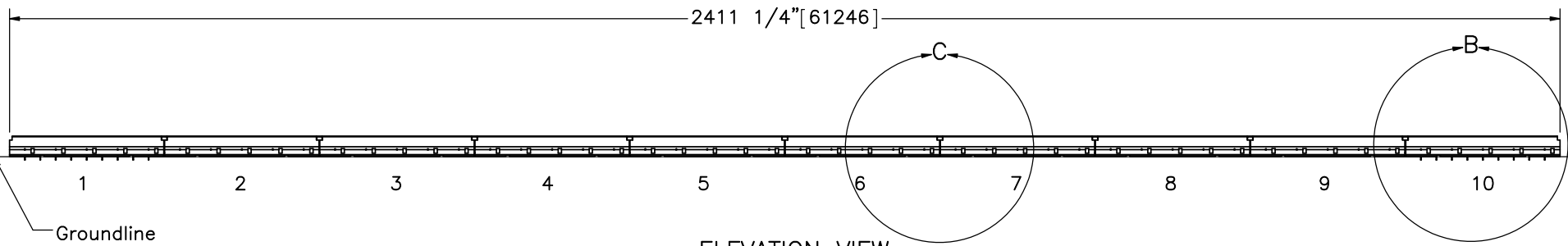
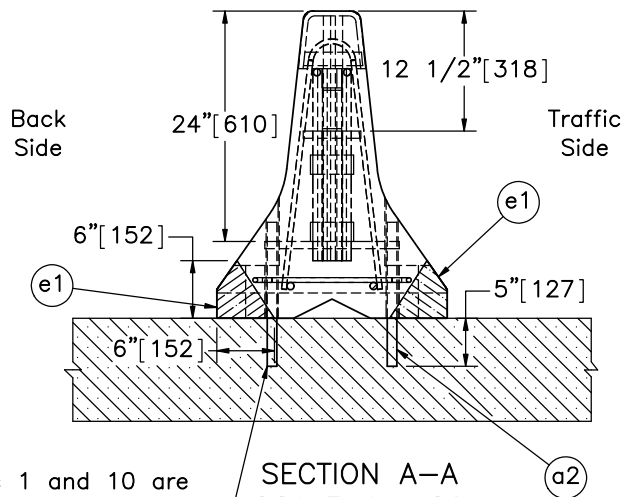


PLAN VIEW



ELEVATION VIEW



SECTION A-A
SCALE 1 : 20

Barrier segments 1 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 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 B as specified in the 2013 NJDOT *Roadway Design Manual*.



Midwest Roadside
Safety Facility

NJ Free-Standing
Portable Concrete Barrier
Test NJPCB-4

System Layout

DWG. NAME.
NJPCB-4_R8

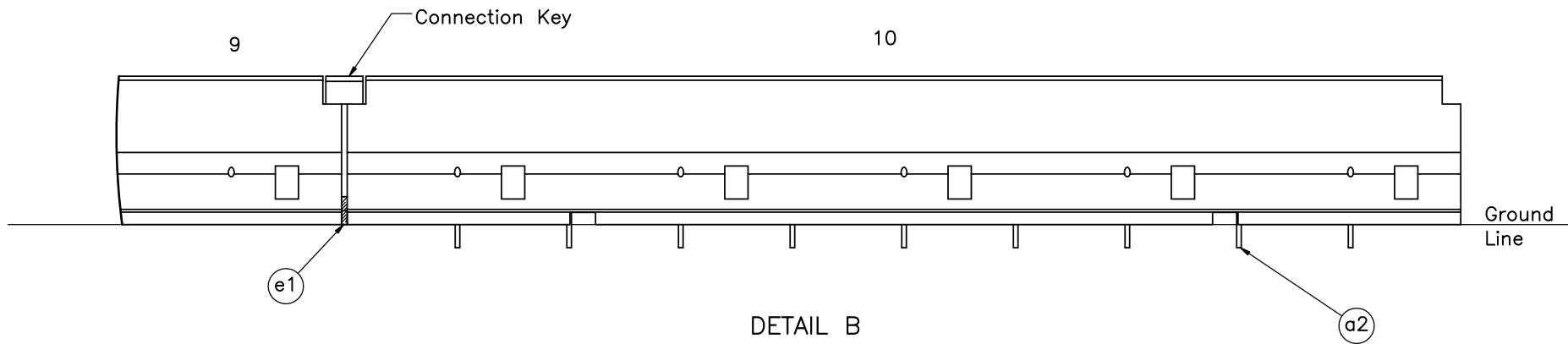
SCALE: 1:245
UNITS: In./[mm]

SHEET:
1 of 14

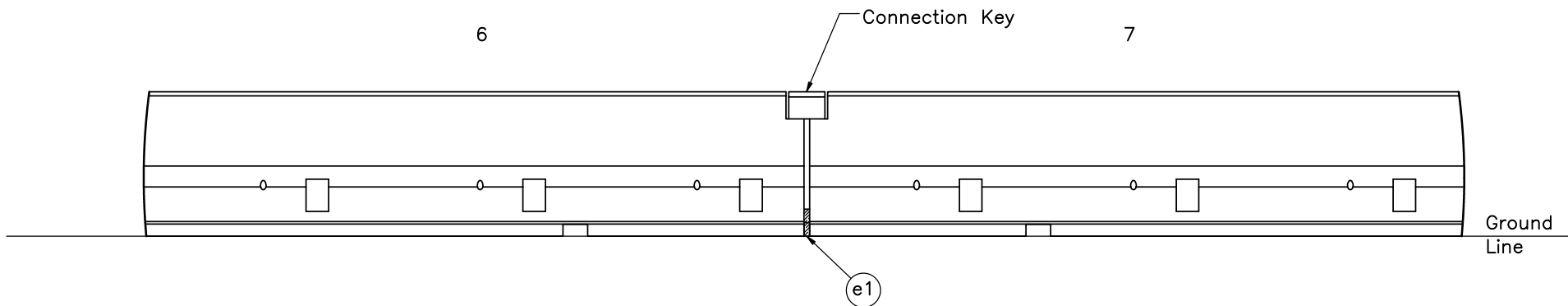
DATE:
10/30/2018

DRAWN BY:
TJD/MES/DT
M/MBD

REV. BY:
SB/KAL



DETAIL B



DETAIL C



Midwest Roadside
Safety Facility

NJ Free-Standing
Portable Concrete Barrier
Test NJPCB-4

Barrier Pin Details

DWG. NAME.
NJPCB-4_R8

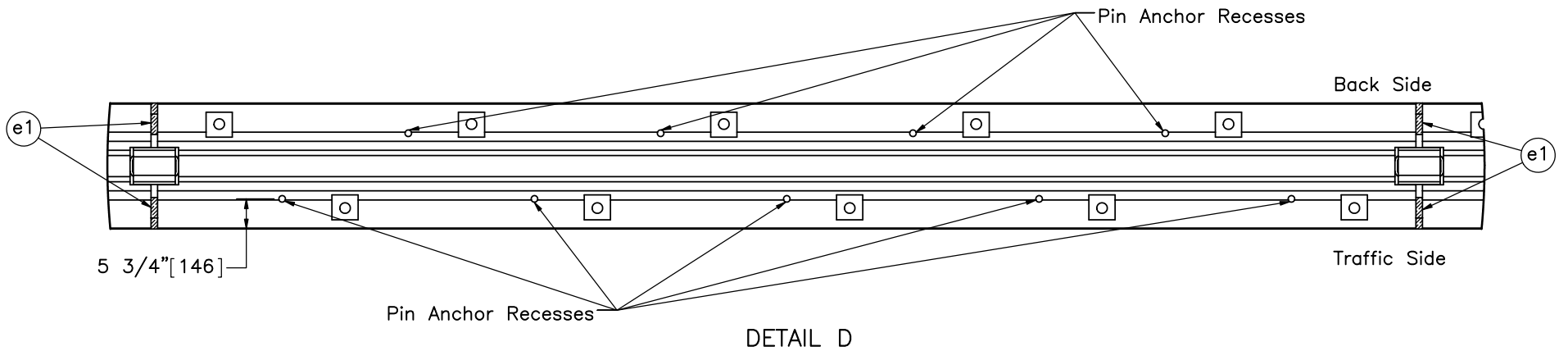
SCALE: 1:35
UNITS: In.[mm]

SHEET:
2 of 14

DATE:
10/30/2018

DRAWN BY:
TJD/MES/DT
M/MBD

REV. BY:
SB/KAL



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



Midwest Roadside
Safety Facility

NJ Free-Standing
Portable Concrete Barrier
Test NJPCB-4

Pin Hole Locations

DWG. NAME.
NJPCB-4_R8

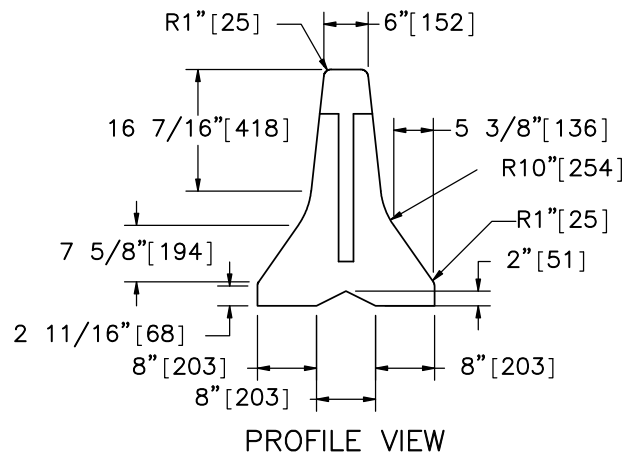
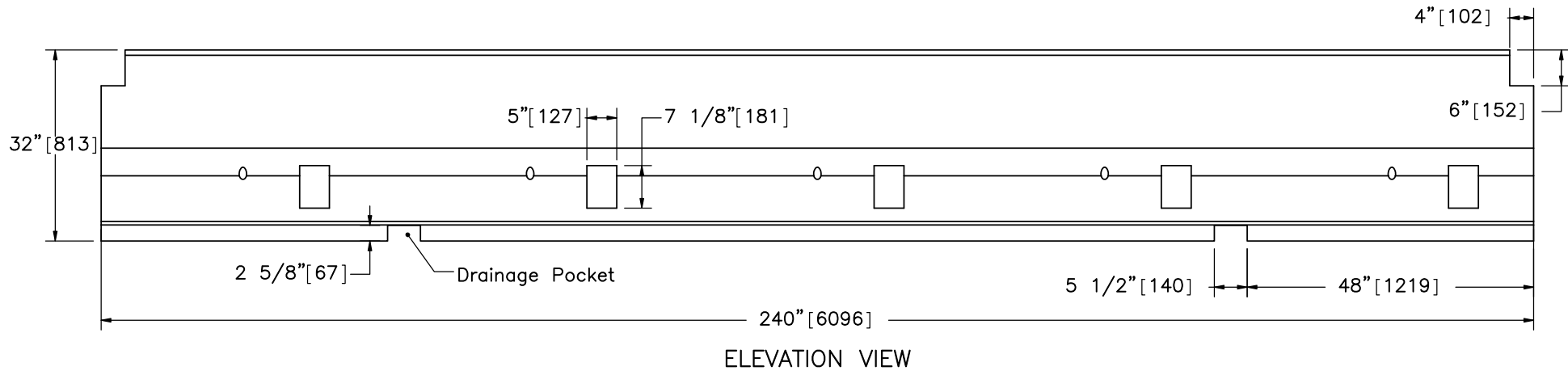
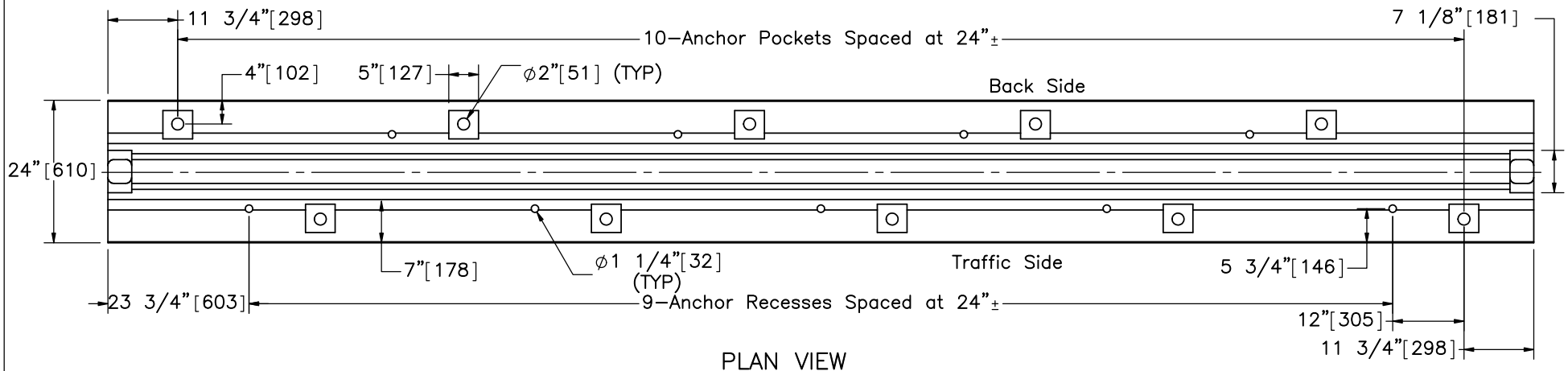
SCALE: 1:30
UNITS: In.[mm]

SHEET:
3 of 14

DATE:
10/30/2018

DRAWN BY:
TJD/MES/DT
M/MBD

REV. BY:
SB/KAL



- 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 x 140] drainage pockets required in segments 12' [3658] long or greater.



Midwest Roadside Safety Facility

NJ Free-Standing Portable Concrete Barrier Test NJPCB-4

Concrete Barrier Segment

DWG. NAME:
NJPCB-4_R8

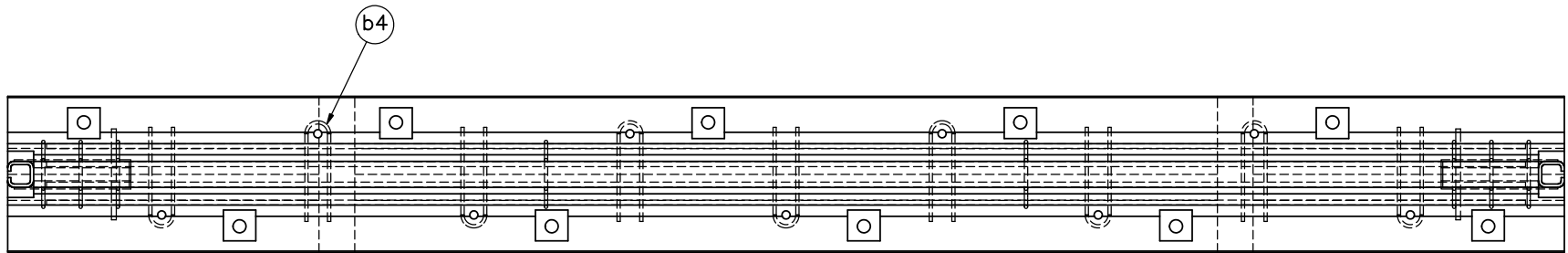
SCALE: 1:26
UNITS: In.[mm]

SHEET:
4 of 14

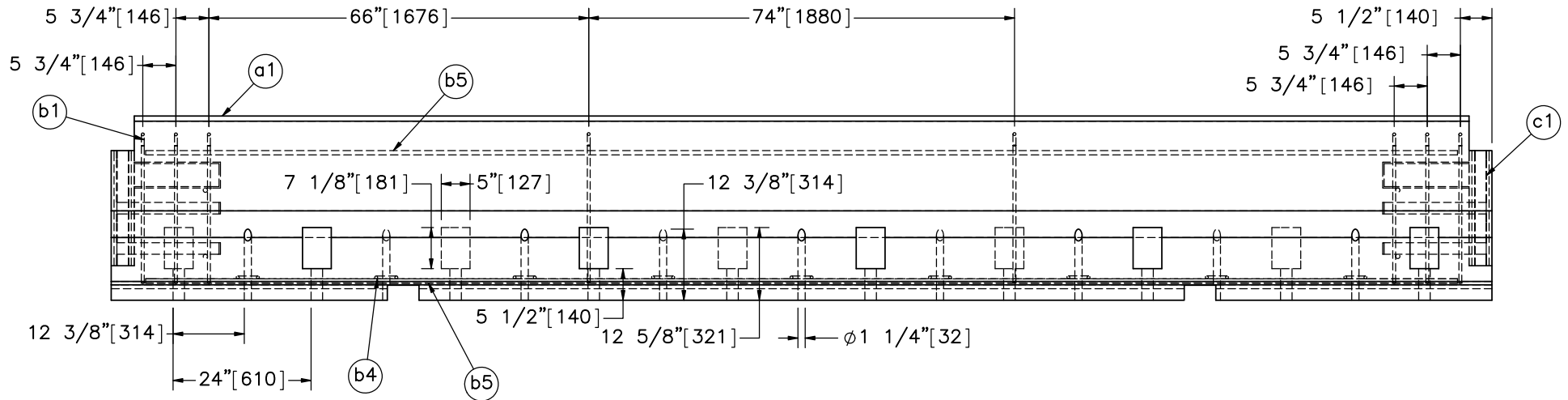
DATE:
10/30/2018

DRAWN BY:
TJD/MES/DT
M/MBD

REV. BY:
SB/KAL



PLAN VIEW



ELEVATION VIEW



Midwest Roadside
Safety Facility

NJ Free-Standing
Portable Concrete Barrier
Test NJPCB-4

Reinforcement Details

DWG. NAME:
NJPCB-4_R8

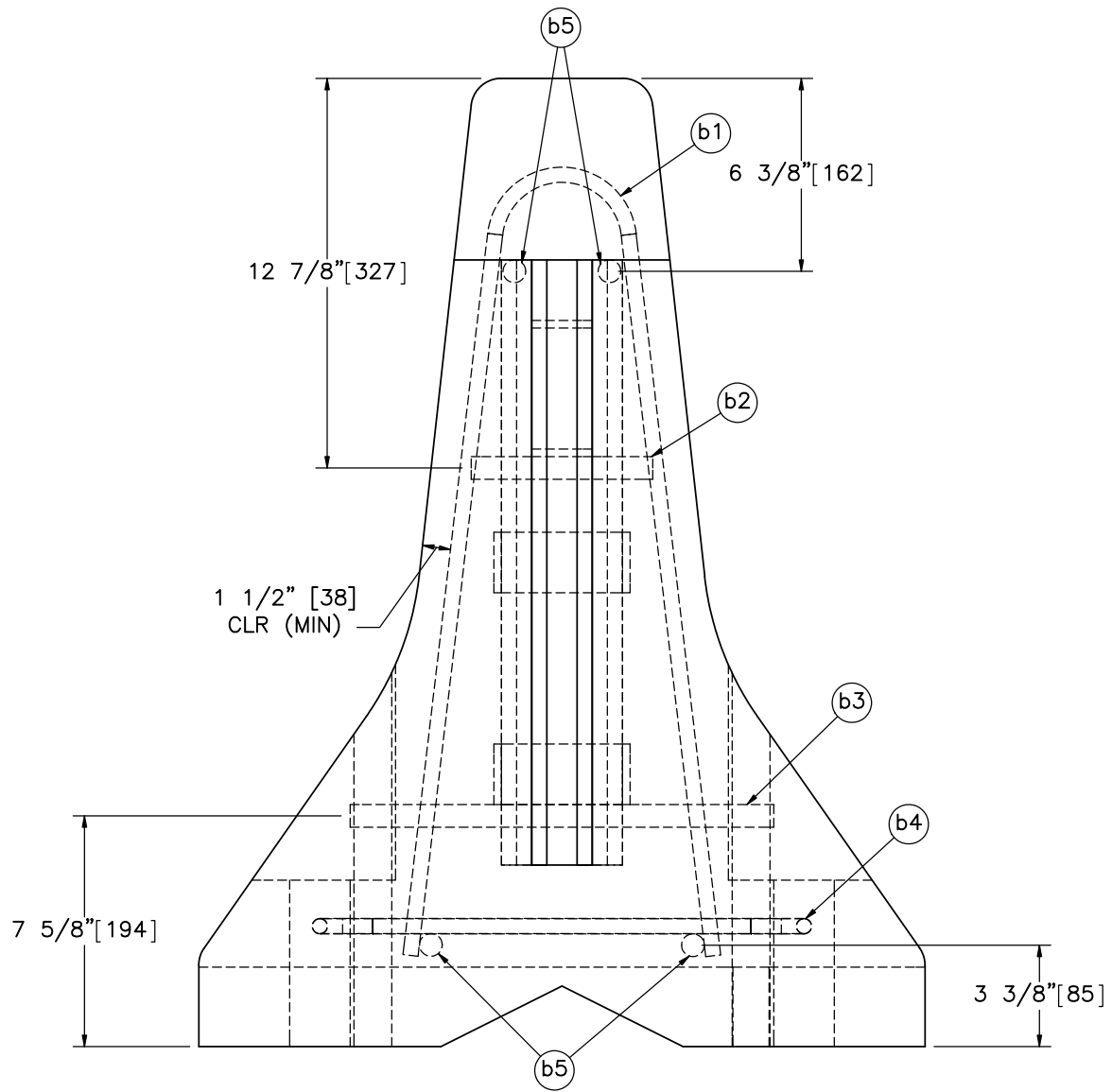
SCALE: 1:27
UNITS: In.[mm]

SHEET:
5 of 14

DATE:
10/30/2018

DRAWN BY:
TJD/MES/DT
M/MBD

REV. BY:
SB/KAL



Midwest Roadside
Safety Facility

NJ Free-Standing
Portable Concrete Barrier
Test NJPCB-4

Reinforcement Details – End
View

DWG. NAME:
NJPCB-4_R8

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

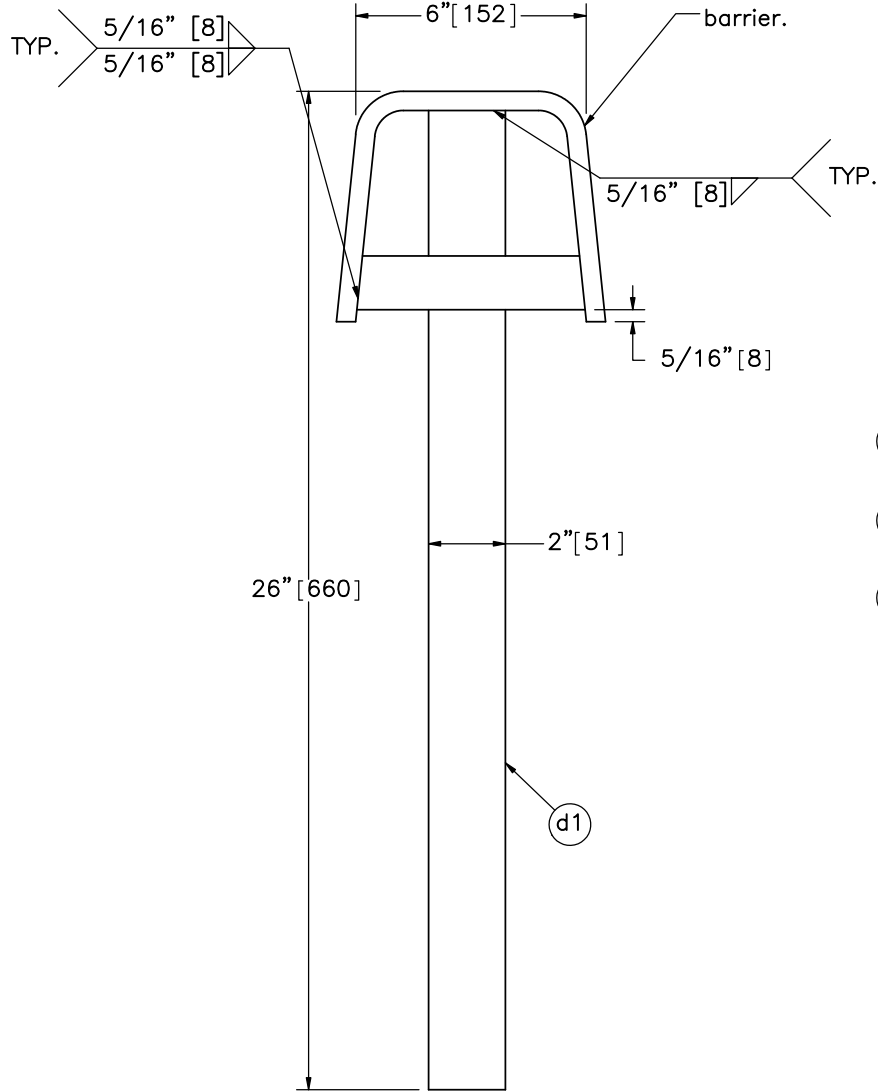
SHEET:
6 of 14

DATE:
10/30/2018

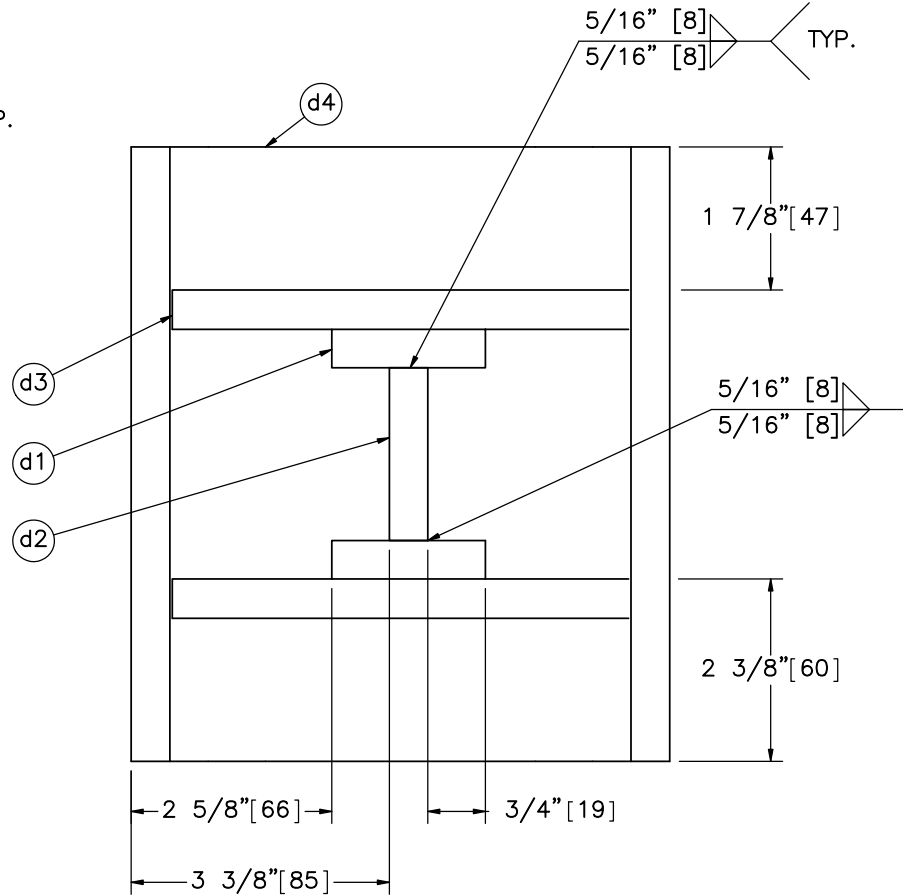
DRAWN BY:
TJD/MES/DT
M/MBD

REV. BY:
SB/KAL

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



PROFILE VIEW



BOTTOM VIEW
SCALE 2:5



Midwest Roadside
Safety Facility

NJ Free-Standing
Portable Concrete Barrier
Test NJPCB-4

Connection Key

DWG. NAME:
NJPCB-4_R8

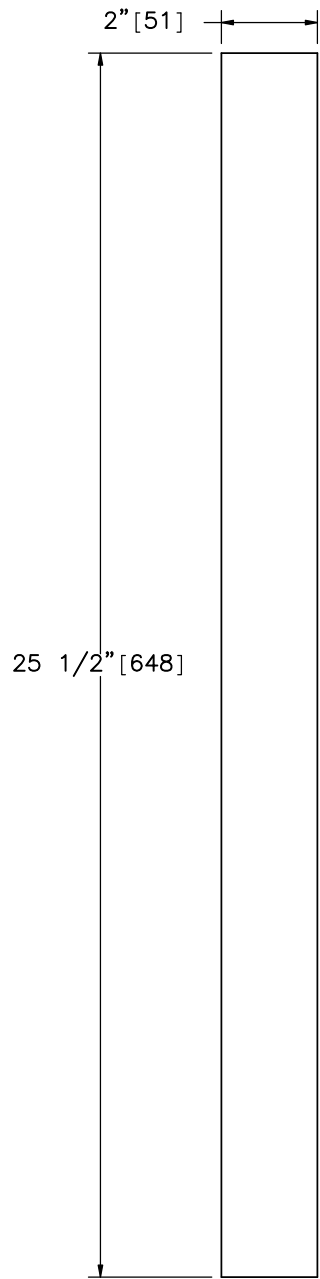
SCALE: 1:5
UNITS: In.[mm]

SHEET:
7 of 14

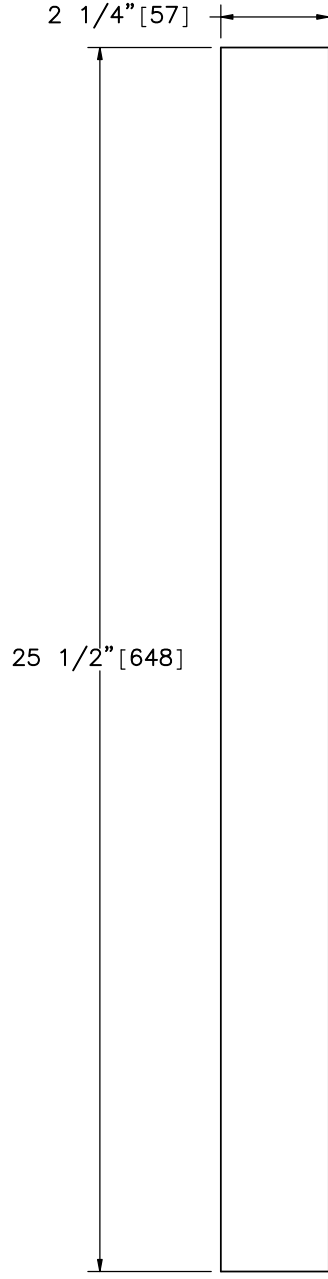
DATE:
10/30/2018

DRAWN BY:
TJD/MES/DT
M/MBD

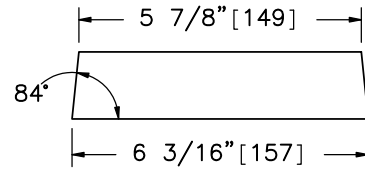
REV. BY:
SB/KAL



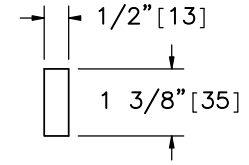
Part d1



Part d2

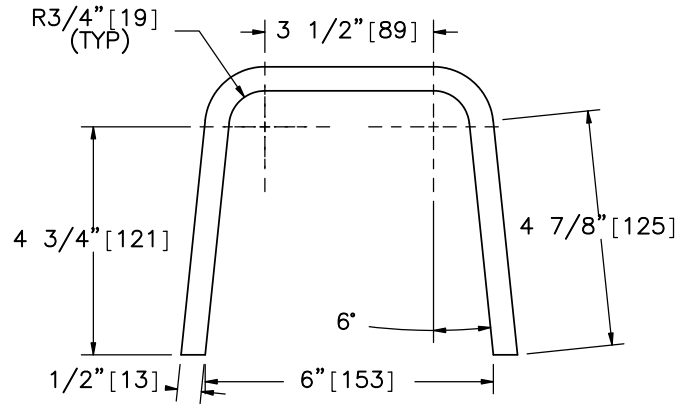


ELEVATION VIEW

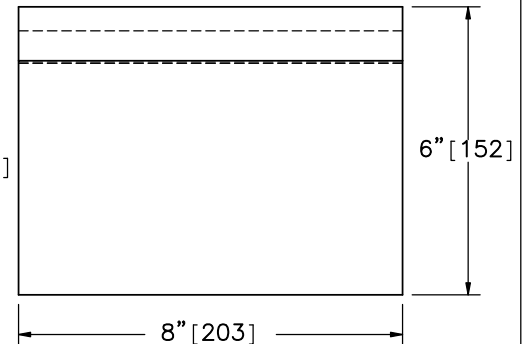


PROFILE VIEW

Part d3



ELEVATION VIEW



PROFILE VIEW

Part d4



Midwest Roadside
Safety Facility

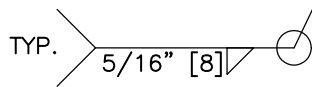
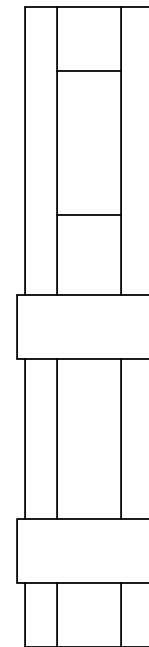
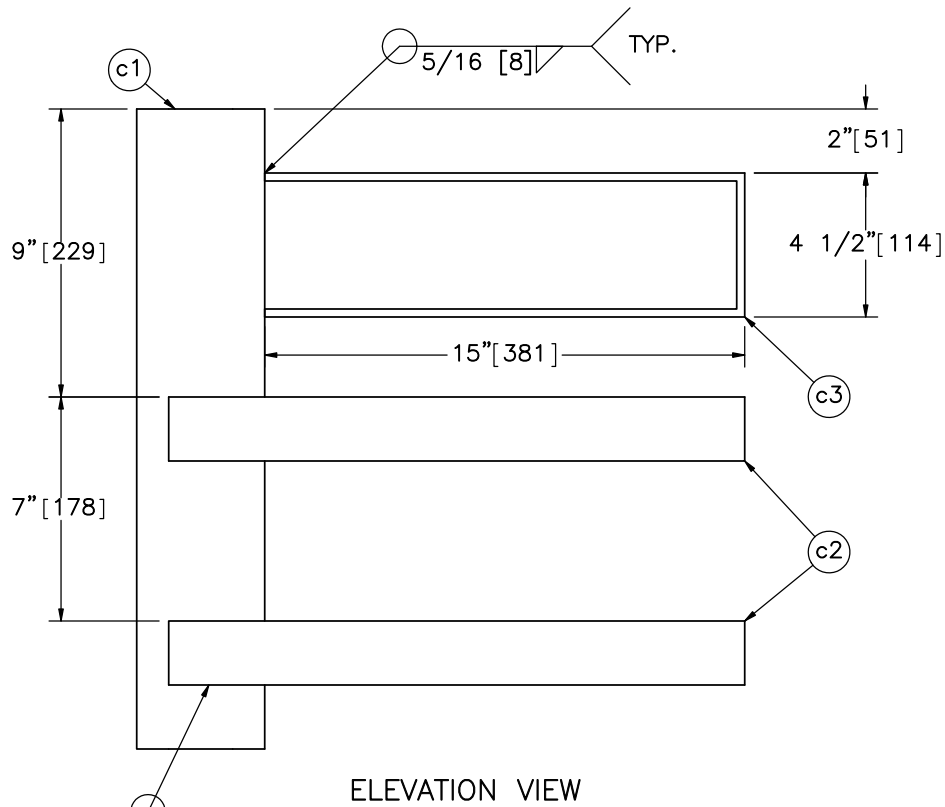
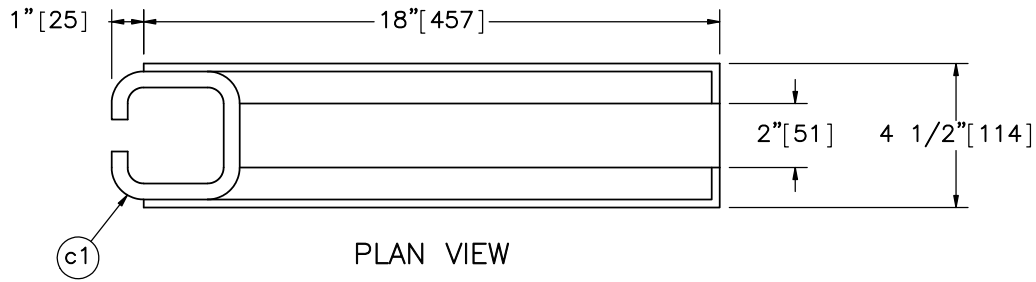
NJ Free-Standing
Portable Concrete Barrier
Test NJPCB-4

Connection Key Components

DWG. NAME:
NJPCB-4_R8

SCALE: 1:4
UNITS: In./mm

SHEET:
8 of 14
DATE:
10/30/2018
DRAWN BY:
TJD/MES/DT
M/MBD
REV. BY:
SB/KAL



Midwest Roadside
Safety Facility

NJ Free-Standing
Portable Concrete Barrier
Test NJPCB-4

Connection Socket

DWG. NAME.
NJPCB-4_R8

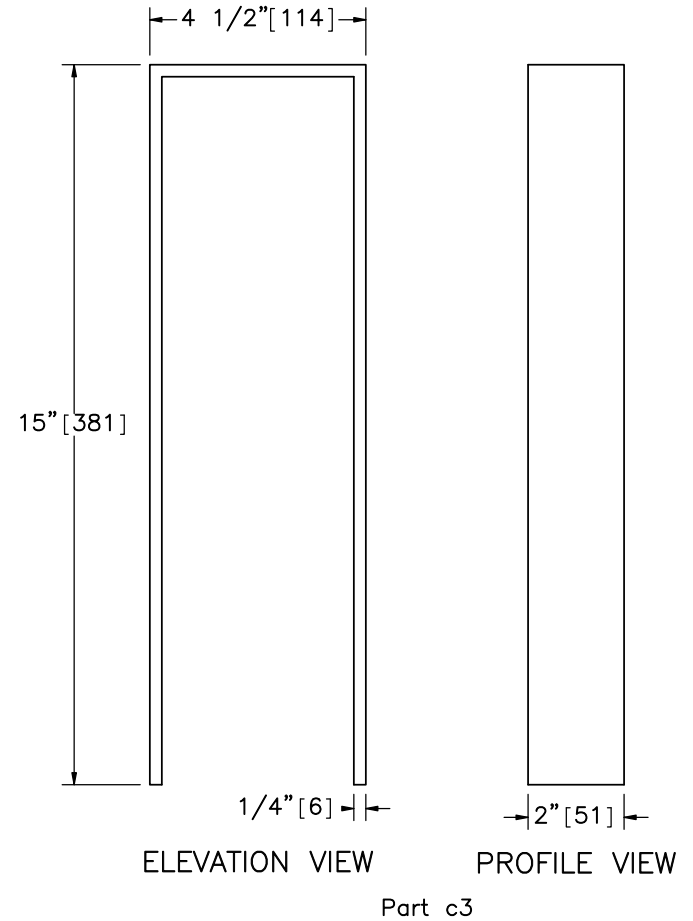
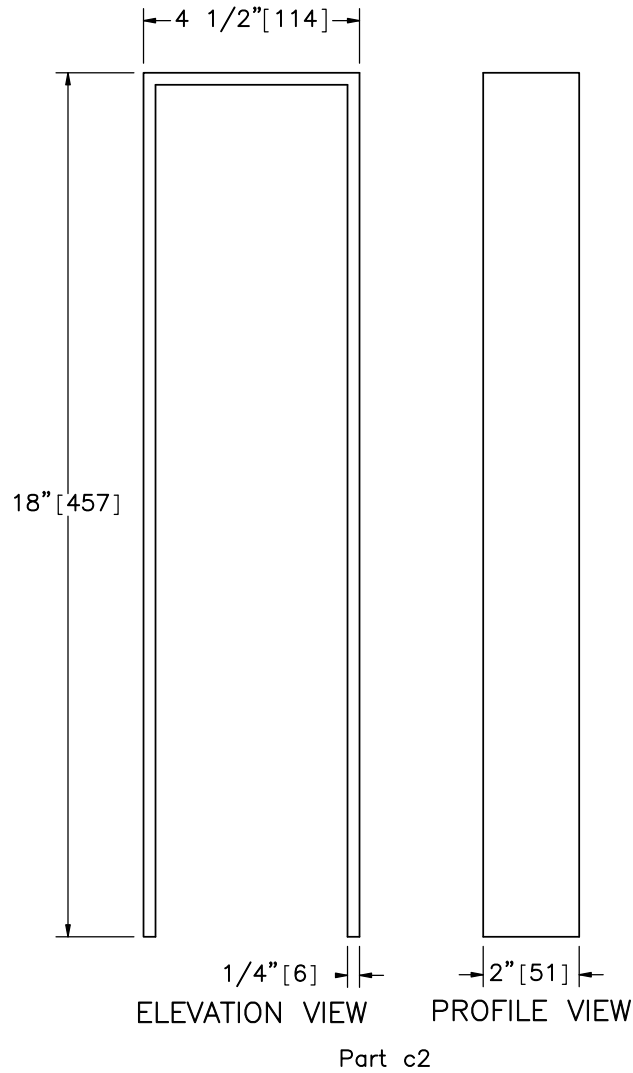
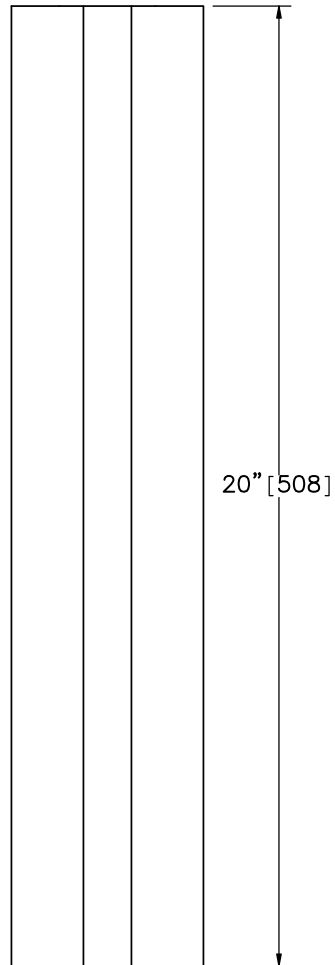
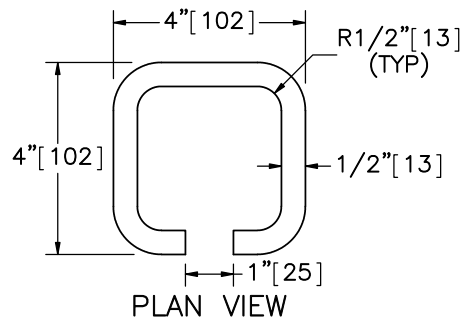
SCALE: 1:6
UNITS: In.[mm]

SHEET:
9 of 14

DATE:
10/30/2018

DRAWN BY:
TJD/MES/DT
M/MBD

REV. BY:
SB/KAL



Midwest Roadside
Safety Facility

NJ Free-Standing
Portable Concrete Barrier
Test NJPCB-4

Connection Socket Components

DWG. NAME:
NJPCB-4_R8

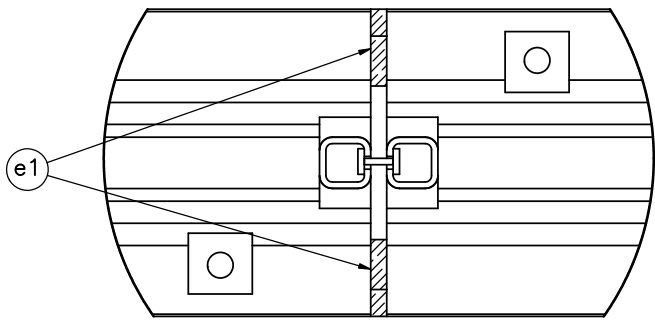
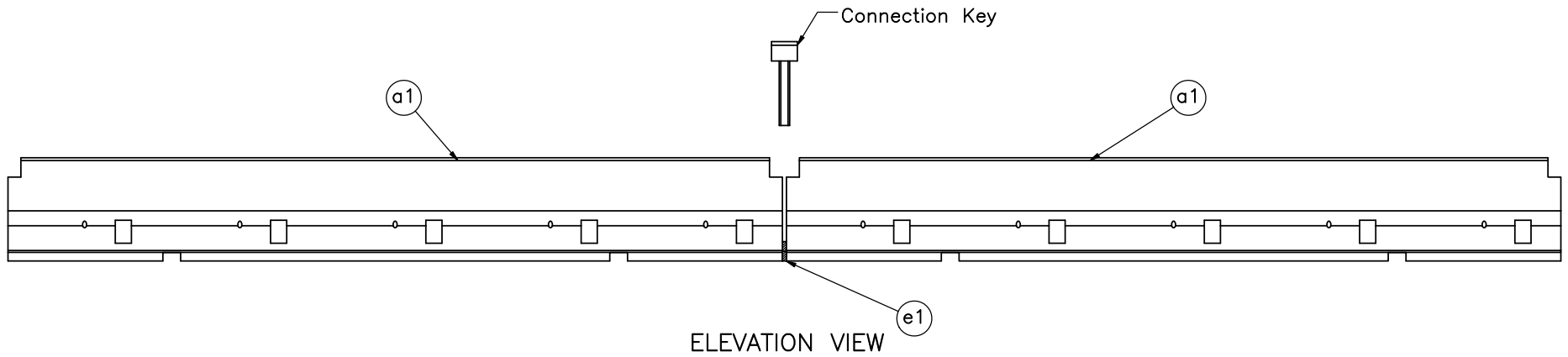
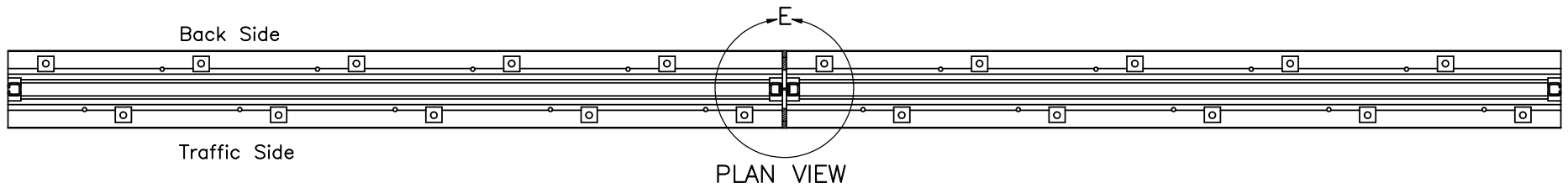
SCALE: 1:4
UNITS: In.[mm]

SHEET:
10 of 14

DATE:
10/30/2018


DRAWN BY:
TJD/MES/DT
M/MBD

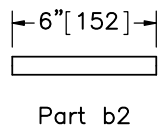
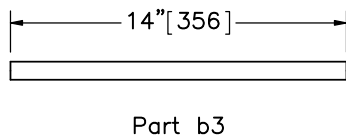
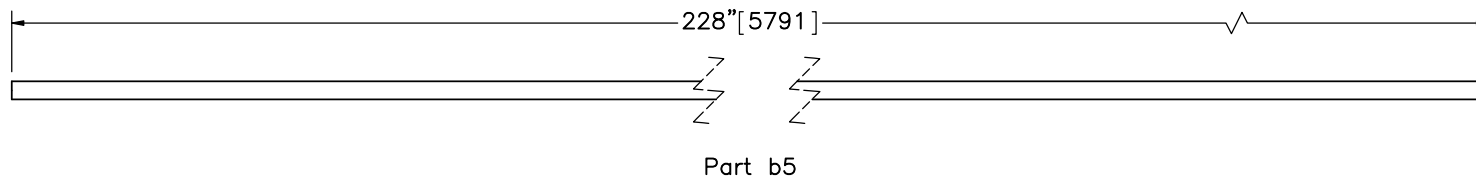
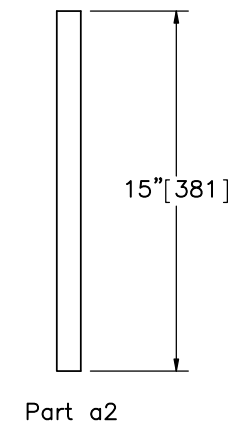
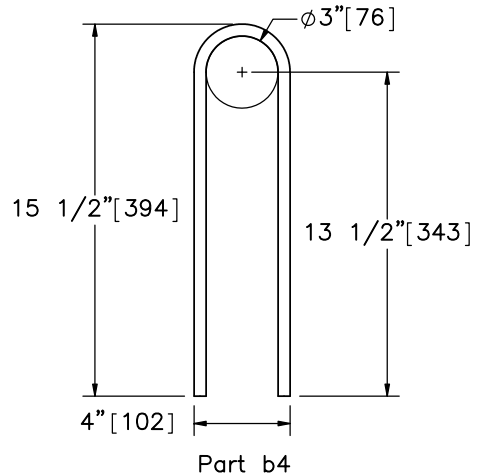
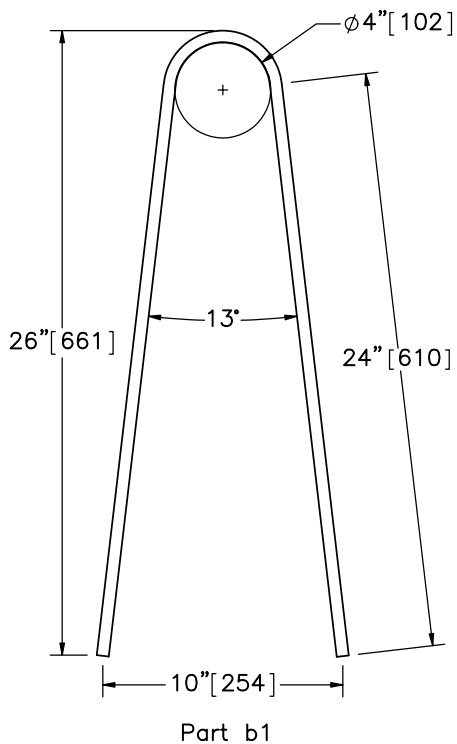
REV. BY:
SB/KAL



DETAIL E
SCALE 1 : 15


- Notes: (1) Curved cover plate and stiffeners not shown in Plan View and Detail E.
- (2) Groundline and vertical anchors at toe of barrier not shown for clarity.

	NJ Free-Standing Portable Concrete Barrier Test NJPCB-4		SHEET: 11 of 14
	Midwest Roadside Safety Facility		DATE: 10/30/2018
Connection Key Placement		DWG. NAME: NJPCB-4_R8	DRAWN BY: TJD/MES/DT M/MBD
		SCALE: 1:50 UNITS: In./mm	REV. BY: SB/KAL




BILL OF BARS				
ITEM NO.	QTY.	BAR SIZE	UNBENT LENGTH	MATERIAL SPEC.
a2	18	$\phi 1'' [25]$	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 Free-Standing Portable Concrete Barrier Test NJPCB-4	SHEET: 12 of 14
	Bill of Bars	DATE: 10/30/2018
DWG. NAME: NJPCB-4_R8	SCALE: 1:8 UNITS: In.[mm]	DRAWN BY: TJD/MES/DT M/MBD
		REV. BY: SB/KAL

- (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. Pin end segments with pins in every anchor pin recess.

	NJ Free-Standing Portable Concrete Barrier Test NJPCB-4		SHEET: 13 of 14
	General Notes		DATE: 10/30/2018
Midwest Roadside Safety Facility	DWG. NAME: NJPCB-4_R8	SCALE: None UNITS: In.[mm]	DRAWN BY: TJD/MES/DT M/MBD
			REV. BY: SB/KAL

Item No.	QTY.	Description	Material Spec	Galvanization Spec
a1	10	Concrete Barrier Segment – NJDOT Type 4 Barrier (Alternate B)	Min. f'c = 3,700 psi [25.5 MPa]	–
a2	18	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.



Midwest Roadside
Safety Facility

NJ Free-Standing
Portable Concrete Barrier
Test NJPCB-4

Bill of Materials

DWG. NAME:
NJPCB-4_R8

SCALE: None
UNITS: In.[mm]

SHEET:
14 of 14
DATE:
10/30/2018
DRAWN BY:
TJD/MES/DT
M/MBD
REV. BY:
SB/KAL

REV.	DATE OF ISSUE	Page	NATURE OF CHANGES	REVIEWER	REVISED BY
0	5/19/2016	–	Drawing created from NJPCB-3.	–	TJD
1	5/20/2016	11	Note edit.	SB	TJD
		12	Bill of bars title edit.		
2	5/25/2016	11	Note edit.	KAL	TJD
		13	Changed sheet scale.		
		14	Bill of materials edit.		
3	6/7/2016	1	Changed grout hatch. Dimension edits.	KAL	TJD
4	6/13/2016	–	Drawing title change.	SB	TJD
5	1/19/2017	–	Template, font sizes, dual dimension placement, conventions updated throughout. Part renumbering. Dimension shifts throughout.	JEK	JEK
6	5/26/2017	14	Edited galvanization spec for part nos. a2, c1, c2, c3, d1, d2, d3, and d4. Added note.	KAL	MES
7	6/5/2017	14	Edited galvanization spec for part nos. b1 through b5.	JEK	DTM
8	10/30/2018	1	Note 6 edit.	KAL	MBD