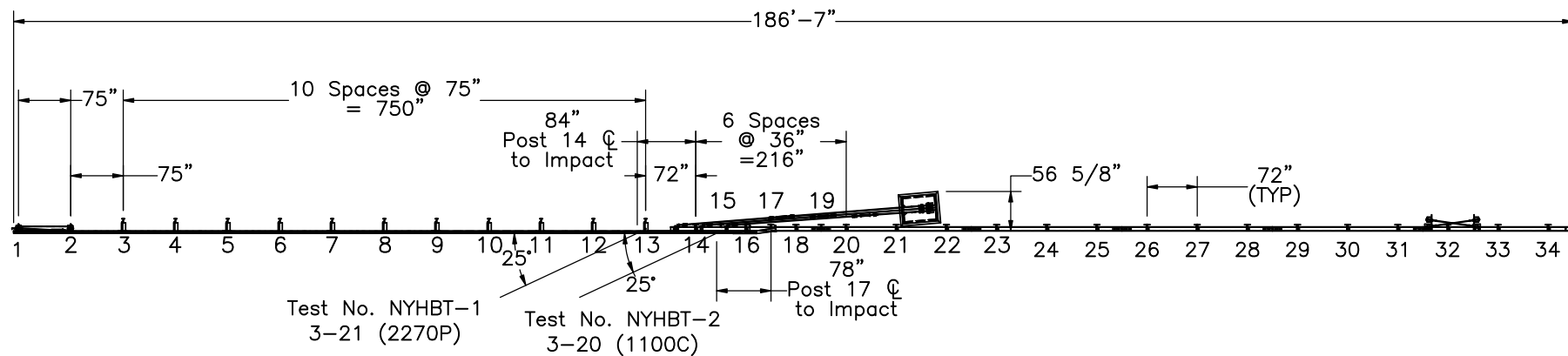
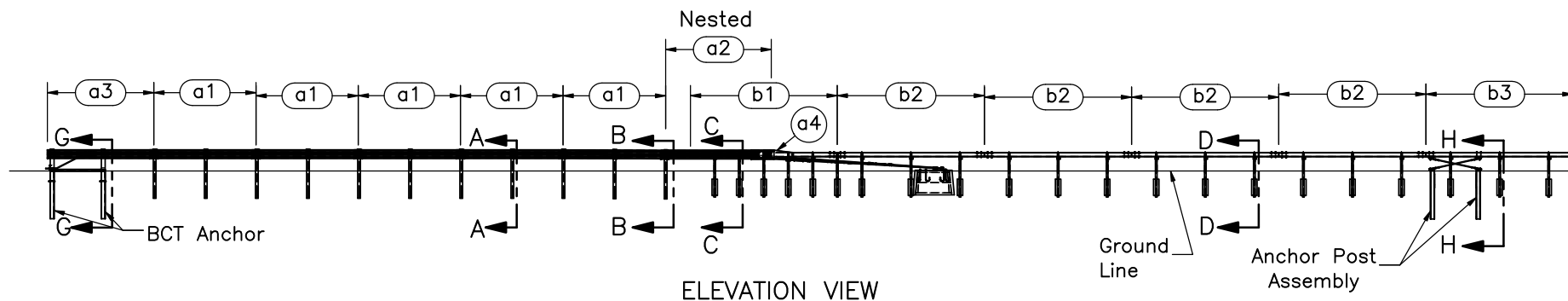




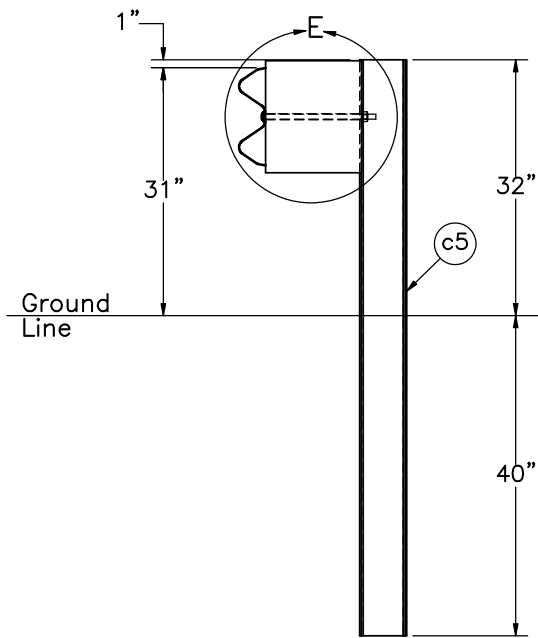
PLAN VIEW



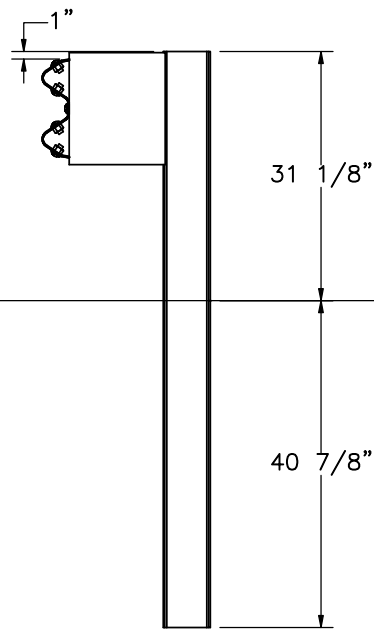
ELEVATION VIEW

- Notes: (1) Test shall be performed according to test designation no. 3-20 and 3-21 using MASH 2016 criteria.
 (2) The impact location for the first test is 84" upstream from the centerline of post no. 14.
 (3) The impact location for the second test is 78" upstream from the centerline of post no. 17.
 (3) Critical region is located between post nos. 11 and 25.
 (4) Anchor posts are placed in $\phi 3'$ holes, then backfilled and tamped with soil.

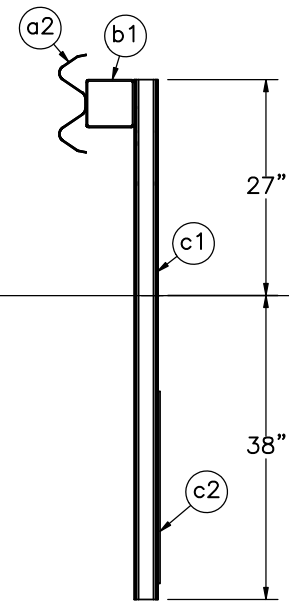
	NY HPBO W-Beam to Box Beam Transition Test Series NYHBT		SHEET: 1 of 37
	System Layout		DATE: 8/6/2021
DWG. NAME: NYHBT-1-2_R20		SCALE: 1:240 UNITS: in.	DRAWN BY: MKB/JEK/JRD/MJM/GHR REV. BY: JEK/KAL/LTH/SBW/JCH/JRR



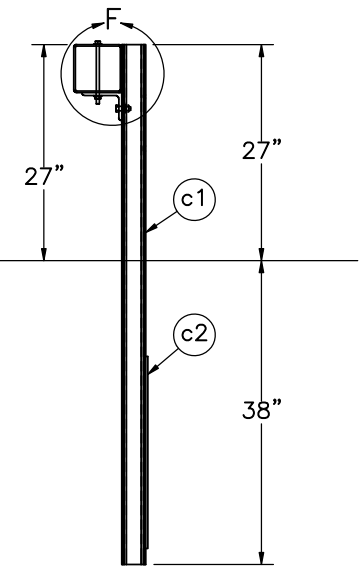
SECTION A-A
Post Nos. 3-11



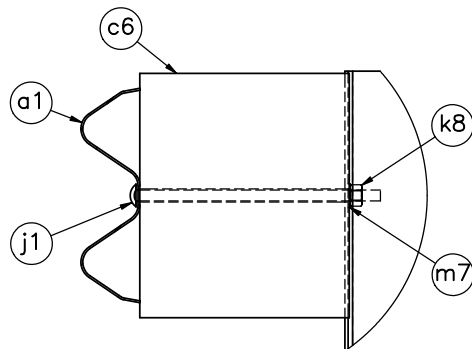
SECTION B-B
Post No. 13



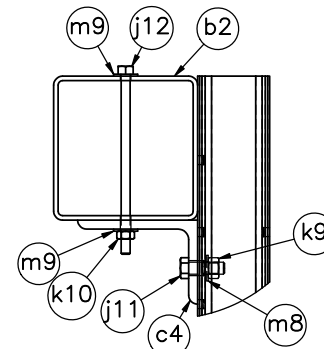
SECTION C-C
Post Nos. 15, 17, and 19
Posts not connected to rail



SECTION D-D
Post Nos. 14, 16, 18,
and 20-34



DETAIL E
SCALE 1:11



DETAIL F
SCALE 1:8

- Notes: (1) Guardrail bolts (part j1) on the upstream side of the web.
(2) Box beam post bolts (part j12) on the upstream side of the web.
(3) HPBO system may have routed blockouts or may use nails to prevent blockout rotation.



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Post Sections

DWG. NAME.
NYHBT-1-2_R20

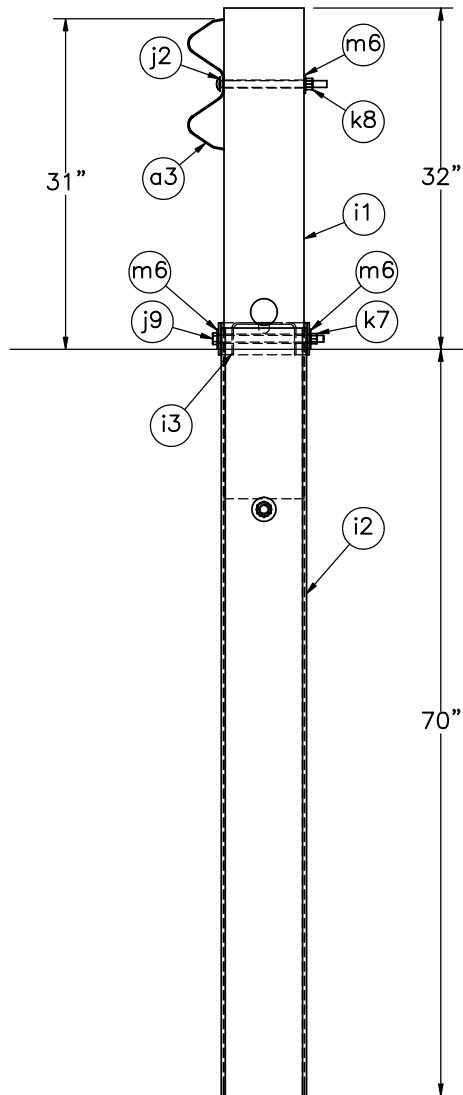
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SHEET:
2 of 37

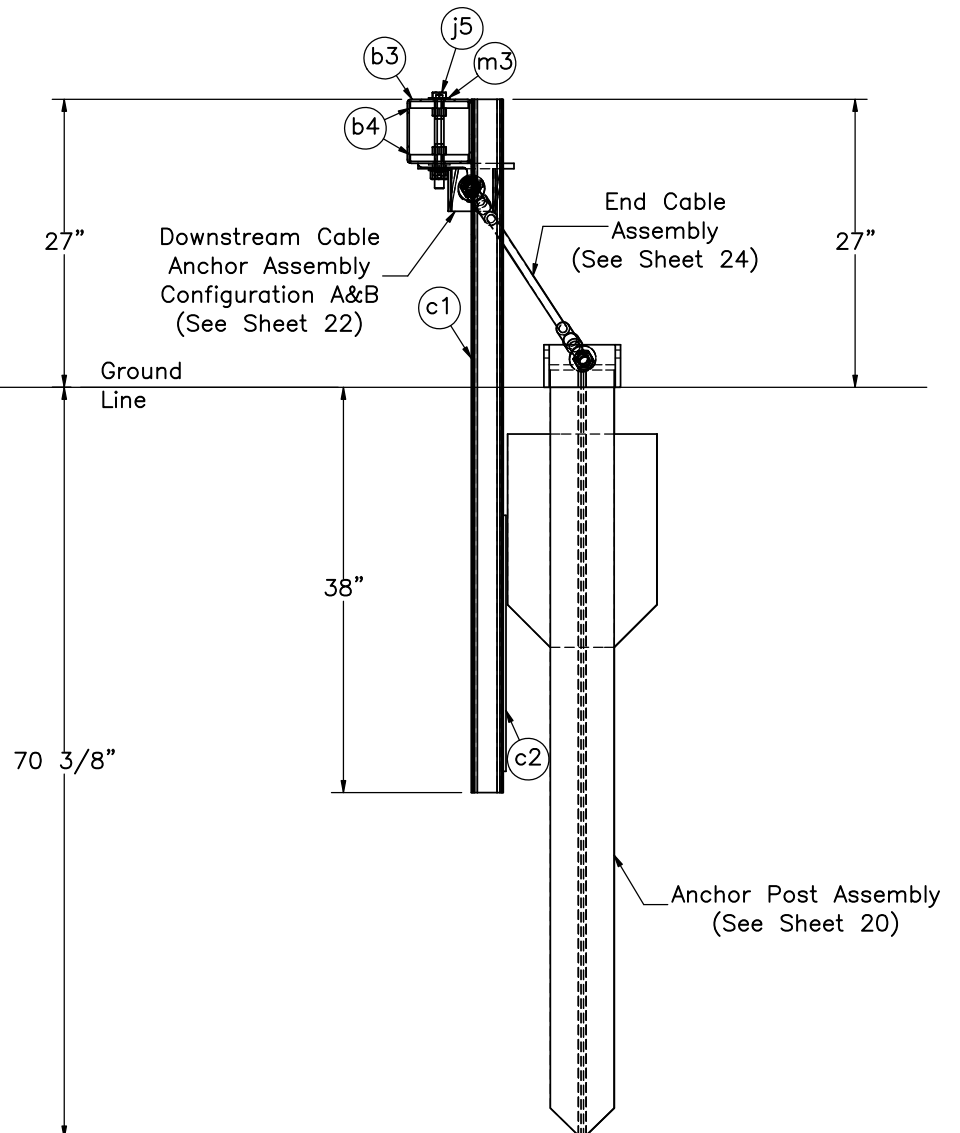
DATE:
8/6/2021

DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



SECTION G-G
Post Nos. 1 and 2



SECTION H-H



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Anchor Post Sections

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NYHBT-1-2_R20

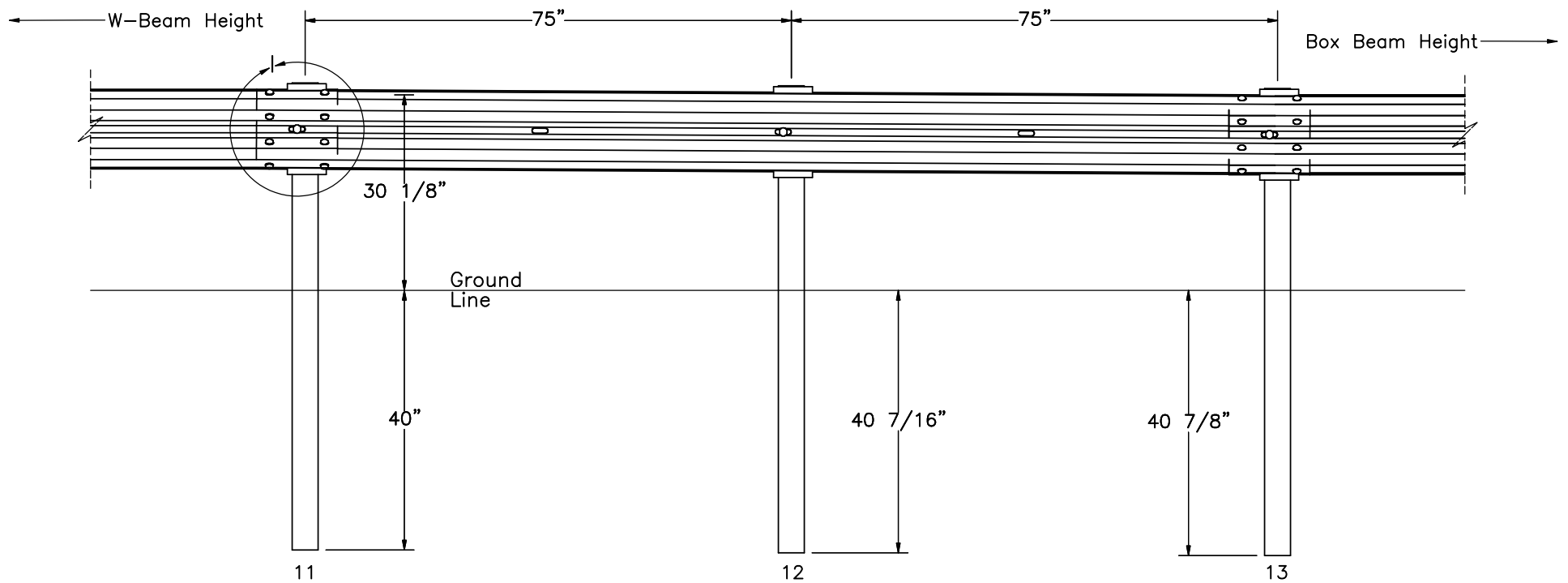
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SHEET:
3 of 37

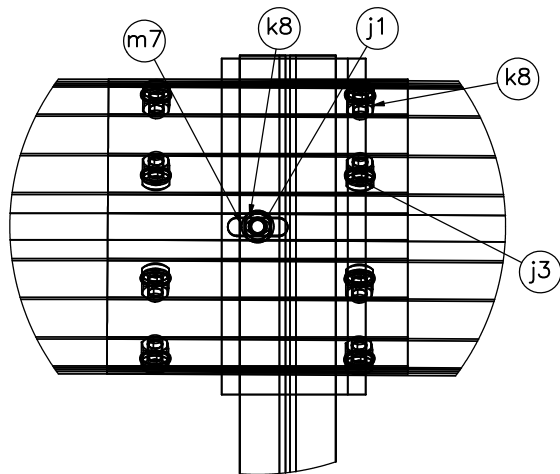
DATE:
8/6/2021

DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



ELEVATION VIEW



DETAIL I
SCALE 1:8



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Rail Elevation Transition Details

DWG. NAME.
NYHBT-1-2_R20

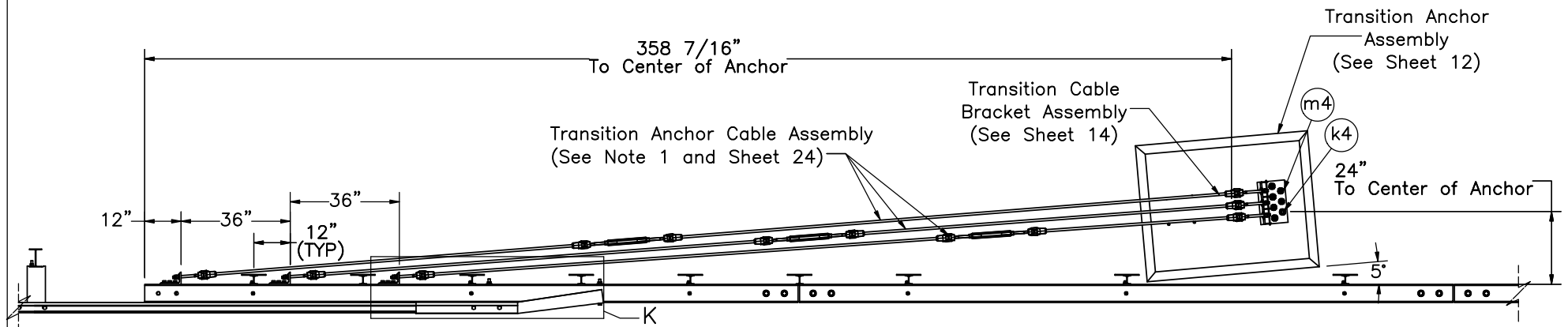
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SHEET:
4 of 37

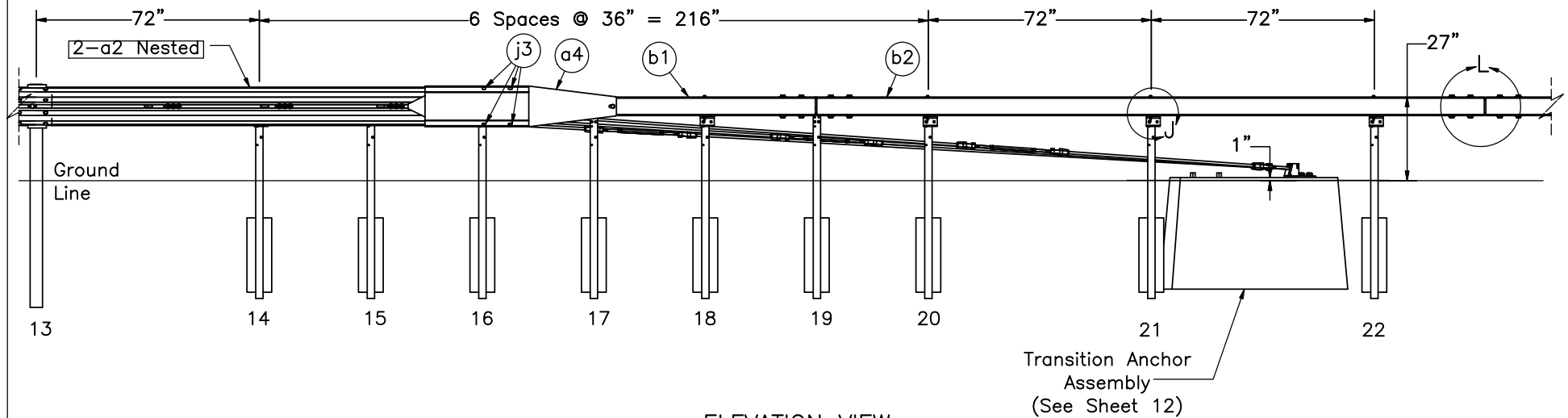
DATE:
8/6/2021

DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



PLAN VIEW



ELEVATION VIEW

Note: (1) The turnbuckles in the transition anchor cable assemblies should be approximately 5', 10', and 15' from the transition cable bracket assembly, with the 5' spacing on the cable nearest the travelway.



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Transition Layout

DWG. NAME.
NYHBT-1-2_R20

SCALE: 1:50
UNITS: in.

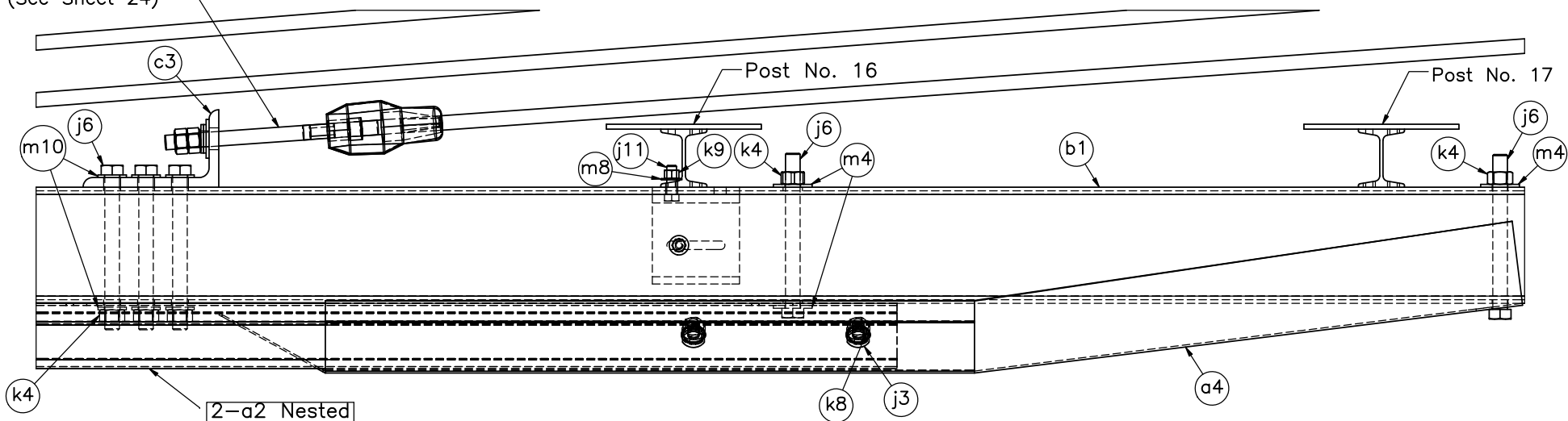
SHEET:
5 of 37

DATE:
8/6/2021

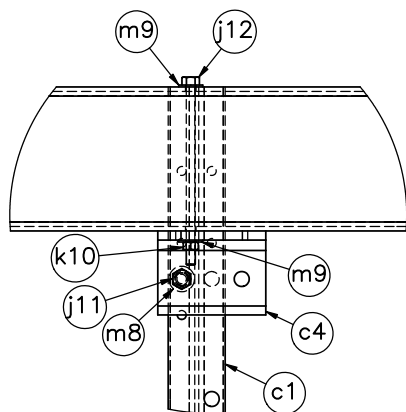
DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR

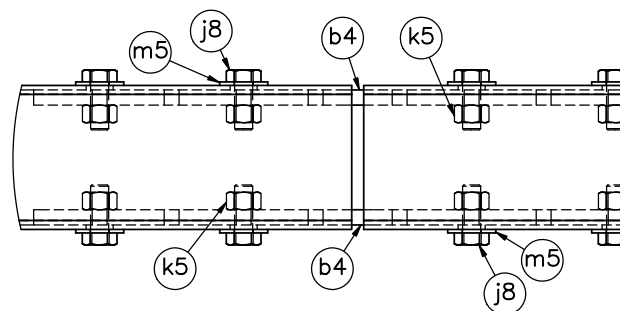
Transition Anchor
Cable Assembly
(See Sheet 24)



DETAIL K



DETAIL J



DETAIL L



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Transition, Post Attachment,
and Box Splice Details

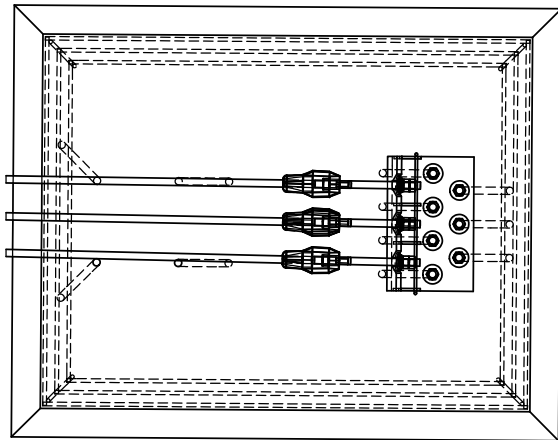
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NYHBT-1-2_R20

SCALE: 1:8
UNITS: in.

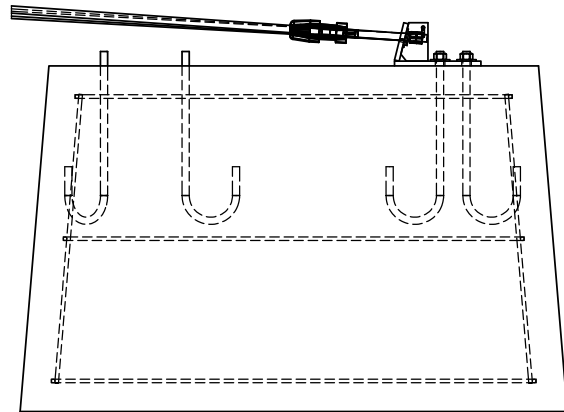
SHEET:
6 of 37

DATE:
8/6/2021

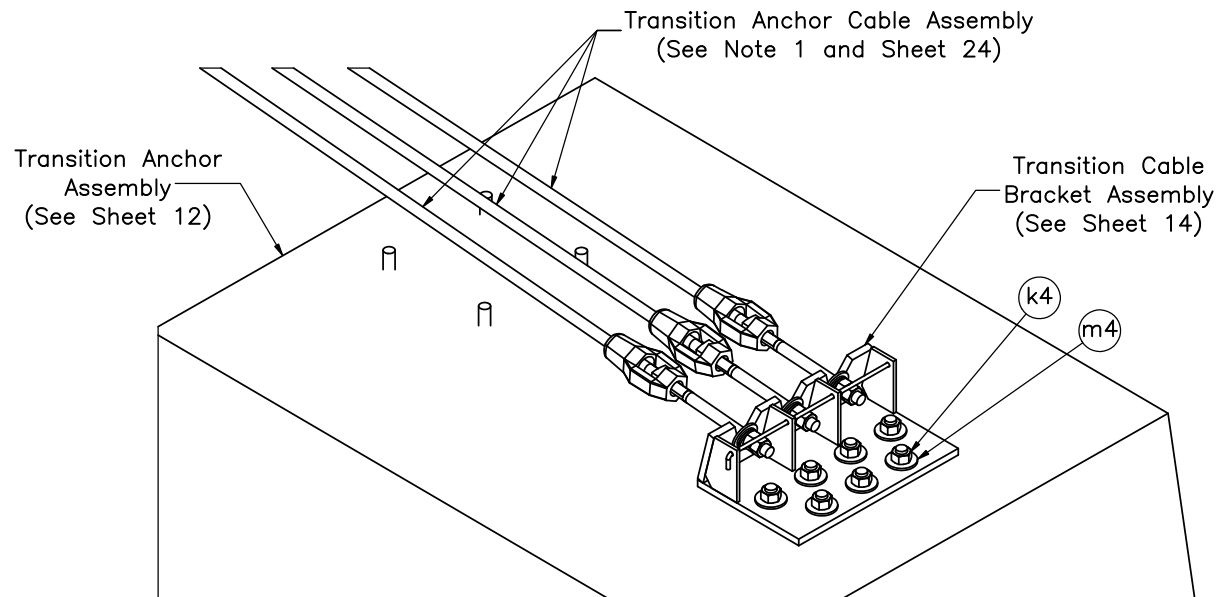
DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R
REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



PLAN VIEW



ELEVATION VIEW



ISOMETRIC CROP VIEW
SCALE 1:12

Note: (1) When constructed, the threaded rods on the Transition Anchor Cable Assembly should have a nearly perpendicular bearing on the Transition Cable Bracket Assembly.



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Cable Bracket Connection
Details

DWG. NAME:
NYHBT-1-2_R20

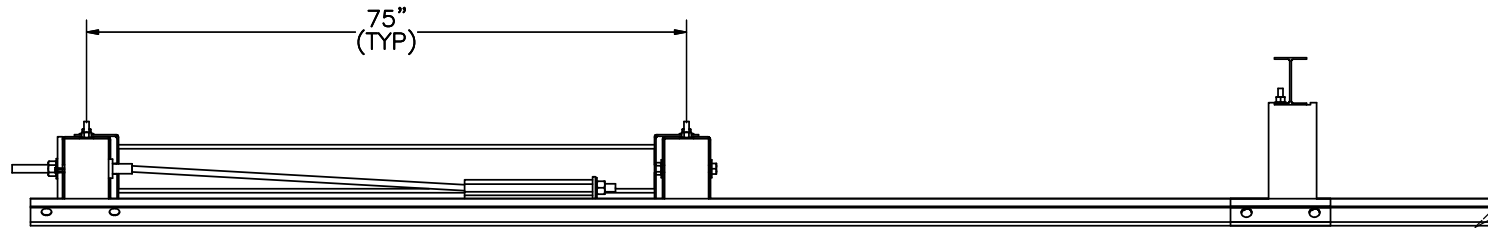
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SHEET:
7 of 37

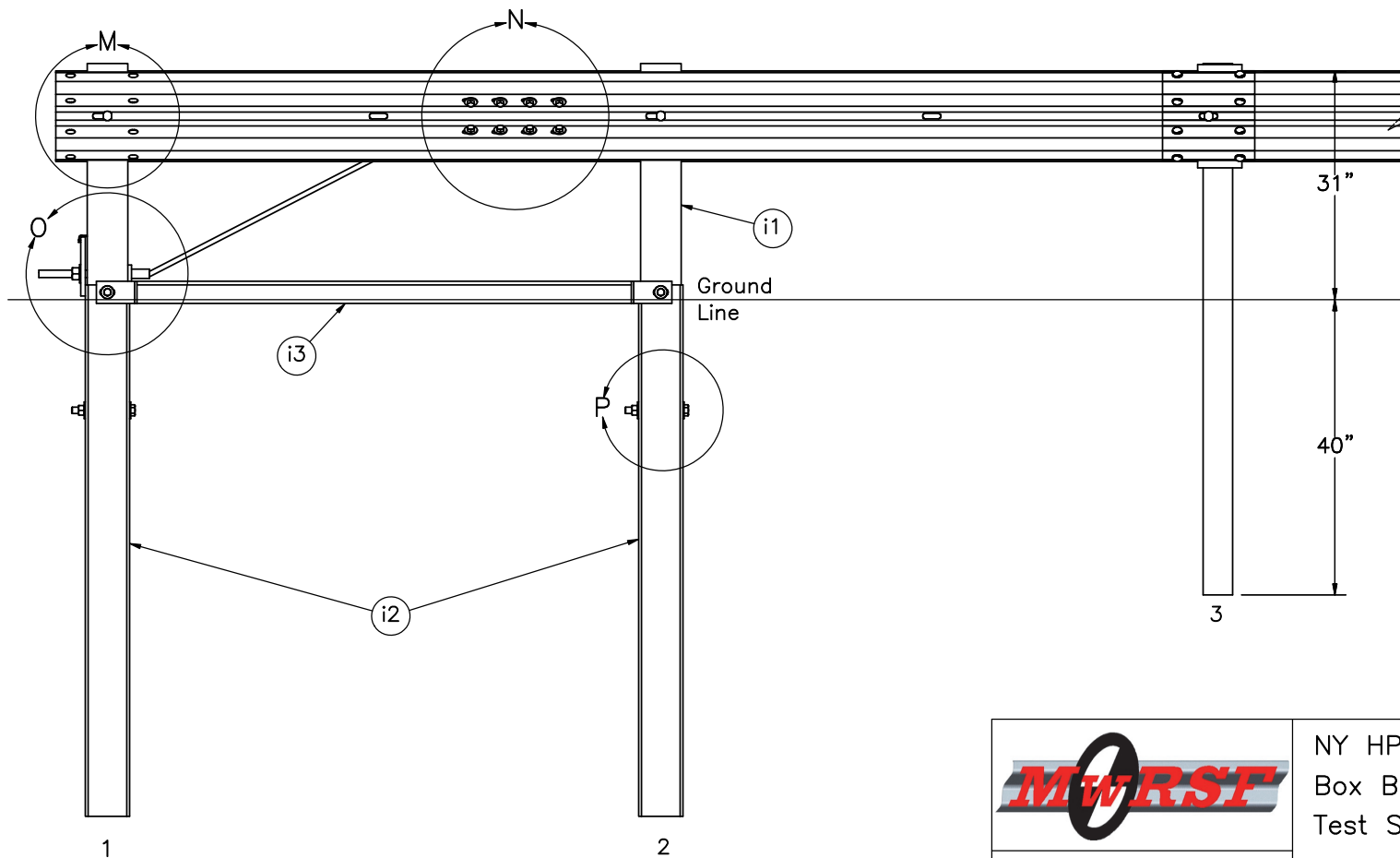
DATE:
8/6/2021

DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



PLAN VIEW



ELEVATION VIEW



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Upstream Anchorage

DWG. NAME.
NYHBT-1-2_R20

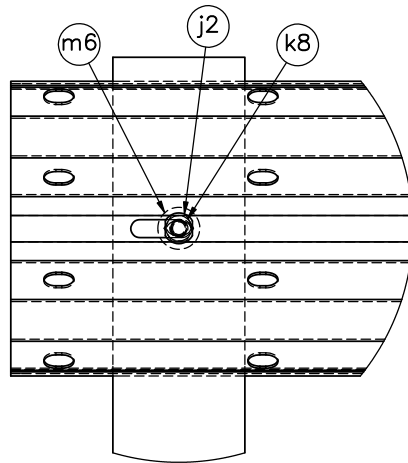
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SHEET:
8 of 37

DATE:
8/6/2021

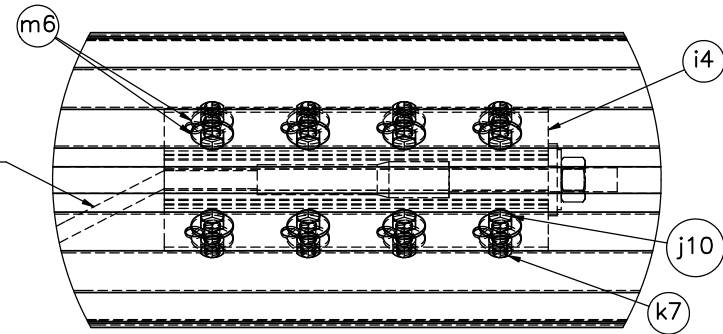
DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR

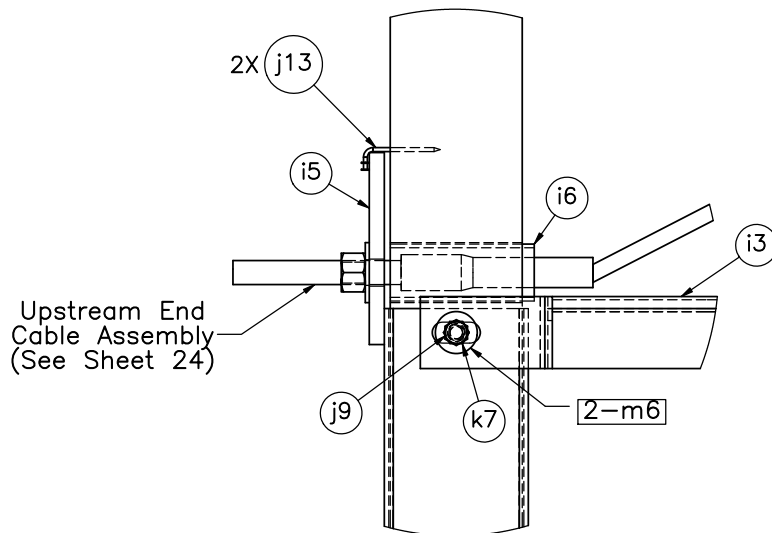


DETAIL M

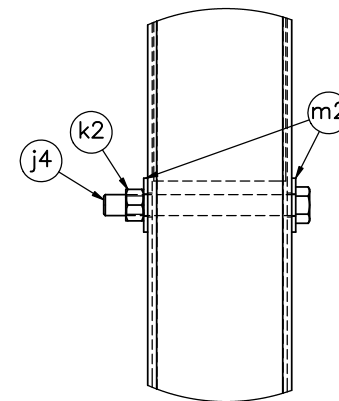
Upstream End
Cable Assembly
(See Sheet 24)



DETAIL N



DETAIL O



DETAIL P



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Upstream Anchorage Details

DWG. NAME.
NYHBT-1-2_R20

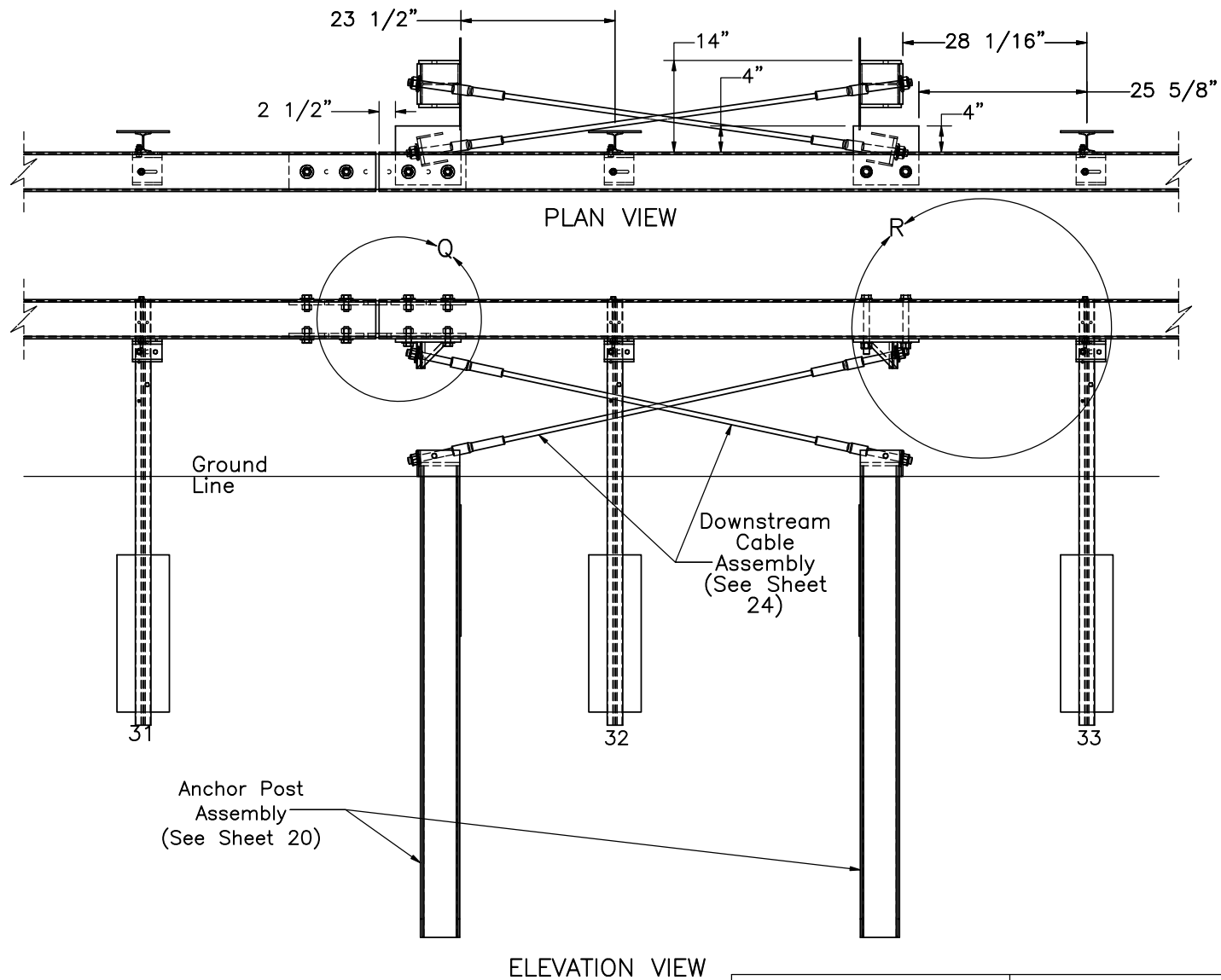
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SHEET:
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DATE:
8/6/2021

DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Downstream Anchorage Details

DWG. NAME.
NYHBT-1-2_R20

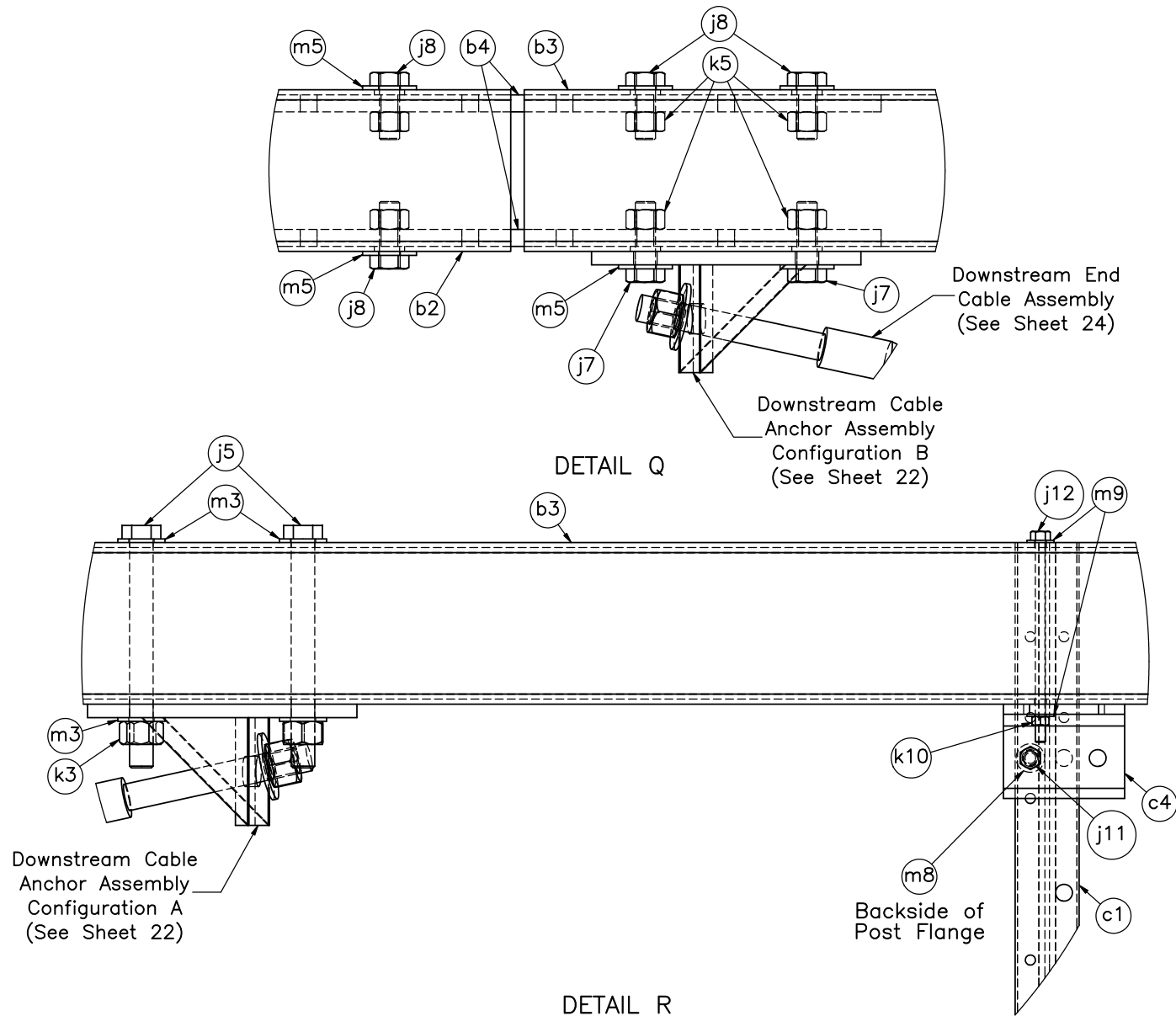
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SHEET:
10 of 37

DATE:
8/6/2021

DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Downstream Anchor Mounting
Details

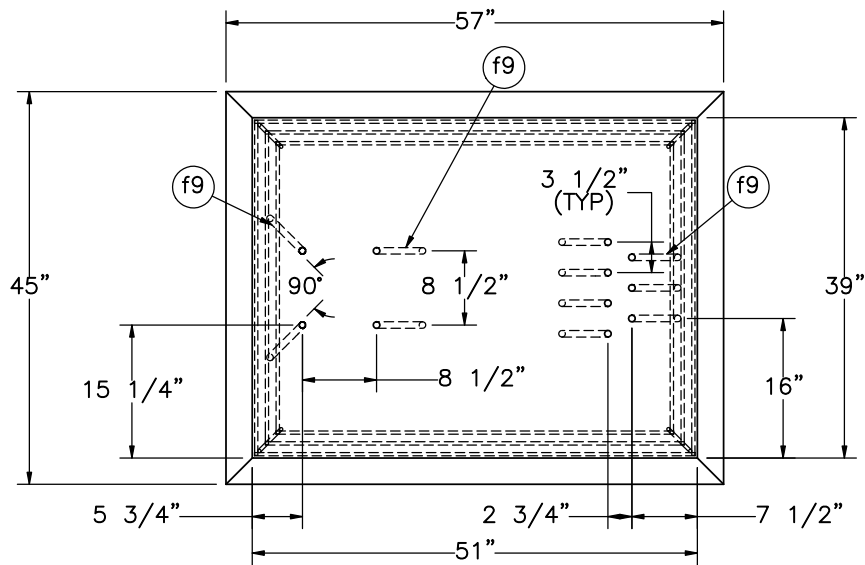
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NYHBT-1-2_R20

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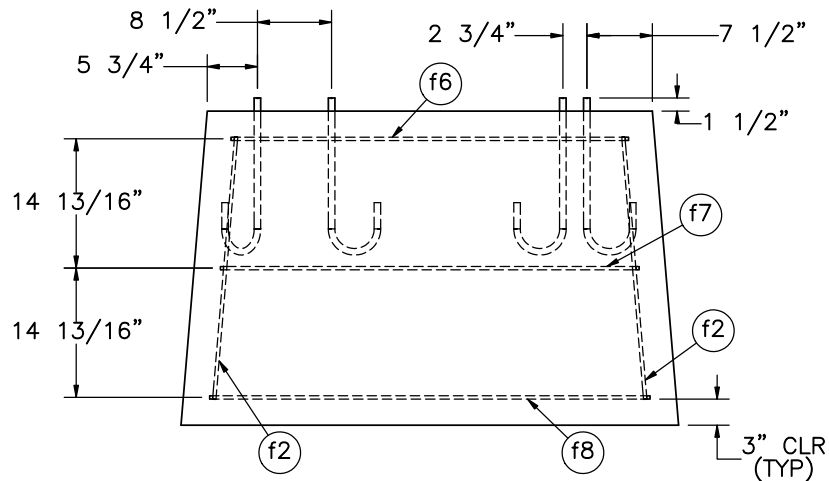
SHEET:
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DATE:
8/6/2021

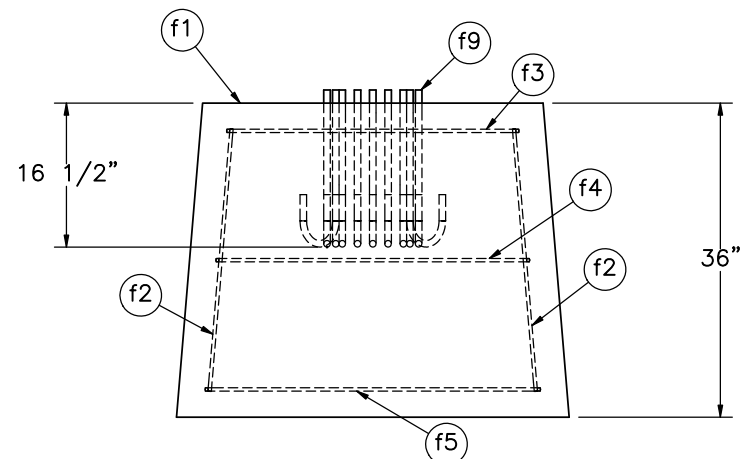
DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R
REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



PLAN VIEW



ELEVATION VIEW



PROFILE VIEW

Item No.	QTY.	Description	Material Specification	Treatment Specification
f1	1	Concrete	Pre-Cast Class A* Min. $f'_c = 3,000$ psi NE Mix 47BD	—
f2	4	#3 Bar, 30 1/4" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **
f3	2	#3 Bar, 33 7/16" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **
f4	2	#3 Bar, 35 7/8" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **
f5	2	#3 Bar, 38 3/8" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **
f6	2	#3 Bar, 45 9/16" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **
f7	2	#3 Bar, 48" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **
f8	2	#3 Bar, 50 1/2" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **
f9	11	3/4" Dia. UNC, Hooked Anchor J-Bolt	ASTM F1554 Gr. 36	ASTM A153 or B695 Class 55 or F2329

Note: (1) Anchor is the same as was used in NYC1 series testing.

* If cast in place, follow Section 501 – Portland Cement Concrete – General of the NY state standards.

** Epoxy-coating not necessary for testing purposes.



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Transition Anchor Assembly

DWG. NAME.
NYHBT-1-2_R20

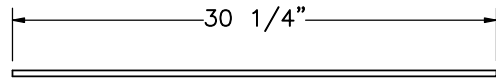
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SHEET:
12 of 37

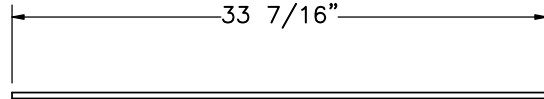
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8/6/2021

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MKB/JEK/J
RD/MJM/GH
R

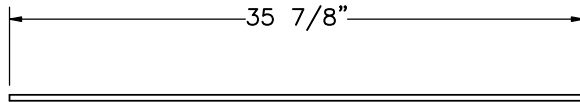
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JEK/KAL/LT
H/SBW/JCH
/JRR



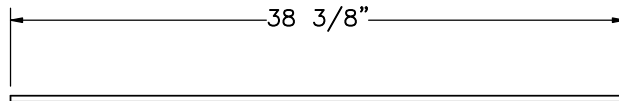
Part f2



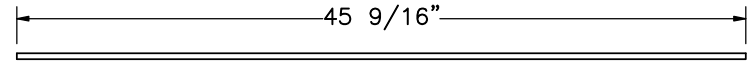
Part f3



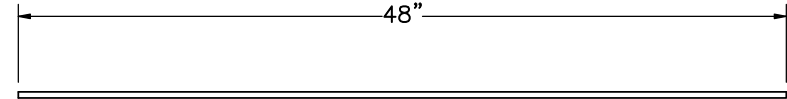
Part f4



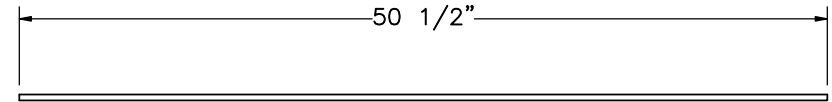
Part f5



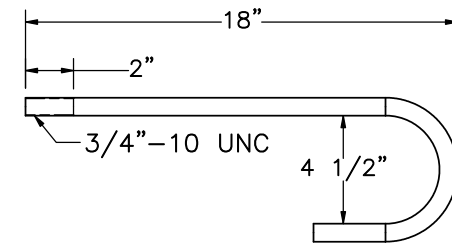
Part f6



Part f7



Part f8



Part f9
SCALE 1:8

Note: (1) Epoxy-coating not necessary for testing purposes.

Bill of Bars

Bar	QTY. (Per Anchor)	Size	Total Unbent Length	Material	Treatment
f2	4	#3	30 1/4"	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934)
f3	2	#3	33 7/16"	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934)
f4	2	#3	35 7/8"	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934)
f5	2	#3	38 3/8"	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934)
f6	2	#3	45 9/16"	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934)
f7	2	#3	48"	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934)
f8	2	#3	50 1/2"	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934)



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Concrete Anchor Components

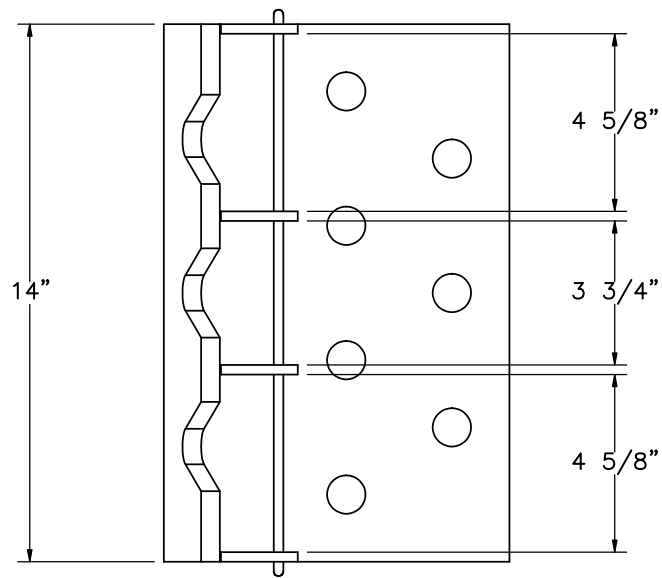
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NYHBT-1-2_R20

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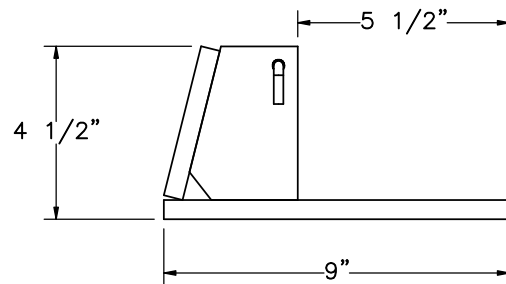
SHEET:
13 of 37

DATE:
8/6/2021

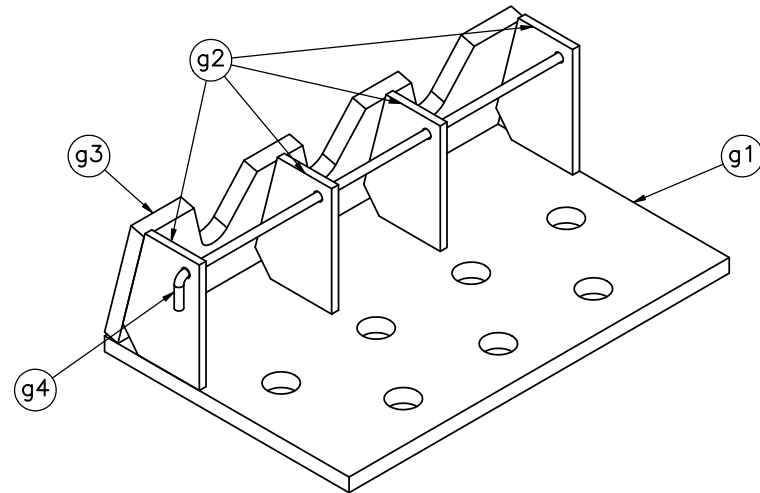
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MKB/JEK/J
RD/MJM/GH
R
REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



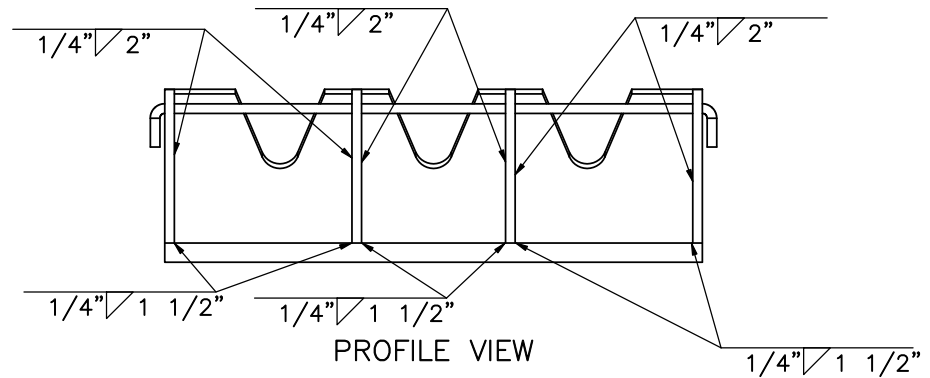
PLAN VIEW



ELEVATION VIEW



ISOMETRIC VIEW



PROFILE VIEW

Item No.	QTY.	Description	Material Specification	Treatment Specification
—	1	Transition Cable Bracket Assembly	—	ASTM A123
g1	1	14"x9"x1/2" Plate	ASTM A36	See Assembly
g2	4	4"x2 13/16"x1/4" Cable Anchor Gusset	ASTM A36	See Assembly
g3	1	14"x3 1/2"x1/2" Cable Anchor Top Plate	ASTM A36	See Assembly
g4	1	1/4" Dia., 16 3/8" Long Brass Rod	ASTM B16-00	—



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Transition Cable Bracket
Assembly

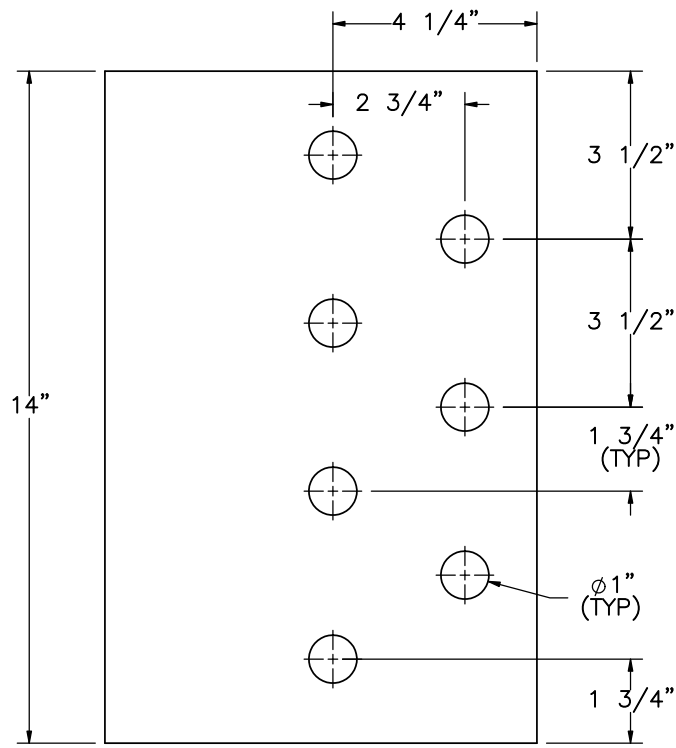
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NYHBT-1-2_R20

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UNITS: in.

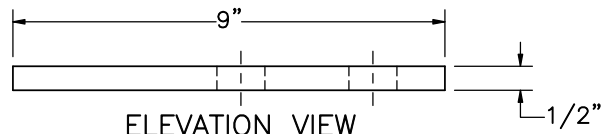
SHEET:
14 of 37

DATE:
8/6/2021

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RD/MJM/GH
R
REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR

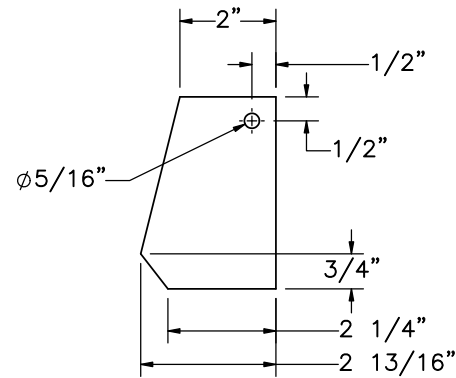


PLAN VIEW

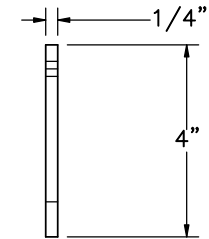


ELEVATION VIEW

Part g1

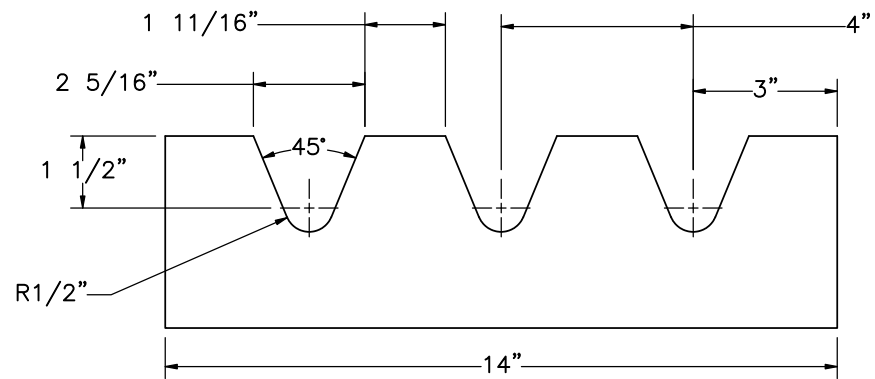


ELEVATION VIEW

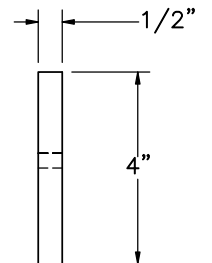


PROFILE VIEW

Part g2

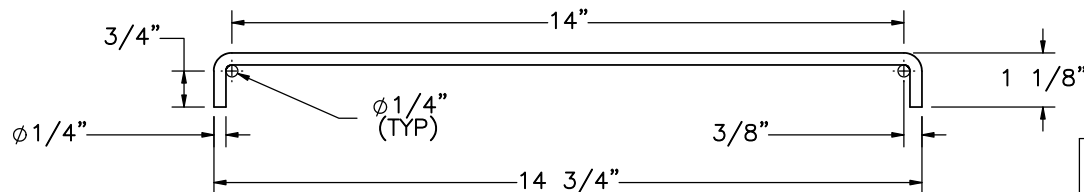


ELEVATION VIEW



PROFILE VIEW

Part g3



Part g4

Note: (1) Part g4 total unbent length is 16 3/8". Bend after installation.



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Transition Cable Bracket
Components

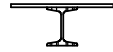
DWG. NAME:
NYHBT-1-2_R20

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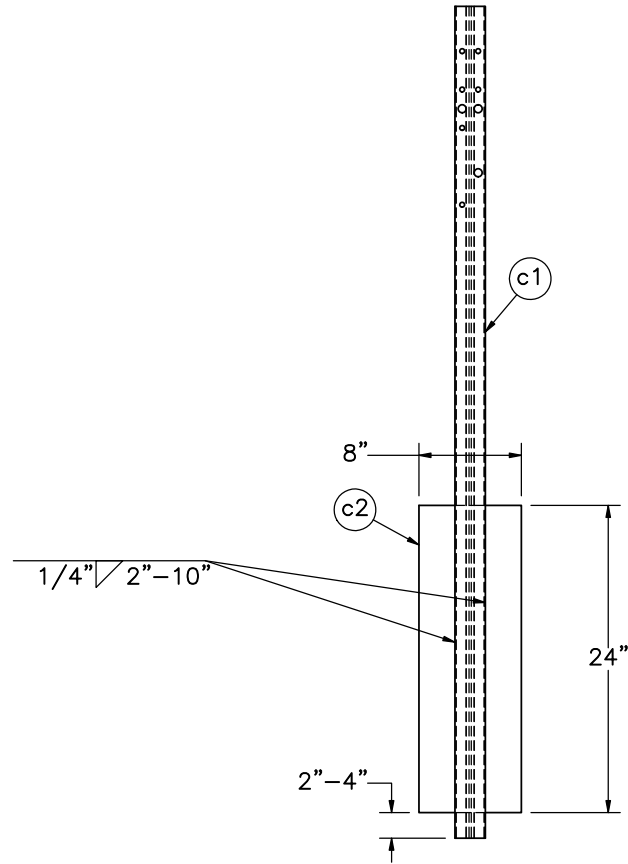
SHEET:
15 of 37

DATE:
8/6/2021

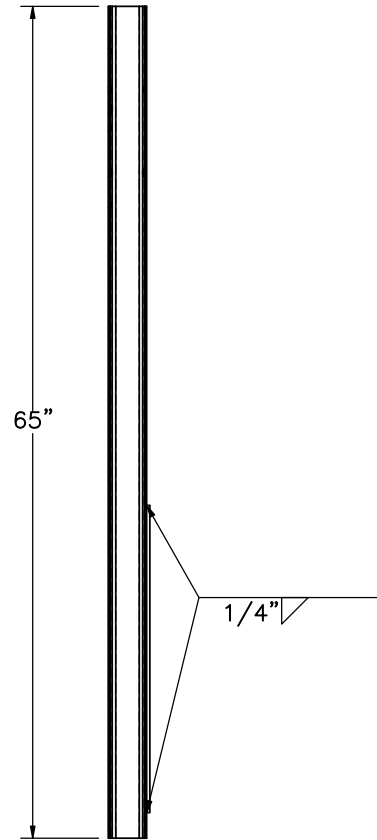
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MKB/JEK/J
RD/MJM/GH
R
REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



PLAN VIEW

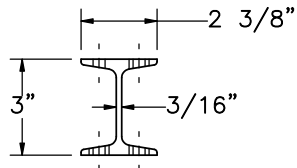


ELEVATION VIEW

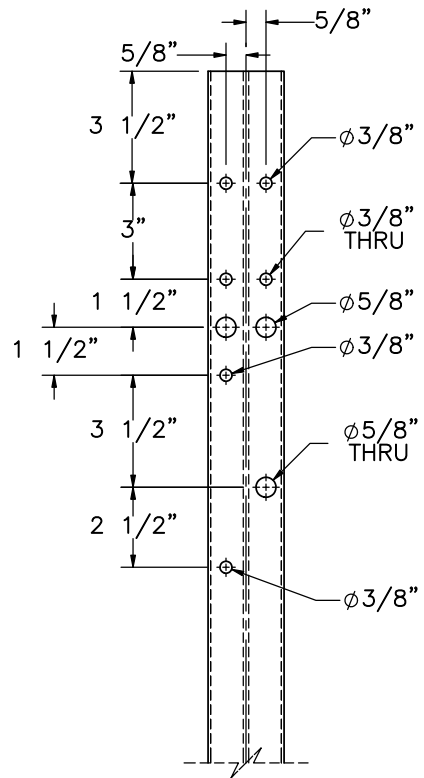


PROFILE VIEW

					 Midwest Roadside Safety Facility	NY HPBO W-Beam to Box Beam Transition Test Series NYHBT		SHEET: 16 of 37
Item No.	QTY.	Description	Material Specification	Treatment Specification		Box Beam Post Assembly		DATE: 8/6/2021
—	21	Box Beam Post Assembly	—	ASTM A123				
c1	1	S3x5.7, 65” Long Post	ASTM A36	See Assembly				DRAWN BY: MKB/JEK/J RD/MJM/GH R
c2	1	24”x8”x1/4” Soil Plate	ASTM A36	See Assembly	DWG. NAME: NYHBT-1-2_R20		SCALE: 1:15 UNITS: in.	REV. BY: JEK/KAL/LT H/SBW/JCH /JRR

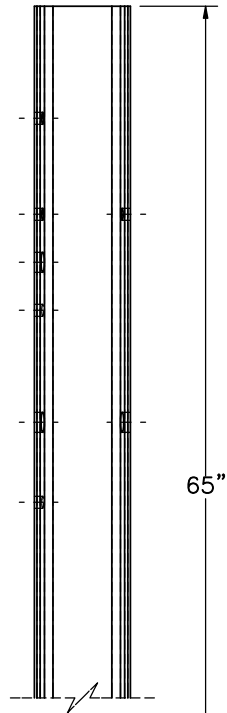


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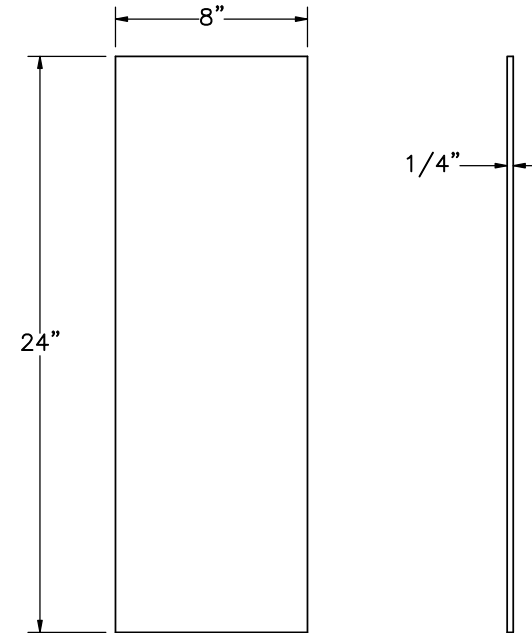


ELEVATION VIEW

Part c1



PROFILE VIEW



ELEVATION VIEW

PROFILE VIEW

Part c2
SCALE 1:8



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Box Beam Post Components

DWG. NAME.
NYHBT-1-2_R20

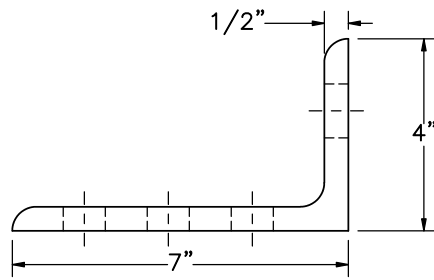
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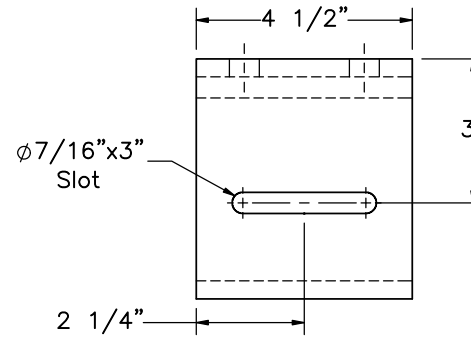
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8/6/2021

DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R

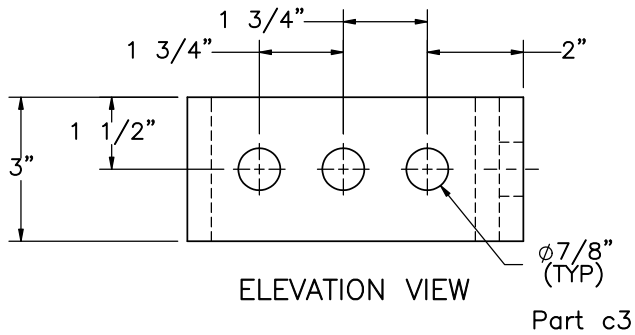
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H/SBW/JCH
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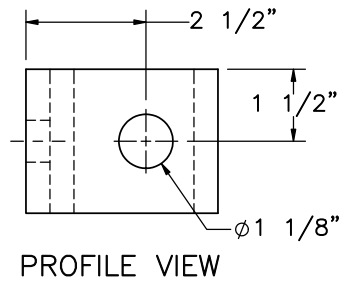
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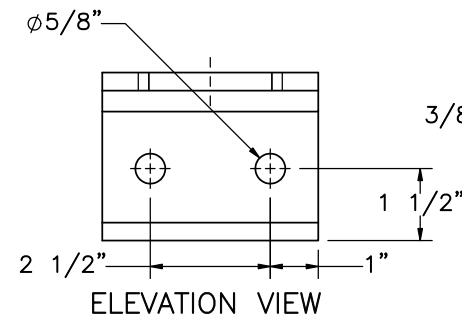
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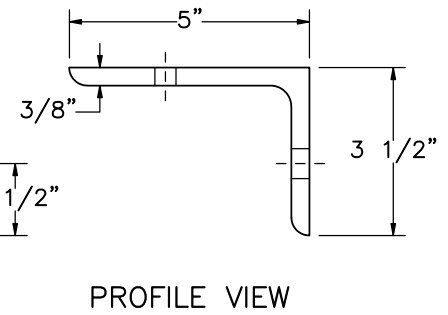
ELEVATION VIEW



PROFILE VIEW



ELEVATION VIEW



PROFILE VIEW



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Box Beam Component Details

DWG. NAME.
NYHBT-1-2_R20

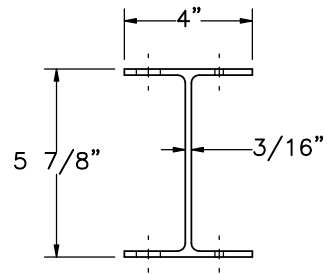
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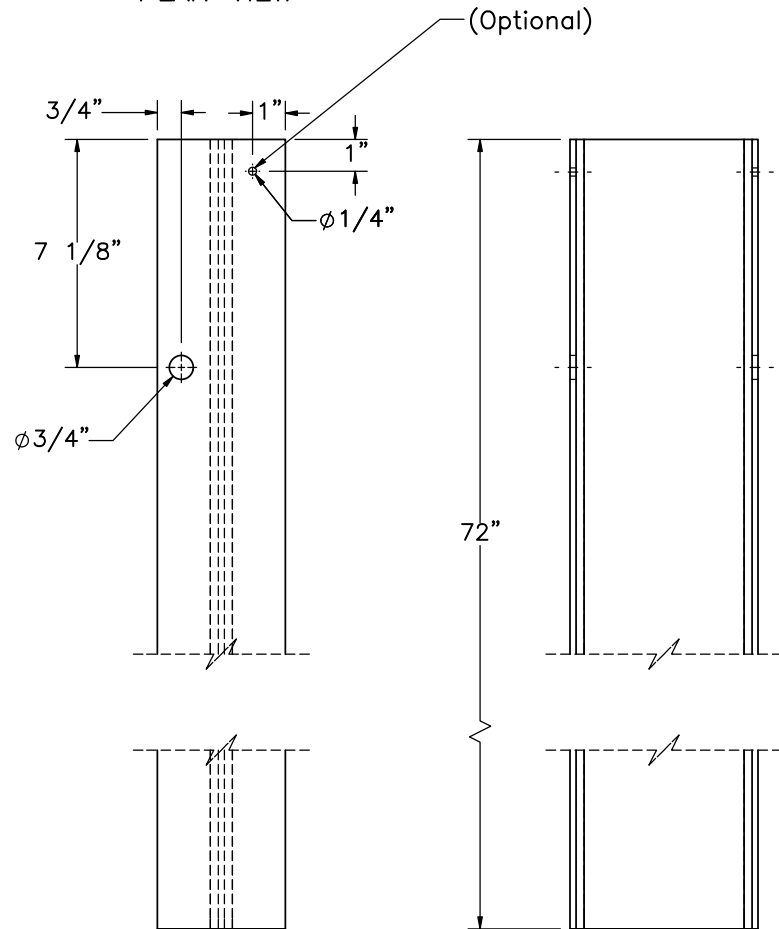
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8/6/2021

DRAWN BY:
MKB/JEK/J
RD/MJM/GH
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REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



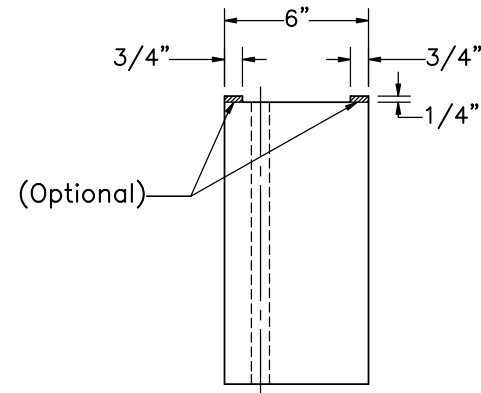
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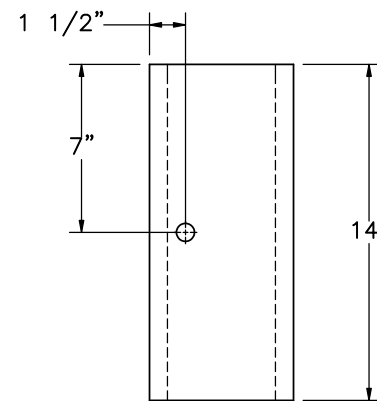
ELEVATION VIEW

Part c5

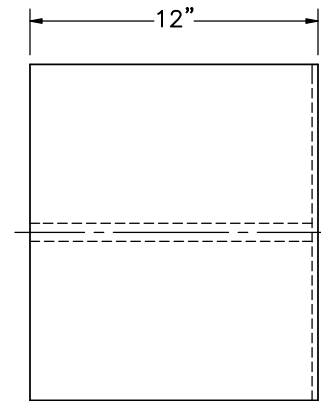
PROFILE VIEW



PLAN VIEW



ELEVATION VIEW



PROFILE VIEW

Part c6

Note: (1) According to NY standards, blockouts may be wood, plastic, or synthetic.



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

W-Beam Post Components

DWG. NAME.
NYHBT-1-2_R20

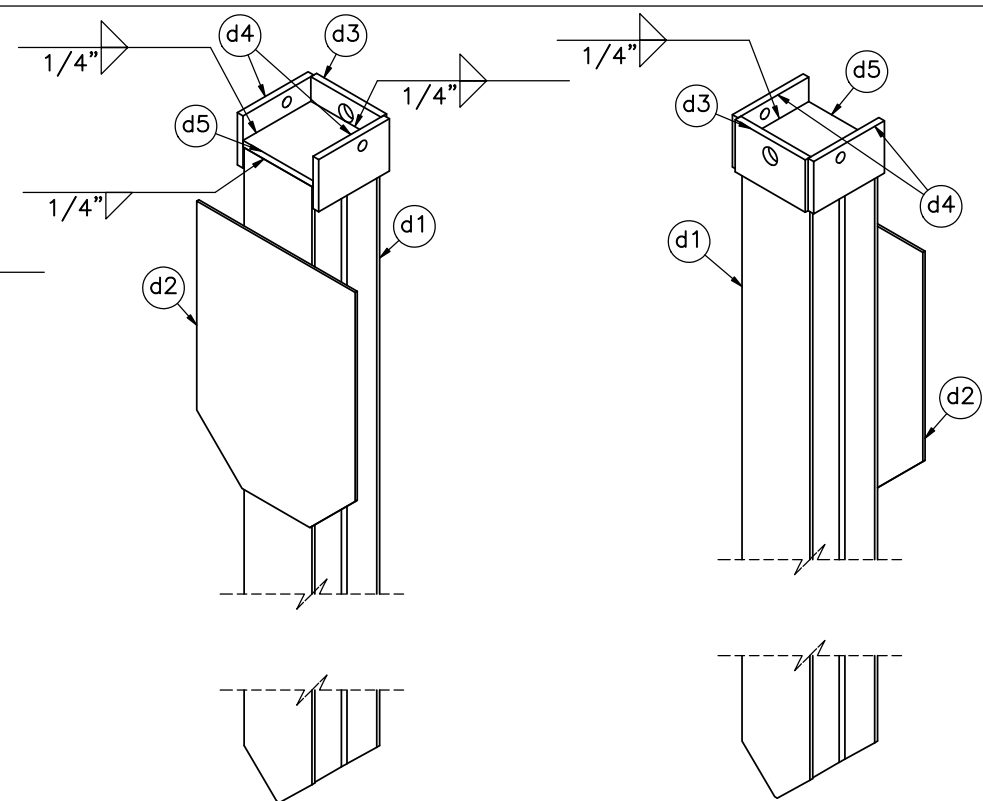
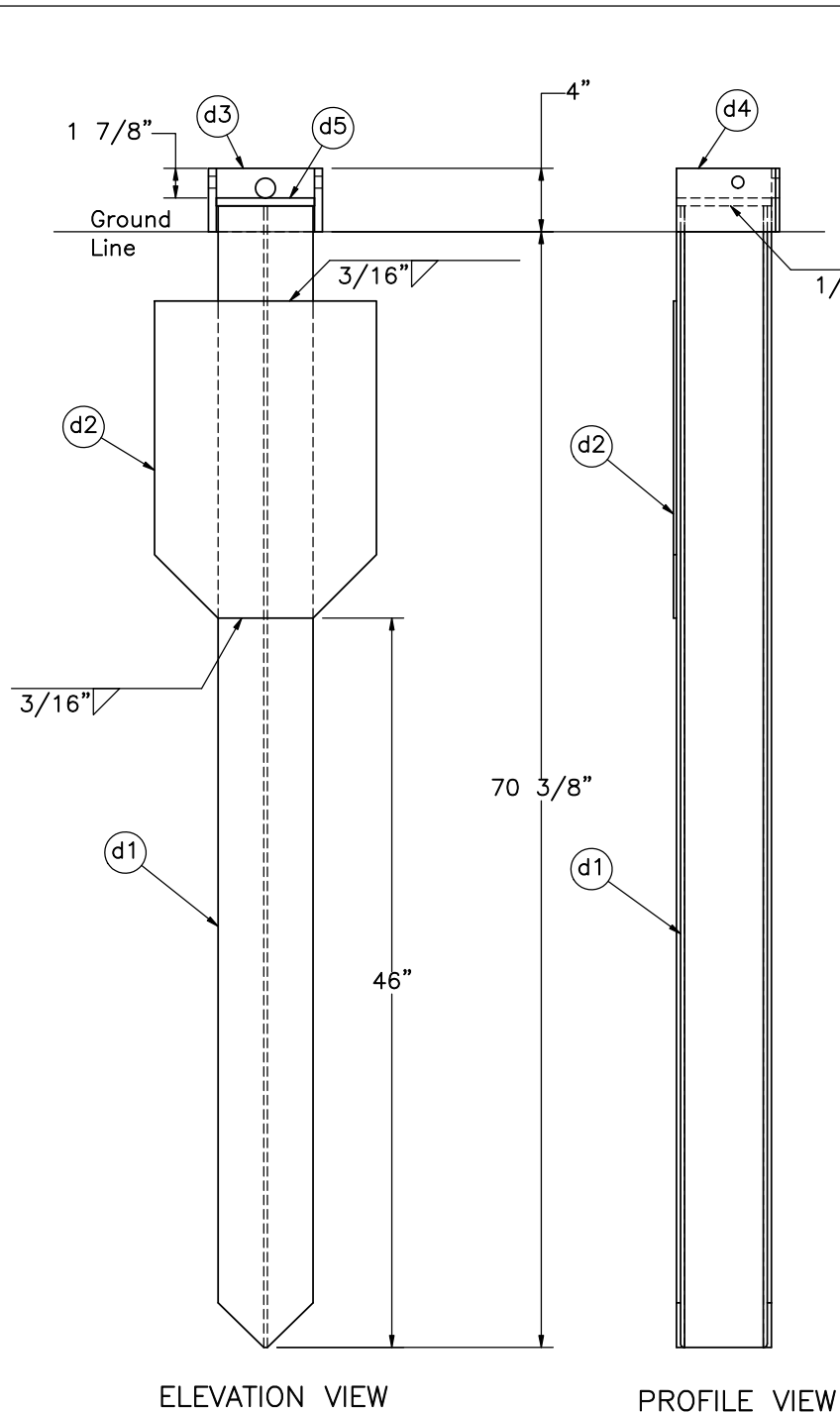
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DATE:
8/6/2021

DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



Item No.	QTY.	Description	Material Specification	Treatment Specification
-	2	Anchor Post Assembly	-	-
d1	1	W6x15, 72" Long Post	ASTM A992 or ASTM A572 Gr. 50	-
d2	1	20"x14"x3/16" Plate	ASTM A36	-
d3	1	6 3/16"x4"x1/2" Plate	ASTM A36	-
d4	2	6 1/4"x4"x1/2" Plate	ASTM A36	-
d5	1	6 3/16"x6"x1/2" Plate	ASTM A36	-



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Anchor Post Assembly

DWG. NAME.
NYHBT-1-2_R20

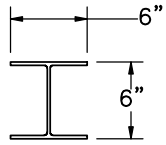
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20 of 37

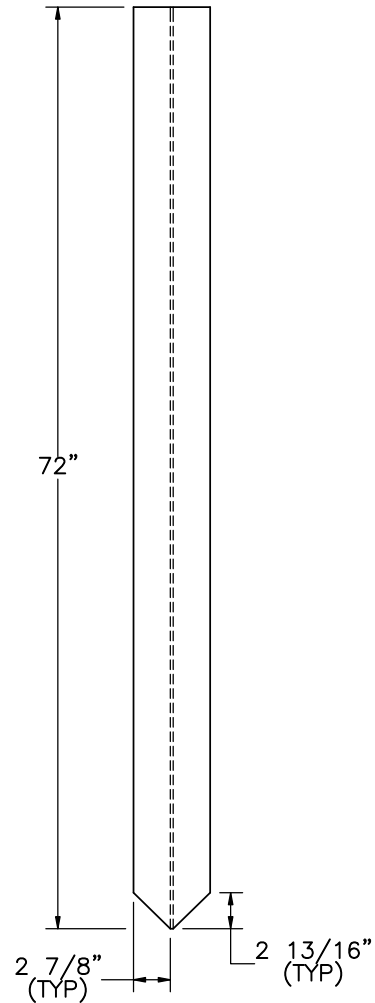
DATE:
8/6/2021

DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR

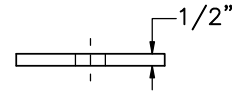


PLAN VIEW

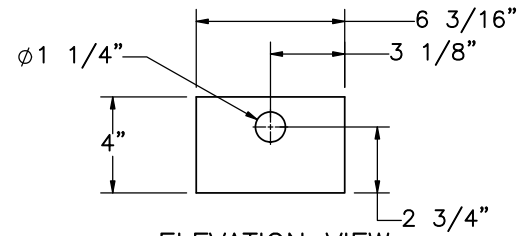


ELEVATION VIEW

Part d1
SCALE 1:15

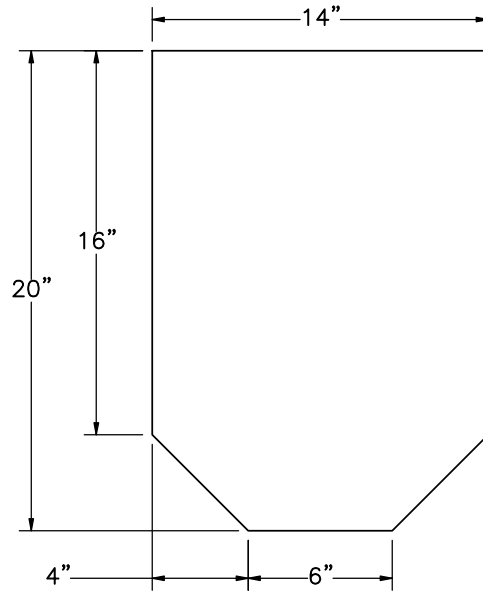


PLAN VIEW



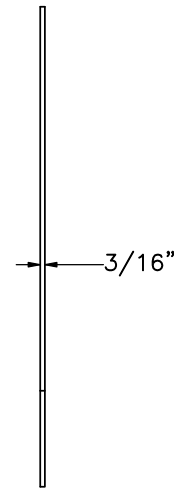
ELEVATION VIEW

Part d3

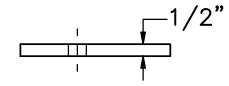


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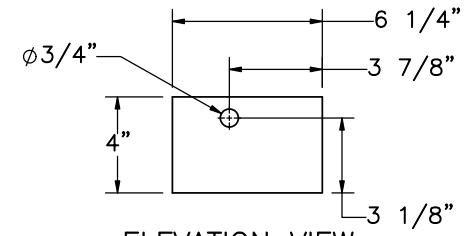
Part d2



PROFILE VIEW

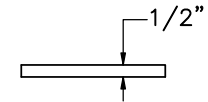


PLAN VIEW

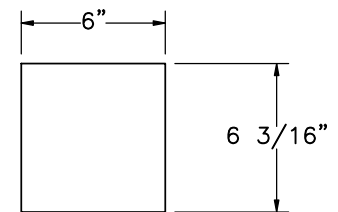


ELEVATION VIEW

Part d4



PLAN VIEW



ELEVATION VIEW

Part d5



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Anchor Post Components

DWG. NAME.
NYHBT-1-2_R20

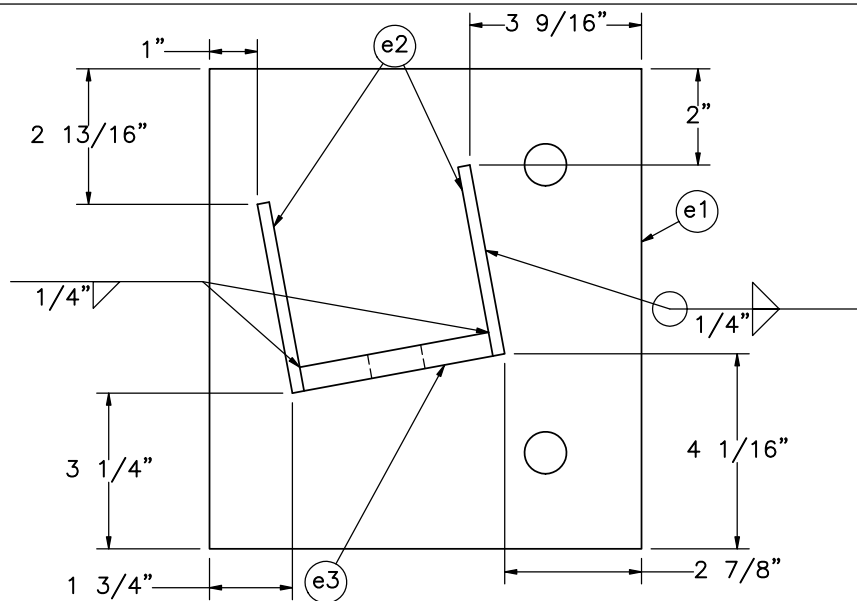
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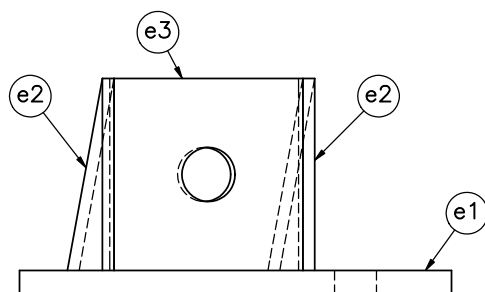
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MKB/JEK/J
RD/MJM/GH
R

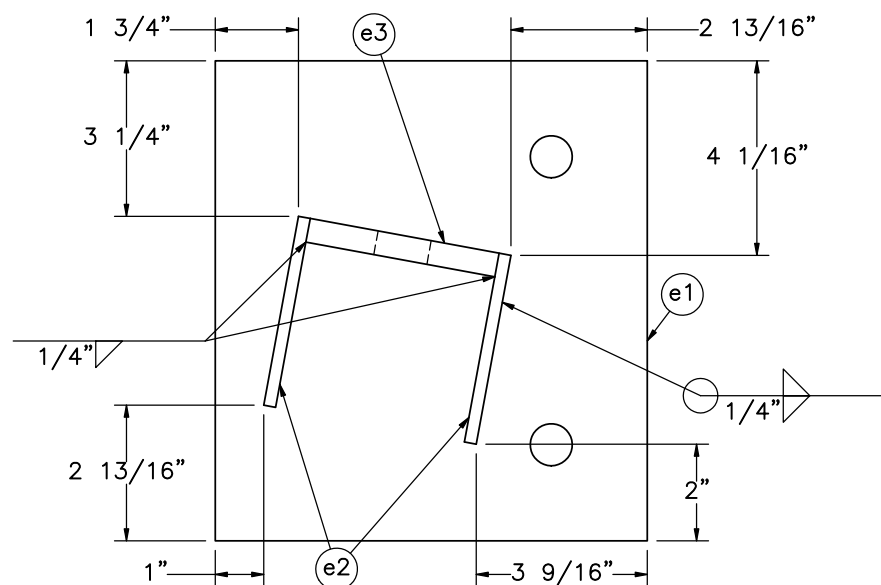
REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



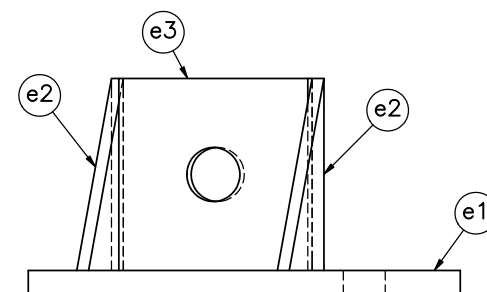
PLAN VIEW



ELEVATION VIEW
Downstream Cable Anchor Assembly
Configuration A



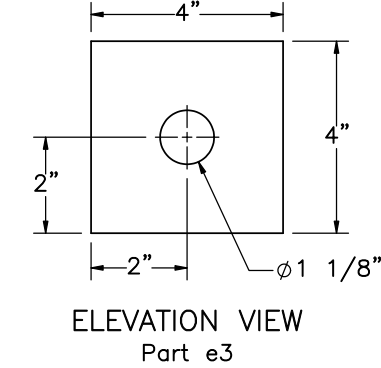
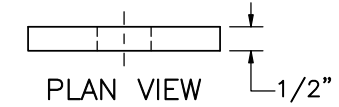
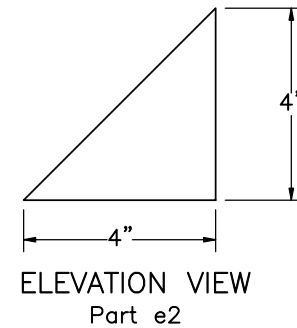
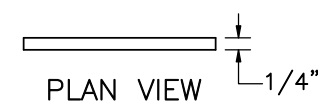
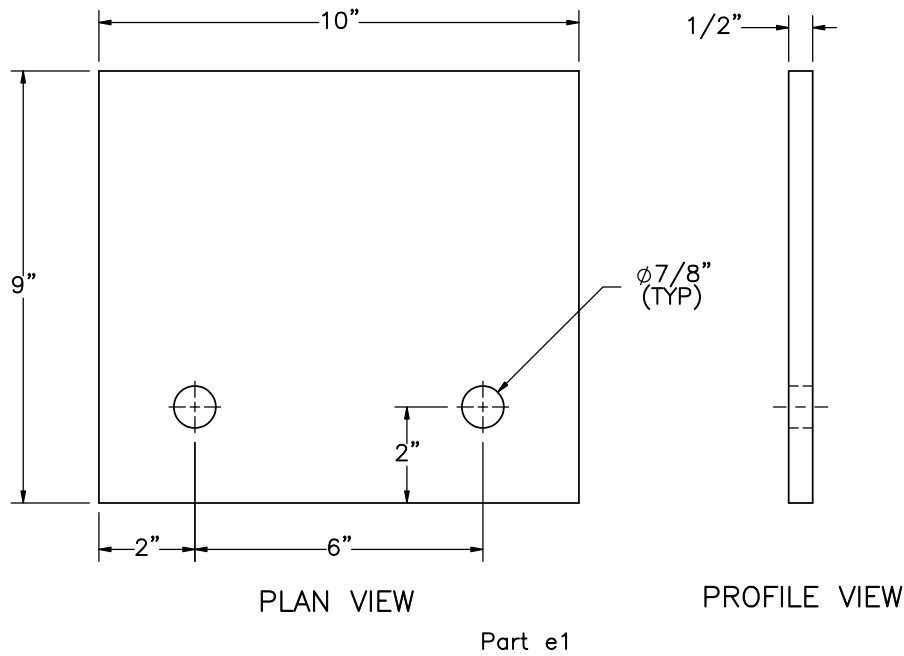
PLAN VIEW



ELEVATION VIEW
Downstream Cable Anchor Assembly
Configuration B

* Galvanization not necessary for testing purposes. Can be painted or spray galvanized if desired.

Item No.	QTY.	Description	Material Specification	Treatment Specification	 Midwest Roadside Safety Facility	NY HPBO W-Beam to Box Beam Transition Test Series NYHBT Downstream Cable Anchor Assembly Details		SHEET: 22 of 37
—	1 each	Downstream Cable Anchor Assembly Configuration A&B	—	ASTM A123*				DATE: 8/6/2021
e1	1	10"x9"x1/2" Box Beam Cable Anchor Base Plate	ASTM A36	See Assembly	Midwest Roadside Safety Facility	DWG. NAME: NYHBT-1-2_R20		DRAWN BY: MKB/JEK/J RD/WJM/GH R
e2	2	4"x4"x1/4" Box Beam Cable Anchor Gusset	ASTM A36	See Assembly				REV. BY: JEK/KAL/LT H/SBW/JCH /JRR
e3	1	4"x4"x1/2" Box Beam Cable Anchor Mounting Plate	ASTM A36	See Assembly				SCALE: 1:4 UNITS: in.



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Upstream Cable Anchor
Components

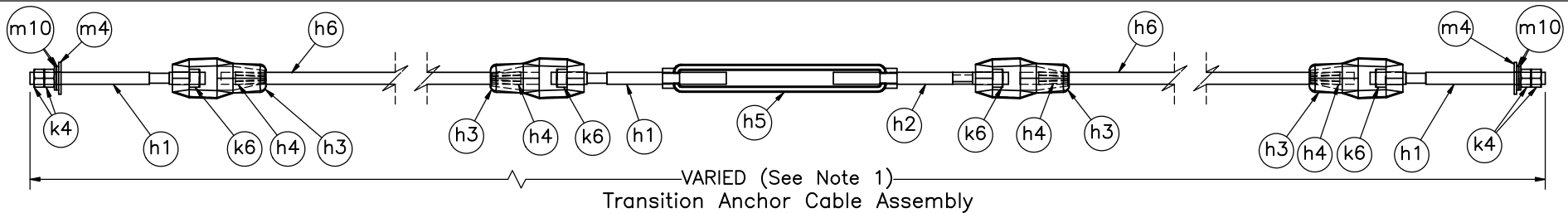
DWG. NAME:
NYHBT-1-2_R20

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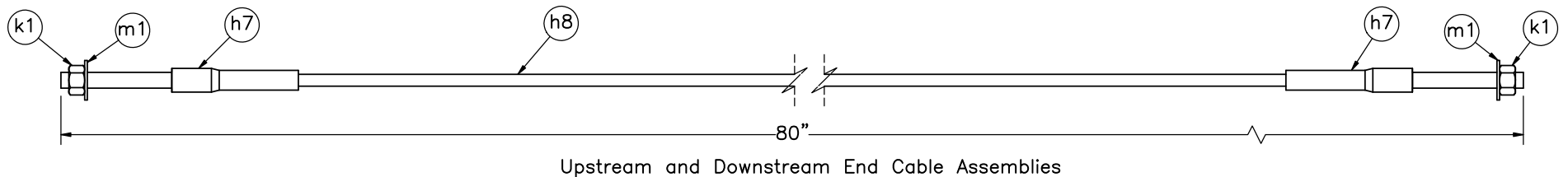
SHEET:
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DATE:
8/6/2021

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RD/MJM/GH
R
REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



Item No.	QTY.	Description	Material Specification	Treatment Specification	Hardware Guide
—	3	Transition Anchor Cable Assembly	—	—	—
h1	3	3/4" Dia. UNC, 11" Long Threaded Rod	ASTM A307 Gr. A or equivalent	ASTM A153 or B695 Class 55 or F2329	RCE03
h2	1	3/4" Dia. UNC, 11" Long Left-Hand Threaded Rod	ASTM A307 Gr. A or equivalent	ASTM A153 or B695 Class 55 or F2329	RCE03
h3	4	Cable End Fitting	ASTM A27 Gr. 70-40 Class 1	ASTM A153 or B695	RCE03
h4	4	Cable Wedge	ASTM A47 Gr. 32510	—	FMM01
h5	1	Standard Turnbuckle	ASTM F1145	ASTM A153 or B633	—
h6	2	3/4" Dia. 3x7 IWRC IPS Wire Rope – Various Lengths	ASTM A741 Type 1	Class A Coating	RCM01
k4	4	3/4"-10 UNC Hex Nut	ASTM A563A or equivalent	ASTM A153 or B695 Class 55 or F2329	FNX20a
k6	4	3/4"-10 UNC Square Nut	ASTM A563A or equivalent	ASTM A153 or B695 Class 55 or F2329	FNS20
m4	2	3/4" Dia. Plain USS Washer	ASTM F844	ASTM A123 or A153 or F2329	FWC20a
m10	4	3/4" Dia. Hardened SAE Washer	ASTM F436	ASTM A153 or B695 Class 55 or F1136 Gr. 3 or F2329	FWC20b



Item No.	QTY.	Description	Material Specification	Treatment Specification	Hardware Guide
—	3	Upstream and Downstream End Cable Assemblies	—	—	FCA01
h7	2	BCT Anchor Cable End Swaged Fitting	Fitting – ASTM A576 Gr. 1035 Stud – ASTM F568 Class C	Fitting – ASTM A153 Stud – ASTM A153 or B695	—
h8	1	3/4" Dia. 6x19 IWRC IPS Wire Rope	ASTM A741 Type 2	Class A Coating	—
k1	2	1"-8 UNC Heavy Hex Nut	ASTM A563DH or equivalent	ASTM A153 or B695 Class 55 or F2329	FNX24b
m1	2	1" Dia. Plain USS Washer	ASTM F844	ASTM A123 or A153 or F2329	FWC24a

Notes: (1) Total lengths of the three transition anchor cable assemblies are approximately 282", 317", and 352".



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Anchor Cable Details

DWG. NAME.
NYHBT-1-2_R20

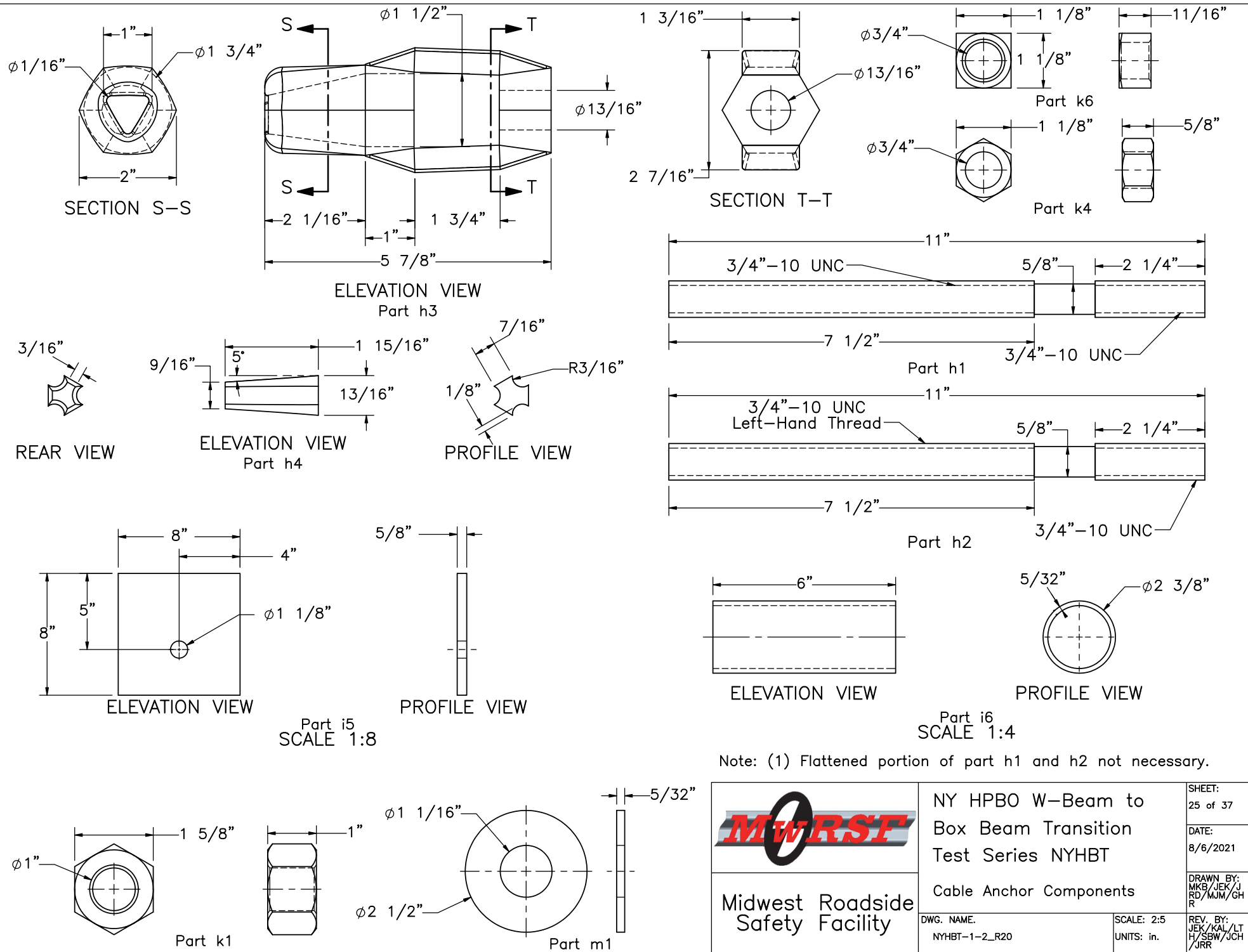
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DATE:
8/6/2021

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MKB/JEK/J
RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
H/SBW/JCH
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Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Cable Anchor Components

DWG. NAME.
NYHBT-1-2_R20

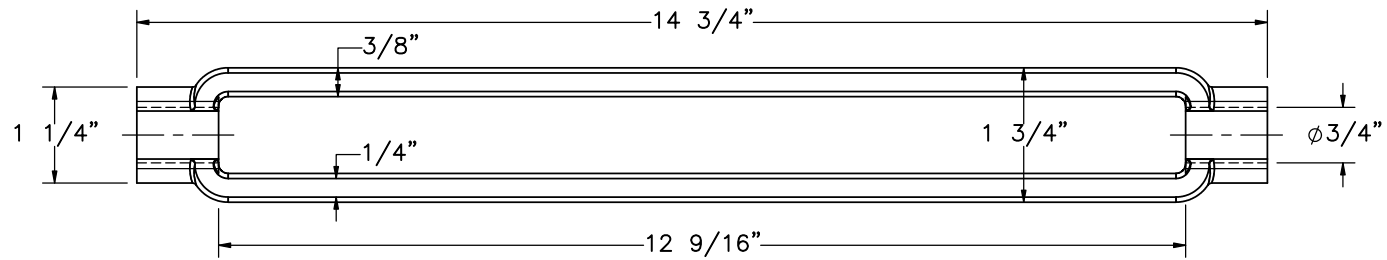
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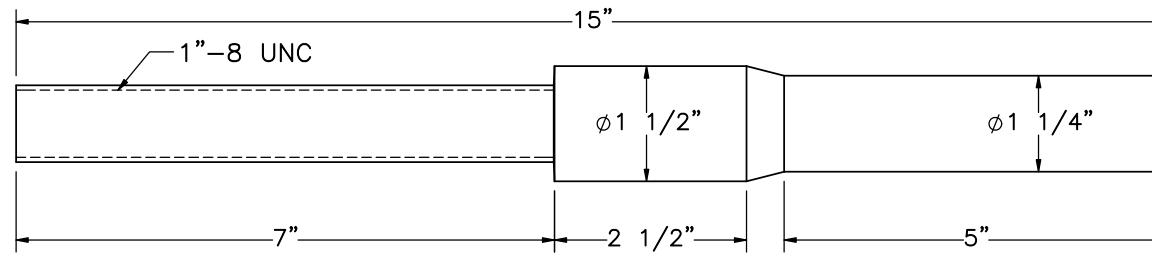
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8/6/2021

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RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



Part h5



Part h7



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Cable Anchor Components

DWG. NAME:
NYHBT-1-2_R20

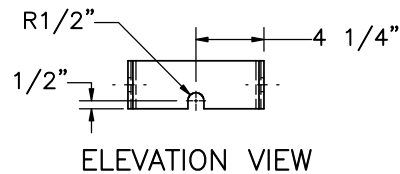
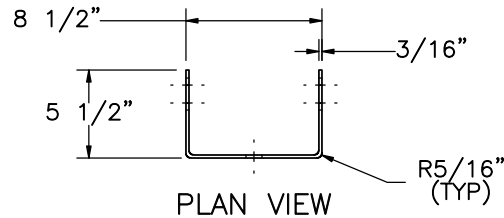
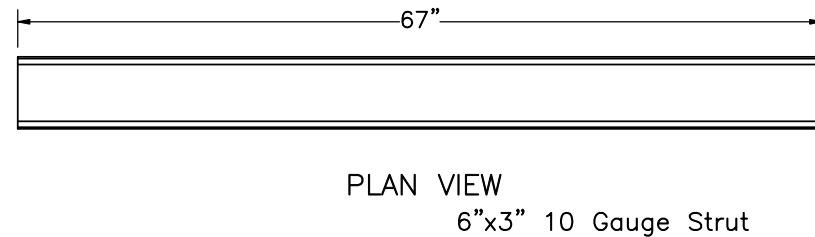
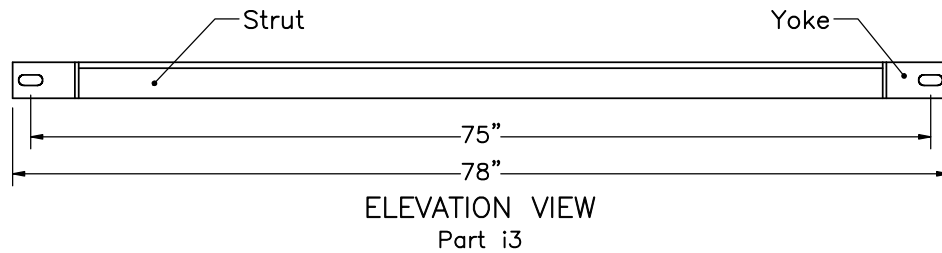
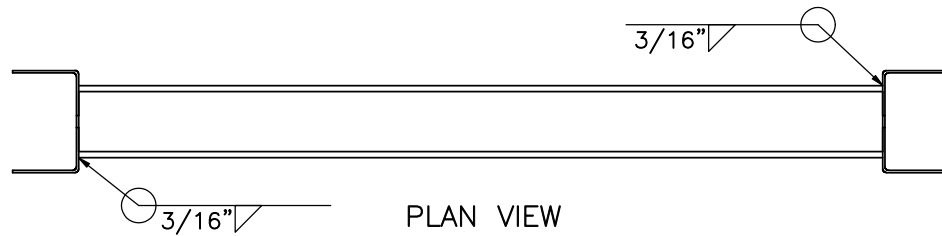
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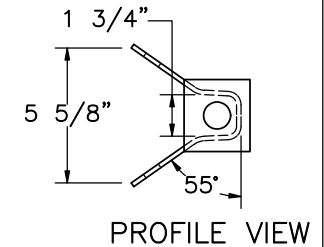
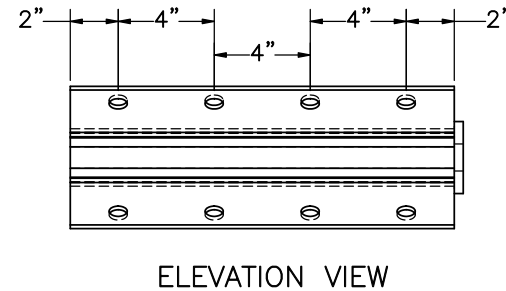
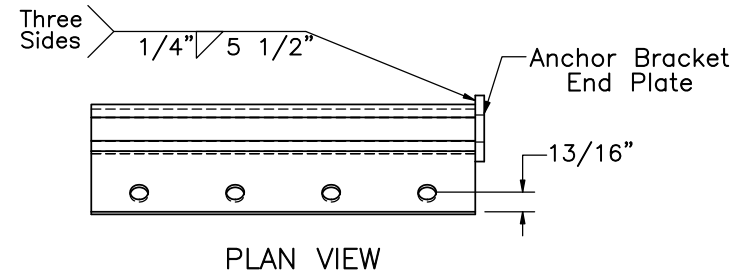
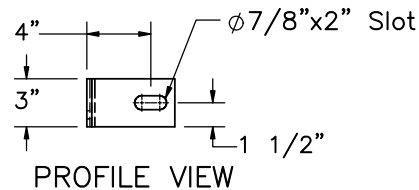
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8/6/2021

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MKB/JEK/J
RD/MJM/GH
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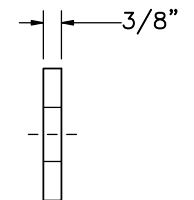
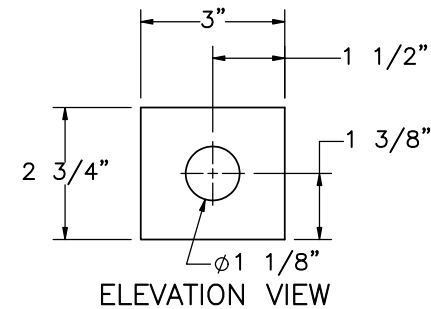
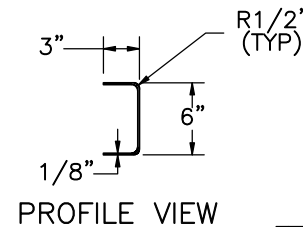
REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR



Yoke
SCALE 1:12



Part i4
SCALE 1:8



Anchor Bracket End Plate
SCALE 1:4



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Ground Strut and Anchor
Bracket Details

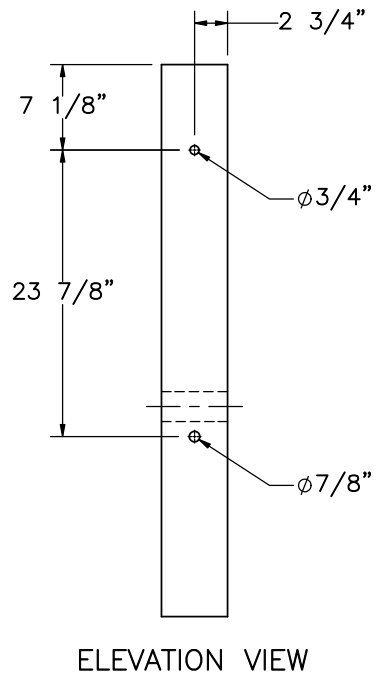
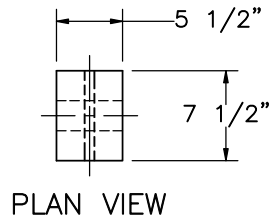
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NYHBT-1-2_R20

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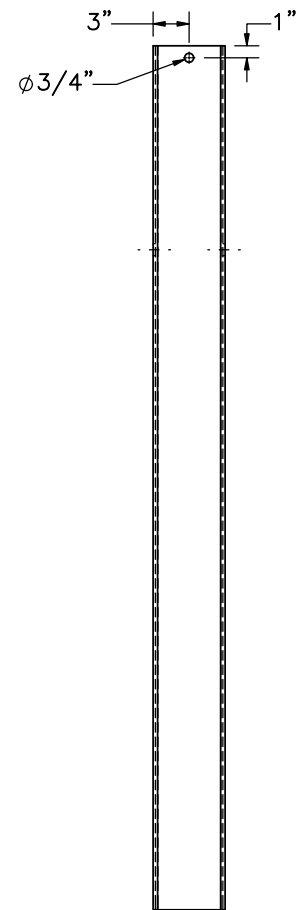
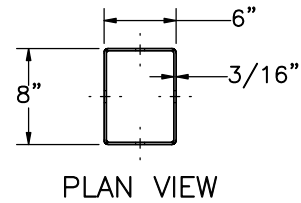
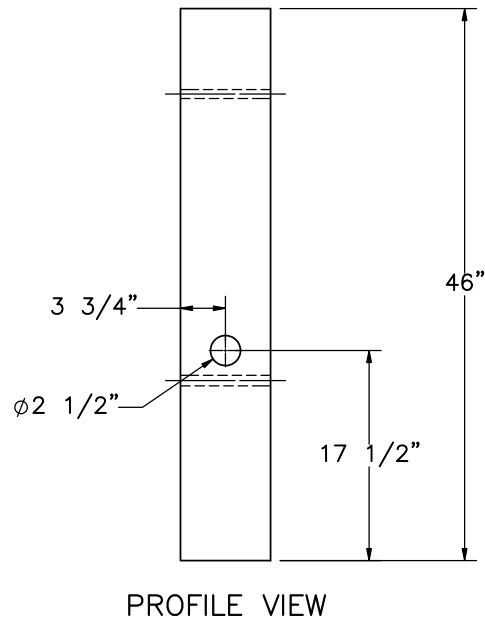
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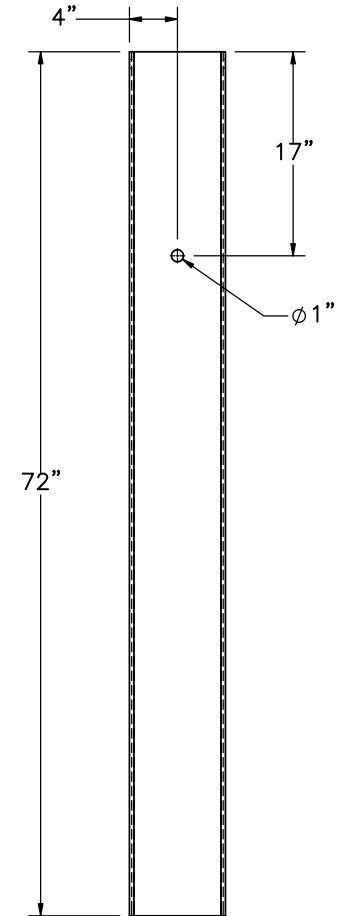
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R
REV. BY:
JEK/KAL/LT
H/SBW/JCH
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Part i1



Part i2



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

BCT Timber Post and
Foundation Tube Details

DWG. NAME:
NYHBT-1-2_R20

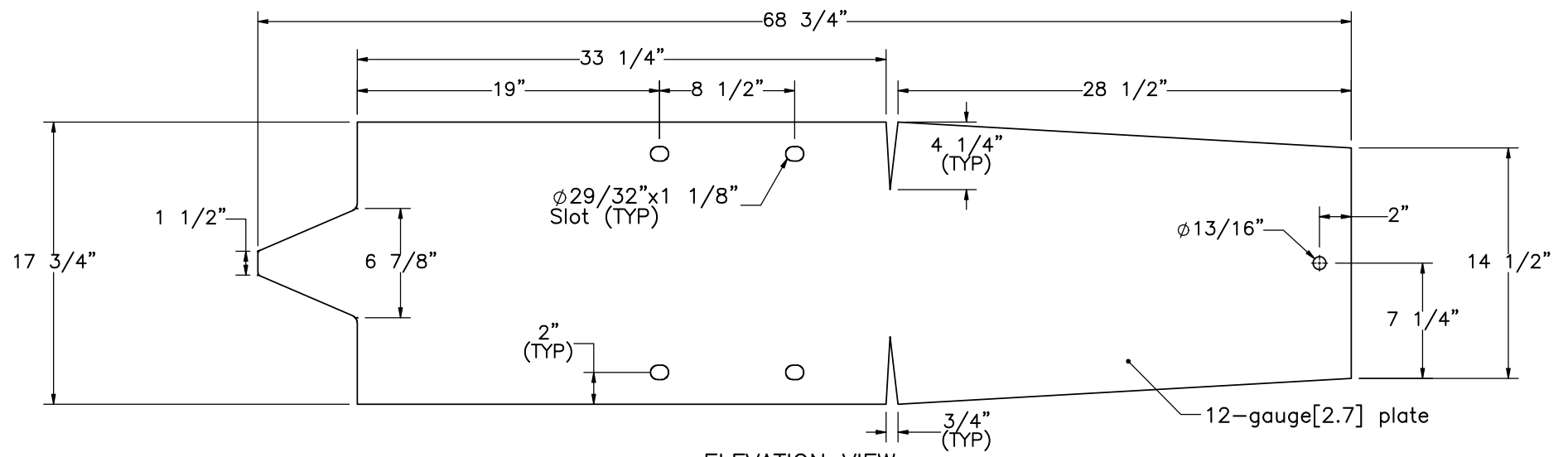
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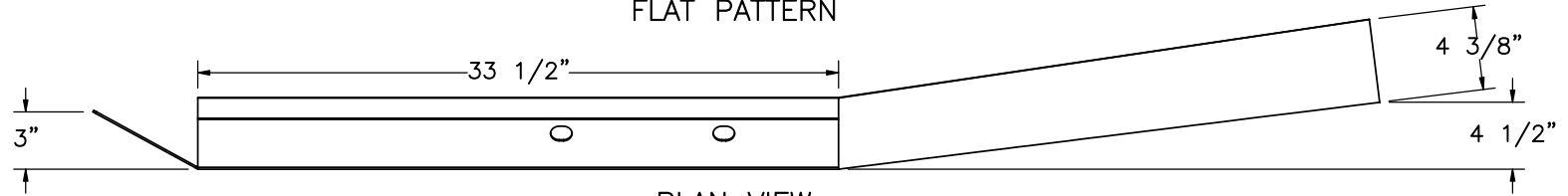
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8/6/2021

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R

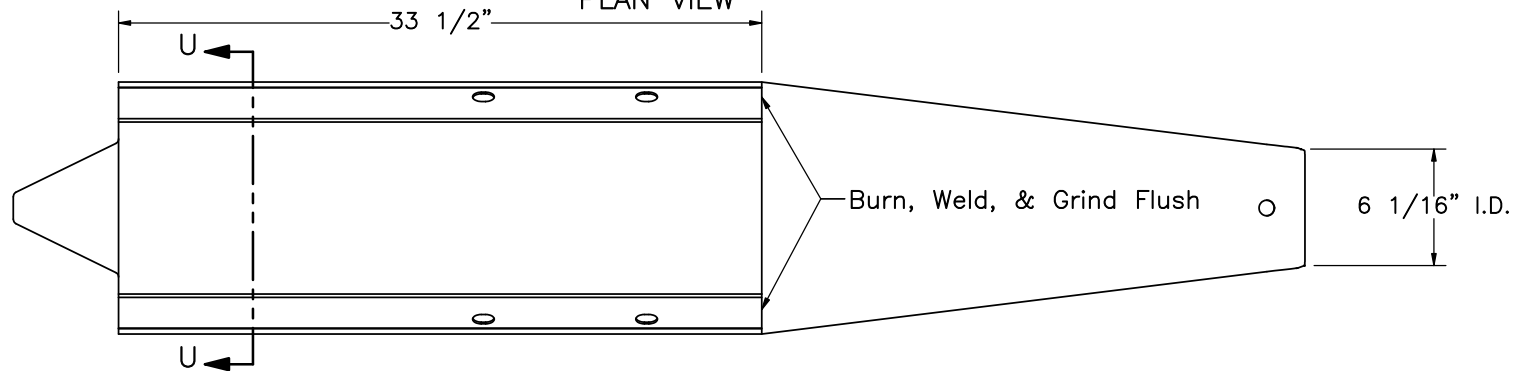
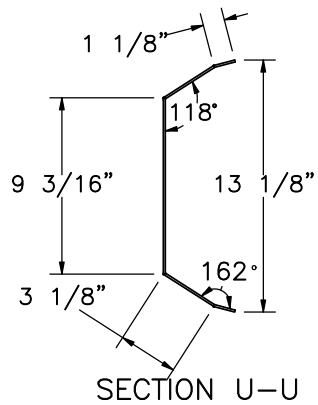
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ELEVATION VIEW
FLAT PATTERN



PLAN VIEW



ELEVATION VIEW
Part a4

Note: (1) Transition cover is the same as used in NYBWT testing series.



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

W-Beam to Box Beam
Transition Cover

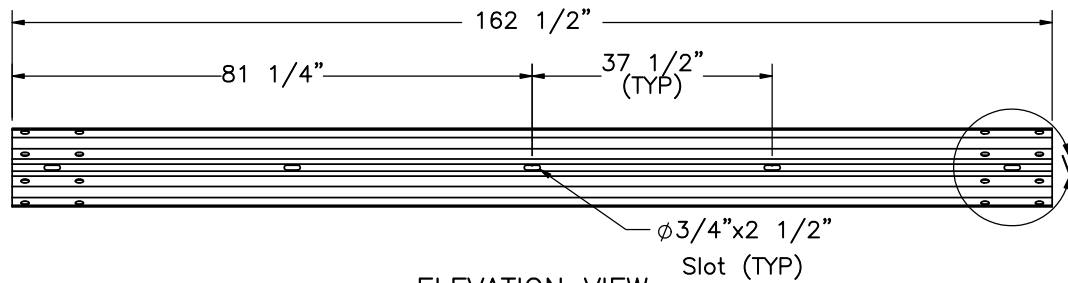
DWG. NAME:
NYHBT-1-2_R20

SCALE: 1:10
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SHEET:
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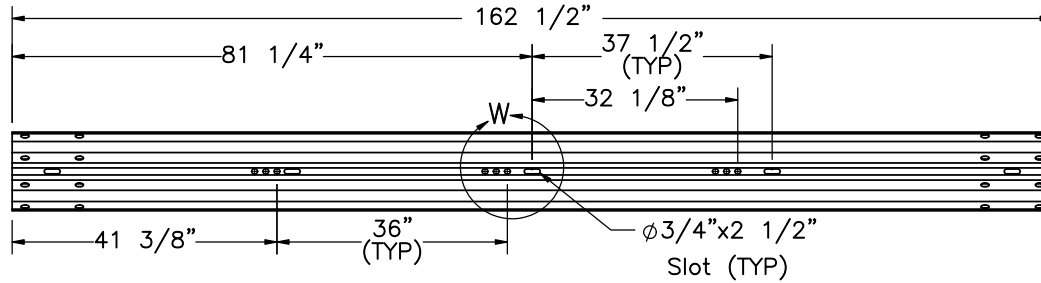
DATE:
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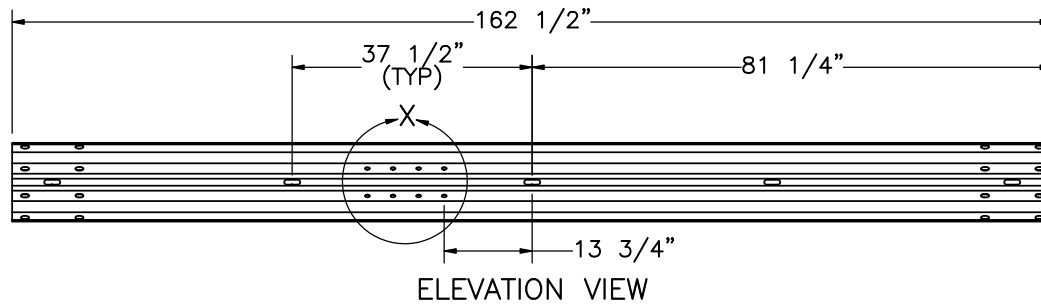
ELEVATION VIEW

Part a1



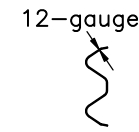
ELEVATION VIEW

Part a2

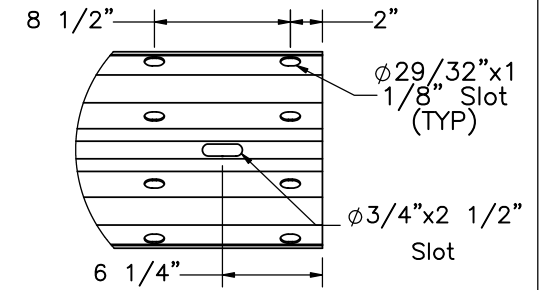


ELEVATION VIEW

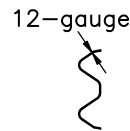
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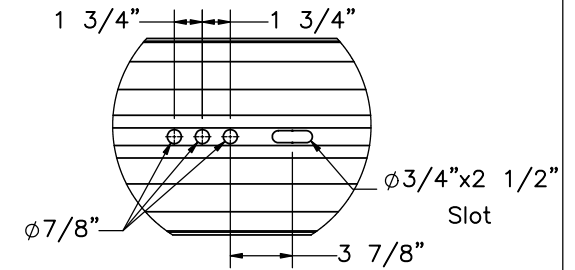
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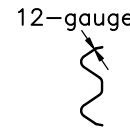
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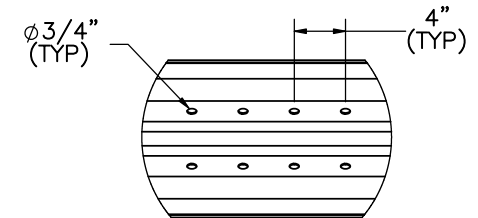
PROFILE VIEW



DETAIL W
SCALE 1:12



PROFILE VIEW



DETAIL X
SCALE 1:15



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

W-Beam Rail Sections

DWG. NAME.
NYHBT-1-2_R20

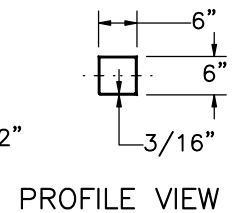
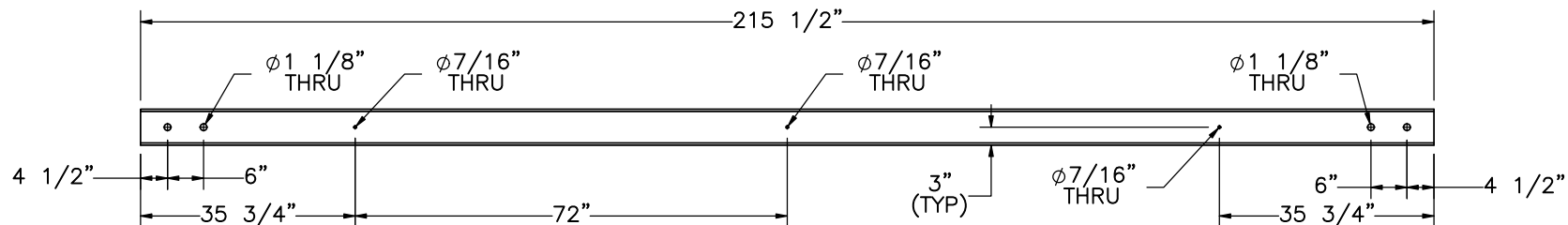
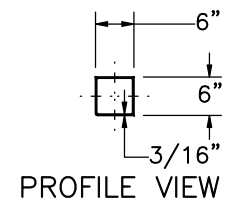
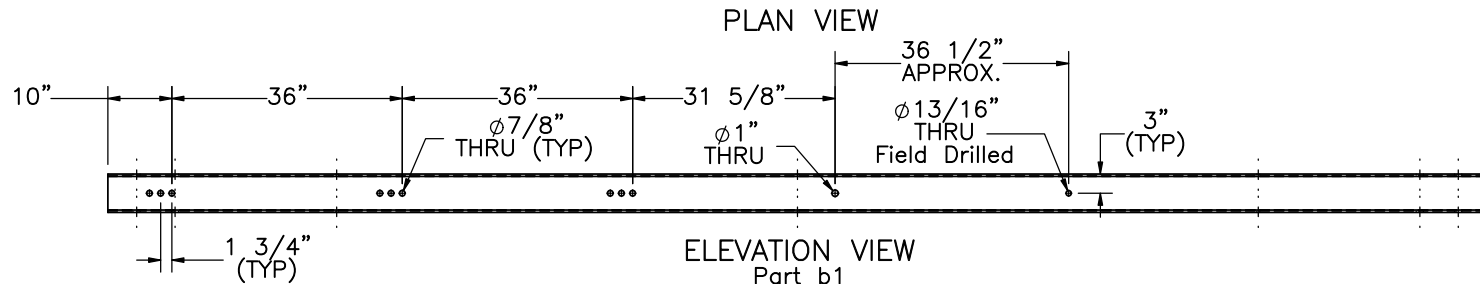
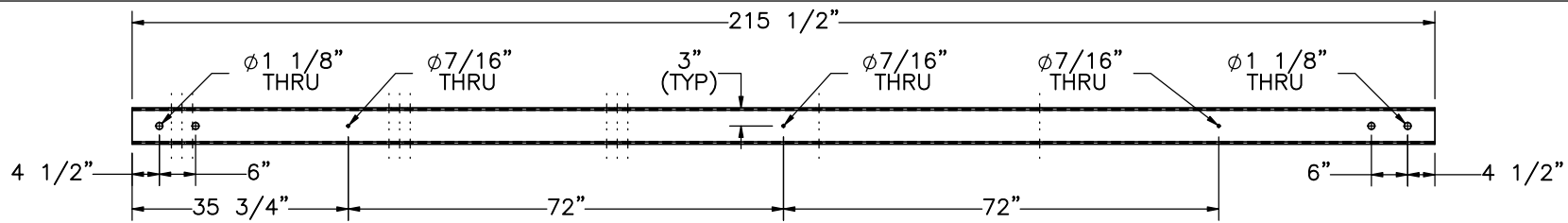
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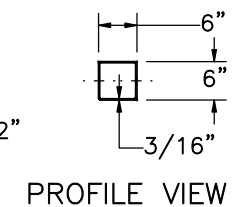
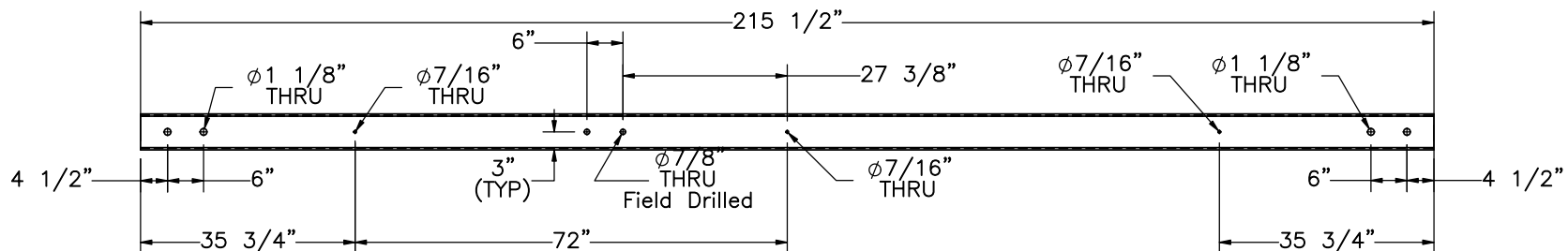
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Part b2



Part b3



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Box Beam Rail Sections

DWG. NAME.
NYHBT-1-2_R20

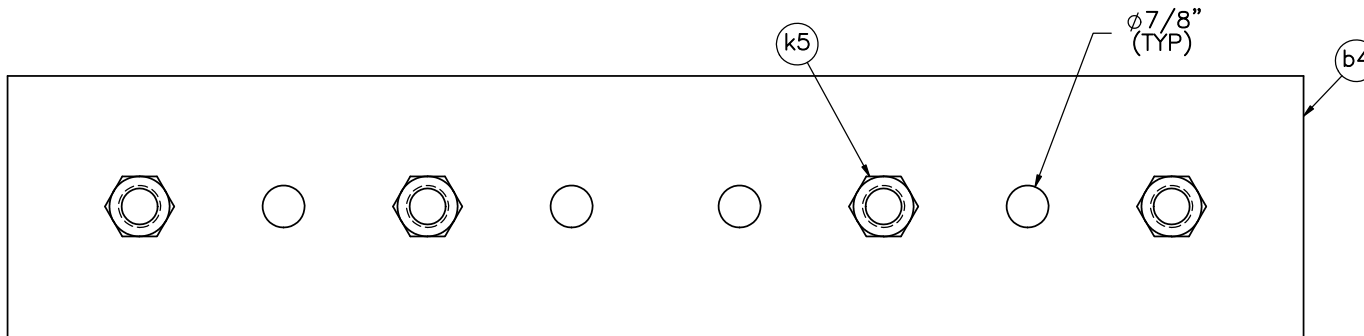
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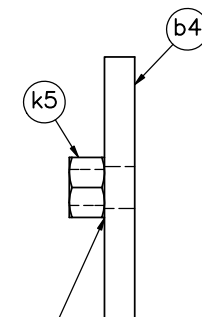
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8/6/2021

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REV. BY:
JEK/KAL/LT
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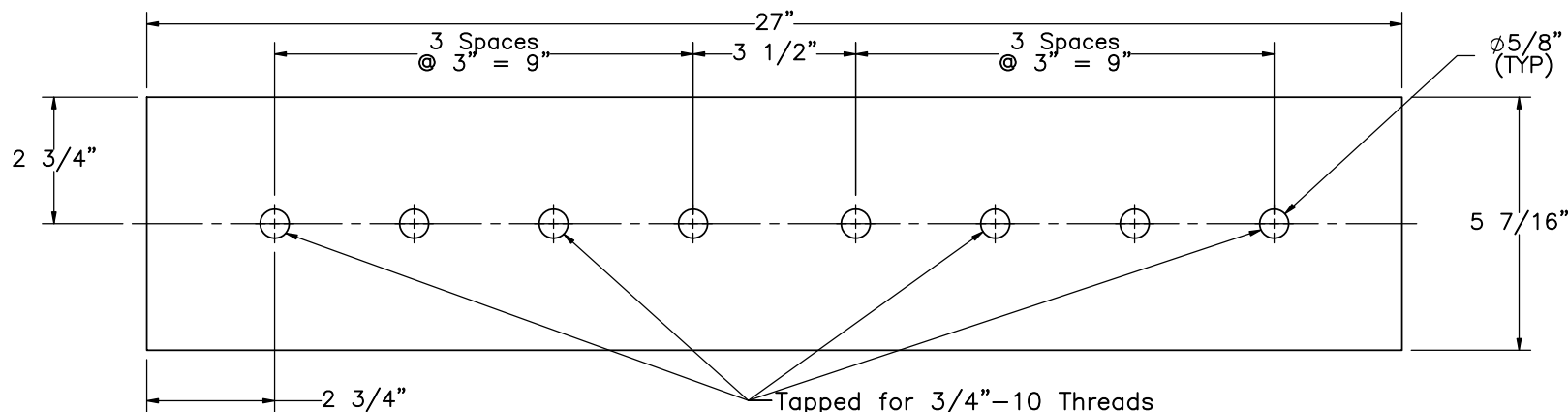


ELEVATION VIEW
Assembled Splice Plate and Nuts

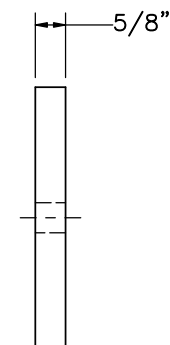


Tack weld all nuts to splice plates prior to assembly.

PROFILE VIEW



ELEVATION VIEW
Alternative Splice Plate With Tapped Holes



PROFILE VIEW

Note: Splice plate with tapped holes may be used instead of splice plate with tack welded nuts. Welded nut splice plate is preferred.

Item No.	QTY.	Description	Material Specification	Treatment Specification	Hardware Guide
—	10	Splice Plate with Tack Welded Nuts	—	ASTM A123	—
b4	1	27"x5 7/16"x5/8" Splice Plate	ASTM A36	See Assembly	—
k5	4	3/4"-10 UNC Heavy Hex Nut	ASTM A563DH or equivalent	See Assembly	FNX20b



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Box Beam Splice Plate Details

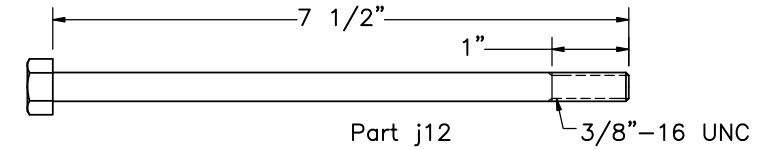
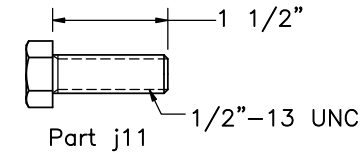
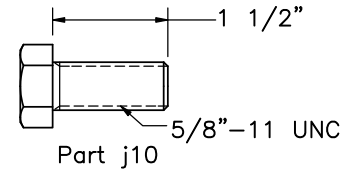
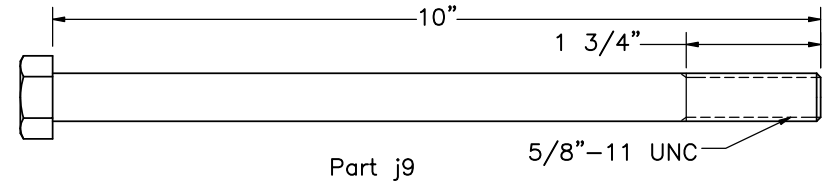
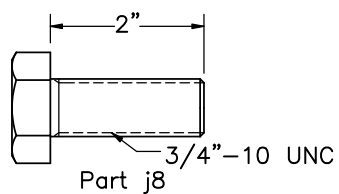
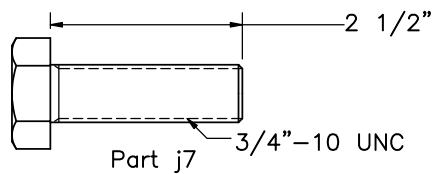
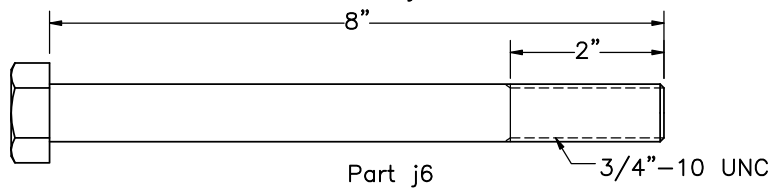
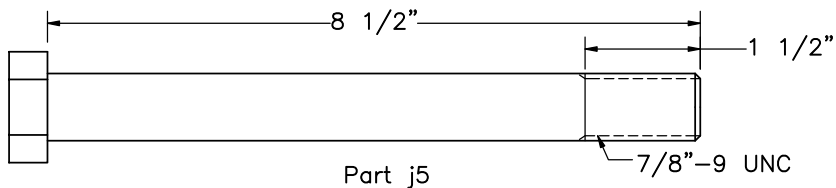
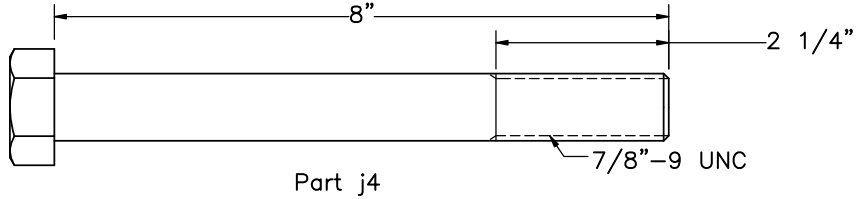
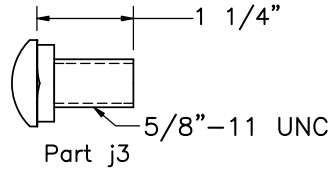
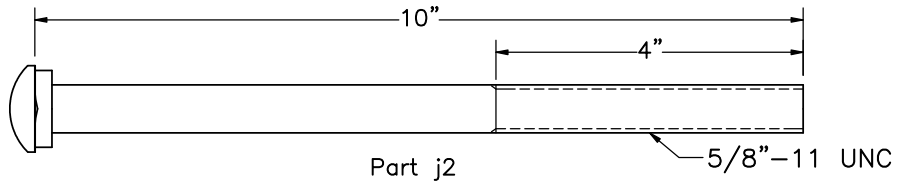
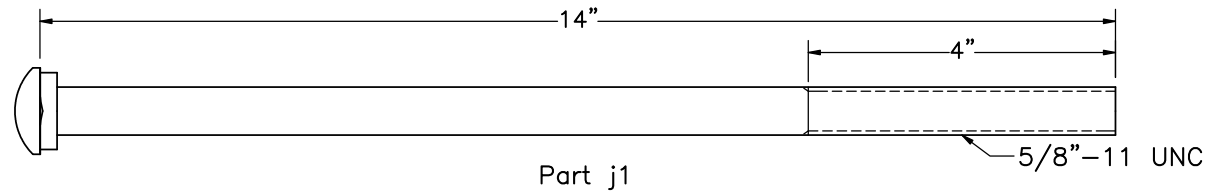
DWG. NAME.
NYHBT-1-2_R20

SCALE: 1:4
UNITS: in.

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Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Hardware Details

DWG. NAME.
NYHBT-1-2_R20

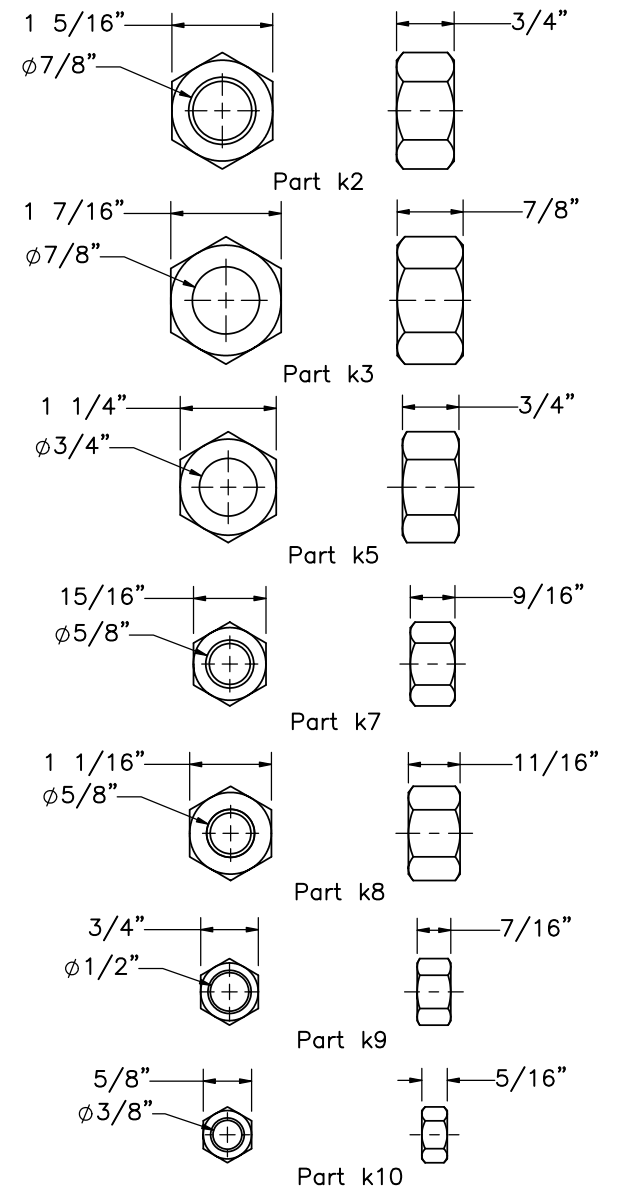
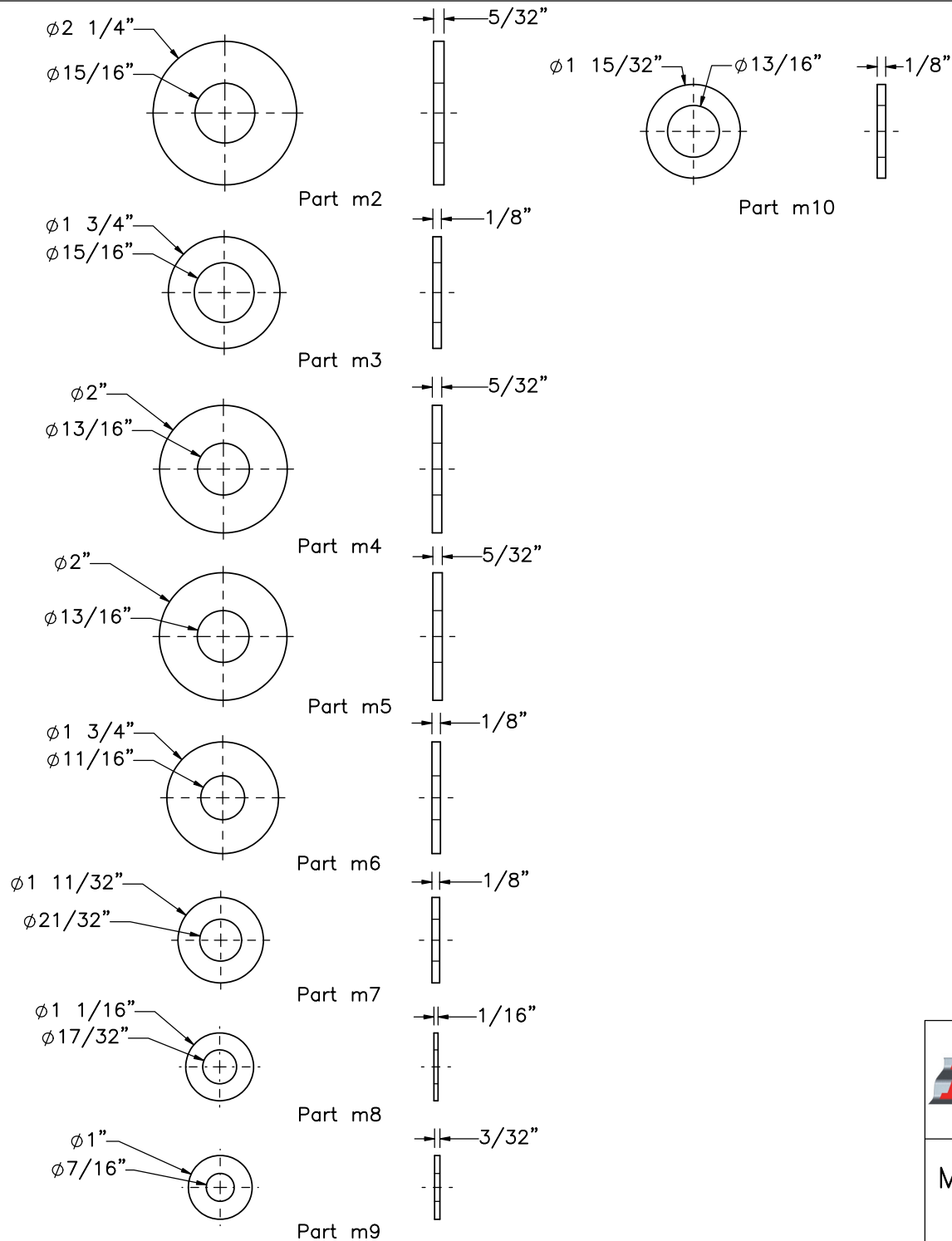
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Midwest Roadside
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NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Hardware Details

DWG. NAME.
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SCALE: 2:5
UNITS: in.

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RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
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/JRR

Item No.	QTY.	Description	Material Specification	Treatment Specification	Hardware Guide
a1	5	12'-6" 12-gauge W-Beam Section	AASHTO M180	ASTM A123 or A653	RWM04a
a2	2	12'-6" 12-gauge W-Beam Section	AASHTO M180	ASTM A123 or A653	—
a3	1	12'-6" 12-gauge W-Beam MGS End Section	AASHTO M180	ASTM A123 or A653	RWM14a
a4	1	W-Beam to Box Beam Transition Cover, 12-gauge	ASTM A36	ASTM A123 or A653	—
b1	1	TS6"x6"x3/16", 215 1/2" Long Box Beam	ASTM A500 Gr. B	ASTM A123	—
b2	4	TS6"x6"x3/16", 215 1/2" Long Box Beam	ASTM A500 Gr. B	ASTM A123	—
b3	1	TS6"x6"x3/16", 215 1/2" Long Box Beam	ASTM A500 Gr. B	ASTM A123	—
b4	10	27"x5 7/16"x5/8" Splice Plate	ASTM A36	See Assembly	—
c1	21	S3x5.7, 65" Long Post	ASTM A36	See Assembly	—
c2	21	24"x8"x1/4" Soil Plate	ASTM A36	See Assembly	—
c3	3	7"x4"x1/2", 3" Long L-Bracket	ASTM A36	ASTM A123	—
c4	18	5"x3 1/2"x3/8", 4 1/2" Long L-Bracket	ASTM A36	ASTM A123	—
c5	11	W6x8.5 or W6x9, 72" Long Steel Post	ASTM A36	ASTM A123	—
c6	11	14"x12"x6" Timber Blockout	SYP Grade No. 1 or better	—	—
d1	2	W6x15, 72" Long Post	ASTM A992 or ASTM A572 Gr. 50	—	—
d2	2	20"x14"x3/16" Plate	ASTM A36	—	—
d3	2	6 3/16"x4"x1/2" Plate	ASTM A36	—	—
d4	4	6 1/4"x4"x1/2" Plate	ASTM A36	—	—
d5	2	6 3/16"x6"x1/2" Plate	ASTM A36	—	—
e1	2	10"x9"x1/2" Box Beam Cable Anchor Base Plate	ASTM A36	See Assembly	—
e2	4	4"x4"x1/4" Box Beam Cable Anchor Gusset	ASTM A36	See Assembly	—
e3	2	4"x4"x1/2" Box Beam Cable Anchor Mounting Plate	ASTM A36	See Assembly	—
f1	1	Concrete	Pre-Cast Class A* Min. f'c = 3,000 psi NE Mix 47BD	—	—
f2	4	#3 Bar, 30 1/4" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **	—
f3	2	#3 Bar, 33 7/16" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **	—
f4	2	#3 Bar, 35 7/8" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **	—
f5	2	#3 Bar, 38 3/8" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **	—
f6	2	#3 Bar, 45 9/16" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **	—
f7	2	#3 Bar, 48" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **	—
f8	2	#3 Bar, 50 1/2" Long	ASTM A615 Gr. 60 or A996 Gr. 60	Epoxy-Coated (ASTM A775 or A934) **	—
f9	11	3/4" Dia. UNC, Hooked Anchor J-Bolt	ASTM F1554 Gr. 36	ASTM A153 or B695 Class 55 or F2329	FRH20a

* If cast in place, follow Section 501 – Portland Cement Concrete – General of the NY state standards.

** Epoxy-coating not necessary for testing purposes.

Note: (1) According to NY standards, blockouts may be wood, plastic, or synthetic.



Midwest Roadside
Safety Facility

NY HPBO W-Beam to
Box Beam Transition
Test Series NYHBT

Bill of Materials

DWG. NAME.
NYHBT-1-2_R20

SCALE: None
UNITS: in.

SHEET:
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8/6/2021

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Item No.	QTY.	Description	Material Specification	Treatment Specification	Hardware Guide
g1	1	14"x9"x1/2" Plate	ASTM A36	See Assembly	—
g2	4	4"x2 13/16"x1/4" Cable Anchor Gusset	ASTM A36	See Assembly	—
g3	1	14"x3 1/2"x1/2" Cable Anchor Top Plate	ASTM A36	See Assembly	—
g4	1	1/4" Dia., 16 3/8" Long Brass Rod	ASTM B16-00	—	—
h1	9	3/4" Dia. UNC, 11" Long Threaded Rod	ASTM A307 Gr. A or equivalent	ASTM A153 or B695 Class 55 or F2329	RCE03
h2	3	3/4" Dia. UNC, 11" Long Left-Hand Threaded Rod	ASTM A307 Gr. A or equivalent	ASTM A153 or B695 Class 55 or F2329	RCE03
h3	6	Cable End Fitting	ASTM A27 Gr. 70-40 Class 1	ASTM A153 or B695	RCE03
h4	6	Cable Wedge	ASTM A47 Gr. 32510	—	FMM01
h5	3	Standard Turnbuckle	ASTM F1145	ASTM A153 or B633	—
h6	6	3/4" Dia. 3x7 IWRC IPS Wire Rope – Various Lengths	ASTM A741 Type 1	Class A Coating	RCM01
h7	6	BCT Anchor Cable End Swaged Fitting	Fitting – ASTM A576 Gr. 1035 Stud – ASTM F568 Class C	Fitting – ASTM A153 Stud – ASTM A153 or B695	—
h7	2	3/4" [19] Dia. 6x19 IWRC IPS Wire Rope	ASTM A741 Type 2	Class A Coating	—
i1	2	BCT Timber Post – MGS Height	SYP Grade No. 1 or better (No knots +/– 9" from weakening hole on tension face)	—	PDF01
i2	2	72" Long Foundation Tube	ASTM A500 Gr. B	ASTM A123	PTE06
i3	1	Ground Strut Assembly	ASTM A36	ASTM A123	PFP01
i4	1	Anchor Bracket Assembly	ASTM A36	ASTM A123	FPA01
i5	1	8"x8"x5/8" Anchor Bearing Plate	ASTM A36	ASTM A123	FPB01
i6	1	2 3/8" O.D. x 6" Long BCT Post Sleeve	ASTM A53 Gr. B Schedule 40	ASTM A123	FMM02
j1	11	5/8"-11 UNC, 14" Long Guardrail Bolt	ASTM A307 Gr. A	ASTM A153 or B695 Class 55 or F2329	FBB06
j2	2	5/8"-11 UNC, 10" Long Guardrail Bolt	ASTM A307 Gr. A	ASTM A153 or B695 Class 55 or F2329	FBB03
j3	52	5/8"-11 UNC, 1 1/4" Long Guardrail Bolt	ASTM A307 Gr. A	ASTM A153 or B695 Class 55 or F2329	FBB01
j4	2	7/8"-9 UNC, 8" Long Hex Head Bolt	ASTM A307 Gr. A or equivalent	ASTM A153 or B695 Class 55 or F2329	—
j5	2	7/8"-9 UNC, 8 1/2" Long Heavy Hex Head Bolt	ASTM F3125 Gr. A325 Type 1 or equivalent	ASTM A153 or B695 Class 55 or F1136 Gr. 3 or F2329 or F2833 Gr. 1	FBX22b
j6	11	3/4"-10 UNC, 8" Long Hex Head Bolt	ASTM A307 Gr. A or equivalent	ASTM A153 or B695 Class 55 or F2329	FBX20a
j7*	2	3/4"-10 UNC, 2 1/2" Long Fully Threaded Heavy Hex Head Bolt	ASTM F3125 Gr. A325 Type 1 or equivalent	ASTM A153 or B695 Class 55 or F1136 Gr. 3 or F2329 or F2833 Gr. 1	FBX20b
j8*	38	3/4"-10 UNC, 2" Long Fully Threaded Heavy Hex Head Bolt	ASTM F3125 Gr. A325 Type 1 or equivalent	ASTM A153 or B695 Class 55 or F1136 Gr. 3 or F2329 or F2833 Gr. 1	FBX20b
j9	2	5/8"-11 UNC, 10" Long Hex Head Bolt	ASTM A307 Gr. A or equivalent	ASTM A153 or B695 Class 55 or F2329	FBX16a
j10	8	5/8"-11 UNC, 1 1/2" Long Hex Head Bolt	ASTM A307 Gr. A or equivalent	ASTM A153 or B695 Class 55 or F2329	FBX16a
j11	18	1/2"-13 UNC, 1 1/2" Long Fully Threaded Hex Head Bolt	ASTM A307 Gr. A or equivalent	ASTM A153 or B695 Class 55 or F2329	FBX14a

* If using the alternate splice plates with tapped holes, these hex bolts can be 1/2" shorter.



Midwest Roadside
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NY HPBO W-Beam to
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Test Series NYHBT

Bill of Materials

DWG. NAME.
NYHBT-1-2_R20

SCALE: None
UNITS: in.

SHEET:
36 of 37

DATE:
8/6/2021

DRAWN BY:
MKB/JEK/J
RD/MJM/GH
R

REV. BY:
JEK/KAL/LT
H/SBW/JCH
/JRR

Item No.	QTY.	Description	Material Specification	Treatment Specification	Hardware Guide
j12	18	3/8"–16 UNC, 7 1/2" Long Hex Head Bolt	ASTM A307 Gr. A or equivalent	ASTM A153 or B695 Class 55 or F2329	FBX10a
j13	2	16D Double Head Nail	—	—	—
k1	6	1"–8 UNC Heavy Hex Nut	ASTM A563DH or equivalent	ASTM A153 or B695 Class 55 or F2329	FNX24b
k2	2	7/8"–9 UNC Hex Nut	ASTM A563A or equivalent	ASTM A153 or B695 Class 55 or F2329	—
k3	2	7/8"–9 UNC Heavy Hex Nut	ASTM A563DH or equivalent	ASTM A153 or B695 Class 55 or F2329	FNX22b
k4	30	3/4"–10 UNC Hex Nut	ASTM A563A or equivalent	ASTM A153 or B695 Class 55 or F2329	FNX20a
k5*	40	3/4"–10 UNC Heavy Hex Nut	ASTM A563DH or equivalent	See Assembly	FNX20b
k6	12	3/4"–10 UNC Square Nut	ASTM A563A or equivalent	ASTM A153 or B695 Class 55 or F2329	FNS20
k7	10	5/8"–11 UNC Hex Nut	ASTM A563A or equivalent	ASTM A153 or B695 Class 55 or F2329	FNX16a
k8	65	5/8"–11 UNC Heavy Hex Nut	ASTM A563A or equivalent	ASTM A153 or B695 Class 55 or F2329	FNX16b
k9	18	1/2"–13 UNC Hex Nut	ASTM A563A or equivalent	ASTM A153 or B695 Class 55 or F2329	FNX14a
k10	18	3/8"–16 UNC Hex Nut	ASTM A563A or equivalent	ASTM A153 or B695 Class 55 or F2329	FNX10a
m1	6	1" Dia. Plain USS Washer	ASTM F844	ASTM A123 or A153 or F2329	FWC24a
m2	4	7/8" Dia. Plain USS Washer	ASTM F844	ASTM A123 or A153 or F2329	—
m3	4	7/8" Dia. Hardened SAE Washer	ASTM F436	ASTM A153 or B695 Class 55 or F1136 Gr. 3 or F2329	FWC22b
m4	16	3/4" Dia. Plain USS Washer	ASTM F844	ASTM A123 or A153 or F2329	FWC20a
m5	40	3/4" Dia. Hardened USS Washer	ASTM F436	ASTM A153 or B695 Class 55 or F1136 Gr. 3 or F2329	—
m6	22	5/8" Dia. Plain USS Washer	ASTM F844	ASTM A123 or A153 or F2329	FWC16a
m7	11	5/8" Dia. Plain SAE Washer	ASTM F844	ASTM A123 or A153 or F2329	—
m8	18	1/2" Dia. Plain Narrow SAE Washer	SAE Low Carbon Gr. 2	ASTM A153 or B695 Class 55 or F1136 Gr. 3 or F2329	—
m9	36	3/8" Dia. Plain USS Washer	ASTM F844	ASTM A123 or A153 or F2329	FWC10a
m10	30	3/4" Dia. Hardened SAE Washer	ASTM F436	ASTM A153 or B695 Class 55 or F1136 Gr. 3 or F2329	FWC20b

* If using the alternate splice plates with tapped holes, these additional hex nuts are not required.

Washer	Washer Series	Inside Diameter			Outside Diameter			Thickness		
		Basic	Tolerance Plus	Tolerance Minus	Basic	Tolerance Plus	Tolerance Minus	Basic	Max.	Min.
3/4"	Regular (m10)	0.812"	0.03"	0.007"	1.469"	0.03"	0.007"	0.134"	0.16"	0.108"
	Wide (m4)	0.812"	0.03"	0.007"	2"	0.03"	0.007"	0.165"	0.192"	0.136"



Midwest Roadside
Safety Facility

NY HPBO W–Beam to
Box Beam Transition
Test Series NYHBT

Bill of Materials

DWG. NAME:
NYHBT–1–2_R20

SCALE: None
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REV.	DATE OF ISSUE	Page	NATURE OF CHANGES	REVIEWER	REVISED BY
0	5/7/2019	–	Originated from drawing NYBWT–1_R14. Major changes to system, based off of NY sheet 606–21, sheets it references, and NY Standards.	–	MKB
1	5/8/2019	–	Generalized test info and impact. Removed sheet references. Renumbered many part nos.	JEK	MKB
		1	Note edit for test info. Relocate post nos for clarity.		
		7	Box beam elevation dim add.		
		10	Ground Line and box beam elevation dim add.		
		22	Former sheets 22 and 23 consolidated and sheet updated to standards.		
		33	Bolts only sheet now		
		34	Nut and Washer sheet		
		BOM	Many part nos. renumbered. Sheets reorganized to show like hardware on same page.		
2	5/14/2019	–	Part c5 changed to meet emeddmnt standard for MGS W–beam of 40". Renumbered section and detail views. Sheets 24–27 moved in front of sheet 16.	JEK	MKB
		2	Dim add. Dim edit. Removed sections B and E because the hardware is outlined later.		
		3	Part callout edit.		
		4	Dim add.		
		7	Dim callout edit.		
		28	Dim callout edit.		
		BOM	HWG: a1,c5,j1,m7 Description: c6,m7 Material Spec: c5,j1,j2,j3,k3,m7 Treatment Spec: m7		
3	7/31/2019	–	Title edit. W–beam anchorage move. Sections/details relettered. Pages re–arranged (4–9, 28–29).	KAL	JEK
		1	Text edits. Section adds.		
		2	Section adds. Note edits.		
		3	Note edits.		
		4	Note adds. W–beam bolts centered in slots. (Former page 6)		
		5	Note edits. (Former page 7)		
		6	Label edits. Note edits. (Former page 8)		
		7	Note edits. (Former page 9)		

3	7/31/2019	8	Anchorage shift. Text edits. (Former page 4)	KAL	JEK
		9	Note edits. (Former page 5)		
		10	Dim shifts. Note edits.		
		11	Note edits.		
		12	Note 1 add. General shift (table).		
		14	Note 1 add.		
		16	Dim add.		
		24	Dim edit. Note edits.		
		28	Note 1 add. (Former page 29)		
		29	Part a3 edit. (Former page 28)		
		31	Note edit.		
4	8/23/2019	–	Anchor block and cable anchor bracket assemblies changed to meet new NYDOT standards. HFT anchor assembly renamed to anchor post assembly. New sheet 26.	LTH/KAL	JRD
		1	Edited anchor post assembly annotation and note 4.		
		2	Edited anchor post assembly annotation.		
		5	Edited anchor dimension.		
		7	Edited sheet scale and views for updated anchor.		
		10	Edited anchor post assembly annotation.		
		12	Edited views and dimensions for updated anchor. Added new components to assembly BOM.		
		13	Removed components from previous anchor. Inserted and dimensioned new anchor components. Updated bill of bars.		
		14	Edited sheet scale, weld notes, and dimensions for updated bracket.		
		15	Edited dimensions for changed components.		
		18	Edited dimensions.		
		20	Renamed sheet and BOM to anchor post assembly.		
		24	Inserted new component to transition anchor cable.		
		25	Moved parts h5 and h6 to sheet 26. Inserted and dimensioned new component.		
		26	New sheet. Inserted components h5 and h6.		
		BOM	New parts: h2, f2, f3, f4, f5, f6, f7, f8. Description: g2		

5	8/23/2019	2	Hide component in section C-C.	JEK	JRD
		12	Added view annotations and two dimensions.		
		14	Moved interfering dimension away from component.		
		15	Added dimension to part g2.		
6	10/11/2019	2	Fixed post hight	JEK	SBW
7	10/23/2019	1	Renamed system	JEK	SBW
		4	Moved dimensions to center of posts.		
		6	Moved interfering dimension away from component.		
		14	Fixed table.		
		15	Moved interfering dimension away from component.		
		BOM	Fixed table.		
8	10/25/2019	All	Removed dual units.	JEK	SBW
		2	Removed cables from view		
		4	Added ground line note		
		BOM	Fixed spacings, updated discriptions, and fixed asterix notation		
9	11/4/2019	12	Note edit.	JCH/KAL	JEK
		BOM	Fixed missing materials. Corrected h7. Mtrl: f9. Reduced pages of BOM. General fixes.		
10	12/6/2019	—	Replaced part k7 with k8 at all splice locations.	JCH	MJM
		4	Added detail I. Splice of nuts and bolts. Renamed following section and detail views.		
		7	Replaced Elevation View with similar view that was not cut off at the end.		
		12	Fixed part bubble to display the correct part number.		
		24	Edited to cable end assemblies to include part h1 and reflect anchor cable details.		
		34	Edited part m5, thickness and inner and outer diameters.		
		BOM	Removed part d6. Edited m5 part description. Parts h1, k7, and k8 reflect new quantities.		
		4	Fixed dimension lines so they cross off the page. Scaled detail I to standard 1:8.		
		6	Moved transition anchor annotation into page box.		
		9	Resized part bubbles for parts j10 and j13.		

11	12/9/2019	11	Resized part bubbles for parts j11 and j12. Moved annotation so it does not cross into m8 part bubble.	JEK	MJM
		25	Relabeled Sections R-R and S-S as S-S and T-T respectively.		
		30	Relabeeld Details U, V, and W as V, W, and X respectively.		
		32/33	Switched page orders.		
12	12/11/2019	4	Edited Detail I annotation.	JEK	MJM
		17	Added duel arrow leaders to hole dimensions on Elevation View of part c1.		
		18	Added duel arrow leaders to hole dimensions on Elevation View of part c4.		
		29	Changed Section T-T to Section U-U.		
		31	Added duel arrow leaders to hole dimensions on Plan Views of parts b1, b2, and b3.		
13	1/22/2020	2	Added not detailing options to prevent blockout rotation.	JCH/JEK	MJM
		9	Added a second nail, part j13, to assembly. Added note to indicate; is reflected in BOM.		
		19	Added hatching and "Optional" label to Plan view of part c6. Added optional hole and label to part c5.		
		31	Added missing leader to Plan View of part b3.		
		BOM	Added note detailing composition of blockouts.		
14	2/13/2020	1	Impact information added. Note edits.	KAL	JEK
15	2/19/2020	30	Part a2 hole pattern edit.	KAL	JEK
16	2/24/2020	—	Washers fixed in model in various locations.	KAL/JCH	JEK
		5	Bubble edit (to point to nut on anchor rather than rod).		
		6	Washer correction (cable bracket attachment). Model only: nuts and washers on cable end fixed.		
		24	Washer m5 replaced with new m10.		
		34	Washer m10 added.		
		BOM	New: m10. Qty: k4, k6, m1, m4, m5, m10. HWG: m5. Washer m5 to m10 in size table.		
17	3/6/2020	14	Removed note	KAL	SBW
		15	Added dimensioning to part g1		
		24	Changed material and galv specs on part h5		
		BOM	Changed material and galv specs on part h5		

18	3/12/2020	14	Corrected welds.	KAL	JEK
		15	Part g1 dimension adds.		
19	4/3/2020	BOM	Renumbered: h6-h8. Added h6 to overall BOM.	KAL	JEK
20	8/6/2021	1	Updated rail callouts in elevation view.	JRR	GHR
		24, BOM	Updated component names.		