



**STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION**

DESIGN DIVISION
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JOE GALBATO III
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BILL LEE
GOVERNOR

INSTRUCTIONAL BULLETIN NO. 21-20

Regarding Various Revised, New and Voided Standard Drawings

Effective May 13, 2022 letting (March 2, 2022 Turn-in), the following Standard Drawings have been revised or are new. In addition, the Roadway Design Guidelines Chapter 7 – Item Numbers, Sections 7-611.00, Manholes, Catchbasins, Inlets and Pipe End Walls, and Section 7-705.00, Guardrails, of the Roadway Design Guidelines has been modified to reflect any changes to or new item numbers in the Standard Drawings of this Instructional Bulletin.

Chapter 10 - Index of Standard Drawings of the Roadway Design Guidelines has been revised as follows.

New Standard Drawings:

10-102.00 CATCH BASINS AND MANHOLES

10-102.01 CATCH BASINS

DRAWING NUMBER	REVISION DATE	DESCRIPTION
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D-CBB-12D		TYPE "B" CAST IRON FRAME, GRATE & CURB HOOD DETAILS FOR NOS. 10, 12, 14, 16 & 17 TYPE CATCH BASINS
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10-106.00 SAFETY DESIGN AND GUARDRAILS

10-106.04 GUARDRAIL DETAILS

DRAWING NUMBER	REVISION DATE	DESCRIPTION
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S-GR31-1D		GUARDRAIL POST PLACEMENT IN ROCK
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10-106.07 GUARDRAIL TERMINALS

DRAWING NUMBER	REVISION DATE	DESCRIPTION
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S-GRT-1A		LAYOUT OF FLARED GUARDRAIL (TL-3)
S-GRT-1B		LAYOUT OF FLARED GUARDRAIL (TL-2)

10-107.00 DESIGN – TRAFFIC CONTROL**10-107.01 PAVEMENT MARKINGS**

DRAWING NUMBER	REVISION DATE	DESCRIPTION
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T-M-18A		DELINEATOR MOUNTING DETAILS
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Revised Standard Drawings:**10-101.00 PIPE CULVERTS AND ENDWALLS****10-101.03 SAFETY SIDE DRAIN ENDWALLS**

DRAWING NUMBER	REVISION DATE	DESCRIPTION
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D-SEW-1A	10-29-21	TYPE "SAFETY" SIDE DRAIN ENDWALL WITH STEEL PIPE GRATE, FOR 15" THRU 48" PIPES, 6:1 SLOPE
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D-SEW-12D	10-29-21	TYPE "SAFETY" SIDE DRAIN ENDWALL WITH STEEL PIPE, FOR 18" PIPE, 12:1 SLOPE
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10-102.00 CATCH BASINS AND MANHOLES**10-102.01 CATCH BASINS**

DRAWING NUMBER	REVISION DATE	DESCRIPTION
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D-CB-99RA	10-29-21	BILL OF STEEL FOR ROUND CATCH BASIN LIDS
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D-CBB-42	10-29-21	CAST IRON GRATE DETAILS FOR NOS. 42, 43 & 44 TYPE CATCH BASINS
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10-104.00 ROADWAY, PAVEMENT APPURTENANCES, AND FENCES**10-104.02 INTERSECTIONS**

DRAWING NUMBER	REVISION DATE	DESCRIPTION
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RP-D-16	10-29-21	DETAILS OF LOWERED STANDARD CONCRETE DRIVEWAYS
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10-106.00 SAFETY DESIGN AND GUARDRAILS**10-106.02 CABLE BARRIER**

DRAWING NUMBER	REVISION DATE	DESCRIPTION
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S-CB-1	10-29-21	CABLE BARRIER PLACEMENT
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10-106.03 CRASH CUSHIONS

DRAWING NUMBER	REVISION DATE	DESCRIPTION
S-CC-1	10-29-21	CRASH CUSHION

10-106.07 GUARDRAIL TERMINALS

DRAWING NUMBER	REVISION DATE	DESCRIPTION
S-GRT-1	10-29-21	TYPE 12 GUARDRAIL TERMINAL BURIED-IN-BACKSLOPE

10-106.09 CONCRETE MEDIAN BARRIERS

DRAWING NUMBER	REVISION DATE	DESCRIPTION
S-SSMB-1	10-29-21	32" SINGLE SLOPE CONCRETE BARRIER WALL
S-SSMB-1A	10-29-21	36" SINGLE SLOPE CONCRETE BARRIER WALL
S-SSMB-2	10-29-21	51" SINGLE SLOPE CONCRETE BARRIER WALL
S-SSMB-3	10-29-21	51" HALF SIZE SINGLE SLOPE CONCRETE BARRIER WALL
S-SSMB-9	10-29-21	SINGLE SLOPE BARRIER WALL FOR GRADE SEPARATED MEDIAN

10-106.10 GUARDRAIL MAINTENANCE

DRAWING NUMBER	REVISION DATE	DESCRIPTION
S-GR28-6M	10-29-21	GUARDRAIL ATTACHMENT TO CONCRETE DECKS

10-107.00 DESIGN – TRAFFIC CONTROL**10-107.01 PAVEMENT MARKINGS**

DRAWING NUMBER	REVISION DATE	DESCRIPTION
T-M-4B	10-29-21	STANDARD SIGNALIZED MID-BLOCK CROSSING
T-M-18	10-29-21	FLEXIBLE DELINEATOR DETAILS

10-107.02 WORK ZONES

DRAWING NUMBER	REVISION DATE	DESCRIPTION
T-WZ-55	10-29-21	SIDEWALK TRAFFIC CONTROL
T-WZ-PCB3	10-29-21	PORTABLE CONCRETE BARRIER RAIL DETAILS

These standard drawings are located on the web site and in Chapter 7 and 10 of the Design Guidelines can be found in the following links.

Standard Drawings:

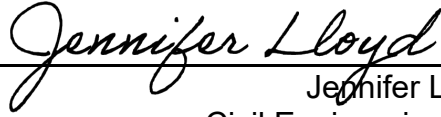
<https://www.tn.gov/content/tn/tdot/roadway-design/standard-drawings-library/standard-roadway-drawings.html>

Chapter 7 – Item Numbers:

https://www.tn.gov/content/dam/tn/tdot/roadway-design/documents/design_guidelines/DG-C7.pdf

Chapter 10 - Index of Standard Drawings is available online at this location:

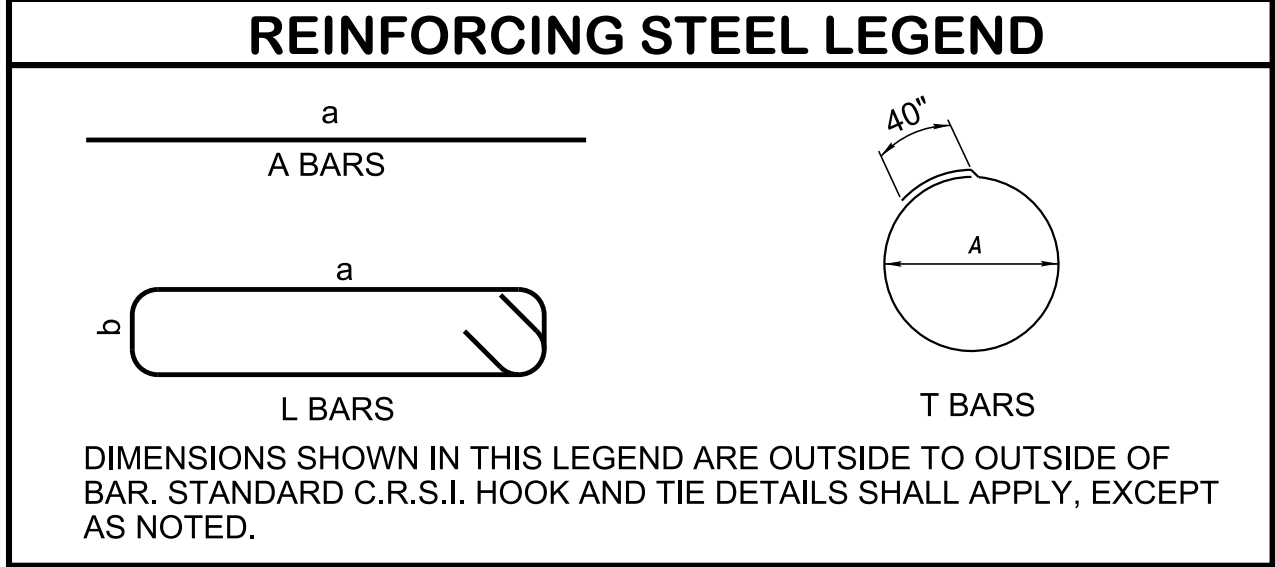
https://www.tn.gov/content/dam/tn/tdot/roadway-design/documents/design_guidelines/DG-C10.pdf


Jennifer Lloyd, PE
Civil Engineering Director
Roadway Design Division

KJL:ARH:RBB
November 3, 2021

REINFORCING BAR SCHEDULE FOR ROUND CB TOP SLABS (inches)

D-CB	DIA	T500	T501	A500	A501	A502	A503	A504	A505	A506	A507	A508	A509	A510	A511	A512	A513	A514	A515	A516	A517	A518	LS301		LS302		A301	
		a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	a	b	a	b		
10RA	48	51 5/8		36 1/2	44 3/8	47 5/16	31 5/16	37	7 1/8	7 7/8	11 3/8	13 8/16	14 5/8	15														
12RA	48	51 5/8		31 3/4	37 11/16	42 3/16	31 5/16	37	5 13/16	7 3/16	7 7/8	7 3/8	9 4/8	10 5/8	11													
12RB	60		65 5/8	40 3/8	49 3/8	55 7/8	58 7/8	37 11/16	45 3/8	51 3/8	55 3/16	13 5/16	14 3/8	14 7/8	15 3/16	16 13/16	17 11/16	18										
12RB	72		79 5/8	51 1/8	63 11/16	72 1/8	74 5/8	48 5/8	60 3/8	68 11/16	71 5/8	20 5/8	21 1/2	21 7/8	22 11/16	24	24 3/4	25										
12RC	84		93 5/8	52 11/16	65 5/8	75 1/8	82 5/16	87 11/16	89 11/16	50 7/8	63	72 3/16	79 5/16	84 13/16	87 3/16	27 7/8	28 11/16	29	30 1/8	31 3/16	31 13/16							
12RC	96		107 5/8	61 1/8	77	88 3/8	96 11/16	102 13/16	104	59 5/16	74 5/8	85 11/16	94	100 5/16	102	35	35 13/16	36	37 3/8	38 2/8	38 13/16							
12RC	108		121 5/8	69 1/2	88 3/8	101 5/8	111	117 5/8	119	67 11/16	86	99	108 1/2	115 3/8	117	42 1/8	42 13/16	43	44 5/8	45 3/8	45 13/16							
12RC	120		135 5/8	77 7/8	99 11/16	114 11/16	125 3/16	132 3/16	134	76 3/16	97 6/16	112 3/16	122 7/8	130 5/16	132	49 3/16	49 13/16	50	51 11/16	52 3/8	52 7/8							
13RA	48	SAME AS 12RA																										
13RB	60	SAME AS 12RB																										
13RB	72	SAME AS 12RB																										
13RC	84	SAME AS 12RC																										
13RC	96	SAME AS 12RC																										
13RC	108	SAME AS 12RC																										
13RC	120	SAME AS 12RC																										
14RB	96		107 5/8	109 1/2	47 5/8	57	64 11/16	56 3/8	70 3/8	81	89 3/16	95 11/16	100 11/16	102 13/16	104	14	23 2/16	27 11/16	31 3/16	34	36 1/8	37 5/8						
25RA	48	SAME AS 12RA																										
25RB	60	SAME AS 12RB																										
25RB	72	SAME AS 12RB																										
25RB	84	SAME AS 12RC																										
25RB	96	SAME AS 12RC																										
31R	84		93 5/8	95 3/8	47	57 5/16	54 5/16	67 7/8	77 5/8	84 13/16	87 3/16	14	16 1/8	20 5/16	23 3/8	25 11/16	27 1/2											
38RB	60		65 5/8	36 3/16	43 1/8	48 1/2	53	56 1/2	13 5/8	14 7/8	15 11/16	16																
38RB	72		79 5/8	45 5/8	56 1/8	63 7/8	69 7/8	72 5/8	21	22 1/8	22 13/16	23																
38RB	84		93 5/8	55	68 7/8	78 11/16	85 13/16	88 2/16	28 5/16	29 3/16	29 13/16	30																
38RB	96		107 5/8	64 5/16	81 3/8	93 1/8	101 3/16	103 2/16	35 1/2	36 5/16	36 13/16	37																
39RB	84		93 5/8	52 13/16	65 11/16	75 3/16	79 1/2	20 5/16	21 3/16	21 13/16	22												52	52	60	60		
39RB	96		107 5/8	63 13/16	80 11/16	92 5/16	95 7/8	27 1/2	28 5/16	28 13/16	29												52	52	60	60		
41RB	60	SAME AS 12RB																										
41RB	72	SAME AS 12RB																										
41RB	84	SAME AS 12RC																										
41RB	96	SAME AS 12RC																										
42RB	60	SAME AS 38RB																										
42RB	72	SAME AS 38RB																										
42RB	84	SAME AS 38RB																										
42RB	96	SAME AS 38RB																										
43R	96		107 5/8	109 1/2	48 7/8	59	67 3/16	56 11/16	70 13/16	81 3/8	89 11/16	96 1/8	101 1/4	103		22 7/8	27 11/16	31 3/16	33 13/16	35 3/5	14	36 11/16	37	96	48	90	46	36



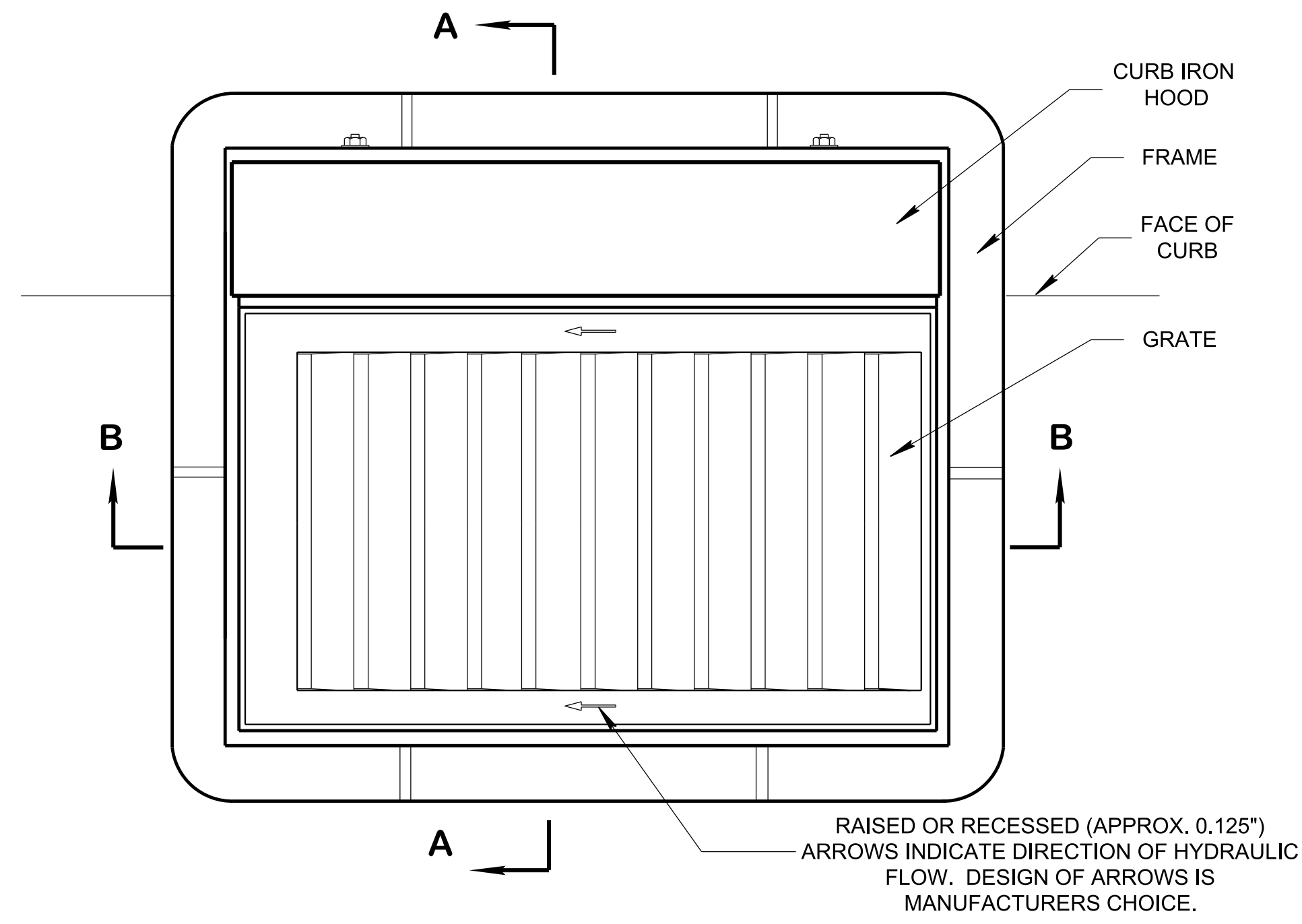
- GENERAL NOTES**
- (A) THE PURPOSE OF THIS DRAWING IS TO PROVIDE A BAR REINFORCEMENT SCHEDULE FOR ROUND CATCH BASIN LIDS
 - (B) DIMENSION DETERMINED BY GEOMETRY. TOLERANCE FOR BAR LOCATIONS AND LENGTH IS +/- 0.5"
 - (C) REINFORCING STEEL: ASTM A615, Fy = 60,000 PSI.

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

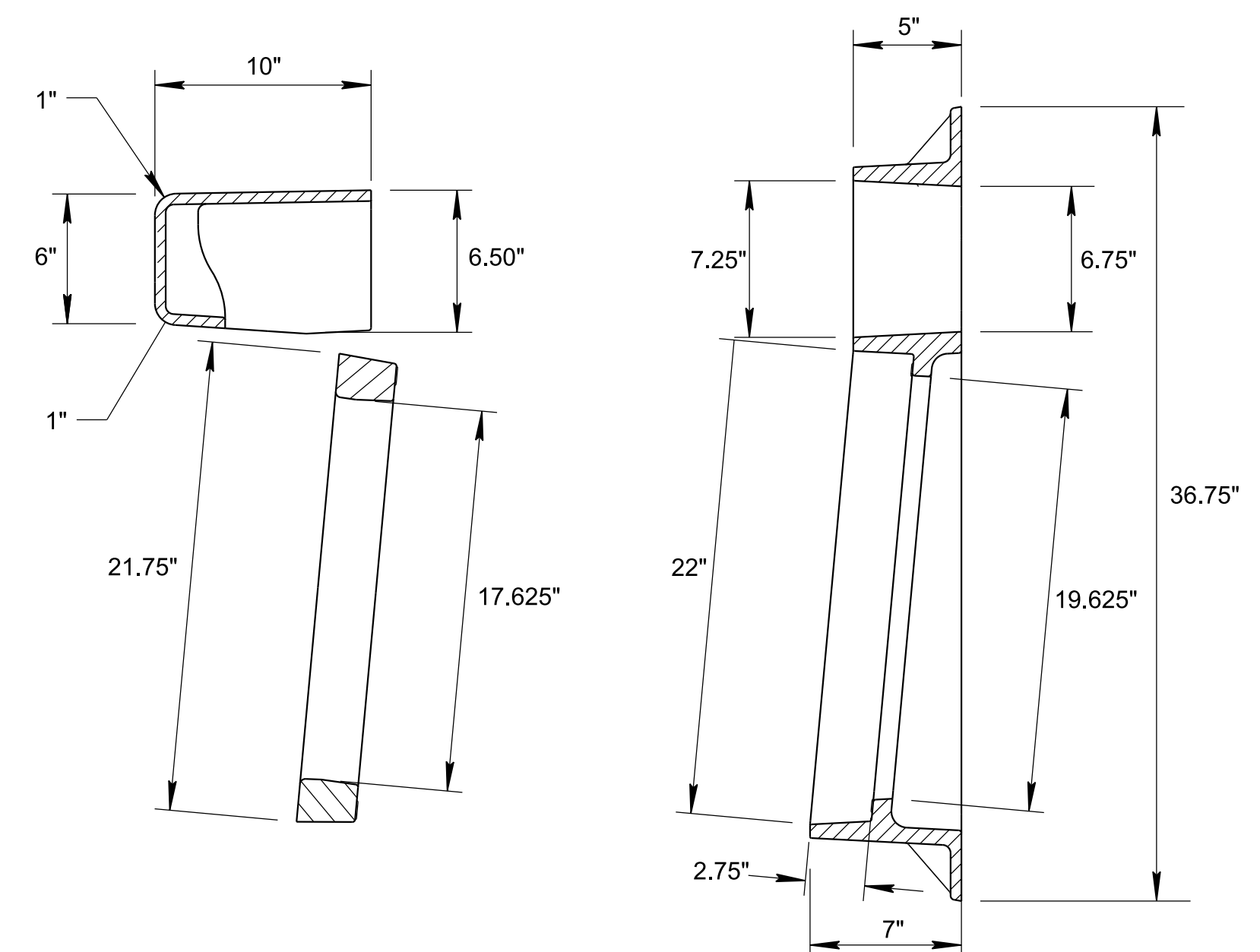
BILL OF STEEL
FOR ROUND
CATCH BASIN LIDS

10/28/2021 8:15:17 AM P:\StandDraw\DESIGN STANDARDS\Standards Library\Standard Roadway Drawings - CURRENT\In Progress\10-102.00 Catch Basins and Manholes IP\102.01 Catch Basins IP\DCB99RA-20211029.dgn

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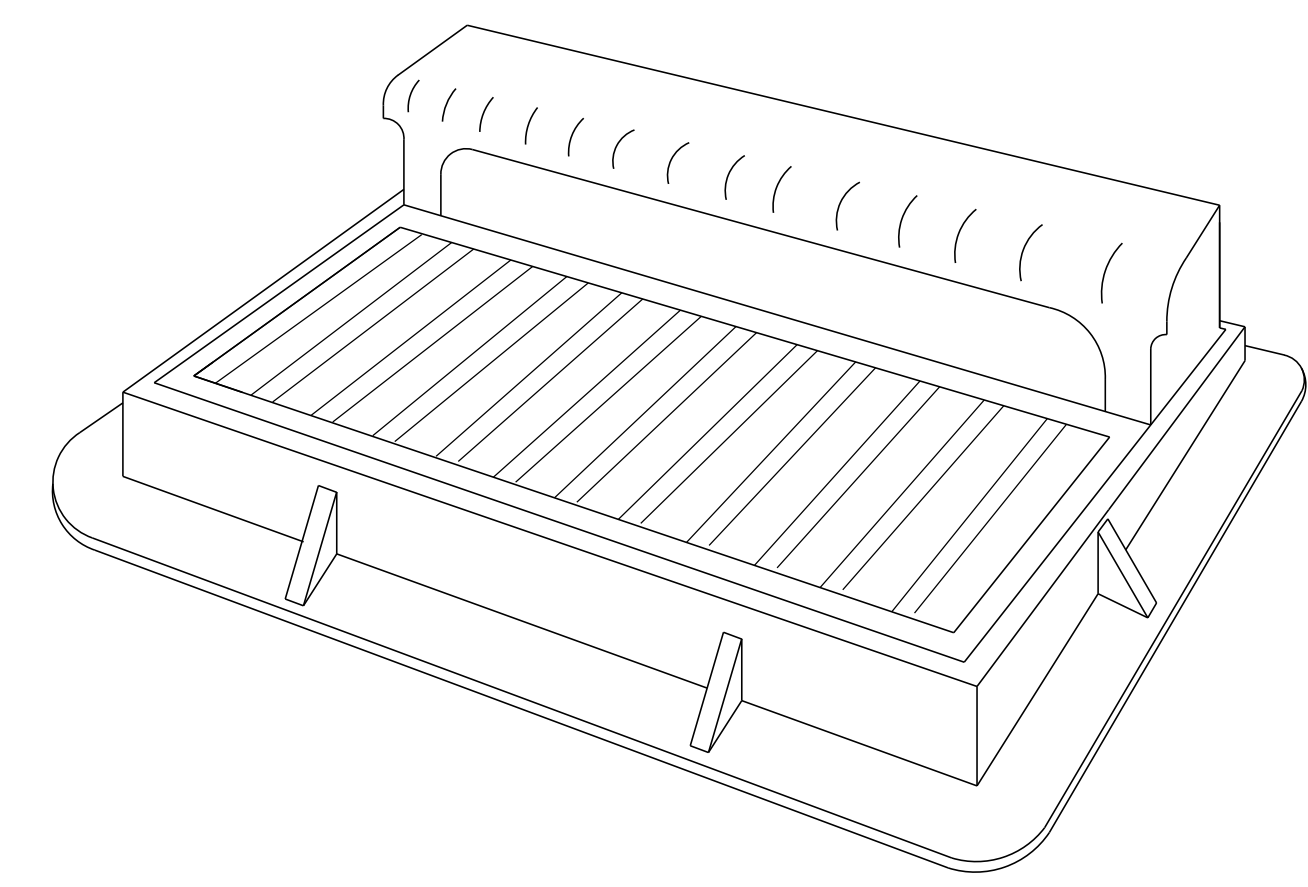
TOP VIEW



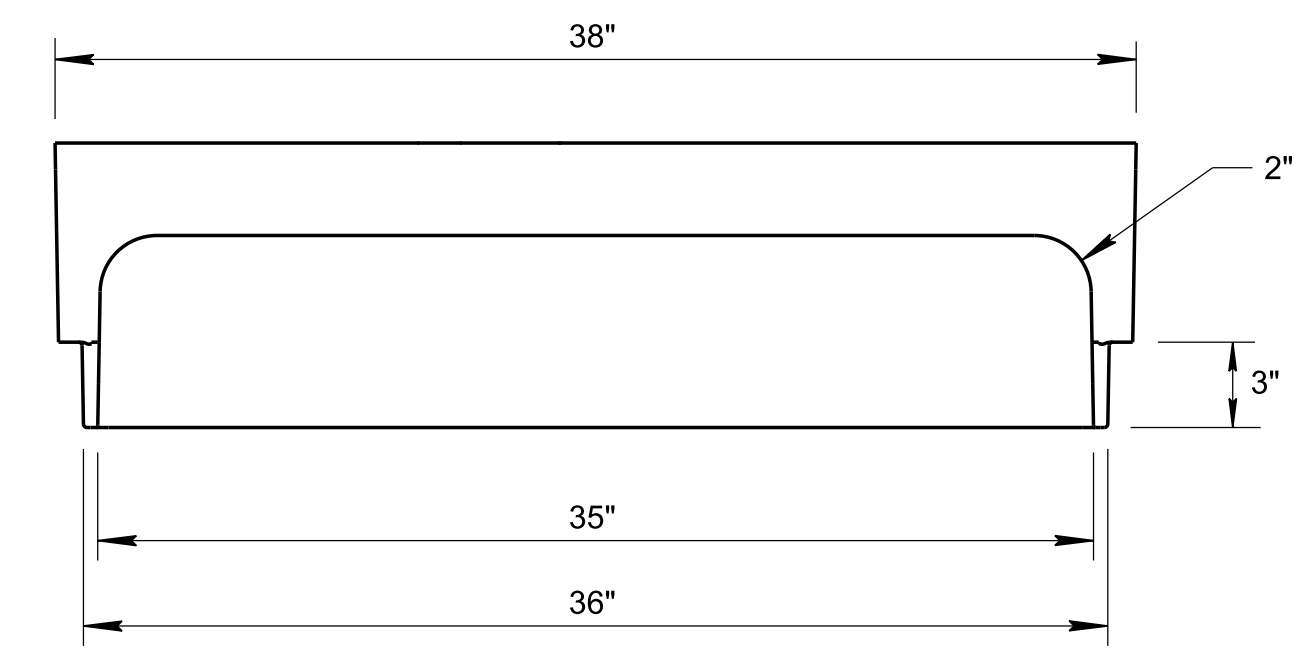
CURB HOOD AND GRATE DIMENSIONS

FRAME DIMENSION

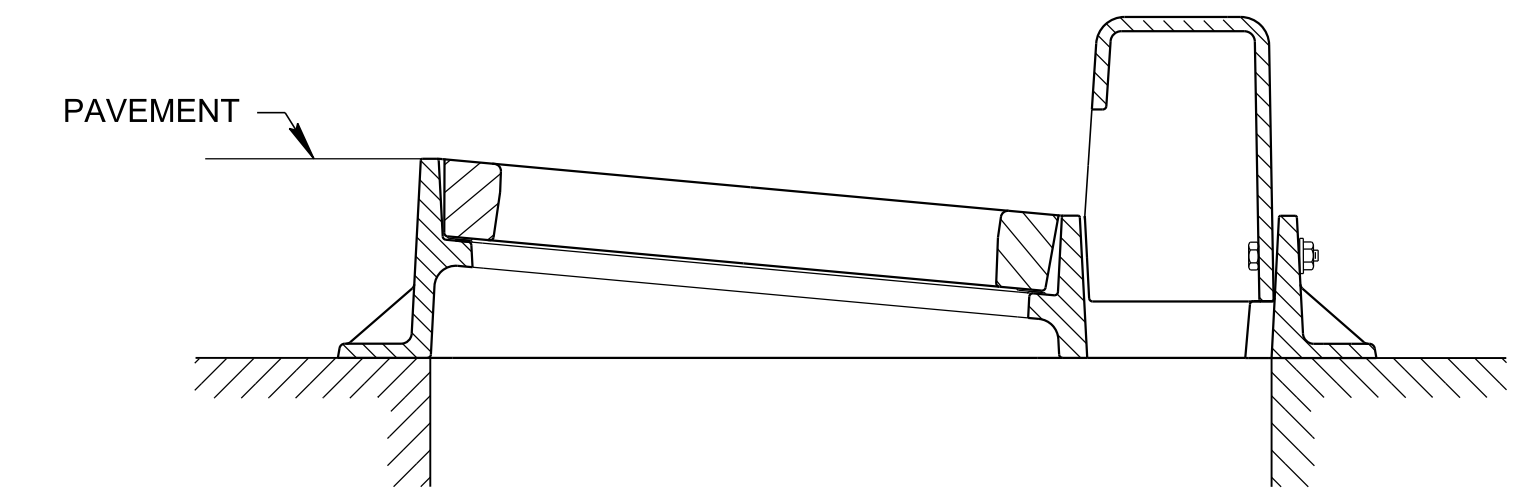
SIDE VIEWS



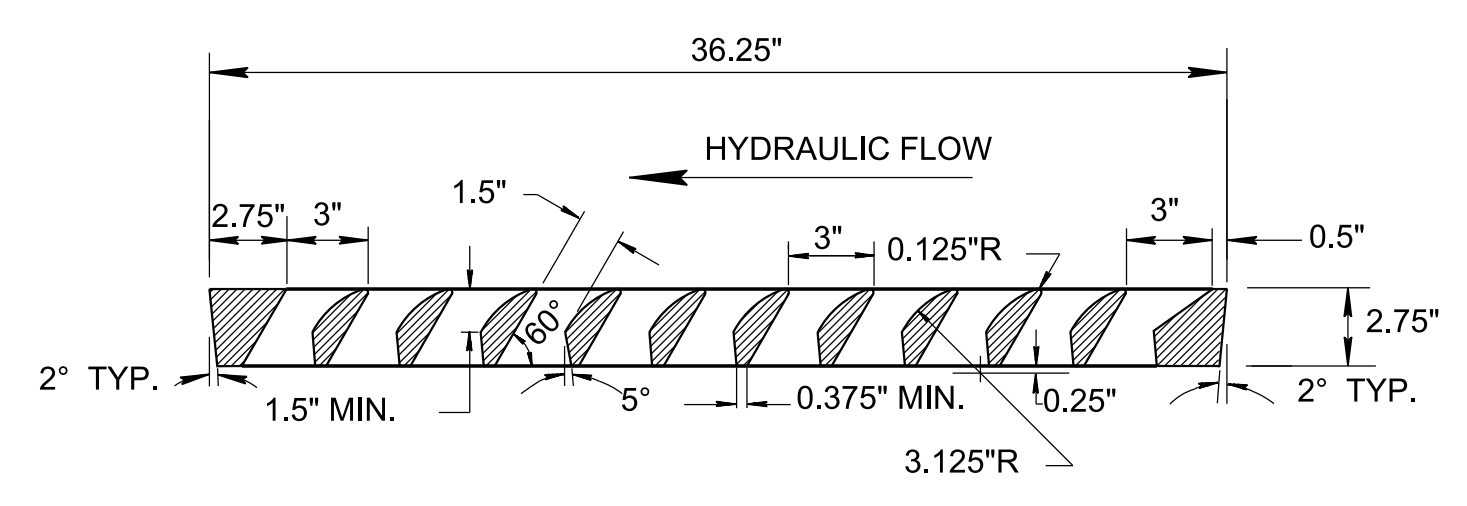
ISOMETRIC VIEW



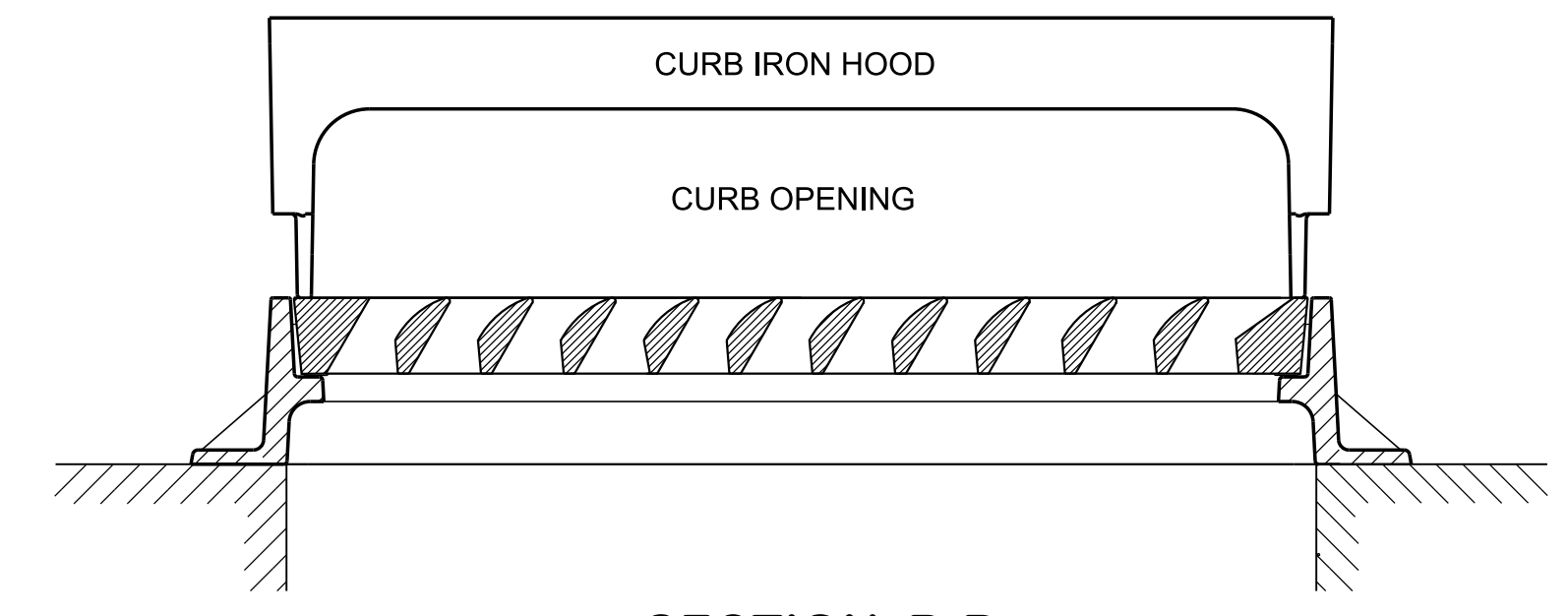
CURB HOOD DIMENSION



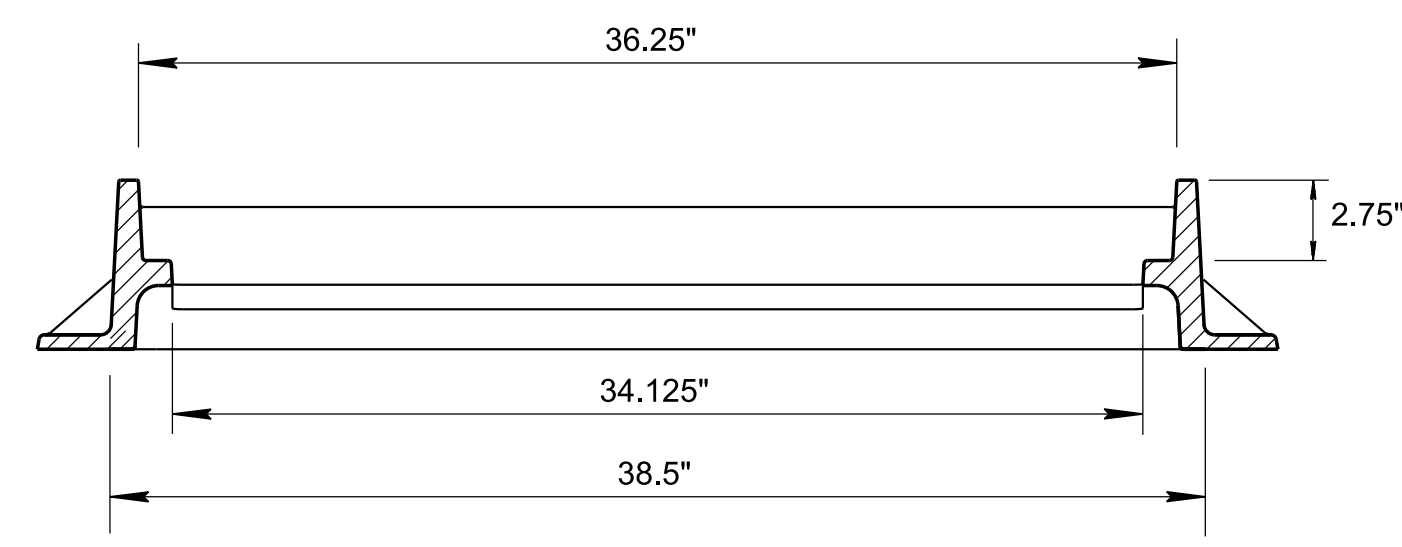
SECTION A-A



GRATE DIMENSION



SECTION B-B



FRAME DIMENSION

FRONT VIEWS

GENERAL NOTES

- (A) WHEN A SIX (6) INCH VERTICAL CURB IS REQUIRED USE THIS DRAWING ON ALL VARIATIONS OF NUMBER 10, 12, 14, 16, AND 17 CATCH BASINS CONTAINED IN THIS SECTION OF THE STANDARD DRAWINGS.
- (B) FOR CLEARNESS, ALL CORNERS ARE SHOWN ON THIS DRAWING BY STRAIGHT LINES WITH THE EXCEPTION OF THE 1" RADIUS AT THE TOP OF FACE OF CURB. ALL INSIDE CORNERS SHOULD BE MADE WITH 1/2" x 1/2" FILLETS OR 3/4" RADIUS FILLETS FOR EASE IN MOLDING.
- (C) IF CATCH BASIN IS PAID FOR UNDER EACH, THEN COST OF CAST IRON USED IN CASTINGS IS TO BE PAID FOR UNDER THE SPECIFIC ITEM BID FOR THAT CATCH BASIN. SEE STANDARD DRAWINGS FOR TYPE 10, 12, 14, 16, AND 17 CATCH BASINS FOR APPLICABLE PAY ITEMS FOR EACH TYPE OF CATCH BASIN.
- (D) GRAY IRON CASTINGS SHALL BE MANUFACTURED CONFIRMING TO AASHTO M105 MEETING 30 KSI WEIGHTING A MINIMUM OF 459 LBS OR AASHTO M306 MEETING 35 KSI WEIGHTING A MINIMUM OF 362 LBS. A +/- 5% WEIGHT TOLERANCE WILL BE ACCEPTABLE. ALL PRODUCTS SHALL BE CERTIFIED BY THE MANUFACTURER MEETING THE ABOVE MANUFACTURING REQUIREMENTS AND HS-20 DESIGN LOADING.
- (E) IF PAID FOR SEPARATELY CAST IRON USED IN CASTINGS IS TO BE PAID FOR UNDER ITEM NO.

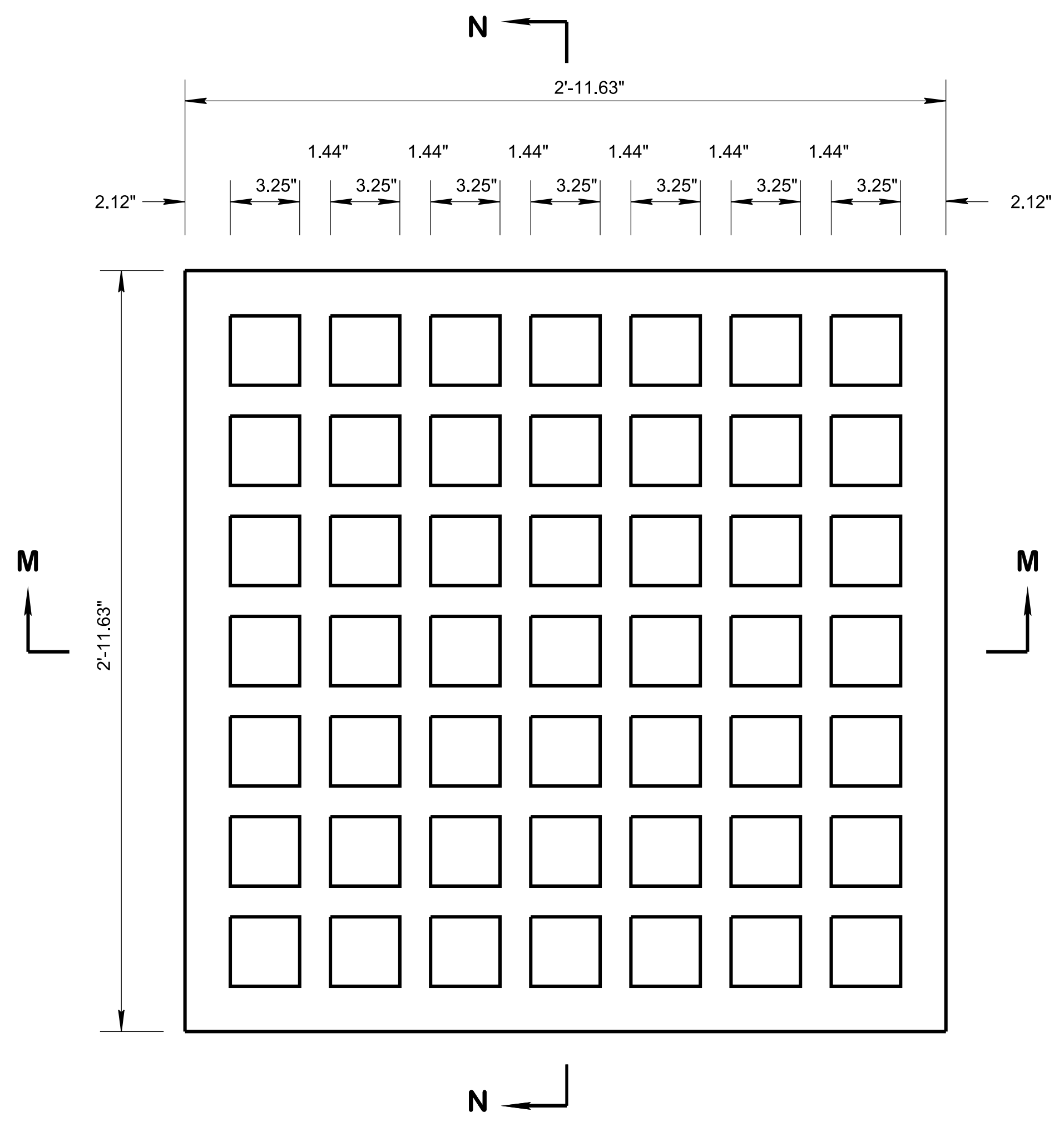
611-03.04, GRAY IRON CASTINGS (CATCH BASIN), LB.

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

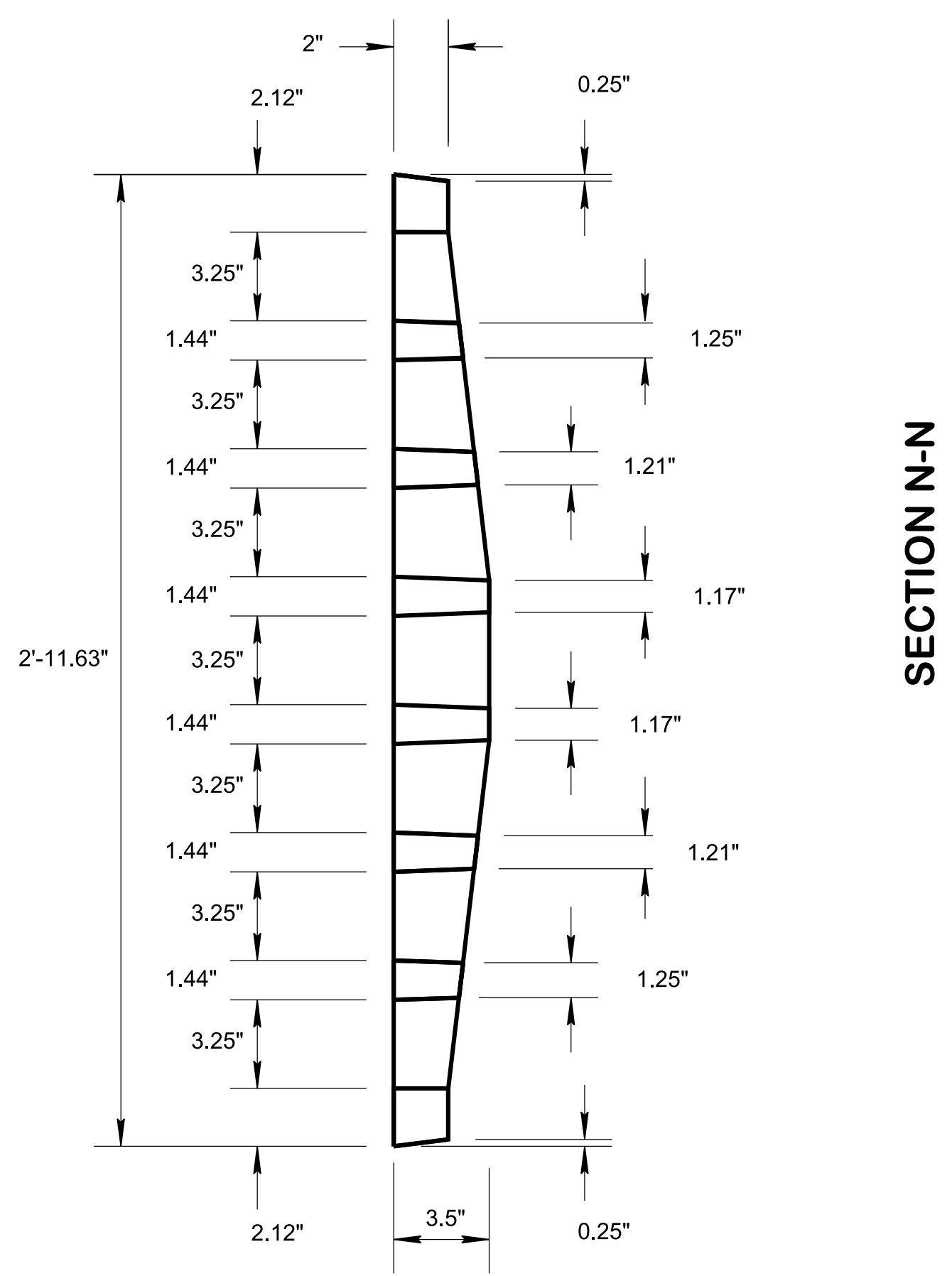
TYPE "B" CAST IRON
FRAME, GRATE &
CURB HOOD DETAILS
FOR NOS. 10, 12, 14, 16 & 17
TYPE CATCH BASINS

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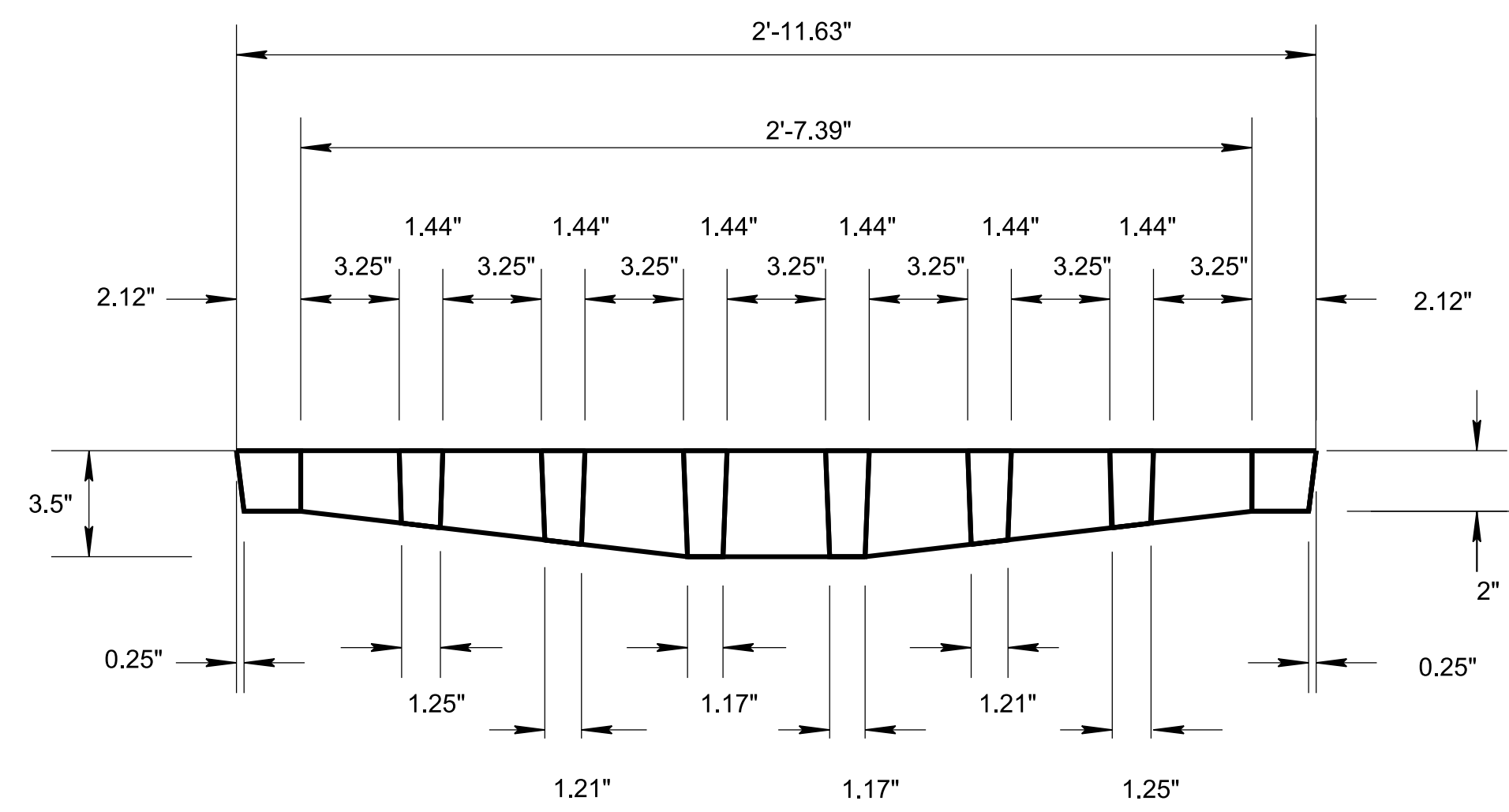
REV. 5-27-98: CHANGED WEIGHT OF GRATE UNIT FROM 485 TO 459 POUNDS.
 REV. 10-26-99: MODIFIED FIRST GENERAL NOTE.
 REV. 5-27-01: CHANGED GENERAL NOTE (D).
 REV. 02-20-2020: REDREW SHEET.
 REV. 03-04-2021: ADDED GENERAL NOTE (E) REVISED GENERAL NOTE (A) AND REMOVED WEIGHT PER GRATE TABLE FROM THE DRAWING.
 REV. 10-29-21: REVISED GENERAL NOTE (E).



TOP VIEW



SECTION N-N



SECTION M-M

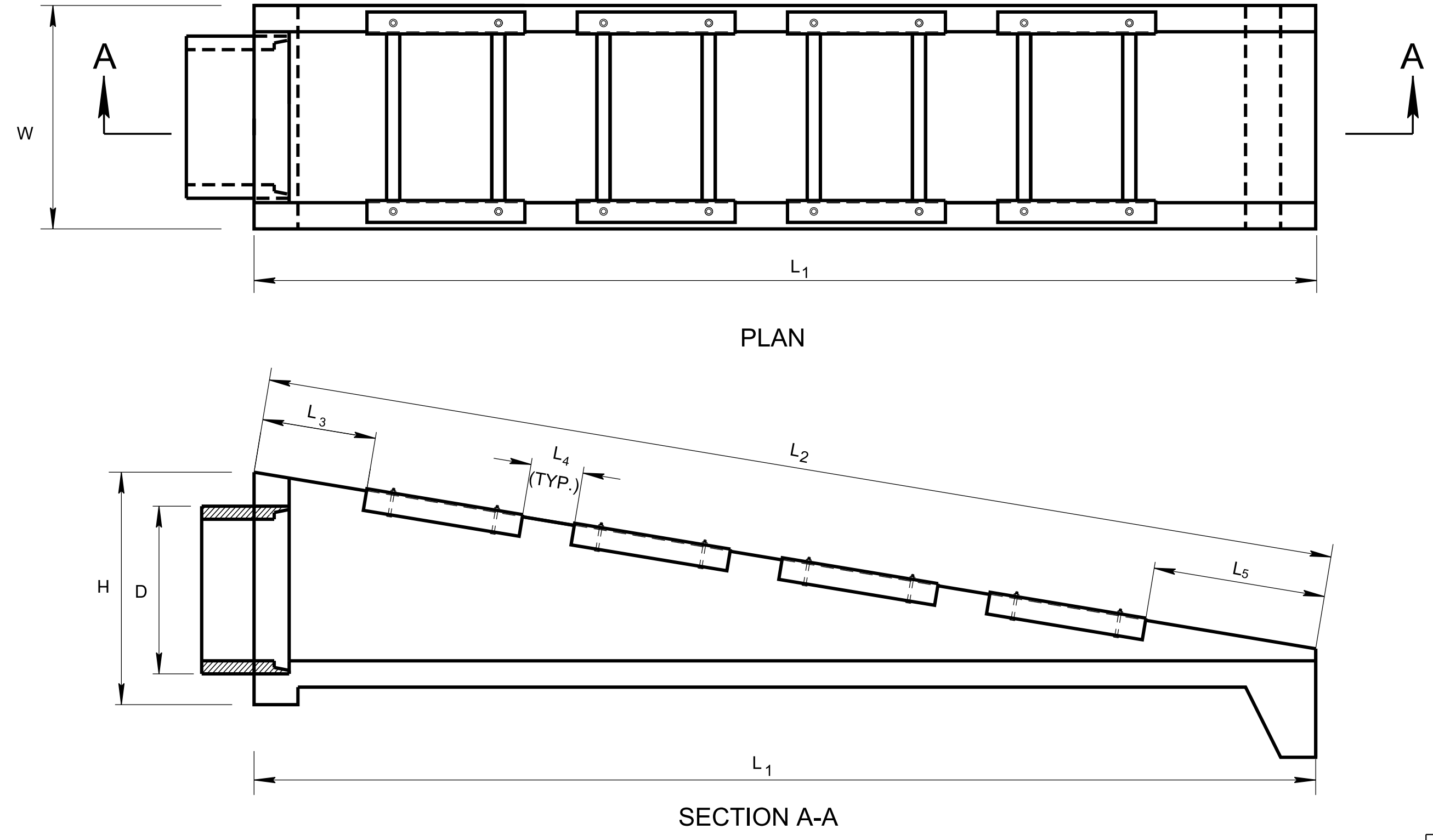
- GENERAL NOTES**
- (A) USE THIS DRAWING AT LOCATIONS OUTSIDE THE TRAVEL LANES AND WHERE MAINTENANCE ACCESS IS NOT REQUIRED ON NUMBER 42, 43, AND 44 CATCH BASINS.
 - (B) FOR CLEARNESS, ALL CORNERS ARE SHOWN ON THIS DRAWING BY STRAIGHT LINES. ALL INSIDE CORNERS SHOULD BE MADE WITH 1/8" RADIUS FILLETS FOR EASE IN MOLDING.
 - (C) IF PAID FOR SEPARATELY, CAST IRON USED IN CASTINGS IS TO BE PAID FOR UNDER ITEM NO. 611-03.04 GRAY IRON CASTINGS (CATCH BASIN) LB.
 - (D) IF CATCH BASIN IS PAID FOR UNDER EACH, THEN COST OF CAST IRON USED IN CASTINGS IS TO BE PAID FOR UNDER THE SPECIFIC ITEM BID FOR THAT CATCH BASIN. SEE STANDARD DRAWINGS FOR TYPE 42, 43, AND 44 CATCH BASINS FOR APPLICABLE PAY ITEMS FOR EACH TYPE OF CATCH BASIN.
 - (E) GRAY IRON CASTINGS SHALL BE MANUFACTURED CONFIRMING TO AASHTO M105 MEETING 30 KSI WEIGHTING A MINIMUM OF 459 LBS OR AASHTO M306 MEETING 35 KSI WEIGHTING A MINIMUM OF 362 LBS. A +/- 5% WEIGHT TOLERANCE WILL BE ACCEPTABLE. ALL PRODUCTS SHALL BE CERTIFIED BY THE MANUFACTURER MEETING THE ABOVE MANUFACTURING REQUIREMENTS AND HS-20 DESIGN LOADING.

NOT TO SCALE

STATE OF TENNESSEE
 STANDARD DRAWING
 DEPARTMENT OF TRANSPORTATION

**CAST IRON
 GRATE DETAILS
 FOR NOS. 42,
 43, & 44 TYPE
 CATCH BASIN**

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SIDE DRAIN DIA. (D)	DIMENSIONS AND QUANTITIES FOR ONE ENDWALL									
	CONCRETE ENDWALL DIMENSIONS				GRATE PLACEMENT DIMENSIONS			STRUCTURAL STEEL GRATE DIMENSIONS AND QUANTITY		STRUCT. STEEL
	H	W	L ₁	L ₂	L ₃	L ₄	L ₅	WG	NO. REQ'D.	LB.
15"	SEE STD. DWG. D-PE-15A				2'-2"	1'-0"	2'-1 1/8"	2'-5"	2	172
18"	SEE STD. DWG. D-PE-18A				10 3/8"	1'-0"	1'-0"	2'-8"	3	269
24"	SEE STD. DWG. D-PE-24A				2'-2"	1'-0"	3'-2 3/8"	3'-3"	3	296
30"	SEE STD. DWG. D-PE-30A				2'-2"	1'-0"	3'-3 3/8"	3'-10"	4	694
36"	SEE STD. DWG. D-PE-36A				2'-2"	1'-0"	2'-9 1/8"	4'-5"	5	975
42"	SEE STD. DWG. D-PE-42A				2'-2"	1'-0"	1'-10 3/8"	5'-0"	6	1,300
48"	SEE STD. DWG. D-PE-48A				2'-2"	1'-0"	1'-5"	5'-7"	7	1,669

- REV. 7-10-12: REVISED ALTERNATE ANCHORS FOR STRUCTURAL STEEL GRATES NOTE.
- REV. 1-10-13: CHANGED REQUIREMENT FOR GRATE ON ALL ENDWALLS.
- REV. 6-14-13: REVISED NOTE (E), ADDED NOTES (F) AND (G).
- REV. 3-16-17: REVISED GENERAL NOTES. ADDED FOOTNOTE TO TABLE.
- REV. 06-28-19: RENAMED AND REDREW SHEET.
- REV. 10-16-20: REVISED SLOT DIMENSION, ADDED ANCHOR BOLT DETAIL AND REVISED 18" PIPE GRATE PLACEMENT DIMENSIONS.
- REV. 03-04-21: REVISED GENERAL NOTES (A), (B) AND (C).
- REV. 10-29-21: ADDED GENERAL NOTE (G).

GENERAL NOTES

(A) DRAWING TO BE USED FOR ALL 15" THRU 48" SIDE DRAIN CONCRETE ENDWALLS. REFER THE FOLLOWING STANDARD DRAWINGS FOR CONSTRUCTION DIMENSIONS.

15" ENDWALL - SEE D-PE-15A & D-PE-15B WITH 6:1 WINGWALL SLOPE
 18" ENDWALL - SEE D-PE-18A & D-PE-18B WITH 6:1 WINGWALL SLOPE
 24" ENDWALL - SEE D-PE-24A & D-PE-24B WITH 6:1 WINGWALL SLOPE
 30" ENDWALL - SEE D-PE-30A & D-PE-30B WITH 6:1 WINGWALL SLOPE
 36" ENDWALL - SEE D-PE-36A & D-PE-36B WITH 6:1 WINGWALL SLOPE
 42" ENDWALL - SEE D-PE-42A & D-PE-42B WITH 6:1 WINGWALL SLOPE
 48" ENDWALL - SEE D-PE-48A & D-PE-48B WITH 6:1 WINGWALL SLOPE

(B) SIDE DRAIN CONCRETE ENDWALL REQUIRES STEEL PIPE GRATES SHOWN ON THIS DRAWING. THE CONTRACTOR SHALL OMIT THE CONCRETE BLOCKOUTS (4" x 7") AS SHOWN ON STANDARD DRAWING D-PE-99 SECTION D-D THRU WINGWALL AND SUBSTITUTE THE FOLLOWING REINFORCING BARS:

30" ENDWALL - SUBSTITUTE A465 & A466 BY EXTENDING A464 TO 19'-5"
 36" ENDWALL - SUBSTITUTE A464 & A465 BY EXTENDING A463 TO 23'-0"
 42" ENDWALL - SUBSTITUTE A465 (2 BARS), A466 & A467 BY EXTENDING A464 TO 26'-0"
 48" ENDWALL - SUBSTITUTE A465 (2 BARS), A466 & A467 BY EXTENDING A464 TO 29'-7"

(C) THE MATERIALS, WELDING AND PAINTING FOR STRUCTURAL STEEL GRATE SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:

- 1 ANGLES: ASTM A36
- 2 STEEL PIPE: ASTM A53 GRADE B, STANDARD WEIGHT (SW) OR ASTM A500 GRADE B AND SHALL BE GALVANIZED FOR 15" THRU 24" DIAMETER PIPE CULVERT. ASTM A53 GRADE B, DOUBLE EXTRA STRONG WEIGHT (XXS) - FOR 30" THRU 48" DIAMETER PIPE CULVERT.
- 3 WELDING: AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)
- 4 ALL STEEL GRATES SHALL BE GALVANIZED.
- 5 PIPES ARE TO BE VENTED PER GALVANIZATION REQUIREMENTS. HOLE SIZE AND LOCATIONS WILL BE DETERMINED BY GALVANIZER DURING THE APPLICATION.

THE MATERIAL AND GALVANIZING FOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:

- 1 BOLTS, NUTS AND WASHERS: ASTM F1554 GRADE 36
- 2 GALVANIZING: ASTM A153

(D) THE COST OF FURNISHING BOLTS, NUTS AND WASHERS, INCLUDING ALL MATERIALS, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION, SHALL BE INCLUDED IN THE PRICE BID FOR STRUCTURAL STEEL.

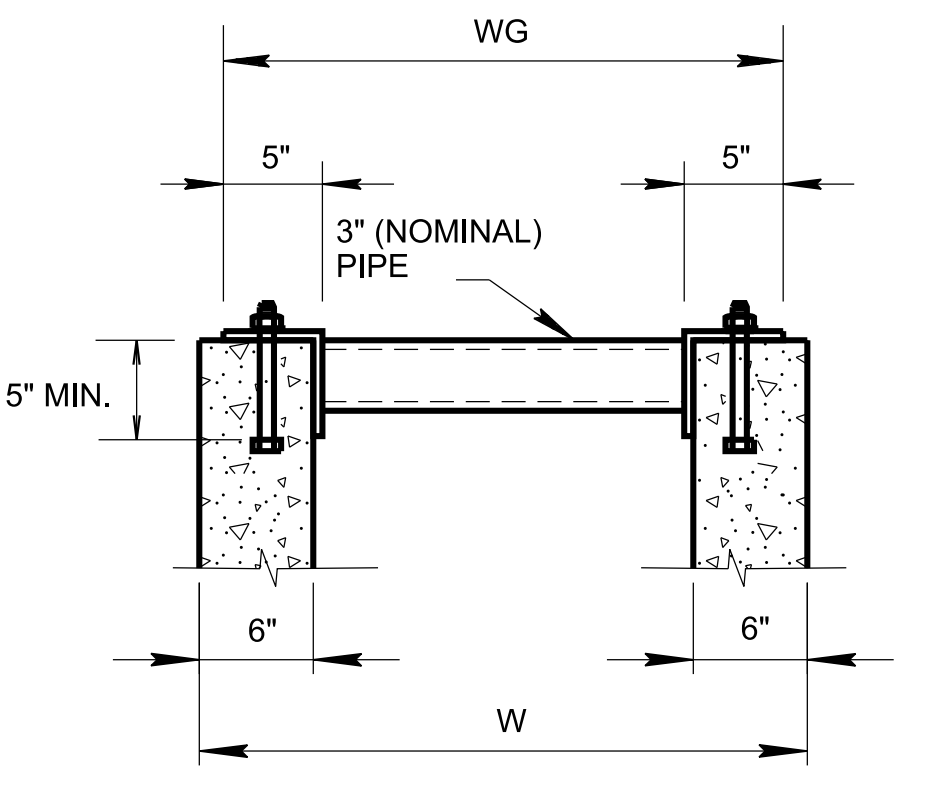
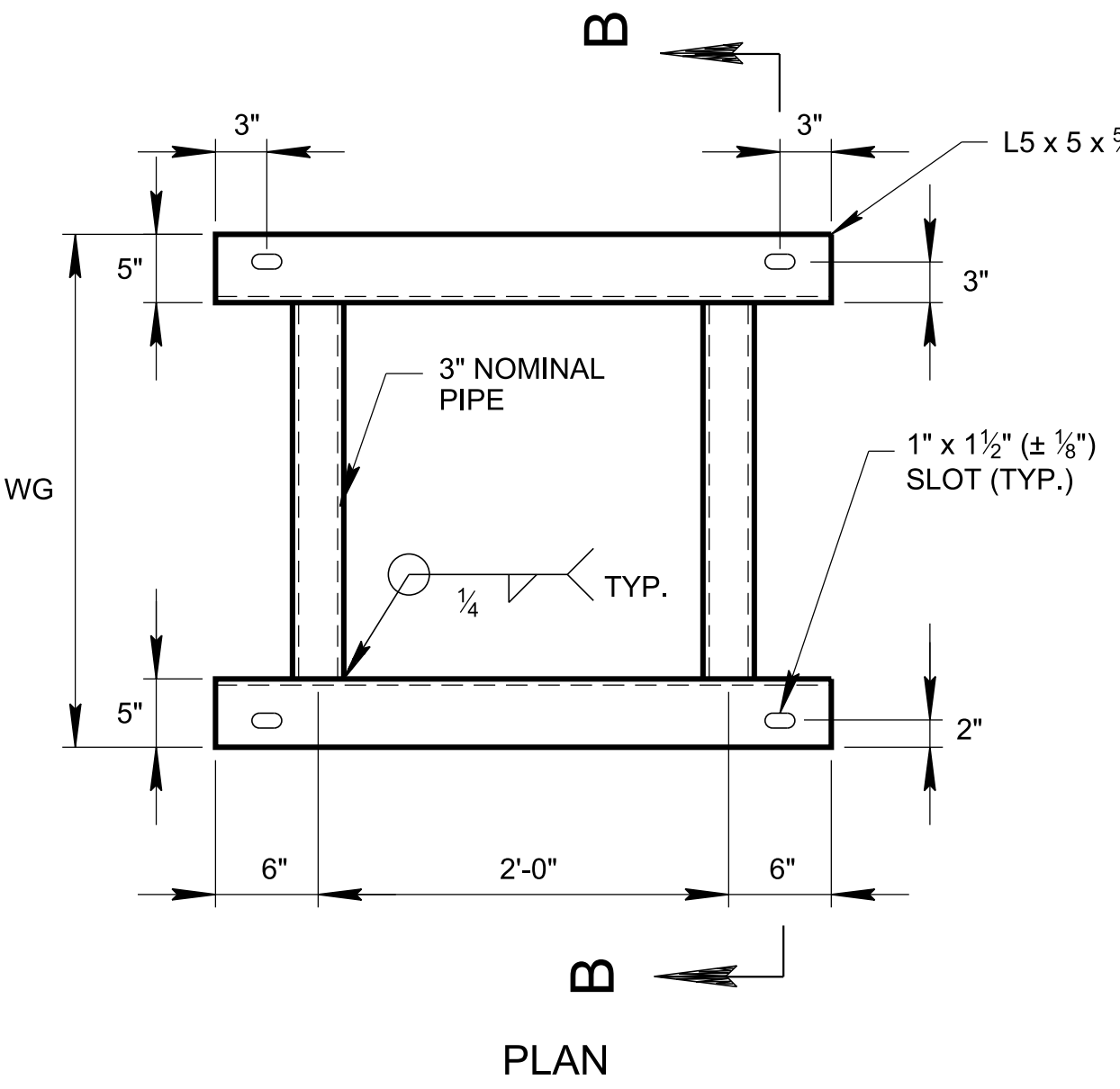
(E) PAYMENT WILL BE MADE UNDER ITEM NUMBERS:

611-07.30	15IN ENDWALL (SIDE DRAIN)	EACH
611-07.31	18IN ENDWALL (SIDE DRAIN)	EACH
611-07.32	24IN ENDWALL (SIDE DRAIN)	EACH
611-07.33	30IN ENDWALL (SIDE DRAIN)	EACH
611-07.34	36IN ENDWALL (SIDE DRAIN)	EACH
611-07.35	42IN ENDWALL (SIDE DRAIN)	EACH
611-07.36	48IN ENDWALL (SIDE DRAIN)	EACH

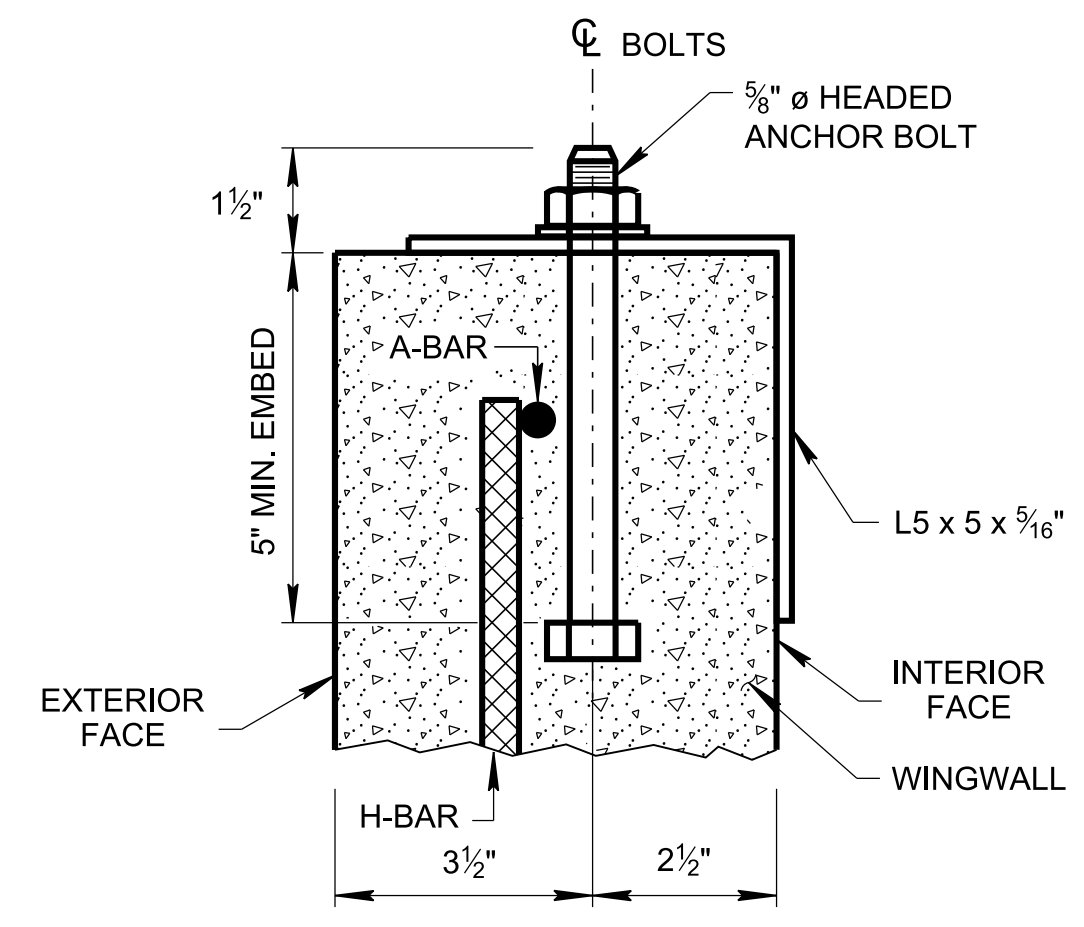
(F) THE CONTRACTOR MAY ELECT TO SUBSTITUTE AN APPROVED ALTERNATIVE DESIGN

(G) DIMENSIONAL AND REINFORCING TOLERANCES WILL BE AS SHOWN IN STANDARD OPERATING PROCEDURE (SOP) 5-3.

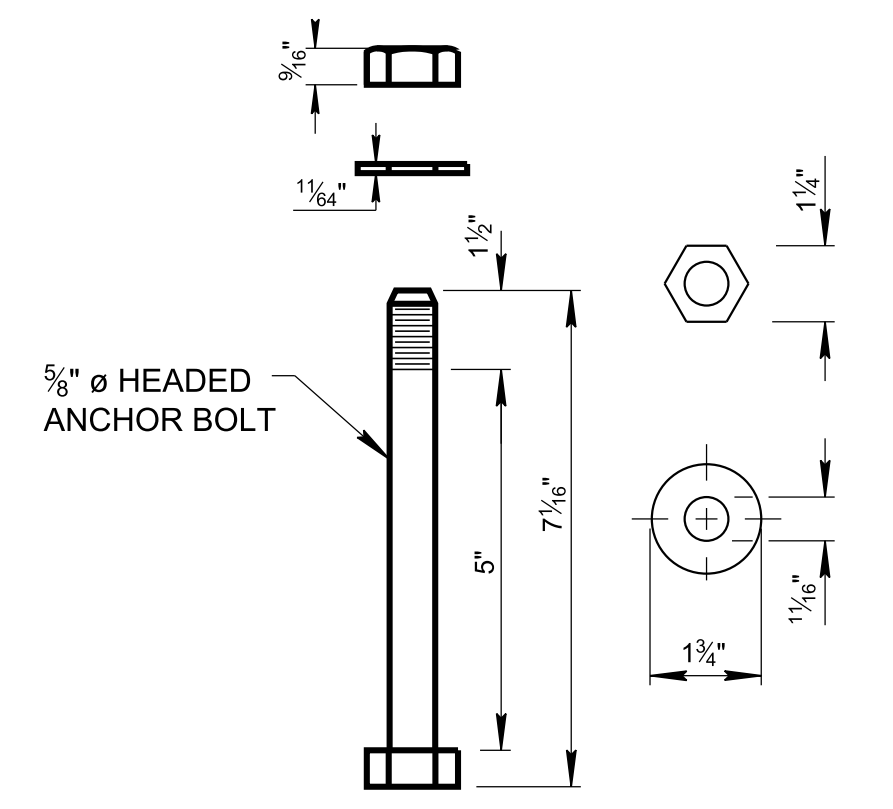
NOTE:
BOLTS SHALL NOT EXTEND MORE THAN 1/2" ABOVE TOP OF NUTS.



SECTION B-B
SHOWING ANCHOR BOLTS AND PARTIAL WINGWALLS
STEEL PIPE GRATE



ANCHOR BOLT ASSEMBLY



ANCHOR BOLT DETAIL

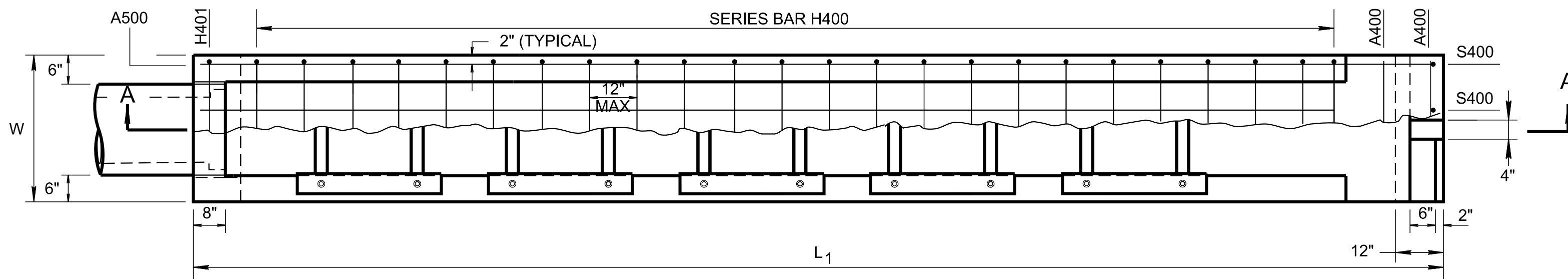
ALTERNATE ANCHORS FOR STRUCTURAL STEEL GRATES

CERTIFICATION: DRILLED-IN EPOXY ANCHORS OR CAST-IN THREADED INSERTS MAY BE UTILIZED IN LIEU OF CAST-IN HEADED ANCHOR BOLTS PROVIDED THAT THE CONTRACTOR FURNISHES CERTIFIED ANCHOR PULL OUT DATA FROM AN INDEPENDENT TESTING LABORATORY USING CLASS "A" CONCRETE AS PRESCRIBED BY TENNESSEE HIGHWAY SPECIFICATIONS. THE REQUIRED ULTIMATE LOAD FOR 5/8" DIAMETER ANCHORS IS 10,000 POUNDS.

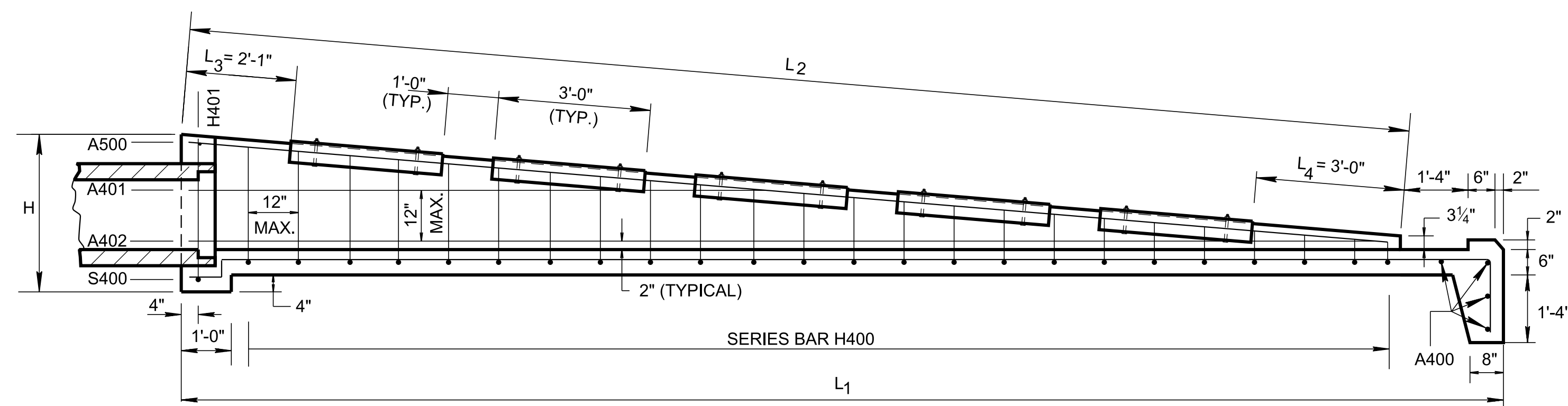
MINOR REVISION -- FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
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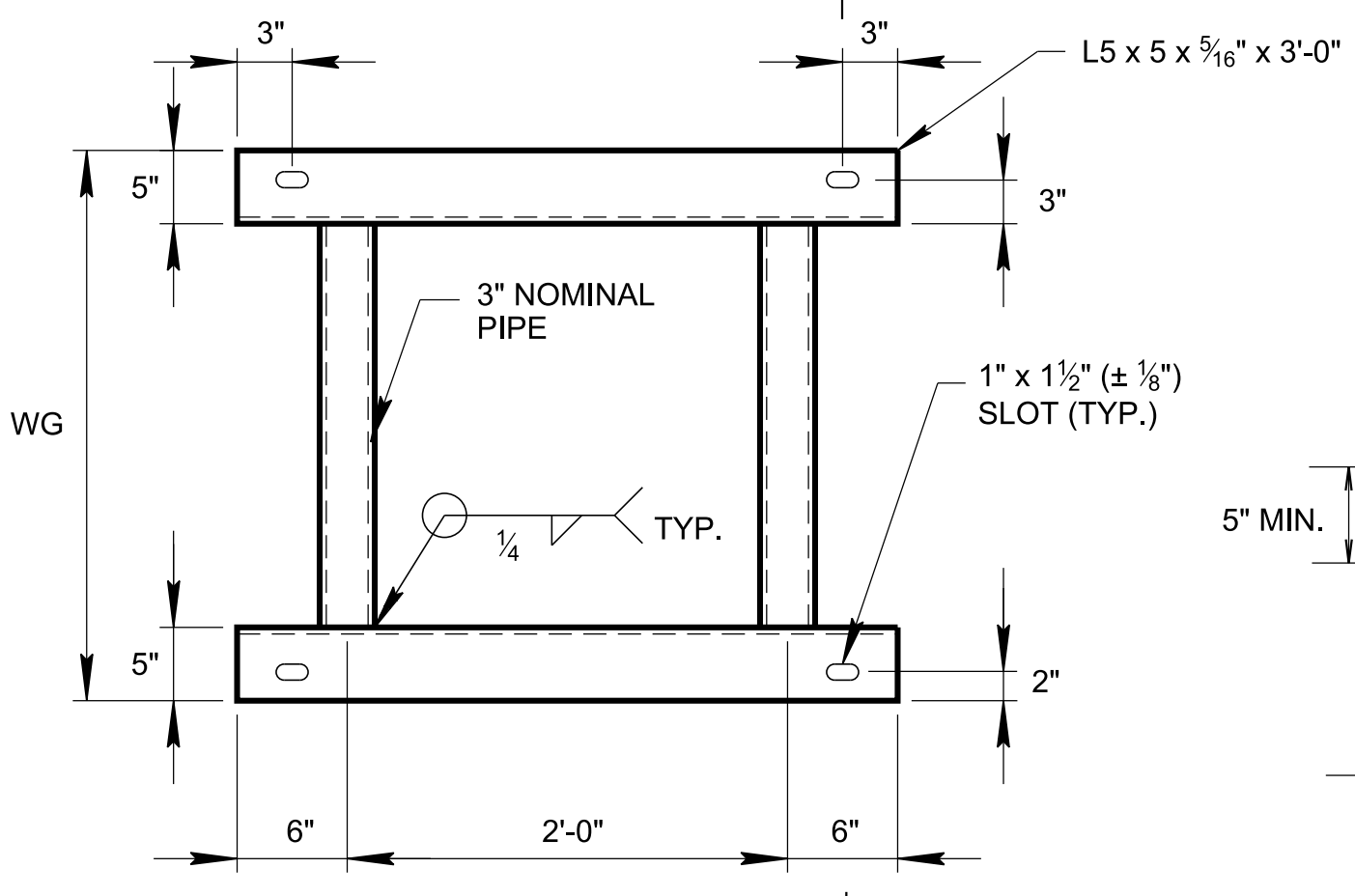
TYPE "SAFETY"
SIDE DRAIN ENDWALL
WITH
STEEL PIPE GRATE,
FOR 15" THRU 48" PIPES,
6:1 SLOPE



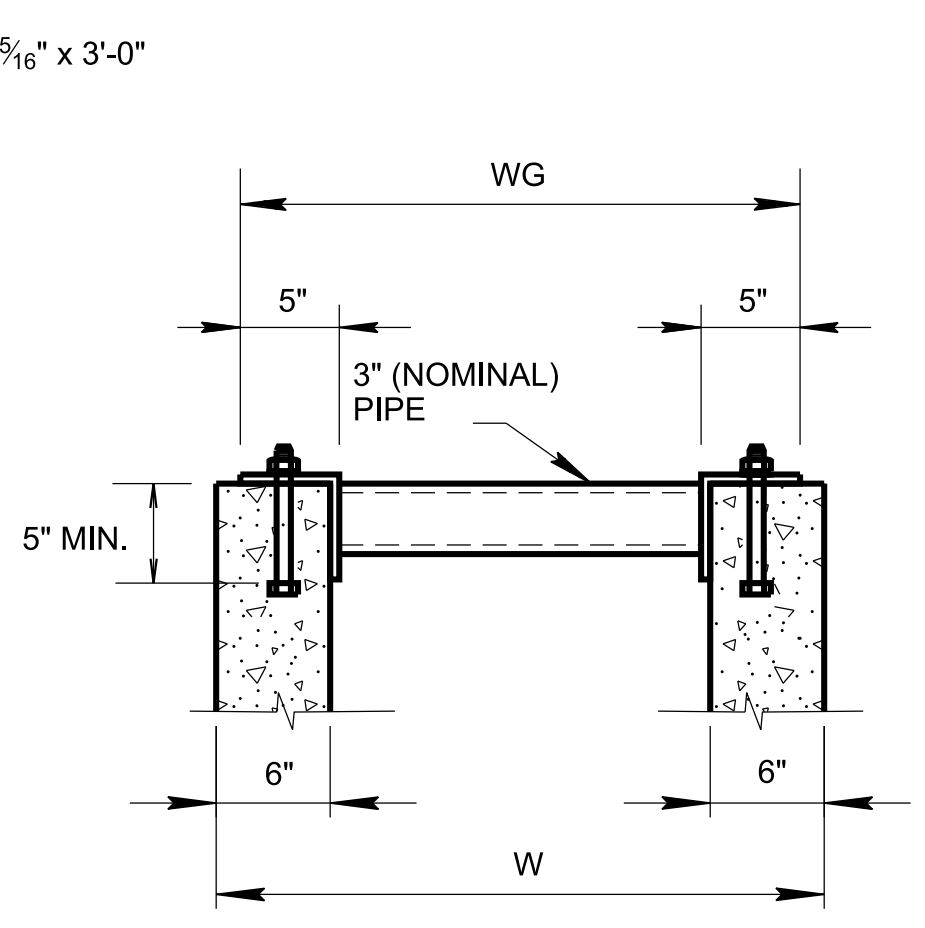
PLAN



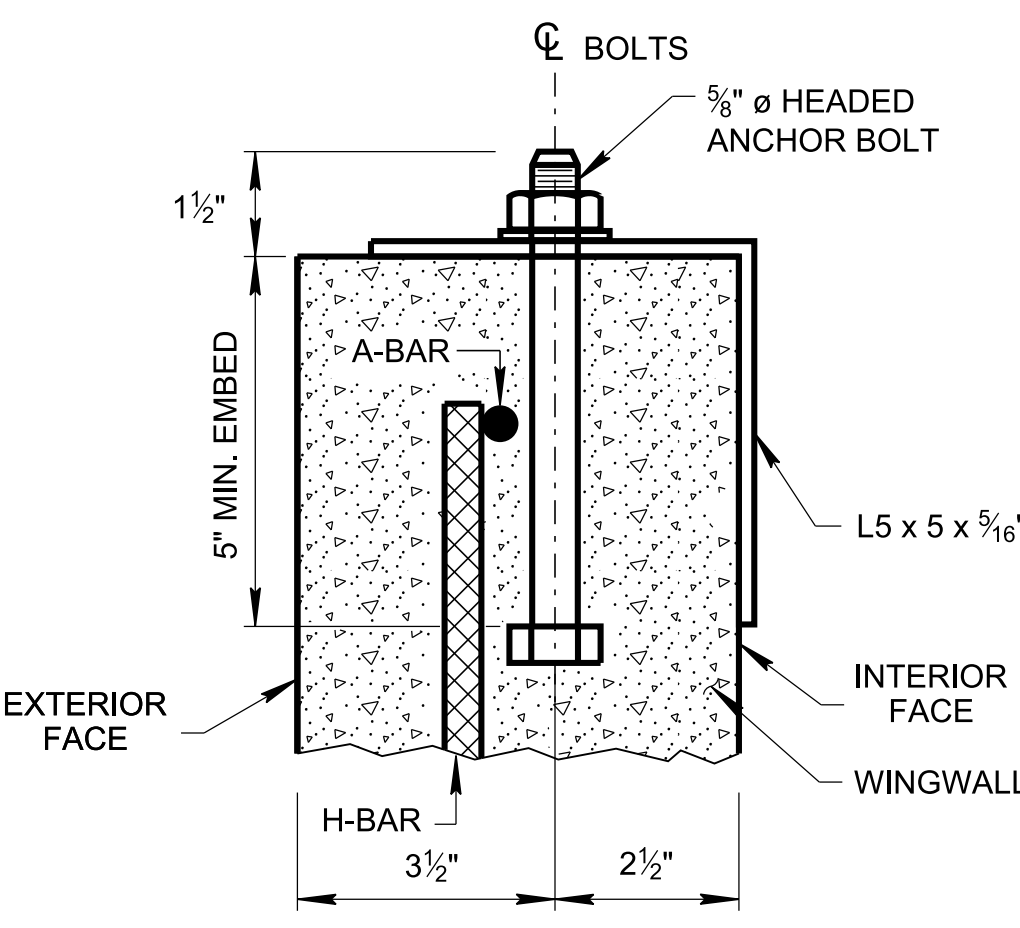
SECTION A-A



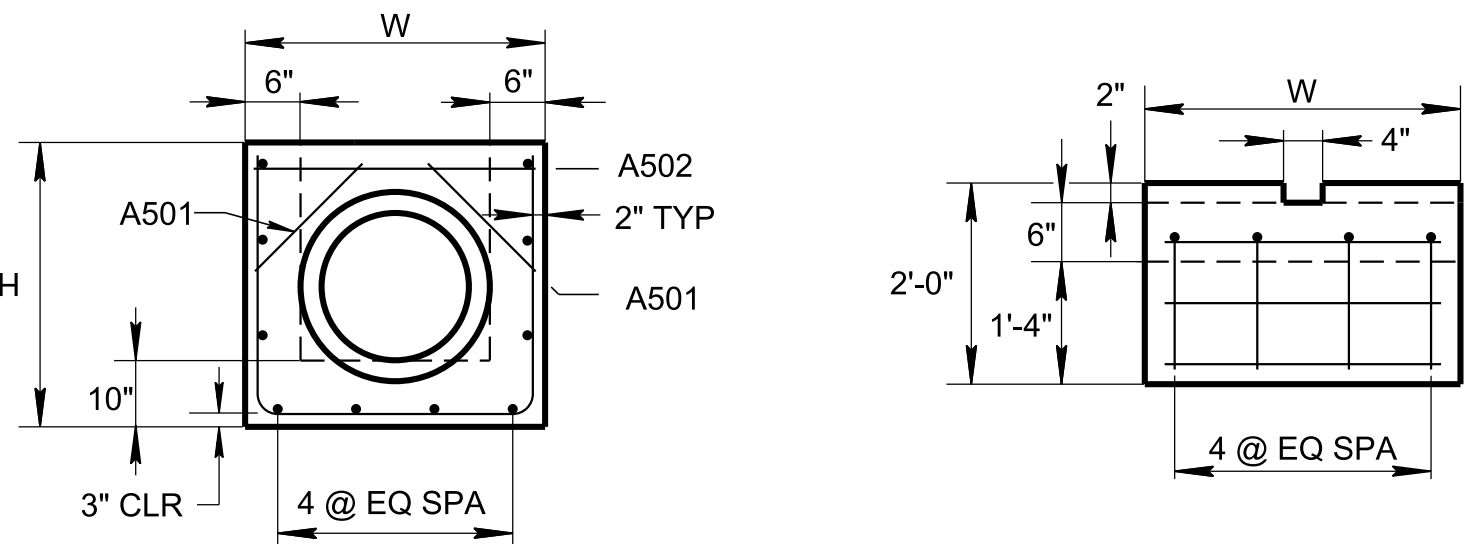
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SECTION B-B
 SHOWING ANCHOR BOLTS AND PARTIAL WINGWALLS



ANCHOR BOLT ASSEMBLY



HEADWALL ELEVATION

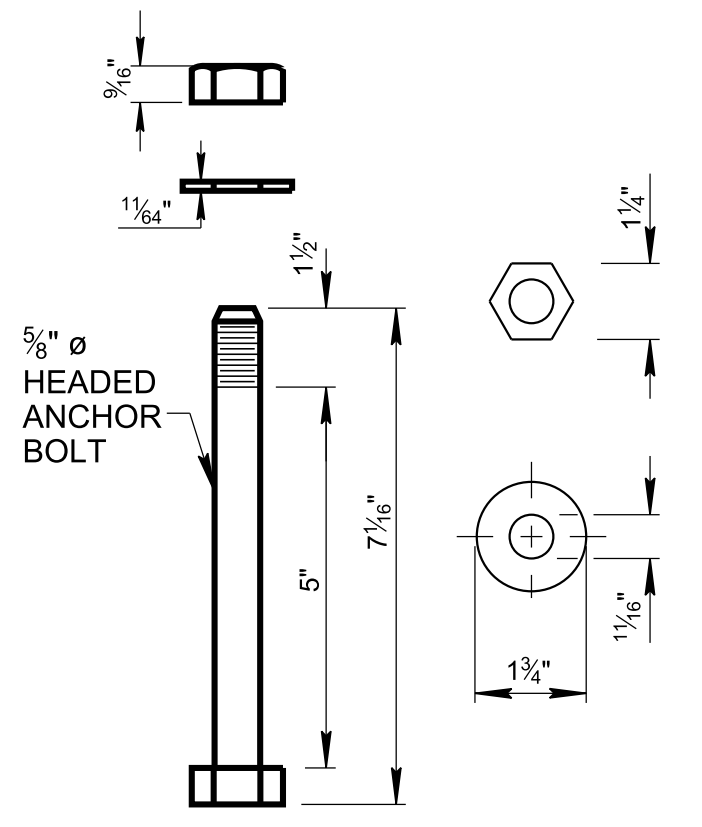
TOEWALL ELEVATION

PIPE CULV. DIA.	CONCRETE ENDWALL DIMENSIONS						STRUCTURAL STEEL GRATE DIMENSION AND QUANTITY		ESTIMATED QUANTITIES		
	H	L ₁	L ₂	L ₃	L ₄	W	WG	NO. REQ'D	CLASS "A" CONCRETE CU. YD.	STEEL BAR REINF. LB.	STRUCT. STEEL LB.
	18"	3'-1 1/4"	26'-0"	24'-1"	2'-1"	3'-0"	3'-1"	2'-10"	5	2.84	256

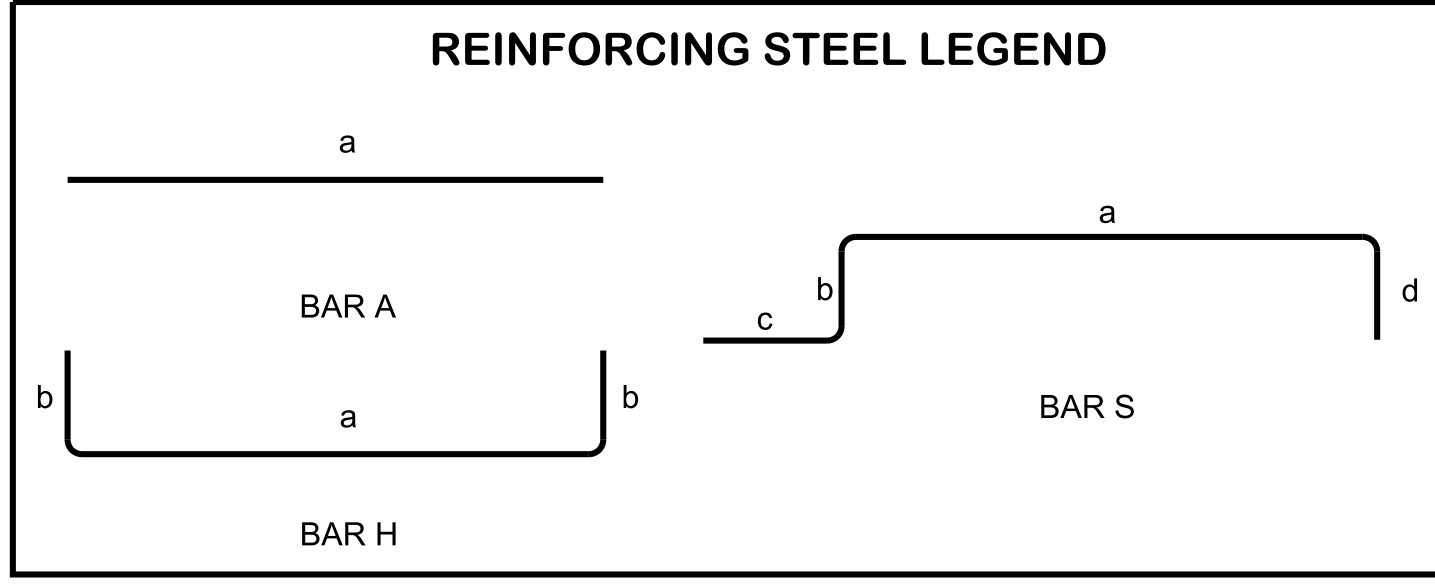
ALTERNATE ANCHORS FOR STRUCTURAL STEEL GRATES

CERTIFICATION: DRILLED-IN EPOXY ANCHORS OR CAST-IN THREADED INSERTS MAY BE UTILIZED IN LIEU OF CAST-IN HEADED ANCHOR BOLTS PROVIDED THAT THE CONTRACTOR FURNISHES CERTIFIED ANCHOR PULL OUT DATA FROM AN INDEPENDENT TESTING LABORATORY USING CLASS "A" CONCRETE AS PRESCRIBED BY TENNESSEE HIGHWAY SPECIFICATIONS. THE REQUIRED ULTIMATE LOAD FOR 5/8" DIAMETER ANCHORS IS 10,000 POUNDS.

NOTE:
 BOLTS SHALL NOT EXTEND MORE THAN 1/2" ABOVE TOP OF NUTS.



ANCHOR BOLT DETAIL



REINFORCING STEEL CODE

TYPE	SIZE	SERIES
A	5	06

DIMENSIONS SHOWN ON THIS SHEET ARE OUTSIDE TO OUTSIDE OF BAR.
 STANDARD C.R.S.I. HOOK DETAILS SHALL APPLY, EXCEPT AS NOTED.

BILL OF STEEL								
BAR TYPE	LOCATION	18" PIPE BENDING DIMENSIONS				NO. REQ'D	LENGTH	
		a	b	c	d			
A400	TOEWALL	2'-9"				4	2'-9"	
A401	WINGWALLS	10'-0 1/2"				2	10'-0 1/2"	
A402	WINGWALLS	23'-6"				2	23'-6"	
A500	WINGWALLS	23'-8"				2	23'-8"	
A501	HEADWALL	1'-8 5/8"				2	1'-8 5/8"	
A502	HEADWALL	2'-9"				1	2'-9"	
H400	BOTTOM SLAB AND WINGWALL	2'-9"	*			1	102'-11"	
		* DIMENSION "b" VARIES FROM 2'-2 7/8" TO 0'-4 7/8" IN INCREMENTS OF 0'-1" (23 BARS)						
H401	BOTTOM SLAB AND HEADWALL	2'-9"	2'-7 7/8"			1	8'-0 3/4"	
S400	BOTTOM SLAB AND TOEWALL	25'-2"	0'-4 1/2"	0'-6"	1'-4"	4	27'-4 1/2"	

GENERAL NOTES

(A) CONCRETE ENDWALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS.

(B) THE MATERIALS, WELDING AND PAINTING FOR STRUCTURAL STEEL GRATE SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:

- ANGLES ASTM A36
- STEEL PIPE ASTM A53 GRADE B, STANDARD WEIGHT (SW) OR ASTM A500 GRADE B.
- WELDING AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)
- ALL STEEL GRATES SHALL BE GALVANIZED.
- PIPES ARE TO BE VENTED PER GALVANIZATION REQUIREMENTS. HOLE SIZE AND LOCATIONS WILL BE DETERMINED BY GALVANIZER DURING THE APPLICATION.

(C) THE MATERIAL AND GALVANIZING FOR BOLTS, NUTS AND WASHERS SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:

- BOLTS, NUTS AND WASHERS ASTM F1554 GRADE 36
- GALVANIZING ASTM A153

(D) THE COST OF FURNISHING BOLTS, NUTS AND WASHERS, INCLUDING ALL MATERIALS, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION, SHALL BE INCLUDED IN THE PRICE BID FOR PIPE ENDWALL.

(E) PIPE OPENINGS FOR HEADWALLS ARE BASED ON REINFORCED CONCRETE PIPE WITH TYPE "B" WALL THICKNESS (AASHTO M1701). SEE STD. DWG. NOS. D-PE-9, 9A & 9B FOR DETAILS.

(F) PAYMENT WILL BE MADE UNDER:

611-07.73 18IN ENDWALL (MEDIAN DRAIN) EACH.

(G) THE CONTRACTOR MAY ELECT TO SUBSTITUTE AN APPROVED ALTERNATIVE DESIGN.

(H) DIMENSIONAL AND REINFORCING TOLERANCES WILL BE AS SHOWN IN STANDARD OPERATING PROCEDURE (SOP) 5-3.

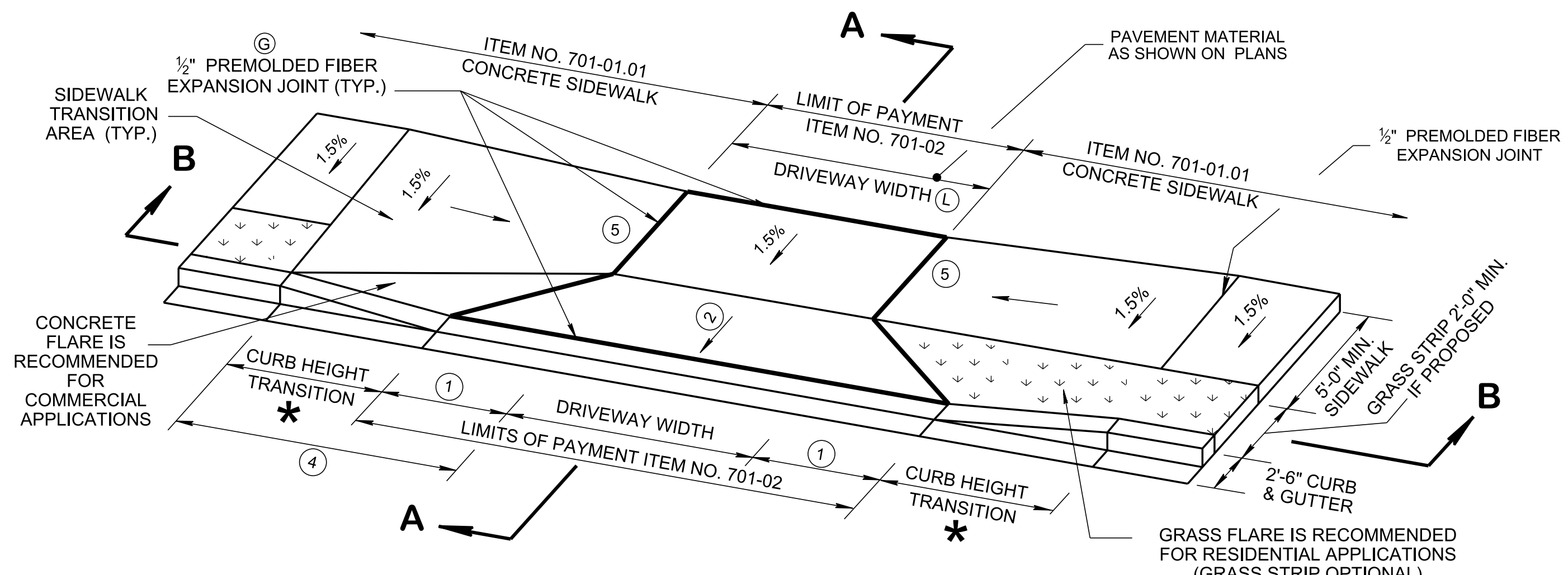
- REV. 7-28-84: CHANGED MATERIAL SPECIFICATIONS FOR STRUCTURAL STEEL PIPES AND PAINT SPECIFICATIONS.
- REV. 3-20-86: CHANGED FEDERAL PAINT SPECIFICATION.
- REV. 7-29-92: REDREW, RENAMED AND REORGANIZED SHEET. CHANGED SHEET NUMBER FROM D-PE-12 TO D-SEW-12D. CHANGED ENDWALL FROM TYPE "U" TO TYPE "SD". UPDATED SPECIFICATIONS IN THE GENERAL NOTES. CORRECTED DIMENSIONS AND ESTIMATED QUANTITIES IN THE DIMENSION AND QUANTITY BLOCK. CORRECTED DIMENSIONS IN BILL OF STEEL.
- REV. 10-26-95: IN GENERAL NOTE (B) CHANGED MINIMUM WALL THICKNESS FROM 0.25" TO 0.216".
- REV. 1-19-97: CHANGED WEIGHT OF STRUCTURAL STEEL GRATES.
- REV. 5-27-99: CHANGED PAINT SPECIFICATION TO TT-E-489J.
- REV. 4-15-00: MODIFIED TOE WALL AND CLASS "A" CONCRETE QUANTITIES.
- REV. 5-27-01: CHANGED DESCRIPTION FOR ITEM NO. 611-07.03.
- REV. 6-1-09: ADDED GENERAL NOTE (F).
- REV. 7-19-10: DELETED GENERAL NOTE (F).
- REV. 3-1-12: REVISED REINFORCING STEEL, BILL OF STEEL, REINFORCING STEEL LEGEND, STEEL GRATE, ANCHOR BOLT DETAIL, ESTIMATED QUANTITIES FOR CLASS "A" CONCRETE, STEEL BAR REINF. & STRUCTURAL STEEL. REVISED GENERAL NOTES AND NOTE FOR ALTERNATE DRILLED IN ANCHORS.
- REV. 6-14-13: REVISED GENERAL NOTE (F) ADDED NOTES (G) AND (H).
- REV. 06-28-19: RENAMED AND REDREW SHEET.
- REV. 10-16-20: REMOVED 15" PIPE INFORMATION, REVISED SLOT DIMENSION, ADJUSTED (L4) AND (L3) DIMENSIONS, CHANGED NUMBER OF GRATES ON PLAN AND ADDED ANCHOR BOLT DETAIL.
- REV. 03-04-21: REVISED GENERAL NOTE (B2).
- REV. 10-29-21: ADDED GENERAL NOTE (B3).

MINOR REVISION -- FHWA APPROVAL NOT REQUIRED

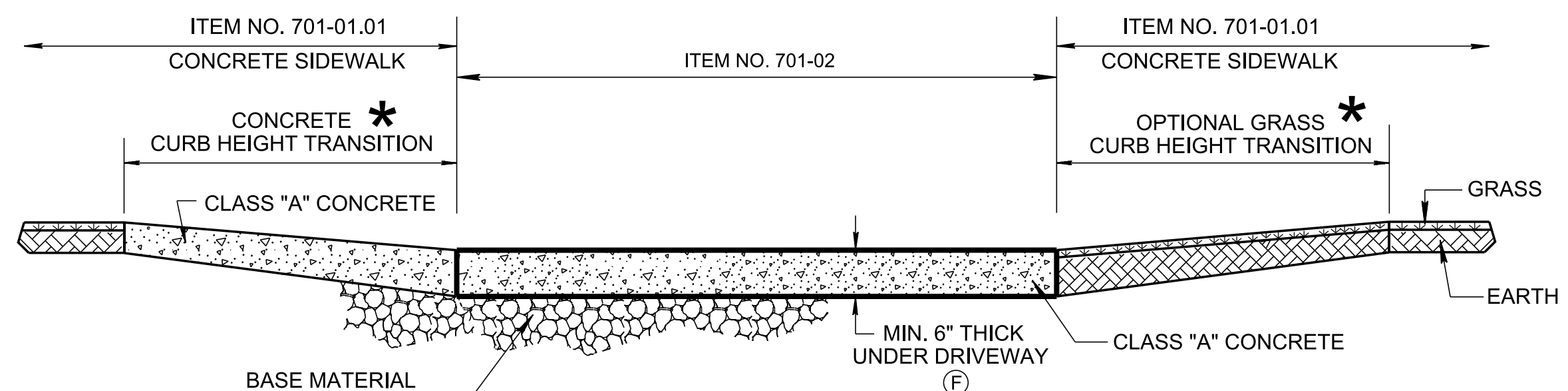
STATE OF TENNESSEE
 STANDARD DRAWING
 DEPARTMENT OF TRANSPORTATION

TYPE "SAFETY" SIDE DRAIN ENDWALL WITH STEEL PIPE GRATE, FOR 18" PIPE, 12:1 SLOPE

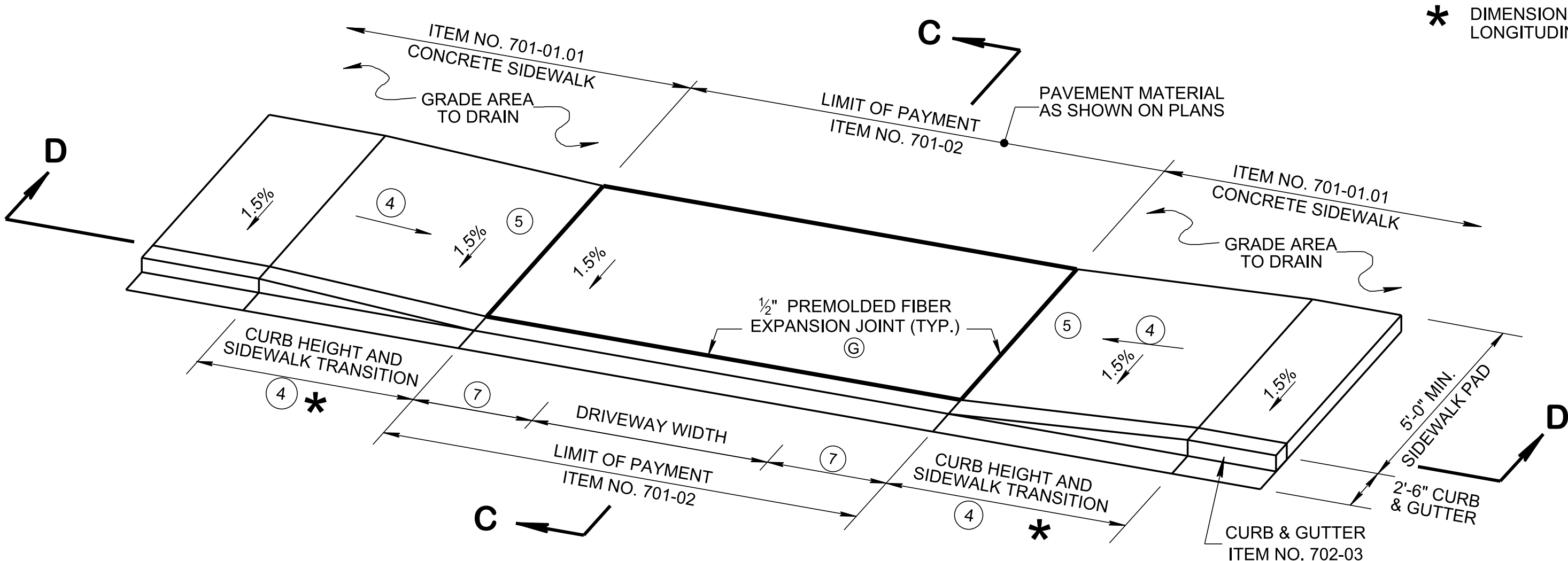
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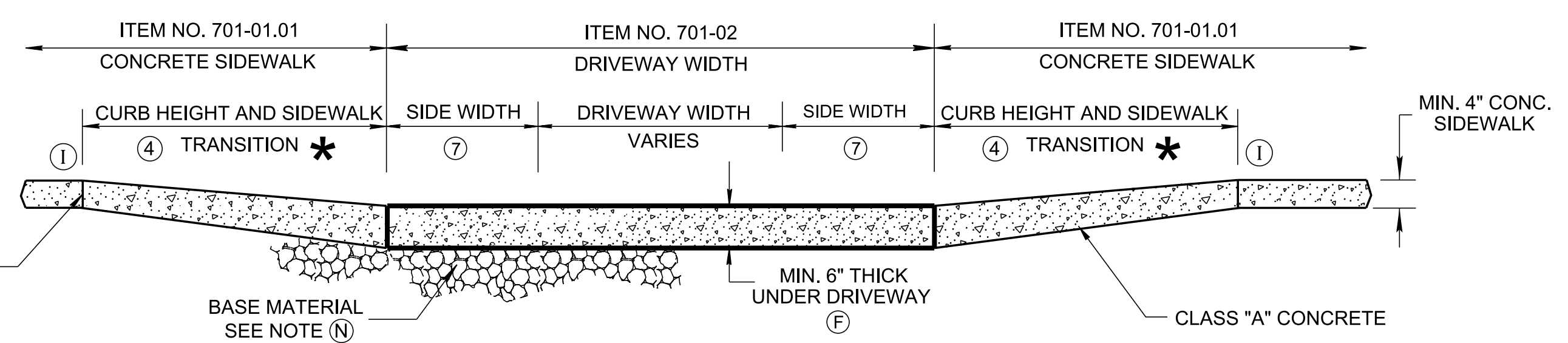
TYPE "B" DRIVEWAY ACROSS LOWERED SIDEWALK (WITH GRASS STRIP)



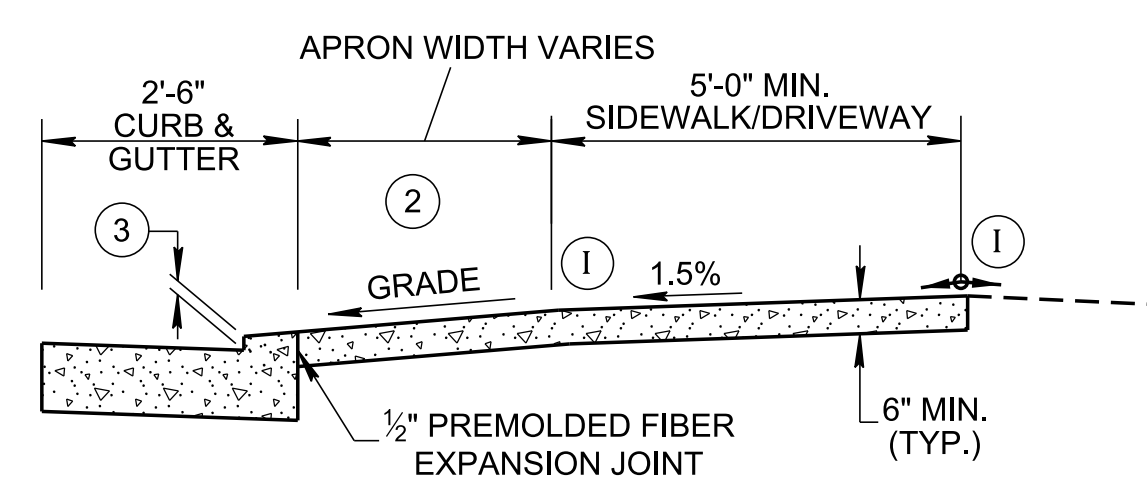
SECTION B-B



TYPE "C" DRIVEWAY ACROSS LOWERED SIDEWALK

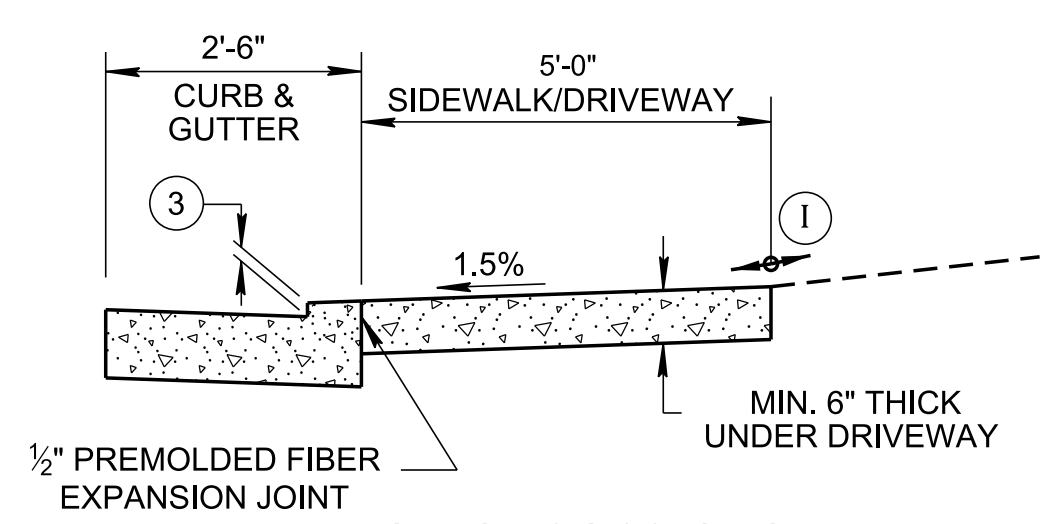


SECTION D-D



SECTION A-A

- FOOTNOTES**
- ① SIDE FLARE WIDTH SHOULD BE A MINIMUM 7'-0" FOR COMMERCIAL DRIVEWAYS. SIDE FLARE WIDTH SHOULD BE A MINIMUM 3'-6" FOR RESIDENTIAL DRIVEWAYS.
 - ② DRIVEWAY RAMP GRADE VARIES, 15% MAX. (10% RECOMMENDED) APRON GRADE FOR RESIDENTIAL DRIVEWAYS. 8% MAX. (5% RECOMMENDED) APRON GRADE FOR COMMERCIAL DRIVEWAYS.
 - ③ HEIGHT OF LOWERED CURB SHALL BE 2.25 INCHES. SEE STD DWG RP-VC-10 & RP-VC-11.
 - ④ THE SLOPE OF THE SIDEWALK AND/OR CURB HEIGHT TRANSITION VARIES TO A MAXIMUM OF 8.33% LENGTH OF TRANSITION IS RELATIVE TO THE LONGITUDINAL ROADWAY GRADE.
 - ⑤ COMMERCIAL DRIVEWAY ENTRANCE TYPICALLY (MAX. 40' WIDE) MAY REQUIRE DETECTABLE WARNING SURFACES IF ENTRANCE SERVES MORE THAN 400 VEHICLES PER DAY. SEE STD. DWG. NOS. MM-CR- SERIES FOR DETAILS.
 - ⑥ 3R PROJECTS MAY REQUIRE SLOPE CORRECTION, PARALLEL CROSS-WALK MARKINGS (ESPECIALLY AT TWO WAY DRIVEWAY ENTRANCES), AND DETECTABLE DOME SURFACE TO MAINTAIN CONTINUITY AT COMMERCIAL DRIVE ENTRANCES. ADDITIONAL SIGNS (WATCH FOR PED) MAY BE ADDED AT DRIVEWAYS BY THE DIRECTION OF AN ENGINEER IF NEEDED.
 - ⑦ SIDE WIDTH SHOULD BE A MINIMUM 7'-0" FOR COMMERCIAL DRIVEWAYS. SIDE WIDTH SHOULD BE A MINIMUM 3'-6" FOR RESIDENTIAL DRIVEWAYS.



SECTION C-C

LEGEND
 * DIMENSION VARIES RELATIVE TO LONGITUDINAL ROADWAY GRADE.

- GENERAL NOTES**
- (A) DUE TO THE ELEVATION CHANGE FOR PEDESTRIANS ON THE SIDEWALK, THIS APPLICATION IS UNDESIRABLE AND IS TO BE USED IN LIMITED APPLICATIONS. SEE RP-D-15 FOR THE PREFERRED DRIVEWAY TYPE.
 - (B) 5'-0" MINIMUM SIDEWALK WITH A MAXIMUM CROSS SLOPE OF 1.5% THROUGH DRIVEWAYS.
 - (C) DESIGNER TO CHECK GUTTER FLOW DEPTH AT DRIVEWAY LOCATIONS TO ASSURE THAT THE DESIGN FLOW DOES NOT OVERTOP THE SIDEWALK AREA. IF OVERTOPPING OCCURS, PLACE AN INLET AT THE UPSTREAM SIDE OF THE DRIVEWAY OR PERFORM OTHER DESIGN MITIGATION
 - (D) THE SLOPE OF THE LANDING AREA SHALL NOT EXCEED 1.5% IN THE SIDEWALK AREA.
 - (E) DRIVEWAYS TO BE BUILT COMPLETE OR IN PART AS INDICATED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
 - (F) ALL CONCRETE DRIVEWAYS TO BE 6" UNIFORM THICKNESS, UNLESS OTHERWISE SHOWN ON PLANS.
 - (G) EXPANSION JOINTS ARE TO BE PLACED AS INDICATED ON THE PLANS. WHEN THE BACK OF THE DRIVEWAY ABUTS AGAINST A CONCRETE DRIVEWAY OR BUILDING, AN ADDITIONAL EXPANSION JOINT WILL BE PLACED AT THAT LOCATION.
 - (H) THE ROADWAY DESIGNER SHALL CONSIDER THE USE OF A CATCH BASIN ON EITHER SIDE OF DRIVEWAY. CAREFUL CONSIDERATION TO THE PLACEMENT OF CATCH BASINS SHALL BE TAKEN IF THE DRIVEWAY IS IN A VERTICAL SAG CURVE.
 - (I) ALGEBRAIC DIFFERENCE NOT TO EXCEED 10.0%.
 - (J) PAY ITEMS:

ITEM NO:	303-01, MINERAL AGGREGATE, TYPE A BASE, GRADING D,	PER TON.
ITEM NO:	701-01.01, CONCRETE SIDEWALK (4"),	PER S.F.
ITEM NO:	701-02, CONCRETE DRIVEWAY,	PER S.F.
ITEM NO:	701-02.02, CONCRETE DRIVEWAY (8"),	PER S.F.
ITEM NO:	702-03, CONCRETE COMBINED CURB & GUTTER,	PER C.Y.
 - (K) WHEN MORE THAN 2 DRIVEWAYS ARE PROPOSED, USE TYPE "A" DRIVEWAY AS SHOWN ON STANDARD DRAWING RP-D-15 TO REDUCE ROLLER COASTER EFFECT FOR PEDESTRIANS.
 - (L) TYPICAL DRIVEWAY WIDTHS ARE 12' (14' TWO WAY) FOR RESIDENTIAL AND 24' (40' MAX.) FOR COMMERCIAL. REFER TO SECTION 5 (ACCESS DESIGN) IN THE MANUAL FOR CONSTRUCTING DRIVEWAY ENTRANCES ON STATE HIGHWAYS (2015).
 - (M) ALL SIDEWALKS SHALL HAVE A MINIMUM CONCRETE THICKNESS OF 4". THE SIDEWALK TRANSITION THICKNESS IS DEPEND ON THE DRIVEWAY AND THE SIDEWALK THICKNESSES, THE COST OF THE SIDEWALK TRANSITION WILL BE INCLUDED IN THE PAY ITEM NO. OF 701-01.01.
 - (N) MINIMUM 4" MINERAL AGGREGATE BASE MATERIAL ITEM NO. 303-01 SHALL BE INSTALLED UNDER NEW CONCRETE DRIVEWAYS. SITE SPECIFIC PAVEMENT DESIGN MAY BE REQUIRED FOR COMMERCIAL DRIVEWAYS USED AS A DELIVERY ACCESS AS WELL. A DRIVEWAY PAVEMENT DESIGN WITH 6" CONCRETE PAVEMENT AND 4" AGGREGATE DEPTH MAY BE LIMITED TO LIGHT COMMERCIAL VEHICULAR TRAFFIC.

REV. 7-15-08: UPDATED SIDEWALK DIMENSIONS.

REV. 4-8-16: ADDED ITEM NUMBERS, UPDATED SLOPES AND DIMENSIONS. UPDATED NOTES.

REV. 07-16-18: ADDED NOTES TO CONC. FLARE AND GRASS FLARE IN ISOMETRIC VIEW. ADDED GENERAL NOTE (M) & (N).

REV. 01-07-19: ADDED LIMITS FOR ITEM NO. 701-02. ADJUSTED LOCATION OF GENERAL NOTE NO'S. (I) & (N) ON DETAILS. REDREW SHEET.

REV. 10-16-20: ADDED GENERAL NOTE (O) MINERAL AGGREGATE ITEM NUMBER AND BASE MATERIAL ON SECTIONS B-B AND D-D.

REV. 06-15-21: REVISED AND MERGED GENERAL NOTES (I) AND (M). ADJUSTED LOCATION OF GENERAL NOTE NO'S. REVISED GENERAL NOTES (C), (M) AND (N). ADDED PAY ITEM NO. 701-02.02.

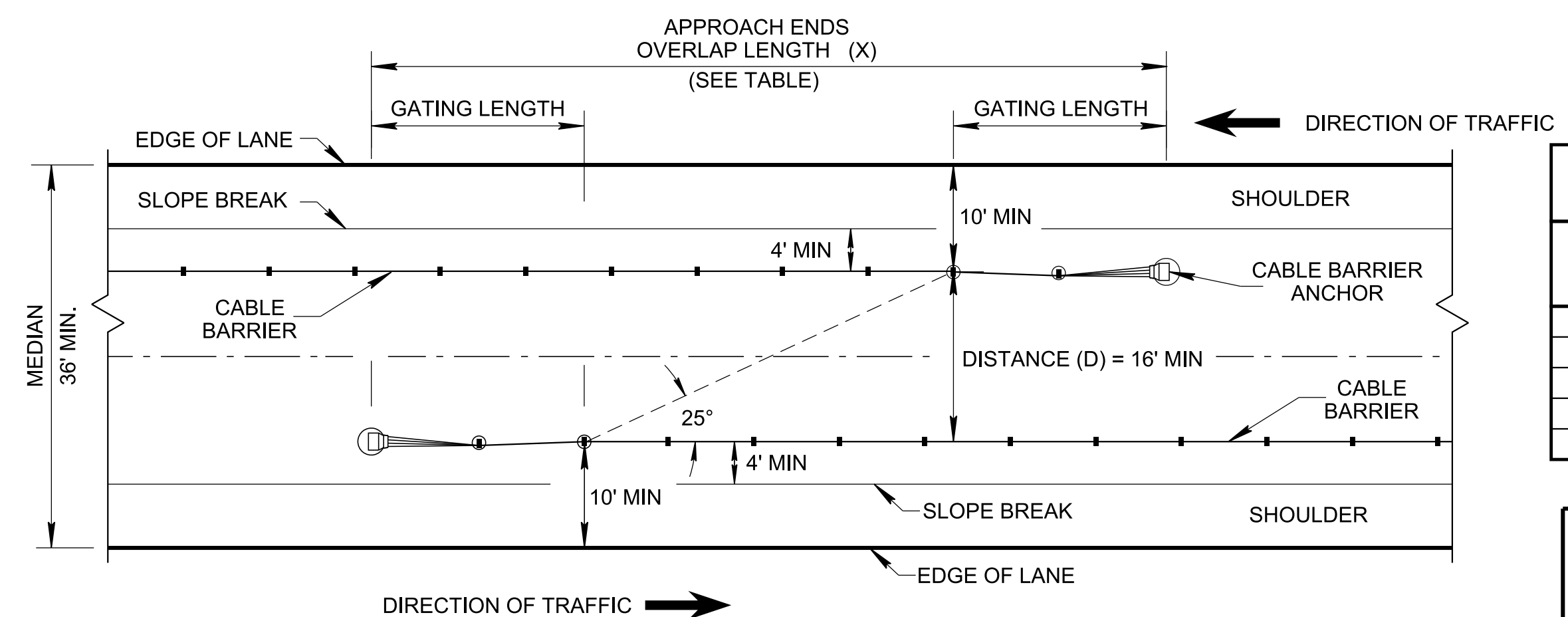
REV. 10-29-2021: FOOTNOTE NUMBER 7 WAS ADDED. SIDE WIDTH AND FOOTNOTE NUMBER 7 WERE ADDED ON TYPE C DRIVEWAY AND ON SECTION D-D.

APPROVED BY FHWA
 (ALL OTHERS APPROVED BY TDOT)

STATE OF TENNESSEE
 STANDARD DRAWING
 DEPARTMENT OF TRANSPORTATION

DETAILS OF LOWERED STANDARD CONCRETE DRIVEWAYS

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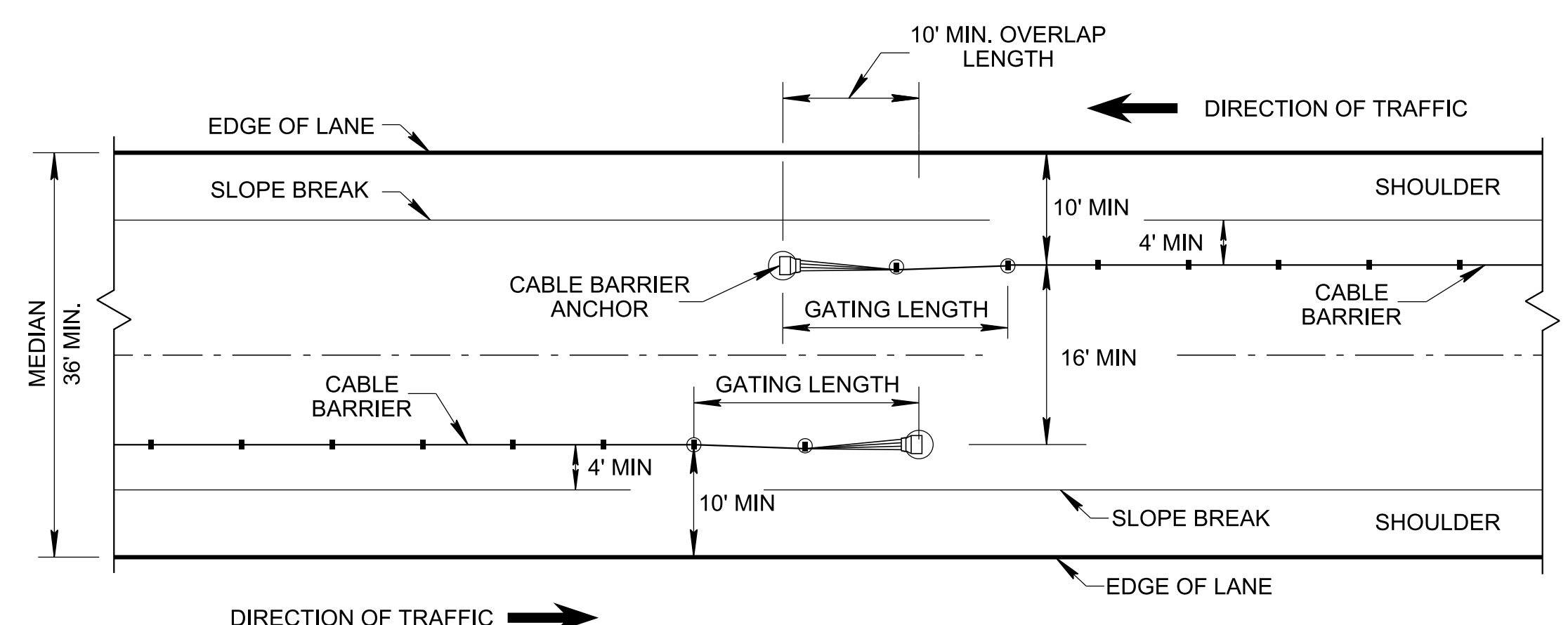


DETAIL A
OVERLAP AT APPROACH ENDS OF CABLE BARRIER

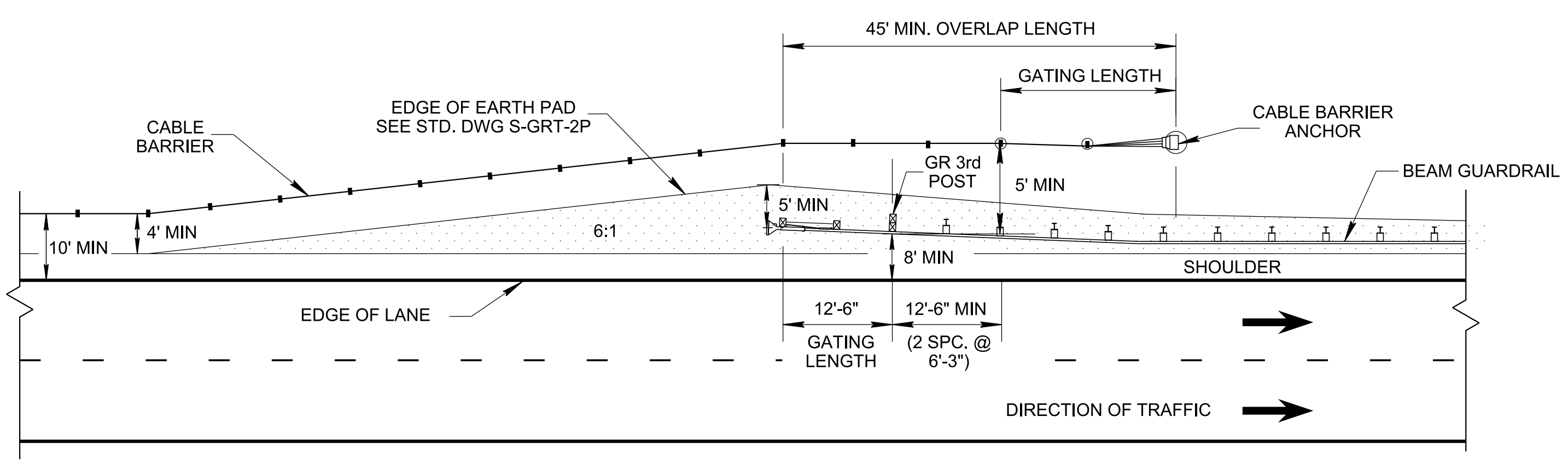
NOTE: TABLE ABOVE REFERS S-CB-2 GATING LENGTH OF 20 FEET. FOR OTHER CABLE BARRIER PRODUCTS REFER TO MANUFACTURER SPECIFICATIONS AND SHOP DRAWINGS.

TABLE	
DISTANCE (D) (FT)	APPROACH ENDS OVERLAP LENGTH (X) (LF)
16	75
20	83
24	91
28	100
32	109

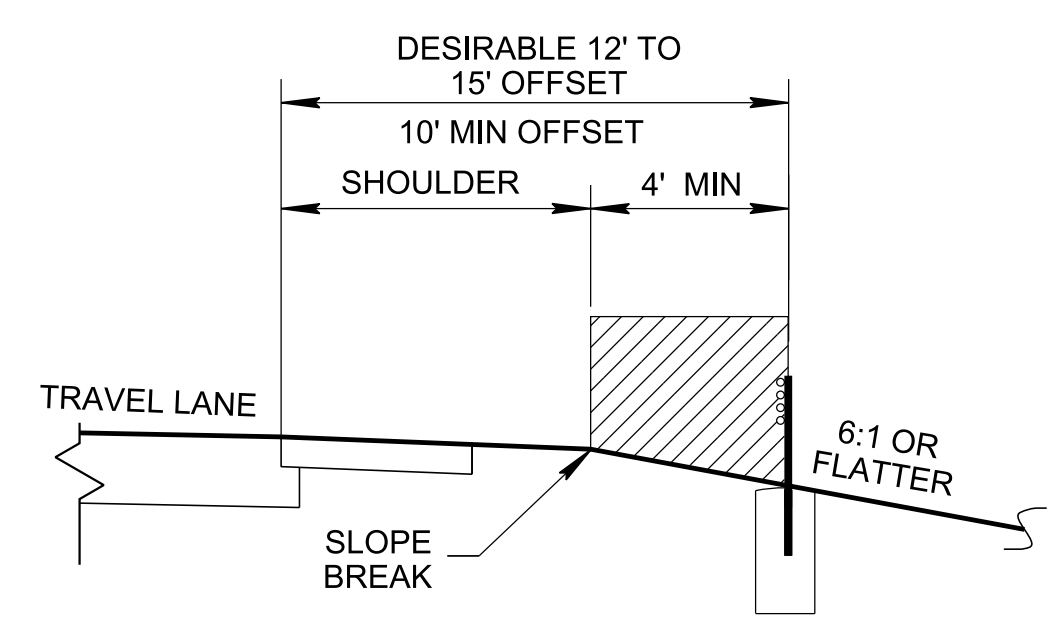
$$X (FT) = 2(GATING LENGTH) + \frac{D}{\tan 25^\circ}$$



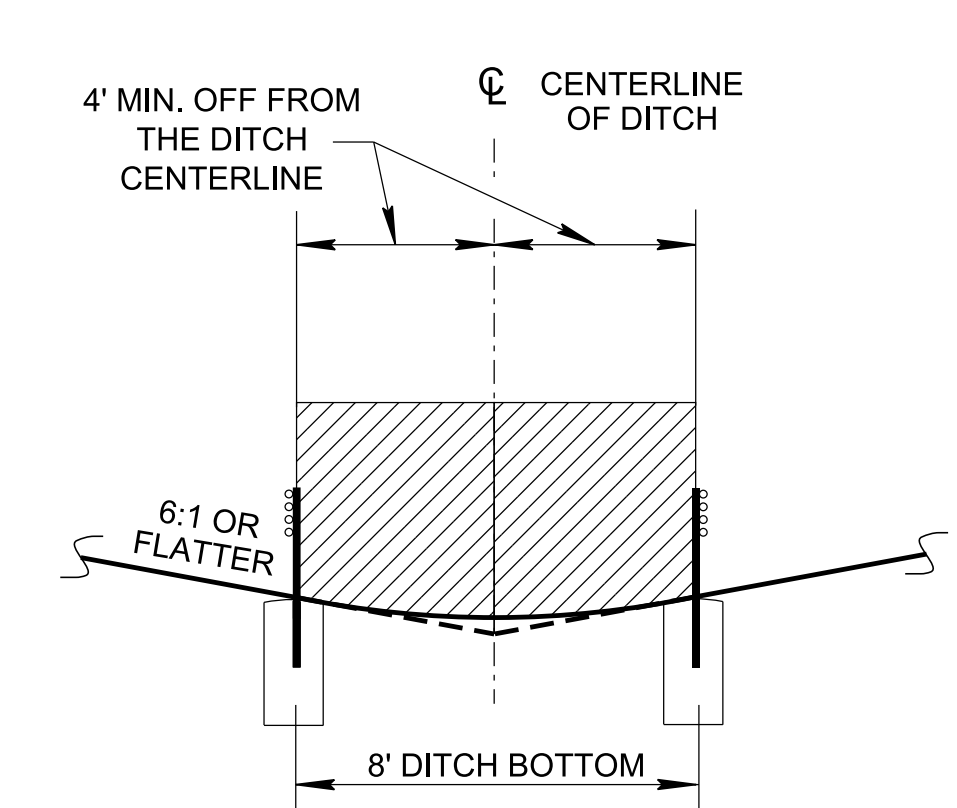
DETAIL B
OVERLAP AT TRAILING ENDS OF CABLE BARRIER
 (USE A MINIMUM OF 10 FEET OVERLAP LENGTH AT TRAILING ENDS OF CABLE BARRIER INSTALLATION.)



DETAIL C
CABLE BARRIER TERMINATION INSTALL BEHIND BEAM GUARDRAIL

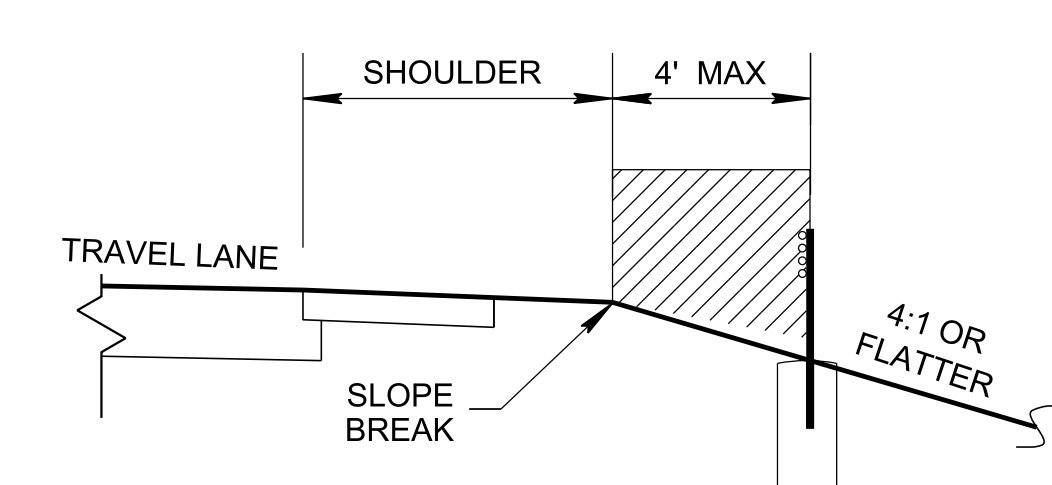


CABLE BARRIER PLACEMENT NEAR SLOPE BREAK

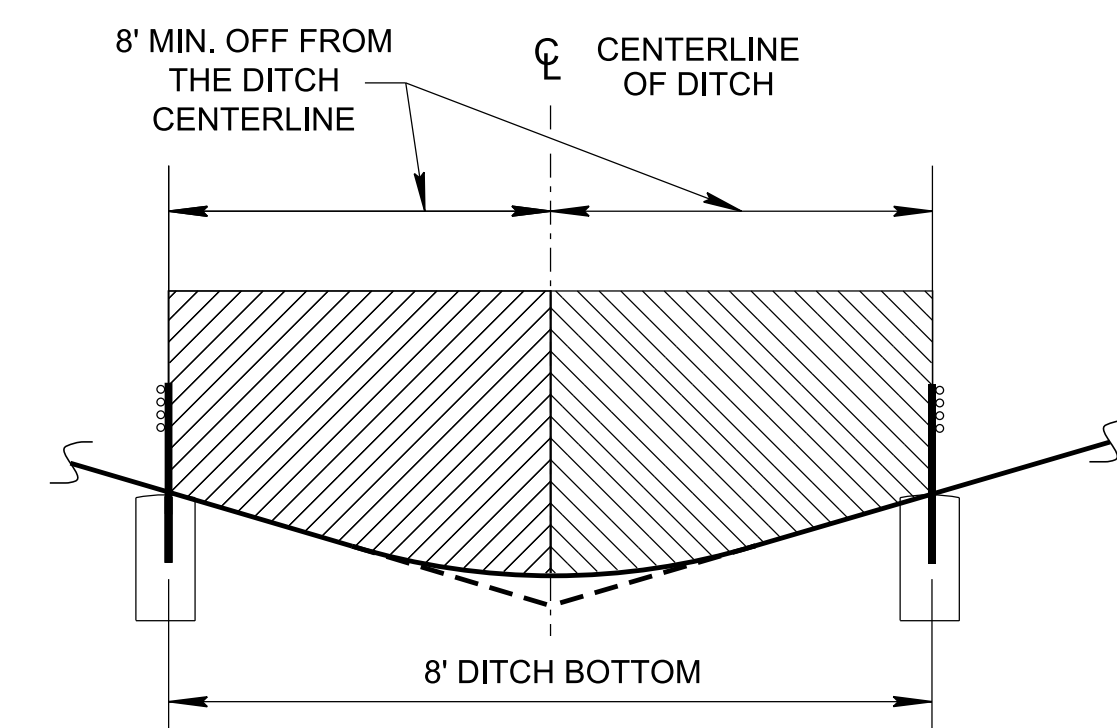


CABLE BARRIER PLACEMENT NEAR DITCH BOTTOM
 (PREFERRED PLACEMENT LOCATION)

FOR FILL SLOPES 6:1 OR FLATTER



CABLE BARRIER PLACEMENT NEAR SLOPE BREAK



CABLE BARRIER PLACEMENT NEAR DITCH BOTTOM
 (PREFERRED PLACEMENT LOCATION)

FOR FILL SLOPES 4:1 MAX

TYPICAL PLACEMENT LOCATIONS FOR CABLE MEDIAN BARRIER
 (MINIMUM WIDTH SHOWN (B))

LEGEND CABLE BARRIER INSTALLATION
 NOT PERMITTED

GENERAL NOTES

- (A) CABLE BARRIERS SHOULD BE CONSIDERED ALONG ROADWAYS WITH DEPRESSED MEDIANS THAT HAVE LOCATIONS THAT: EXPERIENCE HIGHER ROADWAY DEPARTURE RATES, HAVE HIGH ADTS WITH A HISTORY OF MEDIAN CROSSOVERS, AND WHERE A TRAFFIC ENGINEER'S ANALYSIS JUSTIFIES CABLE BARRIERS.
- (B) CABLE BARRIER SHOULD BE USED ON DEPRESSED MEDIANS WIDER THAN 36 FEET.
- (C) CABLE BARRIER ANCHORS MAY VARY IN LENGTH AND DO NOT PROVIDE ANY REDIRECTIVE CAPACITY.
- (D) CABLE BARRIERS SHOULD NOT BE INSTALLED ON FILL SLOPES STEEPER THAN 4:1.
- (E) MAXIMUM RUN LENGTH IS 5000 FT.
- (F) CABLE BARRIERS SHOULD BE INSTALLED PER STANDARD DRAWINGS S-CB-2 THRU S-CB-5, PER MANUFACTURER'S SPECIFICATION OR PER SYSTEMS ON THE QUALIFIED PRODUCTS LIST ONLY.
- (G) CABLE BARRIER SHOULD NOT BE USED TO SHIELD FIXED OBJECTS. CABLE BARRIER RUNS SHALL BE TERMINATED AND GUARDRAIL OR RIGID BARRIER SHALL BE INSTALLED TO SHIELD FIXED OBJECTS.
- (H) CABLE BARRIER SHOULD ONLY BE USED AT LOCATION WHERE THERE IS A MINIMUM OF 10 FEET SPACE IS AVAILABLE BEHIND THE BARRIER TO ALLOW FOR DEFLECTION.
- (I) CABLE BARRIER MAY BE PLACED ON THE INSIDE CURVE WHERE POSSIBLE.
- (J) REFER TO STANDARD DRAWING T-M-18 FOR CABLE BARRIER DELINEATOR. DELINEATOR COST TO BE INCLUDED IN THE COST OF CABLE BARRIER.
- (K) MASH TEST LEVEL TL-4 CABLE BARRIER SYSTEMS CAN BE INSTALLED IN THE MEDIAN DITCH, OR ON THE MEDIAN SIDE SLOPES THAT ARE 6:1 OR FLATTER.
- (L) PAY ITEMS FOR CABLE BARRIER WILL BE UNDER THE FOLLOWING ITEM NUMBERS:

705-06.40	CABLE BARRIER (MASH TL-3)	L.F.
705-06.41	CABLE BARRIER ANCHOR (MASH TL-3)	EACH
705-06.50	CABLE BARRIER (MASH TL-4)	L.F.
705-06.51	CABLE BARRIER ANCHOR (MASH TL-4)	EACH

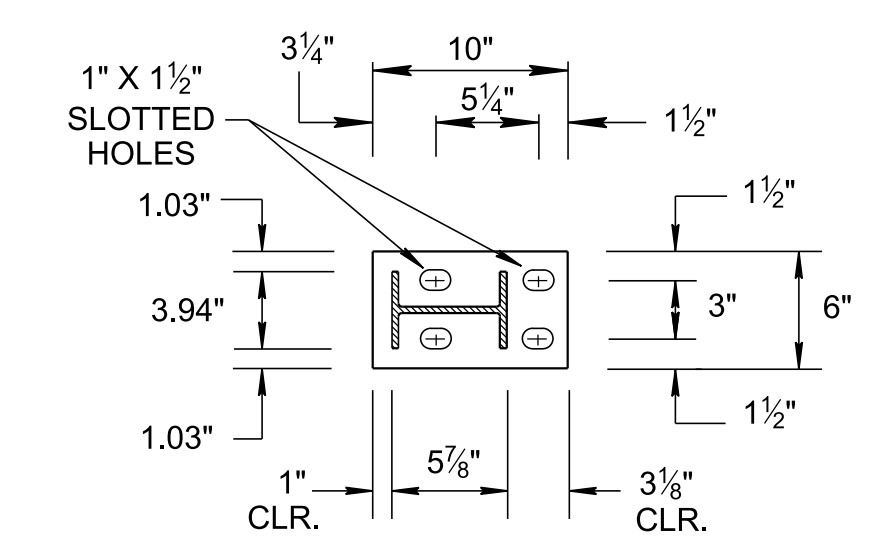
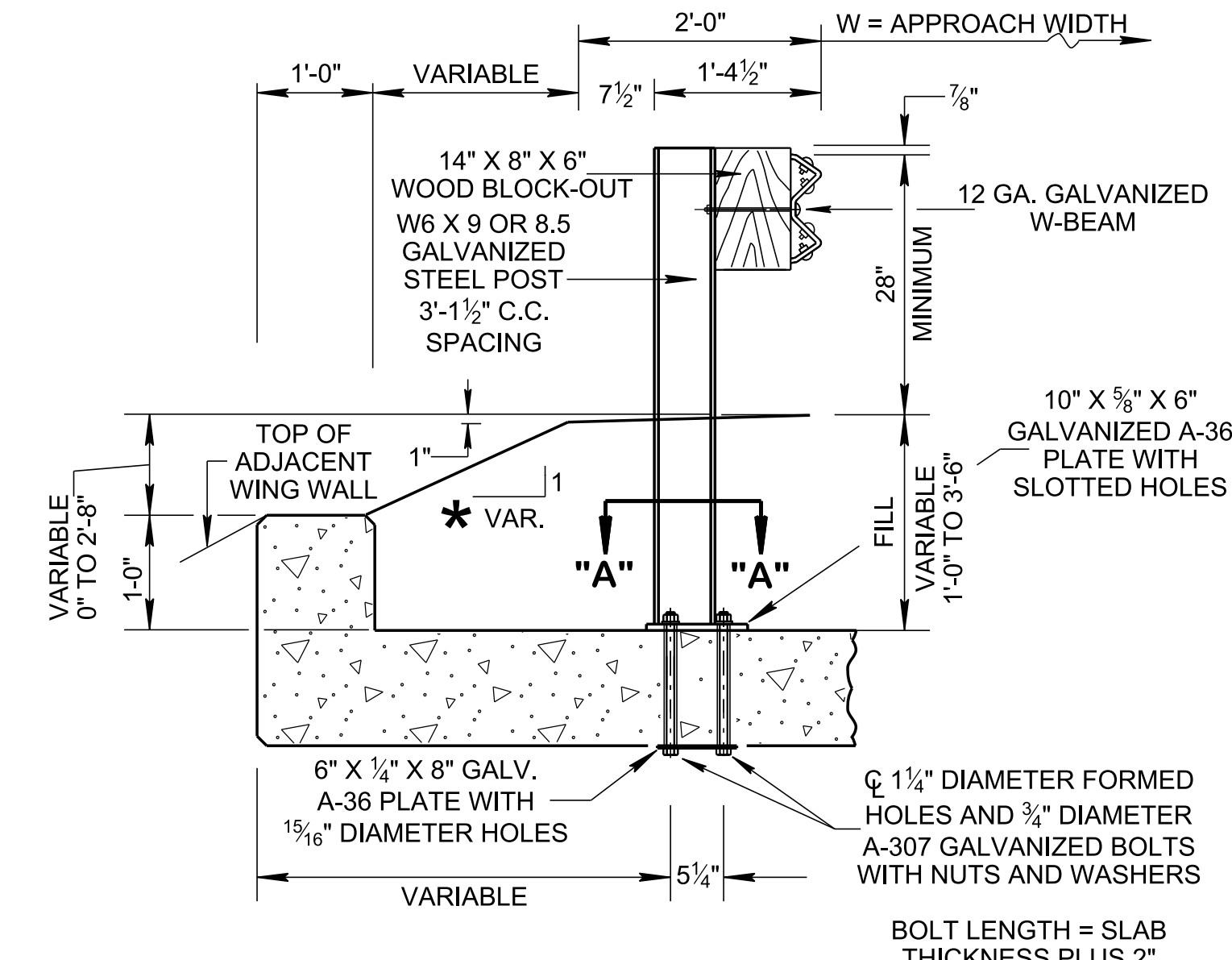
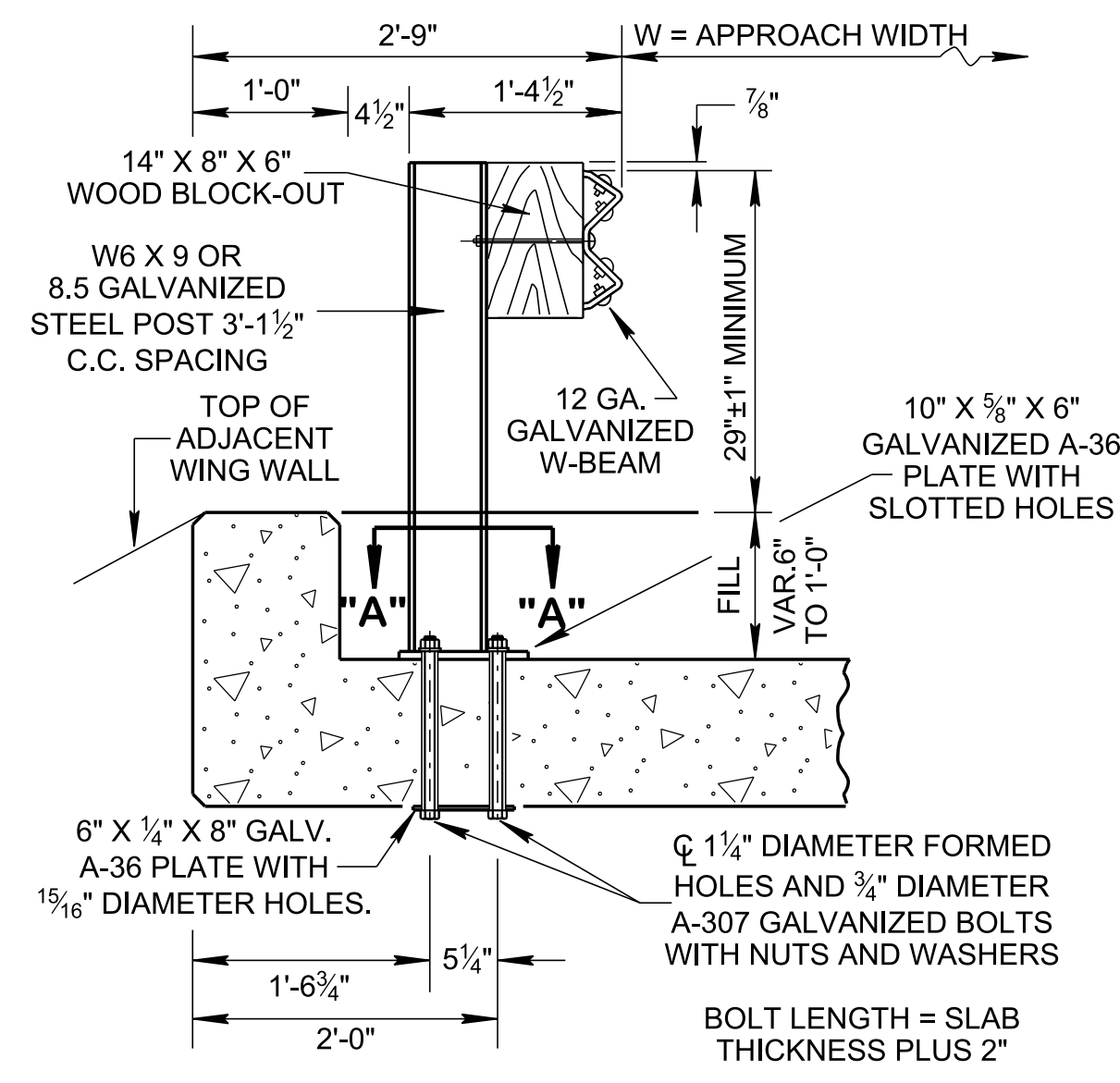
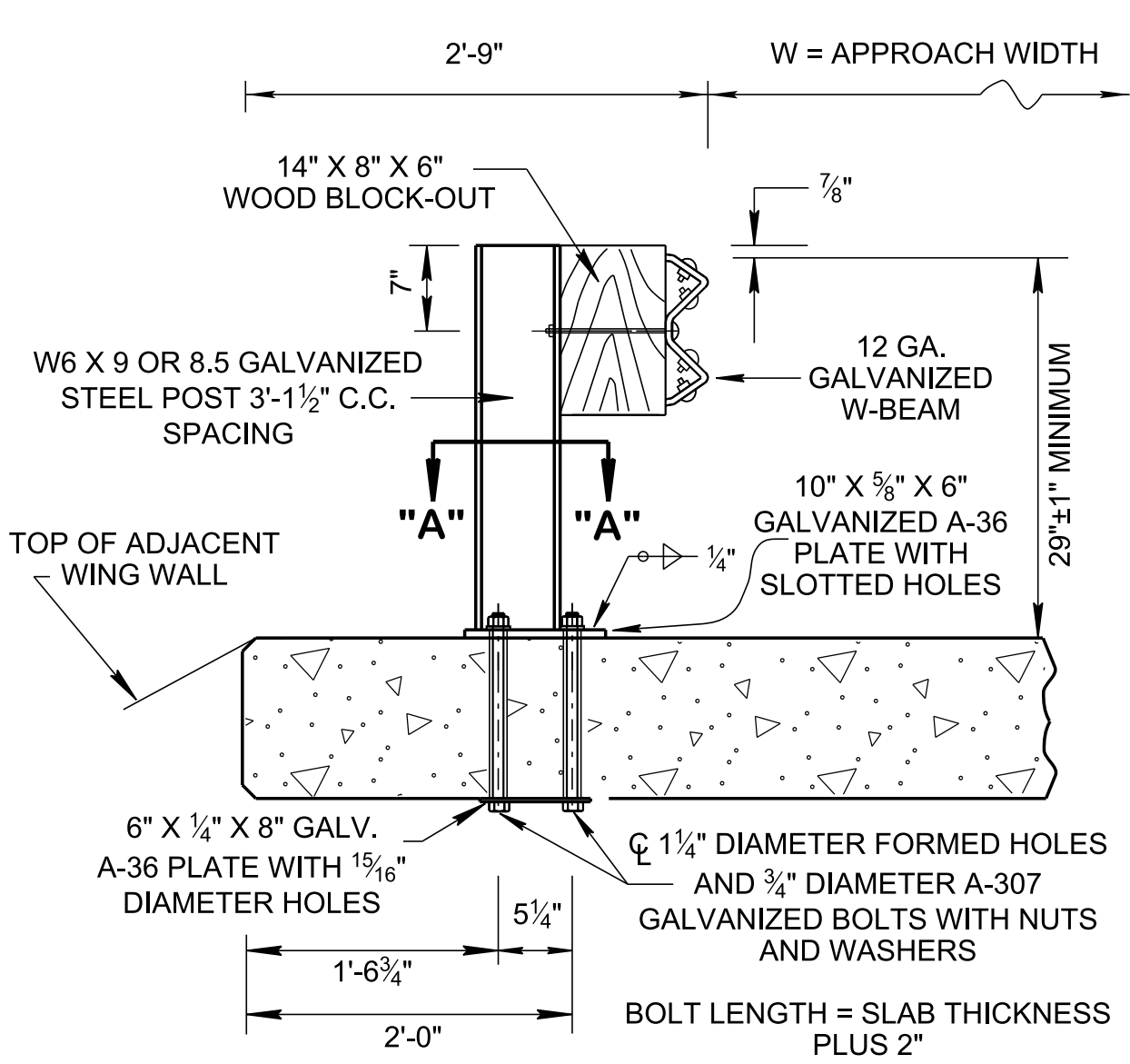
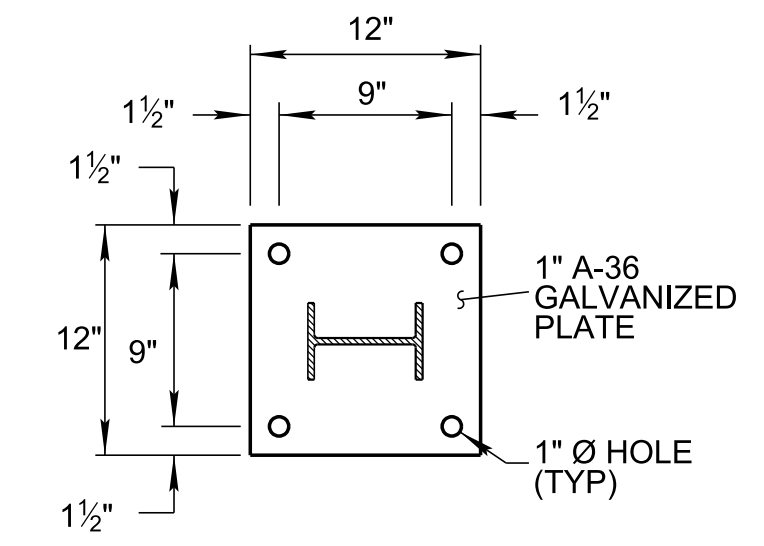
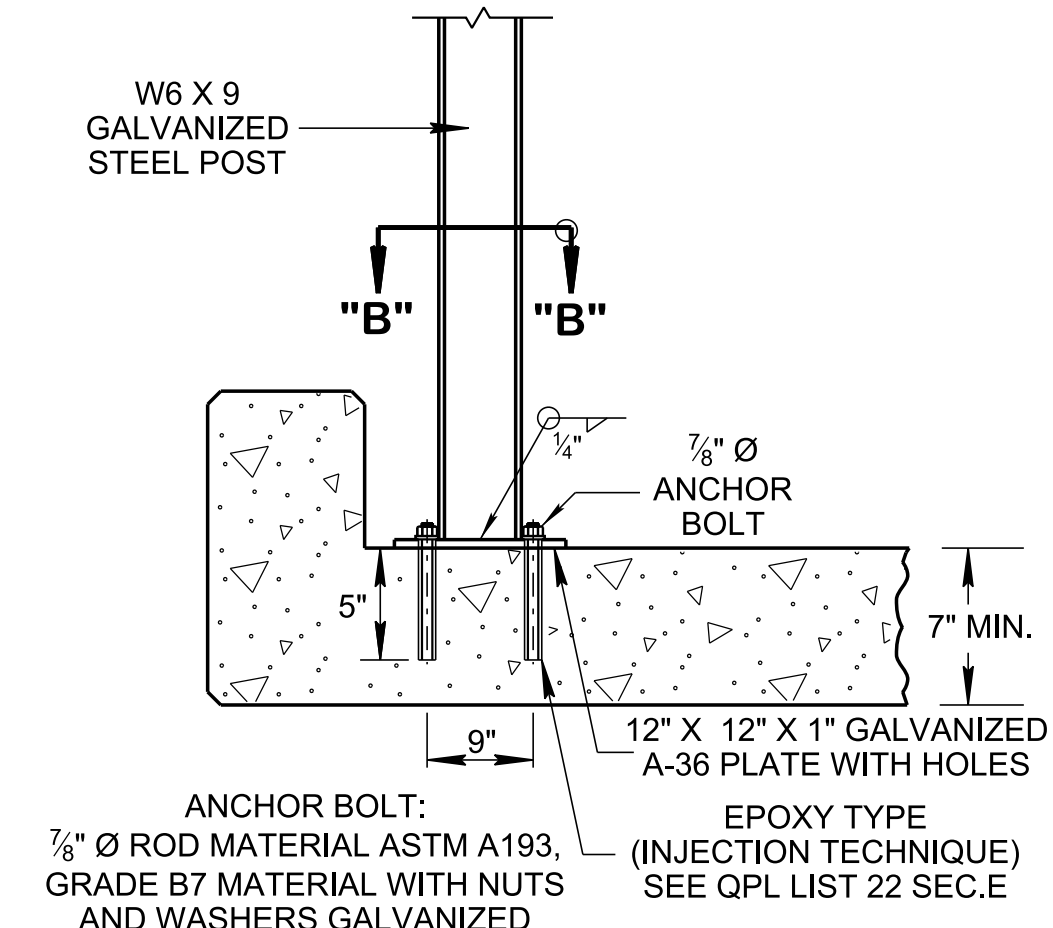
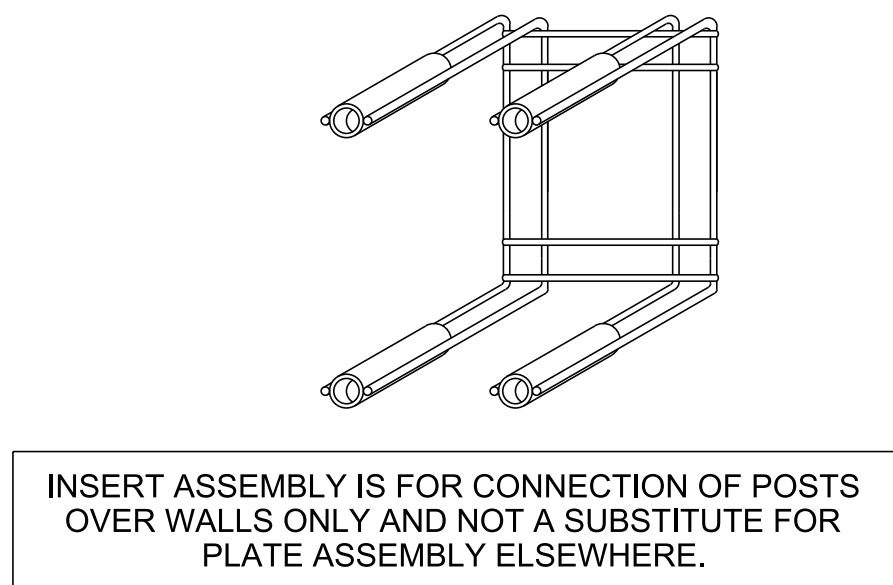
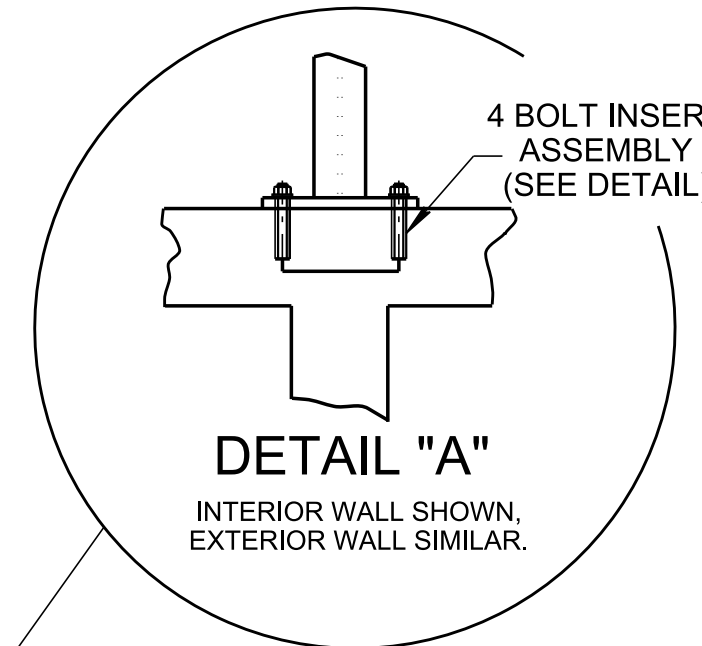
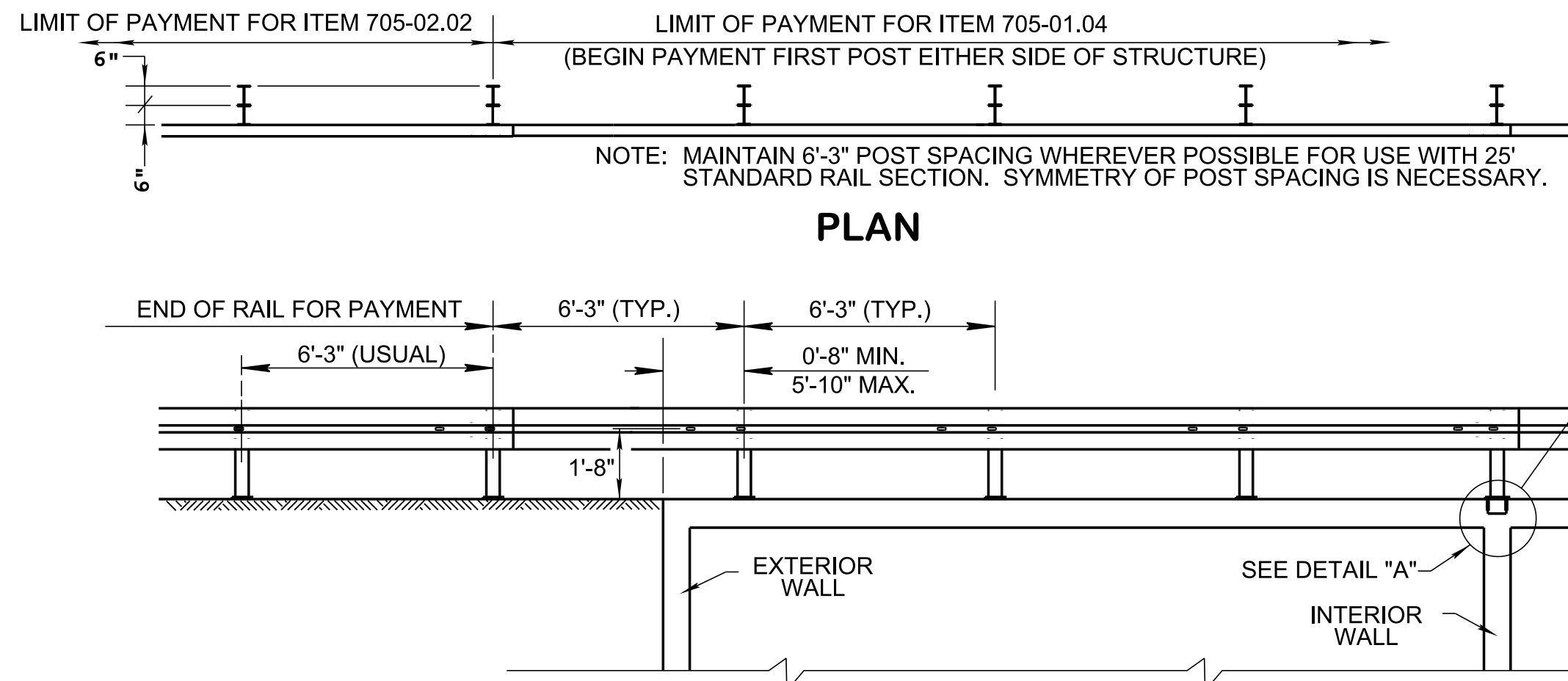
REV. 06-28-19: ADDED ITEM NO 'S 705-06.40, 705-06.41, AND 705-80.03. REMOVED TABLE. REDREW SHEET.

REV. 10-29-21: THE PLAN VIEW AND DETAILS B-1 AND B-2 WERE REMOVED. DETAIL A WAS REDRAWN AND DETAILS B AND C WERE ADDED. THE "TYPICAL PLACEMENT LOCATIONS FOR CABLE MEDIAN BARRIER" WAS REMOVED AND REPLACED WITH FOUR DETAILS. THE TABLE AND ASSOCIATED EQUATION AND NOTE WERE ADDED. ALL GENERAL NOTES WERE REVISED. ITEM NUMBERS 705-80.01 AND 705-80.03 WERE REMOVED. ITEM NUMBERS 705-06.50 AND 705-06.51 WERE ADDED.

STATE OF TENNESSEE
 STANDARD DRAWING
 DEPARTMENT OF TRANSPORTATION

CABLE BARRIER PLACEMENT

THIS DRAWING IS TO BE USED FOR RESURFACING, MAINTENANCE, AND BRIDGE REPAIR PROJECTS ONLY, THIS DRAWING IS NOT INTENDED TO BE USED FOR NEW CONSTRUCTION OR RECONSTRUCTION PROJECTS.



DETAIL FOR CONCRETE DECK USED AS A RIDING SURFACE SHOWING OUTLET END

DETAIL FOR CONCRETE DECK WITH 6" TO 1'-0" OF ROADWAY FILL COVER

DETAIL FOR CONCRETE DECK WITH 1'-0" TO 3'-6" OF ROADWAY FILL COVER
* DENOTES ADJOINING ROADWAY SIDE SLOPE

SECTION "A-A" BASEPLATE DETAIL

DESIGN NOTES

- ① WHEN DEPTH OF FILL AT THE FACE OF GUARDRAIL EXCEEDS 3'-6" DELETE THE USE OF BOLTED BASE PLATES AND DRIVE POSTS.
- ② THE USE OF PRECAST, PRESTRESSED CONCRETE DECK PANELS IN BOX AND SLAB TYPE CULVERTS IS PROHIBITED.
- ③ THIS RAIL SYSTEM HAS BEEN TESTED BY MIDWEST ROADSIDE SAFETY FACILITY IN ACCORDANCE WITH THE CRITERIA SET FORTH IN NCHRP REPORT NUMBER 350 TL-3, REFERENCE REPORT STR-3(017), NOVEMBER 1986.
- ④ ANY REINFORCING STEEL THAT INTERFERES WITH THE 1 1/4" DIAMETER FORMED HOLES SHALL BE MOVED HORIZONTALLY TO PROVIDE A 1" MINIMUM CLEARANCE TO THE HOLE.
- ⑤ GUARDRAIL POST ATTACHMENT USING BASE PLATE AND ANCHOR BOLTS HAS BEEN TESTED PER NCHRP 350-TL3 BY TEXAS TRANSPORTATION INSTITUTE. REPORT NUMBER 405160-12, JANUARY 29, 2009.
- ⑥ DURING REPAIR A NEW POST MAY BE ATTACHED TO THE DECK BY USING ANCHOR BOLTS. POST LOCATION CAN BE MOVED BUT NOT TO EXCEED 6'-3" TYPICAL SPAN AND NOT LESS THAN 3'-1 1/2". ALL SHOP DRILLED HOLES TO W-BEAM RAIL OR CUT POST SHALL RECEIVE GALVANIZED COATING.

GENERAL NOTES

- (A) THE EXACT POSITION OF GUARDRAIL SHALL BE AS SHOWN ELSEWHERE ON THE PLANS OR AS DIRECTED BY THE ENGINEER. GUARDRAIL SHALL BE TRANSITIONED TO A SMOOTH CONNECTION WITH OTHER GUARDRAIL OR STRUCTURE RAILING AS SHOWN ELSEWHERE ON PLANS.
- (B) AT THE OPTION OF THE CONTRACTOR THE RAIL ELEMENTS FOR THE GUARDRAIL MAY BE FURNISHED IN EITHER 12 1/2" OR 25 FOOT NOMINAL LENGTHS WITH POST BOLT SLOTS FOR CONNECTION TO POSTS.
- (C) BOLTS SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND NO MORE THAN 3/4" BEYOND IT.
- (D) GUARDRAIL THAT IS INSTALLED ON A CURVE WITH A RADIUS OF 150 FEET OR LESS SHALL BE SHOP BENT.
- (E) STEEL POST SHALL BE BLOCKED OUT. A 8" X 6" WOOD BLOCK-OUT SHALL BE USED WITH EACH STEEL POST. SEE STANDARD DRAWING S-GR28-2M FOR SPECIFICATIONS AND DETAILS.
- (F) WELDED STEEL POSTS SHALL MEET THE REQUIREMENTS OF ASTM A-769. THE FLANGE WIDTH AND THICKNESS, WEB THICKNESS, AND DEPTH OF WELDED POSTS SHALL EQUAL OR EXCEED THE DIMENSIONS OF A STANDARD ROLLED W6 X 8.5 OR W6 X 9.0 STEEL POST.
- (G) STEEL POSTS SHALL MEET THE REQUIREMENTS OF ASTM A-36. BOLT HOLES SHALL BE APPROXIMATELY CENTERED BETWEEN WEB AND EDGE OF FLANGE OF SPACERS AND POSTS.

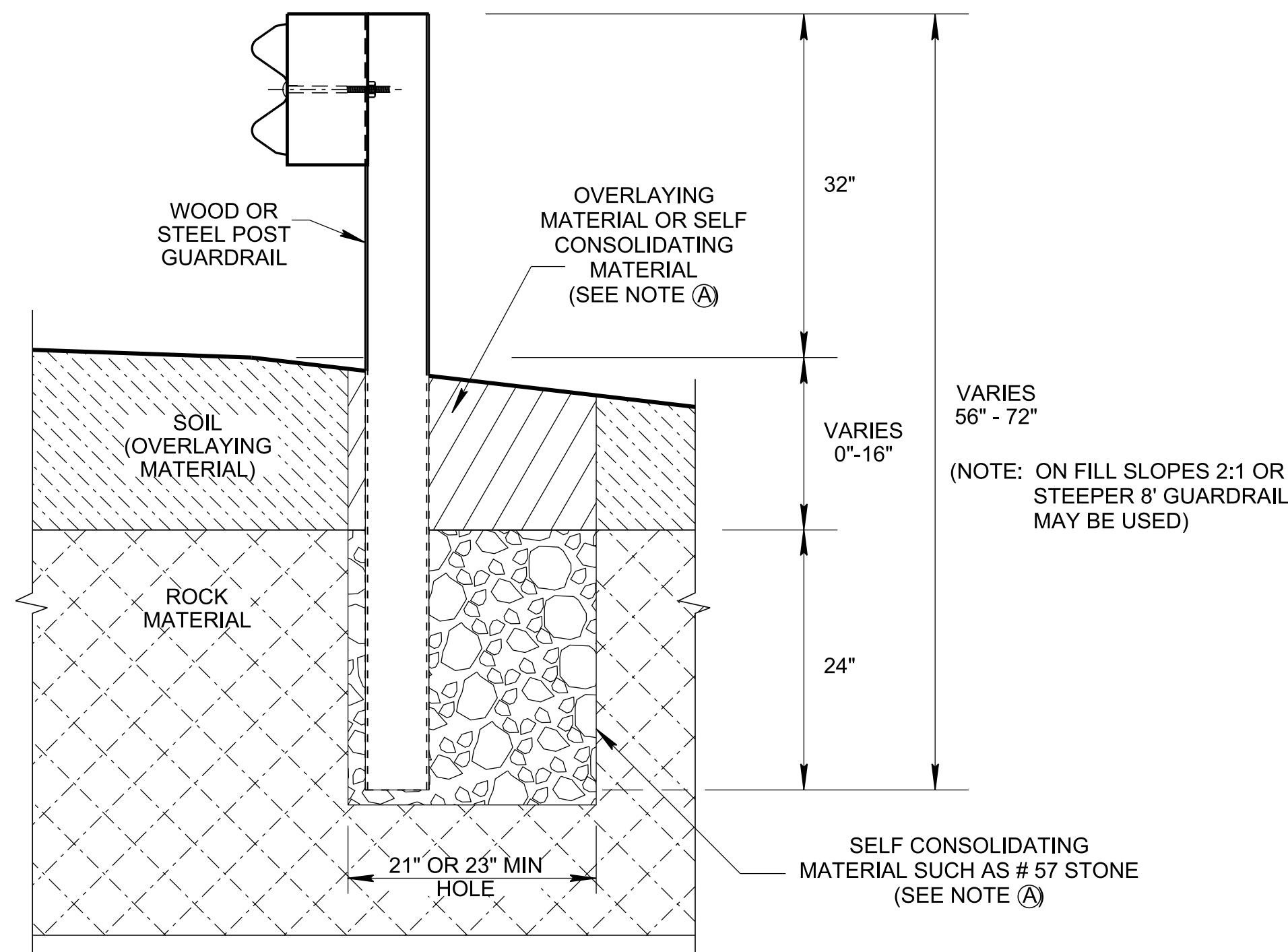
MINOR REVISION -- FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

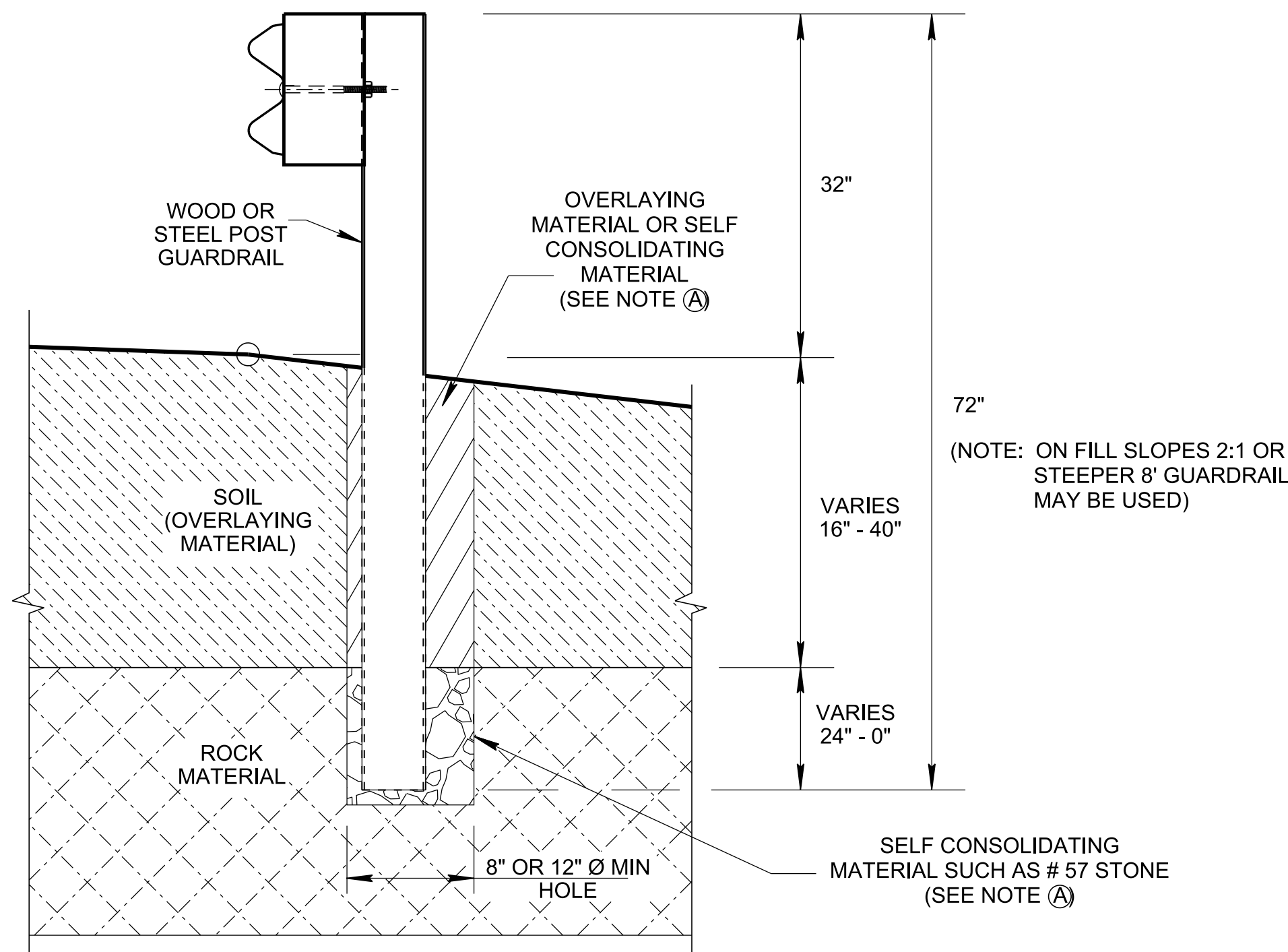
GUARDRAIL ATTACHMENT TO CONCRETE DECKS

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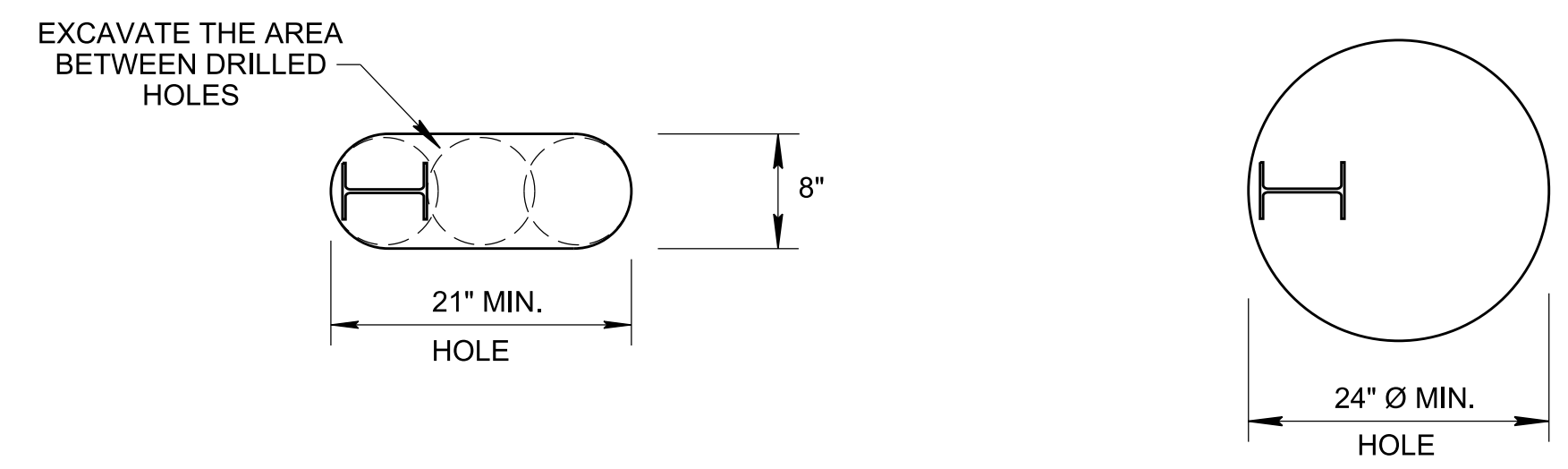
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ELEVATION
GUARDRAIL POST IN ROCK
INSTALLATION DETAIL
 (WHEN SOIL DEPTH IS 16" OR LESS)

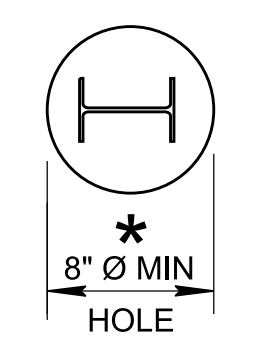


ELEVATION
GUARDRAIL POST IN ROCK
INSTALLATION DETAIL
 (WHEN SOIL DEPTH IS GREATER THAN 16")

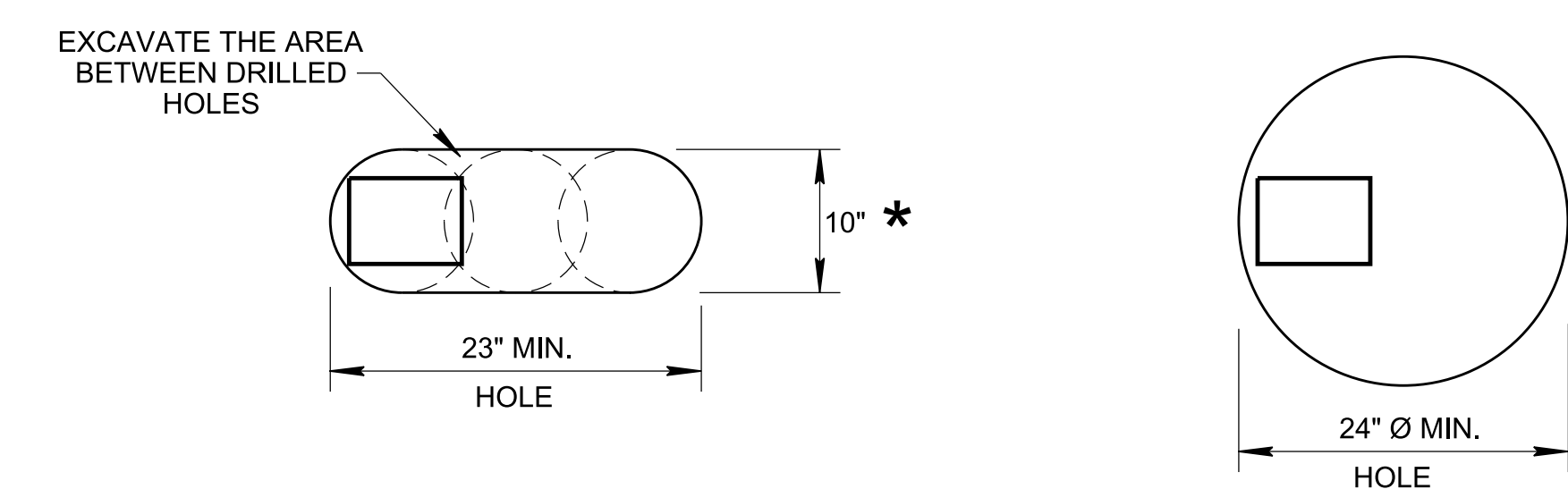


PLAN VIEW
FOR STEEL POST

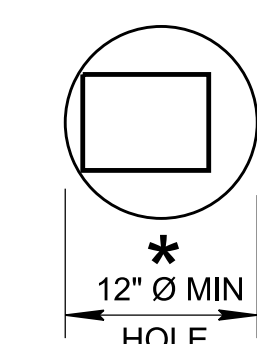
* THIS WIDTH MAY BE INCREASED TO 15 IN. TO ACCOMMODATE CONSTRUCTION TOLERANCES.



PLAN VIEW
FOR STEEL POST



PLAN VIEW
FOR WOOD POST



PLAN VIEW
FOR WOOD POST

GENERAL NOTES	
(A)	MINERAL AGGREGATE BACKFILL SHALL MEET REQUIREMENTS OF SUBSECTION 903.05 OF THE CURRENT TDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
(B)	USE THIS STANDARD DRAWING WHEN POSTS CANNOT BE EMBEDDED TO THE MINIMUM DEPTH SHOWN ON STANDARD DRAWING S-GR31-1C.
(C)	UNLESS OTHERWISE SPECIFIED USE EITHER THE CIRCULAR OR THE OBLONG HOLE CONFIGURATION WHEN THE SOIL DEPTH IS 16 INCHES OR LESS.
(D)	ANY EXCESS POST LENGTH, AFTER MEETING THESE DEPTHS, MAY BE FIELD CUT TO ENSURE PROPER GUARDRAIL MOUNTING HEIGHT AND TREAT FIELD CUT GALVANIZED STEEL POST SURFACES THAT EXPOSE THE BASE METAL WITH TWO COATS OF ZINC-OXIDE PAINT.
(E)	PLACEMENT OF GUARDRAIL POSTS IN ROCK HAS BEEN EVALUATED BY THE MIDWEST ROADSIDE SAFETY FACILITY AND MEET MASH TL-3 STANDARDS, AND THE EVALUATION HAS BEEN DOCUMENTED IN THE MIDWEST ROADSIDE MIDWEST STATES POOLED FUND RESEARCH REPORT NO. TRP-03-119-03.
(F)	SEE STANDARD DRAWINGS S-PL-6 FOR GUARDRAIL PLACEMENT AND S-GR31-1 SERIES FOR GUARDRAIL DETAILS.
(G)	THE COST OF ROCK DRILLING AND MINERAL AGGREGATE BACKFILL WILL BE INCLUDED UNDER ITEM NUMBER:
705-01.14	ROCK DRILLING GUARDRAIL POST PER EACH

STATE OF TENNESSEE
 STANDARD DRAWING
 DEPARTMENT OF TRANSPORTATION

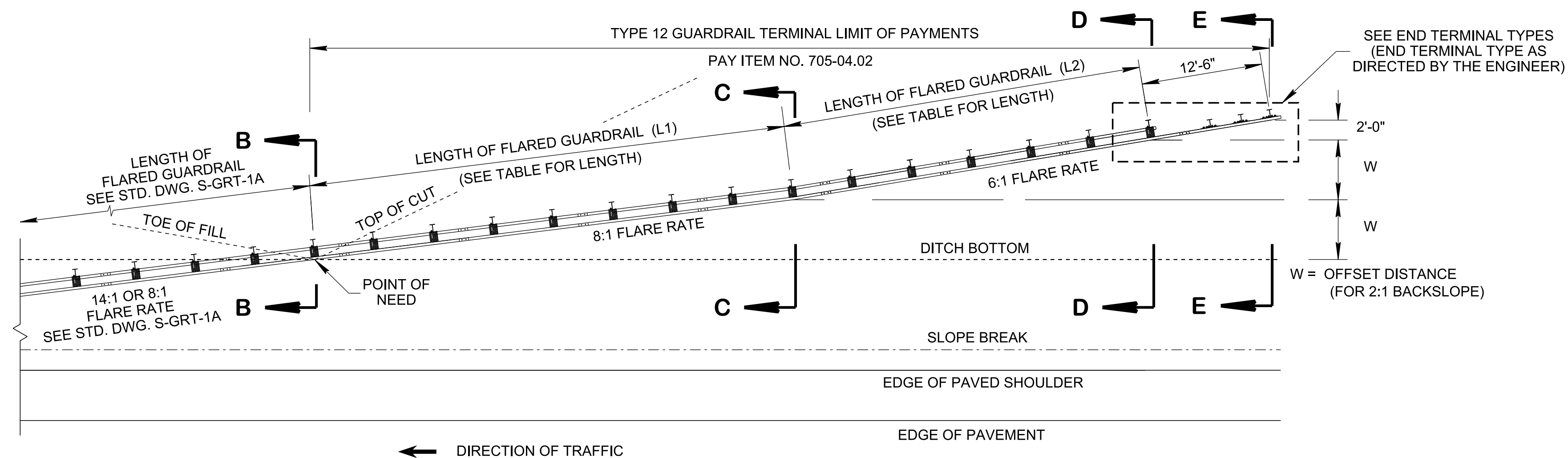
GUARDRAIL POST
PLACEMENT
IN ROCK

NOT TO SCALE

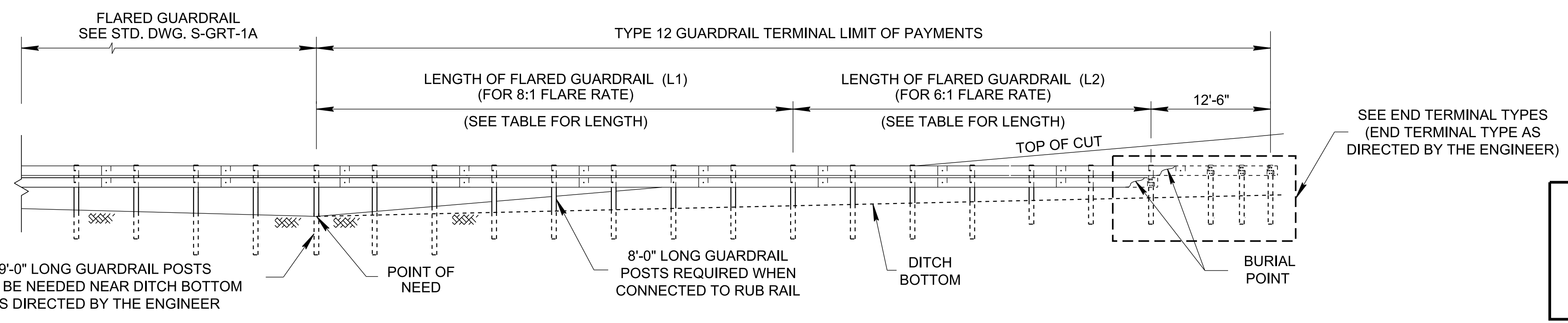
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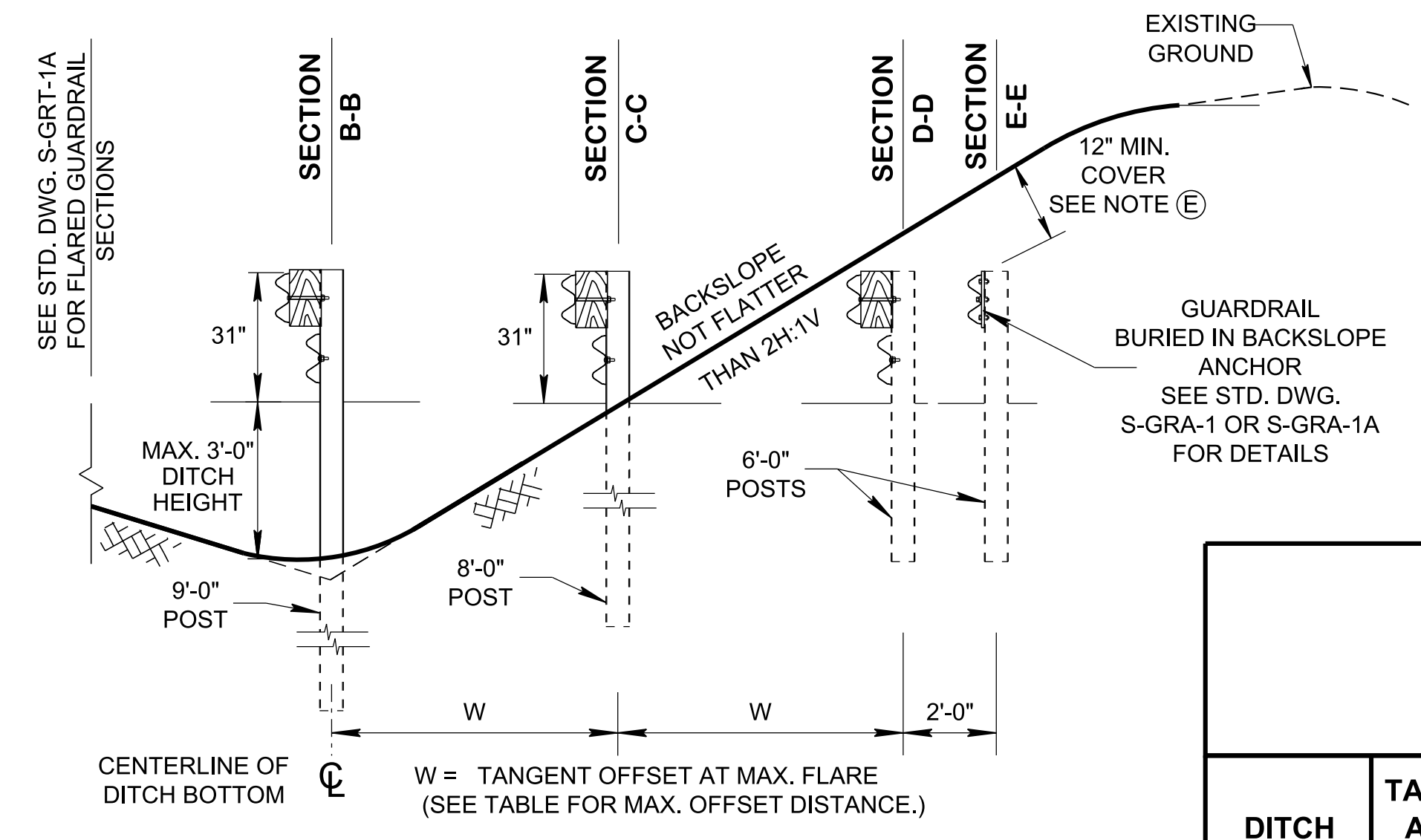


PLAN VIEW

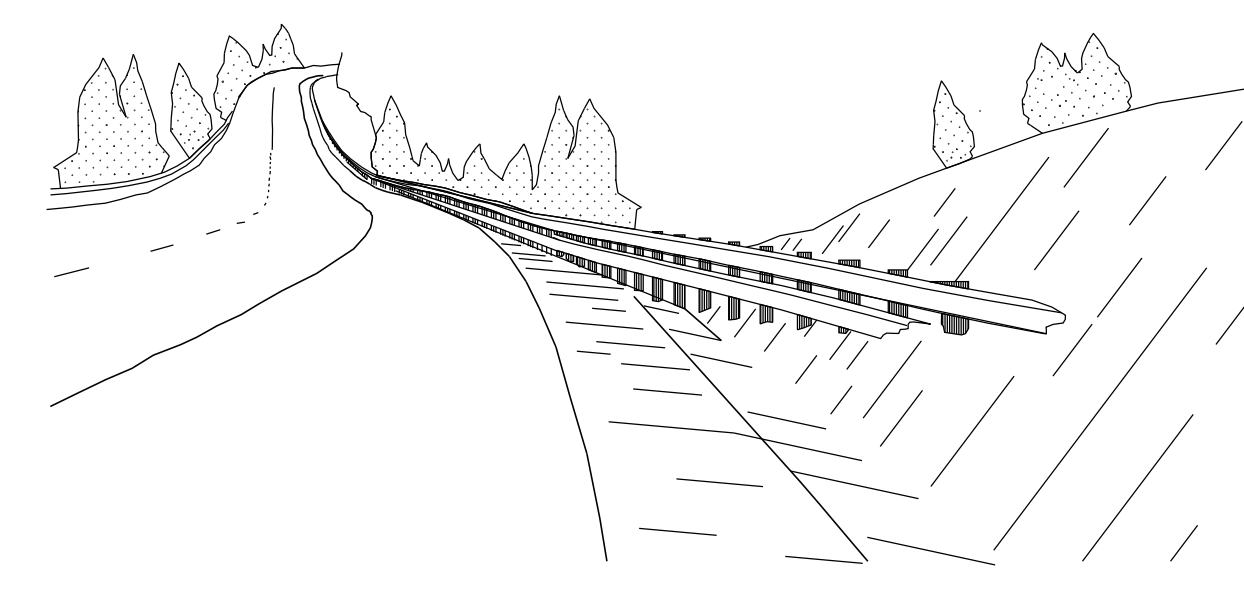


ELEVATION VIEW

MINIMUM INSTALLATION LENGTH OF TYPE 12 GUARDRAIL TERMINAL BURIED-IN-BACK SLOPE



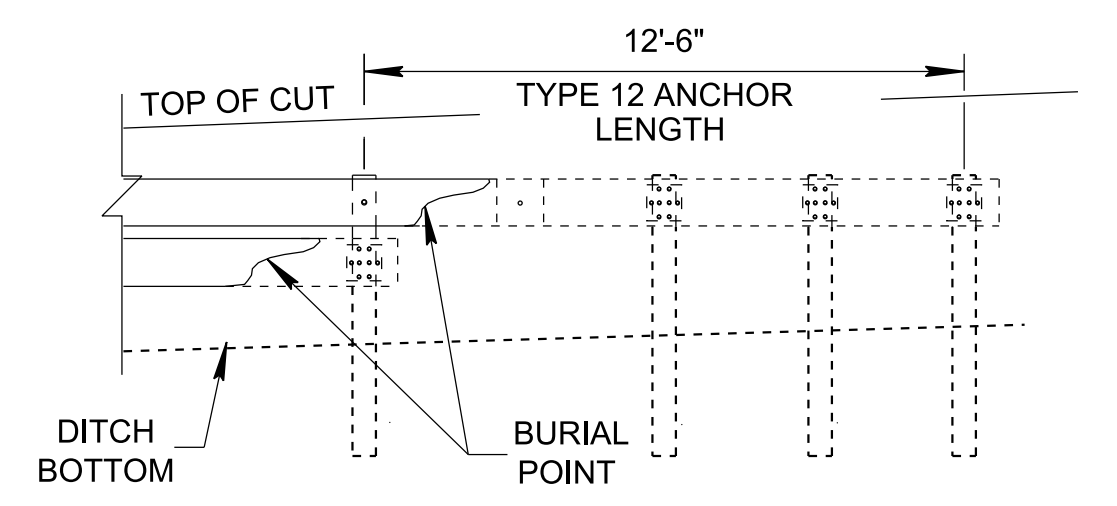
SECTION VIEWS FOR BACKSLOPE



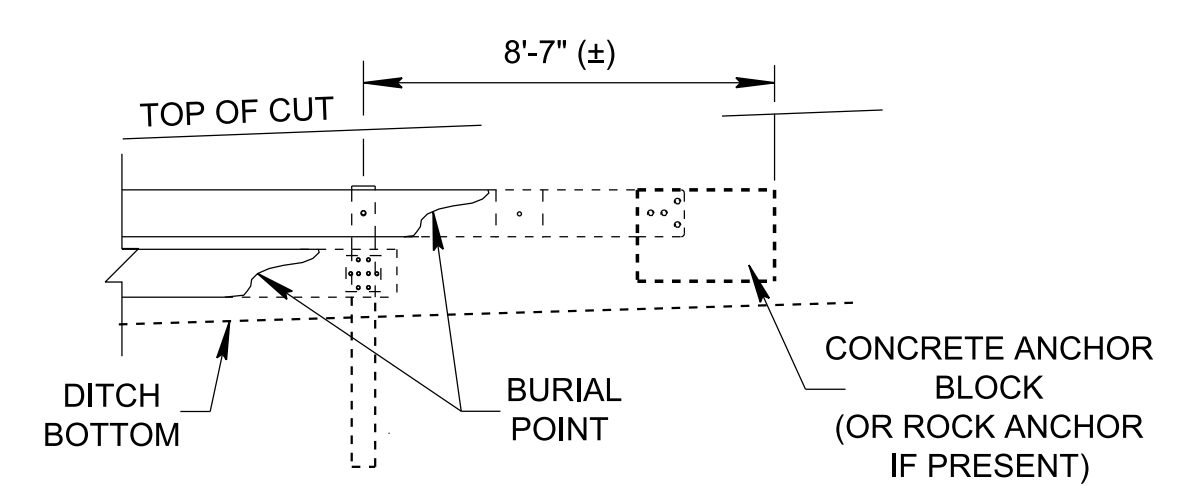
PERSPECTIVE VIEW

TABLE LENGTH OF TYPE 12 GUARDRAIL TERMINAL BURIED-IN-BACKSLOPE					
DITCH HEIGHT	TANGENT OFFSET AT MAX. FLARE (W) (FOR 2:1 BACKSLOPE)	LENGTH OF FLARED GR		TYPE 12 * ANCHOR LENGTH	TOTAL LENGTH OF TYPE 12 TERMINAL
		8:1 FLARE RATE	6:1 FLARE RATE		
3'-0"	6'-0"	50'-0"	37'-6"	12'-6"	100'-0"
2'-0"	4'-0"	37'-6"	25'-0"	12'-6"	75'-0"
1'-0"	2'-0"	25'-0"	12'-6"	12'-6"	50'-0"

* TABLE ABOVE REFERS TYPE 12 ANCHOR LENGTH (STANDARD DRAWING S-GRA-1A). FOR CONCRETE ANCHOR BLOCK (TYPE 12 GUARDRAIL ANCHOR) REFER TO STANDARD DRAWING S-GRA-1.



GUARDRAIL ANCHOR FOR TYPE 12 TERMINAL
(SEE STD. DWG. S-GRA-1A FOR DETAILS)



TYPE 12 GUARDRAIL ANCHOR (ALTERNATIVE ANCHOR)
(SEE STD. DWG. S-GRA-1 FOR DETAILS)

END TERMINAL TYPES
(END TERMINAL TYPE AS DIRECTED BY THE ENGINEER)

NOTE TO DESIGNER

THIS STANDARD DRAWING SHOWS TYPE 12 GUARDRAIL TERMINAL BURIED-IN-BACKSLOPE INSTALLATION IN BACKSLOPE. USE THIS DRAWING WITH REFERENCING STANDARD DRAWINGS S-GRT-1A AND S-GRT-1B

GENERAL NOTES

(A) THE NON-TRAVERSABLE (TL-2) TYPE 12 GUARDRAIL TERMINAL SHOULD BE USED ONLY WITH 2:1 OR STEEPER BACKSLOPE. IF BACKSLOPE IS FLATTER, THE FULL DESIGN LENGTH OF NEED OF THE BARRIER MUST BE PROVIDED.

(B) THE TYPE 12 GUARDRAIL BURIED IN BACKSLOPE TERMINAL HAS BEEN EVALUATED BY TEXAS A & M TRANSPORTATION INSTITUTE AND MEET MASH TL-3 STANDARDS, AND THE EVALUATION HAS BEEN DOCUMENTED IN THE ROADSIDE SAFETY RESEARCH PROGRAM POOLED FUND TEST REPORT NO. 608431-01-1 & 2.

(C) THE FILL SLOPE MUST NOT BE ALLOWED TO SPILL UNDER THE RAIL THROUGHOUT THE LENGTH OF NEED BECAUSE THIS EFFECTIVELY DECREASES THE RAIL HEIGHT AND ALLOWS VEHICLE OVERRIDE RATHER THAN CONTAINMENT AND REDIRECTION.

(D) THE FLARE RATE OF THE GUARDRAIL IS STEEPENED TO 8:1 AFTER CROSSING THE BOTTOM OF DITCH.

(E) IF MINIMUM 12" COVER OVER THE END TERMINAL POST CANNOT BE ACHIEVED, THE ELEVATION OF GUARDRAIL MAY BE LOWERED AT A 10:1 SLOPE RATE AFTER CROSSING THE DITCH BOTTOM.

(F) THE CONTRACTOR SHALL CONSTRUCT FORESLOPES AS PART OF THE INITIAL GRADING OPERATIONS AS SHOWN ON THIS STANDARD DRAWING AFTER FIELD VERIFICATION OF HAZARD LOCATION AND ENGINEER'S APPROVAL.

(G) ONLY USE TYPE 38 OR TYPE 21 (WHERE APPROPRIATE) IF SUITABLE BACKSLOPE IS NOT AVAILABLE.

(H) ADD W-BEAM RUB RAIL WHENEVER THE CLEARANCE FROM THE BOTTOM OF THE W-BEAM TO THE GROUND LINE EXCEEDS 18 INCHES.

(I) FOR THE RUB RAIL SECTION USE 8 FEET LONG POST UNLESS OTHERWISE NOTED. AND 9 FEET LONG POST MAY BE NEEDED NEAR DITCH BOTTOM AS DIRECTED BY THE ENGINEER.

(J) THE DESIGNER SHALL INCORPORATE THE DETAILS SHOWN ON THIS DRAWING IN THE RIGHT-OF-WAY AND CONSTRUCTION PLANS AS WELL AS THE ROADWAY CROSS-SECTION SHEETS.

(K) SEE STANDARD DRAWINGS S-GRA-1 AND S-GRA-1A FOR BURIED-IN-BACKSLOPE END TERMINAL ANCHOR INSTALLATION, S-GR SERIES FOR ADDITIONAL GUARDRAIL DETAILS, RD11-S-11 FOR ROADSIDE SLOPE DEVELOPMENT AND RD11-S-11A FOR ROADSIDE DITCH DETAILS.

(L) PAYMENT FOR FURNISHING AND INSTALLING GUARDRAIL TERMINAL (TYPE 12) INCLUDING ALL COMPONENTS WILL BE MADE UNDER PAY ITEM NUMBER:

705-04.02, GUARDRAIL TERMINAL (TYPE 12) MASH TL-2 PER EACH

REV. 03-16-17: UPDATED REFERENCE TO STD. DWG. FROM "S-GRP-1" TO "S-PL-1". CORRECTED REF. TO STD. DWG. FROM "RD-S-11" TO "RD01-S-11" AND "RD-S-11A" TO "RD01-S-11A".

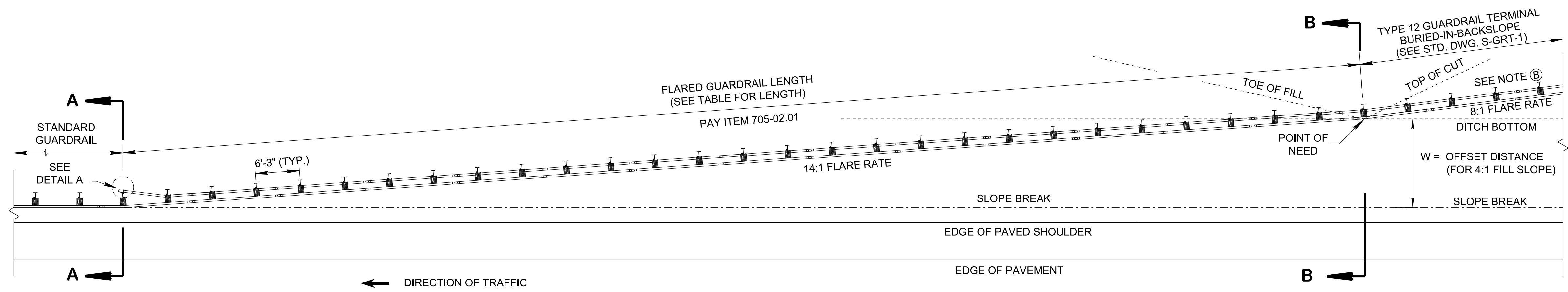
REV. 06-28-19: REVISED FLARE RATES, NOTE (C) AND RUB RAIL LIMITS. MOVED NOTE TO DESIGNER TO GENERAL NOTE NO. (L). REDREW SHEET.

REV. 10-29-2021: THE PLAN AND THE ELEVATION VIEWS WERE REDRAWN. THE PERSPECTIVE VIEW AND THE FLARE RATE TABLE WERE REMOVED. SECTIONS WERE MERGED AND REDRAWN. THE NEW TABLE AND THE END TERMINAL TYPES DETAIL WERE ADDED. ADDED NEW NOTE TO DESIGNER NOTE AND REMOVED FROM GENERAL NOTE. REARRANGED GENERAL NOTE NO'S AND ADDED GENERAL NOTE (L) REVISED GENERAL NOTES (I) AND (K)

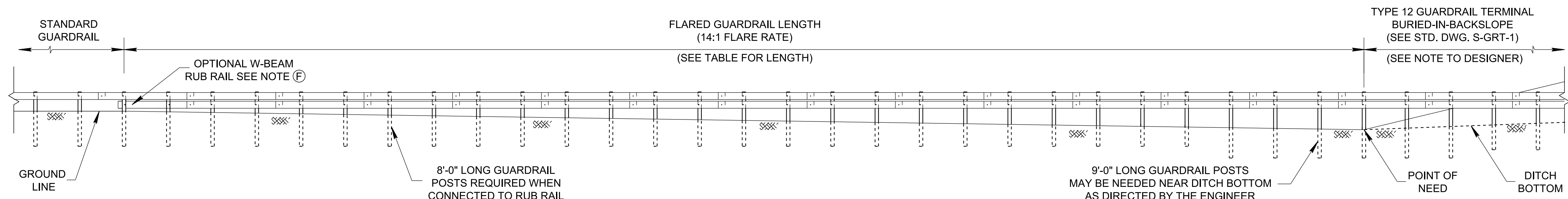
MINOR REVISION -- FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
 STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION
TYPE 12 GUARDRAIL TERMINAL BURIED-IN-BACKSLOPE

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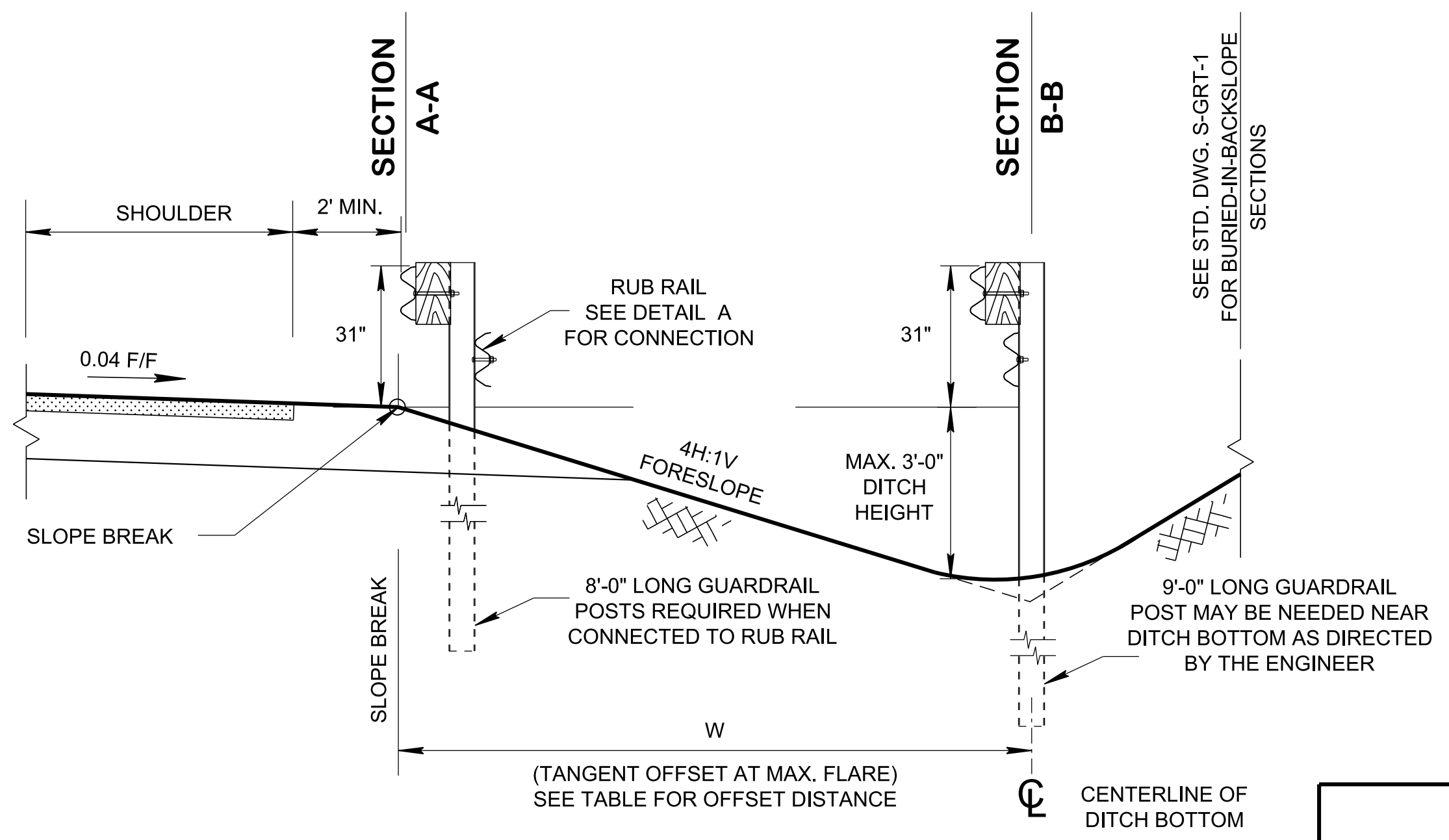


PLAN VIEW

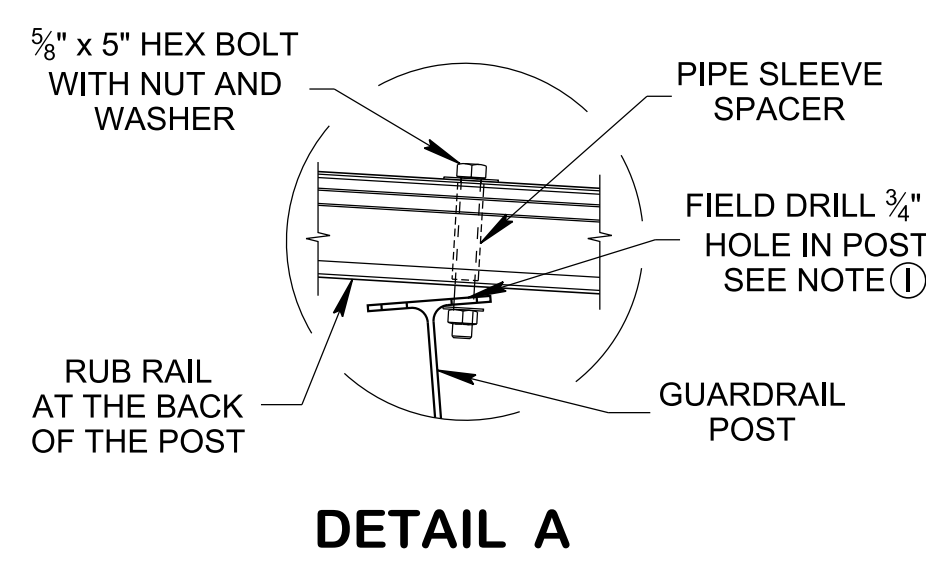


ELEVATION VIEW

FLARED GUARDRAIL INSTALLATION (NON-TRAVERSABLE MASH TL-3)



SECTION VIEWS FOR FILL SLOPE



DETAIL A

TABLE FLARED GUARDRAIL LENGTH (FT)		
DITCH HEIGHT	TANGENT OFFSET AT MAX. FLARE (W) (FOR 4:1 FORESLOPE)	LENGTH OF FLARED GUARDRAIL (14:1 FLARE RATE)
3'-0"	12'-0"	175'-0"
2'-0"	8'-0"	112'-6"
1'-0"	4'-0"	62'-6"

NOTE TO DESIGNER

THIS STANDARD DRAWING SHOWS FLARED GUARDRAIL INSTALLATION IN FILL SLOPE THAT APPROACHING TO THE DITCH BOTTOM. USE THIS DRAWING WITH REFERENCING STANDARD DRAWING S-GRT-1 TYPE 12 GUARDRAIL TERMINAL BURIED-IN-BACKSLOPE.

GENERAL NOTES

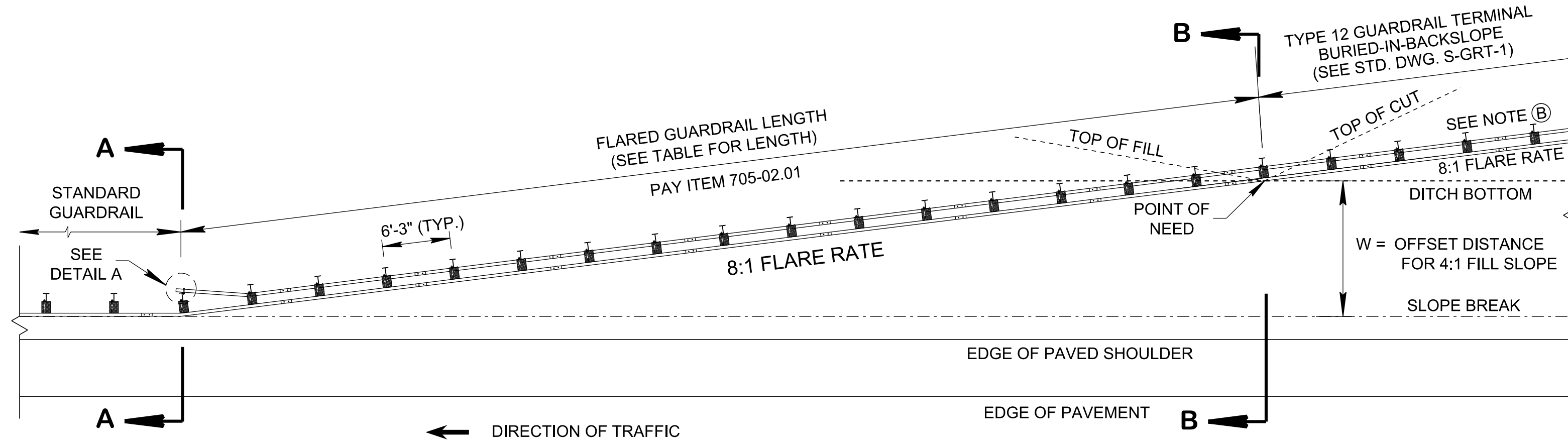
- (A) THE FILL SLOPE MUST NOT BE ALLOWED TO SPILL UNDER THE RAIL THROUGHOUT THE LENGTH OF NEED BECAUSE THIS EFFECTIVELY DECREASES THE RAIL HEIGHT AND ALLOWS VEHICLE OVERRIDE RATHER THAN CONTAINMENT AND REDIRECTION.
- (B) THE FLARE RATE OF THE GUARDRAIL IS STEEPENED TO 8:1 AFTER CROSSING THE BOTTOM OF DITCH.
- (C) REFER TO STANDARD DRAWINGS S-GRT-1 FOR TYPE 12 GUARDRAIL TERMINAL BURIED-IN-BACKSLOPE INSTALLATION, S-GR SERIES FOR ADDITIONAL GUARDRAIL DETAILS, RD11-S-11 FOR ROADSIDE SLOPE DEVELOPMENT AND RD11-S-11A FOR ROADSIDE DITCH DETAILS.
- (D) THE CONTRACTOR SHALL CONSTRUCT FORESLOPES AS PART OF THE INITIAL GRADING OPERATIONS AS SHOWN ON THIS STANDARD DRAWING AFTER FIELD VERIFICATION OF HAZARD LOCATION AND ENGINEER'S APPROVAL.
- (E) ONLY USE TYPE 38 OR TYPE 21 (WHERE APPROPRIATE) IF SUITABLE BACKSLOPE IS NOT AVAILABLE.
- (F) ADD W-BEAM RUB RAIL WHENEVER THE CLEARANCE FROM THE BOTTOM OF THE W-BEAM TO THE GROUND LINE EXCEEDS 18 INCHES.
- (G) FOR THE RUB RAIL SECTION USE 8 FEET LONG POST UNLESS OTHERWISE NOTED. AND 9 FEET LONG POST MAY BE NEEDED NEAR DITCH BOTTOM AS DIRECTED BY THE ENGINEER.
- (H) THE DESIGNER SHALL INCORPORATE THE DETAILS SHOWN ON THIS DRAWING IN THE RIGHT-OF-WAY AND CONSTRUCTION PLANS AS WELL AS THE ROADWAY CROSS-SECTION SHEETS.
- (I) FIELD DRILLED STEEL POSTS ARE ALLOWED FOR BOTTOM ELEMENT. USE ZINC RICH PAINT TO COAT FIELD DRILLED HOLES IN POSTS OR RAIL ELEMENTS. GALVANIZING REQUIRED FOR PLATE AND HARDWARE.
- (J) PAYMENT FOR FURNISHING AND INSTALLING FLARED GUARDRAIL WITH RUB-RAIL WILL BE MADE UNDER PAY ITEM NUMBER:

705-02.01, SINGLE GUARDRAIL WITH RUB-RAIL (TYPE 2) PER L.F.

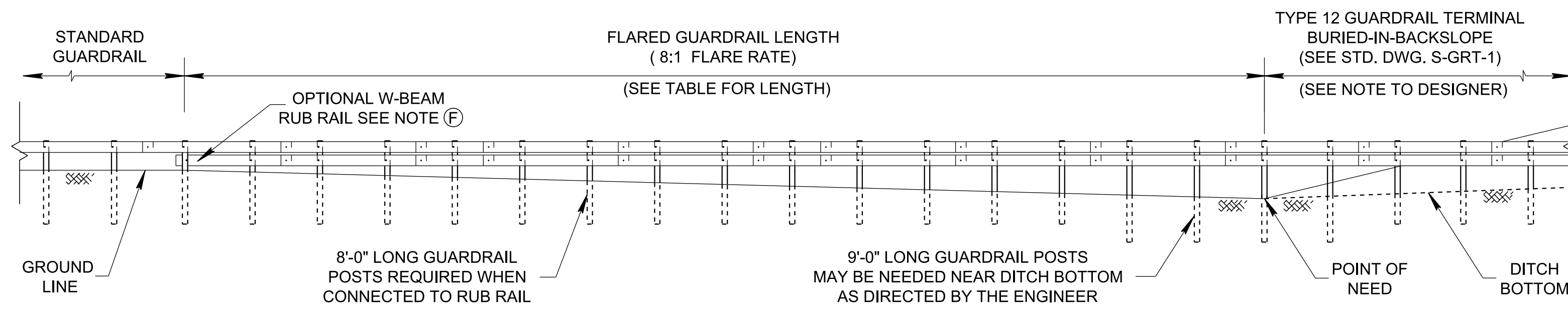
STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

LAYOUT OF
FLARED GUARDRAIL
(TL-3)

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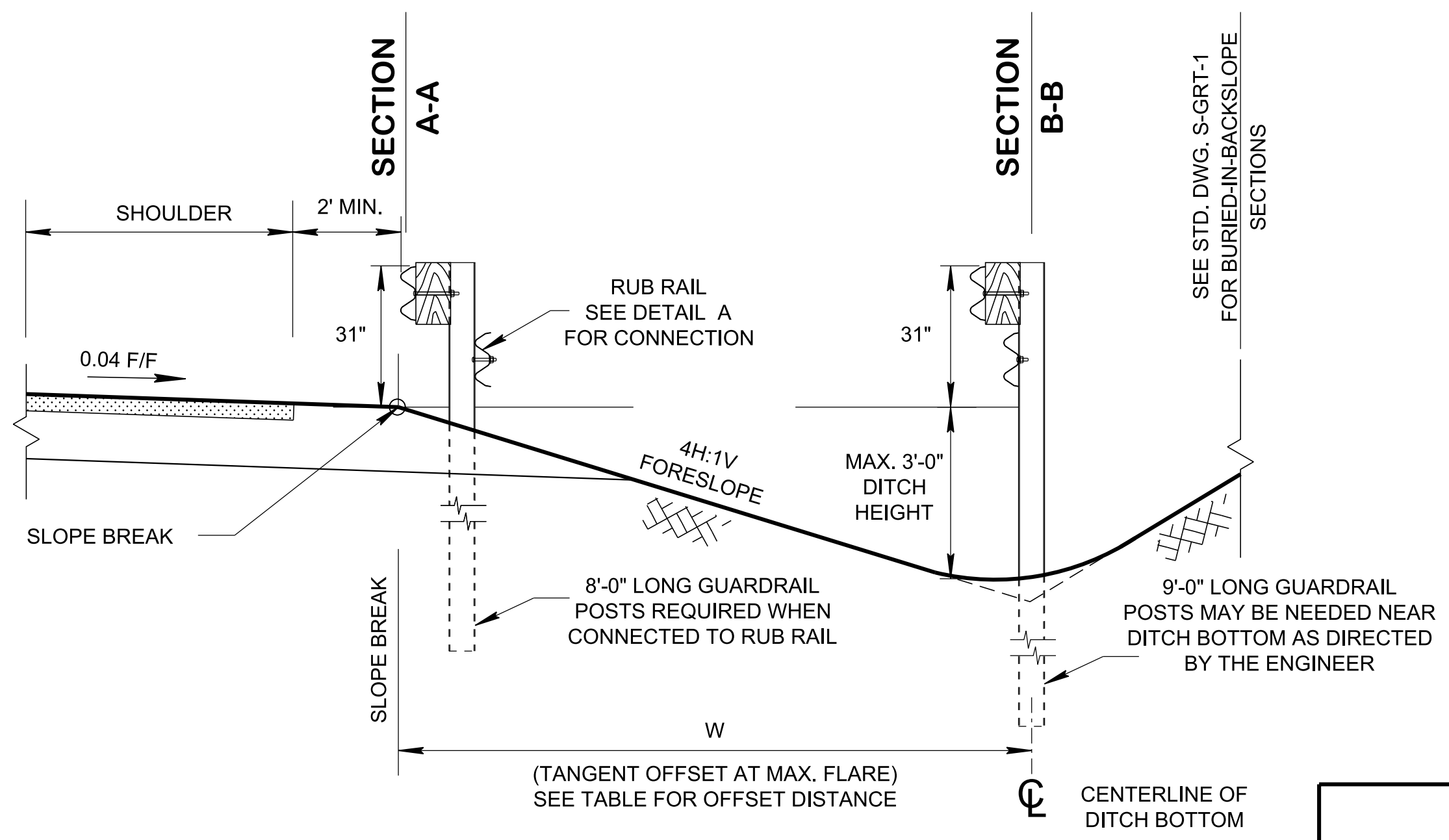


PLAN VIEW

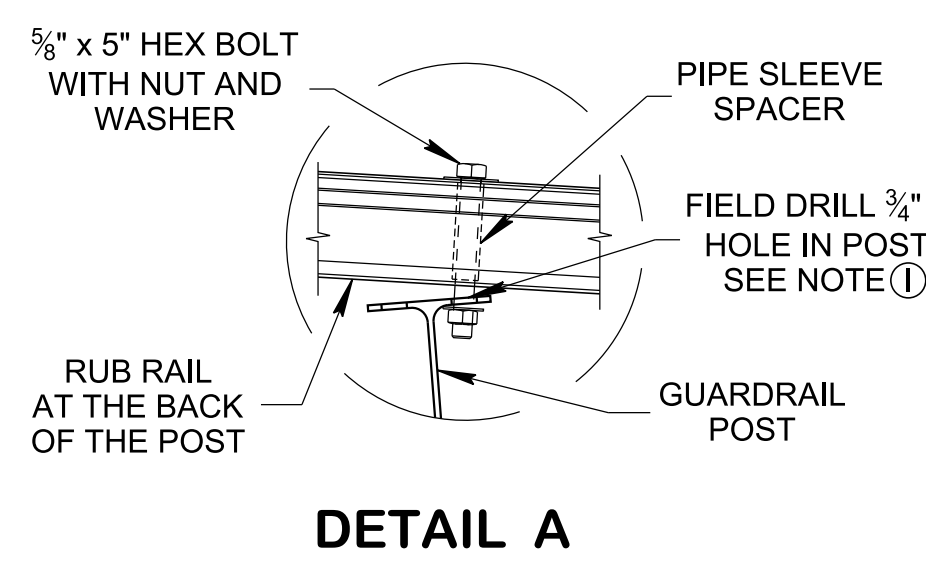


ELEVATION VIEW

FLARED GUARDRAIL INSTALLATION (MASH TL-2)



SECTION VIEWS FOR FILL SLOPE



DETAIL A

TABLE FLARED GUARDRAIL LENGTH (FT)		
DITCH HEIGHT	TANGENT OFFSET AT MAX. FLARE (W) (FOR 4:1 FORESLOPE)	LENGTH OF FLARED GUARDRAIL (8:1 FLARE RATE)
3'-0"	12'-0"	100'-0"
2'-0"	8'-0"	62'-0"
1'-0"	4'-0"	37'-6"

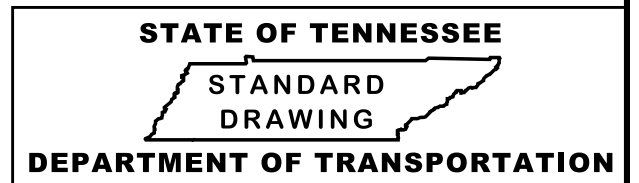
NOTE TO DESIGNER

THIS STANDARD DRAWING SHOWS FLARED GUARDRAIL INSTALLATION IN FILL SLOPE THAT APPROACHING TO THE DITCH BOTTOM. USE THIS DRAWING WITH REFERENCING STANDARD DRAWING S-GRT-1 TYPE 12 GUARDRAIL TERMINAL BURIED-IN -BACKSLOPE.

GENERAL NOTES

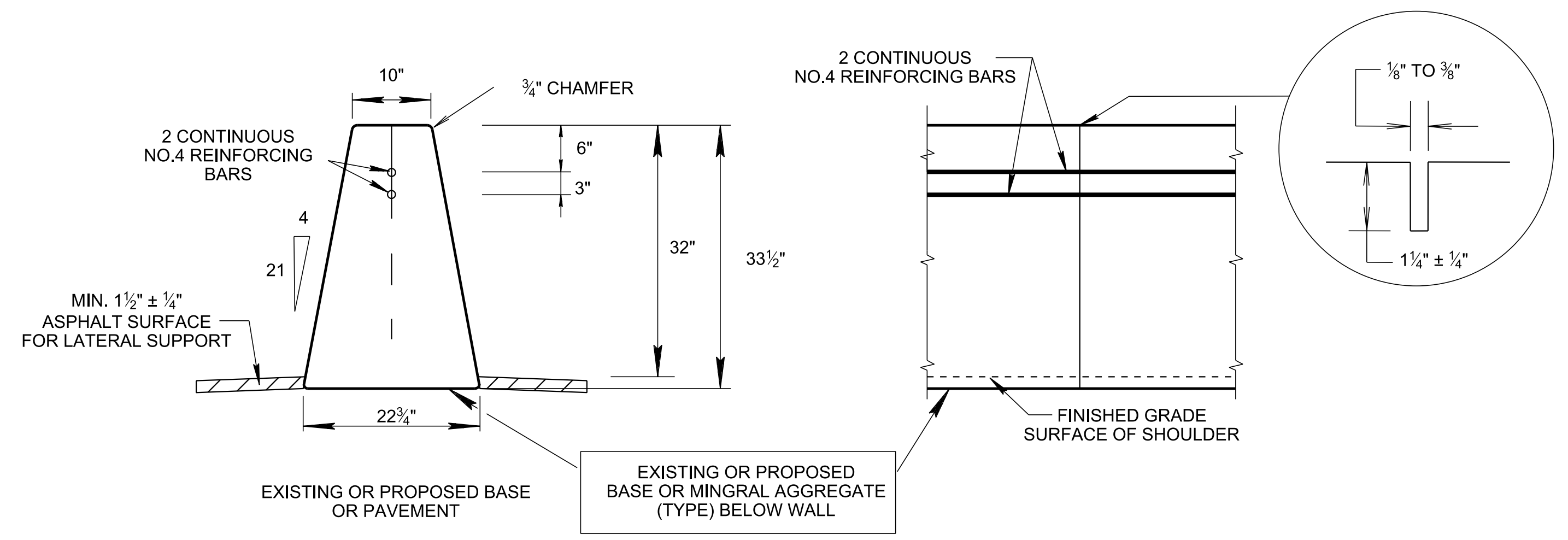
- (A) THE FILL SLOPE MUST NOT BE ALLOWED TO SPILL UNDER THE RAIL THROUGHOUT THE LENGTH OF NEED BECAUSE THIS EFFECTIVELY DECREASES THE RAIL HEIGHT AND ALLOWS VEHICLE OVERRIDE RATHER THAN CONTAINMENT AND REDIRECTION.
- (B) THE FLARE RATE OF THE GUARDRAIL IS STEEPENED TO 8:1 AFTER CROSSING THE BOTTOM OF DITCH.
- (C) REFER TO STANDARD DRAWINGS S-GRT-1 FOR TYPE 12 GUARDRAIL TERMINAL BURIED-IN-BACKSLOPE INSTALLATION, S-GR SERIES FOR ADDITIONAL GUARDRAIL DETAILS, RD11-S-11 FOR ROADSIDE SLOPE DEVELOPMENT AND RD11-S-11A FOR ROADSIDE DITCH DETAILS.
- (D) THE CONTRACTOR SHALL CONSTRUCT FORESLOPES AS PART OF THE INITIAL GRADING OPERATIONS AS SHOWN ON THIS STANDARD DRAWING AFTER FIELD VERIFICATION OF HAZARD LOCATION AND ENGINEER'S APPROVAL.
- (E) ONLY USE TYPE 38 OR TYPE 21 (WHERE APPROPRIATE) IF SUITABLE BACKSLOPE IS NOT AVAILABLE.
- (F) ADD W-BEAM RUB RAIL WHENEVER THE CLEARANCE FROM THE BOTTOM OF THE W-BEAM TO THE GROUND LINE EXCEEDS 18 INCHES.
- (G) FOR THE RUB RAIL SECTION USE 8 FEET LONG POST UNLESS OTHERWISE NOTED. AND 9 FEET LONG POST MAY BE NEEDED NEAR DITCH BOTTOM AS DIRECTED BY THE ENGINEER.
- (H) THE DESIGNER SHALL INCORPORATE THE DETAILS SHOWN ON THIS DRAWING IN THE RIGHT-OF-WAY AND CONSTRUCTION PLANS AS WELL AS THE ROADWAY CROSS-SECTION SHEETS.
- (I) FIELD DRILLED STEEL POSTS ARE ALLOWED FOR BOTTOM ELEMENT. USE ZINC RICH PAINT TO COAT FIELD DRILLED HOLES IN POSTS OR RAIL ELEMENTS. GALVANIZING REQUIRED FOR PLATE AND HARDWARE.
- (J) PAYMENT FOR FURNISHING AND INSTALLING FLARED GUARDRAIL WITH RUB-RAIL WILL BE MADE UNDER PAY ITEM NUMBER:

705-02.01, SINGLE GUARDRAIL WITH RUB-RAIL (TYPE 2) PER L.F.



**LAYOUT OF
FLARED GUARDRAIL
(TL-2)**

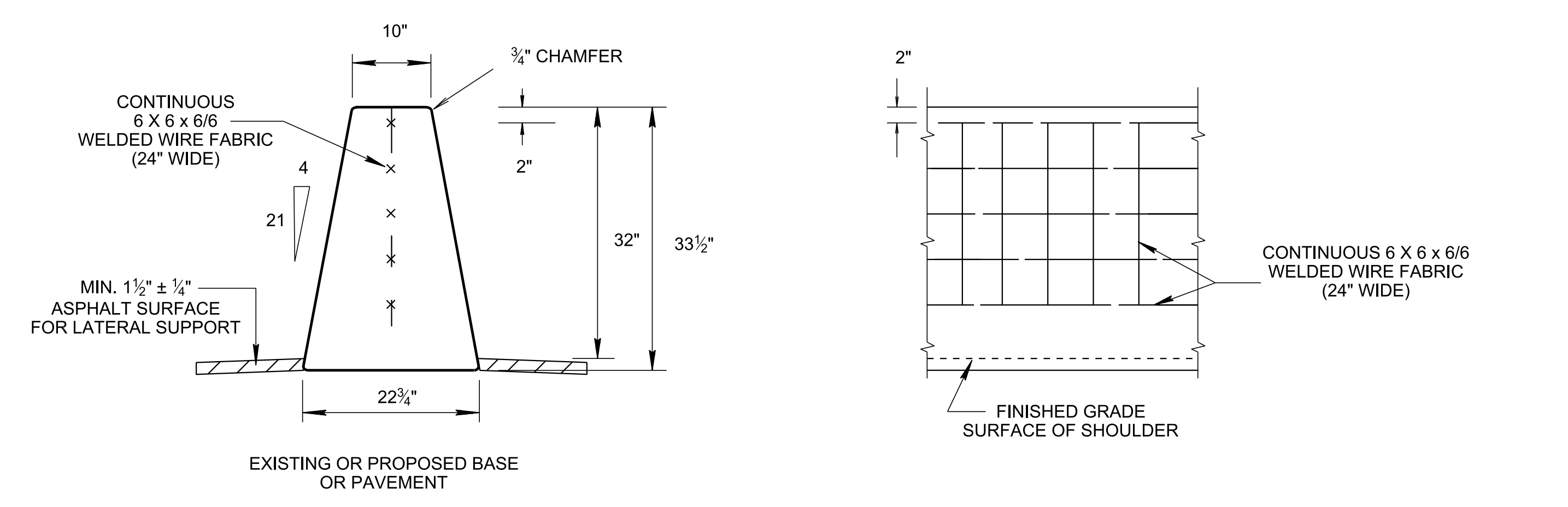
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SECTION VIEW

ELEVATION VIEW

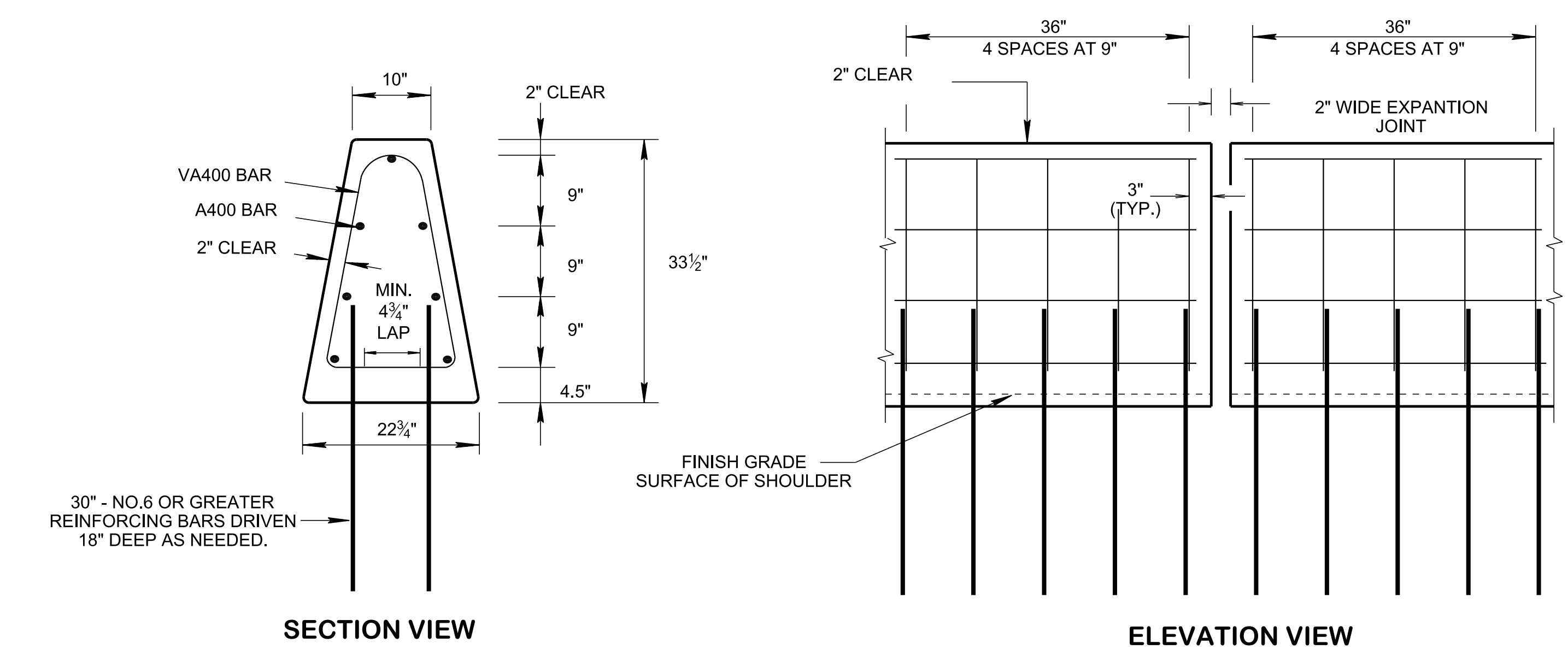
32" HEIGHT WALL



SECTION VIEW

ELEVATION VIEW

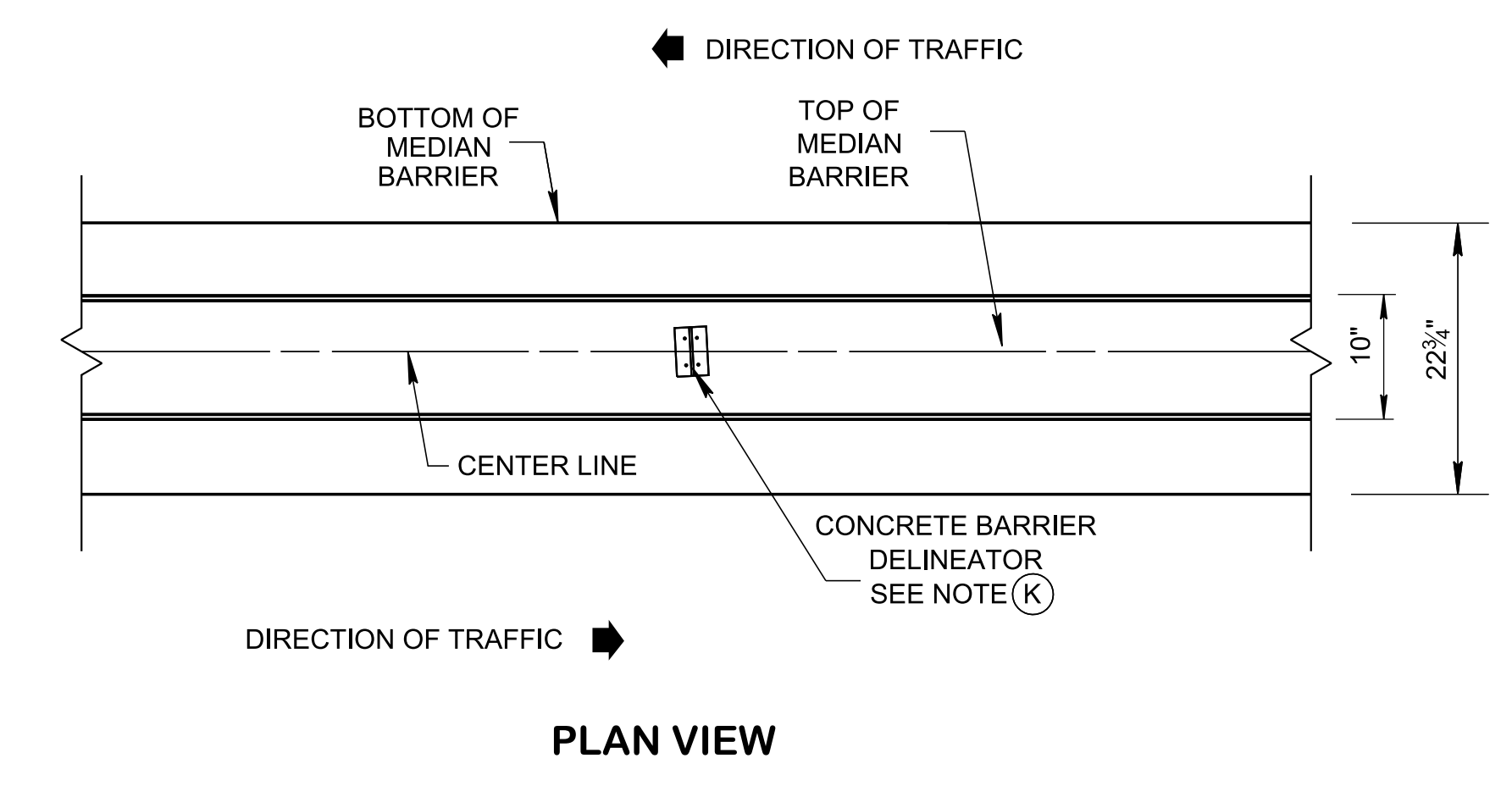
32" HEIGHT WALL WITH ALTERNATE REINFORCING



SECTION VIEW

ELEVATION VIEW

DETAILS OF ADDITIONAL REINFORCING AT THE WALL ENDS OR AT EXPANTION JOINT



PLAN VIEW

NOTE TO DESIGNER

THIS DRAWING IS TO BE USED ON THE MAINTENANCE OF EXISTING 32" MEDIAN BARRIER WALLS ONLY. ON NEW CONSTRUCTION PROJECTS, WHEN THE PROPER SIGHT DISTANCE CANNOT BE ACHIEVED WITH THE USE OF THE 36" MEDIAN BARRIER WALL, THE DESIGNER IS TO USE THE 32" MEDIAN BARRIER WALL. IN ALL OTHER CASES, THE DESIGNER IS TO USE 36" OR 51" MEDIAN BARRIER WALL ON ALL NEW CONSTRUCTION PROJECTS. SEE STANDARD DRAWINGS S-SSMB-1A AND S-SSMB-2 FOR DETAILS.

GENERAL NOTES

(A) CONCRETE BARRIER WALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTION 711 AND/OR CURRENT SPECIAL PROVISIONS.

(B) IF SAWED CONTRACTION JOINTS ARE USED, THE JOINTS MUST BE SAWED WITHIN FOUR (4) HOURS AFTER THE CONCRETE IS PLACED.

(C) THE CONTRACTION JOINTS ARE TO BE SPACED AT 20 TO 25 FOOT INTERVALS WHEN CONSTRUCTED ON ASPHALT PAVEMENT. WHEN THE CONCRETE BARRIER WALL IS ATTACHED TO CONCRETE PAVEMENT THE CONTRACTION JOINTS WILL CORRESPOND TO THE JOINTS IN THE CONCRETE PAVEMENT. THE COST OF MATERIAL AND LABOR FOR THE JOINT INSTALLATION SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.

(D) THE CONCRETE BARRIER WALL SHALL BE GIVEN AN APPLIED TEXTURE FINISH. THE COLOR OF THE FINISH SHALL BE WHITE, FEDERAL SPECIFICATION NO. 37886. THE COST OF MATERIALS AND LABOR FOR THE TEXTURE FINISH SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.

(E) THE TWO (2) INCH OPEN EXPANSION JOINTS SHALL BE PLACED AT A MAXIMUM SPACING NOT TO EXCEED 300 FEET. IF FIXED OBJECTS SUCH AS BRIDGE PIERS, BRIDGE ENDS, OVERHEAD SIGN SUPPORTS, OR OTHER FEATURES PROJECTING THROUGH, INTO OR AGAINST THE BARRIER EXIST THAT REQUIRE TWO INCH EXPANSION JOINTS, THEN THE DISTANCE BETWEEN THE EXPANSION JOINTS IS TO BE REDUCED IN ORDER TO ALLOW AN EQUAL DISTANCE BETWEEN JOINTS THAT IS LESS THAN 300 FEET. ALL ADDITIONAL STEEL REQUIRED AT EXPANSION JOINTS TO BE EPOXY COATED REINFORCING STEEL. THE COST OF MATERIAL AND LABOR FOR THE JOINT INSTALLATION SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.

(F) CHAMFER TOP AND END EDGES 3/4 INCH.

(G) BAR SPLICES FOR ROADWAY BARRIER SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OF THE BAR.

(H) ANY METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL ROADWAY REINFORCING STEEL WILL BE FIXED AGAINST MOVEMENT AND POSITIONED ± 1/2 INCH AS DIMENSIONED WHEN TIED TO THE TRANSVERSE ROADWAY REINFORCING STEEL WILL BE SATISFACTORY.

(I) PAYMENT WILL BE MADE UNDER ITEM NO.:
711-05.70, 32IN SINGLE SLOPE CONCRETE BARRIER WALL, L.F.

(J) MIN. SAFETY PERFORMANCE OF 32" SINGLE SLOPE WALL IS ACCEPTABLE ACCORDING TO THE TL-4 EVALUATION CRITERIA SPECIFIED IN NCHRP REPORT 350.

(K) REFER TO STANDARD DRAWING T-M-18A FOR MEDIAN BARRIER DELINEATOR MOUNTING DETAILS AND NOTES. THE COST OF FURNISHING AND INSTALLING MEDIAN BARRIER DELINEATORS SHALL BE INCLUDED WITH THE BID PRICE FOR CONCRETE MEDIAN BARRIERS.

REV. 8-19-13: REVISED ITEM NUMBER DESCRIPTION.
 REV. 05-01-20: ADDED NOTE TO DESIGNER. REDREW SHEET.
 REV. 07-17-20: REVISED NOTE TO DESIGNER.
 REV. 10-29-2021: DELINEATOR MOUNTING DETAIL AND DELINEATOR NOTES WERE REMOVED. ADDED GENERAL NOTE (K) FOR DELINEATOR MOUNTING DETAILS REFERENCE STD. DWG. AND PLAN VIEW.

STATE OF TENNESSEE
 STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

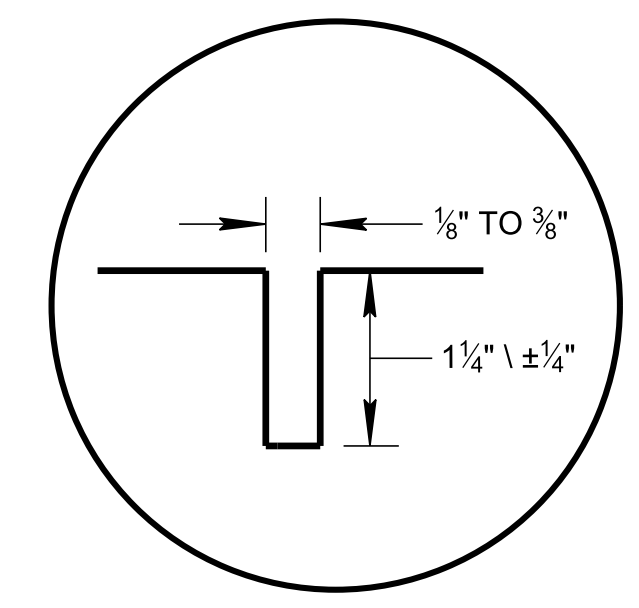
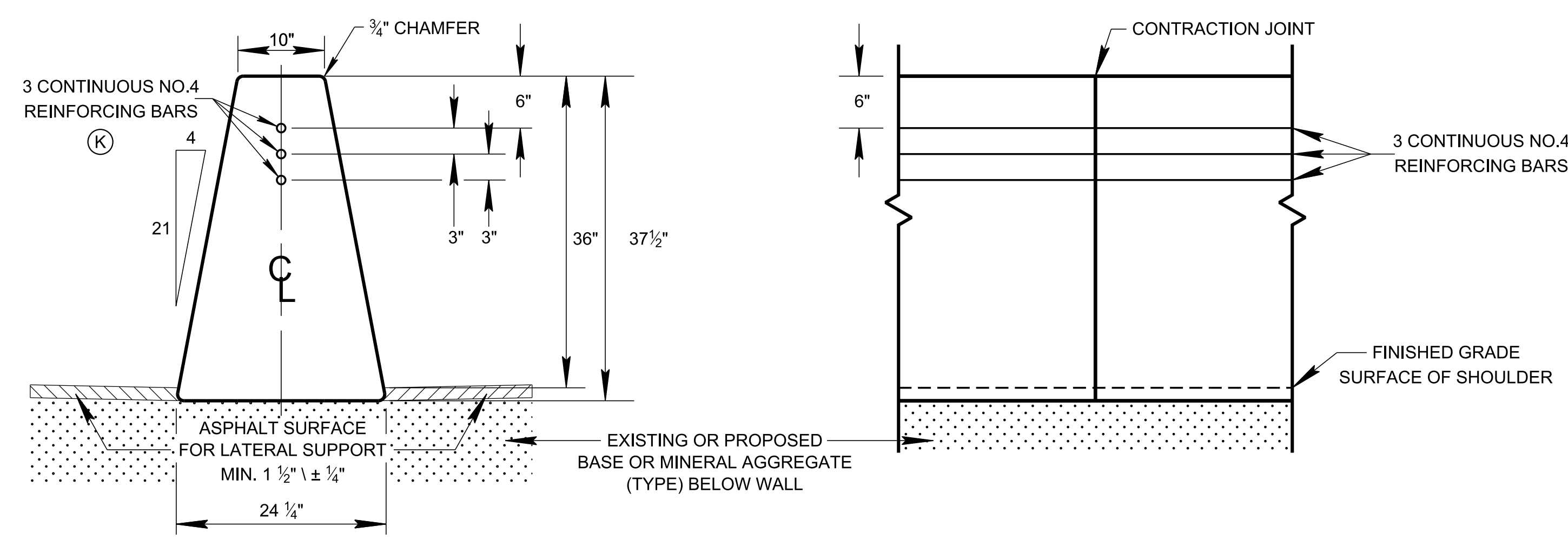
32"
SINGLE SLOPE
CONCRETE
BARRIER
WALL

10-31-2007 S-SSMB-1

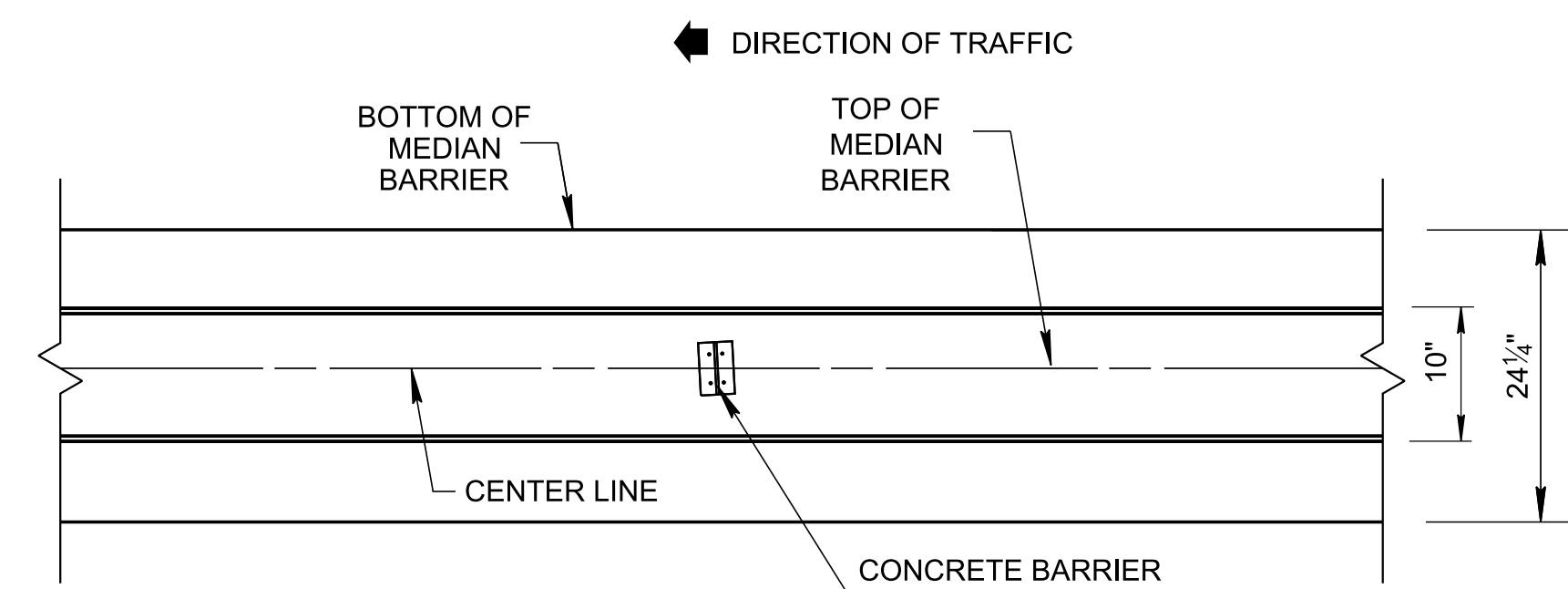
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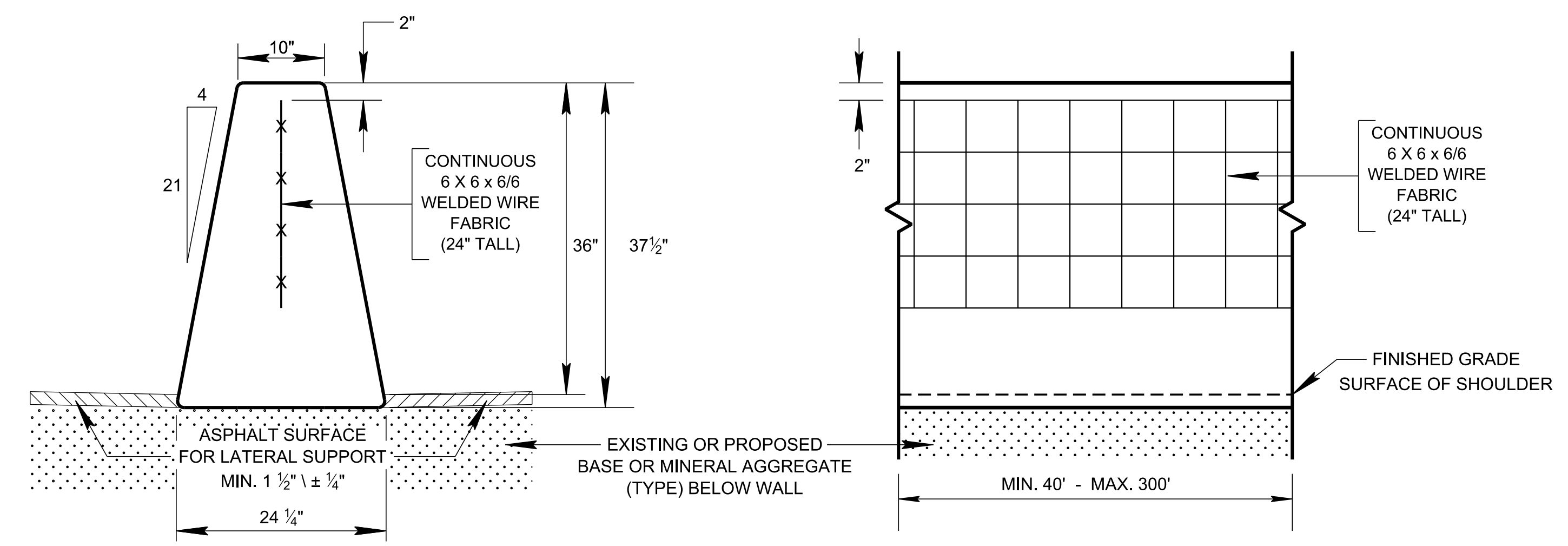
REV. 10-29-2021: DELINEATOR MOUNTING
 DETAIL AND DELINEATOR NOTES WERE
 REMOVED. ADDED GENERAL NOTE (L) FOR
 DELINEATOR MOUNTING DETAILS
 REFERENCE STD. DWG. AND PLAN VIEW.



CONTRACTION JOINT DETAIL



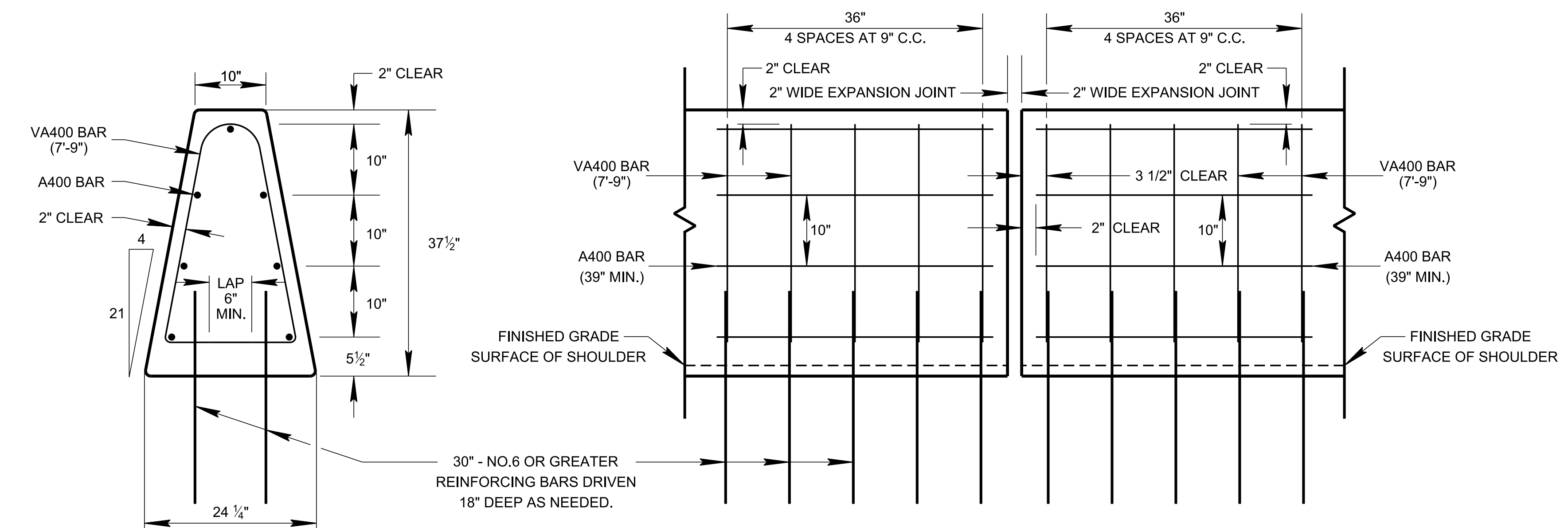
PLAN VIEW



ELEVATION VIEW

SECTION VIEW

36" HEIGHT WALL WITH ALTERNATE REINFORCING



ELEVATION VIEW

SECTION VIEW

DETAILS OF ADDITIONAL REINFORCING AT THE WALL ENDS OR AT EXPANSION JOINT

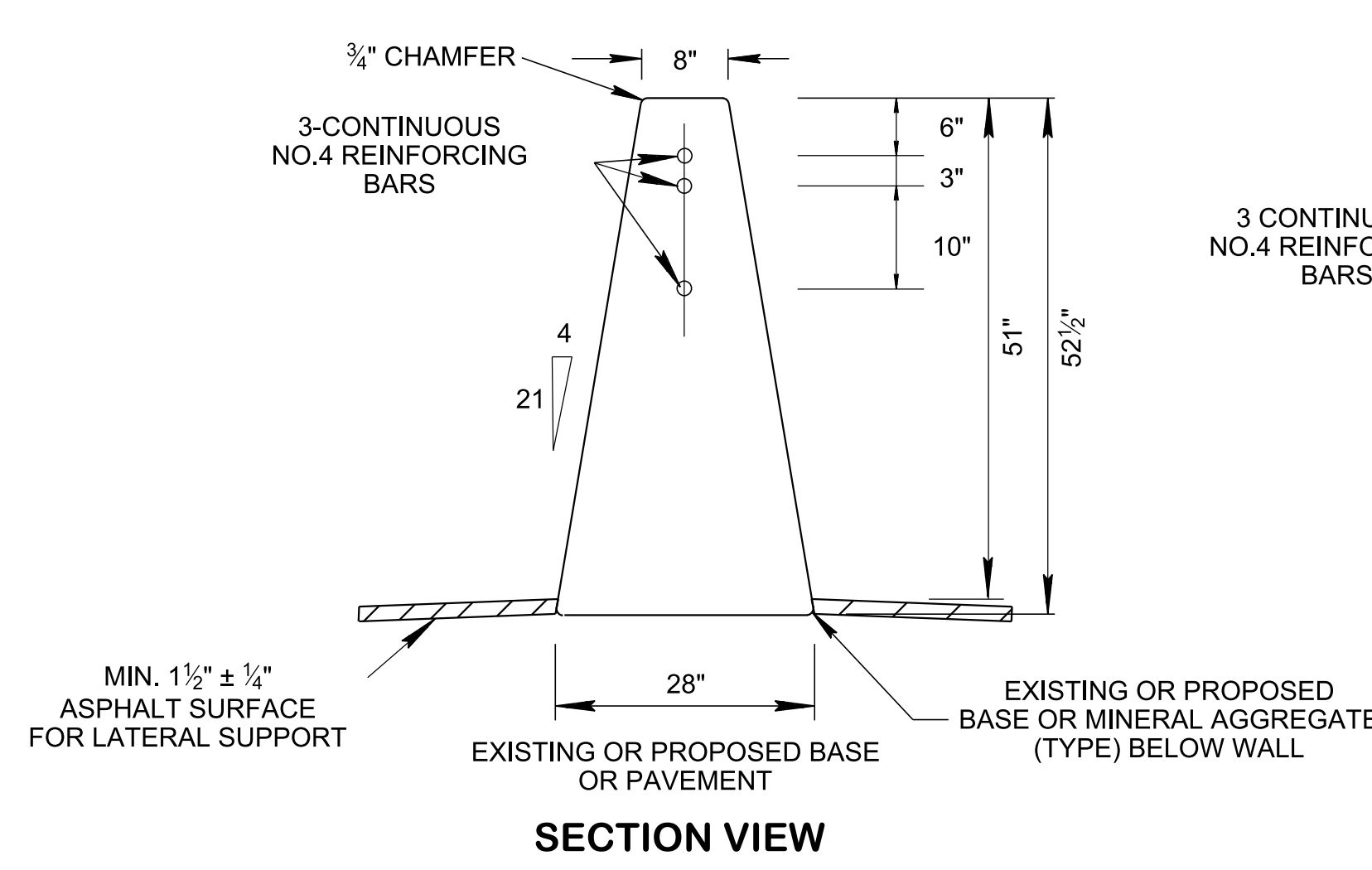
GENERAL NOTES

- (A) CONCRETE BARRIER WALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTION 711 AND/OR CURRENT SPECIAL PROVISIONS.
- (B) IF SAWED CONTRACTION JOINTS ARE USED, THE JOINTS MUST BE SAWED WITHIN FOUR (4) HOURS AFTER THE CONCRETE IS PLACED.
- (C) THE CONTRACTION JOINTS ARE TO BE SPACED AT 20 TO 25 FOOT INTERVALS WHEN CONSTRUCTED ON ASPHALT PAVEMENT. WHEN THE CONCRETE BARRIER WALL IS ATTACHED TO CONCRETE PAVEMENT THE CONTRACTION JOINTS WILL CORRESPOND TO THE JOINTS IN THE CONCRETE PAVEMENT. THE COST OF MATERIAL AND LABOR FOR THE JOINT INSTALLATION SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.
- (D) THE CONCRETE BARRIER WALL SHALL BE GIVEN AN APPLIED TEXTURE FINISH. THE COLOR OF THE FINISH SHALL BE WHITE, FEDERAL SPECIFICATION NO. 37886. THE COST OF MATERIALS AND LABOR FOR THE TEXTURE FINISH SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.
- (E) THE TWO (2) INCH OPEN EXPANSION JOINTS SHALL BE PLACED AT A MAXIMUM SPACING NOT TO EXCEED 300 FEET. IF FIXED OBJECTS SUCH AS BRIDGE PIERS, BRIDGE ENDS, OVERHEAD SIGN SUPPORTS, OR OTHER FEATURES PROJECTING THROUGH, INTO OR AGAINST THE BARRIER EXIST THAT REQUIRE TWO INCH EXPANSION JOINTS, THEN THE DISTANCE BETWEEN THE EXPANSION JOINTS IS TO BE REDUCED IN ORDER TO ALLOW AN EQUAL DISTANCE BETWEEN JOINTS THAT IS LESS THAN 300 FEET. ALL ADDITIONAL STEEL REQUIRED AT EXPANSION JOINTS TO BE EPOXY COATED REINFORCING STEEL. THE COST OF MATERIAL AND LABOR FOR THE JOINT INSTALLATION SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.
- (F) THE TOP AND END EDGES OF THE CONCRETE BARRIER WILL HAVE A 3/4" TO 1" CHAMFER. IF BARRIER WALL IS SLIP-FORMED, ROUNDED EDGES WITH A 1" RADIUS MAY BE USED INSTEAD OF THE CHAMFER.
- (G) BAR SPLICES FOR ROADWAY BARRIER SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OF THE BAR.
- (H) ANY METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL ROADWAY REINFORCING STEEL WILL BE FIXED AGAINST MOVEMENT AND POSITIONED ± 1/2 INCH AS DIMENSIONED WHEN TIED TO THE TRANSVERSE ROADWAY REINFORCING STEEL WILL BE SATISFACTORY.
- (I) PAYMENT WILL BE MADE UNDER ITEM NO. 711-05.69, 36" SINGLE SLOPE CONCRETE BARRIER WALL, PER LINEAR FOOT.
- (J) MIN. SAFETY PERFORMANCE OF 36" SINGLE SLOPE WALL HAS BEEN EVALUATED UNDER MASH TL-4 AND DOCUMENTED ON TEST REPORT TTI: 9-1002-5, "DETERMINATION OF MINIMUM HEIGHT AND LATERAL DESIGN LOAD FOR MASH TEST LEVEL 4 BRIDGE RAILS".
- (K) THE CONTRACTOR MAY ELECT TO USE 3 CONTINUOUS ROPE CABLES INSTEAD OF THE 3 NO. 4 REINFORCING BARS. EACH CABLE MUST BE 3/4 INCH (MINIMUM) DIAMETER, ZINC-COATED (GALVANIZED) WIRE ROPE MANUFACTURED IN ACCORDANCE WITH AASHTO M 30.
- (L) REFER TO STANDARD DRAWING T-M-18A FOR MEDIAN BARRIER DELINEATOR MOUNTING DETAILS AND NOTES. THE COST OF FURNISHING AND INSTALLING MEDIAN BARRIER DELINEATORS SHALL BE INCLUDED WITH THE BID PRICE FOR CONCRETE MEDIAN BARRIERS.

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 STANDARD
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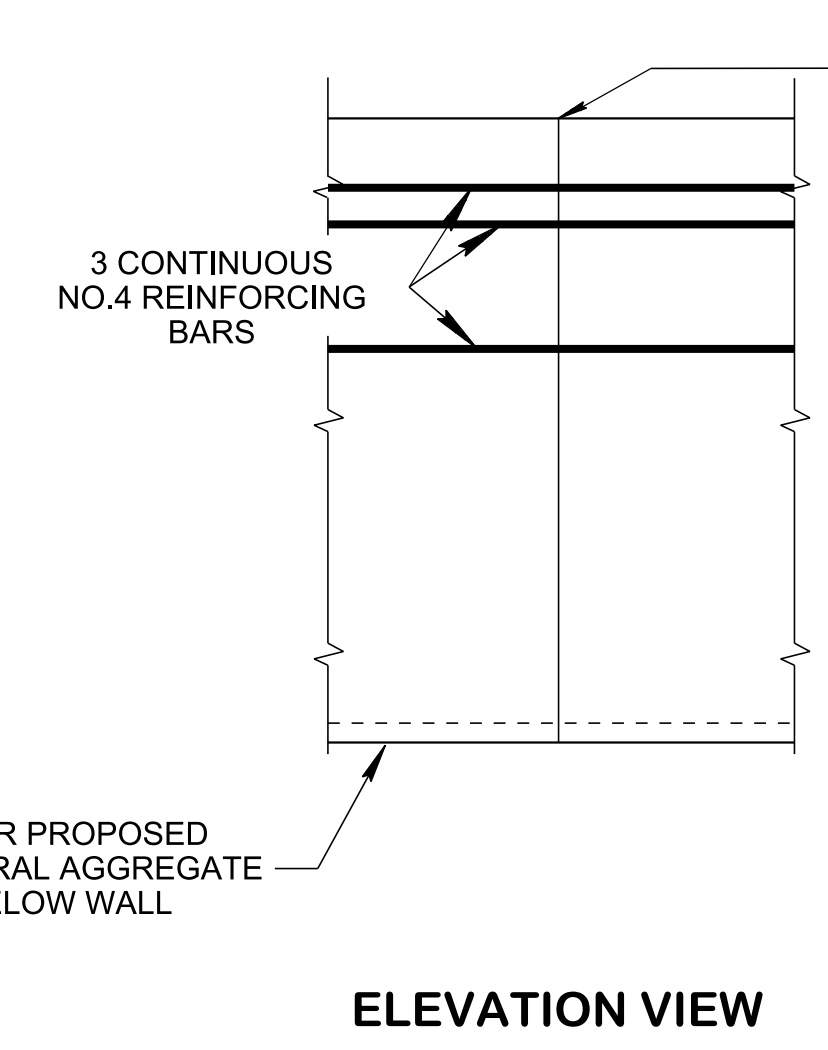
36"
 SINGLE SLOPE
 CONCRETE
 BARRIER
 WALL

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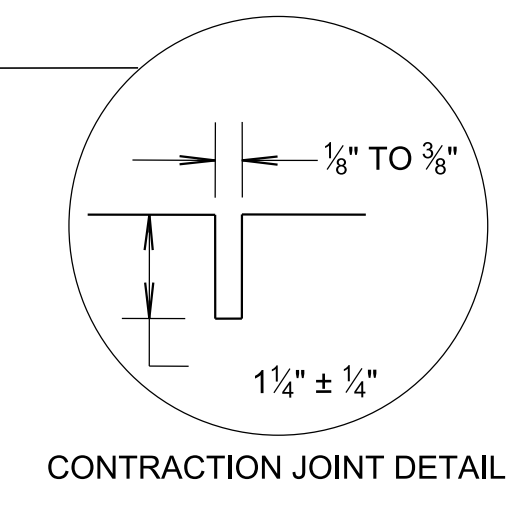


SECTION VIEW

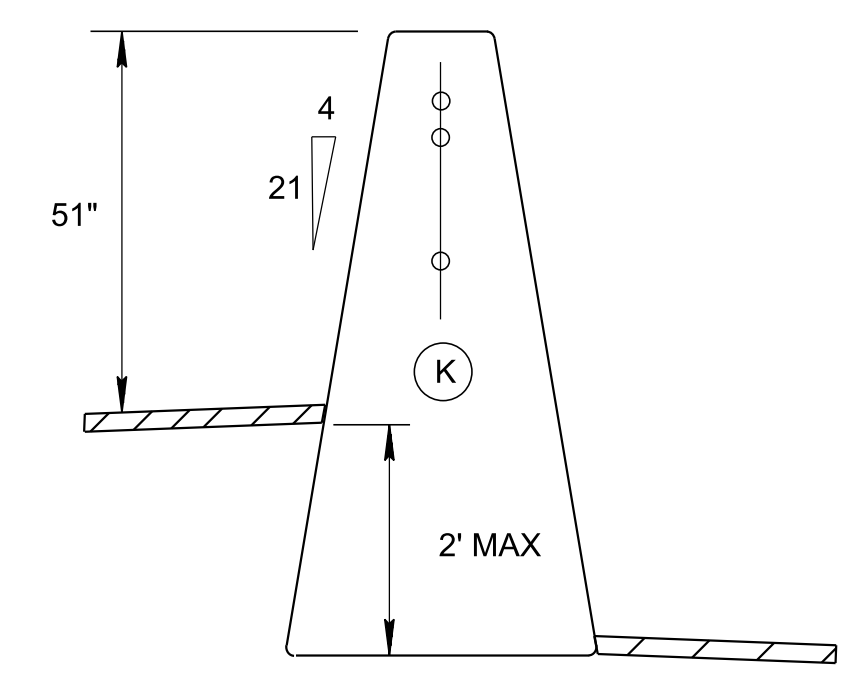
51" HEIGHT WALL



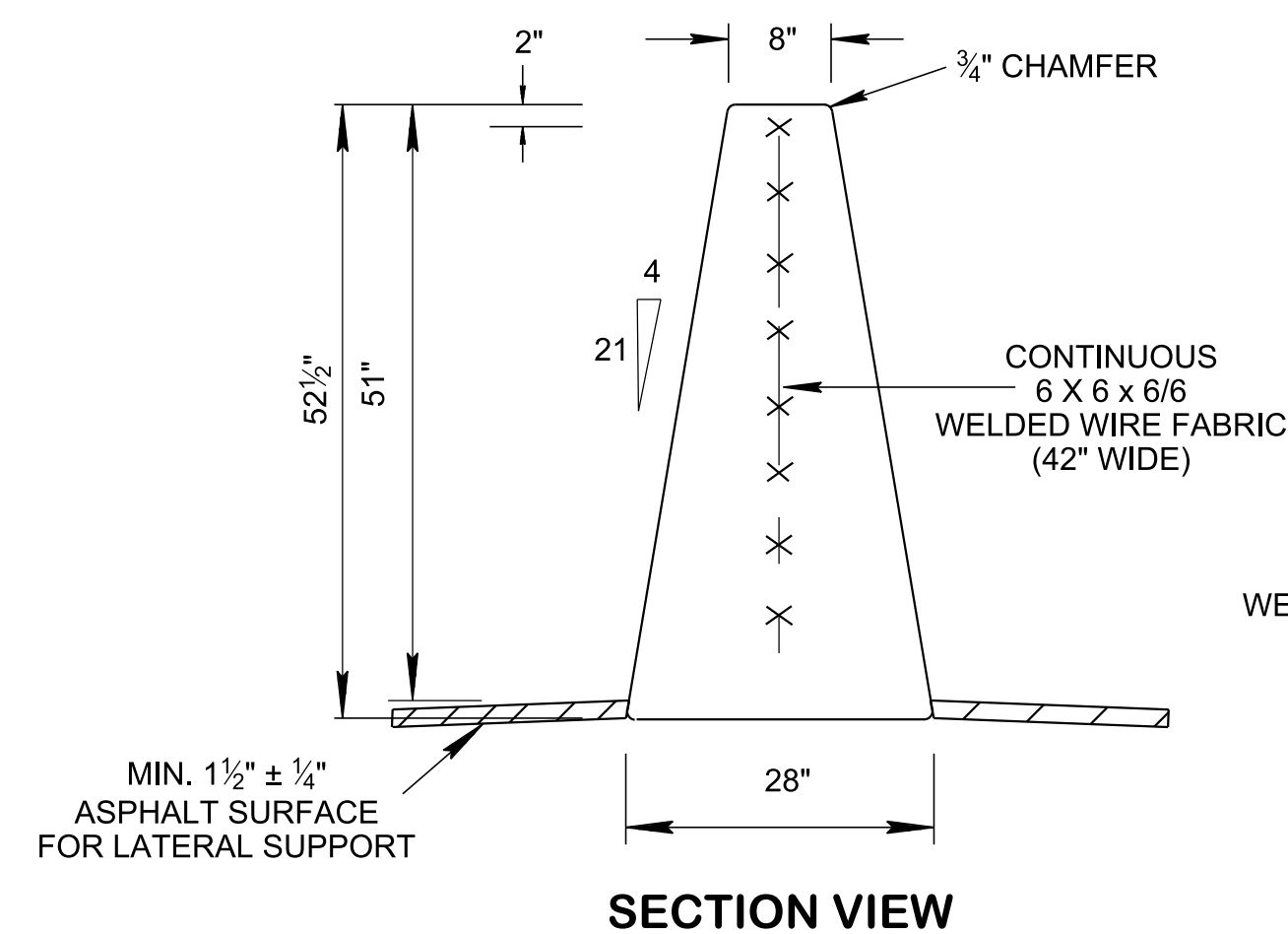
ELEVATION VIEW



CONTRACTION JOINT DETAIL

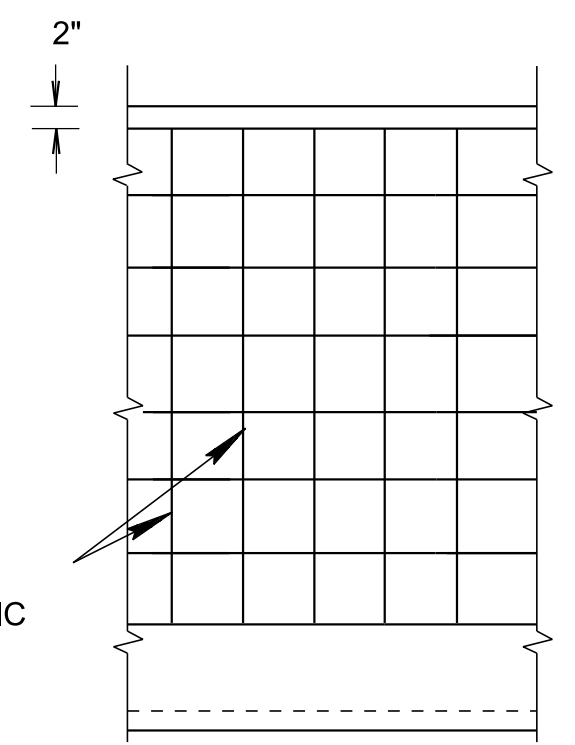


GRADE SEPARATION DETAIL

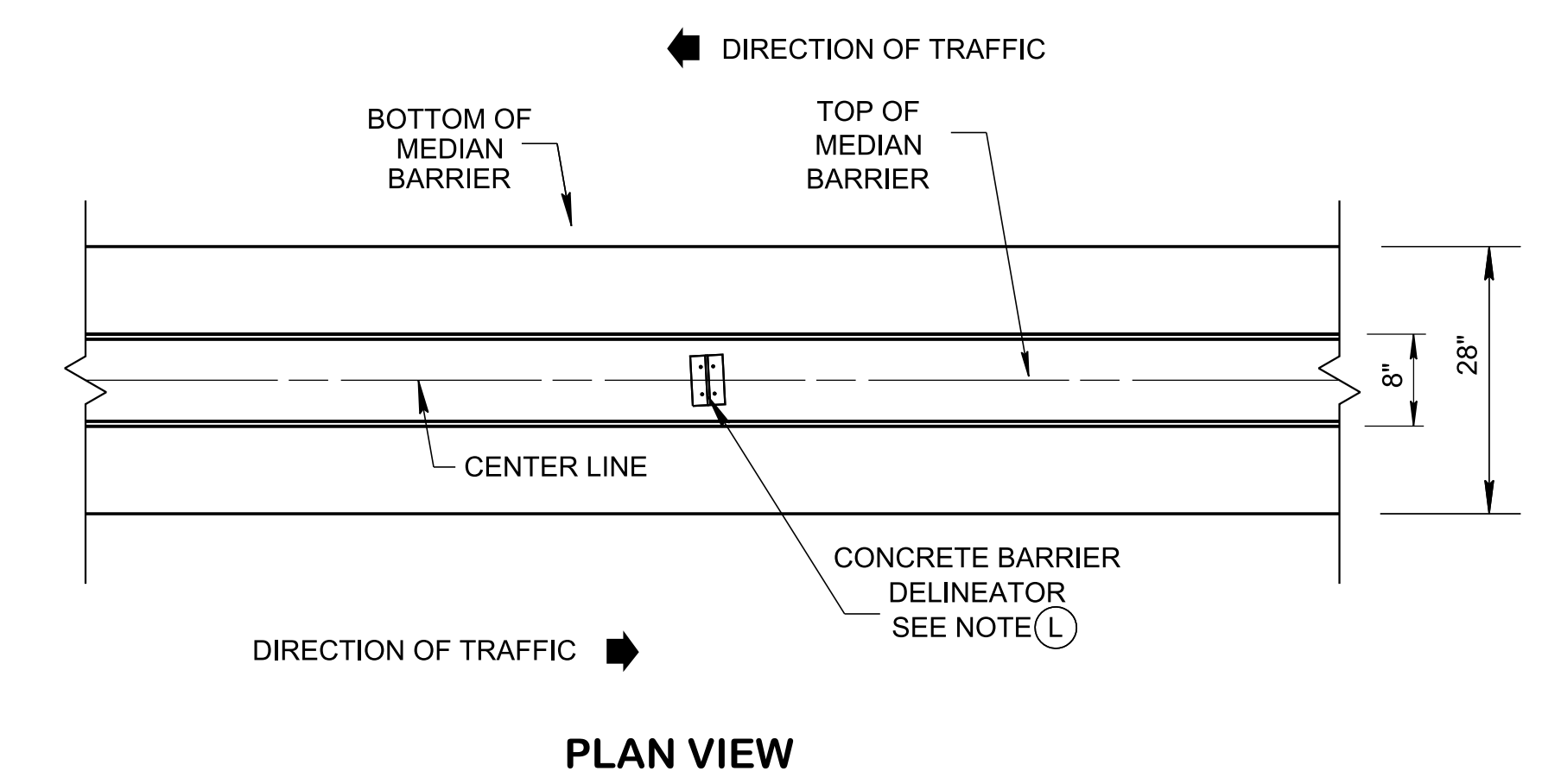


SECTION VIEW

51" HEIGHT WALL WITH ALTERNATE REINFORCING



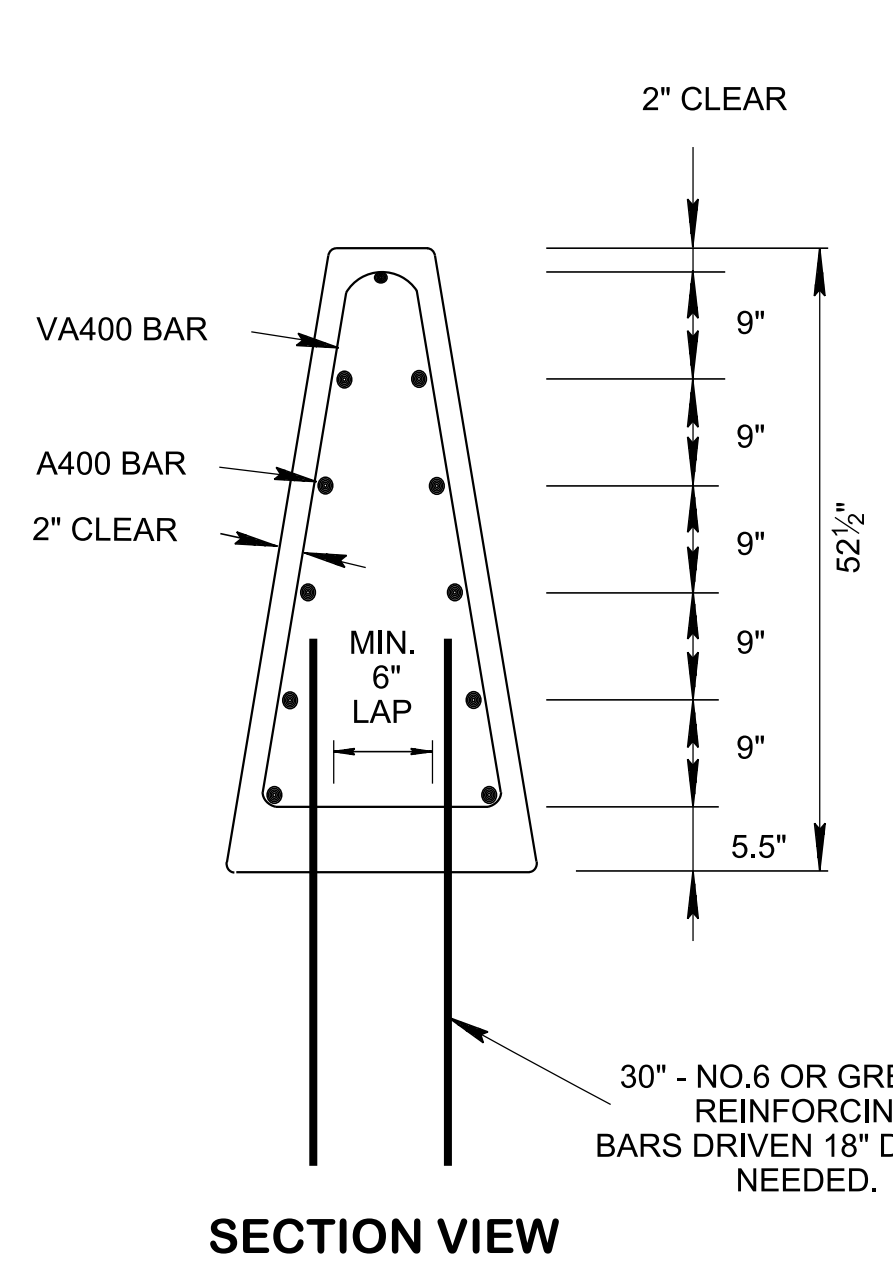
ELEVATION VIEW



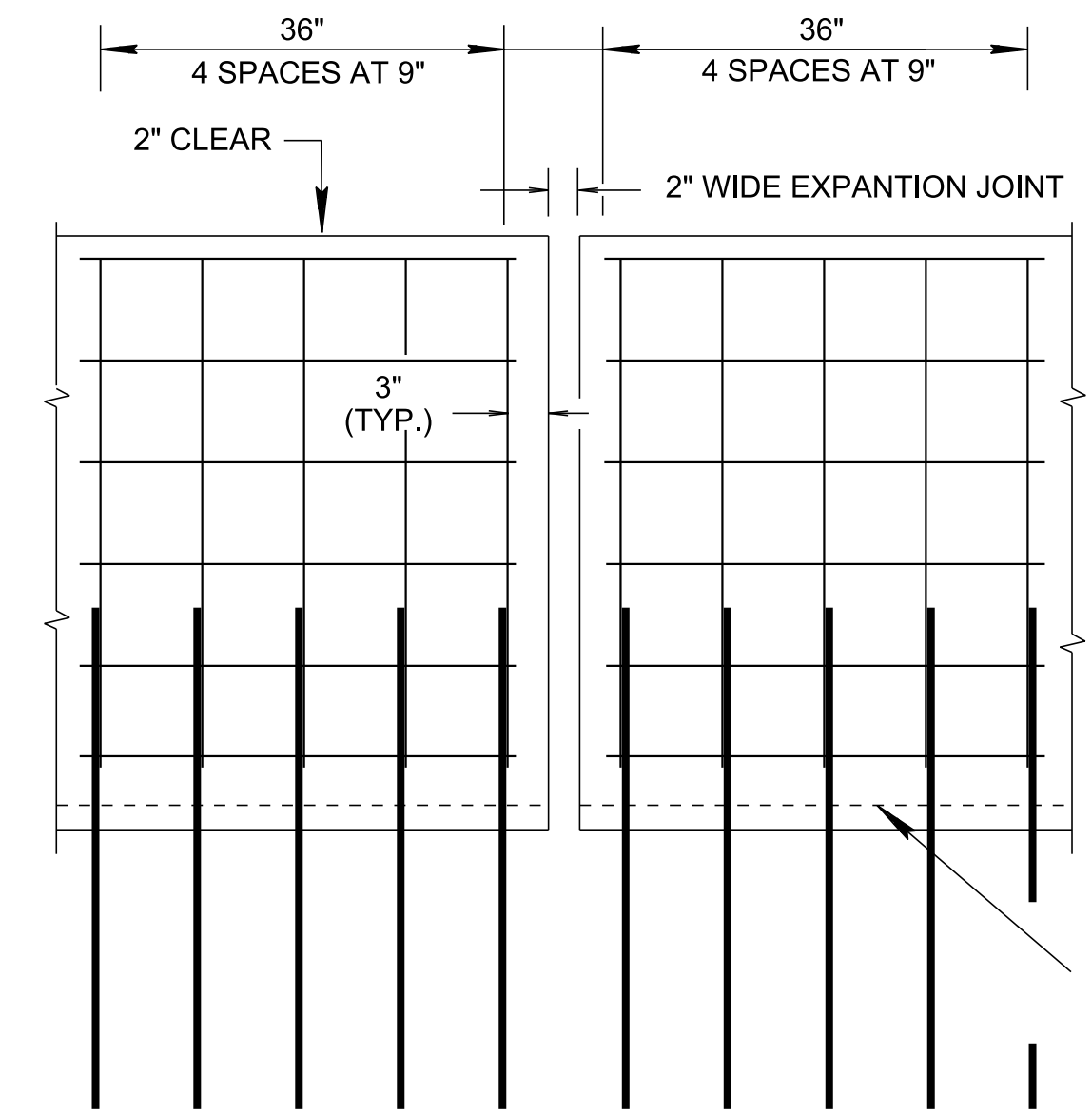
PLAN VIEW

GENERAL NOTES

- (A) CONCRETE BARRIER WALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTION 711 AND/OR CURRENT SPECIAL PROVISIONS.
- (B) IF SAWED CONTRACTION JOINTS ARE USED, THE JOINTS MUST BE SAWED WITHIN FOUR (4) HOURS AFTER THE CONCRETE IS PLACED.
- (C) THE CONTRACTION JOINTS ARE TO BE SPACED AT 20 TO 25 FOOT INTERVALS WHEN CONSTRUCTED ON ASPHALT PAVEMENT. WHEN THE CONCRETE BARRIER WALL IS ATTACHED TO CONCRETE PAVEMENT THE CONTRACTION JOINTS WILL CORRESPOND TO THE JOINTS IN THE CONCRETE PAVEMENT. THE COST OF MATERIAL AND LABOR FOR THE JOINT INSTALLATION SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.
- (D) THE CONCRETE BARRIER WALL SHALL BE GIVEN AN APPLIED TEXTURE FINISH. THE COLOR OF THE FINISH SHALL BE WHITE, FEDERAL SPECIFICATION NO. 37886. THE COST OF MATERIALS AND LABOR FOR THE TEXTURE FINISH SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.
- (E) THE TWO (2) INCH OPEN EXPANSION JOINTS SHALL BE PLACED AT A MAXIMUM SPACING NOT TO EXCEED 300 FEET. IF FIXED OBJECTS SUCH AS BRIDGE PIERS, BRIDGE ENDS, OVERHEAD SIGN SUPPORTS, OR OTHER FEATURES PROJECTING THROUGH, INTO OR AGAINST THE BARRIER EXIST THAT REQUIRE TWO INCH EXPANSION JOINTS, THEN THE DISTANCE BETWEEN THE EXPANSION JOINTS IS TO BE REDUCED IN ORDER TO ALLOW AN EQUAL DISTANCE BETWEEN JOINTS THAT IS LESS THAN 300 FEET. ALL ADDITIONAL STEEL REQUIRED AT EXPANSION JOINTS TO BE EPOXY COATED REINFORCING STEEL. THE COST OF MATERIAL AND LABOR FOR THE JOINT INSTALLATION SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.
- (F) CHAMFER TOP AND END EDGES 3/4 INCH.
- (G) BAR SPLICES FOR ROADWAY BARRIER SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OF THE BAR.
- (H) ANY METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL ROADWAY REINFORCING STEEL WILL BE FIXED AGAINST MOVEMENT AND POSITIONED ± 1/2 INCH AS DIMENSIONED WHEN TIED TO THE TRANSVERSE ROADWAY REINFORCING STEEL WILL BE SATISFACTORY.
- (I) PAYMENT WILL BE MADE UNDER ITEM NO. 711-05.71, 51IN SINGLE SLOPE CONCRETE BARRIER WALL, L.F.
- (J) MIN. SAFETY PERFORMANCE OF 51" SINGLE SLOPE WALL IS ACCEPTABLE ACCORDING TO THE TL-4 EVALUATION CRITERIA SPECIFIED IN NCHRP REPORT 350.
- (K) IF GRADE SEPARATION EXCEEDS 2' USE S-SSMB-9 INSTEAD.
- (L) REFER TO STANDARD DRAWING T-M-18A FOR MEDIAN BARRIER DELINEATOR MOUNTING DETAILS AND NOTES. THE COST OF FURNISHING AND INSTALLING MEDIAN BARRIER DELINEATORS SHALL BE INCLUDED WITH THE BID PRICE FOR CONCRETE MEDIAN BARRIERS.



SECTION VIEW



ELEVATION VIEW

DETAILS OF ADDITIONAL REINFORCING AT THE WALL ENDS OR AT EXPANTION JOINT

APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

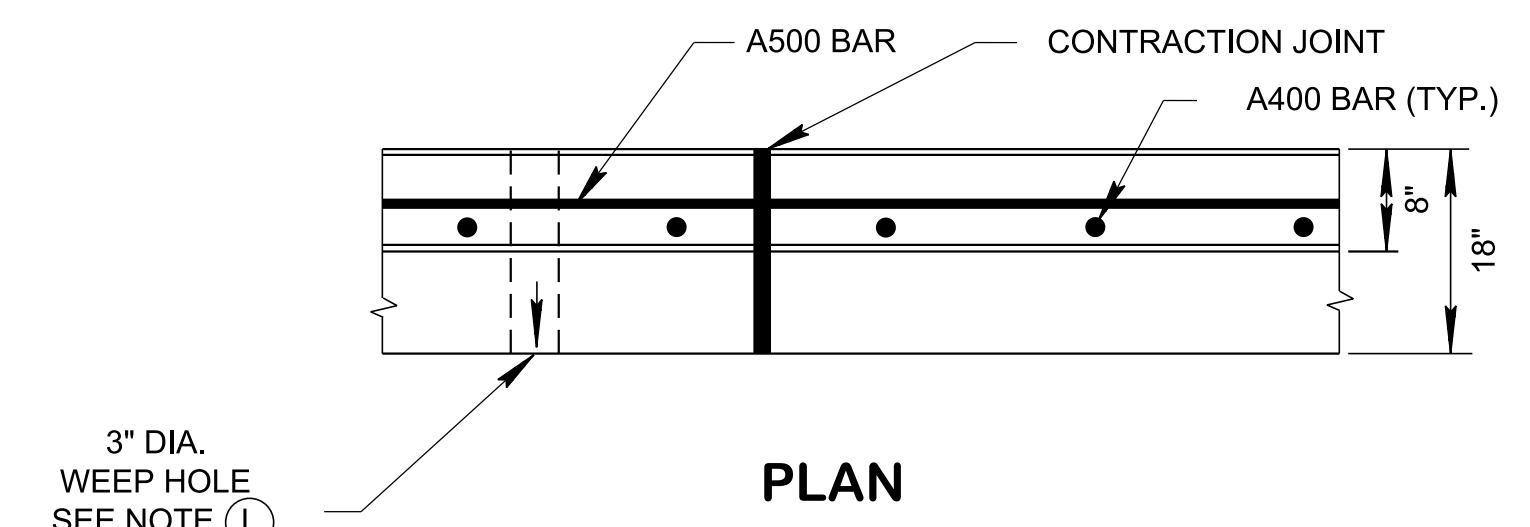
STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

51"
SINGLE SLOPE
CONCRETE
BARRIER
WALL

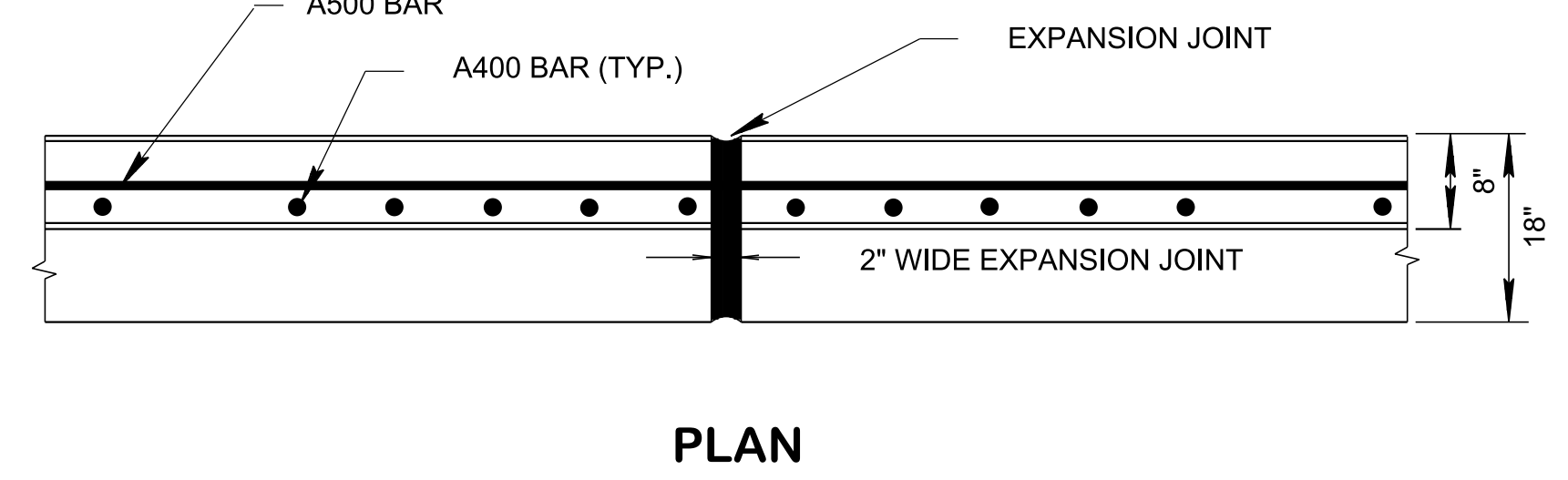
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PLAN

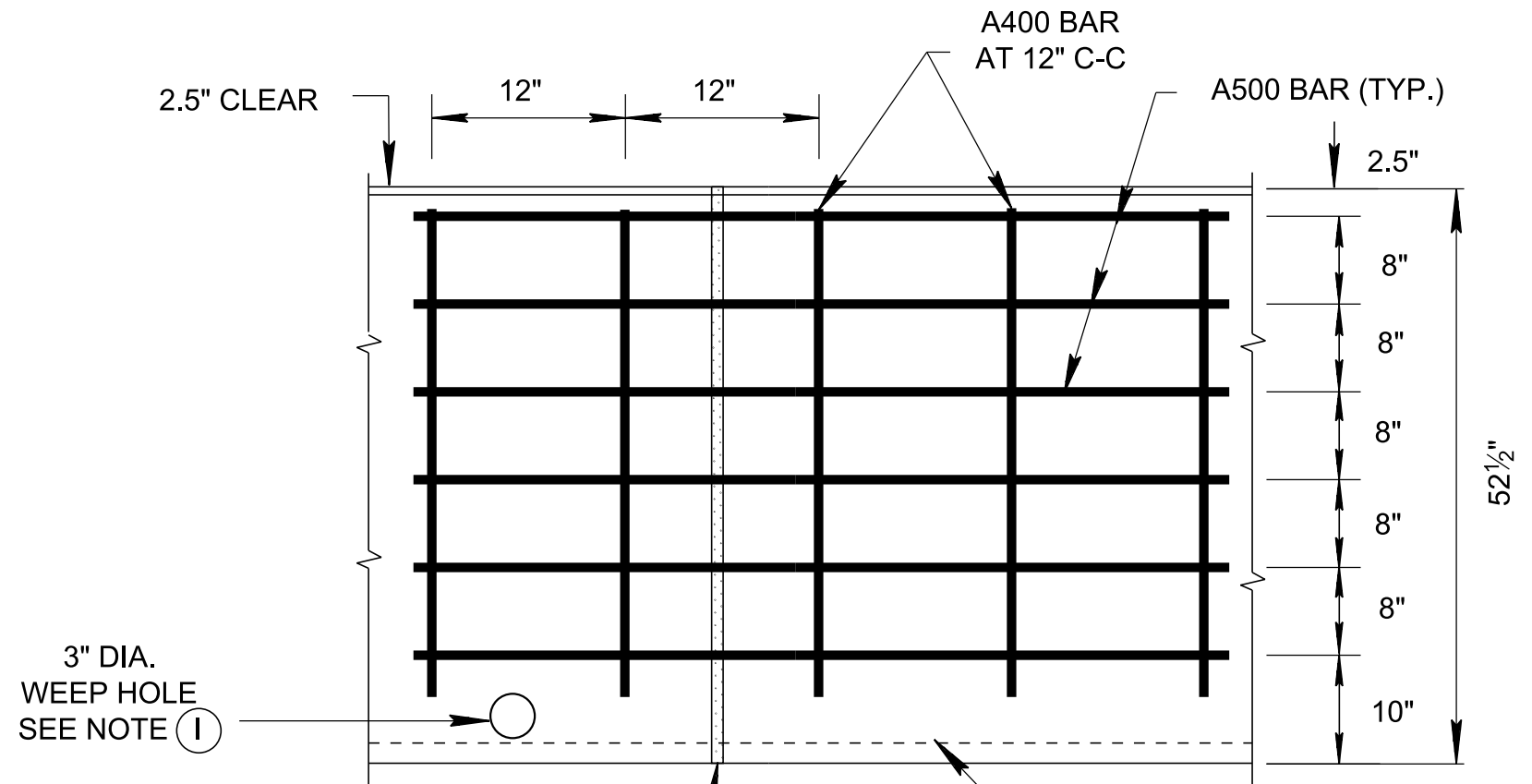


PLAN

NOTE: ALL A400, A500, AND A600 REINFORCING STEEL BARS ARE TO BE EPOXY COATED MEETING ALL REQUIREMENTS OF ASTM D3963.

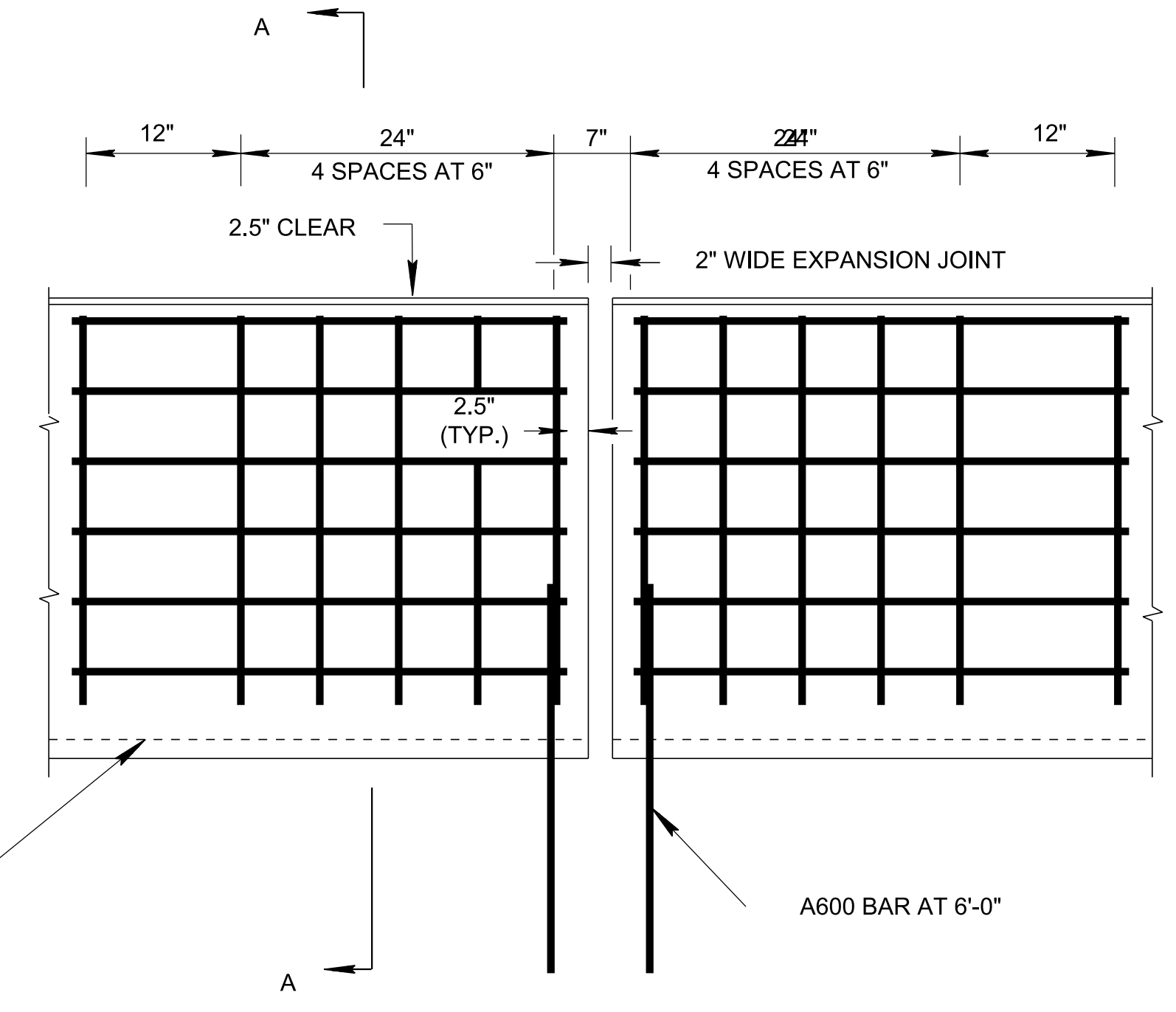
REINFORCING STEEL LEGEND	
47.5"	A400
VARIABLE	A500
48"	A600

- REV. 7-30-10: REVISED REINFORCING STEEL DETAILS AND GENERAL NOTES.
- REV. 1-15-13: REVISED SECTION A-A, ADDED WALL AT PRECAST NOISE WALL DETAIL.
- REV. 7-16-13: ADDED 12" GAP AT NOISE WALL AND EDITED NOTE N.
- REV. 05-01-20: REDREW SHEET.
- REV. 10-29-2021: REVISED # 57 STONE FILL WIDTH ON SECTIONS. GENERAL NOTES (P) AND (N) WERE REVISED.



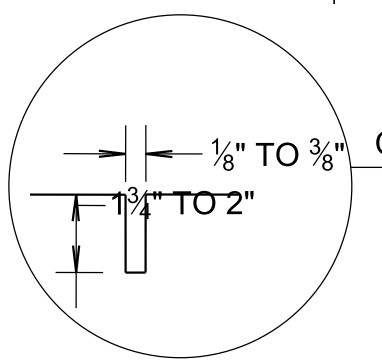
ELEVATION

DETAILS OF REINFORCING AT CONTRACTION JOINT FOR CONCRETE BARRIER



ELEVATION

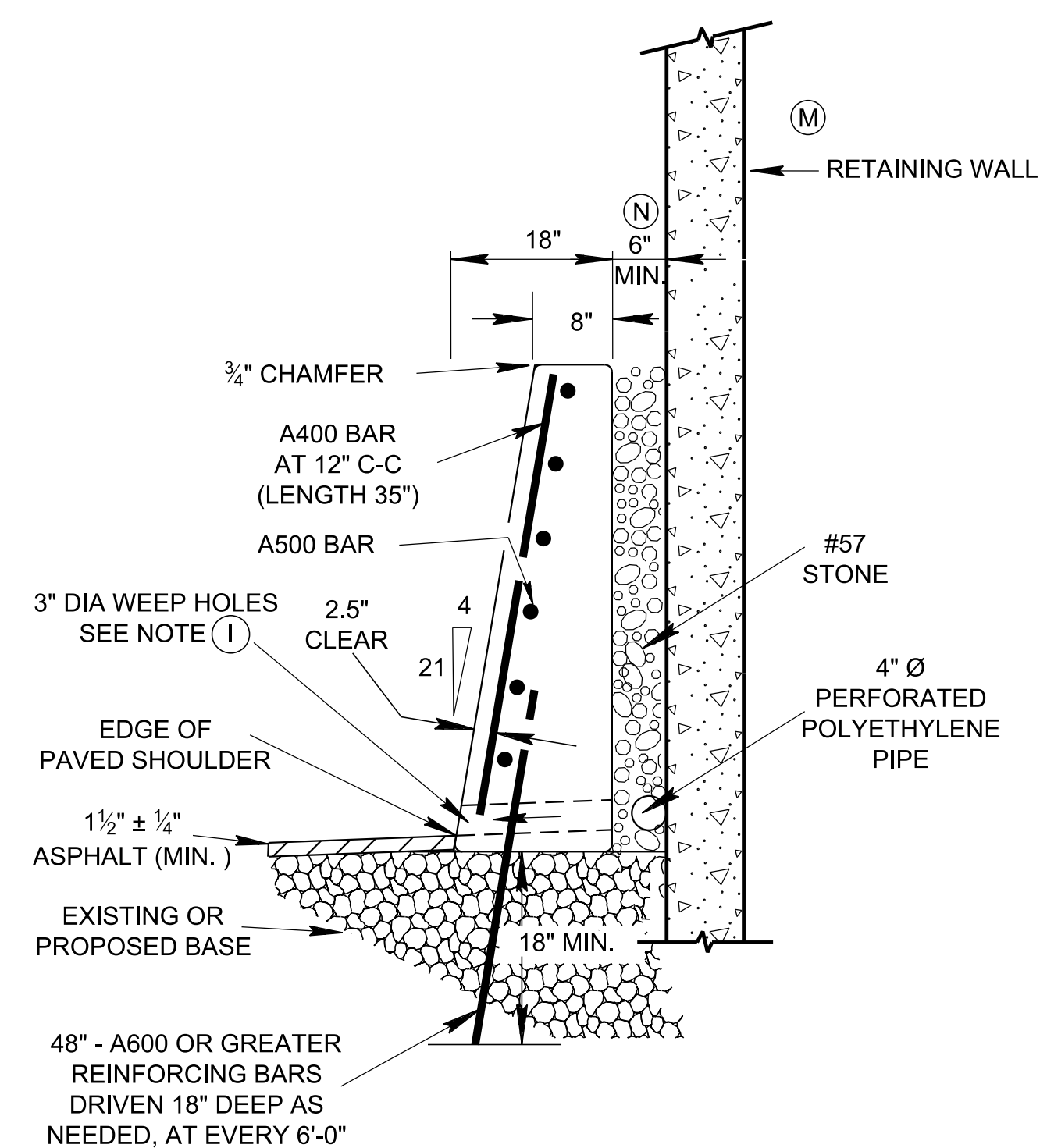
DETAILS OF REINFORCING AT WALL ENDS OR EXPANSION JOINT FOR CONCRETE BARRIER



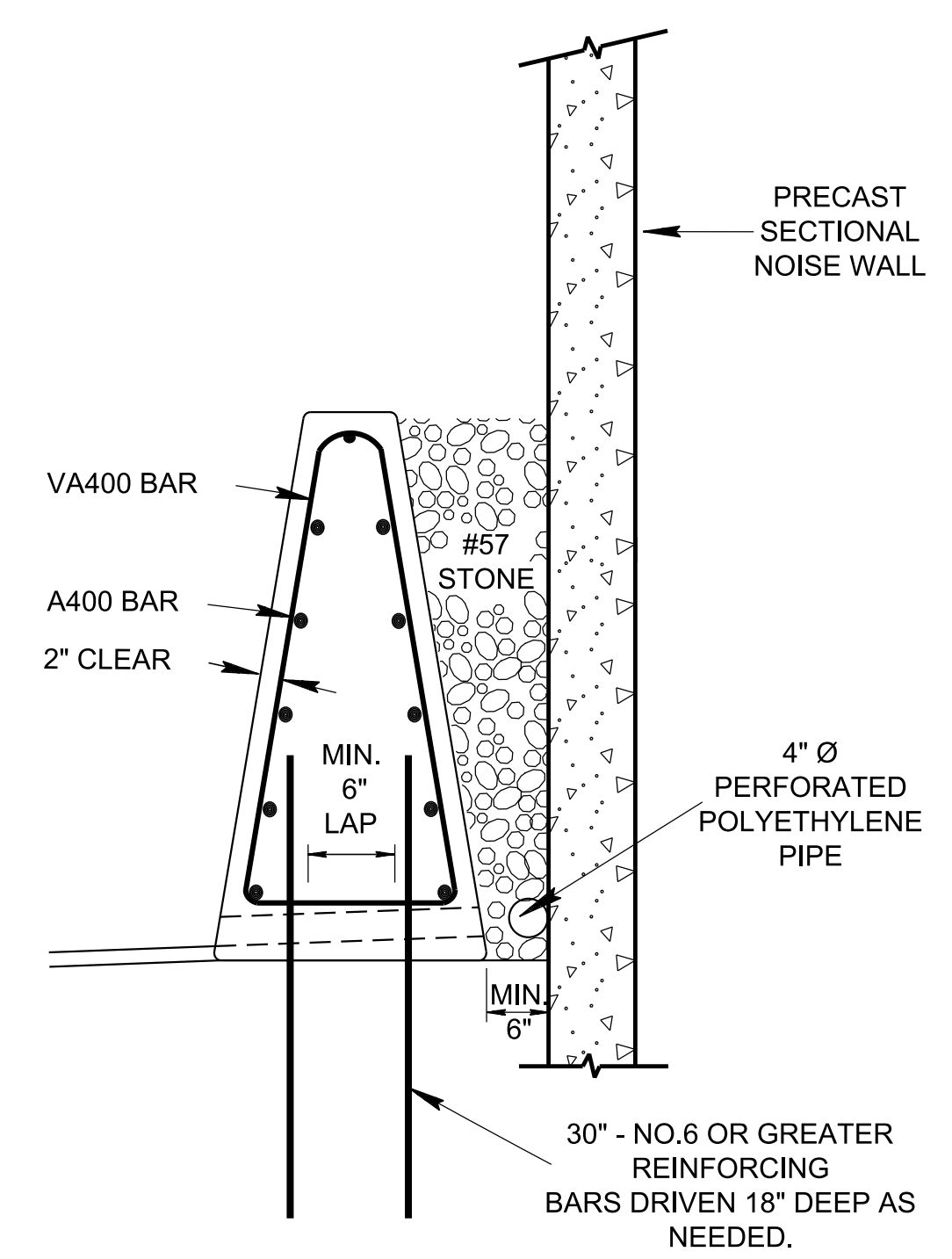
CONTRACTION JOINT DETAIL

FINISHED GRADE OR SURFACE OF SHOULDER

- GENERAL NOTES**
- (A) HALF SIZE SINGLE SLOPE CONCRETE BARRIER WALL IS TO BE USED IN CONJUNCTION WITH NOISE BARRIER OR RETAINING WALL INSIDE THE CLEAR ZONE AS SHOWN ON THIS DRAWING.
 - (B) CONCRETE BARRIER WALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTION 711 AND/OR CURRENT SPECIAL PROVISIONS.
 - (C) CONCRETE: $F_c = 3,000$ POUNDS PER SQUARE INCH AT 28 DAYS
REINFORCING STEEL: ASTM A615, $F_y = 60,000$ POUNDS PER SQUARE INCH
ALL REINFORCING IS TO BE INSTALLED AS DETAILED ON THIS DRAWING.
 - (D) THE CONCRETE BARRIER WALL SHALL BE GIVEN AN APPLIED TEXTURE FINISH. THE COLOR OF THE FINISH SHALL BE WHITE, FEDERAL SPECIFICATION NO. 37886. THE COST OF MATERIALS AND LABOR FOR THE TEXTURE FINISH SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.
 - (E) THE TWO (2) INCH OPEN EXPANSION JOINTS SHALL BE PLACED IN THE PROPOSED SINGLE SLOPE BARRIER WALL AT A MAXIMUM SPACING NOT TO EXCEED 300 FEET. IF FIXED OBJECTS SUCH AS BRIDGE PIERS, BRIDGE ENDS, OVERHEAD SIGN SUPPORTS, OR OTHER FEATURES PROJECTING THROUGH, INTO OR AGAINST THE BARRIER EXIST THAT REQUIRE TWO INCH EXPANSION JOINTS, THEN THE DISTANCE BETWEEN THE EXPANSION JOINTS IS TO BE REDUCED IN ORDER TO ALLOW AN EQUAL DISTANCE BETWEEN JOINTS THAT IS LESS THAN 300 FEET. ALL ADDITIONAL STEEL REQUIRED AT EXPANSION JOINTS TO BE EPOXY COATED REINFORCING STEEL. THE COST OF MATERIAL AND LABOR FOR THE JOINT INSTALLATION INCLUDING SAWING EXPANSION JOINTS SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.
 - (F) THE CONTRACTION JOINTS ARE TO BE SPACED AT 20 TO 25 FOOT INTERVALS WHEN CONSTRUCTED ON ASPHALT PAVEMENT. WHEN THE CONCRETE BARRIER WALL IS ATTACHED TO CONCRETE PAVEMENT THE CONTRACTION JOINTS WILL RESPOND TO THE JOINTS IN THE CONCRETE PAVEMENT. THE COST OF MATERIAL AND LABOR FOR THE JOINT INSTALLATION SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER. IF SAWED CONTRACTION JOINTS ARE USED, THE JOINTS MUST BE SAWED WITHIN FOUR (4) HOURS AFTER THE CONCRETE IS PLACED.
 - (G) THE COST OF FURNISHING AND INSTALLING BARRIER WALL DELINEATORS, INCLUDING ALL MATERIALS, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION, SHALL BE INCLUDED IN PRICE BID FOR CONCRETE BARRIER WALL. SEE STANDARD DRAWING T-M-18A FOR DELINEATOR MOUNTING DETAILS. BARRIER WALL DELINEATOR WILL NOT BE REQUIRED IN AREAS WHERE ROADWAY IS LIGHTED.
 - (H) CHAMFER ALONG TOP EDGES 3/4".
 - (I) FOR CONCRETE PAVEMENT: ANY METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL ROADWAY REINFORCING STEEL WILL BE FIXED AGAINST MOVEMENT AND POSITIONED $\pm 0.5"$ AS DIMENSIONED WHEN TIED TO THE TRANSVERSE ROADWAY REINFORCING STEEL WILL BE SATISFACTORY.
 - (J) 3" DIAMETER WEEP HOLES AT 10'-0" CENTER-TO-CENTER MAXIMUM ARE TO BE PLACED AT LOWEST POINT PRACTICAL FOR PROPER DRAINAGE WITH MIN. 4% SLOPE. WEEP HOLES SHOULD ALIGN WITH THE RETAINING WALL WEEP HOLES IF EXIST. CONSTRUCTION OF WEEP HOLES ARE TO BE PAID FOR UNDER THE PRICE BID FOR OTHER ITEMS OF CONSTRUCTION.
 - (K) FIBER EXPANSION JOINT FILLER MATERIAL TO BE 0.5" OR 1.0" PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 OF STANDARD SPECIFICATIONS.
 - (L) PAYMENT WILL BE MADE UNDER ITEM NO.:
711-05.72, SINGLE SLOPE HALF CONCRETE BARRIER WALL, L.F.
 - (M) MIN. SAFETY PERFORMANCE OF 52 1/2" SINGLE TO THE TL-3 EVALUATION CRITERIA SPECIFIED IN NCHRP REPORT 350. SEE TTI STUDY TPF-5(114).
 - (N) DO NOT USE HALF SIZE WALL WITH PRECAST SECTIONAL NOISE WALL SEE S-SSMB-2.
 - (O) FOR MSE RETAINING WALL OFFSET MAY BE 18" FOR CONCRETE RETAINING WALL OFFSET SHALL BE 6".



REINFORCING STEEL AT SECTION A-A (AT RETAINING WALL)



TYPICAL TREATMENT FOR BARRIER WALL AT PRECAST SECTIONAL NOISE WALL
(SEE S-SSMB-2)

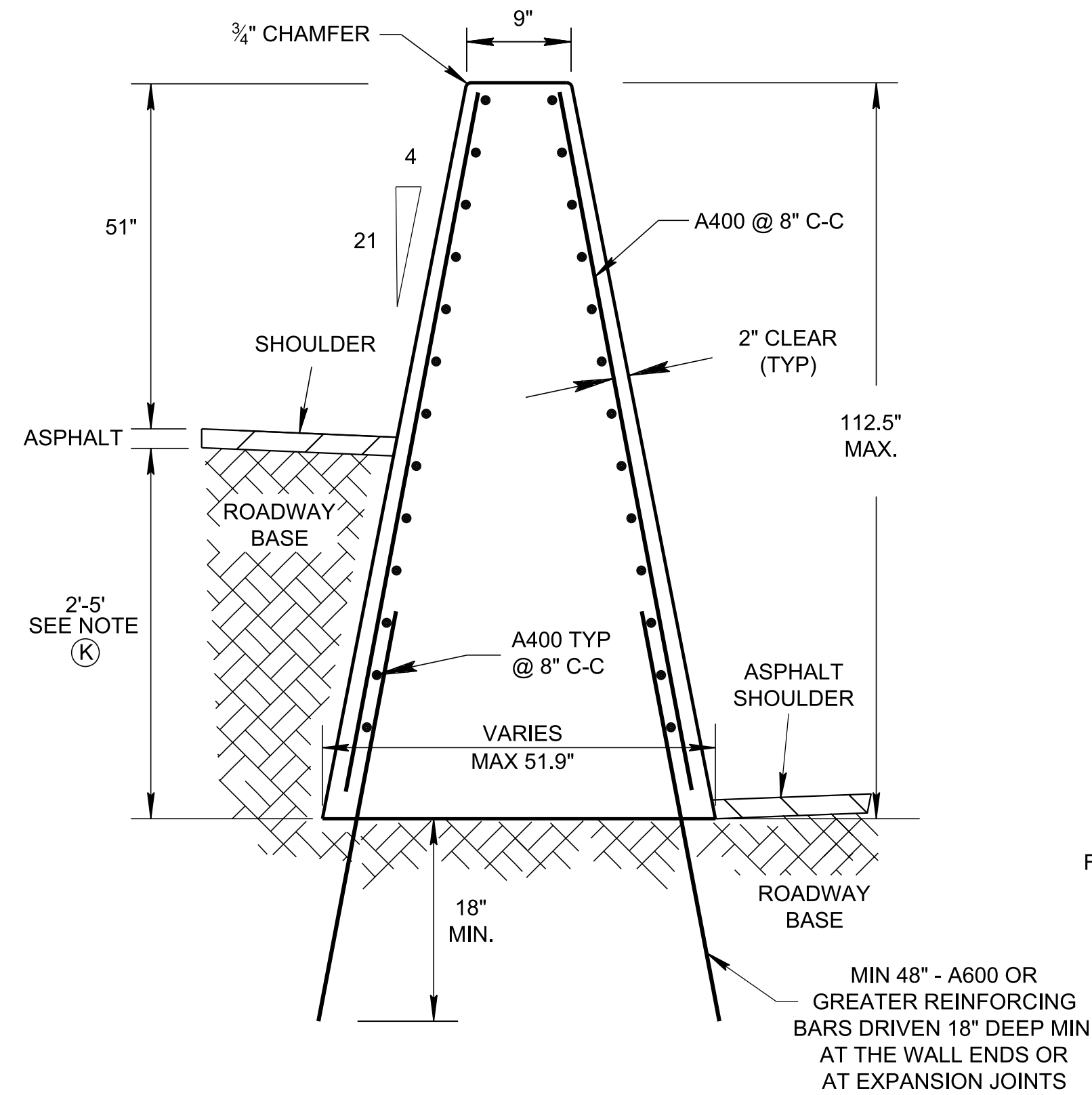
APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

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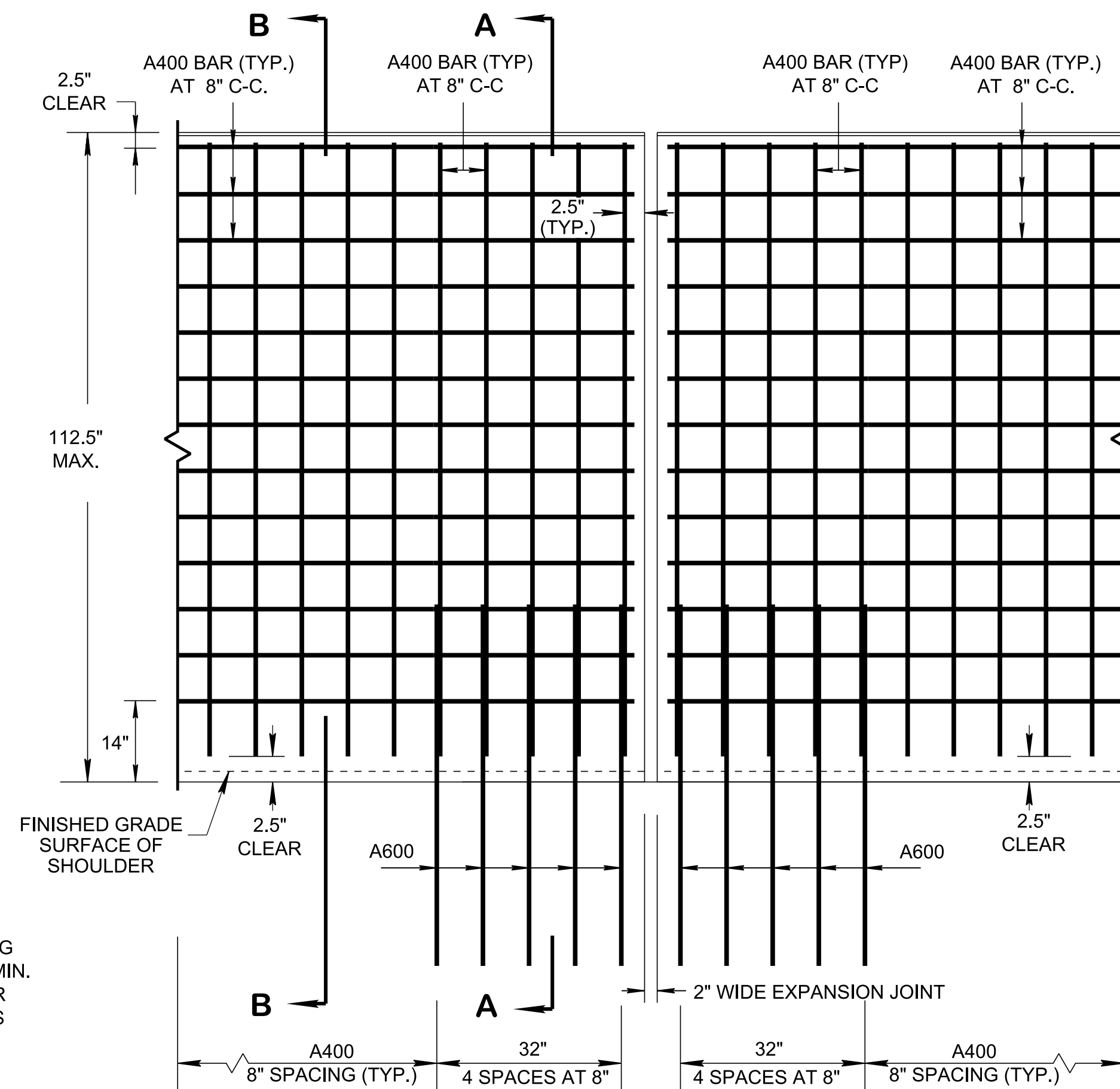
51"
HALF SIZE
SINGLE SLOPE
CONCRETE
BARRIER WALL

NOT TO SCALE

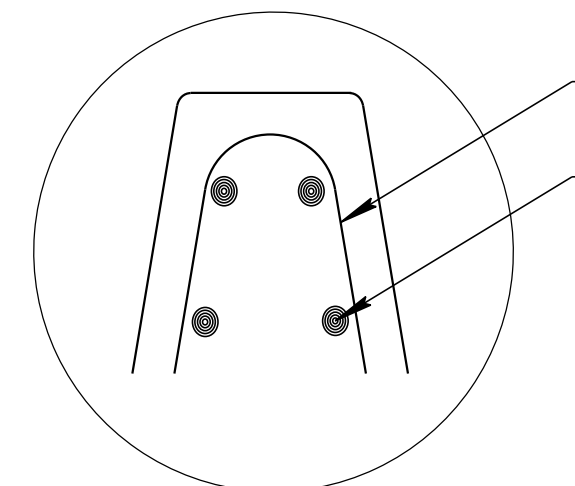
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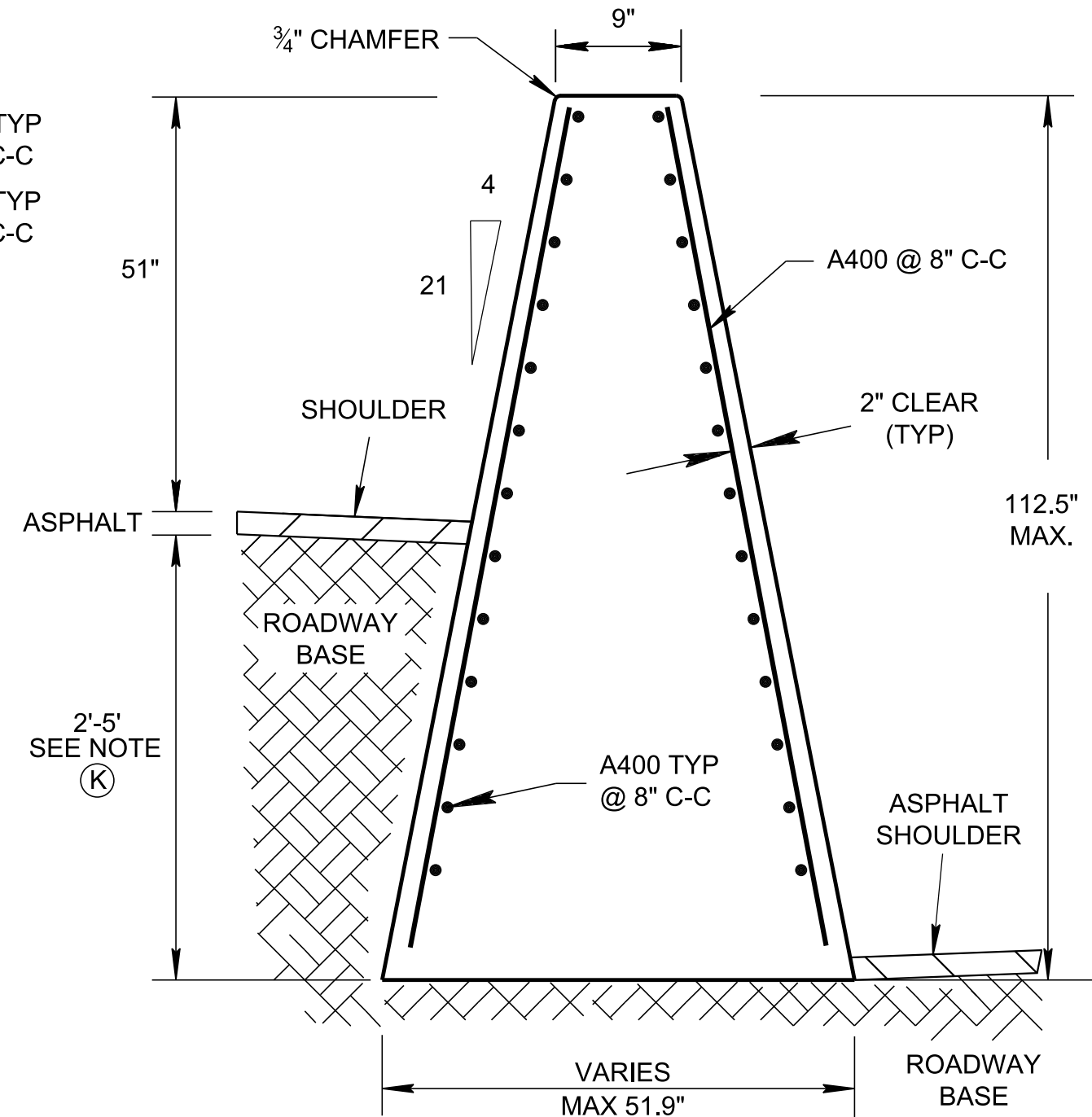
SECTION A-A
TYPICAL AT THE WALL ENDS
OR AT EXPANSION JOINTS



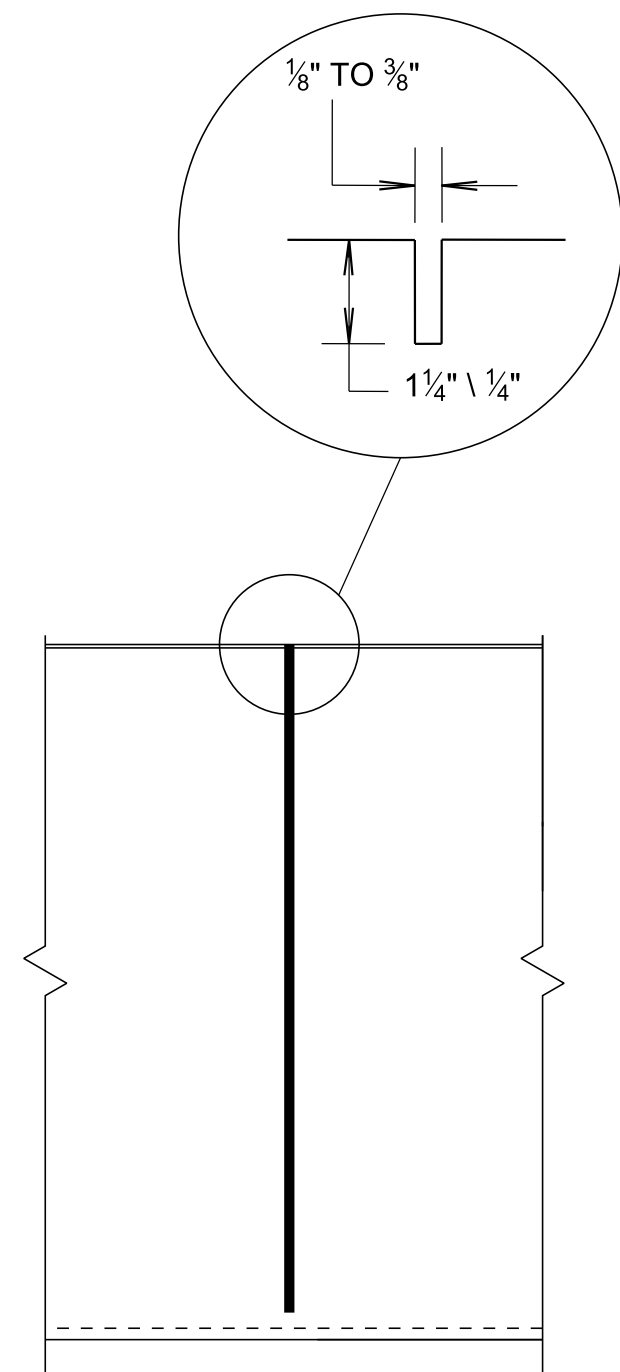
ELEVATION VIEW
ANCHORING REINFORCEMENT DETAIL



ALTERNATIVE DETAIL
SEE NOTE L



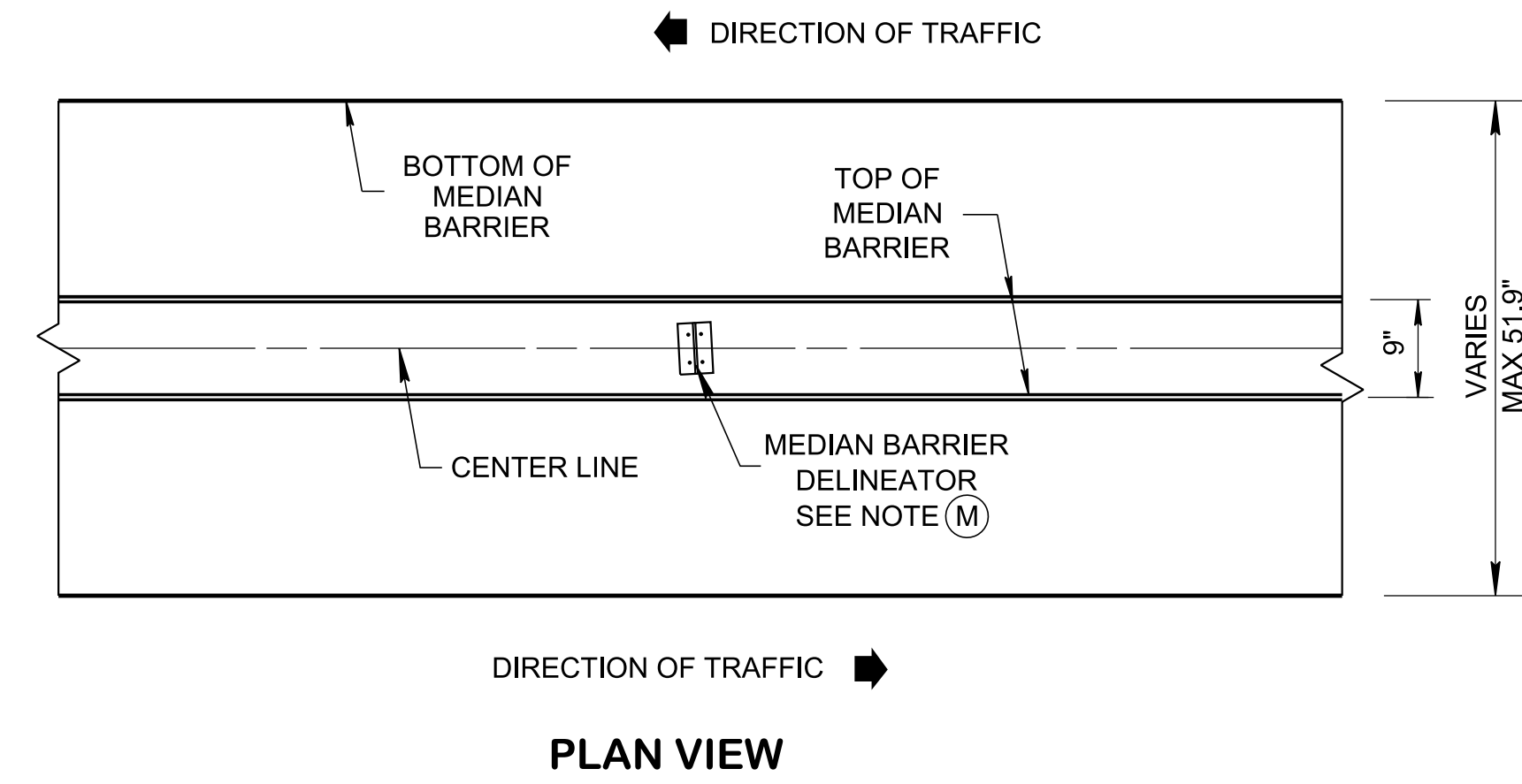
SECTION B-B
TYPICAL AT THE INTERMEDIATE WALL



CONTRACTION JOINT DETAIL
SEE NOTES B AND C

NOTE: ALL A400 AND A600 REINFORCING STEEL BARS ARE TO BE EPOXY COATED MEETING ALL REQUIREMENTS OF ASTM D3963.

REINFORCING STEEL LEGEND	
VARIABLE	A400
48"	A600



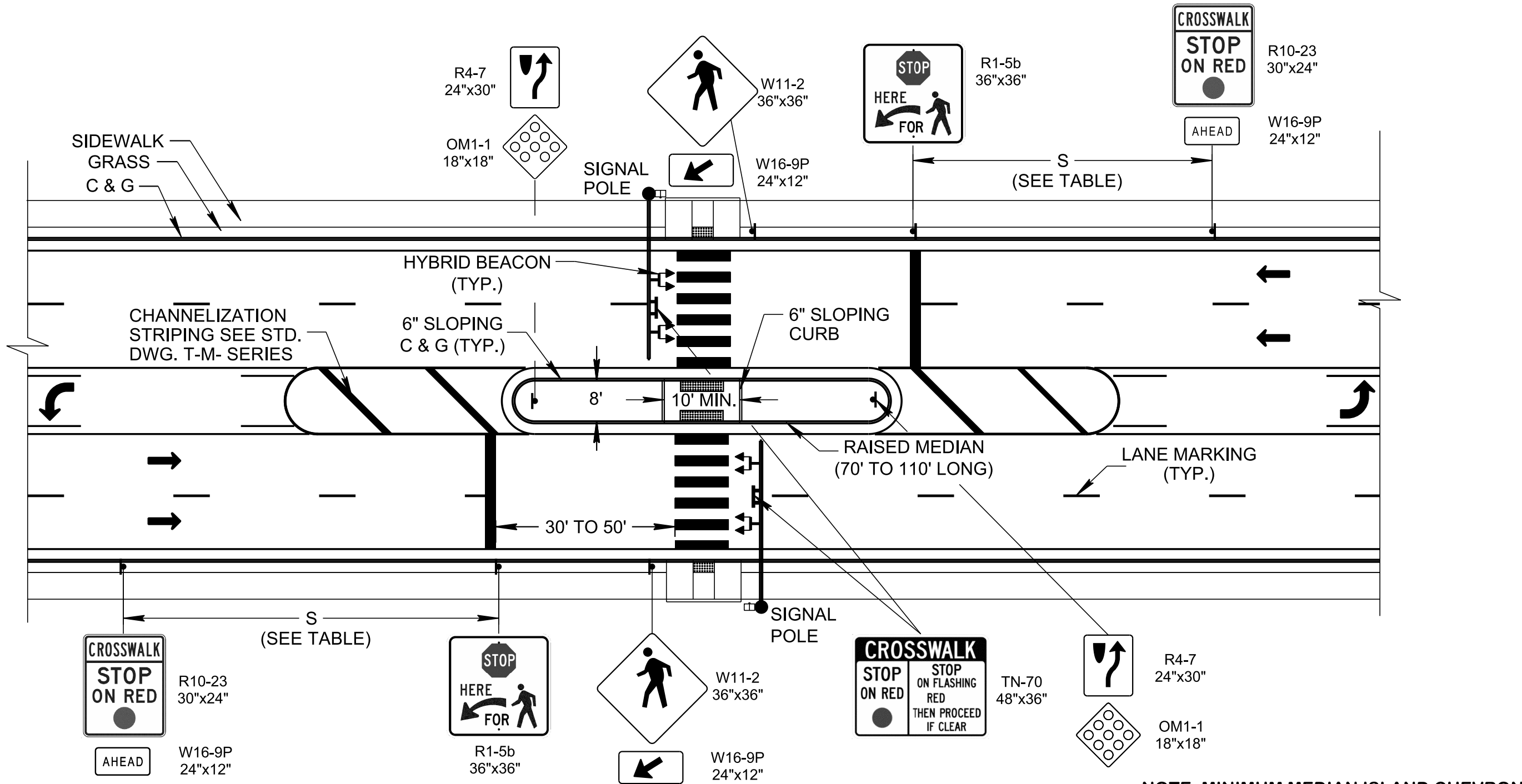
PLAN VIEW

- GENERAL NOTES**
- (A) CONCRETE BARRIER WALL SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTION 711 AND/OR CURRENT SPECIAL PROVISIONS. MINIMUM INSTALLATION REQUIREMENT OF WALL SECTION IS 60'.
 - (B) IF SAWED CONTRACTION JOINTS ARE USED, THE JOINTS MUST BE SAWED WITHIN FOUR (4) HOURS AFTER THE CONCRETE IS PLACED.
 - (C) THE CONTRACTION JOINTS ARE TO BE SPACED AT 20 TO 25 FOOT INTERVALS WHEN CONSTRUCTED ON ASPHALT PAVEMENT. WHEN THE CONCRETE BARRIER WALL IS ATTACHED TO CONCRETE PAVEMENT THE CONTRACTION JOINTS WILL CORRESPOND TO THE JOINTS IN THE CONCRETE PAVEMENT. THE COST OF MATERIAL AND LABOR FOR THE JOINT INSTALLATION SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.
 - (D) THE CONCRETE BARRIER WALL SHALL BE GIVEN AN APPLIED TEXTURE FINISH. THE COLOR OF THE FINISH SHALL BE WHITE, FEDERAL SPECIFICATION NO. 37886. THE COST OF MATERIALS AND LABOR FOR THE TEXTURE FINISH SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.
 - (E) THE TWO (2) INCH OPEN EXPANSION JOINTS SHALL BE PLACED AT A MAXIMUM SPACING NOT TO EXCEED 300 FEET. IF FIXED OBJECTS SUCH AS BRIDGE PIERS, BRIDGE ENDS, OVERHEAD SIGN SUPPORTS, OR OTHER FEATURES PROJECTING THROUGH, INTO OR AGAINST THE BARRIER EXIST THAT REQUIRE TWO INCH EXPANSION JOINTS, THEN THE DISTANCE BETWEEN THE EXPANSION JOINTS IS TO BE REDUCED IN ORDER TO ALLOW AN EQUAL DISTANCE BETWEEN JOINTS THAT IS LESS THAN 300 FEET. ALL ADDITIONAL STEEL REQUIRED AT EXPANSION JOINTS TO BE EPOXY COATED REINFORCING STEEL. THE COST OF MATERIAL AND LABOR FOR THE JOINT INSTALLATION SHALL BE INCLUDED IN THE BID PRICE FOR CONCRETE MEDIAN BARRIER.
 - (F) CHAMFER TOP AND END EDGES 3/4 INCH.
 - (G) BAR SPLICES FOR ROADWAY BARRIER SHALL BE A MINIMUM OF 24 TIMES THE NOMINAL DIAMETER OF THE BAR.
 - (H) ANY METHOD DEvised BY THE CONTRACTOR AND APPROVED BY THE ENGINEER THAT WILL ASSURE THE LONGITUDINAL ROADWAY REINFORCING STEEL WILL BE FIXED AGAINST MOVEMENT AND POSITIONED ± 1/2 INCH AS DIMENSIONED WHEN TIED TO THE TRANSVERSE ROADWAY REINFORCING STEEL WILL BE SATISFACTORY.
 - (I) PAYMENT WILL BE MADE UNDER ITEM NO. 711-05.78, GRADE SEPARATED SINGLE SLOPE MEDIAN WALL PER LINEAR FOOT.
 - (J) MIN. SAFETY PERFORMANCE OF 112.5" SINGLE SLOPE WALL IS ACCEPTABLE ACCORDING TO THE TL-4 EVALUATION CRITERIA SPECIFIED IN MASH AS REPORT 405160-3335.
 - (K) IF GRADE SEPARATION IS LESS THAN 2', USE STANDARD 51" MEDIAN BARRIER (S-SSMB-2)
 - (L) A SINGLE H BAR MAY BE SUBSTITUTED FOR THE TWO A400 BARS AS SHOWN.
 - (M) REFER TO STANDARD DRAWING T-M-18A FOR MEDIAN BARRIER DELINEATOR DETAILS AND NOTES. THE COST OF FURNISHING AND INSTALLING MEDIAN BARRIER DELINEATORS SHALL BE INCLUDED WITH THE BID PRICE FOR CONCRETE MEDIAN BARRIERS.

REV. 7-16-13: ADDED NOTES (K) AND (L) AND ADDED ALTERNATIVE.
 REV. 05-01-20: REDREW SHEET.
 REV. 06-15-21: REVISED SECTIONS AND REDREW THE REINFORCEMENT DETAIL. REMOVED DELINEATOR MOUNTING DETAIL AND NOTES. ADDED PLAN AND GENERAL NOTE (M). REVISED GENERAL NOTE (A).
 REV. 10-29-2021: REVISED DELINEATOR STANDARD DRAWING NUMBER ON GENERAL NOTE (M).

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SINGLE SLOPE BARRIER WALL FOR GRADE SEPARATED MEDIAN



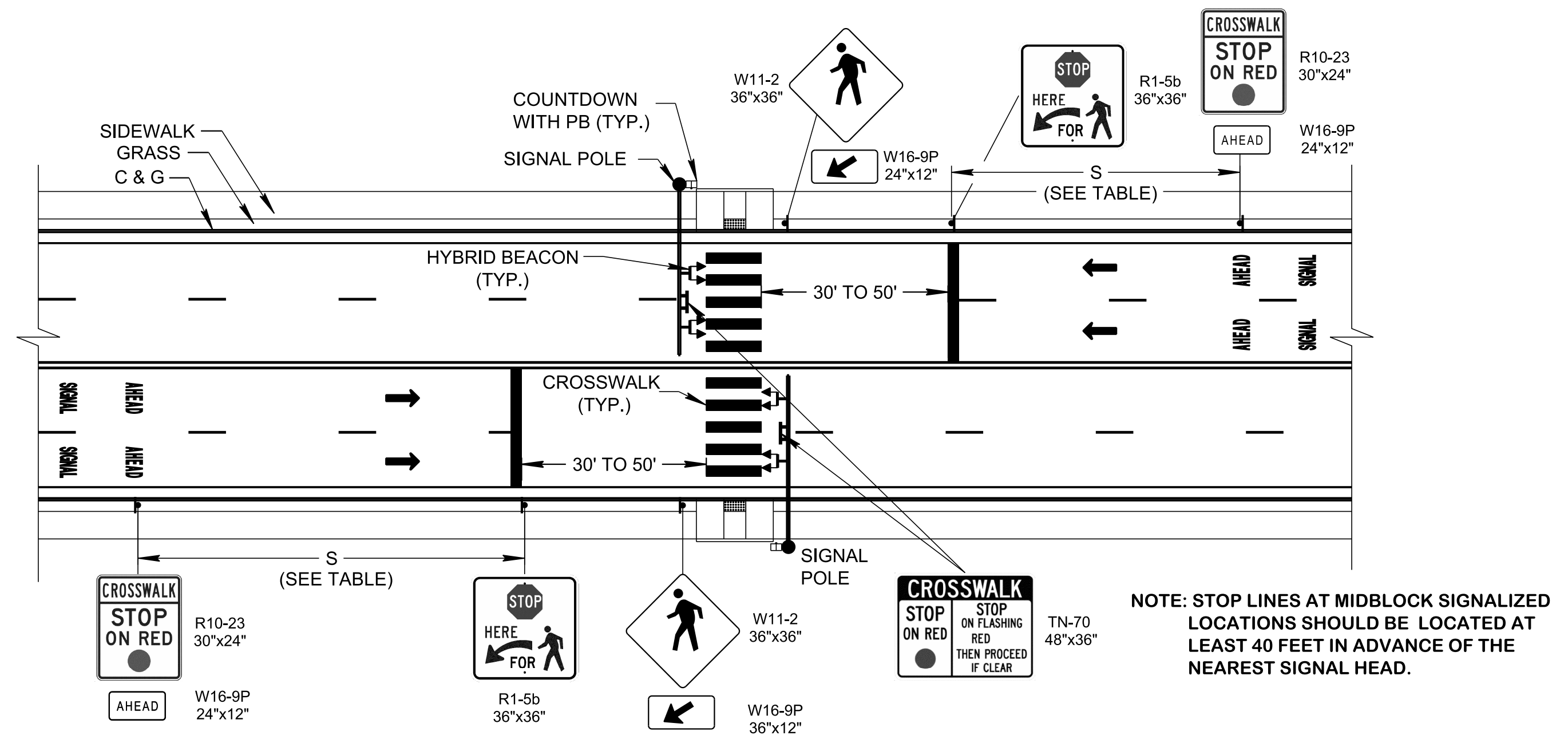
5 LANES WITH PEDESTRIAN HYBRID BEACON MID-BLOCK CROSSING

MINIMUM ADVANCE PLACEMENT OF PEDESTRIAN WARNING SIGNS	
POSTED SPEED	WARNING SIGNS MINIMUM ADVANCE PLACEMENT DISTANCE - S
≤ 35 MPH	100 FT
40 MPH	125 FT
45 MPH	175 FT

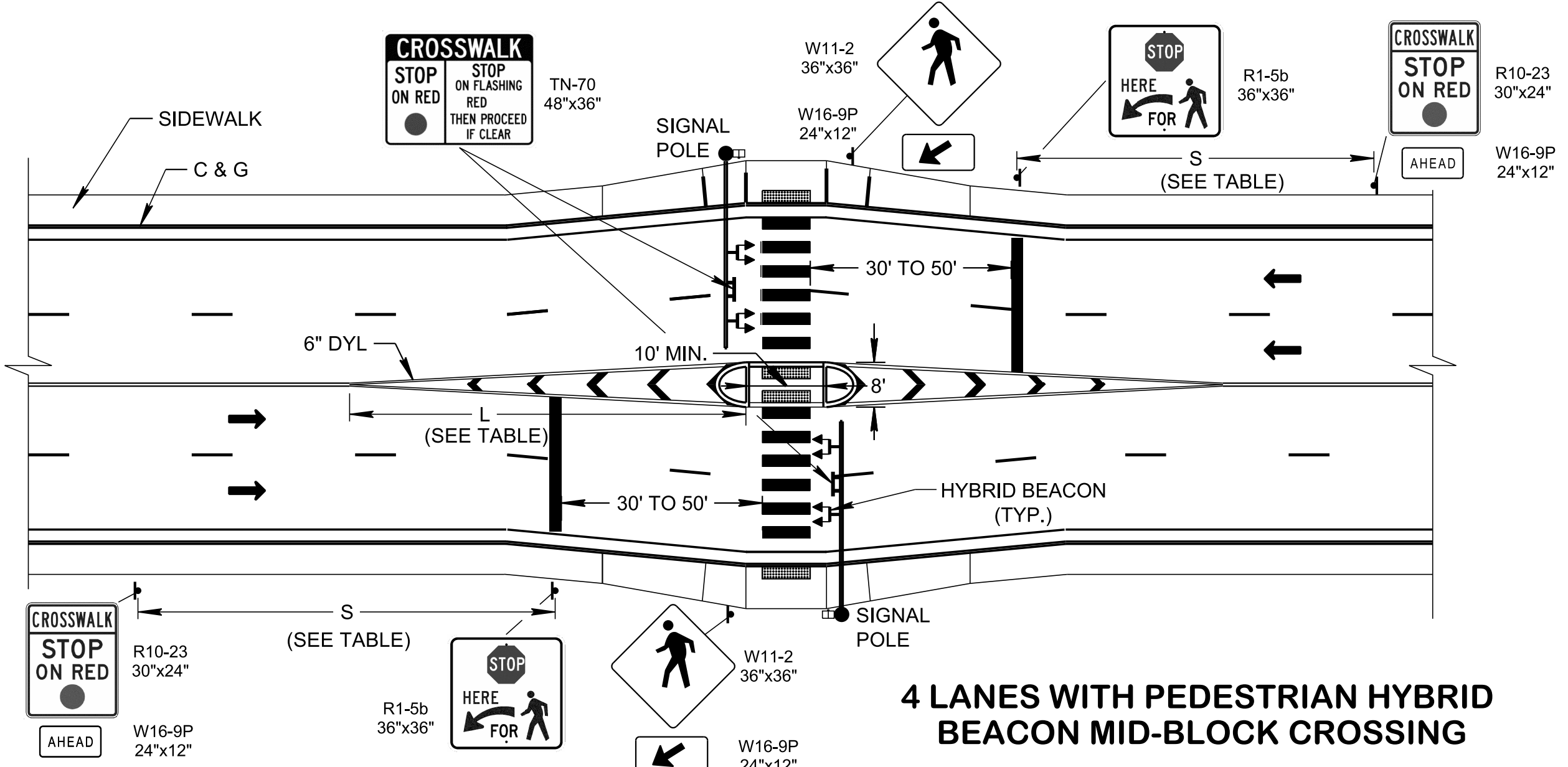
THE APPROPRIATE TAPER LENGTH (L)	
$L = \frac{WS^2}{60}$	40 MPH OR LESS
$L = WS$	45 MPH OR MORE

WHERE:
 L = TAPER LENGTH IN FEET
 W = WIDTH OF OFFSET IN FEET
 S = POSTED SPEED

LEGEND	
	PEDESTRIAN HYBRID BEACON
	GROUND MOUNT SIGN
	MAST ARM SIGNAL POLE
	COUNTDOWN PEDESTRIAN SIGNAL HEAD WITH PUSH BUTTON AND SIGN
	DETECTABLE WARNING SURFACE



4 LANES WITH PEDESTRIAN HYBRID BEACON MID-BLOCK CROSSING



4 LANES WITH PEDESTRIAN HYBRID BEACON MID-BLOCK CROSSING

GENERAL NOTES

- (A) DETAILS SHOWN ON THIS STANDARD DRAWING APPLY TO THE CONSTRUCTION OR RECONSTRUCTION OF MID-BLOCK CROSSINGS AND MODIFICATION OF STREETS, CURBS, OR SIDEWALKS ASSOCIATED WITH IT. SEE TDOT-RDG FOR ADDITIONAL INFORMATION FOR SITE SELECTION, NEW CONSTRUCTION OR RECONSTRUCTION DURING PEDESTRIAN SAFETY INITIATIVE, SPOT SAFETY IMPROVEMENTS AT LOCATIONS MAX 45 MPH. OTHER LOCATIONS WILL NEED SITE SPECIFIC ANALYSIS.
- (B) FOR NEW CONSTRUCTION A TRAFFIC ENGINEERING STUDY WILL HAVE TO BE CONDUCTED TO DETERMINE IF A MID-BLOCK CROSSING IS WARRANTED. MID-BLOCK CROSSINGS SHALL BE INSTALLED DURING RECONSTRUCTION PROJECTS AND REPAVING PROJECTS AT LOCATIONS WHERE EXISTING PEDESTRIAN SAFETY IS A CONCERN.
- (C) PEDESTRIAN IN CROSSWALK SIGNS (W11-2) SHALL BE INSTALLED AT EACH END OF THE CROSSWALK LOCATION. THE SIGNS SHALL BE PLACED IN ADVANCE OF THE CROSSWALK ADJACENT TO THE TRAVEL LANE AND FACING THE DRIVER. REFER TO THE MUTCD FOR ADDITIONAL WARNING SIGNS, TYPE AND LOCATION.
- (D) FOR CURB RAMP, THE DETECTABLE WARNING SURFACE, PAVEMENT MARKINGS, AND CROSSWALK MARKING DETAILS, SEE STD. DWG. SERIES MM-CR AND MM-PM RESPECTIVELY. FOR MARKING STANDARDS AND CONCRETE CURB AND GUTTER SEE STD. DWG T-M- SERIES AND RP-VC SERIES RESPECTIVELY.
- (E) FOR PEDESTRIAN SIGNAL PUSH BUTTONS, I.E HAWK, SEE TDOT TRAFFIC DESIGN MANUAL. IF THE PEDESTRIAN CLEARANCE TIME IS SUFFICIENT ONLY TO CROSS FROM THE CURB OR SHOULDER TO A MEDIAN OF SUFFICIENT WIDTH FOR PEDESTRIANS TO WAIT AND THE SIGNALS ARE PEDESTRIAN ACTUATED, AN ADDITIONAL PEDESTRIAN DETECTOR SHALL BE PROVIDED IN THE MEDIAN.
- (F) STOP LINES SHOULD BE PLACED AT A SUFFICIENT DISTANCE (30' TO 50') FROM THE CROSSWALK TO ENSURE VISIBILITY IS PROVIDED FOR BOTH MOTORISTS AND PEDESTRIANS. STOP LINES AT MID-BLOCK SIGNALIZED LOCATIONS SHOULD BE PLACED AT LEAST 40 FEET IN ADVANCE OF THE NEAREST SIGNAL INDICATION.
- (G) STOP LINES SHALL CONSIST OF SOLID WHITE LINES EXTENDING ACROSS APPROACH LINES TO INDICATE THE POINT AT WHICH THE STOP IS INTENDED OR REQUIRED TO BE MADE. IF STOP LINES ARE USED AT A CROSSWALK THAT CROSSES AT AN UNCONTROLLED MULTI-LANE APPROACH, STOP HERE FOR PEDESTRIANS (R1-5 SERIES) SIGNS SHALL BE USED.
- (H) THE PLACEMENT OF MID-BLOCK SIGNALS. THE PRIMARY SIGNALIZED TREATMENT THAT SHOULD BE CONSIDERED AT MID-BLOCK OR NON-INTERSECTION CROSSINGS IS THE HIGH INTENSITY ACTIVATED CROSSWALK (HAWK) PEDESTRIAN HYBRID BEACON (PHB). A HAWK PEDESTRIAN HYBRID BEACON SHOULD BE EXAMINED WHERE THE PPH EXCEEDS 20 AND MOTOR VEHICULAR SPEEDS EXCEED 35 MPH.
- (I) RECTANGULAR RAPID FLASHING BEACON (RRFB) MAYBE USED AS AN ALTERNATIVE TO ASSIST PEDESTRIANS CROSSING IN A MARKED CROSSWALK AT AN UNSIGNALIZED INTERSECTION WITH SPEED LIMITS LESS THAN 40 MPH. SEE STANDARD DRAWING T-M-4A FOR UNSIGNALIZED MID-BLOCK CROSSING.
- (J) A MEDIAN SHOULD BE AT LEAST 8.0 FEET WIDE TO ALLOW THE PEDESTRIAN TO WAIT COMFORTABLY IN THE CENTER, IF THE DESIRED 8 FEET CANNOT BE ACHIEVED, USE A MINIMUM WIDTH OF 6 FEET. THE PEDESTRIAN CROSSWALK MEDIAN ISLAND ARE ADA-APPROVED RAMP (1:12 GRADE) SHOULD BE USED. IT IS BEST TO PROVIDE A SLIGHT GRADE 2 PERCENT TO PERMIT WATER AND SILT TO DRAIN FROM THE AREA. DRAINAGE STRUCTURES SHALL NOT BE PLACED IN LINE WITH RAMP. INSTALL CATCH BASINS ON UPSTREAM SIDE OF RAMP FOR ROADS WITH GRADES LESS THAN 2%.
- (K) WHEN A PEDESTRIAN HYBRID BEACON IS USED, A CROSSWALK STOP ON RED (TN-70) SIGN SHALL BE MOUNTED ADJACENT TO A PEDESTRIAN HYBRID BEACON FACE ON EACH MAJOR STREET APPROACH. THE PEDESTRIAN HYBRID BEACON SHOULD BE INSTALLED AT LEAST 100 FEET FROM SIDE STREETS OR DRIVEWAYS THAT ARE CONTROLLED BY STOP OR YIELD SIGNS.
- (L) PARKING AND OTHER SIGHT OBSTRUCTIONS SHOULD BE PROHIBITED FOR AT LEAST 100 FEET IN ADVANCE OF AND AT LEAST 20 FEET BEYOND THE MARKED CROSSWALK, OR SITE ACCOMMODATIONS SHOULD BE MADE THROUGH CURB EXTENSIONS OR OTHER TECHNIQUES TO PROVIDE ADEQUATE SIGHT DISTANCE. THE INSTALLATION SHOULD INCLUDE SUITABLE STANDARD SIGNS AND PAVEMENT MARKINGS.
- (M) STREETLIGHTS SHOULD BE INSTALLED AT THE CROSSWALK ON BOTH SIDES ROAD TO IMPROVE PEDESTRIAN COMFORT, SECURITY, AND SAFETY DURING DARK AND BAD WEATHER CONDITIONS. FLUORESCENT YELLOW-GREEN SIGNS PROVIDE SUPERIOR VISIBILITY AND ARE EASILY NOTICEABLE IN DAYLIGHT AND DARK CONDITIONS. USE FLUORESCENT YELLOW-GREEN SIGNS FOR PEDESTRIAN AND BICYCLE WARNING TO HELP KEEP PEDESTRIANS AND DRIVERS SAFE.
- (N) MID BLOCK CROSSWALKS SHOULD BE LOCATED AT LEAST 100 FEET FROM THE NEAREST SIDE STREET OR DRIVEWAY SO THAT DRIVERS TURNING ONTO THE MAJOR STREET HAVE A CHANCE TO NOTICE PEDESTRIANS AND PROPERLY YIELD TO PEDESTRIANS WHO ARE CROSSING THE STREET.
- (O) ADD CHANNELIZING DEVICES AT MID-BLOCK PEDESTRIAN CROSSINGS IN CONJUNCTION WITH IN STREET PEDESTRIAN CROSSING (R1-6 SERIES) SIGNS AS NEEDED.
- (P) PAYMENT 702-01, 702-03, 713-15.40, 716-02.03, 716-02.04, 716-02.05, 730-26.01, CONCRETE CURB, CONCRETE COMBINED CURB AND GUTTER, SIGN INSTALLATION (DESCRIPTION), PLASTIC PAVEMENT MARKING (CROSSWALK), PLASTIC PAVEMENT MARKING (CHANNELIZATION STRIPING), PAVEMENT MARKING (STOP LINE), PEDESTRIAN SIGNAL DISPLAY, PER C.Y., PER C.Y., PER L.S., PER L.F., PER S.Y., PER L.F., PER EACH.

REV. 07-17-20: REMOVED RIGHT TURN ARROWS FROM THE MIDDLE LANE.
 REV. 11-30-20: REVISED CROSSWALK SIGN ON GENERAL NOTE (C). ADDED GENERAL NOTE (P).
 REV. 06-15-21: REVISED GENERAL NOTES (E) AND (I). REMOVED MINIMUM ADVANCE PLACEMENT TABLE NOTE.
 REV. 10-29-21: REMOVED PHB SIGN AND ADDED TN-70 AND R10-23 SIGNS ON THE DRAWINGS. REVISED GENERAL NOTE (X).

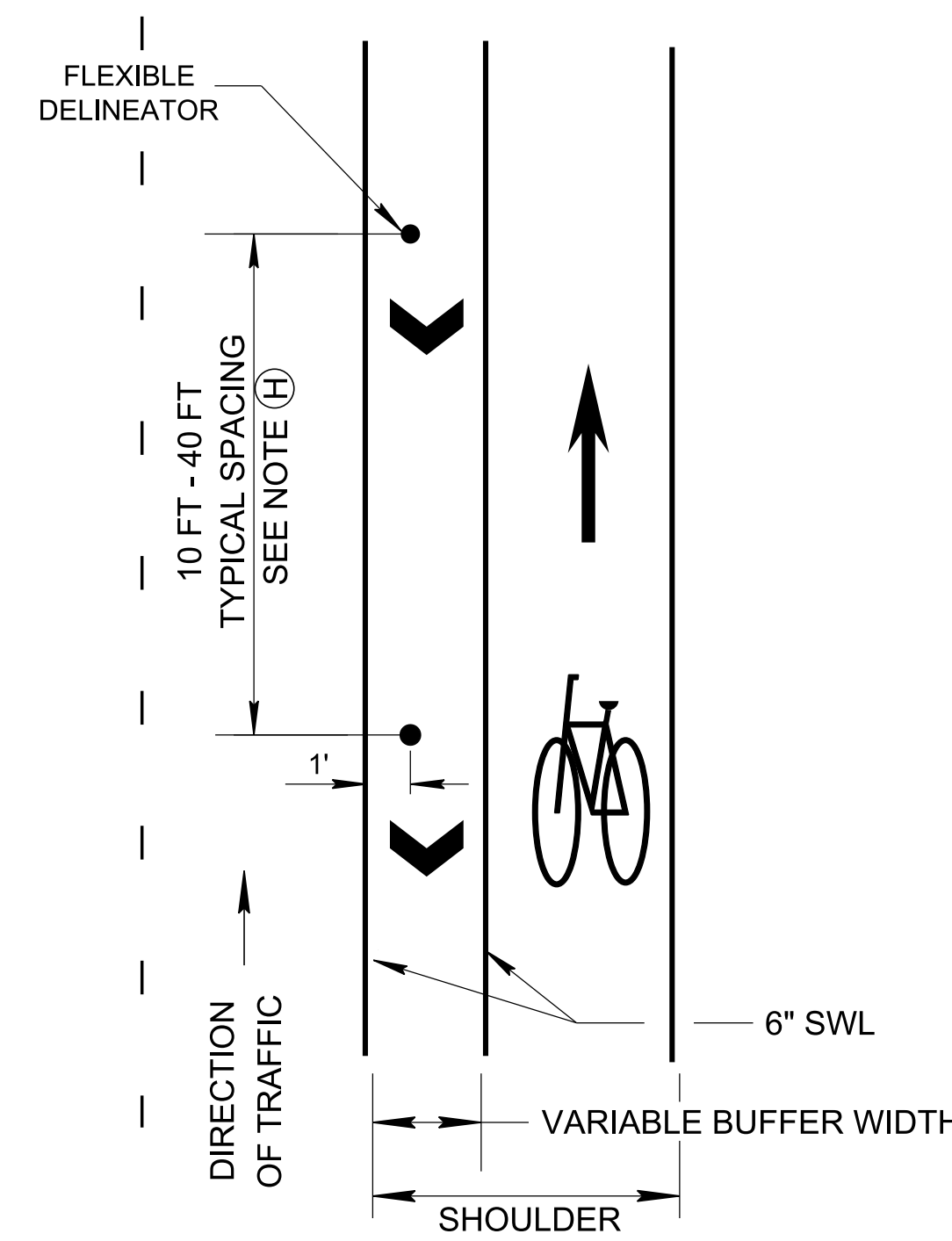
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STANDARD SIGNALIZED MID-BLOCK CROSSING

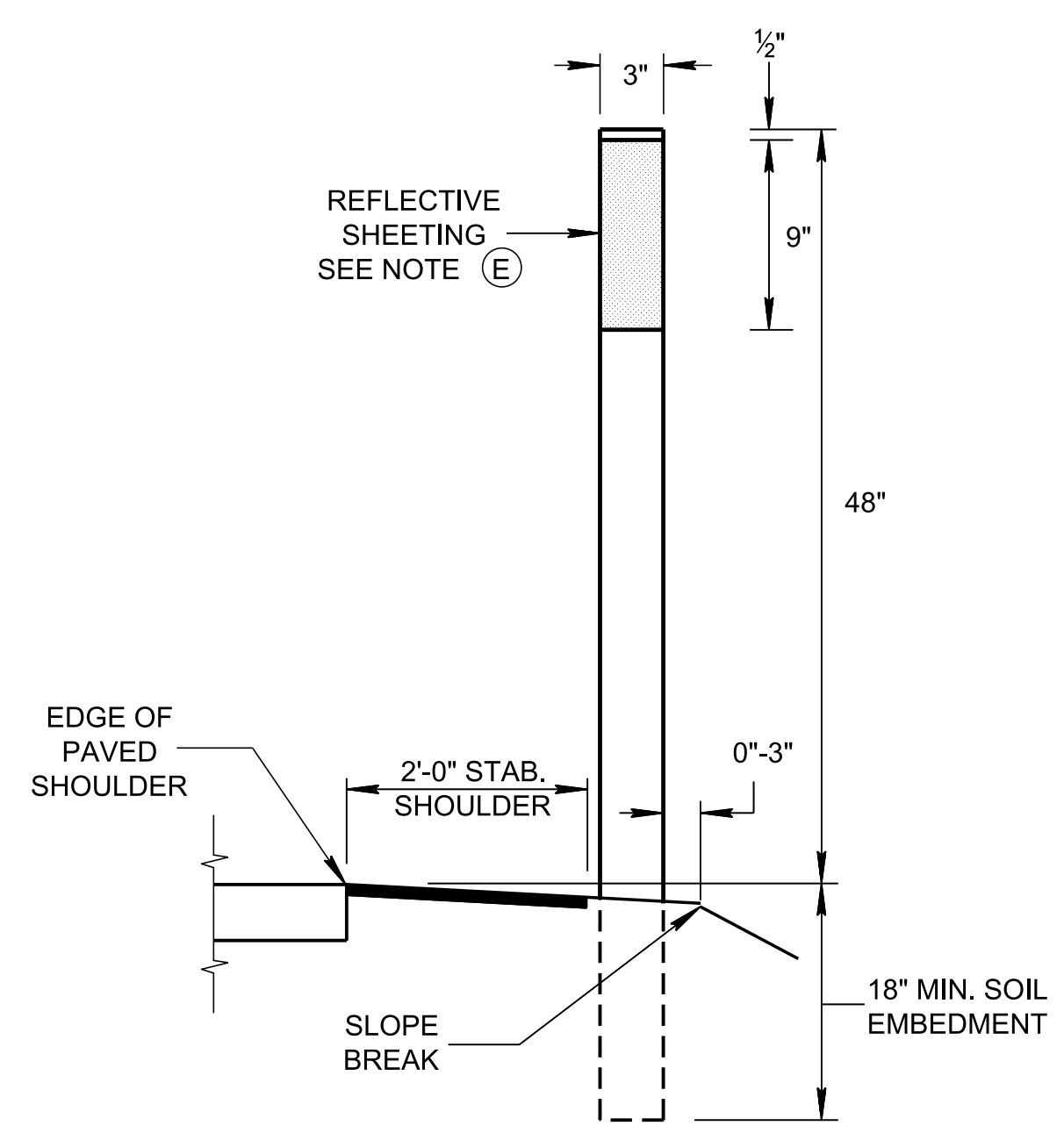
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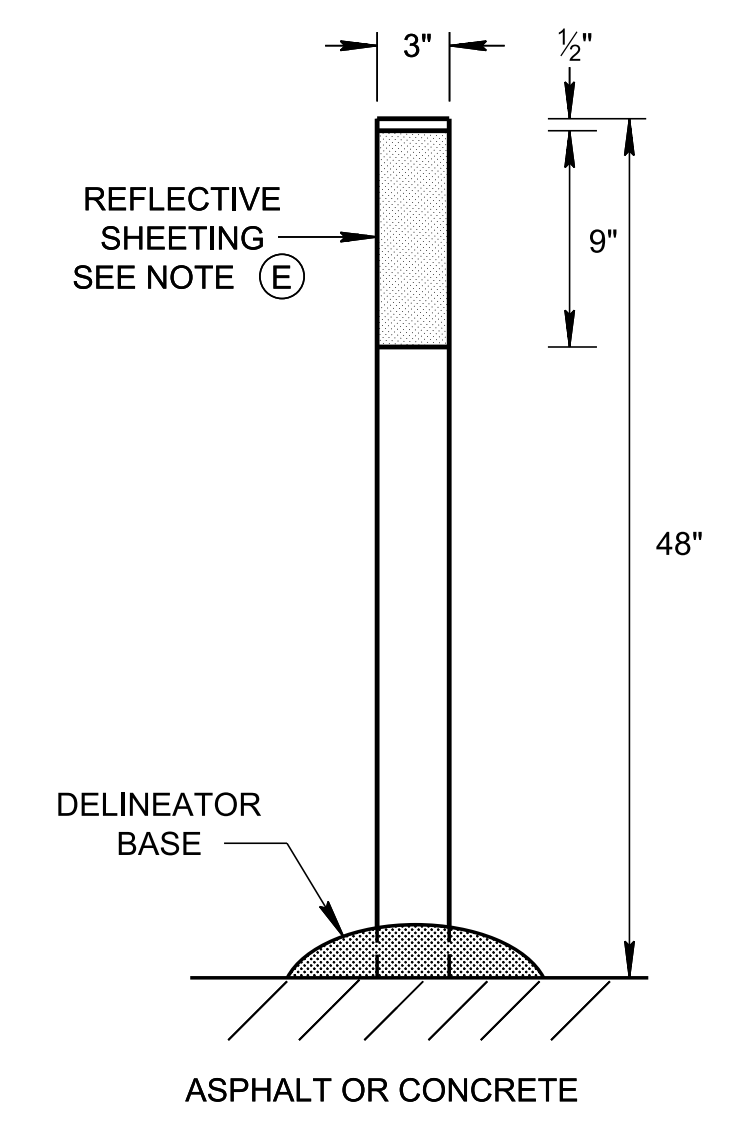
REV. 06-15-2021: ADDED FLEXIBLE DELINEATOR MOUNTING DETAILS AND NOTES FOR GUARDRAILS, CABLE BARRIER AND CONCRETE MEDIAN BARRIERS.
 REV. 10-29-2021: ADDED DELINEATOR SPACING DETAIL, TABLE AND NOTES FOR CURVE. REVISED GENERAL NOTE (H). GUARDRAIL, CABLE BARRIER AND CONCRETE MEDIAN BARRIER DELINEATOR MOUNTING DETAILS AND NOTES WERE REMOVED.



OPTIONAL DELINEATOR PLACEMENT FOR BICYCLE TO VEHICLE SEPARATION

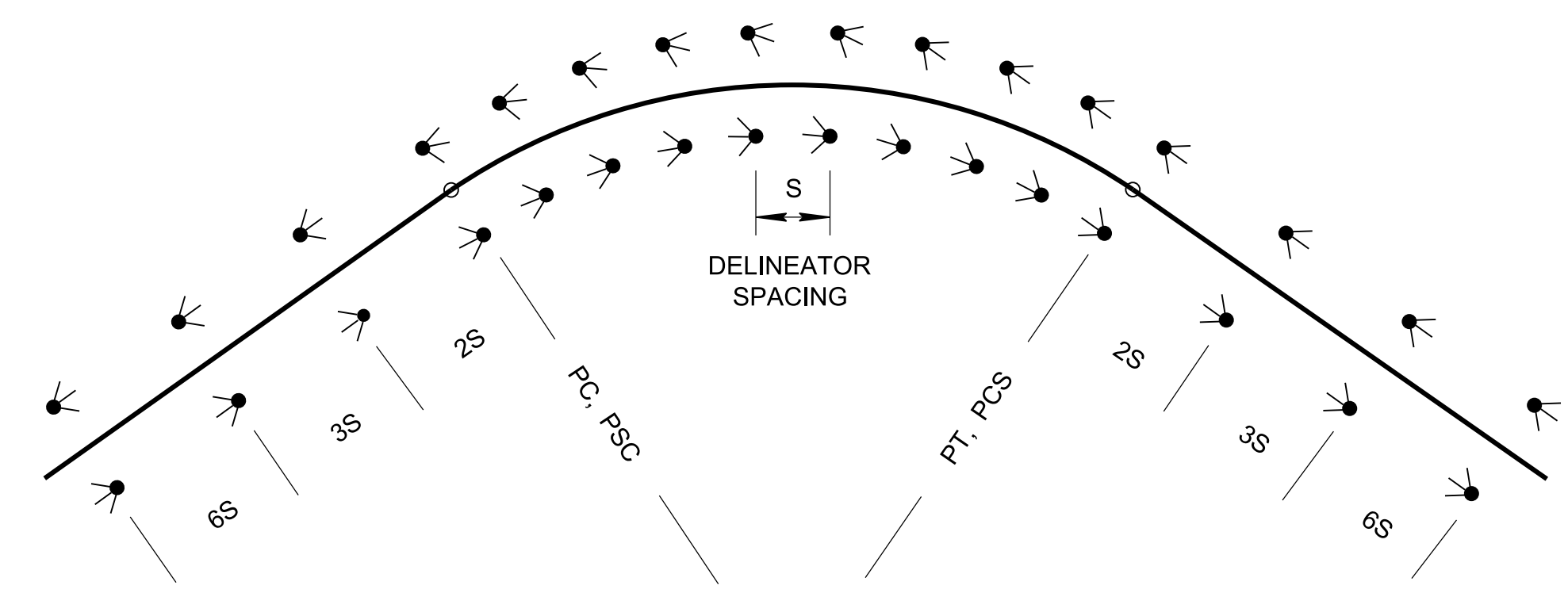


GROUND MOUNTED FLEXIBLE TUBULAR DELINEATOR



SURFACE MOUNTED FLEXIBLE TUBULAR DELINEATOR
SEE NOTE (I)

TABLE			
DELINEATOR SPACING ON HORIZONTAL CURVE			
RADIUS (FT)	SPACING (FT)	RADIUS (FT)	SPACING (FT)
50	20	600	70
100	25	700	75
200	40	800	80
300	50	900	85
500	65	1000	90



DELINEATOR SPACING DETAIL ON A HORIZONTAL CURVE

NOTES: 1. SPACING FOR SPECIFIC RADII MAY BE INTERPOLATED FROM TABLE.
 2. SPACING (S), SPACING IN ADVANCE OF AND BEYOND THE CURVE (2S, 3S AND 6S) SHOULD BE 20 FEET BUT SHOULD NOT EXCEED 300 FEET.
 3. S REFERS TO THE DELINEATOR SPACING. SPACING FOR CURVES NOT SHOWN MAY BE COMPUTED FROM THE FORMULA $S = 3\sqrt{R-50}$.
 4. THE DISTANCES FOR S SHOWN IN THE TABLE ABOVE WERE ROUNDED TO THE NEAREST 5 FEET.

GENERAL NOTES

- (A) THE REFLECTIVE SHEETING SHALL MEET THE REQUIREMENTS OF AASHTO M268, TYPE B OR HIGHER RETROREFLECTION PERFORMANCE LEVEL.
- (B) THE REFLECTIVE SHEETING STRIP ON THE DELINEATORS SHALL BE MIN. 9 INCHES IN LENGTH AND SUFFICIENT WIDTH TO PROVIDE A MIN. 3 INCHES WIDE PROFILE FACING APPROACHING TRAFFIC. THE VARIATIONS IN REFLECTIVE SHEETING DIMENSION SHOULD NOT EXCEED $\pm 10\%$.
- (C) THE CONTRACTOR SHALL SELECT MATERIAL FROM THE DEPARTMENT'S QPL.
- (D) THE COLOR OF THE DELINEATOR POST SHALL BE WHITE UNLESS OTHERWISE NOTED ON THE PLANS.
- (E) THE COLOR OF THE REFLECTIVE SHEETING SHALL CONFORM TO THE COLOR OF EDGE LINES STIPULATED IN SUBSECTION 3B-6 (PAGE 3B-8 AND 3B-11) OF THE CURRENT EDITION OF THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
- (F) PAYMENT FOR GROUND MOUNTED FLEXIBLE DELINEATORS WILL BE MADE AS FOLLOWS ITEM NO'S.:

713-02.14, FLEXIBLE DELINEATOR (WHITE),	PER EACH.
713-02.15, FLEXIBLE DELINEATOR (YELLOW),	PER EACH.
713-02.16, FLEXIBLE TYPE II, OBJECT MARKER,	PER EACH.
713-02.33, FLEXIBLE DELINEATOR (RED),	PER EACH.
- (G) PAYMENT FOR SURFACE MOUNTED FLEXIBLE DELINEATORS WILL BE MADE AS FOLLOWS ITEM NO.:

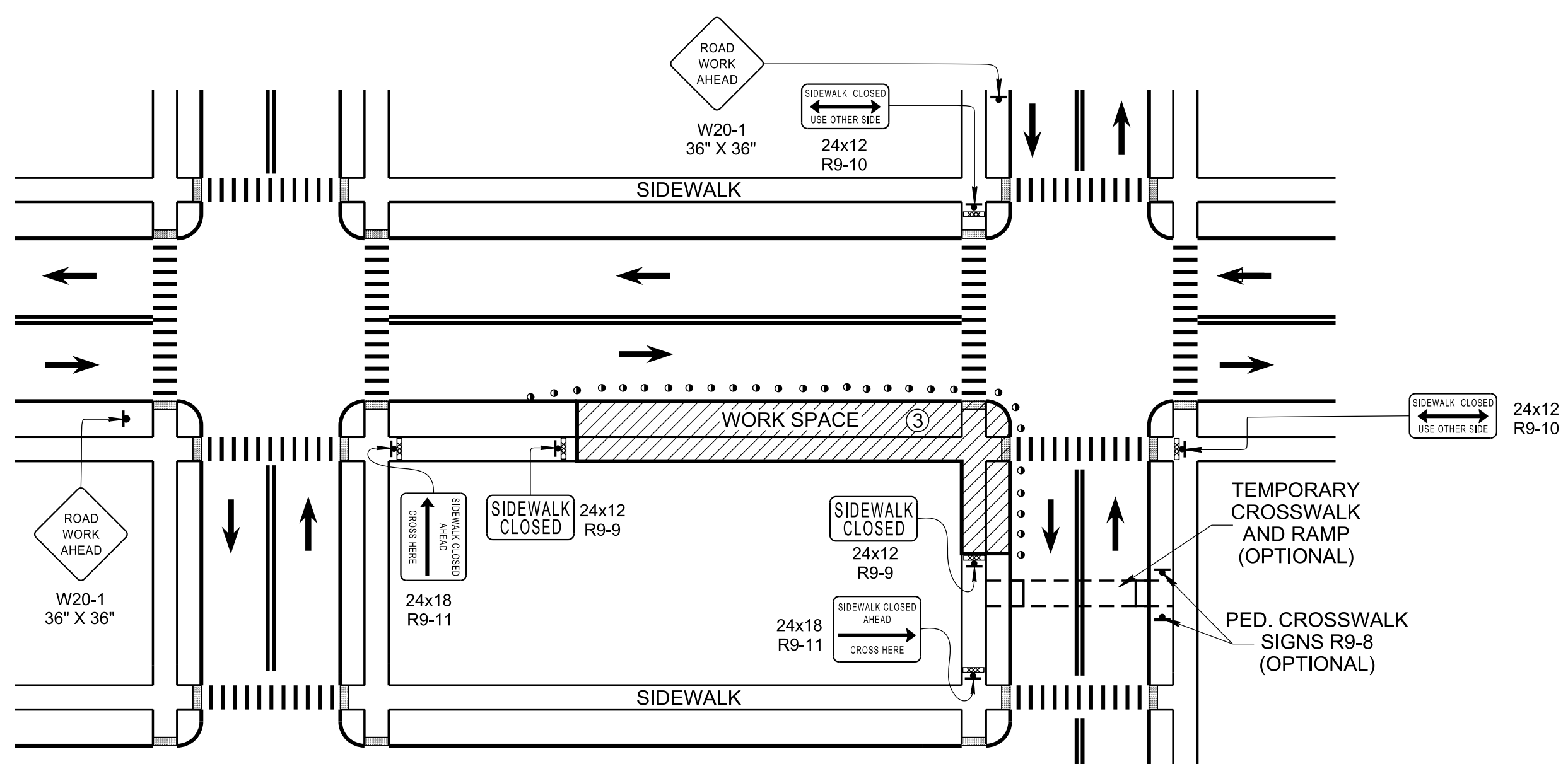
713-02.30, FLEXIBLE TUBULAR DELINEATOR,	PER EACH.
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- (H) **FLEXIBLE DELINEATOR SPACING:-**
 FOR BICYCLE TO VEHICLE SEPARATION, THE FLEXIBLE DELINEATOR POST SHALL BE SPACED FROM 10 FEET TO 40 FEET OR DIRECTED BY THE REGIONAL TRAFFIC ENGINEER.

 GROUND MOUNTED DELINEATOR SHALL BE SPACED 240 FEET APART ON TANGENT. SEE TABLE A FOR DELINEATOR SPACING ON A HORIZONTAL CURVE. REFER TO STANDARD DRAWING T-S-11 FOR ADDITIONAL INFORMATION.
- (I) SURFACE MOUNTED FLEXIBLE DELINEATORS SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.
- (J) ONLY PRODUCTS LISTED ON THE DEPARTMENT'S QPL SHALL BE USED.

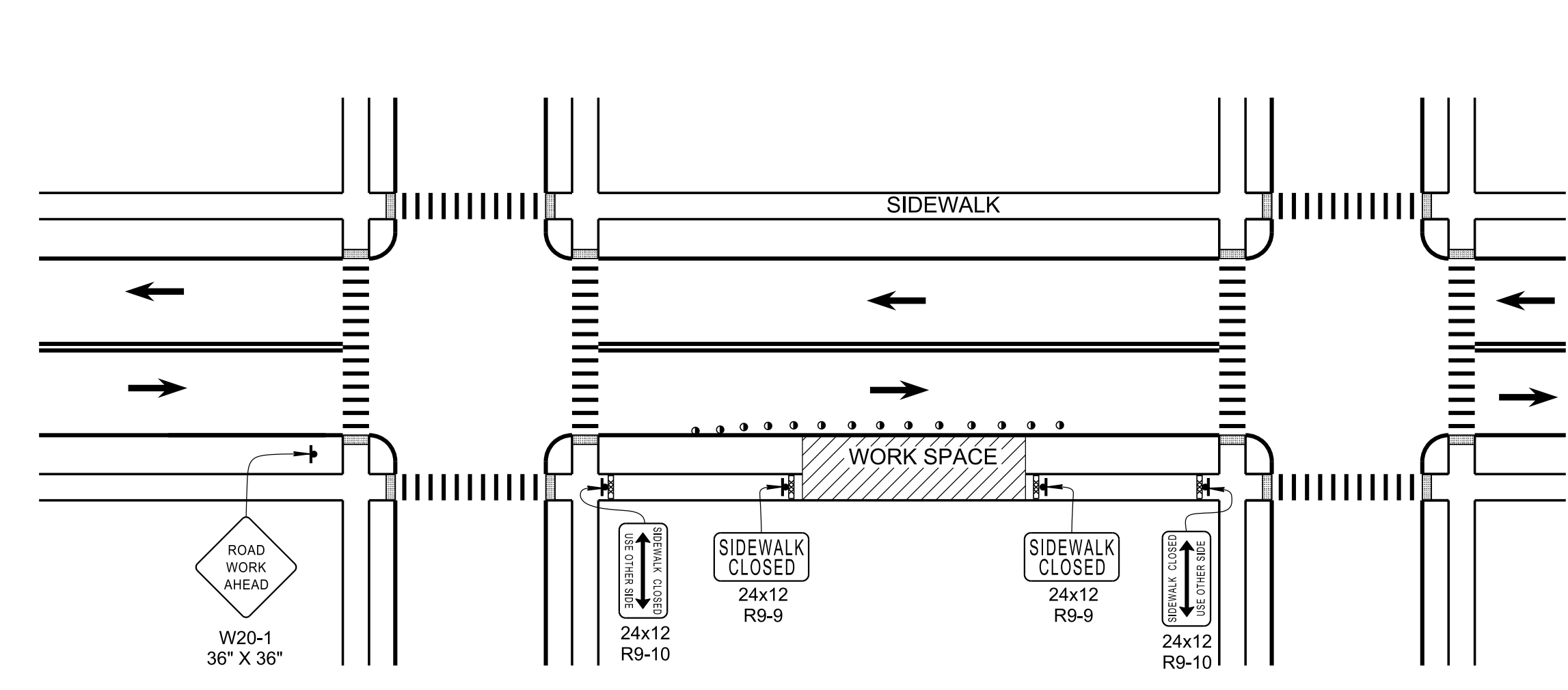
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FLEXIBLE DELINEATOR DETAILS

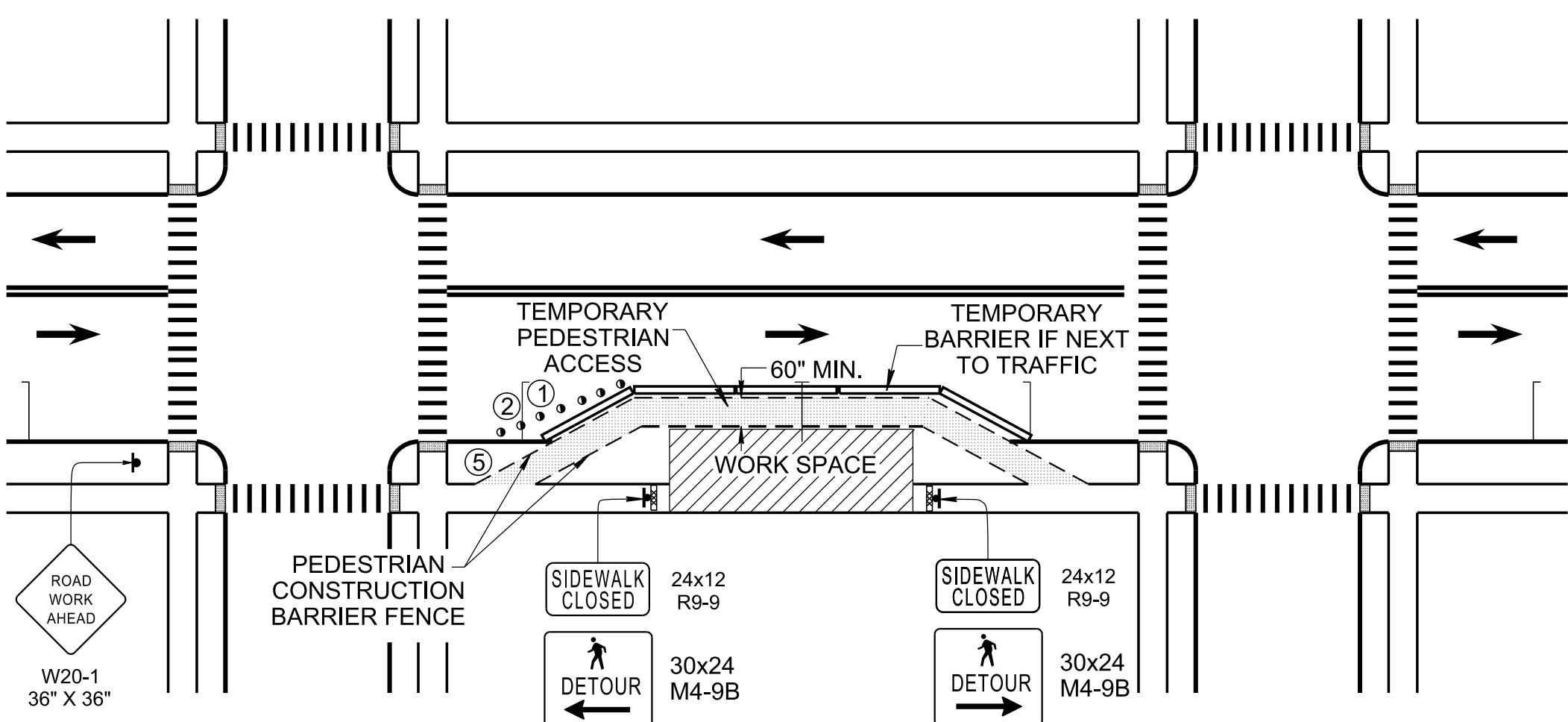
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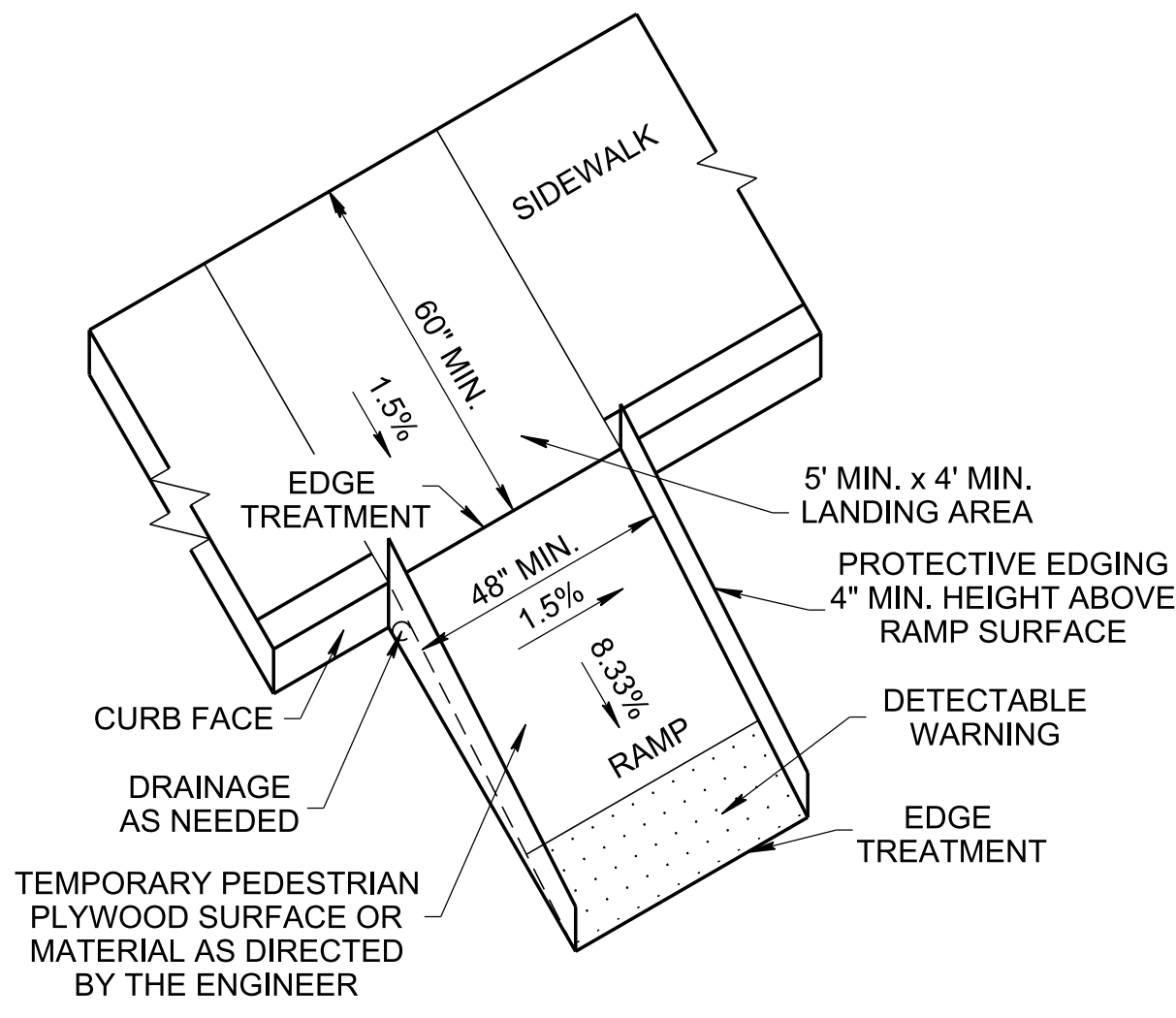
CORNER SIDEWALK AND CROSSWALK CLOSURES WITH OPTIONAL TEMPORARY CROSSWALK



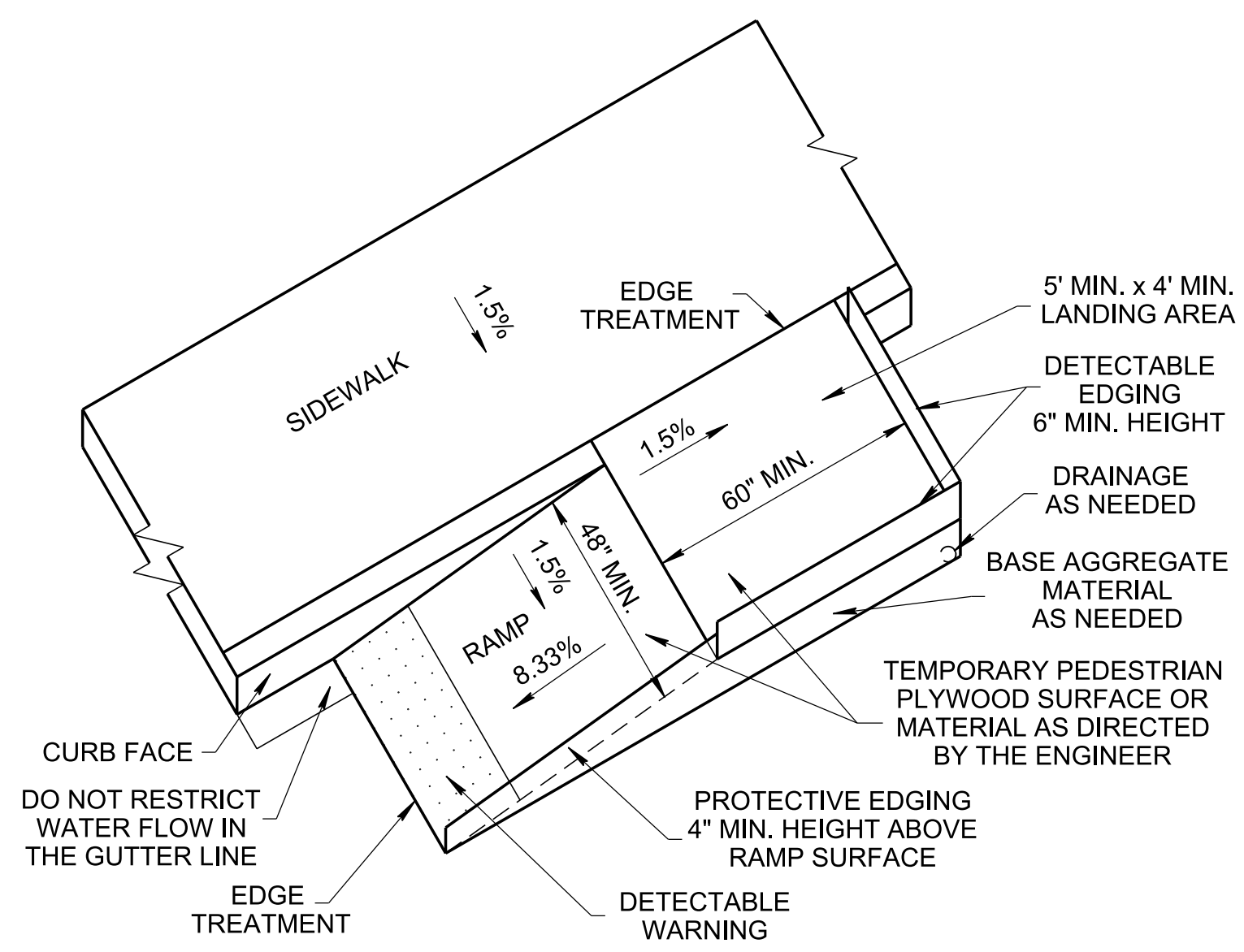
SIDEWALK CLOSURE, MID-BLOCK



MID-BLOCK SIDEWALK CLOSURE IN PARKING LANE WITH SIDEWALK DIVERSION



TEMPORARY PEDESTRIAN ACCESS ROUTES PERPENDICULAR CURB RAMP OPTION



TEMPORARY PEDESTRIAN ACCESS ROUTES PARALLEL CURB RAMP OPTION

GENERAL NOTES FOR SIDEWALK DIVERSION

- (A) SIDEWALK DIVERSION MAY BE USED ON ROADS WITH ON STREET PARKING LANES ADJACENT TO THE SIDEWALK CLOSURE.
- (B) THE PEDESTRIAN WALKWAY SHALL BE AT LEAST 5' WIDE.
- (C) TEMPORARY FACILITIES SHALL BE COMPLIANT WITH THE CURRENT VERSION OF THE AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES (ADAAG).
- (D) DIVERSIONS MUST BE CLEARLY IDENTIFIED, PROTECTED FROM TRAFFIC AND FREE FROM HAZARDS.
- (E) PEDESTRIAN CONSTRUCTION BARRIER FENCE SHALL BE CONTINUOUS THROUGHOUT THE LENGTH OF THE DIVERSION WITH A DETECTABLE EDGING WITH A BOTTOM NO HIGHER THAN 2" ABOVE THE SURFACE AND A TOP NO LOWER THAN 32" ABOVE THE SURFACE. THE PEDESTRIAN CHANNELIZATION DEVICE SHALL BE ORANGE. HIGH VISIBILITY FENCE, PEDESTRIAN, RAIL, AND CHAIN LINK FENCE ARE ACCEPTABLE. COST OF FENCE TO BE PAID UNDER ITEM NUMBER:

707-11.01 PEDESTRIAN CONSTRUCTION BARRIER FENCE PER L.F.
- (F) CROSSING THE DIVERSION PATH BY CONSTRUCTION VEHICLES SHOULD BE AVOIDED, WHEN NECESSARY, IT SHALL BE CONTROLLED BY FLAGGER.
- (G) TRAFFIC CONTROL DEVICES FOR VEHICULAR TRAFFIC MAY BE REQUIRED FOR CLOSING THE LANE AS DIRECTED BY THE ENGINEER.
- (H) A SMOOTH, HARD, CONTINUOUS AND RIDEABLE SURFACE SHALL BE PROVIDED THROUGHOUT THE LENGTH OF THE DIVERSION.
- (I) THE COST OF MAINTAINING PEDESTRIAN DIVERSION, INCLUDING CURB RAMPS IF NEEDED, SHALL NOT BE PAID DIRECTLY BUT PAID FOR IN THE COST OF OTHER ITEMS.

GENERAL NOTES FOR SIDEWALK CLOSURE

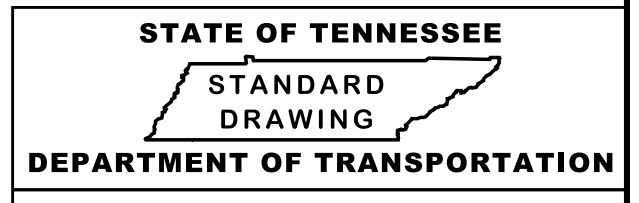
- (A) TRAFFIC CONTROL DEVICES FOR VEHICULAR TRAFFIC MAY BE REQUIRED TO CONTROL VEHICLES THROUGH WORK ZONE AS DIRECTED BY THE ENGINEER.
- (B) SIGNS R9-9, R9-10 AND R9-11 TO BE ATTACHED TO TYPE I OR TYPE II BARRICADE. ALL OTHER SIGNS SHOWN ON THIS PLAN MAY BE PLACED ON PORTABLE SUPPORTS.
- (C) MINIMIZE PEDESTRIAN OUT-OF-DIRECTION TRAVEL. IT IS NOT ACCEPTABLE TO REQUIRE PEDESTRIANS TO RETRACE THEIR PATH TO FIND A SAFE CROSSING.
- (D) DETOUR SHALL BE DETECTABLE AND INCLUDE ACCESSIBILITY FEATURES CONSISTENT WITH THE FEATURES PRESENT IN THE EXISTING FACILITY.
- (E) BARRICADES SHALL BE PLACED ACROSS THE FULL WIDTH OF THE CLOSED SIDEWALK.
- (F) WORK SHALL BE EXPEDITED TO MINIMIZE IMPACTS TO BUSINESS CAUSED BY THE SIDEWALK CLOSURE.

CHANNELIZATION DEVICE LEGEND			
	FLEXIBLE DRUMS (ITEM NO. 712-04.01, PER EACH)		SIGN SUPPORT
	TEMPORARY BARRICADES (TYPE II), (ITEM NO. 712-07.02, PER L.F.) WITH SIGNS (CONSTRUCTION) ATTACHED (ITEM NO. 712-06, PER. S.F.)		DIRECTION OF TRAFFIC
	TEMPORARY BARRICADES (TYPE III), (ITEM NO. 712-07.03, PER L.F.) WITH SIGNS (CONSTRUCTION) ATTACHED (ITEM NO. 712-06, PER. S.F.)		WORK SPACE
	PEDESTRIAN CONSTRUCTION BARRIER FENCE		PORTABLE BARRIER RAIL
	PEDESTRIAN DIVERSION		

- FOOTNOTES**
- ① IF PARKING STALLS ARE USED FOR DIVERSION, CHANNELIZING DEVICES MAY BE SUBSTITUTED FOR PORTABLE BARRIER RAILS IF PORTABLE BARRIER RAILS ARE DEEMED UNNECESSARY BY ENGINEERING JUDGEMENT. SEE T-WZ-PBR/ T-WZ-PCB SERIES FOR PORTABLE BARRIER RAIL.
 - ② IF DIVERSION REQUIRES A LANE CLOSURE SEE T-WZ-SERIES FOR FURTHER INFORMATION.
 - ③ LIMIT WORK TO ONE CORNER AT A TIME TO MINIMIZE DISRUPTION TO PEDESTRIAN TRAFFIC.
 - ④ PEDESTRIAN TRAFFIC SIGNAL DISPLAYS CONTROLLING CLOSED CROSSWALKS SHALL BE COVERED.
 - ⑤ IN AREAS WHERE THE ROUTE CROSSES GRASSY TERRAIN OR ELEVATION CHANGES, PLYWOOD MAY BE USED WITH A HIGHLIGHTED BEVEL AT THE JOINT.

- REV. 6-30-14: ADDED ITEM NUMBER FOR PEDESTRIAN CONSTRUCTION BARRIER FENCE.
- REV. 10-10-16: UPDATED GENERAL NOTE (E) FOR SIDEWALK DIVERSION.
- REV. 10-29-2021: SIDEWALK DIVERSION, SIDEWALK CLOSURE MIDBLOCK AND CORNER DRAWINGS WERE REDRAWN. PLYWOOD CURB RAMP DETAIL WAS REMOVED. TEMPORARY PEDESTRIAN ACCESS ROUTES PERPENDICULAR AND PARALLEL CURB RAMP OPTIONS WERE ADDED. CHANNELIZATION DEVICE LEGEND WAS REVISED. FOOTNOTES (1) WAS REVISED. GENERAL NOTES FOR SIDEWALK DIVERSION (E) AND SIDEWALK CLOSURE (A) WERE REVISED.

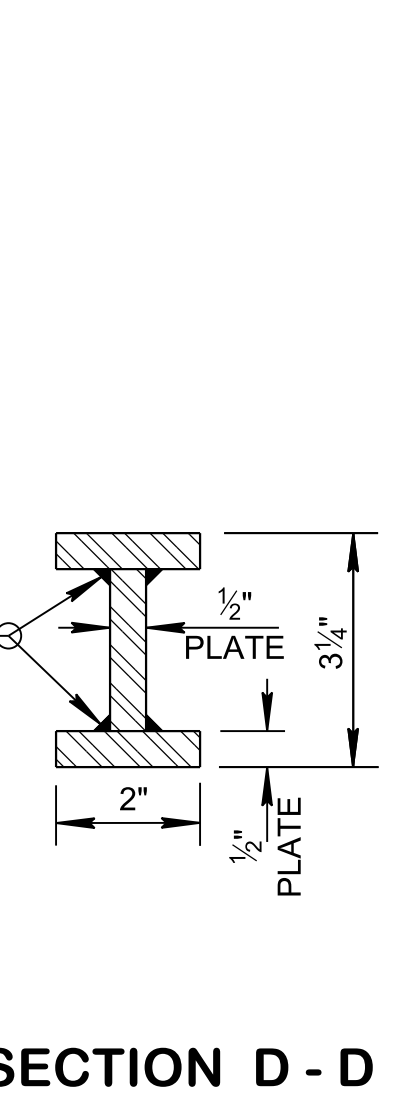
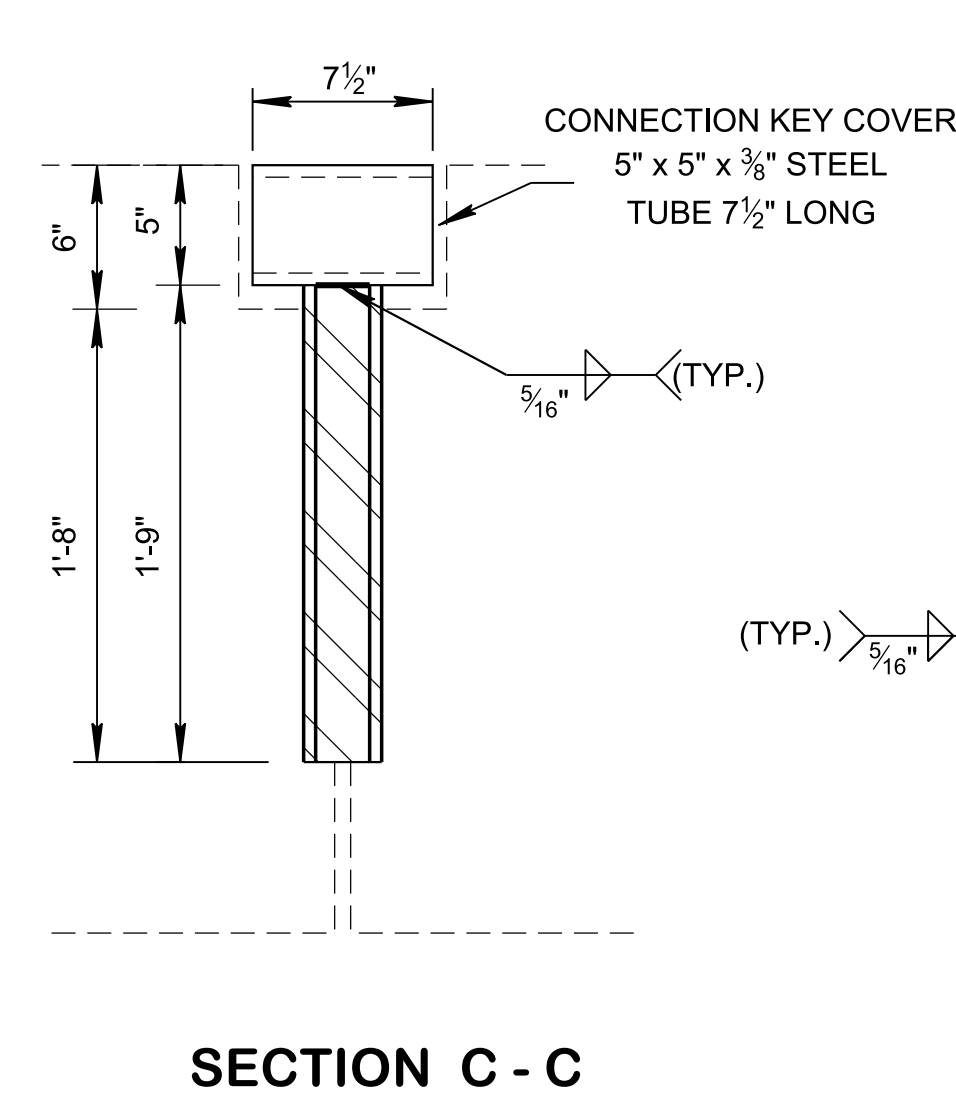
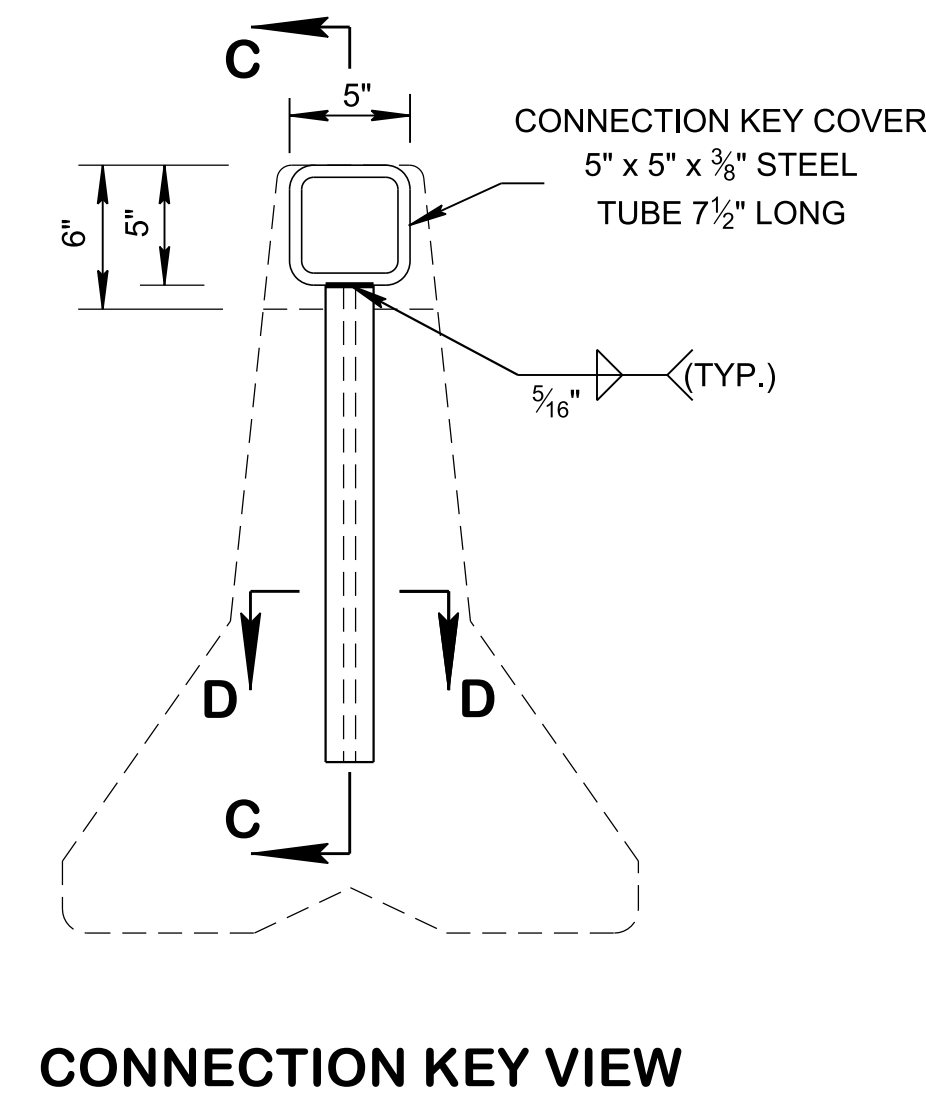
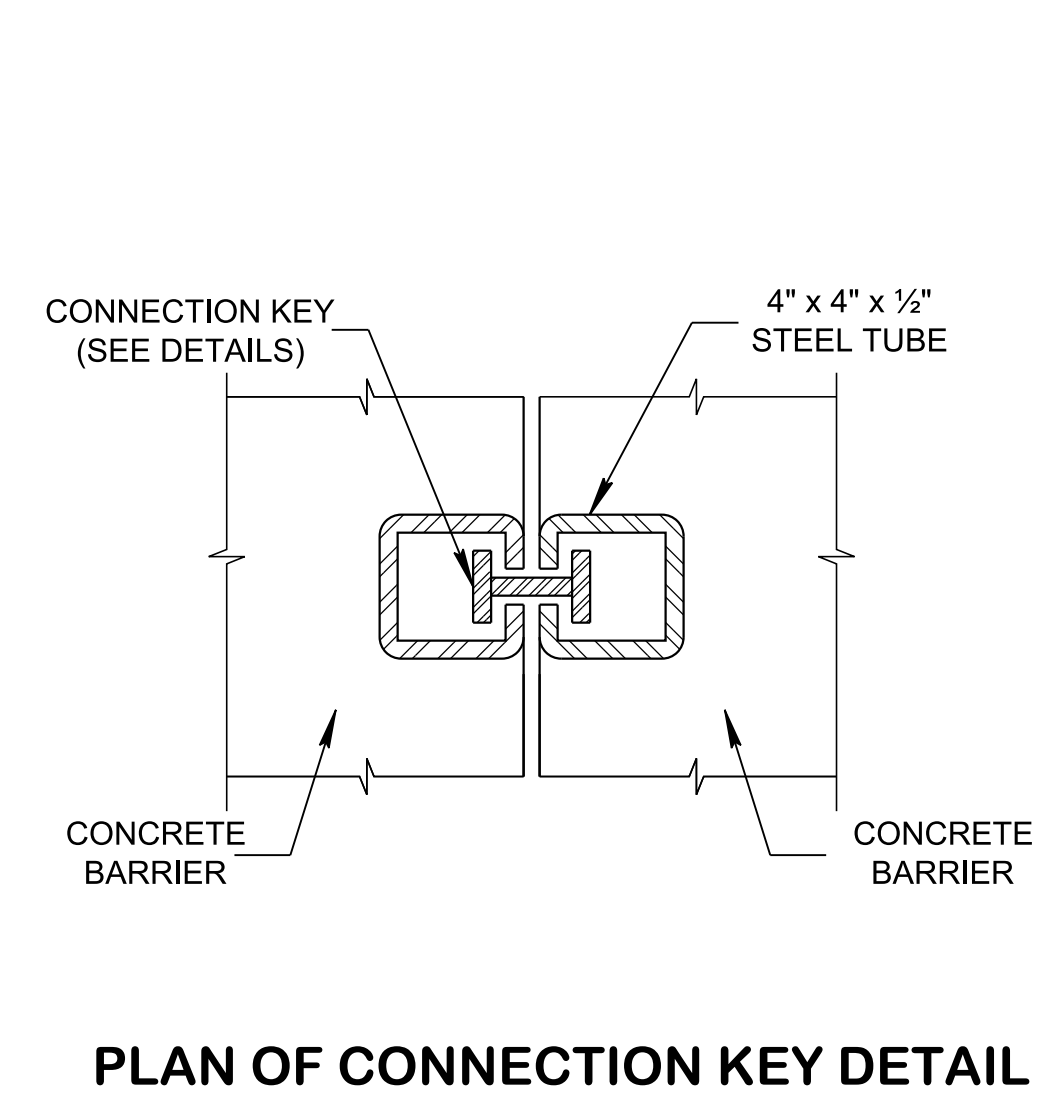
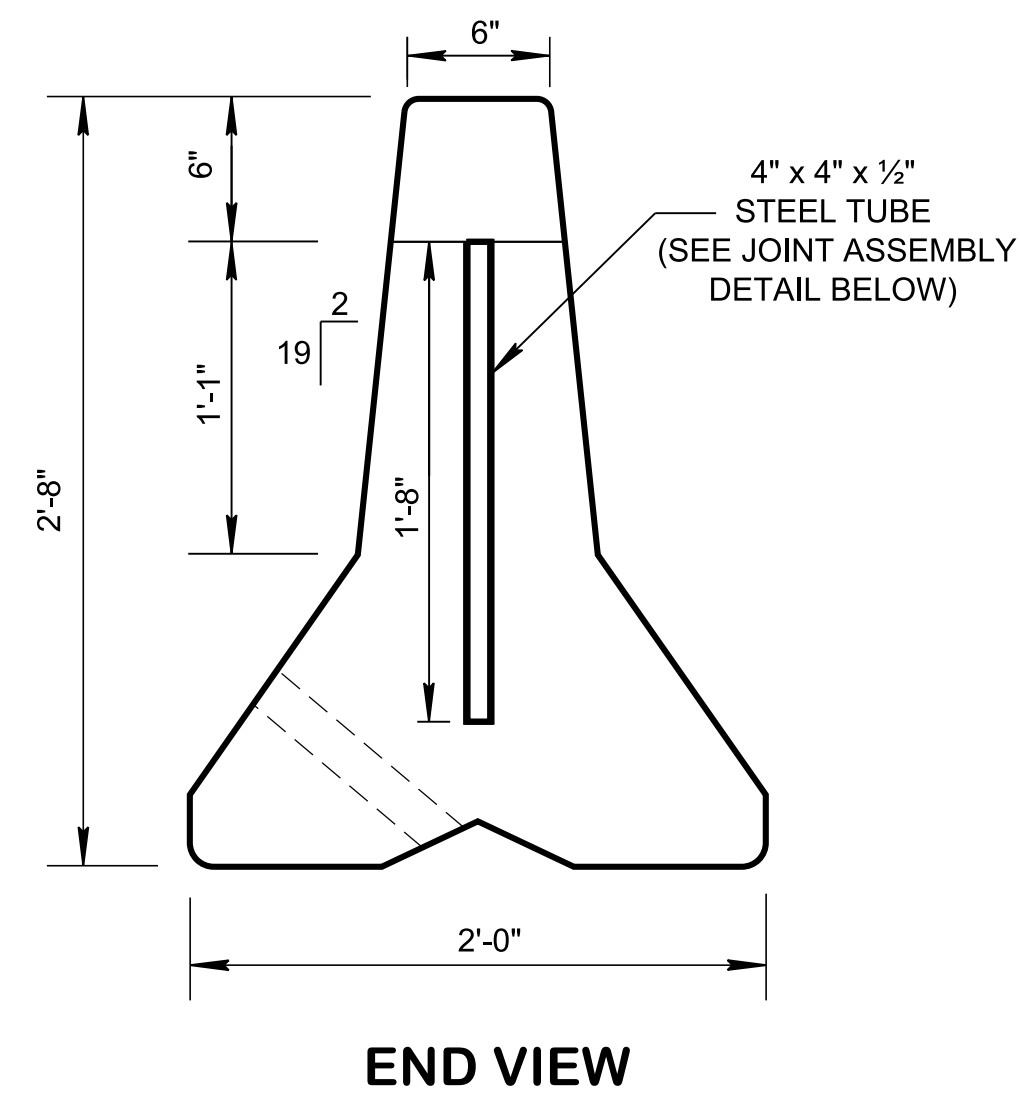
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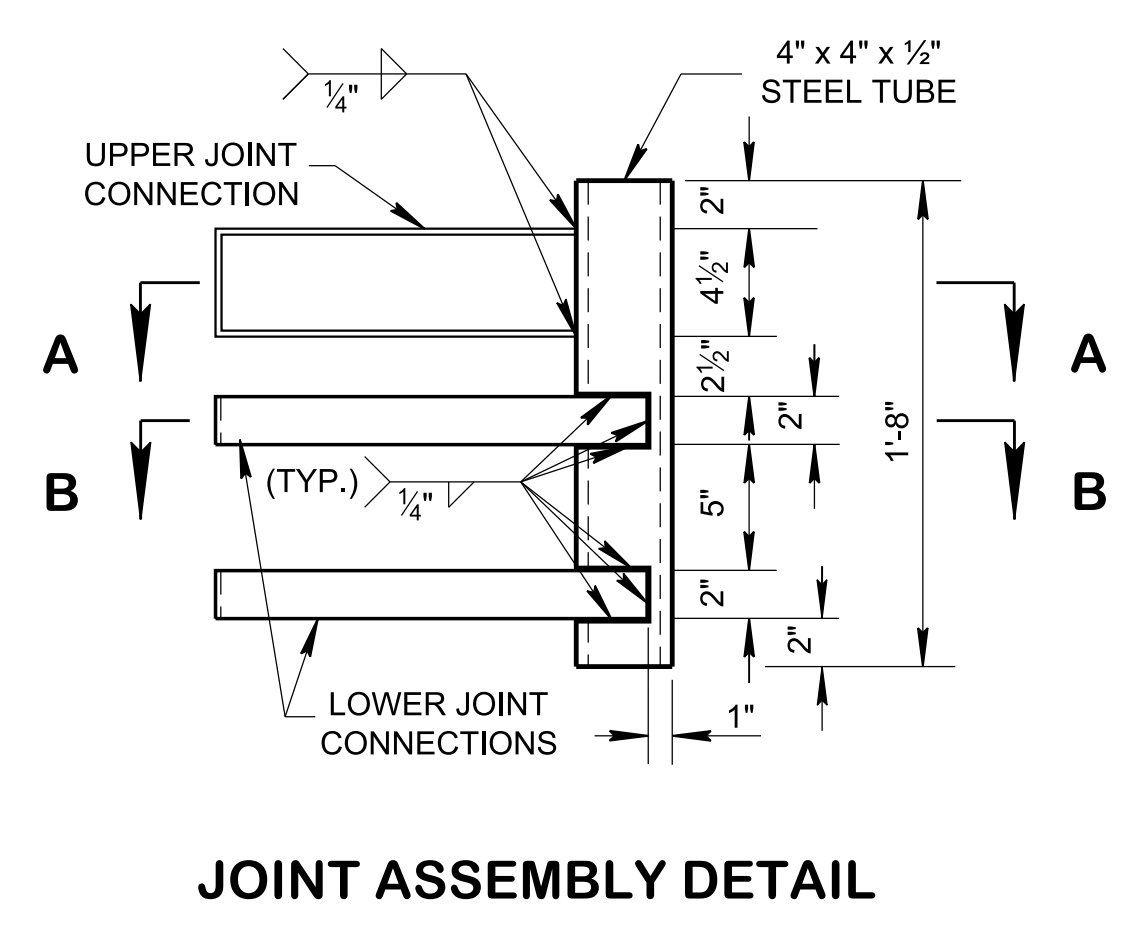
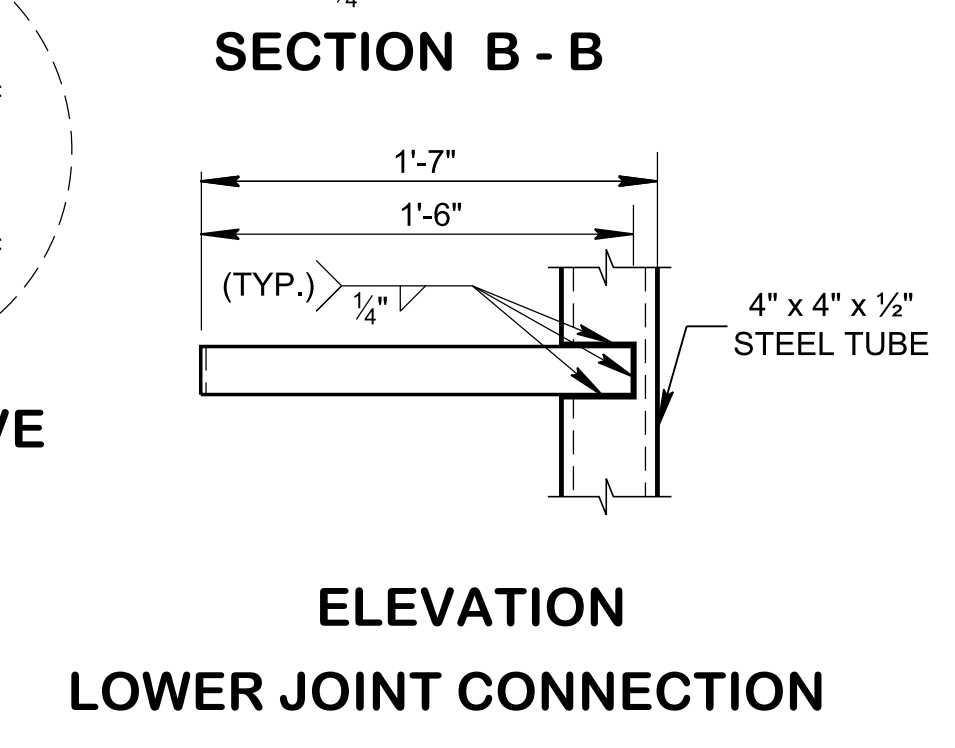
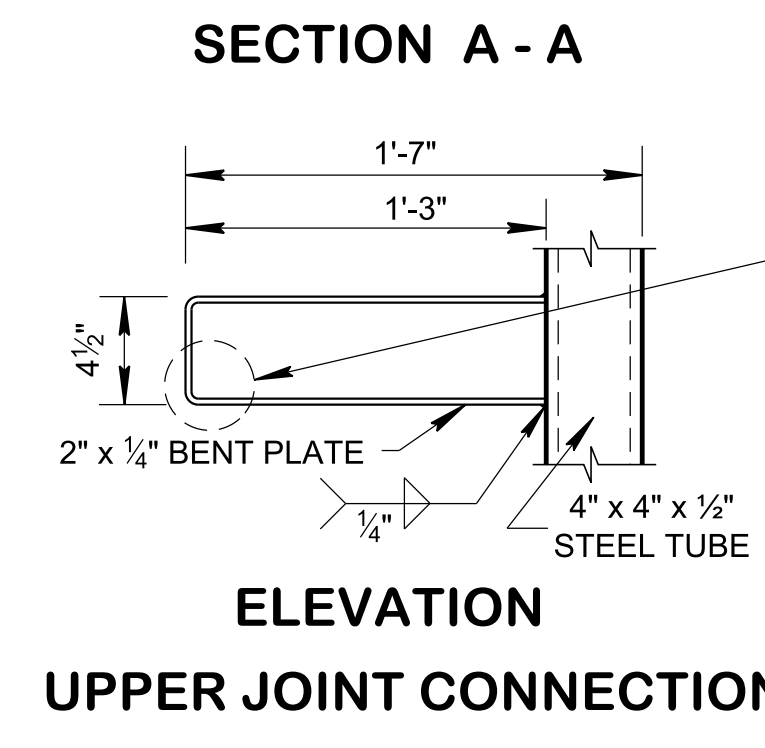
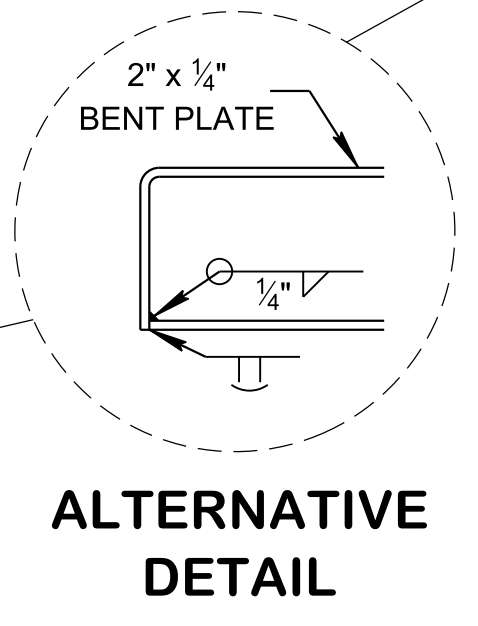
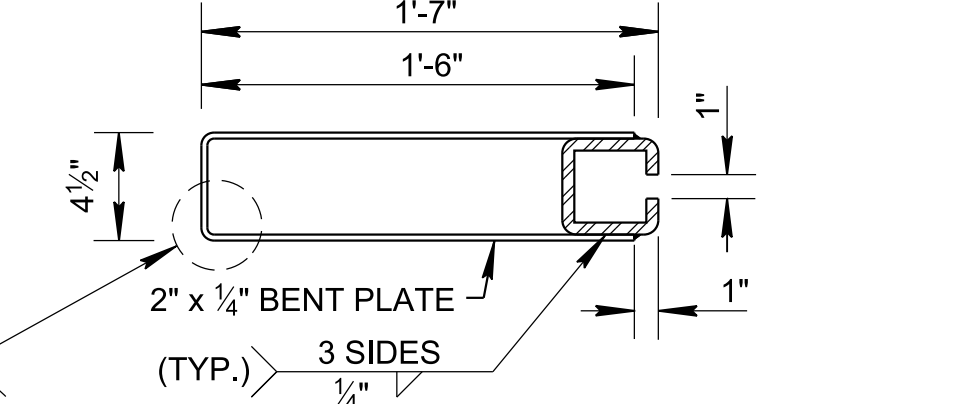
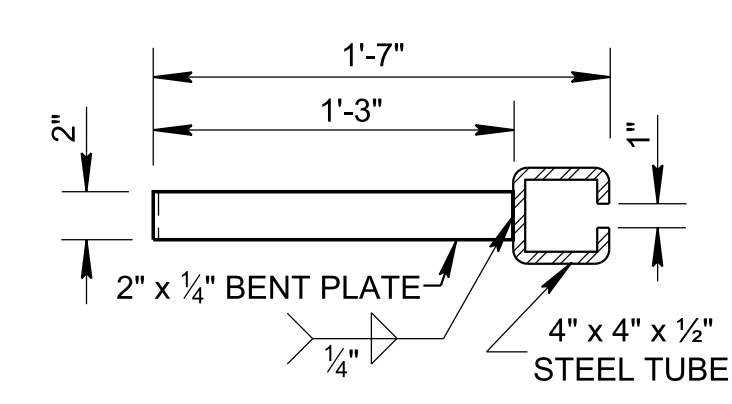
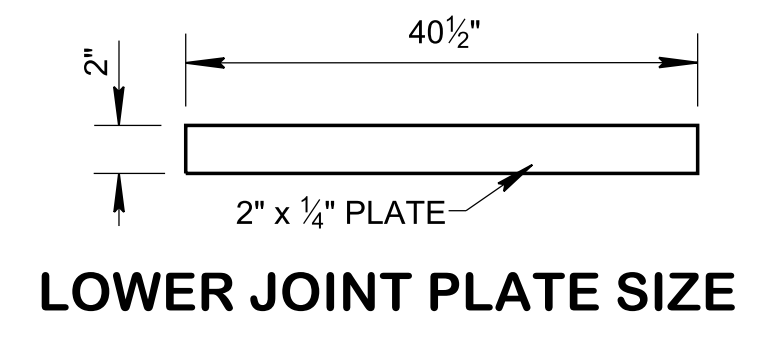
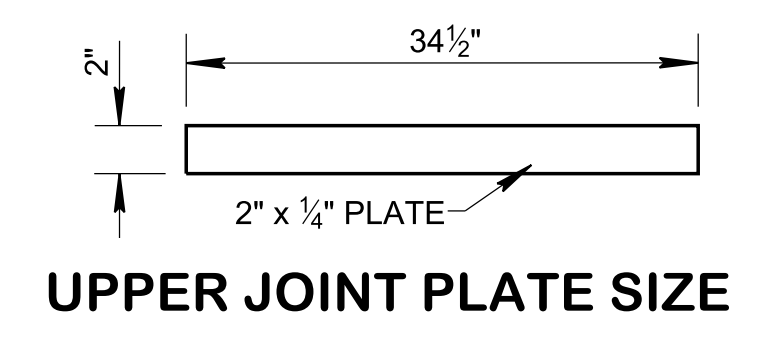
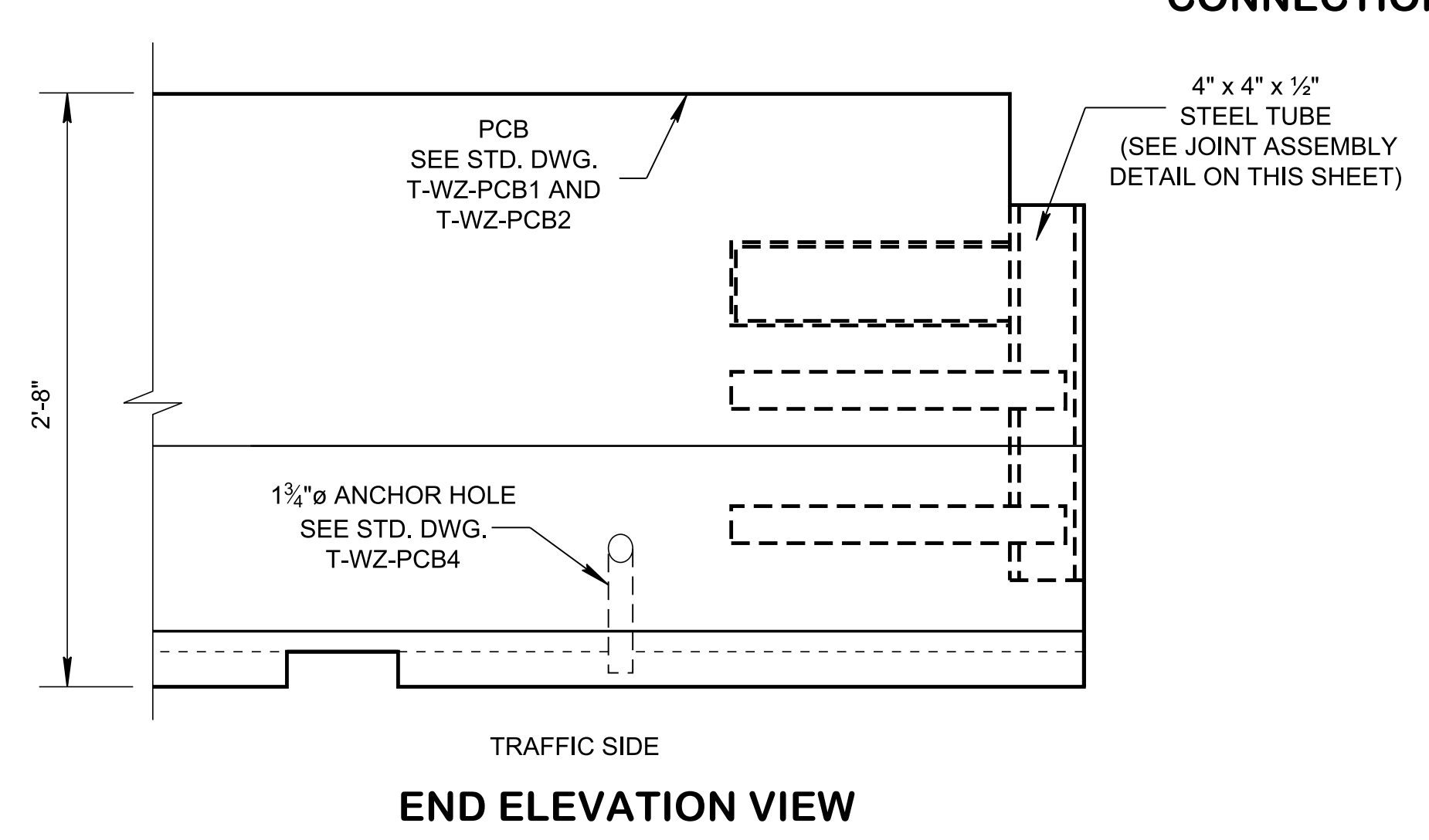
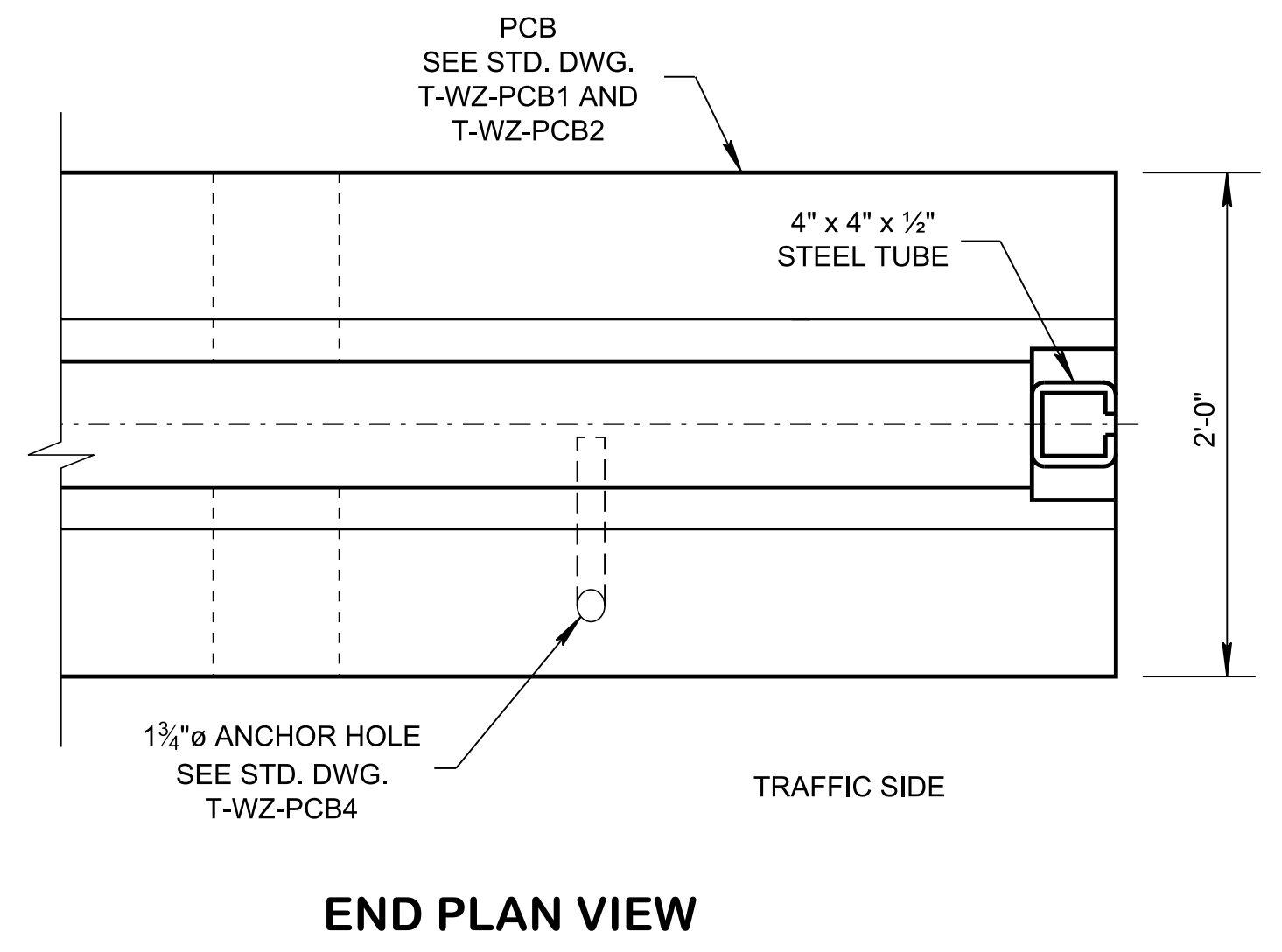
SIDEWALK TRAFFIC CONTROL

NOT TO SCALE

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CONNECTION KEY DETAILS



- GENERAL NOTES**
- (A) SEE STANDARD DRAWINGS T-WZ-PCB1 AND T-WZ-PCB2 FOR PORTABLE CONCRETE BARRIER RAILS.
 - (B) THE CONNECTION KEY AND STEEL PLATES SHALL CONFORM TO ASTM A36. THE STEEL TUBE SHALL CONFORM TO ASTM A500 GRADE B. ALL THE STEEL PLATES FOR THE CONNECTION KEY ASSEMBLY, THE TRANSITION KEY ASSEMBLY AND THE STEEL TUBES SHALL BE GALVANIZED. ALL CUTTING, DRILLING, AND WELDING OF STEEL COMPONENTS SHALL BE DONE BEFORE BEING GALVANIZED.
 - (C) ALL WELDING SHALL BE PERFORMED BY A WELDER QUALIFIED IN ACCORDANCE WITH SECTION 602 OF THE STANDARD SPECIFICATIONS.
 - (D) CONNECTION KEY COVER TUBE SHALL BE INSTALLED FLUSH WITH THE BARRIER TOP.
 - (E) SEE STANDARD DRAWING T-WZ-PCB4 FOR ANCHOR PIN DETAILS.
 - (F) PAYMENT FOR CONNECTION KEY, JOINT ASSEMBLY STEEL TUBE AND PLATES WILL BE INCLUDED IN THE UNIT PRICE OF PORTABLE BARRIER RAIL ITEM NUMBER.
 - (G) THE DIMENSIONS SHALL BE AS SHOWN ON THE DRAWING WITHIN MANUFACTURING TOLERANCE OF +/- 1/8 INCH BUT NOT TO EXCEED 1/4 INCH.

REV. 03-04-2021: REVISED CONNECTION KEY DETAILS AND REVISED GENERAL NOTES (B) AND (C). ADDED GENERAL NOTE (G).

REV. 10-29-2021: ADDED ALTERNATIVE DETAIL FOR UPPER AND LOWER JOINT CONNECTIONS.

STATE OF TENNESSEE
 STANDARD DRAWING
 DEPARTMENT OF TRANSPORTATION
PORTABLE CONCRETE BARRIER RAIL DETAILS

NOT TO SCALE