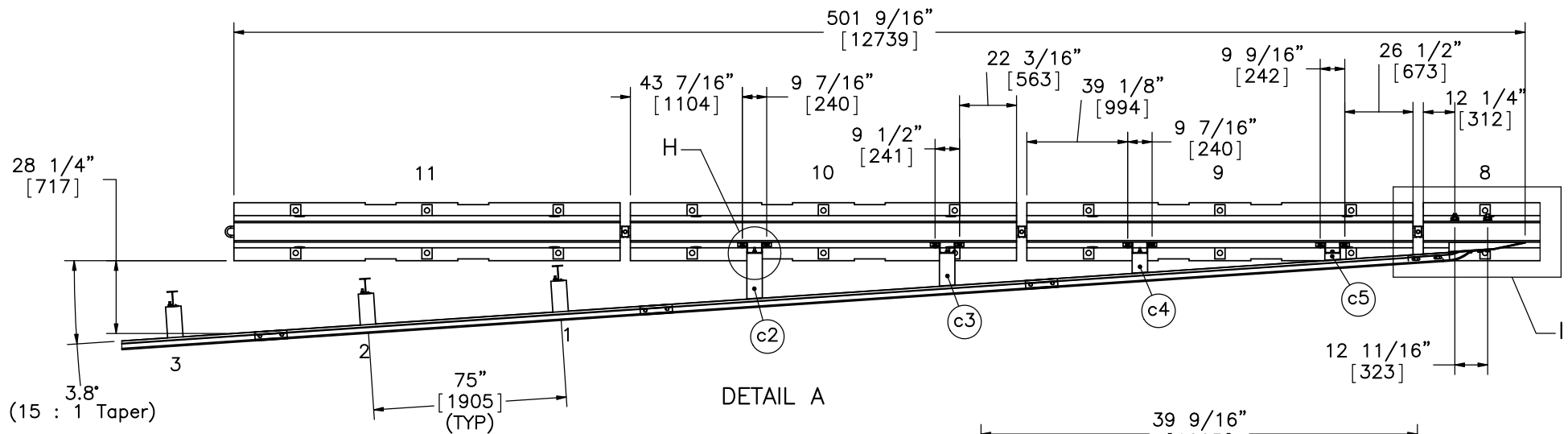
SCALE: 1:120  
UNITS: in.[mm]

SHEET:  
2 of 36

DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

REV. BY:  
RWB/KAL/  
JCH/JAH



Note: (1) All bolt hole measurements in the concrete barrier are field measured and drilled.



Midwest Roadside Safety Facility

NDOR PCB-MGS Transition

Transition Detail

DWG. NAME:  
PCB-MGS\_Trans\_R16

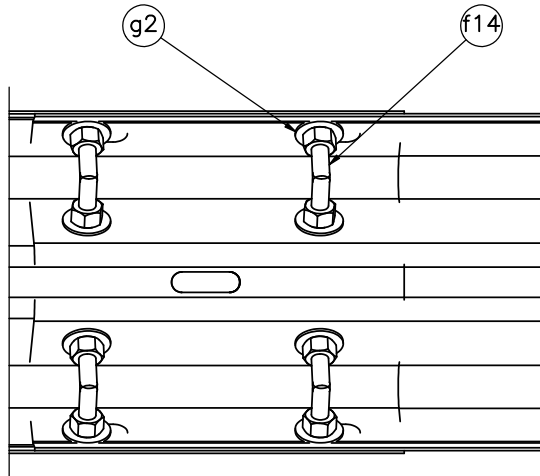
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UNITS: in.[mm]

SHEET:  
3 of 36

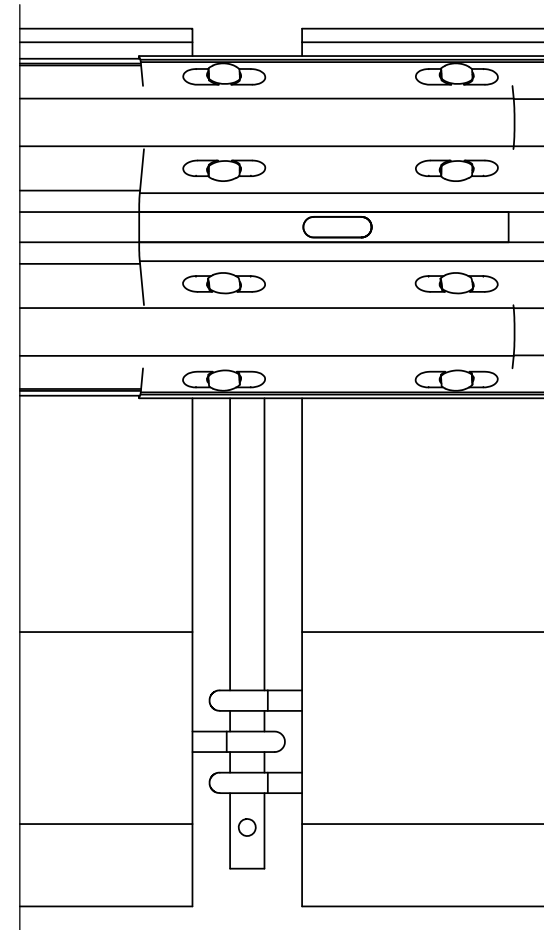
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

REV. BY:  
RWB/KAL/  
JCH/JAH



DETAIL W  
 (PORTABLE CONCRETE BARRIER HIDDEN)  
 BACKSIDE DETAIL



DETAIL W



Midwest Roadside  
 Safety Facility

NDOR PCB-MGS  
 Transition

W-Beam End Shoe Detail

DWG. NAME.  
 PCB-MGS\_Trans\_R16

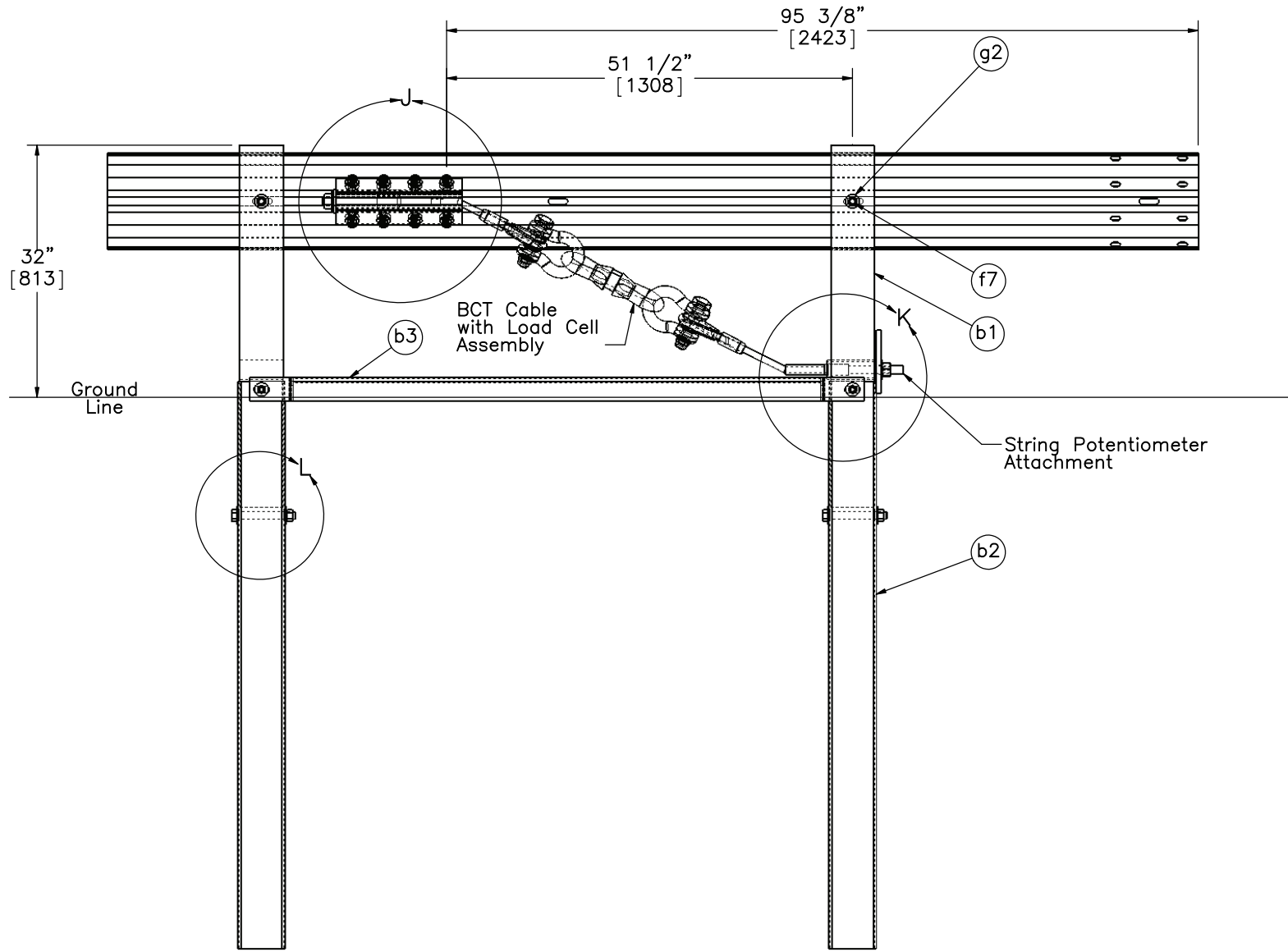
SCALE: 1:7  
 UNITS: in.[mm]

SHEET:  
 4 of 36

DATE:  
 10/20/2016

DRAWN BY:  
 KLK/ALL/  
 JEK/TJD

REV. BY:  
 RWB/KAL/  
 JCH/JAH



SECTION C-C



Midwest Roadside  
Safety Facility

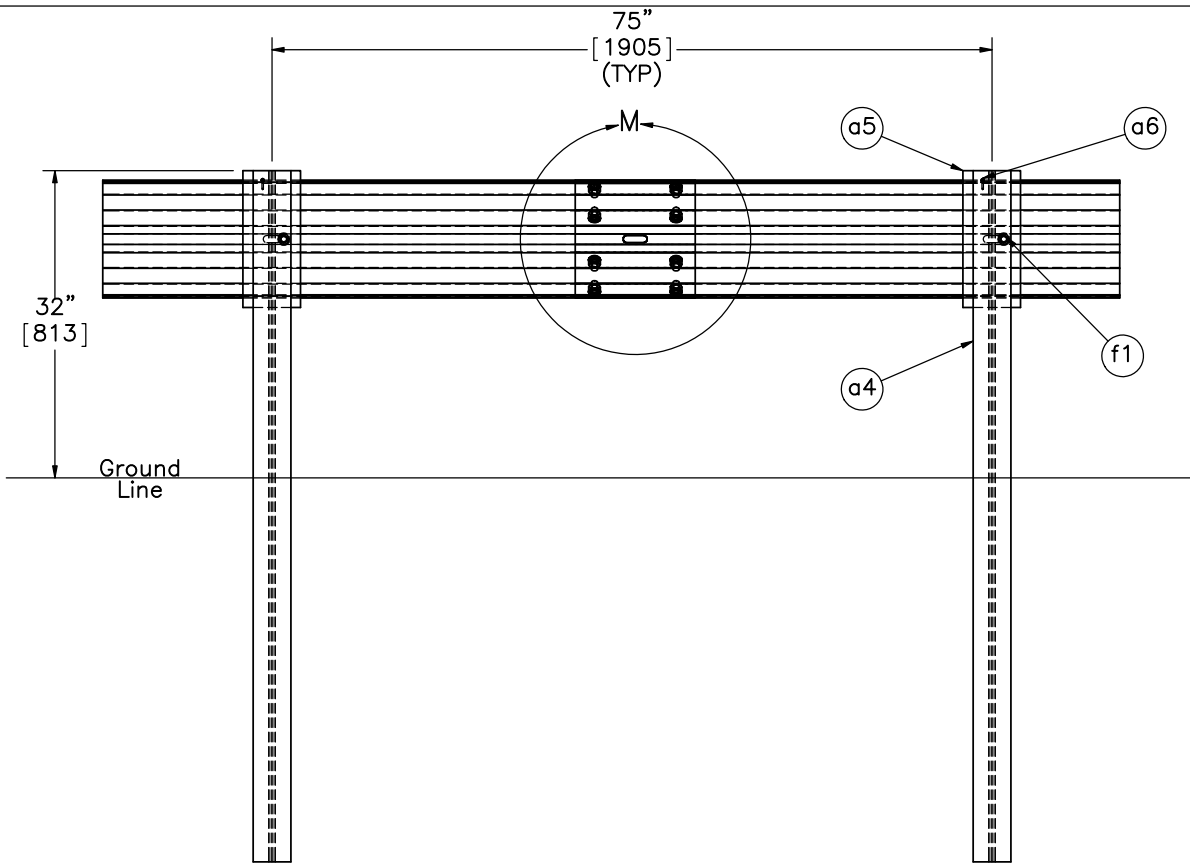
NDOR PCB-MGS  
Transition

End Section Detail

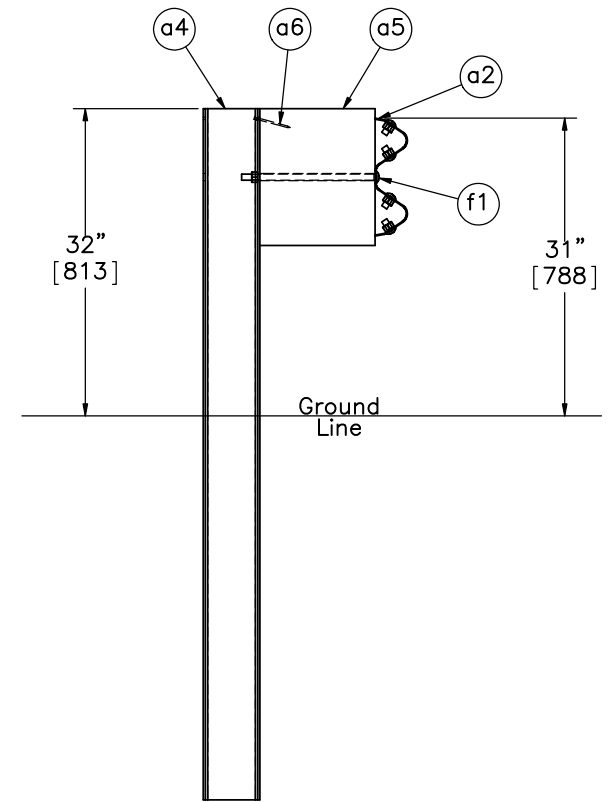
DWG. NAME:  
PCB-MGS\_Trans\_R16

SCALE: 1:20  
UNITS: in.[mm]

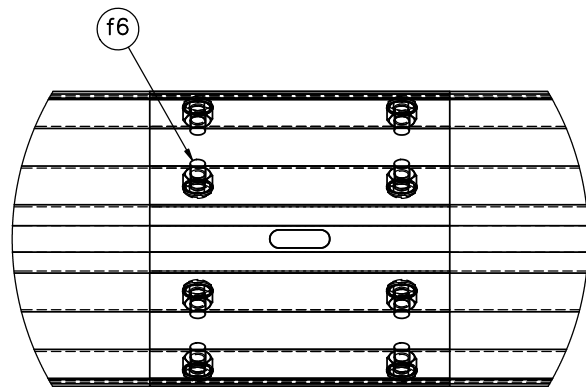
SHEET:  
5 of 36  
DATE:  
10/20/2016  
DRAWN BY:  
KLK/ALL/  
JEK/TJD  
REV. BY:  
RWB/KAL/  
JCH/JAH



SECTION D-D



SECTION E-E



DETAIL M  
SCALE 1 : 8



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

Splice and Post nos. 3-12  
Detail

DWG. NAME:  
PCB-MGS\_Trans\_R16

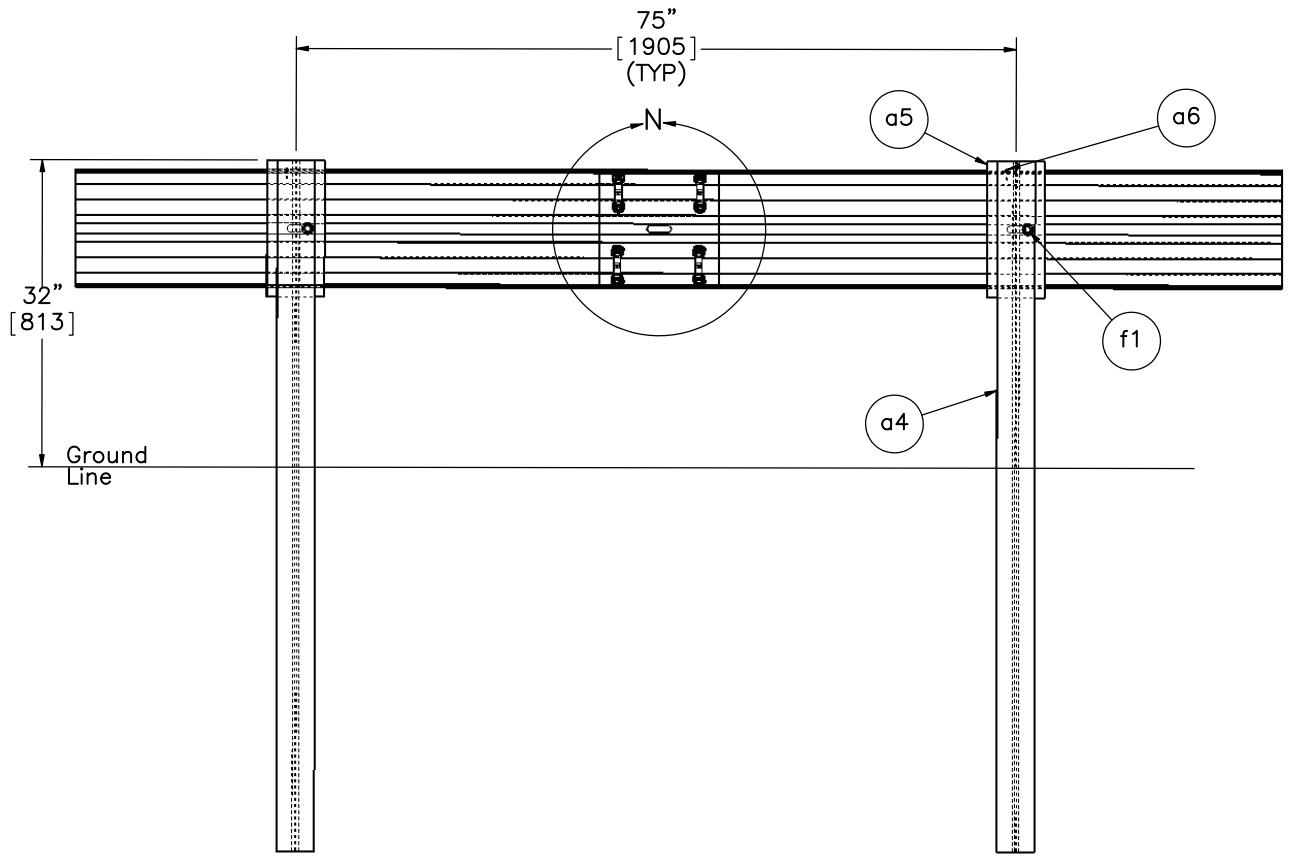
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UNITS: in.[mm]

SHEET:  
6 of 36

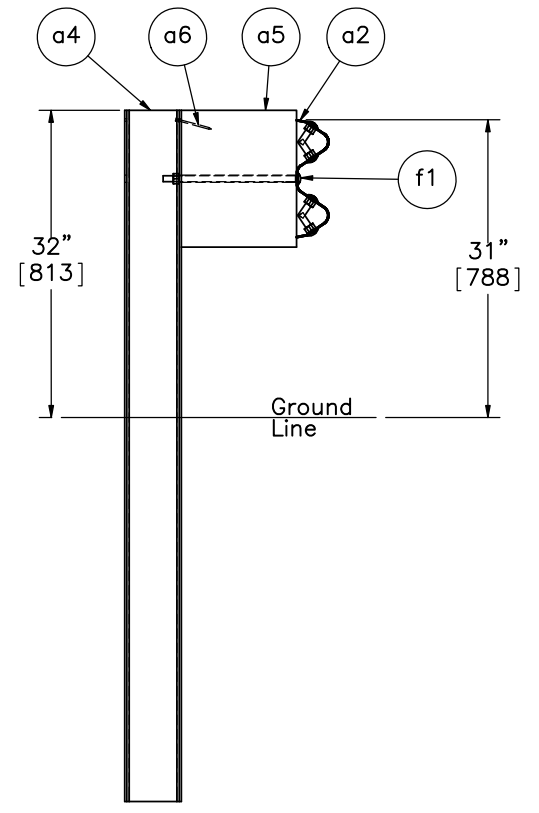
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

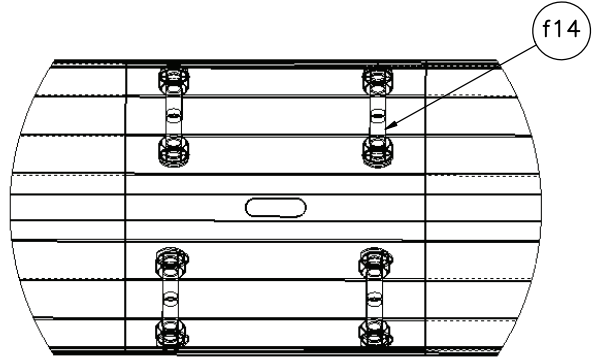
REV. BY:  
RWB/KAL/  
JCH/JAH



SECTION F-F



SECTION G-G



DETAIL N  
SCALE 1 : 8



Midwest Roadside Safety Facility

NDOR PCB-MGS Transition

Splice and Post nos. 13-18 Detail

DWG. NAME:  
PCB-MGS\_Trans\_R16

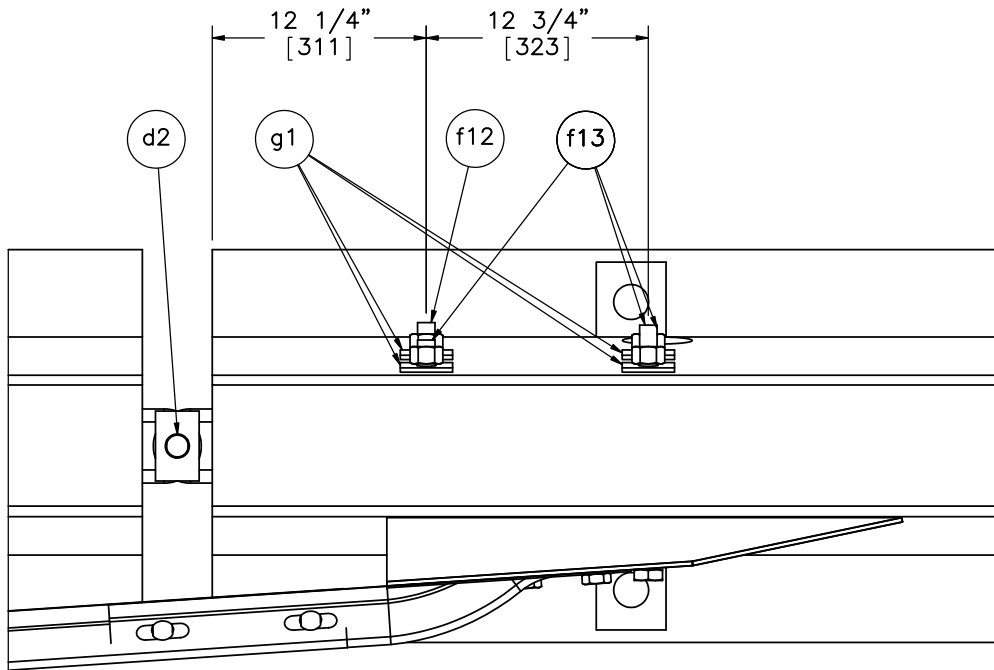
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UNITS: in.[mm]

SHEET:  
7 of 36

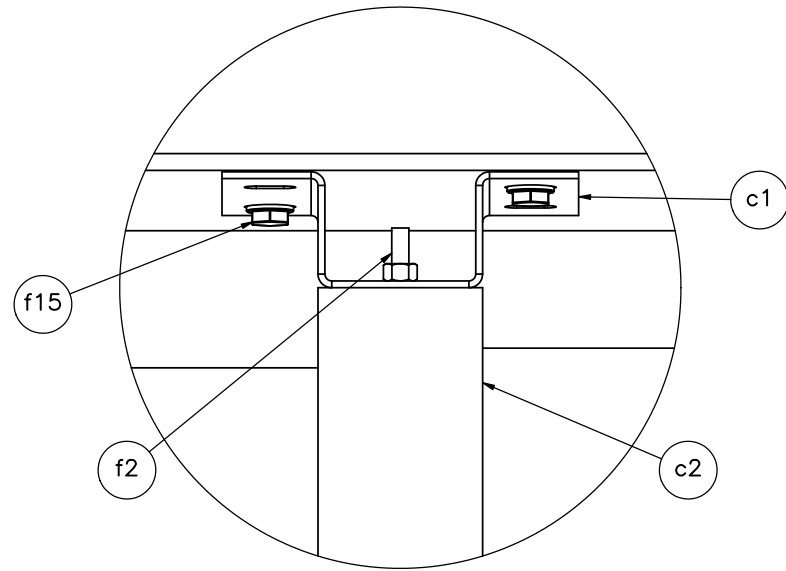
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

REV. BY:  
RWB/KAL/  
JCH/JAH




DETAIL I

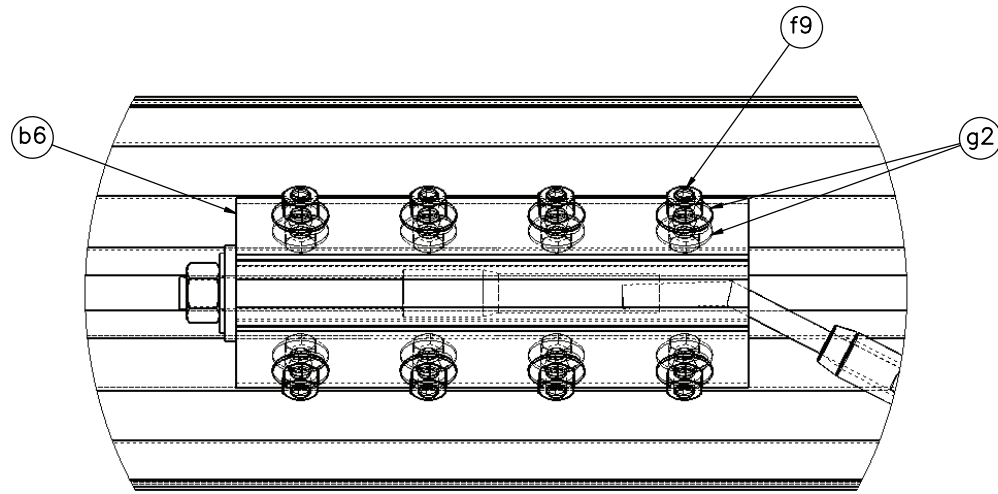


DETAIL H  
SCALE 1 : 7

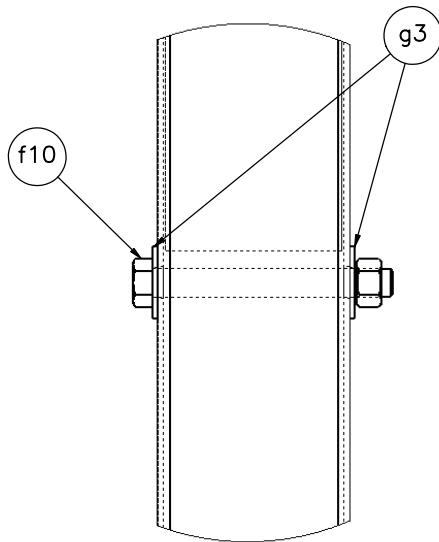
- Notes: (1) Each blockout mounting plate (part c1) uses two diagonal power wedge bolts (part f15).  
 (2) Four  $\phi 1 \frac{1}{8}$ " [29] holes are field drilled through the PCB for the bolts (parts f12, f13, and f14) used to mount the connector plate.

 <b>Midwest Roadside Safety Facility</b>	<b>NDOR PCB-MGS Transition</b>	SHEET: 8 of 36
	Transition Connection Detail	DATE: 10/20/2016
DWG. NAME: PCB-MGS_Trans_R16	SCALE: 1:11 UNITS: in.[mm]	DRAWN BY: KLK/ALL/ JEK/TJD
		REV. BY: RWB/KAL/ JCH/JAH

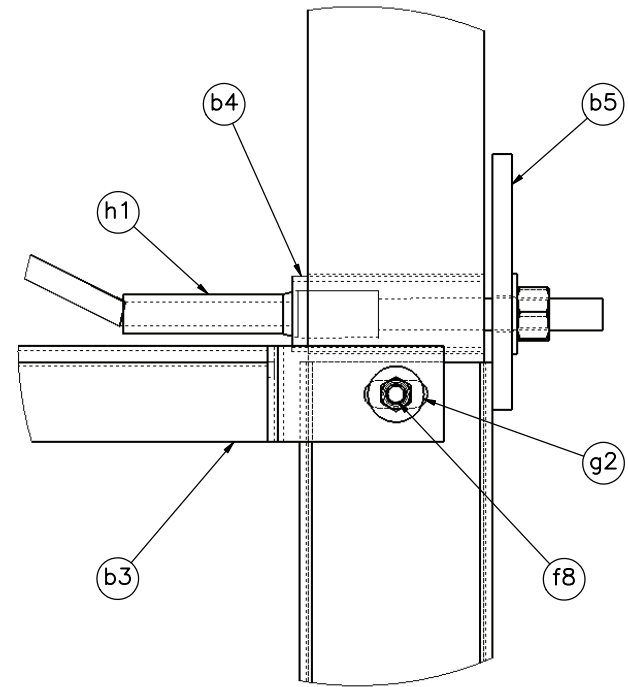




DETAIL J



DETAIL L



DETAIL K

Notes: (1) Additional part g2 on the opposite side under the head of part f8.



Midwest Roadside  
Safety Facility

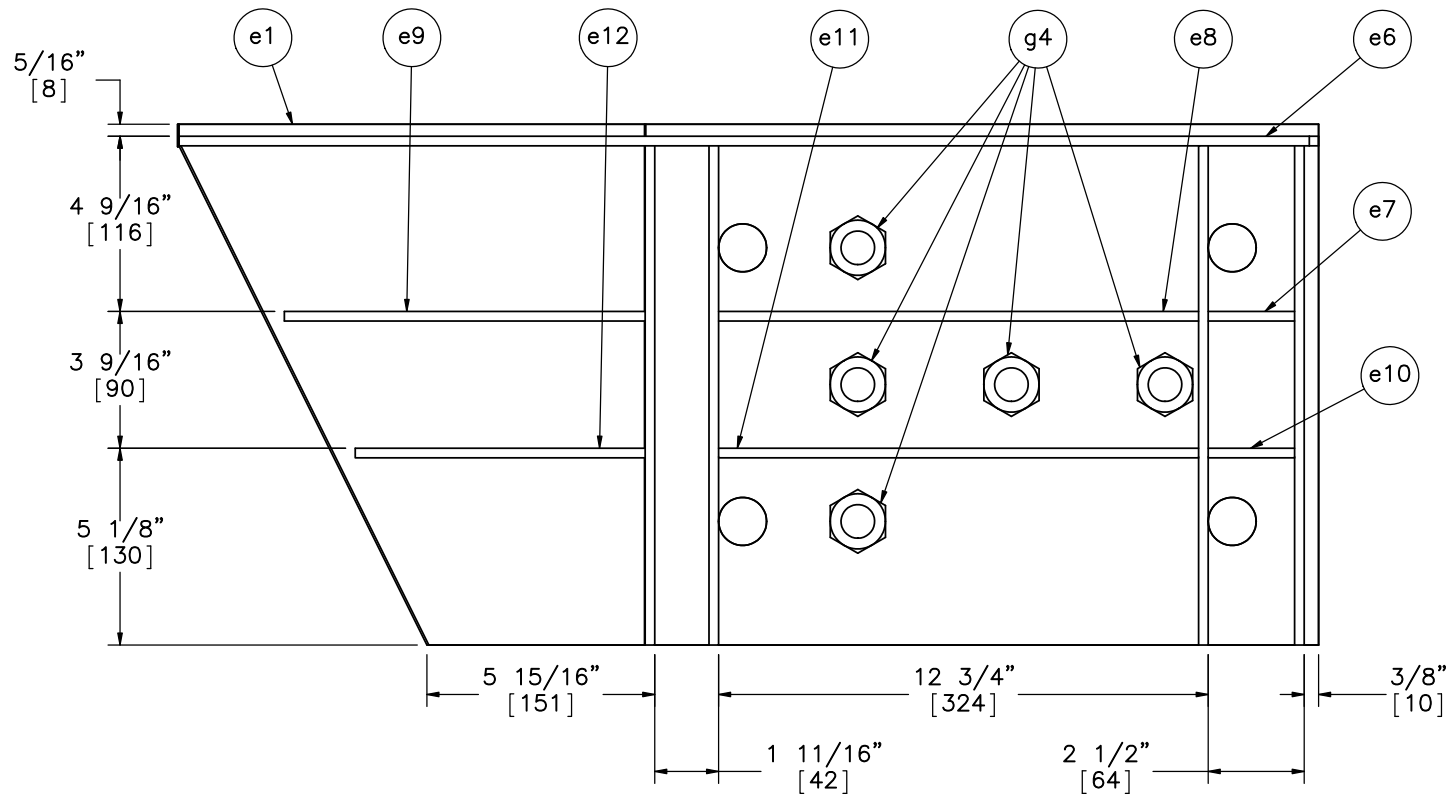
NDOR PCB-MGS  
Transition

BCT Anchor Detail

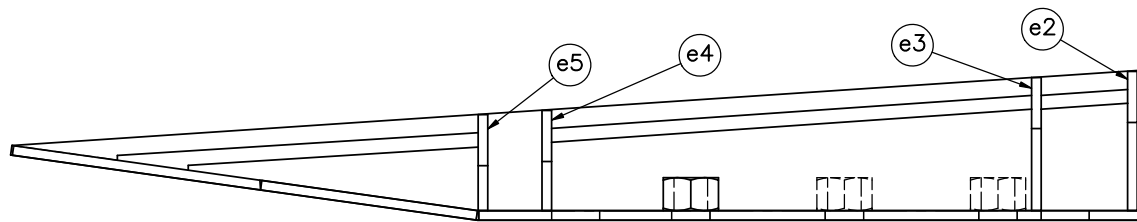
DWG. NAME.  
PCB-MGS\_Trans\_R16

SCALE: 1:6  
UNITS: in.[mm]

SHEET:  
9 of 36  
DATE:  
10/20/2016  
DRAWN BY:  
KLK/ALL/  
JEK/TJD  
REV. BY:  
RWB/KAL/  
JCH/JAH



BACK ELEVATION VIEW



BOTTOM PLAN VIEW



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

Connector Plate Detail

DWG. NAME:  
PCB-MGS\_Trans\_R16

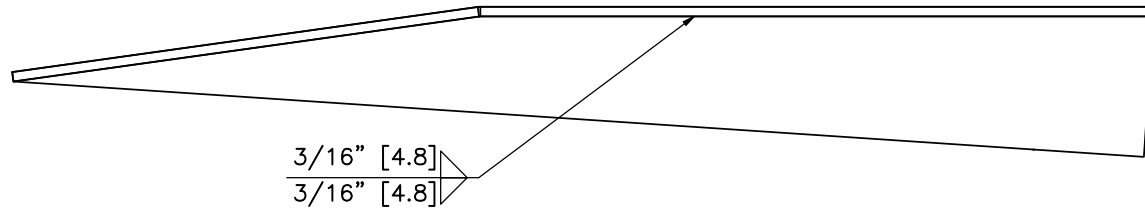
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SHEET:  
10 of 36

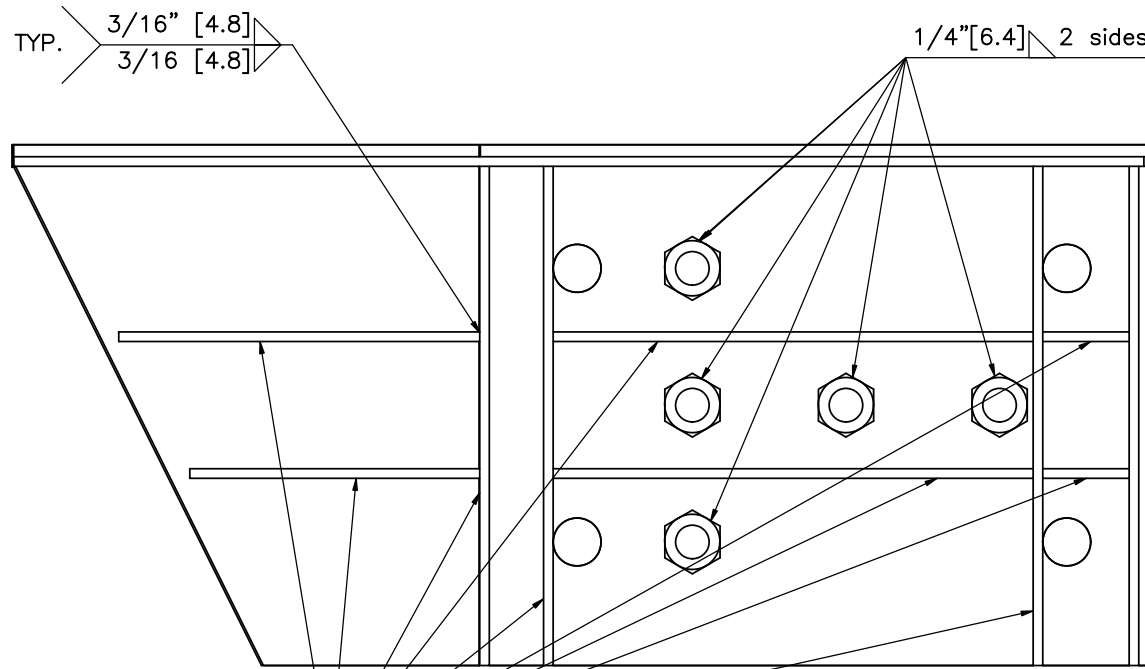
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

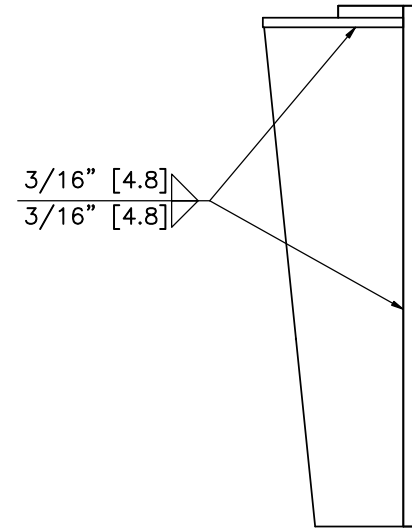
REV. BY:  
RWB/KAL/  
JCH/JAH



PLAN VIEW



BACK ELEVATION VIEW



PROFILE VIEW



Midwest Roadside  
Safety Facility

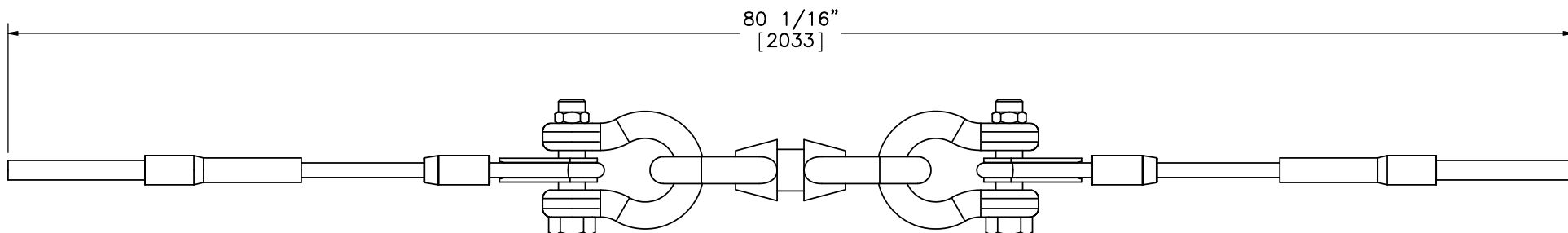
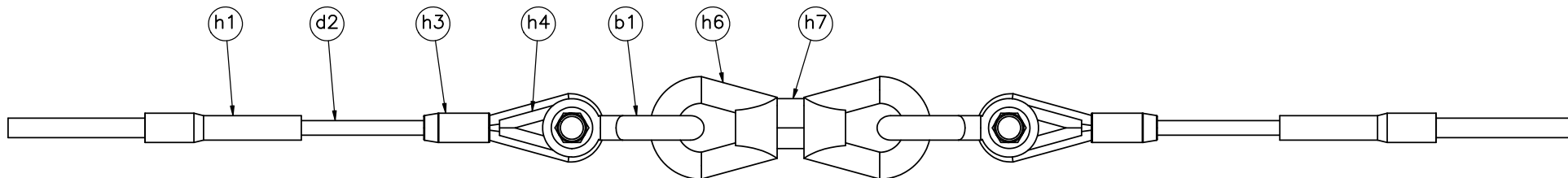
NDOR PCB-MGS  
Transition

Connector Plate Weld Detail

DWG. NAME:  
PCB-MGS\_Trans\_R16

SCALE: 1:5  
UNITS: in.[mm]

SHEET:  
11 of 36  
DATE:  
10/20/2016  
DRAWN BY:  
KLK/ALL/  
JEK/TJD  
REV. BY:  
RWB/KAL/  
JCH/JAH



Notes: (1) 6x25 IWRC IPS cables meet the minimum breaking strength of 42.7 kips [190 kN] and may be substituted for the 6x19 IWRC IPS cables.



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

BCT Anchor Cable and Load  
Cell Detail

DWG. NAME.  
PCB-MGS\_Trans\_R16

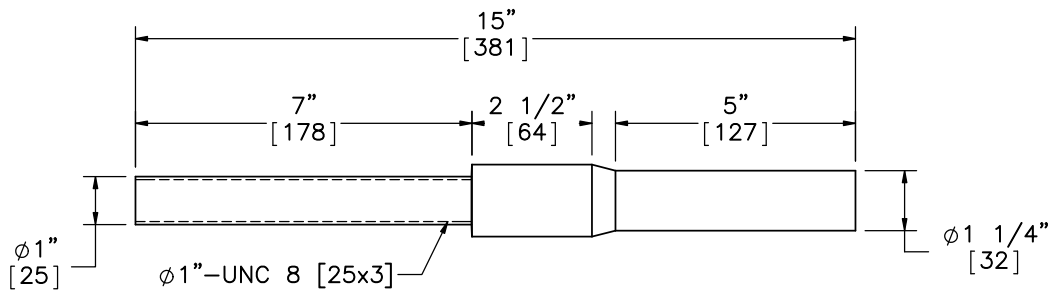
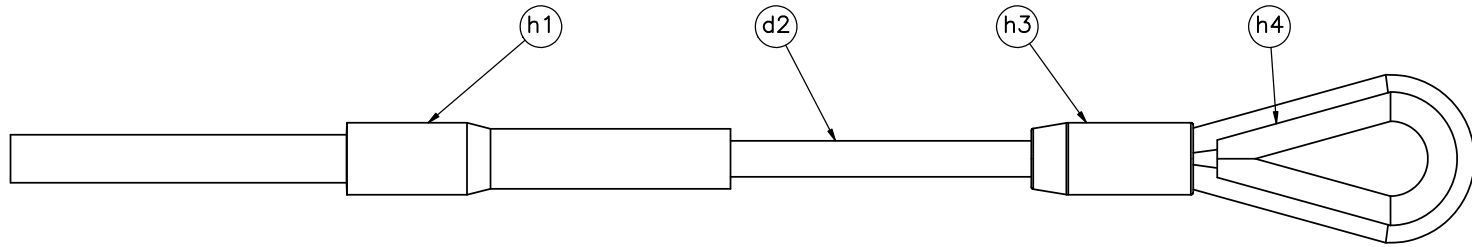
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SHEET:  
12 of 36

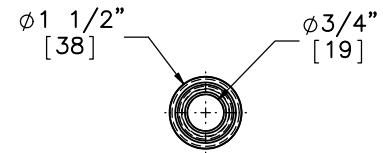
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

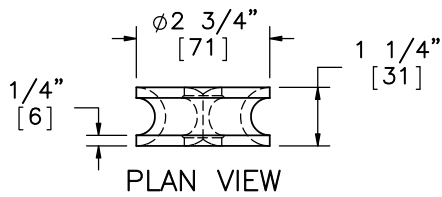
REV. BY:  
RWB/KAL/  
JCH/JAH



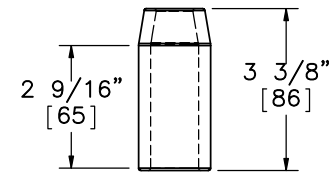
Part h1



PLAN VIEW

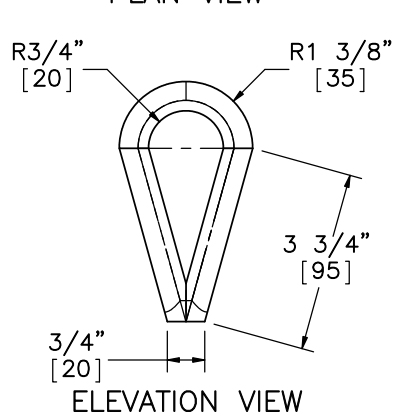


PLAN VIEW



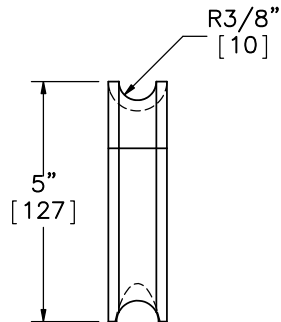
ELEVATION VIEW

Part h3



ELEVATION VIEW

Part h4



PROFILE VIEW



Midwest Roadside Safety Facility

NDOR PCB-MGS Transition

Modified BCT Anchor Cable

DWG. NAME:  
PCB-MGS\_Trans\_R16

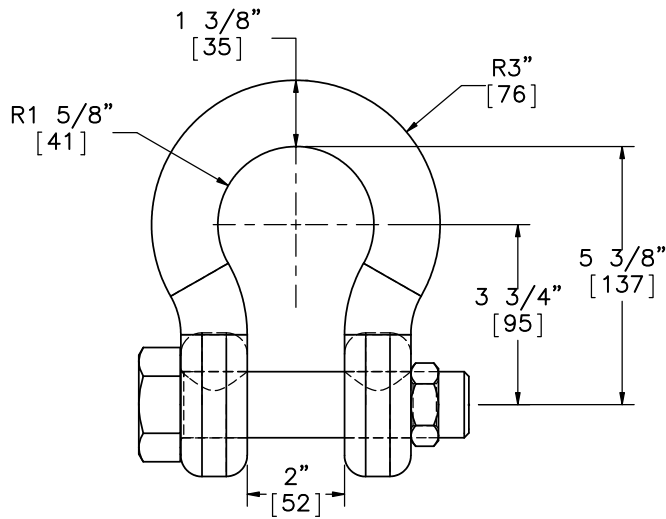
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SHEET:  
13 of 36

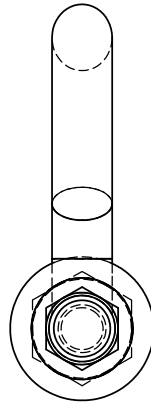
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

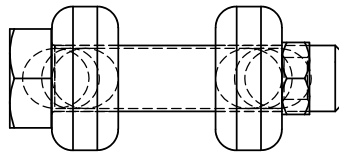
REV. BY:  
RWB/KAL/  
JCH/JAH



ELEVATION VIEW

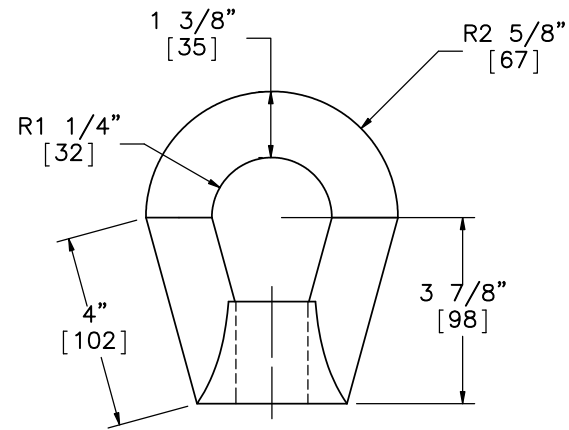


PROFILE VIEW

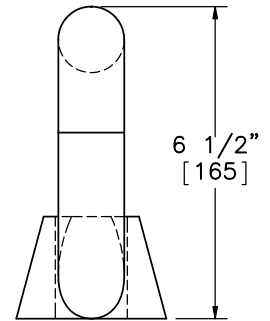


PLAN VIEW

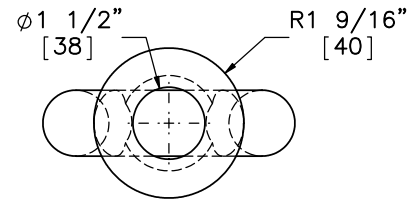
Part h5



ELEVATION VIEW



PROFILE VIEW



PLAN VIEW

Part h6



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

Shackle and Eye Nut Detail

DWG. NAME:  
PCB-MGS\_Trans\_R16

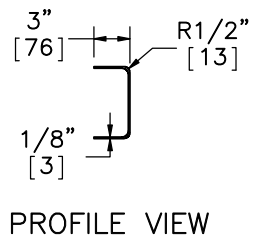
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SHEET:  
14 of 36

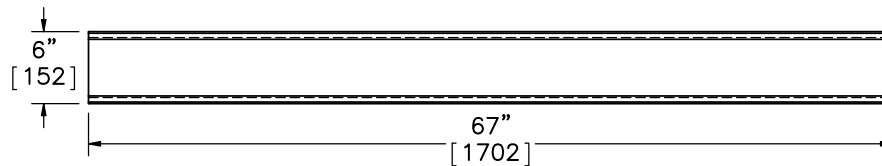
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

REV. BY:  
RWB/KAL/  
JCH/JAH

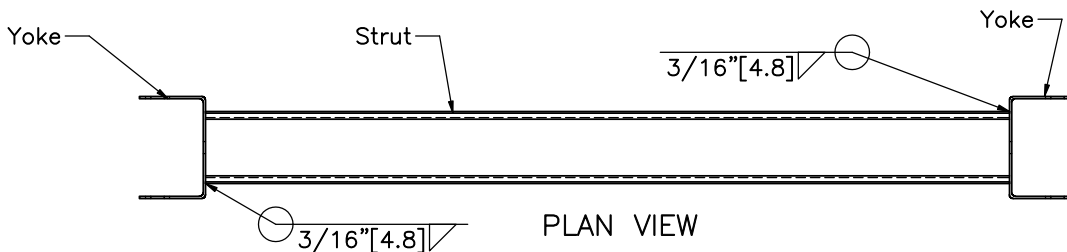


PROFILE VIEW

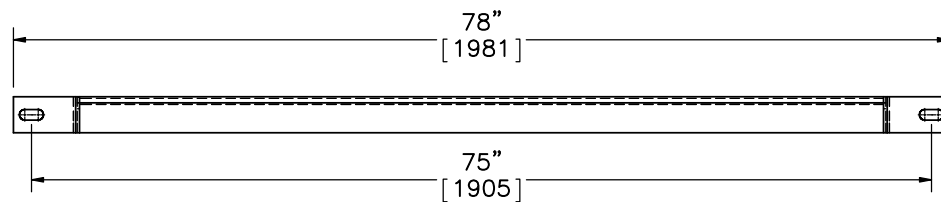


ELEVATION VIEW

Strut

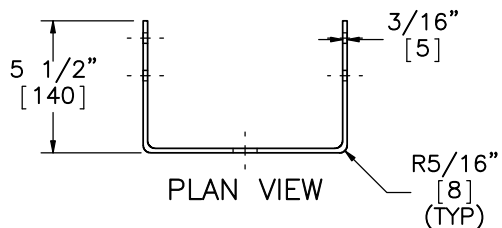


PLAN VIEW

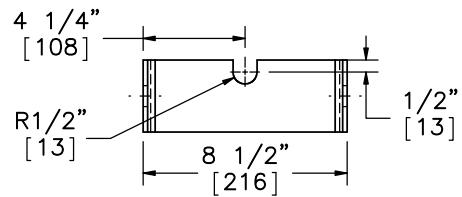


ELEVATION VIEW

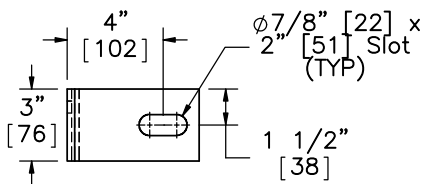
Part b3



PLAN VIEW



ELEVATION VIEW



PROFILE VIEW

Yoke  
SCALE 1 : 8



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

Ground Strut Detail

DWG. NAME:  
PCB-MGS\_Trans\_R16

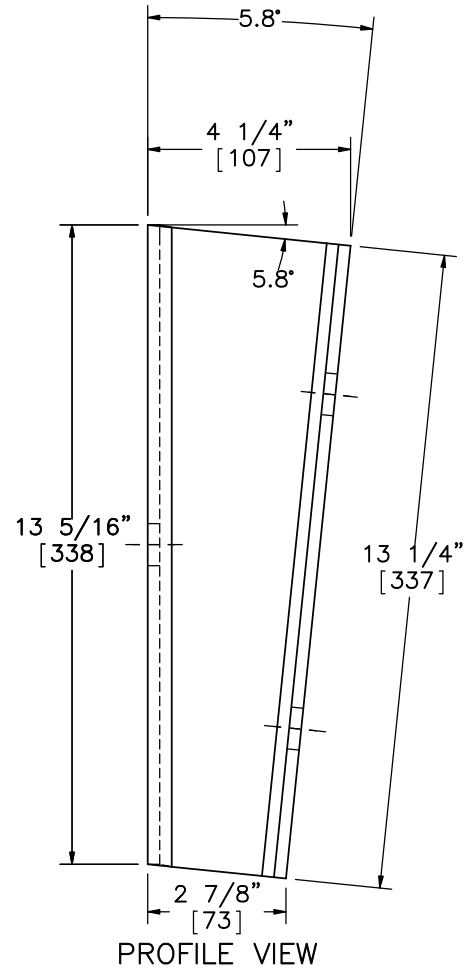
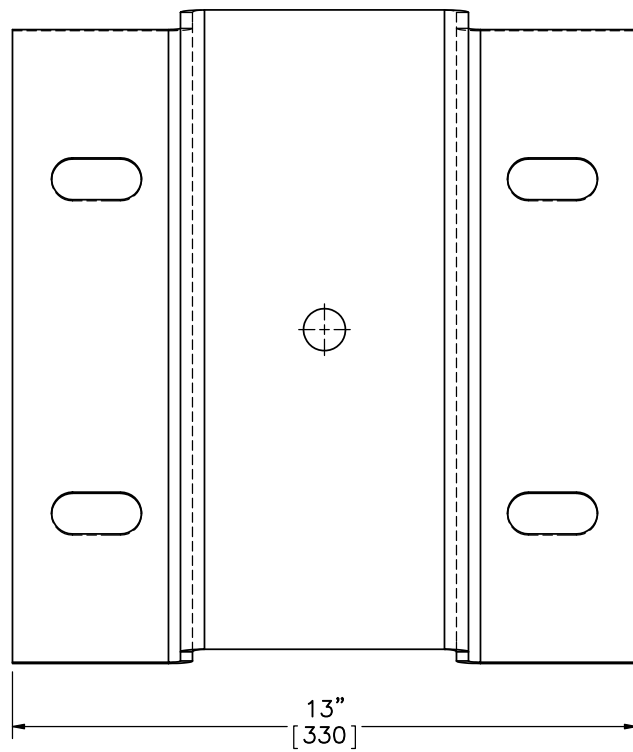
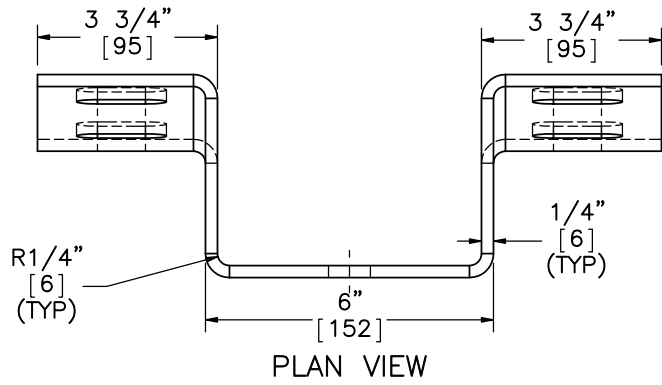
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UNITS: in.[mm]

SHEET:  
15 of 36


DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

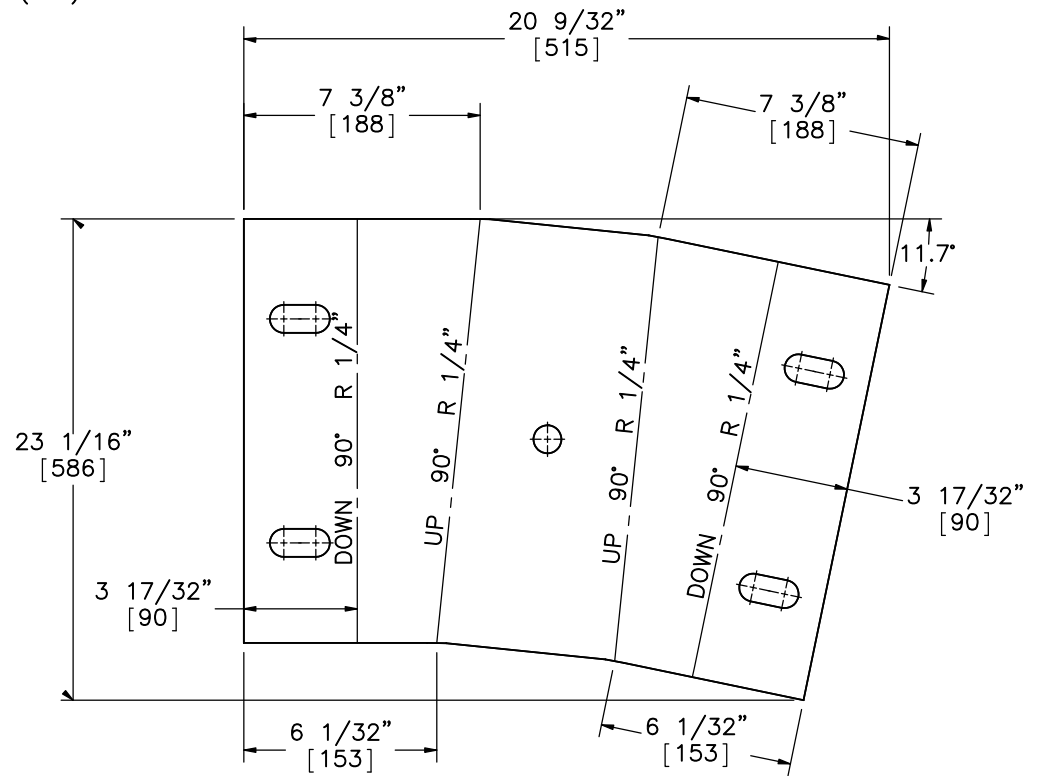
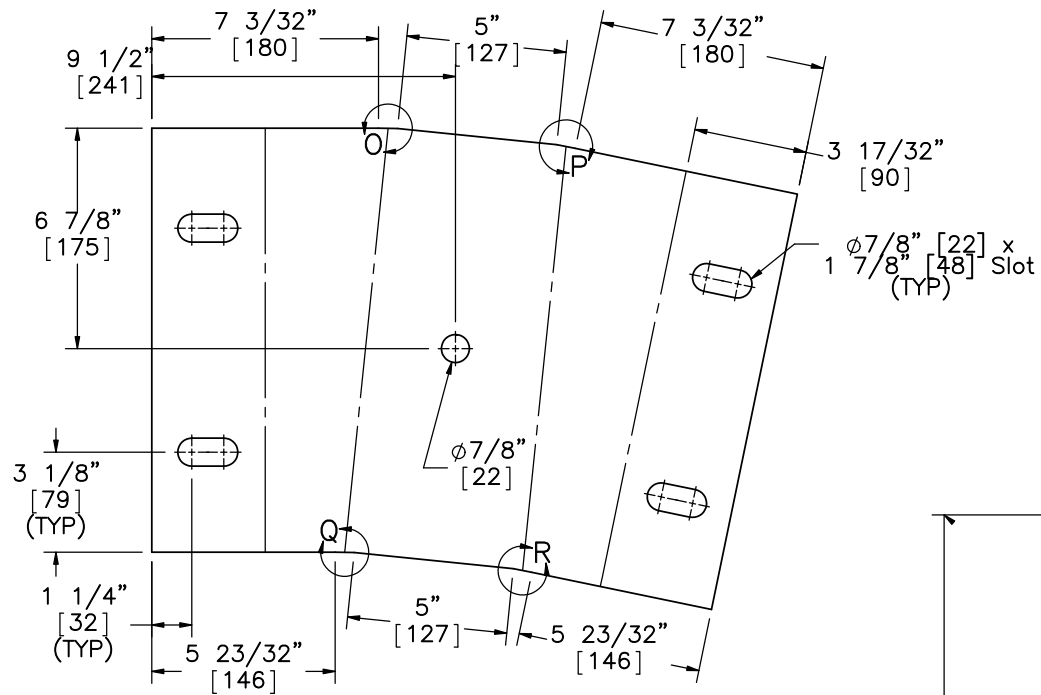
REV. BY:  
RWB/KAL/  
JCH/JAH



Part c1

	<b>NDOR PCB-MGS Transition</b>		SHEET: 16 of 36
	<b>Midwest Roadside Safety Facility</b>		DATE: 10/20/2016
<b>Blockout Mounting Plate Detail</b>			DRAWN BY: KLK/ALL/ JEK/TJD
DWG. NAME: PCB-MGS_Trans_R16		SCALE: 1:4 UNITS: in.[mm]	REV. BY: RWB/KAL/ JCH/JAH





Notes: (1) Thickness of Blockout Mounting Plate is 1/4" [6].



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

Blockout Mounting Plate - Flat  
Pattern

DWG. NAME:  
PCB-MGS\_Trans\_R16

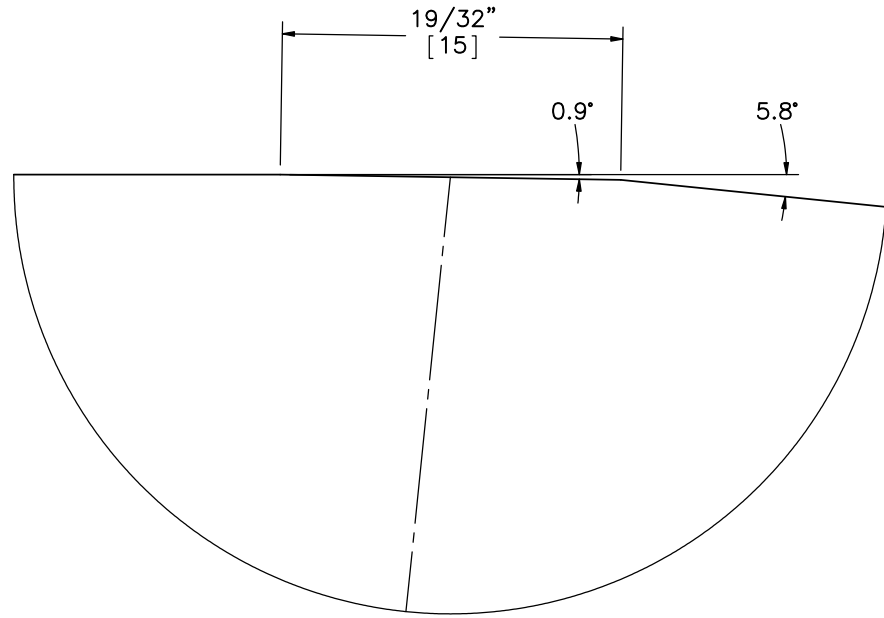
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UNITS: in.[mm]

SHEET:  
17 of 36

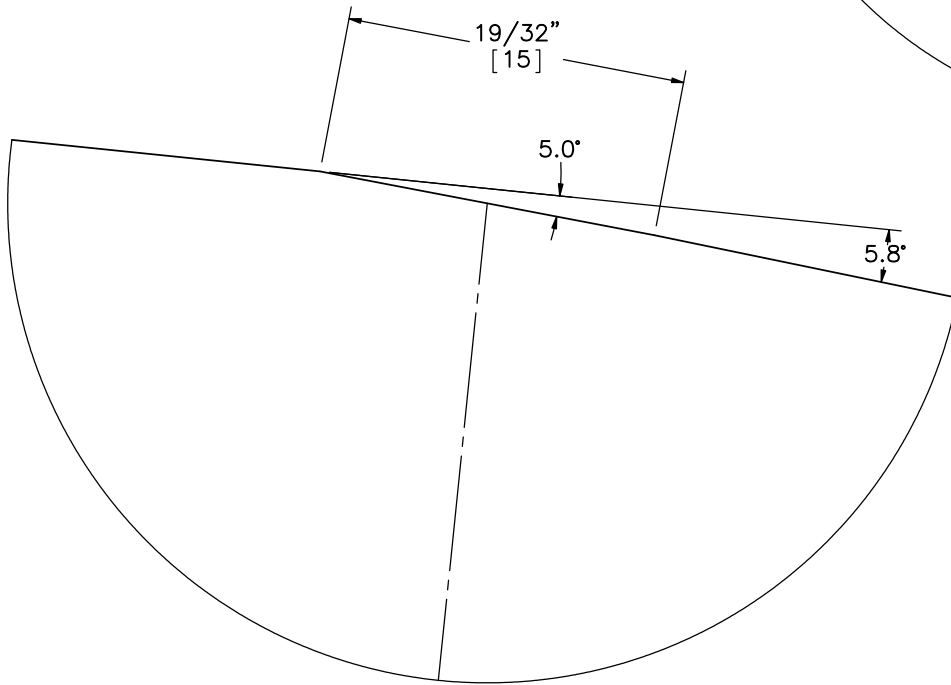
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

REV. BY:  
RWB/KAL/  
JCH/JAH



DETAIL O



DETAIL P



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

Blockout Mounting Plate Detail

DWG. NAME.  
PCB-MGS\_Trans\_R16

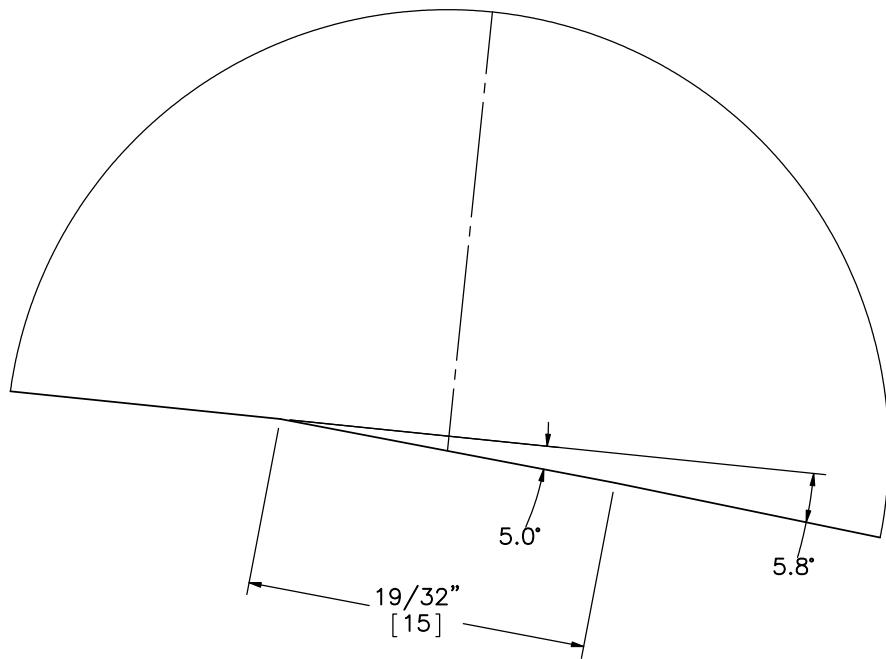
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UNITS: in.[mm]

SHEET:  
18 of 36

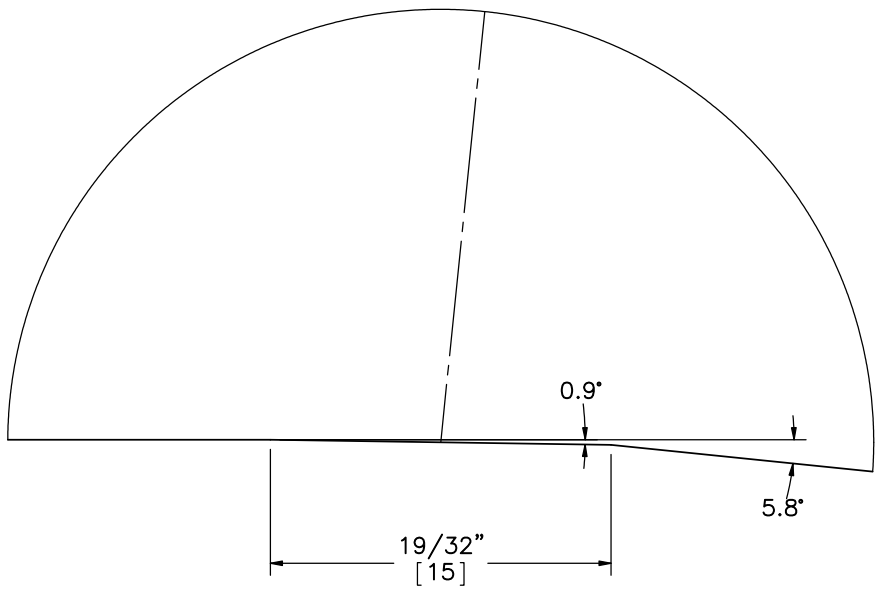
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD


REV. BY:  
RWB/KAL/  
JCH/JAH

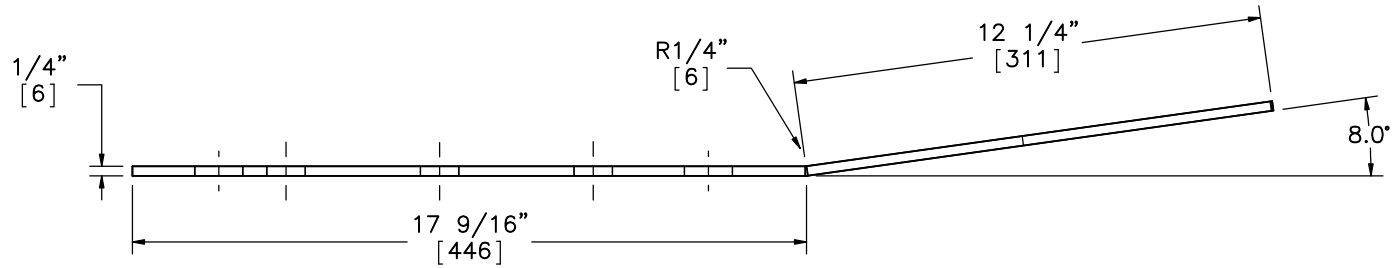


DETAIL R

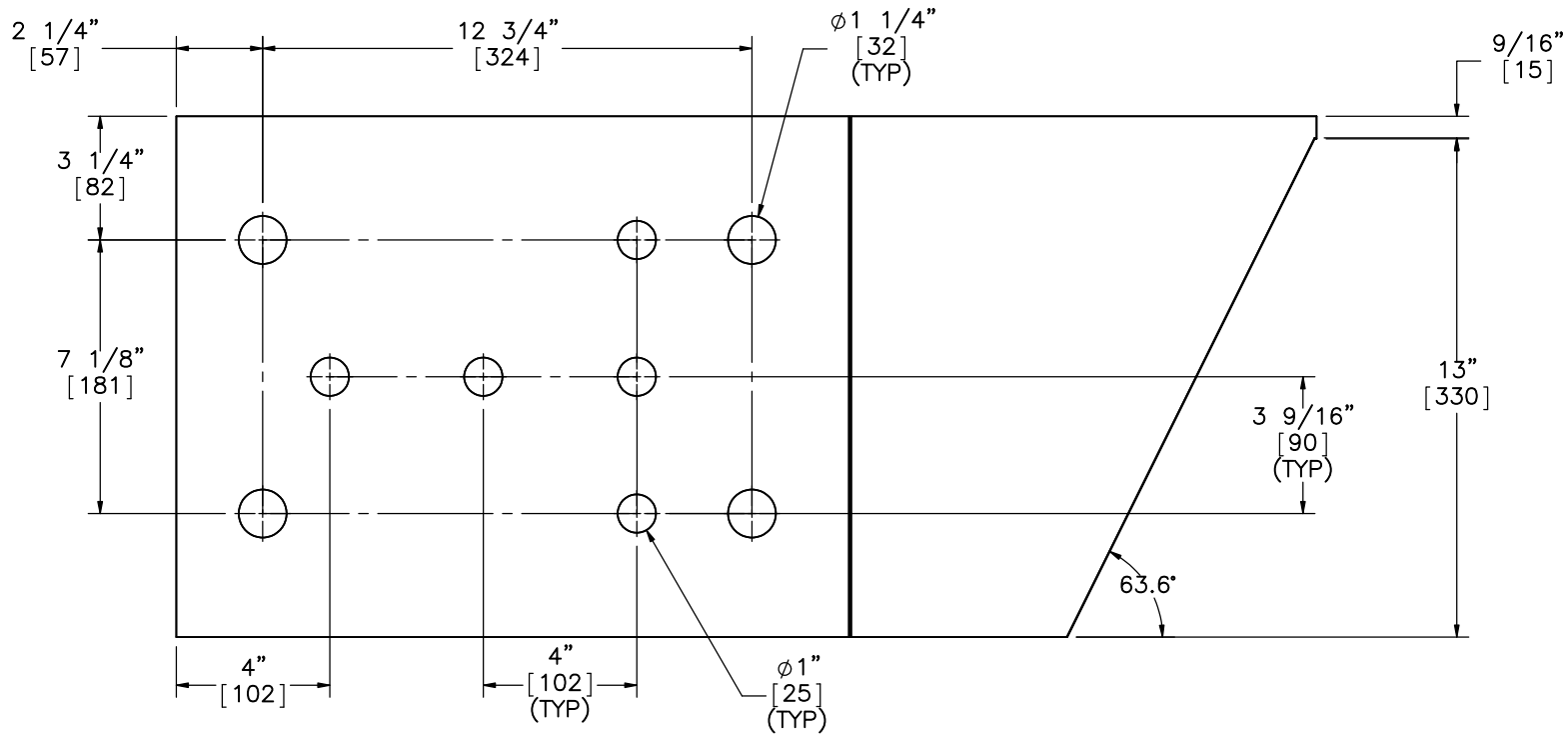


DETAIL Q

	NDOR PCB-MGS Transition		SHEET: 19 of 36
	Midwest Roadside Safety Facility		DATE: 10/20/2016
Blockout Mounting Plate Detail			DRAWN BY: KLK/ALL/ JEK/TJD
DWG. NAME: PCB-MGS_Trans_R16		SCALE: 3:1 UNITS: in.[mm]	REV. BY: RWB/KAL/ JCH/JAH



PLAN VIEW



ELEVATION VIEW  
Part e1



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

Connector Plate Face Plate

DWG. NAME:  
PCB-MGS\_Trans\_R16

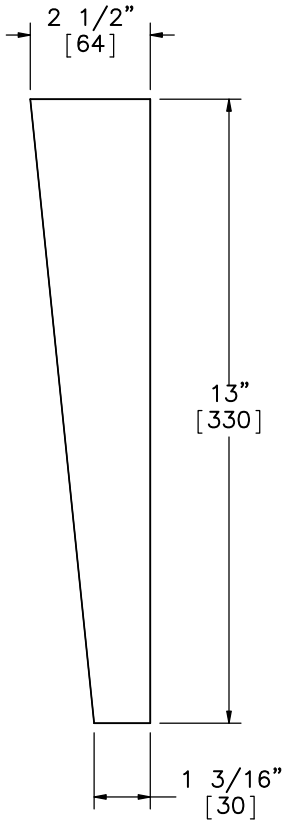
SCALE: 1:5  
UNITS: in.[mm]

SHEET:  
20 of 36

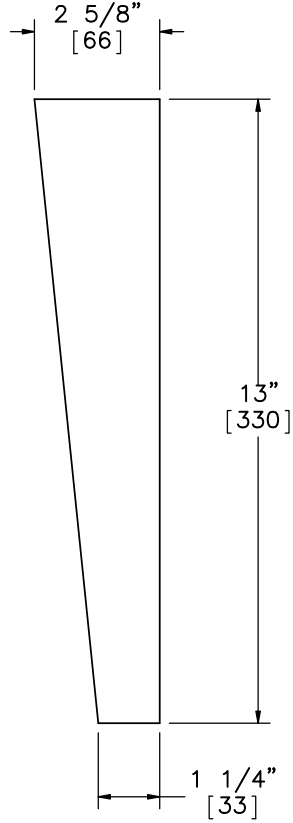
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

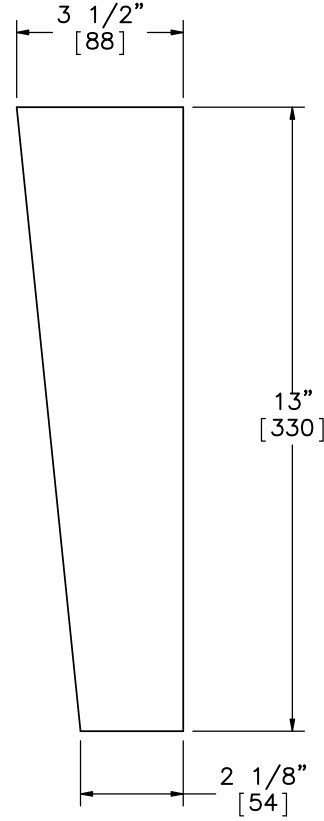
REV. BY:  
RWB/KAL/  
JCH/JAH



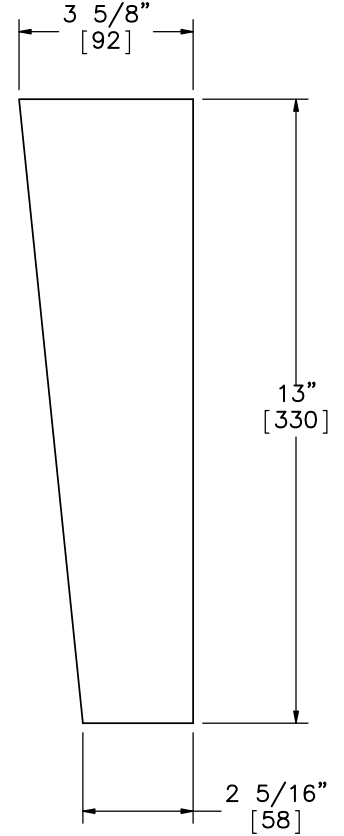
Part e5



Part e4



Part e3



Part e2

Notes: (1) All vertical gussets have a thickness of 1/4" [6].



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

Connector Plate Vertical  
Gussets

DWG. NAME:  
PCB-MGS\_Trans\_R16

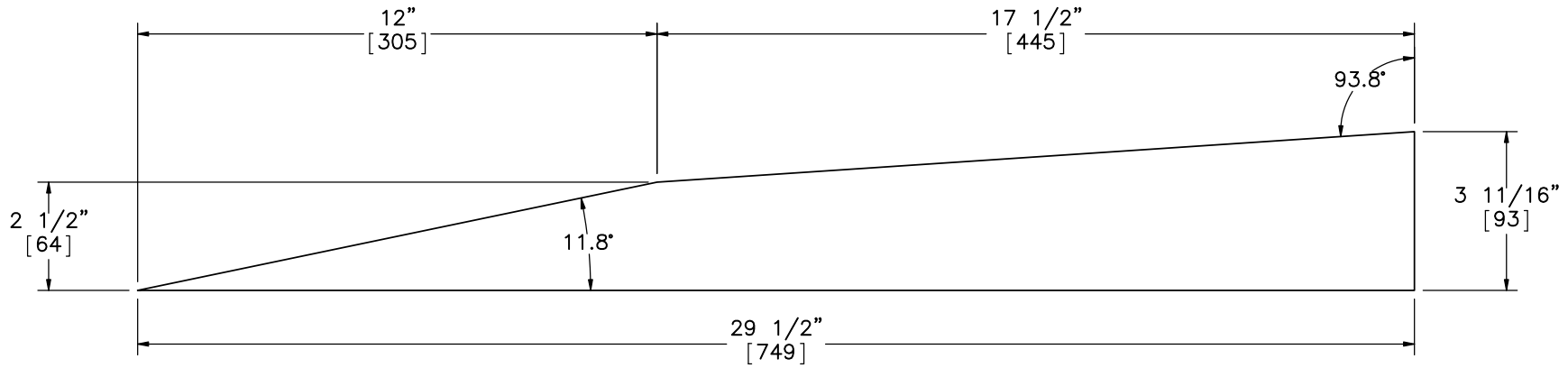
SCALE: 1:4  
UNITS: in.[mm]

SHEET:  
21 of 36

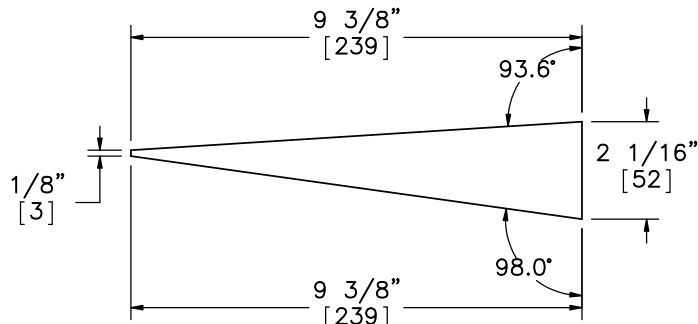
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

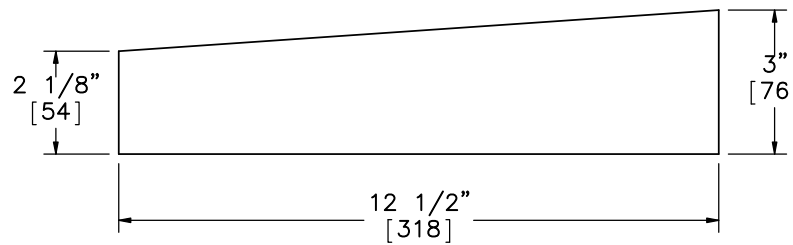
REV. BY:  
RWB/KAL/  
JCH/JAH



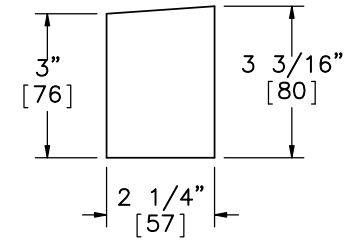
Part e6



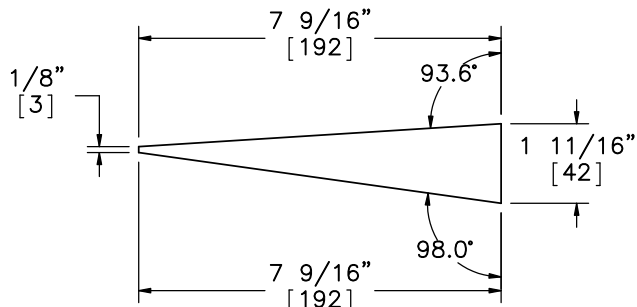
Part e9



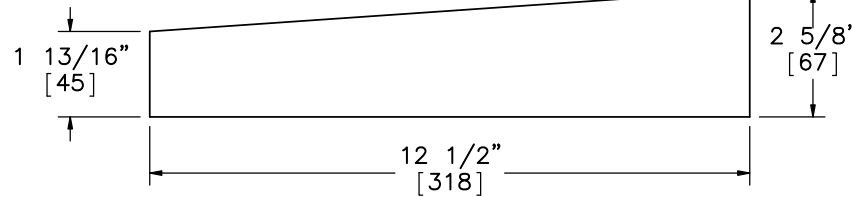
Part e8



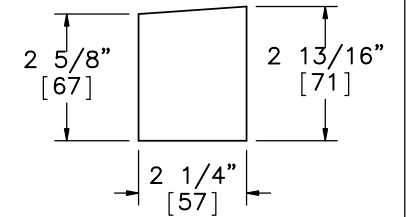
Part e7



Part e12



Part e11



Part e10

Notes: (1) All horizontal gussets have a thickness of 1/4" [6].



Midwest Roadside Safety Facility

NDOR PCB-MGS Transition

Connector Plate Horizontal Gussets

DWG. NAME:  
PCB-MGS\_Trans\_R16

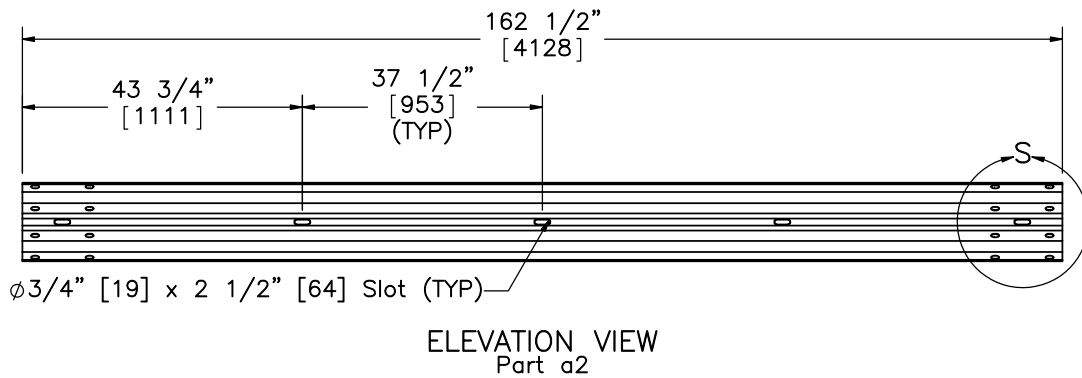
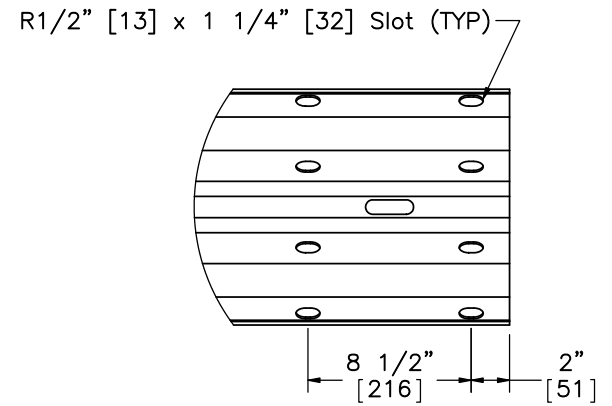
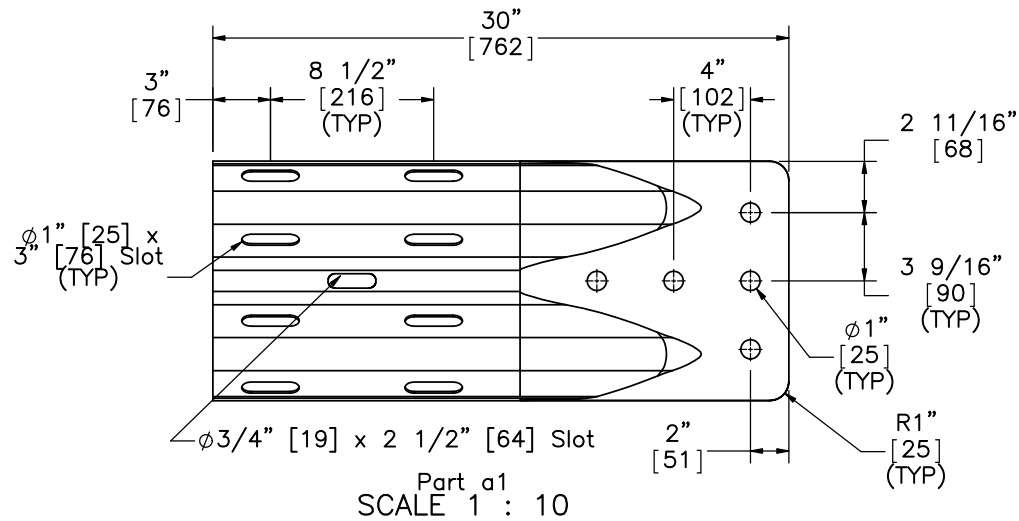
SCALE: 1:4  
UNITS: in.[mm]

SHEET:  
22 of 36

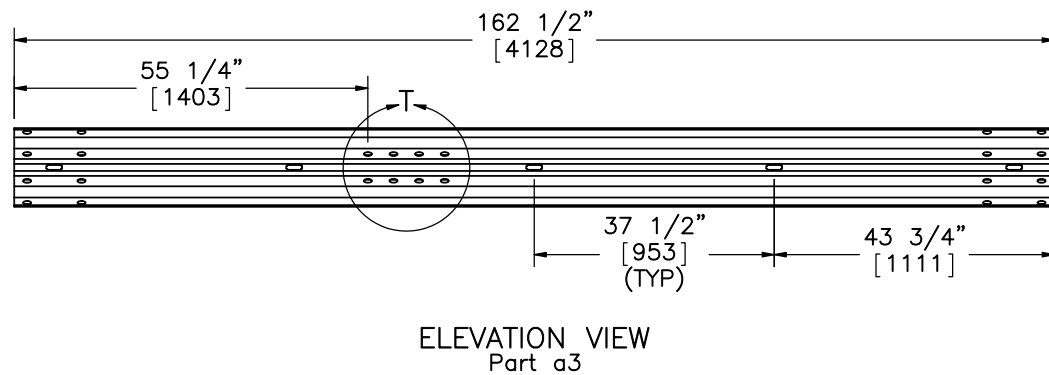
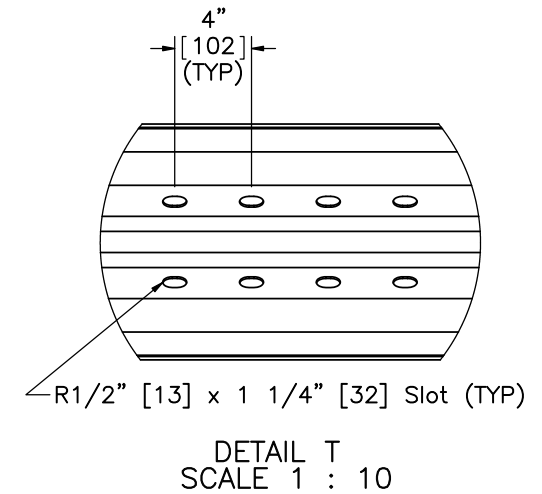
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

REV. BY:  
RWB/KAL/  
JCH/JAH



PROFILE VIEW



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

W-Beam Section Details

DWG. NAME:  
PCB-MGS\_Trans\_R16

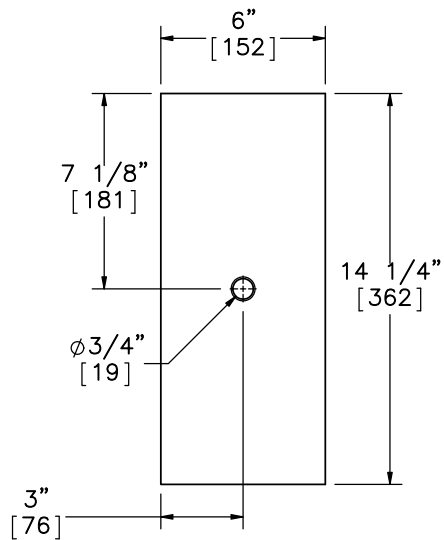
SCALE: 1:30  
UNITS: in.[mm]

SHEET:  
23 of 36

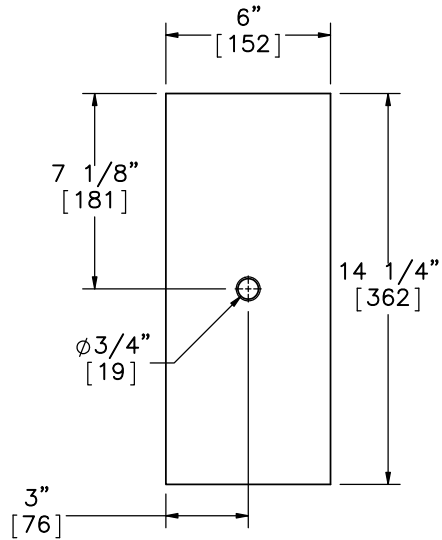
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

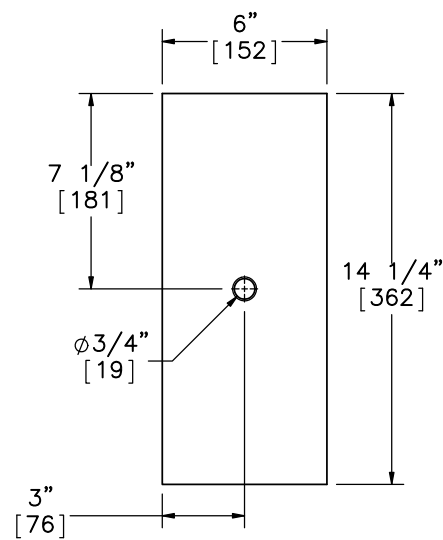
REV. BY:  
RWB/KAL/  
JCH/JAH



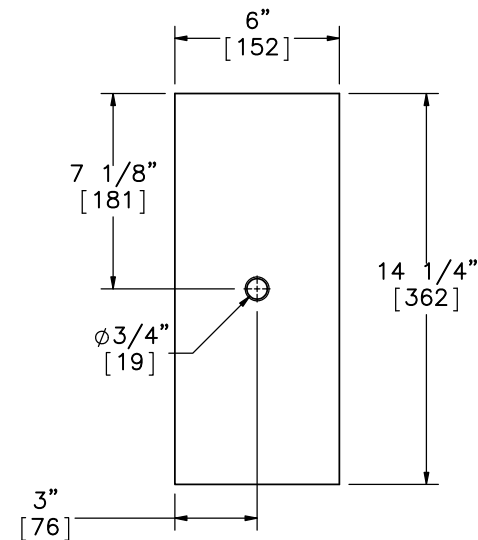
ELEVATION VIEW



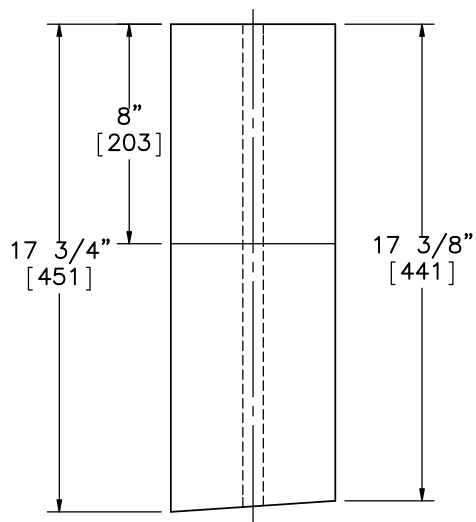
ELEVATION VIEW



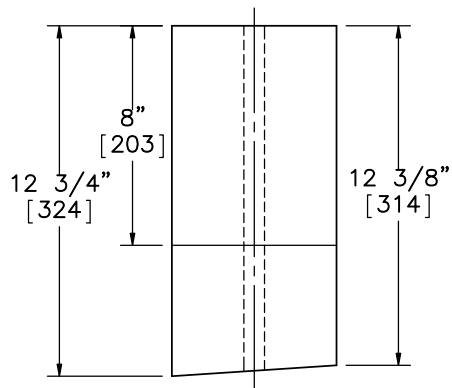
ELEVATION VIEW



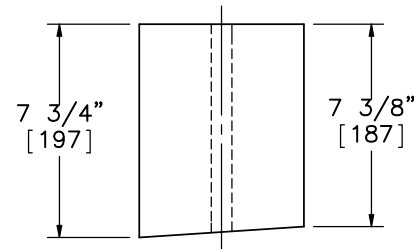
ELEVATION VIEW



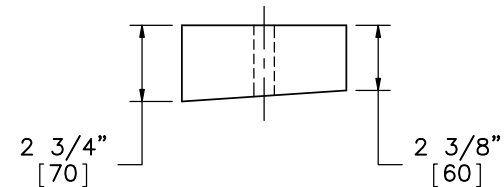
PLAN VIEW  
Part c2



PLAN VIEW  
Part c3



PLAN VIEW  
Part c4



PLAN VIEW  
Part c5

Notes: (1) Parts c2 and c3 can be made from any two combined blackout sizes and can be adjusted as necessary.



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

Transition Blockouts

DWG. NAME:  
PCB-MGS\_Trans\_R16

SCALE: 1:7  
UNITS: in.[mm]

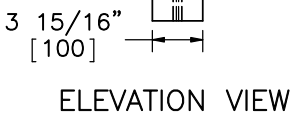
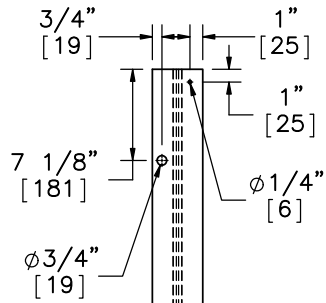
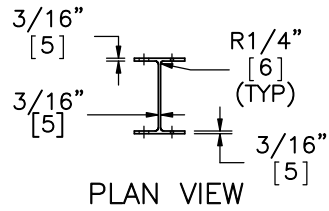
SHEET:  
24 of 36

DATE:  
10/20/2016

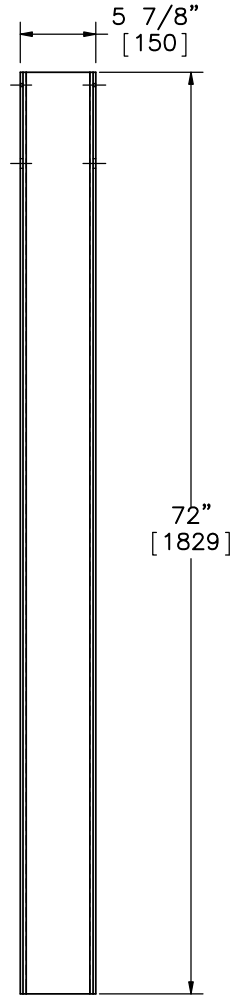
DRAWN BY:  
KLK/ALL/  
JEK/TJD

REV. BY:  
RWB/KAL/  
JCH/JAH

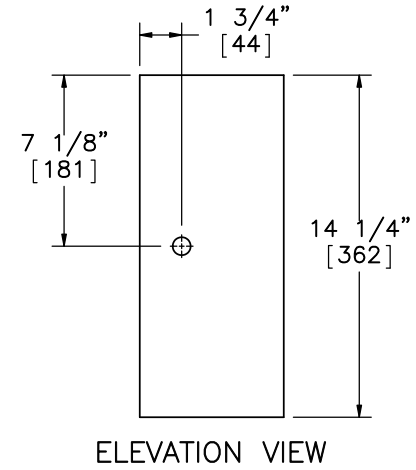
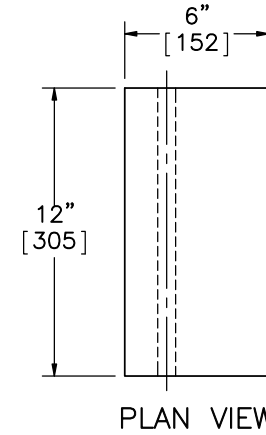




Part a4



PROFILE VIEW



Part a5  
SCALE 1 : 8



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

Post Nos. 3-18 Detail

DWG. NAME.  
PCB-MGS\_Trans\_R16

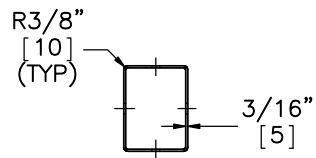
SCALE: 1:15  
UNITS: in.[mm]

SHEET:  
25 of 36

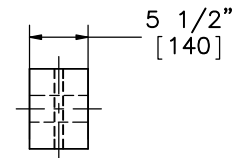
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

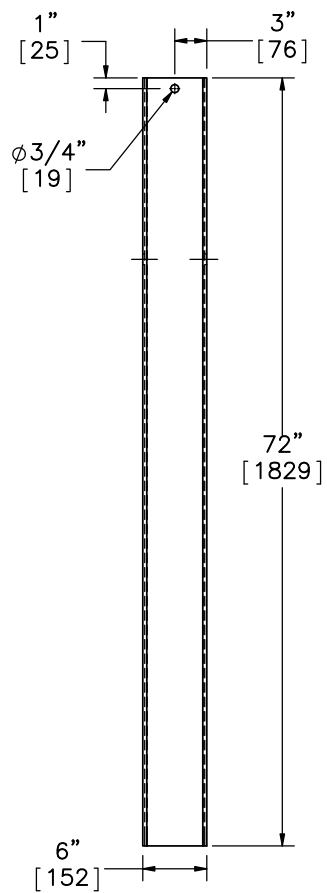
REV. BY:  
RWB/KAL/  
JCH/JAH



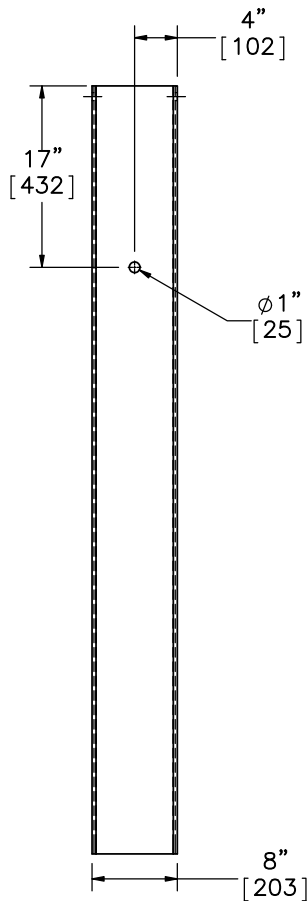
PLAN VIEW



PLAN VIEW

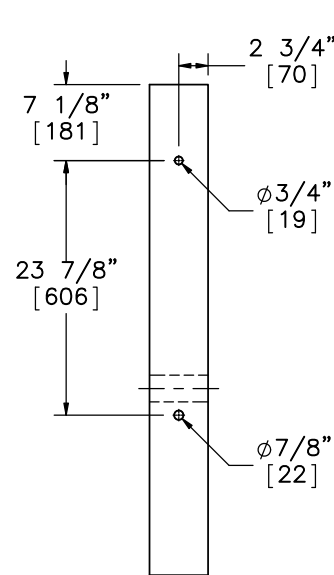


ELEVATION VIEW

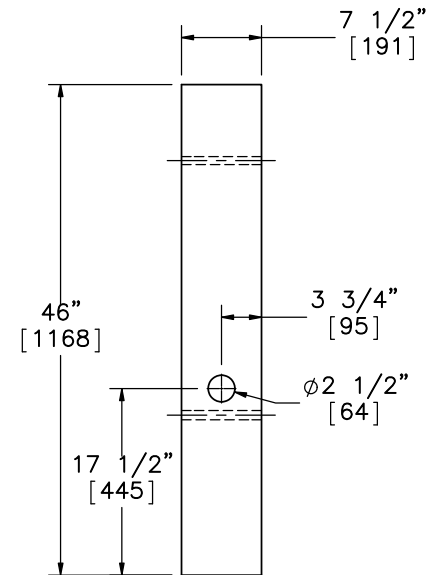


PROFILE VIEW

Part b2



ELEVATION VIEW



PROFILE VIEW

Part b1



Midwest Roadside Safety Facility

NDOR PCB-MGS Transition

BCT Timber Post and Foundation Tube

DWG. NAME:  
PCB-MGS\_Trans\_R16

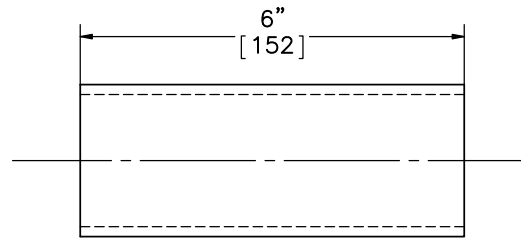
SCALE: 1:18  
UNITS: in.[mm]

SHEET:  
26 of 36

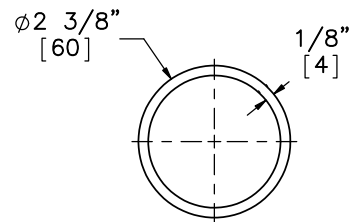
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

REV. BY:  
RWB/KAL/  
JCH/JAH

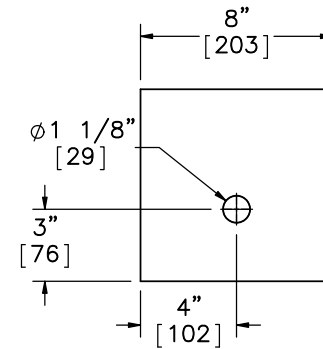


ELEVATION VIEW

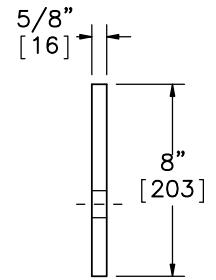


PROFILE VIEW

Part b4  
SCALE 1 : 3

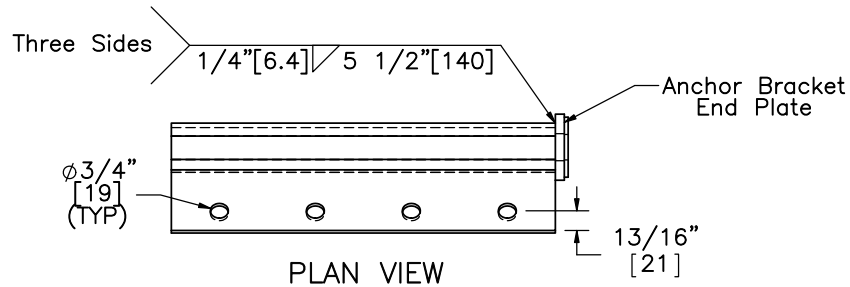


ELEVATION VIEW

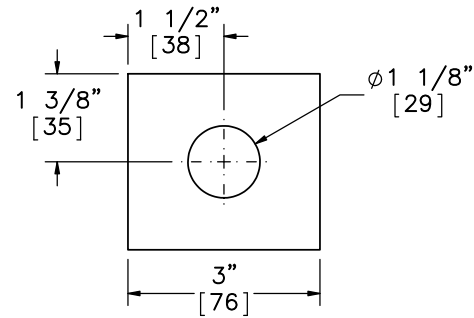


PROFILE VIEW

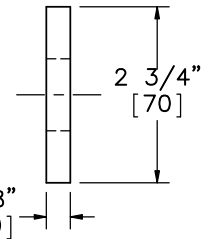
Part b5



PLAN VIEW

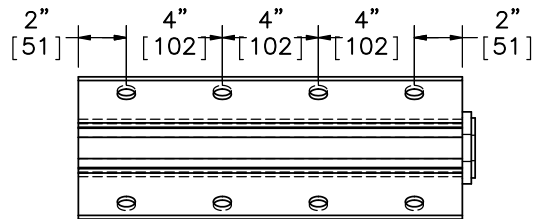


ELEVATION VIEW

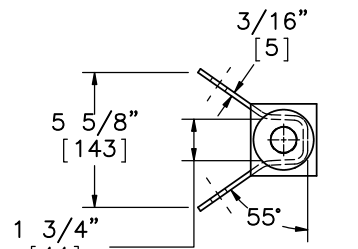


PROFILE VIEW

Anchor Bracket End Plate  
SCALE 1 : 3



ELEVATION VIEW



PROFILE VIEW

Part b6



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

BCT Post Components and  
Anchor Brackets

DWG. NAME:  
PCB-MGS\_Trans\_R16

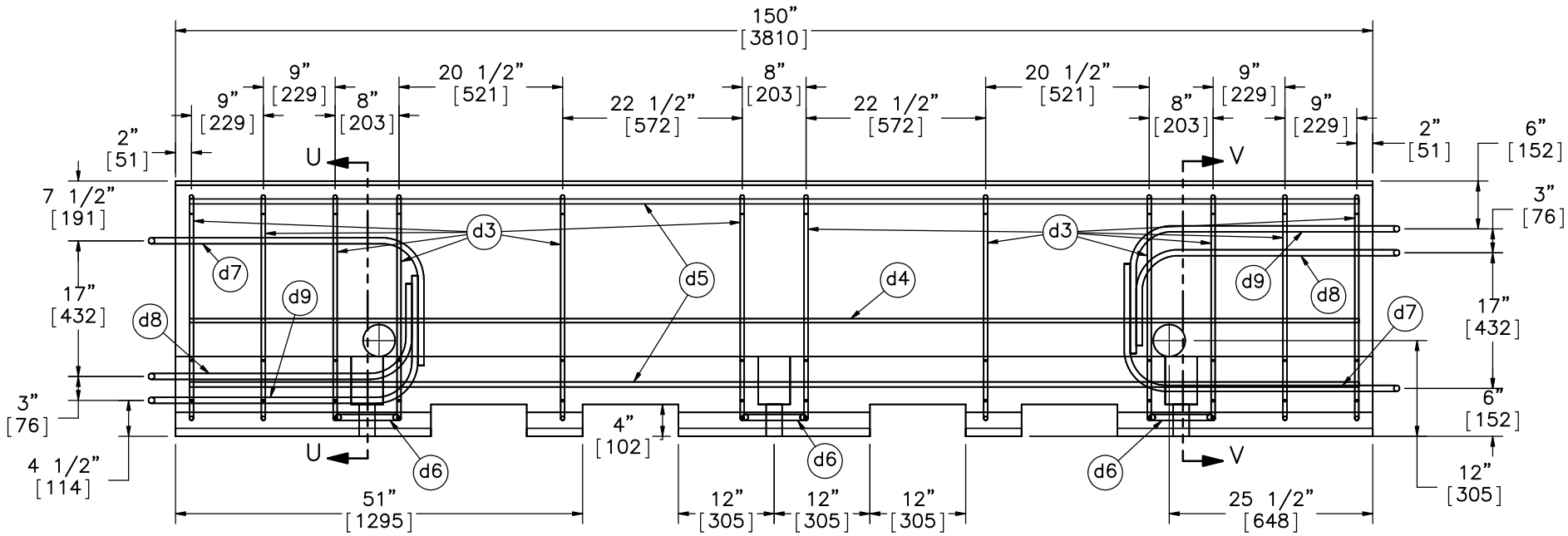
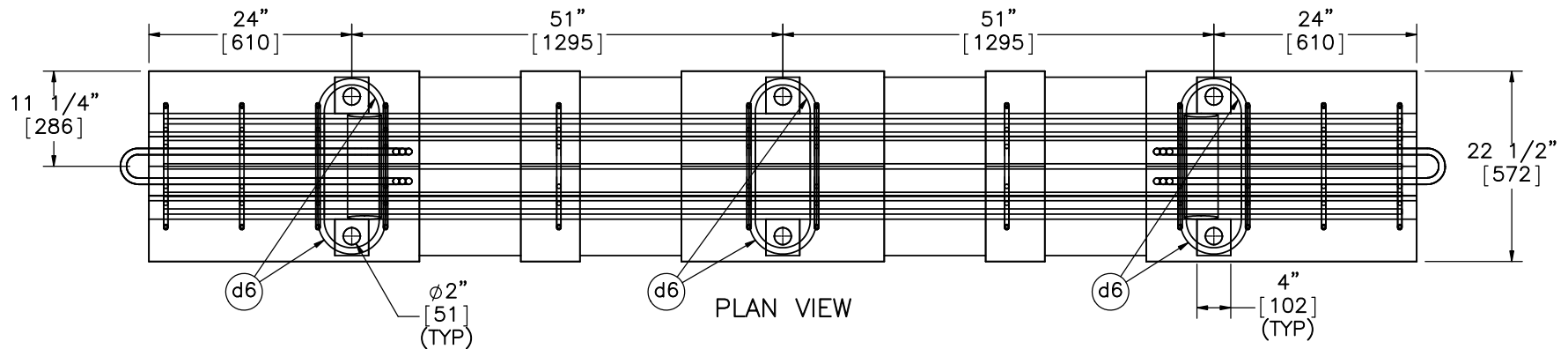
SCALE: 1:8  
UNITS: in.[mm]

SHEET:  
27 of 36

DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

REV. BY:  
RWB/KAL/  
JCH/JAH



ELEVATION VIEW

Part d1



Midwest Roadside Safety Facility

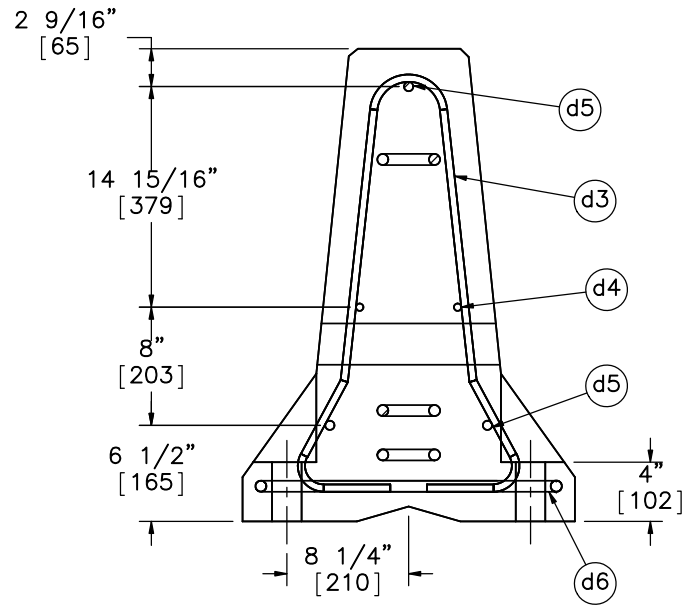
NDOR PCB-MGS Transition

Portable Concrete Barrier

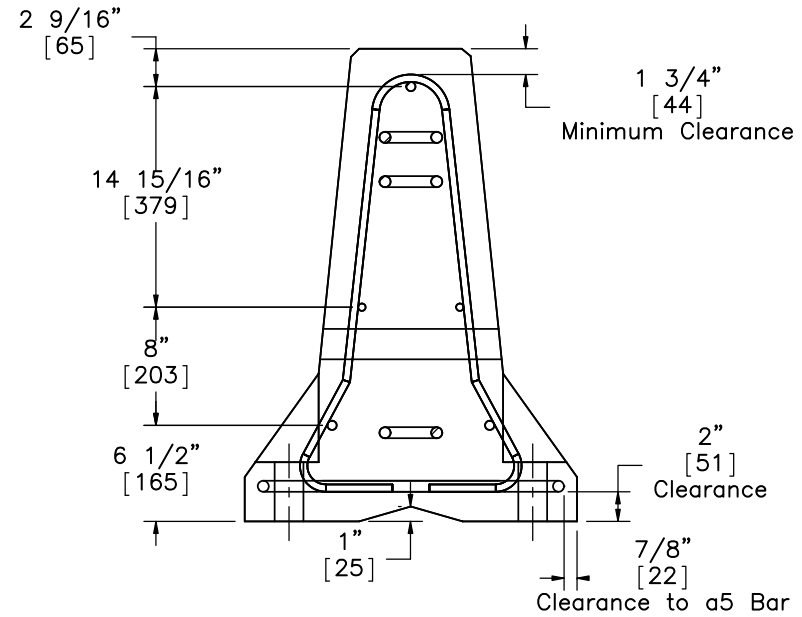
DWG. NAME:  
PCB-MGS\_Trans\_R16

SCALE: 1:20  
UNITS: in.[mm]

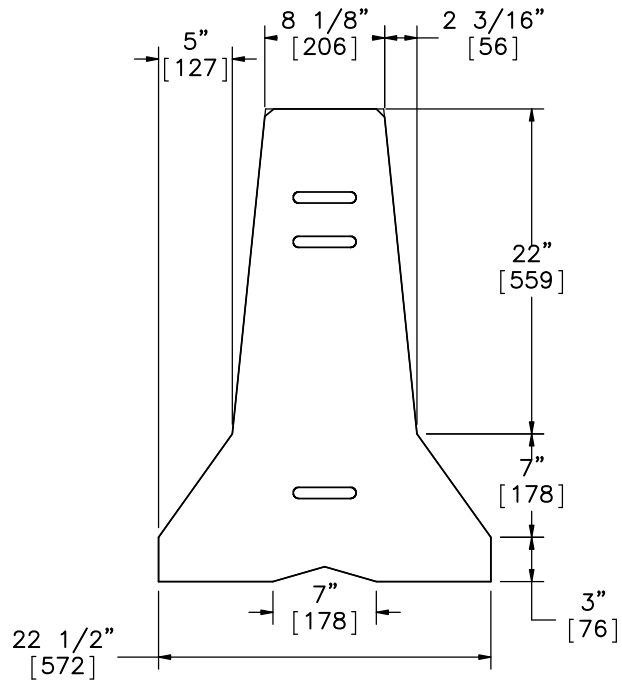
SHEET:  
28 of 36  
DATE:  
10/20/2016  
DRAWN BY:  
KLK/ALL/  
JEK/TJD  
REV. BY:  
RWB/KAL/  
JCH/JAH



SECTION U-U



SECTION V-V



PROFILE VIEW



Midwest Roadside  
Safety Facility

NDOR PCB-MGS  
Transition

Portable Concrete Barrier  
Profile Detail

DWG. NAME:  
PCB-MGS\_Trans\_R16

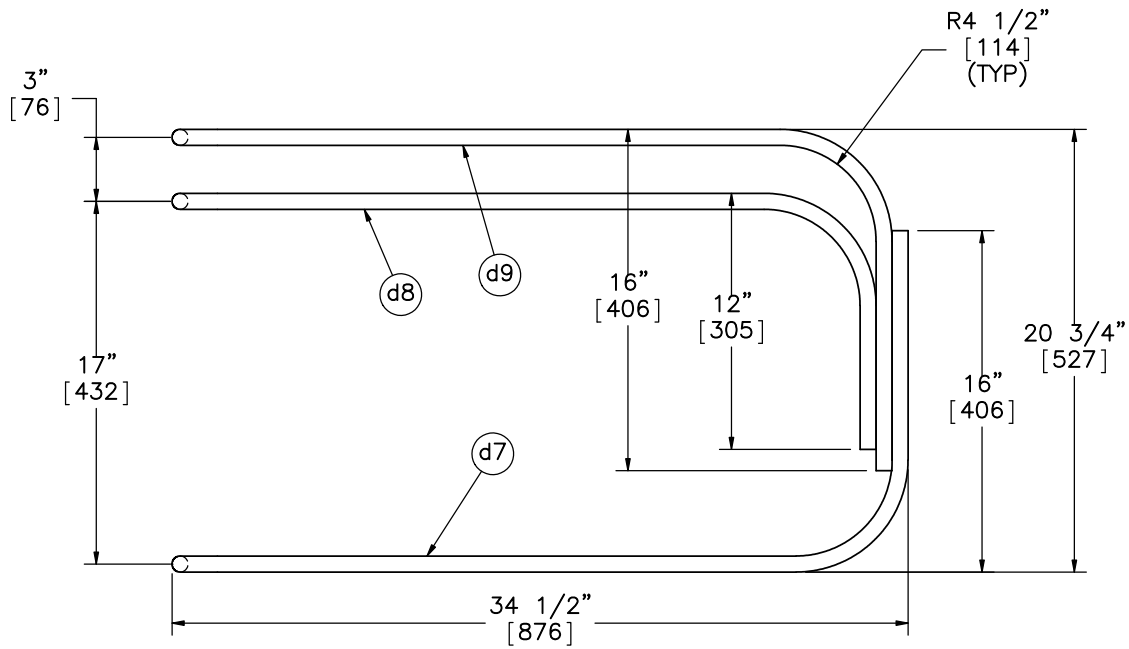
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UNITS: in.[mm]

SHEET:  
29 of 36

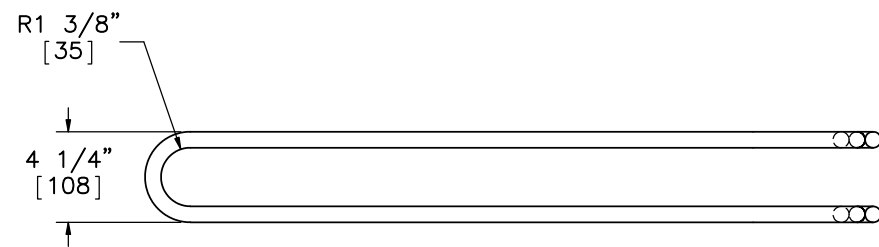
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

REV. BY:  
RWB/KAL/  
JCH/JAH

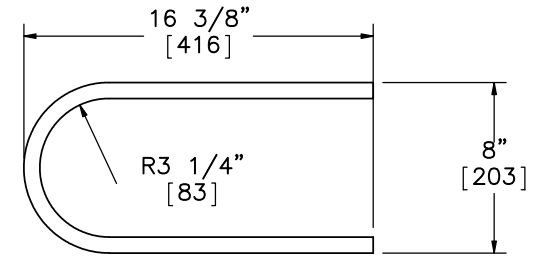


ELEVATION VIEW

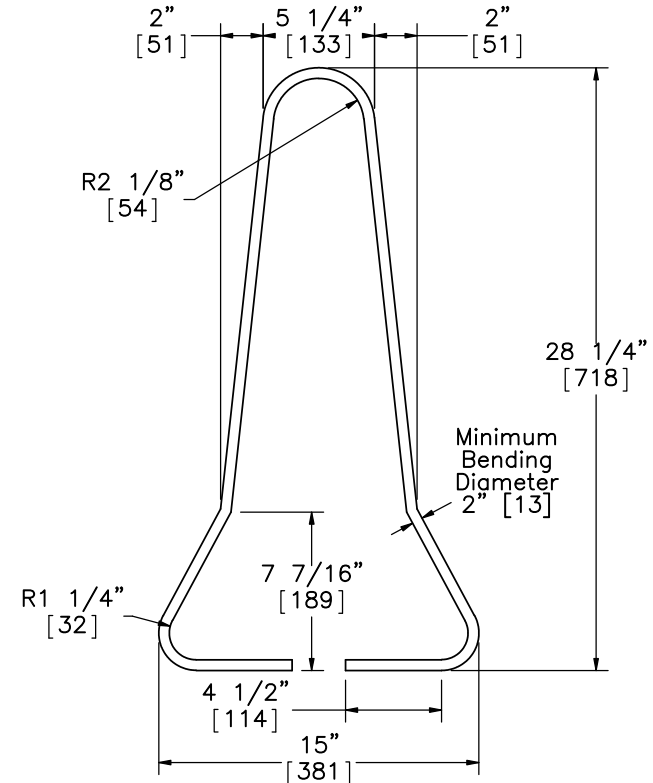


PLAN VIEW

Loop Bar Assembly



Part d6



Part d3



Midwest Roadside Safety Facility

NDOR PCB-MGS Transition

Bill of Bars - Portable Concrete Barriers

DWG. NAME:  
PCB-MGS\_Trans\_R16

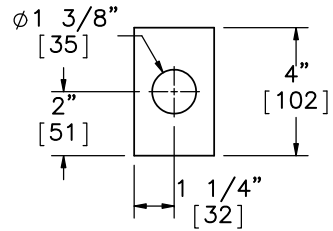
SCALE: 1:9  
UNITS: in.[mm]

SHEET:  
30 of 36

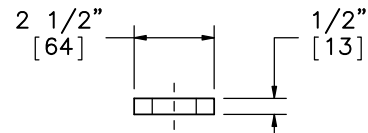
DATE:  
10/20/2016

DRAWN BY:  
KLK/ALL/  
JEK/TJD

REV. BY:  
RWB/KAL/  
JCH/JAH

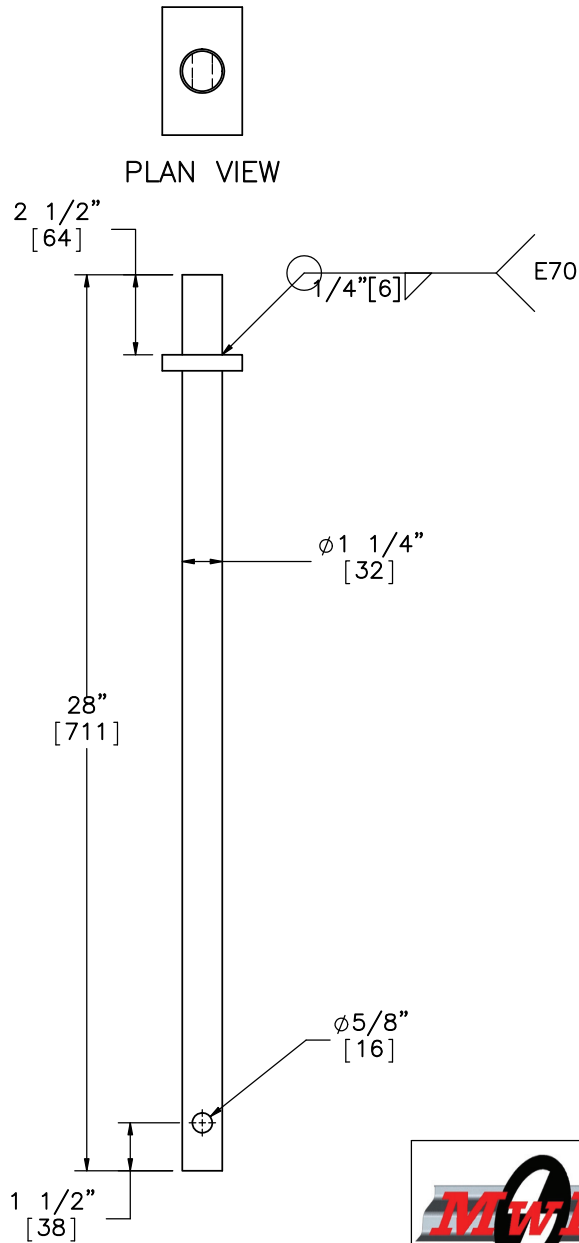


PLAN VIEW



ELEVATION VIEW

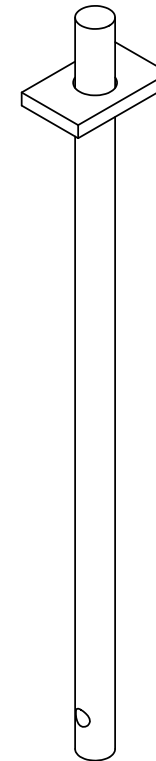
Connection Pin Plate



PLAN VIEW

ELEVATION VIEW

Part d2

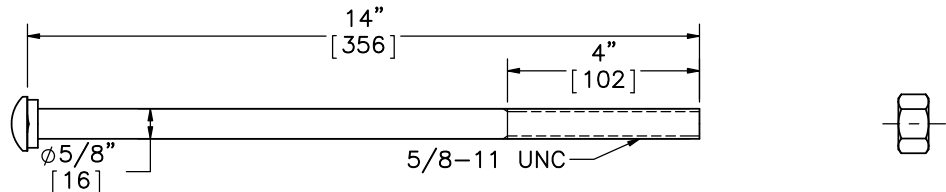


ISOMETRIC VIEW

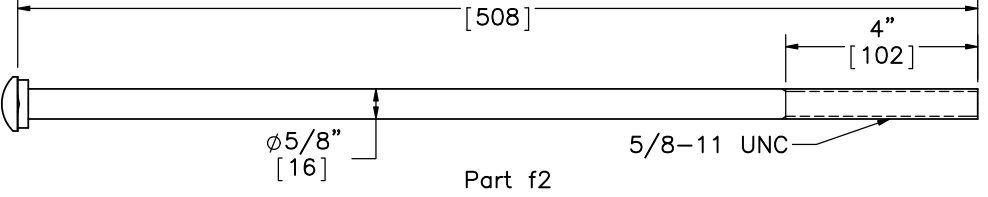


Midwest Roadside Safety Facility

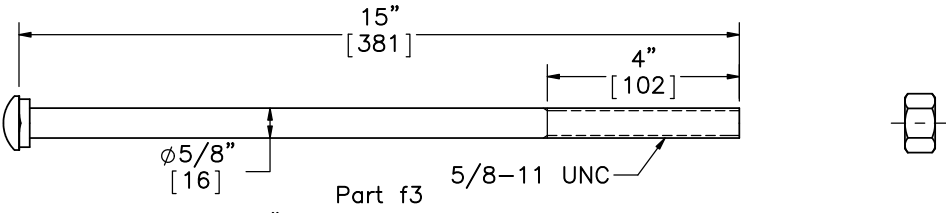
NDOR PCB-MGS Transition		SHEET:	31 of 36
		DATE:	10/20/2016
Connection Pin Detail		DRAWN BY:	KLK/ALL/ JEK/TJD
		DWG. NAME:	PCB-MGS_Trans_R16
SCALE: 1:6		REV. BY:	RWB/KAL/ JCH/JAH
UNITS: in.[mm]			



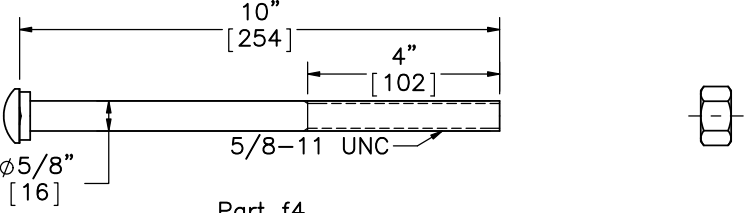
Part f1



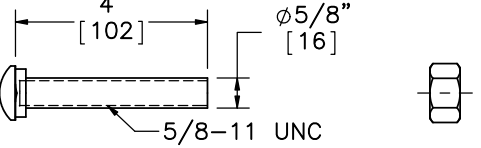
Part f2



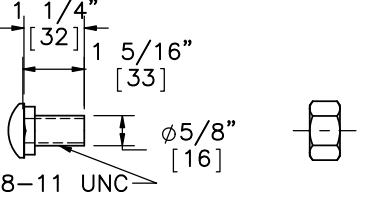
Part f3



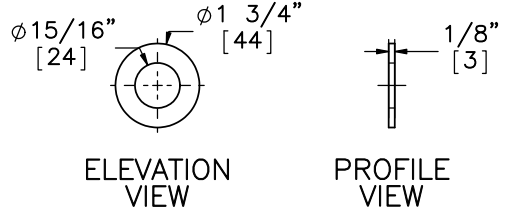
Part f4



Part f5



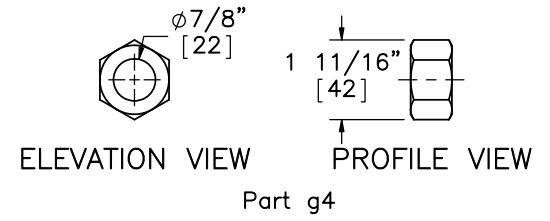
Part f6



ELEVATION VIEW

PROFILE VIEW

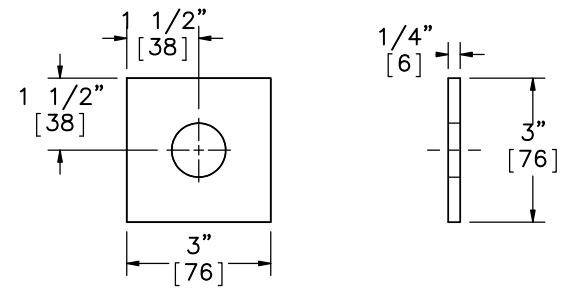
Part g3



ELEVATION VIEW

PROFILE VIEW

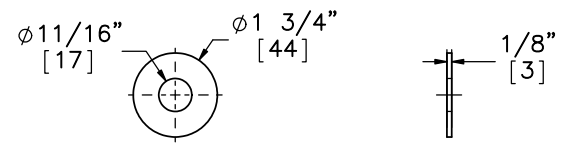
Part g4



ELEVATION VIEW

PROFILE VIEW

Part g1



ELEVATION VIEW

PROFILE VIEW

Part g2

Midwest Roadside Safety Facility

NDOR PCB-MGS Transition

Guardrail Bolts and Washers

DWG. NAME: PCB-MGS\_Trans\_R16

SHEET: 32 of 36

DATE: 10/20/2016

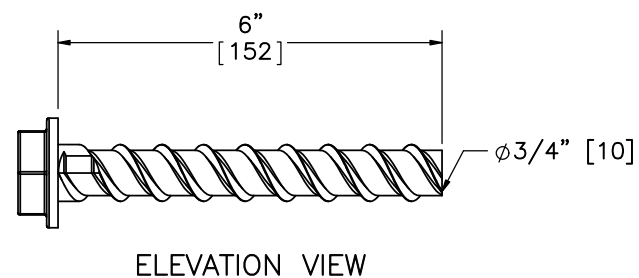
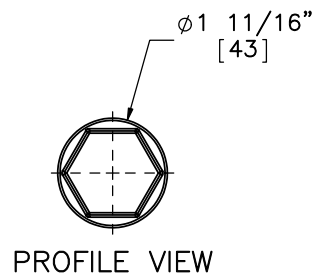
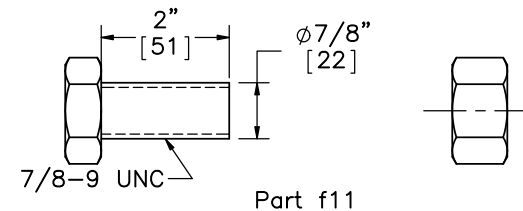
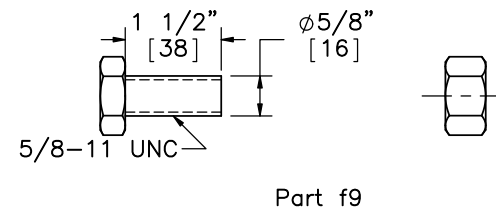
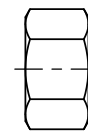
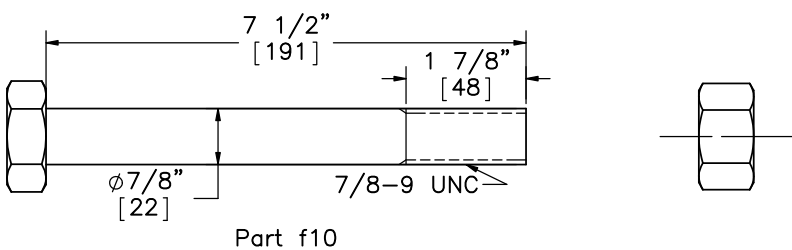
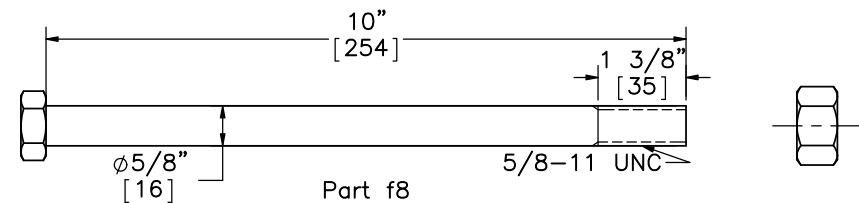
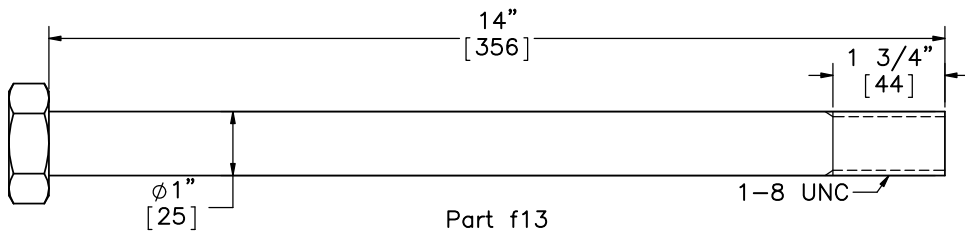
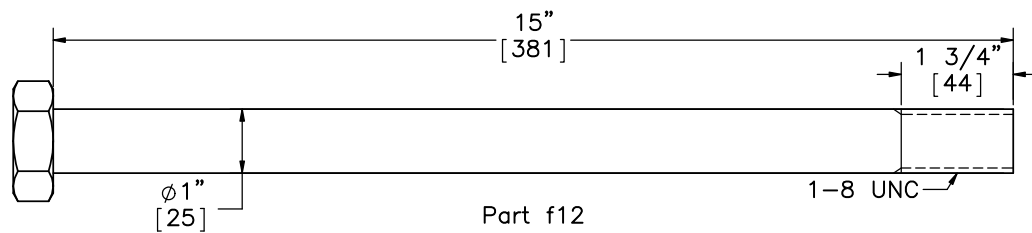
DRAWN BY: KLK/ALL/JEK/TJD

REV. BY: RWB/KAL/JCH/JAH

SCALE: 1:4

UNITS: in.[mm]





Power Wedge Bolt+  
Part f15



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Hex and Power Wedge Bolts

DWG. NAME:  
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SCALE: 1:3  
UNITS: in.[mm]

SHEET:  
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DATE:  
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Item No.	QTY.	Description	Material Spec	Hardware Guide
a1	1	W-Beam End Shoe Section	10 gauge [3.4] AASHTO M180 Galv.	RWE02a
a2	15	12'-6" [3810] W-Beam MGS Section	12 gauge [2.7] AASHTO M180 Galv.	RWM04a
a3	1	12'-6" [3810] W-Beam MGS End Section	12 gauge [2.7] AASHTO M180 Galv.	RWM14a
a4	16	W6"x8.5" [W152x12.6], 72" Long [1829] Steel Post	ASTM A992 Min. 50 ksi [345 MPa] Steel Galv. or W6x9 [W152x13.4] ASTM A36 Min. 36 ksi [248 MPa] Steel Galv.	PWE06
a5	16	6"x12"x14 1/4" [152x305x368] Timber Blockout for Steel Posts	SYP Grade No.1 or better	PDB10a
a6	16	16D Double Head Nail	-	-
b1	2	BCT Timber Post - MGS Height	SYP Grade No. 1 or better (No knots 18" [457] above or below ground tension face)	PDF01
b2	2	72" [1829] Long Foundation Tube	ASTM A500 Grade B Galv.	PTE06
b3	1	Ground Strut Assembly	ASTM A36 Steel Galv.	PFPO2
b4	1	2 3/8" [60] O.D. x 6" [152] Long BCT Post Sleeve	ASTM A53 Grade B Schedule 40 Galv.	FMM02
b5	1	8"x8"x5/8" [203x203x16] Anchor Bearing Plate	ASTM A36 Steel Galv.	FPB01
b6	1	Anchor Bracket Assembly	ASTM A36 Steel Galv.	FPA01
c1	4	Blockout Mounting Plate	ASTM A36 Steel Galv.	-
c2	1	6"x17 3/4"x14 1/4" [152x451x368] Timber Blockout for Steel Posts	SYP Grade No.1 or better	-
c3	1	6"x12 3/4"x14 1/4" [152x324x368] Timber Blockout for Steel Posts	SYP Grade No.1 or better	-
c4	1	6"x7 3/4"x14 1/4" [152x197x368] Timber Blockout for Steel Posts	SYP Grade No.1 or better	-
c5	1	6"x2 3/4"x14 1/4" [152x70x368] Timber Blockout for Steel Posts	SYP Grade No.1 or better	-
d1	11	NDOR Portable Concrete Barrier	min f'c=5000 psi [34.5 MPa]	-
d2	10	1 1/4" [32] Dia., 28" [711] Long Connector Pin	ASTM A36	FMW02
d3	132	1/2" [13] Dia., 72" [1829] Long Form Bar	ASTM A615 Grade 60	-
d4	22	1/2" [13] Dia., 146" [3708] Long Longitudinal Bar	ASTM A615 Grade 60	-
d5	33	5/8" [16] Dia., 146" [3708] Long Longitudinal Bar	ASTM A615 Grade 60	-
d6	66	3/4" [19] Dia., 36" [914] Long Anchor Loop Bar	ASTM A615 Grade 60	-
d7	22	3/4" [19] Dia., 102" [2591] Long Connection Loop Bar	ASTM A709 Grade 70 or A706 Grade 60	-



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Bill of Materials

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SCALE: None  
UNITS: in.[mm]

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Item No.	QTY.	Description	Material Spec	Hardware Guide
d8	22	3/4" [19] Dia., 91" [2311] Long Connection Loop Bar	ASTM A709 Grade 70 or A706 Grade 60	—
d9	22	3/4" [19] Dia., 101" [2565] Long Connection Loop Bar	ASTM A709 Grade 70 or A706 Grade 60	—
e1	1	Connector Plate Face Plate	ASTM A36 Steel Galv.	—
e2	1	3 5/8" [92] Connector Plate Vertical Gusset	ASTM A36 Steel Galv.	—
e3	1	3 1/2" [88] Connector Plate Vertical Gusset	ASTM A36 Steel Galv.	—
e4	1	2 5/8" [66] Connector Plate Vertical Gusset	ASTM A36 Steel Galv.	—
e5	1	2 1/2" [64] Connector Plate Vertical Gusset	ASTM A36 Steel Galv.	—
e6	1	29 1/2" [749] Long Connector Plate Horizontal Gusset	ASTM A36 Steel Galv.	—
e7	1	2 1/4" [57] x 3 3/16" [80] Connector Plate Horizontal Gusset	ASTM A36 Steel Galv.	—
e8	1	12 1/2" [318] x 3" [76] Connector Plate Horizontal Gusset	ASTM A36 Steel Galv.	—
e9	1	9 3/8" [239] Long Connector Plate Horizontal Gusset	ASTM A36 Steel Galv.	—
e10	1	2 1/4" [57] x 2 13/16" [71] Connector Plate Horizontal Gusset	ASTM A36 Steel Galv.	—
e11	1	12 1/2" [318] x 2 5/8" [67] Connector Plate Horizontal Gusset	ASTM A36 Steel Galv.	—
e12	1	7 9/16" [192] Long Connector Plate Horizontal Gusset	ASTM A36 Steel Galv.	—
f1	16	5/8" [16] Dia. UNC, 14" [356] Long Guardrail Bolt and Nut	Bolt ASTM A307 Grade A Galv., Nut ASTM A563 A Galv.	FBB06
f2	1	5/8" [16] Dia. UNC, 20" [508] Long Guardrail Bolt and Nut	Bolt ASTM A307 Galv., Nut ASTM A563 A Galv.	—
f3	1	5/8" [16] Dia. UNC, 15" [381] Long Guardrail Bolt and Nut	Bolt ASTM A307 Galv., Nut ASTM A563 A Galv.	—
f4	1	5/8" [16] Dia. UNC, 10" [254] Long Guardrail Bolt and Nut	Bolt ASTM A307 Galv., Nut ASTM A563 A Galv.	FBB03
f5	1	5/8" [16] Dia. UNC, 4" [102] Long Guardrail Bolt and Nut	Bolt ASTM A307 Galv., Nut ASTM A563 A Galv.	—
f6	40	5/8" [16] Dia. UNC, 1 1/4" [38] Long Guardrail Bolt and Nut	Bolt ASTM A307 Grade A Galv., Nut ASTM A563 A Galv.	FBB01
f7	2	5/8" [16] Dia. UNC, 10" [254] Long Guardrail Bolt and Nut	Bolt ASTM A307 Grade A Galv., Nut ASTM A563 A Galv.	FBB03
f8	2	5/8" [16] Dia. UNC, 10" [254] Long Hex Head Bolt and Nut	Bolt ASTM A307 Grade A Galv., Nut ASTM A563 A Galv.	FBX16a
f9	8	5/8" [16] Dia. UNC, 1 1/2" [38] Long Hex Head Bolt and Nut	Bolt ASTM A307 Grade A Galv., Nut ASTM A563 A Galv.	FBX16a



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Bill of Materials Continued

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Item No.	QTY.	Description	Material Spec	Hardware Guide
f10	2	7/8" [22] UNC, 7 1/2" [191] Long Hex Head Bolt and Nut	Bolt ASTM A307 Grade A Galv., Nut ASTM A563 A Galv.	-
f11	5	7/8" [22] Dia., UNC, 2" [51] Long Heavy Hex Bolt	Bolt ASTM A325 Galv.	FBX22b
f12	1	1" [25] Dia., UNC, 15" [381] Long Heavy Hex Bolt and Nut	Bolt ASTM A325 Galv., Nut ASTM A563DH Galv.	FBX27b
f13	3	1" [25] Dia., UNC, 14" [356] Long Heavy Hex Bolt and Nut	Bolt ASTM A325 Galv., Nut ASTM A563DH Galv.	FBX27b
f14	48	5/8" [16] Dia. UNC, 2" [51] Long Guardrail Bolt and Nut	Bolt ASTM A307 Grade A Galv, Nut ASTM A563 Galv.	FBB02
f15	8	ø3/4" x 6" [M20x152] Power Wedge Bolt+	Galvanized	FBX02
g1	4	3"x3"x1/4" [76x76x6] Square Washer	A572 Grade 50 Galvanized	-
g2	30	5/8" [16] Dia. Plain Round Washer	ASTM F844 Galv.	FWC16a
g3	4	7/8" [22] Dia. Plain Round Washer	ASTM F844 Galv.	-
g4	5	7/8" [22] Dia. UNC Heavy Hex Nut	ASTM A563DH Galv.	FNX22b
h1	2	BCT Anchor Cable End Swaged Fitting	Grade 5 - Galv.	-
h2	2	3/4" [190] Dia. 6x19 IWRC IPS Wire Rope	IPS Galv.	-
h3	2	115-HT Mechanical Splice - 3/4" [19] Dia.	As Supplied	-
h4	2	Crosby Heavy Duty HT - 3/4" [19] Dia. Cable Thimble	Stock No. 1037773 - Galv.	-
h5	2	Crosby G2130 or S2130 Bolt Type Shackle - 1 1/4" [32] Dia. with thin head bolt, nut, and cotter pin, Grade A, Class 3	Stock Nos. 1019597 and 1019604 - As Supplied	-
h6	2	Chicago Hardware Drop Forged Heavy Duty Eye Nut - Drilled and Tapped 1 1/2" [38] Dia. - UNF 12 [M36]	Stock No. 107 - As Supplied	-
h7	1	TLL-50K-PTB Load Cell	-	-



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Bill of Materials Continued

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R9	5/22/2015	1	Added post spacing; edited notes	KAL	ALL
		3	Added post spacing		
		5	Added post spacing		
		6	Added post spacing		
		33	Added part b3 hardware guide; fixed grid lines; took out hardware guide for parts c2-c5		
		34	Fixed grid lines; fixed description and material spec for part f6; fixed description and material spec for part f14		
R10	7/23/2015	-	Impact moved and direction of impact flipped. Post/PCB numbers changed accordingly.	KAL	JEK
		1	Impact moved. Dimensions added. Note 2 and 4 changed.		
		2	Impact added. Demensions added. General Movement.		
		3	Post/PCB numbers changed. General movement. End shoe centerline noted.		
		32	General movement.		
R11	7/23/2015	1	Note 6 removed.	KAL	JEK
R12	8/4/2015	3	G2 washers added to end shoe connection and noted. Note corrected.	RWB/KAL	JEK
		4	String potentiometer noted.		
		22	Detail S name corrected.		
		31	Part g2 inner diameter corrected.		
		32	Part f11 labeled.		
		35	Part g1 description and material corrected. Number of g2 washers corrected.		
R13	8/20/2015	1	Note 6 added, regarding guardrail lapping.	KAL	JEK
R14	1/13/2016	3	Removed washer g3 as they do not appear in photos. Added washer g2 to nut and bolt f14 behind part a1.	KAL	TJD
		4	Added page 4 showing the backside view of part a1. Added callouts for washer g2 and nut and bolt f14.		
		16	Added bend lines to flat pattern view.		
R15	3/15/2016	16	Removed Note 1.	JEK	JAH
R16	10/20/2016	-	BOM updates/corrections	KAL	JEK