STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION
ROADWAY DESIGN DIVISION
SUITE 1200 JAMES K. POLK BUILDING
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CLAY BRIGHT
COMMISSIONER

BILL LEE
GOVERNOR

INSTRUCTIONAL BULLETIN NO. 21-08

Regarding Various Revised Standard Drawings

Effective August 20, 2021 letting (June 9, 2021 Turn-in), the following Standard Drawings have been revised. In addition, Chapter 10 of the Roadway Design Guidelines - Index of Standard Drawings and the web site have been updated accordingly and are available online.

The RD-01 Standard Drawing Series, which are based on the 2001 AASHTO A Policy on Geometric Design of Highways and Streets, shall not be used on projects started after the August 9, 2019 letting. The RD11 Standard Series, which is based on 2011 AASHTO A Policy on Geometric Design of Highways and Streets, should be used instead.

Revised Standard Drawings:

10-101.00 PIPE CULVERTS AND ENDWALLS

10-101.01 PIPE CULVERTS AND FLUME

DRAWING NUMBER	REVISION DATE	DESCRIPTION
D-PB-1	03-04-21	STANDARD DETAILS FOR CONCRETE PIPE INSTALLATION
D-PB-2	03-04-21	STANDARD DETAILS FOR FLEXIABLE PIPE INSTALLATION

10-101.02 SAFETY CROSS DRAIN ENDWALLS

DRAWING NUMBER	REVISION DATE	DESCRIPTION
D-PE-99	03-04-21	TYPE “U” CROSS DRAIN ENDWALL DETAILS, PIPE GRATE & SKEWED CONNECTION

10-101.03 SAFETY SIDE DRAIN ENDWALLS

DRAWING NUMBER	REVISION DATE	DESCRIPTION
D-SEW-1A	03-04-21	TYPE “SAFETY” SIDE DRAIN ENDWALL WITH STEEL PIPE GRATE, FOR 15” THRU 48” PIPES, 6:1 SLOPE
D-SEW-12D	03-04-21	TYPE “SAFETY” SIDE DRAIN ENDWALL WITH STEEL PIPE GRATE, FOR 18” PIPES, 12:1 SLOPE

10-102.00 CATCH BASINS AND MANHOLES

10-102.01 CATCH BASINS

DRAWING NUMBER	REVISION DATE	DESCRIPTION
D-CB-38RB	03-04-21	STANDARD PRECAST CIRCULAR NO. 38 CATCH BASIN
D-CB-38S	03-04-21	STANDARD 32” X 32” SQUARE CONCRETE NO. 38 CATCH BASIN
D-CB-38SB	03-04-21	STANDARD 4’ X 4’ SQUARE CONCRETE NO. 38 CATCH BASIN
D-CB-38SC	03-04-21	STANDARD 5’2” X 5’2” SQUARE CONCRETE NO. 38 CATCH BASIN
D-CB-39RB	03-04-21	STANDARD PRECAST CIRCULAR NO. 39 CATCH BASIN
D-CB-39S	03-04-21	TANDARD 4’ X 4’ SQUARE CONCRETE NO. 39 CATCH BASIN
D-CB-39SC	03-04-21	STANDARD 5’2” X 5’2” SQUARE CONCRETE NO. 39 CATCH BASIN
D-CB-39SD	03-04-21	STANDARD 7’ X 7’ SQUARE CONCRETE NO. 39 CATCH BASIN
D-CB-39SE	03-04-21	STANDARD 9’ X 9’ SQUARE CONCRETE NO. 39 CATCH BASIN
D-CB-40S	03-04-21	STANDARD 4’ X 8’ RECTANGULAR CONCRETE NO. 40 CATCH BASIN
D-CB-40SE	03-04-21	STANDARD 9’ X 9’ SQUARE CONCRETE NO. 40 CATCH BASIN
D-CBB-42	03-04-21	CAST IRON GRATE DETAILS FOR NOS. 42, 43, & 44 TYPE CATCH BASIN

10-104.00 ROADWAY, PAVEMENT APPURTENANCES, AND FENCES

10-104.03 CURBS

RP-SC-1	03-04-21	SLOPING CONCRETE CURB AND CURB AND GUTTER

RP-VC-10	03-04-21	VERTICAL CONCRETE CURB AND CURB AND GUTTER (FOR 8” TO 12” GUTTER DEPTH)
RP-VC-11	03-04-21	VERTICAL CONCRETE CURB AND CURB AND GUTTER (FOR 6” & 7” GUTTER DEPTH)

10-106.00 SAFETY DESIGN AND GUARDRAILS

10-106.03 CRASH CUSHIONS

DRAWING NUMBER	REVISION DATE	DESCRIPTION
S-CC-1	03-04-21	CRASH CUSHION

10-107.00 DESIGN – TRAFFIC CONTROL

10-107.01 PAVEMENT MARKINGS

DRAWING NUMBER	REVISION DATE	DESCRIPTION
T-M-16	03-04-21	RUMBLE STRIPE INSTALLATION LAYOUT

10-107.02 WORK ZONES

DRAWING NUMBER	REVISION DATE	DESCRIPTION
T-WZ-11	03-04-21	ONE LANE CLOSURE DETAIL FOR DIVIDED HIGHWAYS
T-WZ-12	03-04-21	ONE LANE CLOSURE DETAIL FOR BRIDGES ON DIVIDED HIGHWAYS
T-WZ-14	03-04-21	TWO–OUTSIDE LANE CLOSURE FOR INTERSTATES AND EXPRESSWAYS
T-WZ-16	03-04-21	LANE SHIFT FOR DIVIDED HIGHWAYS AND FREEWAYS
T-WZ-18	03-04-21	SHOULDER CLOSURE DETAIL FOR FREEWAYS AND DIVIDED HIGHWAYS
T-WZ-19	03-04-21	MEDIAN CROSS-OVER DETAIL ON FREEWAYS
T-WZ-PCB2A	03-04-21	20 FOOT PORTABLE CONCRETE BARRIER RAIL STIFFENER TUBE
T-WZ-PCB3	03-04-21	PORTABLE CONCRETE BARRIER RAIL DETAILS

Standard Drawing RP-R-2, STANDARD CONSTRUCTION DETAILS FOR ROUNDABOUTS, which was voided by IB 19-18 will be added back to the Standard Drawing list.

These standard drawings are located on the web site and in Chapter 10 of the Design Guidelines and 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 10 - Index of Standard Drawings is available online at this location:

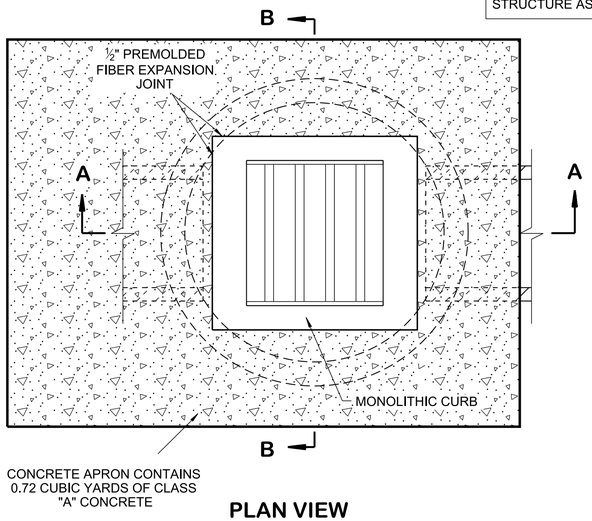
https://www.tn.gov/content/dam/tn/tdot/roadway-design/documents/design_guidelines/DG-C10.pdf

Jennifer Lloyd

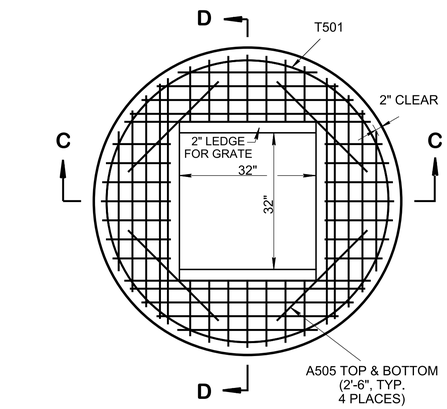
Jennifer Lloyd, PE
Civil Engineering Director
Roadway Design Division

KJL:ARH:RBB:TD
MARCH 31, 2021

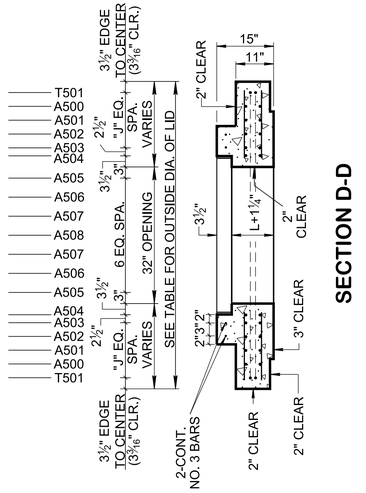
OUT-TO-OUT DIAMETER FOR T501 REINFORCING BARS EQUALS OUTSIDE DIAMETER OF LID MINUS 6⅜ INCHES.
ADDITIONAL A-BARS ARE REQUIRED FOR THE LARGER STRUCTURE AS INDICATED BY "NO. OF EQ. SPACES 'J'"



PLAN VIEW



LID REINFORCING



SECTION D-D

VARIABLE REINFORCING AND SPACING DIMENSIONS IN CONCRETE LID

INSIDE DIA. OF CATCH BASIN (INCHES)	OUTSIDE DIA. OF LID (INCHES)	NO. OF EQUAL SPACES "J"
60	72	3
72	86	4
84	100	5
96	114	6

CATCH BASIN MAXIMUM DEPTH NOTE

MAXIMUM DEPTH FOR PRECAST CONCRETE CIRCULAR CATCH BASINS IS 40.00'.

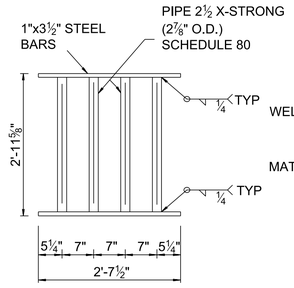
CATCH BASIN DIMENSIONS

INSIDE DIAMETER (D) OF PIPE (INCHES)	PIPE WALL THICKNESS (INCHES)	DIAMETER OF CUT-OUT HOLES (INCHES)	PRECAST SECTION MIN. HEIGHTS (INCHES)				▲ FOR DESIGN USE ONLY CATCH BASIN MINIMUM DESIGN DEPTH (FEET)			
			60"	72"	84"	96"	60"	72"	84"	96"
18	2½	25	57½	58	62½	63	3.52	3.57	3.95	3.99
24	3	32	64½	65	69½	70	4.06	4.11	4.49	4.53
30	3½	39	71½	72	76½	77	4.61	4.65	5.03	5.07
36	4	46	78½	79	83½	84	5.15	5.19	5.57	5.62
42	4½	53	85½	86	90½	91	5.69	5.73	6.11	6.16
48	5	60	92½	93	97½	98	6.23	6.28	6.65	6.70
54	5½	67	99½	100	104½	105	6.77	6.82	7.20	7.24
60	6	74	106½	107	111½	112	7.31	7.36	7.74	7.78
66	6½	81	113½	114	118½	119	7.86	7.90	8.28	8.33

(1) CUT-OUT HOLES BASED ON REINFORCED CONCRETE PIPE WITH WALL TYPE "B".

(2) ALL FLEXIBLE PIPE MATERIALS REQUIRE GASKET. SEE STANDARD DRAWING D-PB-2.

(3) CUT-OUT HOLES FOR PRECAST STRUCTURES TO BE FORMED IN ORDER TO OBTAIN A SMOOTH EDGED HOLE. SCORED OR ETCHED HOLES WITH REINFORCING STEEL LEFT UNCUT WILL NOT BE PERMITTED.

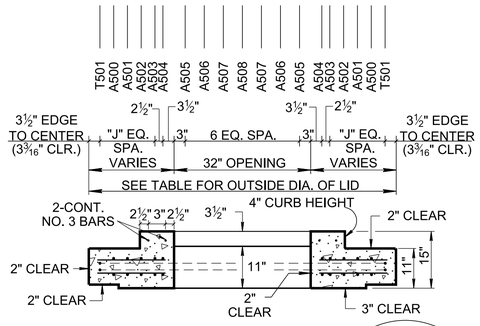


WELDING: AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)

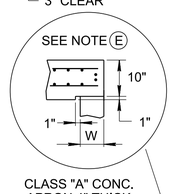
MATERIAL: STEEL BARS SHALL CONFORM TO ASTM A36. FOR THE PIPE CROSS MEMBERS, ASTM A53 GRADE B OR ASTM A500 GRADE B AND ALL SHALL BE GALVANIZED.

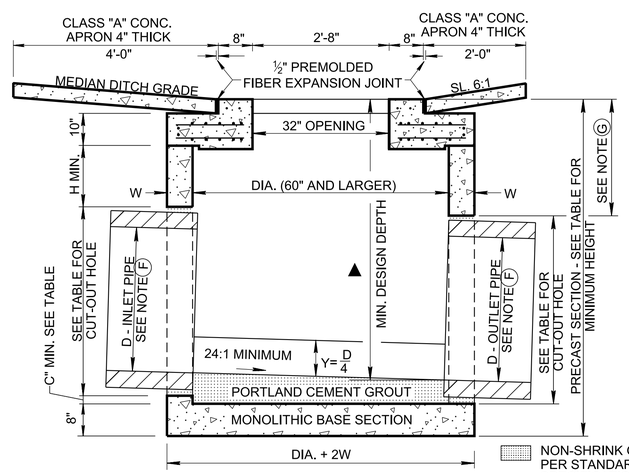
GRATE UNIT NO. 38

GRATE UNIT IS STRUCTURALLY DESIGNED BASED ON HS20 LOADING.

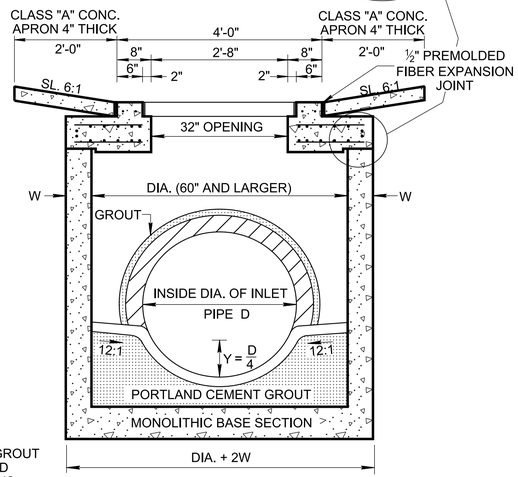


SECTION C-C





SECTION A-A



SECTION B-B

NON-SHRINK GROUT PER STANDARD SPECIFICATIONS SECTION 921 REQUIRED AROUND PIPE OPENINGS ONLY

CATCH BASIN DIMENSIONS

INSIDE DIA. OF CATCH BASIN DIA. (INCHES)	WALL THICKNESS W (INCHES)	LID THICKNESS L (INCHES)	OUTSIDE DIA. OF CATCH BASIN DIA. + 2W (INCHES)	MAX. INLET OR OUTLET CONC. PIPE SIZE - STR. (INCHES)	MAX. INLET OR OUTLET CONC. PIPE SIZE - 90° (INCHES)	DIMENSION	
						C (INCHES)	H (INCHES)
60	6	10	72	36	24	2.5	8
72	7	10	86	48	30	3.0	8
84	8	10	100	60	36	3.5	12
96	9	10	114	66	42	4.0	12

GENERAL NOTES

(A) ALL PRECAST ELEMENTS TO MEET ASTM C478 (CURRENT EDITION) AND AASHTO M199 (CURRENT EDITION) UNLESS SUPERSEDED BY THIS DRAWING:

CONCRETE: f'_c = 4,000 POUNDS PER SQUARE INCH AT 28 DAYS
REINFORCING STEEL: ASTM A615, Fy = 60,000 POUNDS PER SQUARE INCH
ALL REINFORCING IS TO BE INSTALLED AS DETAILED ON THIS DRAWING.

(B) PRECAST CATCH BASIN UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED CATCH BASIN UNITS AT THEIR OWN EXPENSE.

(C) APPROPRIATE SIZING AND LOCATION OF LIFTING DEVICES SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.

(D) THE CONTRACTOR IS TO PATCH ALL LIFTING DEVICE HOLES WITH GROUT AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.

(E) ALTERNATIVE JOINT DETAILS MAY BE ACCEPTABLE. SEE STANDARD DRAWING D-CB-99R FOR ADDITIONAL DETAILS.

(F) SEE ROADWAY PLANS DRAINAGE TABULATION FOR PIPE INLET AND OUTLET ELEVATIONS. IF NEEDED, INVERT ELEVATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER IN ORDER TO ACCOMMODATE INLET AND OUTLET PIPES.

(G) FOR CASES WHERE THE OUTLET PIPE DIAMETER IS LARGER THAN THE INLET PIPE DIAMETER, A MINIMUM 23 INCH DEPTH (FOR 60 OR 72 INCH INSIDE DIAMETER CATCH BASIN) OR 27 INCH DEPTH (FOR 84 OR 96 INCH INSIDE DIAMETER CATCH BASIN) SHALL BE MAINTAINED ABOVE THE OUTLET PIPE.

(H) CONCRETE JOINT MATERIAL TO BE ½" PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 OF STANDARD SPECIFICATIONS.

(I) PAY DEPTH MEASUREMENT MADE FROM TOP OF GRATE TO OUTLET FLOW ELEVATION. PAYMENT INCLUDES GRATE. PAYMENT FOR CATCH BASIN WILL BE MADE UNDER ITEM NUMBERS:

611-38.01, CATCH BASINS, TYPE 38, 0'-4' DEPTH, EACH (THROUGH)
611-38.07, CATCH BASINS, TYPE 38, > 24'-28' DEPTH, EACH.

PAYMENT FOR CATCH BASINS DEEPER THAN 28' WILL BE MADE UNDER ITEM NUMBER:

611-38.08, CATCH BASINS, TYPE 38, _ ' - _ ' DEPTH, EACH.

WHEN CLASS "A" CONCRETE APRON IS USED, IT IS TO BE INCLUDED IN THE PRICE BID PER CATCH BASIN.

REV. 1-19-99: ADDED CURB HEIGHT.

REV. 5-27-01: CHANGED PAY ITEMS IN GENERAL NOTE (I). ADDED CATCH BASIN MAXIMUM DEPTH NOTE.

REV. 9-5-04: CHANGED GROOVE DEPTH IN LID.

☐ REV. 8-01-12: REVISED CATCH BASIN LID FOR COMPLIANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION WITH INTERIMS. REVISED REINFORCING, GENERAL NOTES AND ADDITIONAL MISC. DRAFTING EDITS.

REV. 9-24-12: MODIFIED TOP SLAB AND MINIMUM DEPTH.

REV. 3-11-14: ELIMINATED STIRRUPS.

REV. 05-15-18: REVISED CATCH BASIN MINIMUM DESIGN DEPTH VALUES. CORRECTED STANDARD SPECIFICATIONS SECTION NUMBER TO 921 FOR NON -SHRINK GROUT. UPDATED CATCH BASIN DIMENSION TABLE. ADDED DIMENSION IN SECTION VIEW A-A FOR MINIMUM DESIGN DEPTH. CORRECTED REBAR PLACEMENT IN LIDS.

REV. 02-20-2020: REDREW SHEET.

REV. 03-04-2021: REVISED GRATE UNIT NOTES.

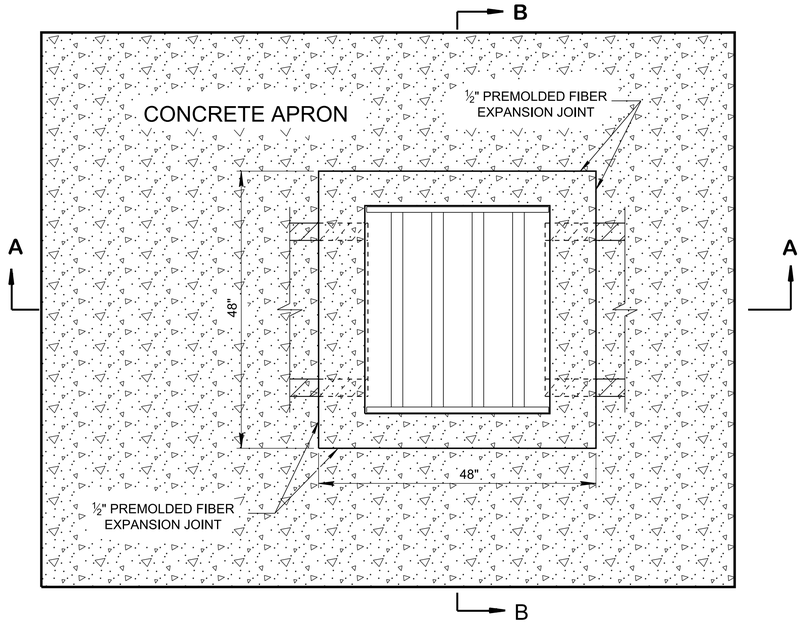
☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

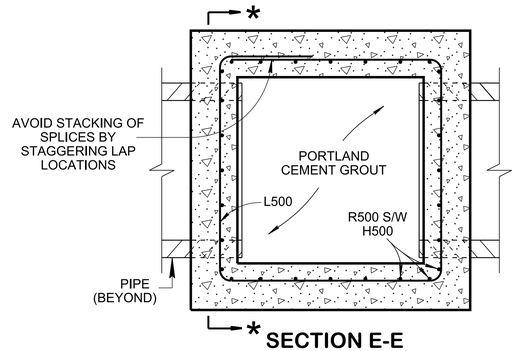
STANDARD PRECAST CIRCULAR NO. 38 CATCH BASIN

01-19-1998 | D-CB-38RB

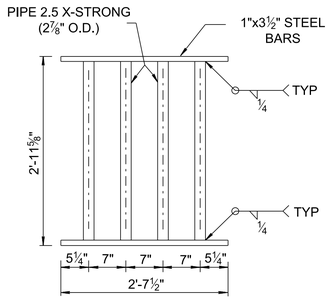
NOT TO SCALE



PLAN VIEW



SECTION E-E



GRATE UNIT NO. 38

GRATE UNIT IS STRUCTURALLY DESIGNED BASED ON HS20 LOADING.

MATERIAL FOR GRATE

SPECIFICATIONS FOR STEEL BARS SHALL CONFORM TO ASTM A36, FOR THE PIPE CROSS MEMBERS, ASTM A53 GRADE B OR ASTM A500 GRADE B AND ALL SHALL BE GALVANIZED.

WELDING:

AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)

CATCH BASIN DIMENSIONS				▲
INSIDE DIAMETER (D) OF PIPE (INCHES)	PIPE WALL THICKNESS (INCHES)	DIAMETER OF CUT-OUT HOLES (INCHES)	BOX SECTION MINIMUM HEIGHTS (INCHES)	FOR DESIGN USE ONLY CATCH BASIN MINIMUM DESIGN DEPTH (FEET)
18	2½	25	46⅜	2.94
24	3	32	53⅜	3.48

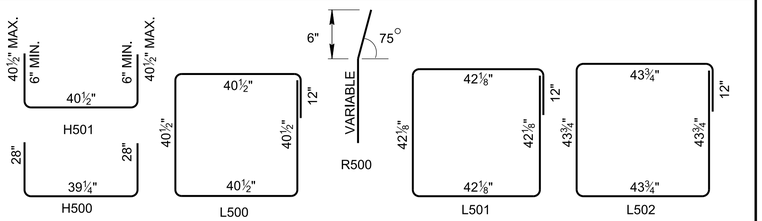
(1) CUT-OUT HOLES BASED ON REINFORCED CONCRETE PIPE WITH WALL TYPE "B".

(2) ALL FLEXIBLE PIPE MATERIALS REQUIRE GASKET. SEE STANDARD DRAWING D-PB-2.

(3) CUT-OUT HOLES FOR PRECAST STRUCTURES TO BE FORMED IN ORDER TO OBTAIN A SMOOTH EDGED HOLE. SCORED OR ETCHED HOLES WITH REINFORCING STEEL LEFT UNCUT WILL NOT BE PERMITTED.

(4) THE BOX SECTION HEIGHT SHALL NOT EXCEED 66".

REINFORCING STEEL LEGEND



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

GENERAL NOTES

(A) DRAWING TO BE USED FOR ALL CAST-IN-PLACE NO. 38S AND ALL PRECAST NO. 38S CONCRETE CATCH BASINS. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL CONSTRUCTION NOTES & DETAILS.

(B) CAST-IN-PLACE CONCRETE CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS UNLESS SUPERSEDED BY THIS DRAWING. THE CONTRACTOR MAY, WITH PERMISSION FROM THE ENGINEER, SUBSTITUTE PRECAST CATCH BASINS FOR CAST-IN-PLACE CATCH BASINS PROVIDED THAT ALL PRECAST ELEMENTS MEET ASTM C913 (CURRENT EDITION) UNLESS SUPERSEDED BY THIS DRAWING.

(C) THE FOLLOWING MATERIAL PROPERTIES ARE REQUIRED FOR BOTH CAST-IN-PLACE AND PRECAST STRUCTURES:

CONCRETE: f'_c = 4,000 POUNDS PER SQUARE INCH AT 28 DAYS
REINFORCING STEEL: ASTM A615, Fy = 60,000 POUNDS PER SQUARE INCH
ALL REINFORCING IS TO BE INSTALLED AS DETAILED ON THIS DRAWING.

(D) PRECAST CATCH BASIN UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED CATCH BASIN UNITS AT THEIR OWN EXPENSE.

(E) APPROPRIATE SIZING AND LOCATION OF LIFTING DEVICES SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.

(F) THE CONTRACTOR IS TO PATCH ALL LIFTING DEVICE HOLES WITH GROUT AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.

(G) SEE ROADWAY PLANS DRAINAGE TABULATION FOR PIPE INLET AND OUTLET ELEVATIONS. IF NEEDED, INVERT ELEVATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER IN ORDER TO ACCOMMODATE INLET AND OUTLET PIPES.

(H) FOR CASES WHERE THE OUTLET PIPE DIAMETER IS LARGER THAN THE INLET PIPE DIAMETER, A MINIMUM 12 INCH DEPTH SHALL BE MAINTAINED ABOVE THE OUTLET PIPE.

(I) CONCRETE JOINT MATERIAL TO BE ½ INCH PREMOLDED FIBER IN ACCORDANCE WITH SECTION 501 OF STANDARD SPECIFICATIONS.

(J) THE CONTRACTOR MAY ELIMINATE THE R500 BARS BY LENGTHENING THE VERTICAL LEG OF THE H500 BARS AND BENDING THE TOP 6 INCHES AT 75° SO THAT 2 INCHES OF CLEAR COVER IS PROVIDED AT THE TOP OF THE STRUCTURE.

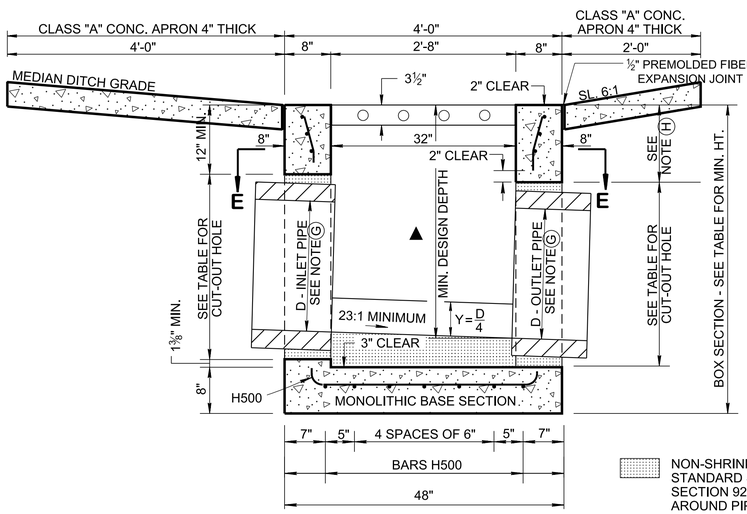
(K) PAY DEPTH MEASUREMENT MADE FROM TOP OF GRATE TO OUTLET FLOW ELEVATION. PAYMENT INCLUDES GRATE. PAYMENT FOR CATCH BASIN WILL BE MADE UNDER ITEM NUMBERS:

611-38.01,	CATCH BASINS, TYPE 38, 0'-4' DEPTH,	EACH
611-38.02,	CATCH BASINS, TYPE 38, > 4'-8' DEPTH,	EACH.

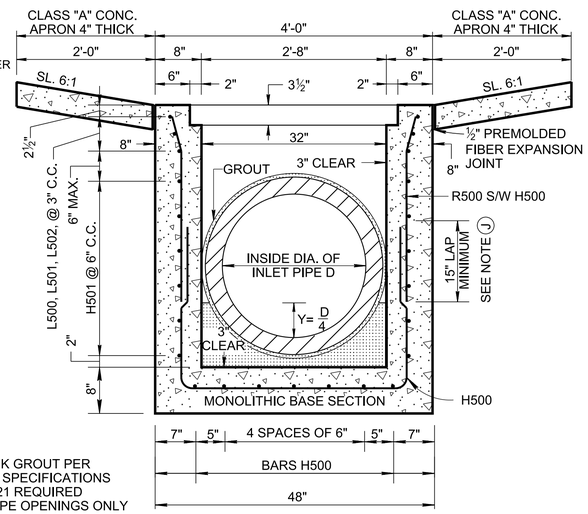
WHEN CLASS "A" CONCRETE APRON IS USED, IT IS TO BE INCLUDED IN THE PRICE BID PER CATCH BASIN.

SECTION *-*

ELEV. VIEW IS PROVIDED ON STANDARD DRAWING D-CB-99 SHOWING REINFORCEMENT REQUIREMENTS AROUND PIPE OPENINGS



SECTION A-A



SECTION B-B

NON-SHRINK GROUT PER STANDARD SPECIFICATIONS SECTION 921 REQUIRED AROUND PIPE OPENINGS ONLY

NOT TO SCALE

REV. 5-27-99: ADDED CATCH BASIN MAXIMUM DEPTH REQUIREMENT NOTE.

REV. 5-30-01: MODIFIED DIMENSIONS IN SECTION A-A AND CATCH BASIN MAXIMUM DEPTH NOTE.

REV. 6-10-01: CHANGED PAY ITEMS IN GENERAL NOTE (J).

REV. 7-29-02: CHANGED ASTM SPECIFICATION IN GENERAL NOTE (C).

☐ REV. 8-01-12: REVISED CATCH BASIN FOR COMPLIANCE WITH AASHTO LRFD BRIDGE DESIGNSPECIFICATIONS, 4TH EDITION WITH INTERIMS. REVISED REINFORCING, GENERAL NOTES, LEGEND AND ADDITIONAL MISC. DRAFTING EDITS.

REV. 05-15-18: REVISED CATCH BASIN MINIMUM DESIGN DEPTH VALUES. CORRECTED STANDARD SPECIFICATIONS SECTION NUMBER TO 921 FOR NON -SHRINK GROUT. ADDED DIMENSION IN SECTION VIEW A-A FOR MINIMUM DESIGN DEPTH. ADJUSTED BOX SECTION MINIMUM HEIGHTS.

REV. 02-20-2020: REDREW SHEET,

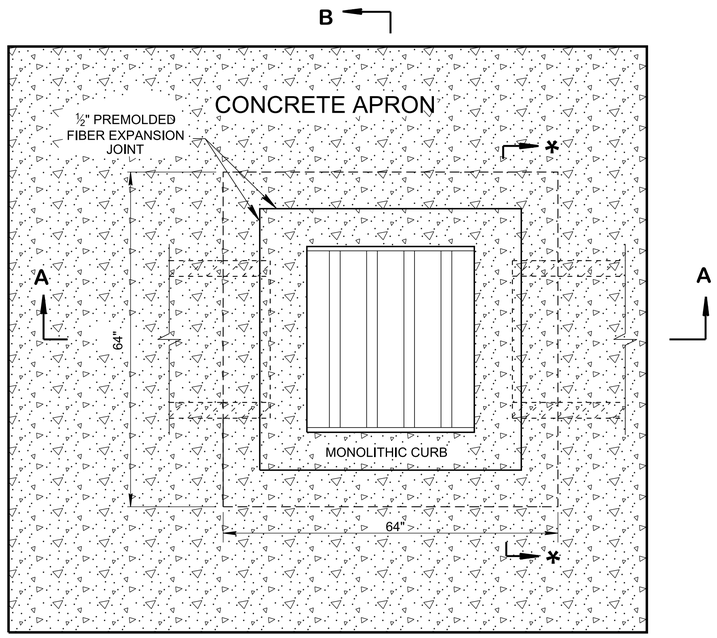
REV. 03-04-2021: REVISED GRATE UNIT NOTES.

☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

STANDARD 32" X 32" SQUARE CONCRETE NO. 38 CATCH BASIN

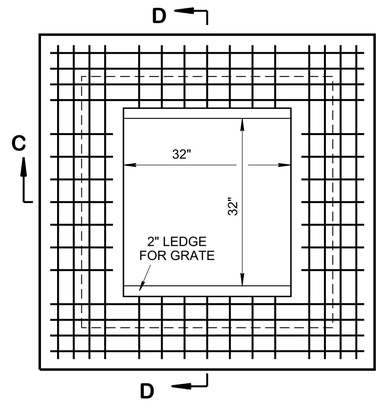
01-19-1998 | D-CB-38S



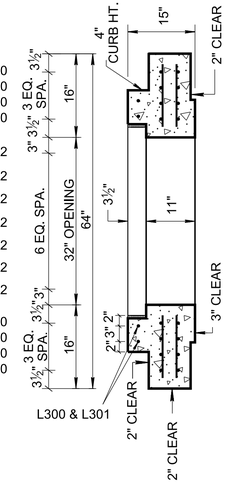
PLAN VIEW

SECTION *-*

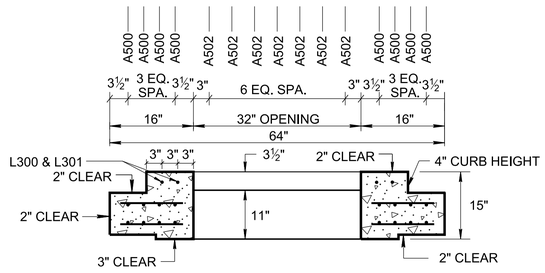
ELEV. VIEW IS PROVIDED ON STANDARD DRAWING D-CB-99 SHOWING REINFORCEMENT REQUIREMENTS AROUND PIPE OPENINGS



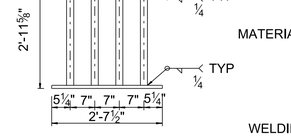
LID REINFORCING



SECTION D-D



SECTION C-C

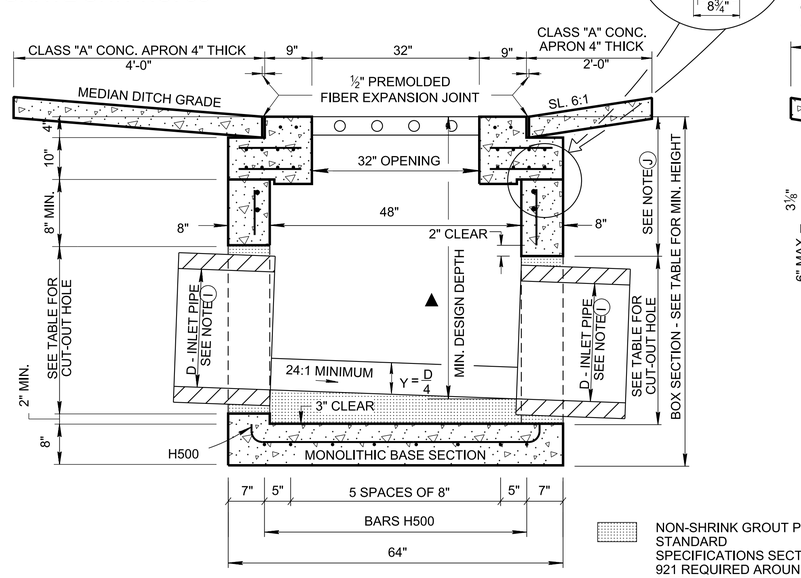


GRATE UNIT NO. 38

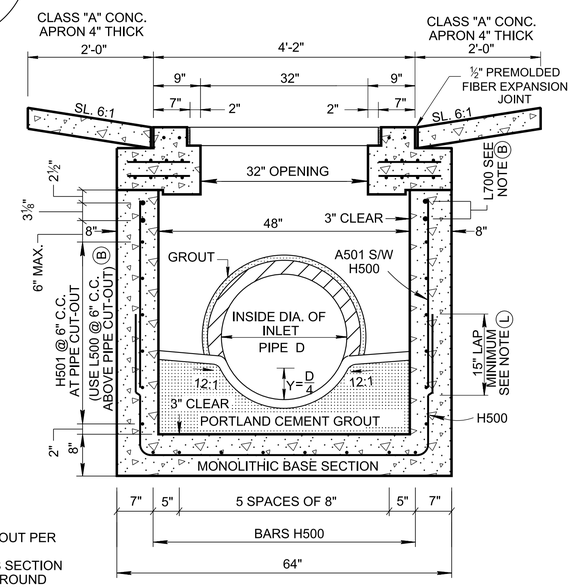
GRATE UNIT IS STRUCTURALLY DESIGNED BASED ON HS20 LOADING.

MATERIAL : STEEL BARS SHALL CONFORM TO ASTM A36. FOR THE PIPE CROSS MEMBERS, ASTM A53 GRADE B OR ASTM A500 GRADE B AND ALL SHALL BE GALVANIZED.

WELDING: AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION).



SECTION A-A



SECTION B-B

NON-SHRINK GROUT PER STANDARD SPECIFICATIONS SECTION 921 REQUIRED AROUND PIPE OPENINGS ONLY

NOT TO SCALE

CATCH BASIN MAXIMUM DEPTH NOTE
MAXIMUM DEPTH FOR THIS STRUCTURE IS 28.00'.

CATCH BASIN DIMENSIONS

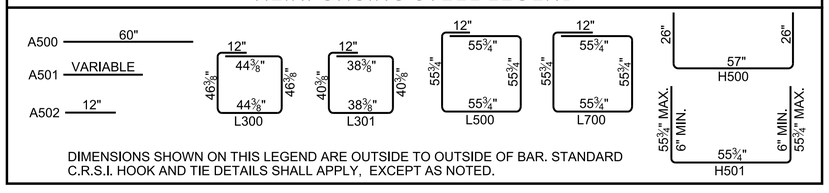
INSIDE DIAMETER (D) OF PIPE (INCHES)	PIPE WALL THICKNESS (INCHES)	DIAMETER OF CUT-OUT HOLES (INCHES)	BOX SECTION MINIMUM HEIGHTS (INCHES)	▲ FOR DESIGN USE ONLY CATCH BASIN MINIMUM DESIGN DEPTH (FEET)
18	2½	25	57	3.82
24	3	32	64	4.36
30	3½	39	71	4.90
36	4	46	78	5.45

(1) CUT-OUT HOLES BASED ON REINFORCED CONCRETE PIPE WITH WALL TYPE "B".

(2) ALL FLEXIBLE PIPE MATERIALS REQUIRE GASKET. SEE STANDARD DRAWING D-PB-2.

(3) CUT-OUT HOLES FOR PRECAST STRUCTURES TO BE FORMED IN ORDER TO OBTAIN A SMOOTH EDGED HOLE. SCORED OR ETCHED HOLES WITH REINFORCING STEEL LEFT UNCUT WILL NOT BE PERMITTED.

REINFORCING STEEL LEGEND



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

GENERAL NOTES

(A) DRAWING TO BE USED FOR ALL CAST-IN-PLACE NO. 38SB CONCRETE CATCH BASINS AND ALL PRECAST NO. 38SB CONCRETE CATCH BASINS. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL CONSTRUCTION NOTES AND DETAILS.

(B) THIS DRAWING DEPICTS THE MINIMUM HORIZONTAL REINFORCING AT THE TOP OF CATCH BASIN WALLS. SEE ADDITIONAL DETAILS ON STANDARD DRAWING D-CB-99 FOR TALLER SECTIONS AND STEEL PLACEMENT ABOVE PIPE OPENINGS.

(C) CAST-IN-PLACE CONCRETE CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS UNLESS SUPERSEDED BY THIS DRAWING. THE CONTRACTOR MAY WITH PERMISSION FROM THE ENGINEER SUBSTITUTE PRECAST CATCH BASINS FOR CAST-IN-PLACE CATCH BASINS PROVIDED THAT ALL PRECAST ELEMENTS MEET ASTM C913 (CURRENT EDITION) UNLESS SUPERSEDED BY THIS DRAWING.

(D) THE FOLLOWING MATERIAL PROPERTIES ARE REQUIRED FOR BOTH CAST-IN-PLACE AND PRECAST STRUCTURES:

CONCRETE: f'_c = 4,000 POUNDS PER SQUARE INCH AT 28 DAYS
REINFORCING STEEL: ASTM A615, Fy = 60,000 POUNDS PER SQUARE INCH
ALL REINFORCING IS TO BE INSTALLED AS DETAILED ON THIS DRAWING.

(E) PRECAST CATCH BASIN UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED CATCH BASIN UNITS AT THEIR OWN EXPENSE.

(F) APPROPRIATE SIZING AND LOCATION OF LIFTING DEVICES SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.

(G) THE CONTRACTOR IS TO PATCH ALL LIFTING DEVICE HOLES WITH GROUT AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.

(H) ALTERNATIVE JOINT DETAILS MAY BE ACCEPTABLE. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL DETAILS.

(I) SEE ROADWAY PLANS DRAINAGE TABULATION FOR PIPE INLET AND OUTLET ELEVATIONS. IF NEEDED, INVERT ELEVATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER IN ORDER TO ACCOMMODATE INLET AND OUTLET PIPES.

(J) FOR CASES WHERE THE OUTLET PIPE DIAMETER IS LARGER THAN THE INLET PIPE DIAMETER, A MINIMUM 22 INCH DEPTH SHALL BE MAINTAINED ABOVE THE OUTLET PIPE.

(K) CONCRETE JOINT MATERIAL TO BE ½ INCH PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 OF STANDARD SPECIFICATIONS.

(L) THE CONTRACTOR MAY ELIMINATE THE A501 BARS BY LENGTHENING THE VERTICAL LEG OF THE H500 BARS SO THAT 1½ INCHES OF CLEAR COVER IS PROVIDED AT THE TOP OF THE STRUCTURE.

(M) PAY DEPTH MEASUREMENT MADE FROM TOP OF GRATE TO OUTLET FLOW ELEVATION. PAYMENT INCLUDES GRATE. PAYMENT FOR CATCH BASIN WILL BE MADE UNDER ITEM NUMBERS:

611-38.01,	CATCH BASINS, TYPE 38, 0'-4' DEPTH,	EACH	(THROUGH)
611-38.07,	CATCH BASINS, TYPE 38, > 24'-28' DEPTH,	EACH.	

WHEN CLASS "A" CONCRETE APRON IS USED, IT IS TO BE INCLUDED IN THE PRICE BID PER CATCH BASIN.

REV. 5-27-01: CHANGED PAY ITEMS IN GENERAL NOTE (J). ADDED CATCH BASIN MAXIMUM DEPTH NOTE.

REV. 9-11-02: MODIFIED LID DETAIL.

REV. 9-5-04: CHANGED GROOVE DEPTH IN LID.

☐ REV. 8-01-12: REVISED CATCH BASIN FOR COMPLIANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS,4TH EDITION WITH INTERIMS. REVISED REINFORCING, GENERAL NOTES, LEGEND AND ADDITIONAL MISC. DRAFTING EDITS.

REV. 9-24-12: MODIFIED TOP SLAB AND MINIMUM DEPTH.

REV. 3-11-14: ELIMINATED STIRRUPS.

REV. 05-15-18: REVISED CATCH BASIN MINIMUM DESIGN DEPTH VALUES. CORRECTED STANDARD SPECIFICATIONS SECTION NUMBER TO 921 FOR NON -SHRINK GROUT. ADDED DIMENSION IN SECTION VIEW A-A FOR MINIMUM DESIGN DEPTH. CORRECTED REBAR PLACEMENT IN LIDS. ADJUSTED BOX SECTION MINIMUM HEIGHTS.

REV. 02-20-2020: REDREW SHEET.

REV. 03-04-2021: REVISED GRATE UNIT NOTES.

☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

STANDARD 4' X 4' SQUARE CONCRETE NO. 38 CATCH BASIN

05-27-1999 | D-CB-38SB

3/18/2021 10:16:14 AM
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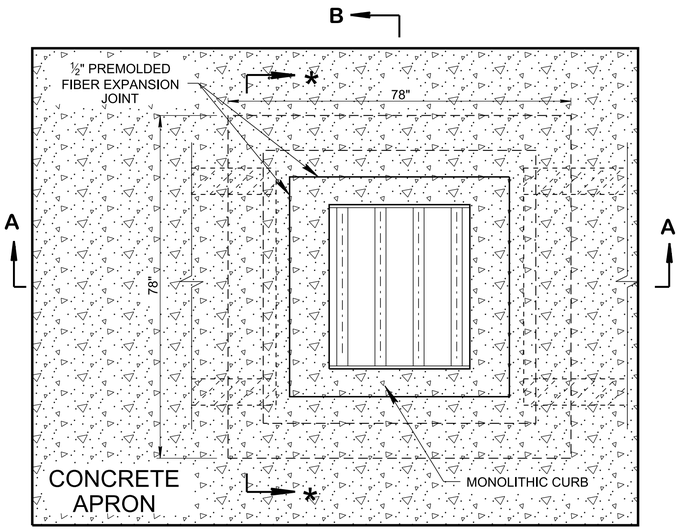
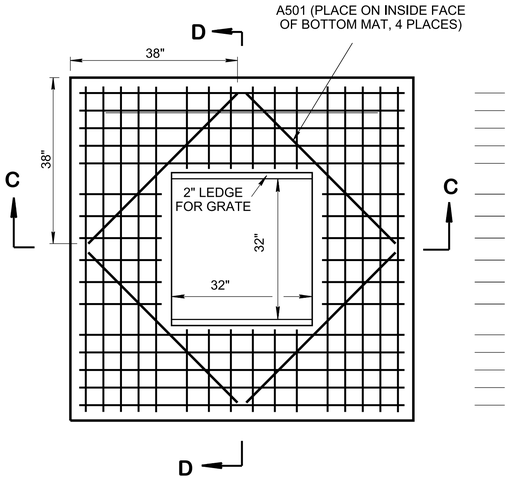
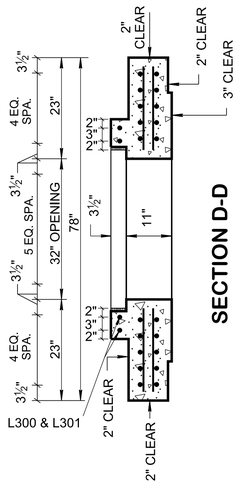


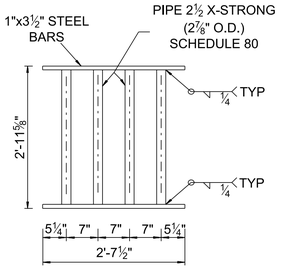
PLAN VIEW



LID REINFORCING



SECTION D-D



GRATE UNIT NO. 38

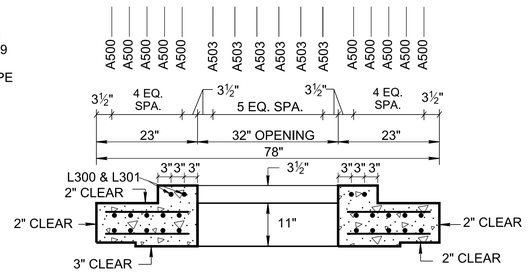
GRATE UNIT IS STRUCTURALLY DESIGNED BASED ON HS20 LOADING.

MATERIAL: STEEL BARS SHALL CONFORM TO ASTM A36. FOR THE PIPE CROSS MEMBERS, ASTM A53 GRADE B OR ASTM A500 GRADE B AND ALL SHALL BE GALVANIZED.

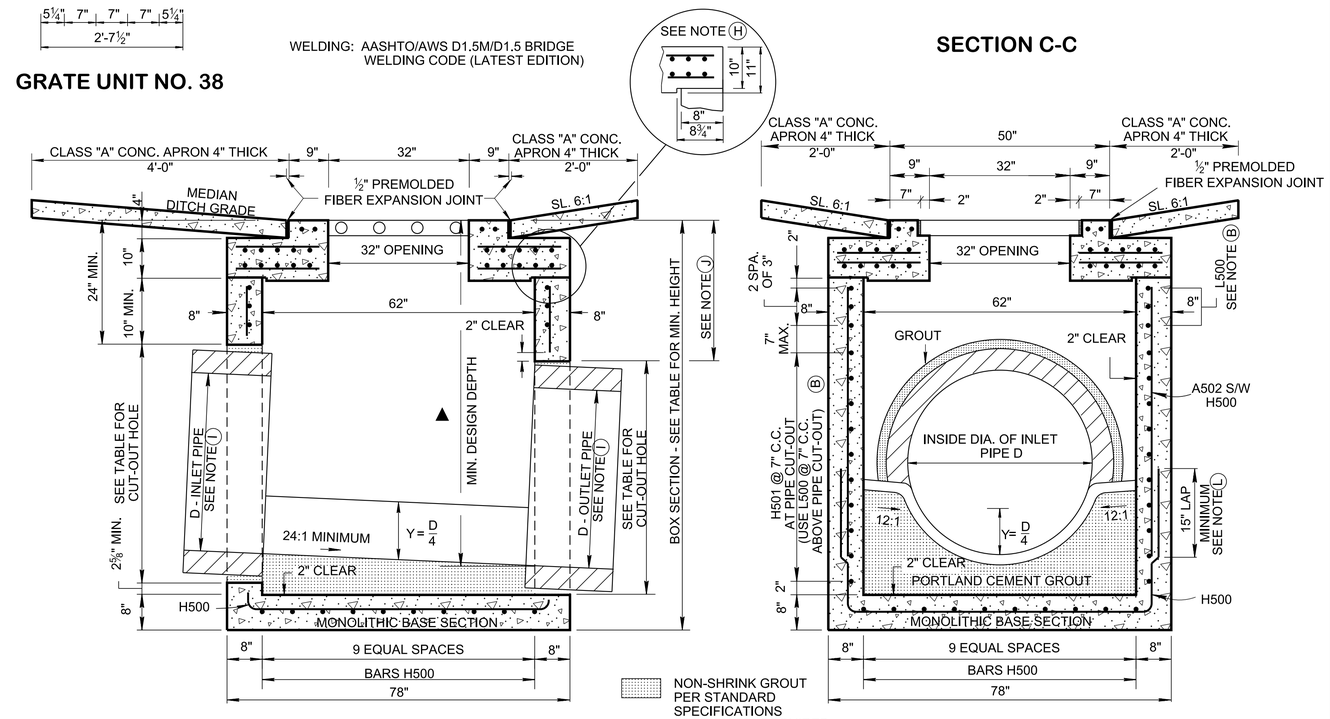
WELDING: AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)

SECTION *-*

ELEV. VIEW IS PROVIDED ON STANDARD DRAWING D-CB-99 SHOWING REINFORCEMENT REQUIREMENTS AROUND PIPE OPENINGS



SECTION C-C



SECTION A-A

SECTION B-B

NON-SHRINK GROUT PER STANDARD SPECIFICATIONS SECTION 921 REQUIRED AROUND PIPE OPENINGS ONLY

CATCH BASIN MAXIMUM DEPTH NOTE
MAXIMUM DEPTH FOR THIS STRUCTURE IS 28.00'.

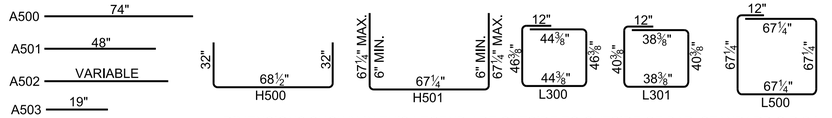
CATCH BASIN DIMENSIONS				▲
INSIDE DIAMETER (D) OF PIPE (INCHES)	PIPE WALL THICKNESS (INCHES)	DIAMETER OF CUT-OUT HOLES (INCHES)	BOX SECTION MINIMUM HEIGHTS (INCHES)	FOR DESIGN USE ONLY CATCH BASIN MINIMUM DESIGN DEPTH (FEET)
18	2½	25	59⅝	4.04
24	3	32	66⅝	4.58
30	3½	39	73⅝	5.12
36	4	46	80⅝	5.66
42	4½	53	87⅝	6.20
48	5	60	94⅝	6.74

(1) CUT-OUT HOLES BASED ON REINFORCED CONCRETE PIPE WITH WALL TYPE "B".

(2) ALL FLEXIBLE PIPE MATERIALS REQUIRE GASKET. SEE STANDARD DRAWING D-PB-2.

(3) CUT-OUT HOLES FOR PRECAST STRUCTURES TO BE FORMED IN ORDER TO OBTAIN A SMOOTH EDGED HOLE. SCORED OR ETCHED HOLES WITH REINFORCING STEEL LEFT UNCUT WILL NOT BE PERMITTED.

REINFORCING STEEL LEGEND



DIMENSIONS SHOWN IN THIS LEGEND ARE OUTSIDE TO OUTSIDE OF BAR. STANDARD C.R.S.I. HOOK AND TIE DETAILS SHALL APPLY, EXCEPT AS NOTED.

GENERAL NOTES

(A) DRAWING TO BE USED FOR ALL CAST-IN-PLACE NO. 38SC CONCRETE CATCH BASINS AND ALL PRECAST NO. 38SC CONCRETE CATCH BASINS. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL CONSTRUCTION NOTES AND DETAILS.

(B) THIS DRAWING DEPICTS THE MINIMUM HORIZONTAL REINFORCING AT THE TOP OF CATCH BASIN WALLS. SEE ADDITIONAL DETAILS ON STANDARD DRAWING D-CB-99 FOR TALLER SECTIONS AND STEEL PLACEMENT ABOVE PIPE OPENINGS.

(C) CAST-IN-PLACE CONCRETE CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS UNLESS SUPERSEDED BY THIS DRAWING. THE CONTRACTOR MAY, WITH PERMISSION FROM THE ENGINEER, SUBSTITUTE PRECAST CATCH BASINS FOR CAST-IN-PLACE CATCH BASINS PROVIDED THAT ALL PRECAST ELEMENTS MEET ASTM C913 (CURRENT EDITION) UNLESS SUPERSEDED BY THIS DRAWING.

(D) THE FOLLOWING MATERIAL PROPERTIES ARE REQUIRED FOR BOTH CAST-IN-PLACE AND PRECAST STRUCTURES:

CONCRETE: f'_C = 4,000 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.

(E) PRECAST CATCH BASIN UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED CATCH BASIN UNITS AT THEIR OWN EXPENSE.

(F) APPROPRIATE SIZING AND LOCATION OF LIFTING DEVICES SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.

(G) THE CONTRACTOR IS TO PATCH ALL LIFTING DEVICE HOLES WITH GROUT AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.

(H) ALTERNATIVE JOINT DETAILS MAY BE ACCEPTABLE. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL DETAILS.

(I) SEE ROADWAY PLANS DRAINAGE TABULATION FOR PIPE INLET AND OUTLET ELEVATIONS. IF NEEDED, INVERT ELEVATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER IN ORDER TO ACCOMMODATE INLET AND OUTLET PIPES.

(J) FOR CASES WHERE THE OUTLET PIPE DIAMETER IS LARGER THAN THE INLET PIPE DIAMETER, A MINIMUM 24 INCH DEPTH SHALL BE MAINTAINED ABOVE THE OUTLET PIPE.

(K) CONCRETE JOINT MATERIAL TO BE ½ INCH PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 OF STANDARD SPECIFICATIONS.

(L) THE CONTRACTOR MAY ELIMINATE THE A502 BARS BY LENGTHENING THE VERTICAL LEG OF THE H500 BARS SO THAT 1½ INCHES OF CLEAR COVER IS PROVIDED AT THE TOP OF THE STRUCTURE.

(M) PAY DEPTH MEASUREMENT MADE FROM TOP OF GRATE TO OUTLET FLOW ELEVATION. PAYMENT INCLUDES GRATE. PAYMENT FOR CATCH BASIN WILL BE MADE UNDER ITEM NUMBERS:

611-38.02, CATCH BASINS, TYPE 38, > 4'-6' DEPTH, EACH (THROUGH)
611-38.07, CATCH BASINS, TYPE 38, > 24'-28' DEPTH, EACH.

WHEN CLASS "A" CONCRETE APRON IS USED, IT IS TO BE INCLUDED IN THE PRICE BID PER CATCH BASIN.

REV. 9-5-04: CHANGED GROOVE DEPTH IN LID.

☐ REV. 8-01-12: REVISED CATCH BASIN FOR COMPLIANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION WITH INTERIMS. REVISED REINFORCING, GENERAL NOTES, LEGEND AND ADDITIONAL MISC. DRAFTING EDITS.

REV. 9-24-12: MODIFIED TOP SLAB AND MINIMUM DEPTH.

REV. 3-11-14: ELIMINATED STIRRUPS.

REV. 05-15-18: REVISED CATCH BASIN MINIMUM DESIGN DEPTH VALUES. CORRECTED STANDARD SPECIFICATIONS SECTION NUMBER TO 921 FOR NON -SHRINK GROUT. ADDED DIMENSION IN SECTION VIEW A-A FOR NOTE (J). CORRECTED REBAR PLACEMENT IN LIDS. ADDED DIMENSION IN SECTION VIEW A-A FOR MINIMUM DESIGN DEPTH. ADJUSTED BOX SECTION MINIMUM HEIGHTS.

REV. 02-20-2020: REDREW SHEET.

REV. 03-04-2021: REVISED GRATE UNIT NOTES.

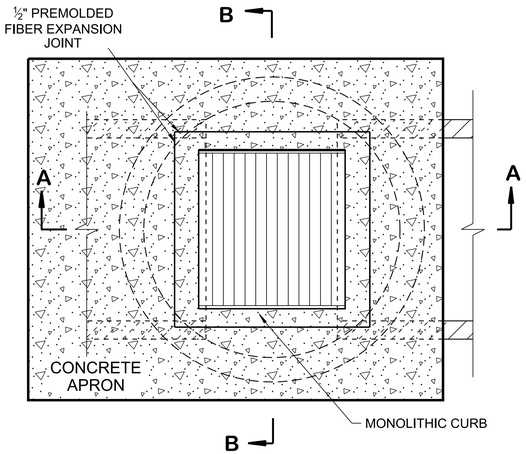
☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

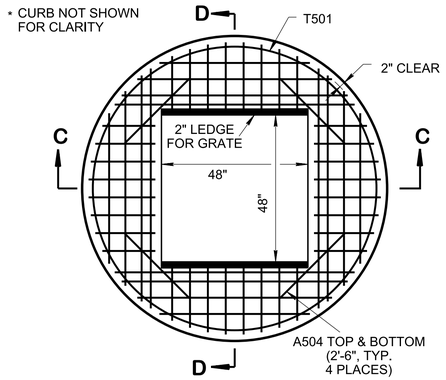
STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 38 CATCH BASIN

09-11-2002 | D-CB-38SC

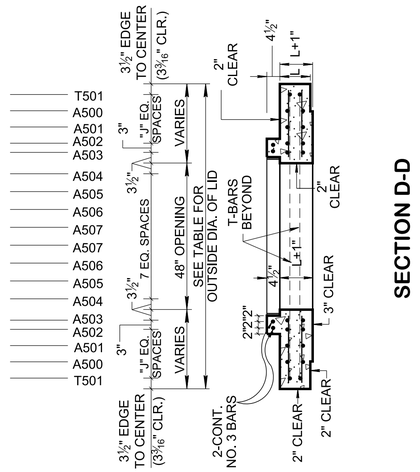
NOT TO SCALE



PLAN VIEW



LID REINFORCING



SECTION D-D

VARIABLE REINFORCING DIMENSIONS AND SPACING IN CONCRETE LID		
INSIDE DIA. OF CATCH BASIN (INCHES)	OUTSIDE DIA. OF LID (INCHES)	NO. OF EQUAL SPACES "J"
84	100	3
96	114	4

OUT-TO-OUT DIAMETER FOR T501 REINFORCING BARS EQUAL OUTSIDE DIAMETER OF LID MINUS 6⅜ INCHES.

ADDITIONAL A-BARS ARE REQUIRED FOR THE LARGER STRUCTURE AS INDICATED BY "NO. OF EQ. SPACES 'J'"

CATCH BASIN MAXIMUM DEPTH NOTE
MAXIMUM DEPTH FOR THIS STRUCTURE IS 40.00'.

CATCH BASIN DIMENSIONS						
INSIDE DIAMETER (D) OF PIPE (INCHES)	PIPE WALL THICKNESS (INCHES)	DIAMETER OF CUT-OUT HOLES (INCHES)	PRECAST SECTION MIN. HEIGHTS (INCHES)		FOR DESIGN USE ONLY CATCH BASIN MINIMUM DESIGN DEPTH (FEET)	
			84"	96"	84"	96"
18	2½	25	63	64½	4.32	4.45
24	3	32	70	71½	4.86	4.99
30	3½	39	77	78½	5.40	5.53
36	4	46	84	85½	5.95	6.07
42	4½	53	91	92½	6.49	6.62
48	5	60	98	99½	7.03	7.16
54	5½	67	105	106½	7.57	7.70
60	6	74	112	113½	8.11	8.24
66	6½	81	119	120½	8.66	8.78

(1) CUT-OUT HOLES BASED ON REINFORCED CONCRETE PIPE WITH WALL TYPE "B".

(2) ALL FLEXIBLE PIPE MATERIALS REQUIRE GASKET. SEE STANDARD DRAWING D-PB-2.

(3) CUT-OUT HOLES FOR PRECAST STRUCTURES TO BE FORMED IN ORDER TO OBTAIN A SMOOTH EDGED HOLE. SCORED OR ETCHED HOLES WITH REINFORCING STEEL LEFT UNCUT WILL NOT BE PERMITTED.

REV. 11-25-98: CHANGED LABELING ON PLAN VIEW OF GRATE UNIT AND SIZE OF STEEL BARS IN GRATE UNIT.

REV. 1-19-99: MODIFIED CATCH BASIN MINIMUM DEPTH TABLE.

REV. 5-27-01: CHANGED PAY ITEMS IN GENERAL NOTE (H). ADDED CATCH BASIN MAXIMUM DEPTH NOTE.

☐ REV. 8-01-12: REVISED CATCH BASIN LID FOR COMPLIANCE WITH LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION WITH INTERIMS. REVISED REINFORCING, GENERAL NOTES AND ADDITIONAL MISC. DRAFTING EDITS.

REV. 9-24-12: ADDED BAR DESIGNATION FOR CONTINOUS #3 BARS AROUND GRATE AND MODIFIED TOP SLAB.

REV. 3-11-14: ELIMINATED STIRRUPS.

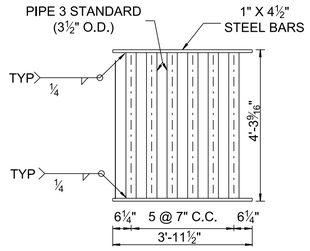
REV. 05-15-18: REVISED CATCH BASIN MINIMUM DESIGN DEPTH VALUES. CORRECTED STANDARD SPECIFICATIONS SECTION NUMBER TO 921 FOR NON -SHRINK GROUT. ADDED DIMENSION IN SECTION VIEW A-A FOR MINIMUM DESIGN DEPTH. CORRECTED REBAR PLACEMENT IN LIDS.

REV. 02-20-2020: REDREW SHEET.

REV. 03-04-2021: REVISED GRATE UNIT NOTES.

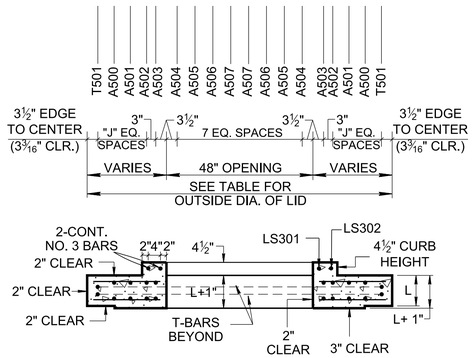
MATERIAL: STEEL BARS SHALL CONFORM TO ASTM A36. FOR THE PIPE CROSS MEMBERS, ASTM A53 GRADE B OR ASTM A500 GRADE B AND ALL SHALL BE GALVANIZED.

WELDING: AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)

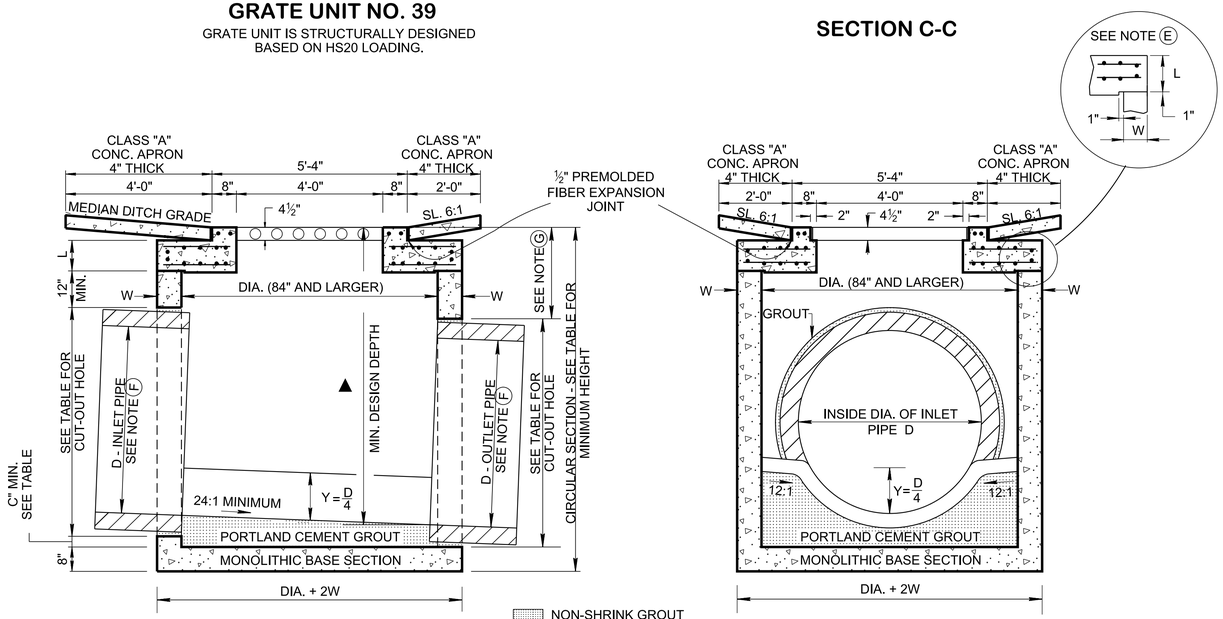


GRATE UNIT NO. 39

GRATE UNIT IS STRUCTURALLY DESIGNED BASED ON HS20 LOADING.



SECTION C-C



SECTION A-A

SECTION B-B

NON-SHRINK GROUT PER STANDARD SPECIFICATIONS SECTION 921 REQUIRED AROUND PIPE OPENINGS ONLY

GENERAL NOTES

(A) ALL PRECAST ELEMENTS TO MEET ASTM C478 (CURRENT EDITION) AND AASHTO M199 (CURRENT EDITION) UNLESS SUPERSEDED BY THIS DRAWING.

CONCRETE: f'_c = 4,000 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.

(B) PRECAST CATCH BASIN UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED CATCH BASIN UNITS AT THEIR OWN EXPENSE.

(C) APPROPRIATE SIZING AND LOCATION OF LIFTING DEVICES SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.

(D) THE CONTRACTOR IS TO PATCH ALL LIFTING DEVICE HOLES WITH GROUT AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.

(E) ALTERNATIVE JOINT DETAILS MAY BE ACCEPTABLE. SEE STANDARD DRAWING D-CB-99R FOR ADDITIONAL DETAILS.

(F) SEE ROADWAY PLANS DRAINAGE TABULATION FOR PIPE INLET AND OUTLET ELEVATIONS. IF NEEDED, INVERT ELEVATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER IN ORDER TO ACCOMMODATE INLET AND OUTLET PIPES.

(G) FOR CASES WHERE THE OUTLET PIPE DIAMETER IS LARGER THAN THE INLET PIPE DIAMETER, A MINIMUM 26½ INCH (FOR 84 INCH INSIDE DIAMETER CATCH BASIN) OR 27½ INCH (FOR 96 INCH INSIDE DIAMETER CATCH BASIN) DEPTH SHALL BE MAINTAINED ABOVE THE OUTLET PIPE.

(H) CONCRETE JOINT MATERIAL TO BE ½" PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 OF STANDARD SPECIFICATIONS.

(I) PAY DEPTH MEASUREMENT MADE FROM TOP OF GRATE TO OUTLET FLOW ELEVATION. PAYMENT INCLUDES GRATE. PAYMENT FOR CATCH BASIN WILL BE MADE UNDER ITEM NUMBERS:

611-39.02, CATCH BASINS, TYPE 39, > 4'-8' DEPTH, EACH (THROUGH)
611-39.07, CATCH BASINS, TYPE 39, > 24'-28' DEPTH, EACH.

PAYMENT FOR CATCH BASINS DEEPER THAN 28' WILL BE MADE UNDER ITEM NUMBER:

611-39.08, CATCH BASINS, TYPE 39, _ ' - _ ' DEPTH, EACH.

WHEN CLASS "A" CONCRETE APRON IS USED, IT IS TO BE INCLUDED IN THE PRICE BID PER CATCH BASIN.

CATCH BASIN DIMENSIONS						
INSIDE DIA. OF CATCH BASIN DIA. (INCHES)	WALL THICKNESS W (INCHES)	LID THICKNESS L (INCHES)	OUTSIDE DIA. OF CATCH BASIN INSIDE DIA. + 2W (INCHES)	MAX. INLET OR OUTLET CONC. PIPE SIZE - STR. (INCHES)	MAX. INLET OR OUTLET CONC. PIPE SIZE - 90° (INCHES)	DIMENSION C (INCHES)
84	8	10	100	60	36	3.5
96	9	11	114	66	42	4.0

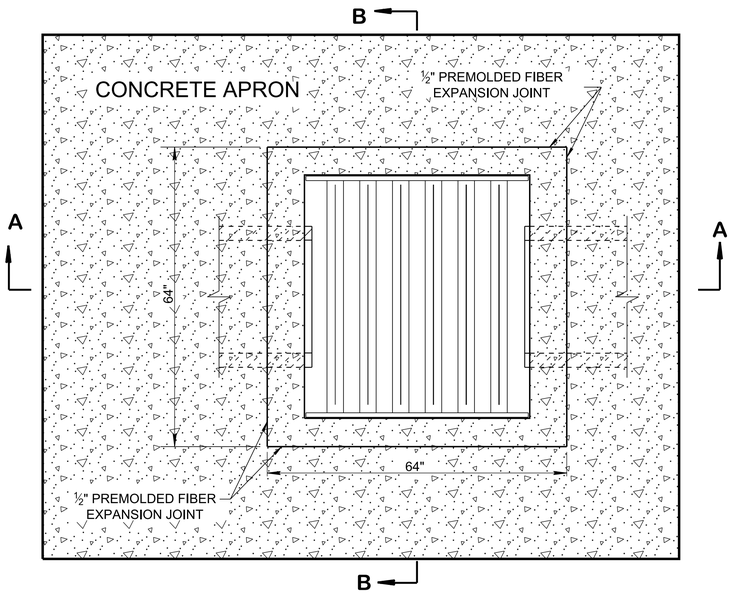
☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

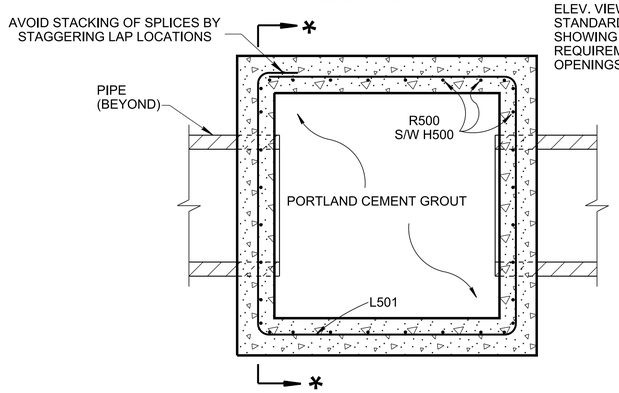
STANDARD PRECAST CIRCULAR NO. 39 CATCH BASIN

19-26-1998 | D-CB-39RB

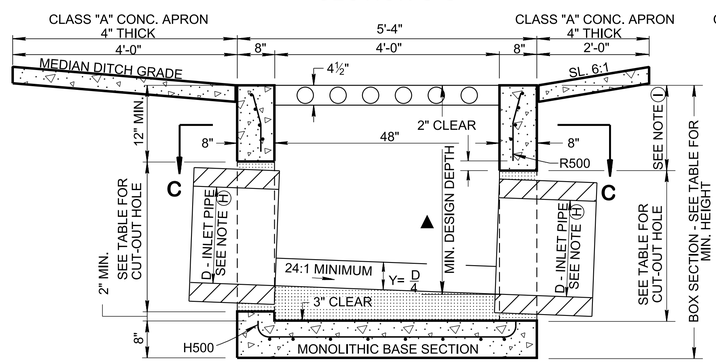
NOT TO SCALE



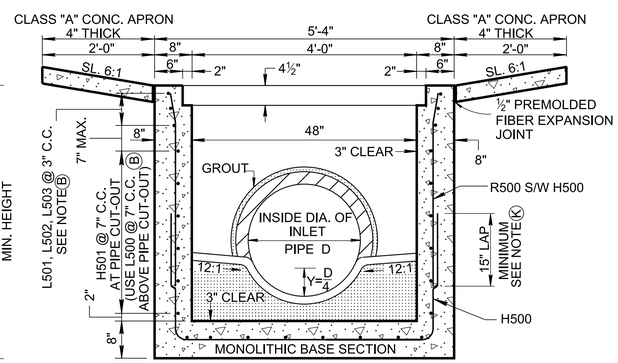
PLAN VIEW



SECTION C-C



SECTION A-A

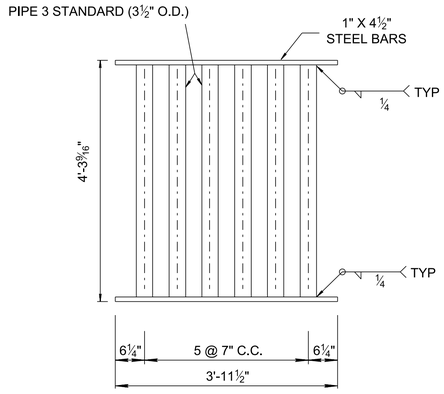


SECTION B-B

NON-SHRINK GROUT PER STANDARD SPECIFICATIONS SECTION 921 REQUIRED AROUND PIPE OPENINGS ONLY

SECTION *-*

ELEV. VIEW IS PROVIDED ON STANDARD DRAWING D-CB-99 SHOWING REINFORCEMENT REQUIREMENTS AROUND PIPE OPENINGS



GRATE UNIT NO. 39

GRATE UNIT IS STRUCTURALLY DESIGNED BASED ON HS20 LOADING.

MATERIAL: STEEL BARS SHALL CONFORM TO ASTM A36. FOR THE PIPE CROSS MEMBERS, ASTM A53 GRADE B OR ASTM A500 GRADE B AND ALL SHALL BE GALVANIZED.

WELDING: AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)

CATCH BASIN MAXIMUM DEPTH NOTE
MAXIMUM DEPTH FOR THIS STRUCTURE IS 28.00'.

CATCH BASIN DIMENSIONS

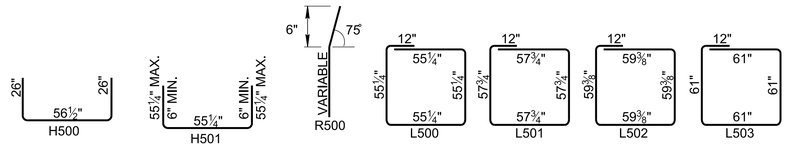
INSIDE DIAMETER (D) OF PIPE (INCHES)	PIPE WALL THICKNESS (INCHES)	DIAMETER OF CUT-OUT HOLES (INCHES)	BOX SECTION MINIMUM HEIGHTS (INCHES)	▲ FOR DESIGN USE ONLY CATCH BASIN MINIMUM DESIGN DEPTH (FEET)
18	2½	25	47	2.99
24	3	32	54	3,53
30	3½	39	61	4.07
36	4	46	68	4.61

(1) CUT-OUT HOLES BASED ON REINFORCED CONCRETE PIPE WITH WALL TYPE "B".

(2) ALL FLEXIBLE PIPE MATERIALS REQUIRE GASKET. SEE STANDARD DRAWING D-PB-2.

(3) CUT-OUT HOLES FOR PRECAST STRUCTURES TO BE FORMED IN ORDER TO OBTAIN A SMOOTH EDGED HOLE. SCORED OR ETCHED HOLES WITH REINFORCING STEEL LEFT UNCUT WILL NOT BE PERMITTED.

REINFORCING STEEL LEGEND



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

GENERAL NOTES

(A) DRAWING TO BE USED FOR ALL CAST-IN-PLACE NO. 39 CONCRETE CATCH BASINS AND ALL PRECAST NO. 39 CONCRETE CATCH BASINS. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL CONSTRUCTION NOTES & DETAILS.

(B) THIS DRAWING DEPICTS THE MINIMUM HORIZONTAL REINFORCING AT THE TOP OF CATCH BASIN WALLS. SEE ADDITIONAL DETAILS ON STANDARD DRAWING D-CB-99 FOR TALLER SECTIONS AND STEEL PLACEMENT ABOVE PIPE OPENINGS.

(C) CAST-IN-PLACE CONCRETE CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS UNLESS SUPERSEDED BY THIS DRAWING. THE CONTRACTOR MAY WITH PERMISSION FROM THE ENGINEER SUBSTITUTE PRECAST CATCH BASINS FOR CAST-IN-PLACE CATCH BASINS PROVIDED THAT ALL PRECAST ELEMENTS MEET ASTM C913 (CURRENT EDITION) UNLESS SUPERSEDED BY THIS DRAWING.

(D) THE FOLLOWING MATERIAL PROPERTIES ARE REQUIRED FOR BOTH CAST-IN-PLACE AND PRECAST STRUCTURES:

CONCRETE: f'_C = 4,000 POUNDS PER SQUARE INCH AT 28 DAYS
REINFORCING STEEL: ASTM A615, Fy = 60,000 POUNDS PER SQUARE INCH
ALL REINFORCING IS TO BE INSTALLED AS DETAILED ON THIS DRAWING.

(E) PRECAST CATCH BASIN UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED CATCH BASIN UNITS AT THEIR OWN EXPENSE.

(F) APPROPRIATE SIZING AND LOCATION OF LIFTING DEVICES SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.

(G) THE CONTRACTOR IS TO PATCH ALL LIFTING DEVICE HOLES WITH GROUT AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.

(H) SEE ROADWAY PLANS DRAINAGE TABULATION FOR PIPE INLET AND OUTLET ELEVATIONS. IF NEEDED, INVERT ELEVATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER IN ORDER TO ACCOMMODATE INLET AND OUTLET PIPES.

(I) FOR CASES WHERE THE OUTLET PIPE DIAMETER IS LARGER THAN THE INLET PIPE DIAMETER, A MINIMUM 12 INCH DEPTH SHALL BE MAINTAINED ABOVE THE OUTLET PIPE.

(J) CONCRETE JOINT MATERIAL TO BE ½ INCH PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 OF STANDARD SPECIFICATIONS.

(K) THE CONTRACTOR MAY ELIMINATE THE R500 BARS BY LENGTHENING THE VERTICAL LEG OF THE H500 BARS AND BENDING THE TOP 6 INCHES AT 75° SO THAT 2 INCHES OF CLEAR COVER IS PROVIDED AT THE TOP OF THE STRUCTURE.

(L) PAY DEPTH MEASUREMENT MADE FROM TOP OF GRATE TO OUTLET FLOW ELEVATION. PAYMENT INCLUDES GRATE. PAYMENT FOR CATCH BASIN WILL BE MADE UNDER ITEM NUMBERS:

611-39.01, CATCH BASINS, TYPE 39, > 0'-4' DEPTH, EACH (THROUGH)
611-39.07, CATCH BASINS, TYPE 39, > 24'-28' DEPTH, EACH.

WHEN CLASS "A" CONCRETE APRON IS USED, IT IS TO BE INCLUDED IN THE PRICE BID PER CATCH BASIN.

REV.10-26-98: CHANGED STEEL BARS ON GRATE UNIT FROM 1" X 4¼" TO 1" X 4½"

REV. 1-19-99: MODIFIED CATCH BASIN MINIMUM DEPTH TABLE.

REV. 5-27-01: CHANGED PAY ITEMS IN GENERAL NOTE (J). ADDED CATCH BASIN MAXIMUM DEPTH NOTE.

☐ REV. 7-29-02: CHANGED ASTM SPECIFICATION IN GENERAL NOTE (C).

REV. 8-01-12: REVISED CATCH BASIN FOR COMPLIANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION WITH INTERIMS. REVISED REINFORCING, GENERAL NOTES, LEGEND AND ADDITIONAL MISC. DRAFTING EDITS.

REV. 05-15-18: REVISED CATCH BASIN MINIMUM DESIGN DEPTH VALUES. CORRECTED STANDARD SPECIFICATIONS SECTION NUMBER TO 921 FOR NON -SHRINK GROUT. ADDED DIMENSION IN SECTION VIEW A-A FOR MINIMUM DESIGN DEPTH.

REV. 02-20-2020: REDREW SHEET.

REV. 03-04-2021: REVISED GRATE UNIT NOTES.

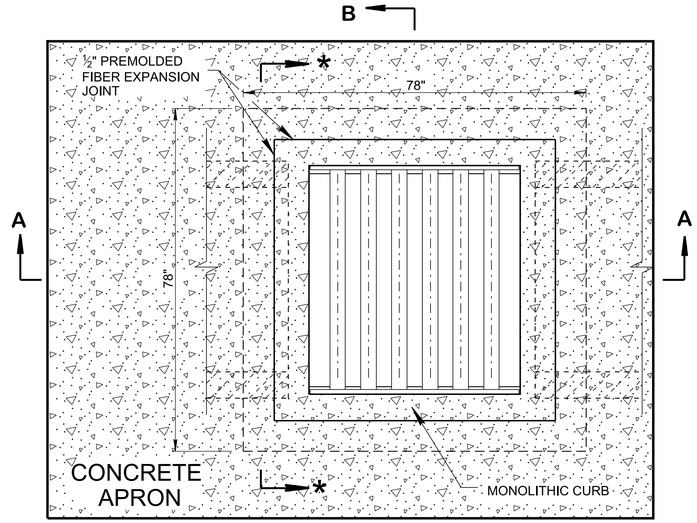
☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

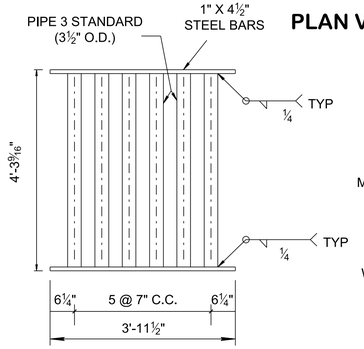
STANDARD 4' X 4' SQUARE CONCRETE NO. 39 CATCH BASIN

01-19-1998 | D-CB-39S

NOT TO SCALE



PLAN VIEW



SECTION *-*

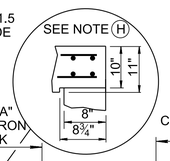
ELEV. VIEW IS PROVIDED ON STANDARD DRAWING D-CB-99 SHOWING REINFORCEMENT REQUIREMENTS AROUND PIPE OPENINGS

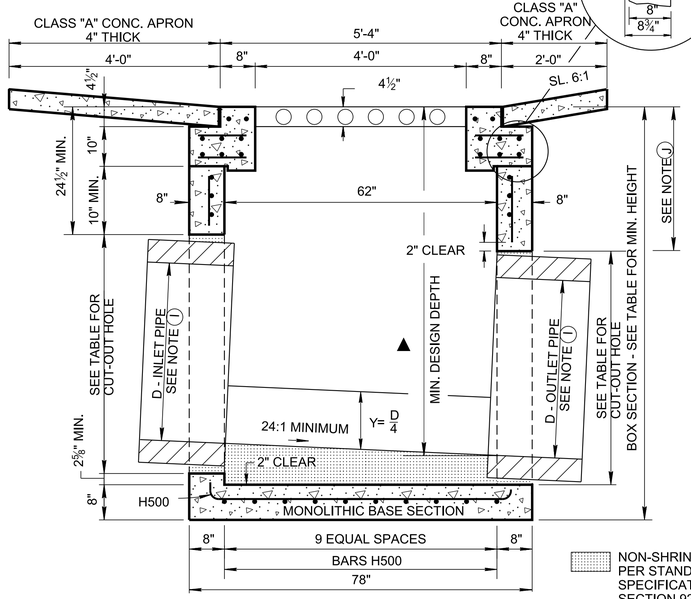
GRATE UNIT NO. 39

GRATE UNIT IS STRUCTURALLY DESIGNED BASED ON HS20 LOADING.

MATERIAL: STEEL BARS SHALL CONFORM TO ASTM A36. FOR THE PIPE CROSS MEMBERS, ASTM A53 GRADE B OR ASTM A500 GRADE B AND ALL SHALL BE GALVANIZED.

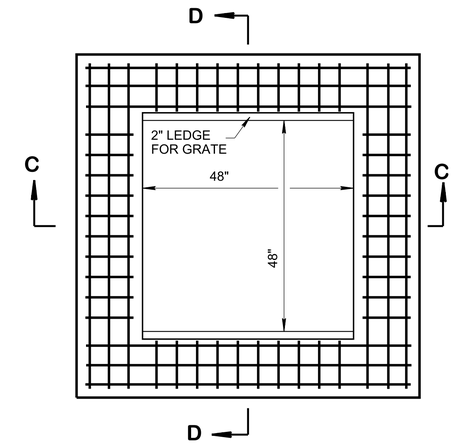
WELDING: AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)



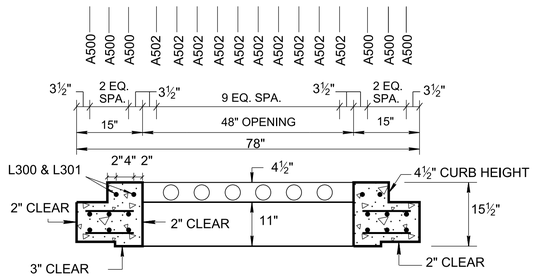


SECTION A-A

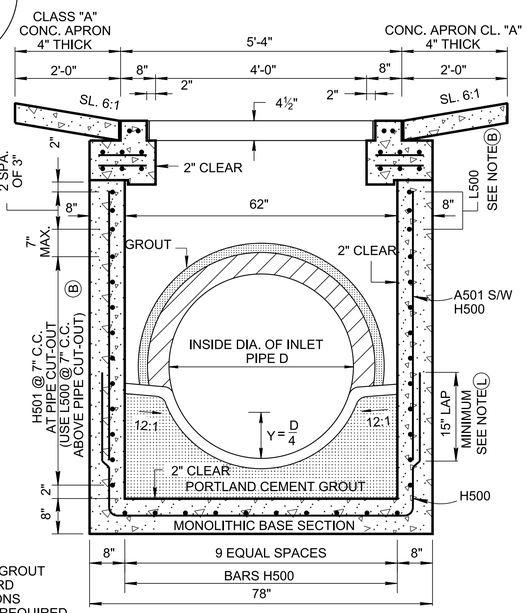
NON-SHRINK GROUT PER STANDARD SPECIFICATIONS SECTION 921 REQUIRED AROUND PIPE OPENINGS ONLY



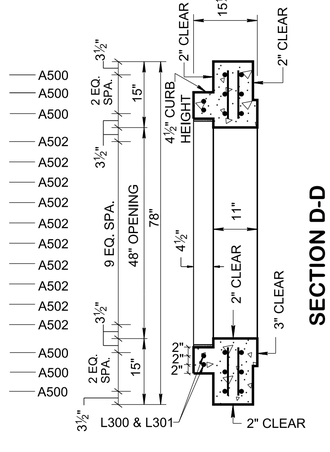
LID REINFORCING



SECTION C-C



SECTION B-B



SECTION D-D

CATCH BASIN MAXIMUM DEPTH NOTE
MAXIMUM DEPTH FOR THIS STRUCTURE IS 28.00'.

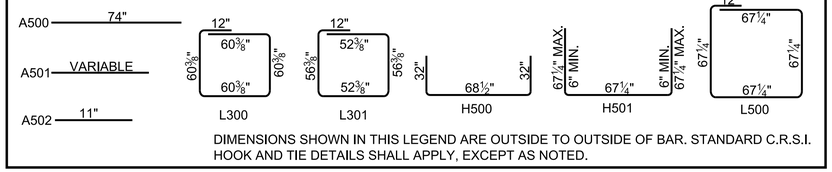
CATCH BASIN DIMENSIONS				▲
INSIDE DIAMETER (D) OF PIPE (INCHES)	PIPE WALL THICKNESS (INCHES)	DIAMETER OF CUT-OUT HOLES (INCHES)	BOX SECTION MINIMUM HEIGHTS (INCHES)	FOR DESIGN USE ONLY CATCH BASIN MINIMUM DESIGN DEPTH (FEET)
18	2½	25	60⅛	4.08
24	3	32	67⅛	4.62
30	3½	39	74⅛	5.16
36	4	46	81⅛	5.70
42	4½	53	88⅛	6.24
48	5	60	95⅛	6.79

(1) CUT-OUT HOLES BASED ON REINFORCED CONCRETE PIPE WITH WALL TYPE "B".

(2) ALL FLEXIBLE PIPE MATERIALS REQUIRE GASKET. SEE STANDARD DRAWING D-PB-2.

(3) CUT-OUT HOLES FOR PRECAST STRUCTURES TO BE FORMED IN ORDER TO OBTAIN A SMOOTH EDGED HOLE. SCORED OR ETCHED HOLES WITH REINFORCING STEEL LEFT UNCUT WILL NOT BE PERMITTED.

REINFORCING STEEL LEGEND



DIMENSIONS SHOWN IN THIS LEGEND ARE OUTSIDE TO OUTSIDE OF BAR. STANDARD C.R.S.I. HOOK AND TIE DETAILS SHALL APPLY, EXCEPT AS NOTED.

GENERAL NOTES

(A) DRAWING TO BE USED FOR ALL CAST-IN-PLACE NO. 39SC CONCRETE CATCH BASINS AND ALL PRECAST NO. 39SC CONCRETE CATCH BASINS. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL CONSTRUCTION NOTES & DETAILS.

(B) THIS DRAWING DEPICTS THE MINIMUM HORIZONTAL REINFORCING AT THE TOP OF CATCH BASIN WALLS. SEE ADDITIONAL DETAILS ON STANDARD DRAWING D-CB-99 FOR TALLER SECTIONS AND STEEL PLACEMENT ABOVE PIPE OPENINGS.

(C) CAST-IN-PLACE CONCRETE CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS UNLESS SUPERSEDED BY THIS DRAWING. THE CONTRACTOR MAY WITH PERMISSION FROM THE ENGINEER SUBSTITUTE PRECAST CATCH BASINS FOR CAST-IN-PLACE CATCH BASINS PROVIDED THAT ALL PRECAST ELEMENTS MEET ASTM C913 (CURRENT EDITION) UNLESS SUPERSEDED BY THIS DRAWING.

(D) THE FOLLOWING MATERIAL PROPERTIES ARE REQUIRED FOR BOTH CAST-IN-PLACE AND PRECAST STRUCTURES:

CONCRETE: f'_c = 4,000 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.

(E) PRECAST CATCH BASIN UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED CATCH BASIN UNITS AT THEIR OWN EXPENSE.

(F) APPROPRIATE SIZING AND LOCATION OF LIFTING DEVICES SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.

(G) THE CONTRACTOR IS TO PATCH ALL LIFTING DEVICE HOLES WITH GROUT AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.

(H) ALTERNATIVE JOINT DETAILS MAY BE ACCEPTABLE. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL DETAILS.

(I) SEE ROADWAY PLANS DRAINAGE TABULATION FOR PIPE INLET AND OUTLET ELEVATIONS. IF NEEDED, INVERT ELEVATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER IN ORDER TO ACCOMMODATE INLET AND OUTLET PIPES.

(J) FOR CASES WHERE THE OUTLET PIPE DIAMETER IS LARGER THAN THE INLET PIPE DIAMETER, A MINIMUM 24½ INCH DEPTH SHALL BE MAINTAINED ABOVE THE OUTLET PIPE.

(K) CONCRETE JOINT MATERIAL TO BE ½ INCH PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 OF STANDARD SPECIFICATIONS.

(L) THE CONTRACTOR MAY ELIMINATE THE A501 BARS BY LENGTHENING THE VERTICAL LEG OF THE H500 BARS SO THAT 1½ INCHES OF CLEAR COVER IS PROVIDED AT THE TOP OF THE STRUCTURE.

(M) PAY DEPTH MEASUREMENT MADE FROM TOP OF GRATE TO OUTLET FLOW ELEVATION. PAYMENT INCLUDES GRATE. PAYMENT FOR CATCH BASIN WILL BE MADE UNDER ITEM NUMBERS:

611-39.02,	CATCH BASINS, TYPE 39, > 4'-8' DEPTH,	EACH	(THROUGH)
611-39.07,	CATCH BASINS, TYPE 39, > 24'-28' DEPTH,	EACH.	

WHEN CLASS "A" CONCRETE APRON IS USED, IT IS TO BE INCLUDED IN THE PRICE BID PER CATCH BASIN.

REV. 8-01-12: REVISED CATCH BASIN FOR COMPLIANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION WITH INTERIMS. REVISED REINFORCING, GENERAL NOTES, LEGEND AND ADDITIONAL MISC. DRAFTING EDITS.

REV. 9-24-12: MODIFIED TOP SLAB AND MINIMUM DEPTH.

REV. 3-11-14: ELIMINATED STIRRUPS.

REV. 05-15-18: REVISED CATCH BASIN MINIMUM DESIGN DEPTH VALUES. CORRECTED STANDARD SPECIFICATIONS SECTION NUMBER TO 921 FOR NON -SHRINK GROUT. ADDED DIMENSION IN SECTION VIEW A-A FOR NOTE (J). CORRECTED REBAR PLACEMENT IN LIDS. ADDED DIMENSION IN SECTION VIEW A-A FOR MINIMUM DESIGN DEPTH. ADJUSTED BOX SECTION MINIMUM HEIGHTS.

REV. 02-20-2020: REDREW SHEET.

REV. 03-04-2021: REVISED GRATE UNIT NOTES.

APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

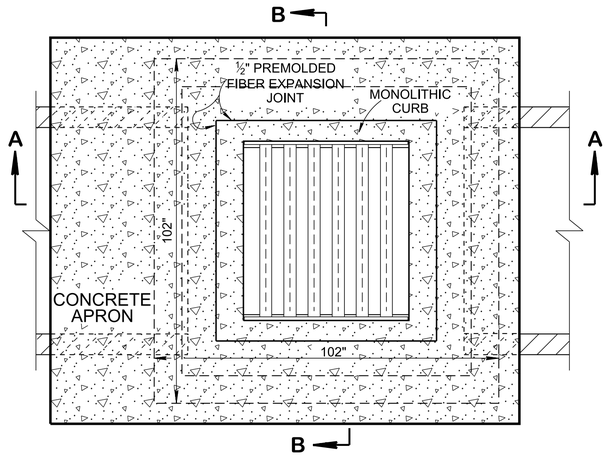
STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

STANDARD 5'2" X 5'2" SQUARE CONCRETE NO. 39 CATCH BASIN

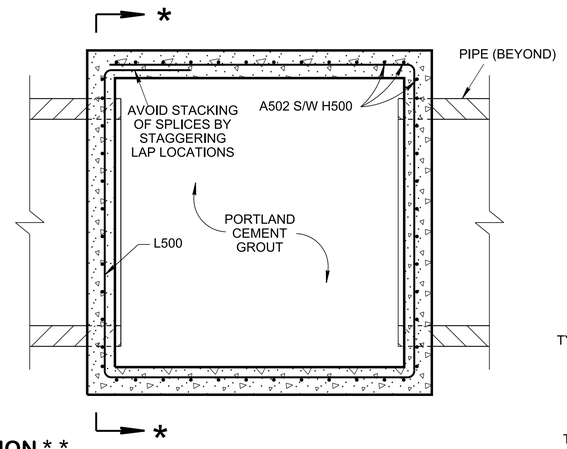
02-14-2003 | D-CB-39SC

NOT TO SCALE

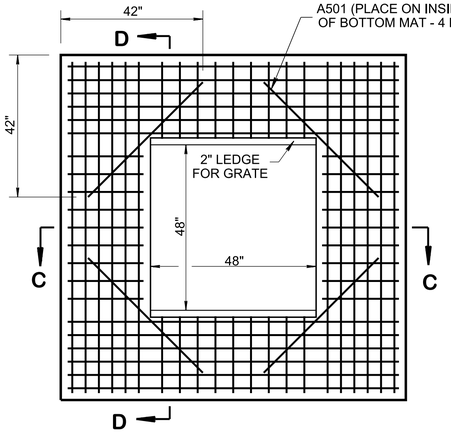
3/16/2021 9:29:41 AM
P:\StandDraw\DESIGN STANDARDS\Standards Drawings Library\Standard Roadway Drawings - CURRENT\In Progress\10-102.00 Catch Basins and Manholes IP\102.01 Catch Basins IP\DCB39SC-20210304.DGN



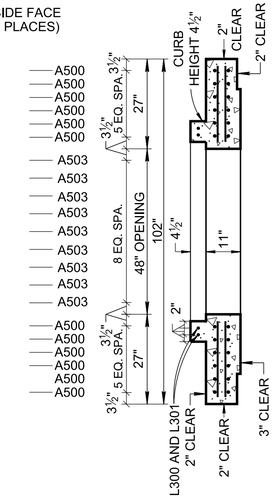
PLAN VIEW



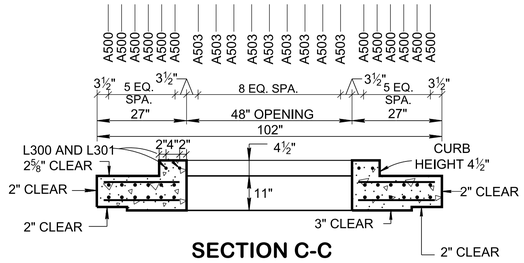
SECTION E-E



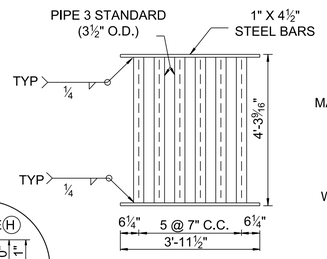
LID REINFORCING



SECTION D-D



SECTION C-C



GRATE UNIT NO. 39

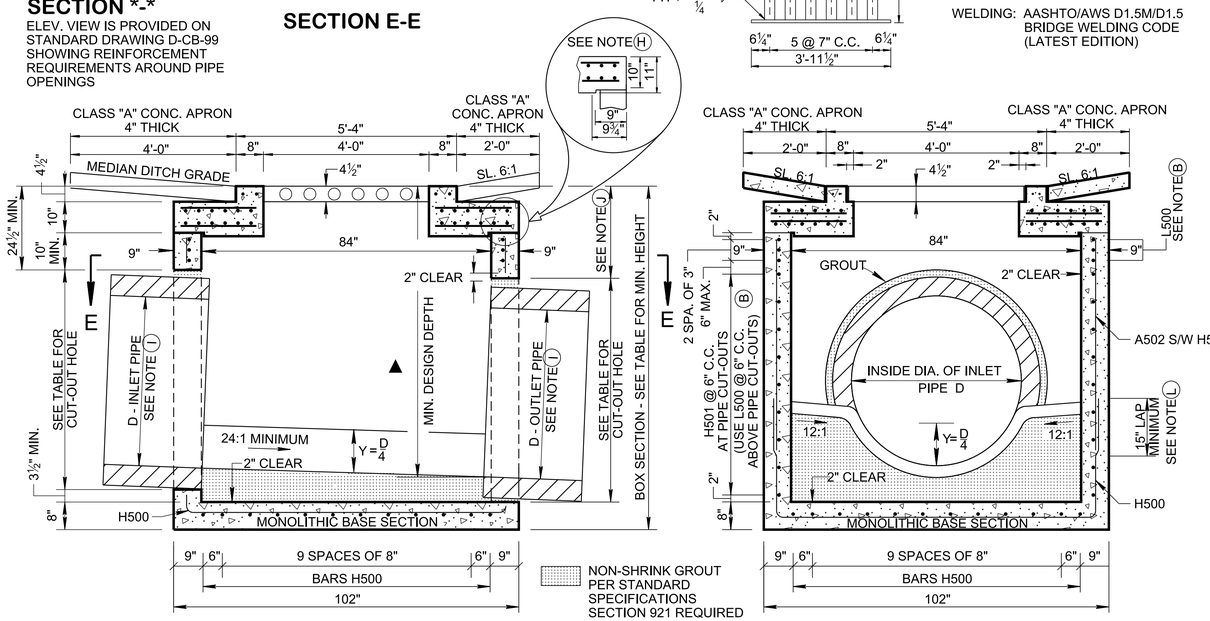
GRATE UNIT IS STRUCTURALLY DESIGNED BASED ON HS20 LOADING.

MATERIAL: STEEL BARS SHALL CONFORM TO ASTM A36. FOR THE PIPE CROSS MEMBERS, ASTM A53 GRADE B OR ASTM A500 GRADE B AND ALL SHALL BE GALVANIZED.

WELDING: AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)

SECTION *-*

ELEV. VIEW IS PROVIDED ON STANDARD DRAWING D-CB-99 SHOWING REINFORCEMENT REQUIREMENTS AROUND PIPE OPENINGS



SECTION A-A

NON-SHRINK GROUT PER STANDARD SPECIFICATIONS SECTION 921 REQUIRED AROUND PIPE OPENINGS ONLY

SECTION B-B

NOT TO SCALE

CATCH BASIN MAXIMUM DEPTH NOTE
MAXIMUM DEPTH FOR THIS STRUCTURE IS 28.00'.

CATCH BASIN DIMENSIONS				▲
INSIDE DIAMETER (D) OF PIPE (INCHES)	PIPE WALL THICKNESS (INCHES)	DIAMETER OF CUT-OUT HOLES (INCHES)	BOX SECTION MINIMUM HEIGHTS (INCHES)	FOR DESIGN USE ONLY CATCH BASIN MINIMUM DESIGN DEPTH (FEET)
18	2½	25	61	4.16
24	3	32	68	4.70
30	3½	39	75	5.24
36	4	46	82	5.78
42	4½	53	89	6.32
48	5	60	96	6.87
54	5½	67	103	7.41
60	6	74	110	7.95
66	6½	81	117	8.49

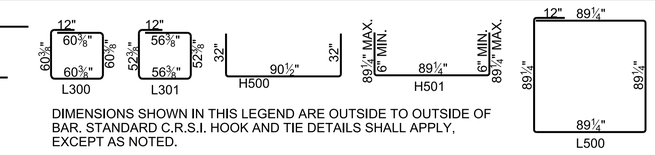
(1) CUT-OUT HOLES BASED ON REINFORCED CONCRETE PIPE WITH WALL TYPE "B".

(2) ALL FLEXIBLE PIPE MATERIALS REQUIRE GASKET. SEE STANDARD DRAWING D-PB-2.

(3) CUT-OUT HOLES FOR PRECAST STRUCTURES TO BE FORMED IN ORDER TO OBTAIN A SMOOTH EDGED HOLE. SCORED OR ETCHED HOLES WITH REINFORCING STEEL LEFT UNCUT WILL NOT BE PERMITTED.

REINFORCING STEEL LEGEND

A500 98"
A501 48"
A502 VARIABLE
A503 23"



DIMENSIONS SHOWN IN THIS LEGEND ARE OUTSIDE TO OUTSIDE OF BAR. STANDARD C.R.S.I. HOOK AND TIE DETAILS SHALL APPLY, EXCEPT AS NOTED.

GENERAL NOTES

(A) DRAWING TO BE USED FOR ALL CAST-IN-PLACE NO. 39SD CONCRETE CATCH BASINS AND ALL PRECAST NO. 39SD CONCRETE CATCH BASINS. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL CONSTRUCTION NOTES & DETAILS.

(B) THIS DRAWING DEPICTS THE MINIMUM HORIZONTAL REINFORCING AT THE TOP OF CATCH BASIN WALLS. SEE ADDITIONAL DETAILS ON STANDARD DRAWING D-CB-99 FOR TALLER SECTIONS AND STEEL PLACEMENT ABOVE PIPE OPENINGS.

(C) CAST-IN-PLACE CONCRETE CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS UNLESS SUPERSEDED BY THIS DRAWING. THE CONTRACTOR MAY WITH PERMISSION FROM THE ENGINEER SUBSTITUTE PRECAST CATCH BASINS FOR CAST-IN-PLACE CATCH BASINS PROVIDED THAT ALL PRECAST ELEMENTS MEET ASTM C913 (CURRENT EDITION) UNLESS SUPERSEDED BY THIS DRAWING.

(D) THE FOLLOWING MATERIAL PROPERTIES ARE REQUIRED FOR BOTH CAST-IN-PLACE AND PRECAST STRUCTURES:

CONCRETE: f'_c = 4,000 POUNDS PER SQUARE INCH AT 28 DAYS
REINFORCING STEEL: ASTM A615, Fy = 60,000 POUNDS PER SQUARE INCH
ALL REINFORCING IS TO BE INSTALLED AS DETAILED ON THIS DRAWING.

(E) PRECAST CATCH BASIN UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED CATCH BASIN UNITS AT THEIR OWN EXPENSE.

(F) APPROPRIATE SIZING AND LOCATION OF LIFTING DEVICES SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.

(G) THE CONTRACTOR IS TO PATCH ALL LIFTING DEVICE HOLES WITH GROUT AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.

(H) ALTERNATIVE JOINT DETAILS MAY BE ACCEPTABLE. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL DETAILS.

(I) SEE ROADWAY PLANS DRAINAGE TABULATION FOR PIPE INLET AND OUTLET ELEVATIONS. IF NEEDED, INVERT ELEVATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER IN ORDER TO ACCOMMODATE INLET AND OUTLET PIPES.

(J) FOR CASES WHERE THE OUTLET PIPE DIAMETER IS LARGER THAN THE INLET PIPE DIAMETER, A MINIMUM 24½ INCH DEPTH SHALL BE MAINTAINED ABOVE THE OUTLET PIPE.

(K) CONCRETE JOINT MATERIAL TO BE ½ INCH PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 OF STANDARD SPECIFICATIONS.

(L) THE CONTRACTOR MAY ELIMINATE THE A502 BARS BY LENGTHENING THE VERTICAL LEG OF THE H500 BARS SO THAT 1½ INCHES OF CLEAR COVER IS PROVIDED AT THE TOP OF THE STRUCTURE.

(M) PAY DEPTH MEASUREMENT MADE FROM TOP OF GRATE TO OUTLET FLOW ELEVATION. PAYMENT INCLUDES GRATE. PAYMENT FOR CATCH BASIN WILL BE MADE UNDER ITEM NUMBERS:

611-39.02, CATCH BASINS, TYPE 39, > 4'-8' DEPTH, EACH (THROUGH)
611-39.07, CATCH BASINS, TYPE 39, > 24'-28' DEPTH, EACH.

WHEN CLASS "A" CONCRETE APRON IS USED, IT IS TO BE INCLUDED IN THE PRICE BID PER CATCH BASIN.

REV. 5-27-01: CHANGED PAY ITEMS IN GENERAL NOTE (J). ADDED CATCH BASIN MAXIMUM DEPTH NOTE.

REV. 5-30-02: MODIFIED REINFORCING STEEL.

REV. 7-29-02: CHANGED ASTM SPECIFICATION IN GENERAL NOTE (C).

REV. 9-11-02: CHANGED REINFORCING STEEL IN BASE SECTION.

☐ REV. 8-01-12: REVISED CATCH BASIN FOR COMPLIANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION WITH INTERIMS. REVISED REINFORCING, GENERAL NOTES, LEGEND AND ADDITIONAL MISC. DRAFTING EDITS.

REV. 9-24-12: MODIFIED TOP SLAB AND MINIMUM DEPTH.

REV. 3-11-14: ELIMINATED STIRRUPS.

REV. 05-15-18: REVISED CATCH BASIN MINIMUM DESIGN DEPTH VALUES. CORRECTED STANDARD SPECIFICATIONS SECTION NUMBER TO 921 FOR NON -SHRINK GROUT. ADDED DIMENSION IN SECTION VIEW A-A FOR NOTE (J). CORRECTED REBAR PLACEMENT IN LIDS. ADDED DIMENSION IN SECTION VIEW A-A FOR MINIMUM DESIGN DEPTH. ADJUSTED BOX SECTION MINIMUM HEIGHTS.

REV. 02-20-2020: REDREW SHEET.

REV. 03-04-2021: REVISED GRATE UNIT NOTES.

☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

STANDARD 7' X 7' SQUARE CONCRETE NO. 39 CATCH BASIN

10-26-1999 | D-CB-39SD

3/16/2021 9:45:11 AM
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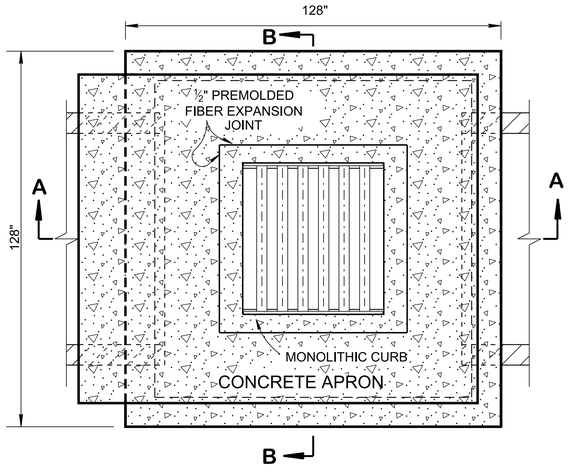
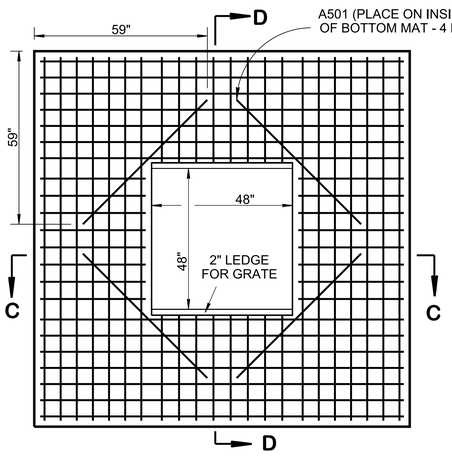
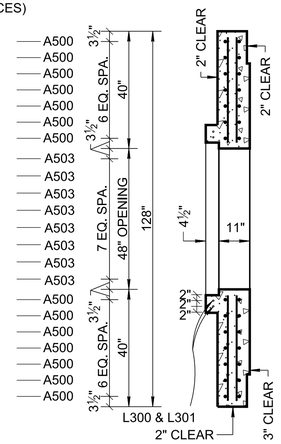


PLAN VIEW



LID REINFORCING



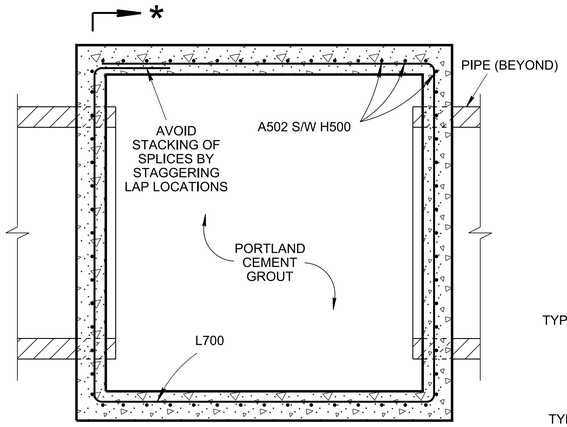
SECTION D-D

CATCH BASIN MAXIMUM DEPTH NOTE
MAXIMUM DEPTH FOR THIS STRUCTURE IS 28.00'.

CATCH BASIN DIMENSIONS

INSIDE DIAMETER (D) OF PIPE (INCHES)	PIPE WALL THICKNESS (INCHES)	DIAMETER OF CUT-OUT HOLES (INCHES)	BOX SECTION MINIMUM HEIGHTS (INCHES)	▲ FOR DESIGN USE ONLY CATCH BASIN MINIMUM DESIGN DEPTH (FEET)
18	2½	25	64	4.24
24	3	32	71	4.79
30	3½	39	78	5.33
36	4	46	85	5.87
42	4½	53	92	6.41
48	5	60	99	6.95
54	5½	67	106	7.50
60	6	74	113	8.04
66	6½	81	120	8.58
72	7	88	127	9.12
78	7½	95	134	9.66

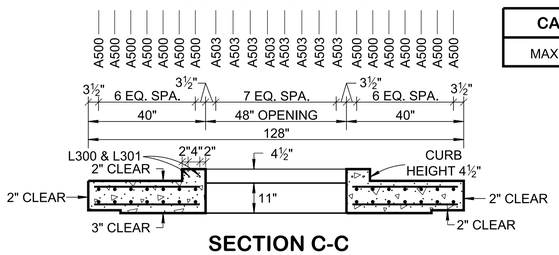
1. CUT-OUT HOLES BASED ON REINFORCED CONCRETE PIPE WITH WALL TYPE "B".
2. ALL FLEXIBLE PIPE MATERIALS REQUIRE GASKET. SEE STANDARD DRAWING D-PB-2.
3. CUT-OUT HOLES FOR PRECAST STRUCTURES TO BE FORMED IN ORDER TO OBTAIN A SMOOTH EDGED HOLE. SCORED OR ETCHED HOLES WITH REINFORCING STEEL LEFT UNCUT WILL NOT BE PERMITTED.



SECTION *-*

ELEV. VIEW IS PROVIDED ON STANDARD DRAWING D-CB-99 SHOWING REINFORCEMENT REQUIREMENTS AROUND PIPE OPENINGS

SECTION E-E



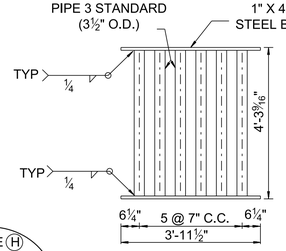
SECTION C-C

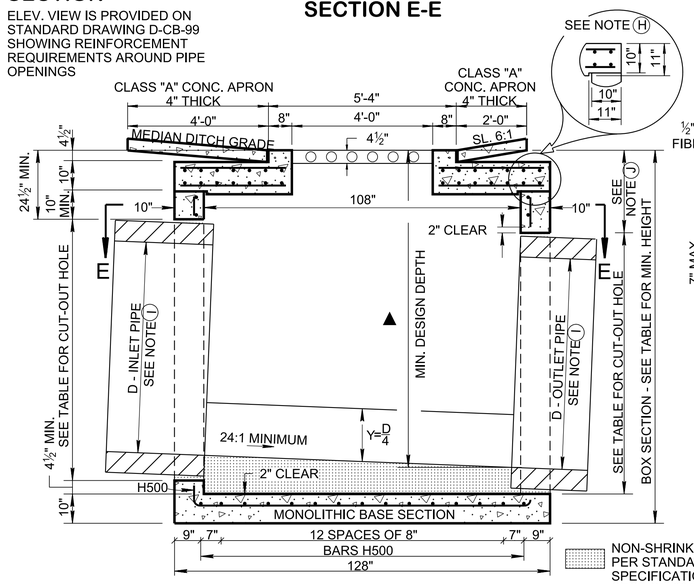
GRATE UNIT NO. 39

GRATE UNIT IS STRUCTURALLY DESIGNED BASED ON HS20 LOADING.

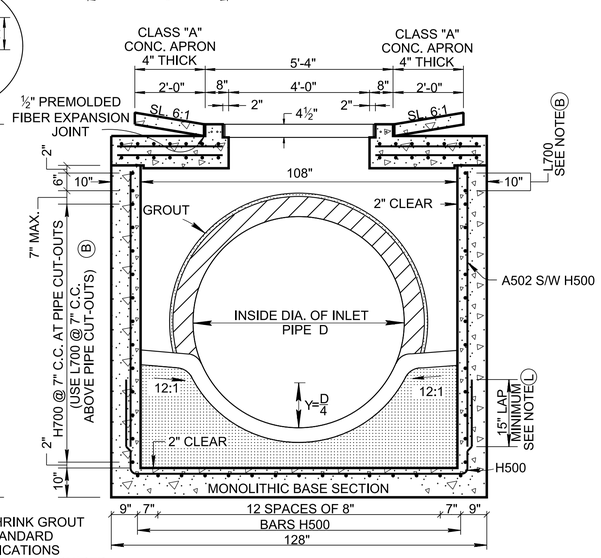
MATERIAL: STEEL BARS SHALL CONFORM TO ASTM A36. FOR THE PIPE CROSS MEMBERS, ASTM A53 GRADE B OR ASTM A500 GRADE B AND ALL SHALL BE GALVANIZED.

WELDING: AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)





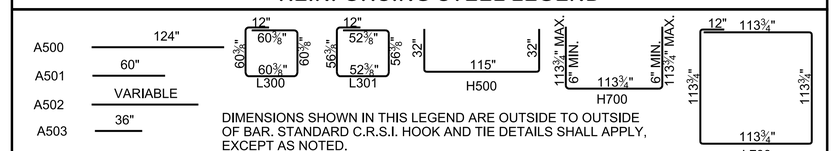
SECTION A-A



SECTION B-B

NON-SHRINK GROUT PER STANDARD SPECIFICATIONS SECTION 921 REQUIRED AROUND PIPE OPENINGS ONLY

REINFORCING STEEL LEGEND



DIMENSIONS SHOWN IN THIS LEGEND ARE OUTSIDE TO OUTSIDE OF BAR. STANDARD C.R.S.I. HOOK AND TIE DETAILS SHALL APPLY, EXCEPT AS NOTED.

GENERAL NOTES

(A) DRAWING TO BE USED FOR ALL CAST-IN-PLACE NO. 39SE CONCRETE CATCH BASINS AND ALL PRECAST NO. 39SE CONCRETE CATCH BASINS. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL CONSTRUCTION NOTES & DETAILS.

(B) THIS DRAWING DEPICTS THE MINIMUM HORIZONTAL REINFORCING AT THE TOP OF CATCH BASIN WALLS. SEE ADDITIONAL DETAILS ON STANDARD DRAWING D-CB-99 FOR TALLER SECTIONS AND STEEL PLACEMENT ABOVE PIPE OPENINGS.

(C) CAST-IN-PLACE CONCRETE CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS UNLESS SUPERSEDED BY THIS DRAWING. THE CONTRACTOR MAY WITH PERMISSION FROM THE ENGINEER SUBSTITUTE PRECAST CATCH BASINS FOR CAST-IN-PLACE CATCH BASINS PROVIDED THAT ALL PRECAST ELEMENTS MEET ASTM C913 (CURRENT EDITION) UNLESS SUPERSEDED BY THIS DRAWING.

(D) THE FOLLOWING MATERIAL PROPERTIES ARE REQUIRED FOR BOTH CAST-IN-PLACE AND PRECAST STRUCTURES:

CONCRETE: f'_c = 4,000 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.

(E) PRECAST CATCH BASIN UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED CATCH BASIN UNITS AT THEIR OWN EXPENSE.

(F) APPROPRIATE SIZING AND LOCATION OF LIFTING DEVICES SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.

(G) THE CONTRACTOR IS TO PATCH ALL LIFTING DEVICE HOLES WITH GROUT AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.

(H) ALTERNATIVE JOINT DETAILS MAY BE ACCEPTABLE. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL DETAILS.

(I) SEE ROADWAY PLANS DRAINAGE TABULATION FOR PIPE INLET AND OUTLET ELEVATIONS, IF NEEDED, INVERT ELEVATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER IN ORDER TO ACCOMMODATE INLET AND OUTLET PIPES.

(J) FOR CASES WHERE THE OUTLET PIPE DIAMETER IS LARGER THAN THE INLET PIPE DIAMETER, A MINIMUM 24½ INCH DEPTH SHALL BE MAINTAINED ABOVE THE OUTLET PIPE.

(K) CONCRETE JOINT MATERIAL TO BE ½ INCH PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 OF STANDARD SPECIFICATIONS, 4TH EDITION WITH INTERIMS.

(L) THE CONTRACTOR MAY ELIMINATE THE A502 BARS BY LENGTHENING THE VERTICAL LEG OF THE H500 BARS SO THAT 1½ INCHES OF CLEAR COVER IS PROVIDED AT THE TOP OF THE STRUCTURE.

(M) PAY DEPTH MEASUREMENT MADE FROM TOP OF GRATE TO OUTLET FLOW ELEVATION. PAYMENT INCLUDES GRATE. PAYMENT FOR CATCH BASIN WILL BE MADE UNDER ITEM NUMBERS:

611-39.02, CATCH BASINS, TYPE 39, > 4'-8' DEPTH, EACH (THROUGH)
611-39.07, CATCH BASINS, TYPE 39, > 24'-28' DEPTH, EACH.

WHEN CLASS "A" CONCRETE APRON IS USED, IT IS TO BE INCLUDED IN THE PRICE BID PER CATCH BASIN.

REV. 7-29-02: CHANGED ASTM SPECIFICATION IN GENERAL NOTE Ⓒ.

REV. 9-11-02: CHANGED REINFORCING STEEL IN BASE SECTION.

REV. 2-13-04: CHANGED REINFORCING STEEL IN BASE SECTION.

☐ REV. 8-01-12: REVISED CATCH BASIN FOR COMPLIANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION WITH INTERIMS. REVISED REINFORCING, GENERAL NOTES, LEGEND AND ADDITIONAL MISC. DRAFTING EDITS.

REV. 3-11-14: ELIMINATED STIRRUPS.

REV. 05-15-18: REVISED CATCH BASIN MINIMUM DESIGN DEPTH VALUES. CORRECTED STANDARD SPECIFICATIONS SECTION NUMBER TO 921 FOR NON -SHRINK GROUT. ADDED DIMENSION IN SECTION VIEW A-A FOR NOTE Ⓙ. CORRECTED REBAR PLACEMENT IN LIDS. ADDED DIMENSION IN SECTION VIEW A-A FOR MINIMUM DESIGN DEPTH.

REV. 02-20-2020: REDREW SHEET.

REV. 03-04-2021: REVISED GRATE UNIT NOTE

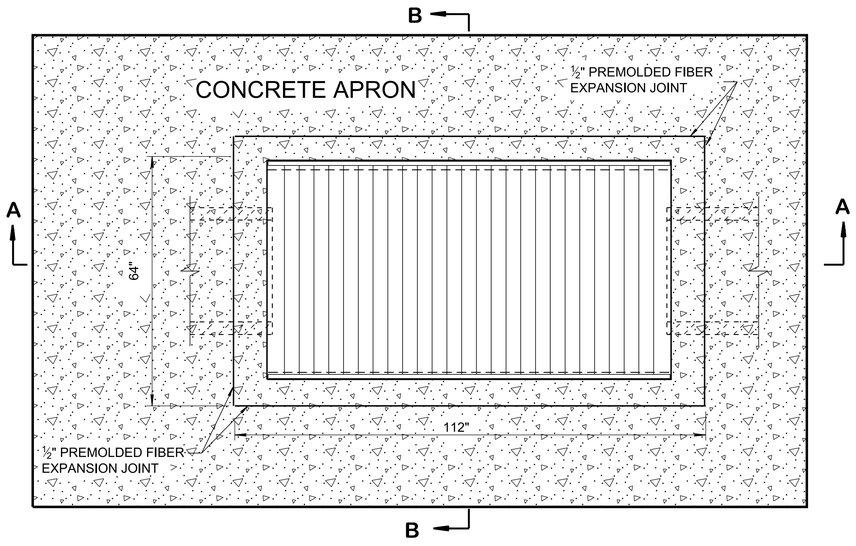
☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

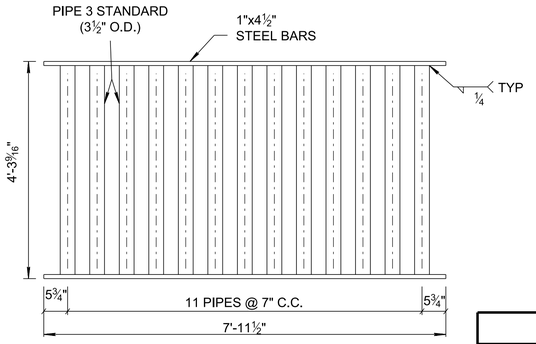
STANDARD 9' X 9' SQUARE CONCRETE NO. 39 CATCH BASIN

12-18-1998 | D-CB-39SE

NOT TO SCALE



PLAN VIEW



GRATE UNIT NO. 40

GRATE UNIT IS STRUCTURALLY DESIGNED BASED ON HS20 LOADING.

MATERIAL: STEEL BARS SHALL CONFORM TO ASTM A36. FOR THE PIPE CROSS MEMBERS, ASTM A53 GRADE B OR ASTM A500 GRADE B AND ALL SHALL BE GALVANIZED.

WELDING: AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)

CATCH BASIN MAXIMUM DEPTH NOTE
MAXIMUM DEPTH FOR THIS STRUCTURE IS 20.00'.

CATCH BASIN DIMENSIONS				▲
INSIDE DIAMETER (D) OF PIPE (INCHES)	PIPE WALL THICKNESS (INCHES)	DIAMETER OF CUT-OUT HOLES (INCHES)	BOX SECTION MINIMUM HEIGHTS (INCHES)	FOR DESIGN USE ONLY CATCH BASIN MINIMUM DESIGN DEPTH (FEET)
18	2½	25	49	3.15
24	3	32	56	3.70
30	3½	39	63	4.24
36	4	46	70	4.78
④ 42	4½	53	77	5.32
④ 48	5	60	84	5.86
④ 54	5½	67	91	6.40
④ 60	6	74	98	6.95

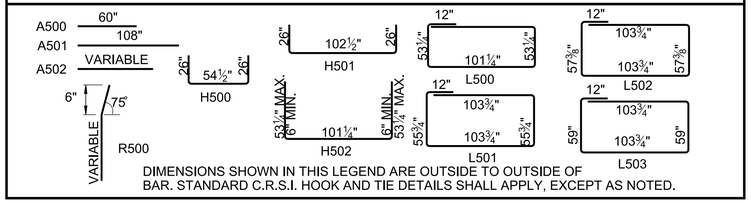
① CUT-OUT HOLES BASED ON REINFORCED CONCRETE PIPE WITH WALL TYPE "B".

② ALL FLEXIBLE PIPE MATERIALS REQUIRE GASKET. SEE STANDARD DRAWING D-PB-2.

③ CUT-OUT HOLES FOR PRECAST STRUCTURES TO BE FORMED IN ORDER TO OBTAIN A SMOOTH EDGED HOLE. SCORED OR ETCHED HOLES WITH REINFORCING STEEL LEFT UNCUT WILL NOT BE PERMITTED.

④ TO BE USED IN 96 INCH INTERIOR WALLS ONLY.

REINFORCING STEEL LEGEND



DIMENSIONS SHOWN IN THIS LEGEND ARE OUTSIDE TO OUTSIDE OF BAR. STANDARD C.R.S.I. HOOK AND TIE DETAILS SHALL APPLY, EXCEPT AS NOTED.

GENERAL NOTES

Ⓐ DRAWING TO BE USED FOR ALL CAST-IN-PLACE NO. 40 CONCRETE CATCH BASINS AND ALL PRECAST NO. 40 CONCRETE CATCH BASINS. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL CONSTRUCTION NOTES & DETAILS.

Ⓑ THIS DRAWING DEPICTS THE MINIMUM HORIZONTAL REINFORCING AT THE TOP OF CATCH BASIN WALLS. SEE ADDITIONAL DETAILS ON STANDARD DRAWING D-CB-99 FOR TALLER SECTIONS AND STEEL PLACEMENT ABOVE PIPE OPENINGS.

Ⓒ CAST-IN-PLACE CONCRETE CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS UNLESS SUPERSEDED BY THIS DRAWING. THE CONTRACTOR MAY WITH PERMISSION FROM THE ENGINEER SUBSTITUTE PRECAST CATCH BASINS FOR CAST-IN-PLACE CATCH BASINS PROVIDED THAT ALL PRECAST ELEMENTS MEET ASTM C913 (CURRENT EDITION) UNLESS SUPERSEDED BY THIS DRAWING.

Ⓓ THE FOLLOWING MATERIAL PROPERTIES ARE REQUIRED FOR BOTH CAST-IN-PLACE AND PRECAST STRUCTURES:

CONCRETE: f'_c = 4,000 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.

Ⓔ PRECAST CATCH BASIN UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED CATCH BASIN UNITS AT THEIR OWN EXPENSE.

Ⓕ THE CONTRACTOR MAY ELIMINATE THE A502 BARS BY LENGTHENING THE VERTICAL LEG OF THE H501 BARS AND MAY ELIMINATE THE R500 BARS BY LENGTHENING THE VERTICAL LEG OF THE H500 BARS AND BENDING THE TOP 6 INCHES 75° SO THAT 2 INCHES OF CLEAR COVER IS PROVIDED AT THE TOP OF THE STRUCTURE.

Ⓖ APPROPRIATE SIZING AND LOCATION OF LIFTING DEVICES SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.

Ⓗ THE CONTRACTOR IS TO PATCH ALL LIFTING DEVICE HOLES WITH GROUT AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.

Ⓘ SEE ROADWAY PLANS DRAINAGE TABULATION FOR PIPE INLET AND OUTLET ELEVATIONS. IF NEEDED, INVERT ELEVATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER IN ORDER TO ACCOMMODATE INLET AND OUTLET PIPES.

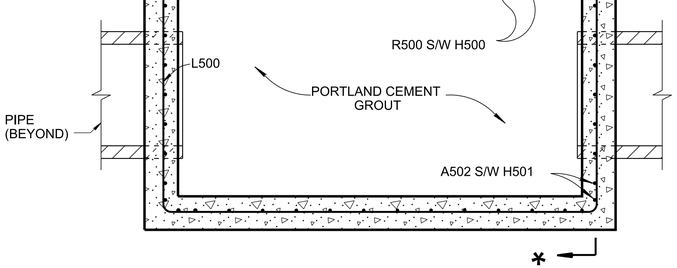
Ⓙ FOR CASES WHERE THE OUTLET PIPE DIAMETER IS LARGER THAN THE INLET PIPE DIAMETER, A MINIMUM 12 INCH DEPTH SHALL BE MAINTAINED ABOVE THE OUTLET PIPE.

Ⓚ CONCRETE JOINT MATERIAL TO BE ½ INCH PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 OF STANDARD SPECIFICATIONS.

Ⓛ PAY DEPTH MEASUREMENT MADE FROM TOP OF GRATE TO OUTLET FLOW ELEVATION. PAYMENT INCLUDES GRATE. PAYMENT FOR CATCH BASIN WILL BE MADE UNDER ITEM NUMBERS:

611-40.01, CATCH BASINS, TYPE 40, > 0'-4' DEPTH, EACH, (THROUGH)
611-40.05, CATCH BASINS, TYPE 40, > 16'-20' DEPTH, EACH.

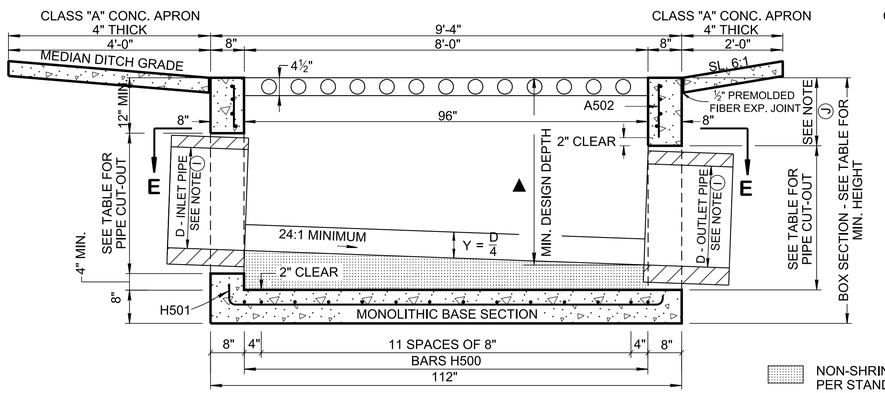
WHEN CLASS "A" CONCRETE APRON IS USED, IT IS TO BE INCLUDED IN THE PRICE BID PER CATCH BASIN.



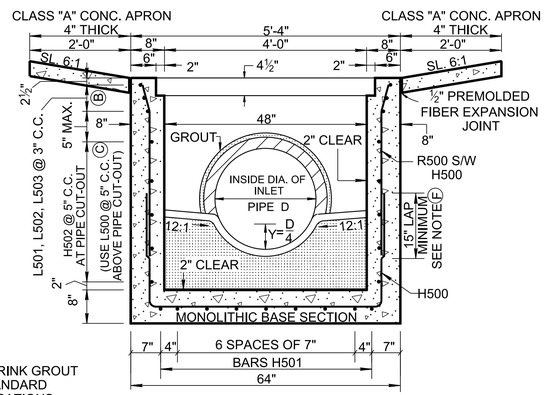
SECTION E-E

SECTION *-*

ELEV. VIEW IS PROVIDED ON STANDARD DRAWING D-CB-99 SHOWING REINFORCEMENT REQUIREMENTS AROUND PIPE OPENINGS



SECTION A-A



SECTION B-B

NON-SHRINK GROUT PER STANDARD SPECIFICATIONS SECTION 921 REQUIRED AROUND PIPE OPENINGS ONLY

NOT TO SCALE

REV. 3-30-00: CHANGED GRATE UNIT DESIGNATION FROM NO. 39 TO NO. 40.

REV. 5-27-01: CHANGED PAY ITEMS IN GENERAL NOTE Ⓙ. ADDED CATCH BASIN MAXIMUM DEPTH NOTE.

REV. 7-29-02: CHANGED ASTM SPECIFICATION IN GENERAL NOTE Ⓒ.

☐ REV. 8-01-12: REVISED CATCH BASIN FOR COMPLIANCE WITH AASHTO LRFD BRIDGE DESIGN PECIFICATIONS, 4TH EDITION WITH INTERIMS. REVISED REINFORCING, GENERAL NOTES, LEGEND AND ADDITIONAL MISC. DRAFTING EDITS.

REV. 05-15-18: REVISED CATCH BASIN MINIMUM DESIGN DEPTH VALUES. CORRECTED STANDARD SPECIFICATIONS SECTION NUMBER TO 921 FOR NON -SHRINK GROUT. ADDED DIMENSION IN SECTION VIEW A-A FOR MINIMUM DESIGN DEPTH.

REV. 02-20-2020: REDREW SHEET.

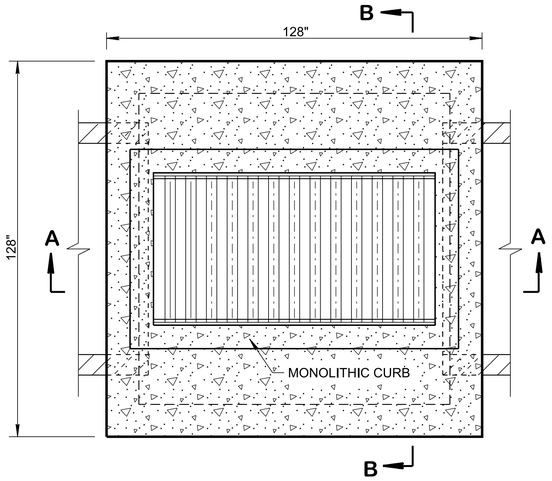
REV. 03-04-2021: REVISED GRATE UNIT NOTES.

☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

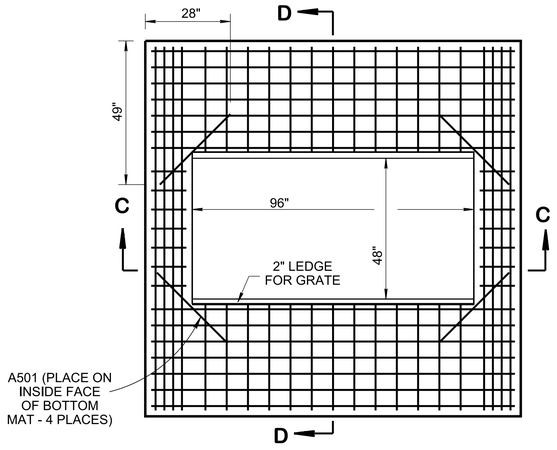
STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

STANDARD 4'X 8' RECTANGULAR CONCRETE NO. 40 CATCH BASIN

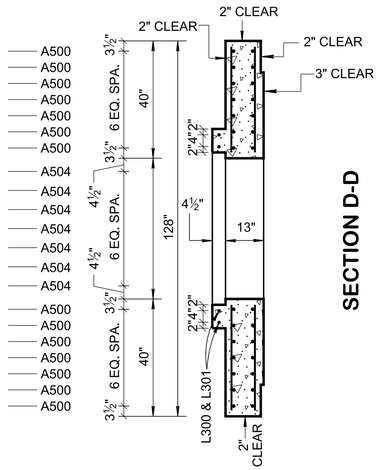
11-25-1999 | D-CB-40S



PLAN VIEW



LID REINFORCING



SECTION D-D

CATCH BASIN DIMENSIONS				▲
INSIDE DIAMETER (D) OF PIPE (INCHES)	PIPE WALL THICKNESS (INCHES)	DIAMETER OF CUT-OUT HOLES (INCHES)	BOX SECTION MINIMUM HEIGHTS (INCHES)	FOR DESIGN USE ONLY CATCH BASIN MINIMUM DESIGN DEPTH (FEET)
18	2½	25	66	4.41
24	3	32	73	4.95
30	3½	39	80	5.49
36	4	46	87	6.04
42	4½	53	94	6.58
48	5	60	101	7.12
54	5½	67	108	7.66
60	6	74	115	8.20
66	6½	81	122	8.75
72	7	88	129	9.29
78	7½	95	136	9.83

(1) CUT-OUT HOLES BASED ON REINFORCED CONCRETE PIPE WITH WALL TYPE "B".

(2) ALL FLEXIBLE PIPE MATERIALS REQUIRE GASKET. SEE STANDARD DRAWING D-PB-2.

(3) CUT-OUT HOLES FOR PRECAST STRUCTURES TO BE FORMED IN ORDER TO OBTAIN A SMOOTH EDGED HOLE. SCORED OR ETCHED HOLES WITH REINFORCING STEEL LEFT UNCUT WILL NOT BE PERMITTED.

REV. 5-5-05: ADDED EXTRA STEEL DIMENSION TO SECTION D-D.

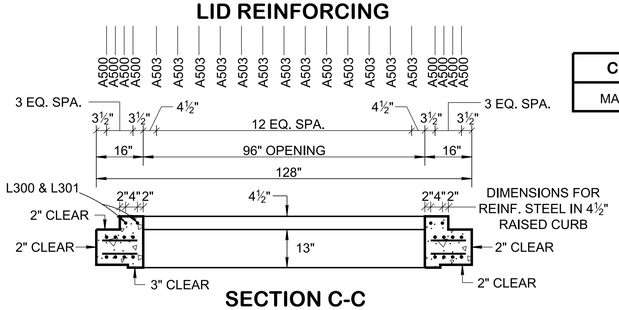
☐ REV. 8-01-12: REVISED CATCH BASIN FOR COMPLIANCE WITH AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, 4TH EDITION WITH INTERIMS. REVISED REINFORCING, GENERAL NOTES, LEGEND AND ADDITIONAL MISC. DRAFTING EDITS.

REV. 3-11-14: ELIMINATED STIRRUPS.

REV. 05-15-18: REVISED CATCH BASIN MINIMUM DESIGN DEPTH VALUES. CORRECTED STANDARD SPECIFICATIONS SECTION NUMBER TO 921 FOR NON -SHRINK GROUT. ADDED DIMENSION IN SECTION VIEW A-A FOR NOTE Ⓚ. CORRECTED REBAR PLACEMENT IN LIDS. ADDED DIMENSION IN SECTION VIEW A-A FOR MINIMUM DESIGN DEPTH.

REV. 02-20-2020: REDREW SHEET.

REV. 03-04-2021: REVISED GRATE UNIT NOTES.

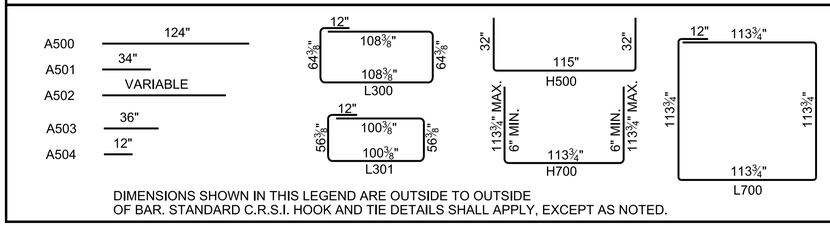


SECTION C-C

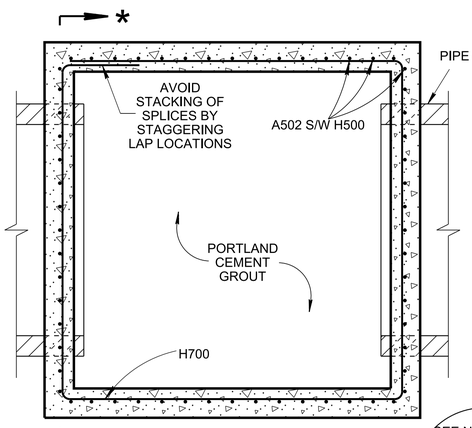
CATCH BASIN MAXIMUM DEPTH NOTE

MAXIMUM DEPTH FOR THIS STRUCTURE IS 28.00'.

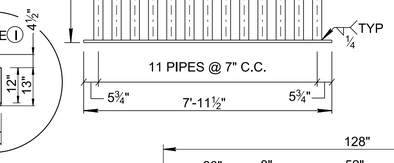
REINFORCING STEEL LEGEND



DIMENSIONS SHOWN IN THIS LEGEND ARE OUTSIDE TO OUTSIDE OF BAR. STANDARD C.R.S.I. HOOK AND TIE DETAILS SHALL APPLY, EXCEPT AS NOTED.



SECTION E-E



GRATE UNIT NO. 40

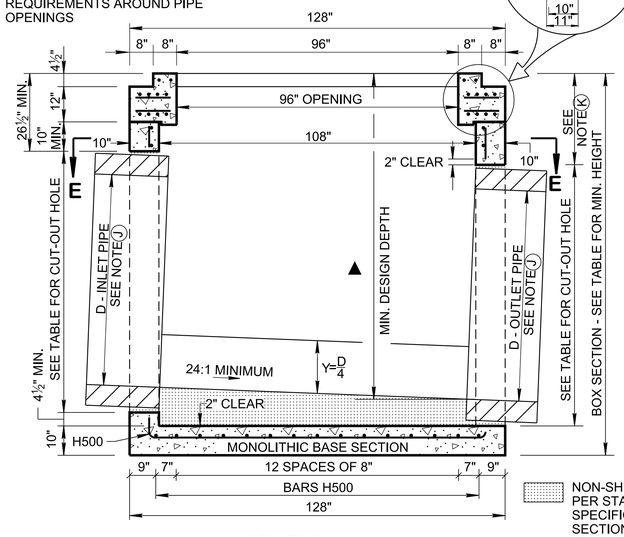
GRATE UNIT IS STRUCTURALLY DESIGNED BASED ON HS20 LOADING.

MATERIAL: STEEL BARS SHALL CONFORM TO ASTM A36. FOR THE PIPE CROSS MEMBERS, ASTM A53 GRADE B OR ASTM A500 GRADE B AND ALL SHALL BE GALVANIZED.

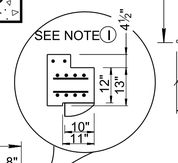
WELDING: AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)

SECTION *-*

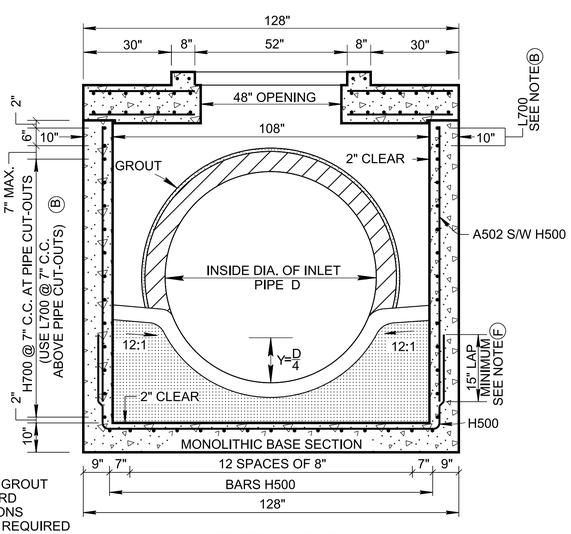
ELEV. VIEW IS PROVIDED ON STANDARD DRAWING D-CB-99 SHOWING REINFORCEMENT REQUIREMENTS AROUND PIPE OPENINGS



SECTION A-A



NON-SHRINK GROUT PER STANDARD SPECIFICATIONS SECTION 921 REQUIRED AROUND PIPE OPENINGS ONLY



SECTION B-B

GENERAL NOTES

Ⓐ DRAWING TO BE USED FOR ALL CAST-IN-PLACE NO. 40SE CONCRETE CATCH BASINS AND ALL PRECAST NO. 40SE CONCRETE CATCH BASINS. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL CONSTRUCTION NOTES & DETAILS.

Ⓑ THIS DRAWING DEPICTS THE MINIMUM HORIZONTAL REINFORCING AT THE TOP OF CATCH BASIN WALLS. SEE ADDITIONAL DETAILS ON STANDARD DRAWING D-CB-99 FOR TALLER SECTIONS.

Ⓒ CAST-IN-PLACE CONCRETE CATCH BASINS SHALL BE CONSTRUCTED IN ACCORDANCE WITH STANDARD SPECIFICATIONS, SECTION 611 AND/OR SPECIAL PROVISIONS UNLESS SUPERSEDED BY THIS DRAWING. THE CONTRACTOR MAY WITH PERMISSION FROM THE ENGINEER SUBSTITUTE PRECAST CATCH BASINS FOR CAST-IN-PLACE CATCH BASINS PROVIDED THAT ALL PRECAST ELEMENTS MEET ASTM C913 (CURRENT EDITION) UNLESS SUPERSEDED BY THIS DRAWING.

Ⓓ THE FOLLOWING MATERIAL PROPERTIES ARE REQUIRED FOR CAST-IN-PLACE AND PRECAST STRUCTURES:

CONCRETE: f'_C = 4,000 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.

Ⓔ PRECAST CATCH BASIN UNITS WHICH ARE DAMAGED DURING SHIPMENT OR INSTALLATION WILL BE REJECTED. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO REPLACE DAMAGED CATCH BASIN UNITS AT THEIR OWN EXPENSE.

Ⓕ THE CONTRACTOR MAY ELIMINATE THE A502 BARS BY LENGTHENING THE VERTICAL LEG OF THE H500 BARS SO THAT 1½ INCHES OF CLEAR COVER IS PROVIDED AT THE TOP OF THE STRUCTURE.

Ⓖ APPROPRIATE SIZING AND LOCATION OF LIFTING DEVICES SHALL BE THE RESPONSIBILITY OF THE FABRICATOR.

Ⓗ THE CONTRACTOR IS TO PATCH ALL LIFTING DEVICE HOLES WITH GROUT AND PLACE A MINIMUM OF ONE (1) INCH OF COVER OVER THE HARDWARE OF THESE DEVICES ON BOTH TOP AND BOTTOM SURFACES.

Ⓘ ALTERNATIVE JOINT DETAILS MAY BE ACCEPTABLE. SEE STANDARD DRAWING D-CB-99 FOR ADDITIONAL DETAILS.

Ⓙ SEE ROADWAY PLANS DRAINAGE TABULATION FOR PIPE INLET AND OUTLET ELEVATIONS. IF NEEDED, INVERT ELEVATIONS MAY BE ADJUSTED AS DIRECTED BY THE ENGINEER IN ORDER TO ACCOMMODATE INLET AND OUTLET PIPES.

Ⓚ FOR CASES WHERE THE OUTLET PIPE DIAMETER IS LARGER THAN THE INLET PIPE DIAMETER, A MINIMUM 26½ INCH DEPTH SHALL BE MAINTAINED ABOVE THE OUTLET PIPE.

Ⓛ CONCRETE JOINT MATERIAL TO BE ½ INCH PREMOLDED FIBER IN ACCORDANCE WITH SECTION 905 OF STANDARD SPECIFICATIONS.

Ⓜ PAY DEPTH MEASUREMENT MADE FROM TOP OF GRATE TO OUTLET FLOW ELEVATION. PAYMENT INCLUDES GRATE. PAYMENT FOR CATCH BASIN WILL BE MADE UNDER ITEM NUMBERS:

611-40.02, CATCH BASINS, TYPE 40, > 4'-8' DEPTH, EACH, (THROUGH)
611-40.05, CATCH BASINS, TYPE 40, > 24'-28' DEPTH, EACH.

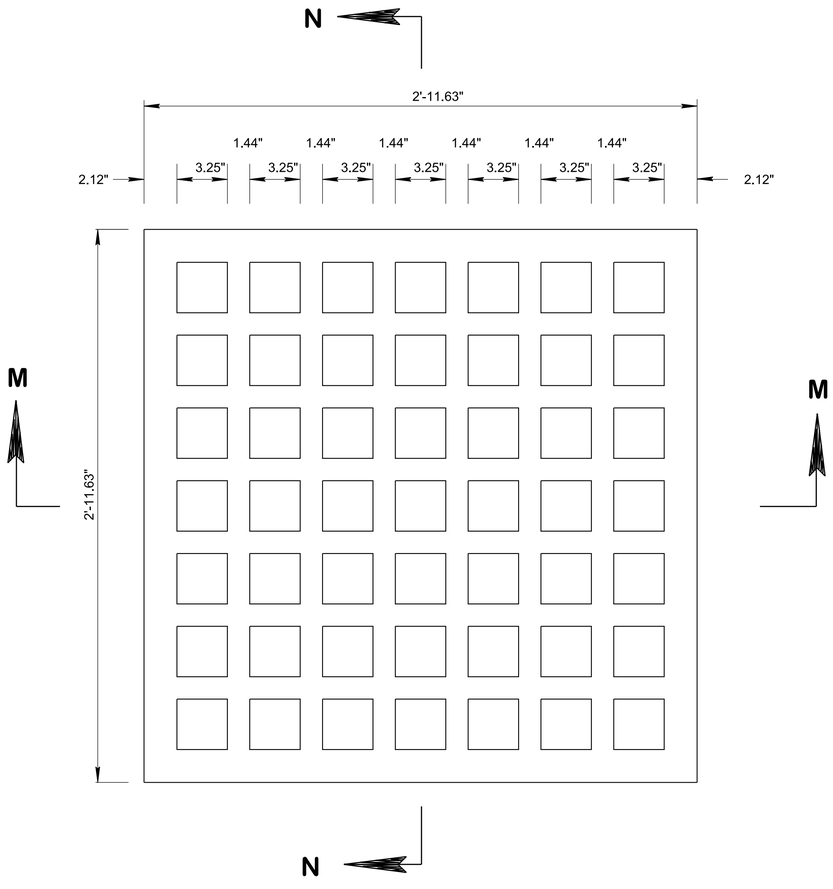
☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

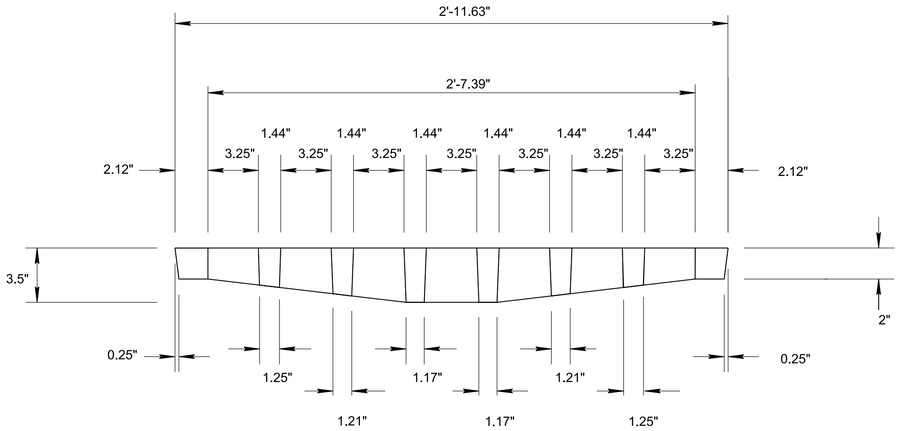
STANDARD 9' X 9' SQUARE CONCRETE NO. 40 CATCH BASIN

0-11-2004 | D-CB-40SE

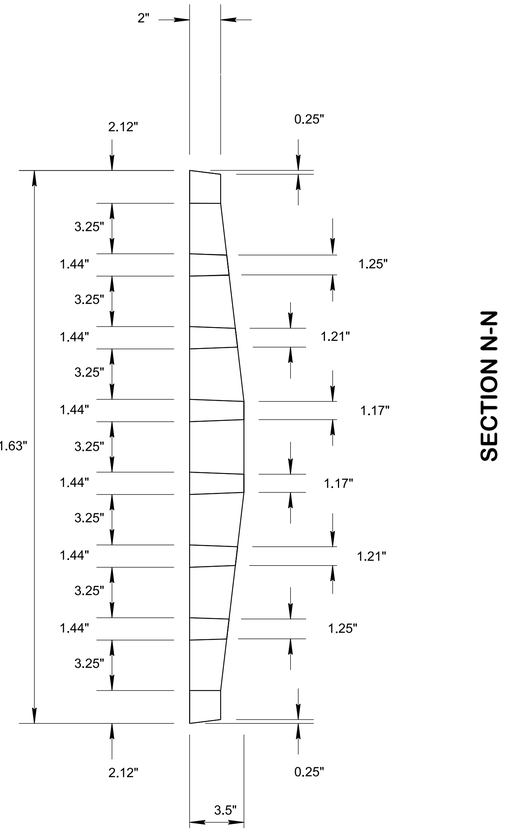
NOT TO SCALE



TOP VIEW



SECTION M-M



SECTION N-N

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 ⅛" 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 HS20 DESIGN LOADING FOR OCCASIONAL TRAFFIC LOADING.

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.

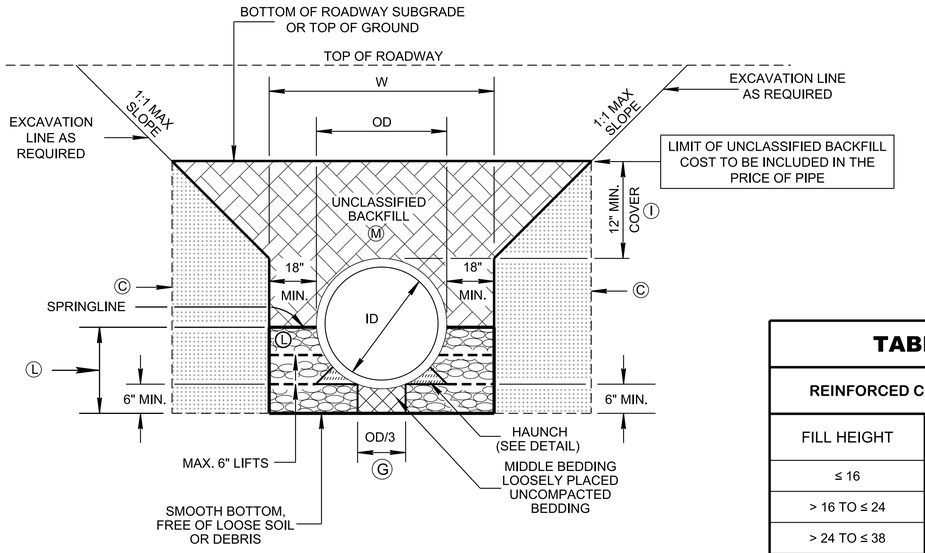
REV. 03-04-2021: ADDED GENERAL NOTE (E) REVISED GENERAL NOTE (A) AND REMOVED WEIGHT PER GRATE TABLE FROM THE DRAWING.

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

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

10-26-1997 | D-CBB-42

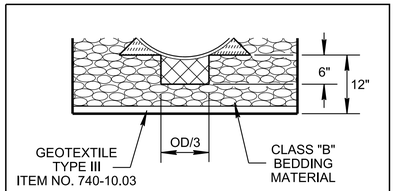
NOT TO SCALE



STANDARD TRENCH INSTALLATION

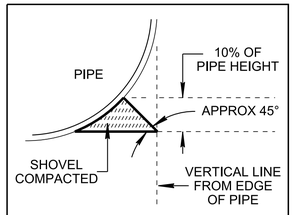
(PIPE CULVERT INSTALLATION DETAIL)
NOTE: CENTER PIPE IN TRENCH
SEE GENERAL NOTE (B)

TABLE A	
REINFORCED CONCRETE PIPE	
FILL HEIGHT	CLASSIFICATION (AASHTO M170)
≤ 16	III
> 16 TO ≤ 24	IV
> 24 TO ≤ 38	V
> 38	SPECIAL DESIGN

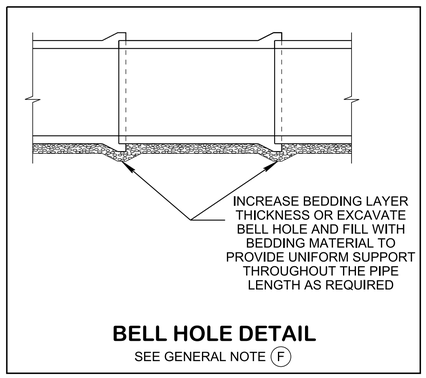


IMPROVED FOUNDATION DETAIL

SEE GENERAL NOTE (G)



HAUNCH AREA DETAIL



BELL HOLE DETAIL

SEE GENERAL NOTE (F)

TABLE B					
CONCRETE PIPE CULVERT				CLASS "B" BEDDING MATERIAL (CY/LF)	UNCLASSIFIED BACKFILL MATERIAL (CY/LF)
PIPE DIA	PAYMENT ITEM NO (PER L.F.)	CLASS**	MIN.* W		
18"	607-03.02 THRU 607-03-04	III THRU V	59"	0.216	0.336
24"	607-05.02 THRU 607-05-04	III THRU V	66"	0.266	0.479
30"	607-06.02 THRU 607-06.04	III THRU V	73"	0.283	0.581
36"	607-07.02 THRU 607-07.04	III THRU V	80"	0.302	0.683
42"	607-08.02 THRU 607-08.04	III THRU V	87"	0.323	0.787
48"	607-09.02 THRU 607-09.04	III THRU V	94"	0.344	0.891
54"	607-10..02 THRU 607-10.04	III THRU V	101"	0.363	0.989
60"	607-11.03 THRU 607-11.05	III THRU V	108"	0.386	1.105

* FOR " WALL B" WALL THICKNESS.

** NOTE: CONCRETE PIPE CLASSES FOR REQUIRED D-LOAD CAPACITY. MINIMUM CLASS III SHALL BE USED UNDER ROADWAYS.

LEGEND

ID = INSIDE DIAMETER
OD = OUTSIDE DIAMETER

- CLASS "B" BEDDING COMPACTED TO 90% STANDARD PROCTOR DENSITY
- CLASS "B" BEDDING UNCOMPACTED
- FIRM INSITU SOIL OR CLASS "B" BEDDING COMPACTED TO 90% STANDARD PROCTOR DENSITY
- HAUNCH AREA, SHOVEL COMPACTED
- UNCLASSIFIED BACKFILL (FINE COMPACTABLE SOIL)

GENERAL NOTES

PIPE MATERIALS:

(A) REINFORCED CONCRETE PIPE SHALL MEET THE REQUIREMENTS OF AASHTO M-170. THE WALL THICKNESS SHALL BE "WALL B" (EXPECT: FOR STRUCTURES DEEPER THAN THE MINIMUM DEPTH, "WALL C" MAY BE USED) AND THE RCP CLASS SHALL BE AS LISTED IN "TABLE A". ALL PIPE MANUFACTURING PLANTS SHALL BE CERTIFIED BY EITHER ACPA OR NPCA. REFER SOP 5-3 FOR MORE INFORMATION.

INSTALLATIONS REQUIREMENTS:

(B) FOR EMBANKMENT AREAS OR WHERE TRENCH CONDITIONS DO NOT EXIST, AN INDUCED TRENCH SOIL EMBANKMENT SHALL BE CONSTRUCTED SEE D-PB-3.

(C) FOR TRENCHES WITH IN SITU SOIL WALLS, THE SOIL SHALL BE AT LEAST AS FIRM AS THE MAJORITY OF THE SUBGRADE AS DETERMINED BY THE ENGINEER. SOIL NOT MEETING THIS REQUIREMENT SHALL BE REMOVED AND REPLACED.

(D) FOR ADDITIONAL INSTALLATION INFO SEE SECTION 27 "CONCRETE CULVERTS" OF THE AASHTO STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES AND ASTM C-1479-10.

(E) ONLY AS MUCH TRENCH AS CAN BE SAFELY MAINTAINED SHALL BE OPENED. ALL TRENCHES SHALL BE BACKFILLED AND COMPACTED TO THE MINIMUM COVER DEPTH 12" ABOVE THE PIPE AS SOON AS PRACTICABLE, BUT NOT LATER THAN THE END OF EACH WORKING DAY IN ACCORDANCE WITH THE COMPACTED REQUIREMENTS.

(F) JOINTS BETWEEN PIPES REQUIRE A RUBBER GASKET MEETING ASTM C443. AT CONNECTIONS TO STRUCTURES USE NON-SHRINK GROUT OR RUBBER GASKET PER C923 OR C1478.
WHERE PIPE WITH BELLS ARE INSTALLED, BELL HOLES SHALL BE EXCAVATED IN BEDDING TO SUCH DIMENSIONS THAT THE ENTIRE LENGTH OF THE BARREL OF THE PIPE WILL BE SUPPORTED BY THE BEDDING WHEN PROPERLY INSTALLED AS SHOWN IN BELL HOLE DETAIL.

(G) WHERE THE TRENCH FOUNDATION IS FOUND UNACCEPTABLE OR LOCATION WHERE THE WATER TABLE IS FOUND HIGH:

(1) IMPROVED FOUNDATION OR EXCAVATABLE FLOWABLE FILL (EFF) MAY BE USED AT ENGINEER'S INSTRUCTION AS SHOWN ON THIS SHEET AND THE COST WILL BE INCLUDED IN THE UNIT PRICE OF THE PIPE.

(2) FIELD ENGINEER SHALL REVIEW SITE CONDITIONS TO CONFIRM TYPICAL BEDDING AS SHOWN IS ADEQUATE TO PROVIDE STRUCTURAL SUPPORT OR FOUNDATION IMPROVEMENT IS REQUIRED.

(H) FOR MULTIPLE PIPES MINIMUM SPACING BETWEEN PIPES IS:

36" PIPES AND SMALLER: EQUAL TO THE OUTSIDE DIAMETER OF THE LARGEST PIPE.

PIPES LARGER THAN 36": EQUAL TO HALF THE OUTSIDE DIAMETER OF THE LARGEST PIPE.

(I) FOR MINIMUM COVER DEPTHS FOR CONSTRUCTION LOADS SEE D-PB-3.

(J) CLASS "B" BEDDING MAY NOT BE REQUIRED UNDER SIDE DRAINS FOR PRIVATE DRIVES, FILED ENTRANCES, PIPES OUTSIDE THE SHOULDER LIMITS OF INTERCHANGE RAMPS, OR PIPES OUTSIDE NORMAL SLOPE LINES BEDDING TYPE AS PER STANDARD SPECIFICATION 204-10.B.

(K) ARCH AND OVAL SHAPED PIPE CULVERTS SHALL BE INSTALLED THE SAME AS CIRCULAR WITH O.D. EQUAL TO THE WIDEST HORIZONTAL DIMENSION ON THE PIPE. TO ESTIMATE BEDDING MATERIAL FOR THESE PIPES WITH INTERNAL WIDTH THE SAME AS DIAMETER IN THE TABLE, MULTIPLY BEDDING QUANTITY BY 0.5 FOR THE SHOWN MINIMUM TRENCH DIMENSIONS.

BEDDING AND BACKFILL REQUIREMENTS:

(L) CLASS "B" BEDDING MATERIAL MEETING THE REQUIREMENTS OF CONSTRUCTION SPECIFICATION SUBSECTION 204.04 SHALL BE PLACED IN LIFTS, NOT TO EXCEED 6 INCHES, TO THE PIPE SPRINGLINE. A MINIMUM COMPACTION LEVEL OF 90% OF THE STANDARD PROCTOR DENSITY PER AASHTO T99 SHALL BE ACHIEVED BY USE OF VIBRATORY PLATE.

(M) UNCLASSIFIED BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING A 8 INCH LOOSE LIFT THICKNESS AND BROUGHT UP EVENLY AND SIMULTANEOUSLY ON BOTH SIDES OF THE PIPE TO AN ELEVATION NOT LESS THAN ONE FOOT ABOVE THE TOP OF THE PIPE.

UNCLASSIFIED BACKFILL TO THE LIMIT OF PIPE BACKFILL LINE SHALL BE COMPACTED IN ACCORDANCE TO STANDARD SPECIFICATION 204.11. HYDRO-HAMMER TYPE OF COMPACTORS MAY BE USED AROUND THE PIPE HOWEVER THEY SHALL NOT BE USED DIRECTLY OVER THE PIPE TO PREVENT ANY DAMAGE. ALL COMPACTION EQUIPMENT USED SHALL BE APPROVED BY THE ENGINEER.

(N) PLACE 6 INCHES MINIMUM OF CLASS "B" BEDDING MATERIAL, ALONG WITH SUFFICIENT ADDITIONAL CLASS "B" BEDDING MATERIAL ACCURATELY SHAPED AS SHOWN IN HAUNCH AREA DETAIL.

(O) **END TREATMENTS:**

(1) ALL CROSS DRAINS (PERPENDICULAR) PLACED UNDER A MAINLINE ROADWAY, REQUIRE TYPE U ENDWALLS CONFORMING TO THE ROADWAY FILL SLOPE AS SHOWN ON STANDARD DRAWINGS D-PE-15A THROUGH D-PE-48A FOR END WALL GEOMETRY AND D-PE-99 FOR GRATE DETAILS. ALL CULVERT ENDWALLS LOCATED WITHIN THE CLEAR ZONE (S-CZ-1) REQUIRE A SAFETY GRATE (18" OR 24" PIPE ENDWALLS MAY OMIT THE STEEL GRATE). ALL CROSS DRAIN CULVERTS LARGER THAN 48" MUST BE PROTECTED BY A GUARDRAIL OR ENDWALL OR MUST BE PLACED OUTSIDE THE CLEAR ZONE. CROSS DRAIN ENDWALLS PLACED OUTSIDE THE CLEAR ZONE MAY USE TYPE A (D-PE-1), TYPE B (D-PE-9 THRU 9F), OR STRAIGHT HEADWALL (D-PE-4) IN LIEU OF TYPE U OR IF THE PIPE END WALL IS PROTECTED BY A GUARDRAIL.

(2) ALL SIDE DRAINS (PARALLEL) PLACED UNDER A SIDE ROAD, DRIVEWAY, OR FIELD ENTRANCE, ETC. THAT INTERSECT A MAINLINE ROADWAY, REQUIRE SAFETY ENDWALLS AS SHOWN ON THE D-SEW- SERIES STANDARD DRAWINGS WITH SAFETY GRATE (D-SEW-1A) WITH A MAXIMUM 6:1 TAPER IF THE CULVERT ENDWALLS ARE LOCATED INSIDE THE CLEAR ZONE (S-CZ-1).

(3) ALL MEDIAN CROSSOVER SIDE DRAINS (LONGITUDINAL) PLACED UNDER MEDIAN OPENINGS REQUIRE SAFETY ENDWALLS AS SHOWN ON D-SEW-12D STANDARD DRAWING WITH SAFETY GRATE (D-SEW-1A) WITH MAXIMUM 12:1 TAPER IF THE CULVERT ENDWALLS ARE LOCATED INSIDE THE CLEAR ZONE (S-CZ-1).

(P) **INSPECTION REQUIREMENTS:**

ALL PIPES SHALL UNDERGO INSPECTION ACCORDING TO SECTION 607.09 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OR PER SECTION 27 OF AASHTO STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES OR PER ASTM C1840.

(Q) **PAYMENT:**

EXCAVATION FOR PIPE WILL NOT BE MEASURED AND PAID FOR DIRECTLY AND ANY SOIL NOT MEETING REQUIREMENT FOR TRENCHES SHALL BE REMOVED AND REPLACED. ALL COST OF THIS WORK WILL BE INCLUDED IN THE COST OF THE PROPOSED PIPE CULVERT. SEE TABLE B FOR PIPE CULVERT ITEM NUMBERS.

PAYMENT FOR CLASS "B" BEDDING MATERIAL, UNCLASSIFIED BACKFILL TO THE LIMIT LINE, AND/OR IF REQUIRED EXCAVATABLE FLOWABLE FILL AND BEDDING MATERIAL WILL BE INCLUDED IN THE UNIT PRICE OF THE PIPE.

GEOTEXTILE TYPE III TO BE USED ONLY IF IMPROVED FOUNDATION IS REQUIRED, AND WILL BE PAID UNDER ITEM NO.

740-10.03 GEOTEXTILE (TYPE III)(EROSION CONTROL) PER S.Y.

☐ REV. 7-12-07: REVISED GENERAL NOTE (J).

REV. 6-1-09: REVISED GENERAL NOTE (I) AND TITLE NAME. ADDED GENERAL NOTE (J).

REV.2-1-12: REVISED DRAWING NAME ADDED EFF DETAIL. REVISED GENERAL NOTES AND TABLE. ADDED MINIMUM COVER TABLE.

REV. 8-21-12: REVISED GENERAL NOTES. CHANGED BACKFILL MATERIAL.

REV. 1-2-13: REVISED TRENCH DETAILS REVISED BEDDING TABLE.

REV. 3-16-17: CLARIFIED PAYMENT ITEM NO. IN TABLE B.

REV. 06-28-19: REVISED DETAIL FOR STANDARD TRENCH INSTALLATION, TABLE A AND GENERAL NOTES. REDREW SHEET.

REV. 11-30-20: REVISED DETAIL FOR STANDARD TRENCH INSTALLATION, TABLE B AND GENERAL NOTES. ADDED BELL HOLE DETAIL.

REV. 03-04-21: REVISED TABLE B.

☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

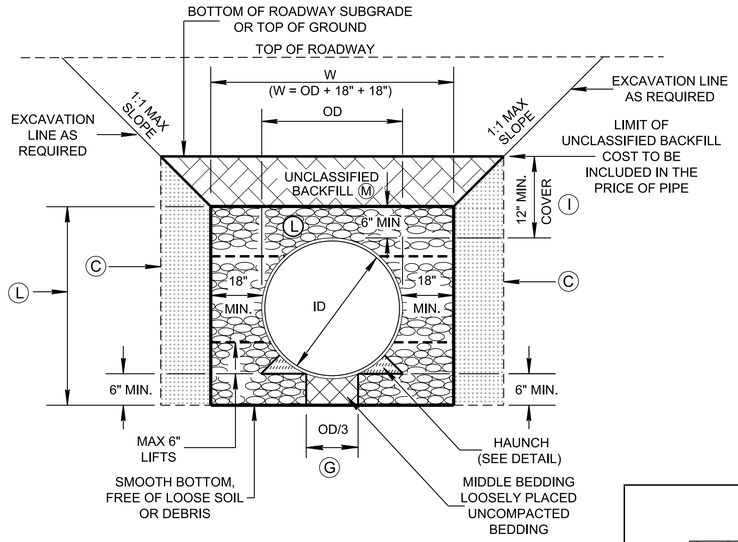
STANDARD DETAILS FOR CONCRETE PIPE INSTALLATION

D-PB-1

NOT TO SCALE

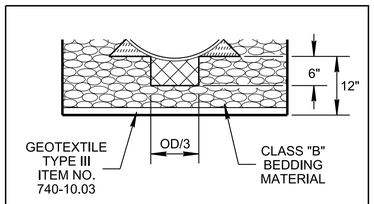
LLP

3/8/2021 11:14:14 AM P:\StandDraw\DESIGN STANDARDS\Standards Drawings Library\Standard Roadway Drawings - CURRENT\In Progress\10-101.00 Pipe Culverts and Endwalls IP\101.01 Pipe Culverts and Flumes IP\DPB1-20210304



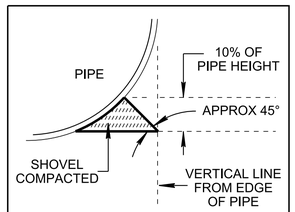
STANDARD TRENCH INSTALLATION

(PIPE CULVERT INSTALLATION DETAIL)
NOTE: CENTER PIPE IN TRENCH
SEE GENERAL NOTE (B)

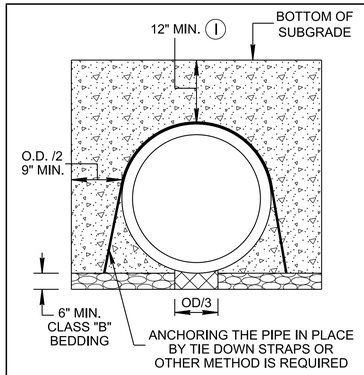


IMPROVED FOUNDATION DETAIL

SEE GENERAL NOTE (G)



HAUNCH AREA DETAIL

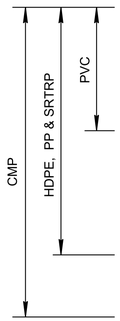


ALTERNATE BACKFILL DETAIL USING EXCAVATABLE FLOWABLE FILL (EFF)

SEE GENERAL NOTE (G)

TABLE A

PIPE CULVERT		CLASS "B" BEDDING MATERIAL (CY/LF)	UNCLASSIFIED BACKFILL MATERIAL (CY/LF)
PIPE DIA	PAYMENT ITEM NO		
18"	607-03.30	0.371	0.095
24"	607-05.30	0.463	0.104
30"	607-06.30	0.595	0.117
36"	607-07.30	0.703	0.127
42"	607-08.30	0.814	0.137
48"	607-09.30	0.932	0.148
54"	607-10.30	1.055	0.158
60"	607-11.30	1.183	0.168
66"	607-12.30	1.315	0.178
72"	607-13.30	1.453	0.188



NOTE: SEE TDOT DESIGN DIVISION DRAINAGE MANUAL SECTION 6, APPENDIX, TABLE 6A-1 FOR PIPE SELECTION CRITERIA BASED ON SYSTEM AND FILL HEIGHT.

LEGEND

ID = INSIDE DIAMETER
OD = OUTSIDE DIAMETER

- CLASS "B" BEDDING COMPACTED TO 90% STANDARD PROCTOR DENSITY
- CLASS "B" BEDDING UNCOMPACTED
- FIRM INSITU SOIL OR CLASS "B" BEDDING COMPACTED TO 90% STANDARD PROCTOR DENSITY
- HAUNCH AREA, SHOVEL COMPACTED
- UNCLASSIFIED BACKFILL (FINE COMPACTABLE SOIL)
- EXCAVATABLE FLOWABLE FILL (EFF)

GENERAL NOTES

PIPE MATERIALS:

(A) FLEXIBLE PIPE MATERIALS ARE HDPE, PVC, CMP, SRTRP, AND PP.

ALL HIGH DENSITY POLYETHYLENE (HDPE) PIPE USED FOR CULVERT AND STORM DRAIN APPLICATIONS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M294, TYPE S, CURRENT EDITION ALL HDPE PIPE DELIVERED AND USED SHALL BE A PARTICIPANT IN NTPEP. MAX. PIPE DIA. FOR HDPE PIPE IS 60".

POLY VINYL CHLORIDE (PVC) PROFILE WALL DRAINAGE PIPE SHALL MEET AASHTO DESIGNATION M-304. THE MAXIMUM PIPE DIAMETER FOR PVC PIPE IS 36".

STEEL REINFORCED THERMOPLASTIC RIBBED PIPE (SRTRP) SHALL MEET AASHTO DESIGNATION M335, THE MAXIMUM PIPE DIAMETER FOR THE PIPE IS 60".

CORRUGATED METAL PIPE (CMP) SHALL BE ALUMINIZED COATED CORRUGATED METAL PIPE AND SHALL MEET AASHTO M274, MAXIMUM DIA IS 72".

POLYPROPYLENE PIPE (PP) SHALL MEET AASHTO DESIGNATION M-330, THE MAXIMUM PIPE DIAMETER IS 60".

INSTALLATIONS REQUIREMENTS:

(B) FOR EMBANKMENT AREAS OR WHERE TRENCH CONDITIONS DO NOT EXIST, AN INDUCED TRENCH SHALL BE CONSTRUCTED. SEE STD. DWG. NO. D-PB-3.

(C) FOR TRENCHES WITH IN SITU SOIL WALLS, ANY PORTION OF THE WALL SHALL BE AT LEAST AS FIRM AS THE MAJORITY OF THE SUBGRADE. SOIL NOT MEETING THIS REQUIREMENT SHALL BE REMOVED AND REPLACED.

(D) FOR ADDITIONAL INSTALLATION INFORMATION SEE AASHTO SECTION 30 OR ASTM D2321. ALL PIPES SHALL BE ASSEMBLED AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. PIPE SHALL BE PLACED IN THE BED STARTING AT THE DOWNSTREAM END.

(E) ONLY AS MUCH TRENCH AS CAN BE SAFELY MAINTAINED SHALL BE OPENED. ALL TRENCHES SHALL BE BACKFILLED AND COMPACTED TO THE MINIMUM COVER DEPTH OF 12" ABOVE THE PIPE AS SOON AS PRACTICABLE, BUT NOT LATER THAN THE END OF EACH WORKING DAY IN ACCORDANCE WITH THE COMPACTION REQUIREMENTS.

(F) JOINTS FOR FLEXIBLE PIPE SHALL MEET THE PERFORMANCE REQUIREMENT OF ASTM D3212. JOINTS SHALL BE INSTALLED SO THAT THE CONNECTION OF PIPE SECTION FOR A CONTINUOUS LINE WILL BE FREE FROM IRREGULARITIES IN THE FLOW LINE. JOINTS BETWEEN PLASTIC FLEXIBLE PIPE AND STRUCTURE SHALL HAVE A GASKET MEETING ASTM F2510. FOR CMP PIPE TO STRUCTURE CONNECTIONS OR PLASTIC PIPE AT A SKEW GREATER THAN 15°, WHERE A GASKET WILL NOT WORK, NON-SHRINK GROUT APPLIED IN TWO STAGES SHALL BE USED.

(G) ONLY WHERE THE TRENCH FOUNDATION IS FOUND UNACCEPTABLE OR LOCATION WHERE THE WATER TABLE IS FOUND HIGH:

(1) IMPROVED FOUNDATION OR EXCAVATABLE FLOWABLE FILL (EFF) MAY BE USED AT ENGINEER'S INSTRUCTION AND THE COST WILL BE INCLUDED IN THE UNIT PRICE OF THE PIPE.

(2) FIELD ENGINEER SHALL REVIEW SITE CONDITIONS INCLUDING THE POSSIBLE EFFECTS OF WATER TABLE TO CONFIRM TYPICAL BEDDING AS SHOWN IS ADEQUATE TO PROVIDE STRUCTURAL SUPPORT OR FOUNDATION IMPROVEMENT IS REQUIRED.

(H) MINIMUM SPACING BETWEEN MULTIPLE PIPES ARE:

36" PIPES AND SMALLER: EQUAL TO THE OUTSIDE DIAMETER OF THE LARGEST PIPE.

PIPES LARGER THAN 36": EQUAL TO HALF THE OUTSIDE DIAMETER OF THE LARGEST PIPE.

(I) FOR MINIMUM COVER DEPTHS FOR CONSTRUCTION LOADS SEE D-PB-3.

(J) MAXIMUM ALLOWABLE FILL HEIGHTS ARE AS DEFINED IN THE DRAINAGE MANUAL SECTION 6, APPENDIX, TABLE 6A-1.

BEDDING AND BACKFILL REQUIREMENTS:

(K) PLACE 6 INCHES MINIMUM OF CLASS B BEDDING MATERIAL, ALONG WITH SUFFICIENT ADDITIONAL CLASS "B" BEDDING MATERIAL ACCURATELY SHAPED AS SHOWN IN HAUNCH AREA DETAIL.

(L) CLASS "B" BEDDING MATERIAL MEETING THE REQUIREMENTS OF CONSTRUCTION SPECIFICATION SUBSECTION 204.04 SHALL BE PLACED IN LIFTS AND UP TO 6 INCHES ABOVE THE TOP OF PIPE. A MINIMUM COMPACTION LEVEL OF 90% OF THE STANDARD PROCTOR DENSITY PER AASHTO T99 SHALL BE ACHIEVED BY USE OF VIBRATORY PLATE.

(M) UNCLASSIFIED BACKFILL SHALL BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING A 8 INCH LOOSE LIFT THICKNESS STARTING FROM THE CLASS B BEDDING, 6 INCHES ABOVE THE TOP OF PIPE, TO AN ELEVATION NOT LESS THAN ONE FOOT ABOVE THE TOP OF THE PIPE.

(N) **END TREATMENTS:**

(1) ALL CROSS DRAINS (PERPENDICULAR) PLACED UNDER A MAINLINE ROADWAY, REQUIRE TYPE U ENDWALLS CONFORMING TO THE ROADWAY FILL SLOPE AS SHOWN ON STANDARD DRAWINGS D-PE-15A THROUGH D-PE-48A FOR END WALL GEOMETRY AND D-PE-99 FOR GRATE DETAILS. ALL CULVERT ENDWALLS LOCATED WITHIN THE CLEAR ZONE (S-CZ-1) REQUIRE A SAFETY GRATE (18" OR 24" PIPE ENDWALLS MAY OMIT THE STEEL GRATE). ALL CROSS DRAIN CULVERTS LARGER THAN 48" MUST BE PROTECTED BY A GUARDRAIL OR ENDWALL OR MUST BE PLACED OUTSIDE THE CLEAR ZONE. CROSS DRAIN ENDWALLS PLACED OUTSIDE THE CLEAR ZONE MAY USE TYPE A (D-PE-1), TYPE B (D-PE-9 THRU 9F), OR STRAIGHT HEADWALL (D-PE-4) IN LIEU OF TYPE U OR IF THE PIPE END WALL IS PROTECTED BY A GUARDRAIL.

(2) ALL SIDE DRAINS (PARALLEL) PLACED UNDER A SIDE ROAD, DRIVEWAY, OR FIELD ENTRANCE, ETC. THAT INTERSECT A MAINLINE ROADWAY, REQUIRE SAFETY ENDWALLS AS SHOWN ON THE D-SEW- SERIES STANDARD DRAWINGS WITH SAFETY GRATE (D-SEW-1A) WITH A MAXIMUM 6:1 TAPER IF THE CULVERT ENDWALLS ARE LOCATED INSIDE THE CLEAR ZONE (S-CZ-1).

(3) ALL MEDIAN CROSSOVER SIDE DRAINS (LONGITUDINAL) PLACED UNDER MEDIAN OPENINGS REQUIRE SAFETY ENDWALLS AS SHOWN ON D-SEW- 12D STANDARD DRAWING WITH SAFETY GRATE (D-SEW-1A) WITH MAXIMUM 12:1 TAPER IF THE CULVERT ENDWALLS ARE LOCATED INSIDE THE CLEAR ZONE (S-CZ-1).

(O) **INSPECTION REQUIREMENTS:**

ALL PIPES SHALL UNDERGO INSPECTION ACCORDING TO SECTION 607.09 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION OR PER SECTION 30 OF AASHTO STANDARD SPECIFICATIONS FOR HIGHWAYS AND BRIDGES CURRENT EDITION.

(P) **PAYMENT:**

EXCAVATION FOR PIPE WILL NOT BE MEASURED AND PAID FOR DIRECTLY AND ANY SOIL NOT MEETING REQUIREMENT FOR TRENCHES SHALL BE REMOVED AND REPLACED. ALL COST OF THIS WORK WILL BE INCLUDED IN THE COST OF THE PROPOSED PIPE CULVERT. SEE TABLE A FOR PIPE CULVERT ITEM NUMBERS.

PAYMENT FOR CLASS "B" BEDDING MATERIAL, UNCLASSIFIED BACKFILL TO THE LIMIT LINE, AND/OR IF REQUIRED EXCAVATABLE FLOWABLE FILL, TIE DOWN STRAPS AND BEDDING MATERIAL WILL BE INCLUDED IN THE UNIT PRICE OF THE PIPE.

GEOTEXTILE TYPE III TO BE USED ONLY IF IMPROVED FOUNDATION IS REQUIRED, AND WILL BE PAID UNDER ITEM NO.

740-10.03	GEOTEXTILE (TYPE III)(EROSION CONTROL)	PER S.Y.

☐ REV. 7-12-07: REVISED GENERAL NOTE (J).

REV. 6-1-09: REVISED GENERAL NOTE (I) AND TITLE NAME. ADDED GENERAL NOTE (J).

REV.2-1-12: REVISED DRAWING NAME ADDED EFF DETAIL. REVISED GENERAL NOTES AND TABLE. ADDED MINIMUM COVER TABLE.

REV. 8-21-12: REVISED GENERAL NOTES. CHANGED BACKFILL MATERIAL.

REV. 1-2-13: REVISED TRENCH AND ADDED FILL DETAIL.

REV. 1-29-14: ADDED PP, RE LETTERED AND REVISED NOTES.

REV. 06-28-19: REVISED DETAIL FOR STANDARD TRENCH INSTALLATION, AND GENERAL NOTES. REMOVED TABLE A AND RENAMED TABLE B TO A. REVISED TABLE A CONTENT AND LEGEND. REDREW SHEET.

REV. 11-30-20: REVISED DETAIL FOR STANDARD TRENCH INSTALLATION, TABLE A AND GENERAL NOTES.

REV. 03-04-21: REVISED TABLE A.

☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

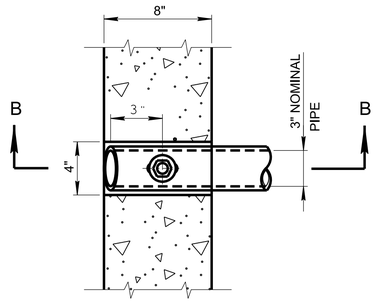
STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

STANDARD DETAILS FOR FLEXIBLE PIPE INSTALLATION

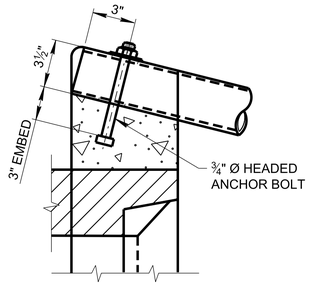
3-15-07 | D-PB-2

NOT TO SCALE

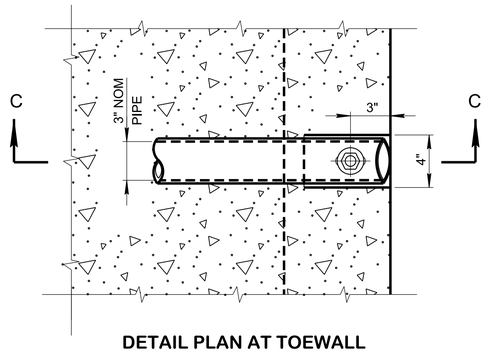
- REV.11-01-13: UPDATED NOTE (4)
- REV. 06-28-19: RENAMED AND REDREW SHEET.
- REV. 03-04-21: REVISED GENERAL NOTE (A).



DETAIL PLAN AT HEADWALL

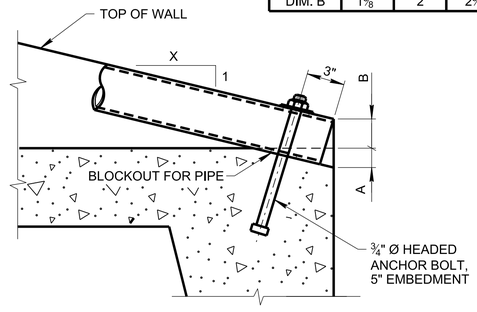


SECTION B-B THRU HEADWALL

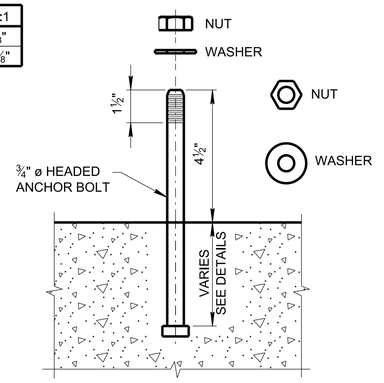


DETAIL PLAN AT TOEWALL

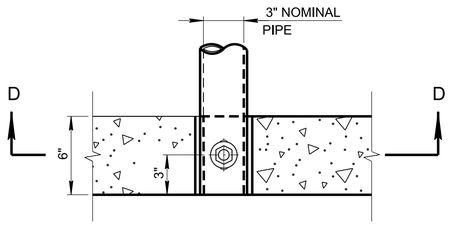
SLOPE	3:1	4:1	6:1
DIM. A	2⅜"	1⅝"	⅞"
DIM. B	1⅜"	2"	2⅝"



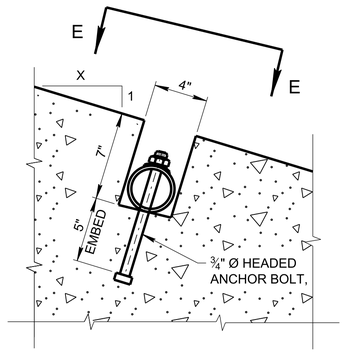
SECTION C-C THRU TOEWALL



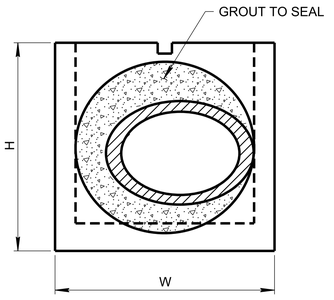
ANCHOR BOLT ASSEMBLY



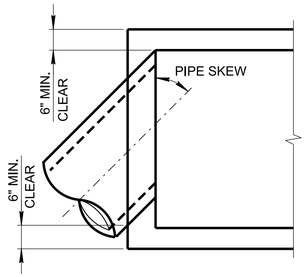
DETAIL PLAN AT WINGWALL



SECTION D-D THRU WINGWALL



HEADWALL ELEVATION



PLAN

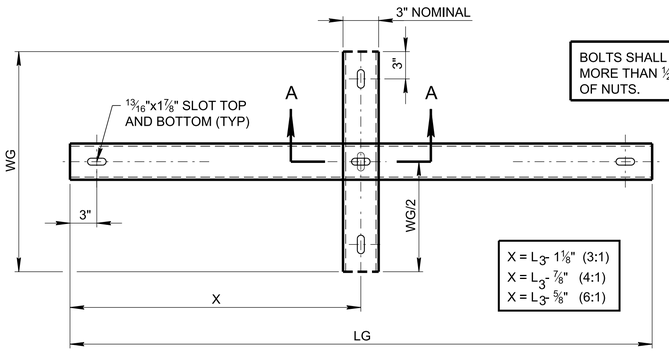
OVERSIZED TYPE "U" CONCRETE END WALL TO BE USED TO ACCOMMODATE THE SKEWED PIPE (ASSUMES CONCRETE PIPE)

PIPE CULV. DIA.	PIPE SKEW		
	75°	60°	45°
18"	24"	24"	30"
24"	30"	36"	42"
30"	36"	42"	48"
36"	42"	48"	*
42"	48"	*	*
48"	*	*	*

* EXCEEDS 48" TYPE "U" ENDWALL OPENING

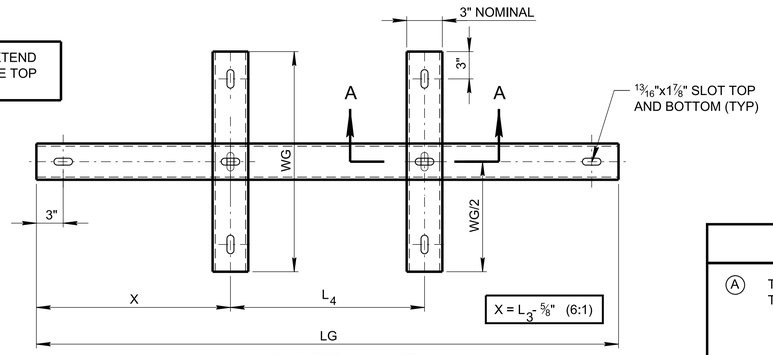
SKEWED CONNECTION DETAIL

NOTE: TABLE VALUES PROVIDED ARE APPROXIMATE ENGINEER SHALL VERIFY MINIMUM CLEARANCES

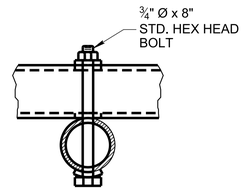


30" AND 36" PIPE (3:1, 4:1 AND 6:1 SLOPES)
42" AND 48" PIPE (3:1 AND 4:1 SLOPES)

BOLTS SHALL NOT EXTEND MORE THAN ½" ABOVE TOP OF NUTS.



42" AND 48" PIPE (6:1 SLOPE)



SECTION A-A

STEEL PIPE GRATE PLANS

FOR L_3 AND L_4 DIMENSIONS SEE STD. DWGS. D-PE-30A THROUGH D-PE-48A

PIPE CULV. DIA.	ALL SLOPES	3:1	4:1	6:1
	WG	LG	LG	LG
30"	4'-1"	10'-10⅝"	14'-0 ⅛"	20'-4 ¾"
36"	4'-8"	12'-8¾"	16'-5"	23'-11 ⅜"
42"	5'-3"	14'-3¾"	18'-5 ¾"	26'-11 ⅞"
48"	5'-10"	16'-1⅞"	20'-10 ⅝"	30'-6 ⅜"

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 ⅜" DIAMETER ANCHORS IS 10,000 POUNDS.

GENERAL NOTES

(A) THE MATERIAL AND PAINTING FOR STRUCTURAL STEEL GRATE SHALL CONFORM TO THE FOLLOWING SPECIFICATIONS:

STEEL PIPE ASTM A53 GRADE B, SCHEDULE 40 OR ASTM A500 GRADE B AND SHALL BE GALVANIZED.

(B) 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.

(C) 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 THE PIPE ENDWALL.

(D) PIPE GRATE TO BE INCLUDED IN THE PRICE OF THE ENDWALL.

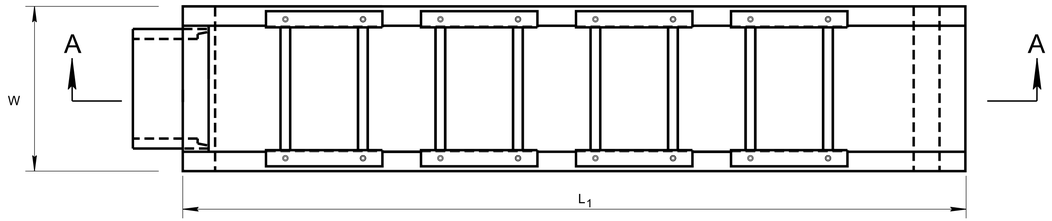
- MINOR REVISION -- FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

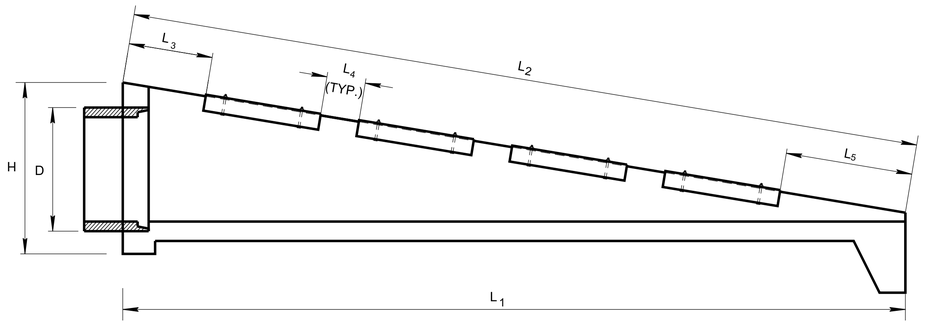
TYPE "U" CROSS DRAIN ENDWALL DETAILS, PIPE GRATE & SKEWED CONNECTION

03-01-2012 | D-PE-99

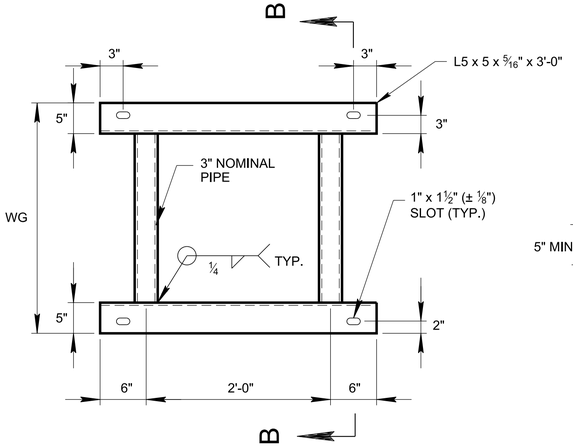
NOT TO SCALE



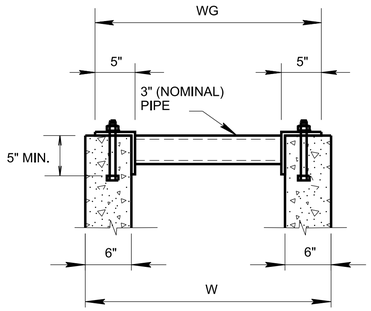
PLAN



SECTION A-A



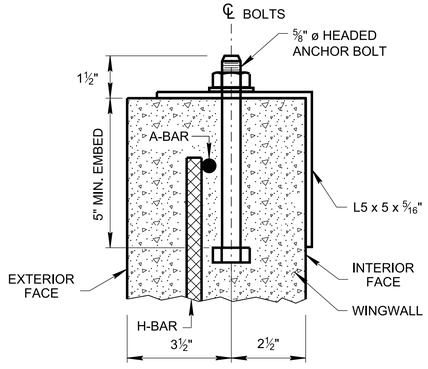
PLAN



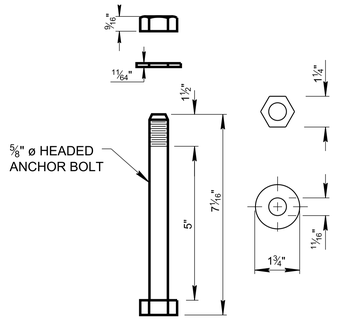
SECTION B-B
SHOWING ANCHOR BOLTS AND PARTIAL WINGWALLS

STEEL PIPE GRATE

NOTE:
BOLTS SHALL NOT EXTEND MORE THAN ½" ABOVE TOP OF NUTS.



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 ⅝" DIAMETER ANCHORS IS 10,000 POUNDS.

NOT TO SCALE

DIMENSIONS AND QUANTITIES FOR ONE ENDWALL

SIDE DRAIN DIA. (D)	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'-1⅞"	2'-5"	2	172
18"	SEE STD. DWG. D-PE-18A				10⅛"	1'-0"	1'-0"	2'-8"	3	269
24"	SEE STD. DWG. D-PE-24A				2'-2"	1'-0"	3'-2⅝"	3'-3"	3	296
30"	SEE STD. DWG. D-PE-30A				2'-2"	1'-0"	3'-3⅜"	3'-10"	4	694
36"	SEE STD. DWG. D-PE-36A				2'-2"	1'-0"	2'-9⅞"	4'-5"	5	975
42"	SEE STD. DWG. D-PE-42A				2'-2"	1'-0"	1'-10⅜"	5'-0"	6	1,300
48"	SEE STD. DWG. D-PE-48A				2'-2"	1'-0"	1'-5"	5'-7"	7	1,669

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.

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.

- 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.

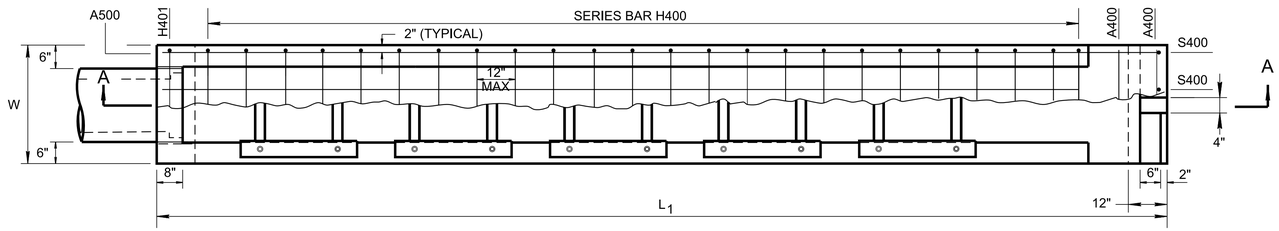
REV. 03-04-21: REVISED GENERAL NOTES (A) (B) AND (C2).

- MINOR REVISION -- FHWA APPROVAL NOT REQUIRED

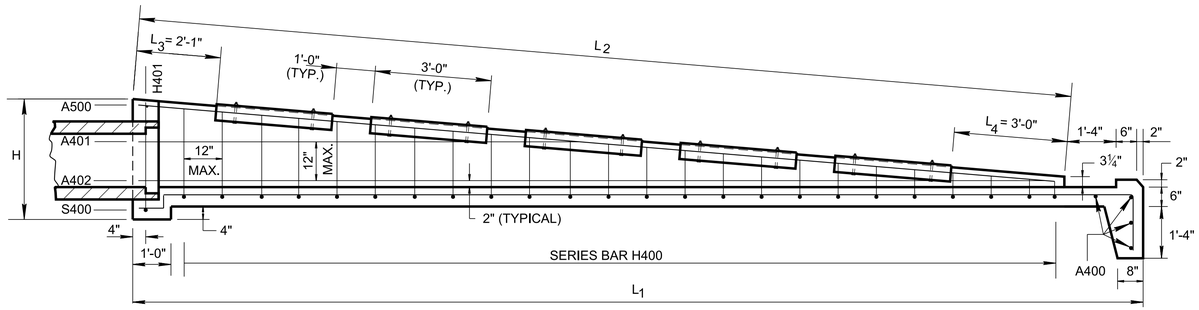
STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

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

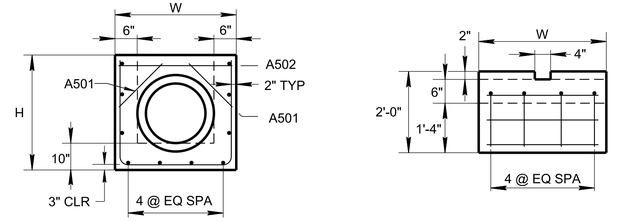
03-01-2012 | D-SEW-1A



PLAN



SECTION A-A



HEADWALL ELEVATION

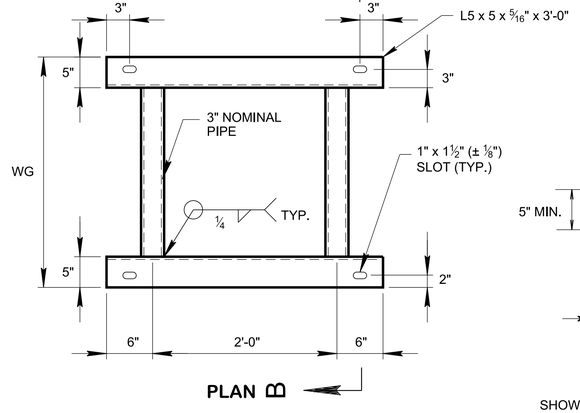
TOEWALL ELEVATION

DIMENSIONS AND QUANTITIES FOR ONE ENDWALL

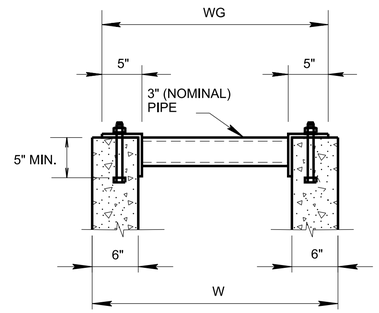
PIPE CULV. DIA.	CONCRETE ENDWALL DIMENSIONS						STRUCTURAL STEEL GRATE DIMENSION AND QUANTITY		ESTIMATED QUANTITIES		
	H	L_1	L_2	L_3	L_4	W	WG	NO. REQ'D	CLASS "A" CONCRETE CU. YD.	STEEL BAR REINF. LB.	STRUCT. STEEL LB.
18"	3'-1¼"	26'-0"	24'-1"	2'-1"	3'-0"	3'-1"	2'-10"	5	2.84	256	480

ALTERNATE ANCHORS FOR STRUCTURAL STEEL GRATES

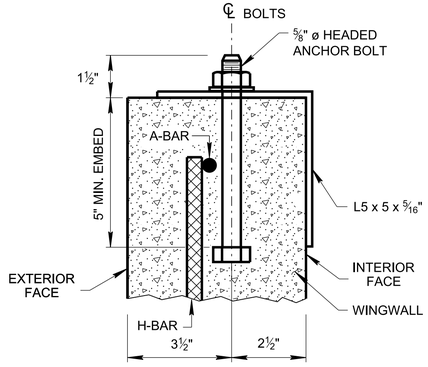
CERTIFICATION: DRILLED-IN EPOXY ANCHORS OR CAST-IN THREADED INSERTS MAY BE UTILIZED IN LIEU OF CAST-IN HEADED ANCHOR BOLTS PROVIDED THAT THE CONTRACTOR FURNISHES CERTIFIED ANCHOR PULL OUT DATA FROM AN INDEPENDENT TESTING LABORATORY USING CLASS "A" CONCRETE AS PRESCRIBED BY TENNESSEE HIGHWAY SPECIFICATIONS. THE REQUIRED ULTIMATE LOAD FOR ⅝" DIAMETER ANCHORS IS 10,000 POUNDS.



PLAN



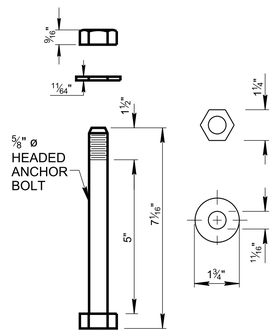
SECTION B-B
SHOWING ANCHOR BOLTS AND PARTIAL WINGWALLS



ANCHOR BOLT ASSEMBLY

STEEL PIPE GRATE

NOTE:
BOLTS SHALL NOT EXTEND MORE THAN ½" ABOVE TOP OF NUTS.



ANCHOR BOLT DETAIL

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:

1. ANGLES ASTM A36
2. STEEL PIPE ASTM A53 GRADE B, STANDARD WEIGHT (SW) OR ASTM A500 GRADE B.
3. WELDING AASHTO/AWS D1.5M/D1.5 BRIDGE WELDING CODE (LATEST EDITION)
4. ALL STEEL GRATES SHALL BE GALVANIZED.

(C) 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 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.

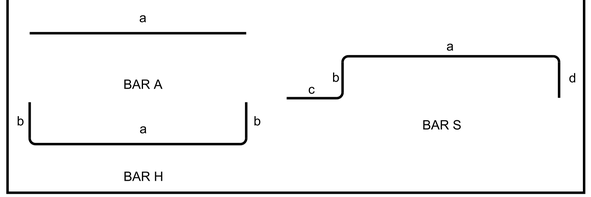
(F) PAYMENT WILL BE MADE UNDER:

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.

REINFORCING STEEL LEGEND



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 a	b	c	d	NO. REQD	LENGTH
A400	TOEWALL	2'-9"	——	——	——	4	2'-9"
A401	WINGWALLS	10'-0½"	——	——	——	2	10'-0½"
A402	WINGWALLS	23'-6"	——	——	——	2	23'-6"
A500	WINGWALLS	23'-8"	——	——	——	2	23'-8"
A501	HEADWALL	1'-8⅝"	——	——	——	2	1'-8⅝"
A502	HEADWALL	2'-9"	——	——	——	1	2'-9"
H400	BOTTOM SLAB AND WINGWALL	2'-9"	*	——	——	1	102'-11"
		* DIMENSION "b" VARIES FROM 2'-2 ⅞" TO 0'-4 ⅞" IN INCREMENTS OF 0'-1" (23 BARS)					
H401	BOTTOM SLAB AND HEADWALL	2'-9"	2'-7⅞"	——	——	1	8'-0¾"
S400	BOTTOM SLAB AND TOEWALL	25'-2"	0'-4½"	0'-6"	1'-4"	4	27'-4½"

NOT TO SCALE

- 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).

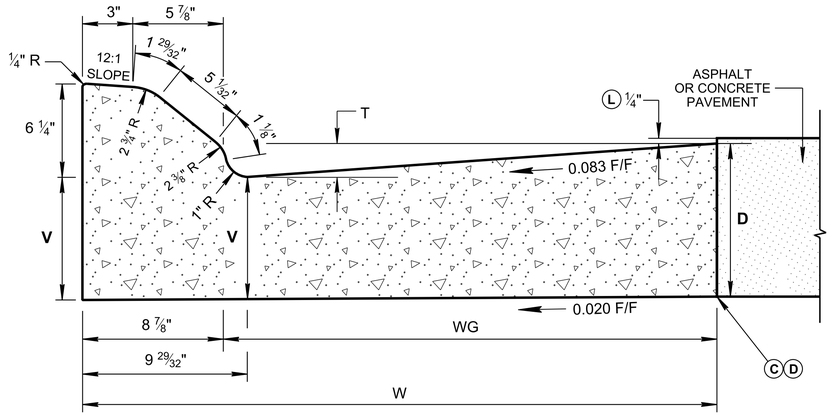
- MINOR REVISION -- FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

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

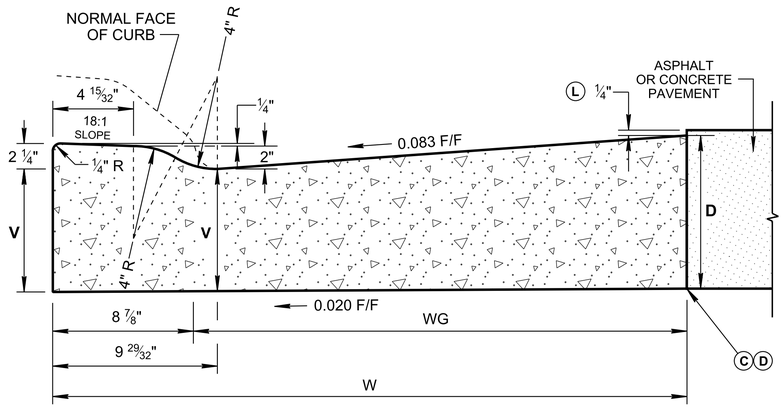
D-SEW-12D

3/10/2021 9:51:31 AM
P:\StandDraw\DESIGN STANDARDS\Standards Drawings Library\Standard Roadway Drawings - CURRENT\In Progress\10-101.00 Pipe Culverts and Endwalls IP\101.03 Safety Side Drain Endwalls IP\DSEW12D-20



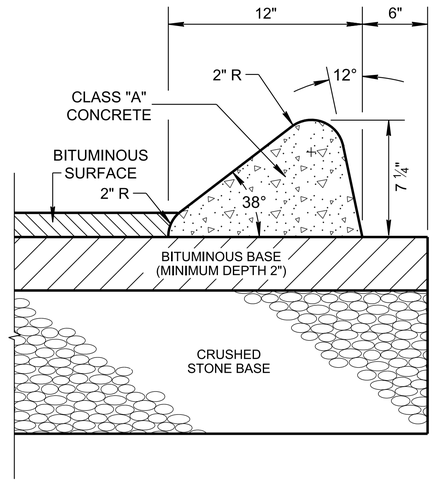
SLOPING CONCRETE CURB AND GUTTER

(PAY ITEM NO. 702-03)



LOWERED CONCRETE CURB AND GUTTER

(PAY ITEM NO. 702-03)



EXTRUDED SLOPING CONCRETE CURB

SEE NOTES (I) & (J)

(PAY ITEM NO. 702-01.01)

REV. 06-28-19: REVISED DETAILS FOR 6" SLOPING CONCRETE COMBINED CURB AND GUTTER, LOWERED CONCRETE CURB AND 6" SLOPING DETACHED CONCRETE CURB. GENERAL NOTES: REVISED (C) AND (D). ADDED NOTE (L) & (M). ADDED DETAIL FOR LOWERED 6" SLOPING DETACHED CONCRETE CURB. REDREW SHEET.

REV. 03-04-2021: REVISED THE DESCRIPTION OF THE STANDARD DRAWING. REMOVED TYPE 6-45 FROM THE DRAWING AND REVISED TABLES. REMOVED "COMBINED" FROM THE TITLE AND FROM THE TABLES. REMOVED 6" FROM SLOPING CONCRETE. ADDED PAY ITEM NO. ON THE DRAWINGS.

SLOPING CONCRETE CURB AND GUTTER TABLE

TYPE	TOTAL WIDTH (W) IN INCHES	WIDTH OF GUTTER (WG) IN INCHES	VERTICAL DROP (T) IN INCHES	VERTICAL DEPTH (V) OF GUTTER AT FLOW LINE ✠
6-33	33	24⅛	2	D - $1\frac{17}{32}$"
6-39	39	30⅛	2½	D - $1\frac{29}{32}$"

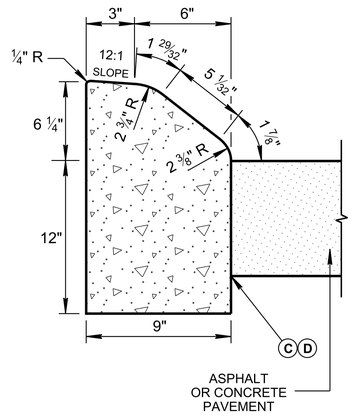
✠ VERTICAL DEPTH (V) MUST ALWAYS EXCEED SIX (6) INCHES.

LEGEND

D	=	VERTICAL DEPTH OF GUTTER (IS BASED ON PAVEMENT DESIGN)
T	=	VERTICAL DROP IN GUTTER FROM FRONT EDGE TO FACE OF CURB
V	=	VERTICAL DEPTH OF GUTTER AT FLOW LINE
W	=	TOTAL WIDTH OF COMBINED CURB AND GUTTER
WG	=	WIDTH OF GUTTER

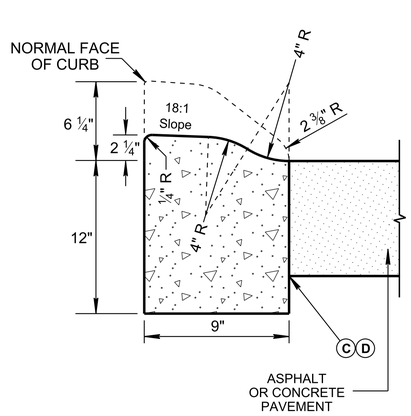
QUANTITIES FOR CURB AND GUTTER

DEPTH (D) OF GUTTER IN INCHES	TOTAL WIDTH (W) IN INCHES	SLOPING CONCRETE CURB AND GUTTER (CY/LF)	LOWERED CONCRETE CURB AND GUTTER (CY/LF)
8	33	0.07060	0.06362
	39	0.08446	0.07748
9	33	0.07909	0.07211
	39	0.09449	0.08751
10	33	0.08757	0.08061
	39	0.10452	0.09754
11	33	0.09606	0.08909
	39	0.11455	0.10758
12	33	0.10455	0.09757
	39	0.12458	0.11763



SLOPING DETACHED CONCRETE CURB

(PAY ITEM NO. 702-01)



LOWERED SLOPING DETACHED CONCRETE CURB

(PAY ITEM NO. 702-01)

QUANTITIES FOR DETACHED CURB

HEIGHT OF CURB	CUBIC YARD PER LINEAR FOOT
LOWERED CURB	0.03099
SLOPING	0.03841

GENERAL NOTES

(A) FOR SPECIFICATIONS SEE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION, SECTION 702 - CEMENT CONCRETE CURB, GUTTER AND COMBINED CURB AND GUTTER.

(B) THE FRONT FACE OF THE CONCRETE CURBS FOR ALL DEGREES OF CURVATURE SHALL CONFORM TO THE CONTOUR OF THE CURVE AND NO CHORD SECTIONS WILL BE PERMITTED.

(C) CONCRETE EXPANSION JOINT MATERIAL IS TO BE 1/2" IN THICKNESS AT ALL LOCATIONS. ALL MATERIAL IS TO BE PRE-MOLDED FIBER IN ACCORDANCE WITH SECTION 905 - JOINT MATERIALS OF THE STANDARD SPECIFICATIONS.

(D) EXPANSION JOINTS ARE TO BE PLACED AS FOLLOWS:
1. AT TANGENT POINTS OF CIRCULAR CURBS.
2. BETWEEN CURBS AND ABUTTING RIGID OBJECTS.
3. AT OTHER PLACES WHERE STRESSES MAY DEVELOP.
4. TO LINE UP WITH PAVEMENT JOINTS WHERE THE ADJACENT PAVEMENT IS CONCRETE.
5. THE MAXIMUM SPACING IS TO BE 100 FEET.
6. BETWEEN CONCRETE CURBS OR CURB AND GUTTERS AND CONCRETE PAVEMENT. IT IS NOT REQUIRED WHEN CURBS OR CURB AND GUTTERS ARE ADJACENT TO ASPHALT.

(E) CONTRACTION JOINTS ARE TO BE SPACED AT 10 FEET. THE SPACING 0F 10 FEET MAY BE REDUCED FOR CLOSURES, BUT NOT LESS THAN 6 FEET.

(F) EDGES OF JOINTS SHALL BE FINISHED ON 1/4" RADII.

(G) ALL COST OF JOINTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE CURBS AND CONCRETE CURBS AND GUTTERS.

(H) THE UNIT PRICE BID FOR CONCRETE CURB, CONCRETE CURB AND GUTTER AND CONCRETE PAVEMENT WILL INCLUDE ANY CIRCULAR SECTION REQUIRED TO BE BUILT CONFORMING TO SECTIONS SHOWN ON THIS SHEET.

(I) WHERE CONCRETE MEDIAN PAVEMENT IS POURED BEHIND EXTRUDED SLOPING CONCRETE CURB. IT MAY BE POURED MONOLITHICALLY WITH THE CURB.

(J) THE EXTRUDED SLOPING CONCRETE CURB IS TO BE USED ONLY IN SPECIAL CONDITIONS SUCH AS LOW SPEED LOW VOLUME LOCAL STREETS, AS A TEMPORARY MEASURE TO CONTROL TRAFFIC FLOW OR WHEN TIEING TO SIMILAR CURBS ON SUBDIVISION STREETS OR IN PARKING LOTS.

(K) PAYMENT WILL BE AS FOLLOWS:

ITEM NO. 702-01	CONCRETE CURB,	PER C.Y.
ITEM NO. 702-01.01	EXTRUDED SLOPING CURB,	PER L.F.
ITEM NO. 702-03	CONCRETE COMBINED CURB AND GUTTER,	PER C.Y.

(L) THE 1/4" HEIGHT IS FOR WHEN ASPHALT PAVEMENT IS ADJACENT TO CONCRETE CURB AND GUTTER ONLY. CONCRETE PAVEMENT WILL BE FLUSH WITH THE TOP OF THE GUTTER.

LOWERED CONCRETE CURB NOTE

(M) TO BE BUILT AS COMBINED CURB AND GUTTER, DETACHED CURB OR INTEGRAL CURB AS NOTED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

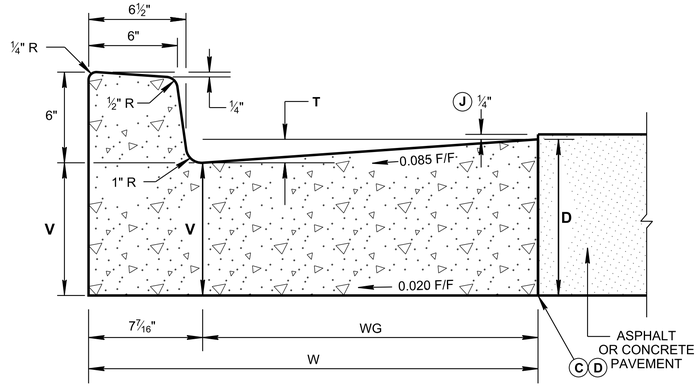
(Replaced Std Dwg RP-MC-2)

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

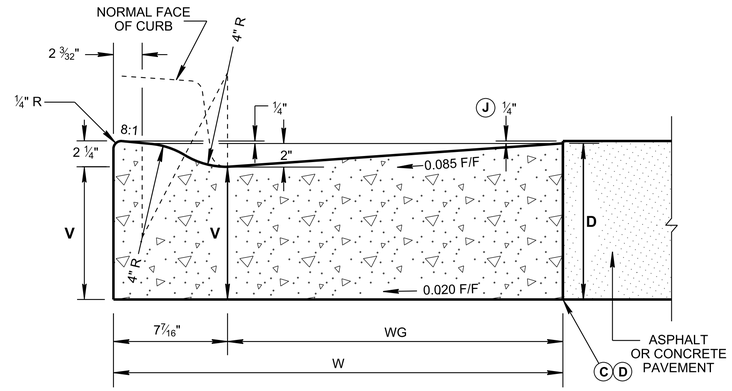
SLOPING CONCRETE CURB AND CURB AND GUTTER

05-15-2018 | RP-SC-1

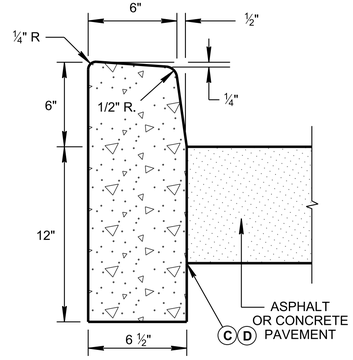
NOT TO SCALE



6" CONCRETE CURB AND GUTTER
(PAY ITEM NO. 702-03)



LOWERED CONCRETE CURB AND GUTTER
(PAY ITEM NO. 702-03)



6" DETACHED CONCRETE CURB
(PAY ITEM NO. 702-01)

CONCRETE CURB AND GUTTER TABLE				
TYPE	TOTAL WIDTH (W) IN INCHES	WIDTH OF GUTTER (WG) IN INCHES	VERTICAL DROP (T) IN INCHES	VERTICAL DEPTH (V) OF GUTTER ✠ AT FLOW LINE
6-30	30	22 9/16"	2	D - 1 17/32"
6-36	36	28 9/16"	2½	D - 1 29/32"

✠ VERTICAL DEPTH (V) MUST ALWAYS EXCEED SIX (6) INCHES.

QUANTITIES FOR DETACHED CURB	
HEIGHT OF CURB	CUBIC YARD PER LINEAR FOOT
6"	0.02950
LOWERED CURB	0.02534

QUANTITIES FOR CURB AND GUTTER			
DEPTH (D) OF GUTTER IN INCHES	TOTAL WIDTH (W) IN INCHES	6" CONCRETE CURB AND GUTTER (CY/LF)	LOWERED CONCRETE CURB AND GUTTER (CY/LF)
8	30	0.06409	0.05711
	36	0.07780	0.07085
9	30	0.07181	0.06483
	36	0.08706	0.08011
10	30	0.07953	0.07254
	36	0.09632	0.08934
11	30	0.08724	0.08026
	36	0.10558	0.09860
12	30	0.09496	0.08799
	36	0.11484	0.10786

LEGEND		
D	=	VERTICAL DEPTH OF GUTTER (IS BASED ON PAVEMENT DESIGN)
T	=	VERTICAL DROP IN GUTTER FROM FRONT EDGE TO FACE OF CURB
V	=	VERTICAL DEPTH OF GUTTER AT FLOW LINE
W	=	TOTAL WIDTH OF COMBINED CURB AND GUTTER
WG	=	WIDTH OF GUTTER

GENERAL NOTES

Ⓐ FOR SPECIFICATIONS SEE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION, SECTION 702 - CEMENT CONCRETE CURB, GUTTER AND COMBINED CURB AND GUTTER.

Ⓑ THE FRONT FACE OF THE CONCRETE CURBS FOR ALL DEGREES OF CURVATURE SHALL CONFORM TO THE CONTOUR OF THE CURVE AND NO CHORD SECTIONS WILL BE PERMITTED.

Ⓒ CONCRETE EXPANSION JOINT MATERIAL IS TO BE 1/2" IN THICKNESS AT ALL LOCATIONS. ALL MATERIAL IS TO BE PRE-MOLDED FIBER IN ACCORDANCE WITH SECTION 905 - JOINT MATERIALS OF THE STANDARD SPECIFICATIONS.

Ⓓ EXPANSION JOINTS ARE TO BE PLACED AS FOLLOWS:
1. AT TANGENT POINTS OF CIRCULAR CURBS.
2. BETWEEN CURBS AND ABUTTING RIGID OBJECTS.
3. AT OTHER PLACES WHERE STRESSES MAY DEVELOP.
4. TO LINE UP WITH PAVEMENT JOINTS WHERE THE ADJACENT PAVEMENT IS CONCRETE.
5. THE MAXIMUM SPACING IS TO BE 100 FEET.
6. BETWEEN CONCRETE CURBS OR CURB AND GUTTERS AND CONCRETE PAVEMENT. IT IS NOT REQUIRED WHEN CURBS OR CURB AND GUTTERS ARE ADJACENT TO ASPHALT.

Ⓔ CONTRACTION JOINTS ARE TO BE SPACED AT 10 FEET. THE SPACING 0F 10 FEET MAY BE REDUCED FOR CLOSURES, BUT NOT LESS THAN 6 FEET.

Ⓕ EDGES OF JOINTS SHALL BE FINISHED ON 1/4" RADII.

Ⓖ ALL COST OF JOINTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE CURBS AND CONCRETE CURBS AND GUTTERS.

Ⓗ THE UNIT PRICE BID FOR CONCRETE CURB, CONCRETE CURB AND GUTTER AND CONCRETE PAVEMENT WILL INCLUDE ANY CIRCULAR SECTION REQUIRED TO BE BUILT CONFORMING TO SECTIONS SHOWN ON THIS SHEET.

Ⓘ PAYMENT WILL BE AS FOLLOWS:
ITEM NO. 702-01, CONCRETE CURB, PER C.Y.
ITEM NO. 702-03, CONCRETE COMBINED CURB AND GUTTER, PER C.Y.

Ⓙ THE 1/4" HEIGHT IS FOR WHEN ASPHALT PAVEMENT IS ADJACENT TO CONCRETE CURB AND GUTTER ONLY. CONCRETE PAVEMENT WILL BE FLUSH WITH THE TOP OF THE GUTTER.

LOWERED CONCRETE CURB NOTES

Ⓚ TO BE BUILT AS COMBINED CURB AND GUTTER, DETACHED CURB OR INTEGRAL CURB AS NOTED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

Ⓛ FOR DETACHED CURB, OMIT RADIUS AT FLOW LINE.

Ⓜ TO BE USED FOR PROPOSED RAMP OPENINGS.

REV. 06-28-19: REVISED DETAILS FOR LOWERED CONCRETE CURB, 6" DETACHED CONCRETE CURB AND 6" CONCRETE COMBINED CURB AND GUTTER. GENERAL NOTES: REVISED NOTES Ⓒ AND Ⓓ, ADDED NOTE Ⓙ, MOVED LOWERED CONCRETE CURB NOTES TO NOTE NOS. Ⓚ, Ⓛ & Ⓜ. ADJUSTED WIDTH OF GUTTER (WG) DIMENSIONS. REDREW SHEET.

REV. 03-04-21: REVISED THE DESCRIPTION OF THE STANDARD DRAWING. REMOVED TYPE 6-45 FROM THE DRAWING AND REVISED TABLES. REMOVED "COMBINED" FROM THE TITLE AND FROM THE TABLES. ADDED PAY ITEM NO. ON THE DRAWINGS.

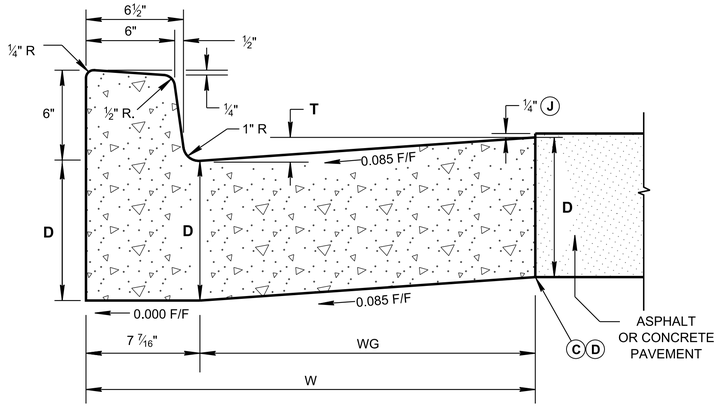
(Replaced Std Dwg RP-NMC-10)

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

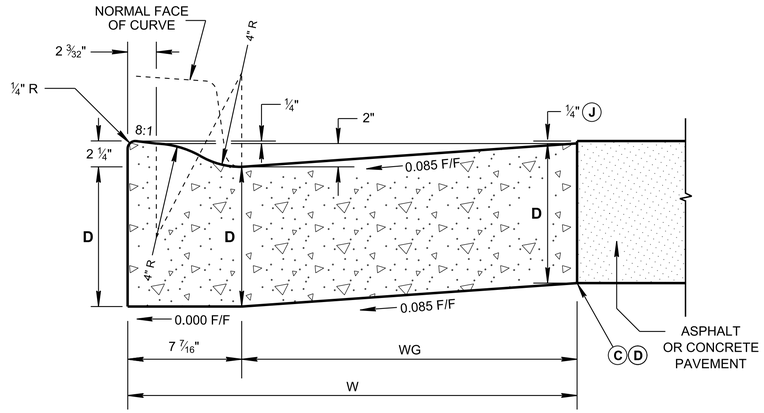
VERTICAL CONCRETE CURB AND CURB AND GUTTER
(FOR 8" TO 12" GUTTER DEPTH)

05-15-2018 | RP-VC-10

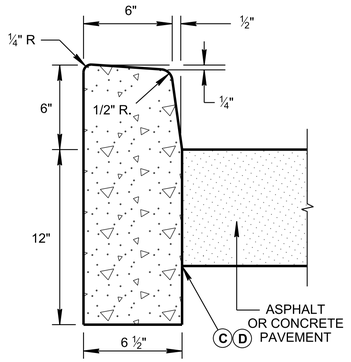
NOT TO SCALE



6" CONCRETE CURB AND GUTTER
(PAY ITEM NO. 702-03)



LOWERED CONCRETE CURB AND GUTTER
(PAY ITEM NO. 702-03)



6" DETACHED CONCRETE CURB
(PAY ITEM NO. 702-01)

CONCRETE CURB AND GUTTER TABLE			
TYPE	TOTAL WIDTH (W) IN INCHES	WIDTH OF GUTTER (WG) IN INCHES	VERTICAL DROP (T) IN INCHES
6-30	30	22 9/16"	2
6-36	36	28 9/16"	2½

QUANTITIES FOR DETACHED CURB	
HEIGHT OF CURB	CUBIC YARD PER LINEAR FOOT
6"	0.02950
LOWERED CURB	0.02534

QUANTITIES FOR CURB AND GUTTER			
DEPTH (D) OF GUTTER IN INCHES	TOTAL WIDTH (W) IN INCHES	6" CONCRETE CURB AND GUTTER (CY/LF)	LOWERED CONCRETE CURB AND GUTTER (CY/LF)
6	30	0.05573	0.04875
	36	0.06499	0.05804
7	30	0.06345	0.05647
	36	0.07425	0.06730

LEGEND

D = VERTICAL DEPTH OF GUTTER (IS BASED ON PAVEMENT DESIGN)
T = VERTICAL DROP IN GUTTER FROM FRONT EDGE TO FACE OF CURB
W = TOTAL WIDTH OF COMBINED CURB AND GUTTER
WG = WIDTH OF GUTTER

GENERAL NOTES

(A) FOR SPECIFICATIONS SEE "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" OF THE TENNESSEE DEPARTMENT OF TRANSPORTATION, SECTION 702 - CEMENT CONCRETE CURB, GUTTER AND COMBINED CURB AND GUTTER.

(B) THE FRONT FACE OF THE CONCRETE CURBS FOR ALL DEGREES OF CURVATURE SHALL CONFORM TO THE CONTOUR OF THE CURVE AND NO CHORD SECTIONS WILL BE PERMITTED.

(C) CONCRETE EXPANSION JOINT MATERIAL IS TO BE 1/2" IN THICKNESS AT ALL LOCATIONS. ALL MATERIAL IS TO BE PRE-MOLDED FIBER IN ACCORDANCE WITH SECTION 905 - JOINT MATERIALS OF THE STANDARD SPECIFICATIONS.

(D) EXPANSION JOINTS ARE TO BE PLACED AS FOLLOWS:
1. AT TANGENT POINTS OF CIRCULAR CURBS.
2. BETWEEN CURBS AND ABUTTING RIGID OBJECTS.
3. AT OTHER PLACES WHERE STRESSES MAY DEVELOP.
4. TO LINE UP WITH PAVEMENT JOINTS WHERE THE ADJACENT PAVEMENT IS CONCRETE.
5. THE MAXIMUM SPACING IS TO BE 100 FEET LINEAR.
6. BETWEEN CONCRETE CURBS OR CURB AND GUTTERS AND CONCRETE PAVEMENT. IT IS NOT REQUIRED WHEN CURBS OR CURB AND GUTTERS ARE ADJACENT TO ASPHALT.

(E) CONTRACTION JOINTS ARE TO BE SPACED AT 10 FEET. THE SPACING 0F 10 FEET MAY BE REDUCED FOR CLOSURES, BUT NOT LESS THAN 6 FEET.

(F) EDGES OF JOINTS SHALL BE FINISHED ON 1/4" RADII.

(G) ALL COST OF JOINTS SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CONCRETE CURBS AND CONCRETE CURBS AND GUTTERS.

(H) THE UNIT PRICE BID FOR CONCRETE CURB, CONCRETE CURB AND GUTTER AND CONCRETE PAVEMENT WILL INCLUDE ANY CIRCULAR SECTION REQUIRED TO BE BUILT CONFORMING TO SECTIONS SHOWN ON THIS SHEET.

(I) PAYMENT WILL BE AS FOLLOWS:
ITEM NO. 702-01 CONCRETE CURB, PER C.Y.
ITEM NO. 702-03 CONCRETE COMBINED CURB AND GUTTER, PER C.Y.

(J) THE 1/4" HEIGHT IS FOR WHEN ASPHALT PAVEMENT IS ADJACENT TO CONCRETE CURB AND GUTTER ONLY. CONCRETE PAVEMENT WILL BE FLUSH WITH THE TOP OF THE GUTTER.

LOWERED CONCRETE CURB NOTES

(K) TO BE BUILT AS COMBINED CURB AND GUTTER, DETACHED CURB OR INTEGRAL CURB AS NOTED ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

(L) TO BE USED FOR PROPOSED RAMP OPENINGS.

REV. 06-28-2019: REVISED DETAILS FOR 6" CONCRETE COMBINED CURB AND GUTTER AND LOWERED CONCRETE CURB, GENERAL NOTES: ADDED NOTE (J), REVISED NOTES (C) AND (D). MOVED LOWERED CONCRETE CURB NOTES TO NOTES NOS. (K) AND (L). ADJUSTED WIDTH OF GUTTER (WG) DIMENSIONS. REDREW SHEET.

REV. 03-04-2021: REVISED THE DESCRIPTION OF THE STANDARD DRAWING. REMOVED TYPE 6-42 FROM THE DRAWING AND REVISED TABLES. REMOVED "COMBINED" FROM THE TITLE AND FROM THE TABLES.

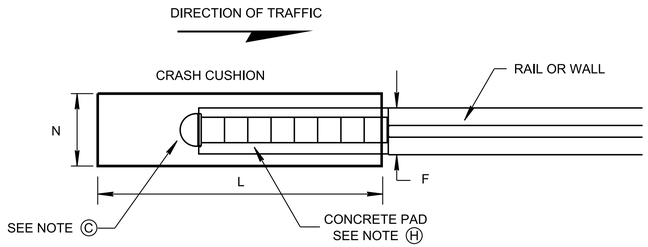
(Replaced Std Dwg RP-NMC-11)

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

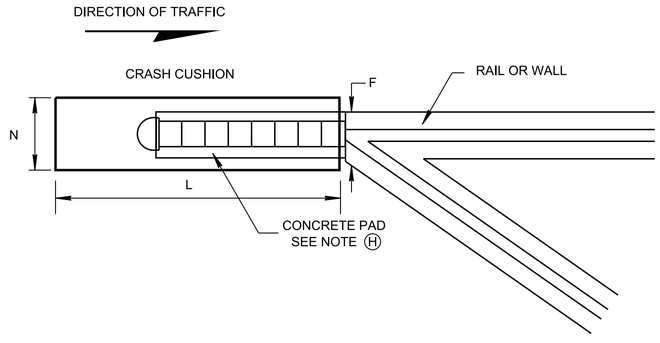
VERTICAL CONCRETE CURB AND CURB AND GUTTER
(FOR 6" & 7" GUTTER DEPTH)

05-15-2018 | RP-VC-11

NOT TO SCALE



CRASH CUSHION AT THE END OF GUARDRAIL OR BARRIER WALL



CRASH CUSHION AT THE END OF DIVERGING GUARDRAILS OR BARRIER WALLS

LEGEND

N: APPROXIMATE WIDTH OF SPACE NECESSARY FOR THE PLACEMENT OF A CRASH CUSHION.

L: APPROXIMATE LENGTH.

F: WIDTH OF A FIXED OBJECT THAT WILL BE SHIELDED WITH A CRASH CUSHION.

MINIMUM CRASH CUSHION RESERVE AREA (FT)

DESIGN SPEED MPH (MAIN LINE)	MINIMUM DIMENSIONS ①				DESIRABLE DIMENSIONS	
	RESTRICTED DIMENSIONS ②		UNRESTRICTED DIMENSIONS			
	N	L	N	L	N	L
30	6	8	8	11	12	17
50	6	17	8	25	12	33
70	6	28	8	45	12	55

① MINIMUM DIMENSIONS SHOULD ONLY BE USED AT LOCATIONS WHERE IT IS INFEASIBLE TO PROVIDE THE DESIRABLE AREA. IN CASES WHEN MORE THAN THE MINIMUM AREA CAN BE PROVIDED, AS MUCH SPACE AS POSSIBLE SHOULD BE PROVIDED.

② RESTRICTED MINIMUM DIMENSIONS SHOULD ONLY BE USED IF THE MINIMUM UNRESTRICTED DIMENSIONS ARE UNATTAINABLE.

LEGEND: CRASH CUSHION

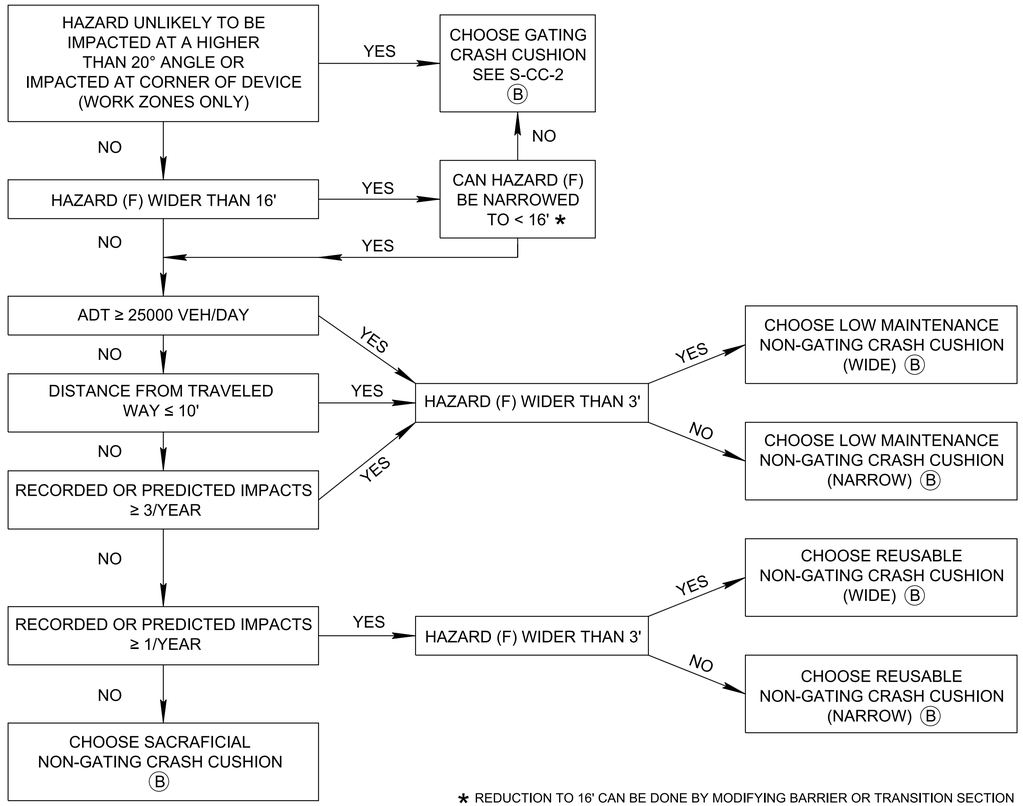
ATTENUATOR CLASSES DESCRIPTION

REUSABLE: DEVICES DESIGNED THAT CAN BE REPAIRED BY SALVAGING MOST MAJOR COMPONENTS.

LOW-MAINTENANCE: DEVICES DESIGNED TO BE EASILY RESET AFTER IMPACT WITH MINIMAL REPAIR, USE IN AREAS WITH FREQUENT IMPACTS.

SELF-RESTORING: DEVICES DESIGNED TO WITHSTAND MULTIPLE IMPACTS WITH MINIMAL REPAIRS (WITH REDUCED CAPACITY), USE IN AREAS WHERE IMPACTS OCCUR FREQUENTLY AND RESPONSE TIME IS CRUCIAL.

CRASH CUSHION SELECTION



* REDUCTION TO 16' CAN BE DONE BY MODIFYING BARRIER OR TRANSITION SECTION

GENERAL NOTES

Ⓐ CRASH CUSHIONS SHOULD ONLY BE USED IF LIMITED SPACE (SUCH AS A GORE AREA) PRECLUDES THE USE OF GUARDRAIL END TERMINALS OR AT OTHER LOCATIONS WHERE GUARDRAIL END TERMINAL WILL NOT FUNCTION.

Ⓑ CRASH CUSHIONS SHALL BE INSTALLED PER MANUFACTURERS SHOP DRAWINGS. SYSTEMS APPEARING ON THE QPL 34, SECTION C, ONLY MAY BE USED FOR THE SPECIFIED CATEGORY DETERMINED.

Ⓒ THE NOSE OR FIRST BARREL OF THE CRASH CUSHION SHALL BE MARKED WITH OBJECT MARKER STRIPING TYPE 3 INCLUDED IN THE COST OF THE SYSTEM.

Ⓓ SYSTEMS SHALL BE INSTALLED ON HARD, SMOOTH SURFACES WITH SLOPES LESS THAN 5% AND VARIATION OF CROSS SLOPE LESS THAN 2% CHANGE FOR THE LENGTH OF RESERVE AREA.

Ⓔ ONLY TL-3 CRASH CUSHION SHALL BE USED ON TDOT PROJECTS.

Ⓕ CURBS SHALL NOT BE INSTALLED IN AREAS NEAR CRASH CUSHIONS, EXISTING CURBS TO BE REMOVED UNLESS OTHERWISE SPECIFIED.

Ⓖ IF A CRASH CUSHION WOULD COMPROMISE SIGHT DISTANCE A SYSTEM WITH REDUCED HEIGHT (LESS THAN 36" HEIGHT) MAY BE SPECIFIED.

Ⓗ ALL PERMANENT INSTALLATIONS REQUIRE CONCRETE FOUNDATION AS SHOWN ON MANUFACTURERS SHOP DRAWINGS.

Ⓘ NON-GATING CRASH CUSHIONS SHALL BE PAID FOR UNDER ITEM NOS.:

705-20.20	LOW MAINT CRASH CUSHION NARROW (MASH TL-3),	EACH
705-20.21	LOW MAINT CRASH CUSHION WIDE (MASH TL-3),	EACH
705-20.22	REUSABLE CRASH CUSHION NARROW (MASH TL-3),	EACH
705-20.23	REUSABLE CRASH CUSHION WIDE (MASH TL-3),	EACH

THE PAYMENT OF PERMANENT CRASH CUSHION INCLUDES CONCRETE FOUNDATION

TEMPORARY WORK ZONE (ALL PERMANENT NON-GATING CRASH CUSHIONS MAY BE USED IN TEMPORARY WORK ZONES)

712-02.60	TEMPORARY WORK ZONE CRASH CUSHION (MASH TL-3),	EACH

Ⓙ PRODUCTS EVALUATED UNDER NCHRP 350 TL3 MAY CONTINUE TO BE USED THROUGHOUT THEIR NORMAL SERVICE LIFE (DAMAGE BEYOND REPAIR) AFTER DECEMBER 31, 2018. SEE QPL 34 FOR APPROVED NCHRP 350 TL3 CRASH CUSHION AND QPL 45 FOR MASH APPROVED CRASH CUSHION.

- REV. 08-26-15: ADDED NOTE Ⓗ AND REVISED NOTE Ⓘ.
- REV. 03-28-17: CHANGED PAY ITEM NUMBERS.

  REV. 06-28-19: DELETED SACRIFICIAL DEVICES FROM THE ATTENUATOR CLASSES DESCRIPTION BOX. ADDED GENERAL NOTE Ⓙ AND MODIFIED NOTES Ⓐ, Ⓔ AND Ⓘ. REDREW SHEET.

  REV. 03-04-21: CHANGED TEMPORARY WORK ZONE CRASH CUSHION PAY ITEM NUMBER.

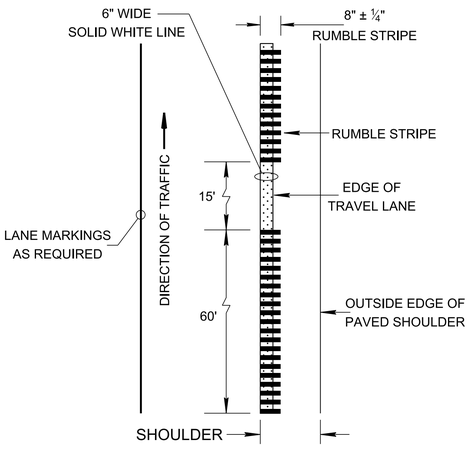
- MINOR REVISION -- FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

CRASH CUSHION

02-13-2013 S-CC-1

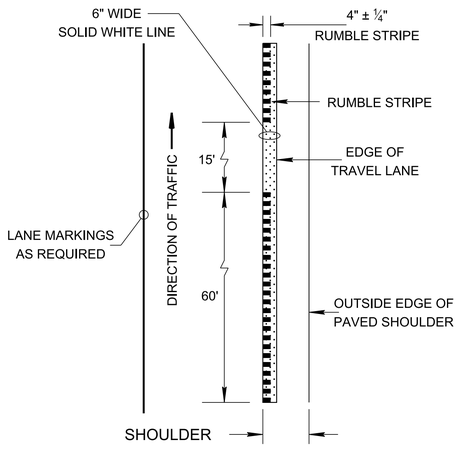
NOT TO SCALE



PLAN VIEW
FOR PAVED SHOULDER WIDTH, 2' < W < 8'

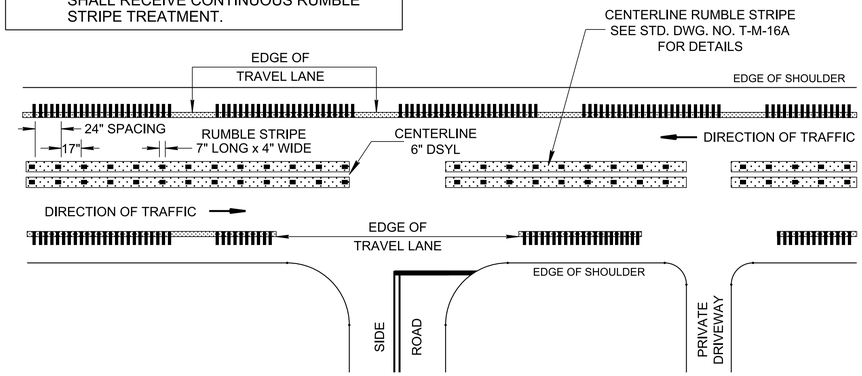
EXISTING PAVED SHOULDER MAY ACCOMMODATE BIKE LANE ON SHOULDER 4' OR WIDER. SEE TDOT ROADWAY DESIGN GUIDELINES AND STD. DWG. MM-PM-2 FOR PAVEMENT MARKING AND SIGNING.

NOTE: INSIDE SHOULDERS OF DIVIDED HIGHWAYS SHALL RECEIVE CONTINUOUS RUMBLE STRIPE TREATMENT.



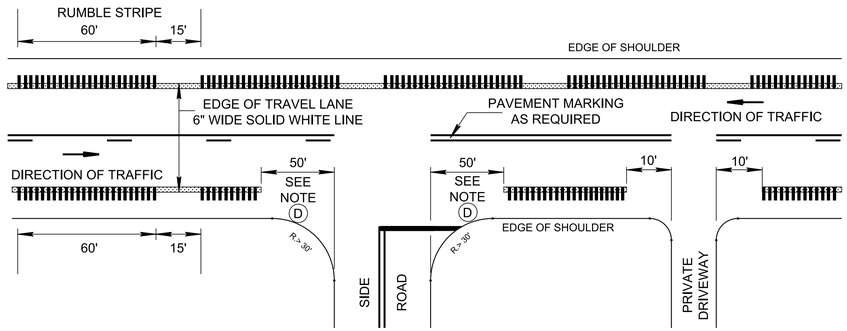
PLAN VIEW
FOR PAVED SHOULDER WIDTH, W ≤ 2'

EXISTING ROADWAY MAY ACCOMMODATE BIKE ROUTE IF POSTED SPEED IS JUSTIFIED. SEE TDOT ROADWAY DESIGN GUIDELINES AND STD. DWG. MM-PM-2 FOR PAVEMENT MARKING AND SIGNING.



PLAN VIEW FOR CENTERLINE RUMBLE STRIPE

IF BIKE LANE OR ROUTE IS PROPOSED
SEE MM-PM-2 FOR PAVEMENT MARKING AND SIGNING



PLAN VIEW FOR EDGE OF PAVEMENT RUMBLE STRIPE AT SIDE ROAD AND DRIVEWAY

IF BIKE LANE OR ROUTE IS PROPOSED
SEE MM-PM-2 FOR PAVEMENT MARKING AND SIGNING

NOT TO SCALE

GENERAL NOTES

(A) ALL ROADWAYS SHALL HAVE RUMBLE STRIP OR STRIPE. THEY SHOULD BE DISCONTINUED IN ADVANCE OF DRIVEWAYS, INTERSECTIONS, AND MEDIAN OPENINGS. REFER TO CURRENT PAVEMENT MARKING POLICY IN THE DESIGN GUIDELINES FOR PROPER APPLICATION.

(B) RUMBLE STRIPES SHOULD BE USED AT LOCATIONS WHERE SHOULDER LIMITS THE USE OF RUMBLE STRIP (SEE STD. DWG'S. T-M-15 & 15A FOR RUMBLE STRIP DETAILS). REFER TO THE CURRENT PAVEMENT MARKING POLICY IN THE DESIGN GUIDELINES FOR PROPER APPLICATION.

(C) RUMBLE STRIPE SHOULD NOT BE USED IN RESIDENTIAL OR COMMERCIAL AREAS.

(D) WHEN A SIDE ROAD RADIUS IS GREATER THAN 30', RUMBLE STRIPE APPLICATION SHOULD BE DISCONTINUED 50' IN ADVANCE.

(E) A 15' LONG GAP BETWEEN 60' LONG SECTIONS OF THE RUMBLE STRIPES, AS SHOWN IN THE PLAN VIEWS, ARE REQUIRED TO ACCOMMODATE BICYCLES TO THE MAXIMUM EXTENT ON THE ROADWAY OR SHOULDER.

(F) ON CONVENTIONAL PAVEMENT, APPLY MILLED-IN RUMBLE STRIPE WITH 7" ±1/4" GROOVES, 7/16" ±1/16" SCORING DEPTH, ON 12" ±1/4" SPACING. ON THIN LIFT PAVEMENT (<1"), APPLY MILLED-IN RUMBLE STRIPE WITH 6" ±1/4" GROOVES, 5/16" ±1/16" SCORING DEPTH, ON 12" ±1/4" SPACING.

(G) THE COLOR OF AN EDGE LINE OR CENTERLINE ASSOCIATED WITH LONGITUDINAL RUMBLE STRIPE SHALL BE IN ACCORDANCE WITH SECTION 3A.05 OF THE MUTCD.

(H) IF RUMBLE STRIPES ARE INSTALLED ON ACCESS CONTROLLED ROUTES AND IF THIN PAVEMENT TYPE IS USED FOR RESURFACING, THE RUMBLE STRIPE IS TO BE INSTALLED CONTINUOUSLY WITHOUT THE 15' GAP. RUMBLE STRIPE WIDTH SHALL BE 16" WIDE AS DETAILED ON STD. DWG. T-M-15.

(I) SEE STD. DWG. NO. T-M-16A FOR MILLED-IN RUMBLE STRIPE DETAILS.

CENTERLINE RUMBLE STRIPE:

(J) FOR NEW CONSTRUCTION; CENTERLINE RUMBLE STRIPES MAY BE SPECIFIED IF THE FOLLOWING CONDITIONS EXIST:

1) DESIGN SPEED > 45 MPH
2) ADT OF 2000 OR MORE
3) LANE WIDTH 12' MINIMUM
4) ROAD SEGMENT IS A TWO OR FOUR LANE UNDIVIDED SECTION
5) ROAD SEGMENT IS A NO PASSING OR ONE WAY PASSING ZONE

(K) THE MILLED-IN RUMBLE STRIPE FOR THE CENTERLINE SHALL HAVE A WITH 7" ±1/4" GROOVES, 7/16" ±1/16" SCORING DEPTH, ON 24" ±1/4" SPACING.

(L) WHEN INSTALLING THE MILLED-IN RUMBLE STRIPE FOR THE CENTERLINE THE PAVEMENT JOINT SHALL NOT BE MILLED.

(M) CENTERLINE RUMBLE STRIPES SHALL NOT BE USED ON BRIDGES.

(N) RUMBLE STRIPES FOR THE CENTERLINE SHALL BE DISCONTINUED WHENEVER THE CENTERLINE PAVEMENT MARKING IS DISCONTINUED.

(O) IF RAISED PAVEMENT MARKINGS ARE REQUIRED, SEE STD. DWG. T-M-1 FOR SPACING. IN LOCATIONS WHERE RPMS ARE PRESENT, STAGGER RUMBLES SUCH THAT RPMS ARE CENTERED BETWEEN RUMBLES.

PAYMENT

(P) RUMBLE STRIPE, ALL COST OF INSTALLATION SHALL BE INCLUDED IN ITEM NOS:

411-12.03	SCORING FOR RUMBLE STRIPE (NON-CONTINUOUS) (8IN WIDTH),	L.M.
411-12.04	SCORING FOR RUMBLE STRIPE (NON-CONTINUOUS) (4IN WIDTH),	L.M.

(Q) SCORING FOR RUMBLE STRIPE SHALL BE CALCULATED BASED ON THE ACTUAL LENGTH OF PAVEMENT SCORED FOR EACH RUN OF SCORING. EXAMPLE: EACH EDGELINE, 4" OR 8" WIDTH LINE, PER. L.M. AND CENTERLINE x 2, ONE FOR EACH LINE, AT 4 IN WIDTH EACH, PER L.M.

(R) PAVEMENT MARKINGS, ALL COST OF INSTALLATION SHALL BE INCLUDED IN ITEM NOS:

716-12.02	ENHANCED FLATLINE THERMOPLASTIC PAVEMENT MARKING (6 IN LINE)	L.M.

(S) THE DESIGNER OR THE FIELD ENGINEER MAY CHOOSE TO ALTERNATE RUMBLE STRIPE WITH PROFILED THERMOPLASTIC PAVEMENT MARKING WHEN THE FOLLOWING CONDITIONS EXIST:

1) WHEN IT IS NOT PRACTICAL OR DESIRABLE TO INSTALL MILLED-IN RUMBLE STRIPES FOR INSIDE AND OUTSIDE EDGE LINE PAVEMENT MARKINGS ON ROADWAYS WITH RIGID PAVEMENT SHOULDERS.

2) WHEN EDGE LINES ON TWO - LANE ROADWAYS THAT DO NOT HAVE PAVED SHOULDERS.

3) WHEN EDGE LINES ON BRIDGES WITH NARROW SHOULDERS, AS A SAFETY COUNTERMEASURE FOR BRIDGE PARAPET IMPACTS.

ALL COST OF INSTALLATION SHALL BE INCLUDED IN ITEM NOS:

716-14.02,	PROFILED THERMO PVMT MRKNG AUDIBLE (6IN),	L.M.

- REV. 11-1-11: CHANGED GENERAL NOTES (E), (F), AND (G). DELETED T-M-11A. ADDED BIKE SYMBOL/ARROW SHARED LANE MARKING DETAILS AND ADDED GENERAL NOTE (H) AND (I).
- REV. 12-1-14: REVISED RUMBLE STRIPE SPACING ADDED REFERENCE TO T-M-11.

REV. 08-02-18: CHANGED THE SHOULDER WIDTH FROM 2' OR GREATER TO 2' - 8' FOR THE 8" WIDE RUMBLE STRIPE. ADDED NOTE (H), (I), AND (J). ADDED PAVEMENT MARKING PAY ITEM NUMBERS TO NOTE (F). REDREW SHEET.

- REV. 06-28-19: REMOVED 4" PAVEMENT MARKING. REDREW SHEET.
- REV. 01-24-20: ADDED GENERAL NOTE (K) AND NOTE (1). REVISED SECTIONS A-A AND B-B.

REV. 02-03-20: MOVED TYPICAL SECTIONS FOR SCORING FOR RUMBLE STRIPE TO DRAWING NO. T-M-16A. ADDED PLAN VIEW FOR CENTERLINE STRIPE. REVISED DRAWING NAME AND GENERAL NOTES. REDREW SHEET.

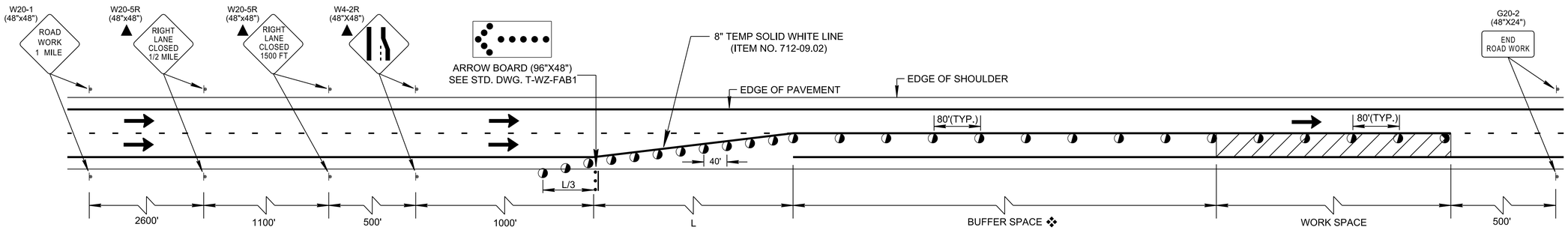
REV. 03-04-21: MINOR REVISONS ON GENERAL NOTES (A) AND (B) ADDED NOTE TO THE PLAN VIEW.

- APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

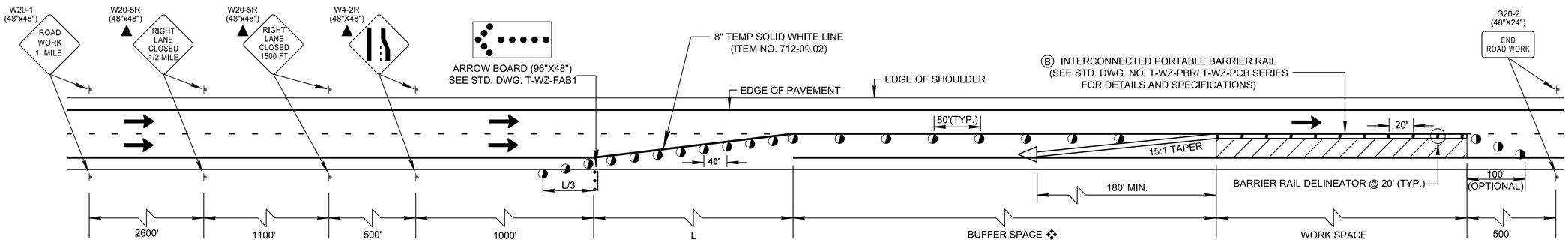
STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

RUMBLE STRIPE INSTALLATION LAYOUT

12-01-09 | T-M-16



TRAFFIC CONTROL FOR ONE LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY (NO PORTABLE BARRIER RAIL SETUP)



TRAFFIC CONTROL FOR ONE LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY (SHOWING PORTABLE BARRIER RAIL SETUP)

▲ FOR LEFT LANE CLOSURE USE SIGNS W20-5L AND W4-2L

❖ **BUFFER SPACE** BASED ON PRE-CONSTRUCTION POSTED SPEED

SPEED	DISTANCE
45	360
50	425
55	495
60	570
65	645
70	730
75	820

COMPUTATION FOR DISTANCE L

L = W x S

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = 10 MPH OVER EXISTING POSTED SPEED LIMIT

CHANNELIZATION DEVICE LEGEND

- FLEXIBLE DRUMS (ITEM NO. 712-04.01, PER EACH)
- FLASHING YELLOW ARROW BOARD (SEE STD. DWG. NO. T-WZ-FAB1, FOR DETAILS AND SPECIFICATIONS) (ITEM NO. 712-08.03, PER EACH)
- SIGN SUPPORT
- DIRECTION OF TRAFFIC
- WORK SPACE
- BARRIER RAIL DELINEATOR (ITEM NO. 712-04.50, PER EACH)
- ATTENUATOR SEE STD. DWG. S-CC-1 (ITEM NO. 712-02.60, PER EACH)

SPECIAL NOTES

LANE WIDTHS SHALL BE A MINIMUM OF 11FT WITH 2FT SHOULDER. WHEN ALIGNMENT IS IN A HORIZONTAL CURVE WITH A RADIUS LESS THAN 2500FT, LANE WIDTHS SHALL BE A MINIMUM OF 12FT WITH 2FT SHOULDERS.

IF THE MINIMUM DESIGN REQUIREMENTS OF THIS STANDARD DRAWING CANNOT BE MET, A WORK ZONE DESIGN DEVIATION MUST BE SUBMITTED TO AND APPROVED BY THE STATE WORK ZONE ENGINEER.

GENERAL NOTES

Ⓐ THIS STANDARD CAN BE USED FOR THE CLOSURE OF AN INSIDE OR OUTSIDE LANE OF ANY MULTI-LANE DIVIDED HIGHWAY. FOR THE CLOSURE OF AN INTERIOR LANE, SEE STANDARD DRAWING NOS.T-WZ-13, TWZ-14, OR T-WZ-15 FOR DETAILS.

Ⓑ MINIMUM TWO FEET (2') OFFSET BETWEEN TRAVEL LANE AND PORTABLE BARRIER IS REQUIRED. THE MAXIMUM POSSIBLE OFFSET BETWEEN TRAVEL LANE AND PORTABLE BARRIER MUST BE OBTAINED. A 2' MINIMUM OFFSET IS REQUIRED BETWEEN THE TRAVELLED LANE AND BRIDGE PARAPET, PORTABLE BARRIER RAIL, CONCRETE MEDIAN BARRIERS, ETC.
3' MINIMAL OFFSET IS REQUIRED BETWEEN THE WORK ZONE AND PORTABLE BARRIER RAIL IF RAIL IS UNPINNED.

Ⓒ PORTABLE BARRIER RAIL WILL BE REQUIRED WHERE DROP OFFS EXCEED 18 INCHES. PORTABLE BARRIER RAIL MAY BE USED WHERE DROP OFFS EXCEED 6 INCHES. FOR MORE SPECIFIC INFORMATION SEE TDOT DROP-OFF POLICY.

Ⓓ TAPER LENGTH SHOWN FOR THE PORTABLE BARRIER RAIL IS A MINIMUM. PORTABLE BARRIER RAIL SHOULD BE EXTENDED BEYOND THE CLEAR ZONE OR BE SHIELDED WITH A CRASH CUSHION WHEN IT IS NOT FEASIBLE TO EXTEND THE PORTABLE BARRIER RAIL. SEE STANDARD DRAWING S-CZ-1 FOR CLEAR ZONE DISTANCE.

Ⓔ REFER TO THE QUALIFIED PRODUCT LIST FOR APPROVED BARRIER RAIL DELINEATORS. DELINEATORS SHOULD NOT BE MIXED IN THE SAME LINE. BARRIER RAIL DELINEATORS SHALL BE USED ON PORTABLE BARRIER RAIL.

Ⓕ RAISED PAVEMENT MARKERS SHOULD NOT BE USED ON RIGHT EDGE LINE.

Ⓖ A SECOND ARROW BOARD MAY BE USED WHEN GEOMETRIC CONDITIONS LIMIT THE VISIBILITY OF A LANE CLOSURE.

- REV. 12-18-99: MODIFIED GENERAL NOTE Ⓔ.
- REV. 7-29-03: CHANGED GENERAL NOTE Ⓔ.
- REV. 4-15-04: CHANGED W4-2 SIGN. CHANGED GENERAL NOTE Ⓓ TO COMPLY WITH 2003 MUTCD.
- REV. 9-1-05: REMOVED TYPE "C" WARNING LIGHTS FROM FLEXIBLE DRUMS IN TAPER.
- REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES Ⓖ & Ⓗ.
- REV. 10-06-06: CHANGED ITEM NO. FOR BARRIER RAIL DELINEATOR. ADDED GENERAL NOTE Ⓘ. CHANGED GENERAL NOTE Ⓔ.
- REV. 03-13-09: CHANGED GENERAL NOTE Ⓔ.
- REV. 03-05-17: ADDED ITEM NO. 716-05.02 OR 712-09.02.
- REV. 06-28-19: ADDED REFERENCED STD DWG S-CC-1 TO LEGEND FOR TEMPORARY CRASH CUSHION. ADDED ITEM NUMBER FOR FLEXIBLE DRUMS. DELETED GENERAL NOTE Ⓓ. REORGANIZED AND MODIFIED GENERAL NOTES FOR CLARITY. ADDED TABLE FOR BUFFER SPACE AND OPTIONAL BARRELS TO THE DOWN STREAM END OF THE WORK ZONE. RENAMED AND REDREW SHEET.

  REV. 05-01-20: ADDED SPECIAL NOTES. ADDED BUFFER SPACE TABLE. REMOVED 716-05.02 PAY ITEM. CHANGED CALCULATION FOR DISTANCE L.

  REV. 03-04-21: CHANGED ITEM NO. 712-02.60 FOR STD DWG S-CC-1. ADDED REFERENCED STD DWG T-WZ-PCB SERIES. REVISED GENERAL NOTE Ⓑ.

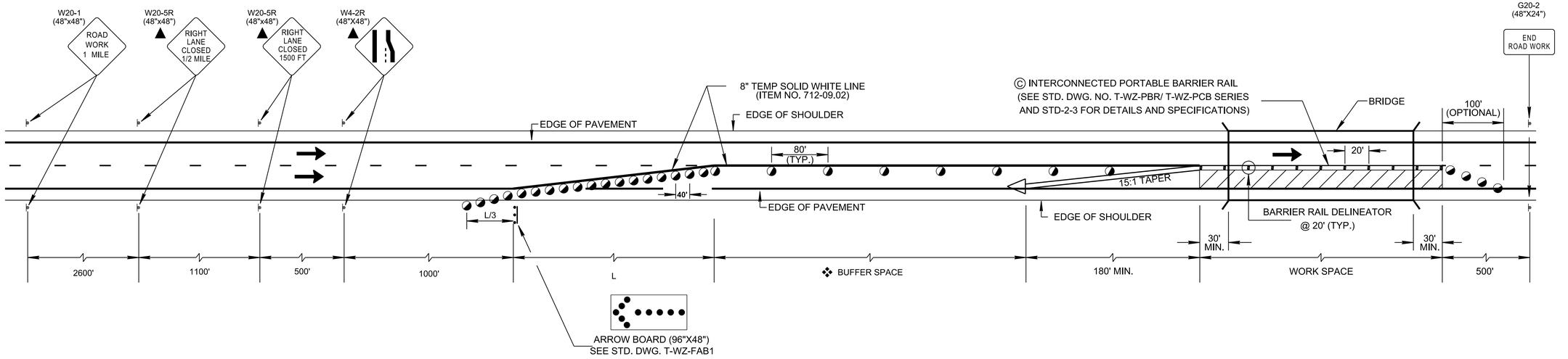
FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

ONE LANE CLOSURE DETAIL FOR DIVIDED HIGHWAYS

NOT TO SCALE

05-27-1998 | T-WZ-11



TRAFFIC CONTROL FOR ONE LANE (RIGHT OR LEFT) CLOSURE FOR BRIDGES ON DIVIDED HIGHWAYS

- REV. 4-15-99: ADDED GENERAL NOTE Ⓕ.
- REV. 12-18-99: MODIFIED GENERAL NOTE Ⓔ.
- REV. 7-29-03: CHANGED GENERAL NOTE Ⓔ.
- REV. 4-15-04: CHANGED W4-2 SIGN. CHANGED GENERAL NOTE Ⓓ TO COMPLY WITH 2003 MUTCD.
- REV. 9-1-05: REMOVED TYPE "C" WARNING LIGHTS FROM FLEXIBLE DRUMS IN TAPER.
- REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES Ⓖ & Ⓗ.
- REV. 10-06-06: CHANGED ITEM NO. FOR BARRIER RAIL DELINEATOR. ADDED GENERAL NOTE Ⓘ. CHANGED GENERAL NOTE Ⓔ.
- REV. 03-13-09: CHANGED GENERAL NOTE Ⓔ AND ATTENUATOR LEGEND DESCRIPTION.
- REV. 03-05-17: ADDED ITEM NO. 716-05.02 AND 712-09.02.
- REV. 06-28-19: ADDED REFERENCED STD DWG S-CC-1 TO LEGEND FOR TEMPORARY CRASH CUSHION. ADDED ITEM NUMBER FOR FLEXIBLE DRUMS. DELETED GENERAL NOTE Ⓓ. REORGANIZED AND MODIFIED GENERAL NOTES FOR CLARITY. ADDED TABLE FOR BUFFER SPACE AND OPTIONAL BARRELS TO THE DOWN STREAM END OF THE WORK ZONE. REDREW SHEET.

  REV. 05-01-20: ADDED SPECIAL NOTES. ADDED BUFFER SPACE TABLE. REMOVED 716-05.02 PAY ITEM. CHANGED CALCULATION FOR DISTANCE L.

  REV. 03-04-21: CHANGED ITEM NO. 712-02.60 FOR STD DWG S-CC-1. ADDED REFERENCED STD DWG T-WZ-PCB SERIES. REVISED GENERAL NOTE Ⓒ

▲ FOR LEFT LANE CLOSURE USE SIGNS W20-5L AND W4-2L

❖ **BUFFER SPACE** BASED ON PRE-CONSTRUCTION POSTED SPEED

SPEED	DISTANCE
45	360
50	425
55	495
60	570
65	645
70	730
75	820

COMPUTATION FOR DISTANCE L

L = W x S

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = 10 MPH OVER EXISTING POSTED SPEED LIMIT

CHANNELIZATION DEVICE LEGEND

- FLEXIBLE DRUMS (ITEM NO. 712-04.01, PER EACH)
- FLASHING YELLOW ARROW BOARD (SEE STD. DWG. NO. T-WZ-FAB1, FOR DETAILS AND SPECIFICATIONS) (ITEM NO. 712-08.03, PER EACH)
- SIGN SUPPORT
- DIRECTION OF TRAFFIC
- WORK SPACE
- BARRIER RAIL DELINEATOR (ITEM NO. 712-04.50, PER EACH)
- ATTENUATOR SEE STD. DWG. S-CC-1 (ITEM NO. 712-02.60, PER EACH)

SPECIAL NOTES

LANE WIDTHS SHALL BE A MINIMUM OF 11FT WITH 2FT SHOULDER. WHEN ALIGNMENT IS IN A HORIZONTAL CURVE WITH A RADIUS LESS THAN 2500FT, LANE WIDTHS SHALL BE A MINIMUM OF 12FT WITH 2FT SHOULDERS.

IF THE MINIMUM DESIGN REQUIREMENTS OF THIS STANDARD DRAWING CANNOT BE MET, A WORK ZONE DESIGN DEVIATION MUST BE SUBMITTED TO AND APPROVED BY THE STATE WORK ZONE ENGINEER.

GENERAL NOTES

Ⓐ THIS STANDARD CAN BE USED FOR THE CLOSURE OF AN INSIDE OR OUTSIDE LANE OF ANY MULTI-LANE DIVIDED HIGHWAY. FOR THE CLOSURE OF AN INTERIOR LANE, SEE STANDARD DRAWING NOS.T-WZ-13, TWZ-14, OR T-WZ-15 FOR DETAILS.

Ⓑ PORTABLE BARRIER RAIL IS REQUIRED FOR BRIDGE DECK AND EXPANSION JOINT WORK. FOR MORE SPECIFIC INFORMATION SEE TDOT DROP-OFF POLICY.

Ⓒ MINIMUM TWO FEET (2') OFFSET BETWEEN TRAVEL LANE AND PORTABLE BARRIER IS REQUIRED. THE MAXIMUM POSSIBLE OFFSET BETWEEN TRAVEL LANE AND PORTABLE BARRIER MUST BE OBTAINED. A 2' MINIMUM OFFSET IS REQUIRED BETWEEN THE TRAVELLED LANE AND BRIDGE PARAPET, PORTABLE BARRIER RAIL, CONCRETE MEDIAN BARRIERS, ETC. 3' MINIMAL OFFSET IS REQUIRED BETWEEN THE WORK ZONE AND PORTABLE BARRIER RAIL IF RAIL IS UNPINNED.

Ⓓ TAPER LENGTH SHOWN FOR THE PORTABLE BARRIER RAIL IS A MINIMUM. PORTABLE BARRIER RAIL SHOULD BE EXTENDED BEYOND THE CLEAR ZONE OR BE SHIELDED WITH A CRASH CUSHION WHEN IT IS NOT FEASIBLE TO EXTEND THE PORTABLE BARRIER RAIL. SEE STANDARD DRAWING S-CZ-1 FOR CLEAR ZONE DISTANCE.

Ⓔ REFER TO THE QUALIFIED PRODUCT LIST FOR APPROVED BARRIER RAIL DELINEATORS. DELINEATORS SHOULD NOT BE MIXED IN THE SAME LINE. BARRIER RAIL DELINEATORS SHALL BE USED ON PORTABLE BARRIER RAIL.

Ⓕ RAISED PAVEMENT MARKERS SHOULD NOT BE USED ON RIGHT EDGE LINE.

Ⓖ A SECOND ARROW BOARD MAY BE USED WHEN GEOMETRIC CONDITIONS LIMIT THE VISIBILITY OF A LANE CLOSURE.

FHWA
APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

ONE LANE CLOSURE DETAIL FOR BRIDGES ON DIVIDED HIGHWAYS

05-27-1998 | T-WZ-12

NOT TO SCALE

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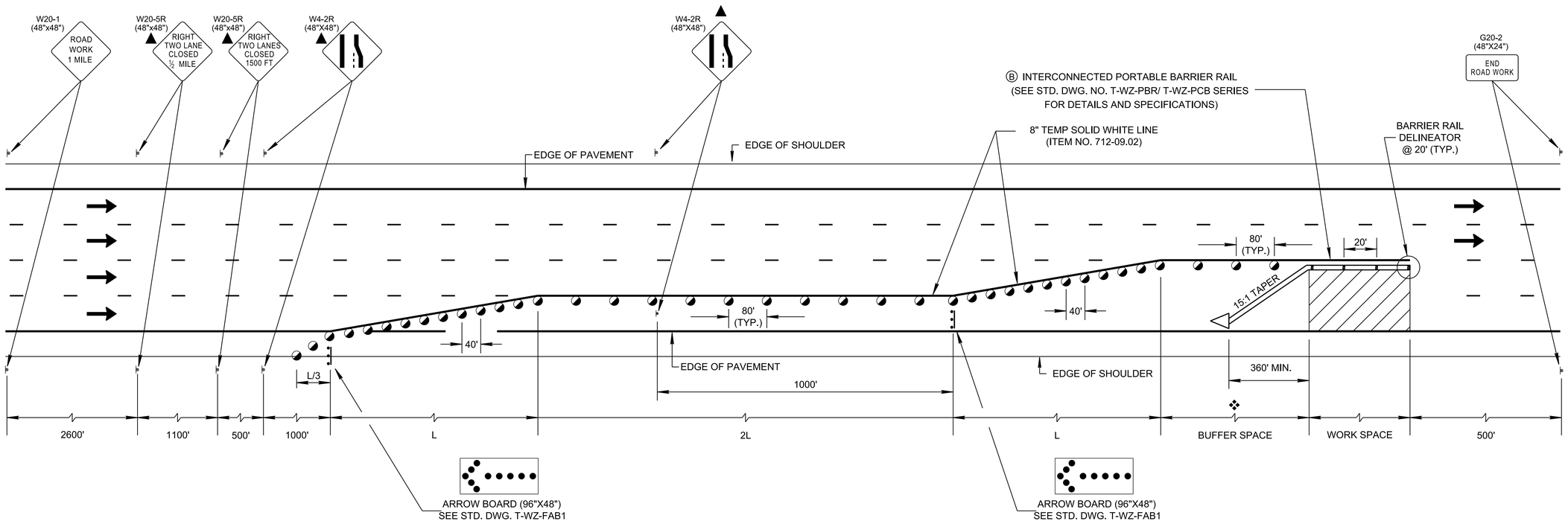


TRAFFIC CONTROL FOR TWO RIGHT OUTSIDE (OR TWO LEFT INSIDE) LANE CLOSURE ON INTERSTATES OR EXPRESSWAYS (WITH INTERCONNECTED PORTABLE BARRIER RAIL)

▲ FOR LEFT LANE CLOSURE USE SIGNS W20-5L AND W4-2L

❖ **BUFFER SPACE** BASED ON PRE-CONSTRUCTION POSTED SPEED

SPEED	DISTANCE
45	360
50	425
55	495
60	570
65	645
70	730
75	820

COMPUTATION FOR DISTANCE L

L = W x S

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = 10 MPH OVER EXISTING POSTED SPEED LIMIT

CHANNELIZATION DEVICE LEGEND

- FLEXIBLE DRUMS (ITEM NO. 712-04.01, PER EACH)
- FLASHING YELLOW ARROW BOARD (SEE STD. DWG. NO. T-WZ-FAB1, FOR DETAILS AND SPECIFICATIONS) (ITEM NO. 712-08.03, PER EACH)
- SIGN SUPPORT
- DIRECTION OF TRAFFIC
- WORK SPACE
- BARRIER RAIL DELINEATOR (ITEM NO. 712-04.50, PER EACH)
- ATTENUATOR SEE STD. DWG. S-CC-1 (ITEM NO. 712-02.60, PER EACH)

SPECIAL NOTES

LANE WIDTHS SHALL BE A MINIMUM OF 11FT WITH 2FT SHOULDER. WHEN ALIGNMENT IS IN A HORIZONTAL CURVE WITH A RADIUS LESS THAN 2500FT, LANE WIDTHS SHALL BE A MINIMUM OF 12FT WITH 2FT SHOULDERS.

IF THE MINIMUM DESIGN REQUIREMENTS OF THIS STANDARD DRAWING CANNOT BE MET, A WORK ZONE DESIGN DEVIATION MUST BE SUBMITTED TO AND APPROVED BY THE STATE WORK ZONE ENGINEER.

GENERAL NOTES

Ⓐ THIS STANDARD IS FOR CLOSURE OF TWO RIGHT LANES. THIS STANDARD APPLIES TO INTERSTATES AND EXPRESSWAYS WITH 6 OR MORE LANES.

Ⓑ MINIMUM TWO FEET (2') OFFSET BETWEEN TRAVEL LANE AND PORTABLE BARRIER IS REQUIRED. THE MAXIMUM POSSIBLE OFFSET BETWEEN TRAVEL LANE AND PORTABLE BARRIER MUST BE OBTAINED. A 2' MINIMUM OFFSET IS REQUIRED BETWEEN THE TRAVELLED LANE AND BRIDGE PARAPET, PORTABLE BARRIER RAIL, CONCRETE MEDIAN BARRIERS, ETC. 3' MINIMAL OFFSET IS REQUIRED BETWEEN THE WORK ZONE AND PORTABLE BARRIER RAIL IF RAIL IS UNPINNED..

Ⓒ PORTABLE BARRIER RAIL WILL BE REQUIRED WHERE DROP OFFS EXCEED 18 INCHES. PORTABLE BARRIER RAIL MAY BE USED WHERE DROP OFFS EXCEED 6 INCHES. FOR MORE SPECIFIC INFORMATION SEE TDOT DROP-OFF POLICY.

Ⓓ TAPER LENGTH SHOWN FOR THE PORTABLE BARRIER RAIL IS A MINIMUM. PORTABLE BARRIER RAIL SHOULD BE EXTENDED BEYOND THE CLEAR ZONE OR BE SHIELDED WITH A CRASH CUSHION WHEN IT IS NOT FEASIBLE TO EXTEND THE PORTABLE BARRIER RAIL. SEE STANDARD DRAWING S-CZ-1 FOR CLEAR ZONE DISTANCE.

Ⓔ REFER TO THE QUALIFIED PRODUCT LIST FOR APPROVED BARRIER RAIL DELINEATORS. DELINEATORS SHOULD NOT BE MIXED IN THE SAME LINE. BARRIER RAIL DELINEATORS SHALL BE USED ON PORTABLE BARRIER RAIL.

Ⓕ LANE DROP APPLICATION SHOWN IS ASSUMED TO BE EXISTING THROUGH LANES OF TRAFFIC. WHERE LANE CLOSURES OCCUR ON EXISTING ACCELERATION OR AUXILIARY LANES, DESIGNER SHALL ENSURE ACCEPTABLE DECISION SIGHT DISTANCE IS PROVIDED.

NOT TO SCALE

- REV. 12-18-99: ADDED BLOCKED IN NOTE FOR TWO LEFT INSIDE LANE CLOSURE.
- REV. 7-29-03: CHANGED GENERAL NOTE Ⓒ.
- REV. 4-15-04: CHANGED W4-2 SIGN. CHANGED GENERAL NOTE Ⓔ TO COMPLY WITH 2003 MUTCD.
- REV. 9-1-05: REMOVED TYPE "C" WARNING LIGHTS FROM FLEXIBLE DRUMS IN TAPER.
- REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES Ⓕ & Ⓖ.
- REV. 10-06-06: CHANGED ITEM NO. FOR BARRIER RAIL DELINEATOR. ADDED GENERAL NOTE Ⓗ. CHANGED GENERAL NOTE Ⓖ.
- REV. 03-13-09: CHANGED GENERAL NOTE Ⓒ AND ATTENUATOR LEGEND DESCRIPTION.
- REV. 03-05-17: ADDED ITEM NO. 716-05.02 AND 712-09.02.
- REV. 06-28-19: ADDED REFERENCED STD DWG S-CC-1 TO LEGEND FOR TEMPORARY CRASH CUSHION. ADDED ITEM NUMBER FOR FLEXIBLE DRUMS. DELETE GENERAL NOTE Ⓔ. REORGANIZED GENERAL NOTES AND MODIFIED FOR CLARITY. ADDED NOTE Ⓕ AND TABLE FOR BUFFER SPACE. RENAMED AND REDREW SHEET.

  REV. 05-01-20: ADDED SPECIAL NOTES. ADDED BUFFER SPACE TABLE. REMOVED 716-05.02 PAY ITEM. CHANGED CALCULATION FOR DISTANCE L. EDITED GENERAL NOTE A.

  REV. 03-04-21: CHANGED ITEM NO. 712-02.60 FOR STD DWG S-CC-1. ADDED REFERENCED STD DWG T-WZ-PCB SERIES. REVISED GENERAL NOTE Ⓑ.

■ FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

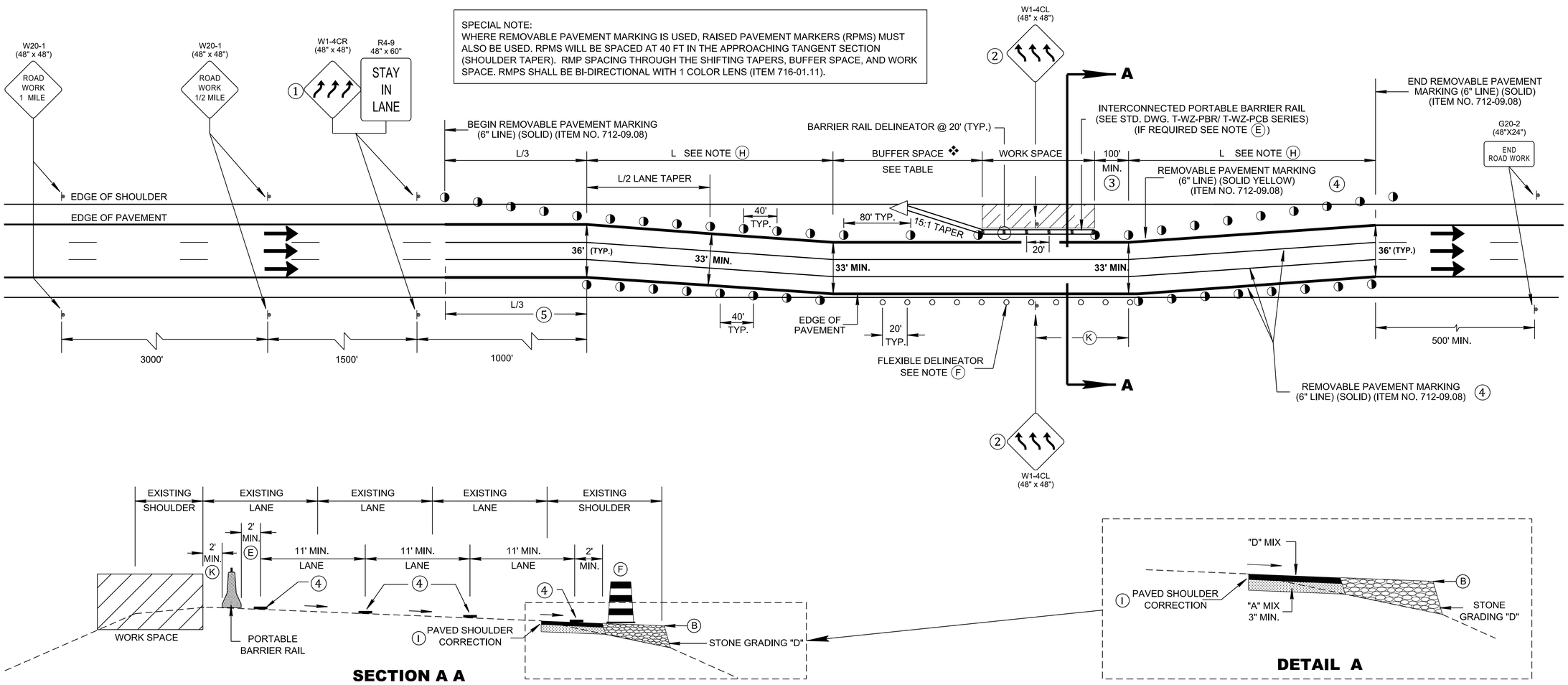
TWO-OUTSIDE LANE CLOSURE FOR INTERSTATES AND EXPRESSWAYS

05-27-1998 | T-WZ-14

TEMPORARY TRAFFIC CONTROL TYPICAL LANE SHIFT APPLICATION (A)

(SHOWING LANE SHIFT USING EXISTING SHOULDER)

SPECIAL NOTE:
WHERE REMOVABLE PAVEMENT MARKING IS USED, RAISED PAVEMENT MARKERS (RPMS) MUST ALSO BE USED. RPMS WILL BE SPACED AT 40 FT IN THE APPROACHING TANGENT SECTION (SHOULDER TAPER). RMP SPACING THROUGH THE SHIFTING TAPERS, BUFFER SPACE, AND WORK SPACE. RMPS SHALL BE BI-DIRECTIONAL WITH 1 COLOR LENS (ITEM 716-01.11).



SECTION A A

DETAIL A

SPECIAL NOTES

LANE WIDTHS SHALL BE A MINIMUM OF 11FT WITH 2FT SHOULDER. WHEN ALIGNMENT IS IN A HORIZONTAL CURVE WITH A RADIUS LESS THAN 2500FT, LANE WIDTHS SHALL BE A MINIMUM OF 12FT WITH 2FT SHOULDERS.

IF THE MINIMUM DESIGN REQUIREMENTS OF THIS STANDARD DRAWING CANNOT BE MET, A WORK ZONE DESIGN DEVIATION MUST BE SUBMITTED TO AND APPROVED BY THE STATE WORK ZONE ENGINEER.

CHANNELIZATION DEVICE LEGEND

- FLEXIBLE DRUMS (ITEM NO. 712-04.01, PER EACH)
- GROUND OR SURFACE MOUNTED FLEXIBLE DELINEATOR (ITEM NO. 713-02.14, PER EACH)
- SIGN SUPPORT
- DIRECTION OF TRAFFIC
- WORK SPACE
- BARRIER RAIL DELINEATOR (ITEM NO. 712-04.50, PER EACH)
- ATTENUATOR SEE STD. DWG. S-CC-1 (ITEM NO. 712-02.60, PER EACH)

FOOTNOTES

(1) FOR LANE SHIFTS TO THE RIGHT USE W1-4BR FOR 2 LANES, W1-4CR FOR 3 LANES, AND W1-4DR FOR 4 LANES.

(2) FOR LANE SHIFTS TO THE LEFT USE W1-4BL FOR 2 LANES, W1-4CL FOR 3 LANES, AND W1-4DL FOR 4 LANES.

(3) 100' MIN REQUIRED AFTER WORK SITE BEFORE TAPER FOR LANE SHIFT.

(4) REMOVABLE PAVEMENT MARKING (6" LINE) (SOLID) (ITEM NO. 712-09.08)

(5) RAISED TRANSVERSE RUMBLE STRIP FOR SPEED CONTROL AS NEEDED. SEE STANDARD DRAWING T-WZ-56.

❖ BUFFER SPACE BASED ON PRE-CONSTRUCTION POSTED SPEED

SPEED	DISTANCE
45	360
50	425
55	495
60	570
65	645
70	730
75	820

COMPUTATION FOR DISTANCE L

L = W x S

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = 10 MPH OVER EXISTING POSTED SPEED LIMIT

GENERAL NOTES

(A) LANE SHIFT SHOW IS GENERALLY INTENDED FOR HIGH SPEED RURAL SETTINGS, OR URBAN SETTINGS WHERE ALL DESIGN ELEMENTS CAN BE ACHIEVED. WHERE ROADWAY FEATURES (GEOMETRICS, INTERCHANGES, ETC.) DO NO PERMIT ALL DESIGN FEATURES TO BE ACHIEVED, DETAILED TRAFFIC CONTROL PLANS MAY BE REQUIRED.

(B) PORTABLE BARRIER RAIL WILL BE REQUIRED WHERE DROP OFFS EXCEED 18 INCHES. PORTABLE BARRIER RAIL MAY BE USED WHERE DROP OFFS EXCEED 6 INCHES. FOR MORE SPECIFIC INFORMATION SEE TDOT DROP-OFF POLICY.

(C) TAPER LENGTH SHOWN FOR THE PORTABLE BARRIER RAIL IS A MINIMUM. PORTABLE BARRIER RAIL SHOULD BE EXTENDED BEYOND THE CLEAR ZONE OR BE SHIELDED WITH A CRASH CUSHION WHEN IT IS NOT FEASIBLE TO EXTEND THE PORTABLE BARRIER RAIL. SEE STANDARD DRAWING S-CZ-1 FOR CLEAR ZONE DISTANCE.

(D) BARRIER RAIL DELINEATORS (ITEM NO. 712-04.50) SHOULD BE USED ON PORTABLE BARRIER RAIL. REFER TO THE QUALIFIED PRODUCTS LIST FOR APPROVED BARRIER RAIL DELINEATORS. DIFFERENT TYPES OF BARRIER RAIL DELINEATORS SHOULD NOT BE MIXED IN THE SAME LINE.

(E) MINIMUM TWO FEET (2') OFFSET BETWEEN TRAVEL LANE AND PORTABLE BARRIER IS REQUIRED. THE MAXIMUM POSSIBLE OFFSET BETWEEN TRAVEL LANE AND PORTABLE BARRIER MUST BE OBTAINED. A 2' MINIMUM OFFSET IS REQUIRED BETWEEN THE TRAVELLED LANE AND BRIDGE PARAPET, PORTABLE BARRIER RAIL, CONCRETE MEDIAN BARRIERS, ETC. 3' MINIMAL OFFSET IS REQUIRED BETWEEN THE WORK ZONE AND PORTABLE BARRIER RAIL IF RAIL IS UNPINNED.

(F) FLEXIBLE DRUMS, CONCRETE BARRIER RAIL OR GROUND MOUNTED FLEXIBLE DELINEATORS MAY BE USED AS NEEDED. SEE STANDARD DRAWING T-WZ-PBR2 FOR GROUND MOUNTED FLEXIBLE DELINEATORS (ITEM NO. 713-02.14). REFER TO THE QPL FOR APPROVED FLEXIBLE DELINEATORS.

(G) RAISED PAVEMENT MARKERS SHOULD NOT BE USED ON THE LEFT OR RIGHT EDGE LINE.

(H) WHILE THE MUTCD USES L/2, TDOT USES L FOR THE SHIFTING LANE LENGTH.

(I) THE EXISTING SHOULDER MAY BE BUILT UP SO THAT IT MATCHES THE EXISTING ADJACENT LANE CROSS SLOPE. THIS CAN BE ACCOMPLISHED BY USING ASPHALT CONCRETE MIX (BPMB-HM) GRADING D MIX IF THE DROP-OFF DOES NOT EXCEED 3". IF THE DROP OFF EXCEEDS 3" THEN ASPHALT CONCRETE MIX (BPMB-HM) GRADING A MIX MUST BE USED IN CONJUNCTION WITH D MIX. SEE DETAIL A FOR DETAILS.

(J) THIS DRAWING IS BASED ON THE MUTCD DRAWING FOR LANE SHIFT ON A FREEWAY (TA-36).

(K) THE SIGNS W1-4CL, 4BL OR 4DL SHALL BE LOCATED WITHIN THE TANGENT SECTION OF THE LANE SHIFT, AT A DISTANCE OF APPROX. 1000 FT. FROM THE END OF THE TANGENT SECTION.

NOT TO SCALE

- REV. 4-15-99: MODIFIED CHANNELIZATION DEVICE LEGEND.

  REV. 12-18-99: CHANGED OUT FLEXIBLE DRUMS FOR VERTICAL PANELS ALONG OUTSIDE SHOULDER IN WORK ZONE AREA. MODIFIED GENERAL NOTE (D).
- REV. 7-29-03: CHANGED GENERAL NOTE (D).
- REV. 4-15-04: CHANGED GENERAL NOTE (B) TO COMPLY WITH 2003 MUTCD.
- REV. 9-1-05: REMOVED TYPE "C" WARNING LIGHTS FROM FLEXIBLE DRUMS IN TAPER.
- REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES (E) & (F).
- REV. 10-06-06: REPLACED VERTICAL PANELS WITH GROUND MOUNTED FLEXIBLE DELINEATOR. ADDED GENERAL NOTE (G) AND (H). CHANGED GENERAL NOTE (E) AND ADD GENERAL NOTE (J). DELETED "FOR LANE SHIFTS EQUAL TO OR LESS THAN 2000' IN LENGTH". ALSO STD.DWG. T-WZ-17 DELETED.
- REV. 03-13-09: CHANGED GENERAL NOTE (D) AND ATTENUATOR LEGEND DESCRIPTION.
- REV. 03-05-17: ADDED ITEM NO. 716-05.02 OR 712-09.02.

  REV. 06-28-19: REVISED ALL NOTES, COMPUTATION FOR DISTANCE L BLOCK. ADDED SECTION **A A** AND DETAIL A . ADDED SIGNS NOS. W-20-1 & R4-9. RENAMED AND REDREW SHEET.

  REV. 03-04-21: CHANGED ITEM NO. 712-02.60 FOR STD DWG S-CC-1. ADDED REFERENCED STD DWG T-WZ-PCB SERIES. REVISED GENERAL NOTE (E).

- MINOR REVISION -- FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

LANE SHIFT FOR DIVIDED HIGHWAYS AND FREEWAYS

5-27-98 | T-WZ-16

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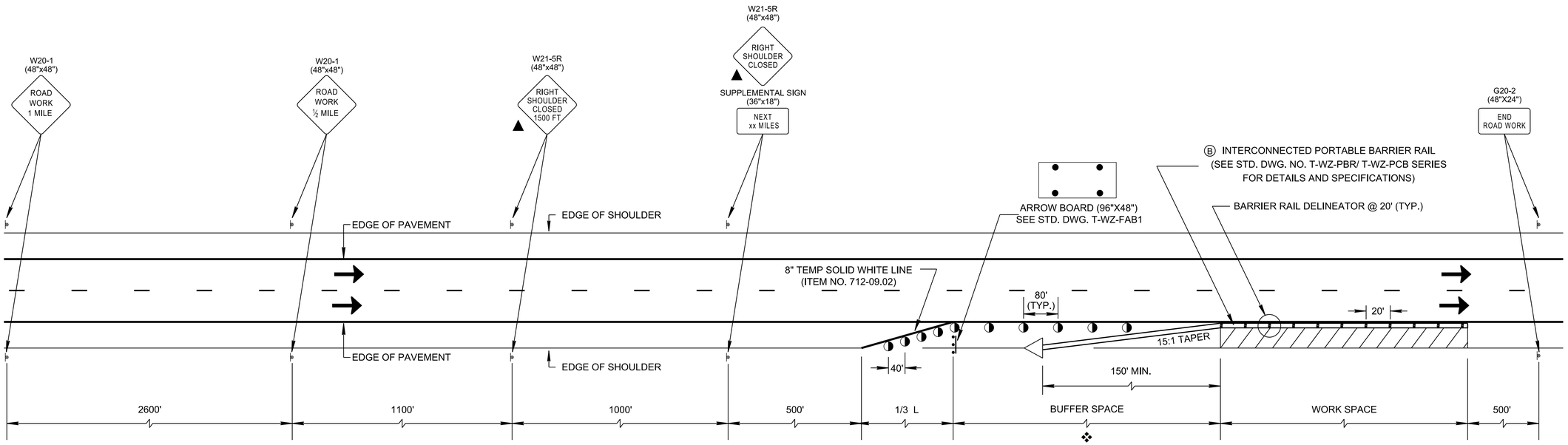


TRAFFIC CONTROL FOR SHOULDER CLOSURE FOR FREEWAYS AND DIVIDED HIGHWAYS

FOR LEFT SHOULDER CLOSURE USE ▲ SIGNS W21-5L REPLACE THE WORD RIGHT WITH LEFT

❖ **BUFFER SPACE** BASED ON PRE-CONSTRUCTION POSTED SPEED

SPEED	DISTANCE
45	360
50	425
55	495
60	570
65	645
70	730
75	820

COMPUTATION FOR DISTANCE L

L = W x S

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = 10 MPH OVER EXISTING POSTED SPEED LIMIT

CHANNELIZATION DEVICE LEGEND

- FLEXIBLE DRUMS (ITEM NO. 712-04.01, PER EACH)
- FLASHING YELLOW ARROW BOARD (SEE STD. DWG. NO. T-WZ-FAB1, FOR DETAILS AND SPECIFICATIONS) (ITEM NO. 712-08.03, PER EACH)
- SIGN SUPPORT
- DIRECTION OF TRAFFIC
- WORK SPACE
- BARRIER RAIL DELINEATOR (ITEM NO. 712-04.50, PER EACH)
- ATTENUATOR SEE STD. DWG. S-CC-1 (ITEM NO. 712-02.60, PER EACH)

SPECIAL NOTES

LANE WIDTHS SHALL BE A MINIMUM OF 11FT WITH 2FT SHOULDER. WHEN ALIGNMENT IS IN A HORIZONTAL CURVE WITH A RADIUS LESS THAN 2500FT, LANE WIDTHS SHALL BE A MINIMUM OF 12FT WITH 2FT SHOULDERS.

IF THE MINIMUM DESIGN REQUIREMENTS OF THIS STANDARD DRAWING CANNOT BE MET, A WORK ZONE DESIGN DEVIATION MUST BE SUBMITTED TO AND APPROVED BY THE STATE WORK ZONE ENGINEER.

GENERAL NOTES

Ⓐ THIS STANDARD CAN BE USED FOR THE CLOSURE OF AN INSIDE OR OUTSIDE SHOULDER OF ANY MULTI-LANE DIVIDED HIGHWAY. FOR THE CLOSURE OF AN INTERIOR LANE, SEE STANDARD DRAWING NOS.T-WZ-13, TWZ-14, OR T-WZ-15 FOR DETAILS.

Ⓑ MINIMUM TWO FEET (2') OFFSET BETWEEN TRAVEL LANE AND PORTABLE BARRIER IS REQUIRED. THE MAXIMUM POSSIBLE OFFSET BETWEEN TRAVEL LANE AND PORTABLE BARRIER MUST BE OBTAINED. A 2' MINIMUM OFFSET IS REQUIRED BETWEEN THE TRAVELLED LANE AND BRIDGE PARAPET, PORTABLE BARRIER RAIL, CONCRETE MEDIAN BARRIERS, ETC. 3' MINIMAL OFFSET IS REQUIRED BETWEEN THE WORK ZONE AND PORTABLE BARRIER RAIL IF RAIL IS UNPINNED.

Ⓒ PORTABLE BARRIER RAIL WILL BE REQUIRED WHERE DROP OFFS EXCEED 18 INCHES. PORTABLE BARRIER RAIL MAY BE USED WHERE DROP OFFS EXCEED 6 INCHES. FOR MORE SPECIFIC INFORMATION SEE TDOT DROP-OFF POLICY.

Ⓓ TAPER LENGTH SHOWN FOR THE PORTABLE BARRIER RAIL IS A MINIMUM. PORTABLE BARRIER RAIL SHOULD BE EXTENDED BEYOND THE CLEAR ZONE OR BE SHIELDED WITH A CRASH CUSHION WHEN IT IS NOT FEASIBLE TO EXTEND THE PORTABLE BARRIER RAIL. SEE STANDARD DRAWING S-CZ-1 FOR CLEAR ZONE DISTANCE.

Ⓔ REFER TO THE QUALIFIED PRODUCT LIST FOR APPROVED BARRIER RAIL DELINEATORS. DELINEATORS SHOULD NOT BE MIXED IN THE SAME LINE. BARRIER RAIL DELINEATORS SHALL BE USED ON PORTABLE BARRIER RAIL.

Ⓕ SEE STANDARD DRAWING T-WZ-10 FOR OTHER NECESSARY ADVANCE WARNING SIGNS.

Ⓖ RAISED PAVEMENT MARKERS SHOULD NOT BE USED ON RIGHT EDGE LINE.

- REV. 4-15-99: MODIFIED CHANNELIZATION DEVICE LEGEND.
- REV. 12-18-99: MODIFIED GENERAL NOTE Ⓑ.
- REV. 7-29-03: CHANGED GENERAL NOTE Ⓑ.
- REV. 4-15-04: CHANGED GENERAL NOTE Ⓓ TO COMPLY WITH 2003 MUTCD.
- REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES Ⓔ & Ⓕ.
- REV. 10-06-06: CHANGED ITEM NO. FOR BARRIER RAIL DELINEATOR. ADDED GENERAL NOTE Ⓖ. CHANGED GENERAL NOTE Ⓕ.
- REV. 03-13-09: CHANGED GENERAL NOTE Ⓑ AND ATTENUATOR LEGEND DESCRIPTION.
- REV. 03-05-17: ADDED ITEM NO. 716-05.02 AND 712-09.02.
- REV. 06-28-19: ADDED REFERENCED STD DWG S-CC-1 TO LEGEND FOR TEMPORARY CRASH CUSHION. ADDED ITEM NUMBER FOR FLEXIBLE DRUMS AND BARRIER RAIL DELINEATORS. REORGANIZED AND MODIFIED GENERAL NOTES FOR CLARITY. REVISED REFERENCE TO OTHER STD DWG. REDREW SHEET.

  REV. 05-01-20: ADDED SPECIAL NOTES. ADDED BUFFER SPACE TABLE. CHANGED CALCULATION FOR DISTANCE L.

  REV. 03-04-21: CHANGED ITEM NO. 712-02.60 FOR STD DWG S-CC-1. ADDED REFERENCED STD DWG T-WZ-PCB SERIES. REVISED GENERAL NOTE Ⓑ.

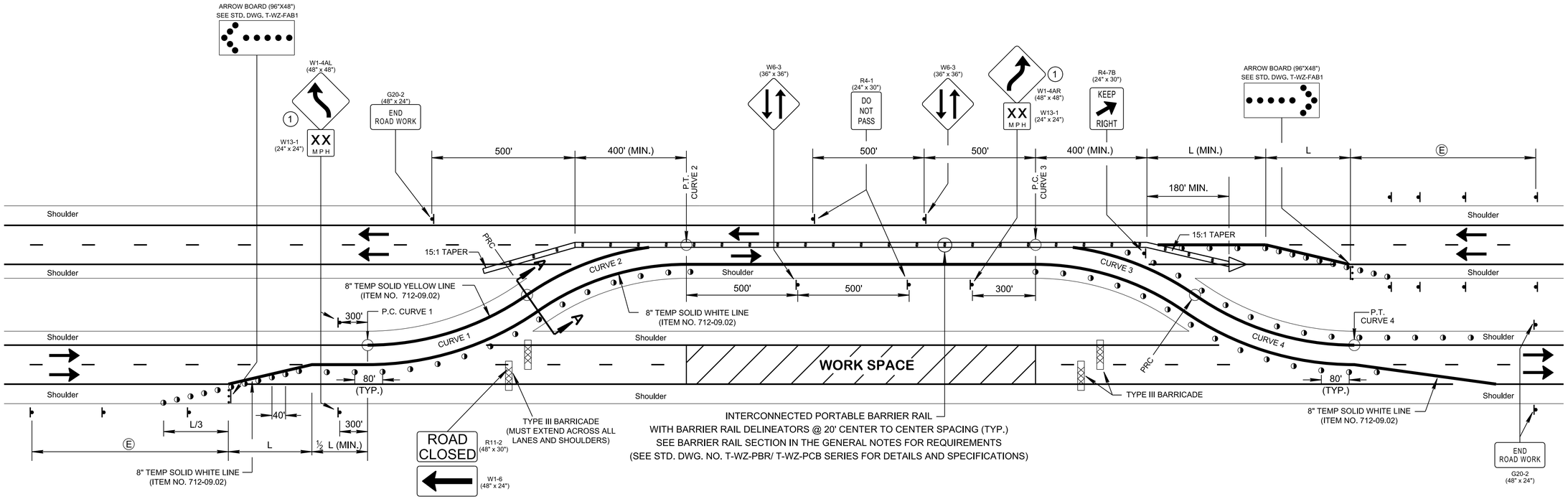
FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

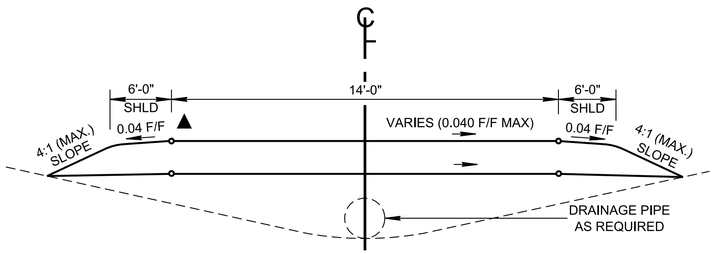
SHOULDER CLOSURE DETAIL FOR FREEWAYS AND DIVIDED HIGHWAYS

05-27-1998 | T-WZ-18

NOT TO SCALE



MEDIAN CROSS-OVER DETAIL ON DIVIDED HIGHWAYS AND BRIDGES



SECTION A-A TYPICAL SECTION OF TEMPORARY MEDIAN CROSS-OVER

▲ THE SLOPES OF THE SHOULDER AND THE ROADWAY PAVEMENT SHALL NOT EXCEED AN ALGEBRAIC DIFFERENCE OF 0.07 FOOT PER FOOT.

SPECIAL NOTE

(1) IF THE TANGENT LENGTH OF THE DIVERSION IS LESS THAN 600', USE ALTERNATE SIGN W24-1L AT BEGINNING OF CROSS OVER IN PLACE OF W1-4AL AND NO SIGN IS REQUIRED AT DOWNSTREAM LOCATION.

ALT. W24-1L (48"X48")

(2) UNLESS REFLECTED DIFFERENT, THE LANE WIDTHS SHALL BE A MINIMUM 11 FT. WIDE WITH 2 FT. SHOULDERS. WHEN EXISTING ROADWAY HORIZONTAL ALIGNMENT IS IN A CURVE AND THE RADIUS IS LESS THAN 2500 FT. THE LANE WIDTHS FOR THE SHIFTING TAPER MUST BE AT LEAST 12 FT. WIDE WITH 2 FT. SHOULDERS.

IF THE MINIMUM DESIGN REQUIREMENTS OF THIS STANDARD CANNOT BE MET, A WORK ZONE DESIGN DEVIATION MUST BE SUBMITTED TO AND APPROVED BY THE STATE WORK ZONE ENGINEER.

COMPUTATION FOR DISTANCE L

L = W x S

L = TAPER LENGTH IN FEET
W = WIDTH OF OFFSET IN FEET
S = 10 MPH OVER EXISTING POSTED SPEED LIMIT

CHANNELIZATION DEVICE LEGEND

- FLEXIBLE DRUMS (ITEM NO. 712-04.01, PER EACH)
- FLASHING YELLOW ARROW BOARD (SEE STD. DWG. NO. T-WZ-FAB1, FOR DETAILS AND SPECIFICATIONS) (ITEM NO. 712-08.03, PER EACH)
- SIGN SUPPORT
- DIRECTION OF TRAFFIC
- WORK SPACE
- BARRIER RAIL DELINEATOR (ITEM NO. 712-04.50, PER EACH)
- ATTENUATOR SEE STD. DWG. S-CC-1 (ITEM NO. 712-02.60, PER EACH)
- TYPE III BARRICADE SEE STD. DWG. T-S-18 (ITEM NO. 713-15.35, PER EACH)

GENERAL NOTES

Ⓐ CROSS-OVERS SHALL BE DESIGNED FOR SPEEDS NOT LESS THAN 10 MILES PER HOUR BELOW THE POSTED SPEED. THE GEOMETRY DETAIL FOR CROSS-OVER SHOWN ON STANDARD DRAWING T-WZ-20 IS FOR A TANGENT DIVIDED HIGHWAY SECTION ONLY. THE DESIGNER SHALL PROVIDE GEOMETRIC DETAILS OF CROSS-OVER(S) ON CURVED DIVIDED HIGHWAY SECTIONS.

Ⓑ ADVISORY SPEED PLATES ON REVERSE CURVE SIGNS (W1-4) SHALL BE 10 MILES PER HOUR LESS THAN THE DESIGN SPEED OF THE CROSS-OVER.

Ⓒ TEMPORARY CROSS DRAINS SHALL BE PROVIDED WHERE CROSS-OVER CROSSES THE LOW POINT OF THE DEPRESSED MEDIAN. THE DESIGNER WILL PROVIDE THE LENGTH AND SIZE OF THESE CROSS DRAINS ON THE PLANS. THESE CROSS DRAINS SHALL BE PAID FOR UNDER ITEM NOS. 621-03.02 THROUGH 621-03.10.

Ⓓ PAVEMENT SECTION OF TEMPORARY MEDIAN CROSS-OVER IS SHOWN ON TYPICAL SECTION SHEETS OF PLANS.

Ⓔ SEE STANDARD DRAWING T-WZ-10 FOR OTHER NEEDED ADVANCE WARNING SIGNS.

Ⓕ TWO-WAY TRAFFIC SYMBOL SIGN (W6-3) AND DO NOT PASS SIGN (R4-1) TO BE PLACED AT 1/2 MILE INTERVALS ON TWO-WAY TEMPORARY TRAFFIC SECTION.

Ⓖ A SECOND ARROW BOARD MAY BE USED WHEN GEOMETRIC CONDITIONS LIMITS THE VISIBILITY OF A LANE CLOSURE.

Ⓗ RAISED PAVEMENT MARKERS SHOULD NOT BE USED ON RIGHT EDGE LINE.

BARRIER RAIL

Ⓘ TAPER LENGTH SHOWN FOR THE PORTABLE BARRIER RAIL IS A MINIMUM. PORTABLE BARRIER RAIL SHOULD BE EXTENDED BEYOND THE CLEAR ZONE OR BE SHIELDED WITH A CRASH CUSHION WHEN IT IS NOT FEASIBLE TO EXTEND THE PORTABLE BARRIER RAIL. SEE STANDARD DRAWING S-CZ-1 FOR CLEAR ZONE DISTANCE.

Ⓙ REFER TO THE QUALIFIED PRODUCT LIST FOR APPROVED BARRIER RAIL DELINEATORS. DELINEATORS SHOULD NOT BE MIXED IN THE SAME LINE. BARRIER RAIL DELINEATORS SHALL BE USED ON PORTABLE BARRIER RAIL.

Ⓚ MINIMUM TWO FEET (2') OFFSET BETWEEN TRAVEL LANE AND PORTABLE BARRIER IS REQUIRED. THE MAXIMUM POSSIBLE OFFSET BETWEEN TRAVEL LANE AND PORTABLE BARRIER MUST BE OBTAINED. A 2' MINIMUM OFFSET IS REQUIRED BETWEEN THE TRAVELLED LANE AND BRIDGE PARAPET, PORTABLE BARRIER RAIL, CONCRETE MEDIAN BARRIERS, ETC. 3' MINIMAL OFFSET IS REQUIRED BETWEEN THE WORK ZONE AND PORTABLE BARRIER RAIL IF RAIL IS UNPINNED.

NOT TO SCALE

- REV. 5-27-01: CHANGED PAY ITEMS IN GENERAL NOTE Ⓒ.

  REV. 7-29-03: CHANGED GENERAL NOTE Ⓗ.

  REV. 9-1-05: REMOVED TYPE "C" WARNING LIGHTS FROM FLEXIBLE DRUMS IN TAPER.

  REV. 5-12-06: REPLACED VERTICAL PANEL WITH BARRIER RAIL DELINEATORS. ADDED GENERAL NOTES Ⓘ & Ⓙ.

  REV. 10-06-06: CHANGED ITEM NO. FOR BARRIER RAIL DELINEATOR. ADDED GENERAL NOTE Ⓚ. DELETED GENERAL NOTE Ⓙ.

  REV. 03-13-09: CHANGED GENERAL NOTE Ⓗ AND ATTENUATOR LEGEND DESCRIPTION.

  REV. 4-2-12: ADDED NOTE (1) AND SIGN W24-1.

  REV. 03-05-17: ADDED ITEM NO. 716-05.02 AND 712-09.02.

- REV. 06-28-19: REORGANIZED GENERAL NOTES AND ADDED NOTE Ⓚ. ADDED DRAINAGE PIPE IN SECTION A-A. CORRECTED 8" TEMPORARY PAVEMENT MARKING COLOR TO YELLOW IN TWO INSTANCES. ADDED 8" TEMPORARY SOLID YELLOW LINE IN ONE INSTANCE. ADDED REFERENCED STD DWG S-CC-1 TO LEGEND FOR TEMPORARY CRASH CUSHION. ADDED ITEM NUMBER FOR FLEXIBLE DRUMS. MODIFIED GENERAL NOTE Ⓙ FOR CLARITY. REMOVED VERTICAL PANELS AND REPLACED THEM WITH DRUMS AT THE MEDIAN CROSS-OVER. ADDED SPECIAL NOTE NO. (2). REDREW SHEET.

  REV. 05-01-20: ADDED SPECIAL NOTES. ADDED BUFFER SPACE TABLE. REMOVED 716-05.02 PAY ITEM. CHANGED CALCULATION FOR DISTANCE L.

  REV. 03-04-21: CHANGED ITEM NO. 712-02.60 FOR STD DWG S-CC-1. ADDED REFERENCED STD DWG T-WZ-PCB SERIES. REVISED GENERAL NOTE K.

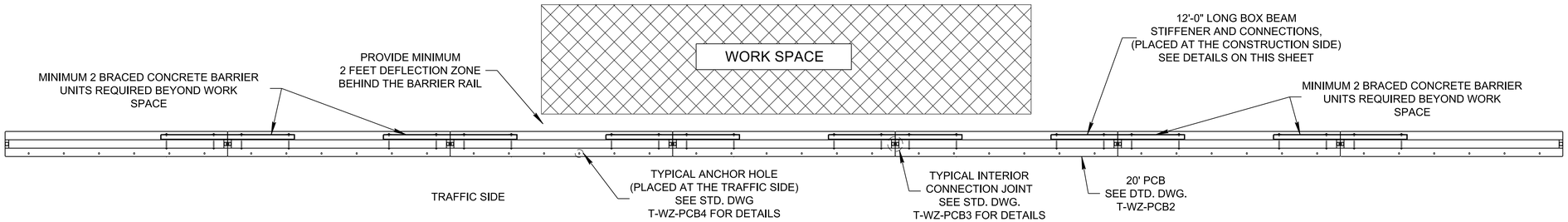
FHWA APPROVAL NOT REQUIRED

STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

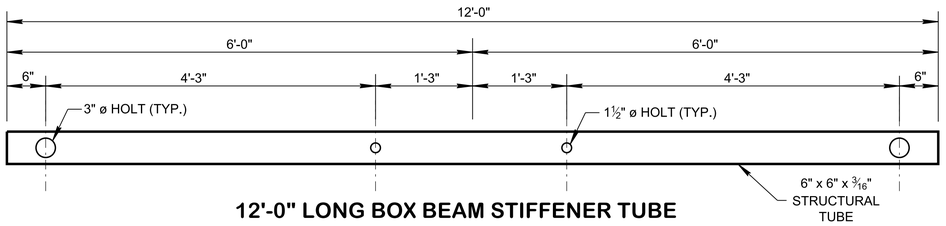
MEDIAN CROSS-OVER DETAIL ON FREEWAYS

10-26-1998 | T-WZ-19

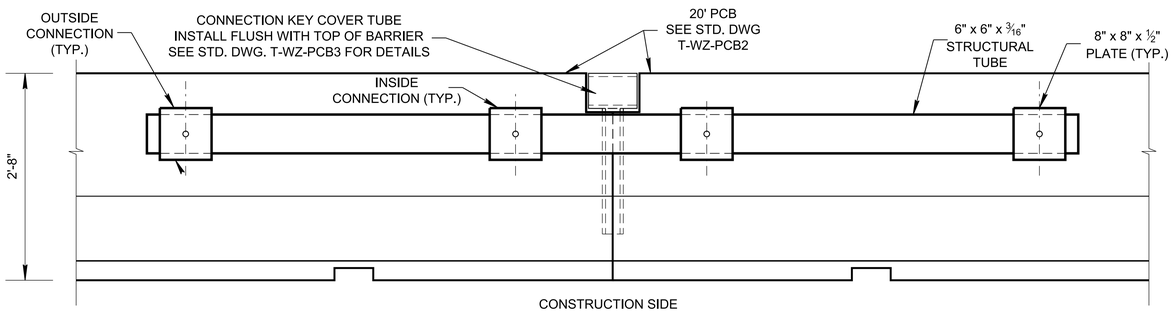
REV. 03-04-2021: REVISED CONNECTION BOLT ON DETAILS AND REVISED GENERAL NOTE Ⓑ.



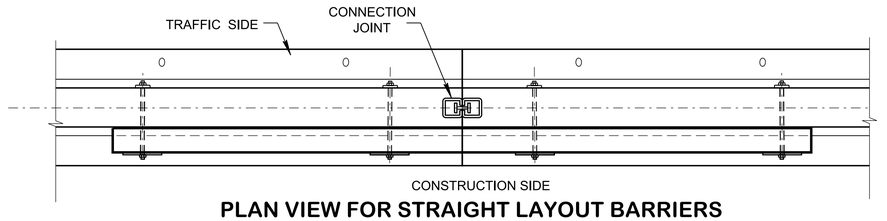
PLAN FOR 20' PCB LAYOUT



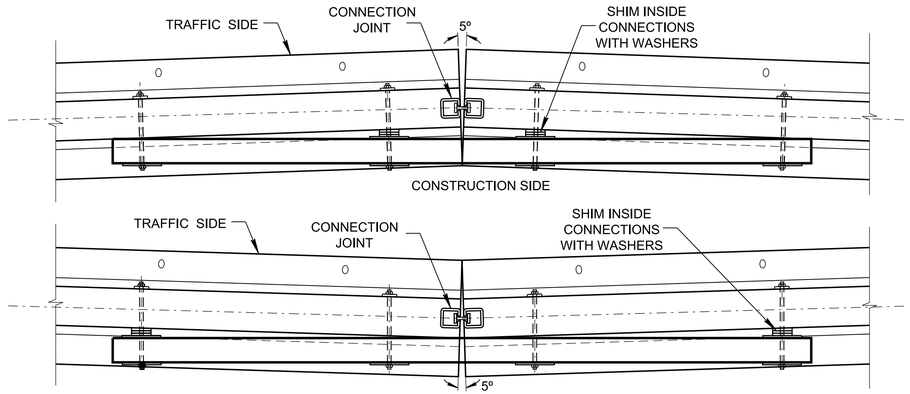
12'-0" LONG BOX BEAM STIFFENER TUBE



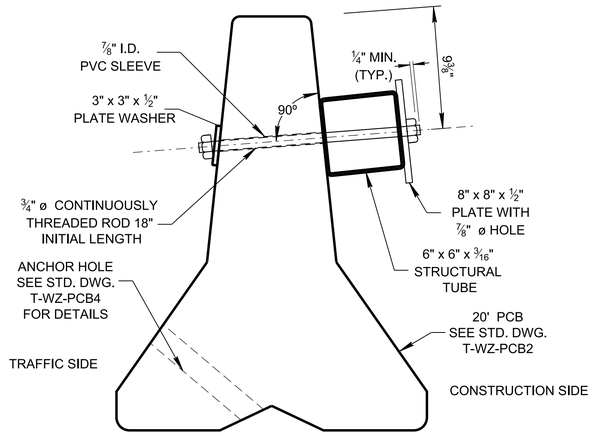
ELEVATION VIEW FOR 20' PCB BOX BEAM STIFFENER TUBE



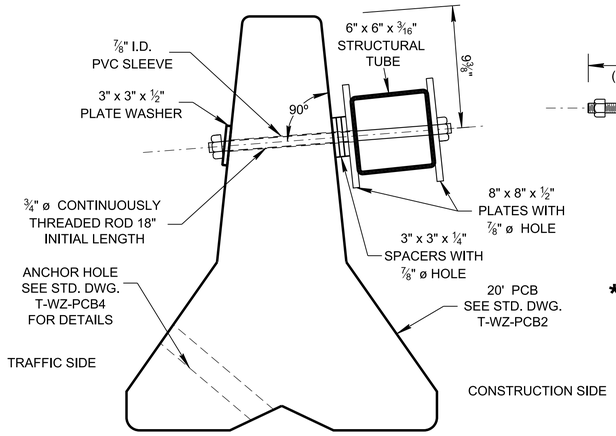
PLAN VIEW FOR STRAIGHT LAYOUT BARRIERS



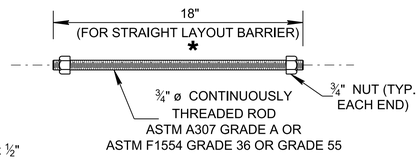
PLAN VIEWS FOR CURVED LAYOUT BARRIERS



SECTION FOR STRAIGHT LAYOUT BARRIERS



SECTION FOR CURVED LAYOUT BARRIERS



¾" ø CONTINUOUSLY THREADED ROD

* NOTE: THE LENGTH OF ¾" CONTINUOUSLY THREADED ROD IS DEPEND ON THE RADIUS OF THE CURVE FOR CURVED LAYOUT BARRIERS.

DETAILS FOR 20' PCB BOX BEAM STIFFENER TUBE

GENERAL NOTES

Ⓐ ALL PORTABLE CONCRETE BARRIER UNITS FOR BOX BEAM STIFFENER SYSTEM SHALL BE A 20 FOOT LONG SEGMENT. SEE STANDARD DRAWING T-WZ-PCB2. DO NOT USE THE BOX BEAM STIFFENING AT LOCATIONS WHERE THE BOX BEAM MAY BE EXPOSED TO TRAFFIC SUCH AT A MEDIAN BARRIER (TRAFFIC ON BOTH SIDES OF THE BARRIER).

Ⓑ ALL STEEL PLATES AND SPACERS SHALL CONFORM TO ASTM A36 AND SHALL BE GALVANIZED. THE ¾" DIAMETER CONTINUOUSLY THREADED RODS FOR THE BOX BEAM STIFFENER SHALL CONFORM TO ASTM A307 GRADE A, OR ASTM F1554 GRADE 36 OR GRADE 55. NUTS SHALL CONFORM TO ASTM A563 GRADE A OR BETTER AND SHALL BE GALVANIZED. BOX BEAM STIFFENER TUBE SHALL CONFORM TO ASTM A500 GRADE B AND SHALL BE GALVANIZED.

Ⓒ THE 32 INCH TALL 20 FOOT LONG STIFFENED PORTABLE CONCRETE BARRIER RAIL WITH FREE STANDING CONFIGURATION, AND CONNECTED USING A CONNECTION KEY AS SHOWN HAS BEEN EVALUATED BY THE MIDWEST ROADSIDE SAFETY FACILITY AND HAS MEET MASH TL-3 STANDARDS. THE EVALUATION OF STIFFENED PCB HAS BEEN DOCUMENTED IN REPORT NUMBER TRP-03-372-18. THE STIFFENED BARRIER SYSTEM HAS BEEN CRASH TESTED WITH A 28.7' DYNAMIC DEFLECTION. AT A MINIMUM 5 SEGMENTS WITH A MINIMUM OF 100 FEET OF INSTALLATION WILL BE REQUIRED FOR THE BARRIER SYSTEM TO PERFORM AS EVALUATED. THE DESIGNER SHOULD CONSIDER PLACING THE PCB SO THAT THERE IS ENOUGH SPACE BETWEEN THE WORK SPACE AND THE PCB FOR A 3 FOOT DYNAMIC DEFLECTION.

Ⓓ PCB WITH BOX BEAM STIFFENER LAYOUT SHALL BEGIN AT LEAST A MINIMUM OF TWO 20 FEET BARRIERS PRIOR TO, BE CONTINUOUS THROUGH AND EXTEND AT LEAST A MINIMUM OF TWO 20 FEET BARRIERS BEYOND THE WORK SPACE REQUIRED LIMIT. AT EACH END OF BRACED BARRIER LAYOUT SHALL BE ANCHORED WITH ANCHOR PINS ON THE TRAFFIC SIDE.

Ⓔ WHERE PORTABLE CONCRETE BARRIERS ARE PLACED ON A RADIUS, THE RESULTING GAP BETWEEN THE BOX BEAM AND CONCRETE BARRIER SHALL BE SHIMMED.

Ⓕ THE SHIMMING SHALL CONSIST OF 8" x 8" x ½" SQUARE PLATES, AND SPACERS AS NEEDED TO SNUG THE BOX BEAM STIFFENER TO THE CONCRETE BARRIER RAIL.

Ⓖ THE PRESENCE OF NORMAL HOLES DRILLED PER THIS SHEET WILL NOT AFFECT THE REUSABILITY OF THE BARRIER SEGMENT.

Ⓗ DRILL HOLES IN PORTABLE BARRIER FOR PURPOSE OF BOX BEAM ATTACHMENT USING A CORE DRILL OR ANY OTHER APPROVED ROTARY DRILLING DEVICE THAT DOES NOT IMPART AN IMPACT FORCE.

Ⓘ PAYMENT:

PAYMENT FOR PORTABLE BARRIER RAIL, BOX BEAM, PLATES, SPACERS, CONNECTION KEY, JOINT ASSEMBLY STEEL TUBE, PLATES, ANCHOR PINS AND OTHER HARDWARE MATERIALS WILL BE INCLUDED IN THE COST OF PORTABLE BARRIER RAIL, REDUCED DEFLECTION ITEM NUMBER.

712-02.12, PORTABLE BARRIER RAIL, REDUCED DEFLECTION (MASH TL-3), PER L.F.

☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

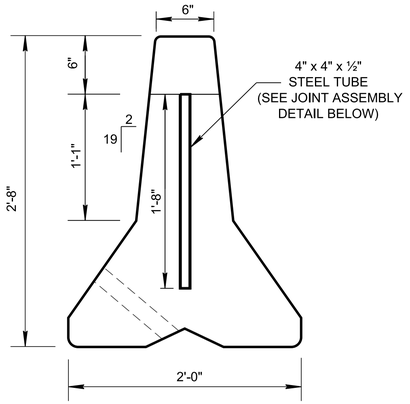
STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

20 FOOT PORTABLE CONCRETE BARRIER RAIL STIFFENER TUBE

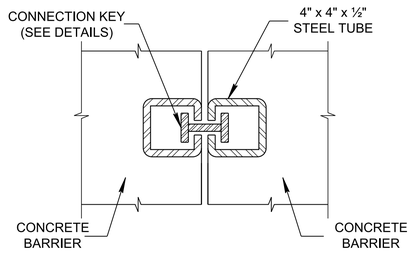
10-16-2020 | T-WZ-PCB2A

NOT TO SCALE

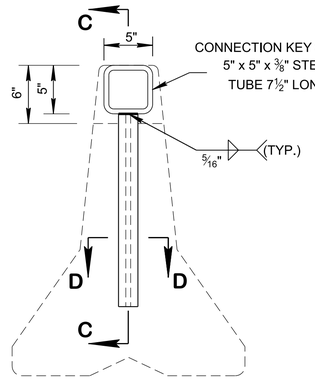
REV. 03-04-2021: REVISED CONNECTION KEY DETAILS AND REVISED GENERAL NOTES Ⓑ AND Ⓒ. ADDED GENERAL NOTE Ⓖ.



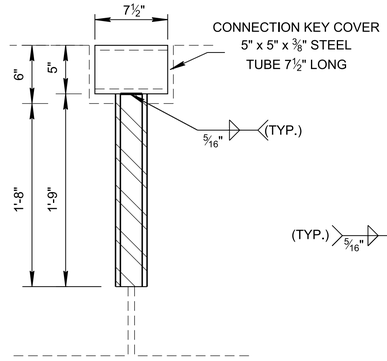
END VIEW



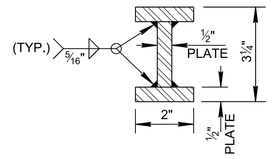
PLAN OF CONNECTION KEY DETAIL



CONNECTION KEY VIEW

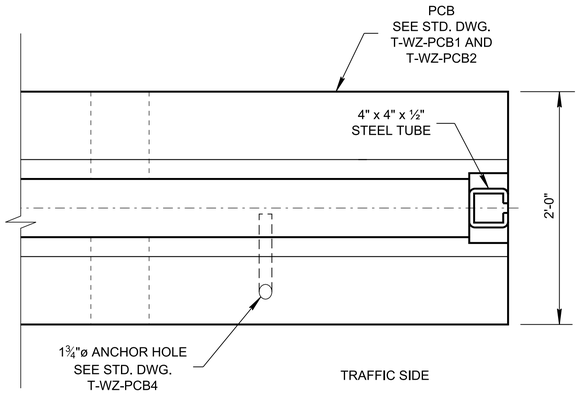


SECTION C - C

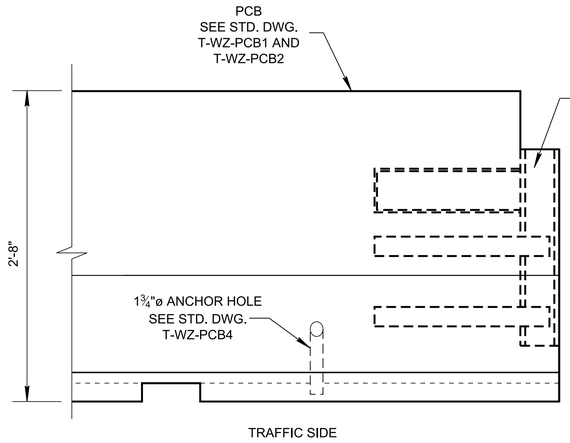


SECTION D - D

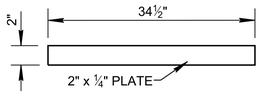
CONNECTION KEY DETAILS



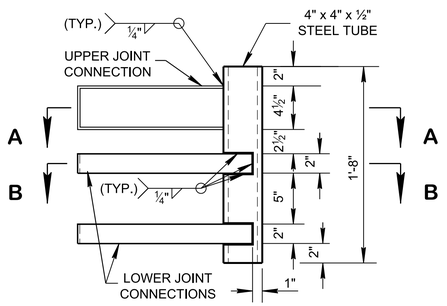
END PLAN VIEW



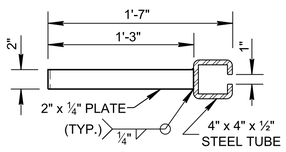
END ELEVATION VIEW



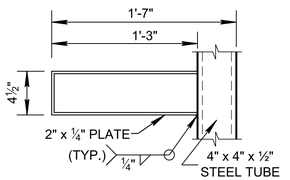
UPPER JOINT PLATE SIZE



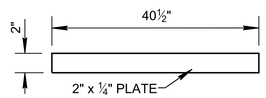
JOINT ASSEMBLY DETAIL



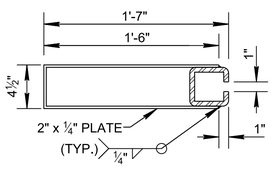
SECTION A - A



ELEVATION
UPPER JOINT CONNECTION



LOWER JOINT PLATE SIZE



SECTION B - B
LOWER JOINT CONNECTION

GENERAL NOTES

Ⓐ SEE STANDARD DRAWINGS T-WZ-PCB1 AND T-WZ-PCB2 FOR PORTABLE CONCRETE BARRIER RAILS.

Ⓑ 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.

Ⓒ ALL WELDING SHALL BE PERFORMED BY A WELDER QUALIFIED IN ACCORDANCE WITH SECTION 602 OF THE STANDARD SPECIFICATIONS.

Ⓓ CONNECTION KEY COVER TUBE SHALL BE INSTALLED FLUSH WITH THE BARRIER TOP.

Ⓔ SEE STANDARD DRAWING T-WZ-PCB4 FOR ANCHOR PIN DETAILS.

Ⓕ PAYMENT FOR CONNECTION KEY, JOINT ASSEMBLY STEEL TUBE AND PLATES WILL BE INCLUDED IN THE UNIT PRICE OF PORTABLE BARRIER RAIL ITEM NUMBER.

Ⓖ THE DIMENSIONS SHALL BE AS SHOWN ON THE DRAWING WITHIN MANUFACTURING TOLERANCE OF +/- ⅛ INCH BUT NOT TO EXCEED ¼ INCH.

☐ APPROVED BY FHWA
(ALL OTHERS APPROVED BY TDOT)

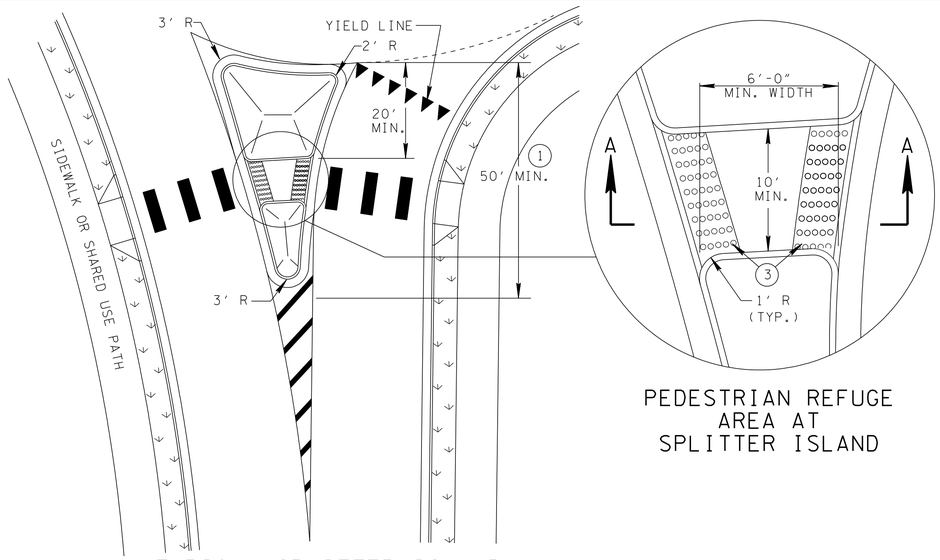
STATE OF TENNESSEE
STANDARD DRAWING
DEPARTMENT OF TRANSPORTATION

PORTABLE CONCRETE BARRIER RAIL DETAILS

10-16-2020

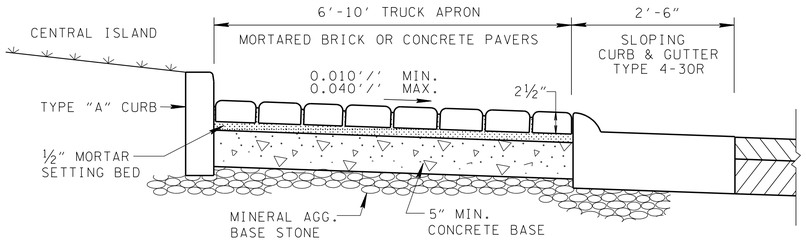
T-WZ-PCB3

NOT TO SCALE



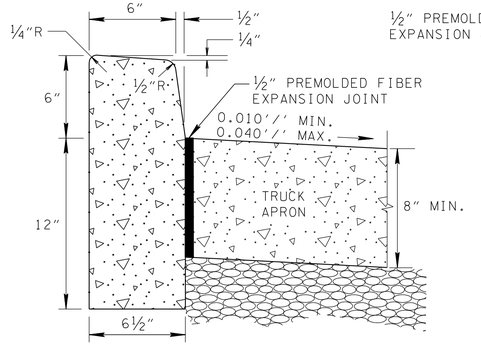
TYPICAL SPLITTER ISLAND

PEDESTRIAN REFUGE AREA AT SPLITTER ISLAND

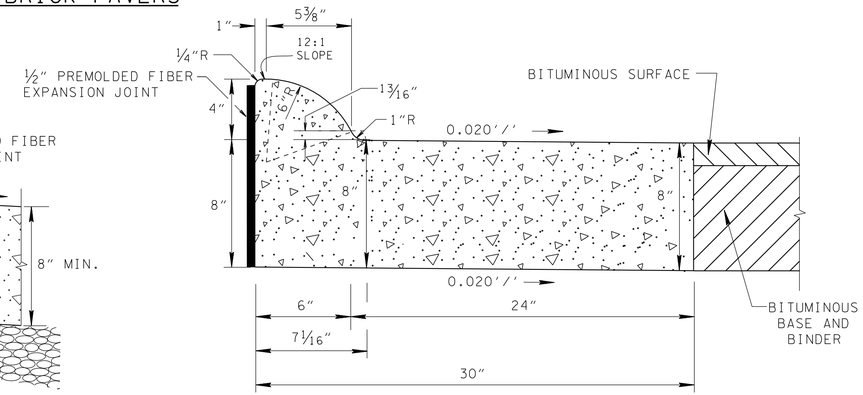


TRUCK APRON WITH CONCRETE OR BRICK PAVERS

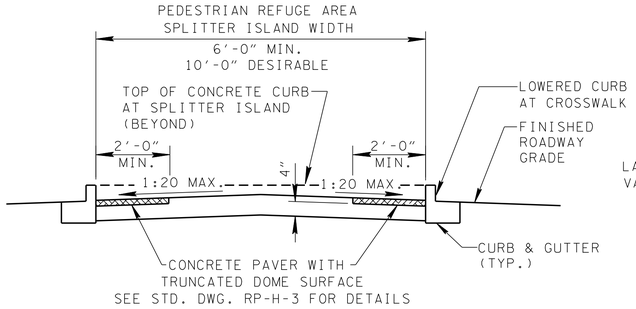
(BRICK PAVERS SHOWN)



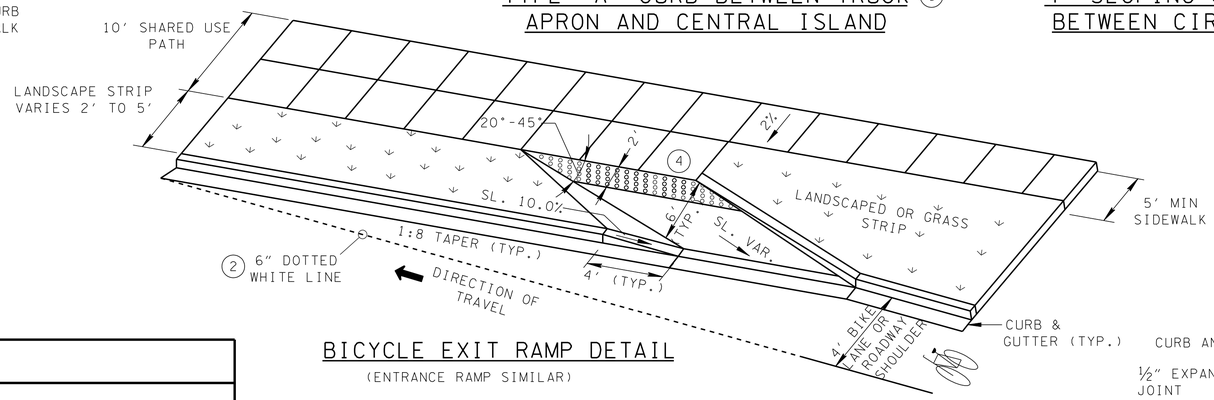
TYPE "A" CURB BETWEEN TRUCK APRON AND CENTRAL ISLAND (6)



4" SLOPING CONCRETE COMBINED CURB AND GUTTER BETWEEN CIRCULATORY ROADWAY AND TRUCK APRON TYPE 4-30R

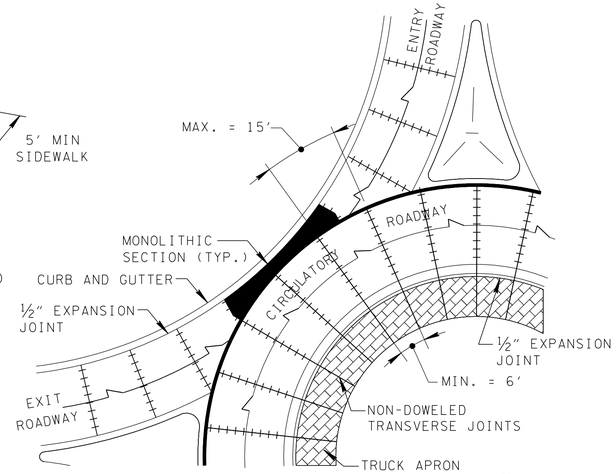


SPLITTER ISLAND CROSSING SECTION A-A



BICYCLE EXIT RAMP DETAIL

(ENTRANCE RAMP SIMILAR)



TYPICAL JOINTING DETAIL FOR CONCRETE PAVEMENT (5)

GENERAL NOTES

(A) 4" SLOPING CONCRETE COMBINED CURB AND GUTTER SHOULD BE USED BETWEEN CIRCULATORY ROADWAY AND TRUCK APRON UNLESS OTHERWISE NOTED. TYPE "A" CURB SHOULD BE USED BETWEEN THE TRUCK APRON AND THE CENTRAL ISLAND.

(B) THE CROSS SLOPE OF THE LANDING AREA SHALL NOT EXCEED 2% IN THE SIDEWALK AREA.

(C) SPLITTER ISLAND SIZE AND SHAPE WILL BE DETERMINED BY THE ROADWAY DEFLECTION.

(D) THE FINISH ON THE TRUCK APRON SHOULD CREATE A CONTRAST IN COLOR OR TEXTURE BETWEEN THE CIRCULATORY ROADWAY AND THE APRON. THIS CAN BE ACCOMPLISHED WITH THE USE OF CONCRETE, STAMPED CONCRETE, COLORED CONCRETE, CONCRETE PAVERS, OR BRICK PAVERS. WHEN PAVERS ARE USED, A BASKETWEAVE OR HERRINGBONE PATTERN SHOULD BE APPLIED.

(E) FOR PAVEMENT MARKINGS AND SIGNAGE AT BICYCLE RAMP AND SHARED USE PATH, SEE STANDARD DRAWING T-M-10.

(F) UNLESS OTHERWISE NOTED ON PLANS, THE CIRCULATORY ROADWAY SHOULD BE CONSTRUCTED OF ASPHALT. THE USE OF CONCRETE PAVEMENT SHALL BE ON A CASE-BY-CASE BASIS.

(G) CONCRETE QUANTITY FOR TYPE 4-30R CURB & GUTTER SHALL BE COMPUTED USING 0.06731 CUBIC YARDS PER LINEAR FOOT. PAYMENT WILL BE AS FOLLOWS:

ITEM NO. 702-01 CONCRETE CURB PER CUBIC YARD
ITEM NO. 702-02 CONCRETE GUTTER PER CUBIC YARD
ITEM NO. 702-03 CONCRETE COMBINED CURB AND GUTTER PER CUBIC YARD

DESIGN NOTES

(1) SPLITTER ISLAND SHOULD BE A RAISED MEDIAN WITH CONCRETE HARDSCAPING (PREFERED). SPLITTER ISLAND SHOULD EXTEND A MINIMUM OF 50' FROM THE YIELD LINE. SEE STANDARD DRAWING RP-H-6 FOR ADDITIONAL DETAILS OF MEDIAN CROSSINGS.

(2) 6" X 2' DOTTED WHITE LINE ALONG ENTIRE LENGTH OF TAPER AT BICYCLE RAMP.

(3) DETECTABLE WARNING SURFACE SHALL BE INSTALLED AT BOTH SIDES OF THE SPLITTER ISLAND PEDESTRIAN REFUGE AREA. SEE STD. DWG. RP-H-3 FOR DETAILS.

(4) DETECTABLE WARNING SURFACE SHALL BE INSTALLED AT THE TOP OF ALL BICYCLE EXIT AND ENTRANCE RAMPS, SEE STD. DWG. RP-H-3 FOR DETAILS.

(5) WHEN CIRCULATORY ROADWAY IS CONCRETE, THE TRANSVERSE CONTRACTION JOINTS SHOULD LINE UP WITH CONTRACTION JOINTS IN THE TRUCK APRON. THE JOINTS IN THE TRUCK APRON SHOULD NOT BE DOWELED. THE COMBINED CURB AND GUTTER SHOULD BE TIED TO THE ROADWAY CONCRETE.

(6) FOR ADDITIONAL DETAILS OF TYPE "A" CURB, SEE STANDARD DRAWING RP-NMC-10.

JOINT SYMBOLS

¾" EXPANSION JOINT

TRANSVERSE CONTRACTION

LONGITUDINAL CONTRACTION OR LONGITUDINAL CONSTRUCTION

STATE OF TENNESSEE
DEPARTMENT OF TRANSPORTATION

STANDARD CONSTRUCTION DETAILS FOR ROUNDABOUTS

4-28-10 | RP-R-2