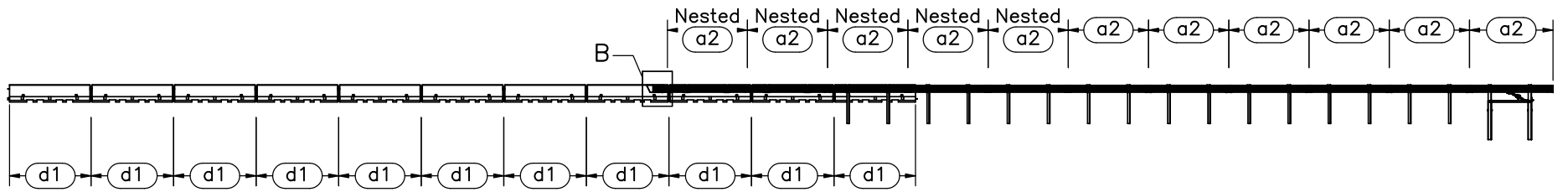



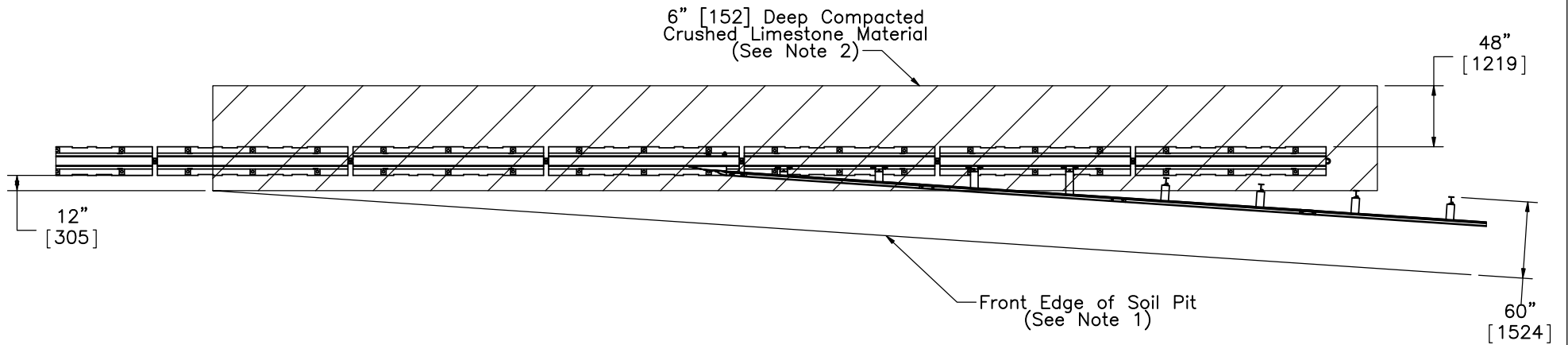
PLAN VIEW



ELEVATION VIEW

- Notes:
- (1) Test shall be performed according to test designation no. 3-21 of MASH criteria.
 - (2) The impact location is at the centerline of post no. 14.
 - (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. 9 through 18 (ϕ 3' holes).
 - (5) BCT anchors are placed in ϕ 3' [914] holes, then backfilled and tamped with soil.
 - (6) Instrumentation consisting of a tension load cell, string potentiometer, and high-speed digital video camera to be used on the upstream end anchor.

 Midwest Roadside Safety Facility	NDOR PCB-MGS Transition Layout 2	SHEET: 1 of 36
	System Layout	DATE: 10/20/2016
DWG. NAME: PCB-MGS_Trans_Layout_2_R9	SCALE: 1:300 UNITS: in.[mm]	DRAWN BY: ALL/JEK/TJD REV. BY: KAL/RWB/JAH

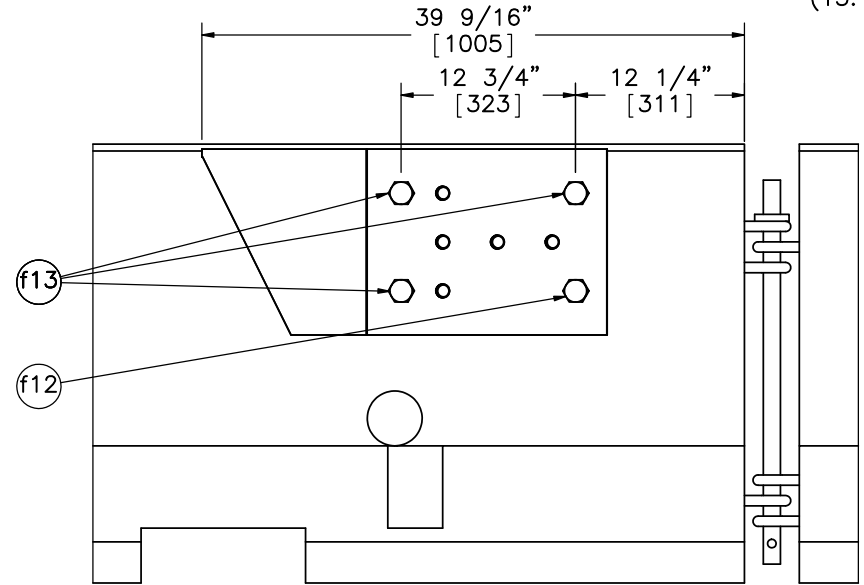
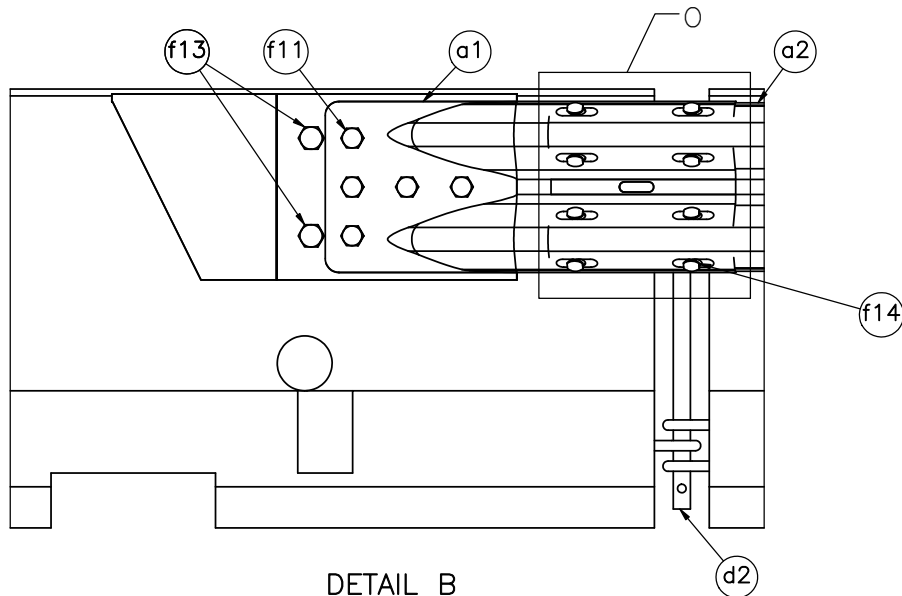
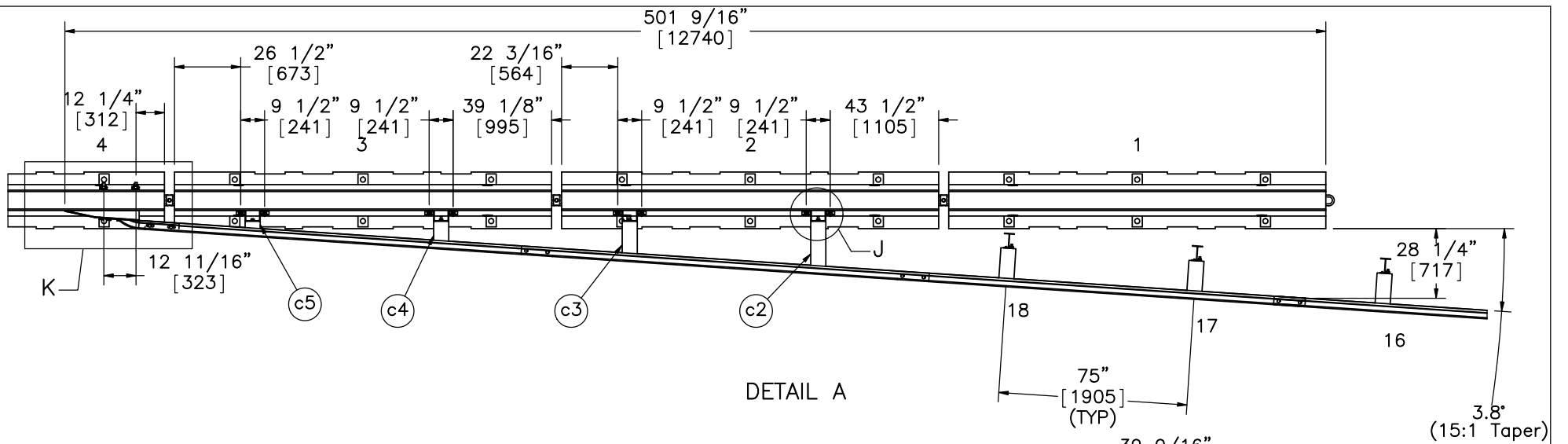


- Notes: (1) The front edge of the soil pit should be at least 5' [1524] from the center of each post. The distance can be adjusted as long as the PCB system does not cross the front edge of the soil pit.
- (2) The compacted crushed limestone material must meet AASHTO Grade B soil specifications. The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



Midwest Roadside
Safety Facility

NDOR PCB-MGS Transition Layout 2		SHEET: 2 of 36
		DATE: 10/20/2016
Soil Pit Detail		DRAWN BY: ALL/JEK/TJ D
		REV. BY: KAL/RWB/J AH
DWG. NAME: PCB-MGS_Trans_Layout_2_R9	SCALE: 1:120 UNITS: in.[mm]	



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



Midwest Roadside
Safety Facility

NDOR PCB-MGS
Transition Layout 2

Transition Detail

DWG. NAME.
PCB-MGS_Trans_Layout_2_R9

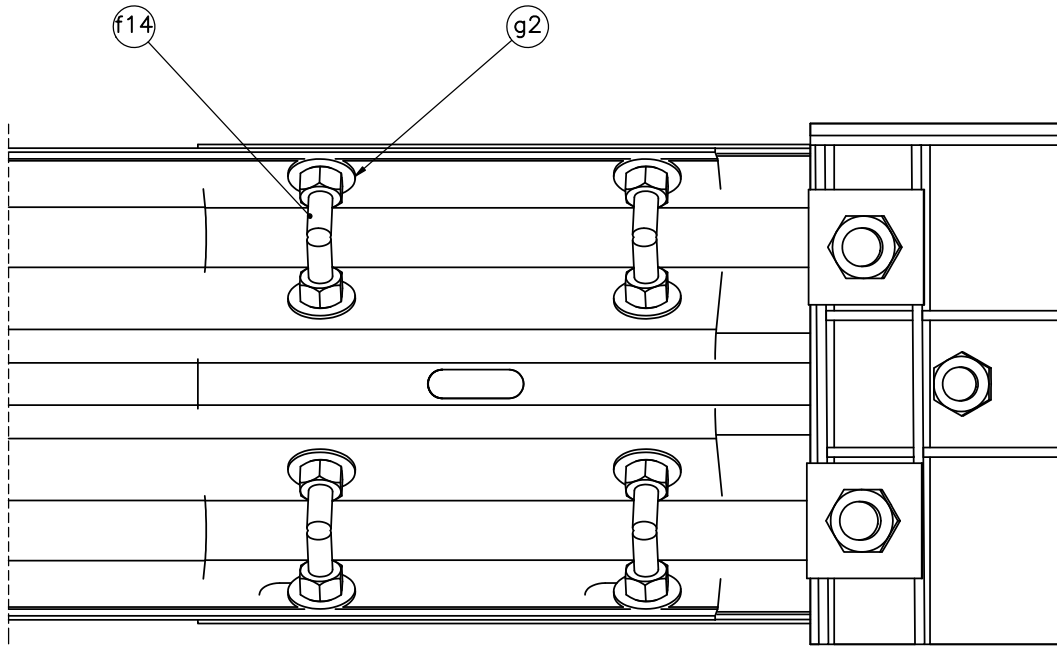
SCALE: 1:60
UNITS: in.[mm]

SHEET:
3 of 36

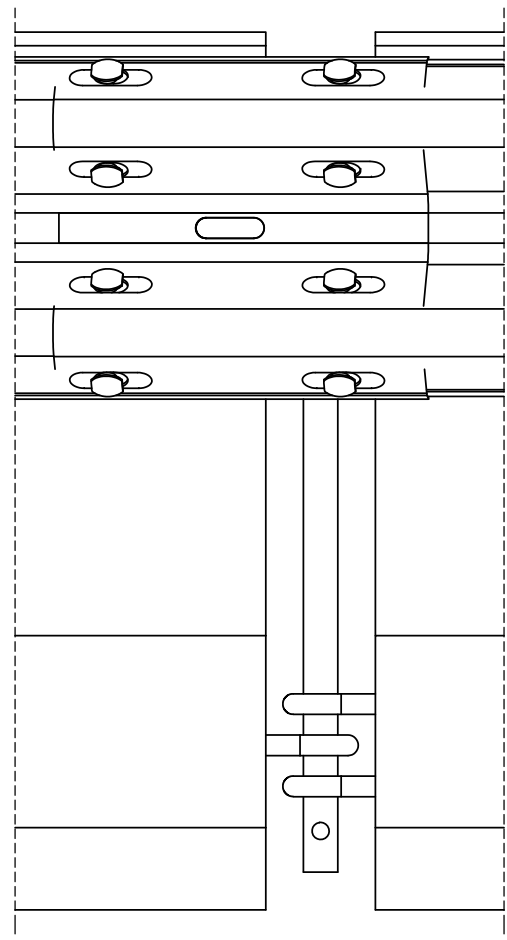
DATE:
10/20/2016

DRAWN BY:
ALL/JEK/TJ
D

REV. BY:
KAL/RWB/J
AH



DETAIL 0 (PORTABLE CONCRETE BARRIER HIDDEN)
BACKSIDE DETAIL



DETAIL 0



Midwest Roadside
Safety Facility

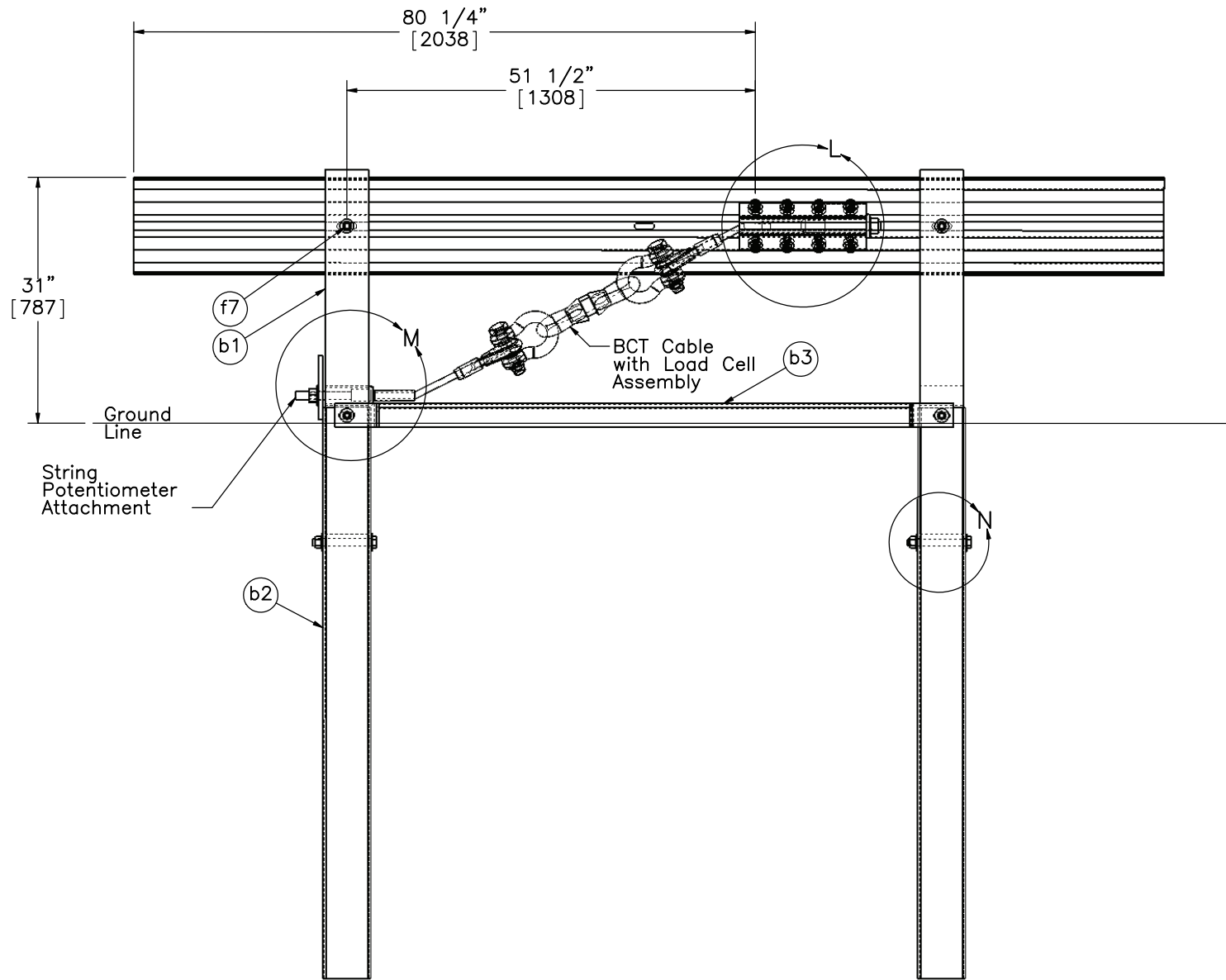
NDOR PCB-MGS
Transition Layout 2

Description of View

DWG. NAME:
PCB-MGS_Trans_Layout 2_R9

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

SHEET:
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DATE:
10/20/2016
DRAWN BY:
ALL/JEK/TJD
REV. BY:
KAL/RWB/JAH



SECTION C-C



Midwest Roadside
Safety Facility

NDOR PCB-MGS
Transition Layout 2

End Section Detail

DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

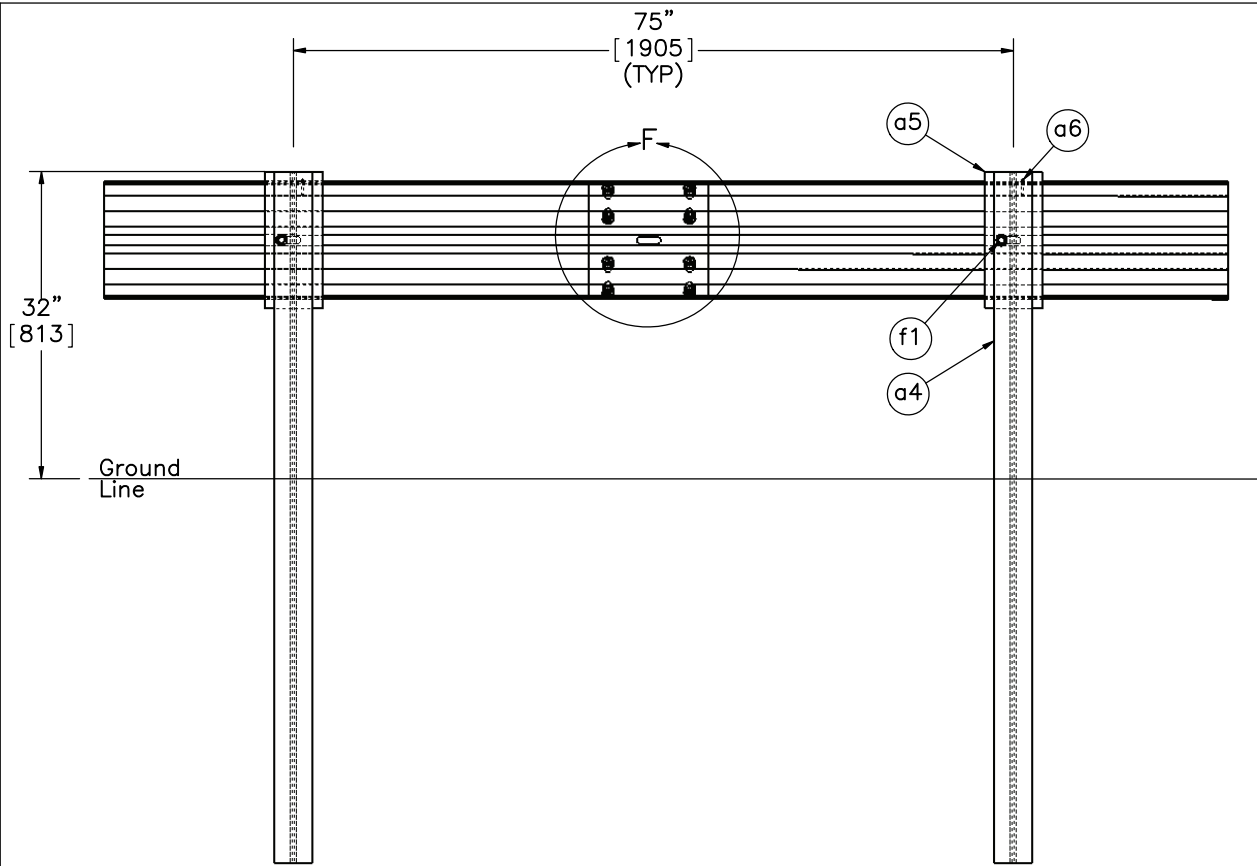
SCALE: 1:20
UNITS: in.[mm]

SHEET:
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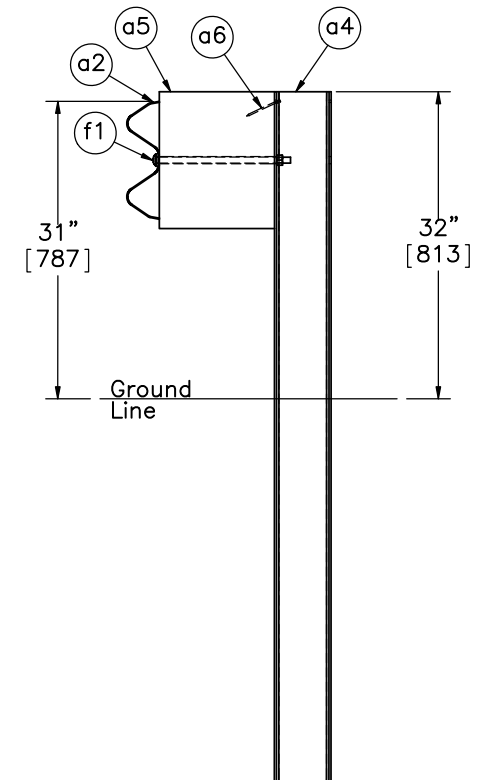
DATE:
10/20/2016

DRAWN BY:
ALL/JEK/TJ
D

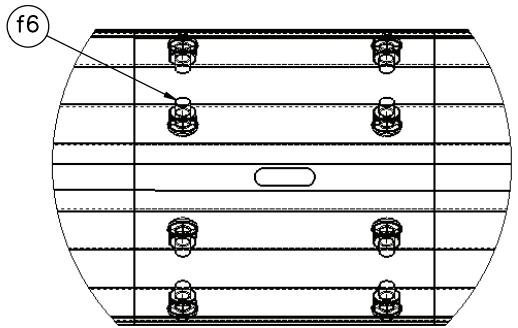
REV. BY:
KAL/RWB/J
AH



SECTION D-D



SECTION E-E



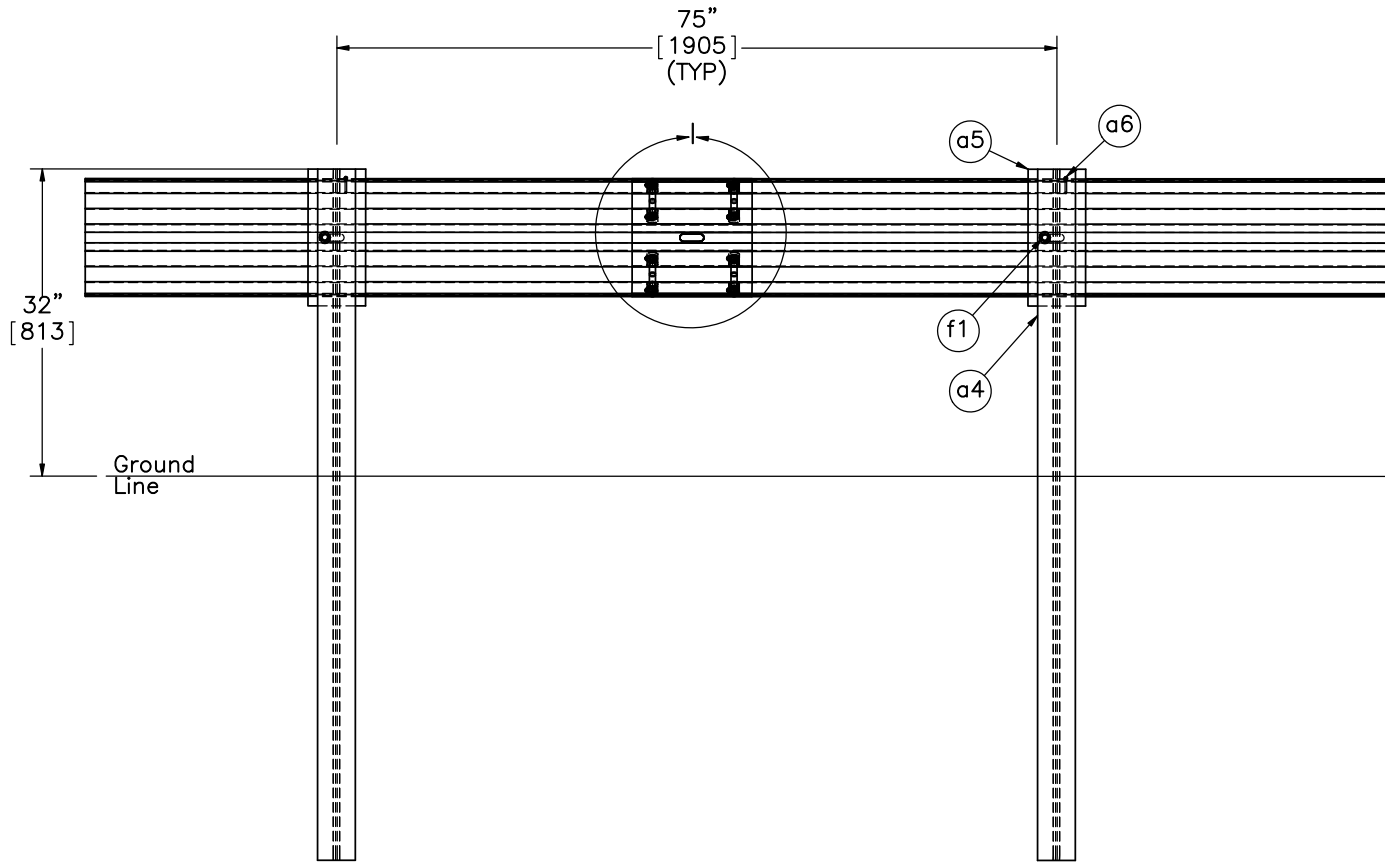
DETAIL F
SCALE 1 : 8



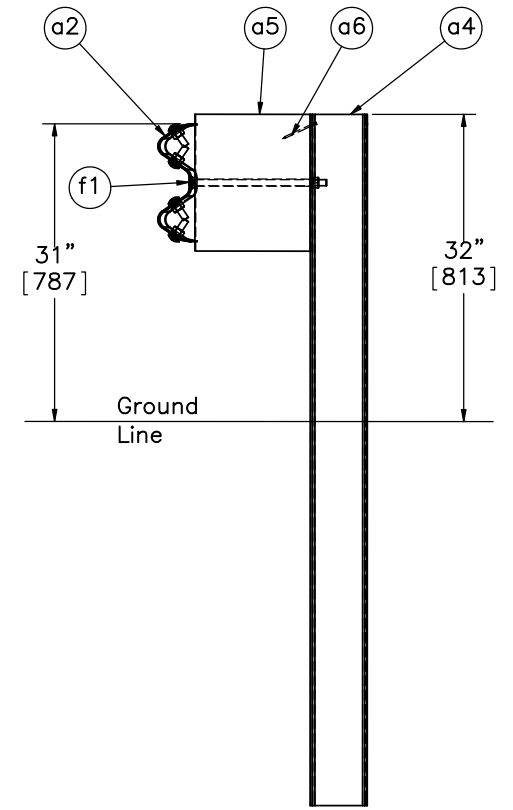
Midwest Roadside Safety Facility

NDOR PCB-MGS Transition Layout 2
 Splice and Post nos. 3-12 Detail
 DWG. NAME: PCB-MGS_Trans_Layout_2_R9
 SCALE: 1:20
 UNITS: in.[mm]

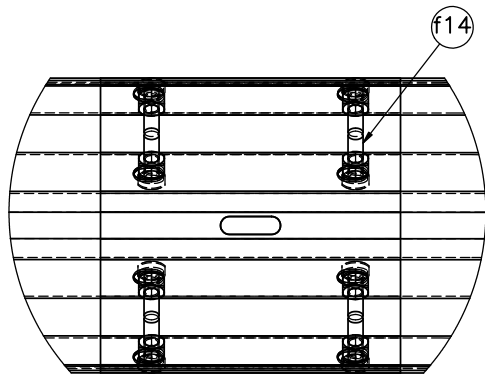
SHEET: 6 of 36
 DATE: 10/20/2016
 DRAWN BY: ALL/JEK/TJD
 REV. BY: KAL/RWB/JAH



SECTION G-G



SECTION H-H



DETAIL 1
SCALE 1 : 8



Midwest Roadside
Safety Facility

NDOR PCB-MGS
Transition Layout 2

Splice and Post nos. 13-18
Detail

DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

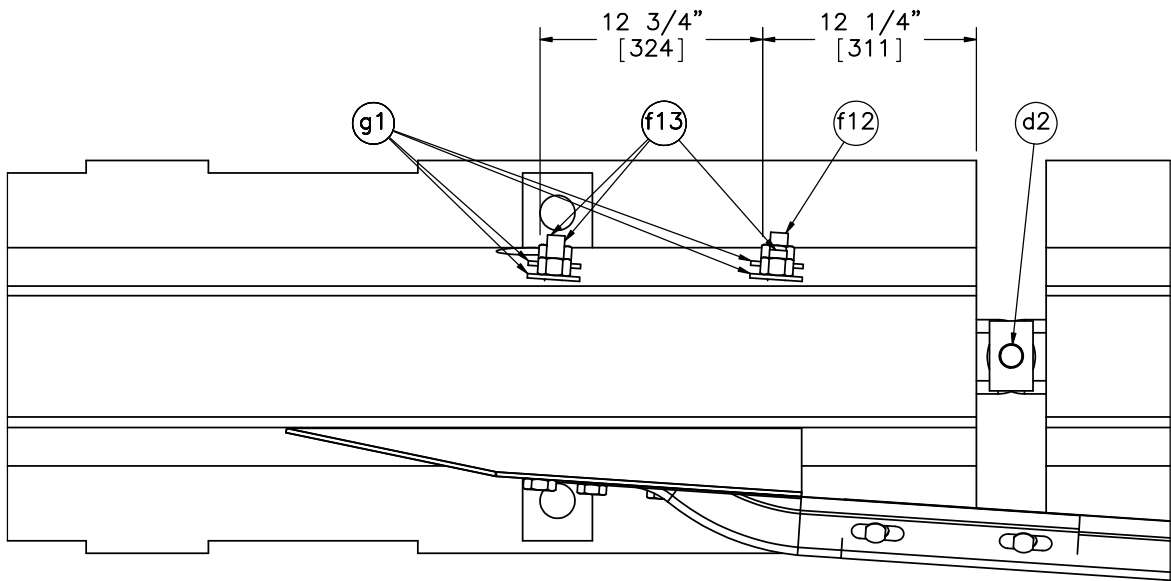
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UNITS: in.[mm]

SHEET:
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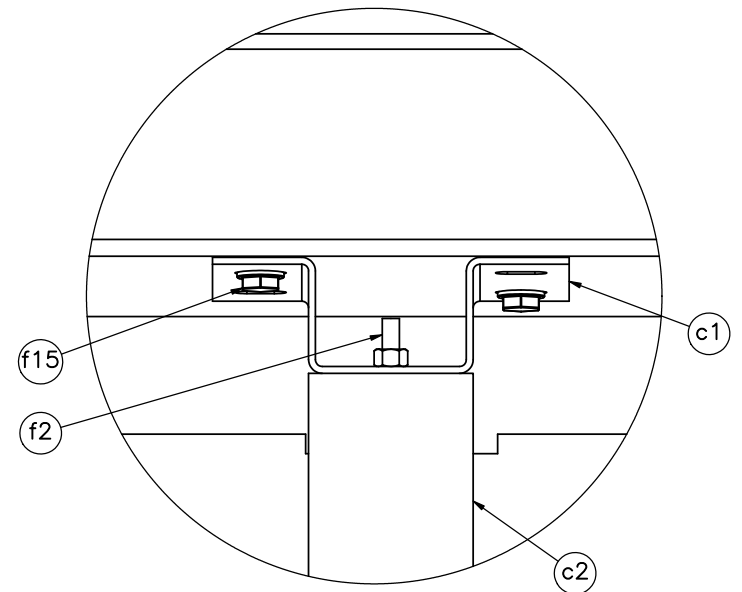
DATE:
10/20/2016

DRAWN BY:
ALL/JEK/TJ
D

REV. BY:
KAL/RWB/J
AH



DETAIL K



DETAIL J
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.



Midwest Roadside
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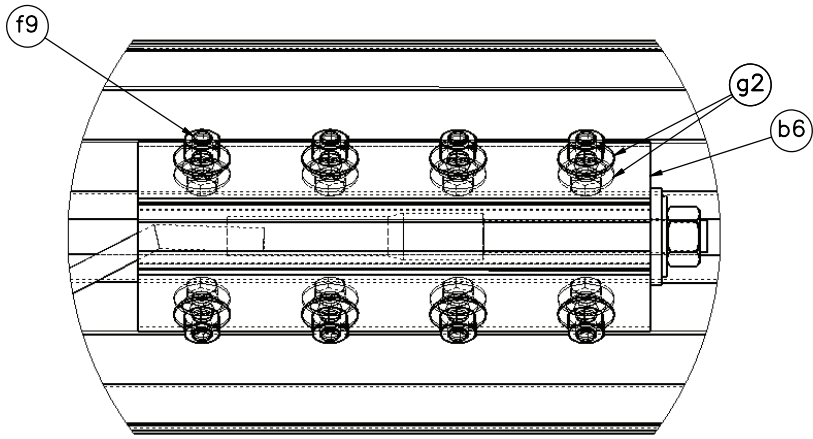
NDOR PCB-MGS
Transition Layout 2

Transition Connection Detail

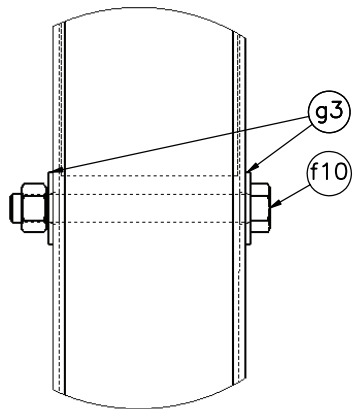
DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

SCALE: 1:11
UNITS: in.[mm]

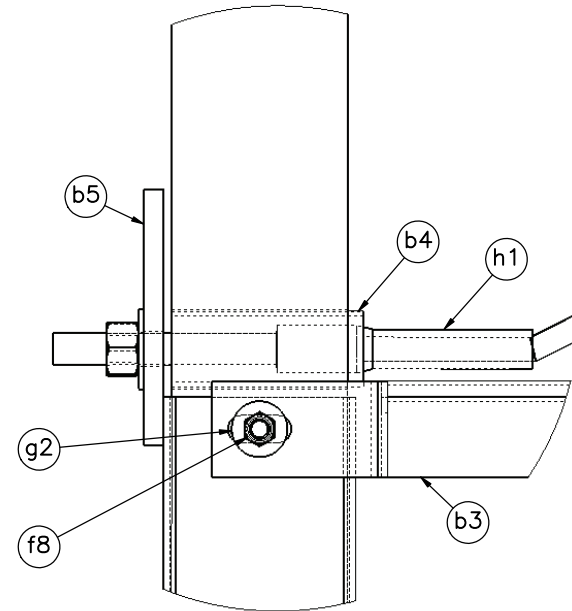
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DETAIL L



DETAIL N



DETAIL M

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



Midwest Roadside
Safety Facility

NDOR PCB-MGS
Transition Layout 2

BCT Anchor Detail

DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

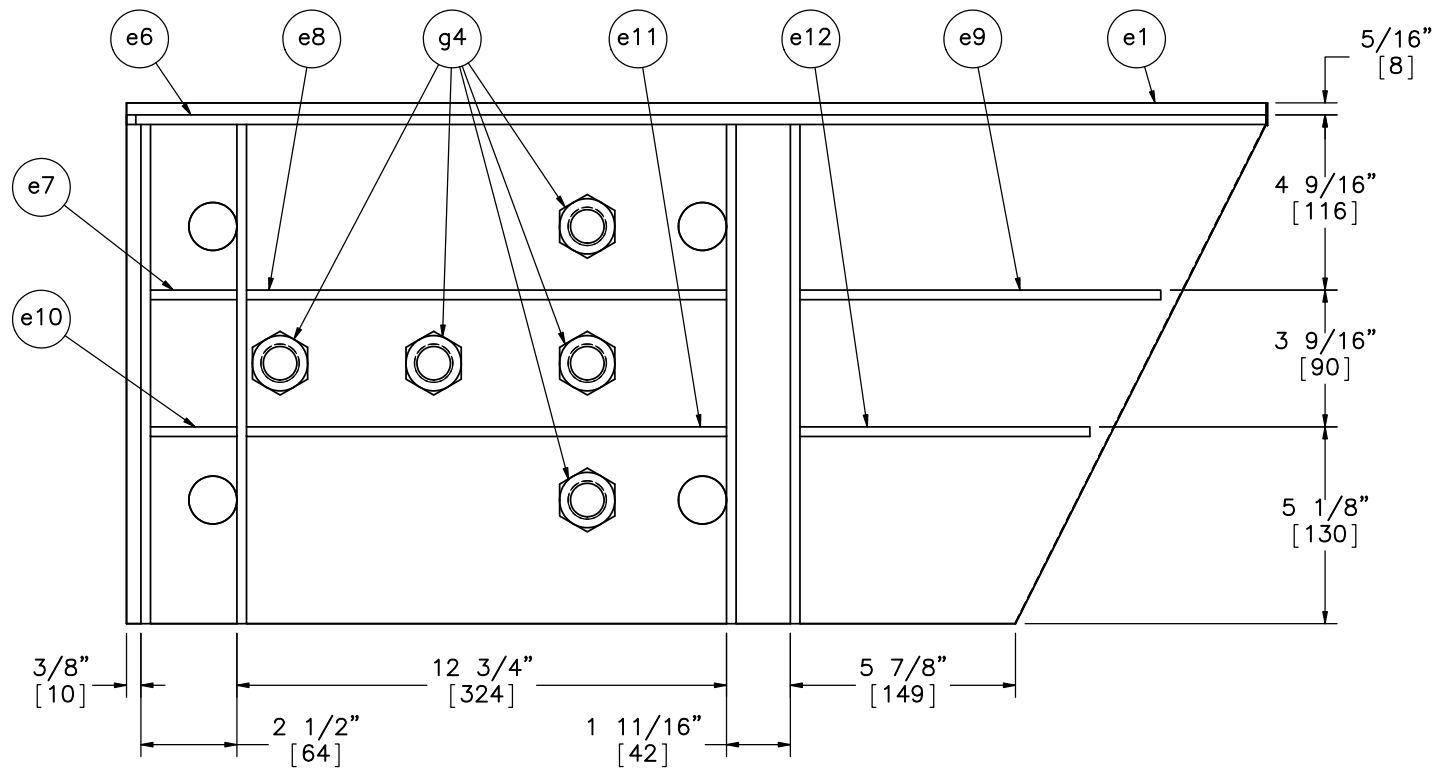
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UNITS: in.[mm]

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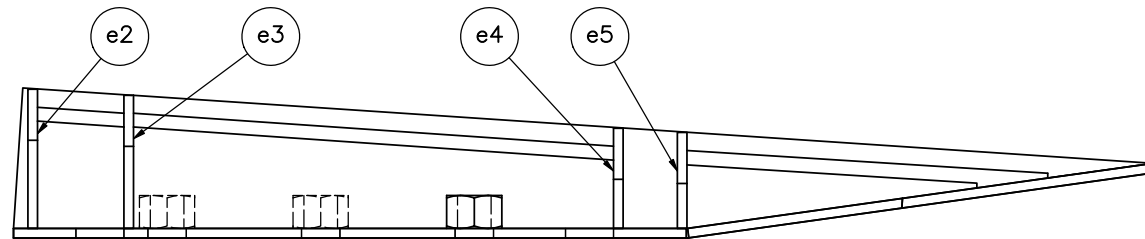
DATE:
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AH



BACK ELEVATION VIEW



BOTTOM PLAN VIEW



Midwest Roadside
Safety Facility

NDOR PCB-MGS
Transition Layout 2

Connector Plate Detail

DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

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

SHEET:
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REV. BY:
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AH

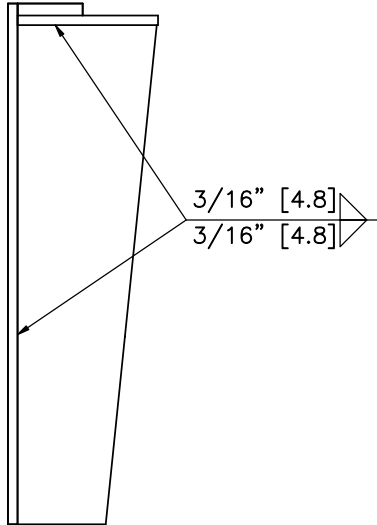


3/16" [4.8]
3/16" [4.8]

PLAN VIEW

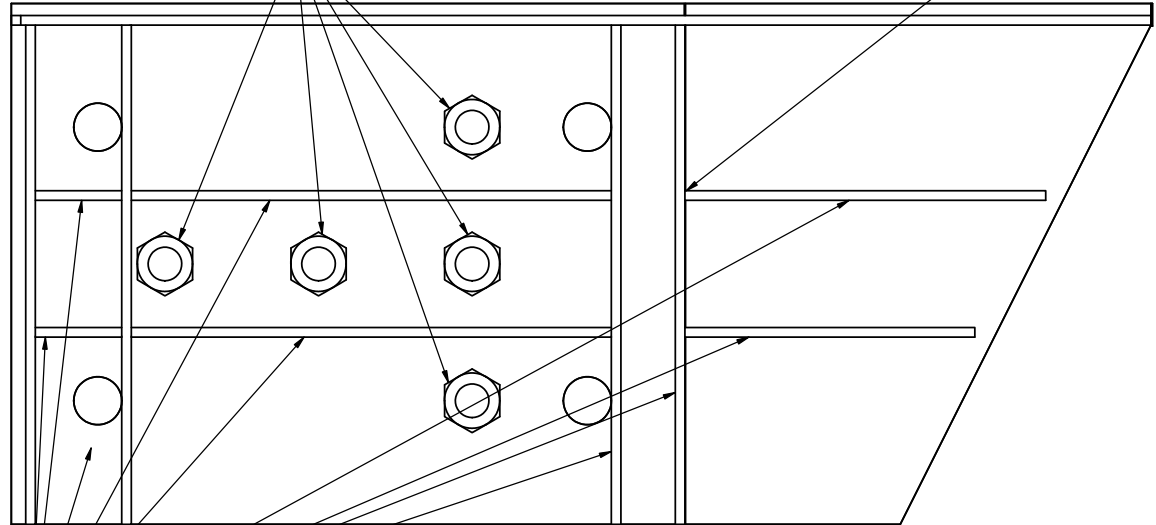
1/4" [6.4] 2 sides

3/16" [4.8]
3/16" [4.8] TYP.



3/16" [4.8]
3/16" [4.8]

PROFILE VIEW



3/16" [4.8] [25-51]
3/16" [4.8] [25-51]

BACK ELEVATION VIEW



Midwest Roadside
Safety Facility

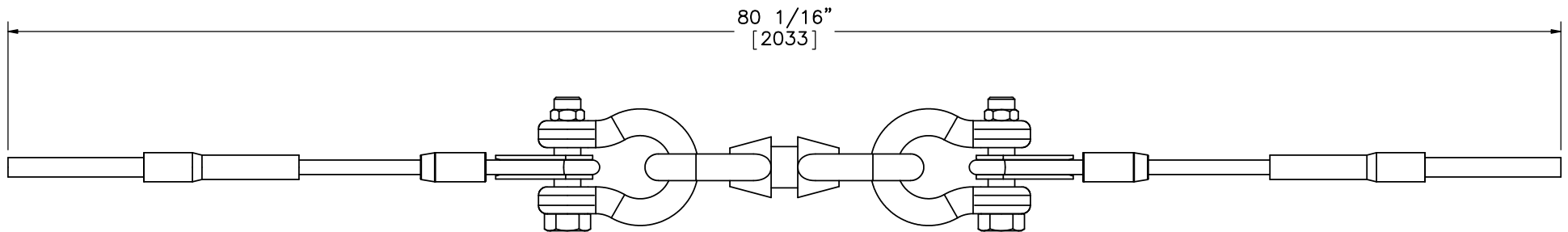
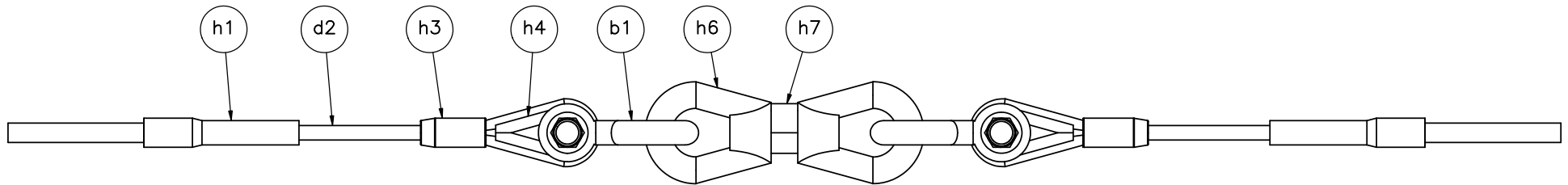
NDOR PCB-MGS
Transition Layout 2

Connector Plate Weld Detail

DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

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

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DRAWN BY:
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D
REV. BY:
KAL/RWB/J
AH



Note: (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 Layout 2

BCT Anchor Cable and Load
Cell Detail

DWG. NAME:
PCB-MGS_Trans_Layout 2_R9

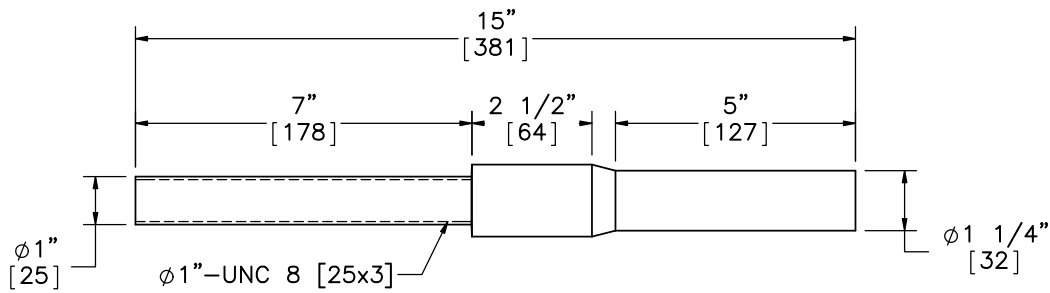
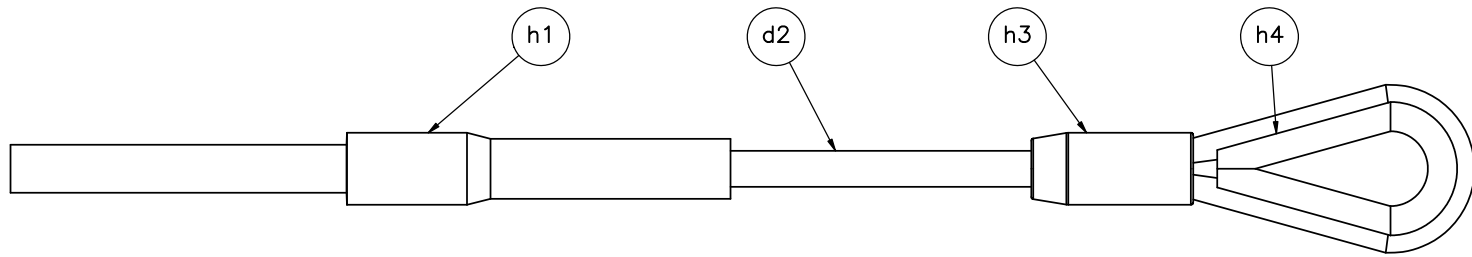
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UNITS: in.[mm]

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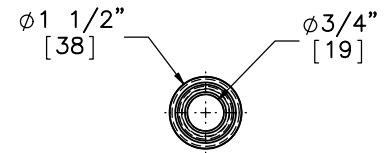
DATE:
10/20/2016

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D

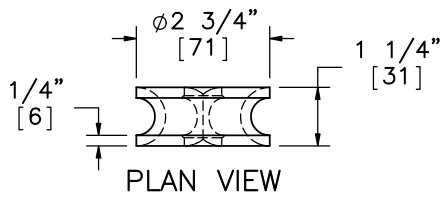
REV. BY:
KAL/RWB/J
AH



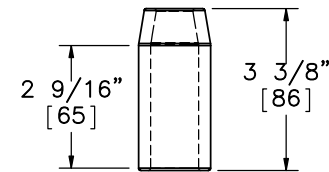
Part h1



PLAN VIEW

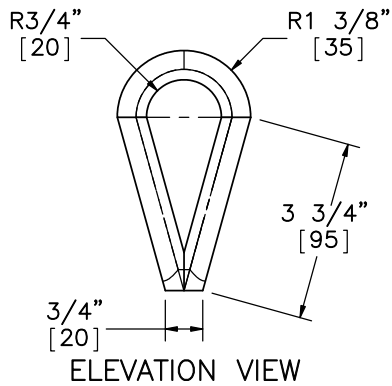


PLAN VIEW



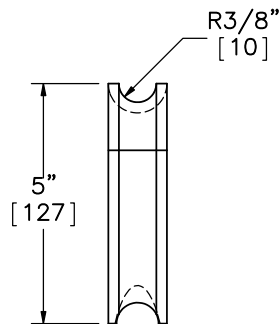
ELEVATION VIEW

Part h3



ELEVATION VIEW

Part h4



PROFILE VIEW



Midwest Roadside
Safety Facility

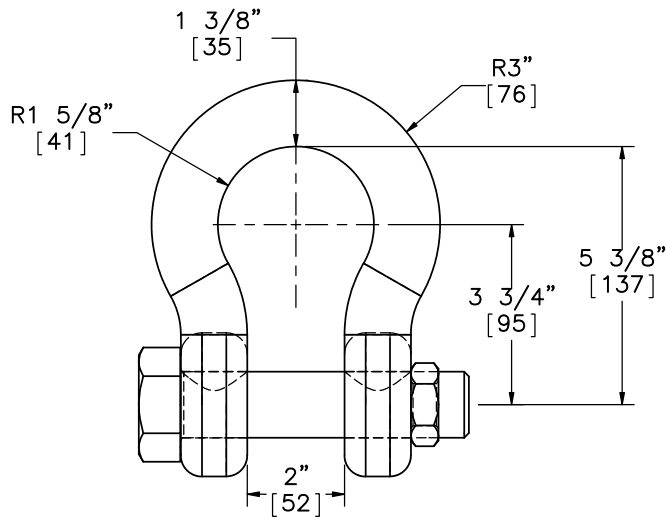
NDOR PCB-MGS
Transition Layout 2

Modified BCT Anchor Cable

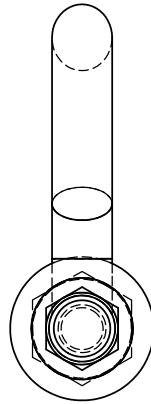
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PCB-MGS_Trans_Layout_2_R9

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

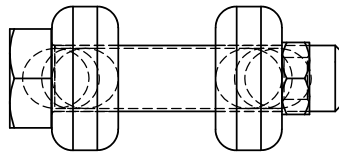
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REV. BY:
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AH



ELEVATION VIEW

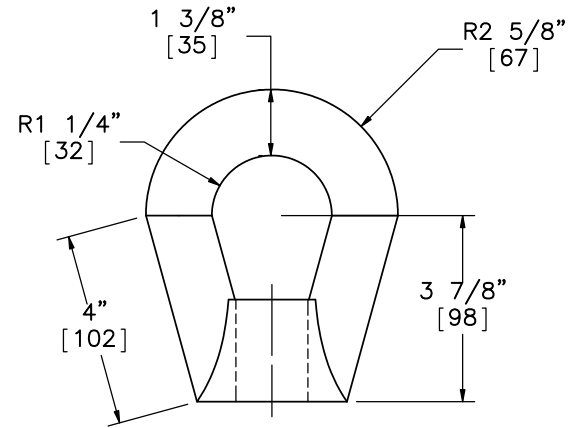


PROFILE VIEW

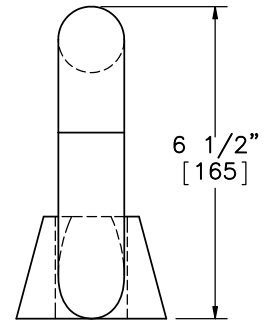


PLAN VIEW

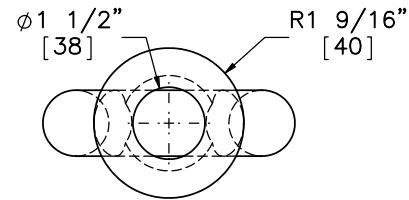
Part h5



ELEVATION VIEW



PROFILE VIEW



PLAN VIEW

Part h6



Midwest Roadside
Safety Facility

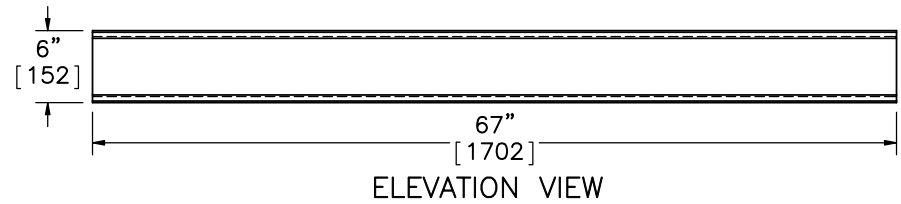
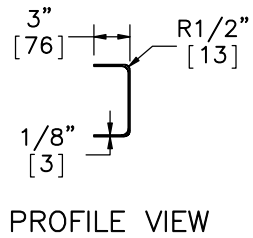
NDOR PCB-MGS
Transition Layout 2

Shackle and Eye Nut Detail

DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

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

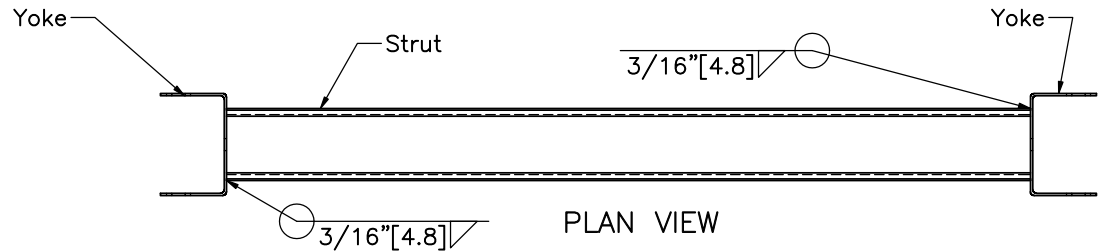
SHEET:
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DRAWN BY:
ALL/JEK/TJ
D
REV. BY:
KAL/RWB/J
AH



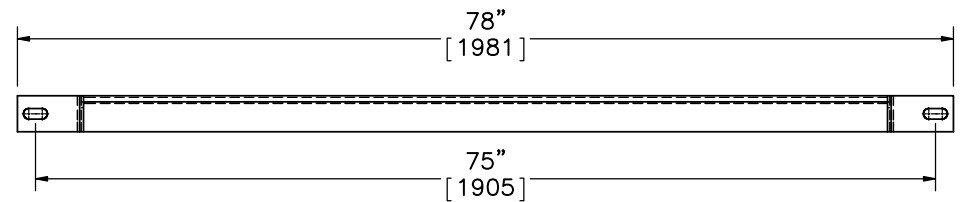
PROFILE VIEW

ELEVATION VIEW

Strut

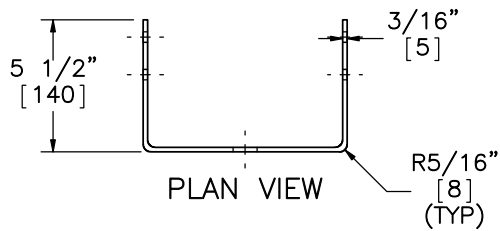


PLAN VIEW

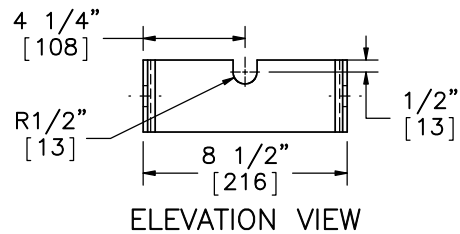


ELEVATION VIEW

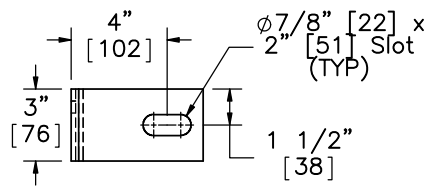
Part b3



PLAN VIEW



ELEVATION VIEW



PROFILE VIEW

Yoke
SCALE 1 : 8



Midwest Roadside
Safety Facility

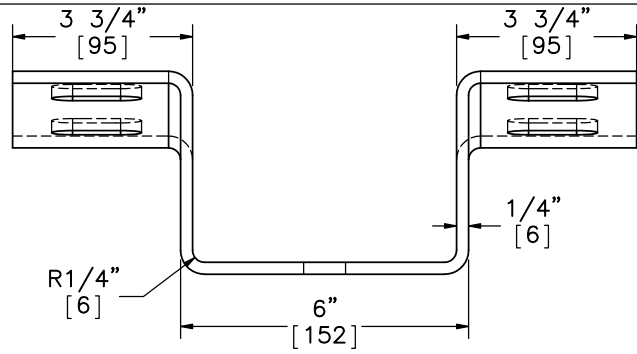
NDOR PCB-MGS
Transition Layout 2

Ground Strut Detail

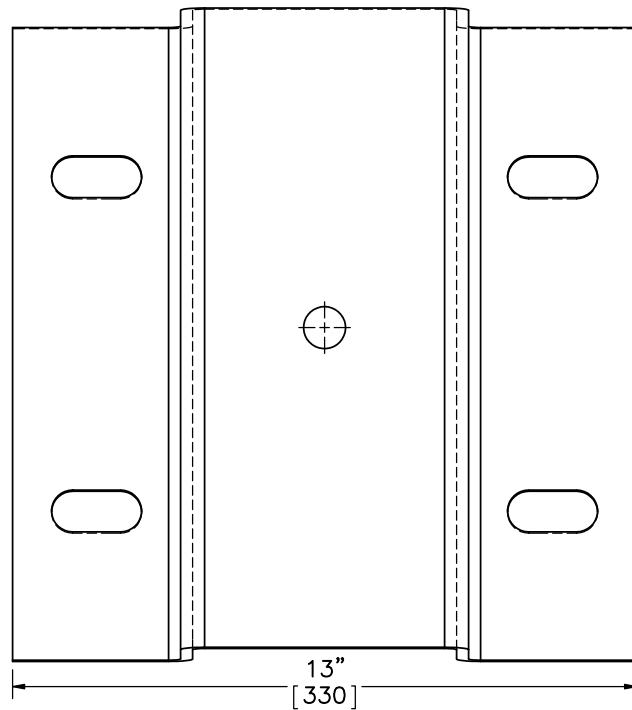
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PCB-MGS_Trans_Layout_2_R9

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UNITS: in.[mm]

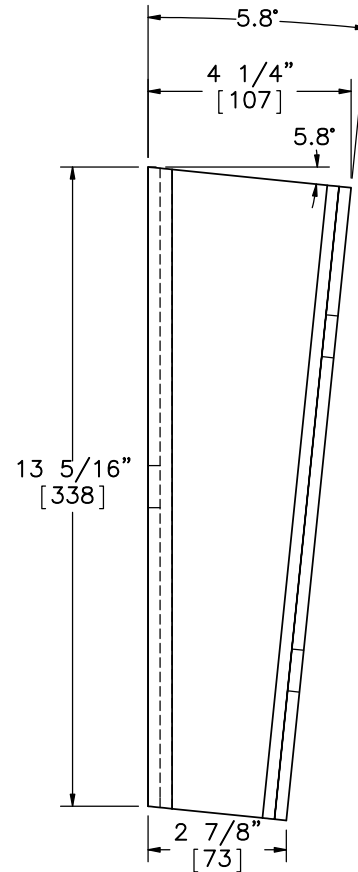
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DATE:
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DRAWN BY:
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D
REV. BY:
KAL/RWB/J
AH



PLAN VIEW



ELEVATION VIEW



PROFILE VIEW

Part c1



Midwest Roadside
Safety Facility

NDOR PCB-MGS
Transition Layout 2

Blockout Mounting Plate

DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

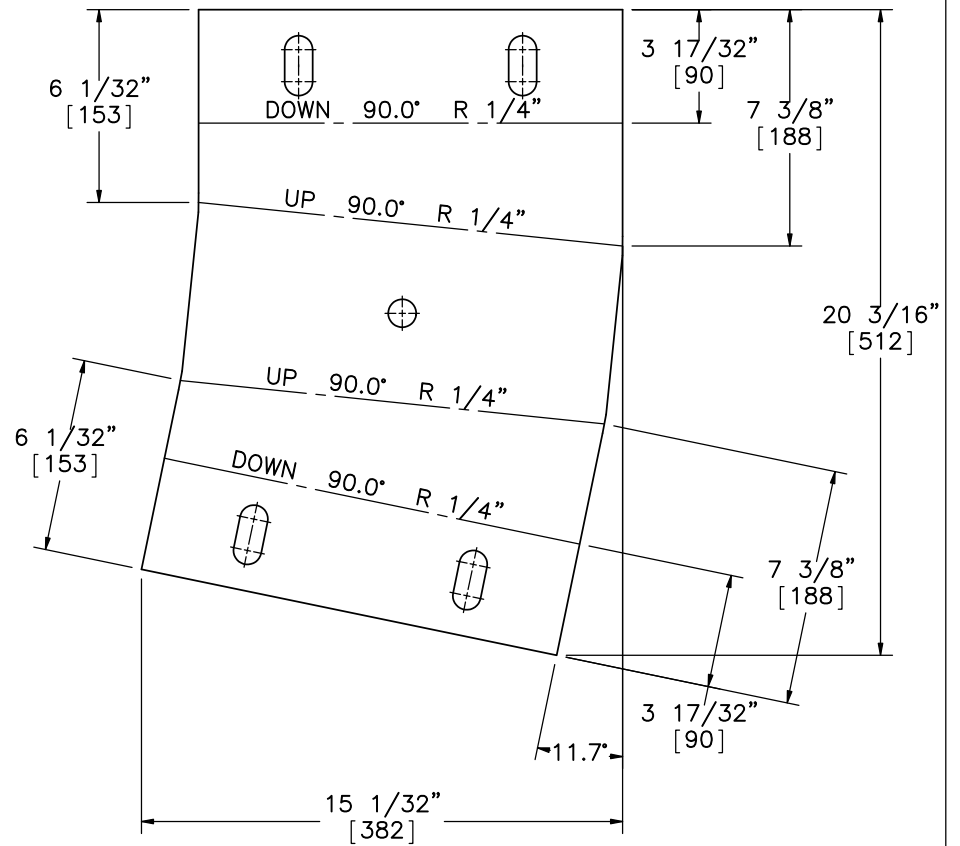
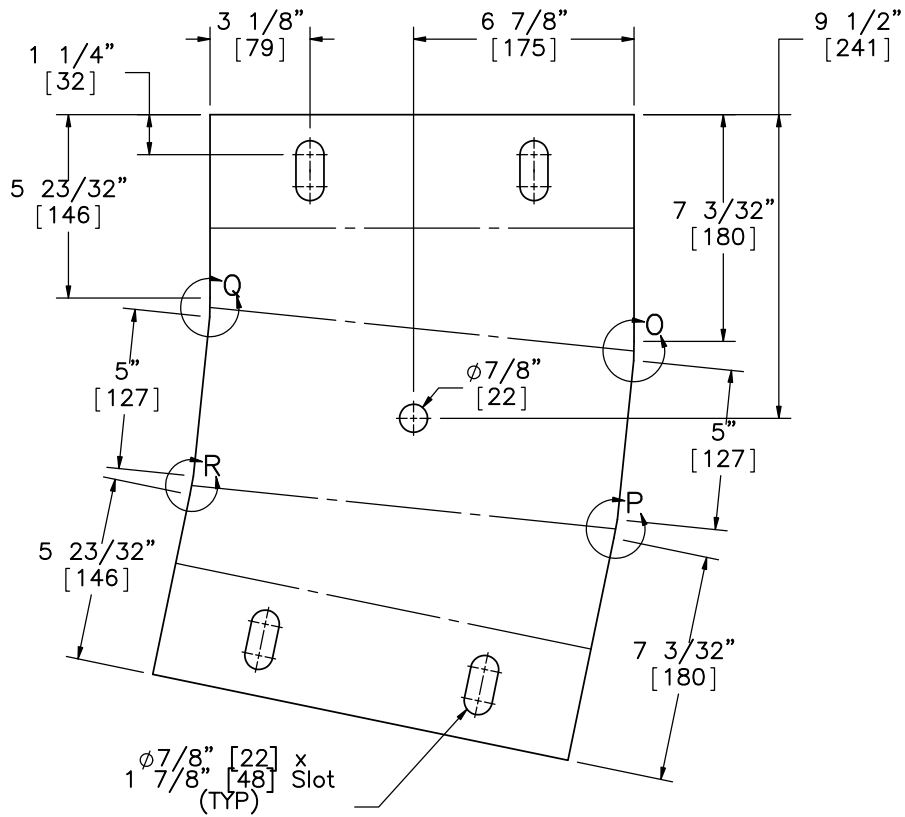
SCALE: 1:4
UNITS: in.[mm]

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DRAWN BY:
ALL/JEK/TJ
D

REV. BY:
KAL/RWB/J
AH



Note: (1) Thickness of Blockout Mounting Plate is $1/4''$ [6].



Midwest Roadside
Safety Facility

NDOR PCB-MGS
Transition Layout 2

Blockout Mounting Plate - Flat
Pattern

DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

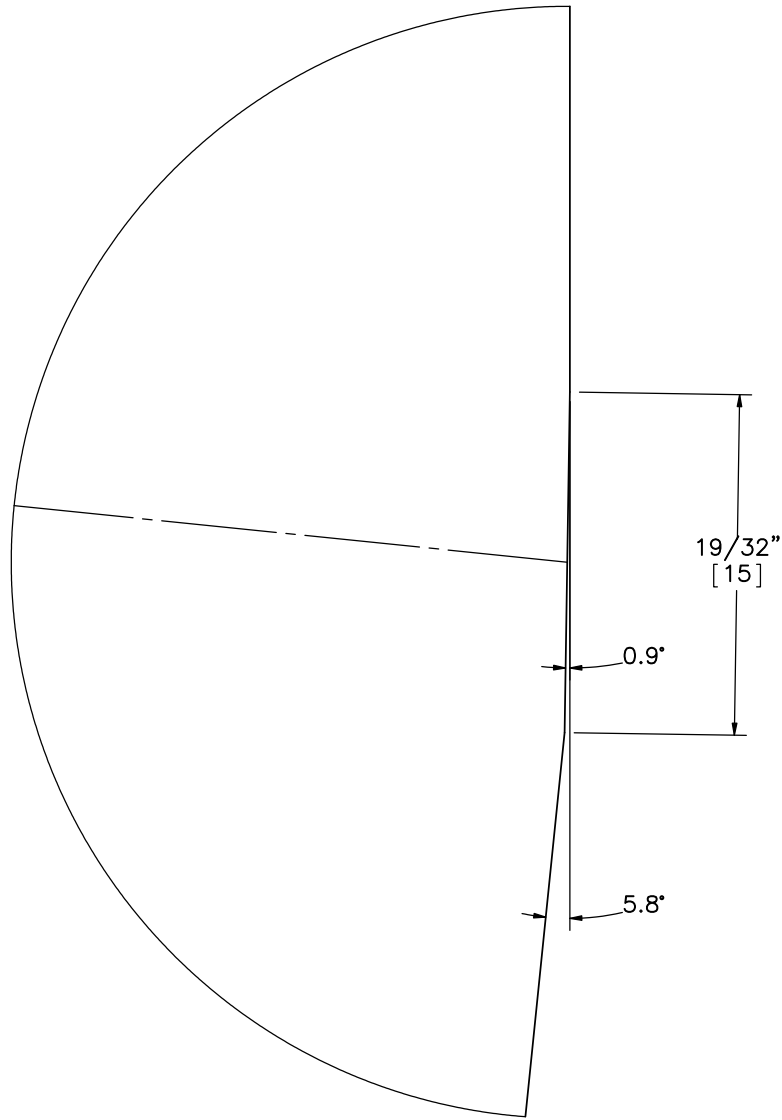
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UNITS: in.[mm]

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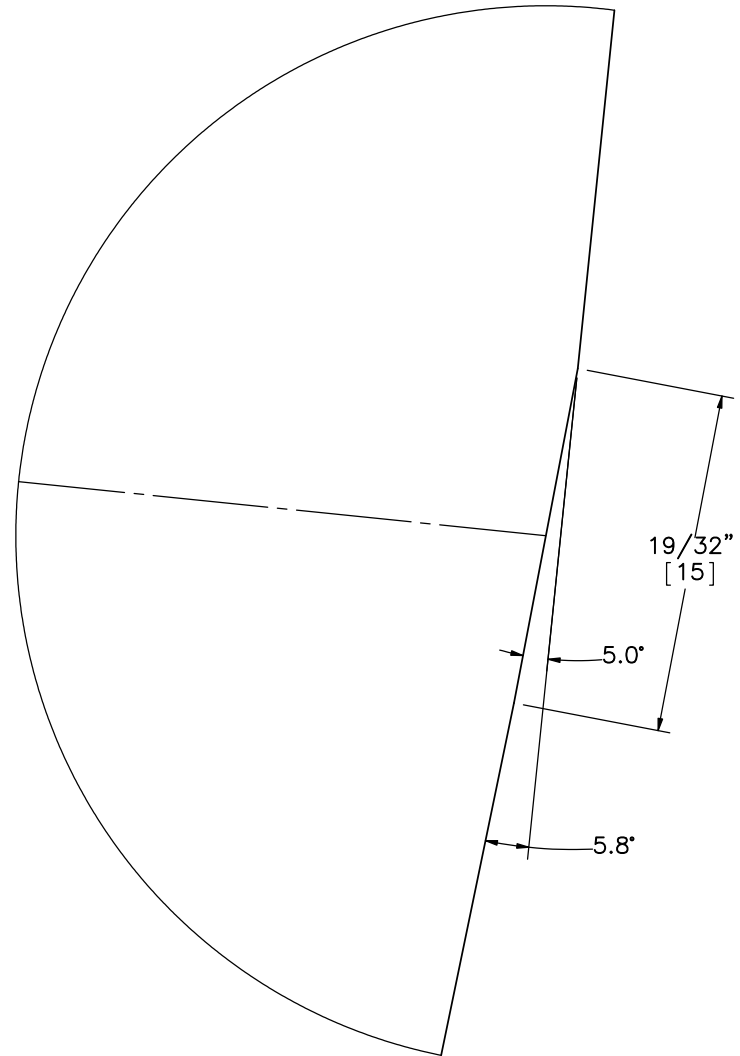
DATE:
10/20/2016

DRAWN BY:
ALL/JEK/TJ
D

REV. BY:
KAL/RWB/J
AH



DETAIL O



DETAIL P



Midwest Roadside
Safety Facility

NDOR PCB-MGS
Transition Layout 2

Blockout Mounting Plate Detail

DWG. NAME.
PCB-MGS_Trans_Layout 2_R9

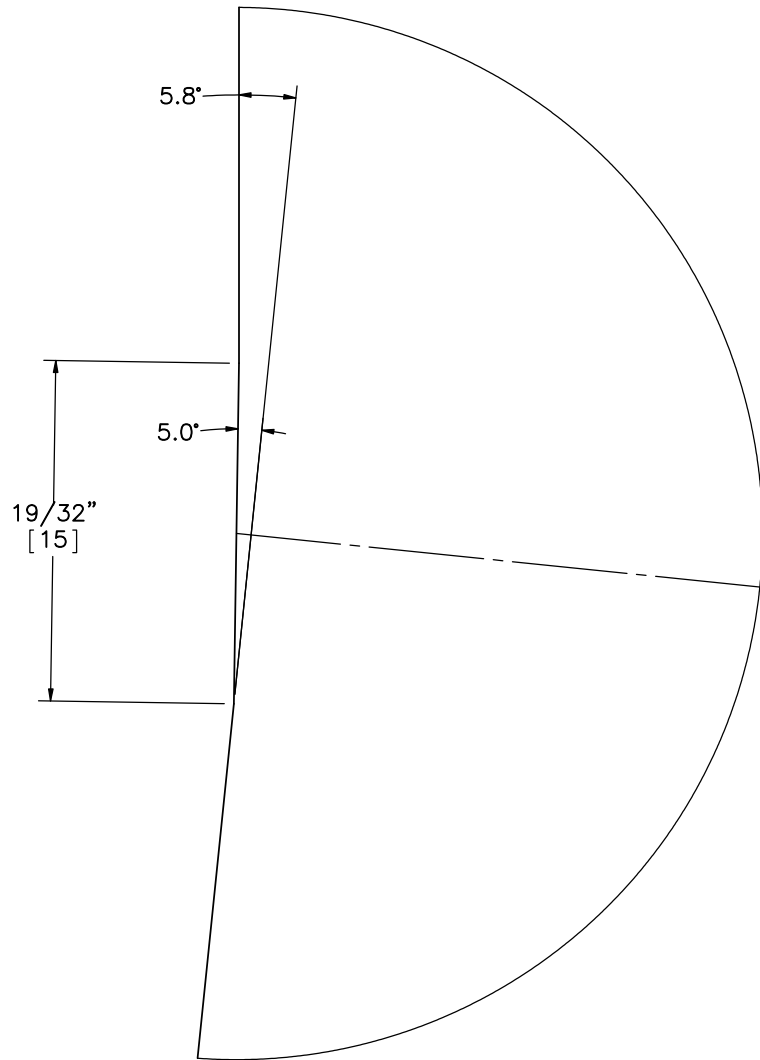
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UNITS: in.[mm]

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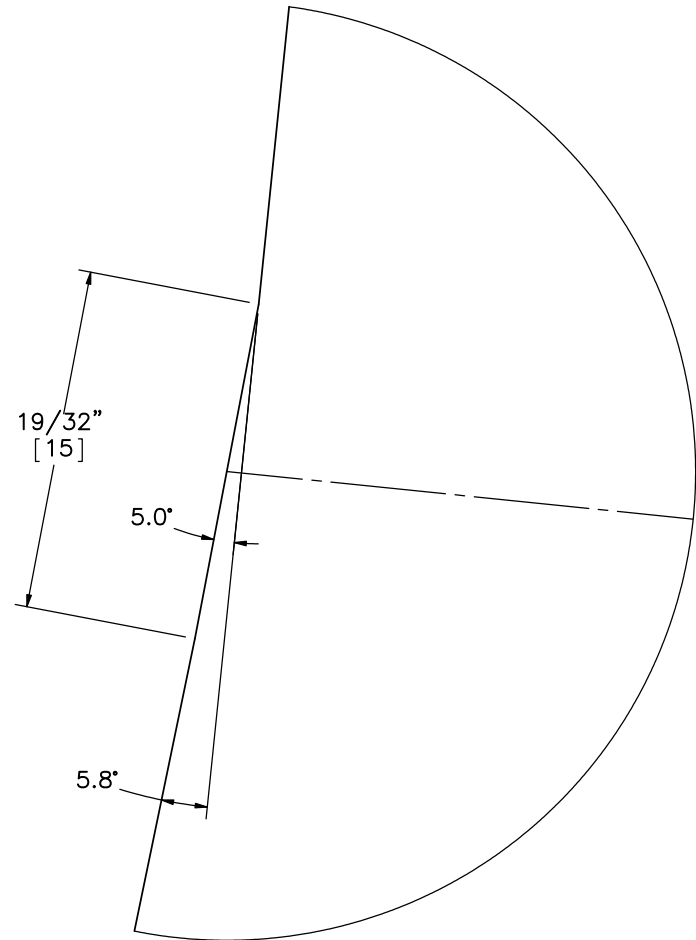
DATE:
10/20/2016

DRAWN BY:
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AH



DETAIL Q



DETAIL R



Midwest Roadside
Safety Facility

NDOR PCB-MGS
Transition Layout 2

Blockout Mounting Plate Detail

DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

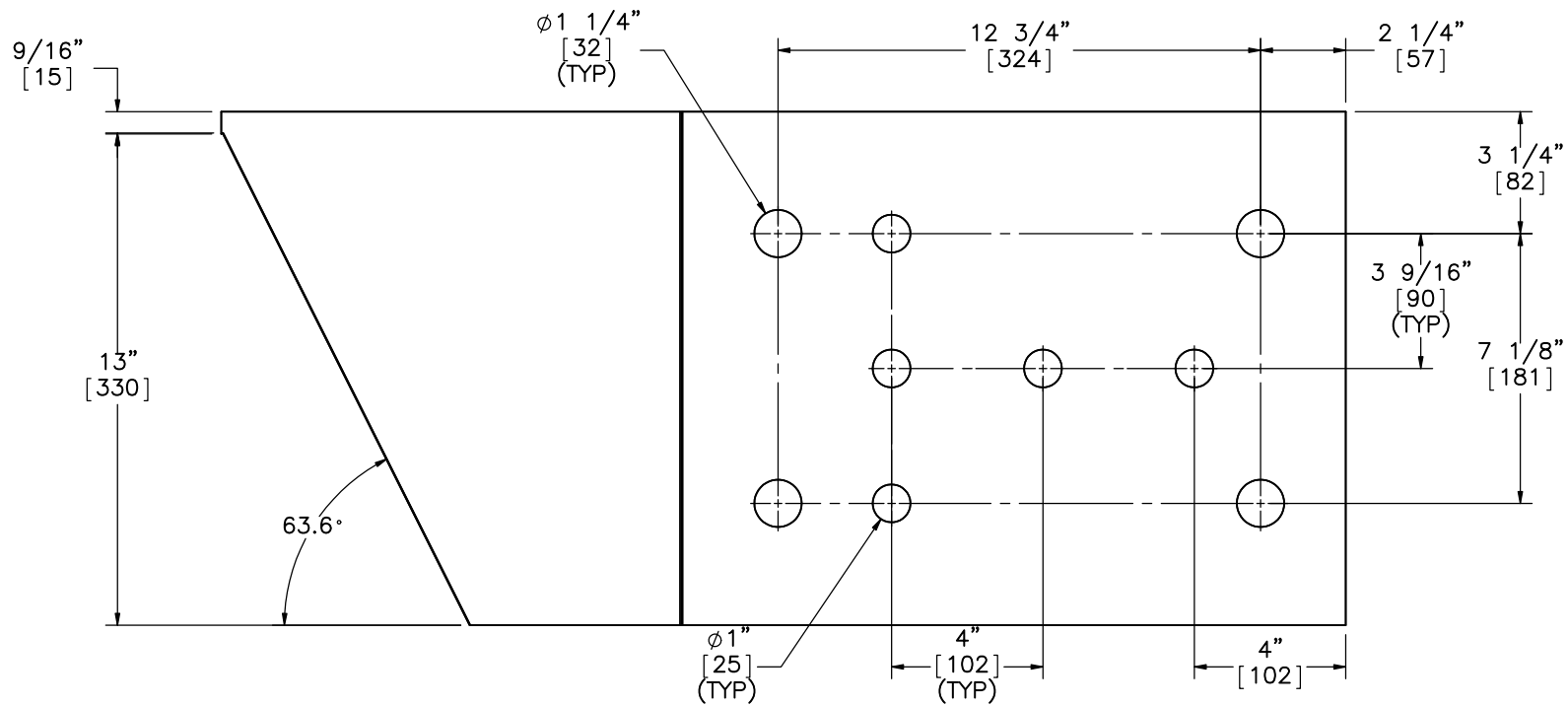
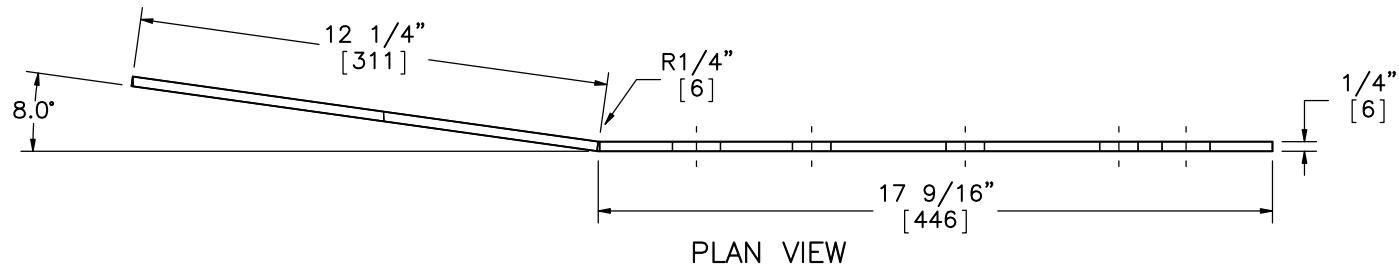
SCALE: 3:1
UNITS: in.[mm]

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Midwest Roadside
Safety Facility

NDOR PCB-MGS
Transition Layout 2

Connector Plate Face Plate

DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

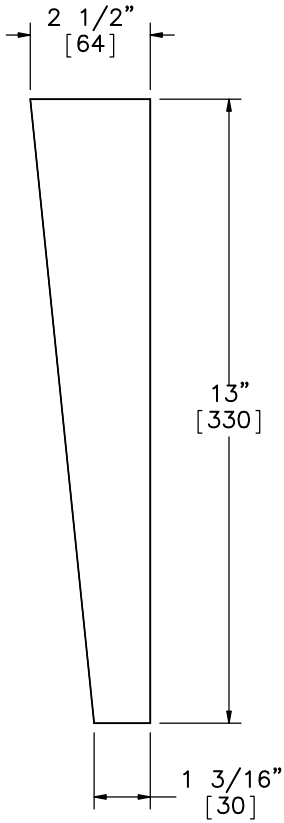
SCALE: 1:5
UNITS: in.[mm]

SHEET:
20 of 36

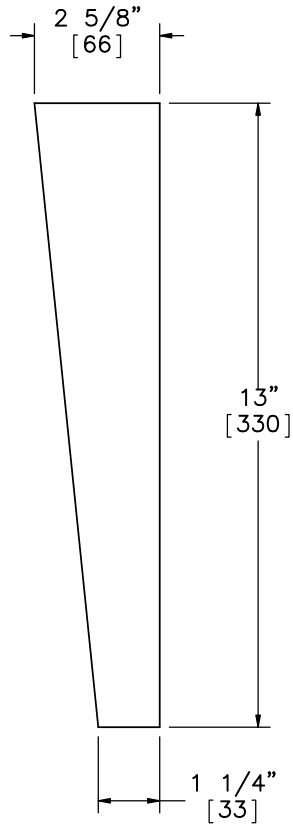
DATE:
10/20/2016

DRAWN BY:
ALL/JEK/TJ
D

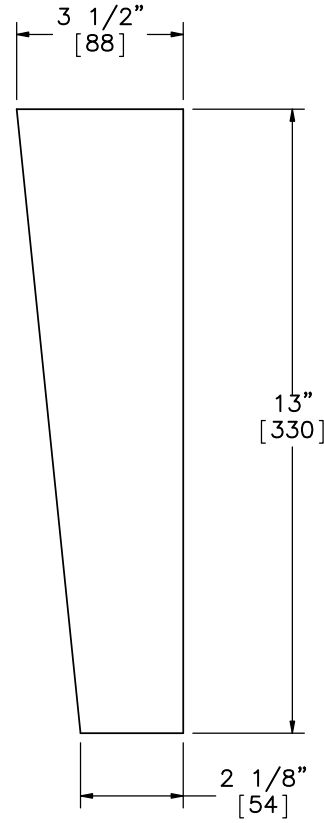
REV. BY:
KAL/RWB/J
AH



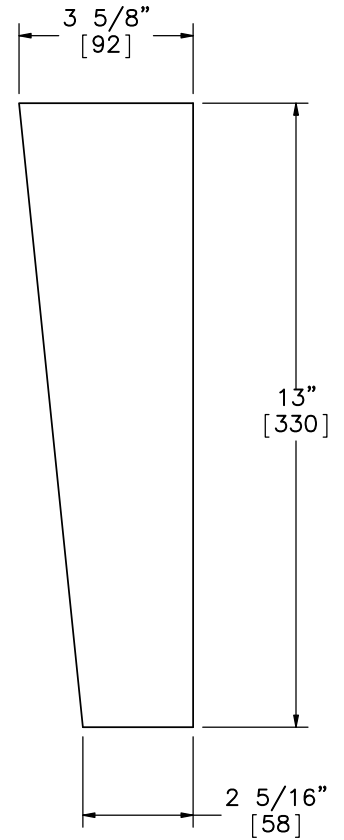
Part e5



Part e4



Part e3



Part e2

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



Midwest Roadside
Safety Facility

NDOR PCB-MGS
Transition Layout 2

Connector Plate Vertical
Gussets

DWG. NAME:
PCB-MGS_Trans_Layout 2_R9

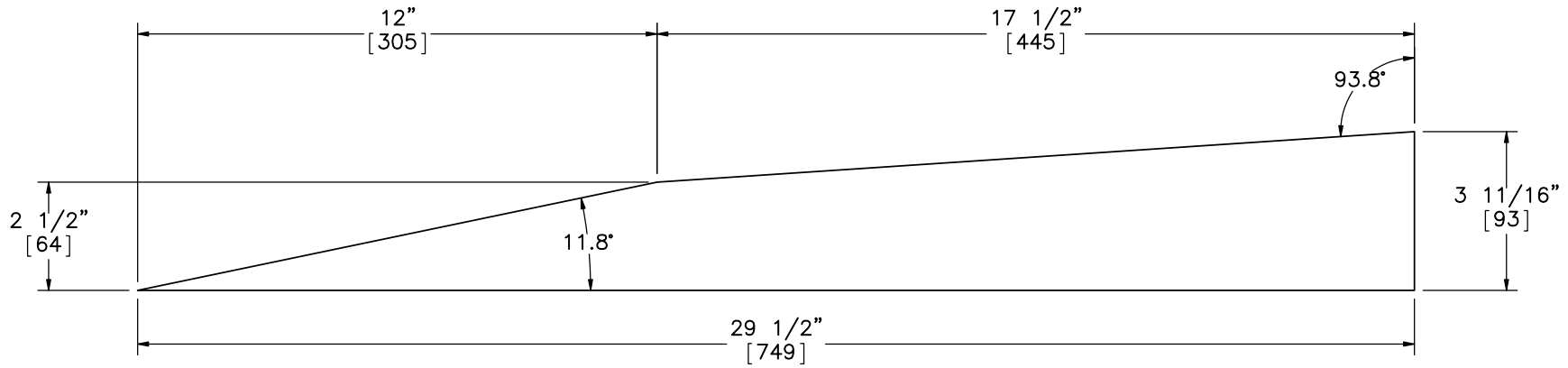
SCALE: 1:4
UNITS: in.[mm]

SHEET:
21 of 36

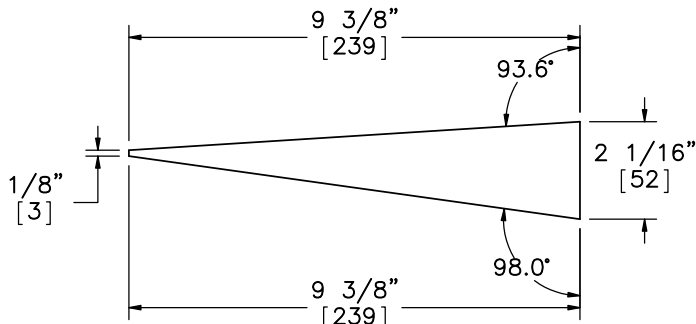
DATE:
10/20/2016

DRAWN BY:
ALL/JEK/TJ
D

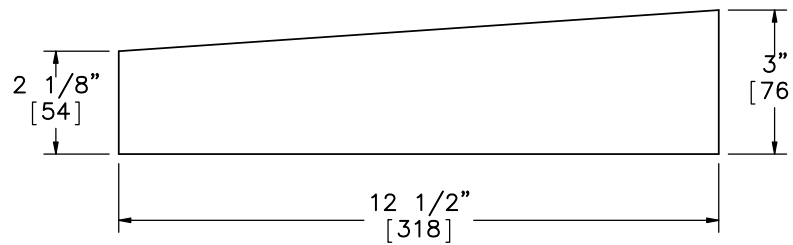
REV. BY:
KAL/RWB/J
AH



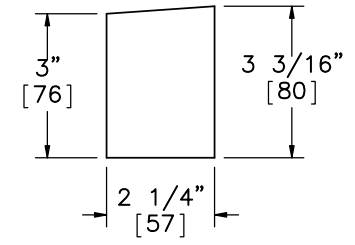
Part e6



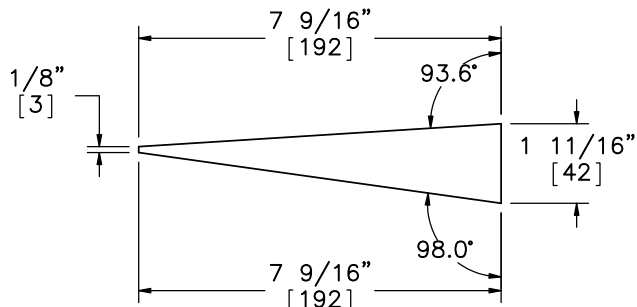
Part e9



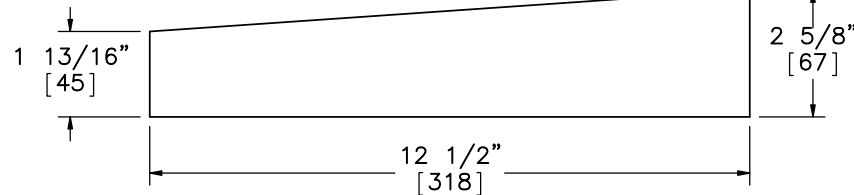
Part e8



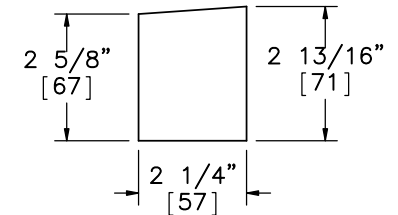
Part e7



Part e12



Part e11



Part e10

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



Midwest Roadside Safety Facility

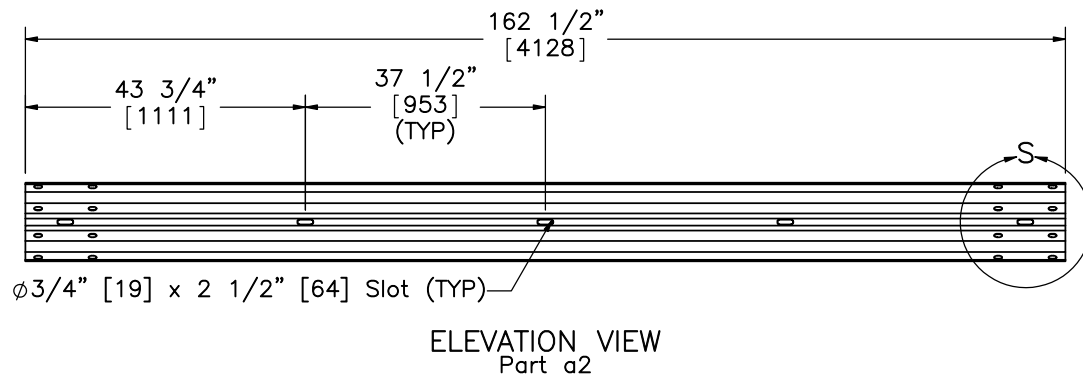
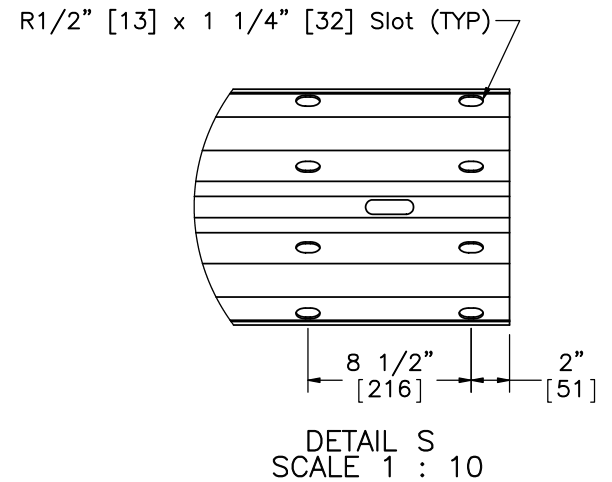
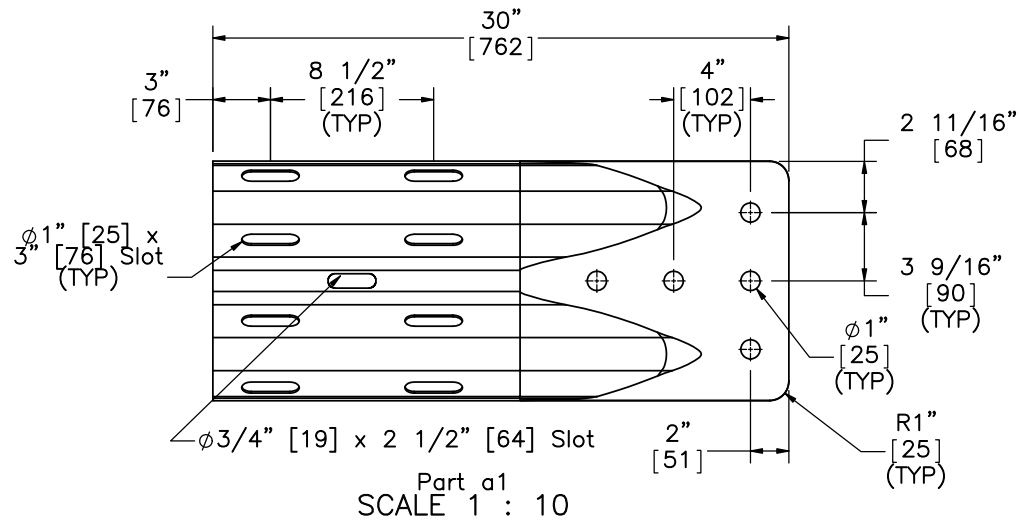
NDOR PCB-MGS Transition Layout 2

Connector Plate Horizontal Gussets

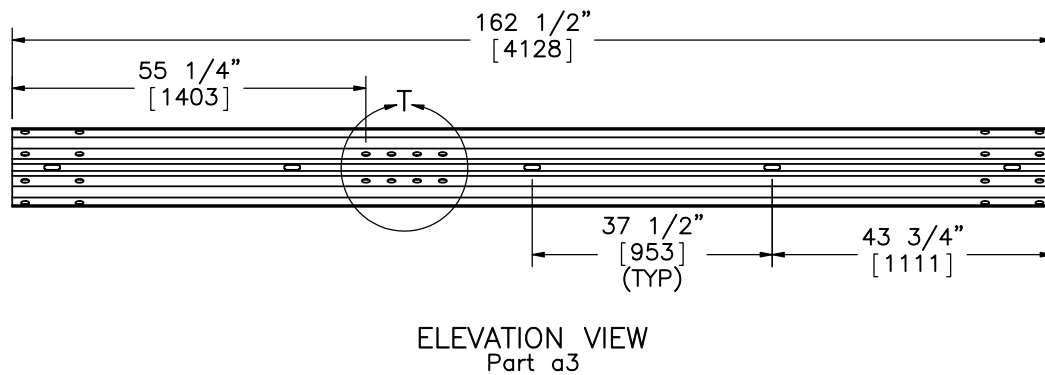
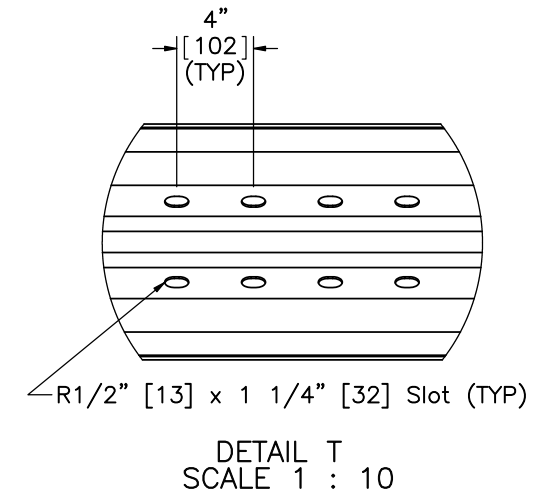
DWG. NAME:
PCB-MGS_Trans_Layout 2_R9

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

SHEET:
22 of 36
DATE:
10/20/2016
DRAWN BY:
ALL/JEK/TJ/D
REV. BY:
KAL/RWB/JAH

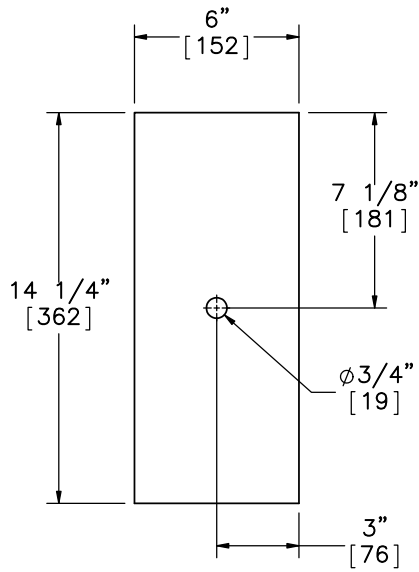



 PROFILE VIEW

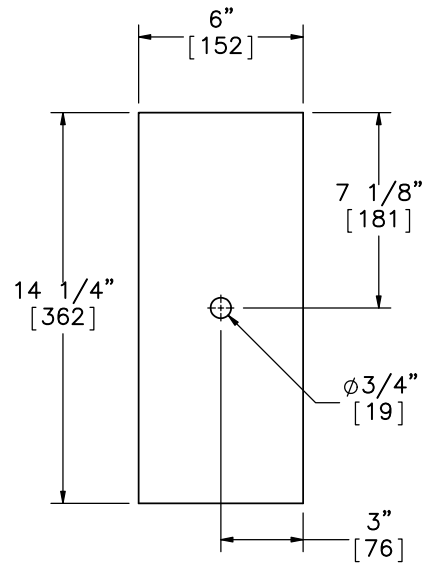


Midwest Roadside
 Safety Facility

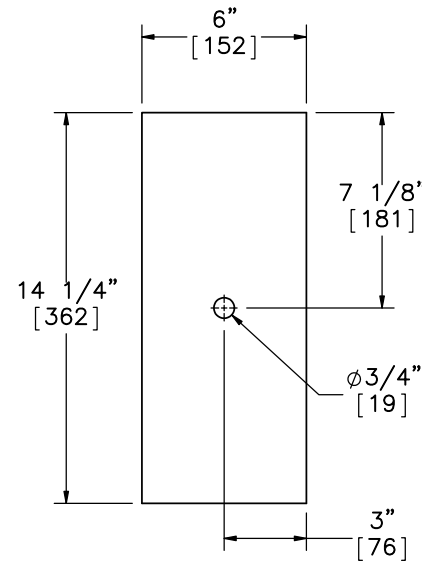
NDOR PCB-MGS Transition Layout 2		SHEET: 23 of 36
		DATE: 10/20/2016
W-Beam Section Details		DRAWN BY: ALL/JEK/TJ D
DWG. NAME: PCB-MGS_Trans_Layout_2_R9	SCALE: 1:30 UNITS: in.[mm]	REV. BY: KAL/RWB/J AH



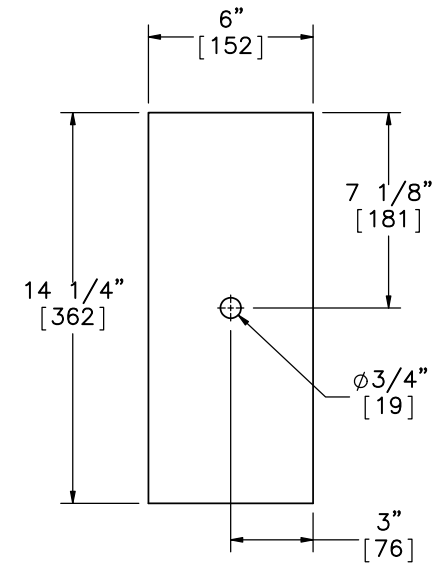
ELEVATION VIEW



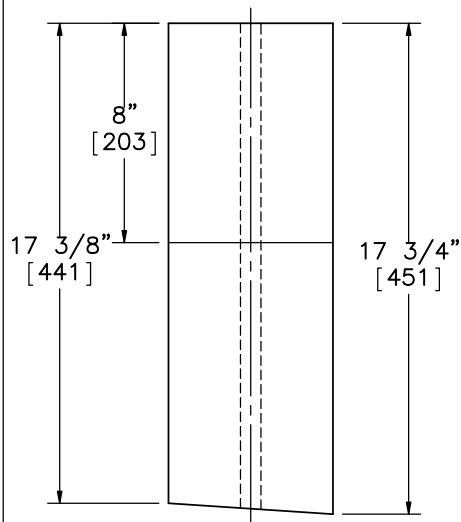
ELEVATION VIEW



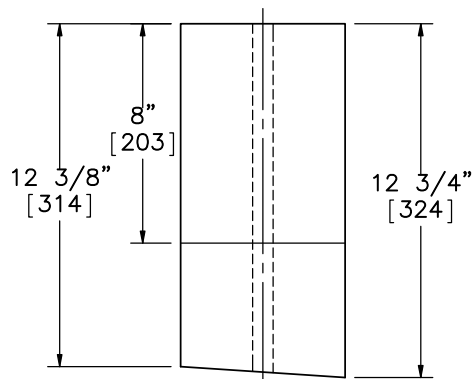
ELEVATION VIEW



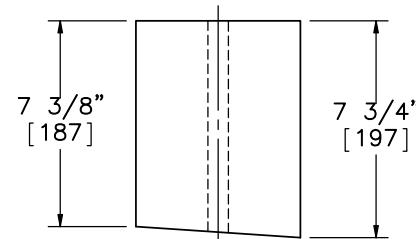
ELEVATION VIEW



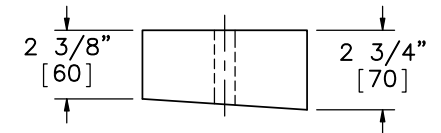
PLAN VIEW
Part c2



PLAN VIEW
Part c3



PLAN VIEW
Part c4



PLAN VIEW
Part c5

Note: (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 Layout 2

Transition Blockouts

DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

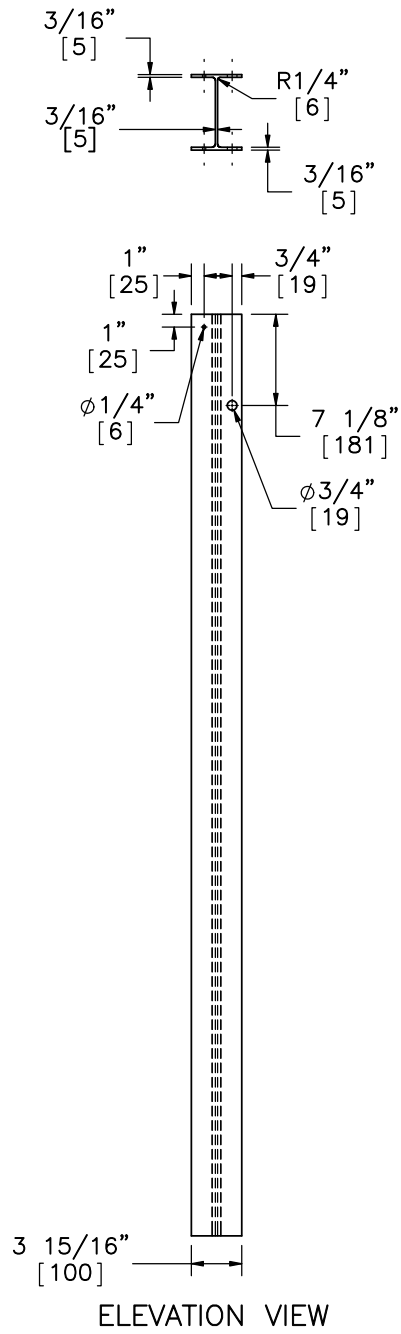
SCALE: 1:7
UNITS: in.[mm]

SHEET:
24 of 36

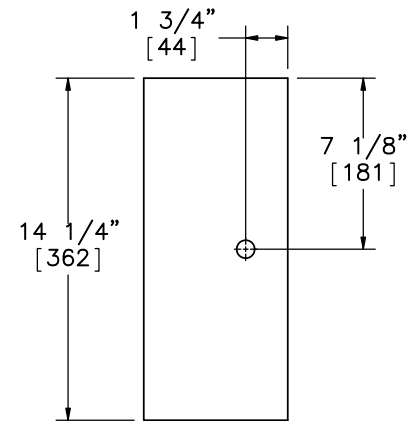
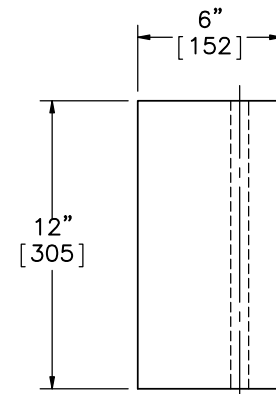
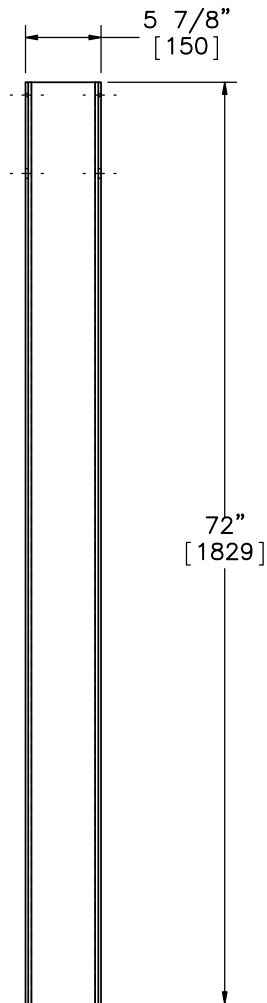
DATE:
10/20/2016

DRAWN BY:
ALL/JEK/TJ
D

REV. BY:
KAL/RWB/J
AH



Part a4



ELEVATION VIEW

Part a5
SCALE 1 : 8



Midwest Roadside
Safety Facility

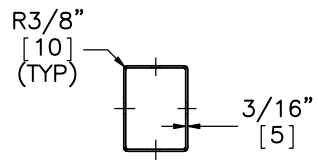
NDOR PCB-MGS
Transition Layout 2

Post Nos. 3-18 Detail

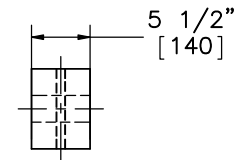
DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

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

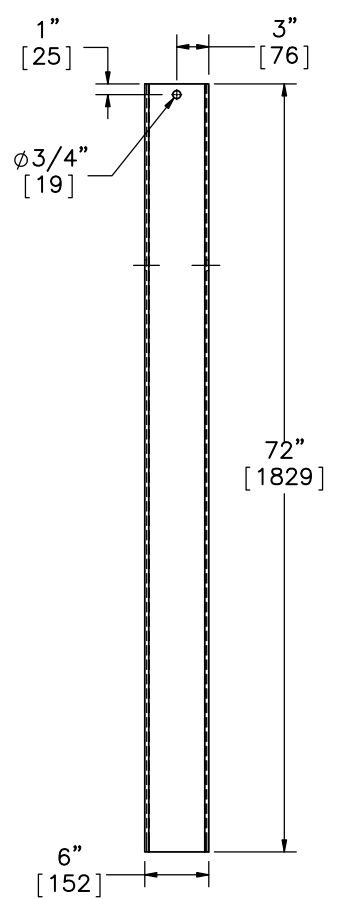
SHEET:
25 of 36
DATE:
10/20/2016
DRAWN BY:
ALL/JEK/TJ
D
REV. BY:
KAL/RWB/J
AH



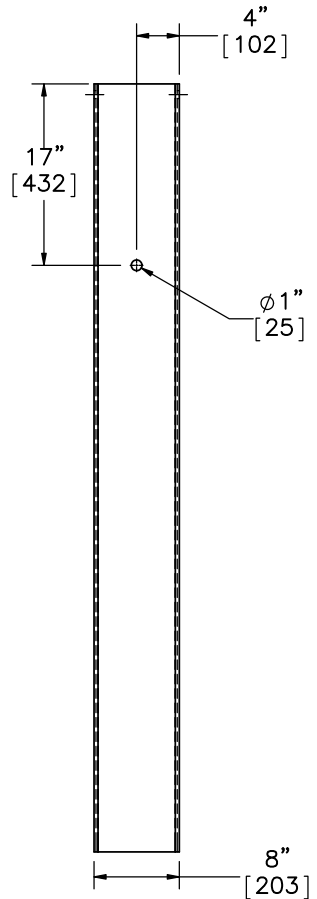
PLAN VIEW



PLAN VIEW

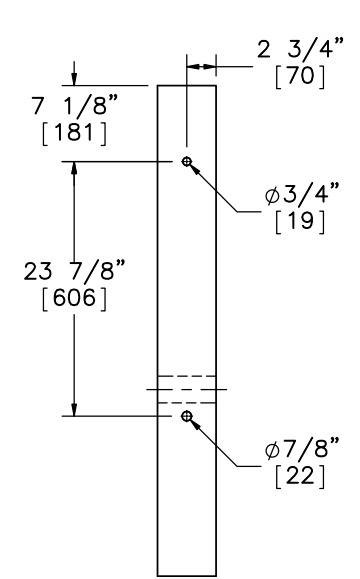


ELEVATION VIEW

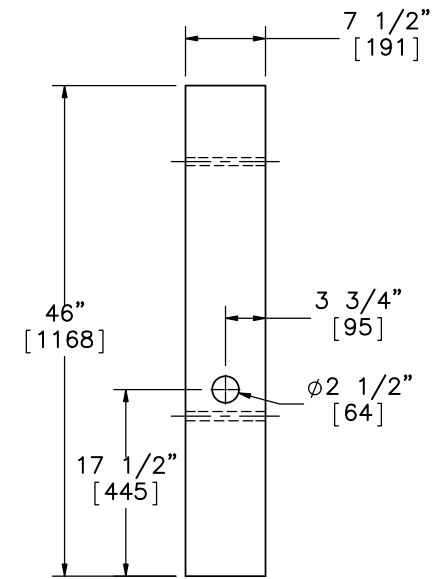


PROFILE VIEW

Part b2



ELEVATION VIEW



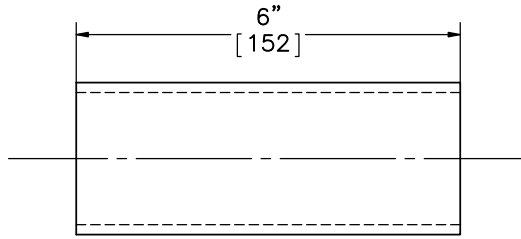
PROFILE VIEW

Part b1

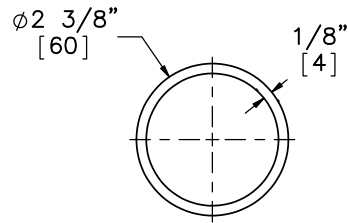


Midwest Roadside Safety Facility

NDOR PCB-MGS Transition Layout 2		SHEET: 26 of 36
BCT Timber Post and Foundation Tube		DATE: 10/20/2016
DWG. NAME: PCB-MGS_Trans_Layout_2_R9	SCALE: 1:18	DRAWN BY: ALL/JEK/TJD
UNITS: in.[mm]	REV. BY: KAL/RWB/JAH	

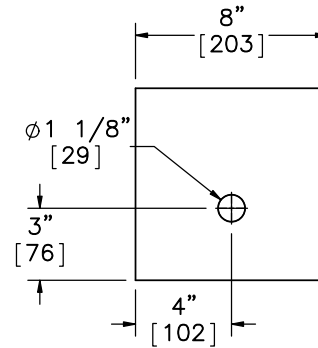


ELEVATION VIEW

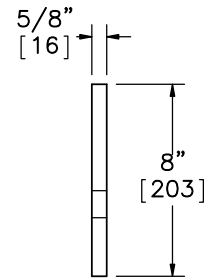


PROFILE VIEW

Part b4
SCALE 1 : 3

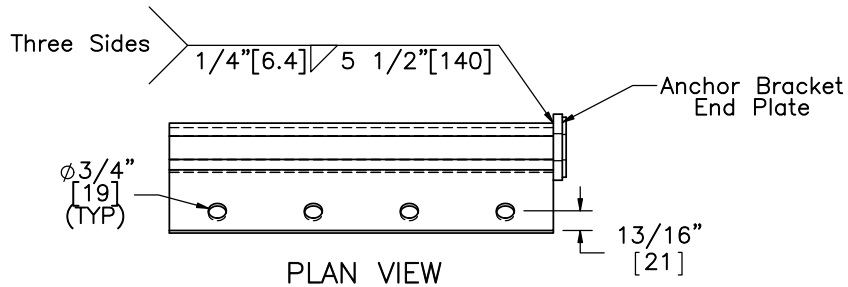


ELEVATION VIEW

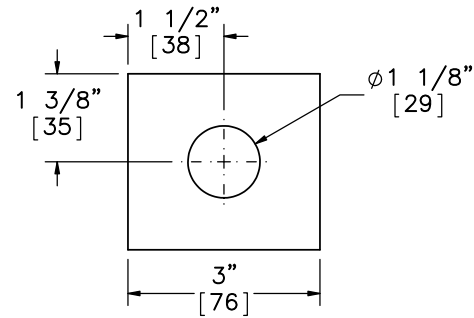


PROFILE VIEW

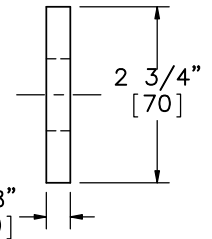
Part b5



PLAN VIEW

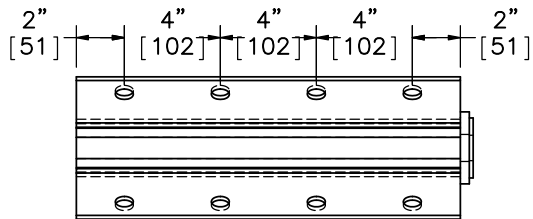


ELEVATION VIEW

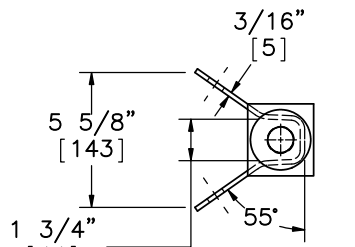


PROFILE VIEW

Anchor Bracket End Plate
SCALE 1 : 3



ELEVATION VIEW



PROFILE VIEW

Part b6



Midwest Roadside
Safety Facility

NDOR PCB-MGS
Transition Layout 2

BCT Post Components and
Anchor Brackets

DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

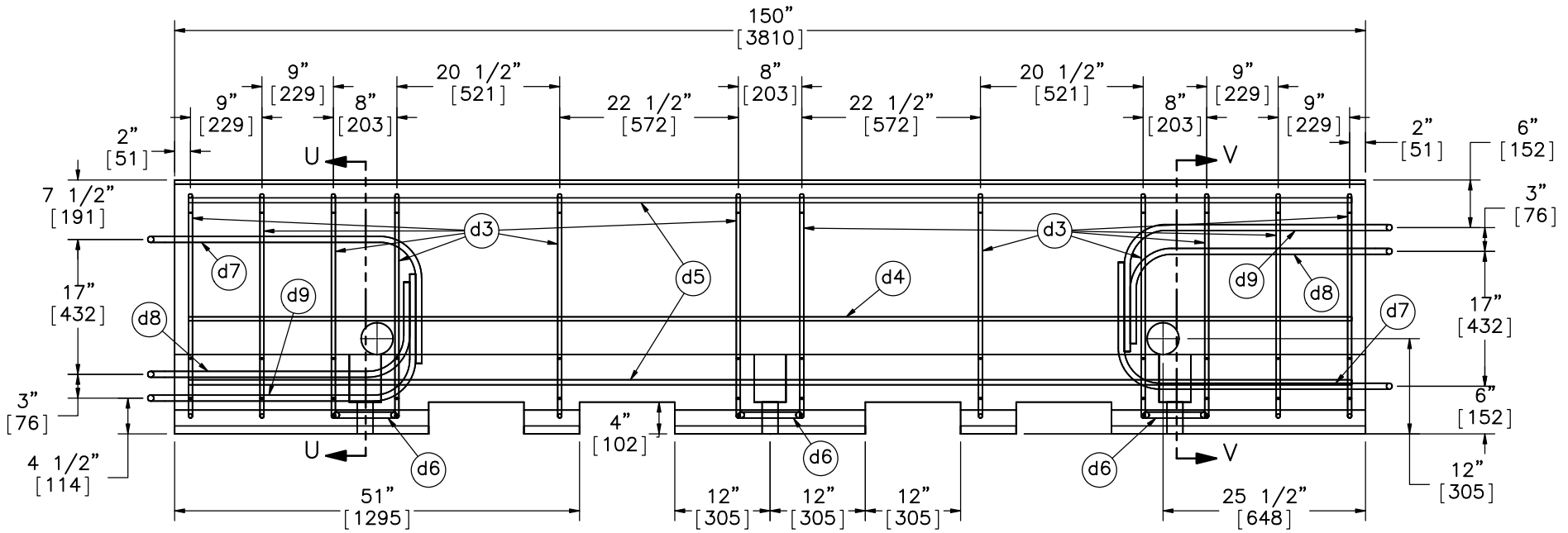
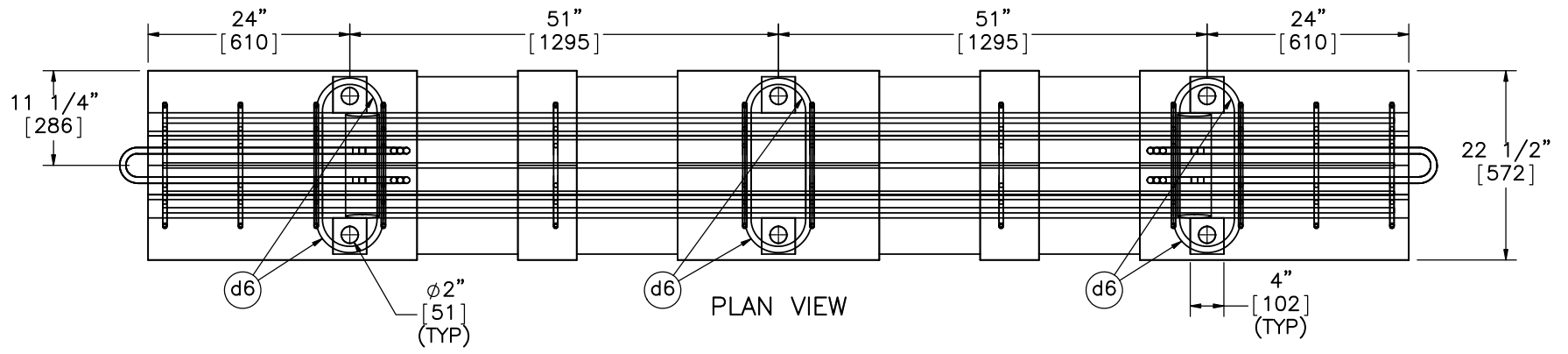
SCALE: 1:8
UNITS: in.[mm]

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DATE:
10/20/2016

DRAWN BY:
ALL/JEK/TJ
D

REV. BY:
KAL/RWB/J
AH



ELEVATION VIEW

Part d1



Midwest Roadside Safety Facility

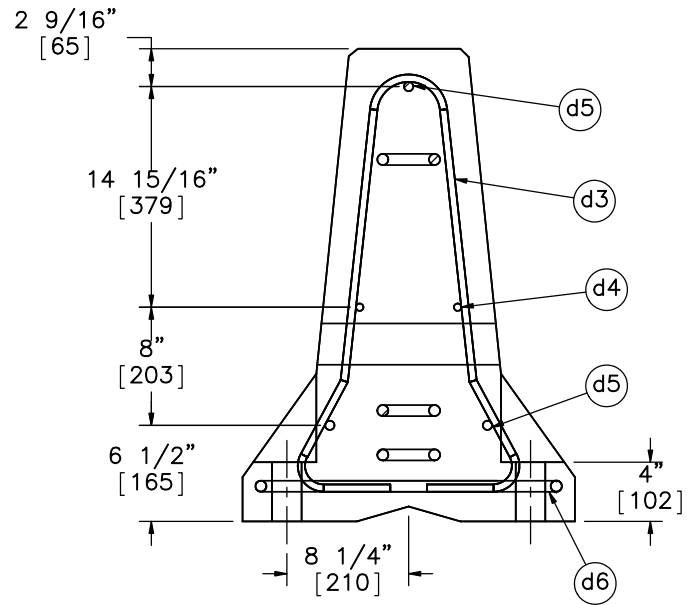
NDOR PCB-MGS Transition Layout 2

Portable Concrete Barrier

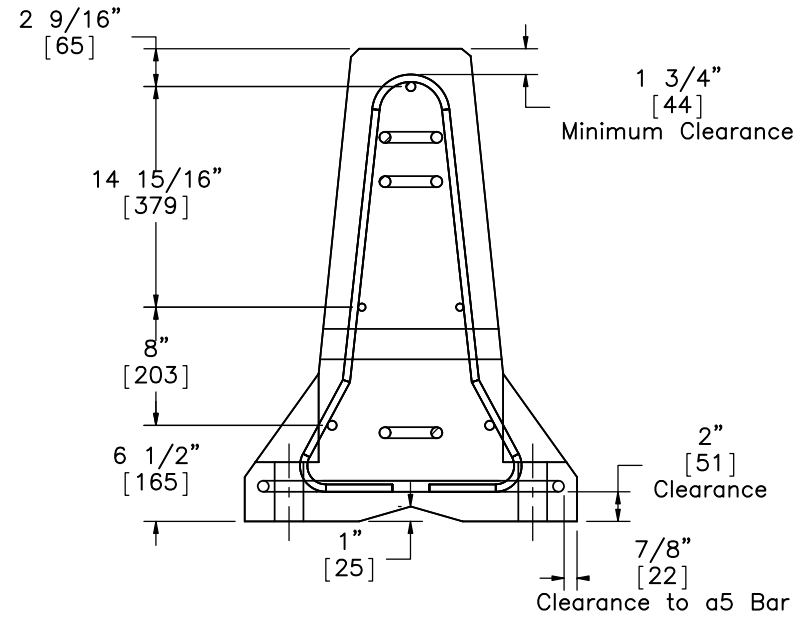
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PCB-MGS_Trans_Layout_2_R9

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

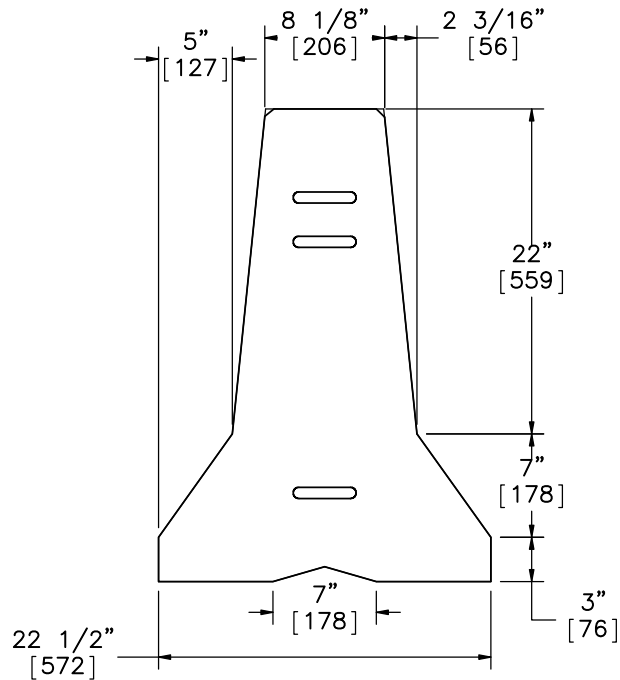
SHEET:
28 of 36
DATE:
10/20/2016
DRAWN BY:
ALL/JEK/TJ
D
REV. BY:
KAL/RWB/J
AH



SECTION U-U



SECTION V-V



PROFILE VIEW



Midwest Roadside
Safety Facility

NDOR PCB-MGS
Transition Layout 2

Portable Concrete Barrier
Profile Detail

DWG. NAME:
PCB-MGS_Trans_Layout 2_R9

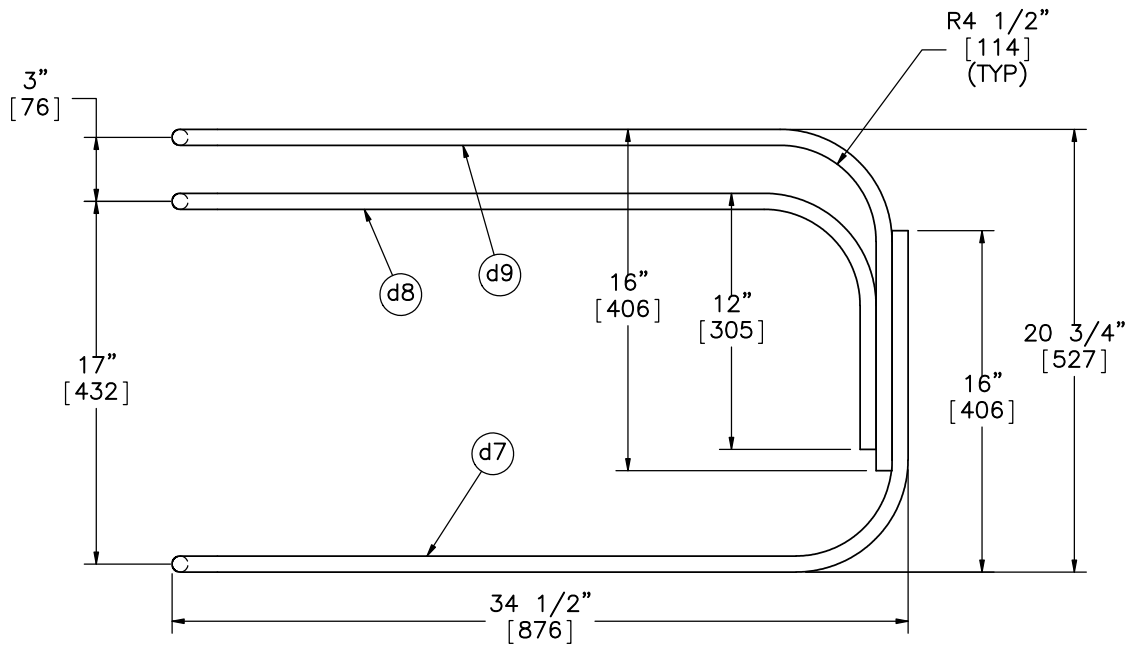
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UNITS: in.[mm]

SHEET:
29 of 36

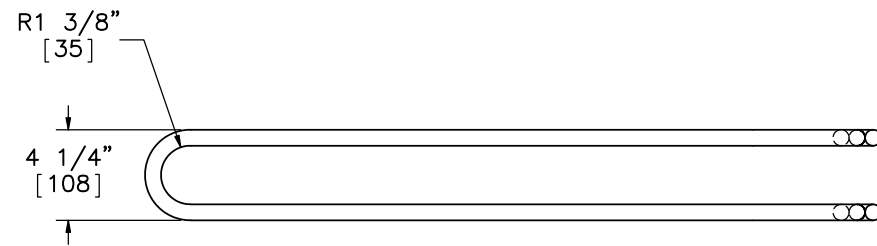
DATE:
10/20/2016

DRAWN BY:
ALL/JEK/TJ
D

REV. BY:
KAL/RWB/J
AH

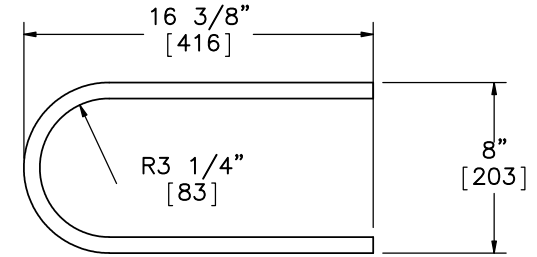


ELEVATION VIEW

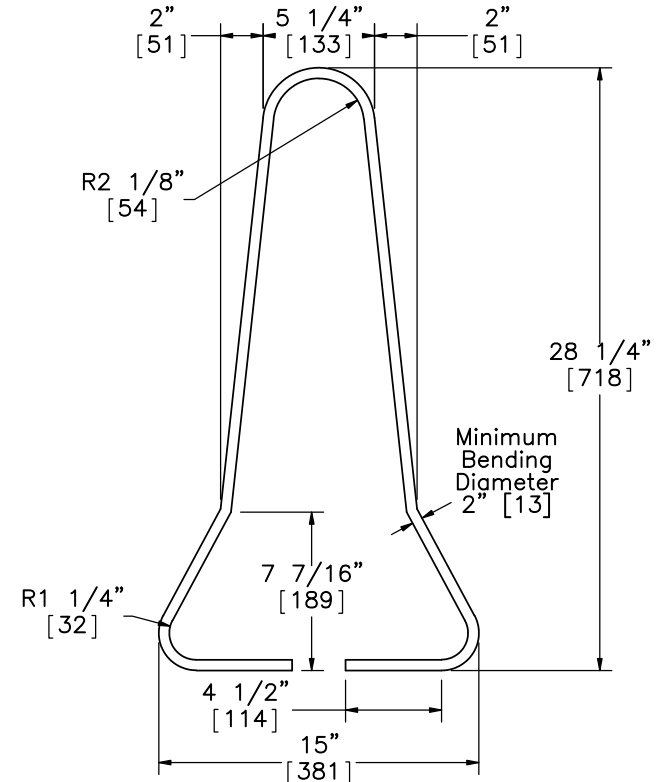


PLAN VIEW

Loop Bar Assembly



Part d6



Part d3



Midwest Roadside Safety Facility

NDOR PCB-MGS Transition Layout 2

Bill of Bars - Portable Concrete Barriers

DWG. NAME:
PCB-MGS_Trans_Layout_2_R9

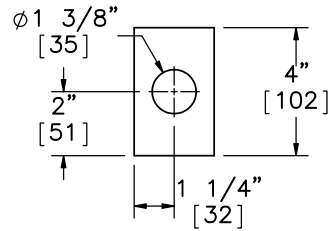
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UNITS: in.[mm]

SHEET:
30 of 36

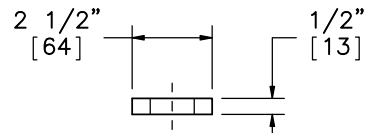
DATE:
10/20/2016

DRAWN BY:
ALL/JEK/TJ/D

REV. BY:
KAL/RWB/JAH

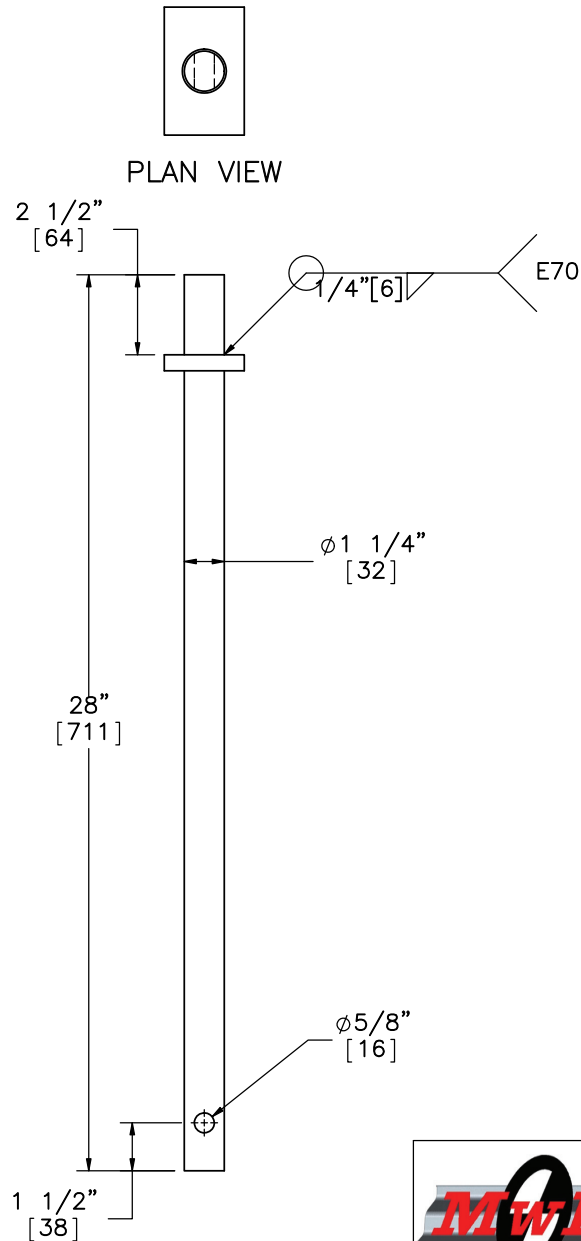


PLAN VIEW



ELEVATION VIEW

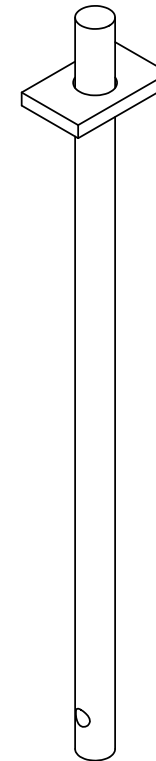
Connection Pin Plate



PLAN VIEW

ELEVATION VIEW

Part d2

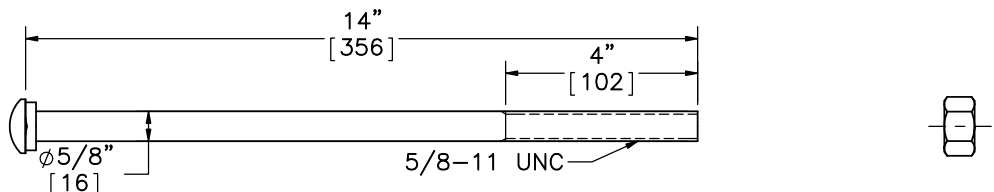


ISOMETRIC VIEW

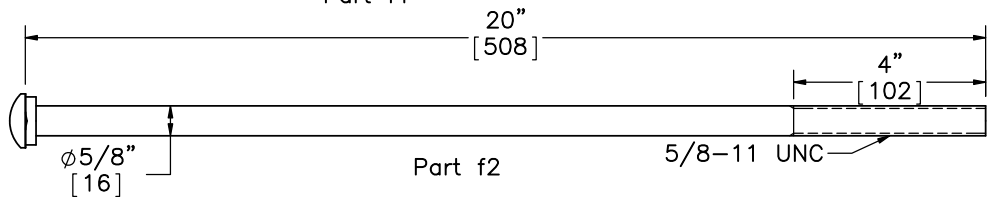


Midwest Roadside Safety Facility

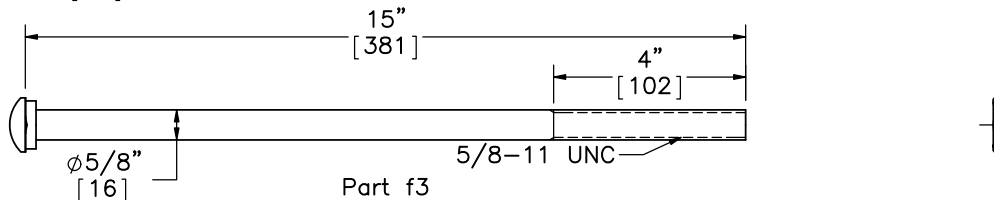
NDOR PCB-MGS Transition Layout 2		SHEET:	31 of 36
		DATE:	10/20/2016
Connection Pin Detail		DRAWN BY:	ALL/JEK/TJD
		REV. BY:	KAL/RWB/JAH
DWG. NAME:	SCALE: 1:6	UNITS: in.[mm]	
PCB-MGS_Trans_Layout_2_R9			



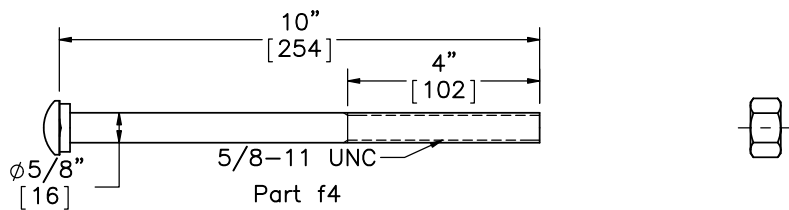
Part f1



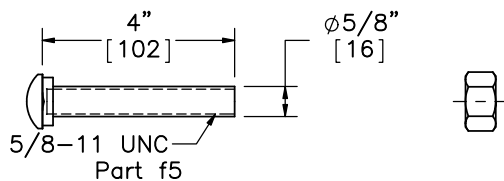
Part f2



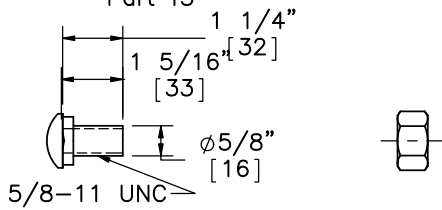
Part f3



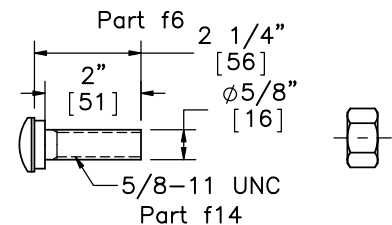
Part f4



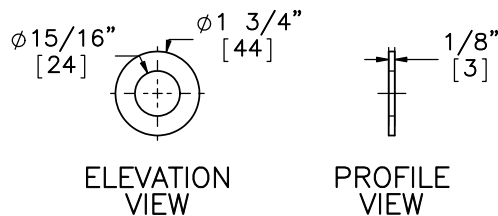
Part f5



Part f6



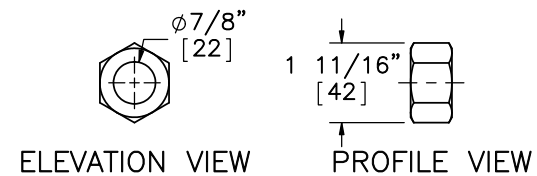
Part f14



ELEVATION VIEW

PROFILE VIEW

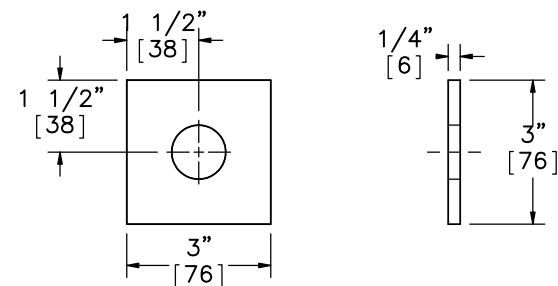
Part g3



ELEVATION VIEW

PROFILE VIEW

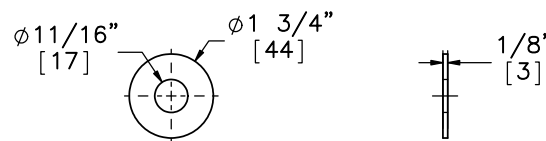
Part g4



ELEVATION VIEW

PROFILE VIEW

Part g1



ELEVATION VIEW

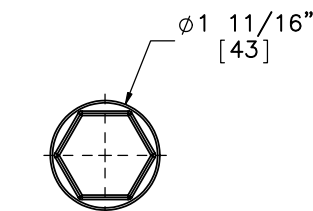
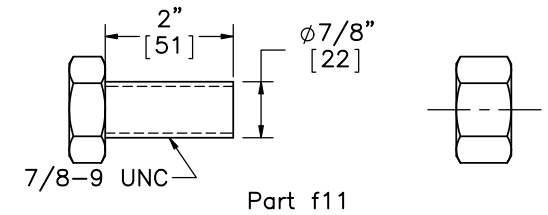
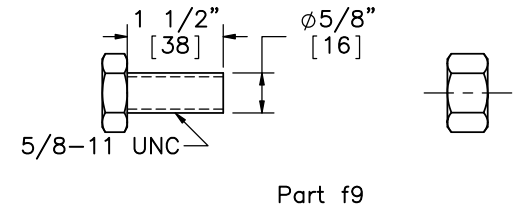
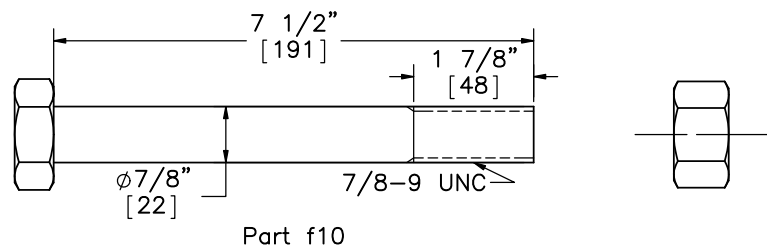
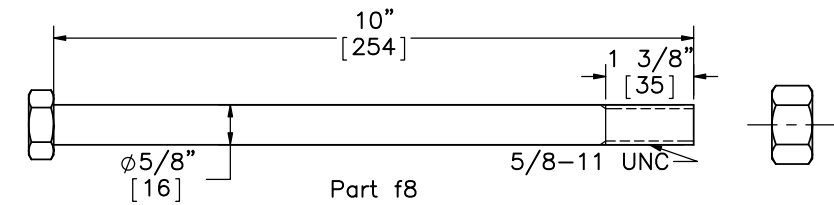
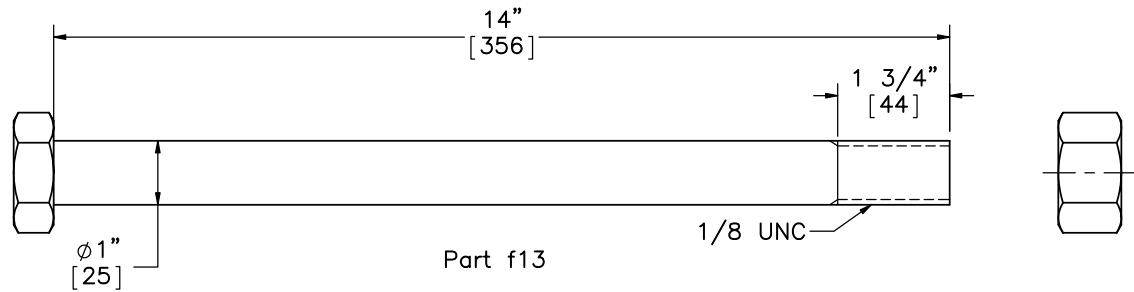
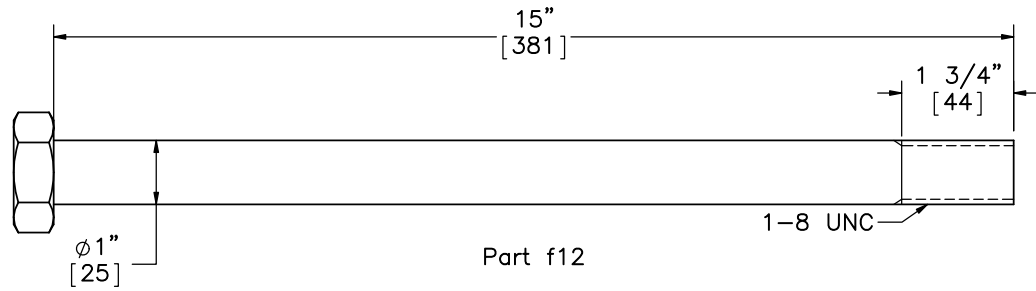
PROFILE VIEW

Part g2

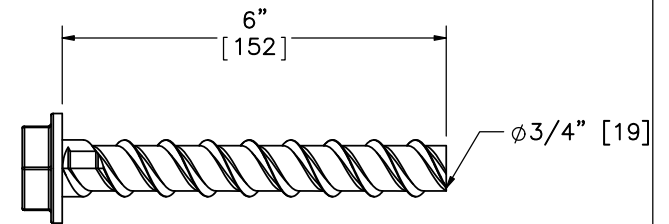


Midwest Roadside Safety Facility

NDOR PCB-MGS Transition Layout 2		SHEET: 32 of 36
Guardrail Bolts and Washers		DATE: 10/20/2016
DWG. NAME: PCB-MGS_Trans_Layout_2_R9		DRAWN BY: ALL/JEK/TJD
SCALE: 1:4	UNITS: in.[mm]	REV. BY: KAL/RWB/JAH



PROFILE VIEW



ELEVATION VIEW

Power Wedge Bolt+
 Part f15



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NDOR PCB-MGS
 Transition Layout 2

Hex and Power Wedge Bolts

DWG. NAME:
 PCB-MGS_Trans_Layout_2_R9

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

SHEET:
 33 of 36

DATE:
 10/20/2016

DRAWN BY:
 ALL/JEK/TJ
 D

REV. BY:
 KAL/RWB/J
 AH

Item No.	QTY.	Description	Material Spec	Hardware Guide
a1	1	W-Beam End Shoe Section	10 gauge [3.4] AASHTO M180 Galv.	RWE02b
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	W6x8.5 [W152x12.6] or W6x9 [W152x13.4], 72" Long [1829] Steel Post	ASTM A992	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.	PPF02
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	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	-
d8	22	3/4" [19] Dia., 91" [2311] Long Connection Loop Bar	ASTM A709 Grade 70 or A706 Grade 60	-



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NDOR PCB-MGS
Transition Layout 2

Bill of Materials

DWG. NAME:
PCB-MGS_Trans_Layout 2_R9

SCALE: 1:768
UNITS: in.[mm]

SHEET:
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DATE:
10/20/2016
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Item No.	QTY.	Description	Material Spec	Hardware Guide
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 Grade A Galv., Nut ASTM A563 A Galv.	—
f3	1	5/8" [16] Dia. UNC, 15" [381] Long Guardrail Bolt and Nut	Bolt ASTM A307 Grade A Galv., Nut ASTM A563 A Galv.	—
f10	2	7/8" Dia. [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 A563A Galv.	FBB02
f15	8	ø3/4" x 6" [M20x152] Power Wedge Bolt+	Galvanized	FBX02



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NDOR PCB-MGS
Transition Layout 2

Bill of Materials Continued

DWG. NAME.
PCB-MGS_Trans_Layout_2_R9

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

SHEET:
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DATE:
10/20/2016
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REV. BY:
KAL/RWB/J
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Item No.	QTY.	Description	Material Spec	Hardware Guide
f4	1	5/8" [16] Dia. UNC, 10" [254] Long Guardrail Bolt and Nut	Bolt ASTM A307 Grade A Galv., Nut ASTM A563 A Galv.	FBB03
f5	1	5/8" [16] Dia. UNC, 4" [102] Long Guardrail Bolt and Nut	Bolt ASTM A307 Grade A Galv., Nut ASTM A563 A Galv.	—
f6	40	5/8" [16] Dia. UNC, 1 1/4" [32] 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
g1	4	3"x3"x1/4" [76x76x6] Square Washer	A572 Grade 50 Galvanized	—
g2	27	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	Fitting — ASTM A576 Gr. 1035 Stud — ASTM F568 Class C	—
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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NDOR PCB-MGS Transition Layout 2		SHEET: 36 of 36
Bill of Materials Continued		DATE: 10/20/2016
DWG. NAME: PCB-MGS_Trans_Layout_2_R9	SCALE: 1:8 UNITS: in.[mm]	DRAWN BY: ALL/JEK/TJ D
		REV. BY: KAL/RWB/J AH

R6	8/4/2015	22	Detail view name fixed.	KAL/RWB	JEK
		26	Typo correction.		
		31	Part g2 innder diameter corrected.		
		32	Part g11 label added. Metric conversion correction.		
		35	Part g1 description and material corrected. Number of g2 washers corrected.		
R7	1/13/2016	3	Fixed bolt f14 callout. Added washers behind part a2. Removed washers g2 as they do not appear in photos on test day. Added detail w.	KAL	TJD
		4	Added page 4 showing detail w. Added callouts for nut and bolt f14 and washer g2.		
		16	Added bend lines to flat pattern of mounting plate.		
R8	3/14/2016	-	Corrected several spelling errors.	JEK	JAH
		17	Added bend lines to flat pattern of mounting plate.		
R9	10/20/2016	-	BOM updates/corrections.	KAL	JEK