
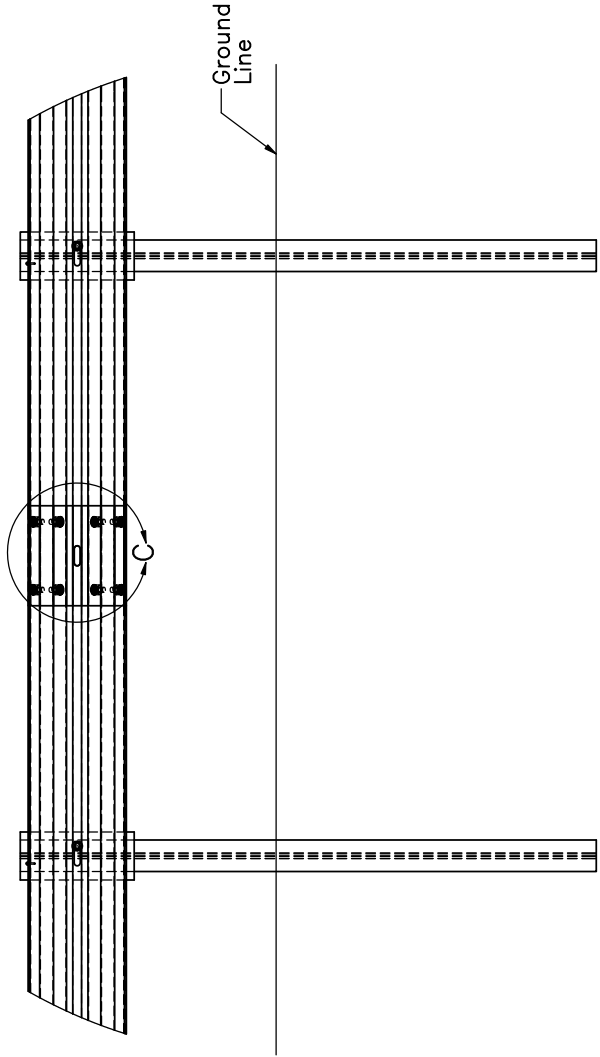
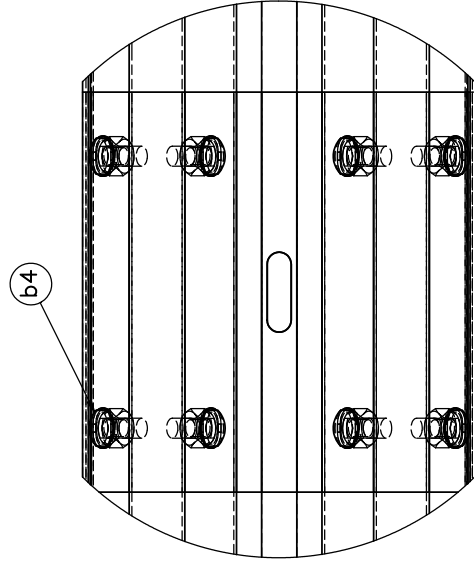
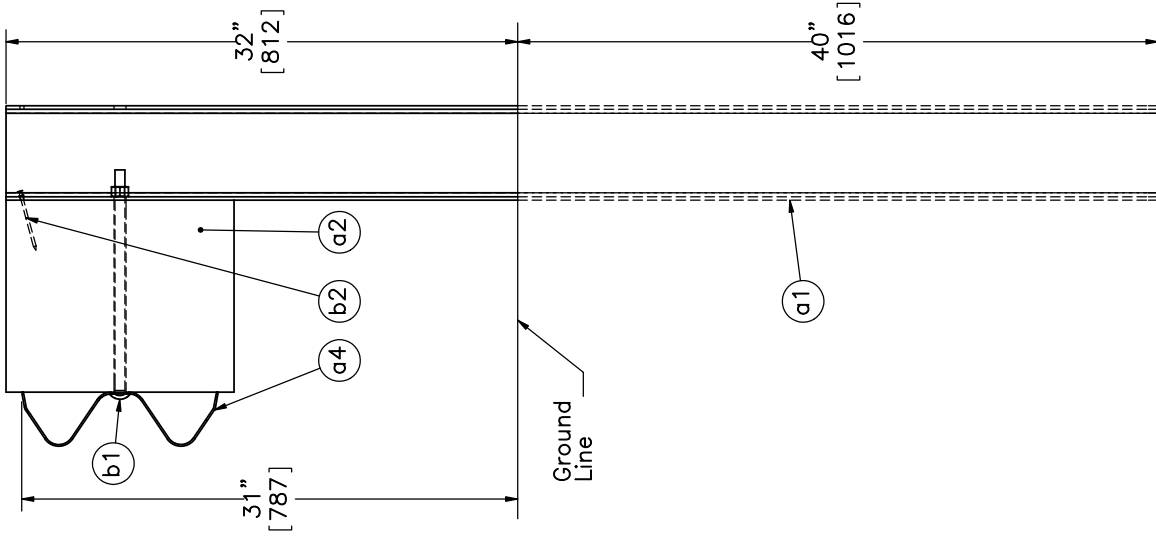


- Notes: (1) Impact location for the 2270P is at the centerline of post no. 24.
- (2) The BCT anchor posts are placed in $\phi 3'$ [914] holes.
- (3) Critical region located between post nos. 21 and 29.
- (4) A string potentiometer and tension load cell shall be placed within the upstream anchorage system.
- (5) A high-speed digital video camera is to be placed perpendicular to downstream anchor.
- (6) Avoid activating vehicle brakes in the first 100' [30480] downstream of post no. 29.
- (7) Allow for a minimum lateral clearance of 30' [9144] behind the system in the first 75' [22860] downstream of post no. 29.
- (8) Paint the downstream bearing plate and BCT cable two different colors.


 Midwest Roadside Safety Facility	Wisconsin DOT Project MGS with Standard Downstream Anchorage System		SHEET: 1 of 15
	System Layout		DATE: 5/25/2012
DWG. NAME: DS-Anchorage-31in_R5		SCALE: 1:225 UNITS: in.[mm]	DRAWN BY: JGP
			REV. BY: KAL/RKF

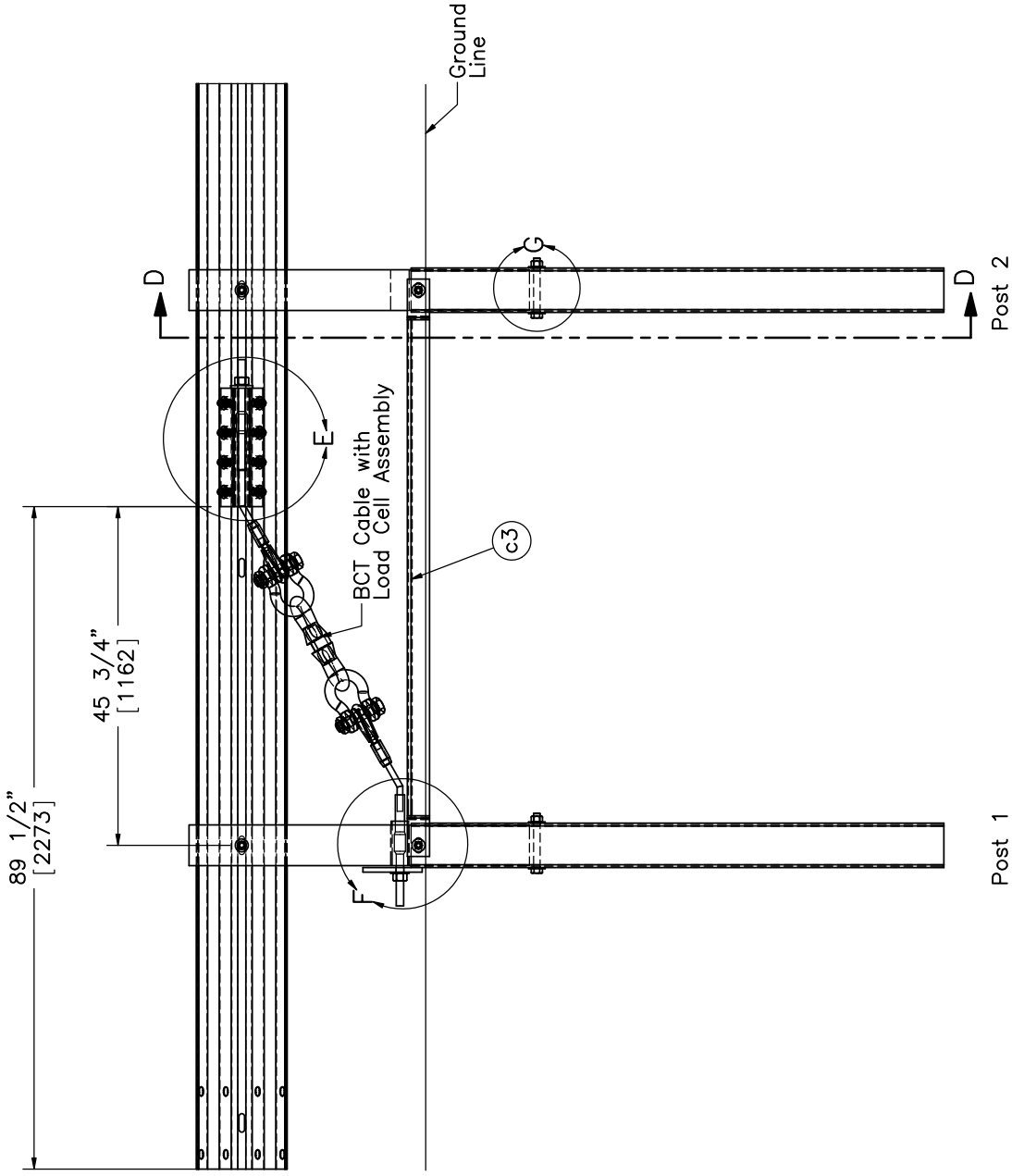


DETAIL A

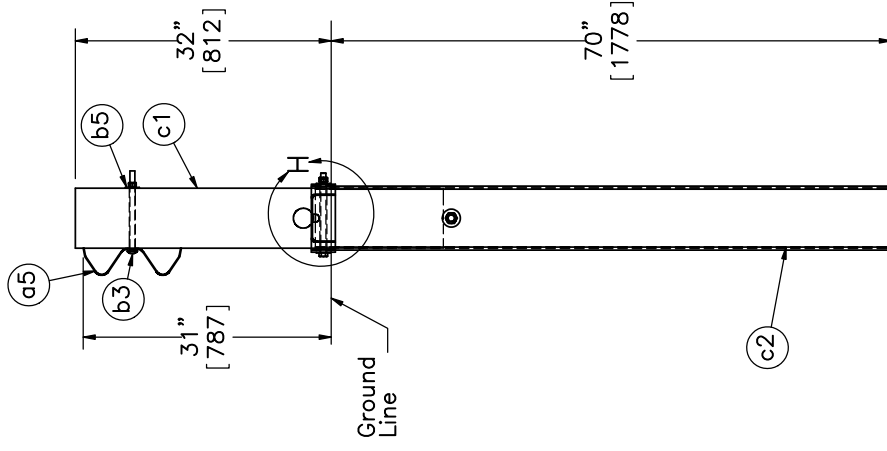


DETAIL C
SCALE 1 : 6


	Wisconsin DOT Project MGS with Standard Downstream Anchorage System		SHEET: 2 of 15
	Post and Splice Details		DATE: 5/25/2012
Midwest Roadside Safety Facility		DWG. NAME: DS-Anchorage-31in_R5	DRAWN BY: JGP
		SCALE: 1:24 UNITS: in,[mm]	REV. BY: KAL/RKF

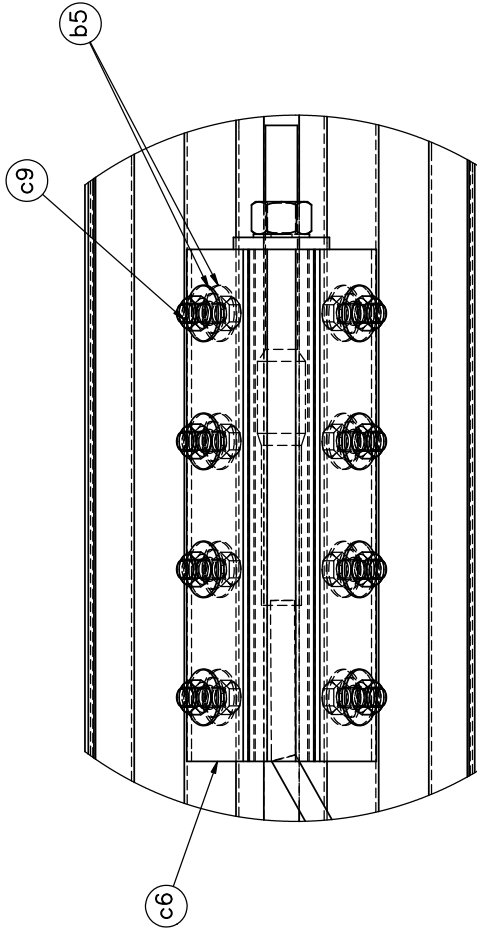


Upstream End Section Detail

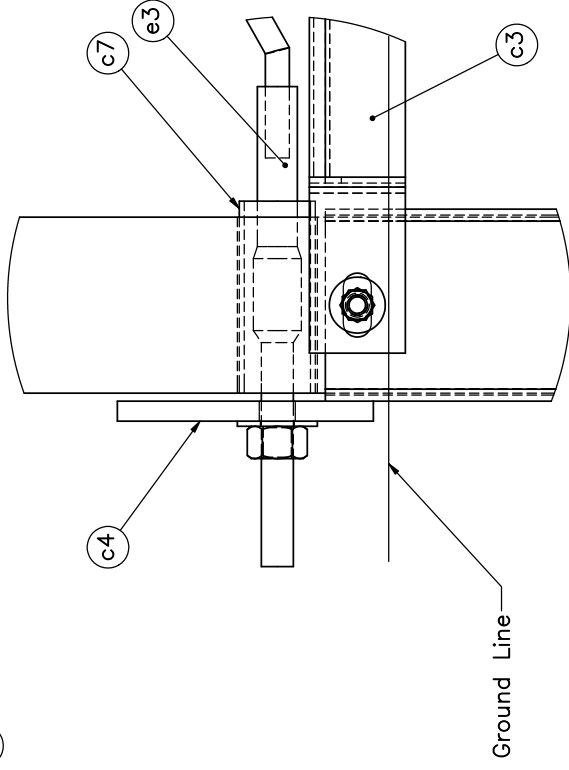


SECTION D-D

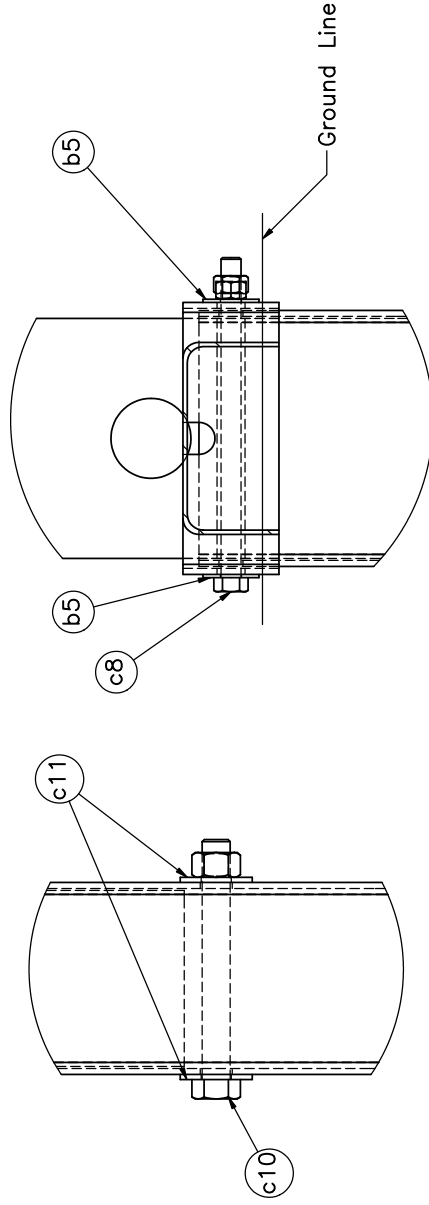
	Wisconsin DOT Project MGS with Standard Downstream Anchorage System	SHEET: 3 of 15 DATE: 5/25/2012
	Upstream End Rail Details	DRAWN BY: JGP REV. BY: KAL/RKF
DWG. NAME: DS-Anchorage-31in_R5	SCALE: 1:24 UNITS: in,[mm]	



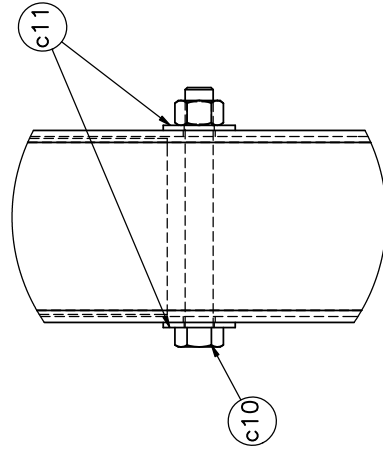
DETAIL E



DETAIL F



DETAIL H

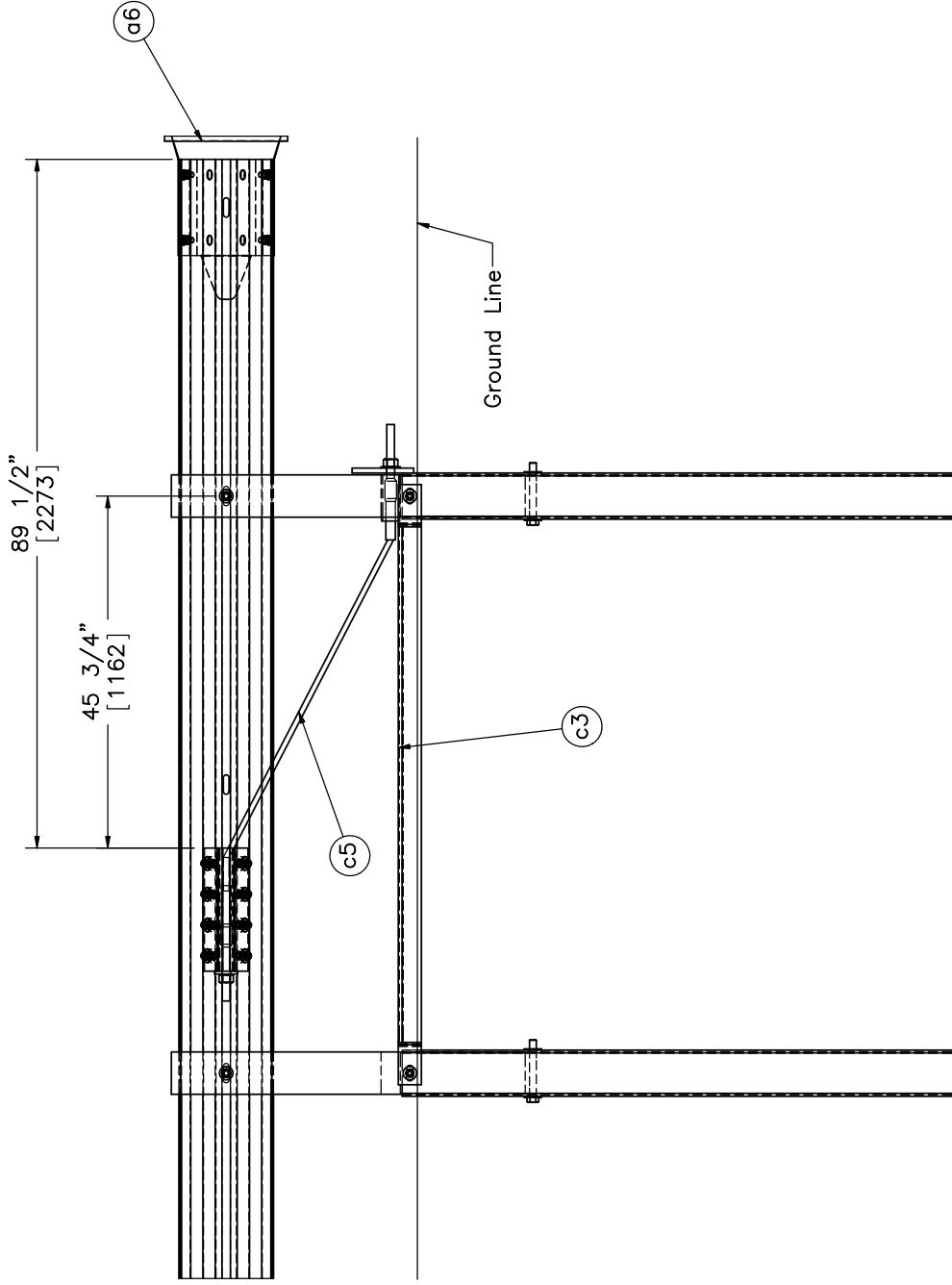


DETAIL G



Midwest Roadside Safety Facility

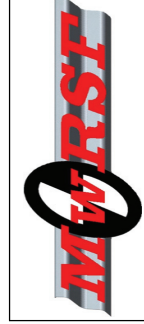
SHEET: 4 of 15	Wisconsin DOT Project MGS with Standard Downstream Anchorage System	Anchor Details	SCALE: 1:6
			UNITS: in,[mm]
DATE: 5/25/2012	DRAWN BY: JGP	REV. BY: KAL/RKF	DWG. NAME: DS-Anchorage-31in_R5



Post 28

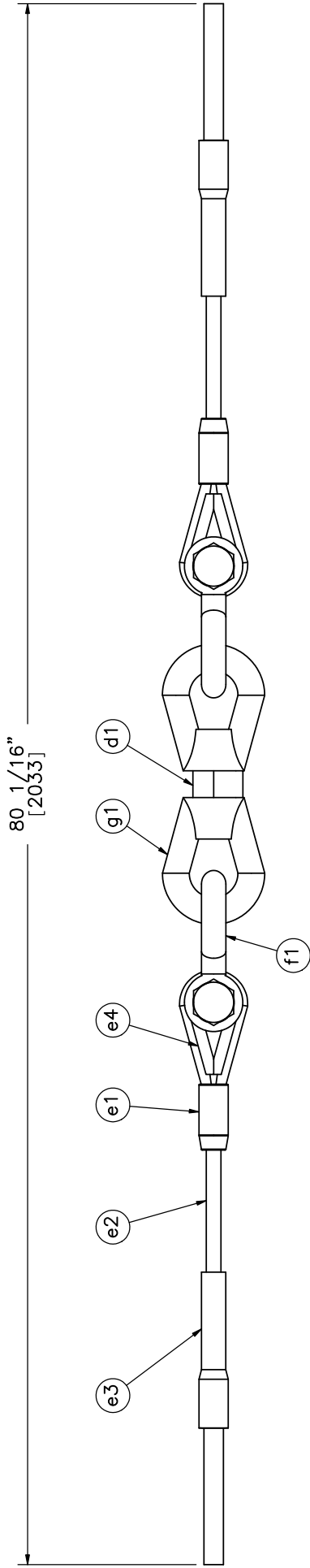
Post 29

Downstream End Section Detail




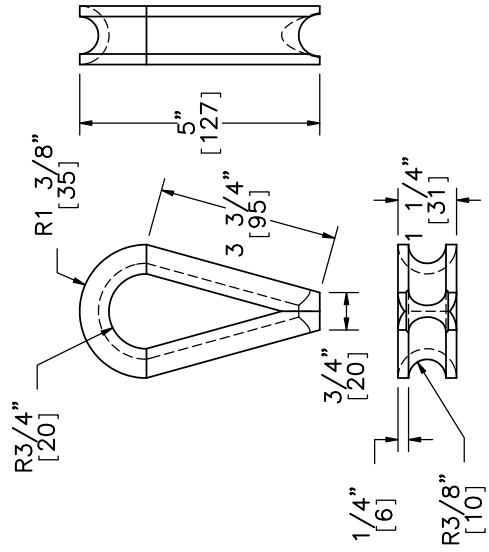
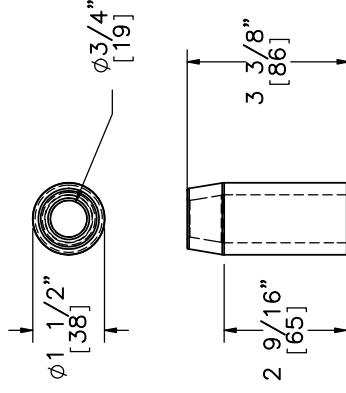
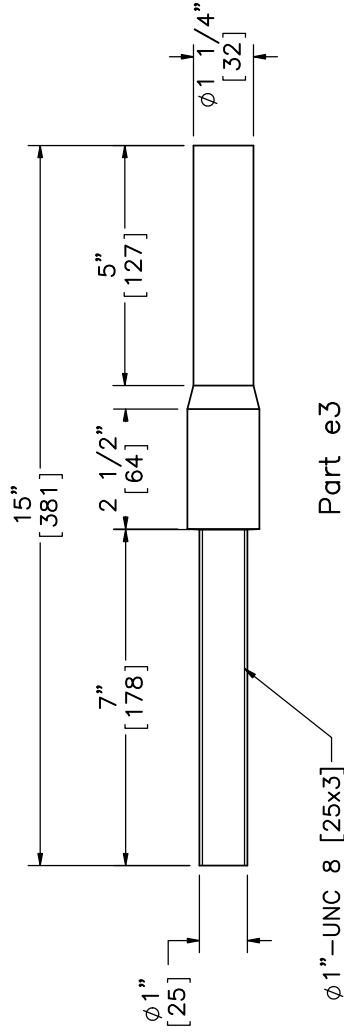
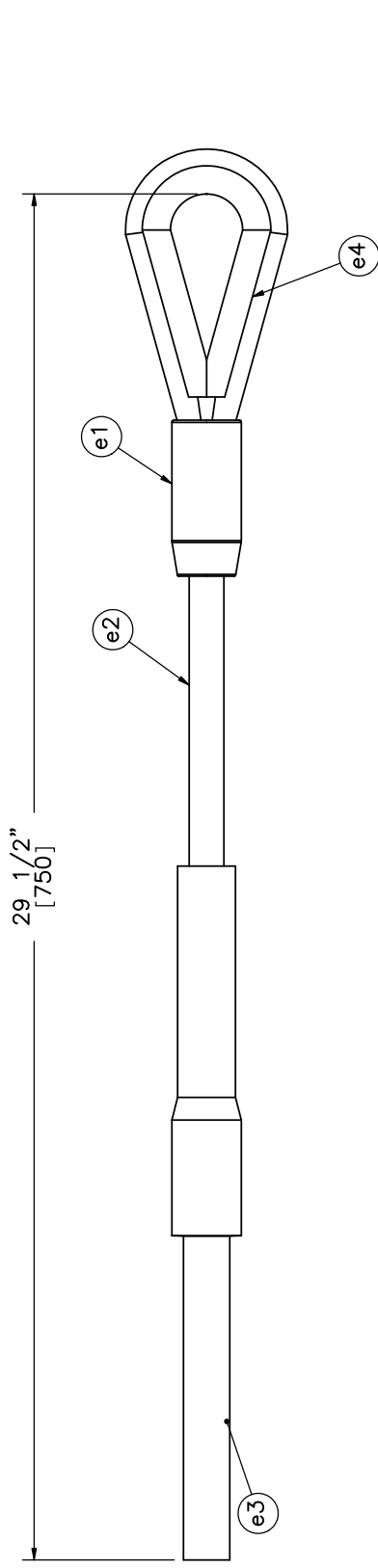
Midwest Roadside Safety Facility

SHEET: 5 of 15	
DATE: 5/25/2012	
DRAWN BY: JGP	
REV. BY: KAL/RKF	
Wisconsin DOT Project MGS with Standard Downstream Anchorage System	
Downstream End Rail Details	
DWG. NAME: DS-Anchorage-31in_R5	SCALE: 1:24 UNITS: in,[mm]



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.

	Wisconsin DOT Project MGS with Standard Downstream Anchorage System		SHEET: 6 of 15
	Modified BCT Cable with Load Cell Assembly DWG. NAME: DS-Anchorage-31in_R5		DATE: 5/25/2012
Midwest Roadside Safety Facility		SCALE: 1:8 UNITS: in,[mm]	DRAWN BY: JGP
			REV. BY: KAL/RKF




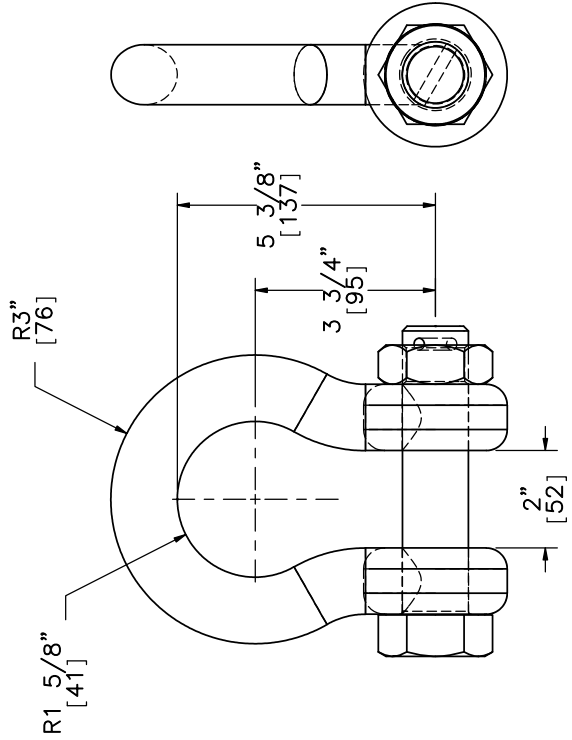
Part e1

Part e3

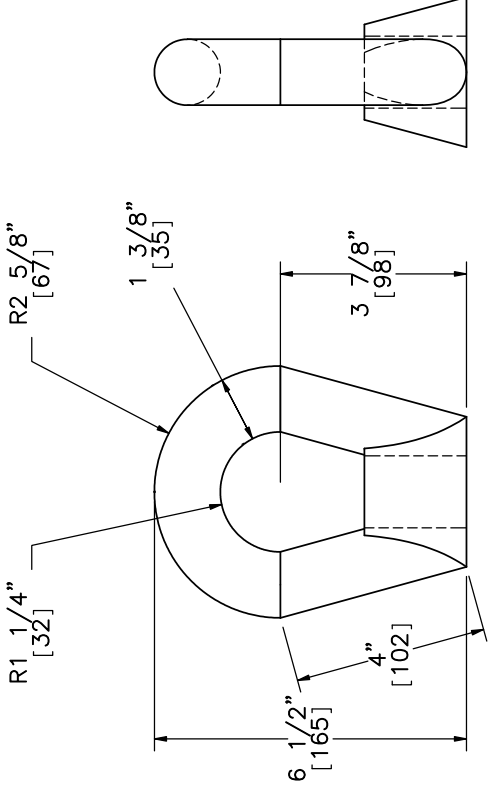
Part e4

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

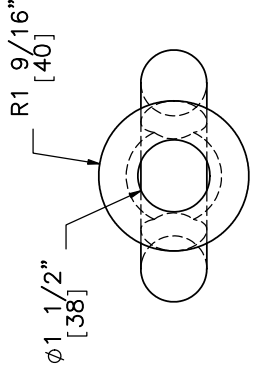
	Wisconsin DOT Project MGS with Standard Downstream Anchorage System	SHEET: 7 of 15
	Modified BCT Cable	DATE: 5/25/2012
Midwest Roadside Safety Facility	DWG. NAME: DS-Anchorage-31in_R5	DRAWN BY: JGP
	SCALE: 1:4 UNITS: in,[mm]	REV. BY: KAL/RKF




Part f1

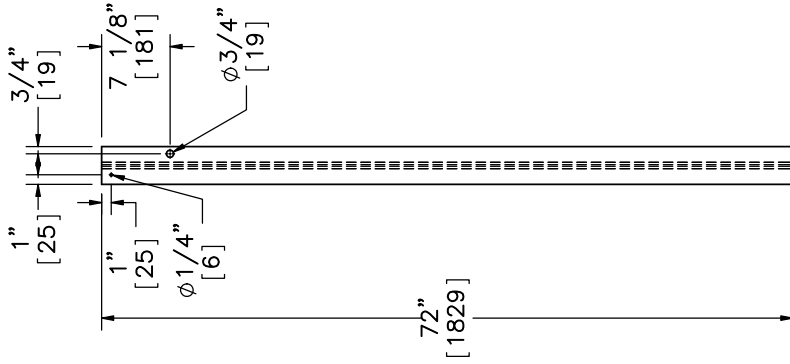


Part g1

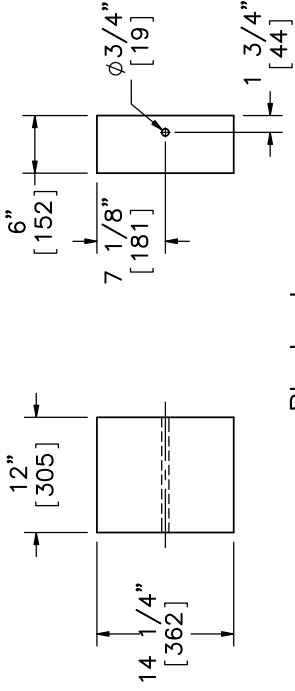


	Wisconsin DOT Project MGS with Standard Downstream Anchorage System	SHEET: 8 of 15
		DATE: 5/25/2012
Midwest Roadside Safety Facility	Shackle and Eye Nut	DRAWN BY: JGP
		REV. BY: KAL/RKF
DWG. NAME: DS-Anchorage-31in_R5		SCALE: 1:4 UNITS: in,[mm]

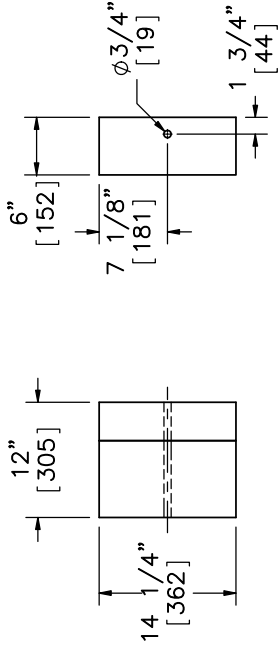
I



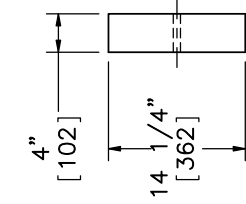
Line Post
Part a1



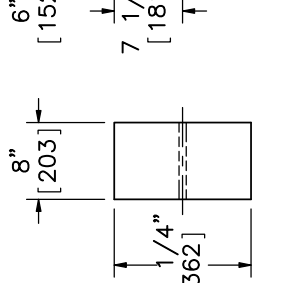
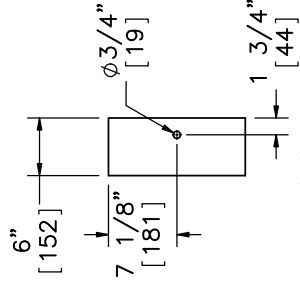
Blockout
Part a2



Alternate Blockout Option –
 6" x 4" x 14 1/4" [152x102x362] Blockout
 with 6" x 8" x 14 1/4" [152x203x362] Blockout



6" x 4" x 14 1/4" [152x102x362] Blockout

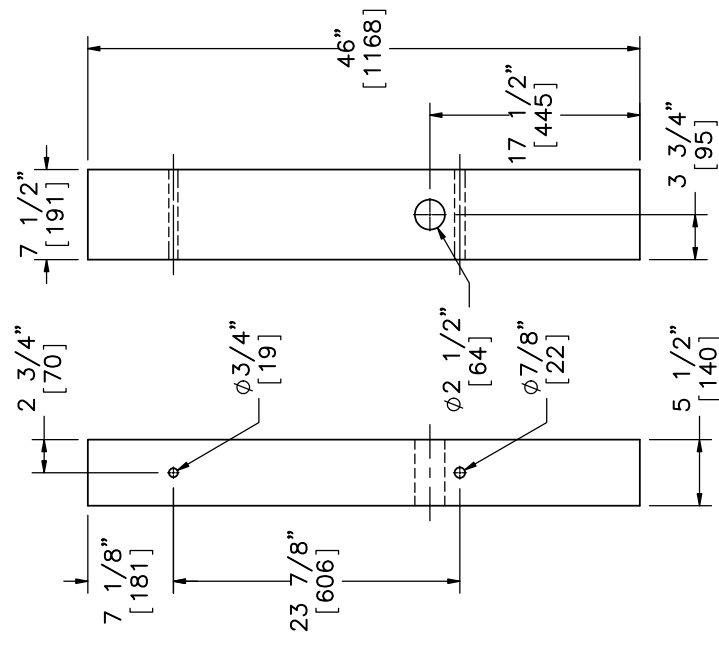
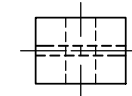


6" x 8" x 14 1/4" [152x203x362] Blockout

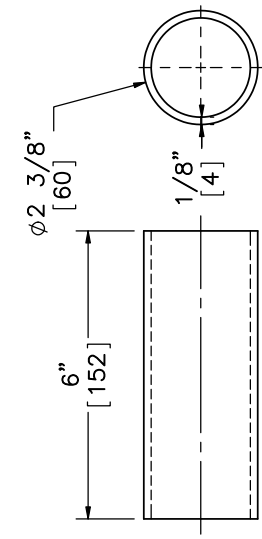


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Safety Facility

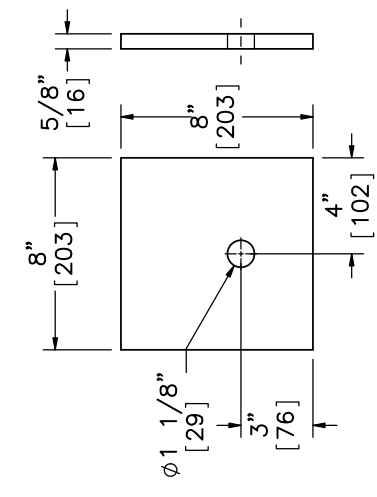
SHEET: 9 of 15	DATE: 5/25/2012	DRAWN BY: JGP	REV. BY: KAL/RKF
Wisconsin DOT Project MGS with Standard Downstream Anchorage System		Post Nos. 3-27 Details	
DWG. NAME: DS-Anchorage-31in_R5		SCALE: 1:20	
		UNITS: in./mm	



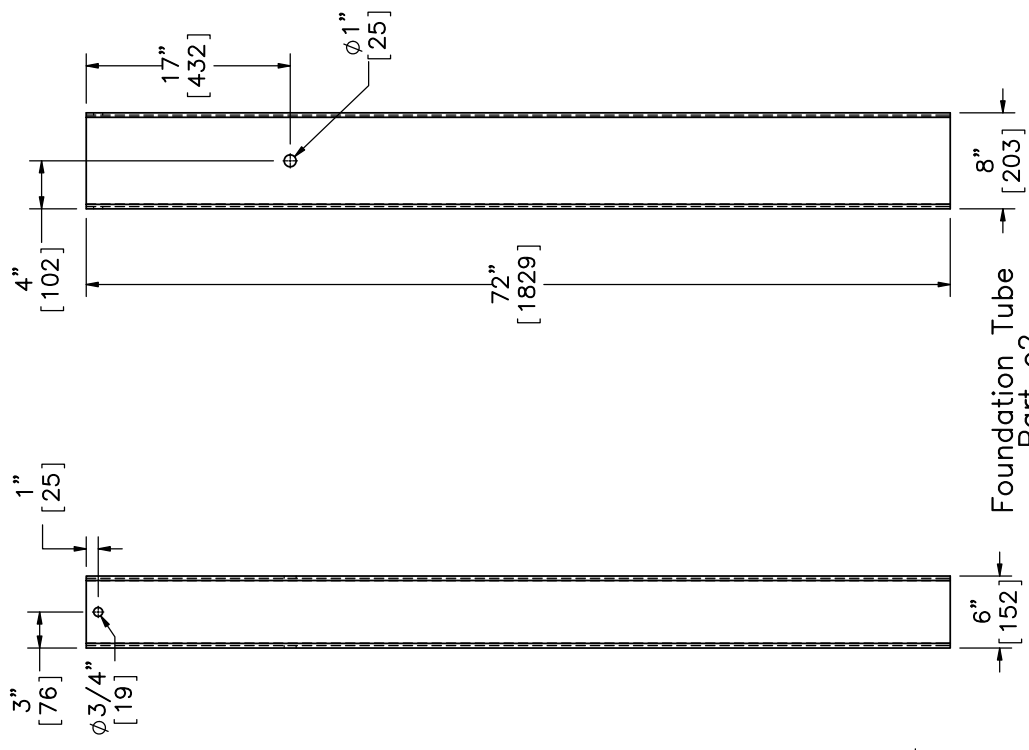
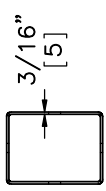
BCT MGS Timber Post
Part c1




BCT Post Sleeve
Part c7
SCALE 1:4

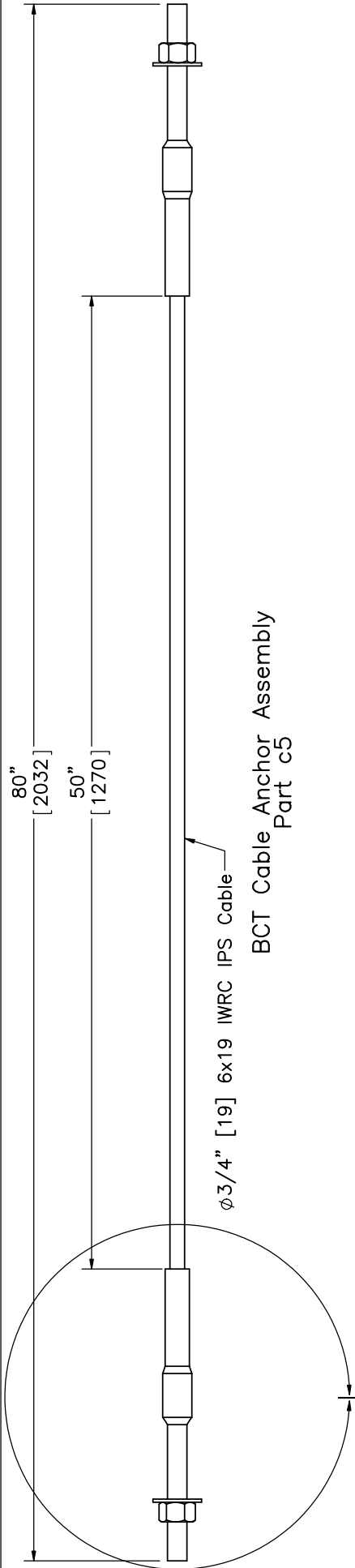


Anchor Bracket Bearing Plate
Part c4
SCALE 1:8

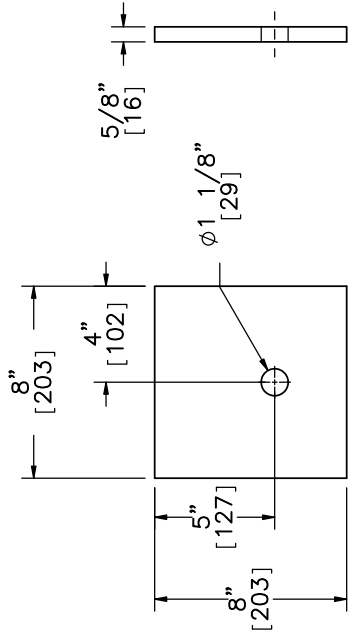


Foundation Tube
Part c2

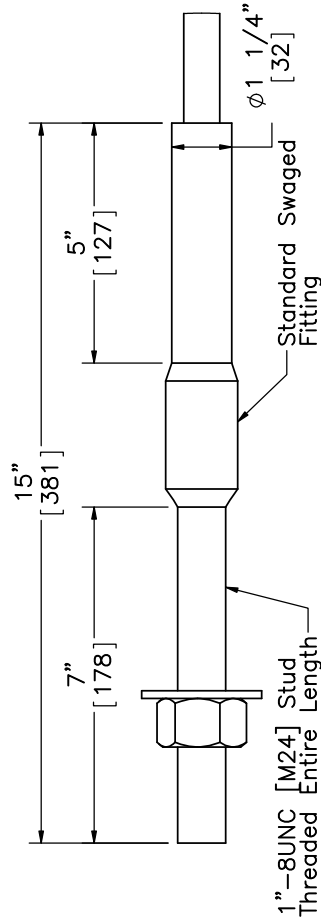
	Wisconsin DOT Project MGS with Standard Downstream Anchorage System	SHEET: 10 of 15
		DATE: 5/25/2012
Midwest Roadside Safety Facility	BCT Timber Post & Foundation Tube Details	DRAWN BY: JGP
		REV. BY: KAL/RKF
DWG. NAME: DS-Anchorage-31in_R5		SCALE: 1:16 UNITS: in,[mm]



$\phi 3/4"$ [19] 6x19 IWRC IPS Cable
 BCT Cable Anchor Assembly
 Part c5



Anchor Bracket Bearing Plate
 Part c4



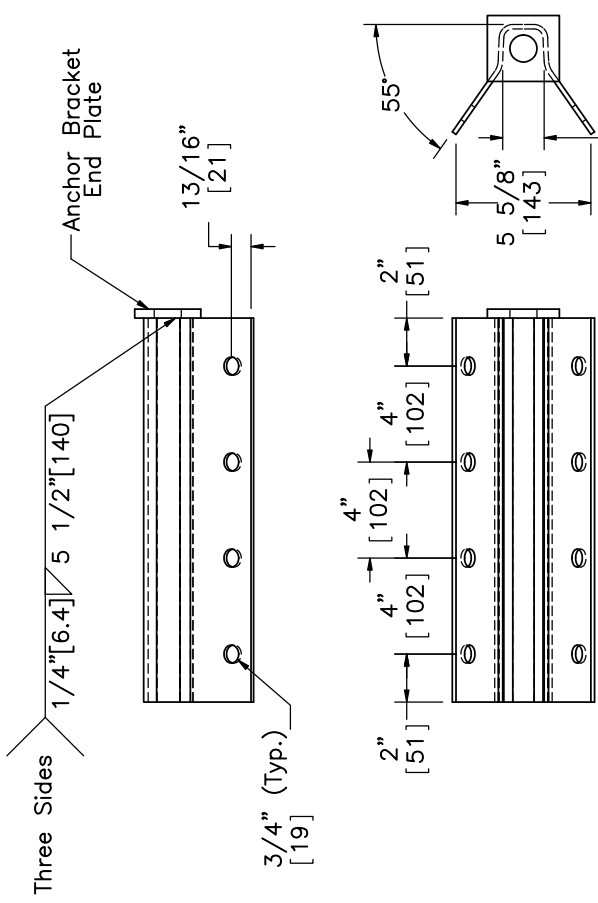
DETAIL I
 SCALE 1:4

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

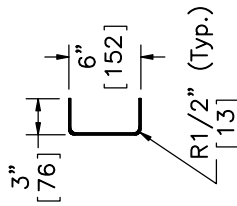


Midwest Roadside
 Safety Facility

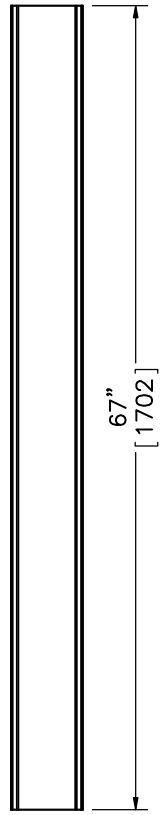
SHEET: 11 of 15 DATE: 5/25/2012 DRAWN BY: JGP REV. BY: KAL/RKF	Wisconsin DOT Project MGS with Standard Downstream Anchorage System	
	BCT Anchor Cable	SCALE: 1:8 UNITS: in,[mm]
DWG. NAME: DS-Anchorage-31in_R5		REV. BY: KAL/RKF



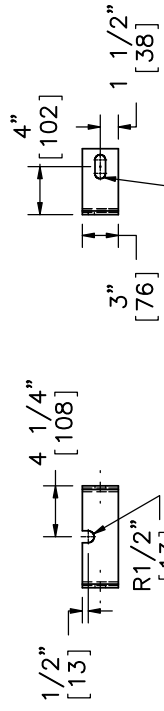
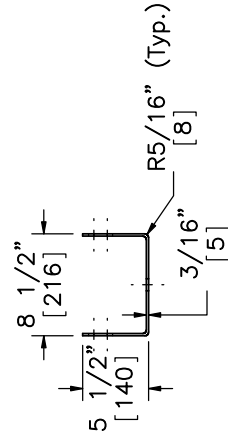
Anchor Bracket (FPA01)
Part c6
SCALE 1:8



Strut and Yoke Assembly
Part c3




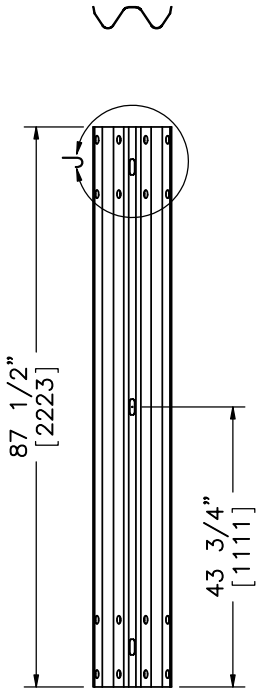
Strut
6" x3" [152x76] 10 Gauge [3.4]



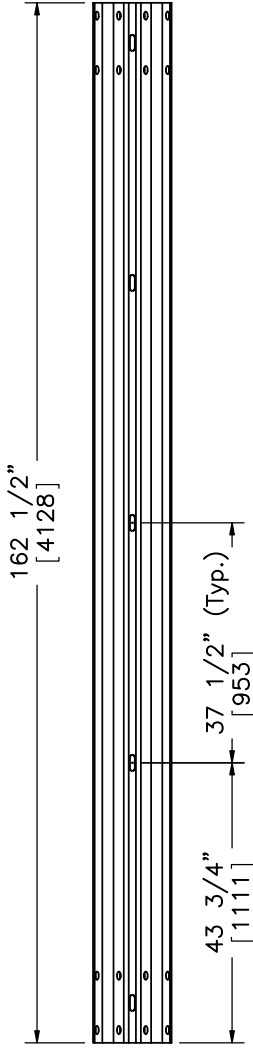
Yoke

Anchor Bracket End Plate
SCALE 1:8

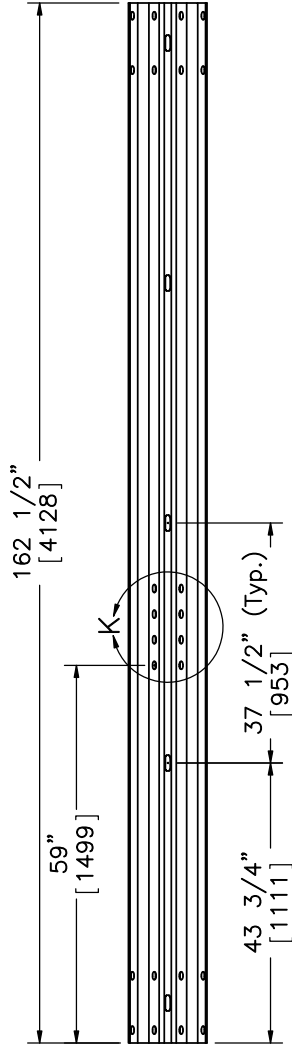
	Wisconsin DOT Project MGS with Standard Downstream Anchorage System	SHEET: 12 of 15 DATE: 5/25/2012 DRAWN BY: JGP REV. BY: KAL/RKF
	Midwest Roadside Safety Facility	Ground Strut & Anchor Bracket Details DWG. NAME: DS-Anchorage-31in_R5 SCALE: 1:16 UNITS: in,[mm]



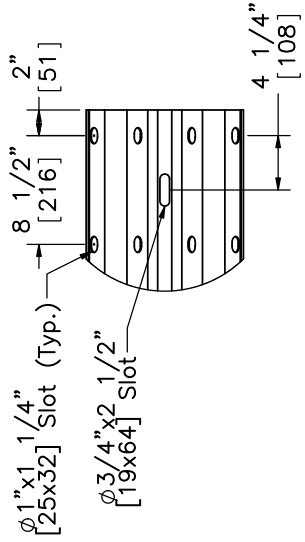
6'-3" [1905] W-Beam Section, 12 gauge [2.7]
Part a3



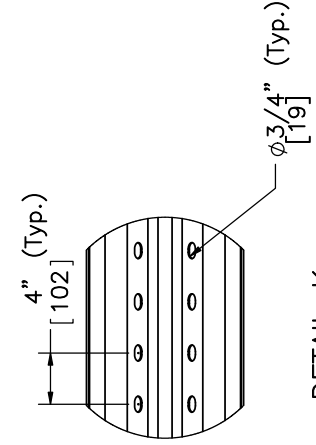
12'-6" [3810] W-Beam Section, 12 gauge [2.7]
Part a4



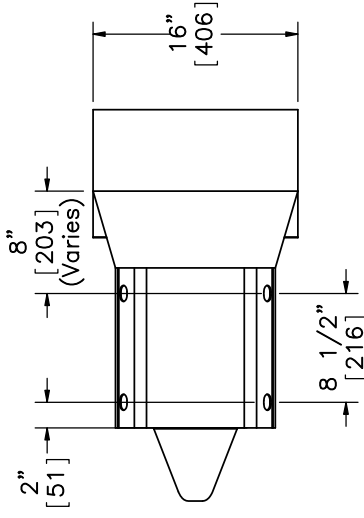
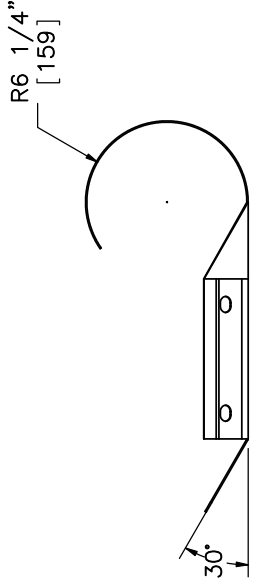
12'-6" [3810] W-Beam Section, 12 gauge [2.7], End Section
Part a5



DETAIL J
SCALE 1:15



DETAIL K
SCALE 1:15



W-Beam Rounded End Section
12 gauge [2.7]
Part a6
SCALE 1:15

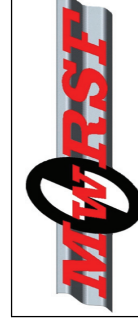
Notes: (1) If rounded W-beam end section cannot be found locally use a spoon end section.



Midwest Roadside
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Wisconsin DOT Project MGS with Standard Downstream Anchorage System	SHEET: 13 of 15
	DATE: 5/25/2012
Rail Section Details	DRAWN BY: JGP
DWG. NAME: DS-Anchorage-31in_R5	REV. BY: KAL/RKF
SCALE: 1:30	UNITS: in./mm


ItemNo.	QTY.	Description	Material Specification	Hardware Guide
a1	25	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	25	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	12	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
a6	1	W-Beam Rounded End Section	12 gauge [2.7] AASHTO M180	RWE03a
b1	25	5/8" Dia. x 14" Long [M16x356] Guardrail Bolt and Nut	Bolt ASTM A307, Nut ASTM A563 A	FBB06
b2	25	16D Double Head Nail	-	-
b3	4	5/8" Dia. x 10" [M16x254] Long Guardrail Bolt and Nut	Bolt ASTM A307, Nut ASTM A563 A	FBB03
b4	116	5/8" Dia. x 1 1/2" Long [M16x38] Guardrail Bolt and Nut	Bolt ASTM A307, Nut ASTM A563 A	FBB01
b5	46	5/8" [16] Dia. Flat Washer	ASTM F844 or SAE Grade 2 Steel	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" [203x203x16] Anchor Bearing Plate	ASTM A36 Steel	FPB01
c5	1	BCT Anchor Cable Assembly	φ3/4" [19] 6x19 IWRC IPS Galvanized Wire Rope	FCA01
c6	2	Anchor Bracket Assembly	ASTM A36 Steel	FPA01
c7	2	2 3/8" [60] O.D. x 6" [152] Long BCT Post Sleeve	ASTM A53 Grade B Schedule 40	FMM02
c8	4	5/8" Dia. x 10" [M16x254] Long Hex Head Bolt and Nut	Bolt ASTM A307, Nut ASTM A563 A	FBX16a
c9	16	5/8" Dia. x 1 1/2" Long [M16x38] Hex Head Bolt and Nut	Bolt ASTM A307, Nut ASTM A563 A	FBX16a
c10	4	7/8" Dia. x 7 1/2" [M22x191] Long Hex Head Bolt and Nut	Bolt ASTM A307, Nut ASTM A563 A	FBX22a
c11	8	7/8" [22] Dia. Flat Washer	ASTM F844 or SAE Grade 2 Steel	FWC22a



Midwest Roadside Safety Facility

SHEET: 14 of 15	DATE: 5/25/2012	DRAWN BY: JGP	REV. BY: KAL/RKF	SCALE: NONE	UNITS: in,[mm]	Wisconsin DOT Project MGS with Standard Downstream Anchorage System
DWG. NAME: DS-Anchorage-31in_R5						

Item No.	QTY.	Description	Material Specification
d1	1	TLL-50K-PTB Load Cell	NA
e1	2	115-HT Mechanical Splice - 3/4" [19] Dia.	As Supplied
e2	2	3/4" [190] 6x19 IWRC IPS Wire Rope	IPS Galvanized
e3	4	BCT Anchor Cable End Swage Fitting	SAE Grade 5 - Galvanized
e4	2	Crosby Heavy Duty HT-3/4" [19] Dia. Cable Thimble	As Manufactured
f1	2	Crosby G2130 or S2130 Bolt Type Shackles - 1 1/4" [32] Dia. with thin head bolt, nut, and cotter pin, Grade A, Class 3	Stock Nos. 1019597 and 1019604 - As Supplied
g1	2	Chicago Hardware Drop-Forged Heavy Duty Eye Nut - Drilled and Tapped 1 1/2" [38] Dia. - UNF 12 [M36]	As Supplied, Stock No. 107

 Midwest Roadside Safety Facility	Wisconsin DOT Project MGS with Standard Downstream Anchorage System	SHEET: 15 of 15 DATE: 5/25/2012 DRAWN BY: JGP REV. BY: KAL/RKF
	Bill of Materials Continued	SCALE: NONE UNITS: in.[mm]