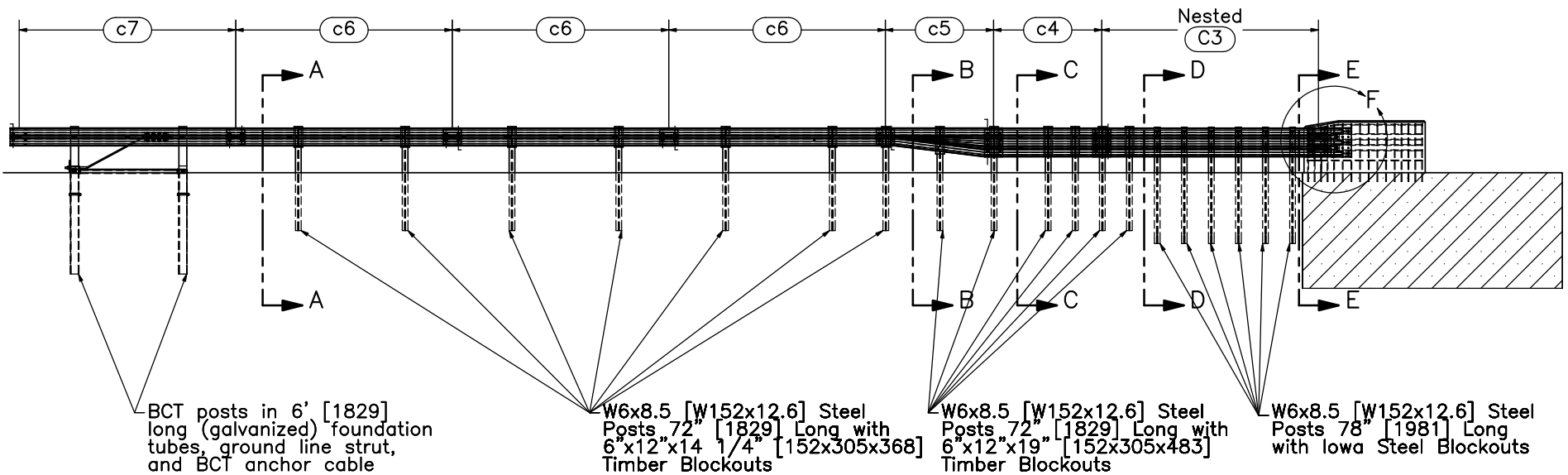


PLAN VIEW



ELEVATION VIEW

- Notes: (1) Test shall be performed according to test designation no. 3-21 of MASH.
- (2) The impact location is 89" [2261] upstream from upstream end of the parapet or 6" [152] upstream from centerline of post no. 17.
- (3) BCT anchors are placed in  $\phi$ 3' [914] holes, then backfilled and tamped with soil.
- (4) Critical region is between post nos. 12 and 21.



Midwest Roadside Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

System Layout

DWG. NAME:  
AGT Buttress\_R13

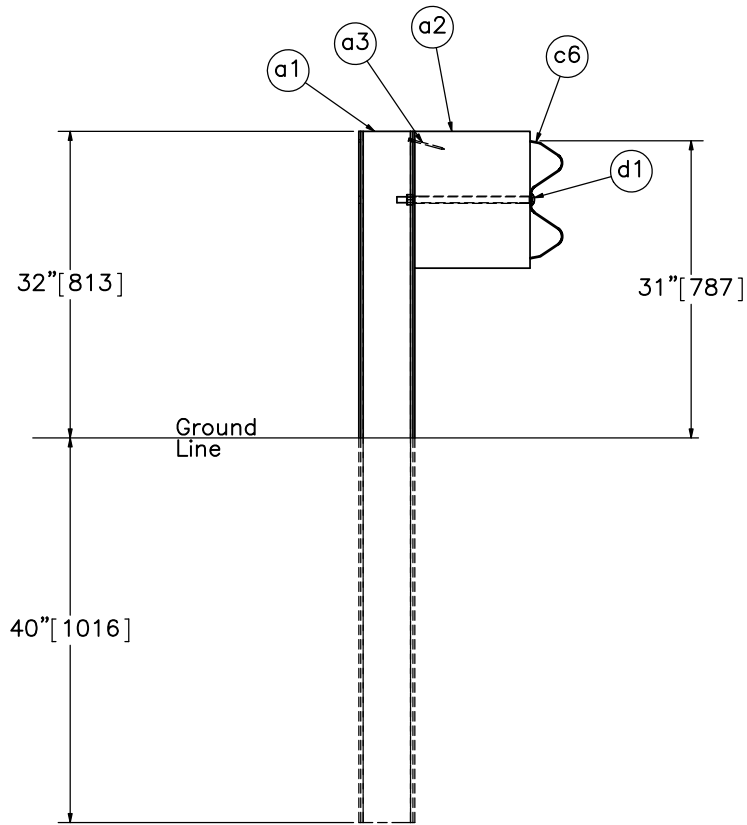
SCALE: 1:110  
UNITS: Inches

SHEET:  
1 of 23

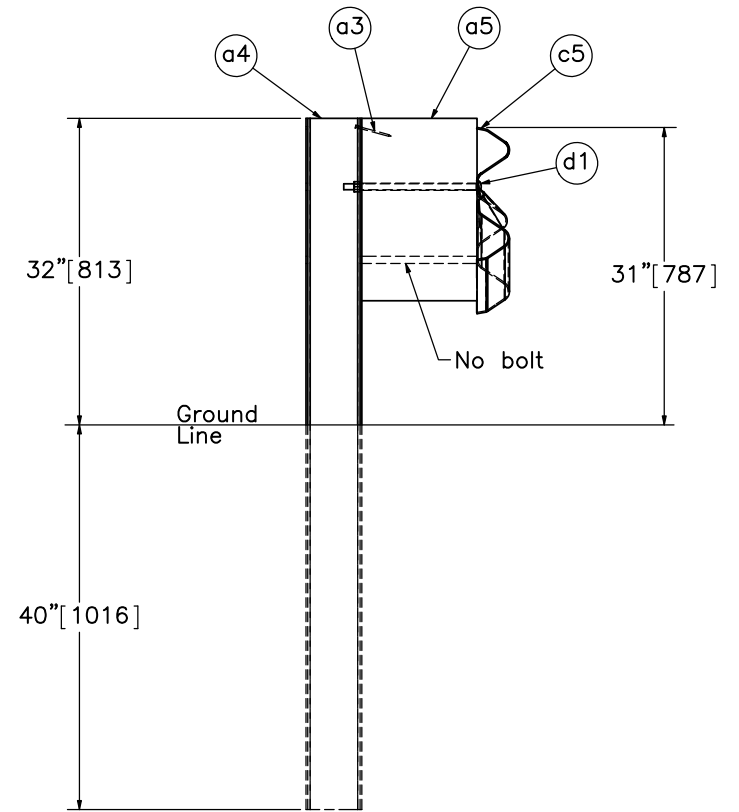
DATE:  
5/22/2017

DRAWN BY:  
SDB/ALL/  
JEK/DTM

REV. BY:  
SKR/KAL



SECTION A-A  
Post Nos. 3-9



SECTION B-B  
Post No. 10



Midwest Roadside  
Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1  
Post Nos. 3-10 Details

DWG. NAME.  
AGT Buttress\_R13

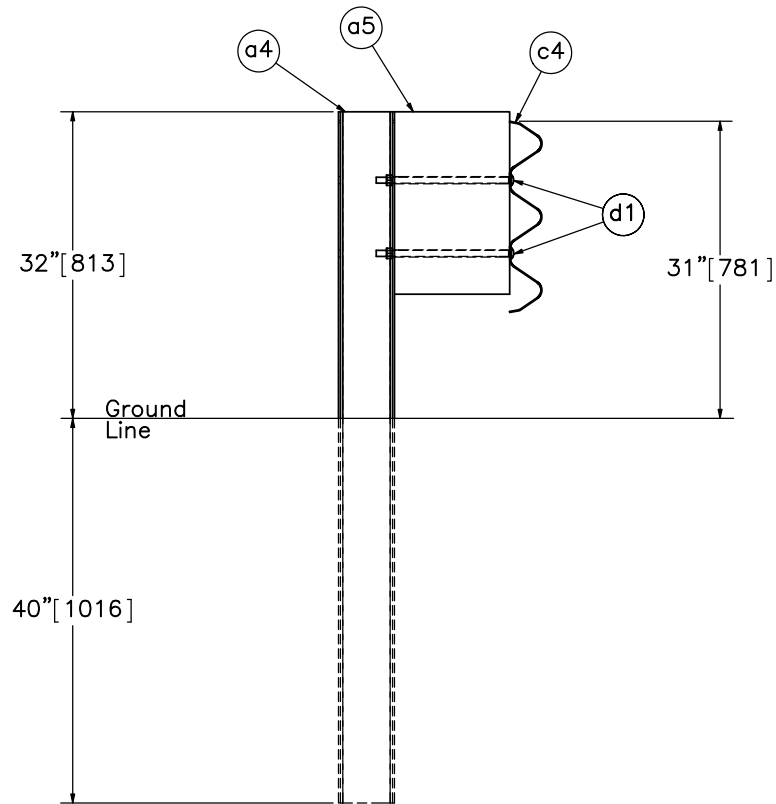
SCALE: 1:20  
UNITS: Inches

SHEET:  
2 of 23

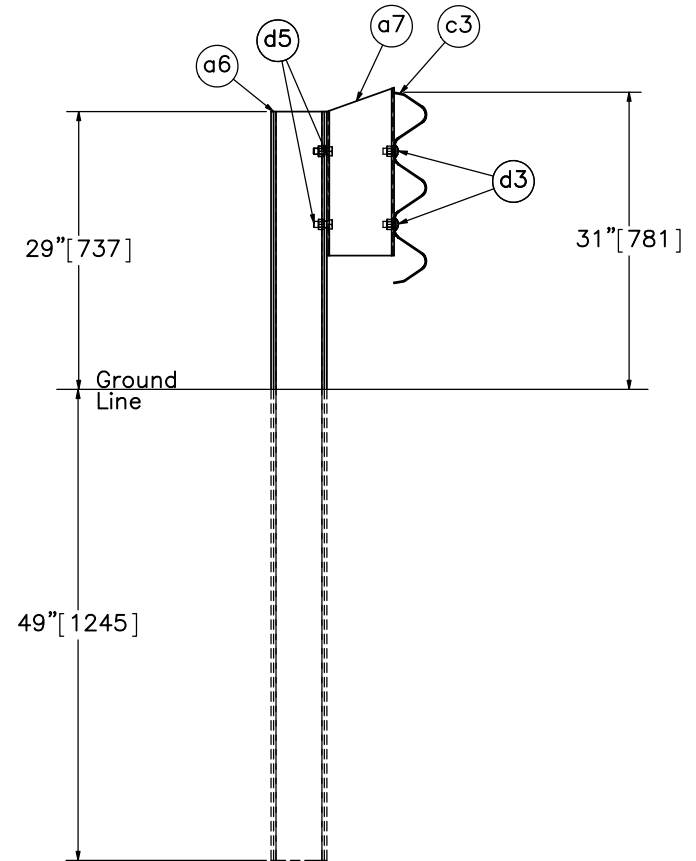
DATE:  
5/22/2017

DRAWN BY:  
SDB/ALL/  
JEK/DTM

REV. BY:  
SKR/KAL



SECTION C-C  
Post Nos. 11-15



SECTION D-D  
Post Nos. 16-21



Midwest Roadside  
Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

Post Nos. 11-21 Details

DWG. NAME.  
AGT Buttress\_R13

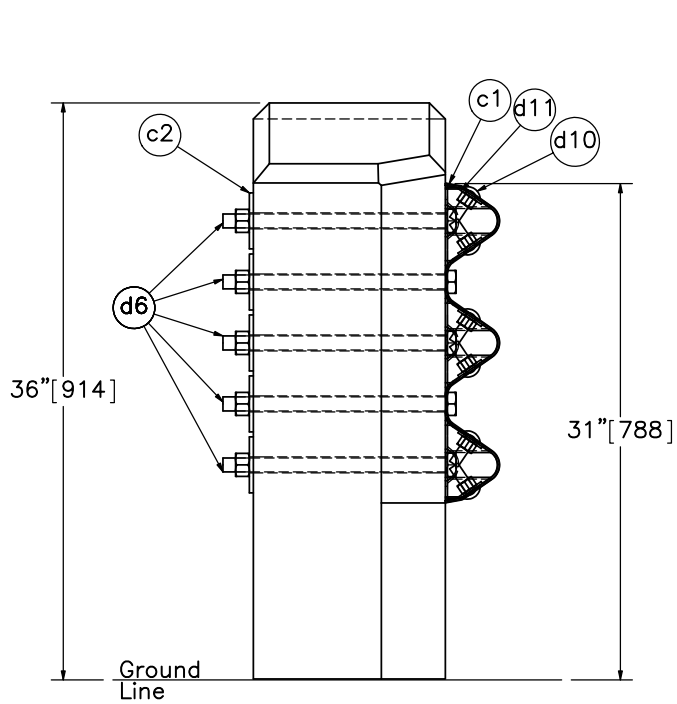
SCALE: 1:20  
UNITS: Inches

SHEET:  
3 of 23

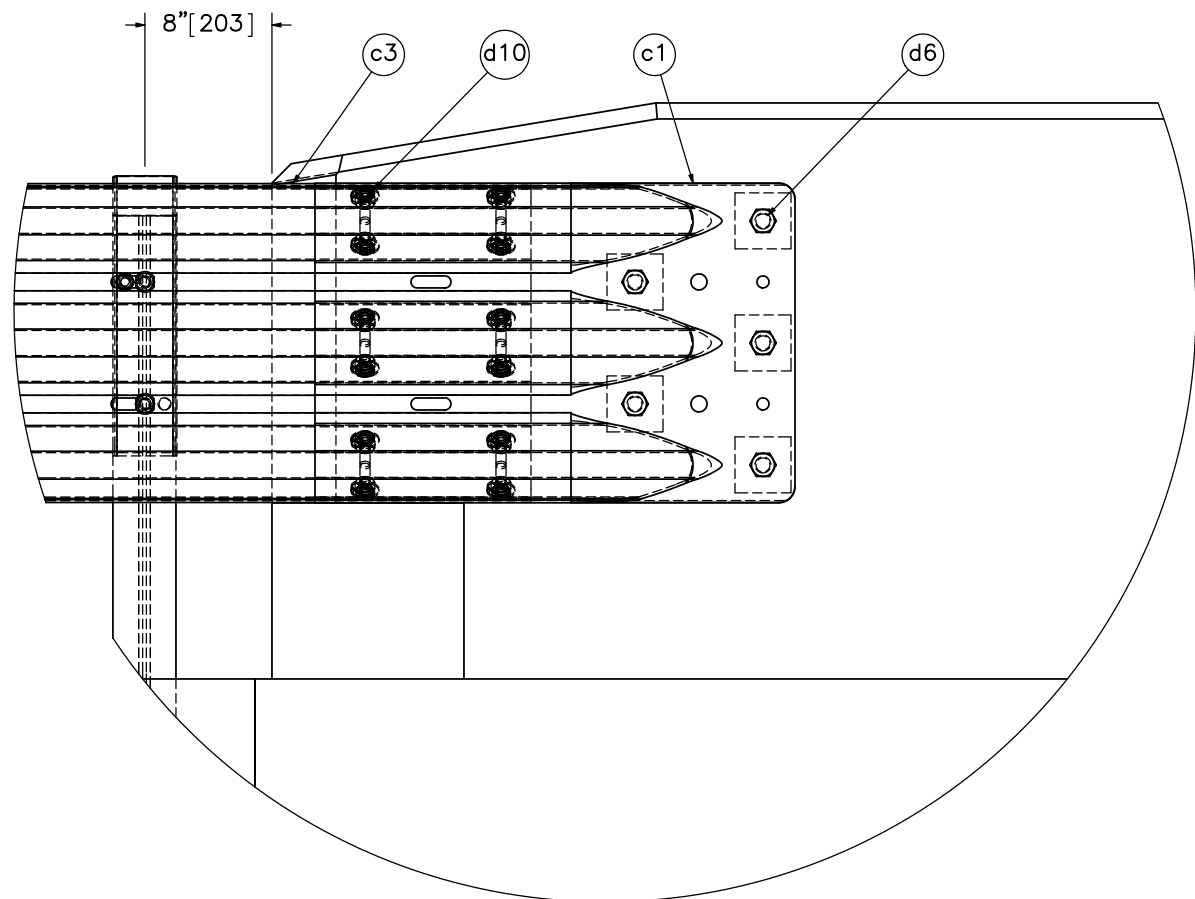
DATE:  
5/22/2017

DRAWN BY:  
SDB/ALL/  
JEK/DTM

REV. BY:  
SKR/KAL



SECTION E-E



DETAIL F

Note: (1) d11 washers placed between nuts and thrie beam end connector.  
 (2) Buttress reinforcement hidden for clarity.



Midwest Roadside  
 Safety Facility

Standardized AGT  
 Buttress  
 Test No. AGTB-1

Thrie Beam End Shoe and  
 Buttress Details

DWG. NAME:  
 AGT Buttress\_R13

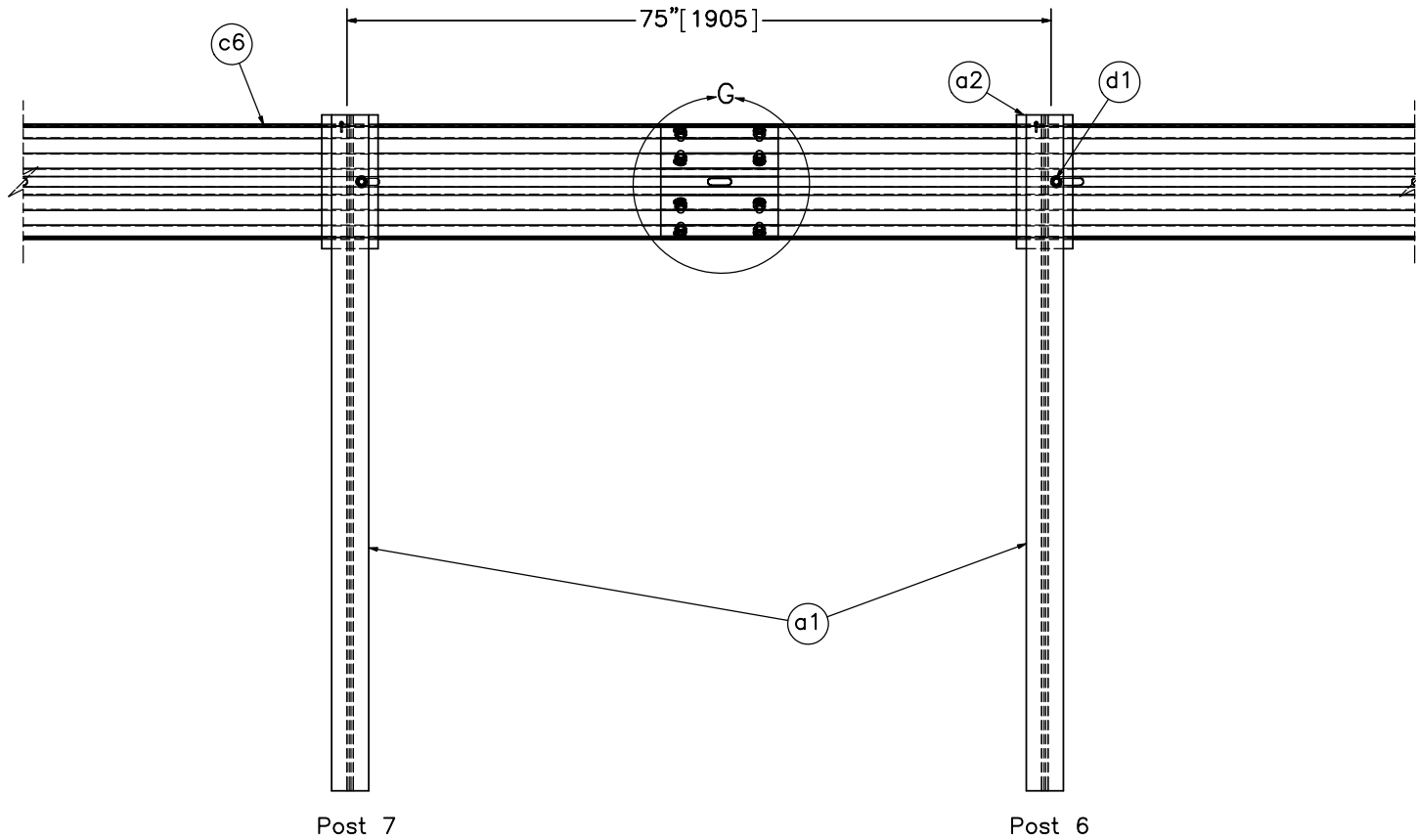
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 UNITS: Inches

SHEET:  
 4 of 23

DATE:  
 5/22/2017

DRAWN BY:  
 SDB/ALL/  
 JEK/DTM

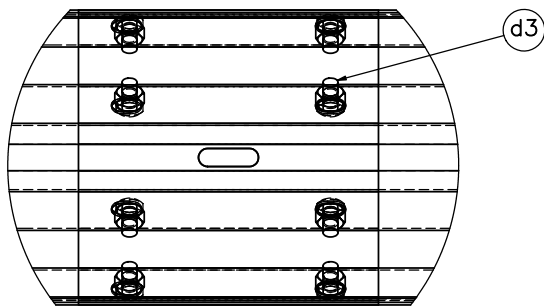
REV. BY:  
 SKR/KAL



Post 7


Post 6

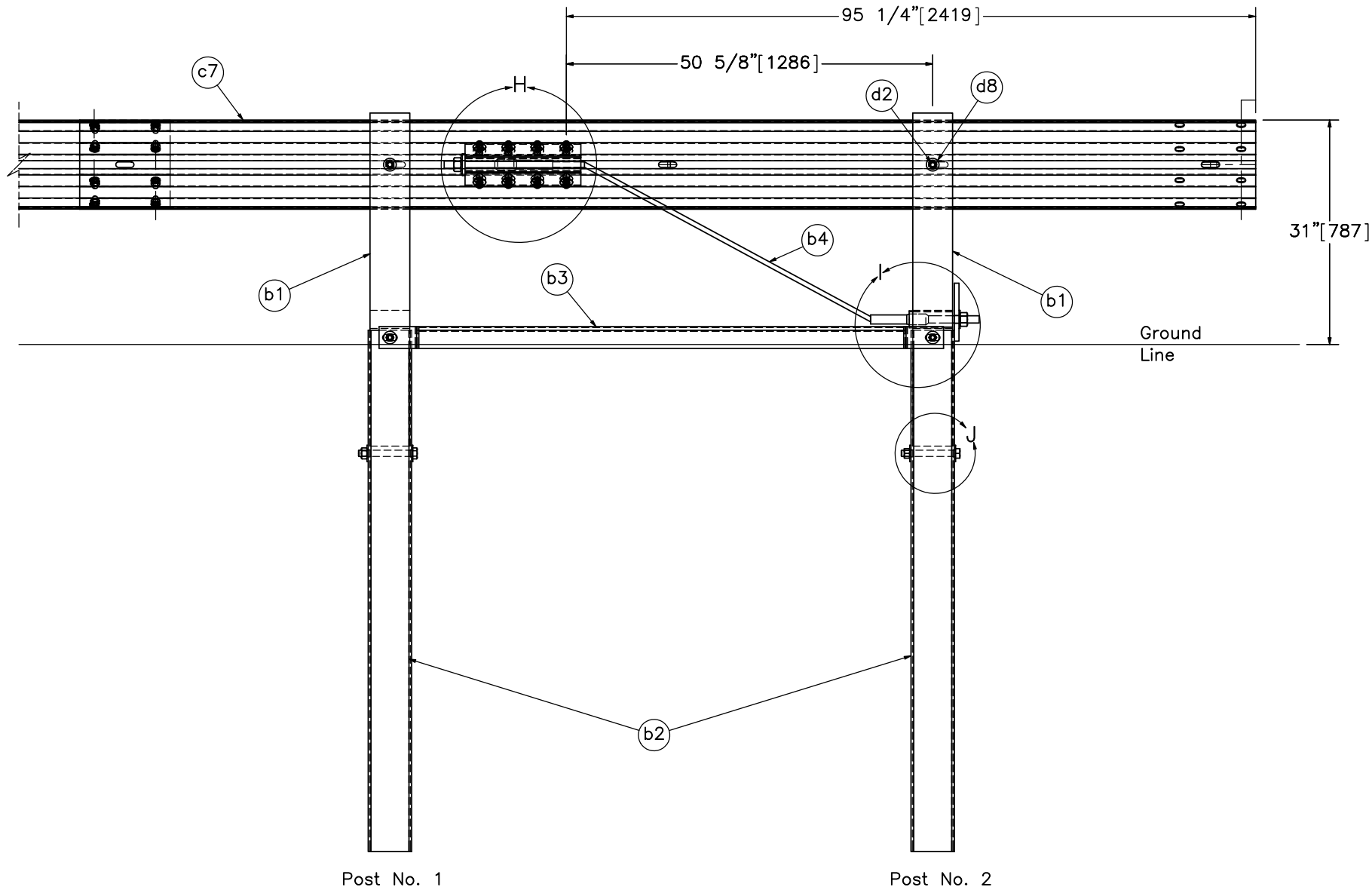
SPLICE DETAIL  
BACKSIDE



DETAIL G  
SCALE 1 : 8

Note: (1) Guardrail bolts (part d1) located on the upstream side of the web.

	Standardized AGT Buttress Test No. AGTB-1		SHEET: 5 of 23
	Splice Detail		DATE: 5/22/2017
Midwest Roadside Safety Facility		DWG. NAME: AGT Buttress_R13	DRAWN BY: SDB/ALL/ JEK/DTM
		SCALE: 1:20 UNITS: Inches	REV. BY: SKR/KAL



END SECTION DETAIL  
BACKSIDE



Midwest Roadside  
Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

End Section Detail

DWG. NAME:  
AGT Buttress\_R13

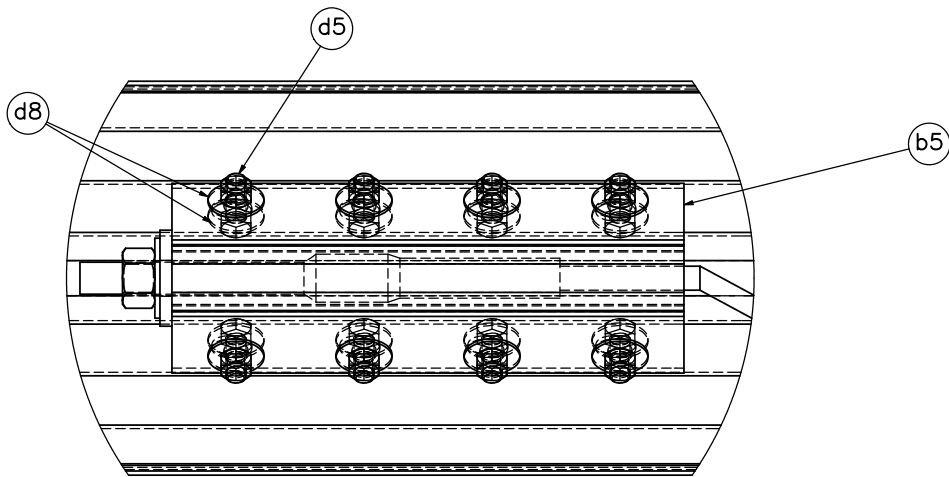
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UNITS: Inches

SHEET:  
6 of 23

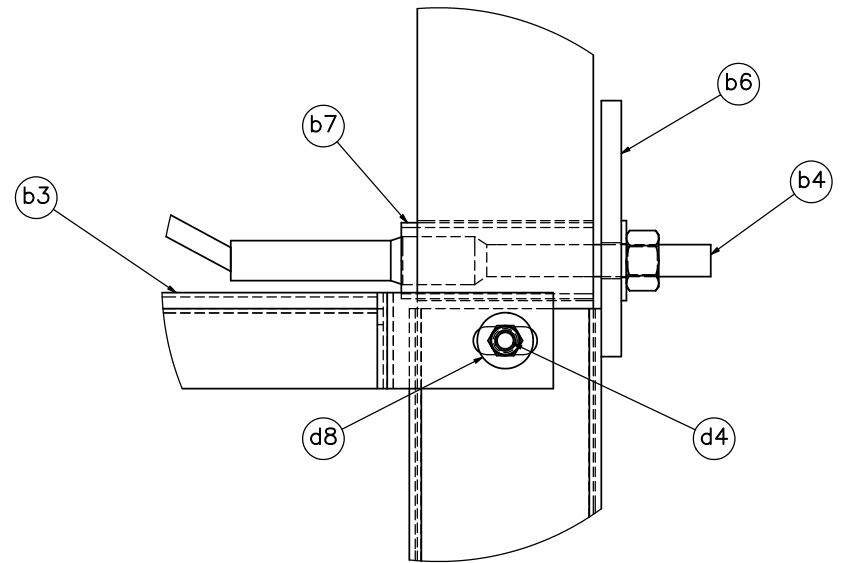
DATE:  
5/22/2017

DRAWN BY:  
SDB/ALL/  
JEK/DTM

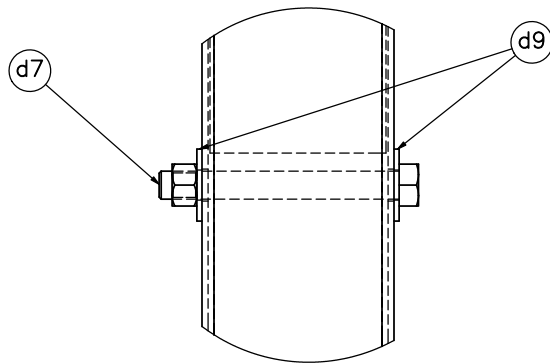
REV. BY:  
SKR/KAL



DETAIL H



DETAIL I



DETAIL J

Note: (1) Additional washer (part d8) on opposite side under the bolt (part d5).



Midwest Roadside Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

BCT Anchor Details

DWG. NAME.  
AGT Buttress\_R13

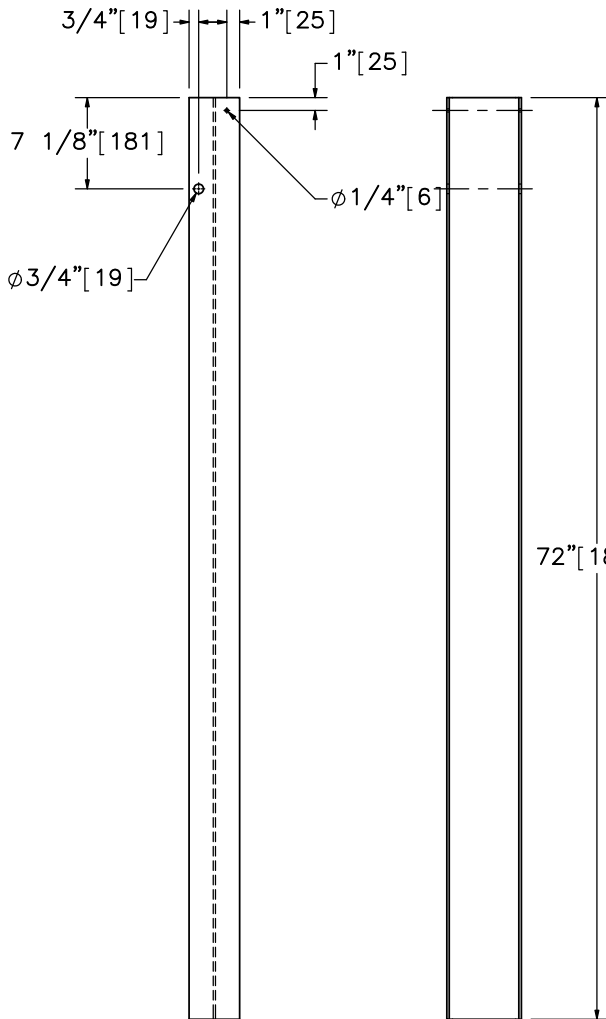
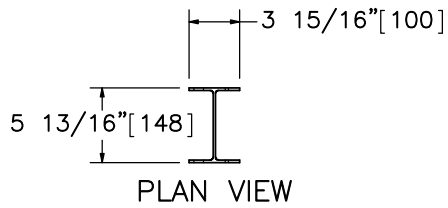
SCALE: 1:6  
UNITS: Inches

SHEET:  
7 of 23

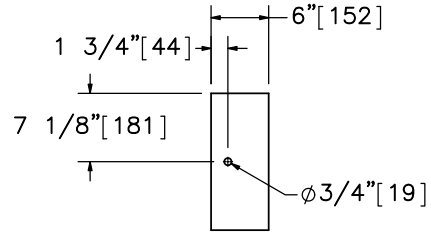
DATE:  
5/22/2017

DRAWN BY:  
SDB/ALL/  
JEK/DTM

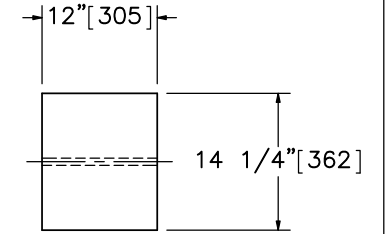
REV. BY:  
SKR/KAL



Part a1

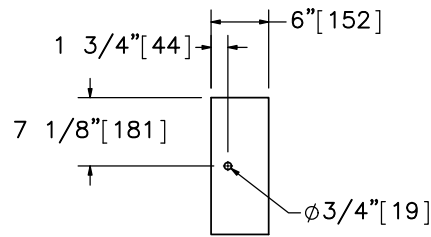


ELEVATION VIEW

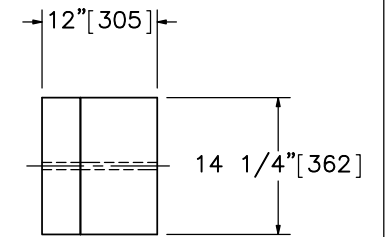


PROFILE VIEW

Part a2

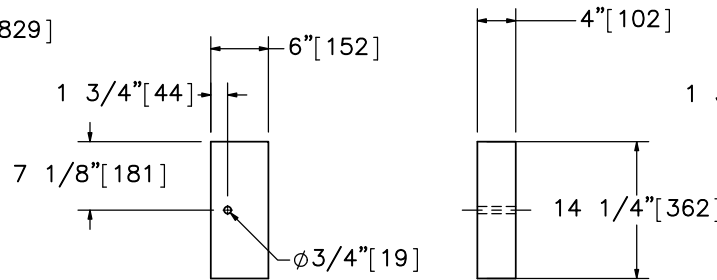


ELEVATION VIEW



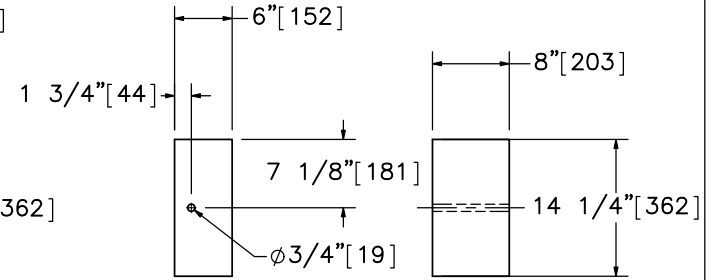
PROFILE VIEW

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

Standardized AGT  
Buttress  
Test No. AGTB-1

Post Nos. 3-9 Components

DWG. NAME:  
AGT Buttress\_R13

SCALE: 1:20  
UNITS: Inches

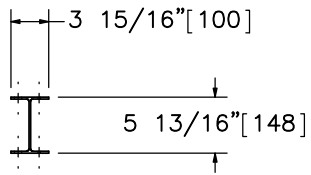
SHEET:  
8 of 23

DATE:  
5/22/2017

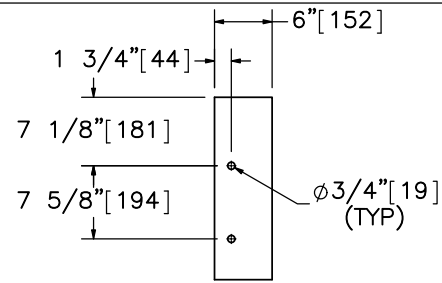
DRAWN BY:  
SDB/ALL/  
JEK/DTM

REV. BY:  
SKR/KAL

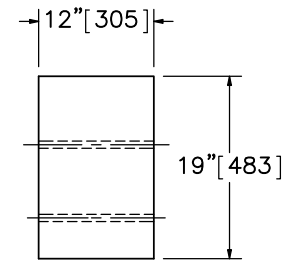




PLAN VIEW

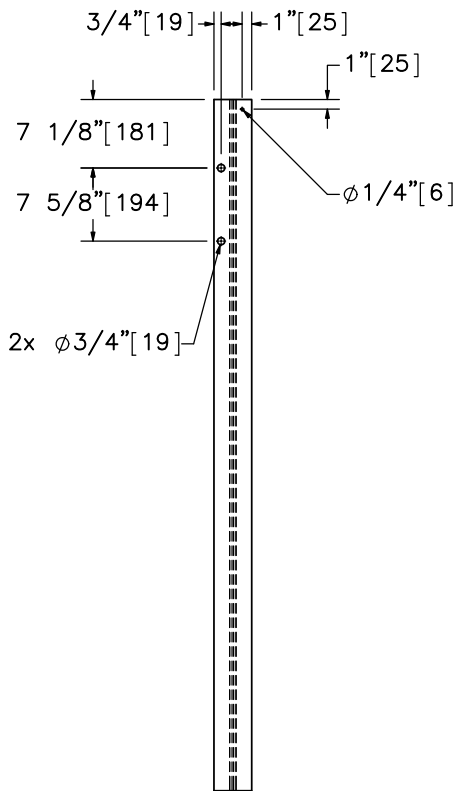


ELEVATION VIEW



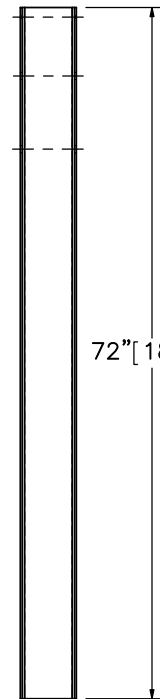
PROFILE VIEW

Part a5

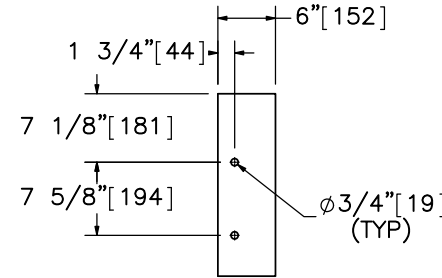


ELEVATION VIEW

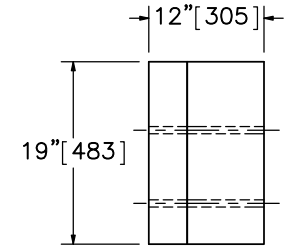
Part a4



PROFILE VIEW

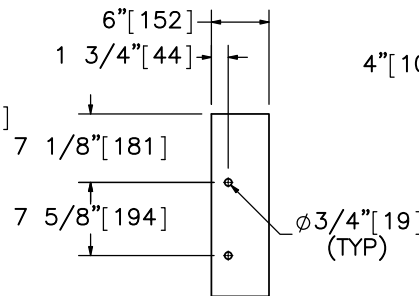


ELEVATION VIEW



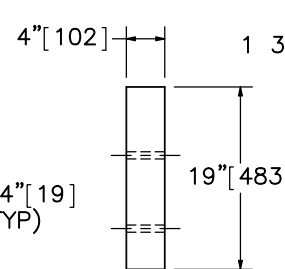
PROFILE VIEW

Alternate Blockout Option -  
 6"x4"x19" [152x102x183] Blockout  
 with 6"x8"x19" [152x203x483] Blockout

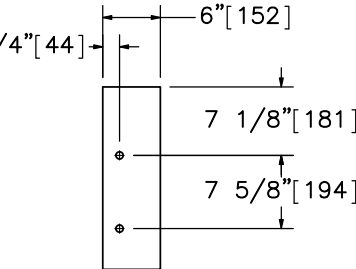


ELEVATION VIEW

6"x4"x19"  
 [152x102x483] Blockout

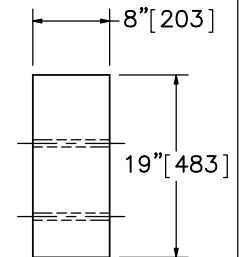


PROFILE VIEW



ELEVATION VIEW

6"x8"x19"  
 [152x203x483] Blockout



PROFILE VIEW



Midwest Roadside  
 Safety Facility

Standardized AGT  
 Buttress  
 Test No. AGTB-1

Post Nos. 10-15 Components

DWG. NAME:  
 AGT Buttress\_R13

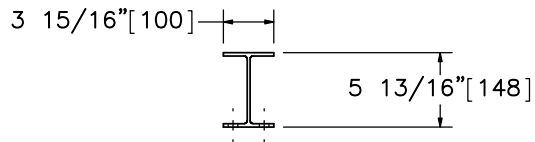
SCALE: 1:20  
 UNITS: Inches

SHEET:  
 9 of 23

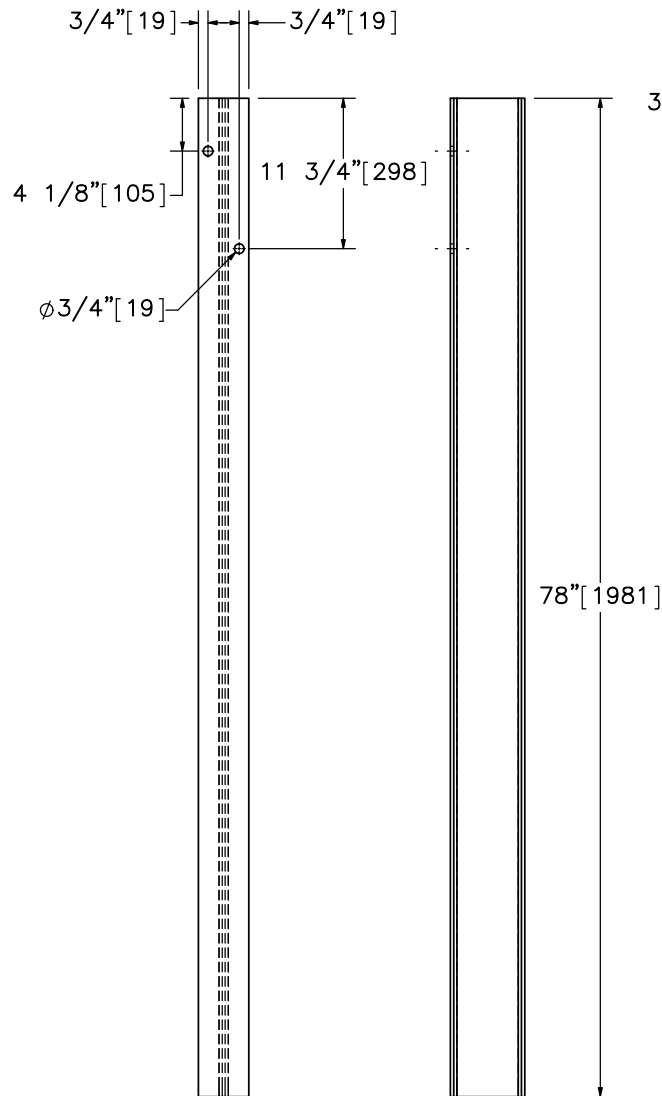
DATE:  
 5/22/2017

DRAWN BY:  
 SDB/ALL/  
 JEK/DTM

REV. BY:  
 SKR/KAL

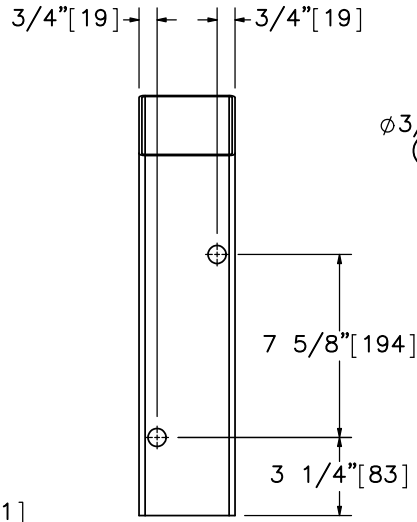


PLAN VIEW

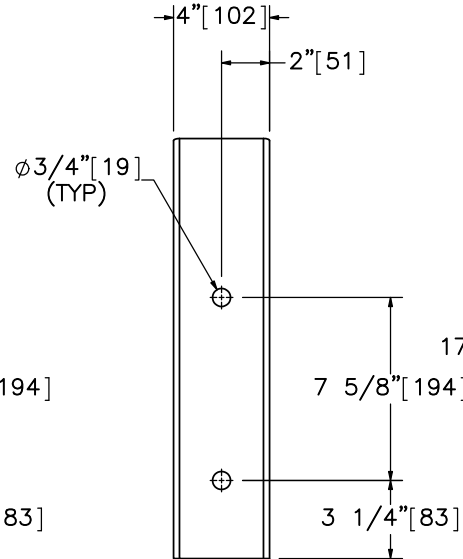


ELEVATION VIEW PROFILE VIEW

Part a6

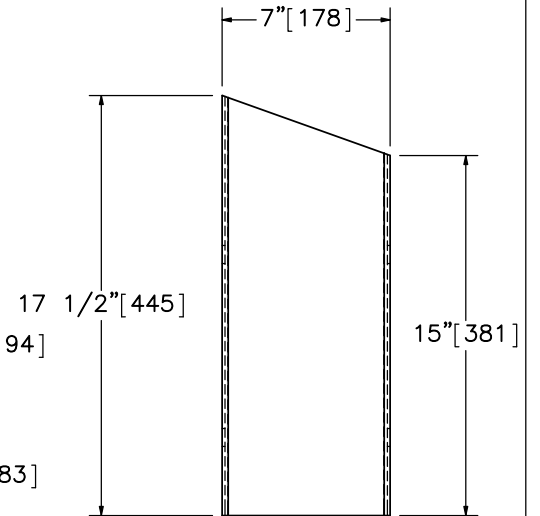


BACK VIEW



ELEVATION VIEW  
SCALE 1 : 8

Part a7



PROFILE VIEW



Midwest Roadside  
Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

Post Nos. 16-21 Components

DWG. NAME.  
AGT Buttress\_R13

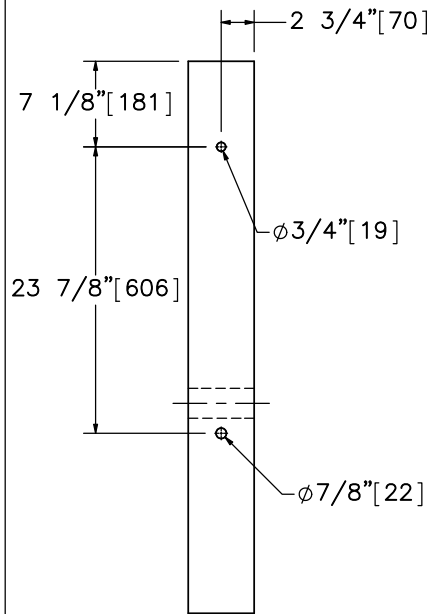
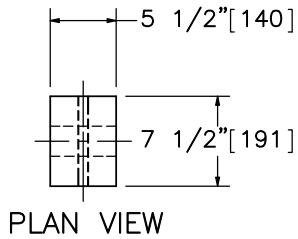
SCALE: 1:15  
UNITS: Inches

SHEET:  
10 of 23

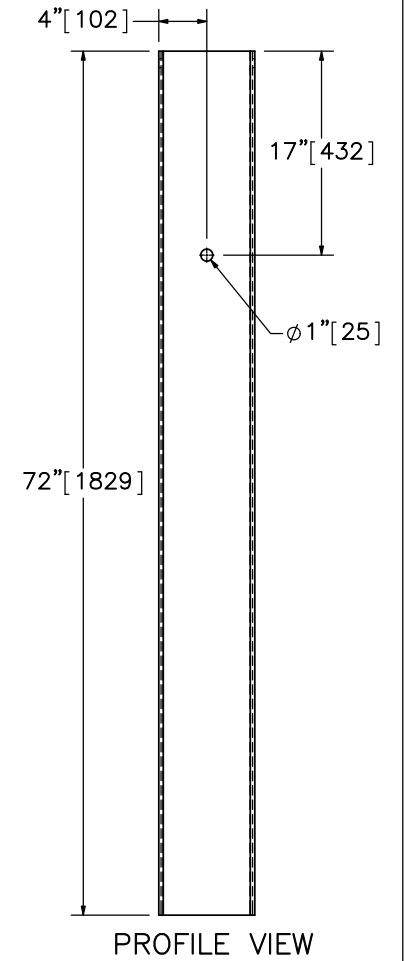
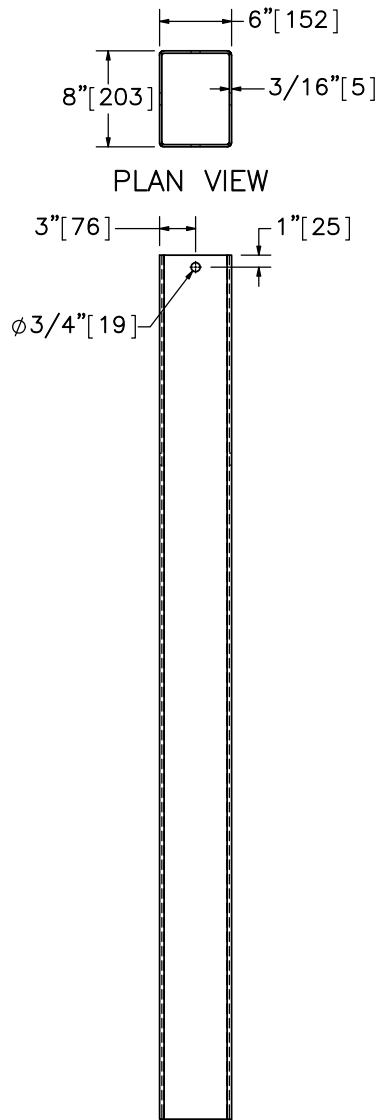
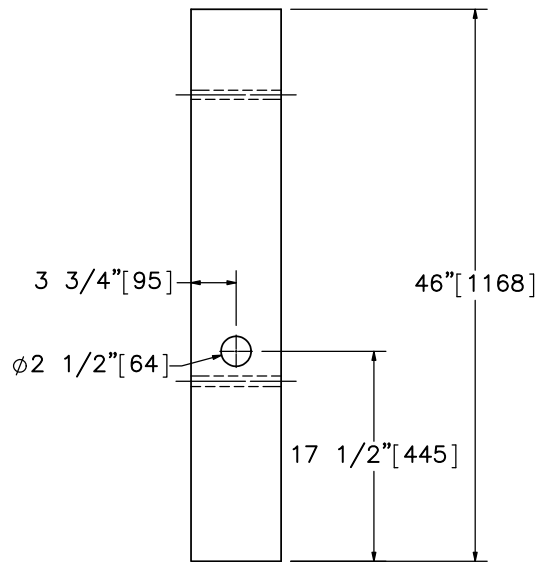
DATE:  
5/22/2017

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JEK/DTM

REV. BY:  
SKR/KAL



Part b1



Part b2



Midwest Roadside  
Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

BCT Timber Post and  
Foundation Tube Details

DWG. NAME.  
AGT Buttress\_R13

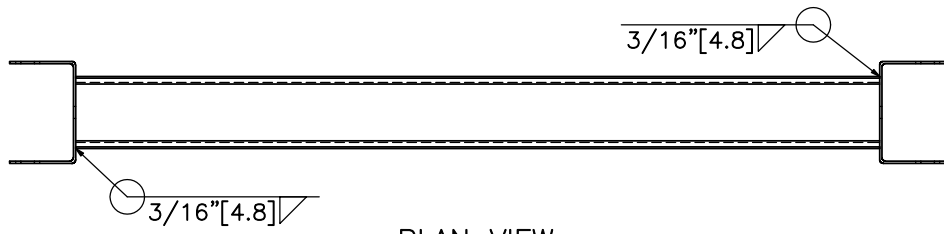
SCALE: 1:16  
UNITS: Inches

SHEET:  
11 of 23

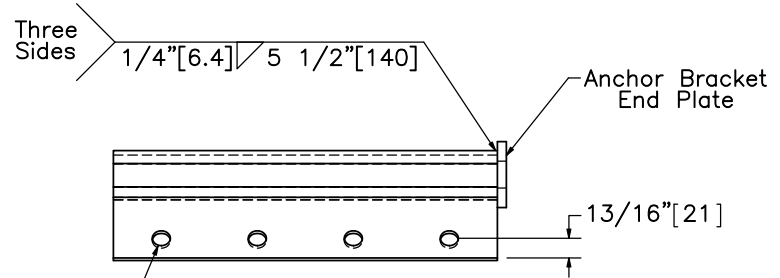
DATE:  
5/22/2017

DRAWN BY:  
SDB/ALL/  
JEK/DTM

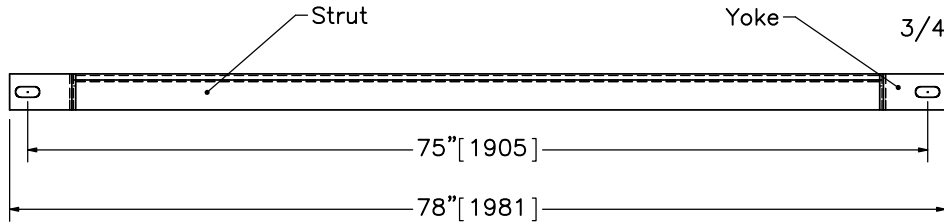
REV. BY:  
SKR/KAL



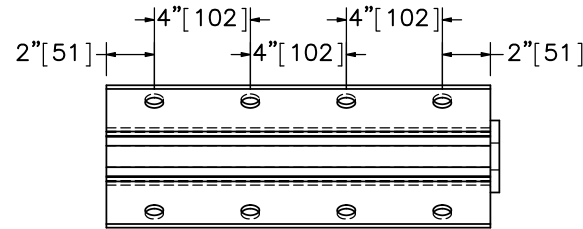
PLAN VIEW



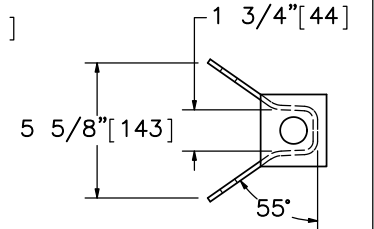
PLAN VIEW



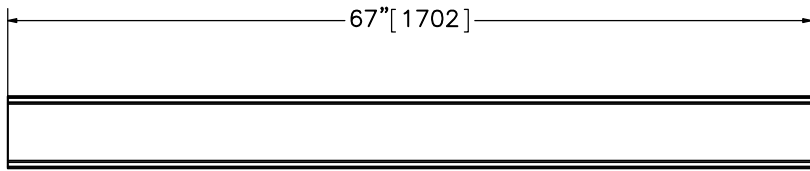
ELEVATION VIEW  
Part b3



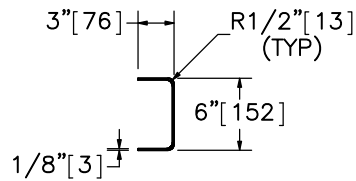
ELEVATION VIEW



PROFILE VIEW



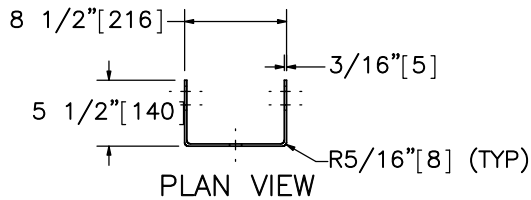
ELEVATION VIEW



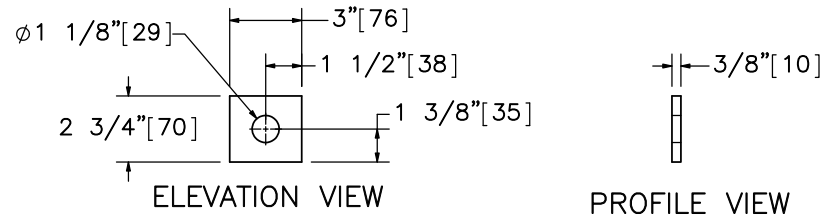
PROFILE VIEW

SCALE 1:8  
Part b5

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



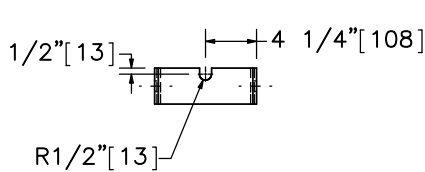
PLAN VIEW



ELEVATION VIEW

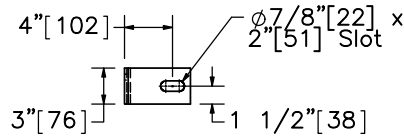
PROFILE VIEW

SCALE 1:8  
Anchor Bracket End Plate



ELEVATION VIEW

Yoke



PROFILE VIEW



Midwest Roadside  
Safety Facility

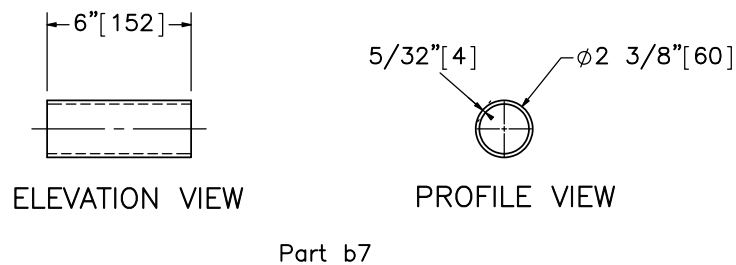
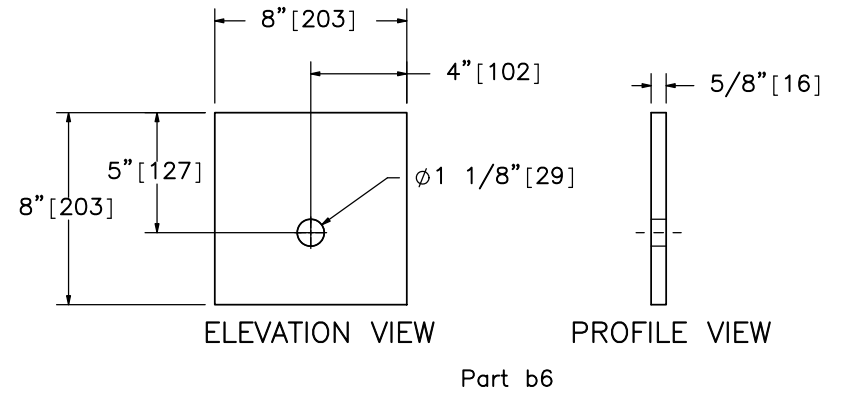
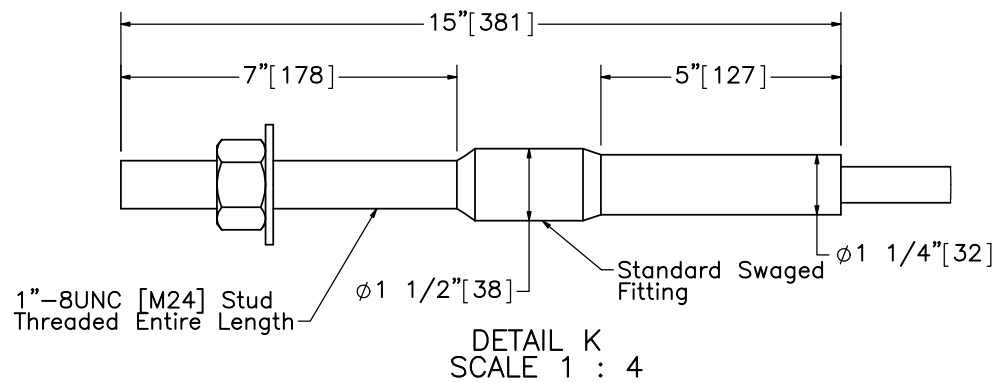
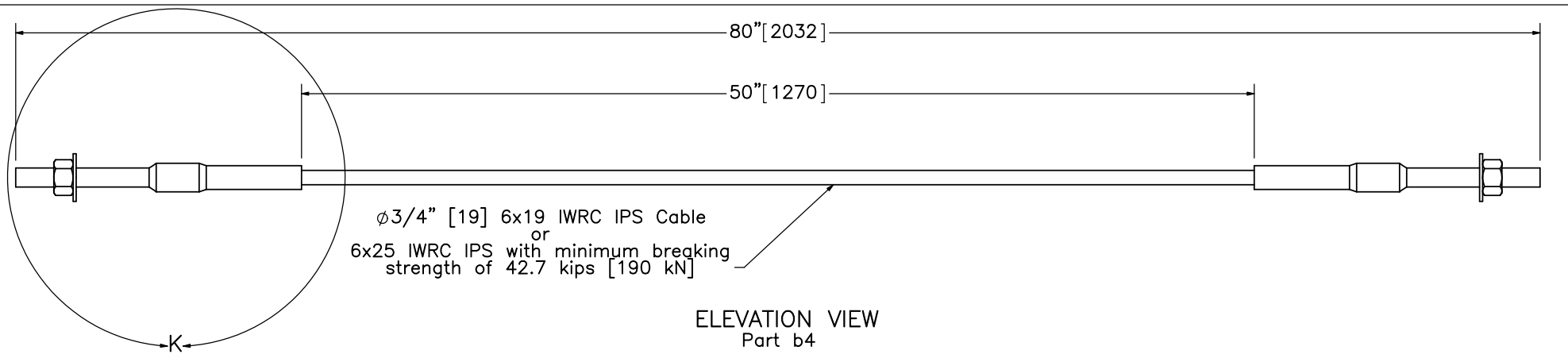
Standardized AGT  
Buttress  
Test No. AGTB-1

Ground Strut Details

DWG. NAME:  
AGT Buttress\_R13

SCALE: 1:16  
UNITS: Inches

SHEET:  
12 of 23  
DATE:  
5/22/2017  
DRAWN BY:  
SDB/ALL/  
JEK/DTM  
REV. BY:  
SKR/KAL



Midwest Roadside Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

BCT Anchor Cable

DWG. NAME:  
AGT Buttress\_R13

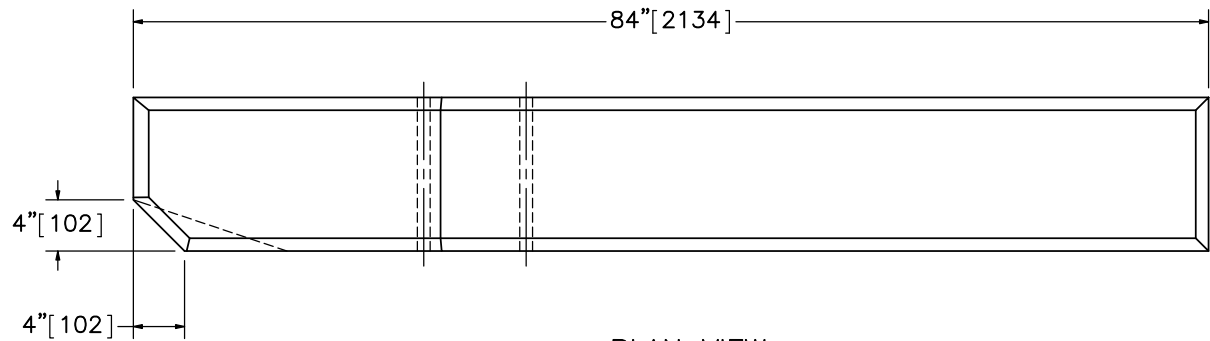
SCALE: 1:8  
UNITS: Inches

SHEET:  
13 of 23

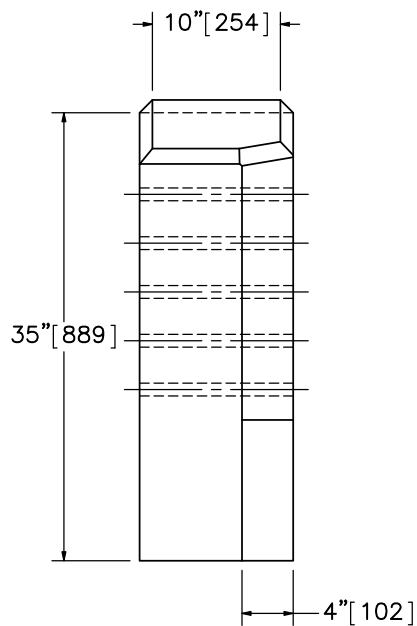
DATE:  
5/22/2017

DRAWN BY:  
SDB/ALL/  
JEK/DTM

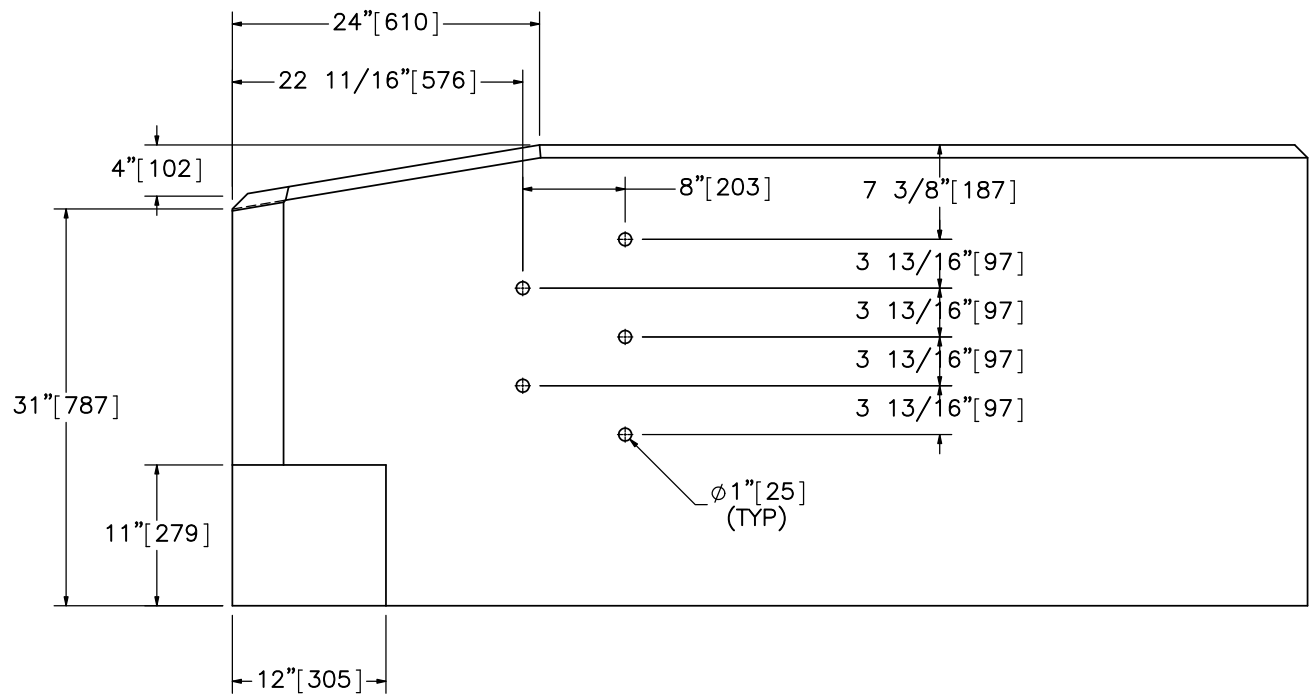
REV. BY:  
SKR/KAL



PLAN VIEW



PROFILE VIEW



ELEVATION VIEW



Midwest Roadside  
Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

Buttress Details

DWG. NAME.  
AGT Buttress\_R13

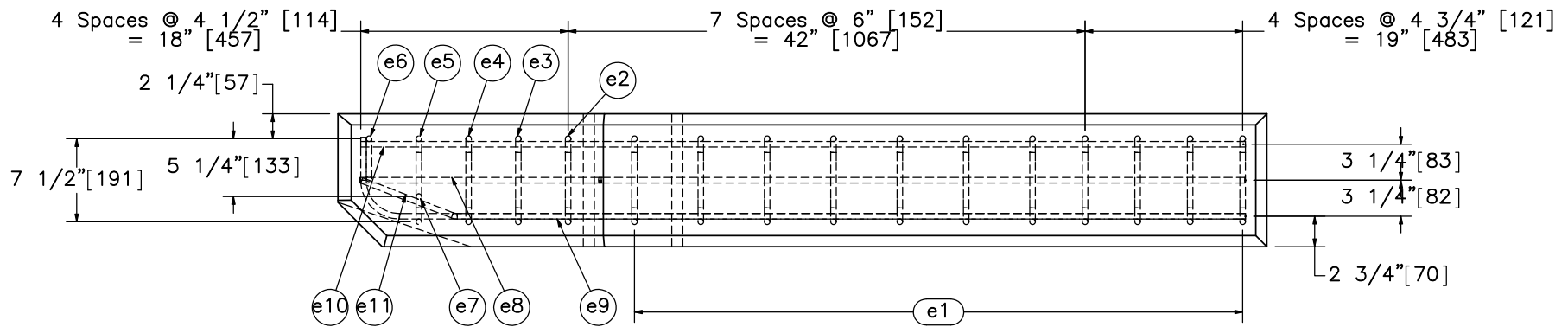
SCALE: 1:15  
UNITS: Inches

SHEET:  
14 of 23

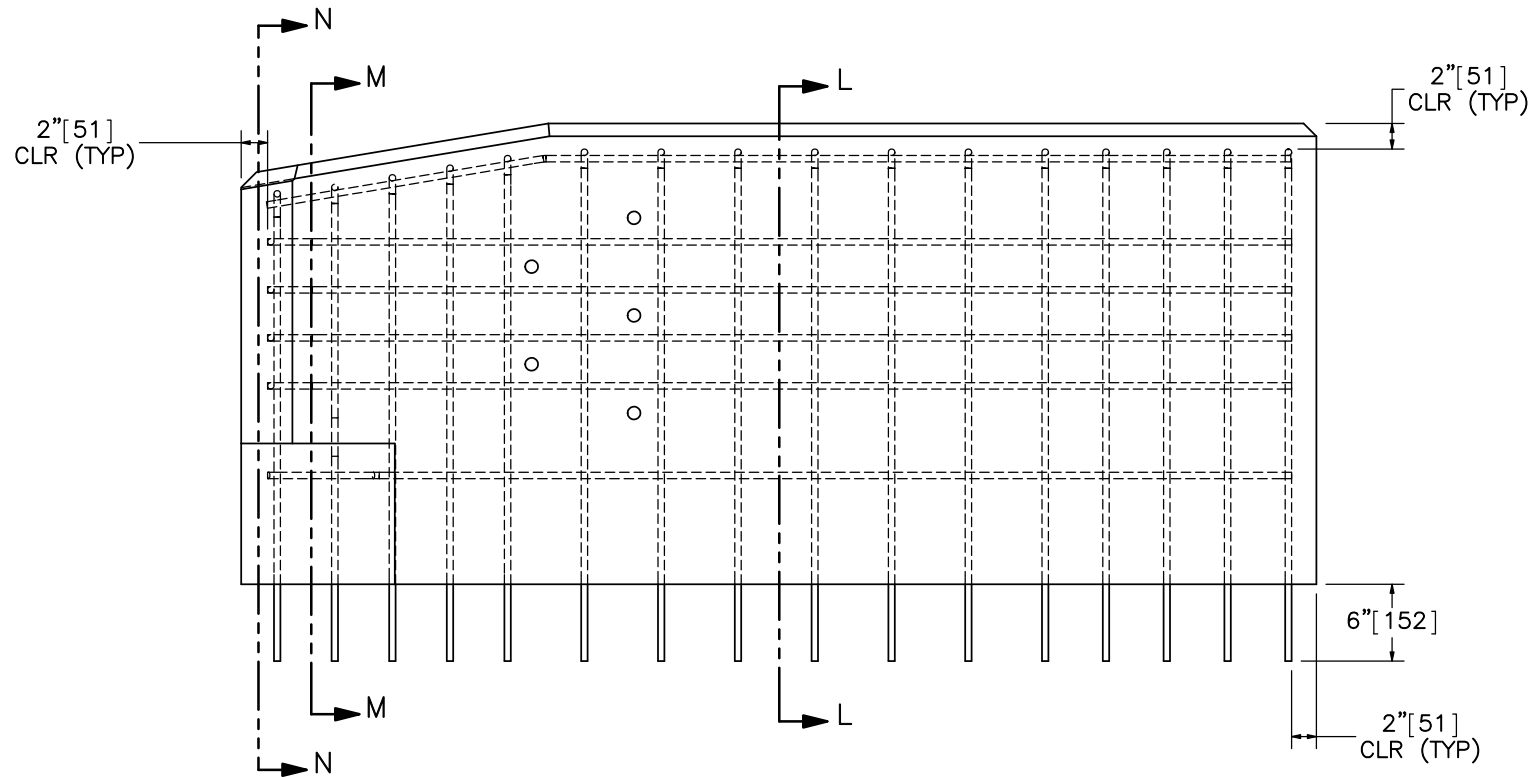
DATE:  
5/22/2017

DRAWN BY:  
SDB/ALL/  
JEK/DTM

REV. BY:  
SKR/KAL



PLAN VIEW



ELEVATION VIEW

- Note: (1) Embed vertical rebar in tarmac with epoxy adhesive with a minimum bond strength of 1450 psi [10.0 MPa].
- (2) All edges of the top of the buttress are chamfered 1" [25].



Midwest Roadside  
Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

Rebar Detail

DWG. NAME:  
AGT Buttress\_R13

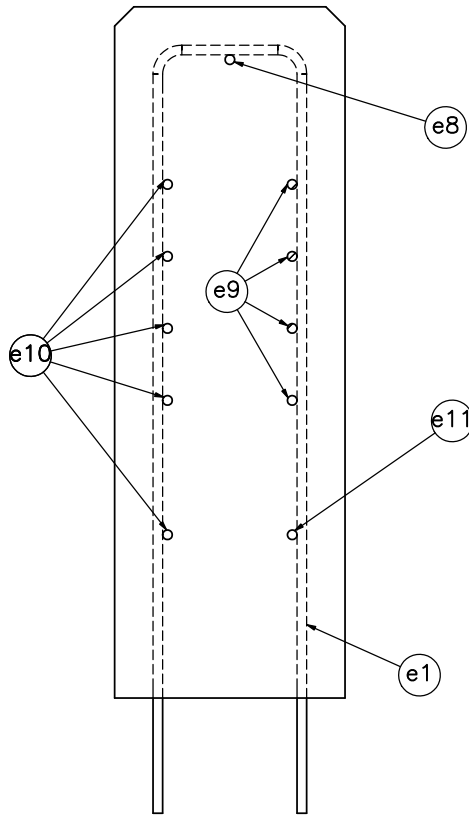
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UNITS: Inches

SHEET:  
15 of 23

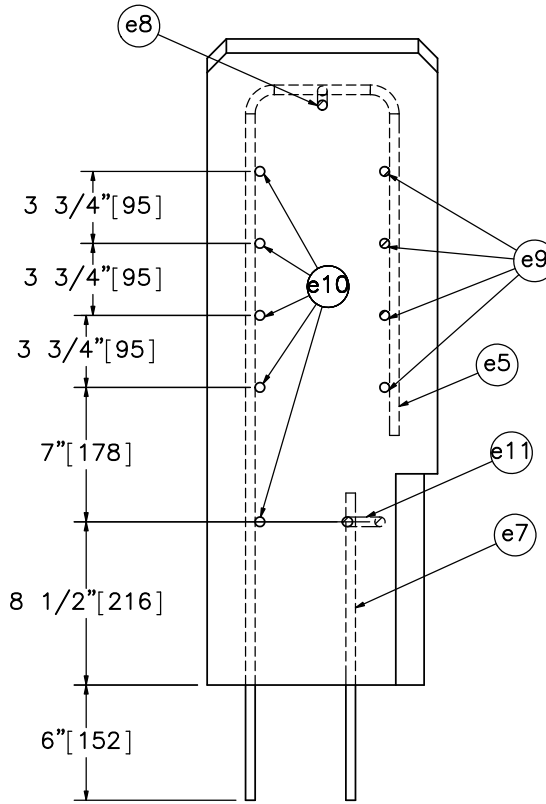
DATE:  
5/22/2017

DRAWN BY:  
SDB/ALL/  
JEK/DTM

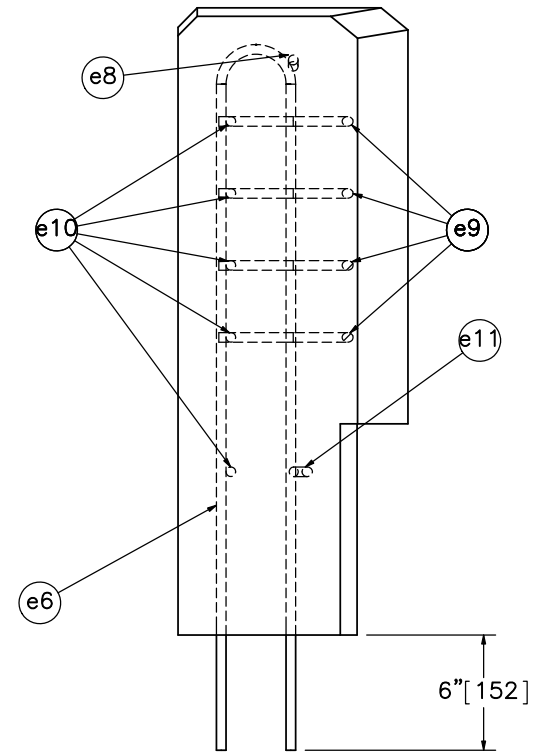
REV. BY:  
SKR/KAL



SECTION L-L



SECTION M-M



SECTION N-N



Midwest Roadside  
Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

Rebar Detail Sections

DWG. NAME:  
AGT Buttress\_R13

SCALE: 1:10  
UNITS: Inches

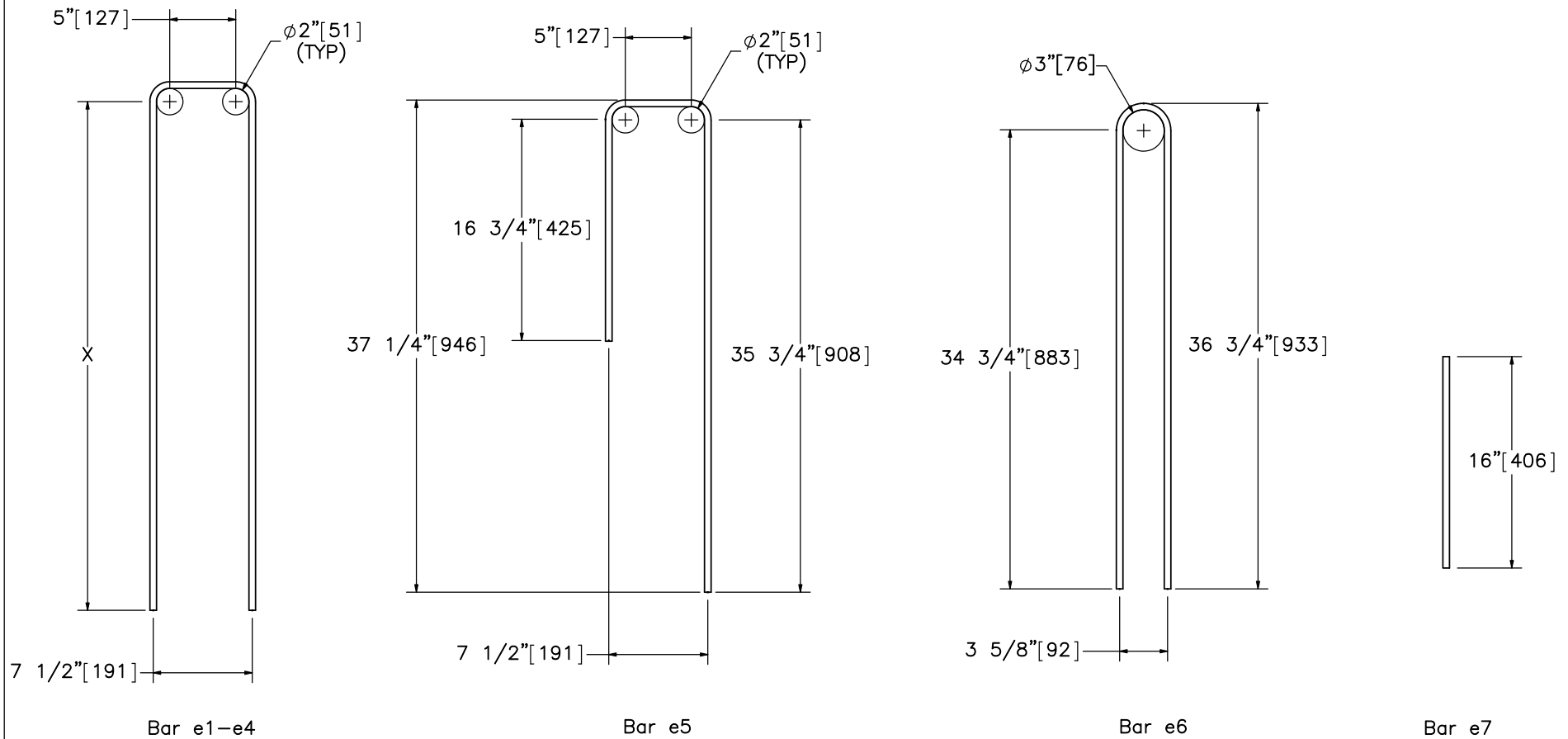
SHEET:  
16 of 23

DATE:  
5/22/2017

DRAWN BY:  
SDB/ALL/  
JEK/DTM

REV. BY:  
SKR/KAL





Bill of Bars

Part No.	Bar No.	Qty.	Start of Bend (X)	Unbent Length	Material
e1	#4	11	38 1/2" [978]	86" [2184]	ASTM A615 Gr. 60
e2	#4	1	38" [965]	85" [2159]	ASTM A615 Gr. 60
e3	#4	1	37 1/4" [946]	83 1/2" [2121]	ASTM A615 Gr. 60
e4	#4	1	36 1/2" [927]	82" [2083]	ASTM A615 Gr. 60
e5	#4	1	-	61 1/2" [1562]	ASTM A615 Gr. 60
e6	#4	1	-	75 1/4" [1908]	ASTM A615 Gr. 60
e7	#4	1	-	16" [406]	ASTM A615 Gr. 60



Midwest Roadside Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

Vertical Rebar Details

DWG. NAME:  
AGT Buttress\_R13

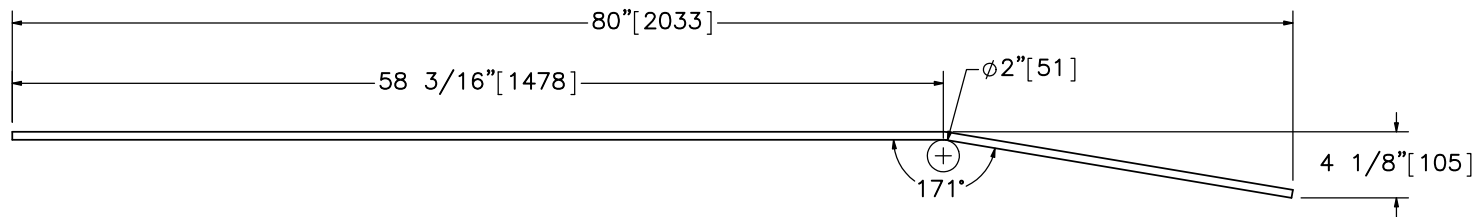
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UNITS: Inches

SHEET:  
17 of 23

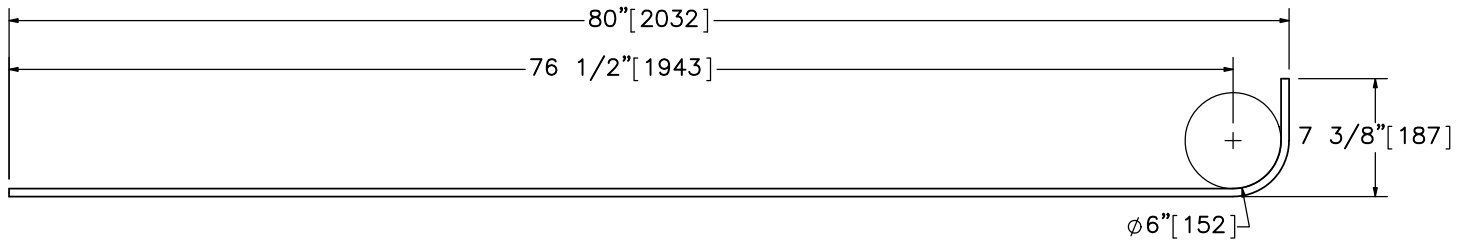
DATE:  
5/22/2017

DRAWN BY:  
SDB/ALL/  
JEK/DTM

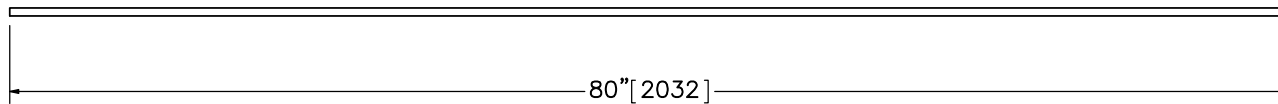
REV. BY:  
SKR/KAL



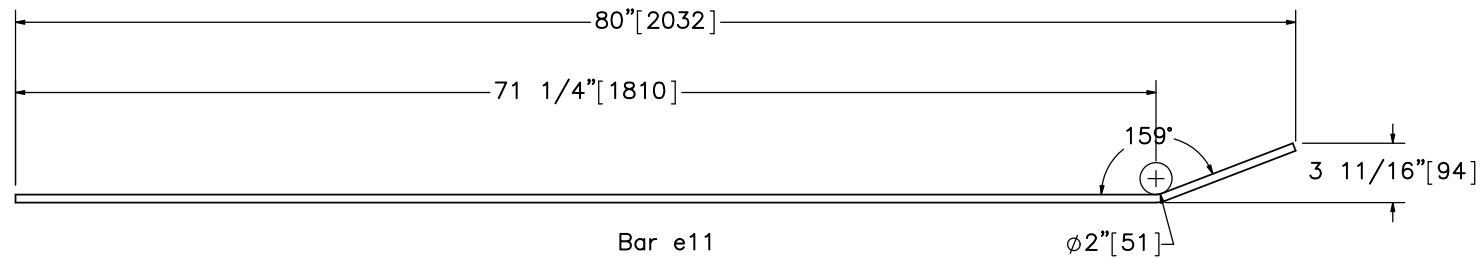
Bar e8



Bar e9



Bar e10



Bar e11

Bill of Bars

Part No.	Bar No.	Qty.	Unbent Length	Material
e8	#4	1	80 1/4" [2038]	ASTM A615 Gr. 60
e9	#4	4	85 1/2" [2172]	ASTM A615 Gr. 60
e10	#4	5	80" [2032]	ASTM A615 Gr. 60
e11	#4	1	80 1/2" [2045]	ASTM A615 Gr. 60



Midwest Roadside Safety Facility

Standardized AGT

Buttress

Test No. AGTB-1

Horizontal Rebar Details

DWG. NAME.  
AGT Buttress\_R13

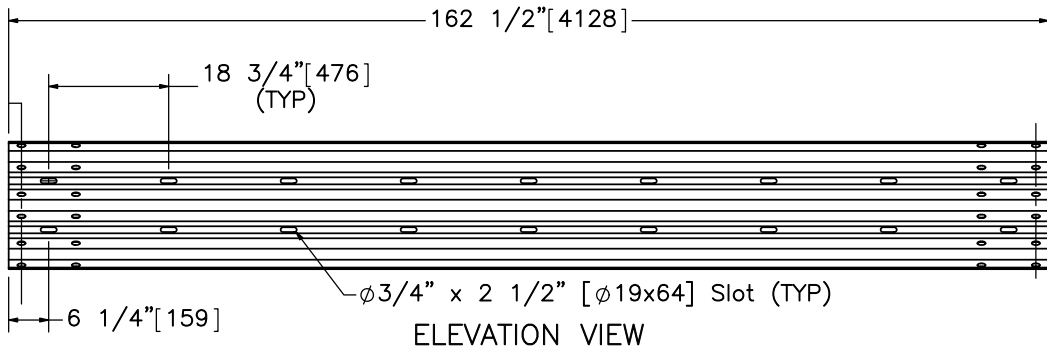
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UNITS: Inches

SHEET:  
18 of 23

DATE:  
5/22/2017

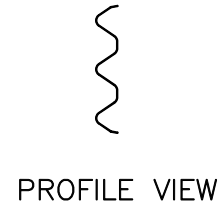
DRAWN BY:  
SDB/ALL/  
JEK/DTM

REV. BY:  
SKR/KAL

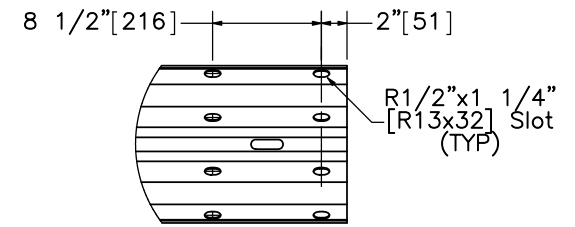


ELEVATION VIEW

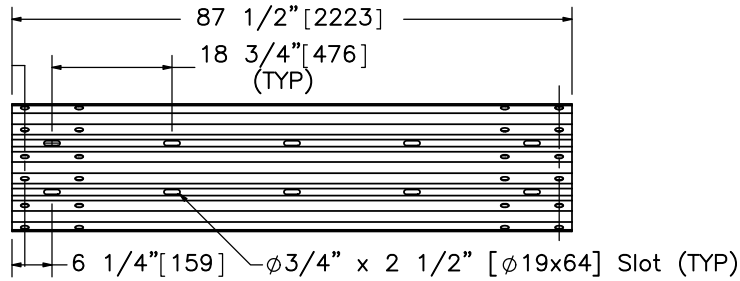
Part c3



PROFILE VIEW



DETAIL O  
SCALE 1 : 15

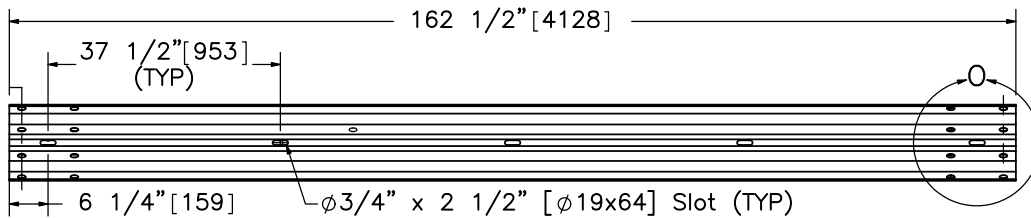


ELEVATION VIEW

Part c4



PROFILE VIEW

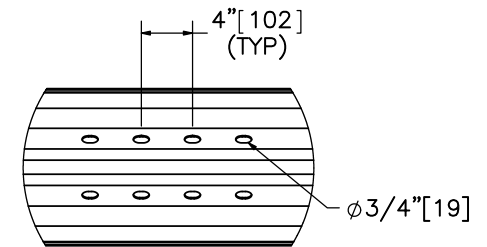


ELEVATION VIEW

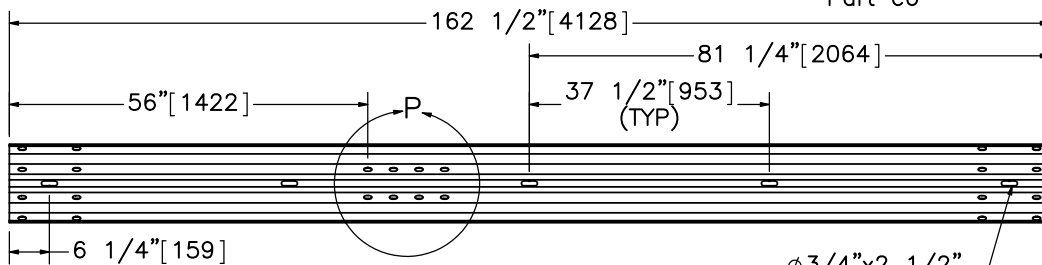
Part c6



PROFILE VIEW



DETAIL P  
SCALE 1 : 15



ELEVATION VIEW  
Part c7

$\phi 3/4$ " x 2 1/2"  
[19x64] Slot  
(TYP)



Midwest Roadside  
Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

Guardrail Section Details

DWG. NAME:  
AGT Buttress\_R13

SCALE: 1:30  
UNITS: Inches

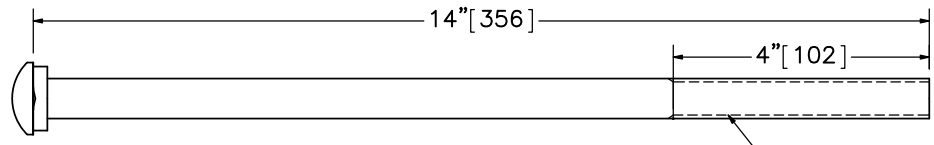
SHEET:  
19 of 23

DATE:  
5/22/2017

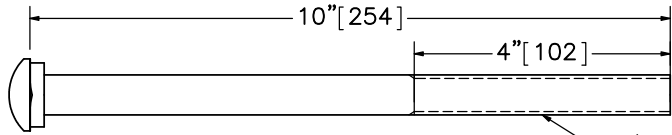
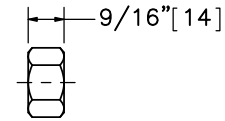
DRAWN BY:  
SDB/ALL/  
JEK/DTM

REV. BY:  
SKR/KAL

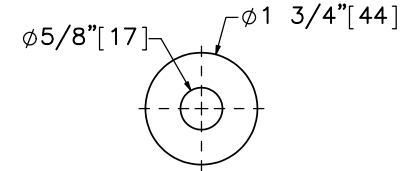
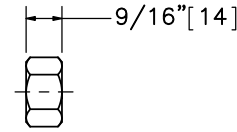




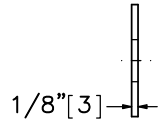
ELEVATION VIEW  
Part d1  
5/8-11 UNC



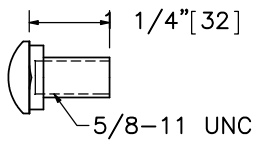
ELEVATION VIEW  
Part d2  
5/8-11 UNC



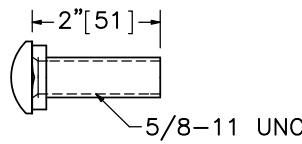
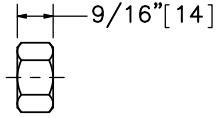
ELEVATION VIEW  
Part d8



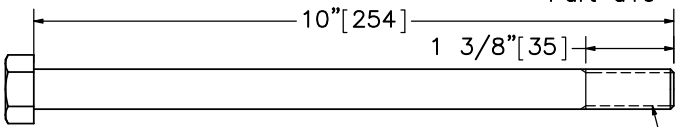
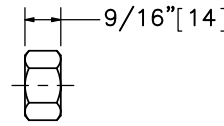
PROFILE VIEW



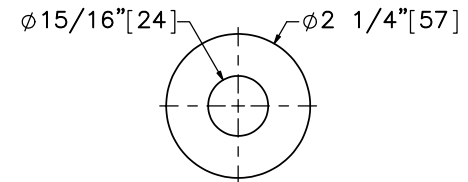
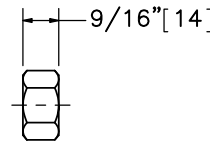
ELEVATION VIEW  
Part d3  
5/8-11 UNC



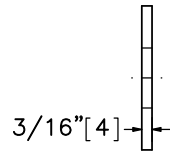
ELEVATION VIEW  
Part d10  
5/8-11 UNC



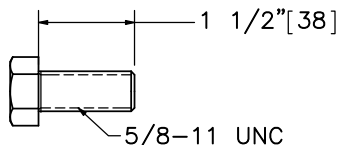
ELEVATION VIEW  
Part d4  
5/8-11 UNC



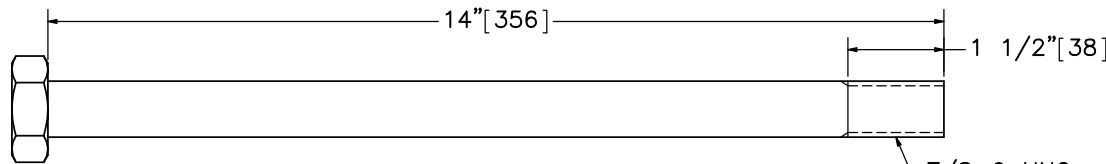
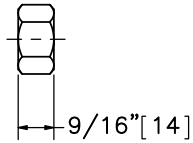
ELEVATION VIEW  
Part d9



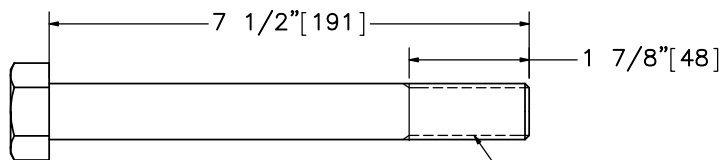
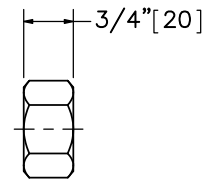
PROFILE VIEW



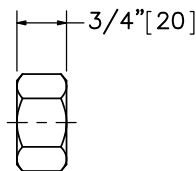
ELEVATION VIEW  
Part d5  
5/8-11 UNC



ELEVATION VIEW  
Part d6  
7/8-9 UNC



ELEVATION VIEW  
Part d7  
7/8-9 UNC



Midwest Roadside  
Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

Hardware

DWG. NAME:  
AGT Buttress\_R13

SCALE: 1:3  
UNITS: Inches

SHEET:  
21 of 23  
DATE:  
5/22/2017  
DRAWN BY:  
SDB/ALL/  
JEK/DTM  
REV. BY:  
SKR/KAL

Item No.	QTY.	Description	Material Spec	Galvanization Spec	Hardware Guide
a1	7	W6x8.5 [W152x12.6] 72" [1829] Long	ASTM A36	ASTM A123	PWE06
a2	7	6"x12"x14 1/4" [152x305x362] Blockout	SYP Grade No.1 or better	—	PDB10a
a3	8	16D Double Head Nail	—	—	—
a4	6	W6x8.5 [W152x12.6] 72" [1829] Long	ASTM A36	ASTM A123	—
a5	6	6"x12"x19" [152x305x483] Blockout	SYP Grade No.1 or better	—	—
a6	6	W6x8.5 [W152x12.6] 78" [1981] Long	ASTM A36	ASTM A123	PWE07
a7	6	17 1/2" Long [445] 7"x4"x3/16" [178x102x5] Iowa Steel Blockout	ASTM A500 Gr. B	ASTM A123	—
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	ASTM A123	PTE06
b3	1	Strut and Yoke Assembly	ASTM A36	ASTM A123	PFP02
b4	2	BCT Cable Anchor Assembly	∅3/4" [19] 6x19 IWRC IPS Wire Rope	ASTM A123	FCA01
b5	1	Anchor Bracket Assembly	ASTM A36	ASTM A123	FPA01
b6	1	8"x8"x5/8" [203x203x16] Anchor Bearing Plate	ASTM A36	ASTM A123	FPB01
b7	1	2 3/8" [60] O.D. x 6" Long [152] BCT Post Sleeve	ASTM A53 Grade B Schedule 40	ASTM A123	FMM02
c1	1	10-gauge [3.4] Thrie Beam Terminal Connector	AASHTO M180	ASTM A123 or A653	RTE01b
c2	5	3 1/2"x3 1/2"x1/4" [89x89x6] Washer Plate	ASTM A36	ASTM A123	—
c3	1	12'-6" [3,810] 12-gauge [2.7] Thrie Beam Section	AASHTO M180	ASTM A123 or A653	RTM08a
c4	1	6'-3" [1,905] 12-gauge [2.7] Thrie Beam Section	AASHTO M180	ASTM A123 or A653	RTM19a
c5	1	6'-3" [1,905] 10-gauge [3.4] W-Beam to Thrie-Beam Asymmetric Transition Section	AASHTO M180	ASTM A123 or A653	RWT02
c6	3	12'-6" [3,810] 12-gauge [2.7] W-Beam MGS Section	AASHTO M180	ASTM A123 or A653	RWM04a
c7	1	12'-6" [3810] 12-gauge [2.7] W-Beam MGS End Section	AASHTO M180	ASTM A123 or A653	RWM14a



Midwest Roadside  
Safety Facility

Standardized AGT  
Buttress  
Test No. AGTB-1

Bill of Materials


DWG. NAME.  
AGT Buttress\_R13

SCALE: 1:110  
UNITS: Inches

SHEET:  
22 of 23  
DATE:  
5/22/2017  
DRAWN BY:  
SDB/ALL/  
JEK/DTM  
REV. BY:  
SKR/KAL

Item No.	QTY.	Description	Material Spec	Galvanization Spec	Hardware Guide
d1	19	5/8" [16] Dia. UNC, 14" [356] Long Guardrail Bolt and Nut	Bolt – ASTM A307 Nut – ASTM A563A	ASTM A153 or B695 Class 55 or F2329	FBB06
d2	2	5/8" [16] Dia. UNC, 10" [254] Long Guardrail Bolt and Nut	Bolt – ASTM A307 Nut – ASTM A563A	ASTM A153 or B695 Class 55 or F2329	FBB03
d3	56	5/8" [16] Dia. UNC, 1 1/4" [32] Long Guardrail Bolt and Nut	Bolt – ASTM A307 Nut – ASTM A563A	ASTM A153 or B695 Class 55 or F2329	FBB01
d4	2	5/8" [16] Dia. UNC, 10" [254] Long Hex Head Bolt and Nut	Bolt – ASTM A307 Nut – ASTM A563A	ASTM A153 or B695 Class 55 or F2329	FBX16a
d5	20	5/8" [16] Dia. UNC, 1 1/2" [38] Long Hex Head Bolt and Nut	Bolt – ASTM A307 Nut – ASTM A563A	ASTM A153 or B695 Class 55 or F2329	FBX16a
d6	5	7/8" [22] Dia. UNC, 14" [356] Long Heavy Hex Bolt and Nut	Bolt – ASTM F3125 Gr. 120 (A325) or A354 Gr. BC Nut – ASTM A563DH or A194 Gr. 2H	Bolt – ASTM A153 or B695 Class 55 or F1136 Gr. 3 or F2329 or F2833 Gr. 1 Nut – ASTM A153 or B633 or B695 Class 55 or F1941 or F2329	FBX22b
d7	2	7/8" [22] Dia. UNC, 7 1/2" [191] Long Heavy Hex Head Bolt and Nut	Bolt – ASTM F3125 Gr. 120 (A325) or A354 Gr. BC Nut – ASTM A563DH or A194 Gr. 2H	Bolt – ASTM A153 or B695 Class 55 or F1136 Gr. 3 or F2329 or F2833 Gr. 1 Nut – ASTM A153 or B633 or B695 Class 55 or F1941 or F2329	FBX22b
d8	22	5/8" [16] Dia. Plain Round Washer	ASTM A844	ASTM A123 or A153 or F2329	FWC16a
d9	4	7/8" [22] Dia. Plain Round Washer	ASTM A844	ASTM A123 or A153 or F2329	FWC22b
d10	24	5/8" [16] Dia. UNC, 2" [51] Long Guardrail Bolt and Nut	Bolt – ASTM A307 Gr. A Nut – ASTM A563A	ASTM A153 or B695 Class 55 or F2329	FBB02
d11	24	5/8" [16] Dia. Plain Round Washer	ASTM A844	ASTM A123 or A153 or F2329	FWC16a
e1	11	1/2" [13] Dia., 86" [2,184] Long Bent Rebar	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*	–
e2	1	1/2" [13] Dia., 85" [2,159] Long Bent Rebar	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*	–
e3	1	1/2" [13] Dia., 83 1/2" [2,121] Long Bent Rebar	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*	–
e4	1	1/2" [13] Dia., 82" [2,083] Long Bent Rebar	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*	–
e5	1	1/2" [13] Dia., 61 1/2" [1,562] Long Bent Rebar	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*	–
e6	1	1/2" [13] Dia., 75 1/8" [1,908] Long Bent Rebar	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*	–
e7	1	1/2" [13] Dia., 16" [406] Long Rebar	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*	–
e8	1	1/2" [13] Dia., 80 1/4" [2,038] Long Bent Rebar	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*	–
e9	4	1/2" [13] Dia., 85 1/2" [2,172] Long Bent Rebar	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*	–
e10	5	1/2" [13] Dia., 80" [2,032] Long Rebar	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*	–
e11	1	1/2" [13] Dia., 80 1/2" [2,045] Long Bent Rebar	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*	–
f1	1	Epoxy Adhesive	Min. Bond Strength = 1450 psi [10.0 MPa]	–	–
g1	1	Concrete	Min. f'c = 4000 psi [27.6 MPa]	–	–

\*Rebar does not need to be epoxy-coated for testing purposes.

	Standardized AGT Buttress Test No. AGTB-1		SHEET: 23 of 23
	Bill of Materials		DATE: 5/22/2017
Midwest Roadside Safety Facility	DWG. NAME: AGT Buttress_R13	SCALE: 1:110 UNITS: Inches	DRAWN BY: SDB/ALL/ JEK/DTM REV. BY: SKR/KAL

REV.	DATE OF ISSUE	Page	NATURE OF CHANGES	REVIEWER	REVISED BY
0	1/29/2015	–	System derived from hand sketches and previous MWT system.	–	SDB
1	4/21/2015	–	Added rebar detail page and bill of bars page after page 13.	SKR	ALL
		1	Moved end of parapet 1" downstream of concrete tarmac; located impact point; edited notes.		
		4	Replaced c2 plate with individual square washers.		
		16	Changed part c2 from plate detail to washer detail.		
		17	Changed item c2 quantity, description, and material spec		
2	5/27/2015	–	Replaced 10' buttress with 7' buttress	SKR	ALL
		13	Changed buttress length to 84"; height to 36"; added taper; moved holes to correct position		
		14	Re-drew rebar according to 7 ft Standardized AGT sketch drawing		
		15–16	Split up rebar to two pages		
3	6/2/2015	–	Replaced c7 with 12' 6" end section; added a third c6 before new c7	SKR	ALL
		1	Edited notes; moved impact point		
		4	Made detail E larger		
		5	Fixed spacing on gaurdrail		
		13	Fixed chamfer on buttress		
		15	Added part balloons		
		16	Added total length to the table		
		17	Added total length to the table; added dimension to bar e11		
		19	Corrected part c7 to have correct holes		
21	Edited bill of materials parts c6 and c7 to match new parts in drawing				
4	6/5/2015	4	Moved bolt holes	SKR	ALL
		13	Moved bolt holes		
		14	Moved rebar to corrent dimension		
		15	Added part labels to rebar		



5	6/8/2015	1	Took spacing out of space notes; added note to posts 1 and 2; edited note for posts 3–9; added note 1, and edited notes 2, and 3	KAL	ALL
		2	Added no bolt note; added post numbers for both sections; changed sheet name		
		3	Added post number for both sections; changed sheet name		
		4	Made c3 on top of c1		
		8	Added alternate blockout option for part a5		
		11	Added profile view for strut; moved anchor bracket end plate below part b5		
		12	Changed part b4 dimensions; added swaged fitting dimension		
		13	Made scale larger; added hole locations dimensions to elevation view		
		14	Re-labeled section view; deleted part numbers from elevation view		
		15	Changed length of view for sections		
		16	Added dimensions for bend length and diameters		
		17	Added diameter dimensions		
		19	Edited detail P hole dimensions; added dimensions to c7; re-arranged parts to be in order		
		20	Larger scale and added dimensions to part c1; changed font on part c2		
6	6/11/2015	13	Added dimension from top to first hole; changed font size	KAL	ALL
		14	Changed font sizes		
		16	Changed No. to Qty. in table; fixed lengths for bends		
		17	Changed No. to Qty. in table and added Post No. headline		
		18	Changed font sizes		
		19	Added TYP to c6 slot spacing		
		20	Changed font sizes; added scale to elevation view for c1		
7	6/24/2015	–	Entire system mirrored. Pages edited for views, general movement, correction of view type, and part alterations.	KAL	JEK

8	6/25/2015	1	Additional post labeling. Note 1 edited.	KAL/SKR	JEK
		3	Leader note placement correction.		
		4	Rebar removed from view of Section E. Section note moved.		
		5	View flipped to show reverse of system. Detail views altered to correspond. General movement.		
		6	Detail views flipped. General movement.		
		13	Profile changed to other side. Additional dimensions. General movement.		
		14	Part indicators moved for readability.		
		15	Missing rebar piece added to drawing. Additional labeling.		
		20	Part c5 slot notation altered. Part c1 slot notation added.		
9	6/26/2015	21	Part a6 length corrected.	KAL	JEK
10	7/13/2015	21	Part a7 description and material correction.	KAL	JEK
11	8/20/2015	-	Butress concrete chamfered.	KAL	JEK
		14	Epoxy and chamfer notes added.		
		22	Epoxy and concrete added to BOM.		
12	10/20/2016	-	Nested attachment hardware changed to 2" bolts. BOM HWG designators corrected/checked. BOM minor description edits. Addition part (2" GR bolt).	KAL	JEK
13	5/19/2017	-	Added washers behind post splice bolts. Minor BOM changes, dimensions added, and text wording and sizing revised.	KAL	DTM