DRAWN BY: VZ CHECKED BY: VZ APPROVED BY: TGF	MICHIGAN DEPARTMENT OF TRANSPORTATION-BUREAU OF HIGHWAYS DECIMAL PARTS OF A FOOT AND INCH	ISSUED: 11/27/01 SUPERSEDES: CAVEMEN

DECIMAL PARTS OF A FOOT													Decimals of an Inch	
Inches	0"	1"	2"	3"	4"	5"	6"	7"	8"	9"	10"	11"		
	0.0000	0.0833	0.1667	0.2500	0.3333	0.4167	0.5000	0.5833	0.6667	0.7500	0.8333	0.9167		
1/32	0.0026	0.0859	0.1693	0.2526	0.3359	0.4193	0.5026	0.5859	0.6693	0.7526	0.8359	0.9193	1/32	0.0313
1/16	0.0052	0.0885	0.1719	0.2552	0.3385	0.4219	0.5052	0.5885	0.6719	0.7552	0.8385	0.9219	1/16	0.0625
3/32	0.0078	0.0911	0.1745	0.2578	0.3411	0.4245	0.5078	0.5911	0.6745	0.7578	0.8411	0.9245	3/32	0.0938
1/8	0.0104	0.0938	0.1771	0.2604	0.3438	0.4271	0.5104	0.5937	0.6771	0.7604	0.8437	0.9271	1/8	0.1250
5/32	0.0130	0.0964	0.1797	0.2630	0.3464	0.4297	0.5130	0.5964	0.6797	0.7630	0.8464	0.9297	5/32	0.1563
3/16	0.0156	0.0990	0.1823	0.2656	0.3490	0.4323	0.5156	0.5990	0.6823	0.7656	0.8490	0.9323	3/16	0.1875
7/32	0.0182	0.1016	0.1849	0.2682	0.3516	0.4349	0.5182	0.6016	0.6849	0.7682	0.8516	0.9349	7/32	0.2188
1/4	0.0208	0.1042	0.1875	0.2708	0.3542	0.4375	0.5208	0.6042	0.6875	0.7708	0.8542	0.9375	1/4	0.2500
9/32	0.0234	0.1068	0.1901	0.2734	0.3568	0.4401	0.5234	0.6068	0.6901	0.7734	0.8568	0.9401	9/32	0.2813
5/16	0.0260	0.1094	0.1927	0.2760	0.3594	0.4427	0.5260	0.6094	0.6927	0.7760	0.8594	0.9427	5/16	0.3125
11/32	0.0286	0.1120	0.1953	0.2786	0.3620	0.4453	0.5286	0.6120	0.6953	0.7786	0.8620	0.9453	11/32	0.3438
3/8	0.0313	0.1146	0.1979	0.2813	0.3646	0.4479	0.5312	0.6146	0.6979	0.7812	0.8646	0.9479	3/8	0.3750
13/32	0.0339	0.1172	0.2005	0.2839	0.3672	0.4505	0.5339	0.6172	0.7005	0.7839	0.8672	0.9505	13/32	0.4063
7/16	0.0365	0.1198	0.2031	0.2865	0.3698	0.4531	0.5365	0.6198	0.7031	0.7865	0.8698	0.9531	7/16	0.4375
15/32	0.0391	0.1224	0.2057	0.2891	0.3724	0.4557	0.5391	0.6224	0.7057	0.7891	0.8724	0.9557	15/32	0.4688
1/2	0.0417	0.1250	0.2083	0.2917	0.3750	0.4583	0.5417	0.6250	0.7083	0.7917	0.8750	0.9583	1/2	0.5000
17/32	0.0443	0.1276	0.2109	0.2943	0.3776	0.4609	0.5443	0.6276	0.7109	0.7943	0.8776	0.9609	17/32	0.5313
9/16	0.0469	0.1302	0.2135	0.2969	0.3802	0.4635	0.5469	0.6302	0.7135	0.7969	0.8802	0.9635	9/16	0.5625
19/32	0.0495	0.1328	0.2161	0.2995	0.3828	0.4661	0.5495	0.6328	0.7161	0.7995	0.8828	0.9661	19/32	0.5938
5/8	0.0521	0.1354	0.2187	0.3021	0.3854	0.4688	0.5521	0.6354	0.7187	0.8021	0.8854	0.9687	5/8	0.6250
21/32	0.0547	0.1380	0.2214	0.3047	0.3880	0.4714	0.5547	0.6380	0.7214	0.8047	0.8880	0.9714	21/32	0.6563
11/16	0.0573	0.1406	0.2240	0.3073	0.3906	0.4740	0.5573	0.6406	0.7240	0.8073	0.8906	0.9740	11/16	0.6875
23/32	0.0599	0.1432	0.2266	0.3099	0.3932	0.4766	0.5599	0.6432	0.7266	0.8099	0.8932	0.9766	23/32	0.7188
3/4	0.0625	0.1458	0.2292	0.3125	0.3958	0.4792	0.5625	0.6458	0.7292	0.8125	0.8958	0.9792	3/4	0.7500
25/32	0.0651	0.1484	0.2318	0.3151	0.3984	0.4818	0.5651	0.6484	0.7318	0.8151	0.8984	0.9818	25/32	0.7813
13/16	0.0677	0.1510	0.2344	0.3177	0.4010	0.4844	0.5677	0.6510	0.7344	0.8177	0.9010	0.9844	13/16	0.8125
27/32	0.0703	0.1536	0.2370	0.3203	0.4036	0.4870	0.5703	0.6536	0.7370	0.8203	0.9036	0.9870	27/32	0.8438
7/8	0.0729	0.1562	0.2396	0.3229	0.4063	0.4896	0.5729	0.6562	0.7396	0.8229	0.9062	0.9896	7/8	0.8750
29/32	0.0755	0.1589	0.2422	0.3255	0.4089	0.4922	0.5755	0.6589	0.7422	0.8255	0.9089	0.9922	29/32	0.9063
15/16	0.0781	0.1615	0.2448	0.3281	0.4115	0.4948	0.5781	0.6615	0.7448	0.8281	0.9115	0.9948	15/16	0.9375
31/32	0.0807	0.1641	0.2474	0.3307	0.4141	0.4974	0.5807	0.6641	0.7474	0.8307	0.9141	0.9974	31/32	0.9688

PREPARED BY DESIGN DIV.	1.11.01

DRAWN BY: BLT	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT	ISSUED: 01/26/26
CHECKED BY: CWC	FACTORS FOR BRIDGE ESTIMATES	SUPERSEDES: 12/16/19
APPROVED BY: KCK		

STEEL REINFORCEMENT WEIGHTS

SUBSTRUCTURE UNIT	LBS/CYD OF CONC.
CANTILEVER ABUTMENT	50
COUNTERFORT ABUTMENT	100
GRAVITY ABUTMENT	15
CURTAIN WALL ABUTMENT	50
COLUMN & GIRDER PIER (HWY.)	120
COLUMN & GIRDER PIER (R.R.)	160
GRAVITY PIER	15
PILE CAP	70

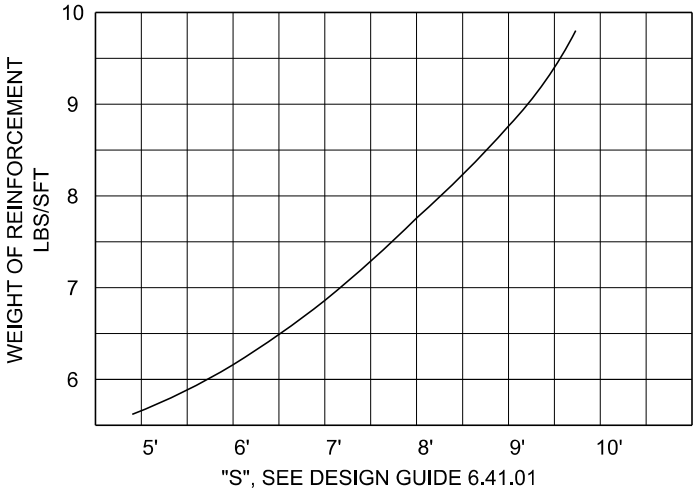
SUBSTRUCTURE UNIT	LBS/CONC. UNIT
STANDARD SLAB (ON STRINGERS)	SEE GRAPH BELOW
SIMPLE SPAN T-BEAM	250/CYD
CONTINUOUS SLAB	260/CYD
CONTINUOUS T-BEAM	350/CYD
SIMPLE SPAN SLAB	170/CYD
BURIED T-BEAM	200/CYD
RIGID FRAME	175/CYD
SOLID PARAPET RAILING	14/FT
BARRIER RAILING, TYPE 4	25/FT
BARRIER RAILING, TYPE 5	21/FT

RAILING WEIGHTS

RAILING TYPE	LBS/FT
SOLID PARAPET RAILING	⟨1⟩ 357
BRIDGE BARRIER RAILING, TYPE 4	475
BRIDGE BARRIER RAILING, TYPE 5	392
BRIDGE BARRIER RAILING, TYPE 6	601
BRIDGE BARRIER RAILING AESTHETIC TYPE 6, DET 2	615
BRIDGE BARRIER RAILING, TYPE 7	414
BRIDGE BARRIER RAILING AESTHETIC TYPE 7, DET 2	428
BRIDGE RAILING, 1 TUBE	10
BRIDGE RAILING, 2 TUBE (TUBE & POST ONLY)	⟨2⟩ 51
BRIDGE RAILING, 2 TUBE (WITH BRUSHBLOCK)	⟨2⟩ 185
BRIDGE RAILING, 3 TUBE WITH PICKETS (SIDEWALK)	⟨2⟩ 86
BRIDGE RAILING, 3 TUBE WITH PICKETS (BRUSHBLOCK)	⟨2⟩ 270
BRIDGE RAILING, 4 TUBE (BICYCLE)	⟨2⟩ 265
BRIDGE RAILING, 4 TUBE (PEDESTRIAN)	⟨2⟩ 80
BRIDGE RAILING, 5 TUBE	⟨2⟩ 70
BRIDGE RAILING, AESTHETIC PARAPET TUBE	⟨2⟩ 320

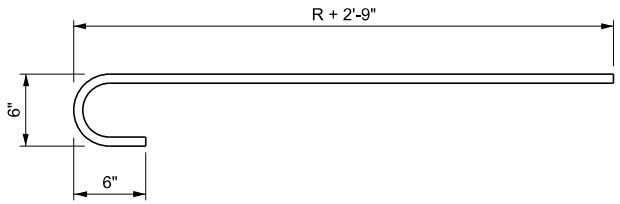
⟨1⟩ INCLUDES WEIGHT OF BRIDGE RAILING, 1-TUBE.

⟨2⟩ VARIES BASED UPON VERTICAL POST SPACING.



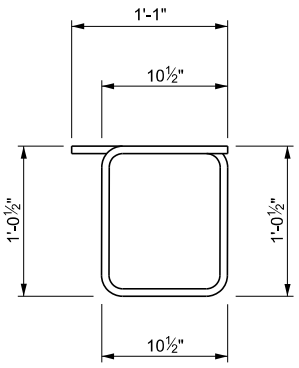
PREPARED BY DESIGN DIVISION	1.21.01

DRAWN BY: BLT CHECKED BY: CWC APPROVED BY: KCK	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT BRIDGE RAILING, 2 TUBE	ISSUED: 01/26/26 SUPERSEDES: 03/27/23

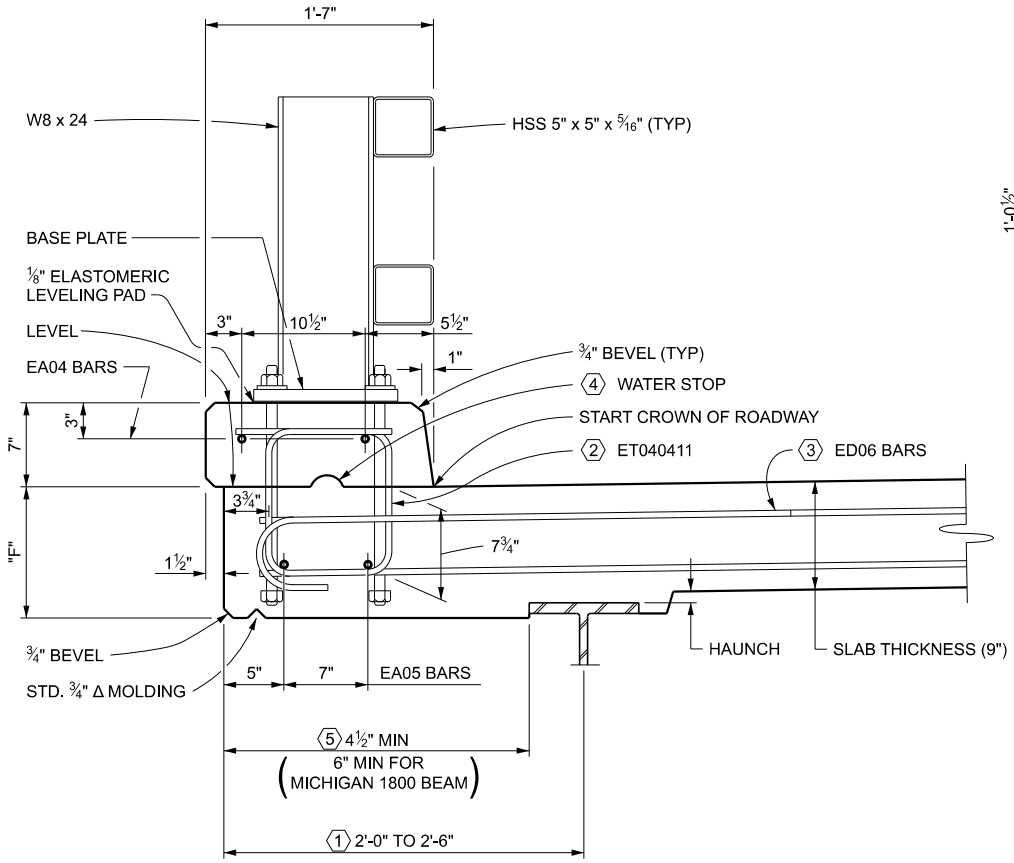


ED06 BAR

R = ℄ BEAM TO SLAB FASCIA DISTANCE



ET040411 BAR



NOTES:

"F" CONSTANT EQUALS SLAB THICKNESS PLUS THICKEST FASCIA BEAM FLANGE PLUS ½" PLUS AMOUNT OF FASCIA BEAM DROP REQUIRED TO MAINTAIN MINIMUM SLAB THICKNESS AT CURB PLUS HAUNCH (1").

IF "F" BECOMES GREATER THAN 12" USE A HAUNCH DETAIL ON THE FASCIA SIDE OF THE BEAM SIMILAR TO THE HAUNCH DETAIL ON THE INTERIOR SIDE. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IN THE AREA OVER THE BEAM FLANGE IF THE HAUNCH BECOMES EXCESSIVE.

THE DETAILED REINFORCEMENT IN THE SLAB (EA05 & ED06 BARS) IS THE MINIMUM FOR THE RAILING. THE DESIGN OF THE SLAB OVERHANG MAY REQUIRE ADDITIONAL REINFORCEMENT (OR INCREASING THE REINFORCEMENT AREA (DIAMETER) SHOWN). BARS WITH PREFIX "E" ARE TO BE EPOXY COATED.

FOR ADDITIONAL DETAILS OF RAILING, SEE STANDARD PLAN B-21-SERIES.

1. IT IS PREFERRED TO PROVIDE A MINIMUM OF 1'-0" OF CLEARANCE FROM THE ET BARS TO THE FASCIA BEAM CENTERLINE TO PERMIT SUPPORT OF THE SCREED RAIL ALONG THE TOP OF THE FASCIA BEAM. IF SUPERSTRUCTURE GEOMETRY DOES NOT ALLOW FOR THIS 1'-0" MINIMUM DISTANCE, ALTERNATE SCREED RAIL SUPPORT METHODS MAY BE REQUIRED. IF THIS SCENARIO APPLIES, CONTACT BOBS BRIDGE CONSTRUCTION TO DISCUSS ALTERNATE SCREED RAIL OPTIONS, BRIDGE DECK FINISHING OPTIONS, AND PROPOSED SUPERSTRUCTURE CONSTRUCTABILITY.

2. SPACE AT ALTERNATE TRANSVERSE SLAB BARS (1'-6" MAX). PLACE ADDITIONAL ET040411 BARS 9" EACH SIDE OF ℄ RAILING POST.

3. AT EACH POST PLACE 7 - ED060409 BARS SPACED AT 9".

4. 2" HIGH x 4" LONG (±). FORMING NOT REQUIRED.

5. 4½" MINIMUM APPLIES TO CURVED GIRDERS ONLY.

PREPARED BY DESIGN DIVISION	6.29.06

DRAWN BY:	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT	ISSUED:
CHECKED BY:		SUPERSEDES:
APPROVED BY:		

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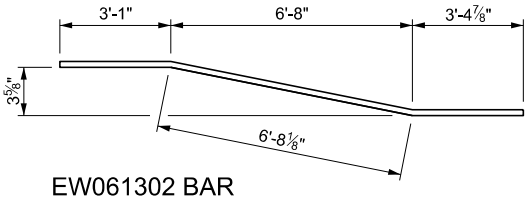
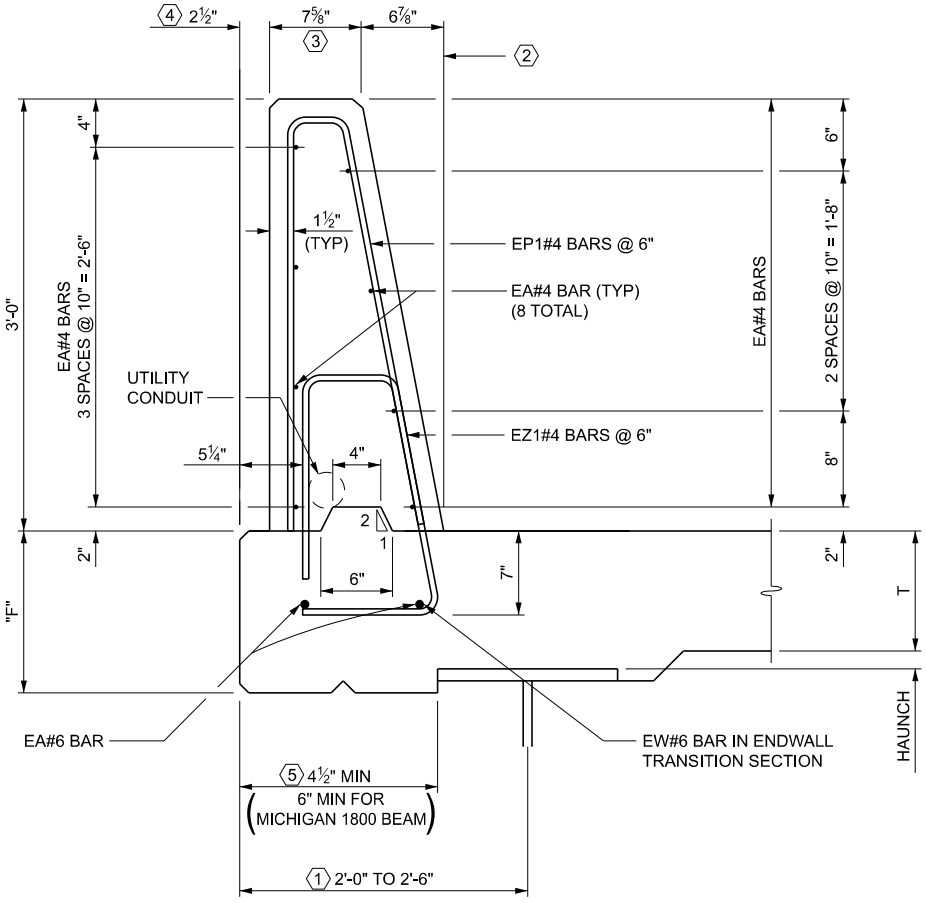
PREPARED BY DESIGN DIVISION	

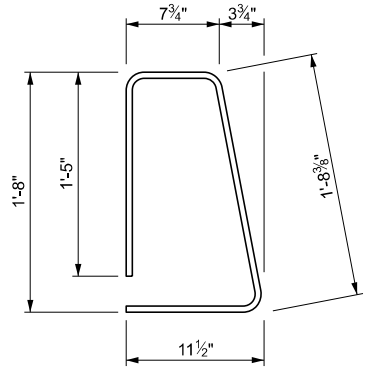
DRAWN BY: BLT CHECKED BY: CWC APPROVED BY: KCK	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT BRIDGE BARRIER RAILING TYPE 7	ISSUED: 01/26/26 SUPERSEDES: 12/16/19



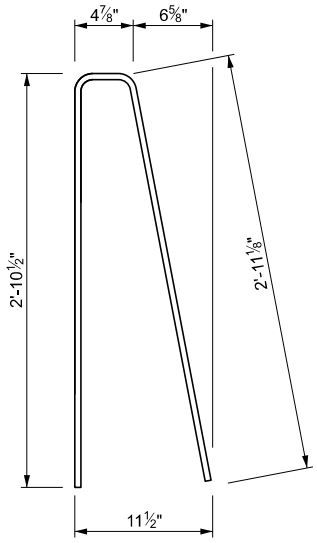
EW061302 BAR

WEIGHT =
414 LBS/LFT (BRIDGE BARRIER RAILING TYPE 7)
428 LBS/LFT (BRIDGE BARRIER RAILING AESTHETIC TYPE 7, DET 2)





EZ1#4 BAR



EP1#4 BAR

NOTE:

"F" EQUALS SLAB THICKNESS PLUS THICKEST FASCIA BEAM FLANGE PLUS ½" PLUS AMOUNT OF FASCIA BEAM DROP REQUIRED TO MAINTAIN MINIMUM SLAB THICKNESS AT CURB PLUS HAUNCH (1").

IF "F" BECOMES GREATER THAN 12" USE A HAUNCH DETAIL ON THE FASCIA SIDE OF THE BEAM SIMILAR TO THE HAUNCH DETAIL ON THE INTERIOR SIDE. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IN THE AREA OVER THE BEAM FLANGE IF THE HAUNCH BECOMES EXCESSIVE.

BARS WITH PREFIX "E" ARE TO BE EPOXY COATED.

FOR ADDITIONAL DETAILS OF RAILING, SEE STANDARD PLAN B-28-SERIES.

DO NOT PLACE MORE THAN ONE 3" Ø UTILITY CONDUIT IN THE BARRIER.

1. IT IS PREFERRED TO PROVIDE A MINIMUM OF 1'-0" OF CLEARANCE FROM THE EZ BARS TO THE FASCIA BEAM CENTERLINE TO PERMIT SUPPORT OF THE SCREED RAIL ALONG THE TOP OF THE FASCIA BEAM. IF SUPERSTRUCTURE GEOMETRY DOES NOT ALLOW FOR THIS 1'-0" MINIMUM DISTANCE, ALTERNATE SCREED RAIL SUPPORT METHODS MAY BE REQUIRED. IF THIS SCENARIO APPLIES, CONTACT BOBS BRIDGE CONSTRUCTION TO DISCUSS ALTERNATE SCREED RAIL OPTIONS, BRIDGE DECK FINISHING OPTIONS, AND PROPOSED SUPERSTRUCTURE CONSTRUCTABILITY.

2. PERPENDICULAR TO PLANE OF SLAB - NORMAL CROWN SECTION AND HIGH SIDE OF SUPERELEVATED SECTIONS. VERTICAL - LOW SIDE OF SUPERELEVATED SECTIONS.

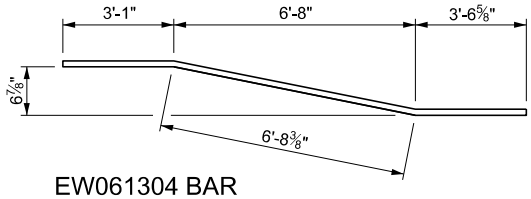
3. 8⅝" BRIDGE BARRIER RAILING AESTHETIC TYPE 7, DET 2.

4. BACK OF BARRIER TO SLAB FASCIA MAY BE DECREASED TO 1½" (FROM 2½") AND TOE OF BARRIER SHIFTED ACCORDINGLY TO ACCOMMODATE THE NEED FOR INCREASED OR MAINTAINING SHOULDER WIDTHS. DISTANCE TO BE DETAILED ON THE PLANS.

5. 4½" MINIMUM APPLIES TO CURVED GIRDERS ONLY.

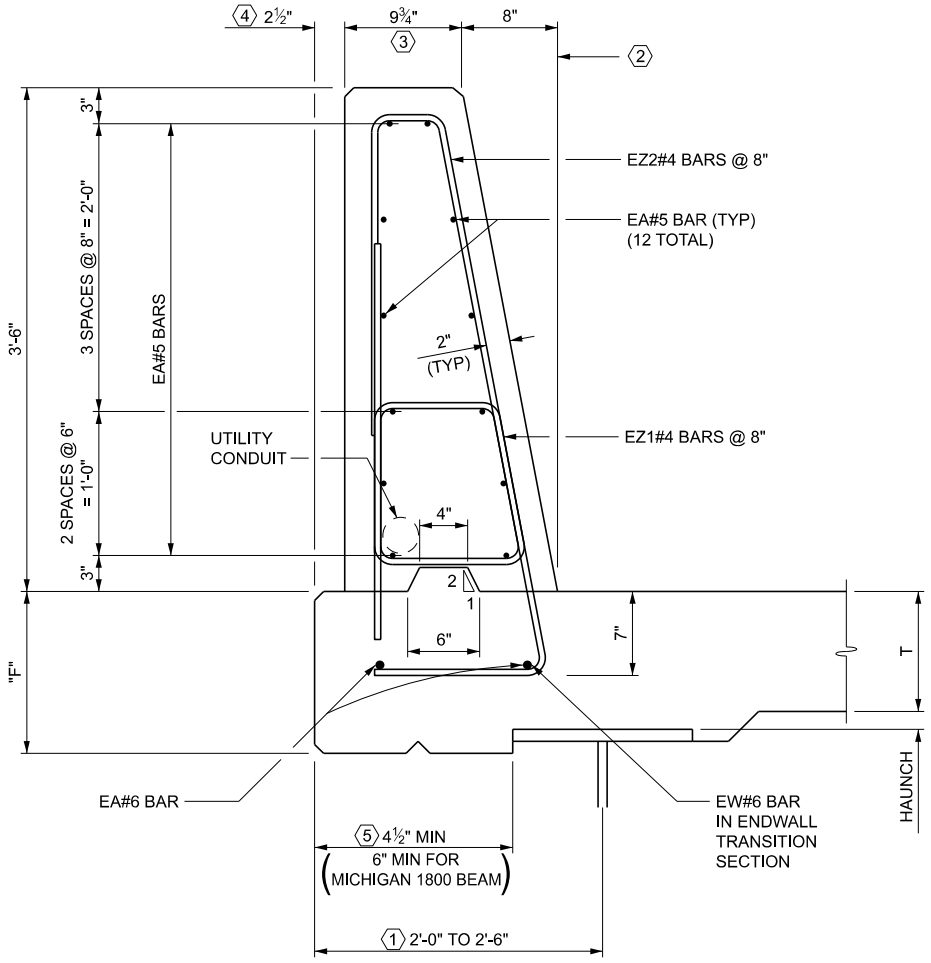
PREPARED BY DESIGN DIVISION	6.29.08

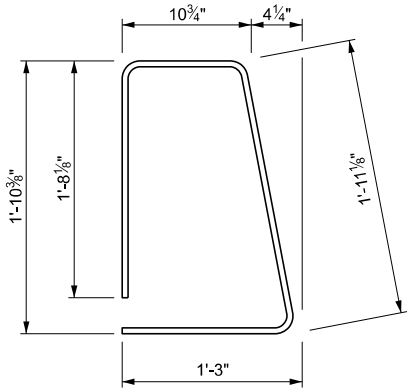
DRAWN BY: BLT	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT	ISSUED: 01/26/26
CHECKED BY: CWC	BRIDGE BARRIER RAILING TYPE 6	SUPERSEDES: 12/16/19
APPROVED BY: KCK		



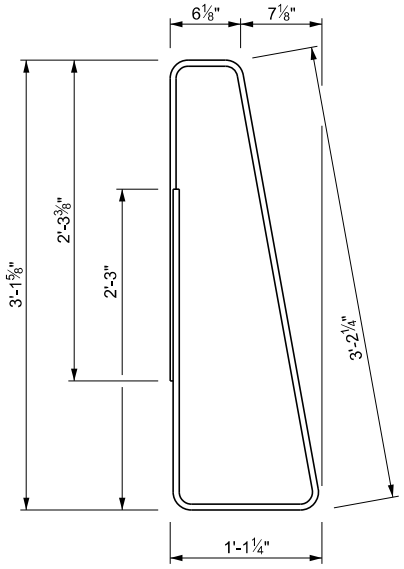
EW061304 BAR

WEIGHT =
601 LBS/LFT (BRIDGE BARRIER RAILING TYPE 6)
615 LBS/LFT (BRIDGE BARRIER RAILING AESTHETIC TYPE 6, DET 2)





EZ1#4 BAR



EZ2#4 BAR

NOTE:

"F" EQUALS SLAB THICKNESS PLUS THICKEST FASCIA BEAM FLANGE PLUS ½" PLUS AMOUNT OF FASCIA BEAM DROP REQUIRED TO MAINTAIN MINIMUM SLAB THICKNESS AT CURB PLUS HAUNCH (1").

IF "F" BECOMES GREATER THAN 12" USE A HAUNCH DETAIL ON THE FASCIA SIDE OF THE BEAM SIMILAR TO THE HAUNCH DETAIL ON THE INTERIOR SIDE. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IN THE AREA OVER THE BEAM FLANGE IF THE HAUNCH BECOMES EXCESSIVE.

BARS WITH PREFIX "E" ARE TO BE EPOXY COATED.

FOR ADDITIONAL DETAILS OF RAILING, SEE STANDARD PLAN B-29-SERIES.

DO NOT PLACE MORE THAN ONE 3" Ø UTILITY CONDUIT IN THE BARRIER.

1. IT IS PREFERRED TO PROVIDE A MINIMUM OF 1'-0" OF CLEARANCE FROM THE EZ BARS TO THE FASCIA BEAM CENTERLINE TO PERMIT SUPPORT OF THE SCREED RAIL ALONG THE TOP OF THE FASCIA BEAM. IF SUPERSTRUCTURE GEOMETRY DOES NOT ALLOW FOR THIS 1'-0" MINIMUM DISTANCE, ALTERNATE SCREED RAIL SUPPORT METHODS MAY BE REQUIRED. IF THIS SCENARIO APPLIES, CONTACT BOBS BRIDGE CONSTRUCTION TO DISCUSS ALTERNATE SCREED RAIL OPTIONS, BRIDGE DECK FINISHING OPTIONS, AND PROPOSED SUPERSTRUCTURE CONSTRUCTABILITY.

2. PERPENDICULAR TO PLANE OF SLAB - NORMAL CROWN SECTION AND HIGH SIDE OF SUPERELEVATED SECTIONS. VERTICAL - LOW SIDE OF SUPERELEVATED SECTIONS.

3. 10¾" BRIDGE BARRIER RAILING AESTHETIC TYPE 6, DET 2.

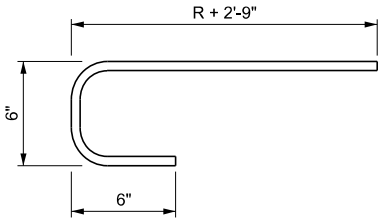
4. BACK OF BARRIER TO SLAB FASCIA MAY BE DECREASED TO 1½" (FROM 2½") AND TOE OF BARRIER SHIFTED ACCORDINGLY TO ACCOMMODATE THE NEED FOR INCREASED OR MAINTAINING SHOULDER WIDTHS. DISTANCE TO BE DETAILED ON THE PLANS.

5. 4½" MINIMUM APPLIES TO CURVED GIRDERS ONLY.

PREPARED BY DESIGN DIVISION	6.29.09

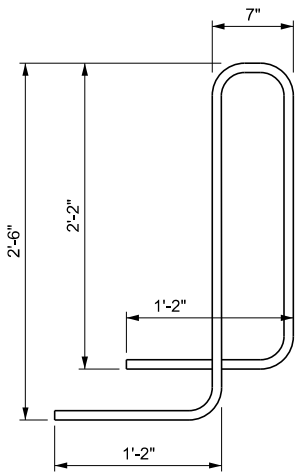
DRAWN BY: BLT	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT	ISSUED: 01/26/26
CHECKED BY: CWC	BRIDGE RAILING, AESTHETIC PARAPET TUBE	SUPERSEDES: 03/27/23
APPROVED BY: KCK		

WEIGHT = 320 LBS/FT

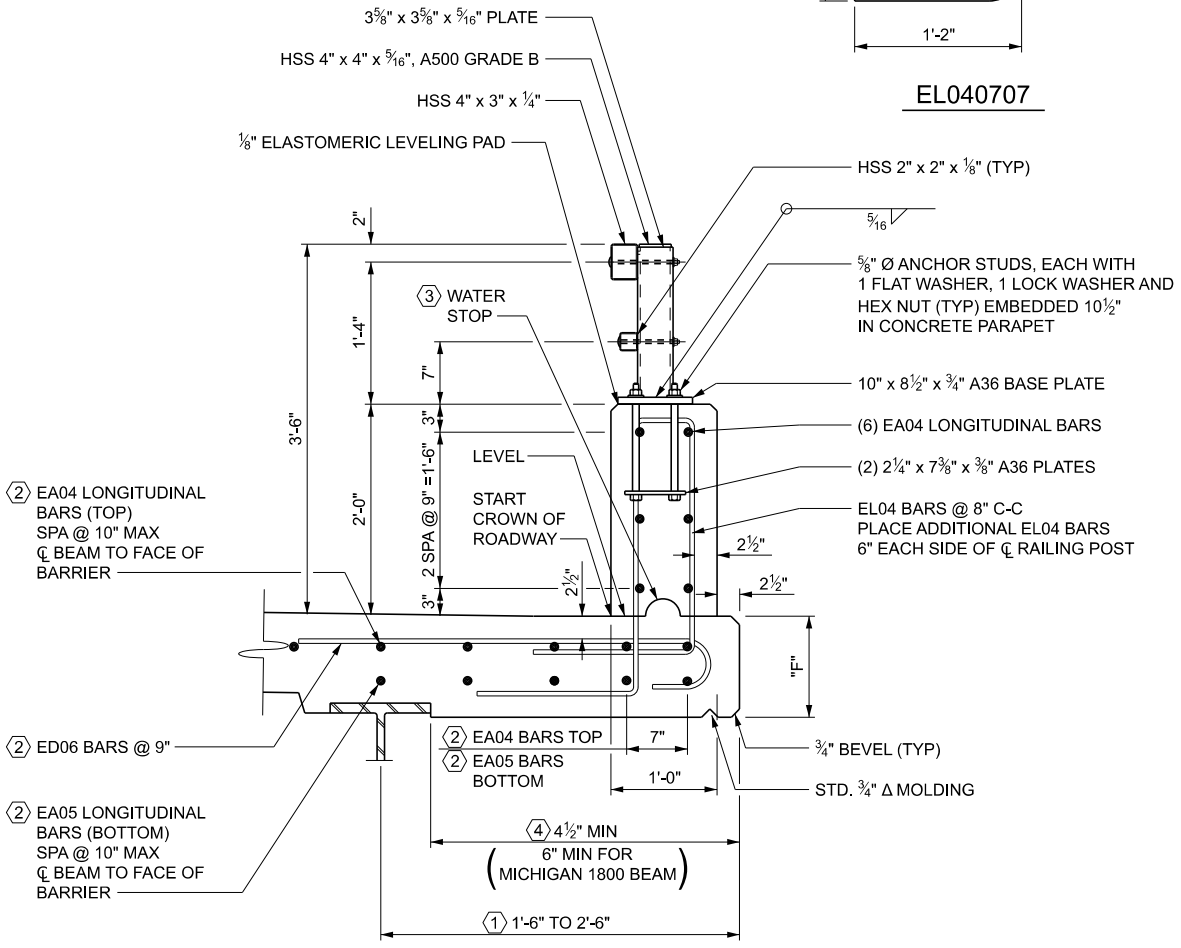


ED06 BAR

R = ℄ BEAM TO SLAB FASCIA DISTANCE



EL040707



FLUSH MOUNT BRIDGE RAILING

NOTES:

1. IT IS PREFERRED TO PROVIDE A MINIMUM OF 1'-0" OF CLEARANCE FROM THE EL BARS TO THE FASCIA BEAM CENTERLINE TO PERMIT SUPPORT OF THE SCREED RAIL ALONG THE TOP OF THE FASCIA BEAM. IF SUPERSTRUCTURE GEOMETRY DOES NOT ALLOW FOR THIS 1'-0" MINIMUM DISTANCE, ALTERNATE SCREED RAIL SUPPORT METHODS MAY BE REQUIRED. IF THIS SCENARIO APPLIES, CONTACT BOBS BRIDGE CONSTRUCTION TO DISCUSS ALTERNATE SCREED RAIL OPTIONS, BRIDGE DECK FINISHING OPTIONS, AND PROPOSED SUPERSTRUCTURE CONSTRUCTABILITY.

2. THE DETAILED REINFORCEMENT IN THE SLAB (EA04, EA05 & ED06 BARS) IS THE MINIMUM FOR THE RAILING IN ADDITION TO STANDARD BRIDGE SLAB REINFORCEMENT. THE DESIGN OF THE SLAB OVERHANG MAY REQUIRE ADDITIONAL REINFORCEMENT (OR INCREASING THE REINFORCEMENT AREA (DIAMETER) SHOWN). ALL TOP TRANSVERSE BRIDGE SLAB REINFORCEMENT IS HOOKED SIMILAR TO THE ED06 BAR DETAILED ON THIS SHEET. BARS WITH PREFIX "E" ARE TO BE EPOXY COATED.

3. 2" HIGH x 4" WIDE (±). FORMING NOT REQUIRED.

4. 4½" MINIMUM APPLIES TO CURVED GIRDERS ONLY.

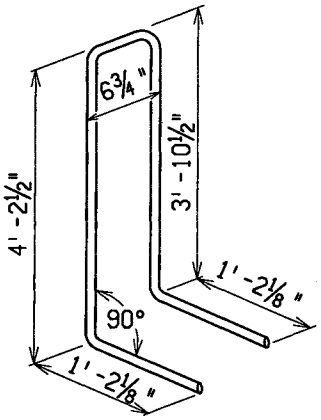
FOR ADDITIONAL DETAILS ON RAILING, SEE STANDARD PLAN B-25-SERIES AND GUIDES 6.29.10A & 6.29.10B.

DO NOT PLACE UTILITY CONDUITS IN THE BARRIER.

IF "F" BECOMES GREATER THAN 12" USE A HAUNCH DETAIL ON THE FASCIA SIDE OF THE BEAM SIMILAR TO THE HAUNCH DETAIL ON THE INTERIOR SIDE. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IN THE AREA OVER THE BEAM FLANGE IF THE HAUNCH BECOMES EXCESSIVE.

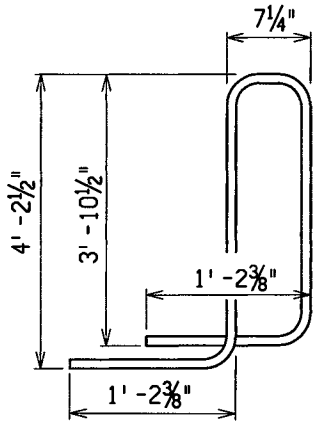
PREPARED BY DESIGN DIVISION	6.29.10

DRAWN BY: BLT CHECKED BY: VZ APPROVED BY: TGF	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DEVELOPMENT BRIDGE RAILING, AESTHETIC PARAPET TUBE END WALLS DETAILS	ISSUED: 08/15/03 SUPERSEDES: 11/27/01



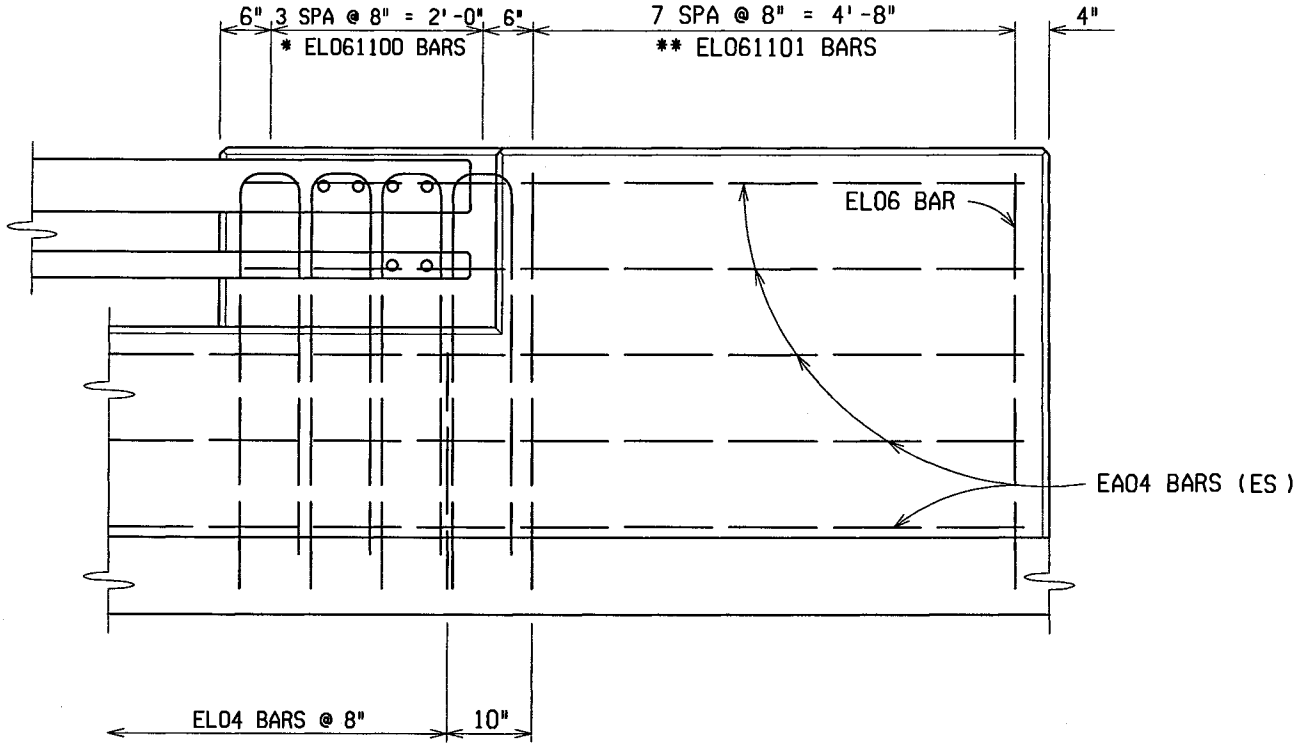
* EL061100

L = a+b+c+d+e = 11'-0"
a = 3'-10½" b = 6¾" c = 4'-2½"
d = 1'-2⅛" e = 1'-2⅛" f = 0
g = 6¾"



** EL061101

L = a+b+c+d+e = 11'-1"
a = 4'-2½" b = 7¼" c = 3'-10½"
d = 1'-2⅜" e = 1'-2⅜" f = 7¼"
g = 0



END WALL DETAIL

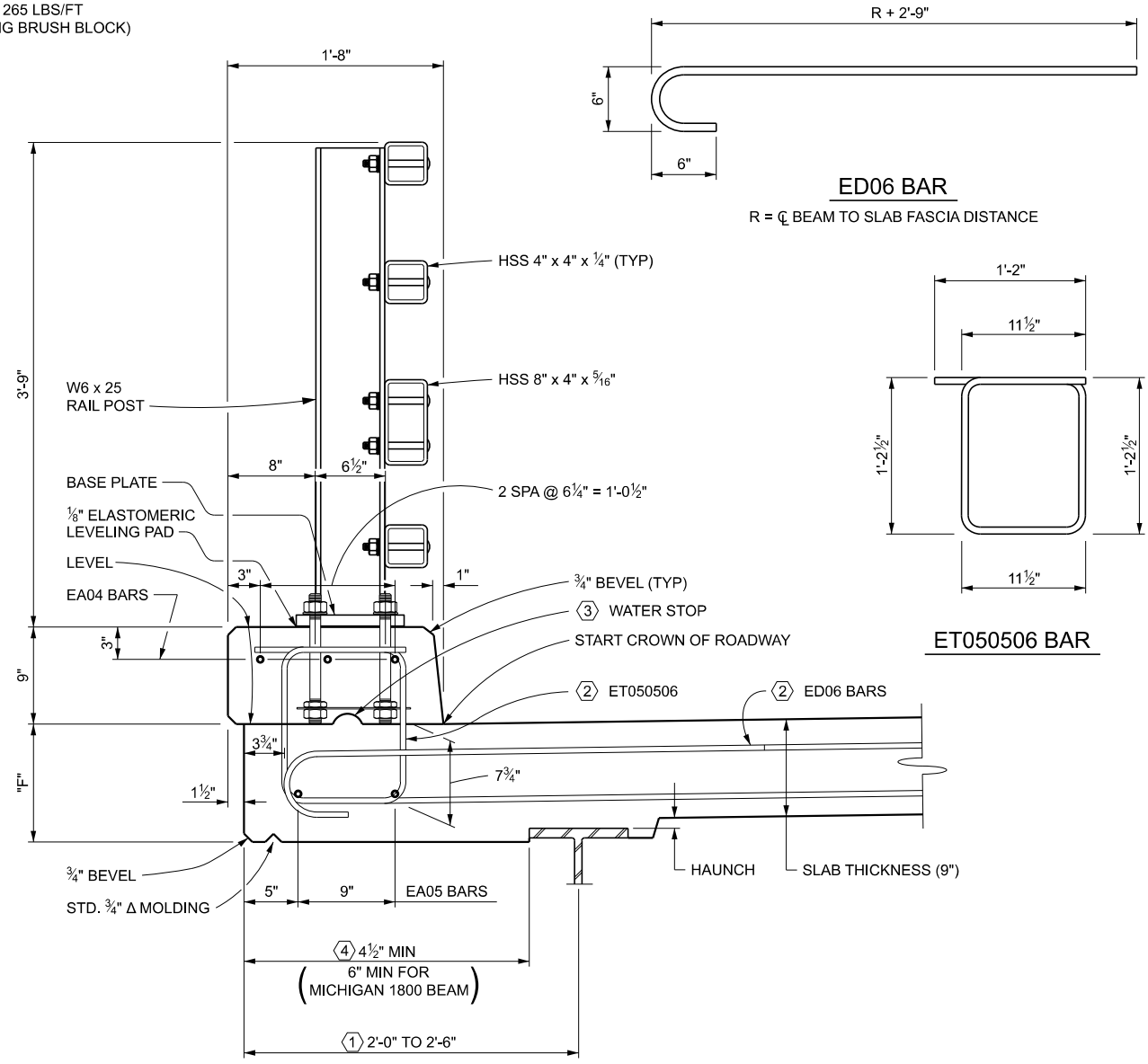
NOTE:

FOR ADDITIONAL DETAILS OF RAILING, SEE STANDARD PLAN B-25-SERIES AND GUIDES 6.29.10 & 6.29.10B.

PREPARED BY DESIGN SUPPORT AREA	6.29.10A

DRAWN BY: BLT	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT	ISSUED: 01/26/26
CHECKED BY: CWC	BRIDGE RAILING, 4 TUBE BICYCLE RAILING OPTION	SUPERSEDES: 03/27/23
APPROVED BY: KCK		

WEIGHT = 265 LBS/FT
(INCLUDING BRUSH BLOCK)



NOTES:

"F" CONSTANT EQUALS SLAB THICKNESS PLUS THICKEST FASCIA BEAM FLANGE PLUS ½" PLUS AMOUNT OF FASCIA BEAM DROP REQUIRED TO MAINTAIN MINIMUM SLAB THICKNESS AT CURB PLUS HAUNCH (1").

IF "F" BECOMES GREATER THAN 12" USE A HAUNCH DETAIL ON THE FASCIA SIDE OF THE BEAM SIMILAR TO THE HAUNCH DETAIL ON THE INTERIOR SIDE. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IN THE AREA OVER THE BEAM FLANGE IF THE HAUNCH BECOMES EXCESSIVE.

THE DETAILED REINFORCEMENT IN THE SLAB (EA05 & ED06 BARS) IS THE MINIMUM FOR THE RAILING. THE DESIGN OF THE SLAB OVERHANG MAY REQUIRE ADDITIONAL REINFORCEMENT (OR INCREASING THE REINFORCEMENT AREA (DIAMETER) SHOWN). BARS WITH PREFIX "E" ARE TO BE EPOXY COATED.

FOR ADDITIONAL DETAILS OF RAILING, SEE STANDARD PLAN B-26-SERIES.

1 IT IS PREFERRED TO PROVIDE A MINIMUM OF 1'-0" OF CLEARANCE FROM THE ET BARS TO THE FASCIA BEAM CENTERLINE TO PERMIT SUPPORT OF THE SCREED RAIL ALONG THE TOP OF THE FASCIA BEAM. IF SUPERSTRUCTURE GEOMETRY DOES NOT ALLOW FOR THIS 1'-0" MINIMUM DISTANCE, ALTERNATE SCREED RAIL SUPPORT METHODS MAY BE REQUIRED. IF THIS SCENARIO APPLIES, CONTACT BOBS BRIDGE CONSTRUCTION TO DISCUSS ALTERNATE SCREED RAIL OPTIONS, BRIDGE DECK FINISHING OPTIONS, AND PROPOSED SUPERSTRUCTURE CONSTRUCTABILITY.

2 AT EACH POST PLACE 7 - ET050506 BARS SPACED AT 6" AND ED06 BARS WITH ALTERNATE ET05 BARS. PLACE ET05 AND ED06 BARS AT 12" MAX IN REMAINING AREAS.

3 2" HIGH x 4" LONG (±). FORMING NOT REQUIRED.

4 4½" MINIMUM APPLIES TO CURVED GIRDERS ONLY.

PREPARED BY DESIGN DIVISION	6.29.17

DRAWN BY:	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT	ISSUED:
CHECKED BY:		SUPERSEDES:
APPROVED BY:		

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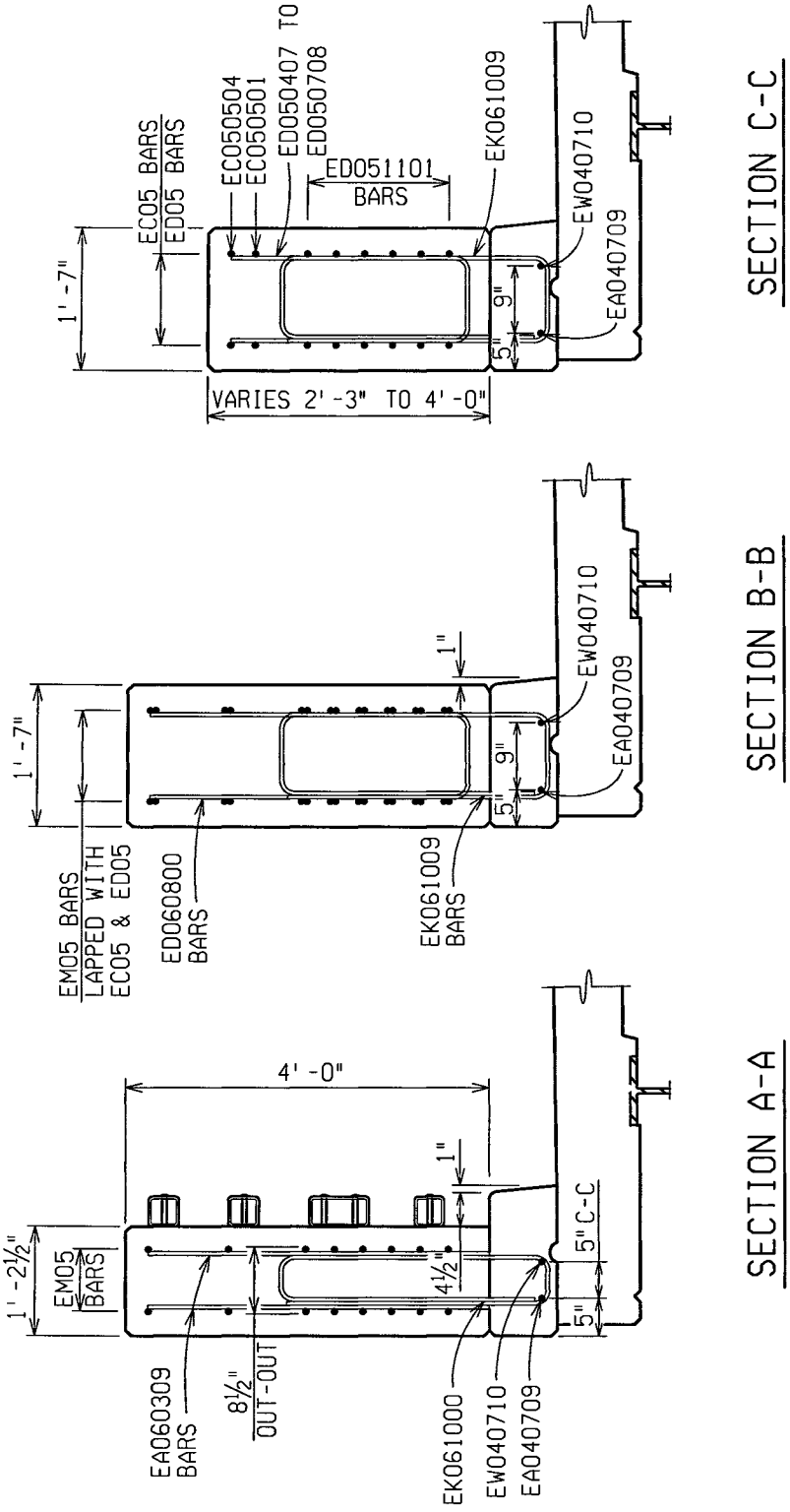
PREPARED BY DESIGN DIVISION	

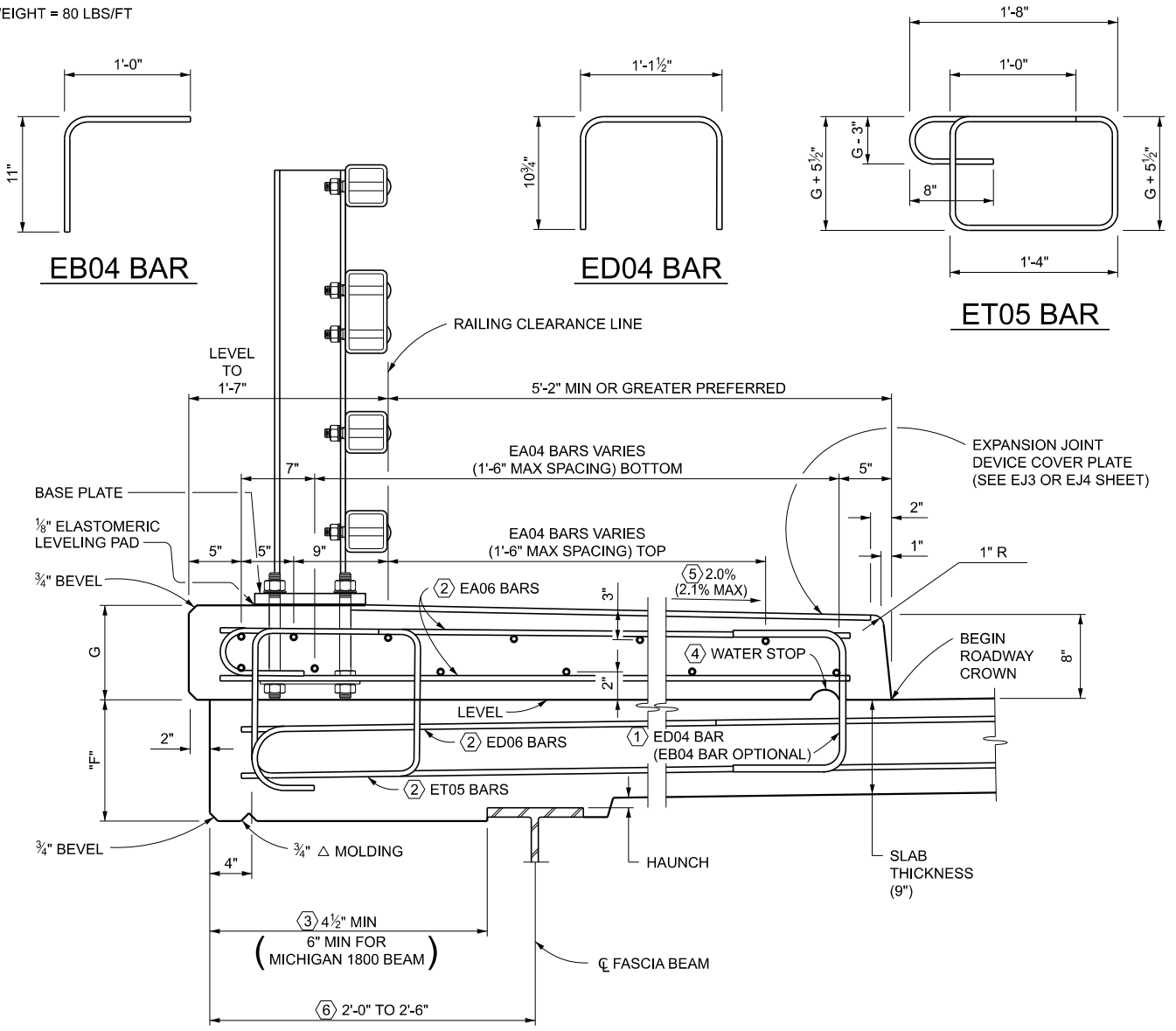
DRAWN BY: BLT CHECKED BY: VZ APPROVED BY: TGF	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF HIGHWAY DEVELOPMENT BRIDGE RAILING, 4 TUBE BICYCLE RAILING SECTIONS	ISSUED: 08/15/03 SUPERSEDES: / /



PREPARED BY DESIGN SUPPORT AREA	6.29.17D

DRAWN BY: BLT CHECKED BY: CWC APPROVED BY: KCK	MICHIGAN DEPARTMENT OF TRANSPORTATION BUREAU OF DEVELOPMENT BRIDGE RAILING, 4 TUBE - SIDEWALK SECTION PEDESTRIAN RAILING OPTION	ISSUED: 01/26/26 SUPERSEDES: 02/26/24

WEIGHT = 80 LBS/FT



NOTES:

"F" CONSTANT EQUALS SLAB THICKNESS PLUS HAUNCH PLUS THICKEST FASCIA BEAM FLANGE PLUS ½" PLUS AMOUNT OF FASCIA BEAM DROP REQUIRED TO MAINTAIN SLAB THICKNESS AT CURB LINE.

IF "F" BECOMES GREATER THAN 12" USE A HAUNCH DETAIL ON THE FASCIA SIDE OF THE BEAM SIMILAR TO THE HAUNCH DETAIL ON THE INTERIOR SIDE. ADDITIONAL REINFORCEMENT MAY BE REQUIRED IN THE AREA OVER THE BEAM FLANGE IF THE HAUNCH BECOMES EXCESSIVE.

THE DETAILED REINFORCEMENT IN THE SLAB (ED06 BARS) IS THE MINIMUM FOR THE RAILING. THE DESIGN OF THE SLAB OVERHANG MAY REQUIRE ADDITIONAL REINFORCEMENT (OR INCREASING THE REINFORCEMENT AREA (DIAMETER) SHOWN). BARS WITH PREFIX "E" ARE TO BE EPOXY COATED.

1. EB04 BAR MAY BE ADHESIVE ANCHORED INTO 6" DEEP HOLE INSTEAD OF ED04 BAR. SPACE WITH ALTERNATE TRANSVERSE SLAB BARS (1'-6" MAX).

2. AT EACH POST PLACE 7 - ET05 BARS SPACED AT 6", ED06 BARS (SEE GUIDE 6.29.17) AND EAO6 BARS WITH ALTERNATE ET05 BARS. PLACE ET05 BARS, ED06 BARS AND EA06 BARS AT 12" MAXIMUM IN REMAINING AREAS.

3. APPLIES TO CURVED BRIDGES ONLY.

4. 2" HIGH x 4" LONG (±). FORMING NOT REQUIRED.

5. USE A TARGET CROSS SLOPE (2.0%) LESS THAN THE MAXIMUM TO ACCOUNT FOR INCONSISTENCIES IN CONCRETE FINISHING.

6. IT IS PREFERRED TO PROVIDE A MINIMUM OF 1'-0" OF CLEARANCE FROM THE ET BARS TO THE FASCIA BEAM CENTERLINE TO PERMIT SUPPORT OF THE SCREED RAIL ALONG THE TOP OF THE FASCIA BEAM. IF SUPERSTRUCTURE GEOMETRY DOES NOT ALLOW FOR THIS 1'-0" MINIMUM DISTANCE, ALTERNATE SCREED RAIL SUPPORT METHODS MAY BE REQUIRED. IF THIS SCENARIO APPLIES, CONTACT BOBS BRIDGE CONSTRUCTION TO DISCUSS ALTERNATE SCREED RAIL OPTIONS, BRIDGE DECK FINISHING OPTIONS, AND PROPOSED SUPERSTRUCTURE CONSTRUCTABILITY.

PREPARED BY DESIGN DIVISION	6.29.17E