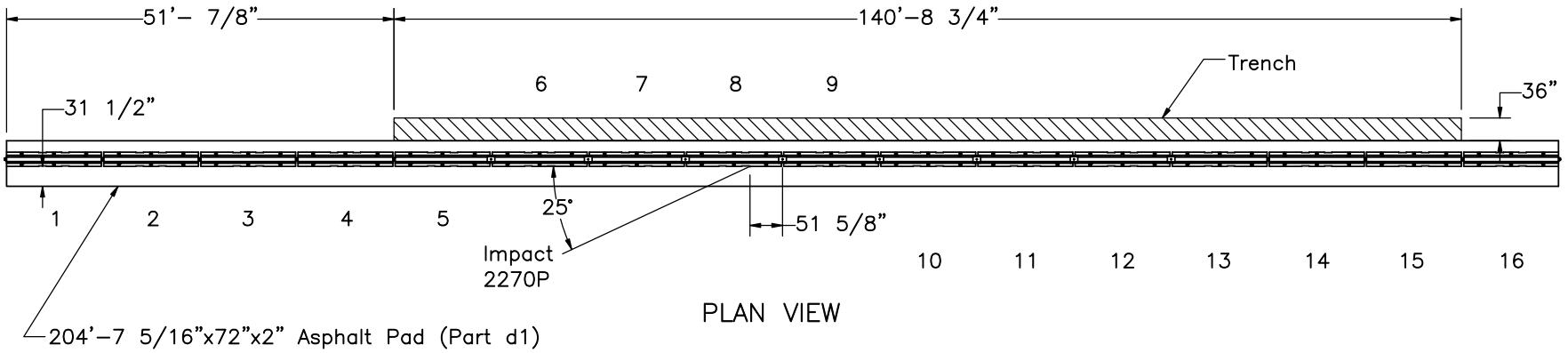
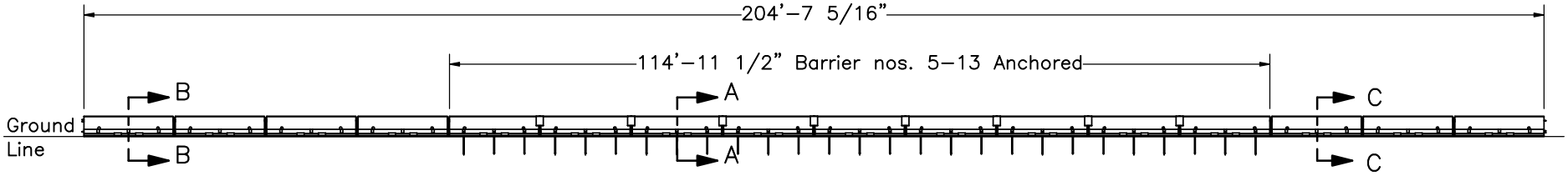


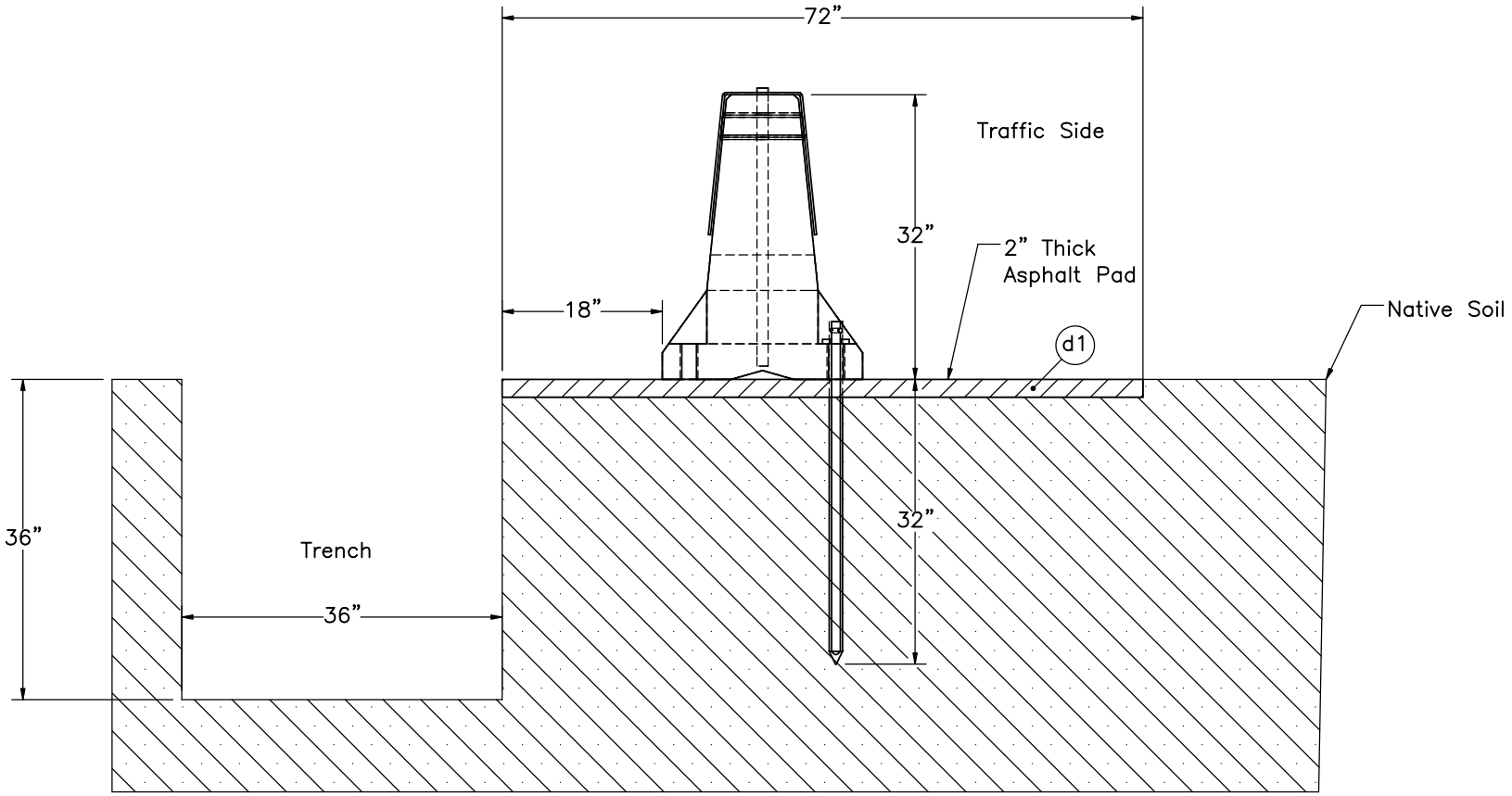
PLAN VIEW



ELEVATION VIEW

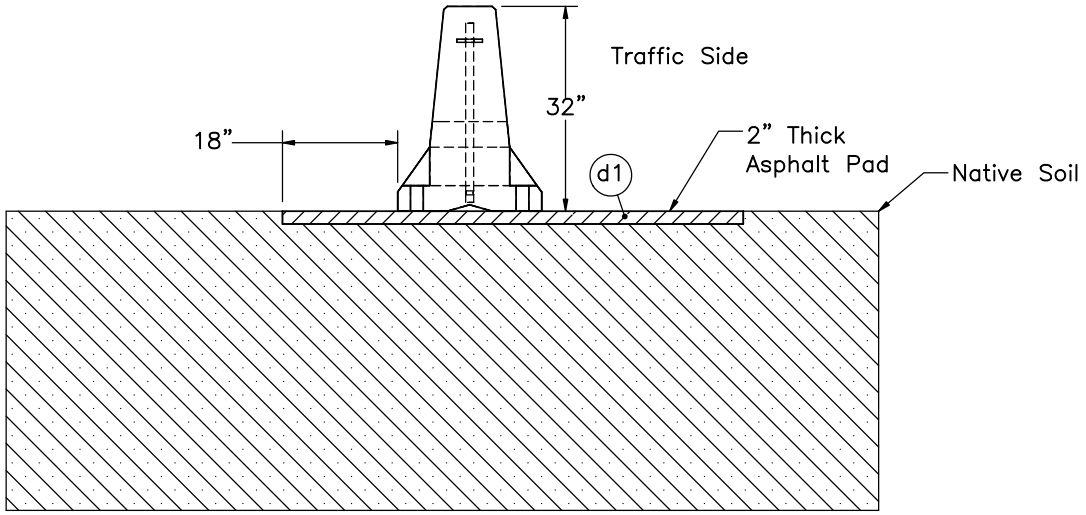
Notes: (1) Test shall be performed according to test designation no. 3–11 of MASH.
(2) The impact location is 51 5/8" upstream of the joint between barrier nos. 8 and 9.
(3) Use native soil fill under asphalt.
(4) The ends of the barrier should be pulled until there is no slack in the joints.
(5) Barrier nos. 5–15 are located in front of trench.
(6) Saddle Cap Assemblies only used between barrier nos. 5–13.

MwRSF	WI PCB Anchorage Tie–Down Test No. WITD–4 System Layout	SHEET: 1 of 14 DATE: 2/6/2023 DRAWN BY: RWB/JPA
Midwest Roadside Safety Facility	DWG. NAME. WITD–4_R4 SCALE: 1:270 UNITS: in.	REV. BY: BJP/KAL/RWB/JCH

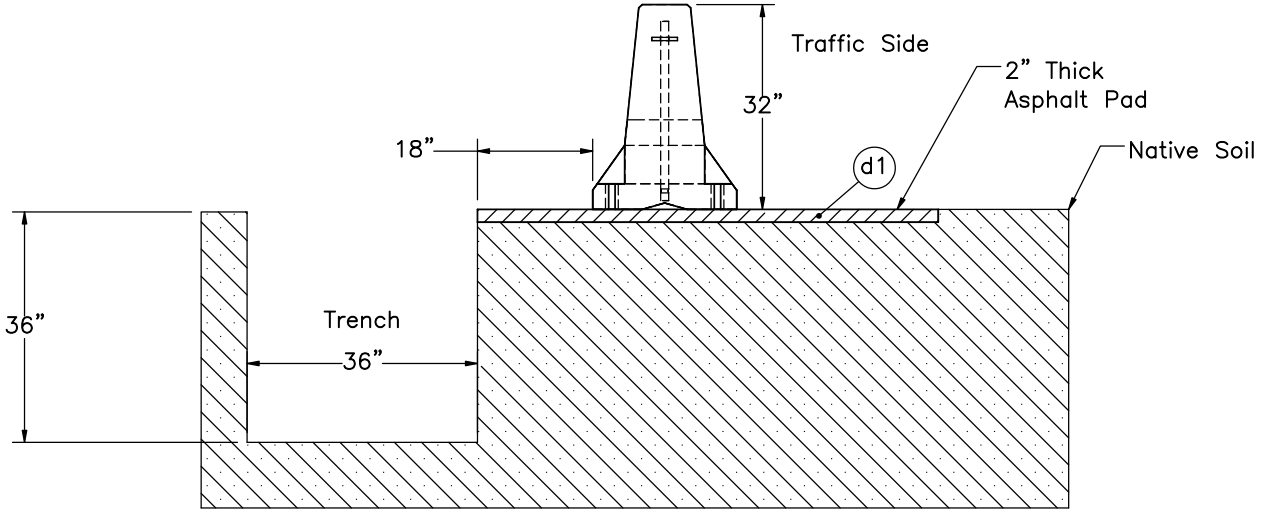


SECTION A–A
Barrier Nos. 5 through 13

Midwest Roadside Safety Facility	WI PCB Anchorage Tie–Down Test No. WITD–4 System Profile	SHEET: 2 of 14 DATE: 2/6/2023 DRAWN BY: RWB/JPA
	DWG. NAME. WITD–4_R4 SCALE: 1:20 UNITS: in.	REV. BY: BJP/KAL/RWB/JCH

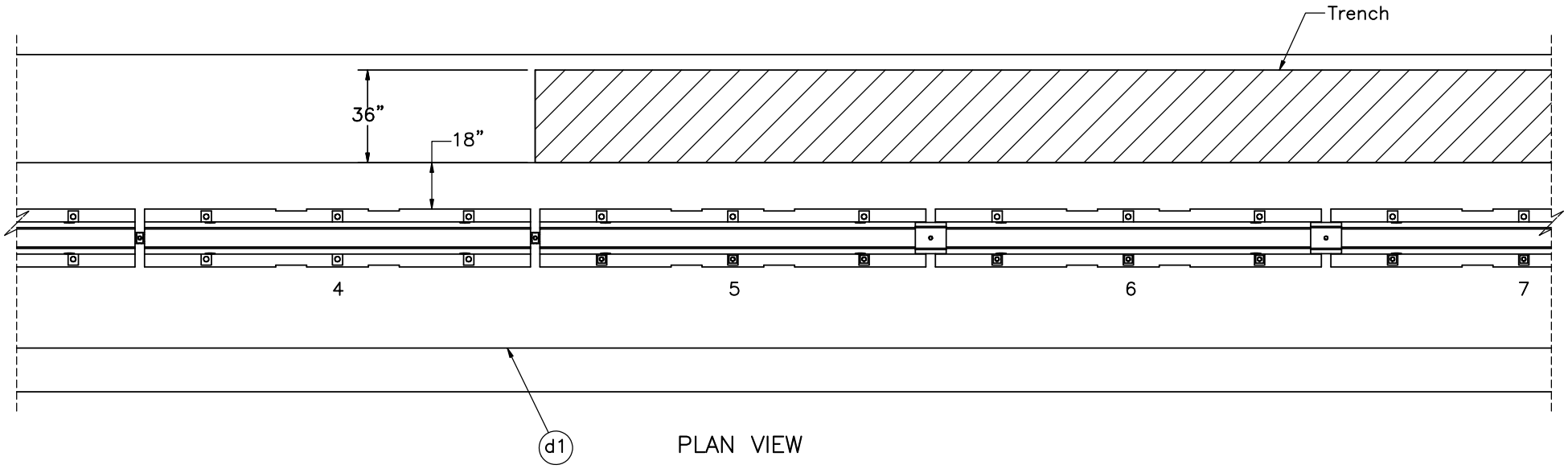


SECTION B–B
Barrier Nos. 1 through 4 and 16

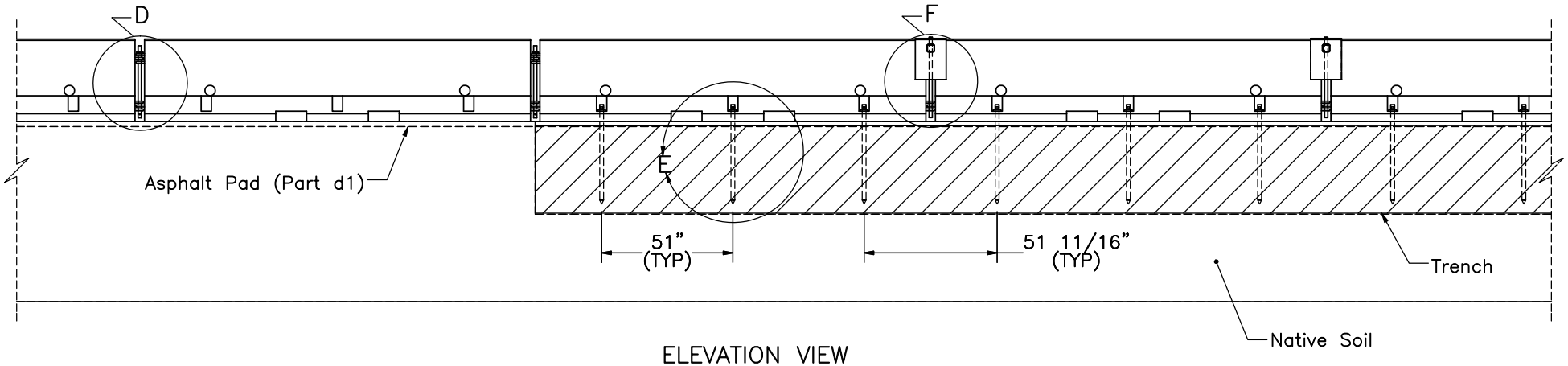


SECTION C–C
Barrier Nos. 14 and 15

MwRSF	WI PCB Anchorage Tie–Down Test No. WITD–4 System Profile	SHEET: 3 of 14 DATE: 2/6/2023 DRAWN BY: RWB/JPA
Midwest Roadside Safety Facility	DWG. NAME. WITD–4_R4 SCALE: 1:30 UNITS: in.	REV. BY: BJP/KAL/RWB/JCH



PLAN VIEW



ELEVATION VIEW

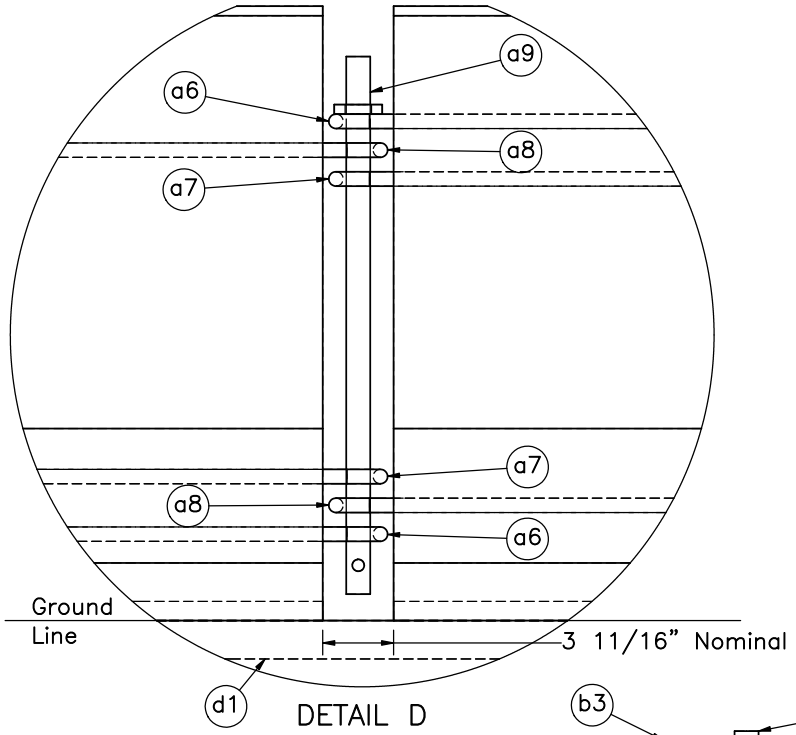
Note: (1) Barrier nos. 5 through 13 are anchored in all traffic-side bolt pockets.

Midwest Roadside Safety Facility

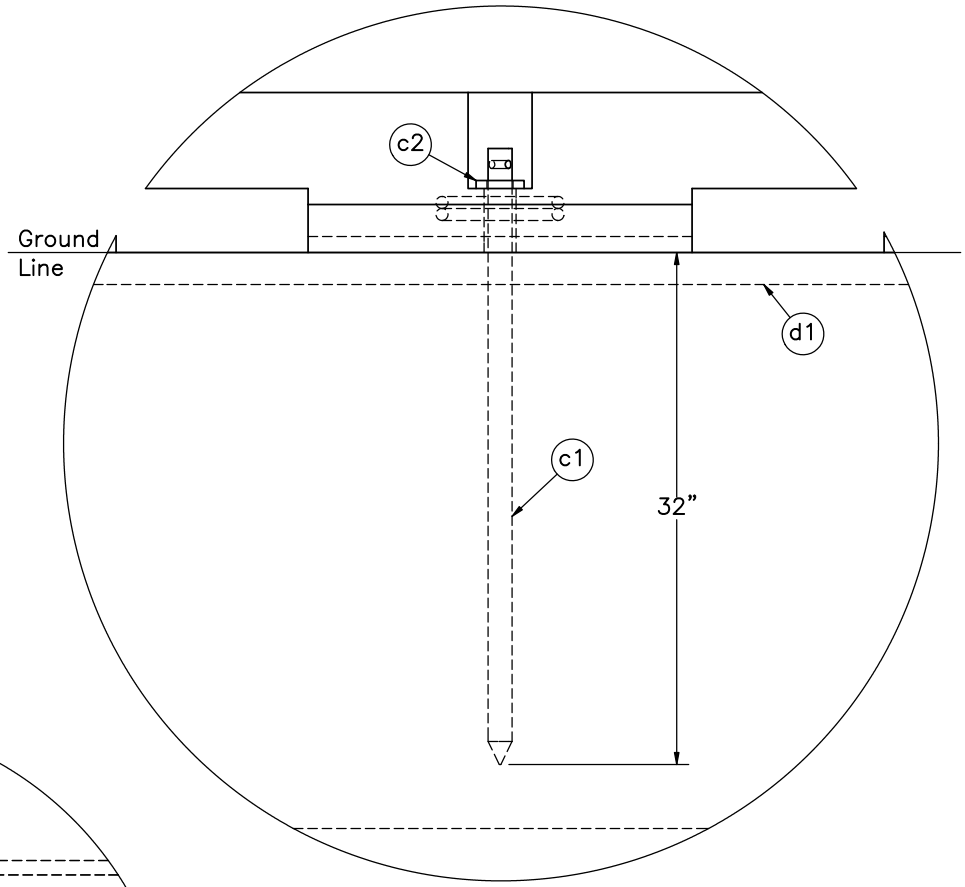
WI PCB Anchorage Tie-Down
Test No. WITD-4
Concrete Barrier Assembly

DWG. NAME. WITD-4_R4	SCALE: 1:60 UNITS: in.	REV. BY: BJP/KAL/RWB/JCH

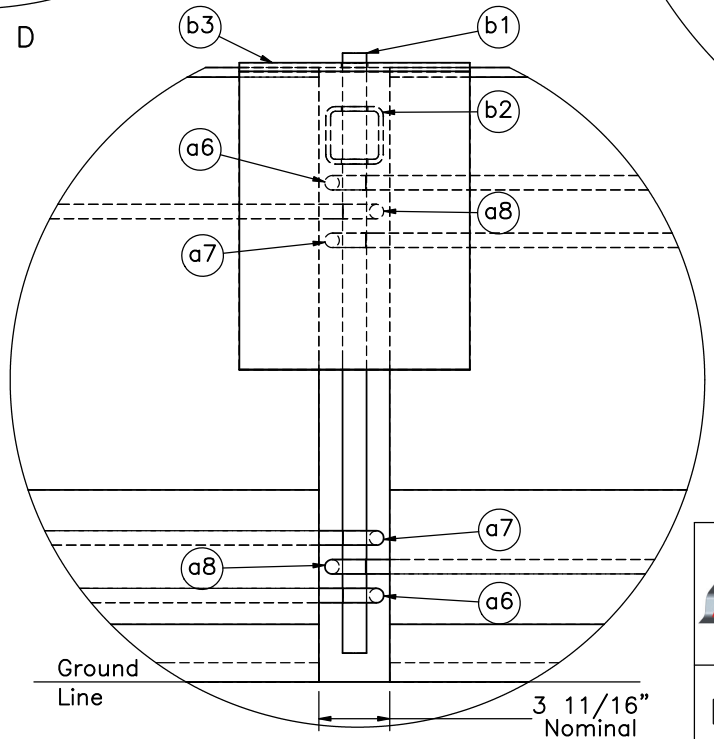
SHEET: 4 of 14
DATE: 2/6/2023
DRAWN BY: RWB/JPA



DETAIL D



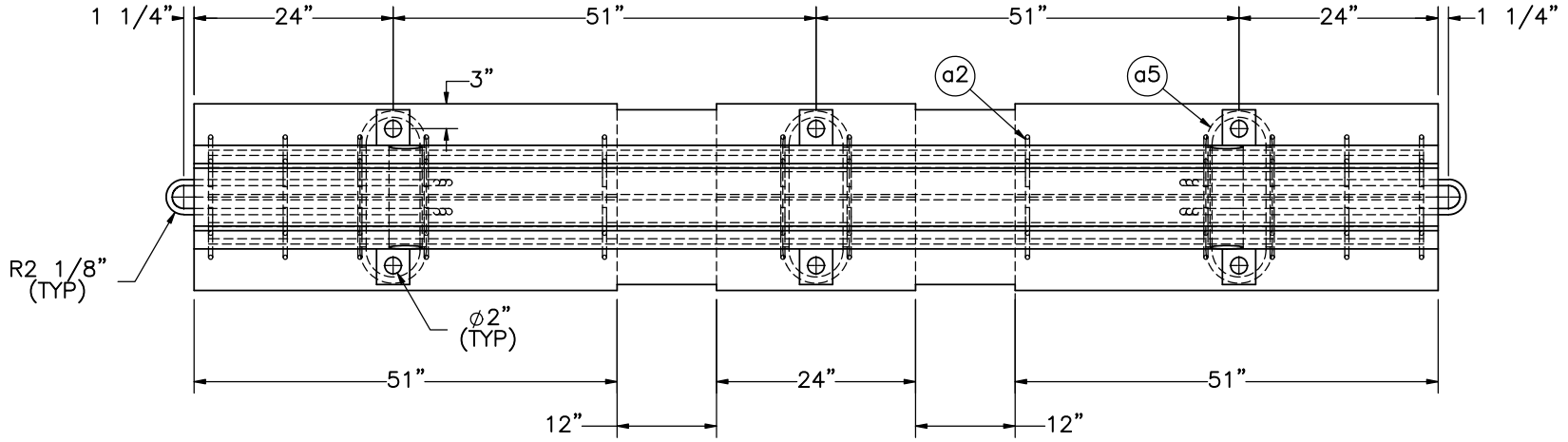
DETAIL E
SCALE 1:12



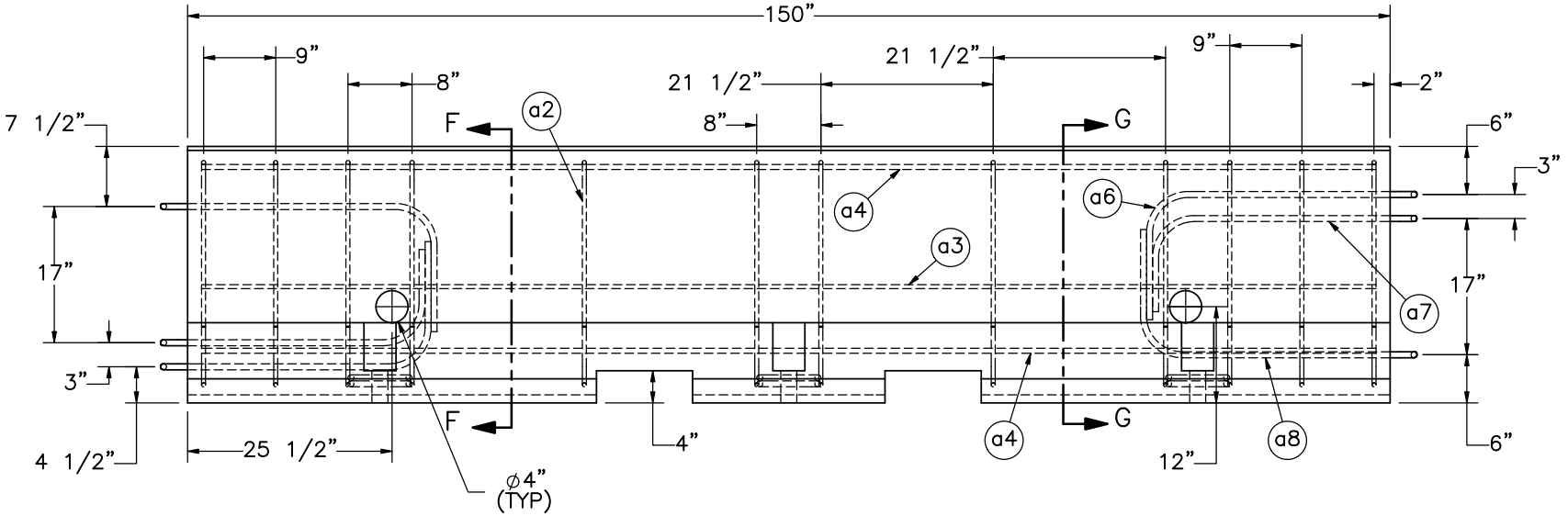
DETAIL F

Note: (1) Barrier nos. 5 through 13 are anchored in all traffic-side bolt pockets.

Midwest Roadside Safety Facility	WI PCB Anchorage Tie-Down Test No. WITD-4 Connection and Anchorage Details	SHEET: 5 of 14 DATE: 2/6/2023 DRAWN BY: RWB/JPA
DWG. NAME. WITD-4_R4	SCALE: 1:10 UNITS: in.	REV. BY: BJP/KAL/RWB/JCH

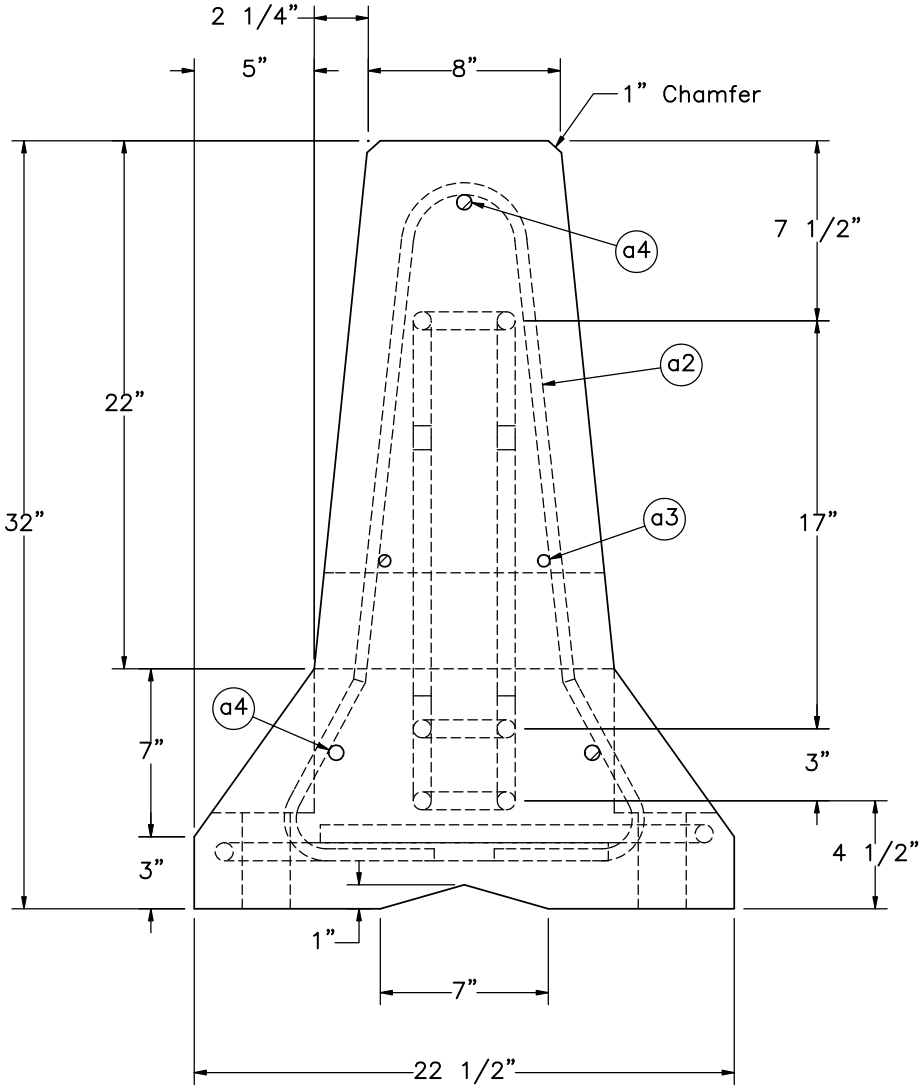


PLAN VIEW

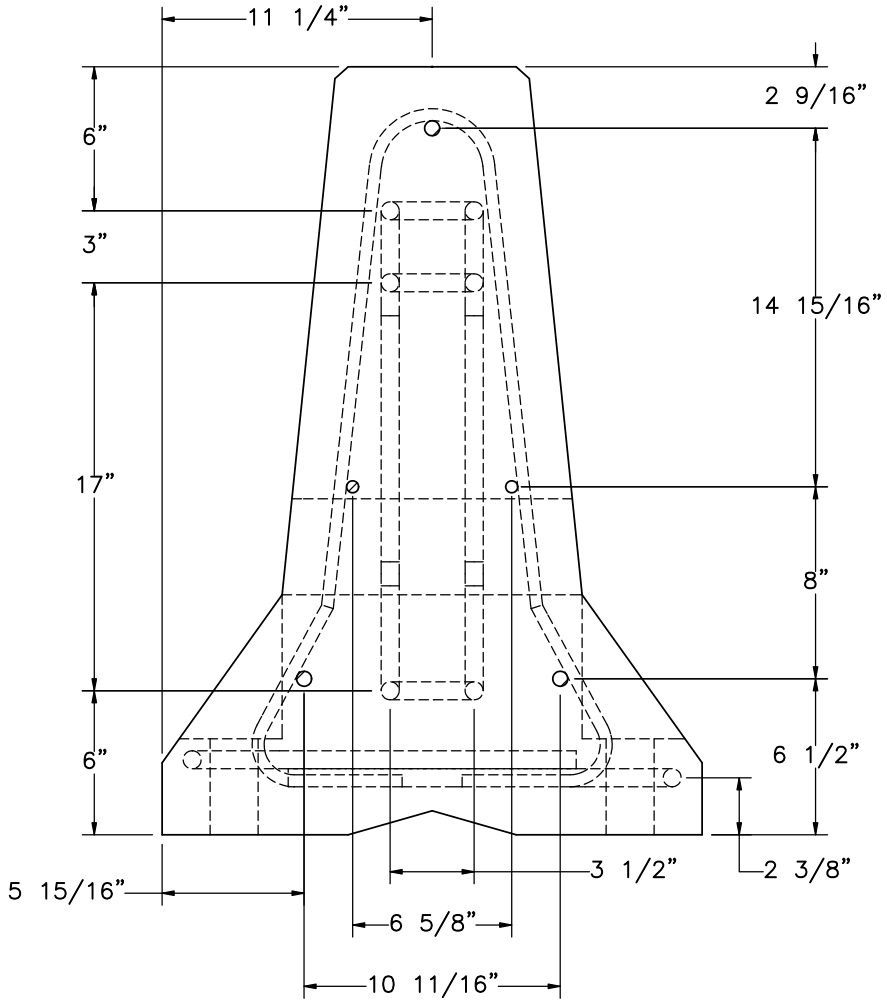


ELEVATION VIEW
Part a1

Midwest Roadside Safety Facility	WI PCB Anchorage Tie-Down Test No. WITD-4 Portable Concrete Barrier Details	SHEET: 6 of 14 DATE: 2/6/2023 DRAWN BY: RWB/JPA
	DWG. NAME. WITD-4_R4 SCALE: 1:22 UNITS: in.	REV. BY: BJP/KAL/RWB/JCH



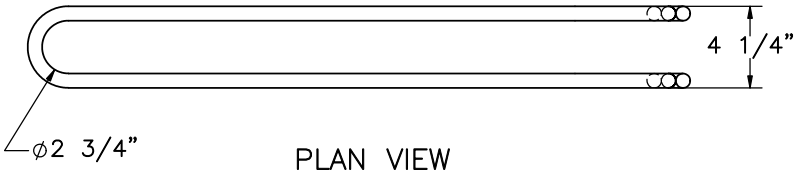
SECTION F–F



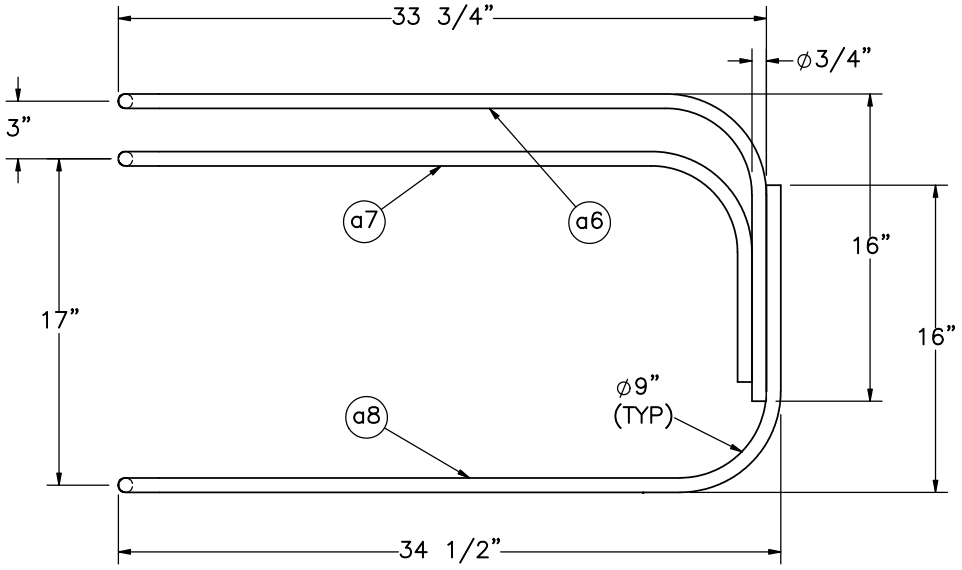
SECTION G–G

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

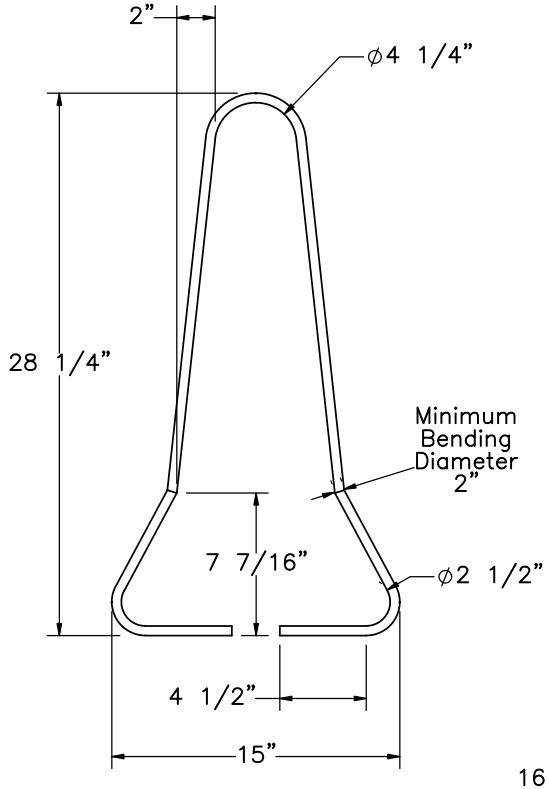
Midwest Roadside Safety Facility	WI PCB Anchorage Tie–Down Test No. WITD–4 Portable Concrete Barrier Details	SHEET: 7 of 14 DATE: 2/6/2023 DRAWN BY: RWB/JPA
	DWG. NAME. WITD–4_R4 SCALE: 1:8 UNITS: in.	REV. BY: BJP/KAL/RWB/JCH



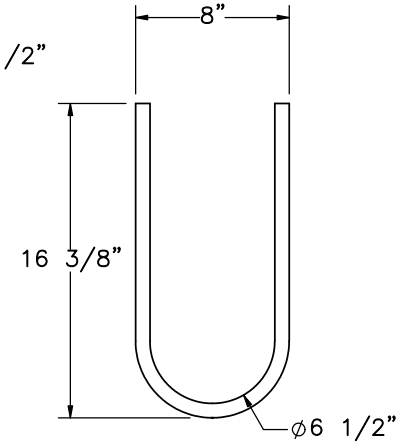
PLAN VIEW



ELEVATION VIEW



PROFILE VIEW
Part a2



PLAN VIEW
Part a5

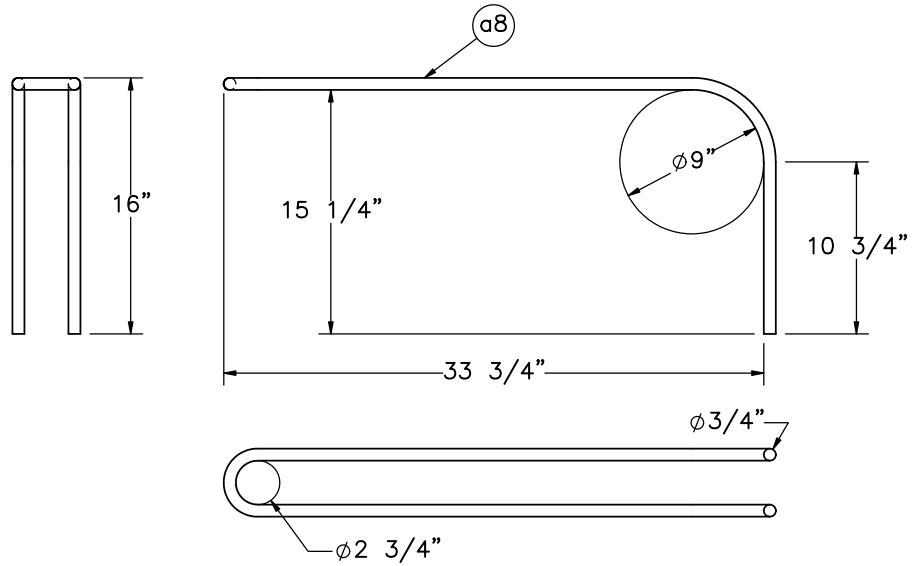
Note: (1) Bar quantities are per barrier (Part a1).

Bill of Bars				
Item No.	QTY	Size	Unbent Length	Material
a2	12	#4	70 9/16"	A615 Gr.60
a3	2	#4	146 1/2"	A615 Gr.60
a4	3	#5	146 1/2"	A615 Gr.60
a5	6	#6	36 1/8"	A615 Gr.60
a6	2	#6	95 1/16"	A709 Gr.70 or A706 Gr.60
a7	2	#6	85 9/16"	A709 Gr.70 or A706 Gr.60
a8	2	#6	96 9/16"	A709 Gr.70 or A706 Gr.60

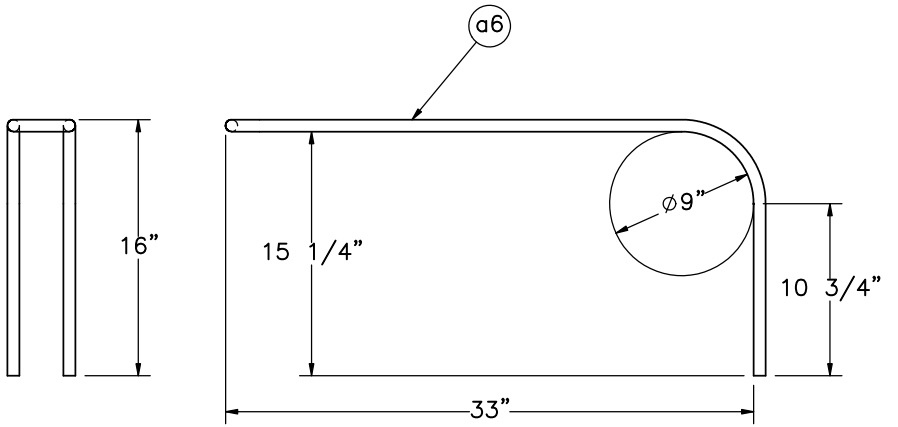
Midwest Roadside Safety Facility

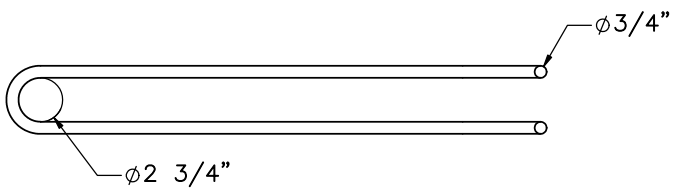
WI PCB Anchorage Tie-Down
Test No. WITD-4
Portable Concrete Barrier Rebar Details

SHEET: 8 of 14
DATE: 2/6/2023
DRAWN BY: RWB/JPA
DWG. NAME. WITD-4_R4
SCALE: 1:10
UNITS: in.
REV. BY: BJP/KAL/RWB/JCH

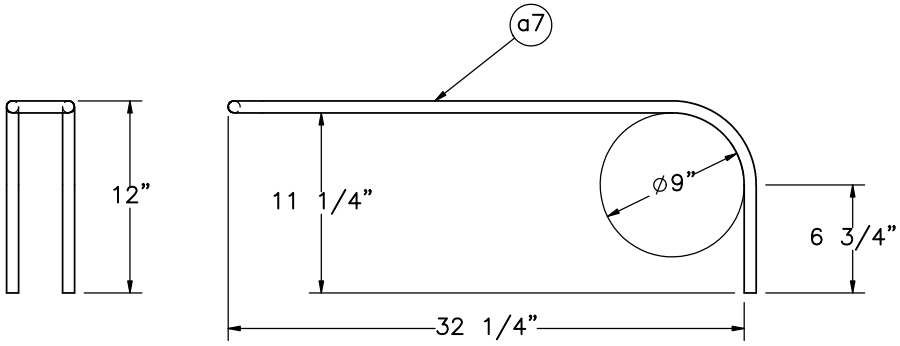


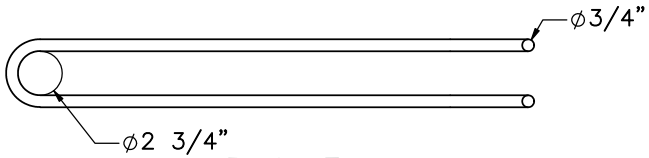
Part a8





Part a6





Part a7

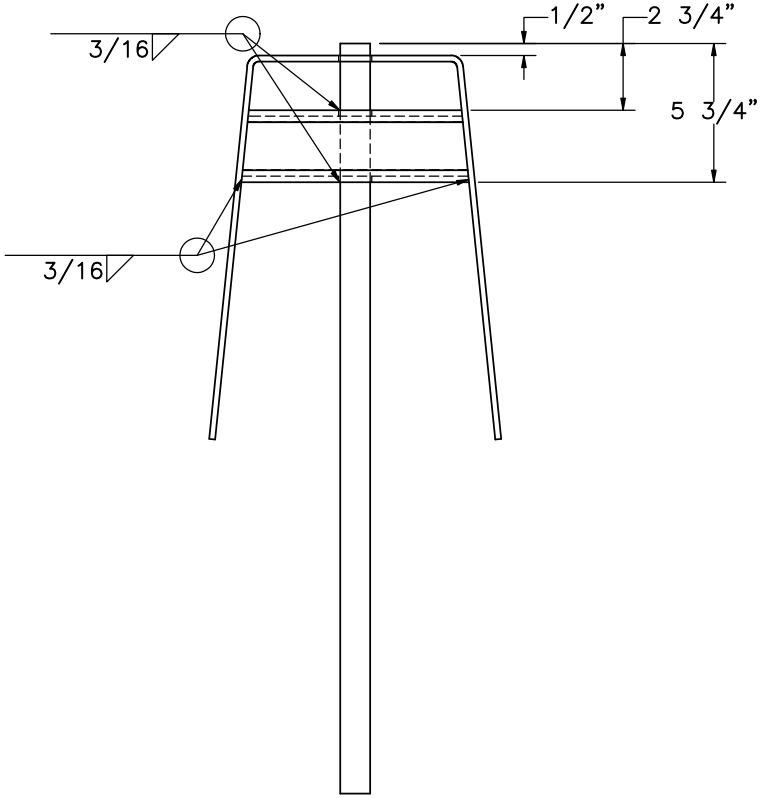
Midwest Roadside Safety Facility

WI PCB Anchorage Tie-Down
Test No. WITD-4

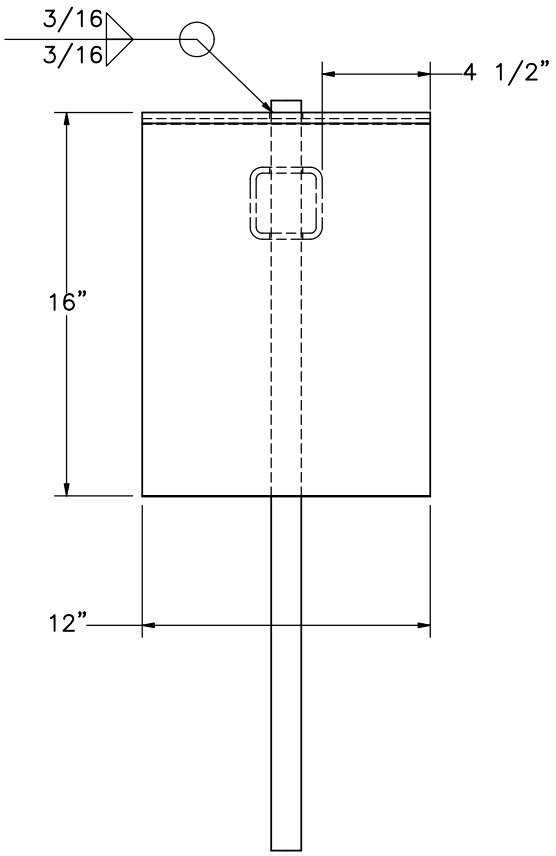
Portable Concrete Barrier Loop Bar Details

DWG. NAME. WITD-4_R4	SCALE: 1:12 UNITS: in.	REV. BY: BJP/KAL/RWB/JCH

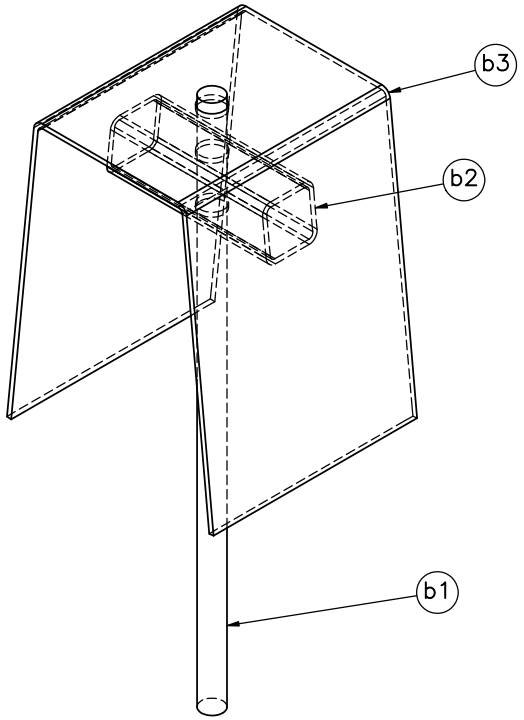
SHEET: 9 of 14
DATE: 2/6/2023
DRAWN BY: RWB/JPA



ELEVATION VIEW



PROFILE VIEW



ISOMETRIC VIEW

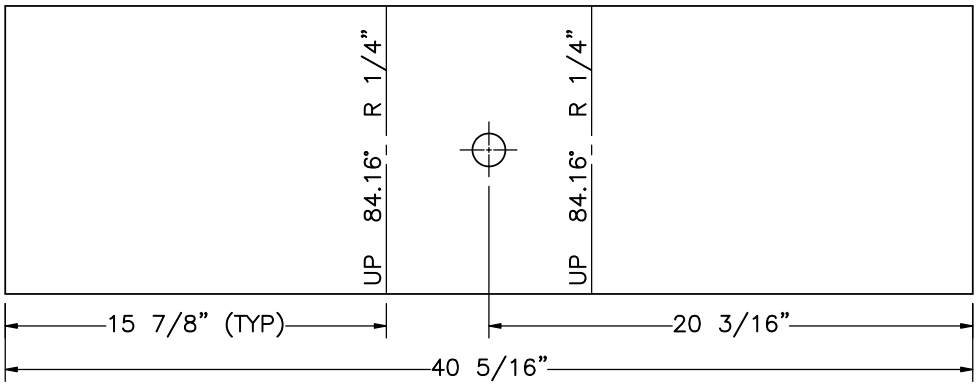
Notes: (1) Complete as many of the welds shown as possible.
(2) Saddle Cap Assemblies only used between barrier nos. 5–13.
(3) Saddle Cap Assembly does not need to be galvanized for testing purposes.

Item No.	QTY.	Description	Material Specification	Treatment Specification
–	8	Saddle Cap Assembly	–	ASTM A123
b1	1	1 1/4" Dia., 31 1/4" Long Connector Pin	ASTM A36	–
b2	1	HSS 3"x3"x1/4", 9 1/2" Long Stiffening Tube	ASTM A1085	–
b3	1	40 5/16"x12"x1/4" Saddle Cap	A572 Gr. 50	–

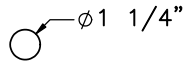
Midwest Roadside Safety Facility

WI PCB Anchorage Tie–Down
Test No. WITD–4
Saddle Cap Assembly Details

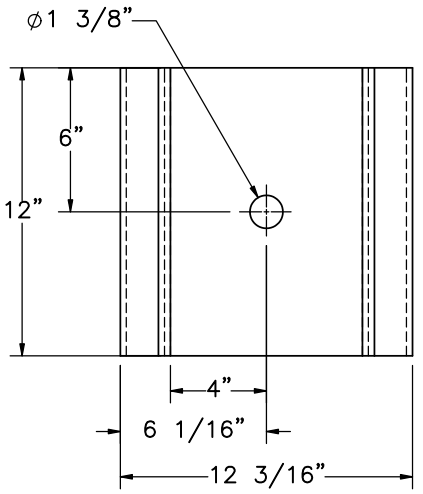
SHEET: 10 of 14
DATE: 2/6/2023
DRAWN BY: RWB/JPA
DWG. NAME. WITD–4_R4
SCALE: 1:8
UNITS: in.
REV. BY: BJP/KAL/RWB/JCH



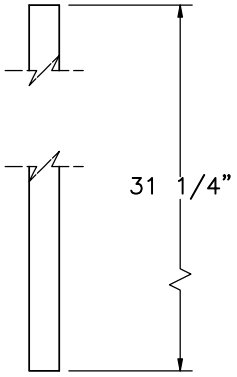
FLAT PATTERN



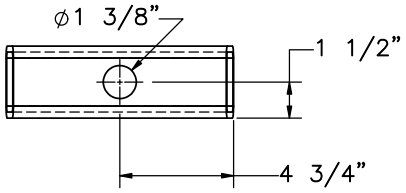
PLAN VIEW



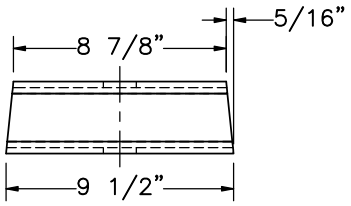
PLAN VIEW



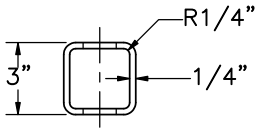
ELEVATION VIEW
Part b1



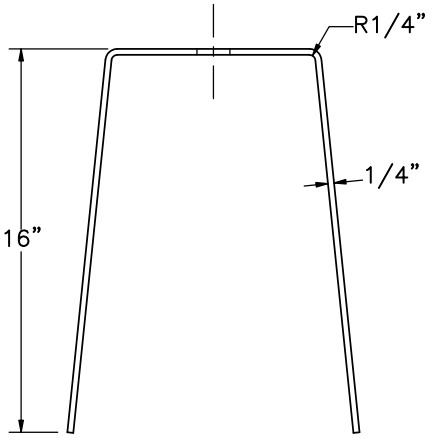
PLAN VIEW



ELEVATION VIEW
Part b2



PROFILE VIEW

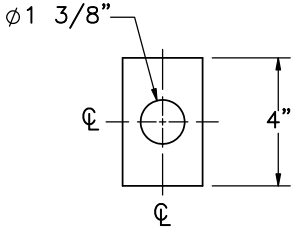


ELEVATION VIEW
Part b3

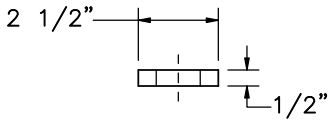
Midwest Roadside Safety Facility

WI PCB Anchorage Tie-Down
Test No. WITD-4
Saddle Cap Assembly Details

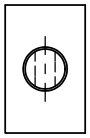
SHEET: 11 of 14
DATE: 2/6/2023
DRAWN BY: RWB/JPA
DWG. NAME. WITD-4_R4
SCALE: 1:8
UNITS: in.
REV. BY: BJP/KAL/RWB/JCH



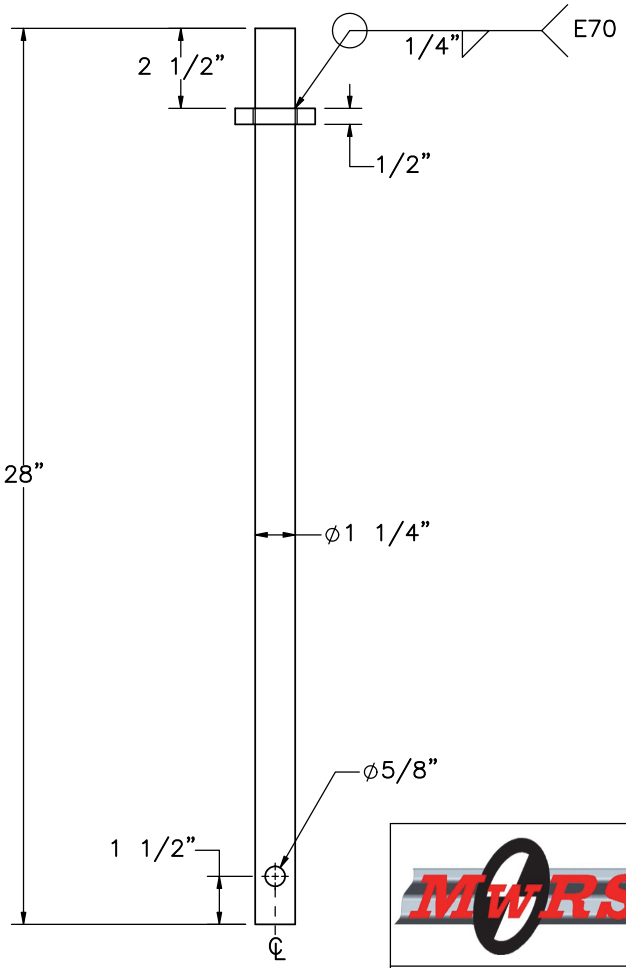
PLAN VIEW



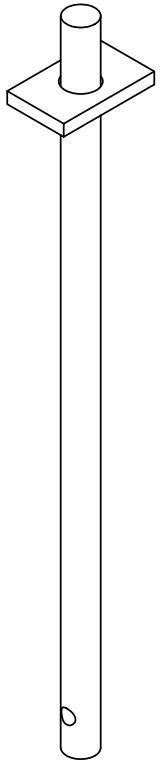
ELEVATION VIEW
PLATE



PLAN VIEW



ELEVATION VIEW
Part a9

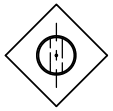


ISOMETRIC VIEW

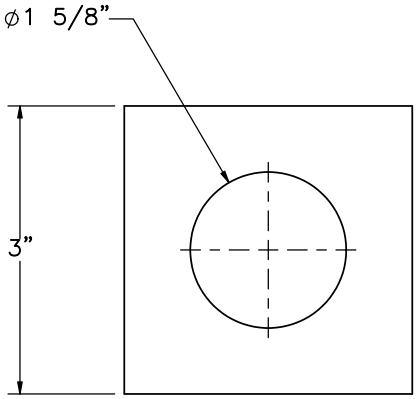
Midwest Roadside Safety Facility

WI PCB Anchorage Tie-Down
Test No. WITD-4
Connector Pin Details

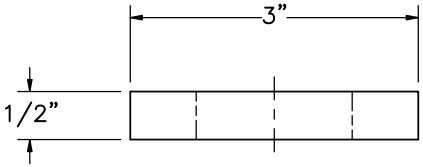
DWG. NAME. WITD-4_R4	SCALE: 1:6 UNITS: in.	REV. BY: BJP/KAL/RWB/JCH	SHEET: 12 of 14
			DATE: 2/6/2023
			DRAWN BY: RWB/JPA



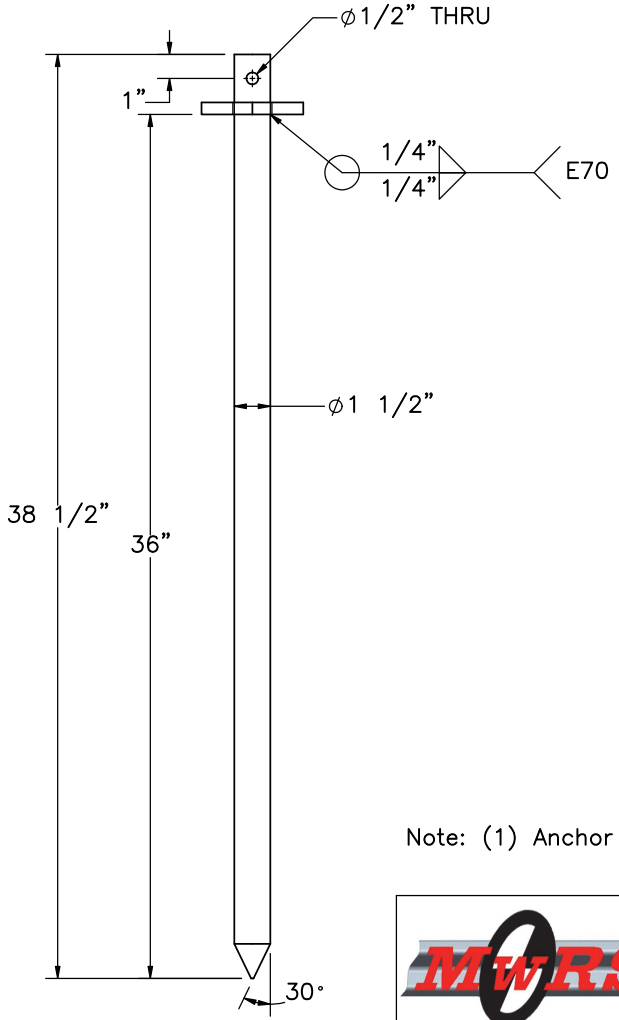
PLAN VIEW



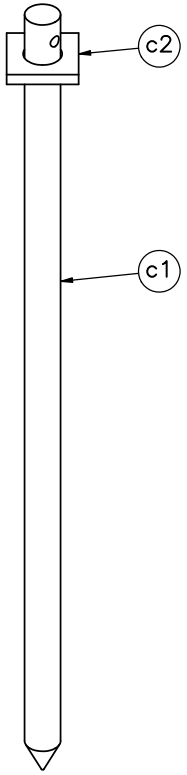
PLAN VIEW



ELEVATION VIEW
SCALE 1:2
Part c2



ELEVATION VIEW



ISOMETRIC VIEW

Note: (1) Anchor pins will be used to anchor barrier nos. 5–13.

MwRSF	WI PCB Anchorage Tie–Down Test No. WITD–4 Anchor Pin Details	SHEET: 13 of 14 DATE: 2/6/2023 DRAWN BY: RWB/JPA
Midwest Roadside Safety Facility	DWG. NAME. WITD–4_R4 SCALE: 1:8 UNITS: in.	REV. BY: BJP/KAL/RWB/JCH

Item No.	QTY.	Description	Material Specification	Treatment Specification	Hardware Guide
a1	16	Portable Concrete Barrier	Min f'c = 5,000 psi	–	SWC09
a2	192	1/2" Dia., 70 9/16" Long Form Bar	ASTM A615 Gr. 60	–	SWC09*
a3	32	1/2" Dia., 146 1/2" Long Longitudinal Bar	ASTM A615 Gr. 60	–	SWC09*
a4	48	5/8" Dia., 146 1/2" Long Longitudinal Bar	ASTM A615 Gr. 60	–	SWC09*
a5	96	3/4" Dia., 36 1/8" Long Anchor Loop Bar	ASTM A615 Gr. 60	–	SWC09*
a6	32	3/4" Dia., 95 1/16" Long Connection Loop Bar	ASTM A709 Gr. 70 or A706 Gr. 60	–	SWC09*
a7	32	3/4" Dia., 85 9/16" Long Connection Loop Bar	ASTM A709 Gr. 70 or A706 Gr. 60	–	SWC09*
a8	32	3/4" Dia., 96 9/16" Long Connection Loop Bar	ASTM A709 Gr. 70 or A706 Gr. 60	–	SWC09*
a9	7	1 1/4" Dia., 28" Long Connector Pin	ASTM A36	–	FMW02
b1	8	1 1/4" Dia., 31 1/4" Long Connector Pin	ASTM A36	See Assembly ***	–
b2	8	HSS 3"x3"x1/4", 9 1/2" Long Stiffening Tube	ASTM A1085	See Assembly ***	–
b3	8	40 5/16"x12"x1/4" Saddle Cap	A572 Gr. 50	See Assembly ***	–
c1	27	1 1/2" Dia., 38 1/2" Long Anchor Pin	ASTM A36	ASTM A123 ***	FRS01
c2	27	3"x3"x1/2" Washer Plate	ASTM A36	ASTM A123 ***	FRS01**
d1	1	204'–7 5/16"x72"x2" Asphalt Pad	NE SPR Mix with 64–34 Grade Binder	–	–

* Included in SWC09 hardware guide designation.
** Included in FRS01 hardware guide designation.
*** Component does not need to be galvanized for testing purposes.

Midwest Roadside Safety Facility

WI PCB Anchorage Tie–Down
Test No. WITD–4
Bill of Materials

SHEET: 14 of 14
DATE: 2/6/2023
DRAWN BY: RWB/JPA
DWG. NAME. WITD–4_R4
SCALE: None
UNITS: in.
REV. BY: BJP/KAL/RWB/JCH

System: WI PCB Anchorage Tie–Down

Drawing: WITD–4

Revision History

REV.	DATE OF ISSUE	Page	NATURE OF CHANGES	REVIEWER	REVISED BY
0	1/6/2023	–	Made from WITD–3. Connector Pin (a9) from WITD–3 replaced with saddle cap assembly consisting of part nos. b1, b2, and b3. Part nos. b1, b2, and c1 from WITD–3 were renamed c1, c2, and d1, respectively.	–	JPA
1	1/10/2023	–	Metric dimensions removed in various locations.	BJP/KAL	JPA
		1	Updated dimension text.		
		2	Notes added under view labels.		
		3	Notes added under view labels.		
		4	Updated dimension text. Shifted barrier nos. up. Edited note 1.		
		5	Edited note 1.		
		6	Removed note.		
		8	Edited bill of bars. Edited rebar labels.		
		9	Edited rebar labels.		
		10	Part labels shifted. Views shifted. Dimension fixed.		
		11	Removed plan view. Edited note 1. Treatment specs updated. Part b2 description updated. QTY column updated. Sheet scale increased.		
		12	Removed part label. Added item no. balloons.		
		BOM	Part b2 description updated. Treatment specs updated for part nos. b1 through b3. Part b1 hardware guide reference removed.		
		–	Connector Pin (a9) to Replace Saddle Cap Assembly (b1, b2, b3) except between barrier nos. 5–13.		
		–	Add sheet 12: Connector Pin Details.		
		1	Impact location dimension change. Added notes 5 and 6. Note 2 edit.		
		2	Added dimension.		
		3	Updated Section B–B and C–C to match new pin selection.		

System: WI PCB Anchorage Tie–Down

Drawing: WITD–4

Revision History

2	1/20/2023	4	Added Detail F.	RWB	JPA
		5	Added Detail F. Updated Detail D.		
		7	Extended dimension leader.		
		10	Becomes sheet 11.		
		11	Becomes sheet 10. Assembly QTY updated.		
		12	Becomes Sheet 13. Move dimension. Add note 1. Add centerline.		
		BOM	Update QTY column. Add part no. a9. Update material spec for b2.		
3	1/24/2023	–	Saddle cap updated throughout (part no. b3). Part renamed accordingly.	RWB/BJP	JPA
		–	Shift part d1 downstream to be beneath barrier no. 16.		
		–	Unbent lengths of rebar corrected throughout (part nos. a2 through a8). Bars renamed accordingly. Likely caused by using inner/outer radii instead of radii at the midpoints in length calculations.		
		1	Dimensions updated and shifted.		
		3	View labels updated.		
		5	Added part balloon.		
		6	Fixed part balloon. Extended dimension leader.		
		7	Combined dimensions.		
		8	Update column label in Bill of Bars. Update rebar lengths.		
		9	Remove treatment specification. Add dimensions.		
		11	Update dimensions.		
		13	Part no. c2 dimension correction.		
		BOM	Add treatment specifications asterisks. Update part descriptions.		
4	2/6/2023	10	Add note 3. Add treatment specification.	JCH	JPA