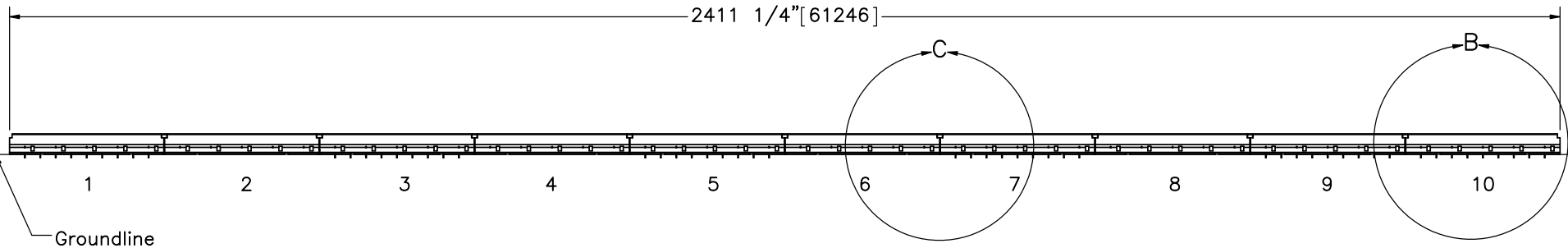
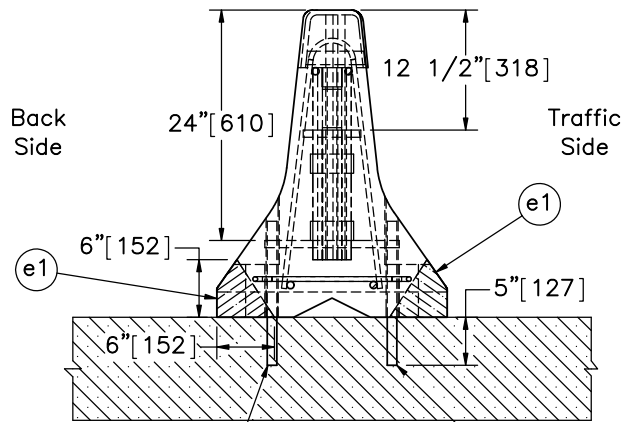


PLAN VIEW



ELEVATION VIEW



SECTION A-A  
SCALE 1 : 20

Barrier segments 1, 3, 5, 7, 9, and 10 are anchored to concrete tarmac through the pin anchor recesses with 1" [25] diameter ASTM A36 steel pins (Part a2) inserted into 1 1/4" [32] diameter pre-drilled holes in the concrete tarmac.

- Notes: (1) Place 1" [25] diameter steel pins (Part a2) into every pin anchor recess (9 each) of barrier segments 1, 3, 5, 7, 9, and 10.  
 (2) Place grout wedges (Part e1) at the toe of each barrier segment between adjacent barrier segments in every joint.  
 (3) Test shall be performed according to test designation no. 3-11 of MASH.  
 (4) The critical impact location is 51 3/16" [1300] upstream from the centerline of the joint between barrier nos. 4 and 5.  
 (5) NJDOT Precast Concrete Curb and Construction Barrier curb will be referred to as Portable Concrete Barrier (PCB).  
 (6) The system is NJDOT Type 4 (Alternate B) barrier with joint class C as specified in the 2013 NJDOT Roadway Design Manual.



Midwest Roadside  
Safety Facility

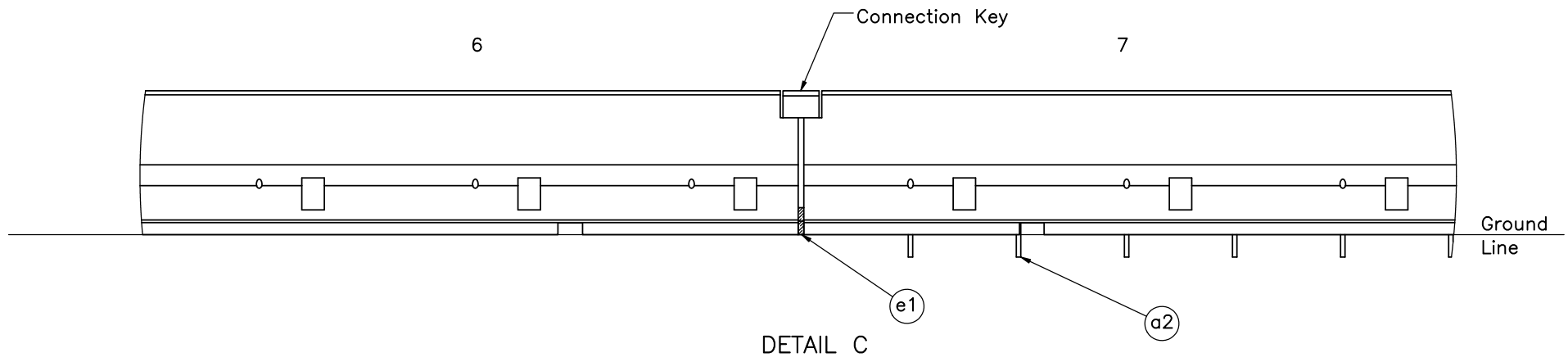
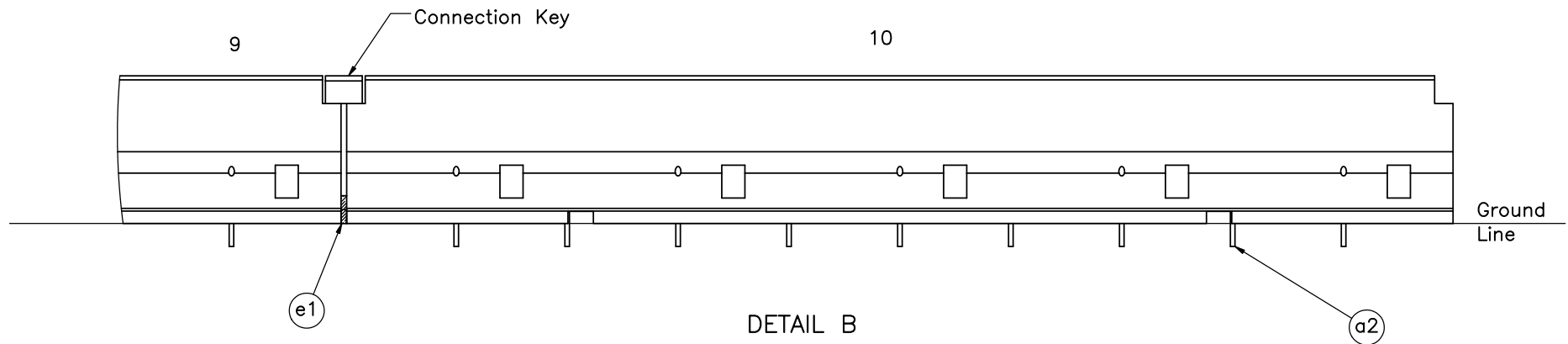
NJ Pinned Portable  
Concrete Barrier  
Test NJPCB-1

System Layout

DWG. NAME:  
NJPCB-1\_R18

SCALE: 1:245  
UNITS: In./mm

SHEET:  
1 of 14  
DATE:  
10/30/2018  
DRAWN BY:  
EMR/TJD/M  
ES/MBD  
REV. BY:  
GA/KAL/RK  
F/JCH/SB



Midwest Roadside  
Safety Facility

NJ Pinned Portable  
Concrete Barrier  
Test NJPCB-1

Barrier Pin Details

DWG. NAME.  
NJPCB-1\_R18

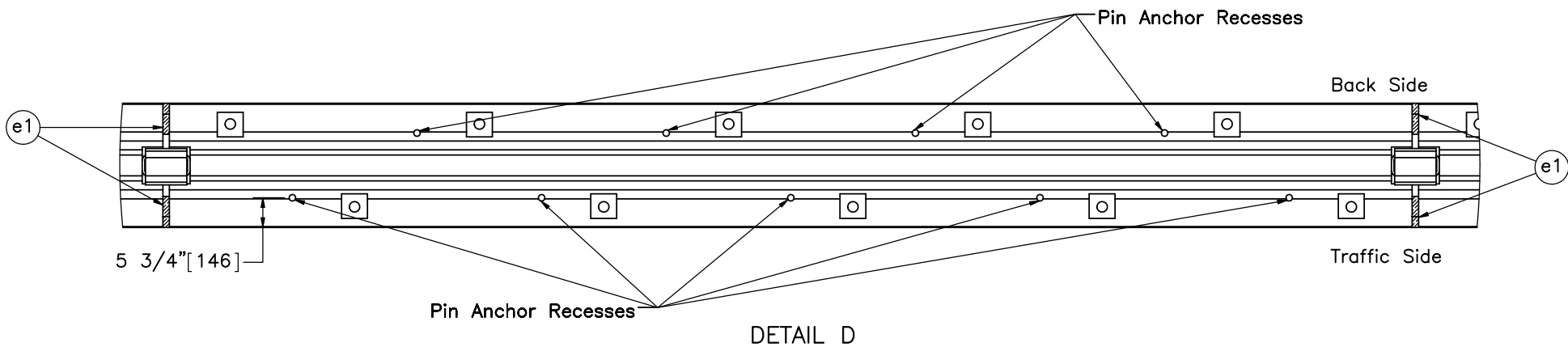
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SHEET:  
2 of 14


DATE:  
10/30/2018

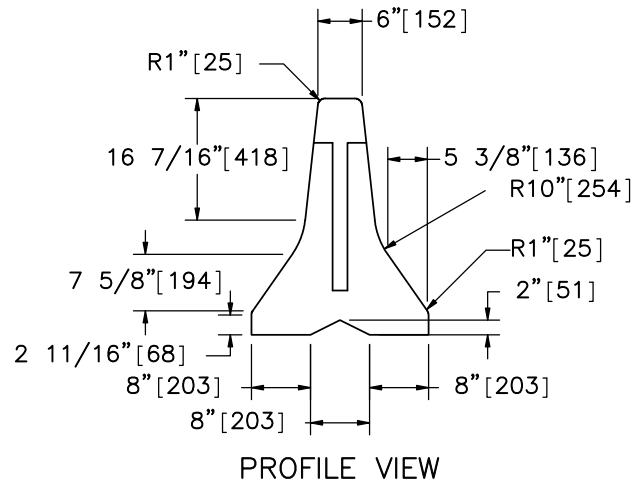
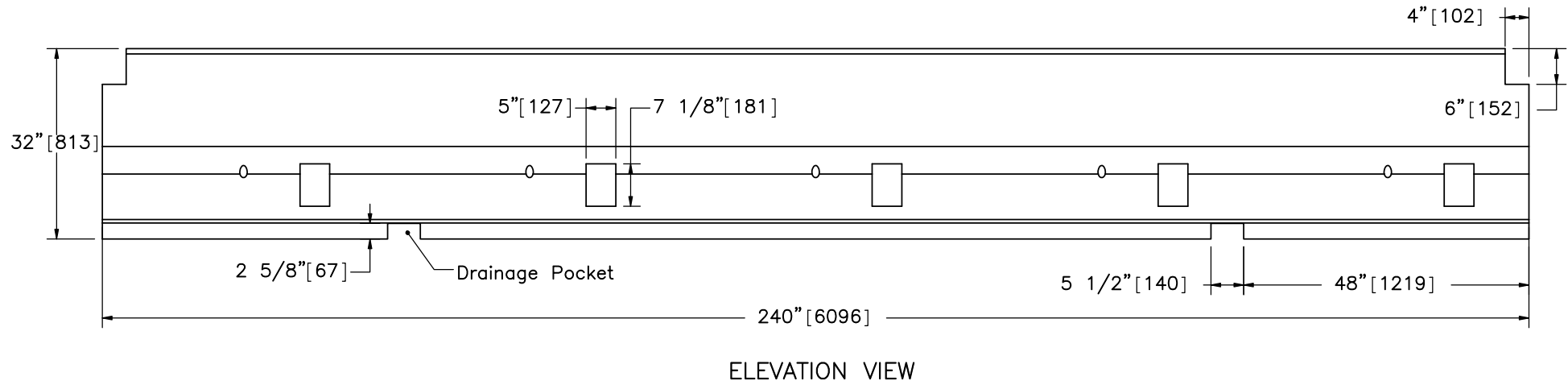
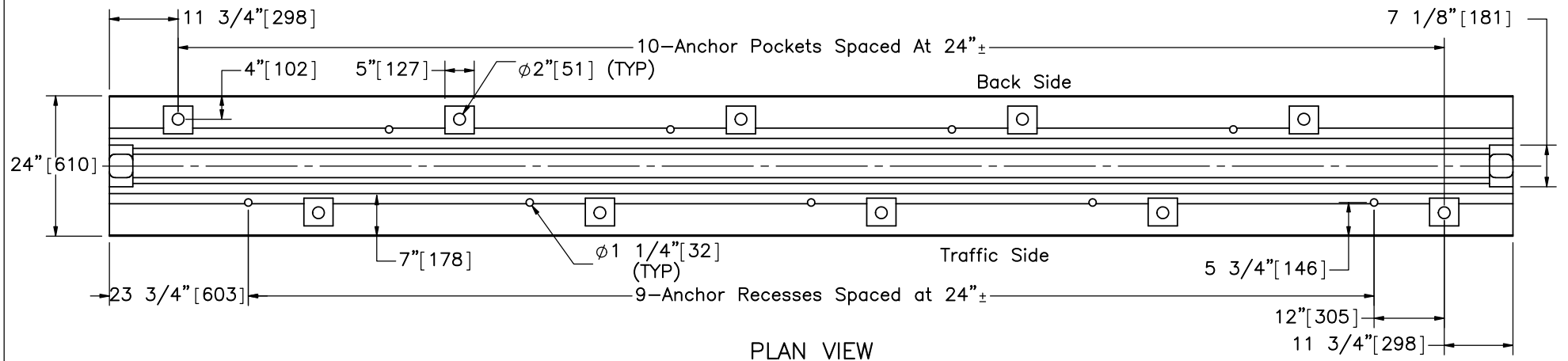
DRAWN BY:  
EMR/TJD/M  
ES/MBD

REV. BY:  
GA/KAL/RK  
F/JCH/SB



Note: (1) Traffic side of barrier contains the five pin hole anchor recesses, and the back side of barrier contains the four pin anchor recesses.

 <b>Midwest Roadside Safety Facility</b>	NJ Pinned Portable Concrete Barrier Test NJPCB-1 Pin Hole Locations		SHEET: 3 of 14
	DWG. NAME: NJPCB-1_R18		DATE: 10/30/2018
		SCALE: 1:30 UNITS: In./[mm]	DRAWN BY: EMR/TJD/M ES/MBD
			REV. BY: GA/KAL/RK F/JCH/SB



- Notes: (1) Concrete has a minimum 28-day compressive strength of 3.7 ksi [25.5 MPa].  
 (2) Two 2 5/8" x 5 1/2" [67 mm x 140 mm] drainage pockets required in segments 12' [3658 mm] long or greater.



Midwest Roadside Safety Facility

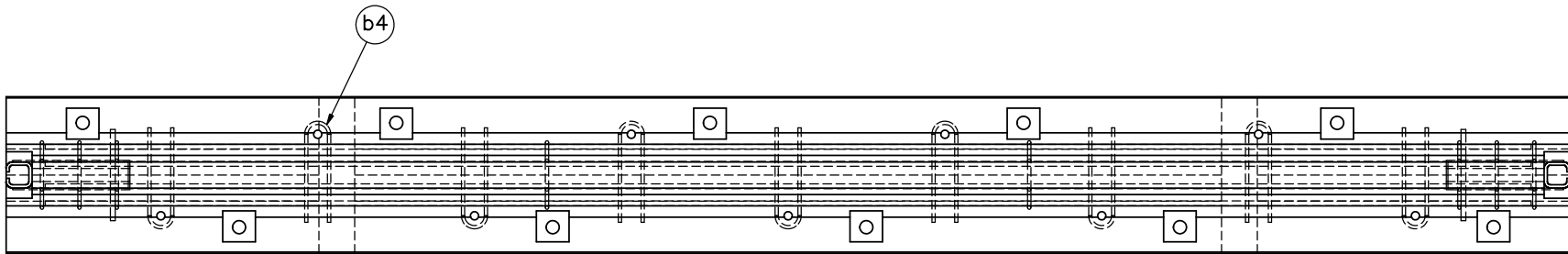
NJ Pinned Portable Concrete Barrier Test NJPCB-1

Concrete Barrier Segment

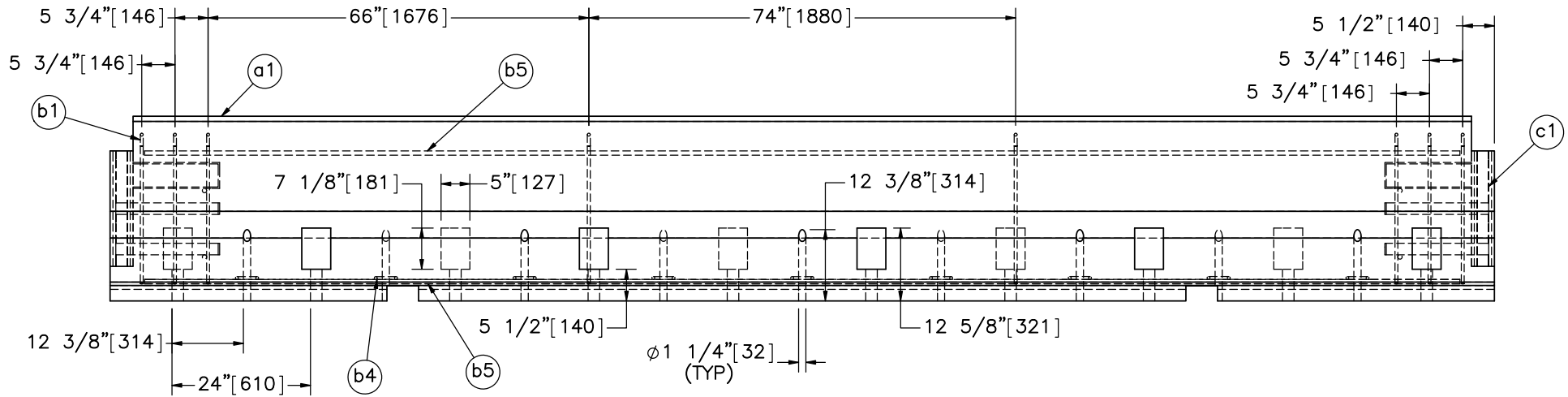
DWG. NAME:  
NJPCB-1\_R18

SCALE: 1:26  
UNITS: In./[mm]

SHEET:  
4 of 14  
DATE:  
10/30/2018  
DRAWN BY:  
EMR/TJD/MES/MBD  
REV. BY:  
GA/KAL/RK/F/JCH/SB



PLAN VIEW



ELEVATION VIEW



Midwest Roadside  
Safety Facility

NJ Pinned Portable  
Concrete Barrier  
Test NJPCB-1

Reinforcement Details

DWG. NAME:  
NJPCB-1\_R18

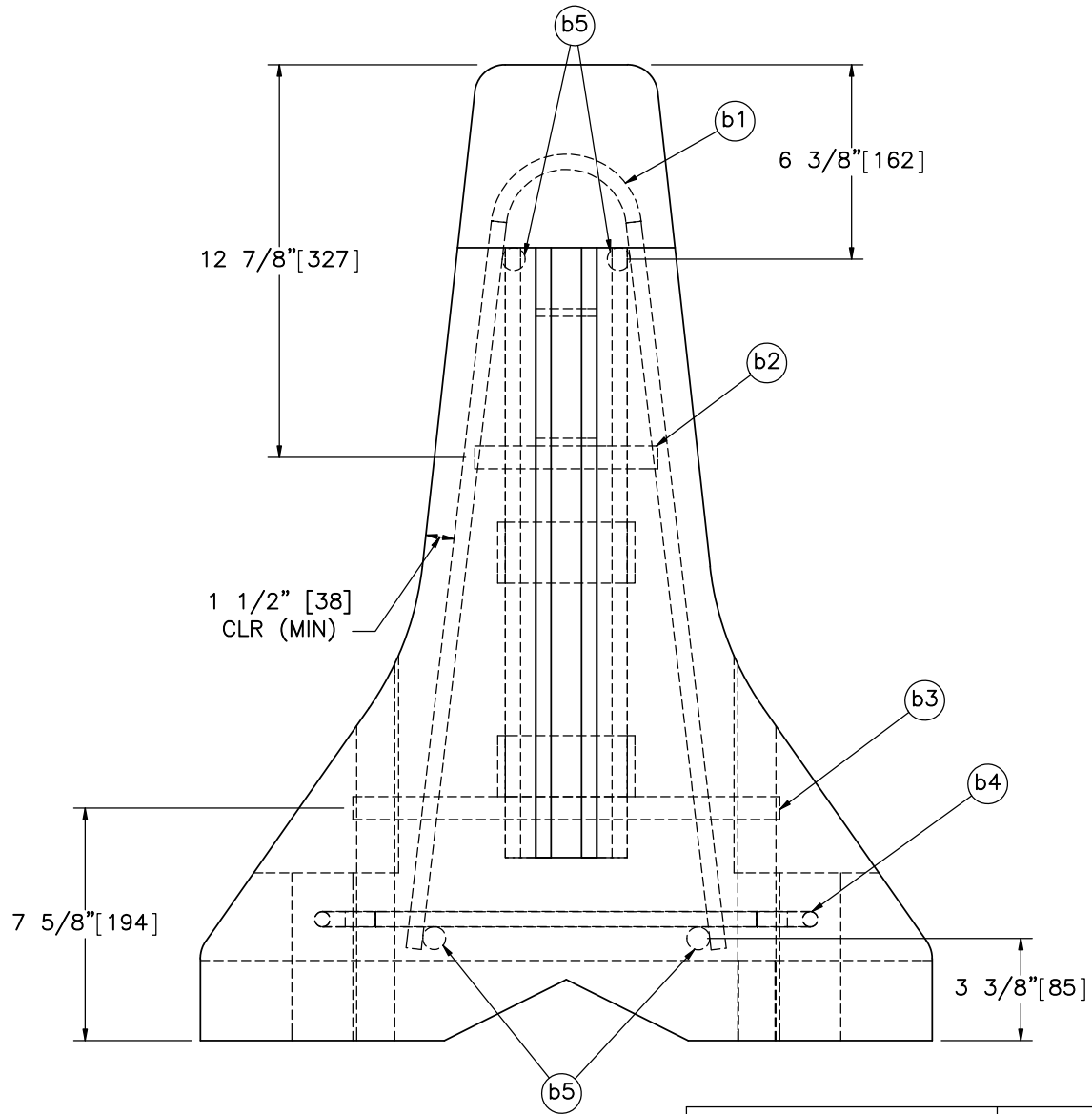
SCALE: 1:27  
UNITS: In.[mm]

SHEET:  
5 of 14

DATE:  
10/30/2018

DRAWN BY:  
EMR/TJD/M  
ES/MBD

REV. BY:  
GA/KAL/RK  
F/JCH/SB



Midwest Roadside  
Safety Facility

NJ Pinned Portable  
Concrete Barrier  
Test NJPCB-1

Reinforcement Details – End  
View

DWG. NAME:  
NJPCB-1\_R18

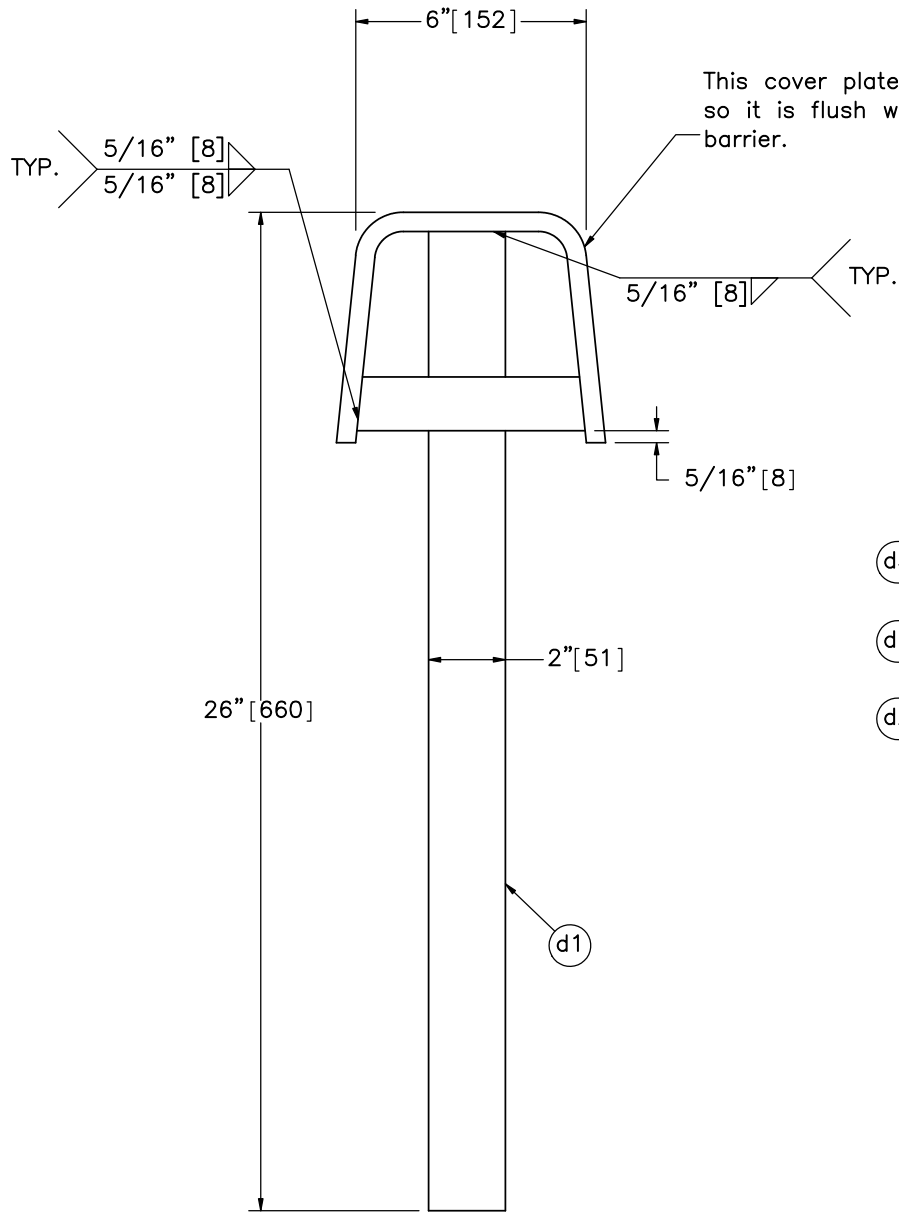
SCALE: 1:6  
UNITS: In.[mm]

SHEET:  
6 of 14

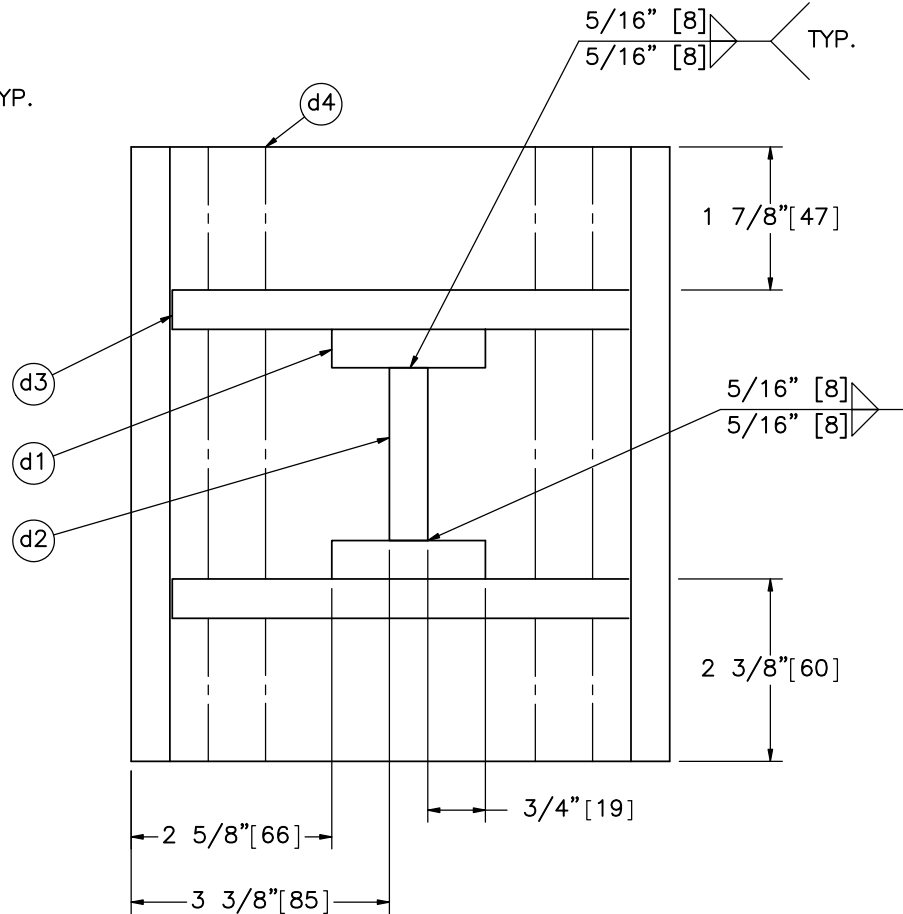
DATE:  
10/30/2018

DRAWN BY:  
EMR/TJD/M  
ES/MBD

REV. BY:  
GA/KAL/RK  
F/JCH/SB



This cover plate shall be installed so it is flush with the top of the barrier.



BOTTOM VIEW  
SCALE 2:5

PROFILE VIEW



Midwest Roadside  
Safety Facility

NJ Pinned Portable  
Concrete Barrier  
Test NJPCB-1

Connection Key

DWG. NAME.  
NJPCB-1\_R18

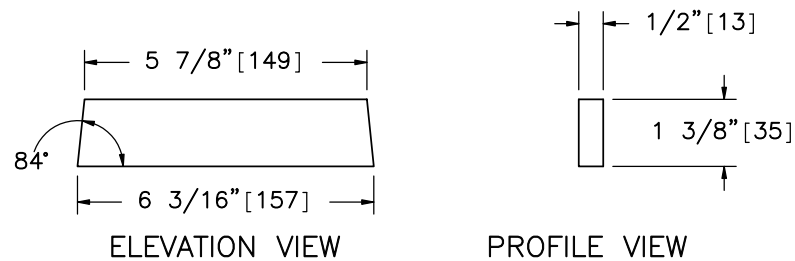
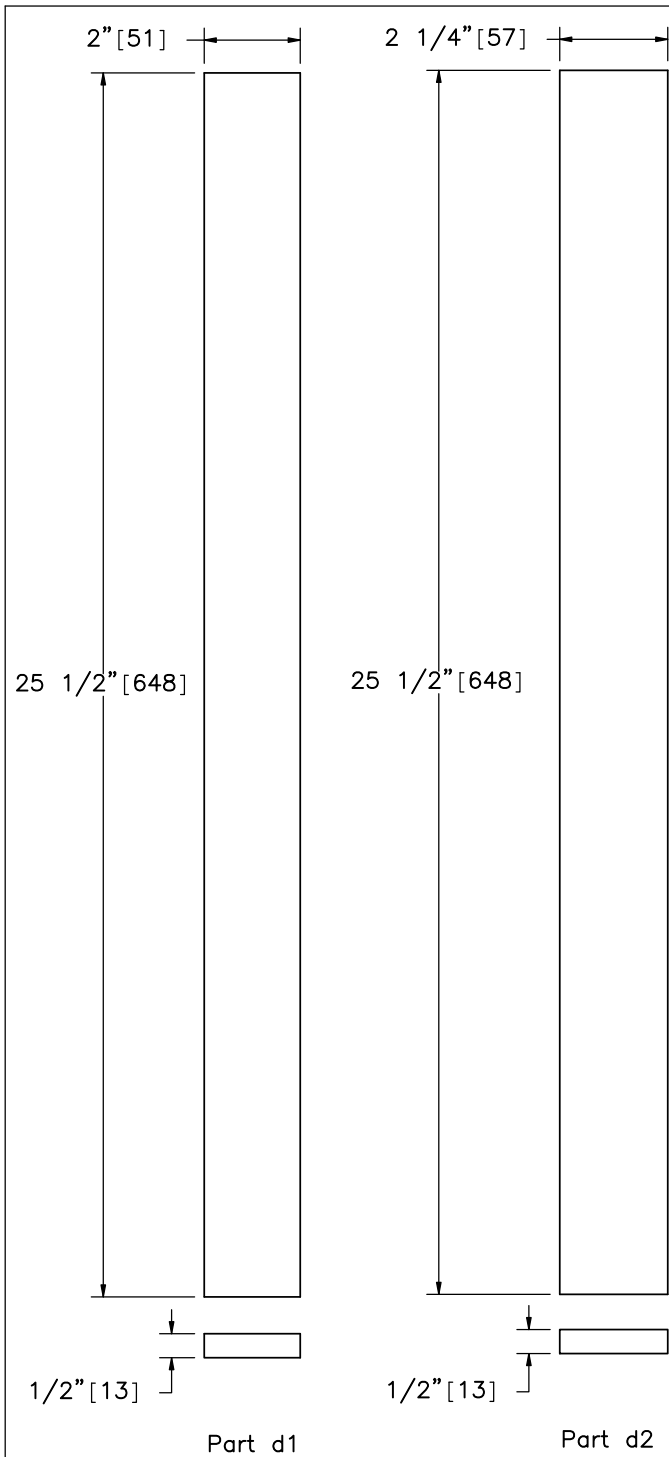
SCALE: 1:8  
UNITS: In.[mm]

SHEET:  
7 of 14

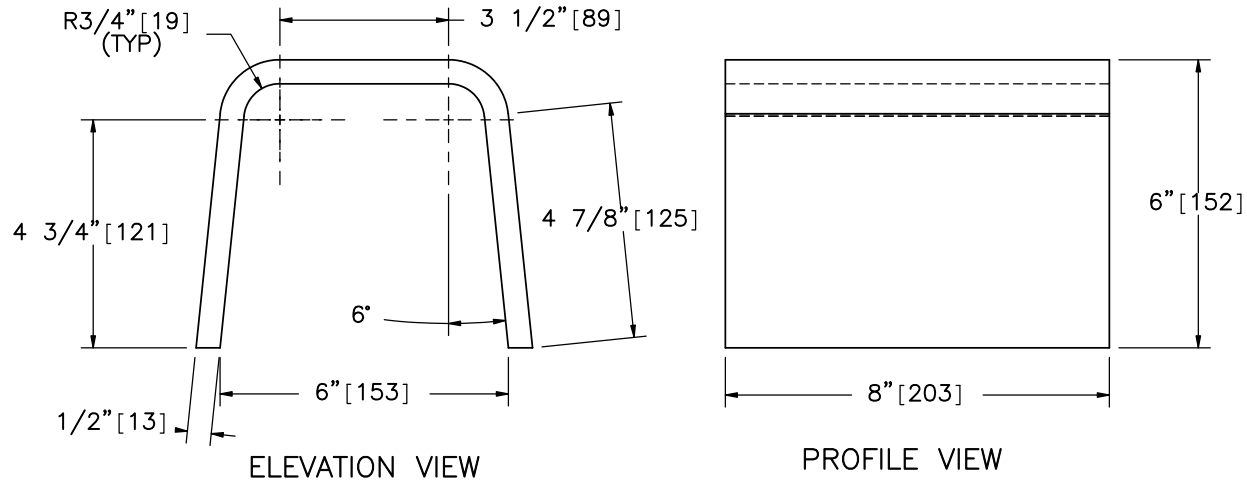
DATE:  
10/30/2018

DRAWN BY:  
EMR/TJD/M  
ES/MBD

REV. BY:  
GA/KAL/RK  
F/JCH/SB



Part d3



Part d4



Midwest Roadside  
Safety Facility

NJ Pinned Portable  
Concrete Barrier  
Test NJPCB-1

Connection Key Components

DWG. NAME:  
NJPCB-1\_R18

SCALE: 1:4  
UNITS: In.[mm]

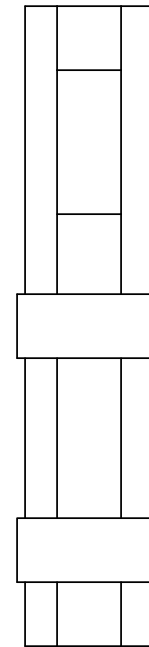
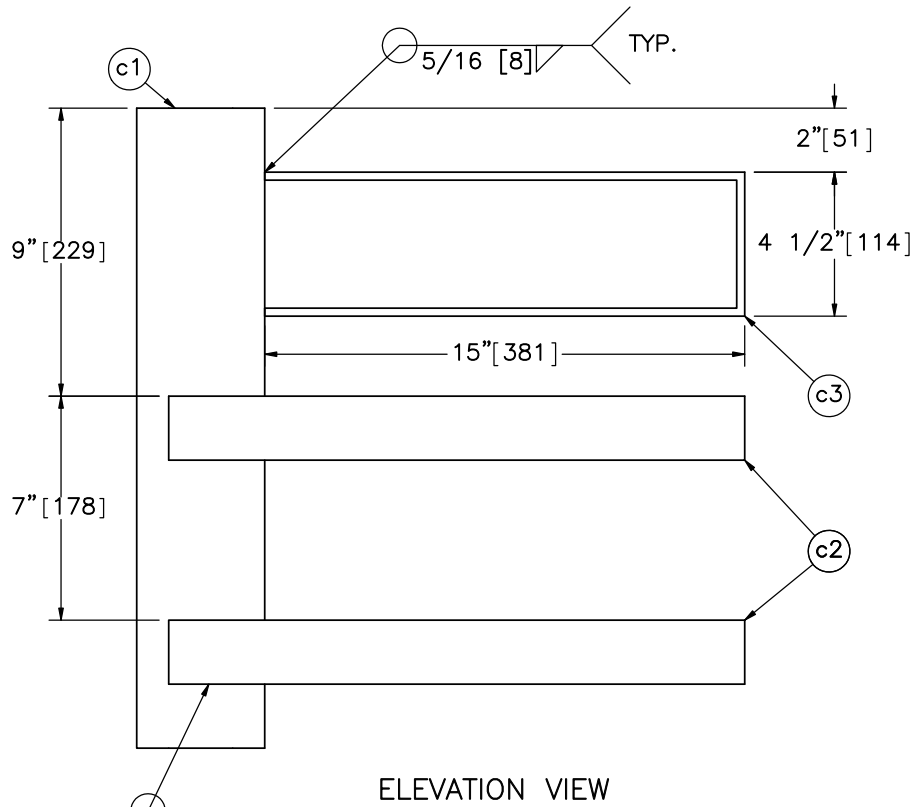
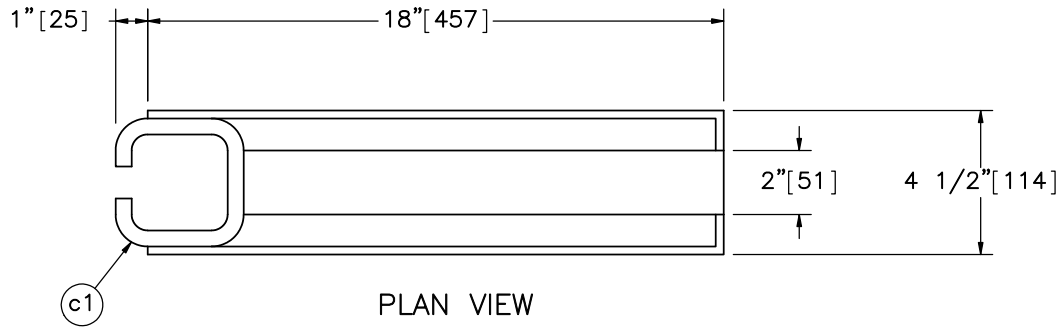
SHEET:  
8 of 14

DATE:  
10/30/2018

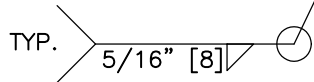
DRAWN BY:  
EMR/TJD/M  
ES/MBD

REV. BY:  
GA/KAL/RK  
F/JCH/SB





PROFILE VIEW



Midwest Roadside  
Safety Facility

NJ Pinned Portable  
Concrete Barrier  
Test NJPCB-1

Connection Socket

DWG. NAME:  
NJPCB-1\_R18

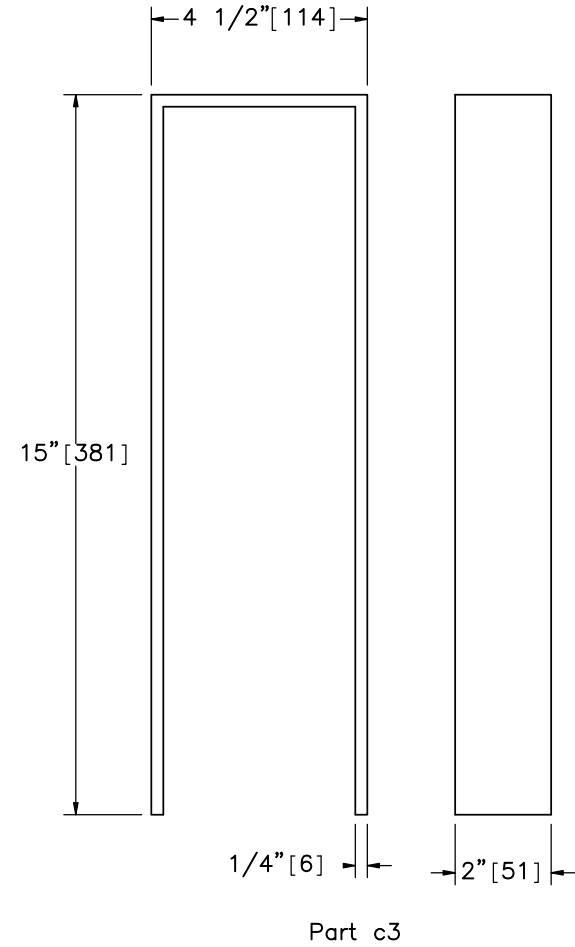
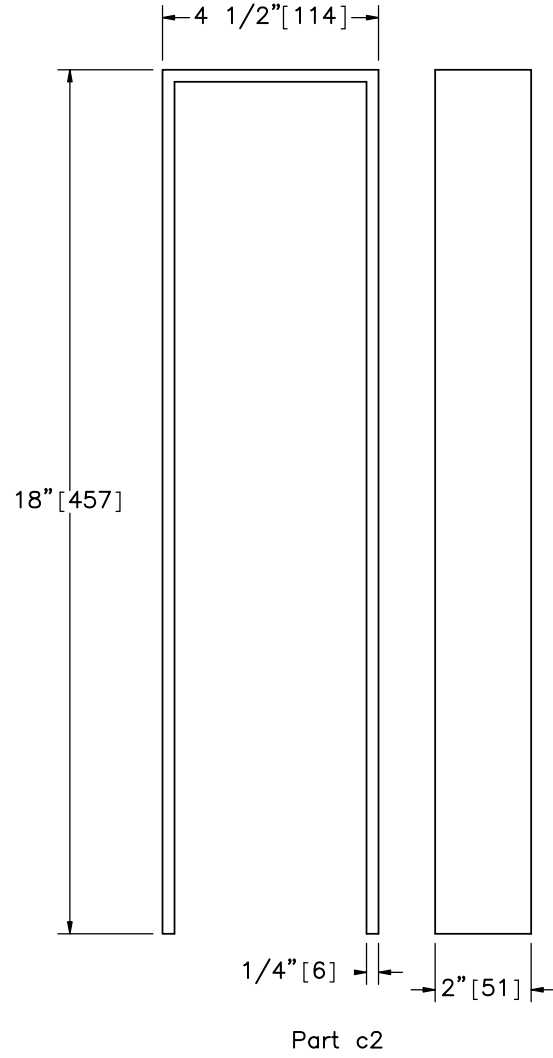
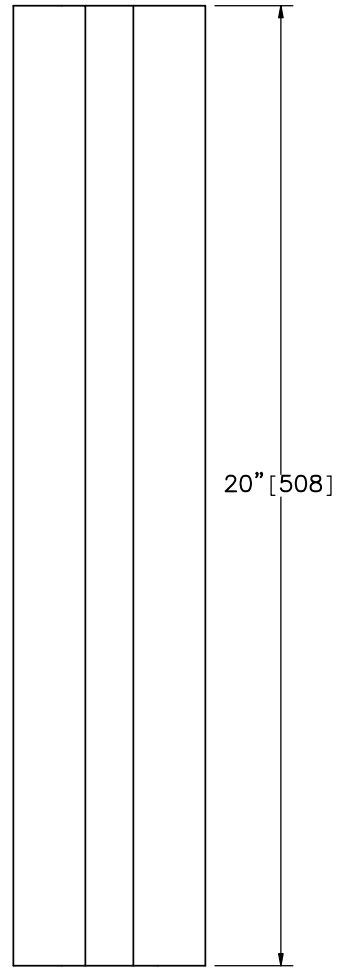
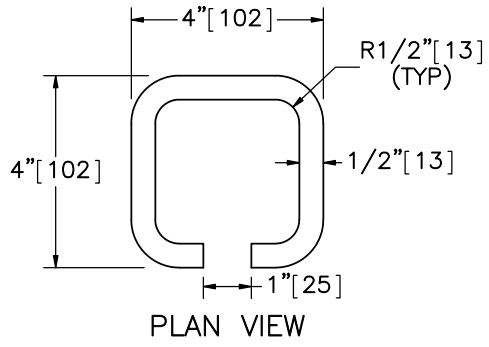
SCALE: 1:6  
UNITS: In.[mm]

SHEET:  
9 of 14

DATE:  
10/30/2018

DRAWN BY:  
EMR/TJD/M  
ES/MBD

REV. BY:  
GA/KAL/RK  
F/JCH/SB



Midwest Roadside  
Safety Facility

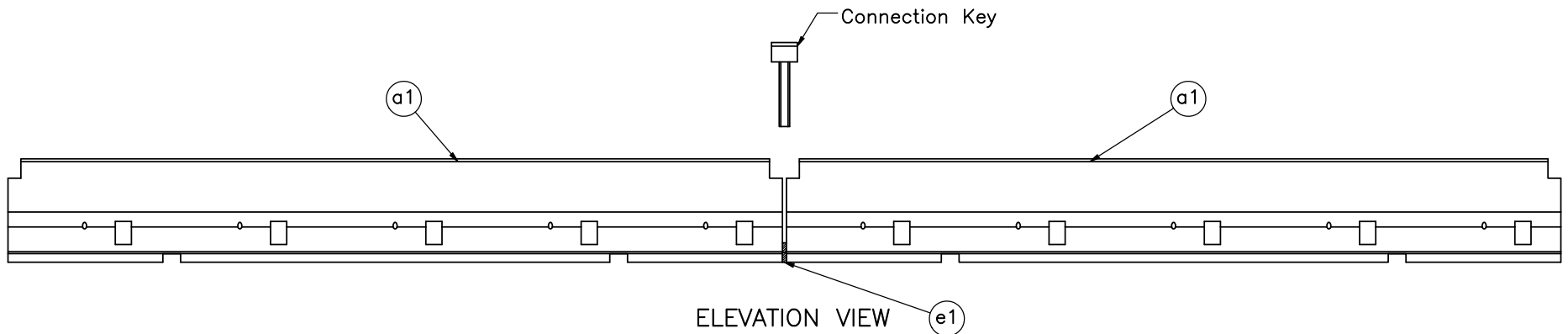
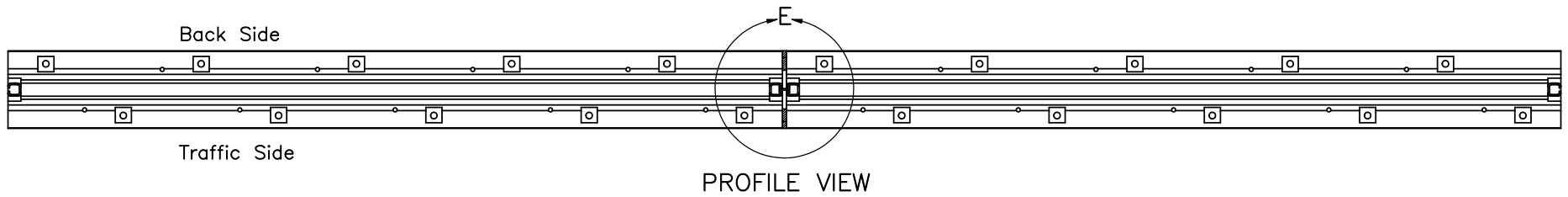
NJ Pinned Portable  
Concrete Barrier  
Test NJPCB-1

Connection Socket Components

DWG. NAME:  
NJPCB-1\_R18

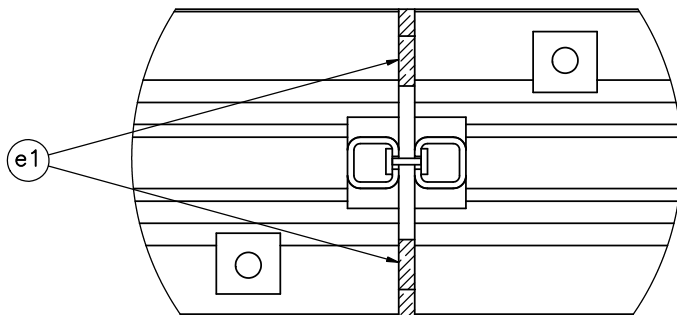
SCALE: 1:4  
UNITS: In.[mm]

SHEET:  
10 of 14  
DATE:  
10/30/2018  
DRAWN BY:  
EMR/TJD/M  
ES/MBD  
REV. BY:  
GA/KAL/RK  
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Notes: (1) Curved cover plate and stiffeners not shown in profile view and Detail E.

(2) Groundline and vertical anchors at toe of barrier not shown for clarity.



DETAIL E  
SCALE 1 : 15



Midwest Roadside  
Safety Facility

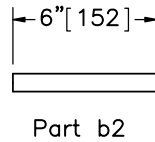
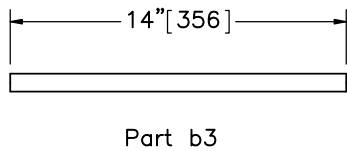
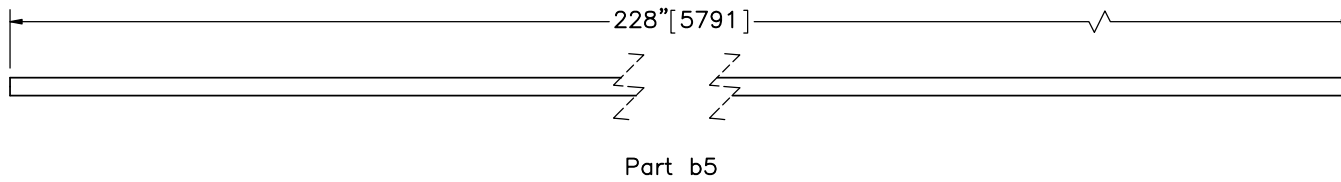
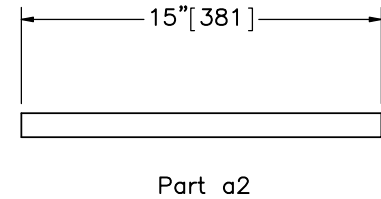
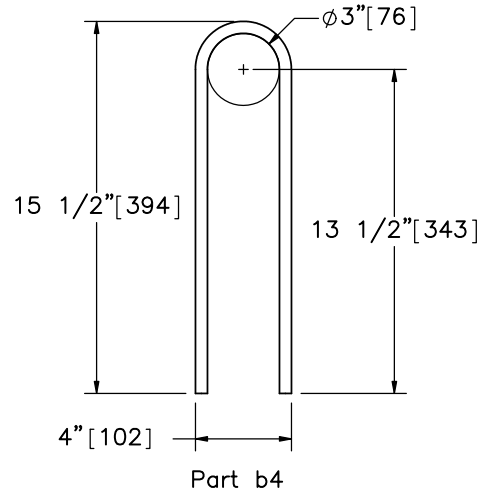
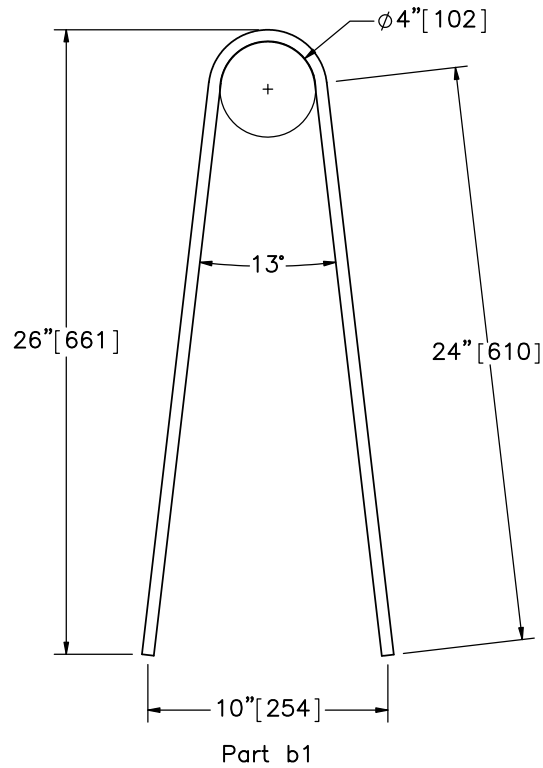
NJ Pinned Portable  
Concrete Barrier  
Test NJPCB-1

Connection Key Placement

DWG. NAME.  
NJPCB-1\_R18

SCALE: 1:50  
UNITS: In./mm

SHEET:  
11 of 14  
DATE:  
10/30/2018  
DRAWN BY:  
EMR/TJD/M  
ES/MBD  
REV. BY:  
GA/KAL/RK  
F/JCH/SB



BILL OF BARS				
ITEM NO.	QTY.	BAR SIZE	UNBENT LENGTH	MATERIAL SPEC.
a2	54	ϕ1" [25]	15" [381]	A36
b1	80	#4 [13]	59" [1499]	A615 Gr. 60
b2	20	#6 [19]	6" [152]	A615 Gr. 60
b3	20	#6 [19]	14" [356]	A615 Gr. 60
b4	90	#4 [13]	37" [940]	A615 Gr. 60
b5	40	#6 [19]	19'-0" [5791]	A615 Gr. 60

Note: (1) Quantities in Bill of Bars represent a system with ten barriers.



Midwest Roadside Safety Facility

NJ Pinned Portable Concrete Barrier Test NJPCB-1


Bill of Bars

DWG. NAME:  
NJPCB-1\_R18

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


SHEET:  
12 of 14  
DATE:  
10/30/2018  
DRAWN BY:  
EMR/TJD/MES/MBD  
REV. BY:  
GA/KAL/RK/F/JCH/SB

- (1) Minimum concrete clear cover for reinforcement steel shall be 1 1/2" [38 mm].
- (2) All end segments shall be pinned.
- (3) After a segment has been placed and the connection key inserted, pull the unit in a direction parallel to its longitudinal axis to remove any slack in the joint.
- (4) The portable concrete barrier shall be cast in steel forms.
- (5) The portable concrete barrier shall be barrier segments of 20 feet [6,096 mm]. However, other lengths may be used to meet field conditions. The number and placement of the b2 and b3 reinforcement steel will vary with the length of the barrier segment as shown on the table of variable reinforcement steel. The b5 reinforcement steel shall be 10" [254 mm] shorter than the nominal length of the barrier segments.
- (6) Reinforcing shown is the minimum required. Additional reinforcing necessary for handling shall be the option and responsibility of the contractor.
- (7) Welding and fabrication of steel structures shall be in accordance with sections 1 thru 6 of the ANSI/AASHTO/AWS D1.5 bridge welding code and section 10 of the ANSI/AWS D1 structural welding code. Surfaces to be welded shall be free of scale, slag, rust, moisture, grease or any other material that will prevent proper welding or produce objectional fumes. Welding shall be shielded metal arc welding using properly dried 5/32" [4 mm] dia. E7018 electrodes.
- (8) The length of the pins shall be such that a minimum embedment length of 5" [127 mm] is obtained when embedded into concrete pavement. When anchor pins are in place, they shall not project above the plane of the concrete surface of the barrier. Holes in bridge decks shall be 1 1/4" [32 mm] diameter maximum and made with a core drill or any other approved rotary drilling device that does not impart an impact force.
- (9) Use non-shrink grout of a plastic consistency that is listed on the QPL and conforms to ASTM C 1107 with the following amendments:
  1. Ensure that the grout has a working time of at least 30 minutes from the time the water is added.
  2. Match the color of the hardened grout, where visible, to the color of the adjacent hardened concrete.
  3. Include 1-day strength tests as part of the performance requirements of ASTM C 1107.
  4. Ensure that the grout contains no more than 0.05 percent chlorides or 5.0 percent sulfates by weight.
  5. Minimum 1-day compressive strength of 1,000 psi [6.9 MPa].
- (10) Use connection key in every joint. Grout is placed at the toe of each barrier segment between adjacent barrier segments in every joint. Pin every other segment, except both end segments are pinned. In segments that are to be anchored, pins shall be required in every anchor pin recess.

	NJ Pinned Portable Concrete Barrier Test NJPCB-1		SHEET: 13 of 14
			DATE: 10/30/2018
Midwest Roadside Safety Facility		General Notes	DRAWN BY: EMR/TJD/M ES/MBD
DWG. NAME: NJPCB-1_R18		SCALE: None UNITS: In.[mm]	REV. BY: GA/KAL/RK F/JCH/SB

Item No.	QTY.	Description	Material Spec	Galvanization Spec
a1	10	Concrete Barrier Segment – NJDOT Type 4 Barrier (Alternate B)	$f'c = 3,700 \text{ psi [25.5 MPa]}$	–
a2	54	1" [25] Dia., 15" [381] Long Anchor Steel Pin	ASTM A36	ASTM A123*
b1	80	1/2" [13] Dia., 59" [1,499] Long Bent Rebar	ASTM A615 Gr. 60	–
b2	20	3/4" [19] Dia., 6" [152] Long Rebar	ASTM A615 Gr. 60	–
b3	20	3/4" [19] Dia., 14" [356] Long Rebar	ASTM A615 Gr. 60	–
b4	90	1/2" [13] Dia., 37" [940] Long Bent Rebar	ASTM A615 Gr. 60	–
b5	40	3/4" [19] Dia., 228" [5,791] Long Rebar	ASTM A615 Gr. 60	–
c1	20	4"x4"x1/2" [102x102x13] x 20" [508] Long Tube	ASTM A500 Gr. B or C	–
c2	40	40 1/2"x2"x1/4" [1,029x51x6] Bent Steel Plate	ASTM A36	–
c3	20	34 1/2"x2"x1/4" [876x51x6] Bent Steel Plate	ASTM A36	–
d1	18	25 1/2"x2"x1/2" [648x51x13] Steel Plate	ASTM A36	–
d2	9	25 1/2"x2 1/4"x1/2" [648x57x13] Steel Plate	ASTM A36	–
d3	18	6 3/16"x1 3/8"x1/2" [157x35x13] Steel Plate – Stiffener	ASTM A36	–
d4	9	17"x8"x1/2" [432x203x13] Bent Steel Plate – Top Plate	ASTM A36	–
e1	18	Non-Shrink Grout	Min. 1-day Compressive Strength 1,000 psi [6.9 MPa]	–

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

 <b>Midwest Roadside Safety Facility</b>	NJ Pinned Portable Concrete Barrier Test NJPCB-1 Bill of Materials		SHEET: 14 of 14
			DATE: 10/30/2018
		DWG. NAME: NJPCB-1_R18	DRAWN BY: EMR/TJD/ME S/MBD
		SCALE: None UNITS: In.[mm]	REV. BY: GA/KAL/RKF /JCH/SB

REV.	DATE OF ISSUE	Page	NATURE OF CHANGES	REVIEWER	REVISED BY
0	11/3/2015	-	Made NJPCB-1 using NYTCBP-5.	-	EMR
1	11/17/2015	1	Note additions and edits. Detail additions. Drawing additions and edits.	GA/KAL/RKF	EMR
		2	Page added.		
		3	Dimension edit. Drawing edit. Note edits.		
		4	Removal of end view. Drawing edit.		
		5	Page added.		
		8	Note edits.		
		9	Page added.		
		10	Note and quantity edits.		
		11	Note edits.		
		12	Quantity and specification edits.		
2	11/23/2015	1	Note edits. Label addition.	KAL	EMR
		2	Label additions and deletions.		
		3	Dimension edit. Label edits and additions.		
		4	Label additions.		
		5	Dimension edit.		
		6	Drawing edits and deletions. Label edits and deletions.		
		7	Drawing edits and deletions. Label edits.		
		8	Drawing edits and deletions. Label edits.		
		9	Page added.		
		10	Note edits.		
		11	Note edits. Dimension edits		
		12	Note edits.		
		13	Note edits.		
3	11/24/2015	-	Document title change. Metric dimension decimals removed.	GA/KAL	JEK
		1	Anchoring added to barrier 10. Note 1 edit. Note 4 added.		
		2	Additional labeling.		
		3	Note 2 edit.		
		4	Additional dimensioning.		
		5	Additional and/or corrected dimensions.		
6	Additional labeling.				
		8	Additional labeling. General dimension movement.		
		9	General dimension movement.		

3	11/24/2015	11	Bar diameter dimensions removed. Table Bar Size column edit. B1 quantity and unbent length change. Note movement.	GA/KAL	JEK
		12	Edits to notes 1 – 5, and 9.		
		13	Item no. changes. Description change: M1, C1c, C1d. Quantity change: B1.		
4	11/24/2015	2	Connection Key labeling.	KAL	JEK
		6-9	Swap part names for part numbers.		
		10	Connection Key labeling.		
		13	Part number changes.		
5	11/24/2015	-	Page 3 added.	RKF	JEK
		1	Orientations labeled. Note edits. Detail Added (page 3).		
		4	Orientations labeled.		
		11	Drawing corrected to correct orientation and labeled.		
		13	Note edit.		
6	12/3/2015	13	Note edit.	KAL	EMR
		14	Note edit.		
7	1/22/2016	1	Space added between barriers. Grout added on section A-A. Note added.	KAL	EMR
		2	Space and grout added between barriers. Notes added.		
		3	Space and grout added between barriers. Notes added.		
		11	Space and grout added between barriers. Notes added.		
		13	Note edit.		
8	2/16/2016	1	Profile and elevation views flipped. Note edits. Item numbers added.	KAL	EMR
		2	Notes removed. Item numbers added.		
		4	Note edits. Dimension edits.		
		5	Note edit. Dimension edit.		
		6	Item number edits.		
		7	Note edits. Note added. Weld detail edit. Bend lines added.		
		8	Note edits. Scale edits. Dimension edit.		
		9	Note edits.		
		10	Dimensions added. Note edits.		
		11	Notes removed. Note added.		
		12	Table column removed. Table column moved. Table rows removed. Table rows moved. Item number edits. Table column width edits. Table title edit. Table column header edits. Bar bend circles added. Dimensions removed. Dimensions added. Drawings added.		
		14	Item number edits. Item description edits. Rows removed. Material specification edits.		



9	2/16/2016	1	Changed font size of drawing views. Added text to note.	KAL	TJD
		3	Added note. Changed text from Pin Hole to Pin Anchor Recesses.		
		8	Changed font of part text. Removed elevation view in part c4.		
		10	Changed font of part text.		
		11	Removed extra period from note.		
		12	Changed font of part text.		
		13	Added text to note 10.		
10	2/19/2016	1	Note edits.	KAL	EMR
		3	Note edit.		
		8	Note edits.		
		10	Note edits.		
		11	Note edit. Note added.		
		12	Note edits.		
11	3/9/2016	1	Note edits.	JCH	TJD
		3	Note edit.		
		11	Added note 2.		
		12	Added degree of bend to part 4b1.		
12	3/10/2016	1	Added note 6.	SB	TJD
		4	Added radii to drawing.		
		14	Bill of materials edit.		
13	3/17/2016	5	Note edits.	SB	TJD
		6	Note edits.		
		12	Note edits. Bill of bars edits.		
		14	Bill of materials edit.		
14	1/18/2017	-	Template, font sizes, dual dimensin placement, conventions updated throughout. Part renumbering. Dimension shifts throughout.	JEK	JEK
15	5/26/2017	14	Edited Galvanization specs for part nos. a2, c1, c2, c3, d1, d2, d3 and d4. Added note.	KAL	MES
16	6/5/2017	14	Edited Galvanization specs for part nos. b1, b2, b3, b4, and b5.	JEK	DTM
17	2/27/2018	13	Note 9-5 edit.	KAL	JEK
		BOM	Mtrl: e1.		
18	10/30/2018	1	Note 6 edit.	KAL	MBD