

- Note: (1) Test shall be performed according to test designation no. 3-11 of MASH.  
 (2) The impact location is 51 3/16" [1,300] upstream of the joint between barrier nos. 8 and 9.  
 (3) Rear toe of barrier placed 1" [25] from edge of bridge pit.  
 (4) Barrier nos. 5-13 are anchored in all traffic-side bolt pockets.



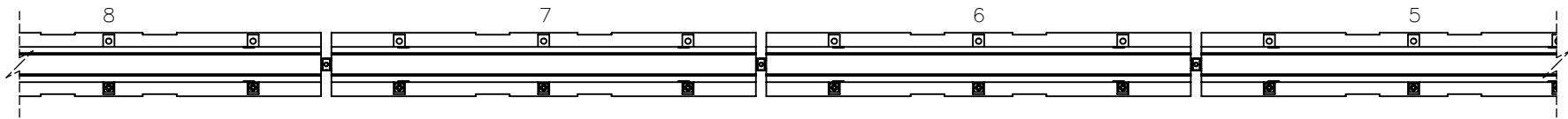
Midwest Roadside  
Safety Facility

WI PCB Anchorage Tie-  
Down  
Test No. WITD-1  
System Layout

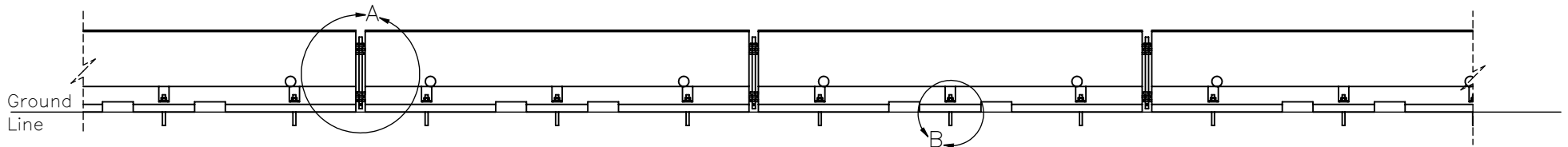
DWG. NAME.  
WITD-1\_R11

SCALE: 1:270  
UNITS: in.[mm]

SHEET:  
1 of 10  
DATE:  
5/25/2017  
DRAWN BY:  
MES/JEK  
REV. BY:  
JEK/KAL/  
RWB



PLAN VIEW



ELEVATION VIEW

Note: (1) Barrier nos. 5–13 are anchored in all traffic-side bolt pockets.  
 (2) Threaded rod epoxy anchored using Hilti HIT-RE 500 V3 epoxy or equivalent.



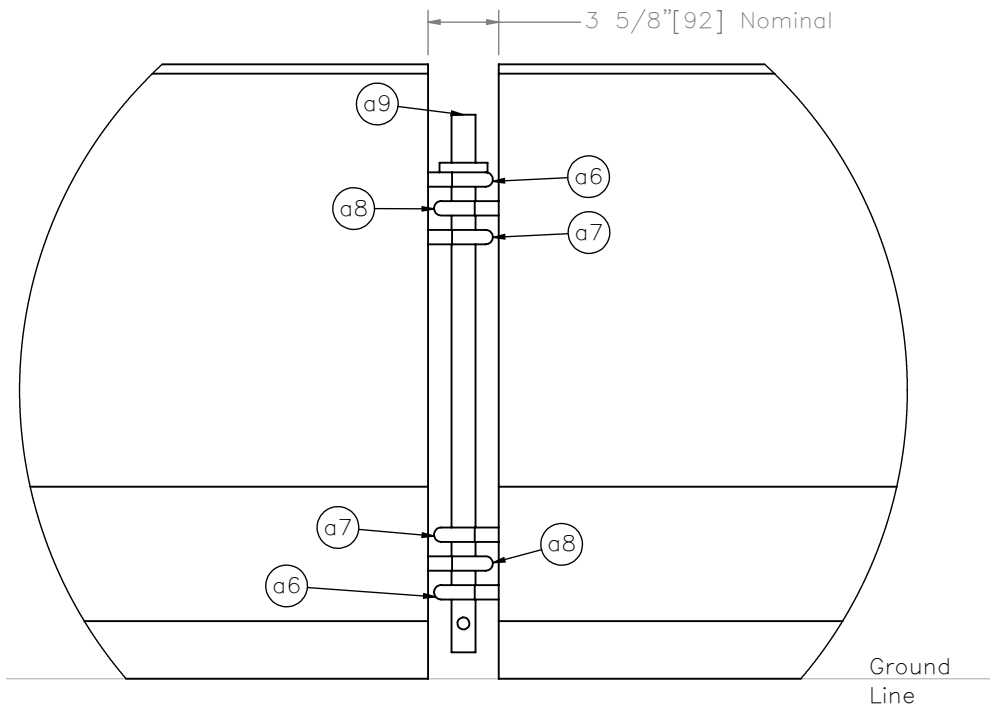
Midwest Roadside  
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WI PCB Anchorage Tie-  
 Down  
 Test No. WITD-1  
 Concrete Barrier Assembly

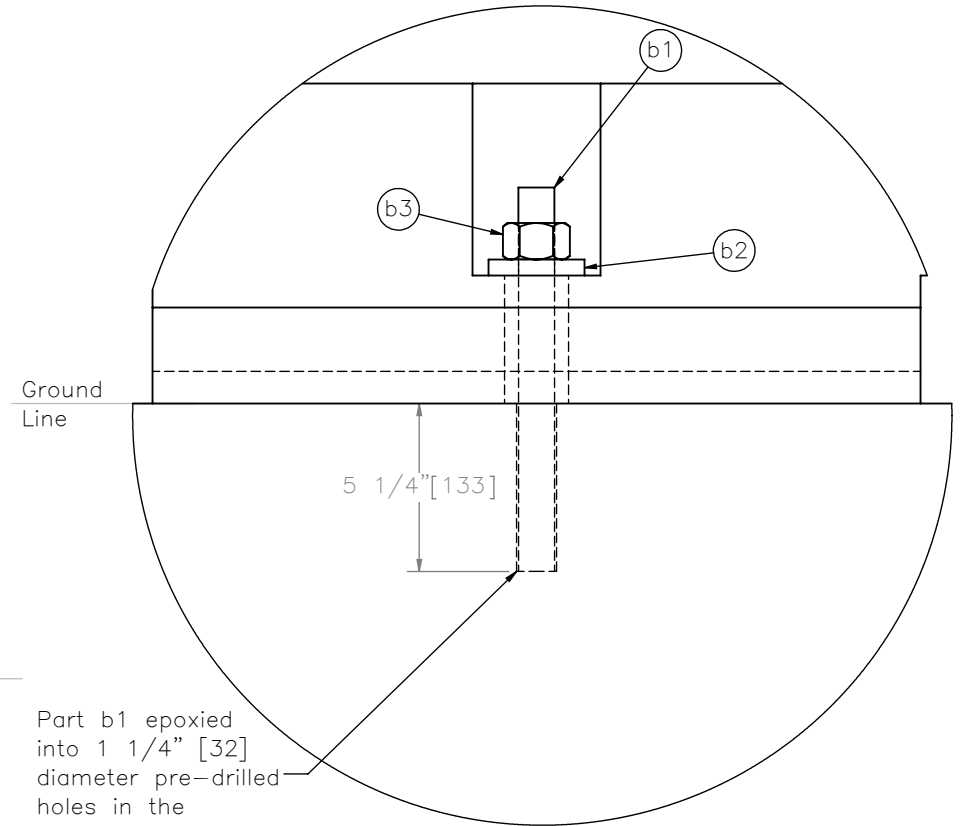
DWG. NAME.  
 WITD-1\_R11

SCALE: 1:60  
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SHEET:  
 2 of 10  
 DATE:  
 5/25/2017  
 DRAWN BY:  
 MES/JEK  
 REV. BY:  
 JEK/KAL/  
 RWB



DETAIL A



Part b1 epoxied into 1 1/4" [32] diameter pre-drilled holes in the concrete tarmac.

DETAIL B  
SCALE 1 : 6

- Note: (1) Barrier nos. 5-13 are anchored in all traffic-side bolt pockets.  
 (2) Threaded rod (part b1) epoxy anchored using Hilti HIT-RE 500 V3 epoxy or equivalent.  
 (3) Follow all Hilti installation guidance. Use 1/8" [3] oversize bit. Clean holes with steel wire brushes and are nozzels to remove dust. Installation temperature range of 23°F-104°F [-5°C-40°C]. Follow cure time on package. Limit installation torque to 175 ft-lbs [237 N-m].



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WI PCB Anchorage Tie-Down  
 Test No. WITD-1

Connection and Anchorage Details

DWG. NAME:  
WITD-1\_R11

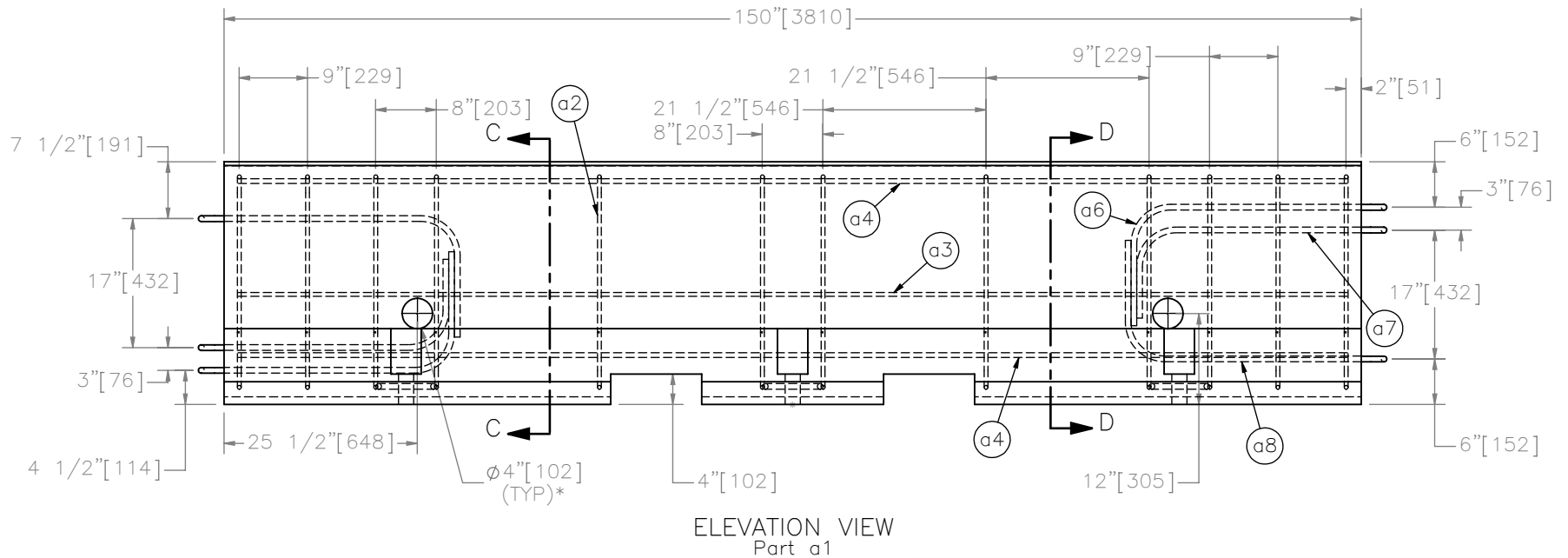
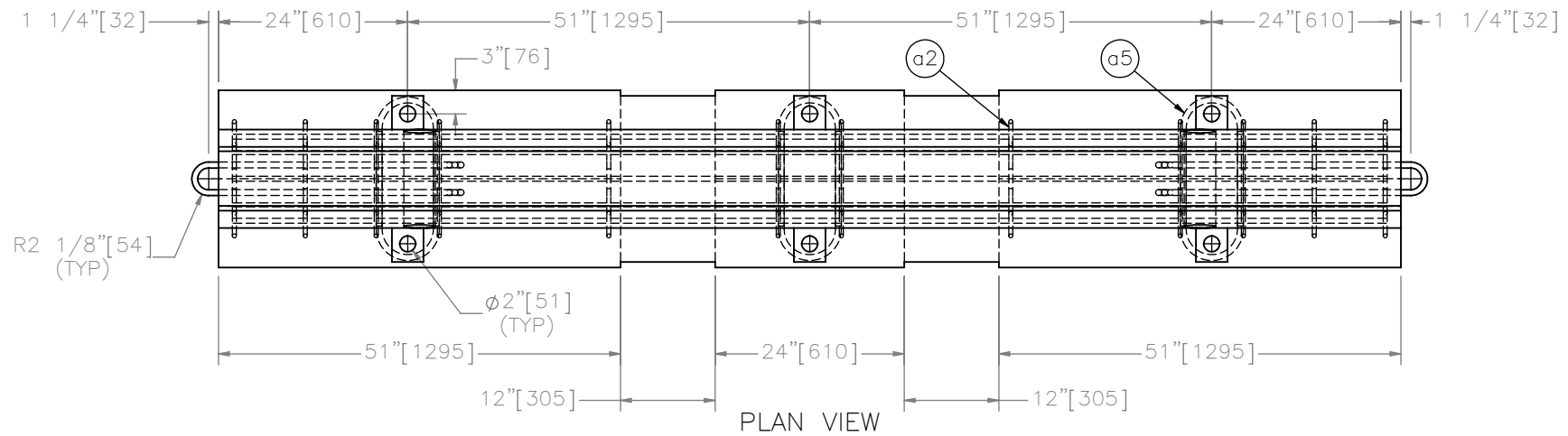
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SHEET:  
3 of 10

DATE:  
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\*Hole in tested barrier 1/2" [13] smaller than design.



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WI PCB Anchorage Tie-  
Down  
Test No. WITD-1

Portable Concrete Barrier  
Details

DWG. NAME:  
WITD-1\_R11

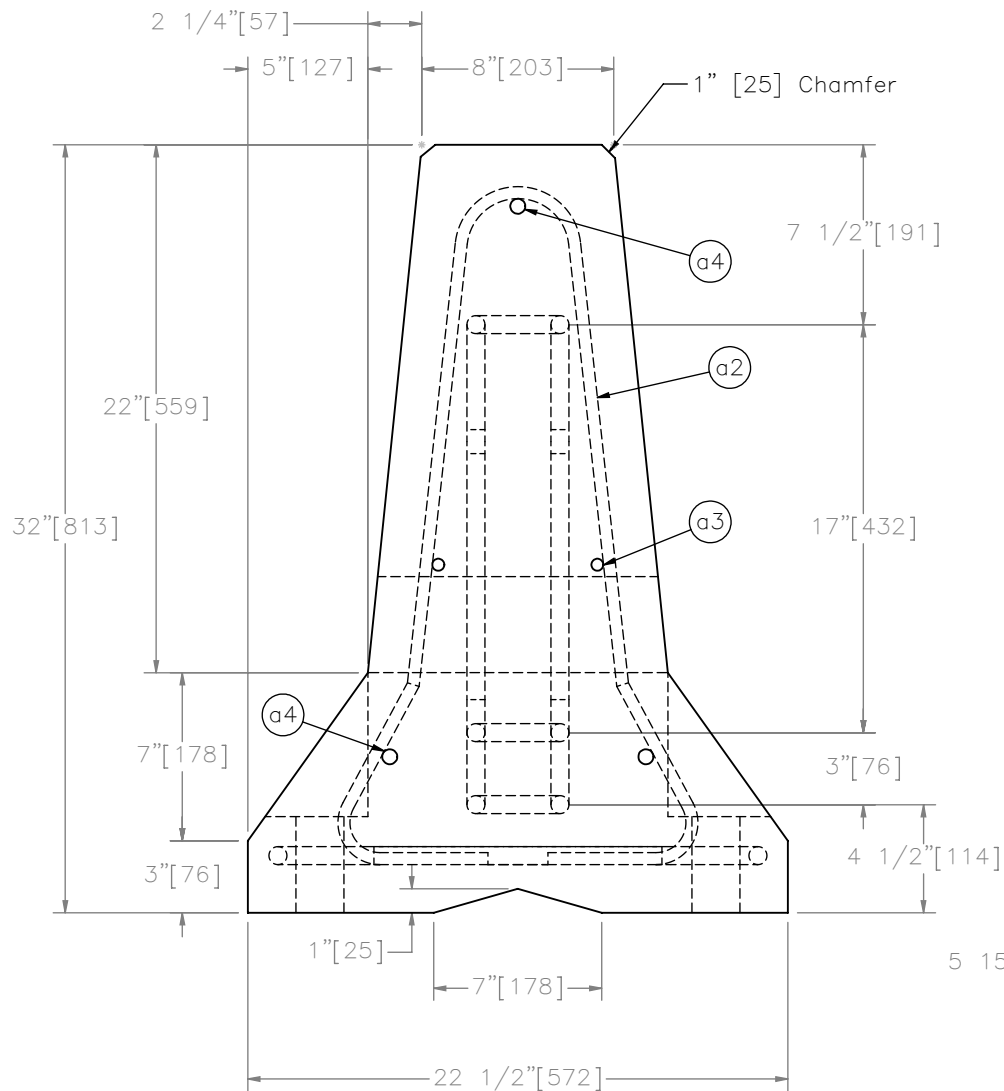
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SHEET:  
4 of 10

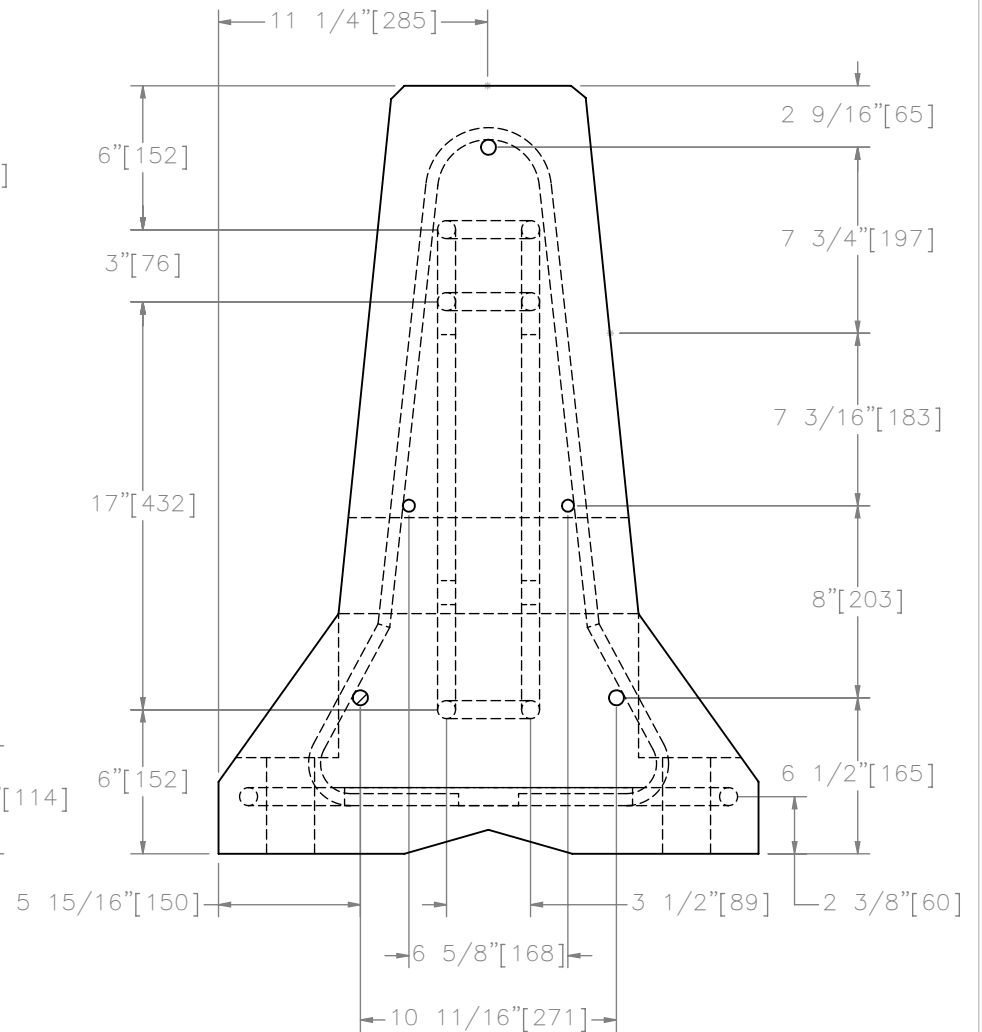
DATE:  
5/25/2017

DRAWN BY:  
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SECTION C-C



SECTION D-D

Note: (1) 2" [51] clear cover used for all reinforcement.



Midwest Roadside Safety Facility

WI PCB Anchorage Tie-Down  
Test No. WITD-1

Portable Concrete Barrier Details

DWG. NAME:  
WITD-1\_R11

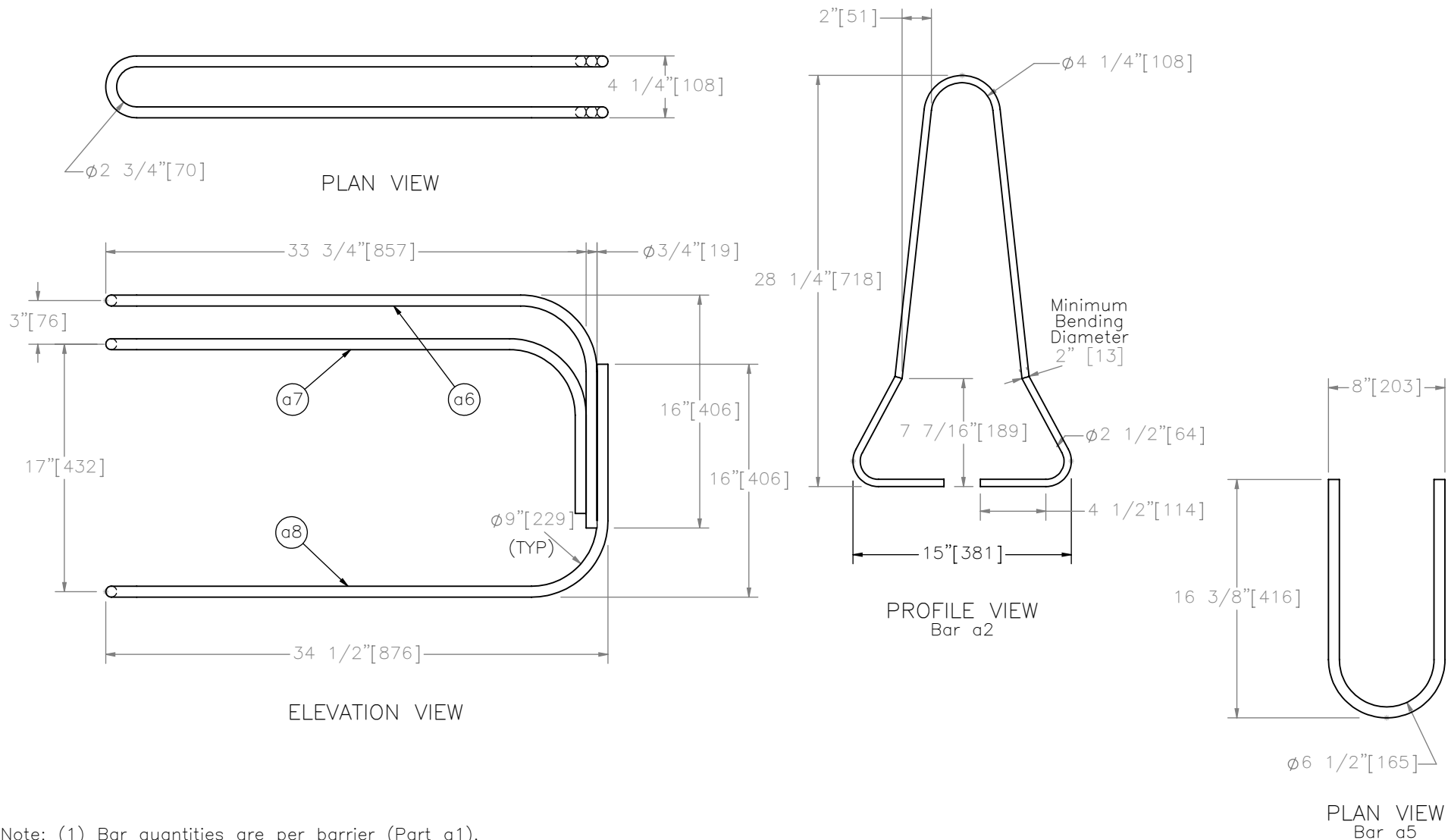
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UNITS: in.[mm]

SHEET:  
5 of 10

DATE:  
5/25/2017

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MES/JEK

REV. BY:  
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Bill of Bars

Bar	QTY	Size	Total Length	Material
a2	12	#4	72" [1829]	A615 Gr.60
a3	2	#4	146" [3708]	A615 Gr.60
a4	3	#5	146" [3708]	A615 Gr.60
a5	6	#6	35" [889]	A615 Gr.60
a6	2	#6	101" [2565]	A709 Gr.70 or A706 Gr.60
a7	2	#6	91" [2311]	A709 Gr.70 or A706 Gr.60
a8	2	#6	102" [2591]	A709 Gr.70 or A706 Gr.60



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WI PCB Anchorage Tie-Down  
Test No. WITD-1

Portable Concrete Barrier Rebar Details

DWG. NAME:  
WITD-1\_R11

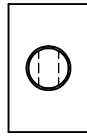
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SHEET:  
6 of 10

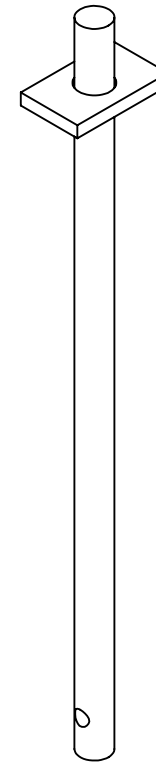
DATE:  
5/25/2017

DRAWN BY:  
MES/JEK

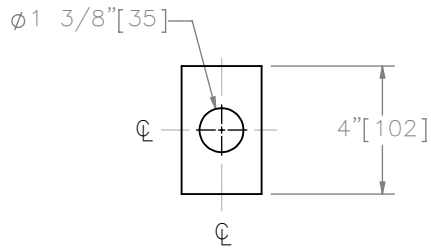
REV. BY:  
JEK/KAL/  
RWB



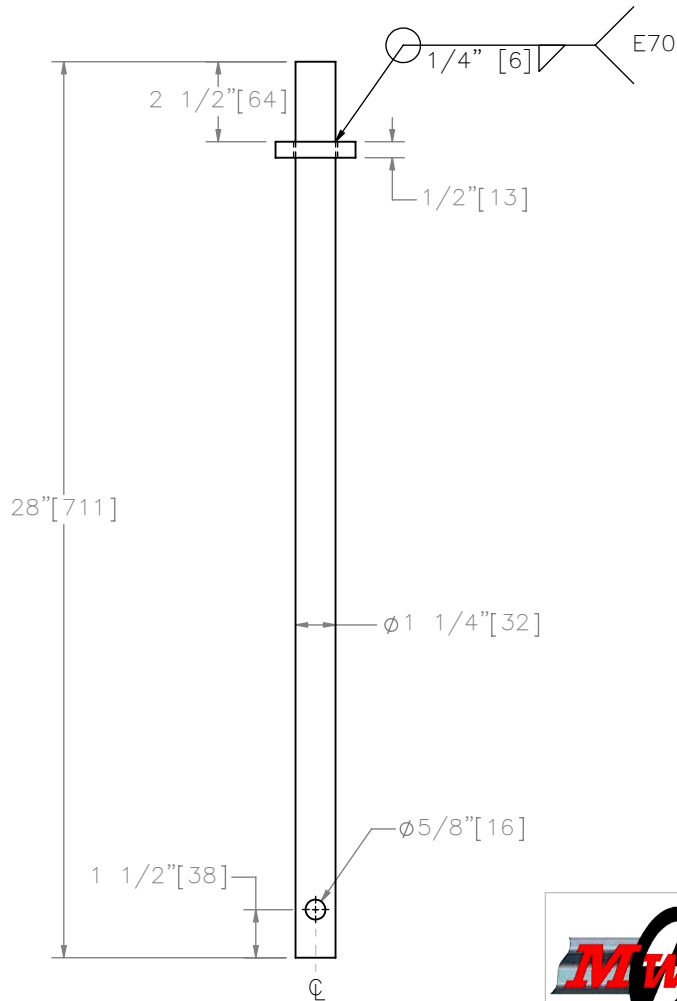
PLAN VIEW



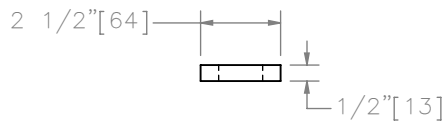
ISOMETRIC VIEW



PLAN VIEW



ELEVATION VIEW  
Part a9



ELEVATION VIEW  
PLATE



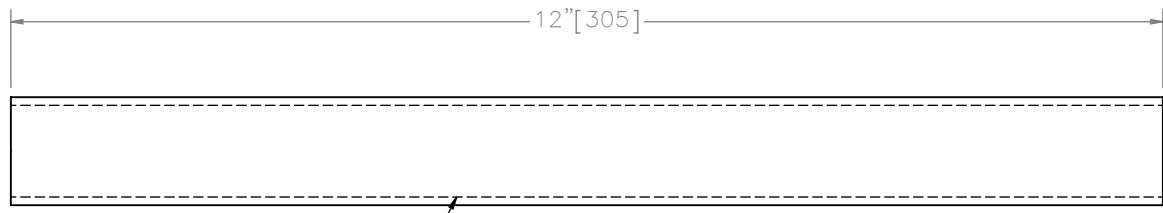
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WI PCB Anchorage Tie-  
Down  
Test No. WITD-1  
Connector Pin Details

DWG. NAME.  
WITD-1\_R11

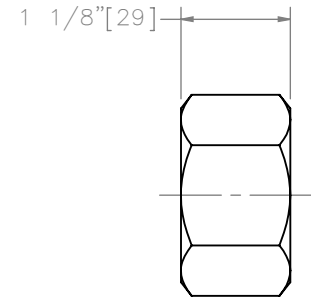
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SHEET:  
7 of 10  
DATE:  
5/25/2017  
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RWB

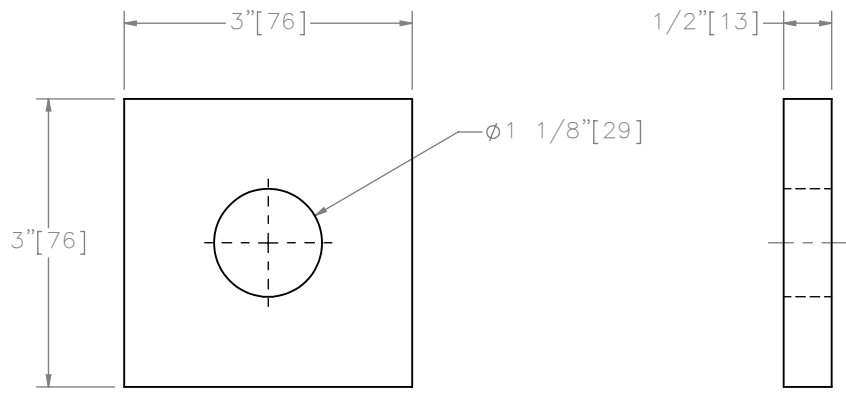


1-1/8"-7 UNC

Part b1



Part b3



Part b2



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WI PCB Anchorage Tie-

Down

Test No. WITD-1

Anchor Components

DWG. NAME.  
WITD-1\_R11

SCALE: 1:2  
UNITS: in.[mm]

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5/25/2017

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RWB



Item No.	QTY.	Description	Material Spec	Galvanization Spec	Hardware Guide
a1	16	Portable Concrete Barrier	Min f'c = 5,000 psi [34.5 MPa]	–	SWC09
a2	192	1/2" [13] Dia., 72" [1,829] Long Form Bar	ASTM A615 Gr. 60	–	SWC09*
a3	32	1/2" [13] Dia., 146" [3,708] Long Longitudinal Bar	ASTM A615 Gr. 60	–	SWC09*
a4	48	5/8" [16] Dia., 146" [3,708] Long Longitudinal Bar	ASTM A615 Gr. 60	–	SWC09*
a5	96	3/4" [19] Dia., 36" [914] Long Anchor Loop Bar	ASTM A615 Gr. 60	–	SWC09*
a6	32	3/4" [19] Dia., 101" [2,565] Long Connection Loop Bar	ASTM A709 Gr. 70 or A706 Gr. 60	–	SWC09*
a7	32	3/4" [19] Dia., 91" [2,311] Long Connection Loop Bar	ASTM A709 Gr. 70 or A706 Gr. 60	–	SWC09*
a8	32	3/4" [19] Dia., 102" [2,591] Long Connection Loop Bar	ASTM A709 Gr. 70 or A706 Gr. 60	–	SWC09*
a9	15	1 1/4" [32] Dia., 28" [711] Long Connector Pin	ASTM A36	–	FMW02
b1	27	1 1/8" [29] Dia. UNC, 12" [305] Long Threaded Rod	ASTM A307 Gr. A	**ASTM A153 or B695 Class 55 or F2329	–
b2	27	3"x3"x1/2" [76x76x13] Washer Plate	ASTM A36	**ASTM A123	–
b3	27	1 1/8" [29] Dia. Heavy Hex Nut	ASTM A563A	**ASTM A153 or B695 Class 55 or F2329	–
c1	–	Hilti HIT-RE 500 V3 Epoxy or equivalent	Minimum bond strength for 1 1/8" [29] anchor > 1,650 psi [11 MPa] in uncracked concrete	–	–

\* Included in SWC09 hardware guide designation.

\*\* Component does not need to be galvanized for testing purposes.



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WI PCB Anchorage Tie-  
Down  
Test No. WITD-1

Bill of Materials

DWG. NAME.  
WITD-1\_R11

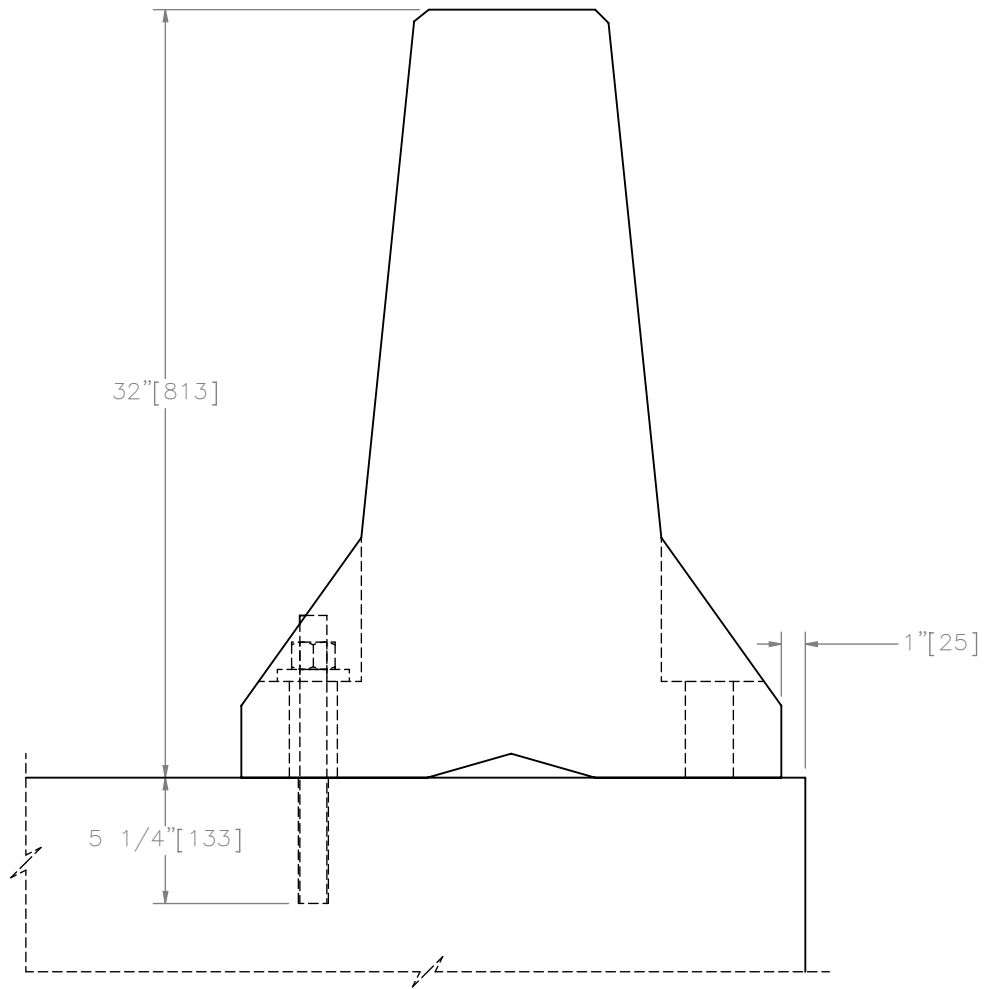
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9 of 10

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RWB



Midwest Roadside  
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WI PCB Anchorage Tie-

Down

Test No. WITD-1

Description of View

DWG. NAME.  
WITD-1\_R11

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

REV. BY:  
JEK/KAL/  
RWB

SHEET:  
10 of 10

DATE:  
5/25/2017

DRAWN BY:  
MES/JEK