

- Notes: (1) Test shall be performed according to test designation no. 3-10 of MASH 2016 criteria.
- (2) The impact location is 43  $\frac{3}{16}$ " [1097] upstream of the expansion joint between barrier nos. 3 and 4.
- (3) Mill existing tarmac surface down 2" [51] in order to accommodate 2" [51] thick concrete pad on front side of barrier.



Midwest Roadside Safety Facility

Hawaii 42" Aesthetic Concrete Bridge Rail Test No. H42BR-1

System Layout

DWG. NAME:  
H42BR-1\_R2

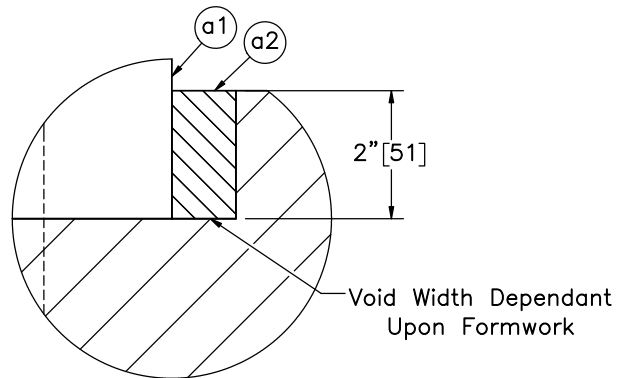
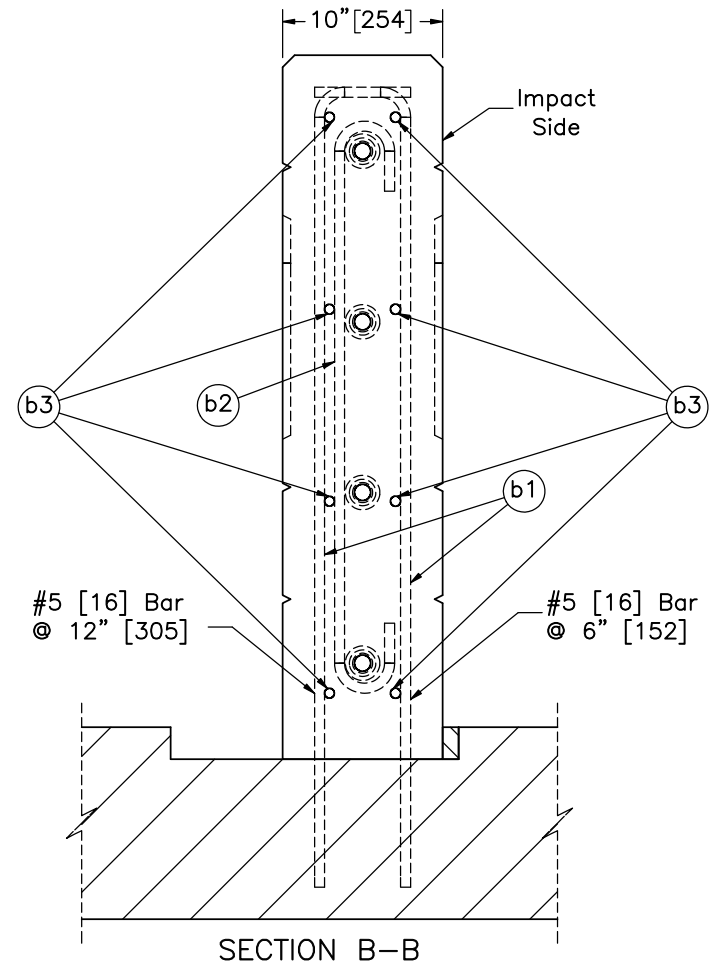
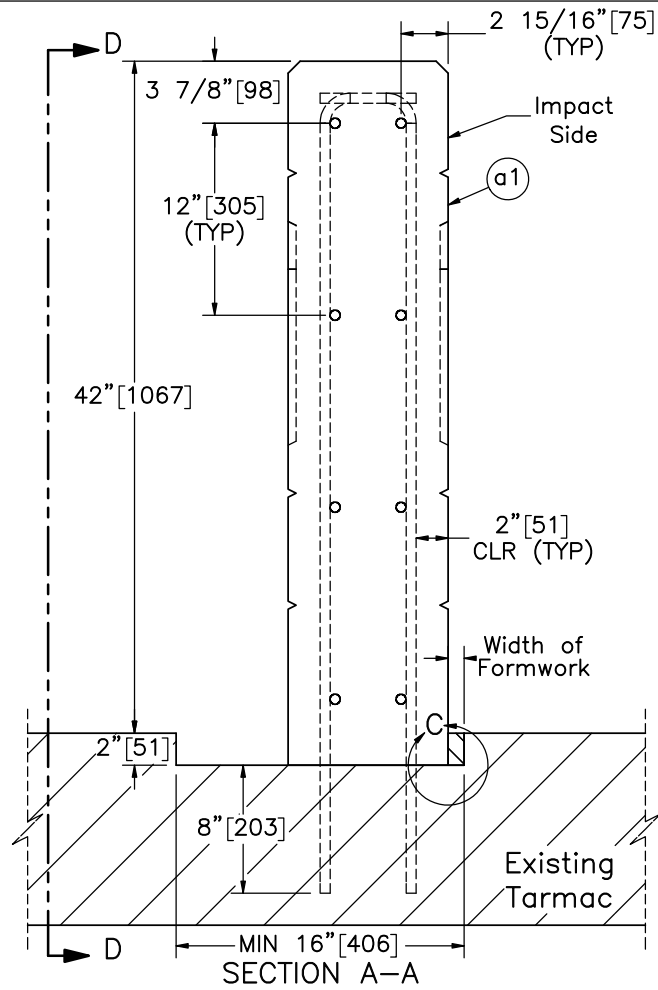
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UNITS: in.[mm]

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1 of 9

DATE:  
3/29/2019

DRAWN BY:  
DJW/MKB

REV. BY:  
JEK/JCH



DETAIL C  
SCALE 1:3

- Notes: (1) Mill existing tarmac surface down to a depth of 2" [51] and a minimum width of 16" [406] to allow for recess of bridge rail on tarmac and installation of concrete formwork. After removal of formwork, fill void on impact side only, using low-strength concrete (part a2).
- (2) Reinforcement bar no. b1 is to be anchored into the existing tarmac with Hilti HIT RE-500 V3 (part c4).



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Safety Facility

Hawaii 42" Aesthetic  
Concrete Bridge Rail  
Test No. H42BR-1

Section Details

DWG. NAME:  
H42BR-1\_R2

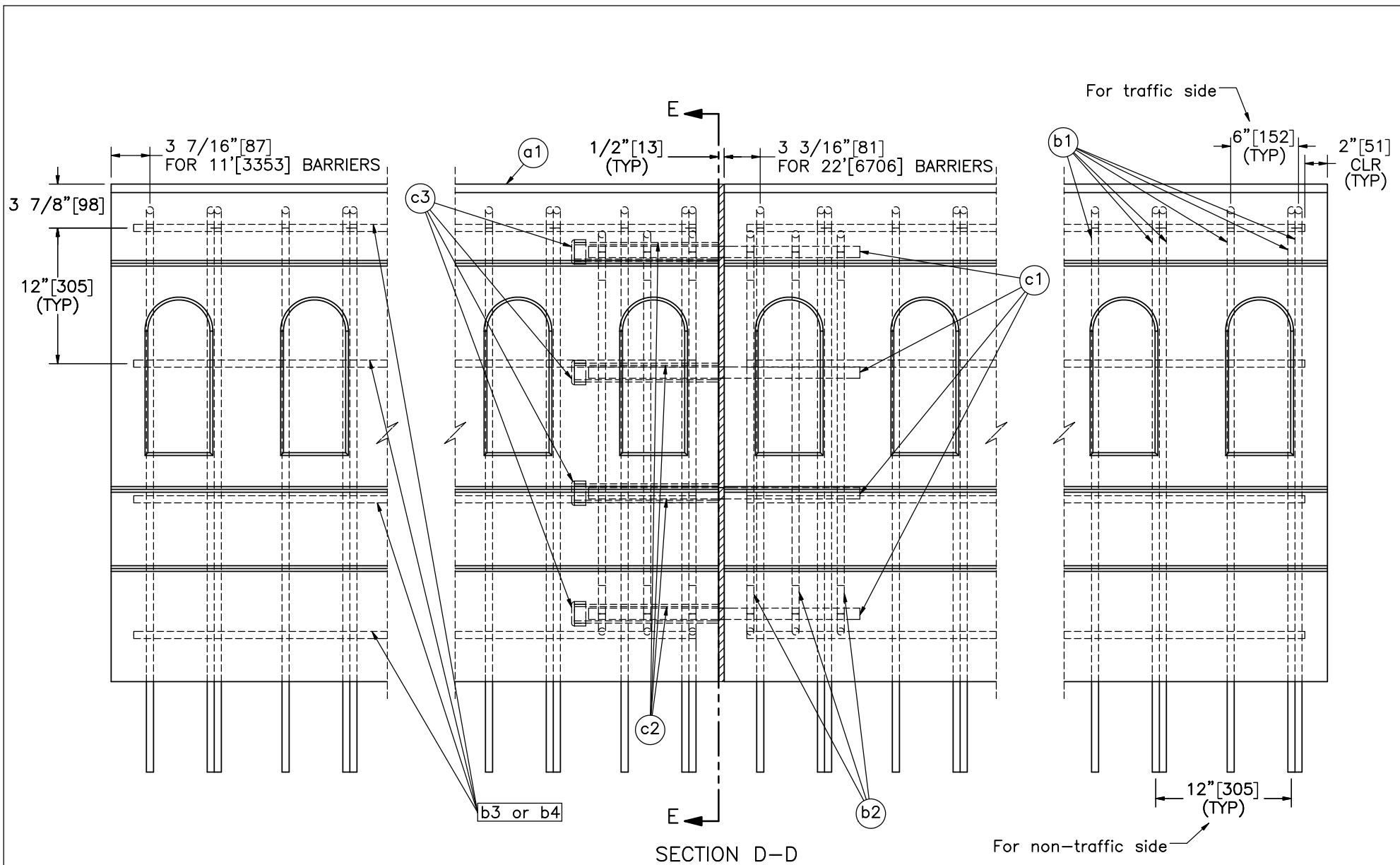
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UNITS: in.[mm]

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3/29/2019

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- Notes: (1) 1/2" [13] expansion joints to be bonded together by premolded joint filler and joint sealer (parts c5 and c6) according to specifications.  
 (2) PVC tubes (parts c2 and c3) are to be cast on the upstream side of expansion joints.



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Reinforcement Detail

DWG. NAME:  
 H42BR-1\_R2

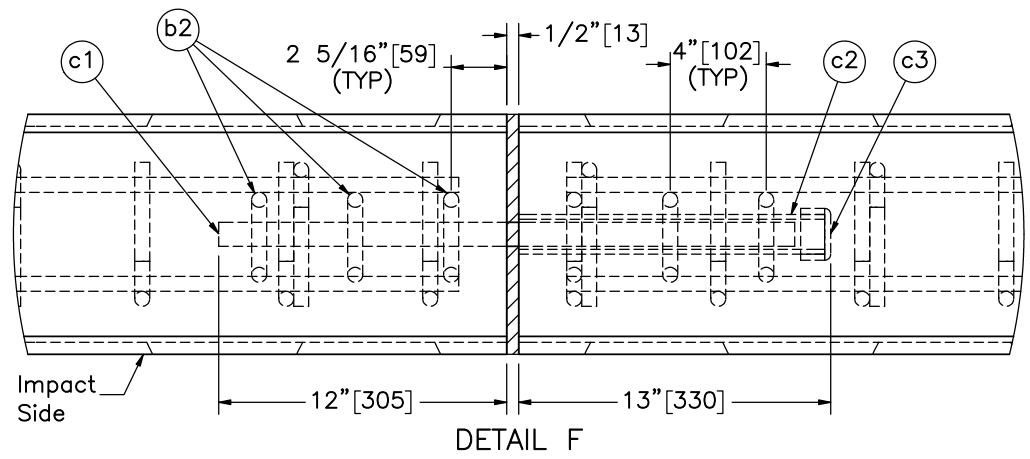
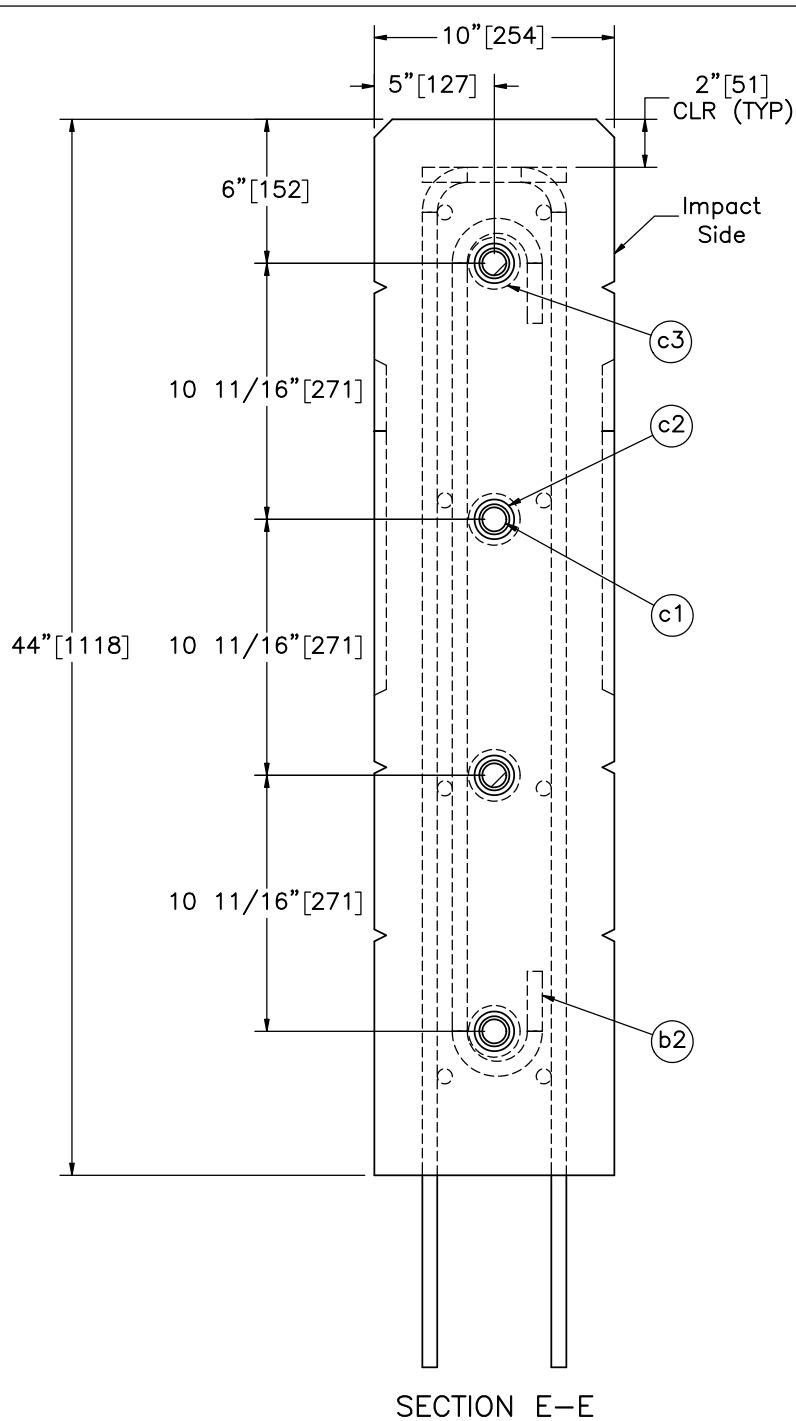
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 UNITS: in.[mm]

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Notes: (1) Smooth dowels (Part c1) are cast in place on one side of the expansion joint, and inserted into plastic sleeves (Part c2), which are cast into the barrier on the other side of the expansion joint.



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Concrete Bridge Rail  
Test No. H42BR-1

Expansion Joint Details

DWG. NAME:  
H42BR-1\_R2

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

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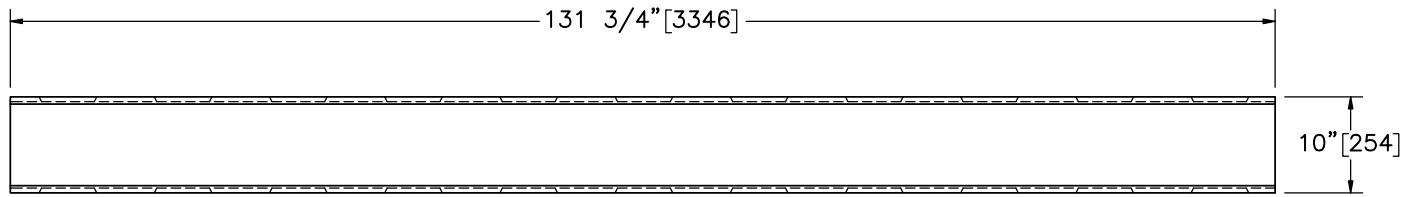
DATE:  
3/29/2019

DRAWN BY:  
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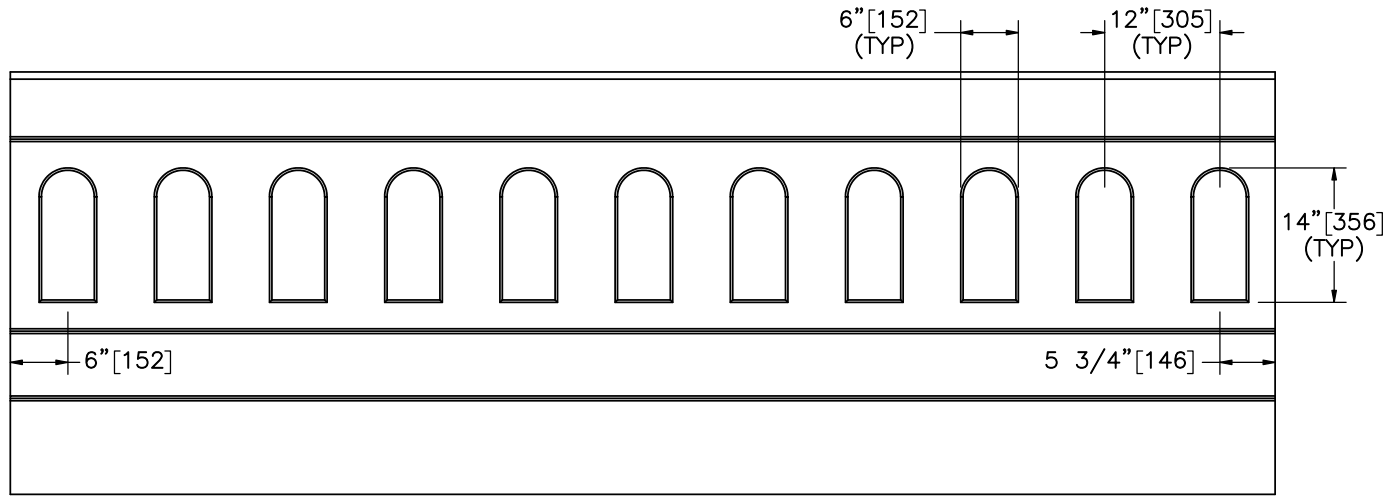
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JEK/JCH

SECTION E-E

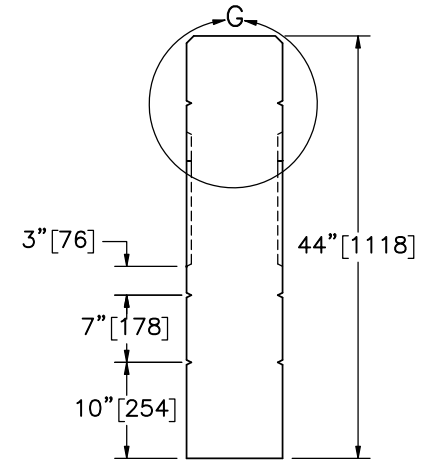
DETAIL F



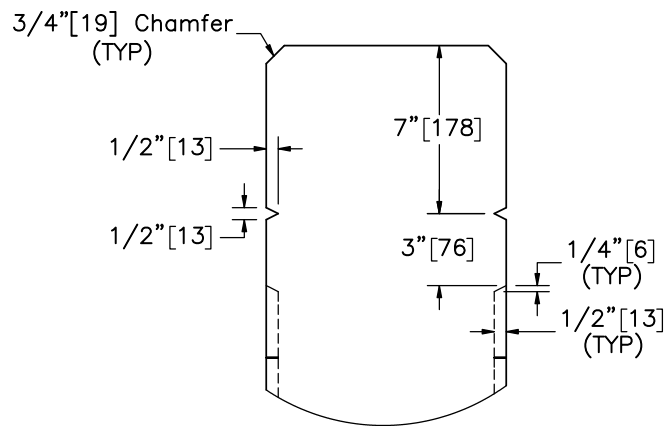
PLAN VIEW



ELEVATION VIEW



PROFILE VIEW



DETAIL G  
SCALE 1:8



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Safety Facility

Hawaii 42" Aesthetic  
Concrete Bridge Rail  
Test No. H42BR-1

11' [3353] Concrete Parapet  
Details

DWG. NAME:  
H42BR-1\_R2

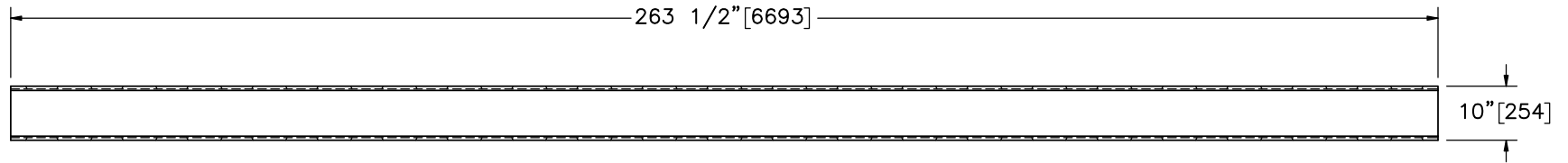
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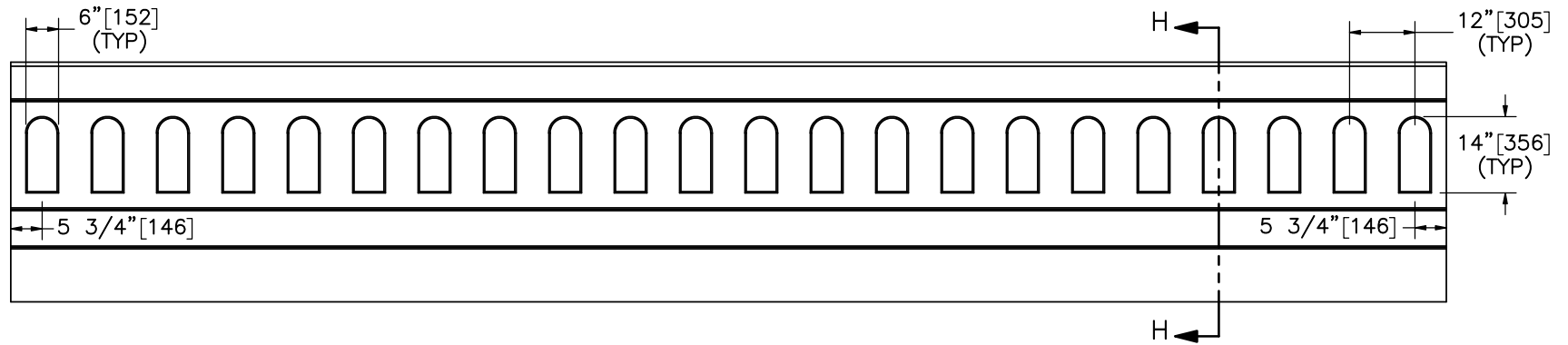
DATE:  
3/29/2019

DRAWN BY:  
DJW/MKB

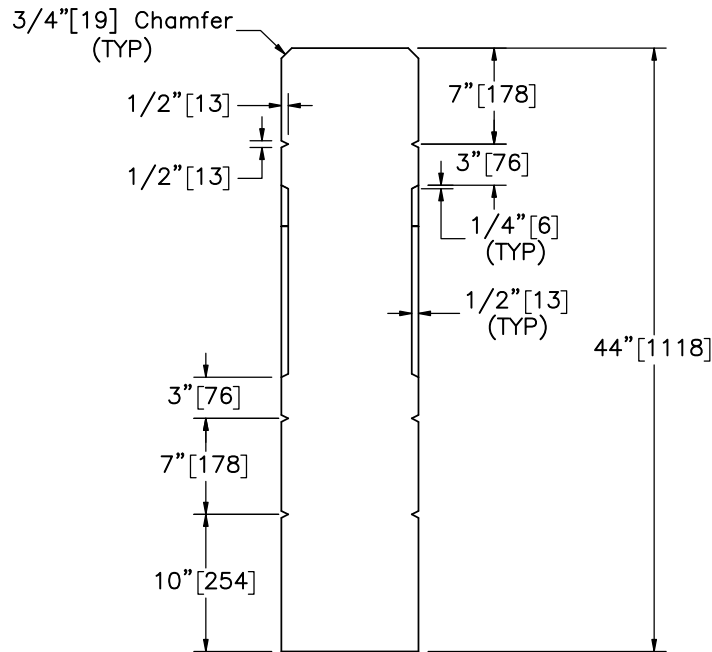
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JEK/JCH



PLAN VIEW



ELEVATION VIEW



SECTION H-H  
SCALE 1:14



Midwest Roadside  
Safety Facility

Hawaii 42" Aesthetic  
Concrete Bridge Rail  
Test No. H42BR-1

22' [6706] Concrete Parapet  
Details

DWG. NAME:  
H42BR-1\_R2

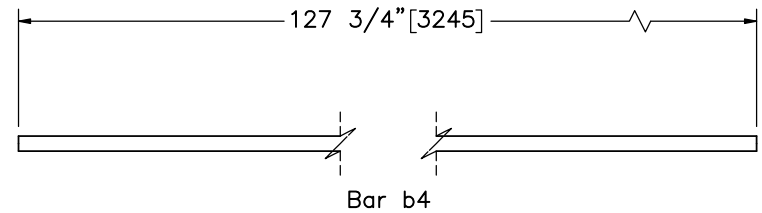
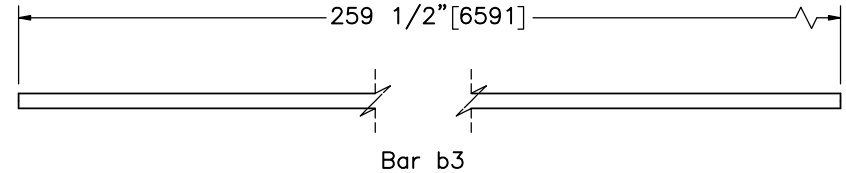
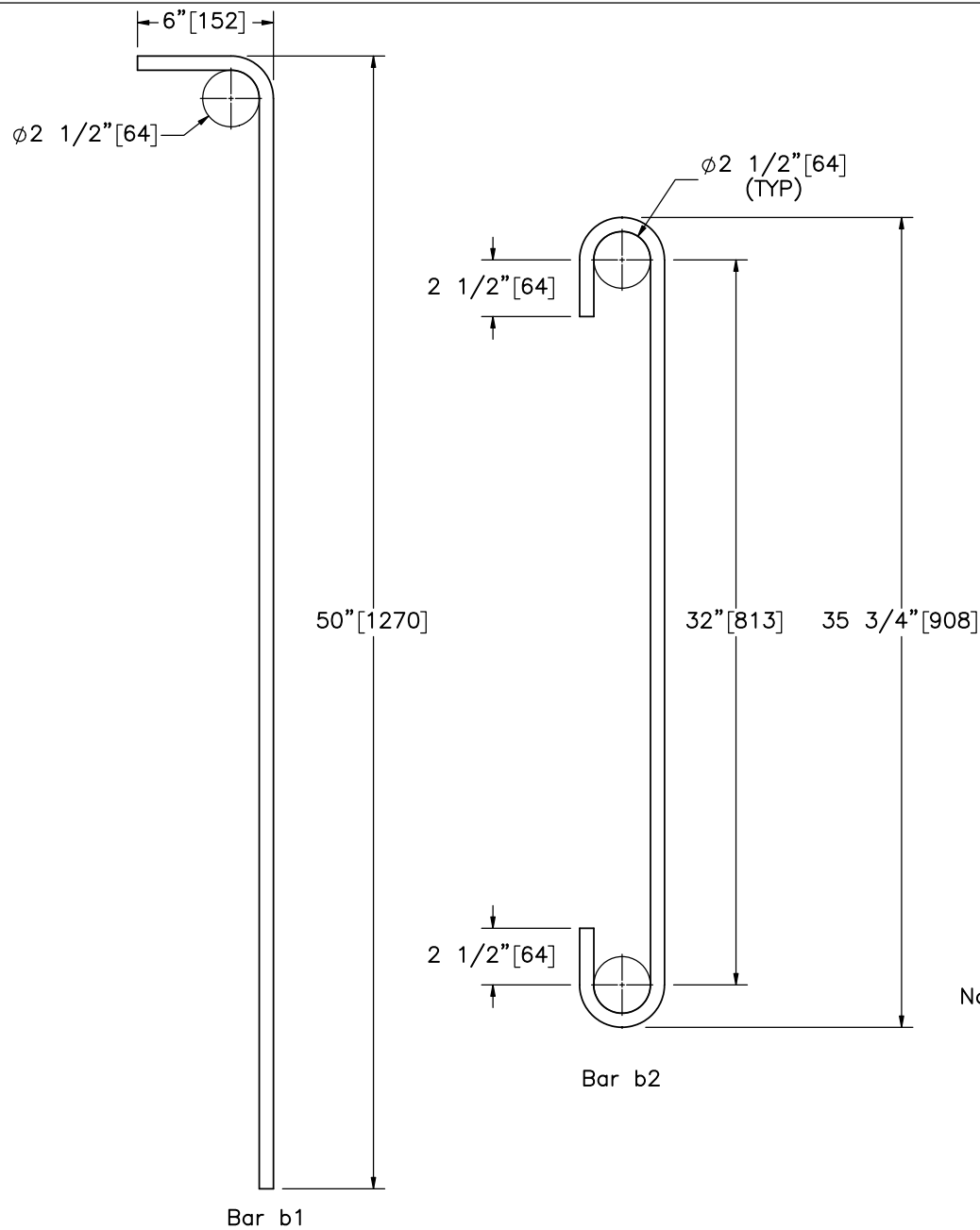
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UNITS: in.[mm]

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- Notes: (1) Reinforced Steel: Deformed and plain carbon steel bars for concrete reinforcement shall meet the requirements of AASHTO M31M/M31-07 Grade 60 (ASTM A615-15a Grade 60).  
 (2) Steel reinforcing shall be supported, bent and placed as per AASHTO LRFD Bridge Design Specifications, 7th Edition, 2014 including all interim revisions.

Bill of Bars				
Part No.	Bar No.	Qty.	Unbent Length	Material Specification
b1	#5	264	54 3/4" [1391]	ASTM A615 Gr. 60
b2	#5	24	46 7/8" [1191]	ASTM A615 Gr. 60
b3	#5	24	259 1/2" [6591]	ASTM A615 Gr. 60
b4	#5	16	127 3/4" [3245]	ASTM A615 Gr. 60



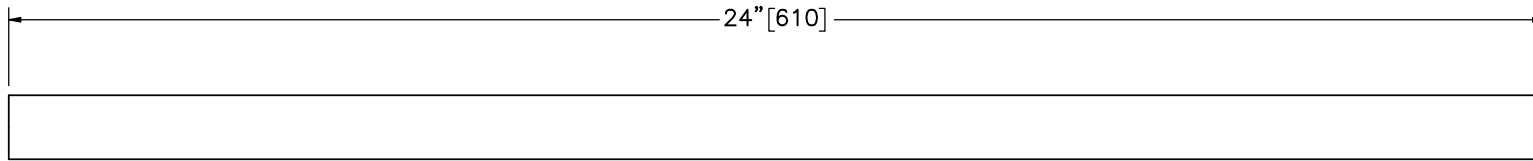
Midwest Roadside Safety Facility

Hawaii 42" Aesthetic Concrete Bridge Rail  
 Test No. H42BR-1

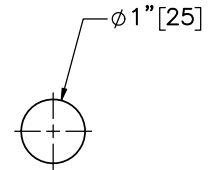
Rebar Details

DWG. NAME: H42BR-1\_R2  
 SCALE: 1:8  
 UNITS: in.[mm]

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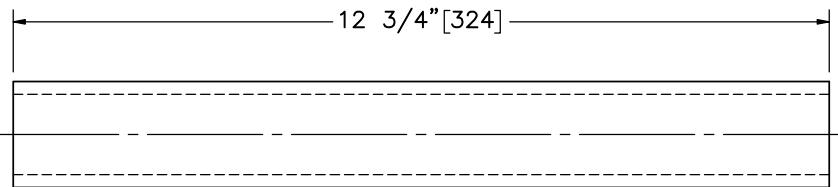


ELEVATION VIEW

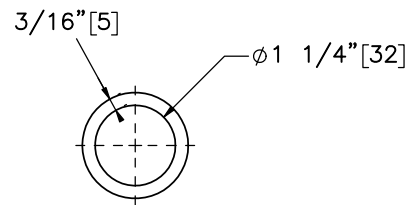


PROFILE VIEW

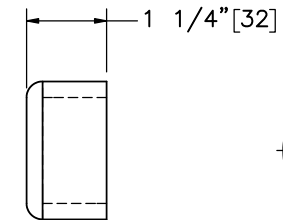
Part c1



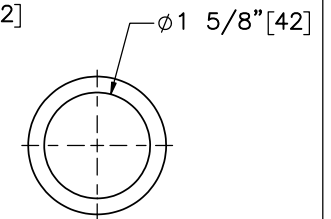
ELEVATION VIEW



PROFILE VIEW



ELEVATION VIEW



PROFILE VIEW

Part c3

Part c2



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Safety Facility

Hawaii 42" Aesthetic  
Concrete Bridge Rail  
Test No. H42BR-1

Expansion Joint Components

DWG. NAME:  
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SCALE: 1:3  
UNITS: in.[mm]

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Item No.	QTY.	Description	Material Specification	Treatment Specification
a1	–	Reinforced Concrete	Min. f'c = 4,000 psi [27.6 MPa] NE Mix 47BD	–
a2	–	Low-Strength Concrete Overlay	Concrete NE Mix 9019 CITY	–
b1	264	#5 [16] Rebar, 54 3/4" [1391] Total Unbent Length	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*
b2	24	#5 [16] Rebar, 46 7/8" [1191] Total Unbent Length	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*
b3	24	#5 [16] Rebar, 259 1/2" [6591] Total Length	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*
b4	16	#5 [16] Rebar, 127 3/4" [3245] Total Length	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*
c1	16	#8 [25] Smooth Rebar, 24" [288] Total Length	ASTM A615 Gr. 60	Epoxy Coated (ASTM A775 or A934)*
c2	16	1 1/4" [32] Dia. PVC Pipe	Schedule 80 PVC Gr. 12454	–
c3	16	1 1/4" [32] PVC Cap	Schedule 80 PVC Gr. 12454	–
c4	–	Epoxy Adhesive	Hilti HIT RE-500 V3	–
c5	–	Expansion Joint Filler	AASHTO M33, M153, or M213	–
c6	–	Expansion Joint Sealant	AASHTO M173, M282, M301, ASTM D3581, or ASTM D5893	–

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



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Hawaii 42" Aesthetic  
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Test No. H42BR-1

Bill of Materials

DWG. NAME.  
H42BR-1\_R2

SCALE: None  
UNITS: in.[mm]

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REV.	DATE OF ISSUE	Page	NATURE OF CHANGES	REVIEWER	REVISED BY
0	1/29/2019	-	Drawing created from H34BR-1_R5.	-	DJW
1	2/4/2019	1	Cosmetic note and section line edits.	JEK	DJW
		2	Cosmetic note and section line edits. Note 1 edit.		
		3	Cosmetic note edit.		
		5,6	Reletter section views.		
2	3/29/2019	3	Note add.	JCH	MKB