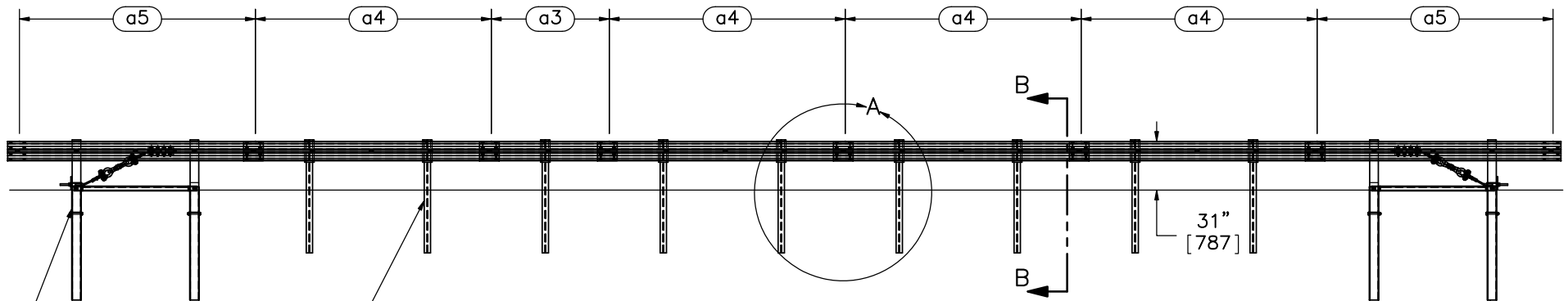


PLAN VIEW



ELEVATION VIEW

BCT Posts in 6' [1829] Long (Galvanized) Foundation Tubes, Ground Line Strut, and BCT Cable Anchor

W6x8.5, 72" [W152x12.6, 1829] Long Posts with 6"x12"x14 1/4" [152x305x362] Blockouts

BCT Posts in 6' [1829] Long (Galvanized) Foundation Tubes, Ground Line Strut, and BCT Cable Anchor

- Notes:
- (1) Impact location for the 2270P is at the centerline of post no. 4.
  - (2) The BCT anchor posts are placed in  $\phi 3'$  [914] holes.
  - (3) Critical region is entire system.
  - (4) Instrumentation consisting of a string potentiometer, tension load cell, and high-speed digital video camera are to be placed on both end anchors.



Midwest Roadside Safety Facility

MGS 75 ft Length

System Layout

DWG. NAME:  
MGSLENGTH\_R8

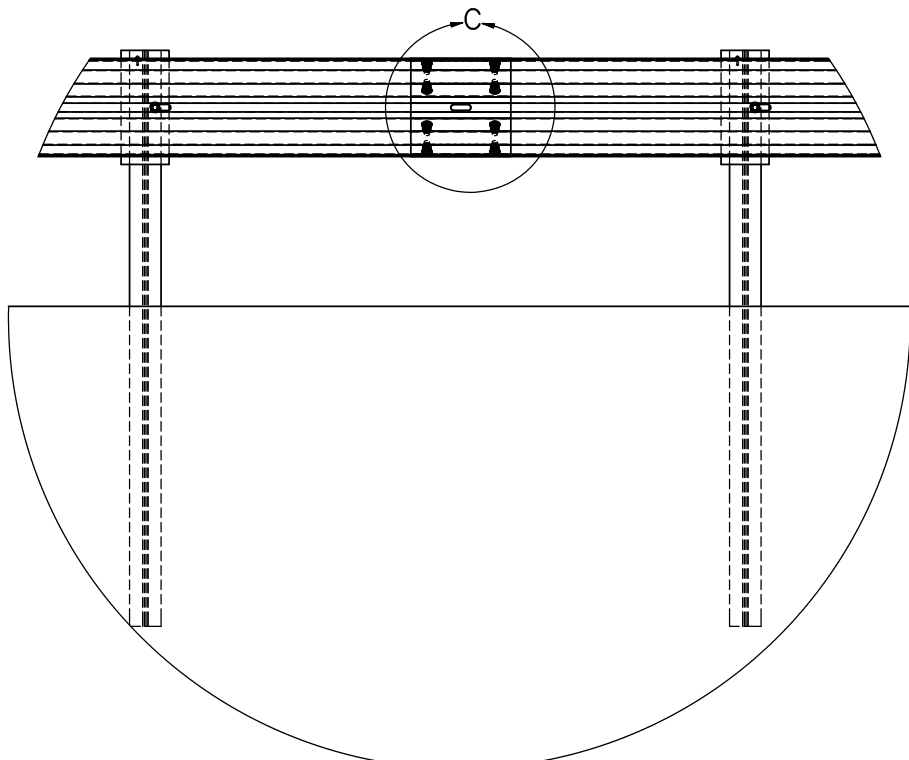
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SHEET:  
1 of 14

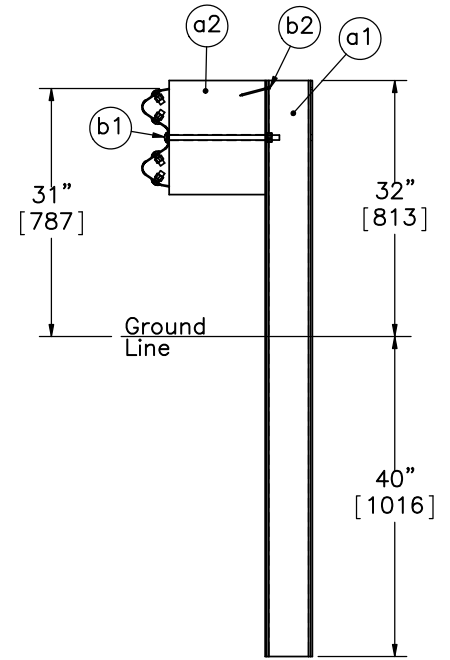
DATE:  
5/10/2013

DRAWN BY:  
DMH/RJT/  
CWP/ESG

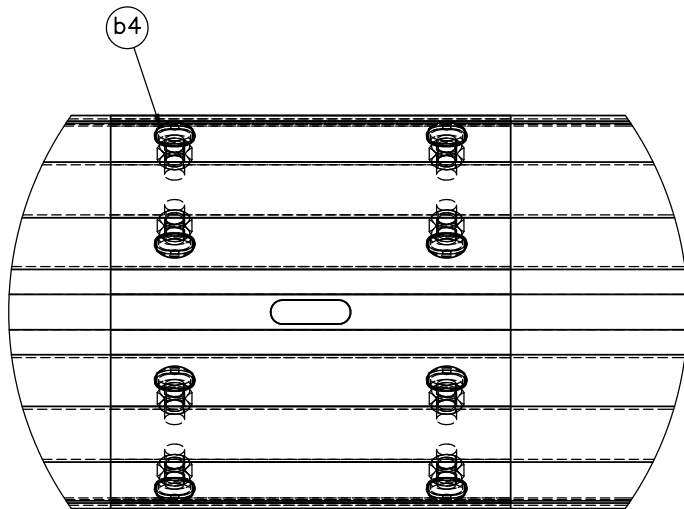
REV. BY:  
MDM/KAL



DETAIL A



SECTION B-B



DETAIL C  
SCALE 1:6



Midwest Roadside  
Safety Facility

MGS 75 ft Length

Posts 3-11 Detail

DWG. NAME:  
MGSLENGTH\_R8

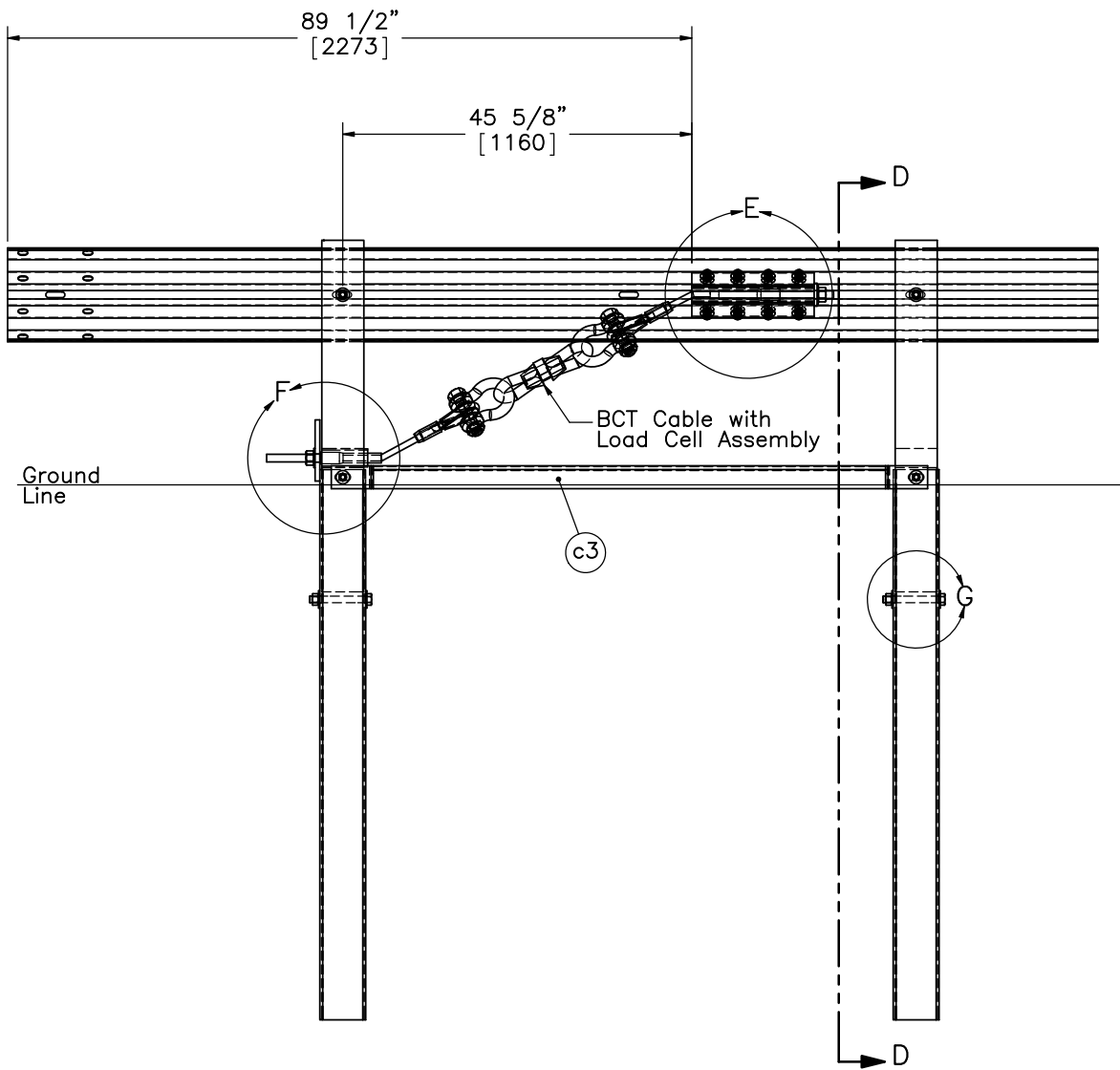
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SHEET:  
2 of 14

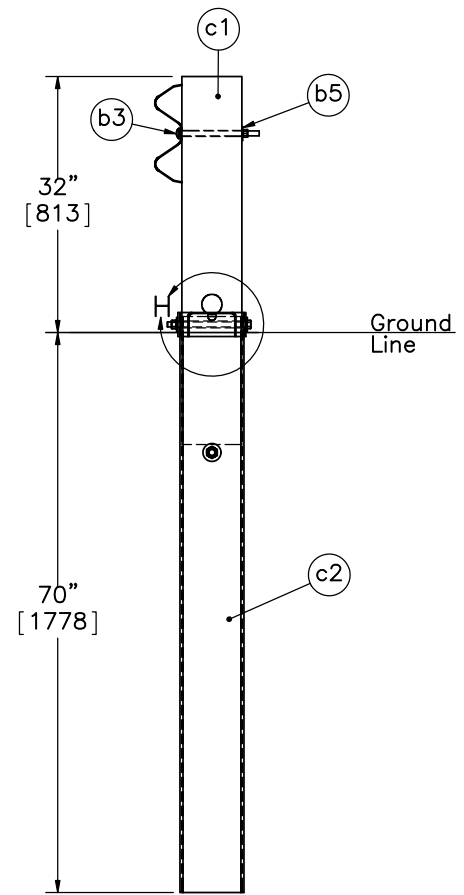
DATE:  
5/10/2013

DRAWN BY:  
DMH/RJT/  
CWP/ESG

REV. BY:  
MDM/KAL



End Section Detail



SECTION D-D



Midwest Roadside  
Safety Facility

MGS 75 ft Length

End Rail Details

DWG. NAME:  
MGSLENGTH\_R8

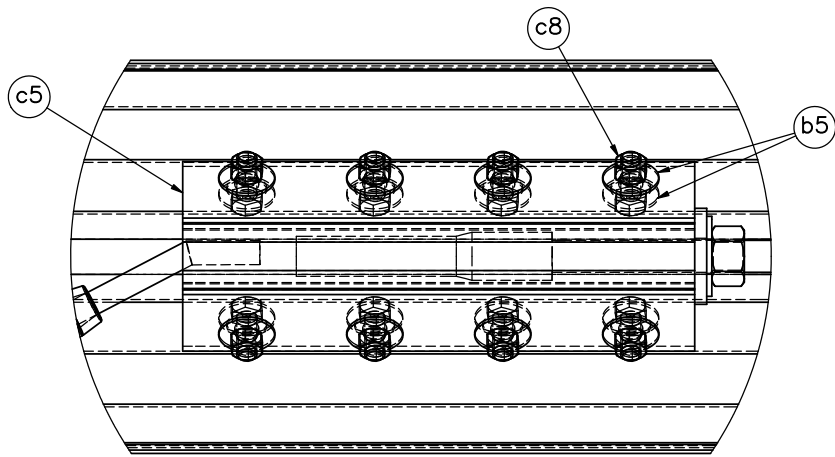
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SHEET:  
3 of 14

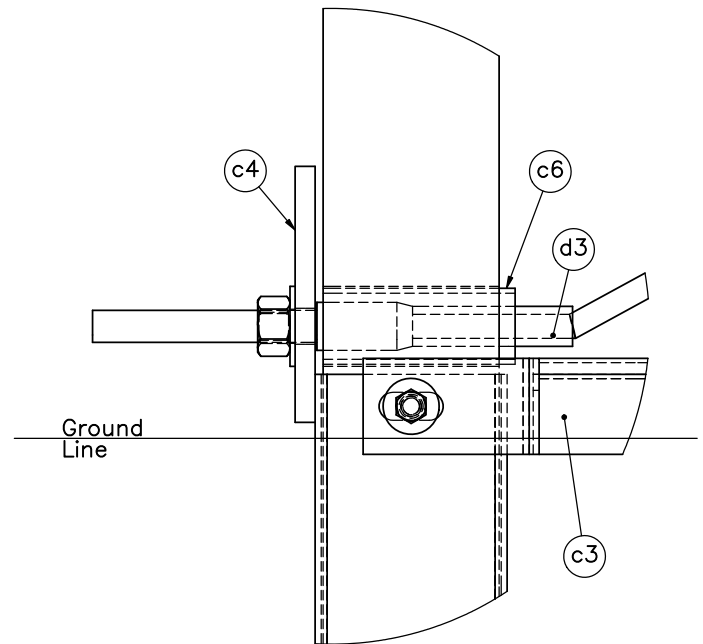
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5/10/2013

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DMH/RJT/  
CWP/ESG

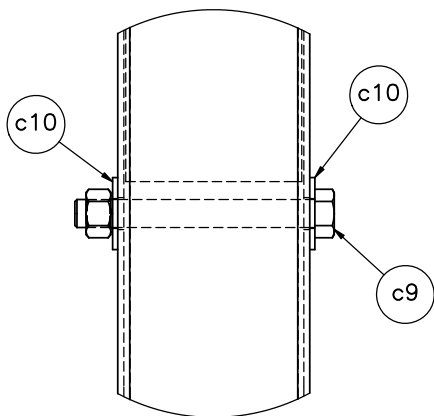
REV. BY:  
MDM/KAL



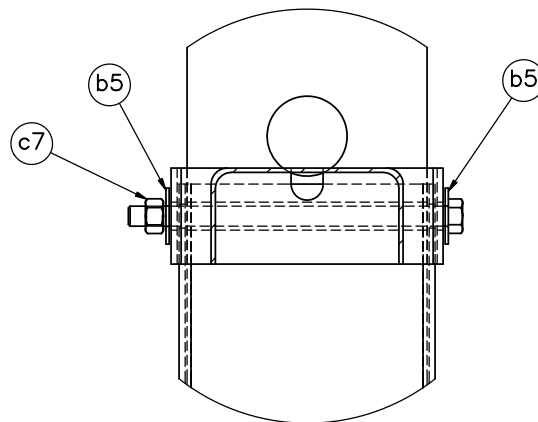
DETAIL E



DETAIL F



DETAIL G



DETAIL H



Midwest Roadside  
Safety Facility

MGS 75 ft Length

Anchor Details

DWG. NAME:  
MGSLENGTH\_R8

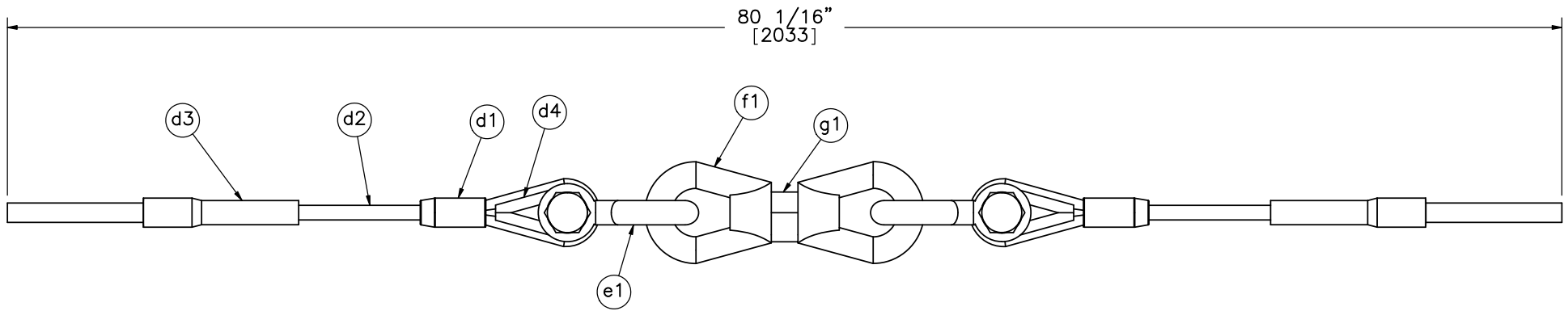
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SHEET:  
4 of 14


DATE:  
5/10/2013

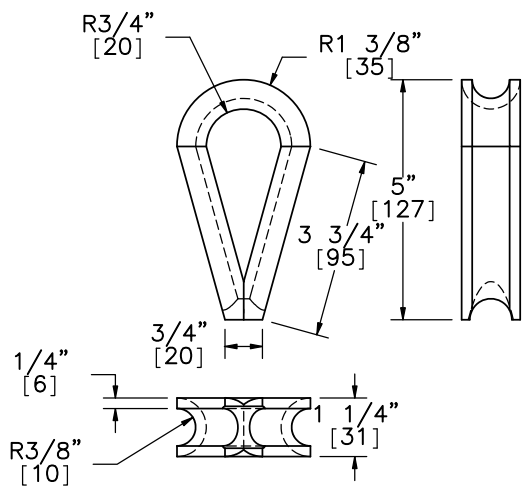
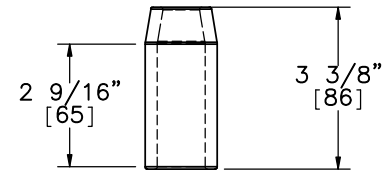
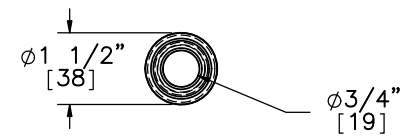
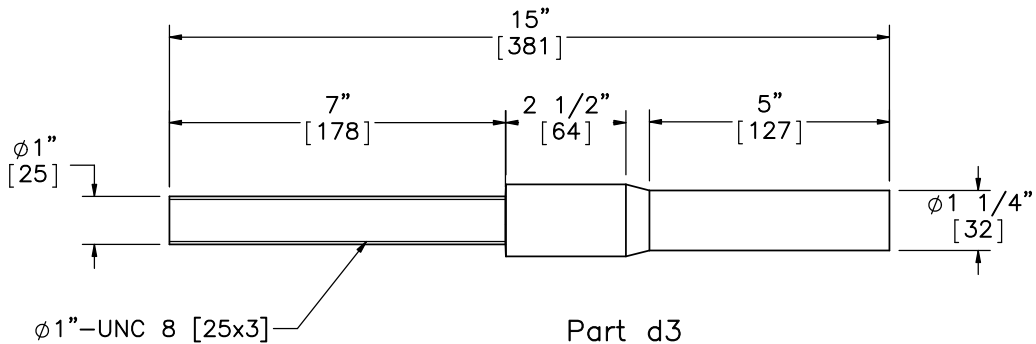
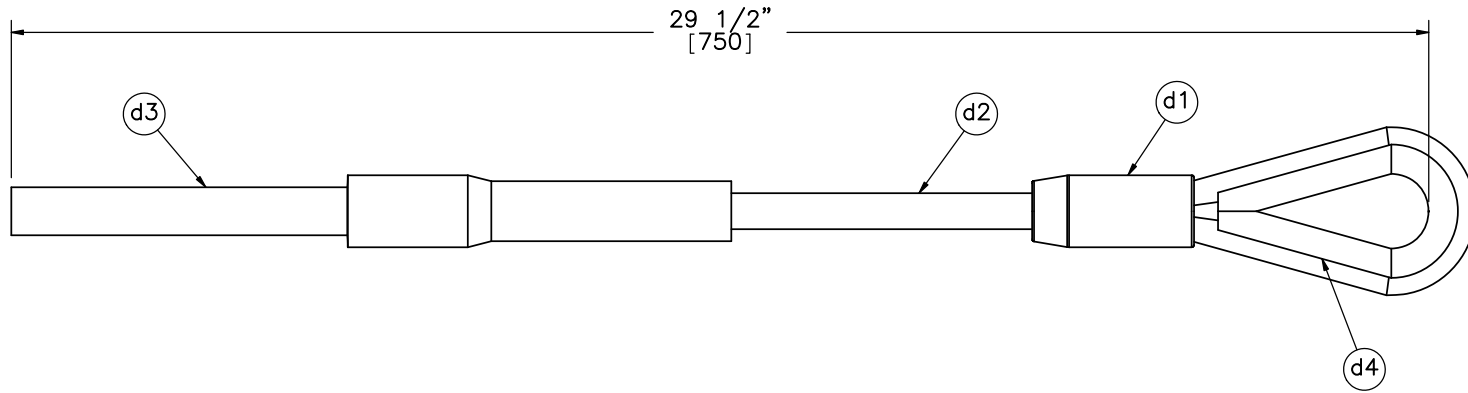
DRAWN BY:  
DMH/RJT/  
CWP/ESG

REV. BY:  
MDM/KAL




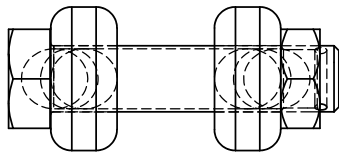
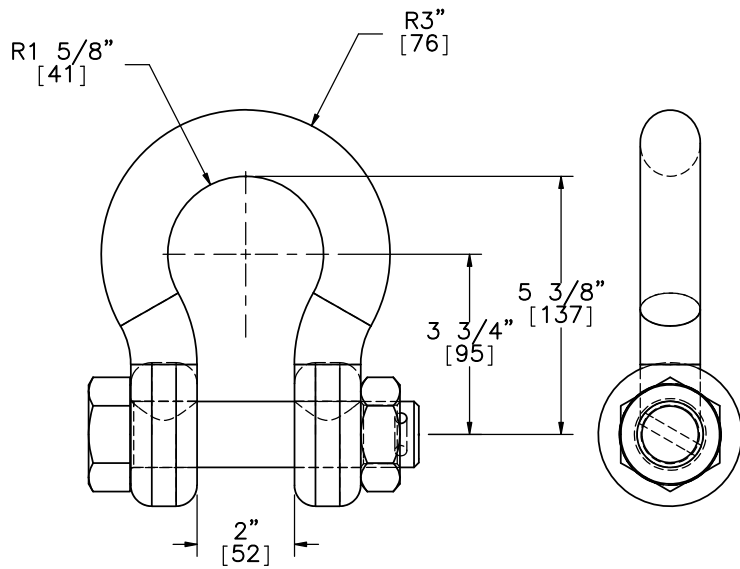
- Notes: (1) 6x25 IWRC IPS cables meet the minimum breaking strength of 42.7 kips [190 kN] and may be substituted for the 6x19 IWRC IPS cables.
- (2) The modified BCT cable was used for testing purposes in lieu of a standard BCT cable

	MGS 75 ft Length		SHEET: 5 of 14
	Modified BCT Cable with Load Cell Assembly		DATE: 5/10/2013
Midwest Roadside Safety Facility			DRAWN BY: DMH/RJT/ CWP/ESG
		DWG. NAME: MGSLENGTH_R8	SCALE: 1:8 UNITS: in.[mm]

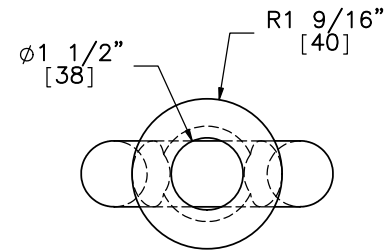
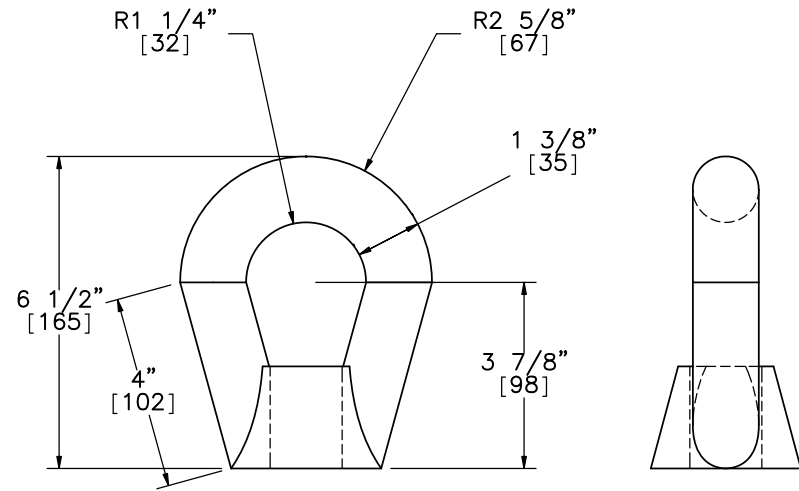


Note: (1) Dimensions are not necessarily representative of the part; see final part for actual dimensions

	MGS 75 ft Length		SHEET: 6 of 14
	Modified BCT Cable		DATE: 5/10/2013
Midwest Roadside Safety Facility	DWG. NAME: MGSLENGTH_R8	SCALE: 1:4 UNITS: in.[mm]	DRAWN BY: DMH/RJT/ CWP/ESG
			REV. BY: MDM/KAL



Part e1



Part f1



Midwest Roadside  
Safety Facility

MGS 75 ft Length

Shackle and Eye Nut

DWG. NAME:  
MGSLENGTH\_R8

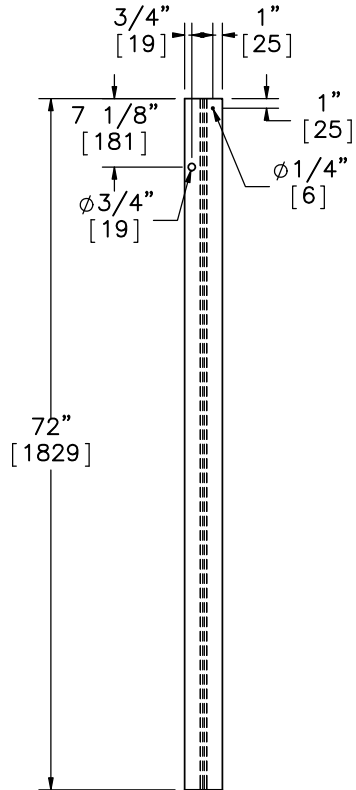
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UNITS: in.[mm]

SHEET:  
7 of 14

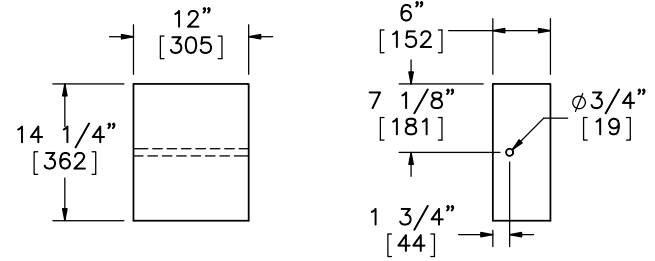
DATE:  
5/10/2013

DRAWN BY:  
DMH/RJT/  
CWP/ESG

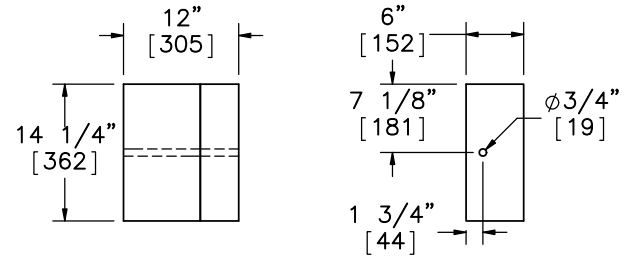
REV. BY:  
MDM/KAL



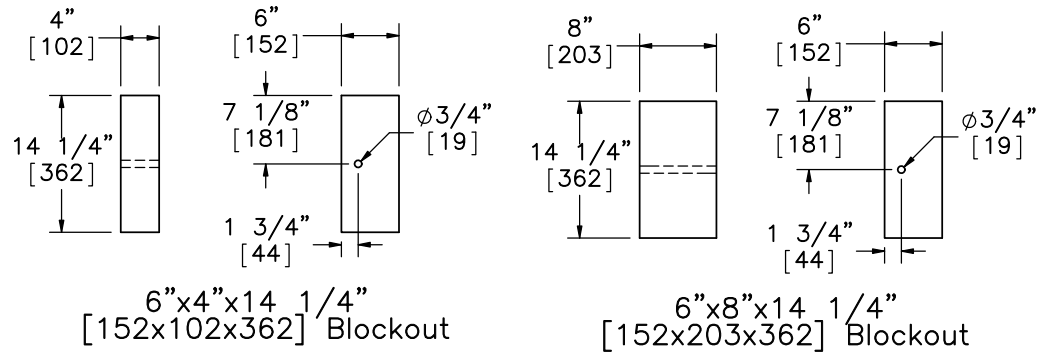
Line Post  
Part a1



Blockout  
Part a2



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



6"x4"x14 1/4"  
[152x102x362] Blockout

6"x8"x14 1/4"  
[152x203x362] Blockout



Midwest Roadside  
Safety Facility

MGS 75 ft Length

Post Nos. 3-11 Details

DWG. NAME:  
MGSLENGTH\_R8

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

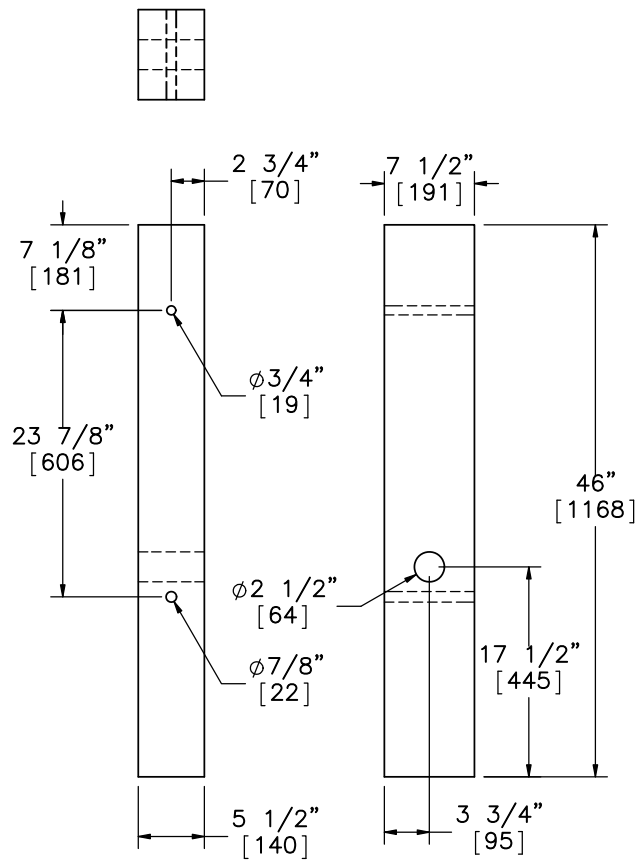
SHEET:  
8 of 14

DATE:  
5/10/2013

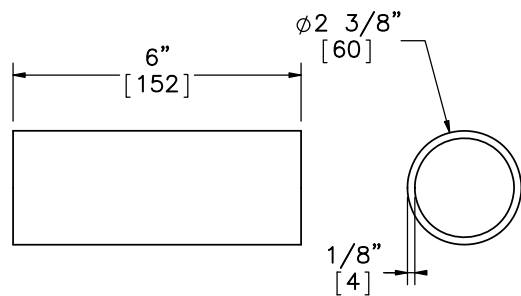
DRAWN BY:  
DMH/RJT/  
CWP/ESG

REV. BY:  
MDM/KAL

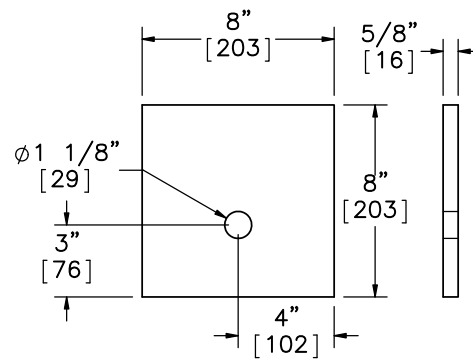




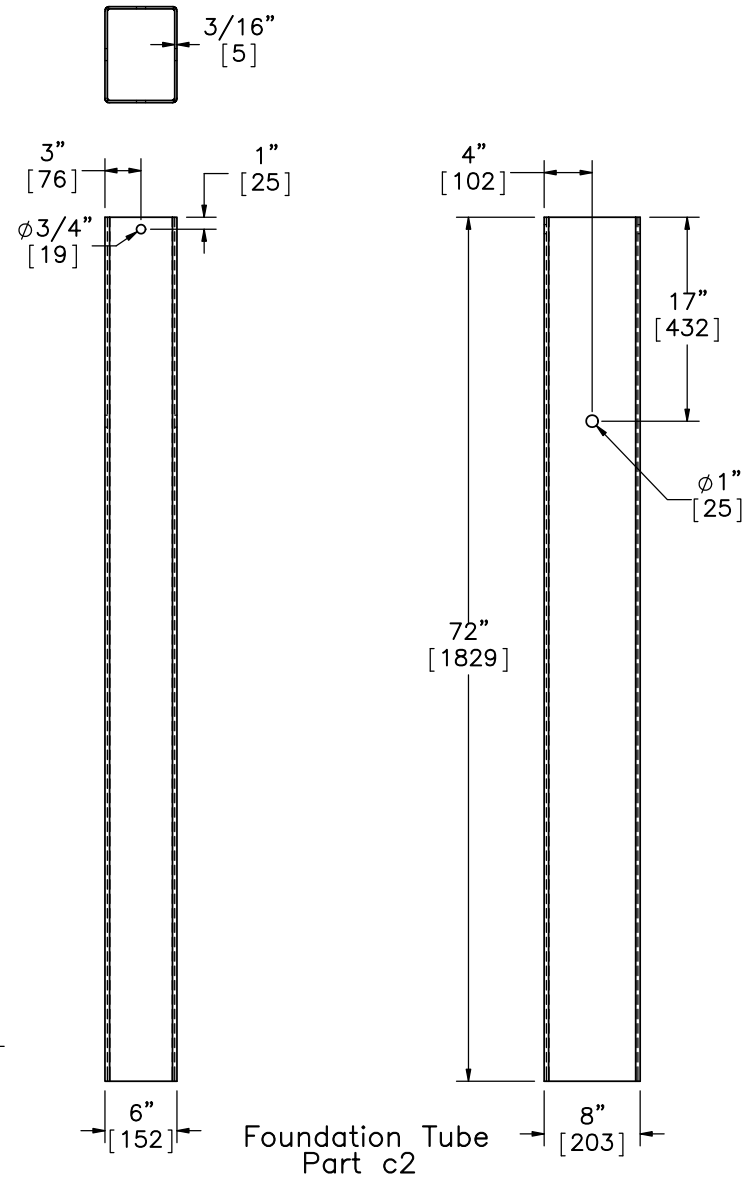
BCT MGS Timber Post  
Part c1



BCT Post Sleeve  
Part c6  
SCALE 1:4



Anchor Bracket Bearing Plate  
Part c4  
SCALE 1:8



Foundation Tube  
Part c2



Midwest Roadside  
Safety Facility

MGS 75 ft Length

BCT Timber Post &  
Foundation Tube Details

DWG. NAME:  
MGSLENGTH\_R8

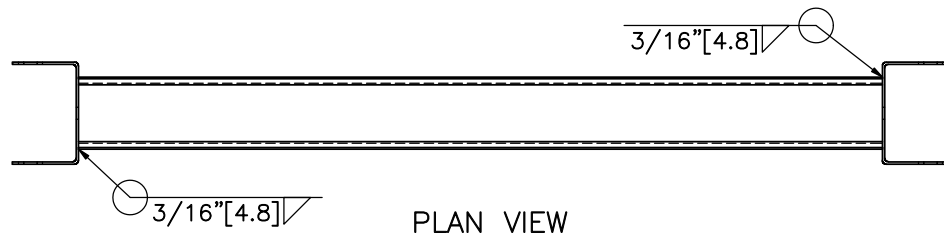
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SHEET:  
9 of 14

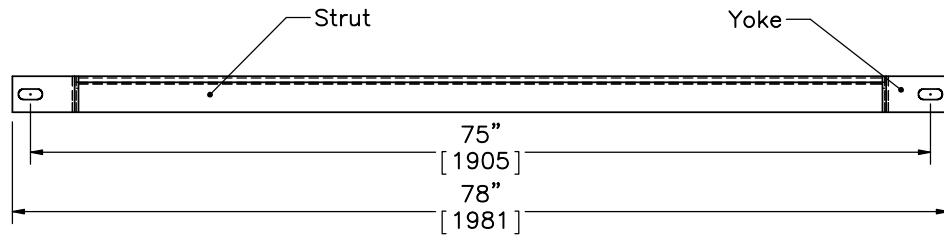
DATE:  
5/10/2013

DRAWN BY:  
DMH/RJT/  
CWP/ESG

REV. BY:  
MDM/KAL

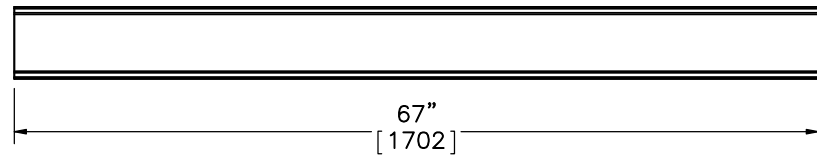


PLAN VIEW

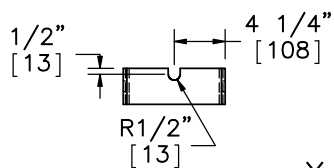
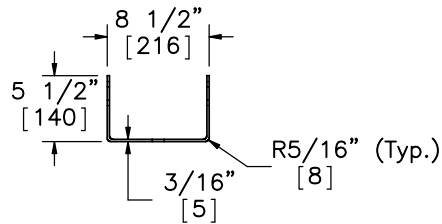


FRONT VIEW

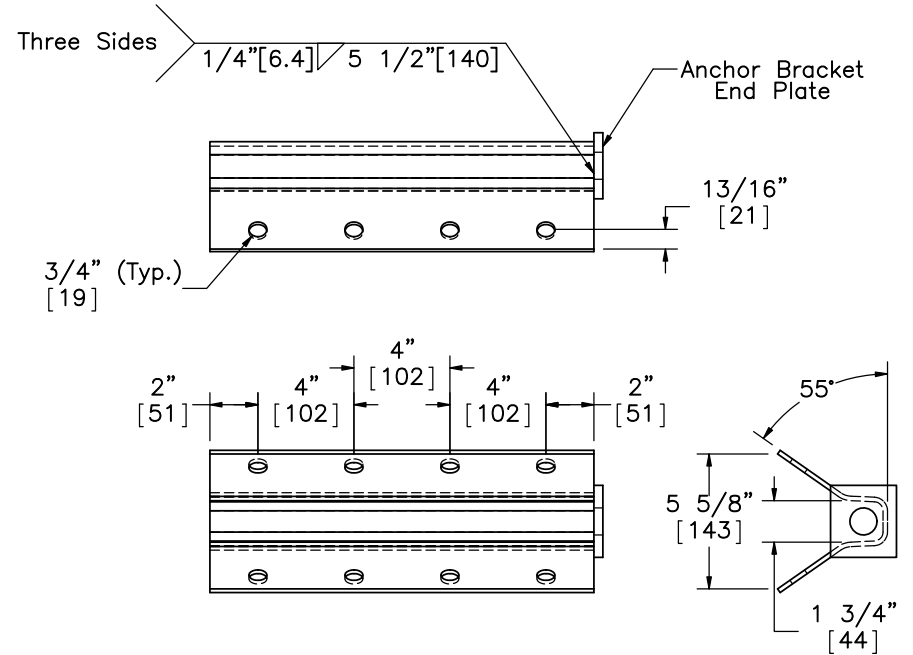
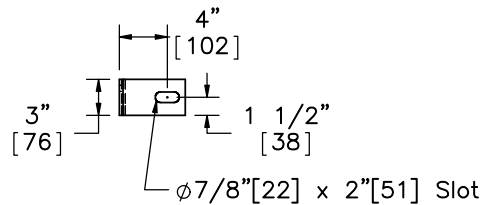
Strut and Yoke Assembly  
Part c3



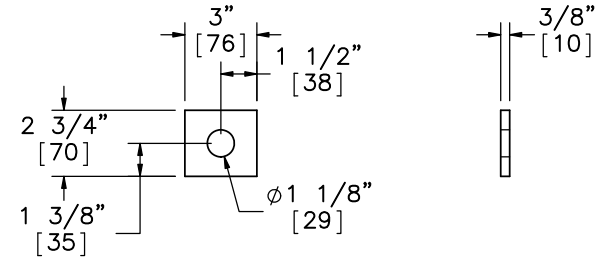
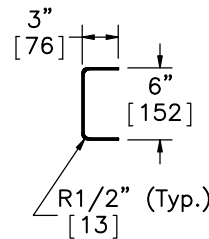
Strut  
6"x3" [152x76] 10 Gauge [3.4]



Yoke



Anchor Bracket Assembly  
(FPA01)  
Part c5  
SCALE 1:8



Anchor Bracket End Plate  
SCALE 1:8



Midwest Roadside  
Safety Facility

MGS 75 ft Length

Ground Strut &  
Anchor Bracket Details

DWG. NAME:  
MGSLENGTH\_R8

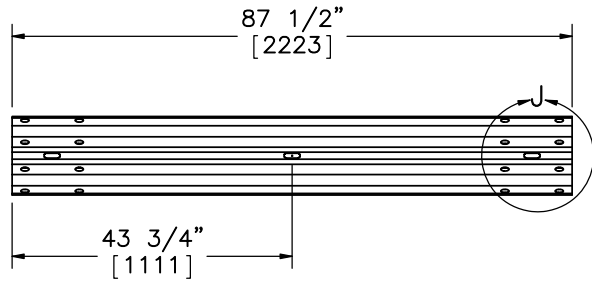
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UNITS: in.[mm]

SHEET:  
10 of 14

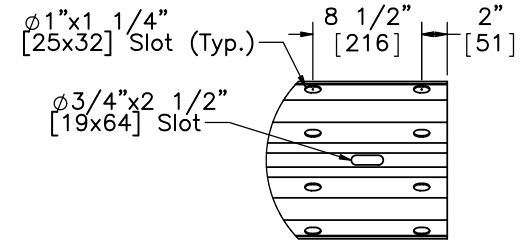
DATE:  
5/10/2013

DRAWN BY:  
DMH/RJT/  
CWP/ESG

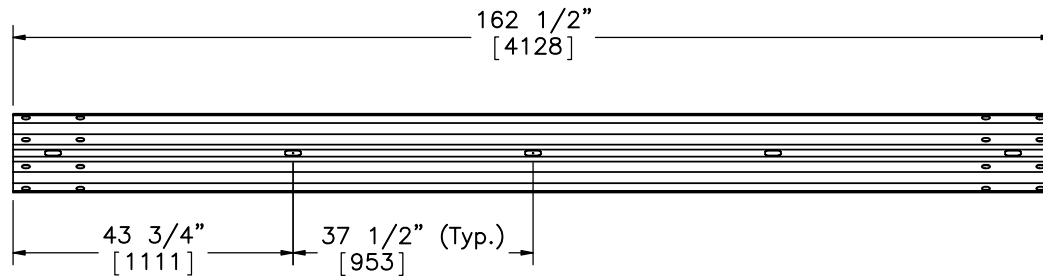
REV. BY:  
MDM/KAL



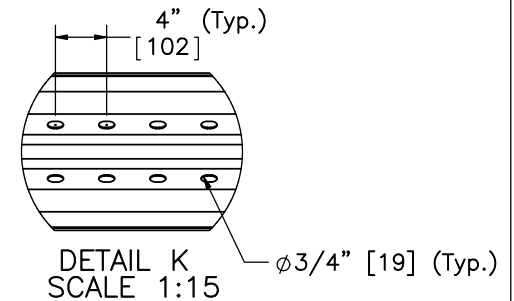
6'-3" [1905] W-Beam Section, 12 gauge [2.7]  
Part a3



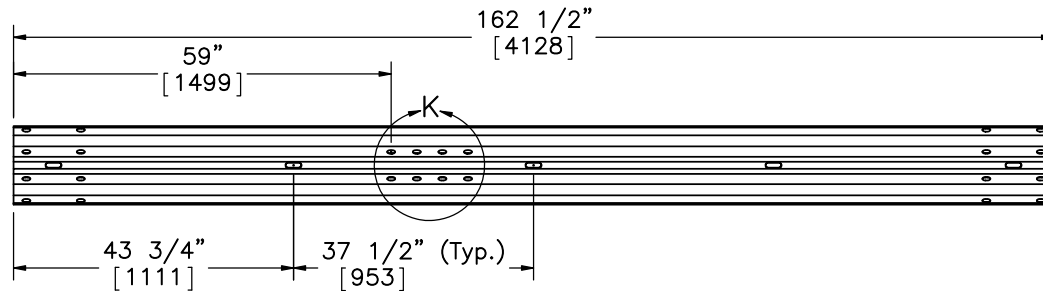
DETAIL J  
SCALE 1:15



12'-6" [3810] W-Beam Section, 12 gauge [2.7]  
Part a4



DETAIL K  
SCALE 1:15



12'-6" [3810] W-Beam Section, 12 gauge [2.7], End Section  
Part a5



Midwest Roadside  
Safety Facility

MGS 75 ft Length

Rail Section Details

DWG. NAME:  
MGSLENGTH\_R8

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

SHEET:  
11 of 14

DATE:  
5/10/2013

DRAWN BY:  
DMH/RJT/  
CWP/ESG

REV. BY:  
MDM/KAL

Item No.	QTY.	Description	Material Specifications	Hardware Guide
a1	9	W6x8.5 6' Long [W152x12.6 1829] Steel Post	ASTM A992 Min. 50 ksi [345 MPa] (W6x9 ASTM A36 Min. 36 ksi [248 MPa])	PWE06
a2	9	6x12x14 1/4" [152x305x362] Blockout	SYP Grade No. 1 or better	PDB10a-b
a3	1	6'-3" [1905] W-Beam MGS Section	12 gauge [2.7] AASHTO M180	RWM01a
a4	4	12'-6" [3810] W-Beam MGS Section	12 gauge [2.7] AASHTO M180	RWM04a
a5	2	12'-6" [3810] W-Beam MGS End Section	12 gauge [2.7] AASHTO M180	RWM14a
b1	9	5/8" Dia. x 14" Long [M16x356] Guardrail Bolt and Nut	Bolt ASTM A307, Nut ASTM A563 DH	FBB06
b2	9	16D Double Head Nail	-	-
b3	4	5/8" Dia. x 10" Long [M16x254] Guardrail Bolt and Nut	Bolt ASTM A307, Nut ASTM A563 DH	FBB03
b4	48	5/8" Dia. x 1 1/2" Long [M16x38] Guardrail Bolt and Nut	Bolt ASTM A307, Nut ASTM A563 DH	FBB01
b5	44	5/8" [16] Dia. Flat Washer	Grade 2	FWC16a
c1	4	BCT Timber Post - MGS Height	SYP Grade No. 1 or better	PDF01
c2	4	72" [1829] Long Foundation Tube	ASTM A53 Grade B	PTE06
c3	2	Strut and Yoke Assembly	ASTM A36 Steel Galvanized	-
c4	2	8x8x5/8" [203x203x15.9] Anchor Bearing Plate	ASTM A36 Steel	FPB01
c5	2	Anchor Bracket Assembly	ASTM A36 Steel	FPA01
c6	2	2 3/8" [60] O.D. x 6" [152] Long BCT Post Sleeve	ASTM A53 Grade B Schedule 40	FMM02
c7	4	5/8" Dia. x 10" Long [M16x254] Hex Head Bolt and Nut	Bolt ASTM A307, Nut ASTM A563 DH	FBX16a
c8	16	5/8" Dia. x 1 1/2" Long [M16x38] Hex Head Bolt and Nut	Bolt ASTM A307, Nut ASTM A563 DH	FBX16a
c9	4	7/8" Dia. x 7 1/2" Long [M22x191] Hex Head Bolt and Nut	Bolt ASTM A307, Nut ASTM A563 DH	FBX22a
c10	8	7/8" [22] Dia. Flat Washer	Grade 2	FWC22a



Midwest Roadside  
Safety Facility

MGS 75 ft Length

Bill of Materials

DWG. NAME.  
MGSLENGTH\_R8

SCALE: NONE  
UNITS: in.[mm]

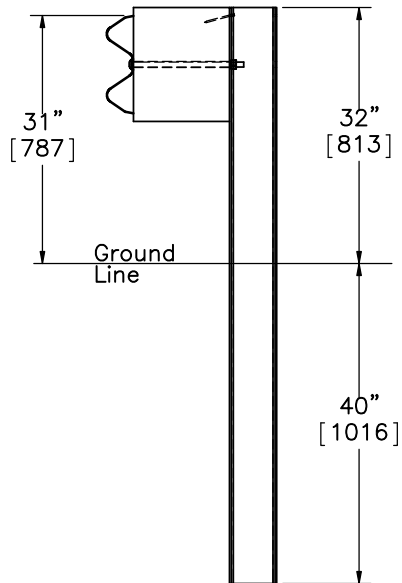
SHEET:  
12 of 14  
DATE:  
5/10/2013  
DRAWN BY:  
DMH/RJT/  
CWP/ESG  
REV. BY:  
MDM/KAL


Item No.	QTY.	Description	Material Specifications
d1	4	115-HT Mechanical Splice – 3/4" [19] Dia.	As Supplied
d2	4	3/4" [190] Dia. 6x19 IWRC IPS Wire Rope	IPS Galvanized
d3	4	BCT Anchor Cable End Swage Fitting	Grade 5 – Galvanized
d4	4	Crosby Heavy Duty HT-3/4" [19] Dia. Cable Thimble	Stock No. 1037773 – Galvanized
e1	4	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
f1	4	Chicago Hardware Drop Forged Heavy Duty Eye Nut – Drilled and Tapped 1 1/2" [38] Dia. – UNF 12 [M36]	As Supplied, Stock No. 107
g1	2	TLL-50K-PTB Load Cell	NA



Midwest Roadside  
Safety Facility

MGS 75 ft Length		SHEET: 13 of 14
		DATE: 5/10/2013
Bill of Materials		DRAWN BY: DMH/RJT/ CWP/ESG
DWG. NAME: MGSLENGTH_R8	SCALE: NONE UNITS: in.[mm]	REV. BY: MDM/KAL



	MGS 75 ft Length	SHEET: 14 of 14
	Description of View	DATE: 5/10/2013
DRAWN BY: DMH/RJT/ CWP/ESG		
REV. BY: MDM/KAL		
Midwest Roadside Safety Facility	DWG. NAME: MGSLENGTH_R8	SCALE: 1:24 UNITS: in.[mm]