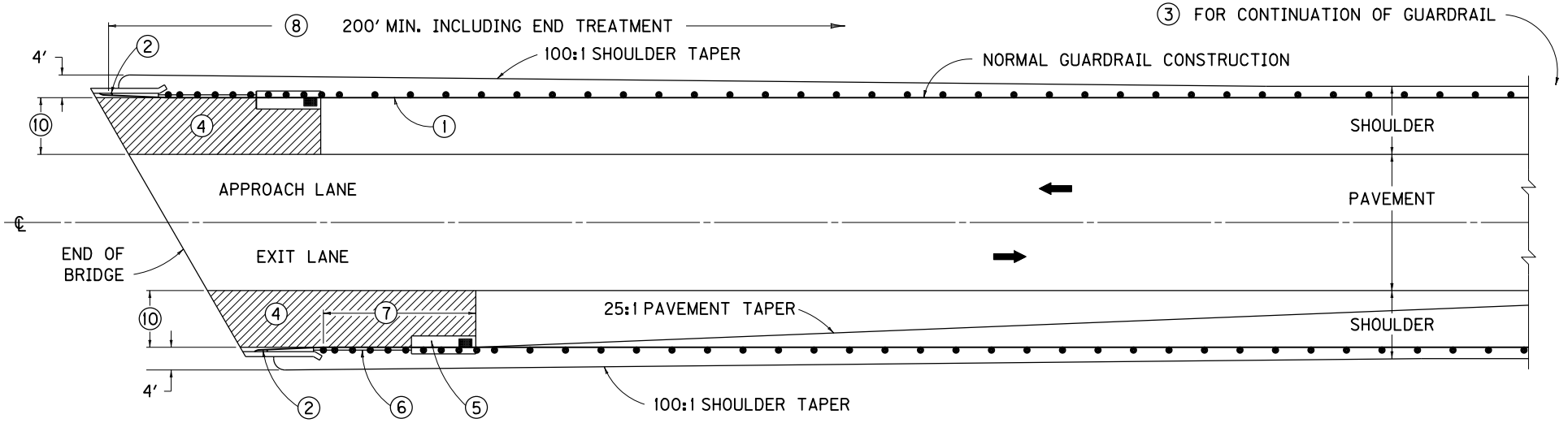


~ NOTES ~

⑦ VARIABLE LENGTH, SEE APPLICABLE "BRIDGE END CONNECTOR" DRAWINGS.

⑧ SHOWN FOR FILL CONDITION. LENGTH MAY BE REDUCED SHOULD FIELD CONDITIONS WARRANT.

9. TO TERMINATE GUARDRAIL INSTALLATION:
   A. ALL FILLS; ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 1 OR 4A.
   B. SOLID ROCK CUTS WITHOUT ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 2A.
   C. EARTH CUTS AND SOFT ROCK CUTS, USE END TREATMENT TYPE 3.

⑩ WHEN THIS DIMENSION IS 6'-0" OR LESS USE ISLAND CURB AND GUTTER AND SAME PAVEMENT AS SHOWN ON MAINLINE DESIGN, (SEE DETAIL A).

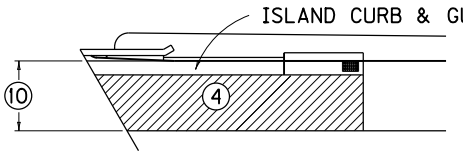
11. NO ANGLES PERMITTED IN NORMAL GUARDRAIL ALIGNMENT.

12. THIS ILLUSTRATION IS FOR TWO-WAY TRAFFIC FLOW. FOR ONE-WAY TRAFFIC FLOW, MAKE THE FOLLOWING ALTERATIONS:

APPROACH END OF STRUCTURE-
A. NO PAVEMENT TAPER REQUIRED
B. ALIGN FACE OF GUARDRAIL WITH STRUCTURE GUTTERLINE

EXIT END OF STRUCTURE-
A. PAVEMENT TAPER REQUIRED FOR BOTH OUTSIDE LANES
B. FOR GUARDRAIL ALIGNMENT SEE BRIDGE END CONNECTOR DRAWINGS

ITEM	STD. DWG. NO. (CURRENT EDITION)
① STEEL W BEAM GUARDRAIL - S FACE	RBR-001
② BRIDGE END CONNECTORS	RBC-SERIES
③ END TREATMENT TYPE 1, 2A, 3 OR 4A (NOTE 9)	RBR-SERIES
DRAINAGE ITEMS (WHEN REQUIRED)	
④ BRIDGE END DRAINAGE AREA (NOTE 10)	
⑤ CURB BOX INLET TYPE B	RDB-SERIES
⑥ ISL. HEADER CURB OR ISL. CURB AND GUTTER	RPM-SERIES



DETAIL A

USE WITH CUR. STD. DWGS. RBC-005, RBC-006, RBR-001

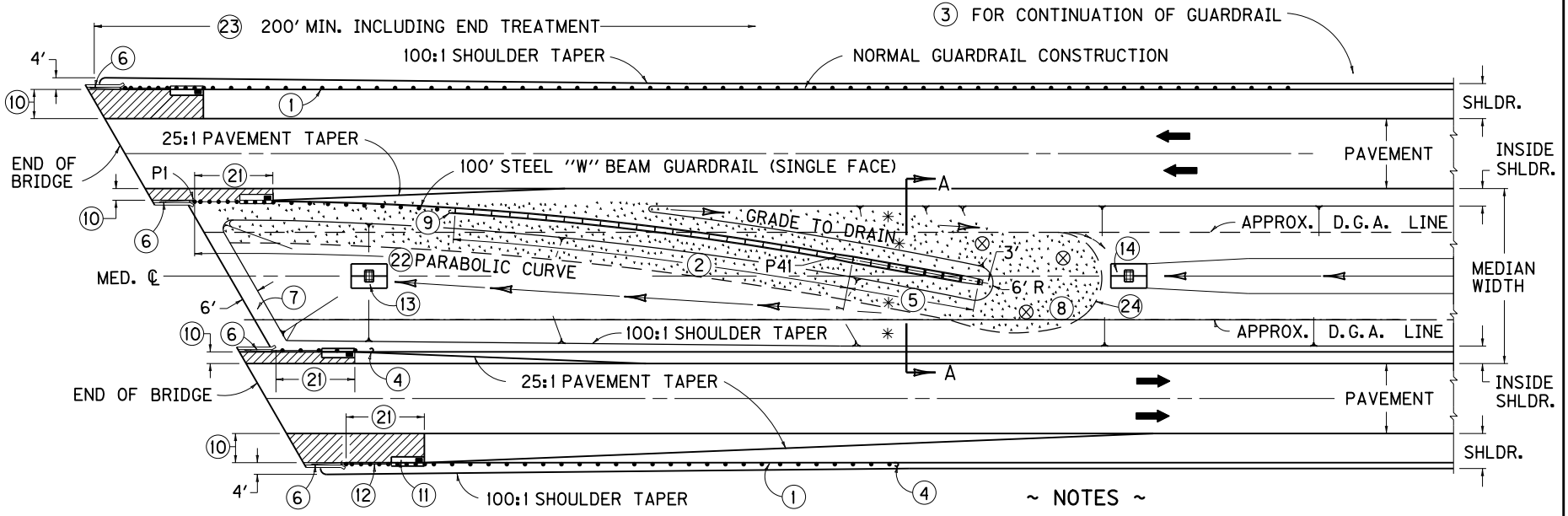
KENTUCKY DEPARTMENT OF HIGHWAYS

GUARDRAIL AND BRIDGE END DRAINAGE FOR SINGLE STRUCTURES

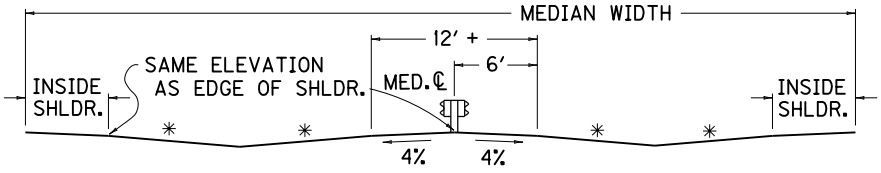
STANDARD DRAWING NO. RBB-001-08

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

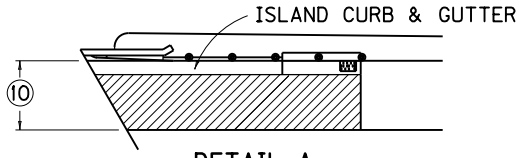
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



ITEM	STD. DWG. NO. (CURRENT EDITION)
(1) STEEL W BEAM GUARDRAIL - S FACE (NOTE 15)	
(2) 137'-6" STEEL W BEAM GUARDRAIL - D FACE	
(3) END TREATMENT TYPE 1, 2A, 3 OR 4A (NOTE 16)	
(4) END TREATMENT TYPE 2A	
(5) CRASH CUSHION TYPE IX-A	RBE-SERIES
(6) BRIDGE END CONNECTORS	RBC-SERIES
(7) 6' EARTH DIKE	RGX-SERIES
(8) GUARDRAIL EARTH BERM (NOTE 17)	
(9) TERMINAL SECTION NO. 1	RBR-SERIES
DRAINAGE ITEMS (WHEN REQUIRED)	
(10) BRIDGE END DRAINAGE AREA (NOTE 18) (TYP.)	
(11) CURB BOX INLET TYPE B	RDB-SERIES
(12) ISL. HEADER CURB OR ISL. CURB AND GUTTER	RPM-SERIES
(13) DROP BOX INLET (NOTE 19)	RDB-SERIES
(14) DROP BOX INLET (NOTE 20)	



SECTION A-A



DETAIL A

✳ SLOPES 12:1 DESIRABLE, 6:1 MINIMUM
⊗ SLOPES 12:1 OR FLATTER REQUIRED

~ NOTES ~

15. NO ANGLES PERMITTED IN NORMAL GUARDRAIL ALIGNMENT.
16. TO TERMINATE GUARDRAIL INSTALLATION:
    A. ALL FILLS; ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 1 OR 4A.
    B. SOLID ROCK CUTS WITHOUT ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 2A.
    C. EARTH CUTS AND SOFT ROCK CUTS, USE END TREATMENT TYPE 3.
17. USE ROADWAY OR BORROW EXCAVATION, OR EMBANKMENT IN PLACE.
18. WHEN THIS DIMENSION IS 6'-0" OR LESS USE ISLAND CURB AND GUTTER AND SAME PAVEMENT AS SHOWN ON MAINLINE DESIGN, (SEE DETAIL A).
19. FLATTEN SLOPES AND ELIMINATE INLET WHEN MEDIAN SLOPES AWAY FROM BRIDGE. (SEE PLANS FOR TYPE)
20. LOCATE AS CLOSE TO GUARDRAIL AS SLOPE WILL PERMIT. (SEE PLANS FOR TYPE)
21. VARIABLE LENGTH. SEE APPLICABLE "BRIDGE END CONNECTOR" DRAWINGS (RBC SERIES).
22. SEE STD. DWG. RBB-003, CURRENT EDITION, FOR MEDIAN GUARDRAIL POST ALIGNMENT.
23. SHOWN FOR FILL CONDITION. REDUCE LENGTH SHOULD FIELD CONDITIONS WARRANT.
24. ROUND SLOPES IN ACCORDANCE WITH CURRENT STD. DWG. RGX-001.

USE WITH CUR. STD. DWGS. RBB-003, RBC-005, RBC-006

KENTUCKY DEPARTMENT OF HIGHWAYS

GUARDRAIL AND BRIDGE END DRAINAGE FOR TWIN STRUCTURES

STANDARD DRAWING NO. RBB-002-09

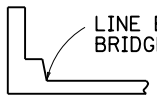
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE

CALCULATIONS FOR MEDIAN GUARDRAIL LOCATION (DEPRESSED MEDIANS)

POST NUMBER	36′		40′		50′		60′		64′		84′	
	DISTANCE	OFFSET	DISTANCE	OFFSET	DISTANCE	OFFSET	DISTANCE	OFFSET	DISTANCE	OFFSET	DISTANCE	OFFSET
P_1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
P_9	25.0	0.1	25.0	0.1	25.0	0.2	25.0	0.2	25.0	0.3	25.0	0.4
P_{13}	50.0	0.5	50.0	0.6	50.0	0.8	50.0	1.0	50.0	1.1	50.0	1.5
P_{17}	75.0	1.1	75.0	1.3	75.0	1.8	75.0	2.2	75.0	2.4	74.9	3.3
P_{21}	100.0	2.0	100.0	2.3	99.9	3.1	99.9	3.9	99.9	4.3	99.8	5.9
P_{25}	124.9	3.2	124.9	3.7	124.9	4.9	124.8	6.2	124.8	6.7	124.6	9.2
P_{29}	149.9	4.6	149.9	5.3	149.8	7.1	149.7	8.9	149.6	9.6	149.2	13.2
P_{33}	174.9	6.2	174.8	7.2	174.6	9.6	174.4	12.1	174.4	13.0	173.8	17.9
P_{37}	199.8	8.1	199.7	9.4	199.5	12.6	199.2	15.8	199.0	17.0	198.2	23.4
P_{41}	224.7	10.3	224.6	11.9	224.3	15.9	223.8	19.9	223.6	21.5	222.4	29.5

DISTANCE IN ABOVE CHART REFERS TO POINTS ALONG AN EXTENDED LINE AT VARIOUS DISTANCES IN FEET FROM A POINT ON FACE OF GUARDRAIL AT LOCATION OF CENTERLINE OF POST NUMBER P1.
OFFSET REFERS TO DISTANCE IN FEET AT 90 DEGREES FROM POINTS ALONG AN EXTENDED LINE TO FACE OF GUARDRAIL AT CORRESPONDING LISTED POST NUMBER.



LINE EXTENDED FROM THIS POINT ON GUTTERLINE OF BRIDGE PARALLELING EDGE OF PAVEMENT.

USE WITH CURRENT STD. DWG.
RBB-002

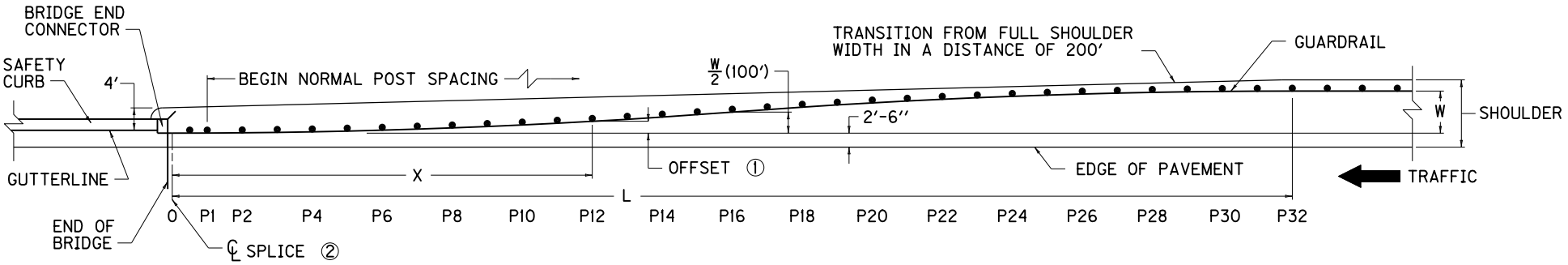
KENTUCKY
DEPARTMENT OF HIGHWAYS

LAYOUT OF GUARDRAIL AT TWIN STRUCTURES (DEPRESSED MEDIAN)

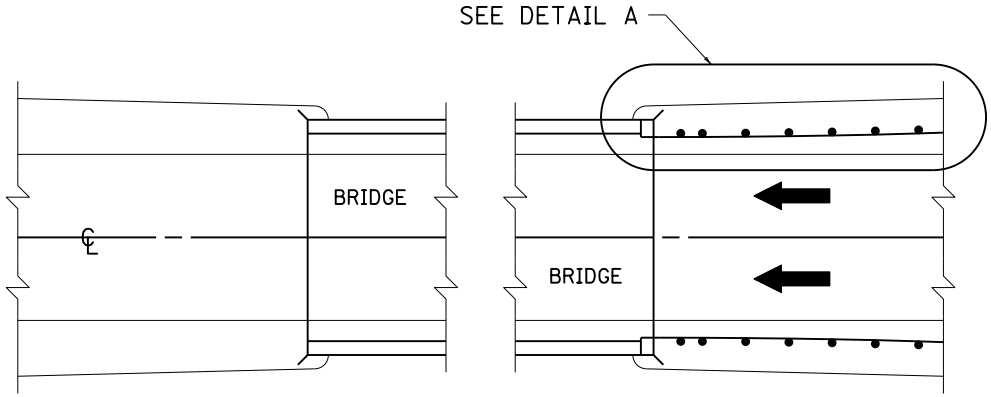
STANDARD DRAWING NO. RBB-003-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



DETAIL A



PLAN VIEW

GUARDRAIL
FLARE DIMENSIONS

POST NUMBER	DISTANCE	OFFSET
	FEET	
0	0	0
P1	12.5	0.01
P2	12.5	0.06
P4	25.0	0.23
P6	37.5	0.53
P8	50.0	0.94
P10	62.5	1.46
P12	75.0	2.11
P14	87.5	2.87
P16	100.0	3.75
P18	112.5	4.63
P20	125.0	5.39
P22	137.5	6.04
P24	150.0	6.56
P26	162.5	6.97
P28	175.0	7.27
P30	187.5	7.44
P32	200.0	7.50

~ NOTES ~

① OFFSETS SHOWN ARE CALCULATED FROM FACE OF GUARDRAIL (TANGENT EXTENDED FROM BRIDGE). OFFSET DIMENSIONS SHOWN ARE FOR 12 FOOT SHOULDERS, WITH W EQUAL TO 7.5 FEET.

② DISTANCES ARE FROM CENTER LINE OF SPLICE. SEE CURRENT STANDARD DRAWING RBC-002 FOR DETAILS.

3. CALCULATIONS FROM 0 FEET TO 100 FEET ARE BASED ON THE FOLLOWING FORMULA: OFFSET = $\left(\frac{X}{L/2}\right)^2 X \frac{W}{2}$ FROM 100 FEET TO 200 FEET THE PROCEDURE IS AS FOLLOWS, FOR EXAMPLE AT P28: 7.5 FEET MINUS 0.23 FEET = 7.27 FEET, ETC.

4. THE ENGINEER SHALL USE THE OFFSET FORMULA AND CALCULATE OFFSETS NEEDED FOR FIELD CONDITIONS DIFFERENT THAN THAT SHOWN IN THE CHART.

USE WITH CUR. STD. DWG.
RBC-002

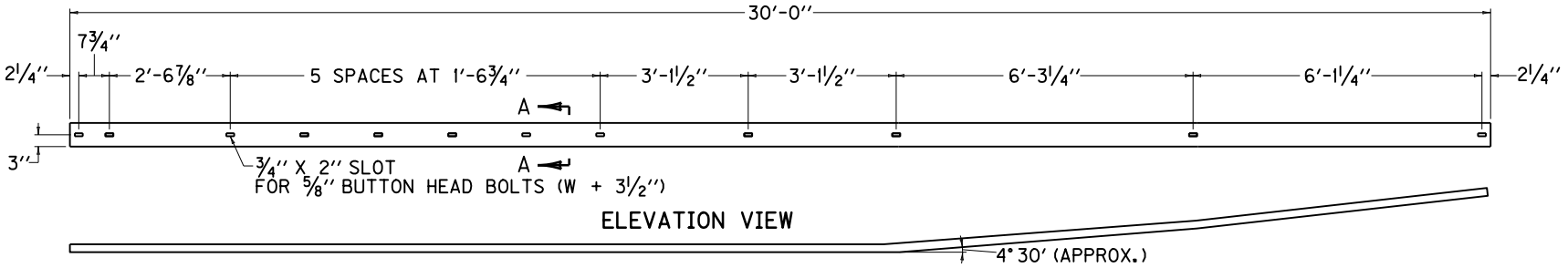
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL TRANSITION FROM NORMAL SHOULDER TO NARROW BRIDGE

STANDARD DRAWING NO. RBB-010-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

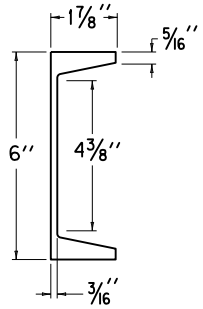
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



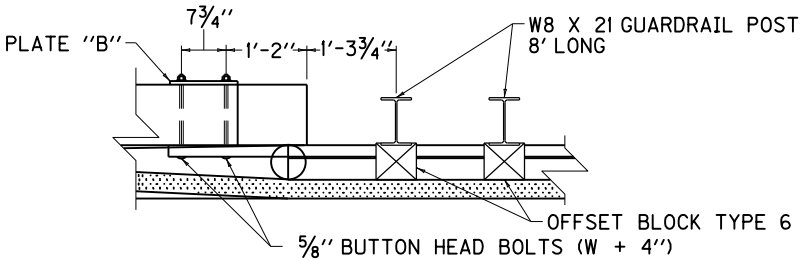
ELEVATION VIEW

PLAN VIEW

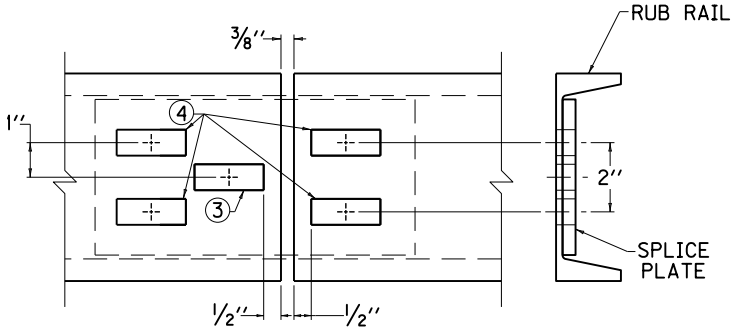
C6 X 8.2 RUB RAIL



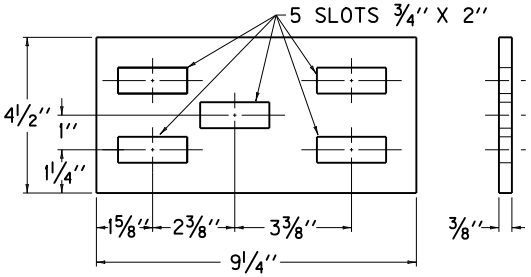
SECTION A-A



RUB RAIL
ATTACHED TO
CONCRETE PARAPET



RUB RAIL SPLICE (TYP.)



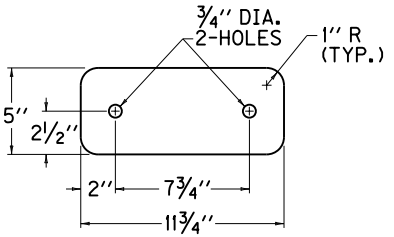
RUB RAIL SPLICE PLATE

~ NOTES ~

1. RUB RAIL IS DETAILED AS ONE CONTINUOUS PIECE, A SPLICE IS PERMITTED PROVIDING IT IS DONE AT A GUARDRAIL POST. SEE "RUB RAIL SPLICE" DETAIL.
2. MATERIAL REQUIREMENTS
   - ALL HARDWARE SHALL BE GALVANIZED. (AASHTO M-232)
   - ⅝" STEEL PLATE "B" (AASHTO M-270)
   - ⅜" STEEL PLATE "RUB RAIL SPLICE PLATE" (AASHTO M-270)
   - ⅝" BUTTON HEAD BOLTS (AASHTO M-180)
   - ⅝" HEAVY HEX NUTS (⅝" THICK) (AASHTO M-291)
   - ⅝" FLAT WASHERS (⅛" THICK) (AASHTO M-293)
   - C6 X 8.2 RUB RAIL (AASHTO M160 AND M270) GRADE 36, GALVANIZED ACCORDING TO AASHTO M111 AFTER PUNCHING AND CUTTING ARE COMPLETE.

③ THIS SLOT FOR BOLTING RAIL AND SPLICE PLATE TO GUARDRAIL POST WITH A ⅝" X 3½" BUTTON HEAD BOLT AND HEX HEAD NUT.

④ THESE SLOTS FOR BOLTING RAIL TO SPLICE PLATE WITH A ⅝" X 1½" BUTTON HEAD BOLT AND HEX HEAD NUT.



⅝" STEEL PLATE "B"

USE WITH CUR. STD. DWG.
RBC-003, RBC-005

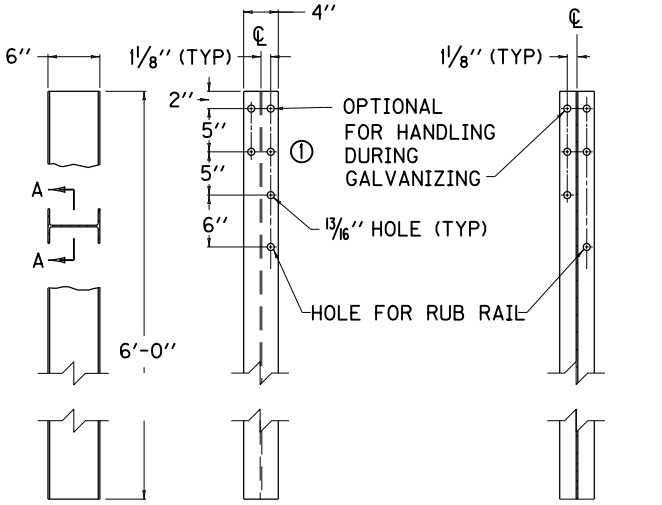
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL CONNECTOR TO BRIDGE END TYPE A COMPONENTS

STANDARD DRAWING NO. RBC-002-03

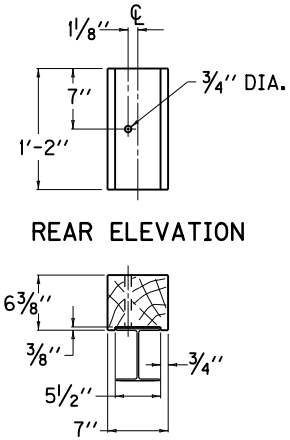
SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN — 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 12-01-15 DATE



~ W6 X 9.0 STEEL GUARDRAIL POST ~

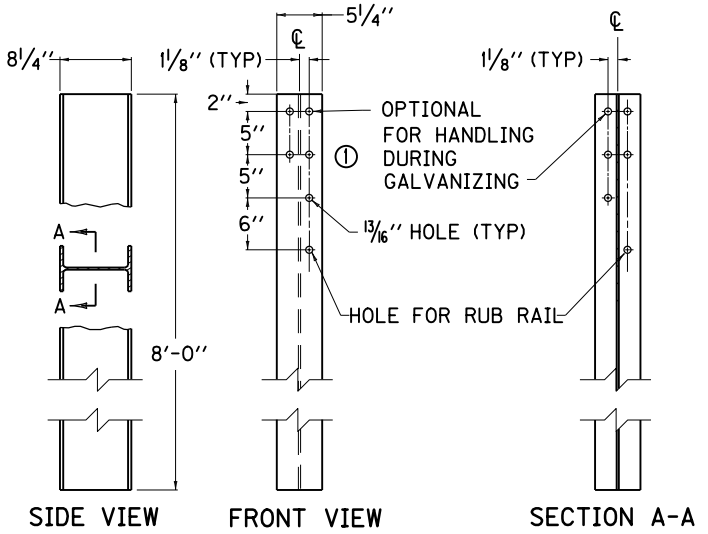
(USED WITH C6 X 8.2 RUB RAIL)



OFFSET BLOCK TYPE 6

(TIMBER)

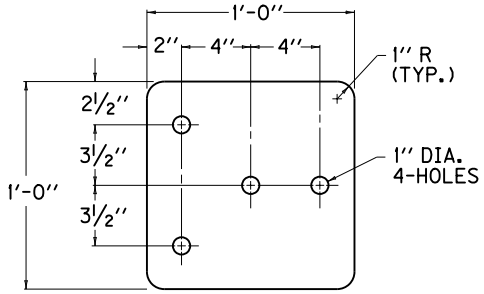
(FOR USE WITH W8 X 21 STEEL POST ONLY)



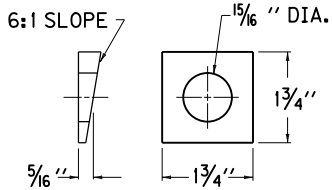
~ W8 X 21 STEEL GUARDRAIL POST ~

~ NOTES ~

① THESE HOLES ARE REQUIRED FOR ATTACHING RAIL.



5⁄8'' STEEL PLATE ''A''



BEVELED WASHER

USE WITH CUR. STD. DWGS.
RBC-002 , RBC-005 , RBC-006

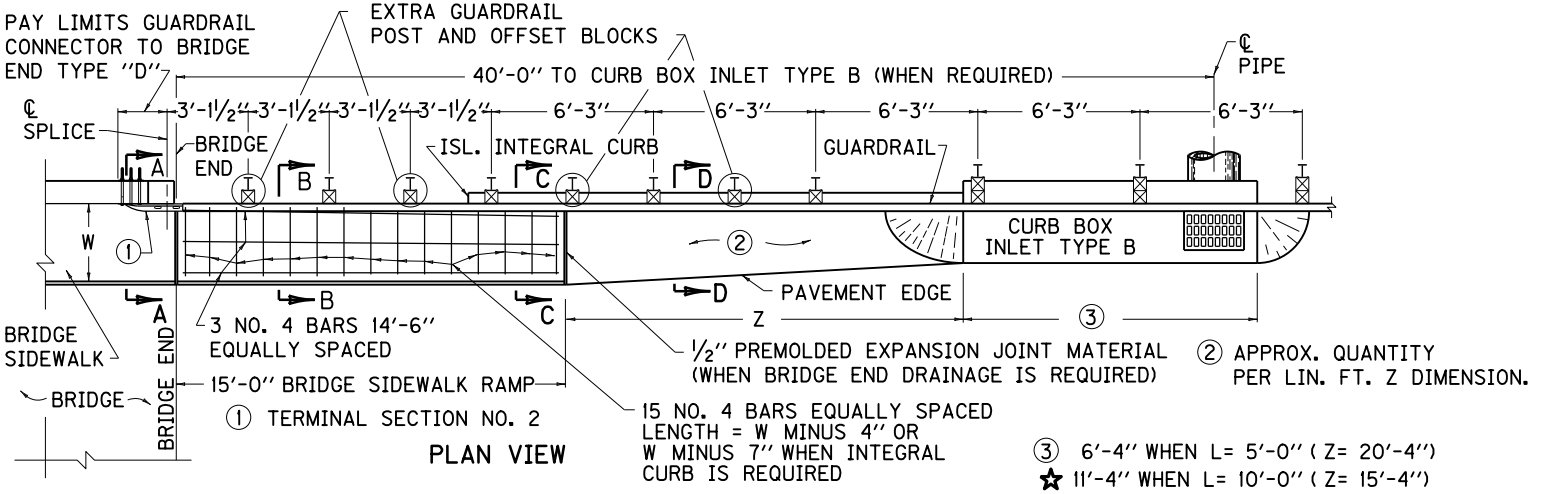
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL CONNECTOR
TO BRIDGE END
TYPE A AND A-1
COMPONENTS

STANDARD DRAWING NO. RBC-003-08

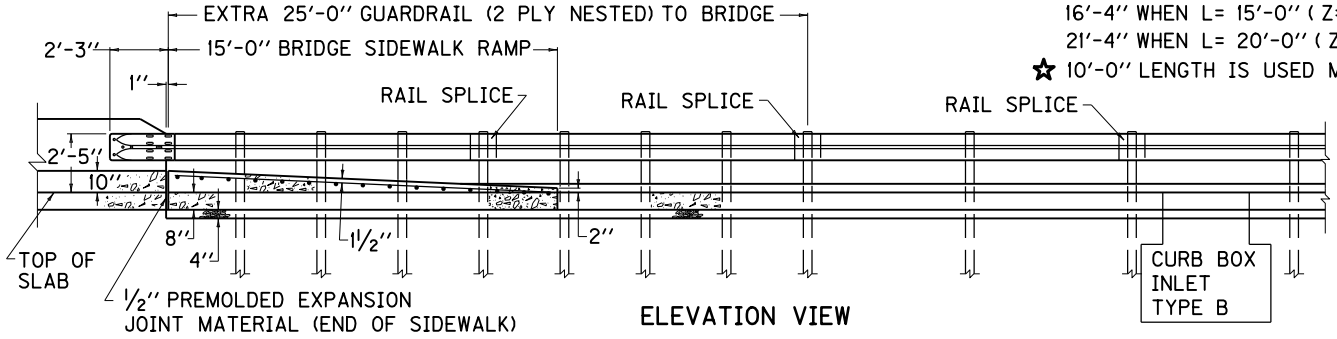
SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

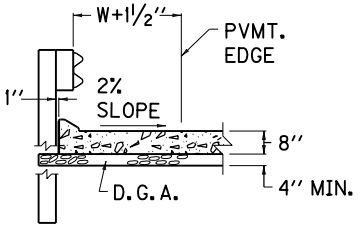
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



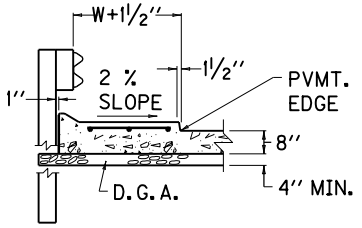
② APPROX. QUANTITY PER LIN. FT. Z DIMENSION.

③ 6'-4" WHEN L= 5'-0" (Z= 20'-4")
★ 11'-4" WHEN L= 10'-0" (Z= 15'-4")
16'-4" WHEN L= 15'-0" (Z= 10'-4")
21'-4" WHEN L= 20'-0" (Z= 5'-4")
★ 10'-0" LENGTH IS USED MOST FREQUENTLY.

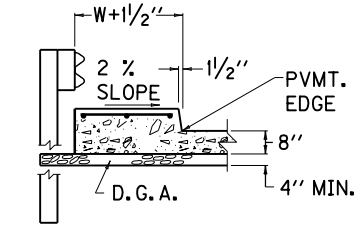




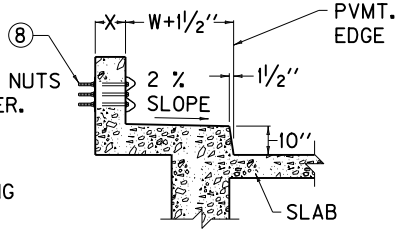
SECTION D-D



SECTION C-C



SECTION B-B



SECTION A-A
(THRU BRIDGE)

~ NOTES ~

4. GUARDRAIL CONNECTOR TO BRIDGE END TYPE "D" SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND SHALL INCLUDE TERMINAL SECTION NO. 2, EXTRA GUARDRAIL POST AND OFFSET BLOCKS, EXTRA GUARDRAIL, BRIDGE SIDEWALK RAMP (INCLUDING CLASS "A" CONCRETE, STEEL REINF. AND STRUCTURE EXCAVATION) ALL COMPLETELY INSTALLED.
5. THIS DRAWING DEPICTS GUARDRAIL CONNECTED TO A POST AT THE END OF THE BRIDGE. WHEN A BRIDGE WING EXTENDS BEYOND THE END OF THE BRIDGE, THE GUARDRAIL SHALL BE MOVED BACK AND CONNECTED IN A CORRESPONDING MANNER.
6. THE GUARDRAIL CONNECTOR TO BRIDGE END TYPE "D" SHALL BE APPLIED ON EACH END OF THE BRIDGE, WHERE A SIDEWALK EITHER EXISTS OR IS PROPOSED, ON THE STRUCTURE AND NOT ON THE ROADWAY. THIS IS ONLY APPLICABLE TO RURAL STRUCTURES THAT HAVE TWO DIRECTIONAL TRAFFIC WITH SIDEWALK.
7. SEE STANDARD DRAWING NO. RBR-SERIES (CURRENT EDITION) FOR ALL OTHER APPLICABLE MATERIAL AND CONSTRUCTION REQUIREMENTS.

BID ITEMS AND UNIT TO BID	
GUARDRAIL CONNECTOR TO BRIDGE END TY D	EACH
ISLAND INTEGRAL CURB (AS REQUIRED)	LF
DGA BASE (AS RQUIRED)	TON
CONCRETE-CLASS A (AS REQUIRED)	CUYD
CURB BOX INLET TYPE B (AS REQUIRED)	EACH

⑧ **CONNECT GUARDRAIL TO BRIDGE END WITH :**
4-⅞" (LTH. = "Z" PLUS 3") HEX HEAD BOLTS OR 4-⅞" (LENGTH = "Z" PLUS 4") STEEL THREADED RODS WITH 4 NUTS FOR THE BOLTS AND 8 NUTS FOR THE RODS AND WITH 8 FLAT WASHERS FOR EITHER.

FORM 1" HOLES FOR THE ⅞" BOLTS WITH PLASTIC PIPE IN PROPOSED BRIDGE ENDS.

DRILL 1" HOLES FOR THE ⅞" BOLTS THROUGH EXISTING BRIDGE ENDS.

BOTH THE ⅞" BOLTS AND STEEL THREADED RODS SHALL HAVE A MINIMUM OF 50,000 LBS. TENSILE STRENGTH AT THEIR NARROWEST POINT.

ALL HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153.

APPROXIMATE QUANTITIES

"W"	SIDEWALK RAMP	GUTTER PAVING	STEEL REINFORCEMENT	ISLAND INTERGAL CURB
	CUBIC YARDS CLASS "A" CONC.		LBS.	LINEAR FEET
2'-6"	1.9	② 0.1	51	19'-6"
3'-0"	2.3		56	
3'-6"	2.7		61	
4'-0"	3.1		66	

USE WITH CUR. STD. DWG. RDB-280

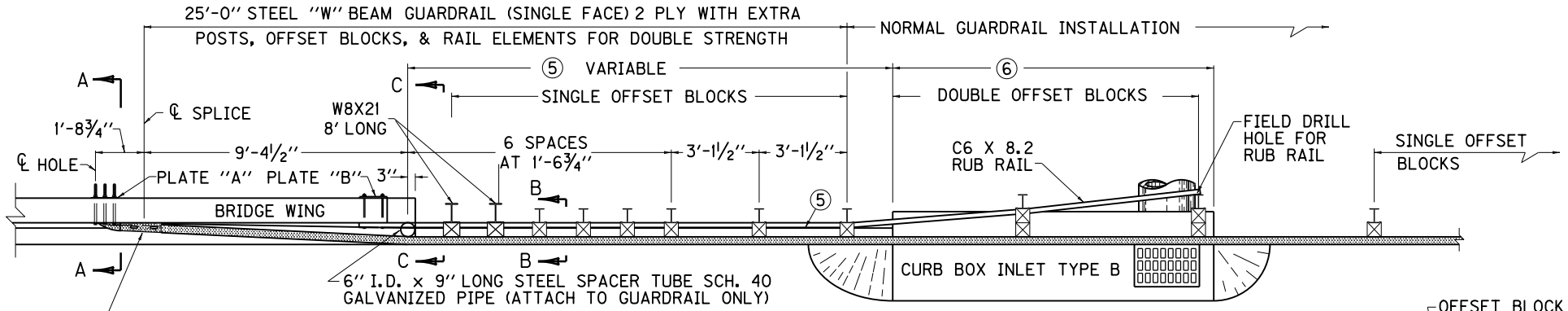
KENTUCKY DEPARTMENT OF HIGHWAYS

GUARDRAIL CONNECTOR TO BRIDGE END TYPE "D"

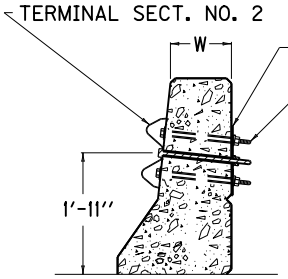
STANDARD DRAWING NO. RBC-004-07

SUBMITTED William S. Hulett DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

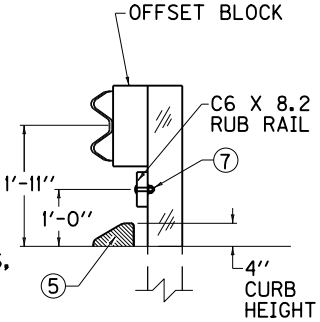
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



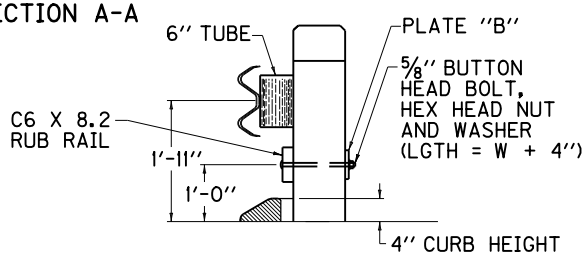
PLAN VIEW



SECTION A-A



SECTION B-B



SECTION C-C

~ NOTES ~

1. GENERAL
   a. SEE CUR. STD. DWGS. IN THE RBB, RBI, RBR, AND RPM-SERIES FOR OTHER RELATED GUARDRAIL DETAILS AND BRIDGE PLANS FOR BRIDGE WING DETAIL.
   b. SEE CUR. STD. DWG. RDB-SERIES FOR CURB BOX INLET TYPE B.
   c. GUARDRAIL CONNECTOR TO BRIDGE END TYPE A IS FOR USE ON BOTH BRIDGE ENDS OF AN UNDIVIDED HIGHWAY AND ON THE APPROACH BRIDGE ENDS OF A DIVIDED HIGHWAY.
2. MATERIAL REQUIREMENTS
   ALL HARDWARE SHALL BE GALVANIZED. (AASHTO M-232)
   ⅝" STEEL PLATE "A" AND "B" (AASHTO M-270)
   ⅞" HEX HEAD BOLTS OR STEEL THREADED RODS (LENGTH AS SHOWN)
   ⅞" HEAVY HEX NUTS (⅞" THICK) (AASHTO M-291)
   ⅞" FLAT WASHERS (3⁄16" THICK) (AASHTO M-293)
   ⅞" BEVELED WASHERS (5⁄16" MEAN THICKNESS) (AASHTO M-293)
   BOTH THE BOLT AND THREADED ROD SHALL HAVE A MINIMUM OF 50,000 LBS. TENSILE STRENGTH AT THE NARROWEST POINT.
3. CONSTRUCTION METHODS
   a. ELIMINATE EXTRA OFFSET BLOCKS WHEN CURB BOX INLET TYPE B IS NOT REQUIRED.
   b. HOLES TO BE FORMED THROUGH BRIDGE WING WITH 1" I.D. PLASTIC PIPE FOR ⅞" BOLTS AND ¾" I.D. PLASTIC PIPE FOR ⅝" BOLTS, PIPE SHALL REMAIN IN PLACE.
4. METHOD OF MEASUREMENT AND BASIS OF PAYMENT
   a. GUARDRAIL CONNECTOR TO BRIDGE END TYPE A SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND INCLUDES: TERMINAL SECTION NO. 2; ALL ITEMS WHICH ARE IN ADDITION TO THE NORMAL INSTALLATION OF STEEL BEAM GUARDRAIL (EXTRA POSTS, OFFSET BLOCKS, RAIL ELEMENTS, SPACER TUBE, HARDWARE, RUB RAIL, ETC.), AND OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION AS DETAILED. STEEL "W" BEAM GUARDRAIL (SINGLE FACE) AND ISLAND HEADER CURB ARE SEPARATE BID ITEMS WHICH ARE ALWAYS REQUIRED. CURB BOX INLET TYPE B IS A SEPARATE BID ITEM THAT WILL BE USED WHEN REQUIRED FOR BRIDGE END DRAINAGE.

   BID ITEMS AND UNIT TO BID

GUARDRAIL CONNECTOR TO BRIDGE END TY A	EACH
GUARDRAIL-STEEL "W" BEAM-S FACE	LF
ISLAND HEADER CURB TYPE 1 OR 2	LF
CURB BOX INLET TYPE B (AS REQUIRED)	EACH

   b. THE PLASTIC PIPE AND COST OF FORMING SHALL BE INCLUDED IN THE UNIT PRICE BID FOR BRIDGE SUPERSTRUCTURE CONCRETE.

⑤ ISLAND HEADER CURB. TRANSITION FROM ISLAND CURB SHAPE TO SHAPE ON BRIDGE WING WITHIN 7'-3". LENGTH OF CURB VARIABLE (22'-3" WHEN L=5'-0") (17'-3" WHEN L=10'-0") (12'-3" WHEN L=15'-0") (7'-3" WHEN L=20'-0"). ON APPROACH END CONSTRUCT 25'-0" OF ISLAND HEADER CURB EVEN WHEN CURB BOX INLET TYPE B IS NOT REQUIRED.

⑥ 6'-4" WHEN L=5'-0"
11'-4" WHEN L=10'-0" ☆
16'-4" WHEN L=15'-0"
21'-4" WHEN L=20'-0"

⑦ ⅝" X 3½" BUTTON HEAD BOLT, HEX HEAD NUT.

8. CURB BOX NOT REQUIRED UNLESS NEEDED FOR DRAINAGE.

☆ 10'-0" LENGTH IS REQUIRED UNLESS OTHERWISE NOTED.

L EQUALS THROAT LENGTH OF BOX.

USE WITH CUR. STD. DWGS.
BHS-008, RBC-002 , RBC-003
RBR-010

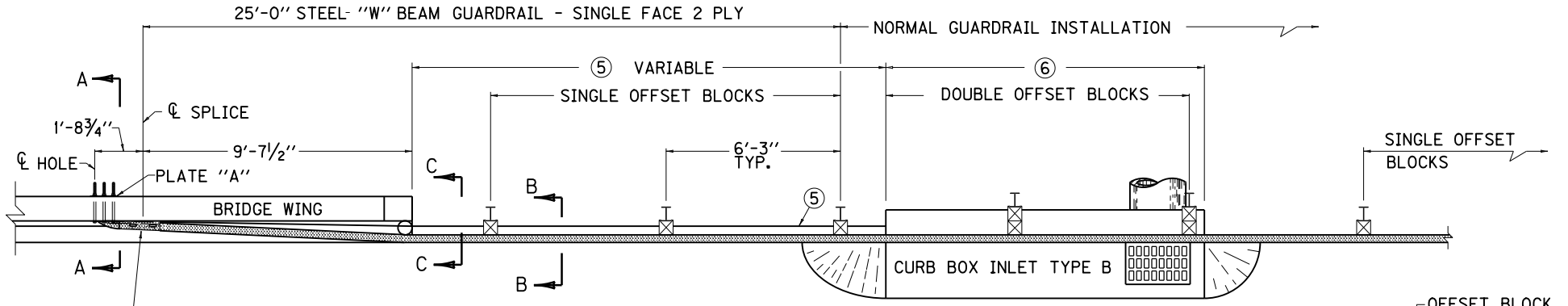
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL CONNECTOR TO BRIDGE END TYPE A

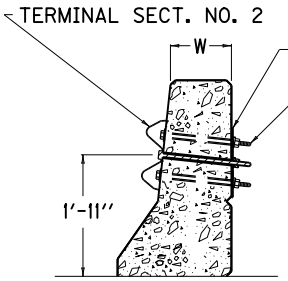
STANDARD DRAWING NO. RBC-005

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

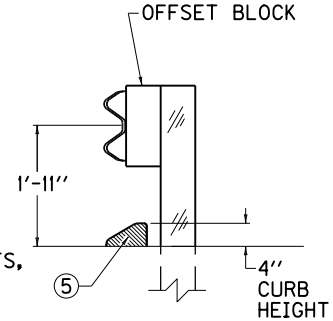
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



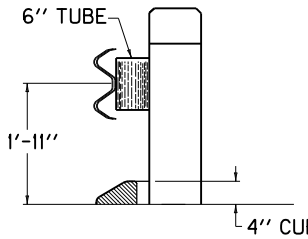
PLAN VIEW



SECTION A-A



SECTION B-B



SECTION C-C

~ NOTES ~

1. GENERAL
   a. SEE CUR. STD. DWGS. IN THE RBB, RBI, RBR, AND RPM-SERIES FOR OTHER RELATED GUARDRAIL DETAILS AND BRIDGE PLANS FOR BRIDGE WING DETAIL.
   b. SEE CUR. STD. DWG. RDB-SERIES FOR CURB BOX INLET TYPE B.
   c. GUARDRAIL CONNECTOR TO BRIDGE END TYPE A-1 IS FOR USE ON THE EXIT END OF A DIVIDED HIGHWAY.
2. MATERIAL REQUIREMENTS
   ALL HARDWARE SHALL BE GALVANIZED. (AASHTO M-232)
   ⅝" STEEL PLATE "A" (AASHTO M-270)
   ⅞" HEX HEAD BOLTS OR STEEL THREADED RODS (LENGTH AS SHOWN)
   ⅞" HEAVY HEX NUTS (⅞" THICK) (AASHTO M-291)
   ⅞" FLAT WASHERS (3⁄16" THICK) (AASHTO M-293)
   ⅞" BEVELED WASHERS (5⁄16" MEAN THICKNESS) (AASHTO M-293)
   BOTH THE BOLT AND THREADED ROD SHALL HAVE A MINIMUM OF 50,000 LBS. TENSILE STRENGTH AT THE NARROWEST POINT.
3. CONSTRUCTION METHODS
   a. ELIMINATE EXTRA OFFSET BLOCKS WHEN CURB BOX INLET TYPE B IS NOT REQUIRED.
   b. HOLES TO BE FORMED THROUGH BRIDGE WING WITH 1" I.D. PLASTIC PIPE FOR ⅞" BOLTS. PLASTIC PIPE SHALL REMAIN IN PLACE.
4. METHOD OF MEASUREMENT AND BASIS OF PAYMENT
   a. GUARDRAIL CONNECTOR TO BRIDGE END TYPE A-1 SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, WHICH INCLUDES TERMINAL SECT. NO. 2, RAIL ELEMENTS, SPACER TUBE, HARDWARE AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION. STEEL "W" BEAM GUARDRAIL (SINGLE FACE) AND ISLAND HEADER CURB ARE SEPARATE BID ITEMS WHICH ARE ALWAYS REQUIRED. CURB BOX INLET TYPE B IS A SEPARATE BID ITEM THAT WILL BE USED WHEN REQUIRED FOR BRIDGE END DRAINAGE.

BID ITEMS AND UNIT TO BID	
GUARDRAIL CONNECTOR TO BRIDGE END TY A-1	EACH
GUARDRAIL-STEEL "W" BEAM-S FACE	LF
ISLAND HEADER CURB TYPE 1 OR 2	LF
CURB BOX INLET TYPE B (AS REQUIRED)	EACH

   b. THE PLASTIC PIPE AND COST OF FORMING SHALL BE INCLUDED IN THE UNIT PRICE BID FOR BRIDGE SUPERSTRUCTURE CONCRETE.

⑤ ISLAND HEADER CURB. TRANSITION FROM ISLAND CURB SHAPE TO SHAPE ON BRIDGE WING WITHIN 7'-3". LENGTH OF CURB VARIABLE (22'-3" WHEN L=5'-0") (17'-3" WHEN L=10'-0") (12'-3" WHEN L=15'-0") (7'-3" WHEN L=20'-0"). ON THE APPROACH END CONSTRUCT 25'-0" OF ISLAND HEADER CURB EVEN WHEN CURB BOX INLET TYPE B IS NOT REQUIRED.

⑥ 6'-4" WHEN L=5'-0"
11'-4" WHEN L=10'-0" ☆
16'-4" WHEN L=15'-0"
21'-4" WHEN L=20'-0"

7. CURB BOX NOT REQUIRED UNLESS NEEDED FOR DRAINAGE.

☆ 10'-0" LENGTH IS REQUIRED UNLESS OTHERWISE NOTED.

L EQUALS THROAT LENGTH OF BOX.

USE WITH CUR. STD. DWGS. BHS-008, RBC-002, RBC-003, RBR-010

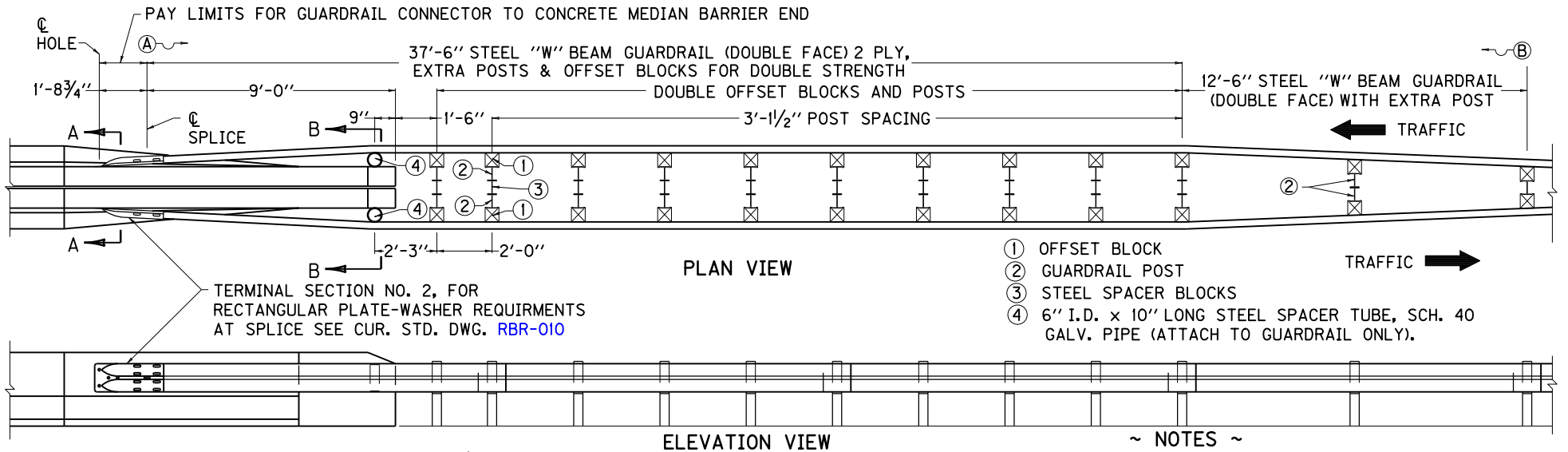
KENTUCKY DEPARTMENT OF HIGHWAYS

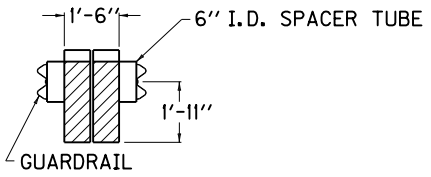
GUARDRAIL CONNECTOR TO BRIDGE END TYPE A-1

STANDARD DRAWING NO. RBC-006

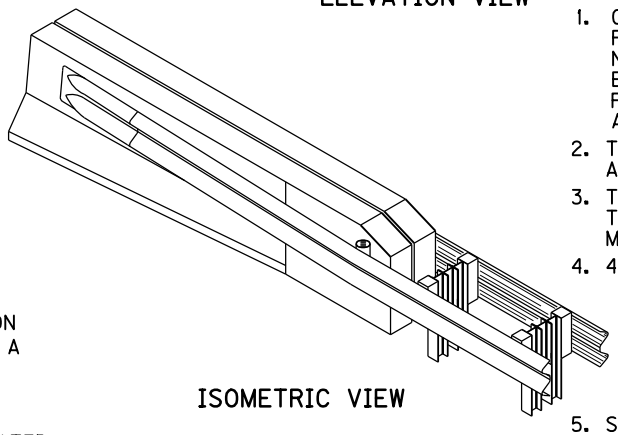
SUBMITTED William S. Hulett DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

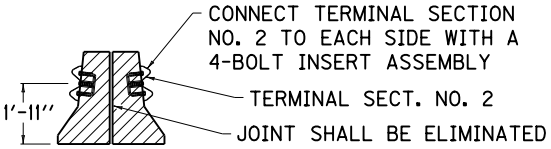




SECTION B-B



ISOMETRIC VIEW



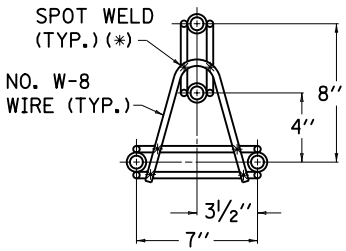
SECTION A-A

~ NOTES ~

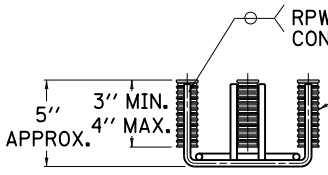
1. GUARDRAIL CONNECTOR TO CONCRETE MEDIAN BARRIER END SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH AND INCLUDES TERMINAL SECTION NO. 2, ADDITIONAL POSTS, ADDITIONAL OFFSET BLOCKS, ADDITIONAL RAIL ELEMENTS, HARDWARE, ETC., AND OTHER INCIDENTALS AS SHOWN BETWEEN POINTS Ⓐ AND Ⓑ NECESSARY TO COMPLETE THE INSTALLATION AS DETAILED.
2. THE STEEL "W" BEAM GUARDRAIL (DOUBLE FACE), IS A SEPARATE BID ITEM AND SHALL BEGIN PAYMENT AT POINT Ⓐ.
3. THE 4-BOLT INSERT ASSEMBLY INSTALLATION SHALL BE INCIDENTAL TO THE COST OF THE BRIDGE SUPERSTRUCTURE CONCRETE OR CONCRETE MEDIAN BARRIER END AS APPLICABLE.
4. 4-BOLT ASSEMBLIES:
   (a) THE ⅞" x 2" CAP SCREWS WITH STANDARD STEEL WASHERS SHALL BE GALVANIZED AND CONFORM TO ASTM A-325.
   (b) NO. W-8 GAGE WIRE, COLD DRAWN CONFORMING TO ASTM A-82.
   (c) STEEL INSERTS SHALL CONFORM TO ASTM A-108 GRADES C1008 AND C1010 OR B1113.
5. SEE CUR. STD. DWGS. IN THE RBI, RBE, AND RBR-SERIES AS APPLICABLE.
6. ▨ SEE BRIDGE PLANS FOR CONSTRUCTION DETAILS WHEN APPLICABLE.

BID ITEMS AND UNIT TO BID	
GUARDRAIL CONNECTOR TO CONCRETE MEDIAN BARRIER END	EACH
GUARDRAIL-STEEL W BEAM-D FACE	LF

FOUR BOLT INSERT ASSEMBLY

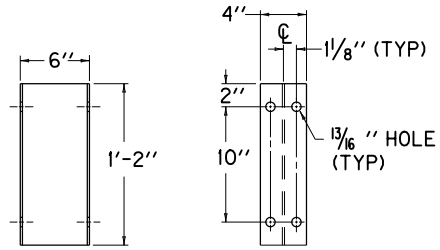


PLAN VIEW



(USE ⅞" x 2" CAP SCREWS)

ELEVATION VIEW



SIDE VIEW FRONT VIEW

SPACER BLOCK (W6 X 9.0)

USE WITH CUR. STD. DWG. RBR-010

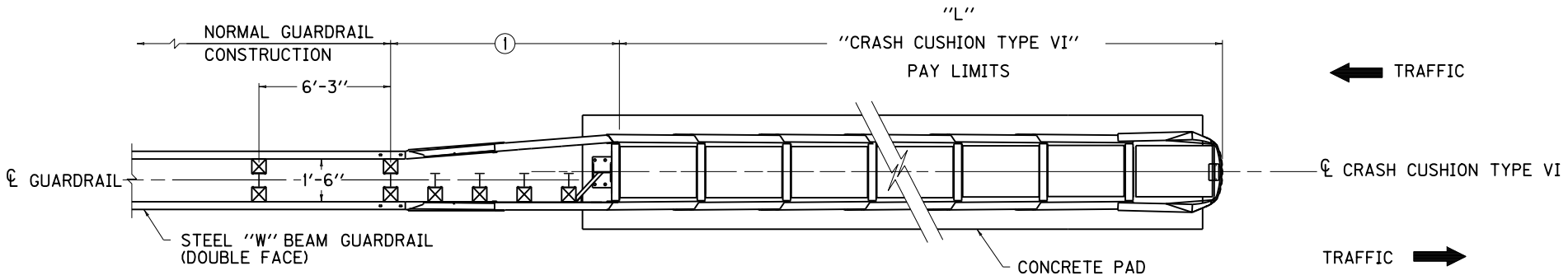
KENTUCKY DEPARTMENT OF HIGHWAYS

GUARDRAIL CONNECTOR TO CONCRETE MEDIAN BARRIER END

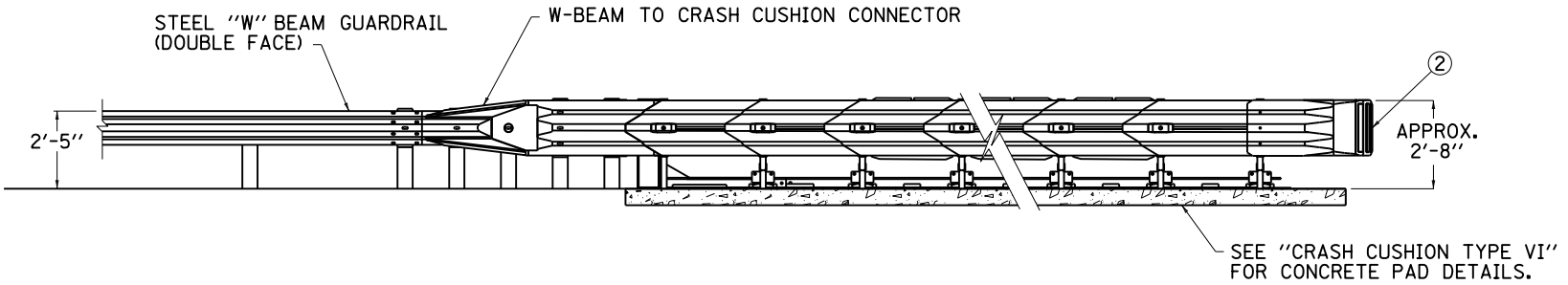
STANDARD DRAWING NO. RBC-100-04

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



~ PLAN ~



~ ELEVATION ~

~ NOTES ~

① ALL HARDWARE, POSTS, OFFSET BLOCKS, ADDITIONAL GUARDRAIL, W-BEAM TO CRASH CUSHION CONNECTOR, LABOR AND INCIDENTALS WITHIN THE TRANSITION LENGTH, AS REQUIRED BY THE CRASH CUSHION MANUFACTURER SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE FOR "CRASH CUSHION TYPE VI ☆ Δ." ΔADD SUFFIX OF 1 TO BID ITEM WHICH DENOTES A BACK-UP SYSTEM OTHER THAN CONCRETE, AS DETAILED ON PLANS AND APPROVED SHOP DRAWINGS.

② OBJECT MARKER TYPE 1, (SEE CURRENT MUTCD MANUAL FOR DETAILS) CENTER HORIZ. AND VERT.

BID ITEM AND UNIT TO BID	
OBJECT MARKER TYPE 1	EACH

USE WITH CUR. STD. DWG.
RBE-060

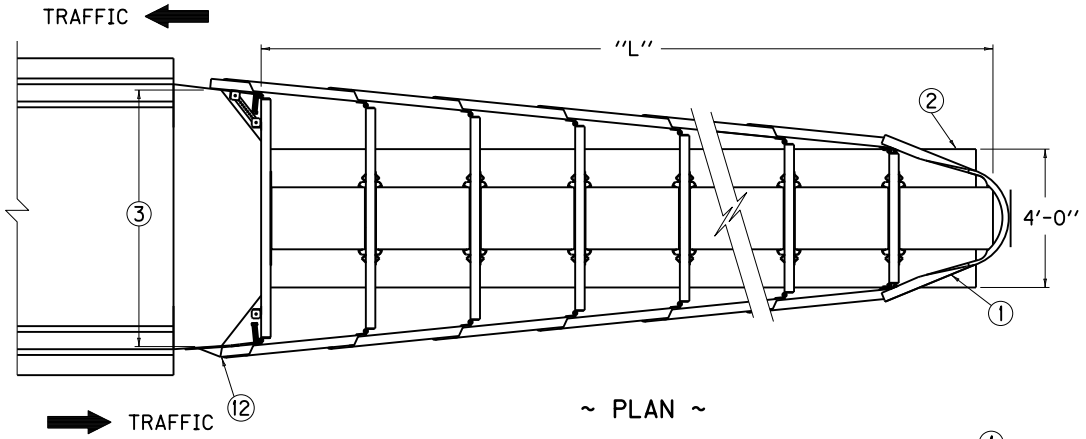
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONNECTION DETAILS OF CRASH CUSHION TYPE VI TO DOUBLE FACE GUARDRAIL

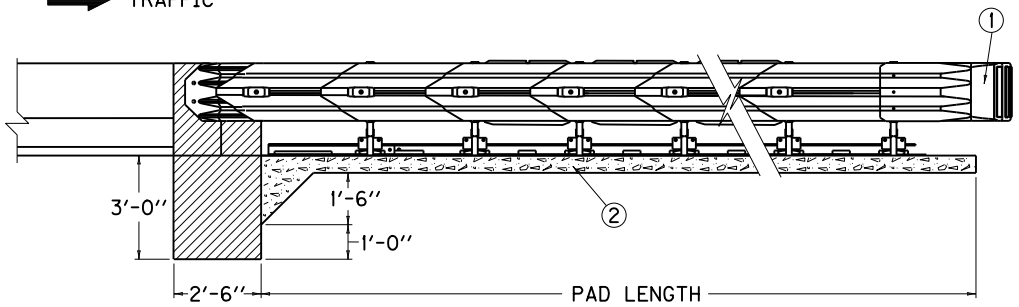
STANDARD DRAWING NO. RBC-110-11

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

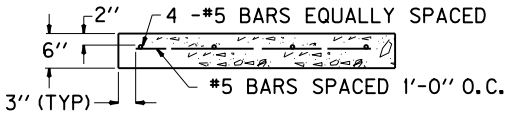
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



~ PLAN ~



~ ELEVATION ~



~ CONCRETE PAD SECTION ~

~ NOTES ~

① NOSE ASSEMBLY (OBJECT MARKER TYPE 1 AS REQUIRED)

② 6" CONCRETE PAD

③ MEDIUM WIDTH = 70 1/2", APPROX. 2.8 CU. YD. CONC. AND 265 LBS. OF STEEL FOR MED. BACKUP.
WIDE WIDTH = 91 1/2", APPROX. 3.8 CU. YD. CONC. AND 299 LBS. OF STEEL FOR WIDE BACKUP.

4. THE CONTRACT UNIT PRICE SHALL BE CRASH CUSHION TYPE VII, CLASS ♠ , ⬡ , △ .
   ♠ CLASS B OR C , AS REQUIRED
   ⬡ TEST LEVEL 2 (TL2) OR TEST LEVEL 3 (TL3), AS REQUIRED.
   △ EITHER M MEDIUM , OR W WIDE , OR S SPECIAL WIDE UNITS
5. THE CONC. PAD SHALL BE REQUIRED ONLY WHEN THE UNIT IS CONSTRUCTED ON NON-RIGID PAVEMENT AND SHALL BE MEASURED AND PAID FOR PER CUBIC YARD OF CLASS "AA" CONC., WHICH SHALL INCLUDE ALL NECESSARY EXCAVATION AND REINFORCING STEEL. THE PAD SHALL BE CURED AND FINISHED AS EITHER SIDEWALK OR PAVEMENT. REAR FOOTINGS AND REAR BACK-UP WALL, EXCEPT ON STRUCTURES, SHALL BE REQUIRED AT ALL INSTALLATIONS, WHICH SHALL BE MEASURED AND PAID FOR AS CLASS "AA" CONCRETE AND SHALL INCLUDE ALL NECESSARY EXCAVATION AND REINFORCING STEEL.
6. THE CROSS SLOPE ON THE PAD OR PAVEMENT SHALL NOT EXCEED 5 PERCENT.
7. WHEN INSTALLED ON A STRUCTURE, DETAILS FOR ANCHORAGE SHALL BE DEVELOPED AND SHOWN ELSEWHERE ON THE PLANS .
8. SPECIAL WIDTH UNITS ARE AVAILABLE FROM THE MANUFACTURERS. WHEN SPECIAL WIDE UNITS ARE REQUIRED DETAILS OF THE UNIT SHALL BE DEVELOPED AND SHOWN ELSEWHERE ON THE PLANS.
9. THE MANUFACTURER SHALL FURNISH TWO (2) SETS OF SHOP PLANS TO THE CONTRACTOR WITH EACH INSTALLATION.
10. CONCRETE PAD AND BELOW GRADE ANCHOR SHALL BE PLACED MONOLITHICALLY.
11. PERMISSABLE ALTERNATES FOR CRASH CUSHION TYPE VII ARE PATENTED ITEMS: QUADGUARD MANUFACTURED BY ENERGY ABSORPTION SYSTEMS, INC. OF CHICAGO, ILL., TRACC MFG. BY TRINITY INDUSTRIES, INC. OF DALLAS, TX., OR SCI PRODUCTS, INC. OF ST. CHARLES, IL.

⑫ END SHOE MAY BE ELIMINATED WITH ONE WAY TRAFFIC.

13. THE CRASH CUSHION TYPE VII MAY ALSO BE UTILIZED FOR TEMPORARY USE AND CONSTRUCTION ZONES (CLASS BT).
14. A CRASH CUSHION TYPE VII CLASS B IS TO BE USED IN AREAS WHERE CRASH HISTORY IS NOT KNOWN TO BE SEVERE.
15. A CRASH CUSHION TYPE VII CLASS C IS CONSIDERED A SEVERE USE CRASH CUSHION.

ADDITIONAL BID ITEMS AND UNIT TO BID

CONCRETE-CLASS AA	CUYD
OBJECT MARKER TYPE 1 (AS REQUIRED)	EACH

CLASS	SPEED (MPH)	ATTENUATOR MODEL	ATTENUATOR PRODUCT NAME	ATTENUATOR LENGTH	APPROX. CU. YD. CONC. FOR PAD	SUGGESTED ADT* RANGE (P.C.P.L.)**
B	45 & LESS	TL2	SHORTRACC	14'-0"	1.12	UP TO 12,000
			3-BAY QUADGUARD	12'-0"	0.87	
	OVER 45	TL3	TRACC	21'-0"	1.63	
			6-BAY QUADGUARD	21'-0"	1.53	
C	OVER 45	TL3	SCI100GM	23'-0"	1.7	8,000 AND OVER
			QUADGUARD ELITE	26'-7"	1.98	

* AVERAGE DAILY TRAFFIC
** PASSENGER CARS PER LANE

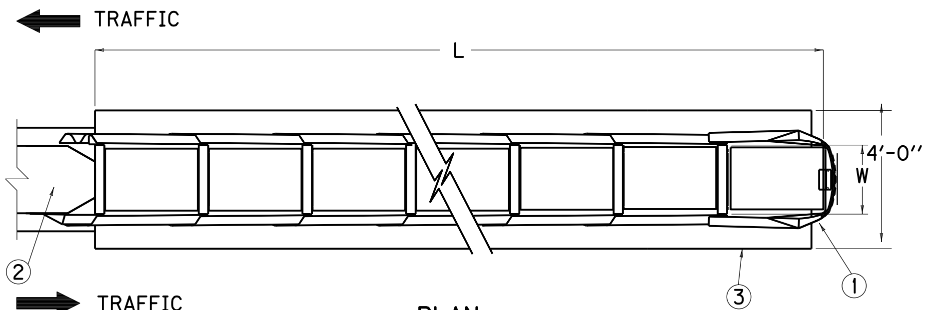
KENTUCKY
DEPARTMENT OF HIGHWAYS

CRASH CUSHION TYPE VII CLASS B AND C (ONE & TWO DIRECTION)

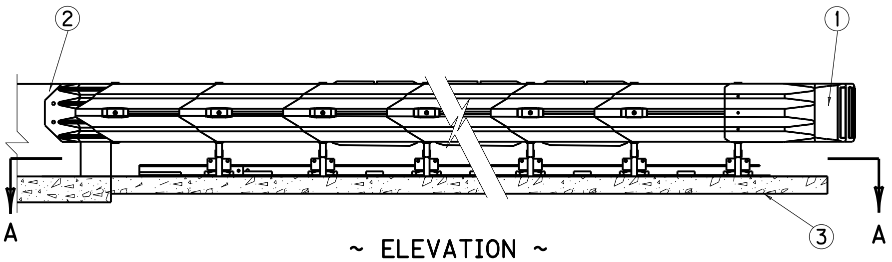
STANDARD DRAWING NO. RBE-040-10

SUBMITTED William S. Hulett — DIRECTOR, DIVISION OF DESIGN — 12-01-15 DATE

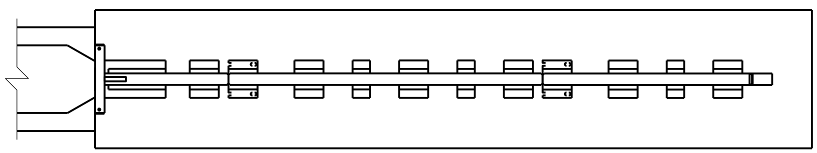
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



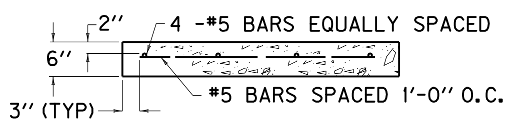
~ PLAN ~



~ ELEVATION ~



~ SECTION A-A ~



~ CONCRETE PAD SECTION ~

~ NOTES ~

① NOSE ASSEMBLY (OBJECT MARKER TYPE 1 AS REQUIRED)

② BACKUP

③ 6" CONCRETE PAD

4. CRASH CUSHION TYPE VI , CLASS ♠ , ☆ , △
   - ♠ CLASS B OR C , AS REQUIRED
   - ☆ EITHER TEST LEVEL 2 (TL2) OR TEST LEVEL 3 (TL3), AS REQUIRED.
   - △ SEE "CONNECTION DETAILS OF CRASH CUSHION TYPE VI TO DOUBLE FACE GUARDRAIL".
5. THE CONCRETE PAD, PAD EXCAVATION AND STEEL REINFORCEMENT, INSTALLED IN PLACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CRASH CUSHION TYPE VI. USE CLASS AA CONCRETE TO CONSTRUCT CONCRETE PAD (SEE CONCRETE PAD SECTION FOR STEEL REQUIREMENTS). THE PAD SHALL BE CURED AND FINISHED AS EITHER SIDEWALK OR PAVEMENT. THE CROSS SLOPE OF THE PAD OR PAVEMENT SHALL NOT EXCEED 5%. THE PAD WILL NOT BE REQUIRED WHEN THE UNIT IS CONSTRUCTED ON RIGID PAVEMENT.
6. CRASH CUSHION TYPE VI MAY BE USED AT THE END OF: CONCRETE MEDIAN BARRIER, BRIDGE PIERS AND STEEL "W" BEAM GUARDRAIL (DOUBLE FACE).
7. WHEN CRASH CUSHION TYPE VI CONNECTS TO: CONCRETE MEDIAN BARRIER OR BRIDGE PIER THE CONTRACT UNIT PRICE SHALL INCLUDE: CRASH CUSHION TYPE VI, ALL HARD-WARE, ADDITIONAL RAIL ELEMENTS, POST, CONCRETE PAD AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION.
8. THIS DRAWING DEPICTS A CONNECTION OF CRASH CUSHION TYPE VI TO CONCRETE MEDIAN BARRIER END. FOR THIS APPLICATION SEE CURRENT STD. DWG. RBE-065 " CONCRETE MEDIAN BARRIER END ".
9. WHEN CRASH CUSHION TYPE VI CONNECTS TO DOUBLE FACE GUARDRAIL SEE CURRENT STD. DWG. RBC-110 "CONNECTION DETAILS OF CRASH CUSHION TYPE VI TO DOUBLE FACE GUARDRAIL".
10. PERMISSABLE ALTERNATES FOR CRASH CUSHION TYPE VI ARE PATENTED ITEMS: QUADGUARD MANUFACTURED BY ENERGY ABSORPTION SYSTEMS, INC. OF CHICAGO, IL., TRINITY INDUSTRIES, INC. OF DALLAS, TX. OR SCI PRODUCTS, INC. OF ST. CHARLES, IL.
11. THE MANUFACTURER SHALL FURNISH TWO (2) SETS OF SHOP PLANS TO THE CONTRACTOR WITH EACH INSTALLATION.
12. THE CRASH CUSHION TYPE VI MAY ALSO BE UTILIZED FOR TEMPORARY USE AND CONSTRUCTION ZONES (CLASS BT).
13. A CRASH CUSHION TYPE VI CLASS B IS TO BE USED IN AREAS WHERE CRASH HISTORY IS NOT KNOWN TO BE SEVERE.
14. A CRASH CUSHION TYPE VI CLASS C IS CONSIDERED A SEVERE USE CRASH CUSHION.

ADDITIONAL BID ITEMS AND UNIT TO BID

OBJECT MARKER TYPE 1 (AS REQUIRED) EACH

CLASS	SPEED (MPH)	ATTENUATOR			APPROX. CU. YD. CONC. FOR PAD	SUGGESTED ADT* RANGE (P.C.P.L.)**
		MODEL	PRODUCT NAME	LENGTH		
B	45 & LESS	TL2	SHORTRACC	14'-0"	1.12	UP TO 12,000
			3-BAY QUADGUARD	12'-0"	0.87	
	OVER 45	TL3	TRACC	21'-0"	1.63	
			6-BAY QUADGUARD	21'-0"	1.53	
C	OVER 45	TL3	SCI100GM	23'-0"	1.7	8,000 AND OVER
			QUADGUARD ELITE	26'-7"	1.98	

W= 2'-0" (INSIDE BAY WIDTH)

* AVERAGE DAILY TRAFFIC
** PASSENGER CARS PER LANE

USE WITH CUR. STD. DWGS. RBE-065, RBC-110

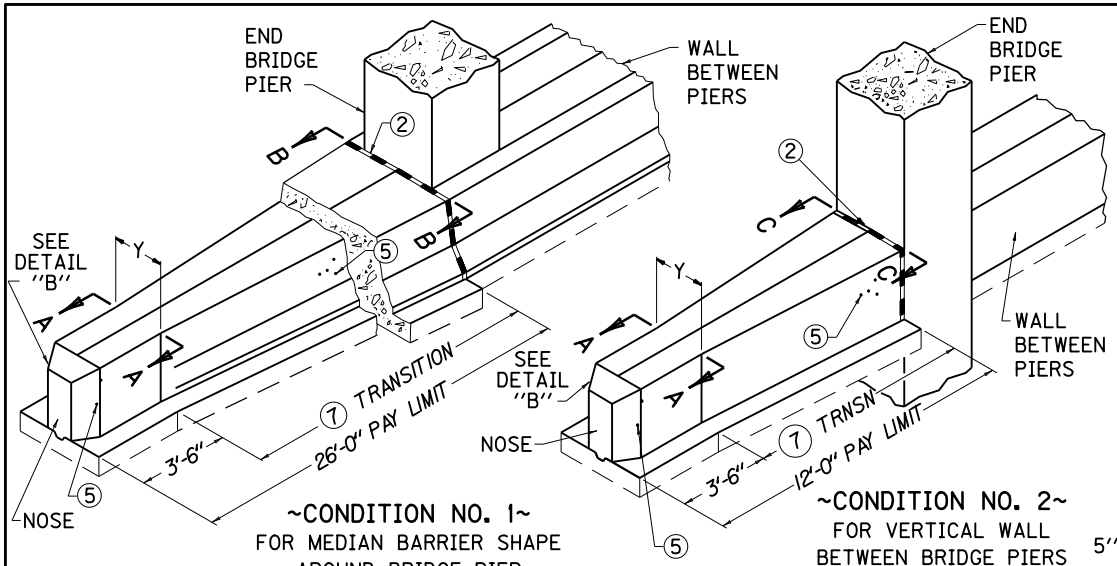
KENTUCKY DEPARTMENT OF HIGHWAYS

CRASH CUSHION TYPE VI ♠ ☆ △ (ONE & TWO DIRECTION)

STANDARD DRAWING NO. RBE-060-14

SUBMITTED [signature] DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED [signature] STATE HIGHWAY ENGINEER 12-01-15 DATE



~CONDITION NO. 1~
FOR MEDIAN BARRIER SHAPE
AROUND BRIDGE PIER

~CONDITION NO. 2~
FOR VERTICAL WALL
BETWEEN BRIDGE PIERS

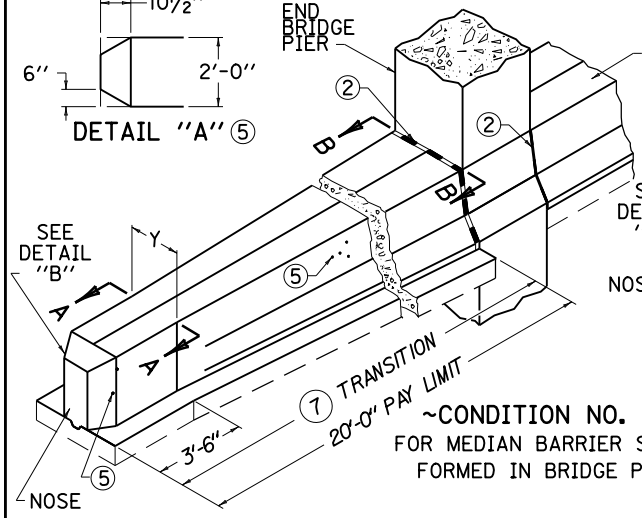
~ NOTES ~

1. THE CONTRACT UNIT PRICE SHALL INCLUDE ALL MATERIALS, TOOLS, FORMS, LABOR, EXCAVATION, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN ACCORDANCE WITH THIS DRAWING.
2. ½" PREMOLDED EXPANSION JOINT MATERIAL REQUIRED.
3. STEEL REINFORCING BARS SHALL BE EVENLY SPACED AS SHOWN AND SHALL BE GRADE 40 MINIMUM.
4. CONCRETE QUANTITIES FOR CONDITION NO.'S. 1, 2, AND 3 ARE BASED ON A BRIDGE PIER WIDTH OF 3'-0".
5. USE DETAIL "A" FOR ENERGY ABSORPTION SYSTEM'S QUADGUARD CRASH CUSHION ALTERNATE. ALL OTHER CONNECTIONS REQUIRE A SQUARE NOSE.
6. Y=2'-0" FOR CRASH CUSHION TYPE VI, AND Y=1'-6" FOR GUARDRAIL CONNECTOR TO CONCRETE MEDIAN BARRIER END.
7. WHEN THE CONCRETE MEDIAN BARRIER END IS PLACED AT A PIER WIDER THAN 3'-0" THE BARRIER END TRANSITION SHALL BE CONSTRUCTED ON A 12:1 MIN. TAPER AND ADDITIONAL CONCRETE AND STEEL QUANTITIES SHALL BE CALCULATED.

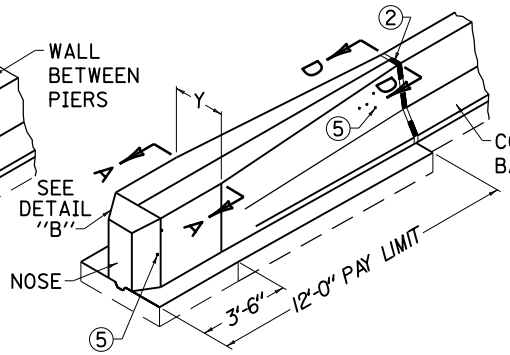
BID ITEMS AND UNIT TO BID:

STEEL REINFORCEMENT	LB
CONCRETE-CLASS A	CUYD

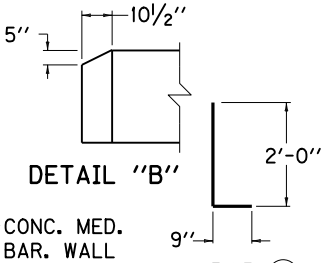
DETAIL "A" ⑤



~CONDITION NO. 3~
FOR MEDIAN BARRIER SHAPE
FORMED IN BRIDGE PIER

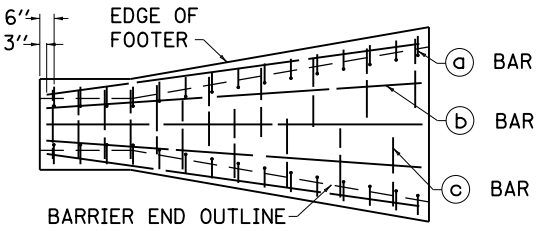


~CONDITION NO. 4~
FOR CONCRETE MEDIAN BARRIER



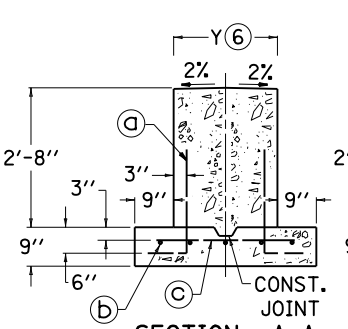
DETAIL "B"

BAR ⓐ

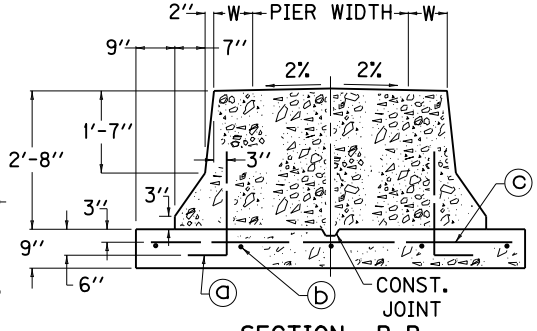


TYPICAL STEEL PLACEMENT

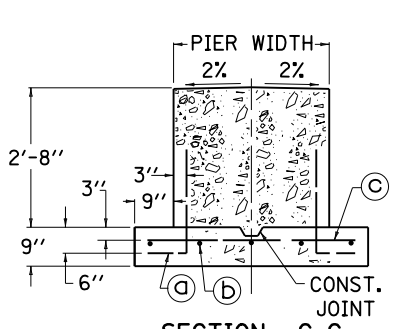
CONDITION NO.	W	NO. 5 STEEL REINFORCEMENT BARS BAR ⓐ QTY.	BAR ⓐ LGTH.	BAR ⓑ QTY.	BAR ⓑ LGTH.	BAR ⓒ QTY.	BAR ⓒ LGTH.	LBS.	CUBIC YARD ④ CLASS "A" CONC. Y=2'-0"	Y=1'-6"
1	6"	52	2'-9"	5	25'-6"	26	2'-8"	354	11.56	10.19
2	-	24			11'-6"	12		163	4.07	3.58
3	-	40			19'-6"	20		272	7.70	6.96
4	9"	24			11'-6"	12		163	3.38	2.89
	12"								3.51	3.03



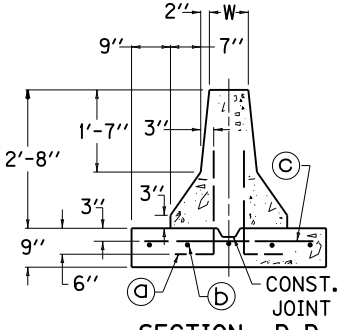
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

USE WITH CUR. STD. DWG.
RBE-060 , RBC-100

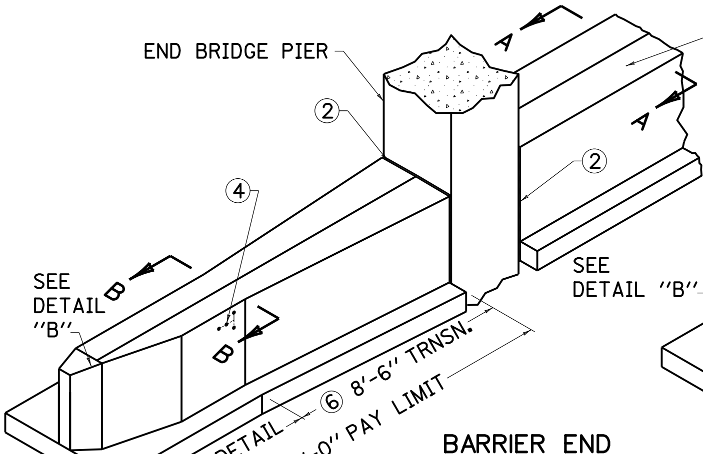
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN BARRIER END

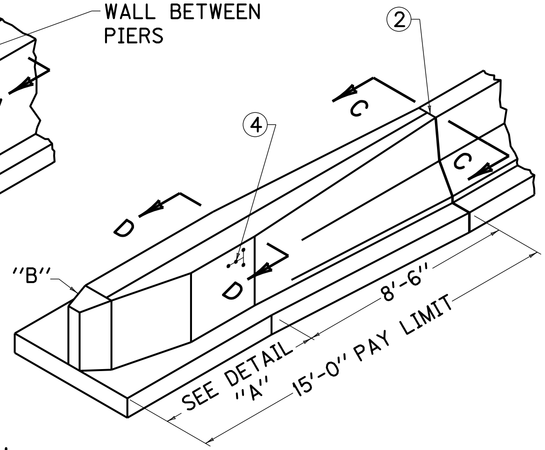
STANDARD DRAWING NO. RBE-065-07

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN — 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 12-01-15 DATE



BARRIER END
FOR VERTICAL WALL
BETWEEN BRIDGE PIERS



BARRIER END
FOR CONCRETE
MEDIAN BARRIER

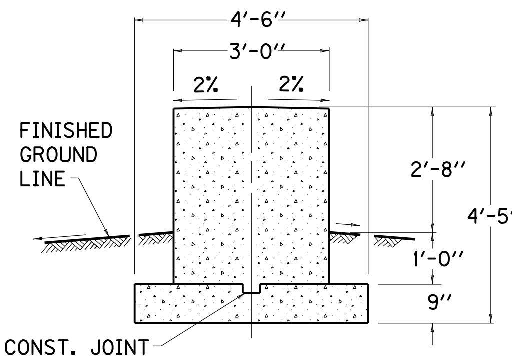
~ NOTES ~

1. THE CONTRACT UNIT PRICE SHALL INCLUDE ALL MATERIALS, TOOLS, FORMS, LABOR, EXCAVATION, AND INCIDENTALS NECESSARY TO COMPLETE THE WORK IN ACCORDANCE WITH THIS DRAWING.
2. ½" PREMOLDED EXPANSION JOINT MATERIAL REQUIRED.
3. STEEL REINFORCING BARS SHALL BE EVENLY SPACED AS SHOWN AND SHALL BE GRADE 40 MINIMUM.
4. 4-BOLT INSERT ASSEMBLIES ARE REQUIRED. (SEE CURRENT STD. DWG. RBC-100 FOR INSERT DETAIL).
5. CONCRETE QUANTITIES AT BRIDGE PIERS ARE BASED ON A BRIDGE PIER WIDTH OF 3'-0".
6. WHEN THE CONCRETE MEDIAN BARRIER END IS PLACED AT A PIER WIDER THAN 3'-0" THE BARRIER END TRANSITION SHALL BE CONSTRUCTED ON A 12:1 MIN. TAPER AND ADDITIONAL CONCRETE AND STEEL QUANTITIES SHALL BE CALCULATED.
7. ALTERNATE END DEPENDENT ON TRAFFIC DIRECTION.

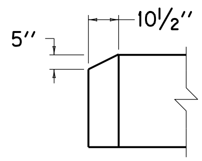
BID ITEMS AND UNIT TO BID	
STEEL REINFORCEMENT	LB
CONCRETE-CLASS A	CUYD

CONDITION	NO. 5 STEEL REINF. BARS						POUNDS OF STEEL	CU. YDS. CLASS "A" CONC.
	(a) BAR		(b) BAR		(c) BAR			
	QTY.	LGTH.	QTY.	LGTH.	QTY.	LGTH.		
BARRIER END AT BRIDGE PIERS	30	2'-9"	5	14'-4"	15	2'-3"	196	(5) 5.73
9" WALL								3.71
12" WALL								3.87
14" WALL								3.96

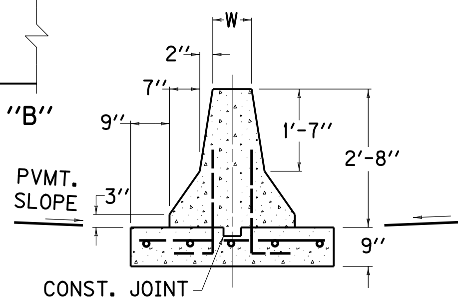
QUANTITIES FOR ONE CONCRETE MEDIAN BARRIER END



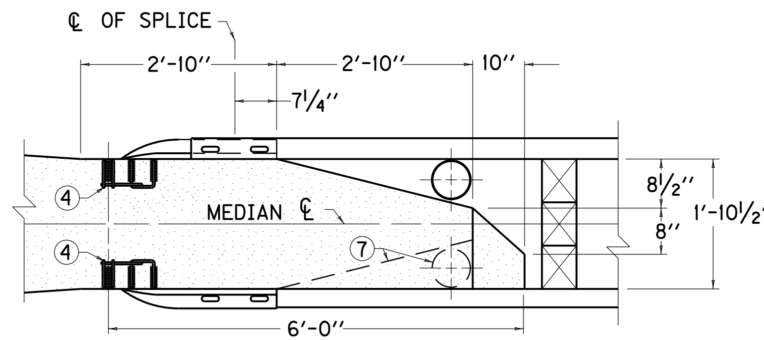
SECTION A-A
(WALL BETWEEN BRIDGE PIERS)



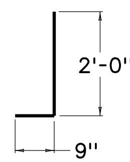
DETAIL "B"



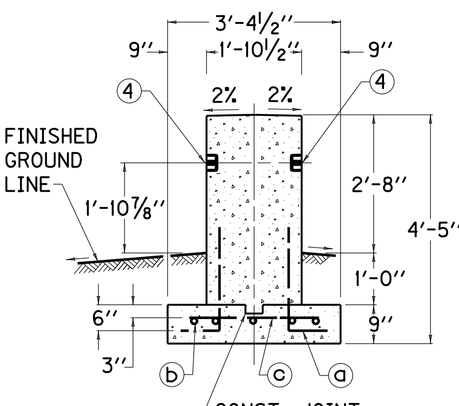
SECTION C-C



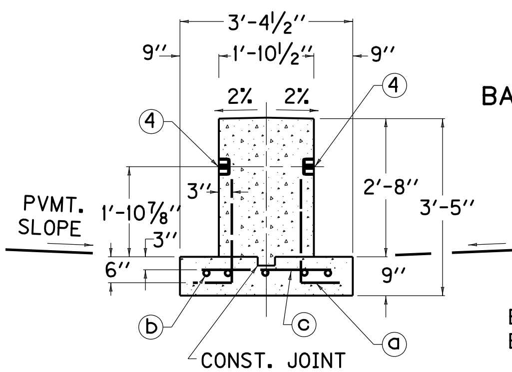
DETAIL "A"



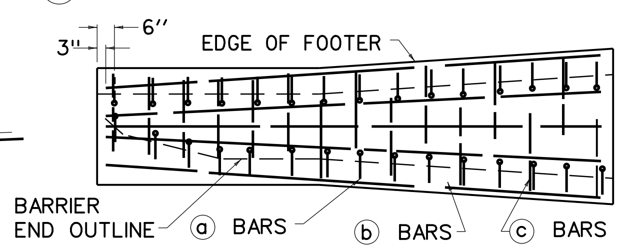
BAR (a) DETAIL



SECTION B-B



SECTION D-D



TYPICAL STEEL PLACEMENT

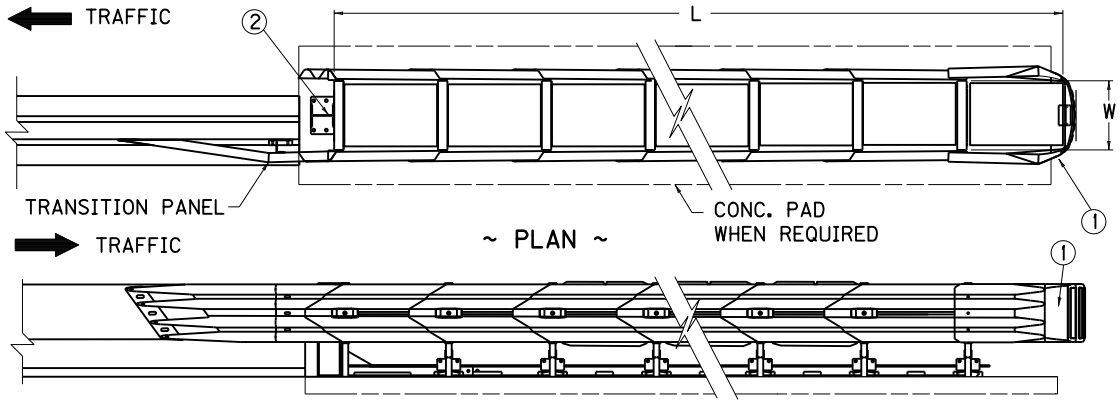
USE WITH CUR. STD. DWG.
RBC-100 , RBE-200

KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN
BARRIER END FOR CRASH
CUSHION TYPE IX

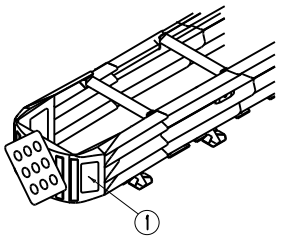
STANDARD DRAWING NO. RBE-070-06

SUBMITTED ______ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE
APPROVED ______ STATE HIGHWAY ENGINEER 12-01-15 DATE

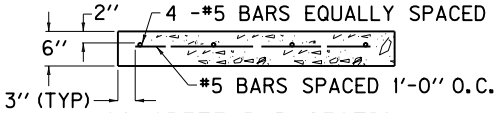


~ PLAN ~

~ ELEVATION ~



~ PICTORIAL VIEW ~



~ CONCRETE PAD SECTION ~
WHEN REQUIRED
(PAD 4'-0'' WIDE x SEE CHART FOR LENGTH)

~ NOTES ~

① NOSE ASSEMBLY (OBJECT MARKER TYPE 1 AS NECESSARY)

② CONSTRUCTION ZONE BACKUP

3. CRASH CUSHION TYPE VI , CLASS B, ☆ , △
   ☆ EITHER TEST LEVEL 2 (TL2) OR TEST LEVEL 3 (TL3), AS REQUIRED.
   △ SEE ''CONNECTION DETAILS OF CRASH CUSHION TYPE VI TO DOUBLE FACE GUARDRAIL''.
4. CRASH CUSHION TYPE VI-BT IS DEPICTED ATTACHED TO A CONCRETE BARRIER (TEMPORARY).
5. WHEN CRASH CUSHION TYPE VI-BT IS ATTACHED TO STEEL ''W'' BEAM GUARDRAIL (DOUBLE FACE), ALL APPLICABLE DETAILS SHOWN ON CUR. STD. DWG. RBC-110 , ''CONNECTION DETAIL OF CRASH CUSHION TYPE VI TO DOUBLE FACE GUARDRAIL'' SHALL BE REQUIRED.
6. WHEN CRASH CUSHION TYPE VI-BT IS ATTACHED TO STEEL ''W'' BEAM GUARDRAIL (DOUBLE FACE), THE TRANSITION PANEL SHALL BE ELIMINATED.
7. IN A TWO-WAY TRAFFIC SITUATION FOR A 6'' OR 9'' TOP WIDTH WALL THE UNIT SHALL BE OFFSET FROM THE CENTERLINE OF THE WALL AS SHOWN IN THE PLAN VIEW. FOR A 12'' TOP WIDTH WALL, THE UNIT SHALL BE CENTERED ON THE END OF THE BARRIER.
8. FOR ONE-WAY APPROACH TRAFFIC THE UNIT SHALL BE CENTERED ON THE END OF THE BARRIER.
9. THE COMPLETE INSTALLATION SHALL MEET ALL APPLICABLE REQUIREMENTS OF ENERGY ABSORPTIONS INC. OR TRINITY INDUSTRIES INC.
10. ANCHORAGE DEVICES TO SECURE THE CRASH CUSHION TO THE EXISTING SURFACE SHALL BE SHOWN ON APPROVED SHOP DRAWINGS.
11. WHEN REQUIRED, THE CONCRETE PAD, PAD EXCAVATION AND STEEL REINFORCEMENT, INSTALLED IN PLACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CRASH CUSHION TYPE VI-BT. USE CLASS AA CONCRETE TO CONSTRUCT CONCRETE PAD (SEE CONCRETE PAD SECTION FOR STEEL REQUIREMENTS). THE PAD SHALL BE CURED AND FINISHED AS EITHER SIDEWALK OR PAVEMENT. THE CROSS SLOPE OF THE PAD OR PAVEMENT SHALL NOT EXCEED 5%. THE PAD WILL NOT BE REQUIRED WHEN UNIT IS CONSTRUCTED ON RIGID PAVEMENT.
12. THE PAD WILL NOT BE REQUIRED WHEN THE UNIT IS CONSTRUCTED ON EXISTING PAVEMENT OR BRIDGES AND THE COST OF ANCHORING SHALL BE INCLUDED IN THE UNIT PRICE OF THE CRASH CUSHION.
13. USE WITH CUR. STD. DWG. RBC-110 WHEN CONNECTING TO DOUBLE FACE GUARDRAIL.
14. PERMISSABLE ALTERNATES FOR CRASH CUSHION TYPE VI-BT ARE PATENTED ITEMS: ENERGY ABSORPTION SYSTEMS, INC. OF CHICAGO, IL., TRINITY INDUSTRIES, INC. OF DALLAS, TX.
15. THE MANUFACTURER SHALL FURNISH TWO (2) SETS OF SHOP DRAWINGS TO THE CONTRACTOR WITH EACH INSTALLATION.

CLASS	SPEED (MPH)	ATTENUATOR			APPROX. CU. YD. CONC. FOR PAD
		MODEL	PRODUCT NAME	LENGTH	
B	45 & LESS	TL2	SHORTRACC	14'-0''	1.12
			3-BAY QUADGUARD	12'-0''	0.87
	OVER 45	TL3	TRACC	21'-0''	1.63
			6-BAY QUADGUARD	21'-0''	1.53

A TYPE VI-CLASS C CAN BE USED AT THE CONTRACTOR'S DISCRETION.

USE WITH CUR. STD. DWG.
RBC-110 , RBE-060

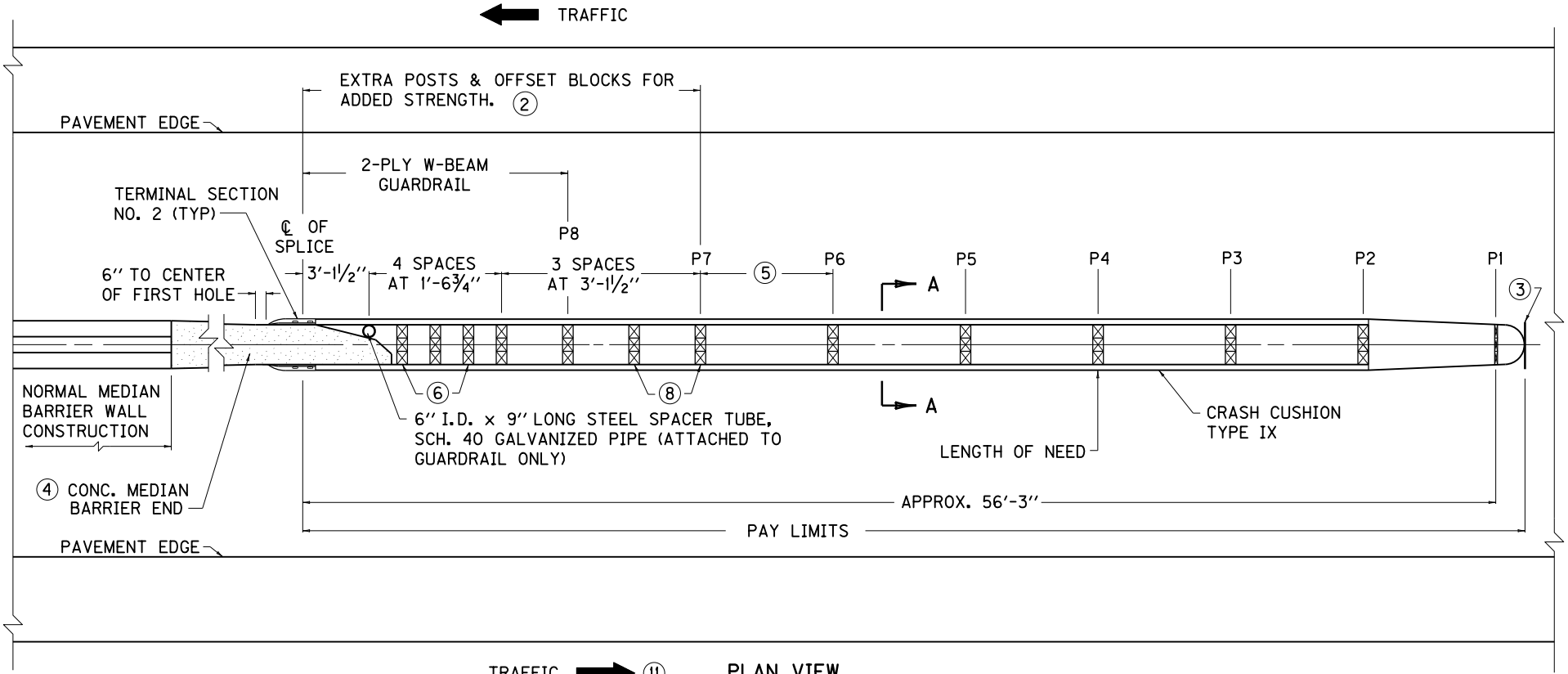
KENTUCKY
DEPARTMENT OF HIGHWAYS

CRASH CUSHION
TYPE VI-BT

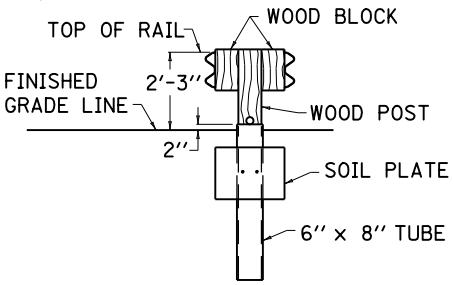
STANDARD DRAWING NO. RBE-100-10

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

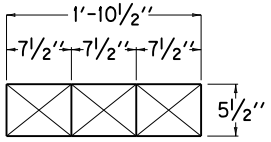
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



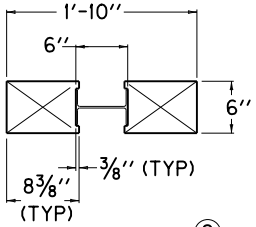
TRAFFIC (11) **PLAN VIEW**



SECTION A-A



WOOD POST (2) WOOD OFFSET BLOCKS



STEEL POST (2) WOOD OFFSET BLOCKS

~ NOTES ~

1. CRASH CUSHION TYPE IX SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND INCLUDES TERMINAL SECTIONS NO. 2, POST, RAIL ELEMENTS, SPACER TUBE, OBJECT MARKER TYPE 1, HARDWARE, AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION AS DETAILED.
2. POSTS AND OFFSET BLOCKS MAY BE WOOD OR STEEL POSTS AND WOOD OFFSET BLOCKS.
3. OBJECT MARKER TYPE 1, (SEE CURRENT MUTCD MANUAL FOR DETAILS) CENTER HORIZ. AND VERT.
4. SEE CUR. STD. DWG. RBE-070 FOR DETAILS OF CRASH CUSHION BARRIER END.
5. POST P1 THROUGH P7 ARE SPACED 6'-3" ON CENTER.
6. GUARDRAIL NOT REQUIRED TO BE ATTACHED TO POST AT THESE LOCATIONS.
7. CRASH CUSHION TYPE IX IS A PATENTED (ONE SOURCE) PRODUCT MANUFACTURED BY TRINITY INDUSTRIES, INC. OF DALLAS TX.
8. BACK-UP PLATES REQUIRED AT THESE POSTS.
9. THE MANUFACTURER SHALL FURNISH TWO (2) SETS OF SHOP PLANS TO THE CONTRACTOR WITH EACH INSTALLATION.
10. FOR NON-PAVEMENT APPLICATIONS SEE ROADWAY PLANS FOR GRADING DETAILS
11. SEE RBE-070 FOR ALTERNATE END DEPENDENT ON TRAFFIC DIRECTION.

BID ITEM AND UNIT TO BID
CRASH CUSHION TYPE IX — EACH

USE WITH CUR. STD. DWG. RBE-070

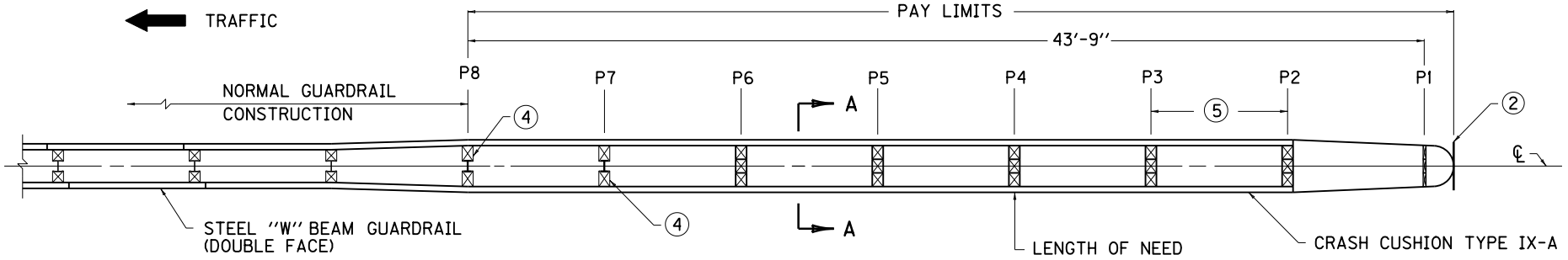
KENTUCKY DEPARTMENT OF HIGHWAYS

CRASH CUSHION TYPE IX

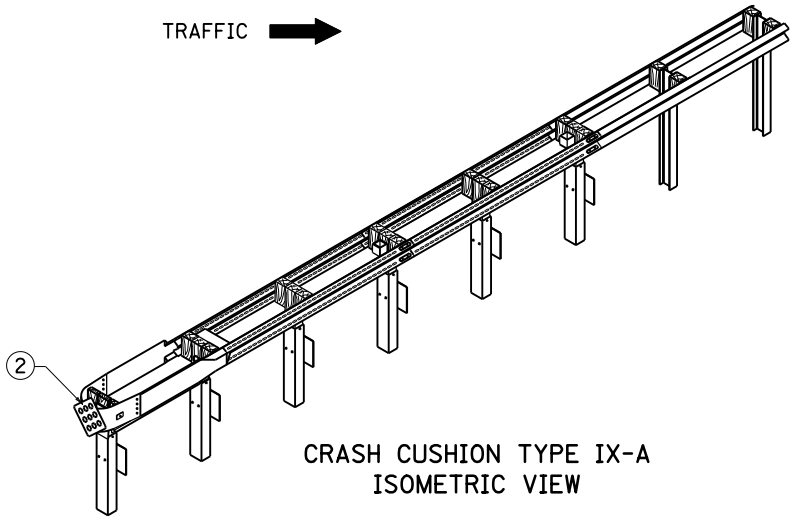
STANDARD DRAWING NO. RBE-200-06

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

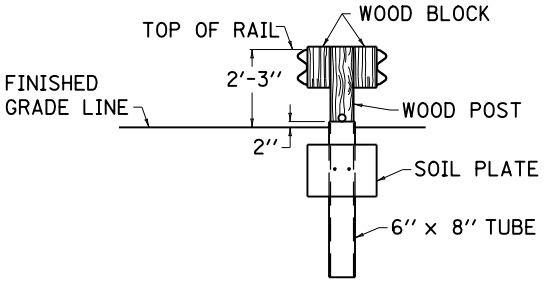
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



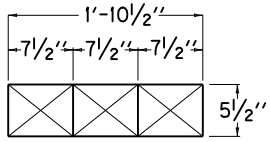
PLAN VIEW



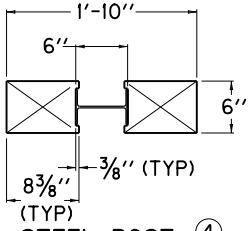
CRASH CUSHION TYPE IX-A
ISOMETRIC VIEW



SECTION A-A



WOOD POST (4)
WOOD OFFSET BLOCKS



STEEL POST (4)
WOOD OFFSET BLOCKS

~ NOTES ~

1. CRASH CUSHION TYPE IX-A SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND INCLUDES POSTS, RAIL ELEMENTS, OBJECT MARKER TYPE 1, HARDWARE, AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION AS DETAILED.
2. OBJECT MARKER TYPE 1, (SEE CURRENT MUTCD MANUAL FOR DETAILS) CENTER HORIZ. AND VERT.
3. CRASH CUSHION TYPE IX-A IS A PATENTED (ONE SOURCE) PRODUCT MANUFACTURED BY TRINITY INDUSTRIES, INC. OF DALLAS, TX.
4. AT POST P7 AND P8 THE POSTS AND OFFSET BLOCKS MAY BE WOOD OR STEEL POST AND WOOD OFFSET BLOCKS.
5. POST P1 THROUGH P8 ARE SPACED 6'-3" ON CENTER.
6. BACK-UP PLATES REQUIRED AT POST P7.
7. THE MANUFACTURER SHALL FURNISH TWO (2) SETS OF SHOP PLANS TO THE CONTRACTOR WITH EACH INSTALLATION.
8. FOR NON-PAVEMENT APPLICATIONS SEE ROADWAY PLANS FOR GRADING DETAILS.

BID ITEM AND UNIT TO BID
CRASH CUSHION TYPE IX-A EACH

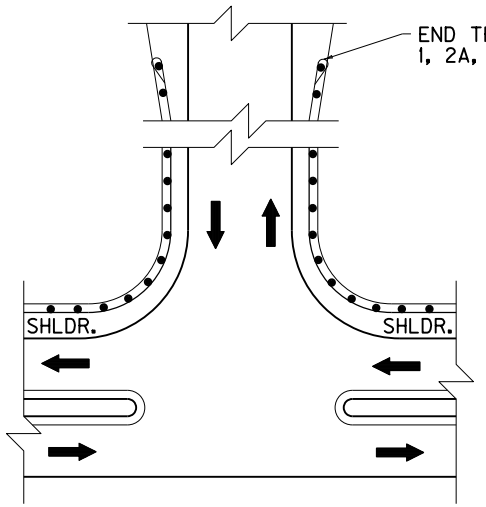
KENTUCKY
DEPARTMENT OF HIGHWAYS

CRASH CUSHION
TYPE IX-A

STANDARD DRAWING NO. RBE-205-06

SUBMITTED William S. Haskins — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

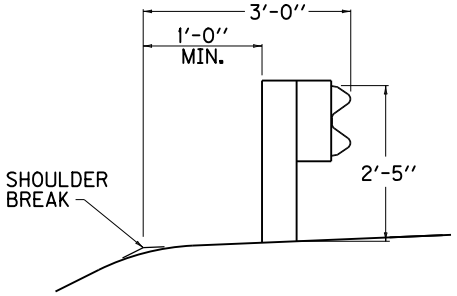
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



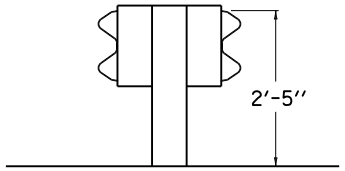
APPROACH ROADS

~ NOTES ~

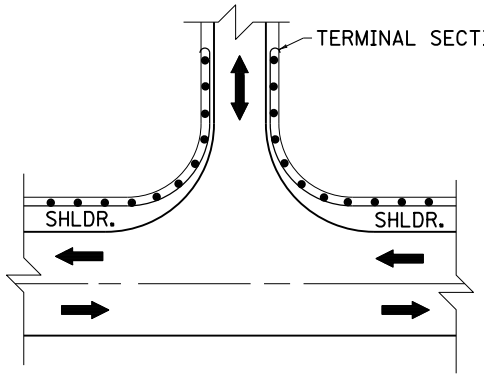
1. FOR END TREATMENT TYPE 4A USE CUR. STD. DWG. RBR-035 FOR OFFSETS.
2. THE MINIMUM LENGTH OF GUARDRAIL, INCLUDING THE END TREATMENT, PRECEDING A FIXED OBJECT IS 200 FEET: (LENGTH MAY BE REDUCED SHOULD FIELD CONDITIONS WARRANT).



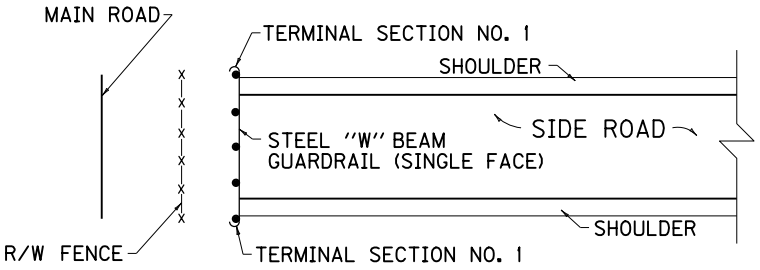
NORMAL GUARDRAIL INSTALLATION



TYPICAL DOUBLE FACE
GUARDRAIL INSTALLATION



ENTRANCES



GUARDRAIL USED AS A BARRICADE

USE WITH CUR. STD. DWG.
RBI-002 , RBR-035

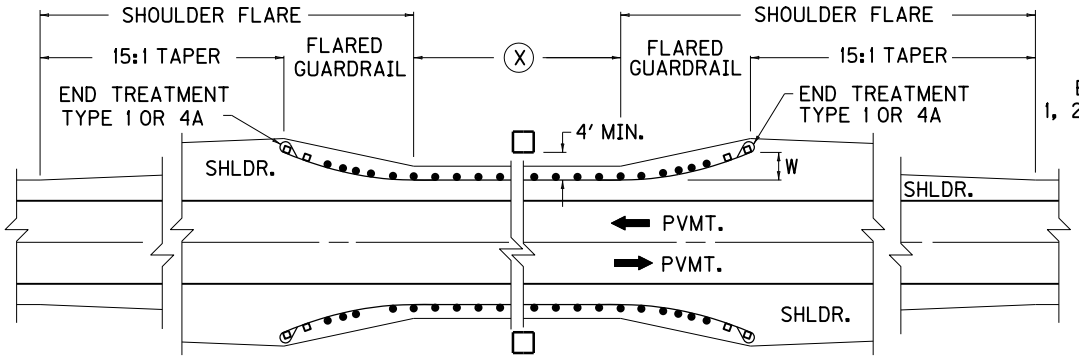
KENTUCKY
DEPARTMENT OF HIGHWAYS

TYPICAL GUARDRAIL
INSTALLATIONS

STANDARD DRAWING NO. RBI-001-11

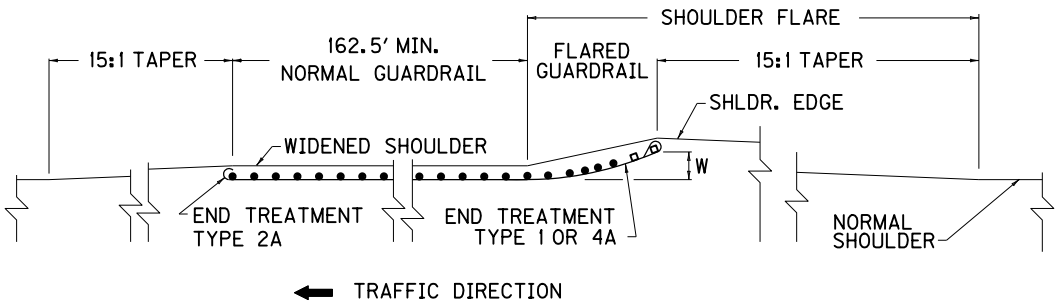
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



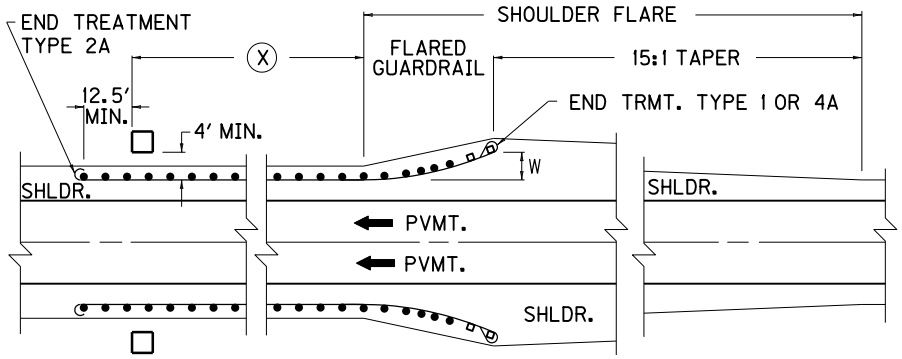
AT A FIXED OBJECT - TWO WAY TRAFFIC (FILL)

FIGURE 1



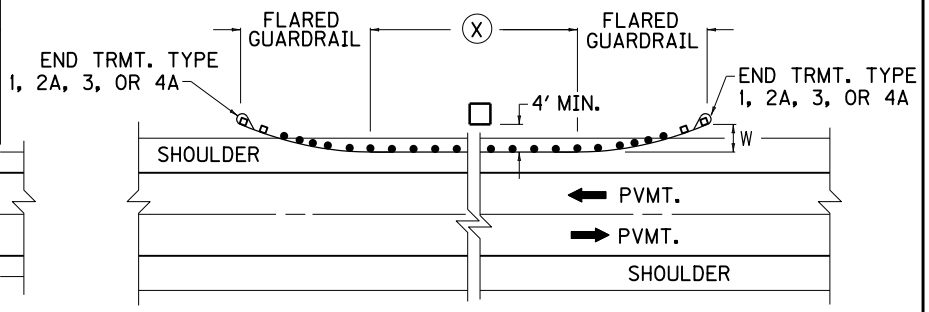
ONE DIRECTION TRAFFIC-FOR SHOULDERS LESS THAN 12' (FILL)

FIGURE 2



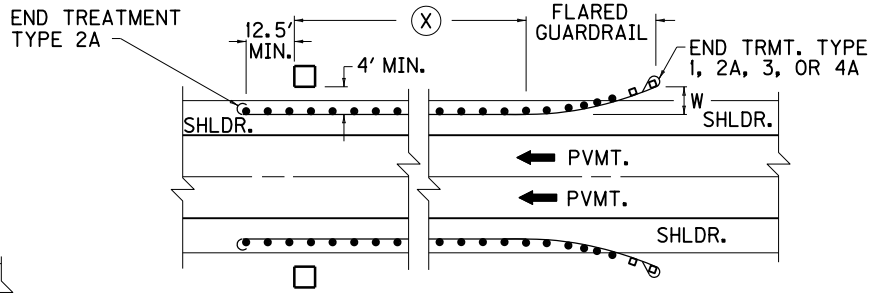
AT A FIXED OBJECT - ONE WAY TRAFFIC (FILL)

FIGURE 3



AT A FIXED OBJECT - TWO WAY TRAFFIC (CUT)

FIGURE 4



AT A FIXED OBJECT - ONE WAY TRAFFIC (CUT)

FIGURE 5

~ NOTES ~

GENERAL APPLICATION OF END TREATMENTS

(a.) ALL FILLS; ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 1 OR 4A.

(b.) SOLID ROCK CUTS WITHOUT ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT TYPE 2A.

(c.) EARTH CUTS AND SOFT ROCK CUTS, USE END TREATMENT TYPE 3.

(X) NORMAL GUARDRAIL INSTALLATION. FOR FIXED OBJECTS, SPECIFY "X" IN 12'-6" INCREMENTS.

☐ FIXED OBJECTS SUCH AS (PIERS, NEAR OR AT GRADE CULVERTS, POST, OR POLE LOCATED IN THE SAFETY ZONE AND NOT HAVING BREAKAWAY FEATURE.

SEE APPROPRIATE CURRENT STANDARD DRAWING FOR PROPER OFFSET "W".

THE MINIMUM LENGTH OF GUARDRAIL, INCLUDING THE END TREATMENT, PRECEDING A FIXED OBJECT IS 200 FEET (LENGTH MAY BE REDUCED SHOULD FIELD CONDITIONS WARRANT).

USE WITH CUR. STD. DWGS.
RBI-003 , RBI-004 , RBR-030 , RBR-035

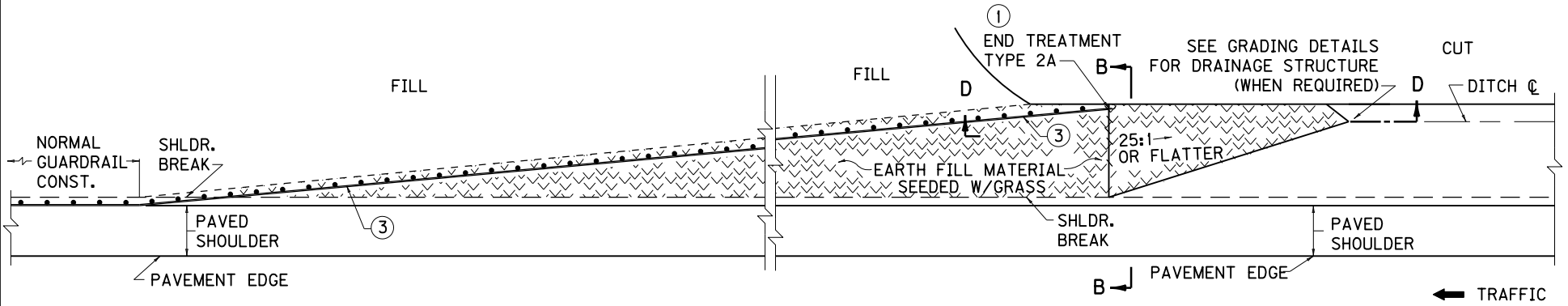
KENTUCKY
DEPARTMENT OF HIGHWAYS

TYPICAL GUARDRAIL INSTALLATIONS

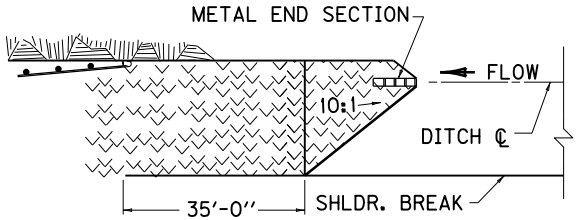
STANDARD DRAWING NO. RBI-002-07

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

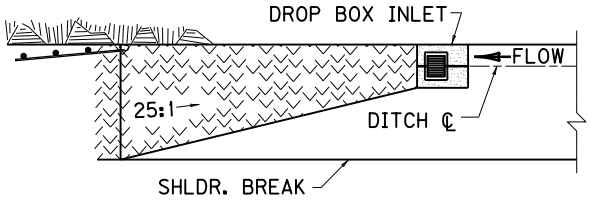
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



DETAIL OF GUARDRAIL FOR FILL TO SOLID ROCK CUT SECTION

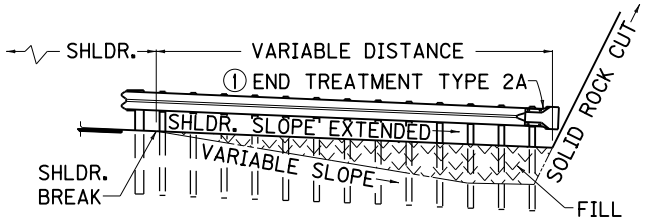


FLOW TOWARD METAL END SECTION



FLOW TOWARD DROP BOX INLET

GRADING DETAILS



SECTION B-B (SOLID ROCK CUT)
DETAIL OF END TREATMENT TYPE 2A

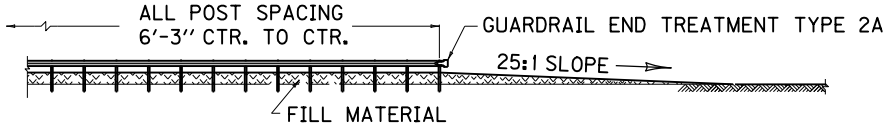
~ NOTES ~

1. SOLID ROCK CUTS WITHOUT AN ADEQUATE RECOVERY ZONE.
2. INTENDED USE: FOR END TREATMENTS AGAINST SOLID ROCK CUTS ONLY. END TREATMENT SHALL NOT ABUT LOOSE ROCK. FOR INSTALLATION WHERE SOLID ROCK IS NOT ENCOUNTERED SEE CURRENT STANDARD DRAWING RBR-030.

BID ITEMS AND UNIT TO BID:

GUARDRAIL END TREATMENT TYPE 2A	EACH
ROADWAY OR BORROW EXCAVATION, OR EMBANKMENT IN PLACE	CUYD

DRAINAGE STRUCTURE BID SEPARATELY.



SECTION D-D (GUARDRAIL END TREATMENT TYPE 2A)

③			
DESIGN SPEED	70+ MPH	60 MPH	50 MPH OR LESS
FLARE RATES	15:1	13:1	11:1

USE WITH CUR. STD. DWGS.
RBI-001, RBI-002, RDB-005, RBR-030

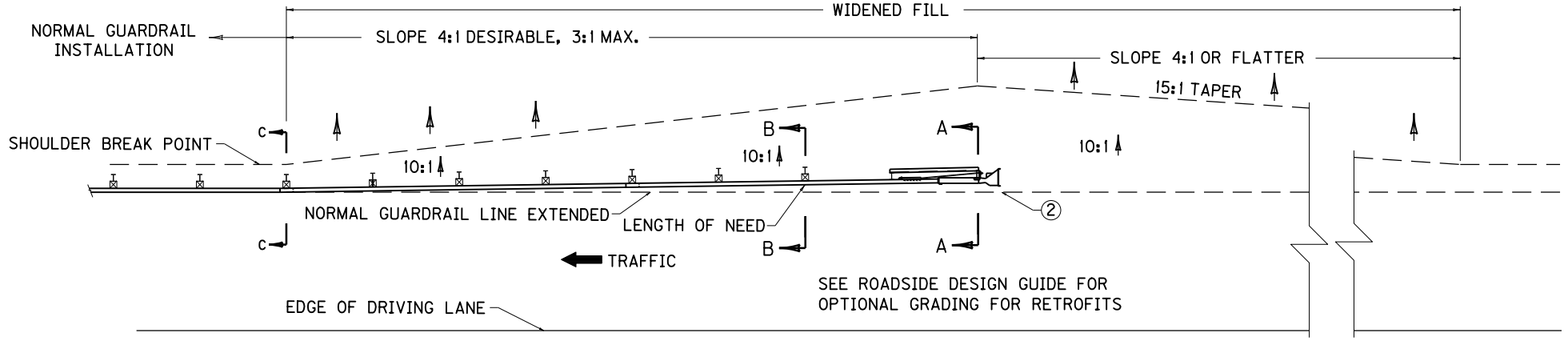
KENTUCKY
DEPARTMENT OF HIGHWAYS

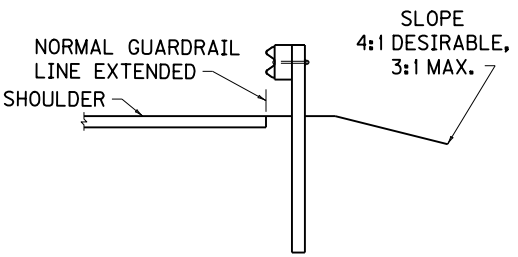
TYPICAL INSTALLATION FOR GUARDRAIL END TREATMENT TYPE 2A

STANDARD DRAWING NO. RBI-003-09

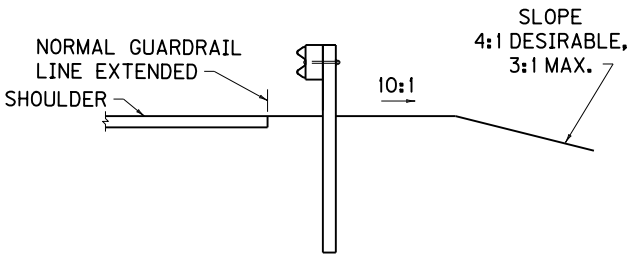
SUBMITTED William S. Haskins DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

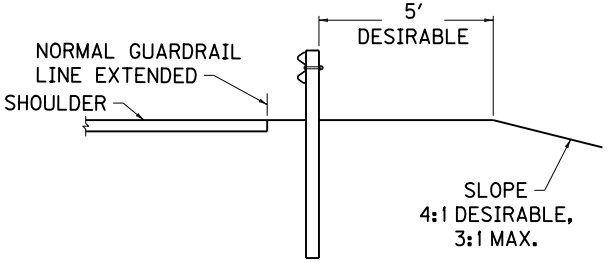




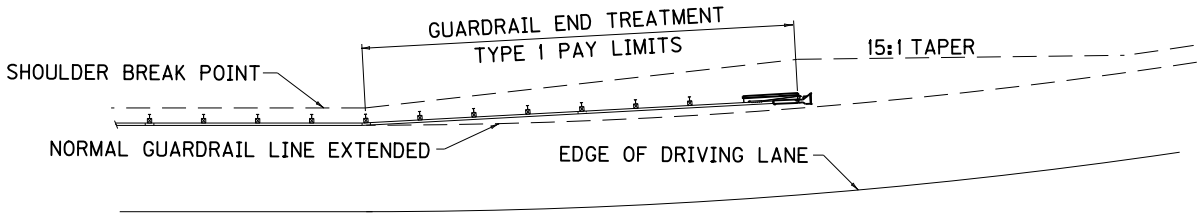
SECTION C-C



SECTION B-B



SECTION A-A



GUARDRAIL END TREATMENT TYPE 1
INSTALLED ON A CURVE ③

~ NOTES ~

BID ITEMS AND UNIT TO BID:

GUARDRAIL END TREATMENT TYPE 1	EACH
ROADWAY OR BORROW EXCAVATION, OR EMBANKMENT IN PLACE	CUYD

1. THE MINIMUM LENGTH OF GUARDRAIL, INCLUDING THE END TREATMENT, PRECEDING A FIXED OBJECT IS 200 FEET (LENGTH MAY BE REDUCED SHOULD FIELD CONDITIONS WARRANT).

② GUARDRAIL EXTRUDER EDGE CLOSEST TO TRAFFIC SHALL BE PLACED ON NORMAL GUARDRAIL LINE EXTENDED.

③ END TREATMENT TYPE 1 MAY BE ATTACHED TO CURVED GUARDRAIL PROVIDED CURVE IS A 550′ RADIUS OR MORE. END TREATMENT TYPE 1 SHALL BE INSTALLED ON A STRAIGHT LINE TAPER WITHIN THE PAY LIMITS.

4. INTENDED USE: FILLS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL.

USE WITH CUR. STD. DWG.
RBR-020

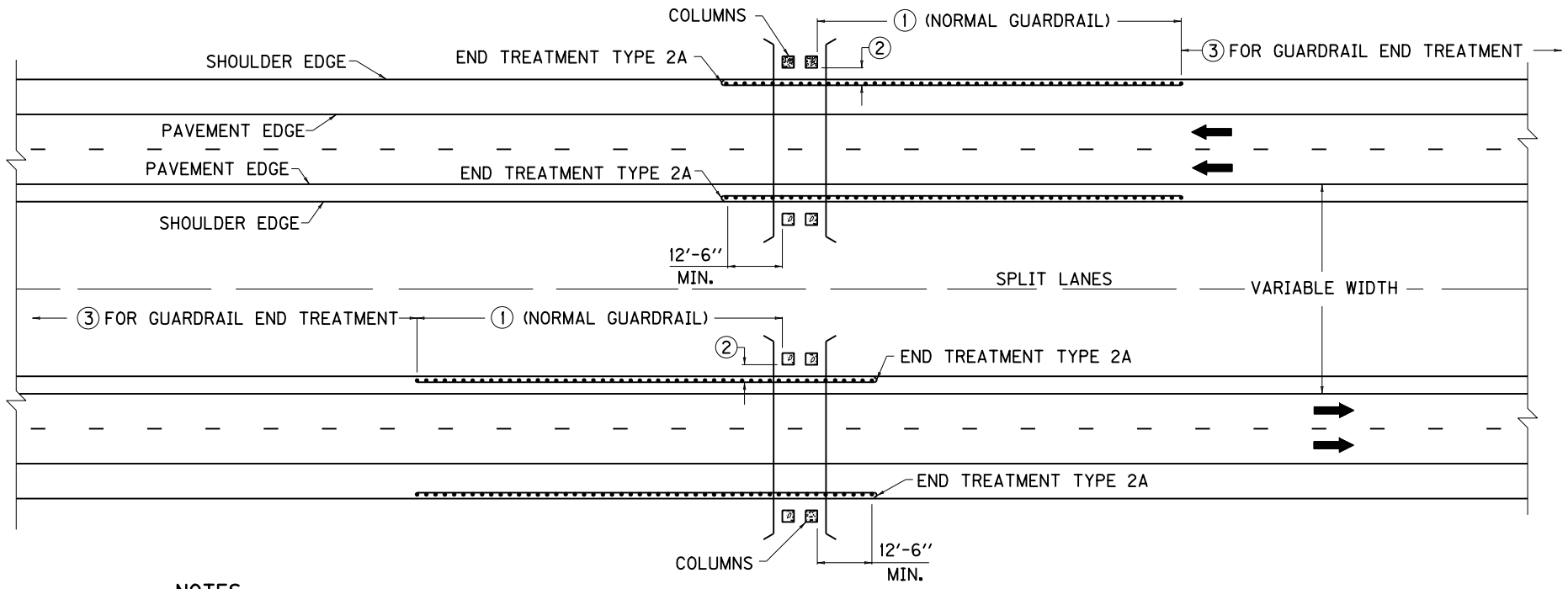
KENTUCKY
DEPARTMENT OF HIGHWAYS

INSTALLATION OF GUARDRAIL END TREATMENT TYPE 1

STANDARD DRAWING NO. RBI-004-05

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



LOCATION OF GUARDRAIL WITH VARIABLE WIDTH MEDIAN

~ NOTES ~

① THE MIN. LENGTH OF GUARDRAIL, INCLUDING THE END TREATMENT, PRECEDING A FIXED OBJECT IS 200 FEET (LENGTH MAY BE REDUCED SHOULD FIELD CONDITIONS WARRANT).

② 4′-0″ OR MORE FROM NORMAL GUARDRAIL ALIGNMENT. HOWEVER, IF COLUMNS, PIERS, ABUTMENTS, ETC. ARE LOCATED IN THE CLEAR ZONE DISTANCE OR 30′-0″ WHICHEVER IS GREATER FROM THE EDGE OF A THROUGH TRAVEL LANE, GUARDRAIL SHALL NOT BE REQUIRED.

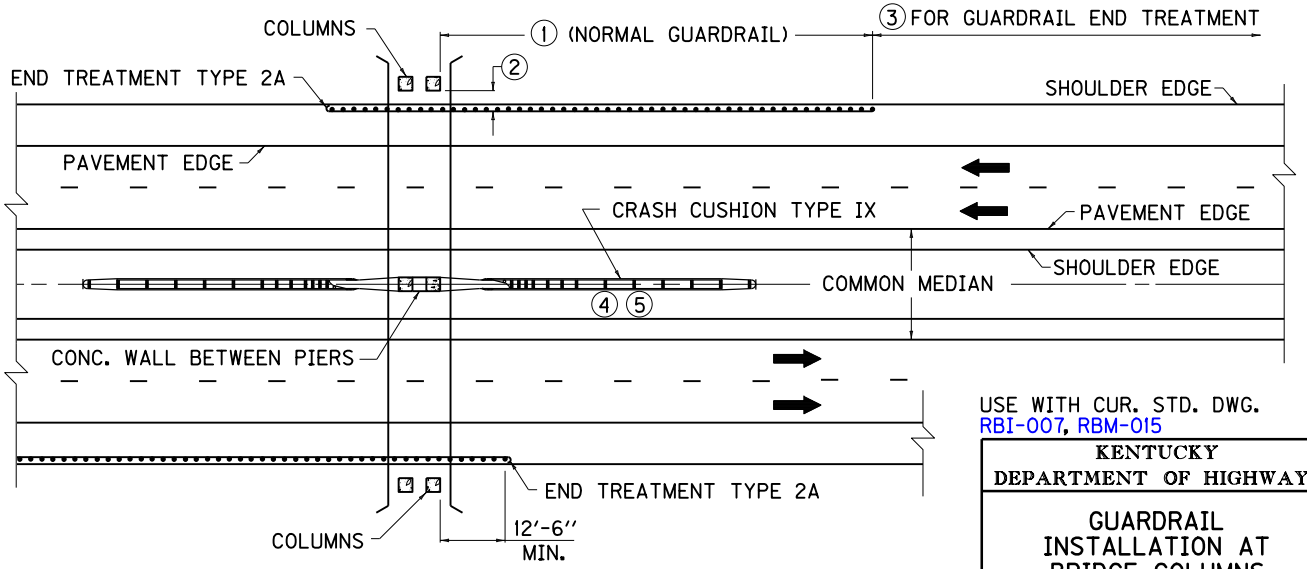
③ TO TERMINATE GUARDRAIL INSTALLATION:
A. ALL FILLS, ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL; USE END TREATMENT TYPE 1 OR 4A.

B. SOLID ROCK CUTS WITHOUT ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL; USE END TREATMENT TYPE 2A.

C. EARTH CUTS AND SOFT ROCK CUTS; USE END TREATMENT TYPE 3.

④ SEE CUR. STD. DWG. RBI-007 OR CUR. STD. DWG. RBI-009 AS APPLICABLE.

⑤ WHEN CONCRETE MEDIAN BARRIER WALL IS REQUIRED, SEE CUR. STD. DWG. RBM-015 FOR APPLICABLE DETAILS.



LOCATION OF GUARDRAIL WITH CONSTANT WIDTH MEDIAN

USE WITH CUR. STD. DWG. RBI-007, RBM-015

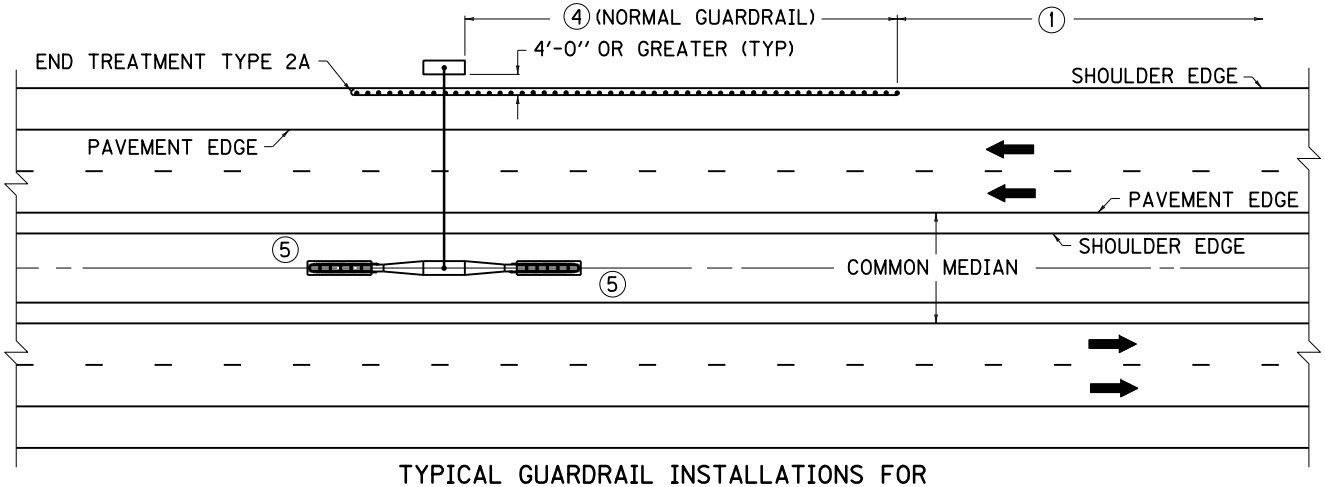
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL INSTALLATION AT BRIDGE COLUMNS

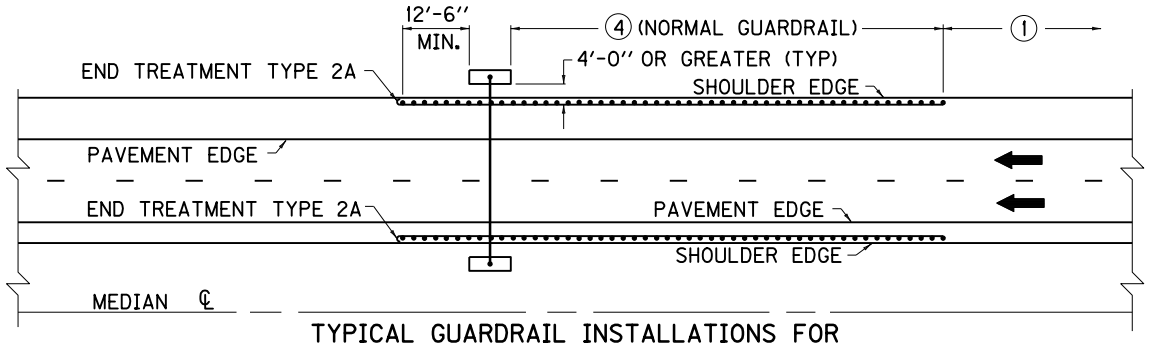
STANDARD DRAWING NO. RBI-005-08

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

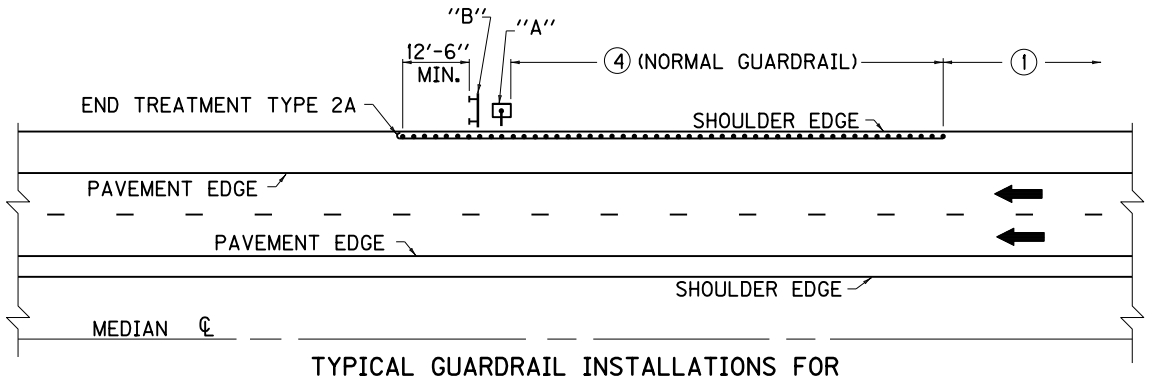
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



TYPICAL GUARDRAIL INSTALLATIONS FOR
OVERHEAD SIGN SUPPORT - TRUSS (RAISED MEDIAN)



TYPICAL GUARDRAIL INSTALLATIONS FOR
OVERHEAD SIGN SUPPORT - TRUSS (DEPRESSED MEDIAN)



TYPICAL GUARDRAIL INSTALLATIONS FOR
"A" CANTILEVER SIGN SUPPORT OR "B" OVERHEAD SIGN SUPPORT

~ NOTES ~

① TO TERMINATE GUARDRAIL INSTALLATION:
A. ALL FILLS, ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL; USE END TREATMENT TYPE 1 OR 4A.
B. SOLID ROCK CUTS WITHOUT ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL; USE END TREATMENT TYPE 2A.
C. EARTH CUTS AND SOFT ROCK CUTS; USE END TREATMENT TYPE 3.

2. IF GAPS OF 200 FEET OR LESS SHOULD OCCUR BETWEEN SECTIONS OF GUARDRAIL, THE GUARDRAIL SHALL BE EXTENDED THROUGH SUCH GAPS TO PROVIDE A COUNTINUOUS SECTION.

3. GUARDRAIL INSTALLATION IS NOT NECESSARY FOR SIGNS MOUNTED ON:
A. CHANNEL POST IN TYPE "B" OR "C" BASES.
B. TYPE "B" BREAKAWAY BEAMS.
C. SIGNS MOUNTED IN CAST ALUMINUM SHOES. (SEE SIGN PLAN).

④ THE MIN. LENGTH OF GUARDRAIL, INCLUDING THE END TREATMENT, PRECEDING A FIXED OBJECT IS 200 FEET (LENGTH MAY BE REDUCED SHOULD FIELD CONDITIONS WARRANT).

⑤ WHEN CONCRETE BARRIER WALL IS REQUIRED SEE CUR. STD. DWG. RBM-015 FOR APPLICABLE DETAILS.

USE WITH CUR. STD. DWG.
RBM-015

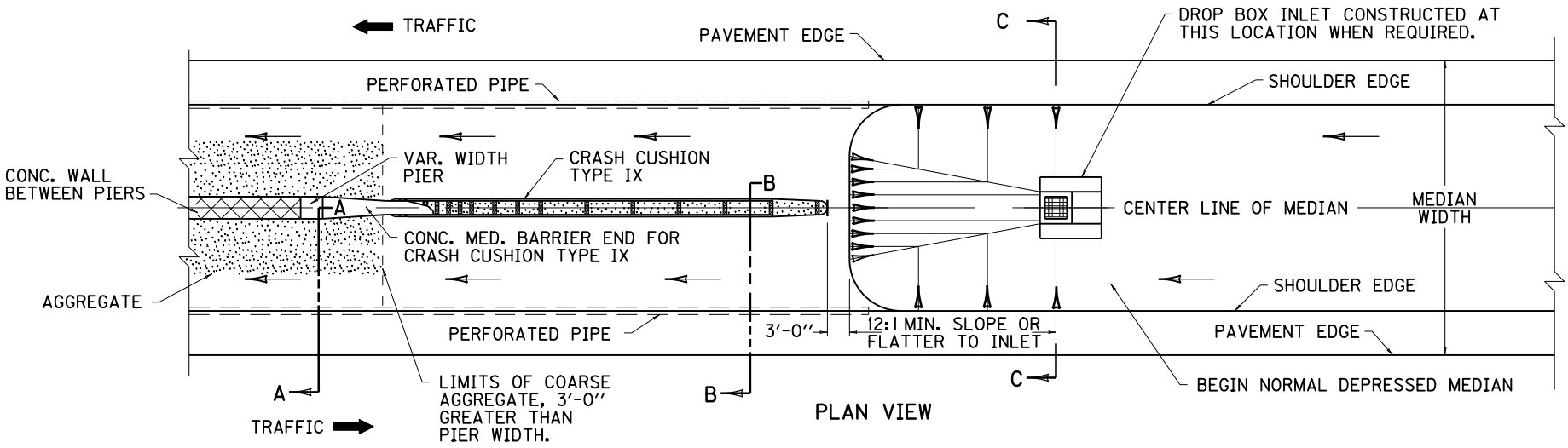
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL INSTALLATION AT SIGN SUPPORTS

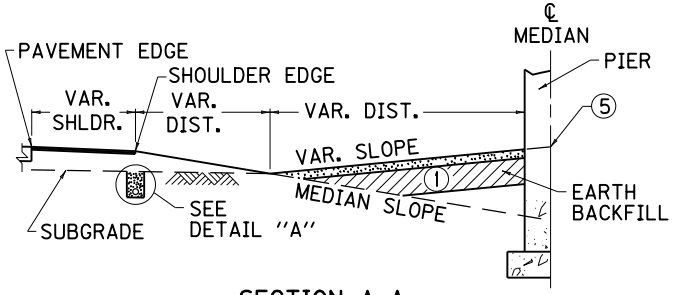
STANDARD DRAWING NO. RBI-006-07

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

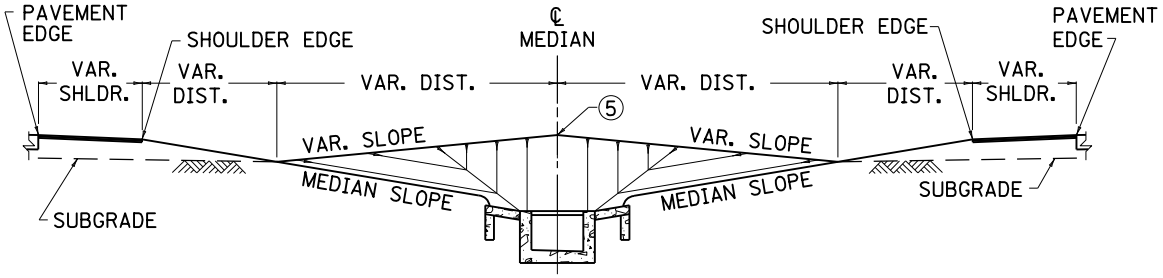
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



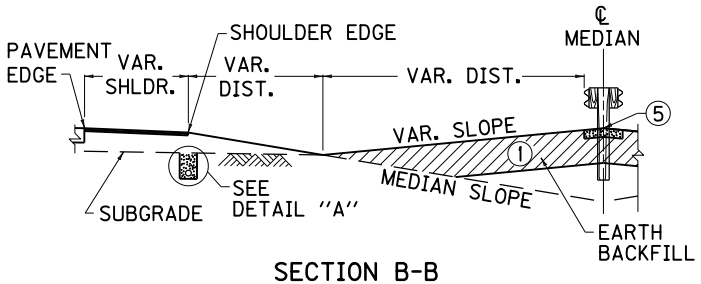
PLAN VIEW



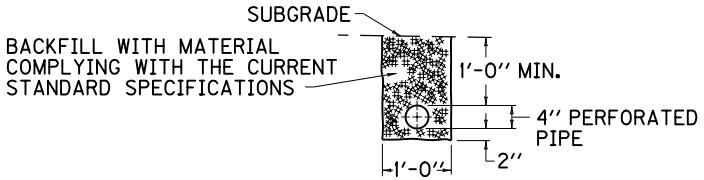
SECTION A-A



SECTION C-C



SECTION B-B



DETAIL "A"

~ NOTES ~

BID ITEMS AND UNIT TO BID:

CRASH CUSHION TYPE IX	EACH
CONC MED BAR END FOR CRASH CUSHION TY IX	EACH
CONCRETE-CLASS A	CUYD
ROADWAY OR BORROW EXCAVATION OR EMBANKMENT-IN-PLACE	CUYD
CRUSHED AGGREGATE SIZE NO 57	TON
PERFORATED PIPE HEADWALL TY (VARIES WITH SLOPE)-4 IN	EACH
PERFORATED PIPE-4 IN	EACH

(1) WHEN SOLID ROCK IS ENCOUNTERED, THIS MATERIAL SHALL BE REMOVED AND BACKFILLED WITH EARTH (ROADWAY OR BORROW EXCAVATION OR EMBANKMENT-IN-PLACE), A DEPTH OF 2'-0".

2. WHEN CRASH CUSHION TYPE IX IS INSTALLED AT THE SUMMIT OF A VERTICAL CURVE, 4" PERFORATED PIPE SHALL BE PLACED AS DETAILED IN BOTH DIRECTIONS. CONSTRUCT A PERFORATED PIPE HEADWALL AT EACH OUTLET OR EXTEND PIPE TO A BOX INLET. WHEN PERFORATED PIPE IS PLACED IN A SAG VERTICAL CURVE, IT SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER.
3. AREA IN DEPRESSED MEDIAN SHALL BE GRADED IN ORDER TO PROVIDE COMPLETE DRAINAGE.
4. THIS DRAWING DEPICTS THE APPLICATION OF MATERIALS NECESSARY TO COMPLETE THE INSTALLATION.

(5) THIS POINT SAME ELEVATION AS INSIDE PAVEMENT EDGE.

6. 6" OF CRUSHED AGGREGATE SIZE NO. 57 (LOOSE DEPTH).

USE WITH CUR. STD. DWG. RBE-070, RBE-200, RDP-010

KENTUCKY DEPARTMENT OF HIGHWAYS

CRASH CUSHION TYPE IX INSTALLATION AT MEDIAN PIERS

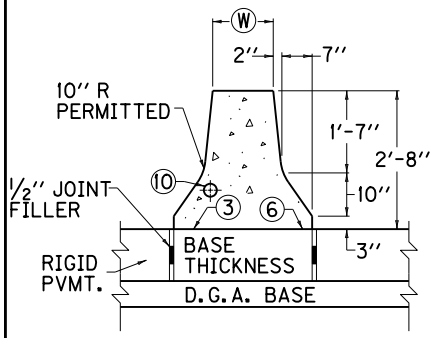
(DEPRESSED MEDIAN)

STANDARD DRAWING NO. RBI-007-09

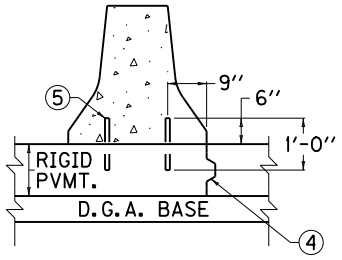
SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

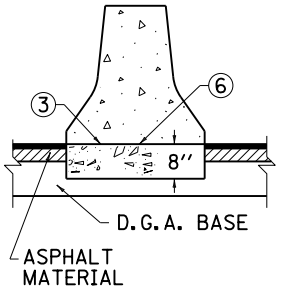
TYPE 9A,
12A OR 14A



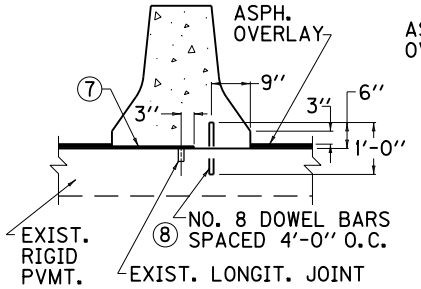
TYPE 9B,
12B OR 14B



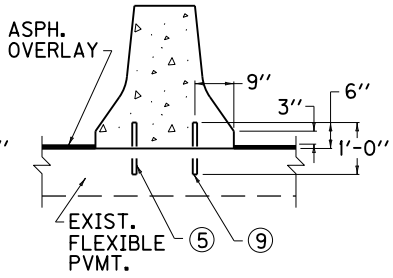
TYPE 9C,
12C OR 14C



TYPE 9D,
12D OR 14D



TYPE 9E,
12E OR 14E



NEW RIGID PAVEMENT

NEW FLEXIBLE PAVEMENT

NEW FLEXIBLE OVERLAY OVER EXISTING RIGID PAVEMENT

NEW FLEXIBLE OVERLAY OVER EXISTING FLEXIBLE PAVEMENT

~ NOTES ~

BID ITEM AND UNIT TO BID

CONC MEDIAN BARRIER TYPE ⊕ ⊕ LF

⊕ 9, 12, OR 14 DEPENDING ON W

⊕ A, B, C, D, OR E DEPENDING ON PAVEMENT TYPE.

1. FOR WALLS IN TRANSITION AND SEPARATE SEGMENT WALLS, SEE CUR. STD. DWG. RBM-015. FOR APPROPRIATE BID ITEMS.
2. THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE MEDIAN BARRIER INCLUDING THE BASE IN TYPES A AND C SHALL BE FULL COMPENSATION FOR ALL MATERIALS, EQUIPMENT, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

(3) WHEN A CONSTRUCTION JOINT IS USED, DOWEL BARS WILL BE REQUIRED AS SHOWN WITH TYPE 9B, 12B, OR 14B BARRIER. SEE NOTE 5.

(4) LONGITUDINAL CONSTRUCTION JOINT WITHOUT TIE BARS IS REQUIRED AND SHALL BE PLACED AT THE LOCATION SHOWN OR MAY BE INSTALLED AT THE CORRESPONDING POINT ON THE OPPOSITE SIDE OF THE BARRIER, AT THE OPTION OF THE CONTRACTOR. IT SHALL BE REQUIRED ON THE LOW SIDE OF A SUPERELEVATED SECTION.

(5) NO. 8 DOWEL BARS SPACED 4'-0'' O.C. AND STAGGERED 2'-0''.

(6) CONSTRUCTION JOINT PERMITTED WHEN FIXED FORMS OR SLIP FORMS ARE USED.

(7) POLYETHYLENE (6 MILS THICK) BOND BREAKER.

(8) PAVEMENT SHALL BE DRILLED AND BARS GROUTED.

(9) BARS SHALL BE EITHER DRILLED AND GROUTED OR DRIVEN.

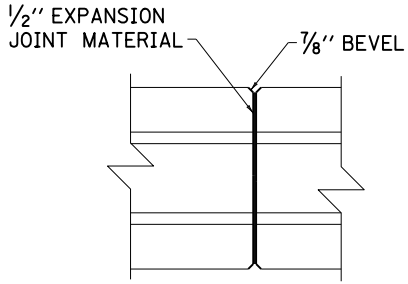
(10) 3'' RACEWAY (TYPICAL) SEE ELSEWHERE IN THE PLANS FOR LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.

APPROXIMATE QUANTITIES PER LINEAR FOOT

TYPE	CONC. - CUYD (W)			STEEL - POUNDS (W)		
	9''	12''	14''	9''	12''	14''
A	0.18	0.20	0.21	▲1.34	▲1.34	▲1.34
B	0.13	0.15	0.16	1.34	1.34	1.34
C	0.18	0.20	0.21	▲1.34	▲1.34	▲1.34
D	0.14	0.16	0.17	0.67	0.67	0.67
E	0.14	0.16	0.17	1.34	1.34	1.34

▲ WHEN REQUIRED

CONCRETE QUANTITIES SHOWN INCLUDE 8'' BASE THICKNESS FOR TYPE A, BUT DO NOT INCLUDE QUANTITIES NECESSARY FOR ASPHALT OVERLAY THICKNESS SHOWN FOR TYPE D AND E.



EXPANSION JOINT DETAIL

USE WITH CUR. STD. DWG. RBM-015

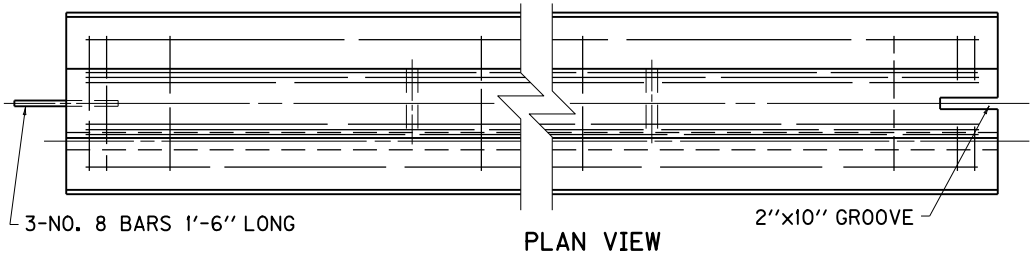
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN BARRIER
FIXED-FORM OR SLIP-FORM
(PERMANENT)

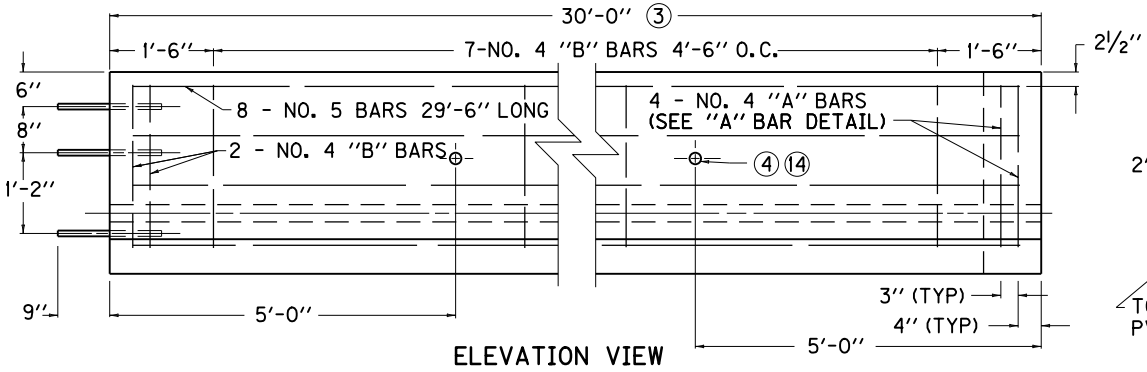
STANDARD DRAWING NO. RBM-001-10

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

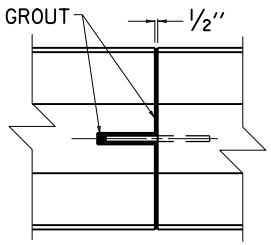
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



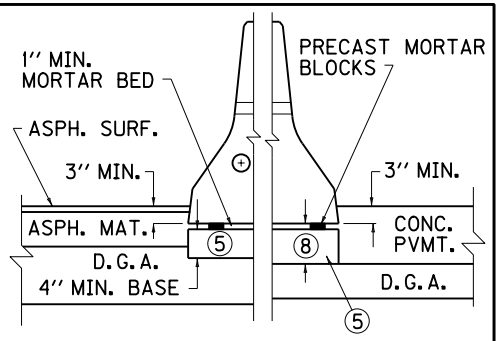
PLAN VIEW



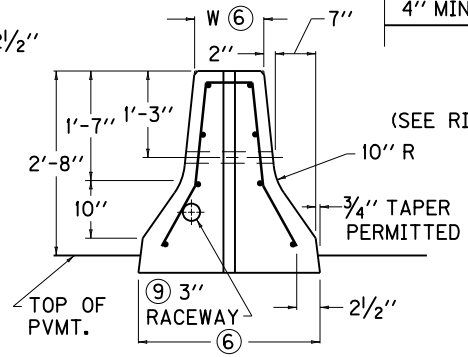
ELEVATION VIEW



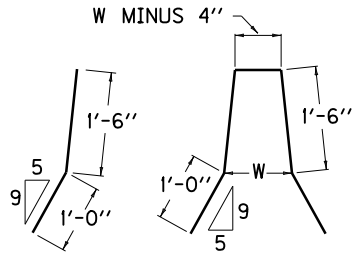
CONNECTION DETAIL



PAVEMENT DETAIL ⑦
(SEE RIGHT ELEVATION FOR DIMENSIONS)



RIGHT ELEVATION VIEW



DETAIL OF "A" BAR

DETAIL OF "B" BAR

FOR ILLUSTRATION PURPOSES, THE PAVEMENT DETAIL (RIGHT) DEPICTS THE INSTALLATION OF A CONCRETE MEDIAN BARRIER (PRECAST) WITH NEW RIGID PAVEMENT ON ONE SIDE AND NEW FLEXIBLE PAVEMENT ON THE OPPOSITE SIDE (SEE PLANS FOR APPLICABLE PAVEMENT DESIGN).

~ NOTES ~

BID ITEM AND UNIT TO BID:
CONCRETE MEDIAN BARRIER TYPE ⊕ ⊕ LF

⊕ 9 OR 12 OR 14 DEPENDING ON "W".

⊕ A OR C DEPENDING ON PAVEMENT TYPE (SEE CUR. STD. DWG. RBM-001 FOR TYPE).

1. WITH FLEXIBLE PAVEMENT THE CONTRACT UNIT PRICE PER LINEAR FOOT SHALL INCLUDE THE BASE, ALL CONCRETE, LABOR, REINFORCING STEEL AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE PERMANENT INSTALLATION.
2. WITH RIGID PAVEMENT THE CONTRACT UNIT PRICE PER LINEAR FOOT SHALL INCLUDE, THE BASE, ALL CONCRETE, LABOR, REINFORCING STEEL AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE PERMANENT INSTALLATION.

③ SHORTER SECTIONS MAY BE PERMITTED IF APPROVED IN WRITING BY THE ENGINEER.

④ 2" DIA. LIFTING HOLE - 2 REQUIRED AT EACH SECTION. FORMED WITH 2" P.V.C. PIPE OR EQUAL.

⑤ SEE ELSEWHERE IN THE PLANS FOR BASE REQUIREMENTS.

⑥ 9" WIDE TOP WITH 2'-3" WIDE BASE, OR 12" WIDE TOP WITH 2'-6" WIDE BASE OR 14" WIDE TOP 2'-8" WIDE BASE. (TAPER NOT INCLUDED IN BASE WIDTH).

⑦ OTHER METHODS OF ANCHORAGE WILL BE ACCEPTABLE IF APPROVED IN WRITING BY THE ENGINEER.

⑧ PAVEMENT THICKNESS MINUS 3".

⑨ THE RACEWAY SHALL BE TIED TO EACH OF THE "A" AND "B" BARS TO PREVENT SAG. SEE ELSEWHERE IN THE PLANS FOR SIZE, LOCATION, AND PAYMENT FOR RACEWAY WHEN REQUIRED.

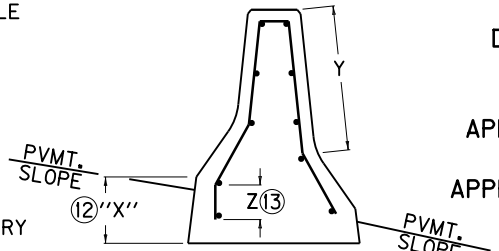
10. PLACE ALL STEEL REINFORCEMENT A CLEAR DISTANCE OF 2" MIN. FROM OUTSIDE FACE OF WALL, EXCEPT WHERE SHOWN OTHERWISE.
11. SHOP DRAWINGS SHALL BE APPROVED PRIOR TO MANUFACTURE.

⑫ WHEN THE "X" DIMENSION EQUALS 10" THE BAR SHALL BE TURNED DOWN 6" ("Z" DIMENSION) AND AN ADDITIONAL LONGITUDINAL BAR SHALL BE ADDED AT THE BOTTOM OF THE TURN DOWN ("Z" DIMENSION) AND TO THE "Y" PORTION OF THE BAR. FOR EACH 6" INCREMENT OF THE "X" DIMENSION ABOVE 10", AN ADDITIONAL LONGITUDINAL BAR SHALL BE ADDED IN THE "Z" AND "Y" PORTION OF THE BAR.

⑬ THE "Z" DIMENSION SHALL INCREASE INCH FOR INCH WHEN THE "X" DIMENSION EXCEEDS 10".

⑭ LIFTING BARS SHALL BE REQUIRED TO PREVENT SPALLING OF CONCRETE AROUND HOLES.

15. WHEN THE PRECAST WALL IS USED IN PERMANENT CONSTRUCTION THE LIFTING HOLES SHALL BE FILLED WITH GROUT.



STEEL PLACEMENT FOR ASYMMETRICAL WALL SECTION

APPROX. REINF./30' SECTION
289 LBS.

APPROX. CU. YD. CONC./LIN. FT.
9" WIDE TOP = 0.16
12" WIDE TOP = 0.18
14" WIDE TOP = 0.20

APPROX. WEIGHT/30' SECTION
BASED ON 150 LBS./CU. FT
9" WIDE TOP = 9.8 TONS
12" WIDE TOP = 11.1 TONS
14" WIDE TOP = 12.1 TONS

USE WITH CUR. STD. DWG.
RBM-001

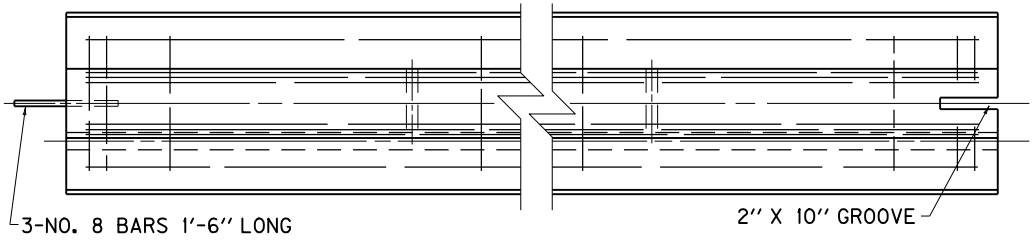
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN BARRIER PRECAST (PERMANENT - NEW PAVEMENT)

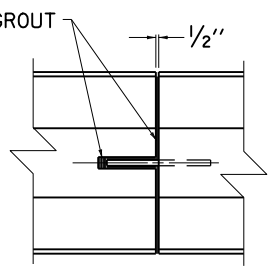
STANDARD DRAWING NO. RBM-003-11

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

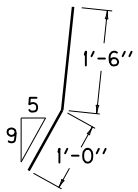
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



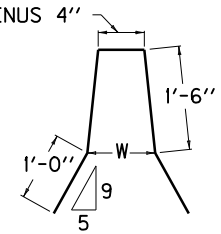
PLAN VIEW



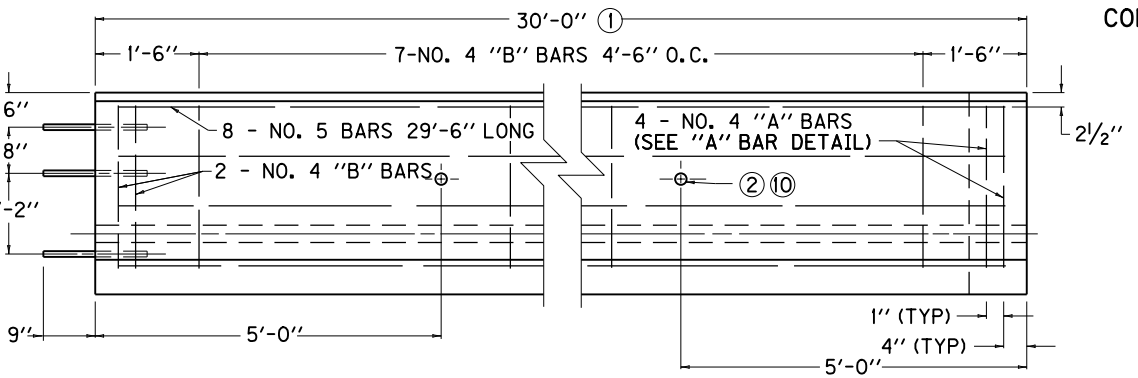
CONNECTION DETAIL



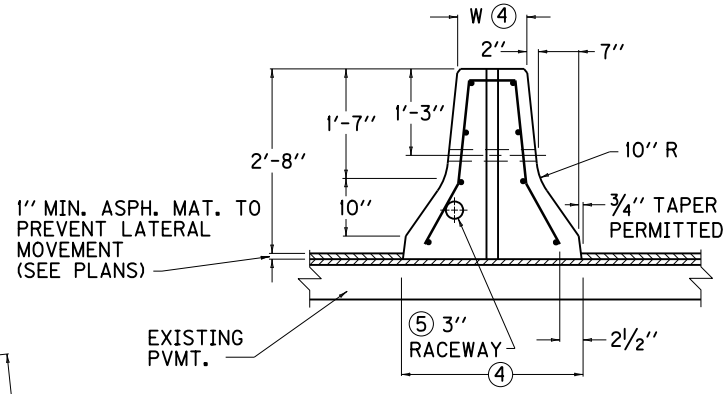
DETAIL OF "A" BAR



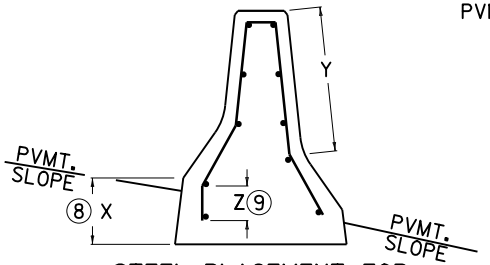
DETAIL OF "B" BAR



ELEVATION VIEW



RIGHT ELEVATION VIEW



STEEL PLACEMENT FOR
ASYMMETRICAL WALL SECTION

APPROX. REINF./30' SECTION
289 LBS.

APPROX. CU. YD. CONC./LIN. FT.
9" WIDE TOP = 0.14
12" WIDE TOP = 0.16
14" WIDE TOP = 0.17

APPROX. WEIGHT/30' SECTION BASED ON 150 LBS./CU. FT.
9" WIDE TOP = 8.1 TONS
12" WIDE TOP = 9.7 TONS
14" WIDE TOP = 10.6 TONS

~ NOTES ~

BID ITEM AND UNIT TO BID:
CONCRETE MEDIAN BARRIER TYPE ⊕ ⊕ LF
⊕ 9 OR 12 OR 14 DEPENDING ON "W".
⊕ D OR E DEPENDING ON PAVEMENT TYPE. (SEE CUR. STD. DWG. RBM-001 FOR TYPE).

(1) SHORTER SECTIONS MAY BE PERMITTED IF APPROVED IN WRITING BY THE ENGINEER.
(2) 2" DIA. LIFTING HOLE - 2 REQUIRED AT EACH SECTION. FORMED WITH 2" P.V.C. PIPE OR EQUAL.
3. SEE ELSEWHERE IN THE PLANS FOR BASE REQUIREMENTS.
(4) 9" WIDE TOP WITH 2'-3" WIDE BASE OR 12" WIDE TOP WITH 2'-6" BASE. 14" WIDE TOP WITH 2'-8" WIDE BASE. (TAPER NOT INCLUDED IN BASE WIDTH).
(5) THE RACEWAY SHALL BE TIED TO EACH OF THE "A" AND "B" BARS TO PREVENT SAG. SEE ELSEWHERE IN THE PLANS FOR SIZE, LOCATION, AND PAYMENT FOR RACEWAY WHEN REQUIRED.
6. PLACE ALL STEEL REINFORCEMENT A CLEAR DISTANCE OF 2" MIN. FROM OUTSIDE FACE OF WALL, EXCEPT WHERE SHOWN OTHERWISE.
7. SHOP DRAWINGS SHALL BE APPROVED PRIOR TO MANUFACTURE.
(8) WHEN THE "X" DIMENSION EQUALS 10" THE BAR SHALL BE TURNED DOWN 6" ("Z" DIMENSION) AND AN ADDITIONAL LONGITUDINAL BAR SHALL BE ADDED AT THE BOTTOM OF THE TURN DOWN ("Z" DIMENSION) AND TO THE "Y" PORTION OF THE BAR. FOR EACH 6" INCREMENT OF THE "X" DIMENSION ABOVE 10" AN ADDITIONAL LONGITUDINAL BAR SHALL BE ADDED IN THE "Z" AND "Y" PORTION OF THE BAR.
(9) THE "Z" DIMENSION SHALL INCREASE INCH FOR INCH WHEN THE "X" DIMENSION EXCEEDS 10".
(10) LIFTING BARS SHALL BE REQUIRED TO PREVENT SPALLING OF CONCRETE AROUND HOLES.
11. WHEN THE PRECAST WALL IS USED IN PERMANENT CONSTRUCTION THE LIFTING HOLES SHALL BE FILLED WITH GROUT.

USE WITH CUR. STD. DWG.
RBM-001

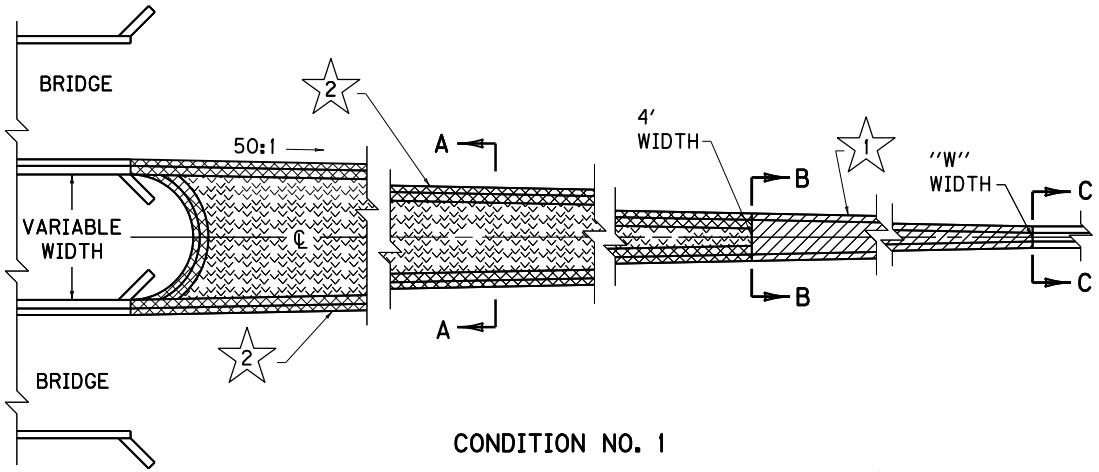
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN BARRIER PRECAST (PERMANENT - EXISTING PAVEMENT)

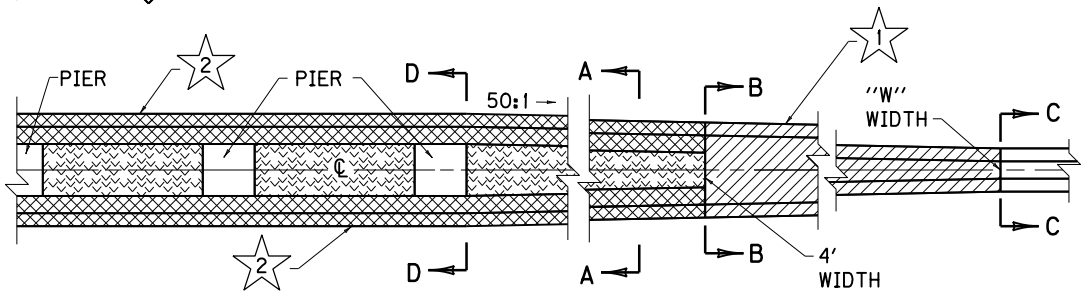
STANDARD DRAWING NO. RBM-006-10

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

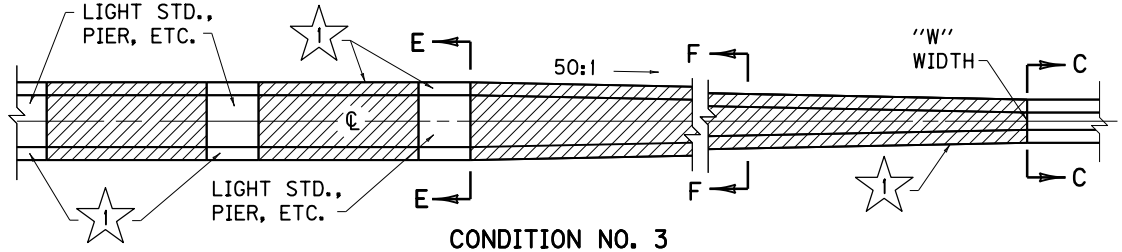
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



CONDITION NO. 1



CONDITION NO. 2



CONDITION NO. 3

~ NOTES ~

BID ITEM AND UNIT TO BID:
CONCRETE MEDIAN BARRIER TYPE ⊕ ⊕ ☆ LF

⊕ 9, 12, OR 14 DEPENDING ON "W"

⊕ A, B, C, D OR E DEPENDING ON PAVEMENT APPLICATION.

☆ 1 = SOLID SEGMENT- DENOTES BARRIER WALL WITH:
- a. TRANSITION FROM "W" WIDTH TO MAX. WIDTH OF 4'.
- b. CONSTANT WIDTH WALL GREATER THAN "W" WIDE BUT NOT GREATER THAN 4' WIDE. (EX.: WALL BETWEEN BRDG. PIERS).

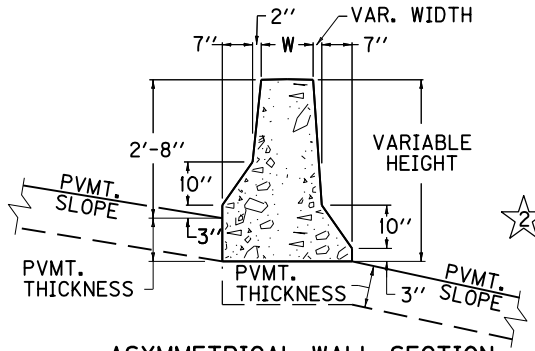
2 = SEPARATE SEGMENT

THE METHOD OF MEASUREMENT FOR CONCRETE MEDIAN BARRIER FOR EACH TYPE WILL BE IN LINEAR FEET MEASURED ALONG THE TOP CENTERLINE OF THE BARRIER.

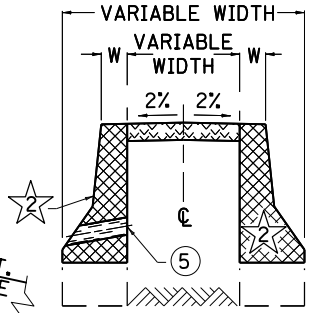
1. TRANSITION CONDITION NO. 1, 2 AND 3 ALONG WITH SYMMETRICAL AND ASYMMETRICAL BARRIER SECTIONS ARE DEPICTED ON THIS DRAWING FOR ILLUSTRATION PURPOSES ONLY AT STRUCTURES AND FIXED OBJECTS. (SEE PLANS FOR ADDITIONAL DETAILS)
2. ALL PAVEMENT, FILL MATERIAL, PIPE DRAINAGE (EXCLUSIVE OF WEEP HOLE PIPE) PLACED BETWEEN SEGMENTS OF THE BARRIER SHALL BE SHOWN SEPARATELY OR INCLUDED WITH OTHER LIKE PAY ITEMS ON THE PROJECT.
3. FOR APPLICATION DETAILS TO NEW OR EXISTING PAVEMENT SEE CUR. STD. DWG. RBM-001.

④ SEE ELSEWHERE IN PLANS FOR SIZE, LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.

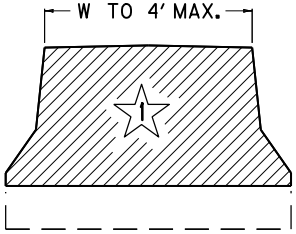
⑤ 4" PIPE FOR WEEP HOLES SPACED ON 20' CENTERS AND STAGGERED 10' WITH EACH WALL.



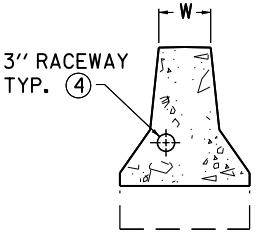
ASYMMETRICAL WALL SECTION



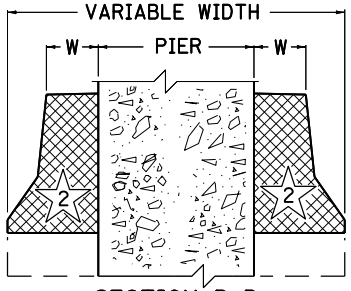
SECTION A-A



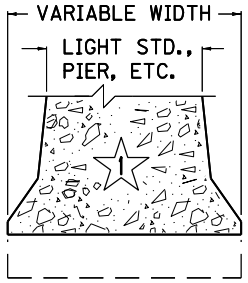
SECTION B-B



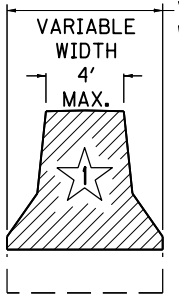
NORMAL SECTION C-C



SECTION D-D



SECTION E-E



SECTION F-F

VARIABLE WIDTH

USE WITH CUR. STD. DWG. RBM-001

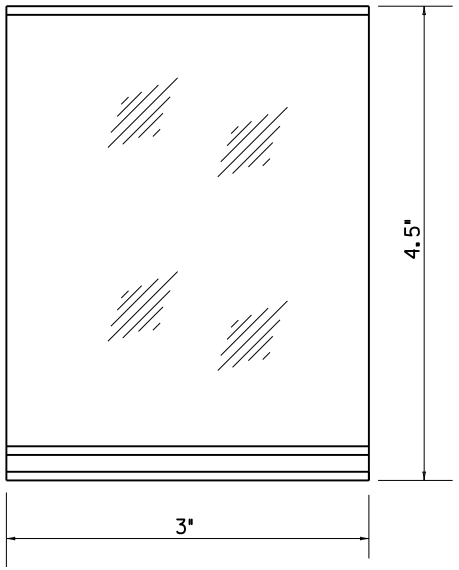
KENTUCKY DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN BARRIER SYMMETRICAL & ASYMMETRICAL SEPARATE & TRANSITION DETAILS

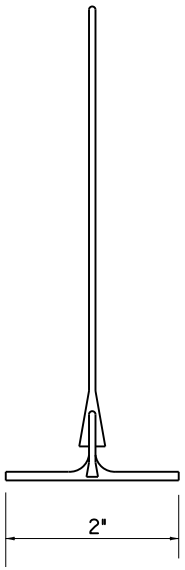
STANDARD DRAWING NO. RBM-015-06

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



FRONT ELEVATION



SIDE ELEVATION

~ NOTES ~

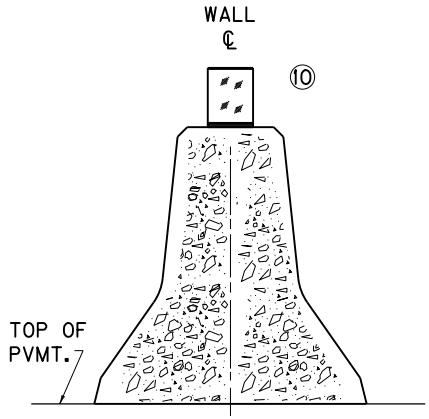
BID ITEM AND UNIT TO BID

DELINEATOR FOR BARRIER WALL - M/W	EACH
DELINEATOR FOR BARRIER WALL - M/Y	EACH
DELINEATOR FOR BARRIER WALL - B/Y	EACH
DELINEATOR FOR BARRIER WALL - B/W	EACH

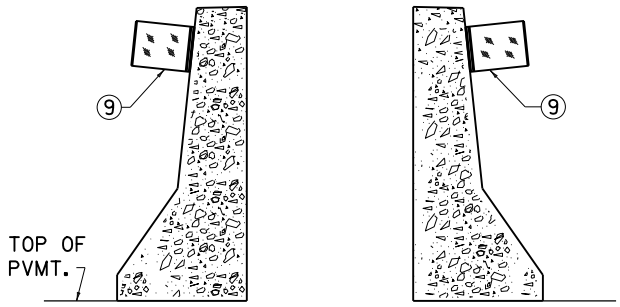
1. BARRIER WALL DELINEATORS SHALL BE REQUIRED ON ALL BARRIER WALLS.
2. DELINEATORS SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR ONE COMPLETE INSTALLATION.
3. THE COLOR OF DELINEATORS SHALL MATCH THE COLOR OF THE EDGELINE THAT THEY SUPPLEMENT. IN GENERAL, DELINEATORS ON BARRIER WALL ALONG THE LEFT SIDE OF DRIVING LANES SHALL BE YELLOW, AND DELINEATORS ON BARRIER WALL ALONG THE RIGHT SIDE OF DRIVING LANES SHALL BE WHITE. DELINEATORS IN BOTH DIRECTIONS ON A TWO-LANE, TWO-WAY ROADWAY SHALL BE BI-DIRECTIONAL WHITE.
4. TYPES OF DELINEATORS PERMITTED SHALL BE FROM THE LIST OF APPROVED MATERIALS. THE DELINEATOR SHAPE AND DIMENSIONS ARE FOR ILLUSTRATION PURPOSES ONLY.
5. THE DELINEATOR UNIT SHALL HAVE THE REFLECTIVE SURFACE INSTALLED FACING TRAFFIC.
6. DELINEATORS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMENDATION.
7. DELINEATORS SHALL BE ATTACHED TO CONCRETE MEDIAN BARRIER WITH AN APPROVED ADHESIVE.
8. DELINEATOR SHEETING SHALL BE TYPE IX, YELLOW OR WHITE.

⑨ DELINEATORS SHOULD BE MOUNTED AT A HEIGHT OF APPROXIMATELY 4' ABOVE PAVEMENT. WHEN CONCRETE BARRIERS EXTEND ACROSS BRIDGE STRUCTURES IN LIEU OF STEEL BEAM GUARDRAIL, DELINEATORS SHALL BE INSTALLED AT THE SAME VERTICAL ALIGNMENT AS ON THE GUARDRAIL.

⑩ FOR BARRIER WALLS 50'' OR LESS IN HEIGHT, DELINEATORS MAY BE INSTALLED ON TOP OF THE BARRIER WALL. FOR MEDIAN BARRIER WALLS 50'' OR LESS IN HEIGHT THAT SEPARATE TWO-WAY TRAFFIC, BI-DIRECTIONAL YELLOW DELINEATORS MAY BE INSTALLED ON THE TOP OF THE BARRIER WALL IN LIEU OF SIDE-MOUNTED MONO-DIRECTIONAL YELLOW DELINEATORS.



NORMAL (SOLID) WALL SECTION



(SEPARATE SEGMENT) WALL SECTION

APPROXIMATE DELINEATOR SPACING	
TANGENT	100'
CURVE	50'

SPACING SHOULD BE ADJUSTED IN CURVES SO THAT SEVERAL DELINEATORS ARE ALWAYS SIMULTANEOUSLY VISIBLE TO THE ROAD USER.

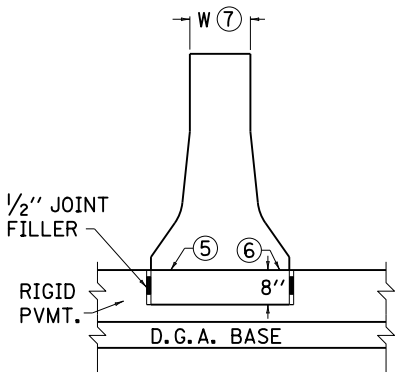
KENTUCKY
DEPARTMENT OF HIGHWAYS

DELINEATORS FOR CONCRETE BARRIERS

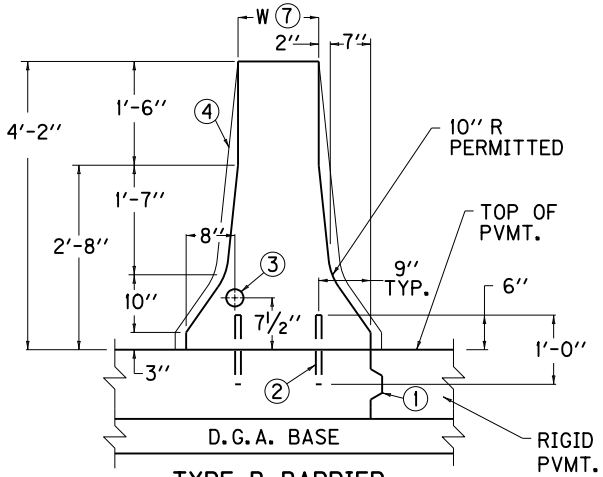
STANDARD DRAWING NO. RBM-020-09

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



TYPE A BARRIER
(NEW RIGID PAVEMENT)



TYPE B BARRIER
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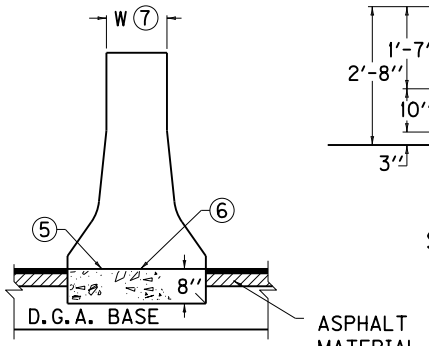
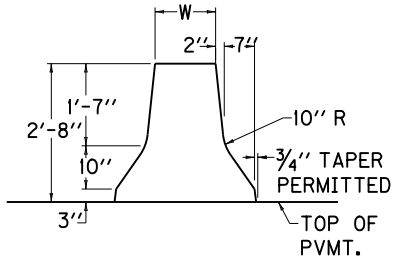
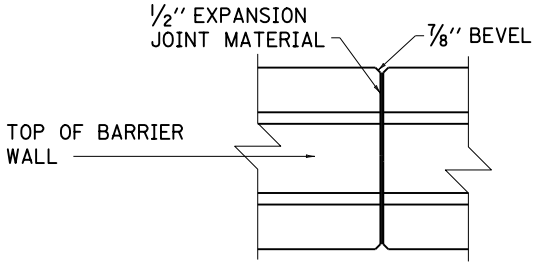


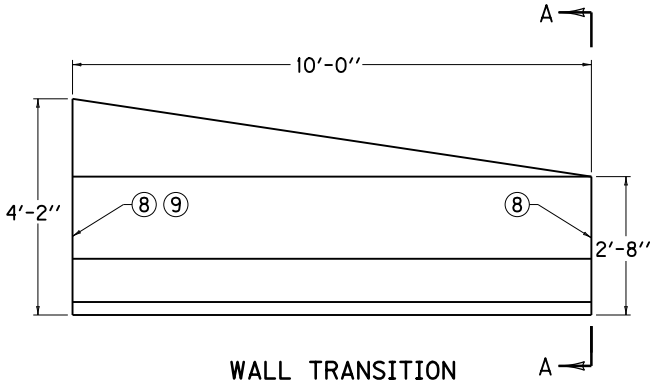
TYPE C BARRIER
(NEW FLEXIBLE PAVEMENT)



SECTION A-A



EXPANSION JOINT DETAIL



WALL TRANSITION
(ELEVATION VIEW)

~ NOTES ~

THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR "CONCRETE MEDIAN BARRIER TYPE ☆ ⊕ 50" SHALL BE FULL COMPENSATION FOR ALL MATERIALS, EQUIPMENT, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

☆ 12 OR 14 DEPENDING ON "W".

⊕ A, B OR C DEPENDING ON PAVEMENT TYPE.

① LONGITUDINAL CONSTRUCTION JOINT WITHOUT TIE BARS IS REQUIRED AND SHALL BE PLACED AT THE LOCATION SHOWN OR MAY BE INSTALLED AT THE CORRESPONDING POINT ON THE OPPOSITE SIDE OF THE BARRIER, AT THE OPTION OF THE CONTRACTOR. IT SHALL BE REQUIRED ON THE LOW SIDE OF A SUPERELEVATED SECTION.

② NO. 8 DOWEL BARS SPACED 4'-0" O.C. AND STAGGERED 2'-0".

③ 3" RACEWAY (TYPICAL). SEE ELSEWHERE IN THE PLANS FOR LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.

④ WALL MAY BE FIXED-FORMED AS DEPICTED BY PHANTOM LINES.

⑤ WHEN A CONSTRUCTION JOINT IS USED, DOWEL BARS WILL BE REQUIRED AS SHOWN WITH TYPE B BARRIERS.

⑥ CONSTRUCTION JOINT PERMITTED WHEN FIXED FORMS OR SLIP FORMS ARE USED.

⑦ A 14" WALL WITH 3" RACEWAY IS REQUIRED WHEN THE ROADWAY WILL BE LIGHTED FROM THE MEDIAN.

⑧ THE WALL TRANSITION DETAILED IS FOR A FIXED-FORM OR SLIP-FORM WALL. SEE CURRENT STANDARD DRAWING RBM-053 FOR CONNECTION DETAILS, STEEL PLACEMENT, LIFTING HOLE DIMENSIONS, ETC. WHEN WALL IS PRECAST.

⑨ SEE TYPE B BARRIER DETAIL FOR WALL DIMENSIONS.

APPROX. QUANTITIES PER LINEAR FOOT

TYPE	12" WALL		14" WALL	
	CONC. IN CU. YDS.	STEEL IN POUNDS	CONC. IN CU. YDS.	STEEL IN POUNDS
A	0.27	△ 1.34	0.30	△ 1.34
B	0.21	1.34	0.23	1.34
C	0.27	△ 1.34	0.30	△ 1.34

△ WHEN REQUIRED

CONCRETE QUANTITIES SHOWN INCLUDE 8" BASE THICKNESS FOR TYPE A AND TYPE C. THE CONTRACTOR IS RESPONSIBLE FOR ADDITIONAL CONCRETE QUANTITIES.

USE WITH CUR. STD. DWG. RBM-053

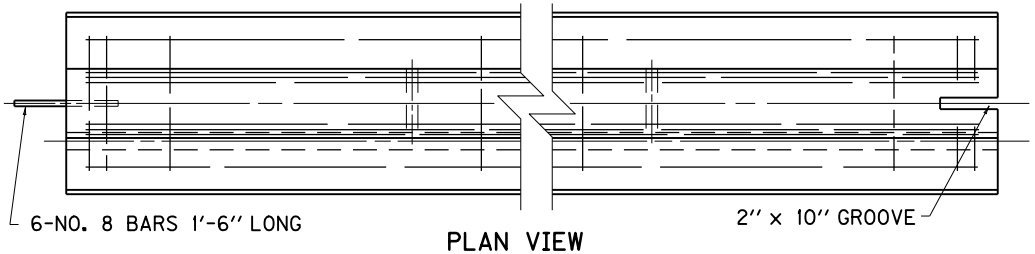
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN BARRIER FIXED-FORM OR SLIP-FORM (PERMANENT) (50" TALL WALL)

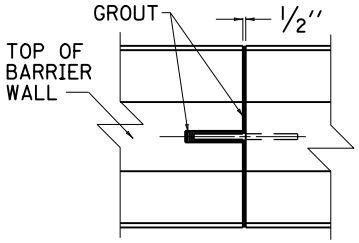
STANDARD DRAWING NO. RBM-050-01

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

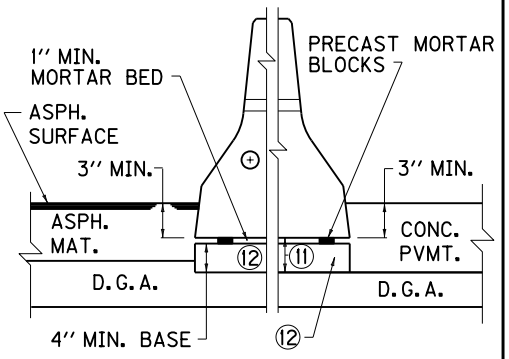
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW

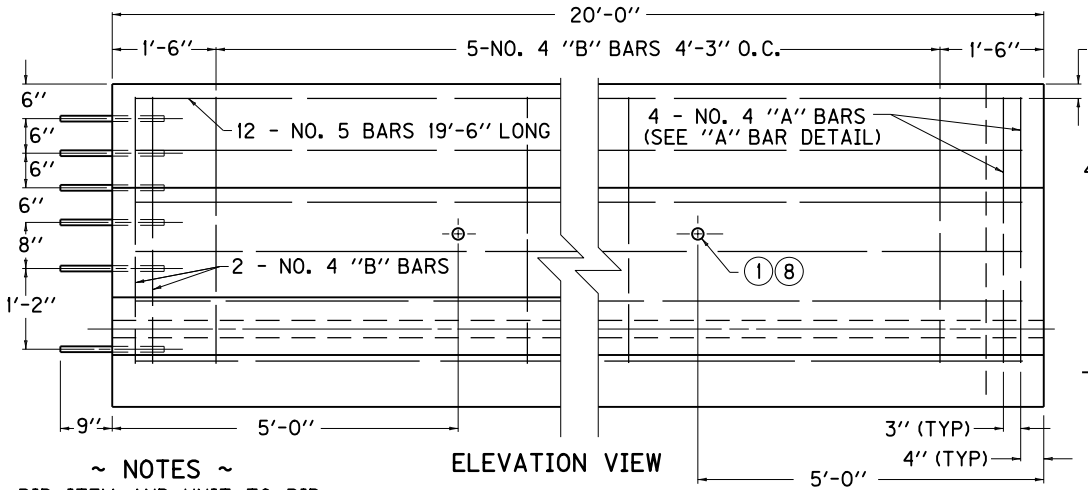


CONNECTION DETAIL

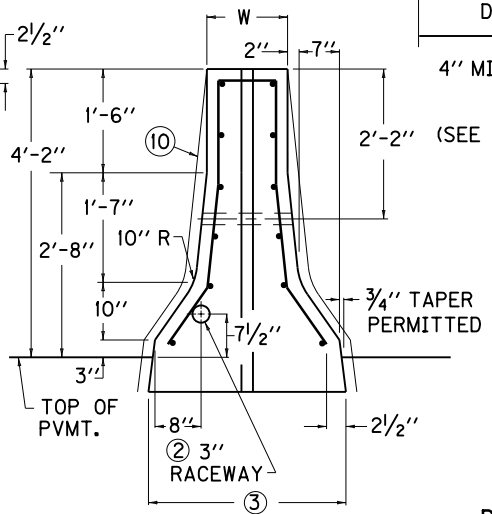


PAVEMENT DETAIL

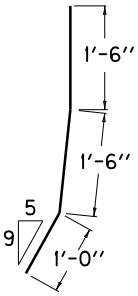
(SEE RIGHT ELEVATION FOR DIMENSIONS)



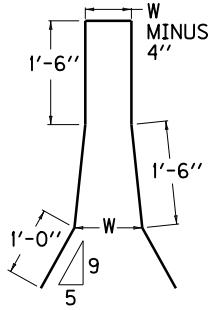
ELEVATION VIEW



RIGHT ELEVATION VIEW



DETAIL OF "A" BAR



DETAIL OF "B" BAR

~ NOTES ~

BID ITEM AND UNIT TO BID:

A. CONCRETE MEDIAN BARRIER TYPE ☆ ⊕ 50 LF

☆ 12 OR 14 DEPENDING ON "W".

⊕ A OR C DEPENDING ON PAVEMENT TYPE. SEE CURRENT STANDARD DRAWING RBM-050 FOR PAVEMENT TYPE.

B. WITH FLEXIBLE PAVEMENT THE CONTRACT UNIT PRICE PER LINEAR FOOT SHALL INCLUDE THE BASE, ALL CONCRETE, LABOR, REINFORCING STEEL AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE PERMANENT INSTALLATION.

C. WITH RIGID PAVEMENT THE CONTRACT UNIT PRICE PER LINEAR FOOT SHALL INCLUDE, THE BASE, ALL CONCRETE, LABOR, REINFORCING STEEL AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE PERMANENT INSTALLATION.

① 2" DIA. LIFTING HOLE - 2 REQUIRED AT EACH SECTION. FORMED WITH 2" P.V.C. PIPE OR EQUAL.

② THE RACEWAY SHALL BE TIED TO EACH OF THE A AND B BARS TO PREVENT SAG. SEE ELSEWHERE IN THE PLANS FOR LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.

③ 12" W WITH 2'-6" WIDE BASE OR 14" W WITH 2'-8" BASE (TAPER NOT INCLUDED IN BASE WIDTH).

4. PLACE ALL STEEL REINFORCEMENT A CLEAR DISTANCE OF 2" MIN. FROM OUTSIDE FACE OF WALL, EXCEPT WHERE SHOWN OTHERWISE.

5. SHOP DRAWINGS SHALL BE APPROVED PRIOR TO MANUFACTURE.

⑥ WHEN THE "X" DIMENSION EQUALS 10" THE BAR SHALL BE TURNED DOWN 6" ("Z" DIMENSION) AND AN ADDITIONAL LONGITUDINAL BAR SHALL BE ADDED AT THE BOTTOM OF THE TURN DOWN ("Z" DIMENSION) AND TO THE "Y" PORTION OF THE BAR. FOR EACH 6" INCREMENT OF THE "X" DIMENSION ABOVE 10" AN ADDITIONAL LONGITUDINAL BAR SHALL BE ADDED IN THE "Z" AND "Y" PORTION OF THE BAR.

⑦ THE "Z" DIMENSION SHALL INCREASE INCH FOR INCH WHEN THE "X" DIMENSION EXCEEDS 10".

⑧ LIFTING BARS SHALL BE REQUIRED TO PREVENT SPALLING OF CONCRETE AROUND HOLES.

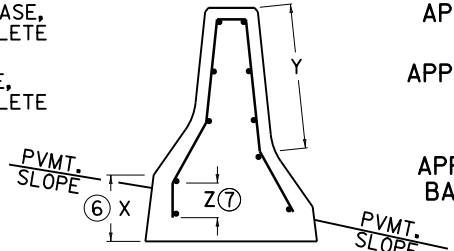
9 THE LIFTING HOLES SHALL BE FILLED WITH GROUT WHEN COMPLETE.

⑩ WALL MAY BE FORMED AS DEPICTED BY PHANTOM LINES.

⑪ PAVEMENT THICKNESS MINUS 3".

⑫ SEE ELSEWHERE IN PLANS FOR BASE REQUIREMENTS.

13. SEE CURRENT STANDARD DRAWING RBM-050 FOR WALL TRANSITION WHEN APPLICABLE.



STEEL PLACEMENT FOR ASYMMETRICAL WALL SECTION

APPROX. REINF./20' SECTION
296 LBS.

APPROX. CU. YD. CONC./LIN. FT.
12" WIDE TOP = 0.23
14" WIDE TOP = 0.26

APPROX. WEIGHT/20' SECTION BASED ON 150 LBS./CU. FT.
12" WIDE TOP = 9.3 TONS
14" WIDE TOP = 10.4 TONS

USE WITH CUR. STD. DWG. RBM-050

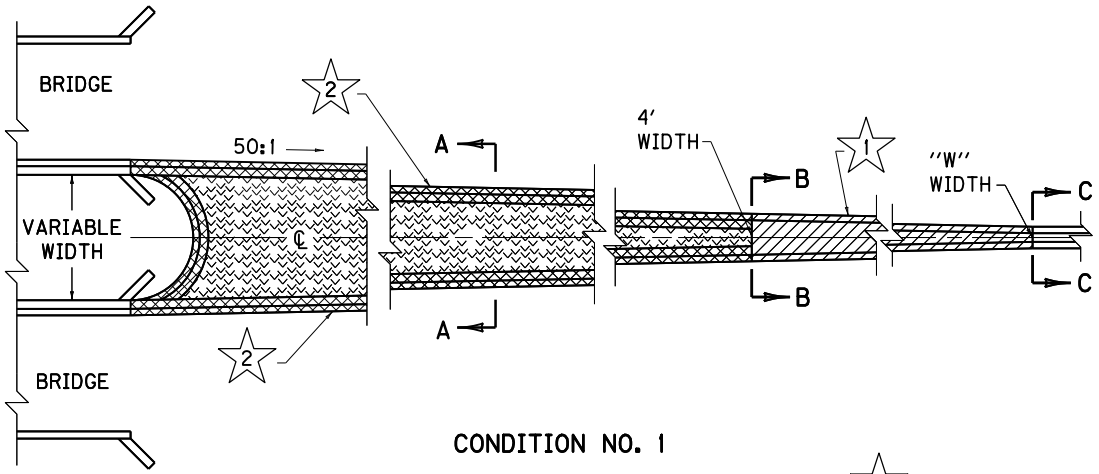
KENTUCKY DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN BARRIER PRECAST (PERMANENT) (50" TALL WALL)

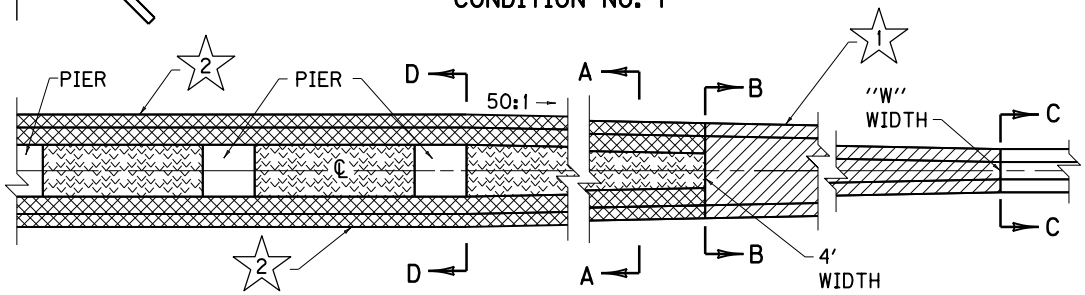
STANDARD DRAWING NO. RBM-053-01

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

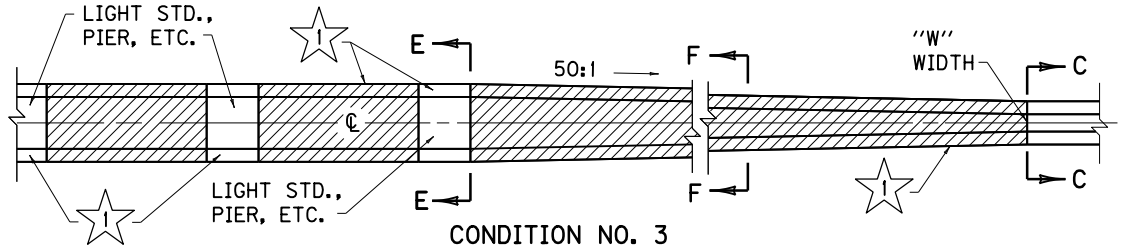
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



CONDITION NO. 1



CONDITION NO. 2



CONDITION NO. 3

~ NOTES ~

1. TRANSITION CONDITION NO. 1, 2 AND 3 ALONG WITH SYMMETRICAL AND ASYMMETRICAL BARRIER SECTIONS ARE DEPICTED ON THIS DRAWING FOR ILLUSTRATION PURPOSES ONLY AT STRUCTURES AND FIXED OBJECTS. (SEE PLANS FOR ADDITIONAL DETAILS)
2. ALL PAVEMENT, FILL MATERIAL, PIPE DRAINAGE (EXCLUSIVE OF WEEP HOLE PIPE) PLACED BETWEEN SEGMENTS OF THE BARRIER SHALL BE SHOWN SEPARATELY OR INCLUDED WITH OTHER LIKE PAY ITEMS ON THE PROJECT.
3. FOR APPLICATION DETAILS SEE CURRENT STANDARD DRAWING RBM-050

THE METHOD OF MEASUREMENT FOR CONCRETE MEDIAN BARRIER FOR EACH TYPE WILL BE IN LINEAR FEET MEASURED ALONG THE TOP CENTERLINE OF THE BARRIER.

BID ITEM AND UNIT TO BID

CONCRETE MEDIAN BARRIER TYPE ⊕ ⊕ ☆ (50) LF

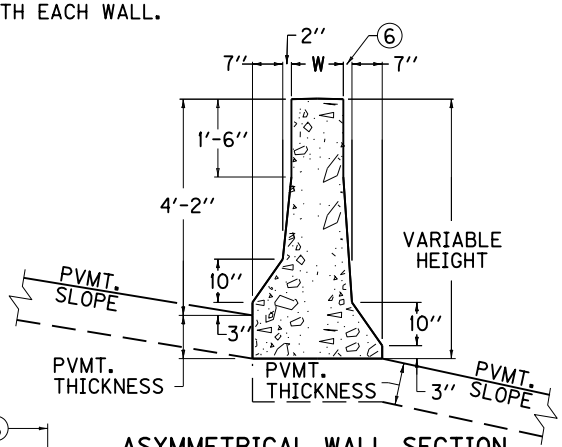
⊕ 12, OR 14 DEPENDING ON "W"

⊕ A, B OR C DEPENDING ON PAVEMENT APPLICATION.

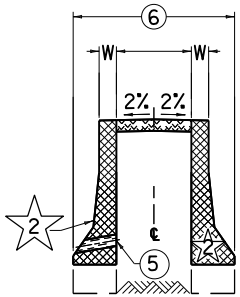
☆ 1 = SOLID SEGMENT- DENOTES BARRIER WALL WITH:
- a. TRANSITION FROM "W" WIDTH TO MAX. WIDTH OF 4'.
- b. CONSTANT WIDTH WALL GREATER THAN "W" WIDE BUT NOT GREATER THAN 4' WIDE. (EX.: WALL BETWEEN BRDG. PIERS).

2 = SEPARATE SEGMENT

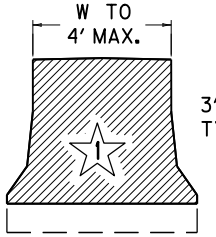
4. SEE ELSEWHERE IN PLANS FOR LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.
5. 4" PIPE FOR WEEP HOLES SPACED ON 20' CENTERS AND STAGGERED 10' WITH EACH WALL.
6. VARIABLE WIDTH



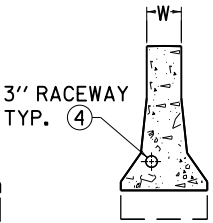
ASYMMETRICAL WALL SECTION



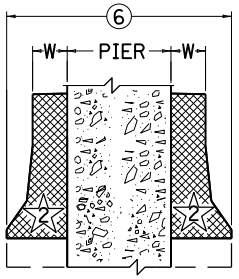
SECTION A-A



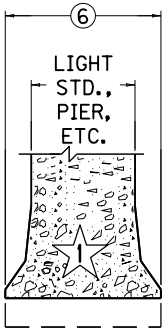
SECTION B-B



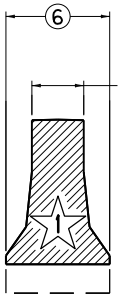
NORMAL SECTION C-C



SECTION D-D



SECTION E-E



SECTION F-F

USE WITH CUR. STD. DWG. RBM-050

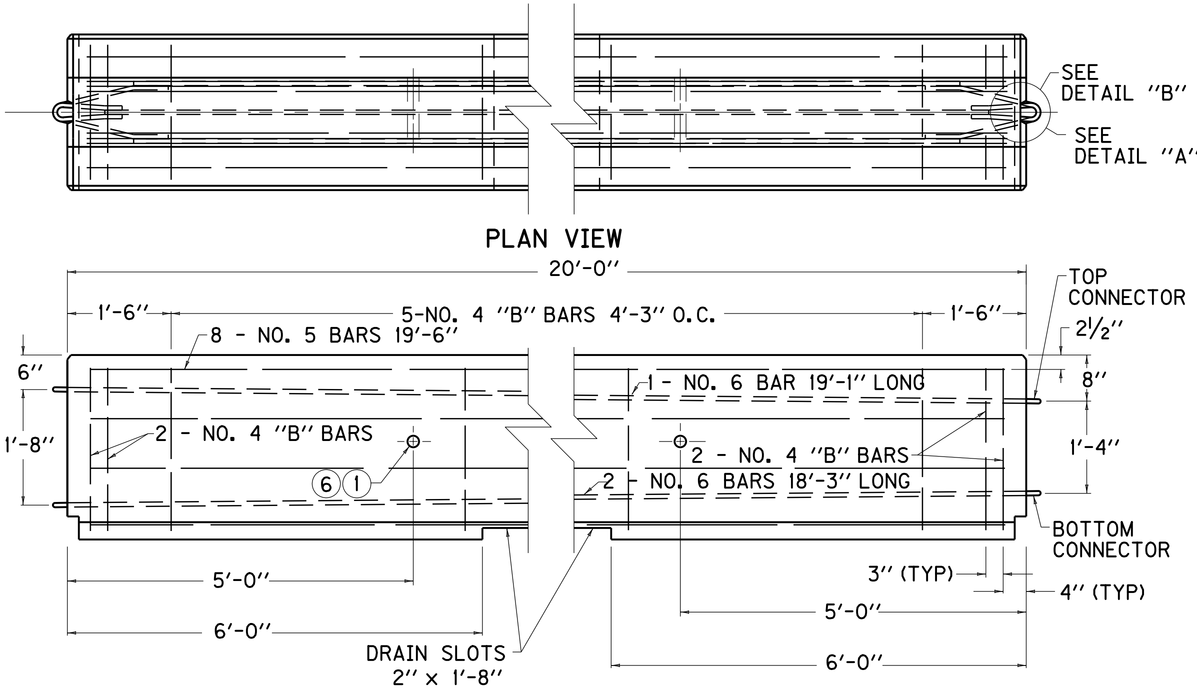
KENTUCKY DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN BARRIER SYMMETRICAL & ASYMMETRICAL SEPARATE & TRANSITION DETAILS (50" TALL WALL)

STANDARD DRAWING NO. RBM-060-01

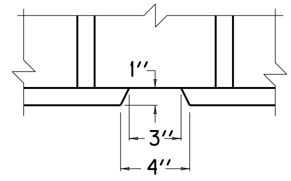
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

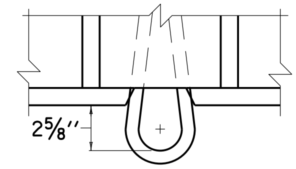


PLAN VIEW

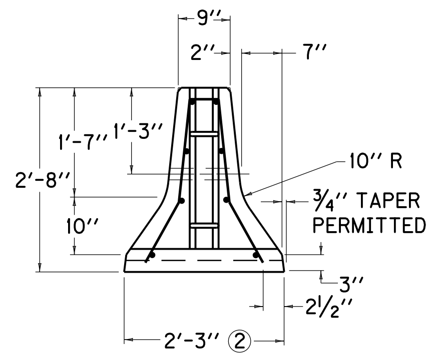
ELEVATION VIEW



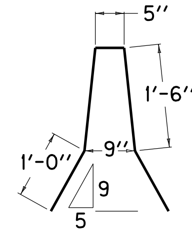
DETAIL "A"



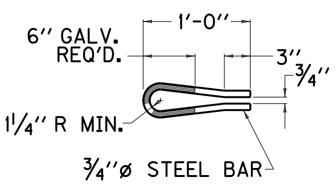
DETAIL "B"



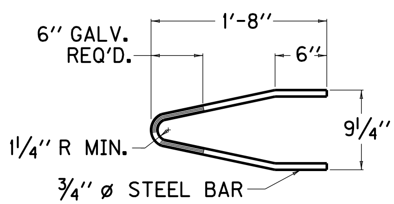
RIGHT ELEVATION VIEW



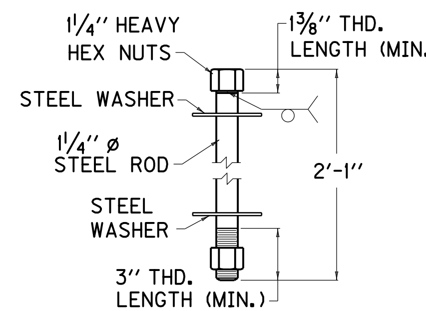
DETAIL OF "B" BAR



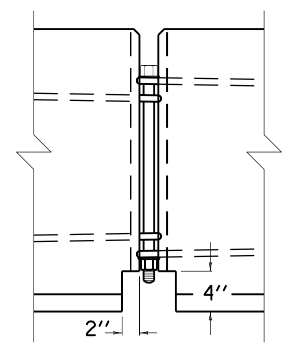
TOP CONNECTOR
(HOT DIP GALVANIZE AFTER FORMING)



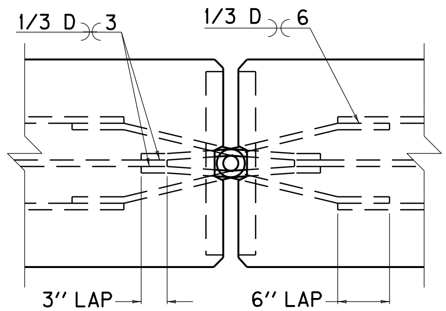
BOTTOM CONNECTOR
(HOT DIP GALVANIZE AFTER FORMING)



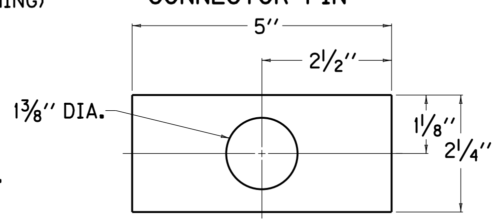
CONNECTOR PIN



ELEVATION OF CONNECTON DETAIL



PLAN OF CONNECTION DETAIL



½" THICK STEEL WASHER

~ NOTES ~

BID ITEM AND UNIT TO BID
CONCRETE BARRIER WALL TYPE 9T LF

1. (circled) 2" DIA. LIFTING HOLE - 2 REQUIRED FOR EACH SECTION. FORMED WITH 2" P.V.C. PIPE OR EQUAL.
2. (circled) TAPER NOT INCLUDED IN BASE WIDTH.
3. SHOP DRAWINGS SHALL BE APPROVED PRIOR TO MANUFACTURE.
4. (circled) BASED ON 150 LBS./CU. FT.
5. PLACE ALL STEEL REINFORCEMENT A CLEAR DISTANCE OF 2" MIN. FROM OUTSIDE FACE OF WALL, EXCEPT WHERE SHOWN OTHERWISE.
6. (circled) LIFTING BARS SHALL BE REQUIRED TO PREVENT SPALLING OF CONCRETE AROUND HOLES.
7. PREVIOUS WALL MANUFACTURED ACCORDING TO STANDARD DRAWING RBM-115-07 MAY STILL BE USED. ANY NEW BARRIER WALL TYPE 9T MANUFACTURED SHALL COMPLY TO THIS STANDARD DRAWING.
8. A PERMISSABLE ALTERNATE FOR THE PIN AND LOOP CONNECTOR IS JJ HOOK MANUFACTURED BY EASI-SET INDUSTRIES OUT OF MIDLAND, VA. SEE MANUFACTURER'S SHOP DRAWINGS FOR DETAILS ON JJ HOOK CONNECTOR AND RECOMMENDED REINFORCEMENT. THE BARRIER WALL'S DIMENSIONS, SHAPE, LENGTH AND THE DRAIN SLOT DIMENSIONS AND LOCATIONS SHALL MATCH THIS DRAWINGS CURRENT DIMENSIONS. 1 6

APPROXIMATE QUANTITIES

20'		
REINF.	CONC.	WEIGHT 4
LBS.	CU. YD./FT.	TONS
195	0.12	5.0

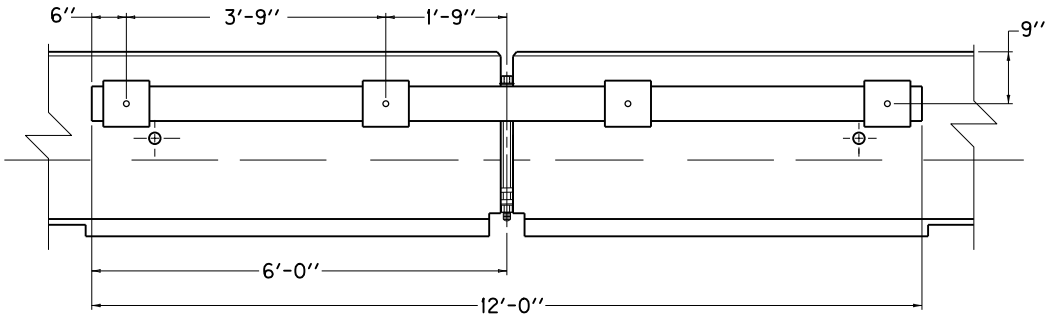
USE WITH CUR. STD. DWG. RBM-120

KENTUCKY
DEPARTMENT OF HIGHWAYS

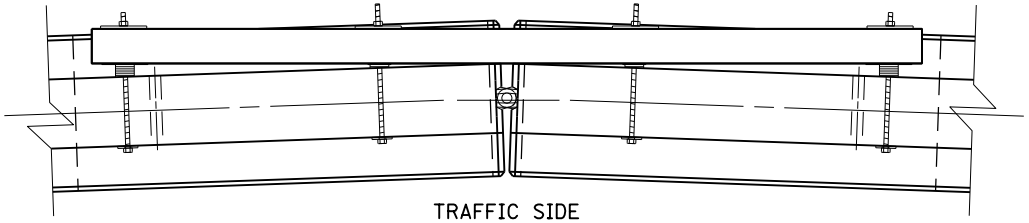
CONCRETE BARRIER WALL TYPE 9T (TEMPORARY)

STANDARD DRAWING NO. RBM-115-10

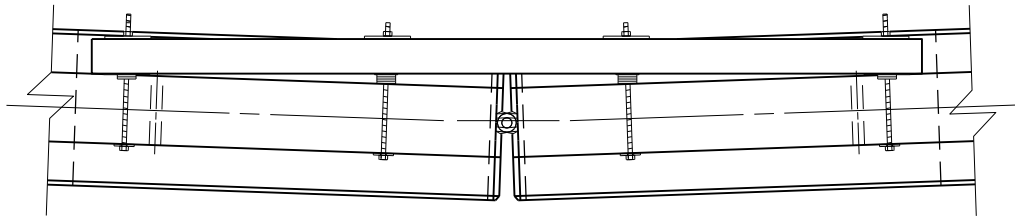
SUBMITTED [signature] DIRECTOR DIVISION OF DESIGN 12-01-15 DATE
APPROVED [signature] STATE HIGHWAY ENGINEER 12-01-15 DATE



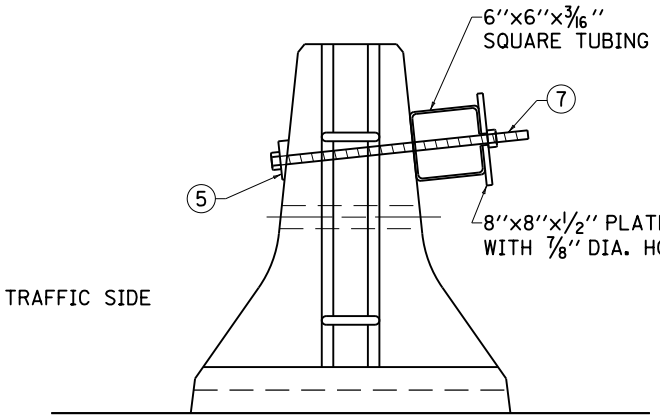
ELEVATION VIEW



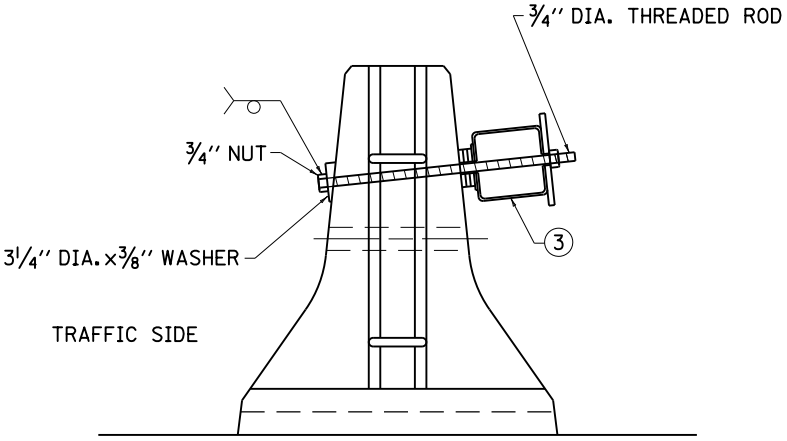
PLAN VIEW



PLAN VIEW



TYPICAL CONNECTION



TYPICAL CONNECTION
SHOWING SHIMMING

~ NOTES ~

1. STIFFENED BARRIER WALL IS REQUIRED IN WORK ZONES WHEN THE EDGE OF THE WALL FURTHEST FROM TRAFFIC IS LOCATED WITHIN 3'-0'' OF THE BRIDGE DECK EDGE PARALLEL TO THE DIRECTION OF TRAFFIC. MAY ALSO BE USED IN OTHER TEMPORARY SITUATIONS WHERE SUBSTANTIAL DROP OFFS EXIST.
2. STIFFENER SHALL BE INSTALLED WHEN BARRIER IS SET AND BEFORE EXPOSED TO TRAFFIC.
3. SQUARE TUBING SHALL BE 50 GRADE STRUCTURAL STEEL.
4. WHEN BARRIER WALL SECTIONS ARE PLACED ON A RADIUS, THE AREA BETWEEN THE SQUARE TUBING AND BARRIER WALL SHALL BE SHIMMED AS SHOWN ABOVE. SHIM SHALL CONSIST OF ONE SQUARE PLATE (4'' NEAR END OF BARRIER WALL SECTION, 8'' NEAR END OF TUBING SECTIONS) 3/16'' THICK WITH AS MANY 3 1/4'' DIA. x 3/8'' THICK WASHERS AS NEEDED.
5. BEVEL WASHER TO BE PARALLEL WITH PLANE OF BARRIER AND BOLT HEAD. (TYP.)
6. ALL MATERIALS, LABOR INVOLVED WITH THIS PROCESS TO BE INCIDENTAL TO LINEAR FEET OF WALL.
7. ROD PERPENDICULAR TO BARRIER WALL SURFACE. (TYP.)

USE WITH CUR. STD. DWG.
RBM-115

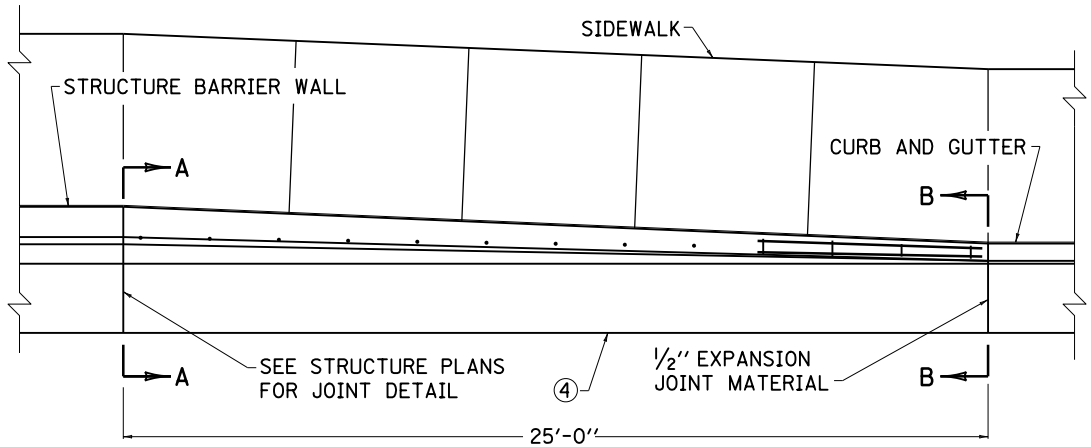
KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX BEAM STIFFENING OF TEMPORARY CONCRETE BARRIER

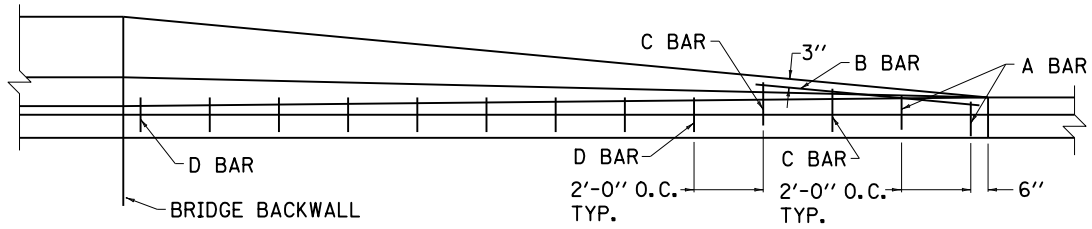
STANDARD DRAWING NO. RBM-120-01

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

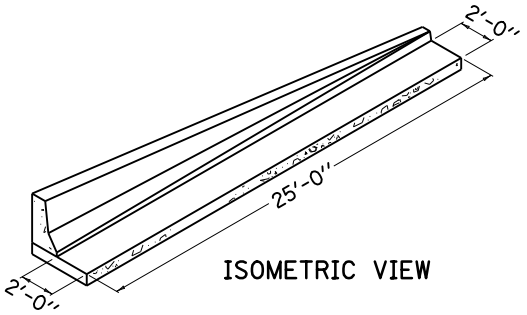
APPROVED _____ STATE HIGHWAY ENGINEER — 12-01-15 DATE



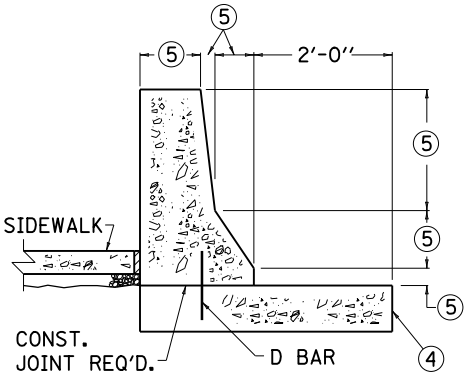
PLAN VIEW



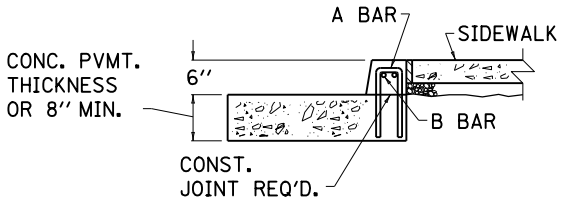
ELEVATION VIEW



ISOMETRIC VIEW



SECTION A-A



SECTION B-B

~ NOTES ~

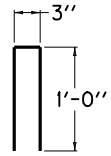
BID ITEM AND UNIT TO BID
CURB TO BARRIER WALL TRANS EACH

1. THE CONTRACT UNIT PRICE EACH FOR THE CURB TO BARRIER WALL TRANSITION SHALL INCLUDE CONCRETE, FORMS, STEEL REINFORCEMENT, EXPANSION JOINT MATERIAL, AND ALL INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION.
2. FOR ILLUSTRATION PURPOSES THE DETAILS DEPICT THE CURB TO BARRIER WALL TRANSITION CONNECTING TO A STANDARD CURB, HOWEVER THE CURB TO BARRIER WALL TRANSITION MAY BE CONSTRUCTED TO MATCH ANY ADJOINING CURB.
3. THE AMOUNT OF CLASS "A" CONCRETE REQUIRED FOR A TRANSITION SECTION WITH A 10½" WIDE TOP IS APPROXIMATELY 2.61 CU. YDS.

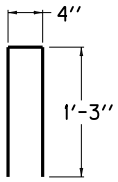
④ WHEN THE CURB TO BARRIER WALL TRANSITION ABUTS RIGID PAVEMENT A LONGITUDINAL SAWED CONSTRUCTION JOINT SHALL BE INSTALLED IN ACCORDANCE WITH CUR. STD. DWG. RPS-010.

⑤ SEE STRUCTURE PLANS FOR DIMENSIONS.

6. CURB TO BARRIER WALL TRANSITION NOT FOR USE ON APPROACH ENDS ON HIGH SPEED N.H.S.



BAR A



BAR C

BILL OF REINFORCEMENT				
BAR	QTY.	SIZE	LENGTH	TOTAL LBS. OF STEEL
A	2	5	2'-2"	48
B	2	5	6'-6"	
C	2	5	2'-9"	
D	9	8	1'-0"	

USE WITH CUR. STD. DWG. RPS-010

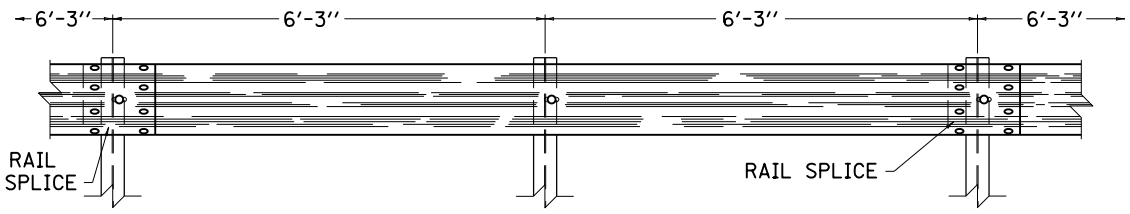
KENTUCKY
DEPARTMENT OF HIGHWAYS

CURB TO BARRIER WALL TRANSITION

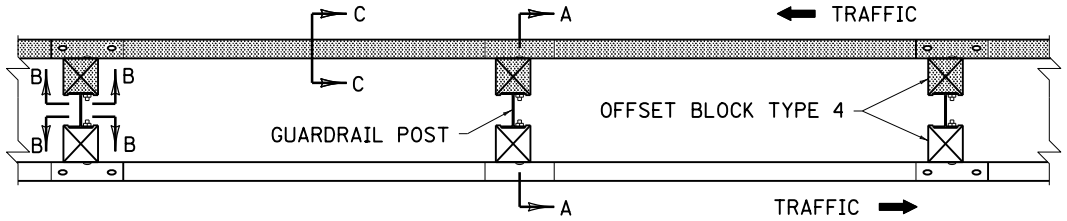
STANDARD DRAWING NO. RBM-130-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

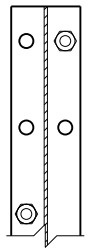
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



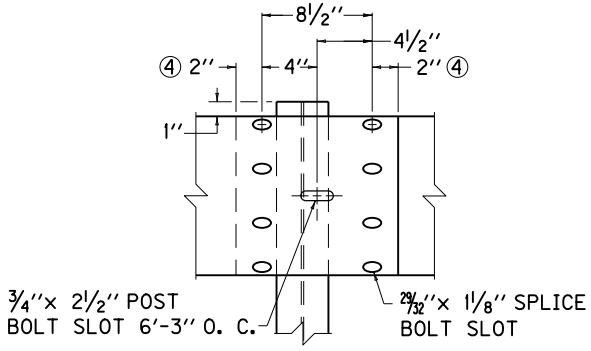
ELEVATION VIEW



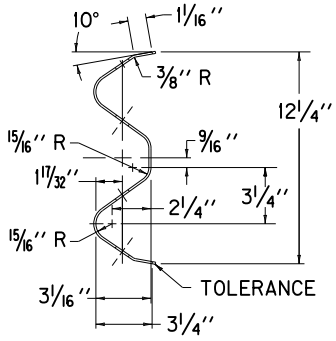
PLAN VIEW
(DOUBLE FACE RAIL OR SINGLE FACE RAIL)



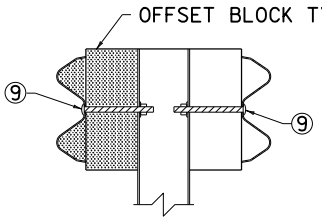
SECTION B-B



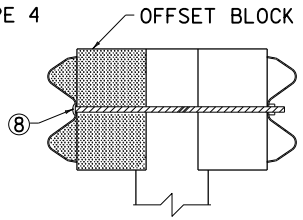
RAIL SPLICE ⑤



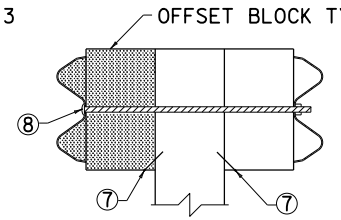
SECTION C-C
(RAIL CORRUGATED
SHEET STEEL BEAM)



SECTION A-A
DOUBLE FACE RAIL WITH
STEEL POST (W6x9)
(TIMBER OFFSET BLOCK)



SECTION A-A
DOUBLE FACE RAIL WITH
ROUND TIMBER POST



SECTION A-A
DOUBLE FACE RAIL WITH
TIMBER POST

~ NOTES ~

BID ITEM AND UNIT TO BID
GUARDRAIL-STEEL W BEAM-S FACE LF
OR
GUARDRAIL-STEEL W BEAM-D FACE LF

1. DIMENSIONAL TOLERANCES NOT SHOWN OR IMPLIED ARE INTENDED TO BE THOSE CONSISTENT WITH THE PROPER FUNCTIONING OF THE PART, INCLUDING ITS APPEARANCE AND ACCEPTED MANUFACTURING PRACTICES.
2. THE RAIL ELEMENT SHALL COMPLY WITH AASHTO M-180 -CLASS A, TYPE II.
3. ALL LAPS SHALL BE PLACED IN THE DIRECTION OF TRAFFIC FLOW.

④ TOLERANCE + 1¼", -¼"

⑤ 8-⅝"x 1¼" LONG BUTTON HEAD BOLTS AND HEX HEAD RECESS NUTS REQUIRED FOR EACH RAIL SPLICE.

⑥ LENGTH EQUALS POST AND BLOCK WIDTH PLUS 2" FOR BOLT OR 2¼" FOR THREADED ROD.

⑦ GALVANIZED STEEL 10d COMMON COATED NAIL (DRIVE NAIL AT THE TOP OR BOTTOM CENTER OF BLOCK AND POST AFTER BOLT IS INSTALLED).

⑧ ⅝"x ⑥ STEEL THREADED ROD AND TWO (2) HEX HEAD NUTS OR ⅝"x ⑥ BUTTON OR HEX HEAD BOLT AND HEX HEAD NUT.

⑨ ⅝"x8" BUTTON HEAD BOLT, HEX HEAD RECESS NUT AND ONE ⅝" ROUND WASHER (TYP.). BOLT SHALL HAVE A MINIMUM THREAD LENGTH OF 2".

▨ REQUIRED FOR DOUBLE RAIL

10. BOTH 12'-6" AND 25' LENGTHS OF "W" BEAM GUARDRAIL SECTIONS WILL BE PERMITTED UNLESS OTHERWISE DIRECTED BY THE ENGINEER.

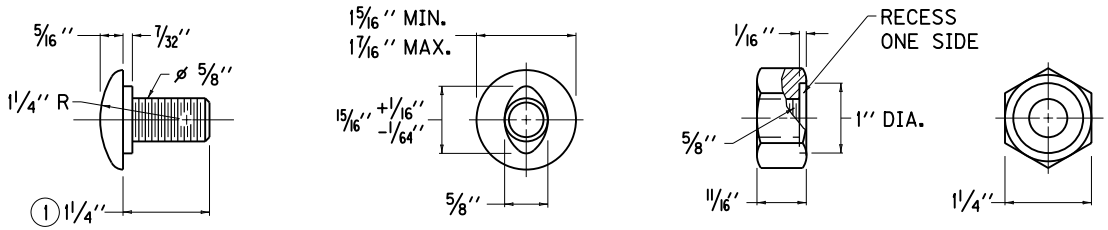
KENTUCKY
DEPARTMENT OF HIGHWAYS

STEEL BEAM GUARDRAIL ("W" BEAM)

STANDARD DRAWING NO. RBR-001-12

SUBMITTED William S. Hulett DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

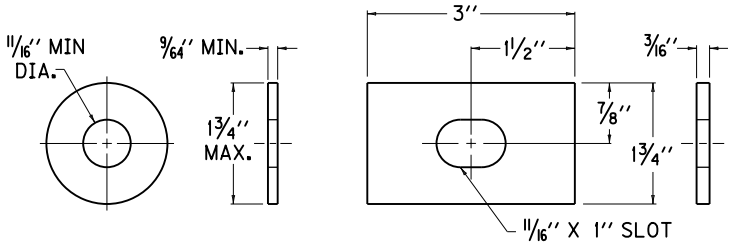


5/8'' BUTTON HEAD BOLT AND RECESSED NUT

~ NOTES ~

1. RAIL BOLT SIMILAR EXCEPT LENGTH.
2. THE THRIE BEAM TO ''W'' BEAM CONNECTOR SHALL COMPLY WITH AASHTO M-180 CLASS A, TYPE 2 EXCEPT WHERE IT IS IN CONFLICT WITH THIS DETAIL.

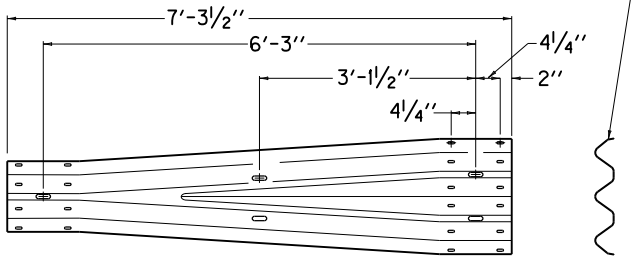
BID ITEM AND UNIT TO BID
THRIE BEAM TO W BEAM CONNECTOR EACH



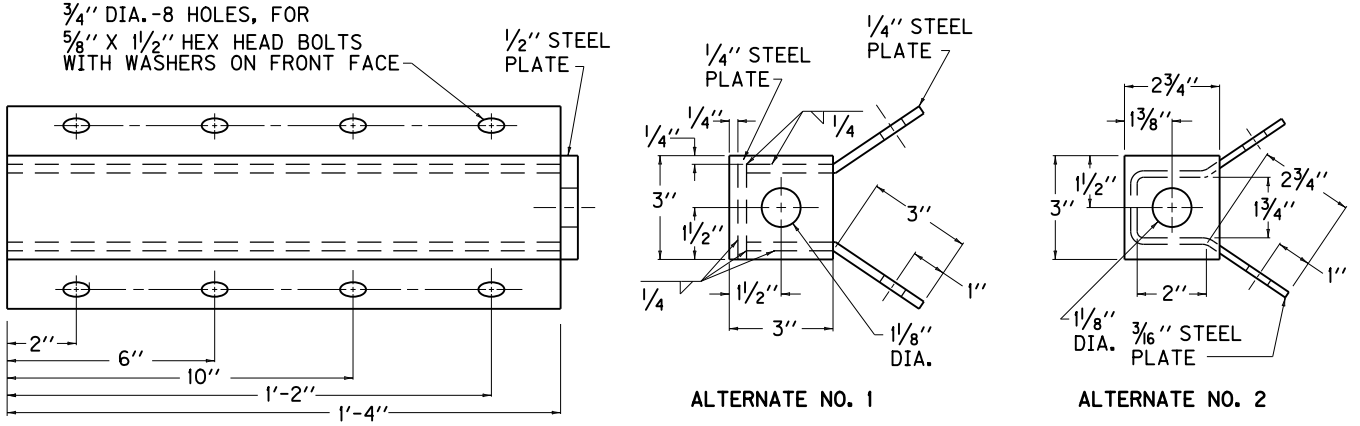
ROUND WASHER AND RECTANGULAR PLATE WASHER

SEE CUR. STD. DWG. RBR-001 FOR DIMENSIONS

SEE CUR. STD. DWG. RBR-100 FOR DIMENSIONS



THRIE BEAM TO ''W'' BEAM CONNECTOR (2)



RAIL ANCHOR ASSEMBLY

USE WITH CUR. STD. DWG. RBR-001 , RBR-100

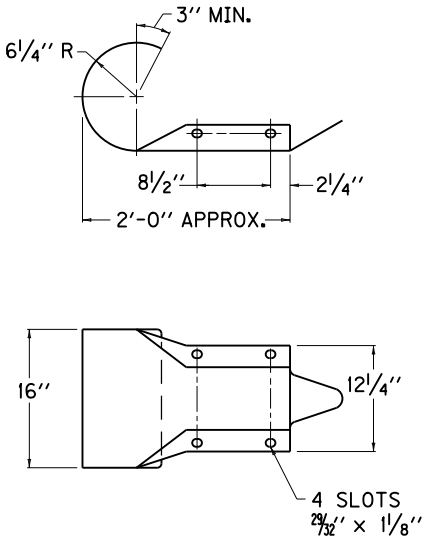
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL COMPONENTS

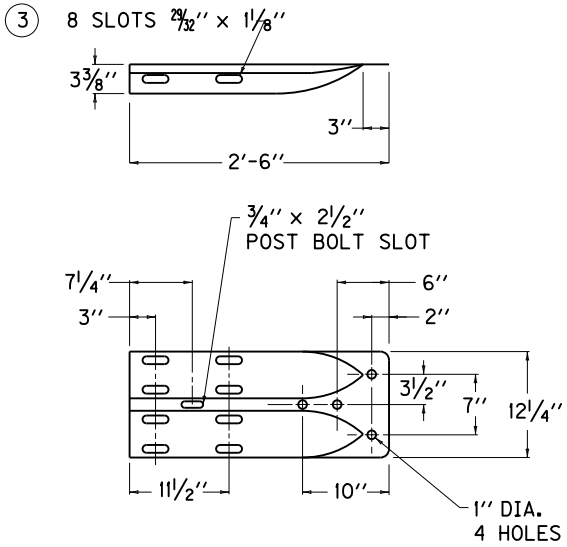
STANDARD DRAWING NO. RBR-005-11

SUBMITTED William S. Hulett DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

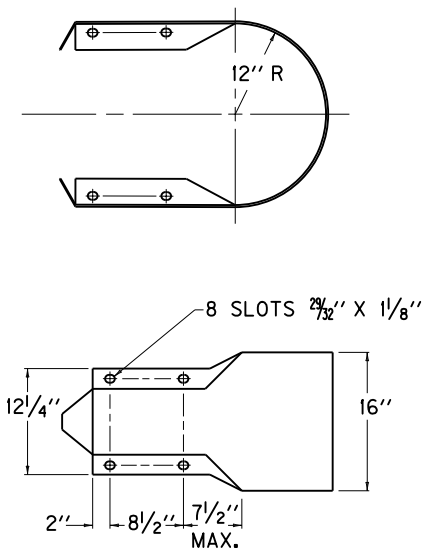
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



TERMINAL SECTION NO. 1



TERMINAL SECTION NO. 2



TERMINAL SECT. NO. 3

~ NOTES ~

BID ITEM AND UNIT TO BID

GUARDRAIL TERMINAL SECTION NO 1	EACH
GUARDRAIL TERMINAL SECTION NO 2	EACH
GUARDRAIL TERMINAL SECTION NO 3	EACH

1. TERMINAL SECTIONS SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID EACH COMPLETE AND INSTALLED, EXCEPT WHEN INCIDENTAL TO OTHER BID ITEMS.
2. TERMINAL SECTIONS SHALL COMPLY WITH AASHTO M-180 AS FOLLOWS:
   A. TERMINAL SECTIONS NO. 1, 3, -CLASS A OR B, TYPE 2
   B. TERMINAL SECTION NO. 2-CLASS B, TYPE 2

(3) WHEN SLOTTED HOLES ARE EXPOSED (8) EIGHT RECTANGULAR FLAT WASHERS SHALL BE REQUIRED - 2'' SPLICE BOLTS ARE TO BE USED IF NEEDED.

4. TERMINAL SECTIONS ARE INTENDED FOR USE WITH OTHER GUARDRAIL COMPONENTS AND SYSTEMS.

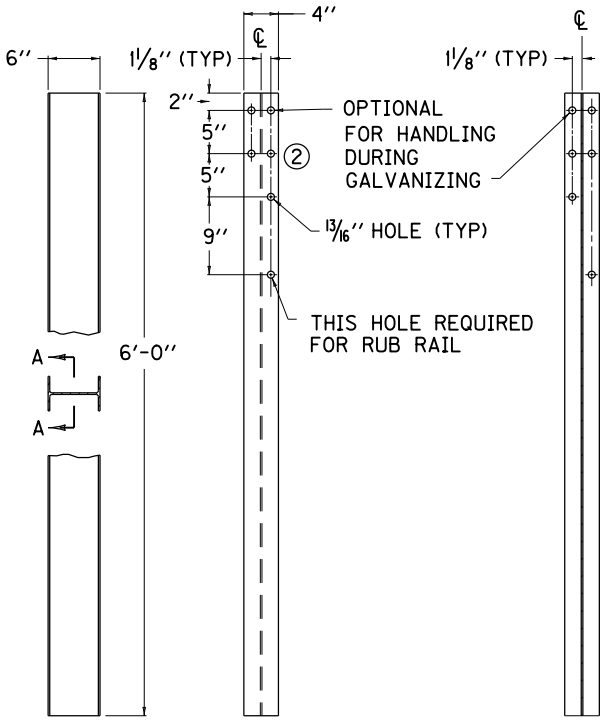
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL TERMINAL SECTIONS

STANDARD DRAWING NO. RBR-010-06

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN — 12-01-15 DATE

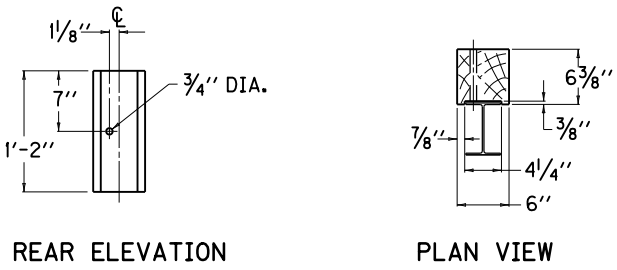
APPROVED _____ STATE HIGHWAY ENGINEER — 12-01-15 DATE



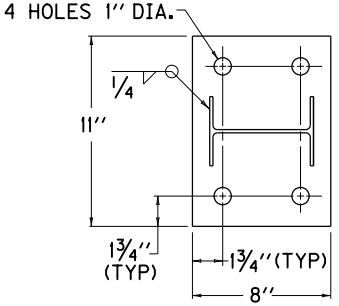
~ W6 X 9.0 STEEL POST ① ~

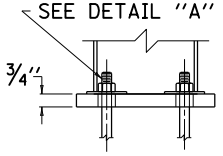
~ NOTES ~

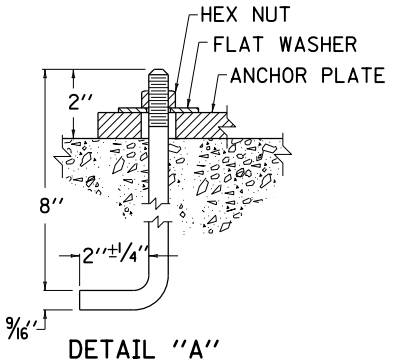
① W6 X 8.5 IS AN ACCEPTABLE ALTERNATE.
② THESE HOLES ARE REQUIRED FOR ATTACHING RAIL.



OFFSET BLOCK TYPE 4
(TIMBER)
(FOR USE WITH STEEL POST ONLY)







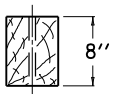
KENTUCKY
DEPARTMENT OF HIGHWAYS

STEEL
GUARDRAIL POSTS

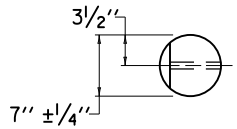
STANDARD DRAWING NO. RBR-015-05

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN _____ 12-01-15 DATE

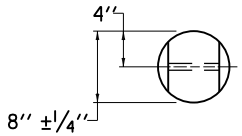
APPROVED _____ STATE HIGHWAY ENGINEER _____ 12-01-15 DATE



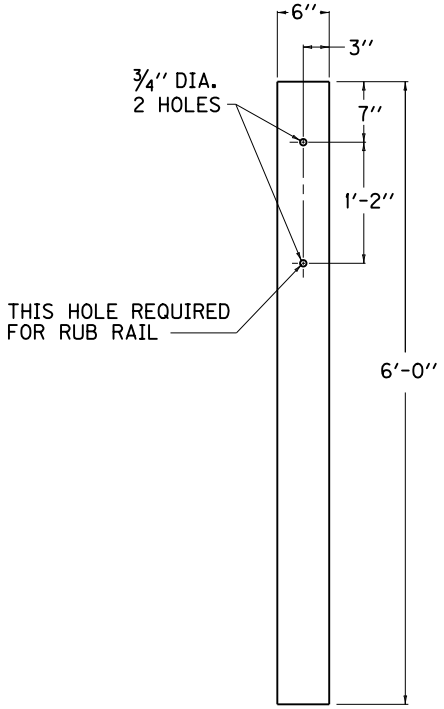
PLAN VIEW



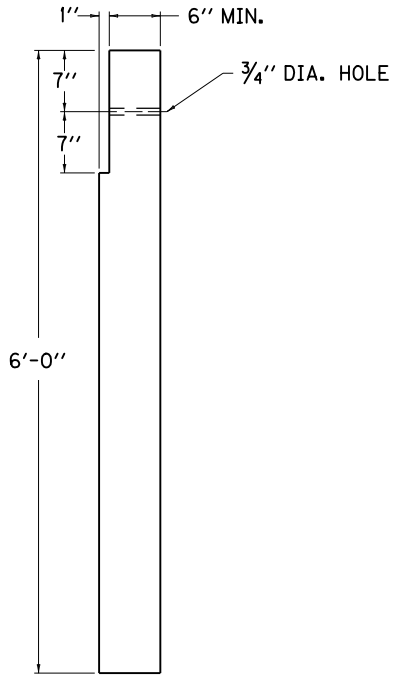
PLAN VIEW



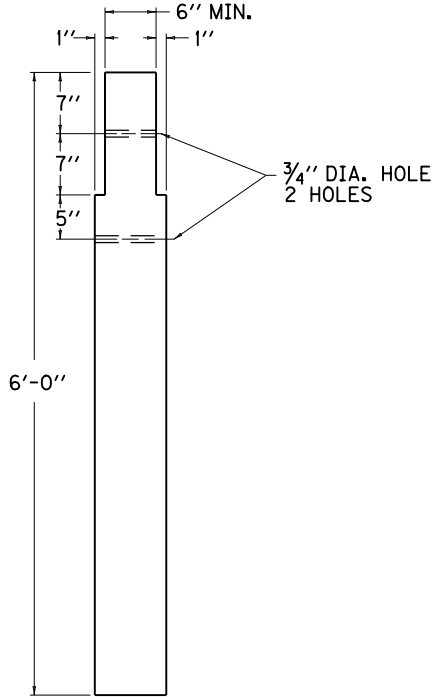
PLAN VIEW



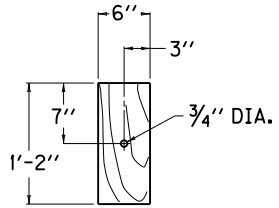
FRONT ELEVATION
6''x8'' TIMBER POST



7'' ROUND TIMBER POST
(SINGLE FACE RAIL)



8'' ROUND TIMBER POST
(DOUBLE FACE RAIL)



FRONT ELEVATION
OFFSET BLOCK TYPE 3
(6'' X 8'' TIMBER)
(FOR USE WITH RECTANGULAR
AND ROUND POSTS)

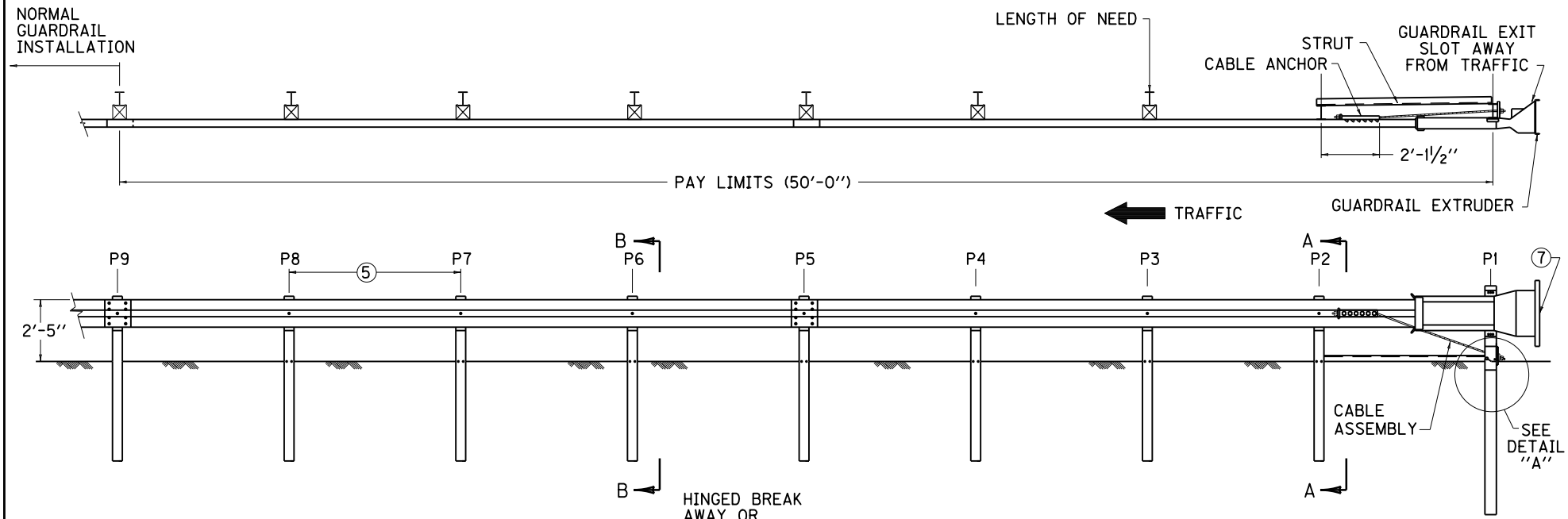
KENTUCKY
DEPARTMENT OF HIGHWAYS

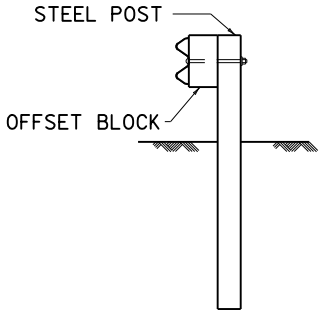
TIMBER GUARDRAIL POSTS

STANDARD DRAWING NO. RBR-016-05

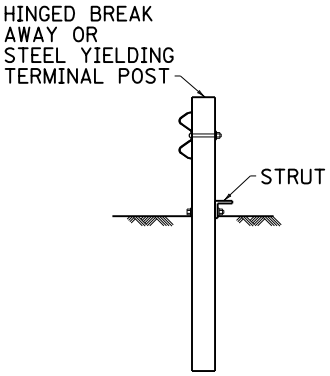
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 12-01-15 DATE

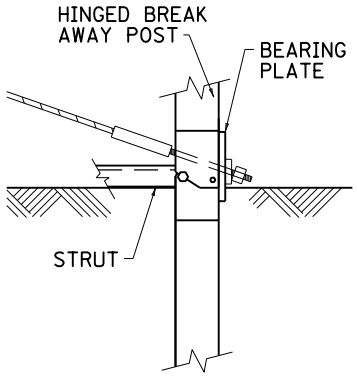




SECTION B-B
(POSTS P3 THRU P8)



SECTION A-A
(POST P2)



DETAIL ″A″

~ NOTES ~

BID ITEM AND UNIT TO BID	
GUARDRAIL END TREATMENT TYPE 1	EACH
OBJECT MARKER TY 3	EACH

1. GUARDRAIL END TREATMENT TYPE 1 SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND INCLUDES POSTS, RAIL ELEMENTS, GUARDRAIL EXTRUDER AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE INSTALLATION AS DETAILED.
2. PERMISSIBLE ALTERNATES FOR GUARDRAIL END TREATMENT TYPE 1 ARE PATENTED ITEMS: ET PLUS MANUFACTURED BY TRINITY INDUSTRIES OF DALLAS, TEXAS OR SKT-SP MANUFACTURED BY ROAD SYSTEMS INC. OF BIG SPRINGS, TEXAS.
3. THE MANUFACTURER SHALL FURNISH TWO (2) SETS OF SHOP PLANS TO THE CONTRACTOR WITH EACH INSTALLATION.
4. THE COMPLETED INSTALLATION SHALL MEET ALL APPLICABLE REQUIREMENTS OF THE MANUFACTURER (SEE SHOP DRAWINGS).

⑤ POSTS P1 THROUGH P9 ARE SPACED 6′-3″ ON CENTER.

6. INTENDED USE: AREAS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND END TREATMENT.

⑦ OBJECT MARKER TYPE 3 (SEE CURRENT MUTCD MANUAL FOR DETAILS)

USE WITH CUR. STD. DWG.
RBI-004

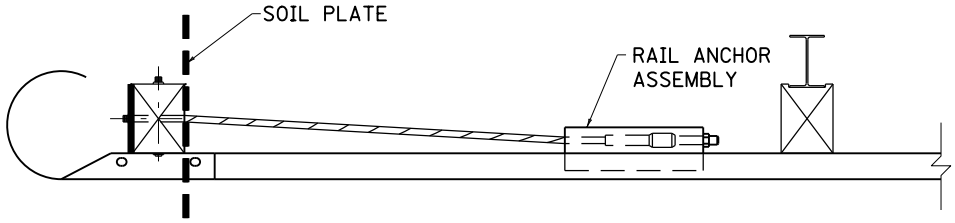
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL END TREATMENT TYPE 1

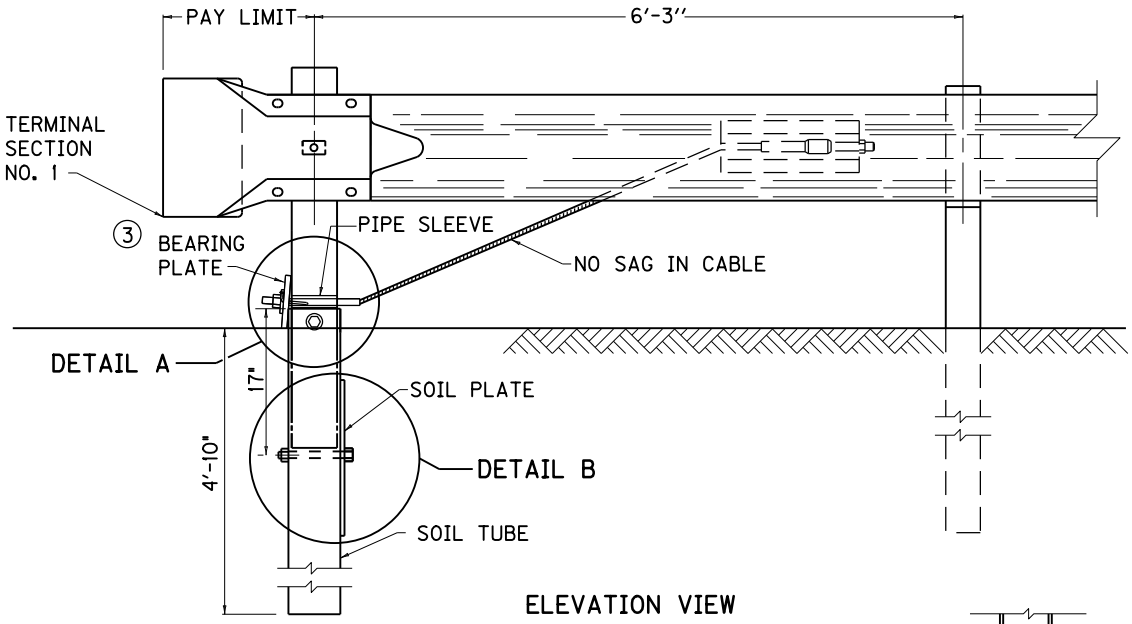
STANDARD DRAWING NO. RBR-020-06

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW



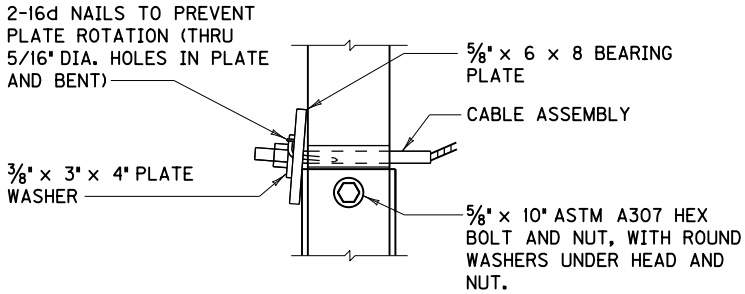
ELEVATION VIEW

~ NOTES ~

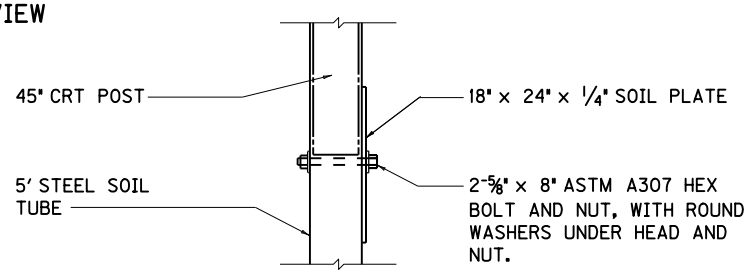
BID ITEM AND UNIT TO BID
GUARDRAIL END TREATMENT TYPE 2A — EACH

1. GUARDRAIL END TREATMENT TYPE 2A SHALL BE TO THE PAY LIMITS AS DETAILED. THE CONTRACT UNIT BID IS EACH AND SHALL INCLUDE A TERMINAL SECTION NO. 1, RAIL ANCHOR ASSEMBLY, CABLE ANCHOR ASSEMBLY, SOIL TUBE, SOIL PLATE AND ALL OTHER INCIDENTALS NECESSARY FOR A COMPLETE INSTALLATION AS DETAILED.
2. IN THE EVENT SOLID ROCK IS ENCOUNTERED, THE SOIL TUBE MAY BE SHORTENED, PROVIDED IT EXTENDS INTO THE SOLID GROUND A MINIMUM OF 3 FEET.

(3) INSTALL BEARING PLATE SO THAT THE "V" OPENING IS AT THE TOP.



DETAIL A



DETAIL B

USE WITH CUR. STD. DWGS.
RBI-001 , RBI-002, RBI-003
RBR-010

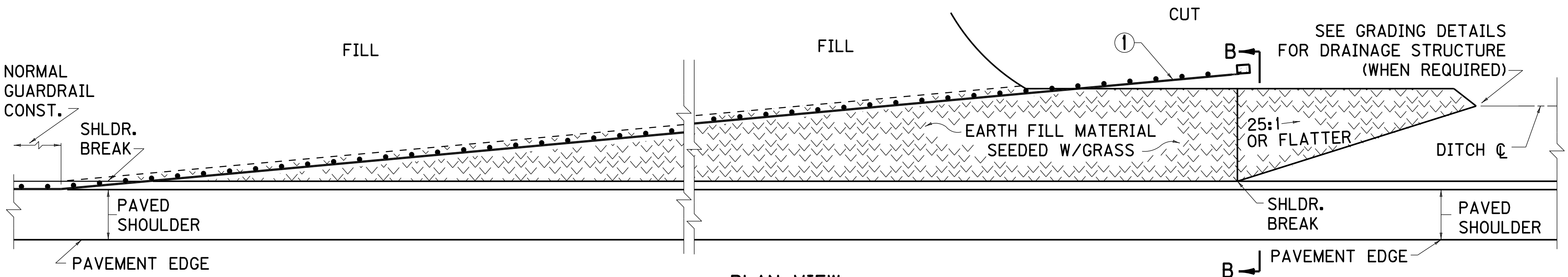
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL
END TREATMENT
TYPE 2A

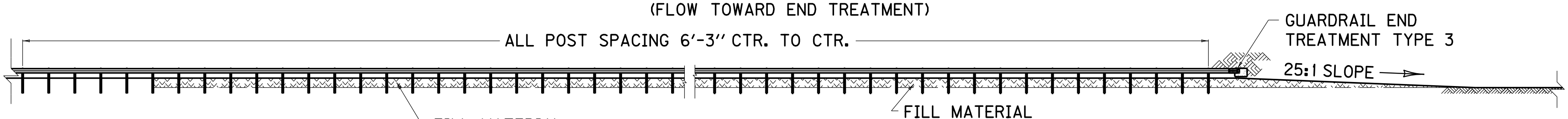
STANDARD DRAWING NO. RBR-025-05

SUBMITTED William S. Hulett — DIRECTOR, DIVISION OF DESIGN — 12-01-15 DATE

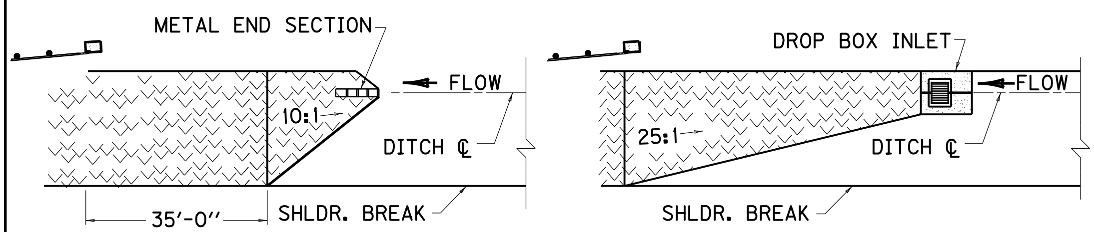
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



PLAN VIEW
(FLOW TOWARD END TREATMENT)



ELEVATION VIEW



FLOW TOWARD METAL END SECTION

FLOW TOWARD DROP BOX INLET

GRADING DETAILS

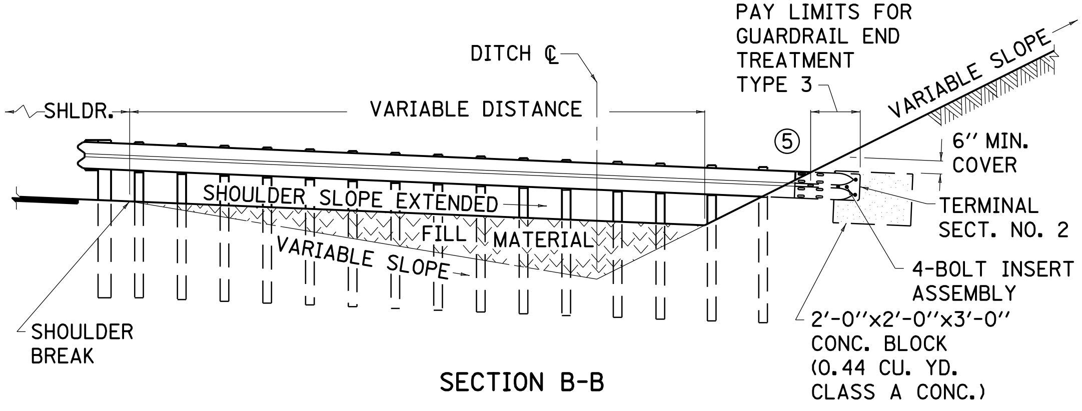
~ NOTES ~

BID ITEMS AND UNIT TO BID

GUARDRAIL END TREATMENT TYPE 3	EACH
ROADWAY OR BORROW EXCAVATION, OR EMBANKMENT IN PLACE	CU. YD.
DRAINAGE STRUCTURE BID SEPARATELY	EACH

2. THE CONTRACT UNIT PRICE FOR GUARDRAIL END TREATMENT TYPE 3 SHALL INCLUDE THE CONCRETE BLOCK, TERMINAL SECTION NO. 2, FOUR BOLT INSERT ASSEMBLY AND ALL INCIDENTALS NECESSARY TO COMPLETE THE WORK.
3. OFFSET BLOCKS MAY BE ELIMINATED ON ANY POST THAT IS COMPLETELY BELOW GRADE.
4. SEE CUR. STD. DWG. RBC-100 FOR 4-BOLT INSERT ASSEMBLY DETAILS.

⑤ SEE CUR. STD. DWG. RBR-032 FOR ALTERNATE END ANCHOR.



SECTION B-B

① FLARE RATES			
DESIGN SPEED	70+ MPH	60 MPH	50 MPH OR LESS
FLARE RATES	15:1	13:1	11:1

USE WITH CUR. STD. DWGS.
RBC-100 , RDB-005, RBR-032

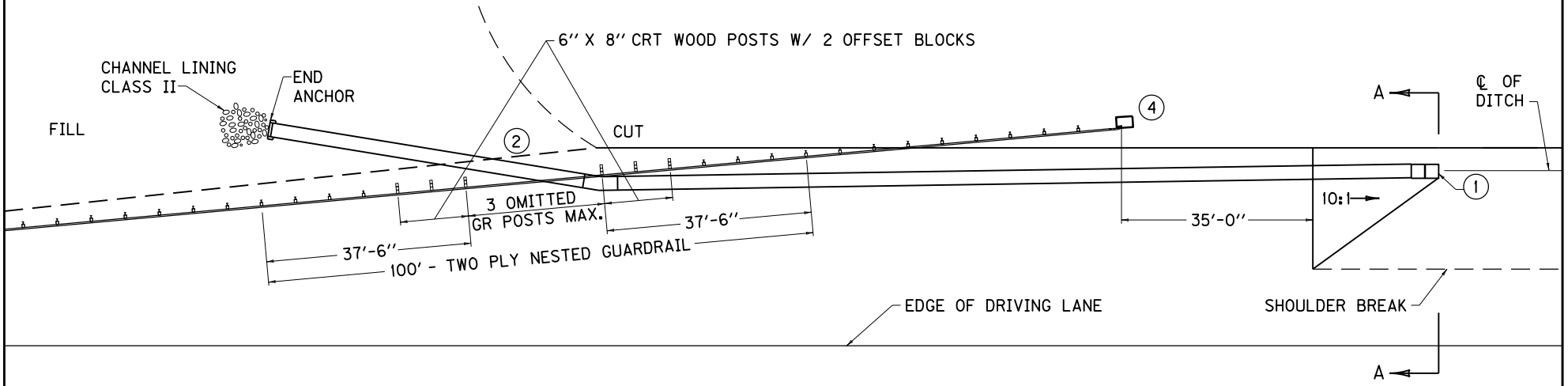
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL END TREATMENT TYPE 3

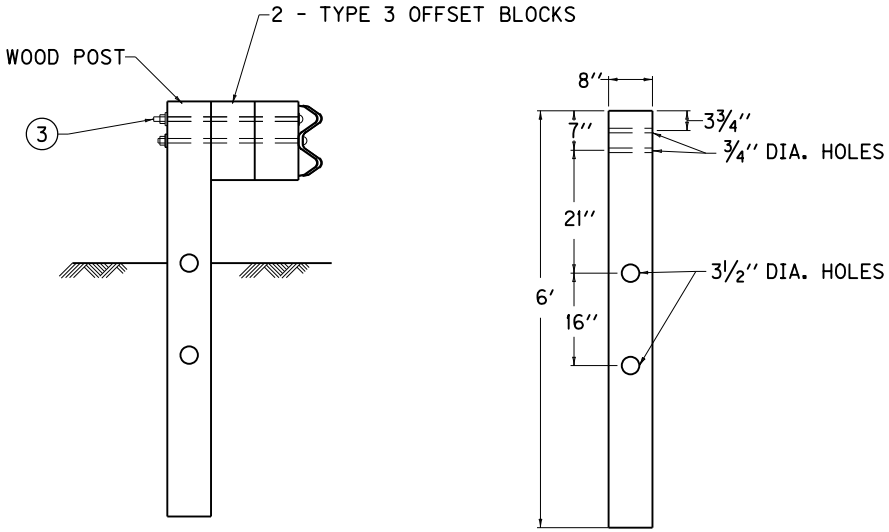
STANDARD DRAWING NO. RBR-030-05

SUBMITTED [signature] DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED [signature] STATE HIGHWAY ENGINEER 12-01-15 DATE

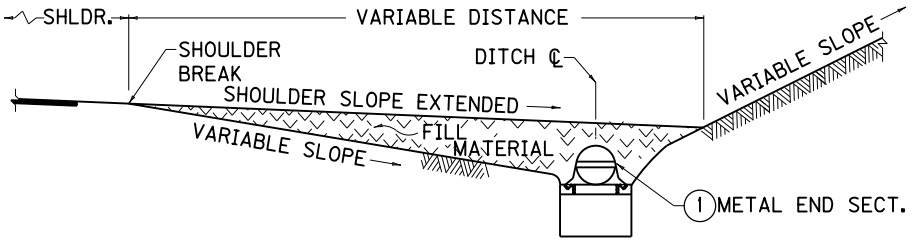


PLAN VIEW



6'' X 8'' CRT WOOD POST W/ 2 OFFSET BLOCKS

6'' X 8'' CRT WOOD POST



SECTION A-A

~ NOTES ~

BID ITEMS AND UNIT TO BID

CHANNEL LINING CLASS II	TON
END ANCHOR	CUYD
PIPE	LF
METAL END SECTION	EACH

SEE CURRENT STANDARD DRAWING RBR-030 FOR OTHER BID ITEMS.

1. SEE CURRENT STANDARD DRAWING RDB-150 AND RDB-160 FOR METAL END SECTIONS.
2. A MINIMUM DISTANCE OF 5'-0'' BEHIND THE RAIL SHALL BE CLEAR OF ANY FIXED OBJECT HAZARDS.
3. 1 - ⅝'' DIA. BOLT WITH TWO ROUND WASHERS.
4. SEE CURRENT STANDARD DRAWING RBR-032 FOR ALTERNATE END ANCHOR.

USE WITH CUR. STD. DWGS.
RBR-030, RBR-032, RDB-150
RDB-160, RDX-060, RDX-065

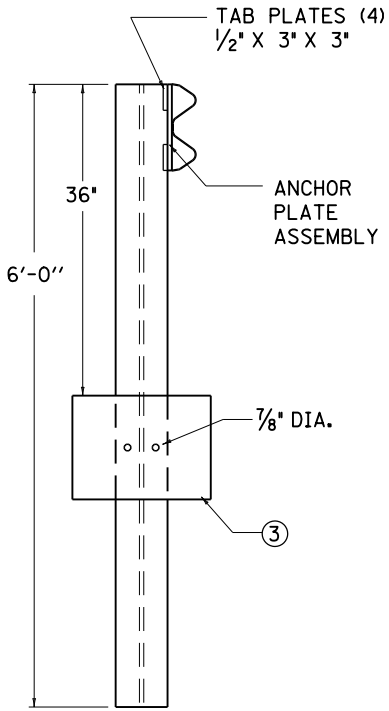
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL END TREATMENT TYPE 3 PIPE DRAINAGE DETAIL

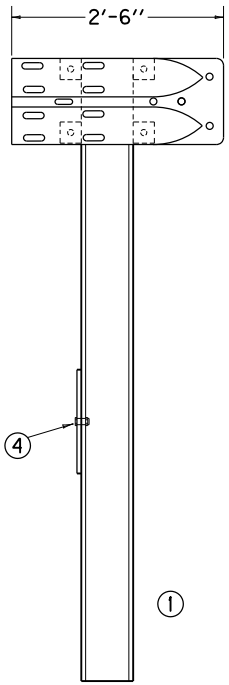
STANDARD DRAWING NO. RBR-031-01

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN — DATE 12-01-15

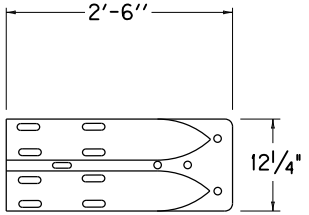
APPROVED _____ STATE HIGHWAY ENGINEER — DATE 12-01-15



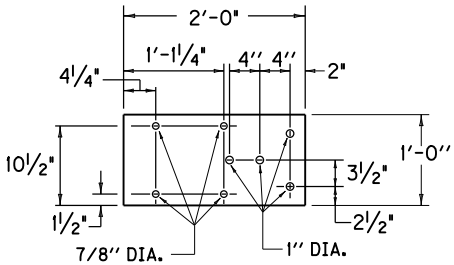
SIDE VIEW



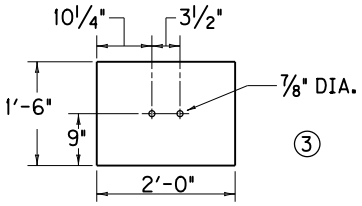
FRONT VIEW



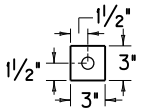
TERMINAL SECTION NO. 2



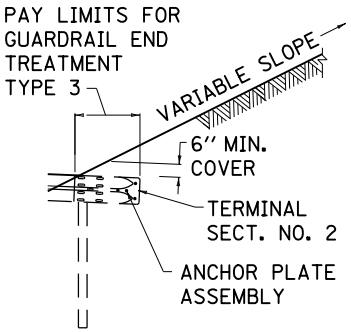
ANCHOR PLATE
ASSMEBLY ②



SOIL PLATE



TAB PLATE



ELEVATION VIEW

~ NOTES ~

5. OFFSET BLOCKS MAY BE ELIMINATED ON ANY POST THAT IS COMPLETELY BELOW GRADE.
6. SEE CUR. STD. DWG. RBR-001, RBR-005, RBR-010 AND RBR-015 FOR APPLICABLE DETAILS AND SPECIFICATIONS.
7. GUARDRAIL END TREATMENT TYPE 3 SHALL BE TO THE PAY LIMITS AS DETAILED AND THE CONTRACT UNIT PRICE EACH SHALL INCLUDE TERMINAL SECTION NO. 2, GUARDRAIL ANCHOR POST, 4-BOLT ASSEMBLY PLATE, SOIL PLATE, HARDWARE, LABOR, EXCAVATION AND ALL INCIDENTALS NECESSARY FOR THE INSTALLATION.

BID ITEM AND UNIT TO BID

GUARDRAIL END TREATMENT TYPE 3	EACH
ROADWAY OR BORROW EXCAVATION, OR EMBANKMENT-IN-PLACE	CUYD

BILL OF MATERIAL

NO.	QTY.	DESCRIPTION
①	1	W6x15 W-BEAM W/TAB PLATES (4 EA)
②	1	2' x 1' x ½" PLATE
③	1	2' x 18" x ¼" PLATE
④	2	¾" DIA. x 2" HEAVY HEX HD BOLT w/NUT & (2) FLAT WASHERS

USE WITH CUR. STD. DWGS.
RBR-001, RBR-005, RBR-010
RBR-015, RBR-030, RBR-031

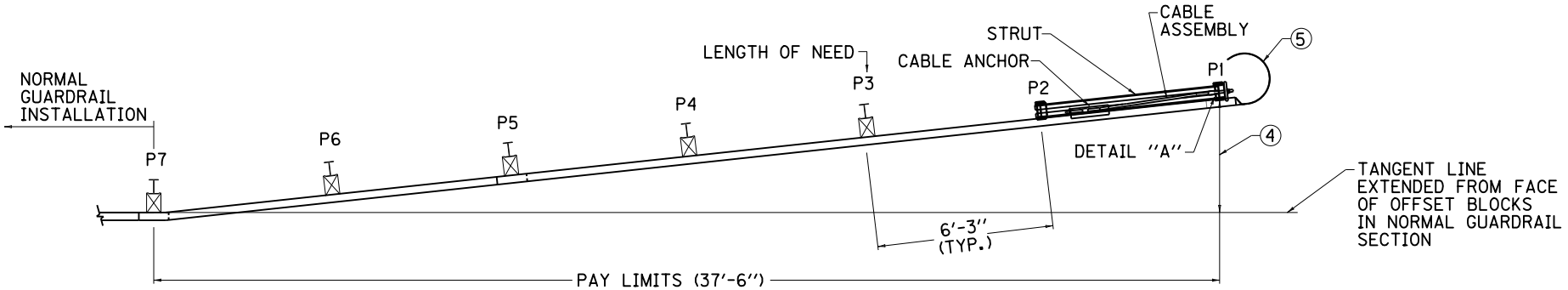
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL END TREATMENT TYPE 3 ALTERNATE ANCHOR

STANDARD DRAWING NO. RBR-032

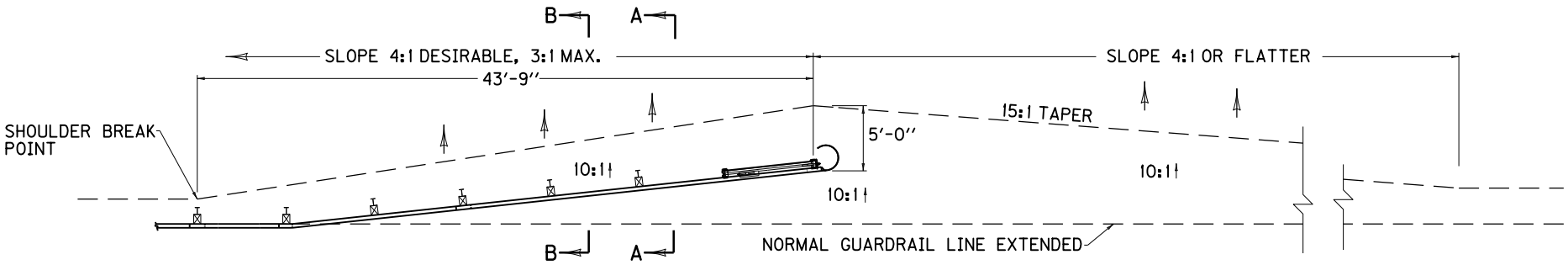
SUBMITTED William S. Hulett — DIRECTOR, DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE

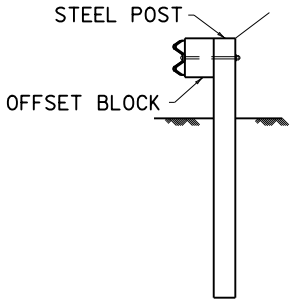


PLAN VIEW

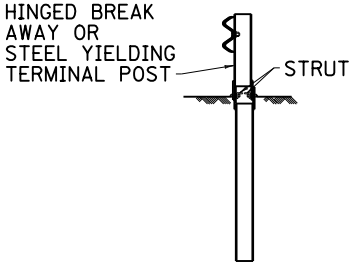
TRAFFIC



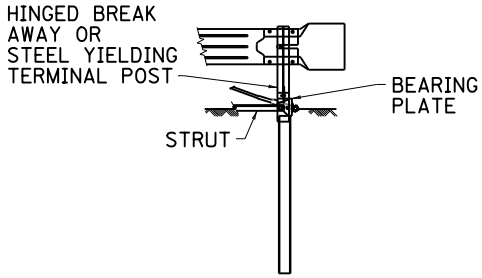
SLOPE LAYOUT AND GRADING DETAIL



SECTION B-B
(POSTS P3 THRU P7)



SECTION A-A
(POST P2)



DETAIL "A"
(ENLARGED VIEW P1)

~ NOTES ~

BID ITEMS AND UNIT TO BID:

GUARDRAIL END TREATMENT TYPE 4A	EACH
ROADWAY OR BORROW EXCAVATION OR EMBANKMENT-IN-PLACE	CUYD
OBJECT MARKER TY 3	EACH

1. INTENDED USE: AREAS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL.
2. PERMISSIBLE ALTERNATES FOR GUARDRAIL END TREATMENT TYPE 4A ARE PATENTED ITEMS: SRT-27 MANUFACTURED BY TRINITY INDUSTRIES OF DALLAS, TEXAS OR FLEAT-SP MANUFACTURED BY ROAD SYSTEMS INC. OF BIG SPRINGS, TEXAS.
3. THE MANUFACTURER SHALL FURNISH TWO (2) SETS OF SHOP PLANS TO THE CONTRACTOR WITH EACH INSTALLATION.
4. SYSTEM OFFSET OF 4'-0" SHALL BE MEASURED FROM FACE OF OFFSET BLOCK AT NORMAL GUARDRAIL SECTION TO FACE OF POST AT P1.
5. OBJECT MARKER TYPE 3 (SEE CURRENT MUTCD MANUAL FOR DETAILS).
6. THE COMPLETED INSTALLATION SHALL MEET ALL APPLICABLE REQUIREMENTS OF THE MANUFACTURER. (SEE SHOP DRAWINGS)

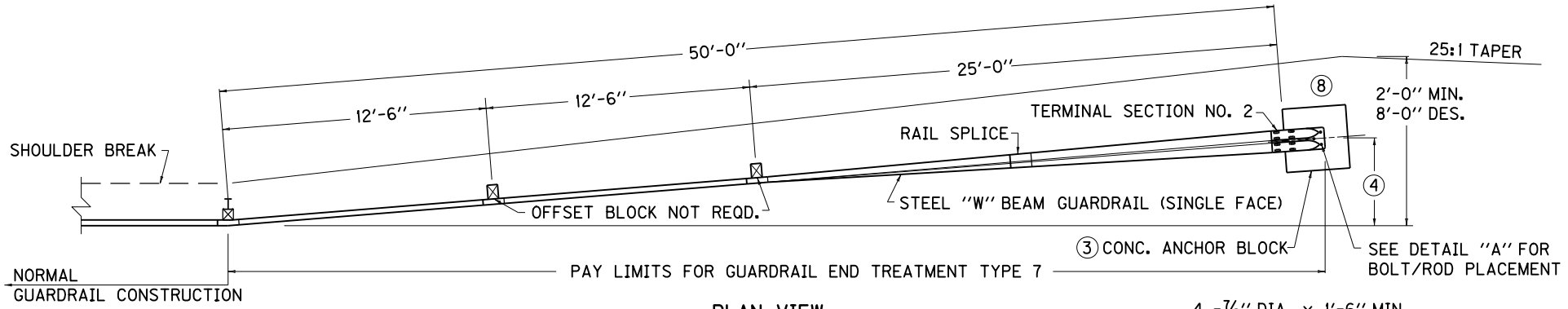
KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL END TREATMENT TYPE 4A

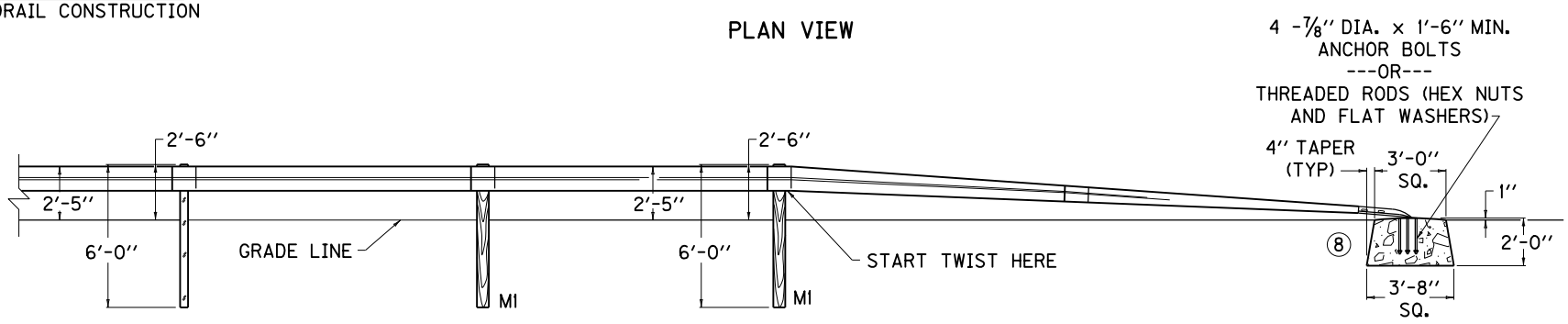
STANDARD DRAWING NO. RBR-035-11

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

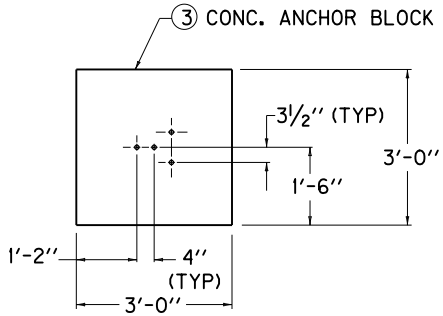
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW



ELEVATION VIEW



DETAIL "A"

USE WITH CUR. STD. DWG.
RBR-001, RBR-005, RBR-010
RBR-015, RBR-051

~ NOTES ~

BID ITEM AND UNIT TO BID
GUARDRAIL END TREATMENT TYPE 7 EACH

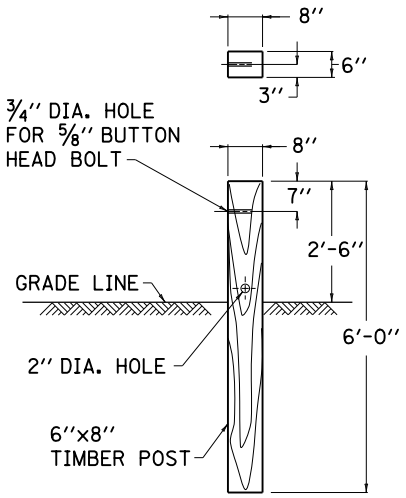
1. GUARDRAIL END TREATMENT TYPE 7 SHALL BE TO THE PAY LIMITS AS DETAILED AND THE CONTRACT UNIT PRICE EACH SHALL INCLUDE TERMINAL SECTION NO. 2, STEEL "W" BEAM GUARDRAIL (SINGLE FACE), GUARDRAIL POSTS M1, CONCRETE ANCHOR BLOCK, EXCAVATION, LABOR, HARDWARE AND INCIDENTALS NECESSARY FOR THE INSTALLATION.
2. SPLICE BOLTS AT TERMINAL SECTION NO. 2 SHALL BE LOOSELY TIGHTENED AND CENTERED TO ALLOW MAXIMUM MOVEMENT DUE TO EXPANSION. ONE (1) 11/16" ROUND WASHER AND ONE (1) RECTANGULAR PLATE WASHER REQUIRED FOR EACH SPLICE BOLT, AT TERMINAL SECTION NO. 2.

③ THE CONCRETE ANCHOR BLOCK MAY BE PRECAST OR CAST-IN-PLACE. WHEN THE CONCRETE ANCHOR BLOCK IS CAST-IN-PLACE FORMING OF THE SIDES SHALL BE REQUIRED.

④ THE DESIREABLE OFFSET DISTANCE FROM THE NORMAL GUARDRAIL LINE SHALL BE 4'-0". THE MINIMUM OFFSET DISTANCE FROM THE NORMAL GUARDRAIL LINE IS ZERO FEET.

5. SEE CUR. STD. DWG. RBR-001, RBR-005, RBR-010, AND RBR-015 FOR APPLICABLE DETAILS AND SPECIFICATIONS.
6. APPROX. QUANTITY FOR ANCHOR BLOCK: 0.83 CU. YD. CLASS "A" CONCRETE FOR TYPE 7 INSTALLATON.
7. THIS GUARDRAIL END TREATMENT IS NOT FOR USE ON APPROACH END ON HIGH SPEED NHS ROUTES ABOVE 35 MPH.

⑧ SEE CUR. STD. DWG. RBR-051 FOR ALTERNATE END ANCHOR.



M1 POST DETAIL

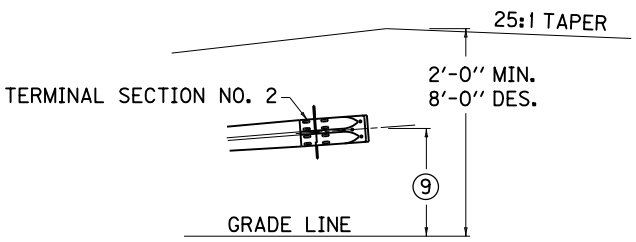
KENTUCKY DEPARTMENT OF HIGHWAYS

GUARDRAIL END TREATMENT TYPE 7

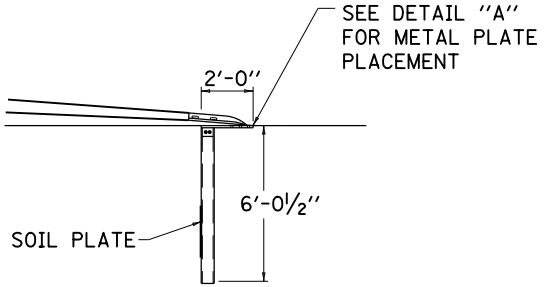
STANDARD DRAWING NO. RBR-050-07

SUBMITTED William S. Hulett DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

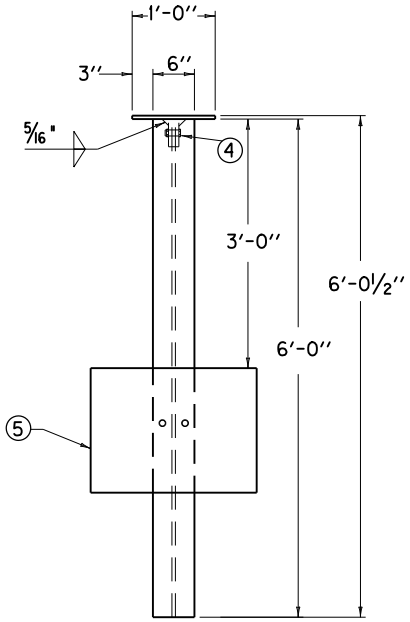
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



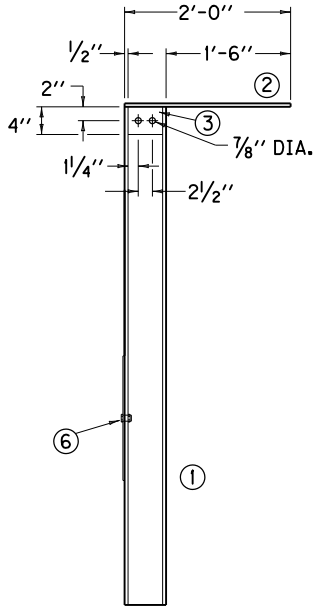
PLAN VIEW



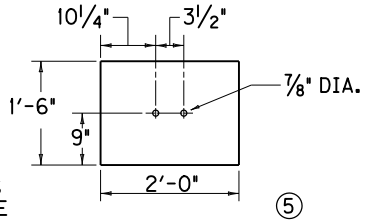
ELEVATION VIEW



SIDE VIEW

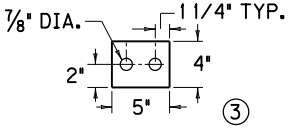


FRONT VIEW

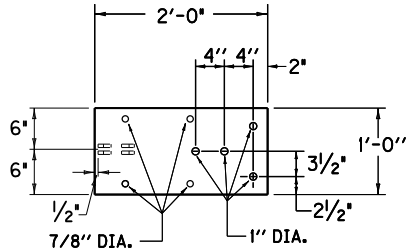


SOIL PLATE

DETAIL "A"



TAB PLATE



ANCHOR PLATE
ASSMEBLY ②

~ NOTES ~

BID ITEM AND UNIT TO BID
GUARDRAIL END TREATMENT TYPE 7 EACH

7. GUARDRAIL END TREATMENT TYPE 7 SHALL BE TO THE PAY LIMITS AS DETAILED AND THE CONTRACT UNIT PRICE EACH SHALL INCLUDE TERMINAL SECTION NO. 2, STEEL "W" BEAM GUARDRAIL (SINGLE FACE), GUARDRAIL POSTS M1, STEEL ANCHOR PLATE AND POST, SOIL PLATE, TAB PLATES, EXCAVATION, LABOR, HARDWARE AND ALL INCIDENTALS NECESSARY FOR THE INSTALLATION.
8. SPLICE BOLTS AT TERMINAL SECTION NO. 2 SHALL BE LOOSELY TIGHTENED AND CENTERED TO ALLOW MAXIMUM MOVEMENT DUE TO EXPANSION. ONE (1) 11/16 " ROUND WASHER AND (1) RECTANGULAR PLATE WASHER REQUIRED FOR EACH SPLICE BOLT, AT TERMINAL SECTION NO. 2.
⑨ THE DESIREABLE OFFSET DISTANCE FROM THE NORMAL GUARDRAIL LINE SHALL BE 4'-0". THE MINIMUM OFFSET DISTANCE FROM THE NORMAL GUARDRAIL LINE IS ZERO FEET.
10. SEE CUR. STD. DWG. RBR-001, RBR-005, RBR-010 AND RBR-015 FOR APPLICABLE DETAILS AND SPECIFICATIONS.
11. LEAVE CLEARNACE IN BETWEEN TAB PLATES FOR GALVANIZED W6 x 15 W-BEAM POST.

BILL OF MATERIAL		
NO.	QTY.	DESCRIPTION
①	1	W6x15 W-BEAM
②	1	2' x 1' x ½" ANCHOR PLATE ASSEMBLY
③	2	4" x 5" x ½" TAB PLATE
④	2	¾" DIA. x 2½" HEAVY HEX HD BOLT w/NUT & (2) FLAT WASHERS
⑤	1	2' x 18" x ¼" SOIL PLATE
⑥	2	¾" DIA. x 2" HEAVY HEX HD BOLT w/NUT & (2) FLAT WASHERS

USE WITH CUR. STD. DWG.
RBR-001, RBR-005, RBR-010
RBR-015, RBR-050

KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL END TREATMENT TYPE 7 ALTERNATE ANCHOR

STANDARD DRAWING NO. RBR-051

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

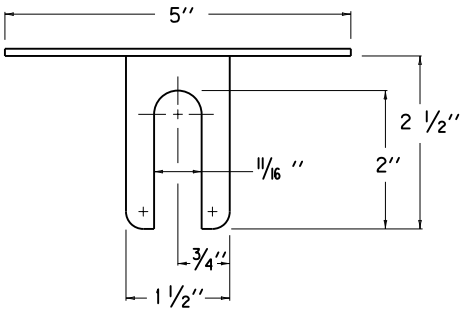
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

~ NOTES ~

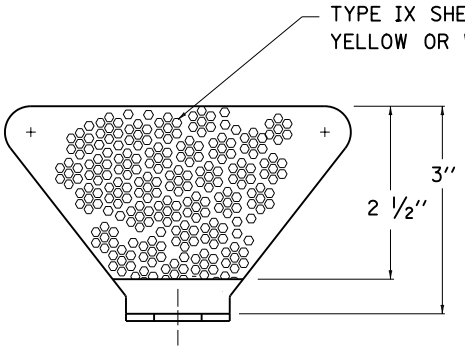
BID ITEMS AND UNIT TO BID

DELINEATOR FOR GUARDRAIL B/W	EACH
DELINEATOR FOR GUARDRAIL M/W	EACH
DELINEATOR FOR GUARDRAIL M/Y	EACH

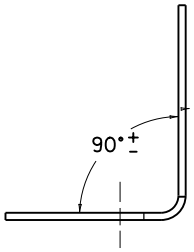
1. DELINEATORS SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE EACH AND SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR ONE COMPLETE INSTALLATION.
2. DELINEATOR SHAPE AND DIMENSIONS ARE SHOWN FOR ILLUSTRATION PURPOSES ONLY. TYPES OF DELINEATORS PERMITTED SHALL BE FROM THE LIST OF APPROVED MATERIALS.
3. GUARDRAIL DELINEATORS SHALL BE REQUIRED ON ALL GUARDRAIL.
4. DELINEATORS SHALL NOT BE INSTALLED WITHIN THE PAY LIMITS OF THE END TREATMENT.
5. DELINEATORS SHALL BE MANUFACTURED FROM 12 GA. GALVANIZED STEEL.
6. DIMENSIONS SHOWN ARE APPROXIMATE AND ARE SUBJECT TO MANUFACTURER'S TOLERANCES.
7. WHEN CONCRETE BARRIERS EXTEND ACROSS BRIDGE STRUCTURES IN LIEU OF STEEL BEAM GUARDRAIL, DELINEATORS SHALL BE INSTALLED AT SAME VERTICAL ALIGNMENT AS ON THE GUARDRAIL, AND DELINEATORS SHALL COMPLY WITH CURRENT STANDARD DRAWING RBM-020.
8. DELINEATORS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.



PLAN VIEW

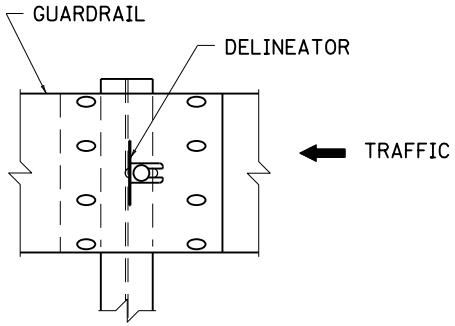


FRONT VIEW

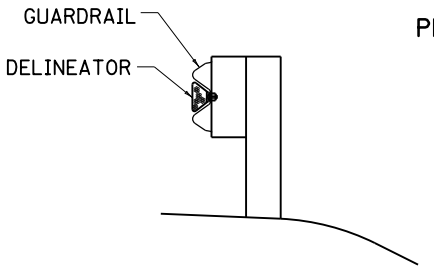


SIDE VIEW

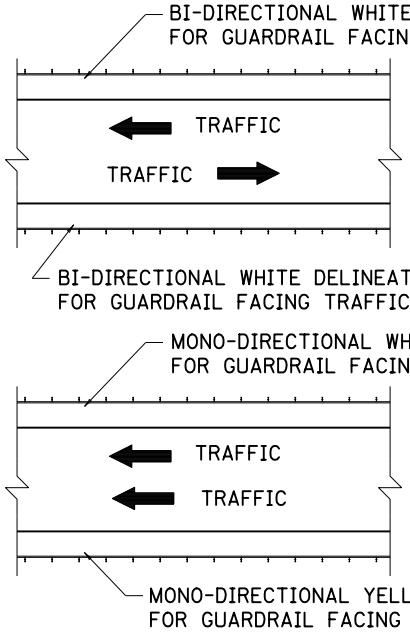
DIMENSIONS SHOWN ARE FOR ONE VERSION OF A WEB-MOUNTED GUARDRAIL DELINEATOR. DELINEATORS WITH ALTERNATE DIMENSIONS MAY BE CONSIDERED FOR INCLUSION ON THE APPROVED PRODUCTS LIST.



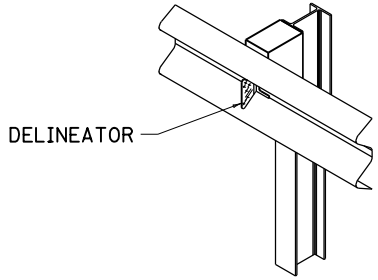
FRONT VIEW



SIDE VIEW



PLACEMENT OF DELINEATORS FOR GUARDRAIL



ISOMETRIC VIEW

APPROXIMATE DELINEATOR SPACING	
TANGENT	100′
CURVE	50′

SPACING SHOULD BE ADJUSTED IN CURVES SO THAT SEVERAL DELINEATORS ARE ALWAYS SIMULTANEOUSLY VISIBLE TO THE ROAD USER.

USE WITH CUR. STD. DWGS. RBM-020, RBR-060

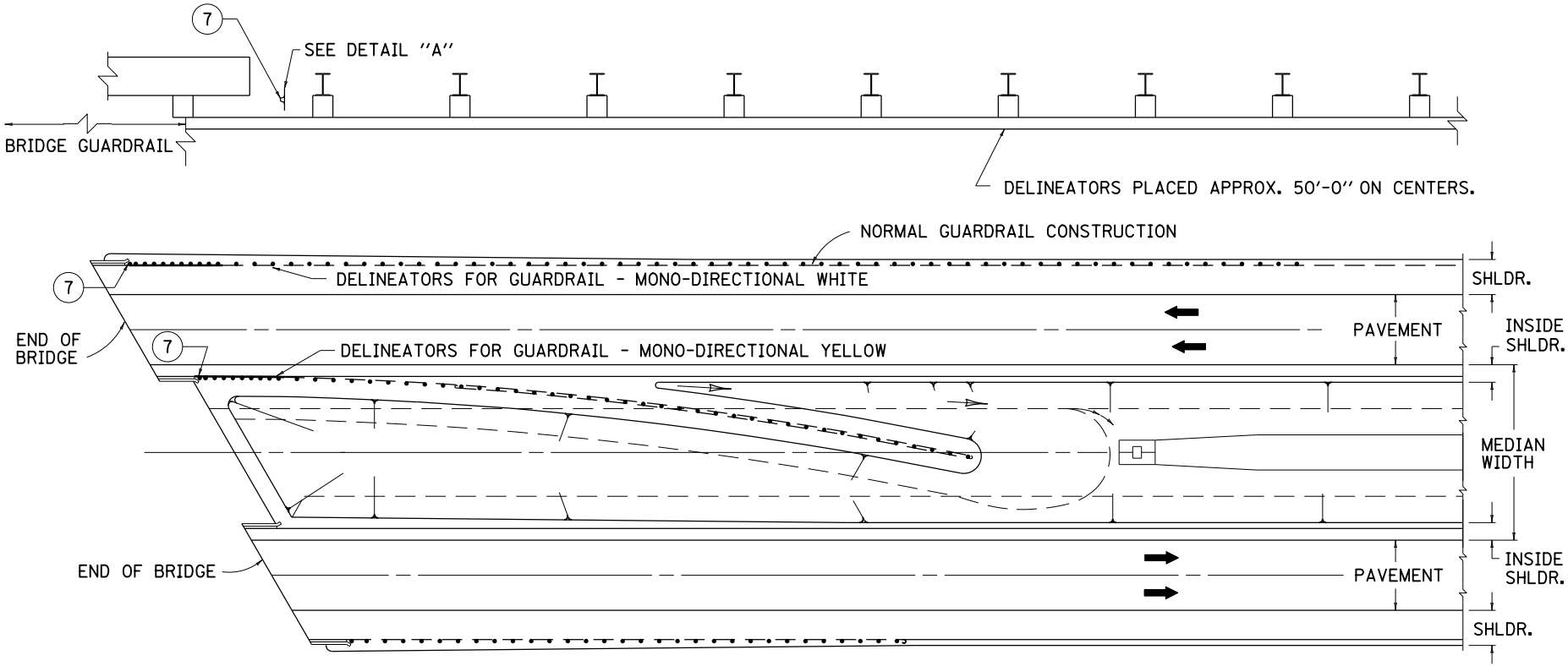
KENTUCKY DEPARTMENT OF HIGHWAYS

DELINEATORS FOR GUARDRAIL

STANDARD DRAWING NO. RBR-055

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



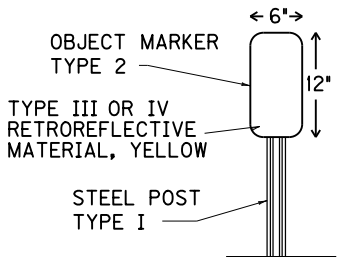
~ NOTES ~

BID ITEMS AND UNIT TO BID

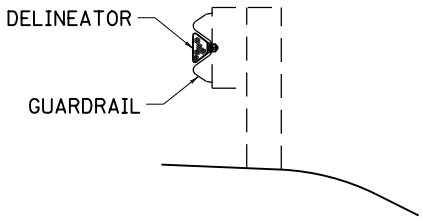
DELINEATORS FOR CONCRETE BARRIERS	
DELINEATOR FOR BARRIER - WHITE	EACH
DELINEATOR FOR BARRIER - YELLOW	EACH
DELINEATORS ON GUARDRAIL	
DELINEATOR FOR GUARDRAIL M/W	EACH
DELINEATOR FOR GUARDRAIL M/Y	EACH
OBJECT MARKER TYPE 2	EACH
STEEL POST TYPE 1	LF

1. DELINEATOR SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR ONE COMPLETE INSTALLATION.
2. THE DELINEATORS SHALL BE YELLOW IN COLOR WHEN THE BARRIER IS PLACED IN THE MEDIAN AND/OR ON THE LEFT SIDE OF THE DRIVING LANE. THE DELINEATORS SHALL BE WHITE IN COLOR WHEN THE BARRIER IS PLACED ON THE RIGHT SIDE OF THE DRIVING LANE.
3. DELINEATORS SHALL BE APPLIED 300 FEET IN ADVANCE OF AND THROUGHOUT THE LENGTH OF ALL BRIDGES THAT DO NOT HAVE FULL WIDTH SHOULDERS. SPACING ON BRIDGES AND 300 FEET IN ADVANCE OF BRIDGES SHALL BE 50 FEET ON CENTERS. THE FIRST DELINEATOR ON THE GUARDRAIL SHALL BE PLACED 50 FEET FROM THE DELINEATOR AT THE END OF THE BRIDGE. DELINEATORS SHALL BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
4. DELINEATORS SHALL NOT BE INSTALLED WITHIN THE PAY LIMITS OF THE END TREATMENT.
5. WHEN CONCRETE BARRIERS EXTEND ACROSS NARROW SHOULDER WIDTH STRUCTURES IN LIEU OF STEEL BEAM GUARDRAIL, DELINEATORS SHALL BE INSTALLED AT SAME VERTICAL ALIGNMENT AS ON THE GUARDRAIL AND DELINEATORS SHALL COMPLY WITH CURRENT STANDARD DRAWING. RBM-020.
6. GUARDRAIL DELINEATORS SHALL COMPLY WITH CURRENT STANDARD DRAWING RBR-055 .

(7) SEE SECTION 718 OF THE CURRENT STANDARD SPECIFICATIONS FOR "OBJECT MARKER TYPE 2".



OBJECT MARKER TYPE 2
DETAIL "A" (7)



ELEV. VIEW

PRIMARY USE:
(PAVEMENT REHABILITATION PROJECTS)

USE WITH CUR. STD. DWGS.
RBM-020, RBR-055

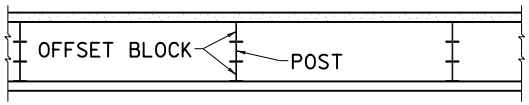
KENTUCKY
DEPARTMENT OF HIGHWAYS

DELINEATORS AT NARROW SHOULDER BRIDGES

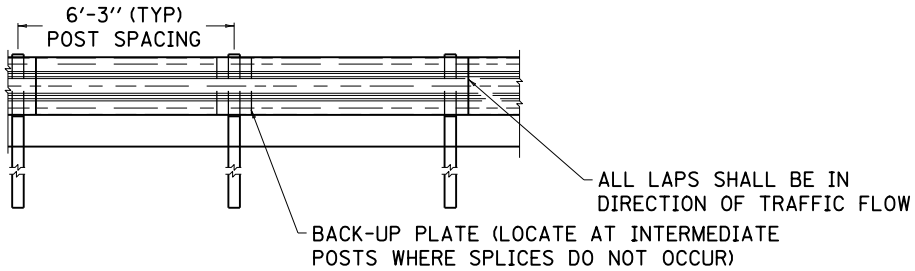
STANDARD DRAWING NO. RBR-060

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

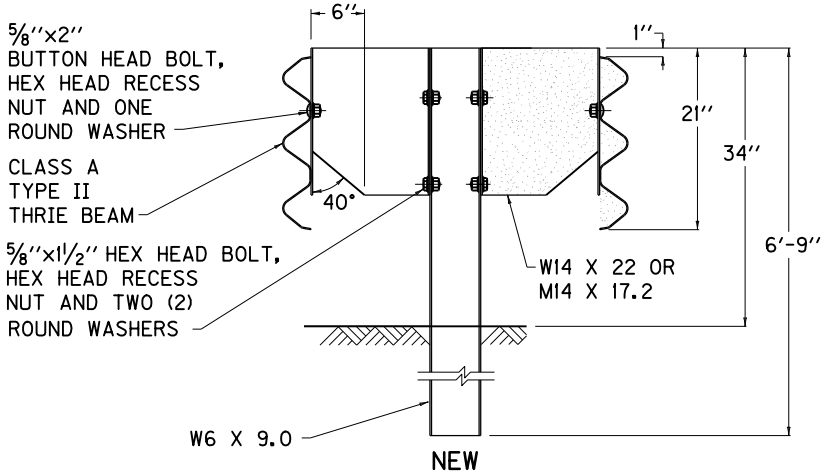
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



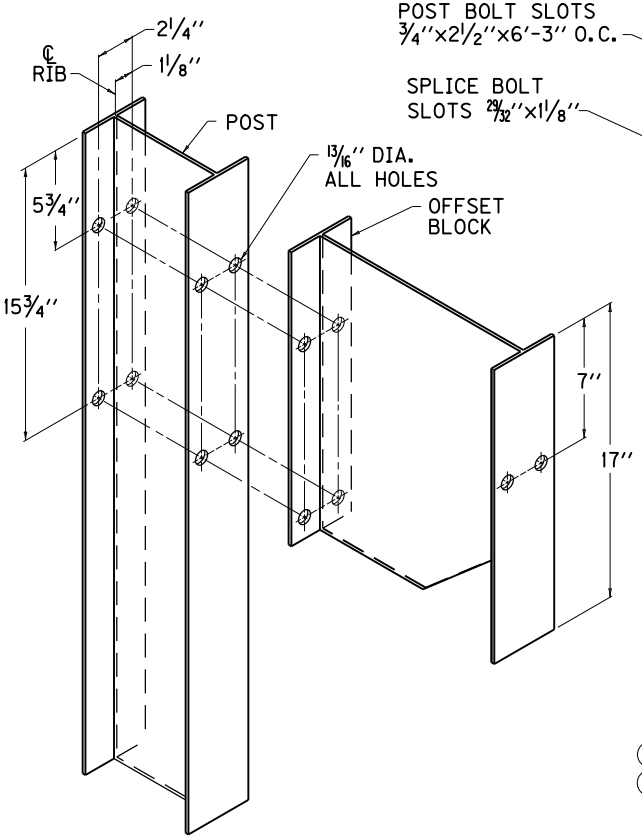
PLAN VIEW



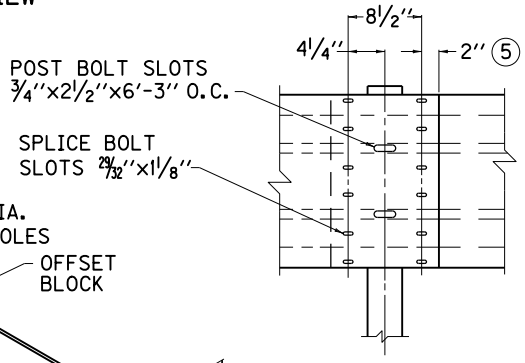
ELEVATION VIEW



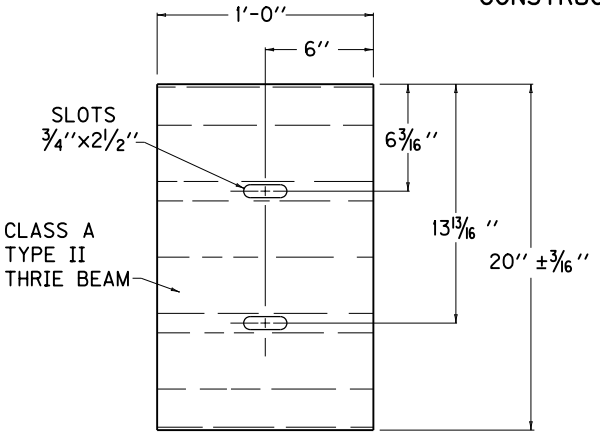
NEW CONSTRUCTION



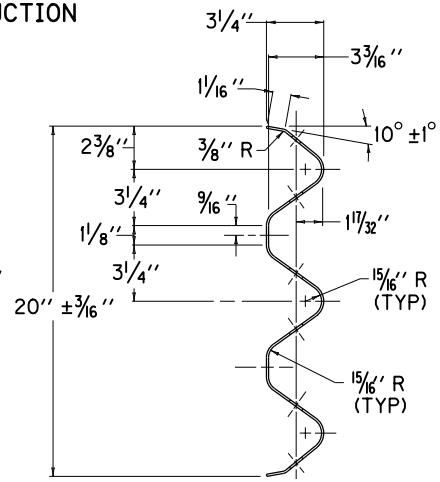
POST & OFFSET BLOCK DETAIL



④ RAIL SPLICE



BACK-UP PLATE



SECTION OF RAIL ELEMENT & BACK-UP PLATE

~ NOTES ~

BID ITEM AND UNIT TO BID
GUARDRAIL THRIE BEAM LF

1. DIMENSIONAL TOLERANCES NOT SHOWN OR IMPLIED ARE INTENDED TO BE THOSE CONSISTENT WITH THE PROPER FUNCTIONING OF THE PART, INCLUDING ITS APPEARANCE AND ACCEPTED MANUFACTURING PRACTICES.
2. THE SAME TYPE OF RAIL ELEMENT, POST, FASTENINGS AND ACCESSORIES SHALL BE USED THROUGHOUT THE WORK.
3. CONNECT OFFSET BLOCK TO STEEL POST WITH TWO DIAGONALLY LOCATED BLOTS.

④ 12 5/8"x 1 1/4" BUTTON HEAD BOLTS AND HEX HEAD RECESS NUTS.

⑤ TOLERANCE + 1 1/4", -3/16"

6. AASHTO M-180 SHALL APPLY EXCEPT WHERE IN CONFLICT WITH THIS DRAWING.
   REQUIRED FOR DOUBLE RAIL NOT REQUIRED FOR SINGLE RAIL.

USE WITH CUR. STD. DWG.
RBR-005

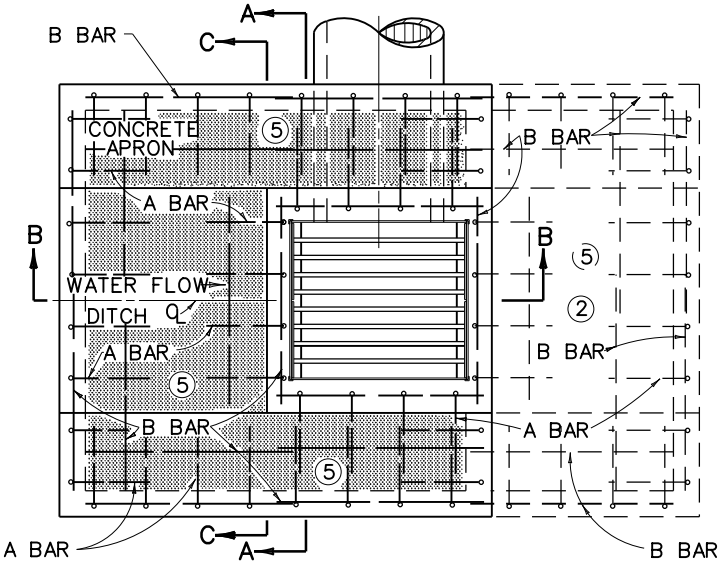
KENTUCKY
DEPARTMENT OF HIGHWAYS

STEEL BEAM GUARDRAIL (THRIE BEAM)

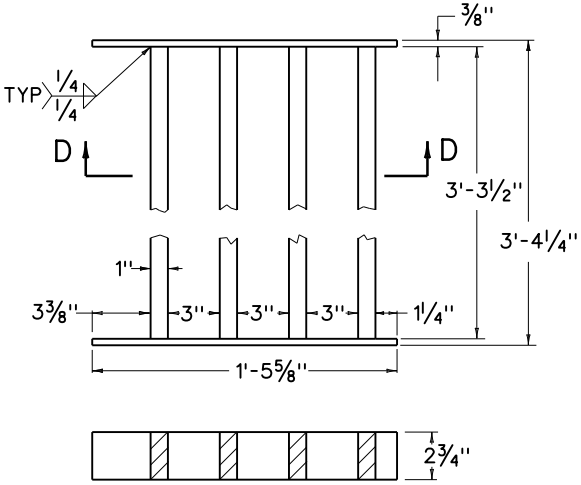
STANDARD DRAWING NO. RBR-100-07

SUBMITTED William S. Hulett — DIRECTOR, DIVISION OF DESIGN — 12-01-15 DATE

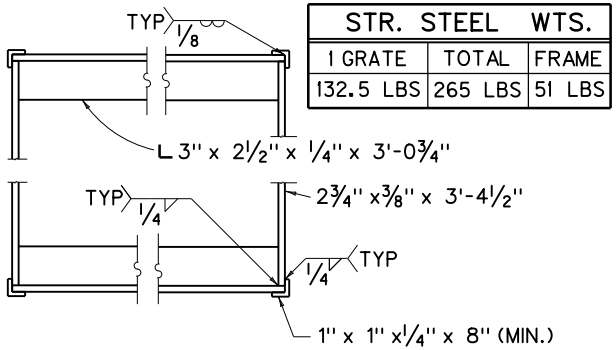
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



PLAN VIEW

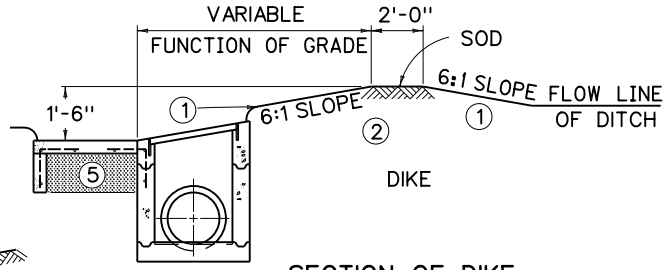


SECTION D-D
DETAIL OF GRATE
(TWO REQUIRED)

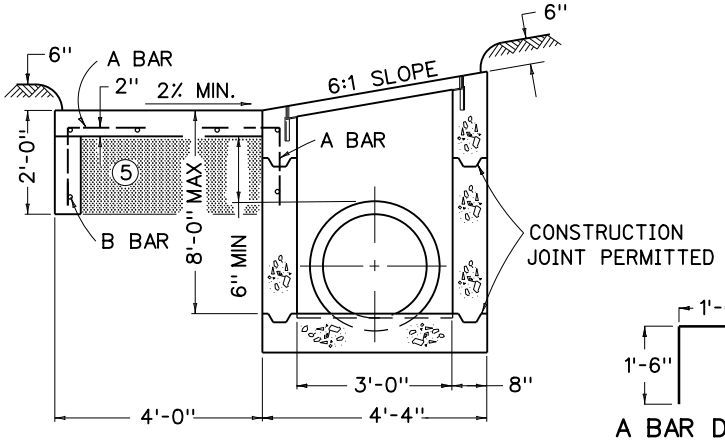


DETAIL OF FRAME

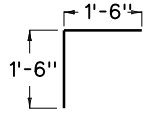
STR. STEEL WTS.		
1 GRATE	TOTAL	FRAME
132.5 LBS	265 LBS	51 LBS



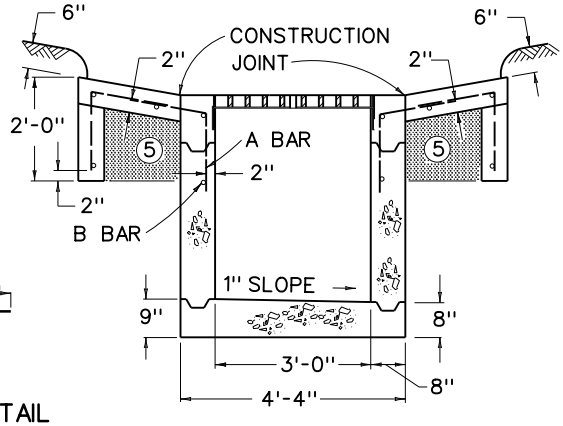
SECTION OF DIKE



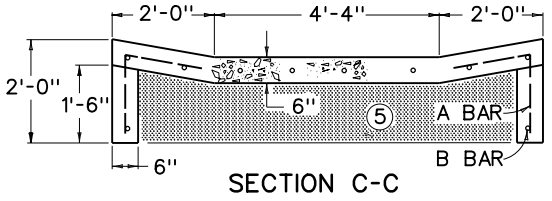
SECTION B-B



A BAR DETAIL



SECTION A-A



SECTION C-C

BILL OF REINFORCEMENT

BAR	NO. OF BARS	SIZE	LENGTH	APPROX. SPACING
A	40 OR 56	#5	3'-0"	1'-0" C TO C
B	25 OR 40	#4	4'-0"	AS SHOWN

NOTE: PRIMARY USE (ROADSIDE DITCH LOCATION)

~ NOTES ~

BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 1 EACH

(1) 6:1 SLOPES ARE WITH REFERENCE TO DITCH GRADE.

(2) WHEN A BOX INLET IS PLACED IN A SAG, OMIT THE EARTH DIKE AND LONGITUDINAL SLOPE OF THE GRATE, AND PROVIDE A CONCRETE APRON ON EACH SIDE OF THE INLET.

(3) RATE OF INCREASE OR DECREASE 0.36 CU. YD. PER FOOT IN HEIGHT.

(4) DEDUCT APPROX. 0.1 CU. YD. OF CONCRETE PER PIPE.

(5) ▨ COMPACT THIS VOLUME WITH D.G.A. BASE OR GRAVEL BASE AND INCLUDE IN THE UNIT PRICE OF THE BOX. SODDING IS NOT INCLUDED.

6. DOWNSTREAM DIKE COMPLETE AND IN PLACE IS INCLUDED IN THE CONTRACT UNIT PRICE OF THE INLET. SODDING IS NOT INCLUDED.

APPROX. QUANTITIES

TYPE	CONCRETE 3'-9" ③ BOX	REINF. STEEL
SAG	4.4 CU. YD.④	282 LBS
GRADE	3.4 CU. YD.④	192 LBS

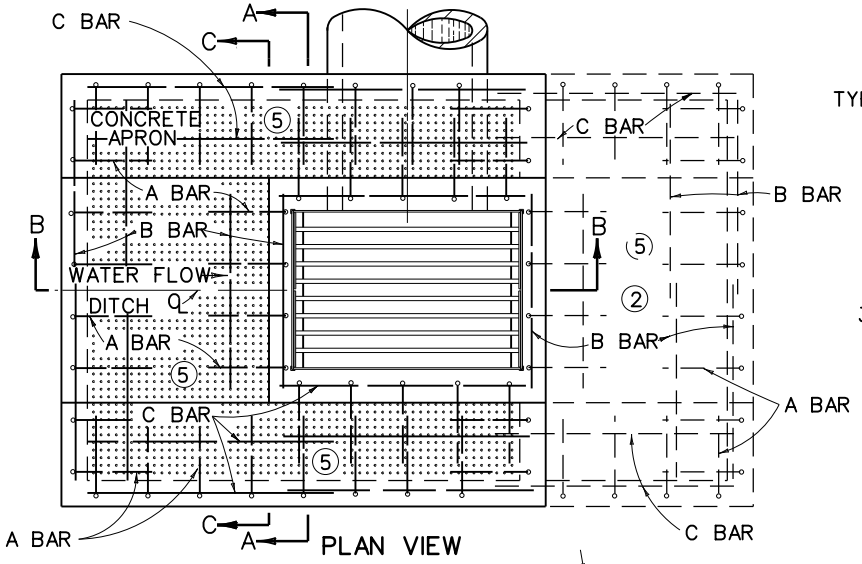
KENTUCKY
DEPARTMENT OF HIGHWAYS

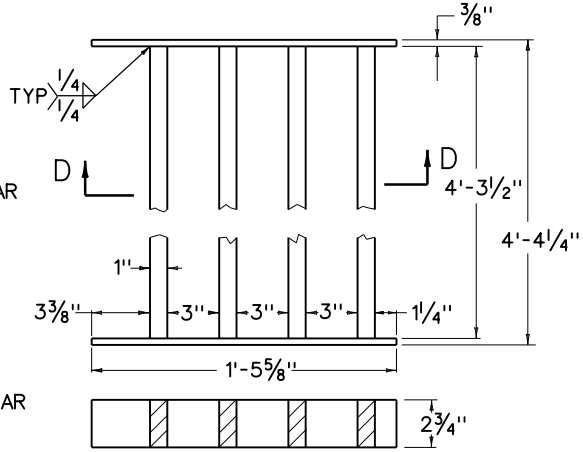
DROP BOX INLET TYPE 1

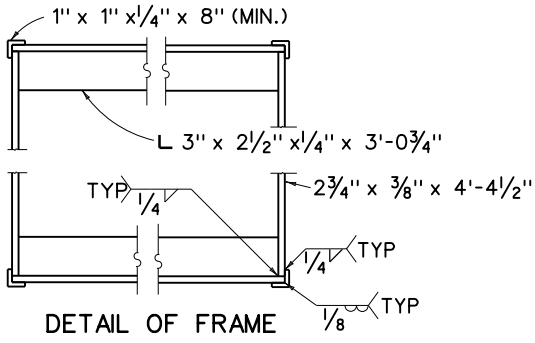
STANDARD DRAWING NO. RDB-001-12

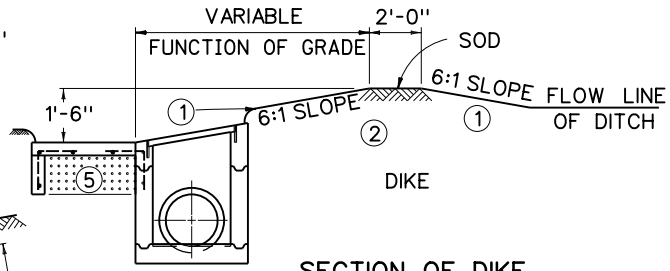
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

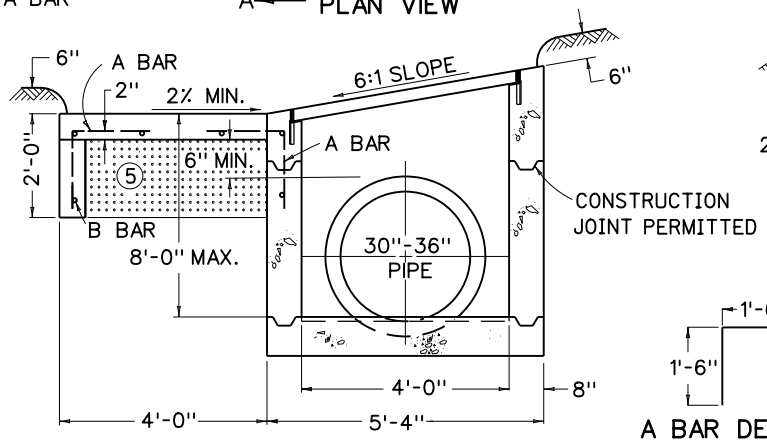
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

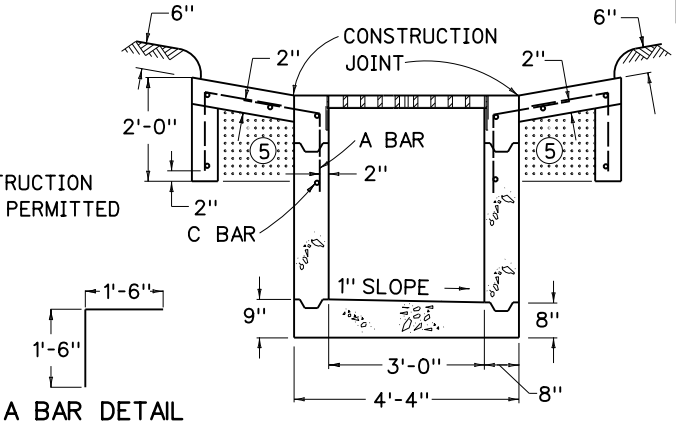


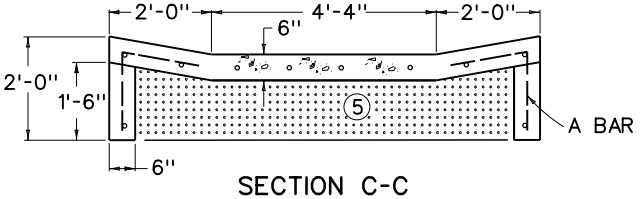












BILL OF REINFORCEMENT

BAR	NO. OF BARS	SIZE	LENGTH	APPROX. SPACING
A	44 OR 60	#5	3'-0"	1'-0" C TO C
B	9 OR 18	#4	3'-9"	AS SHOWN
C	16 OR 22	#4	4'-9"	AS SHOWN

NOTE: PRIMARY USE (ROADSIDE DITCH LOCATION)

~ NOTES ~

BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 2 — EACH

(1) 6:1 SLOPES ARE WITH REFERENCE TO DITCH GRADE.

(2) WHEN A BOX INLET IS PLACED IN A SAG, OMIT THE EARTH DIKE AND LONGITUDINAL SLOPE OF THE GRATE, AND PROVIDE A CONCRETE APRON ON EACH SIDE OF THE INLET.

(3) RATE OF INCREASE OR DECREASE 0.41 CU. YD. PER FOOT IN HEIGHT.

(4) DEDUCT APPROX. 0.2 CU. YD. OF CONCRETE FOR A 30" PIPE AND 0.3 CU. YD. OF CONCRETE FOR A 36" PIPE.

(5) ⁞⁞⁞ COMPACT THIS VOLUME WITH D.G.A. BASE OR GRAVEL BASE AND INCLUDE IN THE UNIT PRICE OF THE BOX.

6. DOWNSTREAM DIKE COMPLETE AND IN PLACE IS INCLUDED IN THE CONTRACT UNIT PRICE OF THE INLET. SODDING IS NOT INCLUDED.

STR. STEEL WTS.		
1 GRATE	TOTAL	FRAME
170 LBS	340 LBS	58 LBS

APPROX. QUANTITIES

TYPE	CONCRETE 3'-9" ③ BOX	REINF. STEEL
SAG	4.8 CU. YD.④	303 LBS
GRADE	3.9 CU. YD.④	212 LBS

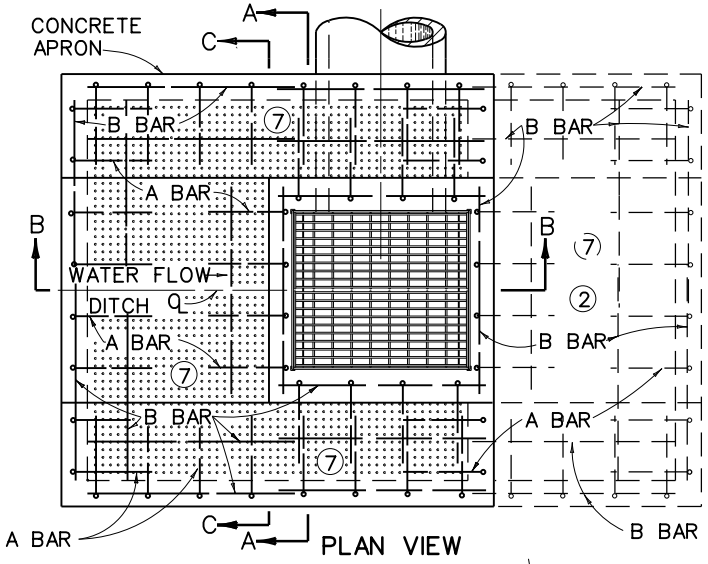
KENTUCKY
DEPARTMENT OF HIGHWAYS

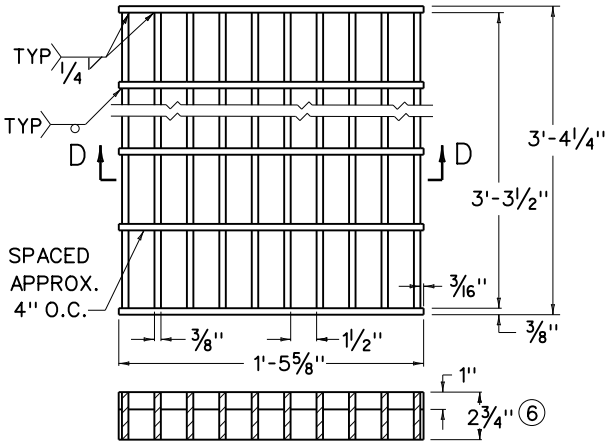
DROP BOX INLET TYPE 2

STANDARD DRAWING NO. RDB-002-12

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN — DATE 12-01-15

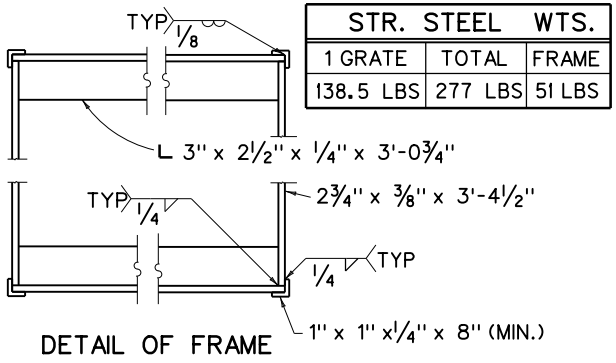
APPROVED _____ STATE HIGHWAY ENGINEER — DATE 12-01-15



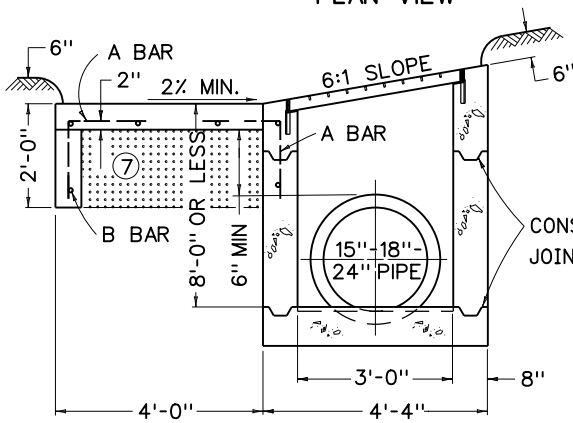


⑤ SECTION D-D
DETAIL OF GRATE
(TWO REQUIRED)

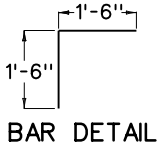
STR. STEEL WTS.		
1 GRATE	TOTAL	FRAME
138.5 LBS	277 LBS	51 LBS



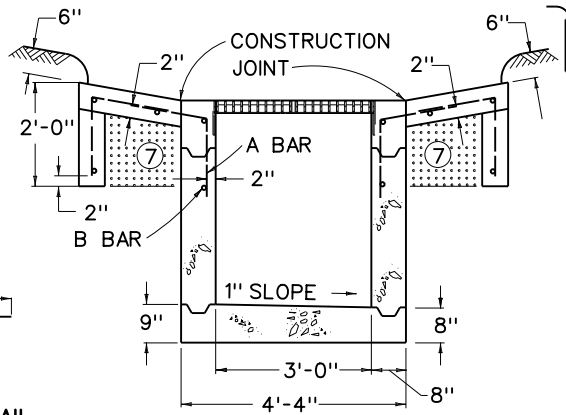
DETAIL OF FRAME



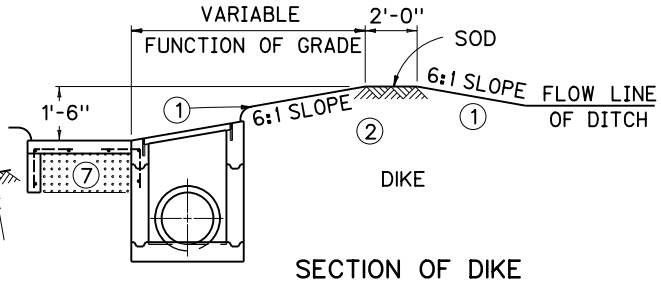
SECTION B-B



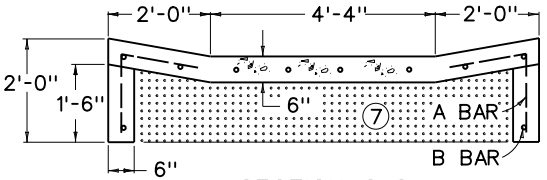
A BAR DETAIL



SECTION A-A



SECTION OF DIKE



SECTION C-C

BILL OF REINFORCEMENT

BAR	NO. OF BARS	SIZE	LENGTH	APPROX. SPACING
A	40 OR 56	#5	3'-0"	1'-0" C TO C
B	25 OR 40	#4	4'-0"	AS SHOWN

NOTE: PRIMARY USE (ROADSIDE DITCH LOCATION)

~ NOTES ~

BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 3 EACH

1. 6:1 SLOPES ARE WITH REFERENCE TO DITCH GRADE.
2. WHEN A BOX INLET IS PLACED IN A SAG, OMIT THE EARTH DIKE AND LONGITUDINAL SLOPE OF THE GRATE, AND PROVIDE A CONCRETE APRON ON EACH SIDE OF THE INLET.
3. RATE OF INCREASE OR DECREASE 0.36 CU. YD. PER FOOT IN HEIGHT.
4. DEDUCT APPROX. 0.1 CU. YD. OF CONCRETE PER PIPE.
5. RELIANCE STEEL (CAT. NO. H2-12D) AND GARY STEEL (CAT. NO. HW3-D-300) ARE ACCEPTABLE ALTERNATES PROVIDED MATCHED GRATES ARE SUPPLIED.
6. THE 2¾" BAR SHALL BE NOTCHED TO RECEIVE THE 1" BAR.
7. ⬚ COMPACT THIS VOLUME WITH D.G.A. BASE OR GRAVEL BASE AND INCLUDE IN THE UNIT PRICE OF THE BOX.
8. DOWNSTREAM DIKE COMPLETE AND IN PLACE IS INCLUDED IN THE CONTRACT UNIT PRICE OF THE INLET. SODDING IS NOT INCLUDED.

APPROX. QUANTITIES

TYPE	CONCRETE 3'-9" ③ BOX	REINF. STEEL
SAG	4.4 CU. YD.④	282 LBS
GRADE	3.4 CU. YD.④	192 LBS

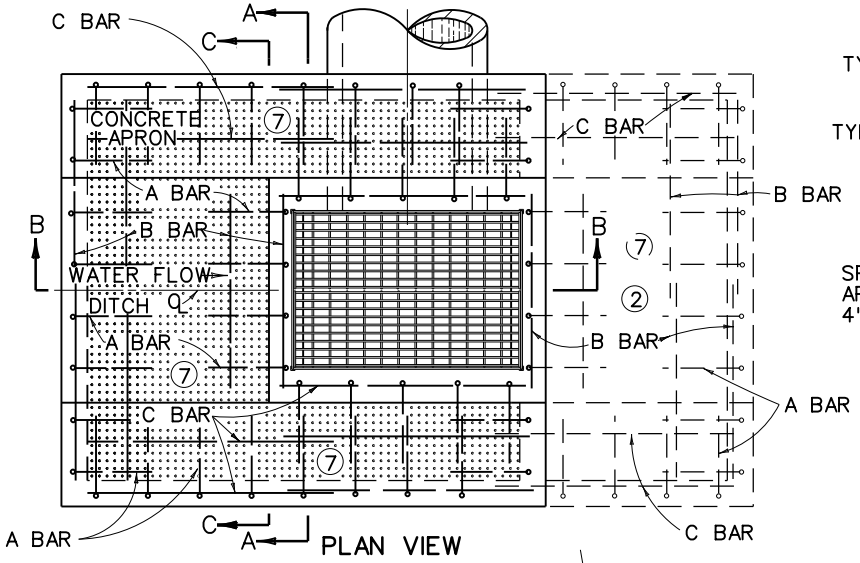
KENTUCKY
DEPARTMENT OF HIGHWAYS

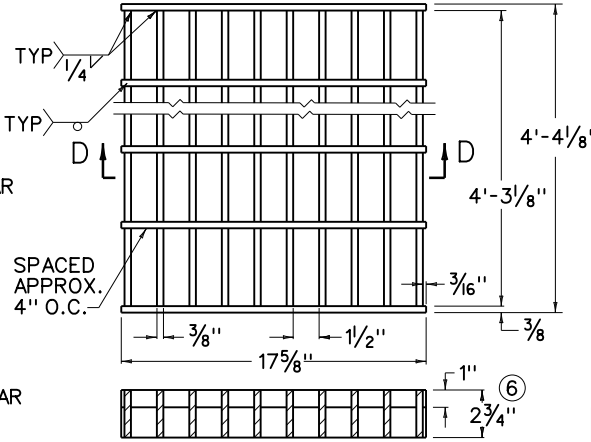
DROP BOX INLET TYPE 3

STANDARD DRAWING NO. RDB-003-08

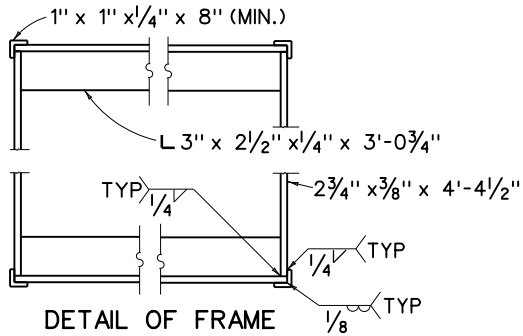
SUBMITTED William S. Haskins — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE

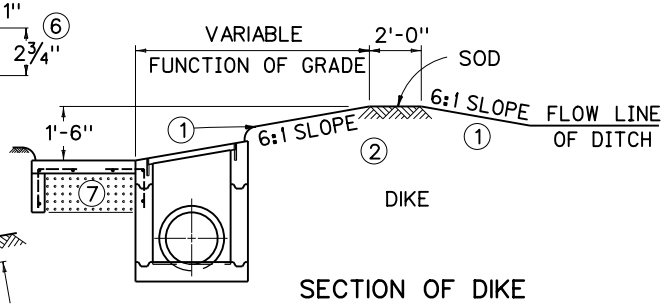




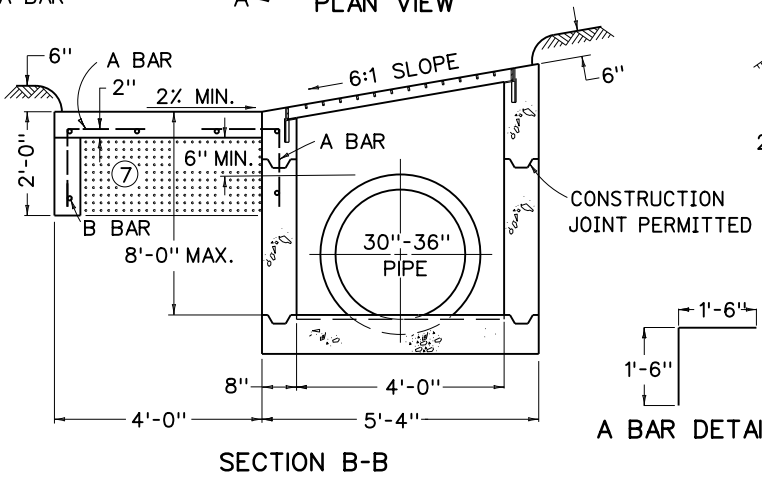
⑤ SECTION D-D
DETAIL OF GRATE
(TWO REQUIRED)



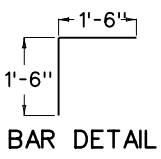
DETAIL OF FRAME



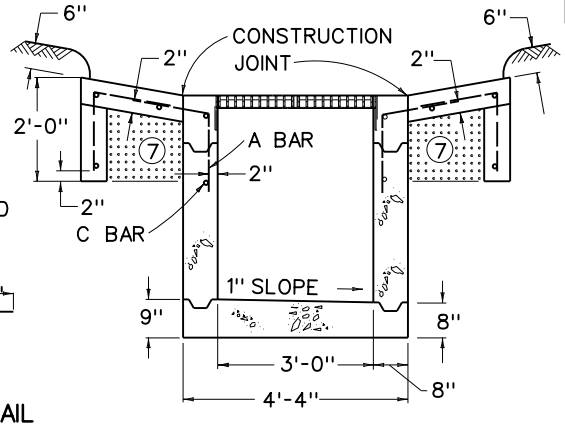
SECTION OF DIKE



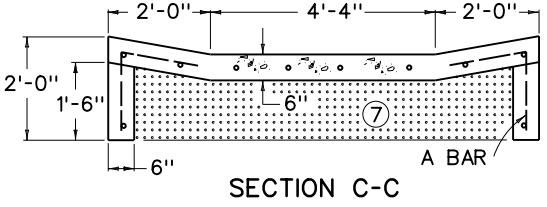
SECTION B-B



A BAR DETAIL



SECTION A-A



SECTION C-C

BILL OF REINFORCEMENT

BAR	NO. OF BARS	SIZE	LENGTH	APPROX. SPACING
A	44 OR 60	#5	3'-0"	1'-0" C TO C
B	9 OR 18	#4	3'-9"	AS SHOWN
		#4		AS SHOWN

NOTE: PRIMARY USE (ROADSIDE DITCH LOCATION)

~ NOTES ~

BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 4 EACH

(1) 6:1 SLOPES ARE WITH REFERENCE TO DITCH GRADE.

(2) WHEN A BOX INLET IS PLACED IN A SAG, OMIT THE EARTH DIKE AND LONGITUDINAL SLOPE OF THE GRATE, AND PROVIDE A CONCRETE APRON ON EACH SIDE OF THE INLET.

(3) RATE OF INCREASE OR DECREASE 0.41 CU. YD. PER F.T IN HEIGHT.

(4) DEDUCT APPROX. 0.2 CU. YD OF CONCRETE OR A 30" PIPE AND 0.3 CU. YD. OF CONCRETE FOR A 36" PIPE.

(5) RELIANCE STEEL (CAT. NO. H2-12D) AND GARY STEEL (CAT. NO. HW3-D-300) ARE ACCEPTABLE ALTERNATES PROVIDED MATCHED GRATES ARE SUPPLIED.

(6) THE 2 3/4" BAR SHALL BE NOTCHED TO RECEIVE THE 1" BAR.

(7) ⋰⋰⋰ COMPACT THIS VOLUME WITH D.G.A. BASE OR GRAVEL BASE AND INCLUDE IN THE UNIT PRICE OF THE BOX.

8. DOWNSTREAM DIKE COMPLETE AND IN PLACE IS INCLUDED IN THE CONTRACT UNIT PRICE OF THE INLET. SODDING IS NOT INCLUDED.

STR. STEEL WTS.		
1 GRATE	TOTAL	FRAME
176 LBS	352 LBS	58 LBS

APPROX. QUANTITIES

TYPE	CONCRETE 3'-9" ③ BOX	REINF. STEEL
SAG	4.8 CU. YD.④	303 LBS
GRADE	3.9 CU. YD.④	212 LBS

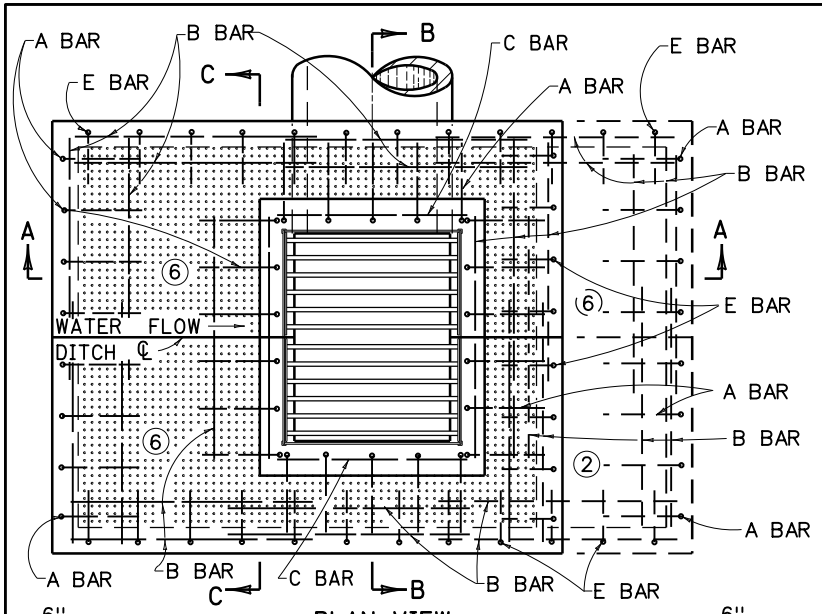
KENTUCKY
DEPARTMENT OF HIGHWAYS

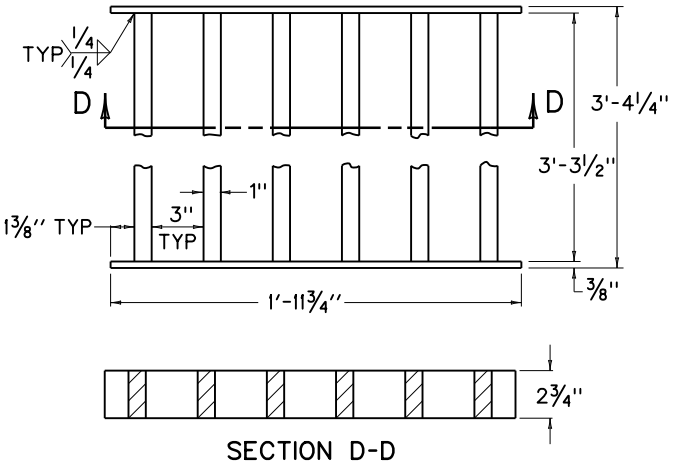
DROP BOX INLET TYPE 4

STANDARD DRAWING NO. RDB-004-10

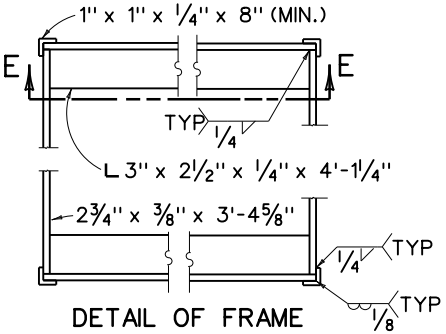
SUBMITTED William S. Haskins DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

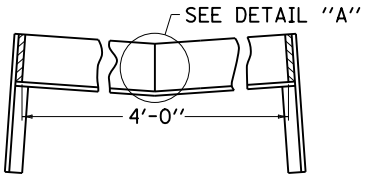




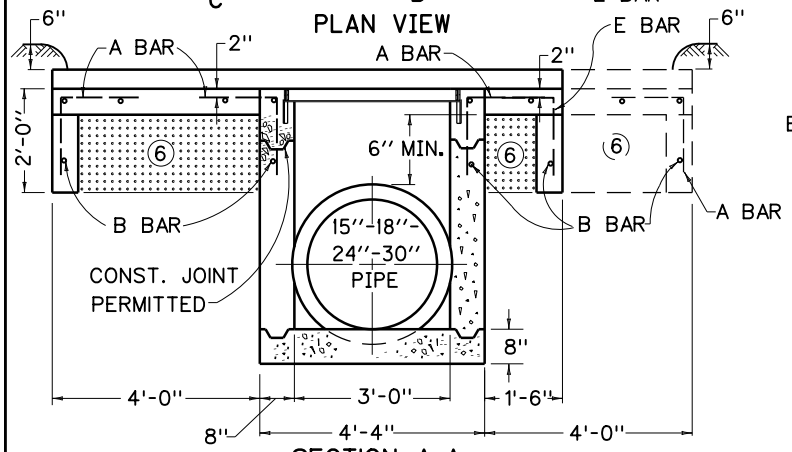
SECTION D-D
DETAIL OF GRATE
(TWO REQUIRED)



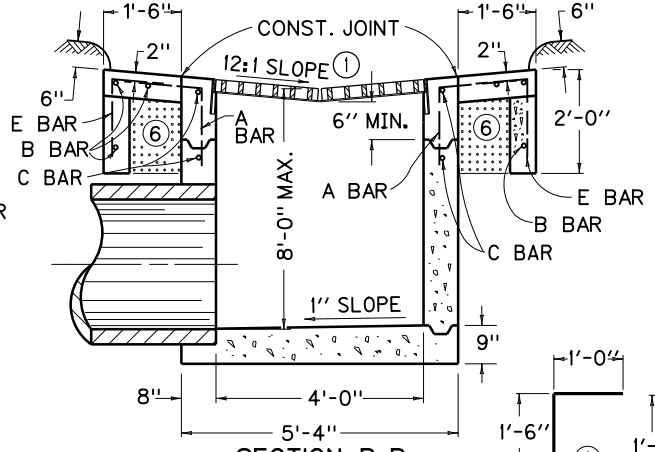
DETAIL OF FRAME



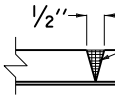
SECTION E-E
DETAIL OF FRAME



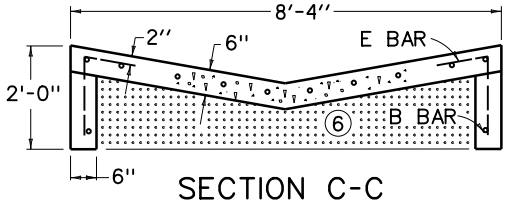
SECTION A-A



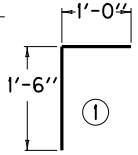
SECTION B-B

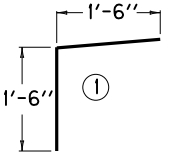


DETAIL "A"



SECTION C-C





BILL OF REINFORCEMENT

BAR	NO. OF BARS	SIZE	LENGTH
A	30 OR 38	#5	3'-0"
B	29 OR 36	#4	4'-8"
		#4	
E	26 OR 24	#5	2'-6"

NOTE: PRIMARY USE (DEPRESSED MEDIAN)

~ NOTES ~

BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 5 (A, B, C, D, E, F) EACH

(1) RELATES TO MEDIAN CROSS SLOPE - 5A=12:1, 5B=6:1, 5C=5:1, 5D=4:1, 5E=3:1, 5F EQUALS ANY ADDITIONAL SLOPE AS SPECIFIED BY THE ENGINEER

(2) WHEN A BOX INLET IS PLACED IN A SAG CONSTRUCT APRON 4'-0" ON EACH SIDE AS SHOWN.

(3) RATE OF INCREASE OR DECREASE 0.41 CU. YD. PER FT. IN HEIGHT.

(4) DEDUCT APPROX. 0.10 CU. YD OF CONCRETE FOR 15", 18", 24" PIPE AND 0.20 CU. YD. OF CONCRETE FOR A 30" PIPE.

5. DETAILS ARE SHOWN FOR A TYPE 5A . IT IS NECESSARY TO REVISE VARIOUS DETAILS INCLUDING FRAME FOR TYPES B, C, D, E, AND F.

(6) COMPACT THIS VOLUME WITH D.G.A. BASE OR GRAVEL BASE AND INCLUDE IN THE UNIT PRICE OF THE BOX.

7. WHEN D.B.I. TYPE 5 IS CONSTRUCTED IN CONJUNCTION WITH PAVED DITCH TYPE 3, SEE PAVED DITCH TYPE 3 DETAIL FOR ADDITIONAL STEEL REQUIREMENTS.

STR. STEEL WTS.		
1 GRATE	TOTAL	FRAME
198 LBS	396 LBS	64 LBS

APPROX. QUANTITIES

TYPE	CONCRETE 3'-6" (3) BOX	REINF. STEEL
SAG	4.0 CU. YD.(4)	304 LBS
GRADE	3.4 CU. YD.(4)	262 LBS

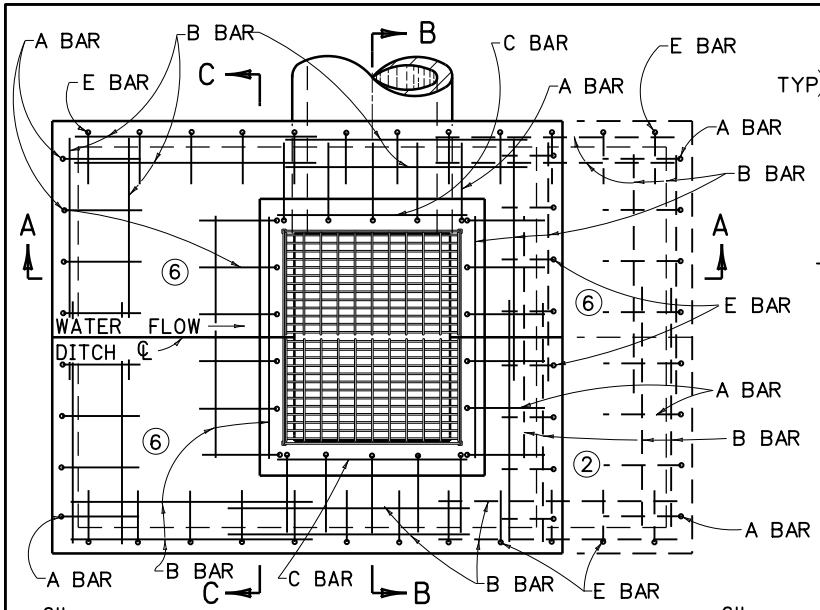
KENTUCKY
DEPARTMENT OF HIGHWAYS

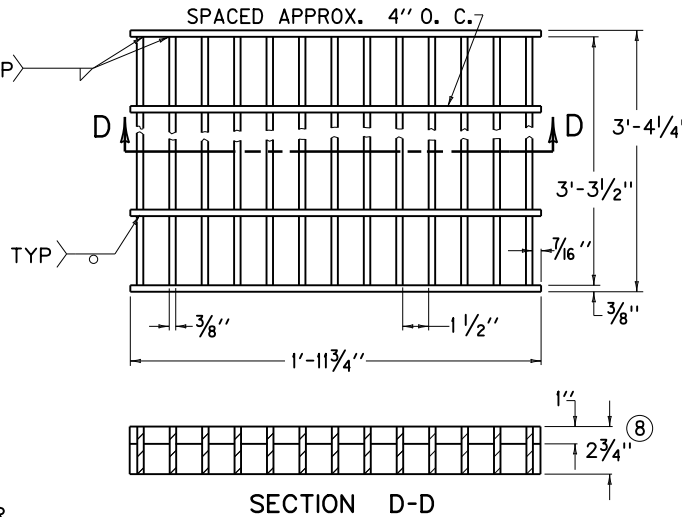
DROP BOX
INLET TYPE
5A-5B-5C-5D-5E & 5F

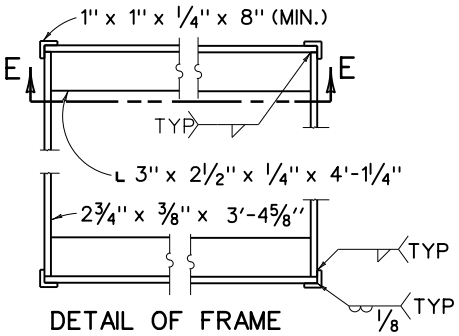
STANDARD DRAWING NO. RDB-005-09

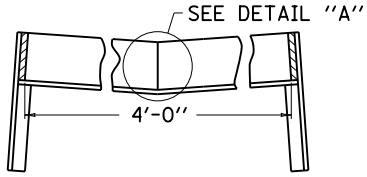
SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

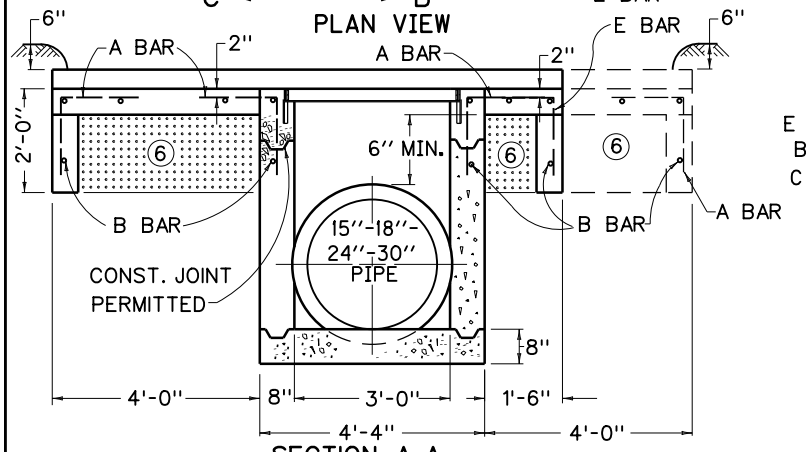
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

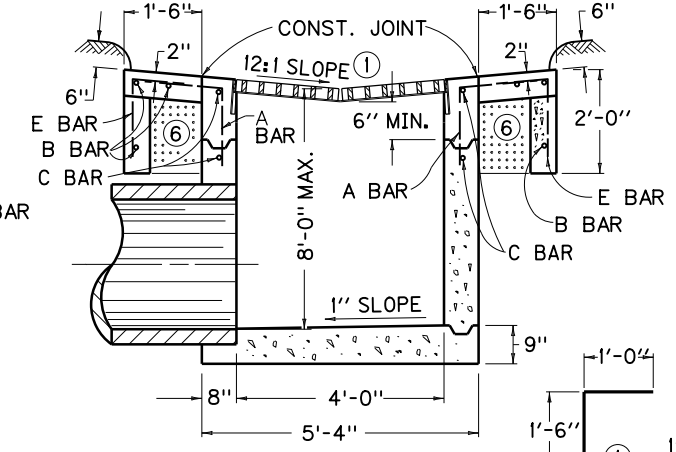


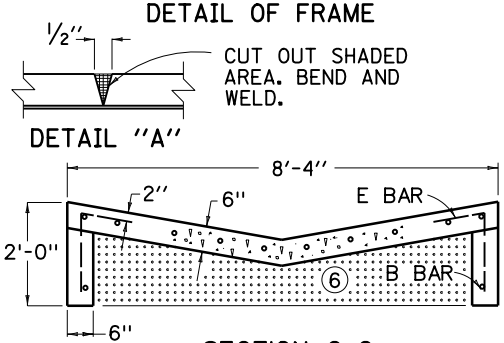


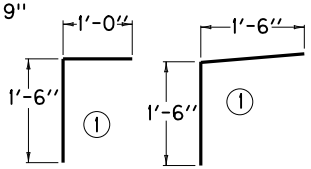












BILL OF REINFORCEMENT

BAR	NO. OF BARS	SIZE	LENGTH
A	30 OR 38	#5	3'-0''
B	29 OR 36	#4	4'-8''
		#4	
E	26 OR 24	#5	2'-6''

~ NOTES ~

BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 6 (A, B, C, D, E, F) EACH

① RELATES TO MEDIAN CROSS SLOPE - 6A=12:1, 6B=6:1, 6C=5:1, 6D=4:1, 6E=3:1, 6F EQUALS ANY ADDITIONAL SLOPE AS SPECIFIED BY THE ENGINEER

② WHEN A BOX INLET IS PLACED IN A SAG CONSTRUCT APRON 4'-0'' ON EACH SIDE AS SHOWN.

③ RATE OF INCREASE OR DECREASE 0.41 CU. YD. PER FT. IN HEIGHT.

④ DEDUCT APPROX. 0.1 CU. YD. OF CONCRETE FOR 15''-18''-24'' PIPE AND 0.2 CU. YD. OF CONCRETE FOR FOR A 30'' PIPE.

5. DETAILS ARE SHOWN FOR A TYPE 6A. IT IS NECESSARY TO REVISE VARIOUS DETAILS INCLUDING FRAME FOR TYPES B, C, D, E, AND F.

⑥ COMPACT THIS VOLUME WITH D.G.A. BASE OR GRAVEL BASE AND INCLUDE IN THE UNIT PRICE OF THE BOX.

⑦ RELIANCE STEEL (CAT. NO. H2-12D) AND GARY STEEL (CAT. NO. HW3-D-300) ARE ACCEPTABLE ALTERNATES PROVIDED MATCHED GRATES ARE SUPPLIED.

⑧ THE 2¾'' BAR SHALL BE NOTCHED TO RECEIVE THE 1'' CROSS BAR.

NOTE: PRIMARY USE (DEPRESSED MEDIAN)

STR. STEEL WTS.		
1 GRATE	TOTAL	FRAME
181 LBS.	362 LBS.	64 LBS.

APPROX. QUANTITIES

TYPE	CONCRETE 3'-6'' ③ BOX	REINF. STEEL
SAG	4.0 CU. YD.④	304 LBS.
GRADE	3.4 CU. YD.④	262 LBS

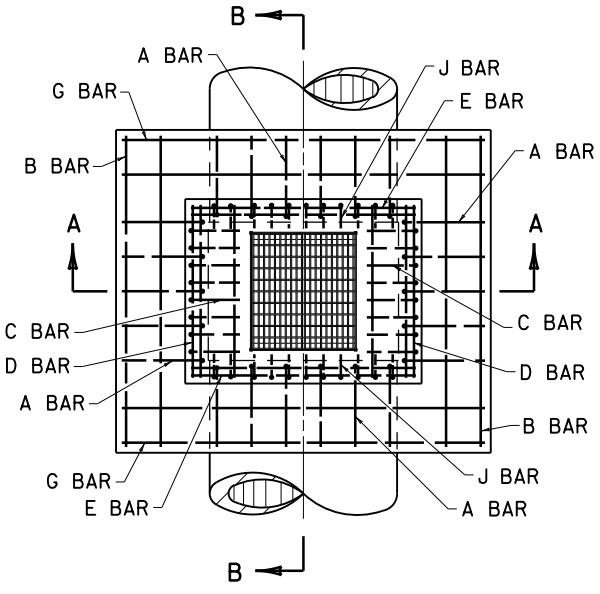
KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET TYPE 6A-6B-6C-6D-6E & 6F

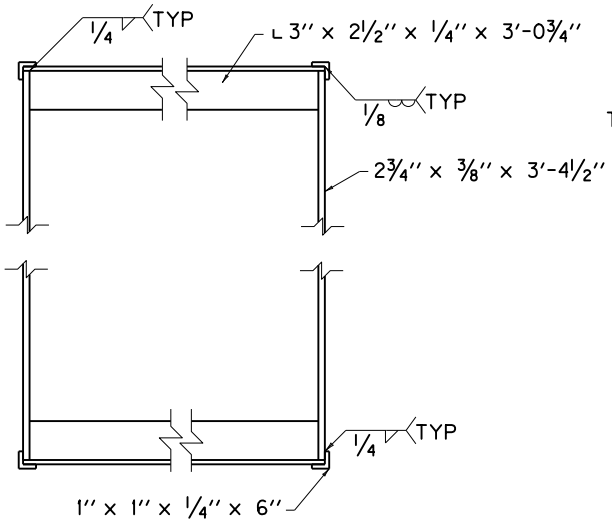
STANDARD DRAWING NO. RDB-006-08

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

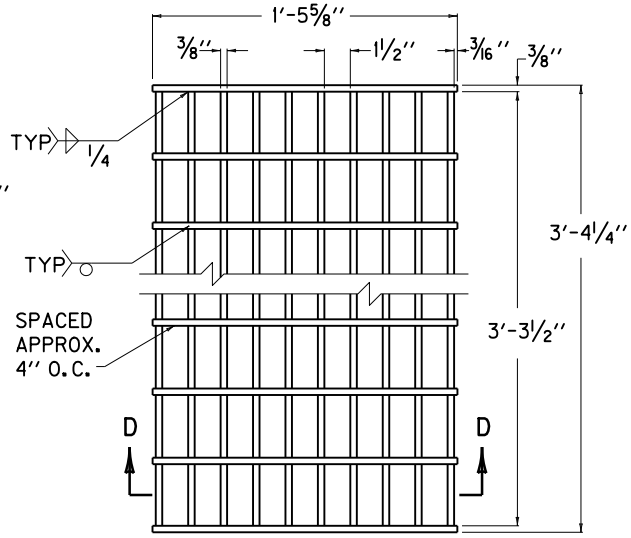
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



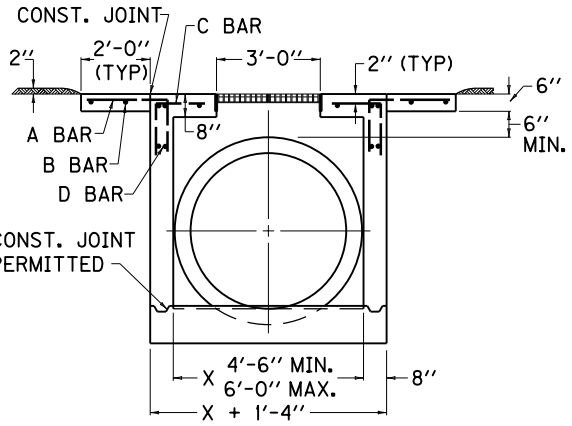
PLAN VIEW



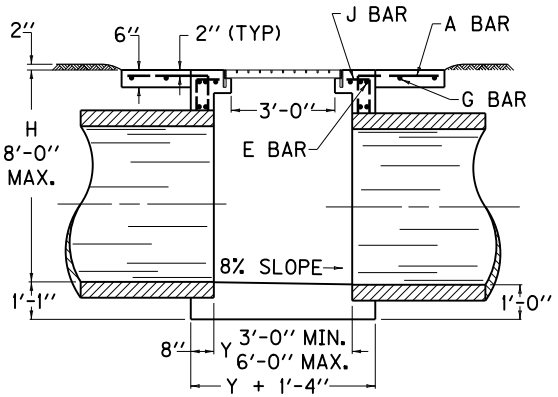
FRAME DETAIL



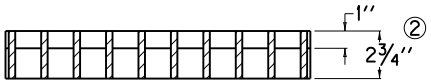
① GRATE DETAIL
(TWO GRATES REQ'D.)



SECTION A-A



SECTION B-B



SECTION D-D

~ NOTES ~

BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 7 EACH

① RELIANCE STEEL (CAT. NO. H2-12D) AND GARY STEEL (CAT. NO. HW3-D-300) ARE ACCEPTABLE ALTERNATES PROVIDED MATCHED GRATES ARE SUPPLIED.

② THE 2 3/4" BAR SHALL BE NOTCHED TO RECEIVE THE 1" CROSS BAR.

3. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2" FROM OUTSIDE FACE UNLESS OTHERWISE SHOWN.
4. THIS BOX IS TO BE USED PRIMARILY FOR SUMP CONDITIONS WHERE A GRATED INLET IS REQUIRED FOR PIPE SIZES 42" THRU 60".
5. SEE CURRENT STANDARD DRAWING RDB-008 FOR DIMENSIONS AND STEEL CHARTS.

USE WITH CUR. STD. DWG.
RDB-008

KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET TYPE 7

(LAYOUT AND STEEL PATTERN)

STANDARD DRAWING NO. RDB-007-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

DIMENSIONS AND ESTIMATE OF QUANTITIES

INLET SIZE NO.	X	Y	PIPE MAX. DIA.	PIPE SIDE	④ H	CONCRETE CUBIC YARDS	CONCRETE ⑥ Q	REINF. STEEL LBS.
1	4′-6″	3′-0″	42″	X	5′-1½″	4.3	0.4	240
2		3′-6″				4.7	0.5	252
3		4′-0″				5.0		348
4		4′-6″		X OR Y		5.3		365
5	5′-0″	3′-0″	48″	X	5′-7″	4.9	0.5	255
6		3′-6″				5.2		268
7		4′-0″				5.6		372
8		4′-6″				5.9		390
9		5′-0″		X OR Y		6.3	0.6	416
10	5′-6″	3′-0″	54″	X	6′-1 ½″	5.4	0.5	262
11		3′-6″				5.8		276
12		4′-0″				6.2		388
13		4′-6″				6.6	0.6	407
14		5′-0″				7.0		434
15		5′-6″		X OR Y		7.4		453
16	6′-0″	3′-0″	60″	X	6′-8″	6.0	0.5	278
17		3′-6″				6.4		292
18		4′-0″				6.8	0.6	412
19		4′-6″				7.3		432
20		5′-0″				7.7		460
21		5′-6″				8.1		480
22		6′-0″		X OR Y		8.5	0.7	508

REFERENCE CHART

DIA. OF PIPE	D.B.I. TYPE 7 PIPE ON ″X″ SIDE OF INLET	D.B.I. TYPE 7 PIPE ON ″Y″ SIDE OF INLET	CONCRETE TO DEDUCT FOR EACH PIPE CUBIC YARDS
0	⑤	3′-0″	—
12″			0.1
15″-18″			
21″-24″			0.2
27″			
30″-33″		3′-6″	
36″		4′-0″	0.3
42″	4′-6″	4′-6″	0.4
48″	5′-0″	5′-0″	0.5
54″	5′-6″	5′-6″	0.6
60″	6′-0″	6′-0″	0.7

BILL OF REINFORCEMENT

NUMBER 5 REINFORCEMENT BARS

4′-6″ × 3′-0″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	18	3	10	2	4
B	4	8	0		
C	12	2	5	0	11
D	10	4	0		
E	4	5	6		
G	4	9	6		

4′-6″ × 3′-6″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	18	3	10	2	4
B	4	8	6		
C	14	2	5	0	11
D	10	4	6		
E	4	5	6		
G	4	9	6		

4′-6″ × 4′-0″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	20	3	10	2	4
B	4	9	0		
C	16	2	5	0	11
D	10	5	0		
E	10	5	6		
G	4	9	6		
J	18	2	2	0	8

4′-6″ × 4′-6″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	20	3	10	2	4
B	4	9	6		
C	18	2	5	0	11
D	10	5	6		
E	10	5	6		
G	4	9	6		
J	18	2	5	0	11

5′-0″ × 3′-0″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	20	3	10	2	4
B	4	8	0		
C	12	2	8	1	2
D	10	4	0		
E	4	6	0		
G	4	10	0		

5′-0″ × 3′-6″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	20	3	10	2	4
B	4	8	6		
C	14	2	8	1	2
D	10	4	6		
E	4	6	0		
G	4	10	0		

5′-0″ × 4′-0″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	22	3	10	2	4
B	4	9	0		
C	16	2	8	1	2
D	10	5	0		
E	10	6	0		
G	4	10	0		
J	20	2	2	0	8

5′-0″ × 4′-6″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	22	3	10	2	4
B	4	9	6		
C	18	2	8	1	2
D	10	5	6		
E	10	6	0		
G	4	10	0		
J	20	2	5	0	11

5′-0″ × 5′-0″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	24	3	10	2	4
B	4	10	0		
C	20	2	8	1	2
D	10	6	0		
E	10	6	0		
G	4	10	0		
J	20	2	8	1	2

5′-6″ × 3′-0″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	20	3	10	2	4
B	4	8	6		
C	14	2	11	1	5
D	10	4	6		
E	4	6	6		
G	4	10	6		

5′-6″ × 3′-6″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	20	3	10	2	4
B	4	8	6		
C	14	2	11	1	5
D	10	4	6		
E	4	6	6		
G	4	10	6		

5′-6″ × 4′-0″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	22	3	10	2	4
B	4	9	0		
C	16	2	11	1	5
D	10	5	0		
E	10	6	6		
G	4	10	6		
J	22	2	2	0	8

5′-6″ × 4′-6″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	22	3	10	2	4
B	4	9	6		
C	18	2	11	1	5
D	10	5	6		
E	10	6	6		
G	4	10	6		
J	22	2	5	0	11

5′-6″ × 5′-0″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	24	3	10	2	4
B	4	10	0		
C	20	2	11	1	5
D	10	6	0		
E	10	6	6		
G	4	10	6		
J	22	2	8	1	2

5′-6″ × 3′-0″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	20	3	10	2	4
B	4	8	0		
C	12	2	11	1	5
D	10	4	0		
E	4	6	6		
G	4	10	6		

5′-6″ × 5′-6″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	24	3	10	2	4
B	4	10	6		
C	22	2	11	1	5
D	10	6	6		
E	10	6	6		
G	4	11	0		
J	22	2	11	1	5

6′-0″ × 3′-0″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	22	3	10	2	4
B	4	8	0		
C	12	3	2	1	8
D	10	4	0		
E	4	7	0		
G	4	11	0		

6′-0″ × 3′-6″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	22	3	10	2	4
B	4	8	6		
C	14	3	2	1	8
D	10	4	6		
E	4	7	0		
G	4	11	0		

6′-0″ × 4′-0″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	24	3	10	2	4
B	4	9	0		
C	16	3	2	1	8
D	10	5	0		
E	10	7	0		
G	4	11	0		
J	24	2	2	0	8

6′-0″ × 4′-6″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	24	3	10	2	4
B	4	9	6		
C	18	3	2	1	8
D	10	6	0		
E	10	7	0		
G	4	11	0		
J	24	2	5	0	11

6′-0″ × 5′-0″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	24	3	10	2	4
B	4	10	6		
C	20	3	2	1	8
D	10	6	0		
E	10	7	0		
G	4	11	0		
J	24	2	8	1	2

6′-0″ × 5′-6″

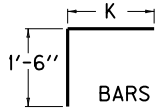
MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	26	3	10	2	4
B	4	10	6		
C	22	3	2	1	8
D	10	6	6		
E	10	7	0		
G	4	11	0		
J	24	3	2	1	8

6′-0″ × 6′-0″

MARK	NO. ①	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	28	3	10	2	4
B	4	11	0		
C	24	3	2	1	8
D	10	7	0		
E	10	7	0		
G	4	11	0		
J	24	3	2	1	8

~ BAR NOTES ~

① NUMBER OF BARS IN ONE D.B.I. TYPE 7.
2. DIMENSIONS ARE O. TO O. OF BARS.
3. ALL BARS ARE STRAIGHT EXCEPT THOSE SHOWN BELOW.



BARS A, C AND J

BENT BAR SHAPES

~ NOTES ~

④ BASED ON ″H″ AS EQUAL TO D+T+1′-2″.
⑤ FOR PIPE SIZES LESS THAN 42″ USE APPLICABLE CURRENT RDB-SERIES.
⑥ Q=CUBIC YARDS OF CONCRETE PER FOOT INCREASE OR DECREASE WHEN ″H″ VARIES FROM D+T+1′-2″.
7. NO DEDUCTIONS HAVE BEEN MADE FOR PIPE, SEE REFERENCE CHART FOR QUANTITIES TO DEDUCT.
8. ″T″ IS CONCRETE PIPE WALL THICKNESS OR METAL PIPE CORRUGATION DEPTH.
9. D=INSIDE DIAMETER OF PIPE.
10. A, B AND G BARS SPACED 1′-0″ O.C., C AND J BARS SPACED 6″ O.C., ALL OTHER BARS SPACED AS SHOWN.

USE WITH CUR. STD. DWG. RDB-007

KENTUCKY DEPARTMENT OF HIGHWAYS

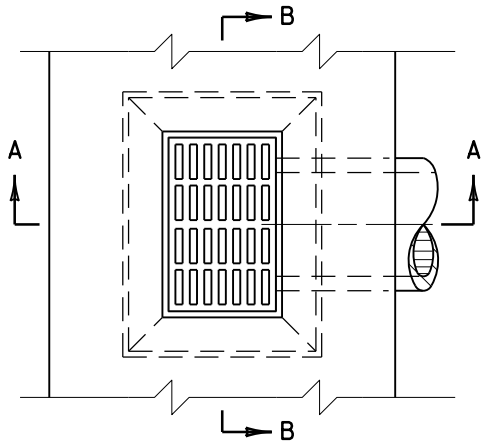
DROP BOX INLET TYPE 7

(DIMENSION & STEEL CHARTS)

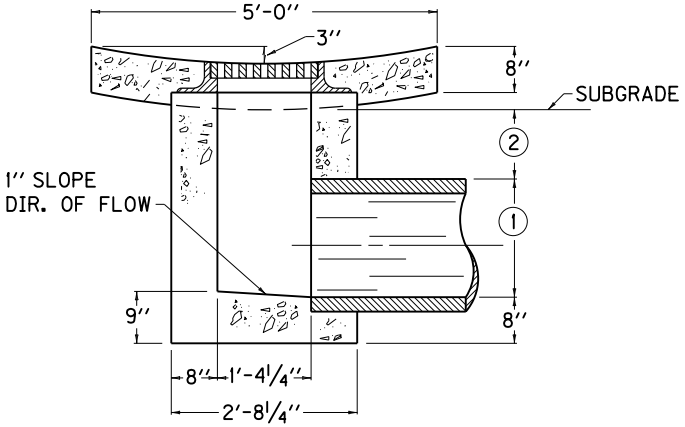
STANDARD DRAWING NO. RDB-008-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

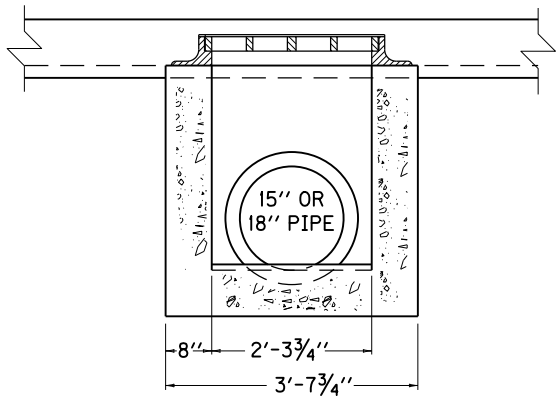
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW



SECTION A-A



SECTION B-B

~ NOTES ~

BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 10 EACH

(1) 1'-5¼" FOR 15" PIPE
1'-8½" FOR 18" PIPE

(2) 1'-0" MINIMUM COVER BELOW SUBGRADE.

3. PRIMARY USE: VALLEY GUTTER LOCATION

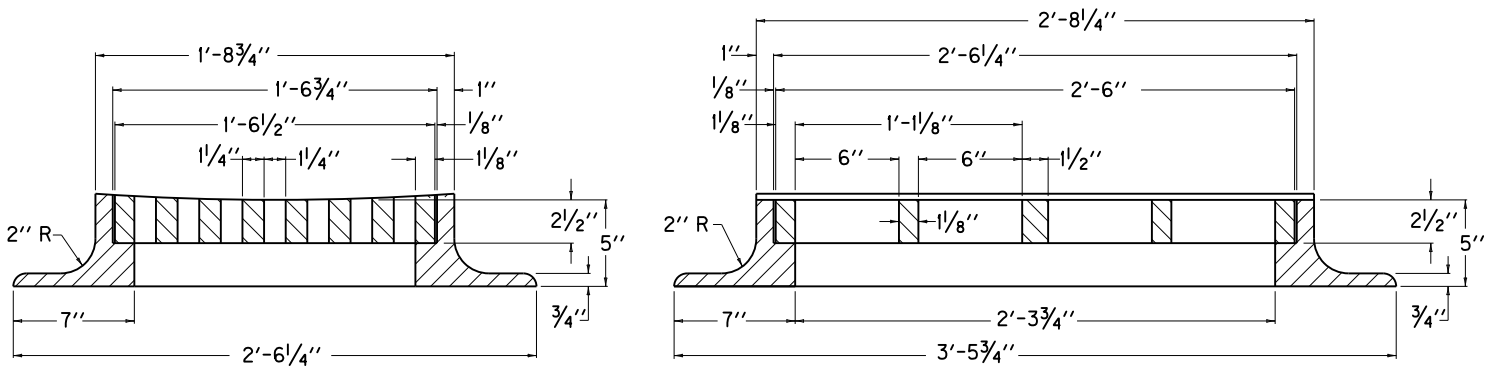
4. CONSTRUCT VALLEY GUTTER IN ACCORDANCE WITH CUR. STD. DWG. RPM-100.

APPROX. CONCRETE QUANTITIES

PIPE SIZE	MIN. HEIGHT	CU. YDS. CONC.
15"	3'-4"	0.90
18"	3'-8"	0.97

APPROXIMATE WEIGHTS
FRAME 365 LBS.
GRATE 185 LBS.

NO DEDUCTIONS HAVE BEEN MADE FOR PIPE.



SECTIONAL VIEW OF FRAME AND GRATE

USE WITH CUR. STD. DWG. RPM-100

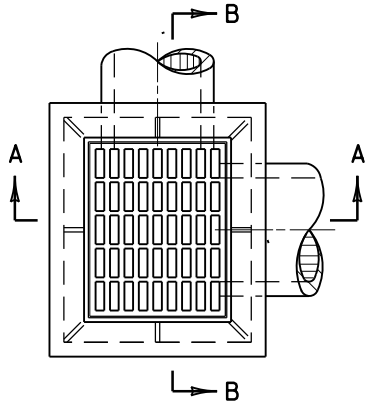
KENTUCKY DEPARTMENT OF HIGHWAYS

DROP BOX INLET TYPE 10

STANDARD DRAWING NO. RDB-010-07

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



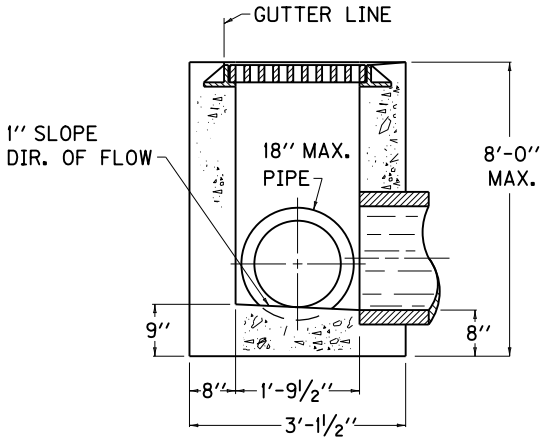
PLAN VIEW

APPROX. CONCRETE QUANTITIES

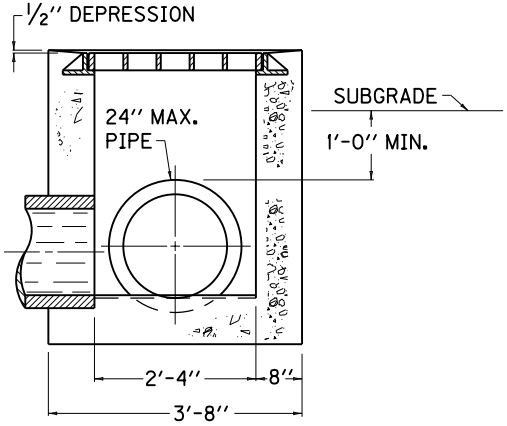
PIPE SIZE	MIN. HEIGHT	CU. YDS. CONC.
15''	2'-11''	0.89
18''	3'-3''	0.97
24''	4'-9''	1.38
APPROXIMATE WEIGHTS		
FRAME 195 LBS.		
GRATE 265 LBS.		

NO DEDUCTIONS HAVE BEEN MADE FOR PIPE.

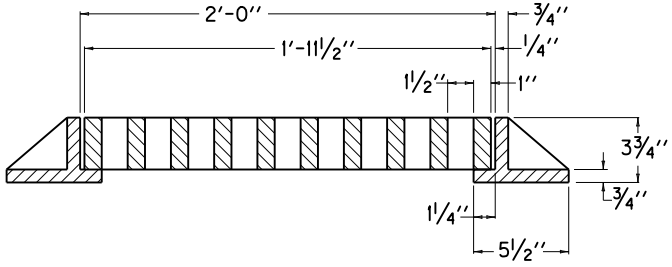
BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 11 EACH

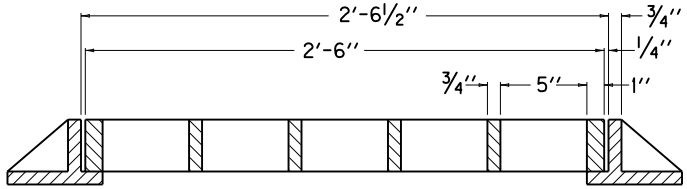


SECTION A-A



SECTION B-B





SECTIONAL VIEW OF FRAME AND GRATE

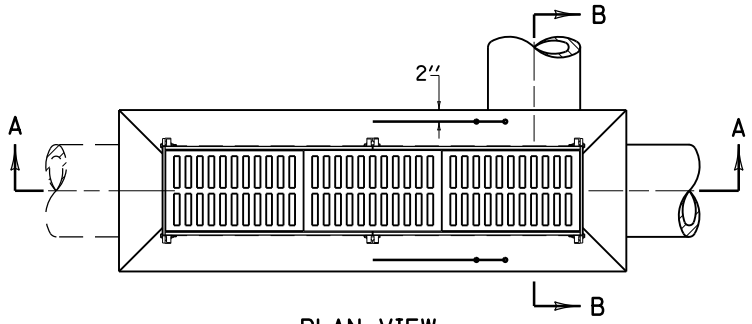
KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX
INLET TYPE 11

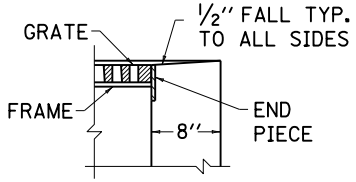
STANDARD DRAWING NO. RDB-011-08

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

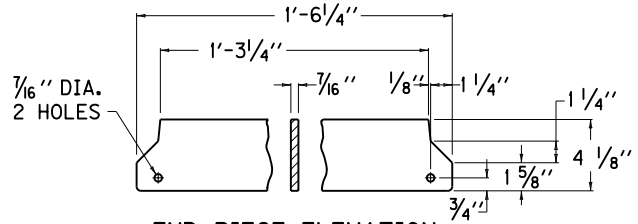
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



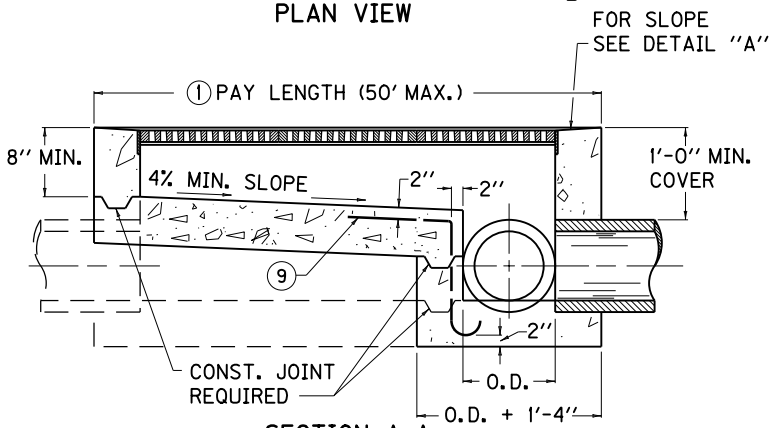
PLAN VIEW



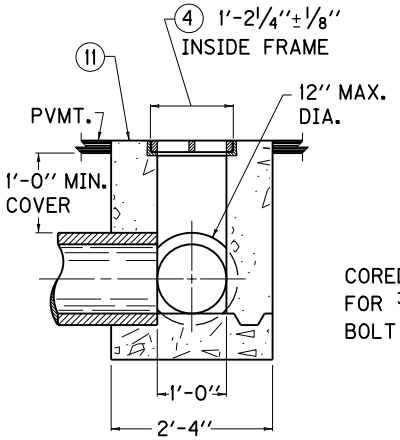
DETAIL "A"



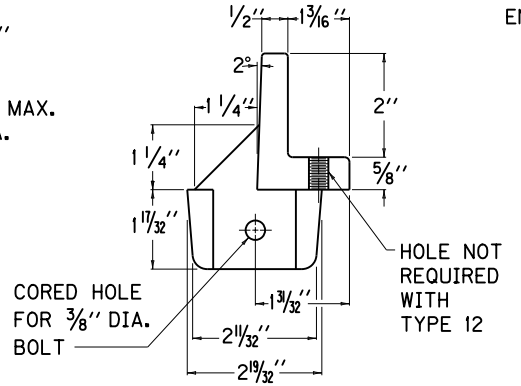
END PIECE ELEVATION



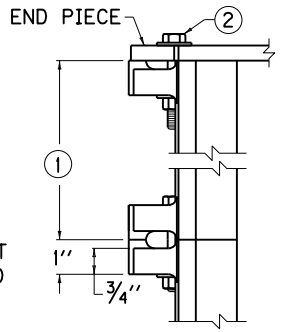
SECTION A-A



SECTION B-B



FRAME ELEVATION



FRAME & END PIECE
PLAN VIEW

~ NOTES ~

BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 12 LF
DROP BOX INLET TYPE 12A LF

12 WHEN THE GRATES ARE NOT TO BE BOLTED TO THE FRAME.
12A WHEN THE GRATES ARE TO BE BOLTED TO THE FRAME.

(1) THE UNIT LENGTHS ARE 3'-0" FOR THE FRAMES AND 1'-11 7/8" FOR THE GRATES AND ARE TO BE CONSTRUCTED IN MULTIPLE LENGTHS OF 6'-0" FOR TYPE 12 INLET.
THE UNIT LENGTHS ARE 2'-0" FOR THE FRAMES AND 1'-11 7/8" FOR THE GRATES AND ARE TO BE CONSTRUCTED IN MULTIPLE LENGTHS OF 2'-0" FOR TYPE 12A INLET.

(2) THE FRAME AND END PIECES SHALL BE ASSEMBLED WITH 3/8" X 2 1/2" HEX HEAD BOLTS, NUTS AND FLAT WASHERS (COMMERCIAL QUALITY).

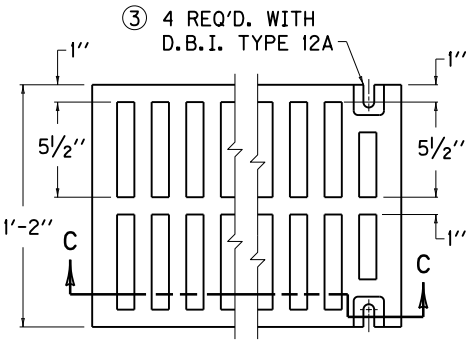
(3) WHEN DROP BOX INLET TYPE 12A IS A BID ITEM, THE GRATES SHALL BE BOLTED TO THE FRAME WITH FOUR 3/8"-16 X 2" STAINLESS STEEL HEX BOLTS AND FLAT WASHERS (COMMERCIAL QUALITY).

(4) THIS IS A CONTROL DIMENSION TO PREVENT FRAME FROM SPREADING.

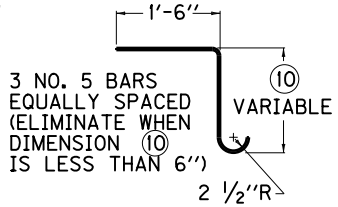
5. THE WALLS AND BASE OF THE STRUCTURE SHALL BE 8" THICK.
6. SEE PIPE SECTIONS IN THE PLANS FOR FLOW LINE ELEVATIONS, PIPE SIZES, AND OTHER PERTINENT DETAILS.
7. SECURITY DEVICES ARE REQUIRED FOR TYPE 12 ONLY.
8. APPROXIMATE WEIGHT OF CASTINGS:
FRAME 15 LBS. PER FT. (BOTH SIDES)
GRATE 50 LBS. PER FT.

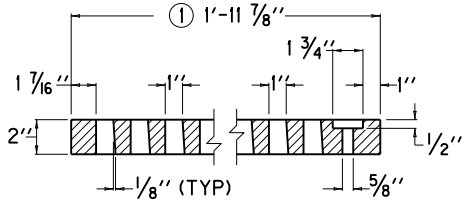
(11) TOP SLOPE OF INLET SHALL BE CONSTRUCTED TO MATCH SLOPE OF ADJACENT PAVEMENT.

12. THESE GRATES ARE BICYCLE FRIENDLY.



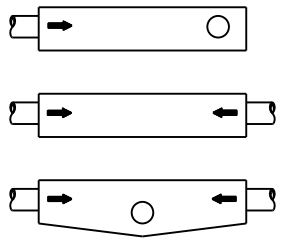
GRATE PLAN VIEW





SECTION C-C

VARIATIONS OF
DRAINAGE PATTERNS



COMBINATIONS OF THE
ABOVE MAY BE REQUIRED
(SEE PIPE SECTIONS FOR
APPROPRIATE DETAILS)

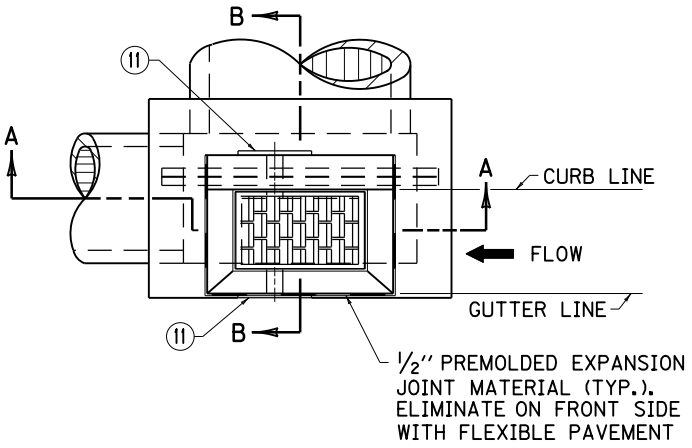
KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 12 OR 12A

STANDARD DRAWING NO. RDB-012-10

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW

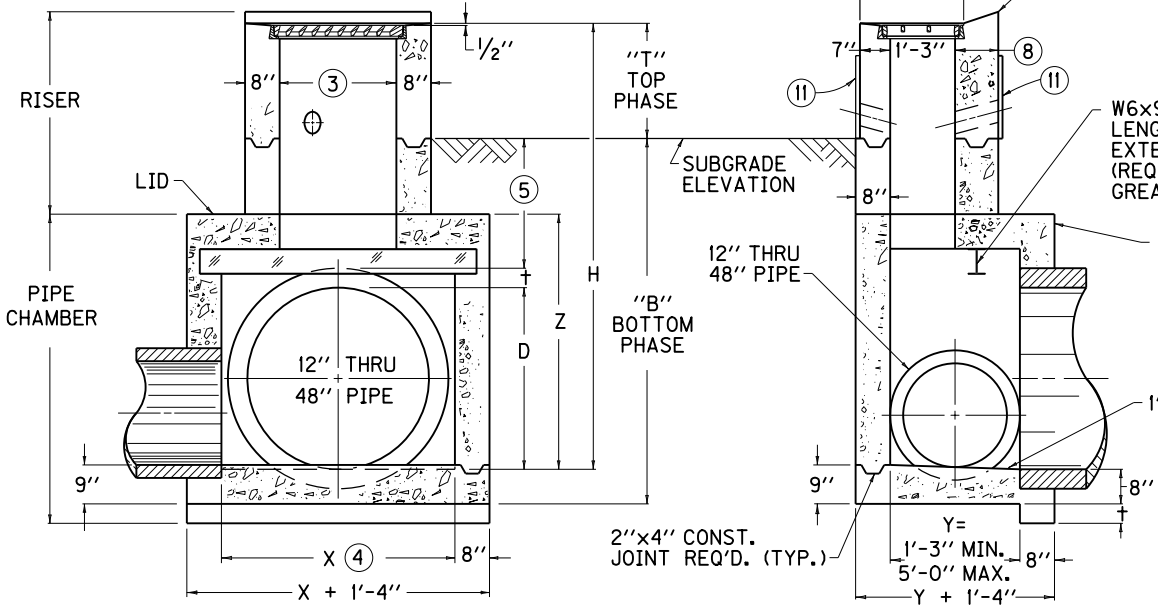
~ NOTES ~

BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 13 (△) (✳) — EACH

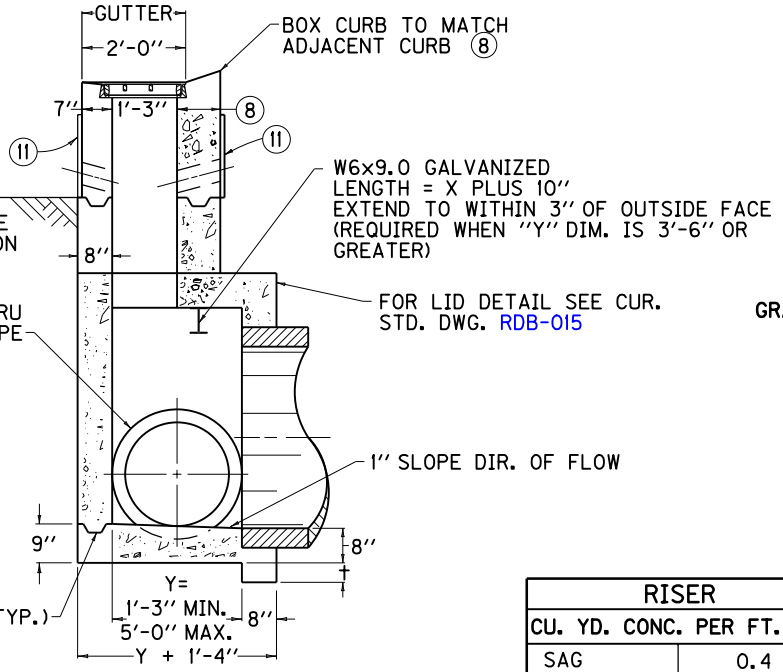
(△) = "S" (SAG CONDITION)
(△) = "G" (GRADE CONDITION)
(✳) = "T" (TOP PHASE)
(✳) = "B" (BOTTOM PHASE)

WITH NO "T" OR "B" SUFFIX A COMPLETE INLET IS REQUIRED.

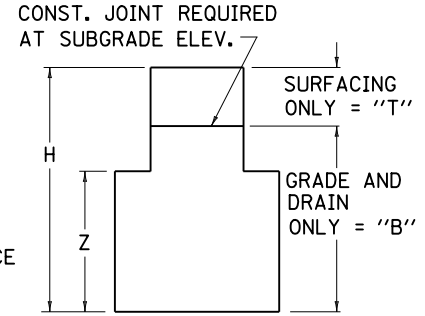
1. BOX INLET SHALL BE CONSTRUCTED IN TWO PHASES (BOTTOM AND TOP) AND MAY BE CONSTRUCTED IN A SAG VERTICAL CURVE OR ON GRADE.
2. FOR ILLUSTRATION PURPOSES THIS DRAWING DEPICTS A BOX LOCATED ON A GRADE CONDITION. SEE CUR. STD. DWG. RDB-014, FOR DETAILS OF SAG AND GRADE CONDITIONS.
3. DIMENSION VARIES DEPENDING UPON LOCATION OF BOX; GRADE CONDITION = 2'-3", SAG CONDITION = 4'-11".
4. GRADE CONDITION: "X" = 2'-3" MIN. TO 5'-0" MAX., SAG CONDITION: "X" = 4'-11".
5. 2'-0" DESIRED COVER, 1'-0" MINIMUM COVER OVER PIPE AND/OR LID.
6. "t" IS CONCRETE PIPE WALL THICKNESS OR METAL CORRUGATION DEPTH.
7. ALL WALLS AND SLABS ARE 8" THICK UNLESS OTHERWISE SHOWN.
8. THICKNESS = CURB WIDTH + 2" (MINIMUM WIDTH 8" WITHOUT CURB). INLET MAY BE CONSTRUCTED WITH OR WITHOUT A CURB. THE CURB ON THE BOX SHALL BE CONSTRUCTED TO MATCH THE ADJOINING CURB WITH THE SAME CONSTRUCTION AND MATERIAL DETAILS (SEE CUR. STD. DWG. RPM-100). THIS DRAWING DEPICTS A LIP CURB APPLICATION.
9. THE TOP PHASE SHALL BE CAST AFTER THE ADJOINING CURB AND GUTTER HAVE BEEN CAST.
10. SEE CUR. STD. DWG. RDB-014, RDB-015, RDB-016, RDB-018, AND RDB-019 FOR FRAME AND GRATE DETAIL, STEEL PATTERN, DIMENSIONS AND QUANTITIES.
11. FABRIC WRAPPED BACKFILL DRAIN, (ONE PER WEEP HOLE).
12. THIS GRATE IS BICYCLE FRIENDLY.



SECTION A-A



SECTION B-B



CONSTRUCTION SEQUENCE FOR GRADE & DRAIN AND/OR SURFACING

RISER	
CU. YD. CONC. PER FT. HT.	
SAG	0.4
GRADE	0.2

USE WITH CUR. STD. DWGS. RDB-014, RDB-015, RDB-016, RDB-017, RDB-018, RDB-019, RPM-100

KENTUCKY DEPARTMENT OF HIGHWAYS

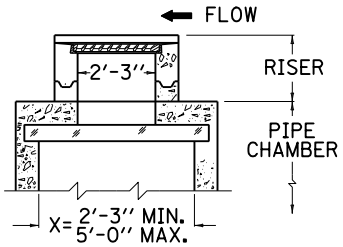
DROP BOX INLET TYPE 13

(DETAIL SHEET)

STANDARD DRAWING NO. RDB-013-07

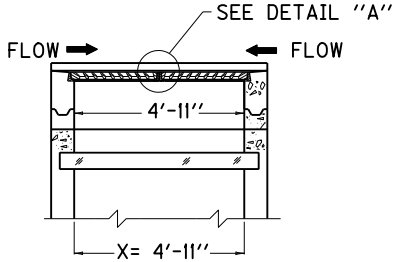
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN — DATE 12-01-15

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 12-01-15



GRADE CONDITION

(1 GRATE & 1 FRAME REQ'D.)



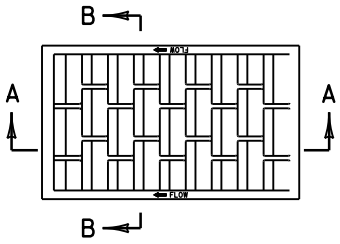
SAG CONDITION

(2 GRATES & 2 FRAMES REQ'D.)

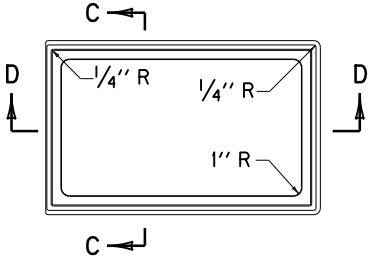
~ NOTES ~

1. ALL FILLETS AND ROUNDS SHALL BE 1/8" r.
2. THE FRAME AND GRATE SHALL BE MANUFACTURED OF CAST GRAY IRON CONFORMING TO ASTM A-48 CLASS 35B.

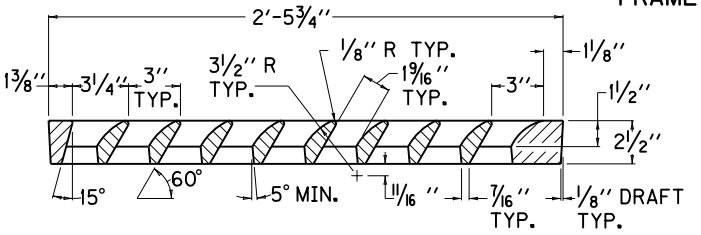
APPROX. WEIGHT	
1 GRATE	160 LBS.
1 FRAME	70 LBS.



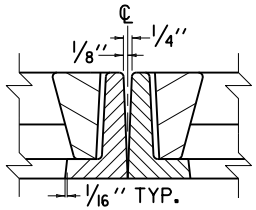
GRATE PLAN VIEW



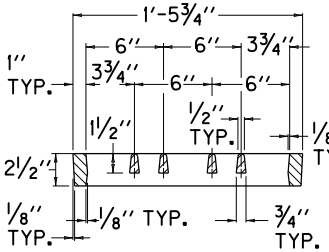
FRAME PLAN VIEW



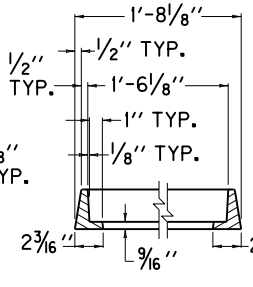
SECTION A-A



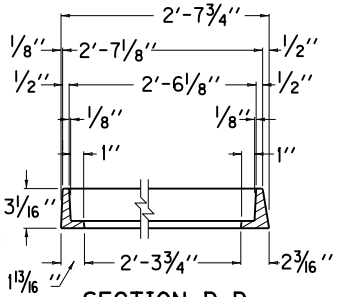
DETAIL "A"



SECTION B-B



SECTION C-C

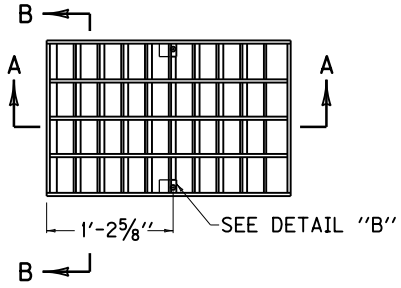


SECTION D-D

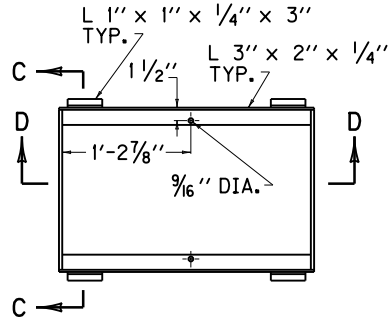
GRAY IRON CASTING

~ NOTES ~

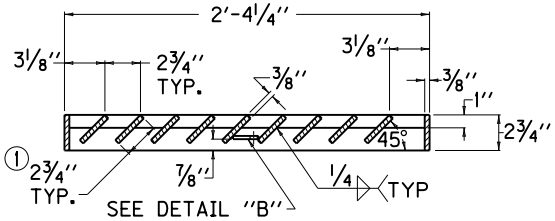
1. THE 2 3/4" BAR SHALL BE NOTCHED TO RECEIVE THE 1" BAR.
2. THE FRAME AND GRATE SHALL BE ASSEMBLED WITH 2 (TWO) 1/2" X 2 1/4" STAINLESS HEX HEAD BOLTS AND NUTS (COMMERICAL QUALITY).
3. ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A-36.



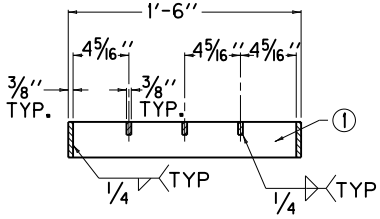
GRATE PLAN VIEW



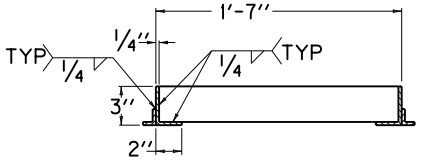
FRAME PLAN VIEW



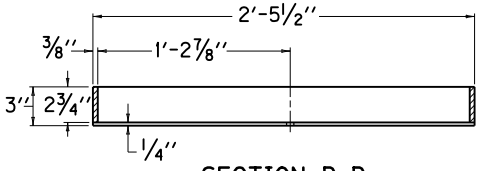
SECTION A-A



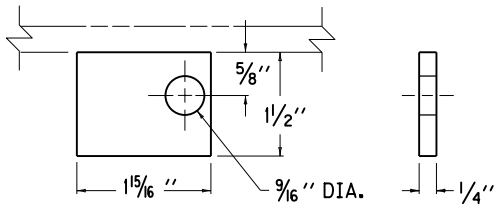
SECTION B-B



SECTION C-C



SECTION D-D



DETAIL "B"

3 STR. STEEL WTS.		
1 GRATE	TOTAL	1 FRAME
82 LBS.	126 LBS.	44 LBS.

STRUCTURAL STEEL

USE WITH CUR. STD. DWGS.
RDB-013, RDB-015, RDB-016, RDB-017, RDB-018, RDB-019, RDB-030, RDB-031, RDB-032, RDB-033, RDB-034, RDB-035,

KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET TYPE 13 AND TYPE 16 (FRAME AND GRATE DETAILS)

STANDARD DRAWING NO. RDB-014-06

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN — DATE 12-01-15

APPROVED _____ STATE HIGHWAY ENGINEER — DATE 12-01-15

REINFORCEMENT STEEL FOR 8" LID

(GRADE CONDITION)

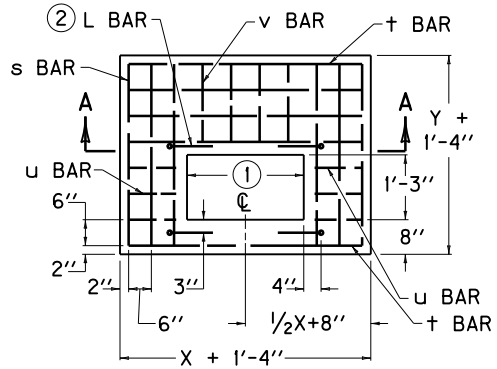
SIZE		NO. 5 STEEL BARS								
X	Y	BAR s		BAR t		BAR u		BAR v		LBS.
		QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	
2'-3"	1'-3"	--	--	--	--	--	--	--	--	7
	2'-0"	4	3'-0"	8	3'-3"	--	--	10	1'-0"	57
	2'-6"		3'-6"	10					1'-6"	71
	3'-0"		4'-0"	12					2'-0"	85
	3'-6"		4'-6"	14					2'-6"	99
	4'-0"		5'-0"	16					3'-0"	113
	4'-6"		5'-6"	18					3'-6"	127
	5'-0"		6'-0"	20					4'-0"	142
2'-6"	1'-3"	8	2'-3"	4	3'-6"	--	--	--	--	40
	2'-0"		3'-0"	8				8	1'-0"	70
	2'-6"		3'-6"	10					1'-6"	85
	3'-0"		4'-0"	12					2'-0"	101
	3'-6"		4'-6"	14					2'-6"	116
	4'-0"		5'-0"	16					3'-0"	132
	4'-6"		5'-6"	18					3'-6"	148
	5'-0"		6'-0"	20					4'-0"	163
3'-0"	1'-3"	8	2'-3"	4	4'-0"	--	--	--	--	42
	2'-0"		3'-0"	8				10	1'-0"	76
	2'-6"		3'-6"	10					1'-6"	94
	3'-0"		4'-0"	12					2'-0"	111
	3'-6"		4'-6"	14					2'-6"	129
	4'-0"		5'-0"	16					3'-0"	147
	4'-6"		5'-6"	18					3'-6"	164
	5'-0"		6'-0"	20					4'-0"	182
3'-6"	1'-3"	12	2'-3"	4	4'-6"	12	0'-11"	--	--	65
	2'-0"		3'-0"	8				8	1'-0"	102
	2'-6"		3'-6"	10					1'-6"	122
	3'-0"		4'-0"	12					2'-0"	142
	3'-6"		4'-6"	14					2'-6"	161
	4'-0"		5'-0"	16					3'-0"	181
	4'-6"		5'-6"	18					3'-6"	201
	5'-0"		6'-0"	20					4'-0"	221
4'-0"	1'-3"	12	2'-3"	4	5'-0"	12	1'-2"	--	--	71
	2'-0"		3'-0"	8				10	1'-0"	111
	2'-6"		3'-6"	10					1'-6"	133
	3'-0"		4'-0"	12					2'-0"	155
	3'-6"		4'-6"	14					2'-6"	177
	4'-0"		5'-0"	16					3'-0"	199
	4'-6"		5'-6"	18					3'-6"	221
	5'-0"		6'-0"	20					4'-0"	243
4'-6"	1'-3"	16	2'-3"	4	5'-6"	12	1'-5"	--	--	85
	2'-0"		3'-0"	8				8	1'-0"	129
	2'-6"		3'-6"	10					1'-6"	153
	3'-0"		4'-0"	12					2'-0"	177
	3'-6"		4'-6"	14					2'-6"	201
	4'-0"		5'-0"	16					3'-0"	225
	4'-6"		5'-6"	18					3'-6"	249
	5'-0"		6'-0"	20					4'-0"	273

(GRADE CONDITION)

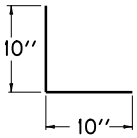
SIZE		NO. 5 STEEL BARS								
X	Y	BAR s		BAR t		BAR u		BAR v		LBS.
		QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	
5'-0"	1'-3"	16	2'-3"	4	6'-0"	12	1'-8"	--	--	90
	2'-0"		3'-0"	8				10	1'-0"	138
	2'-6"		3'-6"	10					1'-6"	164
	3'-0"		4'-0"	12					2'-0"	191
	3'-6"		4'-6"	14					2'-6"	217
	4'-0"		5'-0"	16					3'-0"	243
	4'-6"		5'-6"	18					3'-6"	269
	5'-0"		6'-0"	20					4'-0"	295

REINFORCEMENT STEEL FOR 8" LID
(SAG CONDITION)

SIZE		NO. 5 STEEL BARS								
X	Y	BAR s		BAR t		BAR u		BAR v		LBS.
		QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	
4'-11"	1'-3"	--	--	--	--	--	--	--	--	7
	2'-0"	4	3'-0"	8	5'-11"	--	--	22	1'-0"	92
	2'-6"		3'-6"	10					1'-6"	118
	3'-0"		4'-0"	12					2'-0"	144
	3'-6"		4'-6"	14					2'-6"	169
	4'-0"		5'-0"	16					3'-0"	195
	4'-6"		5'-6"	18					3'-6"	221
	5'-0"		6'-0"	20					4'-0"	247



PLAN VIEW OF 8" LID



L BAR DETAIL

SECTION A-A

~ NOTES ~

1. DIMENSION VARIES DEPENDING UPON LOCATION OF BOX: GRADE CONDITION= 2'-3" SAG CONDITION= 4'-11"
2. IN ADDITION TO THE CHARTED STEEL, FOUR L BARS ARE REQUIRED IN THE LID AND ARE INCLUDED IN THE TOTALS.
3. CONCRETE QUANTITIES FOR LID ARE INCLUDED ON " DIMENSIONS AND ESTIMATE OF QUANTITIES FOR D.B.I. TYPE 13". SEE CUR. STD. DWGS. RDB-016 AND RDB-017.
4. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2" FROM THE OUTSIDE FACE UNLESS OTHERWISE SHOWN.

USE WITH CUR. STD. DWGS.
RDB-013, RDB-014, RDB-016,
RDB-017, RDB-018, RDB-019,

KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 13
(DETAIL & BAR CHART FOR LID)

STANDARD DRAWING NO. RDB-015-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

DIMENSIONS AND ESTIMATE OF QUANTITIES

(PIPE CHAMBER-GRADE CONDITION)

INLET SIZE ④			MAX. PIPE DIA.	PIPE LOCATION	Z ①	CONCRETE	
NO. ⑥	X	Y				CU. YD. ①②	Q ③
1	2′-3″	1′-3″	12″	X OR Y	2′-2″	0.8	0.2
2			15″	X	2′-5″		
3		2′-0″		X OR Y		1.0	0.3
4		1′-3″	18″	X	2′-9″	0.9	0.2
5		2′-0″		X OR Y		1.1	0.3
6		1′-3″	21″	X	3′-0″	1.0	0.2
7		2′-0″				1.2	0.3
8		2′-6″		X OR Y		1.3	
9			24″	Y	3′-3″	1.4	
10	2′-6″	1′-3″		X		1.1	
11		2′-0″				1.3	
12		2′-6″		X OR Y		1.5	
13	2′-3″	3′-0″	27″	Y	3′-6″	1.6	
14	2′-6″					1.7	
15	3′-0″	1′-3″		X		1.3	
16		2′-0″				1.6	
17		2′-6″				1.7	
18		3′-0″		X OR Y		1.9	0.4
19	2′-3″	3′-6″	30″	Y	4′-1″	2.0	0.3
20	2′-6″					2.1	0.4
21	3′-0″					2.3	
22	3′-6″	1′-3″		X	3′-10″	1.5	0.3
23		2′-0″				1.8	
24		2′-6″				2.0	0.4
25		3′-0″				2.2	
26		3′-6″		X OR Y	4′-1″	2.5	
27	2′-3″		33″	Y	4′-4″	2.1	0.3
28	2′-6″					2.2	0.4
29	3′-0″					2.4	
30	3′-6″	1′-3″		X	4′-1″	1.6	0.3
31		2′-0″				1.9	
32		2′-6″				2.1	0.4
33		3′-0″				2.3	
34		3′-6″		X OR Y	4′-4″	2.6	
35	2′-3″	4′-0″	36″	Y	4′-7″	2.4	
36	2′-6″					2.5	
37	3′-0″					2.7	
38	3′-6″					3.0	
39	4′-0″	1′-3″		X	4′-4″	1.8	0.3
40		2′-0″				2.2	0.4
41		2′-6″				2.4	
42		3′-0″				2.6	
43		3′-6″			4′-7″	3.0	
44		4′-0″		X OR Y		3.2	0.5
45	2′-3″	4′-6″	42″	Y	5′-2″	2.8	0.4
46	2′-6″					2.9	
47	3′-0″	4′-6″		Y		3.2	0.4
48	3′-6″					3.4	0.5
49	4′-0″					3.7	
50	4′-6″	1′-3″		X	4′-11″	2.2	0.3
51		2′-0″				2.6	0.4
52		2′-6″				2.8	
53		3′-0″				3.1	
54		3′-6″			5′-2″	3.4	0.5
55		4′-0″				3.7	
56		4′-6″		X OR Y		4.0	
57	2′-3″	5′-0″	48″	Y	5′-8″	3.2	0.4
58	2′-6″					3.3	
59	3′-0″					3.6	0.5
60	3′-6″					3.9	
61	4′-0″					4.2	
62	4′-6″					4.5	
63	5′-0″	1′-3″		X	5′-5″	2.5	0.4
64		2′-0″				3.0	
65		2′-6″				3.2	
66		3′-0″			5′-8″	3.5	0.5
67		3′-6″				3.9	
68		4′-0″				4.2	
69		4′-6″				4.5	
70		5′-0″		X OR Y		4.8	0.6

REFERENCE CHART

DIA. OF PIPE	D.B.I. TYPE 13		CONCRETE TO DEDUCT FOR EACH PIPE
	PIPE ON "X" SIDE OF INLET	PIPE ON "Y" SIDE OF INLET	CUBIC YARDS
0	2′-3″	1′-3″	----
12″			0.1
15″-18″		2′-0″	
21″		2′-6″	
24″	2′-6″		
27″	3′-0″	3′-0″	0.2
30″-33″	3′-6″	3′-6″	
36″	4′-0″	4′-0″	0.3
42″	4′-6″	4′-6″	0.4
48″	5′-0″	5′-0″	0.5

~ NOTES ~

① BASED ON "Z" AS EQUAL TO D+++1′-0″ WHEN "Y" DIMENSION IS LESS THAN 3′-6″.
BASED ON "Z" AS EQUAL TO D+++1′-3″ WHEN "Y" DIMENSION IS 3′-6″ OR GREATER.

② SEE REFERENCE CHART FOR QUANTITIES TO DEDUCT FOR PIPE.

③ Q = CU. YD. PER FT. INCREASE OR DECREASE WHEN Z VARIES.

④ SEE CUR. STD. DWGS. RDB-013 AND RDB-014 FOR DIMENSIONS.

5. SEE CUR. STD. DWGS. RDB-018 AND RDB-019 FOR STEEL REINFORCEMENT IN PIPE CHAMBER AND RISER WHEN H = 8′-0″ OR GREATER.

⑥ INLET IS SHOWN ON PLANS AS "DROP BOX INLET TYPE 13". FOLLOWING THIS IS A NUMBER AND A BOX HEIGHT. USE THIS NUMBER WITH THIS CHART.

7. SEE CUR. STD. DWG. RDB-017 FOR DIMENSIONS AND ESTIMATE OF QUANTITIES WHEN BOXES ARE LOCATED IN A SAG CONDITION.

USE WITH CUR. STD. DWGS.
RDB-013, RDB-014, RDB-015,
RDB-017, RDB-018, RDB-019,

KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 13
(PIPE CHAMBER-GRADE CONDTN.)

STANDARD DRAWING NO. RDB-016-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

DIMENSIONS AND ESTIMATE OF QUANTITIES
(PIPE CHAMBER-SAG CONDITION)

INLET SIZE ④			MAX. PIPE DIA.	PIPE LOCATION	Z ①	CONCRETE	
NO. ⑥	X	Y				CU. YD. ①②	Q ③
71	4'-11"	1'-3"	12"	X OR Y	2'-2"	1.2	0.4
72			15"	X	2'-5"	1.3	
73		2'-0"		X OR Y		1.6	
74		1'-3"	18"	X	2'-9"	1.4	
75		2'-0"		X OR Y		1.8	
76		1'-3"	21"	X	3'-0"	1.5	
77		2'-0"				1.9	
78		2'-6"		X OR Y		2.1	
79		1'-3"	24"	X	3'-3"	1.6	
80		2'-0"				2.0	
81		2'-6"		X OR Y		2.2	
82		1'-3"	27"	X	3'-6"	1.7	
83		2'-0"				2.1	
84		2'-6"				2.3	
85		3'-0"		X OR Y		2.5	0.5
86		1'-3"	30"	X	3'-10"	1.8	0.4
87		2'-0"				2.2	
88		2'-6"				2.4	
89		3'-0"				2.7	0.5
90		3'-6"		X OR Y	4'-1"	3.0	
91		1'-3"	33"	X		1.9	0.4
92		2'-0"				2.3	
93		2'-6"				2.5	
94		3'-0"				2.8	0.5
95		3'-6"		X OR Y	4'-4"	3.2	
96		1'-3"	36"	X		2.0	0.4
97		2'-0"				2.4	
98		2'-6"				2.7	
99		3'-0"				2.9	0.5
100		3'-6"			4'-7"	3.3	
101		4'-0"		X OR Y		3.5	
102		1'-3"	42"	X	4'-11"	2.2	0.4
103		2'-0"				2.6	
104		2'-6"				2.9	
105		3'-0"				3.2	0.5
106		3'-6"			5'-2"	3.6	
107		4'-0"				3.8	
108		4'-6"		X OR Y		4.1	
109		1'-3"	48"	X	5'-5"	2.4	0.4
110		2'-0"				2.8	
111		2'-6"				3.1	
112		3'-0"				3.4	0.5
113		3'-6"			5'-8"	3.8	
114		4'-0"				4.1	
115		4'-6"				4.4	
116		5'-0"		X OR Y		4.6	0.6

REFERENCE CHART

DIA. OF PIPE	D.B.I. TYPE 13		CONCRETE TO DEDUCT FOR EACH PIPE
	PIPE ON "X" SIDE OF INLET	PIPE ON "Y" SIDE OF INLET	CUBIC YARDS
0	4'-11"	1'-3"	----
12"			0.1
15"-18"		2'-0"	
21"		2'-6"	
24"			
27"		3'-0"	0.2
30"-33"		3'-6"	
36"		4'-0"	0.3
42"		4'-6"	0.4
48"		5'-0"	0.5

~ NOTES ~

① BASED ON "Z" AS EQUAL TO D+t+1'-0" WHEN "Y" DIMENSION IS LESS THAN 3'-6". BASED ON "Z" AS EQUAL TO D+t+1'-3" WHEN "Y" DIMENSION IS 3'-6" OR GREATER.

② SEE REFERENCE CHART FOR QUANTITIES TO DEDUCT FOR PIPE .

③ Q = CU. YD. PER FT. INCREASE OR DECREASE WHEN Z VARIES .

④ SEE CUR. STD. DWGS. RDB-013 AND RDB-014 FOR DIMENSIONS.

5. SEE CUR. STD. DWGS. RDB-018 AND RDB-019 FOR STEEL REINFORCEMENT IN PIPE CHAMBER AND RISER WHEN H = 8'-0" OR GREATER .

⑥ INLET IS SHOWN ON PLANS AS "DROP BOX INLET TYPE 13". FOLLOWING THIS IS A NUMBER AND A BOX HEIGHT. USE THIS NUMBER WITH THIS CHART .

7. SEE CUR. STD. DWG. RDB-016 FOR DIMENSIONS AND ESTIMATE OF QUANTITIES WHEN BOXES ARE LOCATED IN A GRADE CONDITION.

USE WITH CUR. STD. DWGS.
RDB-013, RDB-014, RDB-015,
RDB-016, RDB-018, RDB-019,

KENTUCKY
DEPARTMENT OF HIGHWAYS

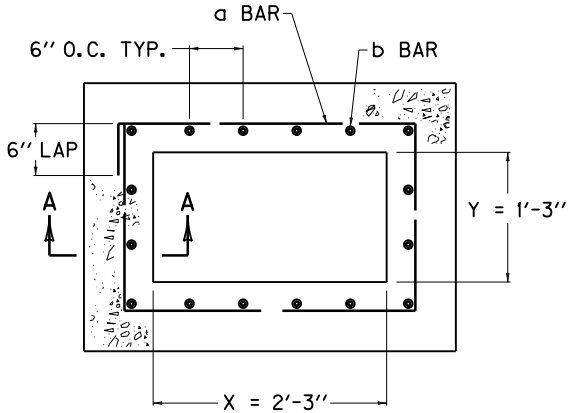
DROP BOX INLET
TYPE 13
(PIPE CHAMBER-SAG CONDITION)

STANDARD DRAWING NO. RDB-017-03

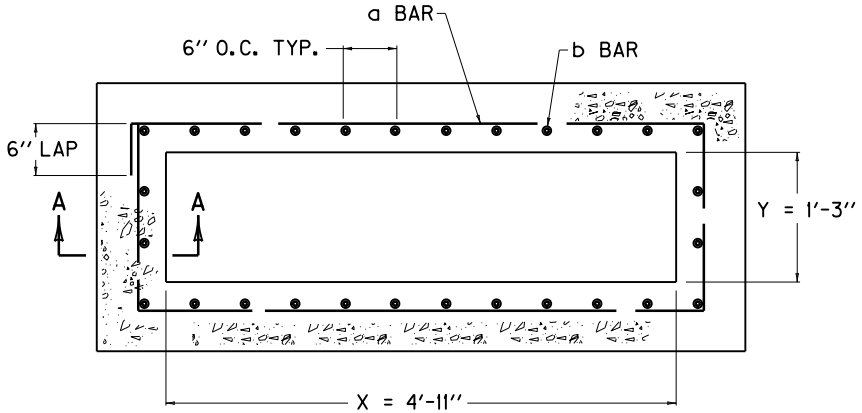
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

ADDITIONAL STEEL REINFORCEMENT REQUIREMENTS
(RISER, H = 8'-0" TO 15'-0", GRADE AND SAG CONDITION)



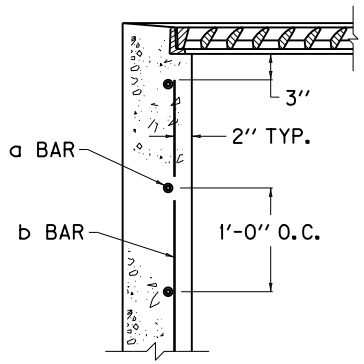
GRADE CONDITION



SAG CONDITION

~ NOTES ~

1. STEEL REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2" FROM THE FACE UNLESS OTHERWISE SHOWN.
2. ALL STEEL REINFORCEMENT SHALL BE NO. 5 BARS.



SECTION A-A

APPROXIMATE RISER QUANTITIES PER ONE FOOT IN HEIGHT							
CONDITION	SIZE		BAR a		BAR b		LBS STEEL
	X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	
GRADE	2'-3"	1'-3"	3	9'-3"	16	1'-0"	26
SAG	4'-11"		3	14'-7"	28		44

USE WITH CUR. STD. DWGS.
RDB-013, RDB-014, RDB-015,
RDB-016, RDB-017, RDB-019,

KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 13
(ADDITIONAL STEEL - RISER)

STANDARD DRAWING NO. RDB-018-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

① ADDITIONAL STEEL REINFORCEMENT REQUIRMENTS
(PIPE CHAMBER, H = 8′ TO 15′, GRADE CONDITION)

SIZE ②		NO. 5 STEEL BARS									
		③ BAR n		④ BAR p		BAR q		BAR r		LBS.	⑤
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	TOTAL	⑥
2′-3″	1′-3″	16	6′-0″	6	9′-3″	4	1′-9″	3	2′-9″	174	26
	2′-0″	20			10′-9″		2′-6″	4		214	32
	2′-6″	22			11′-9″		3′-0″	5		238	35
	3′-0″	24			12′-9″		3′-6″	6		262	38
	3′-6″	26			13′-9″		4′-0″	7		286	41
	4′-0″	28			14′-9″		4′-6″	8		309	45
	4′-6″	30			15′-9″		5′-0″	9		333	48
	5′-0″	32			16′-9″		5′-6″	10		357	51
2′-6″	1′-3″	20	6′-0″	6	9′-9″	5	1′-9″	3	3′-0″	205	31
	2′-0″	22			11′-3″		2′-6″	4		234	35
	2′-6″	24			12′-3″		3′-0″	5		258	38
	3′-0″	26			13′-3″		3′-6″	6		283	41
	3′-6″	28			14′-3″		4′-0″	7		307	44
	4′-0″	30			15′-3″		4′-6″	8		332	47
	4′-6″	32			16′-3″		5′-0″	9		356	50
	5′-0″	34			17′-3″		5′-6″	10		381	53
3′-0″	1′-3″	22	6′-0″	6	10′-9″	6	1′-9″	3	3′-6″	227	34
	2′-0″	24			12′-3″		2′-6″	4		257	38
	2′-6″	26			13′-3″		3′-0″	5		283	41
	3′-0″	28			14′-3″		3′-6″	6		308	44
	3′-6″	30			15′-3″		4′-0″	7		334	47
	4′-0″	32			16′-3″		4′-6″	8		359	50
	4′-6″	34			17′-3″		5′-0″	9		385	53
	5′-0″	36			18′-3″		5′-6″	10		410	57
3′-6″	1′-3″	24	6′-0″	6	11′-9″	7	1′-9″	3	4′-0″	249	37
	2′-0″	26			13′-3″		2′-6″	4		281	41
	2′-6″	28			14′-3″		3′-0″	5		307	44
	3′-0″	30			15′-3″		3′-6″	6		334	47
	3′-6″	32			16′-3″		4′-0″	7		360	50
	4′-0″	34			17′-3″		4′-6″	8		387	53
	4′-6″	36			18′-3″		5′-0″	9		414	57
	5′-0″	38			19′-3″		5′-6″	10		440	60
4′-0″	1′-3″	26	6′-0″	6	12′-9″	8	1′-9″	3	4′-6″	271	40
	2′-0″	28			14′-3″		2′-6″	4		304	44
	2′-6″	30			15′-3″		3′-0″	5		332	47
	3′-0″	32			16′-3″		3′-6″	6		359	50
	3′-6″	34			17′-3″		4′-0″	7		387	53
	4′-0″	36			18′-3″		4′-6″	8		415	57
	4′-6″	38			19′-3″		5′-0″	9		442	60
	5′-0″	40			20′-3″		5′-6″	10		470	63
4′-6″	1′-3″	28	6′-0″	6	13′-9″	9	1′-9″	3	5′-0″	293	44
	2′-0″	30			15′-3″		2′-6″	4		328	47
	2′-6″	32			16′-3″		3′-0″	5		356	50
	3′-0″	34			17′-3″		3′-6″	6		385	53
	3′-6″	36			18′-3″		4′-0″	7		414	57
	4′-0″	38			19′-3″		4′-6″	8		442	60
	4′-6″	40			20′-3″		5′-0″	9		471	63
	5′-0″	42			21′-3″		5′-6″	10		500	66

① ADDITIONAL STEEL REINFORCEMENT REQUIRMENTS
(PIPE CHAMBER, H = 8′ TO 15′, GRADE CONDITION)

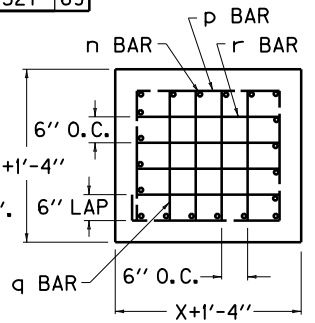
SIZE ②		NO. 5 STEEL BARS									
		③ BAR n		④ BAR p		BAR q		BAR r		LBS.	⑤
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	TOTAL	⑥
5′-0″	1′-3″	30	6′-0″	6	14′-9″	10	1′-9″	3	5′-6″	316	47
	2′-0″	32			16′-3″		2′-6″	4		351	50
	2′-6″	34			17′-3″		3′-0″	5		381	53
	3′-0″	36			18′-3″		3′-6″	6		410	57
	3′-6″	38			19′-3″		4′-0″	7		440	60
	4′-0″	40			20′-3″		4′-6″	8		470	63
	4′-6″	42			21′-3″		5′-0″	9		500	66
	5′-0″	44			22′-3″		5′-6″	10		529	69

① ADDITIONAL STEEL REINFORCEMENT REQUIRMENTS
(PIPE CHAMBER, H = 8′ TO 15′, SAG CONDITION)

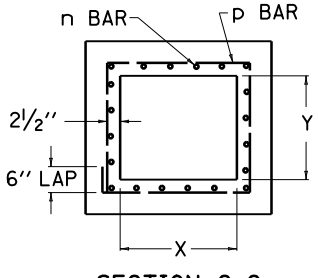
SIZE ②		NO. 5 STEEL BARS									
		③ BAR n		④ BAR p		BAR q		BAR r		LBS.	⑤
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	TOTAL	⑥
4′-11″	1′-3″	28	6′-0″	6	14′-7″	10	1′-9″	3	5′-5″	302	44
	2′-0″	32			16′-1″		2′-6″	4		350	50
	2′-6″	34			17′-1″		3′-0″	5		379	53
	3′-0″	36			18′-1″		3′-6″	6		409	56
	3′-6″	38			19′-1″		4′-0″	7		438	60
	4′-0″	40			20′-1″		4′-6″	8		468	63
	4′-6″	42			21′-1″		5′-0″	9		498	66
	5′-0″	44			22′-1″		5′-6″	10		527	69

~ NOTES ~

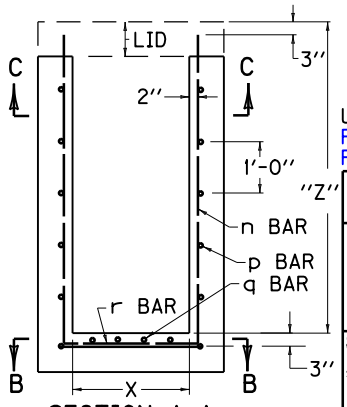
① BASED ON ″Z″ AS EQUAL TO 6′-0″.
② SEE CUR. STD. DWGS. RDB-013 AND RDB-014 FOR LOCATION AND DIMENSIONS.
③ LENGTH OF ″n″ BAR IS ALWAYS SAME AS ″Z″ DIMENSION.
④ ADD OR SUBTRACT ONE ″p″ BAR PER EVEN FT. VARIANCE FROM 6′-0″ ″Z″.
⑤ NO DEDUCTIONS HAVE BEEN MADE FOR PIPE.
⑥ ADD OR SUBTRACT LBS. STEEL PER FT. VARIANCE FROM 6′-0″ ″Z″.
7. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2″ FROM THE FACE UNLESS OTHERWISE SHOWN.



SECTION B-B



SECTION C-C



SECTION A-A

USE WITH CUR. STD. DWGS.
RDB-013, RDB-014, RDB-015,
RDB-016, RDB-017, RDB-018,

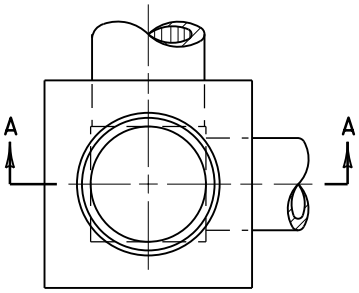
KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 13
(ADDITIONAL STEEL - CHAMBER)

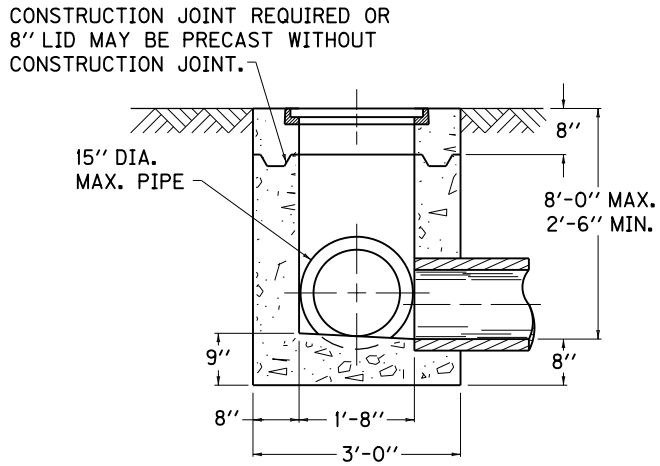
STANDARD DRAWING NO. RDB-019-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW



SECTION A-A

~ NOTES ~

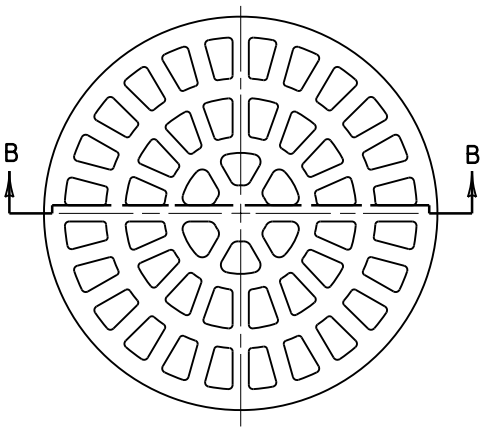
1. TYPE 14 RADIAL GRATE HAS APPROXIMATELY 140 SQ. IN. OF TOTAL OPENING AREA.
2. APPROX. WEIGHT OF TYPE 14 ---- 95 LBS.
   APPROX. WEIGHT OF TYPE 15 ---- 120 LBS.
   APPROX. WEIGHT OF FRAME ------ 95 LBS.

BID ITEM AND UNIT TO BID

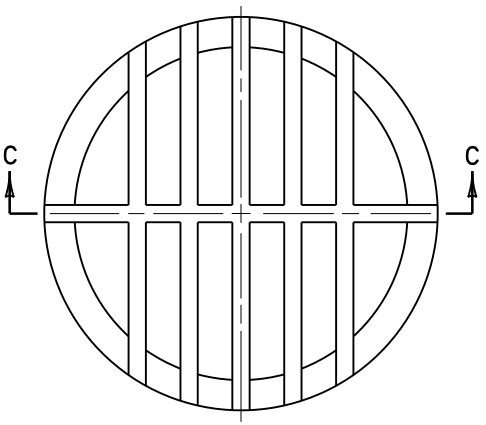
DROP BOX INLET TYPE 14	EACH
OR	
DROP BOX INLET TYPE 15	EACH

LIMITATIONS:
TYPE 14 - FLUSH GRATE AND IS TRAVERSABLE.
TYPE 15 - NON-TRAVERSABLE WITH MAXIMUM RESISTANCE TO CLOGGING.

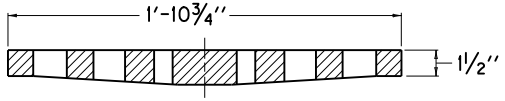
PRIMARY USE:
YARD SUMP



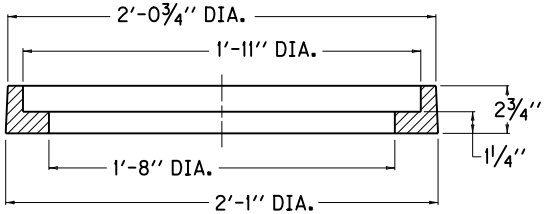
PLAN VIEW



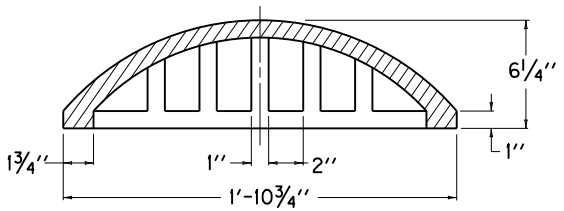
PLAN VIEW



SECTION B-B TYPE 14
(RADIAL)



SECTIONAL DETAIL OF FRAME



SECTION C-C TYPE 15
(BEEHIVE)

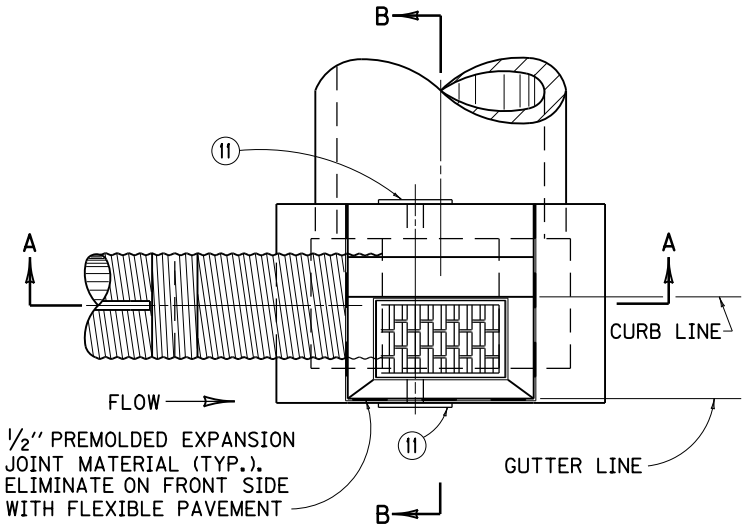
KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET TYPE 14 AND 15

STANDARD DRAWING NO. RDB-020-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW

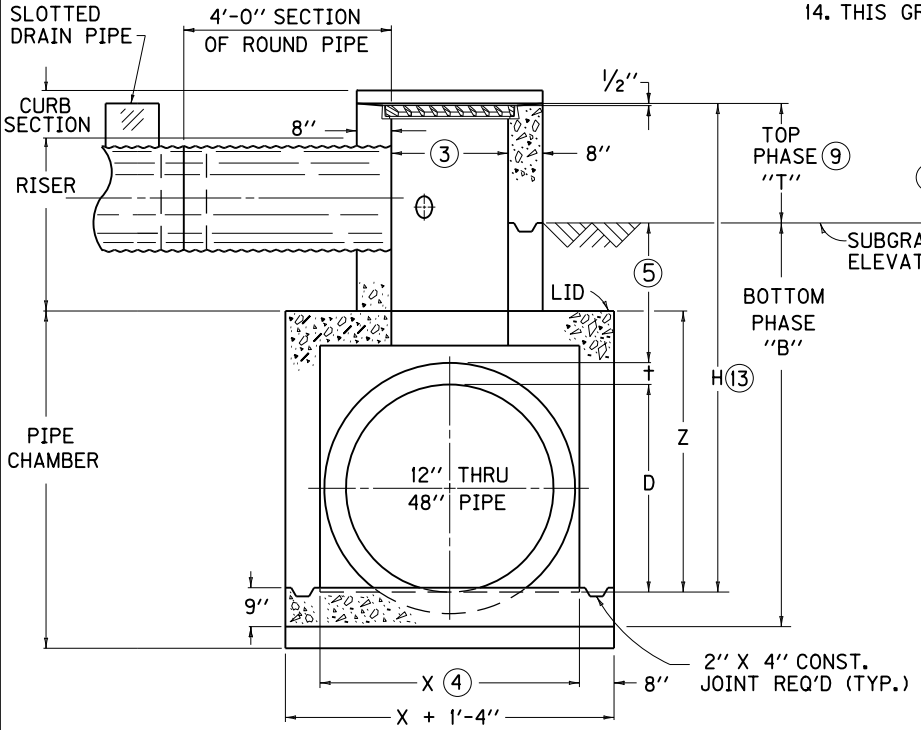
~ NOTES ~

BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 16 (△) (✳) — EACH

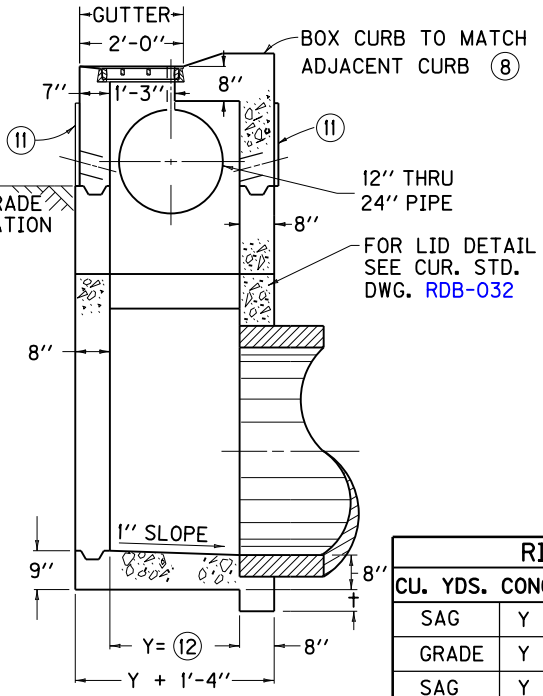
(△) = "S" (SAG CONDITION)
(△) = "G" (GRADE CONDITION)
(✳) = "T" (TOP PHASE)
(✳) = "B" (BOTTOM PHASE)

WITH NO "T" OR "B" SUFFIX A COMPLETE INLET IS REQUIRED.

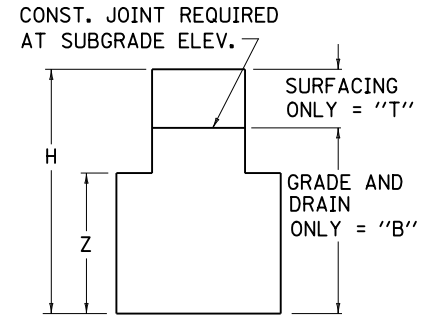
1. BOX INLET MAY BE CONSTRUCTED IN TWO PHASES (BOTTOM AND TOP) AND MAY BE CONSTRUCTED IN A SAG VERTICAL CURVE OR ON GRADE.
2. FOR ILLUSTRATION PURPOSES THIS DRAWING DEPICTS A BOX LOCATED ON A GRADE CONDITION. SEE CUR. STD. DWG. RDB-014 , FOR DETAILS OF SAG AND GRADE CONDITIONS.
3. DIMENSION VARIES DEPENDING UPON LOCATION OF BOX: GRADE CONDITION = 2'-3", SAG CONDITION = 4'-11".
4. GRADE CONDITION: X = 2'-3" MIN. TO 5'-0" MAX. , SAG CONDITION: X=4'-11".
5. 2'-0" DESIRED COVER, 1'-0" MIN. COVER OVER PIPE AND/OR LID.
6. "t" IS CONCRETE PIPE WALL THICKNESS OR METAL CORRUGATION DEPTH.
7. ALL WALLS AND SLABS ARE 8" THICK UNLESS OTHERWISE SHOWN.
8. THE CURB ON THE BOX SHALL BE CONSTRUCTED TO MATCH THE ADJOINING CURB WITH THE SAME CONSTRUCTION AND MATERIAL DETAILS (SEE CUR. STD. DWG. RPM-100). THIS DRAWING DEPICTS A LIP CURB APPLICATION.
9. THE TOP PHASE SHALL BE CAST AFTER THE ADJOINING CURB AND GUTTER HAVE BEEN CAST.
10. SEE CUR.T STD. DWG. RDB-014 FOR FRAME AND GRATE DETAIL. SEE CUR. STD. DWG. RDB-031 FOR STEEL PATTERN. SEE CUR. STD. DWG. RDB-033 FOR DIMENSIONS AND QUANTITIES.
11. FABRIC WRAPPED BACKFILL DRAIN, (ONE PER WEEP HOLE).
12. 2'-0" FOR 12", 15", AND 18" OR 2'-6" FOR 24" SLOTTED DRAIN PIPE.
13. MINIMUM HEIGHT FOR LONGITUDINAL PIPE SHALL BE H = 11" + INSIDE DIAMETER OF PIPE.
14. THIS GRATE IS BICYCLE FRIENDLY.



SECTION A-A



SECTION B-B



CONSTRUCTION SEQUENCE FOR GRADE & DRAIN AND/OR SURFACING

USE WITH CUR. STD. DWGS.
RDB-014, RDB-031, RDB-032, RDB-033 , RDB-034, RDB-035, RDI-200

RISER		
CU. YDS. CONC. PER FT. HT.		
SAG	Y = 2'-0"	0.4
GRADE	Y = 2'-0"	0.3
SAG	Y = 2'-6"	0.4
GRADE	Y = 2'-6"	0.3

KENTUCKY DEPARTMENT OF HIGHWAYS

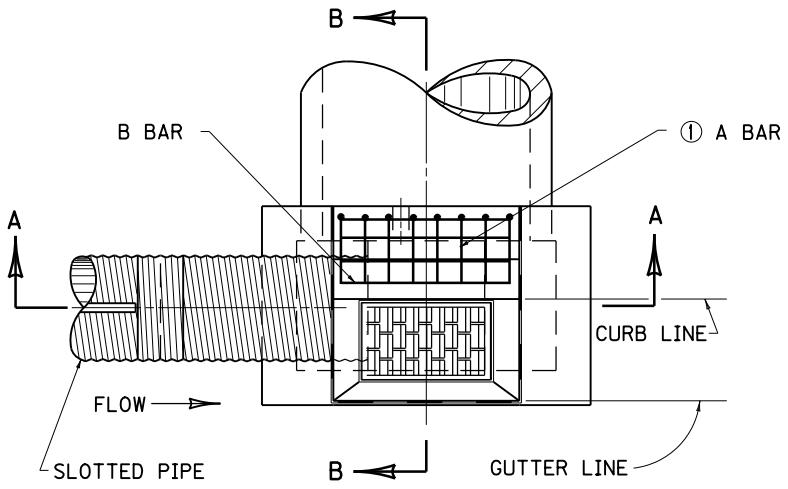
DROP BOX INLET TYPE 16

(DETAIL SHEET)

STANDARD DRAWING NO. RDB-030-04

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



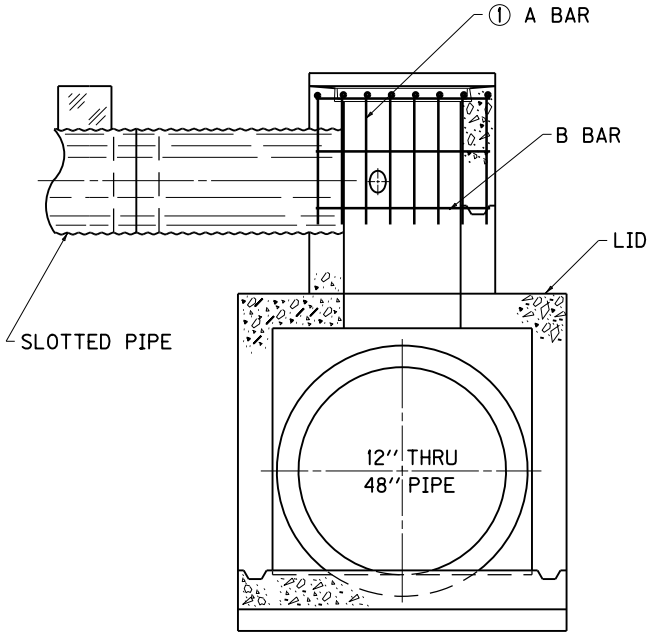
PLAN VIEW

~ NOTES ~

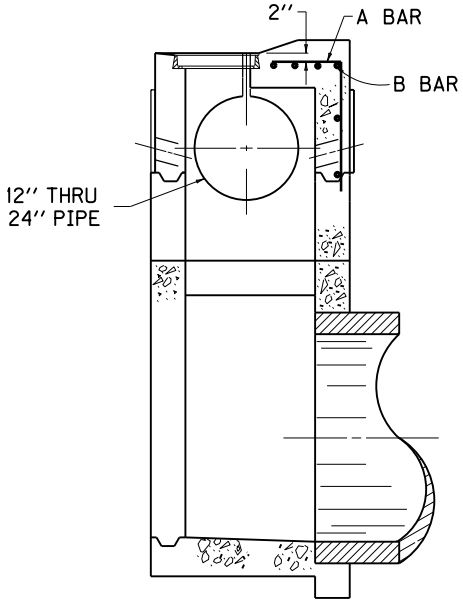
① SLOTTED PIPE SIZE DENOTES WHICH "A" BAR TO USE, SEE STEEL CHART ON THIS DRAWING.
2. SEE CUR. STD. DWG. RDB-032 FOR LID REINFORCEMENT.
3. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2" FROM THE OUTSIDE FACE UNLESS OTHERWISE SHOWN.
4. SPACE "A" BARS APPROXIMATELY 6" CENTER TO CENTER.
5. SPACE "B" BARS AS SHOWN.

STEEL REINFORCEMENT CHART

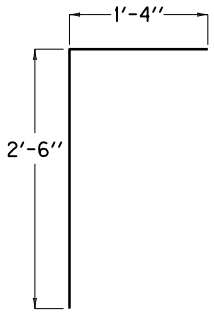
NO. 5 BAR	SLOTTED PIPE SIZE	CONDITION	QTY.	LGTH.	TOTAL LBS
A BAR	12" THRU 18"	GRADE	8	2'-7"	22
B BAR			6	3'-3"	20
A BAR		SAGE	13	2'-7"	35
B BAR			6	5'-11"	37
A BAR	24"	GRADE	8	3'-10"	32
B BAR			6	3'-3"	20
A BAR		SAGE	13	3'-10"	52
B BAR			6	5'-11"	37



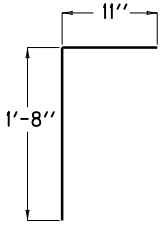
SECTION A-A



SECTION B-B



A BAR DETAIL
24" PIPE



A BAR DETAIL
12" - 18" PIPE

USE WITH CUR. STD. DWGS.
RDI-200, RDB-014, RDB-030, RDB-032, RDB-033, RDB-034, RDB-035

KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 16
(STEEL SHEET)

STANDARD DRAWING NO. RDB-031-04

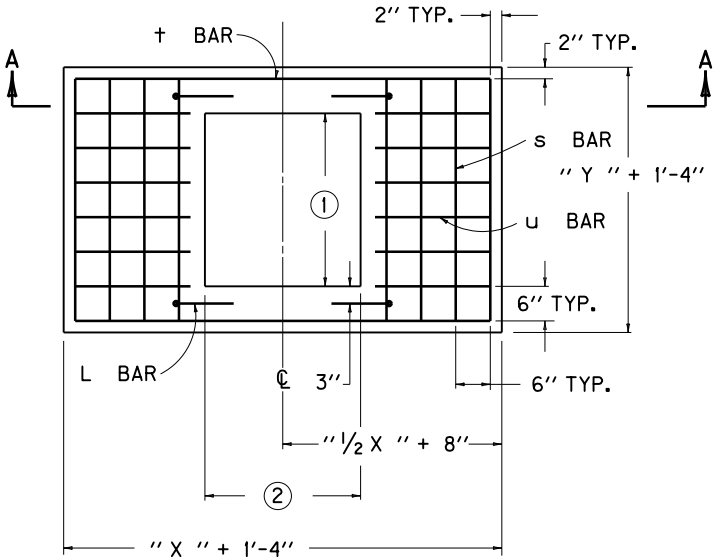
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

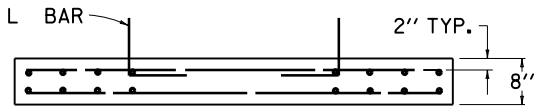
REINFORCEMENT STEEL FOR 8'' LID

(GRADE CONDITION)

SIZE		NO. 5 STEEL BARS						
X	Y	BAR s		BAR †		BAR u		LBS.
		QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	
2'-3''	2'-0''	4	3'-0''	4	3'-3''	--	--	33
	2'-6''		3'-6''			--	--	35
2'-6''	2'-0''	8	3'-0''		3'-6''	--	--	47
	2'-6''		3'-6''			--	--	51
3'-0''	2'-0''		3'-0''		4'-0''	--	--	49
	2'-6''		3'-6''			--	--	53
3'-6''	2'-0''	12	3'-0''		4'-6''	20	0'-11''	82
	2'-6''		3'-6''			24		89
4'-0''	2'-0''		3'-0''		5'-0''	20	1'-2''	86
	2'-6''		3'-6''			24		101
4'-6''	2'-0''	16	3'-0''		5'-6''	20	1'-5''	110
	2'-6''		3'-6''			24		124
5'-0''	2'-0''		3'-0''		6'-0''	20	1'-8''	117
	2'-6''		3'-6''			24		132



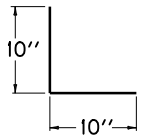
DETAIL OF 8'' LID
PLAN VIEW



SECTION A-A

~ NOTES ~

1. 2'-0'' FOR 12'', 15'', AND 18'' OR 2'-6'' FOR 24'' SLOTTED DRAIN PIPE.
2. DIMENSION VARIES DEPENDING UPON LOCATION OF BOX:
   GRADE CONDITION = 2'-3''
   SAG CONDITION = 4'-11''
3. IN ADDITION TO THE CHARTED STEEL, FOUR ''L'' BARS ARE REQUIRED IN THE LID AND ARE INCLUDED IN THE TOTALS.
4. CONCRETE QUANTITIES FOR LID ARE INCLUDED ON '' DIMENSIONS AND ESTIMATE OF QUANTITIES FOR D.B.I. TYPE 16''. SEE CUR. STD. DWG. RDB-033
5. LID REINFORCING STEEL NOT REQUIRED IN SAG LOCATION.
6. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2'' FROM THE OUTSIDE FACE UNLESS OTHERWISE SHOWN.



L BAR DETAIL

USE WITH CUR. STD. DWGS.
RDI-200, RDB-014, RDB-030, RDB-031, RDB-033, RDB-034, RDB-035

KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 16

(DETAIL & BAR CHART FOR LID)

STANDARD DRAWING NO. RDB-032-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

DIMENSIONS AND ESTIMATE OF QUANTITIES
(GRADE CONDITION)

INLET SIZE ④			MAX. PIPE DIA.	LOCATION	Z ①	CONCRETE	
NO. ⑥	X	Y				CU. YD. ①②	Q ③
1	2′-3″	2′-0″	12″	X OR Y	2′-2″	0.9	0.3
2			15″		2′-5″	1.0	
3			18″		2′-9″	1.1	
4			21″	X	3′-0″		
5		2′-6″		X OR Y		1.3	
6			24″	Y	3′-3″		
7	2′-6″	2′-0″		X			
8		2′-6″		X OR Y		1.4	
9	3′-0″	2′-0″	27″	X	3′-6″	1.5	
10		2′-6″				1.7	
11	3′-6″	2′-0″	30″		3′-10″	1.8	
12		2′-6″				2.0	0.4
13		2′-0″	33″		4′-1″	1.9	0.3
14		2′-6″				2.0	0.4
15	4′-0″	2′-0″	36″		4′-4″	2.1	
16		2′-6″				2.3	
17	4′-6″	2′-0″	42″		4′-11″	2.5	
18		2′-6″				2.7	
19	5′-0″	2′-0″	48″		5′-5″	2.9	
20		2′-6″				3.2	

DIMENSIONS AND ESTIMATE OF QUANTITIES
(SAG CONDITION)

INLET SIZE ④			MAX. PIPE DIA.	LOCATION	Z ①	CONCRETE	
NO. ⑥	X	Y				CU. YD. ①②	Q ③
21	4′-11″	2′-0″	12″	X OR Y	2′-2″	1.4	0.4
22			15″		2′-5″	1.5	
23			18″		2′-9″	1.7	
24			21″	X	3′-0″	1.8	
25		2′-6″		X OR Y		1.9	
26		2′-0″	24″	X	3′-3″		
27		2′-6″		X OR Y		2.0	
28		2′-0″	27″	X	3′-6″		
29		2′-6″				2.1	
30		2′-0″	30″		3′-10″		
31		2′-6″				2.3	
32		2′-0″	33″		4′-1″	2.2	
33		2′-6″				2.4	
34		2′-0″	36″		4′-4″	2.3	
35		2′-6″				2.5	
36		2′-0″	42″		4′-11″		
37		2′-6″				2.8	
38		2′-0″	48″		5′-5″		
39		2′-6″				3.0	

~ NOTES ~

① BASED ON ″Z″ AS EQUAL TO D++12″.
② SEE REFERENCE CHART FOR QUANTITIES TO DEDUCT FOR PIPE.
③ Q = CU. YDS. PER FT. INCREASE OR DECREASE WHEN ″Z″ VARIES.
④ SEE CUR. STD. DWG. RDB-030 FOR DIMENSIONS.
5. SEE CUR. STD. DWGS. RDB-034 AND RDB-035 FOR STEEL REINFORCEMENT IN PIPE CHAMBER AND RISER WHEN H = 8′-0″ OR GREATER.
⑥ INLET IS SHOWN ON PLANS AS ″DROP BOX INLET TYPE 16″. FOLLOWING THIS IS A NUMBER AND A BOX HEIGHT. USE THIS NUMBER WITH THIS CHART.

REFERENCE CHART
(GRADE CONDITION)

DIA. OF PIPE	D.B.I. TYPE 16		CONCRETE TO DEDUCT FOR EACH PIPE
	PIPE ON ″X″ SIDE OF INLET	PIPE ON ″Y″ SIDE OF INLET	CU. YDS.
0	2′-3″	2′-0″	----
12″			0.1
15″-18″			
21″		2′-6″	
24″	2′-6″		
27″	3′-0″	----	0.2
30″-33″	3′-6″		
36″	4′-0″		0.3
42″	4′-6″		0.4
48″	5′-0″		0.5

REFERENCE CHART
(SAG CONDITION)

DIA. OF PIPE	D.B.I. TYPE 16		CONCRETE TO DEDUCT FOR EACH PIPE
	PIPE ON ″X″ SIDE OF INLET	PIPE ON ″Y″ SIDE OF INLET	CU. YDS.
0	4′-11″	2′-0″	----
12″			0.1
15″-18″			
21″		2′-6″	
24″			
27″		----	0.2
30″-33″			
36″			0.3
42″			0.4
48″			0.5

USE WITH CUR. STD. DWGS. RDI-200, RDB-014, RDB-030, RDB-031, RDB-032, RDB-034, RDB-035

KENTUCKY DEPARTMENT OF HIGHWAYS

DROP BOX INLET TYPE 16

(DIMENSIONS & ESTIMATE OF QUANTITIES)

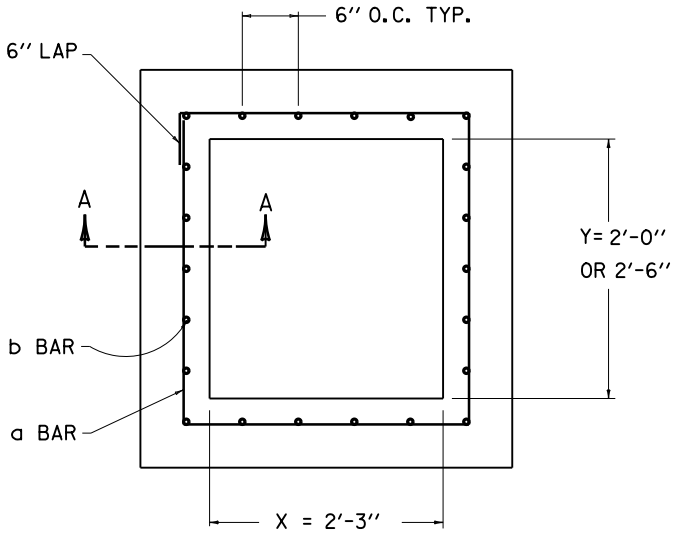
STANDARD DRAWING NO. RDB-033-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

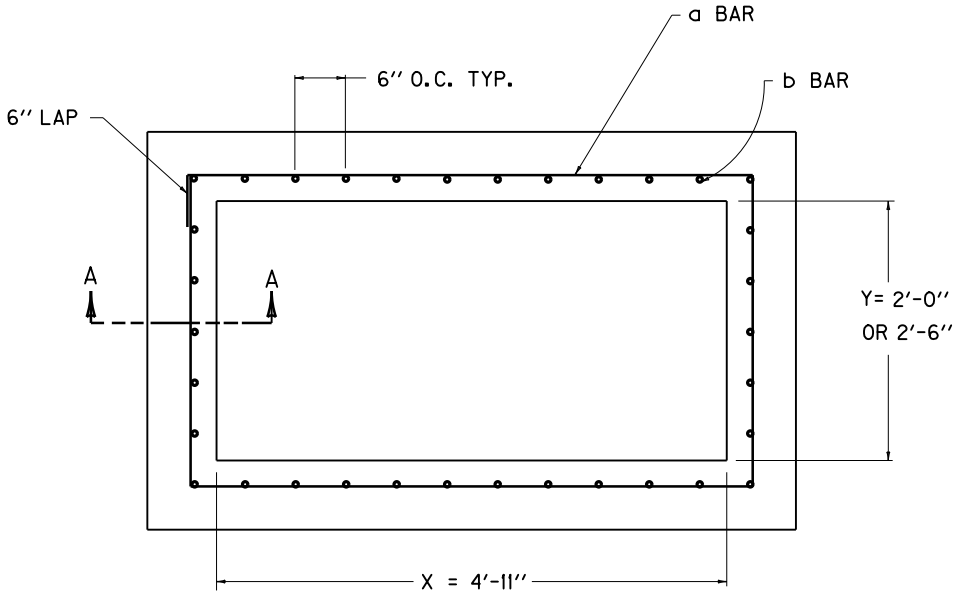
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

ADDITIONAL STEEL REINFORCEMENT REQUIREMENTS

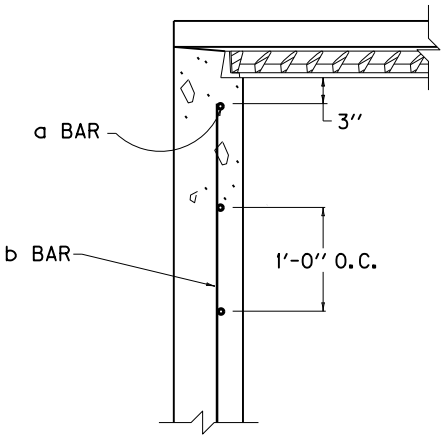
(RISER, H = 8'-0'' TO 15'-0'', GRADE AND SAG CONDITION)



GRADE CONDITION



SAG CONDITION



SECTION A-A

APPROXIMATE RISER QUANTITIES
PER FT. IN HEIGHT-NO. 5 BARS

COND-ITION	SIZE		BAR a		BAR b		LBS STEEL
	X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	
GRADE	2'-3''	2'-0''	1	10'-9''	20	1'-0''	32
		2'-6''	1	11'-6''	22		35
SAG	4'-11''	2'-0''	1	16'-1''	32		50
		2'-6''	1	17'-1''	34		53

USE WITH CUR. STD. DWGS.
RDI-200, RDB-014, RDB-030,
RDB-031, RDB-032, RDB-033,
RDB-035

KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 16
(ADDITIONAL STEEL- RISER)

STANDARD DRAWING NO. RDB-034-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

① ADDITIONAL STEEL REINFORCEMENT FOR PIPE CHAMBER
(H = 8′ TO 15′, GRADE CONDITION)

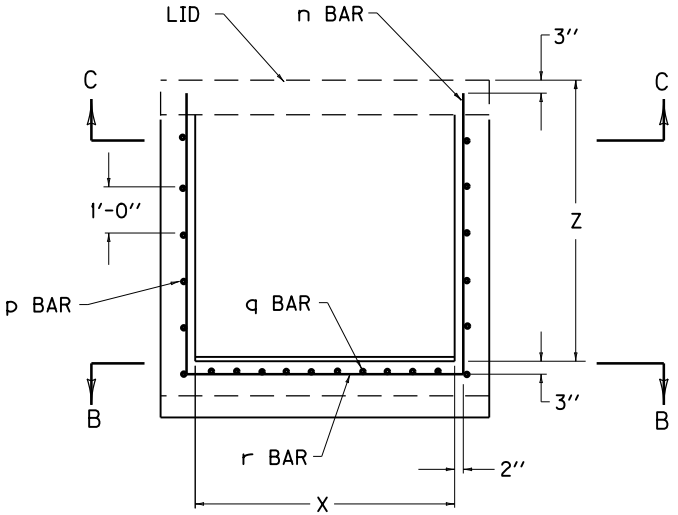
SIZE ②		NO. 5 STEEL BARS									
X	Y	BAR n ③		BAR p ④		BAR q		BAR r		LBS. ⑤	
		QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	TOTAL	⑥
2′-3″	2′-0″	20	6′-0″	6	10′-9″	4	2′-6″	4	2′-9″	214	32
	2′-6″	22			11′-9″		3′-0″	5		238	35
2′-6″	2′-0″				11′-3″	5	2′-6″	4	3′-0″	234	
	2′-6″	24			12′-3″		3′-0″	5		258	38
3′-0″	2′-0″					6	2′-6″	4	3′-6″	257	
	2′-6″	26			13′-3″		3′-0″	5		283	41
3′-6″	2′-0″					7	2′-6″	4	4′-0″	281	
	2′-6″	28			14′-3″		3′-0″	5		307	44
4′-0″	2′-0″					8	2′-6″	4	4′-6″	304	
	2′-6″	30			15′-3″		3′-0″	5		332	47
4′-6″	2′-0″					9	2′-6″	4	5′-0″	328	
	2′-6″	32			16′-3″		3′-0″	5		356	50
5′-0″	2′-0″					10	2′-6″	4	5′-6″	351	
	2′-6″	34			17′-3″		3′-0″	5		381	53

① ADDITIONAL STEEL REINFORCEMENT FOR PIPE CHAMBER
(H = 8′ TO 15′, SAG CONDITION)

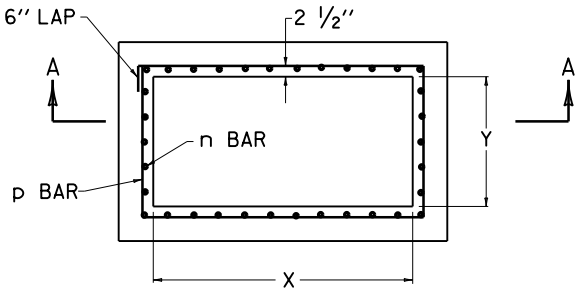
SIZE ②		NO. 5 STEEL BARS									
X	Y	BAR n ③		BAR p ④		BAR q		BAR r		LBS. ⑤	
		QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	TOTAL	⑥
4′-11″	2′-0″	32	6′-0″	6	16′-1″	10	2′-6″	4	5′-5″	350	50
	2′-6″	34			17′-1″		3′-0″	5		379	53

~ NOTES ~

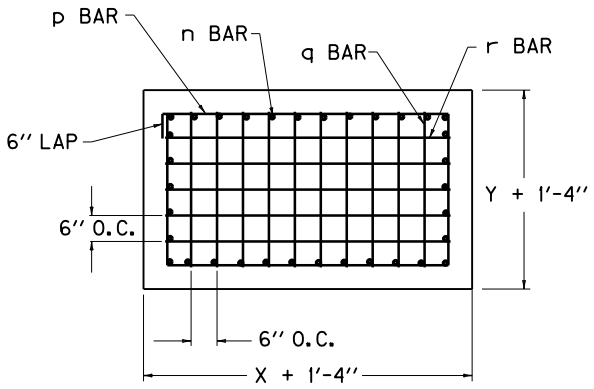
① BASED ON ″Z″ AS EQUAL TO 6′-0″.
② SEE CUR. STD. DWG. RDB-030 FOR LOCATION AND DIMENSIONS.
③ LENGTH OF ″n″ BAR IS ALWAYS SAME AS ″Z″ DIMENSION.
④ ADD OR SUBTRACT ONE ″p″ BAR PER EVEN FT. VARIANCE FROM 6′-0″ ″Z″.
⑤ NO DEDUCTIONS HAVE BEEN MADE FOR PIPE.
⑥ ADD OR SUBTRACT LBS. STEEL PER FT. VARIANCE FROM 6′-0″ ″Z″.
7. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2″ FROM THE FACE UNLESS OTHERWISE SHOWN.



SECTION A-A



SECTION C-C



SECTION B-B

USE WITH CUR. STD. DWGS.
RDI-200, RDB-014, RDB-030, RDB-031, RDB-032, RDB-033, RDB-034

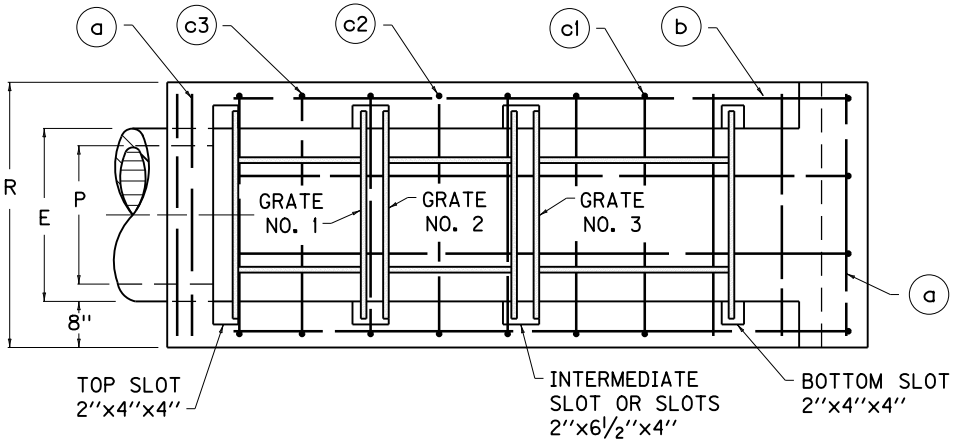
KENTUCKY
DEPARTMENT OF HIGHWAYS

DROP BOX INLET
TYPE 16
(ADDITIONAL STEEL- CHAMBER)

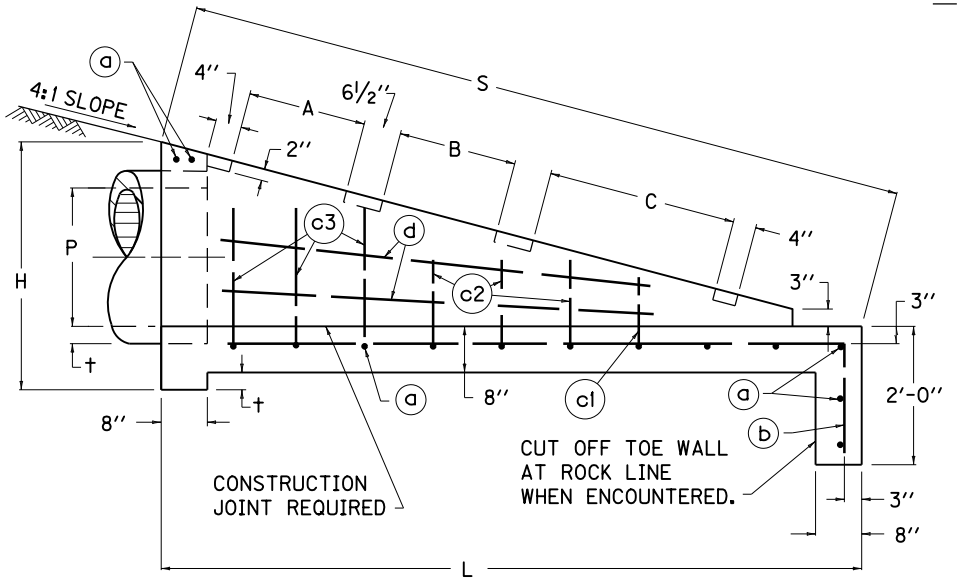
STANDARD DRAWING NO. RDB-035-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW



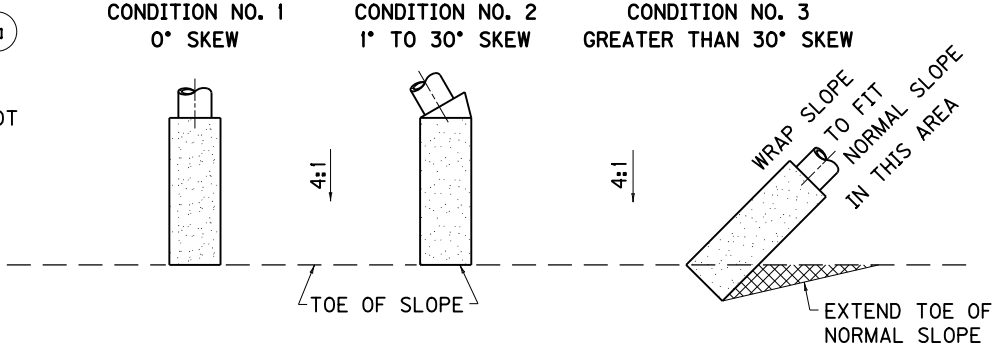
ELEVATION VIEW

DIMENSIONS									NO. OF GRATES REQ'D.	
P	H	L	S	R	E	A	B	C	2'	3'
15" 18"	3'-0"	8'-2"	8'-5½"	3'-3"	1'-11"	1'-8½"	2'-8¾"	-----	1	1
24"	3'-7"	10'-1½"	10'-5⅝"	3'-10"	2'-6"		1'-8½"	2'-8¾"	2	1

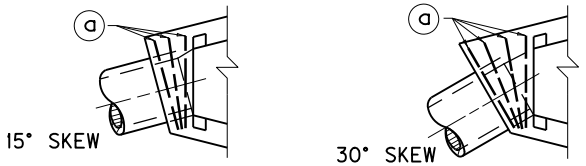
~ NOTES ~

BID ITEM AND UNIT TO BID
SLOPED BOX OUTLET TYPE 1 - ☆ IN (SIZE OF PIPE) EACH

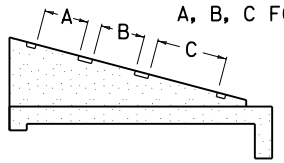
1. THE MINIMUM REQUIREMENT FOR REINFORCING STEEL SHALL BE GRADE 40. FIELD BENDING WILL BE PERMITTED.
2. ONE ADDITIONAL ⓐ BAR WILL BE REQUIRED FOR EACH 15° SKEW.
3. "t" IS THE CONCRETE PIPE WALL THICKNESS OR METAL PIPE CORRUGATION DEPTH.
4. SEE CUR. STD. DWG. RDB-101 FOR REINFORCING STEEL AND GRATE DETAILS.



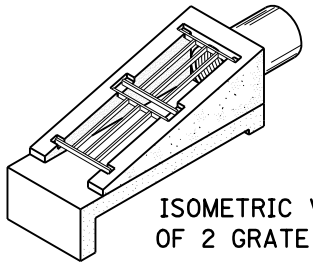
PLAN VIEW OF STRUCTURE LOCATIONS



2 ⓐ BAR DETAIL FOR 15° AND 30° SKEW



DETAIL SHOWING LOCATION OF SLOTS FOR GRATES



ISOMETRIC VIEW OF 2 GRATE BOX

USE WITH CUR. STD. DWG. RDB-101

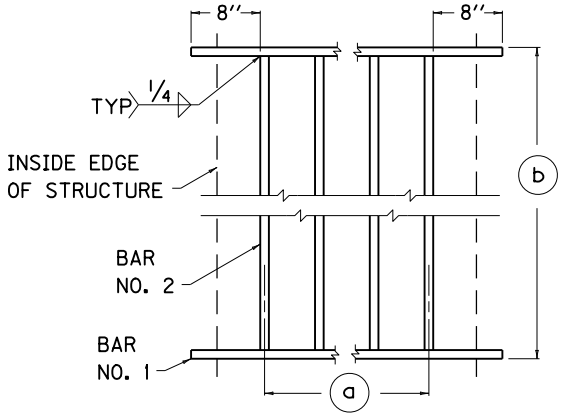
KENTUCKY DEPARTMENT OF HIGHWAYS

SLOPED BOX OUTLET TYPE 1

STANDARD DRAWING NO. RDB-100-05

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



TYPICAL GRATE

~ NOTES ~

1. ADDITIONAL "a" BARS: 1 REQUIRED FOR 15° SKEW, 2 REQUIRED FOR 30° SKEW.
2. ALL COMPONENTS ARE 1" X 2" STRUCTURAL STEEL BARS.
   - (a) EQUALLY SPACE BARS NO. 2.
   - (b) LENGTH OF GRATE SHALL BE EITHER 2'-0" OR 3'-0".
3. FOR SLOPED BOX DETAILS SEE CUR. STD. DWG. RDB-100.

1" X 2" STRUCTURAL STEEL BARS

BOX SIZE	GRATE		BAR NO. 1	BAR NO. 2		LBS STRUCTURAL STEEL	
	NO.	LG.	LENGTH	NO. BARS	LENGTH	EACH GRATE	TOTAL
15" - 18"	1	2'-0"	2'-5"	3	1'-10"	70	161
	2	3'-0"			2'-10"	91	
24"	1	2'-0"	3'-0"	4	1'-10"	91	300
	2						
	3	3'-0"			2'-10"	118	

NO. 4 REINFORCEMENT BARS

PIPE SIZE	(1) BAR a		BAR b		BAR c1		BAR c2		BAR c3		BAR d		TOTAL STEEL	CLASS A CONC.
	NO.	LG.	NO.	LG.	NO.	LG.	NO.	LG.	NO.	LG.	NO.	LG.	LBS.	CU. YDS.
15" 18"	12	2'-5"	4	8'-6"	0	0	6	1'-0"	4	1'-6"	4	4'-3"	62	1.2
24"	14	3'-0"	4	10'-6"	2	1'-0"	6	1'-3"	6	2'-0"	4	6'-3"	87	1.83

USE WITH CUR. STD. DWG. RDB-100

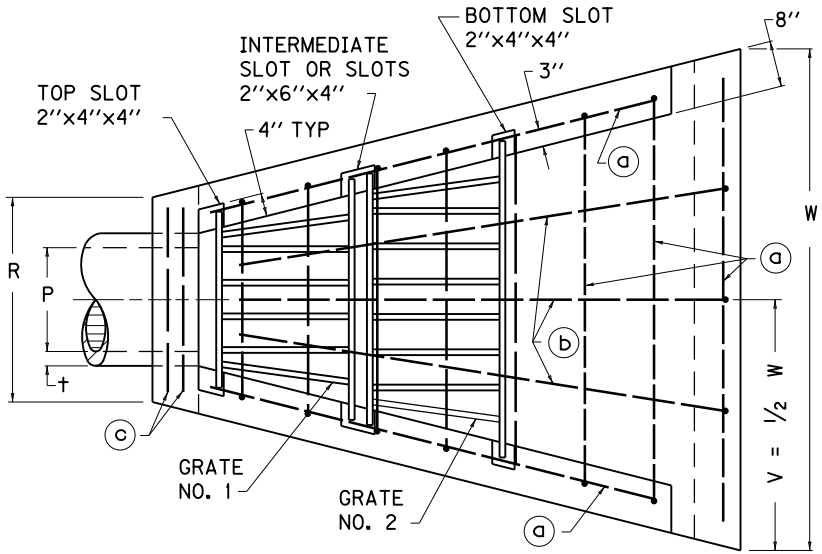
KENTUCKY DEPARTMENT OF HIGHWAYS

GRATES FOR SLOPED BOX OUTLET TYPE 1

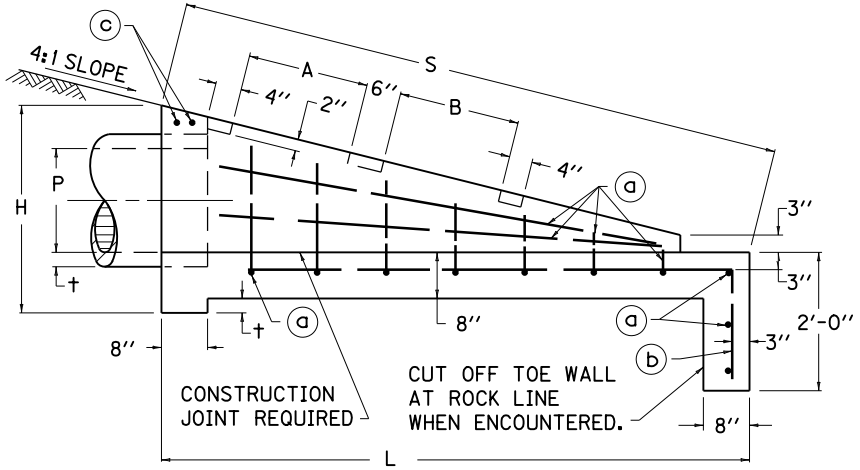
STANDARD DRAWING NO. RDB-101-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW

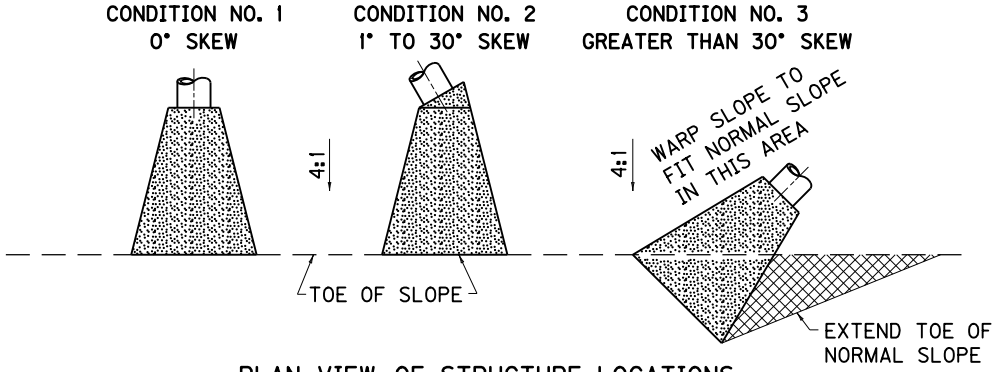


ELEVATION VIEW

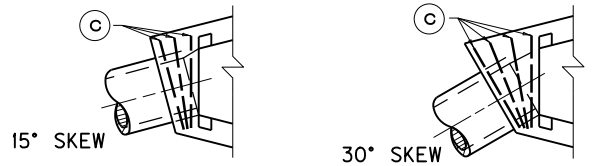
~ NOTES ~

BID ITEM AND UNIT TO BID
S & F BOX INLET-OUTLET - ☆ IN (SIZE OF PIPE) EACH

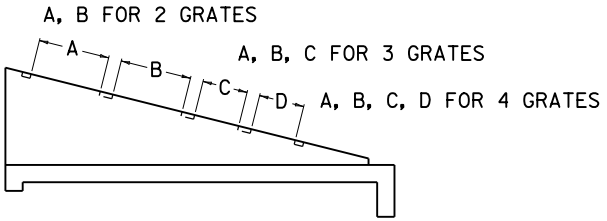
1. THE MINIMUM REQUIREMENT FOR REINFORCING STEEL SHALL BE GRADE 40. FIELD BENDING WILL BE PERMITTED.
2. ONE ADDITIONAL (c) BAR WILL BE REQUIRED FOR EACH 15° SKEW.
3. "t" IS THE CONCRETE PIPE WALL THICKNESS OR METAL PIPE CORRUGATION DEPTH.



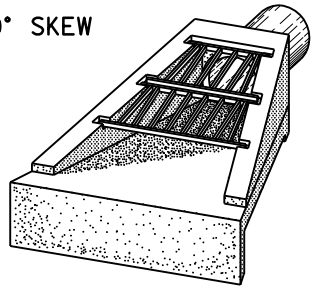
PLAN VIEW OF STRUCTURE LOCATIONS



(2) (c) BAR DETAIL FOR 15° AND 30° SKEW



DETAIL SHOWING LOCATION
OF SLOTS FOR GRATES



PICTORIAL VIEW
OF 18'' OR 24'' STRUCTURE

DIMENSIONS										
P	H	L	S	R	V	W	A	B	C	D
18''	3'-0''	8'-6''	8'-9⅛''	2'-11½''	3'-7½''	7'-3''	1'-9''	1'-9''	-----	-----
24''	3'-7''	10'-8''	11'-0''	3'-6½''	4'-5½''	8'-11''	2'-9''	2'-9''	-----	-----
30''	4'-2''	12'-10''	13'-2¾''	4'-1½''	5'-3½''	10'-7''	2'-9''	2'-9''	1'-9''	-----
36''	4'-9''	15'-0''	15'-5½''	4'-8½''	6'-1½''	12'-3''	2'-9''	2'-9''	1'-9''	1'-9''

NO. OF GRATES REQ'D.	
2'	3'
2	--
--	2
1	2
2	2

NO. 4 REINFORCEMENT BARS NUMBER - LENGTH AND WEIGHT				CLASS A CONC.
(a)	(b)	(3) (c)	LBS.	CU. YDS.
14 @ 6'-5''	3 @ 8'-6''	2 @ 2'-8''	81	1.8
16 @ 8'-0''	3 @ 10'-6''	2 @ 3'-3''	111	2.7
	3 @ 12'-9''	2 @ 3'-10''	146	3.8
20 @ 11'-4''	3 @ 15'-0''	2 @ 4'-5''	187	5.1

USE WITH CUR. STD. DWG.
RDB-106

KENTUCKY
DEPARTMENT OF HIGHWAYS

SLOPED AND FLARED
BOX INLET - OUTLET
18'' - 24'' - 30'' - 36''
ALL SKEWS

STANDARD DRAWING NO. RDB-105-06

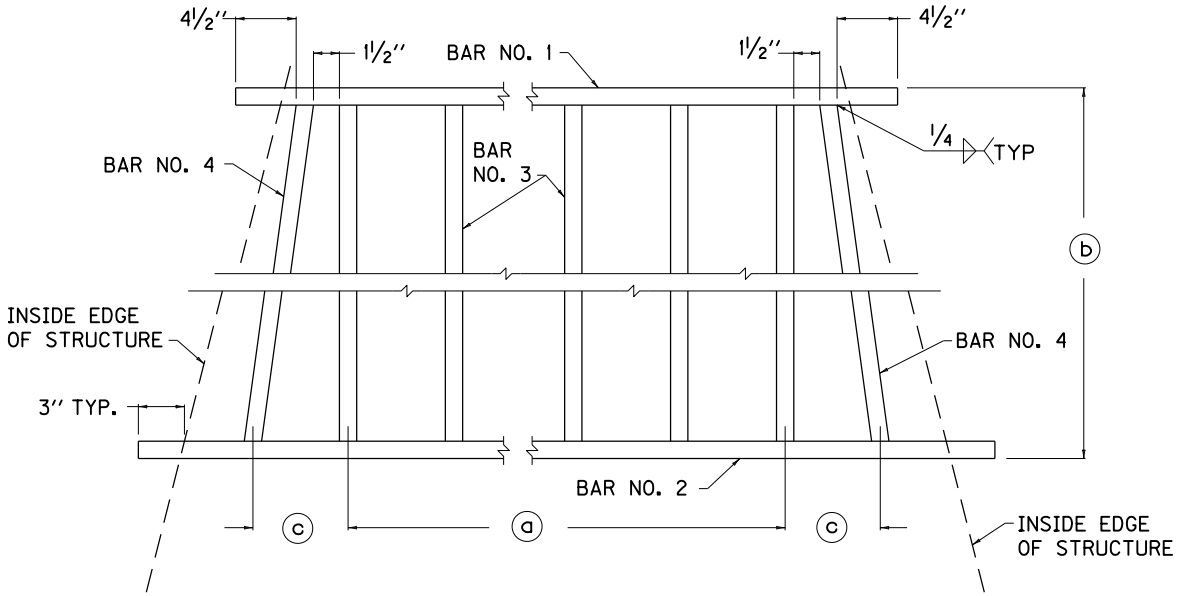
SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

BOX INLET - OUTLET SIZE	GRATE		BAR NO. 1	BAR NO. 2	BARS NO. 3		BARS NO. 4	LBS. STRUCTURAL STEEL	
	NO.	SIZE	LENGTH	LENGTH	NO. BARS	LENGTH	LENGTH	EACH GRATE	TOTAL
18"	1	2'-0"	2'-6 1/2"	3'-5 3/4"	4	1'-10"	1'-10 1/4"	116	272
	2	2'-0"	3'-7 5/8"	4'-6 7/8"	6	1'-10"	1'-10 1/4"	156	
24"	1	3'-0"	3'-1 1/2"	4'-6 5/8"	5	2'-10"	2'-10 3/8"	187	454
	2	3'-0"	4'-8 1/2"	6'-1 5/8"	8	2'-10"	2'-10 3/8"	267	
30"	1	3'-0"	3'-8 1/2"	5'-1 1/2"	6	2'-10"	2'-10 3/8"	215	796
	2	3'-0"	5'-3 1/2"	6'-8 5/8"	9	2'-10"	2'-10 3/8"	294	
	3	2'-0"	6'-10 1/2"	7'-9 3/4"	13	1'-10"	1'-10 1/4"	287	
36"	1	3'-0"	4'-3 1/2"	5'-8 1/2"	7	2'-10"	2'-10 3/8"	242	1218
	2	3'-0"	5'-10 1/2"	7'-3 5/8"	10	2'-10"	2'-10 3/8"	321	
	3	2'-0"	7'-5 1/2"	8'-4 3/4"	14	1'-10"	1'-10 1/4"	308	
	4	2'-0"	8'-6 3/4"	9'-5 7/8"	16	1'-10"	1'-10 1/4"	347	

~ NOTES ~

1. ALL COMPONENTS ARE 1" X 2" STRUCTURAL STEEL BARS.
2. (a) EQUALLY SPACE BARS NO. 3.
   (b) SIZE OF GRATE EITHER 2'-0" OR 3'-0".
   (c) 5 1/2" FOR 2'-0" GRATE, 7" FOR 3'-0" GRATE.



TYPICAL GRATE

USE WITH CUR. STD. DWG. RDB-105

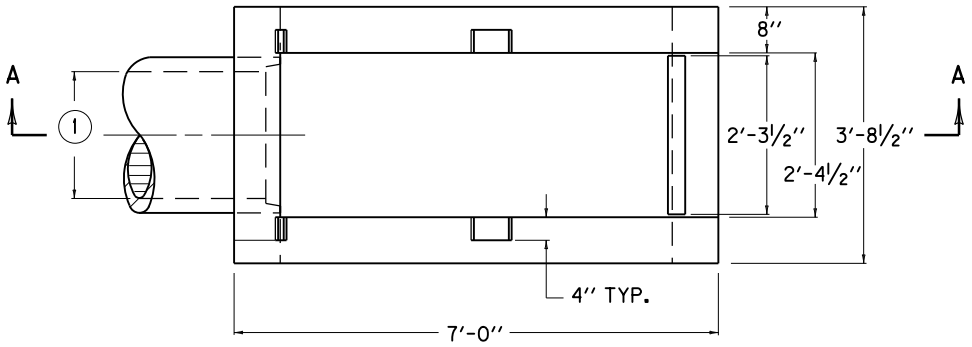
KENTUCKY DEPARTMENT OF HIGHWAYS

GRATES FOR SLOPED AND FLARED BOX INLET - OUTLET

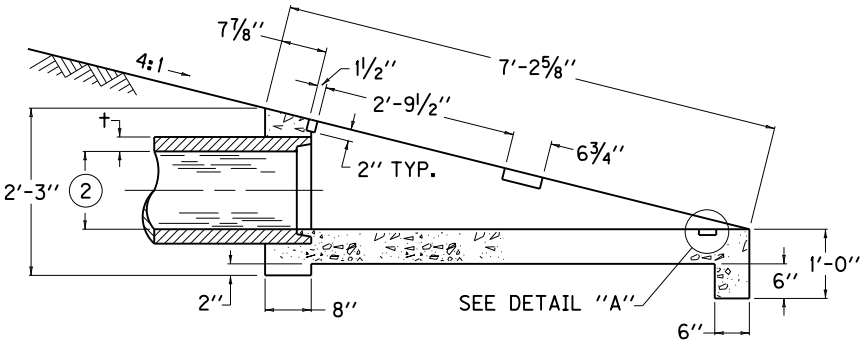
STANDARD DRAWING NO. RDB-106-05

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW



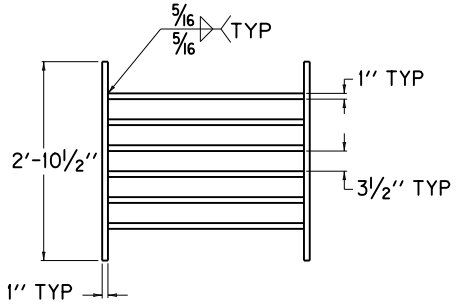
SECTION A-A

~ NOTES ~

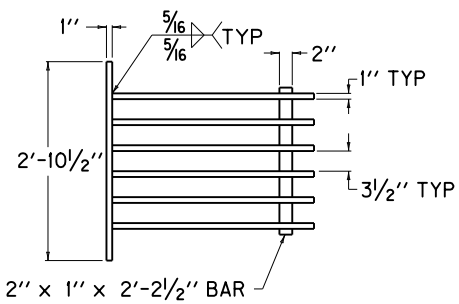
BID ITEM AND UNIT TO BID
SLOPED BOX INLET-OUTLET TYPE 1 EACH

(1) INTERIOR SPAN
(2) INTERIOR RISE

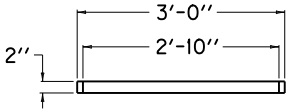
3. THE UNIT PRICE BID FOR EACH STRUCTURE SHALL INCLUDE CONCRETE, STRUCTURAL STEEL GRATINGS, EXCAVATION, LABOR AND ALL INCIDENTALS NECESSARY FOR ITS CONSTRUCTION AS DETAILED ON THIS SHEET.
4. SIZE AND LOCATION OF PIPE SHALL BE SHOWN ON PLANS.
5. SLOPED BOX INLET OR OUTLET TYPE 1 IS INTENDED TO BE USED WITH THE FOLLOWING PIPE SIZES:
   METAL PIPE ARCH - (15'' EQUIV. ROUND)
   METAL PIPE ARCH - (18'' EQUIV. ROUND)
   CONCRETE ELLIPTICAL PIPE - (18'' EQUIV. ROUND)



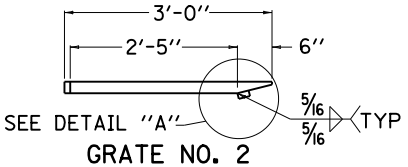
GRATE NO. 1
PLAN VIEW



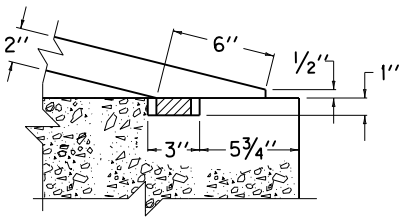
GRATE NO. 2
PLAN VIEW



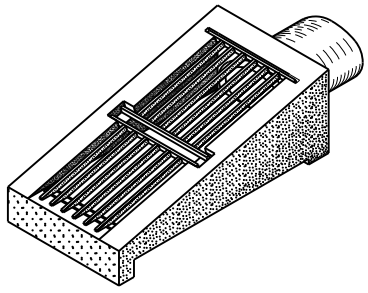
GRATE NO. 1
SIDE ELEVATION



GRATE NO. 2
SIDE ELEVATION



DETAIL ''A''



ISOMETRIC VIEW

APPROXIMATE QUANTITIES			
CLASS ''A'' CONC.	GRATE	LBS STRUCTURAL STEEL	
CU. YDS.	NUMBER	EACH GRATE	TOTAL LBS
0.9	1	155	298
	2	143	

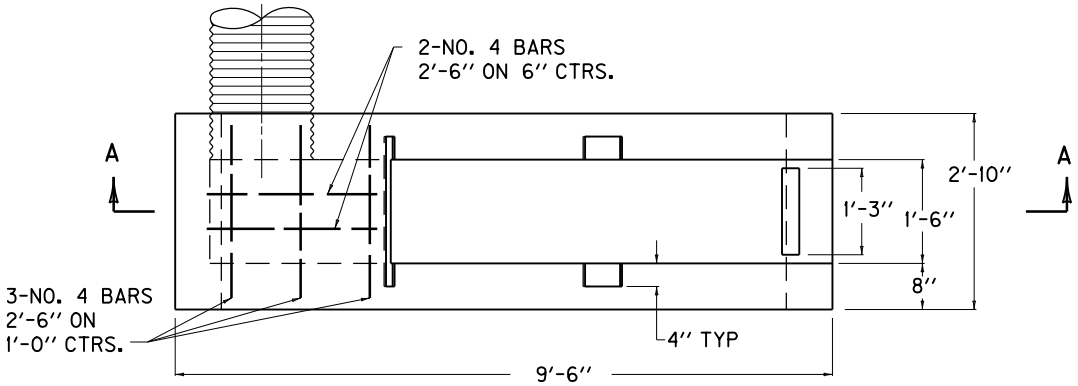
KENTUCKY
DEPARTMENT OF HIGHWAYS

SLOPED BOX
INLET OR OUTLET
TYPE 1

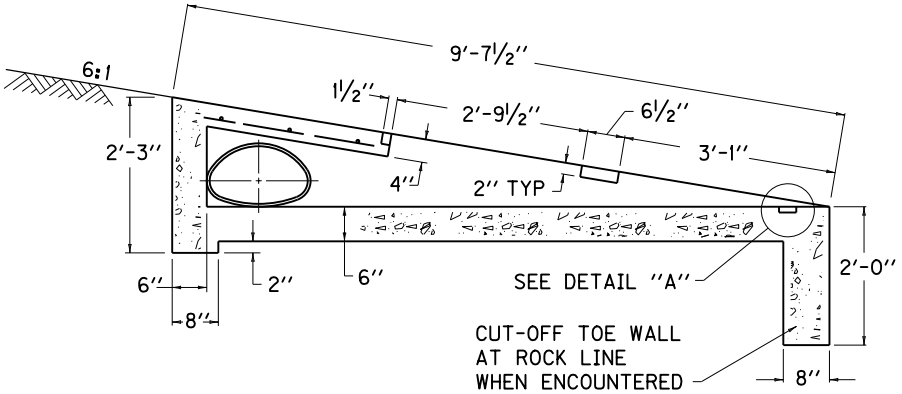
STANDARD DRAWING NO. RDB-110-08

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

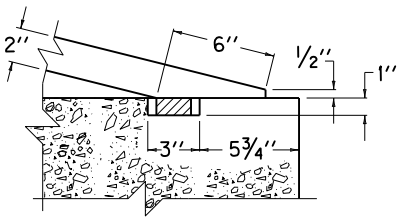
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



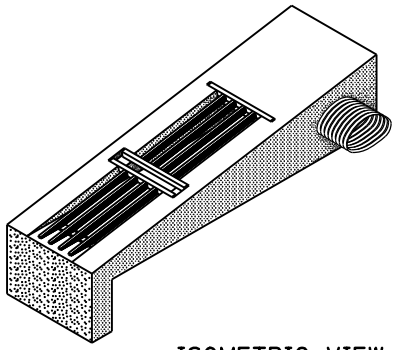
PLAN VIEW



SECTION A-A



DETAIL ''A''

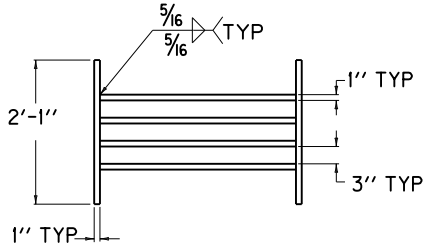


ISOMETRIC VIEW

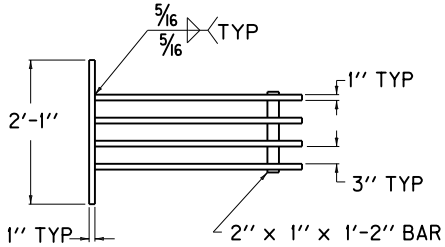
~ NOTES ~

BID ITEM AND UNIT TO BID
SLOPED BOX INLET-OUTLET TYPE 2 EACH

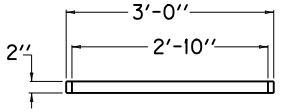
1. THE UNIT PRICE BID FOR EACH STRUCTURE SHALL INCLUDE ALL CONCRETE, STRUCTURAL STEEL GRATINGS, STEEL REINFORCEMENT, EXCAVATION, LABOR, AND ALL OTHER INCIDENTIALS NECESSARY FOR ITS CONSTRUCTION AS DETAILED ON THIS SHEET.
2. PRIMARY USE 6:1 DEPRESSED MEDIAN LOCATION.
3. PIPE SHALL BE METAL PIPE ARCH (15'' EQUIV. ROUND).



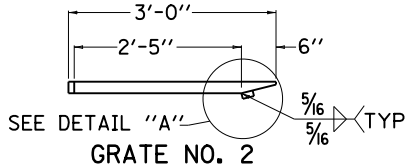
GRATE NO. 1
PLAN VIEW



GRATE NO. 2
PLAN VIEW



GRATE NO. 1
SIDE ELEVATION



GRATE NO. 2
SIDE ELEVATION

APPROXIMATE QUANTITIES				
CLASS ''A'' CONC.	GRATE	LBS. STRUCTURAL STEEL		STEEL REINF.
CU. YDS.	NUMBER	EACH GRATE	TOTAL LBS.	LBS.
1.1	1	106	206	8
	2	100		

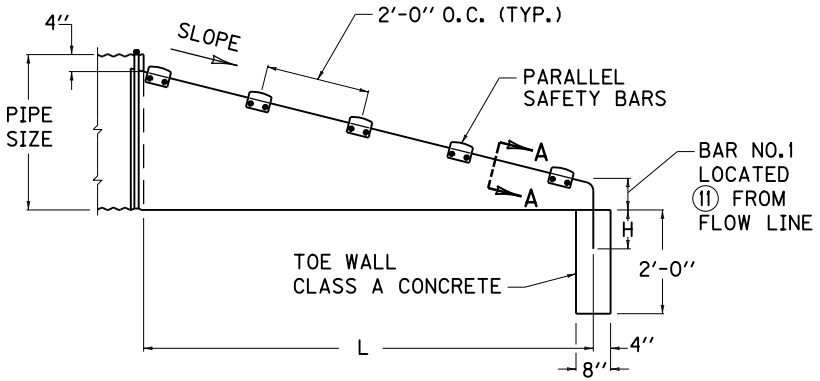
KENTUCKY
DEPARTMENT OF HIGHWAYS

SLOPED BOX
INLET OR OUTLET
TYPE 2

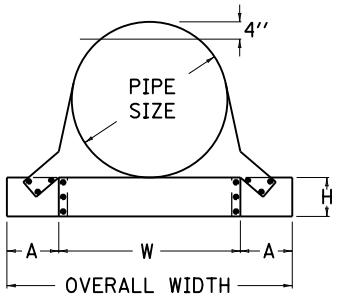
STANDARD DRAWING NO. RDB-111-08

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

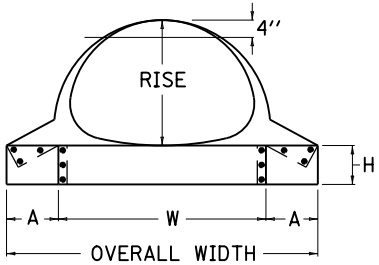
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



SIDE ELEVATION



END SECT. FRONT VIEW
CIRCULAR PIPE



END SECT. FRONT VIEW
ARCHED PIPE

~ NOTES ~

BID ITEM AND UNIT TO BID METAL END SECTION TY ⊗ △ IN EACH

⊗ 1 = PARALLEL STRUCTURE ON 6:1 SLOPE, 2 = PARALLEL STRUCTURE ON 10:1 SLOPE

△ SIZE IN INCHES

BID ITEM EXAMPLE: METAL END SECTION TY 1-15 IN.

THE CONTRACT UNIT PRICE EACH FOR METAL END SECTION SHALL INCLUDE CLASS A CONCRETE, EXCAVATION, AND ALL INCIDENTALS NECESSARY TO COMPLETE ONE INSTALLATION AS DETAILED.

1. METAL END SECTIONS SHALL BE FABRICATED FROM GALVANIZED SHEETS, CONFORMING TO AASHTO M218.
2. METAL END SECTIONS & TAPERED SLEEVES SHALL BE ASPHALT COATED IN ACCORDANCE WITH SECTION 806 OF THE CURRENT KENTUCKY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION. ASPHALT COATING IS NOT REQUIRED ON SAFETY BARS.
3. SAFETY BARS SHALL BE REQUIRED ON ALL METAL END SECTIONS CONSTRUCTED PARALLEL TO THE ROADWAY.
4. SAFETY BARS SHALL BE CONSTRUCTED OF SCHEDULE 40 GALVANIZED STEEL PIPE (COMMERCIAL GRADE).
5. THE TAPERED SLEEVE SHALL BE GALVANIZED SMOOTH METAL CONFORMING TO AASHTO M218, WITH A WALL THICKNESS AS FOLLOWS: 18″ DIA. OR LESS = .079″, 21″ DIA. OR LARGER = .109″.

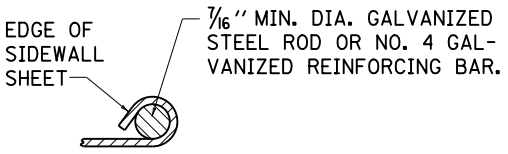
⑥ SLOTTED HOLES FOR SAFETY GRATE ATTACHMENT SHALL BE PUNCHED PRIOR TO GALVANIZING. FIELD DRILLING OF HOLES SHALL NOT BE PERMITTED.

⑦ WATERPROOF MASTIC CONFORMING TO 807.02.03 OF THE CURRENT KENTUCKY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SHALL BE PLACED IN THE VOID BETWEEN THE TAPERED SLEEVE AND CONCRETE PIPE.

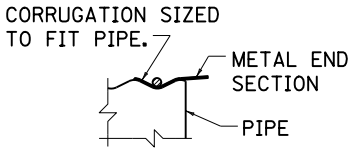
⑧ FORM ½″ × 2⅔″ CORRUGATIONS. MAINTAIN INSIDE DIAMETER OF SLEEVE. FINISHED END IS TO BE THE SAME DIAMETER AS CORRUGATED STEEL PIPE DIAMETER.

9. ALL MISCELLANEOUS HARDWARE SHALL COMPLY WITH AASHTO M36.
10. THE WELDS USED IN THE MANUFACTURE OF THE TAPERED SLEEVE FOR ELLIPTICAL CONC. PIPE SHALL BE REPAIRED IN ACCORDANCE WITH AASHTO M36 USING ZINC OXIDE-**ZINC DUST** PRIMER, FEDERAL SPECIFICATION TT-P-641, TYPE II, NO COLOR ADDED.

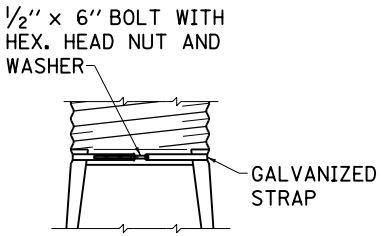
⑪ TYPE 1 = 6″, TYPE 2 = 4″



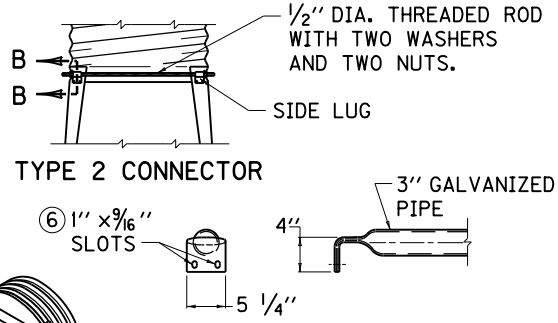
SECTION A-A

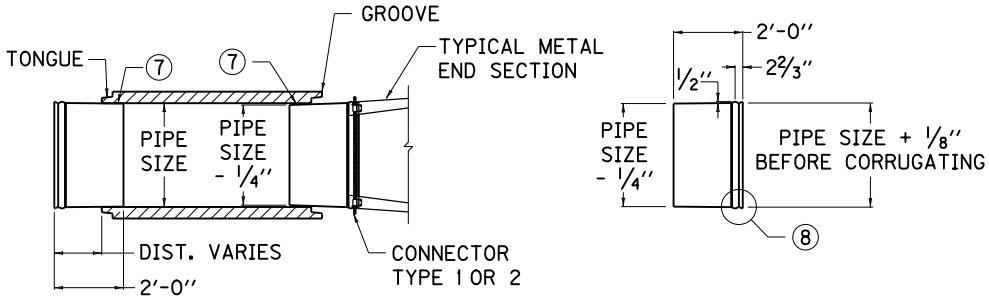


SECTION B-B

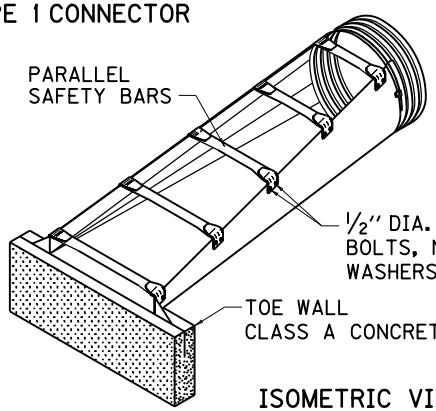


TYPE 1 CONNECTOR





SMOOTH TAPERED SLEEVE FOR USE WITH CONCRETE PIPE



ISOMETRIC VIEW

USE WITH CUR. STD. DWG. RDB-160

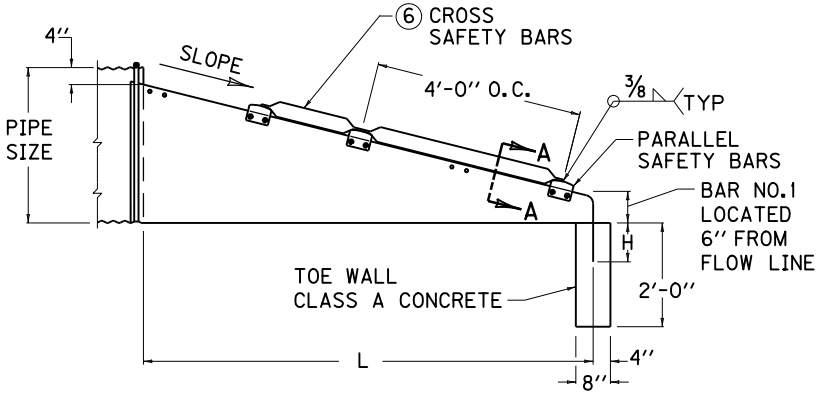
KENTUCKY
DEPARTMENT OF HIGHWAYS

METAL END SECTION TYPE 1 AND 2 (PARALLEL STRUCTURES)

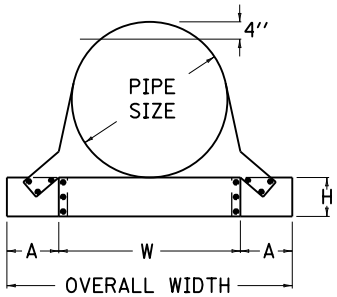
STANDARD DRAWING NO. RDB-150-02

SUBMITTED William S. Pollard — DIRECTOR, DIVISION OF DESIGN — 12-01-15 DATE

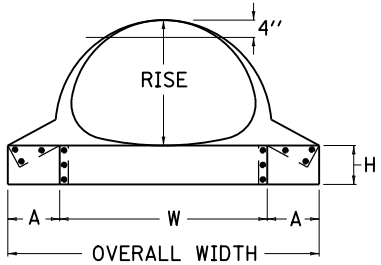
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



SIDE ELEVATION



END SECT. FRONT VIEW
CIRCULAR PIPE



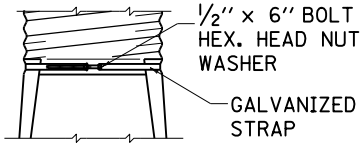
END SECT. FRONT VIEW
ARCHED PIPE

~ NOTES ~

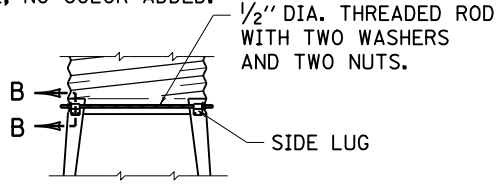
BID ITEM AND UNIT TO BID
METAL END SECTION TY ⊗ △ IN EACH
⊗ 3 = CROSSDRAIN STRUCTURE ON 4:1 SLOPE, 4 = CROSSDRAIN STRUCTURE ON 6:1 SLOPE
△ SIZE IN INCHES
BID ITEM EXAMPLE: METAL END SECTION TY 3-15 IN

THE CONTRACT UNIT PRICE EACH FOR METAL END SECTION SHALL INCLUDE CLASS A CONCRETE, EXCAVATION, AND ALL INCIDENTALS NECESSARY TO COMPLETE ONE INSTALLATION AS DETAILED.

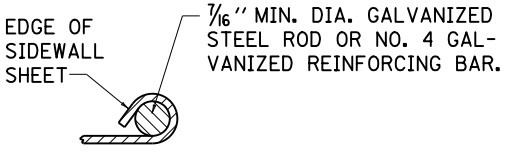
1. FABRICATE METAL END SECTIONS FROM GALVANIZED SHEETS CONFORMING TO AASHTO M218.
2. METAL END SECTIONS & TAPERED SLEEVES SHALL BE ASPHALT COATED IN ACCORDANCE WITH SECT. 806 OF THE CURRENT KENTUCKY STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION. ASPHALT COATING IS NOT REQUIRED ON SAFETY BARS.
3. SAFETY BARS SHALL BE REQUIRED ON ALL 30'' ROUND PIPE AND LARGER.
4. SAFETY BARS SHALL BE REQUIRED ON ALL 24'' ELLIPTICAL EQUIVALENT PIPE AND LARGER.
5. SAFETY BARS SHALL BE CONSTRUCTED OF SCHEDULE 40 GALVANIZED STEEL PIPE (COML. GRADE).
⑥ CROSS SAFETY BARS SHALL BE SPACED A MAXIMUM OF 30'' O.C. AND WELDED TO PARALLEL SAFETY BARS. GALVANIZING REQUIRED AFTER FABRICATION.
7. THE TAPERED SLEEVE SHALL BE GALVANIZED SMOOTH METAL CONFORMING TO AASHTO M218, WITH A WALL THICKNESS AS FOLLOWS: 18'' DIA. OR LESS = .079'', 21'' DIA. OR LARGER = .109''.
⑧ SLOTTED HOLES FOR SAFETY BAR ATTACHMENT SHALL BE PUNCHED PRIOR TO GALVANIZING. FIELD DRILLING OF HOLES SHALL NOT BE PERMITTED.
⑨ WATERPROOF MASTIC CONFORMING TO 807.02.03 OF THE CURRENT KENTUCKY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SHALL BE PLACED IN THE VOID BETWEEN THE TAPERED SLEEVE AND CONCRETE PIPE.
⑩ FORM 1/2'' x 2 2/3'' CORRUGATIONS. MAINTAIN INSIDE DIAMETER OF SLEEVE. FINISHED END TO BE THE SAME DIAMETER AS CORRUGATED STEEL PIPE DIAMETER.
11. ALL MISCELLANEOUS HARDWARE SHALL COMPLY WITH AASHTO M36.
12. THE WELDS USED IN THE MANUFACTURE OF THE TAPERED SLEEVE FOR ELLIPTICAL CONCRETE PIPE SHALL BE REPAIRED IN ACCORDANCE WITH AASHTO M36 USING ZINC OXIDE-ZINC DUST PRIMER, FEDERAL SPECIFICATION TT-P-641, TYPE II, NO COLOR ADDED.



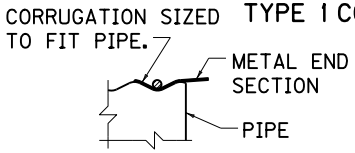
TYPE 1 CONNECTOR



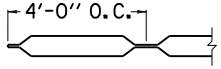
TYPE 2 CONNECTOR



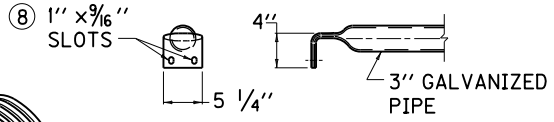
SECTION A-A



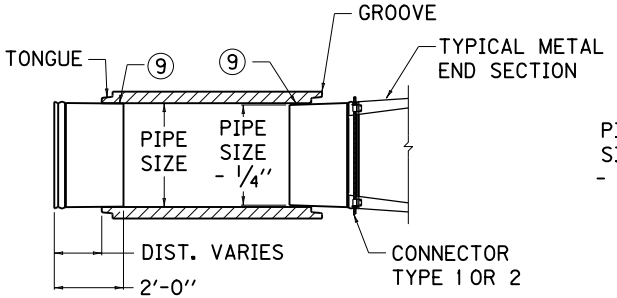
SECTION B-B

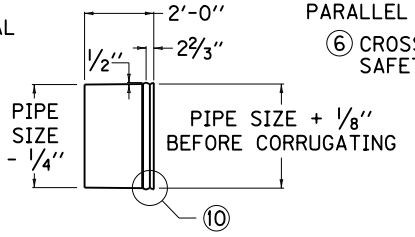


CROSS SAFETY BAR

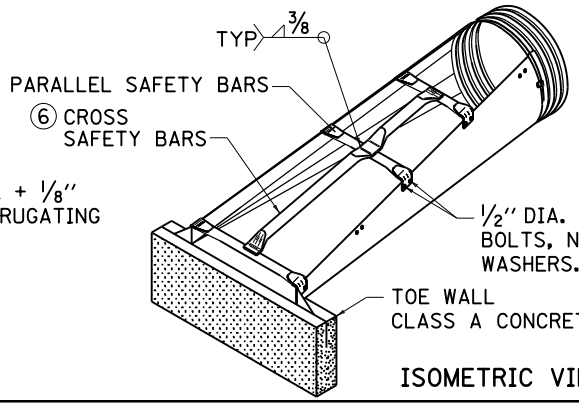


PARALLEL SAFETY BAR





SMOOTH TAPERED SLEEVE FOR USE WITH CONCRETE PIPE



ISOMETRIC VIEW

USE WITH CUR. STD. DWG.
RDB-160

KENTUCKY
DEPARTMENT OF HIGHWAYS

METAL END SECTION
TYPE 3 AND 4
(CROSS STRUCTURES)

STANDARD DRAWING NO. RDB-155-02

SUBMITTED William S. Hulett DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

METAL END SECTIONS FOR CONC. OR METAL CIRCULAR PIPE

PIPE DIA. (IN.)	MIN. THICK. IN INCHES	DIMENSIONS				L DIMENSIONS ①						CONCRETE
		A	H	W	OVERALL WIDTH	SLOPE	LENGTH	SLOPE	LENGTH	SLOPE	LENGTH	CU. YDS.
15 ②	0.064	8″	6″	21″	3′-1″	4:1	1′-8″	6:1	2′-6″	10:1	5′-10″	0.15
18 ②	0.064	8″	6″	24″	3′-4″	4:1	2′-8″	6:1	4′-0″	10:1	8′-4″	0.16
21 ②	0.064	8″	6″	27″	3′-7″	4:1	3′-8″	6:1	5′-6″	10:1	10′-10″	0.18
24 ②	0.064	8″	6″	30″	3′-10″	4:1	4′-8″	6:1	7′-0″	10:1	13′-4″	0.19
30	0.109	12″	9″	36″	5′-0″	4:1	6′-8″	6:1	10′-0″			0.25
36	0.109	12″	9″	42″	5′-6″	4:1	8′-8″	6:1	13′-0″			0.27
42	0.109	16″	12″	48″	6′-8″	4:1	10′-8″	6:1	16′-0″			0.33
48	0.109	16″	12″	54″	7′-2″	4:1	12′-8″	6:1	19′-0″			0.35
54	0.109	16″	12″	60″	7′-8″	4:1	14′-8″	6:1	22′-0″			0.38
60	0.109	16″	12″	66″	8′-2″	4:1	16′-8″	6:1	25′-0″			0.40

CONC. OR METAL CIRCULAR PIPE

~ NOTES ~

① DIMENSIONAL TOLERANCE +1″ -0″

② FOR METAL END SECTIONS WITH A SLOPE OF 10:1 USE A METAL THICKNESS OF .109″ MIN.

METAL END SECTIONS FOR METAL ARCHED PIPE

EQUV. DIA. (IN.)	SPAN (IN.)	RISE (IN.)	MIN. THICK. IN INCHES	DIMENSIONS				L DIMENSIONS ①						CONCRETE
				A	H	W	OVERALL WIDTH	SLOPE	LENGTH	SLOPE	LENGTH	SLOPE	LENGTH	CU. YDS.
18 ②	21	15	.064	8″	6″	27″	3′-7″	4:1	1′-8″	6:1	2′-6″	10:1	5′-10″	0.18
21 ②	24	18	.064	8″	6″	30″	3′-10″	4:1	2′-8″	6:1	4′-0″	10:1	8′-4″	0.19
24 ②	28	20	.064	8″	6″	34″	4′-2″	4:1	3′-4″	6:1	5′-0″	10:1	10′-0″	0.21
30	35	24	.079	12″	9″	41″	5′-5″	4:1	4′-8″	6:1	7′-0″			0.27
36	42	29	.109	12″	9″	48″	6′-0″	4:1	6′-4″	6:1	9′-6″			0.30
42	49	33	.109	16″	12″	55″	7′-3″	4:1	7′-8″	6:1	11′-6″			0.36
48	57	38	.109	16″	12″	63″	7′-11″	4:1	9′-4″	6:1	14′-0″			0.39
54	64	43	.109	16″	12″	70″	8′-6″	4:1	11′-0″	6:1	16′-6″			0.42
60	71	47	.109	16″	12″	77″	9′-1″	4:1	12′-4″	6:1	18′-6″			0.45
72	83	57	.109	16″	12″	89″	10′-1″	4:1	15′-8″	6:1	23′-6″			0.50

METAL ARCHED PIPE

METAL END SECTIONS FOR CONCRETE ELLIPTICAL PIPE

EQUV. DIA. (IN.)	SPAN (IN.)	RISE (IN.)	MIN. THICK. IN INCHES	DIMENSIONS				L DIMENSIONS				CONCRETE
				A	H	W	OVERALL WIDTH	SLOPE	LENGTH	SLOPE	LENGTH	CU. YDS.
18	23	14	.064	8″	6″	29″	3′-9″	4:1	1′-4″	6:1	2′-0″	0.19
24	30	19	.064	8″	6″	36″	4′-4″	4:1	3′-0″	6:1	4′-6″	0.21
30	38	24	.079	12″	9″	44″	5′-8″	4:1	4′-8″	6:1	7′-0″	0.28
36	45	29	.109	16″	12″	51″	6′-11″	4:1	6′-4″	6:1	9′-6″	0.34
42	53	34	.109	16″	12″	59″	7′-7″	4:1	8′-0″	6:1	12′-0″	0.37
48	60	38	.109	16″	12″	66″	8′-2″	4:1	9′-4″	6:1	14′-0″	0.40
54	68	43	.109	16″	12″	74″	8′-10″	4:1	11′-0″	6:1	16′-6″	0.44
60	76	48	.109	16″	12″	80″	9′-4″	4:1	12′-8″	6:1	19′-0″	0.46

CONCRETE ELLIPTICAL PIPE

USE WITH CUR. STD. DWGS. RDB-150, RDB-155

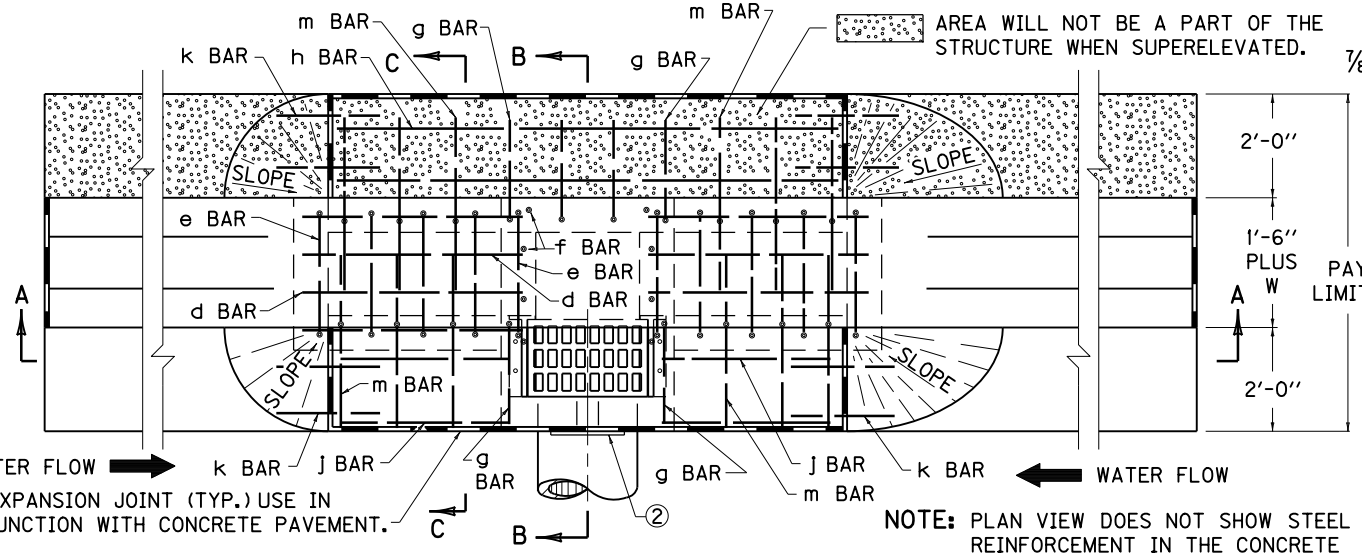
KENTUCKY DEPARTMENT OF HIGHWAYS

DIMENSIONS FOR METAL END SECTIONS

STANDARD DRAWING NO. RDB-160-02

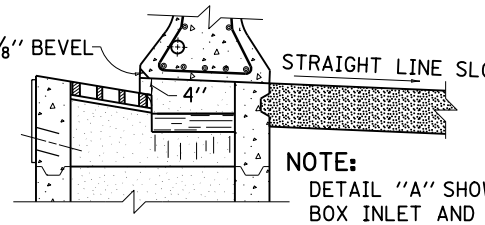
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



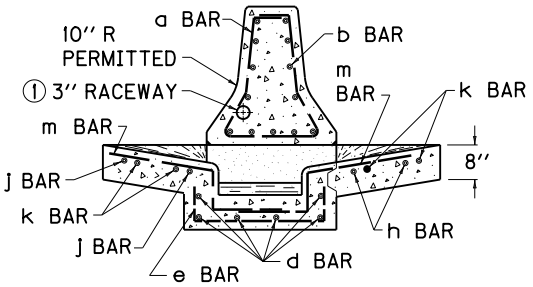
PLAN VIEW (BOX INLET TYPE A)

NOTE: PLAN VIEW DOES NOT SHOW STEEL REINFORCEMENT IN THE CONCRETE MEDIAN BARRIER.

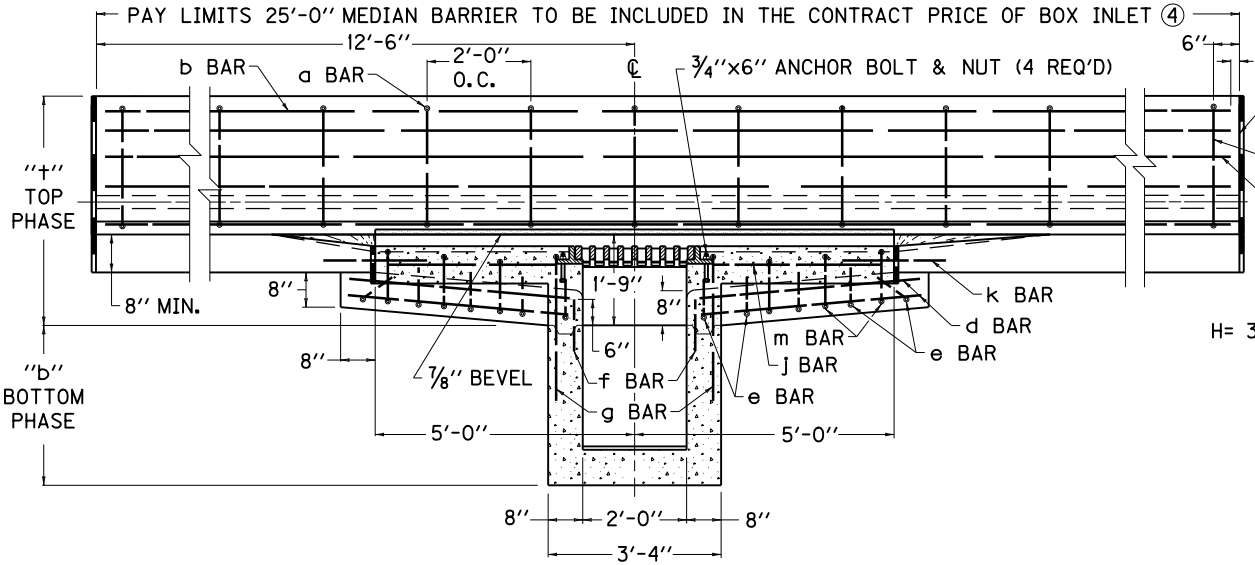


DETAIL "A"

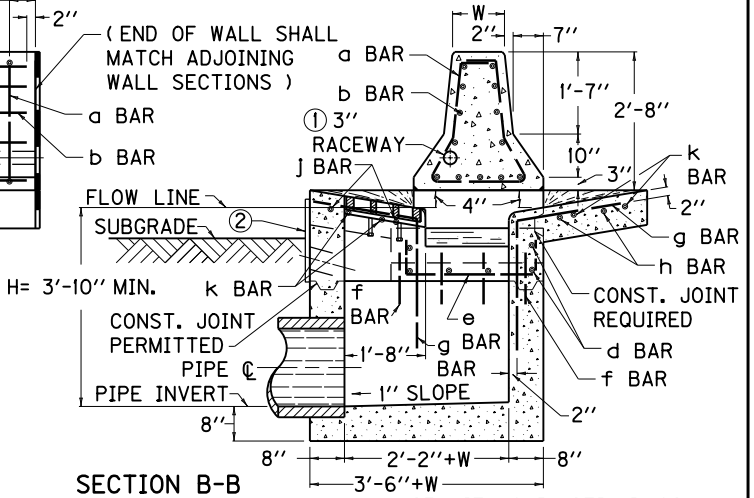
NOTE: DETAIL "A" SHOWS BOX INLET AND THE 25' CONCRETE MEDIAN BARRIER IN SUPERELEVATION.



SECTION C-C



SECTION A-A

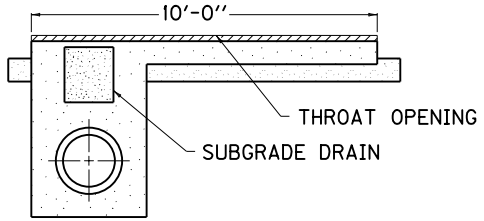


SECTION B-B

USE WITH CUR. STD. DWGS. RBM-001 , RDB-231

~ NOTES ~

① SEE PLANS FOR SIZE, LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.
② FABRIC WRAPPED BACKFILL DRAIN, (ONE PER WEEP HOLE).
3. ALL WALLS AND SLABS ARE 8" THICK UNLESS OTHERWISE SHOWN.
④ MEDIAN BARRIER WALL MAY BE CAST-IN-PLACE, FIXED OR SLIP-FORMED, CONTRACTOR'S OPTION.
5. WALL REINFORCEMENT IS DETAILED FOR CAST-IN-PLACE WALLS. FOR SLIP-FORMED WALLS SEE CURRENT STANDARD DRAWING RDB-231 FOR STEEL DETAIL.



BOX INLET TYPE B

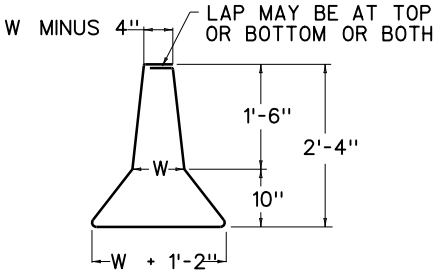
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN BARRIER BOX INLET (CAST-IN-PLACE)

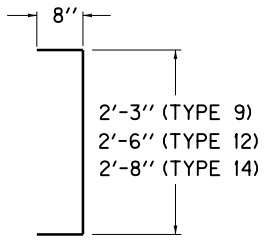
STANDARD DRAWING NO. RDB-230-09

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

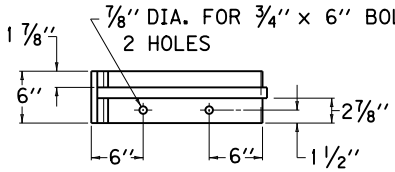
APPROVED _____ STATE HIGHWAY ENGINEER — 12-01-15 DATE



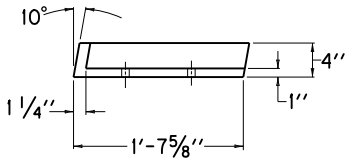
a BAR



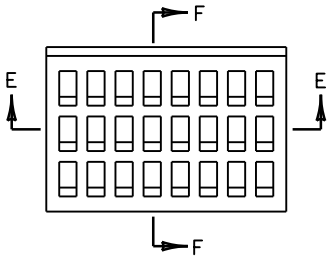
e BAR



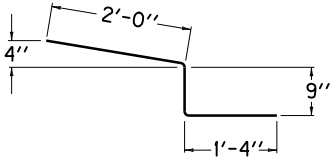
FRAME PLAN VIEW
(LEFT HALF)



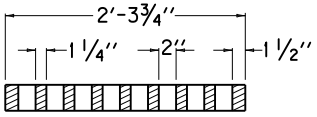
FRAME ELEVATION



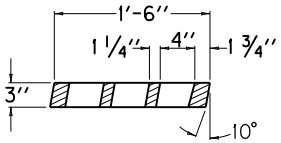
GRATE PLAN VIEW



m BAR



SECTION E-E



SECTION F-F

APPROX. QTYS. FOR 25' CONC. MEDIAN BARRIER

INLET	W	BAR a		BAR b		STEEL	CONC.
		QTY.	LENGTH	QTY.	LENGTH	LBS. (8)	CU. YDS.
TYPE 9	9''	13	7'-4 1/4''	13	24'-8''	434	3.15
TYPE 12	12''	13	8'-1''	13	24'-8''	444	3.77
TYPE 14	14''	13	8'-7 1/2''	13	24'-8''	451	4.18

~ NOTES ~

BID ITEM AND UNIT TO BID
CONC MED BARR BOX INLET TY ☆ ⊗ ⊕ △ EACH

☆ 9, 12, OR 14 DEPENDING ON ''W'' WIDTH

⊗ = ''A'' FOR SAG VERTICALS
''B'' FOR STRAIGHT GRADE

⊕ = 1 FOR OPENING ON ONE SIDE OF BOX INLET
2 FOR OPENING ON BOTH SIDES OF BOX INLET

△ (b) = BOTTOM PHASE (t) = TOP PHASE

NO (b) OR (t) SUFFIX INDICATES COMPLETE INLET.

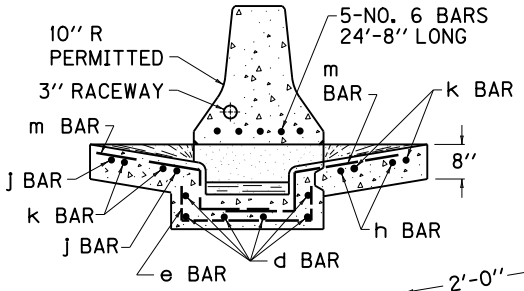
1. ALL STEEL REINFORCEMENT BARS SHALL BE NO. 5 BARS.
2. THE RATE OF INCREASE OF ADDITIONAL CLASS ''A'' CONCRETE PER FT. OF HEIGHT ABOVE THE MINIMUM 3'-10'' SHALL BE 0.32 CU. YDS. FOR A TYPE 9 BOX INLET AND 0.35 CU. YDS. FOR A TYPE 12 AND 0.37 CU. YDS. FOR A TYPE 14 BOX INLET.
3. PLACE ALL STEEL REINFORCEMENT 2'' MINIMUM FROM OUTSIDE FACE OF WALL, EXCEPT AS OTHERWISE SHOWN.
4. SEE CUR. STD. DWG. RDB-420 FOR STEEL REINFORCEMENT IN BOTTOM OF BOX WHEN H = 8'-0'' TO 15'-0''.
5. USE CHAMBER DIMENSIONS TO BEST FIT AND EQUALLY SPACE REINFORCEMENT STEEL.
6. A SYMMETRICAL WALL IS DETAILED, AN ASYMMETRICAL WALL MAY BE REQUIRED (SEE PLANS).

(7) 2'-6'' FOR MIN. HEIGHT OF 3'-10''

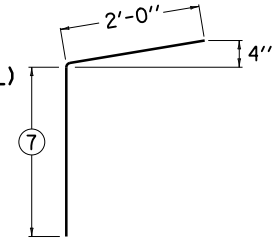
(8) STEEL QUANTITIES ARE FOR CAST-IN-PLACE WALL.

REINFORCEMENT BARS FOR BOX INLET

BAR	QTY.		LIN. FT.		QTY.		LIN. FT.	
	A1	A2	A1	A2	B1	B2	B1	B2
TYPE 9								
e	10		3'-6''		9		3'-6''	
TYPE 12								
e	10		3'-9''		9		3'-9''	
TYPE 14								
e	10		3'-11''		9		3'-11''	
ALL TYPES								
d	12		4'-3''		6		7'-5''	
f	8		1'-0''		8		1'-0''	
g	2	6	4'-6''		1	5	4'-6''	
h	0	2	0	9'-8''	0	2	0	9'-8''
j	4		3'-3''		2		7'-0''	
k	4	8	2'-0''		4	8	2'-0''	
m	6	12	4'-1''		6	12	4'-1''	



SECTION C-C
(SLIP-FORM WALL)



g BAR

APPROX. QUANTITIES FOR INLET

TYPE	CLASS ''A'' CONC.	STEEL
	CU. YDS.	LBS.
9A 1	3.76	155
9B 1	3.72	141
12A 1	3.96	158
12B 1	3.89	143
14A 1	4.09	159
14B 1	3.98	145

FOR APPROX. QUANTITIES FOR TYPE A2 OR B2 (ALL ''W'' WIDTHS) ADD 1.48 CU. YDS. CONCRETE AND 73 LBS. STEEL.

USE WITH CUR. STD. DWGS.
RBM-001 , RDB-230 , RDB-420

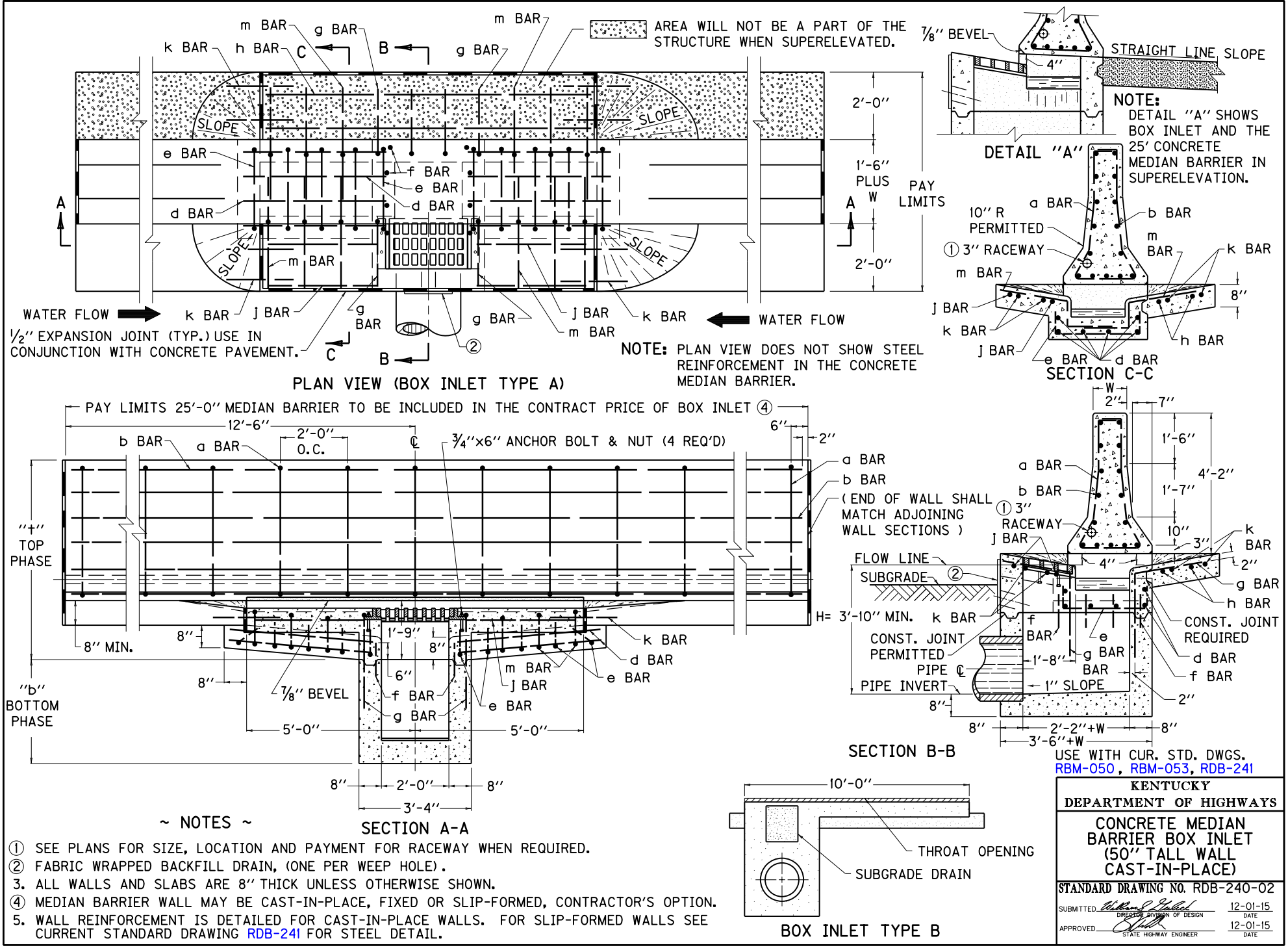
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN BARRIER BOX INLET (SLIP-FORM)

STANDARD DRAWING NO. RDB-231-11

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



~ NOTES ~

① SEE PLANS FOR SIZE, LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.
② FABRIC WRAPPED BACKFILL DRAIN, (ONE PER WEEP HOLE).
3. ALL WALLS AND SLABS ARE 8" THICK UNLESS OTHERWISE SHOWN.
④ MEDIAN BARRIER WALL MAY BE CAST-IN-PLACE, FIXED OR SLIP-FORMED, CONTRACTOR'S OPTION.
5. WALL REINFORCEMENT IS DETAILED FOR CAST-IN-PLACE WALLS. FOR SLIP-FORMED WALLS SEE CURRENT STANDARD DRAWING RDB-241 FOR STEEL DETAIL.

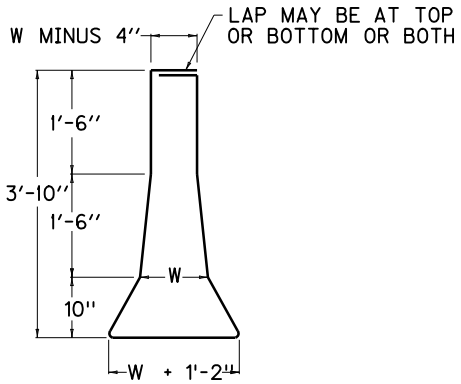
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN BARRIER BOX INLET (50" TALL WALL CAST-IN-PLACE)

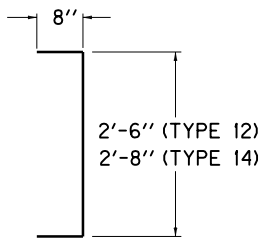
STANDARD DRAWING NO. RDB-240-02

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

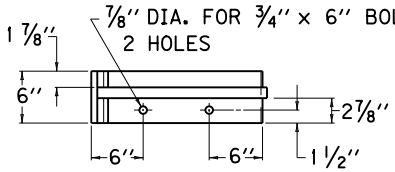
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



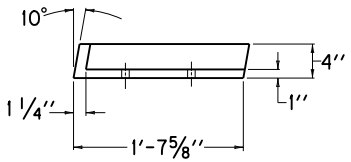
a BAR



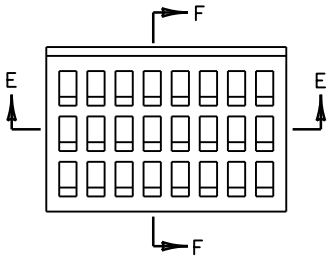
e BAR



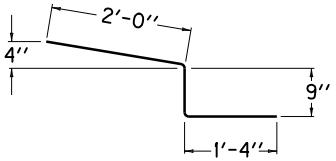
FRAME PLAN VIEW
(LEFT HALF)



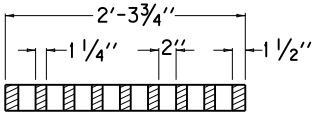
FRAME ELEVATION



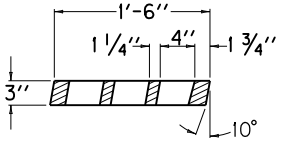
GRATE PLAN VIEW



m BAR



SECTION E-E



SECTION F-F

APPROX. QTYS. FOR 25' CONC. MEDIAN BARRIER

INLET	W	BAR a		BAR b		STEEL	CONC.
		QTY.	LENGTH	QTY.	LENGTH	LBS. (8)	CU. YDS.
TYPE 12	12''	13	11'-6''	15	24'-8''	542	5.16
TYPE 14	14''	13	12'-0''	15	24'-8''	549	5.8

~ NOTES ~

BID ITEM AND UNIT TO BID
CONC. MED BARR BOX INLET TY ☆ ⊗ ⊕ △ -50 EACH

☆ 12 OR 14 DEPENDING ON ''W'' WIDTH

⊗ = ''A'' FOR SAG VERTICALS
''B'' FOR STRAIGHT GRADE

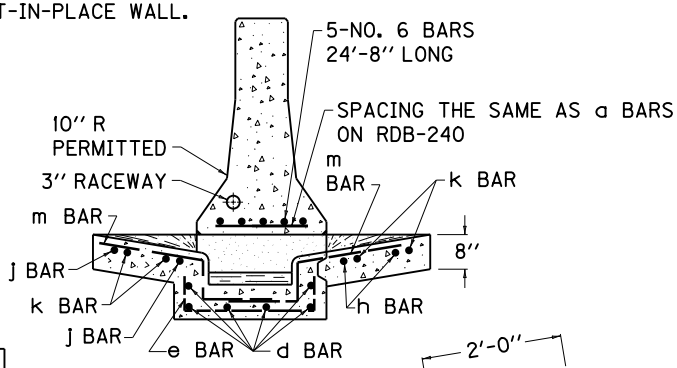
⊕ = 1 FOR OPENING ON ONE SIDE OF BOX INLET
2 FOR OPENING ON BOTH SIDES OF BOX INLET

△ (b) = BOTTOM PHASE (t) = TOP PHASE
NO (b) OR (t) SUFFIX INDICATES COMPLETE INLET.

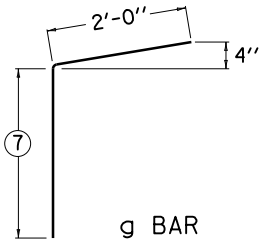
1. ALL STEEL REINFORCEMENT BARS SHALL BE NO. 5 BARS.
2. THE RATE OF INCREASE OF ADDITIONAL CLASS ''A'' CONCRETE PER FT. OF HEIGHT ABOVE THE MINIMUM 3'-10'' SHALL BE 0.35 CU. YD.S FOR A TYPE 12 AND 0.37 CU. YDS. FOR A TYPE 14 BOX INLET.
3. PLACE ALL STEEL REINFORCEMENT 2'' MINIMUM FROM OUTSIDE FACE OF WALL, EXCEPT AS OTHERWISE SHOWN.
4. SEE CUR. STD. DWG. RDB-420 FOR STEEL REINFORCEMENT IN BOTTOM OF BOX WHEN H = 8'-0'' TO 15'-0''.
5. USE CHAMBER DIMENSIONS TO BEST FIT AND EQUALLY SPACE REINFORCEMENT STEEL.
6. A SYMMETRICAL WALL IS DETAILED, AN ASYMMETRICAL WALL MAY BE REQUIRED (SEE PLANS).

(7) 2'-6'' FOR MIN. HEIGHT OF 3'-10''

(8) STEEL QUANTITIES ARE FOR CAST-IN-PLACE WALL.



SECTION C-C
(SLIP-FORM WALL)



g BAR

REINFORCEMENT BARS FOR BOX INLET

BAR	BOX TYPE							
	A1	A2	A1	A2	B1	B2	B1	B2
	QTY.		LENGTH		QTY.		LENGTH	
TYPE 12								
e	10		3'-9''		9		3'-9''	
TYPE 14								
e	10		3'-11''		9		3'-11''	
ALL TYPES								
d	12		4'-3''		6		7'-5''	
f	8		1'-0''		8		1'-0''	
g	2	6	4'-6''		1	5	4'-6''	
h	0	2	0	9'-8''	0	2	0	9'-8''
j	4		3'-3''		2		7'-0''	
k	4	8	2'-0''		4	8	2'-0''	
m	6	12	4'-1''		6	12	4'-1''	

APPROX. QUANTITIES FOR INLET

TYPE	CLASS ''A'' CONC.	STEEL
	CU. YDS.	LBS.
12A 1	3.96	158
12B 1	3.89	143
14A 1	4.09	159
14B 1	3.98	145

FOR APPROX. QUANTITIES FOR TYPE A2 OR B2 (ALL ''W'' WIDTHS) ADD 1.48 CU. YDS. CONCRETE AND 73 LBS. STEEL.

USE WITH CUR. STD. DWGS.
RDB-240 , RDB-420

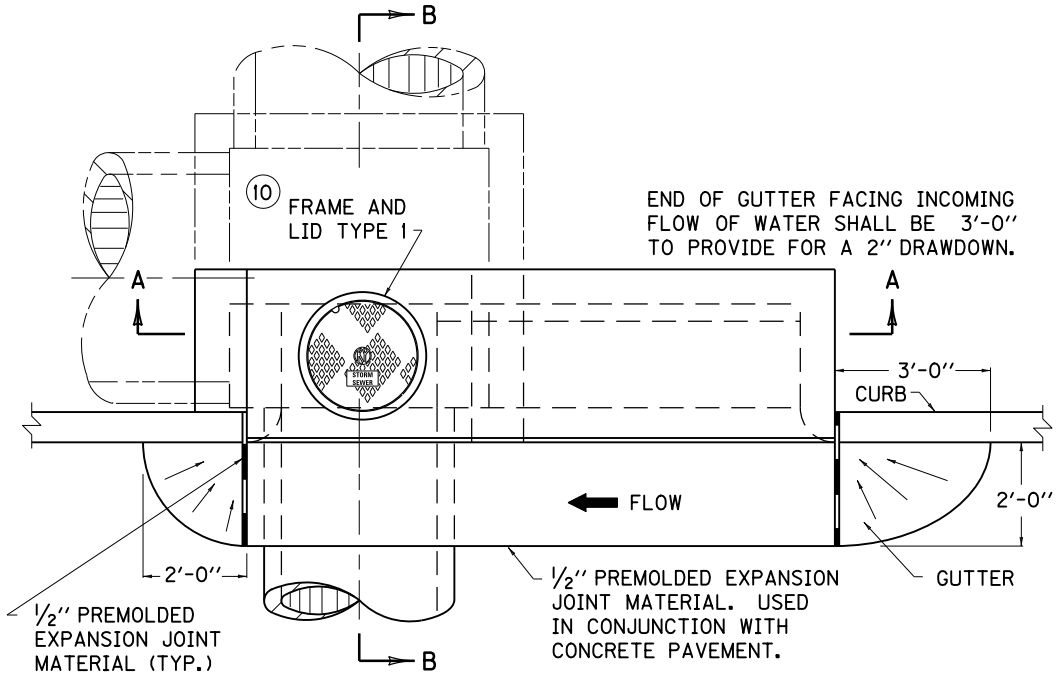
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE MEDIAN BARRIER BOX INLET (50'' TALL WALL SLIP-FORM)

STANDARD DRAWING NO. RDB-241-02

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

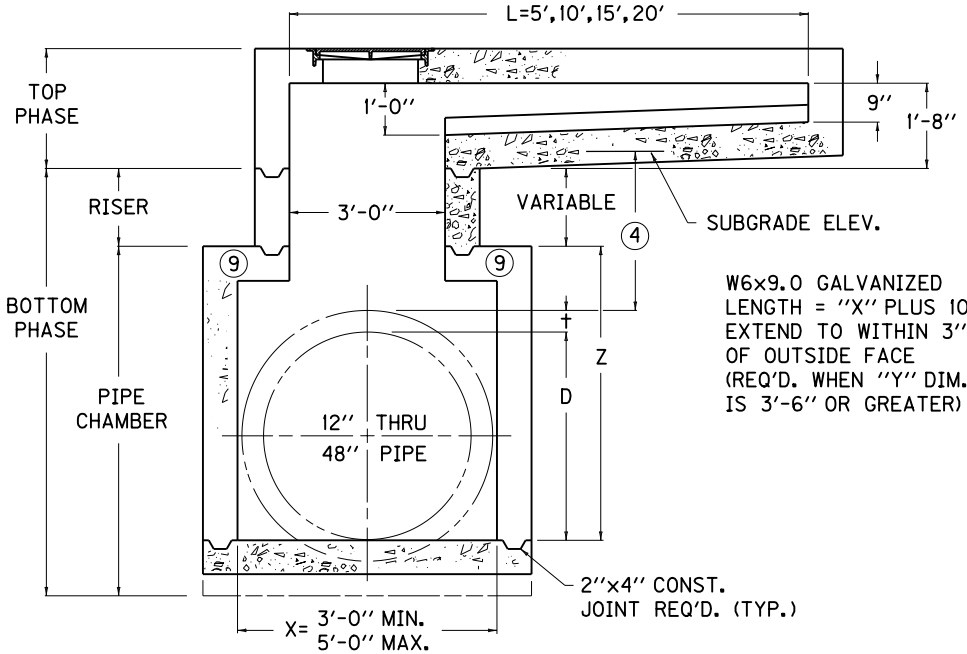


PLAN VIEW

~ NOTES ~

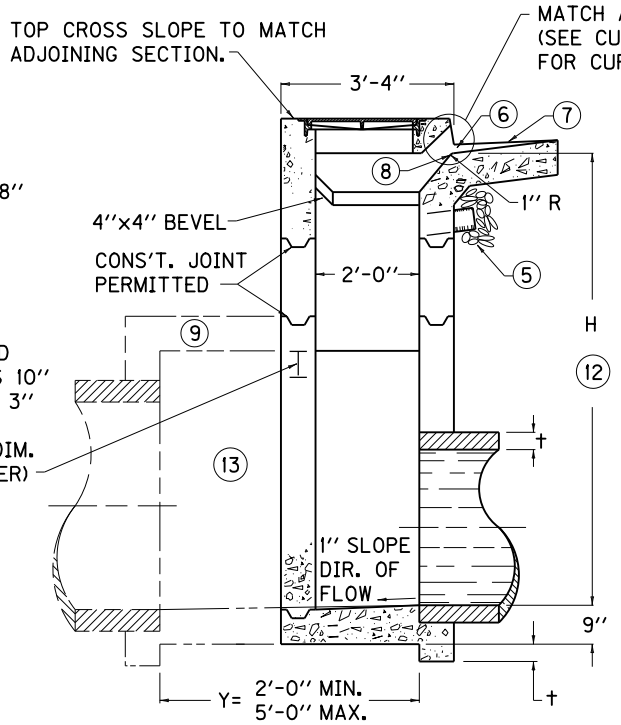
BID ITEM AND UNIT TO BID
CURB BOX INLET TYPE A △ EACH
△ (B) = BOTTOM PHASE ONLY, △ (T) = TOP PHASE ONLY
NO SUFFIX INDICATES COMPLETE INLET.

1. INLET SHALL BE CONSTRUCTED IN TWO PHASES (BOTTOM AND TOP)
2. SEE CUR. STD. DWGS. RDB-271, RDB-272, RDB-273, RDB-400, RDB-410 AND RDB-420 FOR STEEL PATTERN, DIMENSIONS AND QUANTITIES.
3. ALL WALLS, SLABS AND GUTTERS ARE 8" THICK UNLESS OTHERWISE INDICATED.
4. 2'-0" DESIRED COVER, 1'-0" MINIMUM COVER.
5. SPALLS OR CRUSHED STONE AROUND END OF 4" OR 6" PIPE FOR SUBGRADE DRAINAGE.
6. 2" MINIMUM DRAWDOWN.
7. GUTTER CROSS SLOPE.
8. FLOW LINE (2" BELOW NORMAL GUTTERLINE ELEVATION).
9. LID MAY BE RAISED OR LOWERED IF APPROVED BY THE ENGINEER.
10. SEE CUR. STD. DWG. RDM-100 FOR FRAME AND LID TYPE 1.
11. "t" IS CONCRETE PIPE WALL THICKNESS OR METAL PIPE CORRUGATION DEPTH.
12. MINIMUM HEIGHTS
    H = Z + 1'-8" FOR STANDARD CURB
    H = Z + 1'-10" FOR ISLAND CURB
    H = Z + 1'-5" FOR BARRIER CURB
13. CHAMBER MAY BE SHIFTED TO ROADWAY SIDE OF BOX PROVIDED THERE IS 1'-0" MINIMUM COVER BETWEEN SUBGRADE ELEVATION AND TOP OF PIPE.



SECTION A-A

W6x9.0 GALVANIZED
LENGTH = "X" PLUS 10"
EXTEND TO WITHIN 3"
OF OUTSIDE FACE
(REQ'D. WHEN "Y" DIM.
IS 3'-6" OR GREATER)



SECTION B-B

RISER
CU. YDS. CONC. PER FT. HT.
0.3

USE WITH CUR. STD. DWGS.
RDB-271, RDB-272, RDB-273,
RDB-400, RDB-410, RDB-420,
RDM-100

KENTUCKY
DEPARTMENT OF HIGHWAYS

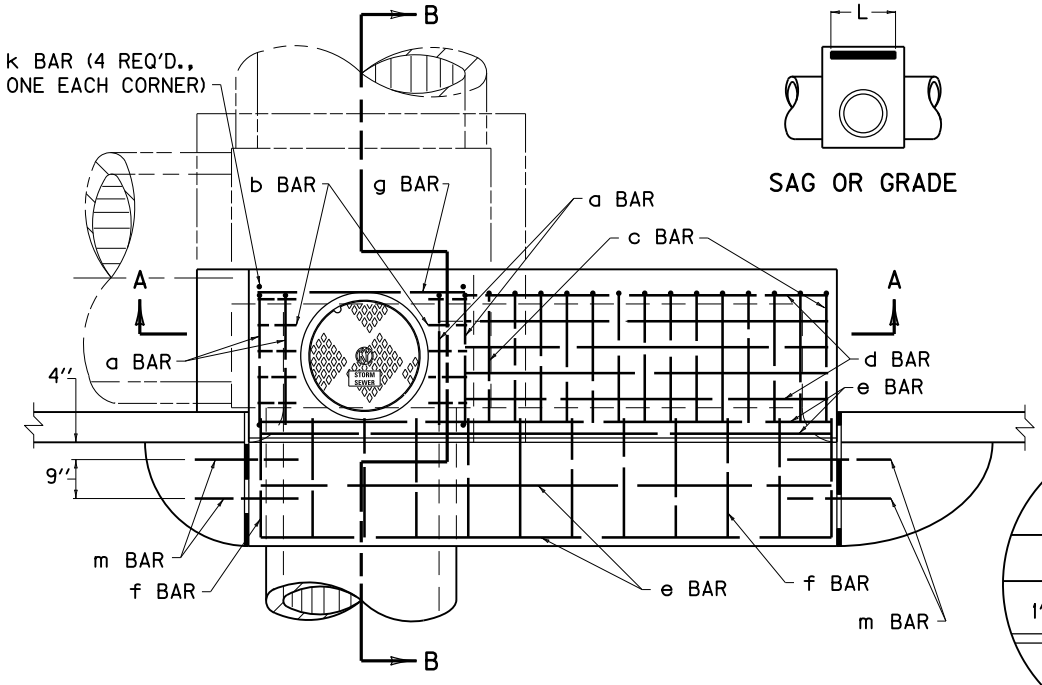
CURB BOX INLET TYPE A

(DETAIL DRAWING)

STANDARD DRAWING NO. RDB-270-09

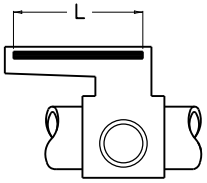
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

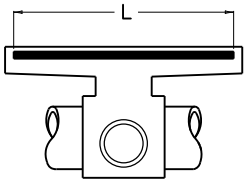


PLAN VIEW

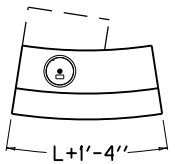
SAG OR GRADE



GRADE



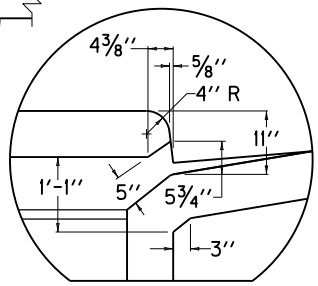
SAG



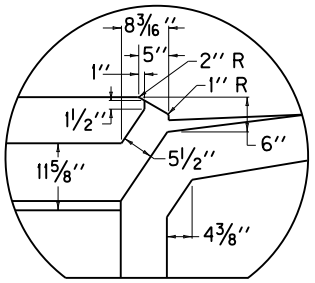
CURVE LAYOUT

~ NOTES ~

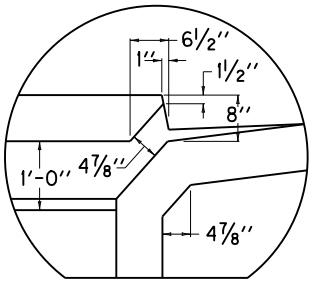
1. SEE CUR. STD. DWG. RDB-273 FOR LID REINFORCEMENT.
2. e, f, AND g BARS SPACED 1'-0'' O.C. ALL OTHER BARS SPACED 6'' O.C. EXCEPT WHERE OTHERWISE SPECIFIED.
3. PLACE ALL STEEL REINFORCEMENT 2'' FROM INSIDE OF INLET WALL EXCEPT WHERE OTHERWISE SPECIFIED.



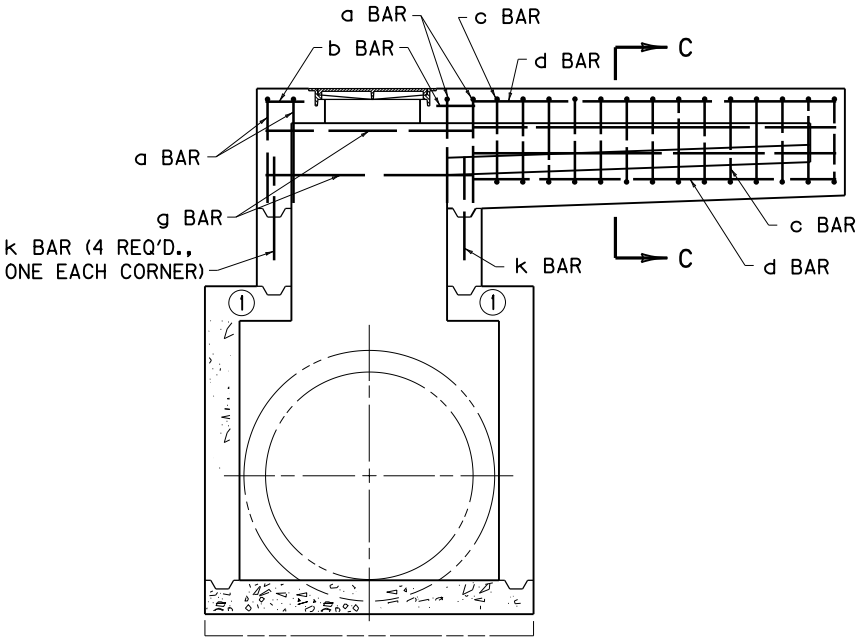
BARRIER CURB



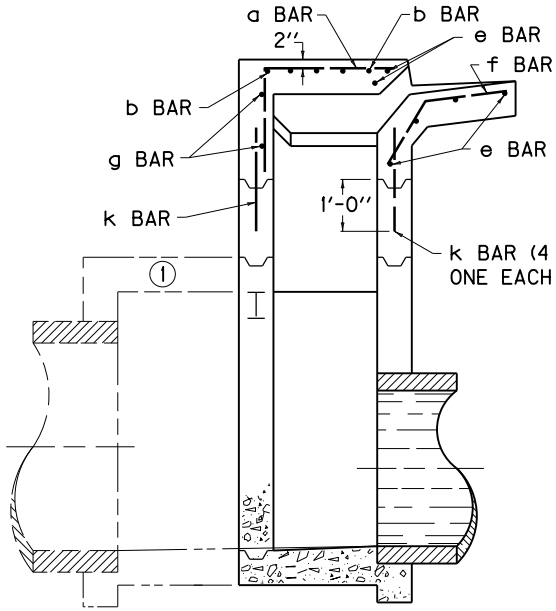
ISLAND CURB



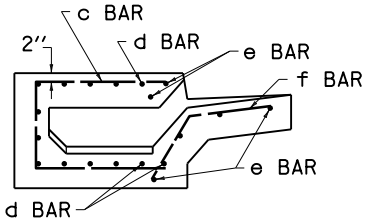
STANDARD CURB



SECTION A-A



SECTION B-B



SECTION C-C

USE WITH CUR. STD. DWGS.
RDB-270 , RDB-272, RDB-273,
RDB-400 , RDB-410, RDB-420

KENTUCKY
DEPARTMENT OF HIGHWAYS

CURB BOX INLET
TYPE A
(STEEL DRAWING)

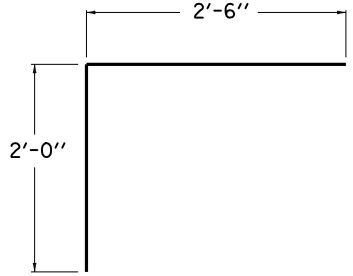
STANDARD DRAWING NO. RDB-271-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

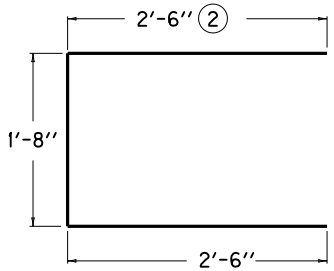
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

DIMENSIONS AND ESTIMATE OF QUANTITIES (TOP PHASE)

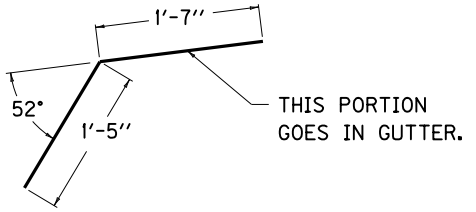
③ SIZE NO.		THROAT "L"	CONC.	NO. 5 STEEL BARS																				
				BAR a		BAR b		BAR c		BAR d ④		BAR d ⑤		BAR e		BAR f		BAR g		BAR k ①		BAR m		LBS.
GRADE	SAG	FT.	CU. YDS.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	
1	5	5′-0″	1.4	4	4′-6″	10	0′-9″	4	6′-7″	13	2′-0″	26	1′-0″	6	6′-0″	7	3′-0″	2	4′-0″	4	2′-0″	4	2′-0″	165
2	6	10′-0″	2.7					14			7′-0″		3′-6″		11′-0″	12								349
3	7	15′-0″	3.9					24			12′-0″		6′-0″		16′-0″	17								532
4	8	20′-0″	5.1					34			17′-0″		8′-6″		21′-0″	22								716



a BAR



c BAR



f BAR

~ NOTES ~

① USE "k" BARS ONLY IN CONJUNCTION WITH THE RISER.
② 2′-3″ FOR ISLAND CURB.
③ INLETS ARE SHOWN ON PLANS AS "CURB BOX INLET TYPE A". FOLLOWING THIS ON THE PLANS ARE TWO NUMBERS AND A BOX HEIGHT. USE SECOND NUMBER WITH THIS CHART.
④ THIS SET OF "d" BARS ARE TO BE USED ONLY WHEN THE BOX INLET IS BUILT ON GRADE.
⑤ THIS SET OF "d" BARS ARE TO BE USED ONLY WHEN THE BOX INLET IS BUILT IN A SAG.
6. "b", "d", "e", "g", "k", AND "m" BARS ARE ALL STRAIGHT BARS.
7. THE ENGINEER MAY REQUIRE ADDITIONAL REINFORCEMENT TO ELIMINATE SETTLEMENT OF ADJOINING SIDEWALK WHEN APPLICABLE. THIS WORK SHALL BE INCIDENTAL TO THE COST OF THE CURB BOX.

USE WITH CUR. STD. DWGS.
RDB-270, RDB-271, RDB-273, RDB-400, RDB-410, RDB-420

KENTUCKY
DEPARTMENT OF HIGHWAYS

CURB BOX INLET
TYPE A
(TOP PHASE TABLE)

STANDARD DRAWING NO. RDB-272-07

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

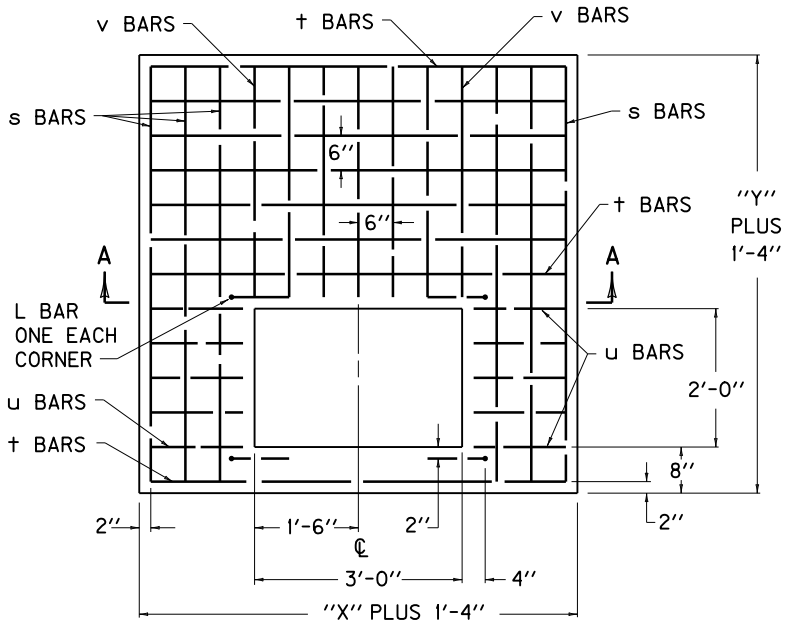
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

REINFORCEMENT STEEL FOR 8'' LID

SIZE		NO. 5 STEEL BARS								LBS.
		BAR s		BAR †		BAR u		BAR v		
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	
3'-0''	2'-0''	-	-	-	-	-	-	-	-	7
	2'-6''	4	3'-6''	6	4'-0''	-	-	14	0'-10''	59
	3'-0''		4'-0''	8					1'-4''	77
	3'-6''		4'-6''	10					1'-10''	94
	4'-0''		5'-0''	12					2'-4''	112
	4'-6''		5'-6''	14					2'-10''	130
	5'-0''		6'-0''	16					3'-4''	147
3'-6''	2'-0''	4	3'-0''	4	4'-6''	-	-	-	-	38
	2'-6''		3'-6''	6				14	0'-10''	62
	3'-0''		4'-0''	8					1'-4''	81
	3'-6''		4'-6''	10					1'-10''	100
	4'-0''		5'-0''	12					2'-4''	118
	4'-6''		5'-6''	14					2'-10''	137
	5'-0''		6'-0''	16					3'-4''	156
4'-0''	2'-0''	8	3'-0''	4	5'-0''	20	0'-10''	-	-	70
	2'-6''		3'-6''	6				14	0'-10''	97
	3'-0''		4'-0''	8					1'-4''	119
	3'-6''		4'-6''	10					1'-10''	141
	4'-0''		5'-0''	12					2'-4''	163
	4'-6''		5'-6''	14					2'-10''	185
	5'-0''		6'-0''	16					3'-4''	207
4'-6''	2'-0''	8	3'-0''	4	5'-6''	20	1'-1''	-	-	78
	2'-6''		3'-6''	6				14	0'-10''	105
	3'-0''		4'-0''	8					1'-4''	128
	3'-6''		4'-6''	10					1'-10''	151
	4'-0''		5'-0''	12					2'-4''	174
	4'-6''		5'-6''	14					2'-10''	197
	5'-0''		6'-0''	16					3'-4''	220
5'-0''	2'-0''	12	3'-0''	4	6'-0''	20	1'-4''	-	-	97
	2'-6''		3'-6''	6				14	0'-10''	127
	3'-0''		4'-0''	8					1'-4''	154
	3'-6''		4'-6''	10					1'-10''	180
	4'-0''		5'-0''	12					2'-4''	207
	4'-6''		5'-6''	14					2'-10''	233
	5'-0''		6'-0''	16					3'-4''	259

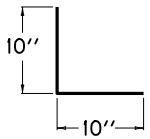
~ NOTES ~

1. IN ADDITION TO THE CHARTED STEEL, FOUR ''L'' BARS ARE REQUIRED IN THE LID AND ARE INCLUDED IN THE TOTALS.
2. CONCRETE QUANTITIES FOR LID ARE INCLUDED ON ''DIMENSIONS AND ESTIMATE OF QUANTITIES (PIPE CHAMBER)'', SEE CUR. STD. DWG. RDB-410.
3. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2'' FROM THE OUTSIDE FACE UNLESS OTHERWISE SHOWN.



DETAIL OF 8'' LID
PLAN VIEW

SECTION A-A



L BAR DETAIL

USE WITH CUR. STD. DWGS.
RDB-271, RDB-272, RDB-400,
RDB-410, RDB-420, RDB-270

KENTUCKY
DEPARTMENT OF HIGHWAYS

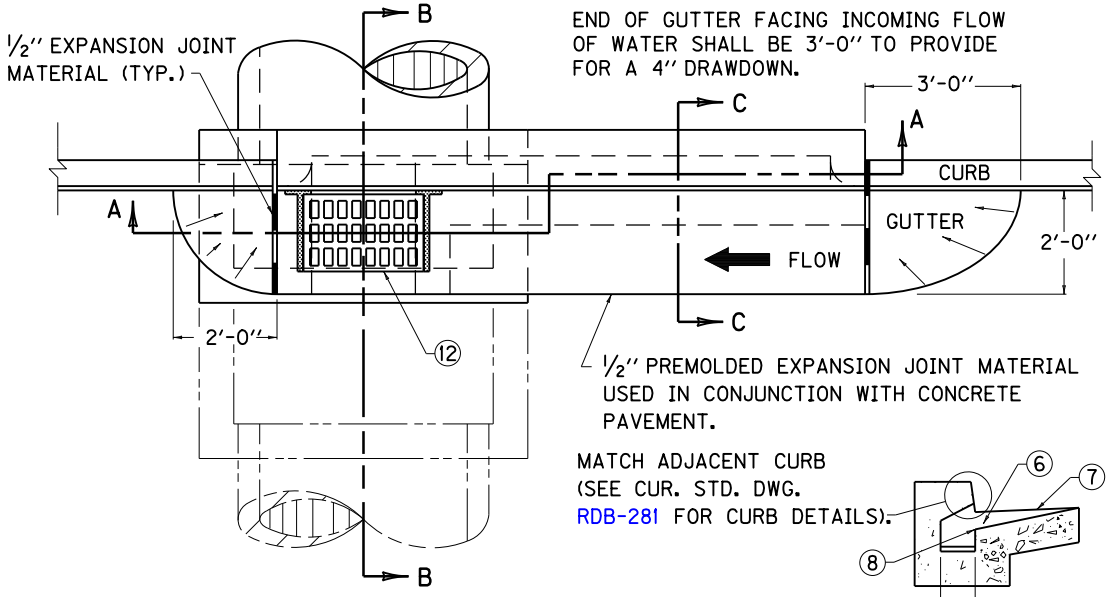
CURB BOX INLET
TYPE A

(DETAIL & BAR CHART FOR 8'' LID)

STANDARD DRAWING NO. RDB-273-06

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

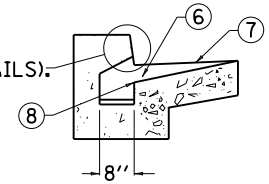
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



END OF GUTTER FACING INCOMING FLOW OF WATER SHALL BE 3'-0" TO PROVIDE FOR A 4" DRAWDOWN.

½" PREMOLDED EXPANSION JOINT MATERIAL USED IN CONJUNCTION WITH CONCRETE PAVEMENT.

MATCH ADJACENT CURB (SEE CUR. STD. DWG. RDB-281 FOR CURB DETAILS).



PLAN VIEW

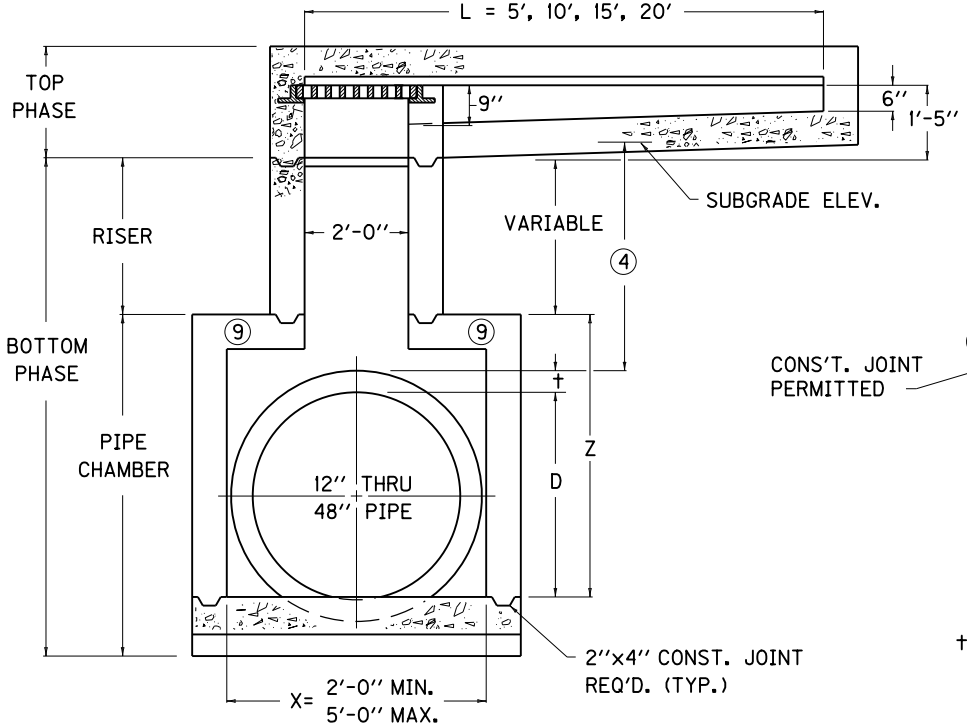
SECTION C-C

~ NOTES ~

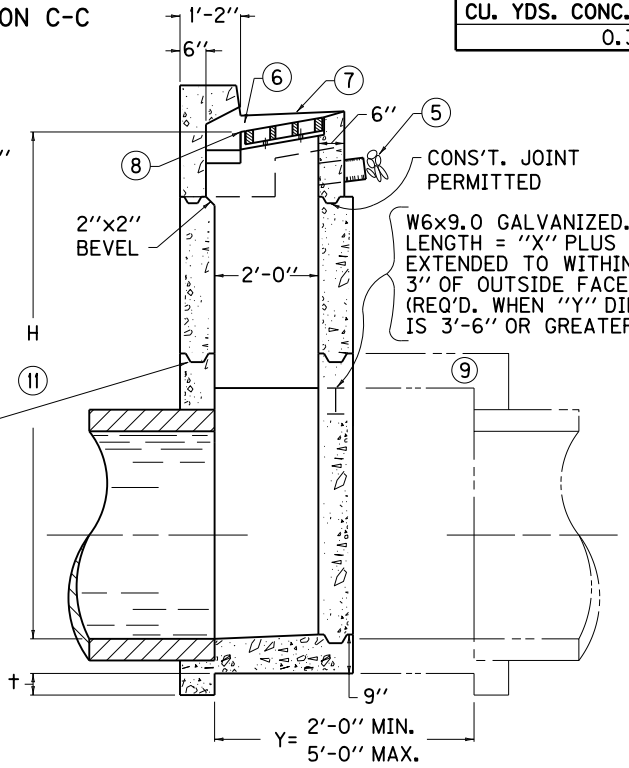
BID ITEM AND UNIT TO BID
CURB BOX INLET TYPE B △ EACH
△ (B) = BOTTOM PHASE ONLY △ (T) = TOP PHASE ONLY
NO SUFFIX INDICATES COMPLETE INLET.

1. INLET SHALL BE CONSTRUCTED IN TWO PHASES (BOTTOM AND TOP).
2. SEE CUR. STD. DWGS. RDB-281, RDB-282, RDB-283, RDB-400, RDB-410, AND RDB-420 FOR STEEL PATTERN, DIMENSIONS AND QUANTITIES.
3. ALL WALLS, SLABS AND GUTTERS ARE 8" THICK UNLESS OTHERWISE INDICATED.
4. 24" DESIRED COVER, 12" MINIMUM COVER.
5. SPALLS OR CRUSHED STONE AROUND END OF A 4" OR 6" PIPE FOR SUBGRADE DRAINAGE.
6. 4" MINIMUM DRAWDOWN.
7. GUTTER CROSS SLOPE.
8. FLOW LINE (4" BELOW NORMAL GUTTERLINE ELEVATION).
9. LID MAY BE RAISED OR LOWERED IF APPROVED BY THE ENGINEER.
10. "†" IS CONCRETE PIPE WALL THICKNESS OR METAL PIPE CORRUGATION DEPTH.
11. MINIMUM HEIGHT H = Z + 1'-4" FOR ALL CURB TYPES
12. SEE CUR. STD. DWG. RDB-282 FOR FRAME AND GRATE DETAIL.

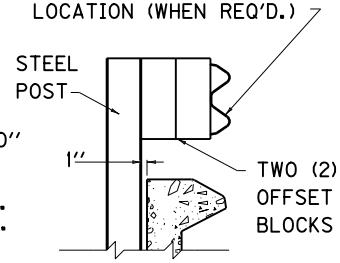
RISER
CU. YDS. CONC. PER FT. HT.
0.3



SECTION A-A



SECTION B-B



GUARDRAIL DETAIL

USE WITH CUR. STD. DWGS. RDB-281, RDB-282, RDB-283, RDB-400, RDB-410, RDB-420

KENTUCKY DEPARTMENT OF HIGHWAYS

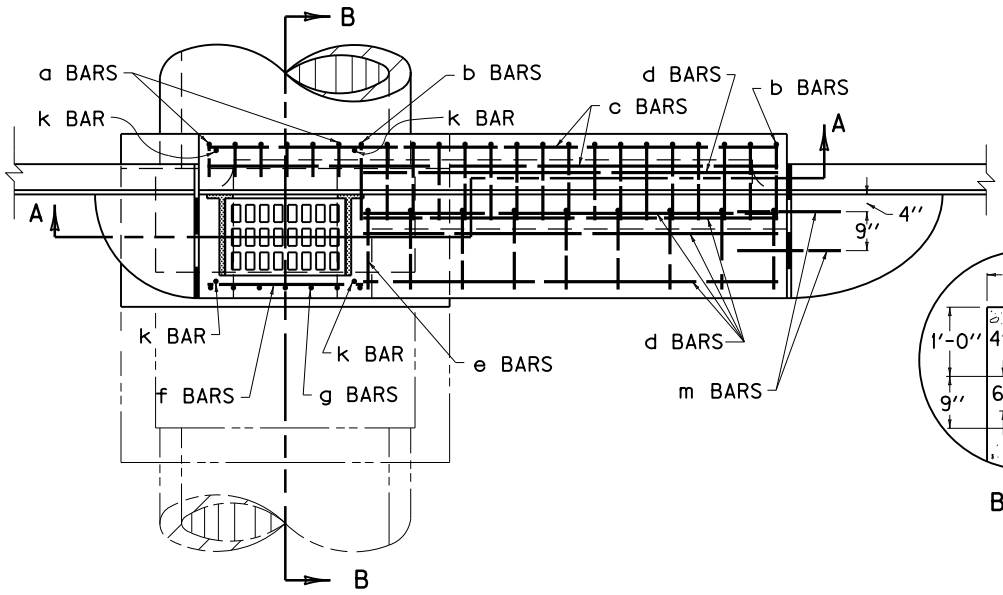
CURB BOX INLET TYPE B

(DETAIL DRAWING)

STANDARD DRAWING NO. RDB-280-06

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

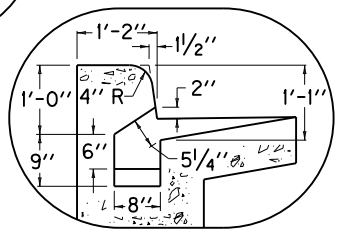
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



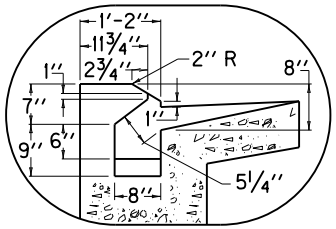
PLAN VIEW

~ NOTES ~

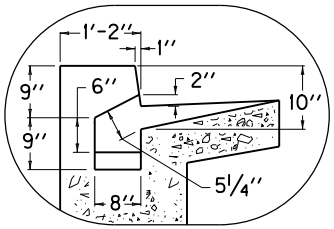
1. SEE CUR. STD. DWG. RDB-283 FOR LID REINFORCEMENT.
2. "e" and "d" BARS SPACED 1'-0" O.C. ALL OTHER BARS SPACED 6" O.C. EXCEPT WHERE OTHERWISE SPECIFIED.
3. PLACE ALL STEEL REINFORCEMENT 2" FROM INSIDE OF INLET WALL EXCEPT WHERE OTHERWISE SPECIFIED.



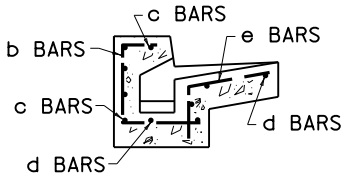
BARRIER CURB



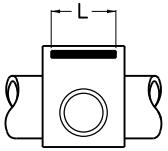
ISLAND CURB



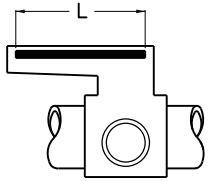
STANDARD CURB



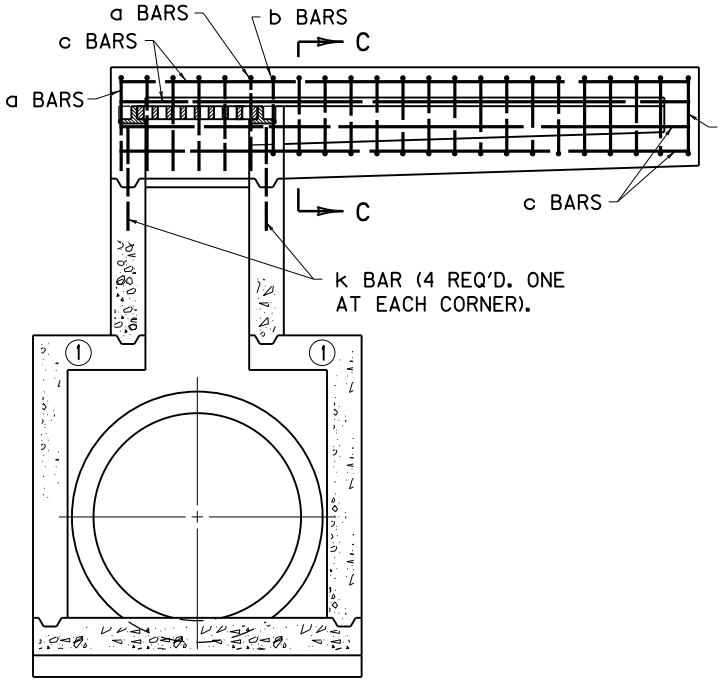
SECTION C-C



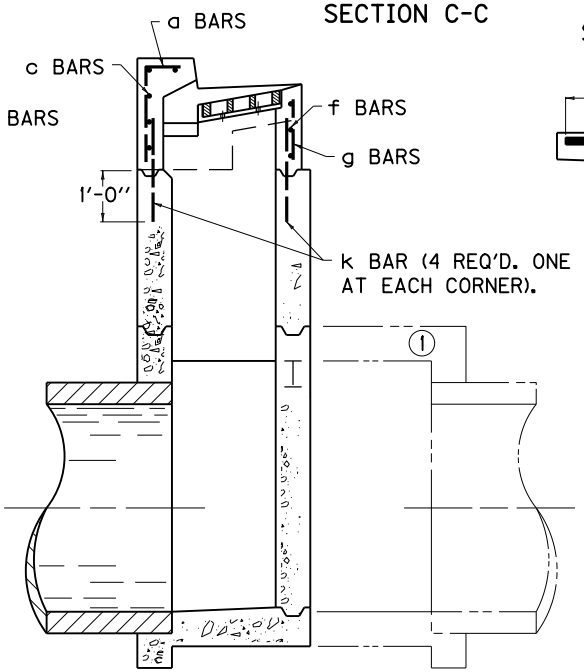
SAG OR GRADE



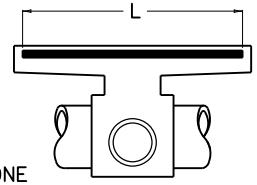
GRADE



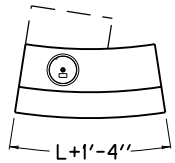
SECTION A-A



SECTION B-B



SAG



CURVE LAYOUT

USE WITH CUR. STD. DWGS.
RDB-280 , RDB-282, RDB-283,
RDB-400 , RDB-410 , RDB-420

KENTUCKY
DEPARTMENT OF HIGHWAYS

CURB BOX INLET
TYPE B
(STEEL DRAWING)

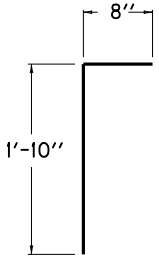
STANDARD DRAWING NO. RDB-281-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

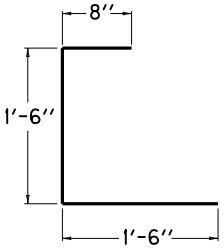
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

DIMENSIONS AND ESTIMATE OF QUANTITIES (TOP PHASE)

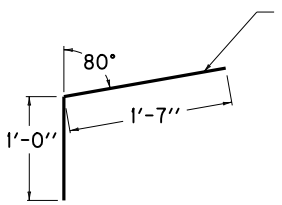
② SIZE NO.		THROAT "L"	CONC.	NO. 5 STEEL BARS																				LBS.
				BAR a		BAR b		BAR c		BAR d ④		BAR d ⑤		BAR e		BAR f		BAR g		BAR k ①		BAR m		
GRADE	SAG	FT.	CU. YDS.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	
1	5	5'-0"	0.8	6	2'-6"	7	3'-7"	5	6'-0"	5	3'-0"	10	1'-6"	4	2'-7"	3	3'-0"	7	1'-2"	4	2'-0"	4	2'-0"	127
2	6	10'-0"	1.5			17			11'-0"		8'-0"		4'-0"	10										233
3	7	15'-0"	2.1			27			16'-0"		13'-0"		6'-6"	14										333
4	8	20'-0"	2.8			37			21'-0"		18'-0"		9'-0"	20										439



a BAR



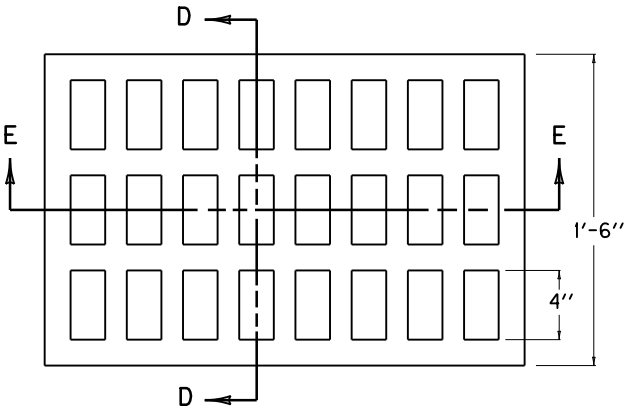
b BAR



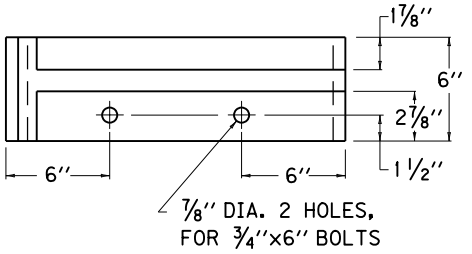
e BAR

~ NOTES ~

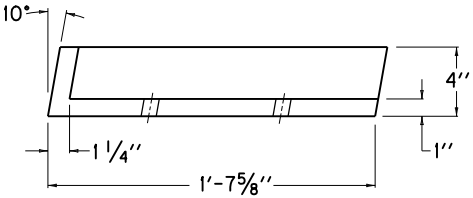
① USE "k" BARS ONLY IN CONJUNCTION WITH THE RISER.
② INLETS ARE SHOWN ON PLANS AS "CURB BOX INLET TYPE B". FOLLOWING THIS ON THE PLANS ARE TWO NUMBERS AND A BOX HEIGHT. USE SECOND NUMBER WITH THIS CHART.
3. MANUFACTURES' DRAFT WILL BE ACCEPTED ON ALL CASTINGS.
④ THIS SET OF "d" BARS ARE TO BE USED ONLY WHEN THE BOX INLET IS BUILT ON GRADE.
⑤ THIS SET OF "d" BARS ARE TO BE USED ONLY WHEN THE BOX INLET IS BUILT IN A SAG.
6. "c", "d", "f", "g", "k", AND "m" BARS ARE ALL STRAIGHT BARS.
7. THE ENGINEER MAY REQUIRE ADDITIONAL REINFORCEMENT, TO ELIMINATE SETTLEMENT OF ADJOINING SIDEWALK WHEN APPLICABLE. THIS WORK SHALL BE INCIDENTAL TO THE COST OF THE CURB BOX.



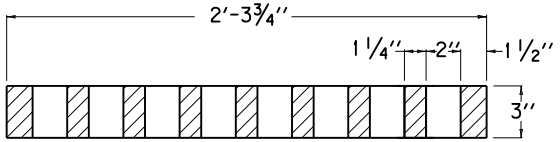
GRATE PLAN VIEW



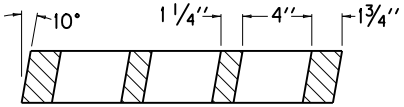
FRAME PLAN VIEW
(LEFT HALF)



FRAME ELEVATION



SECTION E-E



SECTION D-D

USE WITH CUR. STD. DWGS.
RDB-280 , RDB-281 , RDB-283
RDB-400 , RDB-410 , RDB-420

KENTUCKY
DEPARTMENT OF HIGHWAYS

CURB BOX INLET
TYPE B
(TOP PHASE TABLE)

STANDARD DRAWING NO. RDB-282-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

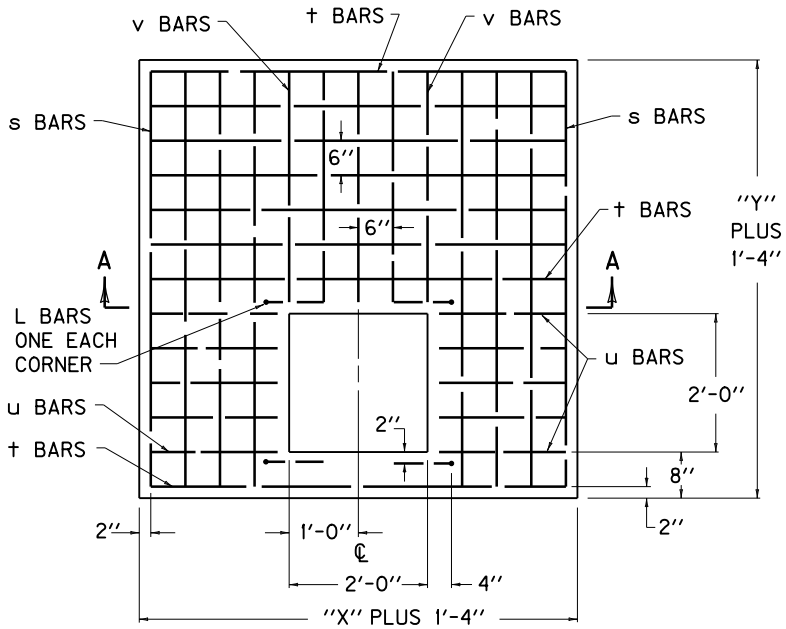
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

REINFORCEMENT STEEL FOR 8'' LID

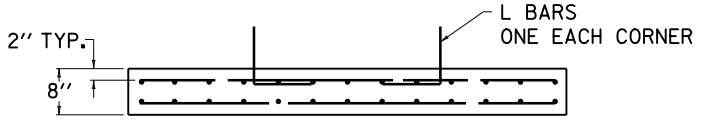
SIZE		NO. 5 STEEL BARS								LBS.
		BAR s		BAR †		BAR u		BAR v		
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	
2'-0''	2'-0''	-	-	-	-	-	-	-	-	7
	2'-6''	4	3'-6''	6	3'-0''	-	-	10	0'-10''	49
	3'-0''		4'-0''	8					1'-4''	63
	3'-6''		4'-6''	10					1'-10''	76
	4'-0''		5'-0''	12					2'-4''	90
	4'-6''		5'-6''	14					2'-10''	103
	5'-0''		6'-0''	16					3'-4''	117
2'-6''	2'-0''	4	3'-0''	4	3'-6''	-	-	-	-	34
	2'-6''		3'-6''	6				10	0'-10''	52
	3'-0''		4'-0''	8					1'-4''	67
	3'-6''		4'-6''	10					1'-10''	81
	4'-0''		5'-0''	12					2'-4''	96
	4'-6''		5'-6''	14					2'-10''	111
	5'-0''		6'-0''	16					3'-4''	125
3'-0''	2'-0''	8	3'-0''	4	4'-0''	20	0'-10''	-	-	66
	2'-6''		3'-6''	6				10	0'-10''	87
	3'-0''		4'-0''	8					1'-4''	105
	3'-6''		4'-6''	10					1'-10''	123
	4'-0''		5'-0''	12					2'-4''	141
	4'-6''		5'-6''	14					2'-10''	158
	5'-0''		6'-0''	16					3'-4''	178
3'-6''	2'-0''	8	3'-0''	4	4'-6''	20	1'-1''	-	-	73
	2'-6''		3'-6''	6				10	0'-10''	96
	3'-0''		4'-0''	8					1'-4''	114
	3'-6''		4'-6''	10					1'-10''	133
	4'-0''		5'-0''	12					2'-4''	152
	4'-6''		5'-6''	14					2'-10''	171
	5'-0''		6'-0''	16					3'-4''	190
4'-0''	2'-0''	12	3'-0''	4	5'-0''	20	1'-4''	-	-	93
	2'-6''		3'-6''	6				10	0'-10''	119
	3'-0''		4'-0''	8					1'-4''	141
	3'-6''		4'-6''	10					1'-10''	162
	4'-0''		5'-0''	12					2'-4''	184
	4'-6''		5'-6''	14					2'-10''	206
	5'-0''		6'-0''	16					3'-4''	228
4'-6''	2'-0''	12	3'-0''	4	5'-6''	20	1'-7''	-	-	101
	2'-6''		3'-6''	6				10	0'-10''	127
	3'-0''		4'-0''	8					1'-4''	150
	3'-6''		4'-6''	10					1'-10''	173
	4'-0''		5'-0''	12					2'-4''	196
	4'-6''		5'-6''	14					2'-10''	219
	5'-0''		6'-0''	16					3'-4''	242
5'-0''	2'-0''	16	3'-0''	4	6'-0''	20	1'-10''	-	-	120
	2'-6''		3'-6''	6				10	0'-10''	150
	3'-0''		4'-0''	8					1'-4''	176
	3'-6''		4'-6''	10					1'-10''	202
	4'-0''		5'-0''	12					2'-4''	228
	4'-6''		5'-6''	14					2'-10''	254
	5'-0''		6'-0''	16					3'-4''	280

~ NOTES ~

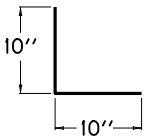
1. IN ADDITION TO THE CHARTED STEEL, FOUR ''L'' BARS ARE REQUIRED IN THE LID AND ARE INCLUDED IN THE TOTALS.
2. CONCRETE QUANTITIES FOR LID ARE INCLUDED ON ''DIMENSIONS AND ESTIMATE OF QUANTITIES (PIPE CHAMBER)'', SEE CUR. STD. DWG. RDB-410.
3. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2'' FROM THE OUTSIDE FACE UNLESS OTHERWISE SHOWN.



DETAIL OF 8'' LID
PLAN VIEW



SECTION A-A



L BAR DETAIL

USE WITH CUR. STD. DWGS.
RDB-280 , RDB-281 , RDB-282,
RDB-400 , RDB-410 , RDB-420

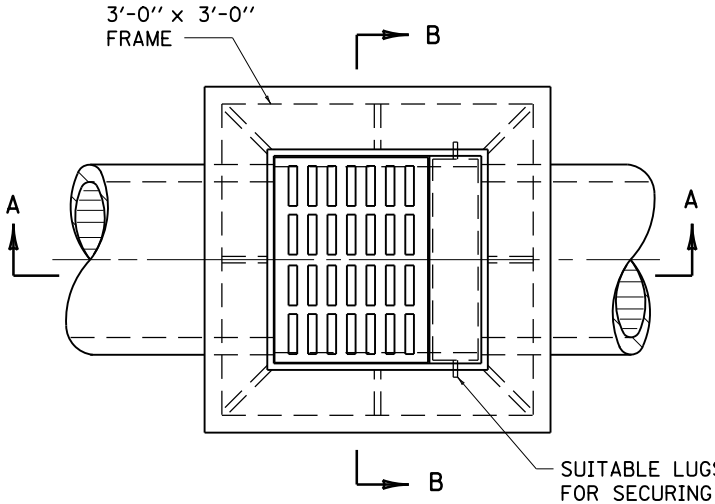
KENTUCKY
DEPARTMENT OF HIGHWAYS

CURB BOX INLET
TYPE B
(DETAIL & BAR CHART FOR 8'' LID)

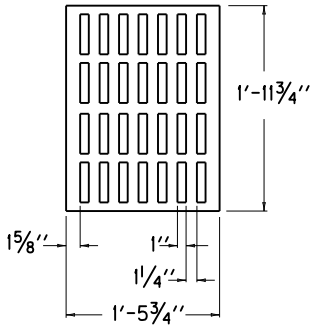
STANDARD DRAWING NO. RDB-283-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

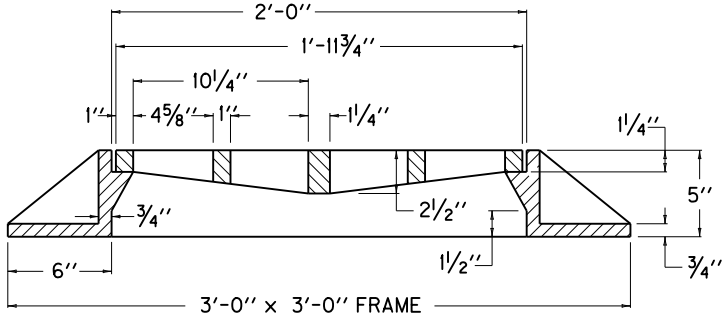
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW



GRATE
PLAN VIEW



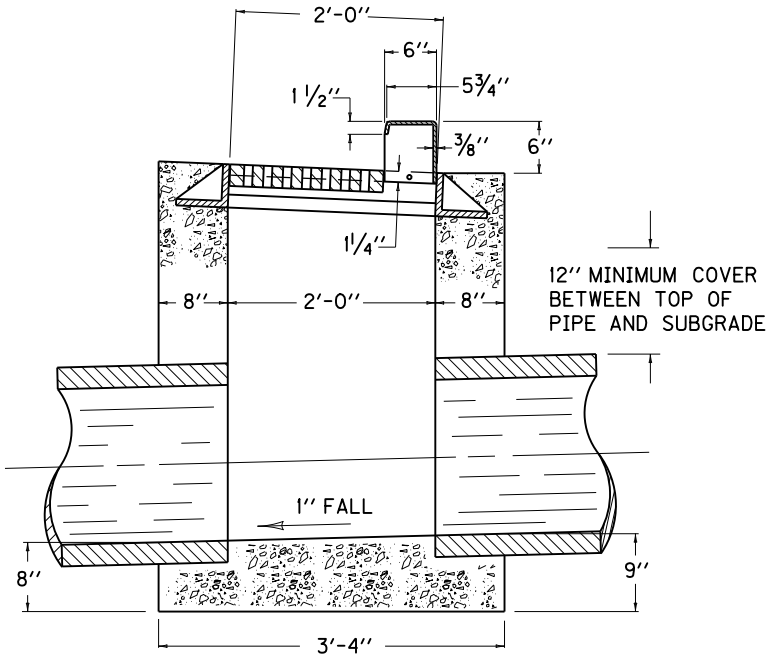
DETAIL OF FRAME & GRATE
AT SECTION A-A

BID ITEM AND UNIT TO BID
CURB BOX INLET TYPE F EACH

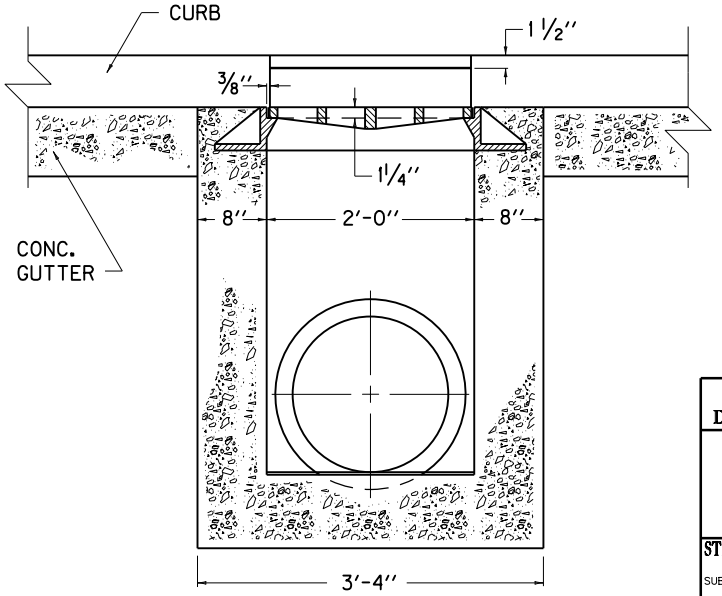
APPROXIMATE QUANTITIES

PIPE SIZE	MIN. HEIGHT	CU. YDS. CONC.
15″	4′-0″	1.15
18″	4′-3″	1.22
CURB FRAME WEIGHT = 61 LBS.		
FRAME WEIGHT = 277 LBS.		
GRATE WEIGHT = 127 LBS.		

NO DEDUCTIONS HAVE BEEN MADE FOR PIPE.



SECTION A-A



SECTION B-B

KENTUCKY
DEPARTMENT OF HIGHWAYS

CURB BOX INLET
TYPE F

STANDARD DRAWING NO. RDB-320-06

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

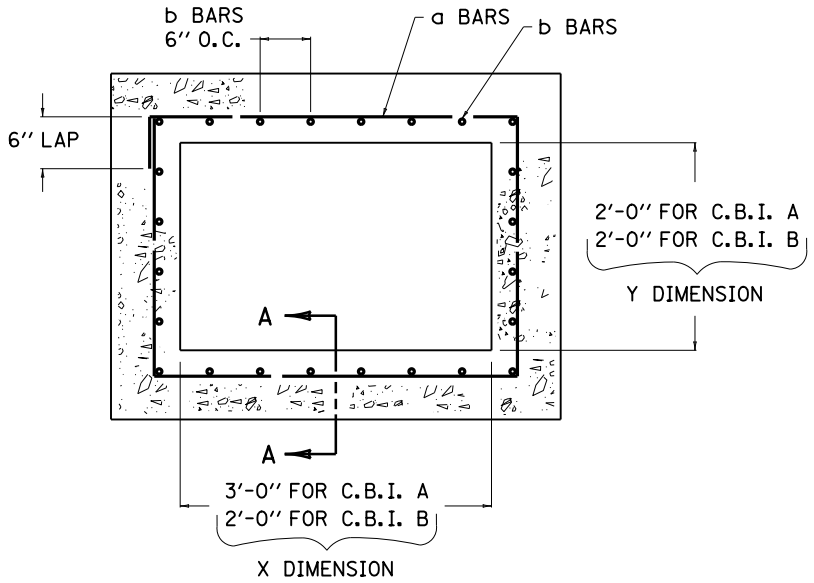
ADDITIONAL STEEL REQUIREMENTS FOR RISER

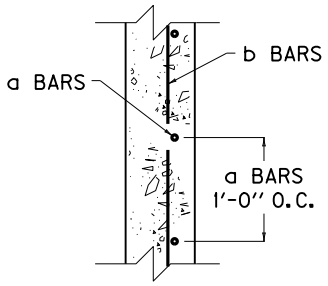
(WHEN H = 8′ TO 15′)

~ NOTES ~

(1) USE WHEN "H" EXCEEDS 8′-0"

2. ALL REINFORCEMENT SHALL BE NO. 5 STEEL BARS.





SECTION A-A
CURB BOX INLET TYPE A
AND
CURB BOX INLET TYPE B

(1) APPROXIMATE QUANTITIES PER ONE FT. IN HEIGHT	
C.B.I. A	C.B.I. B
LBS. STEEL	LBS. STEEL
38	31

(USE WITH C.B.I. A & C.B.I. B WHEN H = 8′ TO 15′)

KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX INLET RISER

STANDARD DRAWING NO. RDB-400-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

DIMENSIONS AND ESTIMATE OF QUANTITIES
(PIPE CHAMBER)

INLET SIZE ④			PIPE		Z ①	CONCRETE	
NO. ⑥	X	Y	MAX. DIA.	LOCA-TION		CU. YDS. ① ②	Q ③
1	2′-0″	2′-0″	12″	X OR Y	2′-2″	0.9	0.3
2	3′-0″					1.1	
3	2′-0″		15″		2′-5″	0.9	
4	3′-0″					1.2	
5	2′-0″		18″		2′-9″	1.0	
6	3′-0″					1.3	
7	2′-0″	2′-6″	21″	Y	3′-0″	1.2	
8	2′-6″	2′-0″		X			
9		2′-6″		X OR Y		1.4	
10	3′-0″	2′-0″		X			
11		2′-6″		X OR Y		1.5	
12	2′-0″	2′-0″	24″	Y	3′-3″	1.3	
13	2′-6″			X			
14		2′-6″		X OR Y		1.5	
15	3′-0″	2′-0″		X		1.4	
16		2′-6″		X OR Y		1.6	
17	2′-0″	3′-0″	27″	Y	3′-6″	1.5	
18	2′-6″					1.7	
19	3′-0″	2′-0″		X		1.5	
20		2′-6″				1.7	
21		3′-0″		X OR Y		1.9	0.4
22	2′-0″	3′-6″	30″	Y	4′-1″		0.3
23	2′-6″					2.1	0.4
24	3′-0″					2.3	
25	3′-6″	2′-0″		X	3′-10″	1.8	0.3
26		2′-6″				2.0	
27		3′-0″				2.2	0.4
28		3′-6″		X OR Y	4′-1″	2.5	
29	2′-0″		33″	Y	4′-4″	2.0	0.3
30	2′-6″					2.2	0.4
31	3′-0″					2.4	
32	3′-6″	2′-0″		X	4′-1″	1.9	0.3
33		2′-6″				2.1	0.4
34		3′-0″				2.3	
35		3′-6″		X OR Y	4′-4″	2.6	
36	2′-0″	4′-0″	36″	Y	4′-7″	2.2	
37	2′-6″					2.5	
38	3′-0″					2.7	
39	3′-6″					2.9	
40	4′-0″	2′-0″		X	4′-4″	2.1	
41		2′-6″				2.4	
42		3′-0″				2.6	
43		3′-6″			4′-7″	2.9	
44		4′-0″		X OR Y		3.2	0.5
45	2′-0″	4′-6″	42″	Y	5′-2″	2.6	
46	2′-6″					2.9	0.4
47	3′-0″					3.2	

INLET SIZE ④			PIPE		Z ①	CONCRETE	
NO. ⑥	X	Y	MAX. DIA.	LOCA-TION		CU. YDS. ① ②	Q ③
48	3′-6″	4′-6″	42″	Y	5′-2″	3.4	0.5
49	4′-0″					3.7	
50	4′-6″	2′-0″		X	4′-11″	2.5	0.4
51		2′-6″				2.8	
52		3′-0″				3.0	
53		3′-6″			5′-2″	3.4	0.5
54		4′-0″				3.5	
55		4′-6″		X OR Y		3.9	
56	2′-0″	5′-0″	48″	Y	5′-8″	3.0	0.4
57	2′-6″					3.3	
58	3′-0″					3.6	0.5
59	3′-6″					3.9	
60	4′-0″					4.2	
61	4′-6″					4.5	
62	5′-0″	2′-0″		X	5′-5″	2.9	0.4
63		2′-6″				3.2	
64		3′-0″				3.5	0.5
65		3′-6″			5′-8″	3.9	
66		4′-0″				4.2	
67		4′-6″				4.5	
68		5′-0″		X OR Y		4.7	0.6

~ NOTES ~

① BASED ON ″Z″ AS EQUAL TO D+†+12″ WHEN ″Y″ DIMENSION IS LESS THAN 3′-6″. BASED ON ″Z″ AS EQUAL TO D+†+15″ WHEN ″Y″ DIMENSION IS 3′-6″ OR GREATER.

② SEE REFERENCE CHART FOR QUANTITIES TO DEDUCT FOR PIPE.

③ Q = CU. YDS. PER FT. INCREASE OR DECREASE WHEN ″Z″ VARIES.

④ SEE THE FOLLOWING CUR. STD. DWGS. FOR STEEL PATTERN AND DIMENSIONS:
CURB BOX INLET TYPE A - RDB-270 AND RDB-271
CURB BOX INLET TYPE B - RDB-280 AND RDB-281

5. SEE CUR. STD. DWGS. RDB-400 AND RDB-420 FOR REINFORCEMENT IN PIPE CHAMBER AND RISER WHEN ″H″ = 8′-0″ OR GREATER.

⑥ INLETS ARE SHOWN ON PLANS AS CURB BOX INLET TYPE ″A″ OR CURB BOX INLET TYPE ″B″. FOLLOWING THIS ON THE PLANS ARE TWO NUMBERS AND A BOX HEIGHT. USE FIRST NUMBER WITH THIS CHART.

REFERENCE CHART

DIA. OF PIPE	C.B.I. TYPE A		C.B.I. TYPE B		CONCRETE TO DEDUCT FOR EACH PIPE
	PIPE ON ″X″ SIDE OF INLET	PIPE ON ″Y″ SIDE OF INLET	PIPE ON ″X″ SIDE OF INLET	PIPE ON ″Y″ SIDE OF INLET	CU. YDS.
0	3′-0″	2′-0″	2′-0″	2′-0″	-
12″					0.1
15″-18″					
21″-24″		2′-6″	2′-6″	2′-6″	
27″		3′-0″	3′-0″	3′-0″	0.2
30″-33″	3′-6″	3′-6″	3′-6″	3′-6″	
36″	4′-0″	4′-0″	4′-0″	4′-0″	0.3
42″	4′-6″	4′-6″	4′-6″	4′-6″	0.4
48″	5′-0″	5′-0″	5′-0″	5′-0″	0.5

USE THIS DRAWING FOR BOTTOM PHASE AND COMPLETE INLET WITH C.B.I. A AND C.B.I. B.

USE WITH CUR. STD. DWG. RDB-270 , RDB-271 , RDB-280 , RDB-281 , RDB-400 , RDB-420

KENTUCKY
DEPARTMENT OF HIGHWAYS

BOX INLET
PIPE CHAMBER

STANDARD DRAWING NO. RDB-410-06

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

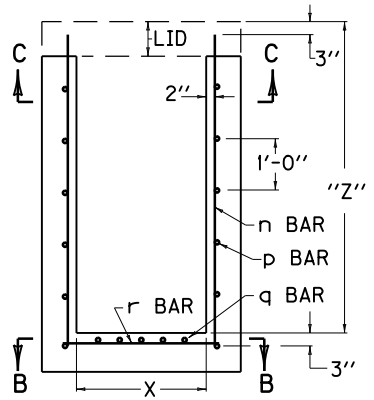
① ADDITIONAL STEEL REINFORCEMENT REQUIREMENTS
(PIPE CHAMBER, H = 8′ TO 15′)

SIZE ②		NO. 5 STEEL BARS									
		③ BAR n		④ BAR p		BAR q		BAR r		LBS.	⑤
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	TOTAL	⑥
2′-0″	2′-0″	20	6′-0″	7	10′-2″	4	2′-6″	4	2′-6″	220	31
	2′-6″	22			11′-2″		3′-0″	5		245	35
	3′-0″	24			12′-2″		3′-6″	6		269	38
	3′-6″	26			13′-2″		4′-0″	7		294	41
	4′-0″	28			14′-2″		4′-6″	8		318	44
	4′-6″	30			15′-2″		5′-0″	9		343	47
	5′-0″	32			16′-2″		5′-6″	10		367	50
2′-6″	2′-0″	22	6′-0″	7	11′-2″	5	2′-6″	4	3′-0″	245	35
	2′-6″	24			12′-2″		3′-0″	5		270	38
	3′-0″	26			13′-2″		3′-6″	6		296	41
	3′-6″	28			14′-2″		4′-0″	7		321	44
	4′-0″	30			15′-2″		4′-6″	8		347	47
	4′-6″	32			16′-2″		5′-0″	9		373	50
	5′-0″	34			17′-2″		5′-6″	10		398	53
3′-0″	2′-0″	24	6′-0″	7	12′-2″	6	2′-6″	4	3′-6″	268	38
	2′-6″	26			13′-2″		3′-0″	5		295	41
	3′-0″	28			14′-2″		3′-6″	6		321	44
	3′-6″	30			15′-2″		4′-0″	7		348	47
	4′-0″	32			16′-2″		4′-6″	8		374	50
	4′-6″	34			17′-2″		5′-0″	9		401	53
	5′-0″	36			18′-2″		5′-6″	10		427	57
3′-6″	2′-0″	26	6′-0″	7	13′-2″	7	2′-6″	4	4′-0″	293	41
	2′-6″	28			14′-2″		3′-0″	5		320	44
	3′-0″	30			15′-2″		3′-6″	6		348	47
	3′-6″	32			16′-2″		4′-0″	7		376	50
	4′-0″	34			17′-2″		4′-6″	8		404	53
	4′-6″	36			18′-2″		5′-0″	9		431	56
	5′-0″	38			19′-2″		5′-6″	10		459	60
4′-0″	2′-0″	28	6′-0″	7	14′-2″	8	2′-6″	4	4′-6″	317	44
	2′-6″	30			15′-2″		3′-0″	5		346	47
	3′-0″	32			16′-2″		3′-6″	6		374	50
	3′-6″	34			17′-2″		4′-0″	7		404	53
	4′-0″	36			18′-2″		4′-6″	8		432	56
	4′-6″	38			19′-2″		5′-0″	9		460	60
	5′-0″	40			20′-2″		5′-6″	10		490	63
4′-6″	2′-0″	30	6′-0″	7	15′-2″	9	2′-6″	4	5′-0″	342	47
	2′-6″	32			16′-2″		3′-0″	5		371	50
	3′-0″	34			17′-2″		3′-6″	6		401	53
	3′-6″	36			18′-2″		4′-0″	7		431	56
	4′-0″	38			19′-2″		4′-6″	8		460	60
	4′-6″	40			20′-2″		5′-0″	9		490	63
	5′-0″	42			21′-2″		5′-6″	10		519	66

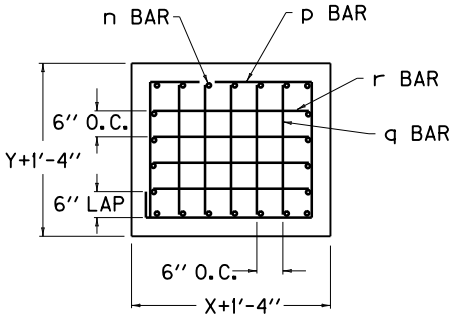
SIZE ②		NO. 5 STEEL BARS									
		③ BAR n		④ BAR p		BAR q		BAR r		LBS.	⑤
X	Y	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	TOTAL	⑥
5′-0″	2′-0″	32	6′-0″	7	16′-2″	10	2′-6″	4	5′-6″	367	50
	2′-6″	34			17′-2″		3′-0″	5		398	53
	3′-0″	36			18′-2″		3′-6″	6		427	56
	3′-6″	38			19′-2″		4′-0″	7		459	60
	4′-0″	40			20′-2″		4′-6″	8		490	63
	4′-6″	42			21′-2″		5′-0″	9		519	66
	5′-0″	44			22′-2″		5′-6″	10		551	69

~ NOTES ~

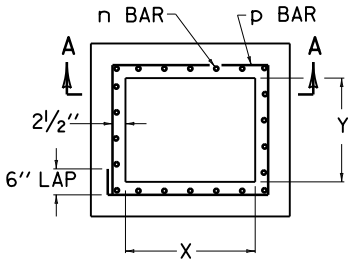
① BASED ON ″Z″ AS EQUAL TO 6′-0″.
② SEE CUR. STD. DWGS. RDB-270 AND RDB-280 FOR LOCATION AND DIMENSIONS.
③ LENGTH OF ″n″ BAR IS ALWAYS SAME AS ″Z″ DIMENSION.
④ ADD OR SUBTRACT ONE ″p″ BAR PER EVEN FT. VARIANCE FROM 6′-0″ ″Z″.
⑤ NO DEDUCTIONS HAVE BEEN MADE FOR PIPE.
⑥ ADD OR SUBTRACT LBS. STEEL PER FT. VARIANCE FROM 6′-0″ ″Z″.
7. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2″ FROM THE FACE UNLESS OTHERWISE SHOWN.



SECTION A-A



SECTION B-B



SECTION C-C

(USE WITH C.B.I. A and C.B.I. B WHEN H = 8′ to 15′)

USE WITH CUR. STD. DWGS. RDB-270 , RDB-280

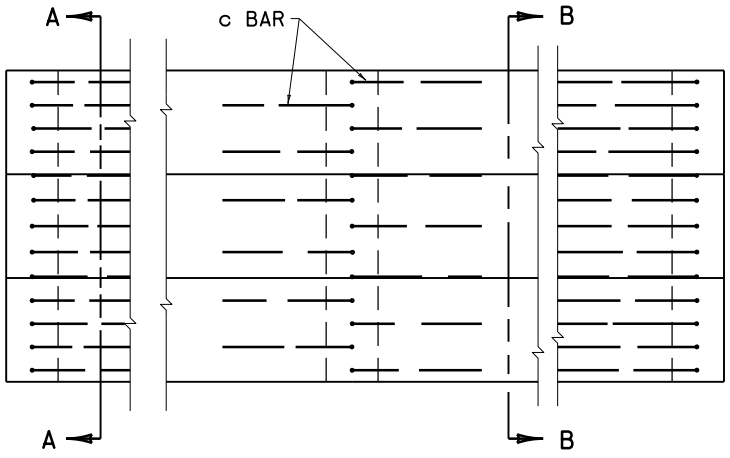
KENTUCKY DEPARTMENT OF HIGHWAYS

BOX INLET
PIPE CHAMBER
(ADDITIONAL STEEL)

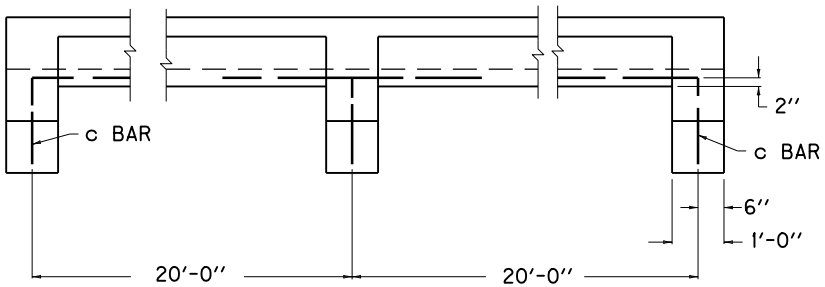
STANDARD DRAWING NO. RDB-420-05

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW



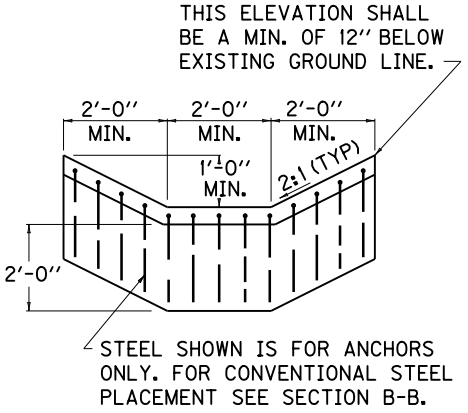
ELEVATION VIEW

~ NOTES ~

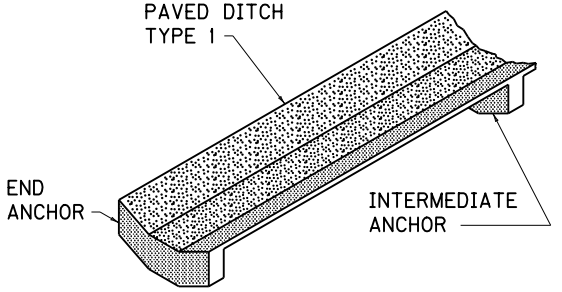
BID ITEM AND UNIT TO BID
PAVED DITCH TYPE 1 SQYD

① ROADWAY EXCAVATION SHALL BE PAID FROM THE TOP OF THE PAVED DITCH SLAB TO THE ORIGINAL GROUND. THE EXCAVATION FROM THE TOP OF THE CONCRETE OF THE PAVED DITCH DOWN, WILL BE INCLUDED IN THE PRICE PAID FOR THE PAVED DITCH INCLUDING THE EXCAVATION FOR THE INTERMEDIATE AND END ANCHORS, AND NO DIRECT PAYMENT WILL BE MADE FOR THIS EXCAVATION.

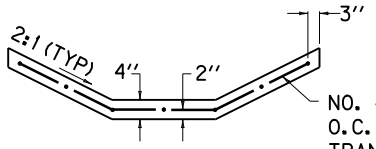
2. ESTIMATE 0.080 CU. YDS. CLASS A CONCRETE PER LINEAR FT. OF PAVED DITCH AND 0.398 CU. YDS. CLASS A CONCRETE PER ANCHOR BASED ON MINIMUM DIMENSIONS SHOWN ON THIS DRAWING.
3. THE SECTION SHOWN WITHIN THE MINIMUM DIMENSION IS ESTIMATED AT 0.72 SQ. YD. PER LIN. FT.
4. COMPACTION, FINISHING AND CURING SHALL BE THE SAME AS REQUIRED FOR CONCRETE SIDEWALK.
5. IF THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT IN THE POURING OF THE PAVED DITCH, IT SHALL BE CONSTRUCTED AS DETAILED.
6. ANY LENGTH OF LONGITUDINAL REINFORCING STEEL WILL BE PERMITTED PROVIDED A 1'-0'' LAP IS USED IN THE SPLICE. ADEQUATE TIES AT THE SPLICE SHALL BE REQUIRED.



SECTION A-A

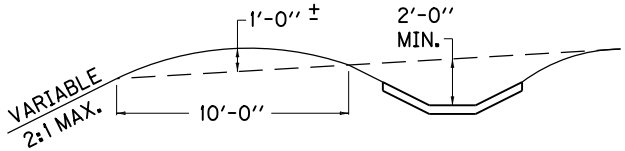


ISOMETRIC VIEW

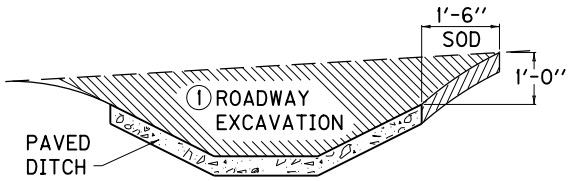


SECTION B-B

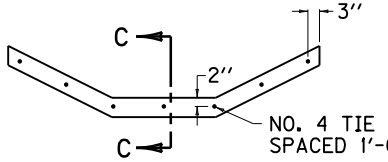
NO. 4 BARS SPACED 1'-0'' O.C. LONGITUDINALLY AND TRANSVERSELY THROUGHOUT THE SECTION. (IN ADDITION TO ANCHOR STEEL).



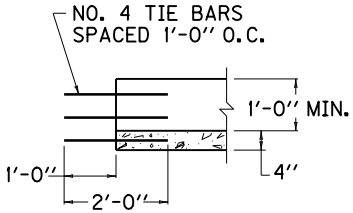
TYPICAL PAVED DITCH
(INTERCEPTOR DITCH)



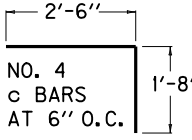
SHOULD THE TERRAIN OF THE EXISTING GROUND BE SO THAT WATER WOULD DRAIN INTO THE DITCH FROM BOTH SIDES, THEN SODDING WILL BE REQUIRED ON BOTH SIDES OF THE DITCH.



TIE BAR SECTIONAL VIEW



SECTION C-C



c BAR DETAIL

APPROX. STEEL QUANTITIES FOR MINIMUM SECTION SHOWN	
END ANCHORS (EACH)	36.19 LBS.
INTERMEDIATE ANCHORS (EACH)	36.19 LBS.
CONSTRUCTION JOINTS (EACH)	9.352 LBS.
BARS PER SQ. YD. OF DITCH	12.047 LBS.

KENTUCKY
DEPARTMENT OF HIGHWAYS

PAVED DITCH
TYPE 1

STANDARD DRAWING NO. RDD-001-06

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

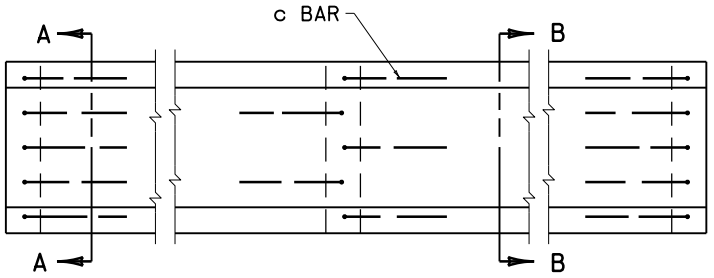
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

~ NOTES ~

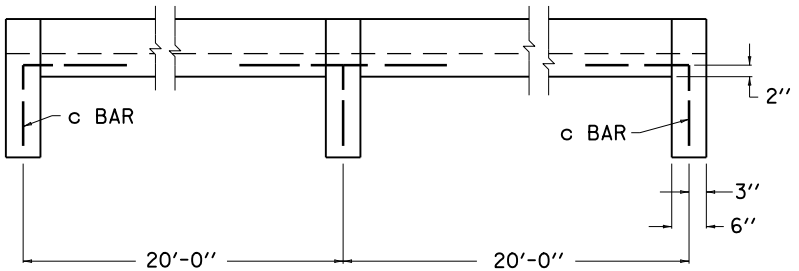
BID ITEM AND UNIT TO BID
PAVED DITCH TYPE 2 SQYD

① ROADWAY EXCAVATION SHALL BE PAID FROM THE TOP OF THE PAVED DITCH SLAB TO THE ORIGINAL GROUND. THE EXCAVATION FROM THE TOP OF THE CONCRETE OF THE PAVED DITCH DOWN, WILL BE INCLUDED IN THE PRICE PAID FOR THE PAVED DITCH INCLUDING THE EXCAVATION FOR THE INTERMEDIATE AND END ANCHORS, AND NO DIRECT PAYMENT WILL BE MADE FOR THIS EXCAVATION.

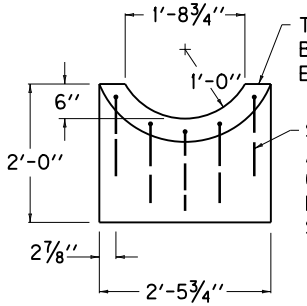
2. ESTIMATE 0.032 CU. YDS. CLASS A CONCRETE PER LINEAR FT. OF PAVED DITCH AND 0.060 CU. YDS. CLASS A CONCRETE PER ANCHOR BASED ON MINIMUM DIMENSIONS SHOWN ON THIS DRAWING.
3. THE SECTION SHOWN WITHIN THE MINIMUM DIMENSION IS ESTIMATED AT 0.30 SQ. YD. PER LIN. FT.
4. COMPACTION, FINISHING AND CURING SHALL BE THE SAME AS REQUIRED FOR CONCRETE SIDEWALK.
5. IF THE CONTRACTOR ELECTS TO USE A CONSTRUCTION JOINT IN THE POURING OF THE PAVED DITCH, IT SHALL BE CONSTRUCTED AS DETAILED.
6. ANY LENGTH OF LONGITUDINAL REINFORCING STEEL WILL BE PERMITTED PROVIDED A 1'-0" LAP IS USED IN THE SPLICE. ADEQUATE TIES AT THE SPLICE SHALL BE REQUIRED.



PLAN VIEW



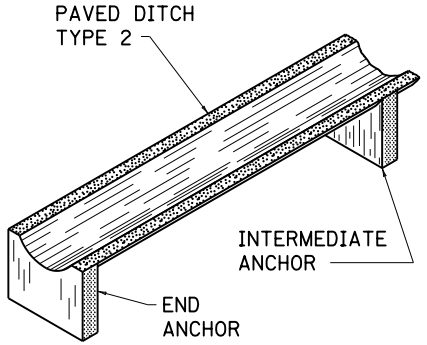
ELEVATION VIEW



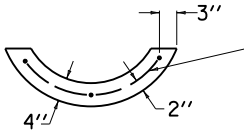
THIS ELEVATION SHALL BE A MIN. 1'-0" BELOW EXISTING GROUND LINE

STEEL SHOWN IS FOR ANCHORS ONLY. FOR CONVENTIONAL STEEL PLACEMENT SEE SECTION B-B.

SECTION A-A

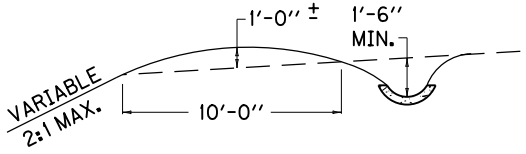


ISOMETRIC VIEW

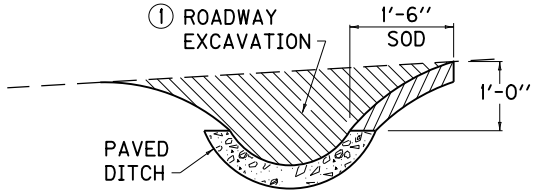


NO. 4 BARS SPACED 1'-0" O.C. LONGITUDINALLY AND TRANSVERSELY THROUGHOUT THE SECTION. (IN ADDITION TO ANCHOR STEEL).

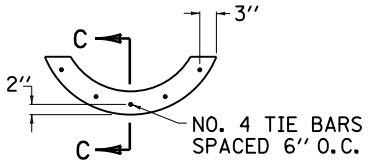
SECTION B-B



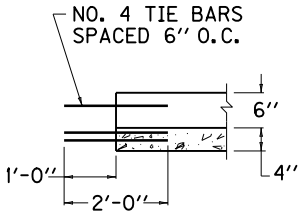
TYPICAL PAVED DITCH
(INTERCEPTOR DITCH)



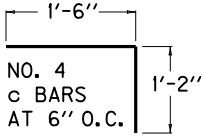
SHOULD THE TERRAIN OF THE EXISTING GROUND BE SO THAT WATER WOULD DRAIN INTO THE DITCH FROM BOTH SIDES, THEN SODDING WILL BE REQUIRED ON BOTH SIDES OF THE DITCH.



TIE BAR SECTIONAL VIEW



SECTION C-C



c BAR DETAIL

APPROX. STEEL QUANTITIES FOR MINIMUM SECTION SHOWN	
END ANCHORS (EACH)	8.90 LBS.
INTERMEDIATE ANCHORS (EACH)	8.90 LBS.
CONSTRUCTION JOINTS (EACH)	6.68 LBS.
BARS PER SQ. YD. OF DITCH	12.47 LBS.

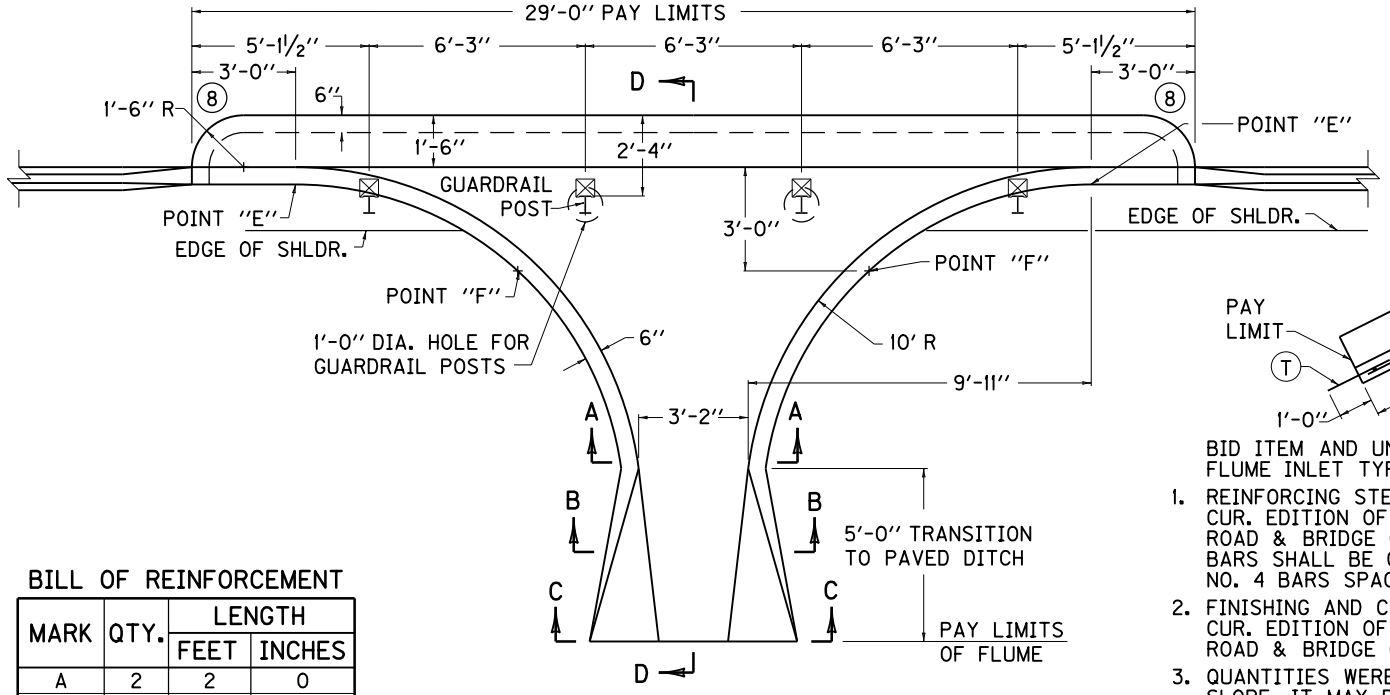
KENTUCKY
DEPARTMENT OF HIGHWAYS

PAVED DITCH
TYPE 2

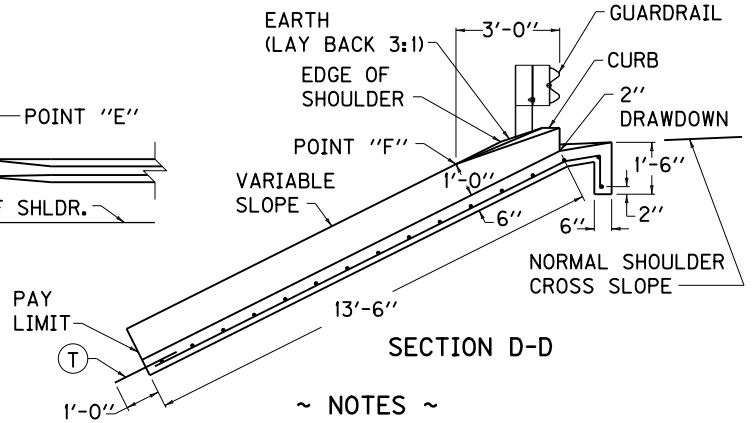
STANDARD DRAWING NO. RDD-002-07

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



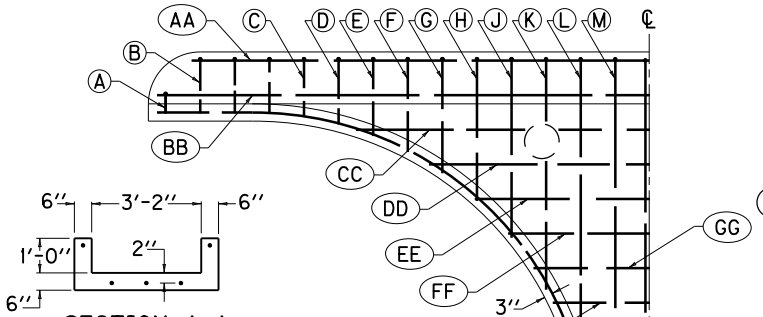
PLAN VIEW



SECTION D-D

BILL OF REINFORCEMENT

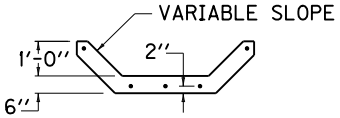
MARK	QTY.	LENGTH	
		FEET	INCHES
A	2	2	0
B	6	2	7
C	2	2	7
D	2	3	3
E	2	3	2
F	2	3	8
G	2	4	3
H	2	5	0
J	2	6	0
K	2	7	6
L	2	10	0
M	3	15	7
N	2	21	7
AA	2	26	6
BB	1	28	4
CC	1	16	2
DD	1	12	3
EE	1	9	9
FF	1	8	0
GG	1	6	5
HH	1	5	4
JJ	1	4	4
KK	1	3	10
LL	1	3	10
MM	1	4	3
NN	1	4	7
OO	1	4	11
PP	1	5	4
T	5	2	0



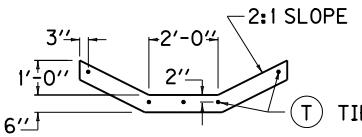
STEEL DIAGRAM

(STEEL SYMMETRICAL ABOUT CENTERLINE

SECTION A-A



SECTION B-B



SECTION C-C

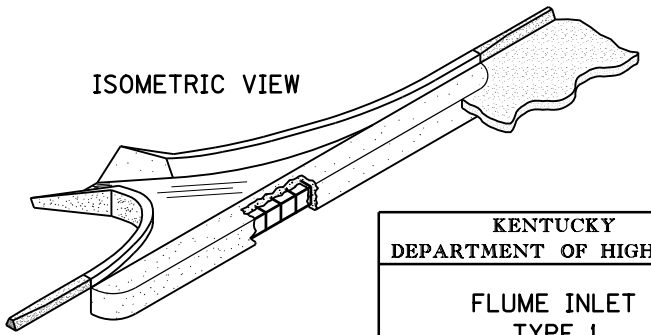
~ NOTES ~

BID ITEM AND UNIT TO BID
FLUME INLET TYPE 1 EACH

1. REINFORCING STEEL SHALL MEET THE REQUIREMENTS OF THE CUR. EDITION OF THE DEPARTMENT'S STD. SPECIFICATIONS FOR ROAD & BRIDGE CONST. THE MIN. REQUIREMENT FOR REINFORCING BARS SHALL BE GRADE 40. ALL REINFORCEMENT SHALL BE NO. 4 BARS SPACED 12" O.C.
2. FINISHING AND CURING SHALL MEET THE REQUIREMENTS OF THE CUR. EDITION OF THE DEPARTMENT'S STD. SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION.
3. QUANTITIES WERE CALCULATED FOR APPLICATIONS ON A 2:1 FILL SLOPE. IT MAY BE NECESSARY TO ADJUST THE STEEL IN THE FIELD FOR APPLICATIONS OTHER THAN 2:1 SLOPE.
4. THE FLOW LINE OF THE FLUME AND THE NORMAL PAVED DITCH FROM POINT "F" ON THE FLUME TO THE LOWER END OF THE NORMAL PAVED DITCH SHALL BE A STRIGHT LINE GRADE.
5. TRANSITION 6" HIGH CURB FROM POINT "E" TO 12" HIGH CURB AT POINT "F".
6. USE 37'-6" GUARDRAIL STEEL W BEAM-S FACE (NESTED) ACROSS FLUME OPENING.
7. CONCRETE, REINFORCEMENT, EXCAVATION AND EXTRA GUARDRAIL (NESTED RAIL) SHALL BE INCIDENTAL TO UNIT BID PRICE.

(8) TRANSITION FROM ADJACENT CURB TYPE TO 6" AT POINT "E".

ISOMETRIC VIEW



APPROX. QUANTITIES	
CLASS "A" CONC.	3.9 CU. YDS.
STEEL REINF.	255 LBS.

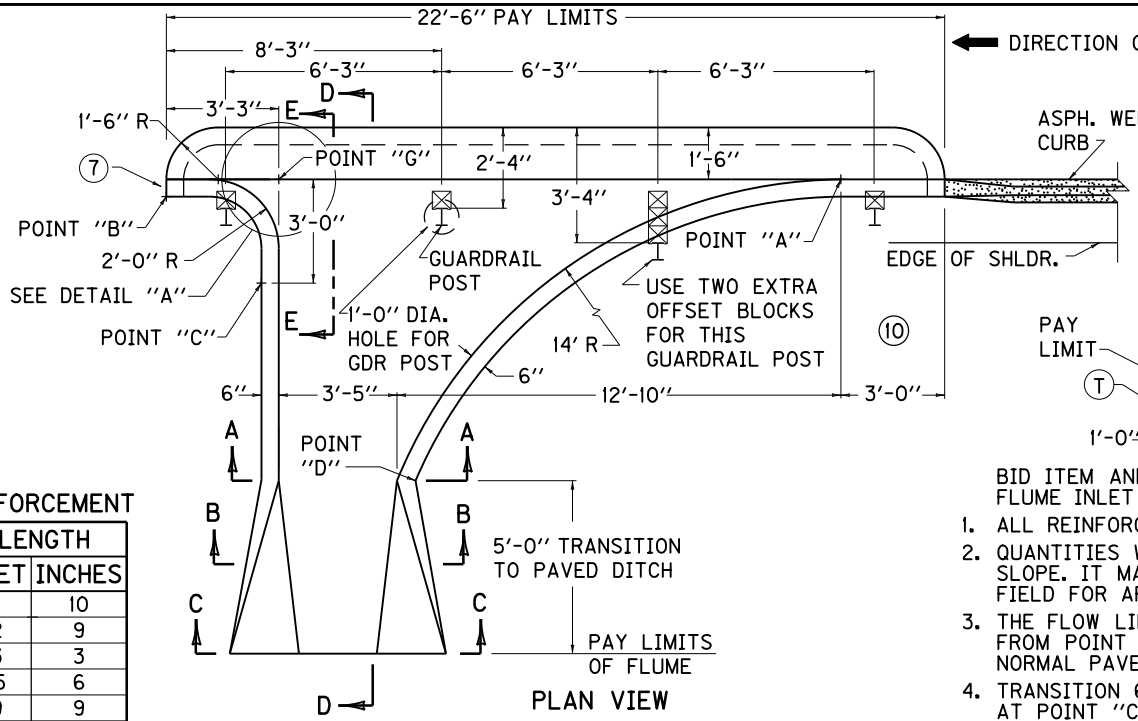
KENTUCKY
DEPARTMENT OF HIGHWAYS

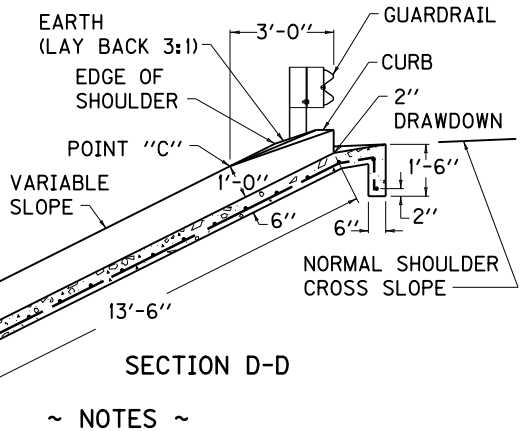
FLUME INLET
TYPE 1

STANDARD DRAWING NO. RDD-020-07

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

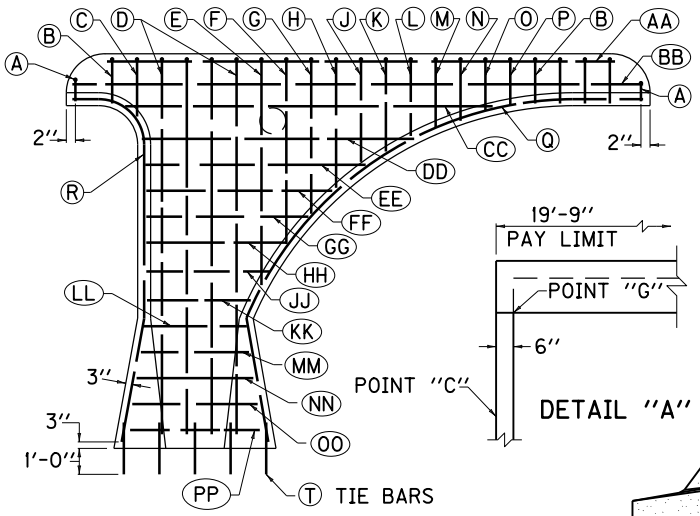
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE





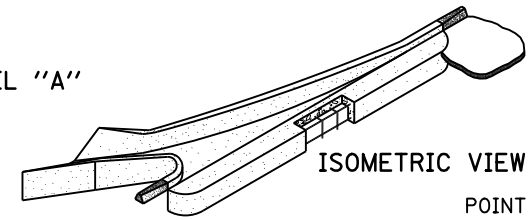
BILL OF REINFORCEMENT

MARK	QTY.	LENGTH	
		FEET	INCHES
A	2	1	10
B	5	2	9
C	1	3	3
D	4	15	6
E	1	9	9
F	1	8	2
G	1	7	0
H	1	6	0
J	1	5	0
K	1	4	6
L	1	4	0
M	1	3	8
N	1	3	5
O	1	3	0
P	1	2	10
Q	1	24	5
R	1	15	7
AA	2	19	7
BB	1	22	0
CC	1	14	2
DD	1	10	6
EE	1	8	6
FF	1	7	2
GG	1	6	3
HH	1	5	5
JJ	1	4	9
KK	1	4	0
LL	1	4	0
MM	1	4	2
NN	1	4	6
OO	1	4	10
PP	1	5	0
T	5	2	0

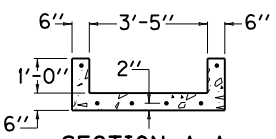


STEEL DIAGRAM

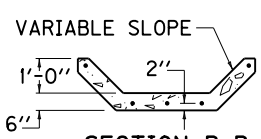
DETAIL "A"



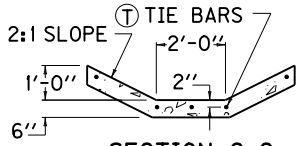
ISOMETRIC VIEW



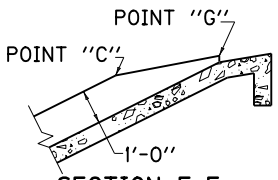
SECTION A-A



SECTION B-B



SECTION C-C



SECTION E-E

~ NOTES ~

BID ITEM AND UNIT TO BID
FLUME INLET TYPE 2 EACH

1. ALL REINFORCEMENT SHALL BE NO. 4 BARS SPACED 1'-0" O.C.
2. QUANTITIES WERE CALCULATED FOR APPLICATION ON A 2:1 FILL SLOPE. IT MAY BE NECESSARY TO ADJUST THE STEEL IN THE FIELD FOR APPLICATION OTHER THAN 2:1 SLOPE.
3. THE FLOW LINE OF THE FLUME AND THE NORMAL PAVED DITCH FROM POINT "G" ON THE FLUME TO THE LOWER END OF THE NORMAL PAVED DITCH SHALL BE A STRAIGHT LINE GRADE.
4. TRANSITION 6" HIGH CURB FROM POINT "B" TO 1'-0" HIGH CURB AT POINT "C" AND FROM POINT "A" TO 1'-0" HIGH CURB AT POINT "D".
5. WHEN A FLUME IS LAST ON A DOWN GRADE, SHORT RADIUS BETWEEN POINTS "B" AND "C" IS NOT NECESSARY. SIDE WALL CAN BE EXTENDED STRAIGHT AND TRANSITIONED FROM 1'-0" AT POINT "C" TO ½" HIGH AT POINT "G". SEE DETAIL "A"
6. WHEN FLUME IS SHORTENED AS DETAIL "A", STEEL REINFORCEMENT BARS A AND B DECREASED ONE BAR EACH. SHORTEN BAR AA TO 18'-3", BAR BB TO 19'-3", AND BAR CC TO 13'-6".

(7) IF CURB IS CONTINUED USE 2'-0" TRANSITION TO ADJACENT CURB.

8. USE 37'-6" GUARDRAIL STEEL W BEAM-S FACE (NESTED) ACROSS FLUME OPENING.
9. CONCRETE, REINFORCEMENT, EXCAVATION AND EXTRA GUARDRAIL (NESTED RAIL) SHALL BE INCIDENTAL TO UNIT BID PRICE.

(10) TRANSITION FROM ADJACENT CURB TO 6" AT POINT "A".

APPROX. QUANTITIES	
CLASS "A" CONC.	3.7 CU. YDS.
STEEL REINF.	225 LBS.

KENTUCKY
DEPARTMENT OF HIGHWAYS

FLUME INLET TYPE 2

STANDARD DRAWING NO. RDD-021-07

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

~ NOTES ~

BID ITEM AND UNIT TO BID
CHANNEL LINING CLASS I A TON

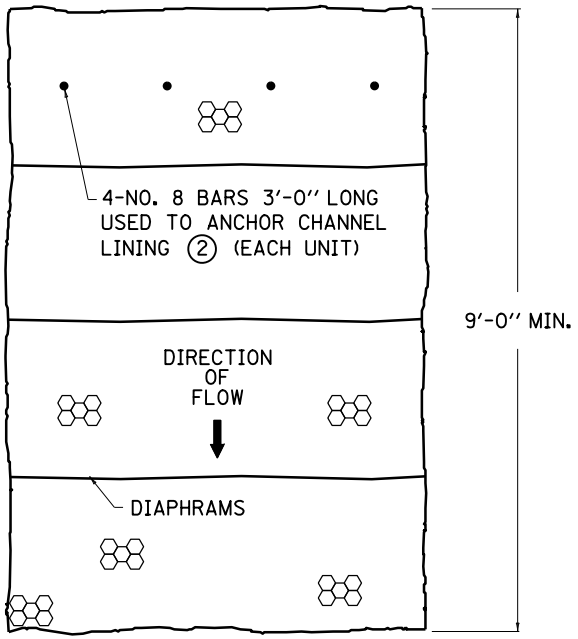
① ROADWAY EXCAVATION SHALL BE PAID FROM THE TOP OF LINING TO THE ORIGINAL GROUND LINE.

② ANCHORS REQUIRED WHEN LINING IS PLACED ON 5% GRADE OR GREATER.

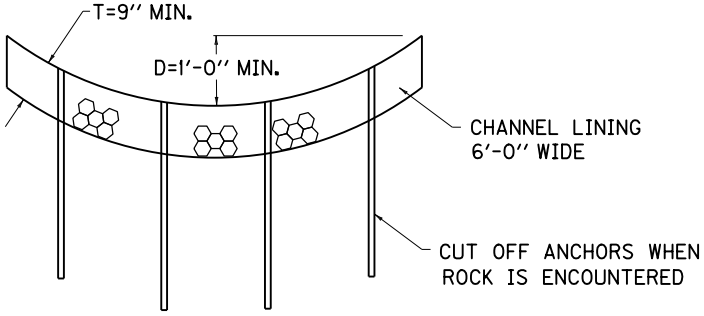
3. SECURE THE LACING WIRE AT THE CORNER OF THE BASKET BY LOOPING AND TWISTING, CONTINUE LACING THROUGHOUT WITH DOUBLE LOOPS AT APPROXIMATELY 5'' INTERVALS. EACH UNIT SHALL CONSIST OF LININGS SUPPLIED IN WIDTHS OF 6'-0'' AS SHOWN AND LENGTHS IN MULTIPLES OF 3'-0''. EACH UNIT SHALL BE SUBDIVIDED INTO COMPARTMENTS A MAXIMUM OF 3'-0'' LONG.

4. AGGREGATE ESTIMATED ON THE BASIS OF 0.50 TON PER SQ. YD. PER FT. OF DEPTH.

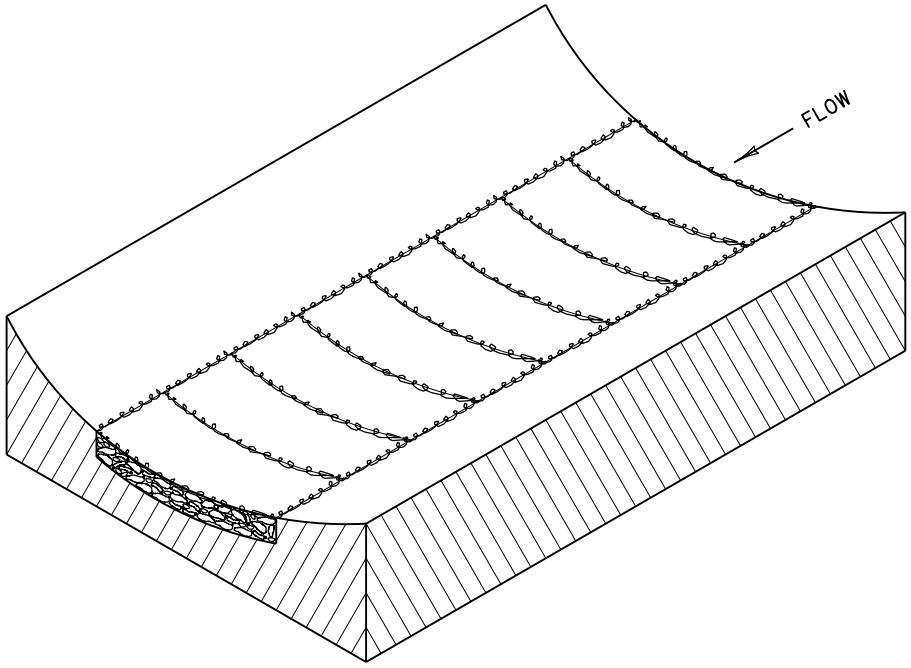
⑤ T= MATTRESS THICKNESS, D= DEPTH TO PROTECT. SEE PLAN NOTES FOR THESE VALUES.



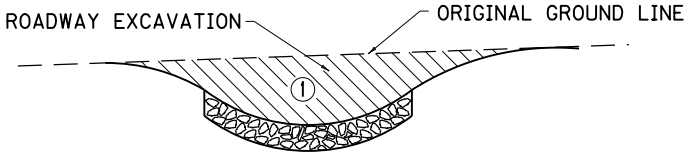
PLAN VIEW



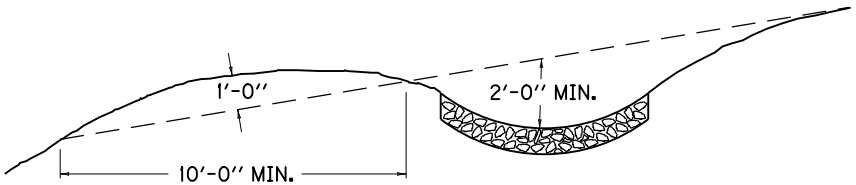
ELEVATION VIEW ⑤



CHANNEL LINING
ISOMETRIC VIEW



ROADWAY EXCAVATION ①



TYPICAL INTERCEPTOR DITCH

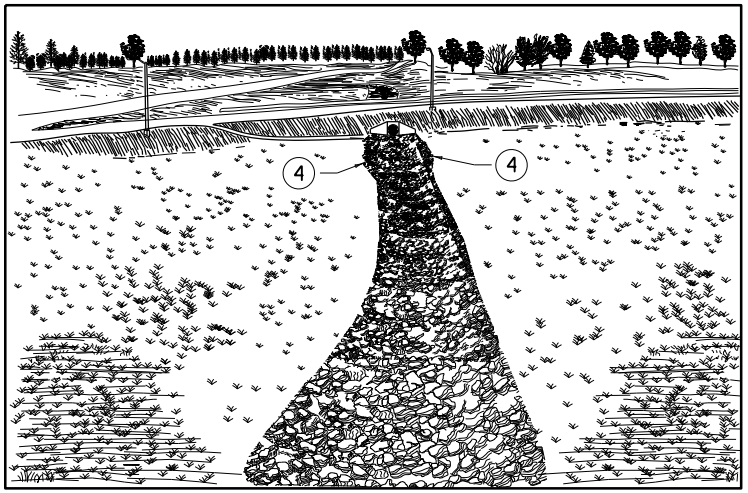
KENTUCKY
DEPARTMENT OF HIGHWAYS

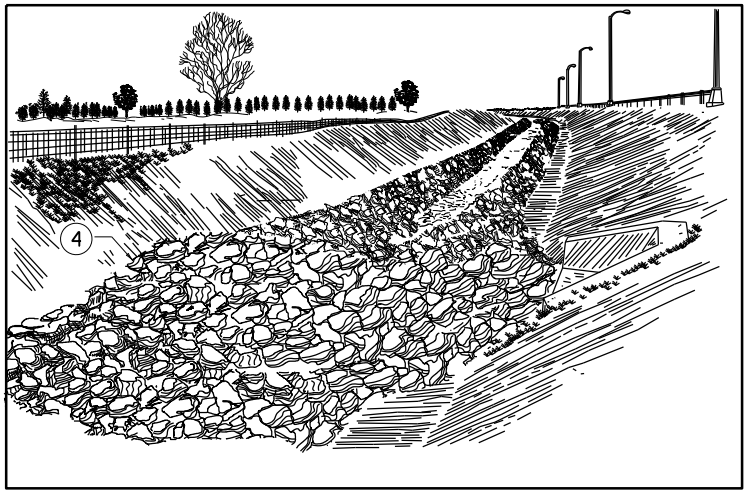
CHANNEL LINING
CLASS IA
(MATTRESS UNITS)

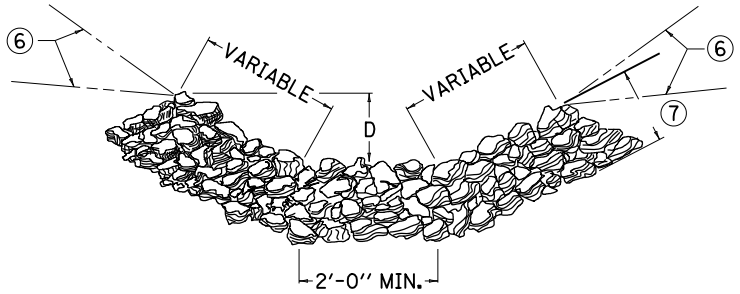
STANDARD DRAWING NO. RDD-030-08

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

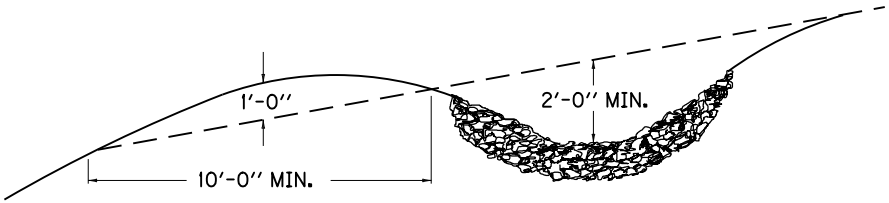
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE







TYPICAL SECTION



TYPICAL INTERCEPTOR DITCH

~ NOTES ~

BID ITEMS AND UNIT TO BID

CHANNEL LINING CLASS II	TON
CHANNEL LINING CLASS III	TON

1. CHANNEL LINING WILL BE PAID FOR AT THE CONTRACT UNIT PRICE PER TON FOR EACH CLASS.
2. CHANNEL LINING WILL NOT BE REQUIRED IN THE BOTTOM OF THE DITCH WHERE SOLID ROCK IS ENCOUNTERED.
3. CHANNEL LINING ESTIMATED ON THE BASIS OF 0.50 TON PER SQ. YD. PER FT. OF DEPTH.

④ WIDEN CHANNEL LINING NEAR OUTLET END OF STRUCTURE AS DIRECTED BY THE ENGINEER.

⑤ FROM THE TOP OF THE LINING TO THE ORIGINAL GROUNDLINE.

⑥ ALTERNATE LOCATION OF GROUNDLINE.

⑦ 15'' MIN. CLASS II, OR 24'' MIN. CLASS III.

8. D = DEPTH TO PROTECT, T = THICKNESS, (SEE PLAN NOTES FOR THESE VALUES)

KENTUCKY
DEPARTMENT OF HIGHWAYS

CHANNEL LINING CLASS II AND III

STANDARD DRAWING NO. RDD-040-05

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

PIPE DIA. (IN)	PIPE TYPE	CIRCULAR PIPE COVER HEIGHTS IN FEET					
		2-5	5-10	10-15	15-20	20-25	25-30
12 & 15	2⅔"x½" CSPHS (1)	16 GA.					
	2⅔"x½" CSPLS (1)	16 GA.					
	2⅔"x½" CAPHS	16 GA.					
	PVC	SMOOTH WALL (SOLID WALL)					
	HDPE					FF	
	RCP (11)						
18	2⅔"x½" CSPHS (1)	16 GA.					
	2⅔"x½" CSPLS (1)	16 GA.					
	2⅔"x½" CAPHS	16 GA.					
	SRS (1)	16 GA.					
	SRA	16 GA.					
	PVC	RIBBED (PROFILE WALL)					
	HDPE					FF	
	RCP (11)						
		2-5	5-10	10-15	15-20	20-25	25-30

PIPE DIA. (IN)	PIPE TYPE	CIRCULAR PIPE COVER HEIGHTS IN FEET											
		2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65
21	2⅔"x½" CSPHS (1)	16 GA.												
	2⅔"x½" CSPLS (1)	16 GA.					10 GA.							
	2⅔"x½" CAPHS	16 GA.												
	SRS (1)	16 GA.												
	SRA	16 GA.				14 GA.								
	PVC	RIBBED (PROFILE WALL)												
	HDPE					FF								
	RCP (11)													
24 (6)	2⅔"x½" CSPHS (1)	16 GA.											14 GA.	
	2⅔"x½" CSPLS (1)	16 GA.					10 GA.							
	2⅔"x½" CAPHS	16 GA.							14 GA.			12 GA.		
	SRS (1)	16 GA.							14 GA.			12 GA.		
	SRA	16 GA.			14 GA.			12 GA.			10 GA.			
	PVC	RIBBED (PROFILE WALL)												
	HDPE					FF								
	RCP (11)													
		2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65

~ NOTES ~

(1) GAGES FOR CORRUGATED STEEL PIPE ITEMS SHOWN ARE BASED ON ALUMINUM-COATED TYPE 2 STEEL AS PER AASHTO M-274. ALUMINUM COATED TYPE 2 STEEL IS ONLY PERMITTED IN Ph RANGES OF 5 TO 9

2. WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES.
3. CSP, CAP, SRS AND SRA ARE SHOWN IN GAGE.
4. MAXIMUM COVER HEIGHT IS MEASURED FROM THE TOP OF PIPE TO SUBGRADE ELEVATION SHALL GOVERN GAGE OF PIPE TO BE USED FOR THE ENTIRE LENGTH OF PIPE INSTALLATION.
5. MINIMUM COVER HEIGHTS FOR PIPE SHALL BE 2 FEET. GAGE OF PIPE FOR COVER HEIGHTS LESS THAN 2 FEET SHALL BE THAT SHOWN FOR COVER HEIGHTS OF 30 FEET (SEE STD. SPECIFICATIONS FOR BACKFILL). HDPE AND PVC SHALL NOT BE PERMITTED FOR COVER HEIGHTS LESS THAN 2 FEET.

(6) 24" DIA. PIPE IS MINIMUM SIZE FOR COVER HEIGHTS FROM 30 FEET TO 65 FEET.

7. MINIMUM COVER HEIGHT FOR ENTRANCE PIPE SHALL BE 0.5 FEET.
8. GAGE OF ENTRANCE PIPE FOR COVER HEIGHTS LESS THAN 2 FEET SHALL MEET THE FOLLOWING REQUIREMENTS:
   a. GAGE OF CSP SHALL BE THAT SHOWN FOR HEIGHTS OF 30 FEET.
   b. GAGE OF CAP SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLE.
9. ALL CIRCULAR STRUCTURAL PLATE SHALL BE 5% VERTICALLY ELONGATED.
10. SEE CUR. STD. DWG. RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.

(11) SEE CUR. STD. DWGS. RDI-021 AND RDI-026 FOR RCP COVER HEIGHT AND BEDDING REQUIREMENTS.

LEGEND

CSPHS: CORRUGATED STEEL PIPE WITH HELICAL LOCK SEAM OR HELICAL WELDED SEAM (HELICAL CORR.)

CSPLS: CORRUGATED STEEL PIPE WITH LONGITUDINAL RIVETED OR SPOT WELDED SEAM (ANNULAR CORR.)

CAPHS: CORRUGATED ALUMINUM ALLOY PIPE WITH HELICAL LOCK SEAM (HELICAL CORR.)

HDPE: HIGH DENSITY POLYETHYLENE PIPE

PVC: POLYVINYL CHLORIDE

SRS: SPIRAL RIB STEEL

SRA: SPIRAL RIB ALUMINUM

RCP: CIRCULAR REINFORCED CONCRETE PIPE

FF: FLOWABLE FILL REQUIRED

12" PIPE - 24" PIPE

USE WITH CUR. STD. DWGS. RDI-021, RDI-026, RDI-035

KENTUCKY DEPARTMENT OF HIGHWAYS

CULVERT, ENTRANCE & STORM SEWER PIPE TYPES & COVER HEIGHTS

STANDARD DRAWING NO. RDI-001-10

SUBMITTED William S. Haddad DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

PIPE DIA. (IN)	PIPE TYPE	CIRCULAR PIPE COVER HEIGHTS IN FEET (3)												
		2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65
27 & 30 (8)	2⅔"x½" CSPHS (1)	16 GA.								14 GA.			12 GA.	
	2⅔"x½" CSPLS (1)	16 GA.				12 GA.								
	2⅔"x½" CAPHS	14 GA.								12 GA.			10 GA.	
	SRS (1)	16 GA.						14 GA.		12 GA.				
	SRA	16 GA.			14 GA.		12 GA.			10 GA.				
	PVC	RIBBED (PROFILE WALL)												
	HDPE					FF								
	RCP (10)													
36	2⅔"x½" CSPHS (1)	14 GA.									12 GA.			10 GA.
	2⅔"x½" CSPLS (1)	14 GA.			12 GA.		10 GA.							
	2⅔"x½" CAPHS	14 GA.						12 GA.			10 GA.			8 GA.
	SRS (1)	14 GA.								12 GA.				
	SRA	14 GA.				12 GA.				10 GA.				
	PVC	RIBBED (PROFILE WALL)												
	HDPE					FF								
	RCP (10)													
42	2⅔"x½" CSPHS (1)	14 GA.								12 GA.			10 GA.	
	2⅔"x½" CSPLS (1)	14 GA.					12 GA.			10 GA.				
	2⅔"x½" CAPHS	12 GA.								10 GA.		8 GA.		
	SRS (1)	14 GA.						12 GA.						
	SRA	12 GA.					10 GA.							
	PVC	RIBBED (PROFILE WALL)												
	HDPE													
	RCP (10)													
		2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65

LEGEND

CSPHS: CORRUGATED STEEL PIPE WITH HELICAL LOCK SEAM OR HELICAL WELDED SEAM (HELICAL CORR.)

CSPLS: CORRUGATED STEEL PIPE WITH LONGITUDINAL RIVETED OR SPOT WELDED SEAM (ANNULAR CORR.)

CAPHS: CORRUGATED ALUMINUM ALLOY PIPE WITH HELICAL LOCK SEAM (HELICAL CORR.)

HDPE: HIGH DENSITY POLYETHYLENE PIPE

PVC: POLYVINYL CHLORIDE

SRS: SPIRAL RIB STEEL

SRA: SPIRAL RIB ALUMINUM

RCP: CIRCULAR REINFORCED CONCRETE PIPE

FF: FLOWABLE FILL REQUIRED

NOTES CONTINUED

(10) SEE DETAIL SHEET "PIPE BEDDING FOR CULVERTS, ENTRANCE, AND STORM SEWER REINFORCED CONC. PIPE" AND DETAIL SHEET "PIPE BEDDING TRENCH CONDITION REINFORCED CONC. PIPE" FOR RCP COVER HEIGHT AND BEDDING REQUIREMENTS.

~ NOTES ~

(1) GAGES FOR CORRUGATED STEEL PIPE ITEMS SHOWN ARE BASED ON ALUMINUM-COATED TYPE 2 STEEL AS PER AASHTO M-274. ALUMINUM COATED TYPE 2 STEEL IS ONLY PERMITTED IN Ph RANGES OF 5 TO 9.

2. WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES.

(3) SEE CUR. STD. DWG. RDI-001 FOR EXPLANATION OF COVER HEIGHTS LESS THAN 2 FEET.

4. CSP, CAP, SRS AND SRA ARE SHOWN IN GAGE.

5. MAXIMUM COVER HEIGHT MEASURED FROM TOP OF PIPE TO SUB GRADE ELEVATION SHALL GOVERN GAGE OF PIPE TO BE USED FOR ENTIRE LENGTH OF PIPE INSTALLATION.

6. MINIMUM COVER HEIGHT FOR ENTRANCE PIPE SHALL BE 0.5 FEET.

7. ALL CIRCULAR STRUCTURAL PLATE SHALL BE 5% VERTICALLY ELONGATED.

(8) ENTRANCE PIPE GREATER THAN 30" DIA. SHALL BE A CULVERT PIPE.

9. SEE CUR. STD. DWG. RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.

27" PIPE - 42" PIPE

USE WITH CUR. STD. DWGS. RDI-001, RDI-035

KENTUCKY DEPARTMENT OF HIGHWAYS

CULVERT, ENTRANCE & STORM SEWER PIPE TYPES & COVER HEIGHTS

STANDARD DRAWING NO. RDI-002-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

PIPE DIA. (IN)	PIPE TYPE	CIRCULAR PIPE COVER HEIGHTS IN FEET (3)																						
		2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120
48	2⅔"x½" CSPHS (1)	14 GA.							12 GA.		10 GA.														
	2⅔"x½" CSPLS (1)	14 GA.				12 GA.																			
	2⅔"x½" CAPHS	12 GA.							10 GA.		8 GA.														
	SRS (1)	14 GA.					12 GA.																		
	SRA	12 GA.					10 GA.																		
	PVC	RIBBED (PROFILE WALL)																							
	HDPE																								
	RCP (9)																								
54 (7)	2⅔"x½" CSPHS (1)	14 GA.						12 GA.							10 GA.										
	2⅔"x½" CSPLS (1)	14 GA.				12 GA.																			
	3"x1" CSPHS (1)	14 GA.							12 GA.						10 GA.										
	3"x1" CSPLS (1)	14 GA.				12 GA.		10 GA.			8 GA.														
	5"x1" CSPHS (1)	14 GA.						12 GA.							10 GA.										
	2⅔"x½" CAPHS	12 GA.					10 GA.							8 GA.											
	3"x1" CAPHS	14 GA.					12 GA.		10 GA.					8 GA.											
	SRS (1)	14 GA.						12 GA.																	
	SRA	12 GA.						10 GA.																	
	RCP (9)																								
		2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120

~ NOTES ~

(1) GAGES FOR CORRUGATED STEEL PIPE ITEMS SHOWN ARE BASED ON ALUMINUM-COATED TYPE 2 STEEL AS PER AASHTO M-274. ALUMINUM COATED TYPE 2 STEEL IS ONLY PERMITTED IN Ph RANGES OF 5 TO 9.

2. WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES.

(3) SEE CUR. STD. DWG. RDI-001 FOR EXPLANATION OF COVER HEIGHTS LESS THAN 2 FEET.

4. CSP, CAP, SRS AND SRA ARE SHOWN IN GAGE.

5. MAXIMUM COVER HEIGHT MEASURED FROM TOP OF PIPE TO SUBGRADE ELEVATION SHALL GOVERN GAGE OF PIPE TO BE USED FOR ENTIRE LENGTH OF PIPE INSTALLATION.

6. ALL CIRCULAR STRUCTURAL PLATE SHALL BE 5% VERTICALLY ELONGATED.

(7) 54" DIA. PIPE IS MINIMUM SIZE FOR COVER HEIGHTS GREATER THAN 65 FEET.

8. SEE CUR. STD. DWG. RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.

(9) SEE CUR. STD. DWGS. RDI-021 AND RDI-026 FOR RCP COVER HEIGHT AND BEDDING REQUIREMENTS.

LEGEND

CSPHS: CORRUGATED STEEL PIPE WITH HELICAL LOCK SEAM OR HELICAL WELDED SEAM (HELICAL CORR.)

CSPLS: CORRUGATED STEEL PIPE WITH LONGITUDINAL RIVETED OR SPOT WELDED SEAM (ANNULAR CORR.)

CAPHS: CORRUGATED ALUMINUM ALLOY PIPE WITH HELICAL LOCK SEAM (HELICAL CORR.)

HDPE: HIGH DENSITY POLYETHYLENE PIPE

PVC: POLYVINYL CHLORIDE

SRS: SPIRAL RIB STEEL

SRA: SPIRAL RIB ALUMINUM

RCP: CIRCULAR REINFORCED CONCRETE PIPE

48" PIPE - 54" PIPE

USE WITH CUR. STD. DWGS. RDI-001, RDI-021, RDI-026, RDI-035

KENTUCKY DEPARTMENT OF HIGHWAYS

CULVERT & STORM SEWER PIPE TYPES & COVER HEIGHTS

STANDARD DRAWING NO. RDI-003-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

PIPE DIA. (IN)	PIPE TYPE	CIRCULAR PIPE COVER HEIGHTS IN FEET (4)																						
		2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120
60	2⅔"x½" CSPHS (1)	12 GA.							10 GA.																
	2⅔"x½" CSPLS (1)	12 GA.																							
	3"x1" CSPHS (1)	14 GA.						12 GA.							10 GA.										
	3"x1" CSPLS (1)	14 GA.				12 GA.						10 GA.													
	5"x1" CSPHS (1)	14 GA.					12 GA.							10 GA.											
	6"x2" CSPLSSB (1)	10 GA.							8 GA.			7 GA.		5 GA.		3 GA.				1 GA.					
	2⅔"x½" CAPHS	10 GA.						8 GA.																	
	3"x1" CAPHS	14 GA.				12 GA.		10 GA.				8 GA.													
	9"x2½" CAPLSSB	10 GA.							8 GA.		7 GA.		5 GA.		3 GA.				1 GA.						
	SRS (1)	12 GA.																							
	SRA	10 GA.																							
	RCP (9)																								
66	2⅔"x½" CSPHS (1)	10 GA.																							
	2⅔"x½" CSPLS (1)	10 GA.																							
	3"x1" CSPHS (1)	14 GA.					12 GA.							10 GA.											
	3"x1" CSPLS (1)	14 GA.			12 GA.				10 GA.																
	5"x1" CSPHS (1)	14 GA.				12 GA.				10 GA.															
	6"x2" CSPLSSB (1)	10 GA.						8 GA.			7 GA.			5 GA.		3 GA.				1 GA.					
	2⅔"x½" CAPHS	8 GA.																							
	3"x1" CAPHS	14 GA.				12 GA.		10 GA.				8 GA.													
	9"x2½" CAPLSSB	10 GA.						8 GA.		7 GA.		5 GA.		3 GA.											
	SRS (1)	12 GA.																							
	SRA	10 GA.																							
	RCP (9)																								
		2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120

~ NOTES ~

(1) GAGES FOR CORRUGATED STEEL PIPE ITEMS SHOWN ARE BASED ON ALUMINUM-COATED TYPE 2 STEEL AS PER AASHTO M-274. ALUMINUM COATED TYPE 2 STEEL IS ONLY PERMITTED IN Ph RANGES OF 5 TO 9.

2. WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES.

3. CONTRARY TO NOTE 2, GAGES FOR 6" x 2" CSPLSSB ARE SHOWN FOR ZINC COATED (GALVANIZED).

(4) SEE CUR. STD. DWG. RDI-001 FOR EXPLANATION OF COVER HEIGHTS LESS THAN 2 FEET.

5. CSP, CAP, SRS AND SRA ARE SHOWN IN GAGE.

6. MAXIMUM COVER HEIGHT MEASURED FROM TOP OF PIPE TO SUBGRADE ELEVATION SHALL GOVERN GAGE OF PIPE TO BE USED FOR ENTIRE LENGTH OF PIPE INSTALLATION.

7. ALL CIRCULAR STRUCTURAL PLATE SHALL BE 5% VERTICALLY ELONGATED.

8. SEE CUR. STD. DWG. RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.

(9) SEE CUR. STD. DWGS. RDI-021 AND RDI-026 FOR RCP COVER HEIGHT AND BEDDING REQUIREMENTS.

LEGEND

CSPHS: CORRUGATED STEEL PIPE WITH HELICAL LOCK SEAM OR HELICAL WELDED SEAM (HELICAL CORR.)

CSPLS: CORRUGATED STEEL PIPE WITH LONGITUDINAL RIVETED OR SPOT WELDED SEAM (ANNULAR CORR.)

CSPLSSB: CORRUGATED STEEL PIPE WITH LONGITUDINAL SEAMS WITH STEEL BOLTS (ANNULAR CORR.)

CAPHS: CORRUGATED ALUMINUM ALLOY PIPE WITH HELICAL LOCK SEAM (HELICAL CORR.)

CAPLSSB: CORRUGATED ALUMINUM ALLOY PIPE WITH LONGITUDINAL SEAMS WITH STEEL BOLTS (ANNULAR CORR.)

SRS: SPIRAL RIB STEEL

SRA: SPIRAL RIB ALUMINUM

RCP: CIRCULAR REINFORCED CONCRETE PIPE

60" PIPE - 66" PIPE

USE WITH CUR. STD. DWGS. RDI-001, RDI-021, RDI-026, RDI-035

KENTUCKY DEPARTMENT OF HIGHWAYS

CULVERT & STORM SEWER PIPE TYPES & COVER HEIGHTS

STANDARD DRAWING NO. RDI-004-04

SUBMITTED William S. Hulick DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

PIPE DIA. (IN)	PIPE TYPE	CIRCULAR PIPE COVER HEIGHTS IN FEET (4)																						
		2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120
72	$2\frac{2}{3}$"x$\frac{1}{2}$" CSPHS (1)	10 GA.																						
	$2\frac{2}{3}$"x$\frac{1}{2}$" CSPLS (1)	10 GA.																						
	3"x1" CSPHS (1)	14 GA.					12 GA.								10 GA.									
	3"x1" CSPLS (1)	14 GA.			12 GA.				10 GA.															
	5"x1" CSPHS (1)	14 GA.				12 GA.					10 GA.													
	6"x2" CSPLSSB (1)	10 GA.						8 GA.			7 GA.		5 GA.		3 GA.				1 GA.					
	$2\frac{2}{3}$"x$\frac{1}{2}$" CAPHS	8 GA.																						
	3"x1" CAPHS	14 GA.				12 GA.		10 GA.					8 GA.											
	9"x$2\frac{1}{2}$" CAPLSSB	10 GA.							8 GA.		7 GA.	5 GA.		3 GA.			1 GA.							
	SRS (1)	12 GA.																						
	RCP (9)																							
78	3"x1" CSPHS (1)	12 GA.																						
	3"x1" CSPLS (1)	12 GA.																						
	5"x1" CSPHS (1)	12 GA.																						
	6"x2" CSPLSSB (1)	10 GA.						8 GA.			7 GA.		5 GA.		3 GA.				1 GA.					
	3"x1" CAPHS	12 GA.					10 GA.					8 GA.												
	9"x$2\frac{1}{2}$" CAPLSSB	10 GA.					8 GA.		7 GA.	5 GA.	3 GA.			1 GA.										
	SRS (1)	12 GA.																						
	RCP (9)																							
		2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120

~ NOTES ~

(1) GAGES FOR CORRUGATED STEEL PIPE ITEMS SHOWN ARE BASED ON ALUMINUM-COATED TYPE 2 STEEL AS PER AASHTO M-274. ALUMINUM COATED TYPE 2 STEEL IS ONLY PERMITTED IN Ph RANGES OF 5 TO 9.

2. WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES.

3. CONTRARY TO NOTE 2, GAGES FOR 6" x 2" CSPLSSB ARE SHOWN FOR ZINC COATED (GALVANIZED).

(4) SEE CUR. STD. DWG. RDI-001 FOR EXPLANATION OF COVER HEIGHTS LESS THAN 2 FEET.

5. CSP, CAP, SRS AND SRA ARE SHOWN IN GAGE.

6. MAXIMUM COVER HEIGHT MEASURED FROM TOP OF PIPE TO SUBGRADE ELEVATION SHALL GOVERN GAGE OF PIPE TO BE USED FOR ENTIRE LENGTH OF PIPE INSTALLATION.

7. ALL CIRCULAR STRUCTURAL PLATE SHALL BE 5% VERTICALLY ELONGATED.

8. SEE CUR. STD. DWG. RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.

(9) SEE CUR. STD. DWGS. RDI-021 AND RDI-026 FOR RCP COVER HEIGHT AND BEDDING REQUIREMENTS.

LEGEND

CSPHS: CORRUGATED STEEL PIPE WITH HELICAL LOCK SEAM OR HELICAL WELDED SEAM (HELICAL CORR.)

CSPLS: CORRUGATED STEEL PIPE WITH LONGITUDINAL RIVETED OR SPOT WELDED SEAM (ANNULAR CORR.)

CSPLSSB: CORRUGATED STEEL PIPE WITH LONGITUDINAL SEAMS WITH STEEL BOLTS (ANNULAR CORR.)

CAPHS: CORRUGATED ALUMINUM ALLOY PIPE WITH HELICAL LOCK SEAM (HELICAL CORR.)

CAPLSSB: CORRUGATED ALUMINUM ALLOY PIPE WITH LONGITUDINAL SEAMS WITH STEEL BOLTS (ANNULAR CORR.) SEAMS WITH STEEL BOLTS (ANNULAR CORR.)

SRS: SPIRAL RIB STEEL

RCP: CIRCULAR REINFORCED CONCRETE PIPE

72" PIPE - 78" PIPE

USE WITH CUR. STD. DWGS. RDI-001, RDI-021, RDI-026, RDI-035

KENTUCKY DEPARTMENT OF HIGHWAYS

CULVERT & STORM SEWER PIPE TYPES & COVER HEIGHTS

STANDARD DRAWING NO. RDI-005-04

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

CIRCULAR PIPE COVER HEIGHTS IN FEET (4)

PIPE DIA. (IN)	PIPE TYPE	2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120
84	3''x1'' CSPHS (1)	12 GA.										10 GA.													
	3''x1'' CSPLS (1)	12 GA.						10 GA.																	
	5''x1'' CSPHS (1)	12 GA.								10 GA.															
	6''x2'' CSPLSSB (1)	10 GA.					8 GA.			7 GA.		5 GA.	3 GA.												
	3''x1'' CAPHS	12 GA.				10 GA.						8 GA.													
	9''x2½'' CAPLSSB	10 GA.					8 GA.		7 GA.		5 GA.	3 GA.		1 GA.											
	RCP (9)																								
90	3''x1'' CSPHS (1)	12 GA.										10 GA.													
	3''x1'' CSPLS (1)	12 GA.						10 GA.																	
	5''x1'' CSPHS (1)	12 GA.								10 GA.															
	6''x2'' CSPLSSB (1)	10 GA.					8 GA.			7 GA.		5 GA.	3 GA.												
	3''x1'' CAPHS	12 GA.				10 GA.						8 GA.													
	9''x2½'' CAPLSSB	10 GA.					8 GA.		7 GA.		5 GA.	3 GA.		1 GA.											
	RCP (9)																								
96	3''x1'' CSPHS (1)	12 GA.								10 GA.															
	3''x1'' CSPLS (1)	12 GA.																							
	5''x1'' CSPHS (1)	12 GA.								10 GA.															
	6''x2'' CSPLSSB (1)	10 GA.				8 GA.		7 GA.		5 GA.		3 GA.													
	3''x1'' CAPHS	12 GA.				10 GA.				8 GA.															
	9''x2½'' CAPLSSB	10 GA.				8 GA.		7 GA.	5 GA.	3 GA.		1 GA.													
	RCP (9)																								

	2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120

~ NOTES ~

(1) GAGES FOR CORRUGATED STEEL PIPE ITEMS SHOWN ARE BASED ON ALUMINUM-COATED TYPE 2 STEEL AS PER AASHTO M-274. ALUMINUM COATED TYPE 2 STEEL IS ONLY PERMITTED IN Ph RANGES OF 5 TO 9.

2. WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES.

3. CONTRARY TO NOTE 2, GAGES FOR 6'' x 2'' CSPLSSB ARE SHOWN FOR ZINC COATED (GALVANIZED).

(4) SEE CUR. STD DWG. RDI-001 FOR EXPLANATION OF COVER HEIGHTS LESS THAN 2 FEET.

5. CSP, CAP, SRS AND SRA ARE SHOWN IN GAGE.

6. MAXIMUM COVER HEIGHT MEASURED FROM TOP OF PIPE TO SUBGRADE ELEVATION SHALL GOVERN GAGE OF PIPE TO BE USED FOR ENTIRE LENGTH OF PIPE INSTALLATION.

7. ALL CIRCULAR STRUCTURAL PLATE SHALL BE 5% VERTICALLY ELONGATED.

8. SEE CUR. STD. DWG. RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.

(9) SEE CUR. STD. DWGS. RDI-021 AND RDI-026 FOR RCP COVER HEIGHT AND BEDDING REQUIREMENTS.

LEGEND

CSPHS: CORRUGATED STEEL PIPE WITH HELICAL LOCK SEAM OR HELICAL WELDED SEAM (HELICAL CORR.)

CSPLS: CORRUGATED STEEL PIPE WITH LONGITUDINAL RIVETED OR SPOT WELDED SEAM (ANNULAR CORR.)

CSPLSSB: CORRUGATED STEEL PIPE WITH LONGITUDINAL SEAMS WITH STEEL BOLTS (ANNULAR CORR.)

CAPHS: CORRUGATED ALUMINUM ALLOY PIPE WITH HELICAL LOCK SEAM (HELICAL CORR.)

CAPLSSB: CORRUGATED ALUMINUM ALLOY PIPE WITH LONGITUDINAL SEAMS WITH STEEL BOLTS (ANNULAR CORR.)

RCP: CIRCULAR REINFORCED CONCRETE PIPE

84'' PIPE - 96'' PIPE

USE WITH CUR. STD. DWGS. RDI-001, RDI-021 , RDI-026 . RDI-035

KENTUCKY DEPARTMENT OF HIGHWAYS

CULVERT & STORM SEWER PIPE TYPES & COVER HEIGHTS

STANDARD DRAWING NO. RDI-006-04

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

CIRCULAR PIPE COVER HEIGHTS IN FEET (4)

PIPE DIA. (IN)	PIPE TYPE	2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120
102	3"x1" CSPHS (1)	12 GA.								10 GA.															
	3"x1" CSPLS (1)	12 GA.				10 GA.																			
	5"x1" CSPHS (1)	12 GA.						10 GA.																	
	6"x2" CSPLSSB (1)	10 GA.				8 GA.		7 GA.		5 GA.	3 GA.						1 GA.								
	3"x1" CAPHS	10 GA.						8 GA.																	
	9"x2½" CAPLSSB	10 GA.				8 GA.	7 GA.	5 GA.	3 GA.		1 GA.														
	RCP (9)																								
108	3"x1" CSPHS (1)	12 GA.								10 GA.															
	3"x1" CSPLS (1)	12 GA.				10 GA.																			
	5"x1" CSPHS (1)	12 GA.						10 GA.																	
	6"x2" CSPLSSB (1)	10 GA.				8 GA.		7 GA.		5 GA.	3 GA.						1 GA.								
	3"x1" CAPHS	10 GA.						8 GA.																	
	9"x2½" CAPLSSB	10 GA.				8 GA.	7 GA.	5 GA.	3 GA.		1 GA.														
	RCP (9)																								
114	3"x1" CSPHS (1)	10 GA.																							
	3"x1" CSPLS (1)	10 GA.																							
	5"x1" CSPHS (1)	10 GA.																							
	6"x2" CSPLSSB (1)	10 GA.				8 GA.		7 GA.		5 GA.	3 GA.						1 GA.								
	3"x1" CAPHS	8 GA.																							
	9"x2½" CAPLSSB	10 GA.				8 GA.		7 GA.	3 GA.		1 GA.														
	RCP (9)																								
		2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120

~ NOTES ~

(1) GAGES FOR CORRUGATED STEEL PIPE ITEMS SHOWN ARE BASED ON ALUMINUM-COATED TYPE 2 STEEL AS PER AASHTO M-274. ALUMINUM COATED TYPE 2 STEEL IS ONLY PERMITTED IN Ph RANGES OF 5 TO 9.

2. WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES.

3. CONTRARY TO NOTE 2, GAGES FOR 6" x 2" CSPLSSB ARE SHOWN FOR ZINC COATED (GALVANIZED).

(4) SEE CUR. STD. DWG. RDI-001 FOR EXPLANATION OF COVER HEIGHTS LESS THAN 2 FEET.

5. CSP, CAP, SRS AND SRA ARE SHOWN IN GAGE.

6. MAXIMUM COVER HEIGHT MEASURED FROM TOP OF PIPE TO SUBGRADE ELEVATION SHALL GOVERN GAGE OF PIPE TO BE USED FOR ENTIRE LENGTH OF PIPE INSTALLATION.

7. ALL CIRCULAR STRUCTURAL PLATE SHALL BE 5% VERTICALLY ELONGATED.

8. SEE CUR. STD. DWG. RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.

(9) SEE CUR. STD. DWGS. RDI-021 AND RDI-026 FOR RCP COVER HEIGHT AND BEDDING REQUIREMENTS.

LEGEND

CSPHS: CORRUGATED STEEL PIPE WITH HELICAL LOCK SEAM OR HELICAL WELDED SEAM (HELICAL CORR.)

CSPLS: CORRUGATED STEEL PIPE WITH LONGITUDINAL RIVETED OR SPOT WELDED SEAM (ANNULAR CORR.)

CSPLSSB: CORRUGATED STEEL PIPE WITH LONGITUDINAL SEAMS WITH STEEL BOLTS (ANNULAR CORR.)

CAPHS: CORRUGATED ALUMINUM ALLOY PIPE WITH HELICAL LOCK SEAM (HELICAL CORR.)

CAPLSSB: CORRUGATED ALUMINUM ALLOY PIPE WITH LONGITUDINAL SEAMS WITH STEEL BOLTS (ANNULAR CORR.)

RCP: CIRCULAR REINFORCED CONCRETE PIPE

102" PIPE - 114" PIPE

USE WITH CUR. STD. DWGS. RDI-001, RDI-021, RDI-026, RDI-035

KENTUCKY DEPARTMENT OF HIGHWAYS

CULVERT & STORM SEWER PIPE TYPES & COVER HEIGHTS

STANDARD DRAWING NO. RDI-007-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

PIPE DIA. (IN)	PIPE TYPE	CIRCULAR PIPE COVER HEIGHTS IN FEET (4)																						
		2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120
120	3"x1" CSPHS (1)	10 GA.																						
	3"x1" CSPLS (1)	10 GA.																						
	5"x1" CSPHS (1)	10 GA.																						
	6"x2" CSPLSSB (1)	10 GA.			8 GA.			7 GA.		5 GA.	3 GA.	1 GA.													
	3"x1" CAPHS	8 GA.																						
	9"x2½" CAPLSSB	10 GA.			8 GA.	7 GA.	5 GA.	3 GA.	1 GA.															
	RCP (9)																							
		2-5	5-10	10-15	15-20	20-25	25-30	30-35	35-40	40-45	45-50	50-55	55-60	60-65	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110	110-115	115-120

~ NOTES ~

(1) GAGES FOR CORRUGATED STEEL PIPE ITEMS SHOWN ARE BASED ON ALUMINUM-COATED TYPE 2 STEEL AS PER AASHTO M-274. ALUMINUM COATED TYPE 2 STEEL IS ONLY PERMITTED IN Ph RANGES OF 5 TO 9.

2. WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES.
3. CONTRARY TO NOTE 2, GAGES FOR 6" x 2" CSPLSSB ARE SHOWN FOR ZINC COATED (GALVANIZED).

(4) SEE CUR. STD. DWG. DRAWING RDI-001 FOR EXPLANATION OF COVER HEIGHTS LESS THAN 2 FEET.

5. CSP, CAP, SRS AND SRA ARE SHOWN IN GAGE.
6. MAXIMUM COVER HEIGHT MEASURED FROM TOP OF PIPE TO SUBGRADE ELEVATION SHALL GOVERN GAGE OF PIPE TO BE USED FOR ENTIRE LENGTH OF PIPE INSTALLATION.
7. ALL CIRCULAR STRUCTURAL PLATE SHALL BE 5% VERTICALLY ELONGATED.
8. SEE CUR. STD. DWG. RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.

(9) SEE CUR. STD. DWGS. RDI-021 AND RDI-026 FOR RCP COVER HEIGHT AND BEDDING REQUIREMENTS.

LEGEND

CSPHS: CORRUGATED STEEL PIPE WITH HELICAL LOCK SEAM OR HELICAL WELDED SEAM (HELICAL CORR.)

CSPLS: CORRUGATED STEEL PIPE WITH LONGITUDINAL RIVETED OR SPOT WELDED SEAM (ANNULAR CORR.)

CSPLSSB: CORRUGATED STEEL PIPE WITH LONGITUDINAL SEAMS WITH STEEL BOLTS (ANNULAR CORR.)

CAPHS: CORRUGATED ALUMINUM ALLOY PIPE WITH HELICAL LOCK SEAM (HELICAL CORR.)

CAPLSSB: CORRUGATED ALUMINUM ALLOY PIPE WITH LONGITUDINAL SEAMS WITH STEEL BOLTS (ANNULAR CORR.)

RCP: CIRCULAR REINFORCED CONCRETE PIPE

120" PIPE

USE WITH CUR. STD. DWGS.
RDI-001, RDI-021 ,RDI-026.
RDI-035

KENTUCKY
DEPARTMENT OF HIGHWAYS

CULVERT & STORM SEWER PIPE TYPES & COVER HEIGHTS

STANDARD DRAWING NO. RDI-008-04

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

EQUI. PIPE DIA. (IN)	PIPE TYPE	NON-CIRCULAR PIPE COVER HEIGHTS IN FEET					
		2 - 5	6	7	8	9	10
15	2⅔"x½" CSPA (1)	16 GA.					
	2⅔"x½" CAPA	16 GA.					
18	2⅔"x½" CSPA (1)	16 GA.					
	2⅔"x½" CAPA	16 GA.					
	SRSA (1)	16 GA.					
	SRAA	16 GA.					
	RCHEP (12)						
21	2⅔"x½" CSPA (1)	16 GA.					
	2⅔"x½" CAPA	16 GA.					
	SRSA (1)	16 GA.					
	SRAA	16 GA.					
	RCHEP (12)						
24	2⅔"x½" CSPA (1)	16 GA.					
	2⅔"x½" CAPA	14 GA.					
	SRSA (1)	16 GA.					
	SRAA	14 GA.					
	RCHEP (12)						
		2 - 5	6	7	8	9	10

EQUI. PIPE DIA. (IN)	PIPE TYPE	NON-CIRCULAR PIPE COVER HEIGHTS IN FEET					
		2 - 5	6	7	8	9	10
30 (9)	2⅔"x½" CSPA (1)	16 GA.					
	2⅔"x½" CAPA	14 GA.					
	SRSA (1)	16 GA.					
	SRAA	14 GA.					
	RCHEP (12)						
36	2⅔"x½" CSPA (1)	14 GA.					
	2⅔"x½" CAPA	12 GA.					
	SRSA (1)	14 GA.					
	SRAA	12 GA.					
	RCHEP (12)						
42	2⅔"x½" CSPA (1)	14 GA.					
	2⅔"x½" CAPA	12 GA.					
	SRSA (1)	14 GA.					
	SRAA	12 GA.					
	RCHEP (12)						
		2 - 5	6	7	8	9	10

EQUI. PIPE DIA. (IN)	PIPE TYPE	NON-CIRCULAR PIPE COVER HEIGHTS IN FEET					
		2 - 5	6	7	8	9	10
48	2⅔"x½" CSPA (1)	12 GA.					
	2⅔"x½" CAPA	10 GA.					
	SRSA (1)	14 GA.					
	SRAA	12 GA.					
	RCHEP (12)						
54	2⅔"x½" CSPA (1)	12 GA.					
	(3) CSPA (1)	14 GA.					
	2⅔"x½" CAPA	10 GA.					
	3"x1" CAPA	14 GA.					
	SRSA (1)	14 GA.					
	SRAA	12 GA.					
	RCHEP (12)						
60	2⅔"x½" CSPA (1)	10 GA.					
	(3) CSPA (1)	14 GA.					
	2⅔"x½" CAPA	8 GA.					
	3"x1" CAPA	14 GA.					
	SRSA (1)	12 GA.					
	SRAA	10 GA.					
	RCHEP (12)						
		2 - 5	6	7	8	9	10

~ NOTES ~

(1) GAGES FOR CORRUGATED STEEL PIPE ITEMS SHOWN ARE BASED ON ALUMINUM-COATED TYPE 2 STEEL AS PER AASHTO M-274. ALUMINUM COATED TYPE 2 STEEL IS ONLY PERMITTED IN Ph RANGES OF 5 TO 9.

2. WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES.

(3) 3" x 1" OR 5" x 1"

4. CSPA, CAPA, SRSA AND SRAA ARE SHOWN IN GAGE.

5. MAXIMUM COVER HEIGHT MEASURED FROM TOP OF PIPE TO SUBGRADE ELEVATION SHALL GOVERN GAGE OF PIPE TO BE USED FOR ENTIRE LENGTH OF PIPE INSTALLATION.

6. MINIMUM COVER HEIGHTS FOR PIPE SHALL BE 2 FEET. GAGE OF PIPE FOR COVER HEIGHTS LESS THAN 2 FEET SHALL BE THAT SHOWN FOR COVER HEIGHTS OF 10 FEET. (SEE STANDARD SPECIFICATIONS FOR BACKFILL)

7. MAXIMUM COVER HEIGHT FOR NON-CIRCULAR PIPE IS 10 FEET. NON-CIRCULAR PIPE SHALL ONLY BE USED WHERE COVER LIMITATIONS EXIST.

8. GAGE OF ENTRANCE PIPE FOR COVER HEIGHTS LESS THAN 2 FEET SHALL MEET THE FOLLOWING REQUIREMENTS:
   a. GAGE OF CAPA SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLE.
   b. GAGE OF CSPA SHALL BE THAT SHOWN IN TABLE.

(9) ENTRANCE PIPE GREATER THAN 30" DIA. SHALL BE CULVERT PIPE.

10. SEE CUR. STD. DWG. RDI-016 FOR NON-CIRCULAR PIPE ALTERNATES.

11. SEE CUR. STD. DWG. RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.

(12) SEE CUR. STD. DWGS. RDI-021 AND RDI-026 FOR RCHEP COVER HEIGHT AND BEDDING REQUIREMENTS.

LEGEND

CSPA: CORRUGATED STEEL PIPE ARCH
CAPA: CORRUGATED ALUMINUM ALLOY PIPE ARCH
SRSA: SPIRAL RIB STEEL ARCH
SRAA: SPIRAL RIB ALUMINUM ARCH
RCHEP: REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE

NON-CIRCULAR
15" PIPE - 60" PIPE

USE WITH CUR. STD. DWGS.
RDI-016, RDI-021, RDI-026, RDI-035

KENTUCKY
DEPARTMENT OF HIGHWAYS

CULVERT, ENTRANCE & STORM SEWER PIPE TYPES & COVER HEIGHTS

STANDARD DRAWING NO. RDI-011-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

EQUI. PIPE DIA. (IN)	PIPE TYPE	NON-CIRCULAR PIPE COVER HEIGHTS IN FEET ④					
		2 - 5	6	7	8	9	10
66	③ CSPA ①	14 GA.					
	6''x2'' CSPA ①	12 GA.					
	3''x1'' CAPA	14 GA.					
	RCHEP ⑪						
72	③ CSPA ①	14 GA.					
	6''x2'' CSPA ①	12 GA.					
	3''x1'' CAPA	12 GA.					
	RCHEP ⑪						
78	③ CSPA ①	12 GA.					
	6''x2'' CSPA ①	12 GA.					
	3''x1'' CAPA	12 GA.					
	9''x2½'' CAPAASB	12 GA.					
	RCHEP ⑪						
		2 - 5	6	7	8	9	10

EQUI. PIPE DIA. (IN)	PIPE TYPE	NON-CIRCULAR PIPE COVER HEIGHTS IN FEET ④					
		2 - 5	6	7	8	9	10
84	③ CSPA ①	12 GA.					
	6''x2'' CSPA ①	12 GA.					
	3''x1'' CAPA	12 GA.					
	9''x2½'' CAPAASB	12 GA.					
	RCHEP ⑪						
90	③ CSPA ①	12 GA.					
	6''x2'' CSPA ①	12 GA.					
	3''x1'' CAPA	10 GA.					
	9''x2½'' CAPAASB	12 GA.					
	RCHEP ⑪						
96	③ CSPA ①	12 GA.					
	6''x2'' CSPA ①	12 GA.					
	3''x1'' CAPA	8 GA.					
	9''x2½'' CAPAASB	12 GA.					
	RCHEP ⑪						
		2 - 5	6	7	8	9	10

EQUI. PIPE DIA. (IN)	PIPE TYPE	NON-CIRCULAR PIPE COVER HEIGHTS IN FEET ④					
		2 - 5	6	7	8	9	10
102	③ CSPA ①	12 GA.					
	6''x2'' CSPA ①	12 GA.					
	3''x1'' CAPA	8 GA.					
	9''x2½'' CAPAASB	12 GA.					
	RCHEP ⑪						
108	③ CSPA ①	10 GA.					
	6''x2'' CSPA ①	12 GA.					
	9''x2½'' CAPAASB	12 GA.					
	RCHEP ⑪						
114	③ CSPA ①	10 GA.					
	6''x2'' CSPA ①	12 GA.					
	9''x2½'' CAPAASB	12 GA.					
	RCHEP ⑪						
120	6''x2'' CSPA ①	12 GA.					
	9''x2½'' CAPAASB	12 GA.					
	RCHEP ⑪						
		2 - 5	6	7	8	9	10

~ NOTES ~

① GAGES FOR CORRUGATED STEEL PIPE ITEMS SHOWN ARE BASED ON ALUMINUM-COATED TYPE 2 STEEL AS PER AASHTO M-274. ALUMINUM COATED TYPE 2 STEEL IS ONLY PERMITTED IN Ph RANGES OF 5 TO 9.

2. WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES.

③ 3'' x 1'' OR 5'' x 1''

④ SEE CUR. STD. DWG. RDI-011 FOR EXPLANATION OF COVER HEIGHTS LESS THAN 2 FEET.

5. CSPA AND CAPA ARE SHOWN IN GAGE.

6. MAXIMUM COVER HEIGHT FROM TOP OF PIPE TO SUBGRADE ELEVATION SHALL GOVERN GAGE OF PIPE TO BE USED FOR ENTIRE LENGTH OF PIPE INSTALLATION.

7. MAXIMUM COVER HEIGHT FOR NON-CIRCULAR PIPE IS 10 FEET. NON-CIRCULAR PIPE SHALL ONLY BE USED WHERE COVER LIMITATIONS EXIST.

8. NON-CIRCULAR CMP HAVING AN EQUIVALENT ROUND DIAMETER GREATER THAN 84'' SHALL BE SUPPLIED AS STRUCTURAL PLATE.

9. SEE CUR. STD. DWG. RDI-016 FOR NON-CIRCULAR PIPE ALTERNATES.

10. SEE CUR. STD. DWG. RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.

⑪ SEE CUR. STD. DWGS. RDI-021 AND RDI-026 FOR RCHEP COVER HEIGHT AND BEDDING REQUIREMENTS.

LEGEND

CSPA: CORRUGATED STEEL PIPE ARCH (ANNULAR CORR.)

CAPA: CORRUGATED ALUMINUM ALLOY PIPE ARCH (ANNULAR CORR.)

CAPAASB: CORRUGATED ALUMINUM ALLOY PIPE ARCH WITH ALUMINUM OR STEEL BOLTS (ANNULAR CORR.)

RCHEP: REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE

USE WITH CUR. STD. DWGS. RDI-011 , RDI-016 , RDI-021 , RDI-026, RDI-035

NON-CIRCULAR
66'' PIPE - 120'' PIPE

KENTUCKY
DEPARTMENT OF HIGHWAYS

CULVERT & STORM SEWER PIPE TYPES & COVER HEIGHTS

STANDARD DRAWING NO. RDI-012-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

EQUIVALENT CIRCULAR PIPE DIAMETER	2⅔'' x ½'' CSPA & CAPA		① CSPA AND 3'' x 1'' CAPA		6'' x 2'' CSPA		9''x2½'' CAPAASB		RCHEP	
	SPAN (INCH)	RISE (INCH)	SPAN (INCH)	RISE (INCH)	SPAN	RISE	SPAN	RISE	SPAN (INCH)	RISE (INCH)
15''	17	13								
18''	21	15							23	14
21''	24	18								
24''	28	20							30	19
30''	35	24							38	24
36''	42	29							45	29
42''	49	33							53	34
48''	57	38							60	38
54''	64	43	60	46					68	43
60''	71	47	66	51					76	48
66''			73	55	6'-1''	4'-7''			83	53
72''			81	59	6'-9''	4'-11''			91	58
78''			87	63	7'-3''	5'-3''	6'-11''	5'-9''	98	63
84''			95	67	7'-11''	5'-7''	7'-9''	6'-0''	106	68
90''			103	71	8'-7''	5'-11''	8'-5''	6'-3''	113	72
96''			112	75	9'-4''	6'-3''	9'-3''	6'-5''	121	77
102''			117	79	9'-9''	6'-7''	9'-11''	6'-8''	128	82
108''			128	83	10'-8''	6'-11''	10'-9''	6'-10''	136	87
114''			137	87	11'-5''	7'-3''	11'-5''	7'-1''	143	92
120''			142	91	11'-10''	7'-7''	12'-3''	7'-3''	151	97

CHART KEY

2⅔''x½'' CSPA: CORRUGATED STEEL PIPE ARCH
3''x1'' OR 5''x1'' CSPA: CORRUGATED STEEL PIPE ARCH
6''x2'' CSPA: CORRUGATED STEEL PIPE ARCH
2⅔''x½'' CAPA: CORRUGATED ALUMINUM ALLOY PIPE ARCH
3''x1'' CAPA: CORRUGATED ALUMINUM ALLOY PIPE ARCH
9''x2½'' CAPAASB: CORRUGATED ALUMINUM ALLOY PIPE ARCH WITH ALUMINUM OR STEEL BOLTS
RCHEP: REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE

~ NOTES ~

① 3''x1'' OR 5''x1''

KENTUCKY DEPARTMENT OF HIGHWAYS

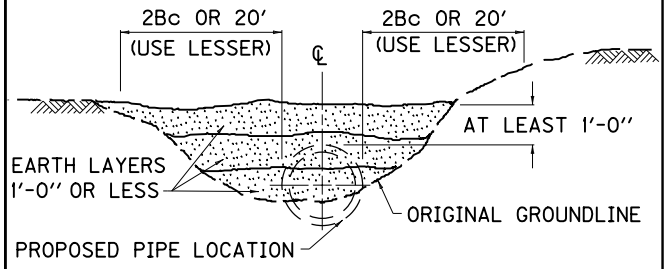
NON-CIRCULAR PIPE ALTERNATES

STANDARD DRAWING NO. RDI-016-03

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

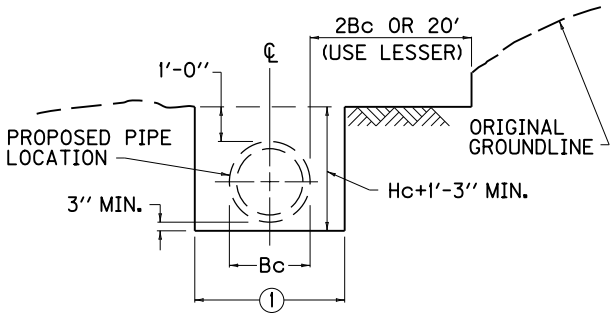
STEP 1



a. IF THE ORIGINAL GROUNDLINE IS AT LEAST 1'-0" ABOVE TOP OF PROPOSED PIPE FOR WIDTH OF 2Bc OR 20' (WHICHEVER IS LESS) ON EACH SIDE OF THE PIPE, GO DIRECTLY TO "STEP 2".

b. IF ORIGINAL GROUNDLINE IS NOT AT LEAST 1'-0" ABOVE TOP OF PROPOSED PIPE, COMPACT EMBANKMENT IN LAYERS OF 1'-0" OR LESS TO ELEVATION AND WIDTH SHOWN. ⬚ MEET DENSITY REQUIREMENTS FOR PROPOSED EMBANKMENT .

STEP 2

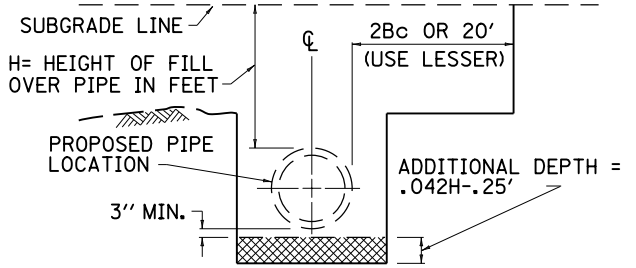


a. EXCAVATE TO WITHIN 1'-0" ABOVE TOP OF PROPOSED PIPE A WIDTH OF 2Bc OR 20' (USE LESSER) ON EACH SIDE OF PIPE.

b. EXCAVATE TRENCH TO WIDTH AND DEPTH SHOWN.

① Bc + 24" FOR PIPE 36" DIA. OR LESS.
Bc + 48" FOR PIPE GREATER THAN 36" DIA.

ROCK FOUNDATION DETAILS — STEP 3

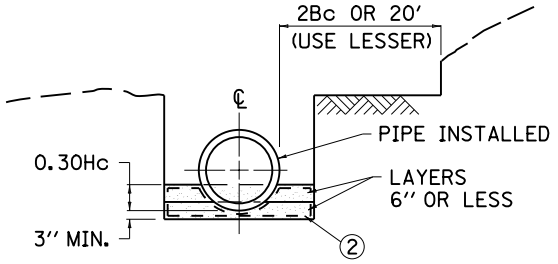


a. IF ROCK FOUNDATION IS NOT ENCOUNTERED, GO DIRECTLY TO "STEP 4".

b. IF ROCK FOUNDATION IS ENCOUNTERED, EXCAVATE TRENCH ADDITIONAL DEPTH USING FORMULA GIVEN. THIS ADDITIONAL DEPTH ▨ SHALL BE A MIN. OF 4" AND SHALL NOT EXCEED 24"

c. BACKFILL ADDITIONAL EXCAVATION AREA WITH COMPACTED BEDDING MATERIAL IN LAYERS 6" OR LESS.

STEP 4



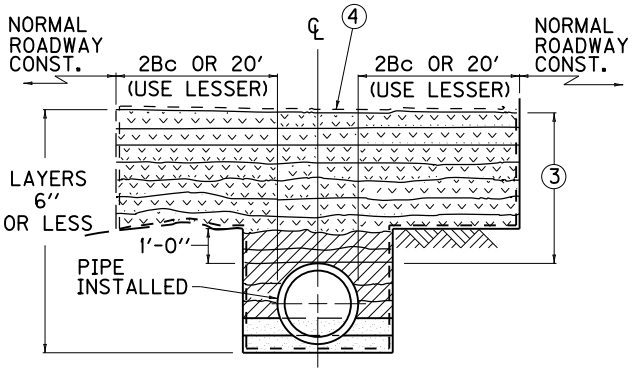
a. COMPACT BEDDING IN TRENCH IN LAYERS OF 6" OR LESS TO WIDTH AND ELEVATION SHOWN. ▭

b. EXCAVATE A GROOVE IN THE COMPACTED BEDDING TO CONFORM TO THE OUTSIDE OF THE PIPE. AFTER EXCAVATION OF THE GROOVE, APPROXIMATELY 4" OF BEDDING SHOULD REMAIN BELOW THE OUTSIDE INVERT OF THE PIPE. THE CRADLE SHALL BE GAGED FOR SHAPE AND SLOPE BY STRIKING OR DRAWING A TEMPLATE THROUGH THE GROOVE IMMEDIATELY BEFORE PLACING EACH SECTION OF PIPE.

c. INSTALL PIPE AT CORRECT ALIGNMENT AND ELEVATION. RECOMPACT ANY LOOSE BEDDING DISTURBED DURING INSTALLATION.

② WRAP BEDDING MATERIAL IN GEOTEXTILE FABRIC WHEN THE STANDARD SPECIFICATIONS SPECIFIES.

STEP 5



③ 4'-0" REQUIRED FOR CONSTRUCTION LOADING IF COVER HEIGHT PERMITS.

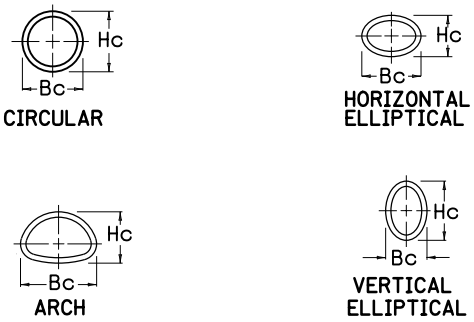
a. COMPACT REQUIRED BACKFILL MATERIAL IN LAYERS OF 6" OR LESS TO 1'-0" ABOVE TOP OF PIPE. ▨

b. COMPACT REQUIRED BACKFILL MATERIAL TO ELEV. ③ ABOVE TOP OF PIPE IN LAYERS OF 6" OR LESS. ▭

c. PROCEED WITH NORMAL ROADWAY CONSTRUCTION.

④ WRAP BEDDING MATERIAL IN GEOTEXTILE FABRIC WHEN THE STANDARD SPECIFICATIONS SPECIFIES.

~ PIPE SHAPES ~



FOR TRENCH CONDITIONS

USE WITH CUR. STD. DWG.
RDI-025

KENTUCKY
DEPARTMENT OF HIGHWAYS

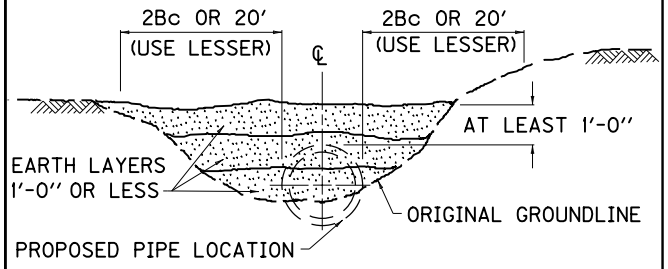
PIPE BEDDING FOR CULVERTS, ENTRANCE AND STORM SEWER PIPE

STANDARD DRAWING NO. RDI-020-09

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

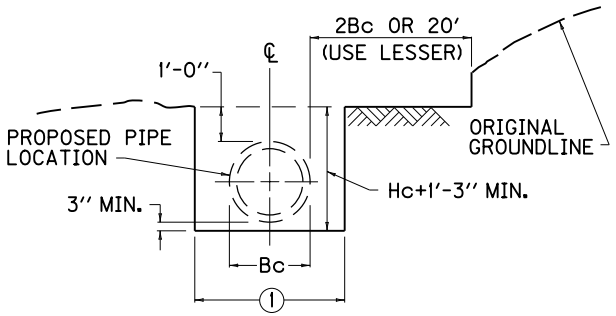
STEP 1



a. IF THE ORIGINAL GROUNDLINE IS AT LEAST 1'-0" ABOVE TOP OF PROPOSED PIPE FOR A WIDTH OF 2Bc OR 20' (WHICHEVER IS LESS) ON EACH SIDE OF THE PIPE GO DIRECTLY TO "STEP 2".

b. IF ORIGINAL GROUNDLINE IS NOT AT LEAST 1'-0" ABOVE TOP OF PROPOSED PIPE, COMPACT EMBANKMENT IN LAYERS 1'-0" OR LESS TO ELEVATION AND WIDTH SHOWN. ▨ MEET DENSITY REQUIREMENTS FOR PROPOSED EMBANKMENT .

STEP 2



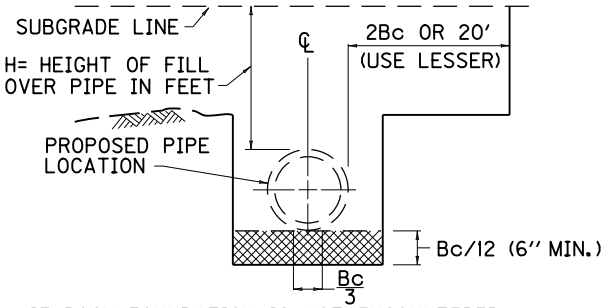
a. EXCAVATE TO WITHIN 1'-0" ABOVE TOP OF PROPOSED PIPE A WIDTH OF 2Bc OR 20' (USE LESSER) ON EACH SIDE OF PIPE.

b. EXCAVATE TRENCH TO THE WIDTH AND DEPTH SHOWN.

① Bc + 24" FOR PIPE 36" DIA. OR LESS.
Bc + 48" FOR PIPE GREATER THAN 36" DIA.

STEP 3

ROCK FOUNDATION DETAILS

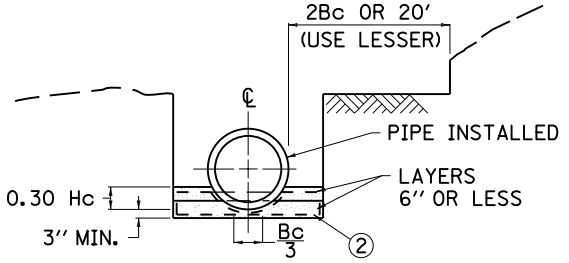


a. IF ROCK FOUNDATION IS NOT ENCOUNTERED, GO DIRECTLY TO "STEP 4".

b. IF ROCK FOUNDATION IS ENCOUNTERED, EXCAVATE TRENCH DEPTH USING FORMULA GIVEN. THIS DEPTH ▨ SHALL BE A MIN. OF 6" AND SHALL NOT EXCEED 24".

c. BACKFILL WITH COMPACTED BEDDING MATERIAL IN LAYERS OF 6" OR LESS LEAVING Bc/3 UNCOMPACTED IN THE FINAL LAYER.

STEP 4



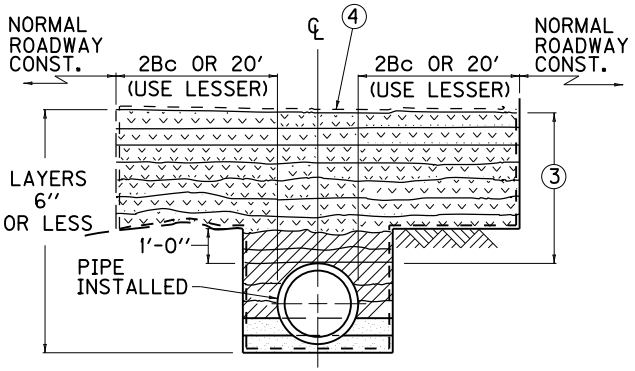
a. UNCOMPACTED 4" BEDDING IN SUBTRENCH. FOR TYPE 1 INSTALLATION COMPACT BEDDING IN LAYERS 6" OR LESS TO AN ELEVATION 0.30 Hc. ▭ LEAVE CENTER THIRD OF OUTSIDE PIPE DIA. (Bc/3) BEDDING UNCOMPACTED.

b. EXCAVATE A GROOVE IN THE COMPACTED BEDDING TO CONFORM TO THE OUTSIDE OF THE PIPE. AFTER EXCAVATION OF THE GROOVE, A MINIMUM 3" OF BEDDING SHOULD REMAIN BELOW THE OUTSIDE INVERT OF THE PIPE. THE CRADLE SHALL BE GAGED FOR SHAPE AND SLOPE BY STRIKING OR DRAWING A TEMPLATE THROUGH THE GROOVE IMMEDIATELY BEFORE PLACING EACH SECTION OF PIPE.

c. INSTALL PIPE AT CORRECT ALIGNMENT AND ELEVATION. RECOMPACT ANY LOOSE BEDDING DISTURBED DURING INSTALLATION.

② WRAP BEDDING MATERIAL IN GEOTEXTILE FABRIC WHEN THE STANDARD SPECIFICATIONS SPECIFIES.

STEP 5



③ 4'-0" REQUIRED FOR CONSTRUCTION LOADING.

a. COMPACT REQUIRED BACKFILL MATERIAL IN LAYERS 6" OR LESS TO 1'-0" ABOVE TOP OF PIPE. ▨

b. COMPACT REQUIRED BACKFILL MATERIAL TO ELEV. ③ ABOVE TOP OF PIPE IN LAYERS OF 6" OR LESS. ▨

c. PROCEED WITH NORMAL ROADWAY CONSTRUCTION.

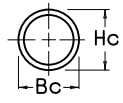
④ WRAP BEDDING MATERIAL IN GEOTEXTILE FABRIC WHEN THE STANDARD SPECIFICATIONS SPECIFIES.

MAX. COVER HEIGHT		
CLASS	TYPE 1	TYPE 4
III	25'	9'
IV	38'	15'
V	57'	23'

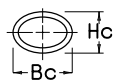
2' OF COVER OR LESS	
CLASS	PIPE DIA.
V	12"-15"-18"
IV	21"-24"
III	27" & LARGER

~ NOTES ~

1. 10' MAXIMUM COVER HEIGHT FOR HORIZONTAL ELLIPTICAL CLASS HE III PIPE.
2. COVER HEIGHTS EXCEEDING THOSE SHOWN IN TABLES REQUIRE SPECIAL DESIGNS.
3. FOR TYPE 4 INSTALLATION PLACE EMBANKMENT MATERIAL ACCORDING TO SECTION 701.03.06A OF THE CURRENT SPEC. BOOK.
4. FOR TYPE 1 INSTALLATION, WHEN THE TOP OF PIPE IS NOT WITHIN ONE PIPE DIAMETER OF THE SUBGRADE, INSTALL ACCORDING TO SECTION 701.03.06A OF THE CURRENT SPEC. BOOK.



CIRCULAR



HORIZONTAL ELLIPTICAL

~ PIPE SHAPES ~

FOR TRENCH CONDITIONS

USE WITH CUR. STD. DWG. RDI-026

KENTUCKY
DEPARTMENT OF HIGHWAYS

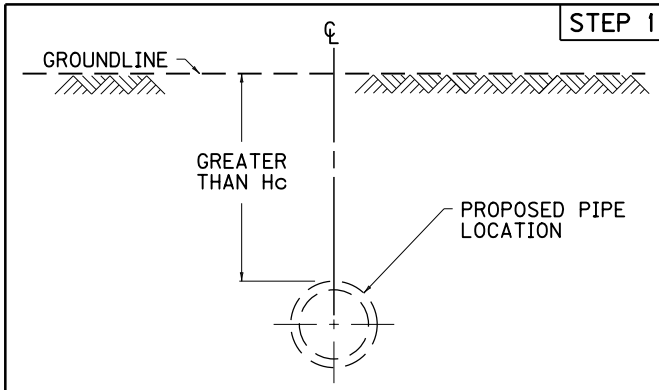
PIPE BEDDING FOR CULVERTS, ENTRANCE, AND STORM SEWER REINFORCED CONC. PIPE

STANDARD DRAWING NO. RDI-021-01

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

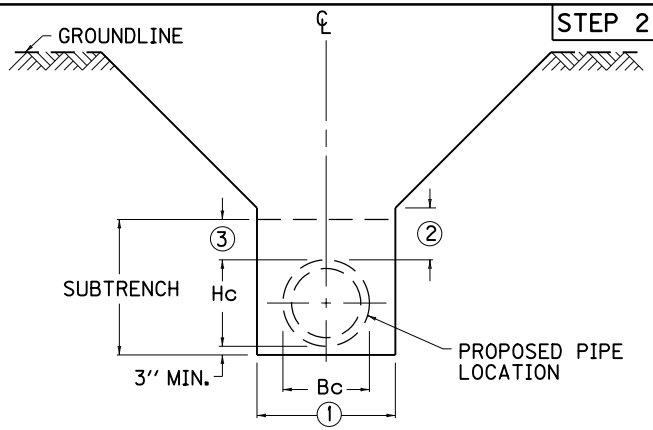
STEP 1



a. TRENCH CONDITION IS WHEN GROUNDLINE ELEVATION IS GREATER THAN Hc ABOVE TOP OF PROPOSED PIPE.

b. GROUNDLINE MAY BE (a) EXISTING OR ORIGINAL
(b) EXCAVATED SURFACE OR
(c) EMBANKMENT SURFACE.

STEP 2



a. EXCAVATE SUBTRENCH TO WIDTH AND DEPTH SHOWN.

b. TRENCH WALLS MAY BE CONSTRUCTED VERTICAL. FOR ILLUSTRATION PURPOSES THE DETAIL DEPICTS A SLOPING WALL TRENCH. WHICHEVER METHOD IS USED, THE TRENCH WALLS SHALL REMAIN SYMMETRICAL ABOUT THE CENTERLINE OF THE PIPE.

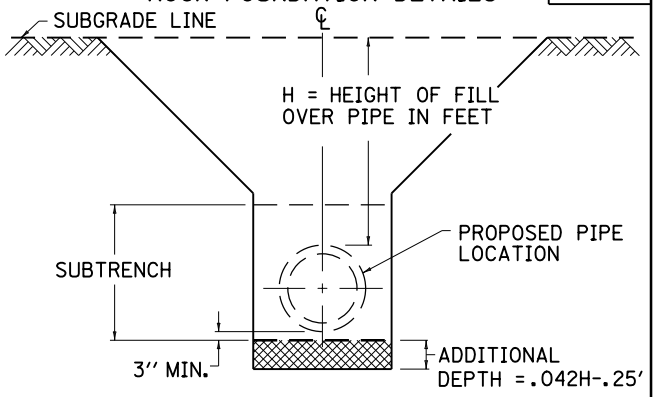
① Bc + 24" FOR PIPE 36" DIA. OR LESS.
Bc + 48" FOR PIPE GREATER THAN 36" DIA.

② SLOPING OF TRENCH WALLS MAY BEGIN AT ANY ELEVATION GREATER THAN 1'-0" ABOVE TOP OF PIPE. THE SUBTRENCH SHALL ALWAYS BE REQUIRED.

③ 1'-0" MINIMUM TO Hc MAXIMUM.

STEP 3

ROCK FOUNDATION DETAILS

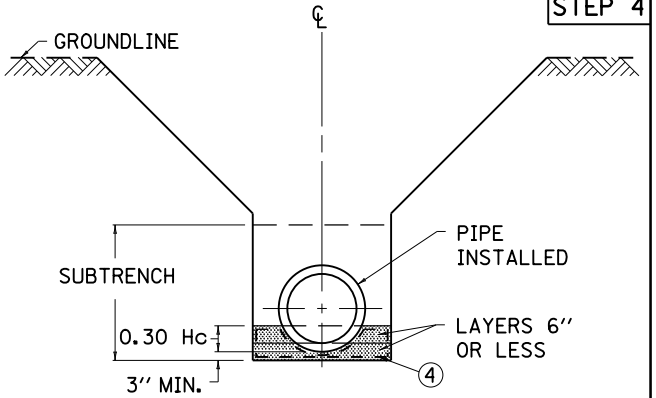


a. IF ROCK FOUNDATION IS NOT ENCOUNTERED, GO DIRECTLY TO "STEP 4".

b. IF ROCK FOUNDATION IS ENCOUNTERED, EXCAVATE TRENCH ADDITIONAL DEPTH USING FORMULA GIVEN. THIS ADDITIONAL DEPTH ▨ SHALL BE A MIN. OF 4" AND SHALL NOT EXCEED 24"

c. BACKFILL ADDITIONAL EXCAVATION AREA WITH COMPACTED BEDDING MATERIAL IN LAYERS 6" OR LESS.

STEP 4



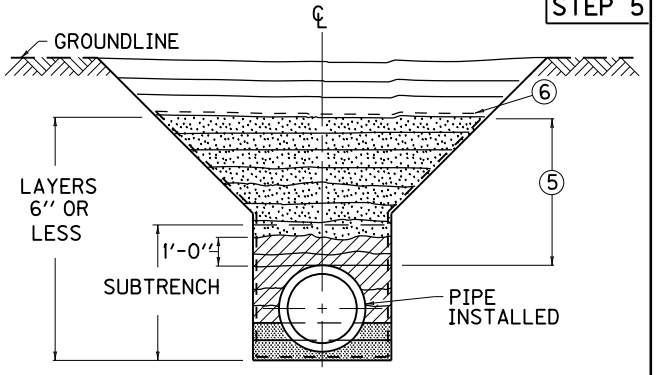
a. COMPACT BEDDING IN SUBTRENCH IN LAYERS OF 6" OR LESS TO WIDTH AND ELEVATION SHOWN. ▨

b. EXCAVATE A GROOVE IN THE COMPACTED BEDDING TO CONFORM TO THE OUTSIDE OF THE PIPE. AFTER EXCAVATION OF THE GROOVE, APPROXIMATELY 4" OF BEDDING SHOULD REMAIN BELOW THE OUTSIDE INVERT OF THE PIPE. THE CRADLE SHALL BE GAGED FOR SHAPE AND SLOPE BY STRIKING OR DRAWING A TEMPLATE THROUGH THE GROOVE IMMEDIATELY BEFORE PLACING EACH SECTION OF PIPE.

c. INSTALL PIPE AT CORRECT ALIGNMENT AND ELEVATION. RECOMPACT ANY LOOSE BEDDING DISTURBED DURING INSTALLATION.

④ WRAP BEDDING MATERIAL IN GEOTEXTILE FABRIC WHEN THE STANDARD SPECIFICATIONS SPECIFIES.

STEP 5



⑤ 4'-0" REQUIRED FOR CONSTRUCTION LOADING IF COVER HEIGHT PERMITS.

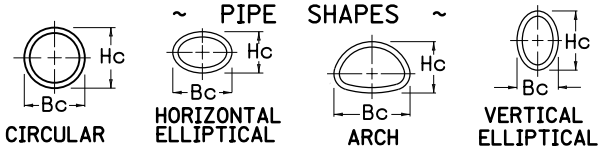
a. COMPACT REQUIRED BACKFILL MATERIAL IN LAYERS OF 6" OR LESS TO 1'-0" ABOVE TOP OF PIPE. ▨

b. IN A UNIFORM SYMMETRICAL MANNER COMPACT REQUIRED BACKFILL MATERIAL TO ELEVATION ⑤ ABOVE TOP OF PIPE IN LAYERS OF 6" OR LESS. ▨

c. PROCEED WITH TRENCH BACKFILL IN A SYMMETRICAL MANNER IN LAYERS OF 1'-0" OR LESS TO THE ORIGINAL GROUND AS DEFINED IN STEP 1.

⑥ WRAP BEDDING MATERIAL IN GEOTEXTILE FABRIC WHEN THE STANDARD SPECIFICATIONS SPECIFIES.

~ PIPE SHAPES ~



~ NOTE ~

1. FOR CLASSES AND GAGES OF PIPE SEE CUR. STD. DWGS. RDI-001 THROUGH RDI-008 AND RDI-011 AND RDI-012.

USE WITH CUR. STD. DWGS.
RDI-001, RDI-008, RDI-011,
RDI-012, RDI-020

KENTUCKY
DEPARTMENT OF HIGHWAYS

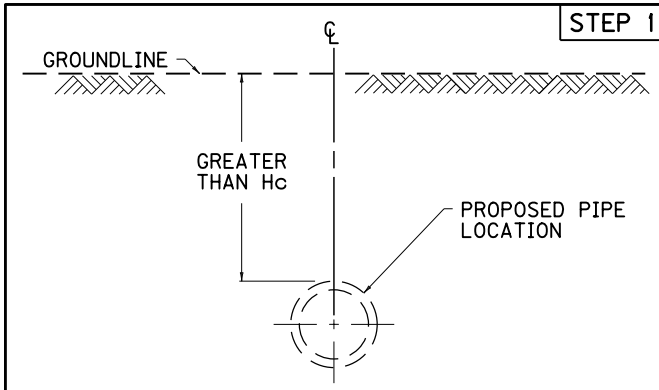
PIPE BEDDING TRENCH CONDITION

STANDARD DRAWING NO. RDI-025-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

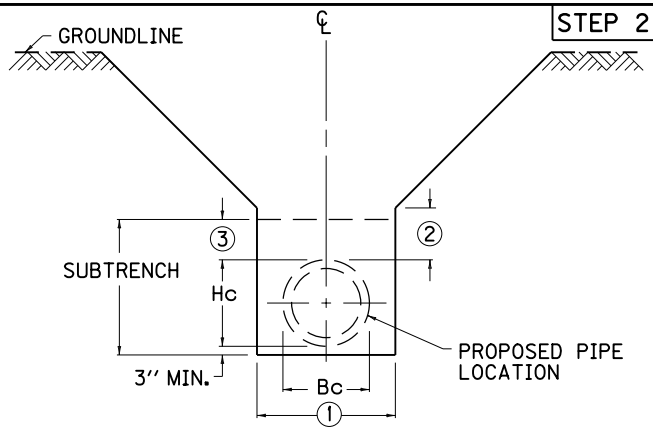
STEP 1



a. TRENCH CONDITION IS WHEN GROUNDLINE ELEVATION IS GREATER THAN Hc ABOVE TOP OF PROPOSED PIPE.

b. GROUNDLINE MAY BE (a) EXISTING OR ORIGINAL
(b) EXCAVATED SURFACE OR
(c) EMBANKMENT SURFACE.

STEP 2



a. EXCAVATE SUBTRENCH TO WIDTH AND DEPTH SHOWN.

b. TRENCH WALLS MAY BE CONSTRUCTED VERTICAL. FOR ILLUSTRATION PURPOSES THE DETAIL DEPICTS A SLOPING WALL TRENCH. WHICHEVER METHOD IS USED, THE TRENCH WALLS SHALL REMAIN SYMMETRICAL ABOUT THE CENTERLINE OF THE PIPE.

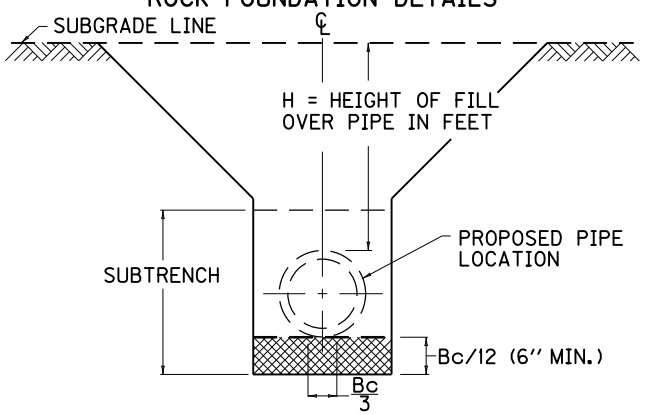
① Bc + 24" FOR PIPE 36" DIA. OR LESS.
Bc + 48" FOR PIPE GREATER THAN 36" DIA.

② SLOPING OF TRENCH WALLS MAY BEGIN AT ANY ELEVATION GREATER THAN 1'-0" ABOVE TOP OF PIPE. THE SUBTRENCH SHALL ALWAYS BE REQUIRED.

③ 1'-0" MINIMUM TO Hc MAXIMUM.

STEP 3

ROCK FOUNDATION DETAILS

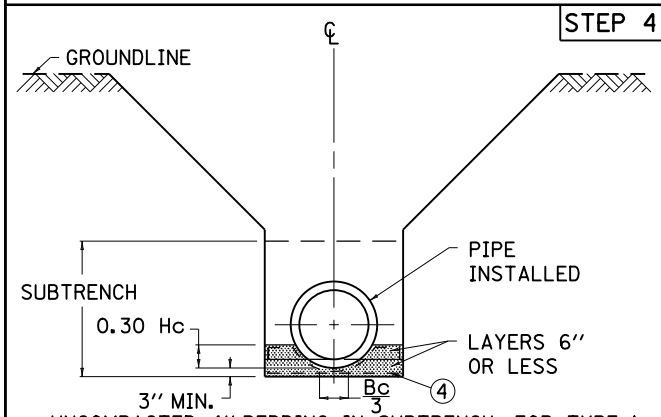


a. IF ROCK FOUNDATION IS NOT ENCOUNTERED, GO DIRECTLY TO "STEP 4".

b. IF ROCK FOUNDATION IS ENCOUNTERED, EXCAVATE TRENCH DEPTH USING FORMULA GIVEN. THIS DEPTH ▨ SHALL BE A MIN. OF 6" AND SHALL NOT EXCEED 24".

c. BACKFILL WITH COMPACTED BEDDING MATERIAL IN LAYERS OF 6" OR LESS LEAVING Bc/3 UNCOMPACTED IN THE FINAL LAYER.

STEP 4



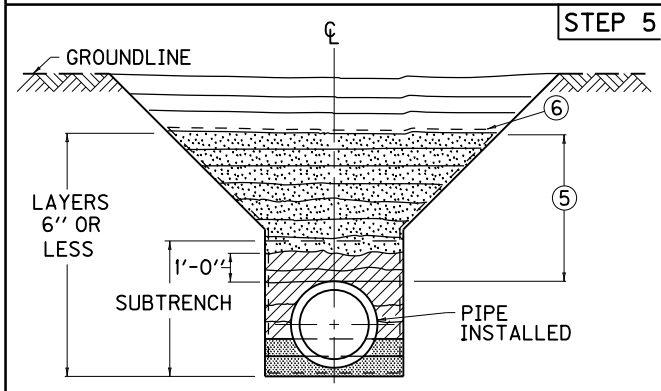
a. UNCOMPACTED 4" BEDDING IN SUBTRENCH. FOR TYPE 1 INSTALLATION COMPACT BEDDING IN LAYERS 6" OR LESS TO AN ELEVATION 0.30 Hc. ▨
LEAVE CENTER THIRD OF OUTSIDE PIPE DIA. (Bc/3) BEDDING UNCOMPACTED.

b. EXCAVATE A GROOVE IN THE BEDDING TO CONFORM TO THE OUTSIDE OF THE PIPE. AFTER EXCAVATION OF THE GROOVE, A MINIMUM 3" OF BEDDING SHOULD REMAIN BELOW THE OUTSIDE INVERT OF THE PIPE. THE CRADLE SHALL BE GAGED FOR SHAPE AND SLOPE BY STRIKING OR DRAWING A TEMPLATE THROUGH THE GROOVE IMMEDIATELY BEFORE PLACING EACH SECTION OF PIPE.

c. INSTALL PIPE AT CORRECT ALIGNMENT AND ELEVATION. RECOMPACT ANY LOOSE BEDDING DISTURBED DURING INSTALLATION.

④ WRAP BEDDING MATERIAL IN GEOTEXTILE FABRIC WHEN THE STANDARD SPECIFICATIONS SPECIFIES.

STEP 5



⑤ 4'-0" REQUIRED FOR CONSTRUCTION LOADING.

a. COMPACT REQUIRED BACKFILL MATERIAL IN LAYERS OF 6" OR LESS TO 1'-0" ABOVE TOP OF PIPE. ▨

b. IN A UNIFORM SYMMETRICAL MANNER COMPACT REQUIRED BACKFILL MATERIAL TO ELEVATION ⑤ ABOVE TOP OF PIPE IN LAYERS OF 6" OR LESS. ⣿

c. PROCEED WITH TRENCH BACKFILL IN A SYMMETRICAL MANNER IN LAYERS OF 1'-0" OR LESS TO THE ORIGINAL GROUND AS DEFINED IN STEP 1.

⑥ WRAP BEDDING MATERIAL IN GEOTEXTILE FABRIC WHEN THE STANDARD SPECIFICATIONS SPECIFIES.

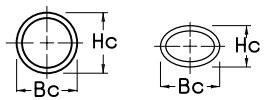
MAX. COVER HEIGHT		
CLASS	TYPE 1	TYPE 4
III	25'	9'
IV	38'	15'
V	57'	23'

2' OF COVER OR LESS	
CLASS	PIPE DIA.
V	12"-15"-18"
IV	21"-24"
III	27" & LARGER

~ NOTES ~

1. 10' MAXIMUM COVER HEIGHT FOR HORIZONTAL ELLIPTICAL CLASS HE III PIPE.
2. COVER HEIGHTS EXCEEDING THOSE SHOWN IN TABLES REQUIRE SPECIAL DESIGNS.
3. FOR TYPE 4 INSTALLATION PLACE EMBANKMENT MATERIAL ACCORDING TO SECTION 701.03.06A OF CURRENT SPEC. BOOK.
4. FOR TYPE 1 INSTALLATION, WHEN THE TOP OF THE PIPE IS NOT WITHIN ONE PIPE DIAMETER OF THE SUBGRADE, INSTALL ACCORDING TO SECTION 701.03.06A OF THE CURRENT SPEC. BOOK.

USE WITH CUR. STD. DWG. RDI-021



~ PIPE SHAPES ~

KENTUCKY
DEPARTMENT OF HIGHWAYS

PIPE BEDDING
TRENCH CONDITION
REINFORCED CONC. PIPE

STANDARD DRAWING NO. RDI-026-01

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

PIPE MATERIAL	pH RANGE ③					
	(ACID) L (< 5)		M (5 - 9) ④		(BASE) H (> 9)	
	COATING	PAVING	COATING	PAVING	COATING	PAVING
STEEL GALVANIZED	P	I	BP	I	P	I
ALUMINUM-COATED TYPE 2 STEEL	-	-	HB	I	-	-
ALUMINUM ALLOY	B	I	HB	I	B	I
REINFORCED CONCRETE	-	EP	-	-	-	EP
PLASTIC	-	-	-	-	-	-

HB - HALF ASPHALT COATED
B - FULLY ASPHALT COATED
BP - FULLY ASPHALT COATED OR POLYMERIC COATED
P - POLYMERIC COATED (PRECOATED GALVANIZED)
EP - EXTRA PROTECTION
I - PAVED INVERT

~ NOTES ~

1. EXCEPTIONS FOR STORM SEWERS:
   a. ANNULAR CORRUGATED PIPE SHALL BE FULLY LINED.
   b. HELICAL CORRUGATED PIPE > 24'' DIA. SHALL BE FULLY LINED.
   c. HELICAL CORRUGATED PIPE < 24'' DIA. SHALL NOT REQUIRE COATING, PAVING, OR LINING.
   d. SPIRAL RIB PIPE SHALL NOT REQUIRE COATING, PAVED INVERT, OR LINING.
2. EXCEPTIONS FOR ENTRANCE PIPE:
   a. COATINGS REQUIRED FOR LOW pH LEVELS.
   b. PAVED INVERTS SHALL NOT BE REQUIRED FOR ENTRANCE PIPE.
   c. ENTRANCE PIPE GREATER THAN 30'' DIA. SHALL BE CULVERT PIPE.

③ L = LOW pH RANGE (ACID)
M = MEDIUM pH RANGE
H = HIGH pH RANGE (BASE)

④ ALUMINUM COATED TYPE 2 STEEL IS ONLY PERMITTED IN Ph RANGES OF 5 TO 9.

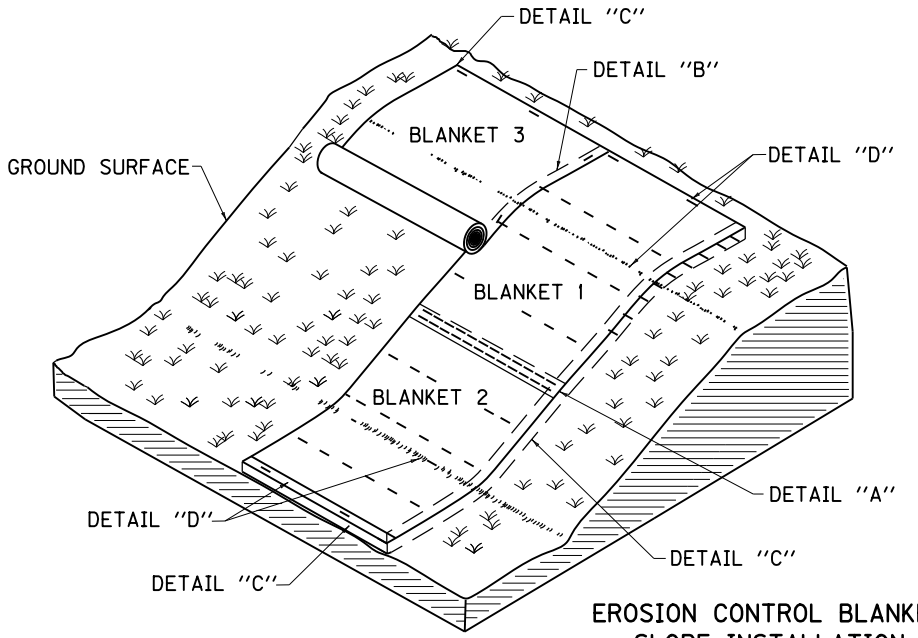
KENTUCKY
DEPARTMENT OF HIGHWAYS

COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PLATE PIPE

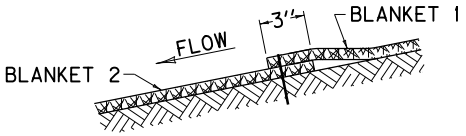
STANDARD DRAWING NO. RDI-035-02

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

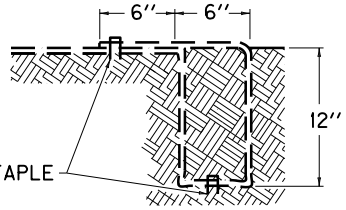
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



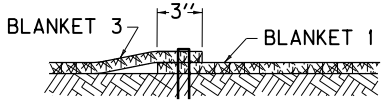
EROSION CONTROL BLANKET
SLOPE INSTALLATION



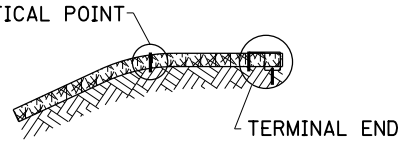
PROFILE VIEW
DETAIL "A"

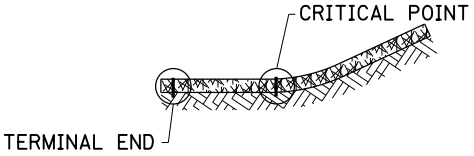


PROFILE VIEW
DETAIL "C"



CROSS SECTION VIEW
DETAIL "B"





CRITICAL POINTS
DETAIL "D"

~ NOTES ~

BID ITEMS AND UNIT TO BID

EROSION CONTROL BLANKET	SQYD
SEEDING AND PROTECTION	SQYD

1. CONSTRUCT A 6" X 12" ANCHOR TRENCH AT THE BEGINNING OF THE SLOPE. LINE THE ANCHOR TRENCH WITH EROSION CONTROL BLANKET (ECB) LEAVING 12" EXTENDING PAST THE ANCHOR TRENCH. FASTEN THE ECB MATERIAL INTO THE ANCHOR TRENCH ON 12" CENTERS BACKFILL THE TRENCH WITH TOPSOIL AND COMPACT. COVER THE AREA WITH THE REMAINING 12" OF THE ECB'S TERMINAL END LEAVING 6" TO OVERLAP THE EROSION CONTROL BLANKET. SECURE THE 6" OVERLAP WITH STAPLES ON 12" CENTERS.
2. UNROLL THE ECB PARALLEL TO THE PRIMARY DIRECTION OF WATER FLOW AND PLACE IN DIRECT CONTACT WITH THE SOIL SURFACE. DO NOT STRETCH OR ALLOW THE MATERIAL TO BRIDGE OVER SURFACE INCONSISTENCIES.
3. SECURELY FASTEN THE ECB TO THE SOIL BY INSTALLING STAPLES AT A MINIMUM RATE OF 1.5 PER SQ. YD. ANCHORS SHALL BE SELECTED SO THAT THEY HAVE SUFFICIENT GROUND PENETRATION TO RESIST PULLOUT. INCREASE ANCHORING FREQUENCY FOR SITE CONDITIONS (LOOSE, SANDY, OR WET SOILS) AS DIRECTED BY THE ENGINEER AND MANUFACTURER'S REPRESENTATIVE.
4. OVERLAP EDGES OF PARALLEL AND PERPENDICULAR BLANKETS ALONG THE SLOPE A MINIMUM OF 3" AND SECURE WITH STAPLES AT A MAXIMUM SPACING OF 1'.
5. CONSTRUCT A 6"X 12" ANCHOR TRENCH AT THE TOE OF THE SLOPE FOLLOWING SIMILAR PROCEDURE DENOTED FOR THE TOP OF THE SLOPE ANCHOR TRENCH.
6. ENSURE THAT THE ECB IS IN DIRECT CONTACT WITH THE SOIL SURFACE WITH NO PROJECTIONS OR PROTRUSIONS.
7. APPLY SEEDING AND PROTECTION ACCORDING TO SECTION 212.03.03 USING SEED MIX TYPE I. DIRECTLY AFTER APPLYING SEEDING AND TREATMENTS IN 212.03.03, BUT BEFORE APPLYING MULCHING OR HYDROMULCHING: INFILL THE VOID SPACES IN THE ECB WITH 1/2" OF TOPSOIL. TOPSOIL IS THE SOIL PROFILE DEFINED TECHNICALLY AS "A" HORIZON BY THE SOIL SCIENCE SOCIETY OF AMERICA. USE LOOSE, FRIABLE TOPSOIL THAT IS FREE OF STONES 1" OR GREATER IN OVERALL DIMENSIONS, ADMIXTURE OF SUBSOIL, REFUSE, STUMPS, ROOTS, BRUSH, WEEDS AND OTHER MATERIALS THAT PREVENT THE FORMATION OF A SUITABLE SEED BED. DO NOT USE TOPSOIL FROM SITES HAVING JOHNSON GRASS, CANADA THISTLE, QUACK GRASS, NODDING THISTLE OR EXCESSIVE AMOUNTS OF WEEDS OR THEIR RHIZOMES.

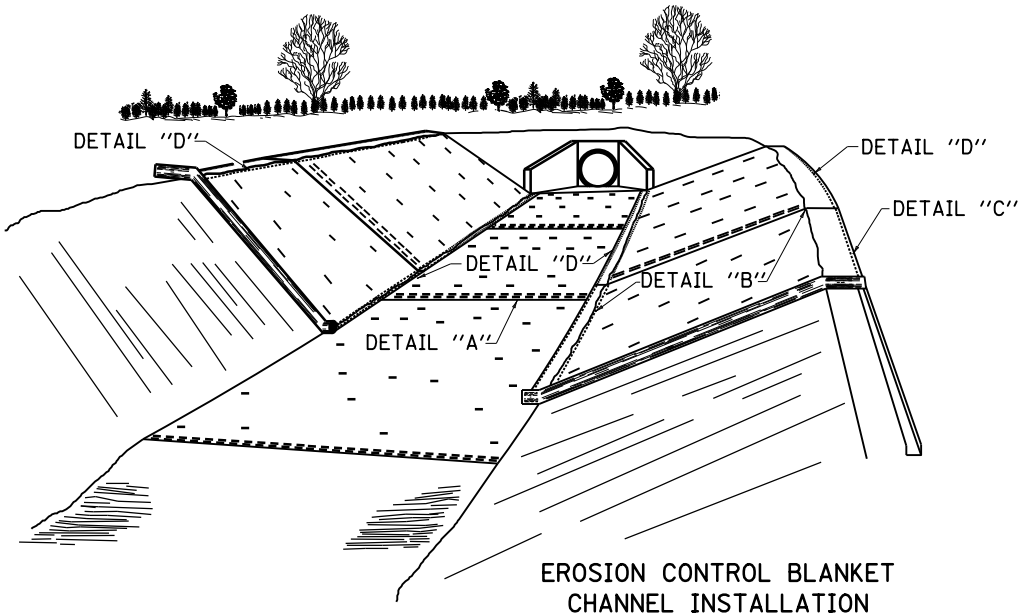
KENTUCKY
DEPARTMENT OF HIGHWAYS

EROSION CONTROL
BLANKET SLOPE
INSTALLATION

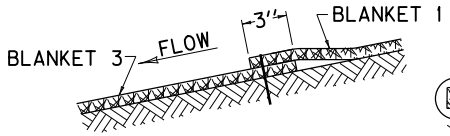
STANDARD DRAWING NO. RDI-040-01

SUBMITTED _____ 12-01-15
DIRECTOR, DIVISION OF DESIGN — DATE

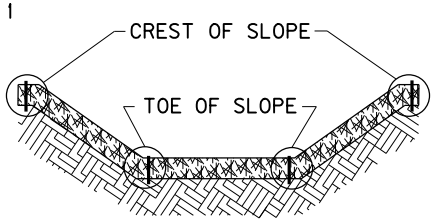
APPROVED _____ 12-01-15
STATE HIGHWAY ENGINEER — DATE



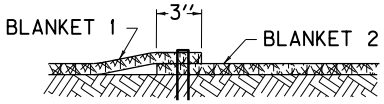
EROSION CONTROL BLANKET
CHANNEL INSTALLATION



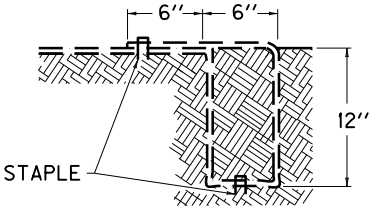
PROFILE VIEW
DETAIL "A"



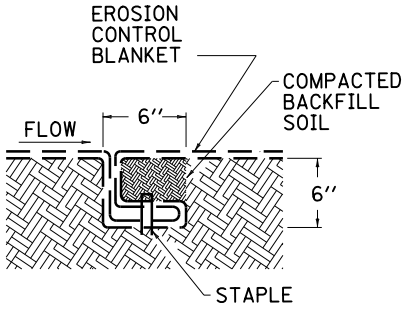
CRITICAL POINTS
DETAIL "D"



CROSS SECTION VIEW
DETAIL "B"



PROFILE VIEW
DETAIL "C"



CHANNEL CHECK SLOT ③

~ NOTES ~

BID ITEMS AND UNIT TO BID

EROSION CONTROL BLANKET	SQYD
SEEDING AND PROTECTION	SQYD

1. CONSTRUCT A 6" X 12" ANCHOR TRENCH AT THE BEGINNING OF THE CHANNEL. LINE THE ANCHOR TRENCH WITH EROSION CONTROL BLANKET (ECB) LEAVING 12" EXTENDING PAST THE ANCHOR TRENCH. FASTEN THE ECB MATERIAL INTO THE ANCHOR TRENCH ON 12" CENTERS BACKFILL THE TRENCH WITH TOPSOIL AND COMPACT. COVER THE AREA WITH THE REMAINING 12" OF THE ECB'S TERMINAL END LEAVING 6" TO OVERLAP THE EROSION CONTROL BLANKET. SECURE THE 6" OVERLAP WITH STAPLES ON 12" CENTERS.
2. UNROLL THE ECB PARALLEL TO THE PRIMARY DIRECTION OF WATER FLOW AND PLACE IN DIRECT CONTACT WITH THE SOIL SURFACE. DO NOT STRETCH OR ALLOW THE MATERIAL TO BRIDGE OVER SURFACE INCONSISTENCIES.

③ EXCAVATE 6" X 6" CHECK SLOTS EVERY 25' ALONG THE LENGTH OF THE CHANNEL. LINE THE SIDE AND BOTTOM OF THE SLOT WITH THE ECB AND THEN PULL BACK OVER. FASTEN WITH STAPLES ON 12" CENTERS. FILL THE CHECK SLOT WITH TOPSOIL, COMPACT, AND CONTINUE UNROLLING ECB DOWN THE CHANNEL.

4. CONTINUE UNROLLING THE ECB DOWNSTREAM OVER THE COMPACTED SLOT TO THE NEXT CHECK SLOT OR TERMINAL ANCHOR TRENCH. IF MORE THAN ONE SECTION OF ECB IS USED OVERLAP UPSTREAM ECB OVER TOP OF THE DOWNSTREAM ECB 3" AND SECURE STAPLES ON 12" CENTERS.
5. SECURE ECB WHILE UNROLLING ON SIDESLOPES AND CHANNEL BOTTOMS WITH STAPLES AT A FREQUENCY THE TABLE INDICATES. USE STAPLES HAVING SUFFICIENT GROUND PENETRATION TO RESIST PULLOUT. INCREASE ANCHORING FREQUENCY AS DIRECTED BY THE ENGINEER AND MANUFACTURER'S REPRESENTATIVE.
6. APPLY SEEDING AND PROTECTION ACCORDING TO SECTION 212.03.03 USING SEED MIX TYPE I. DIRECTLY AFTER APPLYING SEEDING AND TREATMENTS IN 212.03.03, BUT BEFORE APPLYING MULCHING OR HYDROMULCHING: INFILL THE VOID SPACES IN THE ECB WITH 1/2" OF TOPSOIL. TOPSOIL IS THE SOIL PROFILE DEFINED TECHNICALLY AS "A" HORIZON BY THE SOIL SCIENCE SOCIETY OF AMERICA. USE LOOSE, FRIABLE TOPSOIL THAT IS FREE OF STONES 1" OR GREATER IN OVERALL DIMENSIONS, ADMIXTURE OF SUBSOIL, REFUSE, STUMPS, ROOTS, BRUSH, WEEDS AND OTHER MATERIALS THAT PREVENT THE FORMATION OF A SUITABLE SEED BED. DO NOT USE TOPSOIL FROM SITES HAVING JOHNSON GRASS, CANADA THISTLE, QUACK GRASS, NODDING THISTLE OR EXCESSIVE AMOUNTS OF WEEDS OR THEIR RHIZOMES.

SLOPE GRADE	ANCHORING FREQUENCY
UP TO 2H:1V	1.5 ANCHORS/SQYD
2H:1V TO 1H:1V	2.0 ANCHORS/SQYD
STEEPER THAN 1H:1V AND CHANNEL BOTTOMS	3.0 ANCHORS/SQYD

KENTUCKY
DEPARTMENT OF HIGHWAYS

EROSION CONTROL
BLANKET CHANNEL
INSTALLATION

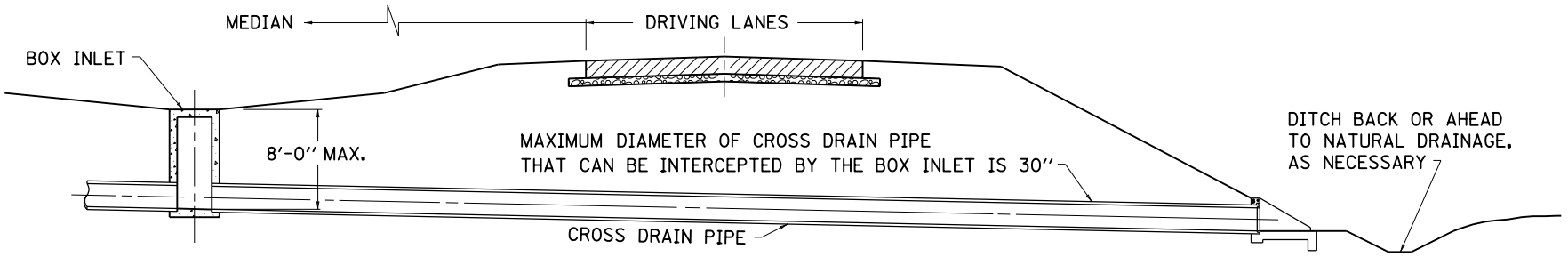
STANDARD DRAWING NO. RDI-041-01

SUBMITTED _____ 12-01-15
DIRECTOR, DIVISION OF DESIGN — DATE

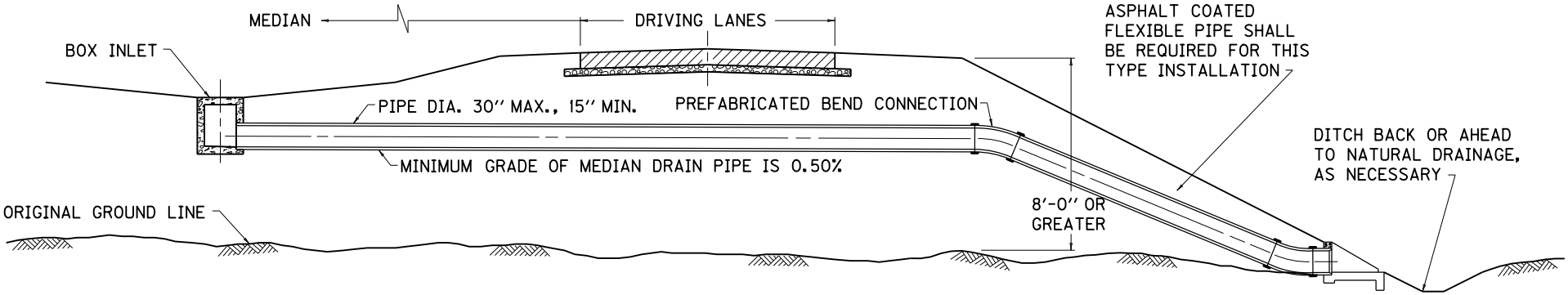
APPROVED _____ 12-01-15
STATE HIGHWAY ENGINEER — DATE

~ NOTES ~

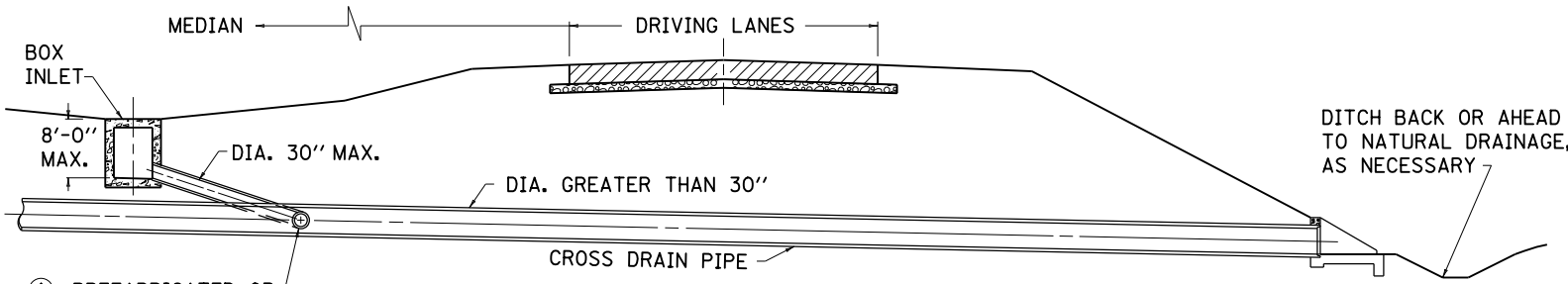
① JUNCTION BOX IS PERMITTED, HOWEVER, IT SHALL BE INCIDENTAL TO THE WORK IF USED (SEE CUR. STD. DWG. RDX-001).



TYPICAL WHEN CROSS DRAINAGE PIPE IS 30" OR LESS IN DIAMETER AND FILL IS 8'-0" OR LESS IN DEPTH



TYPICAL WHEN CROSS DRAINAGE PIPE IS 30" OR LESS IN DIAMETER AND FILL IS MORE THAN 8'-0" IN DEPTH



TYPICAL WHEN CROSS DRAINAGE PIPE IS GREATER THAN 30" IN DIAMETER

USE WITH CUR. STD. DWG. RDX-001

KENTUCKY
DEPARTMENT OF HIGHWAYS

TYPICAL MEDIAN DRAIN INSTALLATIONS

STANDARD DRAWING NO. RDI-045-02

SUBMITTED William S. Haddad DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

BOX SIZES	① TABLE 1 MAXIMUM FILL HEIGHT (FEET)											
	2	3	4	5	6	8	10	12	14	16	18	20
3 X 2												
3 X 3												
4 X 2												
4 X 3												
4 X 4												
5 X 3												
5 X 4												
5 X 5												
6 X 3												
6 X 4												
6 X 5												
6 X 6												
7 X 4												
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10 X 7												
10 X 8												
10 X 9												
10 X 10												
11 X 4												
11 X 6												
11 X 8												
11 X 10												
11 X 11												
12 X 4												
12 X 6												
12 X 8												
12 X 10												
12 X 12												

BOX SIZES	② TABLE 2 MAXIMUM FILL HEIGHT (FEET)											
	2	3	4	5	6	8	10	12	14	16	18	20
3 X 2												
3 X 3												
4 X 2												
4 X 3												
4 X 4												
5 X 3												
5 X 4												
5 X 5												
6 X 3												
6 X 4												
6 X 5												
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7 X 4												
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10 X 8												
10 X 9												
10 X 10												
11 X 4												
11 X 6												
11 X 8												
11 X 10												
11 X 11												
12 X 4												
12 X 6												
12 X 8												
12 X 10												
12 X 12												

BOX SIZES	③ TABLE 3 MAXIMUM FILL HEIGHT (FEET)												
	0	2	3	4	5	6	8	10	12	14	16	18	20	22
3 X 2														
3 X 3														
4 X 2														
4 X 3														
4 X 4														
5 X 3														
5 X 4														
5 X 5														
6 X 3														
6 X 4														
6 X 5														
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11 X 4														
11 X 6														
11 X 8														
11 X 10														
11 X 11														
12 X 4														
12 X 6														
12 X 8														
12 X 10														
12 X 12														

BOX SIZES
3 X 2
3 X 3
4 X 2
4 X 3
4 X 4
5 X 3
5 X 4
5 X 5
6 X 3
6 X 4
6 X 5
6 X 6
7 X 4
7 X 5
7 X 6
7 X 7
8 X 4
8 X 5
8 X 6
8 X 7
8 X 8
9 X 5
9 X 6
9 X 7
9 X 8
9 X 9
10 X 5
10 X 6
10 X 7
10 X 8
10 X 9
10 X 10
11 X 4
11 X 6
11 X 8
11 X 10
11 X 11
12 X 4
12 X 6
12 X 8
12 X 10
12 X 12

BOX SIZES	④ TABLE 1 LESS THAN 2' FILL	⑤ TABLE 2 LESS THAN 2' FILL
3 X 2		
3 X 3		
4 X 2		
4 X 3		
4 X 4		
5 X 3		
5 X 4		
5 X 5		
6 X 3		
6 X 4		
6 X 5		
6 X 6		
7 X 4		
7 X 5		
7 X 6		
7 X 7		
8 X 4		
8 X 5		
8 X 6		
8 X 7		
8 X 8		
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10 X 5		
10 X 6		
10 X 7		
10 X 8		
10 X 9		
10 X 10		
11 X 4		
11 X 6		
11 X 8		
11 X 10		
11 X 11		
12 X 4		
12 X 6		
12 X 8		
12 X 10		
12 X 12		

~ NOTES ~

① HS 25 LIVE LOAD + EARTH DEAD LOAD, AASHTO M259 OR ASTM C789.
② INTERSTATE LIVE LOAD + EARTH DEAD LOAD, AASHTO M259 OR ASTM C789.
③ EARTH DEAD LOAD, AASHTO M259 OR ASTM C789.
④ HS 20 LOADING, AASHTO M273 OR ASTM C850.
⑤ INTERSTATE LOADING, AASHTO M273 OR ASTM C850.

KENTUCKY
DEPARTMENT OF HIGHWAYS

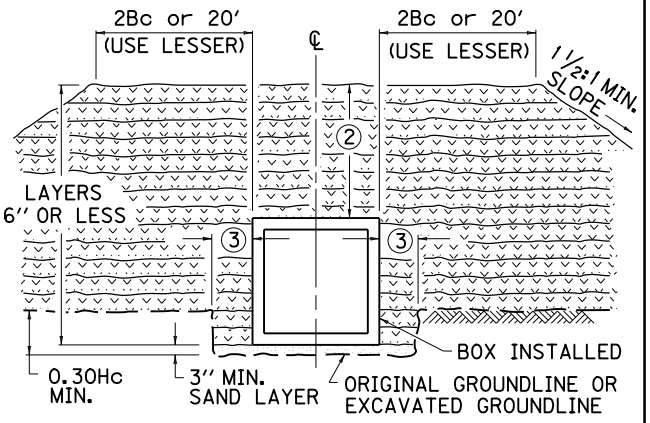
FILL HEIGHTS FOR PRECAST REINF. CONC. BOX CULVERTS

STANDARD DRAWING NO. RDI-100-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

POSITIVE PROJECTION



a. IF ROCK FOUNDATION IS ENCOUNTERED, GO TO PARTS b. AND c. OF STEP 3 ZERO PROJECTION AND THEN PROCEED WITH PARTS b. AND c. OF THIS STEP .

b. UNIFORMLY COMPACT SAND IN TRENCH WITH APPROXIMATELY 3'' OF SAND BELOW BOTTOM OF BOX. LEVEL COMPACTED SAND WITH A TEMPLATE TO INSURE UNIFORM SUPPORT THROUGHOUT ENTIRE WIDTH AND LENGTH . ▭

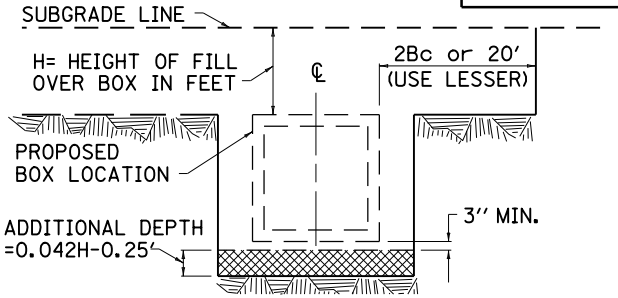
c. COMPACT SELECTED FINE SOIL TO ELEVATION ② IN LAYERS 6'' OR LESS TO MEET SAME DENSITY REQUIREMENTS SPECIFIED FOR ADJACENT EMBANKMENT . ▭

② 48'' REQUIRED, IF FILL HEIGHT PERMITS .

③ 0.3 Bc OR 1'-0'' (USE MAX.)

ROCK FOUNDATION DETAILS

STEP 3 ZERO PROJECTION

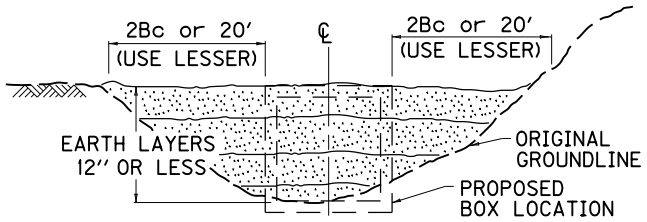


a. IF ROCK FOUNDATION IS NOT ENCOUNTERED, GO DIRECTLY TO STEP 4.

b. IF ROCK FOUNDATION IS ENCOUNTERED, EXCAVATE ADDITIONAL TRENCH DEPTH USING FORMULA GIVEN. THIS ADDITIONAL DEPTH SHALL ALWAYS BE AT LEAST 0.75' AND WILL NOT BE REQUIRED TO BE MORE THAN 0.75HC-0.25', REGARDLESS OF ABOVE FORMULA RESULT.

c. BACKFILL ADDITIONAL EXCAVATED AREA WITH EARTH CUSHION OF FIRMLY COMPACTED FINE SOILS IN LAYERS OF 6'' OR LESS. ▨

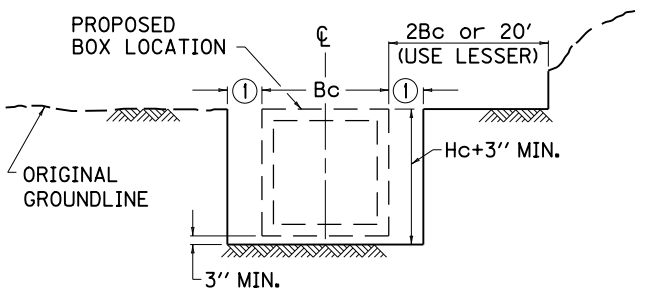
STEP 1 ZERO PROJECTION



a. IF THE ORIGINAL GROUNDLINE IS AT OR ABOVE THE TOP OF THE PROPOSED BOX FOR WIDTH OF 2Bc OR 20' (WHICH-EVER IS LESS) ON EACH SIDE OF THE BOX, GO DIRECTLY TO STEP 2.

b. IF ORIGINAL GROUNDLINE IS BELOW THE TOP OF PROPOSED BOX, COMPACT EMBANKMENT IN LAYERS 12'' OR LESS TO ELEVATION AND WIDTH SHOWN. ▭ MEET DENSITY REQUIREMENTS FOR ADJACENT EMBANKMENT.

STEP 2 ZERO PROJECTION

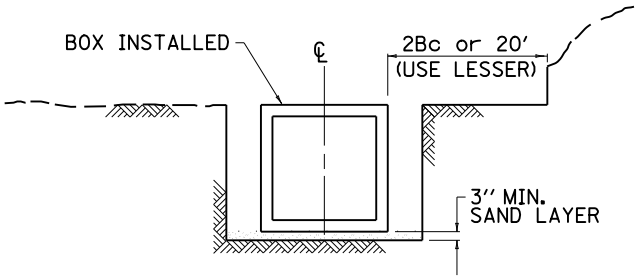


a. EXCAVATE TO TOP OF PROPOSED BOX A WIDTH OF 2Bc OR 20' (USE LESSER) ON EACH SIDE OF BOX.

b. EXCAVATE TRENCH TO WIDTH AND DEPTH SHOWN.

① AT LEAST 12'', BUT NOT MORE THAN 15''.

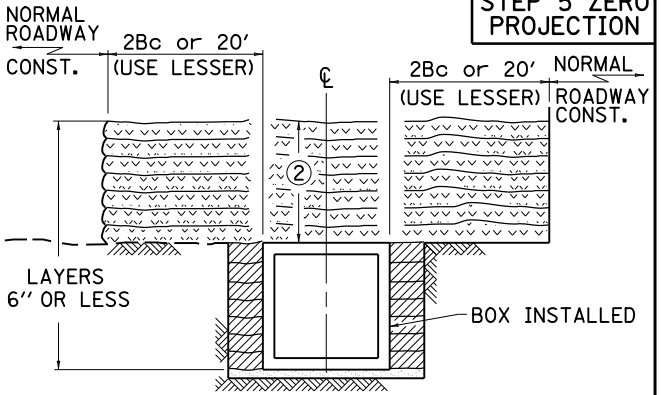
STEP 4 ZERO PROJECTION



a. UNIFORMLY COMPACT SAND IN TRENCH WITH APPROXIMATELY 3'' OF SAND BELOW BOTTOM OF BOX. LEVEL COMPACTED SAND WITH A TEMPLATE TO INSURE UNIFORM SUPPORT THROUGHOUT ENTIRE WIDTH AND LENGTH. ▭

b. INSTALL BOX AT CORRECT ALIGNMENT AND ELEVATION. RECOMPACT ANY LOOSE SAND DISTURBED DURING INSTALLATION.

STEP 5 ZERO PROJECTION



a. COMPACT SELECTED FINE SOIL, NATURAL SAND, OR NO. 10 COARSE AGGREGATE IN LAYERS OF 6'' OR LESS TO TOP OF THE BOX. ▨ THEN COMPACT SELECTED FINE SOIL TO ELEVATION ② ABOVE TOP OF BOX. ▭ MEET DENSITY REQUIREMENTS FOR ADJACENT EMBANKMENT.

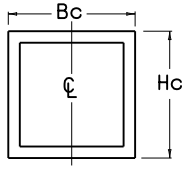
b. PROCEED WITH NORMAL ROADWAY CONSTRUCTION.

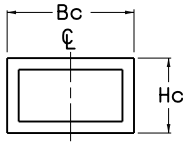
② 48'' REQUIRED, IF FILL HEIGHT PERMITS.

~ NOTE ~

THE CONTRACTOR HAS THE OPTION TO, EITHER BED AND BACKFILL THE PRECAST BOX IN POSITIVE PROJECTION AS DESCRIBED ABOVE, OR MAY BED AND BACKFILL TO ZERO PROJECTION AS DETAILED AND DESCRIBED IN STEPS 1 THRU 5. IN EITHER CASE PARTS b. AND c. OF STEP 3 ZERO PROJECTION MUST BE PERFORMED IN THE EVENT A ROCK FOUNDATION IS ENCOUNTERED.

BOX SHAPES





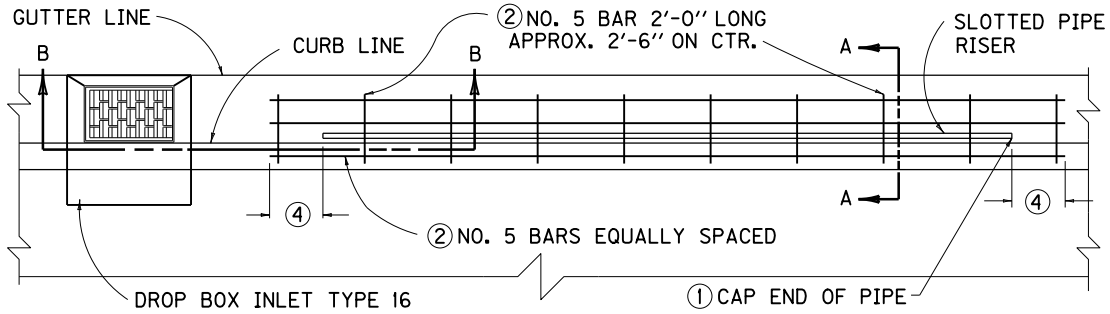
KENTUCKY
DEPARTMENT OF HIGHWAYS

BEDDING FOR PRECAST BOX CULVERTS, SEWERS, STORM DRAINS, AND THEIR COMBINATIONS

STANDARD DRAWING NO. RDI-120-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW

~ NOTES ~

BID ITEMS AND UNIT TO BID

SLOTTED DRAIN PIPE	LF
DROP BOX INLET TYPE 10	EACH
VALLEY GUTTER	LF

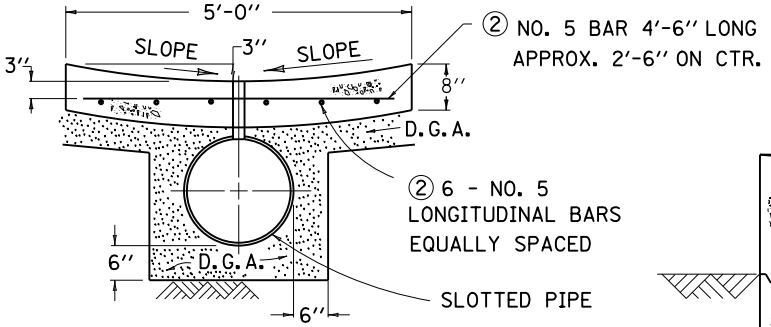
① THE CAP SHALL BE A STANDARD MANUFACTURED ITEM FURNISHED BY THE PIPE SUPPLIER.

② ALL REINFORCING STEEL SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE PER LINEAR FOOT OF SLOTTED DRAIN PIPE. ALL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE DEPARTMENTS STANDARD SPECIFICATIONS.

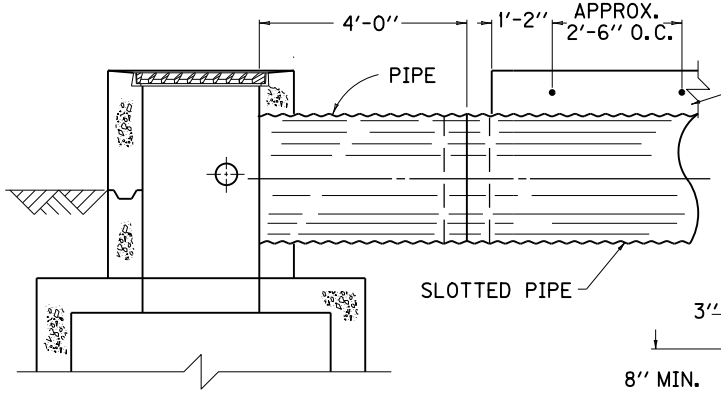
③ USE DROP BOX INLET TYPE 10 WITH VALLEY GUTTER (LIMITED TO 24" METAL PIPE SIZE).

④ EXTEND LONGITUDINAL BAR APPROXIMATELY 1'-6" PAST END OF SLOTTED DRAIN PIPE.

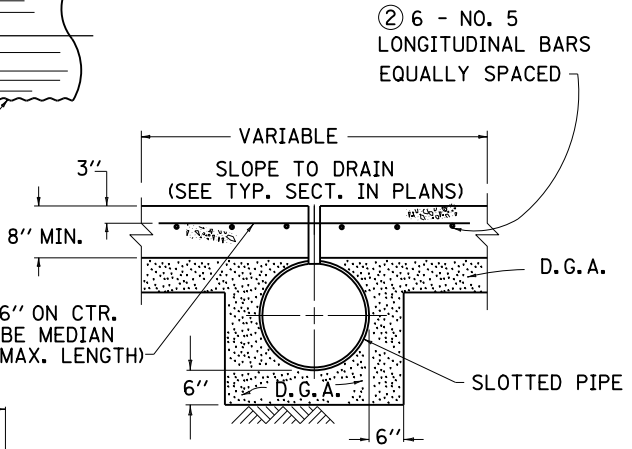
5. MINIMUM THROAT DEPTH FOR SLOTTED DRAIN PIPE SHALL BE 10".



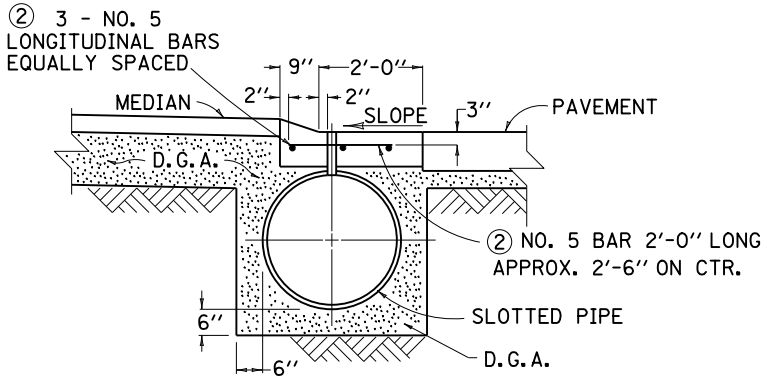
VALLEY GUTTER SECTION ③



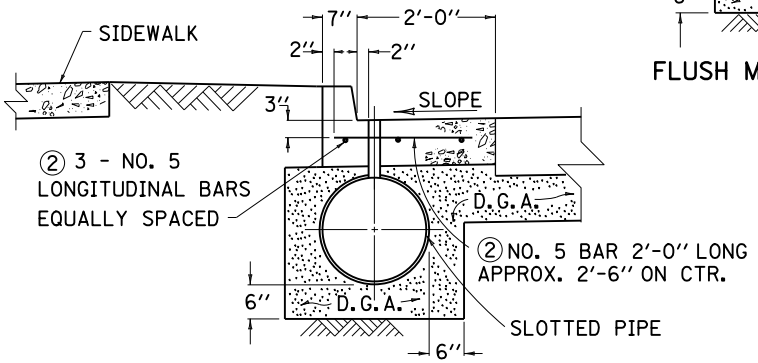
SECTION B-B



FLUSH MEDIAN SECTION



SECTION A-A
LIP CURB SECTION



STD. CURB SECTION

USE WITH CUR. STD. DWGS.:
RDB-014, RDB-030, RDB-031,
RDB-032 , RDB-033, RDB-034,
RDB-035

KENTUCKY
DEPARTMENT OF HIGHWAYS

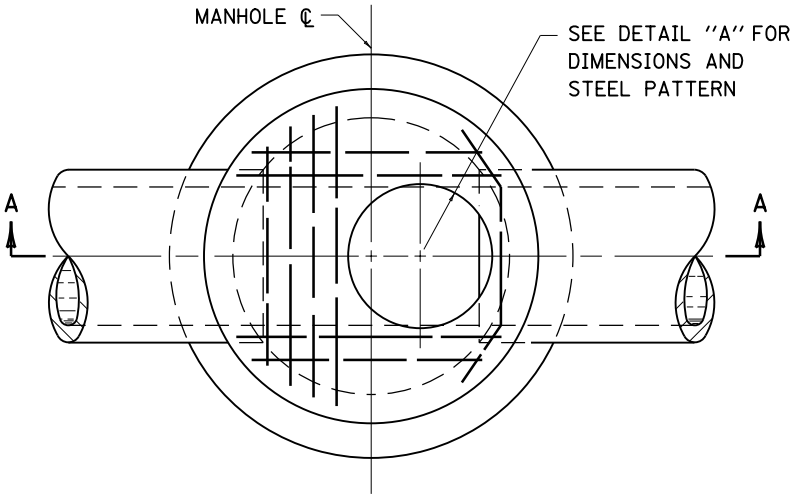
SLOTTED DRAIN PIPE

(DETAIL SHEET)

STANDARD DRAWING NO. RDI-200-05

SUBMITTED William S. Haskins — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE

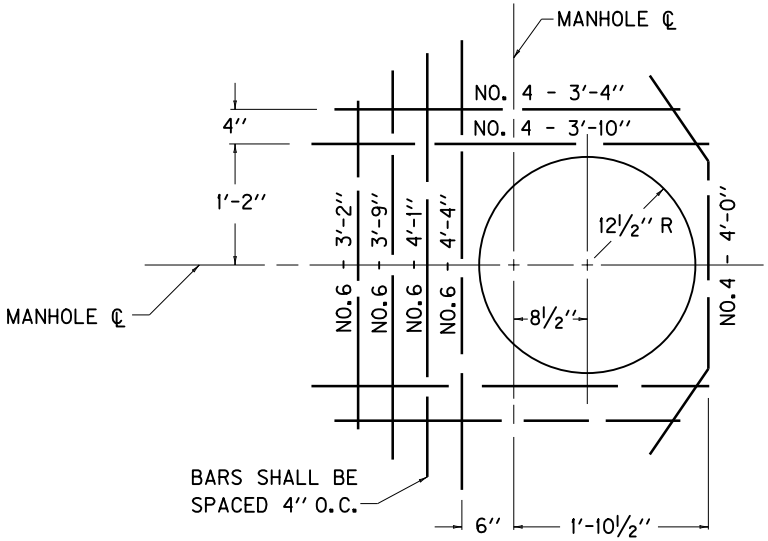


PLAN VIEW

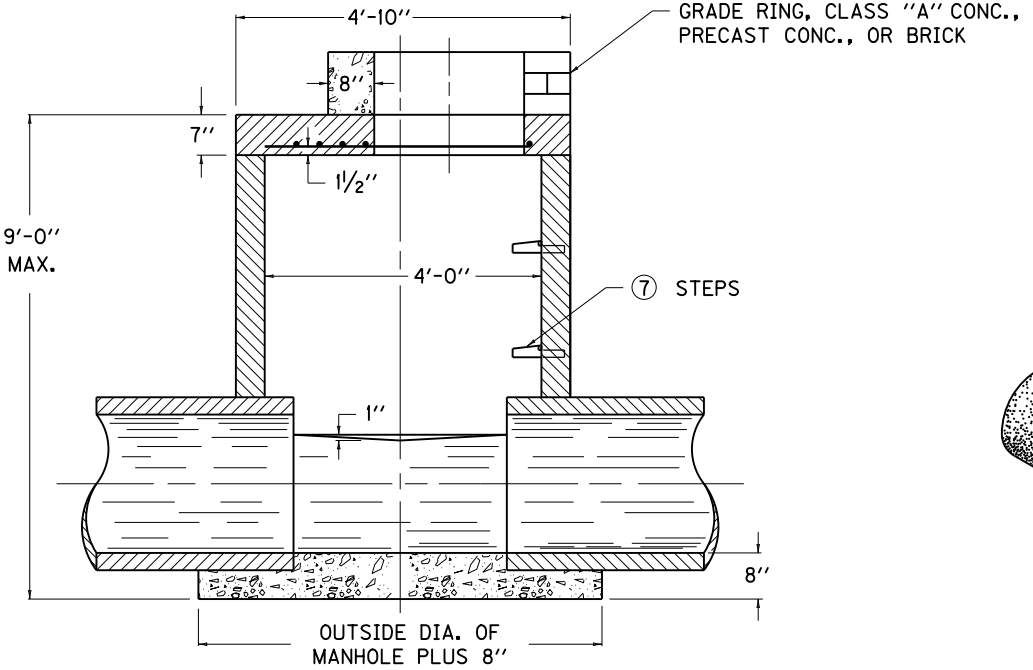
~ NOTES ~

BID ITEM AND UNIT TO BID
MANHOLE TYPE A EACH

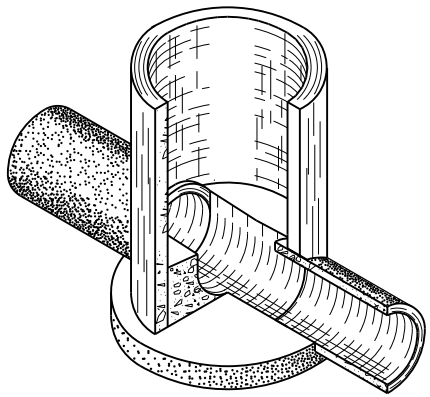
1. SEE CUR. STD. DWG. RDM-105 FOR CASTINGS TO BE USED IN TRAFFIC AREAS AND CUR. STD. DWG. RDM-100 FOR CASTINGS TO BE USED IN NON-TRAFFIC AREAS.
2. THE RISER SECTION MAY BE PRECAST CONCRETE PIPE OR CAST-IN-PLACE CONCRETE. A CONCENTRIC CAST-IN-PLACE CONE OR PRECAST CONCRETE CONE MAY BE PERMITTED, PROVIDED HEIGHT LIMITATIONS WOULD PERMIT.
3. THE MAXIMUM SIZE OF INTERCEPTED PIPE SHALL BE 27".
4. COVER OVER HIGHEST PIPE, EXCLUSIVE OF PAVEMENT, SHALL BE 2'-0".
5. CAST-IN-PLACE CONCRETE MANHOLES SHALL HAVE 8" THICK WALLS.
6. SEE PROPOSAL NOTES OR STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
7. SEE CUR. STD. DWG. RDM-055 FOR STEP TYPE, SPACING AND DETAIL.



DETAIL "A"
DIMENSIONS AND
STEEL PATTERN



SECTION A-A



ISOMETRIC OF BASE

USE WITH CUR. STD. DWGS.
RDM-055, RDM-100, RDM-105

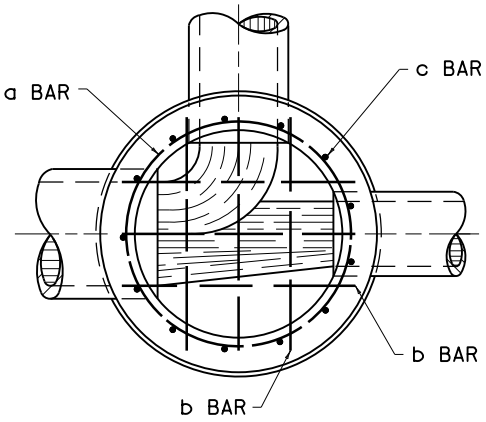
KENTUCKY
DEPARTMENT OF HIGHWAYS

MANHOLE TYPE A

STANDARD DRAWING NO. RDM-001-07

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

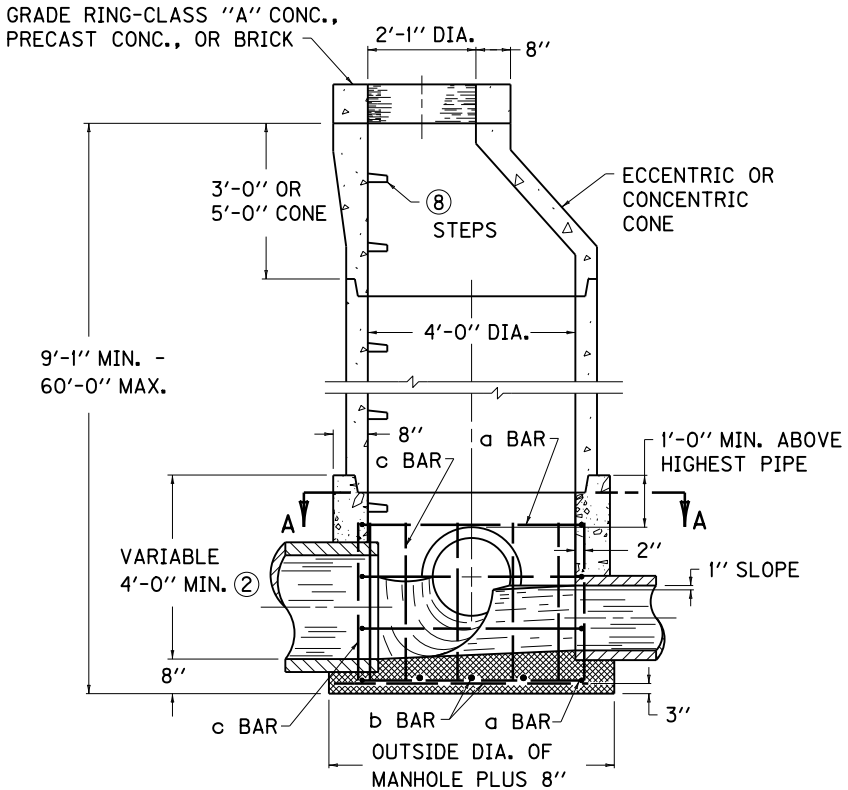


SECTION A-A

~ NOTES ~

BID ITEM AND UNIT TO BID
MANHOLE TYPE B EACH

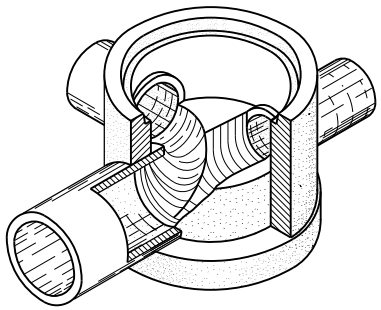
1. SEE CUR. STD. DWG. RDM-105 FOR CASTINGS TO BE USED IN TRAFFIC AREAS AND CUR. STD. DWG. RDM-100 FOR CASTINGS TO BE USED IN NON-TRAFFIC AREAS. THE MANHOLE MAY BE PRECAST CONCRETE PIPE SECTIONS OR CAST-IN-PLACE CONCRETE ⑥.
2. WHEN THE MANHOLE HEIGHT IS 25'-1" OR GREATER A CAST-IN-PLACE BASE WILL BE REQUIRED AS DETAILED. ▨ THIS PORTION OF CAST-IN-PLACE BASE ALWAYS REQUIRED. REINFORCEMENT BARS ARE NOT REQUIRED WHEN MANHOLE HEIGHT IS LESS THAN 12'-0".
3. THE NUMBER OF BARS DEPEND UPON HEIGHT OF BASE.
4. LENGTH OF BARS DEPEND UPON HEIGHT. BAR LOCATIONS SHALL BE BENT AND/OR SHIFTED TO MISS PIPE.
5. SEE PROPOSAL NOTES OR STANDARD SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.
6. CAST-IN-PLACE MANHOLE LIMITATIONS: FROM 9'-1" TO 16'-0" USE 8" WALL THICKNESS, FROM 16'-1" TO 25'-0" USE 12" THICK WALLS.
7. THE MAXIMUM SIZE OF INTERCEPTED PIPE SHALL BE 27".
8. SEE CUR. STD. DWG. RDM-055 FOR STEP TYPE, SPACING AND DETAILS.



SECTIONAL ELEVATION

STEEL REINFORCEMENT

NO. 4 BAR	QTY.	LENGTH	SPACING	TYPE
a	③	13'-8"	APPROX. 1'-0" O.C.	CIR. 4'-4" DIA.
b	6	4'-6"		STR.
c	13	④		STR.



ISOMETRIC OF BASE

USE WITH CUR. STD. DWGS.
RDM-055, RDM-100, RDM-105

KENTUCKY
DEPARTMENT OF HIGHWAYS

MANHOLE
TYPE B

STANDARD DRAWING NO. RDM-005-06

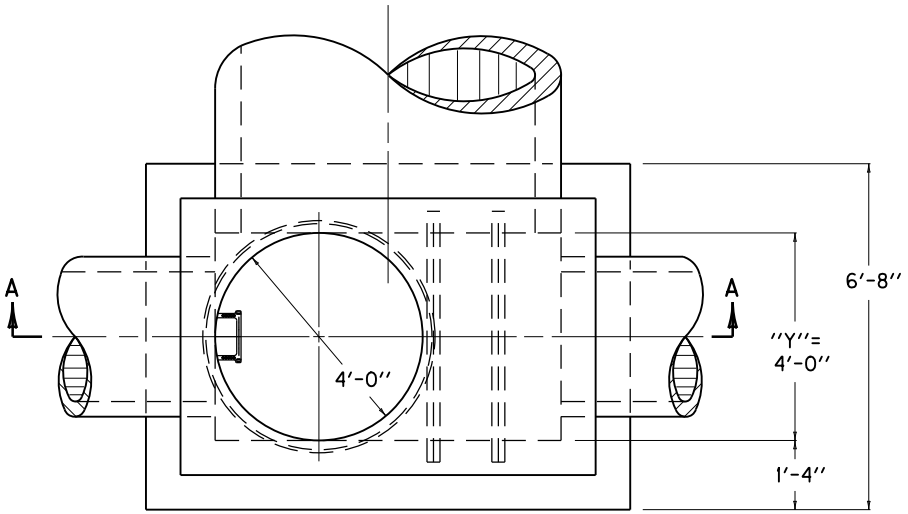
SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

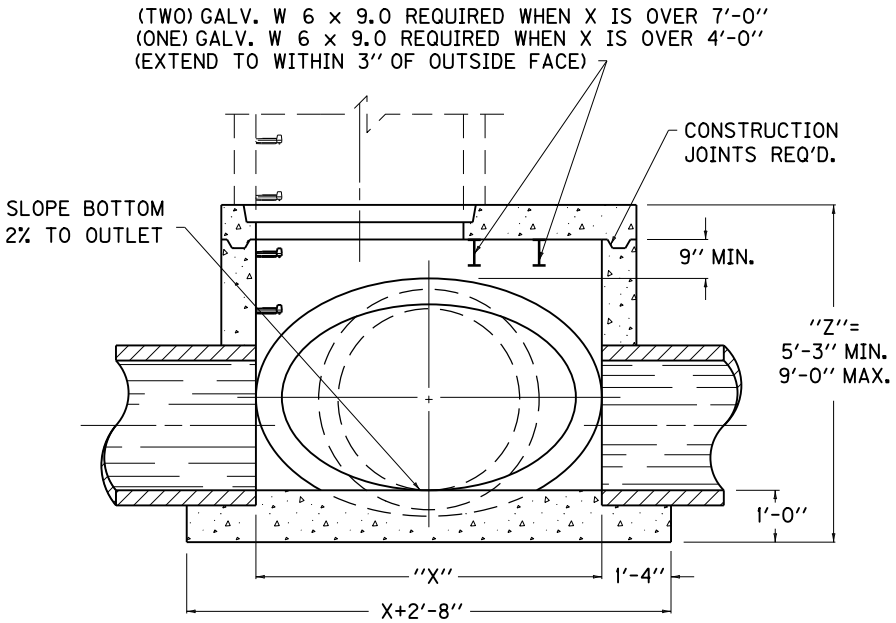
~ NOTES ~

BID ITEM AND UNIT TO BID
MANHOLE TYPE C EACH

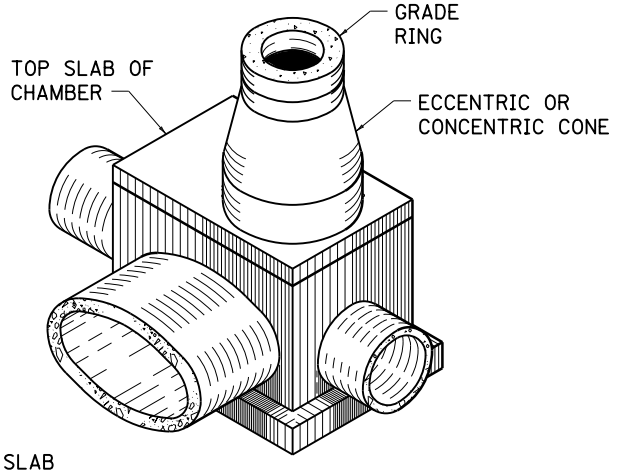
1. SEE CUR. STD. DWG. RDM-105 FOR CASTINGS TO BE USED IN TRAFFIC AREAS AND CUR. STD. DWG. RDM-100 FOR CASTINGS TO BE USED IN NON-TRAFFIC AREAS.
2. THE CHAMBER SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE. USE CLASS "A" OR CLASS "B" TOWER AS HEIGHT DICTATES. THE CLASS "A" TOWER MAY BE CONSTRUCTED OF PRECAST CONCRETE PIPE SECTIONS OR CAST-IN -PLACE CONCRETE.
3. REINFORCEMENT USED IN THE CHAMBER SHALL BE REQUIRED WHEN THE MANHOLE HEIGHT EXCEEDS 8'-0".
4. ALL CHAMBER WALLS AND SLABS ARE 8" THICK, EXCEPT WHERE OTHERWISE SHOWN.
5. THE CHAMBER SHALL BE CONSTRUCTED AT RIGHT ANGLES TO THE CENTERLINE OF THE LARGEST INTERCEPTED PIPE.
6. THE CONTRACT UNIT PRICE BID FOR MANHOLE TYPE C SHALL INCLUDE ALL CONCRETE, STEEL REINFORCEMENT, STRUCTURAL STEEL, FRAME AND LID, TOWER, STEPS AND ALL INCIDENTALS NECESSARY TO COMPLETE THE STRUCTURE.
7. FOR CIRCULAR AND ELLIPTICAL PIPE SIZES OF 30" TO 72".
8. SEE CUR. STD. DWG. RDM-055 FOR STEP TYPE, SPACING AND DETAILS.



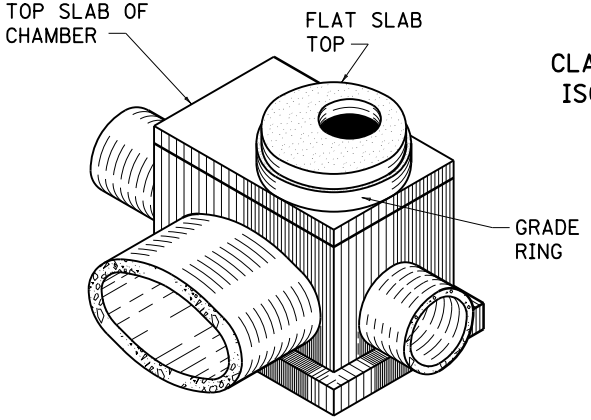
PLAN VIEW



SECTION A-A



CLASS "A" TOWER
ISOMETRIC VIEW



CLASS "B" TOWER
ISOMETRIC VIEW

USE WITH CUR. STD. DWGS.
RDM-011 , RDM-012, RDM-013,
RDM-055 , RDM-100, RDM-105 ,

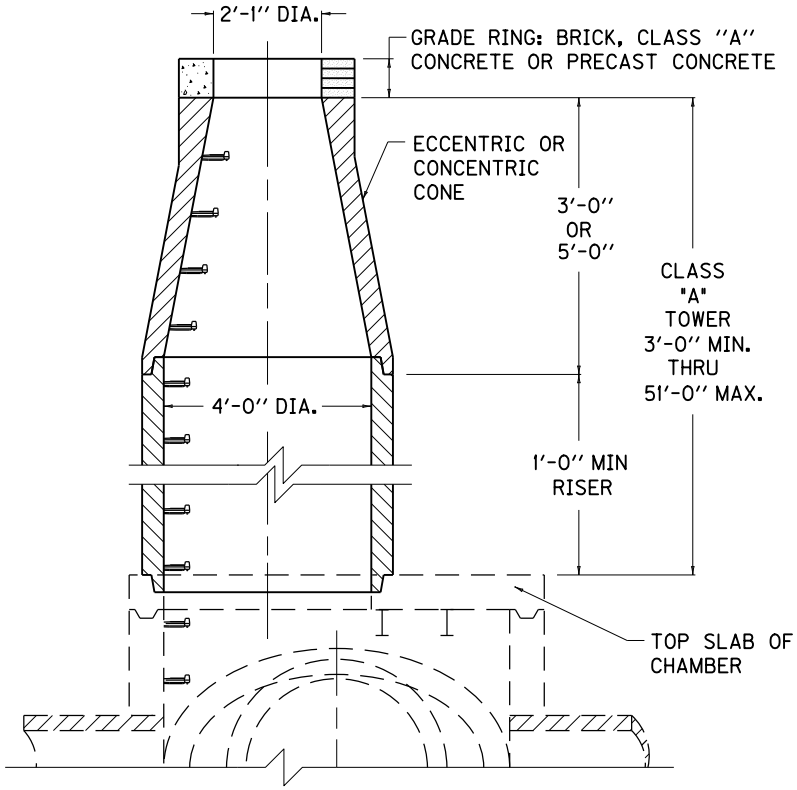
KENTUCKY
DEPARTMENT OF HIGHWAYS

MANHOLE TYPE C
(CHAMBER LAYOUT)

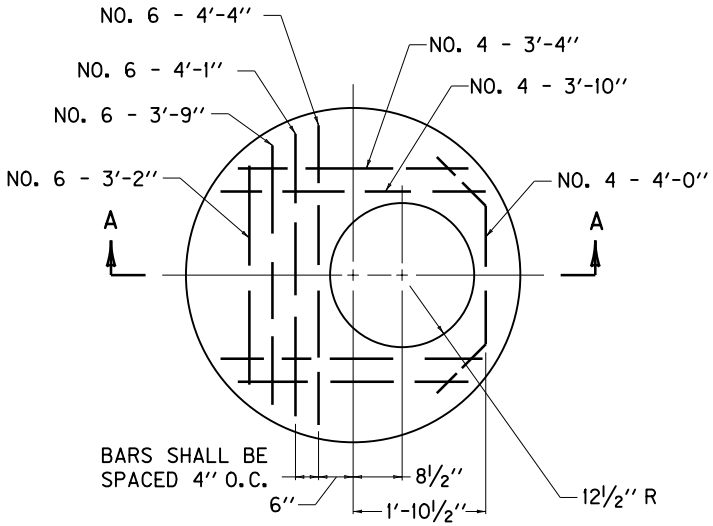
STANDARD DRAWING NO. RDM-010-06

SUBMITTED William S. Haddad — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

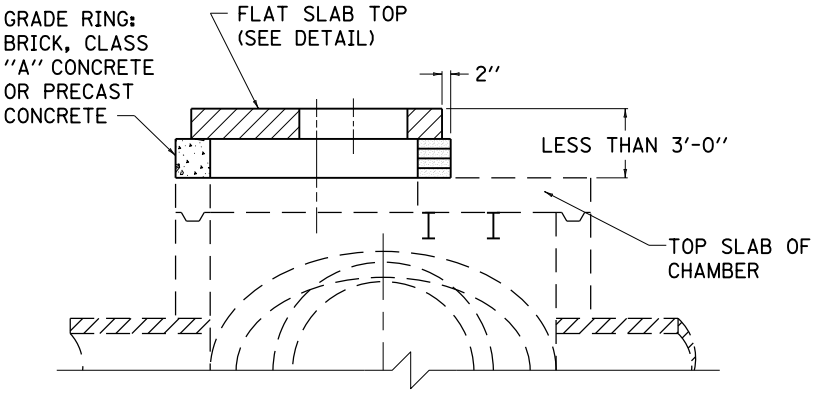
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



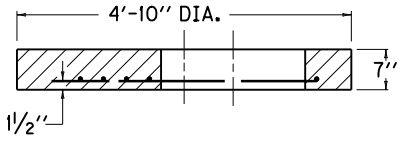
CLASS ''A'' TOWER DETAIL



PLAN VIEW
FLAT SLAB TOP DETAIL



CLASS ''B'' TOWER DETAIL



SECTION A-A
FLAT SLAB TOP DETAIL

USE WITH CUR. STD. DWGS.
RDM-010 , RDM-012, RDM-013

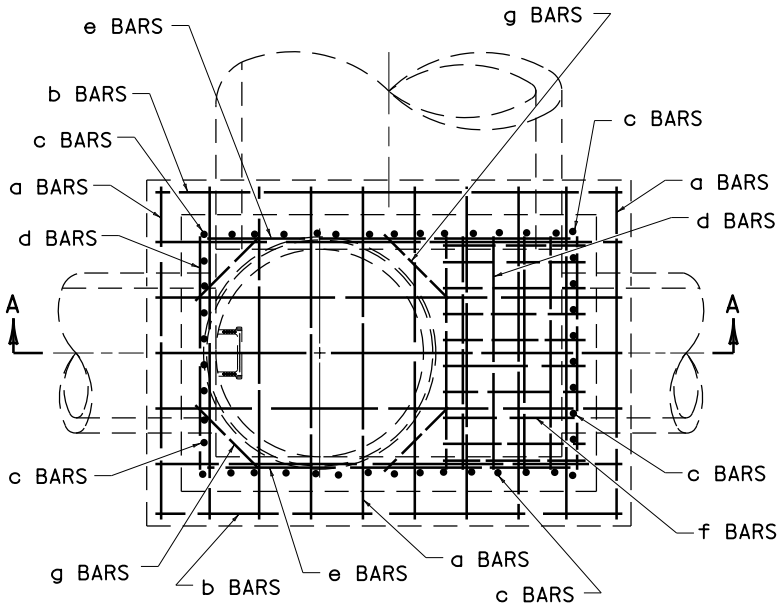
KENTUCKY
DEPARTMENT OF HIGHWAYS

MANHOLE TYPE C (TOWER APPLICATIONS)

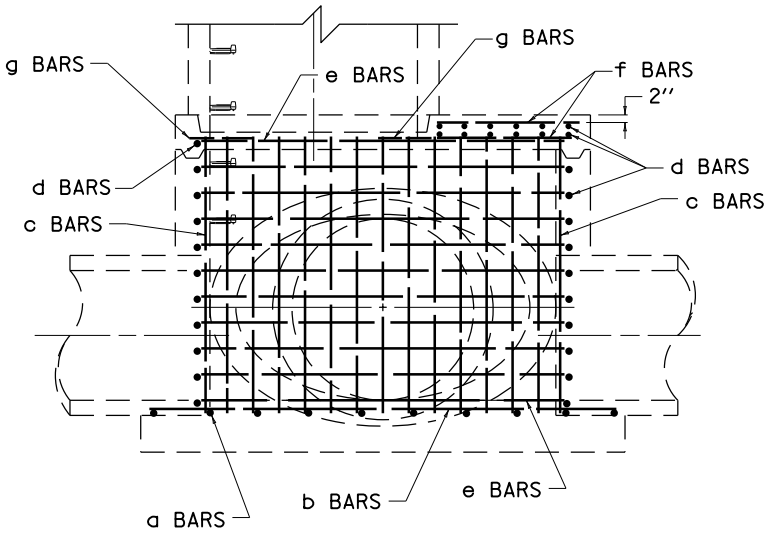
STANDARD DRAWING NO. RDM-011-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW



SECTION A-A

~ NOTES ~

1. PLACE ALL STEEL REINFORCEMENT 2'' FROM INSIDE OF CHAMBER WALL EXCEPT WHERE OTHERWISE SPECIFIED.
2. ALL a AND b BARS SPACED 1'-0'' ON CENTER.
3. ALL c, d, e, AND f BARS SPACED 6'' ON CENTER.

USE WITH CUR. STD. DWGS.
RDM-010 , RDM-011, RDM-013

KENTUCKY
DEPARTMENT OF HIGHWAYS

MANHOLE TYPE C
(STEEL PATTERN)

STANDARD DRAWING NO. RDM-012-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

DIMENSIONS AND ESTIMATE OF QUANTITIES

SIZE ①		PIPE		Z ①	CONCRETE CU. YDS.		④ REINFORCEMENT												LBS.	⑤
							BAR a		BAR b		BAR c		BAR d		BAR e		BAR f			
X	Y	SIZE	LOCATION		②	③	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.		
FOR CIRCULAR PIPE																				
4′-0″	4′-0″	30″	X OR Y	5′-3″	3.7	0.5	7	6′-5″	7	6′-4″	36	4′-1″	17	4′-6″	16	4′-4″	0	—	406	74
		36″		5′-9″	3.9							4′-7″	19		18				444	
4′-3″		42″	X	6′-4″	4.3					6′-7″	38	5′-2″	23		20	4′-7″	20	0′-3″	515	78
4′-10″		48″		6′-10″	4.9		8			7′-2″	40	5′-8″	27		22	5′-2″		0′-10″	612	81
5′-5″		54″		7′-5″	5.6					7′-9″	42	6′-3″	31		24	5′-9″		1′-5″	710	84
6′-0″		60″		7′-11″	6.3	0.6	9			8′-3″	44	6′-9″	35		26	6′-3″		2′-0″	813	91
6′-7″		66″		8′-6″	7.0		10			8′-10″	46	7′-4″	39		28	6′-10″		2′-7″	927	95
7′-2″		72″		9′-0″	7.8					9′-5″	48	7′-10″	41		30	7′-5″		3′-2″	1025	100
FOR ELLIPTICAL PIPE																				
4′-0″	4′-0″	24″x38″	X OR Y	4′-9″	3.5	0.5	7	6′-5″	7	6′-4″	36	3′-7″	15	4′-6″	14	4′-4″	0	—	367	74
4′-6″		29″x45″	X	5′-3″	4.0		8			6′-10″	38	4′-1″	21		16	4′-10″	20	0′-7″	464	79
5′-3″		34″x53″		5′-8″	4.6					7′-7″	40	4′-6″	25		18	5′-7″		1′-4″	554	84
5′-11″		38″x60″		6′-1″	5.2	0.6	9			8′-3″	44	4′-11″	29		20	6′-3″		2′-0″	661	91
6′-8″		43″x68″		6′-6″	5.9		10			9′-0″	46	5′-4″	33		22	7′-0″		2′-9″	767	96
7′-5″		48″x76″		7′-0″	6.7		11			9′-9″	50	5′-10″	39		24	7′-9″		3′-6″	906	103
8′-1″		53″x83″		7′-5″	7.4	0.7				10′-5″	52	6′-3″	43		26	8′-5″		4′-2″	1013	108
8′-10″		58″x91″		7′-11″	8.2		12			11′-2″	56	6′-9″	49		28	9′-2″		4′-11″	1105	115

~ NOTES ~

① SEE CUR. STD. DWG. RDM-010 FOR LOCATION OF ″X″, ″Y″ AND ″Z″ DIMENSIONS.
② CONCRETE REQUIRED FOR ONE MANHOLE CHAMBER. NO DEDUCTIONS FOR PIPE HAVE BEEN MADE.
③ CU. YDS. PER FT. INCREASE IN ″Z″.
④ ALL REINFORCEMENT SHALL BE NO. 5 BARS. 4 - g BARS 1′-9″, REQUIRED IN TOP SLAB.
⑤ LBS. PER FT. INCREASE IN ″Z″.

CONCRETE DISPLACED BY ONE CONCRETE PIPE

SIZE		CONC. CU. YDS.
CIR.	ELLIP.	
30″	24″x38″	0.2
36″	29″x45″	0.3
42″	34″x53″	0.4
48″	38″x60″	0.5
54″	43″x68″	0.6
60″	48″x76″	0.7
66″	—	0.8
—	53″x83″	0.9
72″	58″x91″	1.0

USE WITH CUR. STD. DWGS. RDM-010, RDM-011, RDM-012

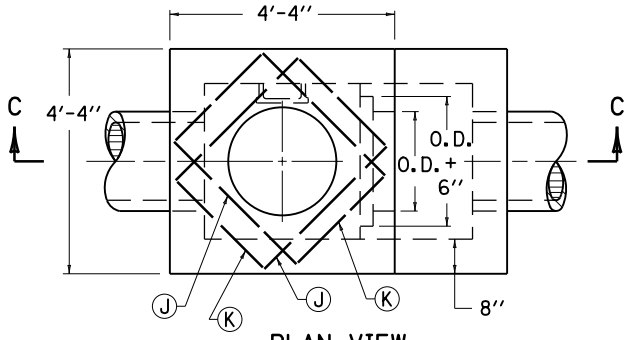
KENTUCKY DEPARTMENT OF HIGHWAYS

MANHOLE TYPE C (TABLE OF QUANTITIES)

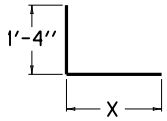
STANDARD DRAWING NO. RDM-013-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

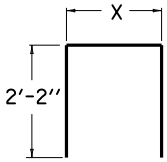
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



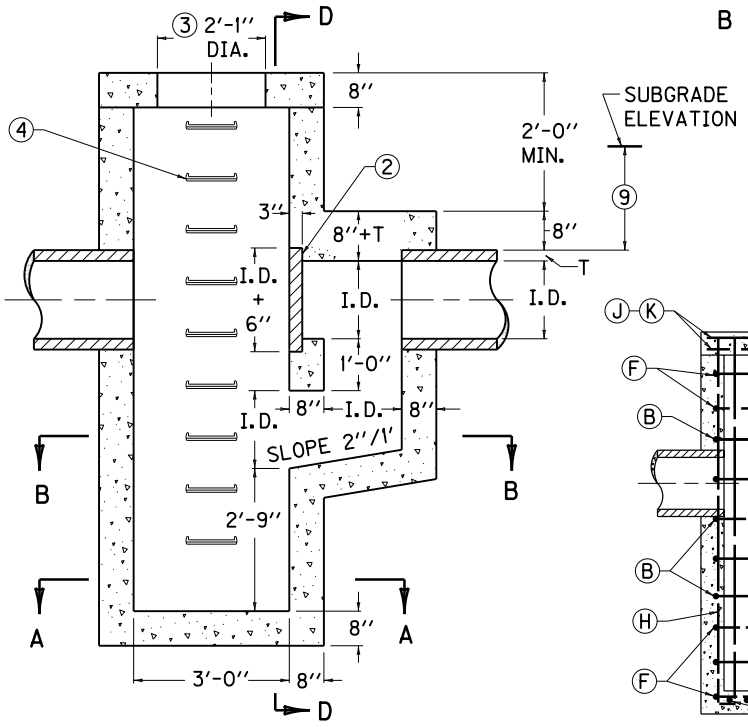
PLAN VIEW



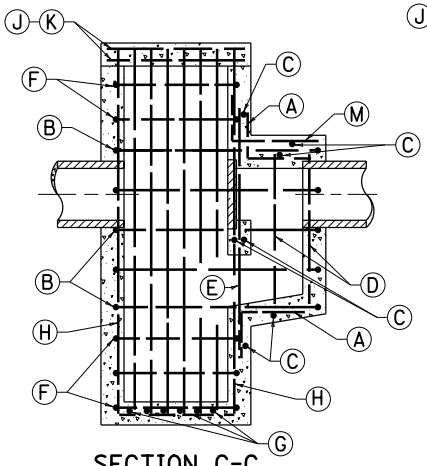
A AND M BARS



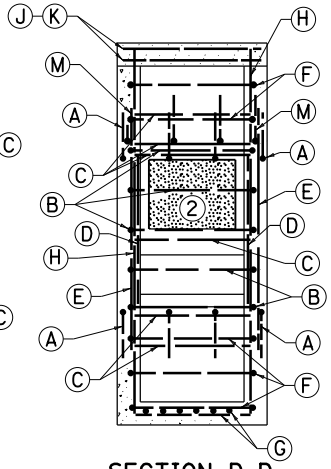
B AND F BARS



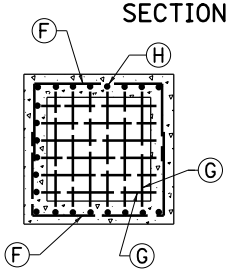
SECTION C-C



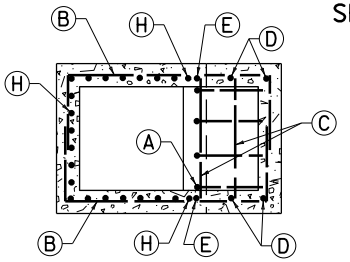
SECTION C-C



SECTION D-D



SECTION A-A



SECTION B-B

⑩ BILL OF REINFORCEMENT (NO. 5 BARS)

PIPE	15"			18"			21"			24"		
NO. 5 BARS	QTY.	TOTAL LG.	X DIM.	QTY.	TOTAL LG.	X DIM.	QTY.	TOTAL LG.	X DIM.	QTY.	TOTAL LG.	X DIM.
Ⓐ	8	2'-11"	1'-7"	8	3'-2"	1'-10"	8	3'-5"	2'-1"	8	3'-8"	2'-4"
Ⓑ	10	9'-6"	5'-3"	10	9'-9"	5'-6"	12	10'-0"	5'-9"	12	10'-4"	6'-0"
Ⓒ	7	3'-4"	-	7	3'-4"	-	7	3'-4"	-	9	3'-4"	-
Ⓓ	4	3'-11"	-	4	4'-4"	-	4	4'-10"	-	6	5'-4"	-
Ⓔ	2	6'-6"	-	2	7'-0"	-	2	7'-6"	-	2	8'-0"	-
Ⓕ	10	7'-7"	3'-4"	10	7'-7"	3'-4"	10	7'-7"	3'-4"	10	7'-7"	3'-4"
Ⓖ	12	3'-4"	-	12	3'-4"	-	12	3'-4"	-	12	3'-4"	-
Ⓗ	22	9'-1"	-	22	9'-8"	-	22	10'-2"	-	22	10'-8"	-
Ⓙ	8	3'-4"	-	8	3'-4"	-	8	3'-4"	-	8	3'-4"	-
Ⓚ	8	2'-4"	-	8	2'-4"	-	8	2'-4"	-	8	2'-4"	-
Ⓜ	4	3'-7"	2'-3"	4	3'-10"	2'-6"	4	4'-1"	2'-9"	4	4'-4"	3'-0"
569 LBS.				591 LBS.			632 LBS.			672 LBS.		

CU. YDS. CLASS "A" CONC.

4.73	5.07	5.43	5.79
0.36 ①			

4. SEE CUR. STD. DWG. RDM-055 FOR STEP TYPE, SPACING AND DETAIL.
5. Ⓖ & Ⓗ BARS SPACED APPROXIMATELY 6" O.C. ALL OTHER BARS SPACED APPROXIMATELY 1'-0" O.C.
6. CONSTRUCTION JOINT NOT PERMITTED BELOW FLOW LINE ELEVATION.
7. ENCIRCLED LETTERS INDICATE STEEL BAR LOCATIONS.
8. T= PIPE THICKNESS, I.D.= INSIDE DIA. OF PIPE, O.D.= OUTSIDE DIA. OF PIPE.
9. 2'-0" DESIRED COVER, 1'-0" MINIMUM COVER OVER PIPE.
10. THE Ⓗ BAR SHALL BE INCREASED INCH FOR INCH WHEN BOX EXCEEDS MINIMUM HEIGHT. ADD TWO Ⓕ BARS FOR EACH 1'-0" INCREASE ABOVE MINIMUM HEIGHT.
11. DIMENSIONS FROM FACE OF CONCRETE TO STEEL SHALL BE 2" CLEAR DISTANCE.

USE WITH CUR. STD. DWGS. RDM-055, RDM-100, RDM-105

~ NOTES ~

BID ITEM AND UNIT TO BID
MANHOLE-TRAPPED EACH

① CU. YD. PER FT. INCREASE OR DECREASE WHEN MANHOLE HEIGHT VARIES FROM 7'-1" + 2 I.D. + T.

② REMOVABLE STOPPER-MASONRY, CAST IRON OR OTHER TYPES OF STOPPERS WILL BE PERMITTED IF APPROVED BY THE ENGINEER.

③ SEE CUR. STD. DWG. RDM-100 FOR CASTINGS TO BE USED IN NON-TRAFFIC AREAS AND CUR. STD. DWG. RDM-105 FOR CASTINGS TO BE USED IN TRAFFIC AREAS.

KENTUCKY
DEPARTMENT OF HIGHWAYS

TRAPPED MANHOLE

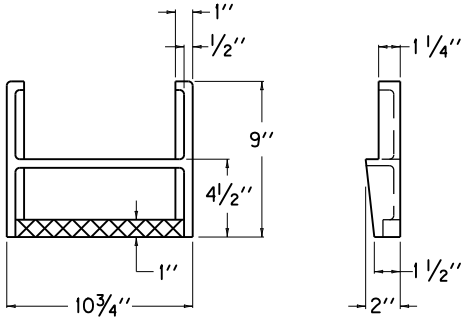
STANDARD DRAWING NO. RDM-050-07

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

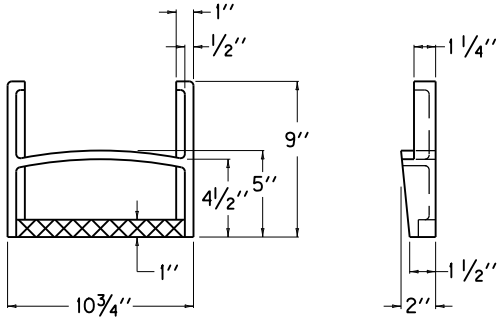
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

~ NOTES ~

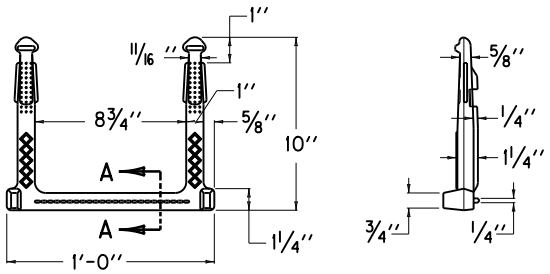
1. STEPS SHALL BE ASPHALT COATED CAST IRON OR POLYPROPYLENE PLASTIC COATED STEEL ROD OR OF A TYPE AND SIZE APPROVED BY THE ENGINEER.
2. STEPS SHALL BE SPACED APPROXIMATELY 12" TO 16" O.C. VERTICALLY SO AS TO FORM A CONTINUOUS LADDER.
3. STEPS SHALL BE REQUIRED IN MANHOLES WHEN THE STRUCTURE IS 4 FEET AND GREATER IN DEPTH. (MEASURE FROM FLOW LINE OF LOWEST PIPE TO TOP OF STRUCTURE).
4. THE TREADS OF ALL STEPS SHALL HAVE ANTI-SKID PROPERTIES FOR HAND AND FOOT GRIPS.
5. MANHOLE: USE STEP TYPE 1 OR TYPE 3 FOR MANHOLE PIPE CHAMBER AND STEP TYPE 2 OR TYPE 4 FOR MANHOLE TOWER.



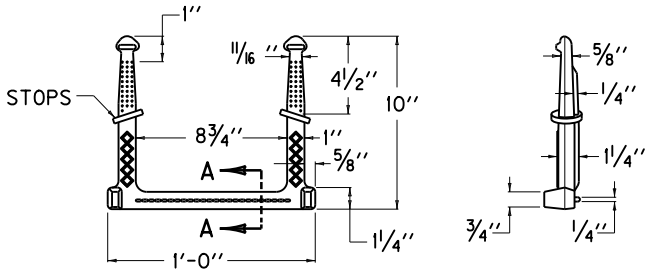
STEP TYPE NO. 1



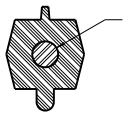
STEP TYPE NO. 2



STEP TYPE NO. 3



STEP TYPE NO. 4



SECTION A-A

USE WITH CUR. STD. DWGS.
RDM-001, RDM-005, RDM-010, RDM-050

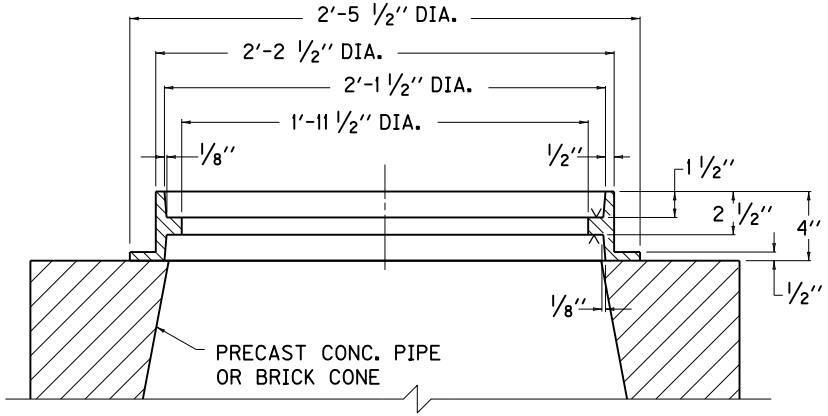
KENTUCKY
DEPARTMENT OF HIGHWAYS

MANHOLE
STEPS

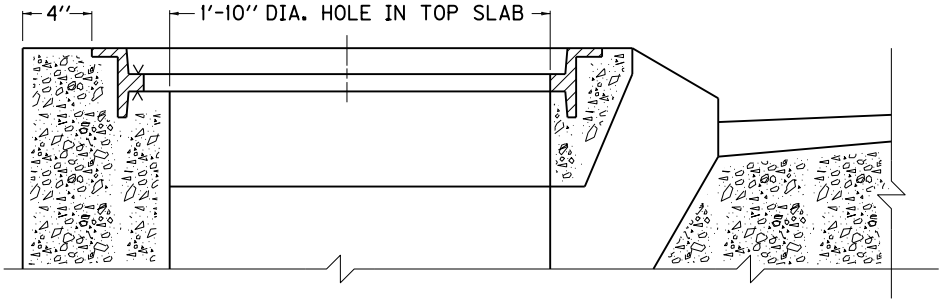
STANDARD DRAWING NO. RDM-055

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

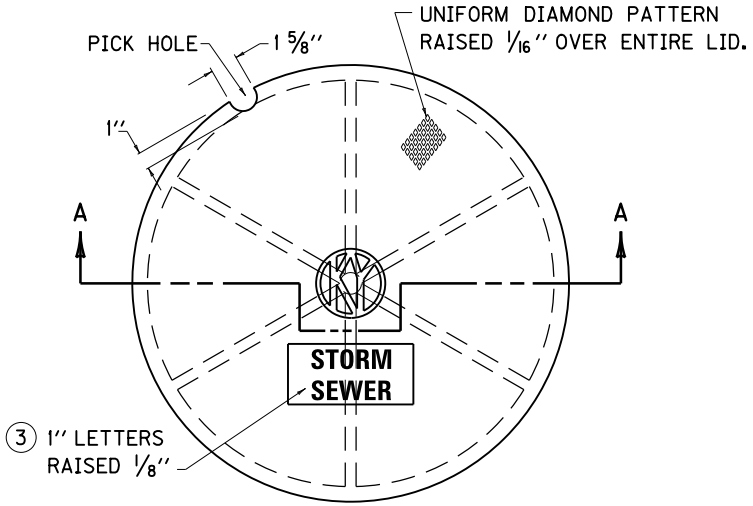
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



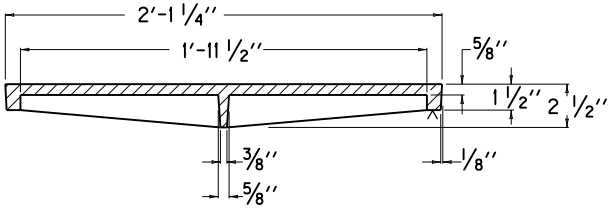
SECTION OF FRAME
WHEN USED WITH MANHOLES



SECTION OF FRAME WHEN
USED WITH CURB BOX INLET



PLAN VIEW

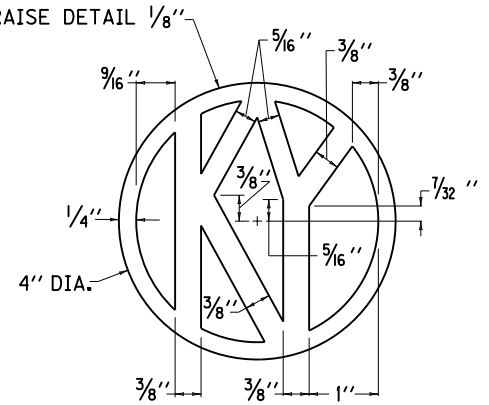


SECTION A-A

~ NOTES ~

BID ITEM AND UNIT TO BID
FRAME AND LID TY 1 EACH

1. THE FRAME IS REVERSIBLE AND IS TO BE USED ON MANHOLES IN NON-VEHICULAR TRAFFIC AREAS, AND ON BOX INLETS AS SPECIFIED.
2. APPLICATIONS SHOWN ARE FOR ILLUSTRATION PURPOSES ONLY.
③ VARIATION IN LID LETTERING (SEE PIPE SUMMARY) DENOTES SEWER TYPES:
   (A) STORM SEWER
   (B) SANITARY SEWER
   (C) SANITARY AND STORM SEWER
4. THE ''KY'' SYMBOL SHALL APPEAR ON ALL LIDS.



DETAIL OF ''KY''

APPROX. WEIGHT	
FRAME	90 LBS.
LID	116 LBS.

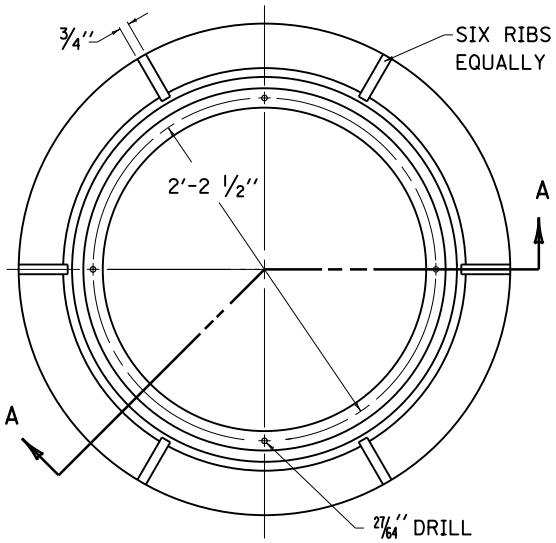
KENTUCKY
DEPARTMENT OF HIGHWAYS

FRAME AND LID
TYPE 1

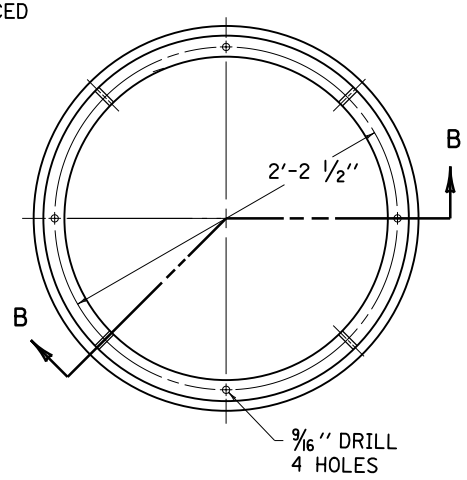
STANDARD DRAWING NO. RDM-100-03

SUBMITTED _____ 12-01-15
DIRECTOR DIVISION OF DESIGN DATE

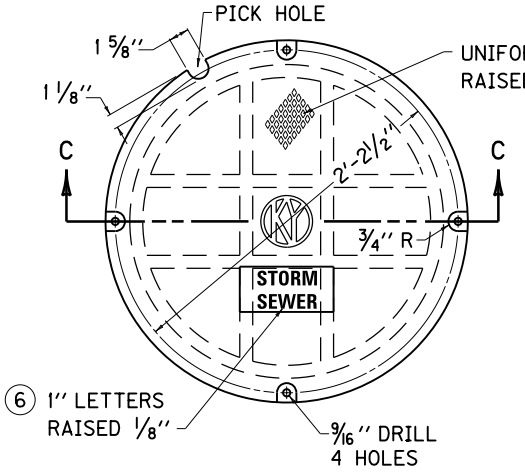
APPROVED _____ 12-01-15
STATE HIGHWAY ENGINEER DATE



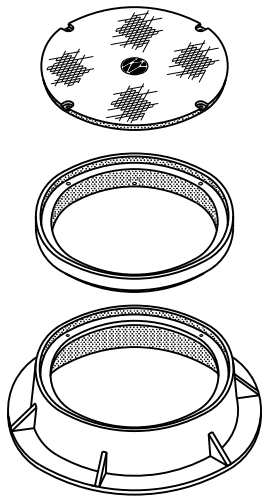
PLAN VIEW



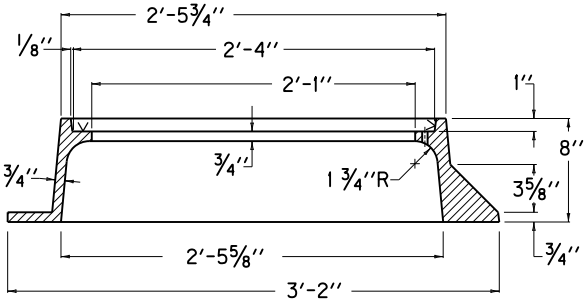
PLAN VIEW



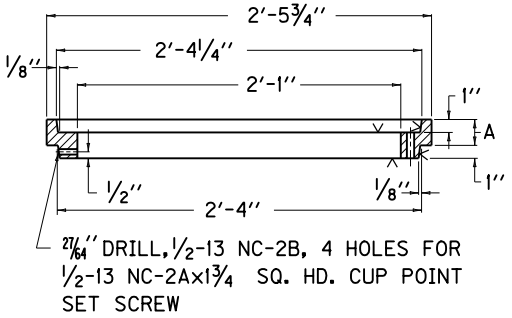
PLAN VIEW



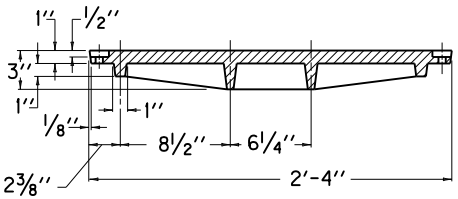
ISOMETRIC
EXPLODED VIEW



FRAME
SECTION A-A



ADJUSTING RING
SECTION B-B



LID
SECTION C-C

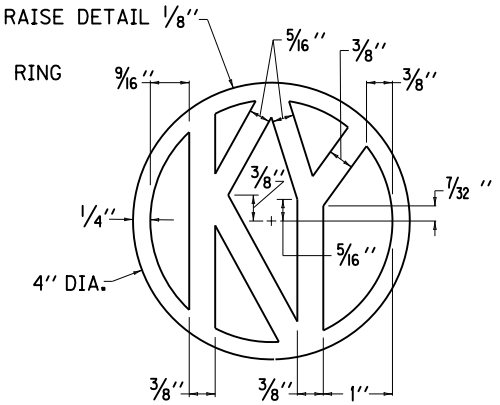
DIMENSION A (8)
1 1/2''
2''
2 1/2''
3''

APPROX. WEIGHT	
FRAME	270 LBS.
LID	240 LBS.

~ NOTES ~

BID ITEM AND UNIT TO BID
FRAME AND LID TY 2 — EACH

1. THE LID SHALL BE FASTENED WITH 1/2-13 NC-2Ax2 HEXAGON CAP SCREW. WHEN THE ADJUSTING RING IS USED ADD DIMENSION (A) SHOWN IN SECTION B-B TO THE LENGTH OF THE CAP SCREW.
2. THE CAP SCREWS AND SET SCREWS SHALL BE STAINLESS STEEL, TYPES 302, 304, AND 430 CONFORMING TO ASTM A276.
3. MANUFACTURER'S TOLERANCES WILL BE ACCEPTED ON ALL DIMENSIONS.
4. ADJUSTING RINGS WHEN REQUIRED SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH AND SHALL INCLUDE THE NECESSARY HEX HEAD BOLTS AND SET SCREWS.
5. THE "v" DENOTES MACHINED SURFACE.
6. VARIATION IN LID LETTERING (SEE PIPE SUMMARY) DENOTES SEWER TYPE:
   (A) STORM SEWER
   (B) SANITARY SEWER
   (C) SANITARY AND STORM SEWER
7. THE "KY" SYMBOL SHALL APPEAR ON ALL LIDS.
8. NET HEIGHT OF ADJUSTING RING (AS SPECIFIED IN CONTRACT).
9. FRAME AND LID TYPE 2 SHALL BE USED IN VEHICULAR TRAFFIC AREAS.



DETAIL OF "KY" SYMBOL

KENTUCKY
DEPARTMENT OF HIGHWAYS

FRAME AND LID
TYPE 2

STANDARD DRAWING NO. RDM-105-03

SUBMITTED William S. Hallahan — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE

MAXIMUM COVER HEIGHTS FOR VARIOUS TYPES OF PERFORATED PIPE

SIZE OF PIPE	STANDARD STRENGTH CLAY	EXTRA STRENGTH CLAY	18 GAGE STEEL PIPE ③	16 GAGE STEEL PIPE ③	ALUMINUM PIPE ③	POLYETHYLENE
4''	14'	17'	---	---	---	43'
6''	9'	15'	55'	---	50'	43'
8''	7'	10'	---	63'	50'	43'
10''	6'	9'	---	60'	40'	---
12''	5'	8'	---	55'	35'	---
15''	5'	8'	---	50'	30'	---
18''	5'	8'	---	40'	25'	---
21''	5'	8'	---	35'	20'	---
24''	5'	8'	---	---	---	---

~ NOTES ~

1. 2'-0'' SHALL BE THE MINIMUM COVER HEIGHT OVER TOP OF PIPE, MEASURED FROM TOP OF PIPE TO SUBGRADE ELEVATION, EXCEPT 1'-0'' COVER HEIGHT WILL BE PERMITTED ONLY WHERE THE 2'-0'' COVER HEIGHT WOULD NOT PERMIT PROPER DRAINAGE OF THE PIPE.
2. THE COMBINING OF MORE THAN ONE TYPE OF PIPE ON CONSTRUCTION OF A CONTINUOUS LINE OF PIPE AT ANY ONE INSTALLATION WILL NOT BE PERMITTED.

③ SEE CUR. STD. DRAWING RDI-035 FOR PIPE COATINGS.

USE WITH CUR. STD. DWG.
RDI-035

KENTUCKY
DEPARTMENT OF HIGHWAYS

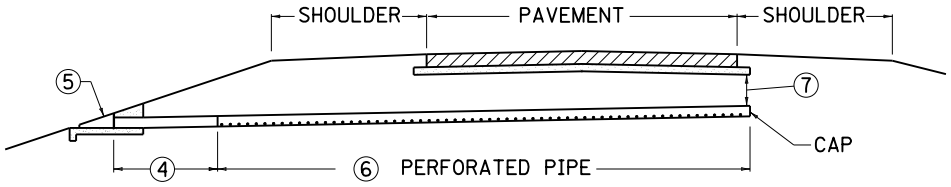
PERFORATED PIPE TYPES AND COVER HEIGHTS

STANDARD DRAWING NO. RDP-001-06

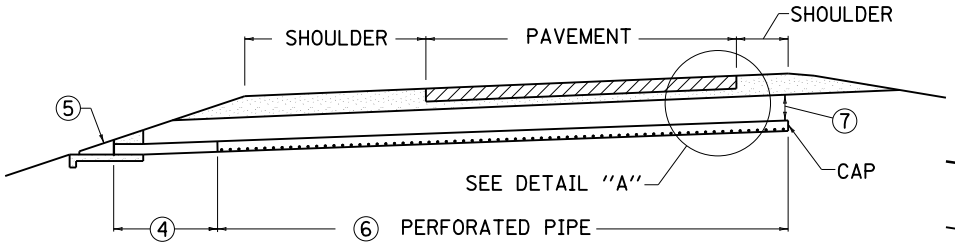
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

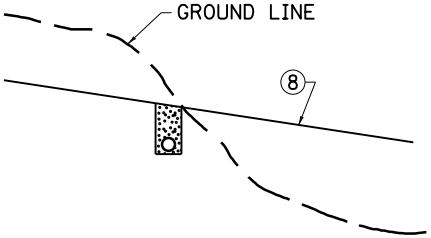
TYPICAL SUBGRADE DRAINAGE LOCATIONS



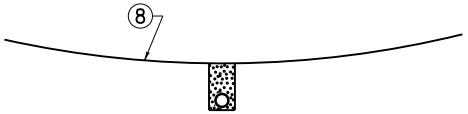
TANGENT SECTION - TWO LANE



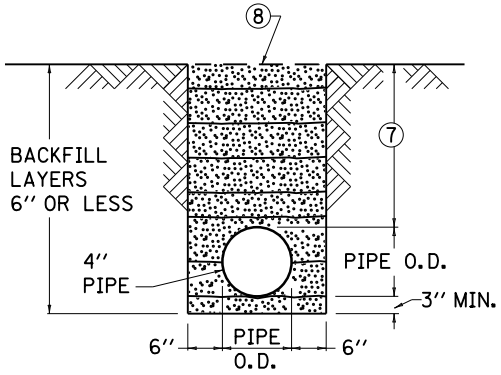
TANGENT SECTION - MULTI LANE



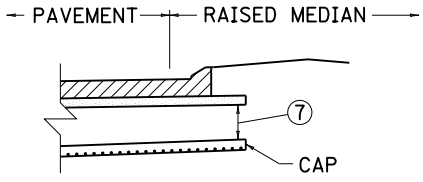
CUT TO FILL



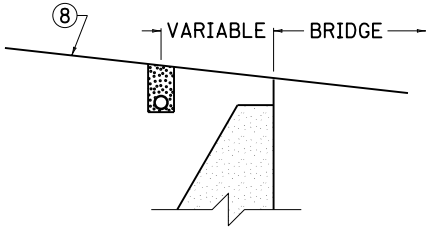
SAG VERTICAL CURVES



TRENCH DETAIL



RAISED MEDIAN
DETAIL "A"



SUBGRADE DRAINAGE SHALL BE INSTALLED AT UPGRADE END OF BRIDGE ONLY.

BRIDGES

~ NOTES ~

BID ITEM AND UNIT TO BID

PERFORATED PIPE- △ IN	LF
NON-PERFORATED PIPE- △ IN	LF

△ = PIPE DIA. IN INCHES

1. SUBGRADE DRAINAGE, AS DEPICTED, IS INTENDED FOR USE WITH THE SURFACING PHASE OF CONSTRUCTION, AND SHALL BE INSTALLED ONLY AFTER THE SUBGRADE HAS BEEN COMPLETED, AND PRIOR TO CONSTRUCTING PAVING MATERIALS.
2. SUBGRADE DRAINAGE WILL NOT BE REQUIRED WHEN:
   a. ROCK SUBGRADE OR NATURAL BANK GRAVEL IS SPECIFIED.
   b. POROUS OR FREE DRAINING SUBGRADES ARE EVIDENT.
   c. DIRECTED BY THE ENGINEER.
3. THE CAP SHALL BE A STANDARD MANUFACTURED ITEM FURNISHED BY PIPE SUPPLIER.

④ APPROXIMATELY 8 TO 12 FEET OF PIPE AT THE OUTLET SHALL BE NON-PERFORATED PIPE MEETING THE REQUIREMENTS OF THE PERFORATED PIPE, EXCEPT FOR PERFORATIONS.

⑤ PERFORATED PIPE HEADWALL REQUIRED AT OUTLET. SEE CUR. STD. DWG. RDP-010 .

⑥ SEE CUR. STD. DWG. RDP-001 FOR ALTERNATES.

⑦ PIPE COVER: 2'-0" DESIREABLE MINIMUM, 1'-0" ABSOLUTE MINIMUM. FLOW SHALL BE DIRECTED TOWARD THE FILL SIDE OF THE ROADWAY WHEN POSSIBLE.

⑧ SUBGRADE ELEVATION.

USE WITH CUR. STD. DWGS. RDP-001 , RDP-010

KENTUCKY
DEPARTMENT OF HIGHWAYS

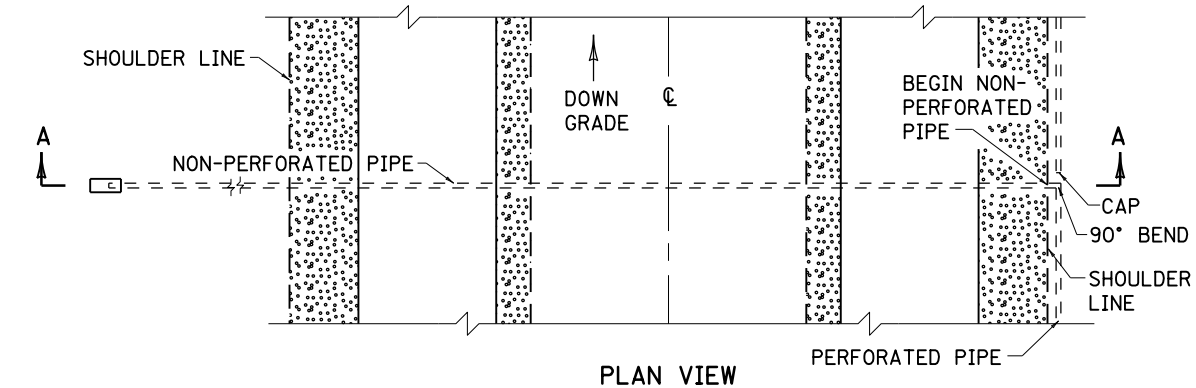
PERFORATED PIPE FOR SUBGRADE DRAINAGE ON TWO-LANE (CLASS 2) AND MULTI-LANE ROADS

STANDARD DRAWING NO. RDP-005-05

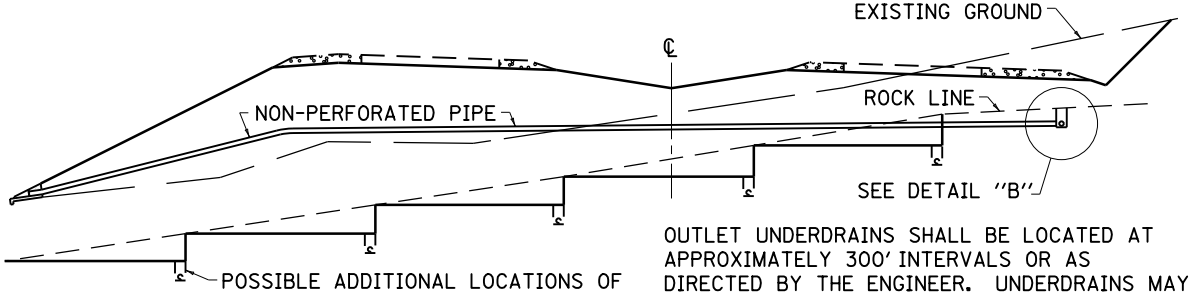
SUBMITTED William S. Hallahan DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

DETAIL FOR LONGITUDINAL UNDERDRAINS



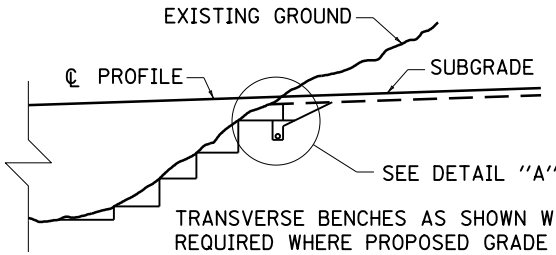
PLAN VIEW



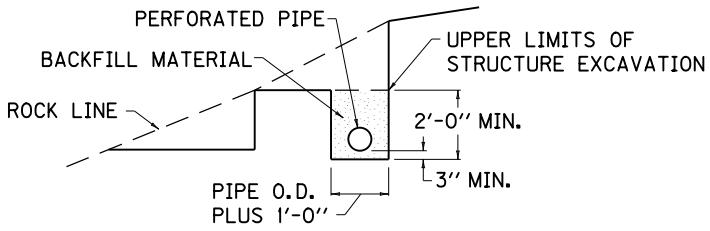
OUTLET UNDERDRAINS SHALL BE LOCATED AT APPROXIMATELY 300' INTERVALS OR AS DIRECTED BY THE ENGINEER. UNDERDRAINS MAY BE CONNECTED TO CROSS DRAINS.

SECTION A-A

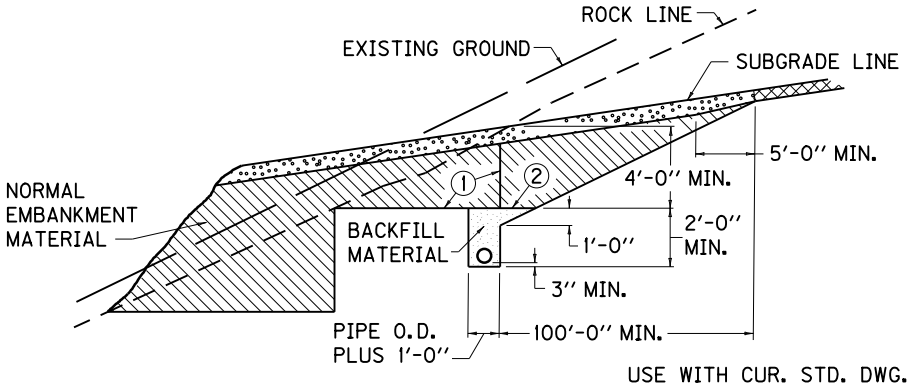
DETAIL FOR TRANSVERSE UNDERDRAIN CUT TO FILL CONDITION



TRANSVERSE BENCHES AS SHOWN WILL BE REQUIRED WHERE PROPOSED GRADE INTERSECTS THE EXISTING GROUND.



DETAIL "B"



DETAIL "A"

~ NOTES ~

BID ITEMS AND UNIT TO BID	
ROADWAY EXCAVATION	CUYD
PERFORATED PIPE- △ IN	LF
NON-PERFORATED PIPE- △ IN	LF

△ = PIPE DIA. IN INCHES

① LIMITS OF FIRST BENCH.

② UPPER LIMITS OF STRUCTURE EXCAVATION.

3. ALL PERFORATED PIPE SHALL COMPLY WITH THE STANDARD SPECIFICATIONS.
4. ALL NON-PERFORATED PIPE SHALL BE THE SAME TYPE AS THE PERFORATED PIPE, EXCEPT WITHOUT PERFORATIONS.
5. THE EXCAVATION NECESSARY TO FORM THE BENCHES SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID FOR ROADWAY EXCAVATION.
6. UNDERDRAINS WILL BE REQUIRED ON UPGRADE BENCH. THIS PERFORATED PIPE UNDERDRAIN SHOULD BE PLACED IN ROCK OR SHALE FORMATIONS IF POSSIBLE. PLAN LOCATIONS ARE FOR ESTIMATING PURPOSES ONLY. EXACT LOCATIONS TO BE DETERMINED BY THE ENGINEER ON CONSTRUCTION. THE FOOTAGE THUS INSTALLED SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR PERFORATED PIPE WHICH SHALL CONSTITUTE FULL COMPENSATION FOR FURNISHING AND INSTALLING PIPE INCLUDING ALL CONNECTIONS, FITTINGS, FURNISHING AND PLACING AGGREGATE, PLACING BACKFILL, AND FURNISHING ALL LABOR AND TOOLS NECESSARY TO COMPLETE THE WORK.
7. EXCAVATION FOR BOTH THE PERFORATED AND NON-PERFORATED PIPE SHALL BE MEASURED AND PAID FOR AT THE UNIT PRICE AS SET FORTH IN THE STANDARD SPECIFICATIONS.
8. BENCHING SHALL BE REQUIRED AT ALL TRANSITIONS FROM ROCK CUTS TO FILL WHETHER OR NOT UNDERDRAIN IS REQUIRED.

USE WITH CUR. STD. DWG. RDP-001

KENTUCKY DEPARTMENT OF HIGHWAYS

PERFORATED PIPE UNDERDRAINS (LONGITUDINAL AND TRANSVERSE)

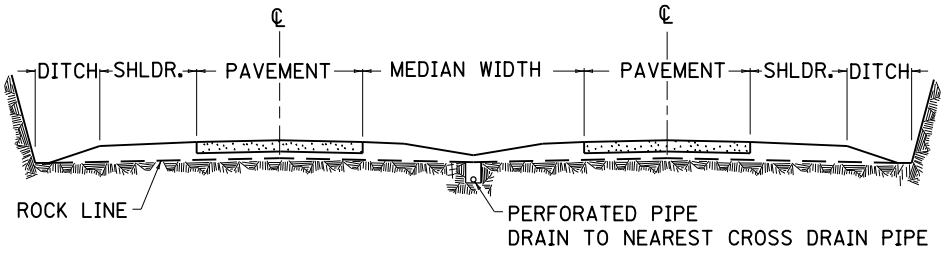
STANDARD DRAWING NO. RDP-006-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

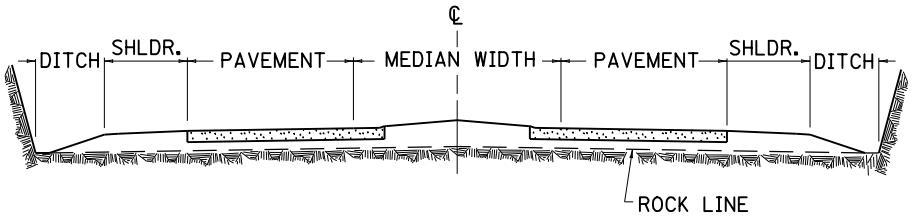
APPROVED _____ STATE HIGHWAY ENGINEER — 12-01-15 DATE

SECTIONS IN SOLID ROCK CUTS

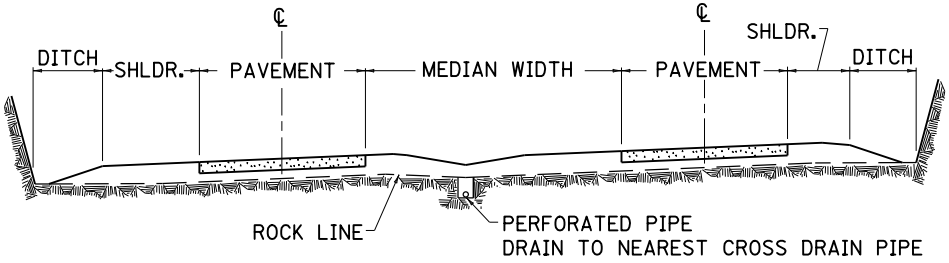
DEPRESSED MEDIAN 36 FEET AND OVER



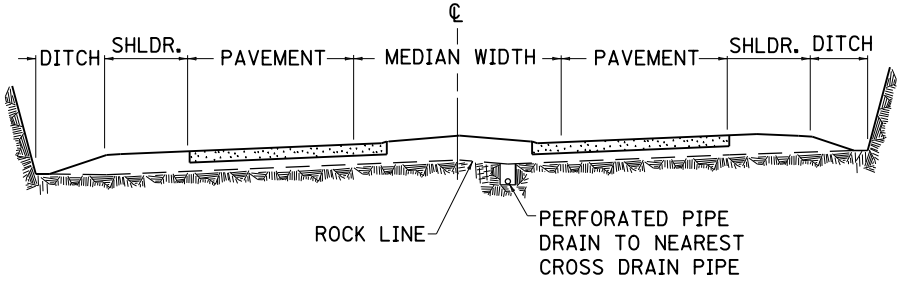
RAISED MEDIAN UNDER 36 FEET



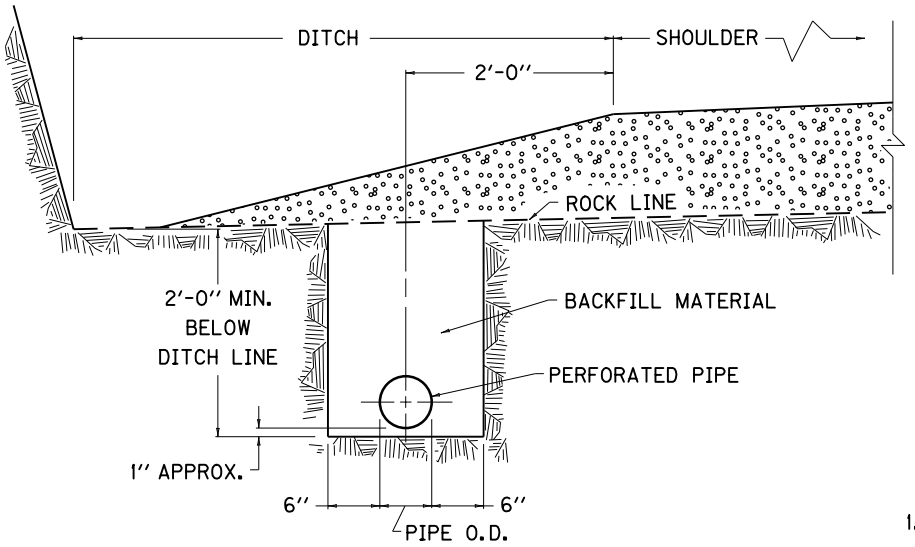
NORMAL SECTION



NORMAL SECTION

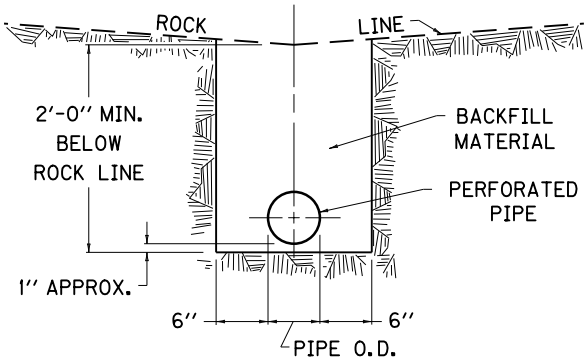


SUPERELEVATED SECTION



PERFORATED PIPE AT DITCH-SHOULDER LOCATION

SUPERELEVATED SECTION



DETAIL OF PERFORATED PIPE AT LOCATIONS AS SHOWN ON THE SECTIONS

~ NOTES ~

BID ITEM AND UNIT TO BID

PERFORATED PIPE- △ IN LF

△ = PIPE DIA. IN INCHES

1. PERFORATED PIPE TO BE CONSTRUCTED AS DETAILED ONLY WHEN SPECIFICALLY CALLED FOR ON THE SOIL PROFILE, PLAN SHT. OR BOTH.

USE WITH CUR. STD. DWG.
RDP-001

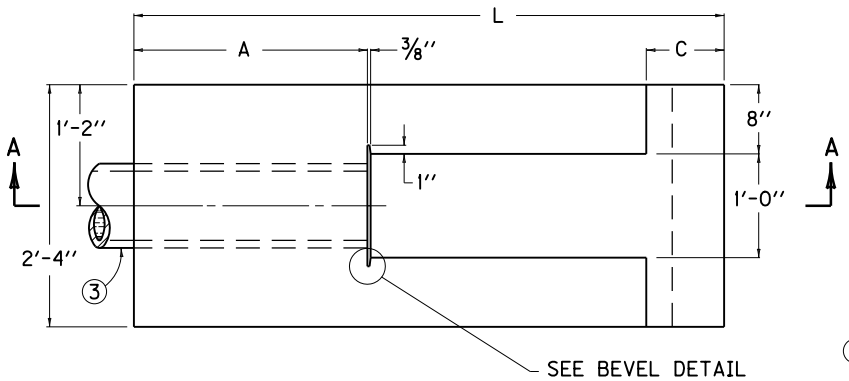
KENTUCKY
DEPARTMENT OF HIGHWAYS

PERFORATED
PIPE DETAILS
(SOLID ROCK)

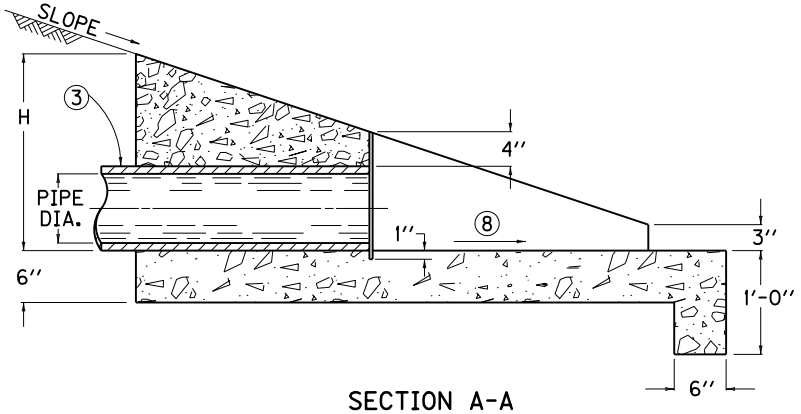
STANDARD DRAWING NO. RDP-007-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW



SECTION A-A

PIPE DIA.	SLOPE	DIMENSIONS				CLASS "A" CONCRETE
		L	H	A	C	CU. YDS.
4'' AND 6''	2 : 1	3'-4 7/8''	1'-8 7/16''	1'-6''	6''	0.38
	3 : 1	5'-1 5/16''		2'-3''	9''	0.56
	4 : 1	6'-9 3/4''		3'-0''	1'-0''	0.74
	6 : 1	7'-2 5/8''	1'-2 7/16''	1'-6''	1'-6''	0.62
8''	2 : 1	3'-9 1/2''	1'-10 3/4''	1'-6''	6''	0.43
	3 : 1	5'-8 1/4''		2'-3''	9''	0.63
	4 : 1	7'-7''		3'-0''	1'-0''	0.83
	6 : 1	8'-4 1/2''	1'-4 3/4''	1'-6''	1'-6''	0.73
10''	2 : 1	4'-2''	2'-1''	1'-6''	6''	0.47
	3 : 1	6'-3''		2'-3''	9''	0.69
	4 : 1	8'-4''		3'-0''	1'-0''	0.91
	6 : 1	9'-6''	1'-7''	1'-6''	1'-6''	0.83

~NOTES~

BID ITEMS AND UNIT TO BID

CRUSHED AGGREGATE SIZE NO 2	TON
PERF PIPE HEADWALL TY ⊗ - △ IN	EACH

⊗ 1 = 2:1 SLOPE
2 = 3:1 SLOPE
3 = 4:1 SLOPE
4 = 6:1 SLOPE

△ = PIPE DIA. IN INCHES

BID ITEM EXAMPLE: PERF PIPE HWALL TY 2 - 6 INCH

1. THE CONTRACT UNIT PRICE FOR PERF. PIPE HEADWALLS INCLUDES ALL LABOR, EXCAVATION, FORMS, CLASS "A" CONCRETE AND INCIDENTALS NECESSARY TO COMPLETE ONE INSTALLATION.
2. THIS HEADWALL IS TO BE USED AT THE OUTLET END OF PERFORATED PIPE INSTALLATIONS.

③ APPROXIMATELY 8'-0" TO 12'-0" OF PIPE AT THE OUTLET SHALL BE NON-PERFORATED PIPE MEETING THE REQUIREMENTS OF THE PERFORATED PIPE, EXCEPT FOR PERFORATIONS. IF VITRIFIED CLAY PIPE IS USED, ALL JOINTS WHICH LIE WITHIN THE ABOVE LIMITS AND NOT ENCASED IN CONCRETE (SEE NOTE 4) SHALL BE IN ACCORDANCE WITH THE CURRENT ASTM C-443.

4. ANY PIPE WHICH HAS LESS THAN 1'-0" OF COVER OVER ITS TOP SHALL BE INCASED IN 6" OF CONCRETE ON ALL SIDES.

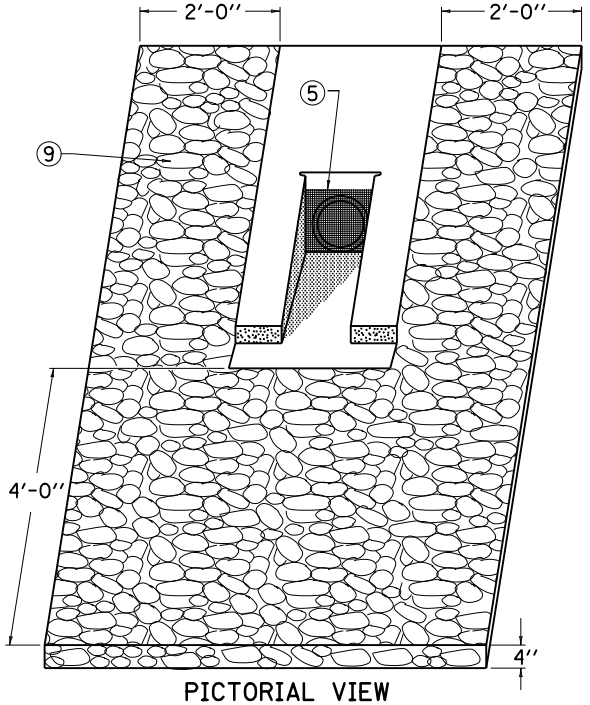
⑤ RODENT SCREEN OF 2x2 MESH 16 GAUGE (0.063 IN. DIA.) STEEL HEAVY (MAX.) HOT DIP GALVANIZED WOVEN WIRE CLOTH. THE MESH SHALL EXTEND A MINIMUM OF 1" ABOVE THE O.D. OF THE PIPE.

6. THE SLOT IS TO BE CONSTRUCTED SO THAT THE MESH CAN BE REMOVED FOR CLEANOUT PURPOSES.

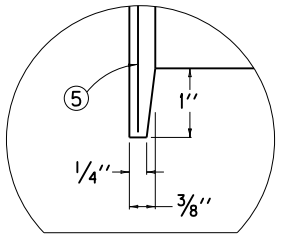
⑦ BEVEL PERMITTED FOR EASY FORM REMOVAL.

⑧ INSTALL OR CONSTRUCT HEADWALL TO SLOPE 4% TO INSURE POSITIVE OUTLET FLOW.

⑨ CRUSHED AGGREGATE SIZE NO. 2 PLACED A MIN. DEPTH OF 4". (APPROX. 1 TON PER HEADWALL)



PICTORIAL VIEW



⑦ BEVEL DETAIL

USE WITH CUR. STD. DWG.
RDP-005

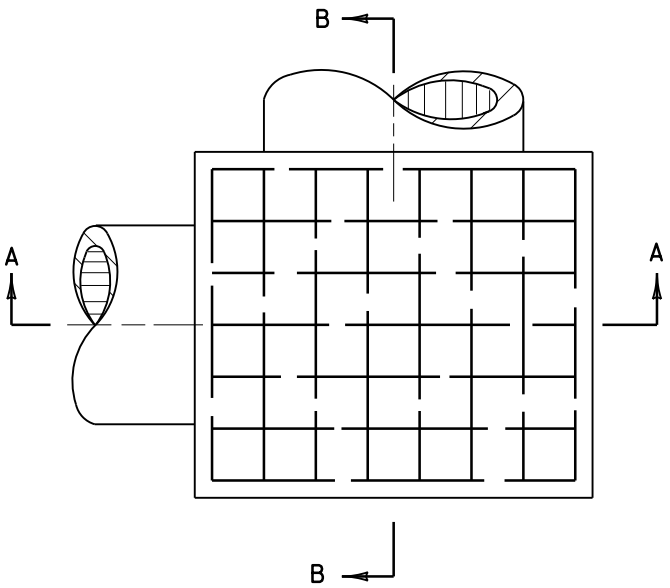
KENTUCKY
DEPARTMENT OF HIGHWAYS

PERFORATED PIPE HEADWALLS

STANDARD DRAWING NO. RDP-010-09

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

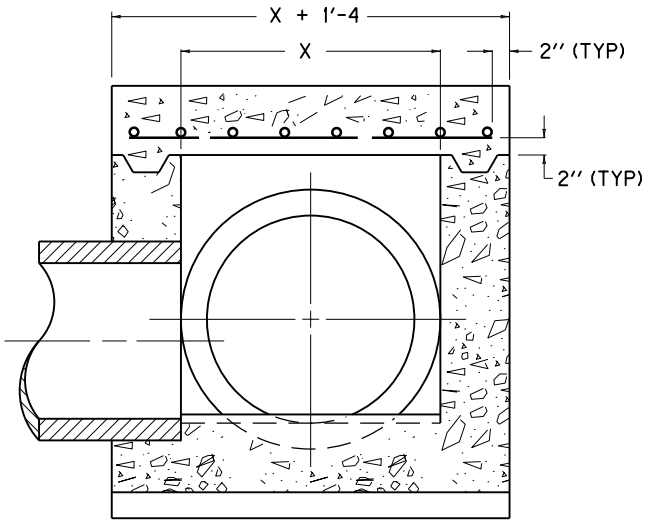


PLAN VIEW

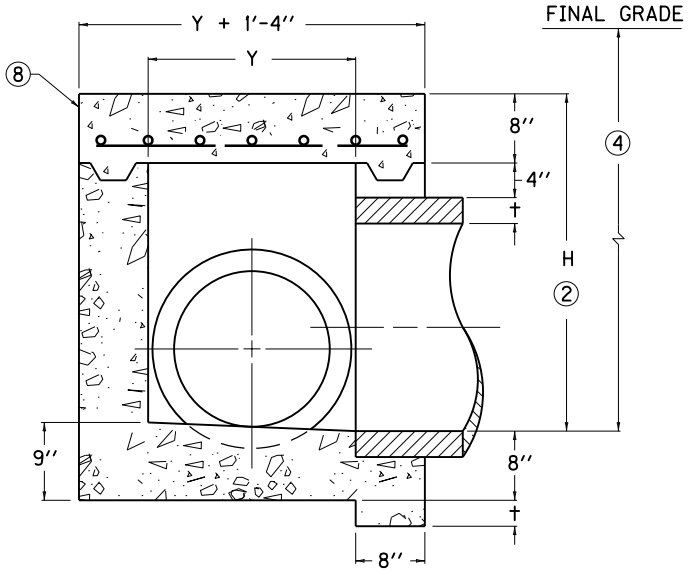
~ NOTES ~

BID ITEM AND UNIT TO BID
JUNCTION BOX EACH

1. THE CONTRACT UNIT PRICE EACH SHALL INCLUDE PAYMENT IN FULL FOR ALL MATERIALS, EXCAVATION, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.
2. H = D + † + 1′-0″ FOR THE LARGEST PIPE INVOLVED.
3. STEEL REINFORCEMENT SHALL BE NO. 4 BARS PLACED 6″ O.C.
4. THE MAXIMUM DEPTH OF THE BOX FROM THE FINAL GRADE TO FLOW LINE OF PIPE SHALL BE 8′-0″. ANY BOXES DEEPER THAN 8′-0″ SHALL BE SPECIFICALLY DESIGNED.
5. SEE CUR. STD. DWG. RDX-002 FOR DIMENSIONS AND QUANTITIES.
6. FOR THIS APPLICATION THE ″X″ DIMENSION IS ASSUMED TO BE EQUAL TO OR GREATER THAN THE ″Y″ DIMENSION.
7. THE BOX SIZE NUMBER IS TO BE SHOWN ON THE PLANS AND SHALL BE DETERMINED BY THE LARGEST PIPE IN THE ″X″ OR ″Y″ DIMENSION.
8. TO ELIMINATE FORM REMOVAL, THE TOP SHALL BE PRECAST.



SECTION A-A



SECTION B-B

USE WITH CUR. STD. DWG.
RDX-002

KENTUCKY
DEPARTMENT OF HIGHWAYS

JUNCTION BOX

STANDARD DRAWING NO. RDX-001-06

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

DIMENSIONS AND ESTIMATE OF QUANTITIES

INLET SIZE			PIPE	①	CONCRETE		REINF.
NO.	X	Y	MAX. DIA.	H	CU. YDS.	② Q	STEEL LBS.
1	2′-0″	2′-0″	12″	2′-2″	0.99	0.3	28
2			15″	2′-5″	1.06		
3			18″	2′-9″	1.13		
4	2′-6″		21″	3′-0″	1.35		32
5		2′-6″			1.51		37
6		2′-0″	24″	3′-3″	1.44		32
7		2′-6″			1.60		37
8	3′-0″	2′-0″	27″	3′-6″	1.68		
9		2′-6″			1.86		42
10		3′-0″			2.04	0.4	48
11	3′-6″	2′-0″	30″	3′-10″	1.93	0.3	41
12		2′-6″			2.13	0.4	47
13		3′-0″			2.34		54
14		3′-6″			2.54		60
15		2′-0″	33″	4′-1″	2.02	0.3	41
16		2′-6″			2.24	0.4	47
17		3′-0″			2.45		54
18		3′-6″			2.66		60
19	4′-0″	2′-0″	36″	4′-4″	2.30		45
20		2′-6″			2.53		52
21		3′-0″			2.76		59
22		3′-6″			2.99		66
23		4′-0″			3.22	0.5	73
24	4′-6″	2′-0″	42″	4′-11″	2.70	0.4	50
25		2′-6″			2.95		57
26		3′-0″			3.21		65
27		3′-6″			3.47	0.5	73
28		4′-0″			3.73		80
29		4′-6″			3.98		88
30	5′-0″	2′-0″	48″	5′-5″	3.12	0.4	54
31		2′-6″			3.41		62
32		3′-0″			3.69	0.5	71
33		3′-6″			3.97		79
34		4′-0″			4.26		88
35		4′-6″			4.54		96
36		5′-0″			4.83	0.6	104
37	5′-6″	2′-0″	54″	6′-0″	3.58	0.4	58
38		2′-6″			3.89	0.5	67
39		3′-0″			4.20		76
40		3′-6″			4.51		86
41		4′-0″			4.82		95
42		4′-6″			5.13	0.6	104
43		5′-0″			5.44		113
44		5′-6″			5.75		122
45	6′-0″	2′-0″	60″	6′-6″	4.06	0.5	63
46		2′-6″			4.39		72
47		3′-0″			4.73		82
48		3′-6″			5.07		92

INLET SIZE			PIPE	①	CONCRETE		REINF.
NO.	X	Y	MAX. DIA.	H	CU. YDS.	② Q	STEEL LBS.
49	6′-0″	4′-0″	60″	6′-6″	5.40	0.6	102
50		4′-6″			5.74		111
51		5′-0″			6.08		121
52		5′-6″			6.42		131
53		6′-0″			6.75	0.7	140
54	7′-0″	2′-0″	66″	7′-1″	4.81	0.5	71
55		2′-6″			5.19		83
56		3′-0″			5.57	0.6	94
57		3′-6″			5.94		105
58		4′-0″			6.32		116
59		4′-6″			6.70		127
60		5′-0″			7.07	0.7	138
61		5′-6″			7.45		149
62		6′-0″			7.83		160
63		7′-0″			8.58	0.8	182
64	7′-6″	2′-0″	72″	7′-7″	5.37	0.5	76
65		2′-6″			5.77	0.6	88
66		3′-0″			6.17		99
67		3′-6″			6.57		111
68		4′-0″			6.98		123
69		4′-6″			7.38	0.7	134
70		5′-0″			7.78		146
71		5′-6″			8.19		158
72		6′-0″			8.59		169
73		7′-0″			9.39	0.8	193
74		7′-6″			9.80		204

REFERENCE CHART

DIA. OF PIPE	JUNCTION BOX		CONCRETE TO DEDUCT FOR EACH PIPE
	PIPE ON ″X″ SIDE OF BOX	PIPE ON ″Y″ SIDE OF BOX	CU. YDS.
0	2′-0″	2′-0″	---
12″			0.1
15″-18″			
21″-24″	2′-6″	2′-6″	
27″	3′-0″	3′-0″	0.2
30″-33″	3′-6″	3′-6″	
36″	4′-0″	4′-0″	0.3
42″	4′-6″	4′-6″	0.4
48″	5′-0″	5′-0″	0.5
54″	5′-6″	5′-6″	0.6
60″	6′-0″	6′-0″	0.7
66″	7′-0″	7′-0″	0.8
72″	7′-6″	7′-6″	1.0

~ NOTES ~

① BASED ON ″H″ AS EQUAL TO D+†+1′-0″.

② ″Q″ = CU. YDS. OF CONCRETE PER FOOT INCREASE OR DECREASE WHEN ″H″ VARIES FROM D+†+1′-0″.

3. NO DEDUCTIONS HAVE BEEN MADE FOR PIPE, SEE REFERENCE CHART FOR QUANTITIES TO DEDUCT.
4. THE DIMENSIONS AND QUANTITIES HAVE BEEN CALCULATED FOR ROUND CONCRETE PIPE. WHEN NON-CIRCULAR PIPE IS USED THE BOX SIZE SHALL BE DETERMINED BY THE CONTROLLING DIMENSIONS OF THE PIPE.

USE WITH CUR. STD. DWG. RDX-001

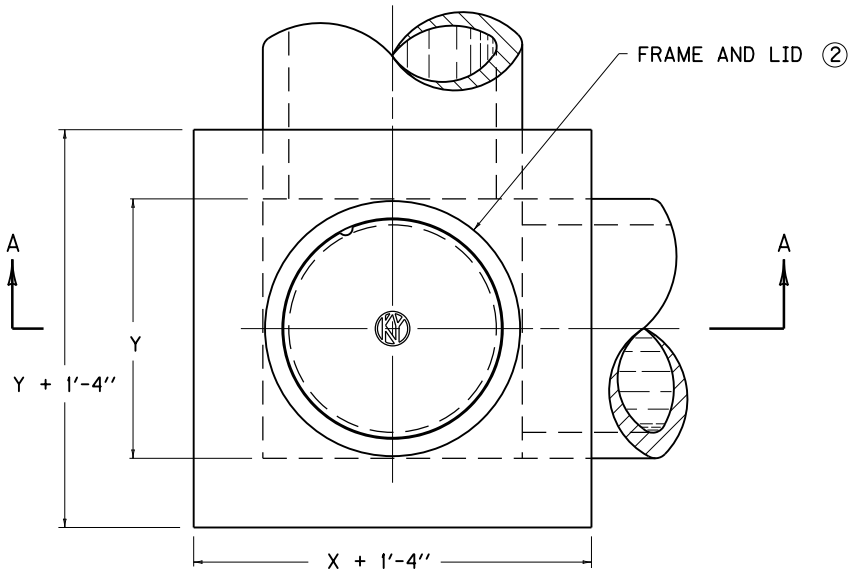
KENTUCKY DEPARTMENT OF HIGHWAYS

JUNCTION BOX (DIMENSIONS & QUANTITIES)

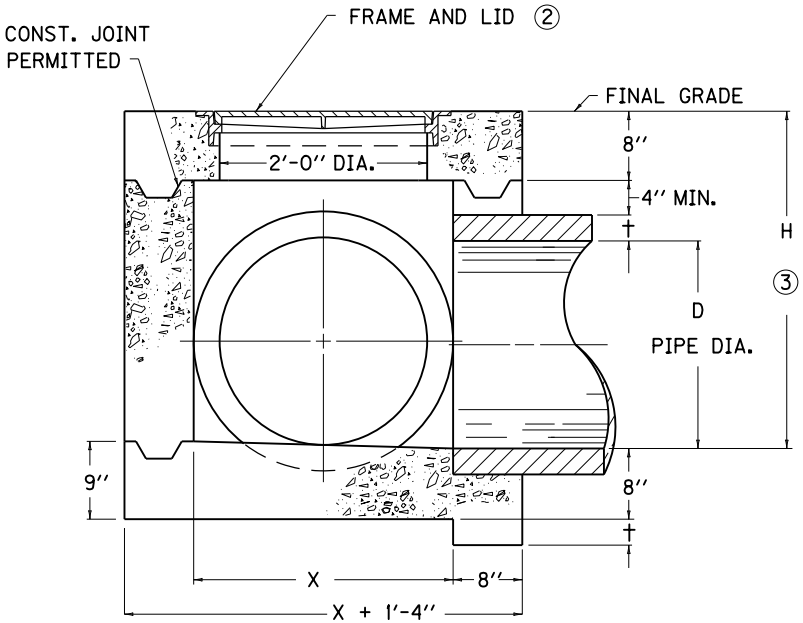
STANDARD DRAWING NO. RDX-002-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW



SECTION A-A

~ NOTES ~

BID ITEM AND UNIT TO BID
JUNCTION BOX TYPE B (☆) EACH
(☆) = "1" (FRAME AND LID TYPE 1)
(☆) = "2" (FRAME AND LID TYPE 2)

1. THE CONTRACT UNIT PRICE EACH SHALL INCLUDE PAYMENT IN FULL FOR EXCAVATION, LABOR, FRAME AND LID, CONCRETE, AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE WORK.

② WHEN THIS BOX IS TO BE USED IN NON-VEHICULAR TRAFFIC AREAS SEE CUR. STD. DWG. RDM-100 "FRAME AND LID TYPE 1".
WHEN THIS BOX IS TO BE USED IN VEHICULAR TRAFFIC AREAS SEE CUR. STD. DWG. RDM-105 "FRAME AND LID TYPE 2".

③ THE MAXIMUM DEPTH OF THE BOX FROM FINAL GRADE TO FLOW LINE OF PIPE SHALL BE 8'-0". ANY BOXES DEEPER THAN 8'-0" SHALL BE SPECIFICALLY DESIGNED.

④ BASED ON "H" AS EQUAL TO D + † + 1'-0".

⑤ "Q" = CUBIC YARDS OF CONCRETE PER FOOT INCREASE OR DECREASE WHEN "H" VARIES FROM D + † + 1'-0".

6. NO DEDUCTIONS HAVE BEEN MADE FOR PIPE, SEE REFERENCE CHART FOR QUANTITIES TO DEDUCT.
7. THE DIMENSIONS AND QUANTITIES HAVE BEEN CALCULATED FOR ROUND CONCRETE PIPE. WHEN NON-CIRCULAR PIPE IS USED THE BOX SIZE SHALL BE DETERMINED BY THE CONTROLLING DIMENSIONS OF THE PIPE.
8. FOR THIS APPLICATION THE "X" DIMENSION IS ASSUMED TO BE EQUAL TO OR GREATER THAN THE "Y" DIMENSION.
9. THE BOX SIZE NUMBER IS TO BE SHOWN ON THE PLANS AND SHALL BE DETERMINED BY THE LARGEST PIPE IN THE "X" AND "Y" DIMENSION.

DIMENSIONS & ESTIMATE OF QUANTITIES

INLET SIZE			PIPE	④	CONCRETE	
NO.	X	Y	MAX. DIA.	H	CU. YDS.	⑤ Q
1	2'-0"	2'-0"	12"	2'-2"	0.91	0.3
2			15"	2'-5"	0.98	
3			18"	2'-9"	1.05	
4	2'-6"		21"	3'-0"	1.27	
5		2'-6"			1.43	
6		2'-0"	24"	3'-3"	1.36	
7		2'-6"			1.52	

REFERENCE CHART			
DIA. OF PIPE	JUNCTION BOX		CONCRETE TO DEDUCT FOR EACH PIPE
	PIPE ON "X" SIDE OF BOX	PIPE ON "Y" SIDE OF BOX	CU. YDS.
0	2'-0"	2'-0"	---
12"			0.1
15"-18"			
21"-24"	2'-6"	2'-6"	

USE WITH CUR. STD. DWGS.
RDM-100 , RDM-105

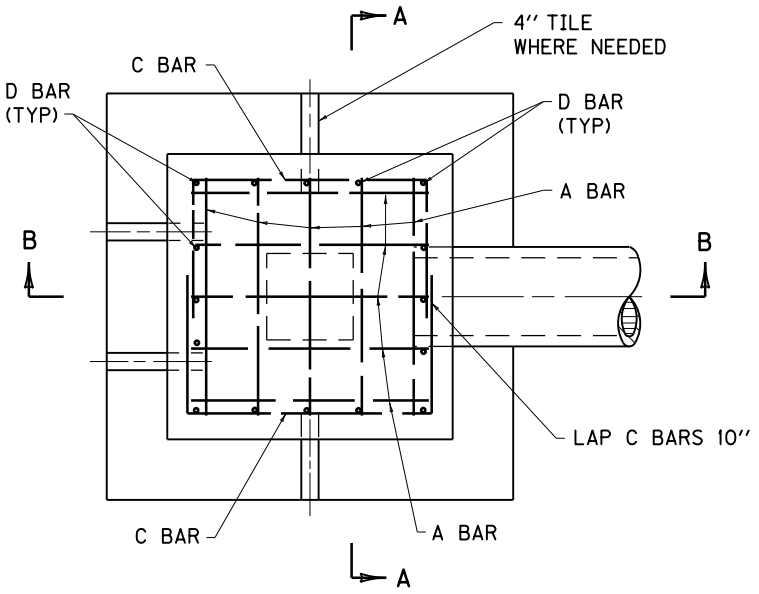
KENTUCKY
DEPARTMENT OF HIGHWAYS

JUNCTION BOX
TYPE B ☆

STANDARD DRAWING NO. RDX-005-03

SUBMITTED William S. Haddad DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW

~ NOTES ~

BID ITEM AND UNIT TO BID
SPRING BOX INLET TYPE A EACH

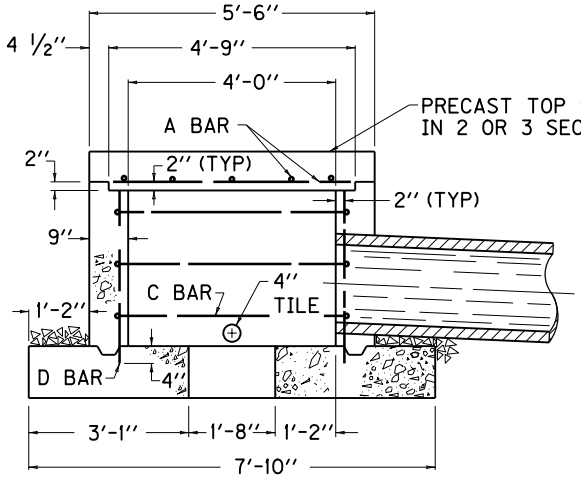
1. LOCATION OF OPENING MAY BE DETERMINED IN THE FIELD FOR A SIDE OR BOTTOM SPRING INLET.
2. SPRING INLET TYPE "A" SHALL BE USED WHEN FILL OVER TOP IS 10' OR MORE.

STEEL REINFORCEMENT

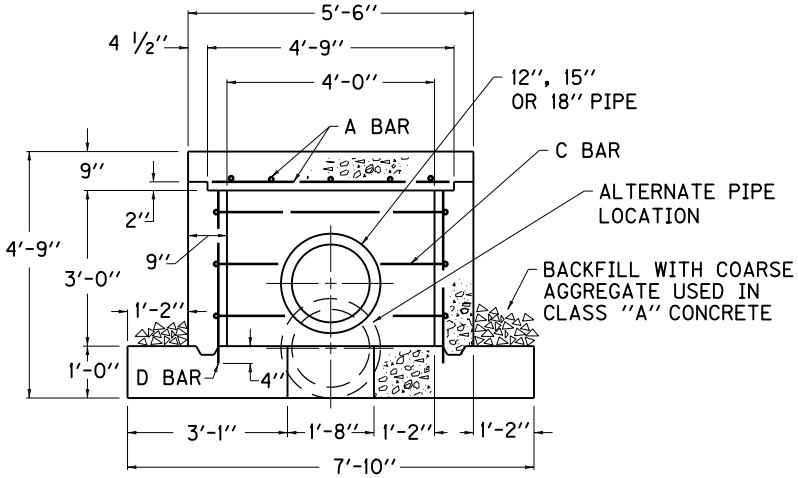
NO. 4 STEEL BARS			TOTAL LBS.
BAR	QTY.	LIN. FT.	
A	10	4'-7"	105
C	6	9'-9"	
D	16	3'-4"	

CLASS "A" CONCRETE

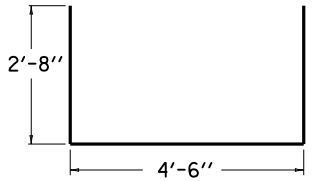
PIPE DIA.	CU. YDS. CONCRETE
12"	4.61
15"	4.59
18"	4.58



SECTION B-B



SECTION A-A



C BAR DETAIL

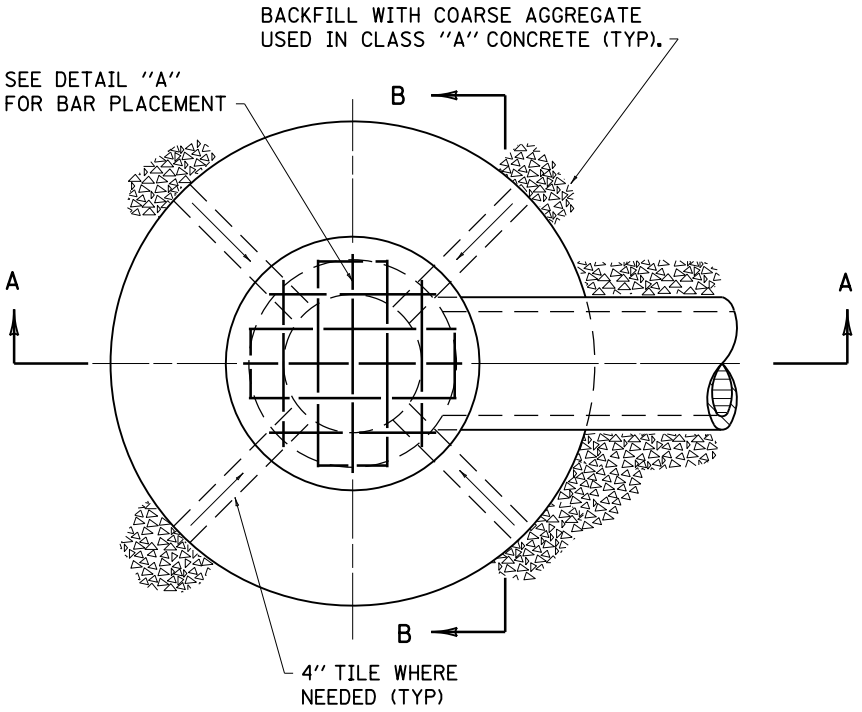
KENTUCKY
DEPARTMENT OF HIGHWAYS

SPRING BOX
INLET
TYPE A

STANDARD DRAWING NO. RDX-010-05

SUBMITTED William S. Haddad DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW

~ NOTES ~

BID ITEM AND UNIT TO BID
SPRING BOX INLET TYPE B EACH

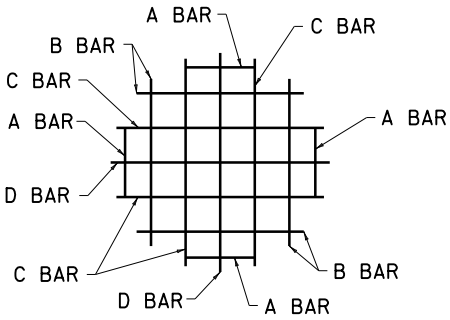
1. 12", 15", OR 18" DIAMETER PIPE OUTLET (SEE PIPE SECTIONS FOR SIZE AND TYPE). MORTAR AROUND PIPE TO PREVENT SEEPAGE.
2. SPRING BOX INLET TYPE "B" MAY BE USED WHEN FILL OVER TOP IS LESS THAN 10'-0".
3. STEEL REINFORCEMENT PLACED 6" ON CENTERS.
4. "t" IS CONCRETE PIPE WALL THICKNESS OR METAL PIPE CORRUGATION DEPTH.

STEEL REINFORCEMENT FOR CONCRETE COVER

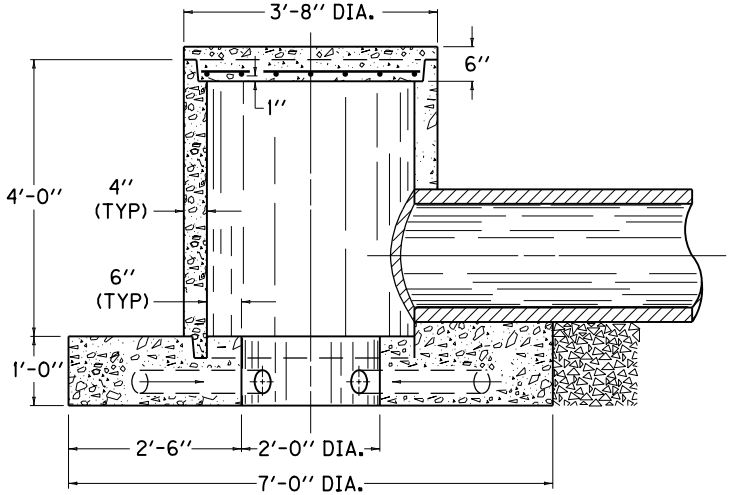
NO. 3 STEEL BARS			TOTAL LBS.
BAR	QTY.	LENGTH	
A	4	1'-0"	13
B	4	2'-5"	
C	4	3'-0"	
D	2	3'-2"	

CLASS "A" CONCRETE

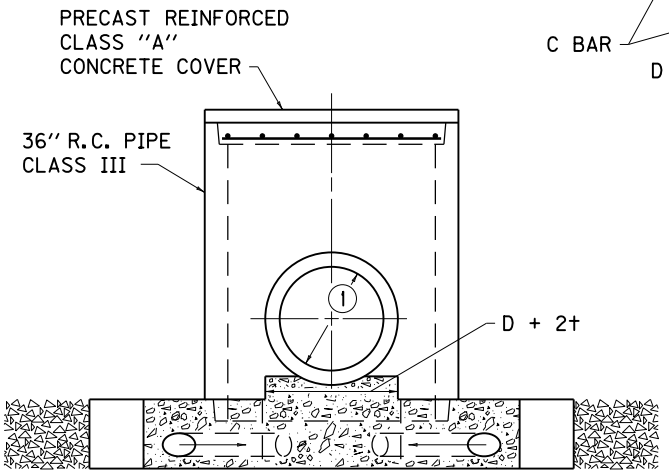
PIPE DIA.	CU. YDS. CONCRETE
12"	1.54
15"	
18"	



DETAIL "A"



SECTION A-A



SECTION B-B

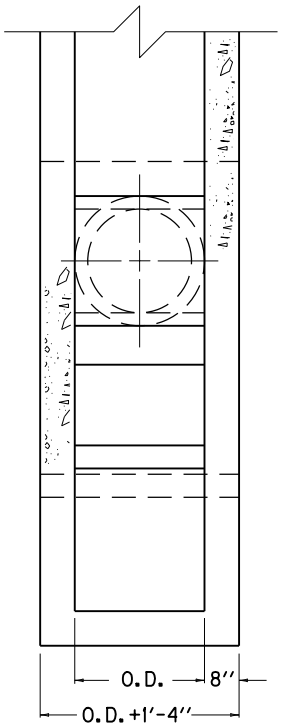
KENTUCKY
DEPARTMENT OF HIGHWAYS

SPRING BOX INLET
TYPE B

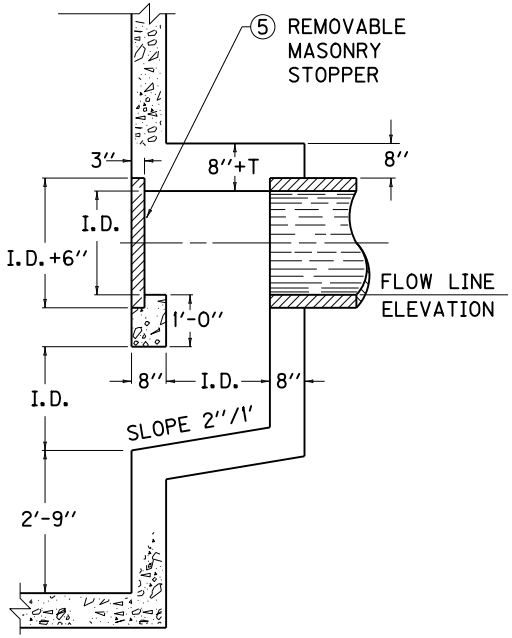
STANDARD DRAWING NO. RDX-011-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

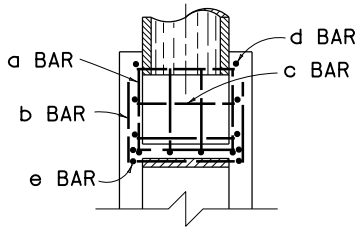


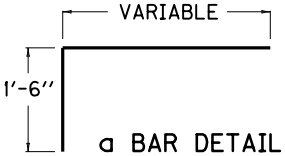
FRONT ELEVATION

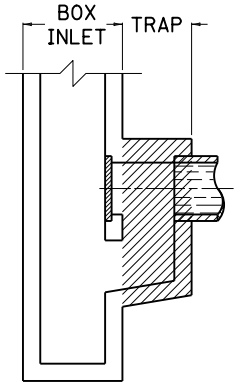


RIGHT SECTIONAL ELEVATION

PIPE SIZE	NO. 5 REINFORCEMENT BARS QUANTITY - LENGTH AND WEIGHT										LBS.	CLASS A CONC.
	a		b		c		d		e			
	QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH		CU. YDS.
12''	6	2'-10''	8	1'-4''	11	1'-8''	4	3'-4''	4	6'-4''	88	0.52
15''	6	3'-1''	10	1'-7''	12	2'-0''	4	3'-10''	4	6'-10''	105	0.69
18''	8	3'-4''	10	1'-10''	13	2'-3''	6	4'-4''	4	7'-4''	135	0.87
21''	8	3'-7''	12	2'-1''	14	2'-7''	6	4'-10''	4	7'-10''	157	1.09
24''	8	3'-10''	12	2'-4''	15	2'-10''	6	5'-4''	4	8'-4''	174	1.32
30''	10	4'-4''	14	2'-10''	17	3'-5''	8	6'-4''	4	9'-4''	239	1.87
36''	10	4'-10''	16	3'-4''	19	4'-0''	8	7'-4''	4	10'-4''	290	2.52
42''	12	5'-4''	18	3'-10''	21	4'-7''	10	8'-4''	4	11'-4''	373	3.28
48''	12	5'-10''	20	4'-4''	23	5'-2''	10	9'-4''	4	12'-4''	436	4.15







TYPICAL TRAPPED BOX INLET

~ NOTES ~

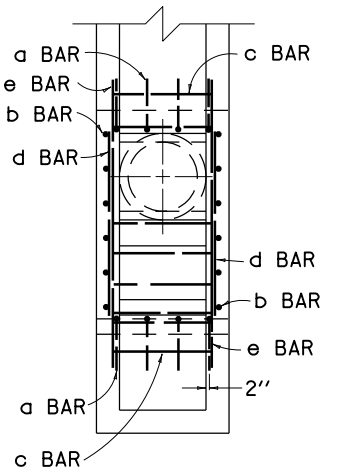
BID ITEMS AND UNIT TO BID
CURB BOX INLET TYPE A TRAPPED EACH
OR
CURB BOX INLET TYPE B TRAPPED EACH

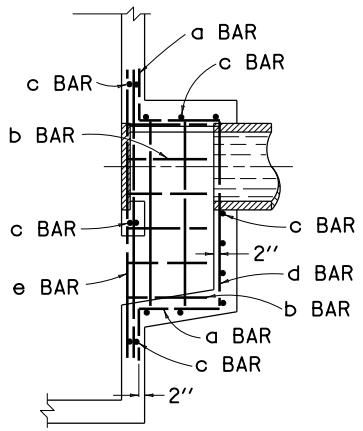
1. QUANTITIES SHOWN FOR STEEL AND CONCRETE ARE FOR INFORMATIONAL PURPOSES ONLY, AND ARE INCLUDED IN THE BID ITEM.
2. STEEL BARS SPACED APPROXIMATELY 12'' O.C. THE MINIMUM REQUIREMENT FOR REINFORCING STEEL SHALL BE GRADE 40.
3. NO CONSTRUCTION JOINTS PERMITTED BELOW FLOW LINE ELEVATION.
4. ▨ THIS INLET TRAP MAY BE APPLIED TO ANY BOX INLET WITH A FLAT VERTICAL FACE.

⑤ CAST IRON OR OTHER TYPES OF STOPPERS WILL BE PERMITTED IF APPROVED BY THE ENGINEER.

6. ▨ DRAWING IS FOR TRAP PORTION OF INLET ONLY AND MUST BE CONSTRUCTED AS AN INTEGRAL PART OF THE BOX INLET.

T = PIPE THICKNESS.
I.D. = INSIDE DIAMETER OF PIPE.
O.D. = OUTSIDE DIAMETER OF PIPE.





STEEL PATTERN

KENTUCKY DEPARTMENT OF HIGHWAYS

TRAP FOR BOX INLETS

STANDARD DRAWING NO. RDX-020-05

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

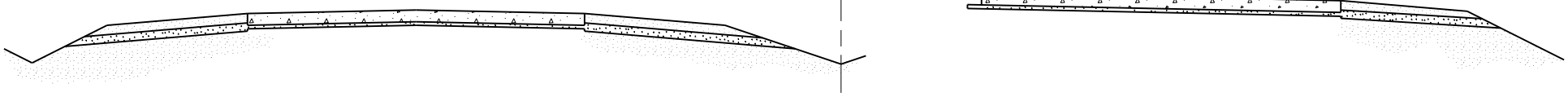
TYPICAL LATERAL SHOULDER DRAINS

FOUR LANE DIVIDED

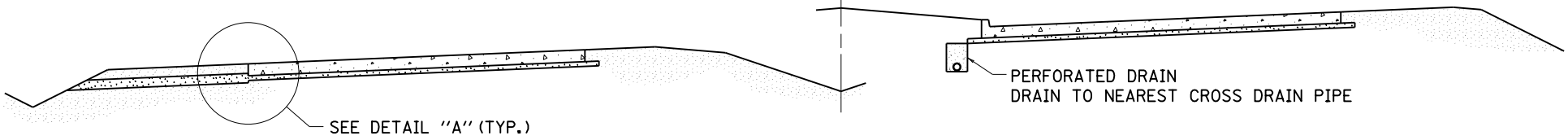
DEPRESSED MEDIAN

℄

RAISED MEDIAN

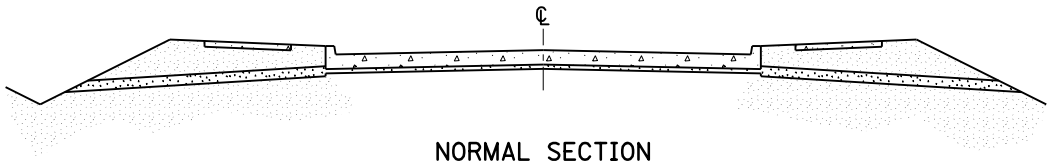


NORMAL SECTION

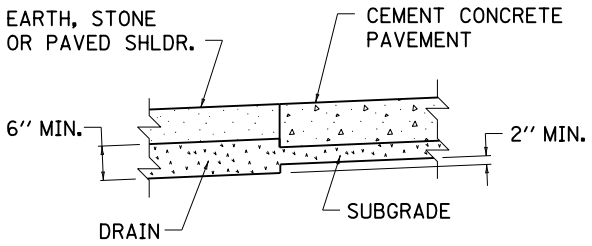


SUPERELEVATED SECTION

MUNICIPAL TYPE



NORMAL SECTION



DETAIL "A"

~ NOTES ~

1. SHOULDER DRAINS SHALL BE:
   REQUIRED FOR EARTH SHOULDERS OR WHERE THE SHOULDER AGGREGATE IS LESS THAN PAVEMENT THICKNESS.
   REQUIRED FOR TWO-LANE, MULTI-LANE AND BIFURCATED FACILITES.
   SPACED OPPOSITE TRANSVERSE JOINTS EXCEPT AT BRIDGE ENDS, AND ON LOW SIDE OF SUPERELEVATED CURVES AT MID-POINT OF 50 FOOT TRANSVERSE JOINT SPACING.
   CONSTRUCTED, MEASURED, AND PAID FOR IN ACCORDANCE WITH STANDARD SPECIFICATIONS.
   ELIMINATED IF APPROVED IN WRITING BY THE ENGINEER, PROVIDED POROUS ROCK OR POROUS BANK GRAVEL IS USED IN SHOULDERS.

KENTUCKY
DEPARTMENT OF HIGHWAYS

SUBGRADE DRAINAGE
CONCRETE PAVEMENT

STANDARD DRAWING NO. RDX-050-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 12-01-15 DATE

INTERMEDIATE ANCHOR FOR PIPE (CLASS "A" CONCRETE)

		DIAMETER OF PIPE IN INCHES															
	% GRADE	12"	15"	18"	21"	24"	27"	30"	36"	42"	48"	54"	60"	66"	72"	78"	84"
VOLUME IN CU. YDS. OF CLASS "A" CONC. FOR ONE ANCHOR	0	0.68	0.86	1.07	1.31	1.59	1.90	2.25	3.06	5.91	7.41	9.30	11.28	14.99	18.34	22.15	25.64
	10	0.72	0.91	1.13	1.38	1.68	2.01	2.38	3.24	6.23	7.83	9.70	11.79	15.77	19.27	23.24	26.88
	20	0.75	0.96	1.19	1.44	1.78	2.14	2.52	3.43	6.59	8.28	10.07	12.24	16.48	20.11	24.22	27.98
	30	0.79	1.01	1.26	1.53	1.88	2.27	2.67	3.65	6.97	8.78	10.40	12.64	17.12	20.87	25.10	28.95
	40	0.84	1.07	1.33	1.62	1.99	2.41	2.83	3.88	7.39	9.31	10.69	12.99	17.70	21.53	25.88	29.79
	50	0.88	1.13	1.41	1.72	2.11	2.56	3.01	4.12	7.83	9.87	10.95	13.30	18.22	22.13	26.55	30.51
	60	0.93	1.19	1.49	1.82	2.24	2.71	3.19	4.38	8.29	10.47	11.12	13.57	18.69	22.66	27.15	31.15
	70	0.98	1.25	1.57	1.94	2.37	2.87	3.38	4.65	8.77	11.10	11.40	13.81	19.12	23.14	27.69	31.70
	80	1.03	1.32	1.66	2.08	2.50	3.07	3.58	4.93	9.28	11.58	11.74	14.02	19.51	23.57	28.16	32.17
	90	1.08	1.39	1.75	2.19	2.64	3.25	3.79	5.22	9.79	11.75	12.41	14.21	19.79	23.87	28.46	32.42
	100	1.13	1.46	1.84	2.31	2.78	3.43	4.00	5.52	10.32	11.91	13.10	14.38	20.20	24.31	28.95	32.92
DIMENSIONS	L	3'-4"	3'-7½"	3'-11"	4'-2½"	4'-6"	4'-9½"	5'-1"	5'-8"	6'-11"	7'-6"	8'-1"	8'-8"	9'-7"	10'-2"	10'-9"	11'-4"
	W	2'-4"	2'-7½"	2'-11"	3'-2½"	3'-6"	3'-9½"	4'-1"	4'-8"	5'-7"	6'-2"	6'-9"	7'-4"	8'-1"	8'-8"	9'-3"	9'-10"
	H	1'-8"	1'-11¼"	2'-2½"	2'-5¾"	2'-9"	3'-0¼"	3'-3½"	3'-10"	4'-6½"	5'-1"	5'-7½"	6'-2"	6'-9½"	7'-4"	7'-10½"	8'-5"
	D	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-6"	1'-6"	1'-6"	1'-8"	1'-8"	1'-8"	2'-0"	2'-0"
	T	6"	6"	6"	6"	6"	6"	6"	6"	8"	8"	8"	8"	9"	9"	9"	9"

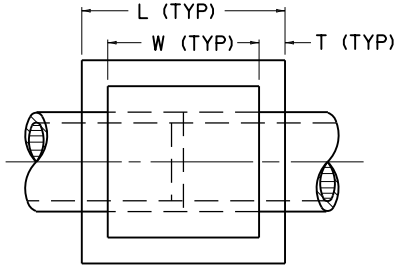
END ANCHOR FOR PIPE OUTLET (CLASS "A" CONCRETE)

DIMENSIONS	L	2'-4"	2'-8"	2'-9"	3'-3"	3'-6"	3'-10"	4'-1"	4'-0"	5'-3"	5'-10"	6'-5"	7'-0"	7'-7"	8'-2"	8'-9"	9'-4"
	H ON EARTH	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	1'-6"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"	2'-0"
	H ON ROCK	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"	1'-0"
VOLUME CU. YDS.	ON EARTH	0.13	0.15	0.16	0.18	0.19	0.21	0.23	0.26	0.39	0.43	0.48	0.52	0.56	0.61	0.65	0.69
	ON ROCK	0.09	0.10	0.10	0.12	0.13	0.14	0.15	0.17	0.19	0.22	0.24	0.26	0.28	0.31	0.33	0.35

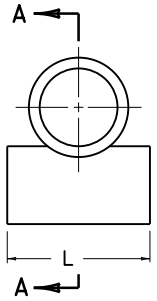
~ NOTES ~

BID ITEM AND UNIT TO BID
CONCRETE-CLASS "A" CUYD

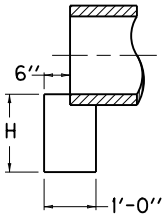
1. CIRCULAR PIPE INCLUDES SLIGHTLY ELLIPTICAL CONCRETE PIPE WITH CIRCULAR REINFORCEMENT.
2. THE VOLUME DISPLACED BY BARREL OF PIPE HAS BEEN COMPUTED USING INSIDE DIMENSION OF PIPE.
3. THE UNIT PRICE BID PER CU. YD. FOR CLASS "A" CONCRETE SHALL INCLUDE ALL FORMS, MATERIAL, LABOR, ETC. INCIDENTAL TO CONSTRUCTION.
4. FOR GRADE BREAKS IN PIPE, USE AVERAGE GRADE TO CALCULATE VOLUMES.



PLAN VIEW

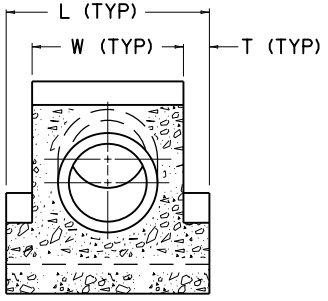


END ELEVATION

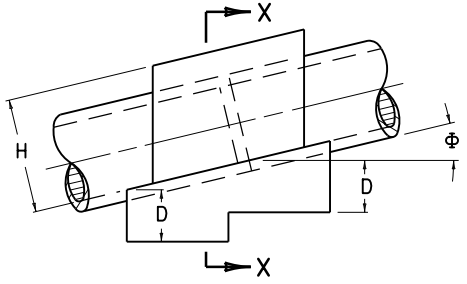


SECTION A-A

END ANCHOR FOR PIPE OUTLET



SECTION X-X



ELEVATION VIEW

INTERMEDIATE ANCHOR

KENTUCKY
DEPARTMENT OF HIGHWAYS

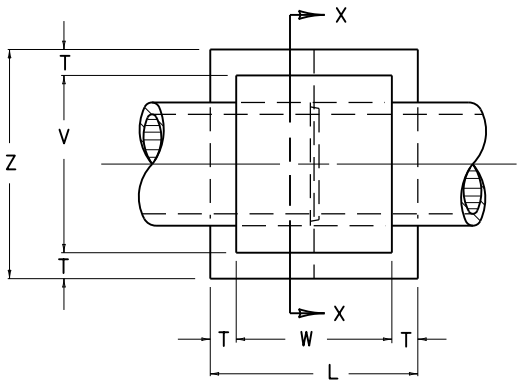
INTERMEDIATE
AND END ANCHORS
FOR CIRCULAR PIPE

STANDARD DRAWING NO. RDX-060-04

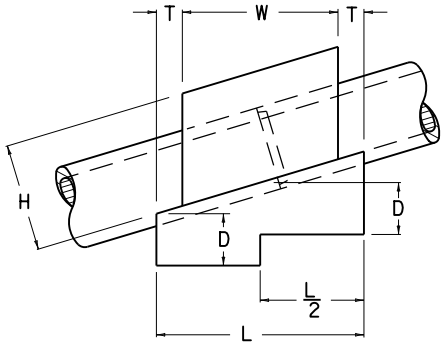
SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

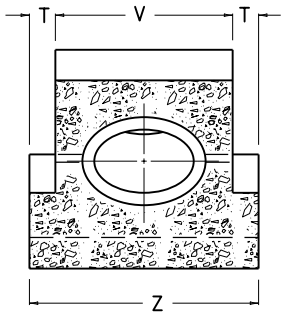
~INTERMEDIATE ANCHOR~



PLAN VIEW

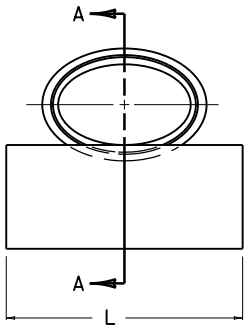


ELEVATION

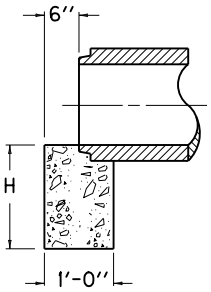


SECTION X-X

~END ANCHOR~



END ELEVATION



SECTION A-A

~ NOTES ~

BID ITEM AND UNIT TO BID
CONCRETE-CLASS "A" CUYD

1. THE UNIT PRICE BID PER CU. YD. FOR CLASS "A" CONCRETE SHALL INCLUDE ALL FORMS, MATERIALS, LABOR, AND ALL OTHER INCIDENTALS NECESSARY TO COMPLETE THE WORK.
2. THE VOLUME DISPLACED BY BARREL OF PIPE HAS BEEN COMPUTED USING DIMENSION OF PIPE.
3. FOR GRADE BREAKS IN PIPE, USE AVERAGE GRADE TO CALCULATE VOLUMES.

INTERMEDIATE ANCHOR FOR PIPE

NON-CIRCULAR PIPE: EQUIVALENT ROUND SIZES

	% GRADE	15"	18"	24"	27"	30"	33"	36"	39"	42"	48"	54"	60"
VOLUME IN CU. YDS. OF CLASS "A" CONCRETE FOR ONE ANCHOR	0	.98	1.22	1.80	2.18	2.57	2.98	3.54	4.60	6.65	8.04	10.66	8.23
	10	1.08	1.27	1.88	2.28	2.69	3.12	3.70	4.83	6.86	8.42	11.20	9.20
	20	1.16	1.32	1.95	2.36	2.80	3.25	3.85	5.04	7.13	8.77	11.70	10.00
	30	1.24	1.36	2.02	2.44	2.90	3.37	3.99	5.23	7.39	9.10	12.16	10.72
	40	1.32	1.40	2.08	2.53	2.99	3.47	4.12	5.41	7.69	9.39	12.59	11.37
	50	1.40	1.45	2.14	2.60	3.08	3.58	4.23	5.57	7.84	9.67	12.97	11.94
	60	1.42	1.49	2.20	2.67	3.14	3.67	4.34	5.72	8.05	9.92	13.33	12.47
	70	1.47	1.53	2.26	2.72	3.24	3.76	4.44	5.86	8.24	10.16	13.67	12.94
	80	1.51	1.57	2.31	2.76	3.31	3.84	4.53	5.99	8.41	10.38	13.98	13.37
	90	1.54	1.60	2.37	2.83	3.39	3.92	4.62	6.12	8.58	10.58	14.27	13.75
	100	1.58	1.64	2.42	2.92	3.45	4.00	4.70	6.23	8.74	10.78	14.54	14.11
DIMENSIONS	L	3'-9"	4'-0"	4'-7"	4'-11"	5'-3"	5'-6"	5'-10"	6'-6"	7'-2"	7'-8"	9'-2"	9'-10"
	W	2'-9"	3'-0"	3'-7"	3'-11"	4'-3"	4'-6"	4'-10"	5'-4"	5'-10"	6'-4"	7'-8"	7'-6"
	H	1'-9"	2'-2"	2'-7"	2'-10"	3'-2"	3'-3"	3'-6"	3'-9"	4'-2"	4'-4"	4'-9"	5'-4"
	D	1'-0"								1'-6"			
	V	3'-0"	3'-5"	4'-1"	4'-5"	4'-10"	5'-2"	5'-6"	6'-1"	6'-7"	7'-3"	8'-2"	7'-6"
	T	6"							7"	8"		9"	8"
	Z	4'-0"	4'-5"	5'-1"	5'-5"	5'-10"	6'-2"	6'-6"	7'-3"	7'-11"	8'-7"	9'-8"	8'-10"

END ANCHOR FOR PIPE OUTLET

(CLASS "A" CONCRETE)

DIMENSIONS	L	3'-0"	3'-5"	4'-1"	4'-5"	4'-10"	5'-2"	5'-6"	6'-0"	6'-6"	7'-2"	7'-10"	7'-10"
	H ON EARTH	1'-6"								2'-0"			
	H ON ROCK	1'-0"											
VOLUME CU. YDS. (ONE ANCHOR)	EARTH	0.17	0.19	0.23	0.25	0.27	0.29	0.31	0.33	0.48	0.53	0.58	0.58
	ROCK	0.11	0.13	0.15	0.16	0.18	0.19	0.20	0.22	0.24	0.27	0.29	0.29

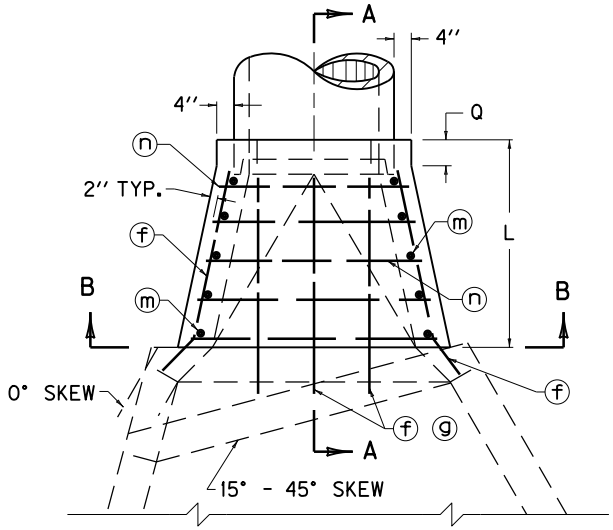
KENTUCKY
DEPARTMENT OF HIGHWAYS

INTERMEDIATE AND END ANCHORS FOR NON-CIRCULAR PIPE

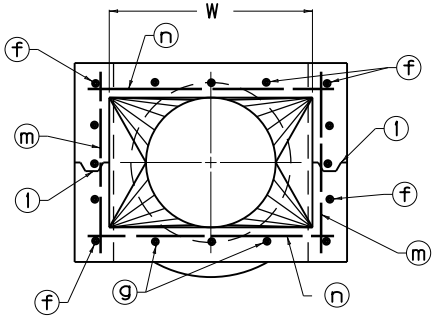
STANDARD DRAWING NO. RDX-065-04

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

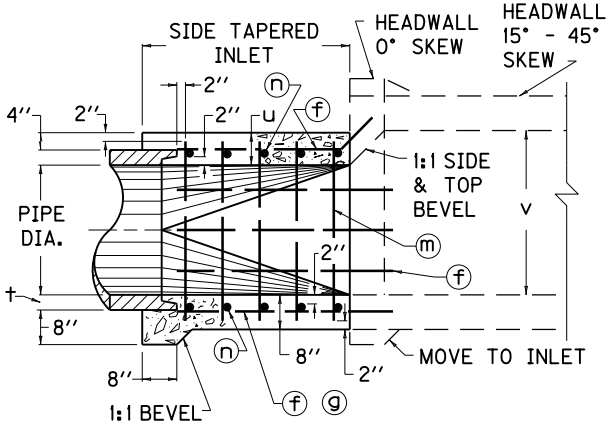
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW

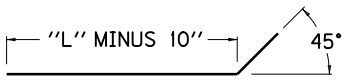


SECTION B-B

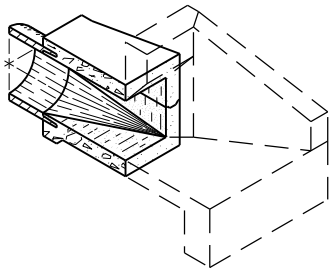


SECTION A-A

DIMENSIONS AND QUANTITIES												
PIPE DIA.	30''		36''		42''		48''		54''		60''	
ELLIPT. EQUIV. HDWL. TO USE	42''		48''		54''		60''		66''		72''	
NO. 5 BARS	QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH
f	13	4'-2''	14	4'-2''	16	5'-2''	17	5'-2''	19	5'-2''	22	6'-2''
g	3	4'-2''	4	4'-2''	4	5'-2''	5	5'-2''	5	5'-2''	6	6'-2''
m	10	3'-6''	10	4'-0''	12	4'-6''	12	5'-0''	12	5'-8''	14	6'-2''
n1	2	3'-8''	2	4'-2''	2	4'-8''	2	5'-2''	2	5'-8''	2	6'-0''
n2	2	3'-11''	2	4'-6''	2	5'-0''	2	5'-6''	2	6'-0''	2	6'-4''
n3	2	4'-2''	2	4'-10''	2	5'-4''	2	5'-10''	2	6'-4''	2	6'-8''
n4	2	4'-6''	2	5'-2''	2	5'-8''	2	6'-2''	2	6'-8''	2	7'-0''
n5	2	4'-9''	2	5'-6''	2	6'-0''	2	6'-6''	2	7'-0''	2	7'-4''
n6	-	-	-	-	2	6'-4''	2	6'-10''	2	7'-4''	2	7'-8''
n7	-	-	-	-	-	-	-	-	-	-	2	8'-0''
LBS. STEEL	150		170		233		256		282		372	
CU. YD. CONC.	1.38		1.66		2.48		2.87		3.28		4.47	
L	4'-0''		4'-0''		5'-0''		5'-0''		5'-0''		6'-0''	
W	3'-11''		4'-7''		5'-4''		6'-1''		6'-9''		7'-6''	
Q	0'-6''		0'-8''		0'-10''		1'-0''		1'-2''		1'-6''	
u	0'-7½''		0'-8''		0'-8½''		0'-9''		0'-9½''		0'-10''	
v	3'-2''		3'-8''		4'-2''		4'-8''		5'-2''		5'-8''	
t	0'-3½''		0'-4''		0'-4½''		0'-5''		0'-5½''		0'-6''	



f BAR DETAIL



ISOMETRIC OF SECTION A-A
(0° SKEW HEADWALL SHOWN)

~ NOTES ~

1. CONSTRUCTION JOINT PERMITTED.
2. THIS INLET SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS.
3. SHOULD INLET DIMENSIONS CONFLICT WITH THOSE OF THE HEADWALL, THE INLET SHALL GOVERN.
4. INLET QUANTITIES SHALL BE COMBINED WITH HEADWALL QUANTITIES. NOTES SHALL APPEAR ON THE PIPE DRAINAGE SUMMARY INDICATING THIS INCLUSION.
5. THE INLET INTERIOR SHALL TAPER FROM A RECTANGULAR OPENING AT THE HEADWALL JUNCTION TO A CIRCULAR CONFIGURATION AT THE PIPE. (NOTE THE 1:1 TOP AND SIDE BEVELS TO BE CONSTRUCTED ON THE HEADWALL PORTION.)
6. MINOR MODIFICATIONS IN THIS DESIGN, SUCH AS TRANSITIONING FROM ELLIPTICAL TO CIRCULAR, MAY BE MADE IF APPROVED IN WRITING BY THE ENGINEER.
7. ENCIRCLED LETTERS INDICATE STEEL REINFORCING BAR LOCATIONS.
8. FIVE PERCENT (5%) VERTICAL ELONGATION OF METAL PIPE SHALL BE ELIMINATED AND MADE ROUND FOR 48'', 54'', AND 60'' PIPE WHERE IT JOINS THE INLET.

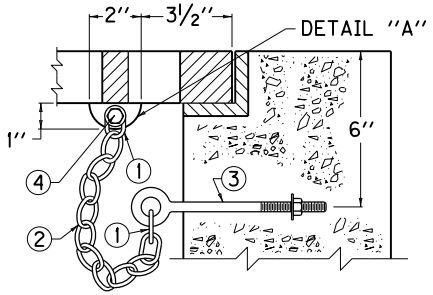
KENTUCKY
DEPARTMENT OF HIGHWAYS

SIDE TAPERED INLETS 30'' TO 60'' DIA. ALL SLOPES - ALL SKEWS

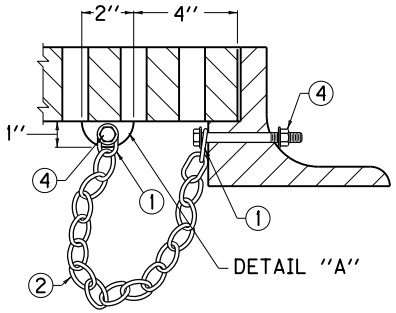
STANDARD DRAWING NO. RDX-150-06

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

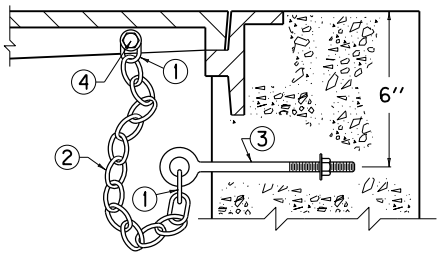
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



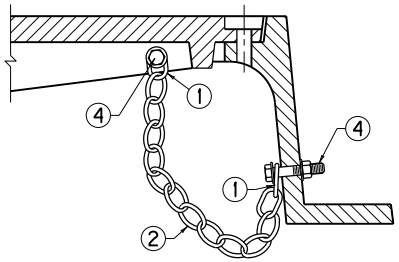
GRATE CONNECTED TO WALL



GRATE CONNECTED TO FRAME



LID CONNECTED TO WALL

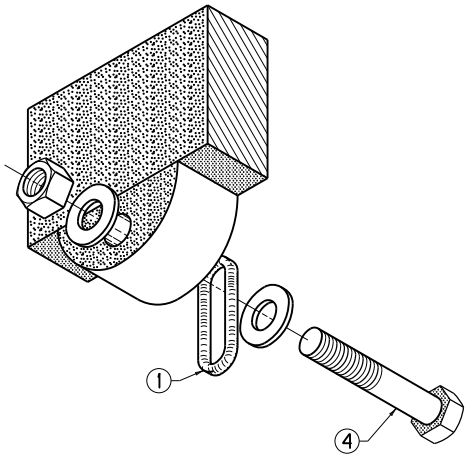


LID CONNECTED TO FRAME

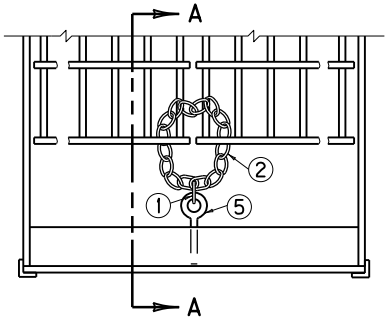
TYPICAL ILLUSTRATIONS FOR CASTINGS

~ NOTES ~

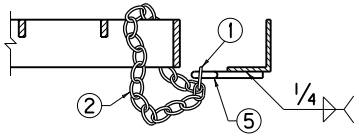
1. CHAIN SHACKLE, OR COLD SHUT OF AN APPROVED TYPE.
2. 3/16'' PROOF COIL CHAIN OF SUFFICIENT LENGTH TO ALLOW REMOVAL AND DISPLACEMENT OF GRATE OR LID.
3. 3/8'' x 6'' EYE BOLT, NUT, AND WASHER.
4. 3/8'' HEX HEAD CAP SCREW (GRADE 2), NUT AND WASHERS. LENGTH DETERMINED BY THICKNESS OF FRAME OR GRATE. 7/16'' DIA. HOLE FOR CAP SCREW. BATTER THREADS ON CAP SCREW TO PREVENT REMOVAL OF NUT.
5. 3/8'' EYE BOLT (LENGTH DETERMINED BY THE FRAME DIMENSION).
6. ALL EYE BOLTS SHALL HAVE A CONTINUOUS OR SOLID EYE.
7. ALL HARDWARE SHALL BE GALVANIZED AND OF COMMERICAL QUALITY AND SHALL BE APPROVED BY THE ENGINEER.
8. THE COST OF THE COMPLETE SECURITY DEVICE, INSTALLED, SHALL BE INCIDENTAL TO THE COST OF THE STRUCTURE.
9. THE DESIGNS SHOWN ARE ACCEPTABLE; HOWEVER ARE SUBJECT TO CHANGE IF APPROVED IN WRITING BY THE ENGINEER.



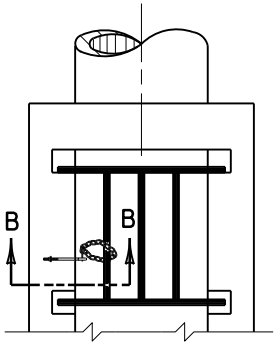
DETAIL Ⓐ
LUG ON CENTER CROSS MEMBER
AND BOLT ASSEMBLY
(AXONOMETRIC VIEW)



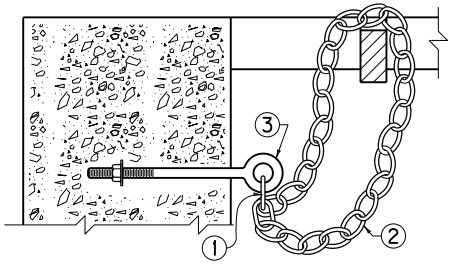
PLAN VIEW



SECTION A-A
GRATE CONNECTED TO FRAME

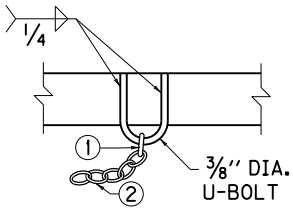


PLAN VIEW



SECTION B-B

GRATE CONNECTED TO WALL



ALTERNATE FOR
STRUCTURAL STEEL
MEMBERS

TYPICAL ILLUSTRATIONS FOR STRUCTURAL STEEL UNITS

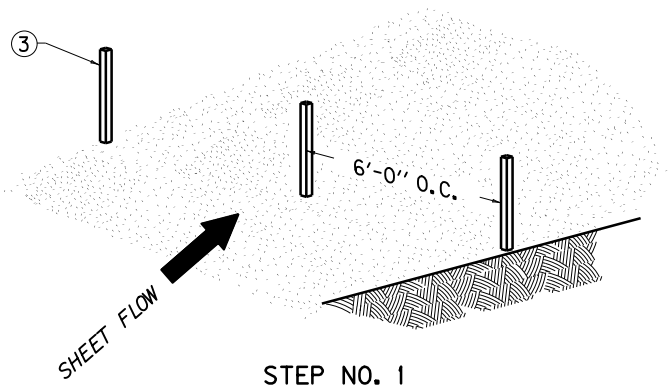
KENTUCKY
DEPARTMENT OF HIGHWAYS

SECURITY DEVICES FOR
FRAMES, GRATES
AND LIDS

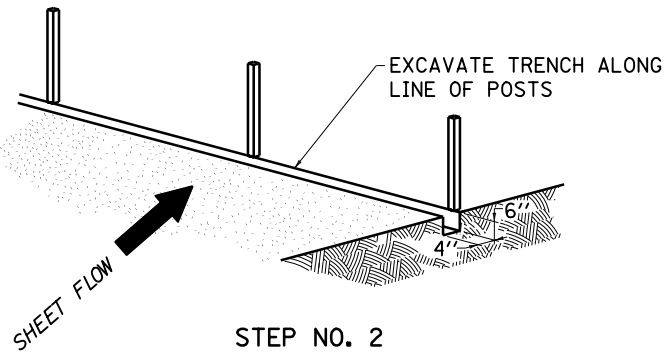
STANDARD DRAWING NO. RDX-160-06

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



STEP NO. 1



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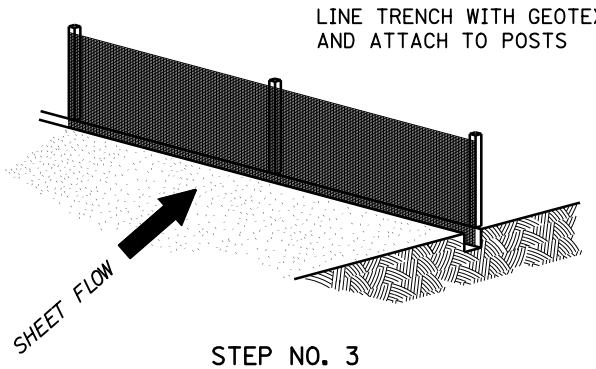

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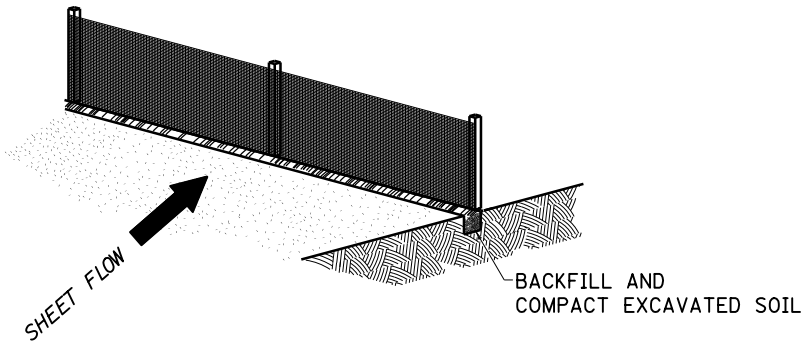

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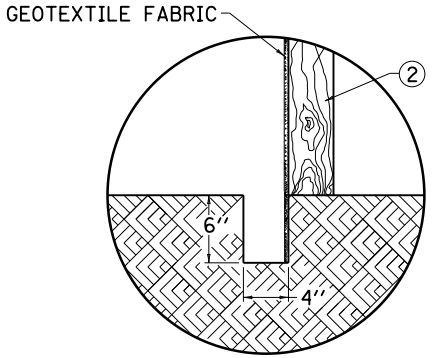


SECTIONAL DETAIL

~ NOTES ~

BID ITEM AND UNIT TO BID
TEMP SILT FENCE LF

1. SEE STANDARD SPECIFICATIONS FOR POST SIZE, GEOTEXTILE FABRIC, WIRE STAPLES AND ALL OTHER PERTINENT INFORMATION.

② POSTS MAY BE WOODEN OR METAL T-SECTION.

③ POSTS SHALL BE SET 1'-4'' DEEP.

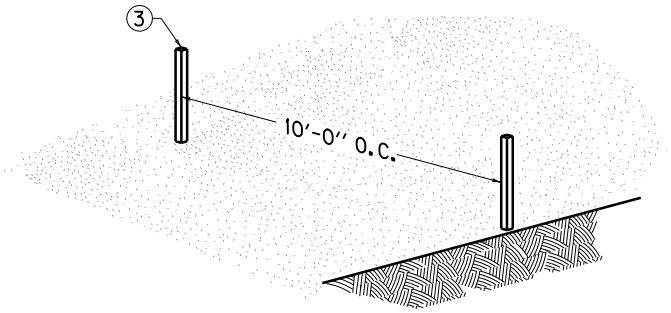
KENTUCKY
DEPARTMENT OF HIGHWAYS

TEMPORARY SILT FENCE

STANDARD DRAWING NO. RDX-210-03

SUBMITTED _____ ASST. DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



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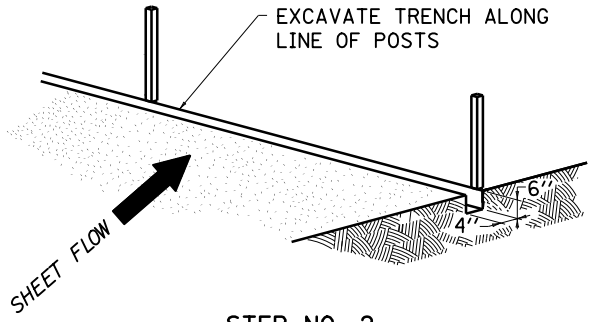

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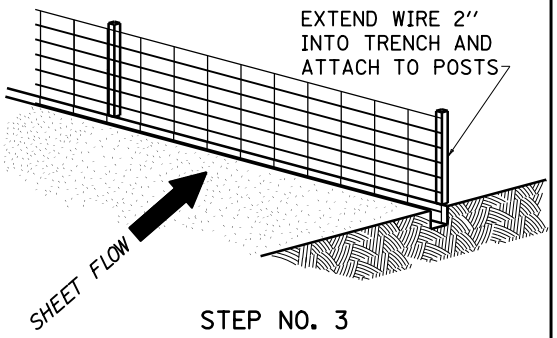

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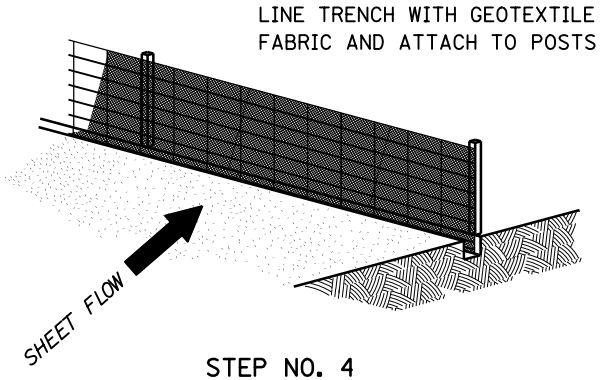

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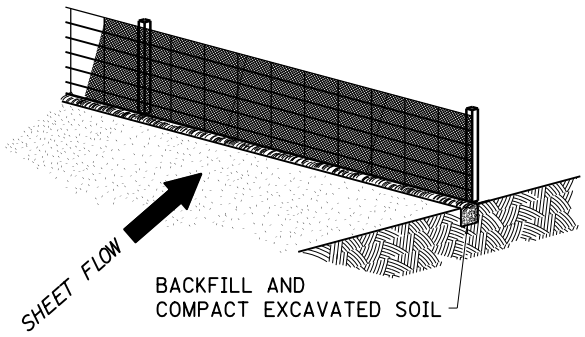

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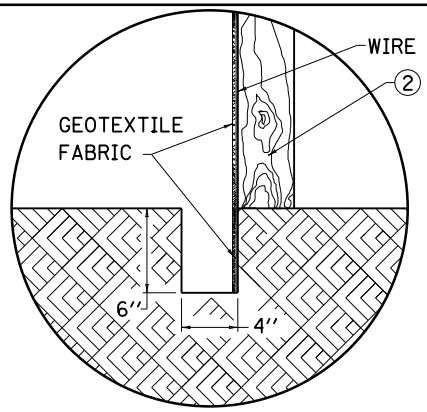


SECTIONAL DETAIL

~ NOTES ~

BID ITEM AND UNIT TO BID
TEMP SILT FENCE LF

1. SEE STANDARD SPECIFICATIONS FOR POST SIZE, WOVEN WIRE FENCE FABRIC, GEOTEXTILE FABRIC, WIRE STAPLE AND ALL OTHER PERTINENT INFORMATION.

② POSTS MAY BE WOODEN OR METAL T-SECTION.

③ POSTS SHALL BE SET 1'-4" DEEP.

KENTUCKY
DEPARTMENT OF HIGHWAYS

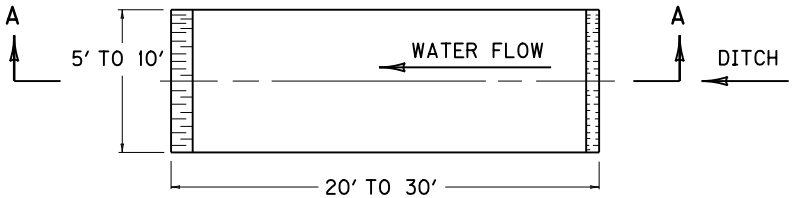
TEMPORARY SILT FENCE WITH WOVEN WIRE FENCE FABRIC

STANDARD DRAWING NO. RDX-215-01

SUBMITTED William S. Hulett — DIRECTOR, DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE

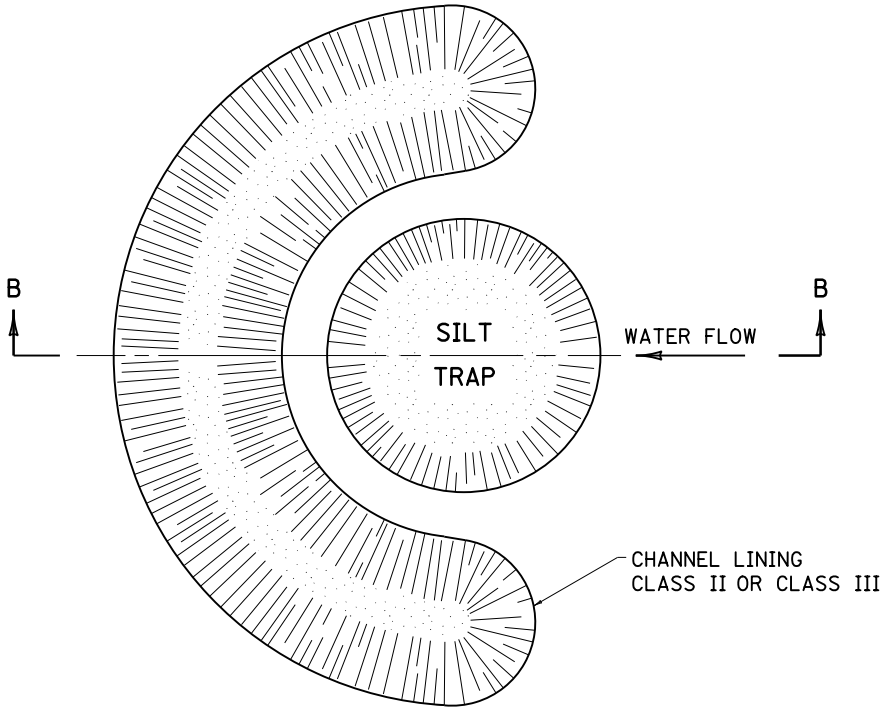
ALTERNATE NO. 1



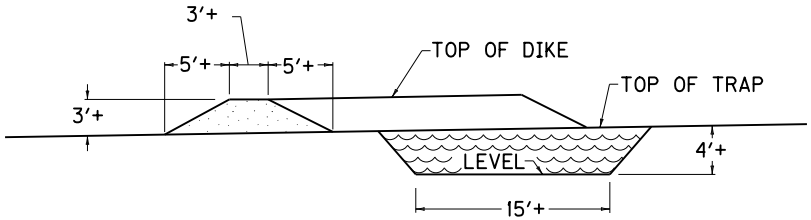
PLAN VIEW

SECTION A-A

ALTERNATE NO. 2



PLAN VIEW



SECTION B-B

~ NOTES ~

BID ITEMS AND UNIT TO BID

SILT TRAP TYPE A	EACH
CLEAN SILT TRAP TYPE A	EACH

1. THE SIZE, SHAPE AND LOCATION OF A TRAP MAY BE ADJUSTED FROM THAT SHOWN IN THE PLANS, AS DIRECTED BY THE ENGINEER.
2. THE SILT TRAP SHALL BE CONSTRUCTED AS DIRECTED BY THE ENGINEER TO MEET VOLUME REQUIREMENTS INDICATED ON THE PLANS.
3. MATERIAL REMOVED IN THE PROCESS OF CONSTRUCTING SILT TRAP TYPE A SHALL BE WASTED ON SITE AT NO ADDITIONAL COST.

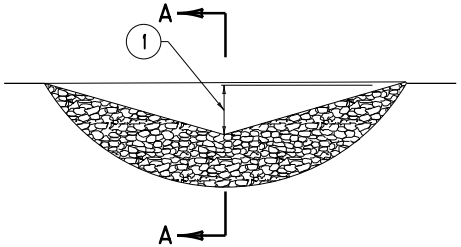
KENTUCKY
DEPARTMENT OF HIGHWAYS

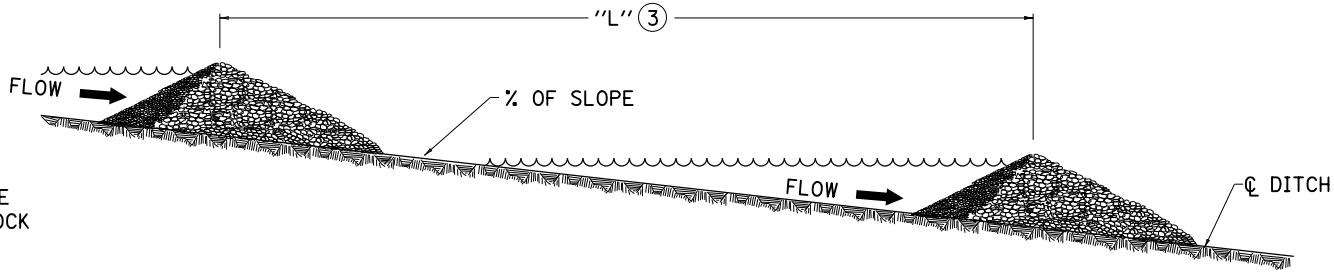
SILT TRAP TYPE A

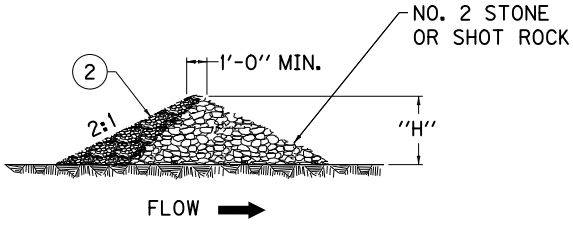
STANDARD DRAWING NO. RDX-220-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

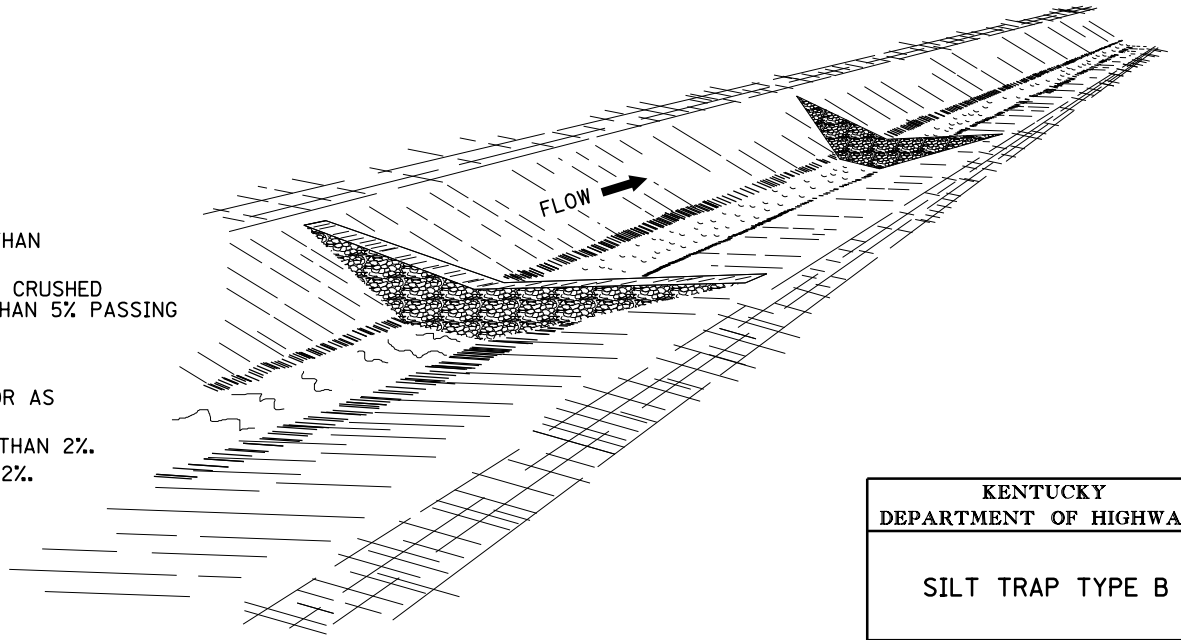
APPROVED _____ STATE HIGHWAY ENGINEER — 12-01-15 DATE







SECTION "A~A"



~ NOTES ~

BID ITEMS AND UNIT TO BID

SILT TRAP TYPE B	EACH
CLEAN SILT TRAP TYPE B	EACH

(1) MIDDLE OF SILT TRAP SHALL BE A MINIMUM OF 1'-0" LOWER THAN SIDES SO FLOW WILL NOT BYPASS TRAP OR ERODE BANKS.

(2) UPSTREAM FACE OF SILT TRAP SHALL BE A 4" MIN. LAYER OF CRUSHED AGGREGATE HAVING 100% PASSING A 3" SIEVE AND NO MORE THAN 5% PASSING A NO. 8 SIEVE (SEE SECTION "A-A").

(3) $L = \frac{H}{\text{SLOPE OF DITCH}}$

4. SPACE SILT TRAPS AT LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
5. SILT TRAP TYPE B SHALL BE USED ON ALL SLOPES GREATER THAN 2%.
6. SILT TRAP TYPE B MAY BE USED ON ALL SLOPES LESS THAN 2%.

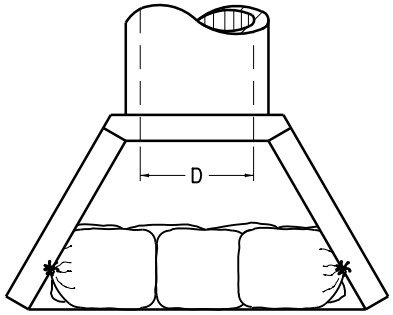
KENTUCKY
DEPARTMENT OF HIGHWAYS

SILT TRAP TYPE B

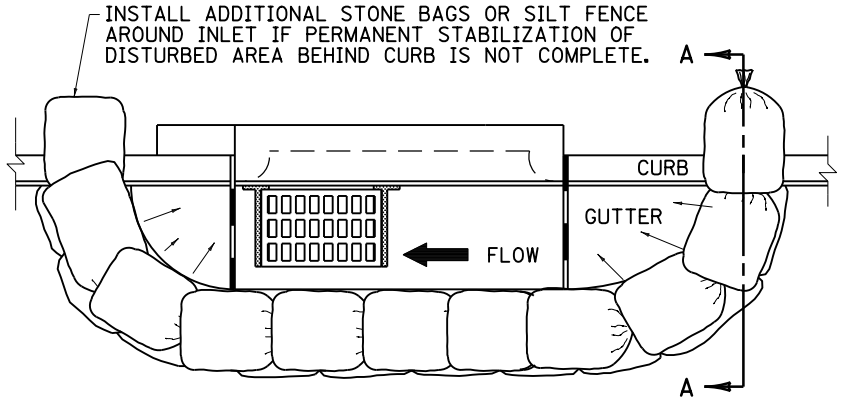
STANDARD DRAWING NO. RDX-225-01

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

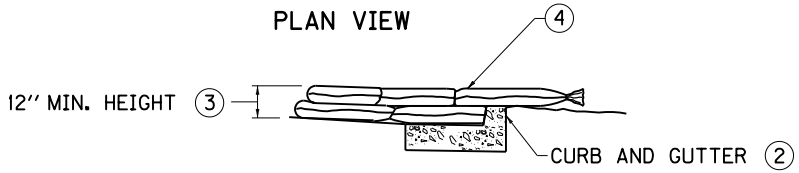
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



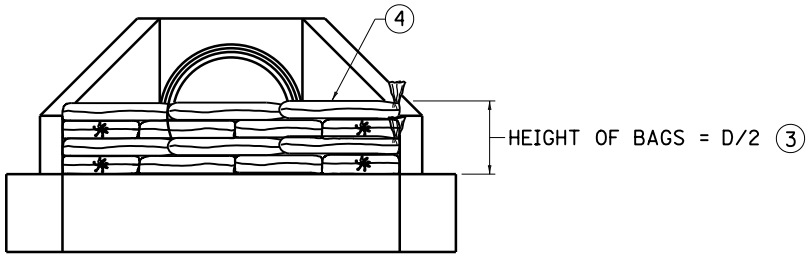
PLAN VIEW



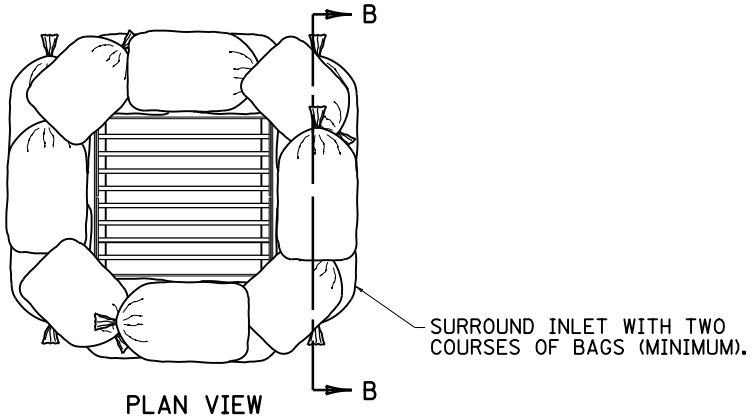
PLAN VIEW



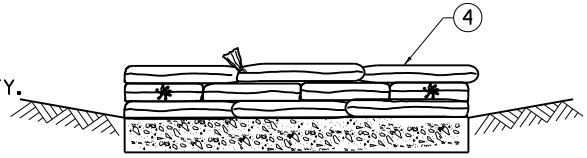
SECTION A~A



FRONT ELEVATION



PLAN VIEW



SECTION B~B

~ NOTES ~

BID ITEMS AND UNIT TO BID:

SILT TRAP TYPE C	EACH
CLEAN SILT TRAP TYPE C	EACH

1. SILT TRAP TYPE C SHALL INCLUDE GEOTEXTILE FABRIC BAGS, NO. 57 STONE, LABOR AND ALL INCIDENTALS NECESSARY FOR ONE COMPLETE INSTALLATION.

(2) INLET PROTECTION IS SUITABLE FOR USE IN BOTH PAVED AND UNPAVED AREAS.

(3) THE HEIGHT REQUIREMENT IS WAIVED IN CASES WHERE IT WILL CREATE AN UNACCEPTABLE PONDING SITUTATION ON THE PAVEMENT OR ON AN ADJACENT PROPERTY.

(4) INTERWEAVE BAG ENDS TO FILL GAPS BETWEEN BAGS.

5. CONSTRUCT 18'' X 30'' BAGS OF NON-WOVEN TYPE II GEOTEXTILE FABRIC CONFORMING TO SECTION 843 OF THE STANDARD SPECIFICATIONS. DOUBLE STITCH BAG SEAMS WITH 1 LB. POLYESTER THREAD. ATTACH ONE (1) TIE STRING TO EACH BAG. BAG OPENING SHALL BE ON 18'' SIDE.
6. FILL BAGS WITH NO. 57 STONE BETWEEN $\frac{1}{2}$ TO $\frac{2}{3}$ FULL (50 LB TO 60 LB).
7. SILT TRAP TYPE C SHALL NOT BE USED IN BLUE LINE STREAMS.

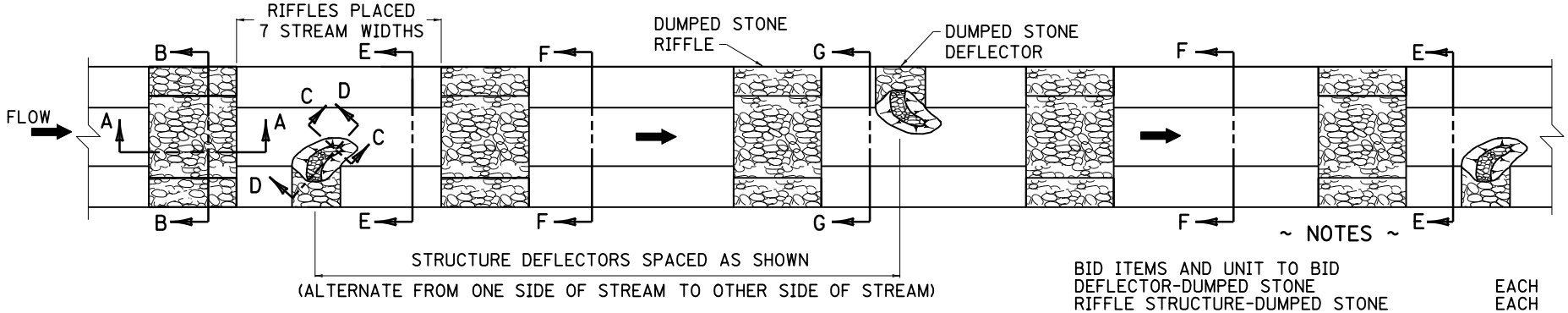
KENTUCKY
DEPARTMENT OF HIGHWAYS

SILT TRAP TYPE C

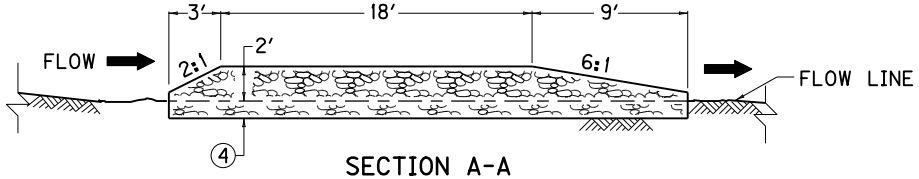
STANDARD DRAWING NO. RDX-230-01

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

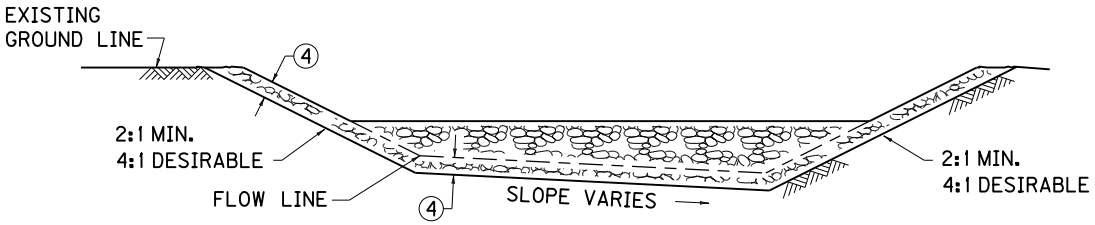
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



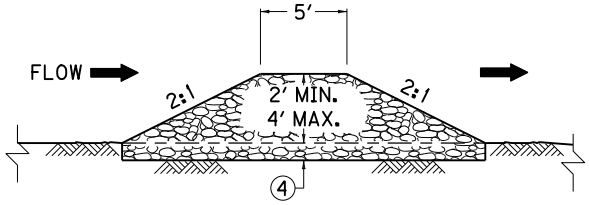
PLAN VIEW



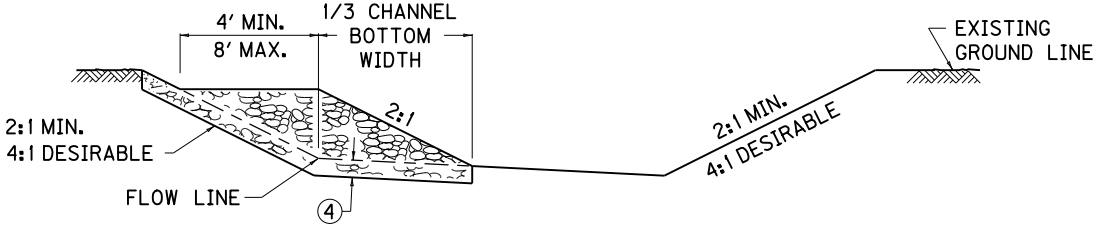
SECTION A-A



SECTION B-B



SECTION C-C



SECTION D-D

~ NOTES ~

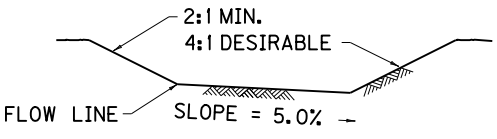
BID ITEMS AND UNIT TO BID

DEFLECTOR-DUMPED STONE	EACH
RIFFLE STRUCTURE-DUMPED STONE	EACH

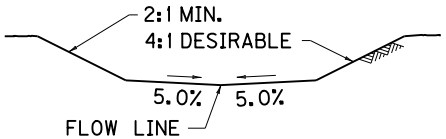
1. DUMPED STONE DEFLECTORS AND DUMPED STONE RIFFLE STRUCTURES SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND SHALL INCLUDE ROCK, LABOR AND ALL INCIDENTALS NECESSARY FOR ONE COMPLETE INSTALLATION.
2. LOCATION OF STRUCTURES ARE AS NOTED IN THE PLANS. MINOR ADJUSTMENTS ARE PERMITTED UPON APPROVAL BY THE ENGINEER.
3. ROCK USED TO CONSTRUCT RIFFLE STRUCTURES AND DUMP STONE DEFLECTORS SHALL CONSIST OF 80% IN THE RANGE OF FOUR (4) TO EIGHT (8) CUBIC FEET AND 20% SMALLER STONE TO FILL VOIDS.

④ ROCK SHALL BE KEYED ONE (1) TO TWO (2) FEET BELOW THE PROPOSED CHANNEL FLOW LINE AND/OR CHANNEL BANK.

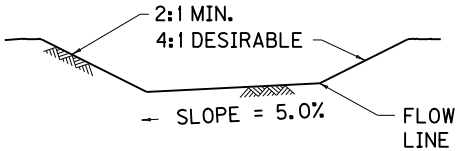
5. DUMPED STONE DEFLECTORS AND DUMPED STONE RIFFLE STRUCTURES SHALL BE REQUIRED ON BLUELINE STREAM CHANNEL CHANGES WHEN THE CHANNEL CHANGE FLOW LINE IS EQUAL TO OR LESS THAN 3%, AND THE CHANNEL CHANGE IS 200 LINEAR FEET OR GREATER.
6. SEE PLANS FOR CHANNEL MITIGATION LOCATIONS.
7. WHEN PIPES ARE INVOLVED IN CHANNEL CHANGES CUT THE CHANNEL TO CONFORM WITH SECTION F-F, A DISTANCE OF 20 FEET FROM THE INLET AND OUTLET ENDS OF PIPE.



SECTION E-E



SECTION F-F



SECTION G-G

DRAWING NOT TO SCALE

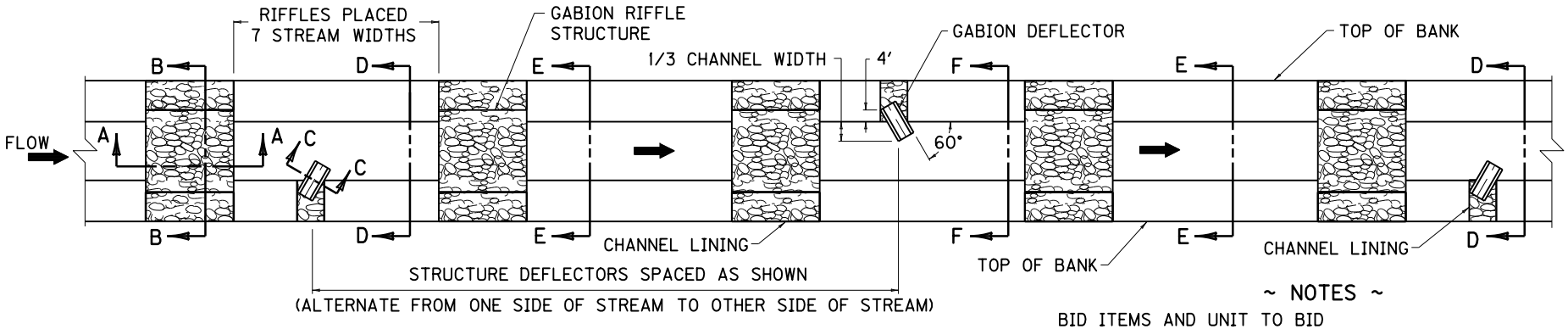
KENTUCKY
DEPARTMENT OF HIGHWAYS

CHANNEL HABITAT IMPROVEMENT STRUCTURES (DUMPED STONE)

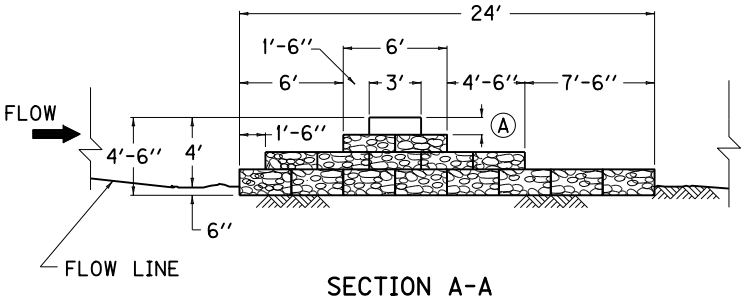
STANDARD DRAWING NO. RDX-240-04

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

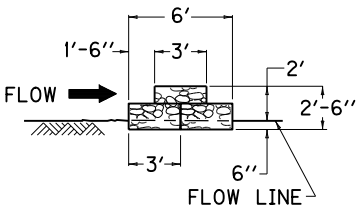
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



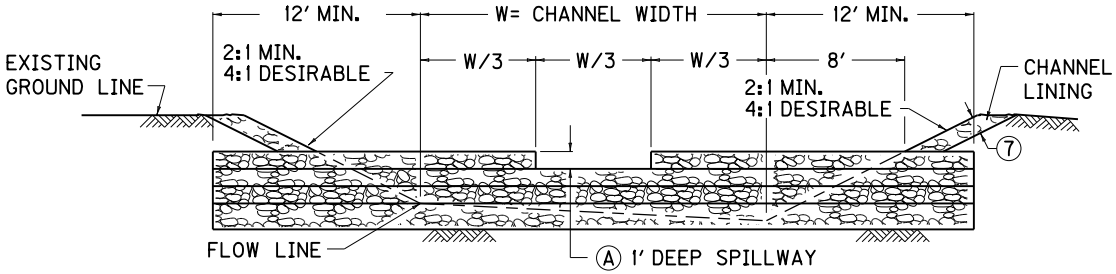
PLAN VIEW



SECTION A-A



SECTION C-C



SECTION B-B

~ NOTES ~

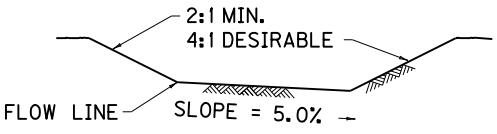
BID ITEMS AND UNIT TO BID

DEFLECTOR-GABION	EACH
RIFFLE STRUCTURE-GABION	EACH
CHANNEL LINING CLASS III	TON

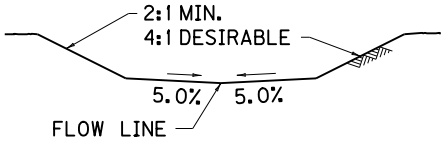
1. GABION DEFLECTORS AND GABION RIFFLE STRUCTURES SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND SHALL INCLUDE GABION BASKETS, AGGREGATE, LABOR AND ALL INCIDENTALS NECESSARY FOR ONE COMPLETE INSTALLATION.
2. LOCATION OF STRUCTURES ARE AS NOTED IN THE PLANS. MINOR ADJUSTMENTS ARE PERMITTED UPON APPROVAL BY THE ENGINEER.
3. AGGREGATE USED TO FILL THE GABION BASKETS SHALL MEET THE REQUIREMENTS OF SECTION 805.13.06 OF THE CURRENT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION".
4. GABION BASKETS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 618.03.05 OF THE CURRENT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION".
5. GABION DEFLECTORS AND GABION RIFFLE STRUCTURES SHALL BE REQUIRED ON BLUELINE STREAM CHANNEL CHANGES WHEN THE CHANNEL CHANGE FLOW LINE IS EQUAL TO OR LESS THAN 3%, AND THE CHANNEL CHANGE IS 200 LINEAR FEET OR GREATER.
6. GABIONS BASKETS SHALL COMPLY WITH SECTION 813.14 OF THE CURRENT "STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION".

(7) ROCK SHALL BE KEYED ONE (1) TO TWO (2) FEET BELOW THE PROPOSED CHANNEL FLOW LINE AND/OR CHANNEL BANK.

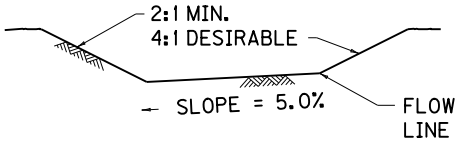
8. SEE PLANS FOR CHANNEL MITIGATION LOCATIONS.
9. WHEN PIPES ARE INVOLVED IN CHANNEL CHANGES CUT THE CHANNEL TO CONFORM WITH SECTION E-E, A DISTANCE OF 20 FEET FROM THE INLET AND OUTLET ENDS OF PIPE.



SECTION D-D



SECTION E-E



SECTION F-F

DRAWING NOT TO SCALE

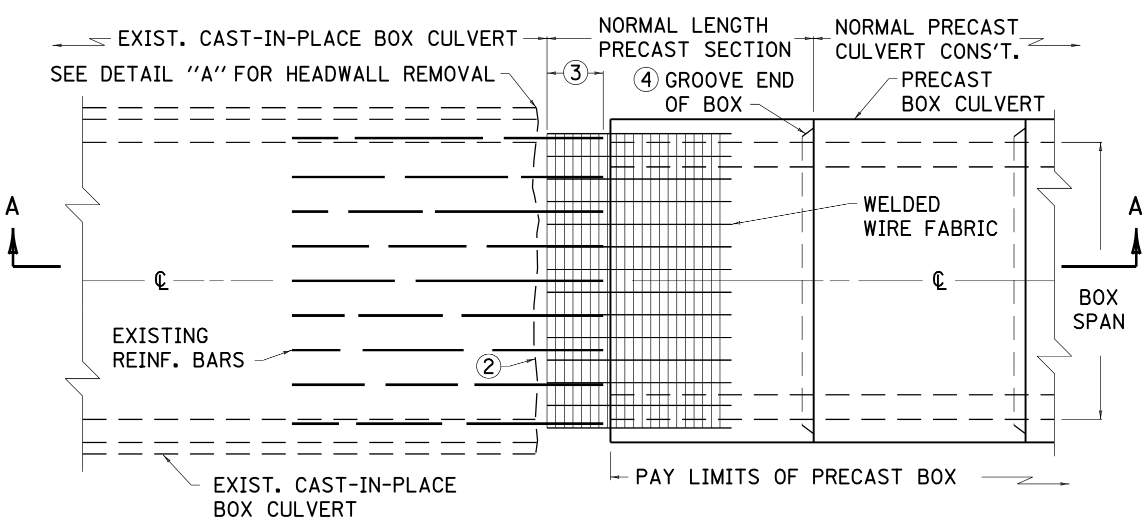
KENTUCKY
DEPARTMENT OF HIGHWAYS

CHANNEL HABITAT IMPROVEMENT STRUCTURES (GABIONS)

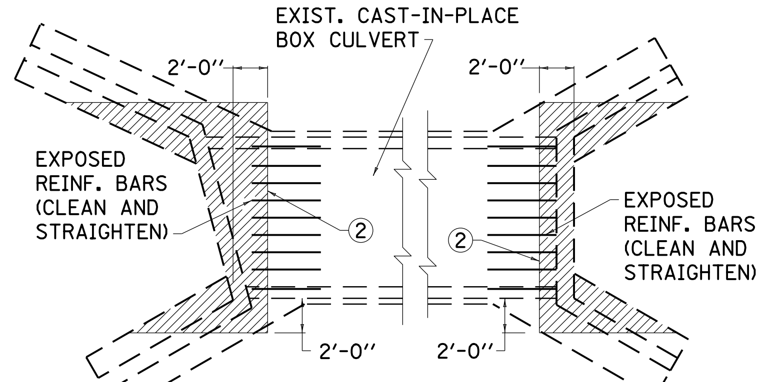
STANDARD DRAWING NO. RDX-245-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN — DATE 12-01-15

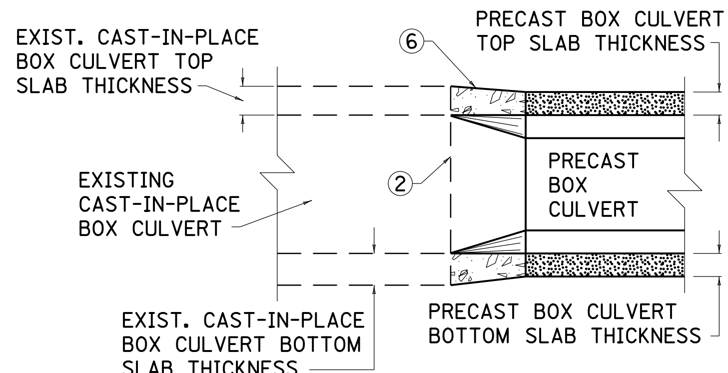
APPROVED _____ STATE HIGHWAY ENGINEER — DATE 12-01-15



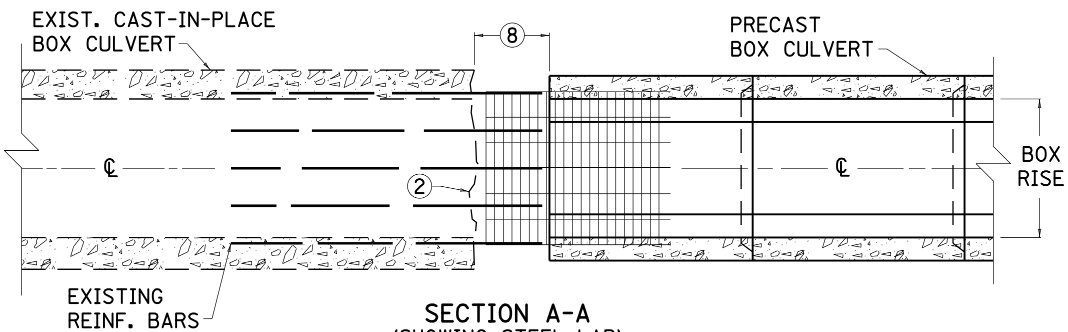
PLAN VIEW



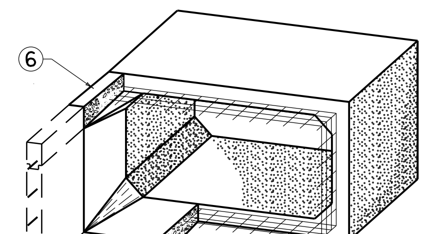
DETAIL "A"



SECTION A-A
(SHOWING CAST-IN-PLACE SECTION)



SECTION A-A
(SHOWING STEEL LAP)



CUT-AWAY
ISOMETRIC VIEW

~ NOTES ~

BID ITEMS AND UNIT TO BID

PRECAST CONC BOX SECT (SIZE)	LF
CONCRETE-CLASS D	CUYD
REMOVE CONCRETE MASONRY	CUYD

1. ▨ CONCRETE TO BE REMOVED BEFORE ATTACHING CULVERT EXTENSION.

② BEFORE REMOVING ANY EXISTING CONCRETE, SAW AROUND THE PERIMETER OF REMOVAL AREA ON THE INTERIOR AND EXTERIOR OF THE CULVERT BARREL A DEPTH OF 1".

③ EXPOSED LONGITUDINAL STEEL IN THE EXISTING CULVERT LAPPED 1'-8" MIN. WITH EXPOSED MESH IN PRE-CAST BOX CULVERT. EXPOSED STEEL SHALL NOT BE KINKED OR BENT BY REMOVAL OPERATIONS. ANY STEEL THAT IS DAMAGED SHALL BE REPAIRED.

④ REINFORCING MESH IN THE PRE-CAST BOX CULVERT SHALL BE EXPOSED ON THE TONGUE END OF THE BOX. CONTRARY TO CURRENT SPECIFICATIONS THE GROOVE END OF THE BOX MAY BE LAID UPSTREAM OR DOWNSTREAM AS NECESSARY TO COMPLETE THE INSTALLATION.

5. EXISTING REMOVED CONCRETE SHALL BE PAID PER CU. YD. "REMOVE CONCRETE MASONRY".

⑥ CLASS D MODIFIED CONCRETE (MAX. SLUMP OF 3½") IN THE SPLICE SHALL BE PAID PER CU. YD. OF "CONCRETE-CLASS D MOD".

7. EXPOSED LONGITUDINAL STEEL IN EXISTING CULVERT AND EXPOSED MESH IN PRE-CAST BOX CULVERT SHALL BE INCIDENTAL TO THE UNIT PRICE BID FOR "CONCRETE-CLASS D MOD".

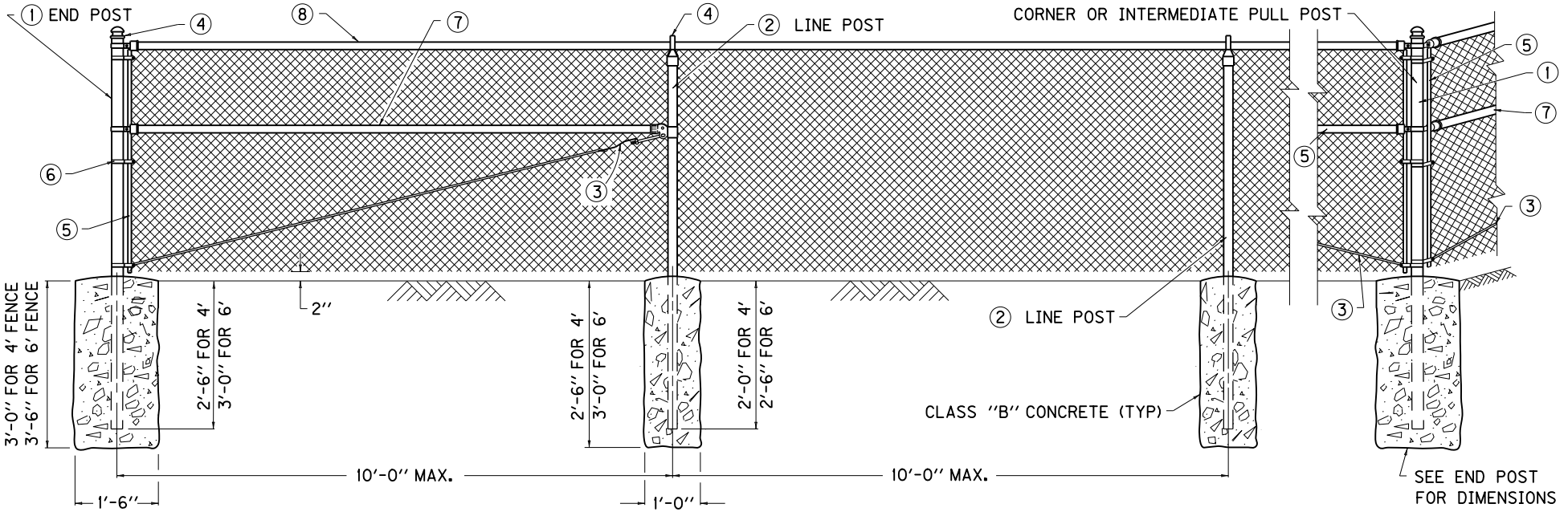
⑧ THE PRE-CAST BOX CULVERT EXTENSION SHALL BE PAID PER LINEAR FOOT OF "PRECAST CONC BOX SECT (SIZE)", WHICH SHALL NOT INCLUDE THE SPLICE.

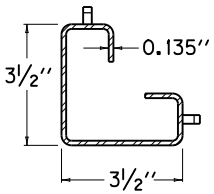
KENTUCKY
DEPARTMENT OF HIGHWAYS

PRECAST BOX
CULVERT EXTENSION

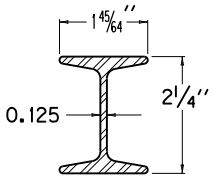
STANDARD DRAWING NO. RDX-300-04

SUBMITTED [signature] DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE
APPROVED [signature] STATE HIGHWAY ENGINEER — 12-01-15 DATE

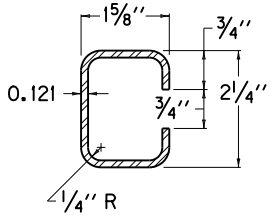




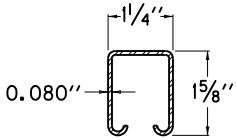
ROLL FORMED
TERMINAL POST &
CORNER POST



HOT ROLLED
LINE POST
H - COLUMN



LINE POST
HEAVY "C" ROLL FORMED



HOT ROLLED
TOP & BRACE
RAIL

~ NOTES ~

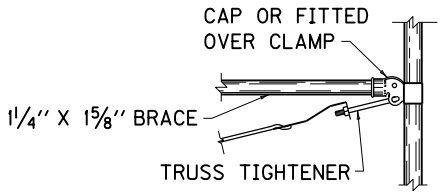
9. TENSION WIRE COMPLYING WITH ASTM A 824 SHALL BE SUBSTITUTED FOR THE TOP RAIL WHEN THE FENCE IS TO BE INSTALLED IN THE PATH OF AN ERRANT VEHICLE.
10. ALL POSTS SHALL BE SET IN CONCRETE TO THE DIMENSIONS INDICATED ON THIS DRAWING.
11. 4' HIGH FENCE SHALL HAVE 4' FABRIC HEIGHT. 6' HIGH FENCE SHALL HAVE 6' FABRIC HEIGHT.
12. ALL FENCE FITTINGS SHALL COMPLY WITH ASTM F626.
13. POST CAPS AND SOCKET TYPE BRACE END CONNECTIONS SHALL BE GALVANIZED PRESSED STEEL, CAST IRON OR OTHER TYPE AS APPROVED BY THE ENGINEER. THEY SHALL BE DESIGNED IN A MANNER TO EXCLUDE MOISTURE FROM INSIDE POSTS AND RAILS.
14. NPS = NOMINAL PIPE SIZE - ASTM F1083 AND F1043 (HEAVY INDUSTRIAL FENCE) SHALL GOVERN.
15. INDISCRIMINATE MIXING OF POSTS WILL NOT BE PERMITTED.

BID ITEMS AND UNIT TO BID

CHAIN LINK FENCE	LF
CONCRETE-CLASS B	CUYD

LEGEND / (ALTERNATES)

	TUBULAR	ROLL FORMED
①	2½" NPS END POST	3½" X 3½" END POST
②	2" NPS LINE POST	2¼" H-COL. LINE POST - OR - 2¼" C-COL. LINE POST
③	⅜" DIA. TRUSS ROD AND TIGHTNER	⅜" DIA. TRUSS ROD AND TIGHTNER
④	APPROVED CAPS	NOT REQUIRED
⑤	FLAT TENSION BAR	NOT REQUIRED
⑥	BRACE BAND AND TENSION BAND	NOT REQUIRED
⑦	1¼" NPS BRACE	1¼" X 1⅝" TOP RAIL & BRACE
⑧	1¼" NPS TOP RAIL (SEE NOTE 9)	



BRACE AND TRUSS
CONNECTOR

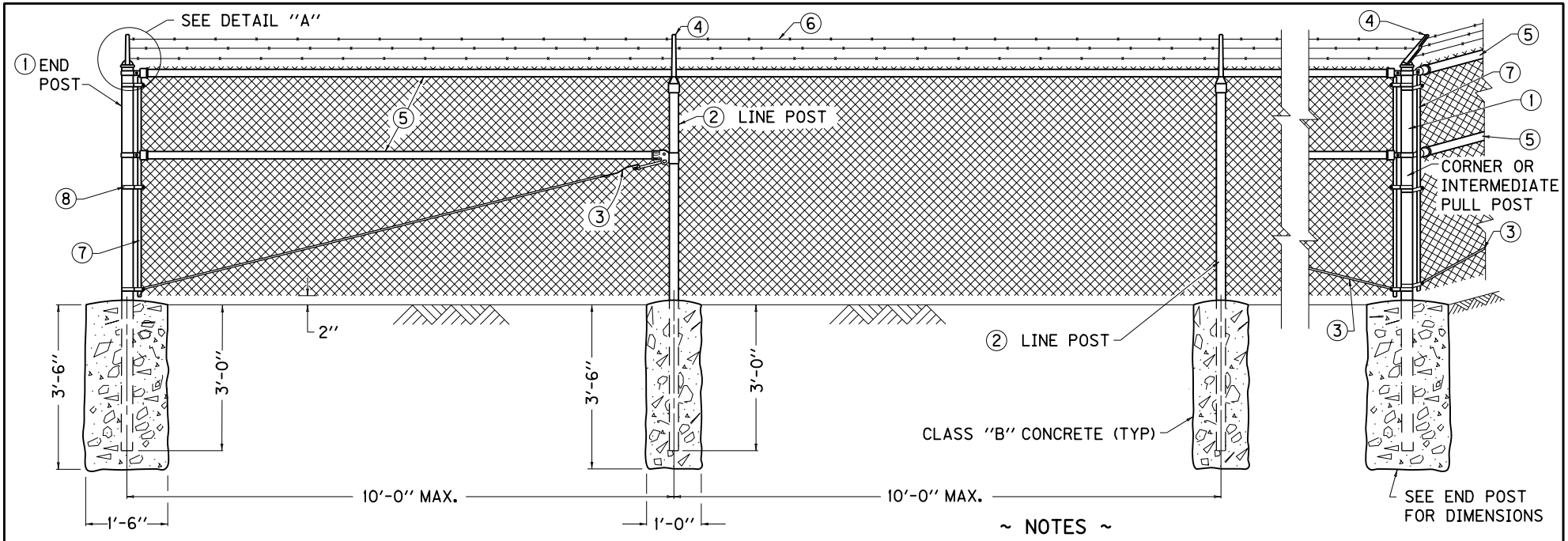
KENTUCKY
DEPARTMENT OF HIGHWAYS

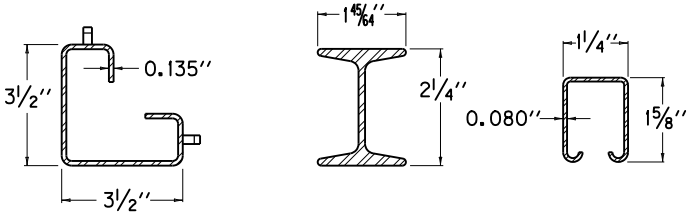
CHAIN LINK FENCE
4' TO 6' HIGH

STANDARD DRAWING NO. RFC-001-08

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE





ROLL FORMED TERMINAL POST & CORNER POST

HOT ROLLED LINE POST H - COLUMN

ROLL FORMED TOP & BRACE RAIL

~ NOTES ~

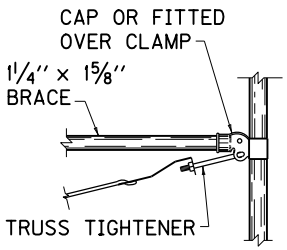
9. ALL POSTS SHALL BE SET IN CONCRETE TO THE DIMENSIONS SHOWN ON THIS DRAWING.
10. A. 1¼" NPS OR A 1¼" × 1⅝" ROLL FORMED SECTION, BOTTOM RAIL SHALL BE REQUIRED AROUND ALL UTILITY INSTALLATIONS AND AT OTHER LOCATIONS DESIGNATED BY THE ENGINEER.
11. 8' HIGH FENCE SHALL HAVE 7' FABRIC HEIGHT. 9' HIGH FENCE SHALL HAVE 8' FABRIC HEIGHT. 10' HIGH FENCE SHALL HAVE 9' FABRIC HEIGHT. 11' HIGH FENCE SHALL HAVE 10' FABRIC HEIGHT. 12' HIGH FENCE SHALL HAVE 11' FABRIC HEIGHT.
12. ALL FENCE FITTINGS SHALL COMPLY WITH ASTM F626.
13. POST CAPS AND SOCKET TYPE BRACE END CONNECTIONS SHALL BE GALVANIZED PRESSED STEEL, CAST IRON OR OTHER TYPE AS APPROVED BY THE ENGINEER. THEY SHALL BE DESIGNED IN A MANNER TO EXCLUDE MOISTURE FROM INSIDE THE POSTS AND RAILS.
14. NPS = NOMINAL PIPE SIZE - ASTM F1083 AND F1043 (HEAVY INDUSTRIAL FENCE) SHALL GOVERN.

BID ITEMS AND UNIT TO BID

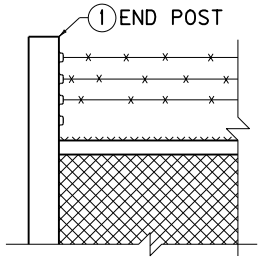
CHAIN LINK FENCE	LF
CONCRETE-CLASS B	CUYD

LEGEND / (ALTERNATES)

	TUBULAR	ROLL FORMED
1	2½" NPS END POST	3½" X 3½" END POST
2	2" NPS LINE POST	2¼" H-COL. LINE POST
3	⅜" DIA. TRUSS ROD AND TIGHTNER	⅜" DIA. TRUSS ROD AND TIGHTNER
4	BARBED WIRE ARMS	BARBED WIRE ARMS
5	1¼" NPS TOP RAIL & BRACE	1¼" X 1⅝" TOP RAIL & BRACE
6	BARBED WIRE	BARBED WIRE
7	FLAT TENSION BAR	NOT REQUIRED
8	BRACE BAND AND TENSION BAND	NOT REQUIRED



BRACE AND TRUSS CONNECTOR



DETAIL "A" ROLL FORMED

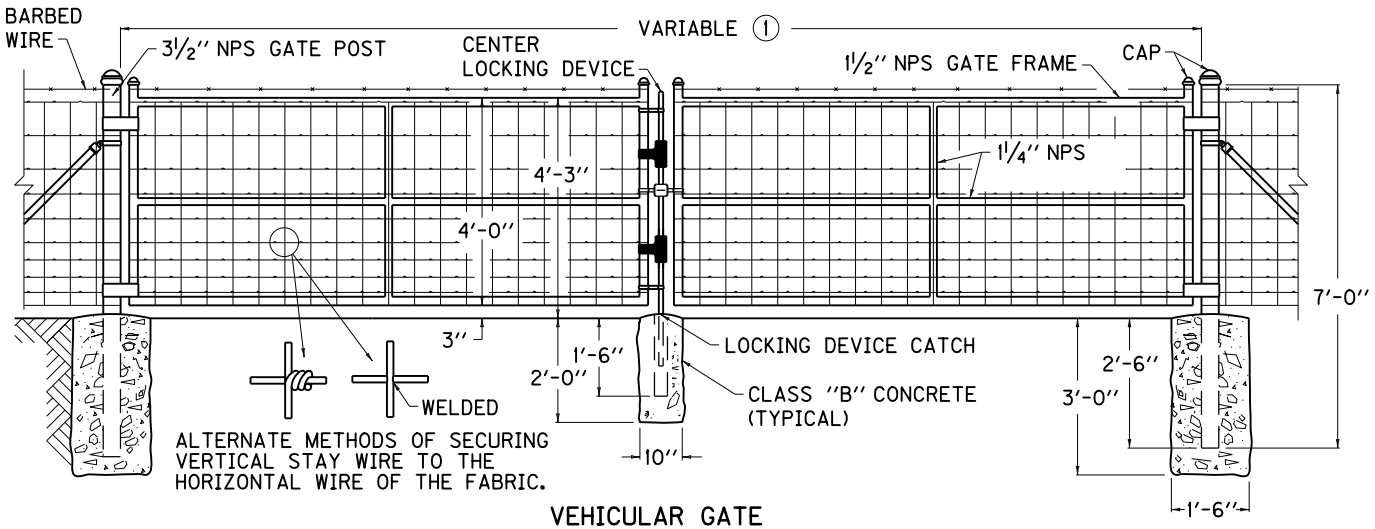
KENTUCKY DEPARTMENT OF HIGHWAYS

CHAIN LINK FENCE 8' TO 12' HIGH

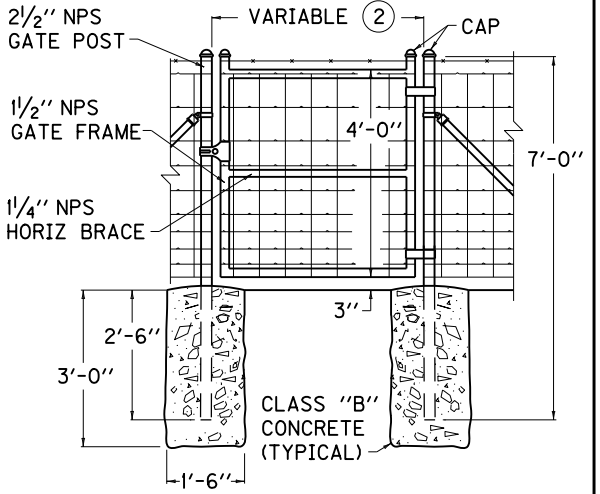
STANDARD DRAWING NO. RFC-002-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN — DATE 12-01-15

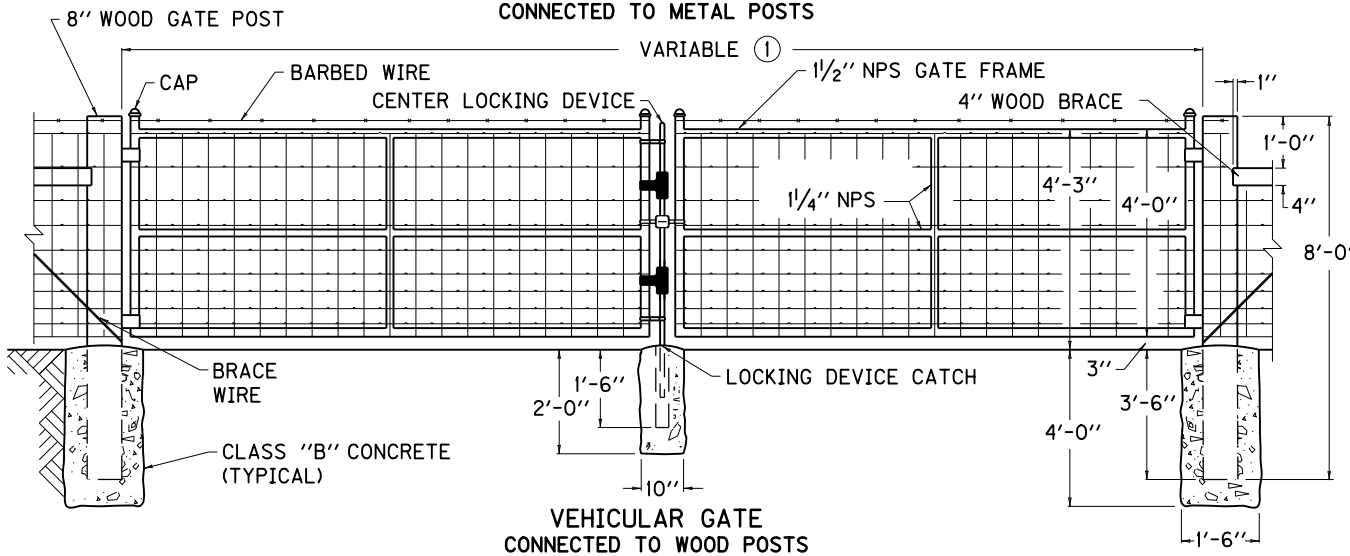
APPROVED _____ STATE HIGHWAY ENGINEER — DATE 12-01-15



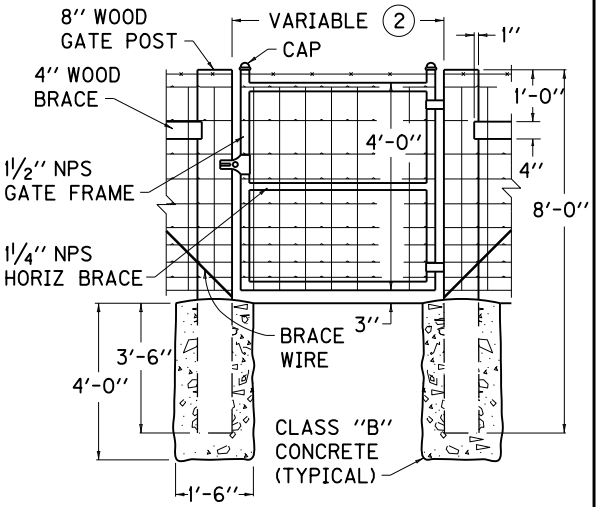
VEHICULAR GATE
CONNECTED TO METAL POSTS



PEDESTRIAN GATE
CONNECTED TO METAL POSTS



VEHICULAR GATE
CONNECTED TO WOOD POSTS



PEDESTRIAN GATE
CONNECTED TO WOOD POSTS

~ NOTES ~

BID ITEMS AND UNIT TO BID

SINGLE VEHICULAR WOVEN WIRE GATE	EACH
OR	
DOUBLE VEHICULAR WOVEN WIRE GATE	EACH
OR	
PEDESTRIAN WOVEN WIRE GATE	EACH
CONCRETE-CLASS B	CUYD

(1) 6' TO 13' WIDTH FOR SINGLE GATE AND 12' TO 26' WIDTH FOR DOUBLE GATE.

(2) 4' TO 6' WIDTH

3. FABRIC TIE WIRES SHALL BE SPACED 1'-0" ON CENTERS.
4. THE CONTRACTOR IS NOT TO ORDER GATES UNTIL THEIR NECESSITY AND LOCATION HAVE BEEN CERTIFIED BY THE ENGINEER.
5. WOVEN-WIRE FABRIC USED IN THE GATES SHALL EITHER BE ALUMINUM-COATED STEEL NO. 1047-6-9 OR ZINC-COATED STEEL NO. 1047-6-9.
6. NPS = NOMINAL PIPE SIZE - ASTM F1083 AND F1043 (HEAVY INDUSTRIAL FENCE) SHALL GOVERN.
7. GATES SHALL HAVE HEAVY PRESSED STEEL CORNERS SECURELY RIVETED OR SHALL BE MACHINE NOTCHED AND ELECTRICALLY WELDED SO AS TO BE RIGID AND WATER TIGHT. ALL WELDED JOINTS SHALL BE CLEANED AND PAINTED WITH TWO (2) COATS OF ALUMINUM PAINT.

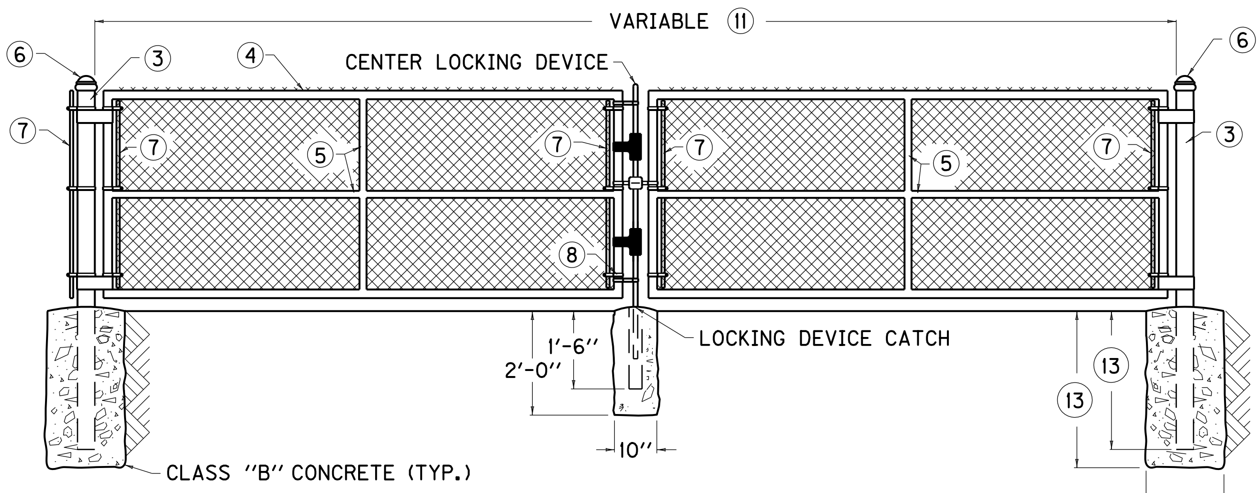
KENTUCKY
DEPARTMENT OF HIGHWAYS

WOVEN WIRE GATES

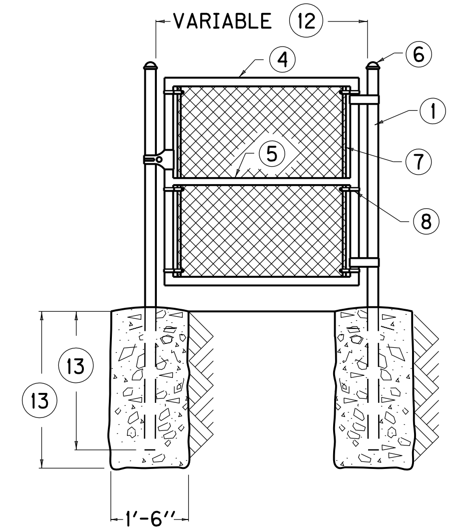
STANDARD DRAWING NO. RFG-001-07

SUBMITTED William S. Hallahan — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



VEHICULAR GATE (4' AND 6' HIGH FENCE)



PEDESTRIAN GATE
(4' AND 6' HIGH FENCE)

~ NOTES ~

(11) 6' TO 13' WIDTH FOR SINGLE GATE OR 12' TO 26' WIDTH FOR DOUBLE GATE. SEE ELSEWHERE IN PLANS FOR GATE HEIGHT.

(12) 4' TO 6' WIDTH. SEE ELSEWHERE IN PLANS FOR GATE HEIGHT.

(13) 3'-0" FOR 4' FENCE OR 3'-6" FOR 6' FENCE. 2'-6" FOR 4' FENCE OR 3'-0" FOR 6' FENCE.

14. ALL POST SHALL BE SET IN CONCRETE TO THE DIMENSIONS AS INDICATED ON THIS DRAWING.

15. VEHICULAR AND PEDESTRIAN GATES SHALL HAVE HEAVY PRESSED STEEL CORNERS SECURELY RIVETED OR SHALL BE MACHINE NOTCHED, AND ELECTRICALLY WELDED SO AS TO BE RIGID AND WATER TIGHT; AND EQUIPPED WITH A PADLOCKING DEVICE AND GROUND STOP.

16. ALL WELDED JOINTS SHALL BE CLEANED AND PAINTED WITH TWO (2) COATS OF ALUMINUM PAINT.

17. 4' HIGH GATES SHALL HAVE 4' FABRIC HEIGHT. 6' HIGH GATES SHALL HAVE 6' FABRIC HEIGHT.
8' HIGH GATES SHALL HAVE 7' FABRIC HEIGHT. 9' HIGH GATES SHALL HAVE 8' FABRIC HEIGHT.
10' HIGH GATES SHALL HAVE 9' FABRIC HEIGHT. 11' HIGH GATES SHALL HAVE 10' FABRIC HEIGHT.
12' HIGH GATES SHALL HAVE 11' FABRIC HEIGHT.

18. BARBED WIRE IS REQUIRED ON 8' TO 12' HIGH GATES. SEE DETAILS A AND B FOR INSTALLATION.

19. THE CONTRACTOR IS NOT TO ORDER GATES UNTIL THEIR NECESSITY AND LOCATION HAVE BEEN CERTIFIED BY THE ENGINEER.

20. ALL FENCE FITTINGS SHALL COMPLY WITH ASTM F626.

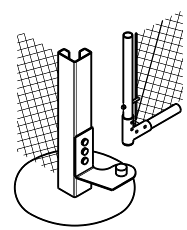
21. NPS = NOMINAL PIPE SIZE - ASTM F1083 AND ASTM F1043 (HEAVY INDUSTRIAL FENCE) SHALL GOVERN.

BID ITEMS AND UNIT TO BID

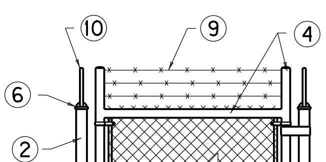
SINGLE VEHICULAR CHAIN LINK GATE	EACH
OR	
DOUBLE VEHICULAR CHAIN LINK GATE	EACH
OR	
PEDESTRIAN CHAIN LINK GATE	EACH
CONCRETE-CLASS B	CUYD

LEGEND / (ALTERNATES)

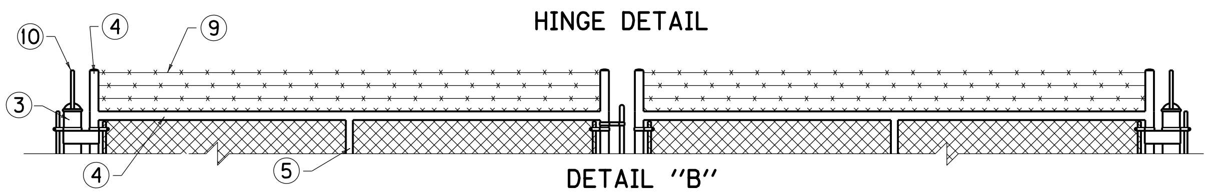
	TUBULAR	ROLL FORMED
(1)	END POST $2\frac{1}{2}$" NPS	$3\frac{1}{2}$" X $3\frac{1}{2}$"
(2)	END POST $2\frac{1}{2}$" NPS	$3\frac{1}{2}$" X $3\frac{1}{2}$"
(3)	GATE POST $3\frac{1}{2}$" NPS	NO ALTERNATE
(4)	GATE FRAME $1\frac{1}{2}$" NPS	NO ALTERNATE
(5)	$1\frac{1}{4}$" NPS	NO ALTERNATE
(6)	APPROVED CAPS	NOT REQUIRED
(7)	FLAT TENSION BAR	NOT REQUIRED
(8)	BRACE BAND AND TENSION BAND	NOT REQUIRED
(9)	BARBED WIRE	BARBED WIRE
(10)	BARBED WIRE ARMS	BARBED WIRE ARMS



ROLL FORMED
HINGE DETAIL



DETAIL "A"
(8' TO 12' HIGH FENCE)



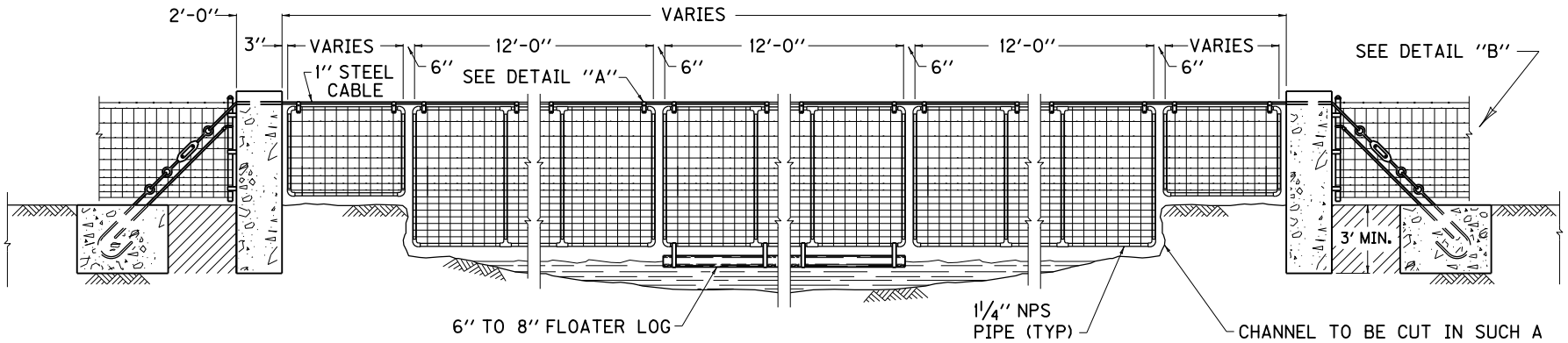
DETAIL "B"
(8' TO 12' HIGH FENCE)

KENTUCKY
DEPARTMENT OF HIGHWAYS

4' TO 12' HIGH
CHAIN LINK GATE

STANDARD DRAWING NO. RFG-005-06

SUBMITTED [signature] DIRECTOR DIVISION OF DESIGN 12-01-15 DATE
APPROVED [signature] STATE HIGHWAY ENGINEER 12-01-15 DATE

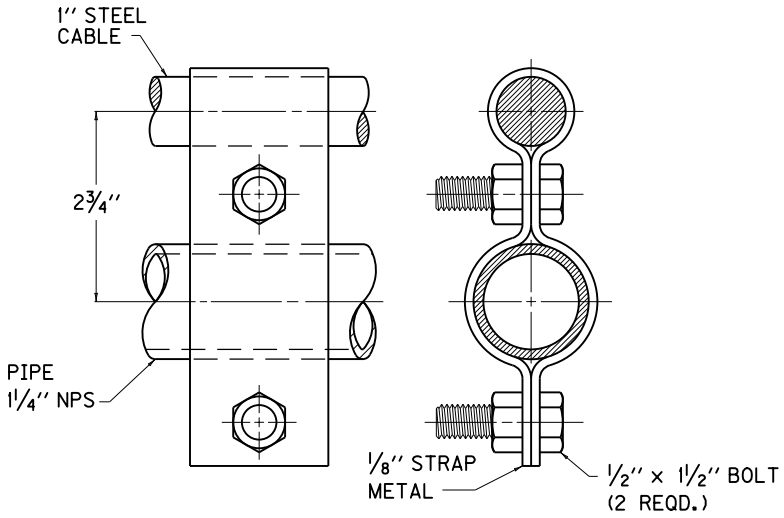


TYPICAL WATER GATE

~ NOTES ~

1. THIS ILLUSTRATION DEPICTS WATER GATE TYPE 1 USING WOVEN WIRE FABRIC.
2. FABRIC TIE WIRES SHALL BE SPACED 1'-0" ON CENTERS. THE CONTRACTOR IS NOT TO ORDER GATES OF ANY TYPE UNTIL THEIR NECESSITY AND LOCATION ARE CERTIFIED BY THE ENGINEER.
3. ALL FENCE FITTINGS SHALL COMPLY WITH ASTM F626.
4. WOVEN-WIRE FABRIC USED ON WATER GATE TYPE 1 SHALL BE EITHER ALUMINUM-COATED STEEL NO. 1047-6-9 OR ZINC COATED STEEL NO. 1047-6-9.
5. WATER GATES SHALL HAVE HEAVY PRESSED STEEL CORNERS SECURELY RIVETED OR SHALL BE MACHINE NOTCHED AND ELECTRICALLY WELDED SO AS TO BE RIGID AND WATER TIGHT. ALL WELDED JOINTS SHALL BE CLEANED AND PAINTED WITH TWO (2) COATS OF ALUMINUM PAINT.
6. NPS = NOMINAL PIPE SIZE - ASTM F1083 AND F1043 (HEAVY INDUSTRIAL FENCE) SHALL GOVERN.

BID ITEMS AND UNIT TO BID	
WATER GATE TYPE 1	EACH
CONCRETE-CLASS A	CUYD
CONCRETE-CLASS B	CUYD
STEEL REINFORCEMENT	LB



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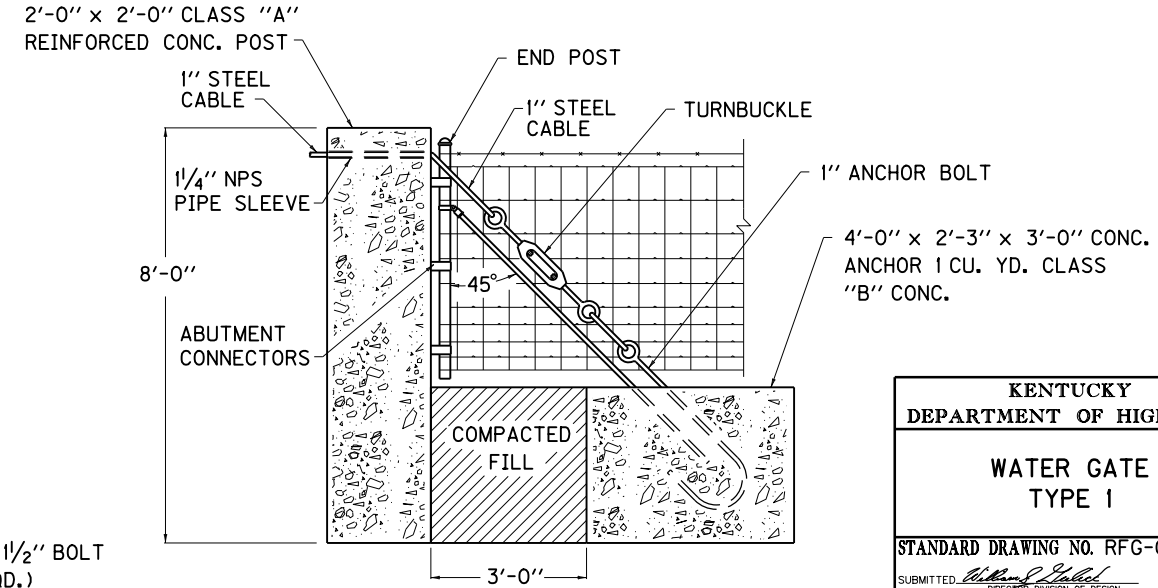


DETAIL "B"

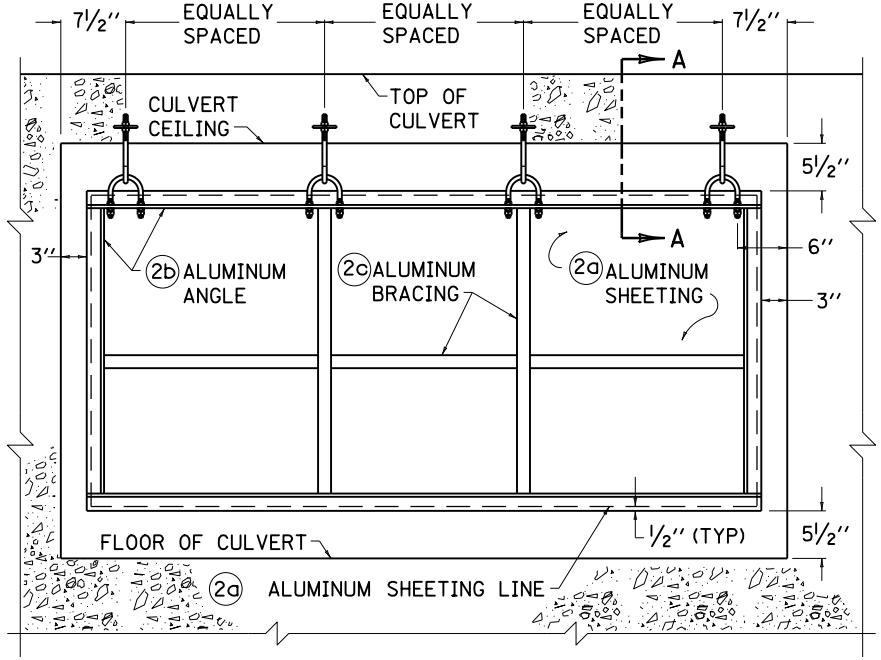
KENTUCKY DEPARTMENT OF HIGHWAYS

WATER GATE TYPE 1

STANDARD DRAWING NO. RFG-010-05

SUBMITTED William S. Hulick DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

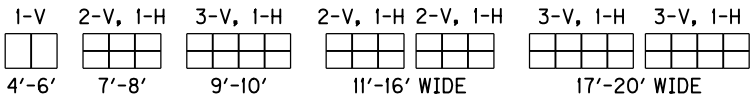


TYPICAL WATER GATE INSTALLATION

~ NOTES ~

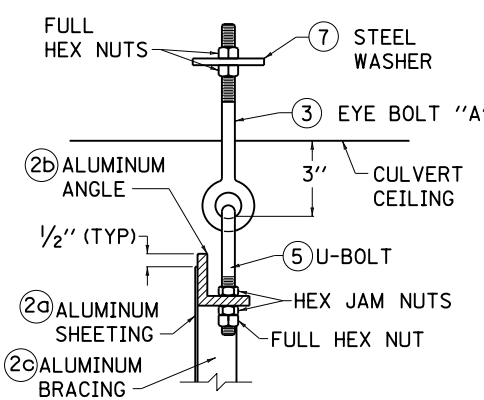
BID ITEM AND UNIT TO BID
WATER GATE TYPE 3 EACH

1. THE CONTRACT UNIT PRICE SHALL INCLUDE LABOR, MATERIALS, INSTALLATION, AND ALL NECESSARY INCIDENTALS TO COMPLETRE THE INSTALLATION. TWO OR MORE SECTIONS PER CULVERT OPENING EQUALS ONE WATER GATE TYPE 3.
2. COMMERCIAL GRADE ALUMINUM
   - (2a) SHEETING - 0.090" THICK, MILL FINISH.
   - (2b) ANGLES - 2" x 2" x 3/8" @ 1.60 LBS./LIN. FT.
   - (2c) BRACING - 1½" x 1½" x 1/8" SQUARE TUBING @ 0.826 LB./LIN. FT.
3. (3) EYEBOLT "A" - GALVANIZED, WELDLESS, ½" DIA., 6" SHANK, 1" EYE I.D., 3" THREAD.
4. (4) EYEBOLT "B" - GALVANIZED, WELDLESS, ½" DIA., 2½" SHANK, 1" EYE I.D., 1" THREAD.
5. (5) U-BOLTS - CADMIUM PLATED STEEL, 3" BETWEEN LEGS, 4½" INSIDE LENGTH, 5" OUTSIDE LENGTH, 2¼" THREAD, ½" DIA.
6. (6) HEX FULL NUTS AND JAM NUTS - ½" DIA., 13 THREADS/IN., FINISHED, DOUBLE CHAMFERED.
7. (7) STEEL WASHER - 5/8" I.D., 2¾" O.D.
8. (8) EXPANSION ANCHORS - 6000 LBS. MINIMUM HOLDING POWER.
9. WELD ANGLE AND BRACE CONNECTIONS FULLY ON ALL EXPOSED SIDES.
10. WELD SHEETING ON BOTH SIDES TO ANGLES AND BRACING AS SHOWN.
11. CULVERT OPENINGS GREATER THAN 10' IN WIDTH - USE MINIMUM OF TWO EQUAL WIDTH SECTIONS PER OPENING WITH 3" GAP BETWEEN SECTIONS (SEE DETAIL "A"). NO SECTION SHALL EXCEED 10' IN WIDTH.
12. USE OF ONE CONTINUOUS ALUMINUM SHEET IS DESIRABLE; HOWEVER IF MORE THAN ONE SHEET IS USED AND THE SEAMS DO NOT FIT THE MINIMUM REQUIRED BRACING DIAGRAM, ADDITIONAL SYMMETRICALLY PLACED BRACING SHALL BE REQUIRED. NO SEAMS SHALL BE VISIBLE FROM THE BRACING SIDE OF THE GATE.

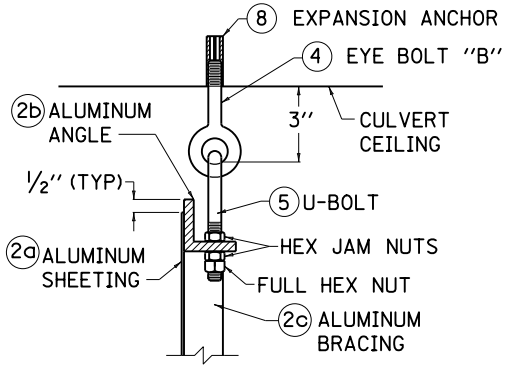


MINIMUM HOR. AND VER. BRACING SYSTEMS FOR VARIOUS WIDTH CULVERT OPENINGS.

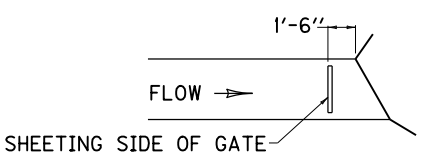
ONE (1) ADDITIONAL HOR. BRACE REQUIRED FOR CULVERT OVER 10' IN HEIGHT.



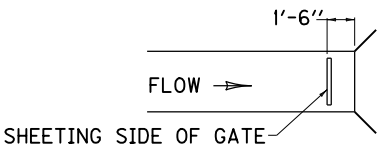
SECTION A-A
NEW CONSTRUCTION HANGER SYSTEM



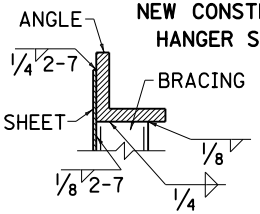
SECTION A-A
EXISTING CONSTRUCTION HANGER SYSTEM



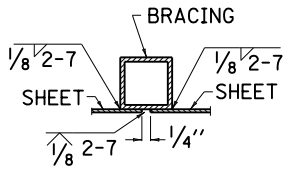
WATER GATE LOCATION IN SKEWED CULVERTS



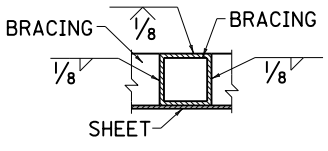
WATER GATE LOCATION IN CULVERTS AT 90°



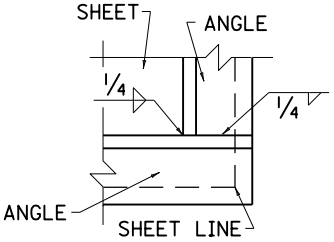
BRACING, ANGLE AND SHEET WELDS



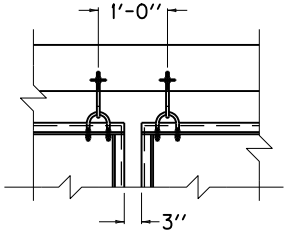
BRACING AND SHEET SEAM WELDS



BRACING AND BRACING WELDS



CORNER JOINT WELDS



DETAIL "A"
(2 OR MORE SECTIONS)

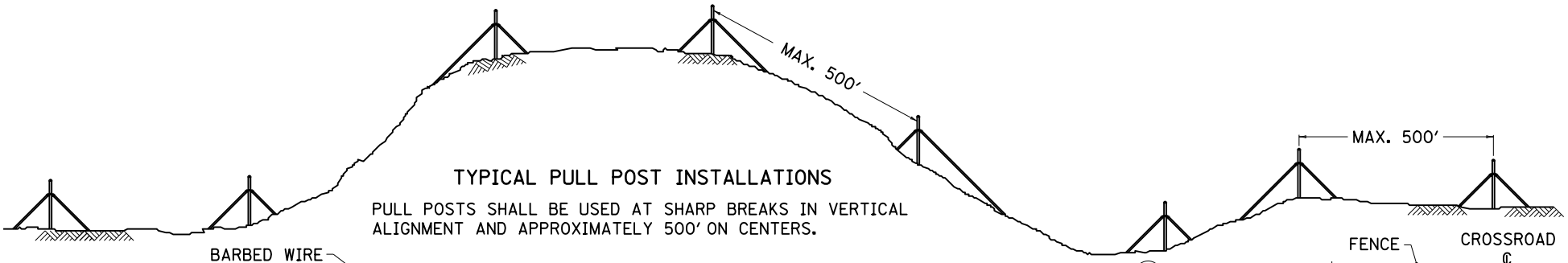
KENTUCKY DEPARTMENT OF HIGHWAYS

WATER GATE TYPE 3

STANDARD DRAWING NO. RFG-011-06

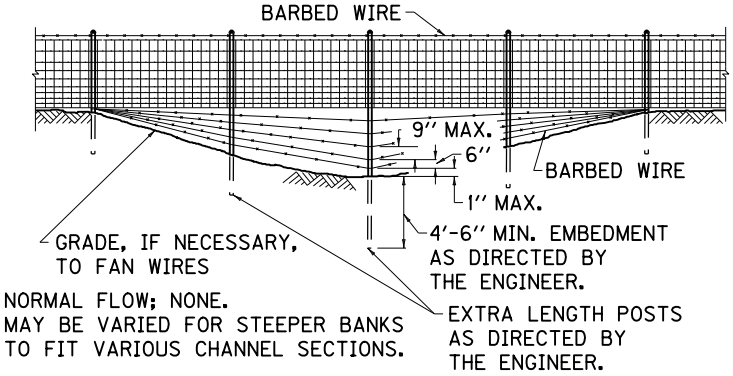
SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

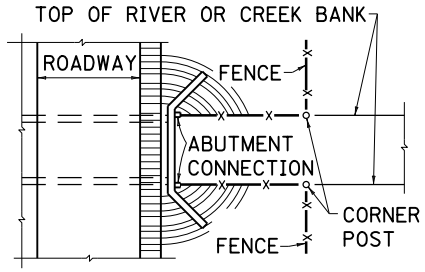


TYPICAL PULL POST INSTALLATIONS

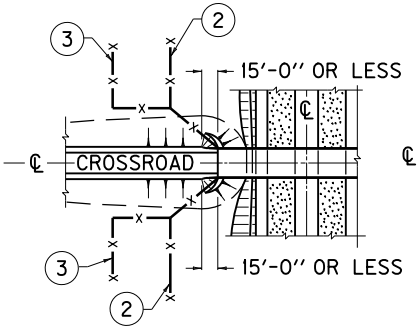
PULL POSTS SHALL BE USED AT SHARP BREAKS IN VERTICAL ALIGNMENT AND APPROXIMATELY 500' ON CENTERS.



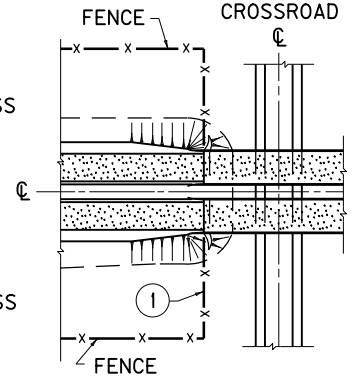
TYPE A CROSSING



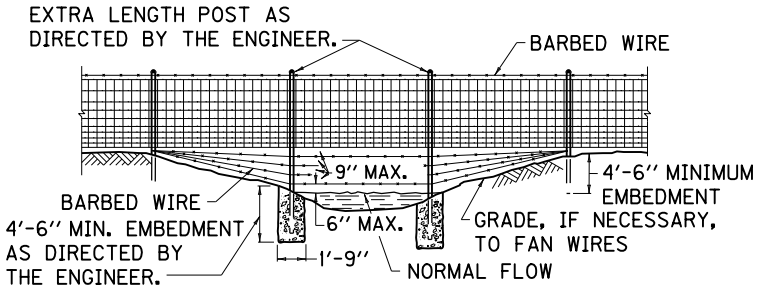
TYPICAL FENCE INSTALLATION FOR BOX CULVERT USED AS CATTLE CROSSING



HIGHWAY UNDER CROSSROAD



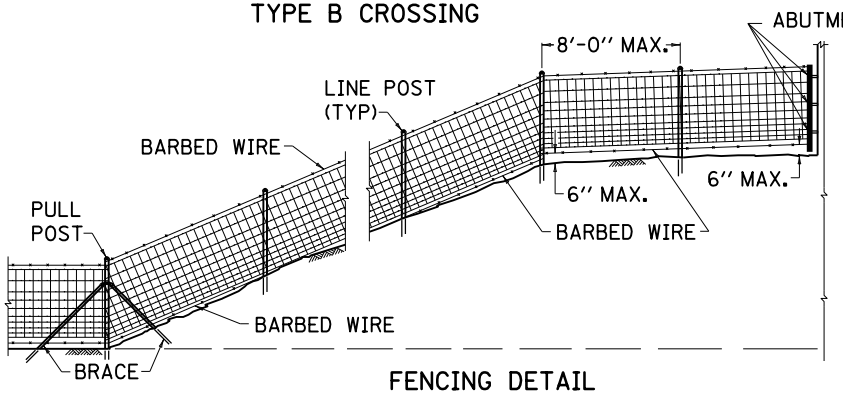
HIGHWAY OVER CROSSROAD



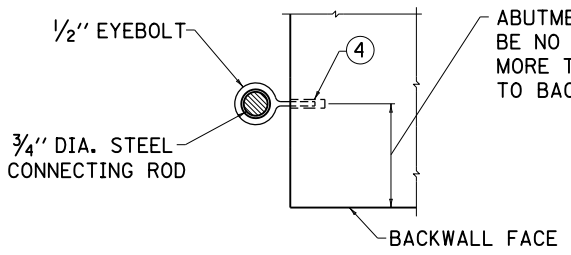
TYPE B CROSSING

~ NOTES ~

1. NORMAL WAY OF HANDLING FENCE WHEN THE HIGHWAY IS OVER THE CROSSROAD AS SHOWN.
2. WHEN HIGHWAY RIGHT-OF-WAY IS 15'-0'' OR LESS FROM THE FACE OF BACKWALL PROJECTED, ANGLE FENCE INTO ABUTMENT FROM TOE OF SLOPE AS SHOWN.
3. WHEN HIGHWAY RIGHT-OF-WAY IS GREATER THAN 15'-0'' FROM THE FACE OF BACKWALL PROJECTED, ANGLE FENCE PARALLEL TO THE CENTERLINE OF CROSSROAD AND INTERSECT DETAIL 2 AS SHOWN.
4. ½''×2'' SELF-DRILL ANCHOR AND EYEBOLT ASSEMBLY.
5. ALL MATERIAL FOR ABUTMENT CONNECTION SHALL BE GALVANIZED.



FENCING DETAIL



ABUTMENT CONNECTION

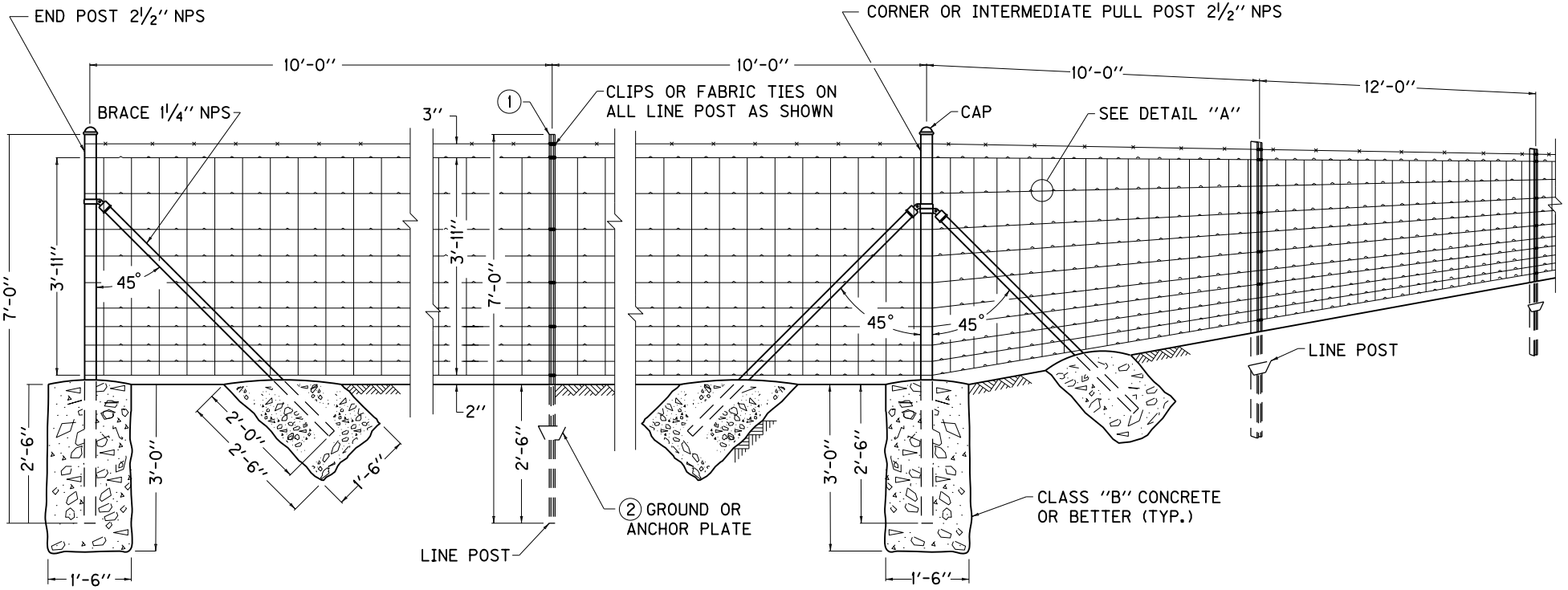
KENTUCKY
DEPARTMENT OF HIGHWAYS

FENCING DETAILS

STANDARD DRAWING NO. RFW-001-06

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE

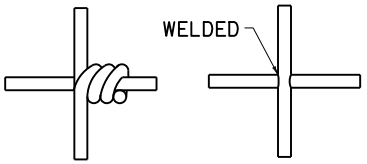


~ NOTES ~

BID ITEMS AND UNIT TO BID

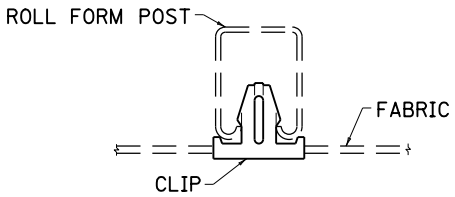
FENCE-WOVEN WIRE TYPE 1	LF
CONCRETE-CLASS B	CUYD

1. STUDDED "T" POST CONFORMING TO ASTM A702 AT 1.33 LBS. PER FOOT
   - OR -
   ROLL FORM POST AT 1.40 LBS. PER FOOT (SEE DETAIL)
2. NOT REQUIRED FOR ROLL FORM POST.
3. WOVEN-WIRE FABRIC SHALL BE EITHER ALUMINUM-COATED STEEL NO. 1047-6-9 OR ZINC-COATED STEEL NO. 1047-6-9.
4. ALL FENCE FITTINGS SHALL COMPLY WITH ASTM F626.
5. NPS = NOMINAL PIPE SIZE - ASTM F1083 AND F1043 (HEAVY INDUSTRIAL FENCE) SHALL GOVERN.

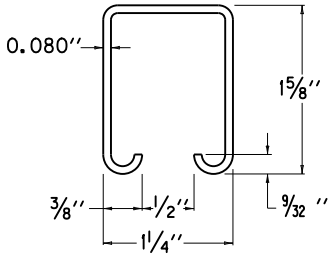


ALTERNATE METHODS OF SECURING VERTICAL STAY WIRE TO THE HORIZONTAL WIRE OF THE FABRIC.

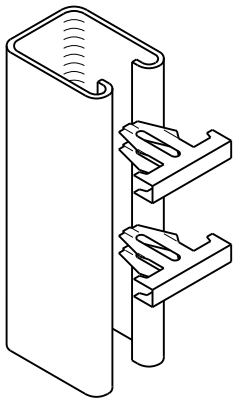
DETAIL "A"



PLAN VIEW OF CLIP INSTALLED IN ROLL FORM POST



PLAN VIEW OF ROLL FORM POST



ISOMETRIC EXPLODED VIEW OF ROLL FORM POST AND CLIPS

CLIPS SHALL BE SPRING STEEL ALUMINUM - FINISHED

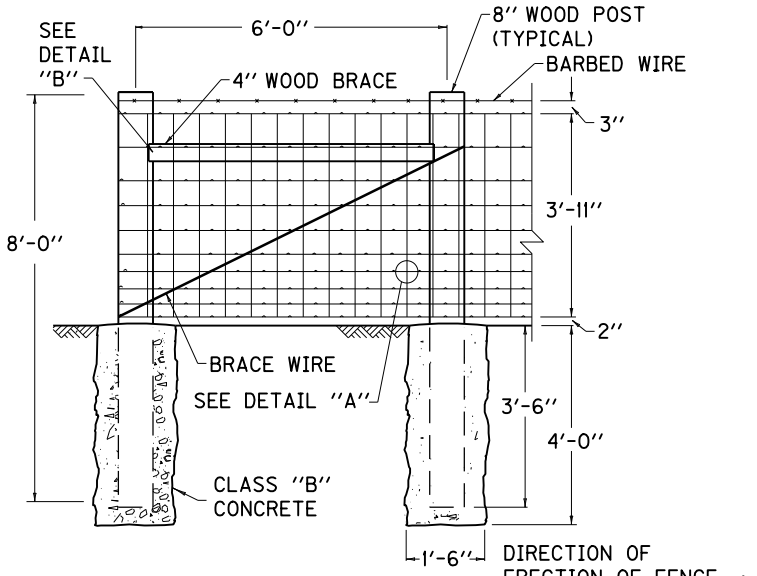
KENTUCKY DEPARTMENT OF HIGHWAYS

WOVEN WIRE FENCE TYPE 1

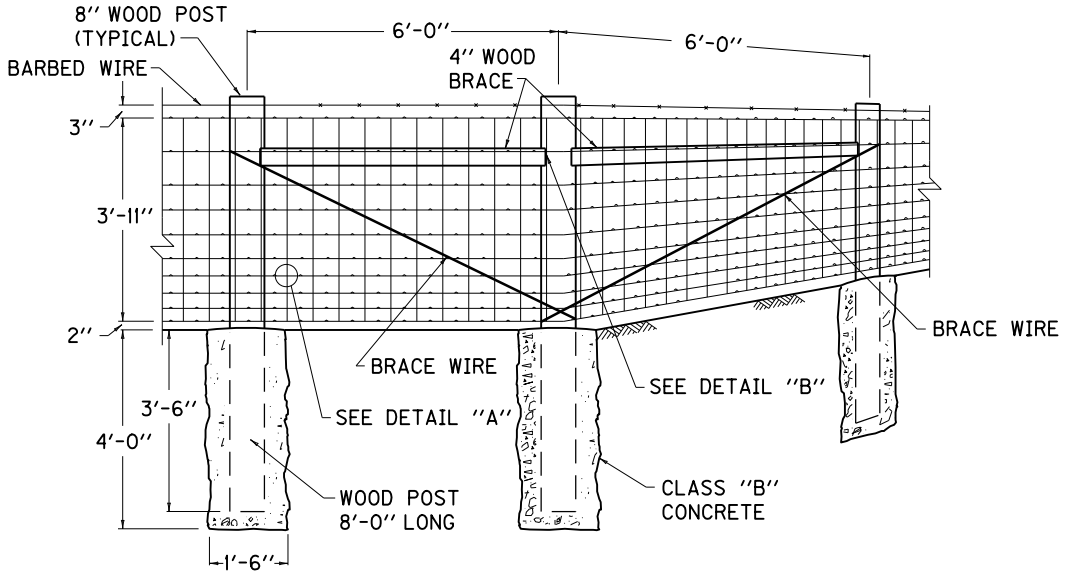
STANDARD DRAWING NO. RFW-005-08

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

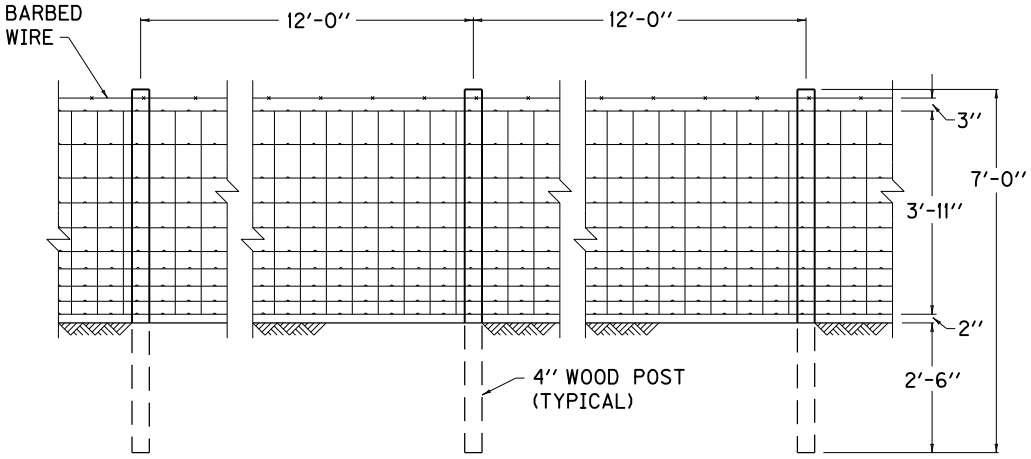
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



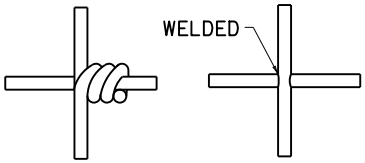
PULL OR END POST ASSEMBLY



CORNER POST ASSEMBLY

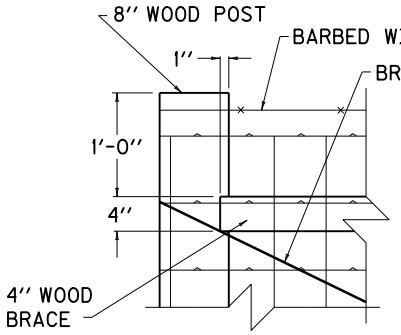


LINE POST



ALTERNATE METHODS OF SECURING VERTICAL STAY WIRE TO THE HORIZONTAL WIRE OF THE FABRIC.

DETAIL "A"



DETAIL "B"

~ NOTES ~

BID ITEM AND UNIT TO BID	
FENCE-WOVEN WIRE TYPE 2	LF
CONCRETE-CLASS B	CUYD

1. ON INTERMEDIATE PULL POST ASSEMBLIES, BRACE WIRES SHALL BE REQUIRED FOR BOTH DIRECTIONS.
2. WOVEN-WIRE FABRIC SHALL BE EITHER ALUMINUM-COATED STEEL NO. 1047-6-9 OR ZINC-COATED STEEL NO. 1047-6-9.

KENTUCKY
DEPARTMENT OF HIGHWAYS

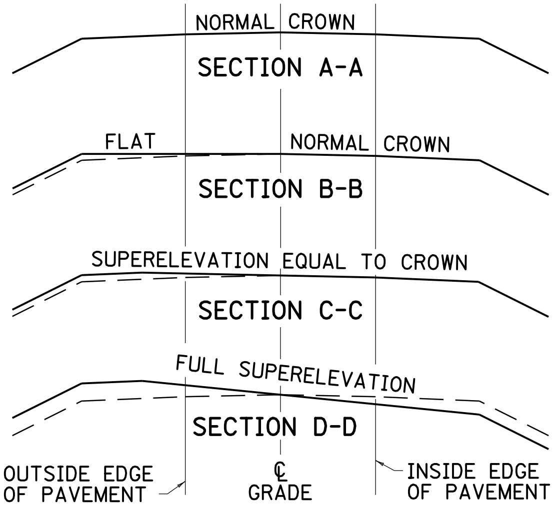
WOVEN WIRE FENCE TYPE 2

STANDARD DRAWING NO. RFW-006-07

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

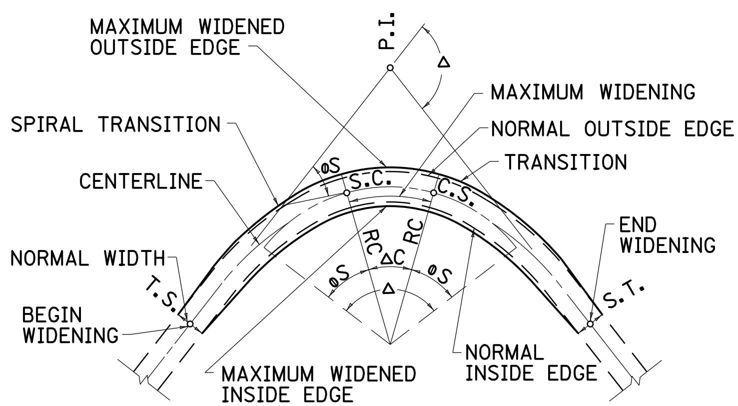
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE

~ SECTIONS ~



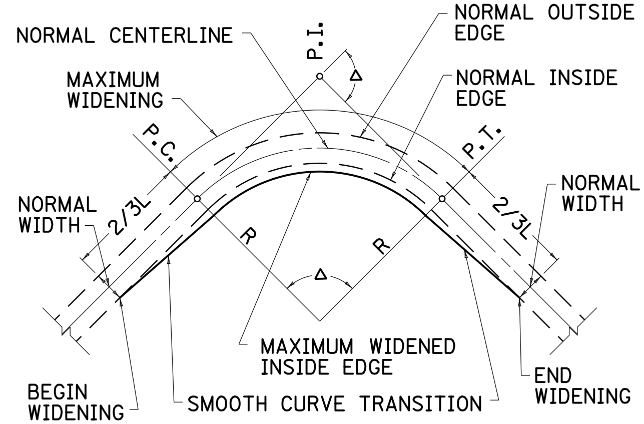
CURVE WIDENING FOR SPIRAL TRANSITION CURVES
(WIDENING DIVIDED EQUALLY ON EACH SIDE)

NOTE: IF DIRECTED, SPIRAL TRANSITION CURVES SHALL BE WIDENED ON INSIDE ONLY.



NOTE: MINIMUM WIDENING = 2′-0″ ⑥

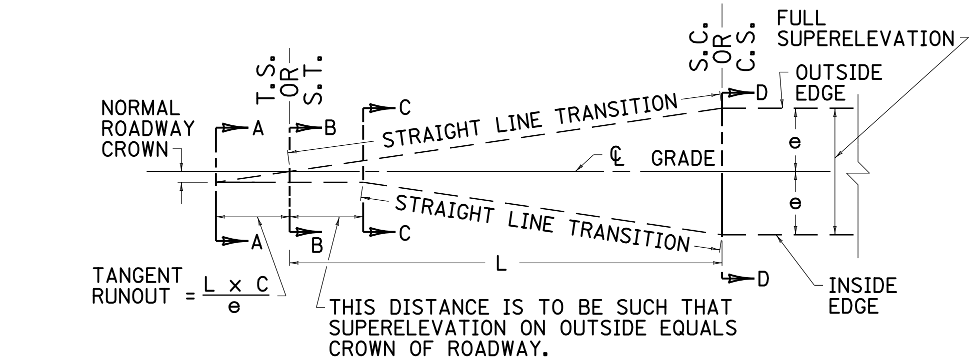
CURVE WIDENING FOR SIMPLE CURVES
(WIDENED ON INSIDE ONLY)



NOTE: MINIMUM WIDENING = 2′-0″
L = MINIMUM LENGTH OF RUNOFF.

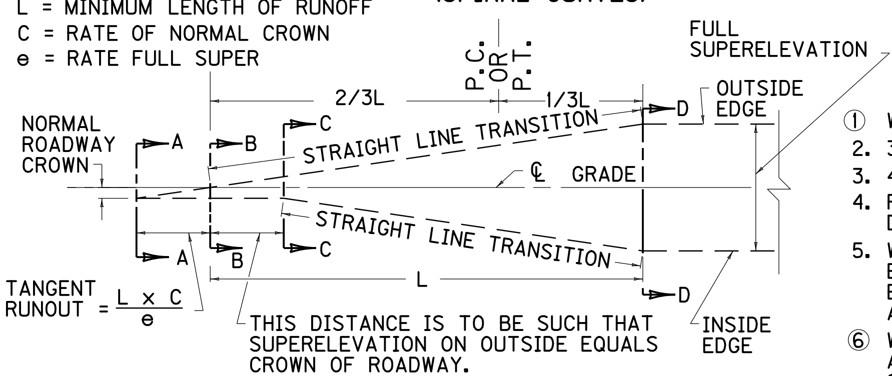
CURVE WIDENING IN FEET FOR TWO-LANE PAVEMENTS ⑥												
① PVMT. WIDTH	24 FEET			22 FEET					20 FEET			
RADIUS OF CURVE	DESIGN SPEED (MPH)											
	30	40	50	30	40	50	60	70	30	40	50	60
5000′												2.0
2500′									2.0	2.0	2.0	2.5
2000′								2.0	2.0	2.0	2.5	2.5
1500′							2.0	2.0	2.0	2.5	2.5	3.0
1200′						2.0	2.0		2.5	2.5	2.5	3.0
1000′					2.0	2.0	2.5		2.5	3.0	3.0	3.5
825′					2.0	2.5			2.5	3.0	3.5	
700′				2.0	2.0	2.5			3.0	3.0	3.5	
600′			2.0	2.0	2.5	3.0			3.0	3.5	4.0	
550′				2.0	2.5				3.0	3.5		
425′		2.0		2.5	3.0				3.5	4.0		
350′	2.0			3.0					4.0			
300′	2.5			3.5					4.5			
250′	3.0			4.0					5.0			
225′	3.5			4.5					5.5			

SUPERELEVATION TRANSITION FOR CURVES
SINGLE LANE PAVEMENT



(SPIRAL CURVES)

L = MINIMUM LENGTH OF RUNOFF
C = RATE OF NORMAL CROWN
e = RATE FULL SUPER



(SIMPLE CURVES)

~ NOTES ~

① WIDTH OF PAVEMENT ON TANGENT.
2. 3-LANE PAVEMENTS: MULTIPLY ABOVE VALUES BY 1.5.
3. 4-LANE PAVEMENTS: MULTIPLY ABOVE VALUES BY 2.
4. FOR INTERMEDIATE DESIGN SPEEDS, USE THE NEXT HIGHER DESIGN SPEED VALUE.
5. WHEN REQUIRED ON CONSTRUCTION, CURVES SHALL BE SUPER-ELEVATED BY REVOLVING SECTION AROUND INSIDE OR OUTSIDE EDGE AS DIRECTED. SHORT VERTICAL CURVES TO BE INSERTED AT "D" AND "A" WHERE DIRECTED ON CONSTRUCTION.
⑥ WHEN SEMI-TRAILER VOLUMES ARE SIGNIFICANT, REFER TO THE AASHTO "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS" MANUAL.

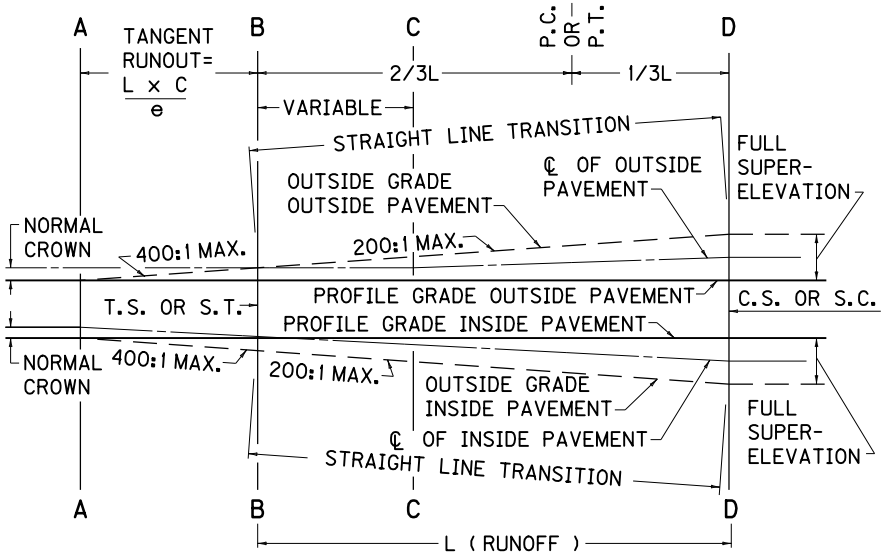
KENTUCKY
DEPARTMENT OF HIGHWAYS

CURVE WIDENING AND SUPERELEVATION TRANSITIONS

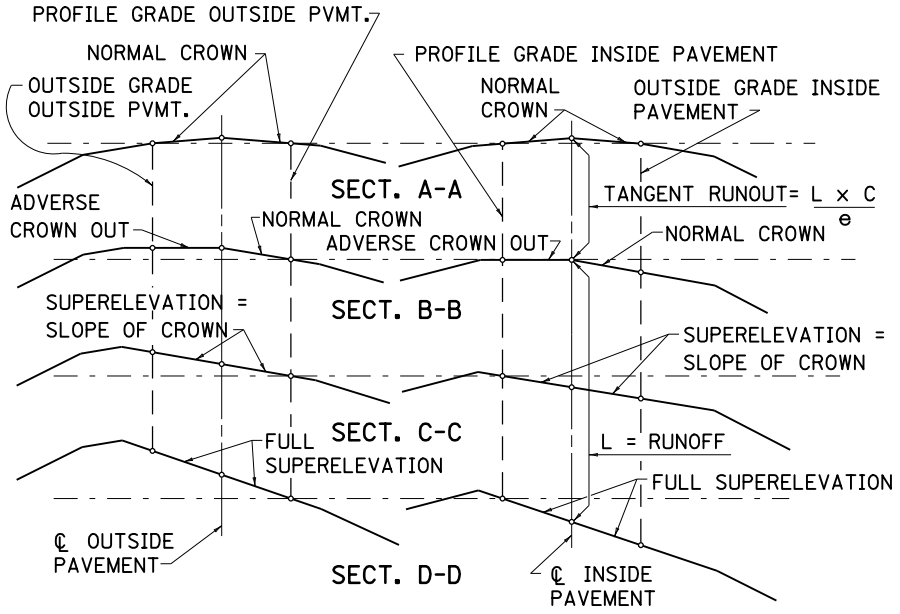
STANDARD DRAWING NO. RGS-001-07

SUBMITTED [signature] DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE
APPROVED [signature] STATE HIGHWAY ENGINEER — 12-01-15 DATE

DEPRESSED MEDIAN

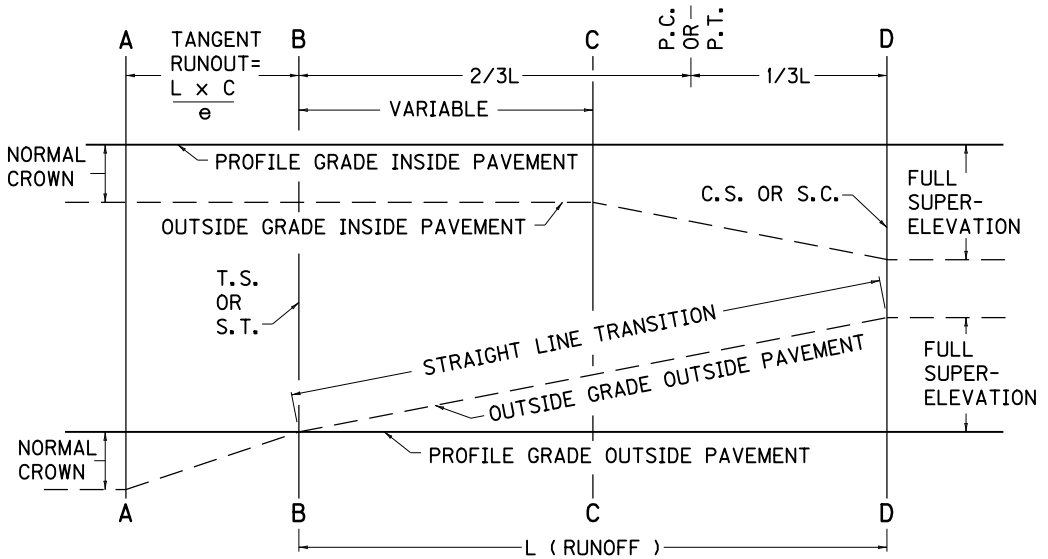


PROFILE OF PAVEMENT EDGES

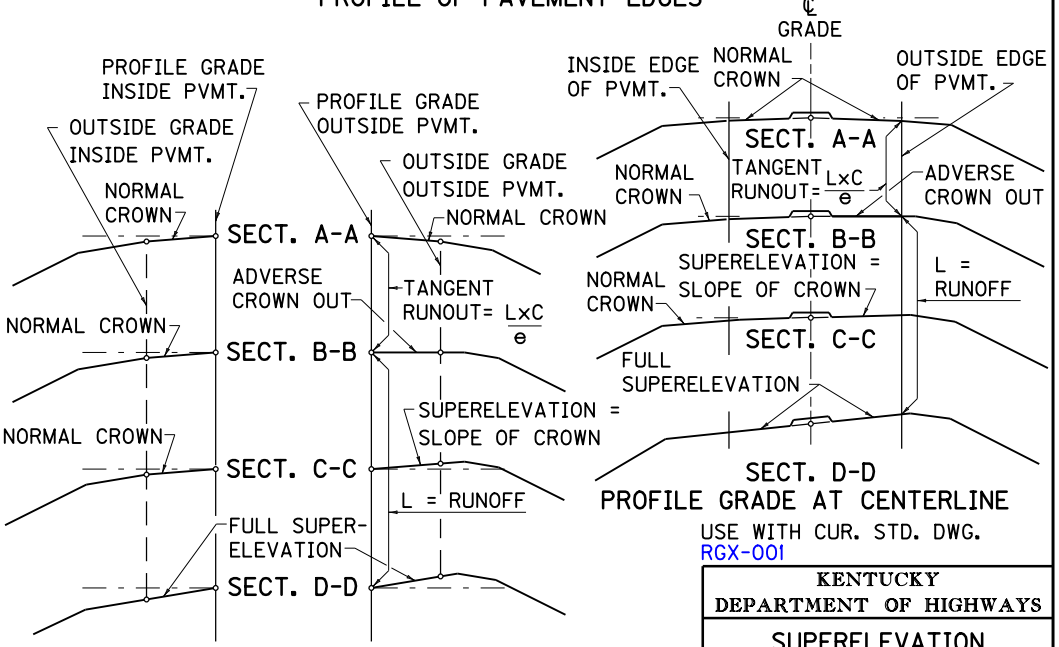


PROFILE GRADE AT MEDIAN EDGE

RAISED MEDIAN



PROFILE OF PAVEMENT EDGES



PROFILE GRADE AT MEDIAN EDGE

PROFILE GRADE AT CENTERLINE

USE WITH CUR. STD. DWG. RGX-001

~ NOTES ~

1. SPECIAL CARE MUST BE EXERCISED IN THE DRAINING OF DITCH SUMPS INDUCED BY THE SUPERELEVATION.
2. "L" = MINIMUM LENGTH OF RUNOFF.
3. FOR HINGE POINT ROUNDING BETWEEN SUPERABLE AND NON-SUPERABLE SHOULDER SEE CUR. STD. DWG. RGX-001 .

KENTUCKY DEPARTMENT OF HIGHWAYS

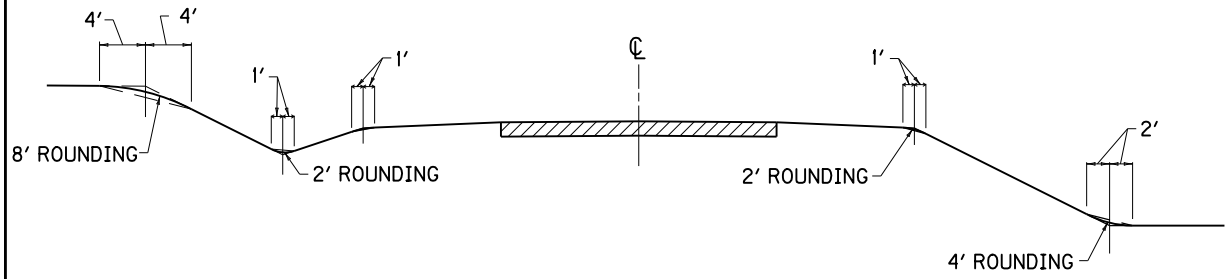
SUPERELEVATION FOR MULTILANE PAVEMENT

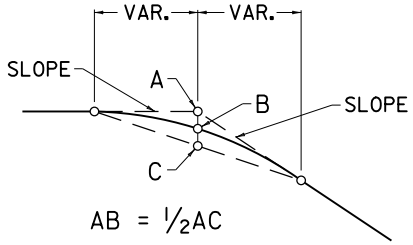
STANDARD DRAWING NO. RGS-002-06

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE

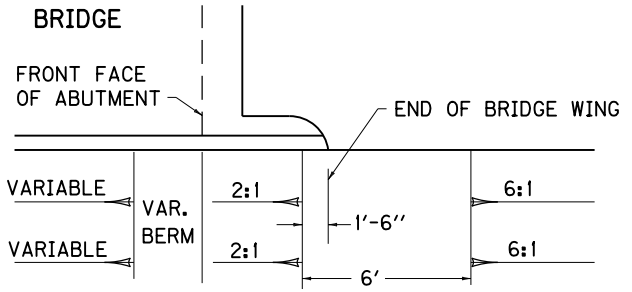
TYPICAL SECTION SHOWING ROUNDING OF SLOPES



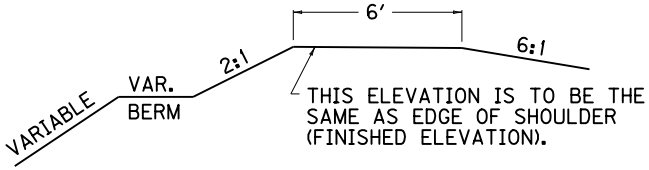


DETAIL FOR ROUNDING OF SLOPES

EARTH DIKE IN DEPRESSED MEDIAN AT THE END OF TWIN BRIDGES



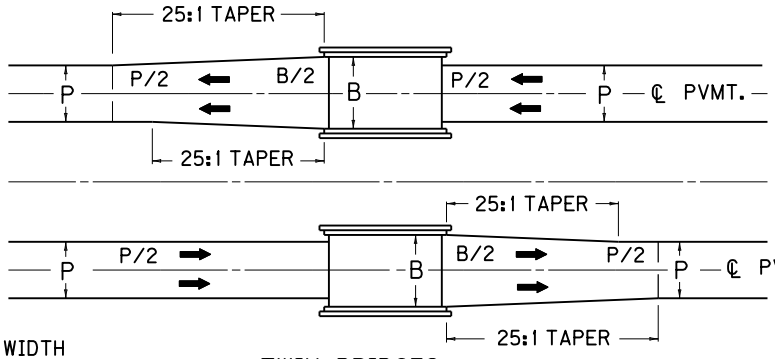
PLAN VIEW



TO BE CONSTRUCTED ON GRADE AND DRAIN CONTRACT.

PROFILE OF EARTH DIKE

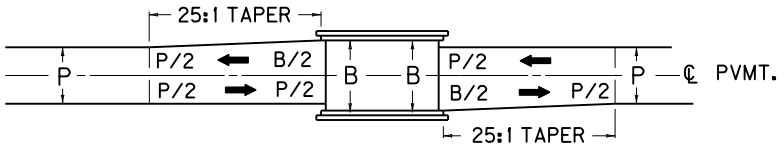
BRIDGE APPROACH FOR USE IN CONJUNCTION WITH ASPHALT CONCRETE PAVEMENT



TWIN BRIDGES

P = NORMAL PAVEMENT WIDTH

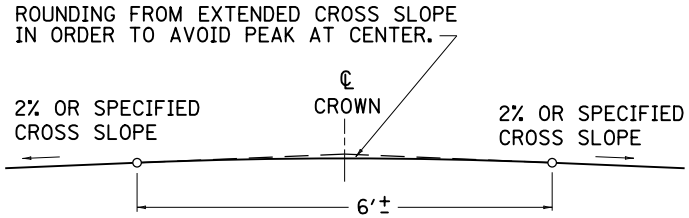
B = BRIDGE ROADWAY



NORMAL PAVEMENT SHALL BE TRANSITIONED TO MEET BRIDGE ROADWAY AS INDICATED ABOVE.

SINGLE BRIDGE

PAVEMENT AND SHOULDER CROWN ROUNDED



IN A HORIZONTAL CURVE, ROUNDING SHOULD BE USED AT HINGE POINT BETWEEN SUPERABLE AND NON-SUPERABLE SHOULDERS.

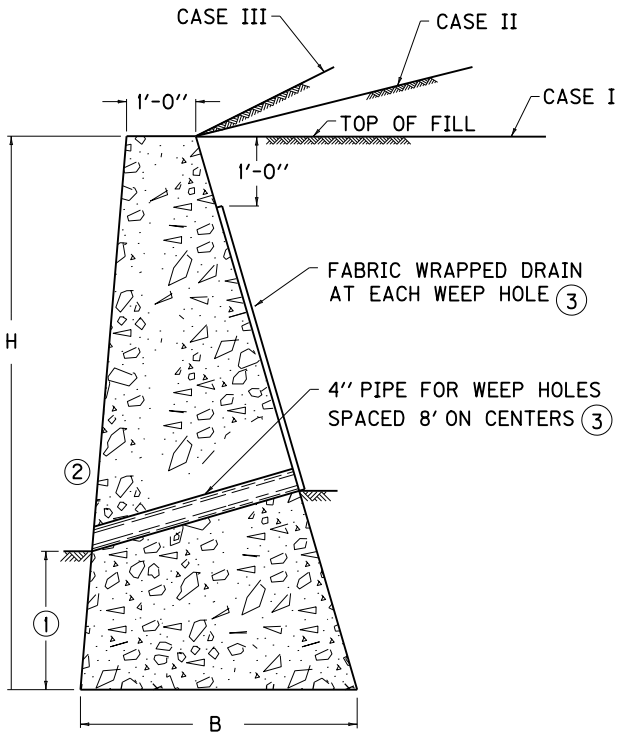
KENTUCKY
DEPARTMENT OF HIGHWAYS

MISCELLANEOUS
STANDARDS

STANDARD DRAWING NO. RGX-001-06

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



CASE I, CASE II, AND CASE III

H	B	END AREA SQ. FT.	VOLUME CU. YDS. /L.F.
CASE I OR II OR III			
3'-0"	1'-6"	3.7500	0.1389
3'-6"	1'-9"	4.8125	0.1782
4'-0"	2'-0"	6.0000	0.2222
4'-6"	2'-3"	7.3125	0.2708
5'-0"	2'-6"	8.7500	0.3241
5'-6"	2'-9"	10.3125	0.3819
6'-0"	3'-0"	12.0000	0.4444
6'-6"	3'-3"	13.8125	0.5116
7'-0"	3'-6"	15.7500	0.5833
7'-6"	3'-9"	17.8125	0.6597
8'-0"	4'-0"	20.0000	0.7407
8'-6"	4'-3"	22.3125	0.8264
9'-0"	4'-6"	24.7500	0.9167
9'-6"	4'-9"	27.3125	1.0116
CASE I			
10'-0"	5'-0"	30.0000	1.1111
10'-6"	5'-3"	32.8125	1.2153
11'-0"	5'-6"	35.7500	1.3241
11'-6"	5'-9"	38.8125	1.4375
12'-0"	6'-0"	42.0000	1.5556
CASE II OR III			
10'-0"	6'-0"	35.0000	1.2963
10'-6"	6'-3"	38.0625	1.4097
11'-0"	6'-6"	41.2500	1.5278
11'-6"	6'-9"	44.5625	1.6505
12'-0"	7'-0"	48.0000	1.7778

~ NOTES ~

(1) MINIMUM EMBEDMENT VALUE FOR FIRM EARTH IS 2'-0"; CASE III REQUIRES AN EMBEDMENT OF 1/4H FOR A WALL OVER 8' (SEE CASE III ABOVE).

(2) BATTER: CASE I, AND CASE II
H = 3'-0" TO LESS THAN 5'-0" (VERTICAL)
H = 5'-0" TO LESS THAN 10'-0" (12 : 1)
H = 10'-0" TO 12'-0" (6 : 1)
CASE III
H = 3'-0" TO LESS THAN 5'-0" (12 : 1)
H = 5'-0" TO 12'-0" (6 : 1)

(3) FABRIC WRAPPED DRAINS AND A 4" PIPE FOR WEEP HOLES SHALL BE INCLUDED IN THE UNIT PRICE BID FOR GRAVITY TYPE RETAINING WALLS.

4. THE RETAINING WALL DEPICTED ON THIS DRAWING SHALL BE USED WHEN THE HEIGHT ("H" DIMENSION) OF THE WALL IS 12'-0" OR LESS PROVIDED THE FILL COMPLIES WITH THE FOLLOWING CONDITIONS:

CASE I - WALL BACKFILL SLOPES DOWN AND IS LEVEL, OR SLOPES UP FROM WALL AT 20:1 OR FLATTER. THIS LOW SLOPE ALLOWS FOR BACKFILLS WHICH WOULD BE LEVEL EXCEPT FOR THE SLOPE REQUIRED TO FACILITATE PROPER DRAINAGE.

CASE II - BACKFILL SLOPES UP STEEPER THAN 20:1 BUT NOT STEEPER THAN 4:1.

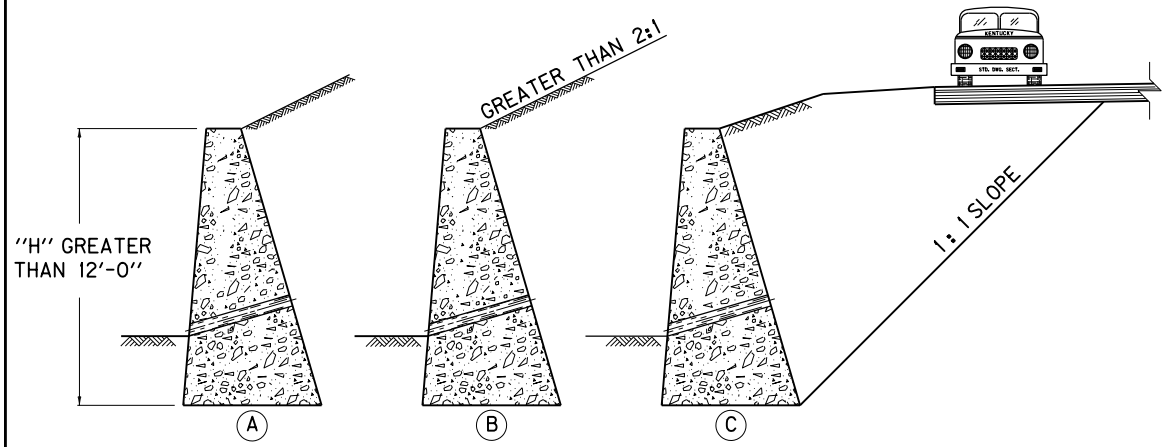
CASE III - BACKFILL SLOPES UP STEEPER THAN 4:1 BUT NOT STEEPER THAN 2:1. WHEN "H" DIMENSION IS GREATER THAN 8' (HEIGHT OF EXPOSED FACE GREATER THAN 6') INCREASE THE EMBEDMENT DEPTH TO 1/4H, (1).

5. SPECIAL DESIGNS SHALL BE REQUIRED WHEN THE FOLLOWING CONDITIONS EXIST:
(A) WALL HEIGHT IS GREATER THAN 12'-0"
(B) WALL IS SURCHARGED WITH DEAD LOAD FILL SLOPES STEEPER THAN 2:1.
(C) WALL IS SURCHARGED WITH A LIVE LOAD WITHIN THE LIMITS OF A 1:1 SLOPE EXTENDING FROM THE BASE OF THE WALL.

6. AREAS AND VOLUMES HAVE BEEN COMPUTED WITHOUT DEDUCTING FOR BEVELED EDGES OR PIPE DRAINS. WHEN A RETAINING WALL VARIES IN HEIGHT, THE PRISMOIDAL FORMULA SHALL BE USED IN COMPUTING VOLUMES.

BID ITEMS AND UNIT TO BID

CONCRETE-CLASS B	CUYD
EXCAVATION	CUYD
GRANULAR EMBANKMENT (WHEN REQUIRED)	CUYD



SPECIAL DESIGNS REQUIRED

KENTUCKY
DEPARTMENT OF HIGHWAYS

RETAINING WALL
GRAVITY TYPE
NON - REINFORCED

STANDARD DRAWING NO. RGX-002-09

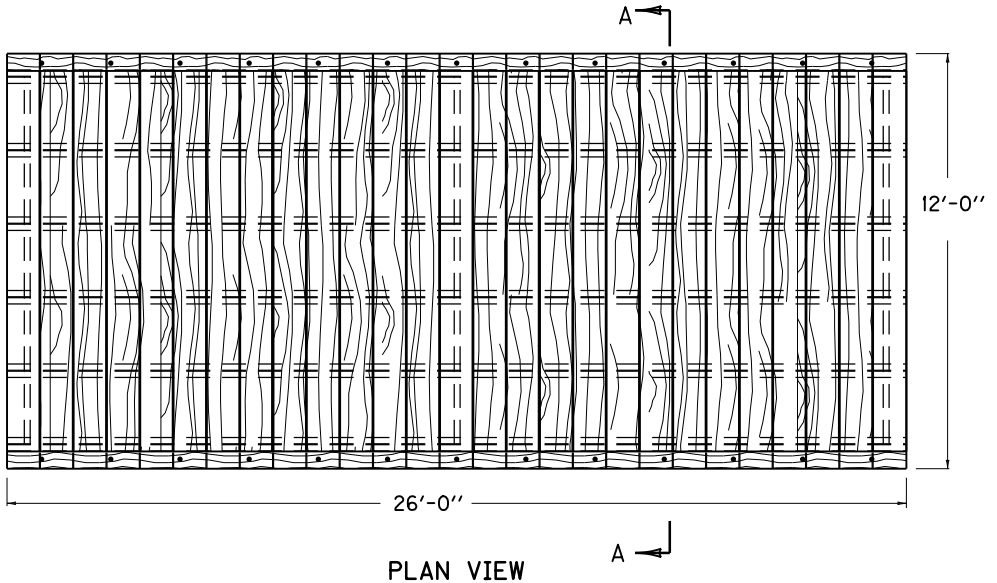
SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

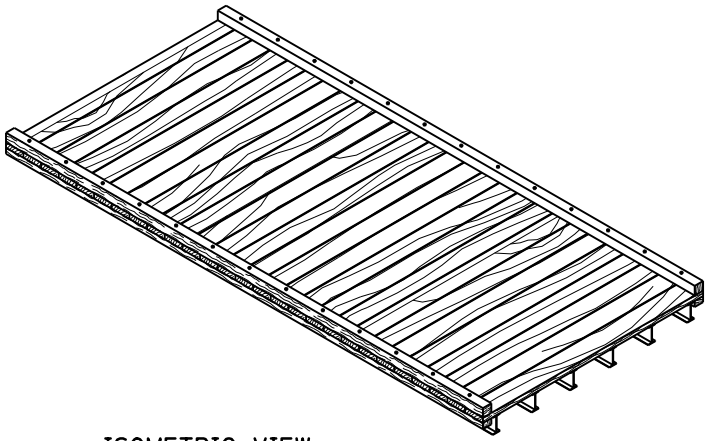
~ NOTES ~

BID ITEM AND UNIT TO BID
TEMPORARY BRIDGE EACH

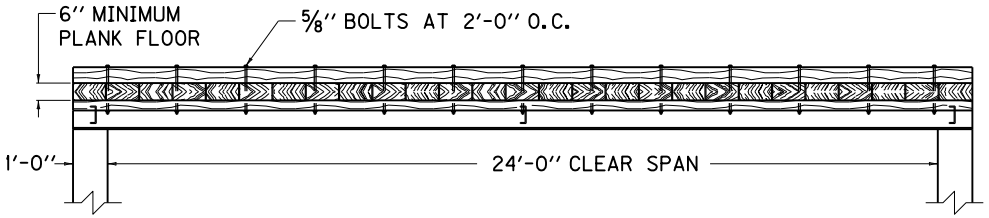
1. TYPES OF TEMPORARY BRIDGES AND PAVEMENT CROSSOVERS, OTHER THAN THE I-BEAM BRIDGE SHOWN HERE, WILL BE ACCEPTABLE UPON APPROVAL BY THE DEPARTMENT.
2. UNLESS OTHERWISE SPECIFIED THE STRUCTURE SHALL BE DESIGNED FOR AN HS20-44 LOADING.
3. STRUCTURE TO REMAIN THE PROPERTY OF THE CONTRACTOR.



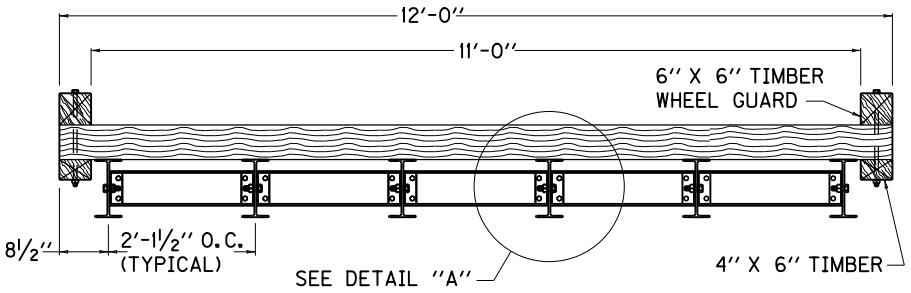
PLAN VIEW



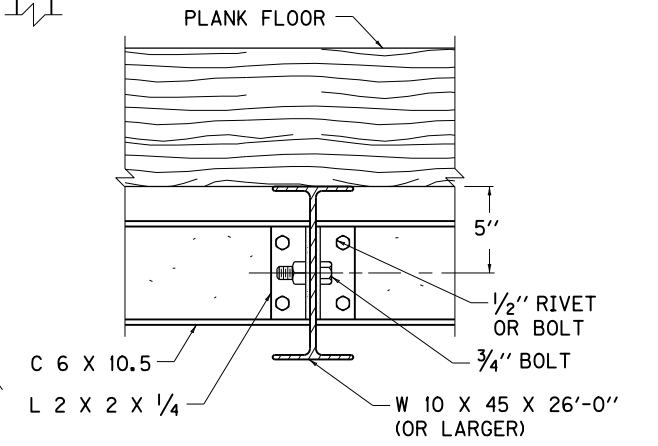
ISOMETRIC VIEW



ELEVATION VIEW



SECTION A-A



DETAIL "A"

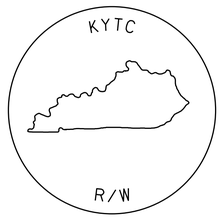
KENTUCKY
DEPARTMENT OF HIGHWAYS

TEMPORARY BRIDGE OR PAVEMENT CROSSOVER

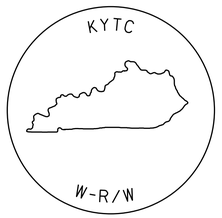
STANDARD DRAWING NO. RGX-003-03

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

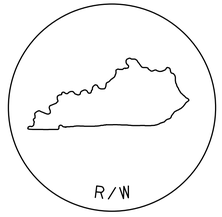
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



R/W MONUMENT
TYPE 1 OR 1A

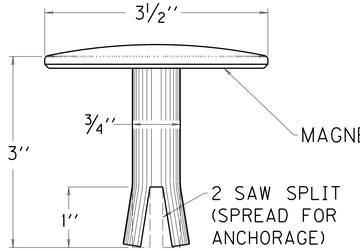


WITNESS R/W
MONUMENT
TYPE 2

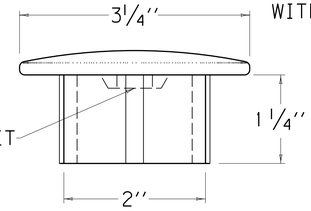


R/W MONUMENT
TYPE 3 OR 3A

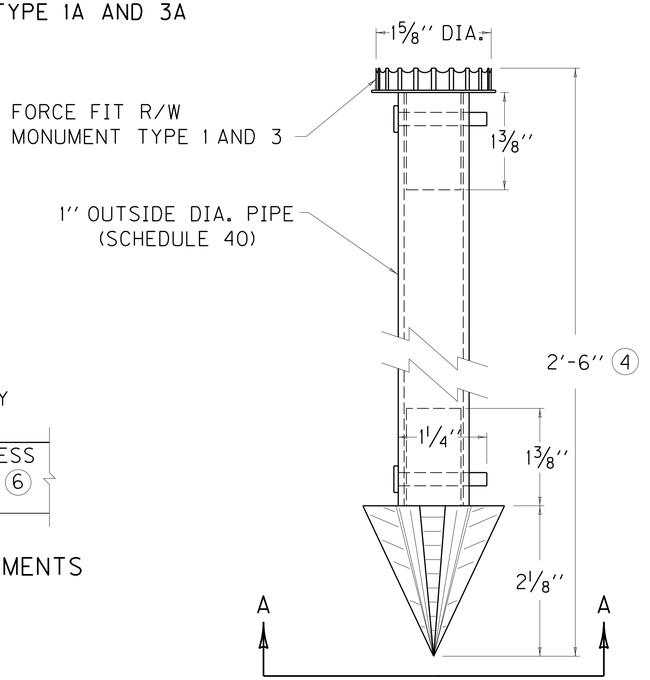
WITNESS R/W
MONUMENT
TYPE 4



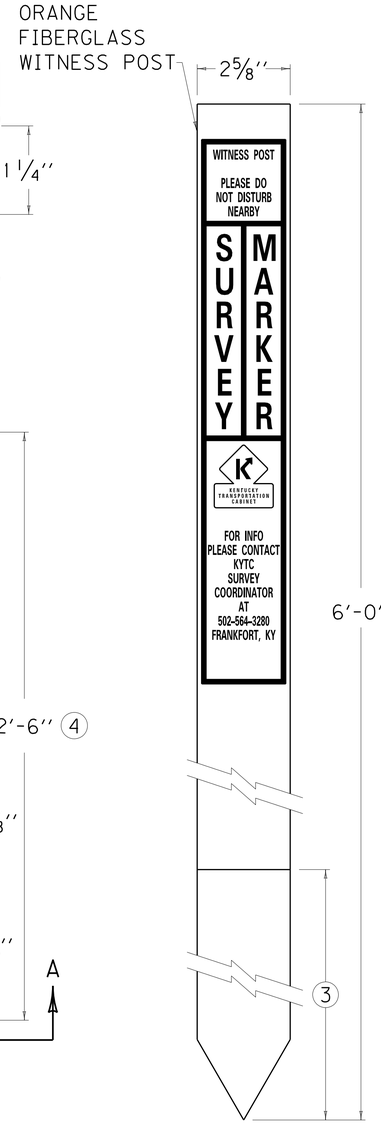
ELEVATION VIEW
R/W MONUMENT
TYPE 1A AND 3A



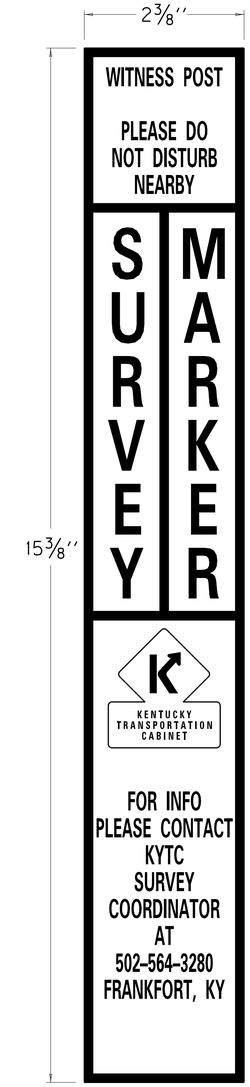
ELEVATION VIEW
R/W MONUMENT
TYPE 1 AND 3



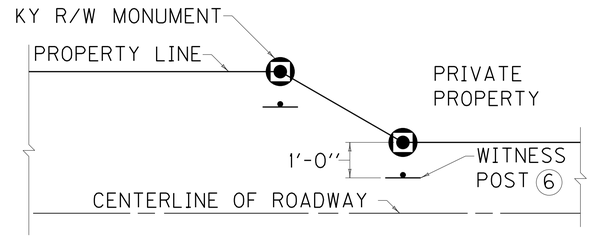
ELEVATION VIEW
R/W MONUMENT
TYPE 1 AND 3



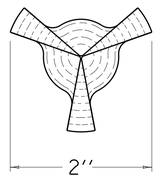
ELEVATION WITNESS POST



WITNESS POST DECAL



LAYOUT OF RURAL RIGHT-OF-WAY MONUMENTS



SECTION A-A

~ NOTES ~

BID ITEMS AND UNIT TO BID RIGHT-OF-WAY MONUMENT TYPE △	EACH
WITNESS RIGHT-OF-WAY MONUMENT TYPE ✳	EACH
WITNESS POST	EACH

△ EITHER TYPE 1, 1A, 3 OR 3A

✳ EITHER TYPE 3 OR 4

1. MANUFACTURE RIGHT-OF-WAY MONUMENTS FROM ALUMINUM ALLOY.
2. TYPE 1A AND 3A MONUMENTS SHALL BE MOUNTED FLUSH IN EXISTING PAVEMENT, DRAINAGE BOXES, ETC. DRILL A 1 1/16'' DIAMETER HOLE AND EPOXY (COMMERCIAL GRADE) INTO EXISTING CONCRETE.
3. WITNESS POST SHALL BE BURIED 1'-6'' TO 2'-0'' IN GROUND.
4. WHEN ROCK IS ENCOUNTERED LENGTH MAY BE REDUCED.
5. SET ALL RIGHT-OF-WAY MONUMENTS FLUSH WITH GROUND OR ADJOINING SURFACE.
6. THE LAND SURVEYOR IN CHARGE OF MONUMENTATION IS ENCOURAGED TO PLACE A WITNESS POST FOR THE RIGHT-OF-WAY MONUMENTS WHERE PRACTICAL AND FEASIBLE. IF POSSIBLE, A MINIMUM OF THREE WITNESS POSTS PER PROJECT SHOULD BE PLACED.

UPDATED J. LAIL 6-2015

KENTUCKY
DEPARTMENT OF HIGHWAYS

RIGHT-OF-WAY MONUMENTS

STANDARD DRAWING NO. RGX-005-06

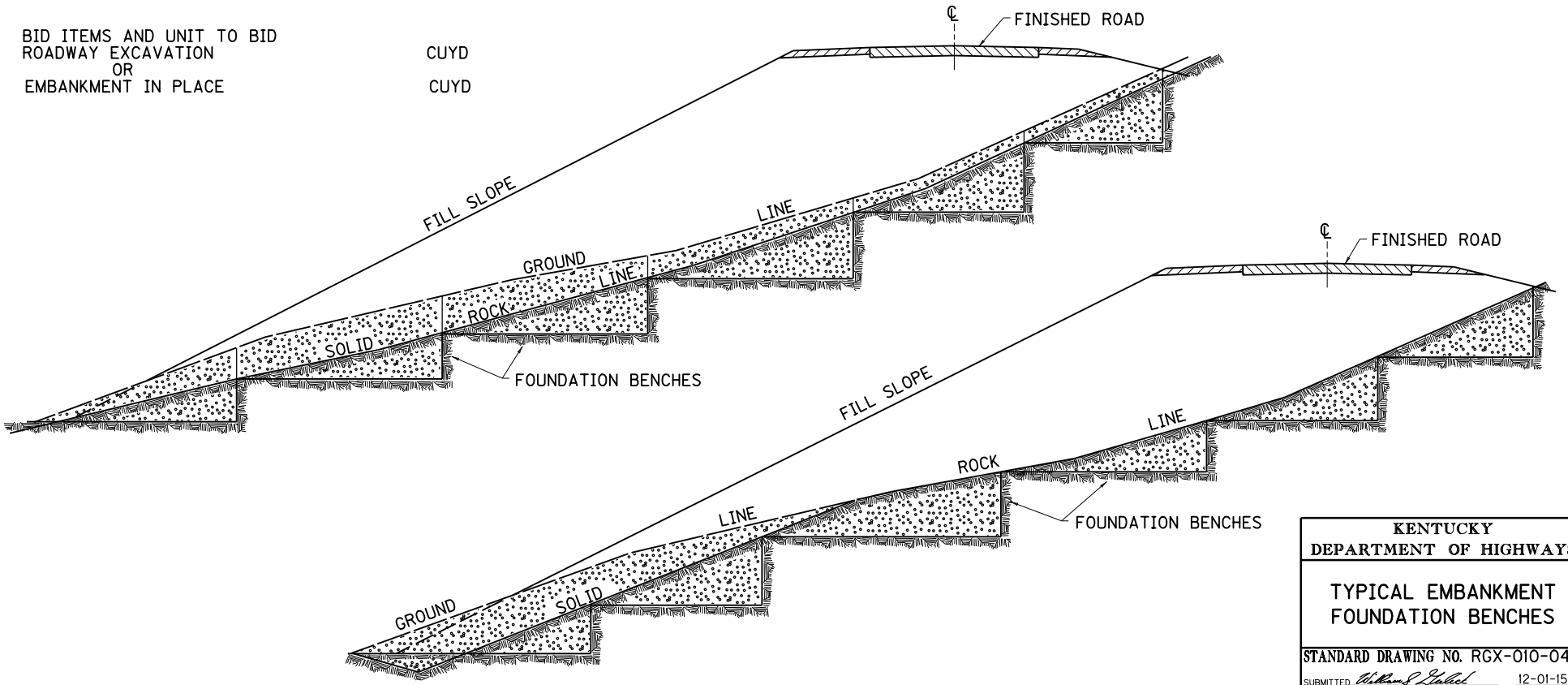
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN _____ DATE

APPROVED _____ STATE HIGHWAY ENGINEER _____ DATE

~ NOTES ~

1. THIS TREATMENT FOR EMBANKMENT FOUNDATION BENCHES, AS INDICATED ON THIS SHEET, SHALL BE ACCEPTED AS GUIDES FOR HIGHWAY DESIGN, HOWEVER, ALL THE CONDITIONS THAT WILL BE ENCOUNTERED CANNOT BE SHOWN, SO THE DESIGNER MUST GIVE CONSIDERABLE THOUGHT TO THE LOCATIONS AND DIMENSIONS OF THESE BENCHES.
2. DEFINITE DESIGN INFORMATION CANNOT BE ESTABLISHED AS TO THE SIZE OF THESE BENCHES, DUE TO THE IRREGULARITIES AND THE DIFFERENT RATES OF INCLINE OF THE EXISTING CROSS SECTION, HOWEVER, IT IS GENERALLY BELIEVED THAT A 6′ TO 12′ RISE AND A 20′ TO 35′ HORIZONTAL RUN IS FAIRLY TYPICAL WITH A 15′ HORIZONTAL RUN BEING THE MINIMUM.
3. WHEN THE INCLINE OF THE CROSS SECTION IS 15% OR GREATER THESE EMBANKMENT FOUNDATION BENCHES SHALL BE CONSTRUCTED IN THE ORIGINAL SLOPE AS THE EMBANKMENT IS CONSTRUCTED IN COMPACTED LAYERS OR LIFTS.
4. WHEN EMBANKMENT FOUNDATION BENCHES ARE SHOWN ON THE CROSS SECTION, THE VOLUME SHALL BE COMPUTED AS ROADWAY EXCAVATION OR EMBANKMENT IN PLACE AS APPLICABLE AND SHOWN IN THE SHEET TOTALS AND BROUGHT FORWARD TO BE INCLUDED IN THE TOTAL EARTHWORK WITH THE NOTE ''TOTAL INCLUDES ''X'' NUMBER OF CUBIC YARDS FROM EMBANKMENT FOUNDATION BENCHES.''
5. THE EXCAVATION FROM THESE BENCHES WILL NOT BE SHOWN IN THE DISTRIBUTION OF QUANTITIES BUT THEY WILL DEFINITELY BE A PAY QUANTITY BY VIRTUE OF THE FACT THAT THEY ARE INCLUDED IN THE TOTAL OF ROADWAY EXCAVATION QUANTITIES.
6. NO QUANTITIES WILL BE ALLOWED FOR THE REFILLING OF THESE BENCHES, SINCE SUPPOSEDLY, THE MATERIAL THAT WAS EXCAVATED WILL BE PROCESSED AND PLACED BACK IN THESE BENCHES.
7. IF THE CROSS SECTION IS AN EARTH ONE, THAT IS IF NO ROCK IS SHOWN, THEN THE FOUNDATION BENCHES SHALL BE INDICATED ON THE CROSS SECTION AND CONSTRUCTED AS SHOWN BY THE DRAWING AND THE VOLUME OF EXCAVATION BECOMES A PAY ITEM AS ROADWAY EXCAVATION OR EMBANKMENT IN PLACE AS APPLICABLE, IN OTHER WORDS, SUPPORT BENCHING OF EARTH SECTIONS SHALL BE GIVEN SAME TREATMENT AS ROCK OR NEAR ROCK SECTION.
8. SHOULD IT BE EVIDENT, AT THE TIME OF CONSTRUCTION, THAT THE ENGINEER FINDS AND SO DIRECTS THAT THE EMBANKMENT FOUNDATION BENCHING IS NECESSARY AND IT IS NOT SO INDICATED ON THE DESIGN CROSS SECTIONS THE BASIS OF PAYMENT SHALL BE AS HEREIN BEFORE STATED.

BID ITEMS AND UNIT TO BID	
ROADWAY EXCAVATION	CUYD
OR	
EMBANKMENT IN PLACE	CUYD



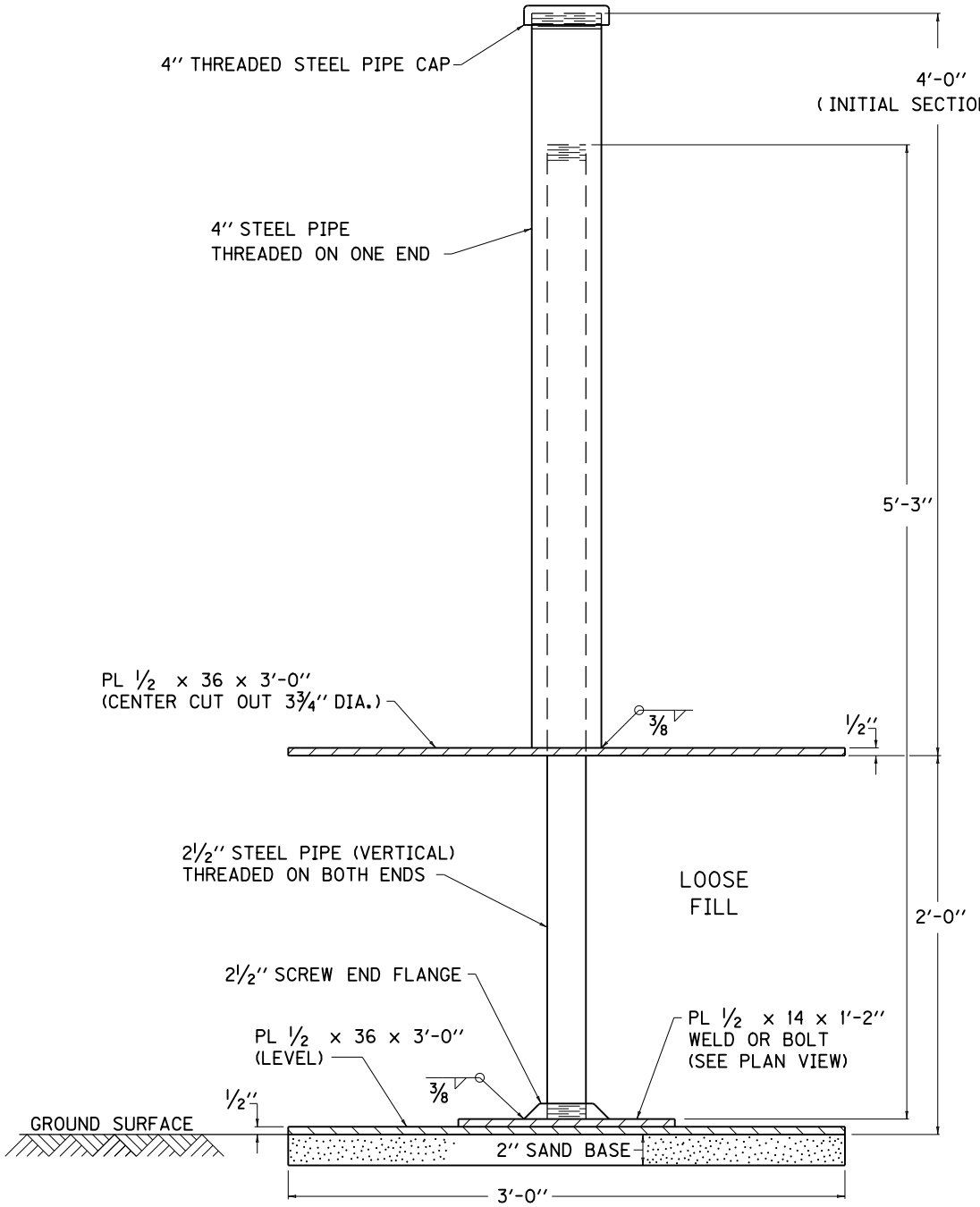
KENTUCKY
DEPARTMENT OF HIGHWAYS

TYPICAL EMBANKMENT FOUNDATION BENCHES

STANDARD DRAWING NO. RGX-010-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

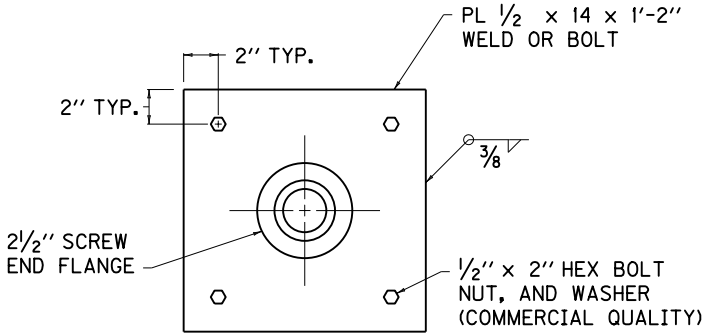


ELEVATION VIEW

~ NOTES ~

1. ADDITIONAL PIPE SHALL BE FURNISHED IN 5'-3'' SECTIONS (DUE TO COMMERICAL PIPE LENGTHS OF 21'-0'') THREADED ON BOTH ENDS, PAID FOR PER LF AND SHALL MEET THE REQUIREMENTS OF SECTION 810.05.03 OF THE CURRENT STANDARD SPECIFICATIONS.
2. PIPE SIZES ARE GIVEN IN NOMINAL DIAMETERS.

BID ITEMS AND UNIT TO BID	
SETTLEMENT PLATFORM	EACH
STEEL PIPE-2 1/2 IN	LF
STEEL PIPE-4 IN	LF



PLAN VIEW

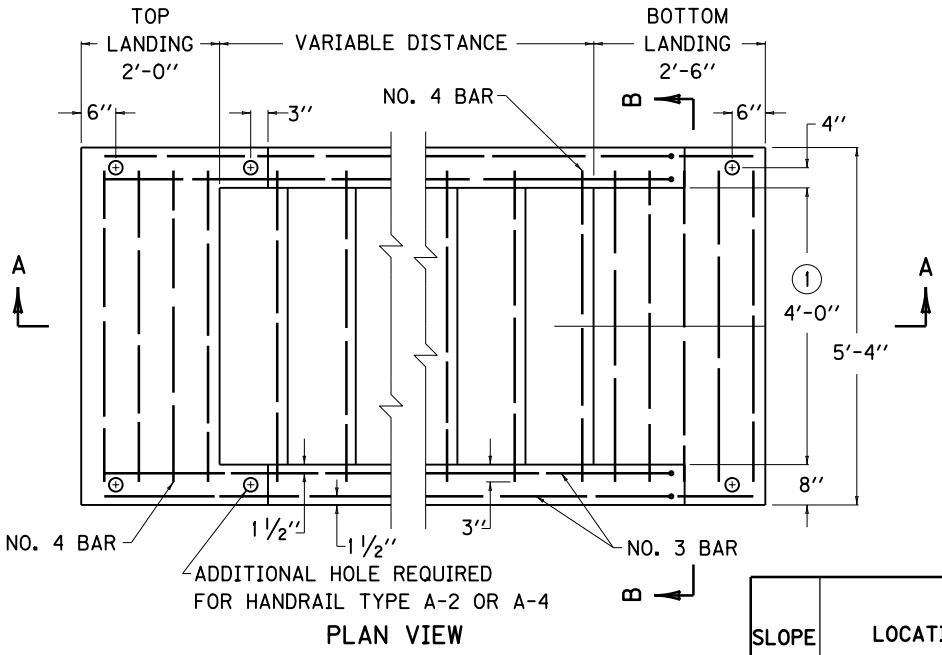
KENTUCKY
DEPARTMENT OF HIGHWAYS

SETTLEMENT PLATFORM

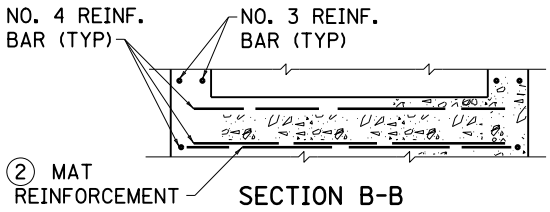
STANDARD DRAWING NO. RGX-015-03

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



PLAN VIEW



SECTION B-B

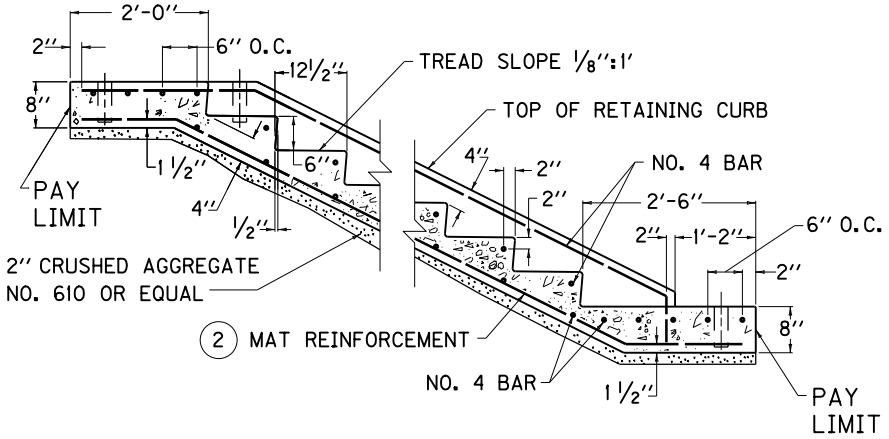
~ NOTES ~

BID ITEM AND UNIT TO BID
CONCRETE-CLASS A FOR STEPS CUYD

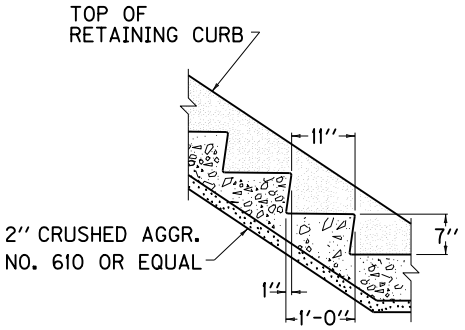
1. APPROXIMATE QUANTITY TO ADD FOR EACH ADDITIONAL FOOT OF WIDTH OVER 4'-0".
2. MAT REINFORCEMENT IN BOTTOM OF THE STEPS SHALL BE WIRE FABRIC OR BAR MAT REINFORCEMENT.
3. MAT REINFORCEMENT:
   (A) NO. 4 REINFORCEMENT BARS, LONGITUDINAL BARS 6" O.C. AND TRANSVERSE BARS 12" O.C. MIN. GRADE 40; OR WELDED WIRE FABRIC - 6x6 - W4xW4 58 LBS./100 SQ. FT.
   (B) NO. 4 REINFORCEMENT BARS ADDITIONALLY AS SHOWN.
   (C) NO. 3 REINFORCEMENT BARS ADDITIONALLY AS SHOWN.
4. ROUND ALL EXPOSED EDGES AND CORNERS 1/4" R.
5. HANDRAIL SHALL BE REQUIRED WITH THREE OR MORE STEPS.
6. REINFORCING STEEL SHALL BE PLACED SO NOT TO INTERFERE WITH HANDRAIL POSTS.

TABLE OF QUANTITIES

SLOPE	LOCATION	ADDITIONAL NO. 4 BAR REINF. (LBS.)		MAT REINFORCEMENT				CU. YDS. CLASS "A" CONCRETE	
				WIRE FABRIC (SQ. FT.)		BAR MAT (LBS.)			
		4' WIDTH	1	4' WIDTH	1	4' WIDTH	1	4' WIDTH	1
2:1	BOTTOM LANDING	23.547	3.340	11.776	2.375	27.388	5.177	0.337	0.059
	INTERMEDIATE STEP	10.855	1.336	5.991	1.208	12.191	2.283	0.16	0.025
	TOP LANDING	22.483	3.340	9.504	1.917	20.708	3.897	0.265	0.051
1 1/2:1	BOTTOM LANDING	23.603	3.340	12.602	2.542	28.613	5.400	0.36	0.062
	INTERMEDIATE STEP	10.271	1.336	5.268	1.063	11.119	2.088	0.16	0.025
	TOP LANDING	22.545	3.340	9.710	1.958	21.014	3.952	0.281	0.054



SECTION A-A 2:1 SLOPE



STEP DETAIL FOR 1 1/2:1 SLOPE

USE WITH CUR. STD. DWG. RGX-030

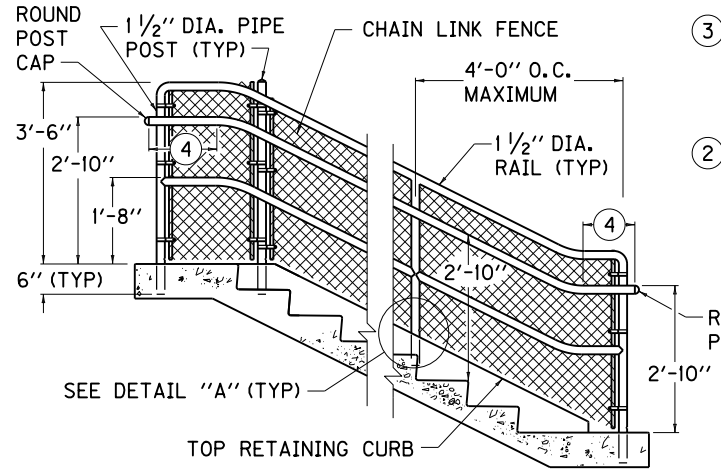
KENTUCKY DEPARTMENT OF HIGHWAYS

CONCRETE STEPS

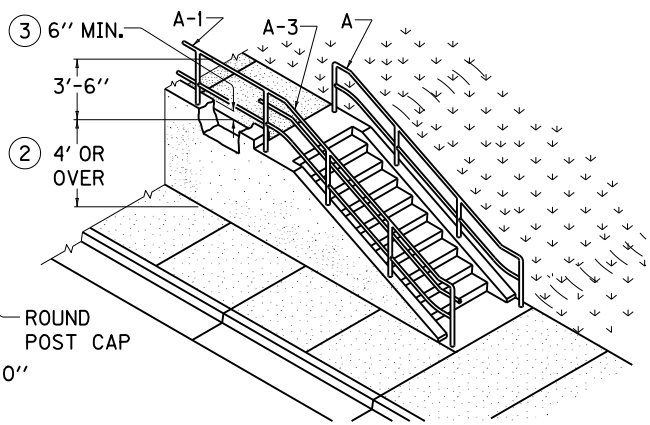
STANDARD DRAWING NO. RGX-020-13

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



ELEVATION OF HANDRAIL TYPE A-4



ISOMETRIC OF HANDRAIL TYPE A, A-1 AND A-2

HANDRAIL TYPE DESCRIPTION TABLE

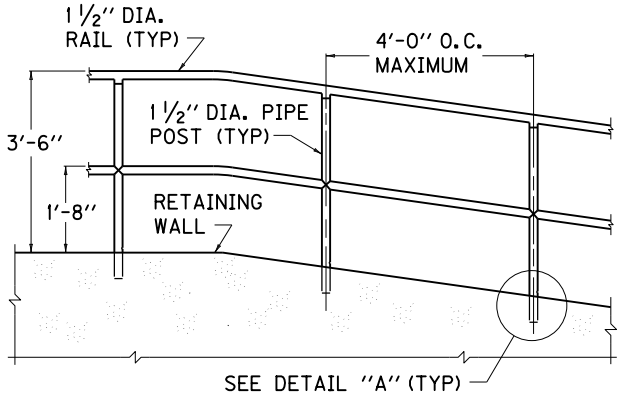
☆ TYPE	HEIGHT REQ'D.	FENCE REQ'D.	MAX. POST SPACING	NO. OF RAILS
A	2'-10"	NO	4'-0"	2
A-1	3'-6"	NO	4'-0"	2
A-2	3'-6"	YES	4'-0"	2
A-3	3'-6"	NO	4'-0"	3
A-4	3'-6"	YES	4'-0"	3

~ NOTES ~

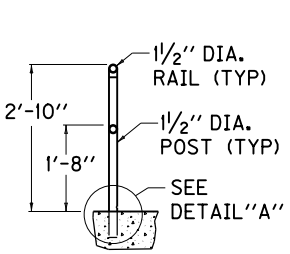
BID ITEM AND UNIT TO BID

HANDRAIL TYPE ☆ LF

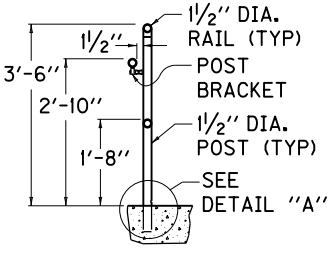
1. HANDRAIL SHALL BE REQUIRED WITH THREE OR MORE STEPS. HANDRAIL IS OPTIONAL WITH LESS THAN THREE STEPS.
2. HANDRAIL USED AS A TOP HANDRAIL ON STEPS AND HANDRAIL USED ON A RETAINING WALL SHALL BE REQUIRED WHEN THE ADJACENT FLOOR, GROUND LEVEL, ROAD, WALK, ETC. IS 4' OR MORE BELOW THE TOP OF THE RETAINING WALL.
3. THE TOP OF THE RETAINING WALL OR CURB SHALL BE A MIN. OF 6" ABOVE THE ADJOINING SIDEWALK.
4. A DISTANCE OF 1'-0" MIN. SHALL BE PARALLEL TO THE STEP RUNNER.
5. HANDRAIL WITH INTERNAL CONNECTIONS: HANDRAIL SHALL BE CONSTRUCTED OF 1 ½" SCHEDULE 40 ALUMINUM PIPE IN ACCORDANCE WITH ASTM B221 ALLOY 6063-T52 FOR RAIL AND ASTM B210 ALLOY 6063-T832 FOR POSTS. ~OR~ HANDRAIL WITH WELDED CONNECTIONS: HANDRAIL SHALL BE CONSTRUCTED OF 1 ½" SCHEDULE 40 ALUMINUM PIPE IN ACCORDANCE WITH ASTM B221 OR B210 ALLOY 6061-T6.
6. ANCHOR POST IN FORMED HOLES (SEE DETAIL "A"). FOR INSTALLATION PROCEDURES OF THE CHAIN LINK FENCE AS APPLICABLE SEE CUR. STD. DWG. RFC-001.
7. ALL INTERNAL CONNECTIONS SHALL BE MADE WITH AN EPOXY ADHESIVE (RECOMMENDED BY THE MANUFACTURE), STAINLESS STEEL MACHINE SCREWS WITH LOCK WASHERS, AND THREADED TUBULAR RIVETS IN ORDER TO PROVIDE A SMOOTH INSTALLATION. EXPANSION JOINTS SHALL BE PROVIDED APPROX. 20'-0" O.C.
8. SIDEWALK SLABS SHALL BE THICKENED TO 8"x8"x8" AT POST LOCATIONS.



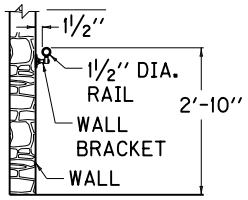
ELEVATION OF HANDRAIL TYPE A-1



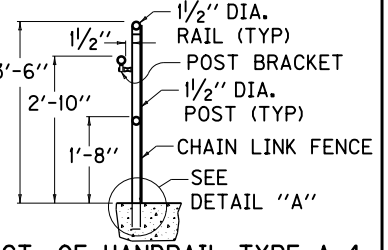
SECTION OF HANDRAIL TYPE A



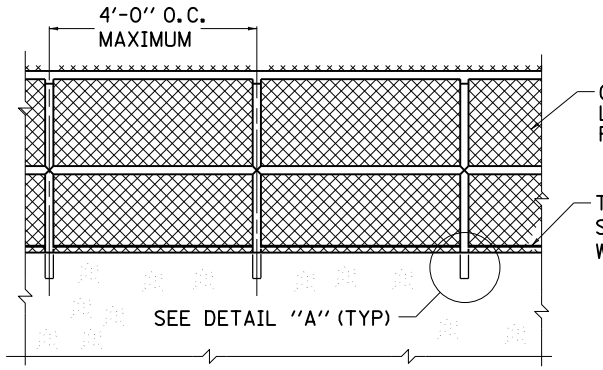
SECTION OF HANDRAIL TYPE A-3



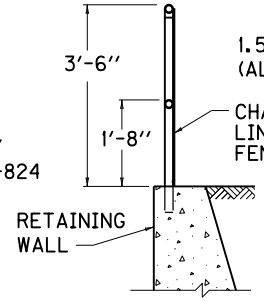
SECT. FOR WALL MOUNTED HANDRAIL



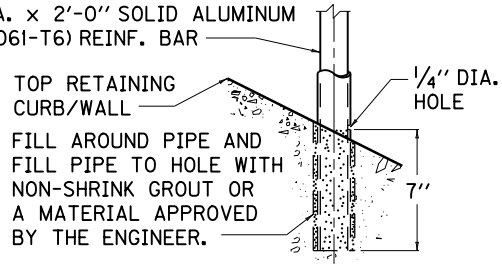
SECT. OF HANDRAIL TYPE A-4



ELEVATION OF HANDRAIL TYPE A-2



SECTION OF HANDRAIL TYPE A-2



DETAIL "A"

USE WITH CUR. STD. DWG. RFC-001

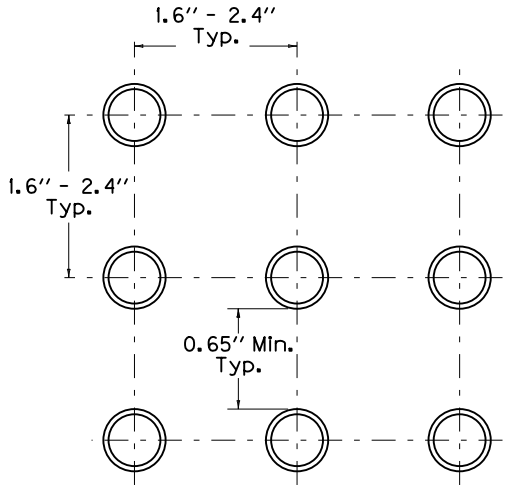
KENTUCKY DEPARTMENT OF HIGHWAYS

HANDRAIL TYPE A, A-1, A-2, A-3, A-4

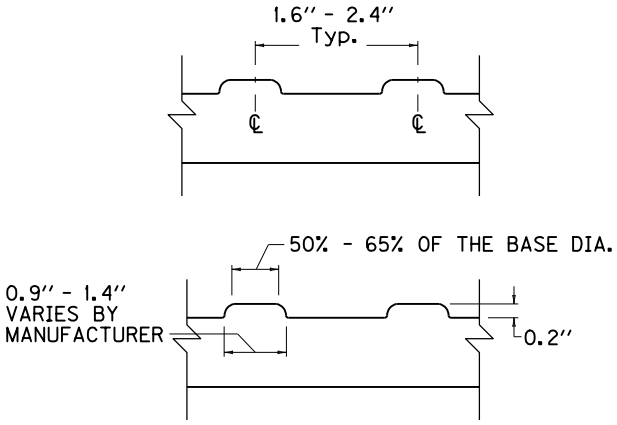
STANDARD DRAWING NO. RGX-030-07

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

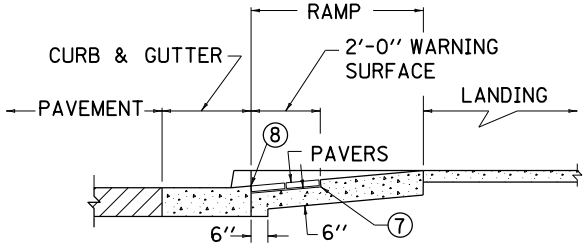
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



SQUARE PATTERN



CONCRETE PAVER PROFILE



TYPICAL CONCRETE
PAVER DETECTABLE
WARNING INSTALLATION

~ NOTES ~

BID ITEM AND UNIT TO BID.
DETECTABLE WARNINGS SF

1. LANDINGS WILL PROVIDE A LEVEL AREA (MAX. 2% GRADE OR CROSS SLOPE) AT APPROXIMATE STREET ELEVATION. A 4' SQUARE LEVEL LANDING IS THE REQUIRED MINIMUM. SEE NOTE 9 ON CUR. STD. DWG. RPM-170.
2. DETECTABLE WARNINGS SHALL BE INSTALLED USING CONCRETE PAVERS IN ACCORDANCE WITH THE CURRENT EDITION OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.
3. JOINTS AROUND PAVERS SHALL BE FILLED WITH DRY MORTAR. MORTAR SHALL BE BRUSHED IN WITH A COURSE BROOM. SAND WILL NOT BE ALLOWED.
4. COMMERCIAL DRIVEWAYS WITH TRAFFIC CONTROL DEVICES REQUIRE ADA SIDEWALK TREATMENTS WITH DETECTABLE WARNINGS.
5. CONCRETE PAVERS SHALL BE CONCRETE WITH A MINIMUM THICKNESS OF 2''.
6. CONCRETE PAVERS SHALL BE A COLOR HOMOGENOUS THROUGHOUT THE PAVER, THAT COLOR SHALL CONTRAST VISUALLY WITH THE ADJOINING SURFACES, EITHER LIGHT-ON-DARK OR DARK-ON-LIGHT. THE DEPARTMENT WILL ALLOW EITHER YELLOW OR RED AS COLORS.

⑦ CONCRETE PAVERS SHALL BE SET IN MORTAR.

⑧ DETECTABLE WARNING SURFACE BEGINS AT BACK OF CURB.

USE WITH CUR. STD. DWGS.
RPM-170, RPM-172

KENTUCKY
DEPARTMENT OF HIGHWAYS

DETECTABLE WARNINGS

STANDARD DRAWING NO. RGX-040-03

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

~ NOTES ~

BID ITEMS AND UNIT TO BID

RETAINING WALL-GABION	CUYD
STRUCTURE EXCAVATION	CUYD

SEE THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

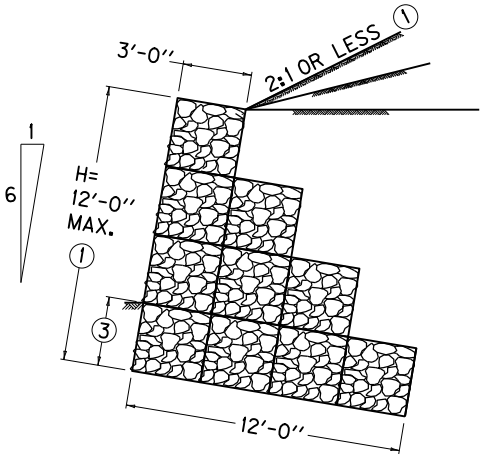
(1) THE GABION RETAINING WALL DEPICTED ON THIS DRAWING SHALL BE USED WHEN THE HEIGHT ("H" DIMENSION) OF THE WALL IS 12'-0" OR LESS AND THE BACKFILL SLOPE IS 2:1 OR LESS.

(2) LENGTH OF GABIONS MAY BE 6'-0", 9'-0" OR 12'-0" LONG WITH PARTITIONS 3'-0" ON CENTER.

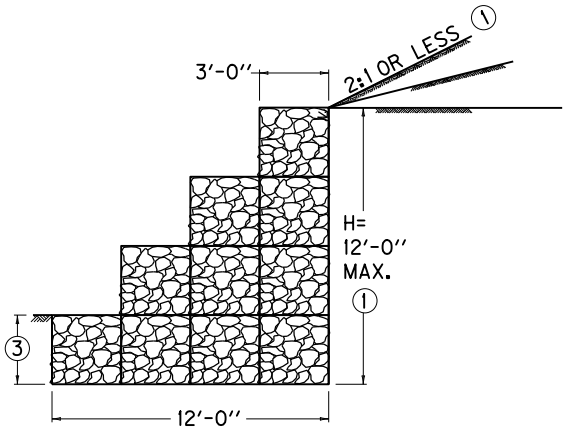
(3) 3'-0" MINIMUM EMBEDMENT.

(4) SPECIAL DESIGNS SHALL BE REQUIRED WHEN THE FOLLOWING CONDITIONS EXIST:

- (A) WALL HEIGHT IS GREATER THAN 12'-0".
- (B) WALL IS SURCHARGED WITH DEAD LOAD FILL SLOPES STEEPER THAN 2:1.
- (C) WALL IS SURCHARGED WITH A LIVE LOAD WITHIN THE LIMITS OF A 1:1 SLOPE EXTENDING FROM THE BASE OF THE WALL.



FRONT FACE 6:1 BATTER



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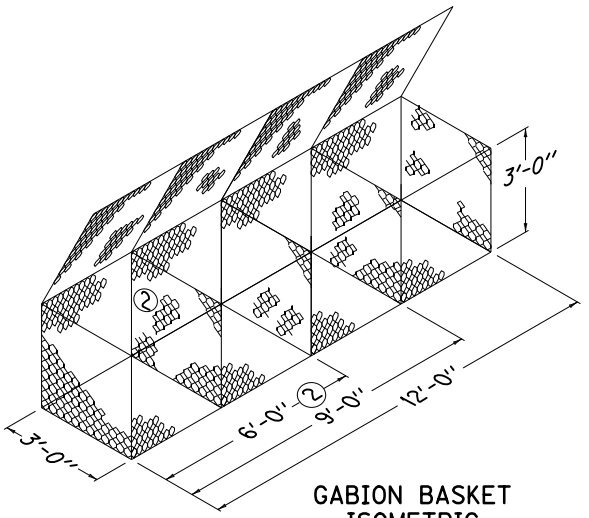
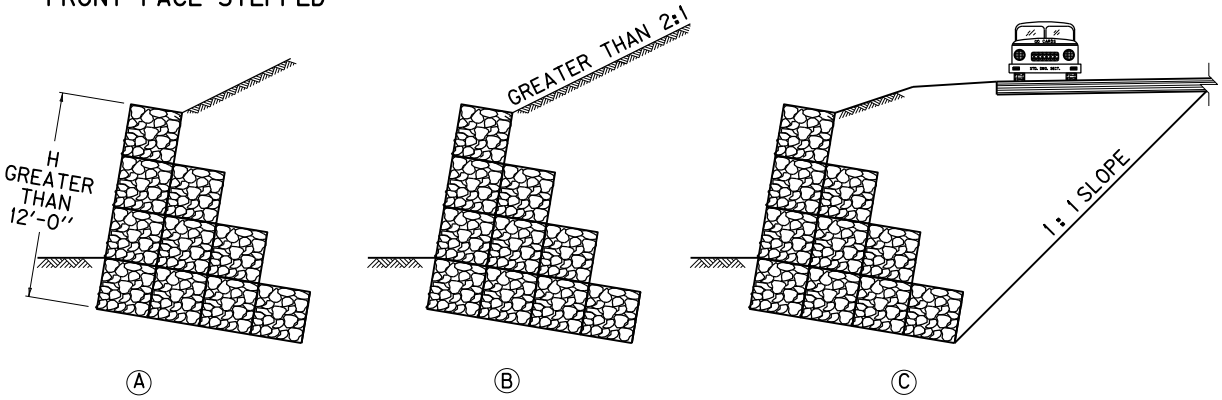


GABION BASKET
ISOMETRIC
VIEW



SPECIAL DESIGNS REQUIRED (4)

KENTUCKY
DEPARTMENT OF HIGHWAYS

GABION
RETAINING WALLS

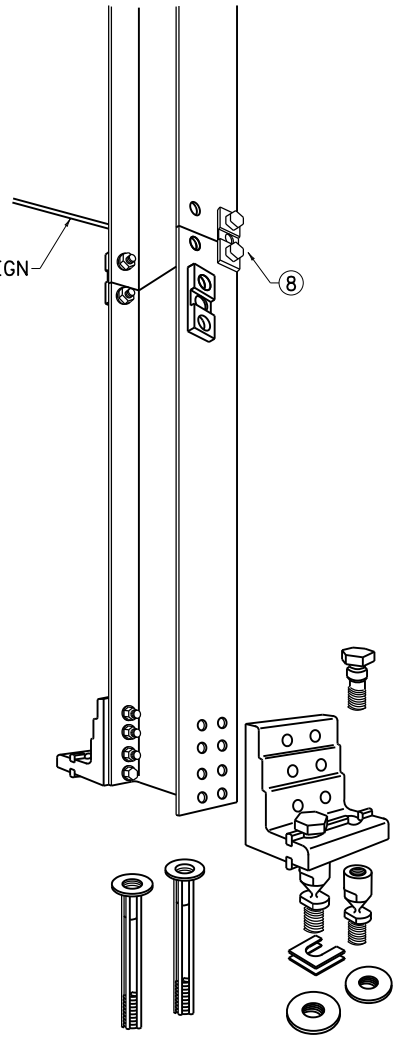
STANDARD DRAWING NO. RGX-050-02

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

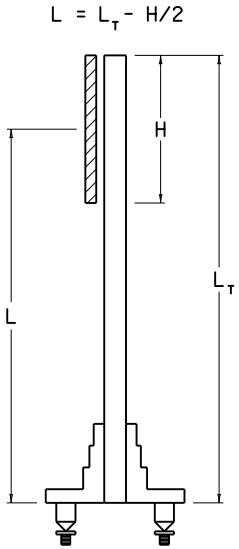
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE

~ NOTES ~

1. BREAKAWAY SIGN SUPPORT SYSTEM FOR TYPE C BEAM SHALL BE SELECTED FROM THE KENTUCKY DEPARTMENT OF HIGHWAYS APPROVED LIST FOR BREAKAWAY SIGN SUPPORT SYSTEMS OR AN APPROVED EQUAL. ACCEPTABLE ALTERNATE BREAKAWAY SIGN SUPPORT SYSTEMS SHALL BE APPROVED BY THE DIVISION OF HIGHWAY DESIGN AND FHWA PRIOR TO INSTALLATION.
2. SELECTION OF THE PROPER BRACKET NUMBER SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
3. ALL HARDWARE ITEMS SUPPLIED ARE AMERICAN STANDARD SIZES AND SHALL BE GALVANIZED AND CONFORM TO ASTM A153 OR ASTM B695.
4. FASTENERS, EXCEPT FOR SPECIAL BOLT AND COUPLINGS, ARE INSTALLED WITH LOCKWASHERS, AND DO NOT HAVE SPECIFIC TORQUE REQUIREMENTS. FASTENERS SHALL BE SECURED AS TIGHT AS POSSIBLE WITH CONVENTIONAL WRENCHES, UNLESS NOTED OTHERWISE.
5. SQUARE UP AND LEVEL INDIVIDUAL COMPONENTS, PARTICULARLY ANCHORS TO MINIMIZE THE NEED FOR SHIMMING BETWEEN THE COUPLINGS AND ANCHORS.
6. NO MORE THAN TWO SHIMS SHALL BE PLACED UNDER ANY ONE COUPLING. NO MORE THAN THREE SHIMS UNDERNEATH ANY PAIR OF COUPLINGS.
7. THE CONTRACTOR SHALL FURNISH TWO (2) COMPLETE SETS OF SHOP PLANS FOR APPROVAL BY THE ENGINEER A MINIMUM OF TWO WEEKS PRIOR TO INSTALLATION.
8. THE HINGE SHOULD BE AT LEAST 7'-0" ABOVE THE GROUND.
9. A SINGLE POST IF 7'-0" OR MORE FROM ANOTHER POST, SHALL HAVE A WEIGHT LESS THAN 45 LB./FT. TOTAL WEIGHT BELOW THE HINGE, BUT ABOVE THE SHEAR PLATE OF THE BREAKAWAY BASE, SHOULD NOT EXCEED 600 LB.
10. FOR TWO POSTS SPACED LESS THAN 7'-0" APART, EACH POST SHOULD HAVE A WEIGHT LESS THAN 18 LB./FT.
11. COUPLINGS SHALL NOT BE USED IN SIGN STRUCTURES WITH THREE SUPPORTS OR MORE IF POSTS ARE CLOSER THAN 7'-0" APART.
12. REFER TO CUR. STD. DWG. RGX-061 FOR FOOTING DETAILS.



~ PICTORIAL VIEW ~



~ ELEVATION VIEW ~

BRACKET SELECTION TABLE

I-BEAM POST SIZE	BRACKET NO. 1		BRACKET NO. 2		BRACKET NO. 3	
	MIN. "L"	MAX. "L"	MIN. "L"	MAX. "L"	MIN. "L"	MAX. "L"
6"	12'-0"	29'-0"	9'-0"	12'-0"	0	9'-0"
8"	14'-0"	29'-0"	10'-0"	14'-0"	0	10'-0"
10"	16'-0"	29'-0"	11'-0"	16'-0"	0	11'-0"
12"	18'-0"	29'-0"	13'-0"	18'-0"	0	13'-0"
14"	19'-0"	29'-0"	14'-0"	19'-0"	0	14'-0"
16"	21'-0"	29'-0"	15'-0"	21'-0"	0	15'-0"
18"	23'-0"	29'-0"	16'-0"	23'-0"	0	16'-0"
21"	25'-0"	29'-0"	18'-0"	25'-0"	0	18'-0"

USE WITH CUR. STD. DWG. RGX-061

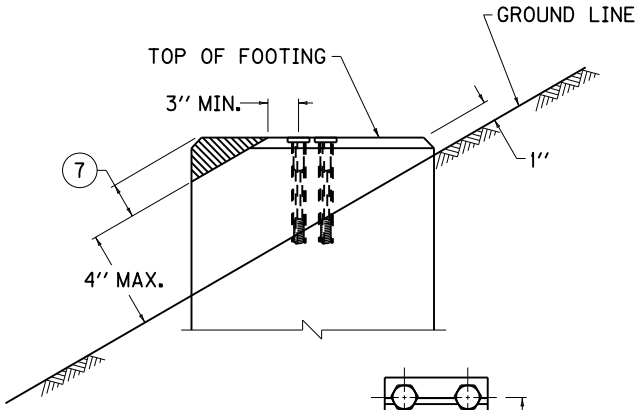
KENTUCKY DEPARTMENT OF HIGHWAYS

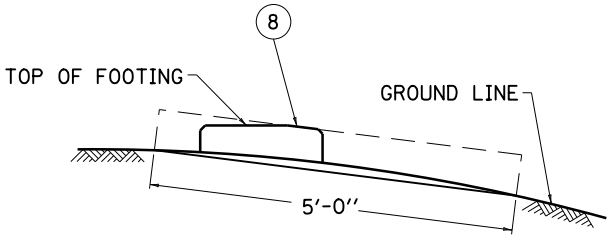
BREAKAWAY SIGN SUPPORT SYSTEM FOR TYPE C BEAM

STANDARD DRAWING NO. RGX-060-01

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



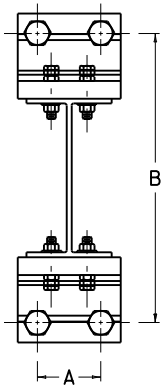


FOOTING SELECTION TABLE

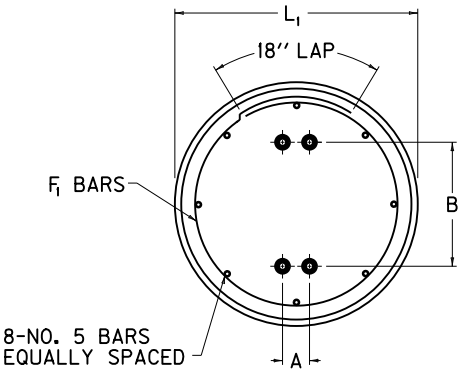
POST SIZE	L_1 DIA.	D_1 DEPTH	STEEL F_1 BARS QTY	STEEL F_1 BARS SIZE	REINF. LBS.	CONC. CU. YDS.
W6	2'-0''	5'-0''	5	#4	57	0.58
W8	2'-6''	7'-0''	7	#4	88	1.27
W10	3'-0''	8'-0''	8	#4	110	2.09
W12	3'-0''	8'-0''	8	#4	110	2.09
W14	3'-0''	9'-0''	9	#4	124	2.36
W16	3'-6''	9'-0''	9	#4	133	3.21
W18	3'-6''	9'-0''	9	#4	133	3.21
W21	4'-0''	9'-0''	9	#4	143	4.19

~ NOTES ~

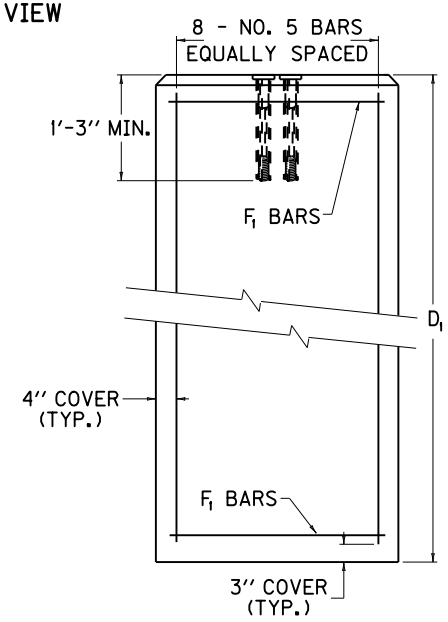
1. ENTER THE FOOTING SELECTION TABLE WITH THE REQUIRED POST SIZE AND FIND THE REQUIRED FOOTING VALUES AS SHOWN IN DETAILS.
2. THE ANCHOR SHALL BE 304 STAINLESS STEEL WITH 1053 STEEL ROD AND COIL.
3. FORM TOP 1'-0'' OF THE FOOTING.
4. USE CLASS ''A'' CONCRETE IN ALL FOOTINGS.
5. ACTUAL DIMENSIONS ''A'' & ''B'' SHOULD BE OBTAINED FROM THE MANUFACTURER OR MEASURED FROM THE ASSEMBLED BRACKETS PRIOR TO THE PLACEMENT OF ANCHORS.
6. TO INSURE PROPER SPACING AND ALIGNMENT OF ANCHORS, IT IS RECOMMENDED THAT ALL ANCHORS BE HELD IN PLACE BY A RIGID TEMPLATE WHILE THE CONCRETE IS PLACED AND CURED.
7. FOOTING PROJECTIONS ABOVE GROUND LINE SHALL BE MINIMIZED. THE MAXIMUM PERMISSIBLE FOOTING PROJECTION SHALL BE 4'' ON THE LOWER SLOPE SIDE. WHERE NECESSARY, THE SHADED AREA OF THE FOOTING SHALL BE REMOVED AND REINFORCEMENT SHALL BE BENT TO FIT.
8. THE TOP OF THE FOOTING SHALL NOT PROJECT MORE THAN 4'' ABOVE ANY 5'-0'' CHORD ALIGNED PERPENDICULARY TO THE EDGE OF THE ROADWAY BETWEEN A POINT ON THE GROUND SURFACE ON ONE SIDE OF THE SUPPORT TO A POINT ON THE GROUND SURFACE ON THE OTHER SIDE OF THE SUPPORT.



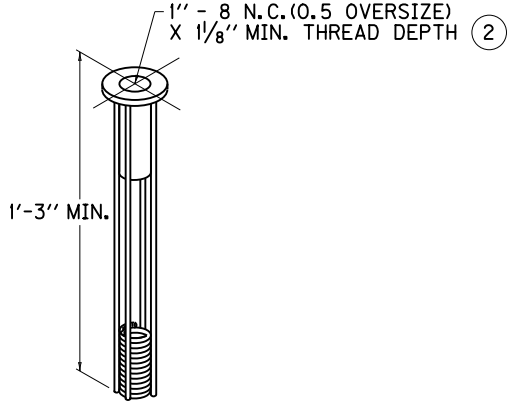
PLAN VIEW



TOP VIEW



SIDE VIEW



ANCHOR PICTORIAL VIEW

USE WITH CUR. STD. DWG.
RGX-060

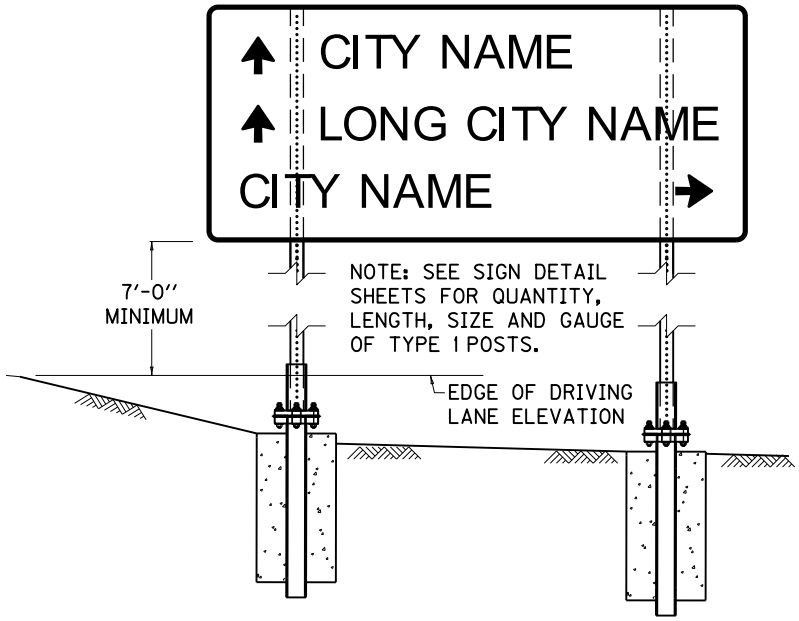
KENTUCKY
DEPARTMENT OF HIGHWAYS

FOOTING DETAILS
FOR
TYPE C BEAM

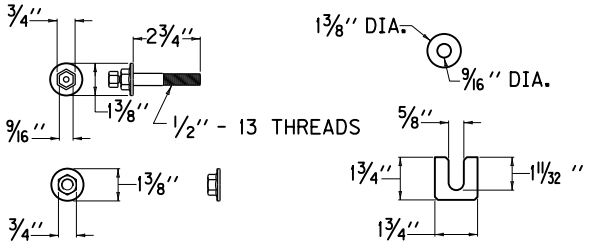
STANDARD DRAWING NO. RGX-061-01

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

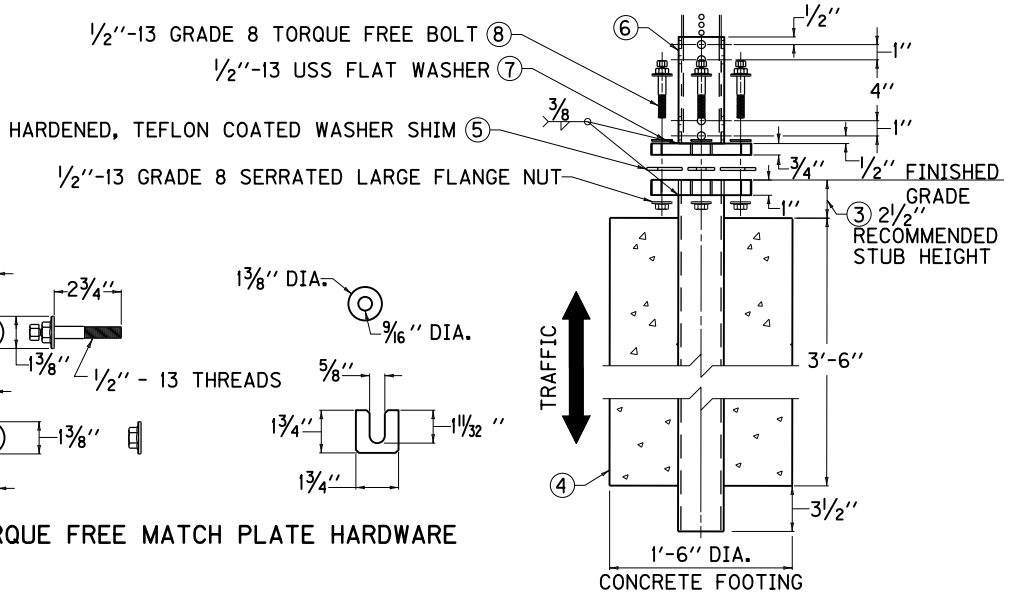
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



TYPICAL SHEETING SIGN BREAKAWAY SUPPORT INSTALLATION



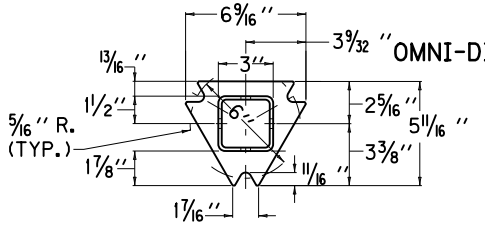
TORQUE FREE MATCH PLATE HARDWARE

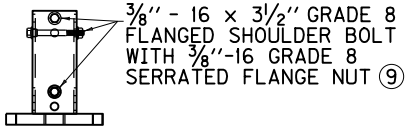


TYPE "D" SUPPORT
OMNI-DIRECTIONAL BREAK-A-WAY
FOR TYPE I POSTS

~ NOTES ~

1. AUGER AN 18" DIA. HOLE BY 42" DEEP AT THE PREDETERMINED LOCATION.
2. TAP THE BOTTOM OF THE 48" BASE STUB INTO THE SOIL IN THE BOTTOM OF THE HOLE WITH THE BASE PLUMB AND SQUARED UP WITH THE ROADWAY, MAKING SURE THE POINT OF THE PLATE IS FACING ONCOMING TRAFFIC. (THIS SERVES TO STABILIZE THE BASE WHILE POURING THE CONCRETE AS WELL AS TO ALLOW FOR WATER DRAINAGE BELOW THE CONCRETE FOOTING.)
3. DEPTH OF IMBEDMENT TO LEAVE 2 1/2" FROM THE GRADE TO THE TOP OF THE BASE.
4. ALLOW CONCRETE TO CURE AT LEAST 5 DAYS BEFORE ERECTING SIGN.
5. PLACE 1 EACH TEFLON COATED WASHER SHIM ON EACH OF THE 3 NOTCHED POINTS, WITH THE OPEN SIDE FACING TOWARDS THE CENTER OF THE TRIANGLE.
6. PLACE TOP POST RECIEVER SO THAT THE SIGN POST IS IN THE CORRECT POSITION FOR SIGN VISIBILITY, ON TO THE BASE AND WASHER SHIMS.
7. PLACE 1 EACH 1/2" WASHER ONTO TORQUE FREE BOLT AND PLACE IN EACH NOTCHED POINT OF THE TRIANGLE. PUSH EACH TEFLON COATED WASHER SHIM AGAINST THE SHANK OF EACH BOLT AND FINGER TIGHTEN 1/2" FLANGED LOCK NUT.
8. FULLY TIGHTEN, THEN LOOSEN, ALL THREE TORQUE FREE BOLTS USING THE LARGER 3/4" HEX HEAD. COMPLETE BY TIGHTENING EACH BOLT USING THE SMALLER 9/16" HEX HEAD UNTIL IT TWIST OFF.
   A. SECONDARY HEAD WILL TWIST OFF AT DESIRED TORQUE LEVEL TO MEET FEDERAL COMPLIANCE.
9. INSERT SIGN SUPPORT INTO THE TUBULAR PORTION OF THE TOP POST RECIEVER AND SECURE WITH 3 EACH 3/8"- 16 x 3 1/2" GRADE 8 FLANGED SHOULDER BOLTS AND FLANGED NUTS.
   A. WHERE HIGHER WINDLOAD IS DESIRED, INSERT THE NEXT SIZE SMALLER SQUARE POST INSIDE BOTTOM OF MAIN UPRIGHT POST.
   B. ON MULTI-LEG INSTALLATIONS, BE SURE THAT ALL ANCHORS ARE SQUARED AND LINED UP WITH EACH OTHER.
10. TYPE D BREAKAWAY SIGN SUPPORT SYSTEMS FOR THE TYPE I POSTS SHALL BE SELECTED FROM THE KENTUCKY DEPARTMENT OF HIGHWAYS APPROVED MATERIALS LIST. OR AN APPROVED EQUAL. ACCEPTABLE ALTERNATES SHALL BE APPROVED BY THE DIVISION OF HIGHWAY DESIGN AND FHWA, PRIOR TO INSTALLATION.

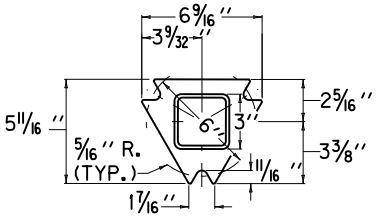




MATERIALS: TUBE RECEIVER - 3" x 3" x 7 GA. ASTM A500
ASTM A500 GRADE B TUBE PLATE - ASTM A572 GRADE 50

TOP POST RECEIVER / FOR 2 1/2" SQUARE POST

2 1/4" x 12 GA. MAYBE INSERTED INTO
2 1/2" X 12 GA. FOR ADDITIONAL WINDLOAD



BOTTOM BASE CONCRETE STUB (2)

MATERIALS: TUBE - 3"X 3" X 7 GA. ASTM A500
GRADE B TUBE PLATE - ASTM A572 GRADE 50

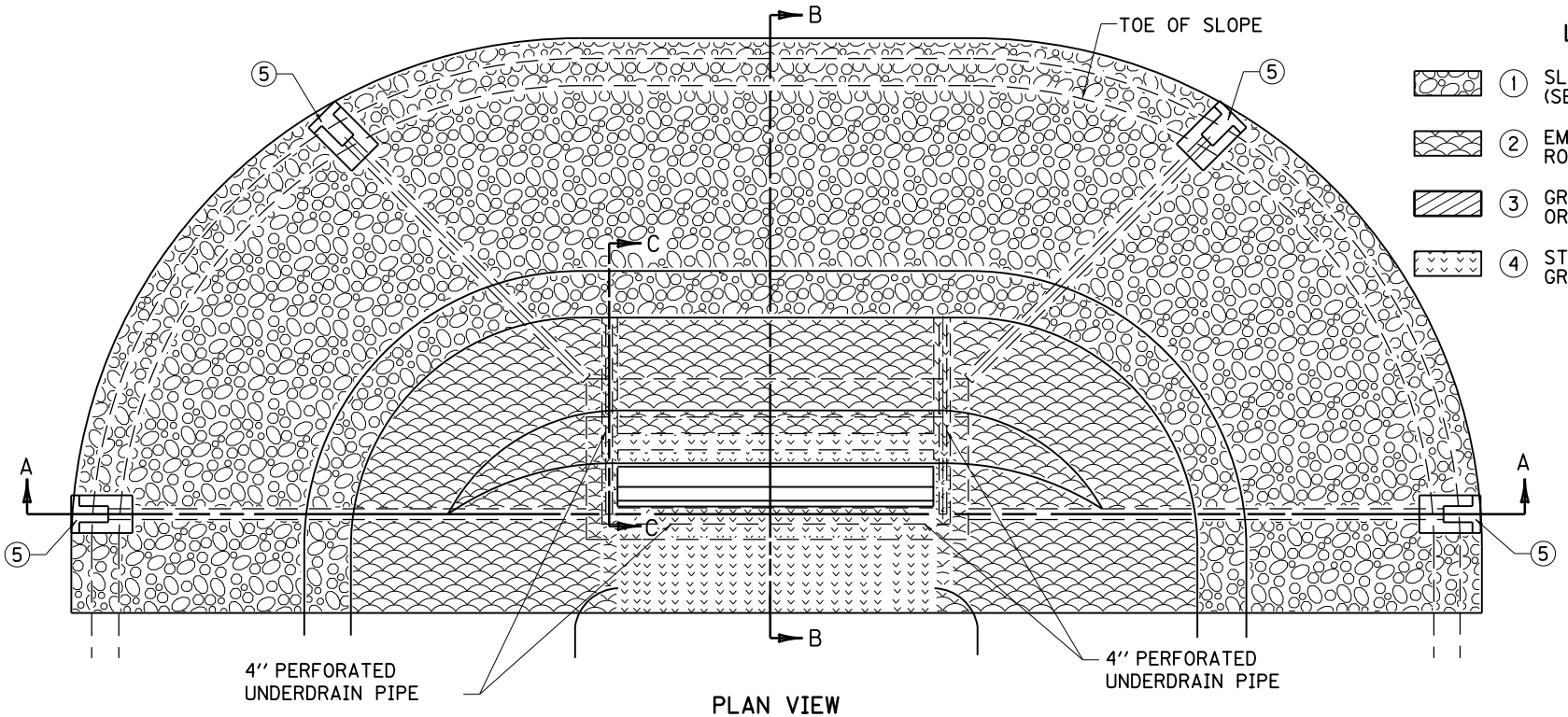
KENTUCKY
DEPARTMENT OF HIGHWAYS

TYPE D BREAKAWAY
SIGN SUPPORT

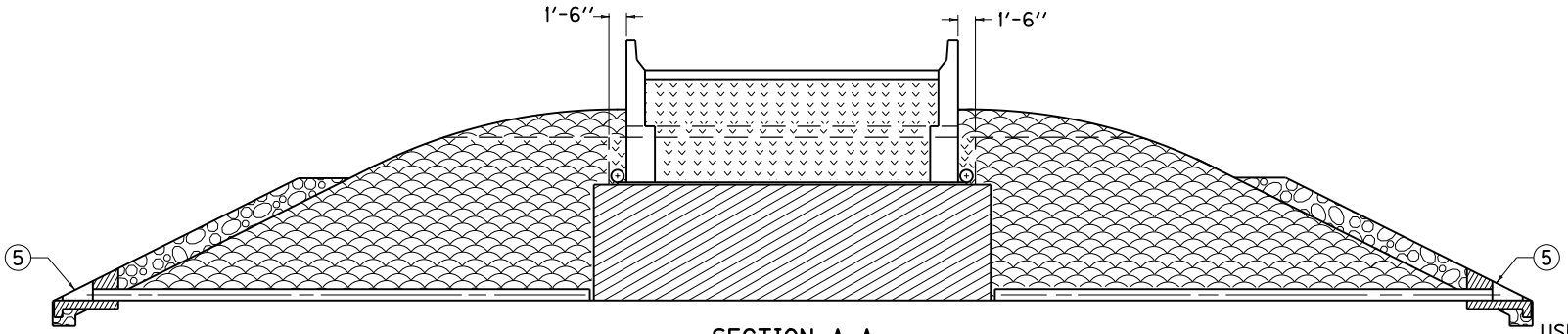
STANDARD DRAWING NO. RGX-065-02

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 12-01-15 DATE



PLAN VIEW



SECTION A-A

LEGEND

1. SLOPE PROTECTION (SEE BRIDGE PLANS)
2. EMBANKMENT (GRANULAR, ROCK OR SOIL PER PLANS)
3. GRANULAR PILE CORE OR COHESIVE PILE CORE
4. STRUCTURE GRANULAR BACKFILL

USE WITH CUR. STD. DWGS.
RDP-010, RGX-105

~ NOTES ~

THE PURPOSE OF THIS DRAWING AND CUR. STD. DWG. RGX-105 IS TO DEFINE THE LIMITS OF THE FOUR MATERIALS SHOWN. FOR SIMPLICITY PURPOSES, AN END-BENT ON A ZERO DEGREE SKEW IS SHOWN. THE SAME PRINCIPLES WOULD APPLY FOR MORE VARIED STRUCTURES.

(1) SLOPE PROTECTION REQUIRED WHEN AND AS NOTED ON THE BRIDGE PLANS.
(2) GRANULAR OR ROCK EMBANKMENT REQUIRED WHEN AND AS NOTED ON THE ROADWAY PLANS.
(3) GRANULAR PILE CORE REQUIRED WITH GRANULAR OR ROCK EMBANKMENT. COHESIVE PILE CORE REQUIRED WITH DRILLED SHAFTS AND PRE-DRILLED PILES.
(4) STRUCTURE GRANULAR BACKFILL REQUIRED AT ALL TIMES.
(5) 8" PERFORATED UNDERDRAIN PIPE. FOR HEADWALL CONSTRUCTION SEE CUR. STD. DWG RDP-010.

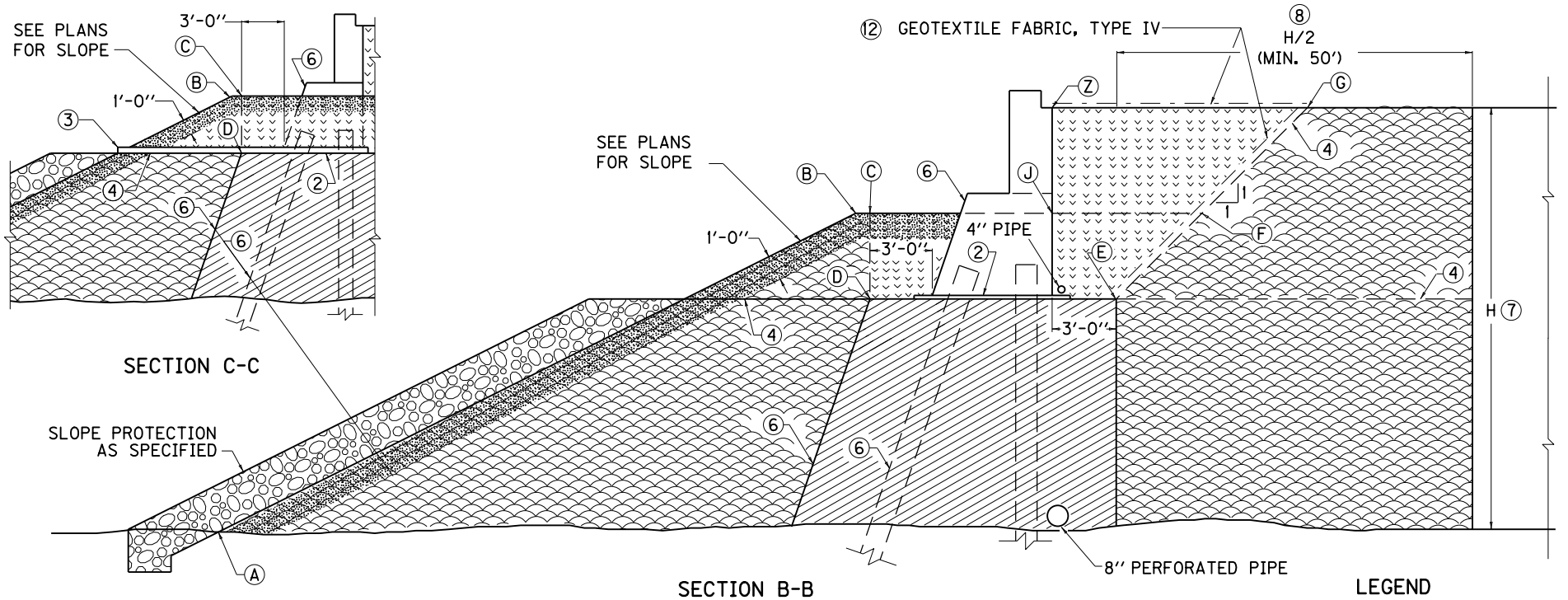
KENTUCKY
DEPARTMENT OF HIGHWAYS

TREATMENT OF EMBANKMENTS AT END-BENTS

STANDARD DRAWING NO. RGX-100-06

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



BID ITEMS AND UNIT TO BID	
PERFORATED PIPE-4 IN	LF
PERFORATED PIPE-8 IN	LF
GRANULAR EMBANKMENT	CUYD
COHESIVE PILE CORE	CUYD
GRANULAR PILE CORE	CUYD
STRUCTURE GRANULAR BACKFILL	CUYD
FABRIC-GEOTEXTILE TYPE IV	SQYD

CONSTRUCTION SEQUENCE "A"

1. CONSTRUCT EMBANKMENT TO SLOPES A, B, F, AND G SUCH THAT NO UNCOMPACTED OR LOOSE MATERIAL SHALL REMAIN.
2. EXCAVATE FOR END-BENT TO C, D, E, AND F.
3. INSTALL PILES (OR OTHER FOUNDATION).
4. PLACE 2" MORTAR BED OR ANY CLASS CONCRETE.
5. CONSTRUCT CONCRETE END-BENT.
6. INSTALL 4" PERFORATED UNDERDRAIN PIPE AND BACKFILL.
7. BACKFILL TO C, D, E, F, G, Z, AND J.

① CONSTRUCTION SEQUENCE "B"

1. CONSTRUCT EMBANKMENT TO TEMPORARY SLOPE ④.
2. INSTALL PILES (OR OTHER FOUNDATION).
3. PLACE 2" MORTAR BED OR ANY CLASS CONCRETE.
4. CONSTRUCT CONCRETE END-BENT.
5. INSTALL 4" PERFORATED UNDERDRAIN PIPE AND BACKFILL.
6. BACKFILL TO FINISHED GRADE.

~ NOTES ~

① CONSTRUCTION SEQUENCE "B" IS A PERMITTED ALTERNATE ONLY WHEN GRANULAR OR ROCK EMBANKMENT IS REQUIRED.

② 2" MORTAR BED OR ANY CLASS CONCRETE.

③ 4" PERFORATED UNDERDRAIN PIPE WRAPPED WITH GEOTEXTILE FABRIC FOR DRAINING THE EXCAVATED TRENCH AND STRUCTURE GRANULAR BACKFILL.

④ ACCEPTABLE ALTERNATE FOR TEMPORARY SLOPE (CONSTRUCTION SEQUENCE "B").

5. SHADED PORTIONS ▨ AND ▨ REPRESENT LIMITS OF NON-ERODIBLE GRANULAR EMBANKMENT.

⑥ SLOPES ARE EQUAL.

⑦ "H" = EMBANKMENT HEIGHT MEASURED FROM SUBGRADE ELEVATION AT POINT Ⓩ TO THE LOWEST ELEVATION AT THE TOE OF THE SLOPE.

⑧ LIMITS OF EMBANKMENT CONSTRUCTION (H/2 OR 50' MIN.) REQUIRING 2' MAX LIFT THICKNESS.

9. SEE CURRENT SPECIAL PROVISION NO. 69 FOR CONSTRUCTION AND MATERIAL REQUIREMENTS, METHOD OF MEASUREMEMT AND BASIS OF PAYMENT.
10. STRUCTURE GRANULAR BACKFILL PLACED AS A COMPLETE SEPARATE OPERATION AFTER CONSTRUCTION OF ALL OTHER EMBANKMENT.
11. *NO INDIVIDUAL FRAGMENTS LARGER THAN 4 INCHES IN ANY DIMENSION PERMITTED WITHIN 3'-0" OF THE STRUCTURE.*

⑫ PLACE GEOTEXTILE FABRIC, TYPE IV PRIOR TO PLACING STRUCTURE GRANULAR BACKFILL (WITH SOIL EMBANKMENT ONLY) AND AGGREGATE BASE COURSE (WITH ALL EMBANKMENT MATERIALS).

LEGEND

- SLOPE PROTECTION (SEE BRIDGE PLANS)
- GRANULAR PILE CORE OR COHESIVE PILE CORE
- STRUCTURE GRANULAR BACKFILL
- EMBANKMENT (GRANULAR, ROCK OR SOIL PER PLANS)

USE WITH CUR. STD. DWG. RGX-100

KENTUCKY DEPARTMENT OF HIGHWAYS

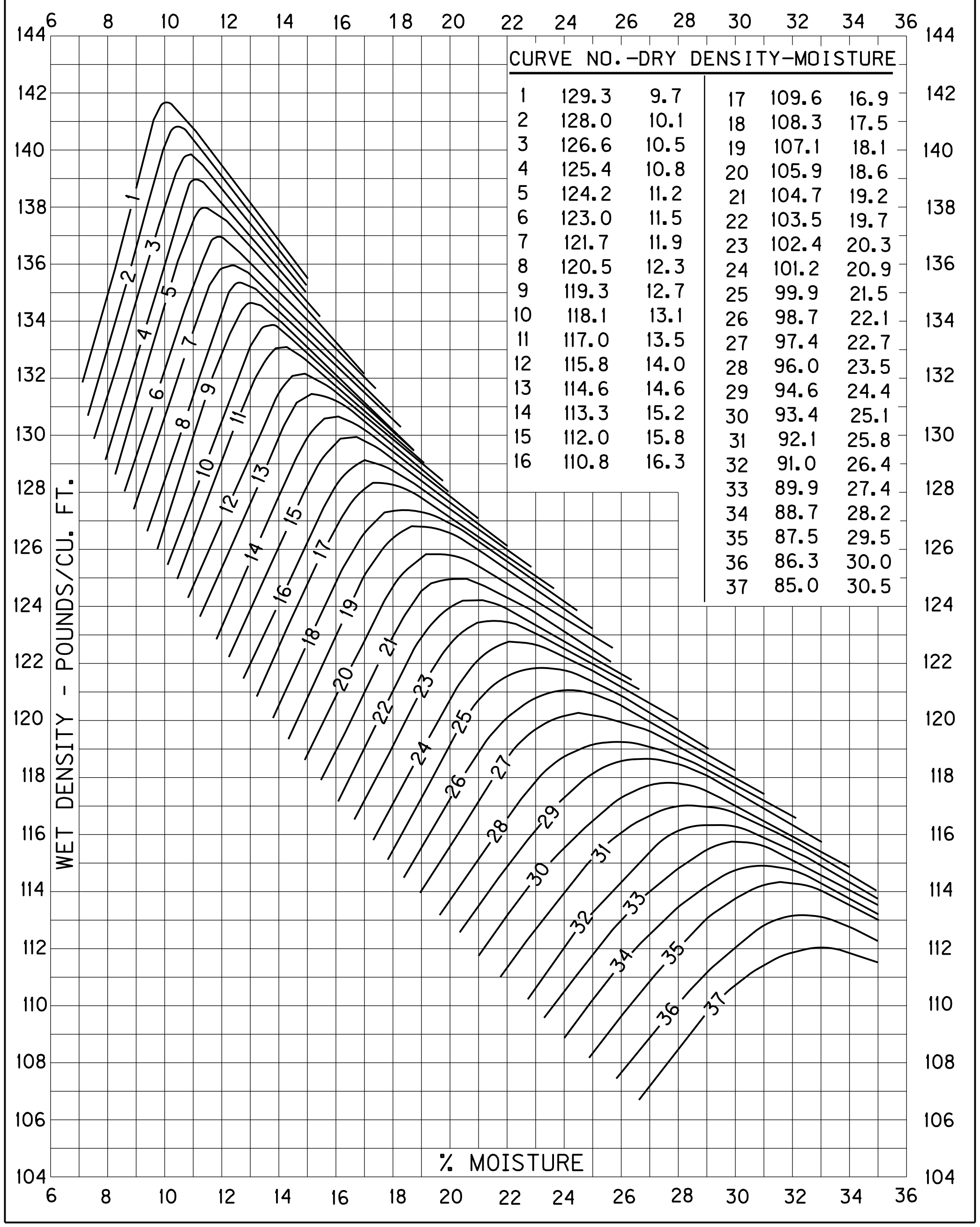
TREATMENT OF EMBANKMENTS AT END-BENTS - DETAILS

STANDARD DRAWING NO. RGX-105-08

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

MOISTURE DENSITY FAMILY OF CURVES



CURVE NO.-DRY DENSITY-MOISTURE

CURVE NO.	DRY DENSITY	MOISTURE
1	129.3	9.7
2	128.0	10.1
3	126.6	10.5
4	125.4	10.8
5	124.2	11.2
6	123.0	11.5
7	121.7	11.9
8	120.5	12.3
9	119.3	12.7
10	118.1	13.1
11	117.0	13.5
12	115.8	14.0
13	114.6	14.6
14	113.3	15.2
15	112.0	15.8
16	110.8	16.3
17	109.6	16.9
18	108.3	17.5
19	107.1	18.1
20	105.9	18.6
21	104.7	19.2
22	103.5	19.7
23	102.4	20.3
24	101.2	20.9
25	99.9	21.5
26	98.7	22.1
27	97.4	22.7
28	96.0	23.5
29	94.6	24.4
30	93.4	25.1
31	92.1	25.8
32	91.0	26.4
33	89.9	27.4
34	88.7	28.2
35	87.5	29.5
36	86.3	30.0
37	85.0	30.5

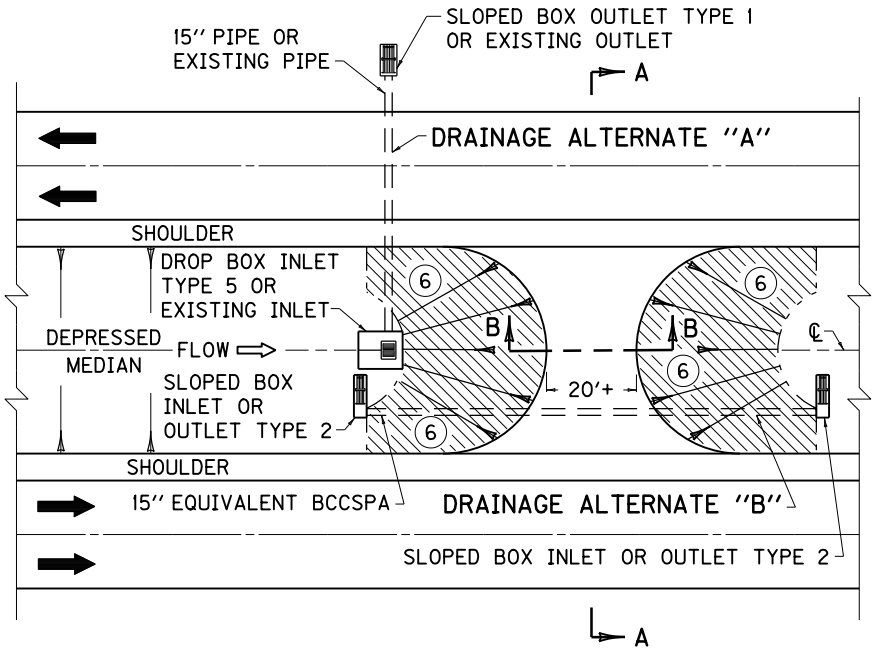
KENTUCKY
DEPARTMENT OF HIGHWAYS

ONE POINT PROCTER FAMILY OF CURVES

STANDARD DRAWING NO. RGX-200-01

SUBMITTED ______ DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED ______ STATE HIGHWAY ENGINEER — 12-01-15 DATE



PLAN VIEW

~ NOTES ~

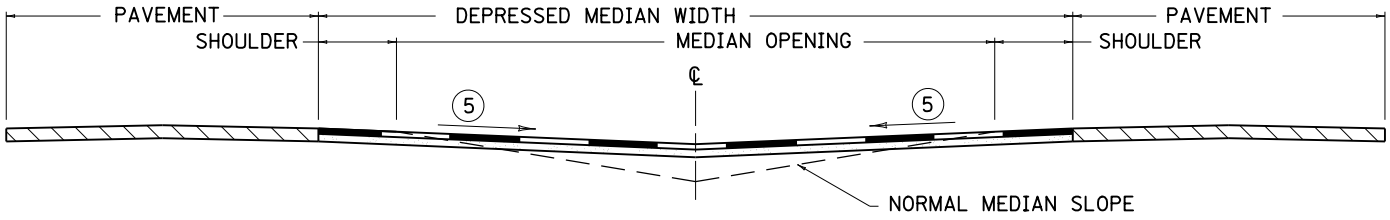
THE ITEMS BELOW SHALL BE INCLUDED IN THE GENERAL, PAVING, AND DRAINAGE SUMMARIES AS APPLICABLE:

1. EARTHWORK - EXCAVATION OR BORROW.
2. PAVING - SAME AS MAINLINE SHOULDER DESIGN.
3. DRAINAGE ALTERNATE ''A'' - USE WHEN MEDIAN OPENING CAN BE LOCATED NEAR PROPOSED OR EXISTING DRAINAGE. MODIFY EXISTING INLET AND OUTLET IF NECESSARY.
4. DRAINAGE ALTERNATE ''B'' - USE WHEN ALTERNATE ''A'' IS NOT POSSIBLE, ESPECIALLY TO PREVENT TUNNELING OR CUTTING EXISTING MAINLINE PAVEMENT. ESTABLISH FLOW LINE AT CORRESPONDING MEDIAN DITCH ELEVATION AND WRAP SLOPES TO FIT BOXES.

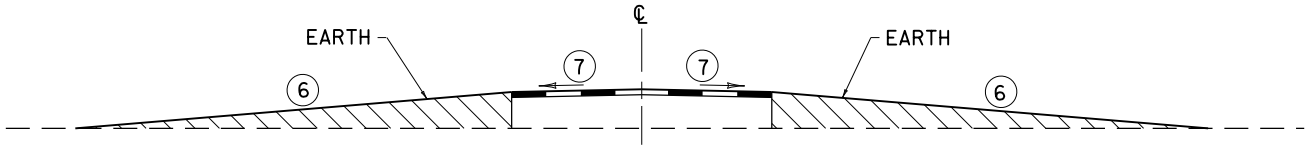
(5) 4% MINIMUM

(6) 12:1 SLOPES OR FLATTER

(7) PAVEMENT CROSS SLOPE = 2%



SECTION A-A



SECTION B-B

THIS DRAWING TO BE USED ONLY FOR FULL CONTROL OF ACCESS PROJECTS WITH DEPRESSED MEDIANS.

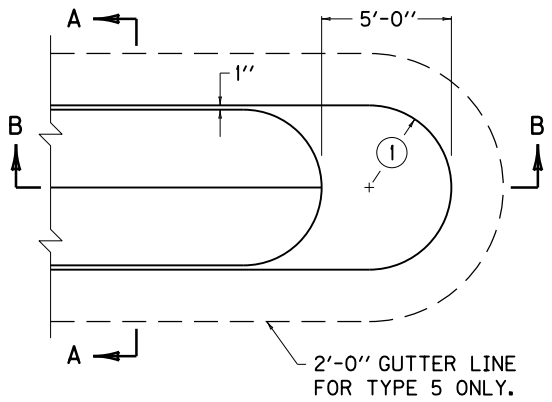
KENTUCKY
DEPARTMENT OF HIGHWAYS

PERMANENT U-TURN MEDIAN OPENING

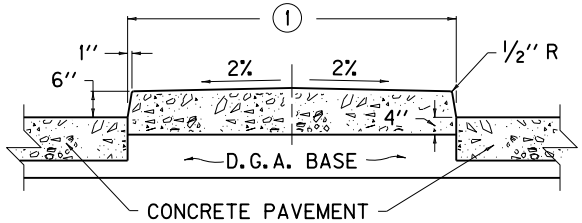
STANDARD DRAWING NO. RPM-001-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

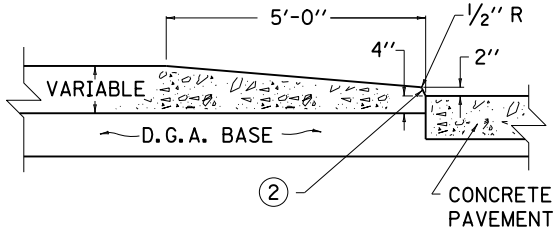
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



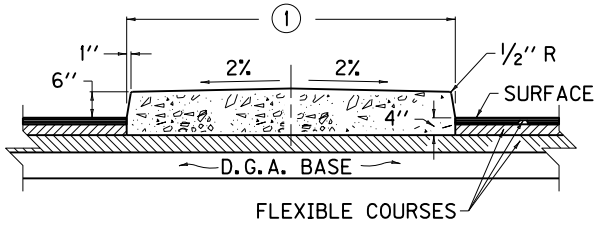
PLAN VIEW
BARRIER MEDIAN



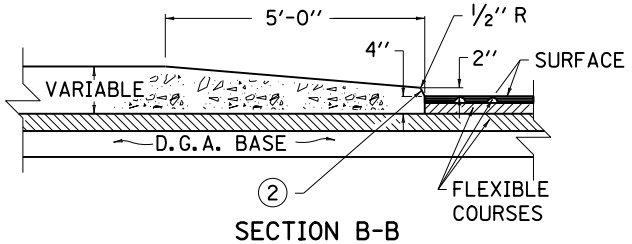
SECTION A-A



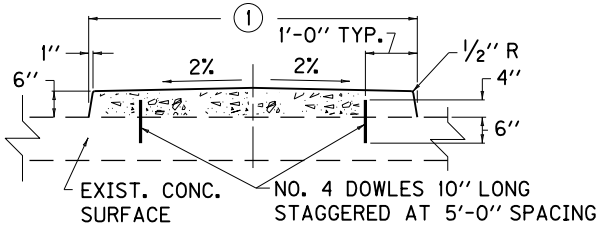
SECTION B-B
BARRIER MEDIAN
WITH RIGID PAVEMENT
(TYPE 1)



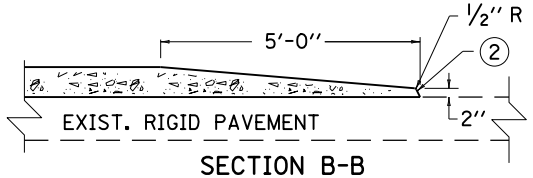
SECTION A-A



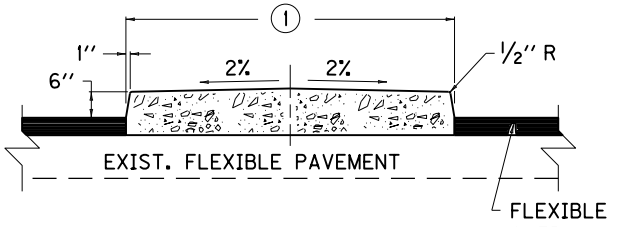
SECTION B-B
BARRIER MEDIAN
WITH FLEXIBLE PAVEMENT
(TYPE 2)



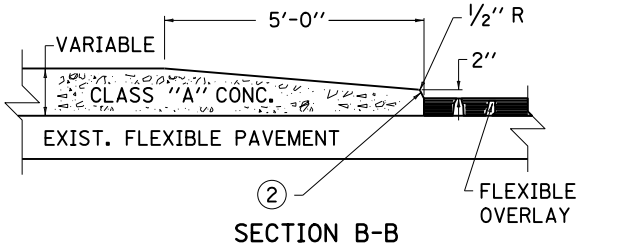
SECTION A-A



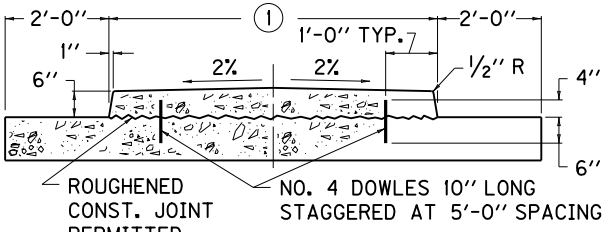
SECTION B-B
BARRIER MEDIAN
ON EXISTING RIGID PAVEMENT
(TYPE 3)



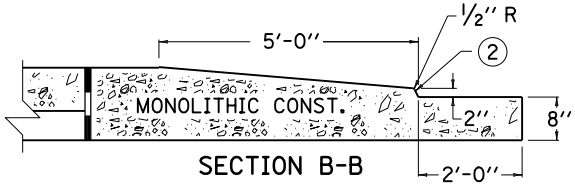
SECTION A-A



SECTION B-B
BARRIER MEDIAN
ON EXISTING FLEXIBLE PAVEMENT
(TYPE 4)



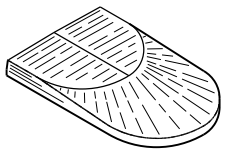
SECTION A-A



SECTION B-B
BARRIER MEDIAN
WITH FLEXIBLE PAVEMENT
(TYPE 5)

~ NOTES ~

(1) SEE PLANS FOR CONSTANT OR VARIABLE WIDTH DIMENSIONS.
(2) SLOPE TO CONFORM TO SIDE SLOPES.
3. ALL BARRIER MEDIANS SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE.
BID ITEM AND UNIT TO BID
STANDARD BARRIER MEDIAN TYPE ☆ SQYD
☆ = 1 OR 2 OR 3 OR 4 OR 5.



ISOMETRIC VIEW
(NOSE)

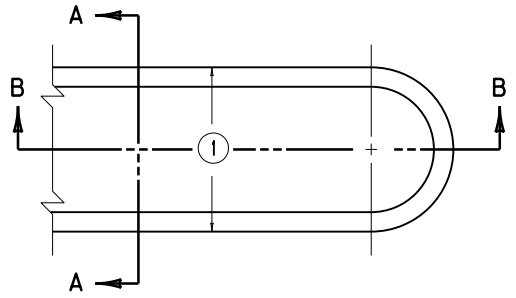
KENTUCKY
DEPARTMENT OF HIGHWAYS

STANDARD
BARRIER MEDIAN

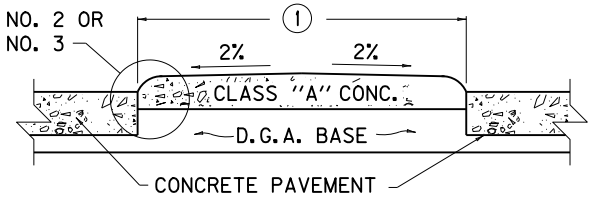
STANDARD DRAWING NO. RPM-010-06

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

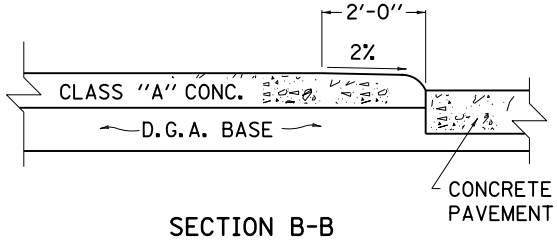
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW
MOUNTABLE MEDIAN



SECTION A-A



SECTION B-B
MOUNTABLE MEDIAN
WITH RIGID PAVEMENT
(TYPE 1 & TYPE 1A)

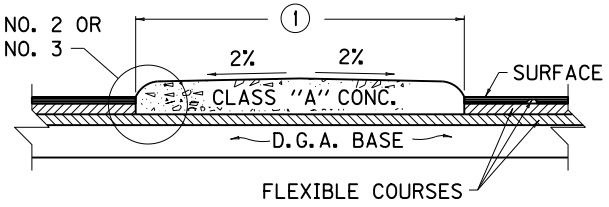
~ NOTES ~

1. SEE PLANS FOR CONSTANT OR VARIABLE WIDTH DIMENSIONS.
2. DEPTH OF CONCRETE SHALL BE SHOWN ELSEWHERE ON THE PLANS, (MIN. OF 6").

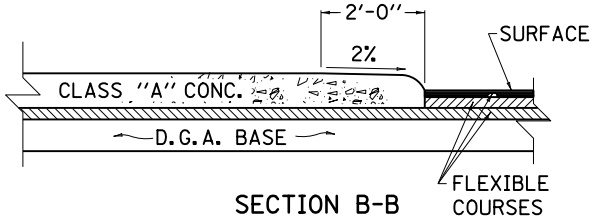
BID ITEM AND UNIT TO BID

MOUNTABLE MEDIAN TYPE ☆ SQYD

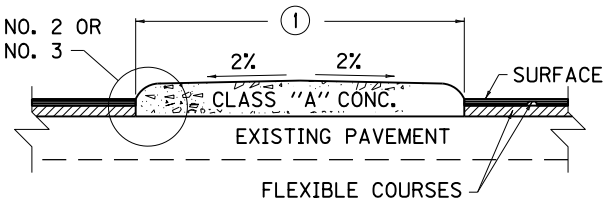
☆ = 1 OR 1A OR 2 OR 2A OR 3 OR 3A OR 4 OR 5.
(THE LETTER "A" DENOTES LIP CURB, NO. 3)



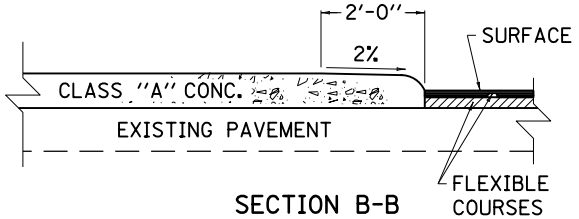
SECTION A-A



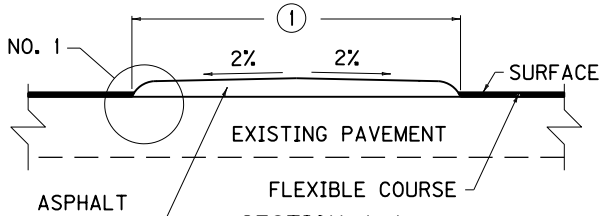
SECTION B-B
MOUNTABLE MEDIAN
WITH FLEXIBLE PAVEMENT
(TYPE 2 & TYPE 2A)



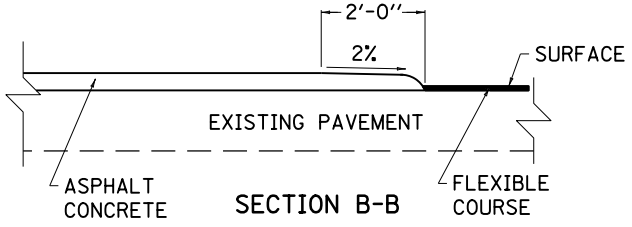
SECTION A-A



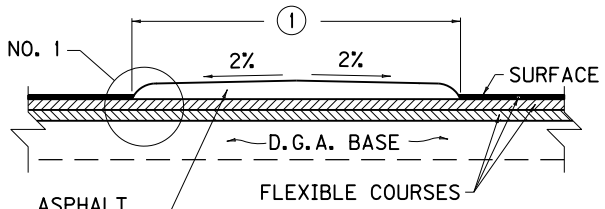
SECTION B-B
MOUNTABLE MEDIAN
ON EXISTING PAVEMENT
(TYPE 3 & TYPE 3A)



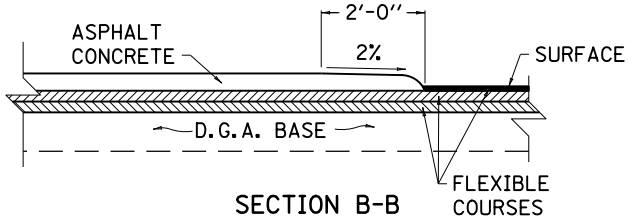
SECTION A-A



SECTION B-B
MOUNTABLE MEDIAN
ON EXISTING PAVEMENT
(TYPE 4)

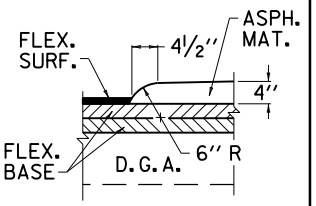


SECTION A-A

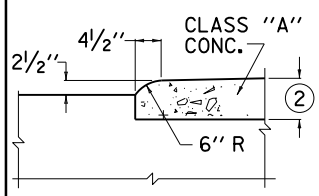


SECTION B-B
MOUNTABLE MEDIAN
WITH FLEXIBLE PAVEMENT
(TYPE 5)

NO. 1



NO. 2



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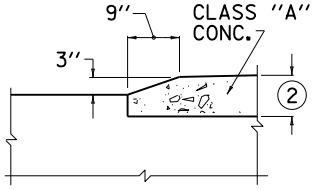


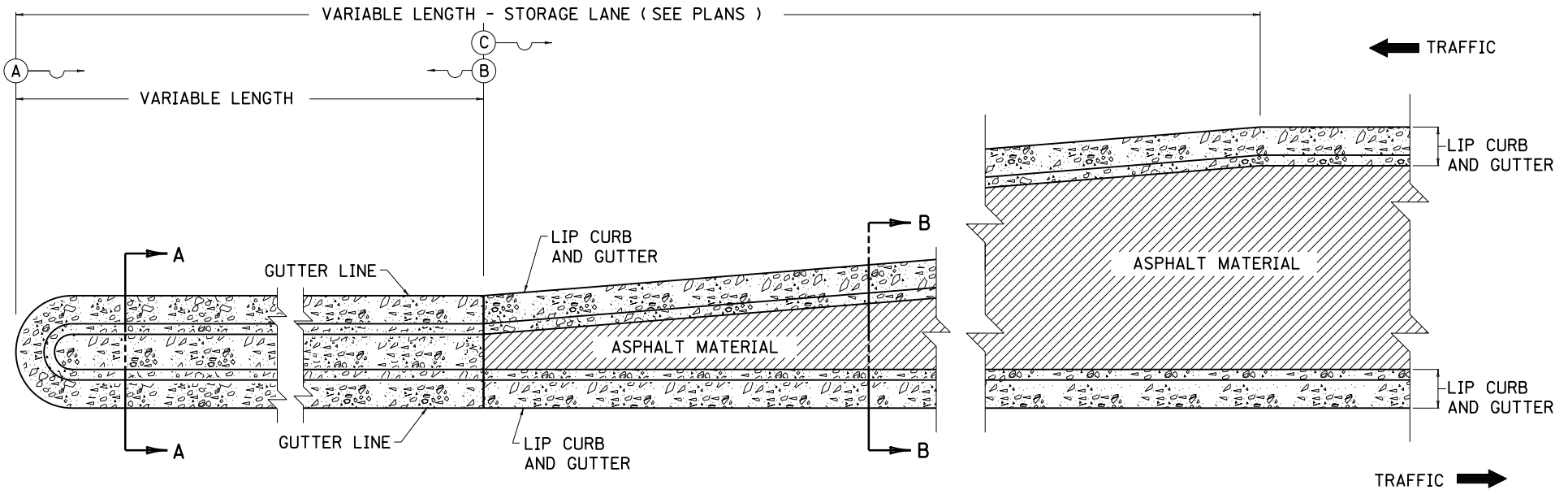
KENTUCKY
DEPARTMENT OF HIGHWAYS

MOUNTABLE
MEDIAN

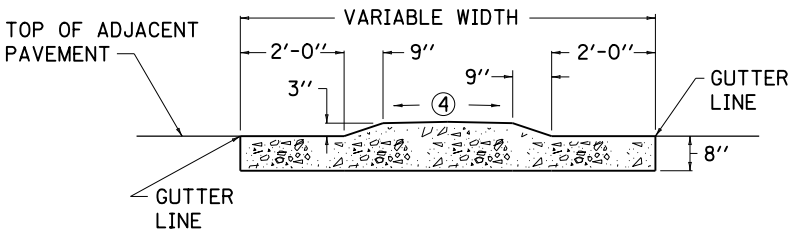
STANDARD DRAWING NO. RPM-011-06

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

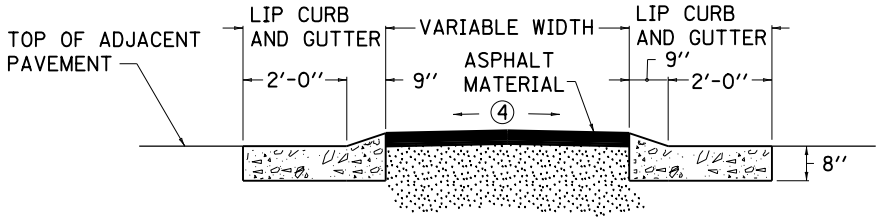
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW



SECTION A-A



SECTION B-B

~ NOTES ~

BID ITEMS AND UNIT TO BID
MOUNTABLE MEDIAN TYPE 6A SQYD
LIP CURB AND GUTTER LF

1. THE BID ITEM PER SQ. YD. BETWEEN POINTS (A) AND (B) SHALL BE "MOUNTABLE MEDIAN TYPE 6A".
2. THE VARIABLE LENGTH MOUNTABLE MEDIAN BETWEEN POINTS (A) AND (B) SHALL MEET THE CURRENT REQUIRMENTS OF STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.
3. CURB AND GUTTER TERMINATES AT POINT (C) (SEE PLANS).

(4) CROSS SLOPE OF 2% ON TANGENTS AND PARALLEL PAVEMENT CROSS SLOPE ON SUPERELEVATED SECTIONS.

USE WITH CUR. STD. DWG.
RPM-100

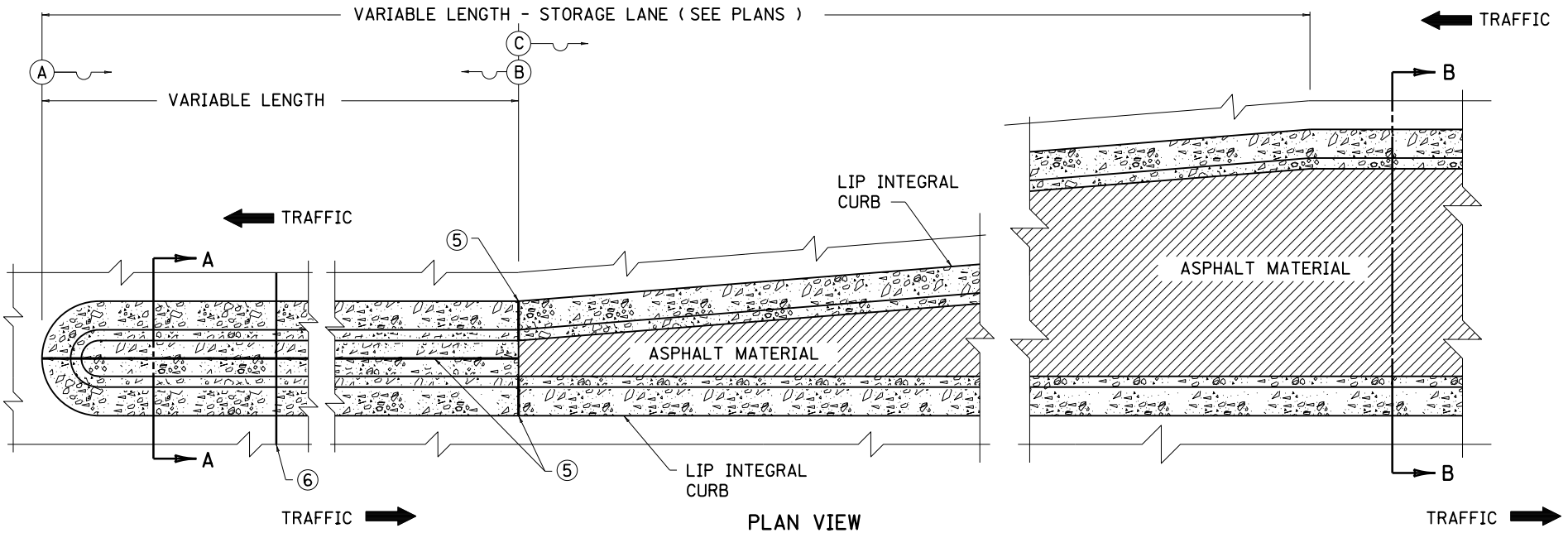
KENTUCKY
DEPARTMENT OF HIGHWAYS

MOUNTABLE MEDIAN TYPE 6A

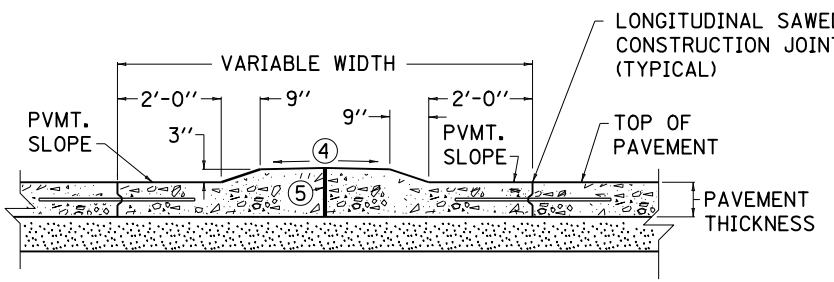
STANDARD DRAWING NO. RPM-012-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

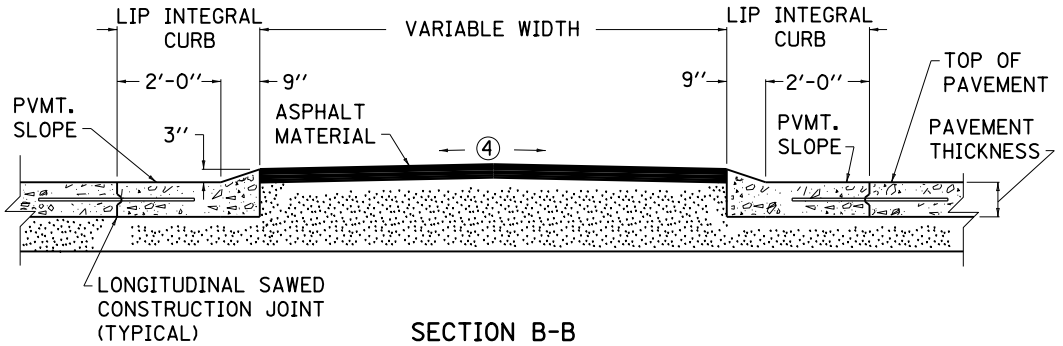
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW



SECTION A-A



SECTION B-B

~ NOTES ~

BID ITEMS AND UNIT TO BID
MOUNTABLE MEDIAN TYPE 7A — SQYD
LIP INTEGRAL CURB — LF

1. THE BID ITEM PER SQ. YD. BETWEEN POINTS (A) AND (B) SHALL BE "MOUNTABLE MEDIAN TYPE 7A".
2. THE VARIABLE LENGTH MOUNTABLE MEDIAN BETWEEN POINTS (A) AND (B) SHALL MEET THE CURRENT REQUIRMENTS OF STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.
3. LIP INTEGRAL CURB TERMINATES AT POINT (C) (SEE PLANS).

(4) CROSS SLOPE OF 2% ON TANGENTS AND PARALLEL PAVEMENT CROSS SLOPE ON SUPERELEVATED SECTIONS.

(5) ½" PREMOLDED EXPANSION JOINT MATERIAL.

(6) TRANSVERSE JOINTS IN THE MOUNTABLE MEDIAN BETWEEN POINTS (A) AND (B) SHALL BE CONSTRUCTED AND SEALED IN THE SAME MANNER AS THE JOINTS IN THE ADJOINING CONCRETE PAVEMENT.

INTENDED USE:
WITH RIGID PAVEMENT

USE WITH CUR. STD. DWG.
RPM-100

KENTUCKY
DEPARTMENT OF HIGHWAYS

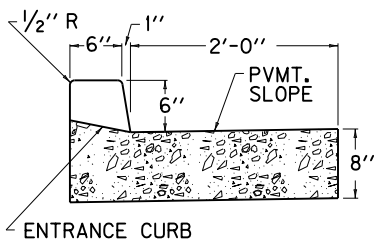
MOUNTABLE MEDIAN TYPE 7A

STANDARD DRAWING NO. RPM-015-04

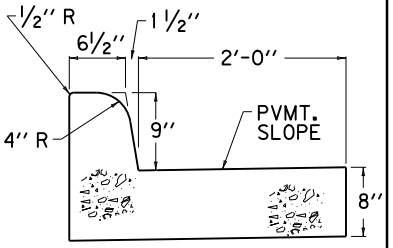
SUBMITTED William S. Hulick — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE

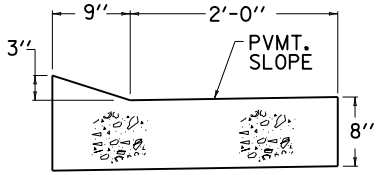
STANDARD CURB & GUTTER



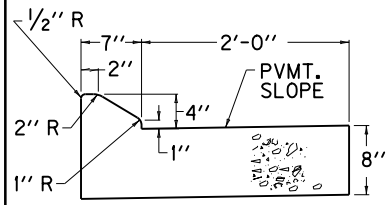
BARRIER CURB & GUTTER



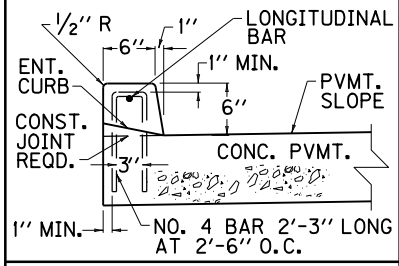
LIP CURB & GUTTER



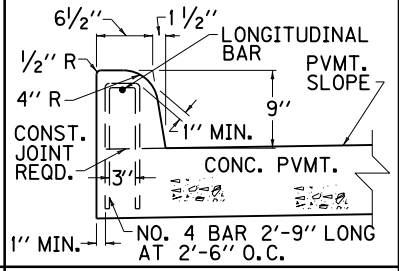
ISLAND CURB & GUTTER



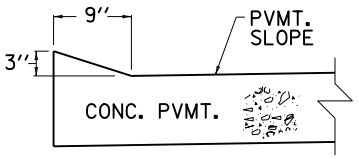
① STANDARD INTEGRAL CURB



BARRIER INTEGRAL CURB

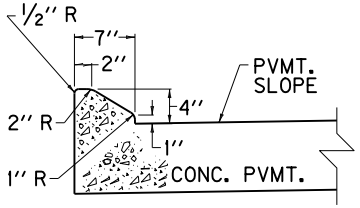


LIP INTEGRAL CURB



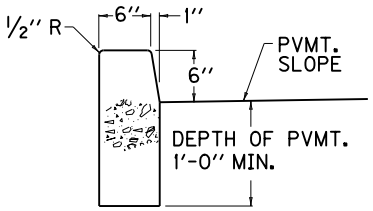
CONST. JOINT NOT PERMITTED

ISLAND INTEGRAL CURB

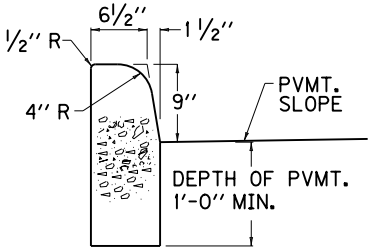


CONST. JOINT NOT PERMITTED

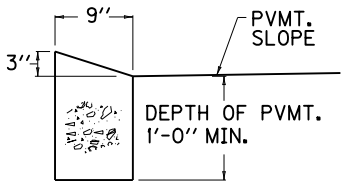
STANDARD HEADER CURB



BARRIER HEADER CURB

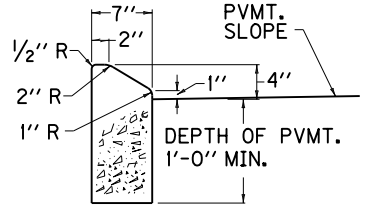


LIP HEADER CURB



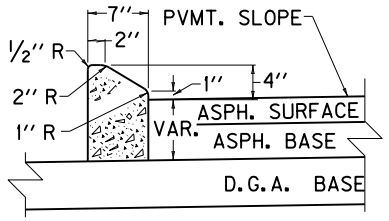
ISLAND HEADER CURB TYPE 1

EXISTING PAVEMENT

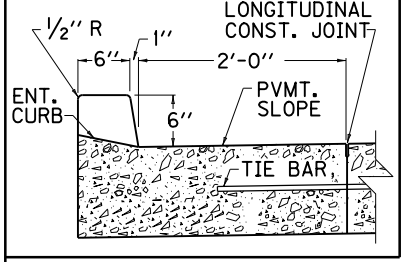


ISLAND HEADER CURB TYPE 2

NEW CONSTRUCTION

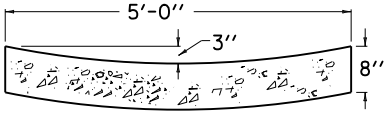


② STANDARD INTEGRAL CURB

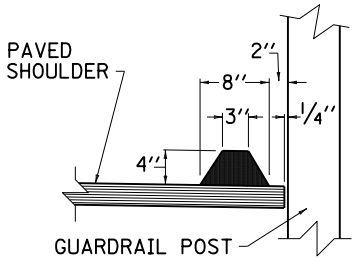


BID ITEM AND UNIT TO BID
(CURB TYPE) LF

VALLEY GUTTER



ASPHALT WEDGE CURB



~ NOTES ~

1. ALL INTEGRAL CURBS SHOWING REINFORCING STEEL SHALL BE CAST SEPARATELY FROM THE PAVEMENT AND THE REINFORCEMENT SHALL CONSIST SOLELY OF NO. 4 BARS AS DETAILED ON THIS DRAWING. ON CONSTRUCTION CARE SHOULD BE TAKEN SO THAT NO REINFORCEMENT BARS ARE CLOSER THAN 3" TO THE CENTER OF THE SAWED TRANSVERSE JOINT.
2. THE CONTRACTOR HAS THE OPTION OF CONSTRUCTING THE STANDARD INTEGRAL CURB AS DETAILED IN EITHER ① OR ② . IF ② IS CHOSEN A LONGITUDINAL CONSTRUCTION JOINT SHALL BE REQUIRED AND THE REMAINING PAVEMENT AND CURB SHALL BE CONSTRUCTED MONOLITHIC WITHOUT A HORIZONTAL CONSTRUCTION JOINT AND ACCOMPANYING REINFORCING STEEL.

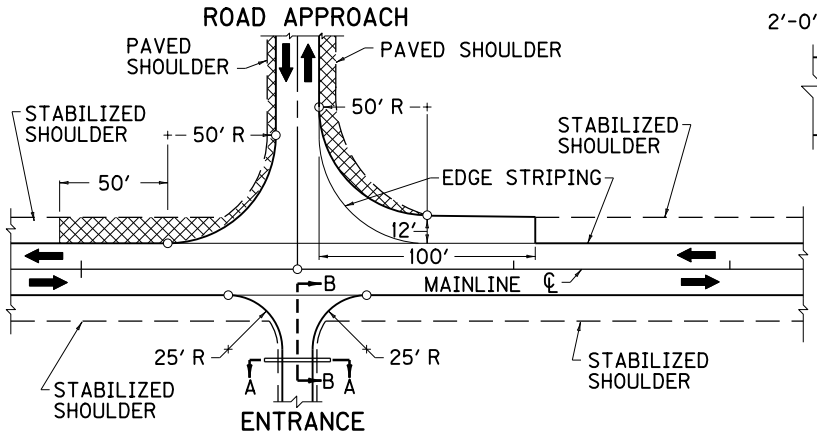
KENTUCKY
DEPARTMENT OF HIGHWAYS

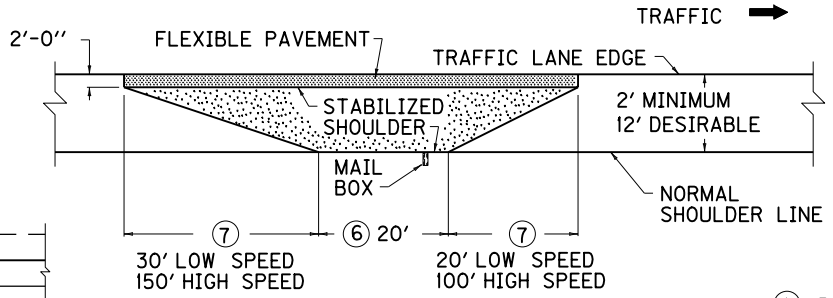
CURB AND GUTTER, CURBS AND VALLEY GUTTER

STANDARD DRAWING NO. RPM-100-10

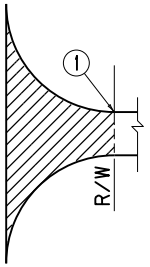
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

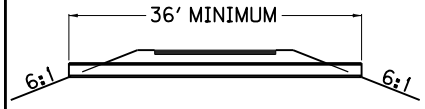




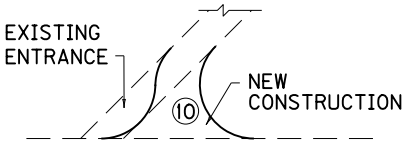
MAIL BOX TURNOUT



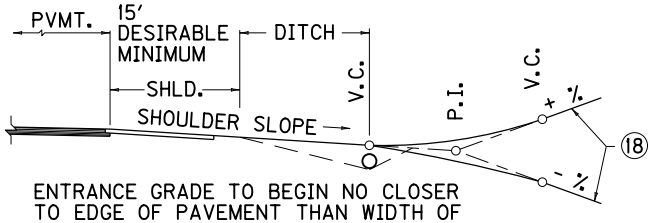
① PAVE TO R/W LINE OR END OF RADIUS, WHICHEVER IS FURTHER FROM THE EDGE OF TRAFFIC LANE.



SECTION A-A



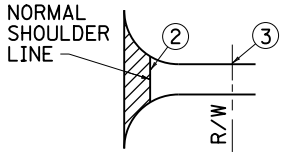
PLAN VIEW



ENTRANCE GRADE TO BEGIN NO CLOSER TO EDGE OF PAVEMENT THAN WIDTH OF SHOULDER PLUS DITCH.

SECTION B-B

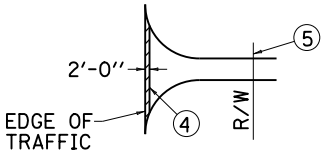
ROAD AND STREET APPROACHES



② PAVED TO SHOULDER LINE

③ SURFACE TO R/W LINE OR TOUCHDOWN WITH TRAFFIC BOUND BASE.

ENTRANCE
(RESIDENTIAL AND COMMERICAL)



ENTRANCE
(FARM FIELD)

④ PAVE AS SHOWN WITH FLEXIBLE PAVEMENT.

⑤ SURFACE TO R/W LINE WITH TRAFFIC BOUND BASE.

~ NOTES ~

MAIL BOX TURNOUT

⑥ ADD 2'-0" FOR EACH ADDITIONAL MAIL BOX.

⑦ HIGH SPEED EQUALS 50 MPH OR GREATER. LOW SPEED EQUALS LESS THAN 50 MPH.

8. ▩ THE 2'-0" WIDE FLEXIBLE PAVEMENT FOR THE LENGTH AS SHOWN, OR AS DETERMINED BY THE ENGINEER, SHALL BE APPLIED TO ALL MAIL BOX TURNOUTS. THE PAVEMENT DESIGN SHALL BE AS SHOWN ON THE PLANS OR AS APPROVED BY THE ENGINEER

9. ▩ FOR STABILIZED SHOULDERS, THIS AREA SHALL RECEIVE THE SAME TREATMENT AS THAT FOR ADJOINING STABILIZED SHOULDERS. FOR EARTH SHOULDERS THIS AREA SHALL RECEIVE 3" TO 5" OF COMPACTED DENSE GRADED AGGREGATE BASE, BANK GRAVEL, OR TRAFFIC BOUND BASE.

APPROACHES AND ENTRANCES

⑩ IF FEASIBLE, ALL APPROACHES AND ENTRANCES SHALL INTERSECT SHOULDER LINE AT RIGHT ANGLES. IF NOT AT RIGHT ANGLES, PIPE LENGTH SHALL BE INCREASED TO PROVIDE ACCURATE RADIUS.

11. ROAD APPROACH ILLUSTRATION IS FOR MAINLINE ROAD, ADT 400 OR GREATER. PAVED SHOULDER PORTION SHOWN SHALL ONLY BE APPLICABLE WHERE THE MAINLINE SPECIFIES STABILIZED OR PAVED SHOULDERS. IF THE MAINLINE SHOULDER IS PAVED, THIS SHOULDER PORTION SHALL ALSO BE PAVED.

12. WHEN THE MAINLINE ADT IS UNDER 400, USE A 25' RADIUS WITH NO DECELERATION WIDTH PROVIDED.

13. THE PAVEMENT ON ENTRANCES AND APPROACHES THAT IS DISTURBED DURING NEW CONSTRUCTION OPERATIONS SHALL BE REPLACED WITH A PAVEMENT EQUIVALENT TO THE EXISTING PAVEMENT, REGARDLESS OF THE SURFACE MATERIAL USED ELSEWHERE. THE PAVEMENT DESIGN SHALL BE AS SHOWN ON THE PLANS OR AS APPROVED BY THE ENGINEER.

14. THE RADII ON COUNTY OR SECONDARY ROADS SHALL NOT BE LESS THAN 25' MEASURED TO THE INSIDE EDGE OF THE SURFACE. EACH ADDITIONAL FOOT OF SURFACE WIDTH WILL REQUIRE AN ADDITIONAL FOOT OF PIPE.

15. PIPE ILLUSTRATION IS BASED ON THE USE OF 15" PIPE. LARGER SIZES MAY BE INSTALLED WITH APPROPRIATE MODIFICATIONS. PIPES SMALLER THAN 15" DIAMETER ARE NOT TO BE USED EXCEPT IN SPECIAL CASES, WHEN SPECIFICALLY AUTHORIZED.

16. IN CUT SECTION, SIGHT DISTANCE SHALL BE PROVIDED ON ENTRANCES AND APPROACHES BY DAYLIGHTING THE CUT FROM THE POINTS WHERE THE RADII BEGINS, TO POINTS NOT LESS THAN 100' ON EACH OF THE INTERSECTING ROADWAY.

17. ▨ MINIMUM PAVED AREAS FOR ENTRANCES AND APPROACHES. THESE PAVED AREAS MAY BE EXTENDED TO TOUCHDOWN OR TIE-DOWN POINT PROVIDED THE EXISTING IS PAVED.

⑱ MAXIMUM GRADE FOR ENTRANCES 50' OR GREATER IN LENGTH: MOUNTAINOUS TERRAIN - 20%, ROLLING TERRAIN - 16% AND FLAT TERRAIN - 12%.

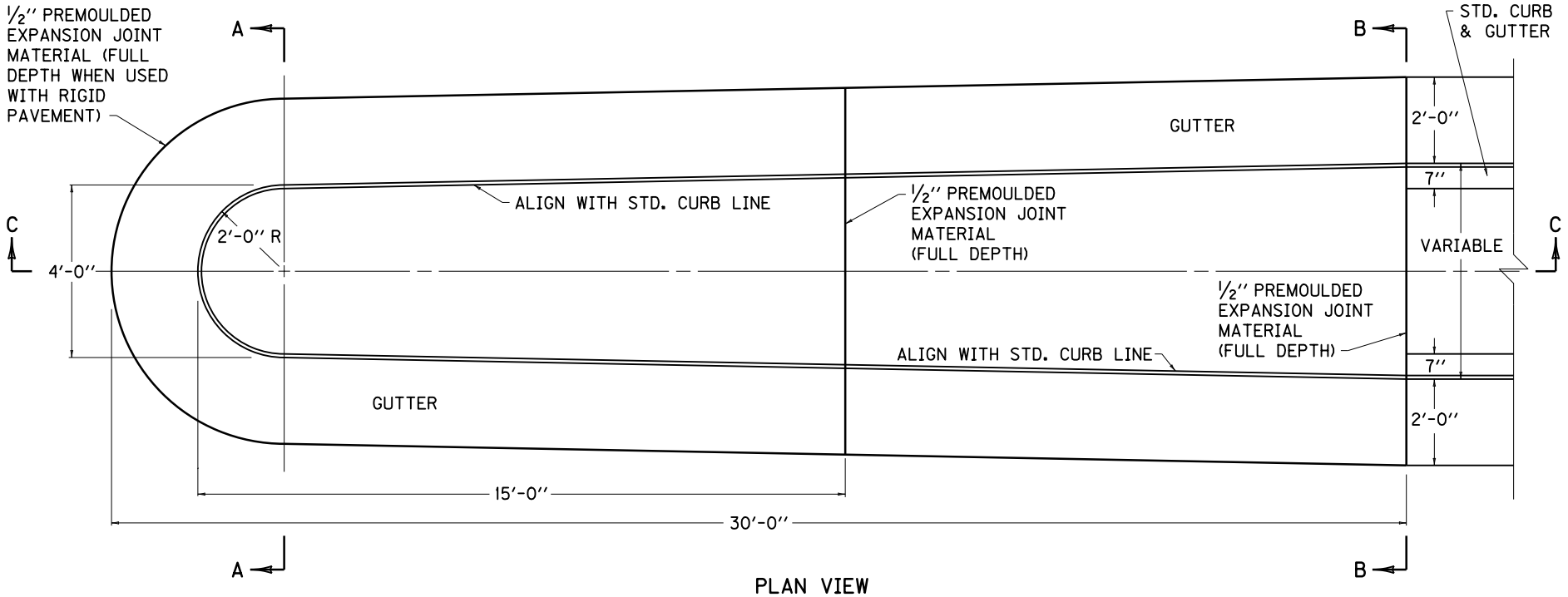
KENTUCKY
DEPARTMENT OF HIGHWAYS

APPROACHES, ENTRANCES AND MAIL BOX TURNOUT

STANDARD DRAWING NO. RPM-110-07

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 12-01-15 DATE



PLAN VIEW

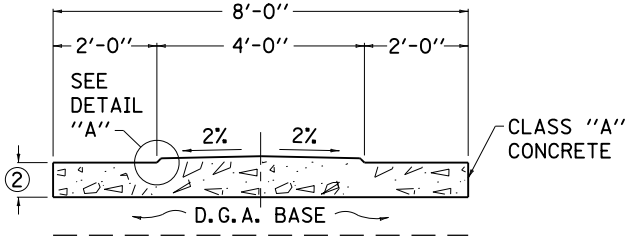
SECTION C-C

~ NOTES ~

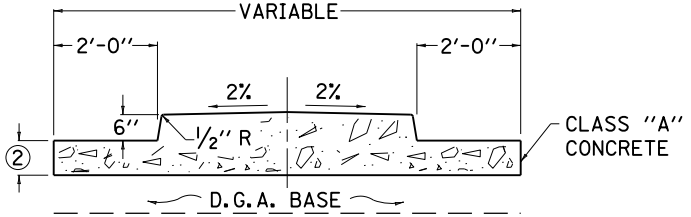
1. THE CONTRACT UNIT PRICE BID EACH FOR CONCRETE TERMINAL SECTION TYPE 1 SHALL INCLUDE ALL MATERIALS, LABOR, TOOLS, AND OTHER INCIDENTALS NECESSARY TO COMPLETE THE WORK IN PLACE, AND SHALL RECEIVE A WOOD FLOAT FINISH.

(2) 8" WHEN USED WITH FLEXIBLE PAVEMENT AND PAVEMENT THICKNESS WITH RIGID PAVEMENT.

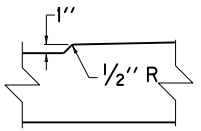
BID ITEM AND UNIT TO BID	
CONCRETE TERMINAL SECTION TYPE 1	EACH



SECTION A-A



SECTION B-B



DETAIL "A"

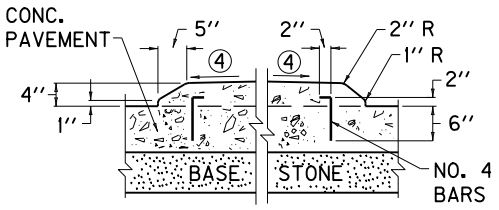
KENTUCKY DEPARTMENT OF HIGHWAYS

CONCRETE TERMINAL SECTION TYPE 1

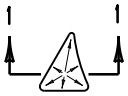
STANDARD DRAWING NO. RPM-115-05

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



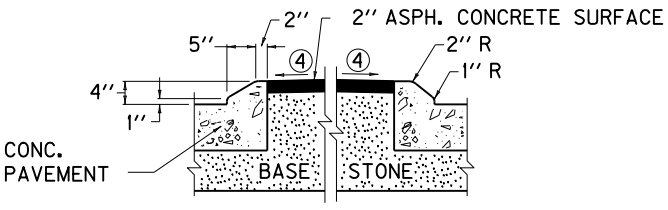
SECTION 1-1



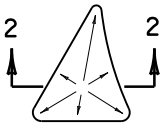
NO. 4 BARS TO BE PLACED 6'' FROM EDGE ON 12'' CENTERS AROUND ENTIRE ISLAND. BARS ARE TO BE 10'' LONG AND BENT AS DETAILED ABOVE.

BASE - FULL DEPTH PAVEMENT

SMALL (UP TO 150 SQ. FT.) CONCRETE ISLAND

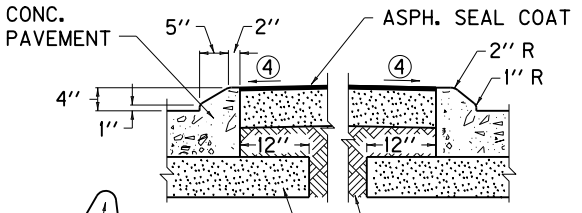


SECTION 2-2

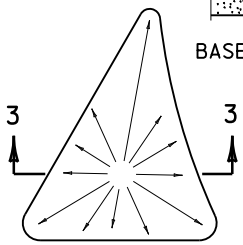


AREA IN ISLAND FILLED WITH BASE STONE AND CAPPED WITH 2'' ASPHALT CONCRETE SURFACE.

INTERMEDIATE (150 TO 1000 SQ. FT.) ISLAND INTEGRAL CURB



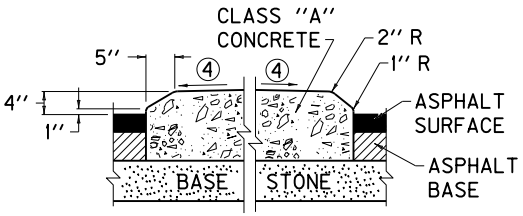
SECTION 3-3



AREA IN ISLAND FILLED WITH WITH COMPACTED EARTH, 7'' BASE STONE AND ASPHALT SEAL COAT.

LARGE (1000 SQ. FT. AND ABOVE) ISLAND INTEGRAL CURB

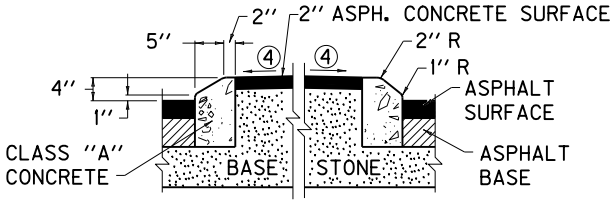
~ RIGID PAVEMENT ~



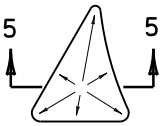
SECTION 4-4

BASE - FULL DEPTH BASE STONE

SMALL (UP TO 150 SQ. FT.) CONCRETE ISLAND

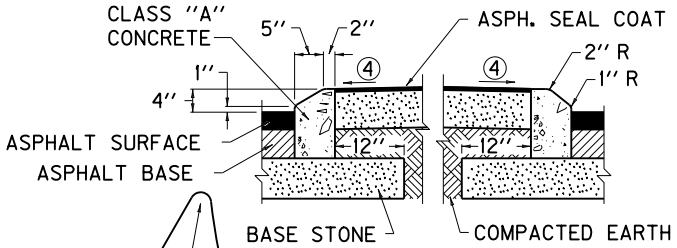


SECTION 5-5

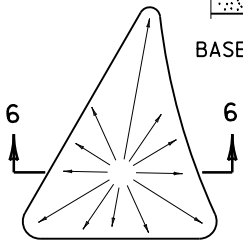


AREA IN ISLAND FILLED WITH BASE STONE AND CAPPED WITH 2'' ASPHALT CONCRETE SURFACE.

INTERMEDIATE (150 TO 1000 SQ. FT.) CONCRETE ISLAND HEADER CURB



SECTION 6-6



AREA IN ISLAND FILLED WITH WITH COMPACTED EARTH, 7'' BASE STONE AND ASPHALT SEAL COAT.

LARGE (1000 SQ. FT. AND ABOVE) CONCRETE ISLAND HEADER CURB

~ FLEXIBLE PAVEMENT ~

~ NOTES ~

BID ITEM AND UNIT TO BID
CONCRETE ISLAND SQYD

1. CONCRETE ISLAND SHALL BE PAID FOR ON A SQ. YD. BASIS AND SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR A COMPLETE INSTALLATION. FINISHING AND CURING SHALL BE THE SAME AS REQUIRED FOR CONCRETE SIDEWALK.
2. THE AREA IN THE LARGE RAISED ISLANDS SHALL BE GRADED AND SURFACED SO AS NOT TO OBSTRUCT SIGHT DISTANCE.
3. SEE SURFACING SCHEDULE FOR BASE STONE AND SURFACING OF ISLANDS IN EXCESS OF 1000 SQ. FT.
4. PAVED AREA SHALL BE SLOPED SO AS TO OBTAIN PROPER DRAINAGE AS DIRECTED BY THE ENGINEER ON CONSTRUCTION.
5. WHEN THE GRADES DO NOT PERMIT THE ISLAND SURFACE TO DRAIN, THEY SHALL BE CROWNED AS SHOWN WITH A MAXIMUM CROSS SLOPE OF 4%.
6. DIMENSIONS AND RADII SHOWN ARE TYPICAL FOR BOTH SIDES OF ISLAND.

USE WITH CUR. STD. DWG. RPM-100

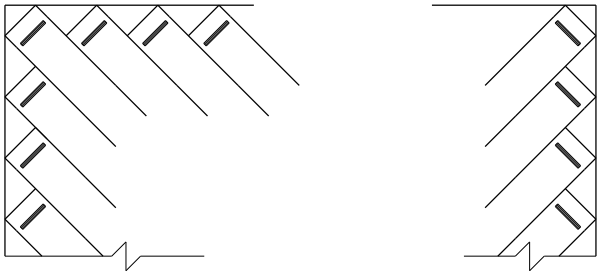
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE ISLAND CURB CONSTRUCTION DETAILS
(RIGID & FLEXIBLE PAVEMENT)

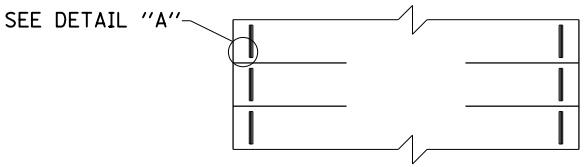
STANDARD DRAWING NO. RPM-120-07

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



ANGLED PARKING



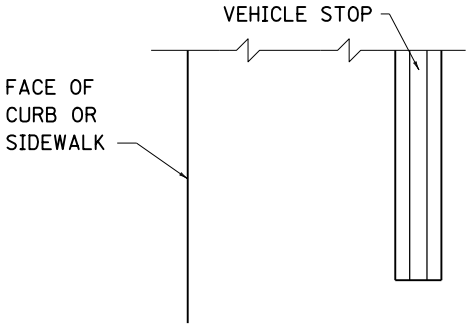
PERPENDICULAR PARKING

TYPICAL VEHICLE STOP INSTALLATION

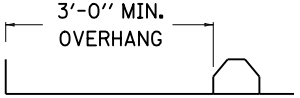
~ NOTES ~

BID ITEM AND UNIT TO BID
PRECAST VEHICLE STOP LF

1. THE UNIT PRICE BID PER LINEAR FOOT FOR "PRECAST VEHICLE STOP" SHALL INCLUDE ALL CLASS "A" CONCRETE, STEEL REINFORCEMENT, STEEL DOWELS, LABOR AND ALL INCIDENTALS NECESSARY FOR A COMPLETE INSTALLATION.
2. THE PLANS SHALL SPECIFY THE LENGTHS OF THE INDEPENDENT UNITS. 2'-0", 4'-0", 6'-0" AND 8'-0" ARE STANDARD LENGTHS. 3'-0", 5'-0" AND 7'-0" LENGTHS MAY BE USED WHEN REQUIRED.
3. NO. 5 BARS - 1'-6" MIN. LENGTH. FILL VOID WITH BUTYL RUBBER CAULKING (COMMERCIAL GRADE) OR OTHER APPROVED MATERIAL.
4. NO. 3 DEFORMED BARS (OR LARGER) 3 REQUIRED.
5. THE MINIMUM REQUIREMENT FOR REINFORCING STEEL SHALL BE GRADE 40.
6. THE UNIT WEIGHS APPROXIMATELY 38 LBS./FT.
7. OTHER TYPES OF STOPS MAY BE PERMITTED IF APPROVED IN WRITING BY THE ENGINEER.

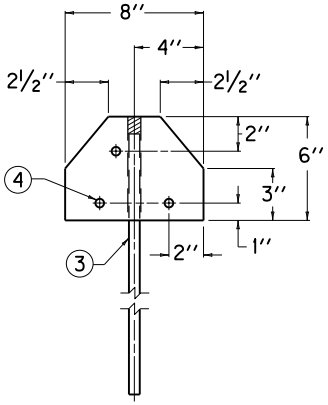


PLAN VIEW

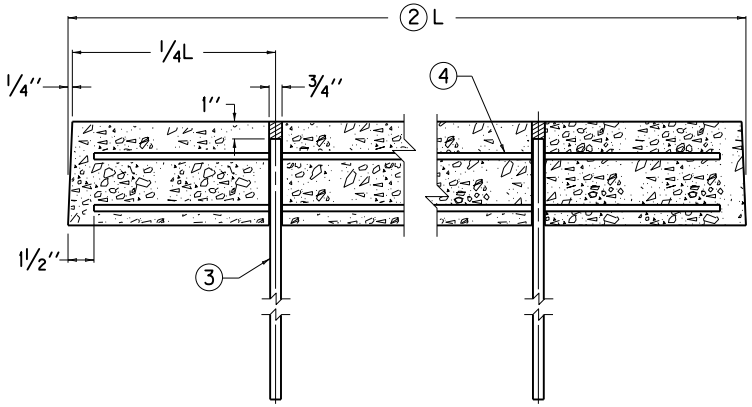


END ELEVATION

DETAIL "A"



END VIEW



SECTIONAL ELEVATION VIEW

KENTUCKY
DEPARTMENT OF HIGHWAYS

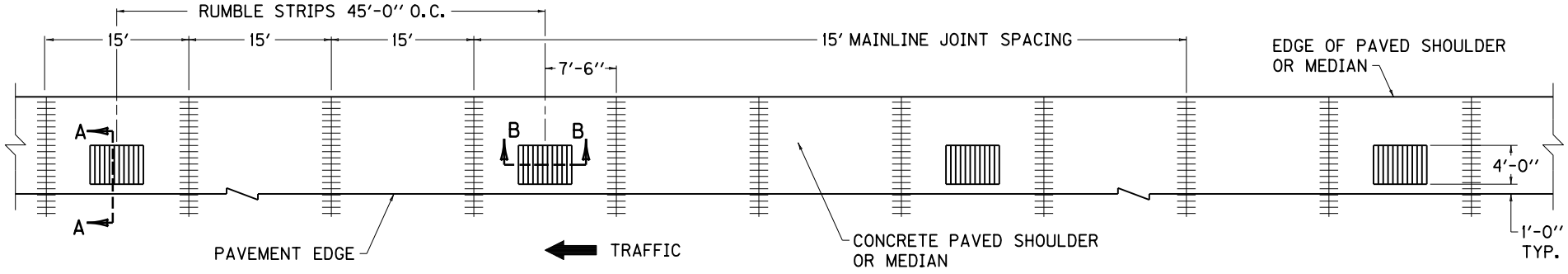
PRECAST
VEHICLE STOP

STANDARD DRAWING NO. RPM-130-04

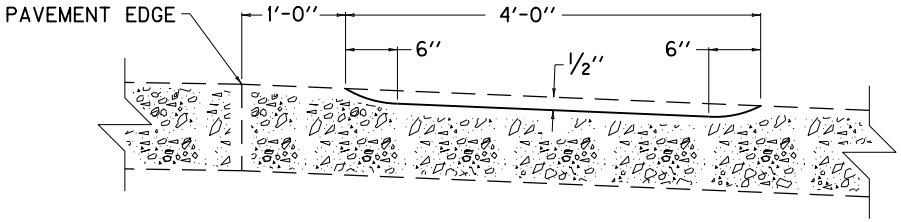
SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE

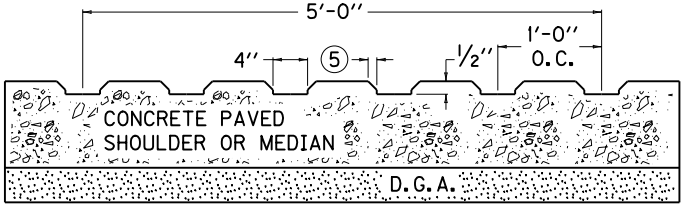
JOINTED PLAIN CONCRETE PAVED SHOULDER OR MEDIAN (DOWELLED) WITH JOINTED PLAIN CONCRETE MAINLINE PAVEMENT



PLAN VIEW



SECTION A-A



SECTION B-B

~ NOTES ~

BID ITEM AND UNIT TO BID
RUMBLE STRIPS TYPE 3 LF

1. THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR A SIX (6) STRIP UNIT SHALL INCLUDE ALL LABOR, MATERIALS AND INCIDENTALS NECESSARY TO COMPLETE ONE INSTALLATION.
2. THE GROOVED RUMBLE STRIPS SHALL BE CUT INTO THE CURED CONCRETE SHOULDER AS DETAILED ON THIS DRAWING.
3. THE GROOVE SHALL BE TAPERED OUT, SO AS TO PROVIDE POSITIVE DRAINAGE.
4. WHEN THE SHOULDER IS USED TO MAINTAIN TRAFFIC DURING CONSTRUCTION, THE RUMBLE STRIPS SHALL NOT BE CUT UNTIL THE MAINLINE IS OPENED TO TRAFFIC.

⑤ 1/4" BEVEL

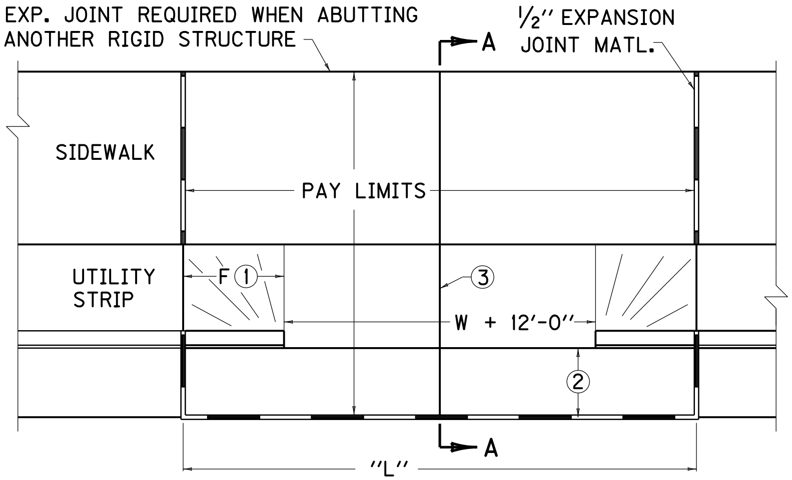
KENTUCKY
DEPARTMENT OF HIGHWAYS

RUMBLE STRIPS
TYPE 3

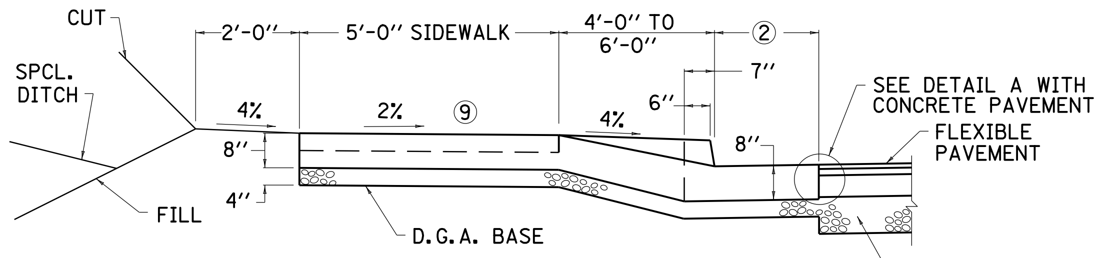
STANDARD DRAWING NO. RPM-145-04

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

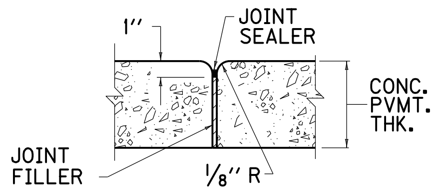
APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



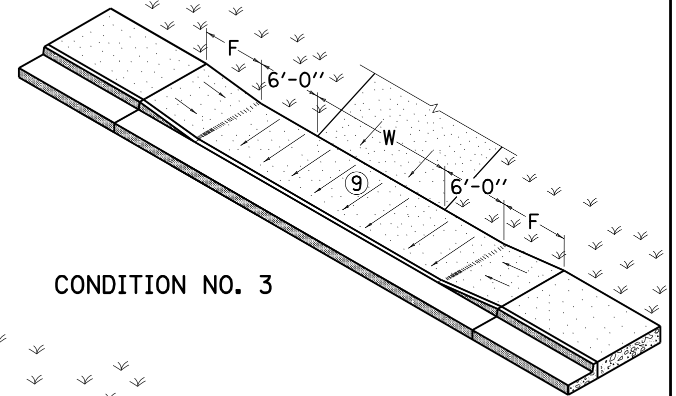
PLAN VIEW



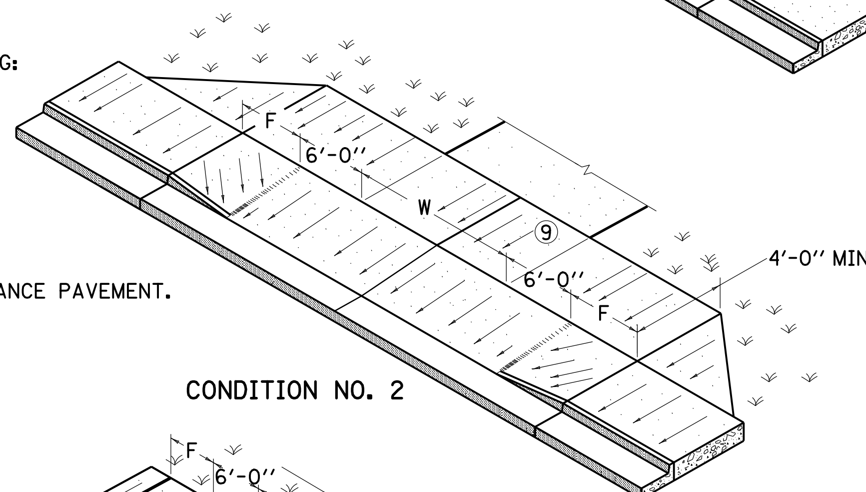
SECTION A-A CONDITION NO. 1



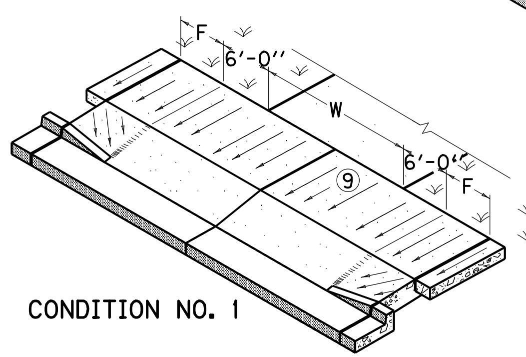
DETAIL A



CONDITION NO. 3



CONDITION NO. 2



CONDITION NO. 1

~ NOTES ~

① FOR WIDTH "W" AND "F":
RESIDENTIAL - MINIMUM W = 12′-0″, MAXIMUM W = 24′-0″; MINIMUM F = 2′-6″, MAXIMUM F = 10′-0″
COMMERCIAL - MINIMUM W = 24′-0″, MAXIMUM W = 36′-0″; F = 10′-0″
WHEN MORE THAN TWO LANES ARE REQUIRED, 36′-0″ WIDTH MAY BE INCREASED TO RELIEVE INTERFERENCE BETWEEN ENTERING AND EXITING TRAFFIC. AT THE ENGINEER'S DISCRETION RADIAL RETURNS MAY BE USED ON ENTRANCES. SOME APPLICABLE CASES ARE THE FOLLOWING:
  a. ON ENTRANCES EXPECTED TO CARRY HIGH VOLUMES OF TRAFFIC.
  b. WHEN ENTRANCE WIDTH IS GREATER THAN 36′.
  c. WHEN THE HIGHWAY HAS A POSTED OR OPERATING SPEED OVER 40 MPH.
  d. ON A RURAL SECTION WHERE A FLUSH SHOULDER EXISTS.
  e. WHERE AN EXCLUSIVE RIGHT TURN LANE IS USED.

② 1′-0″ OR 2′-0″ WITH CONCRETE PAVEMENT, 2′-0″ WITH FLEXIBLE PAVEMENT

③ WHEN "L" DIMENSION IS GREATER THAN 15′-0″ A SAWED AND SEALED JOINT, 1½″ DEEP AND ¼″ WIDE SHALL BE PLACED AT THE CENTER OF THE "L" DIMENSION. WIDE ENTRANCES REQUIRE ADDITIONAL JOINTS, SPACING SHALL NOT EXCEED 15′-0″ O.C.

4. CLASS "A" CONCRETE OR JOINTED PLAIN CONCRETE PAVEMENT SHALL BE USED IN THE ENTRANCE PAVEMENT.

5. THE ENTRANCE PAVEMENT SHALL RECEIVE A BROOM FINISH AND SHALL BE CURED THE SAME AS THE MAINLINE PAVEMENT AND/OR SIDEWALK.

6. THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR "CEM CONC ENT PAVEMENT-8 IN" SHALL INCLUDE CLASS "A" CONCRETE AND ALL INCIDENTALS NECESSARY TO COMPLETE THE WORK. D.G.A. AND DETECTABLE WARNINGS ARE SEPARATE BID ITEMS.

7. USE CONDITION NO. 2 OR NO. 3 WHEN LITTLE OR NO UTILITY STRIP IS PROVIDED, AND INCORPORATE FEATURES OF OTHER DESIGNS SHOWN WHERE NOT IN CONFLICT.

8. PROVIDED THAT ADA GUIDELINES SHOWN IN NOTES ⑨ AND 10 ARE FOLLOWED, THE ENGINEER MAY MODIFY THE DESIGN TO BETTER FIT EXISTING CONDITIONS.

⑨ 2% CROSS SLOPE MAXIMUM ON SIDEWALK. IF CONDITIONS WARRANT, SIDEWALK MAY BE SLOPED 2% AWAY FROM ROADWAY.

10. SIDEWALKS SHOULD BE DESIGNED WITH A MAX. GRADE OF 5%. WHERE A SIDEWALK RUNS ALONG A STEEP ROADWAY, THE SIDEWALK GRADE MAY EXCEED 5% IF IT FOLLOWS THE GRADE OF THE ROADWAY. WHERE THE GRADE EXCEEDS 5%, A LEVEL LANDING SHALL BE REQUIRED EVERY 200′.

11. COMMERCIAL DRIVEWAYS WITH TRAFFIC CONTROL DEVICES REQUIRE ADA SIDEWALK TREATMENTS WITH DETECTABLE WARNINGS.

BID ITEMS AND UNIT TO BID

CEM CONC ENT PAVEMENT-8 IN	SQYD
DGA BASE	TON
DETECTABLE WARNINGS	SQFT

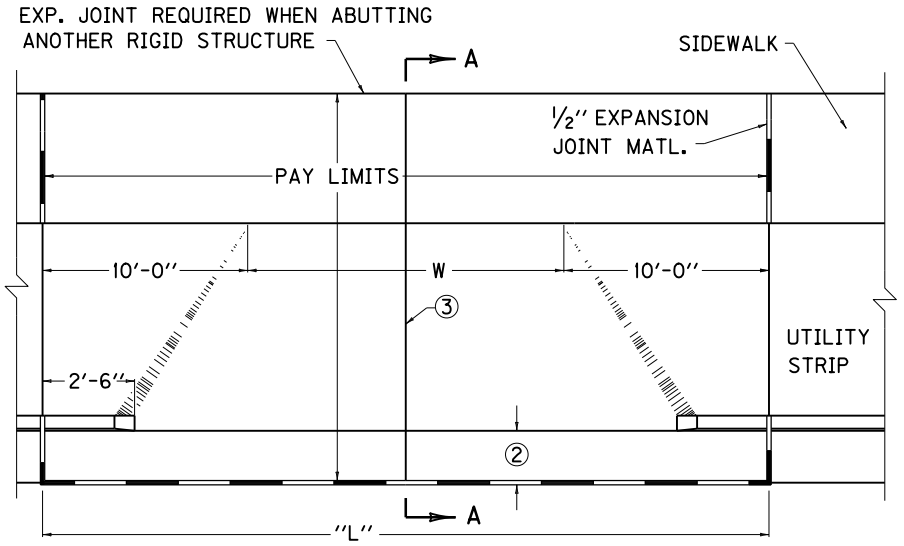
USE WITH CUR. STD. DWG. RGX-040

KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE ENTRANCE PAVEMENT AND SIDEWALK

STANDARD DRAWING NO. RPM-150-08

SUBMITTED [signature] DIRECTOR DIVISION OF DESIGN 12-01-15 DATE
APPROVED [signature] STATE HIGHWAY ENGINEER 12-01-15 DATE



PLAN VIEW

~ NOTES ~

BID ITEMS AND UNIT TO BID	
CEM CONC ENT PAVEMENT-8 IN	SQYD
DGA BASE	TON
DETECTABLE WARNINGS	SQFT

① FOR WIDTH ''W'':
COMMERCIAL - MINIMUM W = 24'-0'', MAXIMUM W = 36'-0''
WHEN MORE THAN TWO LANES ARE REQUIRED, 36' WIDTH MAY BE INCREASED TO RELIEVE INTERFERENCE BETWEEN ENTERING AND EXITING TRAFFIC. AT THE ENGINEER'S DISCRETION RADIAL RETURNS MAY BE USED ON ENTRANCES. SOME APPLICABLE CASES ARE THE FOLLOWING:
a. ON ENTRANCES EXPECTED TO CARRY HIGH VOLUMES OF TRAFFIC.
b. WHEN ENTRANCE WIDTH IS GREATER THAN 36'.
c. WHEN THE HIGHWAY HAS A POSTED OR OPERATING SPEED OVER 40 MPH.
d. ON A RURAL SECTION WHERE A FLUSH SHOULDER EXISTS.
e. WHERE AN EXCLUSIVE RIGHT TURN LANE IS USED.

② 1'-0'' OR 2'-0'' WITH CONCRETE PAVEMENT, 2'-0'' WITH FLEXIBLE PAVEMENT.

③ WHEN ''L'' DIMENSION IS GREATER THAN 15'-0'' A SAWED AND SEALED JOINT, 1 1/2'' DEEP AND 1/4'' WIDE SHALL BE PLACED AT THE CENTER OF THE ''L'' DIMENSION. WIDE ENTRANCES REQUIRE ADDITIONAL JOINTS, SPACING SHALL NOT EXCEED 15'-0'' O.C.

4. CLASS ''A'' CONCRETE OR JOINTED PLAIN CONCRETE PAVEMENT SHALL BE USED IN THE ENTRANCE PAVEMENT.

5. THE ENTRANCE PAVEMENT SHALL RECEIVE A BROOM FINISH AND SHALL BE CURED THE SAME AS THE MAINLINE PAVEMENT AND/OR SIDEWALK.

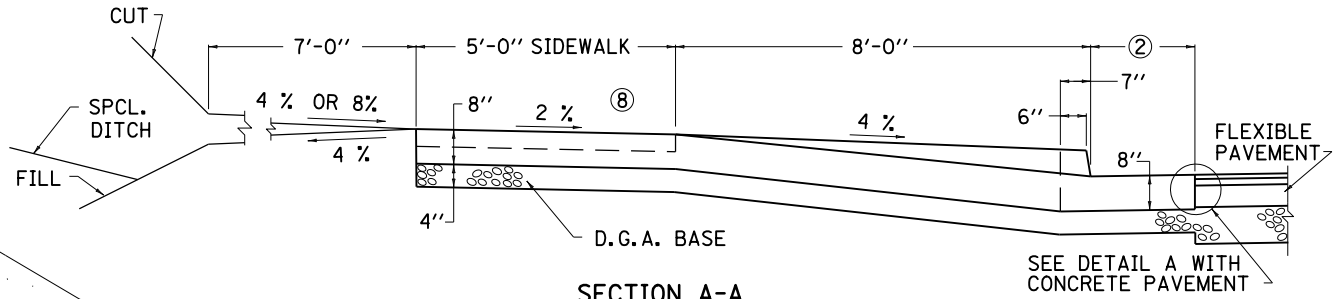
6. THE CONTRACT UNIT PRICE BID PER SQUARE YARD FOR ''CEM CONC ENT PAVEMENT-8 IN'' SHALL INCLUDE CLASS ''A'' CONCRETE AND ALL INCIDENTALS NECESSARY TO COMPLETE THE WORK. D.G.A. AND DETECTABLE WARNINGSARE SEPARATE BID ITEMS.

7. PROVIDING THAT ADA GUIDELINES SHOWN IN NOTE ⑧ AND 9 ARE FOLLOWED, THE ENGINEER MAY MODIFY THE DESIGN TO BETTER FIT EXISTING CONDITIONS.

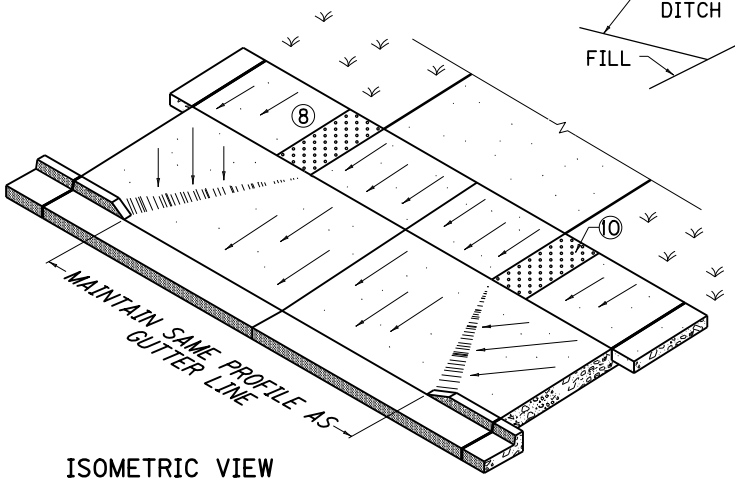
⑧ 2% CROSS SLOPE MAXIMUM ON SIDEWALK.

9. SIDEWALKS SHOULD BE DESIGNED WITH A MAX. GRADE OF 5%. WHERE A SIDEWALK RUNS ALONG A STEEP ROADWAY, THE SIDEWALK GRADE MAY EXCEED 5% IF IT FOLLOWS THE GRADE OF THE ROADWAY.

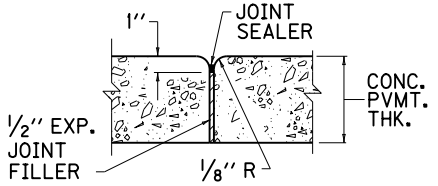
⑩ COMMERCIAL DRIVEWAYS WITH TRAFFIC CONTROL DEVICES REQUIRE ADA SIDEWALK TREATMENTS WITH DETECTABLE WARNINGS.



SECTION A-E



ISOMETRIC VIEW



DETAIL A

USE WITH CUR. STD. DWG.
RGX-040

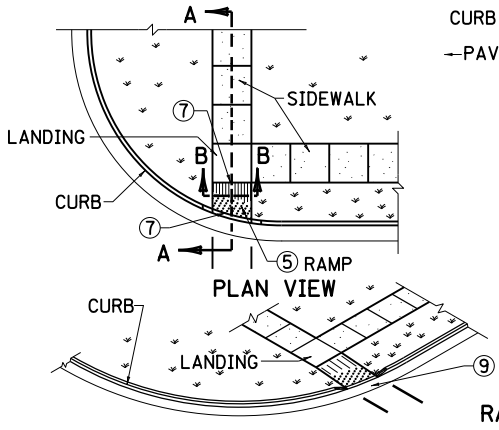
KENTUCKY
DEPARTMENT OF HIGHWAYS

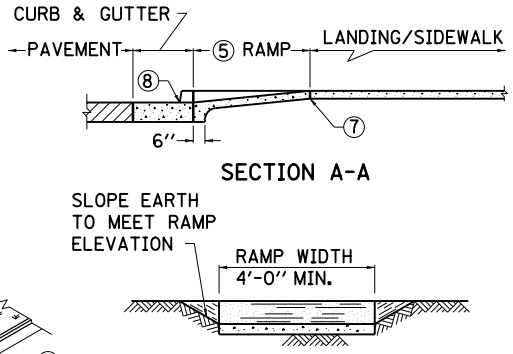
CONCRETE ENTRANCE PAVEMENT AND SIDEWALK

STANDARD DRAWING NO. RPM-152-08

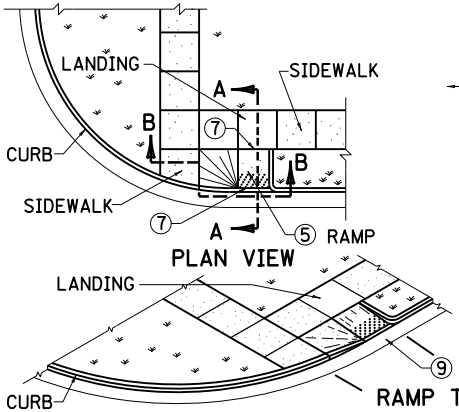
SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — DATE 12-01-15

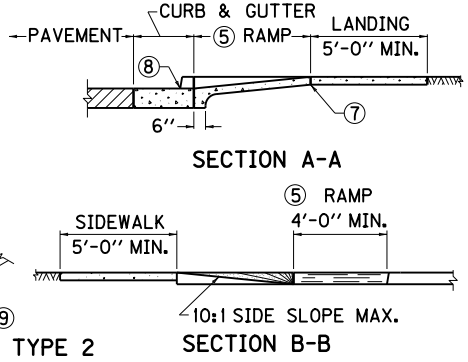
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-15





RAMP TYPE 1





RAMP TYPE 2

~ NOTES ~

BID ITEMS AND UNIT TO BID

SIDEWALK-4 IN CONCRETE	SQYD
DETECTABLE WARNINGS	SQFT

1. THE RAMP SHALL BE CONSTRUCTED OF CLASS "A" CONCRETE. A BROOM FINISH OR EQUAL NON-SKID FINISH IS REQUIRED. DETECTABLE WARNINGS SHALL BE A SEPARATE BID ITEM.
2. RAMPS SHALL BE PAID PER SQ. YD. OF 4" CONCRETE SIDEWALK AND THE UNIT PRICE SHALL INCLUDE ALL MATERIALS, FORMS, CURB BEHIND RAMP AND LANDING, AND INCIDENTALS NECESSARY FOR CONSTRUCTION.
3. THE NORMAL GUTTER LINE SHALL BE MAINTAINED THROUGH THE AREA OF THE RAMP.
4. RAMP TYPE 3 SHOULD BE USED PRIMARILY IN A RETROFIT TYPE CONDITION.

⑤ CURB RAMP GRADE SHALL NOT EXCEED 12:1, CROSS SLOPE SHALL NOT EXCEED 2%. ON RETROFIT CURB RAMPS, GRADES OF 12.5% for 2'-0" OR 10% FOR 5'-0" ARE PERMISSABLE.

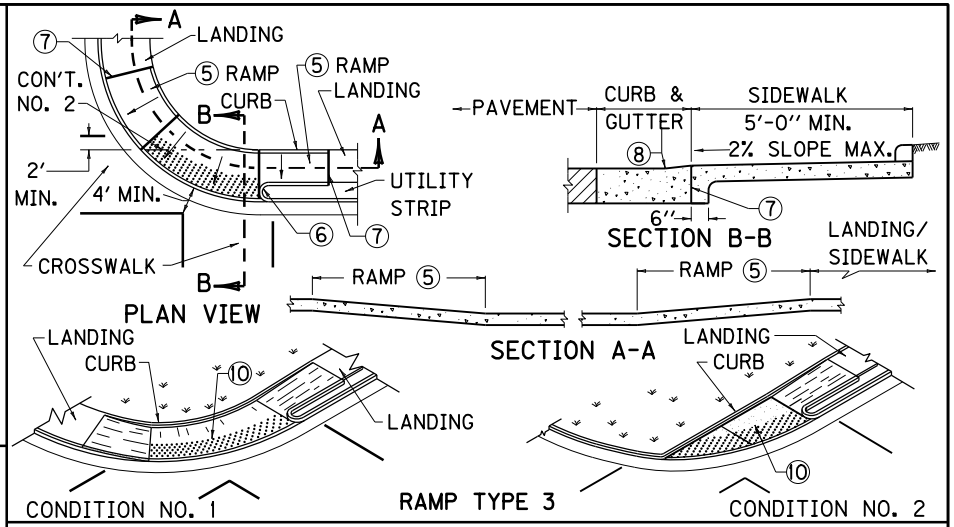
⑥ CURB RETURN REQUIRED WHEN UTILITY STRIP IS 4' OR GREATER. FOR UTILITY STRIPS LESS THAN 4', THE AREA IS TO BE SURFACED WITH SIDEWALK WITHIN THE RAMP.

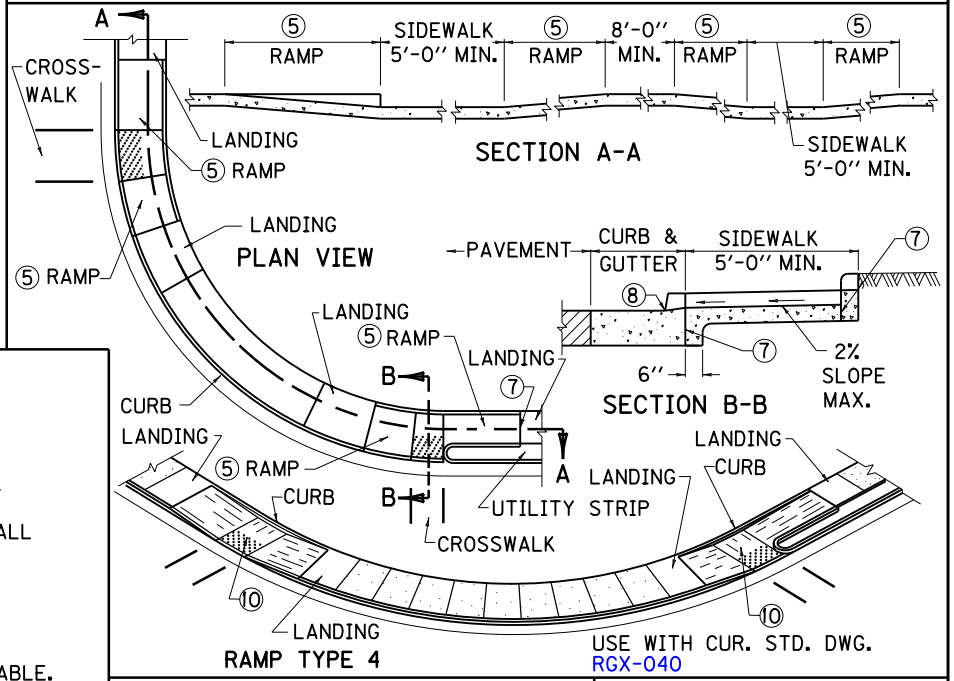
⑦ ½" EXPANSION JOINT AT BACK OF CURB LINE AND AT SIDEWALK LINE.

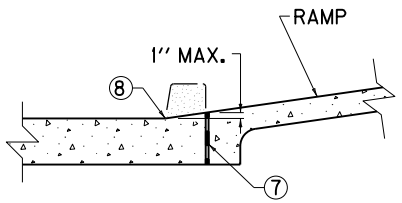
⑧ NO BUMP PERMITTED. SAME SLOPE AS RAMP AND NOT TO EXCEED 1" IN HEIGHT. RAMPS SHALL BE CONSTRUCTED SO THAT WATER WILL NOT ACCUMULATE ON WALKING SURFACES.

⑨ LANDINGS WILL PROVIDE A LEVEL AREA (MAX. 5% GRADE OR CROSS SLOPE) AT APPROXIMATE STREET ELEVATION. A 4' SQUARE LEVEL LANDING IS THE REQUIRED MINIMUM.

⑩ LANDINGS WILL PROVIDE A LEVEL AREA (MAX. 2% GRADE OR CROSS SLOPE) AT APPROXIMATE STREET ELEVATION. A 4' SQUARE LEVEL LANDING IS THE REQUIRED MINIMUM.







DROP CURB FOR RAMP

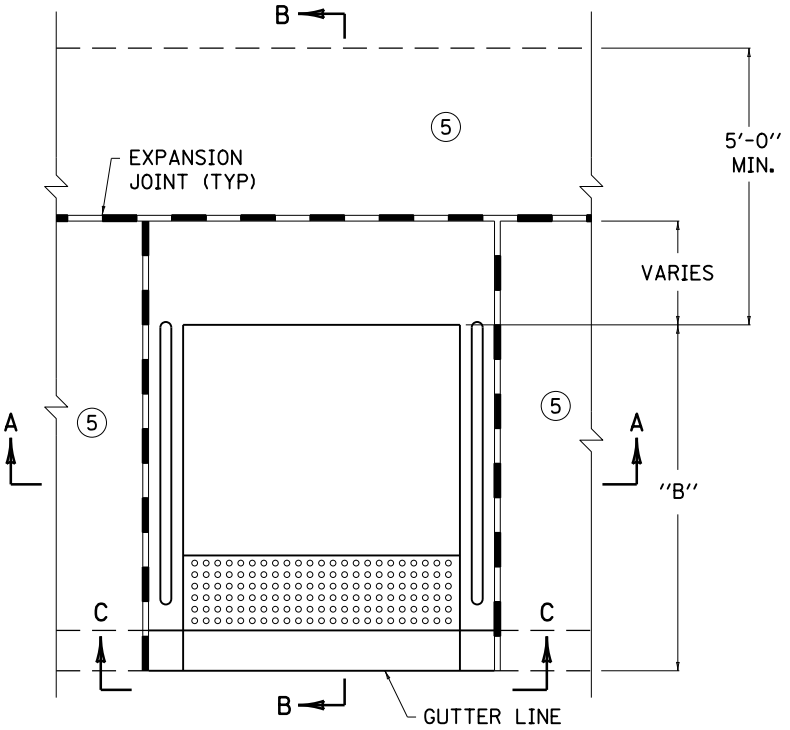
KENTUCKY
DEPARTMENT OF HIGHWAYS

SIDEWALK RAMPS

STANDARD DRAWING NO. RPM-170-09

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



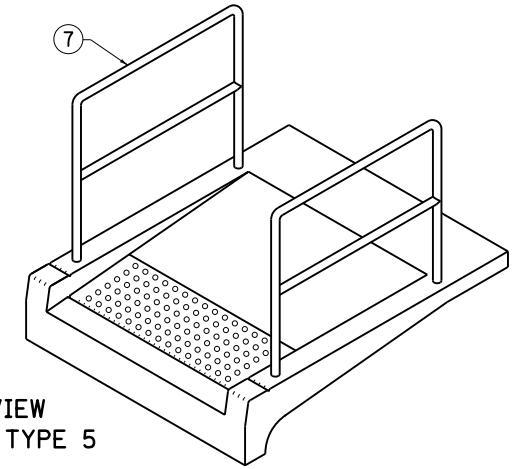
PLAN VIEW
SIDEWALK RAMP TYPE 5

~ NOTES ~

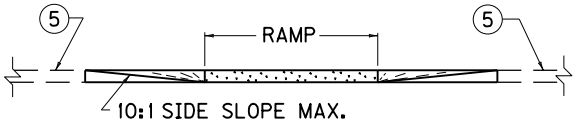
BID ITEMS AND UNIT TO BID

SIDEWALK-4 IN CONCRETE	SQYD
HANDRAIL-TYPE A-1	LF

1. EXISTING SIDEWALK AND CURB SHALL BE REMOVED TO THE LIMITS AS DESIGNATED BY THE ENGINEER.
2. WHERE EXISTING JOINTS ARE LOCATED MORE THAN 2'-0'' FROM THE RAMP LIMITS SHOWN, THE CONTRACTOR SHALL SAW CUT THE SIDEWALK AND CURB PRIOR TO REMOVAL.
3. A BROOM FINISH OR EQUAL NON-SKID FINISH IS REQUIRED.
4. CUT GROOVE TO CONFORM TO THE ADJACENT CURB.
5. EXISTING SIDEWALK.
6. THE LENGTHS SHOWN ARE MINIMUMS. IF ADEQUATE SPACE IS AVAILABLE A MINIMUM SLOPE OF 12:1 IS DESIRABLE.
7. HANDRAIL TYPE A-1 MAY BE ELIMINATED PROVIDED ADEQUATE SPACE IS AVAILABLE TO CONSTRUCT 10:1 RAMP SIDE SLOPES AS SHOWN IN SECTION C-C.
8. ALL SIDEWALK RAMPS REQUIRE DETECTABLE WARNINGS.

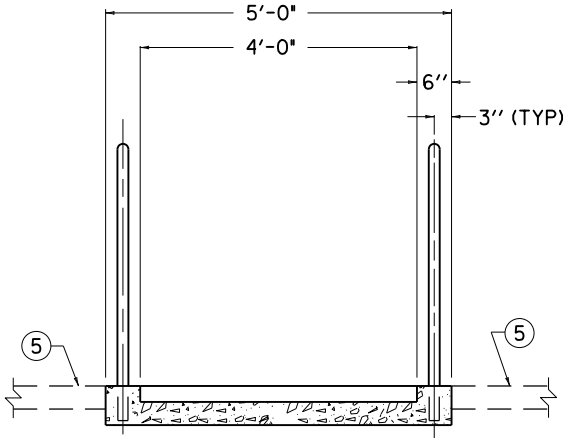


ISOMETRIC VIEW
SIDEWALK RAMP TYPE 5

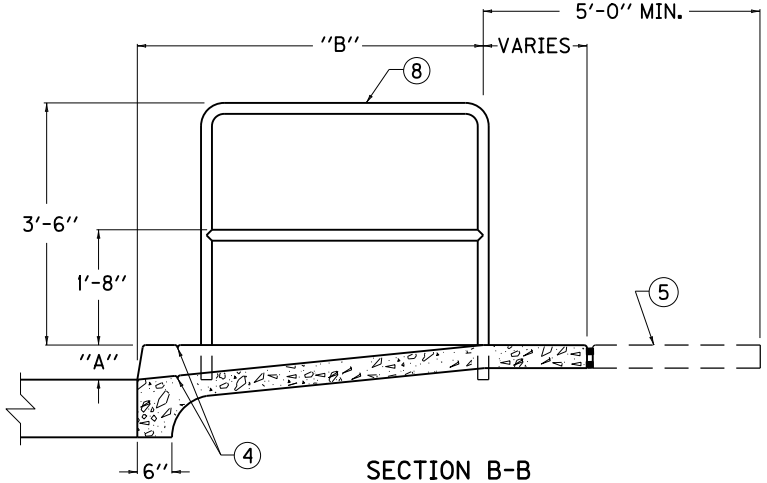


SECTION C-C (8)
(ALTERNATE TO HANDRAIL TYPE B)

RAMP HEIGHT ''A''	(6) RAMP LENGTH ''B''
≤3''	2'-0''
>3''≤6''	5'-0''



SECTION A-A



SECTION B-B

USE WITH CURRENT STD. DWG
RGX-030 , RGX-040

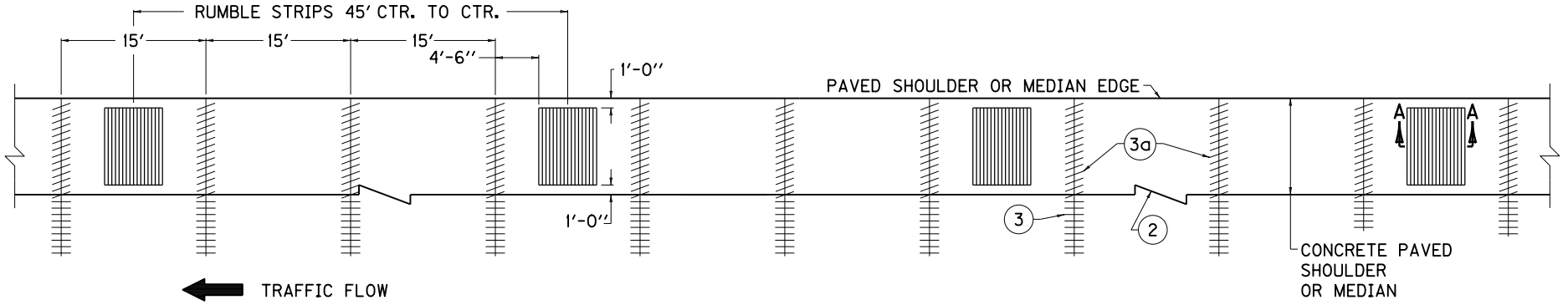
KENTUCKY
DEPARTMENT OF HIGHWAYS

SIDEWALK RAMP
WITH HANDRAIL

STANDARD DRAWING NO. RPM-172-07

SUBMITTED _____ DIRECTOR, DIVISION OF DESIGN 12-01-15 DATE

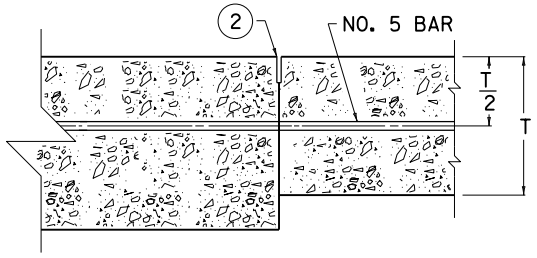
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



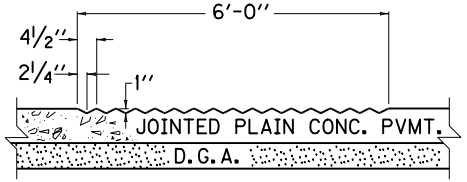
⑥ JOINTED PLAIN CONCRETE PAVED SHOULDER OR MEDIAN (UNDOWELLED) WITH JOINTED PLAIN CONCRETE MAINLINE PAVEMENT

~ NOTES ~

1. THE COST OF CONSTRUCTING RUMBLE STRIPS SHALL BE INCLUDED IN THE UNIT BID PRICE FOR JOINTED PLAIN CONCRETE PAVEMENT.
2. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAILS.
3. AFTER FINAL FINISHING OF THE PAVEMENT, CORRUGATIONS FOR RUMBLE STRIPS SHALL BE FORMED AT THE INTERVALS SHOWN INTO THE PLASTIC CONCRETE.
4. THE CORRUGATIONS SHALL BE ROUNDED RATHER THAN PEAKED, WITH THE TOP FLUSH WITH THE SHOULDER OR MEDIAN SLOPE.
5. THE TROUGH SHALL BE TAILED OUT, SO AS TO PROVIDE POSITIVE DRAINAGE.
6. JOINTED PLAIN CONCRETE SHOULDER OR MEDIAN (UNDOWELLED) IS DETAILED. WHEN JOINTED PLAIN CONCRETE SHOULDER OR MEDIAN (DOWELLED) IS REQUIRED REFER TO CUR. STD. DWG. RPM-145 FOR DETAIL.



JOINT DETAIL



SECTION A-A

USE WITH CUR. STD. DWGS.
RPM-145 , RPS-010

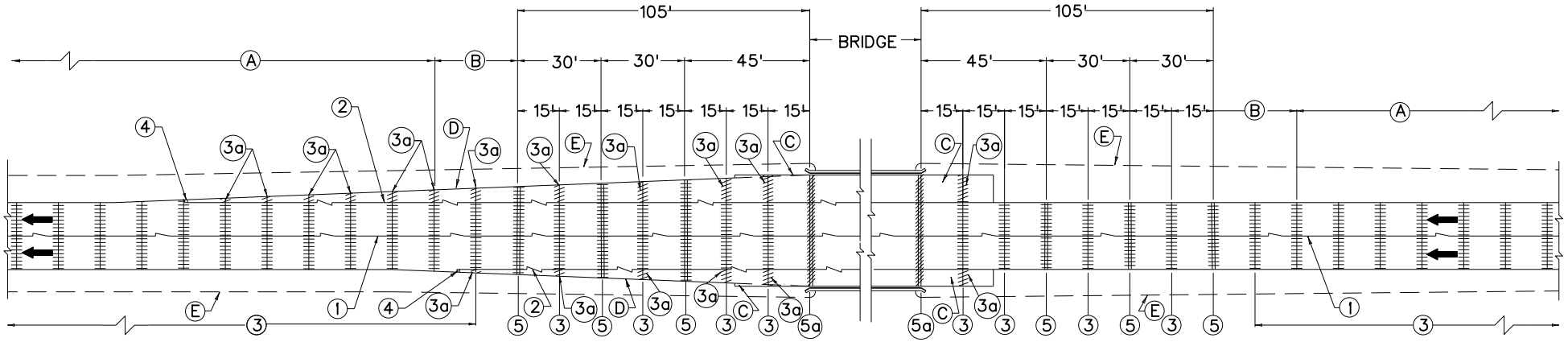
KENTUCKY
DEPARTMENT OF HIGHWAYS

JOINTED PLAIN CONCRETE PAVEMENT FOR SHOULDERS & MEDIANS

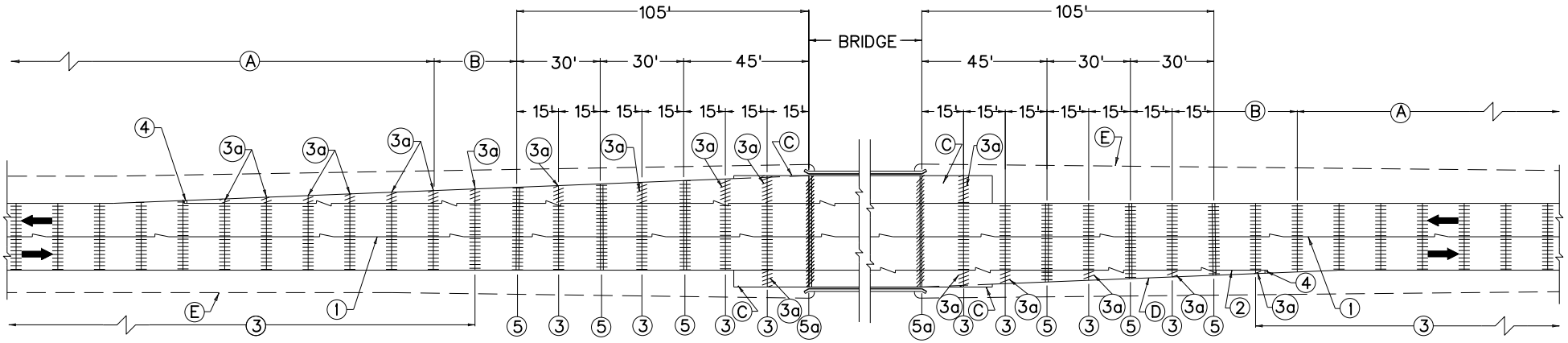
STANDARD DRAWING NO. RPN-001-07

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER — 12-01-15 DATE



SINGLE BRIDGE OR TWIN BRIDGES WITH ONE DIRECTION TRAFFIC



SINGLE BRIDGE WITH TWO DIRECTION TRAFFIC

~ NOTES ~

Ⓐ NORMAL SPACING OF TRANSVERSE CONTRACTION JOINTS ARE 15'-0" ON CENTER TAKEN ALONG ℄ OF PAVEMENT.

Ⓑ THIS DISTANCE IS TO BE EQUALLY DIVIDED WHEN IT IS LESS THAN THE SUM OF THE SPACING OF THE NEXT TWO TRANSVERSE CONTRACTION JOINTS EXCEEDS A MAXIMUM OF 15'-0".

Ⓒ THIS SLAB REQUIRED ONLY WHEN NEEDED FOR BRIDGE END DRAINAGE.

Ⓓ PAVEMENT TRANSITION 25':1', NOT PERMITTED WHEN CONSTRUCTED IN CONJUNCTION WITH P.C.C. SHOULDERS.

Ⓔ SHOULDER TRANSITION 100':1'.

F. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAILS.

G. IF WORK IS INTERRUPTED IN EXCESS OF 30 MINUTES, OR AT THE END OF A DAYS PAVING, A TRANSVERSE CONSTRUCTION JOINT SHALL BE INSTALLED; HOWEVER, IT SHALL NOT BE PERMITTED WITHIN 5' OF A TRANSVERSE CONTRACTION JOINT.

USE WITH CUR. STD. DWG.
RPS-010

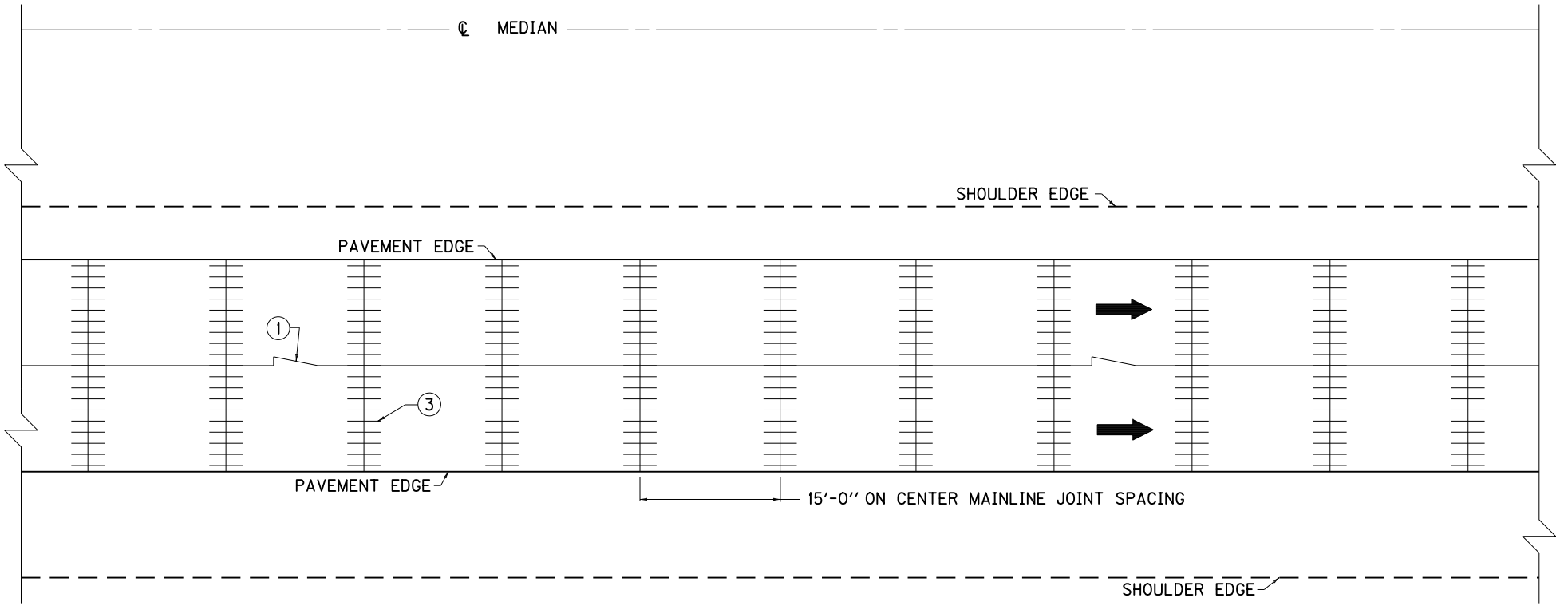
KENTUCKY
DEPARTMENT OF HIGHWAYS

PAVEMENT TRANSITIONS & JOINT DETAILS FOR JOINTED PLAIN CONCRETE PAVEMENT AT BRIDGE ENDS

STANDARD DRAWING NO. RPN-010-07

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



PLAN VIEW

~ NOTES ~

1. TRANSVERSE CONTRACTION JOINTS SHALL BE SPACED 15′-0″ ON CENTER AND SAWED TO A MINIMUM DEPTH OF ONE THIRD OF THE PAVEMENT THICKNESS (T/3) OR 4″ WHICHEVER IS LESS. ALL TRANSVERSE CONTRACTION AND TRANSVERSE EXPANSION JOINTS SHALL REQUIRE LOAD TRANSFER ASSEMBLIES AS DETAILED ON THE PLANS OR STANDARD DRAWINGS.
2. JOINT SPACING AND TYPE, AT BRIDGE ENDS, SHALL BE REQUIRED AS SHOWN ON THE PLANS OR CUR. STD. DWG. RPS-010 .
3. TRANSVERSE CONSTRUCTION JOINTS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 501.03.17 OF THE STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION.
4. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAILS.

USE WITH CUR. STD. DWG.
RPS-010

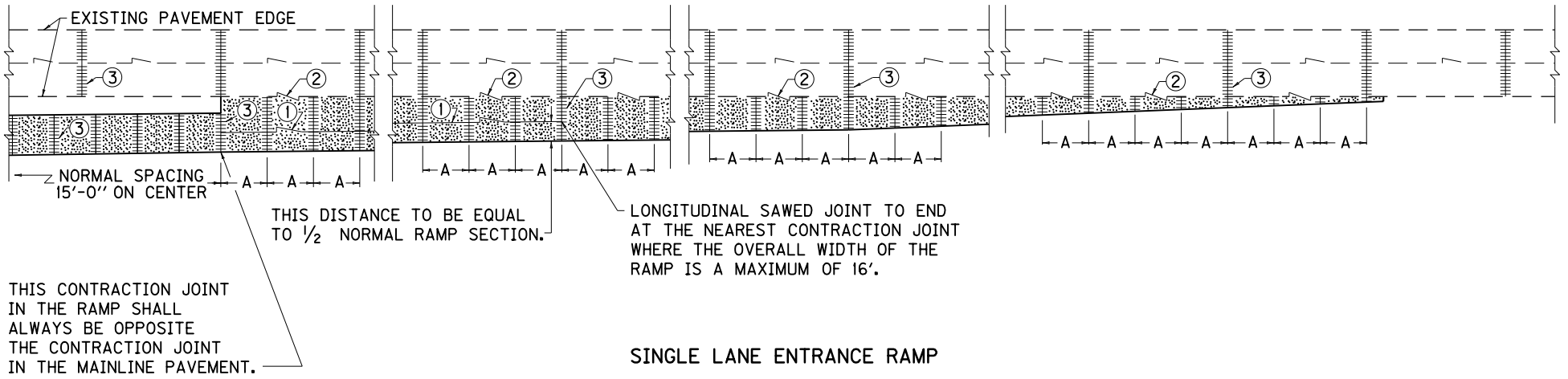
KENTUCKY
DEPARTMENT OF HIGHWAYS

JOINTED PLAIN CONCRETE PAVEMENT

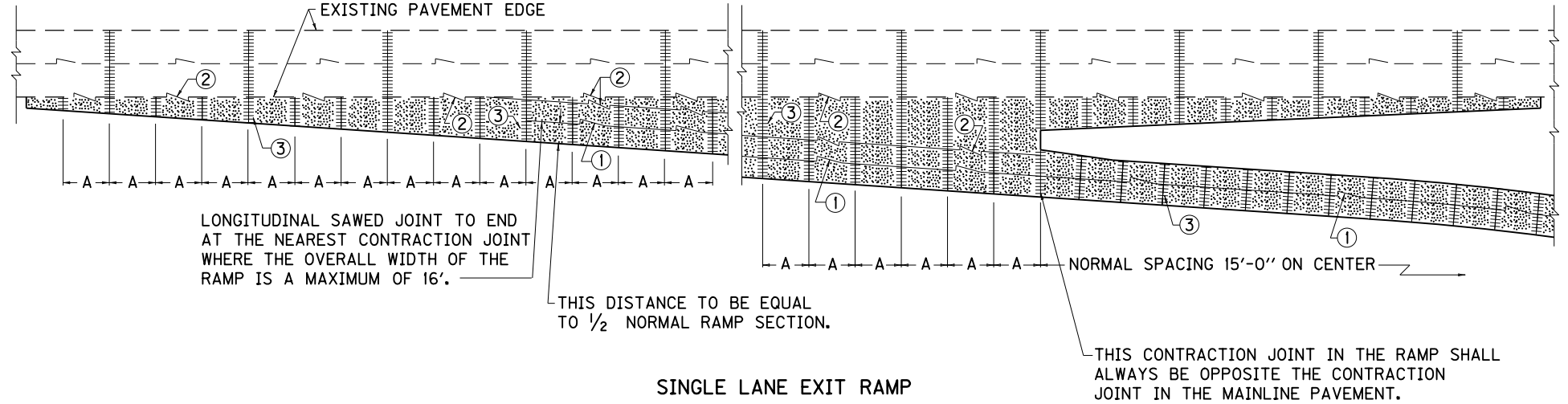
STANDARD DRAWING NO. RPN-015-05

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



SINGLE LANE ENTRANCE RAMP



SINGLE LANE EXIT RAMP

~ NOTES ~

1. (A) WHEN JOINTED PLAIN CONCRETE PAVEMENT IS SPECIFIED FOR AN ACCELERATION LANE, DECELERATION LANE, AN ADDITIONAL LANE, OR TAPER, AND IS TO BE CONSTRUCTED ADJACENT TO AN EXISTING JOINTED REINFORCED CONCRETE PAVEMENT, THE SPACING OF THE TRANSVERSE CONTRACTION JOINTS IN THE JOINTED PLAIN CONCRETE PAVEMENT SHALL BE AS FOLLOWS:
   (a) WHEN THE SPACING OF THE TRANSVERSE CONTRACTION JOINTS IN THE EXISTING PAVEMENT IS 50′, THE SPACING OF THE TRANSVERSE CONTRACTION JOINTS IN THE JOINTED PLAIN CONCRETE PAVEMENT SHALL BE 16⅔′.
   (b) WHEN THE SPACING OF THE TRANSVERSE CONTRACTION JOINTS IN THE EXISTING PAVEMENT IS 25′, THE SPACING OF THE TRANSVERSE CONTRACTION JOINTS IN THE JOINTED PLAIN CONCRETE PAVEMENT SHALL BE 12½′.
2. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAILS.
3. LONGITUDINAL SAWED JOINTS AT CENTER LINE SHALL BE REQUIRED FOR ALL RAMPS AND LOOPS GREATER THAN 16′ IN WIDTH.
4. ALL CONTRACTION JOINTS IN THE RAMP IMMEDIATELY OPPOSITE TO THE MAIN LINE PAVEMENT SHALL BE A CONTINUATION OF THE JOINTS IN THE MAINLINE PAVEMENT.
5. ▨ PROPOSED JOINTED PLAIN CONRETE PAVEMENT.

USE WITH CUR. STD. DWG. RPS-010

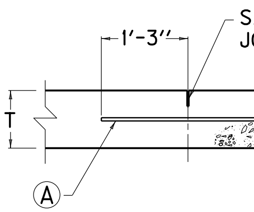
KENTUCKY DEPARTMENT OF HIGHWAYS

CONCRETE PAVEMENT JOINTS TYPES & SPACING

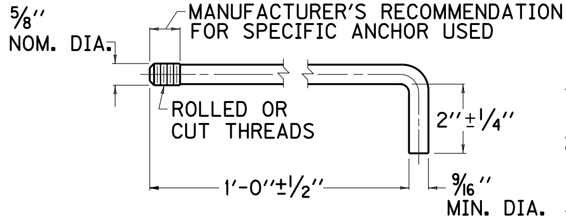
STANDARD DRAWING NO. RPN-020-04

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

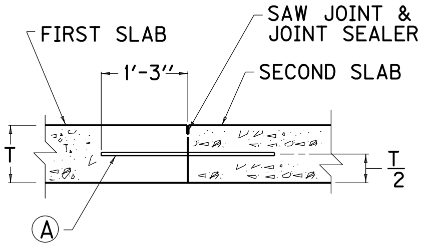
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



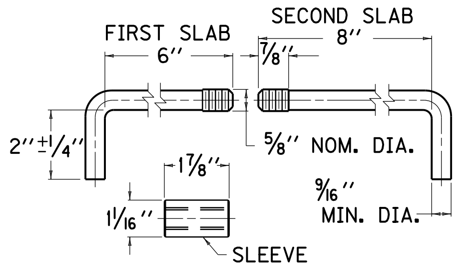
① LONGITUDINAL SAWED JOINT



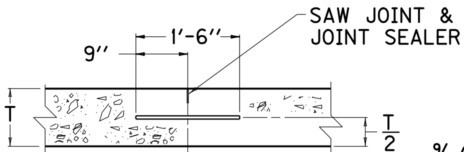
Ⓑ HOOK BOLT FOR USE WITH EXPANSION ANCHOR
(SEE STANDARD SPECIFICATIONS FOR BASIS OF PAYMENT)



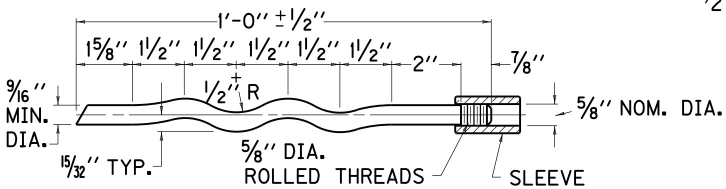
② LONGITUDINAL SAWED CONSTRUCTION JOINT



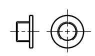
ALTERNATE 1
HOOK BOLTS FOR CONSTRUCTION JOINTS



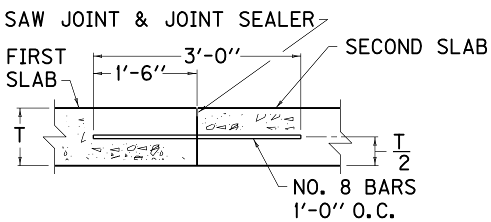
③ TRANSVERSE SAWED CONTRACTION JOINT



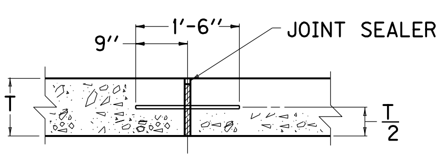
ALTERNATE 2 (FIRST SLAB)
DEFORMED ANCHOR BOLT
(TO BE USED WITH 8" HOOK BOLT)



5/8" PLASTIC INSERT



④ TRANSVERSE SAWED CONSTRUCTION JOINT



⑤ TRANSVERSE EXPANSION JOINT

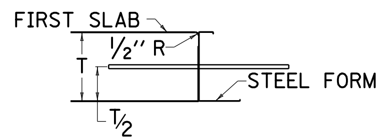
~ NOTES ~

1. LONGITUDINAL JOINTS SHALL BE USED WHEN SHOWN ON THE TYPICAL SECTION, AND STANDARD DRAWINGS AND SHALL BE CONSTRUCTED AS SHOWN ON THIS DRAWING.
2. LONGITUDINAL CONSTRUCTION JOINTS BETWEEN ADJOINING SLABS, AND PAVED IN SEPARATE OPERATIONS SHALL USE HOOK-BOLTS OR TIE BARS AND BE CONSTRUCTED AS SHOWN ON THIS DRAWING.
3. IN LIEU OF THE DEFORMED TIE BARS THE CONTRACTOR SHALL BE PERMITTED TO USE EITHER ALT. 1 OR ALT. 2 HOOK BOLT AS DETAILED.

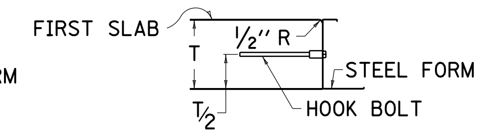
④ DEFORMED TIE BARS USED IN TRANSVERSE CONSTRUCTION JOINTS SHALL BE NO CLOSER THAN 6" TO THE PAVEMENT EDGE OR ANY LONGITUDINAL JOINT.

Ⓐ NO. 5 DEFORMED TIE BAR 2'-6" LONG PLACED 1'-8" ON CENTER AND PLACED 1'-8" MINIMUM FROM ANY TRANSVERSE JOINT.

Ⓑ EXPANSION ANCHOR FOR BOLT SIZE INDICATED SHALL BE BETHLEHEM MINE ROOF EXPANSION TYPE WITH K-1 SHELL , PHILLIPS RED HEAD ANCHOR, CHICAGO EXPANSION BOLT CO. - SPECIAL FLUSH SELF DRILLING ANCHOR , OR APPROVED TYPE. INSTALLATION SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION. HOOK BOLTS WITH EXPANSION ANCHORS ATTACHED SHALL NOT BE LESS THAN 14" IN LENGTH. HOOK BOLTS WITH EXPANSION ANCHORS SHALL BE SPACED 5'-0" O.C.



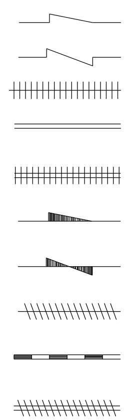
TYPE A



TYPE B

METHODS OF FORMING CONSTRUCTION JOINTS WHEN FORMS ARE USED

JOINT SYMBOLS



① LONGITUDINAL SAWED JOINT
② LONGITUDINAL SAWED CONSTRUCTION JOINT
③ TRANSVERSE SAWED CONTRACTION JOINT
④ TRANSVERSE SAWED CONSTRUCTION JOINT (1'-0" MIN.)
⑤ TRANSVERSE EXPANSION JOINT
(1a) LONGITUDINAL SAWED JOINT (WITHOUT TIE BARS)
(2a) LONGITUDINAL SAWED CONSTRUCTION JOINT (WITHOUT TIE BARS)
(3a) TRANSVERSE SAWED CONTRACTION JOINT (WITHOUT LOAD TRANSFER ASSEMBLY)
(4a) TRANSVERSE SAWED CONSTRUCTION JOINT (WITHOUT TIE BARS)
(5a) 1/2" TRANSVERSE EXPANSION JOINT (WITHOUT LOAD TRANSFER ASSEMBLY)

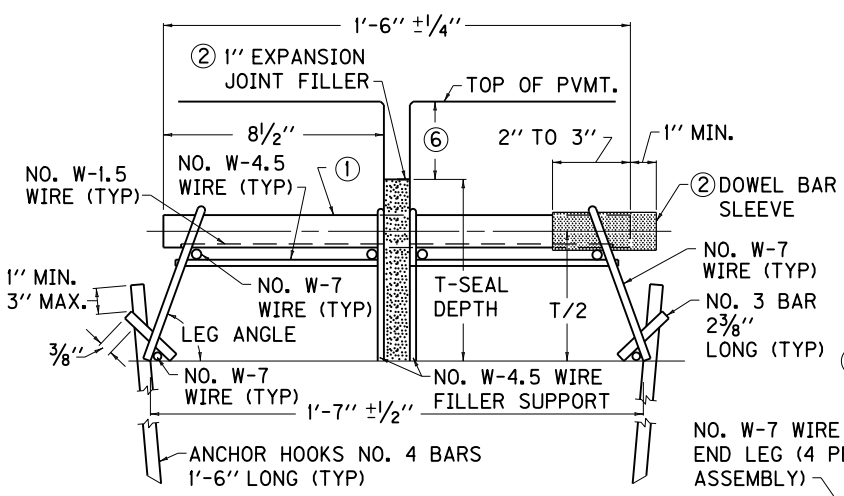
USE WITH CUR. STD. DWGS.
RPN-001, RPN-010 ,RPN-015,
RPN-020, RPS-030 ,RPS-031,
RPS-032, RPS-033 ,RPS-034,
RPS-035, RPS-036 ,RPS-037,
RPS-038, RPS-039 ,RPX-010,
RPX-015, RPX-020

KENTUCKY
DEPARTMENT OF HIGHWAYS

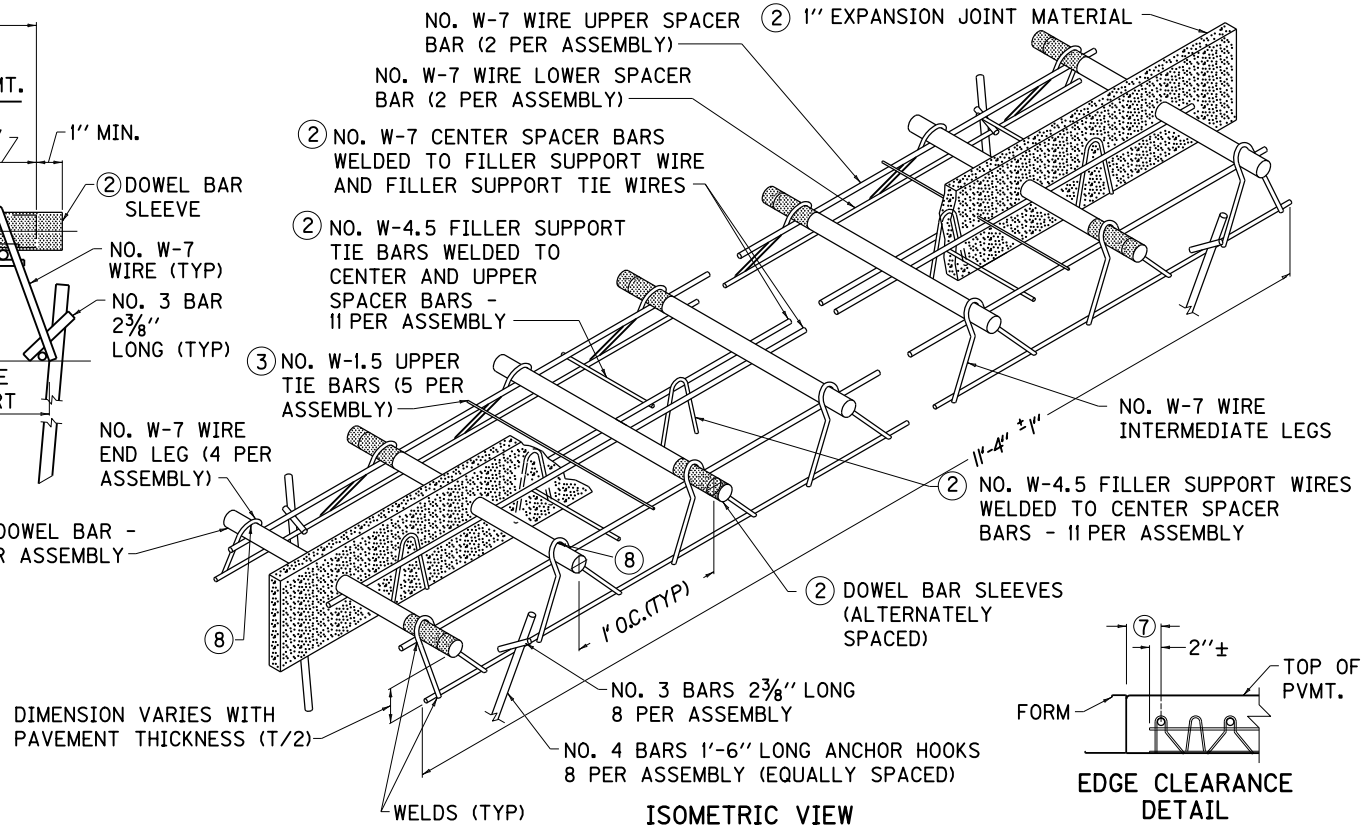
CONCRETE PAVEMENT JOINT DETAILS

STANDARD DRAWING NO. RPS-010-11

SUBMITTED [signature] DIRECTOR DIVISION OF DESIGN 12-01-15 DATE
APPROVED [signature] STATE HIGHWAY ENGINEER 12-01-15 DATE



END ELEVATION



ISOMETRIC VIEW

EDGE CLEARANCE DETAIL

~ NOTES ~

① DOWEL BAR SIZES

PAVEMENT THICKNESS						
8"	9"	10"	11"	12"	13"	14"
BAR DIAMETER						
1 1/4"			1 1/2"		1 3/4"	
LEG ANGLES +/- 3 DEGREES						
63	63	63	70	70	70	70

② EXPANSION ASSEMBLY IS ILLUSTRATED: FOR CONTRACTION ASSEMBLY OMIT CUTTING OF UPPER TIE BARS, 1" EXPANSION JOINT MATERIAL, NO. W-7 CENTER SPACER BARS, NO. W-4.5 FILLER SUPPORT WIRES, FILLER TIE BARS, AND DOWEL BAR SLEEVES.

③ FOR EXPANSION JOINT LOAD TRANSFER ASSEMBLIES THE NO. W-1.5 UPPER TIE BARS, WELDED TO UPPER SPACER BARS, SHALL BE CUT AFTER INTIAL CONCRETE PLACEMENT.

④ FOR END LEGS, BEND WIRE AS SHOWN BY PHANTOM LINES IN INTERMEDIATE LEG DETAIL.

⑤ REFERENCE POINTS SHALL BE REQUIRED ON EACH SIDE OF THE LOAD TRANSFER ASSEMBLY, IN ORDER TO LOCATE THE INTENDED SAWED JOINT AFTER PAVING. ALL SAWING SHALL BE ACCURATELY CONTROLLED TO THE CENTERLINE OF THE LOAD TRANSFER ASSEMBLIES. LONGITUDINAL ORIENTATION OF DOWEL BARS SHALL BE SUCH THAT ALL DOWEL BARS ARE PARALLEL WITH THE CENTERLINE OF EACH PAVING LANE.

⑥ SEE APPLICABLE CUR. STD. DWG. RPX-010 OR RPX-020 FOR SEAL DEPTH.

⑦ 4 1/2" MIN. AND 10 1/2" MAX. FOR VARIABLE SLAB WIDTH. 6" FOR UNIFORM OR STD. SLAB WIDTH. LOCATION AND SPACING SEE APPLICABLE PAVEMENT STANDARD DRAWINGS.

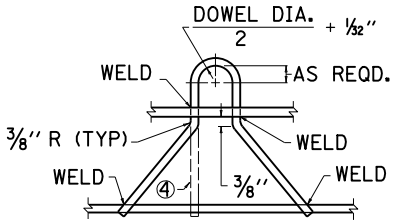
⑧ WELD EITHER NO. W-7 UPPER SPACER BAR OR LEG SUPPORT TO ALTERNATE ENDS OF DOWEL BARS AS TYPICALLY SHOWN.

9. DOWEL ENDS SHALL NOT VARY MORE THAN 1/4" FROM A STRAIGHT LINE.

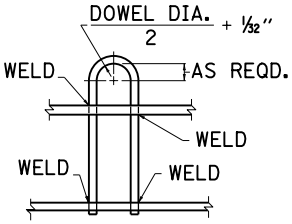
10. DOWELS SHALL BE PARALLEL WITH BASE, WITH A TOLERANCE OF 1/4".

11. EPOXY SHALL BE CLEANED OFF TO BARE METAL BEFORE WELDING DOWEL TO WIRE.

12. "U" LEG OR "A" LEG ARE ACCEPTABLE ALTERNATES PROVIDING MATCHED LEGS ARE SUPPLIED.



INTERMEDIATE OPTIONAL "A" LEG DETAIL



INTERMEDIATE OPTIONAL "U" LEG DETAIL

USE WITH CUR. STD. DWGS. RPX-015 , RPX-020

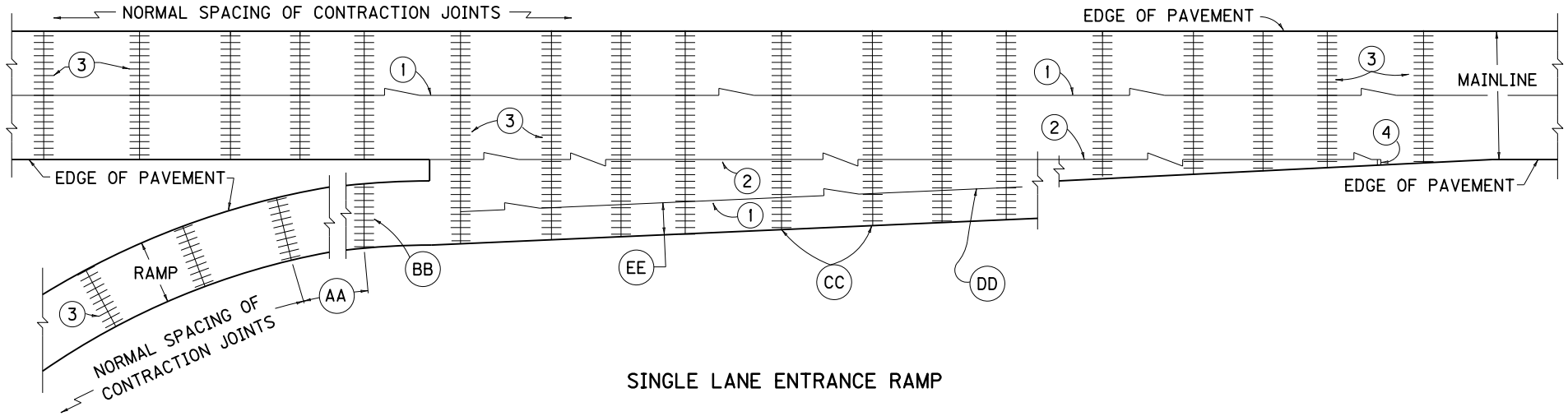
KENTUCKY DEPARTMENT OF HIGHWAYS

EXPANSION AND CONTRACTION JOINT LOAD TRANSFER ASSEMBLIES

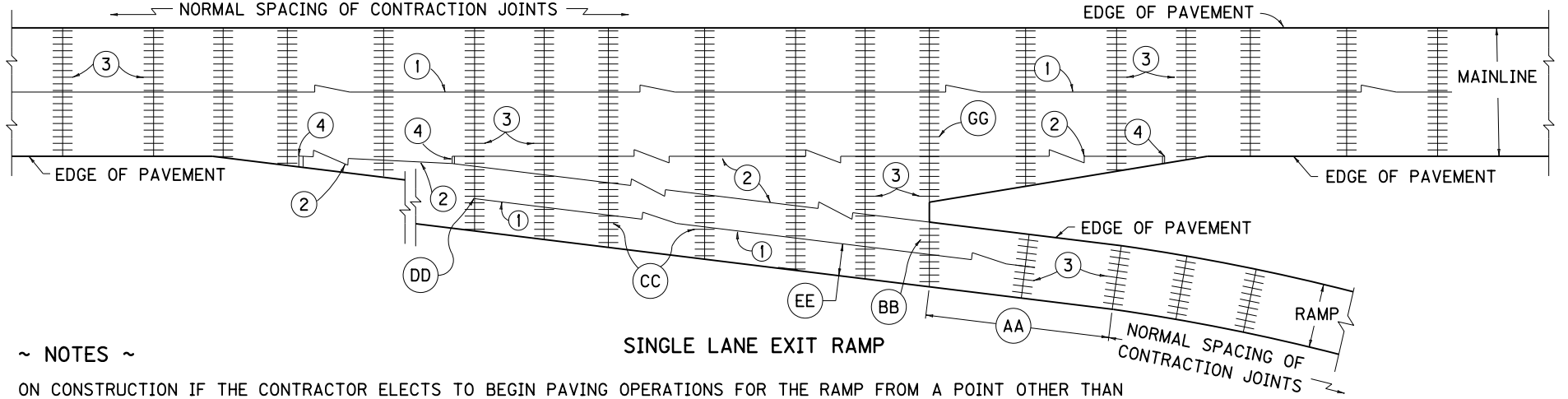
STANDARD DRAWING NO. RPS-020-14

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



SINGLE LANE ENTRANCE RAMP



SINGLE LANE EXIT RAMP

~ NOTES ~

(AA) ON CONSTRUCTION IF THE CONTRACTOR ELECTS TO BEGIN PAVING OPERATIONS FOR THE RAMP FROM A POINT OTHER THAN THAT WHICH IS IMMEDIATELY OPPOSITE THE MAINLINE PAVEMENT THEN THIS DISTANCE SHALL BE EQUALLY DIVIDED WHEN IT BECOMES GREATER THAN 20′ AND LESS THAN 40′.

(BB) THIS CONTRACTION JOINT IN THE RAMP SHALL ALWAYS BE OPPOSITE THE CONTRACTION JOINT IN THE MAINLINE PAVEMENT.

(CC) ALL CONTRACTION JOINTS IN THE RAMP IMMEDIATELY OPPOSITE THE MAINLINE PAVEMENT SHALL BE A CONTINUATION OF THE JOINTS IN THE MAINLINE PAVEMENT.

(DD) LONGITUDINAL SAWED JOINT SHALL END AT THE NEAREST CONTRACTION JOINT, WHERE THE OVERALL WIDTH OF THE RAMP IS A MAXIMUM OF 16′.

(EE) THIS DISTANCE SHALL BE EQUAL TO ½ THE NORMAL RAMP SECTION.

FF. LONGITUDINAL SAWED JOINTS AT CENTERLINE SHALL BE REQUIRED FOR ALL RAMPS AND LOOP WIDTHS GREATER THAN 16′.

(GG) THIS CONTRACTION JOINT SHALL ALWAYS BE PLACED OPPOSITE THE NOSE OF THE RAMP. THE TWO CONTRACTION JOINTS IMMEDIATELY PRECEEDING THIS JOINT, DEPENDING ON THE DIRECTION OF PAVING OPERATIONS, SHALL BE EQUALLY DIVIDED, PROVIDED THE SPACING DOES NOT EXCEED THE NORMAL SPACING. SHOULD SPACING BE GREATER THAN NORMAL, AN EXTRA JOINT SHALL BE ADDED AND THE DISTANCE EQUALLY DIVIDED. THE JOINT IMMEDIATELY FOLLOWING THE JOINT THAT IS PLACED OPPOSITE THE RAMP NOSE SHALL BE NORMALLY SPACED.

HH. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAILS.

II. NORMAL SPACING OF CONTRACTION JOINTS INDICATED ON THIS DRAWING ARE TO BE IN ACCORDANCE WITH SPACING INDICATED ON CUR. STD. DWG. RPN-015 .

USE WITH CUR. STD. DWGS.
RPN-015 , RPS-010

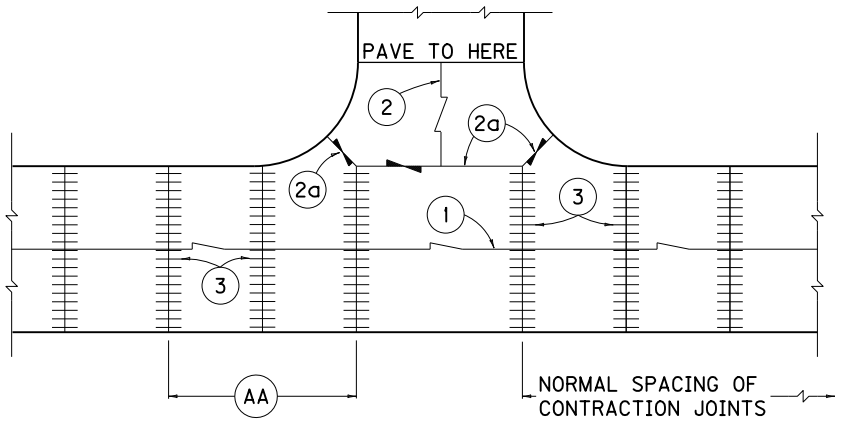
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE PAVEMENT JOINTS TYPES AND SPACING

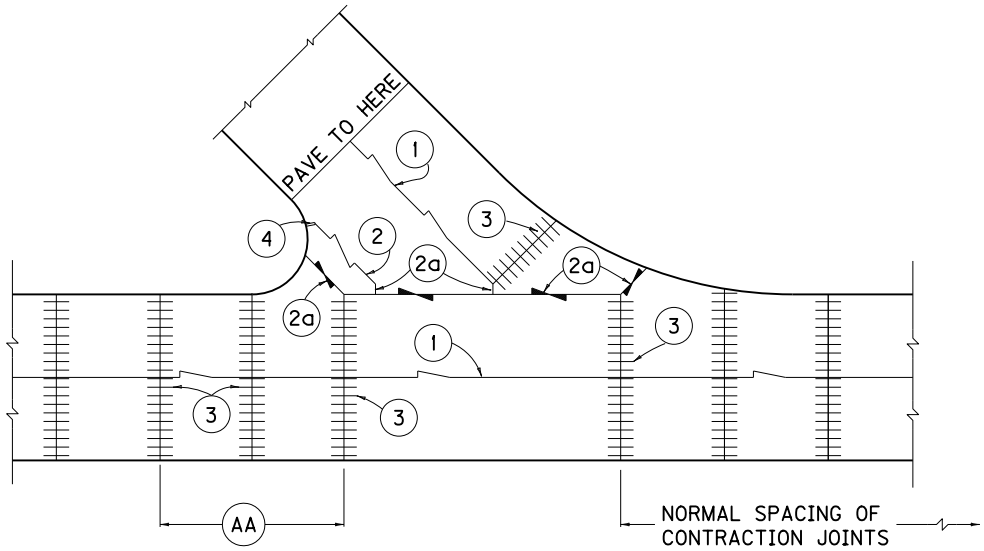
STANDARD DRAWING NO. RPS-030-06

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

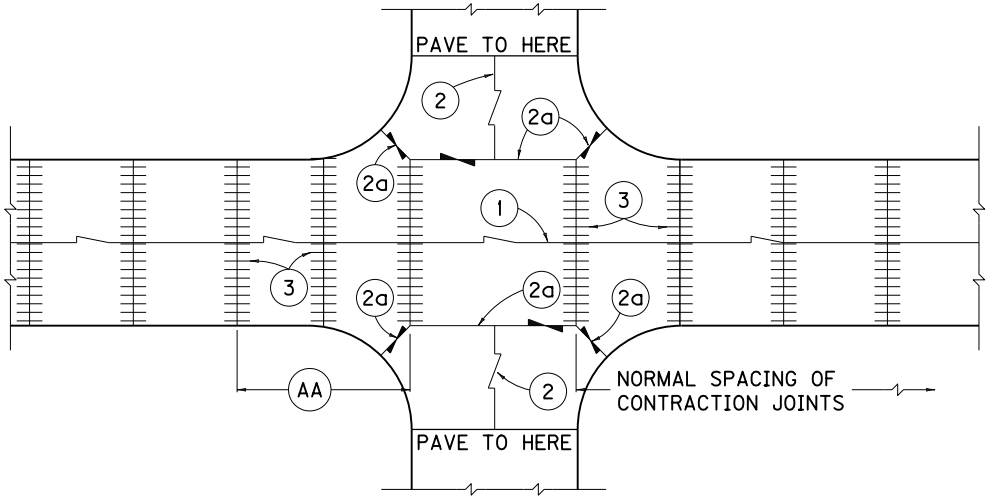
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



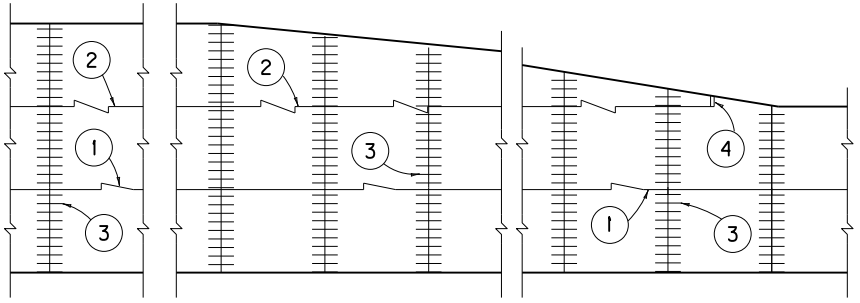
SINGLE INTERSECTIONS



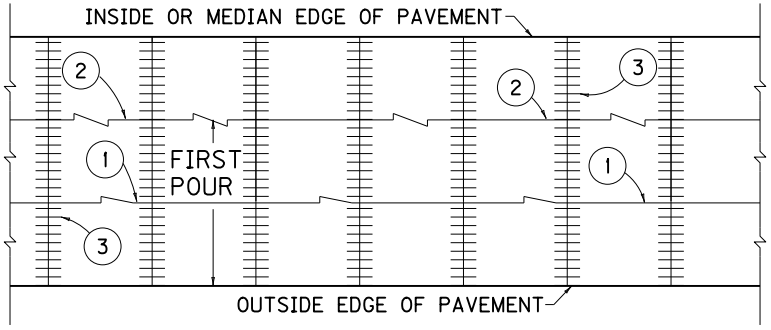
ANGLE INTERSECTION



DOUBLE INTERSECTIONS



DECELERATING LANE



NORMAL THREE LANE PAVEMENT

~ NOTES ~

SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAILS.

DRAWINGS ON THIS SHEET ARE DETAILED ON THE PREMISE THAT PAVEMENT CONSTRUCTION WILL BE FROM LEFT TO RIGHT. IF PAVEMENT CONSTRUCTION IS IN THE OPPOSITE DIRECTION, TRANSVERSE JOINT SPACING DETAILS SHALL BE REVERSED END FOR END.

(AA) THIS DISTANCE TO BE EQUALLY DIVIDED WHEN GREATER THAN 20′ AND LESS THAN 40′.

USE WITH CUR. STD. DWG. RPS-010

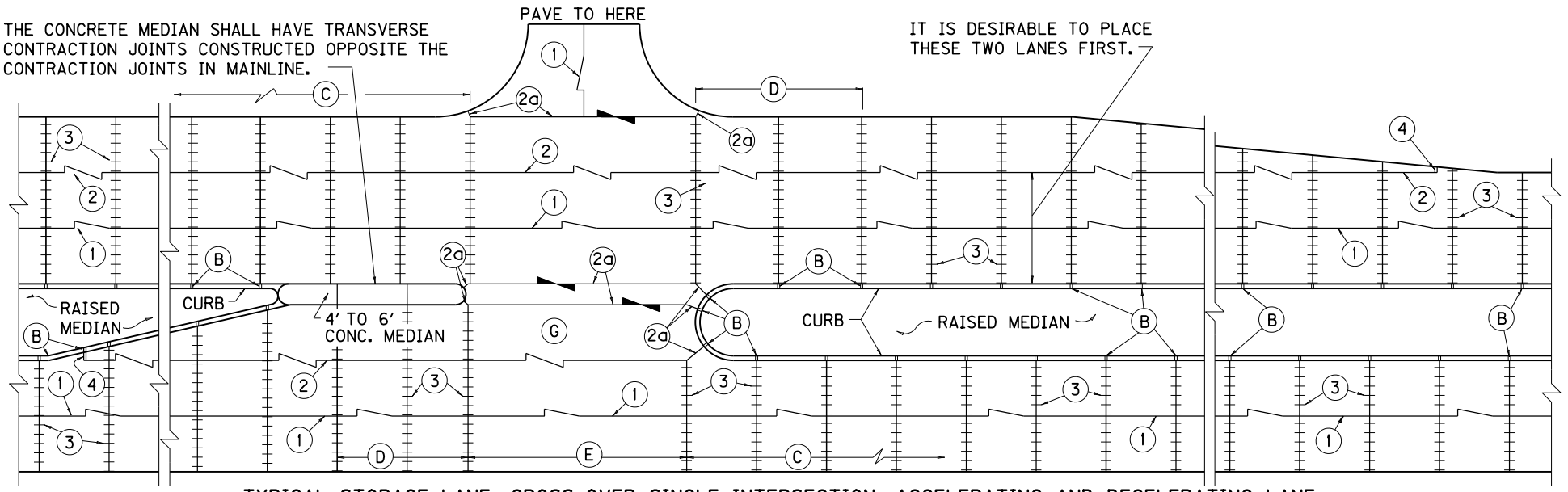
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE PAVEMENT JOINTS TYPES AND SPACING

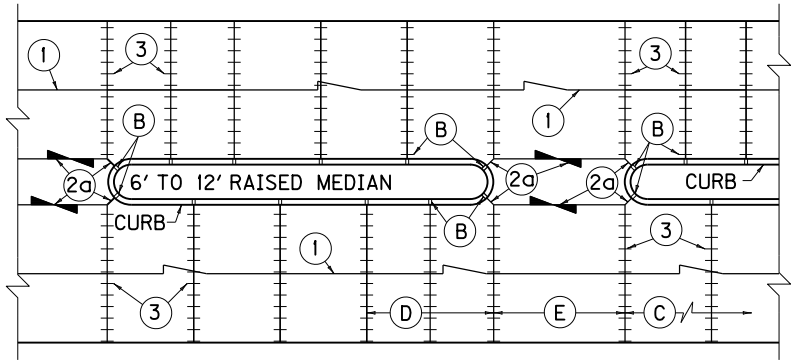
STANDARD DRAWING NO. RPS-031-06

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

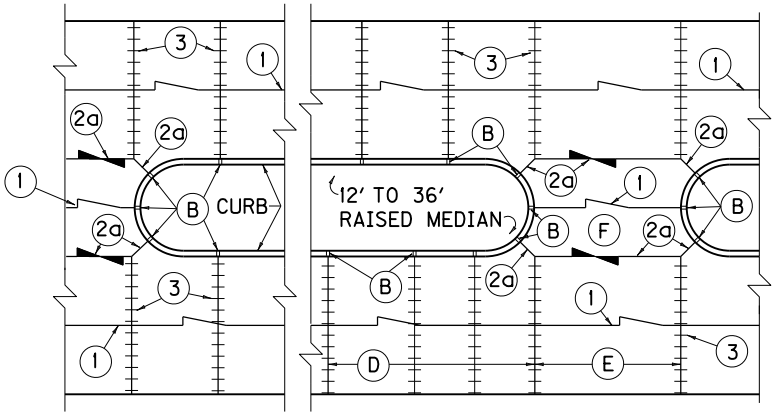
APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



TYPICAL STORAGE LANE, CROSS-OVER SINGLE INTERSECTION, ACCELERATING AND DECELERATING LANE



TYPICAL DIVIDED PAVEMENT WITH NARROW RAISED MEDIAN AND CROSS-OVER



TYPICAL DIVIDED PAVEMENT WITH WIDE RAISED MEDIAN AND CROSS-OVER

~ NOTES ~

(B) 1/2" EXPANSION JOINT FILLER.

(C) NORMAL SPACING OF CONTRACTION JOINTS 15'-0" ON CENTER.

(D) THIS DISTANCE TO BE EQUALLY DIVIDED WHEN GREATER THAN 20' AND LESS THAN 40'.

(E) NO CONTRACTION JOINT REQUIRED WHEN DISTANCE LESS THAN NORMAL SPACING OF JOINTS. EQUALLY DIVIDED WHEN DISTANCE IS GREATER THAN 20' AND LESS THAN 40'.

(F) A LONGITUDINAL SAWED JOINT SHALL BE CONSTRUCTED IN THE CROSS-OVER WHEN THE WIDTH OF CROSS-OVER BECOMES GREATER THAN 16' AND LESS THAN 24'. WHEN WIDTH BECOMES GREATER THAN 24' A LONGITUDINAL SAWED AND LONGITUDINAL CONSTRUCTION JOINT SHALL BE CONSTRUCTED IN THE CROSS-OVER.

(G) SHOULD THE CROSSOVER LENGTH BECOME GREATER THAN NORMAL SPACING OF CONTRACTION JOINTS A TRANSVERSE CONTRACTION JOINT SHALL BE PLACED IN THE CROSS-OVER OPPOSITE THE CONTRACTION JOINTS IN THE MAINLINE.

H. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAIL.

I. ALL INTEGRAL CURBS CONSTRUCTED WITH CONCRETE BASE OR PAVEMENT SHALL HAVE JOINTS COINCIDING WITH THE TRANSVERSE JOINTS AND OTHER JOINTS SHOWN ON THIS STANDARD DRAWING. THE JOINTS SHALL BE FILLED WITH 1/2" PREMOLDED EXPANSION JOINT FILLER, CUT TO THE REQUIRED SECTION.

USE WITH CUR. STD. DWG. RPS-010

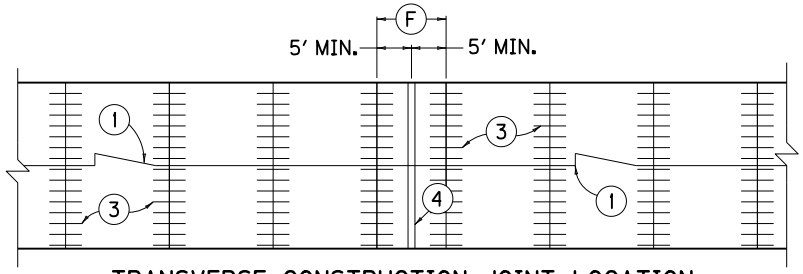
KENTUCKY DEPARTMENT OF HIGHWAYS

CONCRETE PAVEMENT JOINTS TYPES AND SPACING

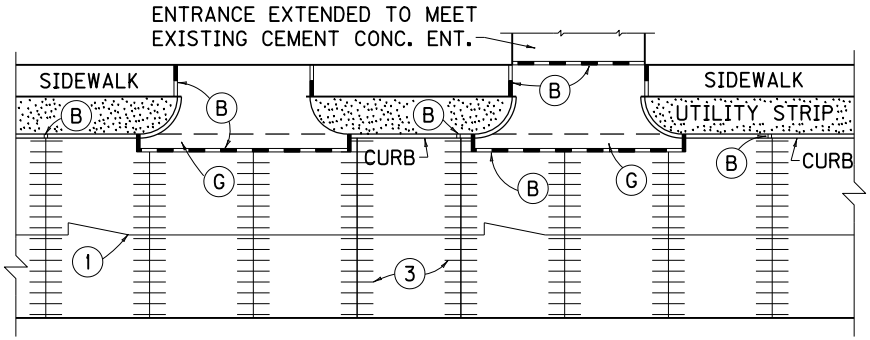
STANDARD DRAWING NO. RPS-032-06

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



TRANSVERSE CONSTRUCTION JOINT LOCATION

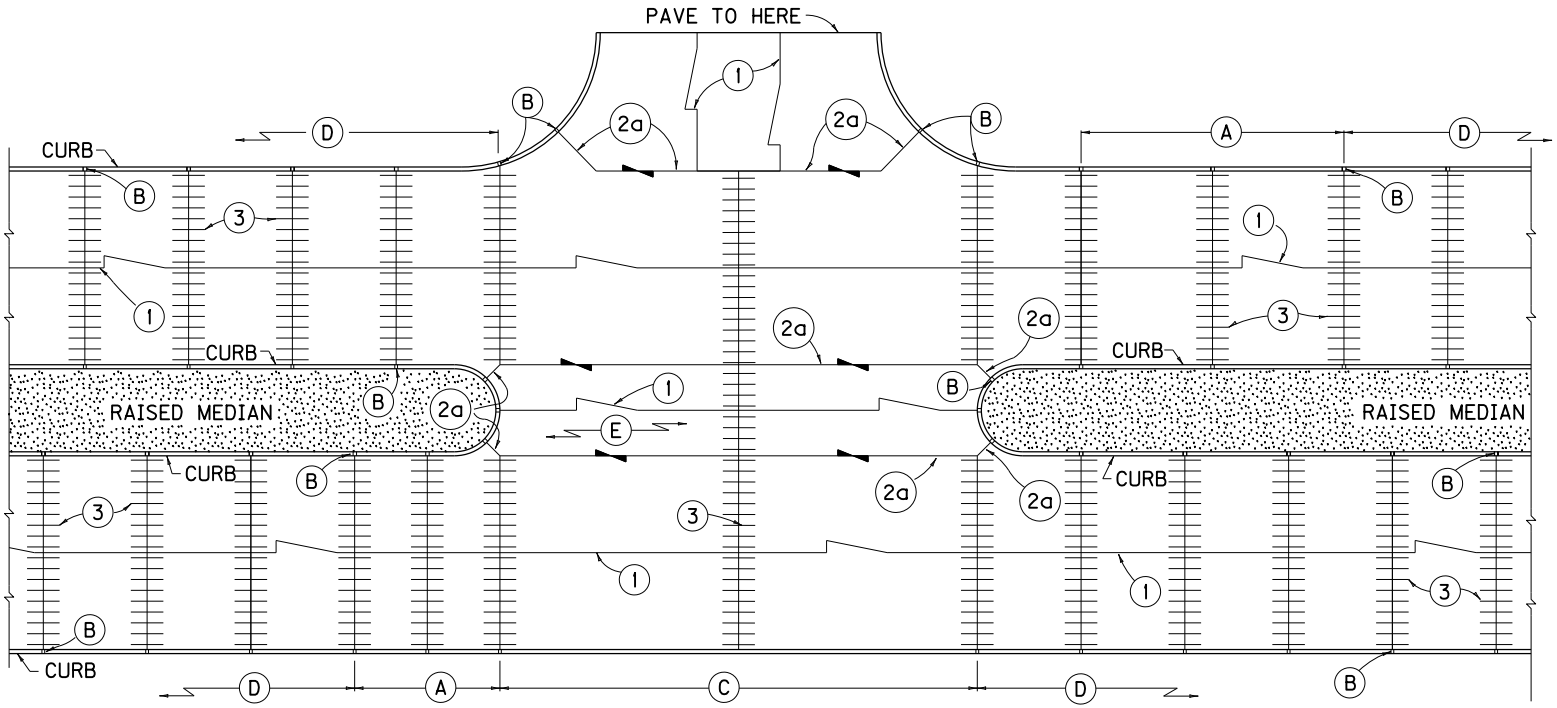


MUNICIPAL TYPE RESIDENTIAL ENTRANCES

~ NOTES ~

1. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAILS.
2. THE INSTALLATION OF LONGITUDINAL SAWED AND CONSTRUCTION JOINTS IN TURNOUTS SHALL DEPEND ON THE WIDTH OF THE TURNOUT WITH THE RULE THAT 16′ SHALL BE THE MAXIMUM POUR WITHOUT CONSTRUCTION OF A LONGITUDINAL JOINT.
3. ALL INTEGRAL CURBS CONSTRUCTED WITH CONCRETE BASE OR PAVEMENT SHALL HAVE JOINTS COINCIDING WITH THE TRANSVERSE JOINTS AND OTHER JOINTS SHOWN ON THIS STANDARD DRAWING. THE JOINTS SHALL BE FILLED WITH ½″ PREMOLDED EXPANSION JOINT FILLER, CUT TO REQUIRED SECTION.

Ⓐ THIS DISTANCE TO BE EQUALLY DIVIDED WHEN GREATER THAN 20′ AND LESS THAN 40′.
Ⓑ ½″ EXPANSION JOINT FILLER.
Ⓒ THIS DISTANCE TO BE EQUALLY DIVIDED WHEN GREATER THAN 20′ AND LESS THAN 40′. NO TRANSVERSE JOINT WILL BE REQUIRED IF THE DISTANCE IS LESS THAN NORMAL SPACING OF JOINTS.
Ⓓ NORMAL SPACING OF CONTRACTION JOINTS.
Ⓔ EQUALLY DIVIDE AND CONSTRUCT LONGITUDINAL SAWED JOINT WHEN WIDTH OF CROSSOVER BECOMES GREATER THAN 16′ AND LESS THAN 24′. WHEN WIDTH BECOMES GREATER THAN 24′, A LONGITUDINAL SAWED AND LONGITUDINAL CONSTRUCTION JOINT SHALL BE CONSTRUCTED IN THE CROSSOVER.
Ⓕ NORMAL SPACING OF TRANSVERSE CONTRACTION JOINTS.
Ⓖ SEE CUR. STD. DWG. RPM-150 OR RPM-152 , AS APPLICABLE FOR MORE DETAIL.



TYPICAL DIVIDED LANE WITH CROSSOVER AND CURB

USE WITH CUR. STD. DWG.
RPM-150, RPM-152, RPS-010

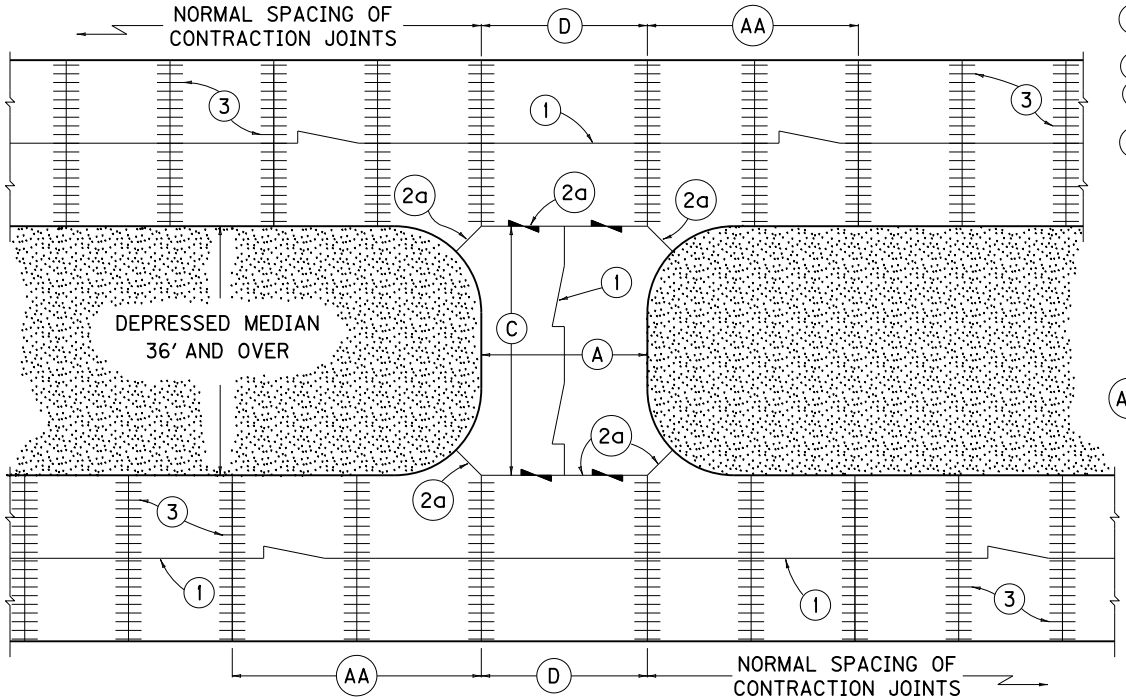
KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE
PAVEMENT JOINTS
TYPES AND SPACING

STANDARD DRAWING NO. RPS-033-07

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



TYPICAL DIVIDED PAVEMENT WITH DEPRESSED MEDIAN AND CROSSOVER

~ NOTES ~

(A) EQUALLY DIVIDE AND CONSTRUCT LONGITUDINAL SAWED JOINT WHEN DISTANCE BECOMES GREATER THAN 16'.

(B) 1/2" EXPANSION JOINT FILLER.

(C) TRANSVERSE CONTRACTION JOINT REQUIRED ONLY WHEN DISTANCE IN EXCESS OF NORMAL SPACING OF CONTRACTION JOINTS.

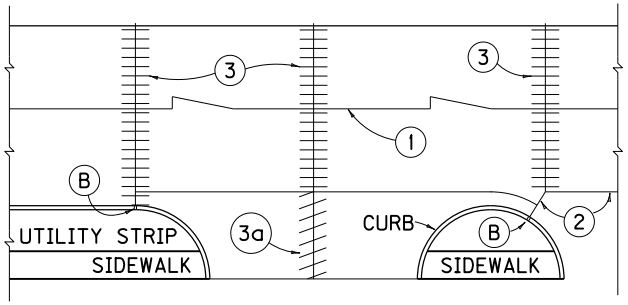
(D) NO CONTRACTION JOINTS REQUIRED BETWEEN THESE TWO CONTRACTION JOINTS WHEN DISTANCE IS LESS THAN NORMAL SPACING OF JOINTS. EQUALLY DIVIDE WHEN DISTANCE IS GREATER THAN 20' AND LESS THAN 40'.

E. ALL INTEGRAL CURBS CONSTRUCTED WITH CONCRETE BASE OR PAVEMENT SHALL HAVE JOINTS COINCIDING WITH THE TRANSVERSE JOINTS AND OTHER JOINTS SHOWN ON THIS STANDARD DRAWING.

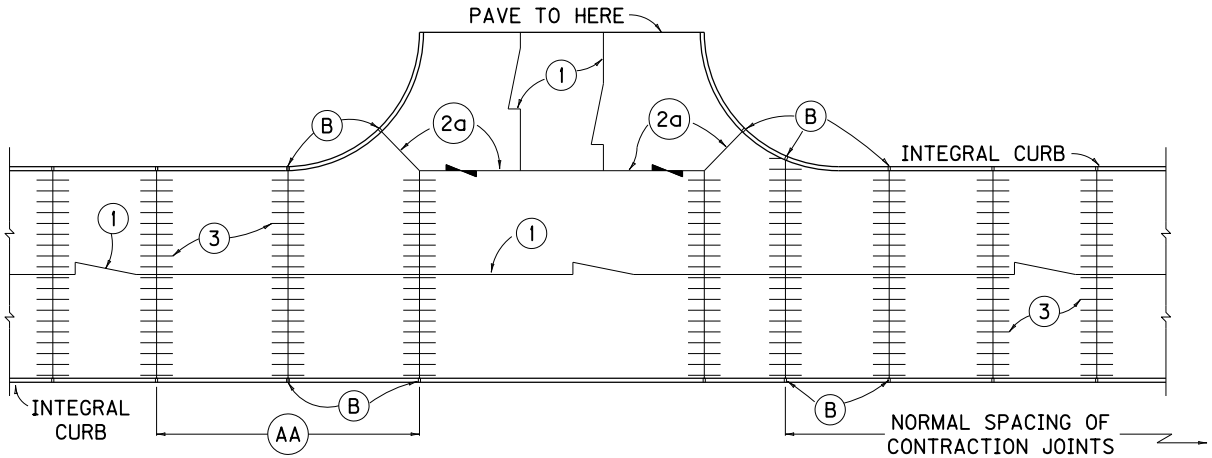
F. THE JOINTS SHALL BE FILLED WITH 1/2" PREMOLDED EXPANSION JOINT FILLER, CUT TO THE REQUIRED SECTION.

G. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAILS.

(AA) THIS DISTANCE TO BE EQUALLY DIVIDED WHEN GREATER THAN 20' AND LESS THAN 40'.



COMMERCIAL ENTRANCE



CEMENT CONCRETE BASE WITH INTEGRAL CURB

USE WITH CUR. STD. DWG. RPS-010

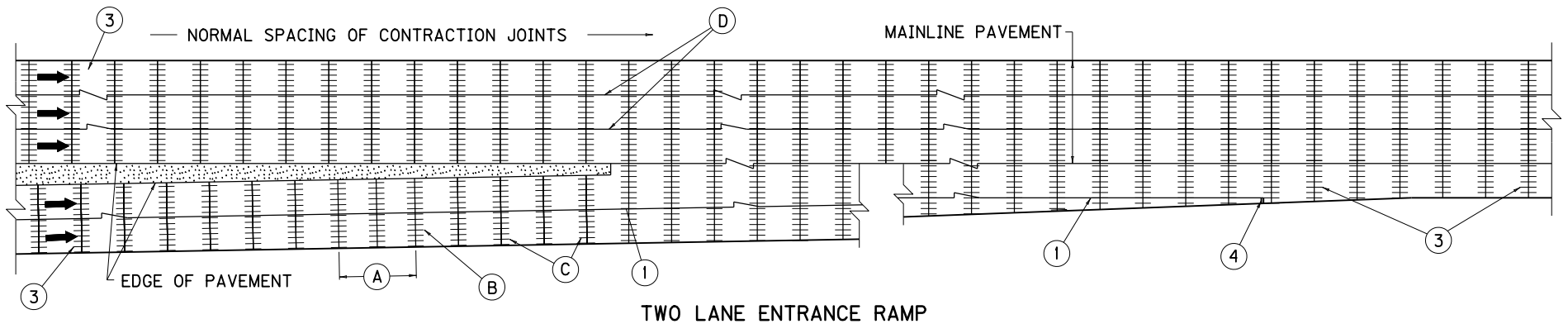
KENTUCKY DEPARTMENT OF HIGHWAYS

CONCRETE PAVEMENT JOINTS TYPES AND SPACING

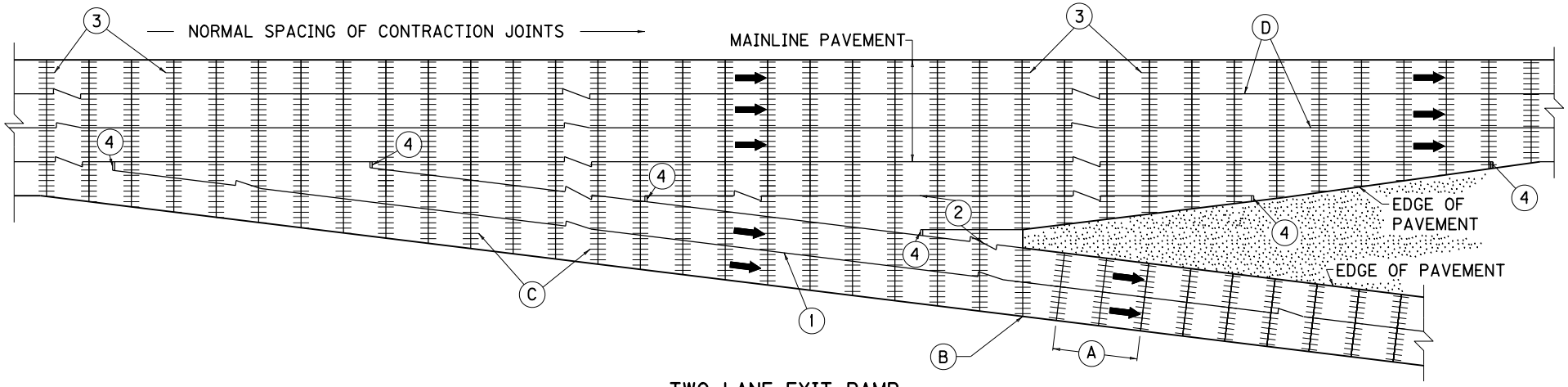
STANDARD DRAWING NO. RPS-034-07

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



TWO LANE ENTRANCE RAMP



TWO LANE EXIT RAMP

~ NOTES ~

(A) ON CONSTRUCTION IF THE CONTRACTOR ELECTS TO BEGIN PAVING OPERATIONS FOR THE RAMP FROM A POINT OTHER THAN WHICH IS IMMEDIATELY OPPOSITE THE MAINLINE PAVEMENT, THIS DISTANCE SHALL BE EQUALLY DIVIDED WHEN IT BECOMES GREATER THAN 20′ AND LESS THAN 40′.

(B) THIS CONTRACTION JOINT IN THE RAMP SHALL ALWAYS BE OPPOSITE THE CONTRACTION JOINT IN THE MAINLINE PAVEMENT.

(C) ALL CONTRACTION JOINTS IN THE RAMP IMMEDIATELY OPPOSITE THE MAINLINE PAVEMENT SHALL BE A CONTINUATION OF THE JOINTS IN THE MAINLINE PAVEMENT.

(D) SEE TYPICAL SECTIONS FOR SPECIFIC TYPE OF LONGITUDINAL JOINT.

E. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOL AND DETAIL.

F. NORMAL SPACING OF CONTRACTION JOINTS INDICATED ON THIS DRAWING ARE TO BE IN ACCORDANCE WITH SPACING INDICATED ON CUR. STD. DWG. RPN-015 .

USE WITH CUR. STD. DWGS.
RPN-015 , RPS-010

KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE PAVEMENT JOINTS TYPES AND SPACING

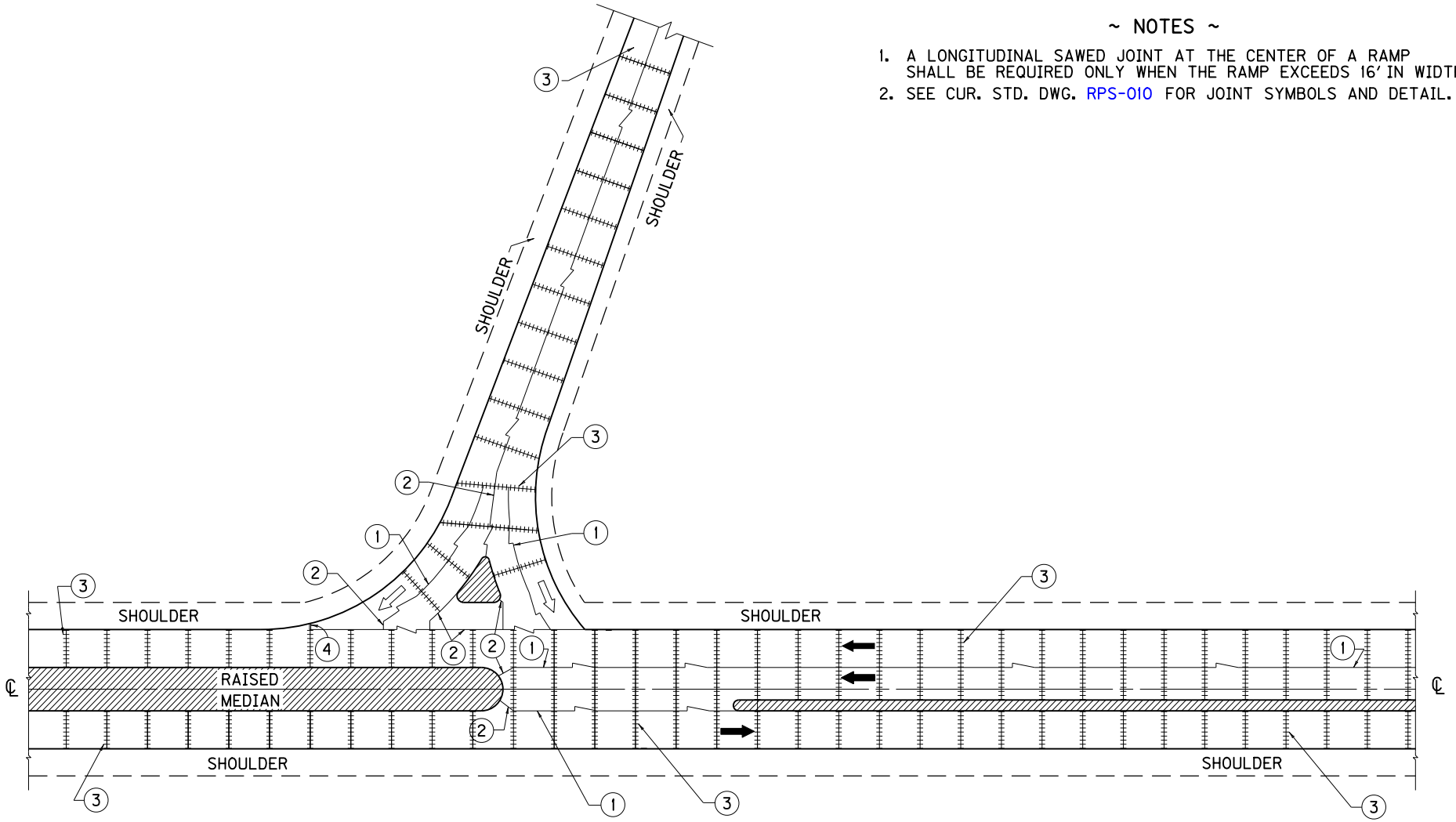
STANDARD DRAWING NO. RPS-035-06

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

~ NOTES ~

1. A LONGITUDINAL SAWED JOINT AT THE CENTER OF A RAMP SHALL BE REQUIRED ONLY WHEN THE RAMP EXCEEDS 16′ IN WIDTH.
2. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAIL.



INTERCHANGE RAMP DETAIL
ENTRANCE TO MINOR TWO LANE ROAD

USE WITH CUR. STD. DWG. RPS-010

KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE
PAVEMENT JOINTS
TYPES AND SPACING

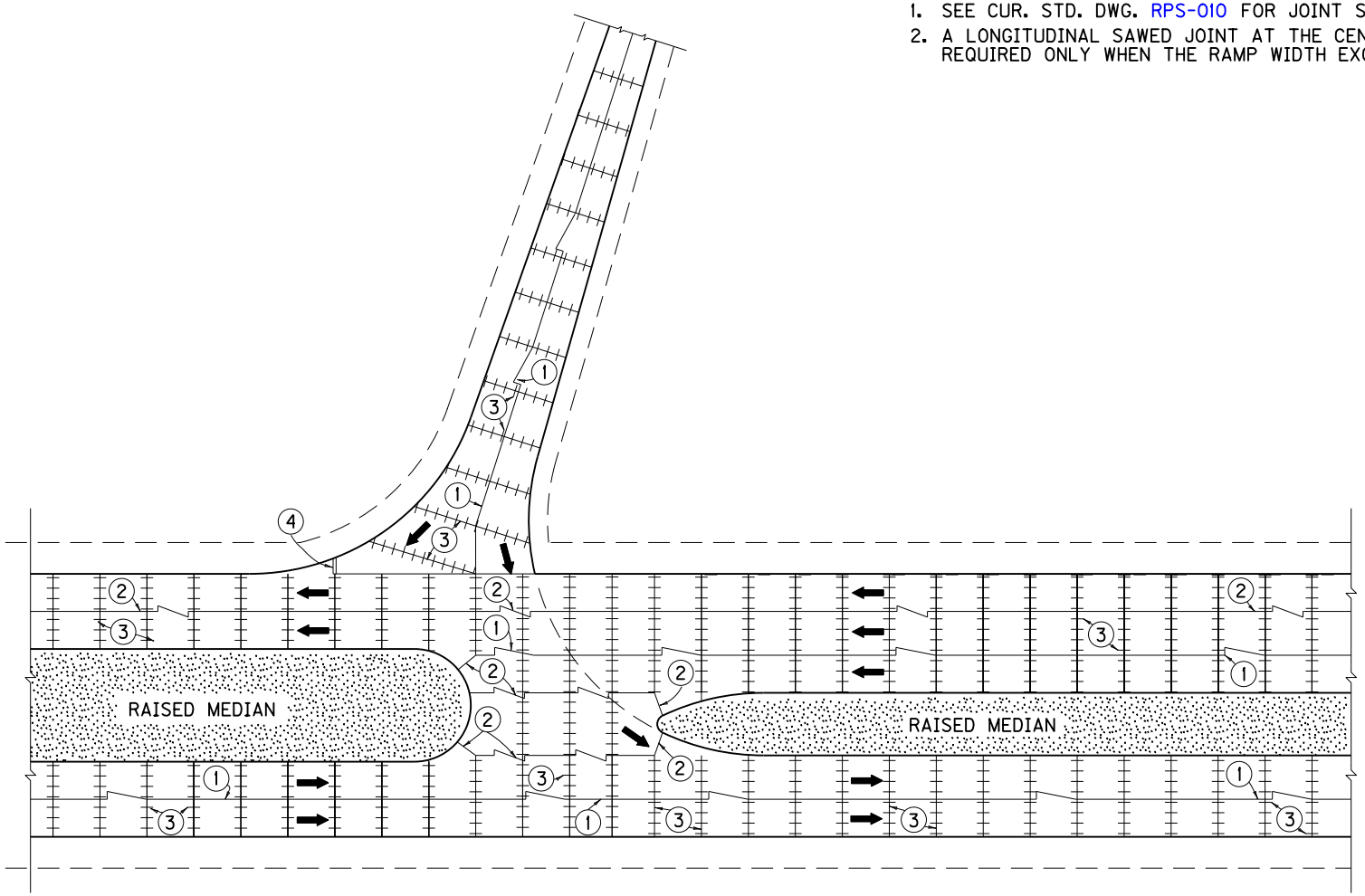
STANDARD DRAWING NO. RPS-036-06

SUBMITTED William S. Haddad — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE

~ NOTES ~

1. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAIL.
2. A LONGITUDINAL SAWED JOINT AT THE CENTER OF A RAMP SHALL BE REQUIRED ONLY WHEN THE RAMP WIDTH EXCEEDS 16'.



INTERCHANGE RAMP DETAIL
ENTRANCE TO MINOR FOUR LANE ROAD

USE WITH CUR. STD. DWG.
RPS-010

KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE
PAVEMENT JOINTS
TYPES AND SPACING

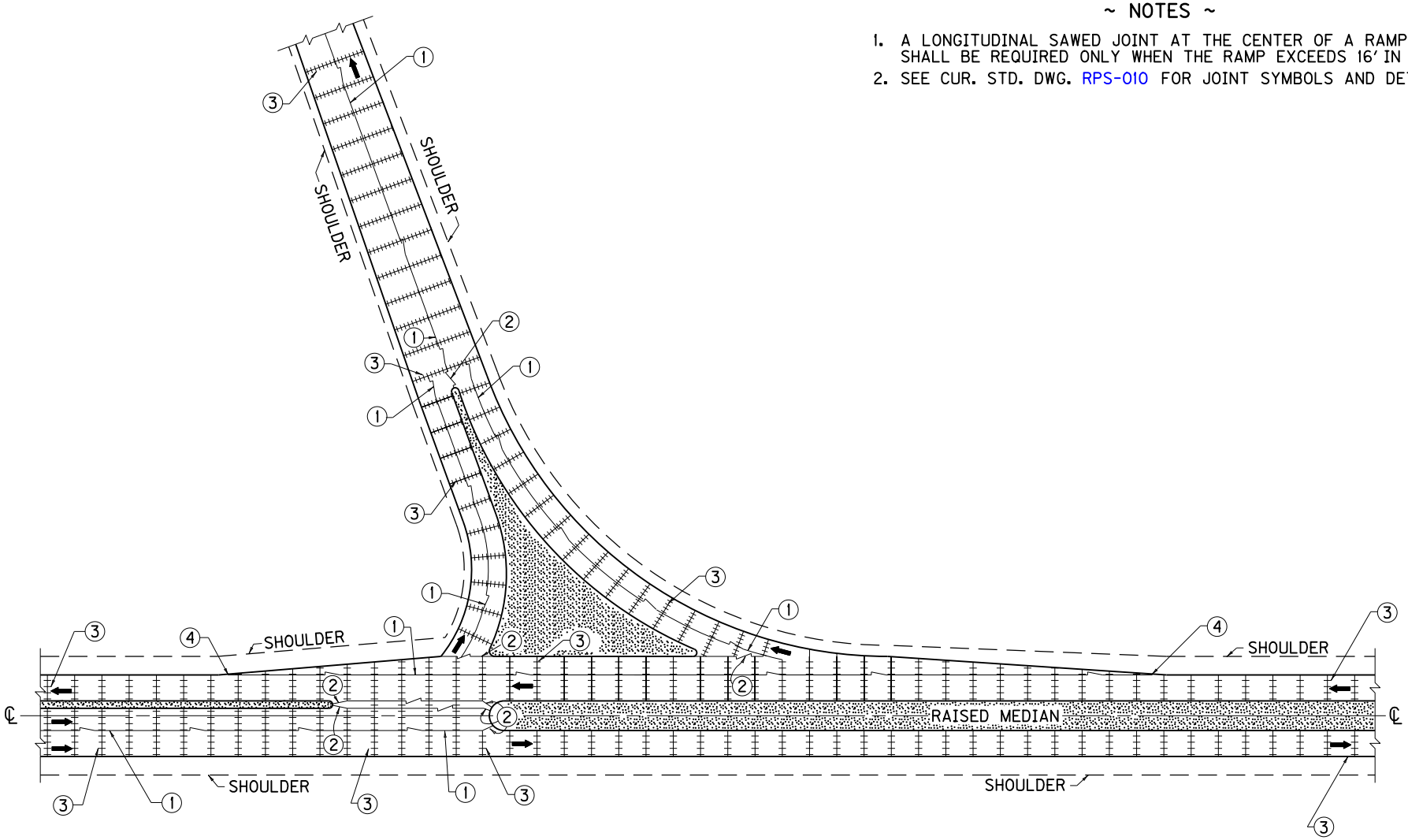
STANDARD DRAWING NO. RPS-037-06

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

~ NOTES ~

1. A LONGITUDINAL SAWED JOINT AT THE CENTER OF A RAMP SHALL BE REQUIRED ONLY WHEN THE RAMP EXCEEDS 16′ IN WIDTH.
2. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAIL.



INTERCHANGE RAMP DETAIL
EXIT FROM MINOR TWO LANE ROAD

USE WITH CUR. STD. DWG. RPS-010

KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE
PAVEMENT JOINTS
TYPES AND SPACING

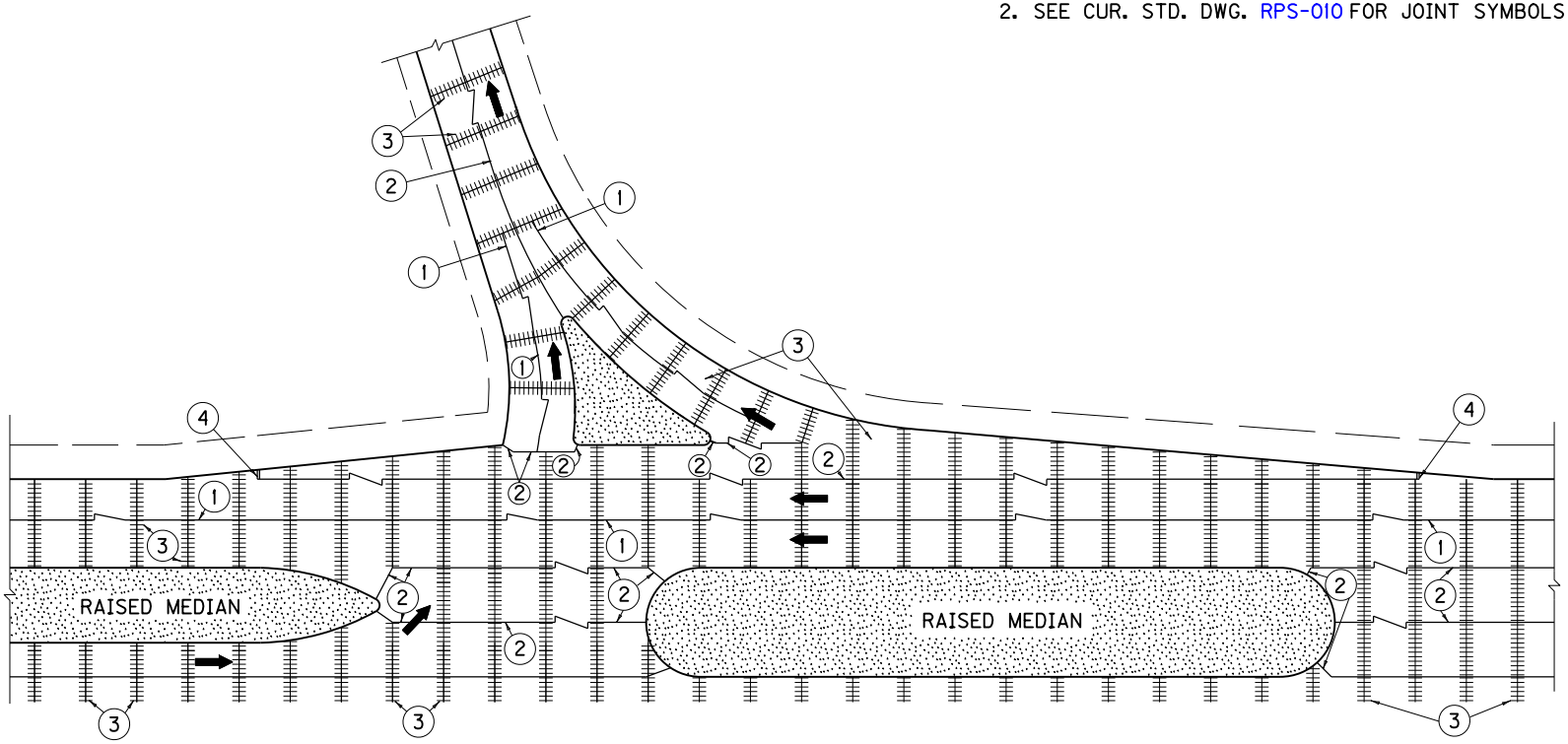
STANDARD DRAWING NO. RPS-038-06

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

~ NOTES ~

1. A LONGITUDINAL SAWED JOINT AT THE CENTER OF A RAMP SHALL BE REQUIRED ONLY WHEN THE RAMP EXCEEDS 16′ IN WIDTH.
2. SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAIL.



INTERCHANGE RAMP DETAIL
EXIT FROM MINOR FOUR LANE ROAD

USE WITH CUR. STD. DWG.
RPS-010

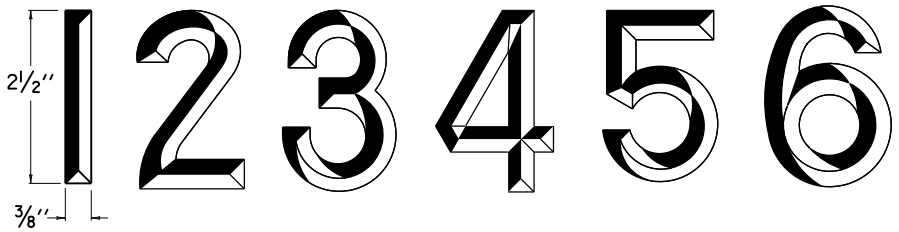
KENTUCKY
DEPARTMENT OF HIGHWAYS

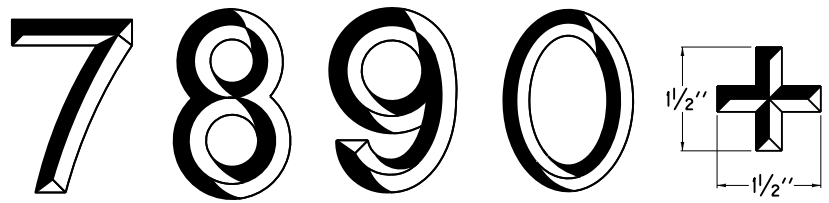
CONCRETE
PAVEMENT JOINTS
TYPES AND SPACING

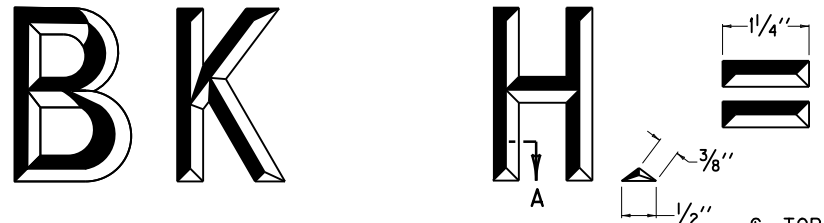
STANDARD DRAWING NO. RPS-039-06

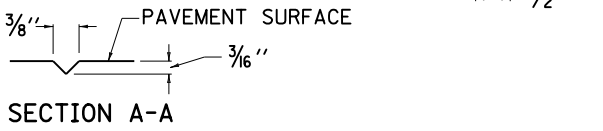
SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE

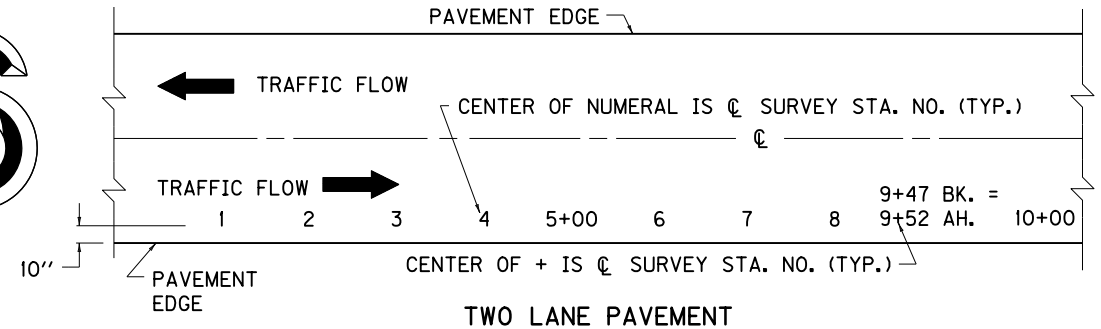




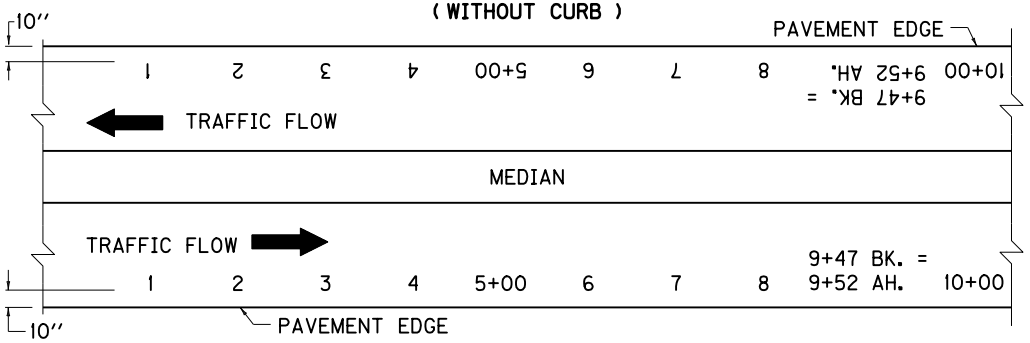




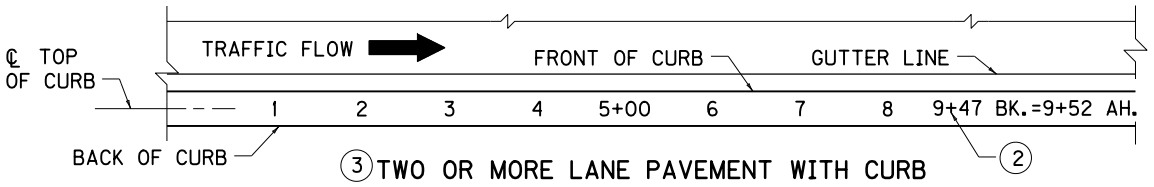
SECTION A-A



TWO LANE PAVEMENT
(WITHOUT CURB)



MULTI-LANE (4-6 ETC.) DIVIDED PAVEMENT
(WITHOUT CURB)



③ TWO OR MORE LANE PAVEMENT WITH CURB

~ NOTES ~

1. THE MARKING SHALL BE ACCOMPLISHED BY THE USE OF RAISED LETTERS IMPRESSED IN THE CONCRETE. THE SIZE, STYLE, PROPORTION, AND OTHER DETAILS SHALL BE AS INDICATED ON THIS SHEET.
2. EQUATIONS SHALL BE SHOWN IN FULL. WHERE AN EQUATION FALLS WITHIN 50' OF A STATION MARKING, THE STATION MARKING SHALL BE ELIMINATED AND THE EQUATION SHOWN IN A STRAIGHT LINE WITH THE + MARK OF THE BACK STATION BEING THE ℄ SURVEY STATION NUMBER.
4. THE PAVEMENT SHALL BE MARKED BEFORE THE CONCRETE HAS TAKEN ITS INITIAL SET, AND ALL DISPLACED AGGREGATE REMOVED SO THAT THE PAVEMENT SURFACE IS LEFT IN A SMOOTH CONDITION WITH LETTERS FULLY AND NEATLY FORMED.
5. THE UNIT PRICE BID PER SQ. YD. FOR CONCRETE PAVEMENT SHALL INCLUDE PAYMENT IN FULL FOR ALL LABOR, MATERIALS, TOOLS AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

TWO LANE PAVEMENTS

6. STATION NUMBERS AND EQUATIONS SHALL BE MARKED ALONG THE RIGHT EDGE OF PAVEMENT IN THE DIRECTION OF SURVEY IN SUCH A POSITION AS TO BE READ RIGHT SIDE UP FROM THE DRIVER'S SEAT OF A CAR TRAVELING ON THE SHOULDER.

MULTI-LANE (4-6 ETC.) DIVIDED PAVEMENTS

7. STATION NUMBERS AND EQUATIONS SHALL BE MARKED ALONG THE OUTSIDE EDGES OF BOTH LANES IN SUCH A POSITION AS TO BE READ RIGHT SIDE UP FROM THE DRIVER'S SEAT OF A CAR TRAVELING ON THE SHOULDER OF EACH TWO LANE COMPONENT.

RAMPS

8. STATION NUMBERS AND EQUATIONS SHALL BE MARKED ON THE RIGHT SIDE OF THE PAVEMENT EDGE IN THE DIRECTION OF THE FLOW OF TRAFFIC SUCH THAT THEY CAN BE READ RIGHT SIDE UP FROM THE DRIVER'S SEAT OF A CAR TRAVELING ON THE RIGHT SHOULDER.

③ ON TWO LANE ROADWAYS WHEN CURB IS TO BE CONSTRUCTED ON THE OUTSIDE EDGE OF THE TRAVELING LANES, THE STATION MARKING SHALL BE PLACED IN THE CURB ON THE RIGHT SIDE ONLY, IN THE DIRECTION OF SURVEY.

ON DIVIDED HIGHWAYS, WHEN CURBS ARE TO BE PLACED ON OUTSIDE EDGE OF EACH LANE OF TRAFFIC, THE STATION MARKINGS SHALL BE PLACED ON EACH OUTSIDE CURB. SEE DETAIL FOR PROPER LOCATION.

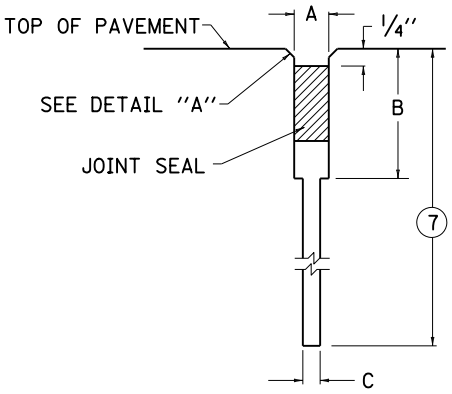
KENTUCKY
DEPARTMENT OF HIGHWAYS

STATION MARKINGS CONCRETE PAVEMENT

STANDARD DRAWING NO. RPX-001-04

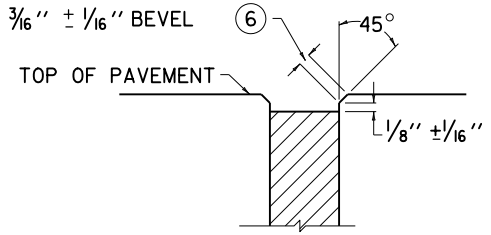
SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



JOINT SHAPE FOR
TRANSVERSE SAWED CONTRACTION JOINT

JOINT SPACING	DIMENSIONS			SEAL WIDTH UNCOMPRESSED
	A	B	C	
15'-0''	3/8''	2''	1/8'' TO 3/8''	11/16 ''
25'-0''	1/2''	2''	1/8'' TO 1/2''	1''
50'-0''	5/8''	2''	1/8'' TO 5/8''	1 1/4''



DETAIL ''A''

~ NOTES ~

1. PAYMENT FOR ALL WORK SHALL BE INCIDENTAL TO THE UNIT PRICE BID PER SQ. YD. OF PAVEMENT.
2. TOLERANCES ON ALL JOINT WIDTH DIMENSIONS PLUS OR MINUS 1/16''.
3. INSTALLATION OF PREFORMED POLYCHLOROPRENE SEALS (NEOPRENE) SHALL BE IN ACCORDANCE WITH SECTION 501.03.18 OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, CURRENT EDITION, EXCEPT TRANSVERSE EXPANSION JOINTS SHALL RECEIVE PREFORMED SEALS IN ACCORDANCE WITH THIS DRAWING.

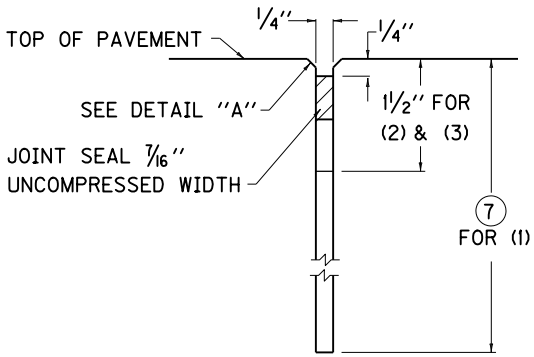
(4) THE REMAINING JOINT SHALL BE IN ACCORDANCE WITH CUR. STD. DWGS. RPS-010 AND RPS-020.

(5) ALL LONGITUDINAL AND TRANSVERSE SAWED CONSTRUCTION JOINTS SHALL BE CUT TO THE DEPTH SHOWN AND SHALL BE SEALED WITH HOT POURED ELASTIC JOINT SEAL.

(6) THESE EDGES SHALL BE BEVELED USING A CUTTING OR GRINDING DEVICE.

(7) JOINT DEPTH IS T/3 OR 4'', WHICHEVER IS LESS.

T = PAVEMENT THICKNESS

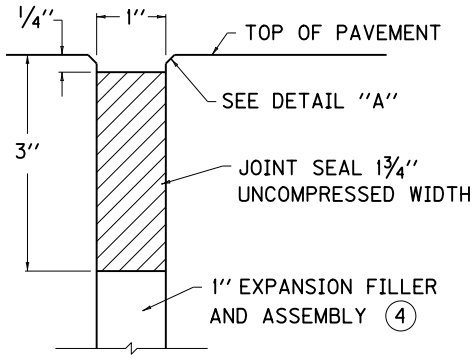


JOINT SHAPE FOR

(1) LONGITUDINAL SAWED JOINT (TIED)

(2) LONGITUDINAL SAWED CONSTRUCTION JOINT (TIED) (5)

(3) TRANSVERSE SAWED CONSTRUCTION JOINT (TIED) (5)



JOINT SHAPE FOR
TRANSVERSE EXPANSION JOINT

USE WITH CUR. STD. DWGS.
RPS-010, RPS-020

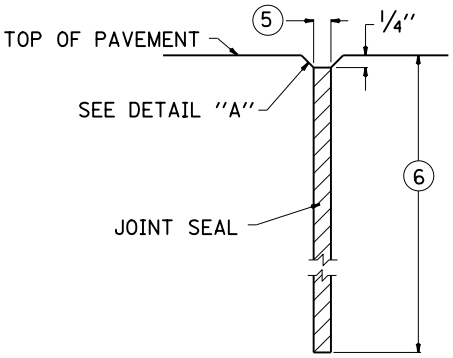
KENTUCKY
DEPARTMENT OF HIGHWAYS

PREFORMED COMPRESSION
JOINT SEAL FOR
CONCRETE PAVEMENT

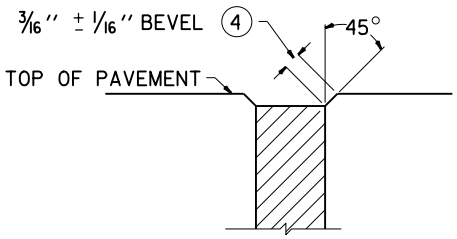
STANDARD DRAWING NO. RPX-010-05

SUBMITTED William S. Hulett — DIRECTOR DIVISION OF DESIGN — 12-01-15 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-15 DATE



JOINT SHAPE FOR
TRANSVERSE SAWED CONTRACTION JOINT

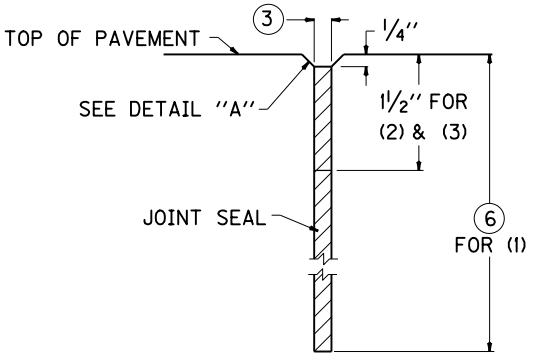


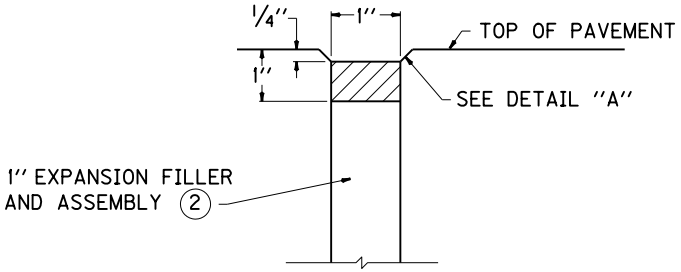
DETAIL ''A''

~ NOTES ~

1. PAYMENT FOR ALL WORK SHALL BE INCIDENTAL TO THE UNIT PRICE BID PER SQ. YD. OF PAVEMENT.
2. THE REMAINING JOINT SHALL BE IN ACCORDANCE WITH CUR. STD. DWGS. RPS-010 AND RPS-020.
3. ALL LONGITUDINAL AND TRANSVERSE SAWED JOINTS SHALL BE CUT TO THE DEPTH SHOWN AND SHALL BE SEALED WITH HOT POURED ELASTIC JOINT SEAL.
4. THESE EDGES SHALL BE BEVELED USING A CUTTING OR GRINDING DEVICE .
5. 1/8'' MIN. - 1/4'' MAX.
6. JOINT DEPTH IS T/3 OR 4'', WHICHEVER IS LESS.

   T = PAVEMENT THICKNESS





JOINT SHAPE FOR
TRANSVERSE EXPANSION JOINT

(1) LONGITUDINAL SAWED JOINT (TIED)

(2) LONGITUDINAL SAWED CONSTRUCTION JOINT (TIED)

(3) TRANSVERSE SAWED CONSTRUCTION JOINT (TIED)

USE WITH CUR. STD. DWGS.
RPS-010 , RPS-020

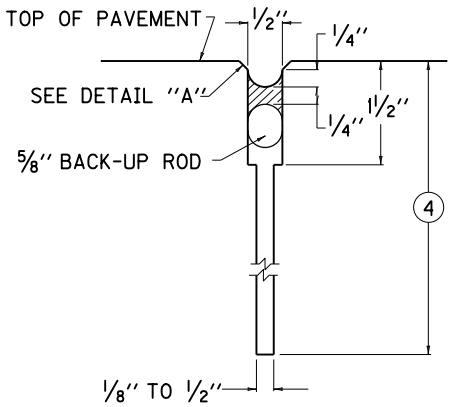
KENTUCKY
DEPARTMENT OF HIGHWAYS

HOT-POURED ELASTIC JOINT SEALS FOR CONCRETE PAVEMENT

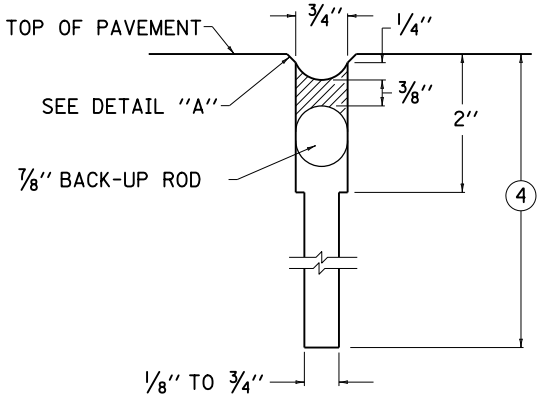
STANDARD DRAWING NO. RPX-015-04

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE



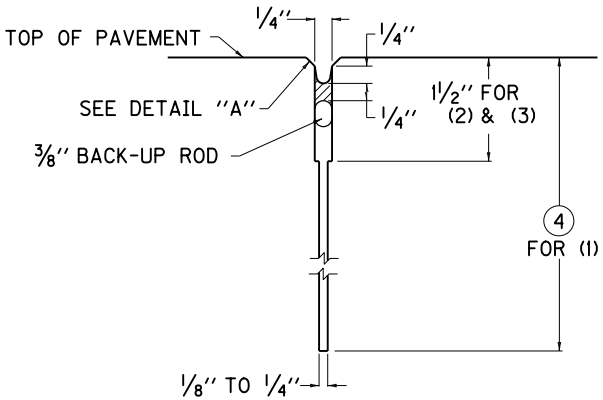
JOINT SHAPE FOR
TRANSVERSE SAWED CONTRACTION JOINT
(WHEN SLAB LENGTH DOES NOT EXCEED 25'-0")



JOINT SHAPE FOR
TRANSVERSE SAWED CONTRACTION JOINT
(WHEN SLAB LENGTH EXCEEDS 25'-0")

~ NOTES ~

1. PAYMENT FOR WORK SHALL BE INCIDENTAL TO THE UNIT PRICE PER SQ. YD. OF PAVEMENT.
2. THE REMAINING JOINT SHALL BE IN ACCORDANCE WITH CUR. STD. DWGS. RPS-020 AND RPS-010.
3. THESE EDGES SHALL BE BEVELED USING A CUTTING OR GRINDING DEVICE.
   JOINT TOLERANCES : SAW CUT DEPTH -0" TO + 1/2"
   SAW CUT WIDTH -0" TO + 1/16"
   SEAL BEAD THICKNESS -0" TO + 1/8"
4. JOINT DEPTH IS T/3 OR 4", WHICHEVER IS LESS.
   T = PAVEMENT THICKNESS.

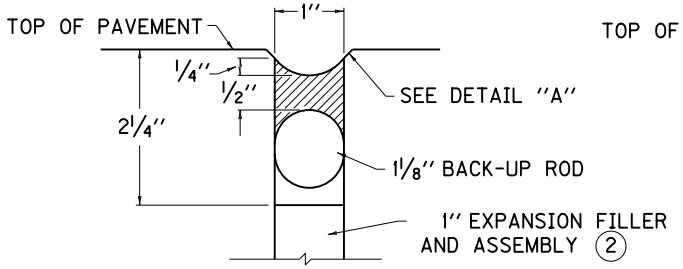


JOINT SHAPE FOR

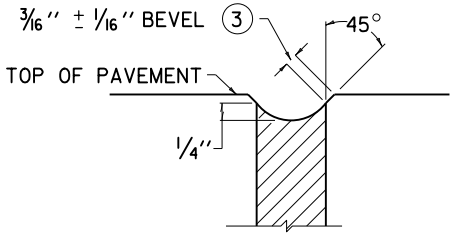
(1) LONGITUDINAL SAWED JOINT (TIED)

(2) LONGITUDINAL SAWED CONSTRUCTION JOINT (TIED)

(3) TRANSVERSE SAWED CONSTRUCTION JOINT (TIED)



JOINT SHAPE FOR
TRANSVERSE EXPANSION JOINT



DETAIL "A"

USE WITH CUR. STD. DWGS.
RPS-010 , RPS-020

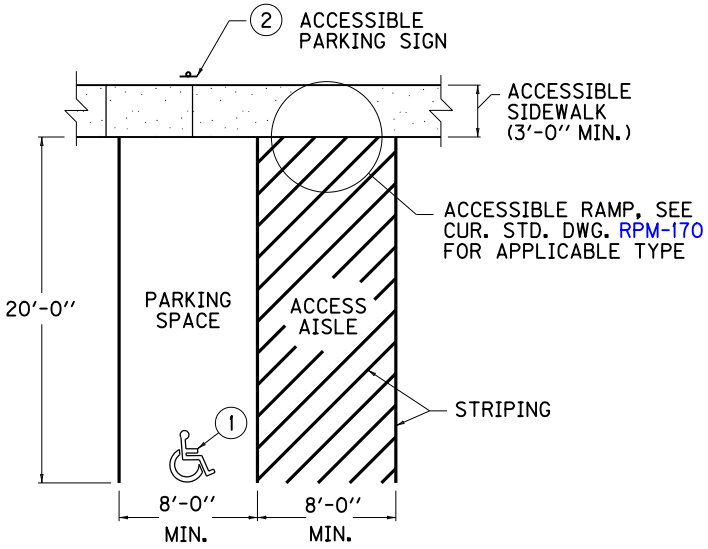
KENTUCKY
DEPARTMENT OF HIGHWAYS

SILICONE RUBBER SEALS
FOR
CONCRETE PAVEMENT

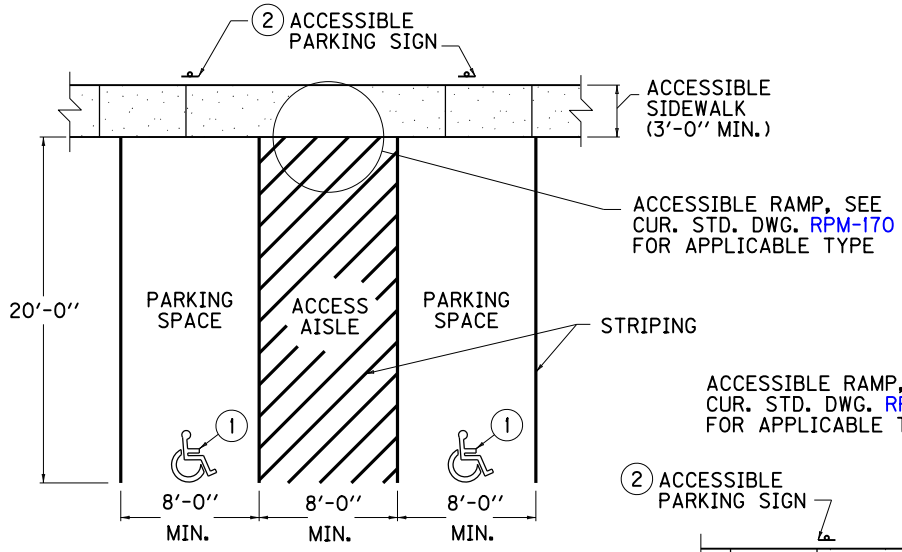
STANDARD DRAWING NO. RPX-020-06

SUBMITTED William S. Hulett DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

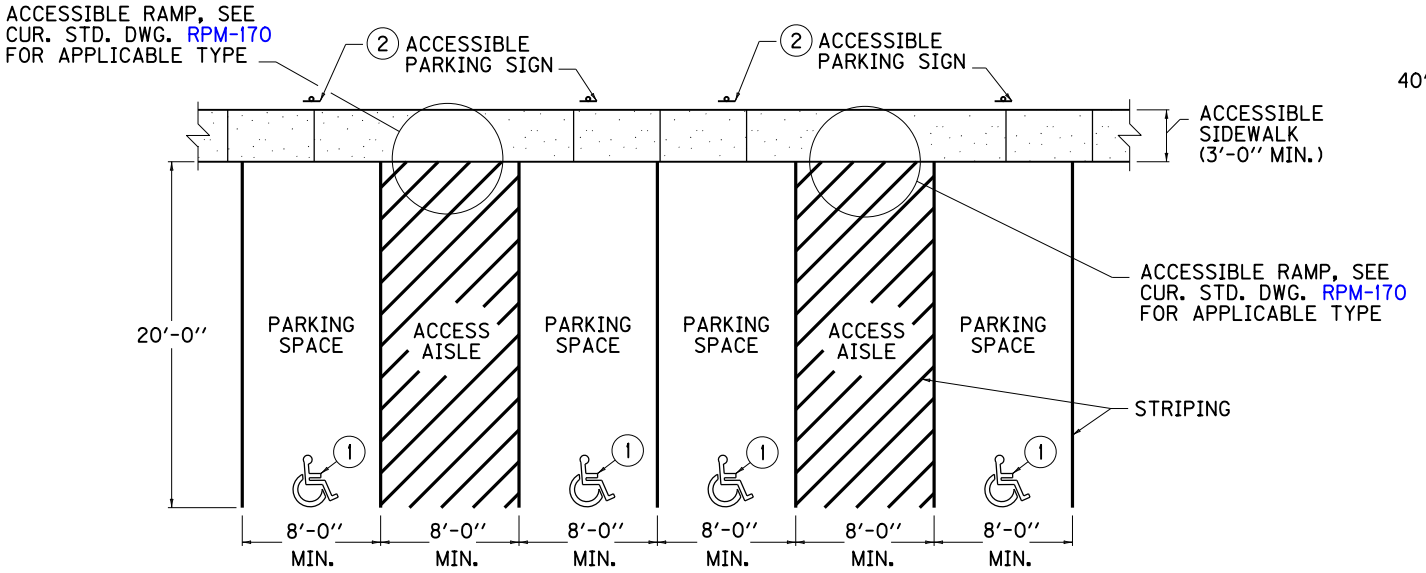
APPROVED STATE HIGHWAY ENGINEER 12-01-15 DATE



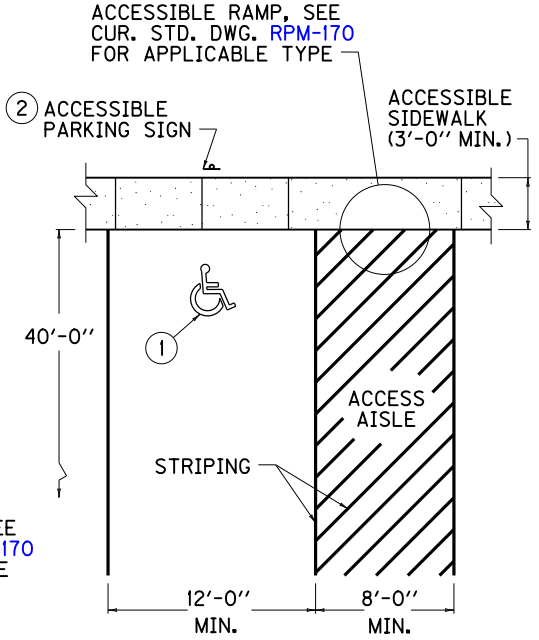
PLAN VIEW OF ONE ACCESSIBLE PARKING SPACE



PLAN VIEW OF TWO ACCESSIBLE PARKING SPACES



PLAN VIEW OF MULTIPLE ACCESSIBLE PARKING SPACES



PLAN VIEW OF BUS ACCESSIBLE PARKING SPACE

~ NOTES ~

1. INTERNATIONAL SYMBOL OF ACCESSIBILITY.
2. INTERNATIONAL SYMBOL OF ACCESSIBILITY WITH ''VAN ACCESSIBLE'' SIGN MOUNTED BELOW.
3. SEE ELSEWHERE IN THE PLANS FOR APPLICABLE ACCESSIBLE SIGNING DETAILS.
4. SEE ELSEWHERE IN THE PLANS FOR STRIPING DETAILS.

USE WITH CUR. STD. DWG. RPM-170

KENTUCKY DEPARTMENT OF HIGHWAYS

ACCESSIBLE PARKING SPACE DETAILS

STANDARD DRAWING NO. RPX-100-03

SUBMITTED _____ DIRECTOR DIVISION OF DESIGN 12-01-15 DATE

APPROVED _____ STATE HIGHWAY ENGINEER 12-01-15 DATE