

- Notes: (1) Test shall be performed according to test designation no. 3-11 of MASH criteria.
- (2) The impact location is 18'-9" [5715] upstream of post no. 15 or at centerline of post no. 12.
- (3) BCT anchors are placed in ϕ 3' [914] holes, then backfilled and tamped with soil.
- (4) Critical region is between post nos. 9 and 20 (ϕ 3' holes).
- (5) The compacted slope shall be constructed prior to installing the posts. Auger holes and place the posts at the slope break point. Backfill and compact soil around the posts, recreating the 2H:1V fill slope.



Midwest Roadside Safety Facility

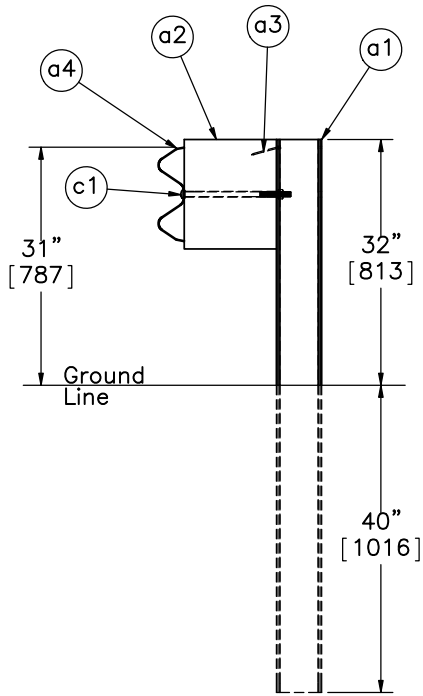
Standard MGS on a 2:1 Fill Slope

System Layout

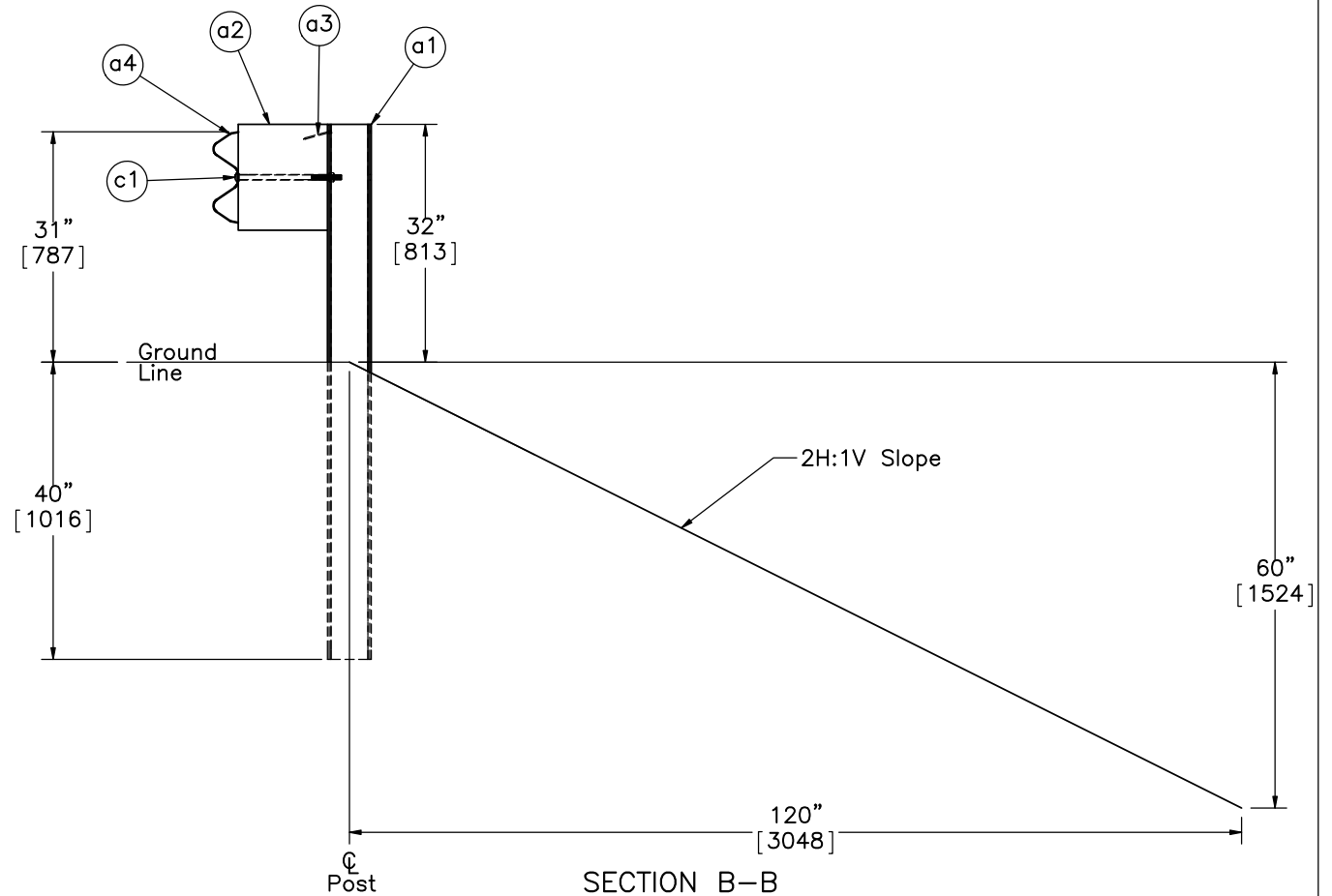
DWG. NAME.
MGS_Standard_2to1Slope_R8

SCALE: 1:220
UNITS: Inches

SHEET:
1 of 12
DATE:
7/13/2015
DRAWN BY:
SDB/JEK
REV. BY:
KAL/RKF



SECTION A-A
Post Nos. 3-8 and 21-27



SECTION B-B
Post Nos. 9-20



Midwest Roadside
Safety Facility

Standard MGS on a 2:1
Fill Slope

Post Details

DWG. NAME.
MGS_Standard_2to1Slope_R8

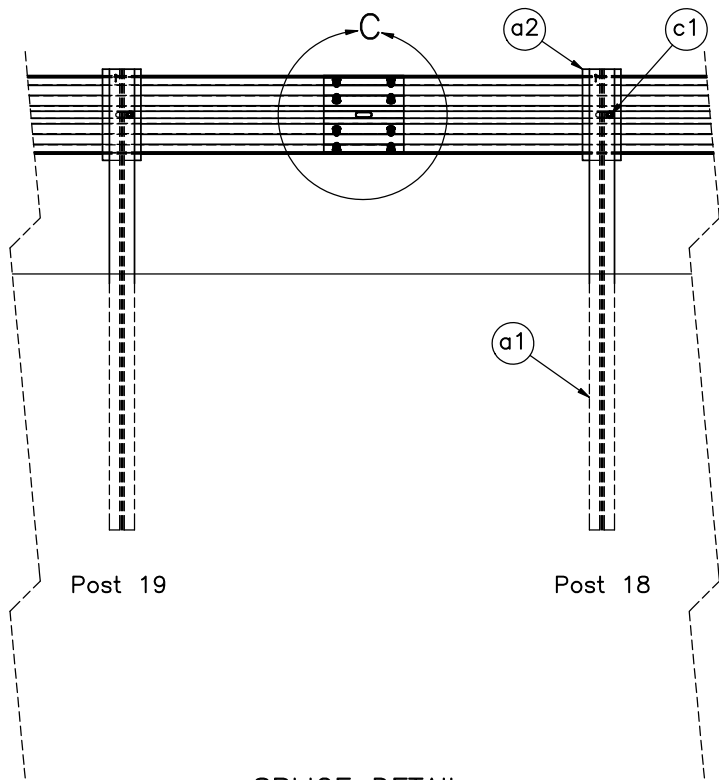
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UNITS: Inches

SHEET:
2 of 12

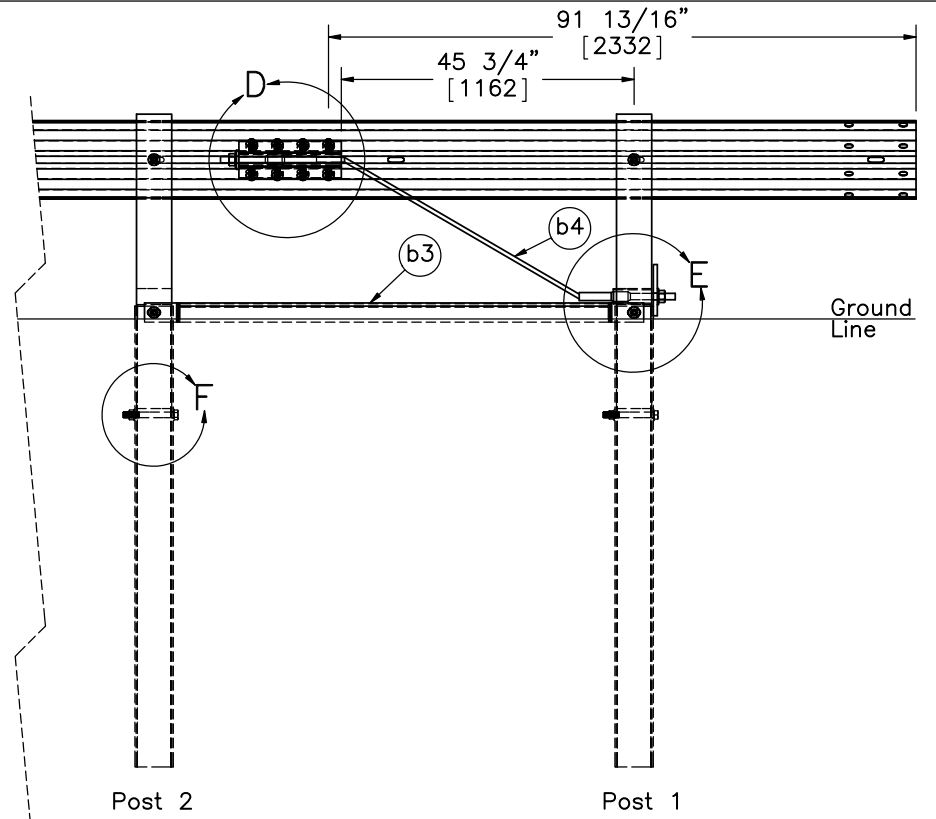
DATE:
7/13/2015

DRAWN BY:
SDB/JEK

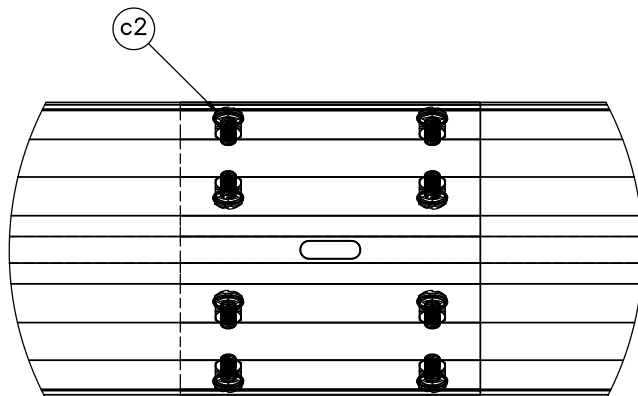
REV. BY:
KAL/RKF



SPLICE DETAIL
BACKSIDE



END SECTION DETAIL
BACKSIDE



DETAIL C
SCALE 1 : 8



Midwest Roadside
Safety Facility

Standard MGS on a 2:1
Fill Slope

End Section & Splice Detail

DWG. NAME:
MGS_Standard_2to1Slope_R8

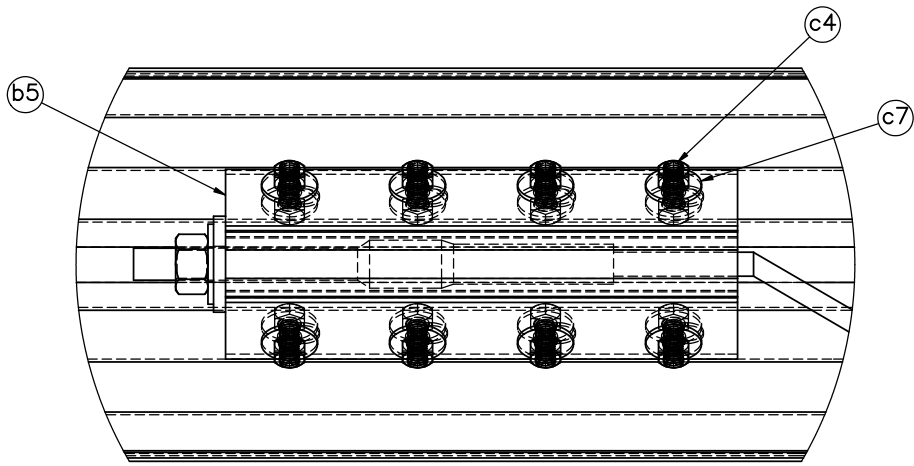
SCALE: 1:30
UNITS: Inches

SHEET:
3 of 12

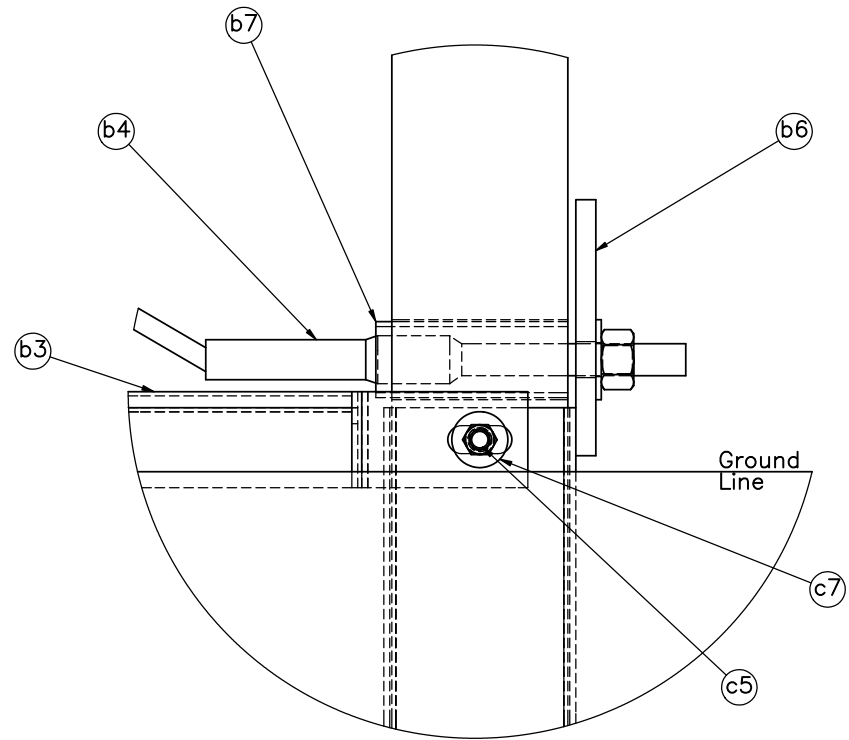
DATE:
7/13/2015

DRAWN BY:
SDB/JEK

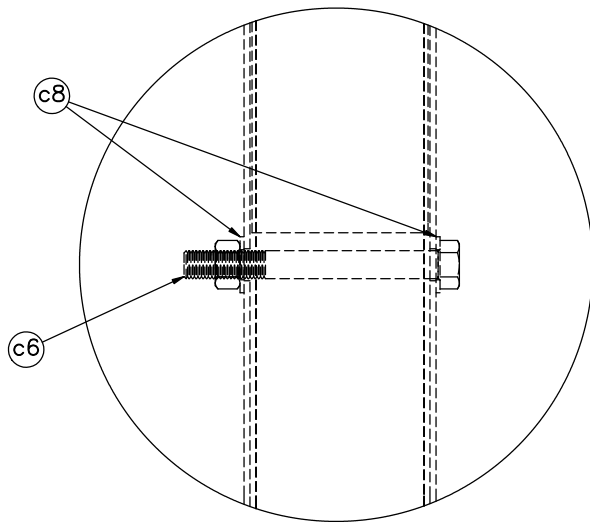
REV. BY:
KAL/RKF



DETAIL D



DETAIL E



DETAIL F



Midwest Roadside
Safety Facility

Standard MGS on a 2:1
Fill Slope

BCT Anchor Details

DWG. NAME:
MGS_Standard_2to1Slope_R8

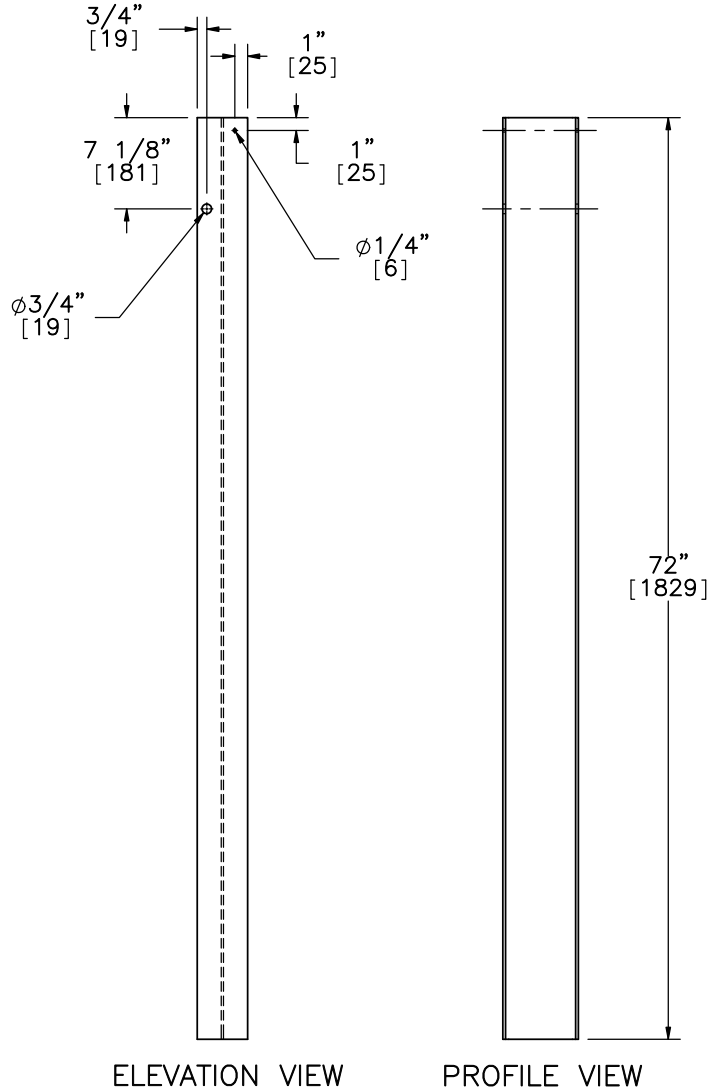
SCALE: 1:6
UNITS: Inches

SHEET:
4 of 12

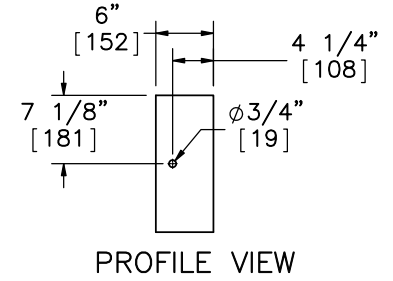
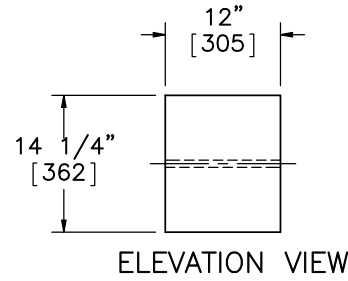
DATE:
7/13/2015

DRAWN BY:
SDB/JEK

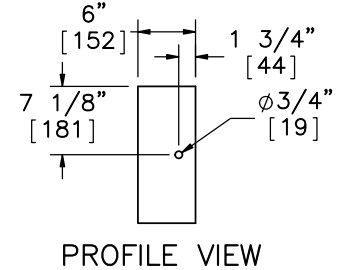
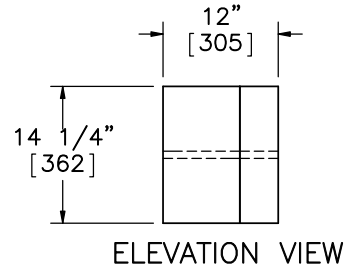
REV. BY:
KAL/RKF



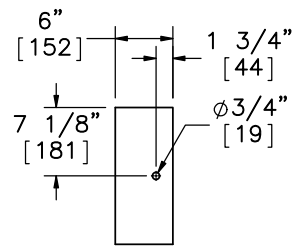
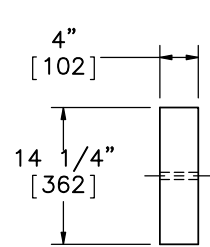
Part a1



Part a2



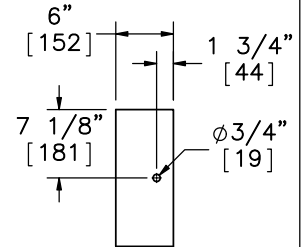
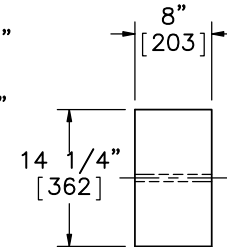
Alternate Blockout Option -
 6"x4"x14 1/4" [152x102x362] Blockout
 with 6"x8"x14 1/4" [152x203x362] Blockout



ELEVATION VIEW

PROFILE VIEW

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



ELEVATION VIEW

PROFILE VIEW

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



Midwest Roadside
 Safety Facility

Standard MGS on a 2:1
 Fill Slope

Post Nos. 3-27 Components

DWG. NAME:
 MGS_Standard_2to1Slope_RB

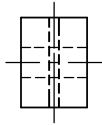
SCALE: 1:20
 UNITS: Inches

SHEET:
 5 of 12

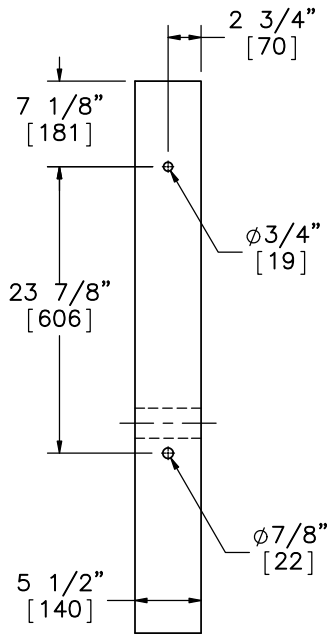
DATE:
 7/13/2015

DRAWN BY:
 SDB/JEK

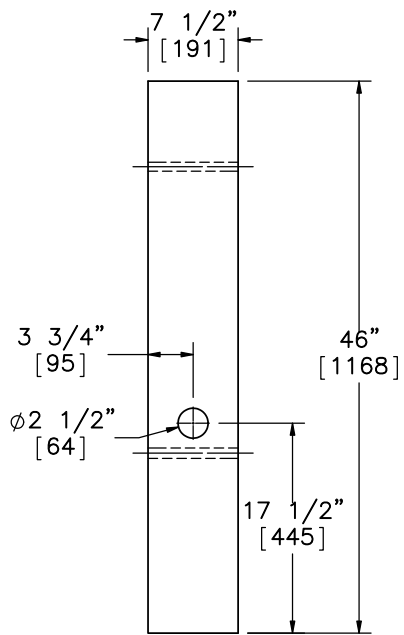
REV. BY:
 KAL/RKF



PLAN VIEW

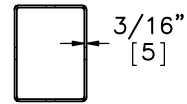


ELEVATION VIEW

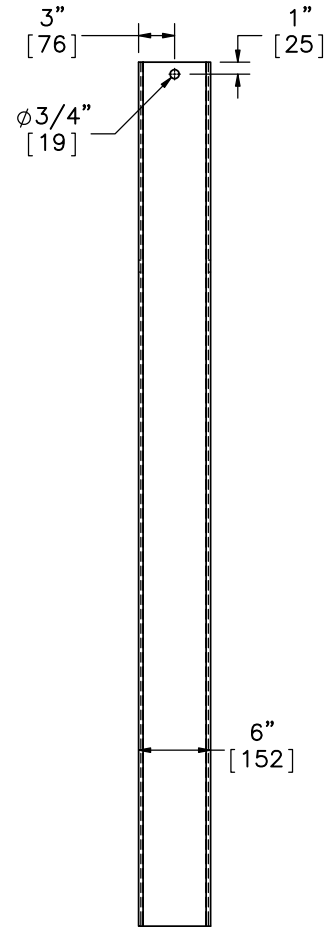


PROFILE VIEW

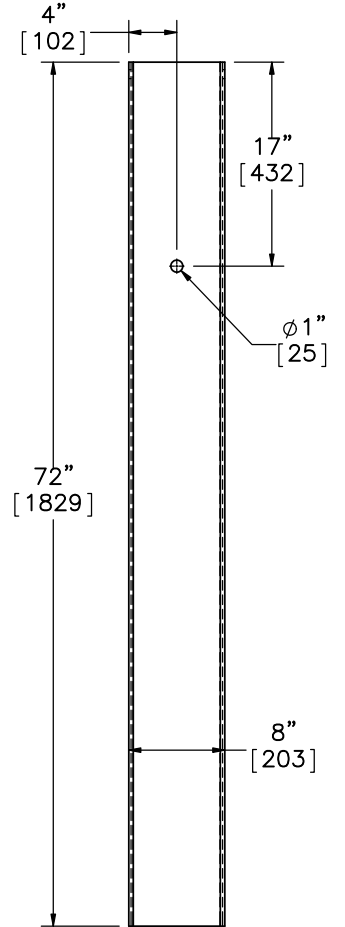
Part b1



PLAN VIEW



ELEVATION VIEW



PROFILE VIEW

Part b2



Midwest Roadside
Safety Facility

Standard MGS on a 2:1
Fill Slope

BCT Timber Post &
Foundation Tube Details

DWG. NAME:
MGS_Standard_2to1Slope_R8

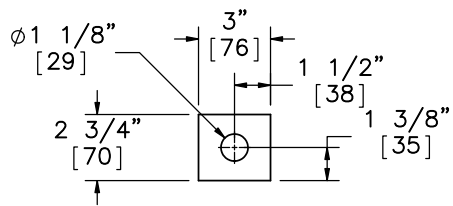
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UNITS: Inches

SHEET:
6 of 12

DATE:
7/13/2015

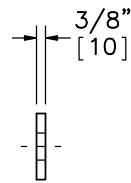
DRAWN BY:
SDB/JEK

REV. BY:
KAL/RKF

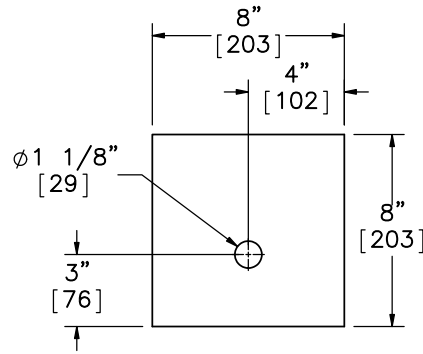


ELEVATION VIEW

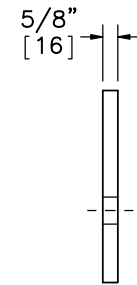
Anchor Bracket End Plate



PROFILE VIEW

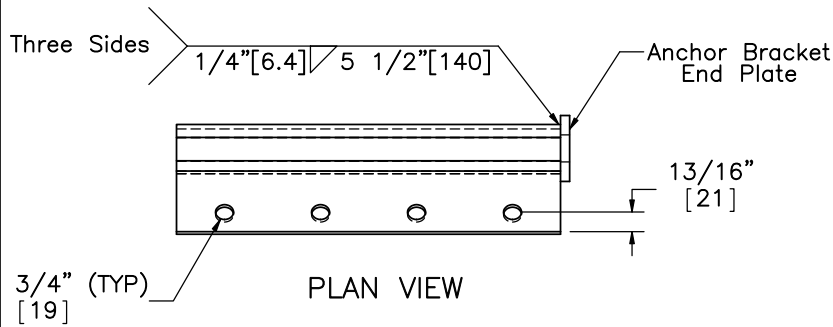


ELEVATION VIEW

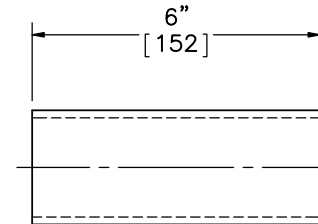


PROFILE VIEW

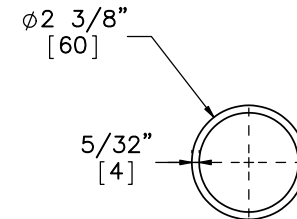
Part b6



PLAN VIEW

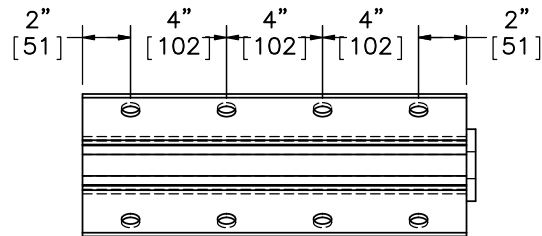


ELEVATION VIEW



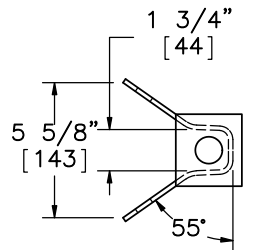
PROFILE VIEW

Part b7
SCALE 1:4



ELEVATION VIEW

Part b5



PROFILE VIEW



Midwest Roadside
Safety Facility

Standard MGS on a 2:1
Fill Slope

BCT Post Components &
Anchor Bracket

DWG. NAME:
MGS_Standard_2to1Slope_R8

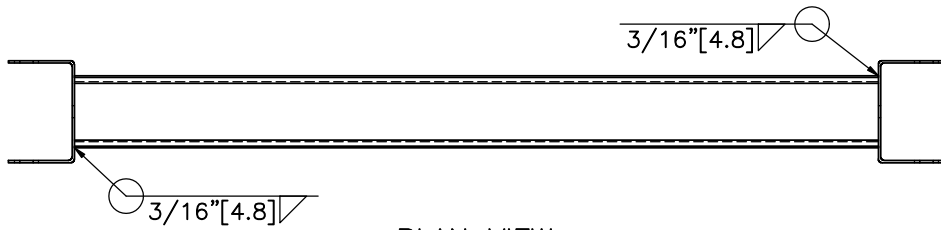
SCALE: 1:8
UNITS: Inches

SHEET:
7 of 12

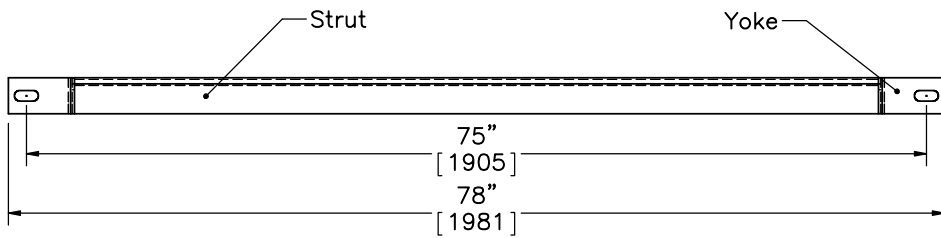
DATE:
7/13/2015

DRAWN BY:
SDB/JEK

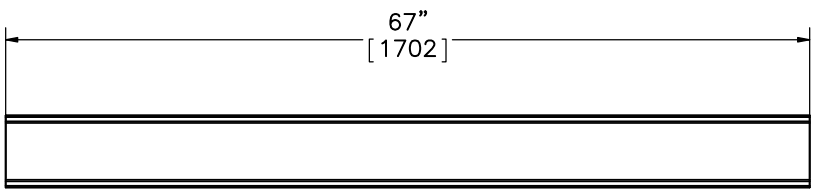
REV. BY:
KAL/RKF



PLAN VIEW

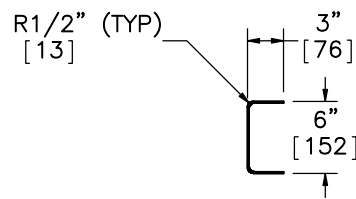


ELEVATION VIEW
Part b3

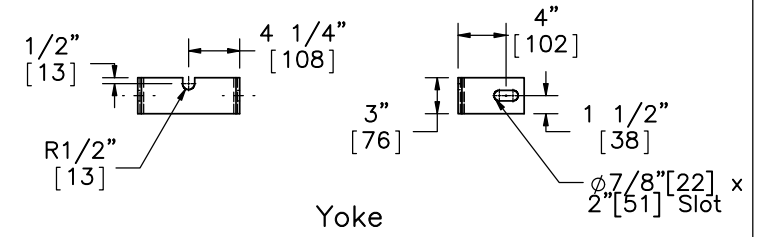
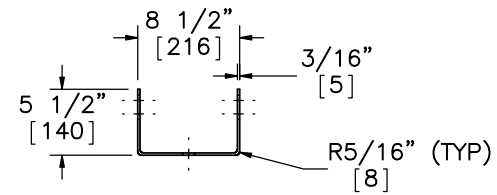


ELEVATION VIEW

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



PROFILE VIEW



Midwest Roadside
Safety Facility

Standard MGS on a 2:1
Fill Slope

Ground Strut Details

DWG. NAME:
MGS_Standard_2to1Slope_R8

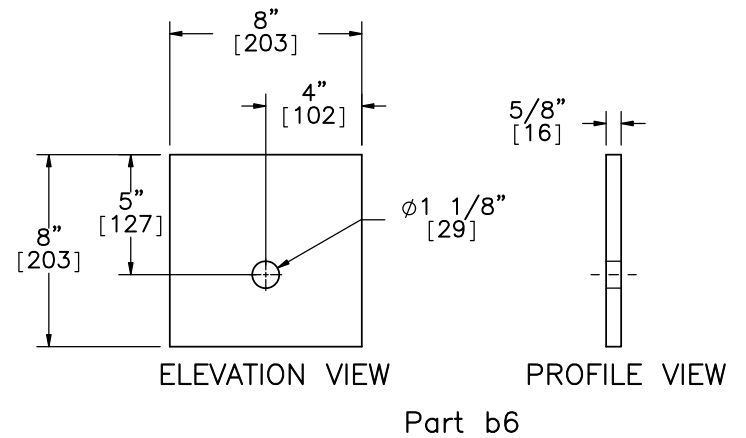
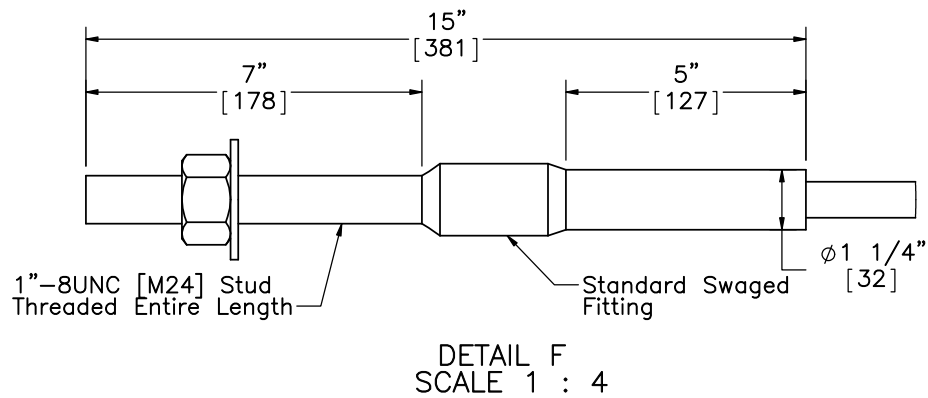
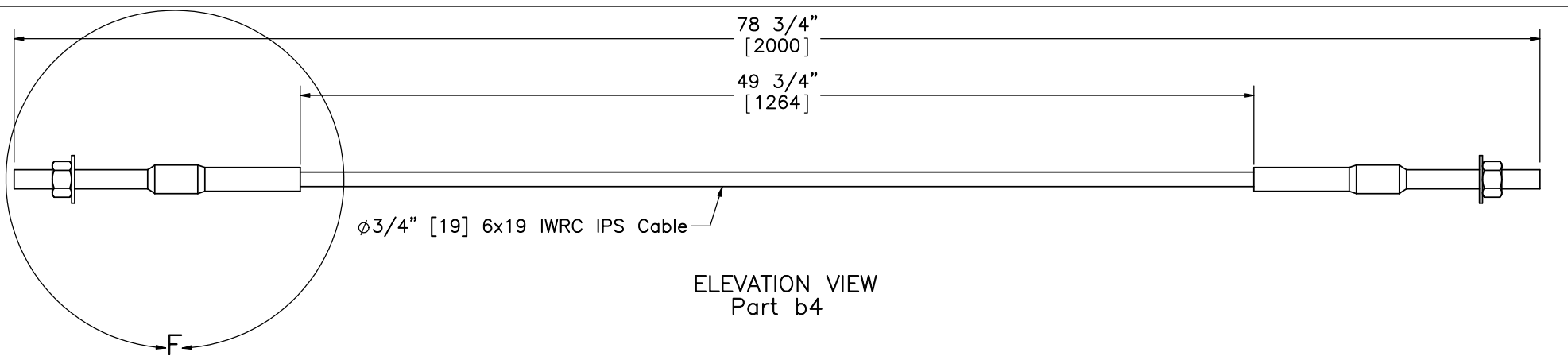
SCALE: 1:16
UNITS: Inches

SHEET:
8 of 12

DATE:
7/13/2015

DRAWN BY:
SDB/JEK

REV. BY:
KAL/RKF



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

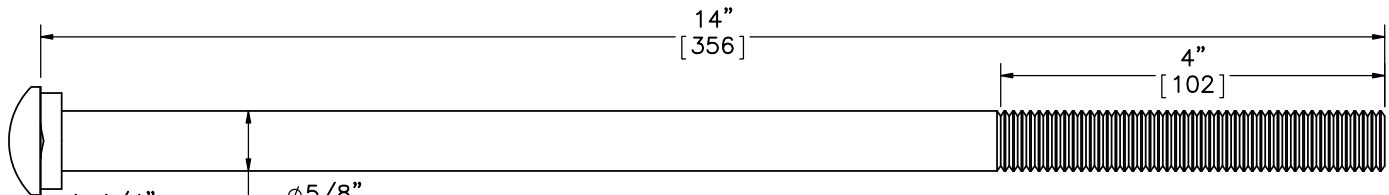
Standard MGS on a 2:1 Fill Slope

BCT Anchor Cable

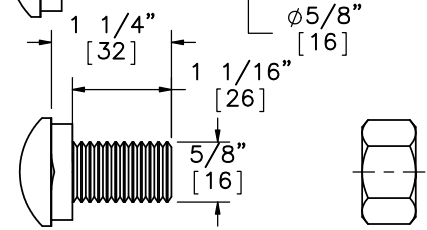
DWG. NAME.
MGS_Standard_2to1Slope_RB

SCALE: 1:8
UNITS: Inches

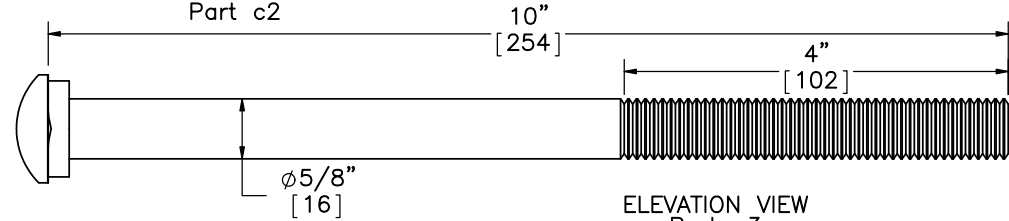
SHEET:
9 of 12
DATE:
7/13/2015
DRAWN BY:
SDB/JEK
REV. BY:
KAL/RKF



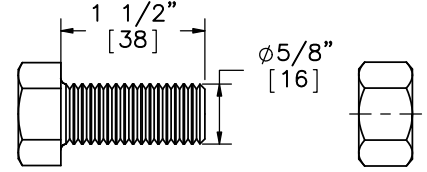
ELEVATION VIEW
Part c1



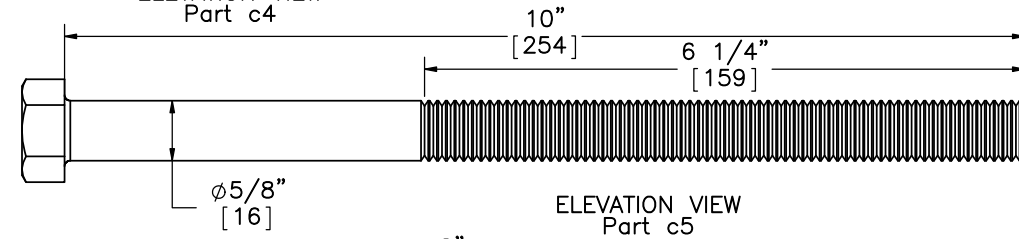
ELEVATION VIEW
Part c2



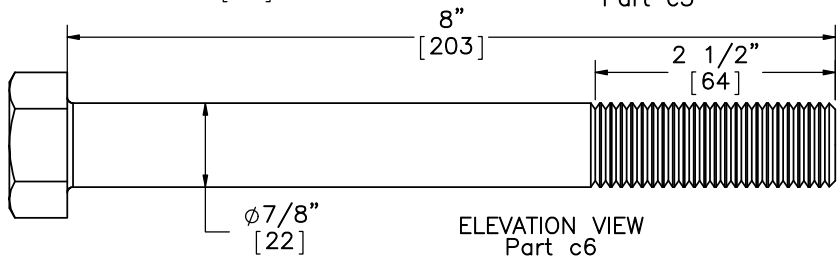
ELEVATION VIEW
Part c3



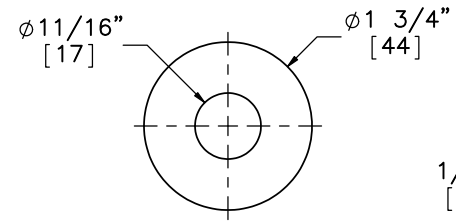
ELEVATION VIEW
Part c4



ELEVATION VIEW
Part c5

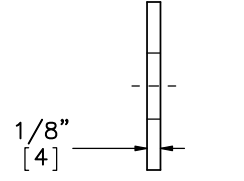


ELEVATION VIEW
Part c6

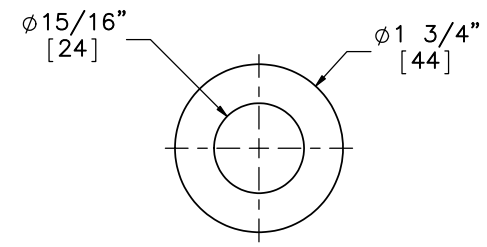


ELEVATION VIEW

Part c7

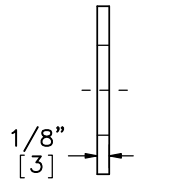


PROFILE VIEW



ELEVATION VIEW

Part c8



PROFILE VIEW



Midwest Roadside
Safety Facility

Standard MGS on a 2:1
Fill Slope

Fasteners

DWG. NAME.
MGS_Standard_2to1Slope_RB

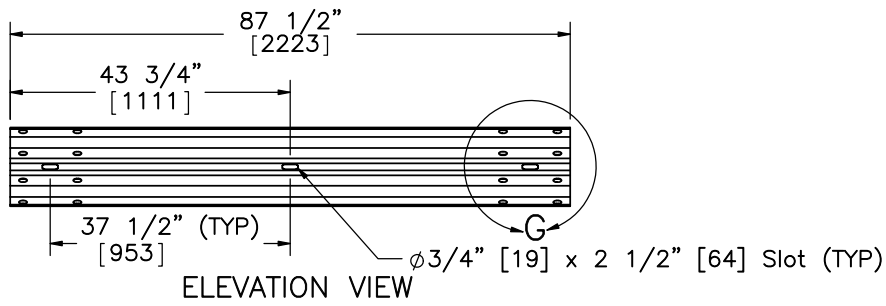
SCALE: 1:8
UNITS: Inches

SHEET:
10 of 12

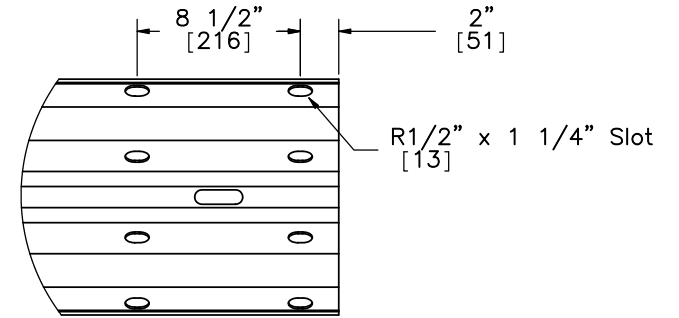
DATE:
7/13/2015

DRAWN BY:
SDB/JEK

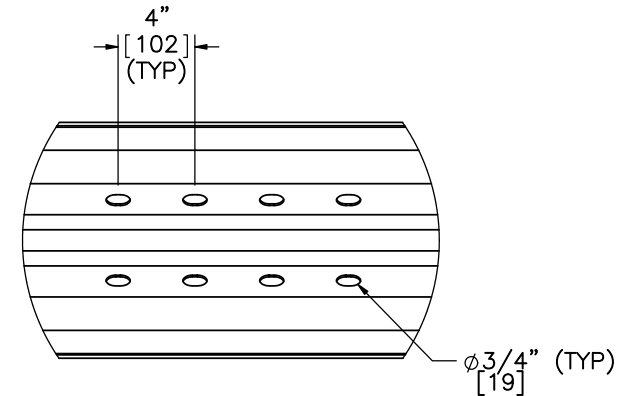
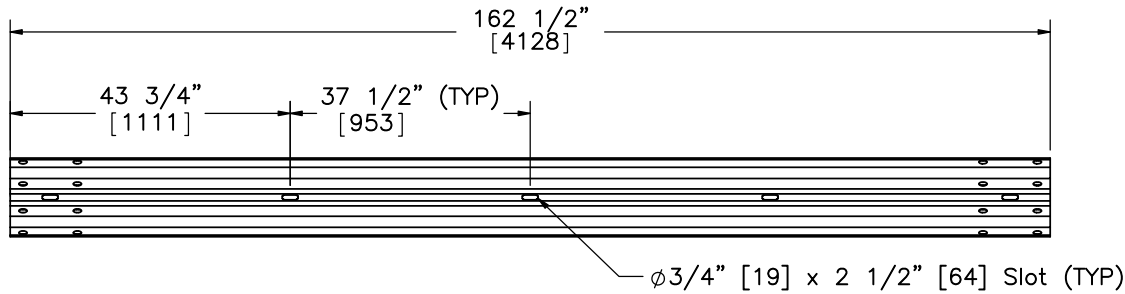
REV. BY:
KAL/RKF



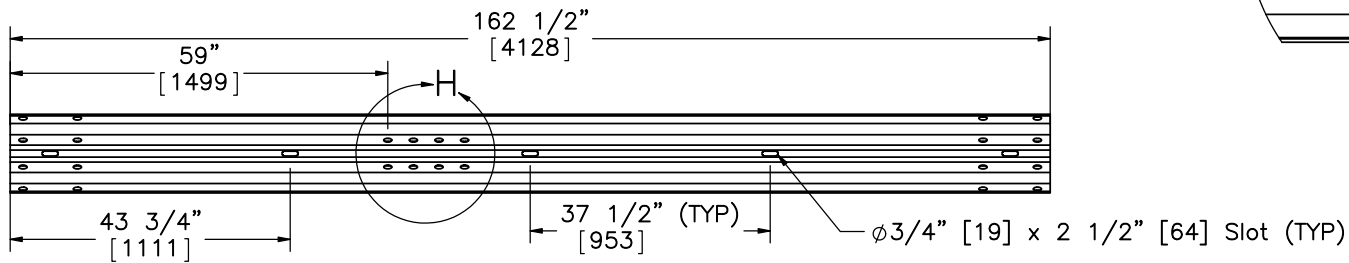
PROFILE VIEW



DETAIL G
SCALE 1 : 10



DETAIL H
SCALE 1 : 10



Midwest Roadside
Safety Facility

Standard MGS on a 2:1
Fill Slope

Rail Section Details

DWG. NAME:
MGS_Standard_2to1Slope_R8

SCALE: 1:30
UNITS: Inches

SHEET:
11 of 12
DATE:
7/13/2015
DRAWN BY:
SDB/JEK
REV. BY:
KAL/RKF

Item No.	QTY.	Description	Material Specification	Hardware Guide Designation
a1	25	W6x8.5 [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
a2	25	6x12x14 1/4" [152x305x362] Timber Blockout for Steel Posts	SYP Grade No.1 or better	PDB10a-b
a3	25	16D Double Head Nail	-	-
a4	12	12'-6" [3810] W-Beam MGS Section	12 gauge [2.7] AASHTO M180 Galv.	RWM04a
a5	1	6'-3" [1905] W-Beam MGS Section	12 gauge [2.7] AASHTO M180 Galv.	RWM04a
a6	2	12'-6" [3810] W-Beam MGS End Section	12 gauge [2.7] AASHTO M180 Galv.	RWM14a
b1	4	BCT Timber Post - MGS Height	SYP Grade No. 1 or better (No knots, 18" [457] above or below ground tension face)	PDF01
b2	4	72" [1829] Long Foundation Tube	ASTM A500 Grade B Galv.	PTE06
b3	2	Strut and Yoke Assembly	ASTM A36 Steel Galv.	-
b4	4	BCT Cable Anchor Assembly	ø3/4" [19] 6x19 IWRC IPS Galvanized Wire Rope	FCA01
b5	2	Anchor Bracket Assembly	ASTM A36 Steel Galv.	FPA01
b6	2	8"x8"x5/8" [203x203x16] Anchor Bearing Plate	ASTM A36 Steel Galv.	FPB01
b7	2	2 3/8" [60] O.D. x 6" Long [152] BCT Post Sleeve	ASTM A53 Grade B Schedule 40 Galv.	FMM02
c1	25	5/8" [16] Dia. UNC, 14" [356] Long Guardrail Bolt and Nut	Bolt ASTM A307 Galv., Nut ASTM A563 A Galv.	FBB06
c2	112	5/8" [16] Dia. UNC, 1 1/4" [32] Guardrail Bolt and Nut	Bolt ASTM A307 Galv., Nut ASTM A563 A Galv.	FBB01
c3	4	5/8" [16] Dia. UNC, 10" [254] Long Guardrail Bolt and Nut	Bolt ASTM A307 Galv., Nut ASTM A563 A Galv.	FBB03
c4	16	5/8" [16] Dia. UNC, 1 1/2" [38] Long Hex Head Bolt and Nut	Bolt ASTM A307 Galv., Nut ASTM A563 A Galv.	FBX16a
c5	4	5/8" [16] Dia. UNC, 10" [254] Long Hex Head Bolt and Nut	Bolt ASTM A307 Galv., Nut ASTM A563 A Galv.	FBX16a
c6	4	7/8" [22] Dia. UNC, 8" [203] Long Hex Head Bolt and Nut	Bolt ASTM A307 Grade A Galv., Nut ASTM A563 A Galv.	-
c7	44	5/8" [16] Dia. Plain Round Washer	ASTM F844 Galv.	FWC14a
c8	8	7/8" [22] Dia. Plain Round Washer	ASTM F844 Galv.	-



Midwest Roadside Safety Facility

Standard MGS on a 2:1 Fill Slope

Bill of Materials

DWG. NAME:
MGS_Standard_2to1Slope_R8

SCALE: None
UNITS: Inches

SHEET:
12 of 12

DATE:
7/13/2015

DRAWN BY:
SDB/JEK

REV. BY:
KAL/RKF

REV.	DATE OF ISSUE	Page	NATURE OF CHANGES	REVISED BY
R5	10/17/2013	-	Page 9 moved before page 5	SDB
		1	Note 4 Changed	
		3	Hidden line added to show rail overlap of Detail C	
		6	Part numbers changed on both parts (Part numbers were swapped)	
		7	Part b7 wall thickness corrected to 5/32"	
		10	Midslots added to all rails	
R6	10/21/2013	-	Inserted Page of Fasteners after Page 9	SDB
		1	Guardrail Part numbers corrected	
		12	Part c9 removed from BOM because it is part of the BCT Anchor Cable Assembly	
R7	11/1/2013	1	The impact location changed to 18'-9" [5715] upstream of post no. 15 or at centerline of post no. 12. Notes 2, 3, and 5 were changed.	SDB
		2	Post Centerline Note added.	
		9	Cable (Part b4) dimensions corrected	
		10	Shoulder added to Part c1. Bolt length corrected on Parts c2 and c6. Thread length corrected on Parts c1, c2, c5, and c6. Part c8 OD, ID and thickness corrected.	
		12	Part c2, c6, and c8 descriptions changed. Part c6 Material specification changed. Parts b3, c6, and c8 Hardware Guide Designations removed since they were incorrect and not in the Hardware Guide.	
R8	7/13/2015	12	Part a2 description corrected.	JEK