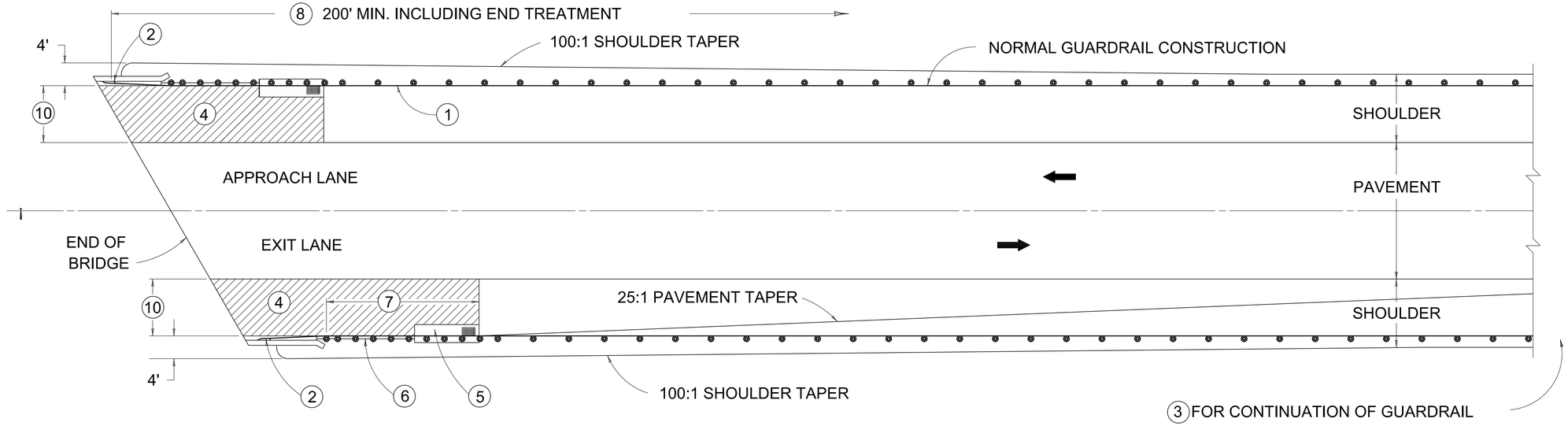


~ NOTES ~

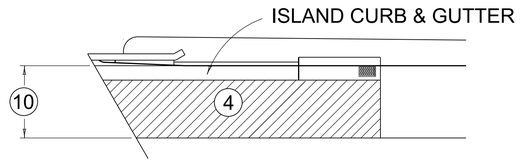
7. *VARIABLE LENGTH, SEE APPLICABLE "BRIDGE END CONNECTOR" DRAWINGS.*
8. *SHOWN FOR FILL CONDITION. LENGTH MAY BE REDUCED SHOULD FIELD CONDITIONS WARRANT.*
9. *TO TERMINATE GUARDRAIL INSTALLATION:*
   A. ALL FILLS; ALSO SOLID ROCK CUTS WITH ADEQUATE VEHICLE RECOVERY ZONE BEHIND GUARDRAIL, USE END TREATMENT 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. *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

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

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

REVISION DATE: 02/26/2020
REVISION NUMBER: 0

SUBMITTED DIVISION DIRECTOR 02-26-2020 DATE
APPROVED STATE HIGHWAY ENGINEER 02-26-2020 DATE

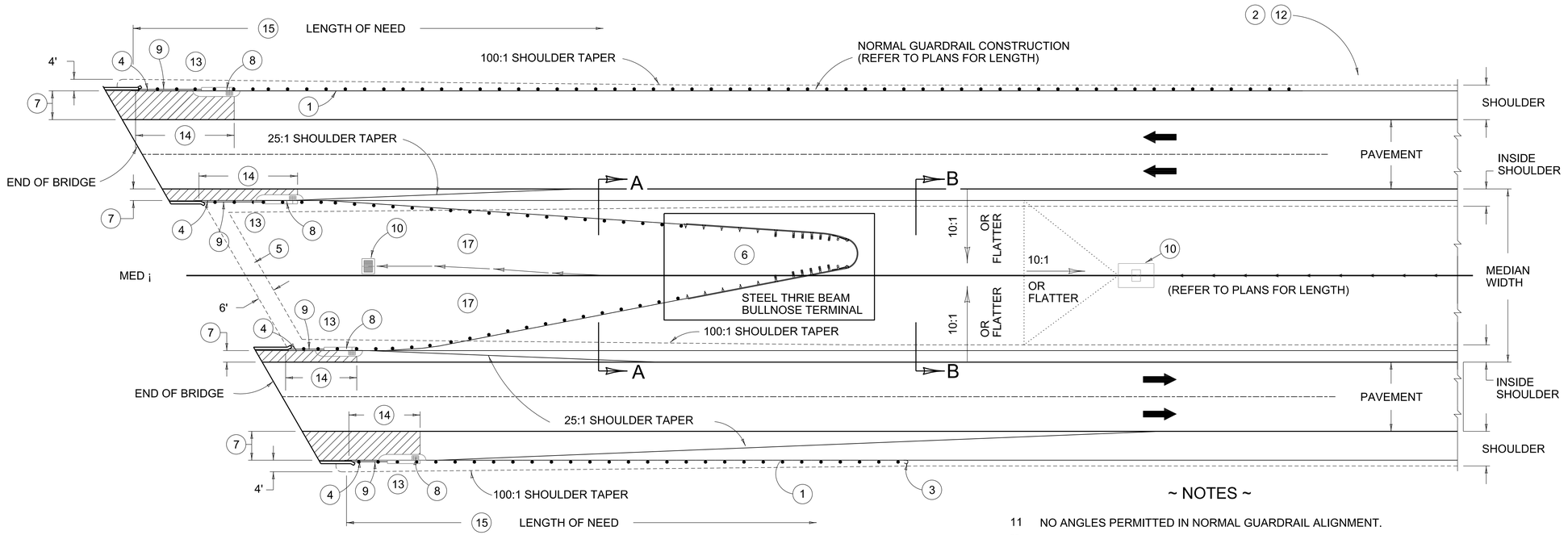
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

GUARDRAIL AND BRIDGE END DRAINAGE

FOR SINGLE STRUCTURES

STANDARD DRAWING NUMBER
RBB-001-09



ITEM		STD. DWG. NO
1	STEEL W BEAM GUARDRAIL - SINGLE FACE (NOTE 11)	RBR-SERIES
2	END TREATMENT TYPE 1, 3, OR 4A (NOTE 12)	
3	END TREATMENT TYPE 2A (TRAILING END TERMINAL)	
4	THRIE-BEAM GUARDRAIL TRANSITION	BHS-013, BHS-014
5	6' EARTH DIKE	RGX-001
6	STEEL THRIE BEAM BULLNOSE TERMINAL	RBE-210
	DRAINAGE ITEMS (IF NECESSARY)	
7	BRIDGE END DRAINAGE AREA (NOTE 13)	
8	CURB BOX INLET TYPE B (SHOWN) OR FLUME INLET	RDB OR RDD SERIES
9	STANDARD HEADER CURB OR STANDARD HEADER CURB AND GUTTER	RPM-100
10	DROP BOX INLET (NOTE 13)	RDB-SERIES

~ NOTES ~

11 NO ANGLES PERMITTED IN NORMAL GUARDRAIL ALIGNMENT.

12 PROPERLY ENDING A GUARDRAIL INSTALLATION:

A. IN AREAS WITH ADEQUATE VEHICLE RECOVEY SPACE, USE GUARDRAIL END TREATMENT 1 OR 4A.

B. IN SOLID ROCK CUTS WITHOUT AN ADEQUATE VEHICLE RECOVER ZONE BEHIND THE GUARDRAIL, EXTEND THE GUARDRAIL TO A SUITABLE RECOVERY AREA AND USE END TREATMENT TYPE 1 OR 4A.

C. EARTH CUTS AND SOFT ROCK BACKSLOPES (2:1 OR STEEPER), USE GUARDRAIL END TREATMENT TYPE 3.

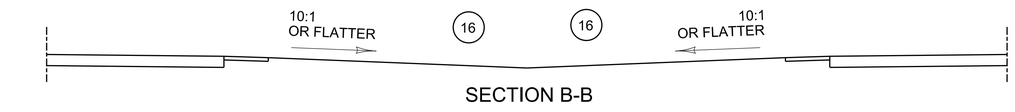
13 FLATTEN SLOPES AND REMOVE INLET WHEN MEDIAN OR SHOULDER SLOPES AWAY FROM BRIDGE. REFER TO THE PLANS FOR DETAILS.

14 VARIABLE LENGTH. SEE APPLICABLE "THRIE-BEAM GUARDRAIL TRANSITION" DRAWINGS (BHS-013 AND BHS-014).

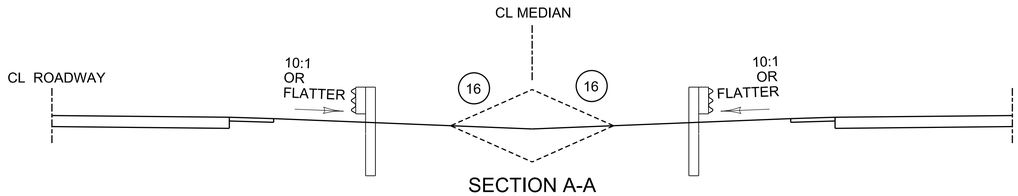
15 PROPERLY SHIELD ROADSIDE OBSTACLES AND AREAS OF CONCERN BY CALCULATING THE LENGTH OF NEED (LON) TO DETERMINE THE NECESSARY BARRIER LENGTH.

16 SEE SHEET 004 OF SEPIA 095 FOR GRADING DETAILS FOR THE BULLNOSE.

17 GRADE TO DRAIN THE MEDIAN AREA BEHIND THE BARRIER WHILE ENSURING THAT A MINIMUM OF 2 FEET OF 10:1 MATERIAL IS PLACED BEHIND THE BARRIER POST.



SECTION B-B



SECTION A-A

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

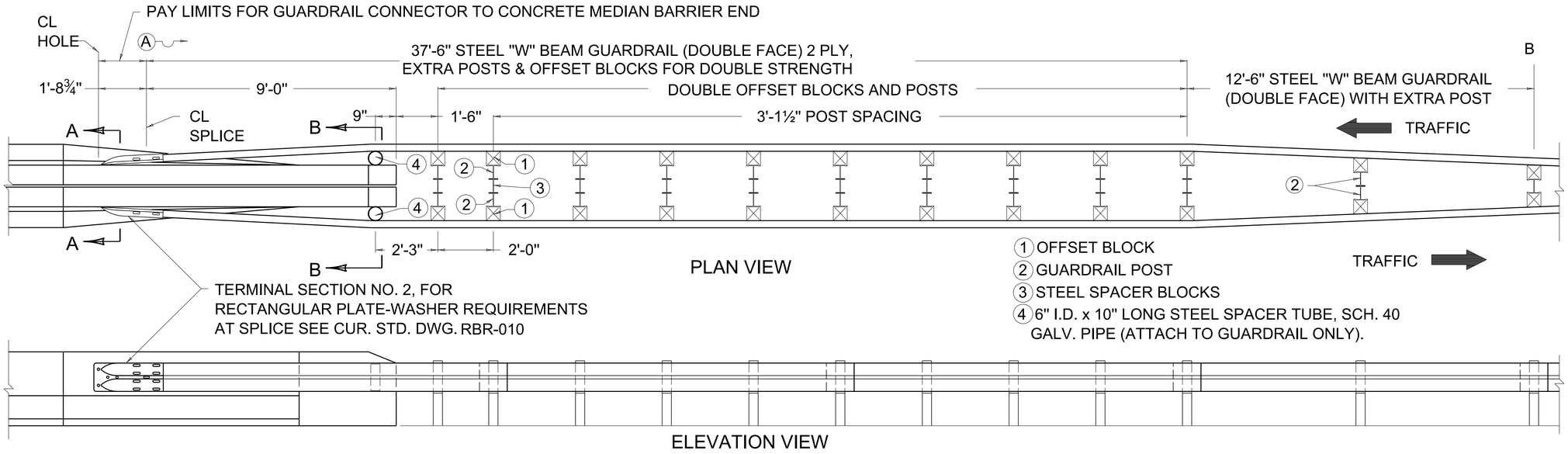
BARRIERS

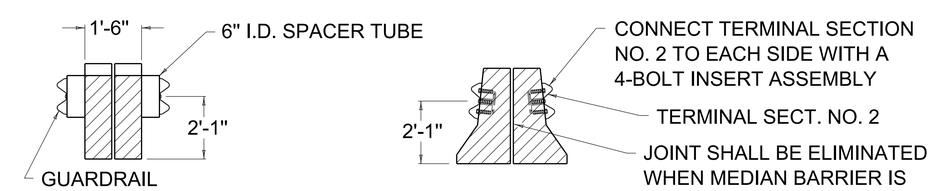
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

GUARDRAIL AND BRIDGE END DRAINAGE

FOR TWIN STRUCTURE

STANDARD DRAWING NUMBER
RBB-002-010

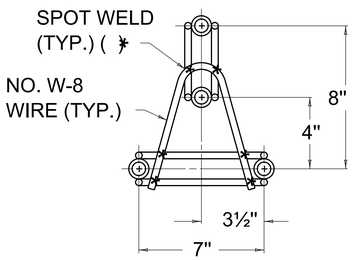




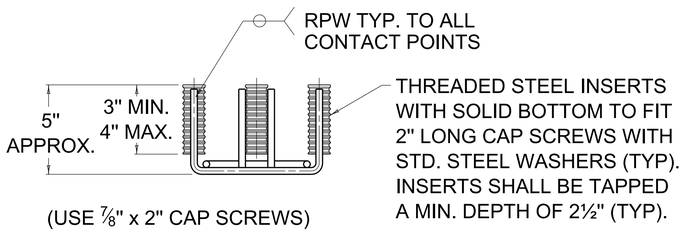
SECTION B-B

SECTION A-A

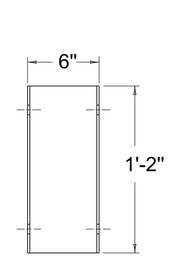
FOUR BOLT INSERT ASSEMBLY



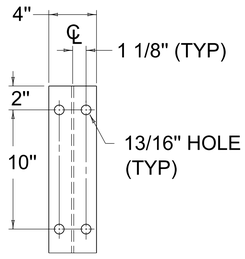
PLAN VIEW



ELEVATION VIEW

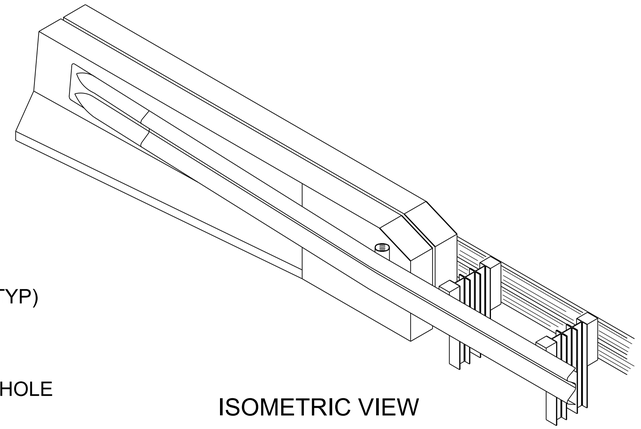


SIDE VIEW



FRONT VIEW

SPACER BLOCK
(W6 X 9.0)



ISOMETRIC VIEW

~ NOTES ~

SEE CURRENT STANDARD DRAWING NUMBER RBC-100N FOR ALL NOTES AND APPLICABLE MAINTENANCE NOTES.

NOT FOR NEW CONSTRUCTION. ONLY USE FOR REPAIRING OR RESTORING EXISTING HARDWARE.

USE WITH CUR. STD. DWG. RBR-010

REVISION DATE: 02/26/2020
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APPROVED — STATE HIGHWAY ENGINEER — 02-26-2020 DATE

BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

GUARDRAIL

CONNECTOR TO CONCRETE MEDIAN BARRIER END

STANDARD DRAWING NUMBER
RBC-100-05

~ 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 (A) AND (B) 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 (A) .
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 7/8" 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

~ MAINTENANCE NOTES ~

1. NOT FOR NEW CONSTRUCTION. ONLY USE FOR REPAIRING OR RESTORING EXISTING HARDWARE.
2. USE 3500 PSI CONCRETE FOR REPAIRS TO EXISTING JERSEY SHAPES.

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APPROVED — STATE HIGHWAY ENGINEER — 02-26-2020 DATE

BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

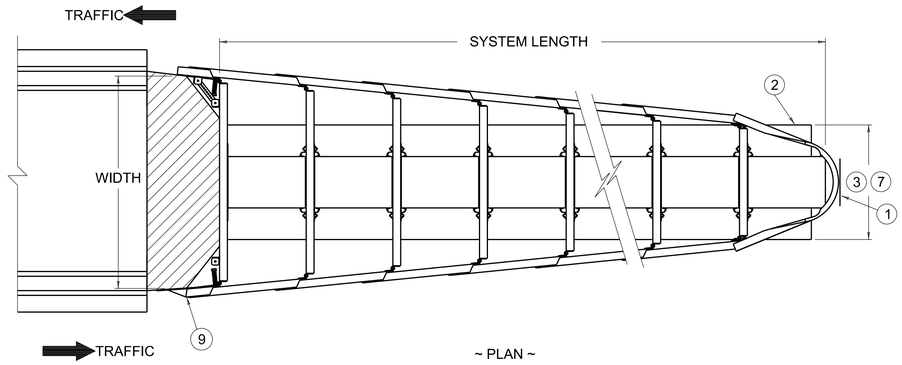
GUARDRAIL

CONNECTOR TO CONCRETE MEDIAN BARRIER END NOTES

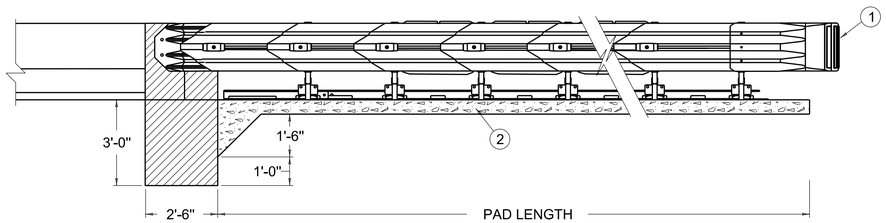
STANDARD DRAWING NUMBER
RBC-100N-05

CLASS	SPEED (MPH)	ATTENUATOR				SYSTEM LENGTH	SUGGESTED AADT* RANGE (P.C.P.L.) **
		MODEL	PRODUCT NAME	MANUFACTURER	WIDTH		
B	45 & LESS	TL3	QUADGUARD M WIDE	VALTIR OF DALLAS, TEXAS	69"	22' - 0"	UP TO 12,000
C	OVER 45	TL3	QUADGUARD ELITE M10 WIDE	VALTIR OF DALLAS, TEXAS	69"	27' - 1"	8,000 AND OVER

* ANNUAL AVERAGE DAILY TRAFFIC
** PASSENGER CARS PER LANE



~ PLAN ~



~ ELEVATION ~

~ NOTES ~

1. *NOSE ASSEMBLY (OBJECT MARKER TYPE 3 AS REQUIRED).*
2. *6" CONCRETE PAD PER MANUFACTURER SPECIFICATIONS.*
3. *THE CONCRETE PAD, PAD EXCAVATION AND STEEL REINFORCEMENT, INSTALLED IN PLACE SHALL BE INCLUDED IN THE UNIT PRICE BID FOR CRASH CUSHION TYPE VI. DIMENSION AND REINFORCEMENT SPECIFICATIONS FOR CONCRETE PADS ARE TO BE PROVIDED BY THE MANUFACTURER. THE PAD WILL NOT BE REQUIRED WHEN THE UNIT IS CONSTRUCTED ON RIGID PAVEMENT.*
4. *THE CROSS SLOPE ON THE PAD OR PAVEMENT SHALL BE PER MANUFACTURER SPECIFICATIONS.*
5. *WHEN INSTALLED ON A STRUCTURE, DETAILS FOR ANCHORAGE SHALL BE DEVELOPED AND SHOWN ELSEWHERE ON THE PLANS.*
6. *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.*
7. *CRASH CUSHIONS ARE TO BE INSTALLED PER MANUFACTURER SPECIFICATIONS, INCLUDING THE CONCRETE PAD. SEE QR CODE ON THIS SHEET FOR LINK TO MANUFACTURERS INSTALLATION MANUAL.*
8. *CONCRETE PAD AND BELOW GRADE ANCHOR SHALL BE PLACED MONOLITHICALLY.*
9. *END SHOE MAY BE ELIMINATED WITH ONE WAY TRAFFIC.*
10. *THE CRASH CUSHION TYPE 7 MAY ALSO BE UTILIZED FOR TEMPORARY USE AND CONSTRUCTION ZONES (CLASS BT).*
11. *A CRASH CUSHION TYPE 7 CLASS B IS TO BE USED IN AREAS WHERE CRASH HISTORY IS NOT KNOWN TO BE SEVERE.*
12. *A CRASH CUSHION TYPE 7 CLASS C IS CONSIDERED A SEVERE USE CRASH CUSHION.*

BID ITEMS AND UNIT TO BID:

CRASH CUSHION TYPE 7 CLASS ♠ ⬡. *EACH*

♠ CLASS B OR C , AS REQUIRED.

⬡ TEST LEVEL 2 (TL2) OR TEST LEVEL 3 (TL3), AS REQUIRED.

OBJECT MARKER TYPE 3 (AS REQUIRED) *EACH*

VALTIR
QUADGUARD ELITE
M10 WIDE

VALTIR
QUADGUARD M WIDE

THIS STANDARD DRAWING PROVIDES GUIDANCE ONLY. CONSULT THE MANUFACTURER FOR THE LATEST DETAILS AND INSTALLATION INSTRUCTIONS.

SCAN THE QR CODES TO ACCESS THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS FOR THE CRASH CUSHIONS.

REINFORCEMENT PER MANUFACTURER SPECIFICATIONS

~ CONCRETE PAD SECTION ~
(PER MANUFACTURER SPECIFICATIONS)
REFER TO NOTES (5)

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

CRASH CUSHION

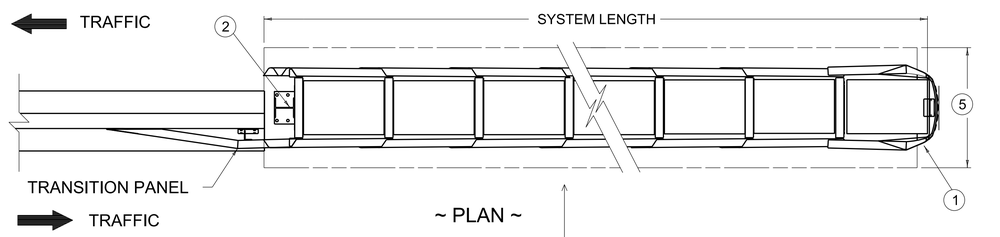
CRASH CUSHION TYPE 7 CLASS B AND C
(ONE AND TWO DIRECTION)

STANDARD DRAWING NUMBER
RBE-040-12

CRASH CUSHION TYPE 6 —APPROVED SYSTEMS LIST

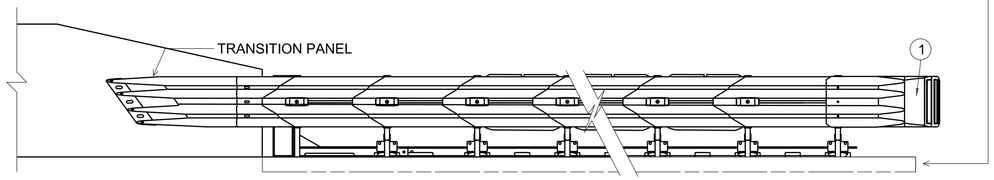
CLASS	SPEED (MPH)	ATTENUATOR				SYSTEM LENGTH	SUGGESTED AADT* RANGE (P.C.P.L)**
		MODEL	PRODUCT NAME	MANUFACTURER	WIDTH		
B	45 & LESS	TL2	SCI 70 GM IMPACT ATTENUATOR SMART CUSHION	HILL AND SMITH OF COLUMBUS, OHIO	24"	13'-6"	UP TO 12,000
			3-BAY QUADGUARD M10	VALTIR OF DALLAS, TEXAS	24"	13'-0"	
	OVER 45	TL3	SCI 100 GM SMART CUSHION	HILL AND SMITH OF COLUMBUS, OHIO	24"	21'-6"	UP TO 12,000
			6-BAY QUADGUARD M10	VALTIR OF DALLAS, TEXAS	24"	22'-0"	
C	OVER 45	TL3	SCI 100 GM SMART CUSHION	HILL AND SMITH OF COLUMBUS, OHIO	24"	21'-6"	≥8,000
			QUADGUARD ELITE M10	VALTIR OF DALLAS, TEXAS	24"	27'-2"	
D	OVER 45	TL3	REACT M	VALTIR OF DALLAS, TEXAS	38 ¾"	22'- 2¾"	≥15,000

*ANNUAL AVERAGE DAILY TRAFFIC **PASSENGER CARS PER LANE



~ PLAN ~

SEE MANUFACTURER'S INSTRUCTIONS FOR FOUNDATION PADS INSTALLATIONS.



~ ELEVATION ~

~ NOTES ~

(1) *NOSE ASSEMBLY (OBJECT MARKER TYPE 3 AS REQUIRED).*

(2) *BACKUP ASSEMBLY PER MANUFACTURER'S ASSEMBLY INSTRUCTIONS*

3. *IN THE DRAWING ABOVE, THE CRASH CUSHION TYPE 6 IS SHOWN ATTACHED TO A CONCRETE MEDIAN BARRIER.*

4. *A PROPER TRANSITION PANEL OR SIDE PANEL MUST BE INSTALLED ON EACH SIDE OF THE CRASH CUSHION BACKUP. CONSULT THE PLANS TO DETERMINE TRAFFIC DIRECTION AND THE TYPE OF BARRIER OR ROADWAY FEATURE BEING SHIELDED. REFER TO THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS FOR TRANSITION DESIGN AND INSTALLATION DETAILS. SELECT THE APPROPRIATE TRANSITION TYPE AND ALL REQUIRED COMPONENTS. ALL WORK AND MATERIALS RELATED TO THE TRANSITION ARE INCIDENTAL TO THE CRASH CUSHION TYPE 6 BID ITEM.*

(5) *PREPARE THE SITE AND INSTALL FOUNDATION PADS APPROPRIATE FOR PERMANENT INSTALLATIONS IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS. FOLLOW ALL MANUFACTURER INSTRUCTIONS FOR MATERIALS, THICKNESS, SPECIFICATIONS, AND ANCHORING. ALL WORK AND MATERIALS ASSOCIATED WITH THE FOUNDATION PAD ARE INCIDENTAL TO THE CRASH CUSHION TYPE 6 BID ITEM.*

6. *CRASH CUSHION TYPE 6 INSTALLATIONS SHALL FOLLOW THE MANUFACTURER'S INSTRUCTIONS. SYSTEMS SHALL NOT BE MODIFIED FROM THEIR APPROVED CONFIGURATIONS.*

7. *BOTH CRASH CUSHION TYPE 6 CLASS C AND CLASS D ARE CONSIDERED A SEVERE USE CRASH CUSHION.*

8. *CLASS D CRASH CUSHIONS ARE TO BE PLACED IN AREAS OF HIGH CRASH RATES WHERE MAINTENANCE WILL BE DIFFICULT.*

BID ITEMS AND UNIT TO BID

CRASH CUSHION TYPE 6 CLASS ♠, ⬡, △.

♠ CLASS B, C OR D, AS REQUIRED.

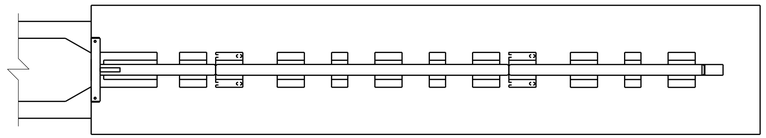
⬡ EITHER TEST LEVEL 2 (TL2) OR TEST LEVEL 3 (TL3), AS REQUIRED.

△ SEE "CONNECTION DETAILS OF CRASH CUSHION TYPE 6 TO DOUBLE FACE GUARDRAIL", RBC-110.

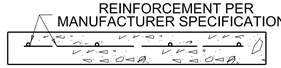
BID ITEMS AS APPLICABLE

OBJECT MARKER TYPE 3 (AS REQUIRED) EACH

USE WITH CUR. STD. DWG.
RBE-065 RBC-110



~ SECTION A-A ~



~ CONCRETE PAD SECTION ~

(PER MANUFACTURERS SPECIFICATIONS)
REFER TO NOTES (5)

THIS STANDARD DRAWING PROVIDES GUIDANCE ONLY. CONSULT THE MANUFACTURER FOR THE LATEST DETAILS AND INSTALLATION INSTRUCTIONS.

SCAN THE QR CODES TO ACCESS THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS FOR THE CRASH CUSHIONS.

HILL AND SMITH SMART CUSHION

VALTIR QUADGUARD M10

VALTIR QUADGUARD ELITE M10

VALIR REACT M

REVISION DATE: 08/11/2025
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BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

CRASH CUSHION

CRASH CUSHION TYPE 6 (ONE AND TWO DIRECTION)

STANDARD DRAWING NUMBER
RBE-060-16

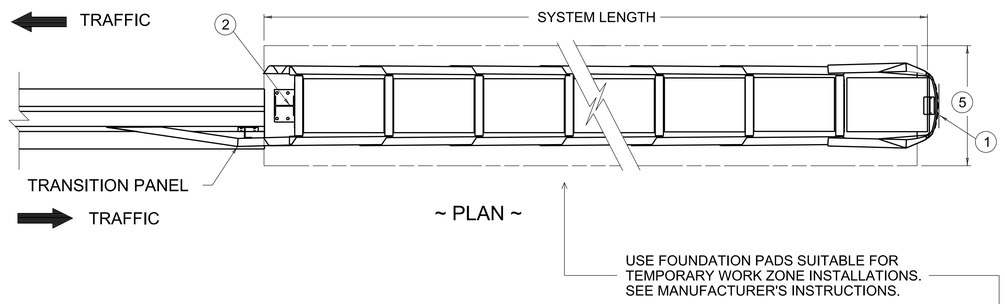
CRASH CUSHION TYPE 6 CLASS T —APPROVED SYSTEMS LIST

SPEED (MPH)	ATTENUATOR				SYSTEM LENGTH	SUGGESTED AADT* RANGE (P.C.P.L)**
	MODEL	PRODUCT NAME	MANUFACTURER	WIDTH		
45 & LESS	TL2	SCI 70 GM IMPACT ATTENUATOR SMART CUSHION	HILL AND SMITH OF COLUMBUS, OHIO	24"	13'-6"	UP TO 12,000
		3-BAY QUADGUARD M10	VALTIR OF DALLAS, TEXAS	24"	13'-0"	
OVER 45	TL3	SCI 100 GM SMART CUSHION	HILL AND SMITH OF COLUMBUS, OHIO	24"	21'-6"	UP TO 12,000
		6-BAY QUADGUARD M10	VALTIR OF DALLAS, TEXAS	24"	22'-0"	
OVER 45	TL3	SCI 100 GM SMART CUSHION	HILL AND SMITH OF COLUMBUS, OHIO	24"	21'-6"	≥8,000
		QUADGUARD ELITE M10	VALTIR OF DALLAS, TEXAS	24"	27'-2"	
OVER 45	TL3	REACT M	VALTIR OF DALLAS, TEXAS	38 ¾"	22'- 2¾"	≥15,000

*ANNUAL AVERAGE DAILY TRAFFIC **PASSENGER CARS PER LANE

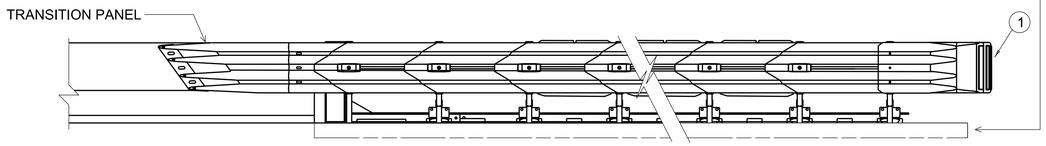
TYPE 6 CLASS T CRASH CUSHIONS ARE TEMPORARY DEVICES USED IN WORK ZONES AS PART OF TEMPORARY TRAFFIC CONTROL TO SHIELD THE BLUNT ENDS OF RIGID OBJECTS, SUCH AS TEMPORARY CONCRETE BARRIERS.

WHEN INSTALLING A CRASH CUSHION TYPE 6 CLASS T, CONTRACTORS MAY SELECT ANY DEVICE FROM THE APPROVED SYSTEMS LIST ABOVE, PROVIDED THE SELECTED SYSTEM MEETS THE TEST LEVEL SPECIFIED IN THE PLANS AND IS APPROPRIATE FOR THE WORK ZONE CONTEXT.

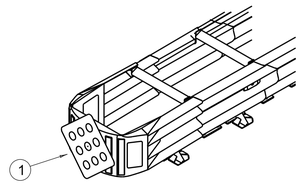


~ PLAN ~

USE FOUNDATION PADS SUITABLE FOR TEMPORARY WORK ZONE INSTALLATIONS. SEE MANUFACTURER'S INSTRUCTIONS.



~ ELEVATION ~



~ PICTORIAL VIEW ~

~ NOTES ~

1. *NOSE ASSEMBLY (OBJECT MARKER TYPE 3 AS REQUIRED)*
2. *CONSTRUCTION ZONE BACKUP ASSEMBLY PER MANUFACTURER'S ASSEMBLY INSTRUCTIONS*
3. *IN THE DRAWING ABOVE, THE CRASH CUSHION TYPE 6-T IS SHOWN ATTACHED TO A TEMPORARY CONCRETE BARRIER.*
4. *CONSULT THE PLANS TO DETERMINE THE TRAFFIC DIRECTION AND THE TYPE OF BARRIER OR ROADWAY FEATURE BEING SHIELDED BY THE CRASH CUSHION. REFER TO THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS FOR TRANSITION DESIGN AND CRASH CUSHION INSTALLATION DETAILS. SELECT THE APPROPRIATE TRANSITION TYPE AND ALL NECESSARY COMPONENTS FOR INSTALLATION. ALL WORK AND MATERIALS RELATED TO THE TRANSITION ARE INCIDENTAL TO THE CRASH CUSHION TYPE 6-T BID ITEM.*
5. *PREPARE THE SITE AND INSTALL FOUNDATION PADS SUITABLE FOR TEMPORARY WORK ZONES IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS. FOLLOW MANUFACTURER INSTRUCTIONS FOR MATERIALS, THICKNESS, SPECIFICATIONS, AND ANCHORING. ALL WORK AND MATERIALS RELATED TO THE FOUNDATION PAD ARE INCIDENTAL TO THE CRASH CUSHION TYPE 6-T BID ITEM.*
6. *WHEN REQUIRED BY THE PLANS OR ENGINEER, RELOCATE CRASH CUSHION TYPE 6 CLASS T AS DIRECTED. THE BID ITEM 'RELOCATE CRASH CUSHION' INCLUDES THE UNIT'S REMOVAL AND RE-INSTALLATION.*
7. *CRASH CUSHION TYPE 6 CLASS T INSTALLATIONS SHALL FOLLOW THE MANUFACTURER'S INSTRUCTIONS. SYSTEMS SHALL NOT BE MODIFIED FROM THEIR APPROVED CONFIGURATIONS.*

BID ITEMS AND UNIT TO BID

CRASH CUSHION TY 6 CLASS T ☆ EACH
☆ EITHER TL2 (TEST LEVEL 2) OR TL3 (TEST LEVEL 3), AS REQUIRED
RELOCATE CRASH CUSHION EACH
OBJECT MARKER TYPE 3 (AS REQUIRED) EACH

THIS STANDARD DRAWING PROVIDES GUIDANCE ONLY. CONSULT THE MANUFACTURER FOR THE LATEST DETAILS AND INSTALLATION INSTRUCTIONS.

HILL AND SMITH SMART CUSHION

VALTIR QUADGUARD M10

VALTIR QUADGUARD ELITE M10

VALIR REACT M

SCAN THE QR CODES TO ACCESS THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS FOR THE CRASH CUSHIONS.

REVISION DATE: 08/11/2025
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SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

CRASH CUSHION

CRASH CUSHION TYPE 6 CLASS T (TL2 AND TL3)

STANDARD DRAWING NUMBER
RBE-100-12

~ NOTES ~

(100) *ON THE PLAN SHEETS, THE DESIGNER MUST DOCUMENT THE APPROXIMATE STATION AND OFFSET, OR APPROXIMATE COORDINATES FOR THE CENTER OF POSTS 5A AND 5B. THESE VALUES ARE INTENDED TO SERVE AS GUIDANCE FOR CONSTRUCTION LAYOUT AND SHOULD ALLOW FOR TYPICAL CONSTRUCTION TOLERANCES. REFER TO SHEET 3 FOR INSTALLATION DETAILS AND BULLNOSE TERMINAL LAYOUT.*

(101) *U-BOLT CABLE CLIPS (3 PER CABLE) SPACED OUT ON NOSE, TO HOLD CABLE TO BACKSIDE OF THE RAIL.*

(102) *NOSE CABLE WITH SWAGGED END BUTTONS.*

(103) *NOSE CABLE ANCHOR BRACKET (BACKSIDE OF SPLICE).*

(104) *THE SLACK IN THE NOSE CABLES SHALL BE EVENLY DISTRIBUTED BETWEEN THE CABLE CLIP FASTENERS AND POST NO. 1 ON EITHER SIDE OF THE NOSE.*

(105) *MODIFIED THRIE-BEAM (BULLNOSE) MINIMUM WORKING WIDTH 4' - 6". GUARDRAIL-STEEL W BEAM-S FACE MINIMUM WORKING WIDTH 5' - 0".*

GRADING INSIDE W-BEAM GUARDRAIL OR MODIFIED THRIE-BEAM (BULLNOSE) GUARDRAIL BEYOND POST 12 MAY BE ADJUSTED FOR DRAINAGE, PROVIDED THERE IS A MINIMUM OF 2' OF FILL BEHIND THE POSTS TO ENSURE ADEQUATE SUPPORT FOR THE SYSTEM.

(106) *MINIMUM WIDTH OF SYSTEM FROM POST 5 TO POST 12 IS 14' - 9¼" MEASURED FROM FACE OF GUARDRAIL TO FACE OF GUARDRAIL.*

(107) *FIXED OBJECT OR OTHER OBSTACLE.*

108 *PARTS E1 THROUGH E4 ARE THRIE-BEAM RAILS. SEE SHEET 9 FOR DETAILS.*

- E1 *SLOTTED THRIE-BEAM RAIL (POST 1B TO POST 1A)*
- E2 *SLOTTED THRIE-BEAM RAIL (POST 1 TO POST 5)*
- E3 *SLOTTED THRIE-BEAM RAIL (POST 5 TO POST 8)*
- E4 *UNBENT STANDARD THRIE-BEAM RAIL (POST 8 TO POST 12 AND BEYOND POST 12 WHEN MODIFIED THRIE-BEAM (BULLNOSE) USED)*

(109) *BEYOND POST 12, EITHER MODIFIED THRIE-BEAM (BULLNOSE) OR W-BEAM GUARDRAIL MAY BE CONSTRUCTED. BOTH OPTIONS ARE PAID PER LINEAR FOOT. INDICATE THE SELECTED TYPE IN THE ROADWAY PLANS.*

(110) *MODIFIED THRIE-BEAM (BULLNOSE) IS SHOWN IN PLAN VIEW - TYPICAL BULLNOSE LAYOUT. TRANSITIONING TO W-BEAM GUARDRAIL WILL HAVE A DIFFERENT LAYOUT. SEE SHEET 4 DETAIL B.*

111 *SEE SHEET 6 FOR DETAILS ON THE INSTALLATION OF DELINEATOR REFLECTORS.*

112 *SEE SHEET 5 FOR MEDIAN GRADING.*

113 *THRIE-BEAM RAILS MAY NEED TO BE FIELD BENT TO FIT THE LOCATION.*

114 *IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 1/2". MINIMUM DIAMETER OF THE ROCK REMOVAL IS 12" DIAMETER. BACKFILL WITH CUTTING SPOILS, PLACING GRANULAR MATERIAL, OR SMALL ROCK (#9 OR #57 STONE) IN THE BOTTOM 2 1/2" FOR DRAINAGE. THE REMOVAL OF ROCK AND BACKFILL MATERIAL IS INCIDENTAL.*

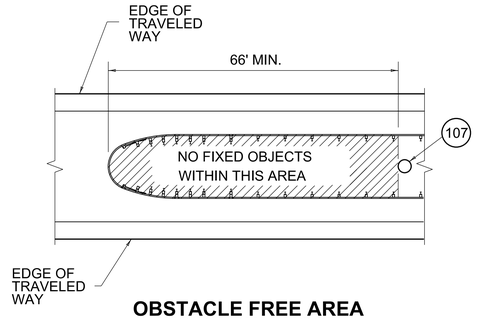
BID ITEMS AND UNIT TO BID

THRIE-BEAM BULLNOSE TERMINAL	*EACH*

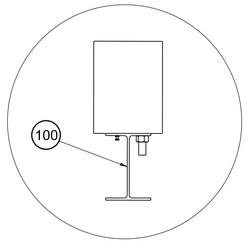
BID ITEMS AS APPLICABLE

GUARDRAIL-STEEL W BEAM-S FACE	*LF*
MODIFIED THRIE-BEAM (BULLNOSE)	*LF*
THRIE BEAM TO W BEAM CONNECTOR	*EACH*

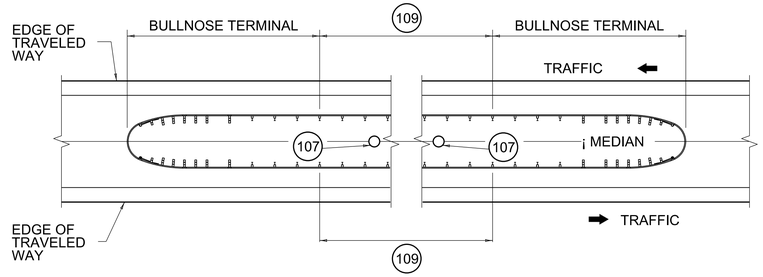
LAPPING DETAIL



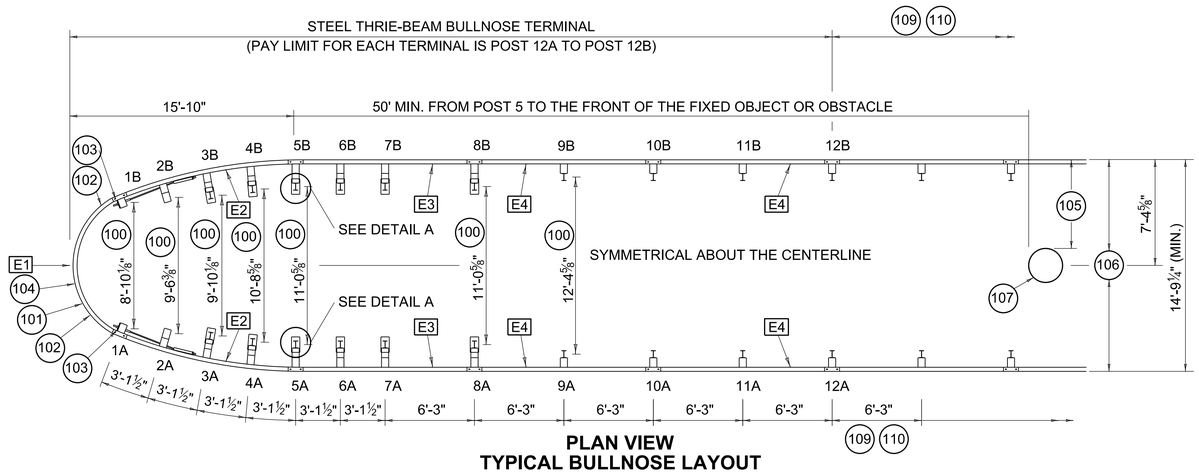
OBSTACLE FREE AREA INSIDE BULLNOSE



DETAIL A



MEDIAN FIXED OBJECT SHIELDING PAY LIMITS



PLAN VIEW
TYPICAL BULLNOSE LAYOUT

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SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

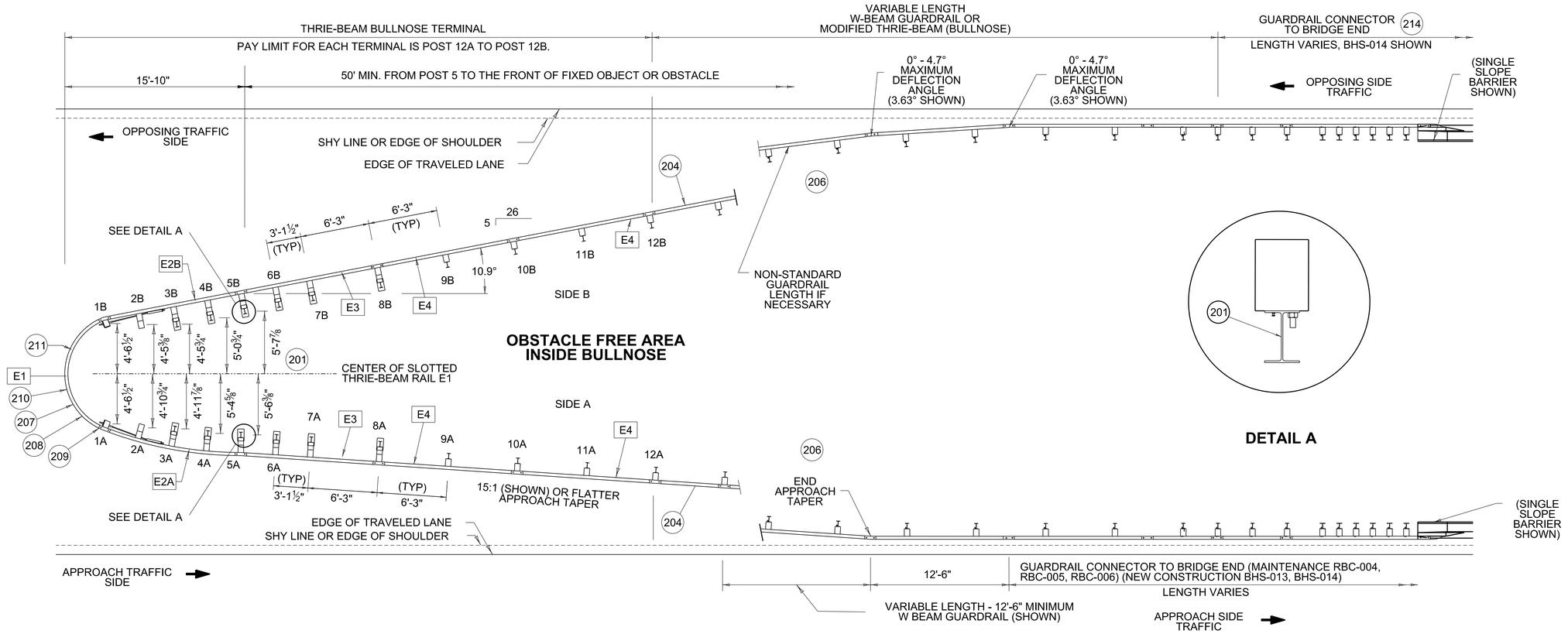
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

STEEL THRIE-BEAM BULLNOSE TERMINAL

SHEET 001: SYMMETRICAL BULLNOSE

STANDARD DRAWING NUMBER
RBE-210



TYPICAL LAYOUT FOR ASYMMETRICAL BULLNOSE FOR SYSTEM WIDTHS GREATER THAN 24'

~ NOTES ~

(201) *DIMENSIONS ARE MEASURED FROM THE CENTER OF SLOTTED THRIE-BEAM RAIL E1 TO THE CENTER OF EACH GUARDRAIL POST.*

ON THE PLAN SHEETS, THE DESIGNER MUST DOCUMENT THE APPROXIMATE STATION AND OFFSET, OR APPROXIMATE COORDINATES FOR THE CENTER OF POSTS 5A AND 5B. THESE VALUES ARE INTENDED TO SERVE AS GUIDANCE FOR CONSTRUCTION LAYOUT AND SHOULD ALLOW FOR TYPICAL CONSTRUCTION TOLERANCES. REFER TO SHEET 3 FOR INSTALLATION DETAILS AND BULLNOSE TERMINAL LAYOUT.

202 *SAW, DRILL, OR PUNCH THE RAIL AS REQUIRED. DO NOT TORCH-CUT. REPAIR GALVANIZED COATINGS IN ACCORDANCE WITH ASTM A780 (THIS IS INCIDENTAL). SPACING BETWEEN INDIVIDUAL POSTS FROM POST 1 TO POST 7 IS 3'-1½"*

203 *PARTS E1 THROUGH E4 ARE THRIE-BEAM RAILS. SEE SHEET 9 FOR DETAILS.*

- E1 *SLOTTED THRIE-BEAM RAIL (POST 1B TO POST 1A)*
- E2 *SLOTTED THRIE-BEAM RAIL (POST 1 TO POST 5) WITH A RADIAL OPTION ON THE APPROACH SIDE AND A TANGENT OPTION ON THE OPPOSING SIDE.*
- E3 *SLOTTED THRIE-BEAM RAIL (POST 5 TO POST 8)*
- E4 *UNBENT STANDARD THRIE-BEAM RAIL (POST 8 TO POST 12, AND BEYOND POST 12 WHEN MODIFIED THRIE-BEAM (BULLNOSE) USED)*

(204) *BEYOND POST 12, EITHER MODIFIED THRIE-BEAM (BULLNOSE) OR W-BEAM GUARDRAIL MAY BE CONSTRUCTED. BOTH OPTIONS ARE PAID PER LINEAR FOOT. INDICATE THE SELECTED TYPE IN THE ROADWAY PLANS.*

FOR WIDER MEDIANS, TAPER THE OPPOSING TRAFFIC SIDE BEFORE TAPERING THE APPROACH TRAFFIC SIDE, AS SHOWN.

EXTEND THE RAIL BEYOND POST 12 AT A TAPER RATE OF 15:1 OR FLATTER ON THE APPROACH SIDE, AND UP TO A MAXIMUM TAPER RATE OF 26:5 ON THE OPPOSING TRAFFIC SIDE, AS NEEDED. THE LENGTH OF EXTENSION WILL VARY BASED ON MEDIAN WIDTH OR WORKING WIDTH REQUIREMENTS.

205 *SEE SHEET 5 FOR MEDIAN GRADING.*

(206) *MODIFIED THRIE-BEAM (BULLNOSE) MINIMUM WORKING WIDTH 4' - 6". GUARDRAIL-STEEL W BEAM-S FACE MINIMUM WORKING WIDTH 5' - 0".*

GRADING INSIDE W-BEAM GUARDRAIL OR MODIFIED THRIE-BEAM (BULLNOSE) GUARDRAIL BEYOND POST 12 MAY BE ADJUSTED FOR DRAINAGE, PROVIDED THERE IS A MINIMUM OF 2' OF FILL BEHIND THE POSTS TO ENSURE ADEQUATE SUPPORT FOR THE SYSTEM.

(207) *U-BOLT CABLE CLIPS (3 PER CABLE) SPACED OUT ON NOSE, TO HOLD CABLE TO BACKSIDE OF THE RAIL.*

(208) *NOSE CABLE WITH SWAGGED END BUTTONS.*

(209) *NOSE CABLE ANCHOR BRACKET (BACKSIDE OF SPLICE).*

(210) *THE SLACK IN THE NOSE CABLES SHALL BE EVENLY DISTRIBUTED BETWEEN THE CABLE CLIP FASTENERS AND POST NO. 1 ON EITHER SIDE OF THE NOSE.*

(211) *BEND THE RAIL IN THE FIELD AS NEEDED TO MAKE CONNECTIONS. THE MAXIMUM DEFLECTION ANGLE IS 4.7° (3.63° SHOWN).*

212 *IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 1/2". MINIMUM DIAMETER OF THE ROCK REMOVAL IS 12" DIAMETER. BACKFILL WITH CUTTING SPOILS, PLACING GRANULAR MATERIAL, OR SMALL ROCK (#9 OR #57 STONE) IN THE BOTTOM 2 1/2" FOR DRAINAGE. THE REMOVAL OF ROCK AND BACKFILL MATERIAL IS INCIDENTAL.*

213 *SEE SHEET 6 FOR DETAILS ON THE INSTALLATION OF DELINEATOR REFLECTORS.*

(214) *GUARDRAIL CONNECTOR TO BRIDGE END. FOR NEW CONSTRUCTION USE BHS-013 OR BHS-014. FOR MAINTENANCE ONLY RBC-004, RBC-005, RBC-006.*

BID ITEM AND UNIT TO BID

THRIE-BEAM BULLNOSE TERMINAL	*EACH*

BID ITEMS AS APPLICABLE

MODIFIED THRIE-BEAM (BULLNOSE)	*LF*
GUARDRAIL-STEEL W BEAM-S FACE	*LF*
THRIE BEAM TO W BEAM CONNECTOR	*EACH*
THRIE-BEAM GUARDRAIL TRANSITION TL-3	*EACH*
THRIE-BEAM GUARDRAIL TRANSITION TL-2	*EACH*

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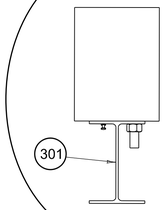
APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

BARRIERS

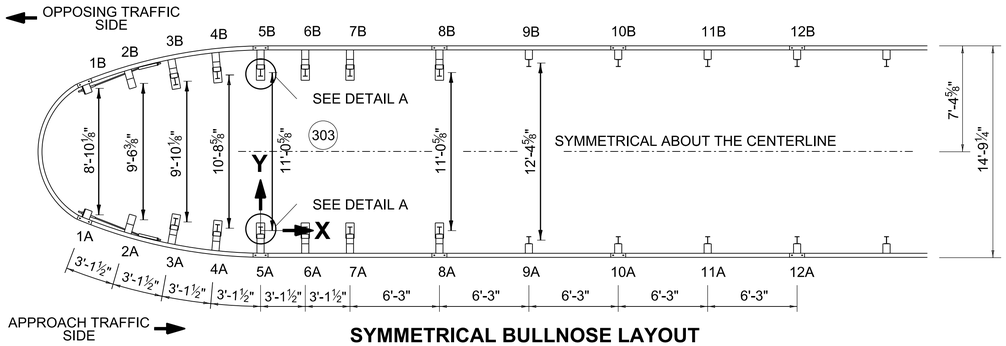
BULLNOSE TERMINAL INSTALLATION LAYOUT GUIDE

SYMMETRICAL BULLNOSE POST COORDINATES (APPROXIMATE)			
POST NUMBER	X (FT, IN)	Y (FT, IN)	ANGLE OF POST (FLANGE FACE)
12A	37' - 6"	- 0' - 8 1/8"	0
11A	31' - 3"	- 0' - 8 1/8"	0
10A	25' - 0"	- 0' - 8 1/8"	0
9A	18' - 9"	- 0' - 8 1/8"	0
8A	12' - 6"	0' - 0"	0
7A	6' - 3"	0' - 0"	0
6A	3' - 1 1/2"	0' - 0"	0
5A	0' - 0"	0' - 0"	0
4A	- 3' - 1/4"	0' - 2"	5
3A	- 5' - 11 5/8"	0' - 7 1/4"	10
2A	- 9' - 1/4"	0' - 9 "	16
1A	- 12' - 1 3/8"	1' - 1 5/8"	21
1B	- 12' - 1 3/8"	9' - 10 3/4"	21
2B	- 9' - 1/4"	10' - 3 3/8"	16
3B	- 5' - 11 5/8"	10' - 5 1/8"	10
4B	- 3' - 1/4"	10' - 10 3/8"	5
5B	0' - 0"	11' - 3/8"	0
6B	3' - 1 1/2"	11' - 3/8"	0
7B	6' - 3"	11' - 3/8"	0
8B	12' - 6"	11' - 3/8"	0
9B	18' - 9"	11' - 8 1/2"	0
10B	25' - 0"	11' - 8 1/2"	0
11B	31' - 3"	11' - 8 1/2"	0
12B	37' - 6"	11' - 8 1/2"	0

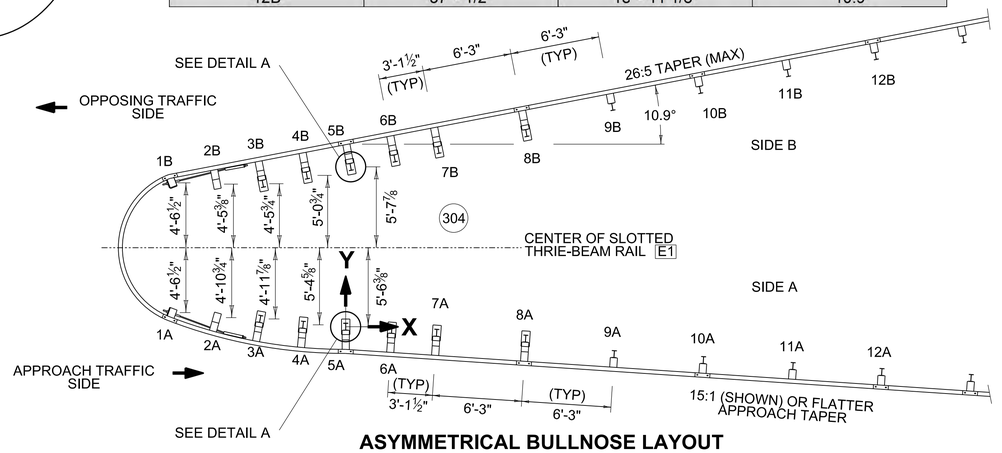
DETAIL A



ASYMMETRICAL BULLNOSE POST COORDINATES (APPROXIMATE)			
POST NUMBER	X (FT, IN)	Y (FT, IN)	ANGLE OF POST (FLANGE FACE)
12A	37' - 5 5/8"	- 3' - 2"	3.8
11A	31' - 3 1/8"	- 2' - 9"	3.8
10A	25' - 0"	- 2' -4"	3.8
9A	18' - 9 1/8"	- 1' - 11"	3.8
8A	12' - 6 7/8"	- 0' - 10"	3.8
7A	6' - 4 1/4"	- 0' - 5 1/8"	3.8
6A	3' - 2 5/8"	- 0' - 2 5/8"	3.8
5A	0' - 0"	0' - 0"	0
4A	- 2' - 11 3/4"	0' - 1 5/8"	5
3A	- 5' - 11 3/4"	0' - 6 1/2"	10
2A	- 9' - 1/4"	0' - 7 5/8"	16
1A	- 12' - 1 1/2"	0' - 11 5/8"	21
1B	- 12' - 1 1/2"	10' - 7/8"	21
2B	- 9' - 1/8"	9' - 11 5/8"	10.9
3B	- 5' - 9 1/2"	10' - 0"	10.9
4B	- 2' - 8 5/8"	10' - 7"	10.9
5B	0' - 4 1/8"	11' - 2 1/8"	10.9
6B	3' - 5"	11' - 9 1/4"	10.9
7B	6' - 5 3/4"	12' - 4 3/8"	10.9
8B	12' - 7 1/2"	13' - 6 1/2"	10.9
9B	18' - 7 5/8"	15' - 4 1/2"	10.9
10B	24' - 9 1/4"	16' - 6 3/4"	10.9
11B	30' - 10 7/8"	17' - 8 7/8"	10.9
12B	37' - 1/2"	18' - 11 1/8"	10.9



SYMMETRICAL BULLNOSE LAYOUT



ASYMMETRICAL BULLNOSE LAYOUT

~ NOTES ~

300 *ON THE PLAN SHEETS, THE DESIGNER MUST DOCUMENT THE APPROXIMATE STATION AND OFFSET, OR APPROXIMATE COORDINATES FOR THE CENTER OF POSTS 5A AND 5B. THESE VALUES ARE INTENDED TO SERVE AS GUIDANCE FOR CONSTRUCTION LAYOUT AND SHOULD ALLOW FOR TYPICAL CONSTRUCTION TOLERANCES.*

(301) *DIMENSIONS ARE MEASURED TO THE CENTER OF GUARDRAIL POSTS. REFER TO DETAIL A FOR ADDITIONAL INFORMATION. THE CONTRACTOR SHALL LAYOUT THE BULLNOSE TERMINAL IN THE FIELD USING THE STATION AND OFFSET (OR OTHER LOCATION INFORMATION) FOR POST 5A, ENSURING A MINIMUM LENGTH OF 50' FROM POST 5 TO THE FRONT OF THE FIXED OBJECT OR OBSTACLE. POST COORDINATES IN THE TABLES ABOVE MAY BE USED TO LAYOUT THE REMAINING POSTS. NORMAL CONSTRUCTION TOLERANCES APPLY.*

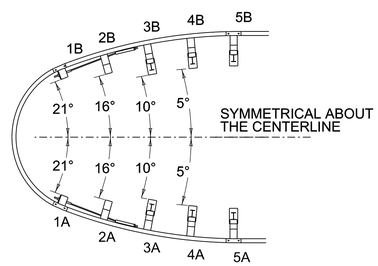
302 *TO ASSIST WITH LAYING OUT THE BULLNOSE TERMINAL, ASSEMBLE THE E1 BEAM AND E2 BEAMS (WITHOUT ATTACHING TO THE POSTS) TO SERVE AS AN ON-THE-GROUND TEMPLATE FOR THE TERMINAL SYSTEM. DURING THIS DEMONSTRATION ASSEMBLY, POST LOCATIONS MAY BE ADJUSTED TO MATCH THE LAYOUT. ERECT THE RAIL ELEMENTS TO FORM A SMOOTH, CONTINUOUS RAIL AS SHOWN IN THE PLANS AND STANDARD DRAWINGS. SET POSTS PLUMB AND ACCURATELY ALIGNED AND SPACED. KYTC WILL REVIEW THE LAYOUT PRIOR TO THE CONTRACTOR DRIVING POSTS.*

(303) *FOR THE SYMMETRIC BULLNOSE, LAYOUT AND ANGLE DIMENSIONS FOR POST 1-5 ARE MEASURED FROM THE CENTER OF THE POSTS ON SIDE A TO THE CENTER OF POSTS ON SIDE B.*

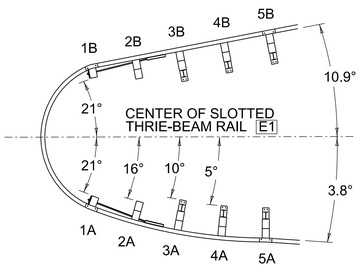
(304) *FOR THE ASYMMETRIC BULLNOSE, LAYOUT AND ANGLE DIMENSIONS FOR POST 1-5 ARE MEASURED FROM THE CENTER OF SLOTTED THRIE-BEAM RAIL E1 TO THE CENTER OF EACH GUARDRAIL POST.*

305 *POSTS LABELED AS 'A' SHALL BE ALIGNED TO THE APPROACH TRAFFIC SIDE. THE ABOVE CHARTS SHALL BE MIRRORED ACCORDINGLY IF PLACED IN A DIFFERENT ORIENTATION. THE CHART SPACING SHALL STILL APPLY.*

306 *FOR ADDITIONAL ASSEMBLY INFORMATION, SCAN THE QR CODE TO ACCESS THE MASH BULLNOSE INSTALLATION MANUAL.*



SYMMETRICAL POST ANGLE (APPROX.)



ASYMMETRICAL POST ANGLE (APPROX.)

REVISION DATE: 08/11/2025
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SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

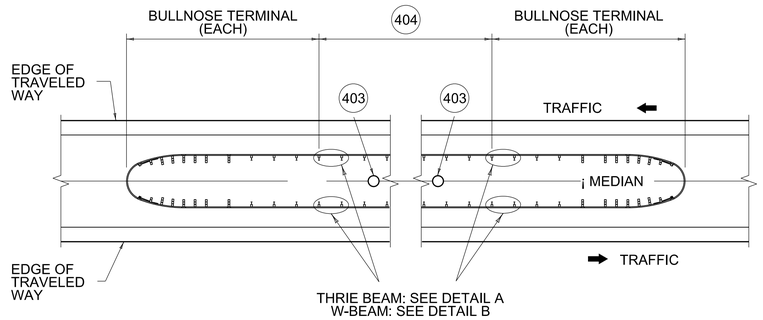
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

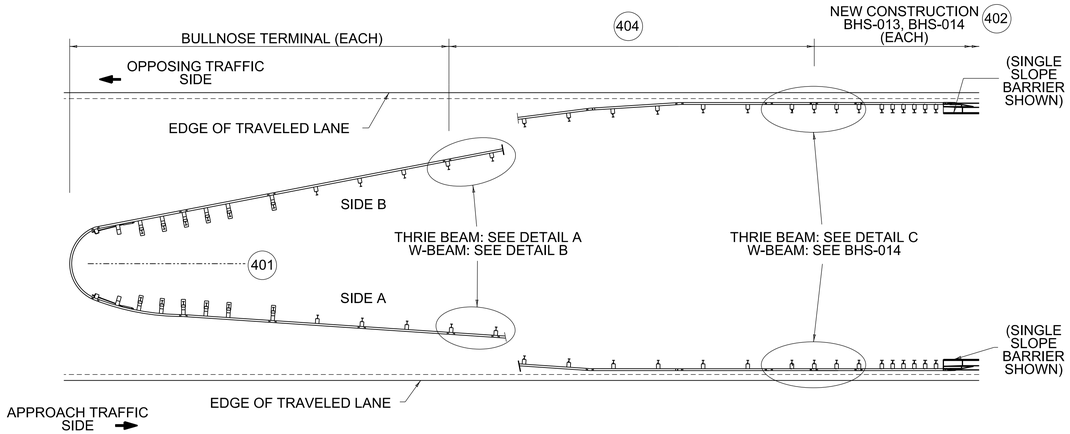
STEEL THRIE-BEAM BULLNOSE TERMINAL

SHEET 003: BULLNOSE TERMINAL INSTALLATION LAYOUT

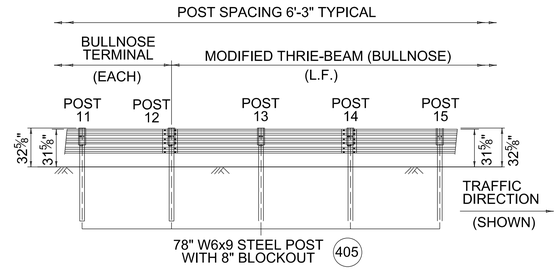
STANDARD DRAWING NUMBER
RBE-210



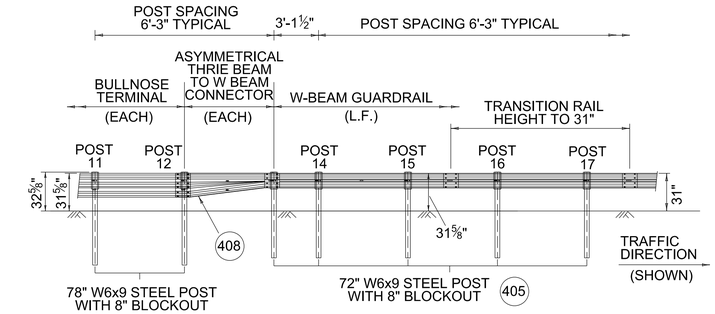
SYMMETRICAL BULLNOSE



ASYMMETRICAL BULLNOSE



DETAIL A
BULLNOSE TERMINAL TRANSITION TO MODIFIED THRIE-BEAM (BULLNOSE)



DETAIL B
BULLNOSE TERMINAL TRANSITION TO W-BEAM GUARDRAIL

~ NOTES ~

400 *SEE SHEET 5 FOR MEDIAN GRADING*

401 *SYMMETRY LINE OF SLOTTED THRIE-BEAM RAIL E1.*

402 *FOR MAINTENANCE ONLY USE RBC-004, RBC-005, RBC-006*

403 *FIXED OBJECT*

MODIFIED THRIE-BEAM (BULLNOSE) MINIMUM WORKING WIDTH 4' - 6"
GUARDRAIL-STEEL W BEAM-S FACE MINIMUM WORKING WIDTH 5' - 0"

404 *BEYOND POST 12, EITHER MODIFIED THRIE-BEAM (BULLNOSE) OR W-BEAM GUARDRAIL MAY BE CONSTRUCTED. BOTH OPTIONS ARE PAID PER LINEAR FOOT. INDICATE THE SELECTED TYPE IN THE ROADWAY PLANS.*

405 *SEE SHEET 7 FOR POST, RAIL, AND BLOCKOUT DETAILS.*

406 *CONTRARY TO BHS-013 AND BHS-014, IF MODIFIED THRIE-BEAM (BULLNOSE) IS USED TO CONNECT TO A THRIE-BEAM GUARDRAIL TRANSITION (BHS-013 OR BHS-014), THE ASYMMETRICAL THRIE BEAM TO W BEAM CONNECTOR PIECE IS REPLACED WITH A 12' - 6" LONG THRIE-BEAM RAIL WITH POST SPACING AS SHOWN IN DETAIL C. 6" X 8" X 18" BLOCKOUTS (SEE BHS-013 AND BHS-014 FOR DETAILS) ARE TO BE USED IN THIS SECTION OF THRIE BEAM. BEYOND THIS, STANDARD BLOCKOUTS FOR GUARDRAIL THRIE BEAM (BULLNOSE) IS USED.*

407 *EXTEND STANDARD HEADER CURB OR STANDARD HEADER CURB AND GUTTER TO THE END OF THE SECOND THRIE-BEAM PIECE FROM THE BRIDGE END. TAPER DOWN TO 4" IN HEIGHT OVER THE LAST 3' - 1 ½".*

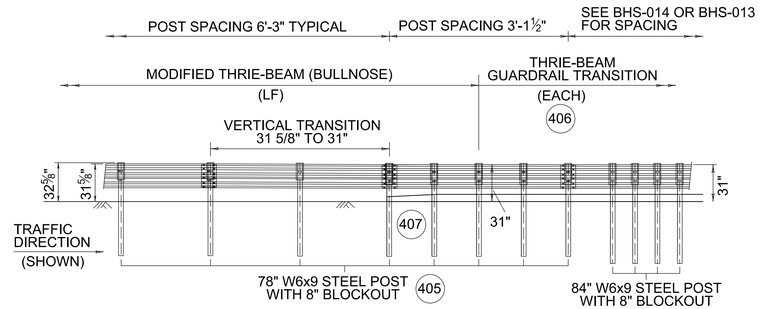
408 *THRIE BEAM TO W BEAM CONNECTOR PAID AS EACH. USE 10 GAUGE STEEL. SEE HARDWARE GUIDE DRAWING RWT02 FOR ADDITIONAL DETAILS.*

BID ITEM AND UNIT TO BID

THRIE-BEAM BULLNOSE TERMINAL	*EACH*

BID ITEMS AS APPLICABLE

MODIFIED THRIE-BEAM (BULLNOSE)	*LF*
GUARDRAIL-STEEL W BEAM-S FACE	*LF*
THRIE BEAM TO W BEAM CONNECTOR	*EACH*
THRIE-BEAM GUARDRAIL TRANSITION TL-3	*EACH*
THRIE-BEAM GUARDRAIL TRANSITION TL-2	*EACH*



DETAIL C
MODIFIED THRIE-BEAM (BULLNOSE) TO THRIE-BEAM TRANSITION (BHS-014 SHOWN)

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 08-11-2025 DATE

APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

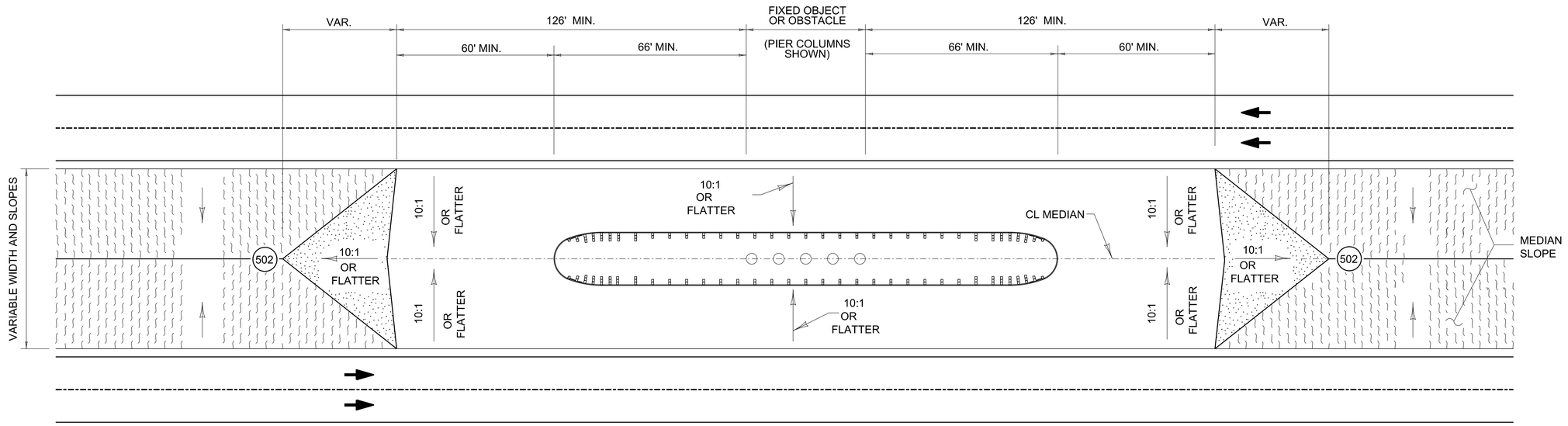
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

STEEL THRIE-BEAM BULLNOSE TERMINAL

SHEET 004: BULLNOSE TRANSITIONS

STANDARD DRAWING NUMBER
RBE-210



GRADING AT BULLNOSE

~ NOTES ~

(500) *MODIFIED THRIE-BEAM (BULLNOSE) MINIMUM WORKING WIDTH 4' - 6". GUARDRAIL-STEEL W BEAM-S FACE MINIMUM WORKING WIDTH 5' - 0".*

GRADING FROM POST 1 TO POST 12 AND THE 60' LEADING OR TRAILING THE THRIE-BEAM TERMINAL SHALL BE 10:1 OR FLATTER.

GRADING BEYOND POST 12 MAY BE ADJUSTED FOR DRAINAGE, PROVIDED THERE IS A MINIMUM OF 2' OF FILL BEHIND THE POSTS TO ENSURE ADEQUATE SUPPORT FOR THE SYSTEM.

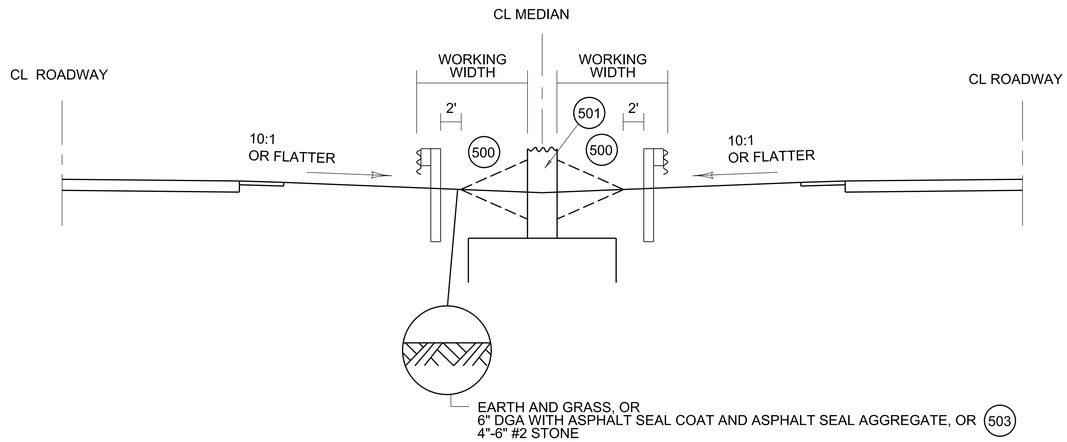
(501) *FIXED OBJECT OR OTHER OBSTACLE.*

(502) *EVALUATE MEDIAN DRAINAGE AND ENSURE POSITIVE FLOW. INCLUDE A DROP BOX INLET AND PIPING AS NEEDED, AND ENSURE THAT ALL NECESSARY BID ITEMS ARE INCLUDED.*

(503) *AT THE DISCRETION OF THE ENGINEER, MATERIAL CAN BE ANY OF THE FOLLOWING:*
EARTH AND GRASS, OR
6" DGA WITH ASPHALT SEAL COAT AND ASPHALT SEAL AGGREGATE, OR
4"-6" #2 STONE

504 *WHILE MEDIAN GRADING DETAIL DEPICTS SYMMETRICAL THRIE-BEAM BULLNOSE TERMINAL, ALL GRADING REQUIREMENTS APPLY TO ASYMMETRICAL THRIE-BEAM BULLNOSE TERMINALS ALSO.*

505 *GRADING QUANTITIES MUST BE CALCULATED AND SHOWN AS BID ITEMS.*



CROSS SECTION AT FIXED OBJECT

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

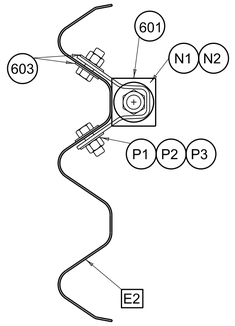
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

STEEL THRIE-BEAM BULLNOSE TERMINAL

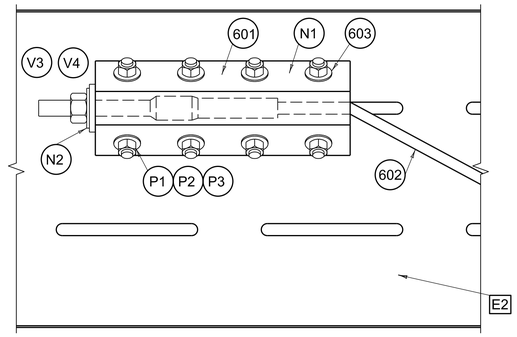
SHEET 005: GRADING AT BULLNOSE

STANDARD DRAWING NUMBER
RBE-210

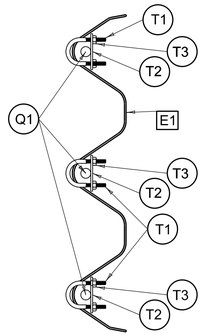


PROFILE VIEW

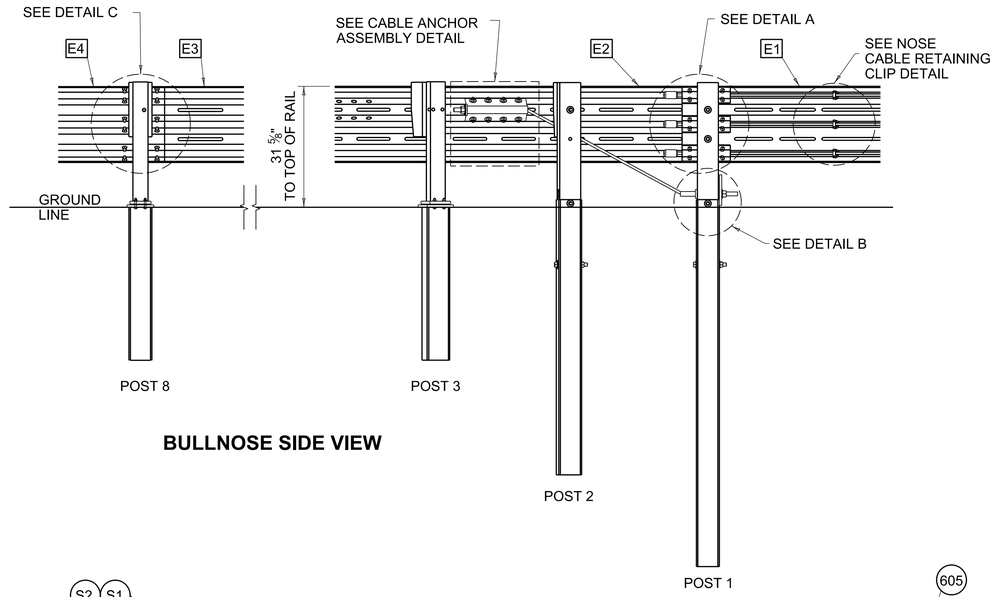
CABLE ANCHOR
ASSEMBLY CONNECTION



CABLE ANCHOR ASSEMBLY



NOSE CABLE RETAINING CLIP



BULLNOSE SIDE VIEW

~ NOTES ~

600 *SEE SHEET 10 FOR PART DESCRIPTIONS.*

(601) *SEE ANCHOR BRACKET ASSEMBLY DETAIL ON SHEET 10.*

(602) *SEE ANCHOR CABLE ASSEMBLY DETAIL ON SHEET 10.*

(603) *ONE WASHER BETWEEN BOLT HEAD AND RAIL AND BETWEEN NUT AND ANCHOR BRACKET ASSEMBLY.*

(604) *ONE WASHER BETWEEN BOLT HEAD AND FOUNDATION TUBE AND BETWEEN NUT AND FOUNDATION TUBE.*

(605) *BEND TWO NAILS OVER THE BEARING PLATE TO PREVENT ROTATION.*

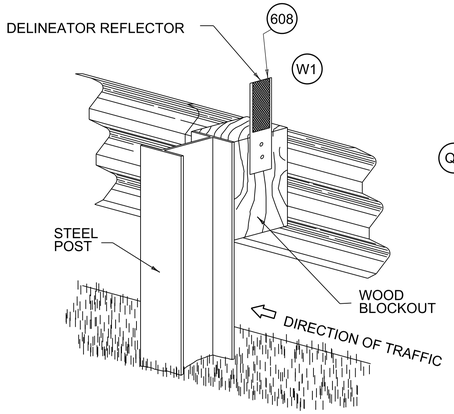
606 *NO MATERIAL IS TO BE PLACED AGAINST THE VERTICAL FACES OF BEARING PLATE.*

607 *PREVENT OR REMOVE MATERIALS THAT BLOCK ACCESS TO BOLTS FOR POST ASSEMBLIES.*

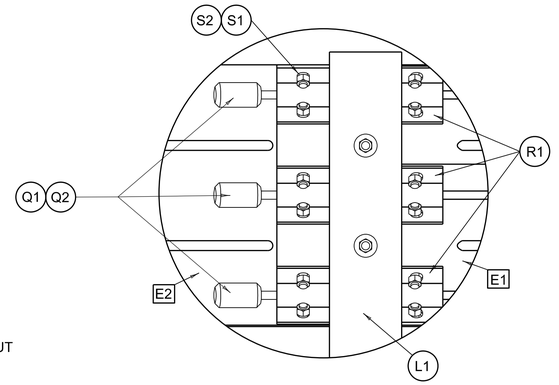
(608) *THE COLOR OF DELINEATORS MUST MATCH THE COLOR OF THE EDGELINE THEY SUPPLEMENT.*

609 *DELINEATOR SPACING SHOULD BE 100' WITH A MINIMUM OF 3 REFLECTORS. THE FIRST DELINEATOR SHOULD BE PLACED ON POST 3, ON THE ADJACENT TRAFFIC SIDE OF THE BULLNOSE.*

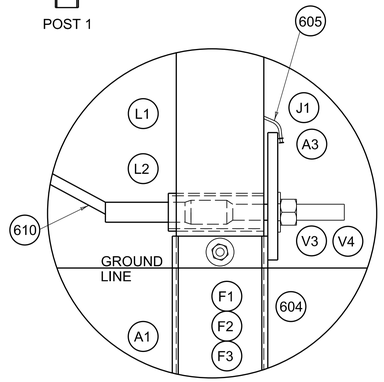
(610) *ANCHOR CABLE ASSEMBLY INCLUDES PARTS V1, V2, V3, AND V4.*



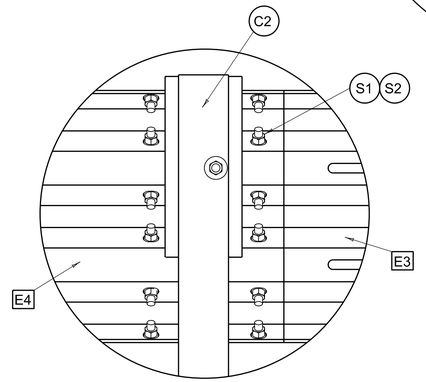
ONE-SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION



DETAIL A



DETAIL B



DETAIL C
THRIE-BEAM SPLICE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 08-11-2025 DATE

APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

BARRIERS

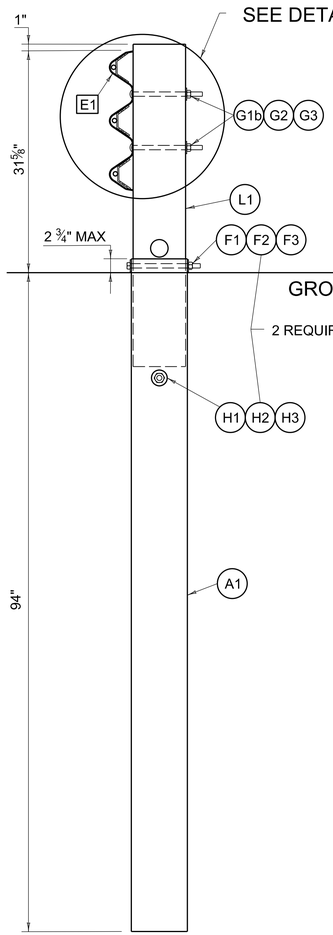
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

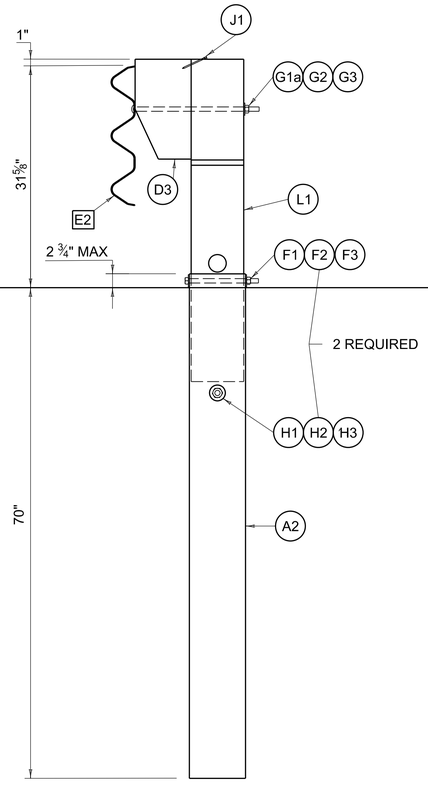
STEEL THRIE-BEAM BULLNOSE TERMINAL

SHEET 006: NOSE AND ANCHOR DETAILS

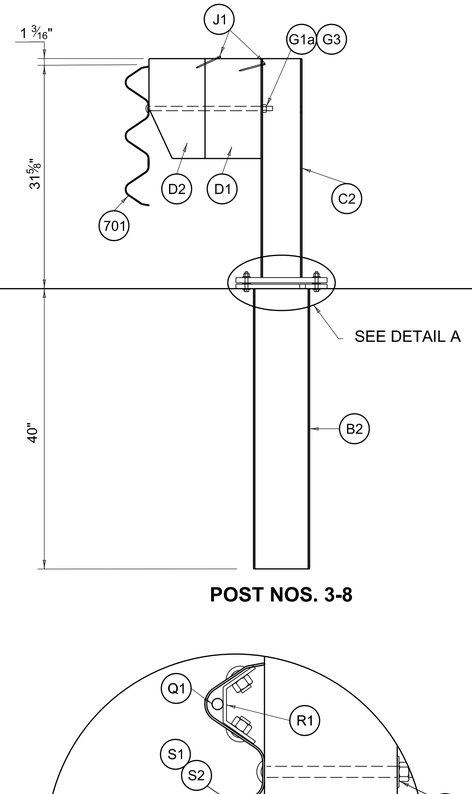
STANDARD DRAWING NUMBER
RBE-210



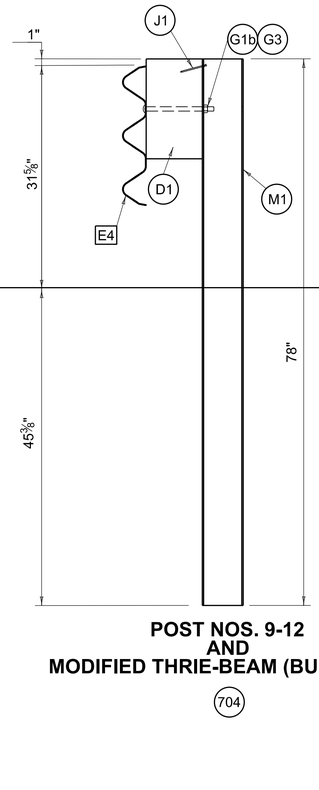
POST NO. 1



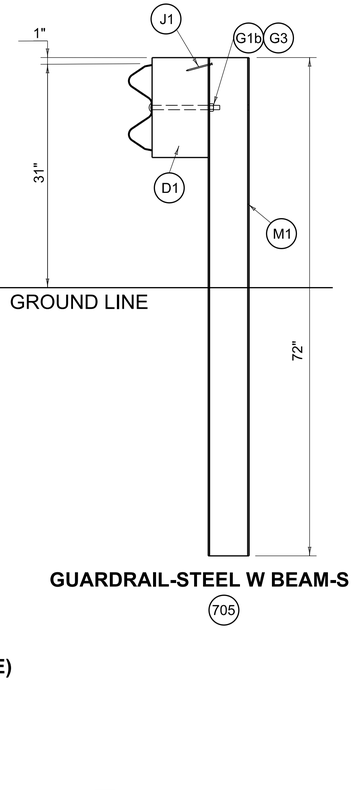
POST NO. 2



POST NOS. 3-8

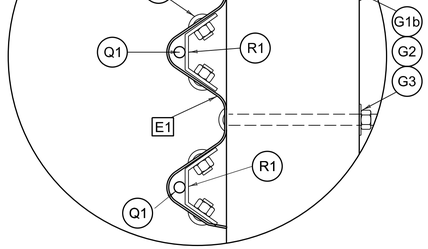


POST NOS. 9-12
AND
MODIFIED THRIE-BEAM (BULLNOSE)
(704)

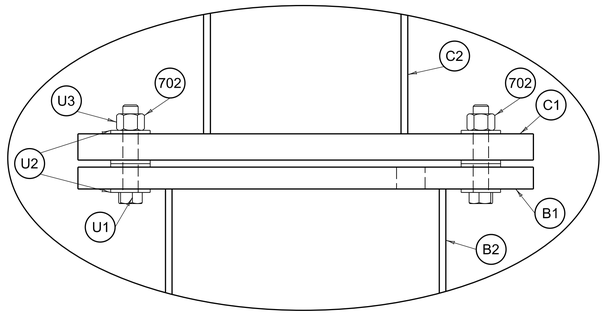


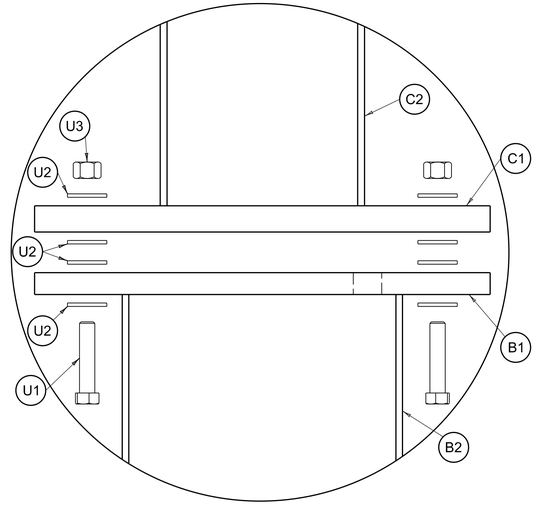
GUARDRAIL-STEEL W BEAM-S FACE
(705)

DETAIL B



DETAIL A





EXPLODED VIEW
DETAIL A

~ NOTES ~

700 *SEE SHEET 10 FOR PART DESCRIPTIONS.*

(701) *RAIL CAN BE [E2] OR [E3] DEPENDING ON POST LOCATION.*

(702) *TORQUE BOLT BETWEEN 60-75 FT-LB*

703 *SEE SHEET 4 FOR BULLNOSE TRANSITIONS. BEYOND POST 12 EITHER MODIFIED THRIE-BEAM (BULLNOSE) OR W-BEAM GUARDRAIL MAY BE CONSTRUCTED. BOTH OPTIONS PAID FOR AS LINEAR FOOT. INDICATE THE TYPE SELECTED IN THE ROADWAY PLANS.*

(704) *IF THE MODIFIED THRIE-BEAM (BULLNOSE) OPTION IS INSTALLED BEYOND POST 12, MATCH THE CONFIGURATION, SPACING, AND COMPONENTS USED BETWEEN POSTS 9 AND 12.*

(705) *BEYOND POST 12, IF W-BEAM GUARDRAIL IS SELECTED, TRANSITION THE RAIL BETWEEN POST 12 AND POST 13 USING A THRIE BEAM TO W BEAM CONNECTOR, FOLLOWED BY A STANDARD POST AND BLOCK SPACED AT 3' - 1½". CONTINUE THE BARRIER SYSTEM WITH STANDARD 6' - 3" POST SPACING, AND TRANSITION THE BULLNOSE RAIL HEIGHT TO 31" OVER A 12' -6" BEAM LENGTH. SEE SHEET 4 FOR W-BEAM TRANSITION DETAILS.*

REVISION DATE: 08/11/2025
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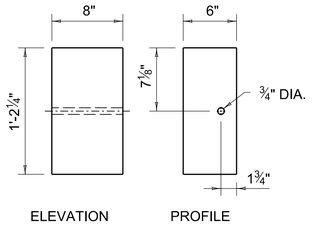
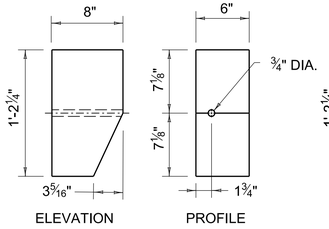
SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

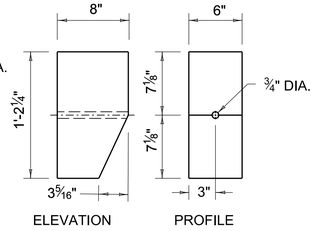
BARRIERS



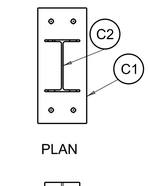
BLOCKOUT (D1)

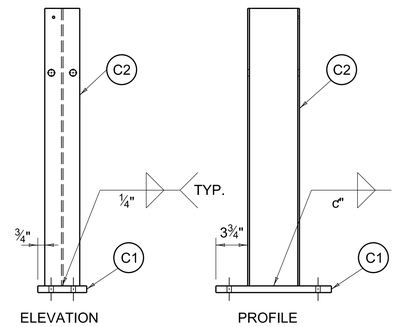


BLOCKOUT (D2)

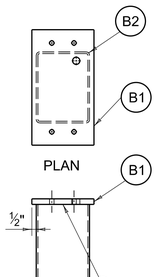


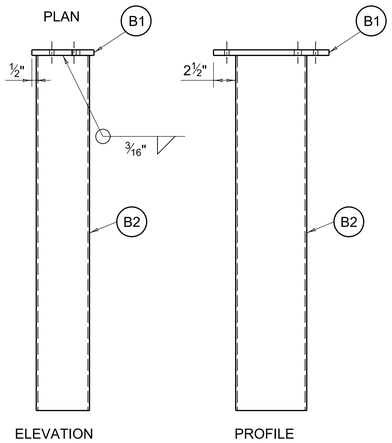
BLOCKOUT (D3)



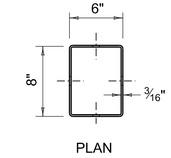


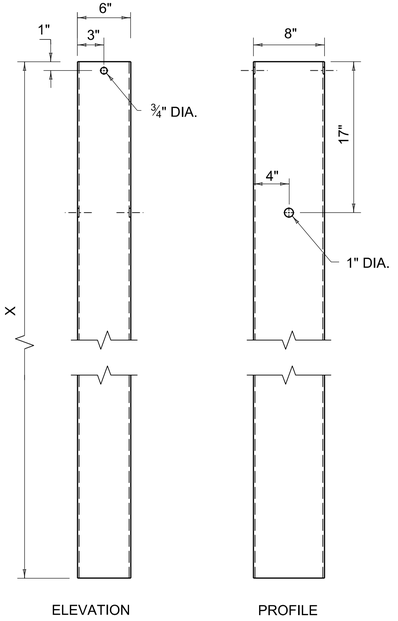
UPPER POST ASSEMBLY





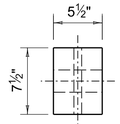
LOWER POST ASSEMBLY

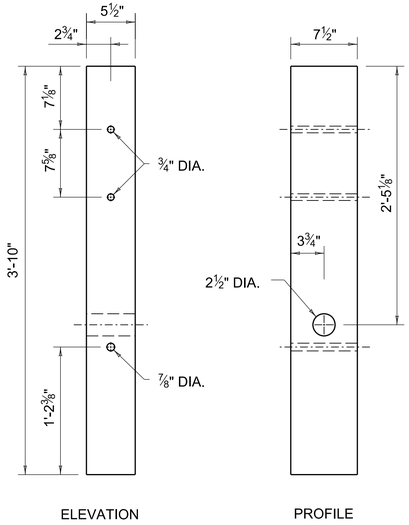




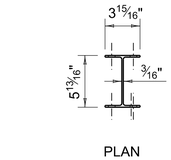
FOUNDATION TUBE (A1, A2, & B2)

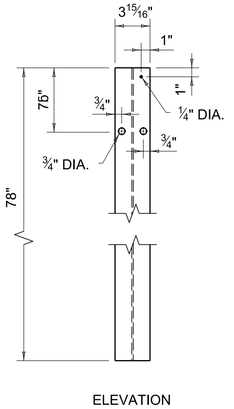
PART	LENGTH "X"
A1	96"
A2	72"
B2	40"



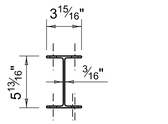


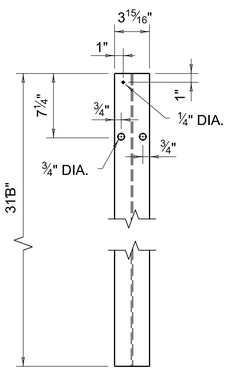
BCT TIMBER POST (L1)



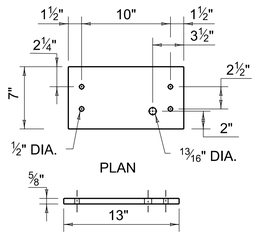


STEEL POST (M1)

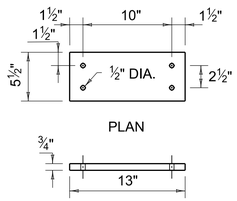




STEEL POST (C2)



LOWER SHEAR PLATE (B1)



UPPER SHEAR PLATE (C1)

~ NOTES ~

800 *SEE SHEET 10 FOR PART DESCRIPTIONS.*

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BARRIERS

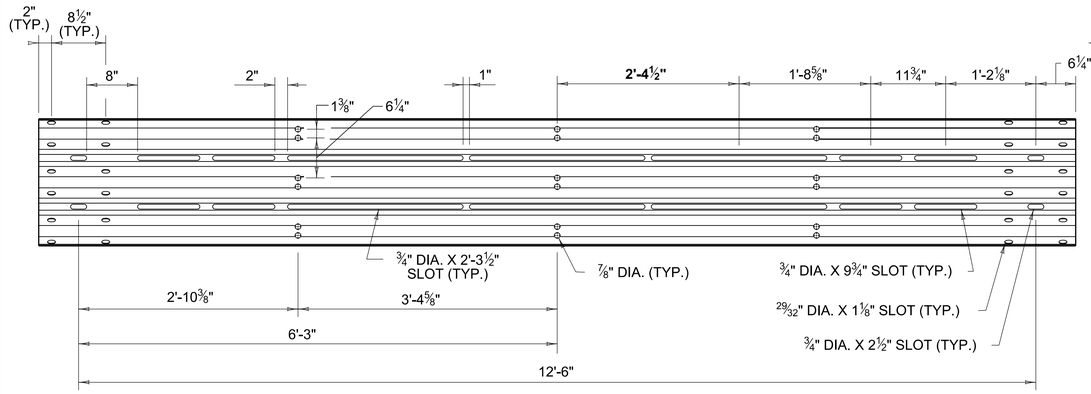
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

STEEL THRIE-BEAM BULLNOSE TERMINAL

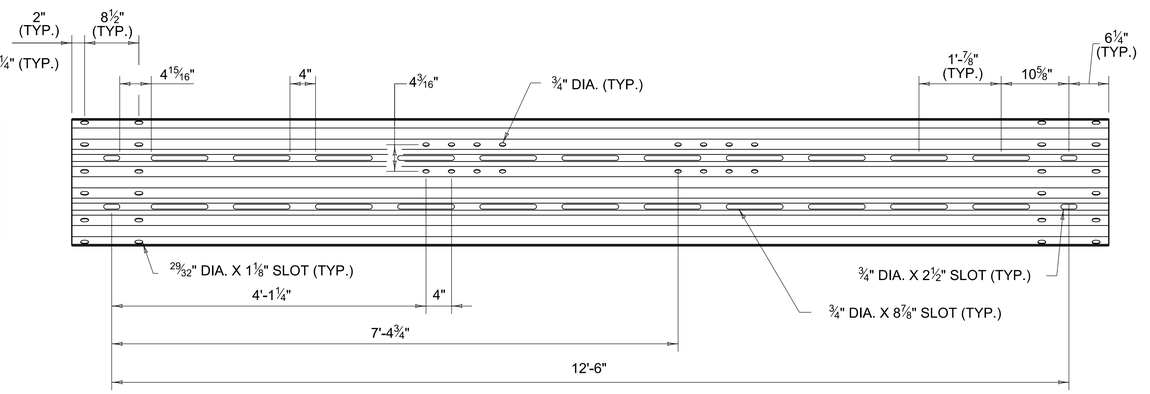
SHEET 008: POST, BLOCK, AND HARDWARE DETAILS

STANDARD DRAWING NUMBER
RBE-210



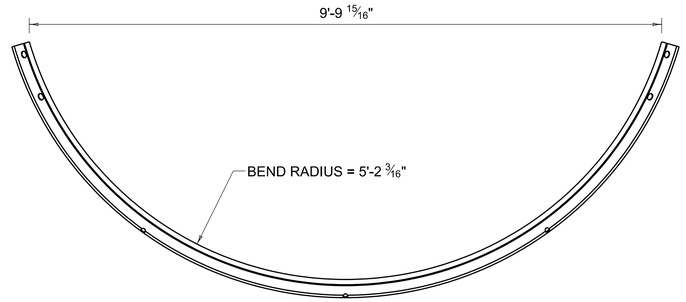
ELEVATION VIEW NON-RADIUSED

SLOTTED THRIE-BEAM RAIL E1



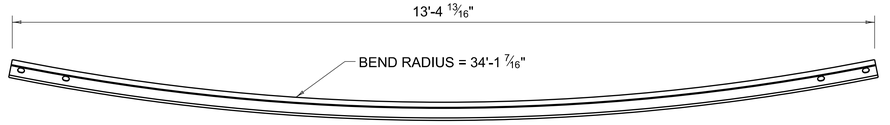
ELEVATION VIEW NON-RADIUSED

SLOTTED THRIE-BEAM RAIL E2



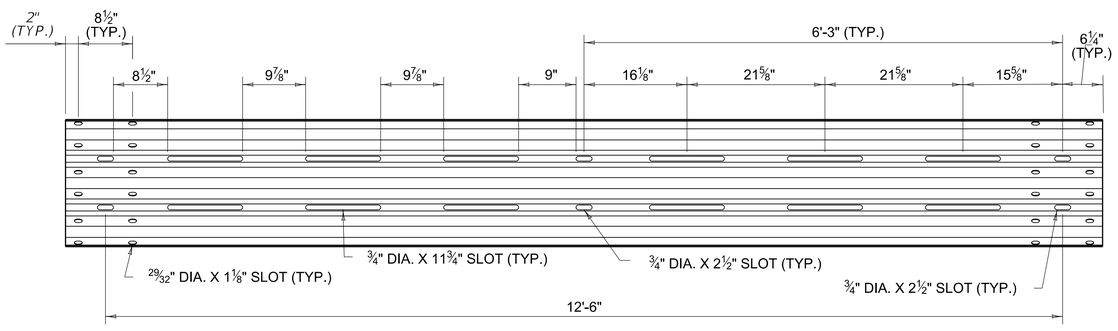
PLAN VIEW

SLOTTED THRIE-BEAM RAIL E1

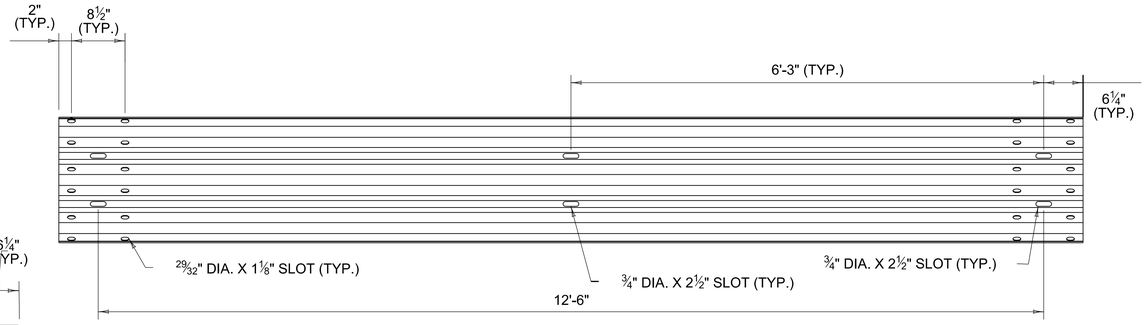


PLAN VIEW

SLOTTED THRIE-BEAM RAIL E2



SLOTTED THRIE-BEAM RAIL E3



UNBENT STANDARD THRIE-BEAM RAIL E4

~ NOTES ~

901 *FOR THRIE-BEAM RAIL, USE AASHTO M180, SPEC SECTION 814, AND GUARDRAIL MANUFACTURER FROM KYTC'S LIST OF APPROVED MATERIALS.*

902 *MARK THE RADIUS OF CURVATURE ON EACH OF THE CURVED ELEMENTS.*

903 *IN AN ASYMMETRICAL BULLNOSE, THE OPPOSING-SIDE E2 THRIE-BEAM IS STRAIGHT, NOT CURVED. THIS TANGENT BEAM HAS A LENGTH OF 13' - 6 ½".*

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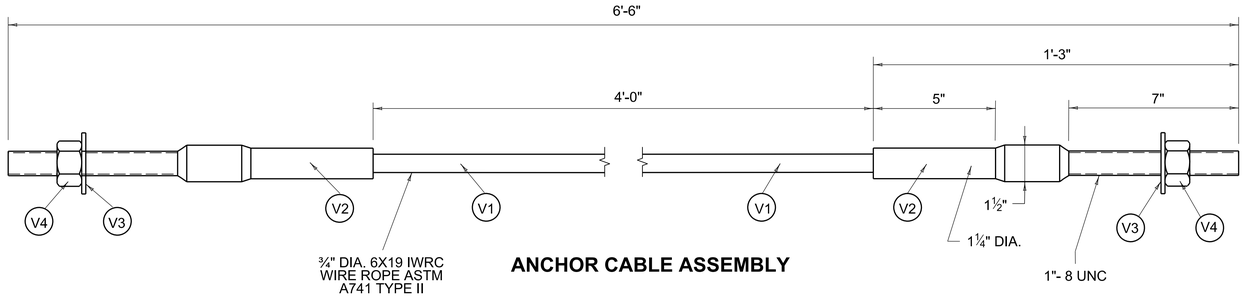
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

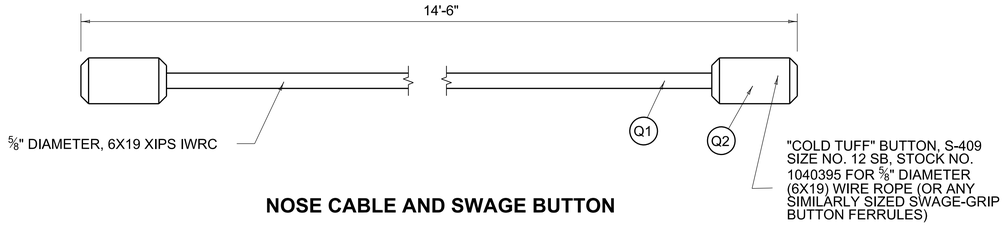
STEEL THRIE-BEAM BULLNOSE TERMINAL

SHEET 009: SLOTTED THRIE-BEAM RAIL

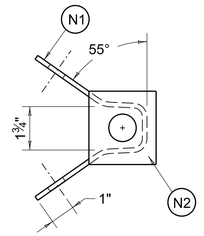
STANDARD DRAWING NUMBER
RBE-210



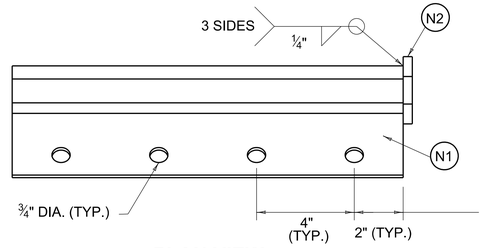
ANCHOR CABLE ASSEMBLY



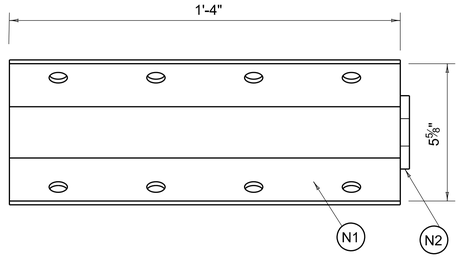
NOSE CABLE AND SWAGE BUTTON



PROFILE VIEW

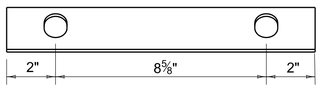


PLAN VIEW

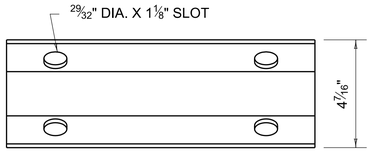


ELEVATION VIEW

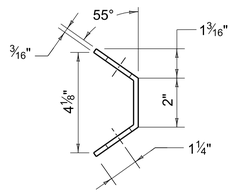
ANCHOR BRACKET ASSEMBLY (N1)



PLAN VIEW

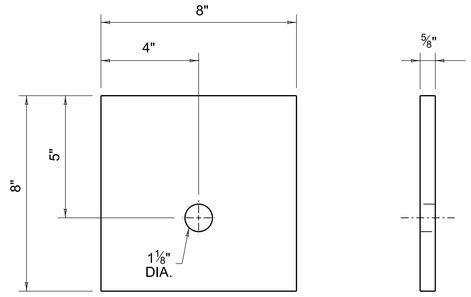


ELEVATION VIEW



PROFILE VIEW

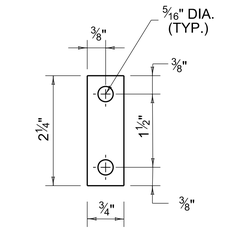
NOSE CABLE ANCHOR BRACKET (R1)



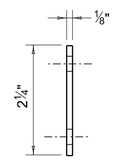
ELEVATION VIEW

PROFILE VIEW

BCT BEARING PLATE (A3)

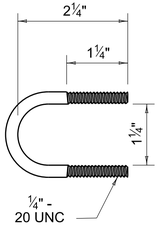


ELEVATION VIEW



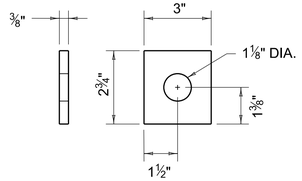
PROFILE VIEW

U - BOLT PLATE WASHER (T2)

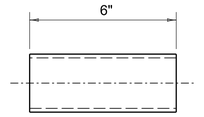


U - BOLT (T1)

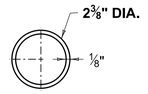
U - BOLT NUT (T3)



ANCHOR BRACKET END PLATE (N2)



ELEVATION VIEW



PROFILE VIEW

BCT POST SLEEVE (L2)

~ NOTES ~

1000 *SEE SHEET 11 FOR PART DESCRIPTIONS.*

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BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

STEEL THRIE-BEAM BULLNOSE TERMINAL

SHEET 010: ASSEMBLY DETAILS

STANDARD DRAWING NUMBER
RBE-210

THRIE-BEAM BULLNOSE TERMINAL MATERIALS LIST

Part Number	Quantity	Description	Hardware Guide[1]	Material Descriptions[2,3]
A1	2	LONG FOUNDATION TUBE	PTE07	ASTM A500 GRADE B OR ASTM A501
A2	2	FOUNDATION TUBE	PTE06	ASTM A500 GRADE B OR ASTM A501
A3	2	BCT BEARING PLATE	FPB01	ASTM A36 MIN. STRENGTH 36 KSI. SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
B1	12	LOWER SHEAR PLATE	PTE08	ASTM A36 MIN. STRENGTH 36 KSI. SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
B2	12	FOUNDATION TUBE	PTE08	ASTM A500 GRADE B OR ASTM A501
C1	12	UPPER SHEAR PLATE	PWE11	ASTM A36 MIN. STRENGTH 36 KSI. SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
C2	12	STEEL POST	PWE11	W 6X9 OR W 6X8.5 STEEL POST / ASTM A36 MIN. STRENGTH 36 KSI
D1	20	BLOCKOUT FOR STEEL POST - WOOD	PDB09	SYP GRADE NO. 1 OR BETTER / SEE SPEC. SECTION 814.04.02 FOR TIMBER USE
D2	12	TAPERED BLOCKOUT FOR STEEL POST - WOOD	PDB20	SYP GRADE NO. 1 OR BETTER / SEE SPEC. SECTION 814.04.02 FOR TIMBER USE
D3	2	TAPERED BLOCKOUT FOR BCT POST - WOOD	PDB12	SYP GRADE NO. 1 OR BETTER / SEE SPEC. SECTION 814.04.02 FOR TIMBER USE
E1	1	SLOTTED THRIE BEAM RAIL - SHOP BENT AND PUNCHED	RTM07a	12 GUAGE / CURVE GUADRAIL IN SHOP / MARK THE RADIUS OF CURVATURE ON EACH OF THE CURVED ELEMENTS
E2	2	SLOTTED THRIE BEAM RAIL - SHOP BENT AND PUNCHED	RTM07d	12 GUAGE / CURVE GUARDRAIL IN SHOP / MARK THE RADIUS OF CURVATURE ON EACH OF THE CURVED ELEMENTS / NOTE: IN AN ASSYMETRICAL BULLNOSE, THE OPPOSING TRAFFIC SIDE E2 THRIE BEAM IS STRAIGHT AND NOT CURVED WITH A LENGTH OF 13' 6 1/2".
E3	2	SLOTTED THRIE BEAM RAIL - PUNCHED	RTM07e	12 GUAGE
E4	4	UNBENT STANDARD THRIE BEAM RAIL	RTM02a	12 GUAGE
F1	4	5/8" DIA. HEX HEAD GROUND STRUT AND YOKE BOLT - 11 UNC - 10" LONG	FBX16a	ASTM A307
F2	8	5/8" DIA. HEX HEAD GROUND STRUT AND YOKE BOLT - WASHER 1 3/4" OUTSIDE DIAMETER, 11/16" INSIDE DIAMETER, 1/8" THICK	FWC16a	ASTM F844
F3	4	5/8" DIA. HEX HEAD GROUND STRUT AND YOKE BOLT - 5/8" NUT, 9/16" THICK	FBX16a	ASTM A563, GRADE A OR BETTER
G1a	14	5/8" DIA. POST BOLT - 11 UNC - 18" LONG	FBB04	
G1b	12	5/8" DIA. POST BOLT - 11 UNC - 10" LONG	FBB03	
G2	6	POST BOLT - WASHER 1 3/4" OUTSIDE DIAMETER, 11/16" INSIDE DIAMETER, 1/8" THICK	FWC16a	ASTM F844
G3	26	POST BOLT - 5/8" NUT, 9/16" THICK	FBB03/ FBB04	ASTM A563, GRADE A OR BETTER
H1	4	7/8" DIA. HEX HEAD SOIL TUBE BOLT - 9 UNC - 8" LONG	NA	ASTM A307 / AASHTO M232 CLASS C
H2	8	7/8" DIA. HEX HEAD SOIL TUBE BOLT - WASHER 2 1/4" OUTSIDE DIAMETER, 15/16" INSIDE DIAMETER, 3/16" THICK	NA	ASTM F844 / AASHTO M232 CLASS C
H3	4	7/8" DIA. HEX HEAD SOIL TUBE BOLT - 7/8" NUT, 3/4" THICK	NA	ASTM A563, GRADE A OR BETTER / AASHTO M232 C
J1	38	16D DOUBLE HEAD NAIL	NA	AASHTO M232 CLASS D
L1	4	BCT TIMBER POST	PDF04	SYP GRADE NO. 1 OR BETTER / NO KNOTS +/- 18" FROM GROUND ON TENSION FACE / SEE SPEC. SECTION 814.04.02 FOR TIMBER USE
L2	2	BCT POST SLEEVE	FMM02	

Part Number	Quantity	Description	Hardware Guide[1]	Material Descriptions[2,3]
M1	8	W6X8.5 OR W6X9 STEEL POST	NA	W 6X9 OR W 6X8.5 STEEL POST / ASTM A36 MIN. STRENGTH 36 KSI
N1	2	ANCHOR BRACKET ASSEMBLY	FPA01	ASTM A36 MIN. STRENGTH 36 KSI. SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
N2	2	ANCHOR BRACKET END PLATE	FPA01	ASTM A36 MIN. STRENGTH 36 KSI. SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
P1	16	5/8" DIA. HEX HEAD ANCHOR BRACKET BOLT - 11 UNC - 1 1/2" LONG	FBX16a	ASTM A307
P2	32	5/8" DIA. HEX HEAD ANCHOR BRACKET BOLT - WASHER, 1 3/4" OUTSIDE DIAMETER, 11/16" INSIDE DIAMETER, 1/8" THICK	FWC16a	ASTM F844
P3	16	5/8" DIA. HEX HEAD ANCHOR BRACKET BOLT - 5/8" NUT, 9/16" THICK	FBX16a	ASTM A563, GRADE A OR BETTER
Q1	3	5/8" DIA. NOSE CABLE 6X19 XIPS IWRC	RCM02	AASHTO M30 CLASS A COATING / NOMINAL BREAKING STRENGTH OF 41.2 KIPS
Q2	6	NOSE CABLE - SWAGE BUTTON	RCM02	COLD TUFF BUTTON, S-409 SIZE NO. 12 SB STOCK NUMBER 1040395 FOR 5/8" DIAMETER (6X19) WIRE ROPE (OR ANY SIMILARLY SIZED SWAGE-GRIP BUTTON FERRULES) / AASHTO M30 CLASS A COATING
R1	6	NOSE CABLE ANCHOR BRACKET	FPA04	ASTM A36 MIN. STRENGTH 36 KSI. SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
S1	120	5/8" DIA. SPLICE BOLT - 11 UNC - 1 1/4" LONG	FBB01	
S2	120	5/8" DIA. SPLICE BOLT - 5/8" NUT, 9/16" THICK	FBB01	ASTM A563, GRADE A OR BETTER
T1	9	1/4" DIA. NOSE CABLE U BOLT - 20 UNC	NA	ASTM A307 / AASHTO M232 CLASS C
T2	9	1/4" DIA. NOSE CABLE U-BOLT - PLATE WASHER, 1/8" THICK	NA	ASTM A1011 TYPE SS GRADE 36 / AASHTO M232 CLASS C
T3	18	1/4" DIA. NOSE CABLE U-BOLT -1/4" NUT, 1/4" THICK	NA	ASTM A563, GRADE A OR BETTER / AASHTO M232 CLASS C
U1	48	SLIP POST ASSEMBLY - BREAKAWAY 7/16" DIA. HEX HEAD BOLT - 14 UNC - 2 1/2" LONG	FBX12b	ASTM A449 OR SAE J429 GRADE 5
U2	192	SLIP POST ASSEMBLY - BREAKAWAY 7/16" DIA. HEX HEAD BOLT - WASHER, 1 1/4" OUTSIDE DIAMETER, 1/2" INSIDE DIAMETER, 3/32" THICK	FWC12a	ASTM F844
U3	48	SLIP POST ASSEMBLY - BREAKAWAY 7/16" DIA. HEX HEAD BOLT - 7/16" NUT, 1/2" THICK	FBX12b	ASTM A563DH OR SAE J995 GRADE 5
V1	2	3/4" DIA. BCT CABLE	FCA01	
V2	4	ANCHOR CABLE-SWAGE FITTING, 1 1/4" DIAMTER	FCA01	FITTING ASTM A576 GRADE 1035 / STUD ASTM F568 CLASS C
V3	4	1" DIA. ANCHOR CABLE-WASHER	FWC24a	ASTM F844
V4	4	1" DIA. ANCHOR CABLE-NUT	FNX24a	ASTM A563, GRADE A OR BETTER
W1	3	REFLECTOR	NA	SEE SPEC. SECTION 838 AND KYTC LIST OF APPROVED MATERIALS

[1] The Hardware Guide number is referenced in the *Task Force 13 Guide to Standardized Roadside Hardware*, available at https://tf13.org/guides/. When AASHTO and ASTM material specifications are available for a component, they are listed in the guide.

[2] If the *Task Force 13 Guide to Standardized Roadside Hardware* does not reference the AASHTO and ASTM specifications, they are provided in the Material Descriptions column. Additional material specifications can be found in Kentucky Standard Specifications, Section 814 - Guardrail Systems.

[3] If there are discrepancies in material or dimensions between the *Task Force 13 Guide to Standardized Roadside Hardware* and this Standard Drawing set, the details in the Standard Drawing set shall take precedence.

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APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

BARRIERS

~ NOTES ~

(100) *ON THE PLAN SHEETS, THE DESIGNER MUST DOCUMENT THE APPROXIMATE STATION AND OFFSET, OR APPROXIMATE COORDINATES FOR THE CENTER OF POSTS 5A AND 5B. THESE VALUES ARE INTENDED TO SERVE AS GUIDANCE FOR CONSTRUCTION LAYOUT AND SHOULD ALLOW FOR TYPICAL CONSTRUCTION TOLERANCES. REFER TO SHEET 3 FOR INSTALLATION DETAILS AND BULLNOSE TERMINAL LAYOUT.*

(101) *U-BOLT CABLE CLIPS (3 PER CABLE) SPACED OUT ON NOSE, TO HOLD CABLE TO BACKSIDE OF THE RAIL.*

(102) *NOSE CABLE WITH SWAGGED END BUTTONS.*

(103) *NOSE CABLE ANCHOR BRACKET (BACKSIDE OF SPLICE).*

(104) *THE SLACK IN THE NOSE CABLES SHALL BE EVENLY DISTRIBUTED BETWEEN THE CABLE CLIP FASTENERS AND POST NO. 1 ON EITHER SIDE OF THE NOSE.*

(105) *MODIFIED THRIE-BEAM (BULLNOSE) MINIMUM WORKING WIDTH 4' - 6". GUARDRAIL-STEEL W BEAM-S FACE MINIMUM WORKING WIDTH 5' - 0".*

GRADING INSIDE W-BEAM GUARDRAIL OR MODIFIED THRIE-BEAM (BULLNOSE) GUARDRAIL BEYOND POST 12 MAY BE ADJUSTED FOR DRAINAGE, PROVIDED THERE IS A MINIMUM OF 2' OF FILL BEHIND THE POSTS TO ENSURE ADEQUATE SUPPORT FOR THE SYSTEM.

(106) *MINIMUM WIDTH OF SYSTEM FROM POST 5 TO POST 12 IS 14' - 9¼" MEASURED FROM FACE OF GUARDRAIL TO FACE OF GUARDRAIL.*

(107) *FIXED OBJECT OR OTHER OBSTACLE.*

108 *PARTS E1 THROUGH E4 ARE THRIE-BEAM RAILS. SEE SHEET 9 FOR DETAILS.*

- E1 *SLOTTED THRIE-BEAM RAIL (POST 1B TO POST 1A)*
- E2 *SLOTTED THRIE-BEAM RAIL (POST 1 TO POST 5)*
- E3 *SLOTTED THRIE-BEAM RAIL (POST 5 TO POST 8)*
- E4 *UNBENT STANDARD THRIE-BEAM RAIL (POST 8 TO POST 12 AND BEYOND POST 12 WHEN MODIFIED THRIE-BEAM (BULLNOSE) USED)*

(109) *BEYOND POST 12, EITHER MODIFIED THRIE-BEAM (BULLNOSE) OR W-BEAM GUARDRAIL MAY BE CONSTRUCTED. BOTH OPTIONS ARE PAID PER LINEAR FOOT. INDICATE THE SELECTED TYPE IN THE ROADWAY PLANS.*

(110) *MODIFIED THRIE-BEAM (BULLNOSE) IS SHOWN IN PLAN VIEW - TYPICAL BULLNOSE LAYOUT. TRANSITIONING TO W-BEAM GUARDRAIL WILL HAVE A DIFFERENT LAYOUT. SEE SHEET 4 DETAIL B.*

111 *SEE SHEET 6 FOR DETAILS ON THE INSTALLATION OF DELINEATOR REFLECTORS.*

112 *SEE SHEET 5 FOR MEDIAN GRADING.*

113 *THRIE-BEAM RAILS MAY NEED TO BE FIELD BENT TO FIT THE LOCATION.*

114 *IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 1/2". MINIMUM DIAMETER OF THE ROCK REMOVAL IS 12" DIAMETER. BACKFILL WITH CUTTING SPOILS, PLACING GRANULAR MATERIAL, OR SMALL ROCK (#9 OR #57 STONE) IN THE BOTTOM 2 1/2" FOR DRAINAGE. THE REMOVAL OF ROCK AND BACKFILL MATERIAL IS INCIDENTAL.*

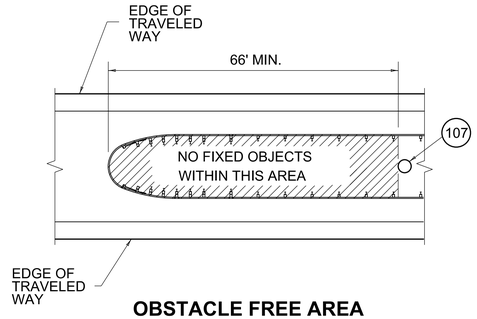
BID ITEMS AND UNIT TO BID

THRIE-BEAM BULLNOSE TERMINAL	*EACH*

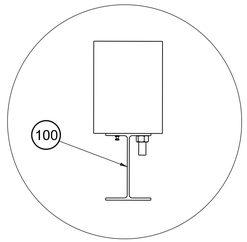
BID ITEMS AS APPLICABLE

GUARDRAIL-STEEL W BEAM-S FACE	*LF*
MODIFIED THRIE-BEAM (BULLNOSE)	*LF*
THRIE BEAM TO W BEAM CONNECTOR	*EACH*

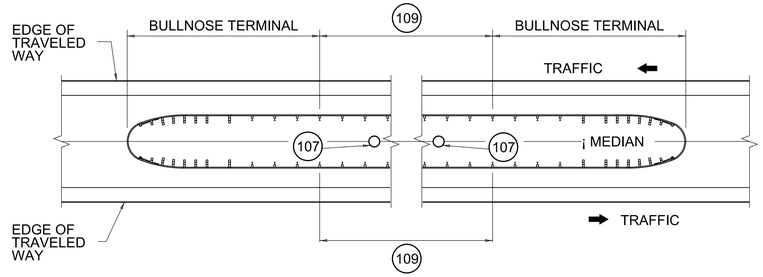
LAPPING DETAIL



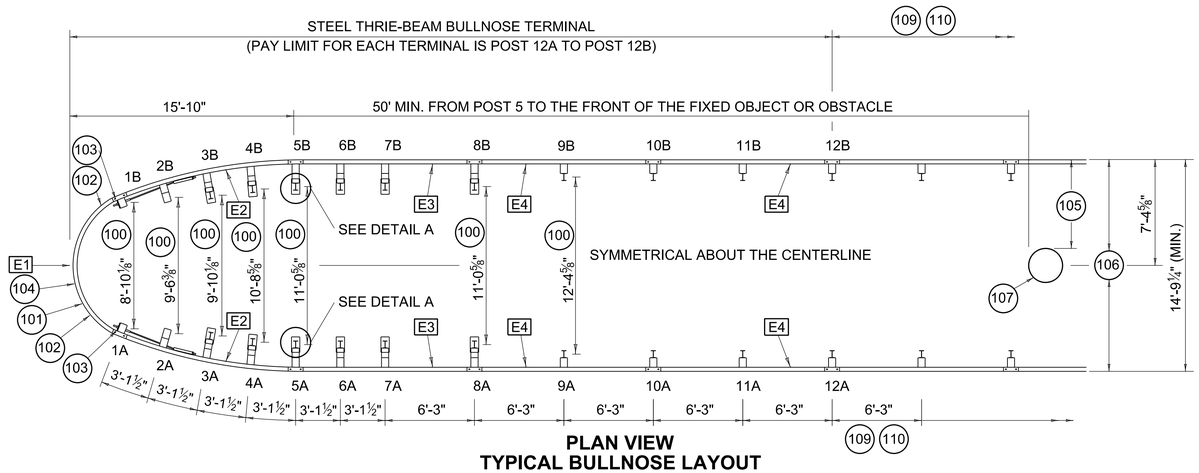
OBSTACLE FREE AREA INSIDE BULLNOSE



DETAIL A



MEDIAN FIXED OBJECT SHIELDING PAY LIMITS



PLAN VIEW
TYPICAL BULLNOSE LAYOUT

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025
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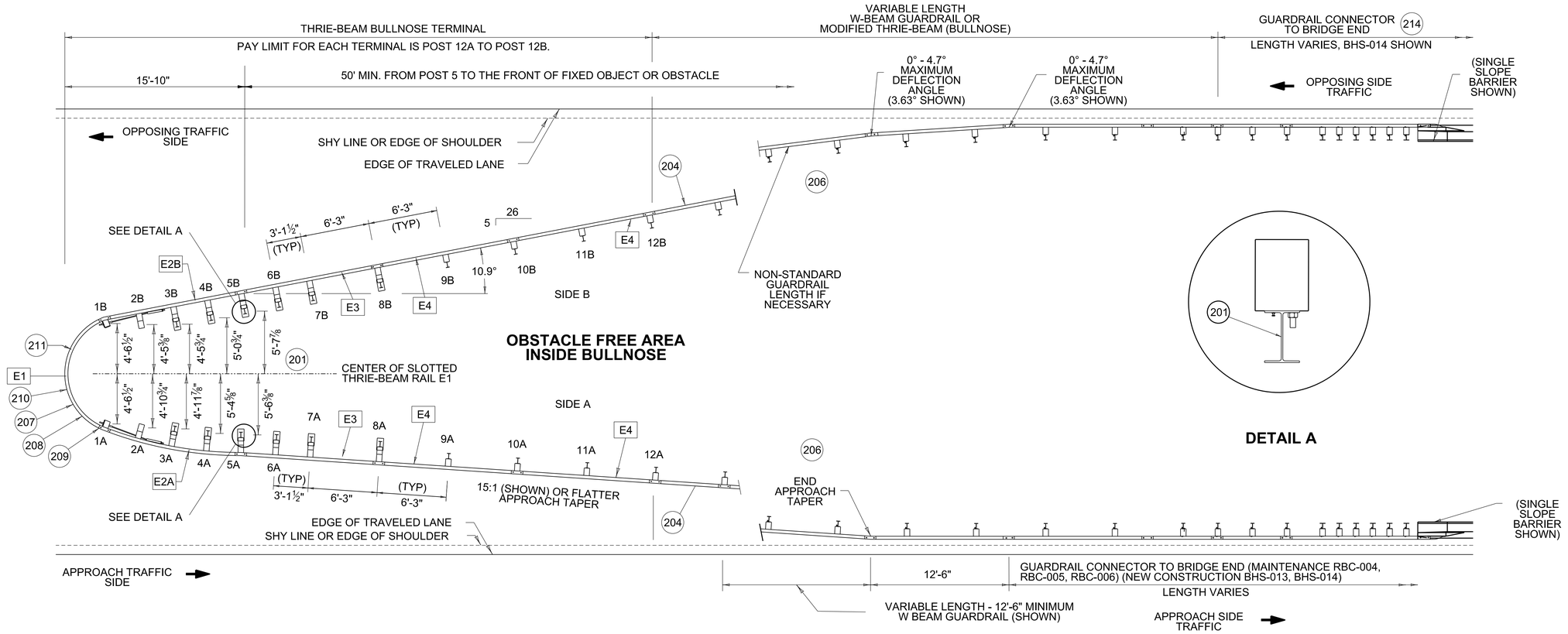
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

STEEL THRIE-BEAM BULLNOSE TERMINAL

SHEET 001: SYMMETRICAL BULLNOSE

STANDARD DRAWING NUMBER
RBE-210



TYPICAL LAYOUT FOR ASYMMETRICAL BULLNOSE FOR SYSTEM WIDTHS GREATER THAN 24'

~ NOTES ~

(201) *DIMENSIONS ARE MEASURED FROM THE CENTER OF SLOTTED THRIE-BEAM RAIL E1 TO THE CENTER OF EACH GUARDRAIL POST.*

ON THE PLAN SHEETS, THE DESIGNER MUST DOCUMENT THE APPROXIMATE STATION AND OFFSET, OR APPROXIMATE COORDINATES FOR THE CENTER OF POSTS 5A AND 5B. THESE VALUES ARE INTENDED TO SERVE AS GUIDANCE FOR CONSTRUCTION LAYOUT AND SHOULD ALLOW FOR TYPICAL CONSTRUCTION TOLERANCES. REFER TO SHEET 3 FOR INSTALLATION DETAILS AND BULLNOSE TERMINAL LAYOUT.

202 *SAW, DRILL, OR PUNCH THE RAIL AS REQUIRED. DO NOT TORCH-CUT. REPAIR GALVANIZED COATINGS IN ACCORDANCE WITH ASTM A780 (THIS IS INCIDENTAL). SPACING BETWEEN INDIVIDUAL POSTS FROM POST 1 TO POST 7 IS 3'-1½"*

203 *PARTS E1 THROUGH E4 ARE THRIE-BEAM RAILS. SEE SHEET 9 FOR DETAILS.*

- E1 *SLOTTED THRIE-BEAM RAIL (POST 1B TO POST 1A)*
- E2 *SLOTTED THRIE-BEAM RAIL (POST 1 TO POST 5) WITH A RADIAL OPTION ON THE APPROACH SIDE AND A TANGENT OPTION ON THE OPPOSING SIDE.*
- E3 *SLOTTED THRIE-BEAM RAIL (POST 5 TO POST 8)*
- E4 *UNBENT STANDARD THRIE-BEAM RAIL (POST 8 TO POST 12, AND BEYOND POST 12 WHEN MODIFIED THRIE-BEAM (BULLNOSE) USED)*

(204) *BEYOND POST 12, EITHER MODIFIED THRIE-BEAM (BULLNOSE) OR W-BEAM GUARDRAIL MAY BE CONSTRUCTED. BOTH OPTIONS ARE PAID PER LINEAR FOOT. INDICATE THE SELECTED TYPE IN THE ROADWAY PLANS.*

FOR WIDER MEDIANS, TAPER THE OPPOSING TRAFFIC SIDE BEFORE TAPERING THE APPROACH TRAFFIC SIDE, AS SHOWN.

EXTEND THE RAIL BEYOND POST 12 AT A TAPER RATE OF 15:1 OR FLATTER ON THE APPROACH SIDE, AND UP TO A MAXIMUM TAPER RATE OF 26:5 ON THE OPPOSING TRAFFIC SIDE, AS NEEDED. THE LENGTH OF EXTENSION WILL VARY BASED ON MEDIAN WIDTH OR WORKING WIDTH REQUIREMENTS.

205 *SEE SHEET 5 FOR MEDIAN GRADING.*

(206) *MODIFIED THRIE-BEAM (BULLNOSE) MINIMUM WORKING WIDTH 4' - 6". GUARDRAIL-STEEL W BEAM-S FACE MINIMUM WORKING WIDTH 5' - 0".*

GRADING INSIDE W-BEAM GUARDRAIL OR MODIFIED THRIE-BEAM (BULLNOSE) GUARDRAIL BEYOND POST 12 MAY BE ADJUSTED FOR DRAINAGE, PROVIDED THERE IS A MINIMUM OF 2' OF FILL BEHIND THE POSTS TO ENSURE ADEQUATE SUPPORT FOR THE SYSTEM.

(207) *U-BOLT CABLE CLIPS (3 PER CABLE) SPACED OUT ON NOSE, TO HOLD CABLE TO BACKSIDE OF THE RAIL.*

(208) *NOSE CABLE WITH SWAGGED END BUTTONS.*

(209) *NOSE CABLE ANCHOR BRACKET (BACKSIDE OF SPLICE).*

(210) *THE SLACK IN THE NOSE CABLES SHALL BE EVENLY DISTRIBUTED BETWEEN THE CABLE CLIP FASTENERS AND POST NO. 1 ON EITHER SIDE OF THE NOSE.*

(211) *BEND THE RAIL IN THE FIELD AS NEEDED TO MAKE CONNECTIONS. THE MAXIMUM DEFLECTION ANGLE IS 4.7° (3.63° SHOWN).*

212 *IF ROCK IS ENCOUNTERED, REMOVE ROCK TO FULL DEPTH OF POST PLUS 2 1/2". MINIMUM DIAMETER OF THE ROCK REMOVAL IS 12" DIAMETER. BACKFILL WITH CUTTING SPOILS, PLACING GRANULAR MATERIAL, OR SMALL ROCK (#9 OR #57 STONE) IN THE BOTTOM 2 1/2" FOR DRAINAGE. THE REMOVAL OF ROCK AND BACKFILL MATERIAL IS INCIDENTAL.*

213 *SEE SHEET 6 FOR DETAILS ON THE INSTALLATION OF DELINEATOR REFLECTORS.*

(214) *GUARDRAIL CONNECTOR TO BRIDGE END. FOR NEW CONSTRUCTION USE BHS-013 OR BHS-014. FOR MAINTENANCE ONLY RBC-004, RBC-005, RBC-006.*

BID ITEM AND UNIT TO BID

THRIE-BEAM BULLNOSE TERMINAL	*EACH*

BID ITEMS AS APPLICABLE

MODIFIED THRIE-BEAM (BULLNOSE)	*LF*
GUARDRAIL-STEEL W BEAM-S FACE	*LF*
THRIE BEAM TO W BEAM CONNECTOR	*EACH*
THRIE-BEAM GUARDRAIL TRANSITION TL-3	*EACH*
THRIE-BEAM GUARDRAIL TRANSITION TL-2	*EACH*

REVISION DATE: 08/11/2025
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SUBMITTED — DIVISION DIRECTOR — 08-11-2025 DATE

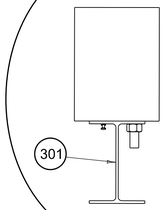
APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

BARRIERS

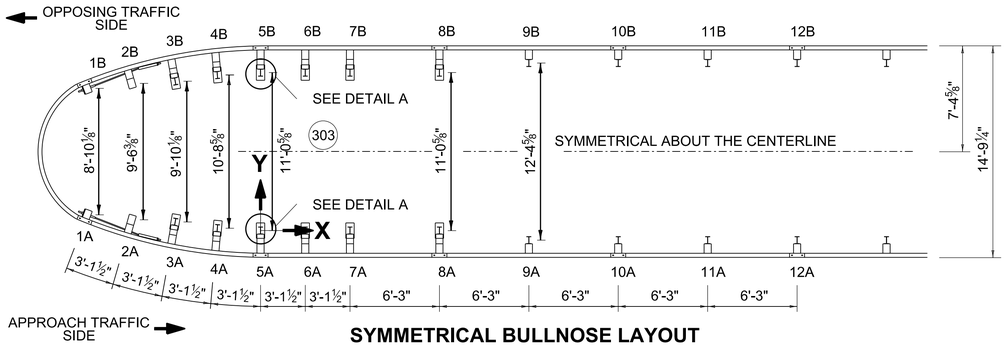
BULLNOSE TERMINAL INSTALLATION LAYOUT GUIDE

SYMMETRICAL BULLNOSE POST COORDINATES (APPROXIMATE)			
POST NUMBER	X (FT, IN)	Y (FT, IN)	ANGLE OF POST (FLANGE FACE)
12A	37' - 6"	- 0' - 8 1/8"	0
11A	31' - 3"	- 0' - 8 1/8"	0
10A	25' - 0"	- 0' - 8 1/8"	0
9A	18' - 9"	- 0' - 8 1/8"	0
8A	12' - 6"	0' - 0"	0
7A	6' - 3"	0' - 0"	0
6A	3' - 1 1/2"	0' - 0"	0
5A	0' - 0"	0' - 0"	0
4A	- 3' - 1/4"	0' - 2"	5
3A	- 5' - 11 5/8"	0' - 7 1/4"	10
2A	- 9' - 1/4"	0' - 9 "	16
1A	- 12' - 1 3/8"	1' - 1 5/8"	21
1B	- 12' - 1 3/8"	9' - 10 3/4"	21
2B	- 9' - 1/4"	10' - 3 3/8"	16
3B	- 5' - 11 5/8"	10' - 5 1/8"	10
4B	- 3' - 1/4"	10' - 10 3/8"	5
5B	0' - 0"	11' - 3/8"	0
6B	3' - 1 1/2"	11' - 3/8"	0
7B	6' - 3"	11' - 3/8"	0
8B	12' - 6"	11' - 3/8"	0
9B	18' - 9"	11' - 8 1/2"	0
10B	25' - 0"	11' - 8 1/2"	0
11B	31' - 3"	11' - 8 1/2"	0
12B	37' - 6"	11' - 8 1/2"	0

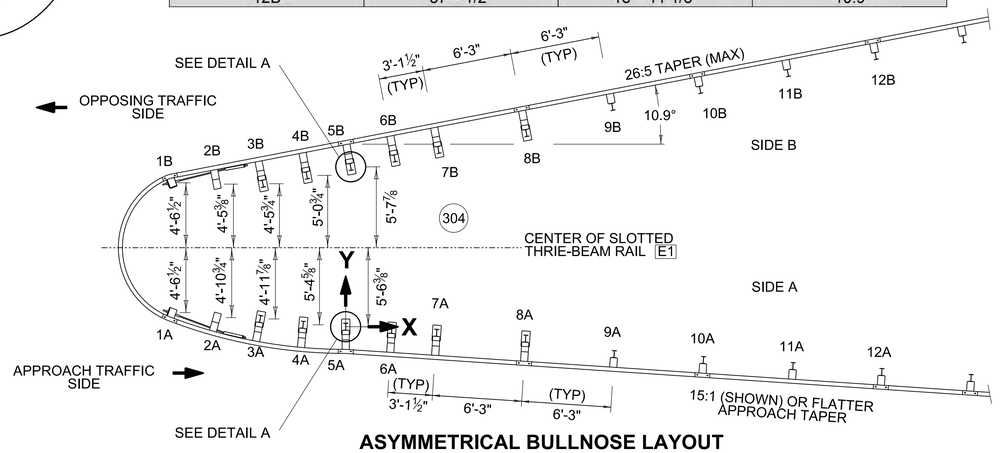
DETAIL A



ASYMMETRICAL BULLNOSE POST COORDINATES (APPROXIMATE)			
POST NUMBER	X (FT, IN)	Y (FT, IN)	ANGLE OF POST (FLANGE FACE)
12A	37' - 5 5/8"	- 3' - 2"	3.8
11A	31' - 3 1/8"	- 2' - 9"	3.8
10A	25' - 0"	- 2' -4"	3.8
9A	18' - 9 1/8"	- 1' - 11"	3.8
8A	12' - 6 7/8"	- 0' - 10"	3.8
7A	6' - 4 1/4"	- 0' - 5 1/8"	3.8
6A	3' - 2 5/8"	- 0' - 2 5/8"	3.8
5A	0' - 0"	0' - 0"	0
4A	- 2' - 11 3/4"	0' - 1 5/8"	5
3A	- 5' - 11 3/4"	0' - 6 1/2"	10
2A	- 9' - 1/4"	0' - 7 5/8"	16
1A	- 12' - 1 1/2"	0' - 11 5/8"	21
1B	- 12' - 1 1/2"	10' - 7/8"	21
2B	- 9' - 1/8"	9' - 11 5/8"	10.9
3B	- 5' - 9 1/2"	10' - 0"	10.9
4B	- 2' - 8 5/8"	10' - 7"	10.9
5B	0' - 4 1/8"	11' - 2 1/8"	10.9
6B	3' - 5"	11' - 9 1/4"	10.9
7B	6' - 5 3/4"	12' - 4 3/8"	10.9
8B	12' - 7 1/2"	13' - 6 1/2"	10.9
9B	18' - 7 5/8"	15' - 4 1/2"	10.9
10B	24' - 9 1/4"	16' - 6 3/4"	10.9
11B	30' - 10 7/8"	17' - 8 7/8"	10.9
12B	37' - 1/2"	18' - 11 1/8"	10.9



SYMMETRICAL BULLNOSE LAYOUT



ASYMMETRICAL BULLNOSE LAYOUT

~ NOTES ~

300 *ON THE PLAN SHEETS, THE DESIGNER MUST DOCUMENT THE APPROXIMATE STATION AND OFFSET, OR APPROXIMATE COORDINATES FOR THE CENTER OF POSTS 5A AND 5B. THESE VALUES ARE INTENDED TO SERVE AS GUIDANCE FOR CONSTRUCTION LAYOUT AND SHOULD ALLOW FOR TYPICAL CONSTRUCTION TOLERANCES.*

(301) *DIMENSIONS ARE MEASURED TO THE CENTER OF GUARDRAIL POSTS. REFER TO DETAIL A FOR ADDITIONAL INFORMATION. THE CONTRACTOR SHALL LAYOUT THE BULLNOSE TERMINAL IN THE FIELD USING THE STATION AND OFFSET (OR OTHER LOCATION INFORMATION) FOR POST 5A, ENSURING A MINIMUM LENGTH OF 50' FROM POST 5 TO THE FRONT OF THE FIXED OBJECT OR OBSTACLE. POST COORDINATES IN THE TABLES ABOVE MAY BE USED TO LAYOUT THE REMAINING POSTS. NORMAL CONSTRUCTION TOLERANCES APPLY.*

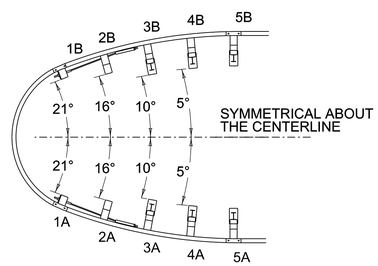
302 *TO ASSIST WITH LAYING OUT THE BULLNOSE TERMINAL, ASSEMBLE THE E1 BEAM AND E2 BEAMS (WITHOUT ATTACHING TO THE POSTS) TO SERVE AS AN ON-THE-GROUND TEMPLATE FOR THE TERMINAL SYSTEM. DURING THIS DEMONSTRATION ASSEMBLY, POST LOCATIONS MAY BE ADJUSTED TO MATCH THE LAYOUT. ERECT THE RAIL ELEMENTS TO FORM A SMOOTH, CONTINUOUS RAIL AS SHOWN IN THE PLANS AND STANDARD DRAWINGS. SET POSTS PLUMB AND ACCURATELY ALIGNED AND SPACED. KYTC WILL REVIEW THE LAYOUT PRIOR TO THE CONTRACTOR DRIVING POSTS.*

(303) *FOR THE SYMMETRIC BULLNOSE, LAYOUT AND ANGLE DIMENSIONS FOR POST 1-5 ARE MEASURED FROM THE CENTER OF THE POSTS ON SIDE A TO THE CENTER OF POSTS ON SIDE B.*

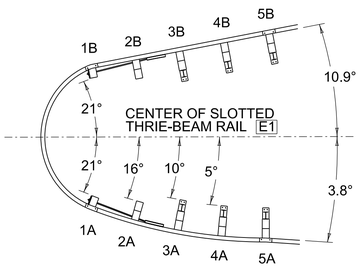
(304) *FOR THE ASYMMETRIC BULLNOSE, LAYOUT AND ANGLE DIMENSIONS FOR POST 1-5 ARE MEASURED FROM THE CENTER OF SLOTTED THRIE-BEAM RAIL E1 TO THE CENTER OF EACH GUARDRAIL POST.*

305 *POSTS LABELED AS 'A' SHALL BE ALIGNED TO THE APPROACH TRAFFIC SIDE. THE ABOVE CHARTS SHALL BE MIRRORED ACCORDINGLY IF PLACED IN A DIFFERENT ORIENTATION. THE CHART SPACING SHALL STILL APPLY.*

306 *FOR ADDITIONAL ASSEMBLY INFORMATION, SCAN THE QR CODE TO ACCESS THE MASH BULLNOSE INSTALLATION MANUAL.*



SYMMETRICAL POST ANGLE (APPROX.)



ASYMMETRICAL POST ANGLE (APPROX.)

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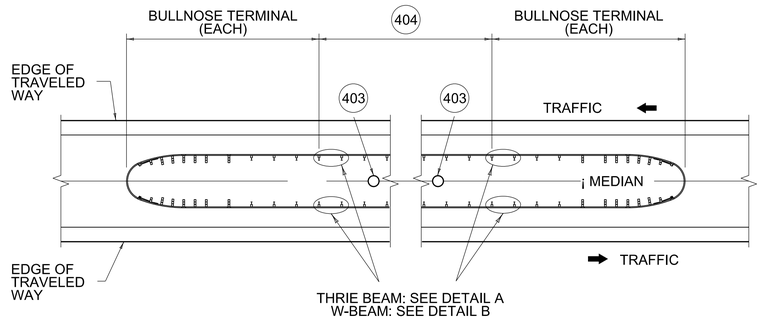
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

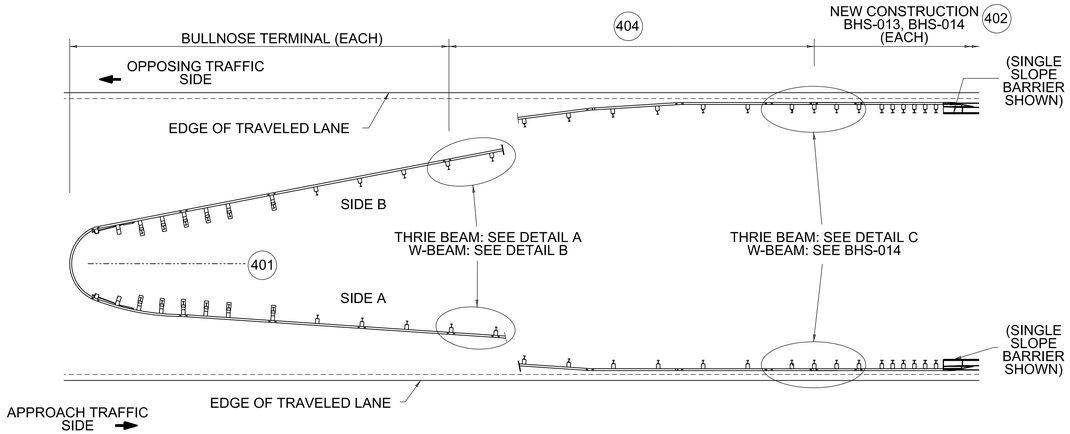
STEEL THRIE-BEAM BULLNOSE TERMINAL

SHEET 003: BULLNOSE TERMINAL INSTALLATION LAYOUT

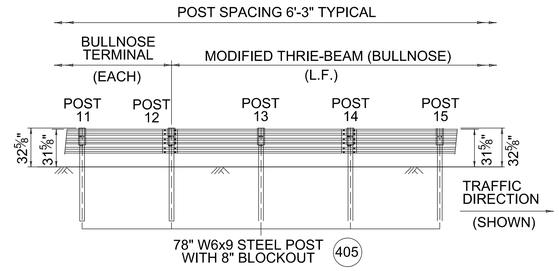
STANDARD DRAWING NUMBER
RBE-210



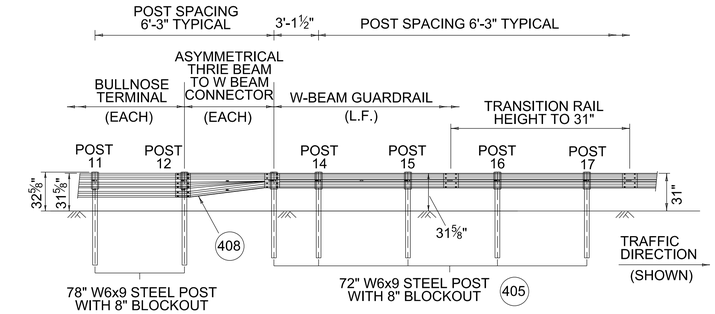
SYMMETRICAL BULLNOSE



ASYMMETRICAL BULLNOSE



DETAIL A
BULLNOSE TERMINAL TRANSITION TO MODIFIED THRIE-BEAM (BULLNOSE)



DETAIL B
BULLNOSE TERMINAL TRANSITION TO W-BEAM GUARDRAIL

~ NOTES ~

400 *SEE SHEET 5 FOR MEDIAN GRADING*

401 *SYMMETRY LINE OF SLOTTED THRIE-BEAM RAIL E1.*

402 *FOR MAINTENANCE ONLY USE RBC-004, RBC-005, RBC-006*

403 *FIXED OBJECT*

MODIFIED THRIE-BEAM (BULLNOSE) MINIMUM WORKING WIDTH 4' - 6"
GUARDRAIL-STEEL W BEAM-S FACE MINIMUM WORKING WIDTH 5' - 0"

404 *BEYOND POST 12, EITHER MODIFIED THRIE-BEAM (BULLNOSE) OR W-BEAM GUARDRAIL MAY BE CONSTRUCTED. BOTH OPTIONS ARE PAID PER LINEAR FOOT. INDICATE THE SELECTED TYPE IN THE ROADWAY PLANS.*

405 *SEE SHEET 7 FOR POST, RAIL, AND BLOCKOUT DETAILS.*

406 *CONTRARY TO BHS-013 AND BHS-014, IF MODIFIED THRIE-BEAM (BULLNOSE) IS USED TO CONNECT TO A THRIE-BEAM GUARDRAIL TRANSITION (BHS-013 OR BHS-014), THE ASYMMETRICAL THRIE BEAM TO W BEAM CONNECTOR PIECE IS REPLACED WITH A 12' - 6" LONG THRIE-BEAM RAIL WITH POST SPACING AS SHOWN IN DETAIL C. 6" X 8" X 18" BLOCKOUTS (SEE BHS-013 AND BHS-014 FOR DETAILS) ARE TO BE USED IN THIS SECTION OF THRIE BEAM. BEYOND THIS, STANDARD BLOCKOUTS FOR GUARDRAIL THRIE BEAM (BULLNOSE) IS USED.*

407 *EXTEND STANDARD HEADER CURB OR STANDARD HEADER CURB AND GUTTER TO THE END OF THE SECOND THRIE-BEAM PIECE FROM THE BRIDGE END. TAPER DOWN TO 4" IN HEIGHT OVER THE LAST 3' - 1 ½".*

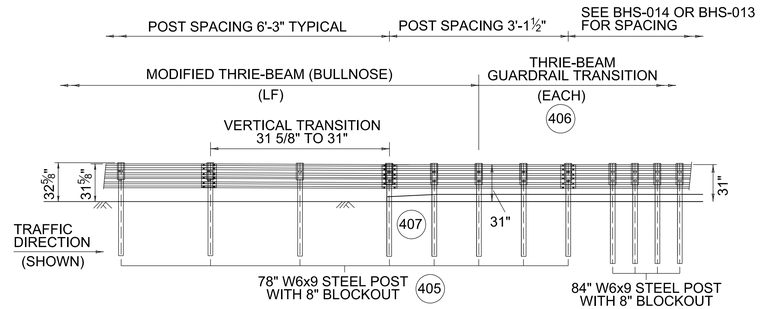
408 *THRIE BEAM TO W BEAM CONNECTOR PAID AS EACH. USE 10 GAUGE STEEL. SEE HARDWARE GUIDE DRAWING RWT02 FOR ADDITIONAL DETAILS.*

BID ITEM AND UNIT TO BID

THRIE-BEAM BULLNOSE TERMINAL	*EACH*

BID ITEMS AS APPLICABLE

MODIFIED THRIE-BEAM (BULLNOSE)	*LF*
GUARDRAIL-STEEL W BEAM-S FACE	*LF*
THRIE BEAM TO W BEAM CONNECTOR	*EACH*
THRIE-BEAM GUARDRAIL TRANSITION TL-3	*EACH*
THRIE-BEAM GUARDRAIL TRANSITION TL-2	*EACH*



DETAIL C
MODIFIED THRIE-BEAM (BULLNOSE) TO THRIE-BEAM TRANSITION (BHS-014 SHOWN)

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SUBMITTED — DIVISION DIRECTOR — 08-11-2025 DATE

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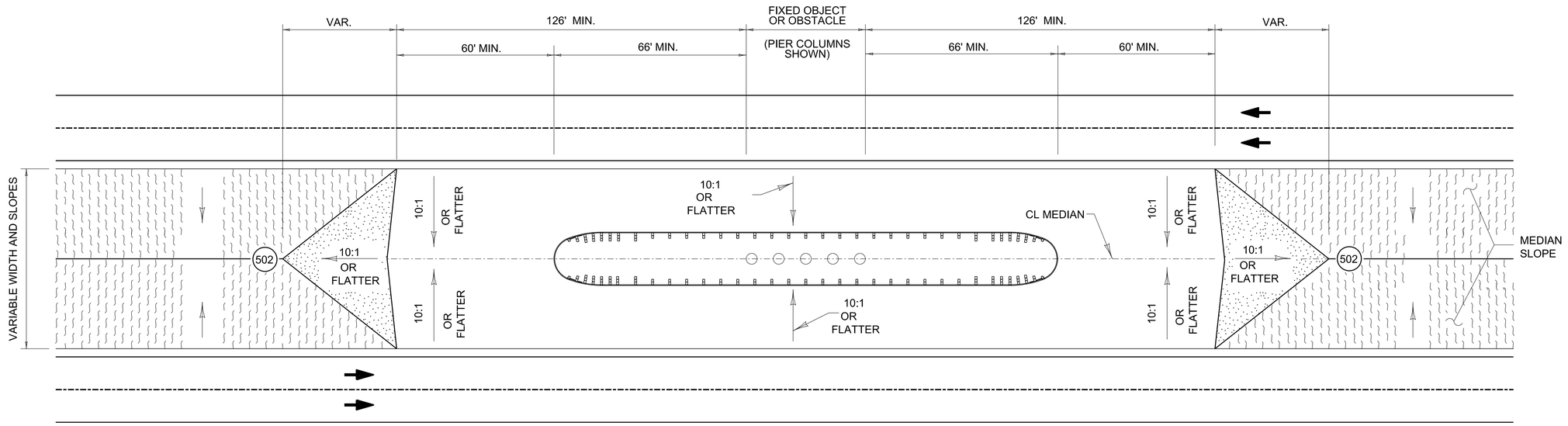
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

STEEL THRIE-BEAM BULLNOSE TERMINAL

SHEET 004: BULLNOSE TRANSITIONS

STANDARD DRAWING NUMBER
RBE-210



GRADING AT BULLNOSE

~ NOTES ~

(500) *MODIFIED THRIE-BEAM (BULLNOSE) MINIMUM WORKING WIDTH 4' - 6". GUARDRAIL-STEEL W BEAM-S FACE MINIMUM WORKING WIDTH 5' - 0".*

GRADING FROM POST 1 TO POST 12 AND THE 60' LEADING OR TRAILING THE THRIE-BEAM TERMINAL SHALL BE 10:1 OR FLATTER.

GRADING BEYOND POST 12 MAY BE ADJUSTED FOR DRAINAGE, PROVIDED THERE IS A MINIMUM OF 2' OF FILL BEHIND THE POSTS TO ENSURE ADEQUATE SUPPORT FOR THE SYSTEM.

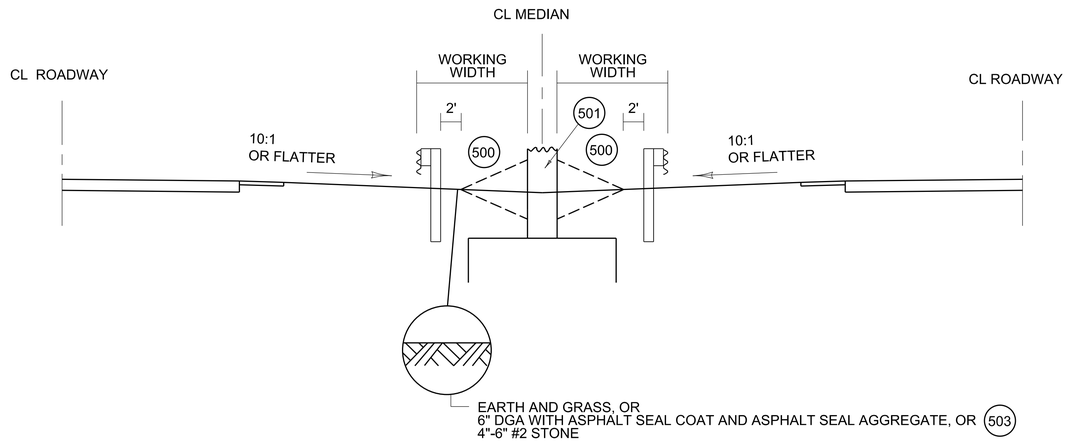
(501) *FIXED OBJECT OR OTHER OBSTACLE.*

(502) *EVALUATE MEDIAN DRAINAGE AND ENSURE POSITIVE FLOW. INCLUDE A DROP BOX INLET AND PIPING AS NEEDED, AND ENSURE THAT ALL NECESSARY BID ITEMS ARE INCLUDED.*

(503) *AT THE DISCRETION OF THE ENGINEER, MATERIAL CAN BE ANY OF THE FOLLOWING:*
EARTH AND GRASS, OR
6" DGA WITH ASPHALT SEAL COAT AND ASPHALT SEAL AGGREGATE, OR
4"-6" #2 STONE

504 *WHILE MEDIAN GRADING DETAIL DEPICTS SYMMETRICAL THRIE-BEAM BULLNOSE TERMINAL, ALL GRADING REQUIREMENTS APPLY TO ASYMMETRICAL THRIE-BEAM BULLNOSE TERMINALS ALSO.*

505 *GRADING QUANTITIES MUST BE CALCULATED AND SHOWN AS BID ITEMS.*



CROSS SECTION AT FIXED OBJECT

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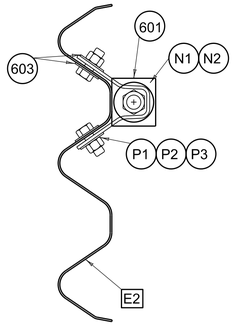
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

STEEL THRIE-BEAM BULLNOSE TERMINAL

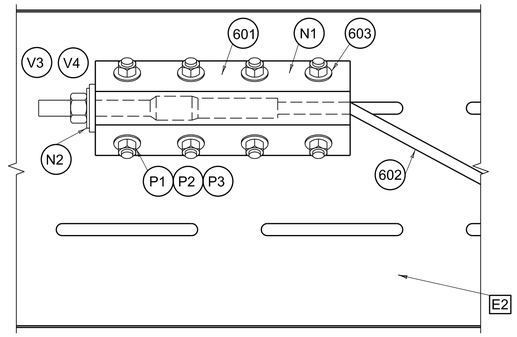
SHEET 005: GRADING AT BULLNOSE

STANDARD DRAWING NUMBER
RBE-210

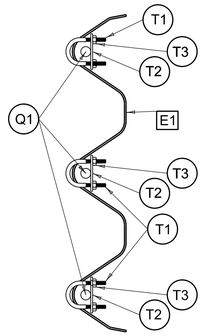


PROFILE VIEW

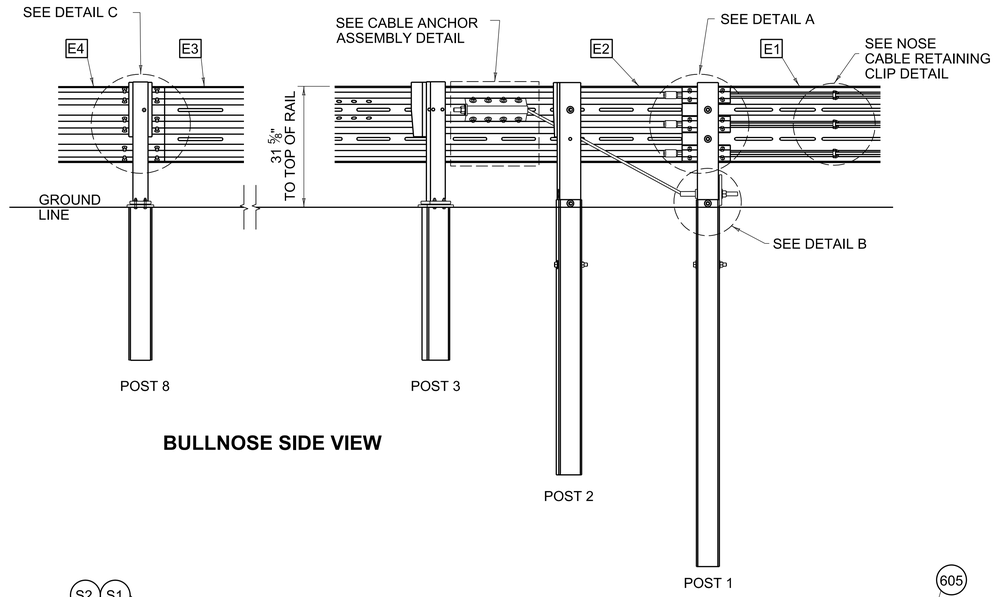
CABLE ANCHOR
ASSEMBLY CONNECTION



CABLE ANCHOR ASSEMBLY



NOSE CABLE RETAINING CLIP



BULLNOSE SIDE VIEW

~ NOTES ~

600 *SEE SHEET 10 FOR PART DESCRIPTIONS.*

(601) *SEE ANCHOR BRACKET ASSEMBLY DETAIL ON SHEET 10.*

(602) *SEE ANCHOR CABLE ASSEMBLY DETAIL ON SHEET 10.*

(603) *ONE WASHER BETWEEN BOLT HEAD AND RAIL AND BETWEEN NUT AND ANCHOR BRACKET ASSEMBLY.*

(604) *ONE WASHER BETWEEN BOLT HEAD AND FOUNDATION TUBE AND BETWEEN NUT AND FOUNDATION TUBE.*

(605) *BEND TWO NAILS OVER THE BEARING PLATE TO PREVENT ROTATION.*

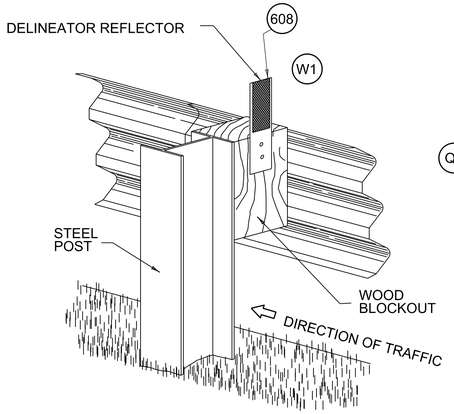
606 *NO MATERIAL IS TO BE PLACED AGAINST THE VERTICAL FACES OF BEARING PLATE.*

607 *PREVENT OR REMOVE MATERIALS THAT BLOCK ACCESS TO BOLTS FOR POST ASSEMBLIES.*

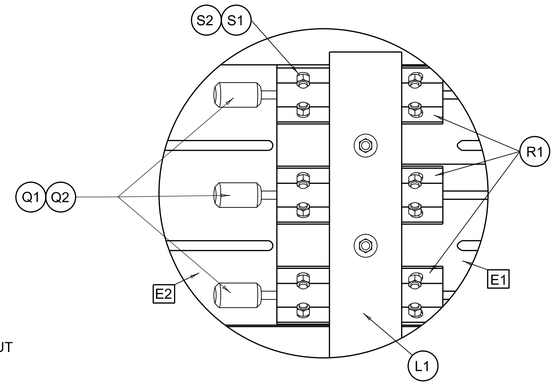
(608) *THE COLOR OF DELINEATORS MUST MATCH THE COLOR OF THE EDGELINE THEY SUPPLEMENT.*

609 *DELINEATOR SPACING SHOULD BE 100' WITH A MINIMUM OF 3 REFLECTORS. THE FIRST DELINEATOR SHOULD BE PLACED ON POST 3, ON THE ADJACENT TRAFFIC SIDE OF THE BULLNOSE.*

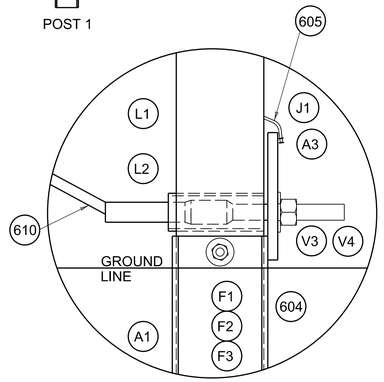
(610) *ANCHOR CABLE ASSEMBLY INCLUDES PARTS V1, V2, V3, AND V4.*



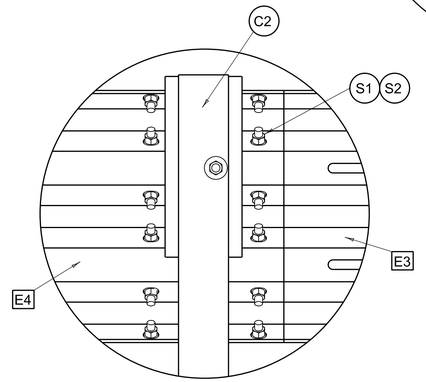
ONE-SIDED REFLECTOR DETAIL AND TYPICAL INSTALLATION



DETAIL A



DETAIL B



DETAIL C
THRIE-BEAM SPLICE

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 08-11-2025 DATE

APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

BARRIERS

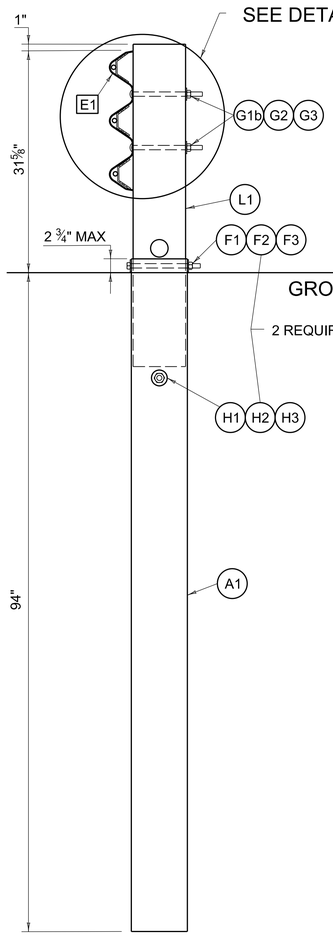
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

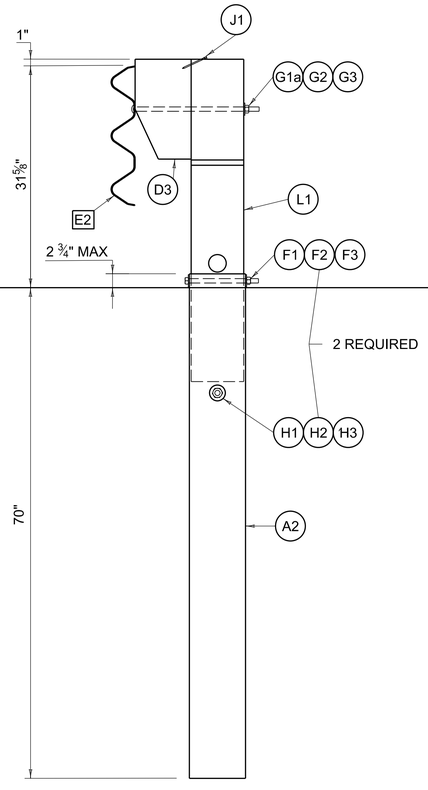
STEEL THRIE-BEAM BULLNOSE TERMINAL

SHEET 006: NOSE AND ANCHOR DETAILS

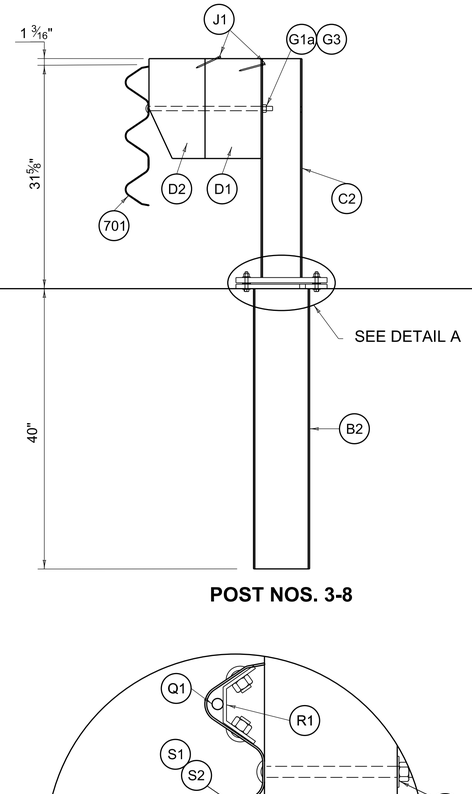
STANDARD DRAWING NUMBER
RBE-210



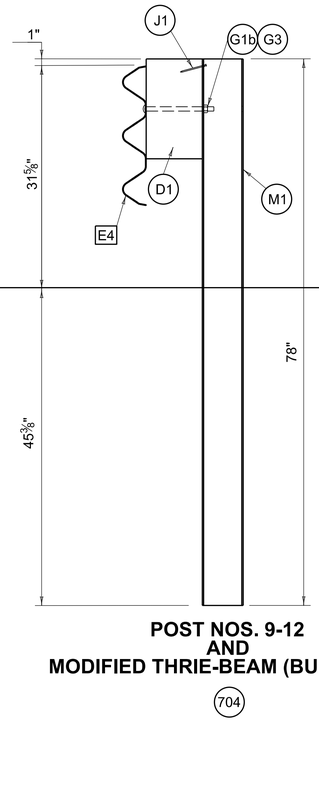
POST NO. 1



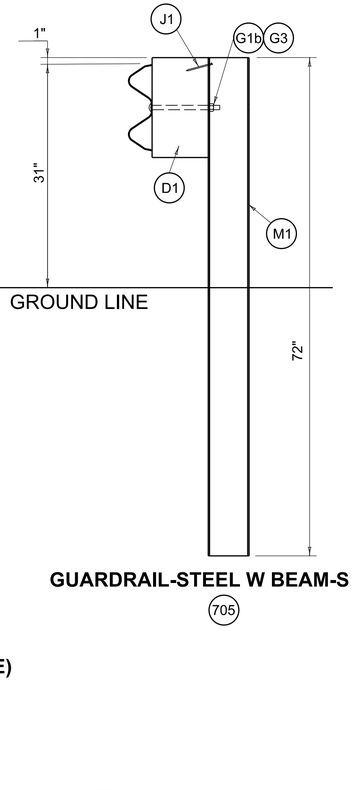
POST NO. 2



POST NOS. 3-8

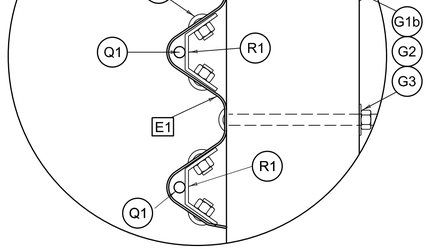


POST NOS. 9-12
AND
MODIFIED THRIE-BEAM (BULLNOSE)
(704)

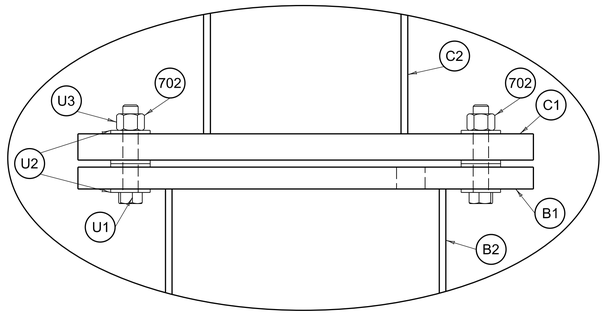


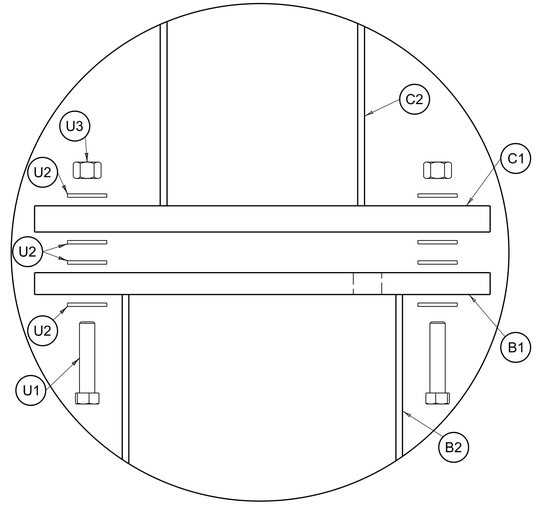
GUARDRAIL-STEEL W BEAM-S FACE
(705)

DETAIL B



DETAIL A





EXPLODED VIEW
DETAIL A

~ NOTES ~

700 *SEE SHEET 10 FOR PART DESCRIPTIONS.*

(701) *RAIL CAN BE [E2] OR [E3] DEPENDING ON POST LOCATION.*

(702) *TORQUE BOLT BETWEEN 60-75 FT-LB*

703 *SEE SHEET 4 FOR BULLNOSE TRANSITIONS. BEYOND POST 12 EITHER MODIFIED THRIE-BEAM (BULLNOSE) OR W-BEAM GUARDRAIL MAY BE CONSTRUCTED. BOTH OPTIONS PAID FOR AS LINEAR FOOT. INDICATE THE TYPE SELECTED IN THE ROADWAY PLANS.*

(704) *IF THE MODIFIED THRIE-BEAM (BULLNOSE) OPTION IS INSTALLED BEYOND POST 12, MATCH THE CONFIGURATION, SPACING, AND COMPONENTS USED BETWEEN POSTS 9 AND 12.*

(705) *BEYOND POST 12, IF W-BEAM GUARDRAIL IS SELECTED, TRANSITION THE RAIL BETWEEN POST 12 AND POST 13 USING A THRIE BEAM TO W BEAM CONNECTOR, FOLLOWED BY A STANDARD POST AND BLOCK SPACED AT 3' - 1½". CONTINUE THE BARRIER SYSTEM WITH STANDARD 6' - 3" POST SPACING, AND TRANSITION THE BULLNOSE RAIL HEIGHT TO 31" OVER A 12' -6" BEAM LENGTH. SEE SHEET 4 FOR W-BEAM TRANSITION DETAILS.*

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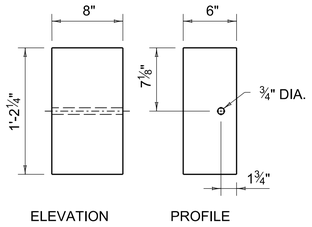
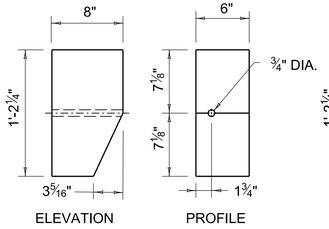
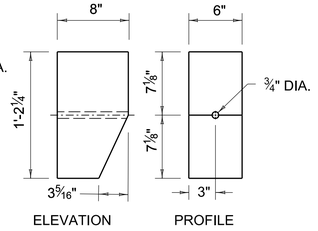
BARRIERS



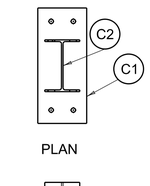
BLOCKOUT (D1)

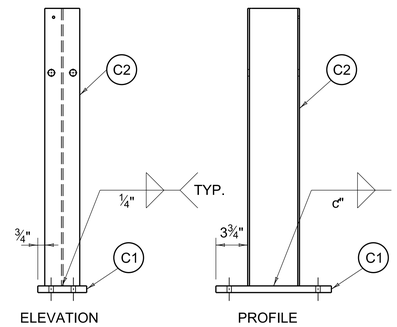


BLOCKOUT (D2)

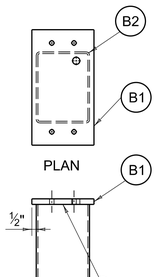


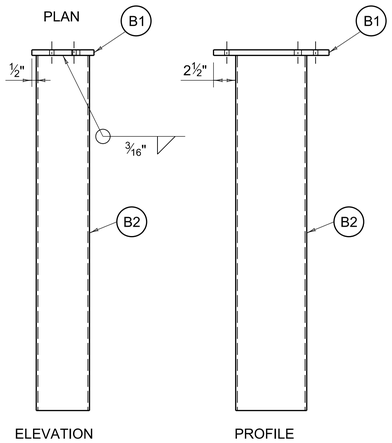
BLOCKOUT (D3)



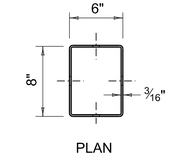


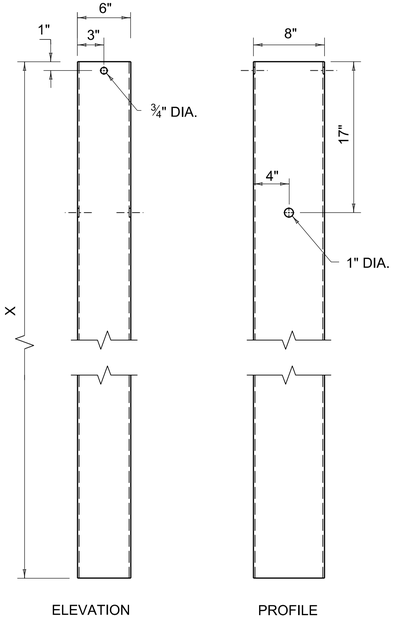
UPPER POST ASSEMBLY





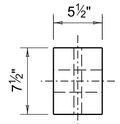
LOWER POST ASSEMBLY

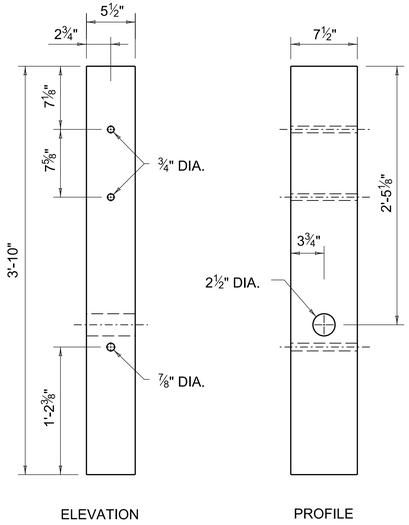




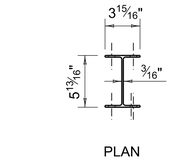
FOUNDATION TUBE (A1, A2, & B2)

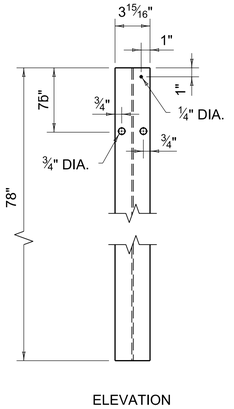
PART	LENGTH "X"
A1	96"
A2	72"
B2	40"



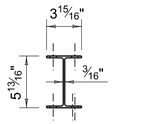


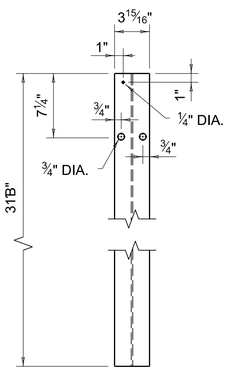
BCT TIMBER POST (L1)



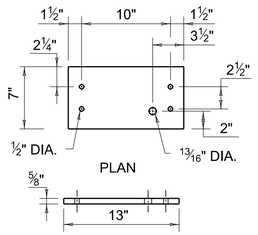


STEEL POST (M1)

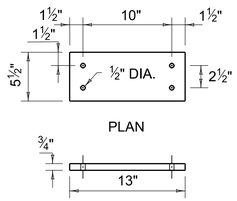




STEEL POST (C2)



LOWER SHEAR PLATE (B1)



UPPER SHEAR PLATE (C1)

~ NOTES ~

800 *SEE SHEET 10 FOR PART DESCRIPTIONS.*

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BARRIERS

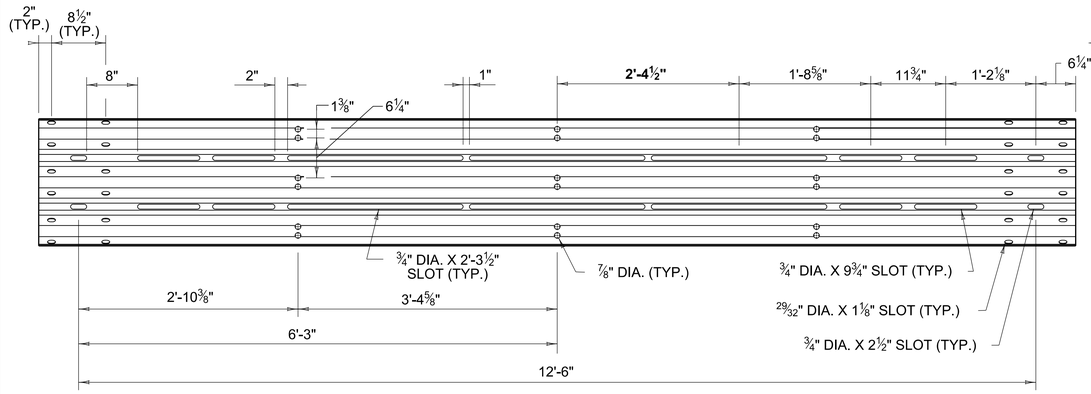
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

STEEL THRIE-BEAM BULLNOSE TERMINAL

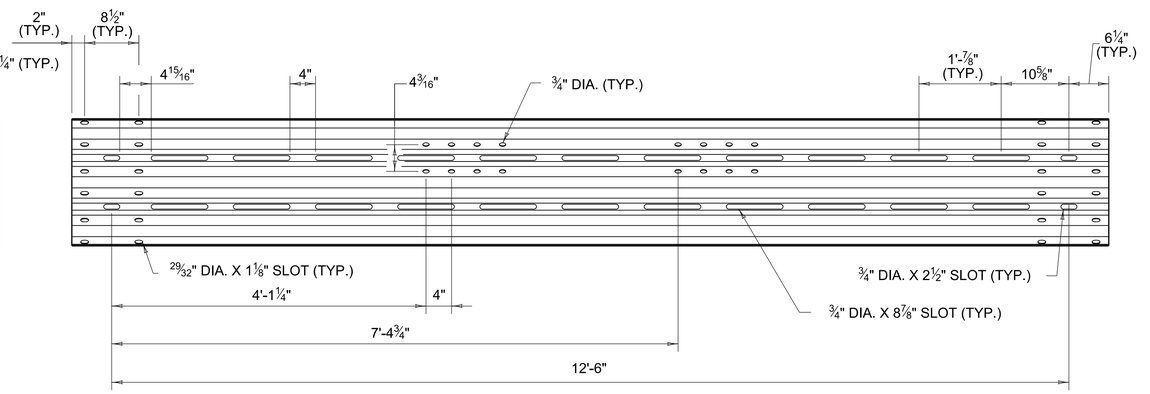
SHEET 008: POST, BLOCK, AND HARDWARE DETAILS

STANDARD DRAWING NUMBER
RBE-210



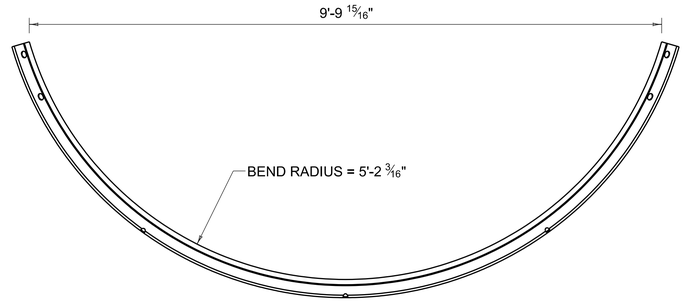
ELEVATION VIEW NON-RADIUSED

SLOTTED THRIE-BEAM RAIL E1



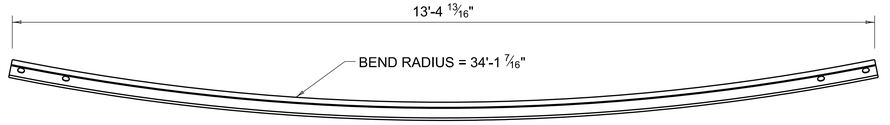
ELEVATION VIEW NON-RADIUSED

SLOTTED THRIE-BEAM RAIL E2



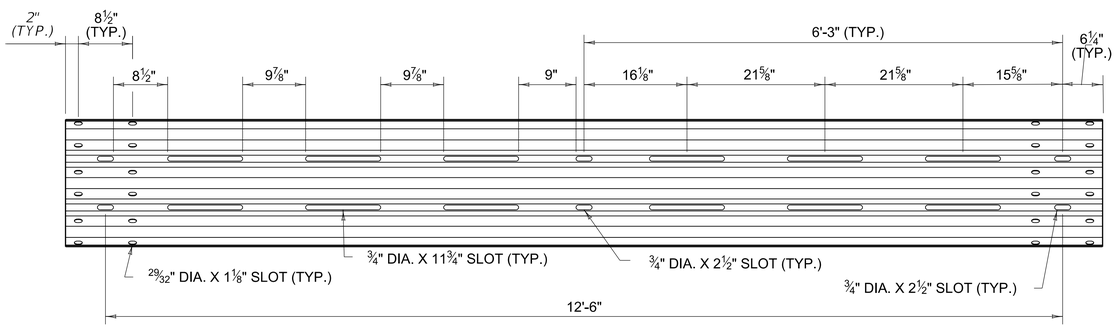
PLAN VIEW

SLOTTED THRIE-BEAM RAIL E1

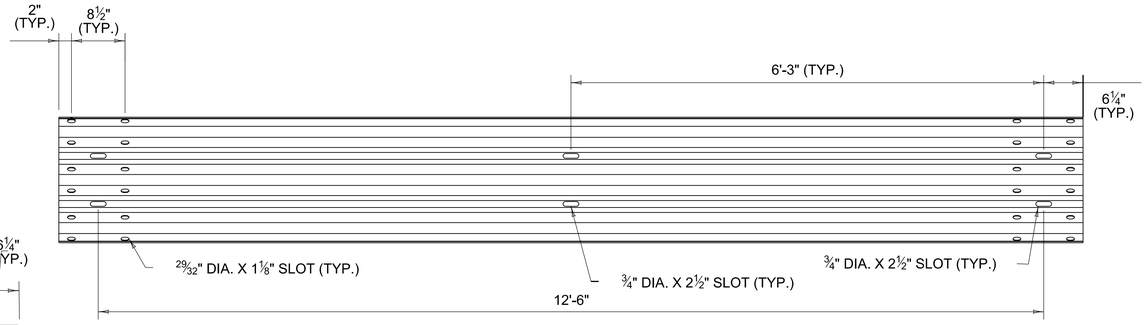


PLAN VIEW

SLOTTED THRIE-BEAM RAIL E2



SLOTTED THRIE-BEAM RAIL E3



UNBENT STANDARD THRIE-BEAM RAIL E4

~ NOTES ~

901 *FOR THRIE-BEAM RAIL, USE AASHTO M180, SPEC SECTION 814, AND GUARDRAIL MANUFACTURER FROM KYTC'S LIST OF APPROVED MATERIALS.*

902 *MARK THE RADIUS OF CURVATURE ON EACH OF THE CURVED ELEMENTS.*

903 *IN AN ASYMMETRICAL BULLNOSE, THE OPPOSING-SIDE E2 THRIE-BEAM IS STRAIGHT, NOT CURVED. THIS TANGENT BEAM HAS A LENGTH OF 13' - 6 ½".*

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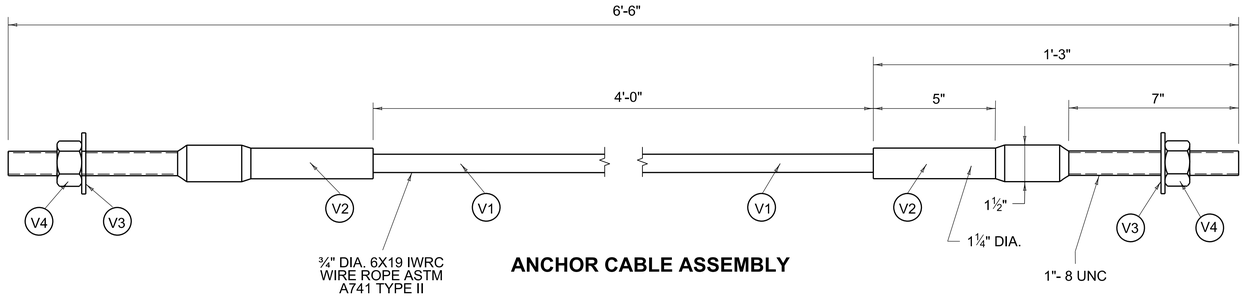
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

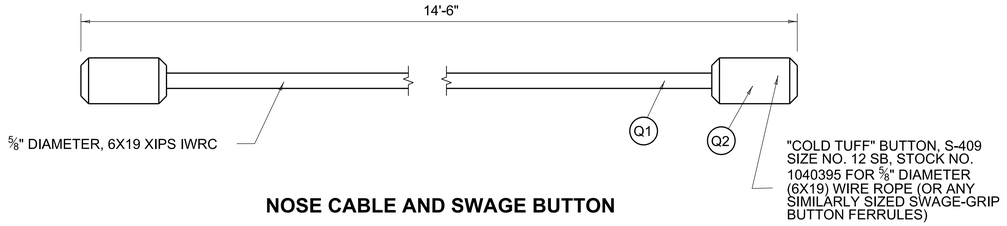
STEEL THRIE-BEAM BULLNOSE TERMINAL

SHEET 009: SLOTTED THRIE-BEAM RAIL

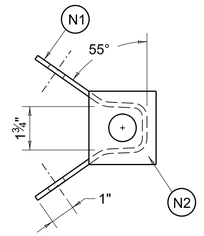
STANDARD DRAWING NUMBER
RBE-210



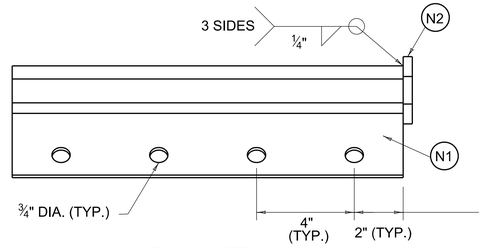
ANCHOR CABLE ASSEMBLY



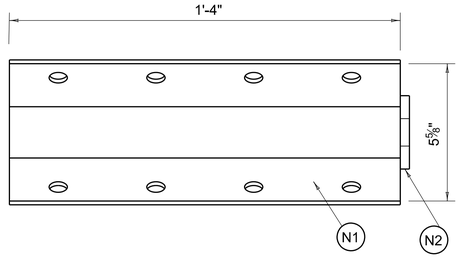
NOSE CABLE AND SWAGE BUTTON



PROFILE VIEW

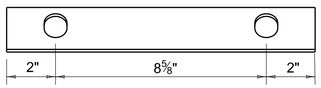


PLAN VIEW

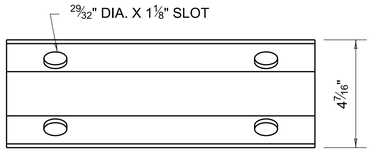


ELEVATION VIEW

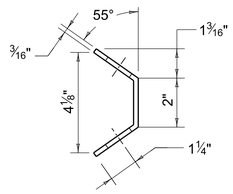
ANCHOR BRACKET ASSEMBLY (N1)



PLAN VIEW

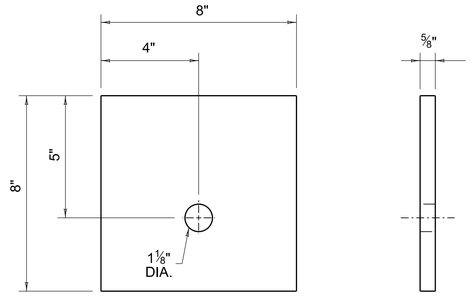


ELEVATION VIEW



PROFILE VIEW

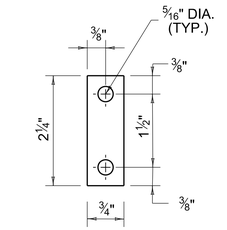
NOSE CABLE ANCHOR BRACKET (R1)



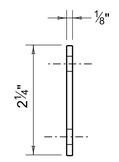
ELEVATION VIEW

PROFILE VIEW

BCT BEARING PLATE (A3)

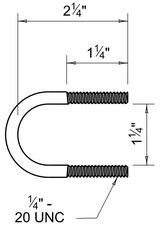


ELEVATION VIEW



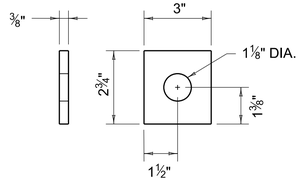
PROFILE VIEW

U - BOLT PLATE WASHER (T2)

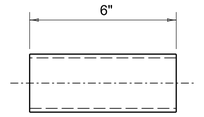


U - BOLT (T1)

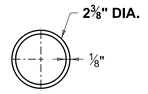
U - BOLT NUT (T3)



ANCHOR BRACKET END PLATE (N2)



ELEVATION VIEW



PROFILE VIEW

BCT POST SLEEVE (L2)

~ NOTES ~

1000 *SEE SHEET 11 FOR PART DESCRIPTIONS.*

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BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

STEEL THRIE-BEAM BULLNOSE TERMINAL

SHEET 010: ASSEMBLY DETAILS

STANDARD DRAWING NUMBER
RBE-210

THRIE-BEAM BULLNOSE TERMINAL MATERIALS LIST

Part Number	Quantity	Description	Hardware Guide[1]	Material Descriptions[2,3]
A1	2	LONG FOUNDATION TUBE	PTE07	ASTM A500 GRADE B OR ASTM A501
A2	2	FOUNDATION TUBE	PTE06	ASTM A500 GRADE B OR ASTM A501
A3	2	BCT BEARING PLATE	FPB01	ASTM A36 MIN. STRENGTH 36 KSI. SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
B1	12	LOWER SHEAR PLATE	PTE08	ASTM A36 MIN. STRENGTH 36 KSI. SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
B2	12	FOUNDATION TUBE	PTE08	ASTM A500 GRADE B OR ASTM A501
C1	12	UPPER SHEAR PLATE	PWE11	ASTM A36 MIN. STRENGTH 36 KSI. SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
C2	12	STEEL POST	PWE11	W 6X9 OR W 6X8.5 STEEL POST / ASTM A36 MIN. STRENGTH 36 KSI
D1	20	BLOCKOUT FOR STEEL POST - WOOD	PDB09	SYP GRADE NO. 1 OR BETTER / SEE SPEC. SECTION 814.04.02 FOR TIMBER USE
D2	12	TAPERED BLOCKOUT FOR STEEL POST - WOOD	PDB20	SYP GRADE NO. 1 OR BETTER / SEE SPEC. SECTION 814.04.02 FOR TIMBER USE
D3	2	TAPERED BLOCKOUT FOR BCT POST - WOOD	PDB12	SYP GRADE NO. 1 OR BETTER / SEE SPEC. SECTION 814.04.02 FOR TIMBER USE
E1	1	SLOTTED THRIE BEAM RAIL - SHOP BENT AND PUNCHED	RTM07a	12 GUAGE / CURVE GUADRAIL IN SHOP / MARK THE RADIUS OF CURVATURE ON EACH OF THE CURVED ELEMENTS
E2	2	SLOTTED THRIE BEAM RAIL - SHOP BENT AND PUNCHED	RTM07d	12 GUAGE / CURVE GUARDRAIL IN SHOP / MARK THE RADIUS OF CURVATURE ON EACH OF THE CURVED ELEMENTS / NOTE: IN AN ASSYMETRICAL BULLNOSE, THE OPPOSING TRAFFIC SIDE E2 THRIE BEAM IS STRAIGHT AND NOT CURVED WITH A LENGTH OF 13' 6 1/2".
E3	2	SLOTTED THRIE BEAM RAIL - PUNCHED	RTM07e	12 GUAGE
E4	4	UNBENT STANDARD THRIE BEAM RAIL	RTM02a	12 GUAGE
F1	4	5/8" DIA. HEX HEAD GROUND STRUT AND YOKE BOLT - 11 UNC - 10" LONG	FBX16a	ASTM A307
F2	8	5/8" DIA. HEX HEAD GROUND STRUT AND YOKE BOLT - WASHER 1 3/4" OUTSIDE DIAMETER, 11/16" INSIDE DIAMETER, 1/8" THICK	FWC16a	ASTM F844
F3	4	5/8" DIA. HEX HEAD GROUND STRUT AND YOKE BOLT - 5/8" NUT, 9/16" THICK	FBX16a	ASTM A563, GRADE A OR BETTER
G1a	14	5/8" DIA. POST BOLT - 11 UNC - 18" LONG	FBB04	
G1b	12	5/8" DIA. POST BOLT - 11 UNC - 10" LONG	FBB03	
G2	6	POST BOLT - WASHER 1 3/4" OUTSIDE DIAMETER, 11/16" INSIDE DIAMETER, 1/8" THICK	FWC16a	ASTM F844
G3	26	POST BOLT - 5/8" NUT, 9/16" THICK	FBB03/ FBB04	ASTM A563, GRADE A OR BETTER
H1	4	7/8" DIA. HEX HEAD SOIL TUBE BOLT - 9 UNC - 8" LONG	NA	ASTM A307 / AASHTO M232 CLASS C
H2	8	7/8" DIA. HEX HEAD SOIL TUBE BOLT - WASHER 2 1/4" OUTSIDE DIAMETER, 15/16" INSIDE DIAMETER, 3/16" THICK	NA	ASTM F844 / AASHTO M232 CLASS C
H3	4	7/8" DIA. HEX HEAD SOIL TUBE BOLT - 7/8" NUT, 3/4" THICK	NA	ASTM A563, GRADE A OR BETTER / AASHTO M232 C
J1	38	16D DOUBLE HEAD NAIL	NA	AASHTO M232 CLASS D
L1	4	BCT TIMBER POST	PDF04	SYP GRADE NO. 1 OR BETTER / NO KNOTS +/- 18" FROM GROUND ON TENSION FACE / SEE SPEC. SECTION 814.04.02 FOR TIMBER USE
L2	2	BCT POST SLEEVE	FMM02	

Part Number	Quantity	Description	Hardware Guide[1]	Material Descriptions[2,3]
M1	8	W6X8.5 OR W6X9 STEEL POST	NA	W 6X9 OR W 6X8.5 STEEL POST / ASTM A36 MIN. STRENGTH 36 KSI
N1	2	ANCHOR BRACKET ASSEMBLY	FPA01	ASTM A36 MIN. STRENGTH 36 KSI. SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
N2	2	ANCHOR BRACKET END PLATE	FPA01	ASTM A36 MIN. STRENGTH 36 KSI. SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
P1	16	5/8" DIA. HEX HEAD ANCHOR BRACKET BOLT - 11 UNC - 1 1/2" LONG	FBX16a	ASTM A307
P2	32	5/8" DIA. HEX HEAD ANCHOR BRACKET BOLT - WASHER, 1 3/4" OUTSIDE DIAMETER, 11/16" INSIDE DIAMETER, 1/8" THICK	FWC16a	ASTM F844
P3	16	5/8" DIA. HEX HEAD ANCHOR BRACKET BOLT - 5/8" NUT, 9/16" THICK	FBX16a	ASTM A563, GRADE A OR BETTER
Q1	3	5/8" DIA. NOSE CABLE 6X19 XIPS IWRC	RCM02	AASHTO M30 CLASS A COATING / NOMINAL BREAKING STRENGTH OF 41.2 KIPS
Q2	6	NOSE CABLE - SWAGE BUTTON	RCM02	COLD TUFF BUTTON, S-409 SIZE NO. 12 SB STOCK NUMBER 1040395 FOR 5/8" DIAMETER (6X19) WIRE ROPE (OR ANY SIMILARLY SIZED SWAGE-GRIP BUTTON FERRULES) / AASHTO M30 CLASS A COATING
R1	6	NOSE CABLE ANCHOR BRACKET	FPA04	ASTM A36 MIN. STRENGTH 36 KSI. SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
S1	120	5/8" DIA. SPLICE BOLT - 11 UNC - 1 1/4" LONG	FBB01	
S2	120	5/8" DIA. SPLICE BOLT - 5/8" NUT, 9/16" THICK	FBB01	ASTM A563, GRADE A OR BETTER
T1	9	1/4" DIA. NOSE CABLE U BOLT - 20 UNC	NA	ASTM A307 / AASHTO M232 CLASS C
T2	9	1/4" DIA. NOSE CABLE U-BOLT - PLATE WASHER, 1/8" THICK	NA	ASTM A1011 TYPE SS GRADE 36 / AASHTO M232 CLASS C
T3	18	1/4" DIA. NOSE CABLE U-BOLT -1/4" NUT, 1/4" THICK	NA	ASTM A563, GRADE A OR BETTER / AASHTO M232 CLASS C
U1	48	SLIP POST ASSEMBLY - BREAKAWAY 7/16" DIA. HEX HEAD BOLT - 14 UNC - 2 1/2" LONG	FBX12b	ASTM A449 OR SAE J429 GRADE 5
U2	192	SLIP POST ASSEMBLY - BREAKAWAY 7/16" DIA. HEX HEAD BOLT - WASHER, 1 1/4" OUTSIDE DIAMETER, 1/2" INSIDE DIAMETER, 3/32" THICK	FWC12a	ASTM F844
U3	48	SLIP POST ASSEMBLY - BREAKAWAY 7/16" DIA. HEX HEAD BOLT - 7/16" NUT, 1/2" THICK	FBX12b	ASTM A563DH OR SAE J995 GRADE 5
V1	2	3/4" DIA. BCT CABLE	FCA01	
V2	4	ANCHOR CABLE-SWAGE FITTING, 1 1/4" DIAMTER	FCA01	FITTING ASTM A576 GRADE 1035 / STUD ASTM F568 CLASS C
V3	4	1" DIA. ANCHOR CABLE-WASHER	FWC24a	ASTM F844
V4	4	1" DIA. ANCHOR CABLE-NUT	FNX24a	ASTM A563, GRADE A OR BETTER
W1	3	REFLECTOR	NA	SEE SPEC. SECTION 838 AND KYTC LIST OF APPROVED MATERIALS

[1] The Hardware Guide number is referenced in the *Task Force 13 Guide to Standardized Roadside Hardware*, available at https://tf13.org/guides/. When AASHTO and ASTM material specifications are available for a component, they are listed in the guide.

[2] If the *Task Force 13 Guide to Standardized Roadside Hardware* does not reference the AASHTO and ASTM specifications, they are provided in the Material Descriptions column. Additional material specifications can be found in Kentucky Standard Specifications, Section 814 - Guardrail Systems.

[3] If there are discrepancies in material or dimensions between the *Task Force 13 Guide to Standardized Roadside Hardware* and this Standard Drawing set, the details in the Standard Drawing set shall take precedence.

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BARRIERS

Standard Drawing Reference Report

RBE-210 STEEL THRIE-BEAM BULLNOSE TERMINAL
Effective with the December 11, 2025 Letting

Design Notes

The Steel Thrie-Beam Bullnose (Bullnose) has passed MASH 2016 crash testing. It is commonly considered for three field applications: protecting gaps between twin bridges, shielding gore areas, and addressing narrow median fixed objects such as bridge piers and overhead sign supports. Each application requires evaluation of site-specific design and installation factors to ensure appropriate use.

During a head-on impact, an errant vehicle is expected to come to a stop within the object-free area inside the Bullnose. This area—located adjacent to Posts 1 through 12—must remain clear of fixed objects and be properly graded to ensure stability for vehicle deceleration and containment. In addition, the area in front of and alongside the Bullnose must be graded to provide sufficient stability for an errant vehicle departing the roadway and approaching the Bullnose.

Bullnose posts are embedded deeper than standard guardrail posts, which increases the potential for underground conflicts. Designers must review subsurface and drainage-related features—such as utilities, drainage structures, rock, and foundations—near the Bullnose location. Roadside drainage may need to be addressed through the installation or modification of drainage structures.

Include individual construction details for each Bullnose installation in the project plans, tailored to the specific site. On the plan sheets, the designer must document the approximate station and offset—or approximate coordinates—for the center of Post 5A, ensuring a minimum length of 50 feet from Post 5 to the front of the fixed object or roadside condition. These values serve as guidance for construction layout and are intended to accommodate typical construction tolerances.

The Bullnose is a complex but highly effective system that requires careful attention during both design and construction. Designers and contractors should thoroughly review all notes on the Standard Drawings to ensure proper application and installation. If there are any questions or uncertainties, contact the Standard Drawing staff in the Division of Highway Design for guidance.

References

KYTC Standard Specifications for Road and Bridge Construction

- Section 719 – Guardrail
- Section 814 – Guardrail Systems

Highway Design Guidance Manual

- HD-800 ROADSIDE DESIGN

KYTC Steel Thrie-Beam Bullnose Manual – Assembly, Maintenance, and Repair

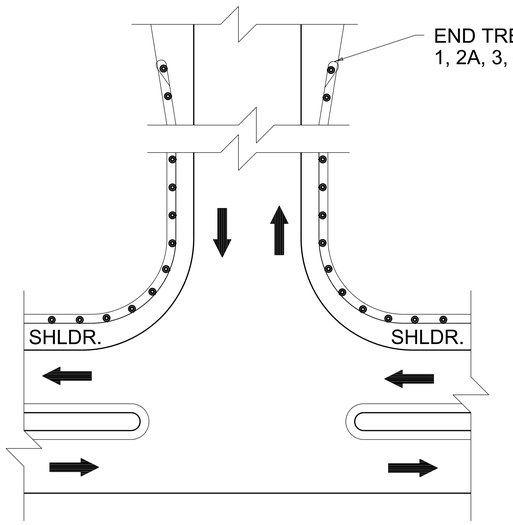
Crash Test Reports

MwRSF TRP-03-418-20
MwRSF TRP-03-389-20
MwRSF Pooled Fund Q&A ID 1975

Related Standard Drawings

BHS-013	THRIE-BEAM GUARDRAIL TRANSITION (TL-3)
BHS-014	THRIE-BEAM GUARDRAIL TRANSITION (TL-2)
RBB-002	GUARDRAIL AND BRIDGE END DRAINAGE FOR TWIN STRUCTURES
RBC-004	GUARDRAIL CONNECTOR TO BRIDGE END (MAINTENANCE)
RBC-005	GUARDRAIL CONNECTOR TO BRIDGE END (MAINTENANCE)
RBC-006	GUARDRAIL CONNECTOR TO BRIDGE END (MAINTENANCE)
RBR-001	STEEL BEAM GUARDRAIL (“W” BEAM)

Standard Drawing Revision History

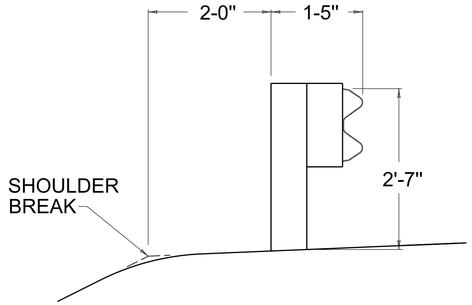


APPROACH ROADS

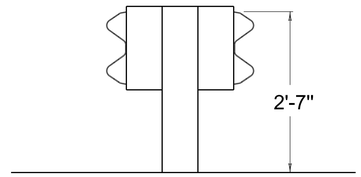
~ NOTES ~

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).

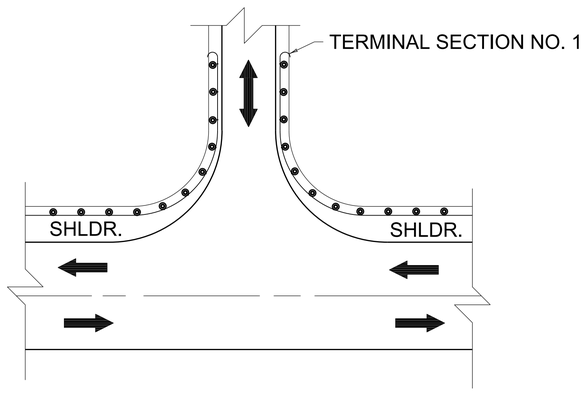
USE WITH CUR. STD. DWG.
RBI-002 RBR-035



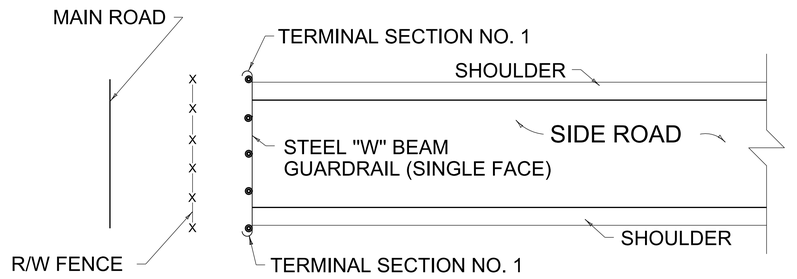
NORMAL GUARDRAIL INSTALLATION



TYPICAL DOUBLE FACE
GUARDRAIL INSTALLATION



ENTRANCES



GUARDRAIL USED AS A BARRICADE

REVISION DATE: 02/26/2020
REVISION NUMBER: 0

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DIVISION DIRECTOR DATE

APPROVED 02-26-2020
STATE HIGHWAY ENGINEER DATE

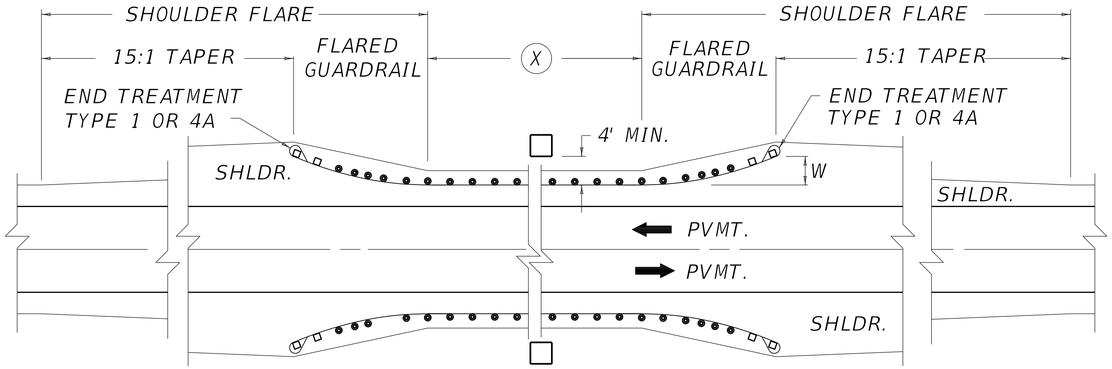
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

GUARDRAIL

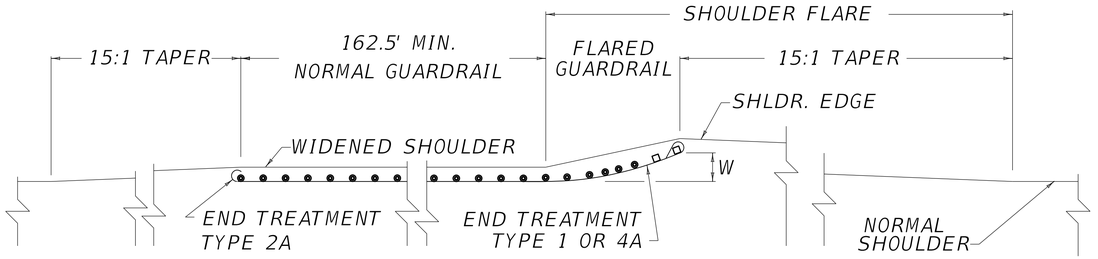
TYPICAL INSTALLATIONS

STANDARD DRAWING NUMBER
RBI-001-12



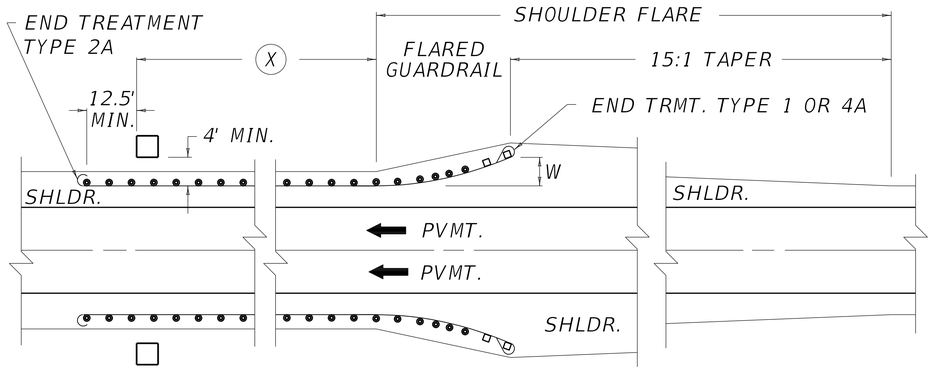
AT A FIXED OBJECT – TWO WAY TRAFFIC (FILL)

FIGURE 1



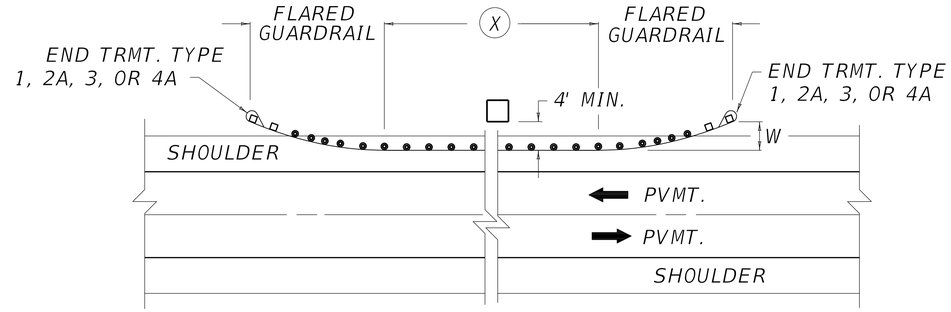
ONE DIRECTION TRAFFIC–FOR SHOULDERS LESS THAN 12' (FILL)

FIGURE 2



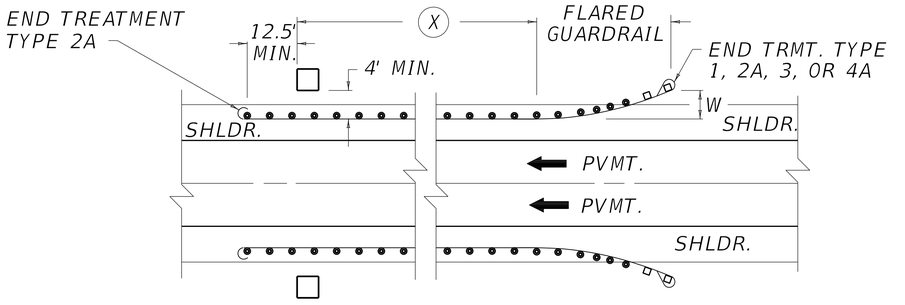
AT A FIXED OBJECT – ONE WAY TRAFFIC (FILL)

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

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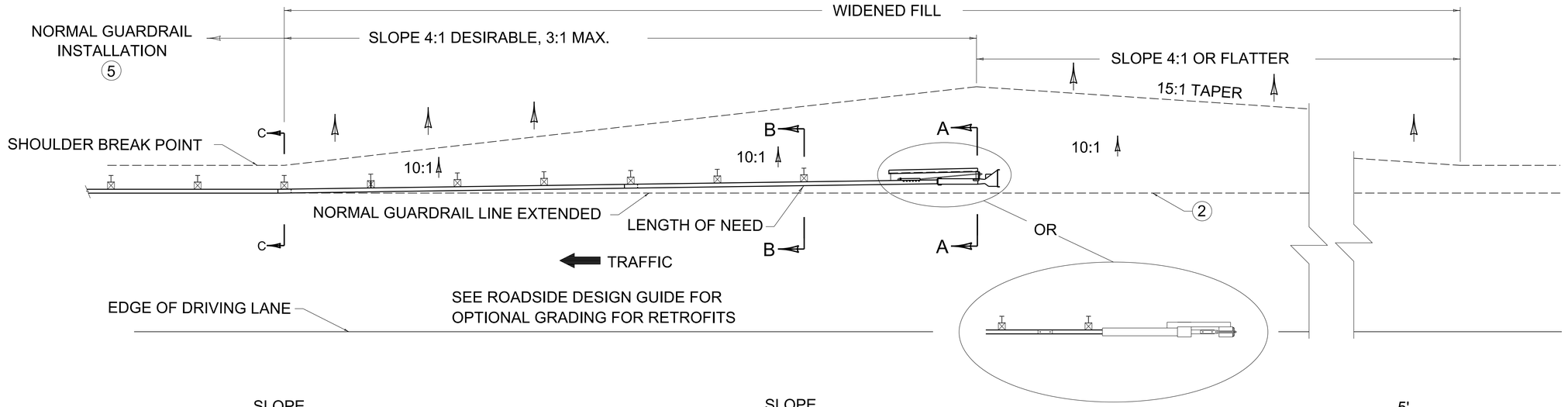
BARRIERS

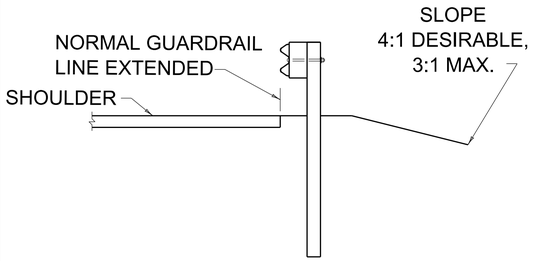
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

GUARDRAIL

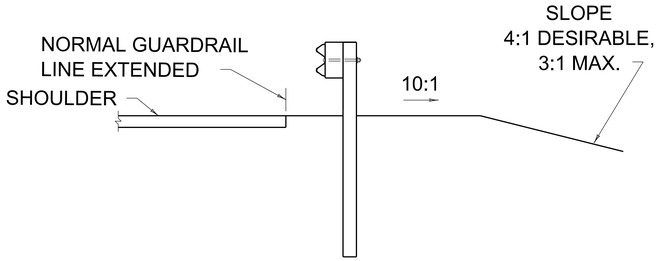
TYPICAL INSTALLATIONS

STANDARD DRAWING NUMBER
RBI-002-07

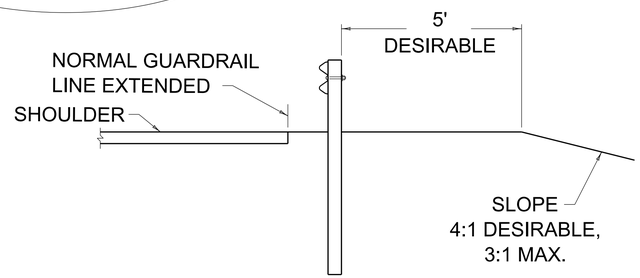




SECTION C-C



SECTION B-B



SECTION A-A

~ 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).

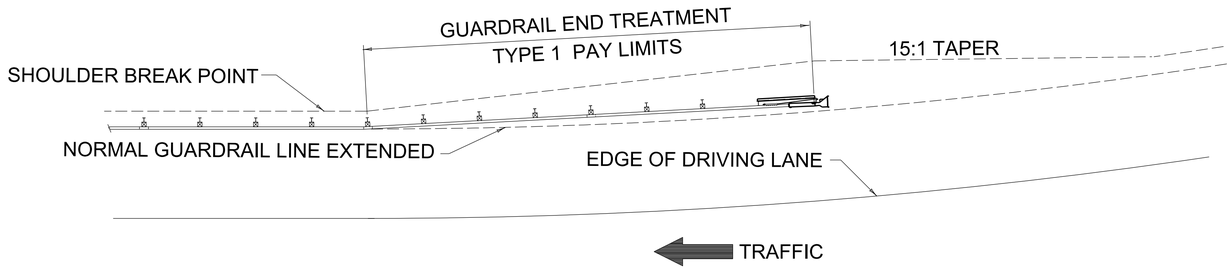
(2) GUARDRAIL EXTRUDER EDGE CLOSEST TO TRAFFIC SHALL BE PLACED ON NORMAL GUARDRAIL LINE EXTENDED.

(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.

(5) FOR MAINTENANCE AND REPAIR PROJECTS, USE "GUARDRAIL SYSTEM TRANSITION" (RBR-018), TO TRANSITION BACK TO 27" OR 29" GUARDRAIL HEIGHT, IF ONLY THE TERMINAL IS PROPOSED TO BE REPLACED.

USE WITH CUR. STD. DWG.
RBR-020



GUARDRAIL END TREATMENT TYPE 1
INSTALLED ON A CURVE (3)

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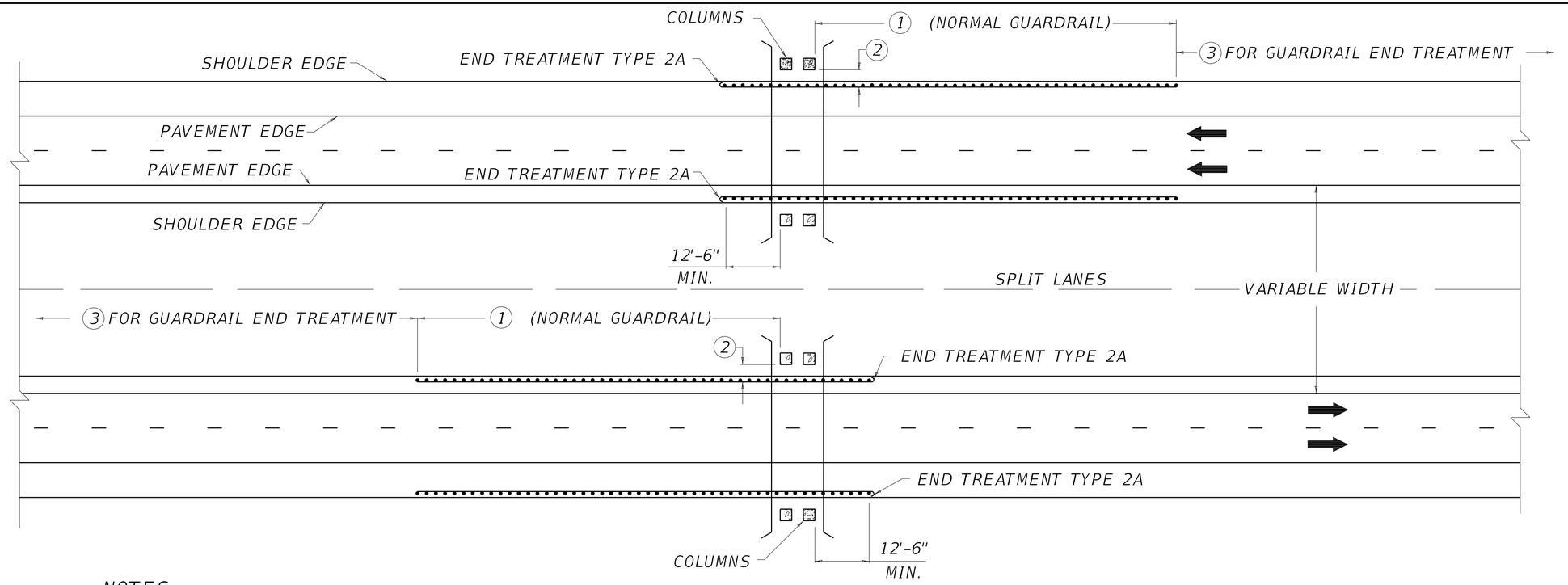
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

GUARDRAIL

INSTALLATION OF END TREATMENT TYPE 1

STANDARD DRAWING NUMBER
RBI-004-06

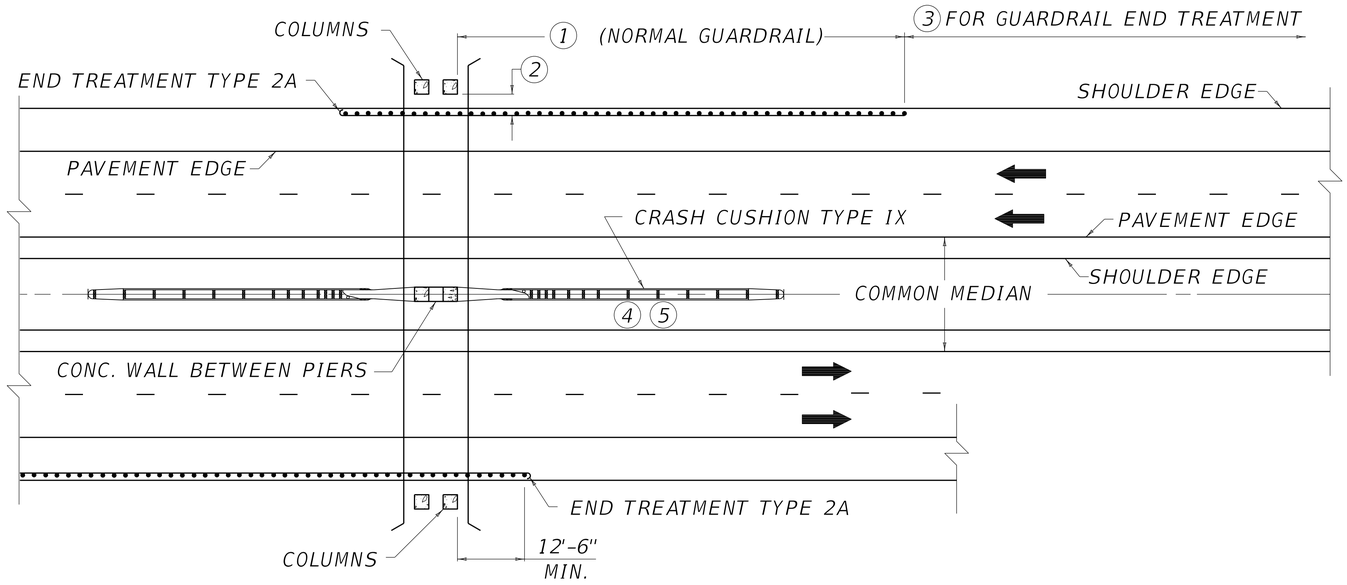


LOCATION OF GUARDRAIL WITH VARIABLE WIDTH MEDIAN

~ 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.

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



LOCATION OF GUARDRAIL WITH CONSTANT WIDTH MEDIAN

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

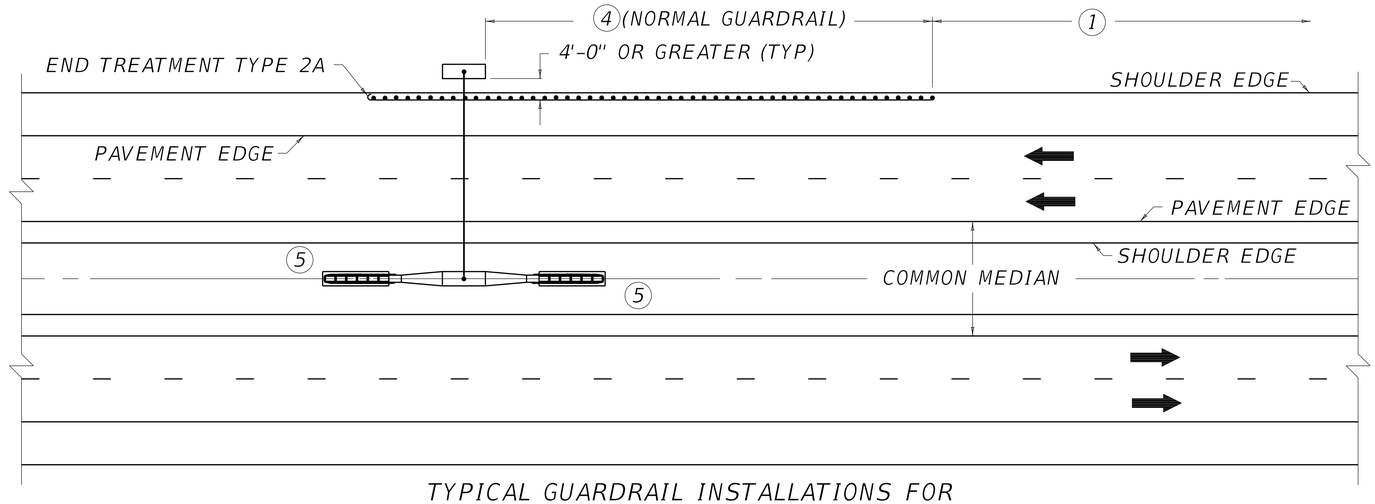
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

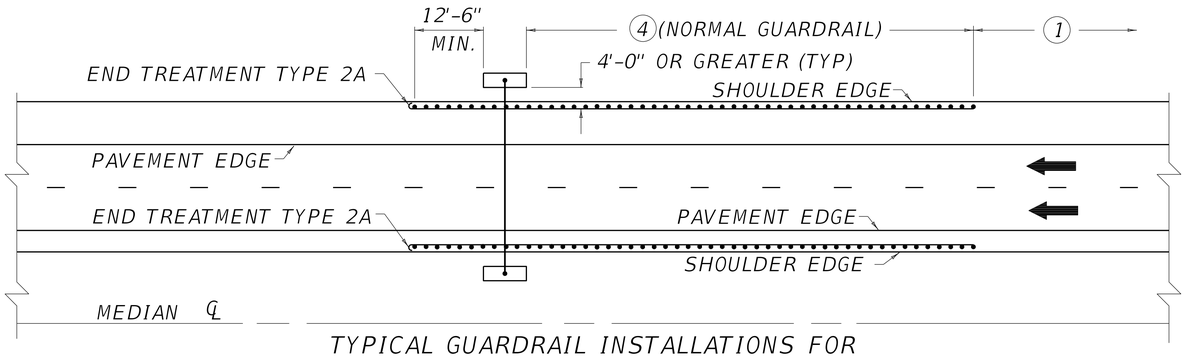
GUARDRAIL

INSTALLATION AT BRIDGE COLUMNS

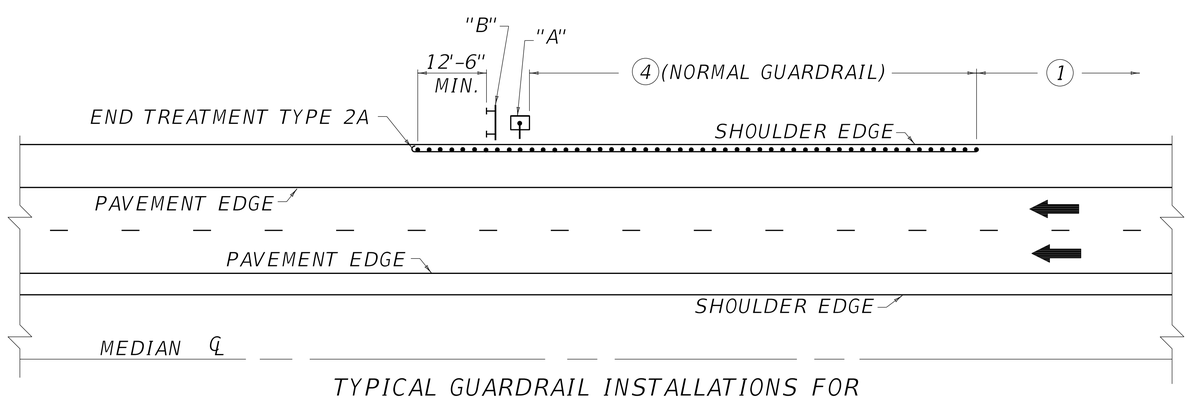
STANDARD DRAWING NUMBER
RBI-005-08



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

REVISION DATE: 12/01/2015
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SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

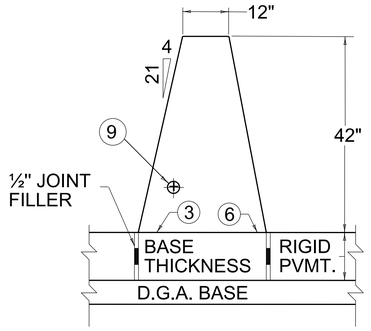
TEAM KENTUCKY TRANSPORTATION CABINET

GUARDRAIL

INSTALLATION AT SIGN SUPPORTS

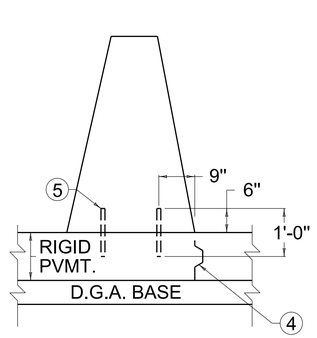
STANDARD DRAWING NUMBER
RBI-006-07

TYPE A

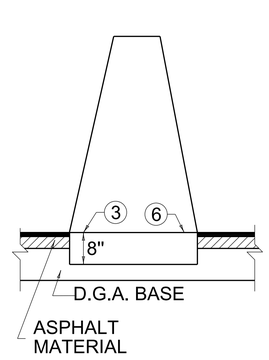


NEW RIGID PAVEMENT

TYPE B

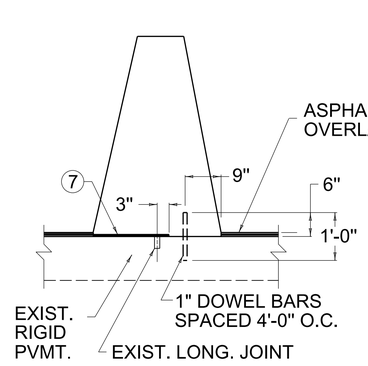


TYPE C



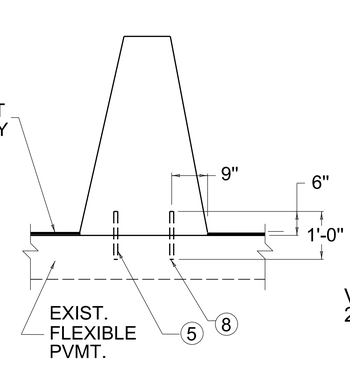
NEW FLEXIBLE PAVEMENT

TYPE D

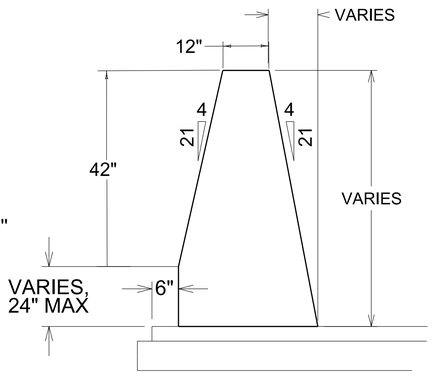


NEW FLEXIBLE OVERLAY OVER EXISTING RIGID PAVEMENT

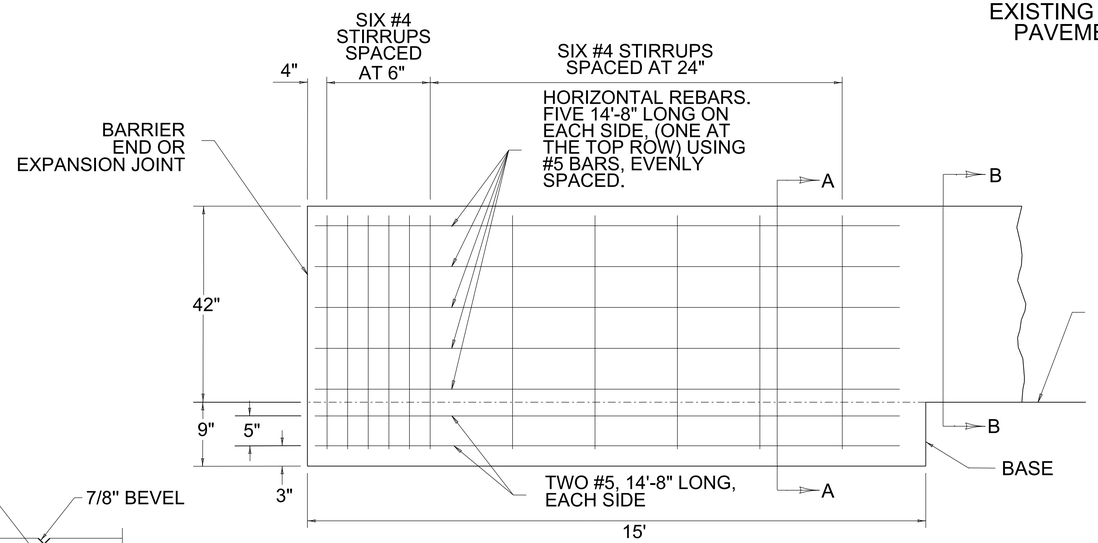
TYPE E



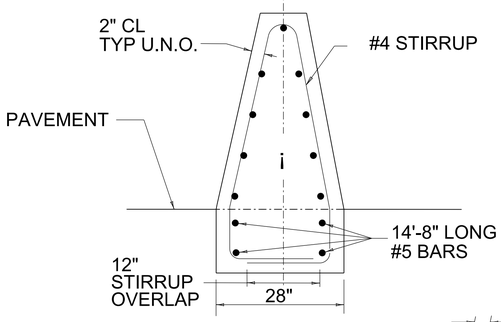
NEW FLEXIBLE OVERLAY OVER EXISTING FLEXIBLE PAVEMENT



ASYMMETRICAL WALL SECTION

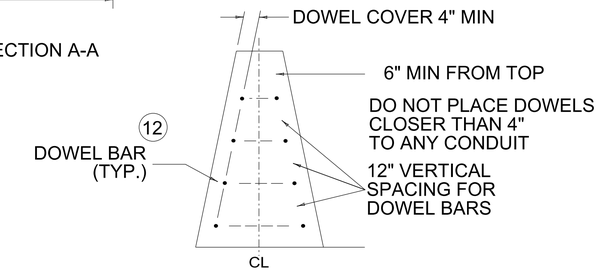


ELEVATION VIEW



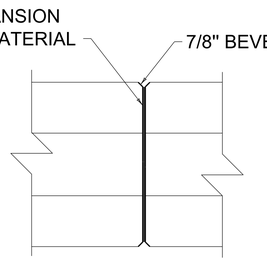
SECTION A-A

END ANCHORAGE (11)



DOWEL BAR PLACEMENT

SECTION B-B
CONSTRUCTION JOINT
DOWEL BAR
PLACEMENT



EXPANSION JOINT DETAIL

APPROXIMATE QUANTITIES PER LINEAR FOOT

TYPE	CONC.- CUYD	STEEL - LBS
A	0.28	▲ 1.34
B	0.22	1.34
C	0.28	▲ 1.34
D	0.22	0.67
E	0.22	1.34

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

▲ WHEN REQUIRED

~ NOTES ~

SEE CURRENT SHEET, SHEET 002, FOR ALL NOTES.
USE WITH CURRENT SHEET, SHEET 002.

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

BARRIERS

~ NOTES ~

1. FOR WALLS IN TRANSITION AND SEPARATE SEGMENT WALLS, SEE CURRENT SHEET, SHEET 003, FOR APPROPRIATE BID ITEMS.
2. THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE MEDIAN BARRIER SHALL BE FULL COMPENSATION FOR ALL MATERIALS (INCLUDING THE BASE IN TYPES A AND C AND ALL REINFORCING STEEL), 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 B 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. CONSTRUCTION JOINT PERMITTED WHEN FIXED FORMS OR SLIP FORMS ARE USED.

(5) 1" DOWEL BARS SPACED 4'-0" O.C. AND STAGGERED 2'-0".

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

(7) PAVEMENT SHALL BE DRILLED AND BARS GROUTED.

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

(9) 3" RACEWAY (TYPICAL) SEE ELSEWHERE IN THE PLANS FOR LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.

10. CONSTRUCT 42" CONCRETE MEDIAN BARRIER USING CONCRETE CLASS AA WITH A STRENGTH OF 4000PSI.

(11) REINFORCED END ANCHORAGES ARE REQUIRED AT THE ENDS OF CONCRETE BARRIER RUNS. CONSTRUCT THE LAST 15' USING THE END ANCHORAGE DETAIL AS SHOWN HERE. AT EXPANSION JOINTS, CONSTRUCT AN END ANCHORAGE ON BOTH SIDES OF JOINT, WITH A MAX GAP OF 2" FOR THE OPEN JOINT. THE MAX EXPANSION JOINT SPACING SHALL BE 800'. THIS ANCHORAGE IS NOT NEEDED AT CONSTRUCTION JOINTS.

(12) BARRIER RUNS WITH ABUTTING VERTICAL SURFACES AT EITHER REQUIRED OR PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE DOWELED TO EACH OTHER BY USE OF 5" DIAMETER BY 18" LONG EPOXY COATED DEFORMED DOWEL BARS. BARS ARE TO BE PLACED AS SHOWN ON THE DOWEL BAR PLACEMENT DETAIL ON SEPIA 018. PROVIDE A 4" CLEARANCE TO BARRIER SURFACES AND TO ANY RACEWAYS. PAYMENT FOR DOWELS IS INCIDENTAL TO THE BID ITEM.

13. CONSTRUCT USING EPOXY COATED REINFORCEMENT THROUGHOUT WHEN MEDIAN BARRIER IS INSTALLED ON A STRUCTURE.

BID ITEMS AND UNIT TO BID

CONC MEDIAN BARRIER TYPE ⊕ TL3 42" LF

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

USE WITH CURRENT SHEETS, SHEET 001 AND SHEET 003.

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED DIVISION DIRECTOR 08-11-2025 DATE

APPROVED STATE HIGHWAY ENGINEER 08-11-2025 DATE

BARRIERS

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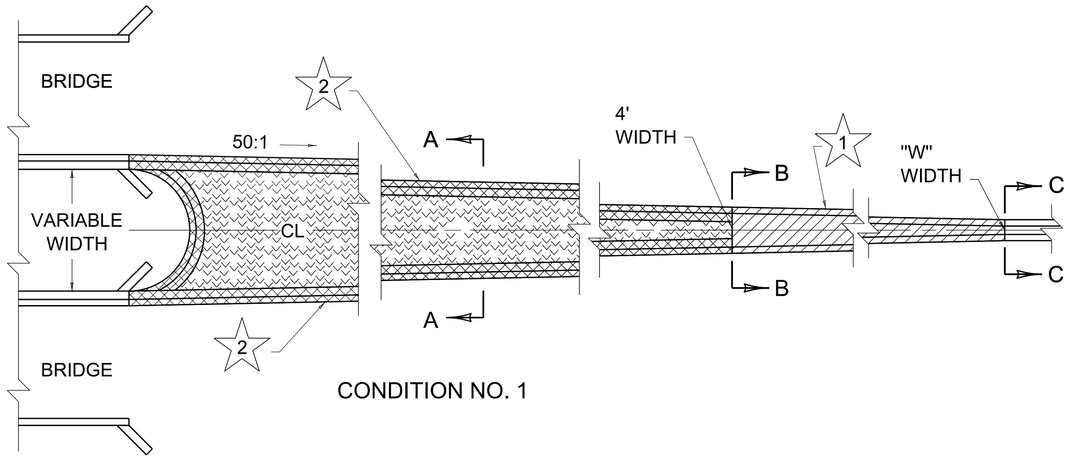
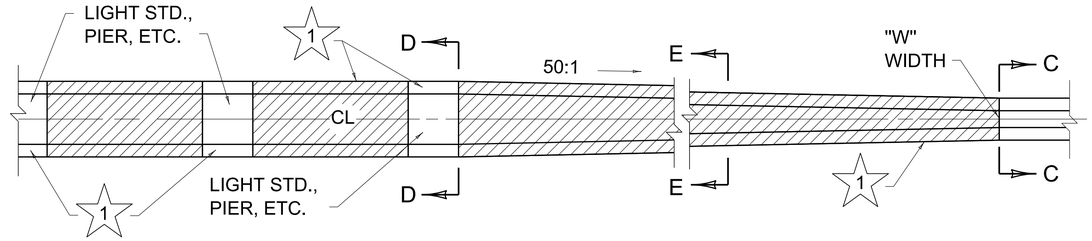


CONDITION NO. 1



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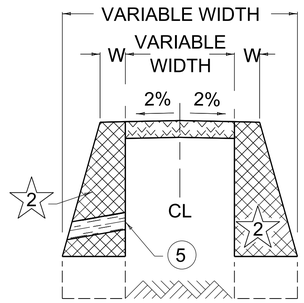
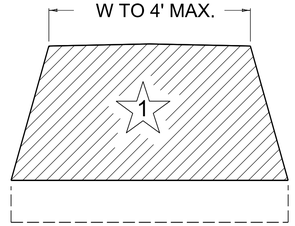
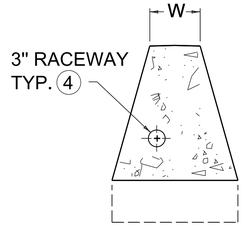


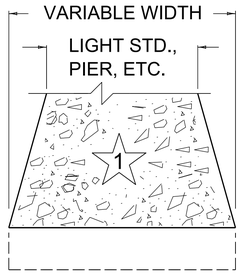
SECTION A-A



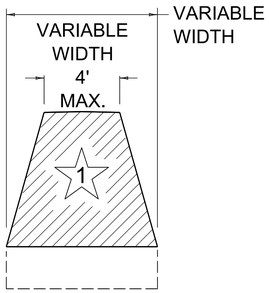
SECTION B-B



NORMAL SECTION
C-C



SECTION D-D



SECTION E-E

~ 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 TO NEW OR EXISTING PAVEMENT SEE CUR. SHEET, SHEET 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.

BID ITEMS AND UNIT TO BID

CONCRETE MEDIAN BARRIER TYPE ⊕ ☆	TL3 42"	LF

⊕ 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.

USE WITH CURRENT SHEET, SHEET 001.

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

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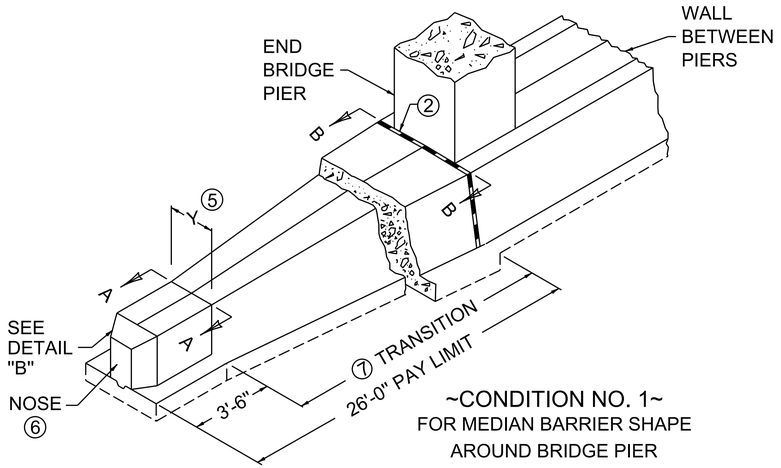
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY

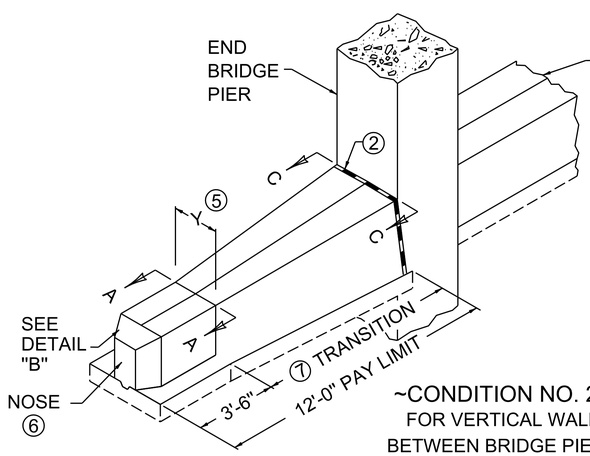
CONCRETE BARRIER WALLS

SHEET 003: CONCRETE MEDIAN BARRIER TL3 42 IN HORIZONTAL TRANSITIONS

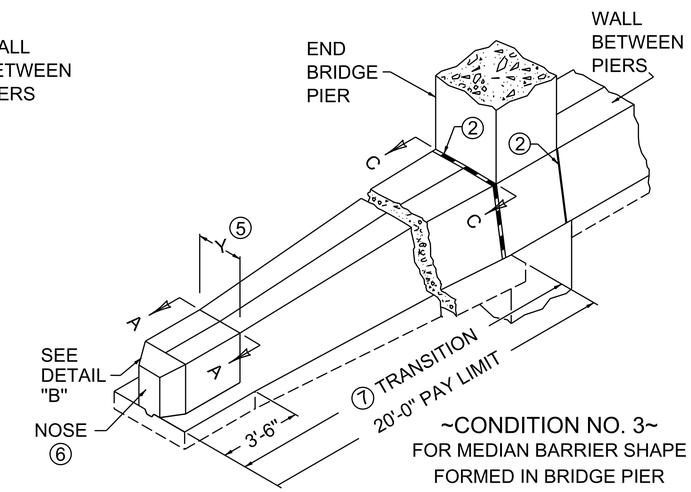
STANDARD DRAWING NUMBER
RBM-135



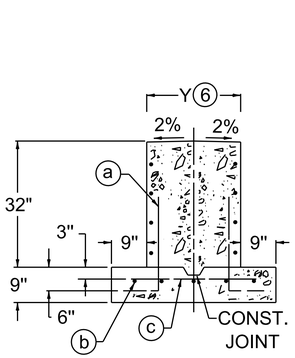
~CONDITION NO. 1~
FOR MEDIAN BARRIER SHAPE
AROUND BRIDGE PIER



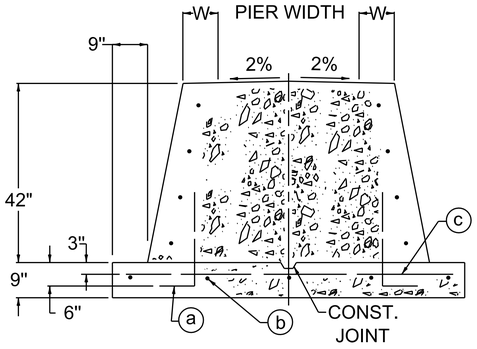
~CONDITION NO. 2~
FOR VERTICAL WALL
BETWEEN BRIDGE PIERS



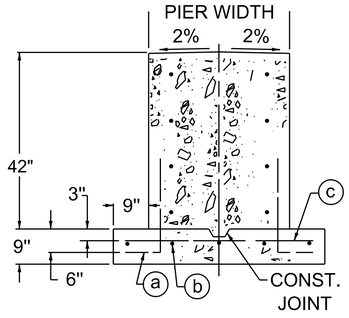
~CONDITION NO. 3~
FOR MEDIAN BARRIER SHAPE
FORMED IN BRIDGE PIER



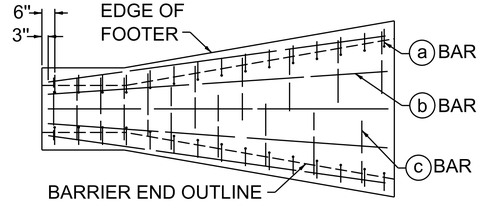
SECTION A-A



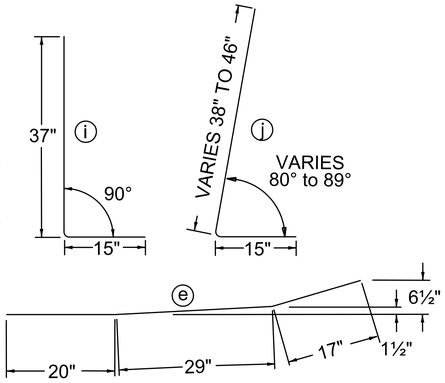
SECTION B-B



SECTION C-C



TYPICAL STEEL PLACEMENT



BENDING DIAGRAMS

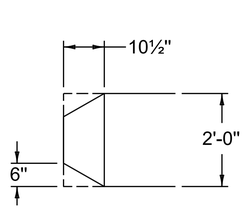
CONDITION NO.	W	NO. 5 STEEL REINFORCEMENT BARS										CUBIC YARD ④ CLASS "A" CONC.	
		BAR ⓐ		BAR ⓑ		BAR ⓒ Y=1'-6"			BAR ⓒ Y=2'-0"				
		QTY.	LGTH.	QTY.	LGTH.	QTY.	LGTH.	LBS.	QTY.	LGTH.	LBS.	Y=2'-0"	Y=1'-6" ⑤
1	6"	52	2'-9"	5	25'-8"	52	2'-8"	429	52	3'-2"	456	13.35	12.41
2	-	24			11'-8"	24		197	24		210	4.46	3.98
3	-	40			19'-8"	40		329	40		350	7.70	6.96

ⓓ SEE NOTE 7 ON SHEET 005 FOR LONGITUDINAL DOWELS

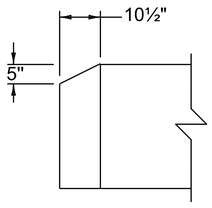
~NOTES~

SEE CURRENT SHEET, SHEET 005, FOR ALL NOTES.

USE WITH CURRENT SHEET, SHEET 005.



DETAIL "A" ⑥



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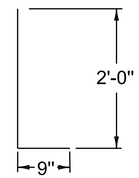

BAR ⓐ

REVISION DATE: 08/11/2025
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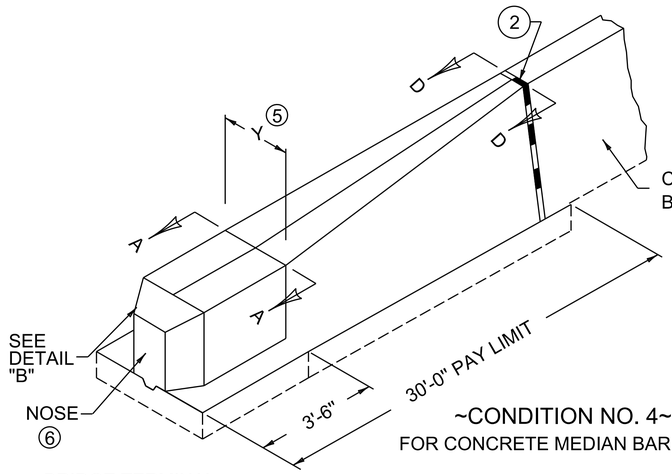
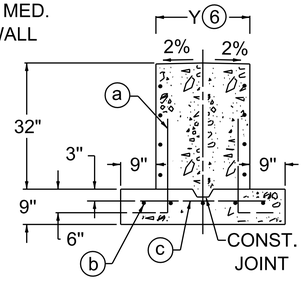
APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

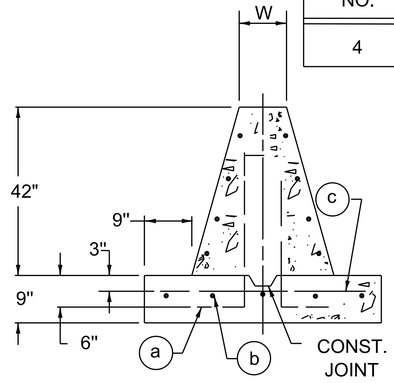
BARRIERS



~CONDITION NO. 4~
FOR CONCRETE MEDIAN BARRIER



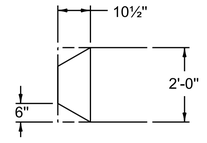
SECTION A-A



SECTION D-D

CONDITION NO.	NO. 5 STEEL REINFORCEMENT BARS											CUBIC YARD ④ CLASS "A" CONC.	
	W	BAR ⓐ		BAR ⓑ		BAR ⓒ Y=1'-6"			BAR ⓒ Y=2'-0"				
		QTY.	LGTH.	QTY.	LGTH.	QTY.	LGTH.	LBS.	QTY.	LGTH.	LBS.	Y=2'-0"	Y=1'-6"
4	12"	60	2'-9"	5	29'-8"	30	2'-8"	411	30	3'-2"	427	7.98	7.01

ⓓ SEE NOTE 7 ON SHEET 005 FOR LONGITUDINAL DOWELS



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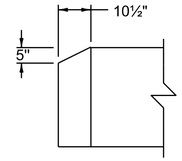

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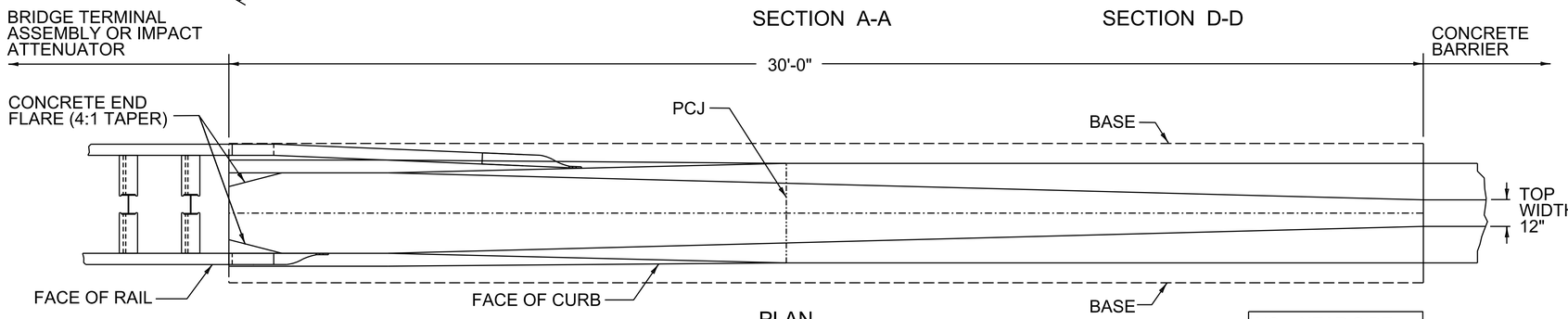
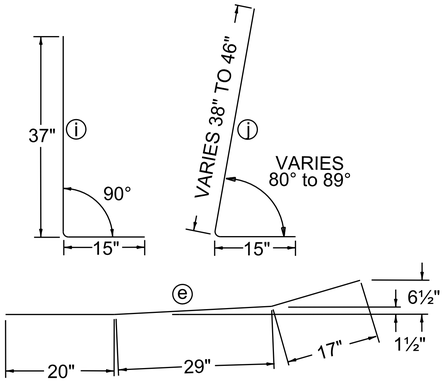
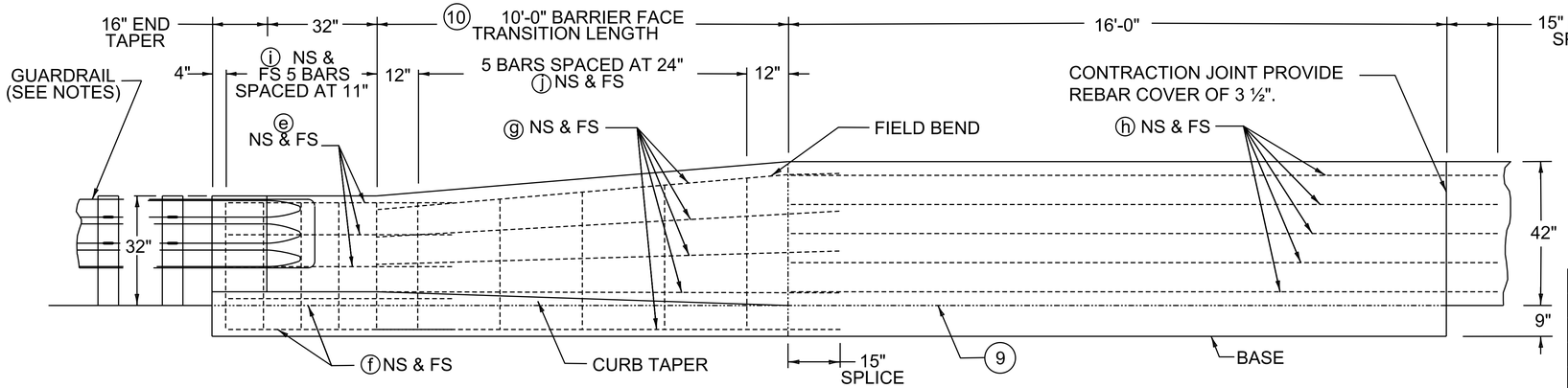


PLAN
(REINFORCING NOT SHOWN)

NS = NEAR SIDE
FS = FAR SIDE



BENDING DIAGRAMS



ELEVATION
BARRIER END SECTION TYPE B

TYPE B STEEL LIST				
MARK	BAR	SHAPE	NO.	LENGTH
ⓔ	#5	BENT	6	5'-6"
ⓕ	#5	STRAIGHT	4	5'-6"
ⓖ	#5	STRAIGHT	10	11'-1"
ⓗ	#5	STRAIGHT	10	17'-2"
ⓘ	#6	BENT	10	4'-2"
ⓙ	#6	BENT	2 SERIES OF 5	VARIES 4'-3" TO 5'-3"

~NOTES~
SEE CURRENT SHEET, SHEET 005, FOR ALL NOTES

USE WITH CURRENT SHEET, SHEET 005.

REVISION DATE: 08/11/2025
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BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

CONCRETE BARRIER WALLS

SHEET 004B: CONCRETE MEDIAN BARRIER TL3 42 IN END SECTIONS

STANDARD DRAWING NUMBER
RBM-135

~ NOTES ~

1. THE CONTRACT UNIT PRICE SHALL INCLUDE ALL MATERIALS, TOOLS, 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) Y=2'-0" FOR CRASH CUSHION TYPE VI, AND Y=1'-6" FOR GUARDRAIL CONNECTOR TO CONCRETE MEDIAN BARRIER END.

(6) USE CONCRETE END FLARE DETAIL "A" FOR VALTIR'S QUADGUARD CRASH CUSHION ALTERNATE. ALL OTHER CONNECTIONS REQUIRE A SQUARE NOSE.

(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.

8. THIS END SECTION IS TO BE USED IN MEDIAN APPLICATIONS WHEN TRAFFIC IS ON BOTH SIDES AND ATTACHES TO A SINGLE SLOPE BARRIER. PROVIDE 2" CONCRETE COVER OVER REBARS, UNLESS SPECIFIED ELSEWISE.

(9) PCJ: PERMISSABLE CONSTRUCTION JOINT. IN THE UNREINFORCED BASE SECTIONS, BARRIER MAY BE PLACED ON TOP OF CONCRETE BASE IF DOWELED.

(10) TO PREVENT VEHICLE SNAGGING IN BARRIER FACE TRANSITIONS, SMOOTH TRANSITIONS FROM VERTICAL FACES TO THE SINGLE SLOPE FACES ARE MADE OVER A 10' DISTANCE.

BID ITEMS AND UNIT TO BID

STEEL REINFORCEMENT	LB
CONCRETE-CLASS AA	CUYD

USE WITH CURRENT SHEETS, SHEETS 004A AND 004B.

REVISION DATE: 08/11/2025
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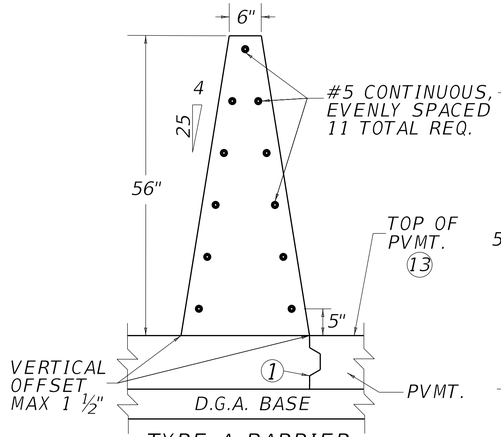
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

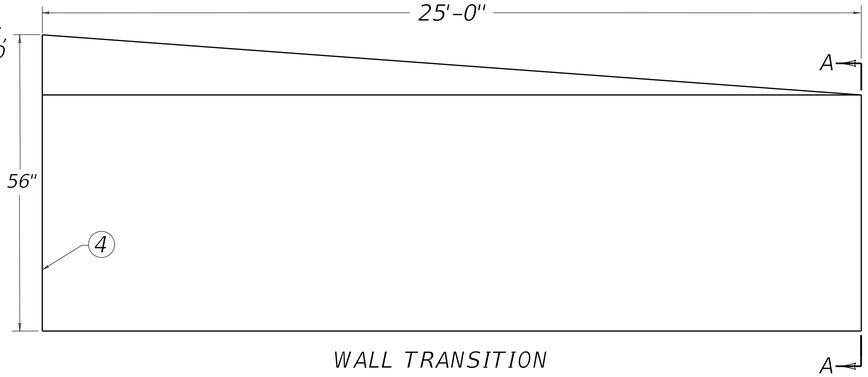
CONCRETE BARRIER WALLS

SHEET 005: CONCRETE MEDIAN BARRIER TL3 42 IN END SECTIONS NOTES

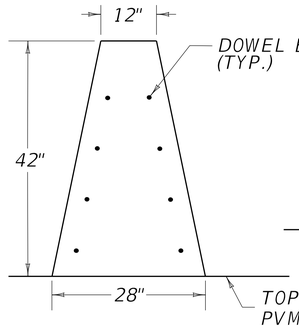
STANDARD DRAWING NUMBER
RBM-135



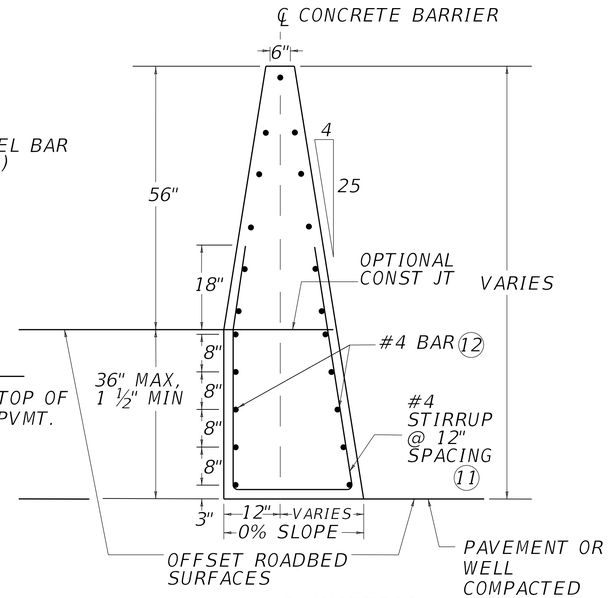
TYPE A BARRIER
(ROADWAY)



WALL TRANSITION
(ELEVATION VIEW)

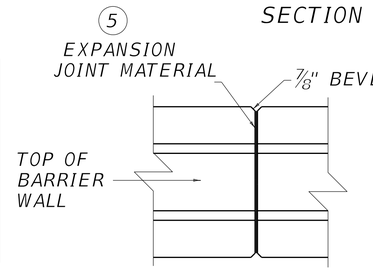


SECTION A-A



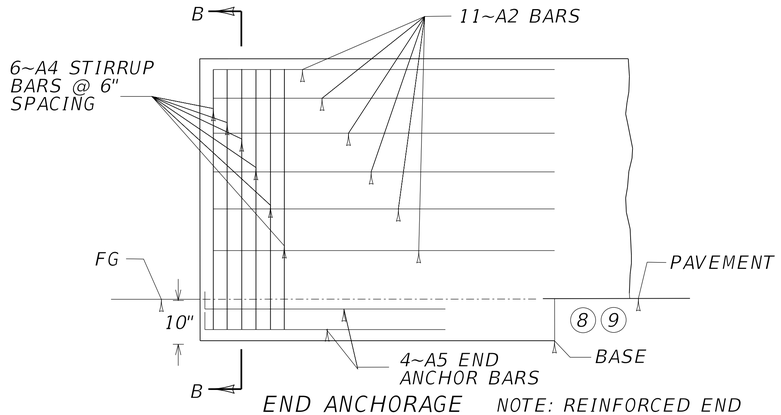
ASYMMETRICAL
WALL SECTION

BILL OF REINFORCEMENT									
MARK	NO.	SIZE	LENGTH	LOCATION	A	B	C	D	E
A1	8	5	3'- 0"	DOWELS					
A2	11	5	24'- 8"	LONGITUDINAL					
A3	6	4	9'- 3"	STIRRUP AT 42" END	2'- 0"	0'-7½"	3'- 0"	3'-0⅝"	0'-6⅞"
A4	6	4	11'- 3"	STIRRUP AT 56" END	1'- 8"	0'-7½"	4'- 2"	4'-2⅝"	0'- 8"
A5	8	5	5'- 5"	END ANCHORS	0'- 6"	5'- 0"			



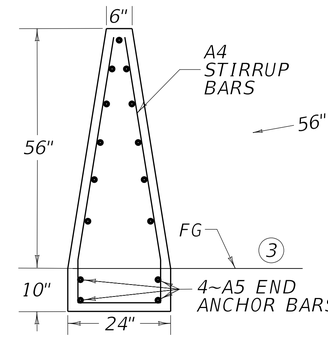
EXPANSION JOINT DETAIL

QUANTITIES 13	
CONCRETE	7 C.Y.
STEEL	440 LBS.

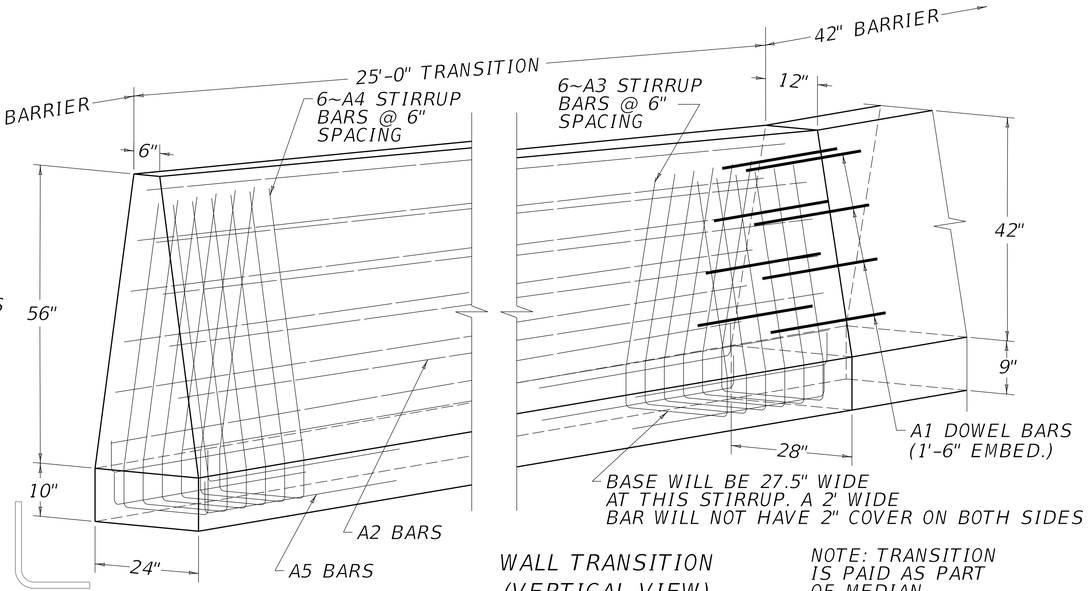


END ANCHORAGE

NOTE: REINFORCED END ANCHORAGES ARE REQUIRED AT THE ENDS OF CONCRETE BARRIER RUNS. SEE ALL END ANCHORAGE NOTES IN NOTES ⑧ AND ⑨.



SECTION B-B

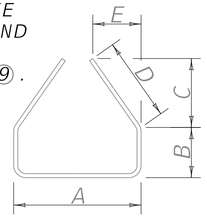


WALL TRANSITION
(VERTICAL VIEW)

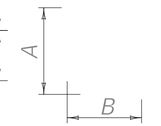
NOTE: TRANSITION IS PAID AS PART OF MEDIAN BARRIER TL5 56 IN

~NOTES~
SEE CURRENT SHEET, SHEET 007, FOR ALL NOTES

USE WITH CURRENT SHEET, SHEET 007.



A3 AND A4 BARS



A5 BARS

REVISION DATE: 08/11/2025
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BARRIERS

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

~ NOTES ~

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

3. FOOTING CAN BE MONOLYTHICALLY POURED OR DOWELED WITH 2-#8 X 8" @ 2'-0" SPACING. THE FOOTING IS REQUIRED AT CONCRETE BARRIER ENDS.

4. SEE TYPE "A" OR "B" BARRIER DETAIL FOR WALL DIMENSIONS. SEE BRIDGE DRAWINGS FOR TYPE "B", WHEN APPLICABLE.

5. TRANSVERSE EXPANSION JOINTS SHALL BE INSTALLED PER STANDARD SPECIFICATONS FOR ROAD AND BRIDGE CONSTRUCTION.

6. CONSTRUCT USING CONCRETE CLASS AA WITH A STRENGTH OF 4000 PSI.

7. CONSTRUCT USING EPOXY COATED REINFORCEMENT THROUGHOUT WHEN MEDIAN BARRIER IS INSTALLED ON A STRUCTURE.

8. REINFORCED END ACHORAGES ARE REQUIRED AT THE ENDS OF CONCRETE BARRIER RUNS. CONSTRUCT THE LAST 10' USING THE END ANCHORAGE DETAIL AS SHOWN HERE. AT EXPANSION JOINTS, CONSTRUCT AN END ANCHORAGE ON BOTH SIDES OF JOINT, WITH A MAX GAP OF 2" FOR THE OPEN JOINT. THE MAX EXPANSION JOINT SPACING SHALL BE 800'. THIS ANCHORAGE IS NOT NEEDED AT CONSTRUCTION JOINTS; PROVIDE DOWEL BAR CONNECTIONS INSTEAD.

9. WHEN SPLICED, LAP #5 CONTINUOUS BARS 2'-5" MINIMUM. PROVIDE 2" CLEAR COVER TO REINFORCEMENT AT ALL LOCATIONS.

10. THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE MEDIAN BARRIER SHALL BE FULL COMPENSATION FOR ALL MATERIALS (INCLUDING ALL REINFORCING STEEL), EQUIPMENT, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

11. REINFORCING STIRRUP NOT REQUIRED FOR OFFSETS LESS THAN 1'-0".

12. ROADBED SURFACES OFFSET (RANGES)

    1 ½" TO 3" – NO ADDITIONAL REINFORCEMENT IS REQUIRED.

    3" < 8" – USE 2, #4 BARS AT 3" ABOVE THE LOWER ROADBED SURFACE.

    8" ≤ 12" – USE 2, #4 BARS AT 3" ABOVE THE LOWER ROADBED SURFACE AND 2, #4 BARS AT 8" ABOVE THE LOWER ROADBED SURFACE.

    12" ≤ 36"– USE 2, #4 BARS AT 3" ABOVE THE LOWER ROADBED SURFACE AND 2, #4 BARS AT EVERY 8" INCREMENT VERTICAL SPACING ABOVE THE FIRST 2 BARS.

13. CONCRETE OF THE SINGLE SLOPE BARRIER WALL MAY EXTEND INTO PAVEMENT LAYERS FOR CONSTRUCTIBILITY (KEYED-IN). THE CONCRETE QUANTITY PRESENTED IN THE TABLE ON SHEET 006 IS FOR THE TOP OF PAVEMENT OPTION. DEPTH INTO PAVEMENT CAN BE VARIABLE.

BID ITEM AND UNIT TO BID

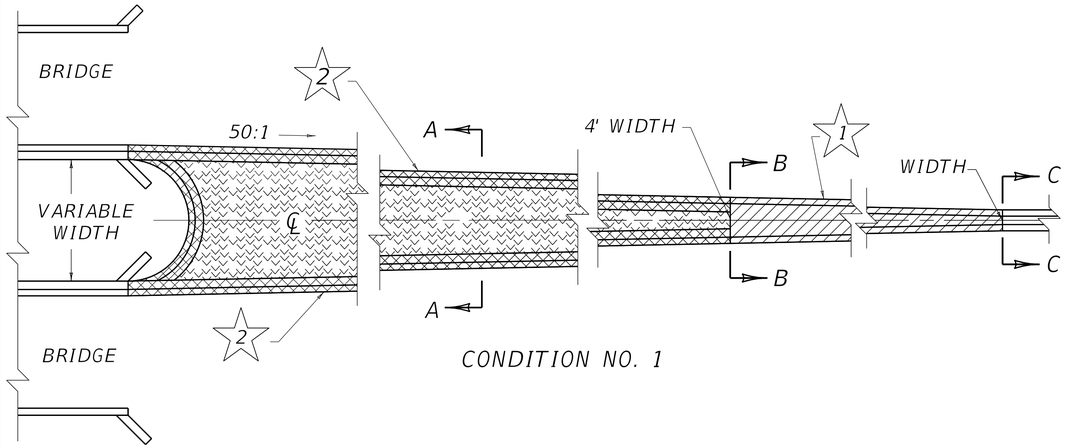
CONC MEDIAN BARRIER TYPE ⊕ TL5 56 IN LF

⊕ A OR B DEPENDING ON LOCATION.

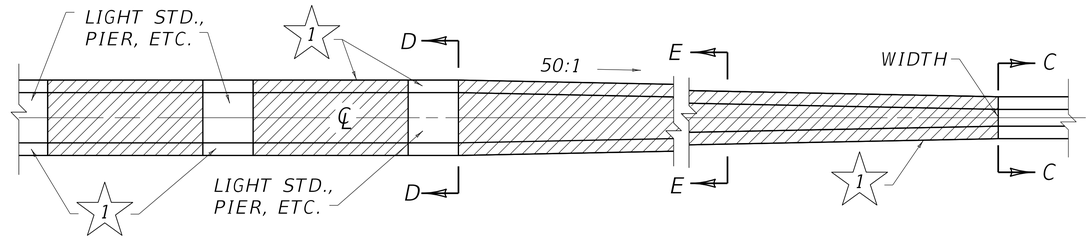
USE WITH CURRENT SHEET, SHEET 006.

BARRIERS

OpenRoads Designer v23.00.01.11 USER: matthew.sipes FILE NAME: C:\KYTC_STANDARDS\ORGANIZATION-CIVIL\KYTC_STANDARDS_OC_KYTC\DGNLIB\SHEET SEEDS\KYTC STANDARDS BORDER SEED.DGNLIB



CONDITION NO. 1



CONDITION NO. 2

~ 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. WEEP HOLES ARE INCIDENTAL TO THE BID ITEM.

3. FOR DETAILS PRETAINING TO ROADWAY OR BRIDGE APPLICATIONS, SEE CURRENT BRIDGE DRAWING. THE METHOD OF MEASUREMENT FOR CONCRETE MEDIAN BARRIER FOR EACH TYPE WILL BE IN LINEAR FEET MEASURED ALONG THE TOP CENTERLINE OF THE BARRIER.

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.

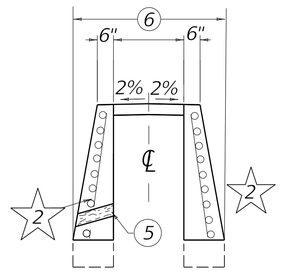
7. CONSTRUCT USING CONCRETE CLASS AA WITH A STRENGTH OF 4000 PSI.

BID ITEM AND UNIT TO BID

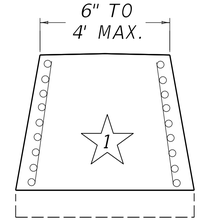
CONCRETE MEDIAN BARRIER TYPE ☆ TL5 56" TALL WALL LF

☆ 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

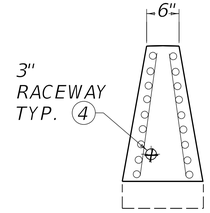
USE WITH CURRENT SHEET, SHEET 006.



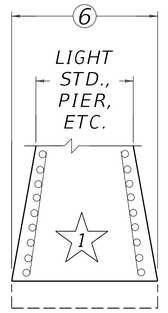
SECTION A-A



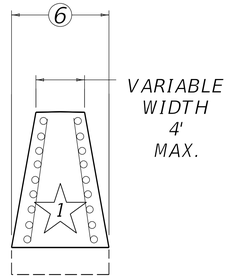
SECTION B-B



NORMAL SECTION
SECTION C-C



SECTION D-D



SECTION E-E

REVISION DATE: 08/11/2025
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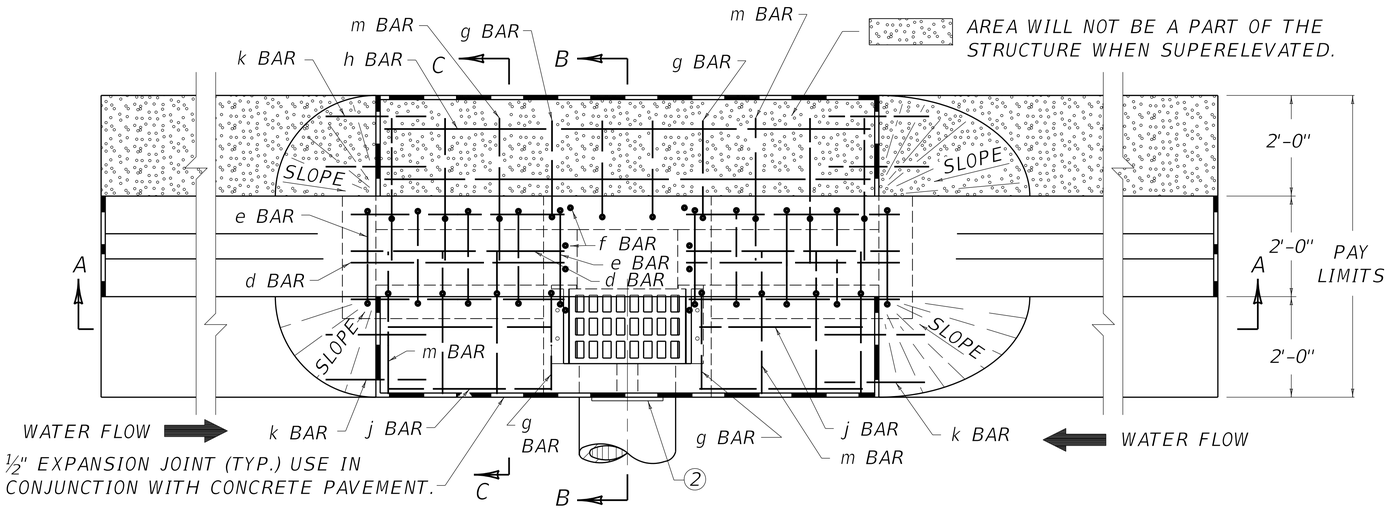
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

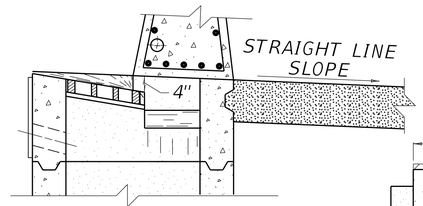
CONCRETE BARRIER WALLS

SHEET 008: CONCRETE MEDIAN BARRIER TL5 56 IN HORIZONTAL TRANSITIONS.

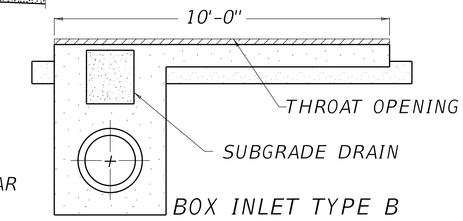
STANDARD DRAWING NUMBER
RBM-135



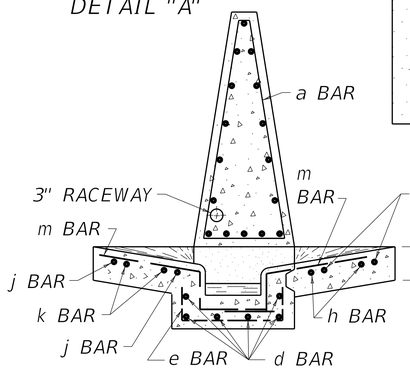
PLAN VIEW (BOX INLET TYPE A)



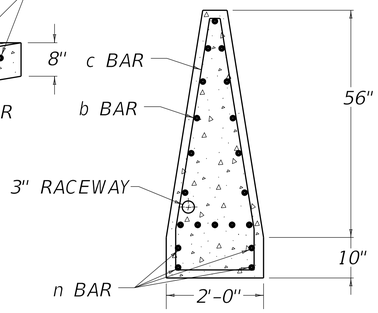
DETAIL "A"



BOX INLET TYPE B



SECTION C-C



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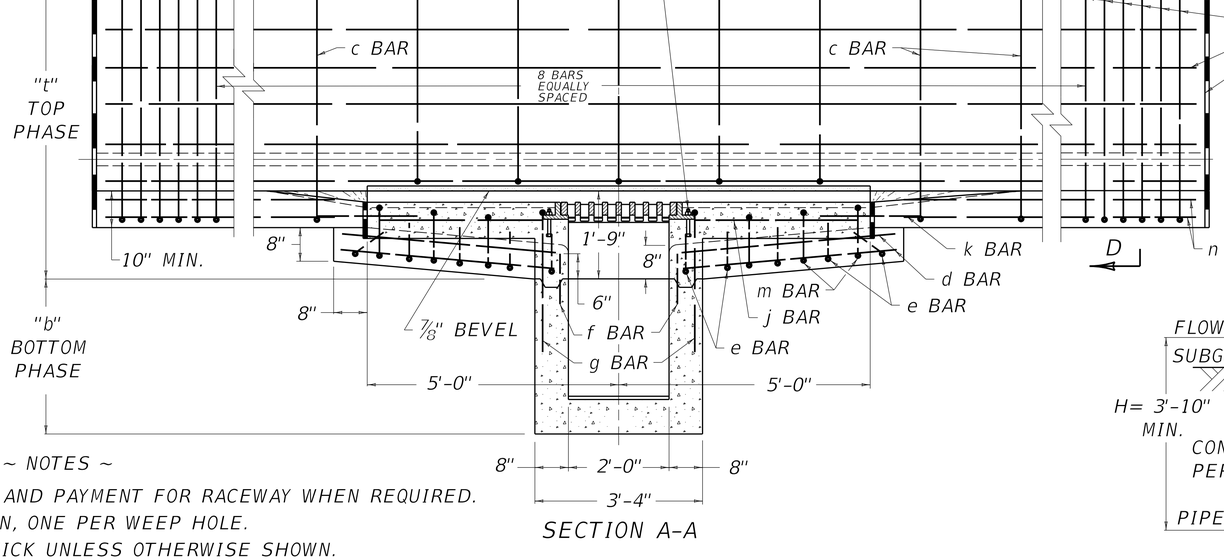
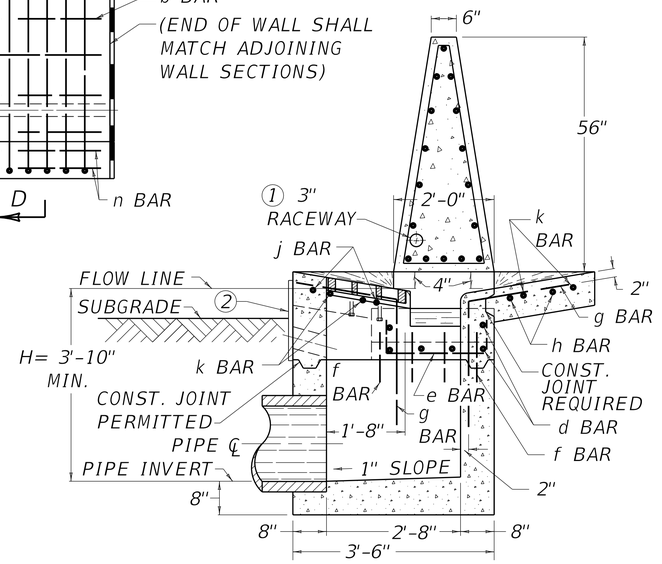


SECTION A-A



SECTION B-B

~ 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.
5. WALL REINFORCEMENT IS DETAILED FOR CAST-IN-PLACE WALLS AND SLIP FORMED WALLS. SEE CURRENT SHEET, SHEET 006 , FOR STEEL DETAIL.
6. DETAIL "A" SHOWS BOX INLET AND THE 25' CONCRETE MEDIAN BARRIER IN SUPERELEVATION.
7. PLAN VIEW DOES NOT SHOW STEEL REINFORCEMENT IN THE CONCRETE MEDIAN BARRIER.

USE WITH CURRENT SHEETS, SHEET 006 AND SHEET 010.

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APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

CONCRETE BARRIER WALLS

SHEET 009: CONCRETE MEDIAN BARRIER BOX INLET TL5 56 IN

STANDARD DRAWING NUMBER
RBM-135

REINFORCEMENT BARS FOR BOX INLET

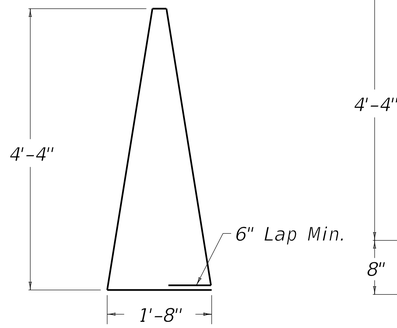
BAR	BOX TYPE							
	A1	A2	A1	A2	B1	B2	B1	B2
	QTY.		LENGTH		QTY.		LENGTH	
e	10		3'-3"		9		3'-3"	
d	12		4'-3"		6		7'-5"	
f	8		1'-0"		8		1'-0"	
g	2	6	4'-6"		1	5	4'-6"	
h	0	2	0	9'-8"	0	2	0	9'-8"
j	4		3'-3"		2		7'-0"	
k	4	8	2'-0"		4	8	2'-0"	
m	6	12	4'-1"		6	12	4'-1"	

APPROX. QUANTITIES FOR INLET

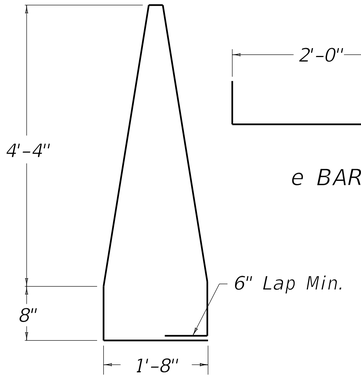
TYPE	CLASS "A" CONC.	STEEL
	CU. YDS.	LBS.
A1	3.96	153
A2	3.96	226
B1	3.89	139
B2	3.89	212

APPROX. QTYS. FOR 25' CONC. MEDIAN BARRIER (8)

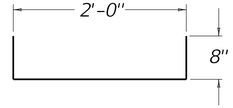
BAR a		BAR b		BAR c		BAR n		STEEL	CONC.
QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH	LBS.	CU. YDS.
5	11'-6"	16	24'-8"	16	13'-2"	8	7'-2"	753	6.33



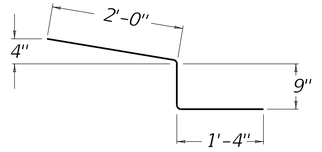
a BAR



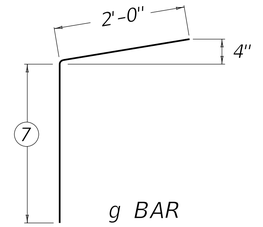
c BAR



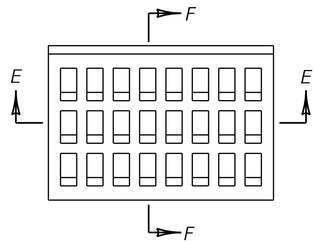
e BAR



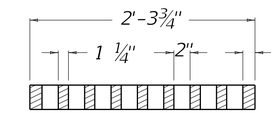
m BAR



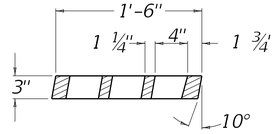
g BAR



GRATE PLAN VIEW



SECTION E-E



SECTION F-F

~ NOTES ~

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 CURRENT SHEET, SHEET 006 , 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 AND CONCRETE QUANTITIES ARE FOR BOTH CAST-IN-PLACE AND SLIP FORM WALL.

BID ITEM AND UNIT TO BID

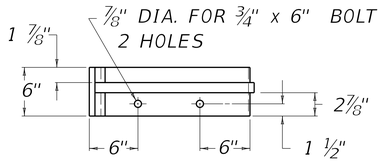
CONC. MED BARR BOX INLET TY ⊗ ⊕ △ TL5 56" TALL WALL EACH

⊗ = "A" FOR SAG VERTICALS, "B" FOR STRAIGHT GRADE

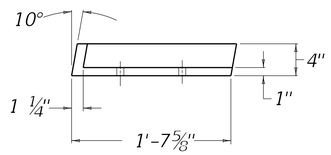
⊕ = 1 FOR OPENING ON ONE SIDE OF BOX INLET, 2 FOR OPENING ON BOTH SIDES OF BOX INLET

△ (b) = BOTTOM PHASE, (†) = TOP PHASE
~NO (b) OR (†) SUFFIX PRESENT INDICATES COMPLETE INLET~

USE WITH CURRENT SHEETS, SHEET 006 AND SHEET 009.



FRAME PLAN VIEW (LEFT HALF)



FRAME ELEVATION

REVISION DATE: 08/11/2025
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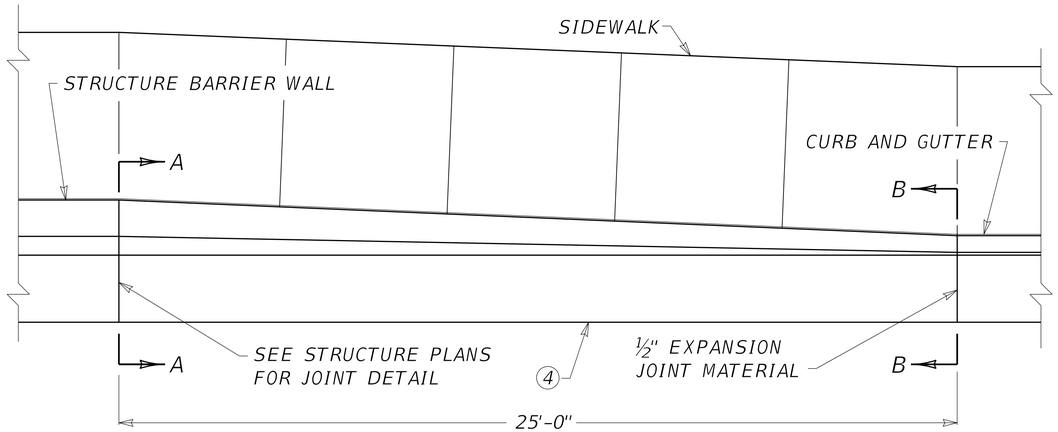
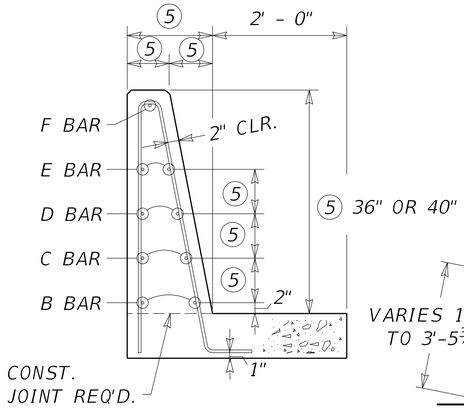
SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

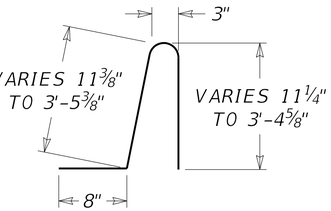
BARRIERS



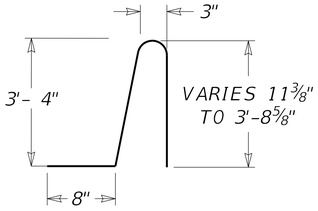
PLAN VIEW



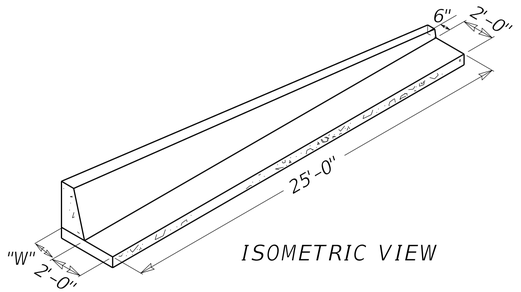
SECTION A-A



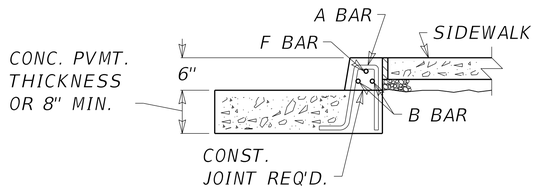
A BAR (36")



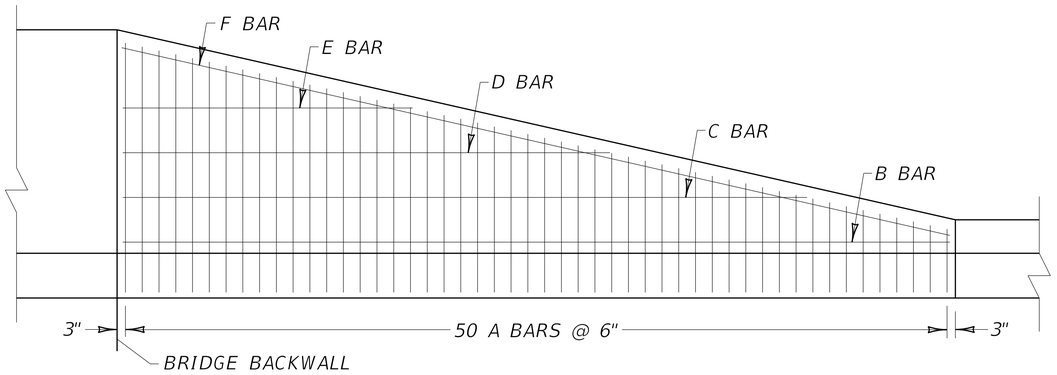
A BAR (40")



ISOMETRIC VIEW



SECTION B-B



ELEVATION VIEW

~ NOTES ~

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 7½" WIDE TOP IS APPROXIMATELY 3.2 CU. YDS. (36") & 3.4 CU. YDS. (40")

(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. REFER TO BHS-009 AND BHS-010 .

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

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

USE WITH CUR. STD. DWGS. RPS-010, BHS-009, BHS-010

BILL OF REINFORCEMENT (40")				
BAR	QTY.	SIZE	LENGTH	TOTAL LBS. OF STEEL
A	50	4	Varies	290
B	2	4	24'-8"	
C	2	4	20'-5"	
D	2	4	14'-6"	
E	2	4	8'-7"	
F	1	4	24'-10"	

BILL OF REINFORCEMENT (36")				
BAR	QTY.	SIZE	LENGTH	TOTAL LBS. OF STEEL
A	50	4	Varies	273
B	2	4	24'-8"	
C	2	4	19'-10"	
D	2	4	13'-2"	
E	2	4	6'-5"	
F	1	4	24'-9"	

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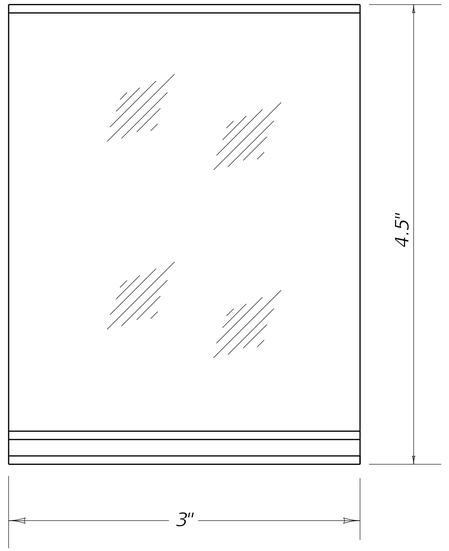
BARRIERS

OpenRoads Designer v23.00.01.11 USER: matthew.sipes FILE NAME: C:\KYTC_STANDARDS\ORGANIZATION-CIVIL\KYTC_STANDARDS_OC_KYTC\DGNLIB\SHEET SEEDS\KYTC STANDARDS BORDER SEED.DGNLIB

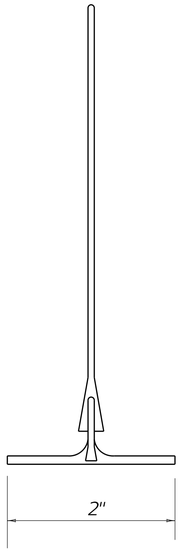
APPROXIMATE DELINEATOR SPACING	
TANGENT-RAMPS	100'
TANGENT	200-530'
CURVE	50'

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

CURVE SPACING IS A FUNCTION OF CURVE RADIUS AND IS FOUND IN TABLE 2F-1 OF THE MUTCD.



FRONT ELEVATION



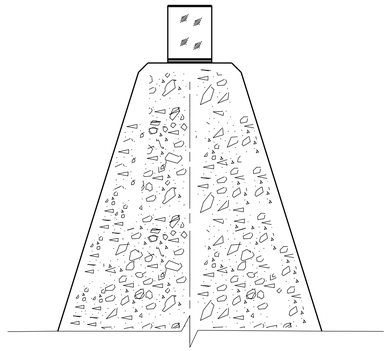
SIDE ELEVATION

~ NOTES ~

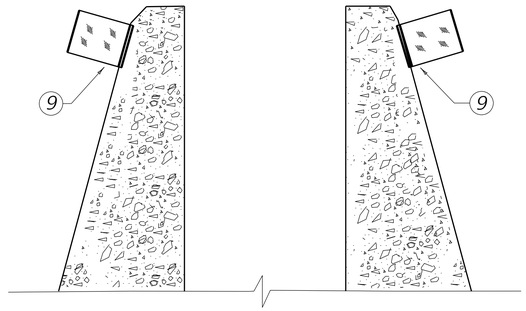
1. BARRIER WALL DELINEATORS SHALL BE REQUIRED ON ALL BARRIER WALLS.
2. DELINEATORS SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR ONE COMPLETE INSTALLATION.
3. THE COLOR OF DELINEATORS SHALL MATCH THE COLOR OF THE EDGELINE THAT 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. KYTC STANDARD SPEC 508.02.10, DELINEATORS FOR BARRIERS, STATES TO USE STIMSONITE MARKER 962, AKT CORPORATION MARKER NO. 181, OR A DEPARTMENT APPROVED EQUAL.
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.
11. IF BARRIER WALL IS PRESENT AT OFF RAMPS, THE BACKSIDE OF THE DELINEATOR SHOULD BE RED RETROREFLECTIVE SHEETING. RED SHEETING ON THE BACK SIDE CAN BE USED IN ANY SITUATION TO DISCOURAGE WRONG WAY DRIVING.

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



NORMAL (SOLID) WALL SECTION (10)



(SEPARATE SEGMENT) WALL SECTION

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

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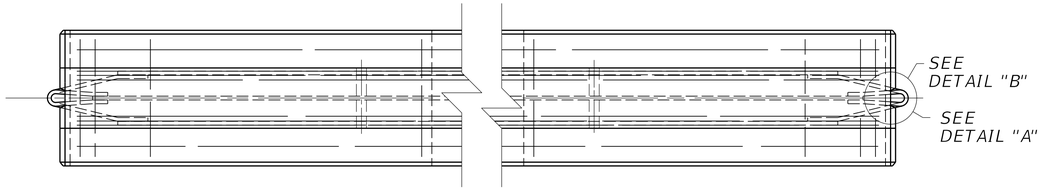
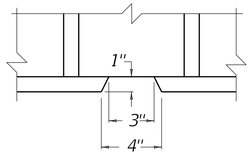
APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

BARRIERS

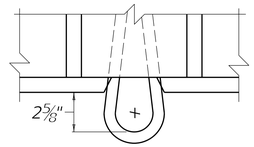
OpenRoads Designer v23.00.01.11 USER: matthew.sipes FILE NAME: C:\KYTC_STANDARDS\ORGANIZATION-CIVIL\KYTC_STANDARDS_OC_KYTC\DGNLIB\SHEET SEEDS\KYTC STANDARDS BORDER SEED.DGNLIB



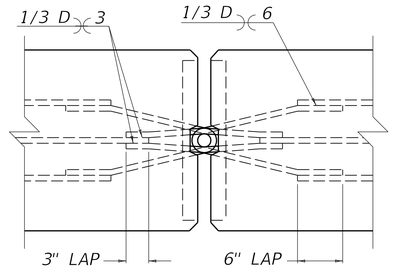
PLAN VIEW



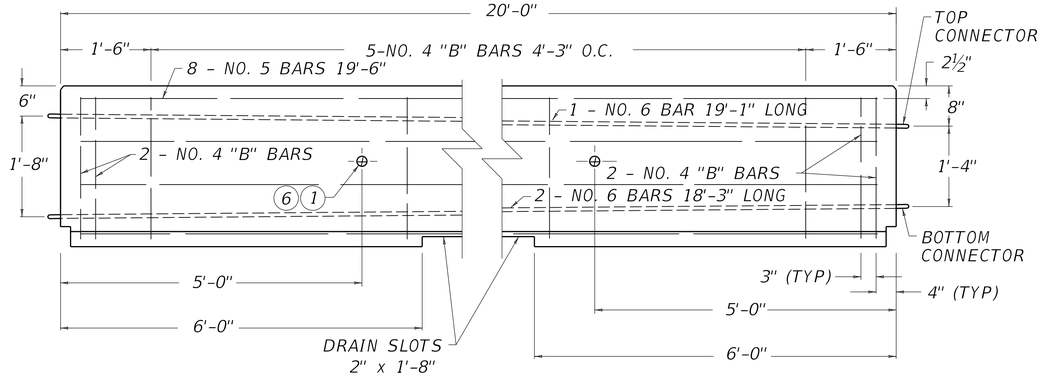
DETAIL "A"



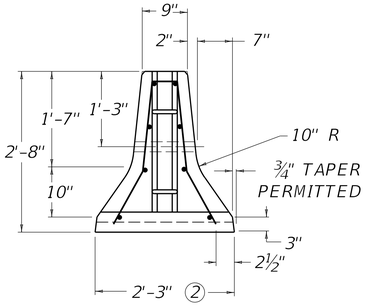
DETAIL "B"



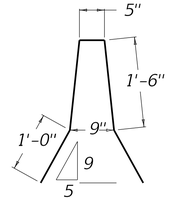
PLAN OF CONNECTION DETAIL



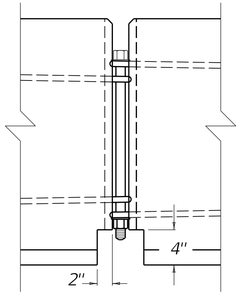
ELEVATION VIEW



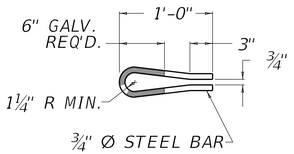
RIGHT ELEVATION VIEW



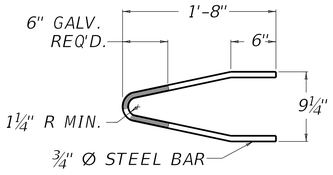
DETAIL OF
"B" BAR



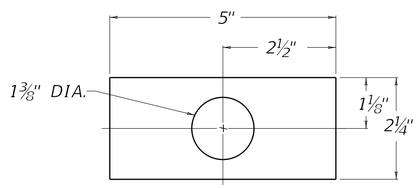
ELEVATION OF
CONNECTON DETAIL



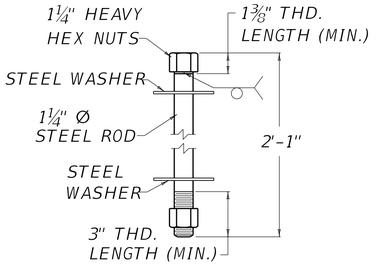
TOP CONNECTOR
(HOT DIP GALVANIZE
AFTER FORMING)



BOTTOM CONNECTOR
(HOT DIP GALVANIZE AFTER FORMING)



½" THICK STEEL WASHER



CONNECTOR PIN

APPROXIMATE QUANTITIES

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

~ NOTES ~

1. 2" DIA. LIFTING HOLE - 2 REQUIRED FOR EACH SECTION. FORMED WITH 2" P.V.C. PIPE OR EQUAL.
2. TAPER NOT INCLUDED IN BASE WIDTH.
3. SHOP DRAWINGS SHALL BE APPROVED PRIOR TO MANUFACTURE.
4. 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. LIFTING BARS SHALL BE REQUIRED TO PREVENT SPALLING OF CONCRETE AROUND HOLES.
7. PREVIOUS WALL MANUFACTURED ACCORDING TO STANDARD DRAWING RBM-115 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.

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

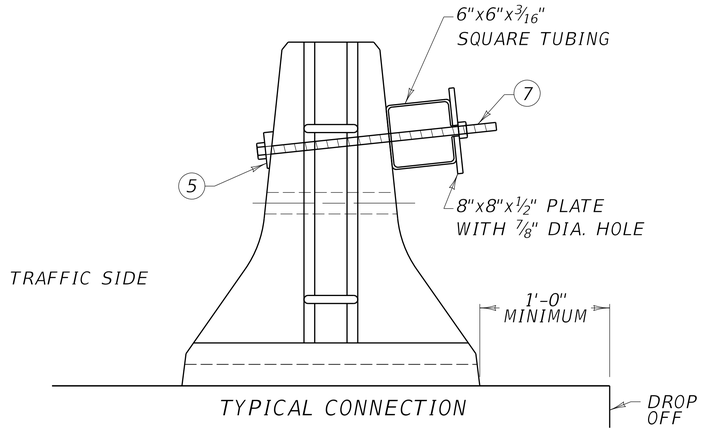
USE WITH CUR. STD. DWG. RBM-120

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

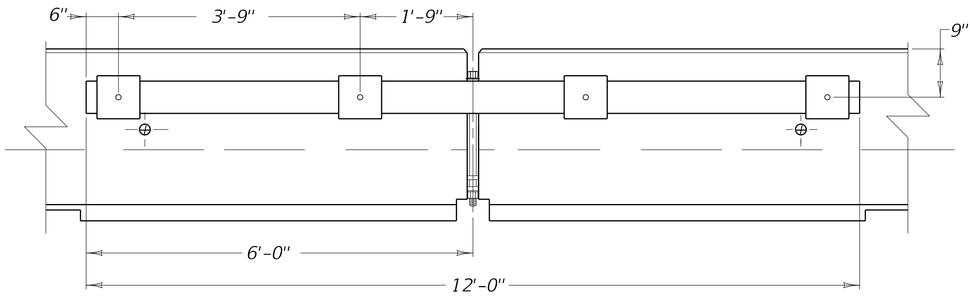
SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

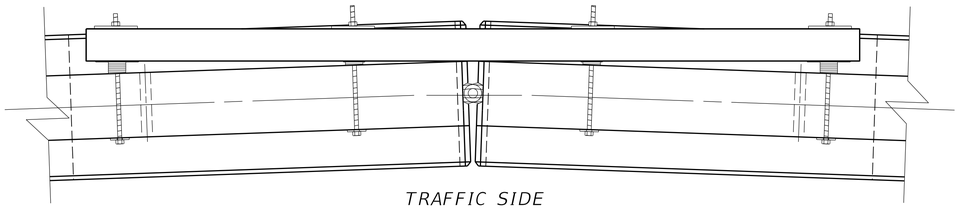
BARRIERS



TYPICAL CONNECTION

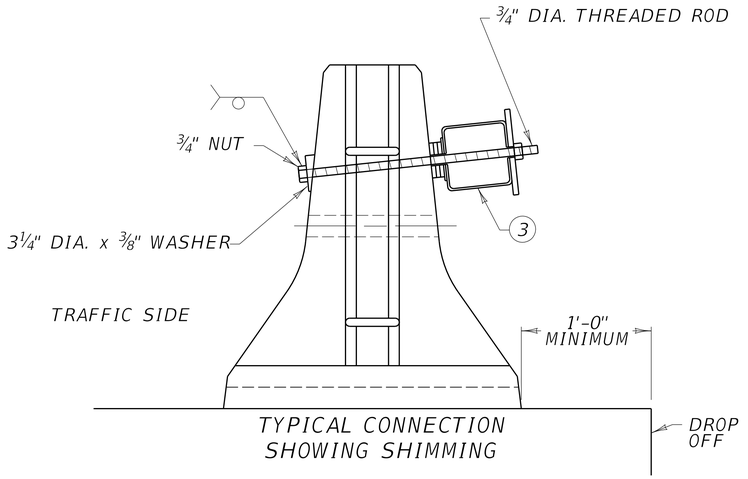


ELEVATION VIEW

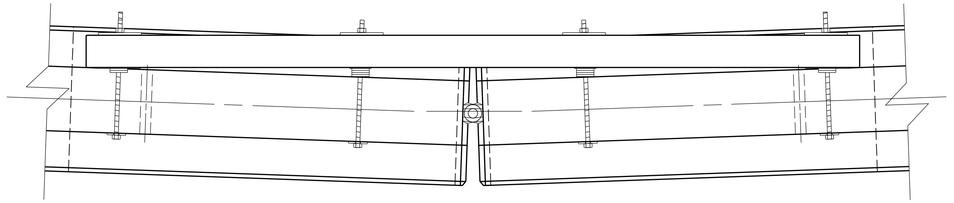


TRAFFIC SIDE

PLAN VIEW



TYPICAL CONNECTION SHOWING SHIMMING



TRAFFIC SIDE

PLAN VIEW

~ 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. MAINTAIN 1'-0" MINIMUM FROM EDGE OF BARRIER TO DROP OFF.
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

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BARRIERS

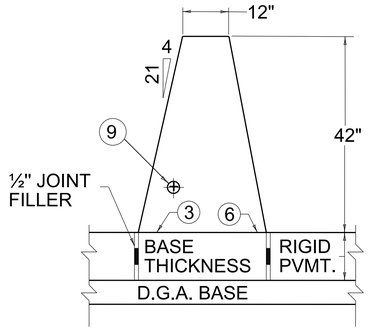
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

CONCRETE BARRIER WALLS

SHEET 014: BOX BEAM STIFFENING PF TEMPORARY CONCRETE BARRIER

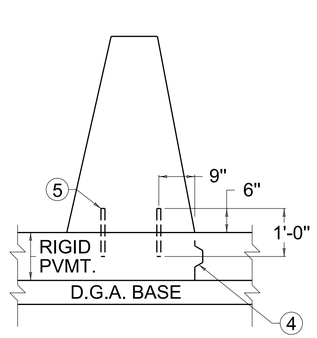
STANDARD DRAWING NUMBER
RBM-135

TYPE A

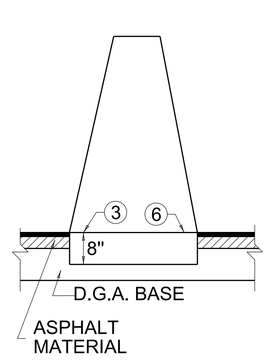


NEW RIGID PAVEMENT

TYPE B

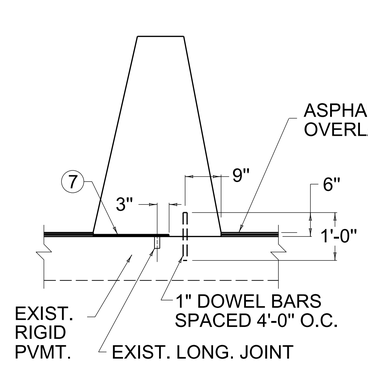


TYPE C



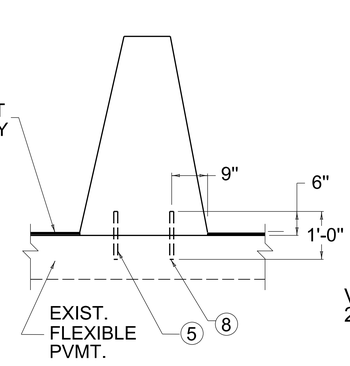
NEW FLEXIBLE PAVEMENT

TYPE D

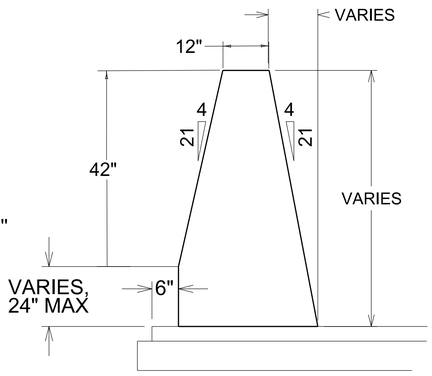


NEW FLEXIBLE OVERLAY OVER EXISTING RIGID PAVEMENT

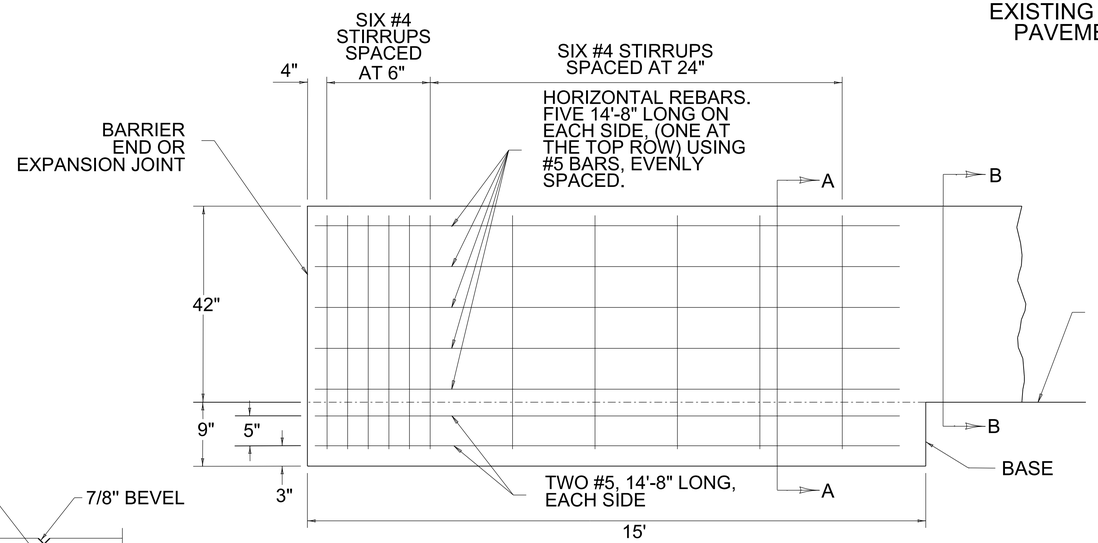
TYPE E



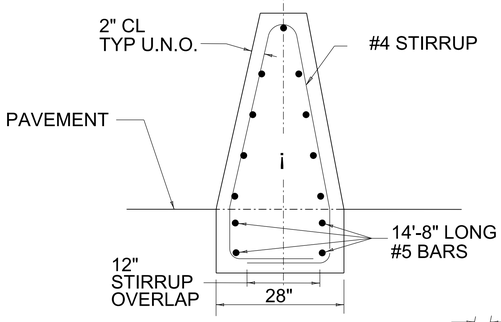
NEW FLEXIBLE OVERLAY OVER EXISTING FLEXIBLE PAVEMENT



ASYMMETRICAL WALL SECTION

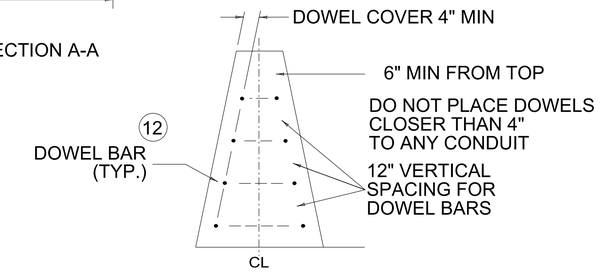


ELEVATION VIEW



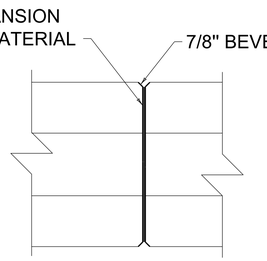
SECTION A-A

END ANCHORAGE (11)



DOWEL BAR PLACEMENT

SECTION B-B
CONSTRUCTION JOINT
DOWEL BAR
PLACEMENT



EXPANSION JOINT DETAIL

APPROXIMATE QUANTITIES PER LINEAR FOOT

TYPE	CONC.- CUYD	STEEL - LBS
A	0.28	▲ 1.34
B	0.22	1.34
C	0.28	▲ 1.34
D	0.22	0.67
E	0.22	1.34

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

▲ WHEN REQUIRED

~ NOTES ~

SEE CURRENT SHEET, SHEET 002, FOR ALL NOTES.
USE WITH CURRENT SHEET, SHEET 002.

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

BARRIERS

~ NOTES ~

1. FOR WALLS IN TRANSITION AND SEPARATE SEGMENT WALLS, SEE CURRENT SHEET, SHEET 003, FOR APPROPRIATE BID ITEMS.
2. THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE MEDIAN BARRIER SHALL BE FULL COMPENSATION FOR ALL MATERIALS (INCLUDING THE BASE IN TYPES A AND C AND ALL REINFORCING STEEL), 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 B 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. CONSTRUCTION JOINT PERMITTED WHEN FIXED FORMS OR SLIP FORMS ARE USED.

(5) 1" DOWEL BARS SPACED 4'-0" O.C. AND STAGGERED 2'-0".

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

(7) PAVEMENT SHALL BE DRILLED AND BARS GROUTED.

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

(9) 3" RACEWAY (TYPICAL) SEE ELSEWHERE IN THE PLANS FOR LOCATION AND PAYMENT FOR RACEWAY WHEN REQUIRED.

10. CONSTRUCT 42" CONCRETE MEDIAN BARRIER USING CONCRETE CLASS AA WITH A STRENGTH OF 4000PSI.

(11) REINFORCED END ANCHORAGES ARE REQUIRED AT THE ENDS OF CONCRETE BARRIER RUNS. CONSTRUCT THE LAST 15' USING THE END ANCHORAGE DETAIL AS SHOWN HERE. AT EXPANSION JOINTS, CONSTRUCT AN END ANCHORAGE ON BOTH SIDES OF JOINT, WITH A MAX GAP OF 2" FOR THE OPEN JOINT. THE MAX EXPANSION JOINT SPACING SHALL BE 800'. THIS ANCHORAGE IS NOT NEEDED AT CONSTRUCTION JOINTS.

(12) BARRIER RUNS WITH ABUTTING VERTICAL SURFACES AT EITHER REQUIRED OR PERMISSIBLE CONSTRUCTION JOINTS ARE TO BE DOWELED TO EACH OTHER BY USE OF 5" DIAMETER BY 18" LONG EPOXY COATED DEFORMED DOWEL BARS. BARS ARE TO BE PLACED AS SHOWN ON THE DOWEL BAR PLACEMENT DETAIL ON SEPIA 018. PROVIDE A 4" CLEARANCE TO BARRIER SURFACES AND TO ANY RACEWAYS. PAYMENT FOR DOWELS IS INCIDENTAL TO THE BID ITEM.

13. CONSTRUCT USING EPOXY COATED REINFORCEMENT THROUGHOUT WHEN MEDIAN BARRIER IS INSTALLED ON A STRUCTURE.

BID ITEMS AND UNIT TO BID

CONC MEDIAN BARRIER TYPE ⊕ TL3 42" LF

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

USE WITH CURRENT SHEETS, SHEET 001 AND SHEET 003.

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED DIVISION DIRECTOR 08-11-2025 DATE

APPROVED STATE HIGHWAY ENGINEER 08-11-2025 DATE

BARRIERS

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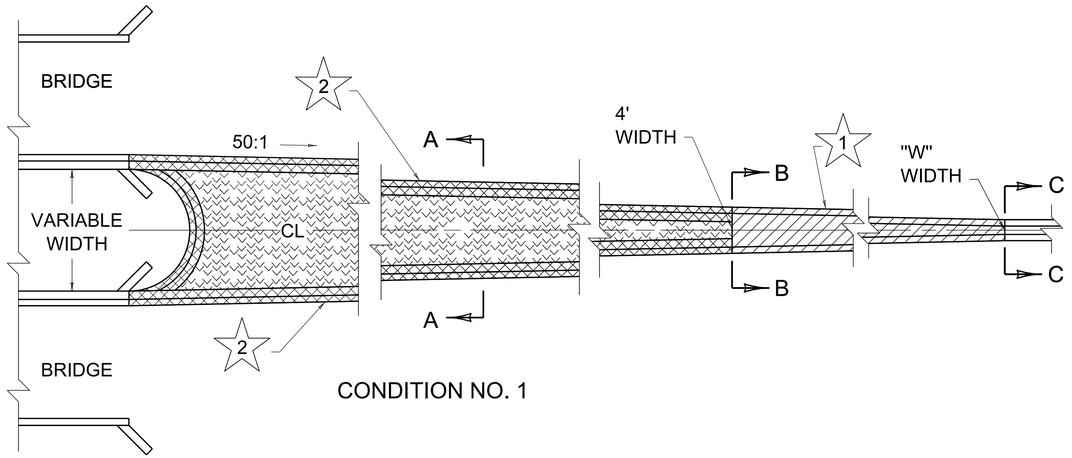
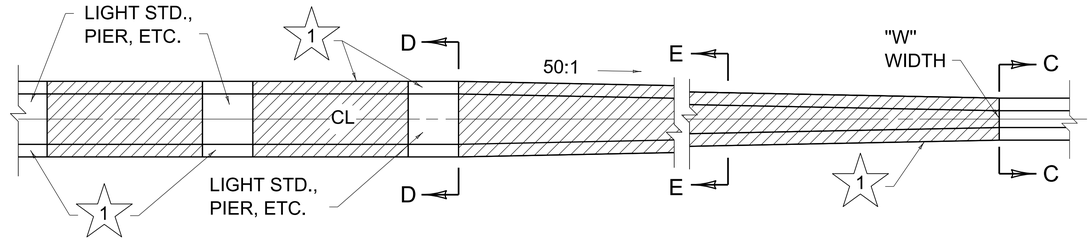


CONDITION NO. 1



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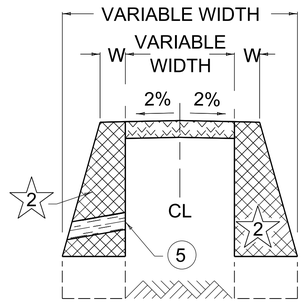
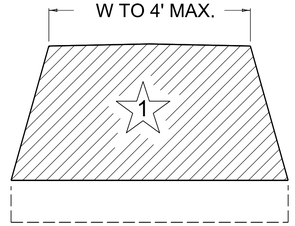
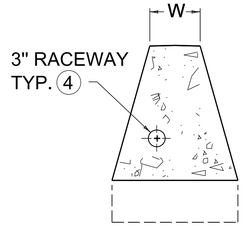


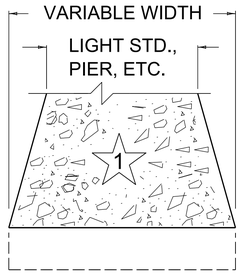
SECTION A-A



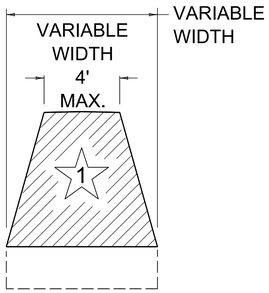
SECTION B-B



NORMAL SECTION
C-C



SECTION D-D



SECTION E-E

~ 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 TO NEW OR EXISTING PAVEMENT SEE CUR. SHEET, SHEET 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.

BID ITEMS AND UNIT TO BID

CONCRETE MEDIAN BARRIER TYPE ⊕ ☆	TL3 42"	LF

⊕ 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.

USE WITH CURRENT SHEET, SHEET 001.

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APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

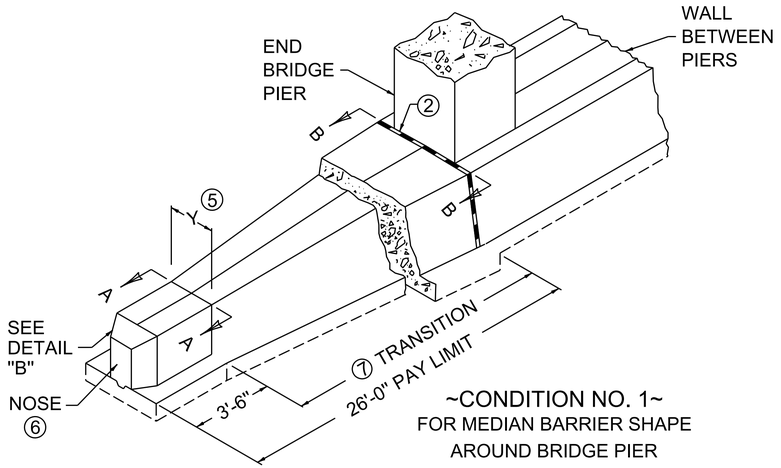
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY

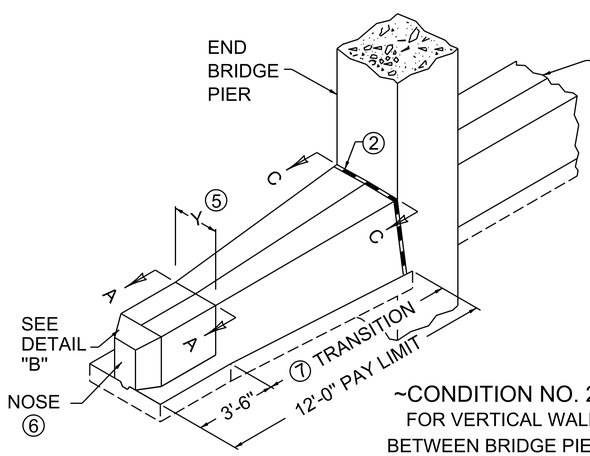
CONCRETE BARRIER WALLS

SHEET 003: CONCRETE MEDIAN BARRIER TL3 42 IN HORIZONTAL TRANSITIONS

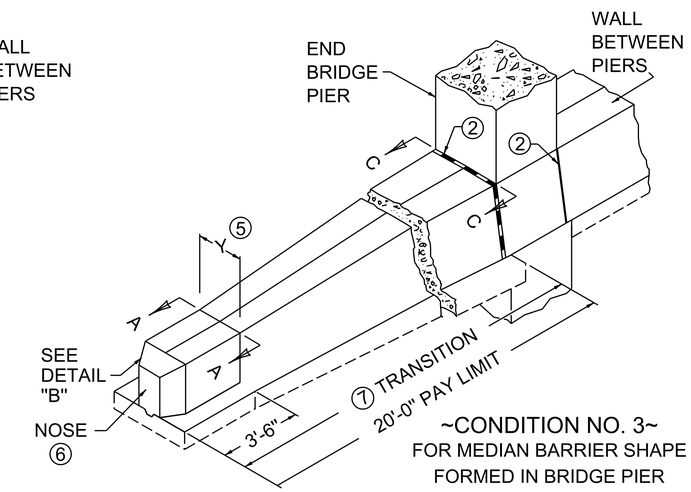
STANDARD DRAWING NUMBER
RBM-135



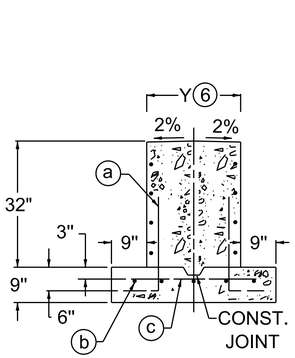
~CONDITION NO. 1~
FOR MEDIAN BARRIER SHAPE
AROUND BRIDGE PIER



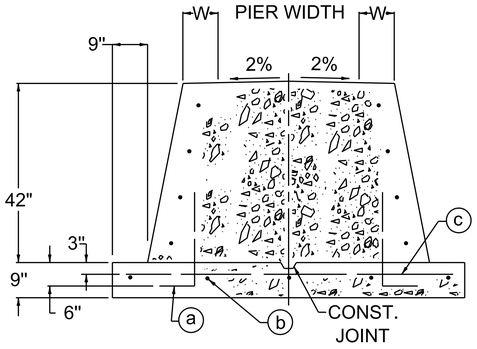
~CONDITION NO. 2~
FOR VERTICAL WALL
BETWEEN BRIDGE PIERS



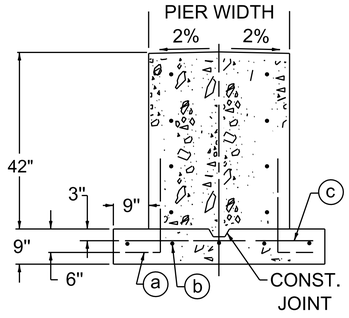
~CONDITION NO. 3~
FOR MEDIAN BARRIER SHAPE
FORMED IN BRIDGE PIER



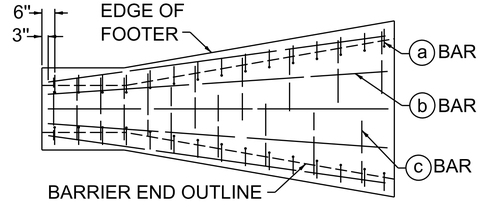
SECTION A-A



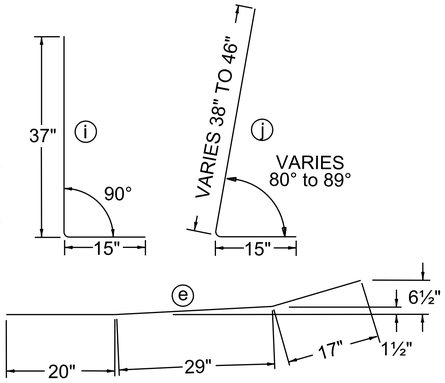
SECTION B-B



SECTION C-C



TYPICAL STEEL PLACEMENT



BENDING DIAGRAMS

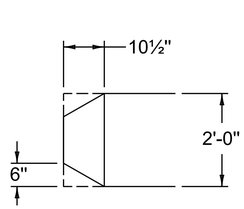
CONDITION NO.	W	NO. 5 STEEL REINFORCEMENT BARS										CUBIC YARD ④ CLASS "A" CONC.	
		BAR ⓐ		BAR ⓑ		BAR ⓒ Y=1'-6"			BAR ⓒ Y=2'-0"				
		QTY.	LGTH.	QTY.	LGTH.	QTY.	LGTH.	LBS.	QTY.	LGTH.	LBS.	Y=2'-0"	Y=1'-6" ⑤
1	6"	52	2'-9"	5	25'-8"	52	2'-8"	429	52	3'-2"	456	13.35	12.41
2	-	24			11'-8"	24		197	24		210	4.46	3.98
3	-	40			19'-8"	40		329	40		350	7.70	6.96

ⓓ SEE NOTE 7 ON SHEET 005 FOR LONGITUDINAL DOWELS

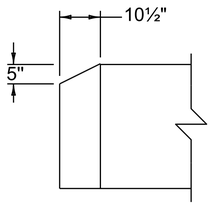
~NOTES~

SEE CURRENT SHEET, SHEET 005, FOR ALL NOTES.

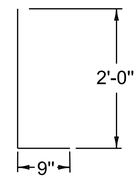
USE WITH CURRENT SHEET, SHEET 005.



DETAIL "A" ⑥



DETAIL "B"



BAR ⓐ

REVISION DATE: 08/11/2025
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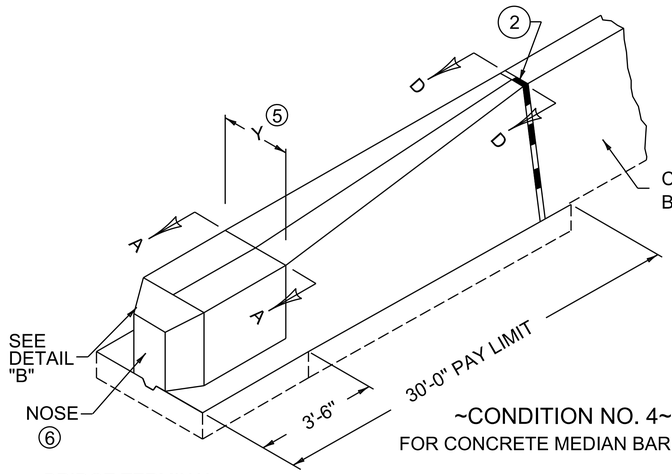
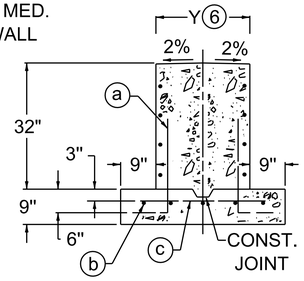
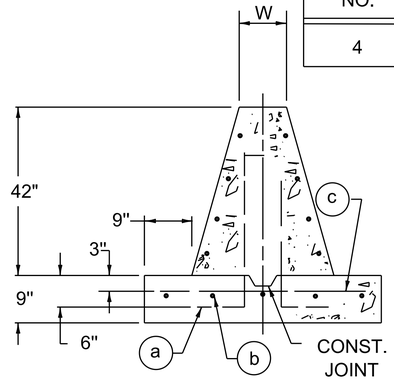
BARRIERS



~CONDITION NO. 4~
FOR CONCRETE MEDIAN BARRIER



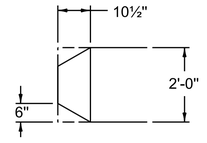
SECTION A-A



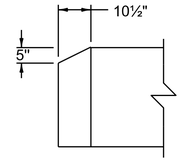
SECTION D-D

CONDITION NO.	NO. 5 STEEL REINFORCEMENT BARS											CUBIC YARD ④ CLASS "A" CONC.	
	W	BAR ⓐ		BAR ⓑ		BAR ⓒ Y=1'-6"			BAR ⓒ Y=2'-0"				
		QTY.	LGTH.	QTY.	LGTH.	QTY.	LGTH.	LBS.	QTY.	LGTH.	LBS.	Y=2'-0"	Y=1'-6"
4	12"	60	2'-9"	5	29'-8"	30	2'-8"	411	30	3'-2"	427	7.98	7.01

ⓓ SEE NOTE 7 ON SHEET 005 FOR LONGITUDINAL DOWELS



DETAIL "A" ⑤



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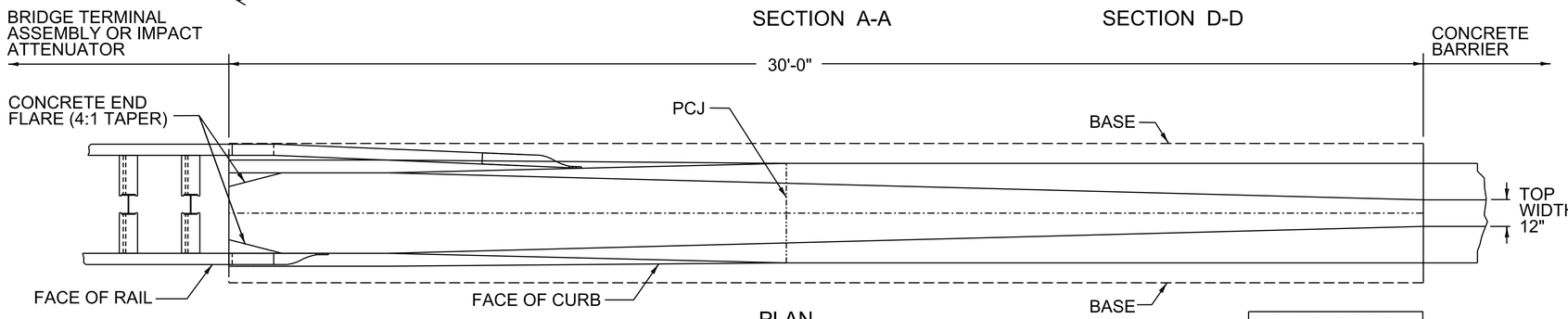
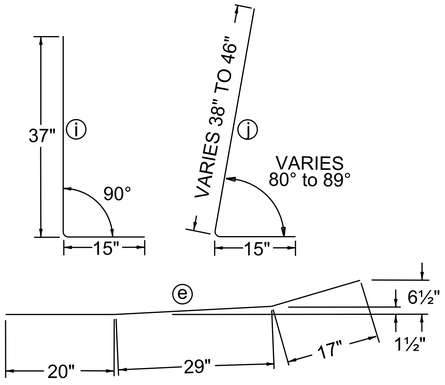
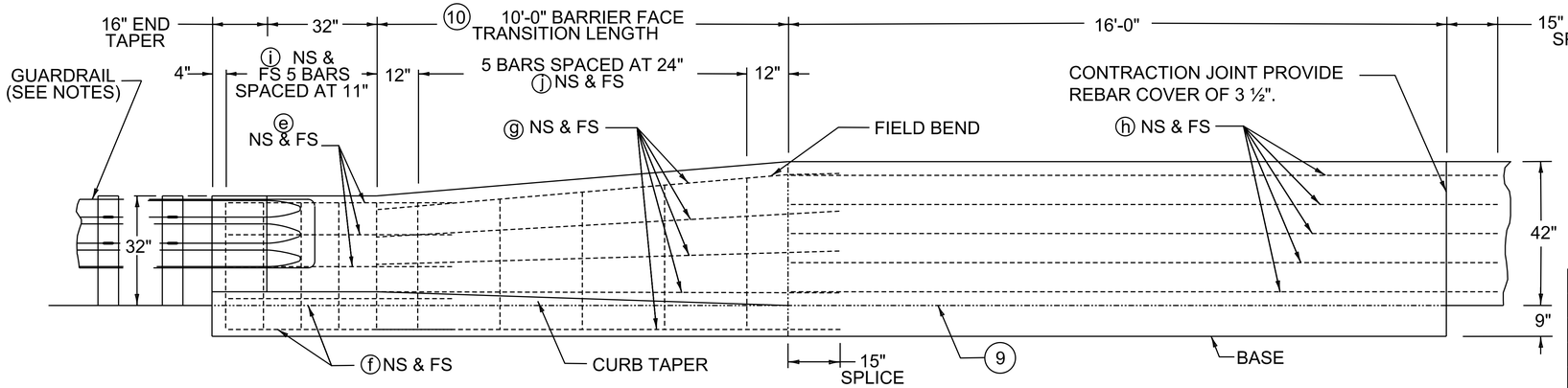


PLAN
(REINFORCING NOT SHOWN)

NS = NEAR SIDE
FS = FAR SIDE



BENDING DIAGRAMS



ELEVATION
BARRIER END SECTION TYPE B

TYPE B STEEL LIST				
MARK	BAR	SHAPE	NO.	LENGTH
ⓔ	#5	BENT	6	5'-6"
ⓕ	#5	STRAIGHT	4	5'-6"
ⓖ	#5	STRAIGHT	10	11'-1"
ⓗ	#5	STRAIGHT	10	17'-2"
ⓘ	#6	BENT	10	4'-2"
ⓙ	#6	BENT	2 SERIES OF 5	VARIES 4'-3" TO 5'-3"

~NOTES~
SEE CURRENT SHEET, SHEET 005, FOR ALL NOTES

USE WITH CURRENT SHEET, SHEET 005.

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BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

CONCRETE BARRIER WALLS

SHEET 004B: CONCRETE MEDIAN BARRIER TL3 42 IN END SECTIONS

STANDARD DRAWING NUMBER
RBM-135

~ NOTES ~

1. THE CONTRACT UNIT PRICE SHALL INCLUDE ALL MATERIALS, TOOLS, 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) Y=2'-0" FOR CRASH CUSHION TYPE VI, AND Y=1'-6" FOR GUARDRAIL CONNECTOR TO CONCRETE MEDIAN BARRIER END.

(6) USE CONCRETE END FLARE DETAIL "A" FOR VALTIR'S QUADGUARD CRASH CUSHION ALTERNATE. ALL OTHER CONNECTIONS REQUIRE A SQUARE NOSE.

(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.

8. THIS END SECTION IS TO BE USED IN MEDIAN APPLICATIONS WHEN TRAFFIC IS ON BOTH SIDES AND ATTACHES TO A SINGLE SLOPE BARRIER. PROVIDE 2" CONCRETE COVER OVER REBARS, UNLESS SPECIFIED ELSEWISE.

(9) PCJ: PERMISSABLE CONSTRUCTION JOINT. IN THE UNREINFORCED BASE SECTIONS, BARRIER MAY BE PLACED ON TOP OF CONCRETE BASE IF DOWELED.

(10) TO PREVENT VEHICLE SNAGGING IN BARRIER FACE TRANSITIONS, SMOOTH TRANSITIONS FROM VERTICAL FACES TO THE SINGLE SLOPE FACES ARE MADE OVER A 10' DISTANCE.

BID ITEMS AND UNIT TO BID

STEEL REINFORCEMENT	LB
CONCRETE-CLASS AA	CUYD

USE WITH CURRENT SHEETS, SHEETS 004A AND 004B.

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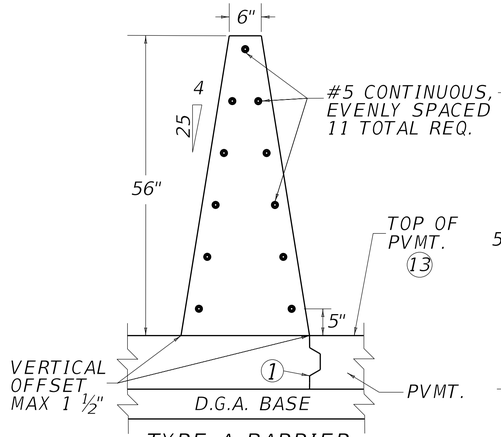
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

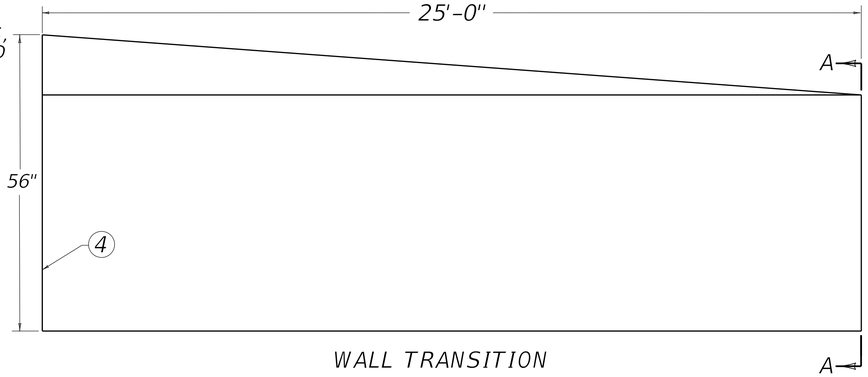
CONCRETE BARRIER WALLS

SHEET 005: CONCRETE MEDIAN BARRIER TL3 42 IN END SECTIONS NOTES

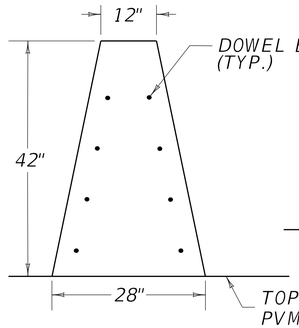
STANDARD DRAWING NUMBER
RBM-135



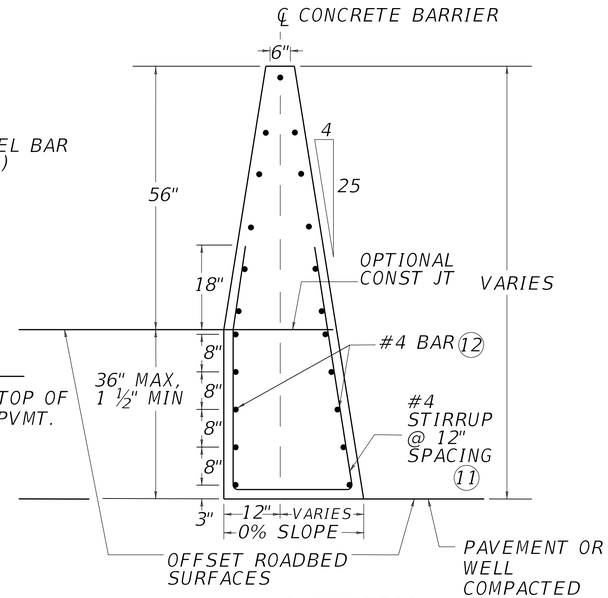
TYPE A BARRIER
(ROADWAY)



WALL TRANSITION
(ELEVATION VIEW)

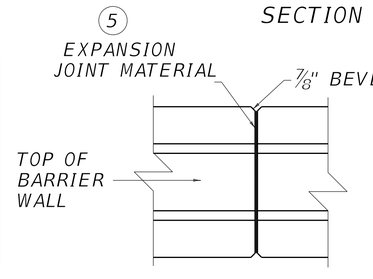


SECTION A-A



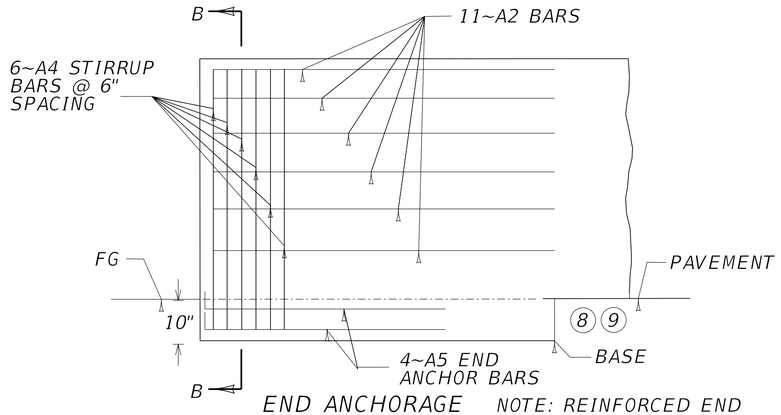
ASYMMETRICAL
WALL SECTION

BILL OF REINFORCEMENT									
MARK	NO.	SIZE	LENGTH	LOCATION	A	B	C	D	E
A1	8	5	3'- 0"	DOWELS					
A2	11	5	24'- 8"	LONGITUDINAL					
A3	6	4	9'- 3"	STIRRUP AT 42" END	2'- 0"	0'-7½"	3'- 0"	3'-0⅝"	0'-6⅞"
A4	6	4	11'- 3"	STIRRUP AT 56" END	1'- 8"	0'-7½"	4'- 2"	4'-2⅝"	0'- 8"
A5	8	5	5'- 5"	END ANCHORS	0'- 6"	5'- 0"			



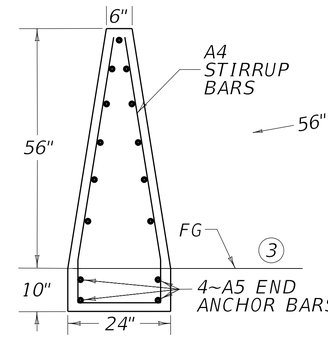
EXPANSION JOINT DETAIL

QUANTITIES 13	
CONCRETE	7 C.Y.
STEEL	440 LBS.

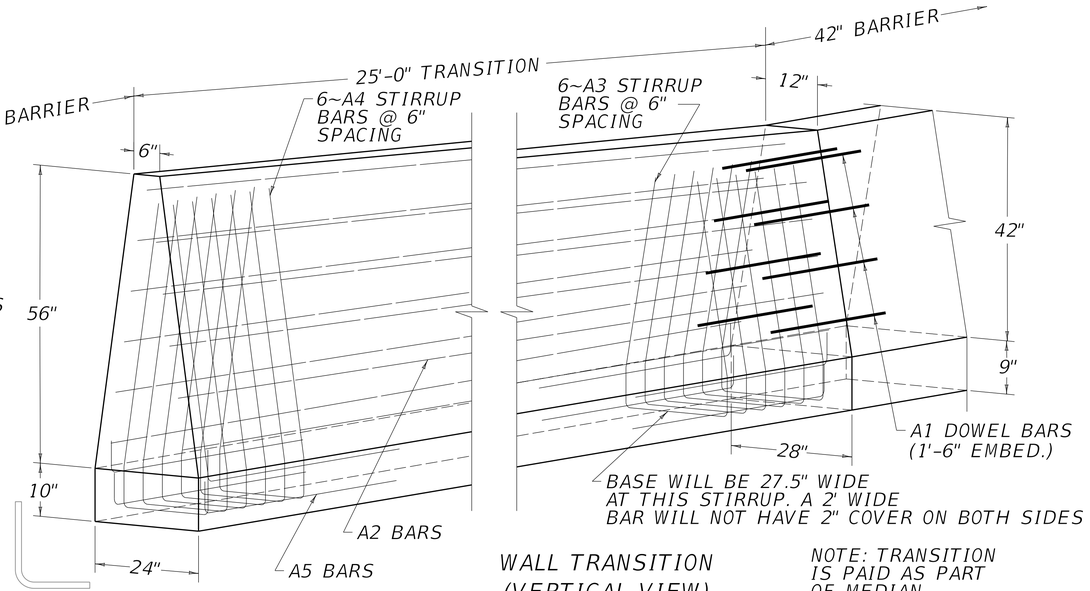


END ANCHORAGE

NOTE: REINFORCED END ANCHORAGES ARE REQUIRED AT THE ENDS OF CONCRETE BARRIER RUNS. SEE ALL END ANCHORAGE NOTES IN NOTES ⑧ AND ⑨.



SECTION B-B

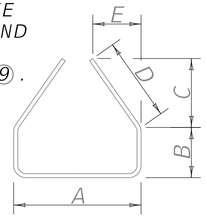


WALL TRANSITION
(VERTICAL VIEW)

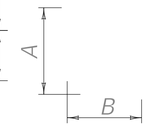
NOTE: TRANSITION IS PAID AS PART OF MEDIAN BARRIER TL5 56 IN

~NOTES~
SEE CURRENT SHEET, SHEET 007, FOR ALL NOTES

USE WITH CURRENT SHEET, SHEET 007.



A3 AND A4 BARS



A5 BARS

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BARRIERS

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

~ NOTES ~

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

3. FOOTING CAN BE MONOLYTHICALLY POURED OR DOWELED WITH 2-#8 X 8" @ 2'-0" SPACING. THE FOOTING IS REQUIRED AT CONCRETE BARRIER ENDS.

4. SEE TYPE "A" OR "B" BARRIER DETAIL FOR WALL DIMENSIONS. SEE BRIDGE DRAWINGS FOR TYPE "B", WHEN APPLICABLE.

5. TRANSVERSE EXPANSION JOINTS SHALL BE INSTALLED PER STANDARD SPECIFICATONS FOR ROAD AND BRIDGE CONSTRUCTION.

6. CONSTRUCT USING CONCRETE CLASS AA WITH A STRENGTH OF 4000 PSI.

7. CONSTRUCT USING EPOXY COATED REINFORCEMENT THROUGHOUT WHEN MEDIAN BARRIER IS INSTALLED ON A STRUCTURE.

8. REINFORCED END ACHORAGES ARE REQUIRED AT THE ENDS OF CONCRETE BARRIER RUNS. CONSTRUCT THE LAST 10' USING THE END ANCHORAGE DETAIL AS SHOWN HERE. AT EXPANSION JOINTS, CONSTRUCT AN END ANCHORAGE ON BOTH SIDES OF JOINT, WITH A MAX GAP OF 2" FOR THE OPEN JOINT. THE MAX EXPANSION JOINT SPACING SHALL BE 800'. THIS ANCHORAGE IS NOT NEEDED AT CONSTRUCTION JOINTS; PROVIDE DOWEL BAR CONNECTIONS INSTEAD.

9. WHEN SPLICED, LAP #5 CONTINUOUS BARS 2'-5" MINIMUM. PROVIDE 2" CLEAR COVER TO REINFORCEMENT AT ALL LOCATIONS.

10. THE CONTRACT UNIT PRICE PER LINEAR FOOT FOR CONCRETE MEDIAN BARRIER SHALL BE FULL COMPENSATION FOR ALL MATERIALS (INCLUDING ALL REINFORCING STEEL), EQUIPMENT, LABOR AND INCIDENTALS NECESSARY TO COMPLETE THE WORK.

11. REINFORCING STIRRUP NOT REQUIRED FOR OFFSETS LESS THAN 1'-0".

12. ROADBED SURFACES OFFSET (RANGES)

    1 ½" TO 3" – NO ADDITIONAL REINFORCEMENT IS REQUIRED.

    3" < 8" – USE 2, #4 BARS AT 3" ABOVE THE LOWER ROADBED SURFACE.

    8" ≤ 12" – USE 2, #4 BARS AT 3" ABOVE THE LOWER ROADBED SURFACE AND 2, #4 BARS AT 8" ABOVE THE LOWER ROADBED SURFACE.

    12" ≤ 36"– USE 2, #4 BARS AT 3" ABOVE THE LOWER ROADBED SURFACE AND 2, #4 BARS AT EVERY 8" INCREMENT VERTICAL SPACING ABOVE THE FIRST 2 BARS.

13. CONCRETE OF THE SINGLE SLOPE BARRIER WALL MAY EXTEND INTO PAVEMENT LAYERS FOR CONSTRUCTIBILITY (KEYED-IN). THE CONCRETE QUANTITY PRESENTED IN THE TABLE ON SHEET 006 IS FOR THE TOP OF PAVEMENT OPTION. DEPTH INTO PAVEMENT CAN BE VARIABLE.

BID ITEM AND UNIT TO BID

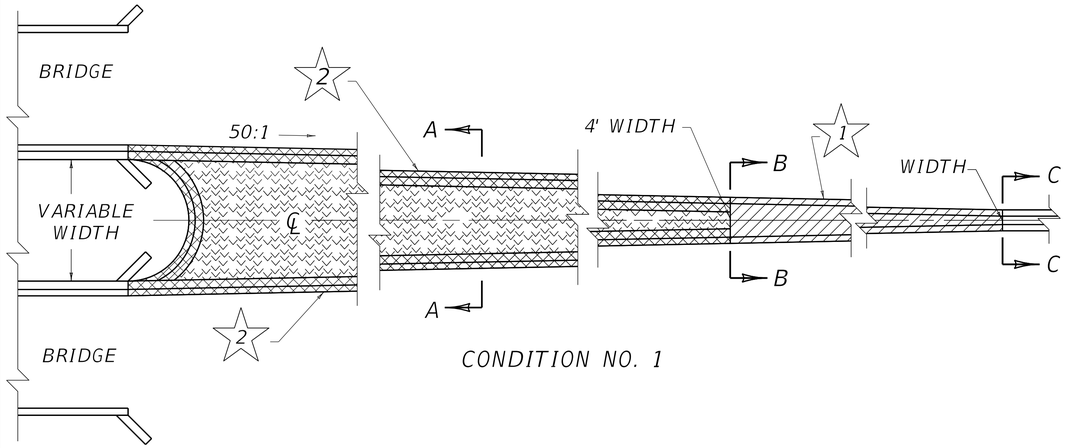
CONC MEDIAN BARRIER TYPE ⊕ TL5 56 IN LF

⊕ A OR B DEPENDING ON LOCATION.

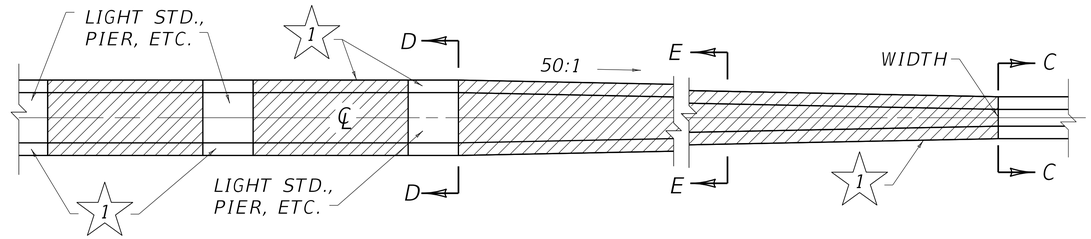
USE WITH CURRENT SHEET, SHEET 006.

BARRIERS

OpenRoads Designer v23.00.01.11 USER: matthew.sipes FILE NAME: C:\KYTC_STANDARDS\ORGANIZATION-CIVIL\KYTC_STANDARDS_OC_KYTC\DGNLIB\SHEET SEEDS\KYTC STANDARDS BORDER SEED.DGNLIB



CONDITION NO. 1



CONDITION NO. 2

~ 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. WEEP HOLES ARE INCIDENTAL TO THE BID ITEM.

3. FOR DETAILS PRETAINING TO ROADWAY OR BRIDGE APPLICATIONS, SEE CURRENT BRIDGE DRAWING. THE METHOD OF MEASUREMENT FOR CONCRETE MEDIAN BARRIER FOR EACH TYPE WILL BE IN LINEAR FEET MEASURED ALONG THE TOP CENTERLINE OF THE BARRIER.

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.

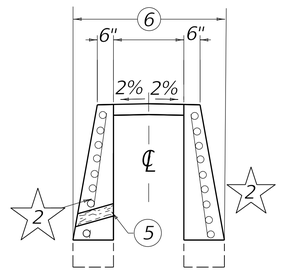
7. CONSTRUCT USING CONCRETE CLASS AA WITH A STRENGTH OF 4000 PSI.

BID ITEM AND UNIT TO BID

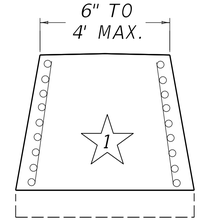
CONCRETE MEDIAN BARRIER TYPE ☆ TL5 56" TALL WALL LF

☆ 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

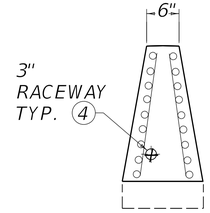
USE WITH CURRENT SHEET, SHEET 006.



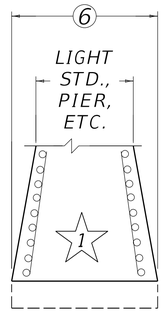
SECTION A-A



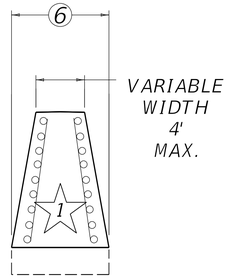
SECTION B-B



NORMAL SECTION
SECTION C-C



SECTION D-D



SECTION E-E

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

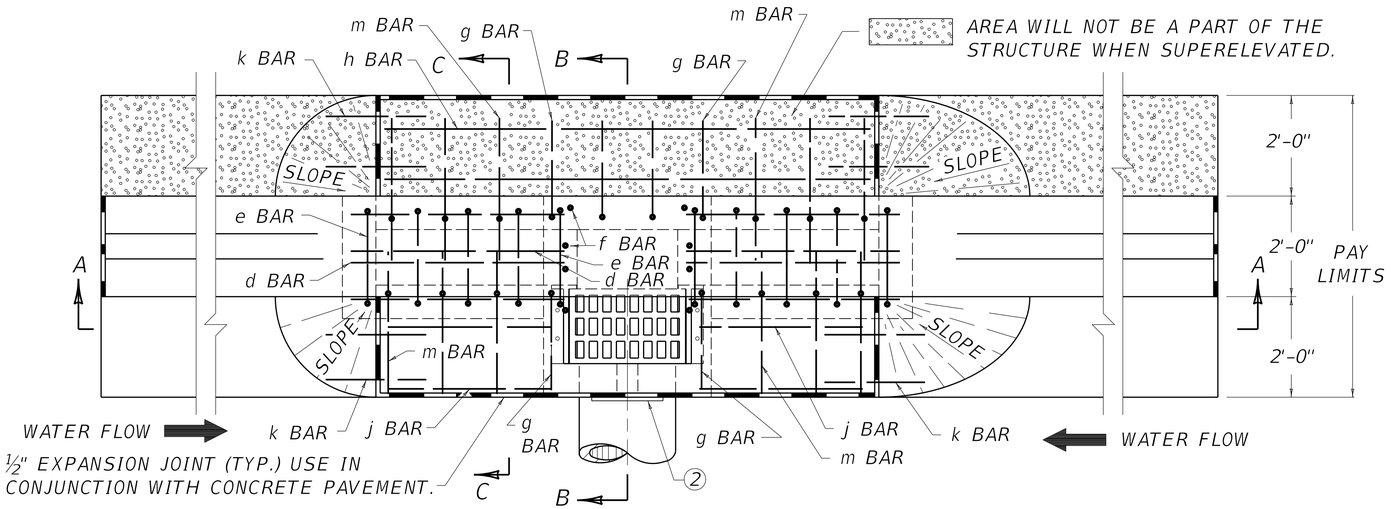
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

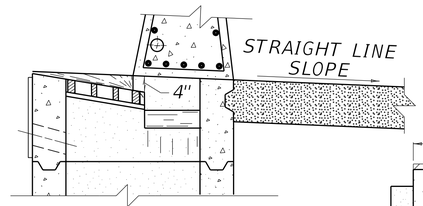
CONCRETE BARRIER WALLS

SHEET 008: CONCRETE MEDIAN BARRIER TL5 56 IN HORIZONTAL TRANSITIONS.

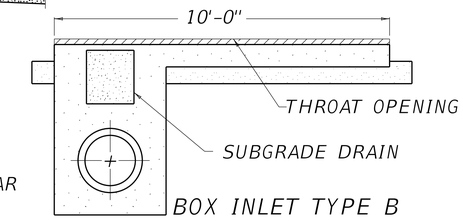
STANDARD DRAWING NUMBER
RBM-135



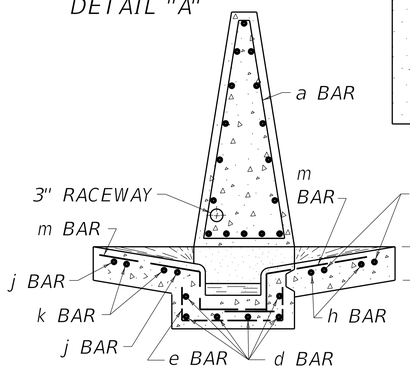
PLAN VIEW (BOX INLET TYPE A)



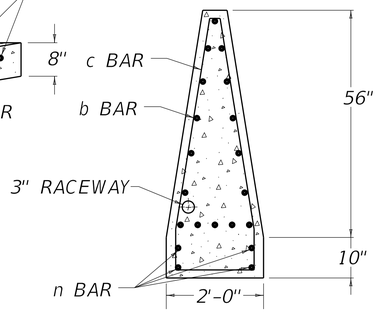
DETAIL "A"



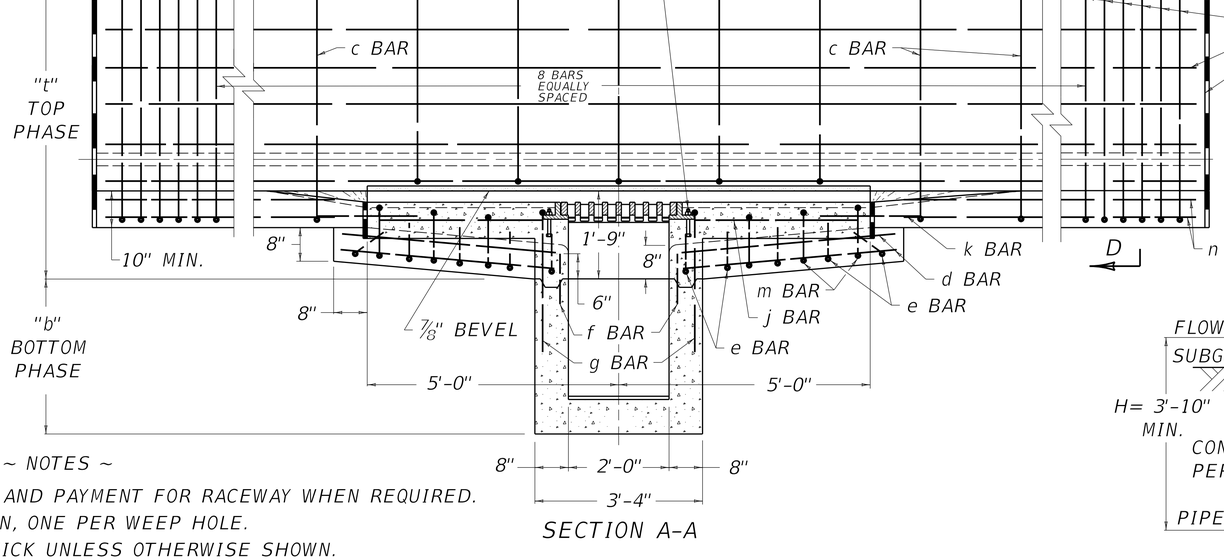
BOX INLET TYPE B



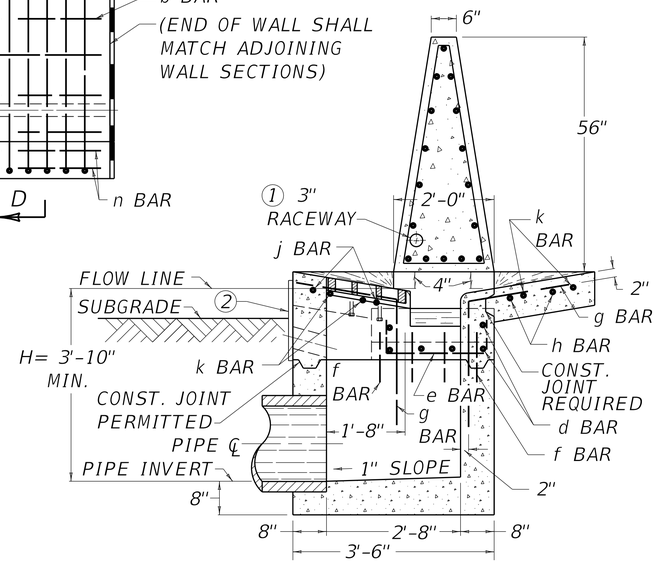
SECTION C-C



SECTION D-D



SECTION A-A



SECTION B-B

~ 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.
5. WALL REINFORCEMENT IS DETAILED FOR CAST-IN-PLACE WALLS AND SLIP FORMED WALLS. SEE CURRENT SHEET, SHEET 006 , FOR STEEL DETAIL.
6. DETAIL "A" SHOWS BOX INLET AND THE 25' CONCRETE MEDIAN BARRIER IN SUPERELEVATION.
7. PLAN VIEW DOES NOT SHOW STEEL REINFORCEMENT IN THE CONCRETE MEDIAN BARRIER.

USE WITH CURRENT SHEETS, SHEET 006 AND SHEET 010.

REVISION DATE: 08/11/2025
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BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

CONCRETE BARRIER WALLS

SHEET 009: CONCRETE MEDIAN BARRIER BOX INLET TL5 56 IN

STANDARD DRAWING NUMBER
RBM-135

REINFORCEMENT BARS FOR BOX INLET

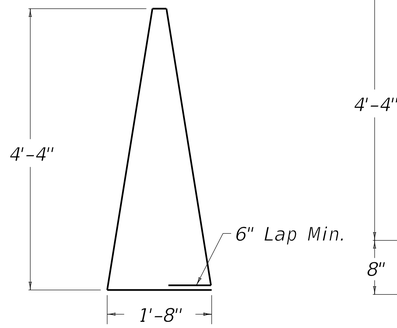
BAR	BOX TYPE							
	A1	A2	A1	A2	B1	B2	B1	B2
	QTY.		LENGTH		QTY.		LENGTH	
e	10		3'-3"		9		3'-3"	
d	12		4'-3"		6		7'-5"	
f	8		1'-0"		8		1'-0"	
g	2	6	4'-6"		1	5	4'-6"	
h	0	2	0	9'-8"	0	2	0	9'-8"
j	4		3'-3"		2		7'-0"	
k	4	8	2'-0"		4	8	2'-0"	
m	6	12	4'-1"		6	12	4'-1"	

APPROX. QUANTITIES FOR INLET

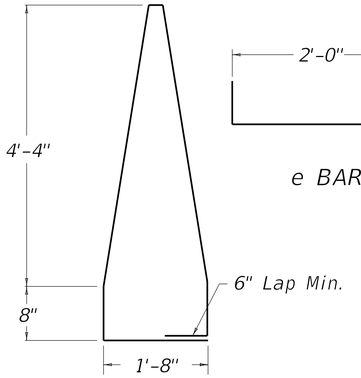
TYPE	CLASS "A" CONC.	STEEL
	CU. YDS.	LBS.
A1	3.96	153
A2	3.96	226
B1	3.89	139
B2	3.89	212

APPROX. QTYS. FOR 25' CONC. MEDIAN BARRIER (8)

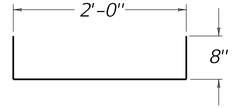
BAR a		BAR b		BAR c		BAR n		STEEL	CONC.
QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH	LBS.	CU. YDS.
5	11'-6"	16	24'-8"	16	13'-2"	8	7'-2"	753	6.33



a BAR



c BAR



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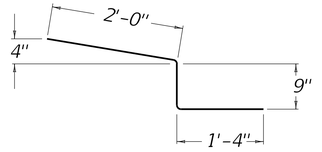

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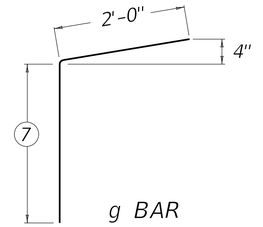

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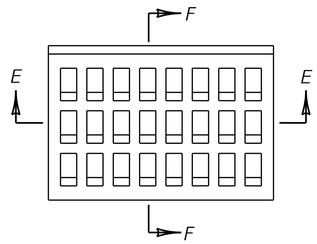
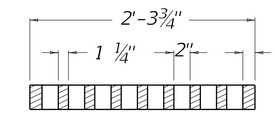
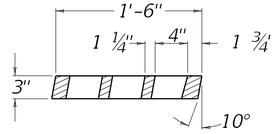


GRATE PLAN VIEW



SECTION E-E



SECTION F-F

~ NOTES ~

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 CURRENT SHEET, SHEET 006 , 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 AND CONCRETE QUANTITIES ARE FOR BOTH CAST-IN-PLACE AND SLIP FORM WALL.

BID ITEM AND UNIT TO BID

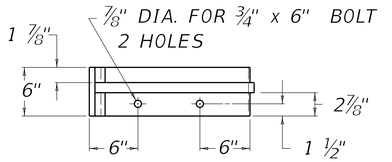
CONC. MED BARR BOX INLET TY ⊗ ⊕ △ TL5 56" TALL WALL EACH

⊗ = "A" FOR SAG VERTICALS, "B" FOR STRAIGHT GRADE

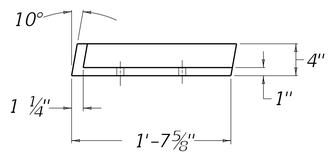
⊕ = 1 FOR OPENING ON ONE SIDE OF BOX INLET, 2 FOR OPENING ON BOTH SIDES OF BOX INLET

△ (b) = BOTTOM PHASE, (†) = TOP PHASE
~NO (b) OR (†) SUFFIX PRESENT INDICATES COMPLETE INLET~

USE WITH CURRENT SHEETS, SHEET 006 AND SHEET 009.



FRAME PLAN VIEW (LEFT HALF)



FRAME ELEVATION

REVISION DATE: 08/11/2025
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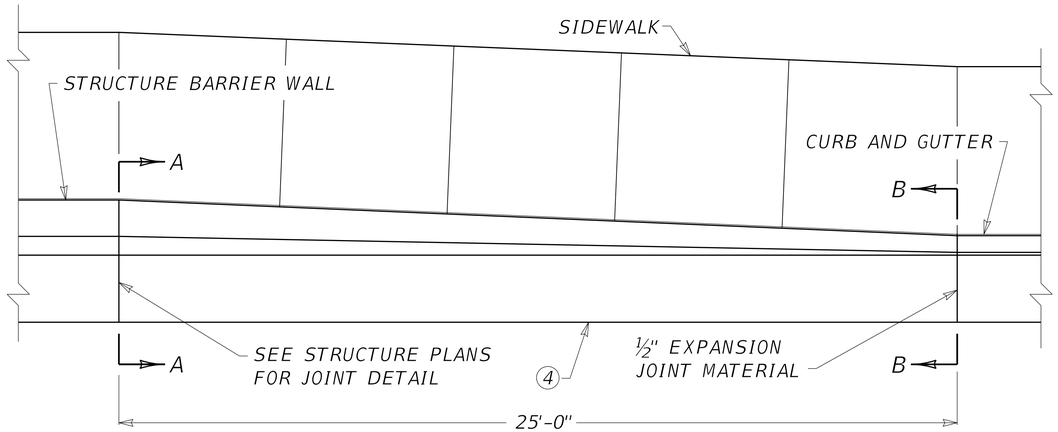
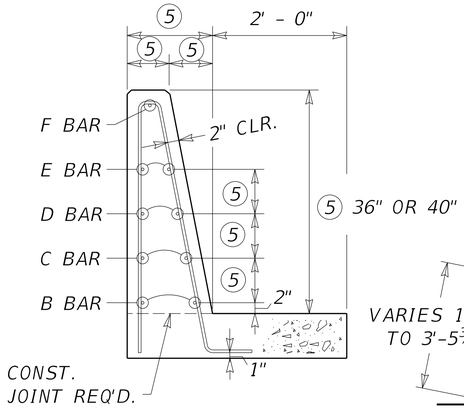
SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

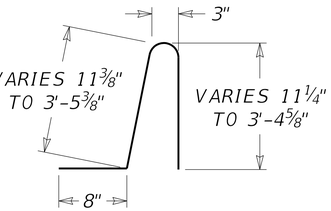
BARRIERS



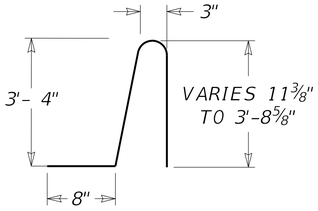
PLAN VIEW



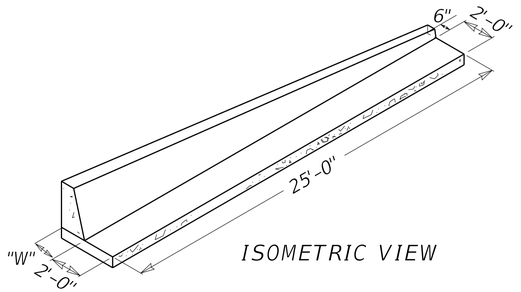
SECTION A-A



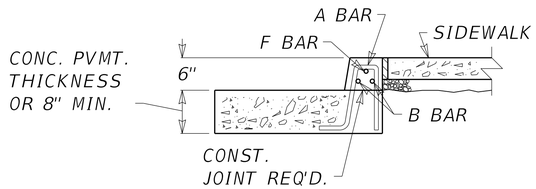
A BAR (36")



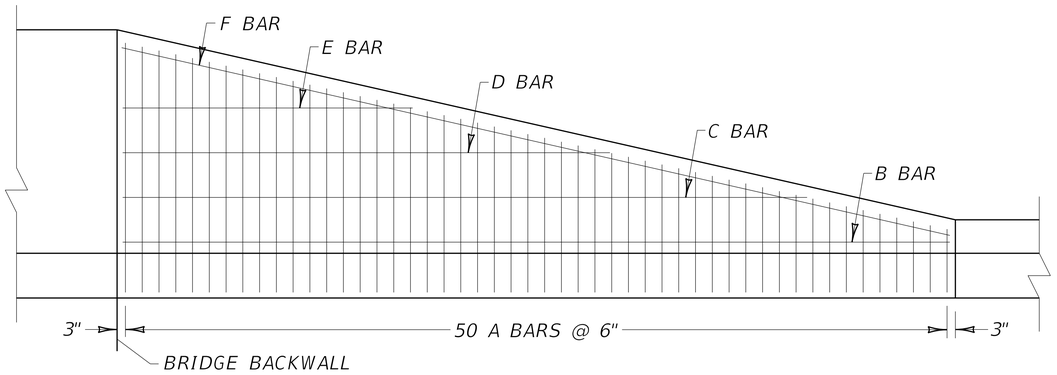
A BAR (40")



ISOMETRIC VIEW



SECTION B-B



ELEVATION VIEW

~ NOTES ~

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 7½" WIDE TOP IS APPROXIMATELY 3.2 CU. YDS. (36") & 3.4 CU. YDS. (40")

(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. REFER TO BHS-009 AND BHS-010 .

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

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

USE WITH CUR. STD. DWGS. RPS-010, BHS-009, BHS-010

BILL OF REINFORCEMENT (40")				
BAR	QTY.	SIZE	LENGTH	TOTAL LBS. OF STEEL
A	50	4	Varies	290
B	2	4	24'-8"	
C	2	4	20'-5"	
D	2	4	14'-6"	
E	2	4	8'-7"	
F	1	4	24'-10"	

BILL OF REINFORCEMENT (36")				
BAR	QTY.	SIZE	LENGTH	TOTAL LBS. OF STEEL
A	50	4	Varies	273
B	2	4	24'-8"	
C	2	4	19'-10"	
D	2	4	13'-2"	
E	2	4	6'-5"	
F	1	4	24'-9"	

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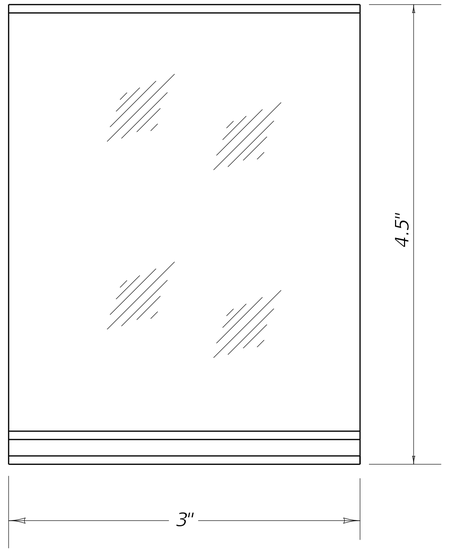
BARRIERS

OpenRoads Designer v23.00.01.11 USER: matthew.sipes FILE NAME: C:\KYTC_STANDARDS\ORGANIZATION-CIVIL\KYTC_STANDARDS_OC_KYTC\DGNLIB\SHEET SEEDS\KYTC STANDARDS BORDER SEED.DGNLIB

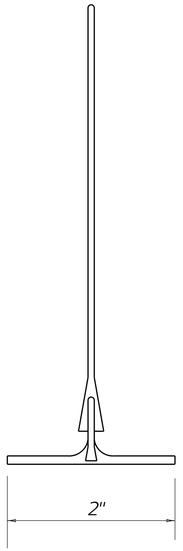
APPROXIMATE DELINEATOR SPACING	
TANGENT-RAMPS	100'
TANGENT	200-530'
CURVE	50'

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

CURVE SPACING IS A FUNCTION OF CURVE RADIUS AND IS FOUND IN TABLE 2F-1 OF THE MUTCD.



FRONT ELEVATION



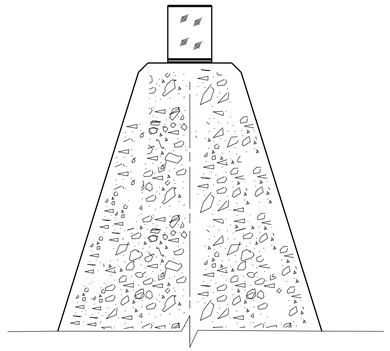
SIDE ELEVATION

~ NOTES ~

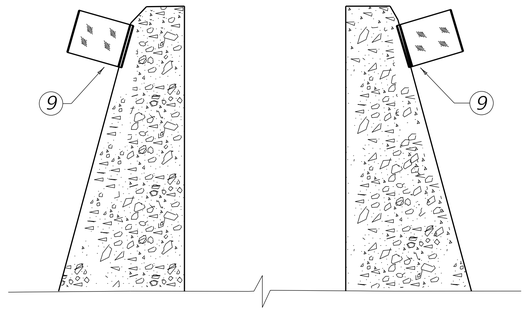
1. BARRIER WALL DELINEATORS SHALL BE REQUIRED ON ALL BARRIER WALLS.
2. DELINEATORS SHALL BE MEASURED AND PAID FOR AT THE CONTRACT UNIT PRICE EACH, AND SHALL INCLUDE ALL MATERIALS AND LABOR NECESSARY FOR ONE COMPLETE INSTALLATION.
3. THE COLOR OF DELINEATORS SHALL MATCH THE COLOR OF THE EDGELINE THAT 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. KYTC STANDARD SPEC 508.02.10, DELINEATORS FOR BARRIERS, STATES TO USE STIMSONITE MARKER 962, AKT CORPORATION MARKER NO. 181, OR A DEPARTMENT APPROVED EQUAL.
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.
11. IF BARRIER WALL IS PRESENT AT OFF RAMPS, THE BACKSIDE OF THE DELINEATOR SHOULD BE RED RETROREFLECTIVE SHEETING. RED SHEETING ON THE BACK SIDE CAN BE USED IN ANY SITUATION TO DISCOURAGE WRONG WAY DRIVING.

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



NORMAL (SOLID) WALL SECTION (10)



(SEPARATE SEGMENT) WALL SECTION

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 08-11-2025 DATE

APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

BARRIERS

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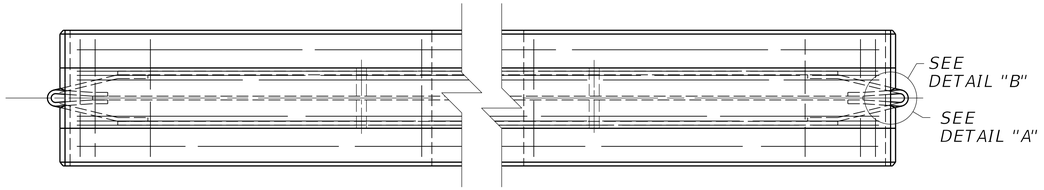
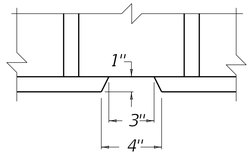
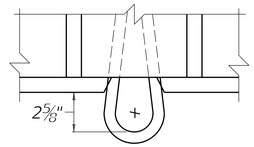


PLAN VIEW



DETAIL "A"



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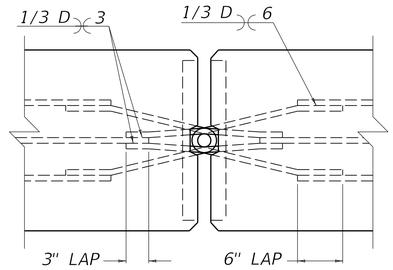
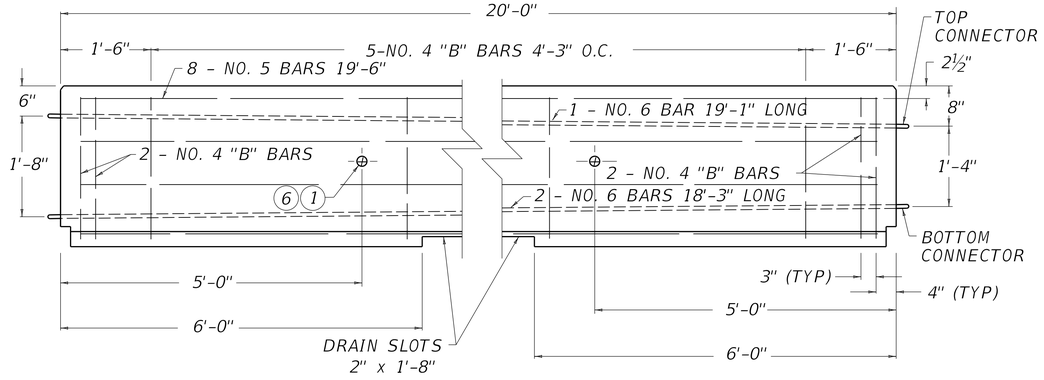
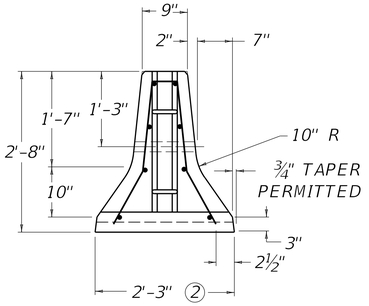


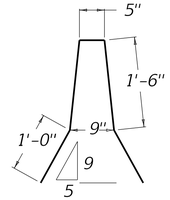
PLAN OF CONNECTION DETAIL



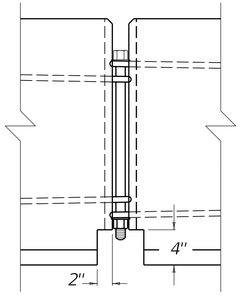
ELEVATION VIEW



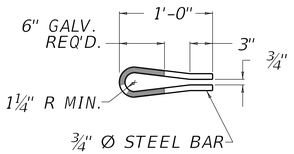
RIGHT ELEVATION VIEW



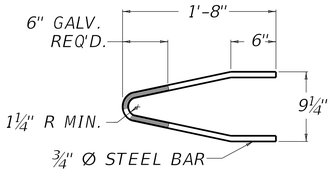
DETAIL OF
"B" BAR



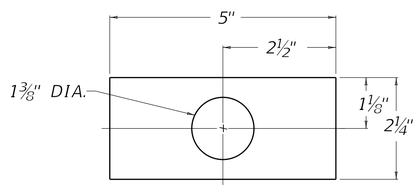
ELEVATION OF
CONNECTON DETAIL



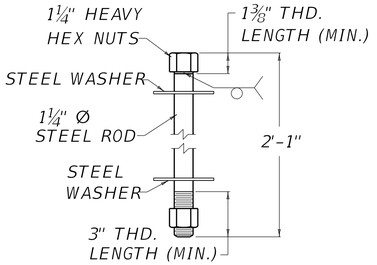
TOP CONNECTOR
(HOT DIP GALVANIZE
AFTER FORMING)



BOTTOM CONNECTOR
(HOT DIP GALVANIZE AFTER FORMING)



½" THICK STEEL WASHER



CONNECTOR PIN

APPROXIMATE QUANTITIES

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

~ NOTES ~

1. 2" DIA. LIFTING HOLE - 2 REQUIRED FOR EACH SECTION. FORMED WITH 2" P.V.C. PIPE OR EQUAL.
2. TAPER NOT INCLUDED IN BASE WIDTH.
3. SHOP DRAWINGS SHALL BE APPROVED PRIOR TO MANUFACTURE.
4. 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. LIFTING BARS SHALL BE REQUIRED TO PREVENT SPALLING OF CONCRETE AROUND HOLES.
7. PREVIOUS WALL MANUFACTURED ACCORDING TO STANDARD DRAWING RBM-115 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.

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

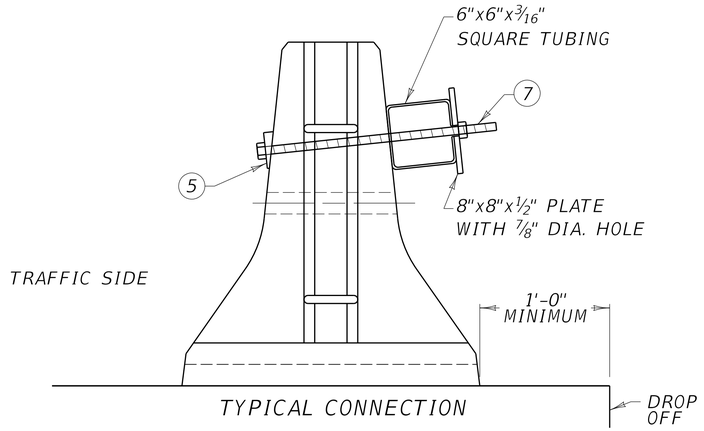
USE WITH CUR. STD. DWG. RBM-120

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

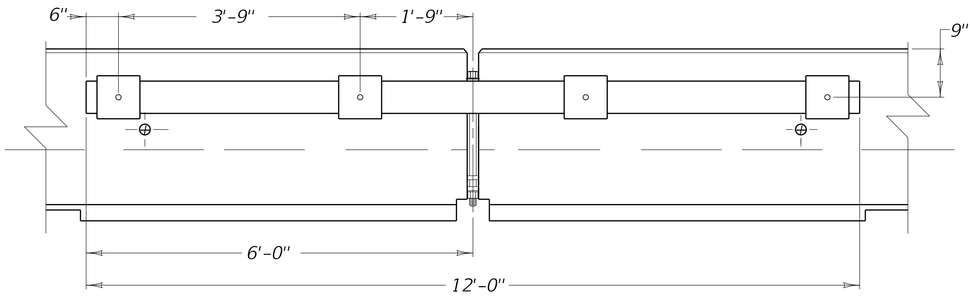
SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

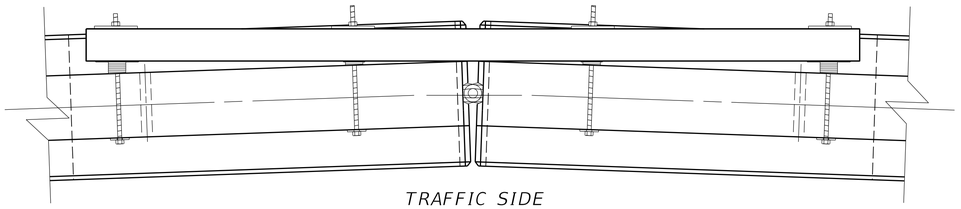
BARRIERS



TYPICAL CONNECTION

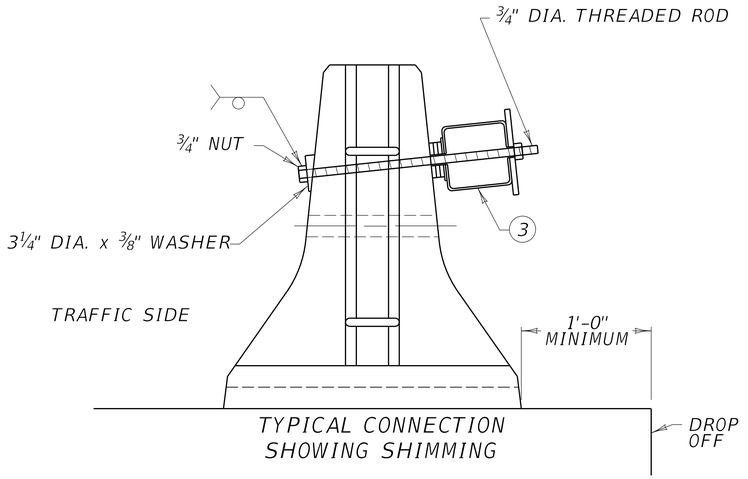


ELEVATION VIEW

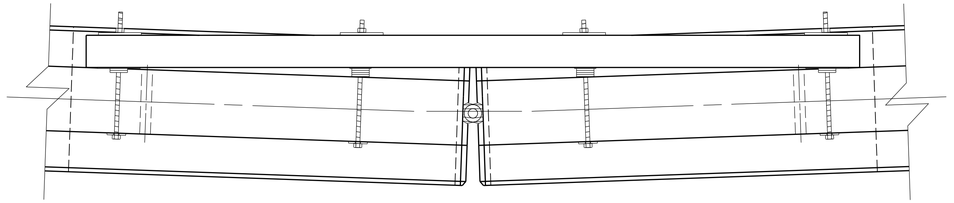


TRAFFIC SIDE

PLAN VIEW



TYPICAL CONNECTION SHOWING SHIMMING



TRAFFIC SIDE

PLAN VIEW

~ 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. MAINTAIN 1'-0" MINIMUM FROM EDGE OF BARRIER TO DROP OFF.
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

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

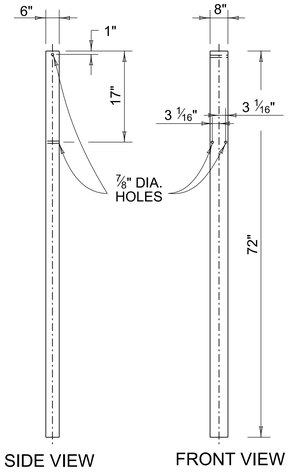
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

CONCRETE BARRIER WALLS

SHEET 014: BOX BEAM STIFFENING PF TEMPORARY CONCRETE BARRIER

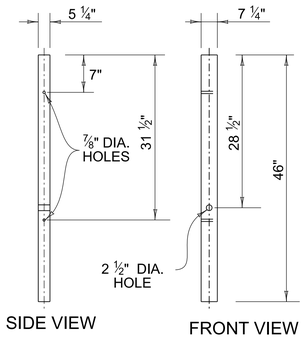
STANDARD DRAWING NUMBER
RBM-135



STEEL FOUNDATION TUBE

6"x 8"x ⅛" x 72" STEEL TUBE

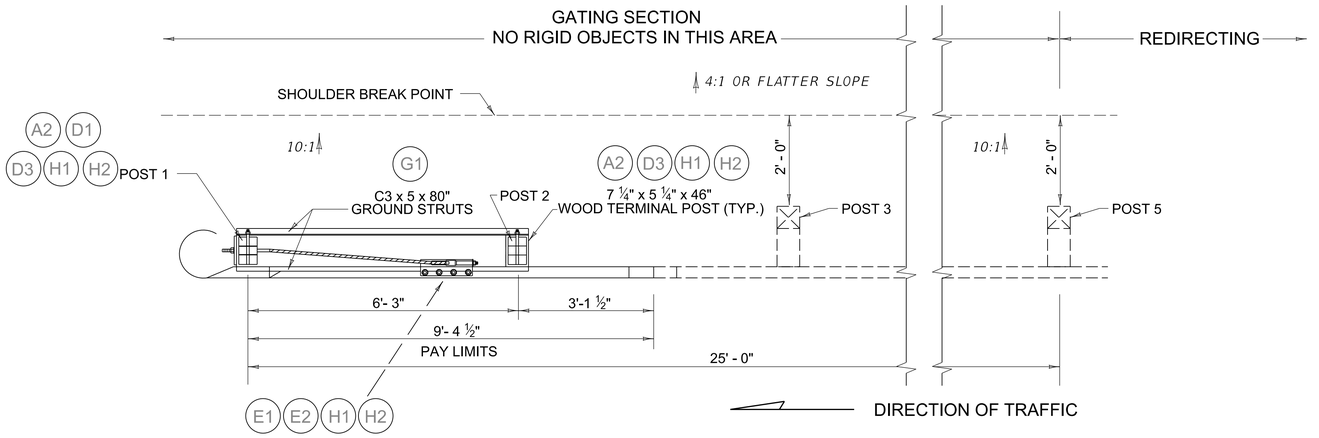
A1 6



TERMINAL POST

7 ¼"x 5 ¼"x 46" WOOD POST

A2

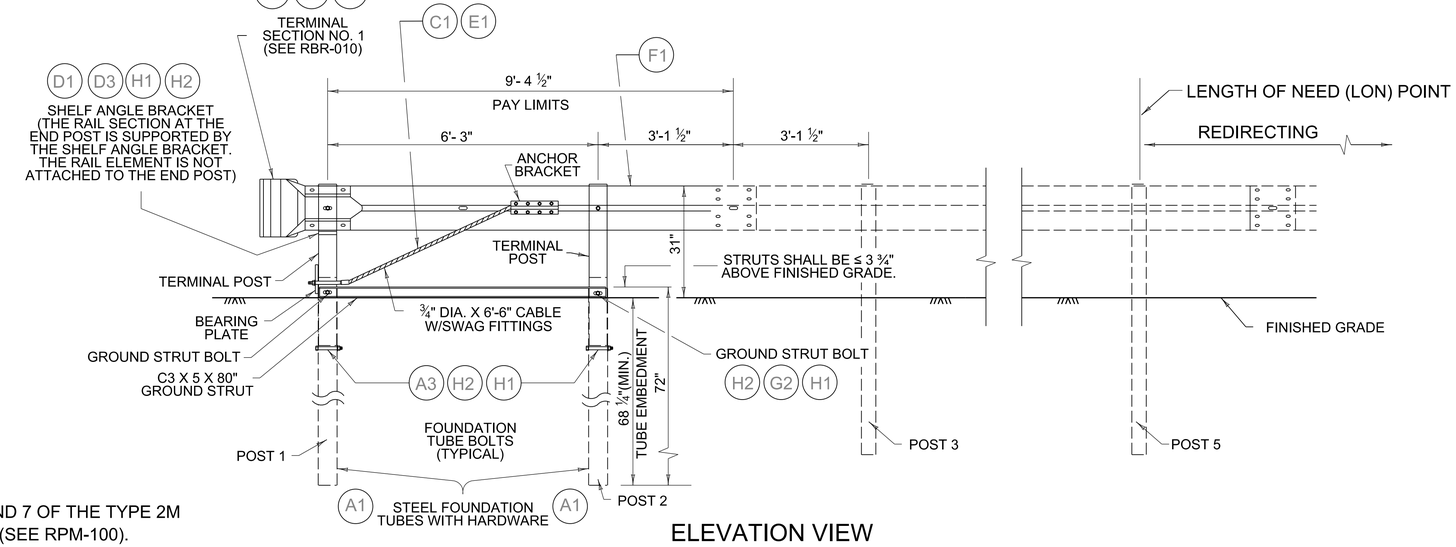


PLAN VIEW

THIS GUARDRAIL ANCHOR SHALL ONLY BE INSTALLED AT TRAILING ENDS WHEN LOCATED OUTSIDE THE CLEAR ZONE AREA OF OPPOSING TRAFFIC.

~ NOTES ~

1. TYPE 2M GUARDRAIL ANCHOR SHALL ONLY BE INSTALLED AT TRAILING ENDS WHEN LOCATED OUTSIDE THE CLEAR ZONE AREA OF OPPOSING TRAFFIC. THE LENGTH OF NEED (LON) OF THE GUARDRAIL IS ONLY OBTAINED AT THE FIFTH GUARDRAIL POST.
2. ALL HOLES IN WOOD POSTS ARE TO BE DRILLED BEFORE PRESERVATIVE TREATMENT IS APPLIED.
3. ALL CUTTING, DRILLING, AND WELDING OF STEEL COMPONENTS SHALL BE DONE BEFORE GALVANIZING.
4. THE FINISHED CABLE ASSEMBLY WILL NOT BE ACCEPTABLE UNLESS IT IS IN TENSION WITH NO SAG.
5. ALL HARDWARE SHALL CONFORM TO ASTM A307 UNLESS OTHERWISE SHOWN.
6. FOR END TERMINAL POSTS 1 AND 2 INSTALLED WITH FOUNDATION TUBES:
   *FOR TYPICAL SOILS, MINIMUM EMBEDMENT REQUIRED IS 68 1/4".
   *IF SOLID ROCK IS ENCOUNTERED AT 20" OR LESS DEPTH, DRILL A 12"-16" DIAMETER HOLE 2 INCHES DEEPER THAN REQUIRED AND INSTALL THE TUBE AT THE STANDARD HEIGHT.
   *IF SOLID ROCK DEPTH EXCEEDS 20 INCHES, DRILL A 12"-16" DIAMETER HOLE AT LEAST 36" DEEP. ADJUST THE TUBE LENGTH TO ENSURE THAT IT IS FULLY EMBEDDED IN THE 36-INCH DRILLED HOLE AND A MAXIMUM 4-INCH PROJECTION ABOVE GRADE, TRIMMING AS NEEDED.
   BACKFILL WITH CUTTING SPOILS, PLACING GRANULAR MATERIAL OR SMALL ROCK (#9 OR #57 STONE) IN THE BOTTOM 2 INCHES FOR DRAINAGE.
7. WHEN CURB AND GUTTER ARE PRESENT WITH GUARDRAIL, BETWEEN POSTS 6 AND 7 OF THE TYPE 2M TERMINAL TRANSITION TO LIP CURB AND GUTTER OR ISLAND CURB AND GUTTER (SEE RPM-100). CONTINUE THE LIP OR ISLAND CURB AND GUTTER FOR 50 FEET BEYOND POST 1 OF THE TERMINAL.
8. COMPONENT DETAILS LABELED BY LETTER AND NUMBER (e.g., A1, H2) ARE DEFINED IN THE MATERIALS LIST ON SHEET 2.



ELEVATION VIEW

BID ITEM AND UNIT TO BID

GUARDRAIL END TREATMENT TYPE 2M	EACH

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 08-11-2025 DATE

APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

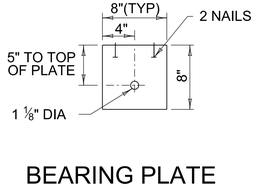
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

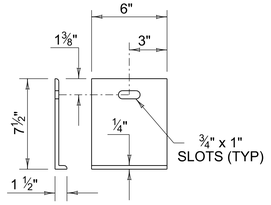
GUARDRAIL END TREATMENT

SHEET 001: GUARDRAIL END TREATMENT TYPE 2M (TRAILING END TERMINAL)

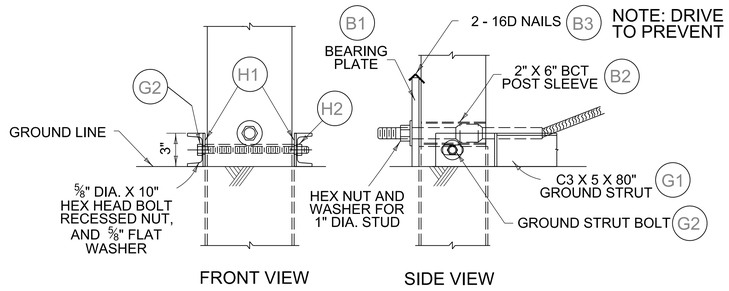
STANDARD DRAWING NUMBER
RBR-025-07



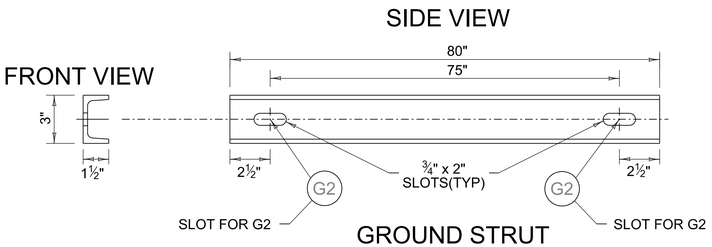
BEARING PLATE
8"x 8"x ⅝" PL
B1



SHELF ANGLE BRACKET
D1



BEARING PLATE ASSEMBLY DETAIL



GROUND STRUT
C3 x 5 x 80", GRADE A36
G1

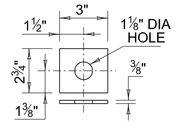
TYPE 2M MATERIALS LIST

PART NUMBER	QUANTITY	DESCRIPTION	HARDWARE GUIDE [1]	MATERIAL DESCRIPTIONS [2, 3]
A1	2	6" x 8" x 72" STEEL FOUNDATION TUBE	NA	AASHTO M111/ASTM A123 ASTM A500 GRADE B OR ASTM A-501
A2	2	7 ¼" X 5 ¼" X 46" WOOD TERMINAL POST	NA	S4S FINISH ON 4 SIDES
A3	4	BOLT, ⅝" DIA. X 8" HEX FOR SOIL FOUNDATION TUBE	FBX16a	ASTM A307
B1	1	BEARING PLATE	FPB01	SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES.
B2	1	BCT POST SLEEVE	FMM02	SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES.
B3	2	16D DOUBLE HEAD NAIL (FOR BEARING PLATE)	NA	AASHTO M232 CLASS D
C1	1	¾" DIA. X 6'-6" CABLE W/ SWAGE FITTINGS (BCT CABLE)	FCA01	
C2	2	1" DIA. ANCHOR CABLE ASSEMBLY WASHER	FWC24a	
C3	2	1" DIA. ANCHOR ASSEMBLY NUT	FNX24a	ASTM A563, GRADE A OR BETTER
D1	1	SHELF ANGLE BRACKET	FPP02	AASHTO M111/ASTM 123/ASTM A36 MIN. STRENGTH 36 KSI, SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
D2	4	BOLT, BUTTON-HEAD 1 ¼" (FOR CONNECTING TERMINAL SECTION NO. 1)	FBB01	
D3	2	BOLT, BUTTON-HEAD 10" (⅝" DIA. POST BOLT)	FBB03	
E1	1	ANCHOR BRACKET	FPA01	SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES.
E2	8	BOLT, ⅝" DIA. X 2" HEX FOR ANCHOR BRACKET ASSEMBLY	FBX16a	ASTM A307
F1	1	10" 4 ¾" TERMINAL RAIL ELEMENT (12 GA. W-BEAM)	RWM02a	
F2	1	W-BEAM TERMINAL SECTION NO. 1 (12 GA.)	RWE03a	RBR-010
G1	2	C3 X 5 X 80" GROUND STRUT	NA	AASHTO M111/ASTM 123/ASTM A36 MIN. STRENGTH 36 KSI, SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
G2	2	BOLT, ⅝" DIA. X 10" HEX FOR GROUND STRUT ATTACHMENT TO TERMINAL POSTS	FBX16a	ASTM A307
H1	18	WASHER, ⅝" FLAT	FWC16a	
H2	20	NUT, RECESSED GUARDRAIL	FBB	ASTM A563, GRADE A OR BETTER

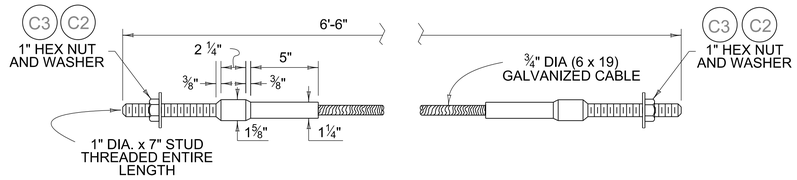
[1] THE HARDWARE GUIDE NUMBER IS REFERENCED IN THE TASK FORCE 13 GUIDE TO STANDARDIZED ROADSIDE HARDWARE, AVAILABLE AT https://tf13.org/guides/. WHEN AASHTO AND ASTM MATERIAL SPECIFICATIONS ARE AVAILABLE FOR COMPONENT, THEY ARE LISTED IN THE GUIDE.

[2] IF THE TASK FORCE 13 GUIDE TO STANDARDIZED ROADSIDE HARDWARE DOES NOT REFERENCE THE AASHTO AND ASTM SPECIFICATIONS, THEY ARE PROVIDED IN THE MATERIAL DESCRIPTIONS COLUMN. ADDITIONAL MATERIAL SPECIFICATIONS CAN BE FOUND IN KENTUCKY STANDARD SPECIFICATIONS, SECTION 814-GUARDRAIL SYSTEMS.

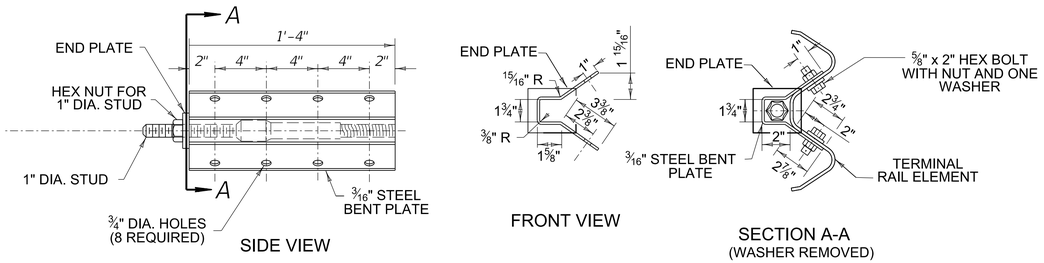
[3] IF THERE ARE DISCREPANCIES IN MATERIAL OR DIMENSIONS BETWEEN THE TASK FORCE 13 GUIDE TO STANDARDIZED ROADSIDE HARDWARE AND THIS STANDARD DRAWING SET, THE DETAILS IN THE STANDARD DRAWING SET SHALL TAKE PRECEDENCE.



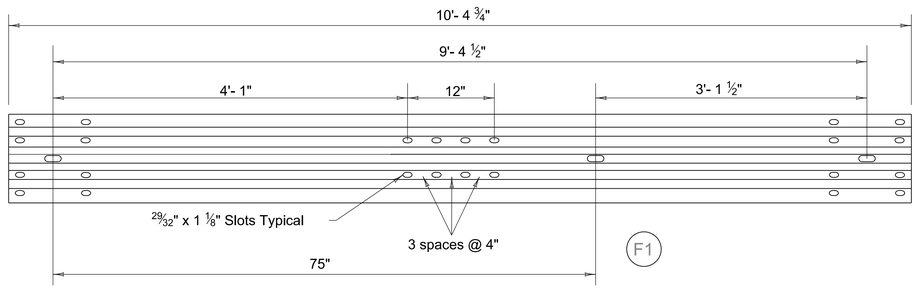
END PLATE



STANDARD SWAGE FITTING AND STUD
NOTE: CABLE TO BE SWAGE-CONNECTED
C1



ANCHOR BRACKET ASSEMBLY DETAILS
(ANCHOR PLATE, (8) ⅝" X 2" HEX HEAD BOLTS, NUTS, AND WASHERS)



TERMINAL RAIL ELEMENT

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 08-11-2025 DATE
APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

GUARDRAIL END TREATMENT

SHEET 002: GUARDRAIL END TREATMENT TYPE 2M (TRAILING END TERMINAL)

STANDARD DRAWING NUMBER
RBR-025-07

Standard Drawing Reference Report

RBR-025-07
GUARDRAIL END TREATMENT TYPE 2M (TRAILING END TERMINAL)
Effective with the August 21, 2025 Letting

Design Notes

The Type 2M terminal is a non-proprietary terminal used to anchor 31" Midwest Guardrail System (MGS) W-beam guardrail. As a downstream trailing end terminal, it is crashworthy only in the direction of adjacent traffic. It is not designed to withstand impacts from the opposite direction. These terminals are typically installed beyond the clear zone of opposing traffic or at the downstream end of guardrail systems on one-way roadways. The Type 2M terminal has passed MASH Test Level 3 crash testing for impacts from the direction of adjacent traffic.

The Type 2M terminal provides structural support for the entire guardrail system. Inadequate grading at the terminal location may compromise the barrier's performance. Refer to drawing for grading details.

Type 2M terminals are fully gating from post 1 to post 5. This means that, during a crash, the terminal allows a vehicle to pass through the end of the barrier rather than redirect or contain it. Therefore, the terminal is not intended to shield fixed objects located within the gating zone, which extends perpendicular to posts 1 through 5. The terminal must be placed so that this area remains clear of obstacles. If fixed objects are present within the proposed gating zone, consider extending the guardrail to shift the gating zone beyond the fixed object.

For impacts occurring upstream of post 5, the guardrail system anchored by the Type 2M terminal is designed to redirect impacting vehicles. The Length of Need for the Type 2M begins at post 5. To ensure proper performance, no rigid objects should be placed adjacent to the barrier within the system's working width—60 inches for MGS—as these could compromise the guardrail's ability to redirect vehicles.

When curb and gutter are present with guardrail, between posts 6 and 7 of the Type 2M terminal transition to lip curb and gutter or island curb and gutter (see RPM-100). Continue the lip or island curb and gutter for 50 feet beyond post 1 of the terminal.

References

KYTC Standard Specifications for Road and Bridge Construction

- Section 719 – Guardrail
- Section 814 – Guardrail Systems

Highway Design Guidance Manual

- HD-800 ROADSIDE DESIGN
- HD-801.6 END TREATMENTS & CRASH CUSHIONS

Crash Test Reports

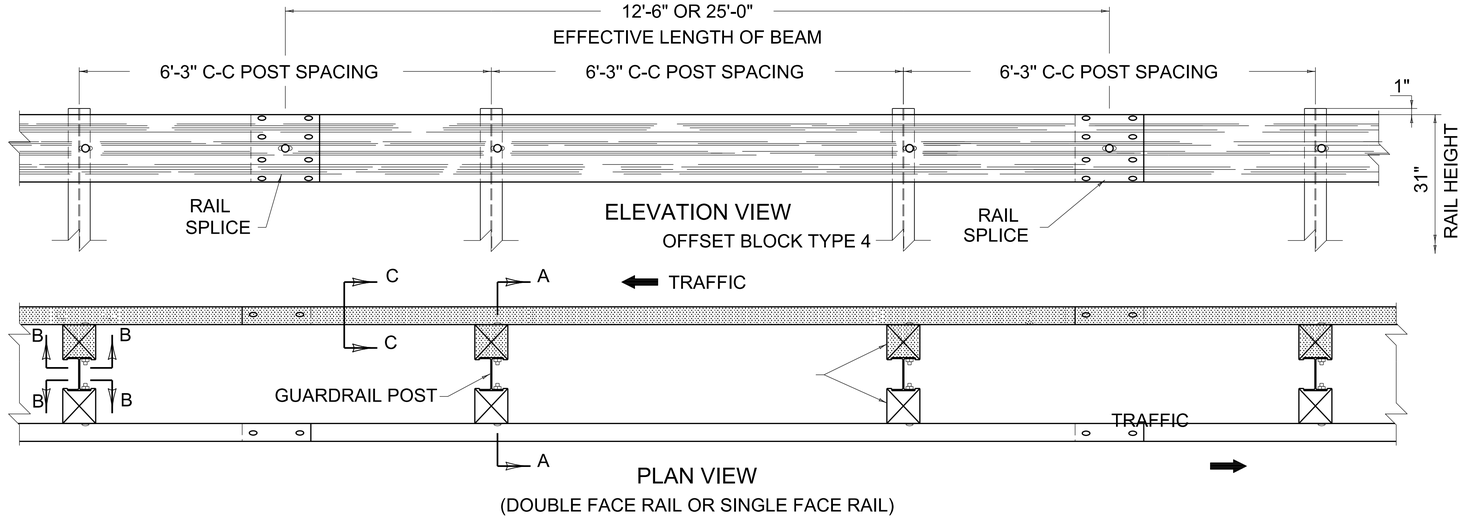
TTI REPORT 9-1002-6
MwRSF TRP-03-279-13
MwRSF TRP-03-469-24

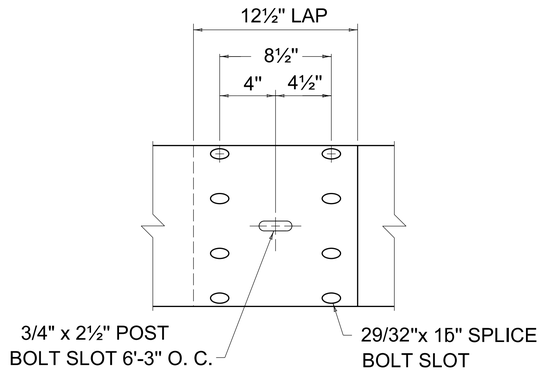
Related Standard Drawings

RBB-002	GUARDRAIL AND BRIDGE END DRAINAGE FOR TWIN STRUCTURE
RBI-001	TYPICAL GUARDRAIL INSTALLATIONS
RBI-002	TYPICAL GUARDRAIL INSTALLATIONS
RBI-005	GUARDRAIL INSTALLATIONS AT BRIDGE COLUMNS
RBI-006	GUARDRAIL INSTALLATIONS AT SIGN SUPPORTS
RBR-001	STEEL BEAM GUARDRAIL (“W” BEAM)
RBR-010	GUARDRAIL TERMINAL SECTIONS
RBR-018	GUARDRAIL SYSTEM TRANSITION

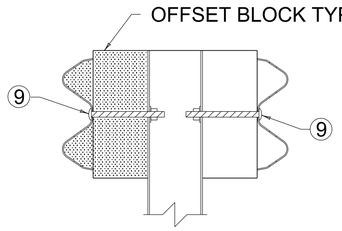
Standard Drawing Revision History

Revision	Description of Changes
RBR-025-06-S DATE: 2025-07-16	➢ Renamed Guardrail End Treatment Type 2A to Type 2M (Trailing End Terminal) ➢ Updated the design to a MASH-compliant terminal for use on the downstream trailing end of guardrail systems



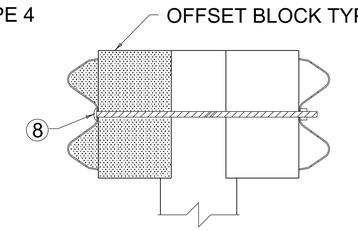


RAIL SPLICE ⑤



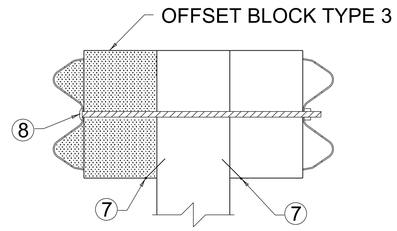
SECTION A-A

DOUBLE FACE RAIL WITH STEEL POST (W6x9) (TIMBER OR APPROVED COMPOSITE OFFSET BLOCK)



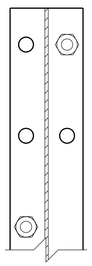
SECTION A-A

DOUBLE FACE RAIL WITH ROUND TIMBER POST

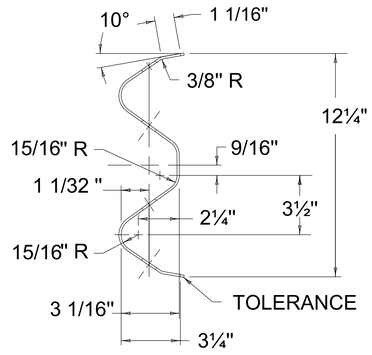


SECTION A-A

DOUBLE FACE RAIL WITH TIMBER POST



SECTION B-B



SECTION C-C
(RAIL CORRUGATED SHEET STEEL BEAM)

~ 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 8-5/8"x 1," 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 5/8"x ⑥ STEEL THREADED ROD AND TWO (2) HEX HEAD NUTS OR 5/8"x ⑥ BUTTON OR HEX HEAD BOLT AND HEX HEAD NUT.

⑨ 5/8"x8" BUTTON HEAD BOLT, HEX HEAD RECESS NUT AND ONE b" 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.

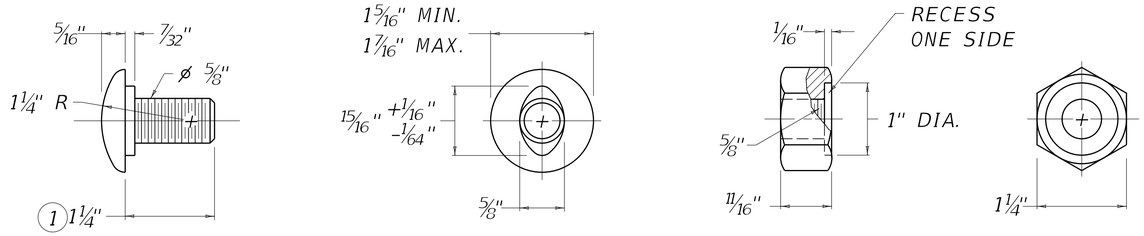
REVISION DATE: 02/26/2020
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 02-26-2020
APPROVED — STATE HIGHWAY ENGINEER — DATE 02-26-2020

BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

GUARDRAIL | STEEL BEAM ("W" BEAM) | STANDARD DRAWING NUMBER RBR-001-13



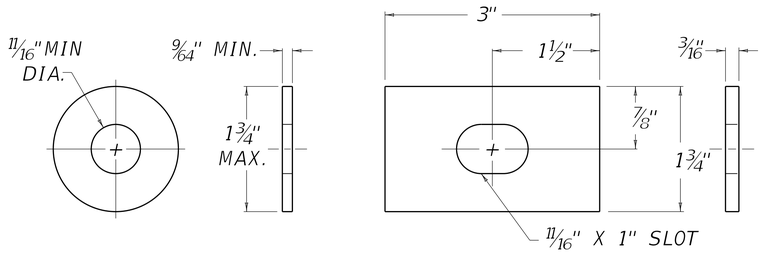
5/8" BUTTON HEAD BOLT AND RECESSED NUT

~ 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

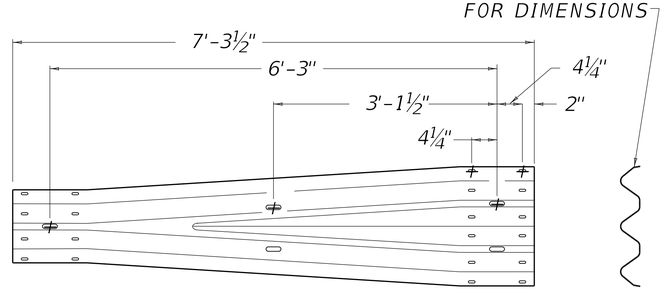
USE WITH CUR. STD. DWG.
RBR-001 RBR-100



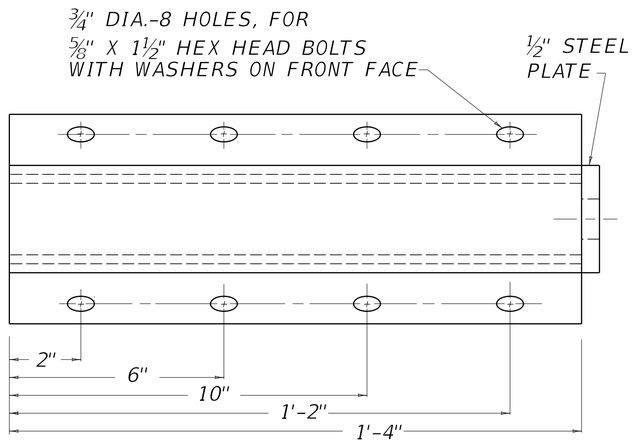
ROUND WASHER AND RECTANGULAR PLATE WASHER

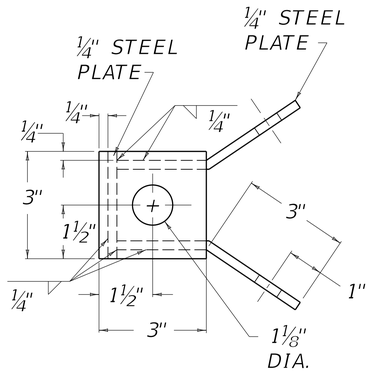
SEE CUR. STD. DWG. RBR-001 FOR DIMENSIONS

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

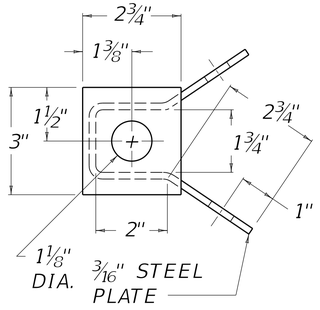


THRIE BEAM TO "W" BEAM CONNECTOR (2)





ALTERNATE NO. 1



ALTERNATE NO. 2

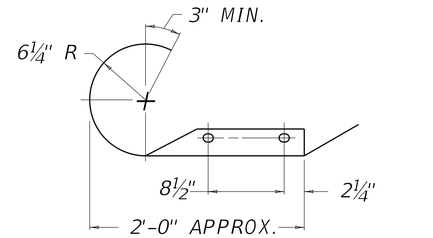
RAIL ANCHOR ASSEMBLY

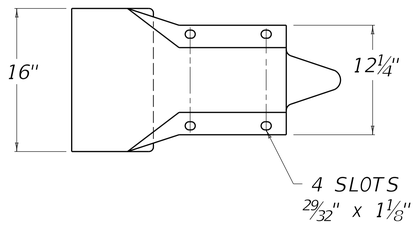
REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

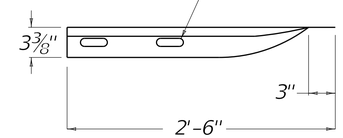
BARRIERS

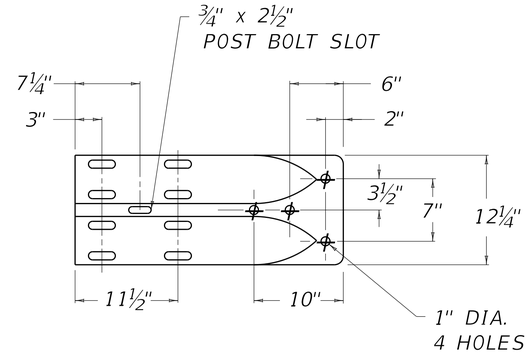




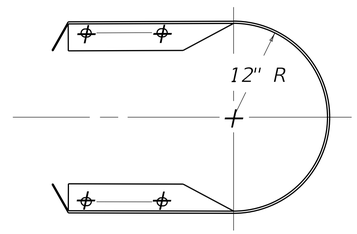
TERMINAL SECTION NO. 1

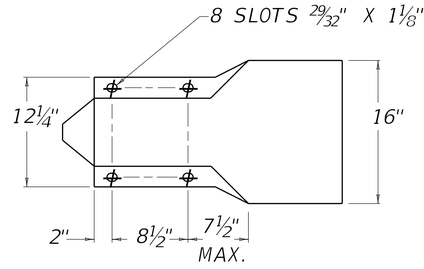
(3) 8 SLOTS 29/32" x 1⅛"





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

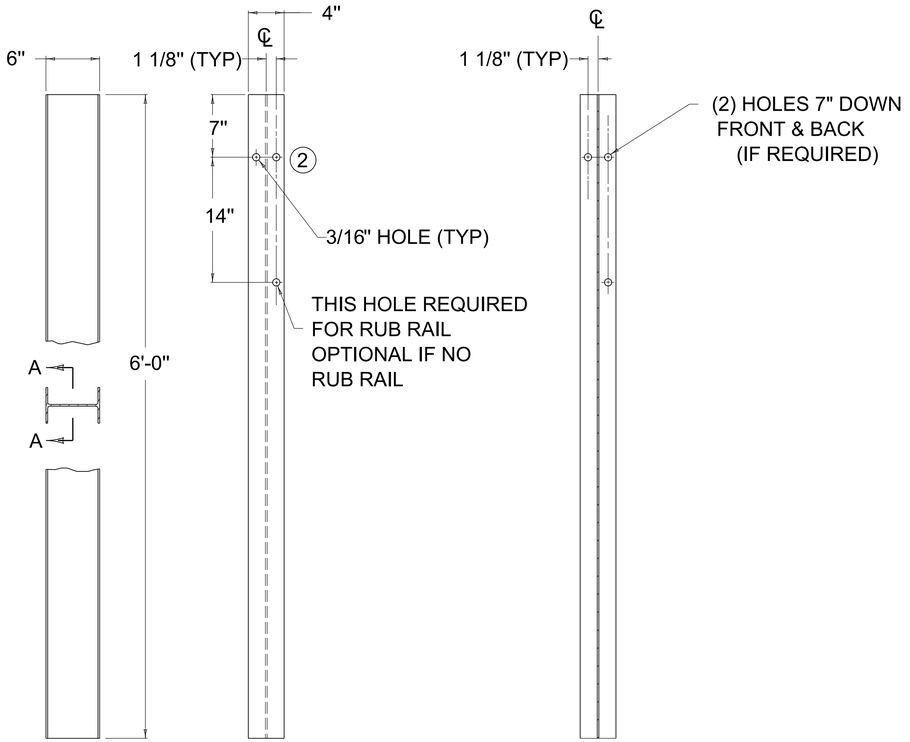
1. TERMINAL SECTIONS SHALL BE PAID FOR AT THE CONTRACT UNIT PRICE BID EACH COMPLETE AND INSTALLED, EXCEPT WHEN INCIDENTAL TO OTHER BID ITEMS.
2. TERMINAL SECTIONS SHALL COMPLY WITH AASHTO M-180 AS FOLLOWS:
   A. TERMINAL SECTIONS NO. 1, 3, -CLASS A OR B, TYPE 2
   B. TERMINAL SECTION NO. 2-CLASS B, TYPE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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

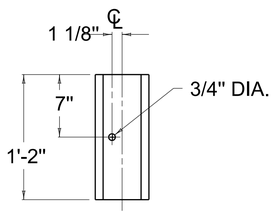
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

BARRIERS

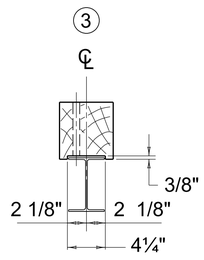


SIDE VIEW FRONT VIEW SECTION A-A

~ W6 X 9.0 STEEL POST ~(1)



REAR ELEVATION

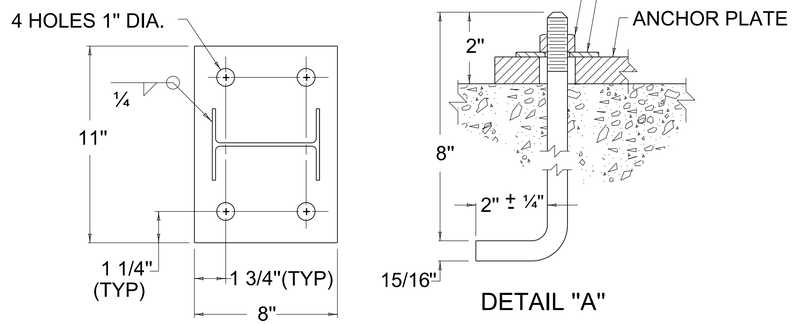


PLAN VIEW

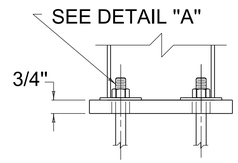
OFFSET BLOCK TYPE 4
6" X 8" (Nominal Size)
(TIMBER OR APPROVED COMPOSITE)
(FOR USE WITH STEEL POST ONLY)

~ NOTES ~

1. W6 X 8.5 IS AN ACCEPTABLE ALTERNATE.
2. THESE HOLES ARE REQUIRED FOR ATTACHING RAIL.
3. TIMBER OR COMPOSITE BLOCKOUTS MAY BE USED WITH STEEL POST.



PLAN VIEW DETAIL "A"



SIDE VIEW
ANCHOR PLATE

REVISION DATE: 02/26/2020
REVISION NUMBER: 0

SUBMITTED 02-26-2020
DIVISION DIRECTOR DATE

APPROVED 02-26-2020
STATE HIGHWAY ENGINEER DATE

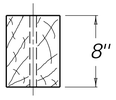
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

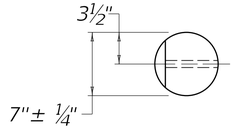
GUARDRAIL

STEEL POSTS

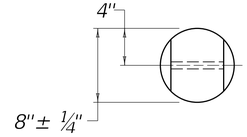
STANDARD DRAWING NUMBER
RBR-015-06



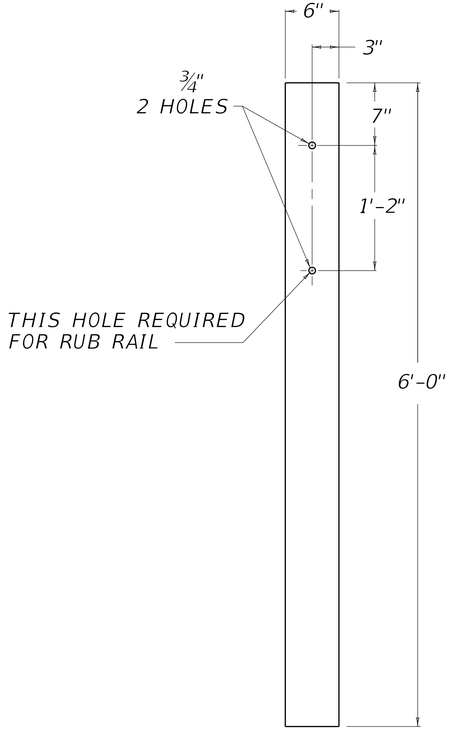
PLAN VIEW



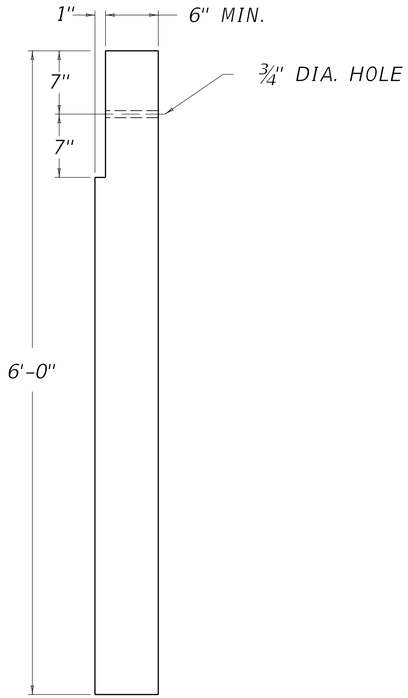
PLAN VIEW



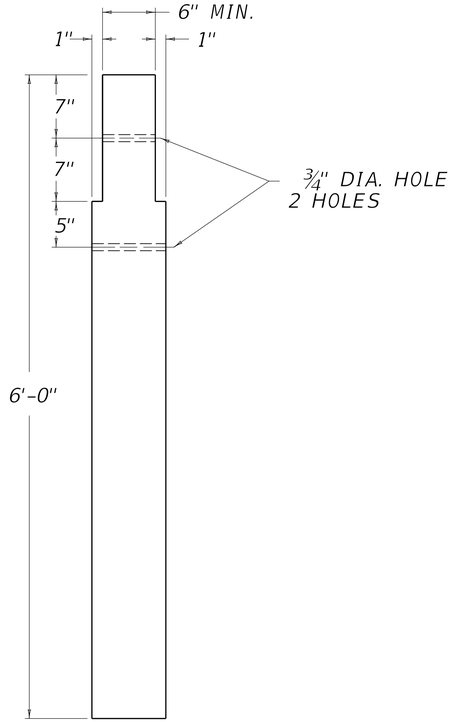
PLAN VIEW



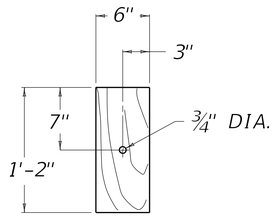
FRONT ELEVATION
6"x8" TIMBER POST



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)

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015

APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

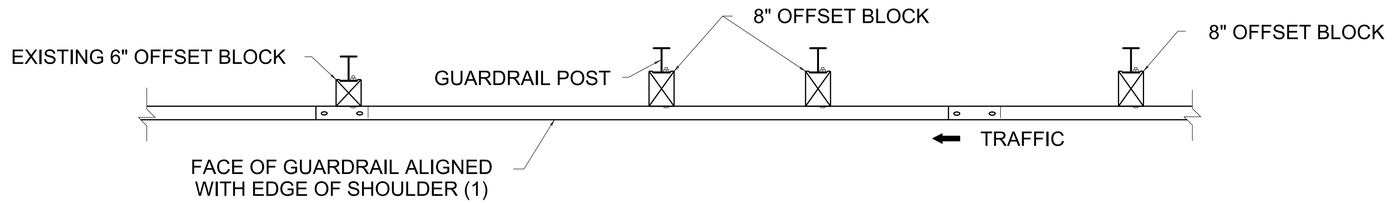
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

GUARDRAIL

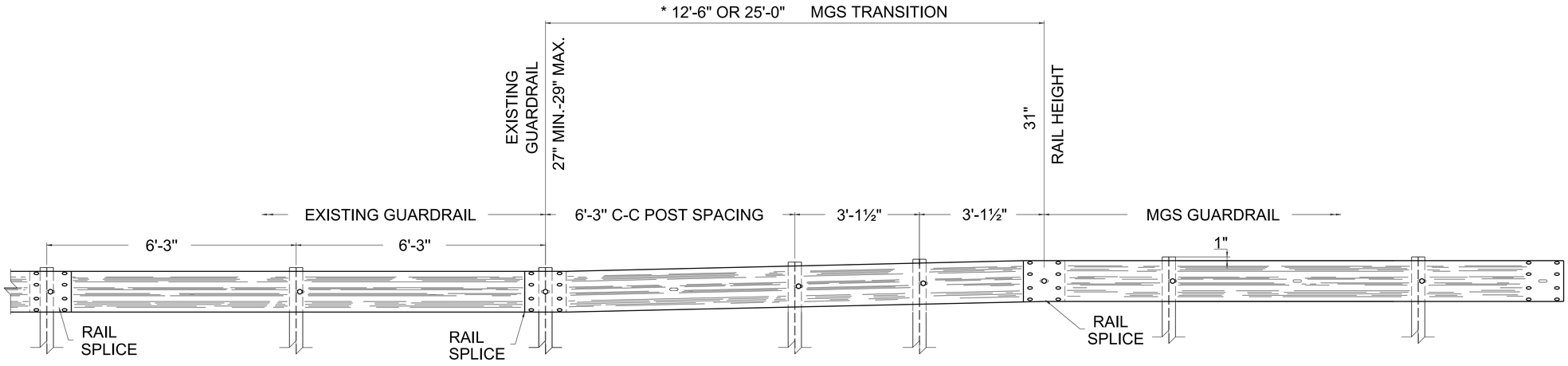
TIMBER POSTS

STANDARD DRAWING NUMBER
RBR-016-05



PLAN VIEW

* 12'-6' TRANSITION FROM 29" TO 31" SHOWN,
25'-0" REQUIRED FOR 27" TO 31" TRANSITION.



ELEVATION VIEW

~ NOTES ~

1) WHERE POST OFFSET IS CONSTRAINED, AND WHEN THE EXISTING SHOULDER IS WIDER THAN 4 FEET, THE EXISTING SHOULDER MAY BE REDUCED UP TO 2 INCHES TO ACCOMMODATE THE 8 INCH BLOCKS OF THE MGS GUARDRAIL. WHERE SITE CONSTRAINTS PROHIBIT THE POST FROM BEING PLACED AT LEAST 6 INCHES IN FRONT OF THE SLOPE BREAK POINT, USE 7 FOOT POSTS.

2) MGS TRANSITION FROM EXISTING GUARDRAIL SHALL BE COMPLETED OUTSIDE THE 50 FEET MGS END TERMINAL LIMITS.

REVISION DATE: 02/26/2020
REVISION NUMBER: 0

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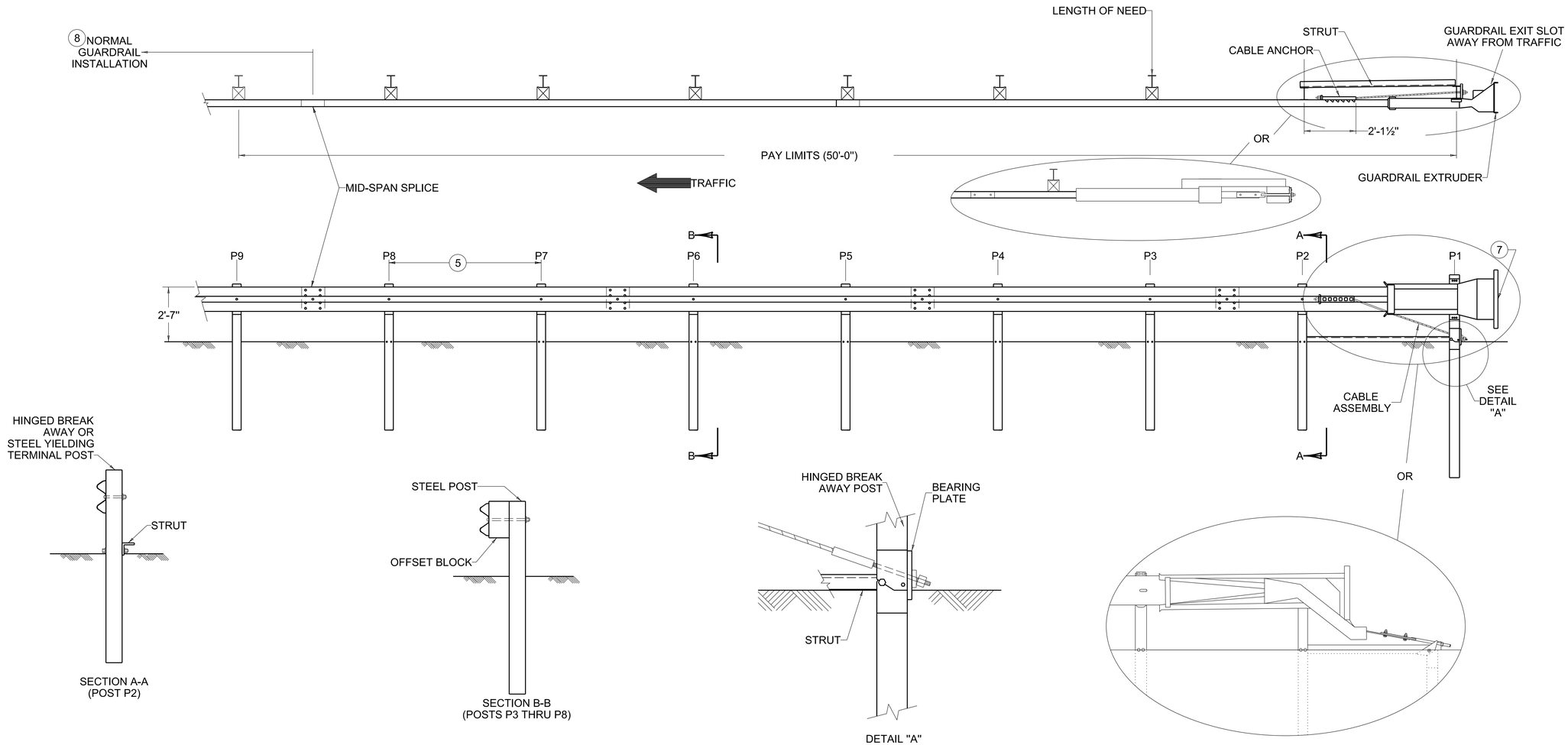
APPROVED — STATE HIGHWAY ENGINEER — 02-26-2020 DATE

BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

GUARDRAIL | TRANSITIONS | STANDARD DRAWING NUMBER RBR-018-00



~ NOTES ~

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: SOFT-STOP MANUACTURED BY VALTIR OF DALLAS, TEXAS OR MSKT 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).*
8. *FOR MAINTENANCE AND REPAIR PROJECTS, USE "GUARDRAIL SYSTEM TRANSITION" (RBR-018) TO TRANSITION BACK TO 27" OR 29" GUARDRAIL HEIGHT, IF ONLY THE TERMINAL IS PROPOSED TO BE REPLACED.*

BID ITEM AND UNIT TO BID:

GUARDRAIL END TREATMENT TYPE 1	*EACH*	*USE WITH CUR. STD. DWG.*
OBJECT MARKER TY 3	*EACH*	*RBR-018*

SCAN THE QR CODES TO ACCESS THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS FOR THE CRASH CUSHIONS.

VALTIR SOFT-STOP

ROAD SYSTEMS INC. MSKT

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025

APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

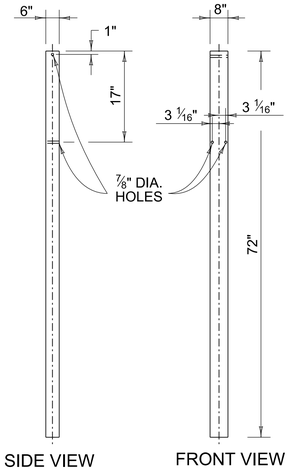
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

GURADRAIL END TREATMENT

GUARDRAIL END TREAMENT TYPE 1

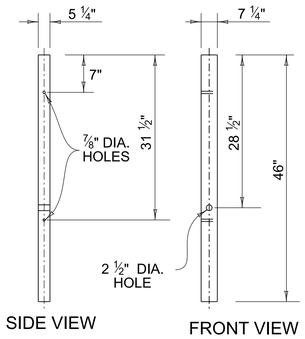
STANDARD DRAWING NUMBER
RBR-020-08



STEEL FOUNDATION TUBE

6"x 8"x ⅛" x 72" STEEL TUBE

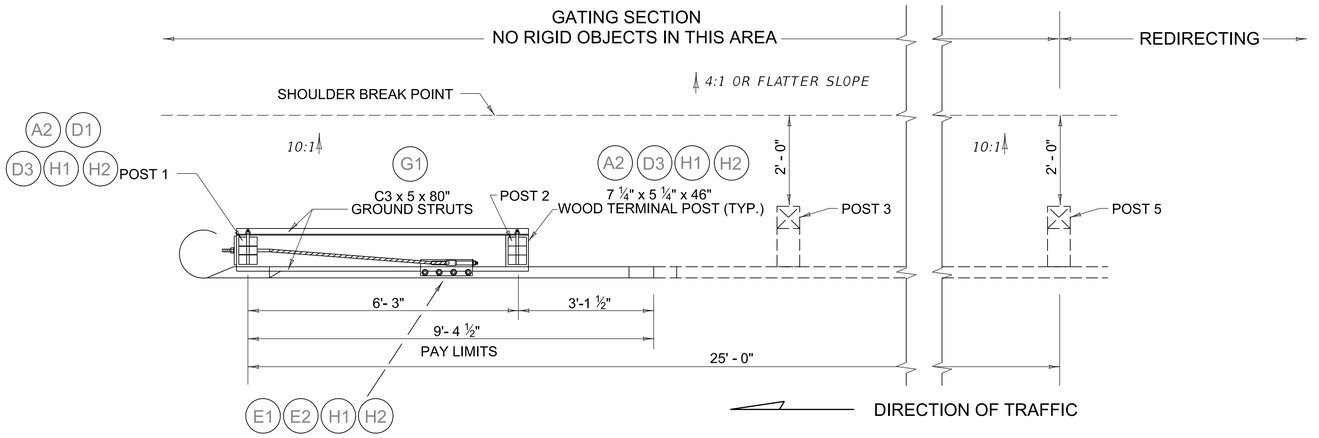
A1 6



TERMINAL POST

7 ¼"x 5 ¼"x 46" WOOD POST

A2

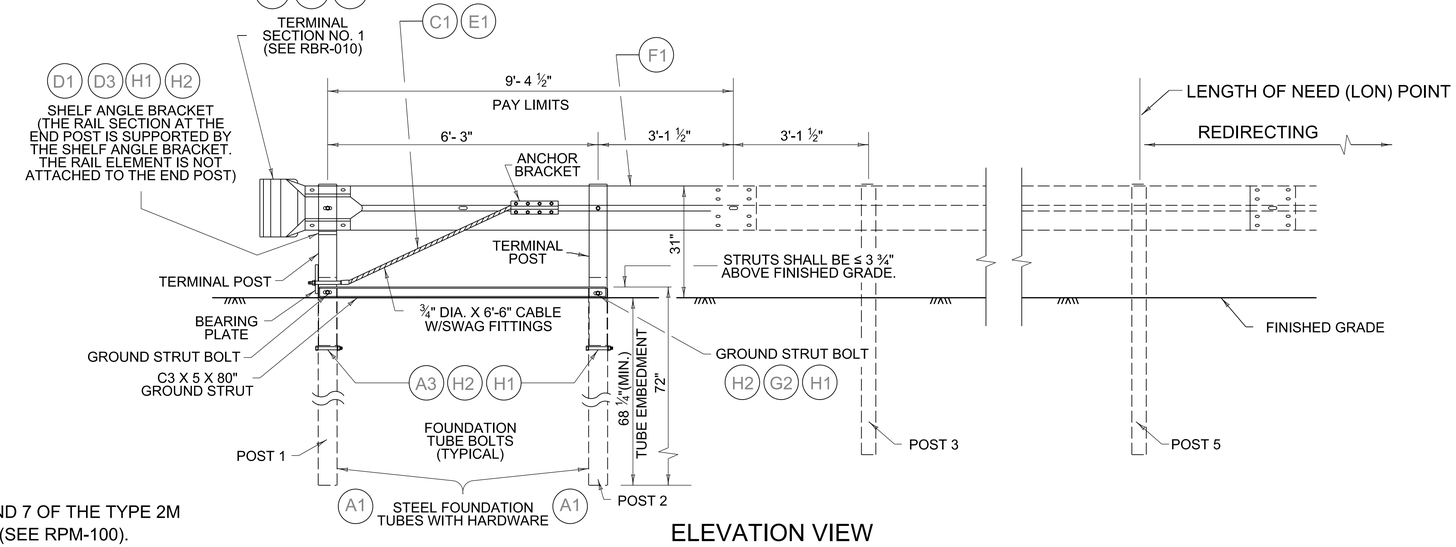


PLAN VIEW

THIS GUARDRAIL ANCHOR SHALL ONLY BE INSTALLED AT TRAILING ENDS WHEN LOCATED OUTSIDE THE CLEAR ZONE AREA OF OPPOSING TRAFFIC.

~ NOTES ~

1. TYPE 2M GUARDRAIL ANCHOR SHALL ONLY BE INSTALLED AT TRAILING ENDS WHEN LOCATED OUTSIDE THE CLEAR ZONE AREA OF OPPOSING TRAFFIC. THE LENGTH OF NEED (LON) OF THE GUARDRAIL IS ONLY OBTAINED AT THE FIFTH GUARDRAIL POST.
2. ALL HOLES IN WOOD POSTS ARE TO BE DRILLED BEFORE PRESERVATIVE TREATMENT IS APPLIED.
3. ALL CUTTING, DRILLING, AND WELDING OF STEEL COMPONENTS SHALL BE DONE BEFORE GALVANIZING.
4. THE FINISHED CABLE ASSEMBLY WILL NOT BE ACCEPTABLE UNLESS IT IS IN TENSION WITH NO SAG.
5. ALL HARDWARE SHALL CONFORM TO ASTM A307 UNLESS OTHERWISE SHOWN.
6. FOR END TERMINAL POSTS 1 AND 2 INSTALLED WITH FOUNDATION TUBES:
   *FOR TYPICAL SOILS, MINIMUM EMBEDMENT REQUIRED IS 68 1/4".
   *IF SOLID ROCK IS ENCOUNTERED AT 20" OR LESS DEPTH, DRILL A 12"-16" DIAMETER HOLE 2 INCHES DEEPER THAN REQUIRED AND INSTALL THE TUBE AT THE STANDARD HEIGHT.
   *IF SOLID ROCK DEPTH EXCEEDS 20 INCHES, DRILL A 12"-16" DIAMETER HOLE AT LEAST 36" DEEP. ADJUST THE TUBE LENGTH TO ENSURE THAT IT IS FULLY EMBEDDED IN THE 36-INCH DRILLED HOLE AND A MAXIMUM 4-INCH PROJECTION ABOVE GRADE, TRIMMING AS NEEDED.
   BACKFILL WITH CUTTING SPOILS, PLACING GRANULAR MATERIAL OR SMALL ROCK (#9 OR #57 STONE) IN THE BOTTOM 2 INCHES FOR DRAINAGE.
7. WHEN CURB AND GUTTER ARE PRESENT WITH GUARDRAIL, BETWEEN POSTS 6 AND 7 OF THE TYPE 2M TERMINAL TRANSITION TO LIP CURB AND GUTTER OR ISLAND CURB AND GUTTER (SEE RPM-100). CONTINUE THE LIP OR ISLAND CURB AND GUTTER FOR 50 FEET BEYOND POST 1 OF THE TERMINAL.
8. COMPONENT DETAILS LABELED BY LETTER AND NUMBER (e.g., A1, H2) ARE DEFINED IN THE MATERIALS LIST ON SHEET 2.



ELEVATION VIEW

BID ITEM AND UNIT TO BID

GUARDRAIL END TREATMENT TYPE 2M	EACH

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 08-11-2025 DATE

APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

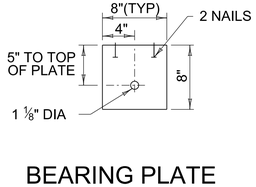
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

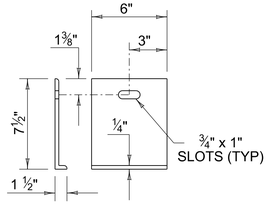
GUARDRAIL END TREATMENT

SHEET 001: GUARDRAIL END TREATMENT TYPE 2M (TRAILING END TERMINAL)

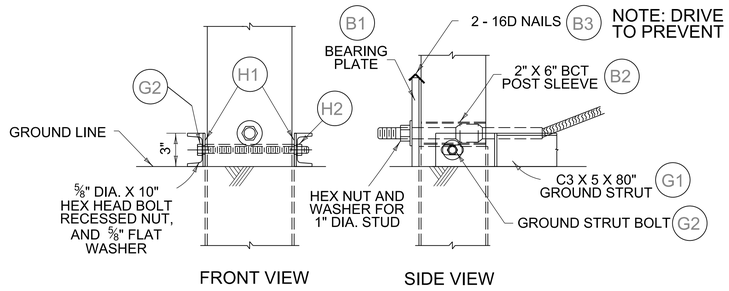
STANDARD DRAWING NUMBER
RBR-025-07



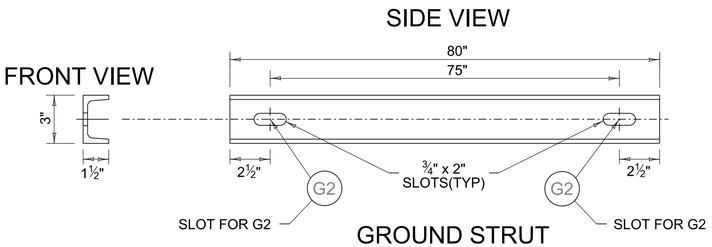
BEARING PLATE
8"x 8"x ⅝" PL
B1



SHELF ANGLE BRACKET
D1



BEARING PLATE ASSEMBLY DETAIL



GROUND STRUT
C3 x 5 x 80", GRADE A36
G1

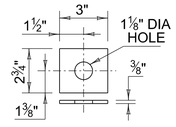
TYPE 2M MATERIALS LIST

PART NUMBER	QUANTITY	DESCRIPTION	HARDWARE GUIDE [1]	MATERIAL DESCRIPTIONS [2, 3]
A1	2	6" x 8" x 72" STEEL FOUNDATION TUBE	NA	AASHTO M111/ASTM A123 ASTM A500 GRADE B OR ASTM A-501
A2	2	7 ¼" X 5 ¼" X 46" WOOD TERMINAL POST	NA	S4S FINISH ON 4 SIDES
A3	4	BOLT, ⅝" DIA. X 8" HEX FOR SOIL FOUNDATION TUBE	FBX16a	ASTM A307
B1	1	BEARING PLATE	FPB01	SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES.
B2	1	BCT POST SLEEVE	FMM02	SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES.
B3	2	16D DOUBLE HEAD NAIL (FOR BEARING PLATE)	NA	AASHTO M232 CLASS D
C1	1	¾" DIA. X 6'-6" CABLE W/ SWAGE FITTINGS (BCT CABLE)	FCA01	
C2	2	1" DIA. ANCHOR CABLE ASSEMBLY WASHER	FWC24a	
C3	2	1" DIA. ANCHOR ASSEMBLY NUT	FNX24a	ASTM A563, GRADE A OR BETTER
D1	1	SHELF ANGLE BRACKET	FPP02	AASHTO M111/ASTM 123/ASTM A36 MIN. STRENGTH 36 KSI, SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
D2	4	BOLT, BUTTON-HEAD 1 ¼" (FOR CONNECTING TERMINAL SECTION NO. 1)	FBB01	
D3	2	BOLT, BUTTON-HEAD 10" (⅝" DIA. POST BOLT)	FBB03	
E1	1	ANCHOR BRACKET	FPA01	SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES.
E2	8	BOLT, ⅝" DIA. X 2" HEX FOR ANCHOR BRACKET ASSEMBLY	FBX16a	ASTM A307
F1	1	10" 4 ¾" TERMINAL RAIL ELEMENT (12 GA. W-BEAM)	RWM02a	
F2	1	W-BEAM TERMINAL SECTION NO. 1 (12 GA.)	RWE03a	RBR-010
G1	2	C3 X 5 X 80" GROUND STRUT	NA	AASHTO M111/ASTM 123/ASTM A36 MIN. STRENGTH 36 KSI, SEE SPEC. SECTION 812.01.01 FOR ALTERNATIVE STEEL GRADES
G2	2	BOLT, ⅝" DIA. X 10" HEX FOR GROUND STRUT ATTACHMENT TO TERMINAL POSTS	FBX16a	ASTM A307
H1	18	WASHER, ⅝" FLAT	FWC16a	
H2	20	NUT, RECESSED GUARDRAIL	FBB	ASTM A563, GRADE A OR BETTER

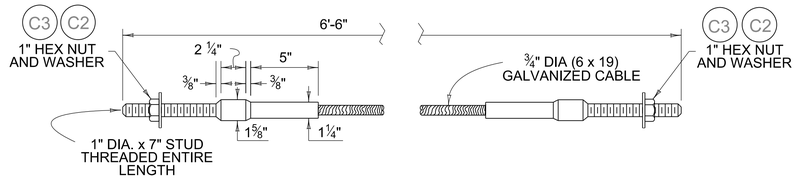
[1] THE HARDWARE GUIDE NUMBER IS REFERENCED IN THE TASK FORCE 13 GUIDE TO STANDARDIZED ROADSIDE HARDWARE, AVAILABLE AT https://tf13.org/guides/. WHEN AASHTO AND ASTM MATERIAL SPECIFICATIONS ARE AVAILABLE FOR COMPONENT, THEY ARE LISTED IN THE GUIDE.

[2] IF THE TASK FORCE 13 GUIDE TO STANDARDIZED ROADSIDE HARDWARE DOES NOT REFERENCE THE AASHTO AND ASTM SPECIFICATIONS, THEY ARE PROVIDED IN THE MATERIAL DESCRIPTIONS COLUMN. ADDITIONAL MATERIAL SPECIFICATIONS CAN BE FOUND IN KENTUCKY STANDARD SPECIFICATIONS, SECTION 814-GUARDRAIL SYSTEMS.

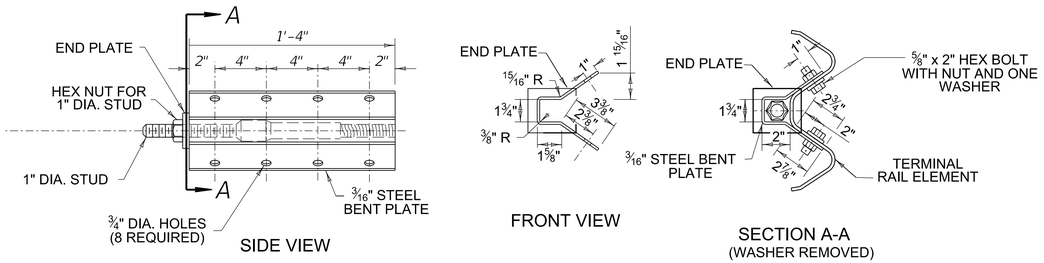
[3] IF THERE ARE DISCREPANCIES IN MATERIAL OR DIMENSIONS BETWEEN THE TASK FORCE 13 GUIDE TO STANDARDIZED ROADSIDE HARDWARE AND THIS STANDARD DRAWING SET, THE DETAILS IN THE STANDARD DRAWING SET SHALL TAKE PRECEDENCE.



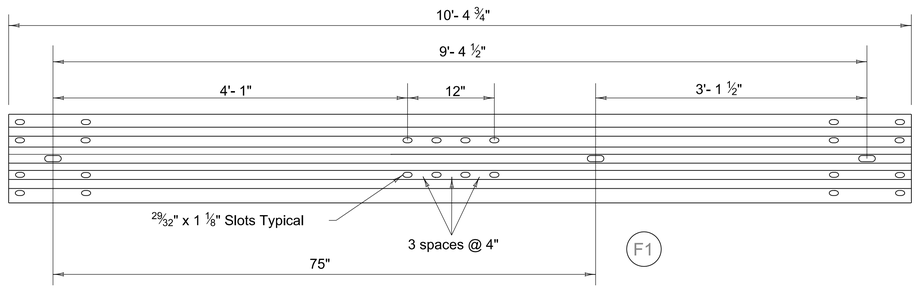
END PLATE



STANDARD SWAGE FITTING AND STUD
NOTE: CABLE TO BE SWAGE-CONNECTED
C1



ANCHOR BRACKET ASSEMBLY DETAILS
(ANCHOR PLATE, (8) ⅝" X 2" HEX HEAD BOLTS, NUTS, AND WASHERS)



TERMINAL RAIL ELEMENT

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 08-11-2025 DATE
APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

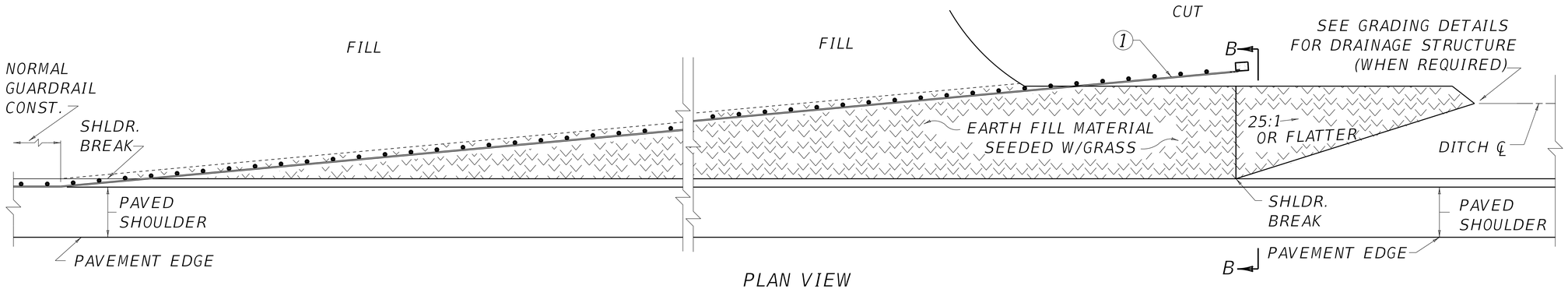
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

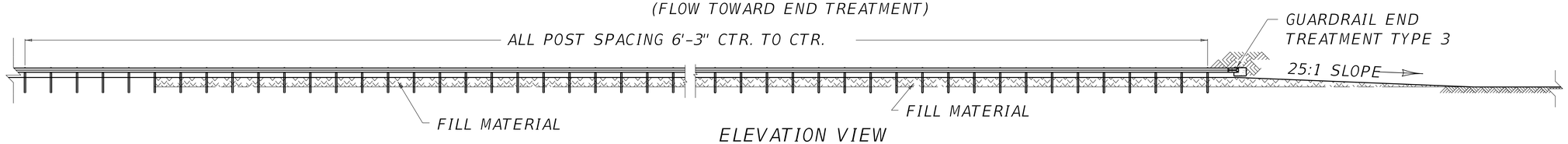
GUARDRAIL END TREATMENT

SHEET 002: GUARDRAIL END TREATMENT TYPE 2M (TRAILING END TERMINAL)

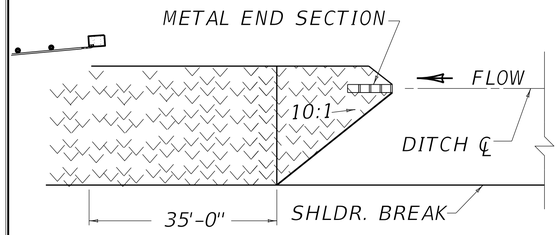
STANDARD DRAWING NUMBER
RBR-025-07



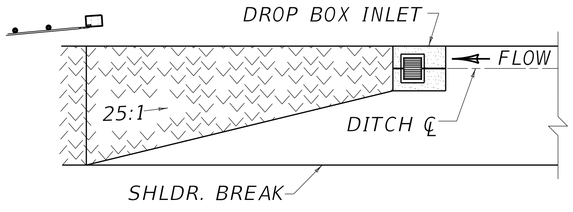
PLAN VIEW
(FLOW TOWARD END TREATMENT)



ELEVATION VIEW

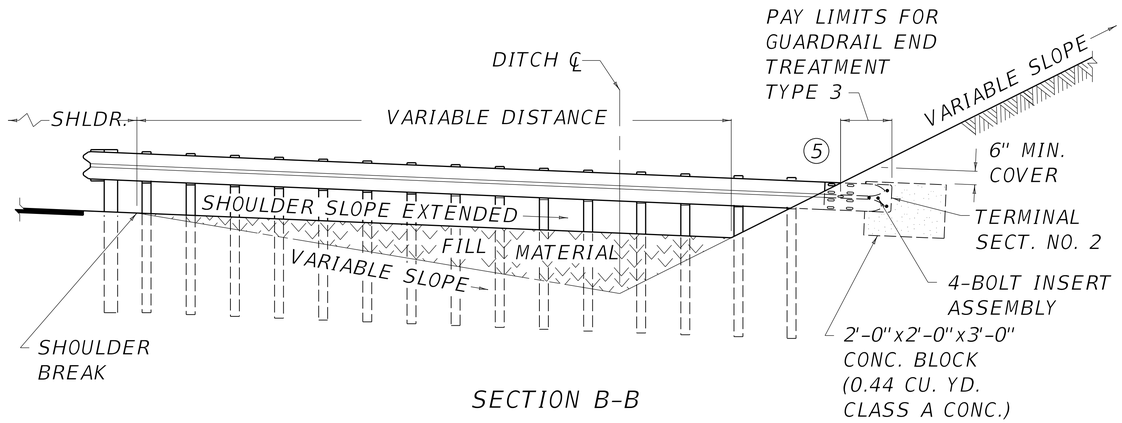


FLOW TOWARD METAL END SECTION



FLOW TOWARD DROP BOX INLET

GRADING DETAILS



SECTION B-B

~ 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.

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

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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

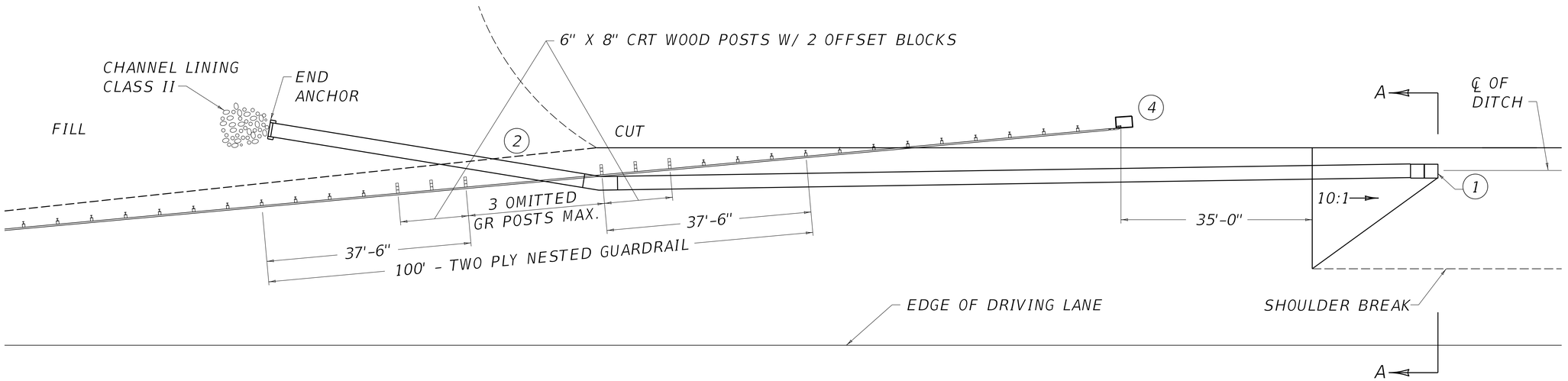
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

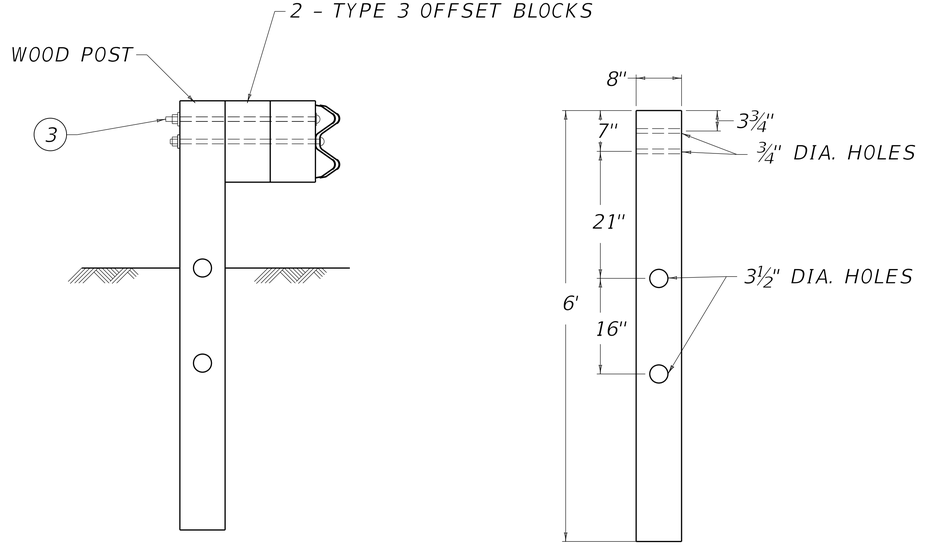
GUARDRAIL

END TREATMENT TYPE 3

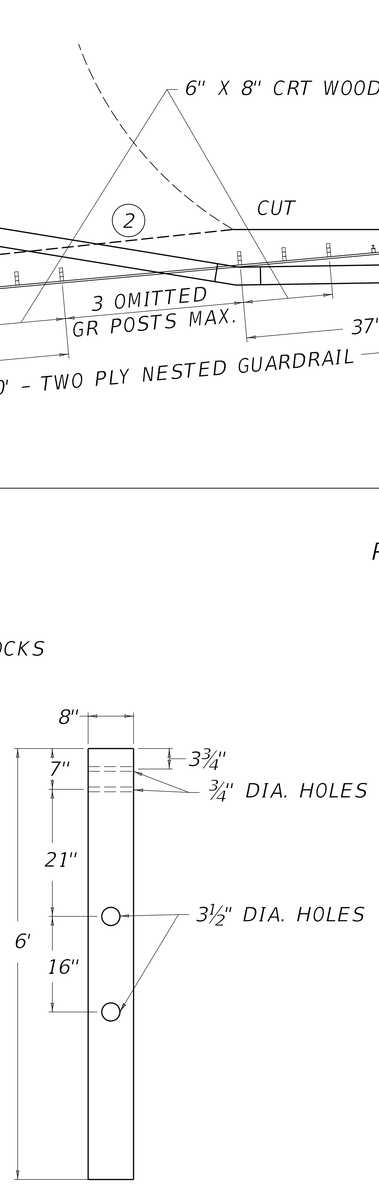
STANDARD DRAWING NUMBER
RBR-030-05



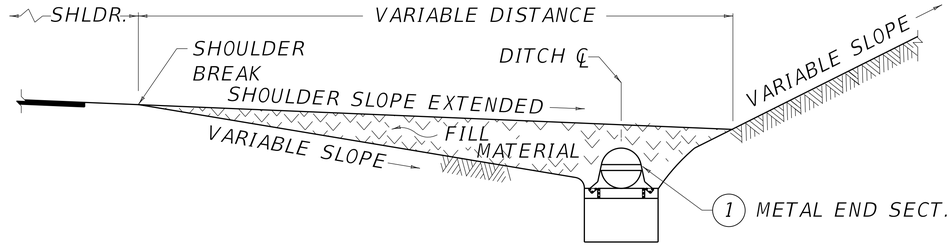
PLAN VIEW



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

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

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.

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

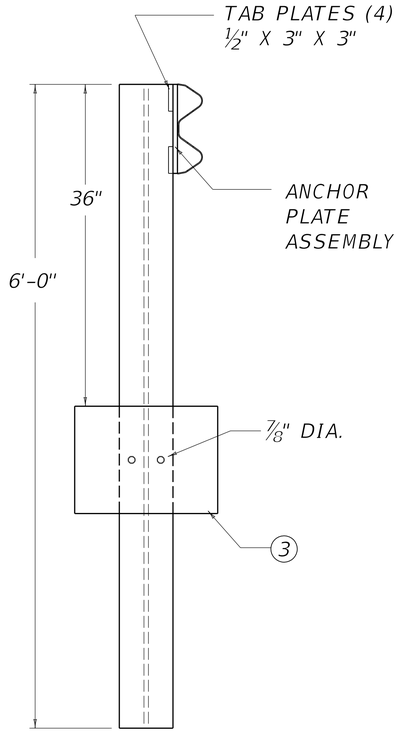
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

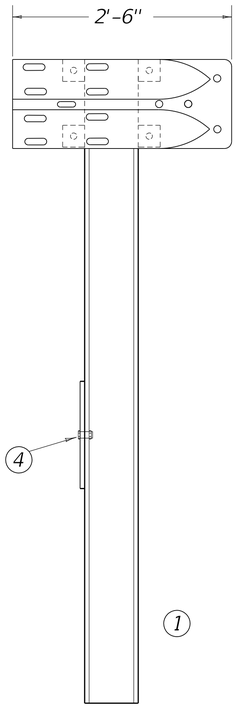
GUARDRAIL

END TREATMENT TYPE 3 PIPE DRAINAGE DETAIL

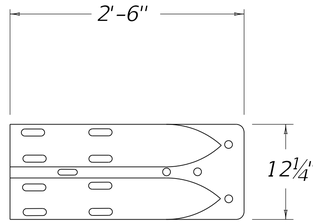
STANDARD DRAWING NUMBER
RBR-031-01



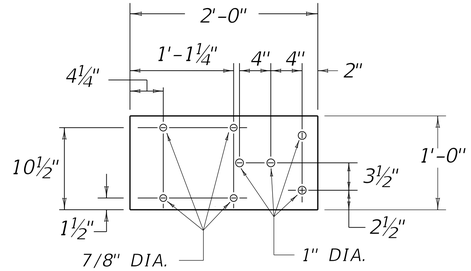
SIDE VIEW



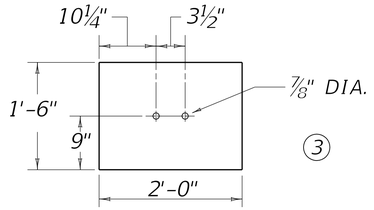
FRONT VIEW



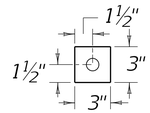
TERMINAL SECTION NO. 2



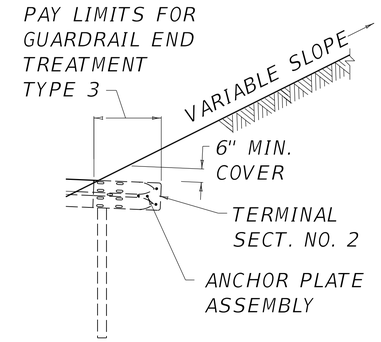
ANCHOR PLATE ASSMEBLY (2)



SOIL PLATE



TAB PLATE



ELEVATION VIEW

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

~ 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

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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015

APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

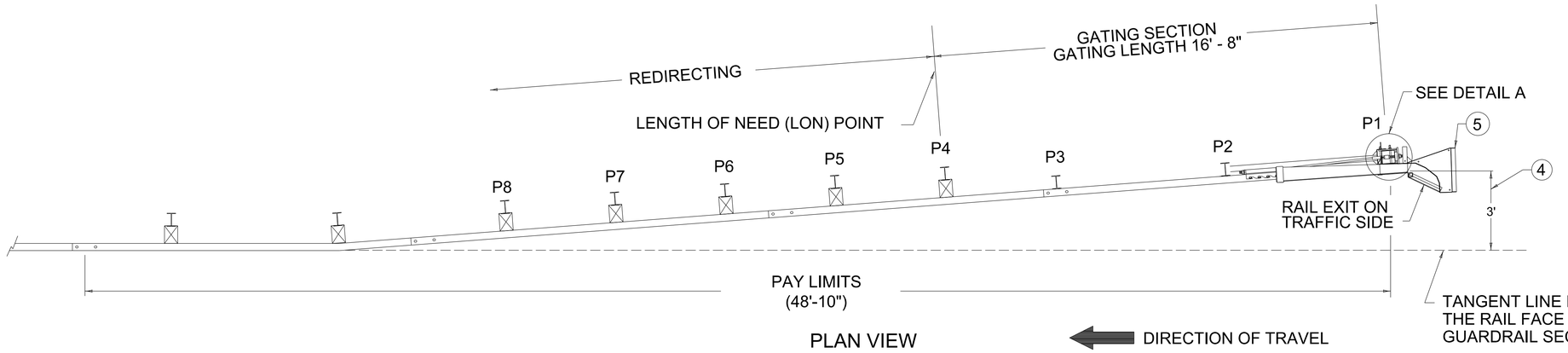
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

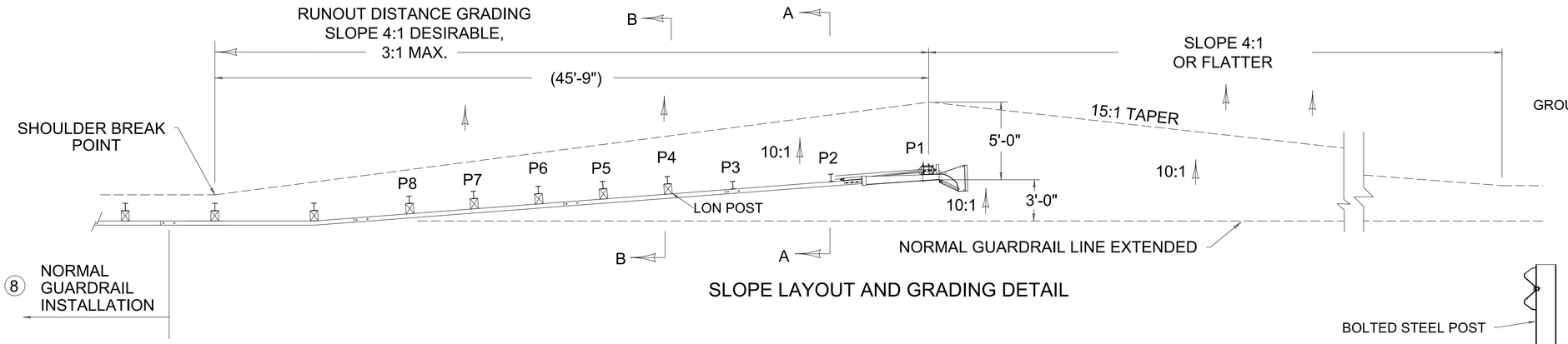
GUARDRAIL

END TREATMENT TYPE 3 ALTERNATE ANCHOR

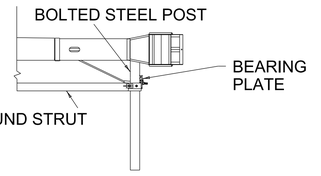
STANDARD DRAWING NUMBER
RBR-032-00



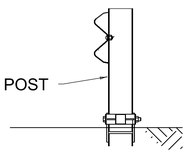
PLAN VIEW



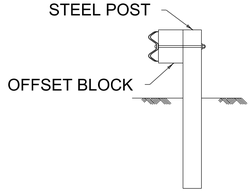
SLOPE LAYOUT AND GRADING DETAIL



DETAIL "A"
(SIDE VIEW POST P1)



SECTION A-A
(POSTS P2 AND P3)



SECTION B-B
(POSTS P4 THRU P8)

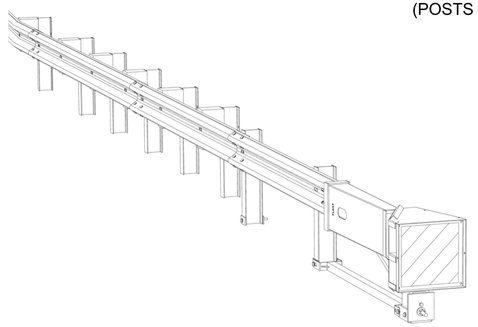
~ NOTES ~

1. *THE 4A END TREATMENT IS A TEST LEVEL 3 (TL-3) DEVICE DESIGNED FOR INSTALLATION IN AREAS WHERE THERE IS ADEQUATE VEHICLE RECOVERY SPACE. THE AREA BEHIND POSTS 1 THROUGH 4 SHOULD BE FREE OF FIXED OBJECTS TO ENSURE PROPER PERFORMANCE.*
2. *THE PERMISSIBLE ALTERNATIVE FOR GUARDRAIL END TREATMENT TYPE 4A IS THE PATENTED MFLEAT, MANUFACTURED BY ROAD SYSTEMS INC. OF BIG SPRING, TEXAS.*
3. *REFER TO THE MANUFACTURER'S SPECIFICATIONS FOR REQUIREMENTS RELATED TO THE POST, RAIL ELEMENT, AND POST-TO-RAIL CONNECTION. KEEP SHOP DRAWINGS AVAILABLE ON-SITE FOR REFERENCE DURING INSTALLATION.*
4. *INSTALL MFLEAT WITH A 3-FOOT OFFSET ACCORDING TO THE MANUFACTURER'S ASSEMBLY INSTRUCTIONS.*
5. *OBJECT MARKER TYPE 3 (SEE CURRENT MUTCD MANUAL FOR DETAILS).*
6. *INSTALL THE SYSTEM AFTER ALL SITE GRADING REQUIREMENTS HAVE BEEN COMPLETED.*
7. *THERE IS NO RADIUSED RAIL WITHIN THE MFLEAT.*
8. *FOR MAINTENANCE AND REPAIR PROJECTS, USE GUARDRAIL SYSTEM TRANSITION RBR-018 TO TRANSITION BACK TO A 27" OR 29" GUARDRAIL HEIGHT IF ONLY THE TERMINAL IS BEING REPLACED.*

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*

SCAN THE QR CODE TO ACCESS THE ASSEMBLY INSTRUCTIONS FOR THE MFLEAT.



THIS IS A PROPRIETARY ITEM: MFLEAT
(BY ROAD SYSTEMS, INC.)

THIS STANDARD DRAWING PROVIDES GUIDANCE ONLY. CONSULT THE MANUFACTURER FOR THE LATEST DETAILS AND INSTALLATION INSTRUCTIONS.

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 08-11-2025 DATE
APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

GUARDRAIL END TREATMENT

GUARDRAIL END TREATMENT TYPE 4A

STANDARD DRAWING NUMBER
RBR-035-013

Standard Drawing Reference Report

RBR-035-13 GUARDRAIL END TREATMENT TYPE 4A
Effective with the July 18, 2025 Letting

Design Notes

The Type 4A end treatment is a proprietary, single-sided guardrail end treatment known as the MFLEAT. It is manufactured and sold by Road Systems Inc. as well as its authorized representatives. Detailed information is contained in the manufacturer's installation manual (see QR code on Standard Drawing).

The MFLEAT is a flared, energy-absorbing guardrail end terminal that meets MASH Test Level 3 crash testing criteria. It is used with MGS 31-inch tall W-beam barrier and installed with a 3-foot lateral offset at the terminal's end, in accordance with the manufacturer's assembly instructions. The flared design helps reduce nuisance impacts from errant vehicles at shallow angles. The system is engineered to redirect, gate, or bring vehicles to a controlled stop, depending on the angle and severity of impact.

The Type 4A end treatment is used at the leading end of a guardrail run where there is sufficient lateral space for the flare, or at the trailing end when it is within the clear zone of opposing traffic. Adequate clear zone must be provided behind this gating terminal to allow for vehicle recovery.

Review drainage and grading conditions near the Type 4A end treatment early in the roadway design process. Additional right of way may be required to accommodate necessary grading and drainage features in this area. Because the Type 4A end treatment provides structural support for the entire guardrail system, inadequate grading at the terminal location may compromise its performance.

The Type 4A end treatment gates at Posts 1 – 4. This means the end treatment allows an impacting vehicle to pass through the end of the barrier, rather than redirecting or containing it. Therefore, the end treatment is not intended to shield fixed objects located within the gating zone, which extends perpendicular to Posts 1 – 4. Installation of the end treatment must keep this area free of obstacles. If fixed objects are present within the proposed gating area, consider extending the guardrail to shift the gating zone beyond the fixed object.

From Post 4 onward, the guardrail system anchored by the Type 4A end treatment is designed to redirect impacting vehicles. Ensure no rigid objects are placed adjacent to the barrier within the system's working width — 60 inches for Midwest Guardrail System — as they may interfere with guardrail performance.

When curb and gutter are present with guardrail, transition to lip curb and gutter or island curb and gutter (see RPM-100) at Post 10 of the Type 4A end treatment. Continue the selected curb and gutter type along the normal guardrail line, extending it alongside the Type 4A end treatment and for 50 feet beyond Post 1.

References

KYTC Standard Specifications for Road and Bridge Construction

- Section 719 – Guardrail
- Section 814 – Guardrail Systems

Highway Design Guidance Manual

- HD-800 ROADSIDE DESIGN
- HD-801.6 END TREATMENTS & CRASH CUSHIONS

Crash Test Reports

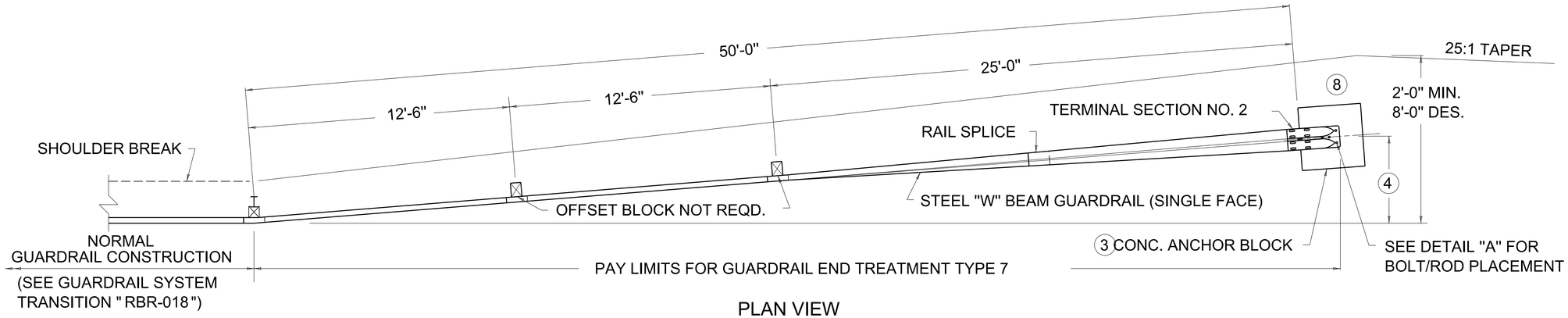
FHWA Letter CC-143 (4-10-2019)

Related Standard Drawings

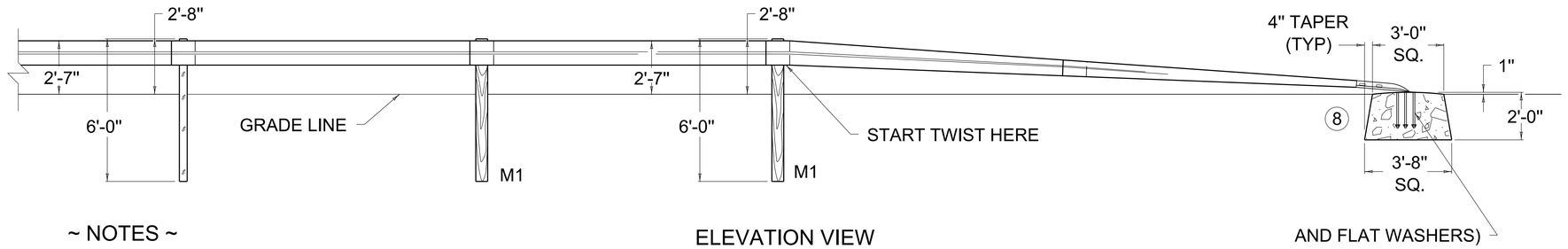
RBB-002	GUARDRAIL AND BRIDGE END DRAINAGE FOR TWIN STRUCTURE
RBI-001	TYPICAL GUARDRAIL INSTALLATIONS
RBI-002	TYPICAL GUARDRAIL INSTALLATIONS
RBI-005	GUARDRAIL INSTALLATIONS AT BRIDGE COLUMNS
RBI-006	GUARDRAIL INSTALLATIONS AT SIGN SUPPORTS
RBR-001	STEEL BEAM GUARDRAIL (“W” BEAM)
RBR-018	GUARDRAIL SYSTEM TRANSITION

Standard Drawing Revision History

Revision Date	Description of Changes
SEPIA 035 DATE: 2025-6-11	➢ Updated guidance for Guardrail End Treatment Type 4A on the Standard Drawing ➢ Added a QR code linking to the MFLEAT assembly instructions



PLAN VIEW



ELEVATION VIEW

~ 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) ½" ROUND WASHER AND ONE (1) RECTANGULAR PLATE WASHER REQUIRED FOR EACH SPLICE BOLT, AT TERMINAL SECTION NO. 2.

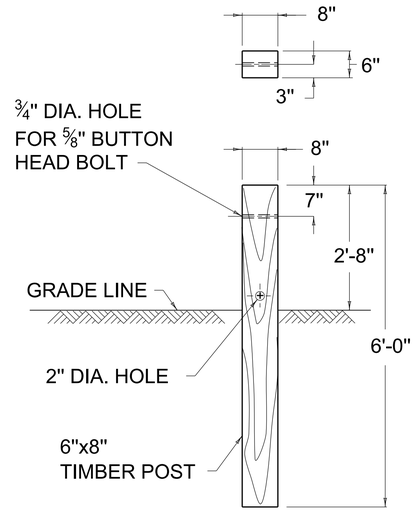
(3) THE CONCRETE ANCHOR BLOCK MAY BE PRECAST OR CAST-IN-PLACE. WHEN THE CONCRETE ANCHOR BLOCK IS CAST-IN-PLACE FORMING OF THE SIDES SHALL BE REQUIRED.

(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.

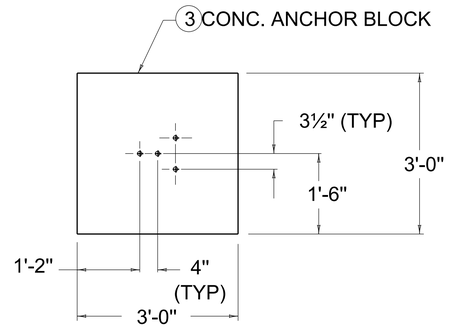
5. SEE CUR. STD. DWG. RBR-001, RBR-005, RBR-010, AND RBR-015 FOR APPLICABLE DETAILS AND SPECIFICATIONS.
6. APPROX. QUANTITY FOR ANCHOR BLOCK: 0.83 CU. YD. CLASS "A" CONCRETE FOR TYPE 7 INSTALLATON.
7. THIS GUARDRAIL END TREATMENT IS NOT FOR USE ON APPROACH END ON HIGH SPEED NHS ROUTES ABOVE 35 MPH.

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

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



M1 POST DETAIL



DETAIL "A"

REVISION DATE: 02/26/2020
REVISION NUMBER: 0

SUBMITTED 02-26-2020 DATE
DIVISION DIRECTOR

APPROVED 02-26-2020 DATE
STATE HIGHWAY ENGINEER

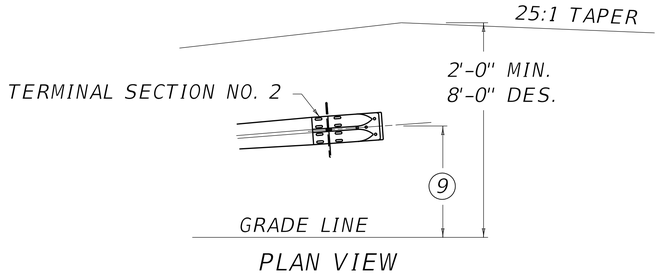
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

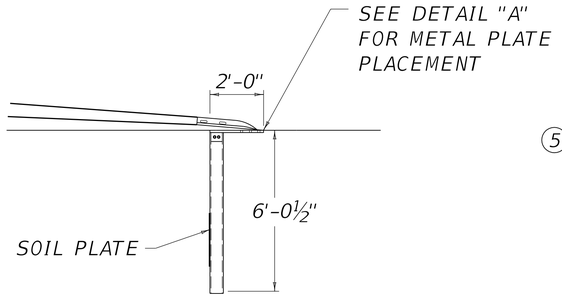
GUARDRAIL

END TREATMENT TYPE 7

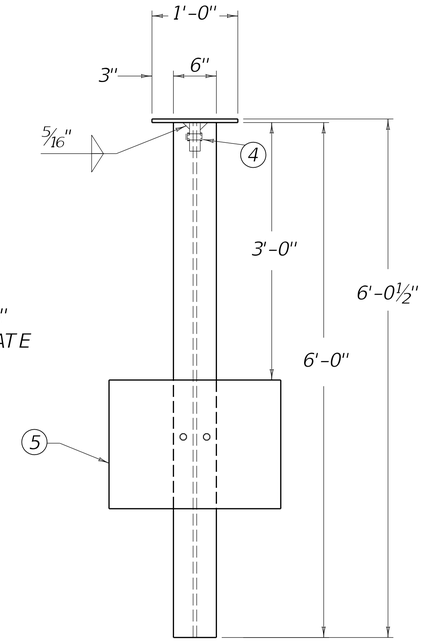
STANDARD DRAWING NUMBER
RBR-050-08



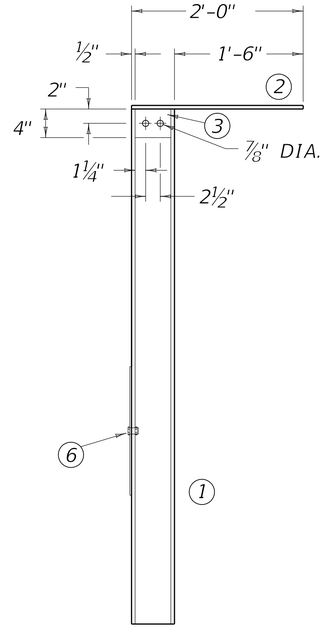
PLAN VIEW



ELEVATION VIEW



SIDE VIEW



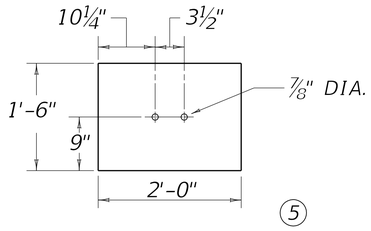
FRONT VIEW

~ NOTES ~

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

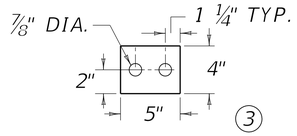
7. GUARDRAIL END TREATMENT TYPE 7 SHALL BE TO THE PAY LIMITS AS DETAILED AND THE CONTRACT UNIT PRICE EACH SHALL INCLUDE TERMINAL SECTION NO. 2, STEEL "W" BEAM GUARDRAIL (SINGLE FACE), GUARDRAIL POSTS M1, STEEL ANCHOR PLATE AND POST, SOIL PLATE, TAB PLATES, EXCAVATION, LABOR, HARDWARE AND ALL INCIDENTALS 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 CLEARANCE IN BETWEEN TAB PLATES FOR GALVANIZED W6 x 15 W-BEAM POST.

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

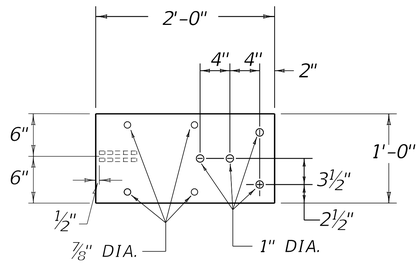


SOIL PLATE

DETAIL "A"



TAB PLATE



ANCHOR PLATE
ASSMEBLY ②

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

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REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 02-26-2020 DATE
APPROVED — STATE HIGHWAY ENGINEER — 02-26-2020 DATE

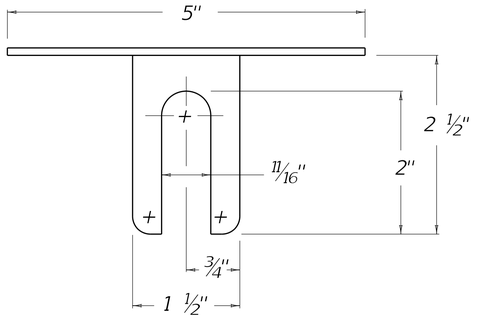
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

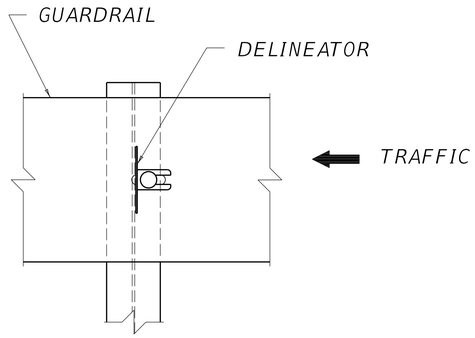
GUARDRAIL

END TREATMENT TYPE 7 ALTERNATE ANCHOR

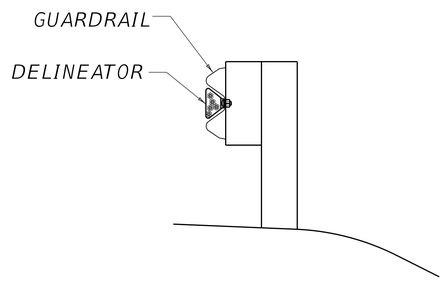
STANDARD DRAWING NUMBER
RBR-051-01



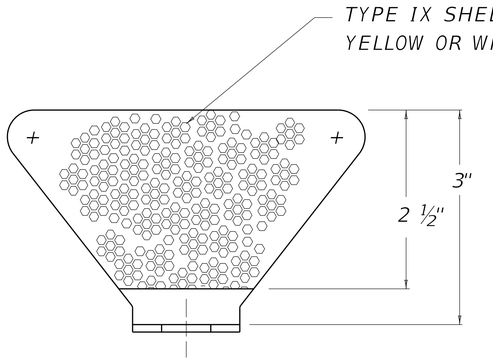
PLAN VIEW



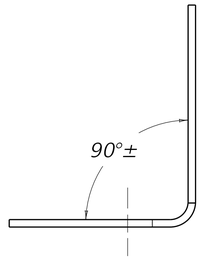
FRONT VIEW



SIDE VIEW



FRONT VIEW



SIDE VIEW

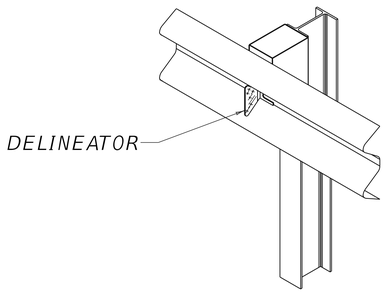
DIMENSIONS SHOWN ARE FOR ONE VERSION OF A WEB-MOUNTED GUARDRAIL DELINEATOR. DELINEATORS WITH ALTERNATE DIMENSIONS MAY BE CONSIDERED FOR INCLUSION ON THE APPROVED PRODUCTS LIST.

~ NOTES ~

BID ITEMS AND UNIT TO BID

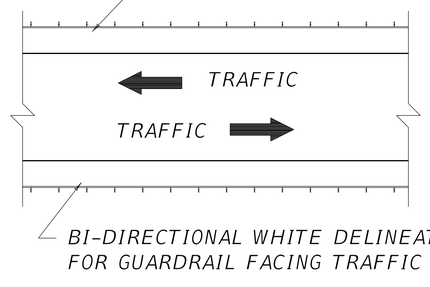
DELINEATOR FOR GUARDRAIL B/W	EACH
DELINEATOR FOR GUARDRAIL M/W	EACH
DELINEATOR FOR GUARDRAIL M/Y	EACH

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.



ISOMETRIC VIEW

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



PLACEMENT OF DELINEATORS FOR GUARDRAIL

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.

REVISION DATE: 02/26/2020
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 02-26-2020 — DATE
APPROVED — STATE HIGHWAY ENGINEER — 02-26-2020 — DATE

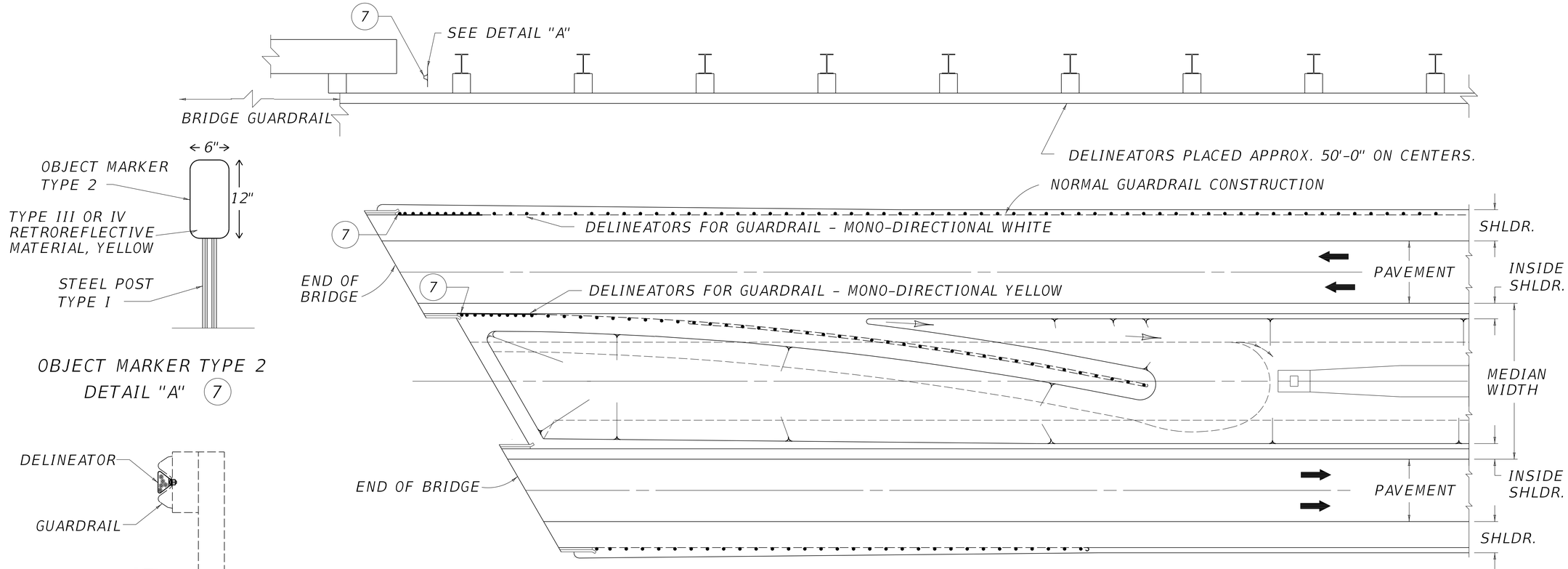
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

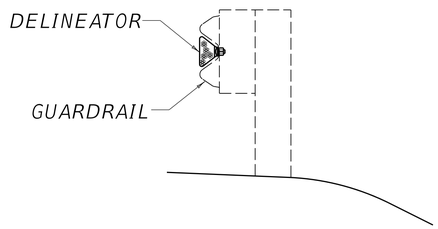
GUARDRAIL

DELINEATORS FOR GUARDRAIL

STANDARD DRAWING NUMBER
RBR-055-01



OBJECT MARKER TYPE 2
DETAIL "A" (7)



ELEV. VIEW

~ NOTES ~

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".

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

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

PRIMARY USE:
(PAVEMENT REHABILITATION PROJECTS)

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

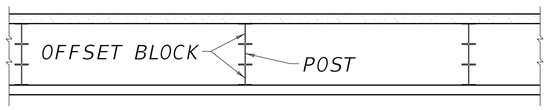
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

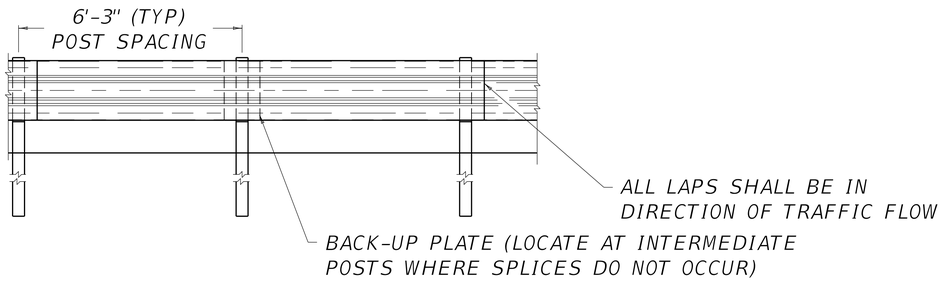
GUARDRAIL

DELINEATORS AT NARROW SHOULDER BRIDGES

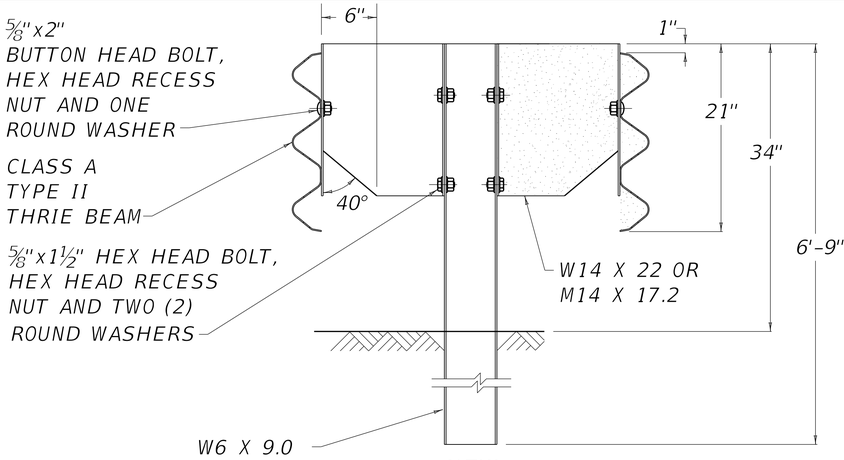
STANDARD DRAWING NUMBER
RBR-060-00



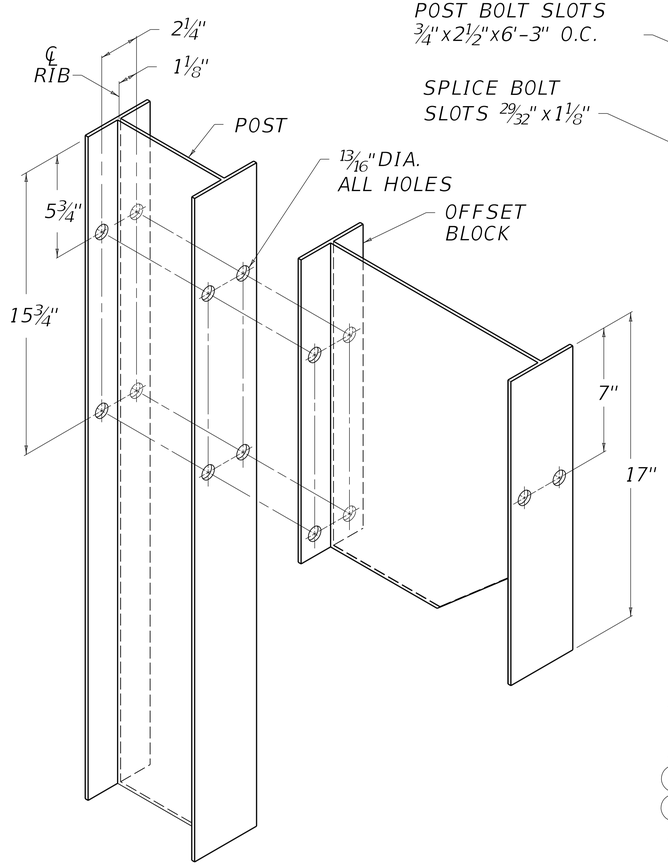
PLAN VIEW



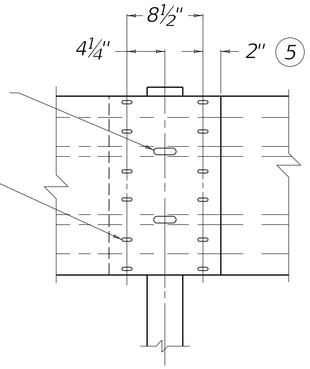
ELEVATION VIEW



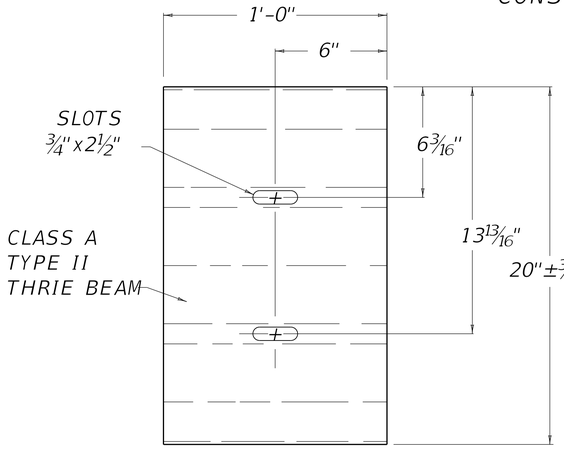
NEW CONSTRUCTION



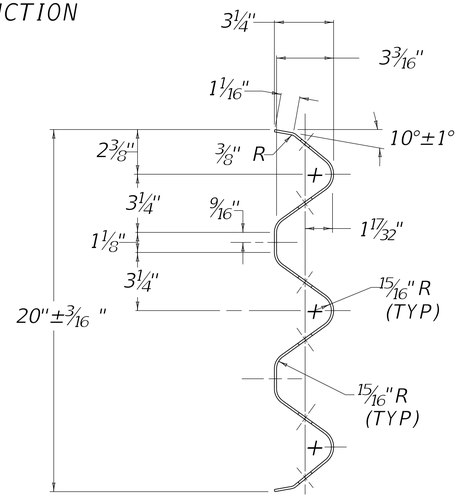
POST & OFFSET BLOCK DETAIL



(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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

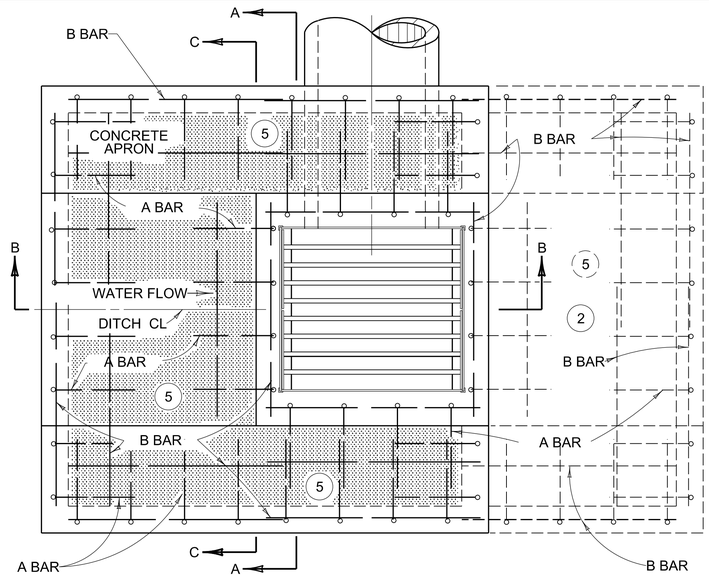
BARRIERS

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

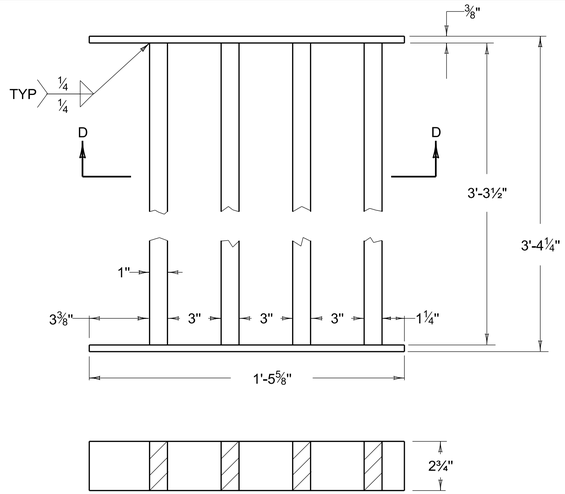
GUARDRAIL

STEEL BEAM (THRIE BEAM)

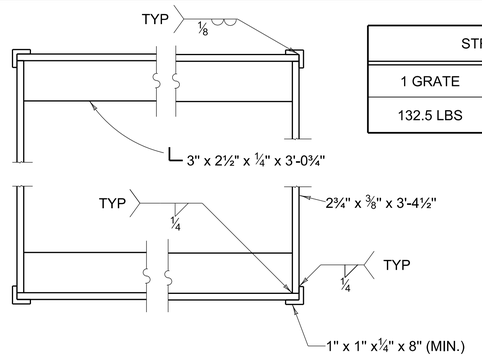
STANDARD DRAWING NUMBER
RBR-100-07



PLAN VIEW

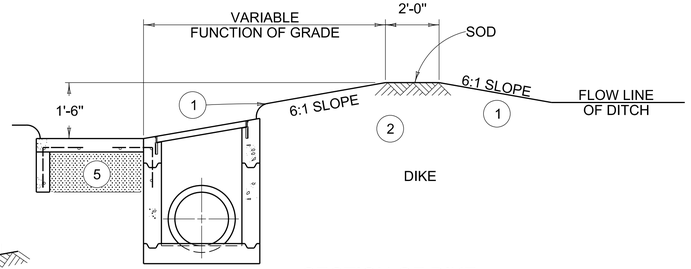


SECTION D-D
DETAIL OF GRATE
(TWO REQUIRED)

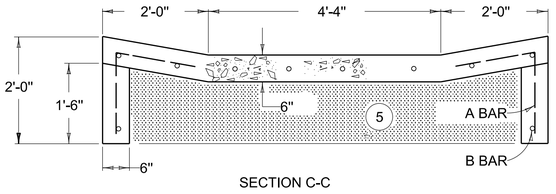


DETAIL OF FRAME

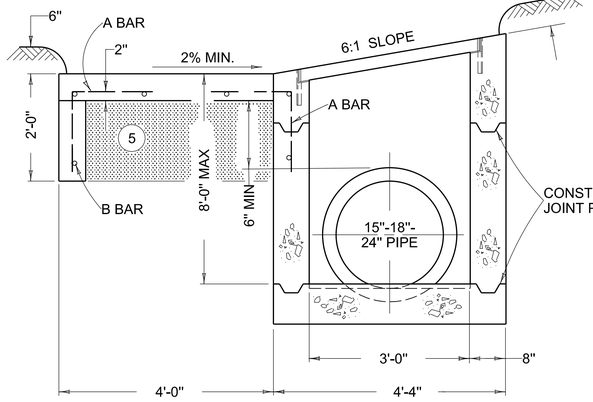
STR. STEEL WTS.		
1 GRATE	TOTAL	FRAME
132.5 LBS	265 LBS	51 LBS



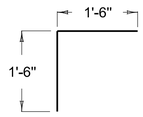
SECTION OF DIKE



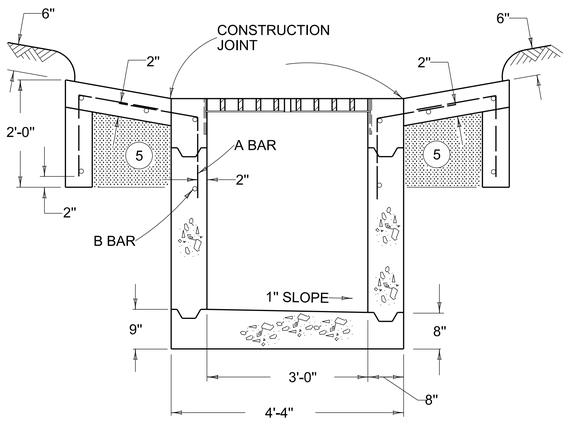
SECTION C-C



SECTION B-B



A BAR DETAIL



SECTION A-A

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)

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

~ 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.*

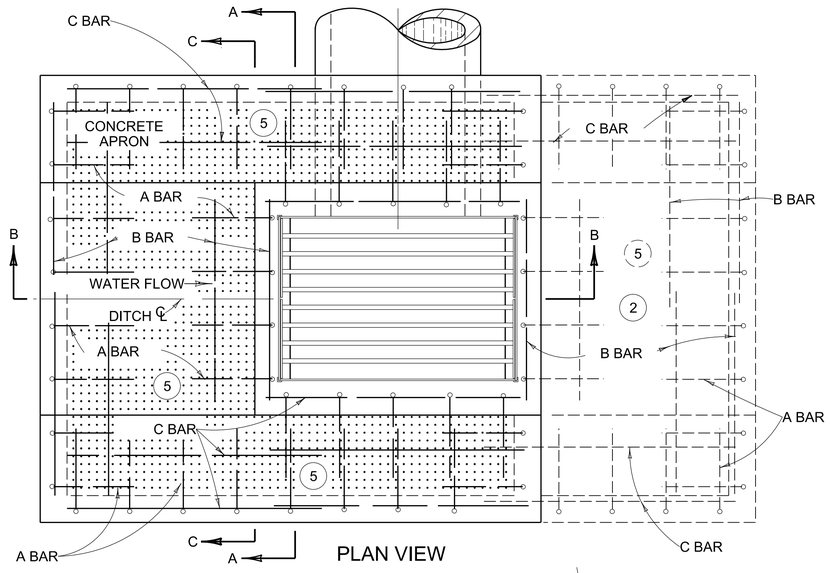
(5) COMPACT THIS VOLUME WITH D.G.A. BASE OR GRAVEL BASE AND INCLUDE IN THE UNIT PRICE OF THE BOX. SODDING IS NOT INCLUDED.

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

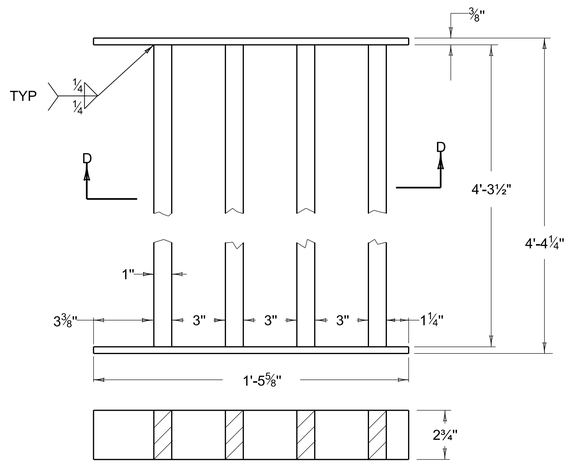
REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

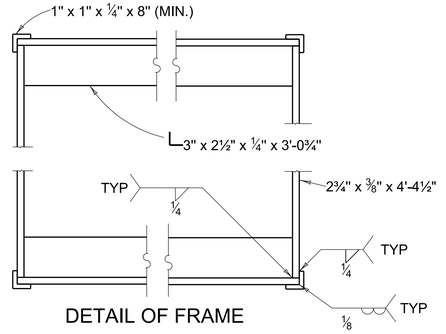
DRAINAGE



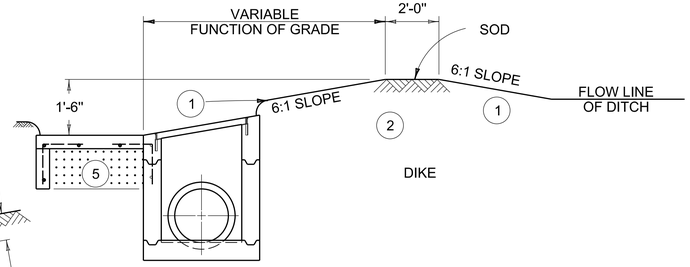
PLAN VIEW



SECTION D-D
DETAIL OF GRATE
(TWO REQUIRED)

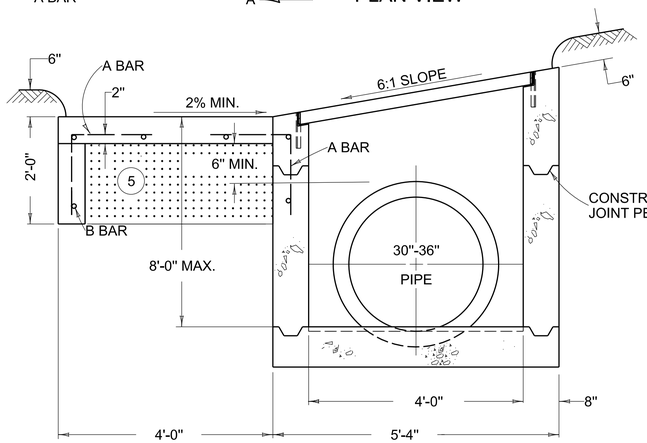


DETAIL OF FRAME

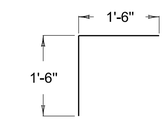


DIKE

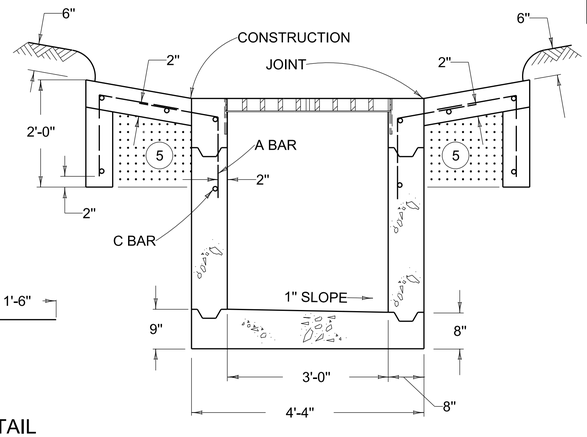
SECTION OF DIKE



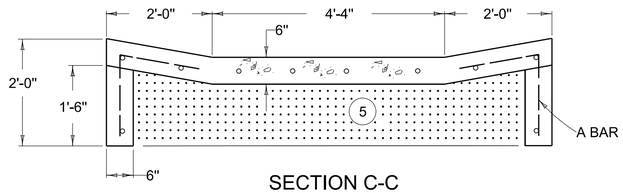
SECTION B-B



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
C	16 OR 22	#4	4'-9"	AS SHOWN

NOTE: PRIMARY USE (ROADSIDE DITCH LOCATION)

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

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

~ 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.*

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

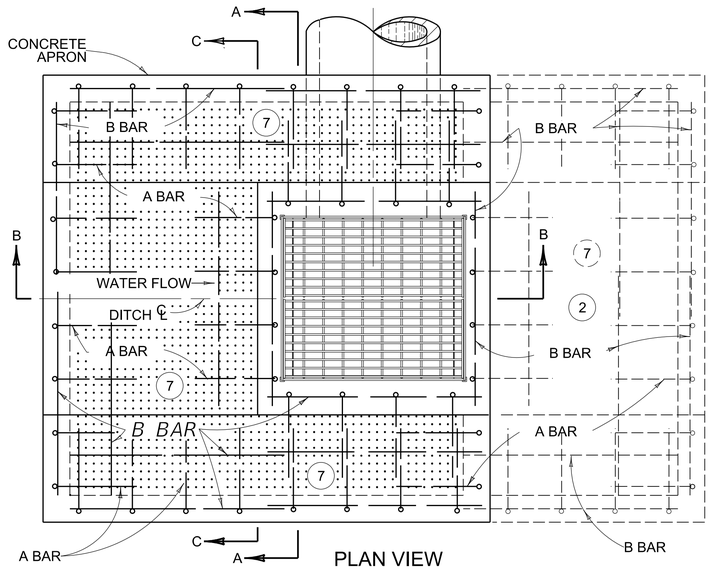
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

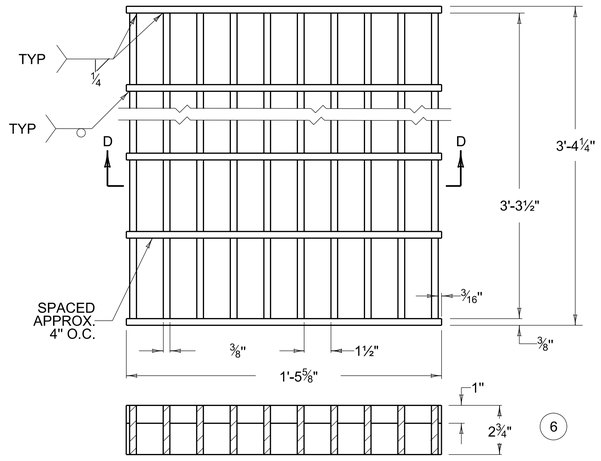
INLETS

DROP BOX INLET TYPE 2

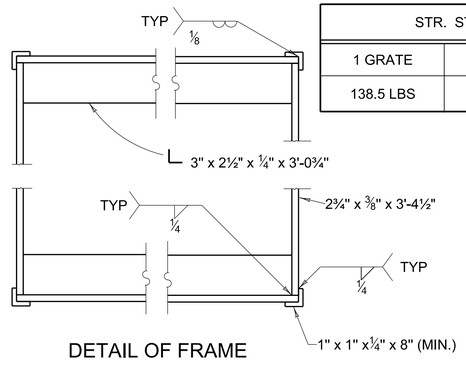
STANDARD DRAWING NUMBER
RDB-002-12



PLAN VIEW

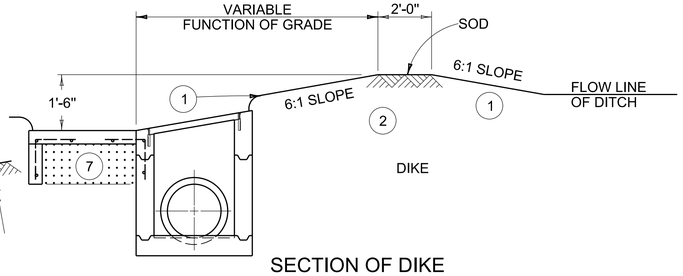


5 SECTION D-D
DETAIL OF GRATE
(TWO REQUIRED)

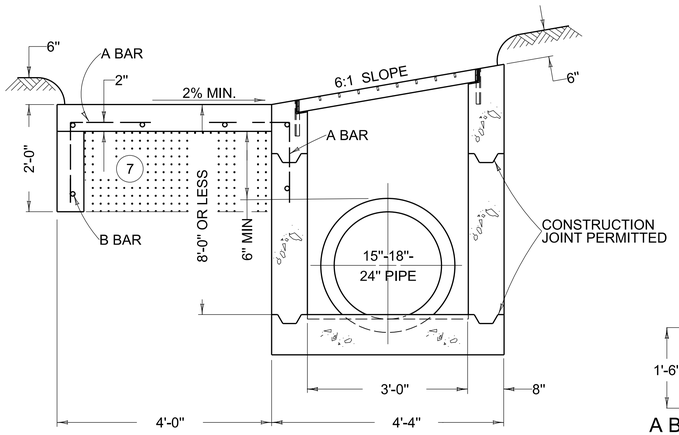


DETAIL OF FRAME

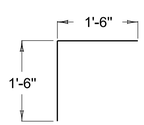
STR. STEEL WTS.		
1 GRATE	TOTAL	FRAME
138.5 LBS	277 LBS	51 LBS



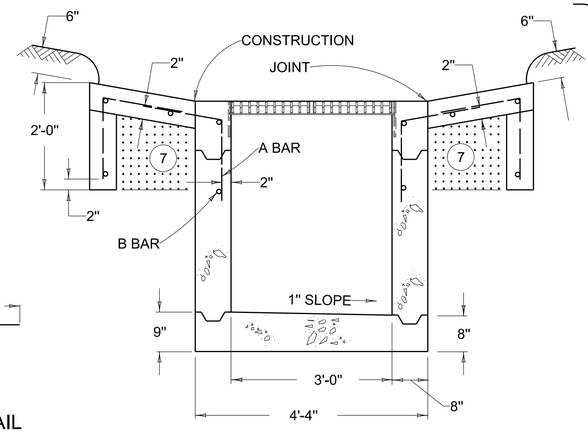
SECTION OF DIKE



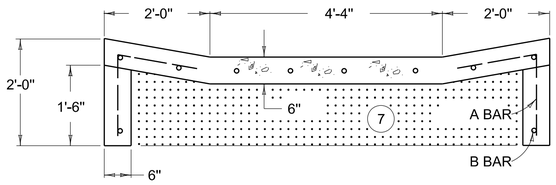
SECTION B-B



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)

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

~ NOTES ~

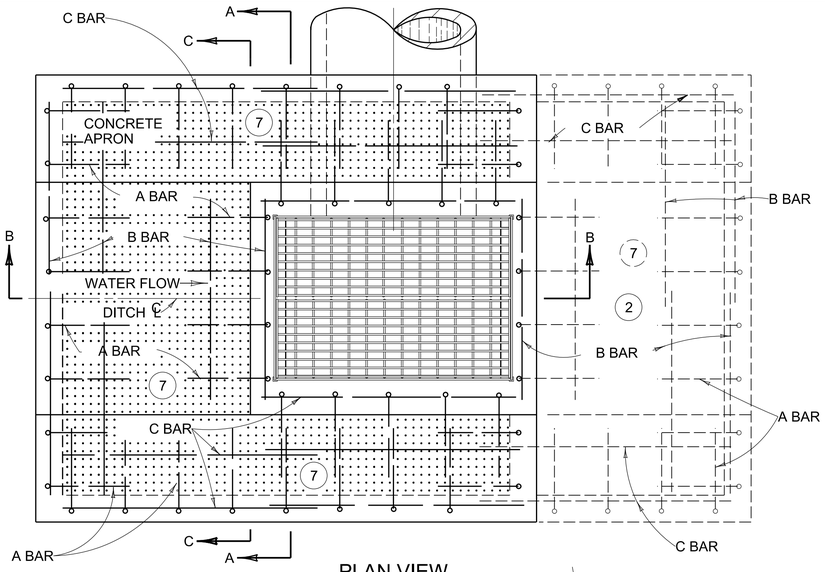
BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 3 — *EACH*

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.*

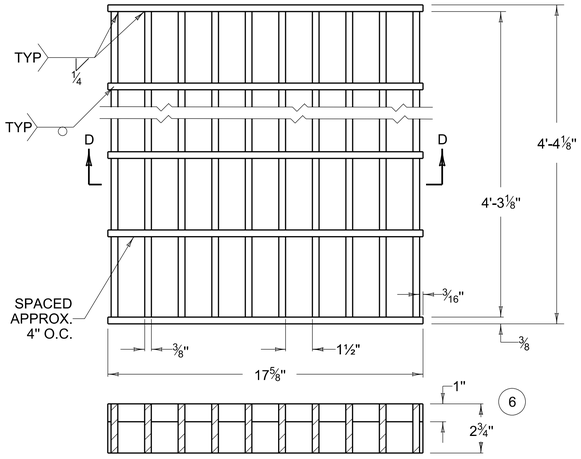
REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

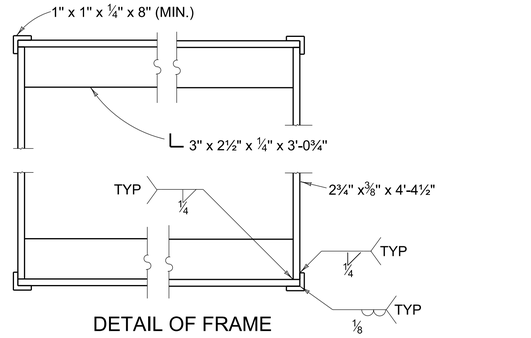
DRAINAGE



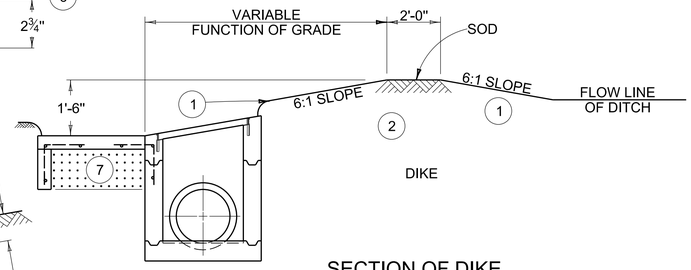
PLAN VIEW



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

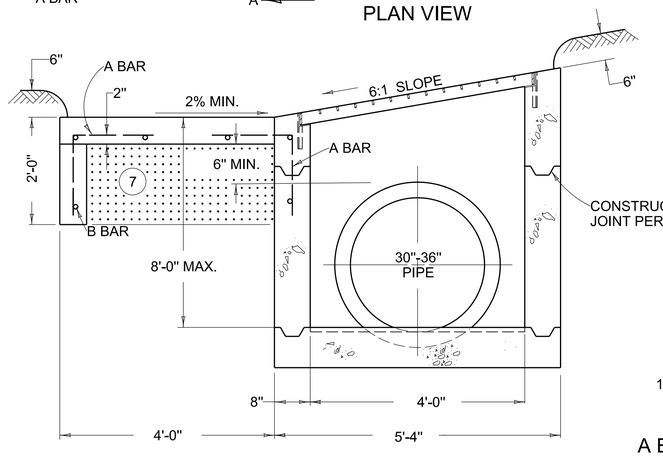


DETAIL OF FRAME

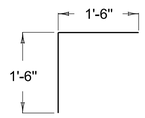


DIKE

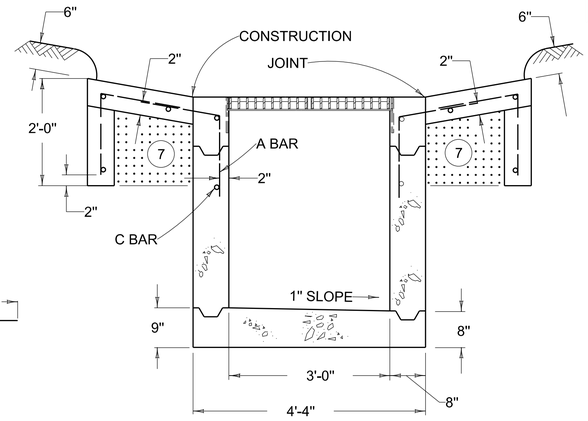
SECTION OF DIKE



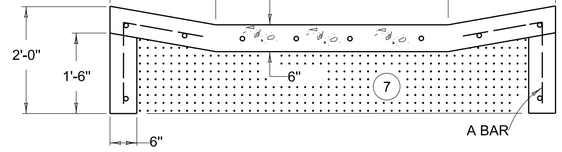
SECTION B-B



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
C	16 OR 20	#4	4'-9"	AS SHOWN

NOTE: PRIMARY USE (ROADSIDE DITCH LOCATION)

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

~ *NOTES* ~

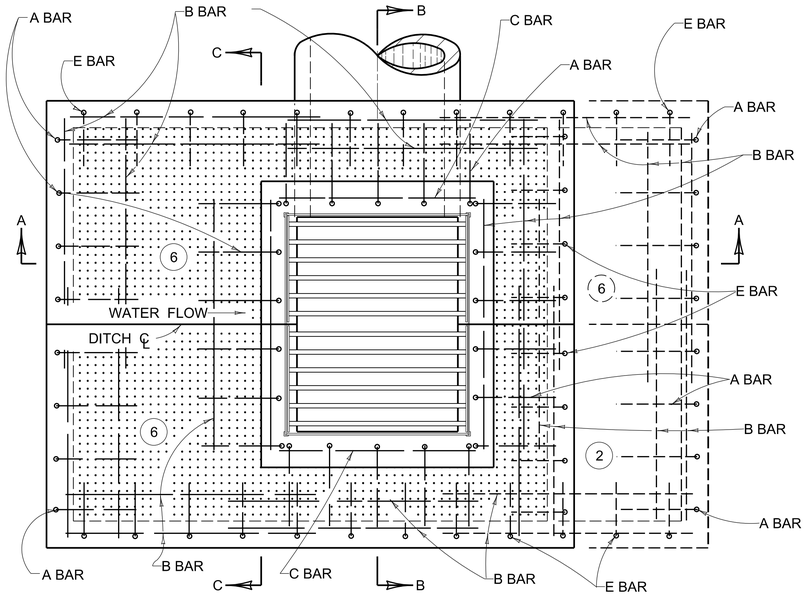
BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 4 *EACH*

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 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.*

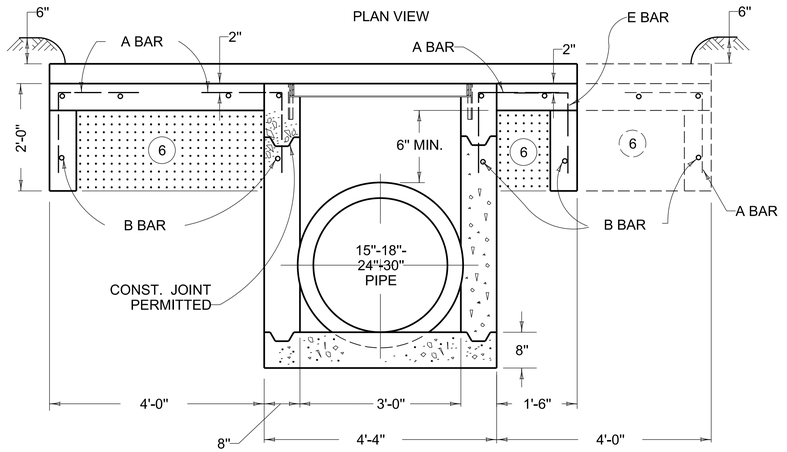
REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

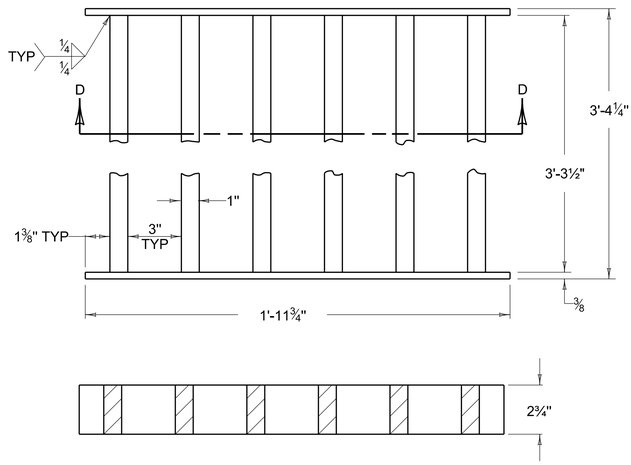
DRAINAGE



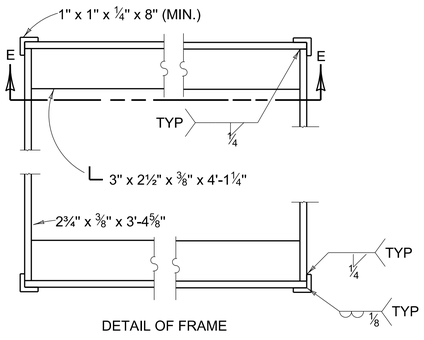
PLAN VIEW



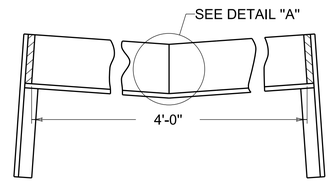
SECTION A-A



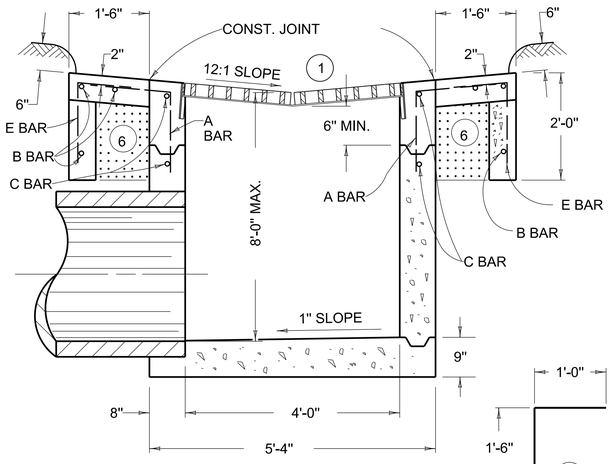
SECTION D-D
DETAIL OF GRATE
(TWO REQUIRED)



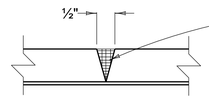
DETAIL OF FRAME



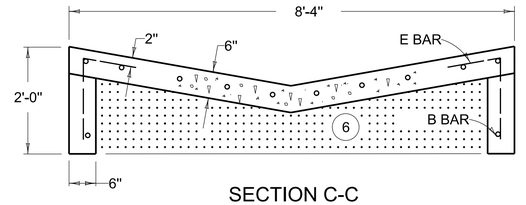
SECTION E-E
DETAIL OF FRAME



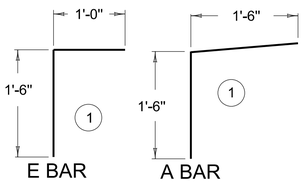
SECTION B-B



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"
C	4	#4	3'-8"
E	26 OR 24	#5	2'-6"

NOTE:PRIMARY USE (DEPRESSED MEDIAN)

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

~ *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.*

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

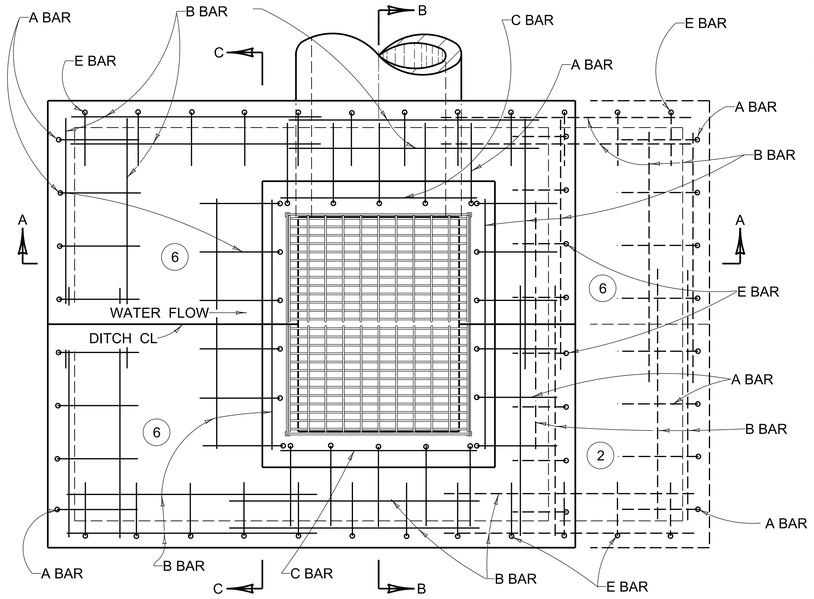
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

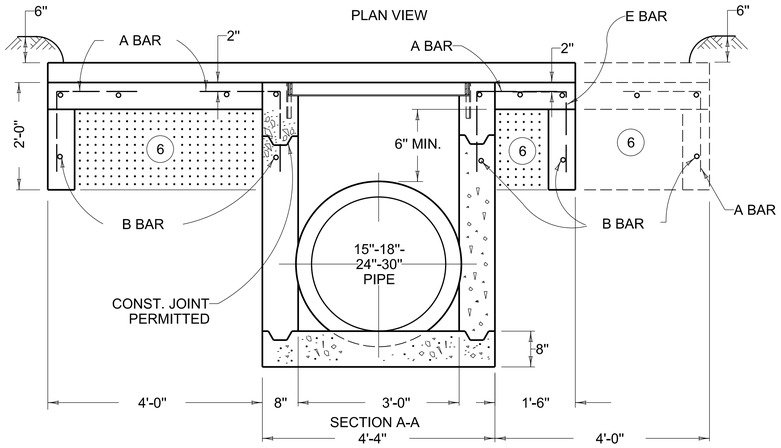
INLETS

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

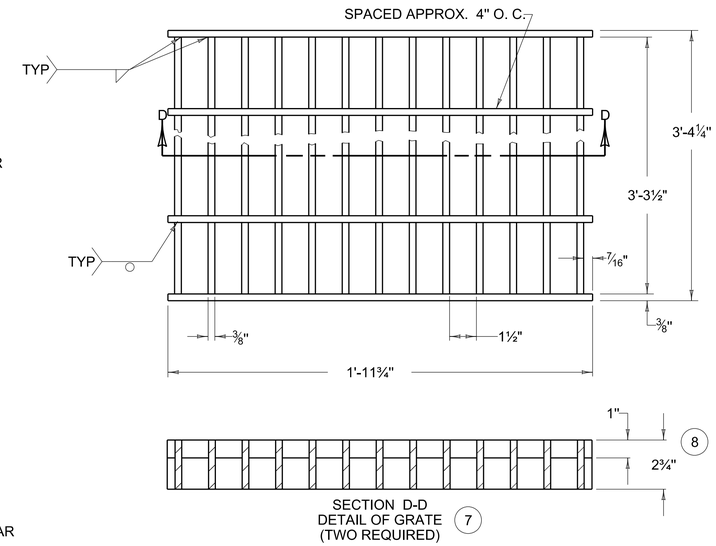
STANDARD DRAWING NUMBER
RDB-005-09



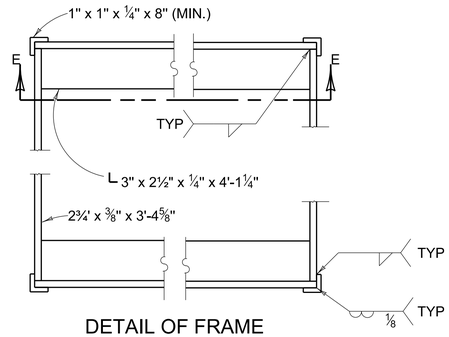
PLAN VIEW



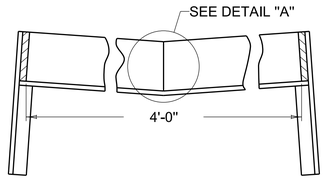
SECTION A-A



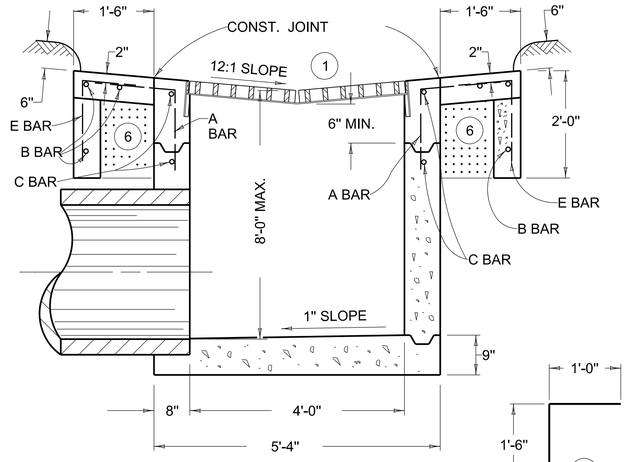
SECTION D-D
DETAIL OF GRATE (7)
(TWO REQUIRED)



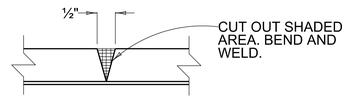
DETAIL OF FRAME



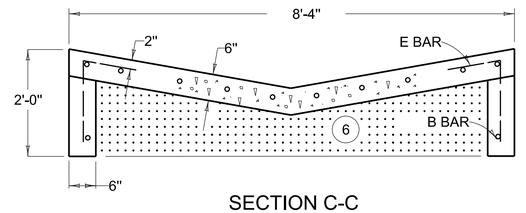
SECTION E-E
DETAIL OF FRAME



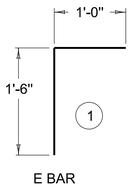
SECTION B-B

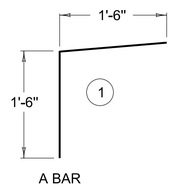


DETAIL "A"



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"
C	4	#4	3'-8"
E	26 OR 24	#5	2'-6"

NOTE:PRIMARY USE (DEPRESSED MEDIAN)

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.

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

~ 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.*

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

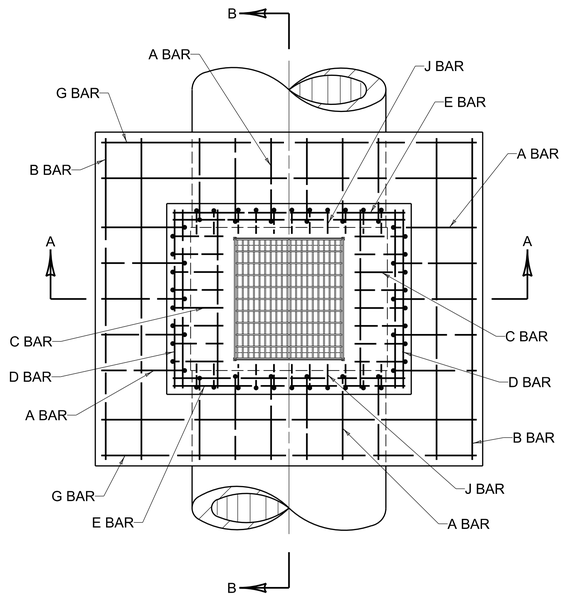
DRAINGAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

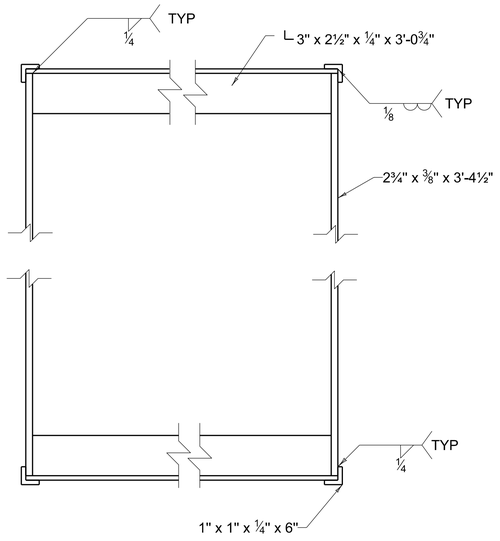
INLET

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

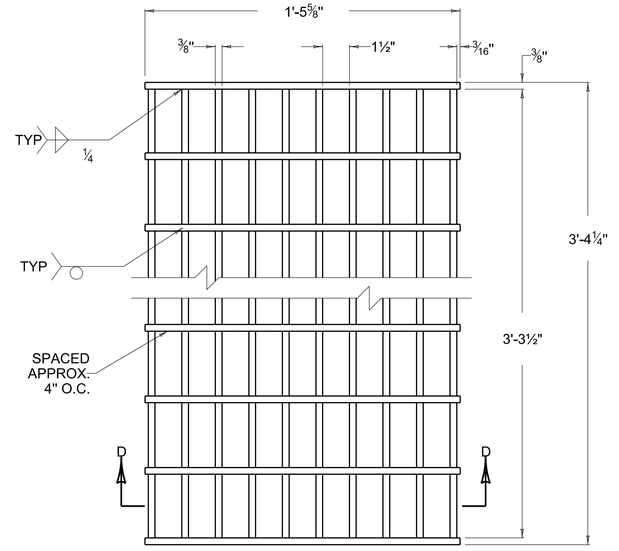
STANDARD DRAWING NUMBER
RDB-006-08



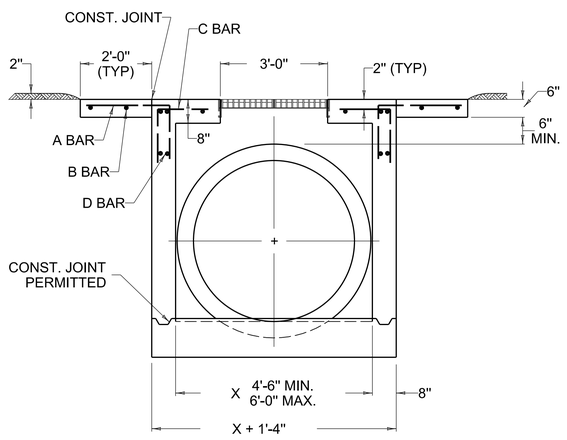
PLAN VIEW



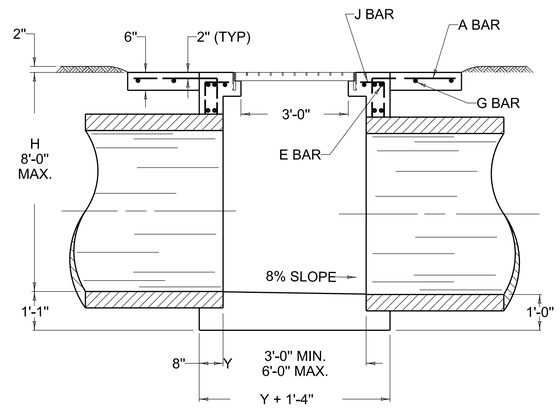
FRAME DETAIL



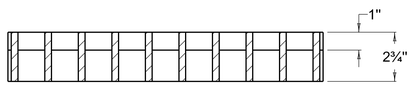
1 GRATE DETAIL
(TWO GRATES REQ'D.)



SECTION A-A



SECTION B-B



SECTION D-D (2)

~ 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 2¾" 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.*

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015

APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

INLETS

DROP BOX INLET TYPE 7 (LAYOUT AND STEEL PATTERN)

STANDARD DRAWING NUMBER
RDB-007-03

DIMENSIONS AND ESTIMATE OF QUANTITIES

INLET SIZE			PIPE		(4)	CONCRETE		REINF. STEEL
NO.	X	Y	MAX. DIA.	SIDE	H	CUBIC YARDS	(6) Q	LBS.
1	4'-6"	3'-0"	42"	X	5'-½"	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'-1½"	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"			
27"			0.2
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" x 3'-0"

MARK	(1) NO.	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" x 3'-6"

MARK	(1) NO.	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" x 4'-0"

MARK	(1) NO.	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" x 4'-6"

MARK	(1) NO.	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	20	3	10	2	4
B	4	9	0		
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" x 3'-0"

MARK	(1) NO.	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" x 3'-6"

MARK	(1) NO.	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" x 4'-0"

MARK	(1) NO.	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" x 4'-6"

MARK	(1) NO.	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" x 5'-0"

MARK	(1) NO.	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" x 3'-0"

MARK	(1) NO.	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" x 3'-6"

MARK	(1) NO.	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" x 4'-0"

MARK	(1) NO.	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" x 4'-6"

MARK	(1) NO.	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" x 5'-0"

MARK	(1) NO.	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" x 3'-0"

MARK	(1) NO.	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" x 3'-6"

MARK	(1) NO.	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" x 4'-0"

MARK	(1) NO.	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" x 4'-6"

MARK	(1) NO.	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" x 5'-0"

MARK	(1) NO.	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" x 5'-6"

MARK	(1) NO.	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	10	6		
J	22	2	5	0	11

6'-0" x 3'-0"

MARK	(1) NO.	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" x 3'-6"

MARK	(1) NO.	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" x 4'-0"

MARK	(1) NO.	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" x 4'-6"

MARK	(1) NO.	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	5	6		
E	10	7	0		
G	4	11	0		
J	24	2	5	0	11

6'-0" x 5'-0"

MARK	(1) NO.	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	26	3	10	2	4
B	4	10	0		
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" x 5'-6"

MARK	(1) NO.	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	2	11	1	5

6'-0" x 6'-0"

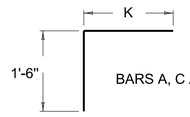
MARK	(1) NO.	LGTH. FT.	LGTH. IN.	K FT.	K IN.
A	28	3	10	2	4
B	4	11	0		
C	24	3	2	1	8
D	10	7	0		
E	10	7	0		
G	4	11	0		
J	24	3	2	1	8

~ 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.*

REVISION DATE: 12/01/2015
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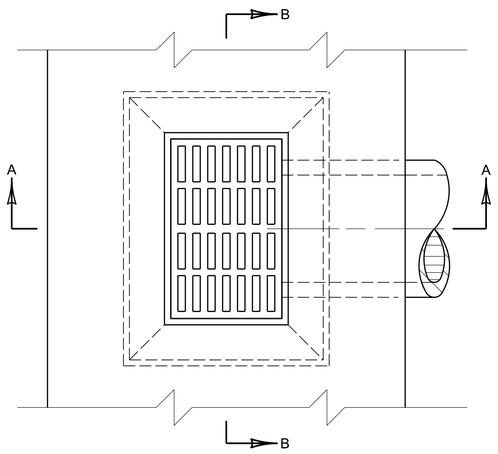
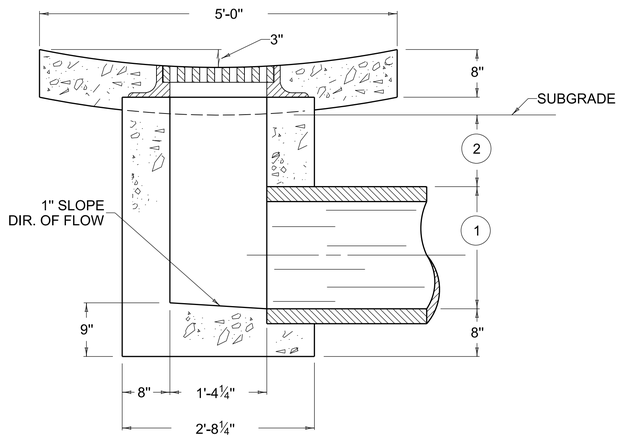
DRAINAGE



PLAN VIEW



SECTION A-A

~ NOTES ~

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

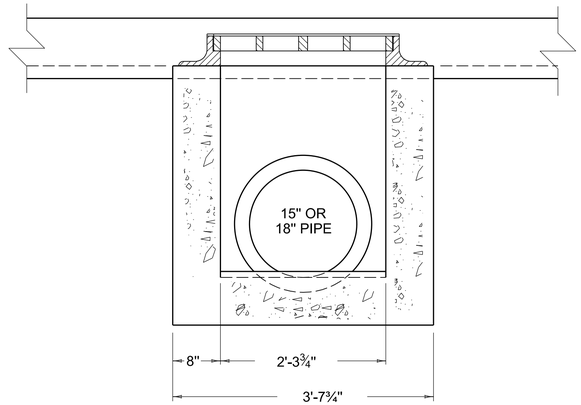
1. *1'-5¼" FOR 15" PIPE*
   1'-8½" FOR 18" PIPE
2. *1'-0" MINIMUM COVER BELOW SUBGRADE.*
3. *PRIMARY USE: VALLEY GUTTER LOCATION*
4. *CONSTRUCT VALLEY GUTTER IN ACCORDANCE WITH CUR. STD. DWG. RPM-100*

APPROX. CONCRETE QUANTITIES

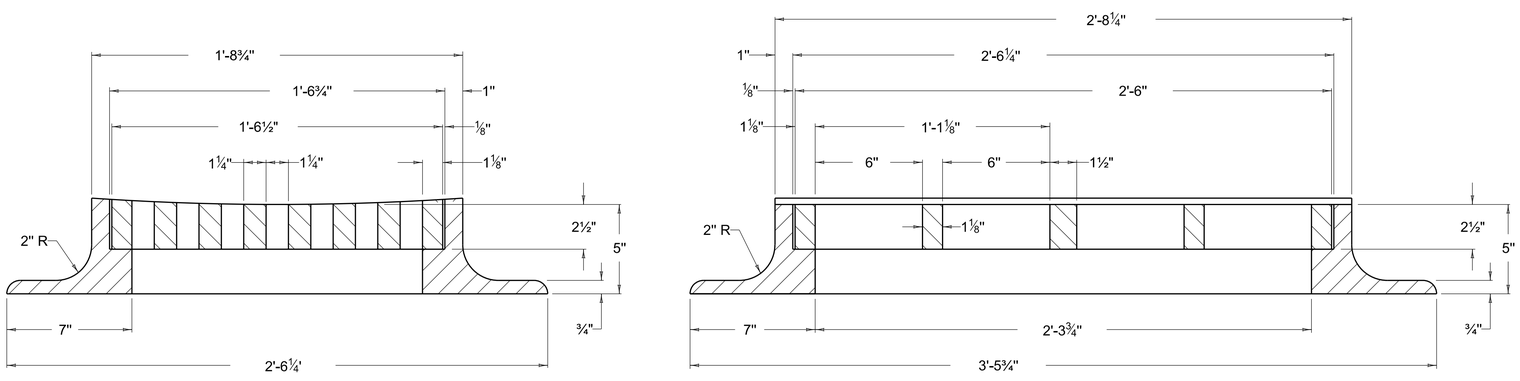
PIPE SIZE	MIN. HEIGHT	CU. YDS. CONC.
15"	3'-4"	0.90
18"	3'-8"	0.97

APPROXIMATE WEIGHTS
FRAME 365 LBS.
GRATE 185 LBS.

NO DEDUCTIONS HAVE BEEN MADE FOR PIPE.



SECTION B-B



SECTIONAL VIEW OF FRAME AND GRATE

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

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APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

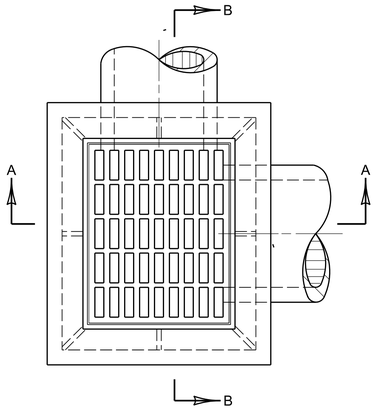
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

INLETS

DROP BOX INLET TYPE 10

STANDARD DRAWING NUMBER
RDB-010-07



PLAN VIEW

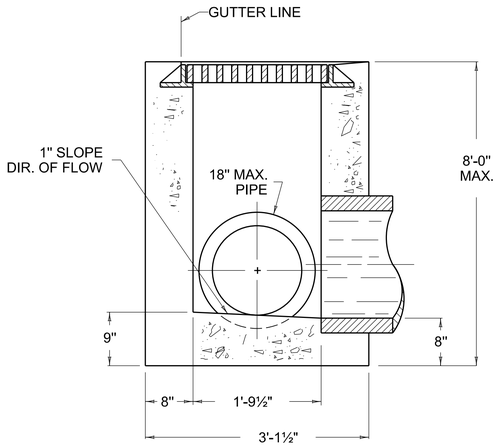
APPROX. CONCRETE QUANTITIES

PIPE SIZE	MIN. HEIGHT	CU. YDS. CONC.
15"	2'-11"	0.89
18"	3'-3"	0.97
24"	4'-9"	1.38

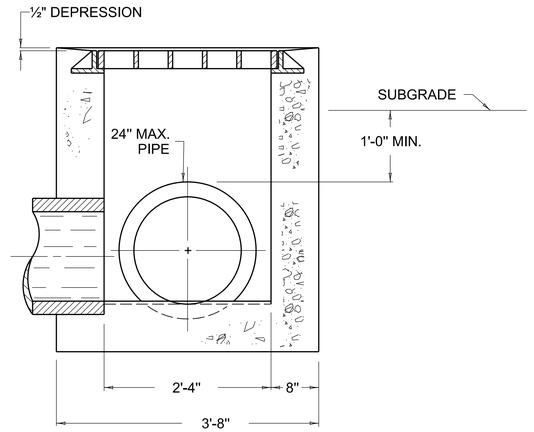
APPROXIMATE WEIGHTS
FRAME 195 LBS.
GRATE 265 LBS.

NO DEDUCTIONS HAVE BEEN MADE FOR PIPE.

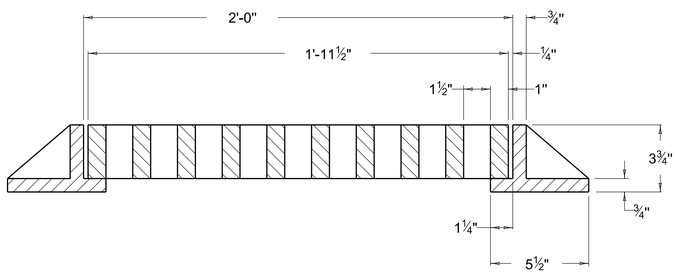
BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 11 — *EACH*

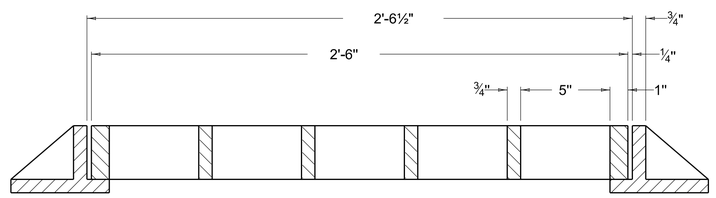


SECTION A-A



SECTION B-B





SECTIONAL VIEW OF FRAME AND GRATE

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

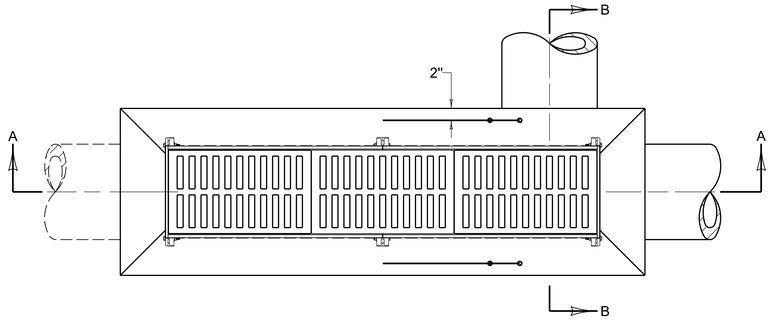
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

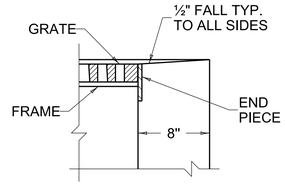
INLET

DROP BOX INLET TYPE 11

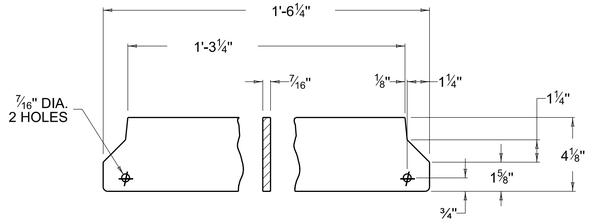
STANDARD DRAWING NUMBER
RDB-011-08



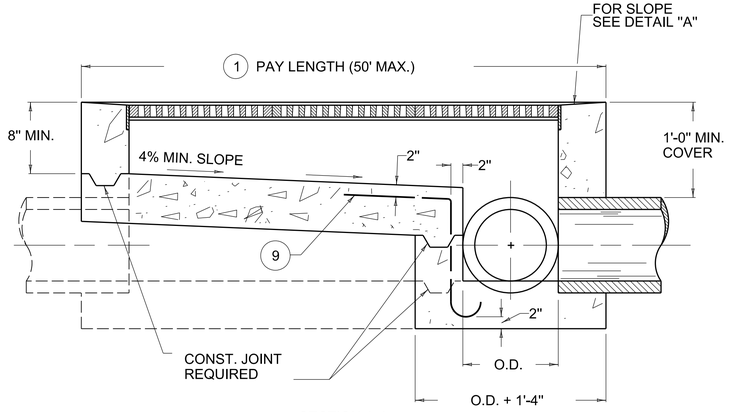
PLAN VIEW



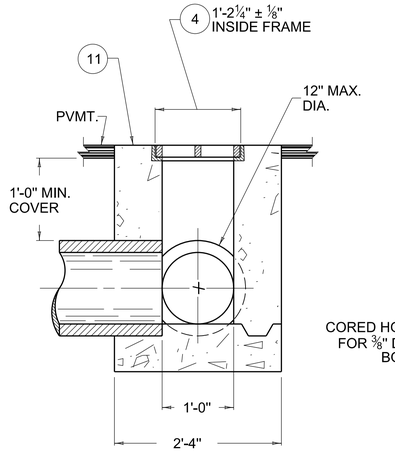
DETAIL "A"



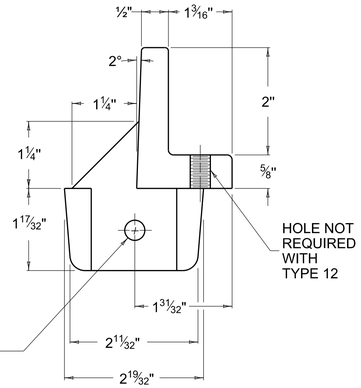
END PIECE ELEVATION



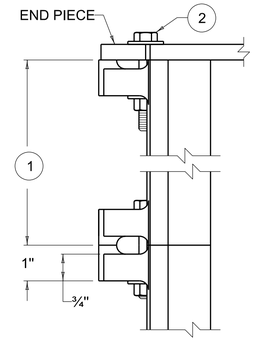
SECTION A-A



SECTION B-B



FRAME ELEVATION



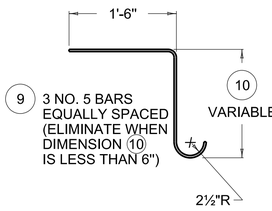
FRAME & END PIECE
PLAN VIEW

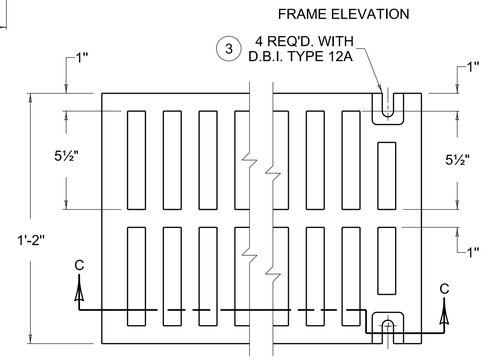
~ NOTES ~

1. *THE UNIT LENGTHS ARE 3'-0" FOR THE FRAMES AND 1'-11⅞" FOR THE GRATES AND ARE TO BE CONSTRUCTED IN MULTIPLE LENGTHS OF 6'-0" FOR TYPE 12 INLET.*

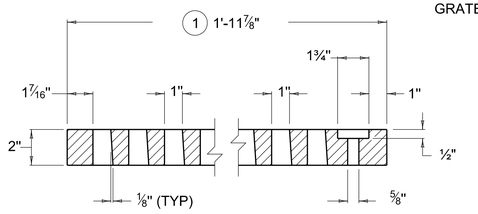
   THE UNIT LENGTHS ARE 2'-0" FOR THE FRAMES AND 1'-11⅞" FOR THE GRATES AND ARE TO BE CONSTRUCTED IN MULTIPLE LENGTHS OF 2'-0" FOR TYPE 12A INLET.
2. *THE FRAME AND END PIECES SHALL BE ASSEMBLED WITH ⅜" X 2½" HEX HEAD BOLTS, NUTS AND FLAT WASHERS (COMMERCIAL QUALITY).*
3. *WHEN DROP BOX INLET TYPE 12A IS A BID ITEM, THE GRATES SHALL BE BOLTED TO THE FRAME WITH FOUR ¾"-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.*

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.



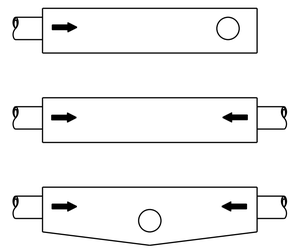


GRATE PLAN VIEW



SECTION C-C

VARIATIONS OF
DRAINAGE PATTERNS



COMBINATIONS OF THE
ABOVE MAY BE REQUIRED

(SEE PIPE SECTIONS FOR
APPROPRIATE DETAILS)

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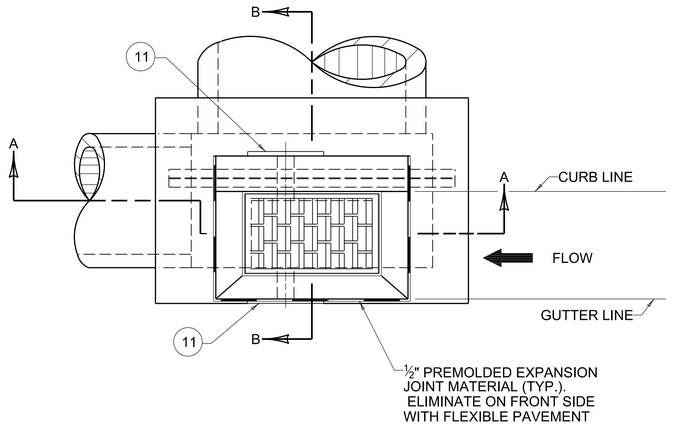
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

INLETS

DROP BOX INLET TYPE 12 OR 12A

STANDARD DRAWING NUMBER
RDB-012-10

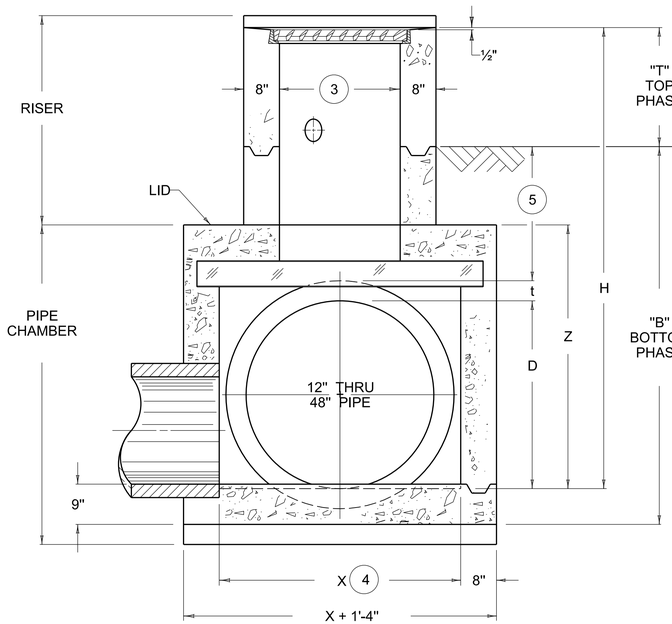


PLAN VIEW

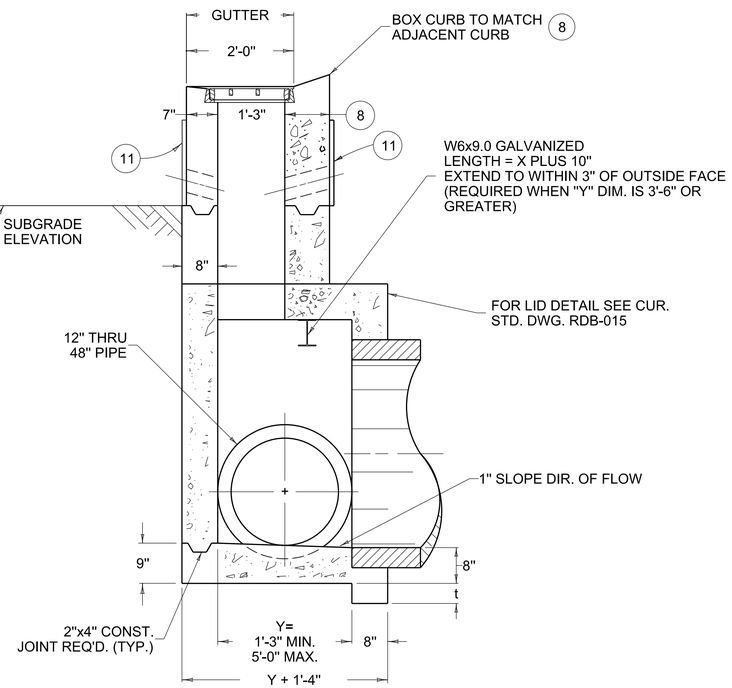
~ NOTES ~

BID ITEM AND UNIT TO BID	
DROP BOX INLET TYPE 13 (⊿) (✳)	*EACH*
(⊿) = "S" (SAG CONDITION)	
(⊿) = "G" (GRADE CONDITION)	
(✳) = "T" (TOP PHASE)	*WITH NO "T" OR "B" SUFFIX A COMPLETE INLET*
(✳) = "B" (BOTTOM PHASE)	*IS REQUIRED.*

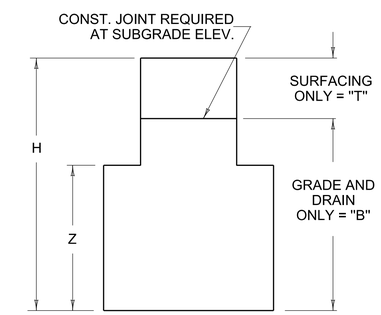
1. *BOX INLET SHALL BE CONSTRUCTED IN TWO PHASES (BOTTOM AND TOP) AND MAY BE CONSTRUCTED IN A SAG VERTICAL CURVE OR ON GRADE.*
2. *FOR ILLUSTRATION PURPOSES THIS DRAWING DEPICTS A BOX LOCATED ON A GRADE CONDITION. SEE CUR. STD. DWG. RDB-014 FOR DETAILS OF SAG AND GRADE CONDITIONS.*
3. *DIMENSION VARIES 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

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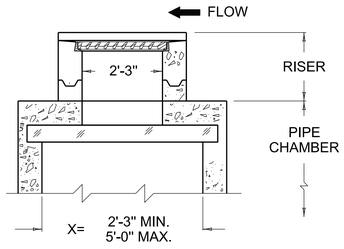
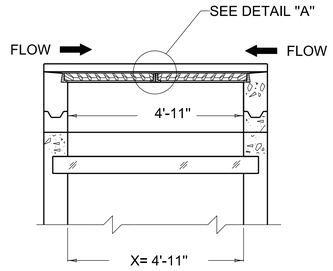
DRAINAGE



GRADE CONDITION
(1 GRATE & 1 FRAME REQ'D.)

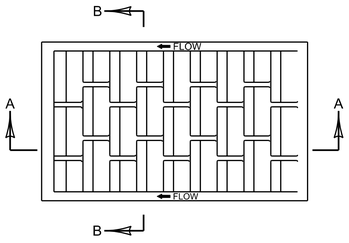


SAG CONDITION
(2 GRATES & 2 FRAMES REQ'D.)

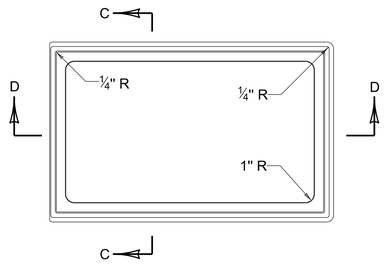
~ NOTES ~

1. ALL FILLETS AND ROUNDS SHALL BE ⅛" r.
2. THE FRAME AND GRATE SHALL BE MANUFACTURED OF CAST GRAY IRON CONFORMING TO ASTM A-48 CLASS 35B.

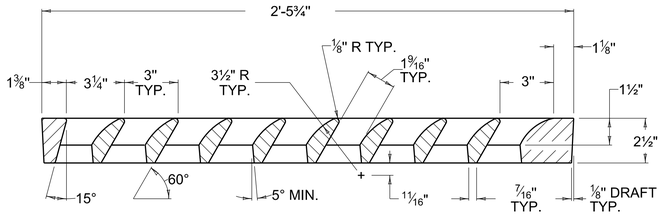
APPROX. WEIGHT	
1 GRATE	160 LBS.
1 FRAME	70 LBS.



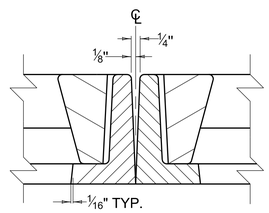
GRATE PLAN VIEW



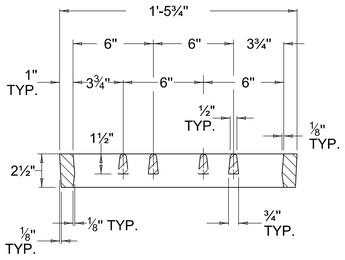
FRAME PLAN VIEW



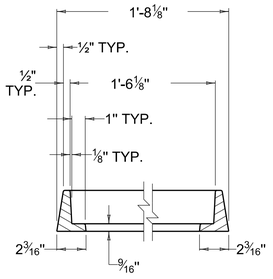
SECTION A-A



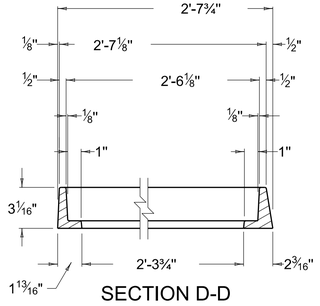
DETAIL "A"



SECTION B-B



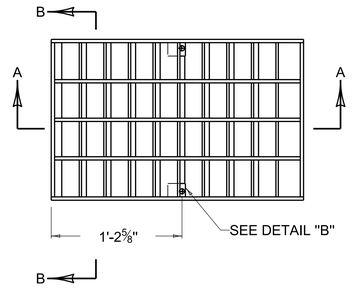
SECTION C-C
GRAY IRON CASTING



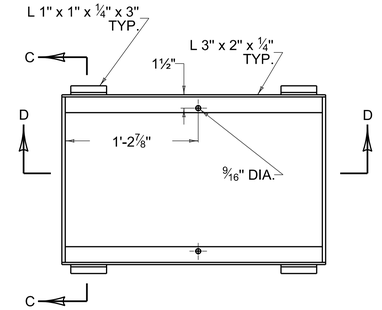
SECTION D-D

~ NOTES ~

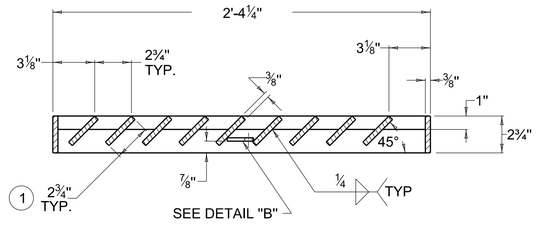
1. THE 2¾" BAR SHALL BE NOTCHED TO RECEIVE THE 1" BAR.
2. THE FRAME AND GRATE SHALL BE ASSEMBLED WITH 2 (TWO) ½" X 2¼" STAINLESS HEX HEAD BOLTS AND NUTS (COMMERICAL QUALITY).
3. ALL STRUCTURAL STEEL SHALL CONFORM TO ASTM A-36.



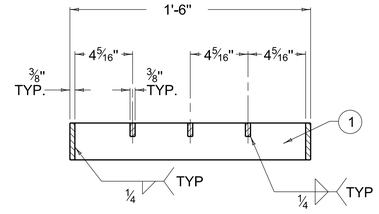
GRATE PLAN VIEW



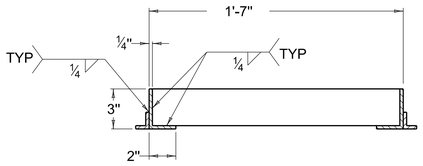
FRAME PLAN VIEW



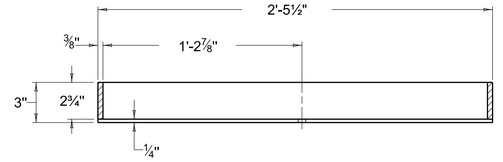
SECTION A-A



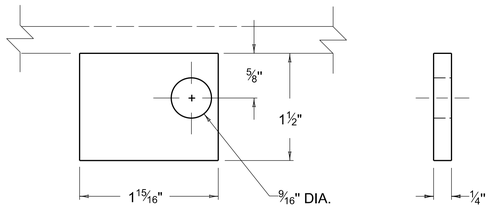
SECTION B-B



SECTION C-C



SECTION D-D



DETAIL "B"

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

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

STRUCTURAL STEEL

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

INLETS

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

STANDARD DRAWING NUMBER
RDB-014-06

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

(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.	
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
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

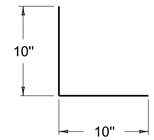
(SAG CONDITION)

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

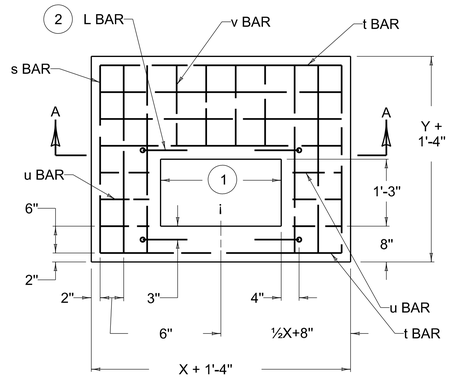
~ NOTES ~

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.*

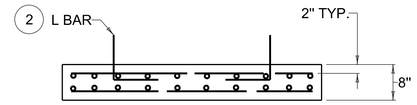
USE WITH CUR. STD. DWGS.
RDB-013 RDB-014 RDB-016
RDB-017 RDB-018 RDB-019



L BAR DETAIL



PLAN VIEW OF 8" LID



SECTION A-A

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

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. (1)(2)	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	
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	0.3
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	
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	0.4
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"					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	
52		2'-6"				2.8	0.4
53		3'-0"				3.1	
54		3'-6"			5'-2"	3.4	
55		4'-0"				3.7	0.5
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"				3.5	0.5
67		3'-6"			5'-8"	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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015

APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY. Transportation Pays Dividends

INLETS

DROP BOX INLET TYPE (POPE CHAMBER-GRADE CONDITION)

STANDARD DRAWING NUMBER
RDB-016-03

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. (1)(2)	Q (3)
71		1'-3"	12"	X OR Y	2'-2"	1.2	
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	0.4
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	
87		2'-0"				2.2	0.4
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	
92		2'-0"				2.3	0.4
93		2'-6"				2.5	
94	4'-11"	3'-0"				2.8	0.5
95		3'-6"		X OR Y	4'-4"	3.2	
96		1'-3"	36"	X		2.0	
97		2'-0"				2.4	0.4
98		2'-6"				2.7	
99		3'-0"				2.9	
100		3'-6"			4'-7"	3.3	0.5
101		4'-0"		X OR Y		3.5	
102		1'-3"	42"	X	4'-11"	2.2	
103		2'-0"				2.6	0.4
104		2'-6"				2.9	
105		3'-0"				3.2	
106		3'-6"			5'-2"	3.6	0.5
107		4'-0"				3.8	
108		4'-6"		X OR Y		4.1	

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. (1)(2)	Q (3)
109	4'-11"	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+†+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-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

REVISION DATE: 12/01/2015
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SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

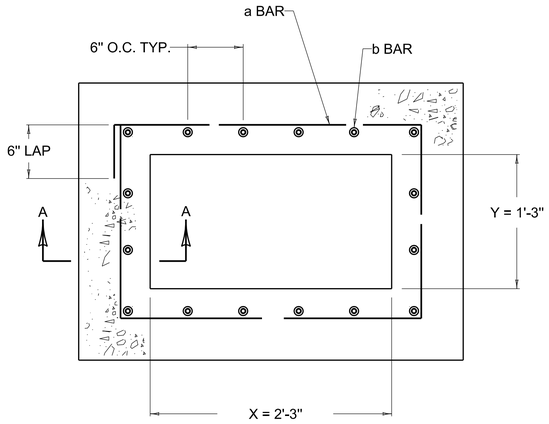
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

INLETS

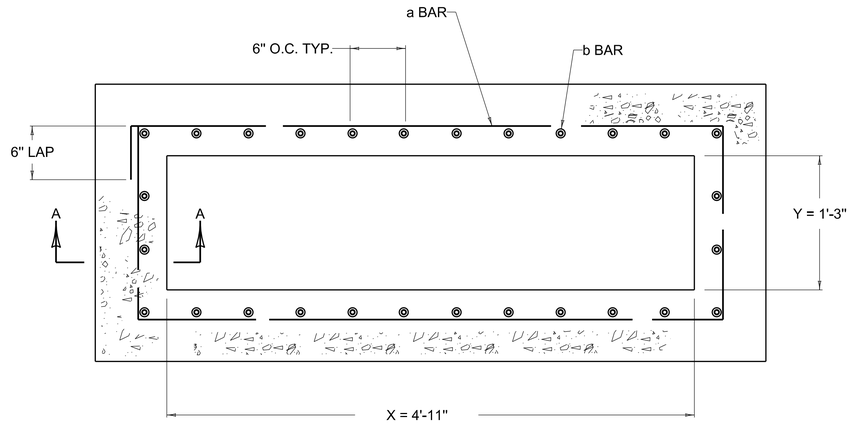
DROP BOX INLET TYPE 13 (PIPE CHAMBER-SAG CONDITION)

STANDARD DRAWING NUMBER
RDB-017-03

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



GRADE CONDITION



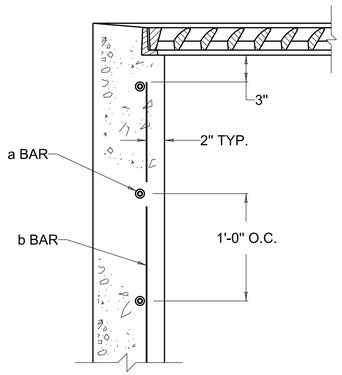
SAG CONDITION

~ 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.

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



SECTION A-A

APPROXIMATE RISER QUANTITIES
PER ONE FOOT IN HEIGHT

COND-ITION	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

REVISION DATE: 12/01/2015
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DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

INLETS

DROP BOX INLET TYPE 13 (ADDITIONAL STEEL-RISER)

STANDARD DRAWING NUMBER
RDB-018-04

(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

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'-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
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

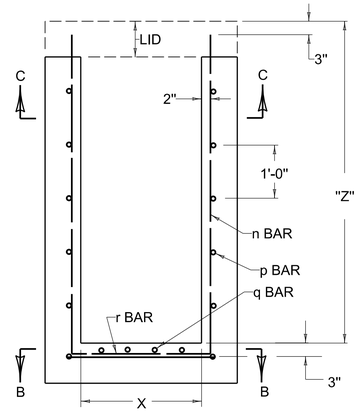
(1) ADDITIONAL STEEL REINFORCEMENT REQUIRMENTS (PIPE CHAMBER, H = 8' TO 15', SAG CONDITION)

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

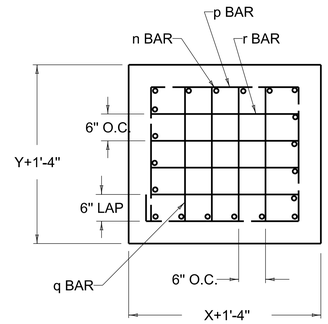
~ NOTES ~

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*

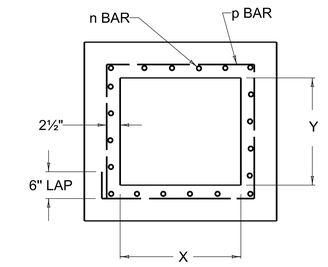
USE WITH CUR. STD. DWGS.
RDB-013 RDB-014 RDB-015
RDB-016 RDB-017 RDB-018



SECTION A-A



SECTION B-B



SECTION C-C

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

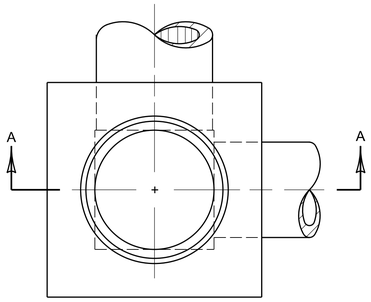
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

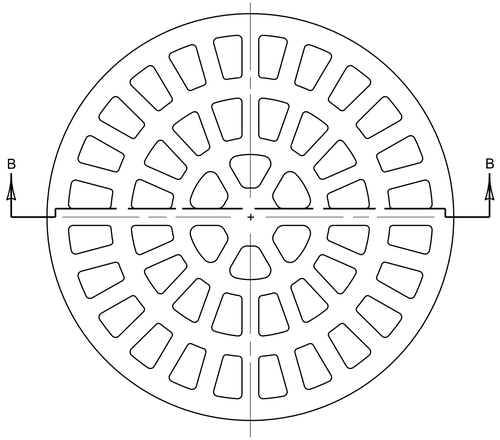
INLETS

DROP BOX INLET TYPE 13 (ADDITIONAL STEEL- CHAMBER)

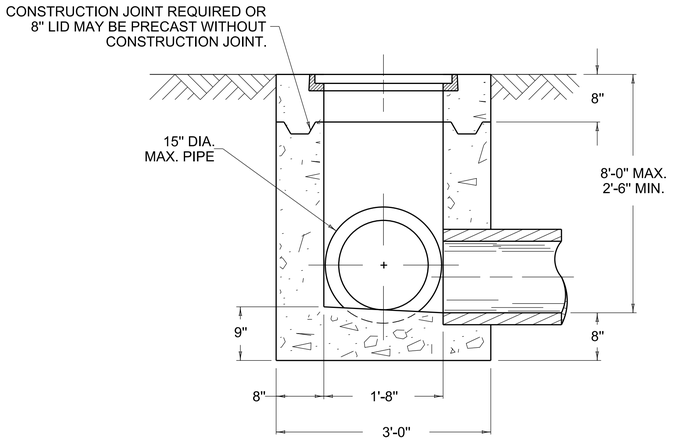
STANDARD DRAWING NUMBER
RDB-019-04



PLAN VIEW



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.

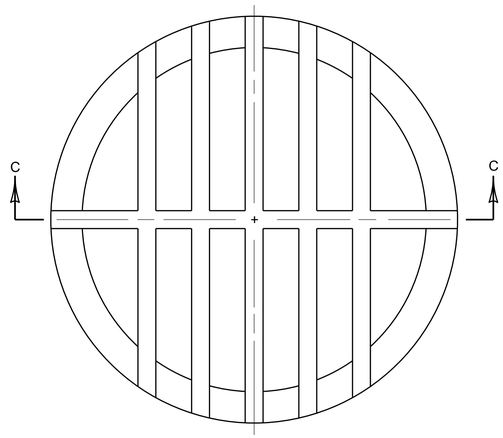
BID ITEM AND UNIT TO BID

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

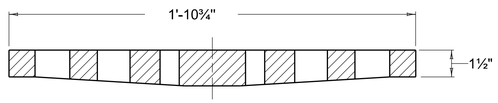
LIMITATIONS:

TYPE 14 - FLUSH GRATE, TRAVERSABLE.
TYPE 15 - NON-TRAVERSABLE WITH MAXIMUM RESISTANCE TO CLOGGING.

PRIMARY USE: YARD SUMP

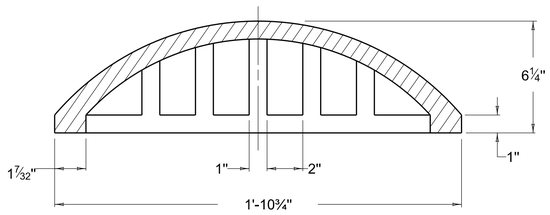


PLAN VIEW



SECTION B-B TYPE 14
(RADIAL)

SECTIONAL DETAIL OF FRAME



SECTION C-C TYPE 15
(BEEHIVE)

REVISION DATE: 12/01/2015
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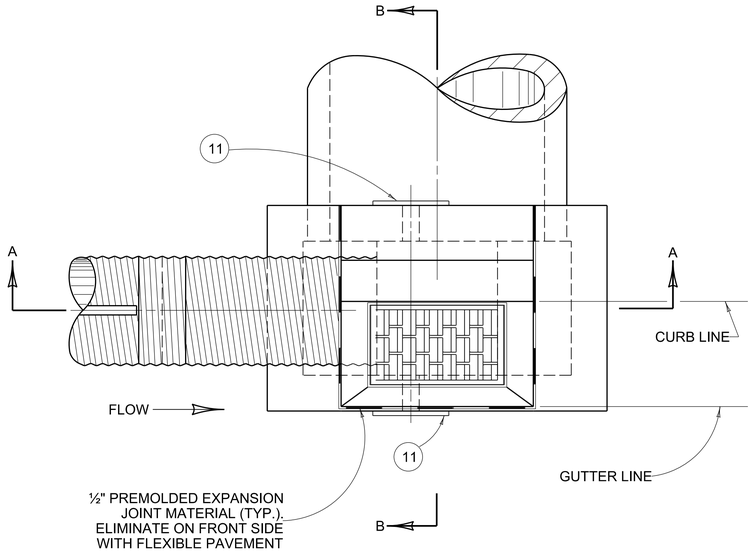
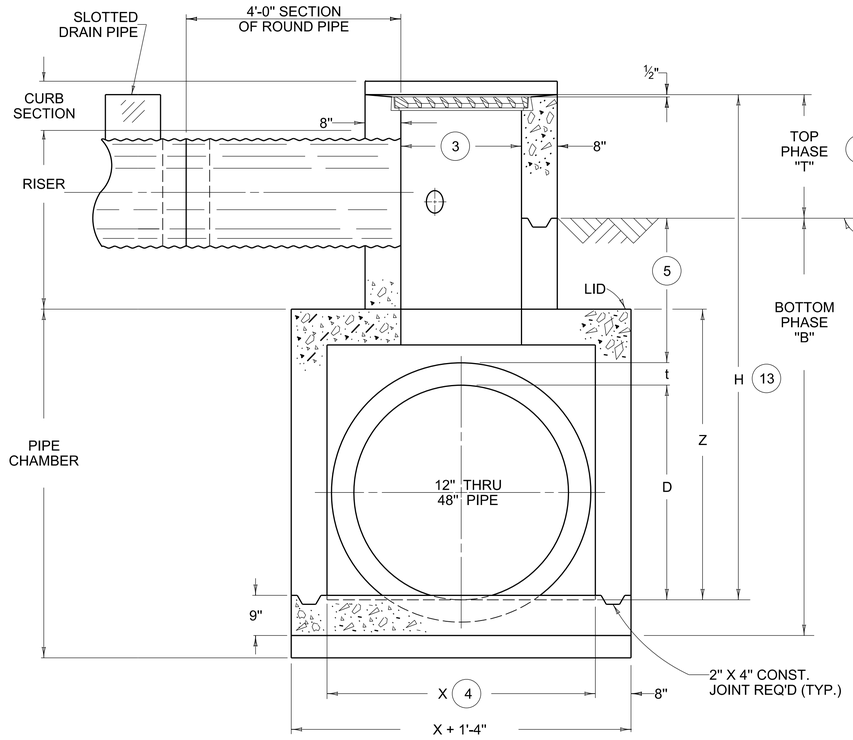
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

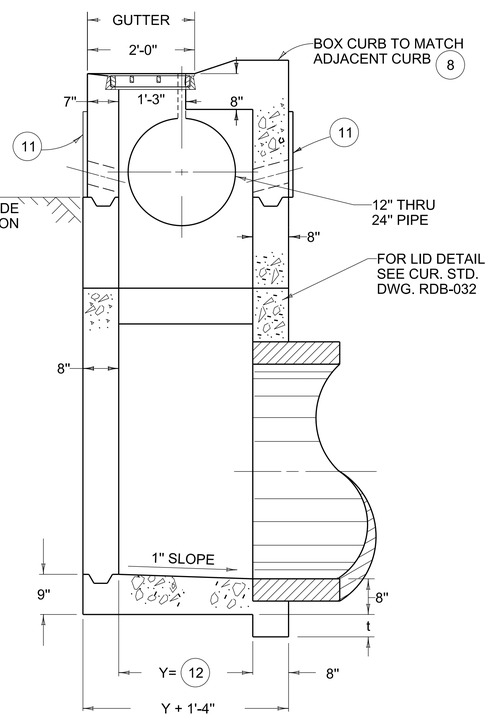
INLETS	DROP BOX INLET TYPE 14 AND 15	STANDARD DRAWING NUMBER RDB-020-05



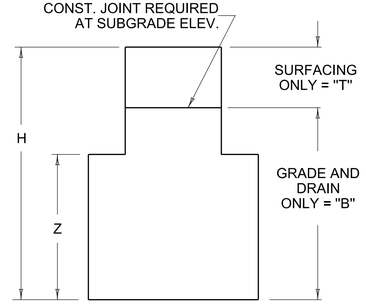
PLAN VIEW



SECTION A-A



SECTION B-B



CONSTRUCTION SEQUENCE FOR GRADE & DRAIN AND/OR SURFACING

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

~ NOTES ~

BID ITEM AND UNIT TO BID
DROP BOX INLET TYPE 16 (Δ)(✳) EACH
(Δ) = "S" (SAG CONDITION)
(Δ) = "G" (GRADE CONDITION)
(✳) = "T" (TOP PHASE)
(✳) = "B" (BOTTOM PHASE)
WITH NO "T" OR "B" SUFFIX A COMPLETE INLET IS REQUIRED.

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

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 OR 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.*

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

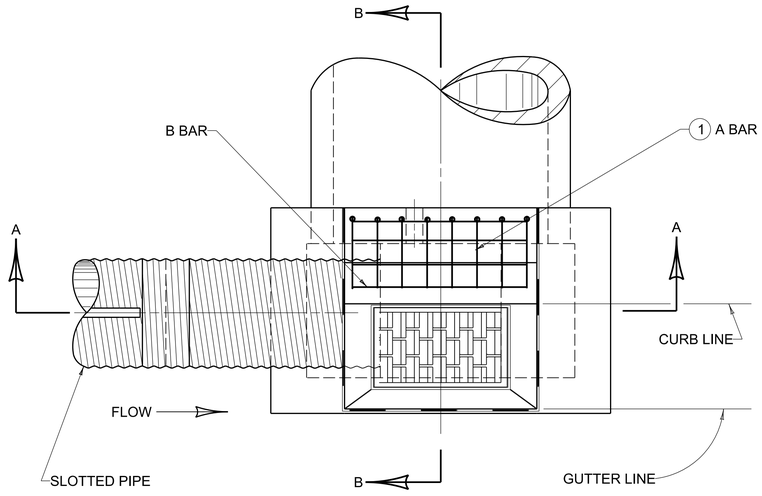
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY Transportation Cabinet

INLETS

DROP BOX INLET TYPE 16 (DETAIL SHEET)

STANDARD DRAWING NUMBER
RDB-030-04



PLAN VIEW

~ NOTES ~

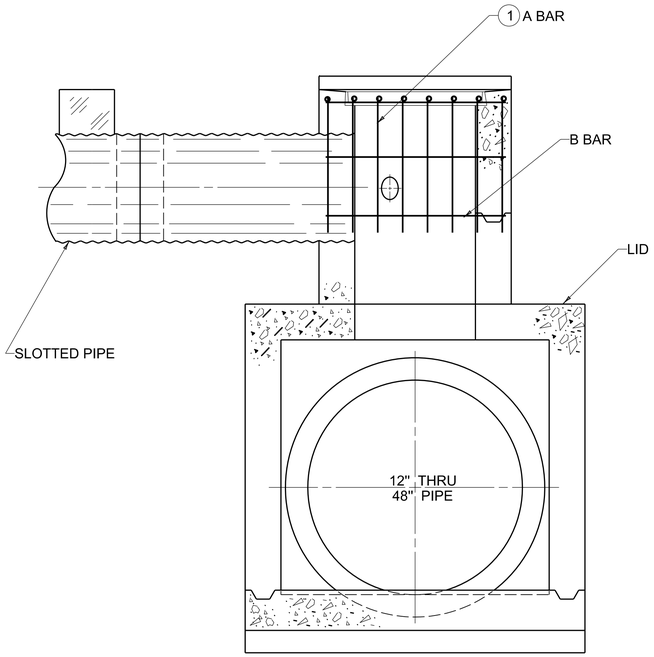
1. *SLOTTED PIPE SIZE DENOTES WHICH "A" BAR TO USE, SEE STEEL CHART ON THIS DRAWING.*
2. *SEE CUR. STD. DWG. RDB-032 FOR LID REINFORCEMENT.*
3. *REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2" FROM THE OUTSIDE FACE UNLESS OTHERWISE SHOWN.*
4. *SPACE "A" BARS APPROXIMATELY 6" CENTER TO CENTER.*
5. *SPACE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

USE WITH CUR. STD. DWGS.

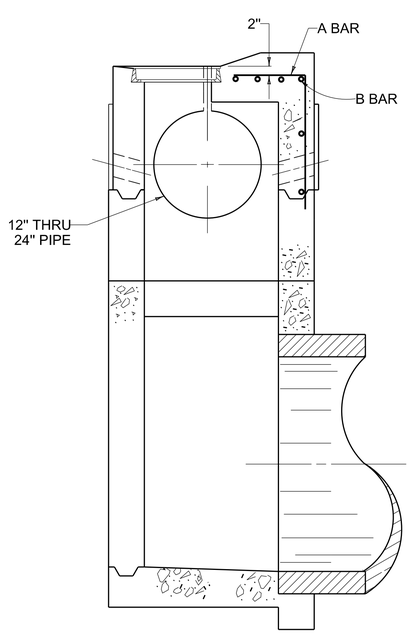
RDI-200	RDB-014	RDB-030
RDB-032	RDB-033	RDB-034
RDB-035		

STEEL REINFORCEMENT CHART

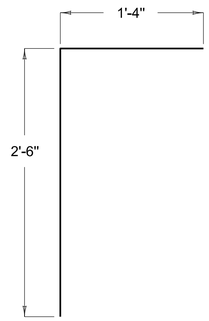
NO. 5 BAR	SLOTTED PIPE SIZE	CONDITION	QTY.	LGTH.	TOTAL LBS
A BAR	12" THRU 18"	GRADE	8	2'-7"	22
B BAR			6	3'-3"	20
A BAR		SAG	13	2'-7"	35
B BAR			6	5'-11"	37
A BAR	24"	GRADE	8	3'-10"	32
B BAR			6	3'-3"	20
A BAR		SAG	13	3'-10"	52
B BAR			6	5'-11"	37



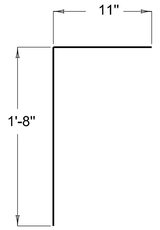
SECTION A-A



SECTION B-B



A BAR DETAIL
24" PIPE



A BAR DETAIL
12" - 18" PIPE

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

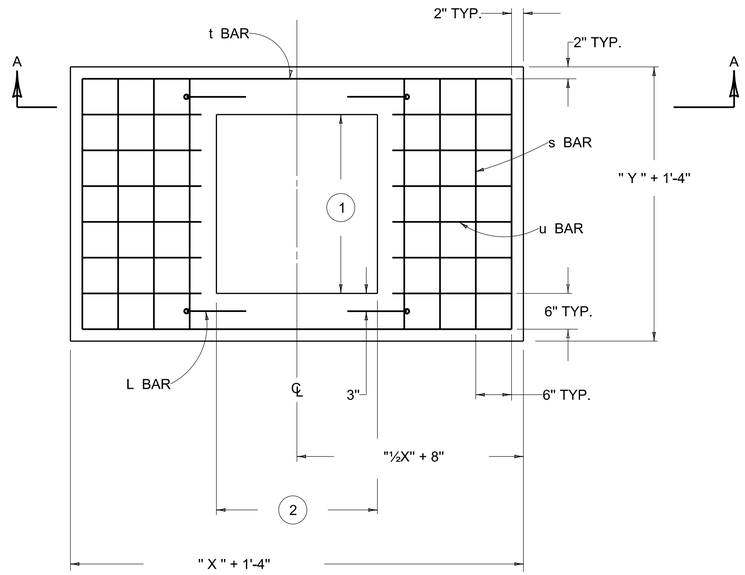
INLETS

DROP BOX INLET TYPE 16 (STEEL SHEET)

STANDARD DRAWING NUMBER
RDB-031-04

REINFORCEMENT STEEL FOR 8" LID (GRADE CONDITION)

SIZE		NO. 5 STEEL BARS						
X	Y	BAR s		BAR t		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

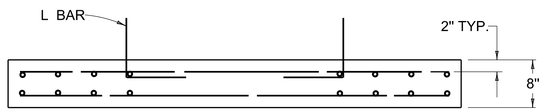


DETAIL OF 8" LID
PLAN VIEW

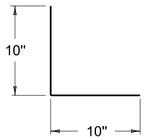
~ NOTES ~

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 LIB 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.

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



SECTION A-A



L BAR DETAIL

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

DIMENSIONS AND ESTIMATE OF QUANTITIES (GRADE CONDITION)

INLET SIZE (4)			MAX. PIPE DIA.	LOCATION	Z (1)	CONCRETE	
NO. (6)	X	Y				CU. YD. (1)(2)	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. (1)(2)	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.*

USE WITH CUR. STD. DWGS.

RDI-200 RDB-014 RDB-030
RDB-031 RDB-032 RDB-034
RDB-035

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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED William S. Ballard 12-01-2015
DIVISION DIRECTOR DATE

APPROVED Scott Thomas 12-01-2015
STATE HIGHWAY ENGINEER DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

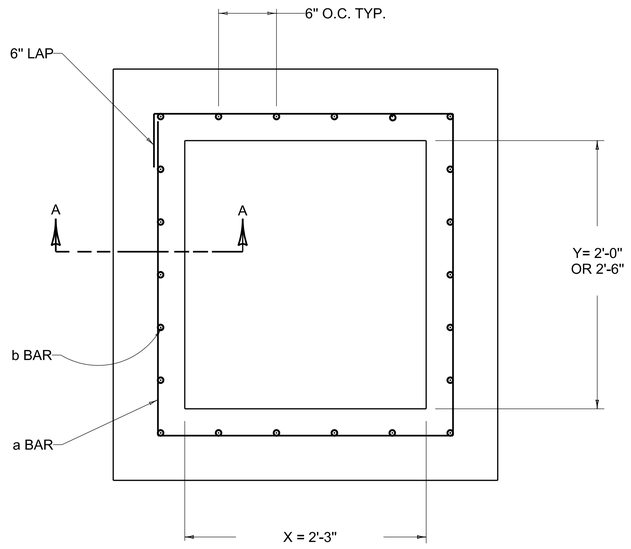
INLETS

DROP BOX INLET TYPE 16 (DIMENSIONS & ESTIMATE OF QUANTITIES)

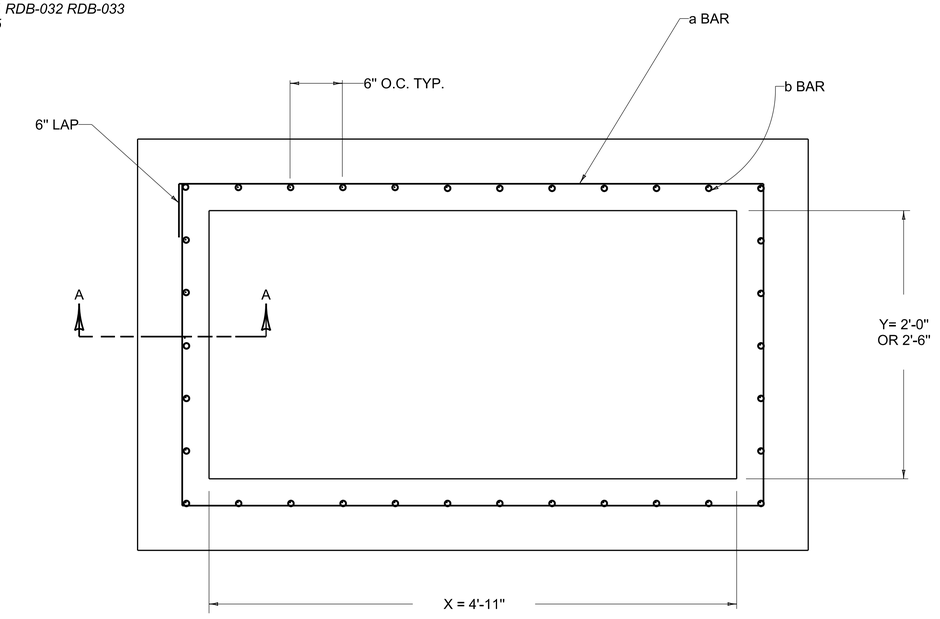
STANDARD DRAWING NUMBER
RDB-033-03

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

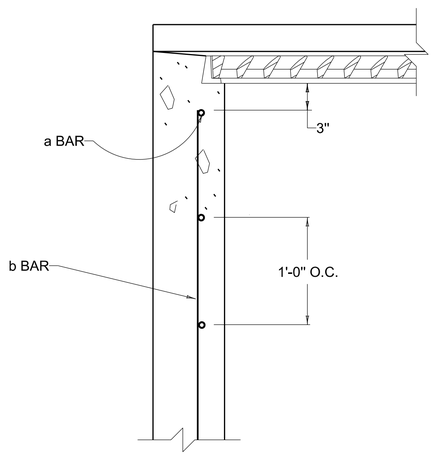
USE WITH CUR. STD. DWGS.
RDI-200 RDB-014 RDB-030
RDB-031 RDB-032 RDB-033
RDB-035



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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

INLETS

DROP BOX INLET TYPE 16 (ADDITIONAL STEEL-RISER)

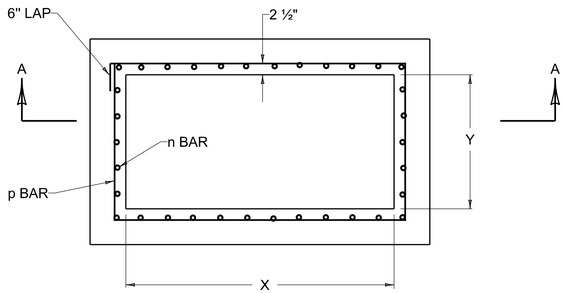
STANDARD DRAWING NUMBER
RDB-034-04

(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)
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

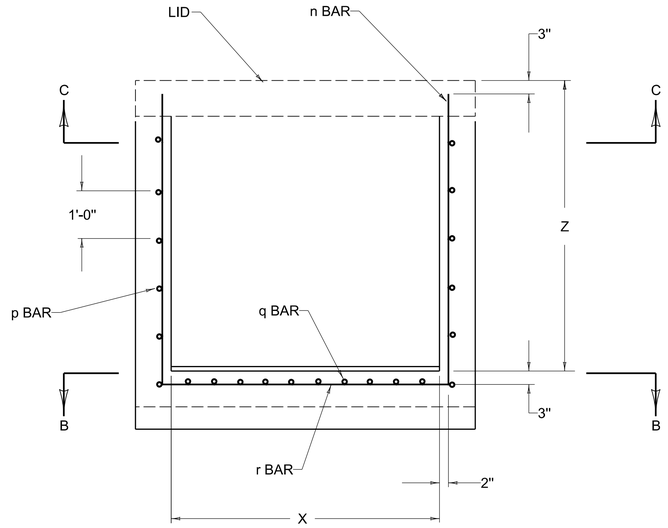


SECTION C-C

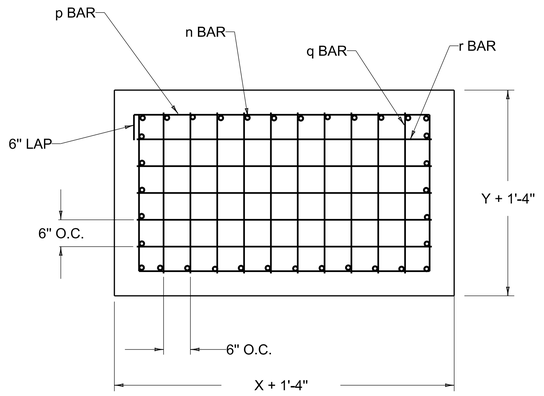
~ NOTES ~

(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.*

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



SECTION A-A



SECTION B-B

REVISION DATE: 12/01/2015
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APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

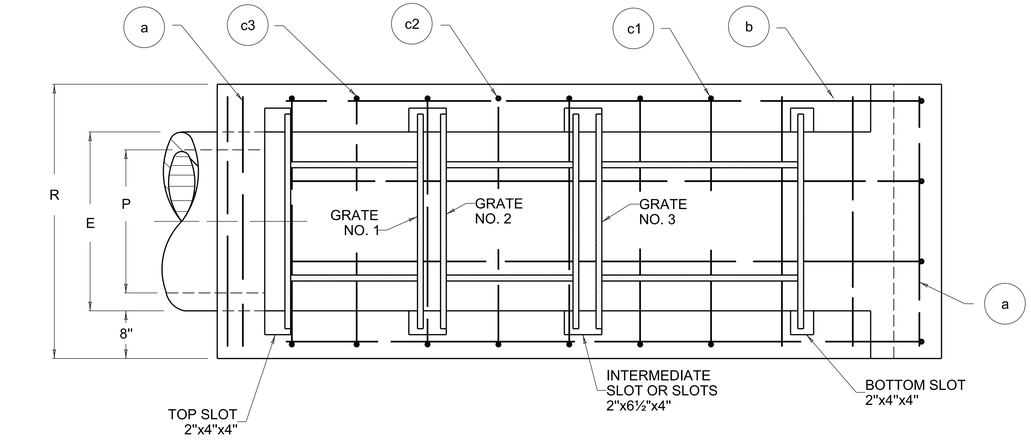
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

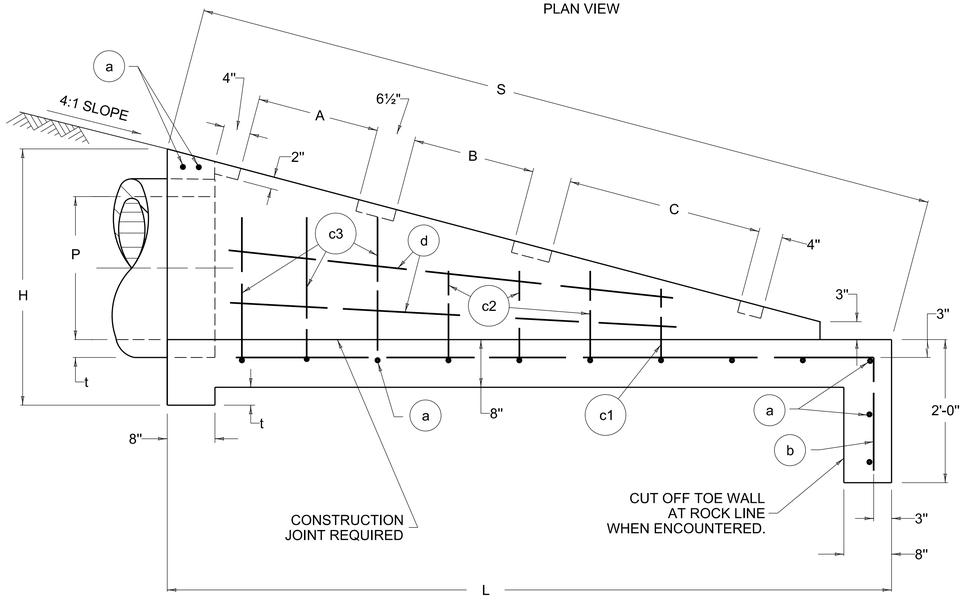
INLETS

DROP BOX INLET TYPE 16 (ADDITIONAL STEEL-CHAMBER)

STANDARD DRAWING NUMBER
RDB-035-04



PLAN VIEW



ELEVATION VIEW

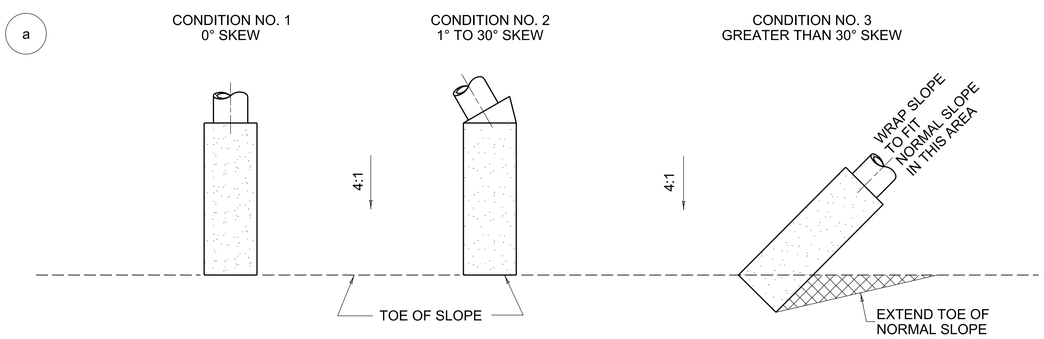
DIMENSIONS									NO. OF GRATES REQ'D.	
P	H	L	S	R	E	A	B	C	2'	3'
15"	3'-0"	8'-2"	8'-5½"	3'-3"	1'-11"	1'-8½"	2'-8¾"	-----	1	1
18"										
24"	3'-7"	10'-1½"	10'-5⅝"	3'-10"	2'-6"		1'-8½"	2'-8¾"	2	1

~ NOTES ~

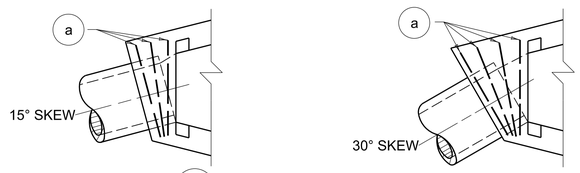
1. *THE MINIMUM REQUIREMENT FOR REINFORCING STEEL SHALL BE GRADE 40. FIELD BENDING WILL BE PERMITTED.*
2. *ONE ADDITIONAL a BAR WILL BE REQUIRED FOR EACH 15° SKEW.*
3. *"t" IS THE CONCRETE PIPE WALL THICKNESS OR METAL PIPE CORRUGATION DEPTH.*
4. *SEE CUR. STD. DWG. RDB-101 FOR REINFORCING STEEL AND GRATE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

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

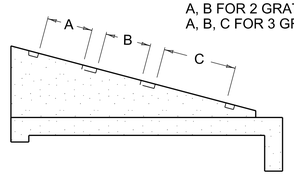
USE WITH CUR. STD. DWG.
RDB-101



PLAN VIEW OF STRUCTURE LOCATIONS

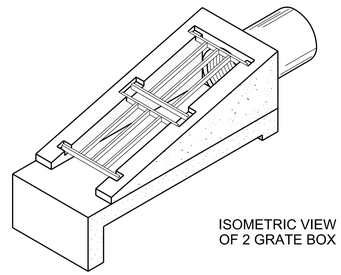


2 a BAR DETAIL FOR 15° AND 30° SKEW



A, B FOR 2 GRATES
A, B, C FOR 3 GRATES

DETAIL SHOWING LOCATION OF SLOTS FOR GRATES



ISOMETRIC VIEW OF 2 GRATE BOX

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

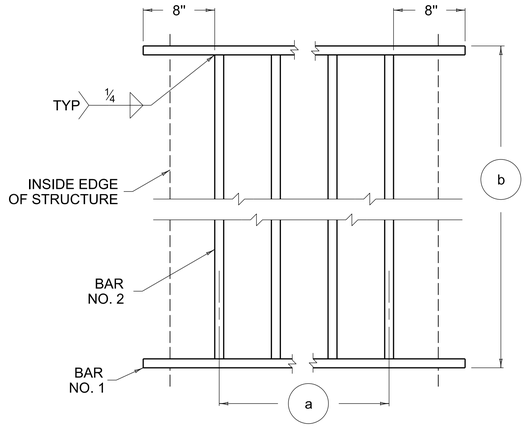
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

OUTLETS

SLOPED BOX OUTLET TYPE 1

STANDARD DRAWING NUMBER
RDB-100-05



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.

USE WITH 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"	12	2'-5"	4	8'-6"	0	0	6	1'-0"	4	1'-6"	4	4'-3"	62	1.2
18"														
24"	14	3'-0"	4	10'-6"	2	1'-0"	6	1'-3"	6	2'-0"	4	6'-3"	87	1.83

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

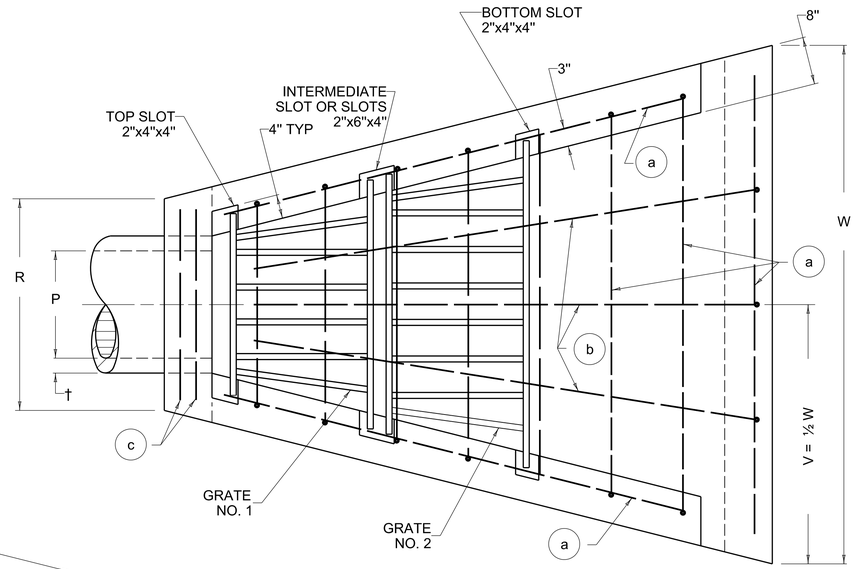
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

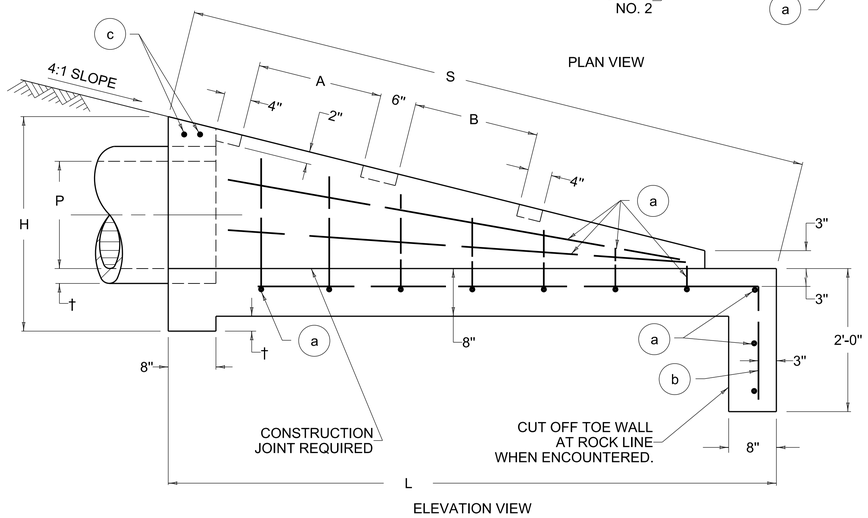
OUTLETS

GRATES FOR SLOPED BOX OUTLET TYPE 1

STANDARD DRAWING NUMBER
RDB-101-05



PLAN VIEW



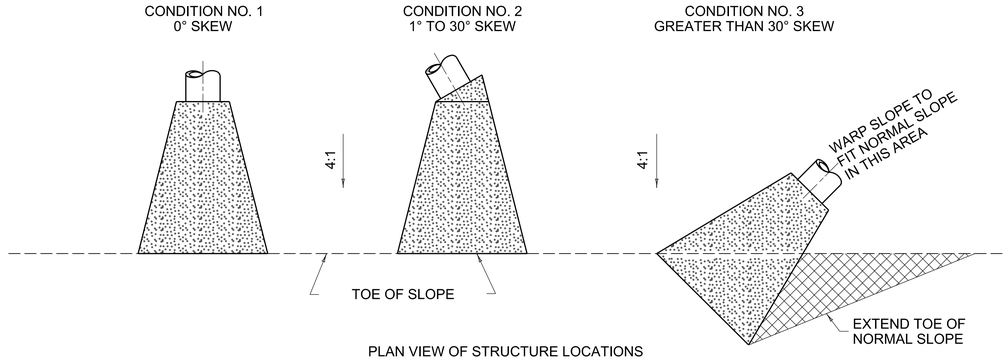
ELEVATION VIEW

~ NOTES ~

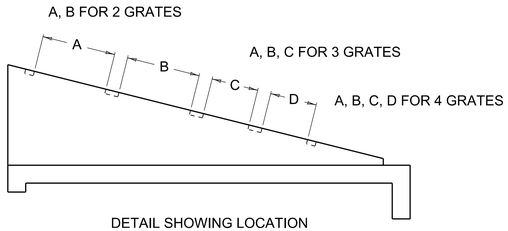
1. *THE MINIMUM REQUIREMENT FOR REINFORCING STEEL SHALL BE GRADE 40. FIELD BENDING WILL BE PERMITTED.*
2. *ONE ADDITIONAL ⓒ BAR WILL BE REQUIRED FOR EACH 15° SKEW.*
3. *"†" IS THE CONCRETE PIPE WALL THICKNESS OR METAL PIPE CORRUGATION DEPTH.*

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

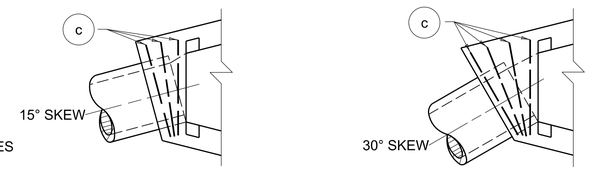
USE WITH CUR. STD. DWG.
RDB-106



PLAN VIEW OF STRUCTURE LOCATIONS

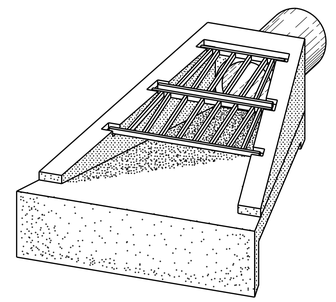


DETAIL SHOWING LOCATION
OF SLOTS FOR GRATES



2 ⓒ BAR DETAIL FOR 15° AND 30° SKEW

DIMENSIONS											NO. OF GRATES REQ'D.		NO. 4 REINFORCEMENT BARS NUMBER - LENGTH AND WEIGHT				CLASS A CONC.
P	H	L	S	R	V	W	A	B	C	D	2'	3'	a	b	3 ⓒ	LBS.	CU.YDS.
18"	3'-0"	8'-6"	8'-9⅛"	2'-11½"	3'-7½"	7'-3"	1'-9"	1'-9"	-----	-----	2	--	14 @ 6'-5"	3 @ 8'-6"	2 @ 2'-8"	81	1.8
24"	3'-7"	10'-8"	11'-0"	3'-6½"	4'-5½"	8'-11"	2'-9"	2'-9"	-----	-----	--	2	16 @ 8'-0"	3 @ 10'-6"	2 @ 3'-3"	111	2.7
30"	4'-2"	12'-10"	13'-2¾"	4'-1½"	5'-3½"	10'-7"	2'-9"	2'-9"	1'-9"	-----	1	2		3 @ 12'-9"	2 @ 3'-10"	146	3.8
36"	4'-9"	15'-0"	15'-5½"	4'-8½"	6'-1½"	12'-3"	2'-9"	2'-9"	1'-9"	1'-9"	2	2	20 @ 11'-4"	3 @ 15'-0"	2 @ 4'-5"	187	5.1



PICTORIAL VIEW
OF 18" OR 24" STRUCTURE

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

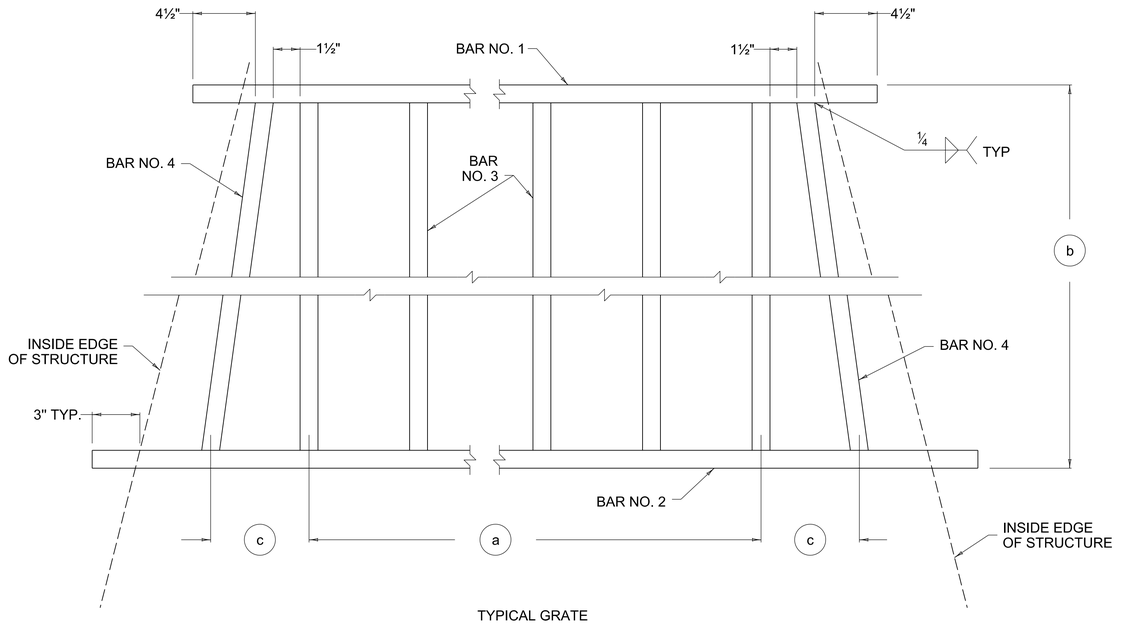
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

OUTLETS

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

STANDARD DRAWING NUMBER
RDB-105-06

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'-6½"	3'-5¾"	4	1'-10"	1'-10¼"	116	272
	2	2'-0"	3'-7⅝"	4'-6⅞"	6	1'-10"	1'-10¼"	156	
24"	1	3'-0"	3'-1½"	4'-6⅝"	5	2'-10"	2'-10⅜"	187	454
	2	3'-0"	4'-8½"	6'-1⅝"	8	2'-10"	2'-10⅜'	267	
30"	1	3'-0"	3'-8½"	5'-1½"	6	2'-10"	2'-10⅜"	215	796
	2	3'-0"	5'-3½"	6'-8⅝"	9	2'-10"	2'-10⅜"	294	
	3	2'-0"	6'-10½"	7'-9¾"	13	1'-10"	1'-10¼"	287	
36"	1	3'-0"	4'-3½"	5'-8½"	7	2'-10"	2'-10⅜"	242	1218
	2	3'-0"	5'-10½"	7'-3⅝"	10	2'-10"	2'-10⅜'	321	
	3	2'-0"	7'-5½"	8'-4¾"	14	1'-10"	1'-10¼"	308	
	4	2'-0"	8'-6¾"	9'-5⅞"	16	1'-10"	1'-10¼"	347	



TYPICAL GRATE

~ 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) 5½" FOR 2'-0" GRATE, 7" FOR 3'-0" GRATE.

USE WITH CUR. STD. DWG.
RDB-105

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

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APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

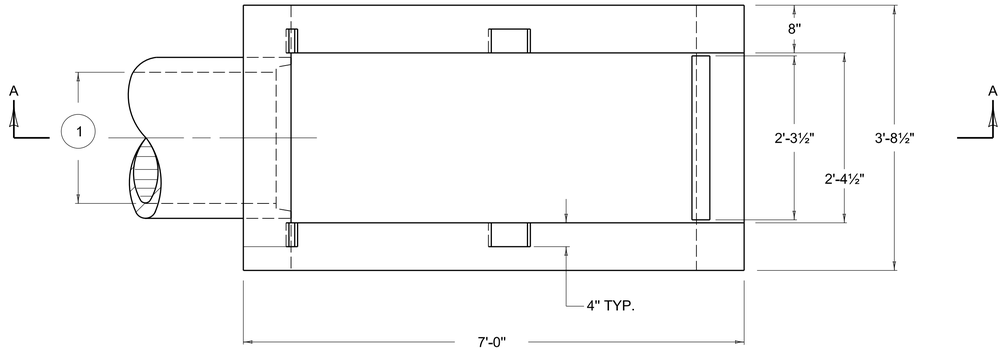
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

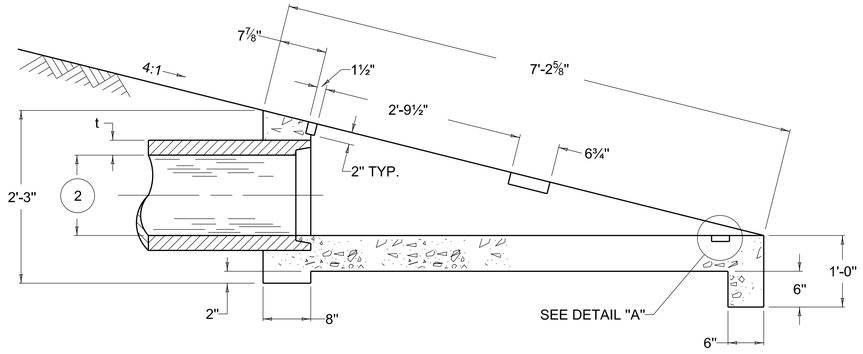
INLETS

GRATES FOR SLOPED AND FLARED BOX INLET - OUTLET

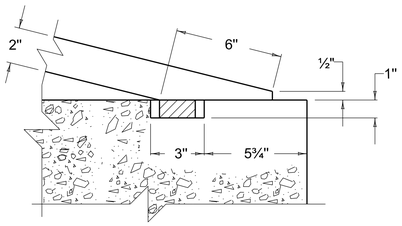
STANDARD DRAWING NUMBER
RDB-106-05



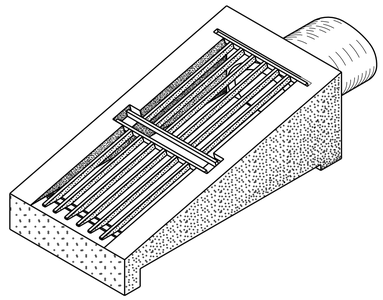
PLAN VIEW



SECTION A-A



DETAIL "A"



ISOMETRIC VIEW

~ NOTES ~

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

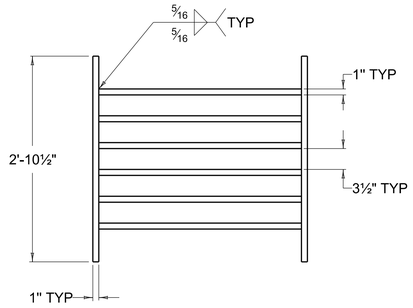
(1) *INTERIOR SPAN*

(2) *INTERIOR RISE*

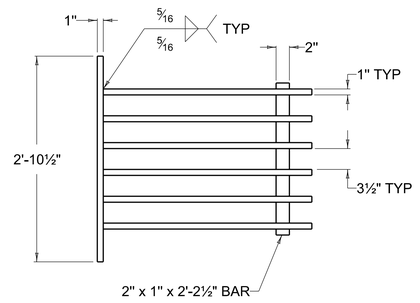
3. *THE UNIT PRICE BID FOR EACH STRUCTURE SHALL INCLUDE CONCRETE, STRUCTURAL STEEL GRATINGS, EXCAVATION, LABOR AND ALL INCIDENTALS NECESSARY FOR ITS CONSTRUCTION AS DETAILED ON THIS SHEET.*

4. *SIZE AND LOCATION OF PIPE SHALL BE SHOWN ON PLANS.*

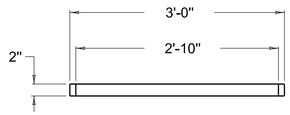
5. *SLOPED BOX INLET OR OUTLET TYPE 1 IS INTENDED TO BE USED WITH THE FOLLOWING PIPE SIZES:*
   METAL PIPE ARCH - (15" EQUIV. ROUND)
   METAL PIPE ARCH - (18" EQUIV. ROUND)
   CONCRETE ELLIPTICAL PIPE - (18" EQUIV. ROUND)



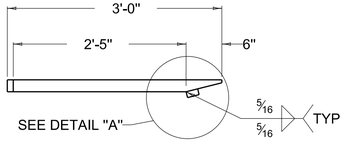
GRATE NO. 1
PLAN VIEW



GRATE NO. 2
PLAN VIEW



GRATE NO. 1
SIDE ELEVATION



GRATE NO. 2
SIDE ELEVATION

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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

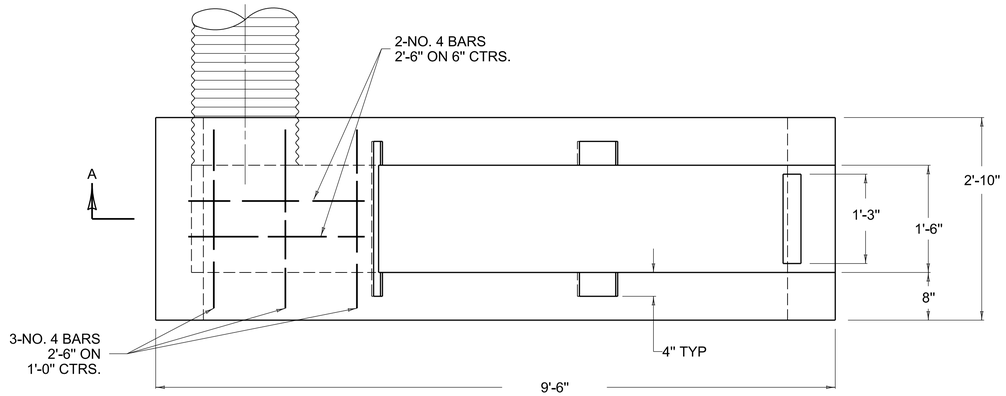
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

INLETS

SLOPED BOX INLET OR OUTLET TYPE 1

STANDARD DRAWING NUMBER
RDB-110-08

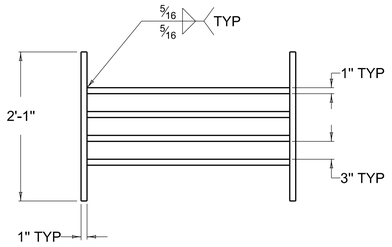


PLAN VIEW

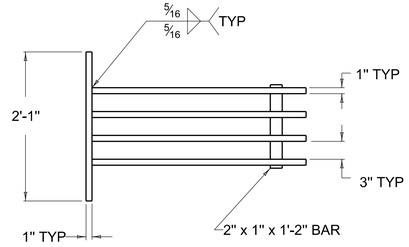
~ NOTES ~

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 INCIDENTALS 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).*

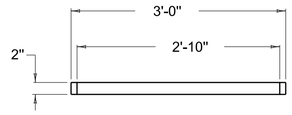


GRATE NO. 1
PLAN VIEW

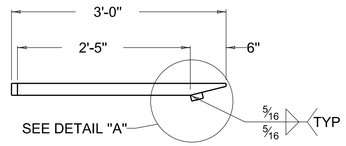


GRATE NO. 2
PLAN VIEW

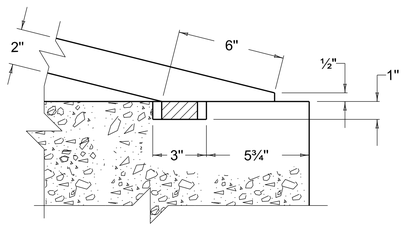
SECTION A-A



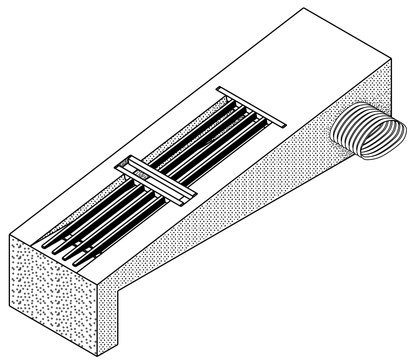
GRATE NO. 1
SIDE ELEVATION



GRATE NO. 2
SIDE ELEVATION



DETAIL "A"



ISOMETRIC VIEW

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		

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

INLETS

SLOPED BOX INLET OR OUTLET TYPE 2

STANDARD DRAWING NUMBER
RDB-111-08

~ NOTES ~

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

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

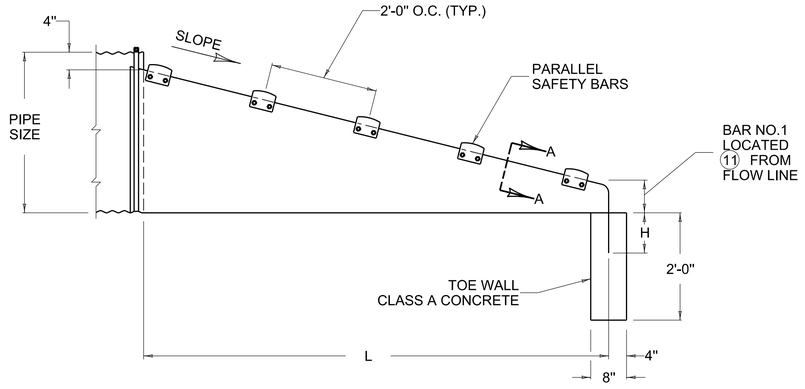
(7) WATERPROOF MASTIC CONFORMING TO 807.02.03 OF THE CURRENT KENTUCKY STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION SHALL BE PLACED IN THE VOID BETWEEN THE TAPERED SLEEVE AND CONCRETE PIPE.

(8) FORM ½" x 2⅔" CORRUGATIONS. MAINTAIN INSIDE DIAMETER OF SLEEVE. FINISHED END IS TO BE THE SAME DIAMETER AS CORRUGATED STEEL PIPE DIAMETER.

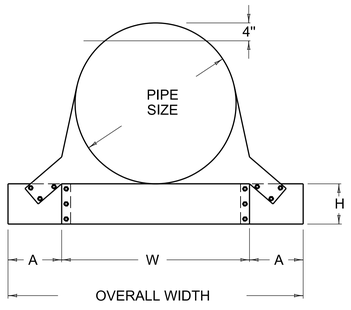
9. ALL MISCELLANEOUS HARDWARE SHALL COMPLY WITH AASHTO M36.
10. THE WELDS USED IN THE MANUFACTURE OF THE TAPERED SLEEVE FOR ELLIPTICAL CONC. PIPE SHALL BE REPAIRED IN ACCORDANCE WITH AASHTO M36 USING ZINC OXIDE-ZINC DUST PRIMER, FEDERAL SPECIFICATION TT-P-641, TYPE II, NO COLOR ADDED.

(11) TYPE 1 = 6", TYPE 2 = 4"

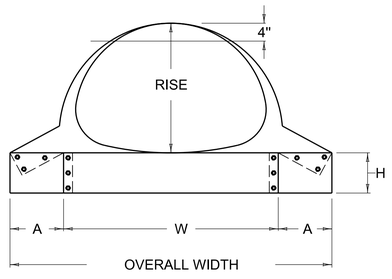
USE WITH CUR. STD. DWG.
RDB-160



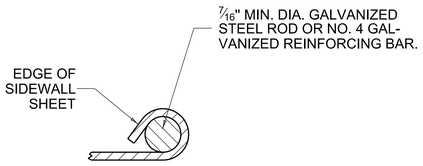
SIDE ELEVATION



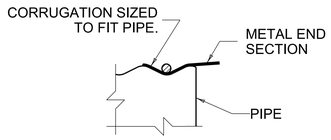
END SECT. FRONT VIEW
CIRCULAR PIPE



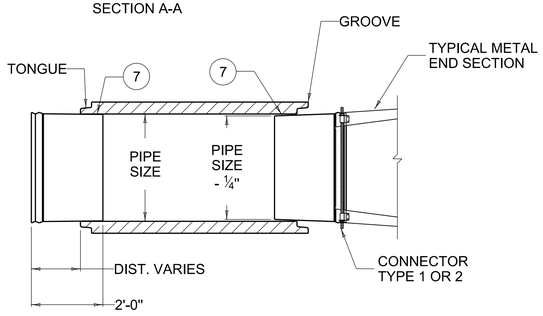
END SECT. FRONT VIEW
ARCHED PIPE

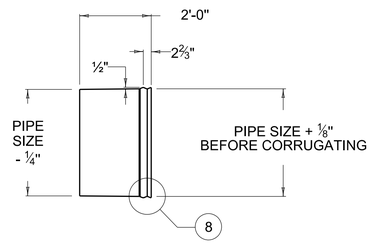


SECTION A-A

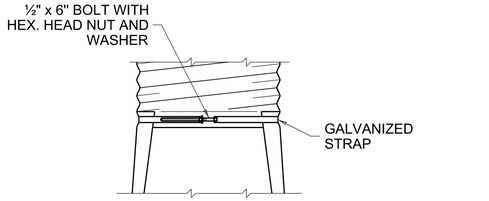


SECTION B-B

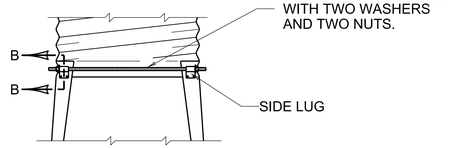




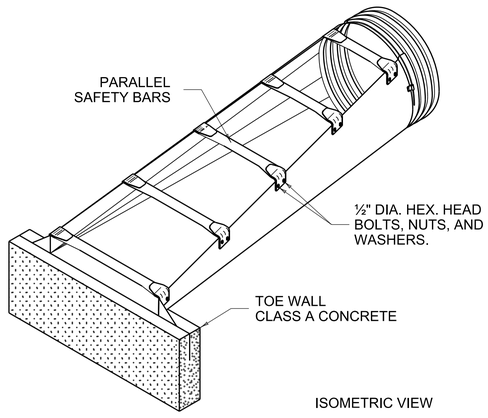
SMOOTH TAPERED SLEEVE FOR USE WITH CONCRETE PIPE



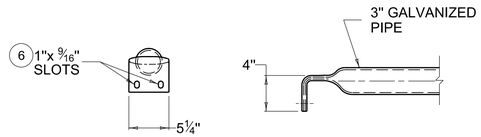
TYPE 1 CONNECTOR



TYPE 2 CONNECTOR



ISOMETRIC VIEW



PARALLEL SAFETY BAR

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

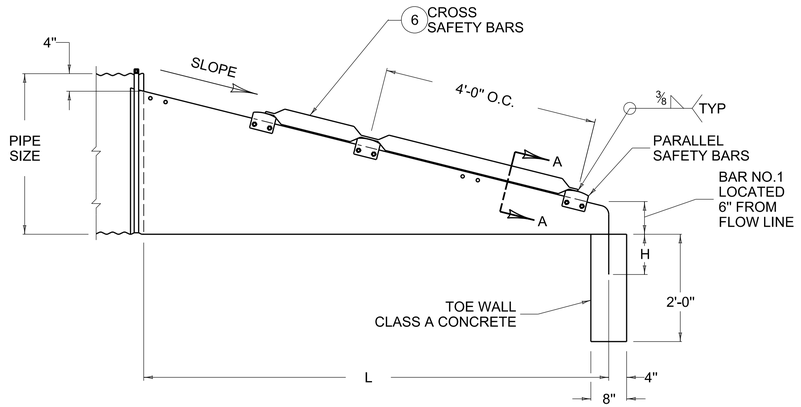
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

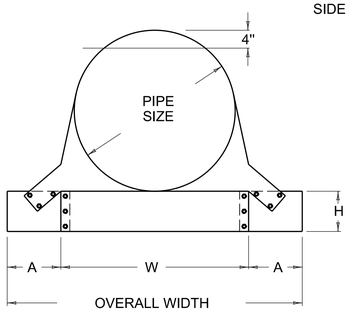
END SECTIONS

METAL END SECTION TYPE 1 AND 2 (PARALLEL STRUCTURES)

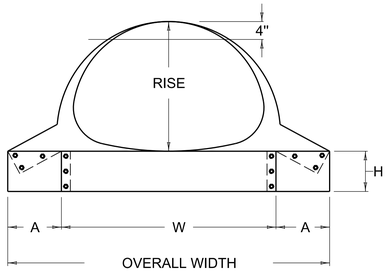
STANDARD DRAWING NUMBER
RDB-150-02



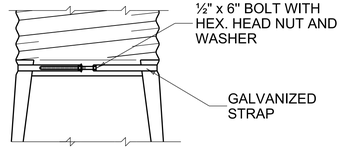
SIDE ELEVATION



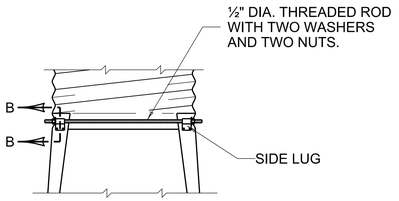
END SECT. FRONT VIEW
CIRCULAR PIPE



END SECT. FRONT VIEW
ARCHED PIPE



TYPE 1 CONNECTOR



TYPE 2 CONNECTOR

~ NOTES ~

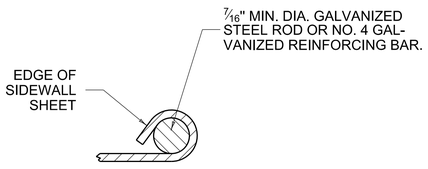
BID ITEM AND UNIT TO BID
METAL END SECTION TY ⊗ △ IN EACH
⊗3 = CROSSDRAIN STRUCTURE ON 4:1 SLOPE, 4 = CROSSDRAIN STRUCTURE ON 6:1 SLOPE
△SIZE IN INCHES

BID ITEM EXAMPLE: METAL END SECTION TY 3-15 IN

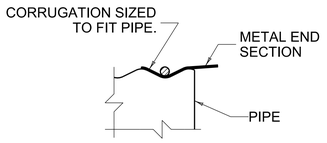
THE CONTRACT UNIT PRICE EACH FOR METAL END SECTION SHALL INCLUDE CLASS A CONCRETE, EXCAVATION, AND ALL INCIDENTALS NECESSARY TO COMPLETE ONE INSTALLATION AS DETAILED.

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 ½" x 2⅔" 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.*

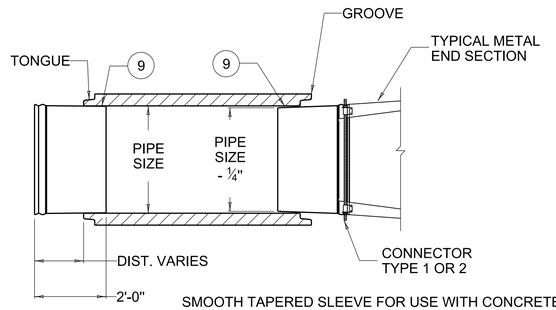
USE WITH CUR. STD. DWG.
RDB-160



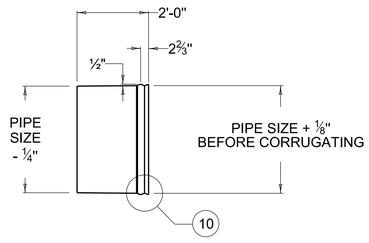
SECTION A-A

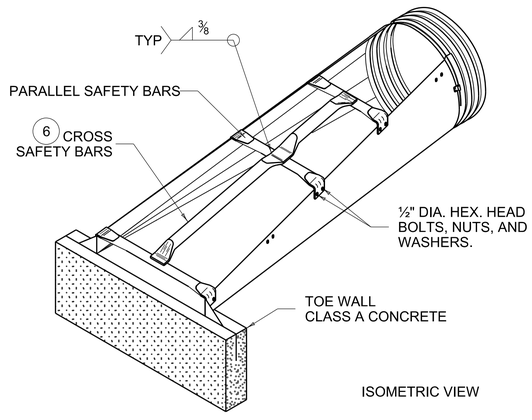


SECTION B-B

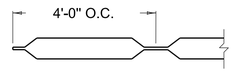


SMOOTH TAPERED SLEEVE FOR USE WITH CONCRETE PIPE

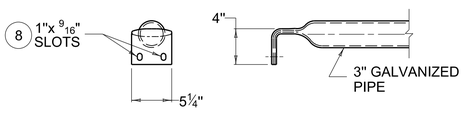




ISOMETRIC VIEW



CROSS SAFETY BAR



PARALLEL SAFETY BAR

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

END SECTIONS

METAL END SECTION TYPE 3 AND 4 (CROSS STRUCTURES)

STANDARD DRAWING NUMBER
RDB-155-02

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

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

~ NOTES ~

(1) *DIMENSIONAL TOLERANCE +1" -0"*

(2) *FOR METAL END SECTIONS WITH A SLOPE OF 10:1 USE A METAL THICKNESS OF .109" MIN.*

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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015

APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

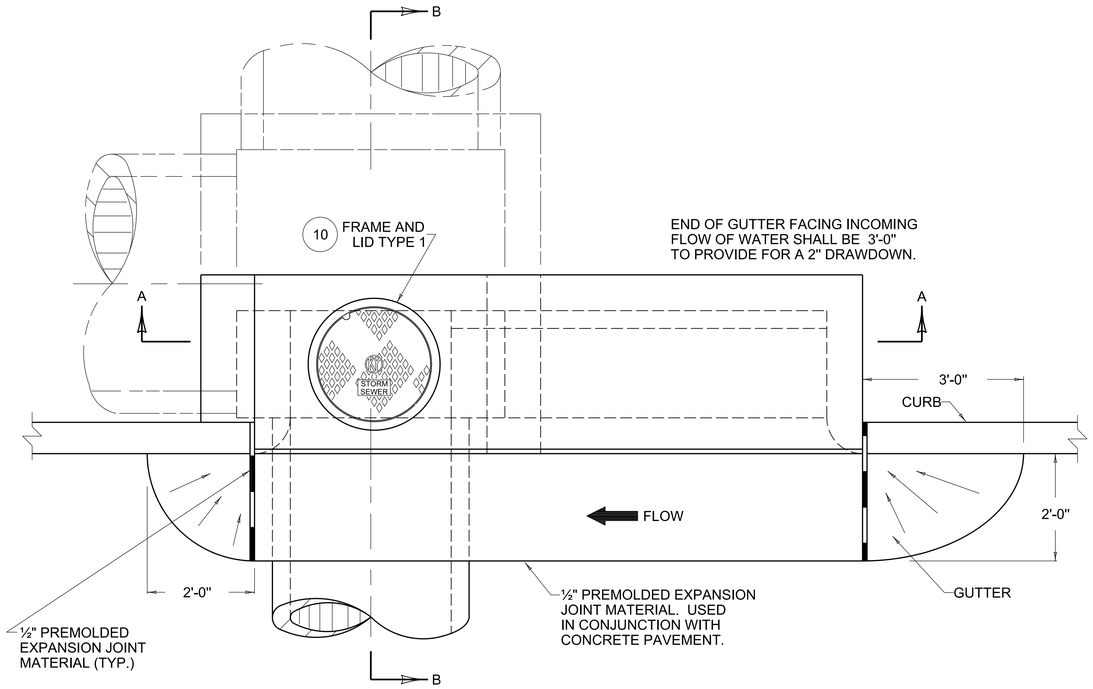
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

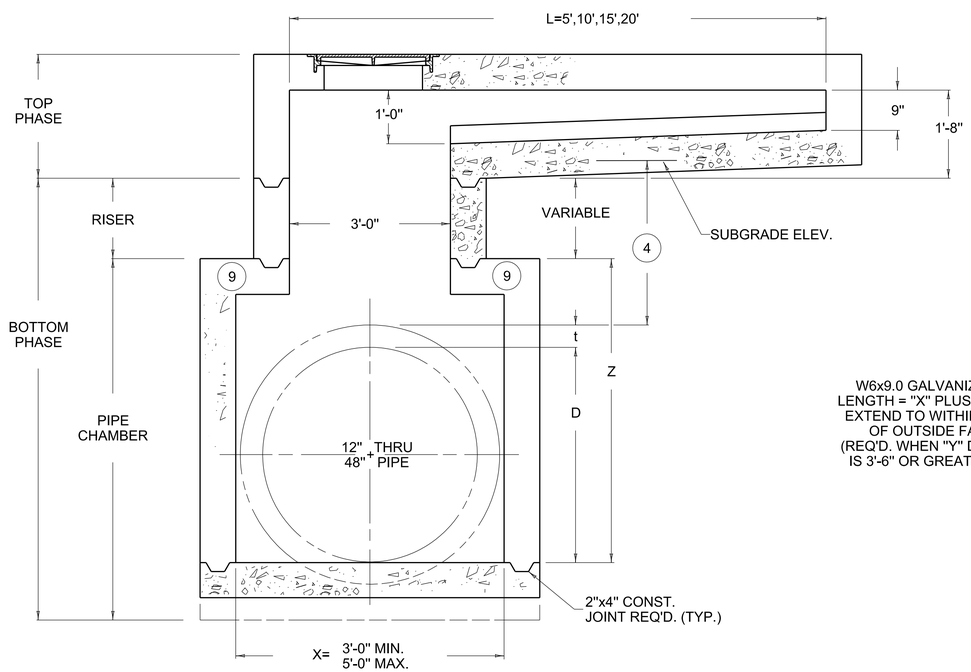
END SECTIONS

DIMENSIONS FOR METAL END SECTIONS

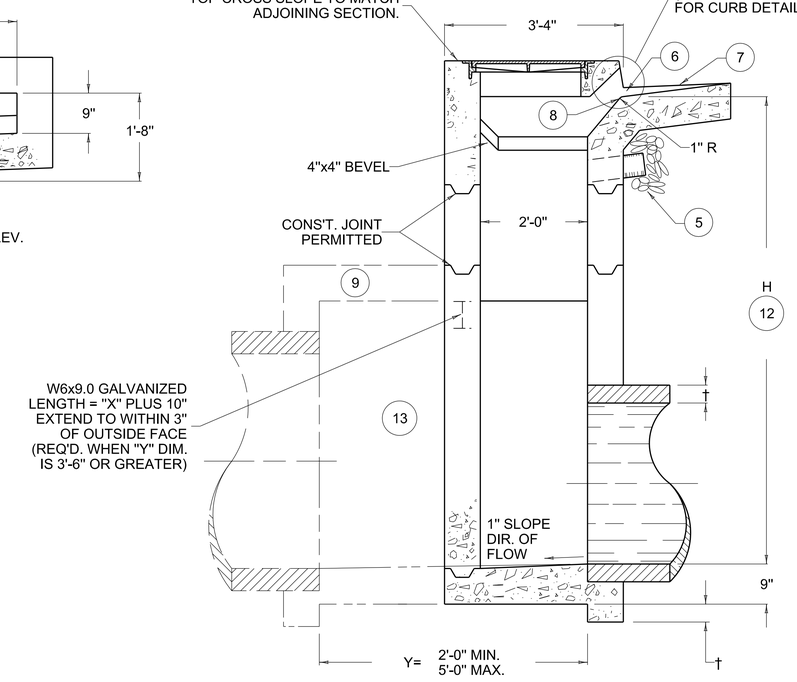
STANDARD DRAWING NUMBER
RDB-160-02



PLAN VIEW



SECTION A-A



SECTION B-B

~ NOTES ~

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.*

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.

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

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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

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APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

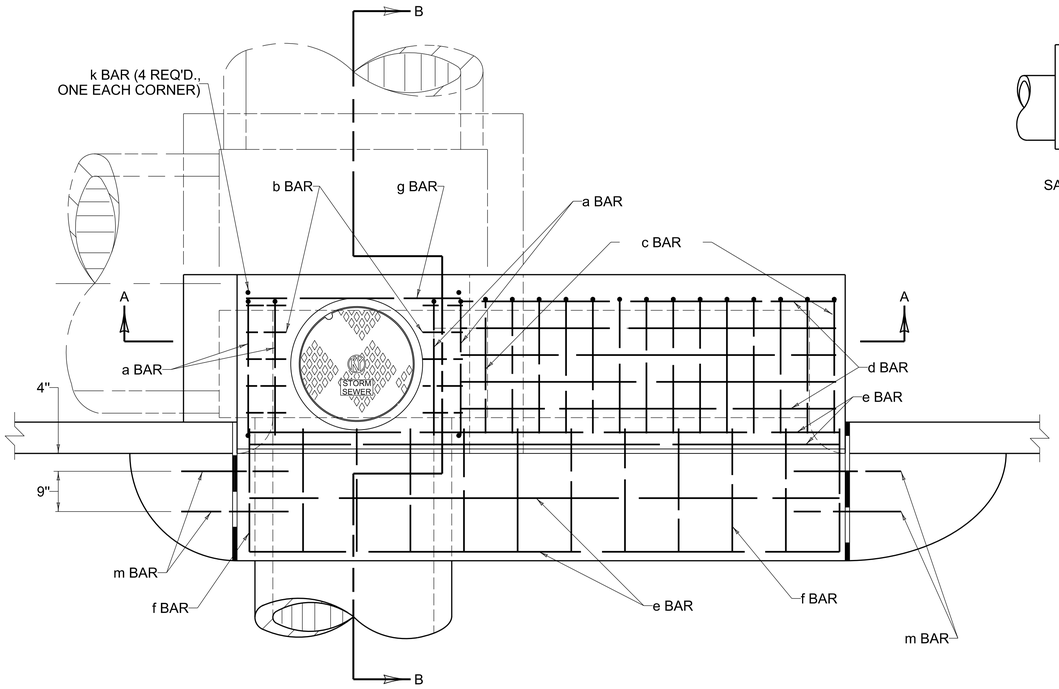
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

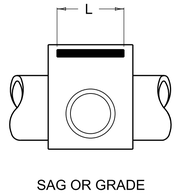
INLETS

CURB BOX INLET TYPE A (DETAIL DRAWING)

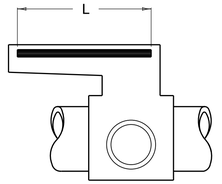
STANDARD DRAWING NUMBER
RDB-270-09



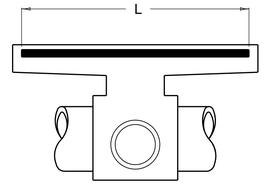
PLAN VIEW



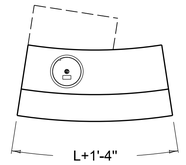
SAG OR GRADE



GRADE



SAG



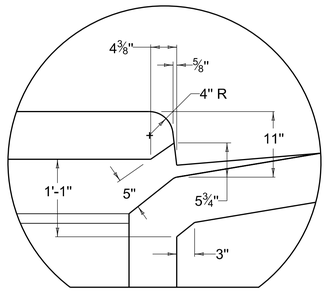
CURVE LAYOUT

~ NOTES ~

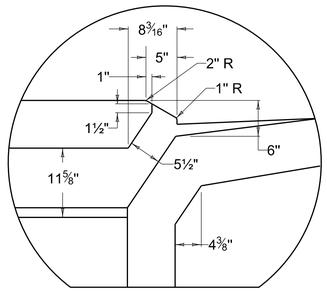
1. *SEE CUR. STD. DWG. RDB-273 FOR LID REINFORCEMENT.*
2. *e, f, AND g BARS SPACED 1'-0" O.C. ALL OTHER BARS SPACED 6" O.C. EXCEPT WHERE OTHERWISE SPECIFIED.*
3. *PLACE ALL STEEL REINFORCEMENT 2" FROM INSIDE OF INLET WALL EXCEPT WHERE OTHERWISE SPECIFIED.*

USE WITH CUR. STD. DWGS.

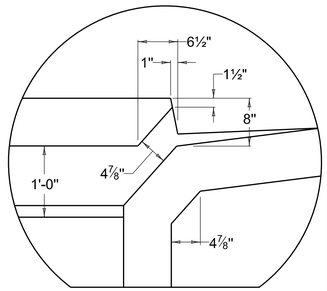
RDB-270	RDB-272	RDB-273
RDB-400	RDB-410	RDB-420



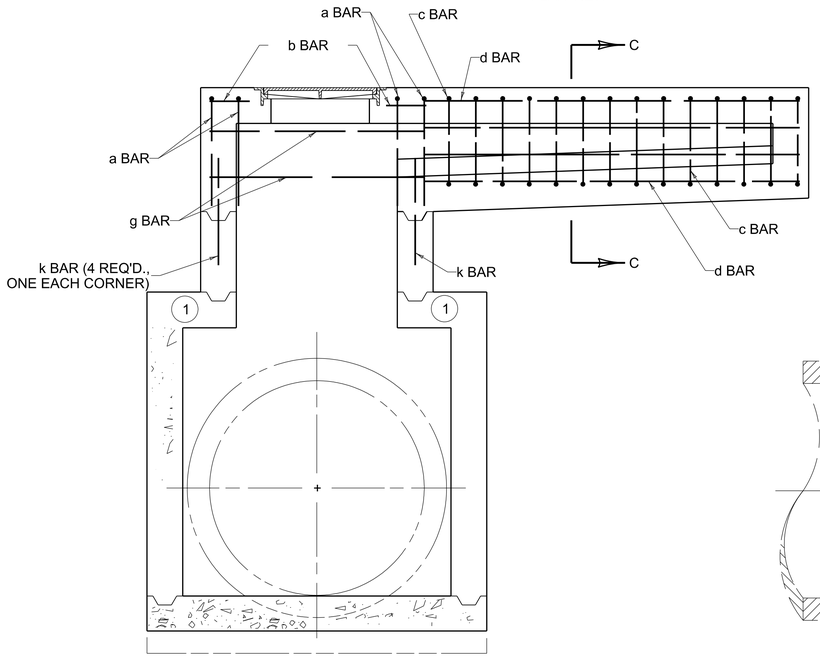
BARRIER CURB



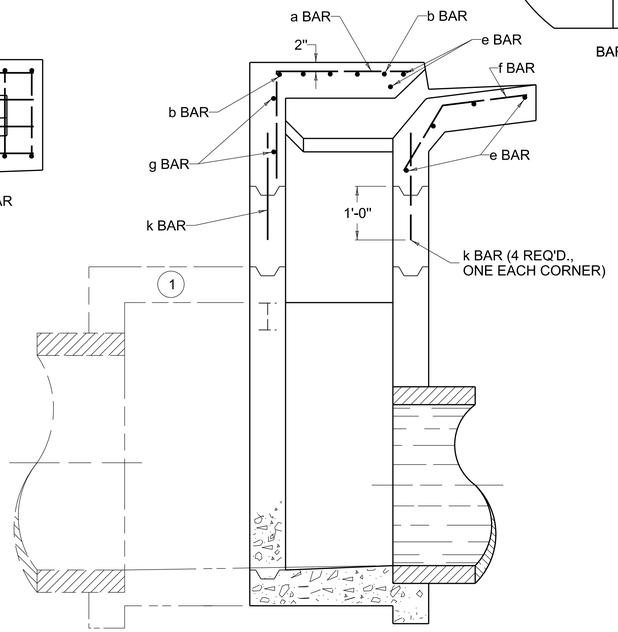
ISLAND CURB



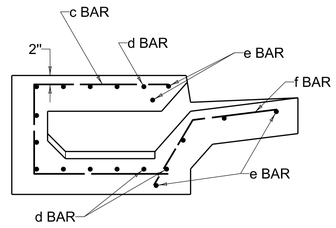
STANDARD CURB



SECTION A-A



SECTION B-B



SECTION C-C

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

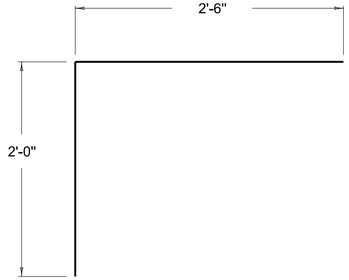
INLETS

CURB BOX INLET TYPE A (STEEL DRAWING)

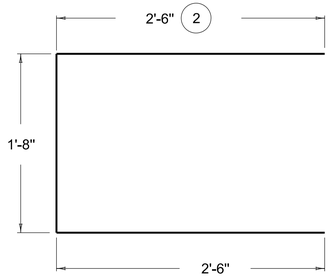
STANDARD DRAWING NUMBER
RDB-271-05

DIMENSIONS AND ESTIMATE OF QUANTITIES (TOP PHASE)

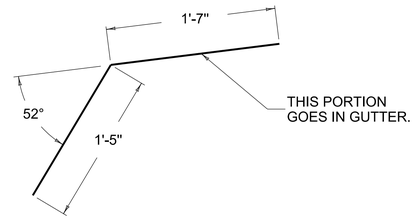
(3) SIZE NO.		THROAT "L"	CONC.	NO. 5 STEEL BARS																				
				BAR a		BAR b		BAR c		BAR d (4)		BAR d (5)		BAR e		BAR f		BAR g		BAR k (1)		BAR m		LBS.
GRADE	SAG	FT.	CU.YDS.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. 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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015

APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

DRAINAGE

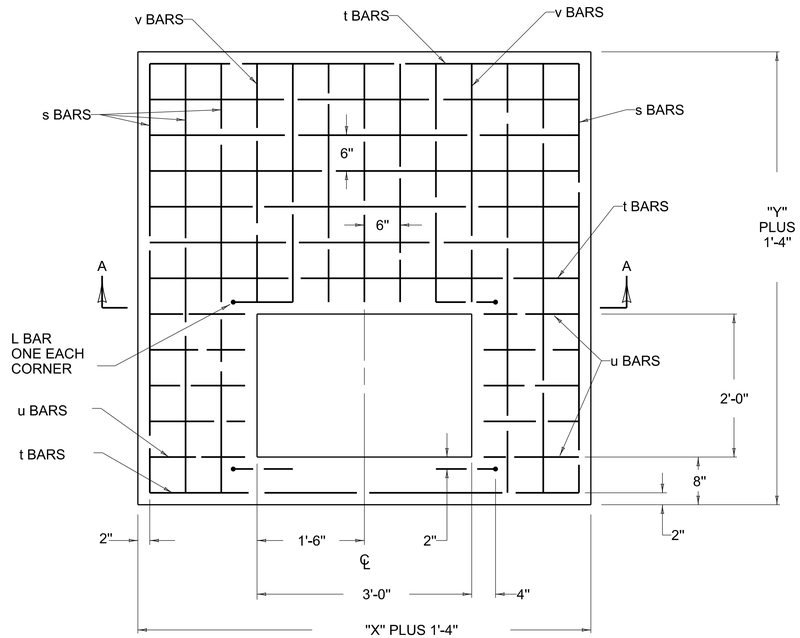
REINFORCEMENT STEEL FOR 8" LID

SIZE		NO. 5 STEEL BARS								
		BAR s		BAR t		BAR u		BAR v		LBS.
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

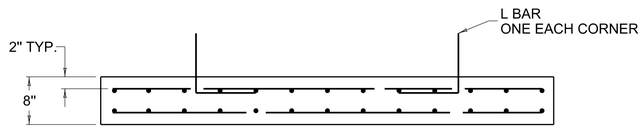
~ NOTES ~

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.*

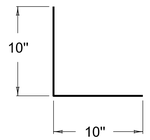
USE WITH CUR. STD. DWGS.
RDB-271 RDB-272 RDB-400
RDB-410 RDB-420 RDB-270



DETAIL OF 8" LID
PLAN VIEW



SECTION A-A



L BAR DETAIL

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

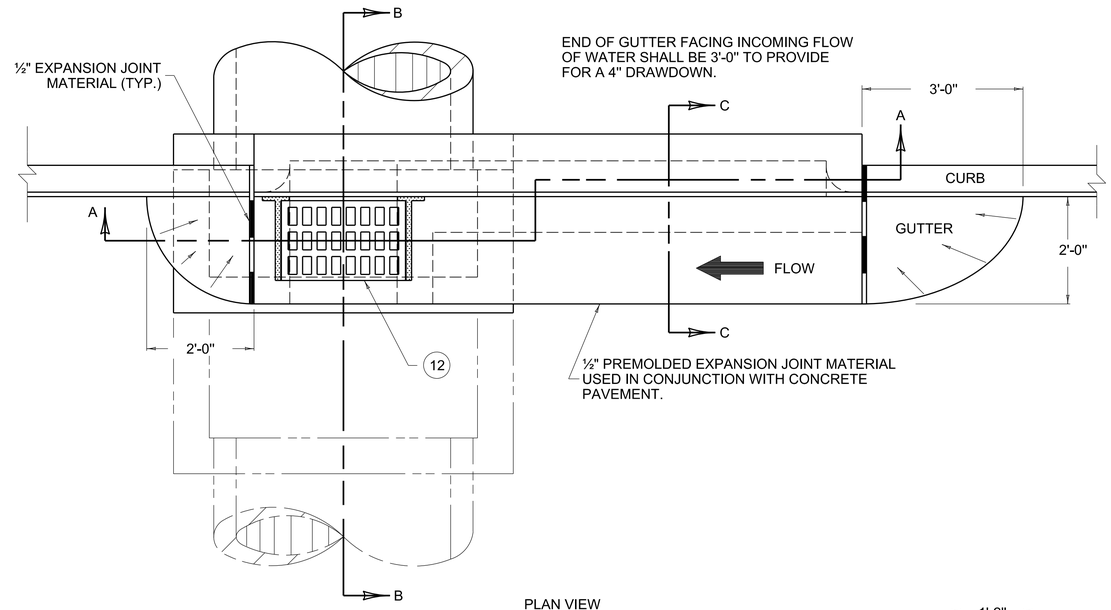
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY. TRANSPORTATION CABINET

INLETS

CURB BOX INLET TYPE A (DERAIL & BAR CHART FOR 8" LID)

STANDARD DRAWING NUMBER
RDB-273-06



PLAN VIEW

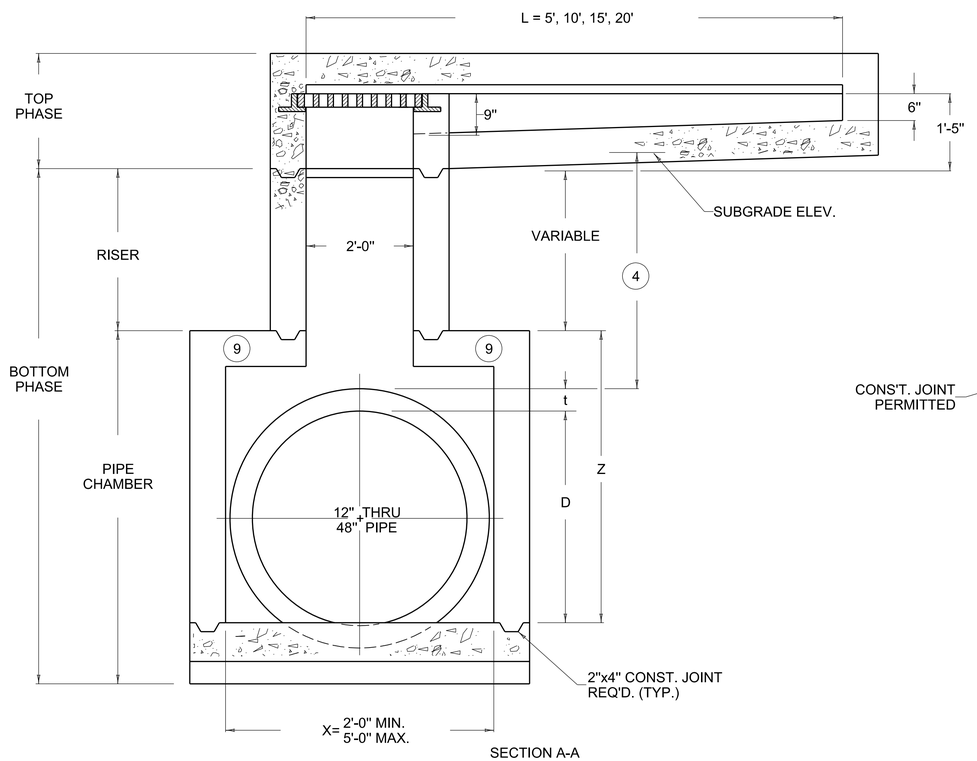
~ NOTES ~

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. *"t" 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.*

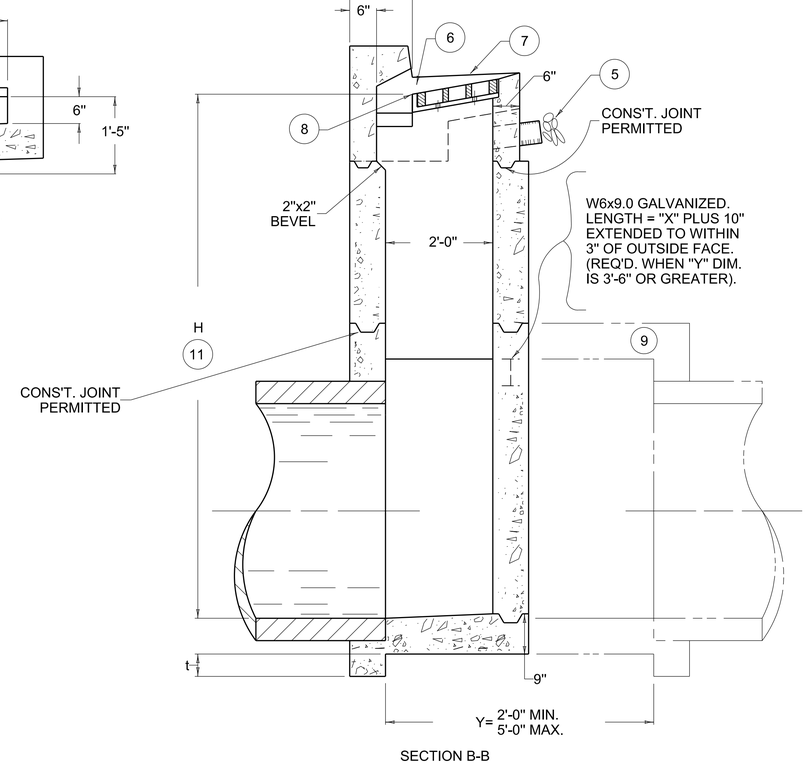
BID ITEM AND UNIT TO BID
CURB BOX INLET TYPE B △ *EACH*
△ (B) = BOTTOM PHASE ONLY *△ (T) = TOP PHASE ONLY*
NO SUFFIX INDICATES COMPLETE INLET.

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

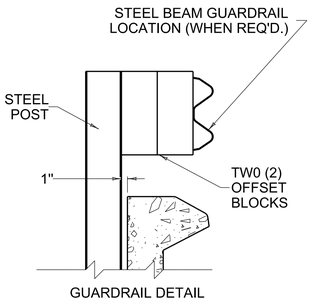
RISER
CU. YDS. CONC. PER FT. HT.
0.3



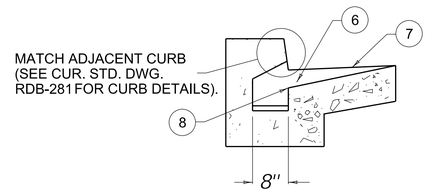
SECTION A-A



SECTION B-B



GUARDRAIL DETAIL



SECTION C-C

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

INLETS

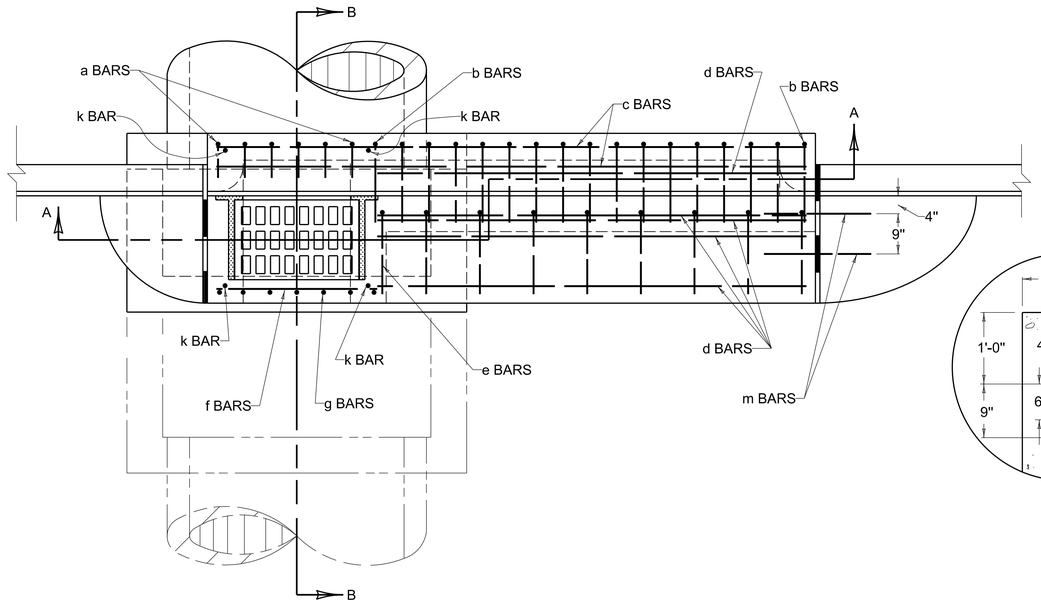
CURB BOX INLET TYPE B (DETAIL DRAWING)

STANDARD DRAWING NUMBER
RDB-280-06

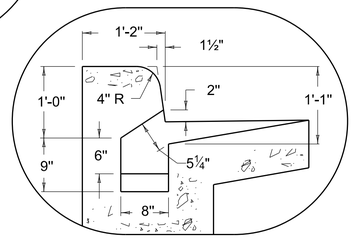
~ NOTES ~

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.

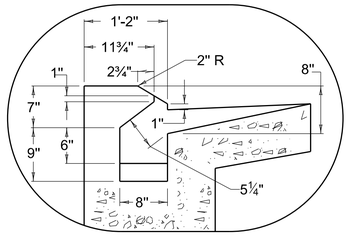
USE WITH CUR. STD. DWGS.
RDB-280 RDB-282 RDB-283
RDB-400 RDB-410 RDB-420



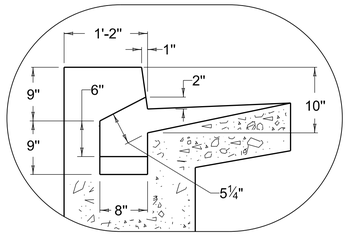
PLAN VIEW



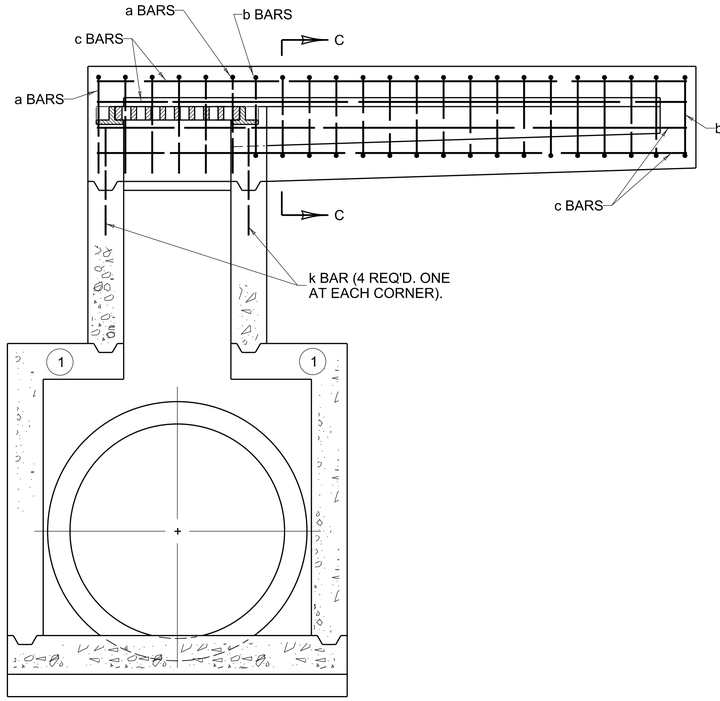
BARRIER CURB



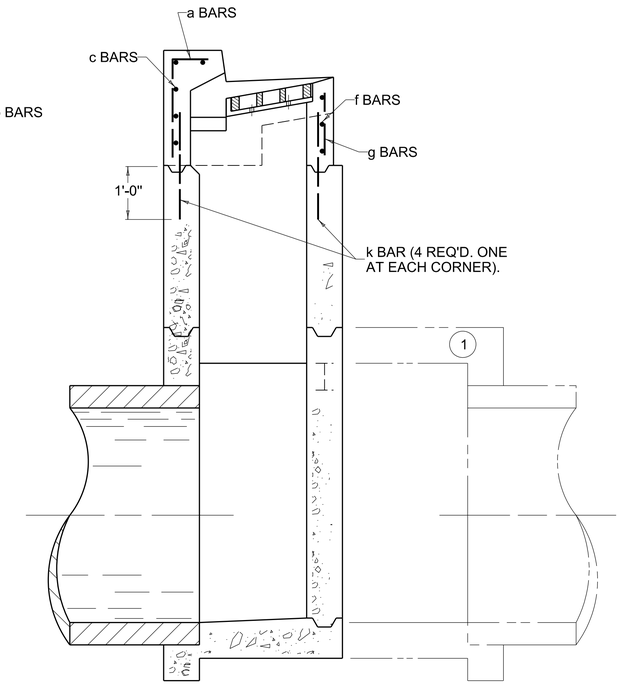
ISLAND CURB



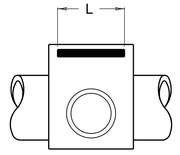
STANDARD CURB



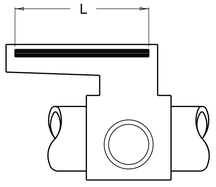
SECTION A-A



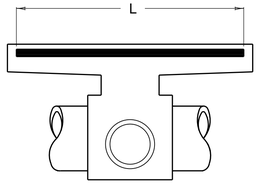
SECTION B-B



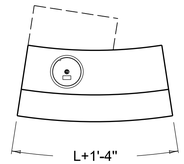
SAG OR GRADE



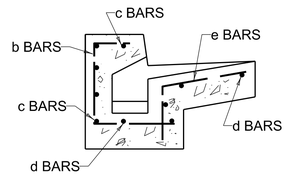
GRADE



SAG



CURVE LAYOUT



SECTION C-C

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

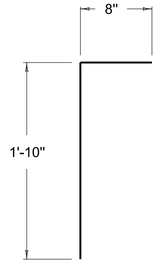
INLETS

CURB BOX INLET TYPE B (STEEL DRAWING)

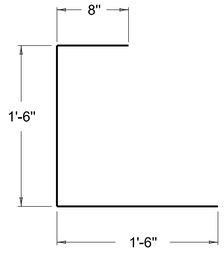
STANDARD DRAWING NUMBER
RDB-281-030

DIMENSIONS AND ESTIMATE OF QUANTITIES (TOP PHASE)

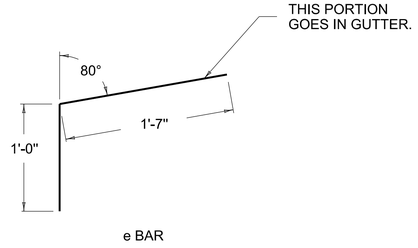
(2) SIZE NO.		THROAT "L"	CONC.	NO. 5 STEEL BARS																		LBS.
				BAR a		BAR b		BAR c		BAR d (4)		BAR d (5)		BAR e		BAR f		BAR g		BAR k (1)		BAR m		
GRADE	SAG	FT.	CU.YDS.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. FT.	QTY.	LIN. 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

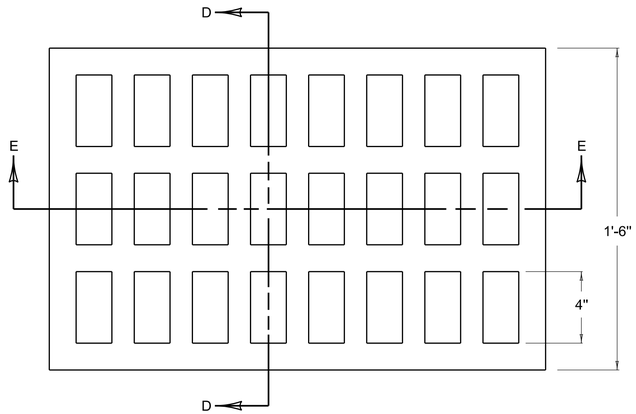


e BAR

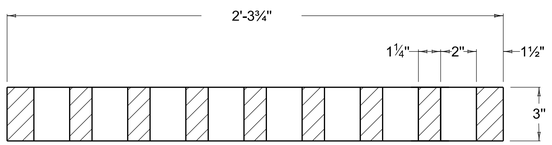
~ NOTES ~

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.

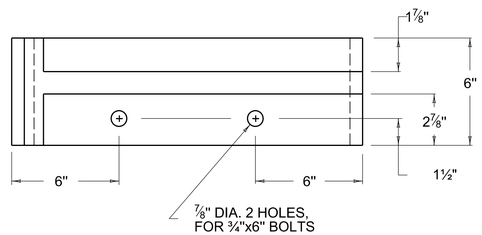
USE WITH CUR. STD. DWGS.
RDB-280 RDB-281 RDB-283
RDB-400 RDB-410 RDB-420



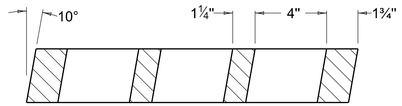
GRATE PLAN VIEW



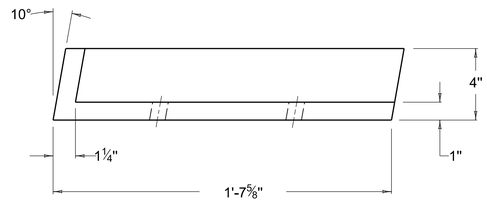
SECTION E-E



FRAME PLAN VIEW
(LEFT HALF)



SECTION D-D



FRAME ELEVATION

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SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

INLETS

CURB BOX INLET TYPE B (TOP PHASE TABLE)

STANDARD DRAWING NUMBER
RDB-282-04

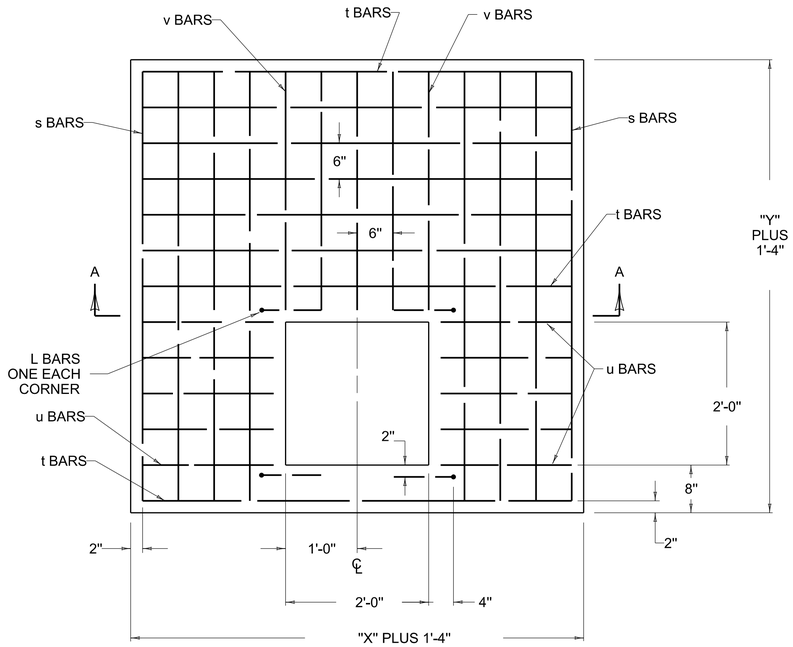
REINFORCEMENT STEEL FOR 8" LID

SIZE		NO. 5 STEEL BARS								
		BAR s		BAR t		BAR u		BAR v		LBS.
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

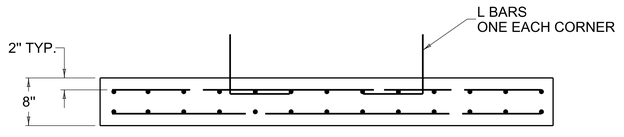
~ NOTES ~

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.*

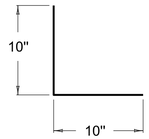
USE WITH CUR. STD. DWGS.
RDB-280 RDB-281 RDB-282
RDB-400 RDB-410 RDB-420



DETAIL OF 8" LID
PLAN VIEW



SECTION A-A



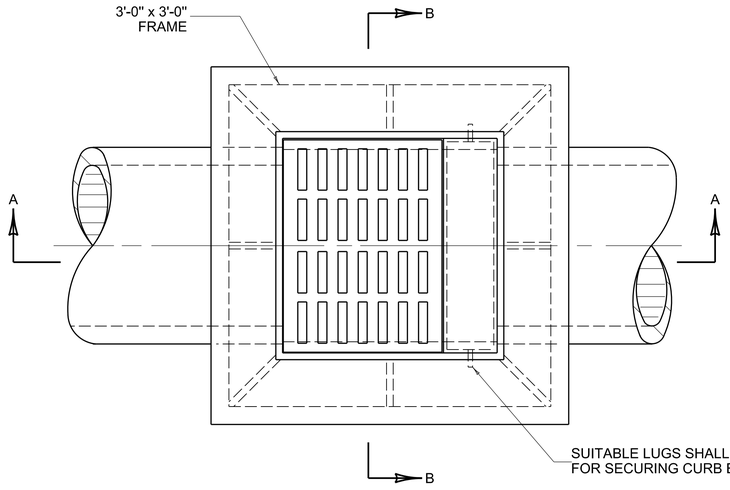
L BAR DETAIL

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

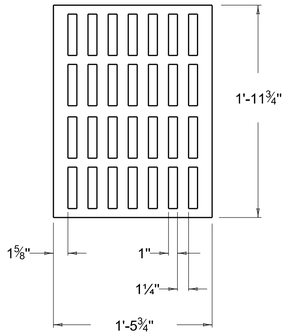
SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

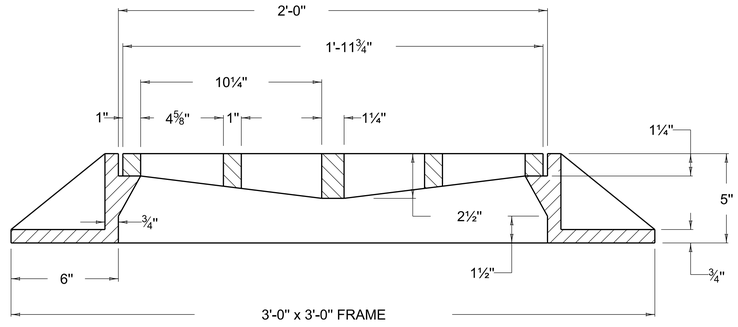
DRAINAGE



PLAN VIEW



GRATE
PLAN VIEW



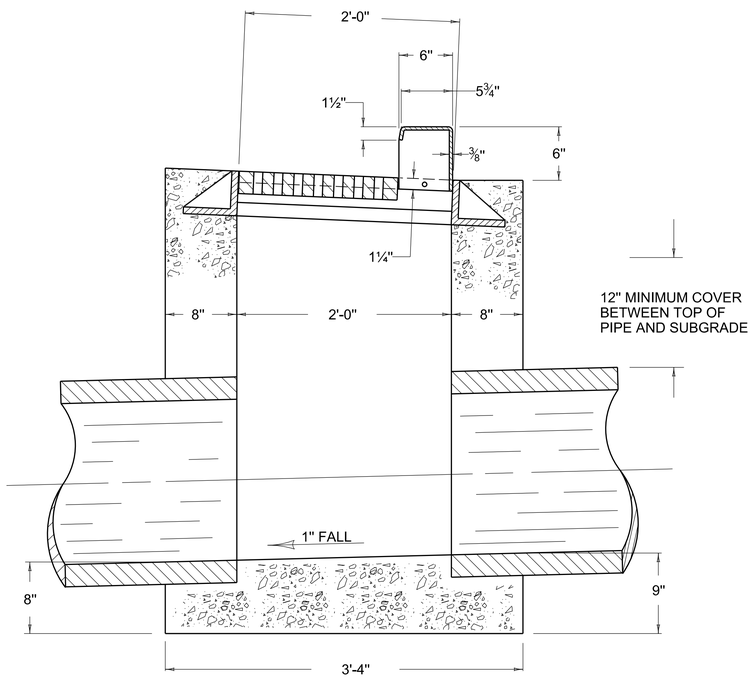
DETAIL OF FRAME & GRATE
AT SECTION A-A

APPROXIMATE QUANTITIES

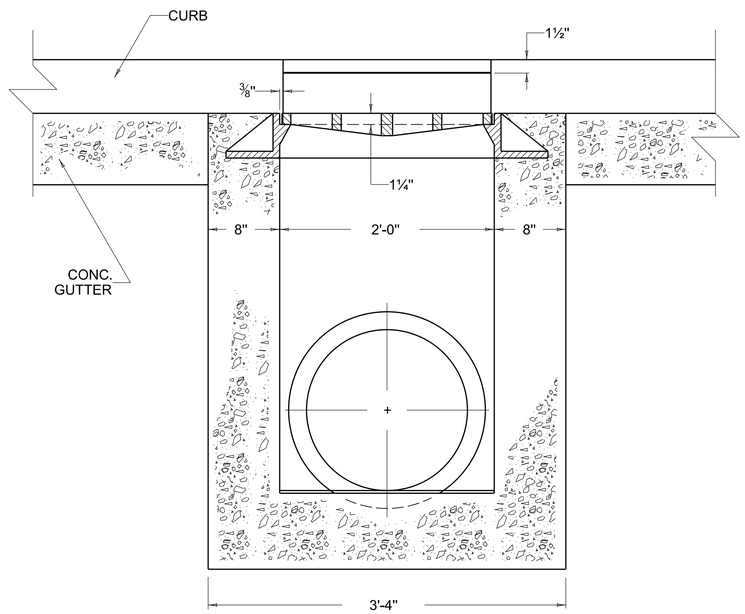
PIPE SIZE	MIN. HEIGHT	CU. YDS. CONC.
15"	4'-0"	1.15
18"	4'-3"	1.22
CURB FRAME WEIGHT = 61 LBS.		
FRAME WEIGHT = 277 LBS.		
GRATE WEIGHT = 127 LBS.		

NO DEDUCTIONS HAVE BEEN MADE FOR PIPE.

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



SECTION A-A



SECTION B-B

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

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APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

INLETS

CURB BOX INLET TYPE F

STANDARD DRAWING NUMBER
RDB-320-06

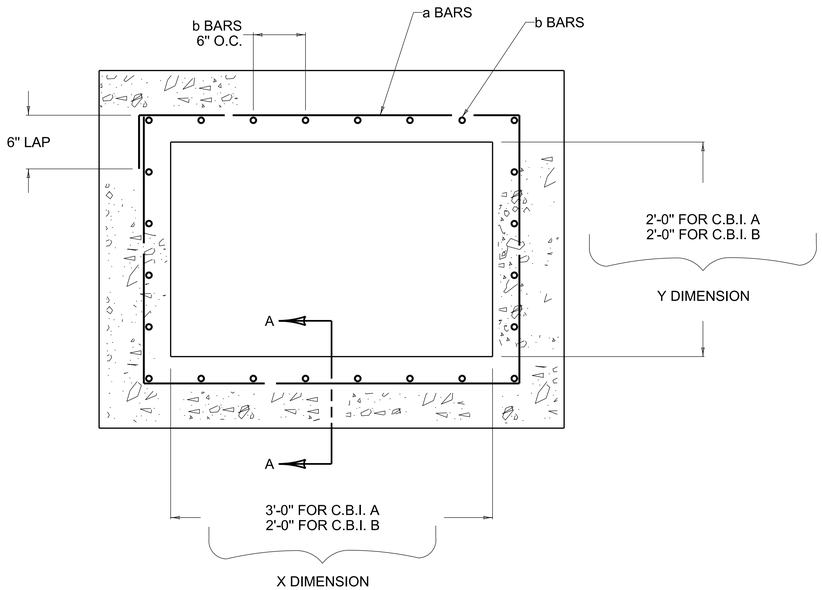
ADDITIONAL STEEL REQUIREMENTS FOR RISER
(WHEN H = 8' TO 15')

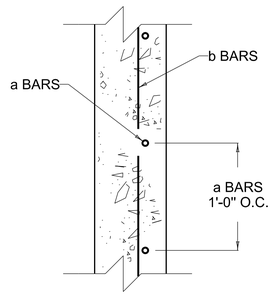
~ NOTES ~

(1) *USE WHEN "H" EXCEEDS 8'-0"*

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

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





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

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DRAINAGE

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"		Y	4'-1"		0.3
23	2'-6"					2.1	0.4
24	3'-0"					2.3	
25	3'-6"	2'-0"	30"	X	3'-10"	1.8	0.3
26		2'-6"				2.0	0.4
27		3'-0"				2.2	
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	0.4
46	2'-6"					2.9	
47	3'-0"					3.2	
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+t+12" WHEN "Y" DIMENSION IS LESS THAN 3'-6". BASED ON "Z" AS EQUAL TO D+t+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.*

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

REVISION DATE: 12/01/2015
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SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

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

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

INLETS

BOX INLET PIPE CHAMBER

STANDARD DRAWING NUMBER
RDB-410-06

(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".

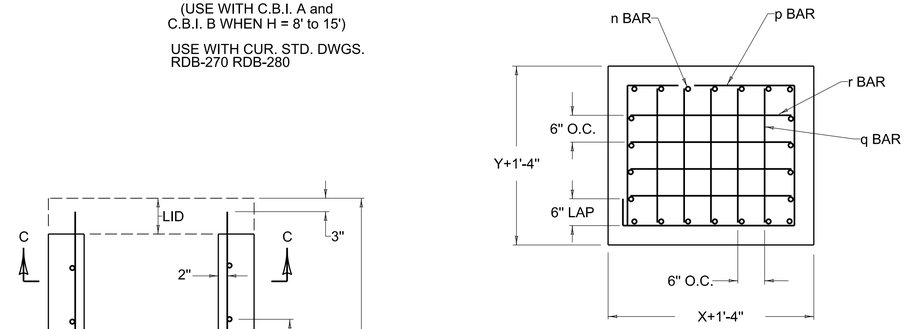
(5) NO DEDUCTIONS HAVE BEEN MADE FOR PIPE.

(6) ADD OR SUBTRACT LBS. STEEL PER FT. VARIANCE FROM 6'-0" "Z".

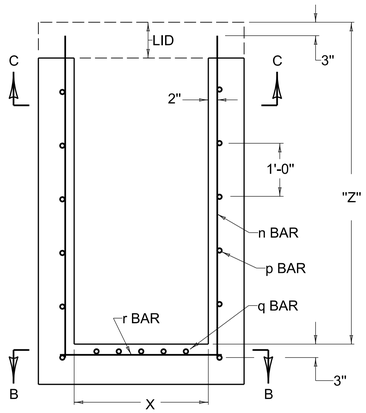
7. REINFORCEMENT SHALL HAVE A CLEAR DISTANCE OF 2" FROM THE FACE UNLESS OTHERWISE SHOWN.

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

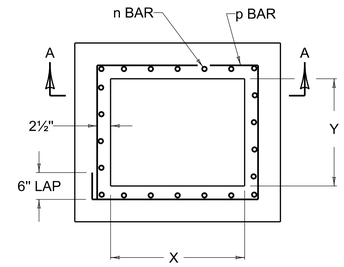
USE WITH CUR. STD. DWGS. RDB-270 RDB-280



SECTION B-B



SECTION A-A



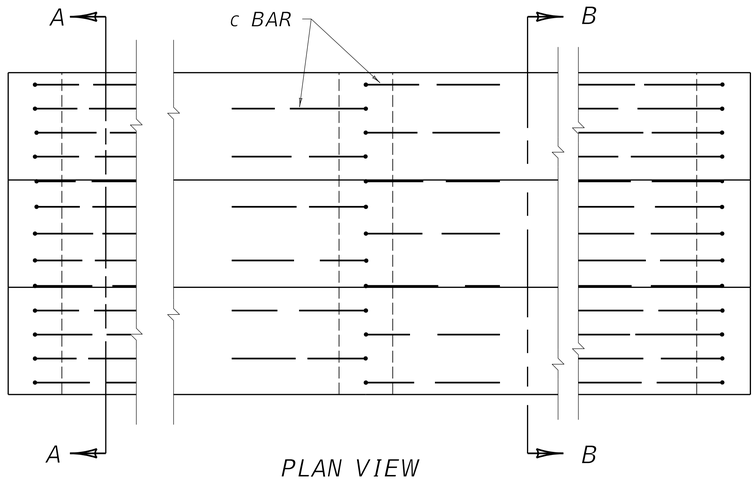
SECTION C-C

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

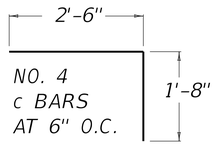
SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

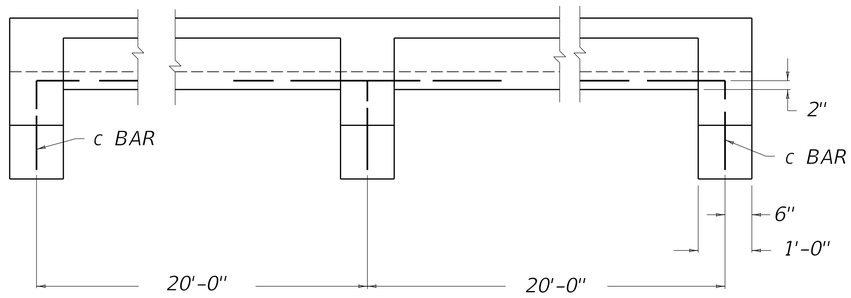
DRAINAGE



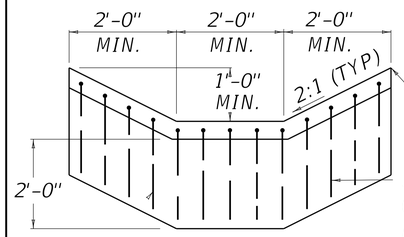
PLAN VIEW



c BAR DETAIL



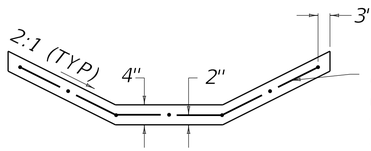
ELEVATION VIEW



THIS ELEVATION SHALL BE A MIN. OF 12" BELOW EXISTING GROUND LINE.

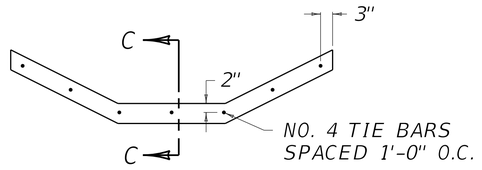
STEEL SHOWN IS FOR ANCHORS ONLY. FOR CONVENTIONAL STEEL PLACEMENT SEE SECTION B-B.

SECTION A-A

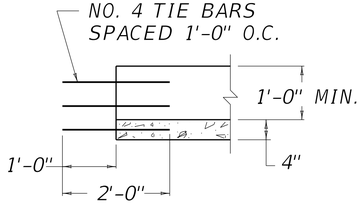


NO. 4 BARS SPACED 1'-0" O.C. LONGITUDINALLY AND TRANSVERSELY THROUGHOUT THE SECTION. (IN ADDITION TO ANCHOR STEEL).

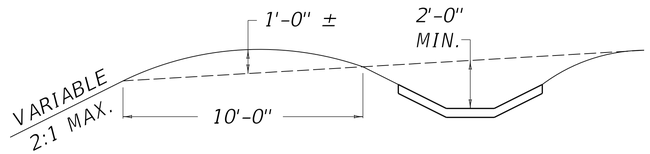
SECTION B-B



TIE BAR SECTIONAL VIEW



SECTION C-C

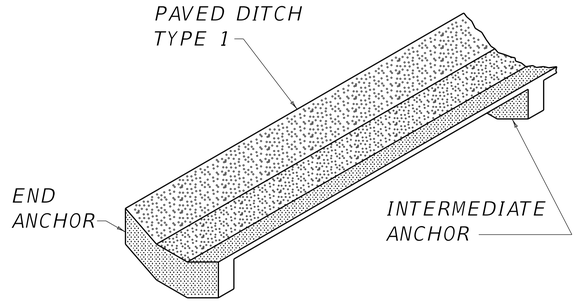


TYPICAL PAVED DITCH
(INTERCEPTOR DITCH)

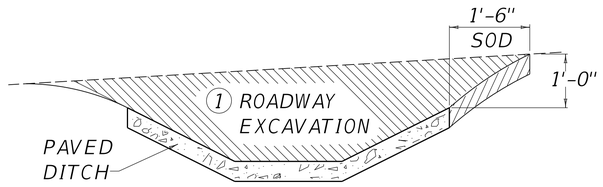
~ NOTES ~

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.



ISOMETRIC VIEW



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.

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.

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

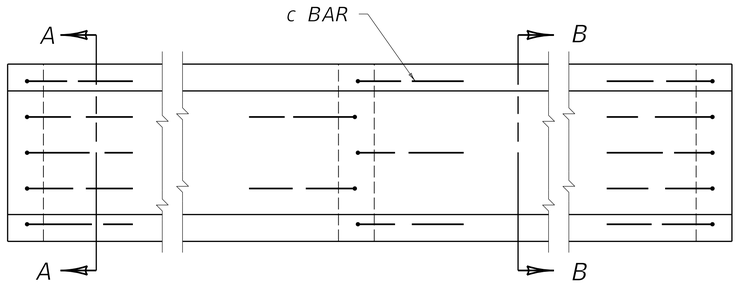
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

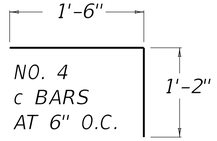
DITCHING

PAVED DITCH TYPE 1

STANDARD DRAWING NUMBER
RDD-001-06



PLAN VIEW

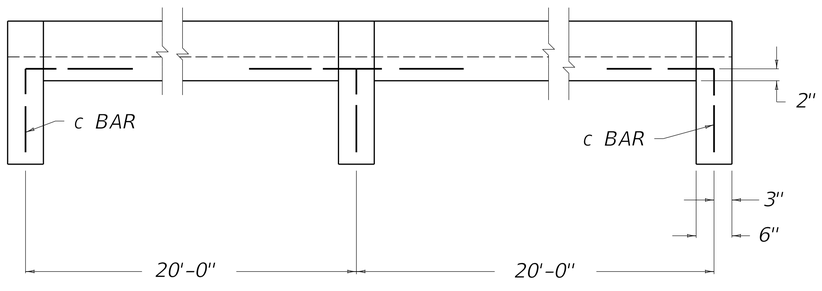


c BAR DETAIL

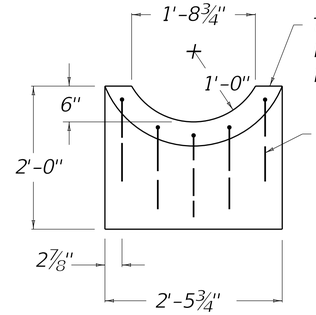
~ NOTES ~

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.



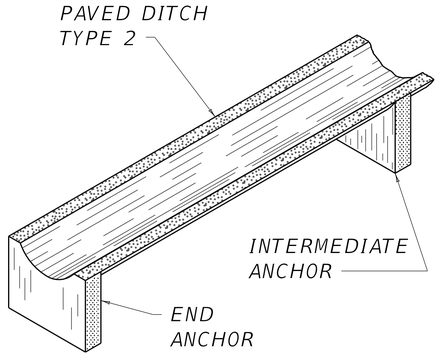
ELEVATION VIEW



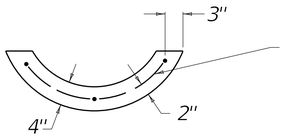
THIS ELEVATION SHALL BE A MIN. 1'-0" BELOW EXISTING GROUND LINE

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

SECTION A-A

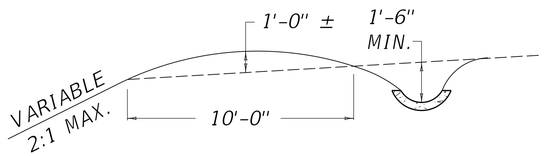


ISOMETRIC VIEW

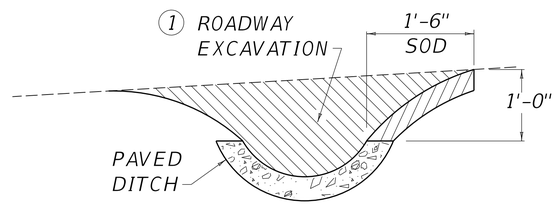


NO. 4 BARS SPACED 1'-0" O.C. LONGITUDINALLY AND TRANSVERSELY THROUGHOUT THE SECTION. (IN ADDITION TO ANCHOR STEEL).

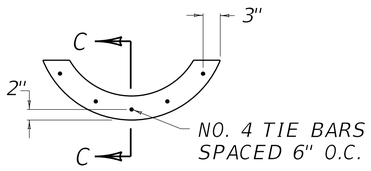
SECTION B-B



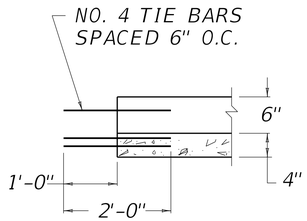
TYPICAL PAVED DITCH
(INTERCEPTOR DITCH)



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

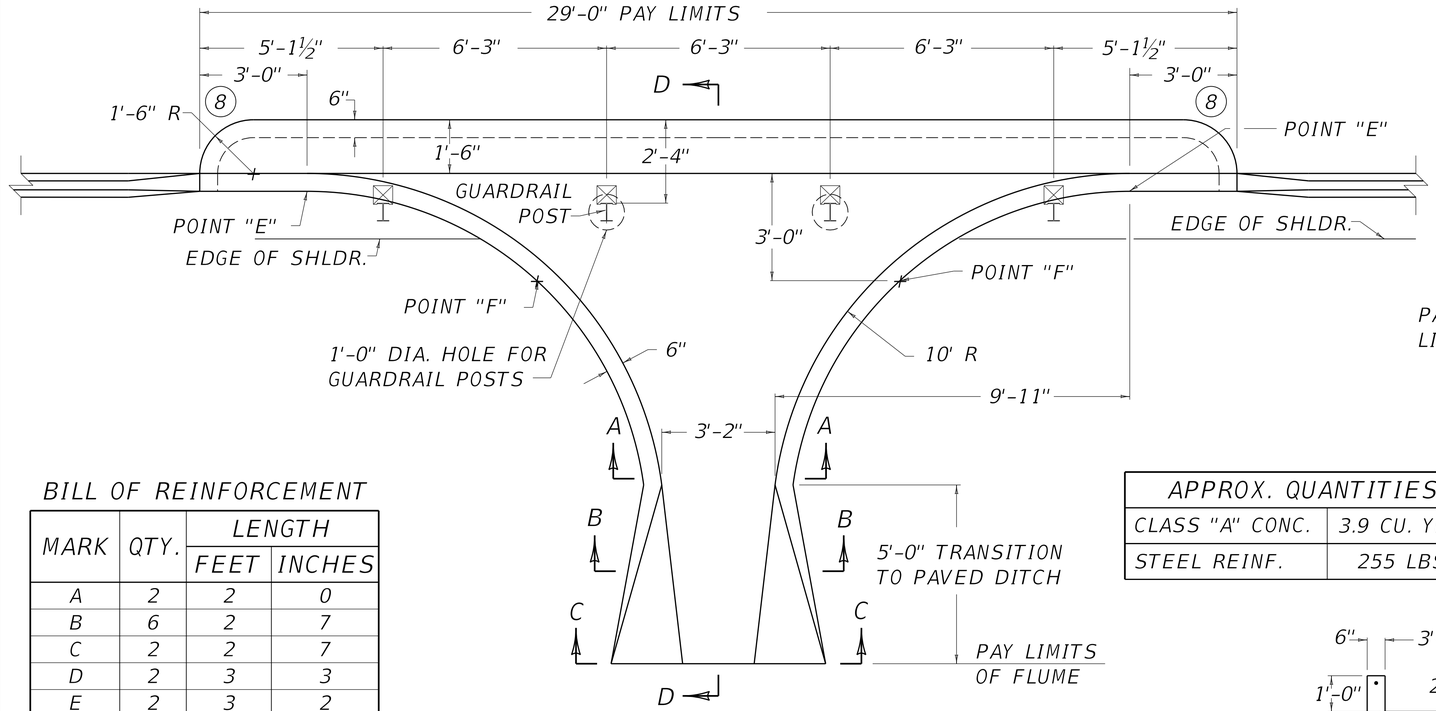
APPROX. STEEL QUANTITIES FOR MINIMUM SECTION SHOWN	
END ANCHORS (EACH)	8.90 LBS.
INTERMEDIATE ANCHORS (EACH)	8.90 LBS.
CONSTRUCTION JOINTS (EACH)	6.68 LBS.
BARS PER SQ. YD. OF DITCH	12.47 LBS.

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

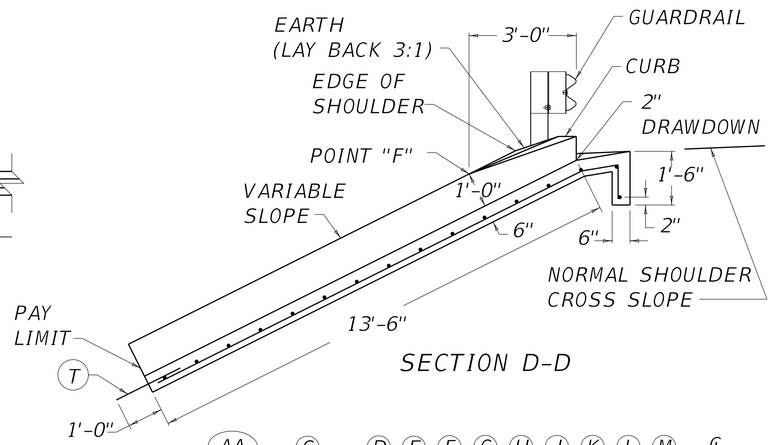
SUBMITTED Allen S. Pollock 12-01-2015
DIVISION DIRECTOR DATE

APPROVED 12-01-2015
STATE HIGHWAY ENGINEER DATE

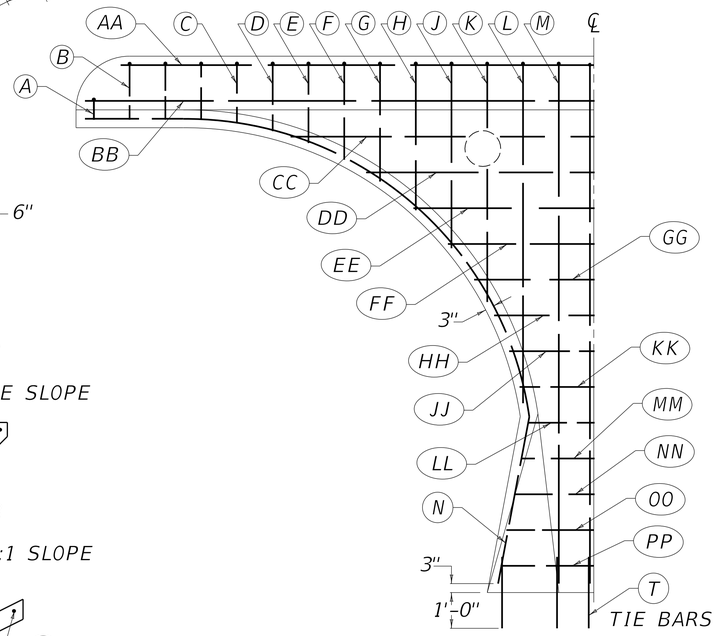
DRAINAGE



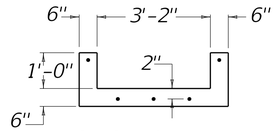
PLAN VIEW



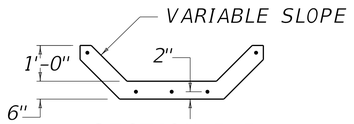
SECTION D-D



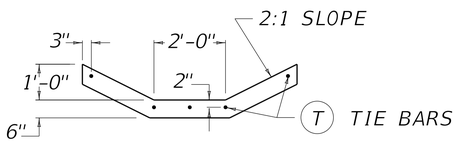
STEEL DIAGRAM
(STEEL SYMMETRICAL ABOUT CENTERLINE)



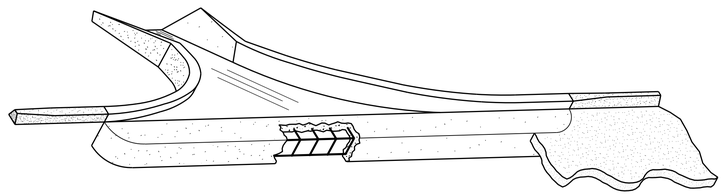
SECTION A-A



SECTION B-B



SECTION C-C



ISOMETRIC VIEW

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

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

~ NOTES ~

BID ITEM AND UNIT TO BID
FLUME INLET TYPE 1 EACH

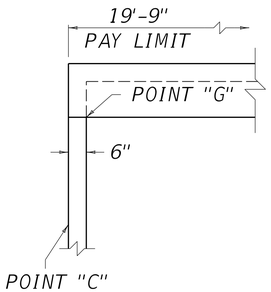
1. REINFORCING STEEL SHALL MEET THE REQUIREMENTS OF THE CUR. EDITION OF THE DEPARTMENT'S STD. SPECIFICATIONS FOR ROAD & BRIDGE CONST. THE MIN. REQUIREMENT FOR REINFORCING BARS SHALL BE GRADE 40. ALL REINFORCEMENT SHALL BE NO. 4 BARS SPACED 12" O.C.
2. FINISHING AND CURING SHALL MEET THE REQUIREMENTS 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".

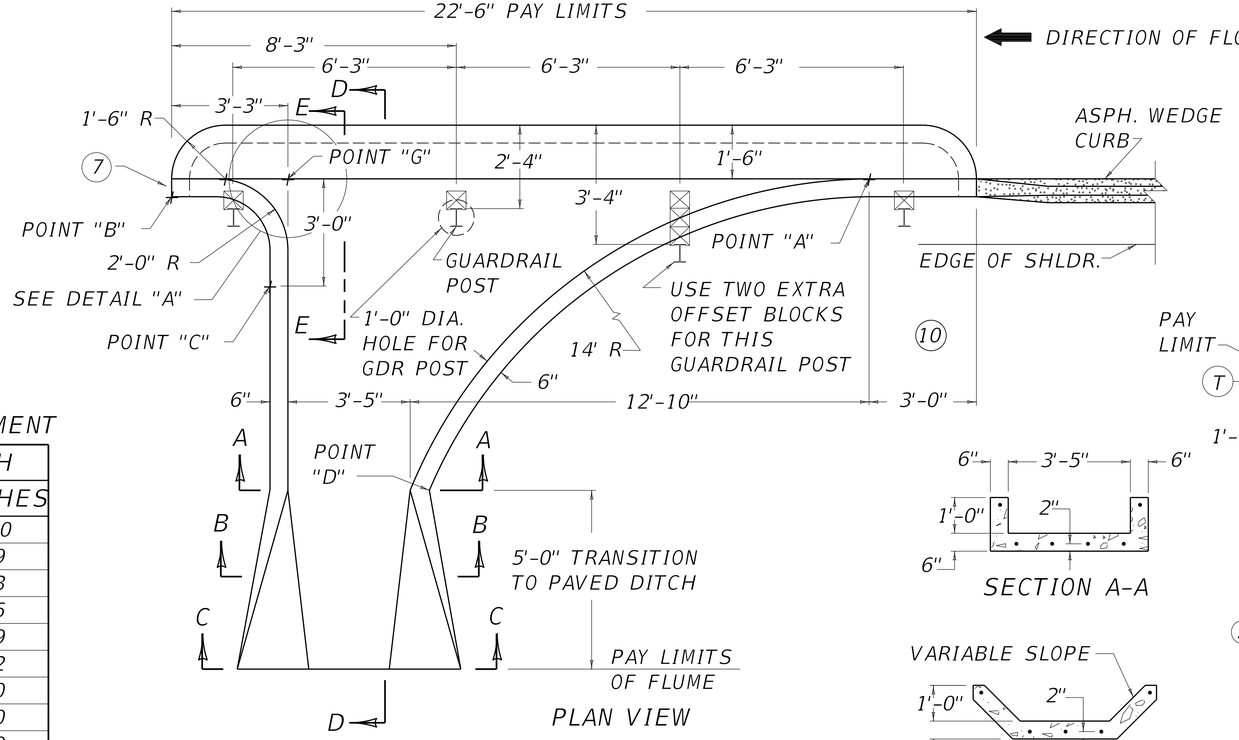
REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

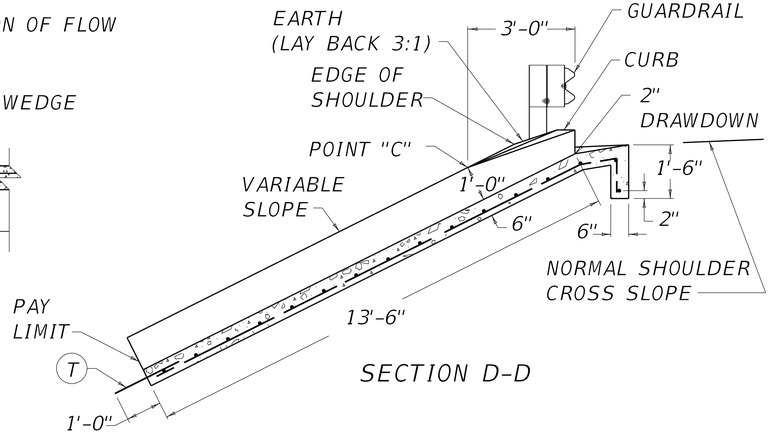
DRAINAGE



DETAIL "A"

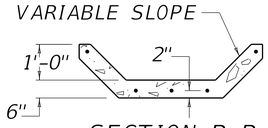


PLAN VIEW

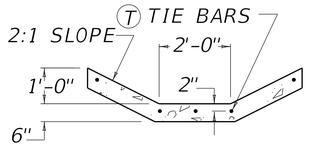


SECTION D-D

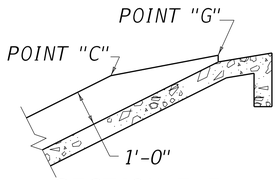
SECTION A-A



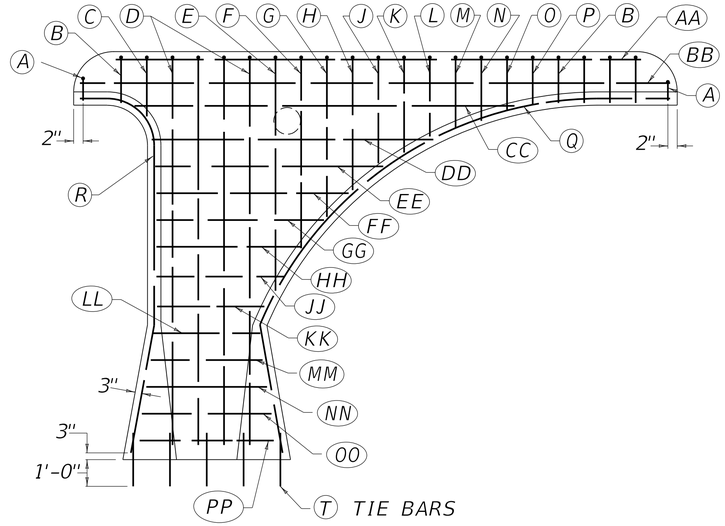
SECTION B-B



SECTION C-C



SECTION E-E



STEEL DIAGRAM

BILL OF REINFORCEMENT

MARK	QTY.	LENGTH FEET	LENGTH 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

~ NOTES ~

BID ITEM AND UNIT TO BID
FLUME INLET TYPE 2 — EACH

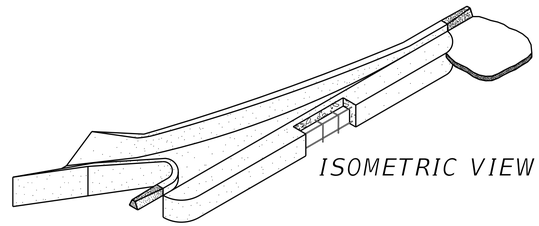
1. ALL REINFORCEMENT SHALL BE NO. 4 BARS SPACED 1'-0" O.C.
2. QUANTITIES WERE CALCULATED FOR APPLICATION ON A 2:1 FILL SLOPE. IT MAY BE NECESSARY TO ADJUST THE STEEL IN THE FIELD FOR APPLICATION OTHER THAN 2:1 SLOPE.
3. THE FLOW LINE OF THE FLUME AND THE NORMAL PAVED DITCH FROM POINT "G" ON THE FLUME 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.



ISOMETRIC VIEW

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

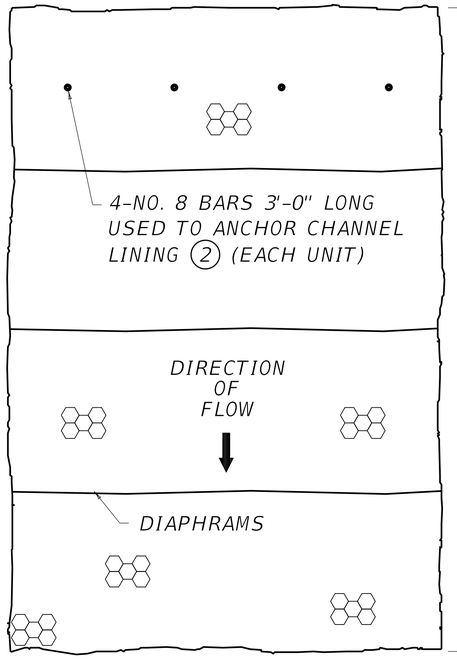
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

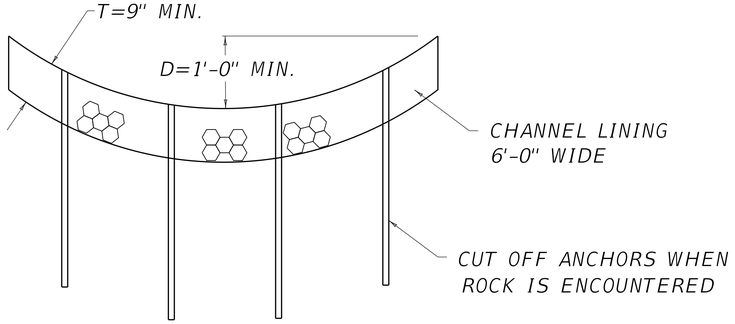
INLET

FLUME INLET TYPE 2

STANDARD DRAWING NUMBER
RDD-021-07



PLAN VIEW



ELEVATION VIEW (5)

~ NOTES ~

BID ITEM AND UNIT TO BID

CHANNEL LINING CLASS I A	TON

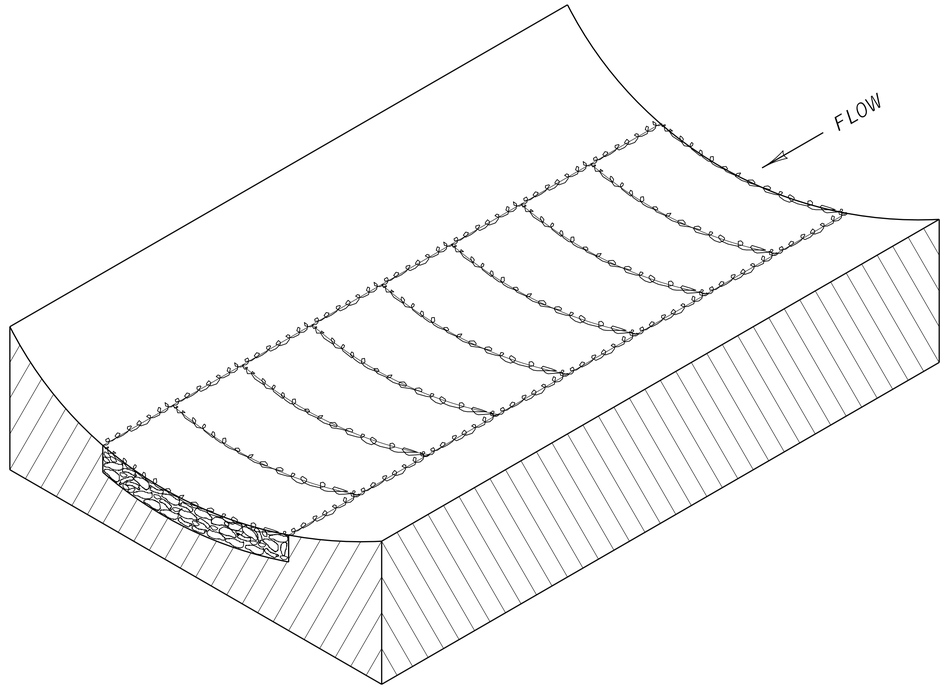
(1) ROADWAY EXCAVATION SHALL BE PAID FROM THE TOP OF LINING TO THE ORIGINAL GROUND LINE.

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

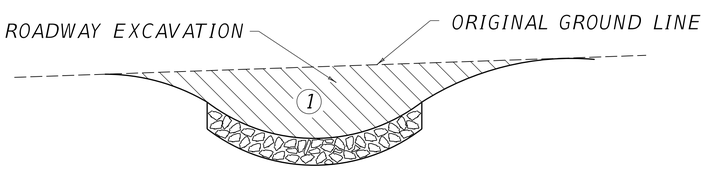
3. SECURE THE LACING WIRE AT THE CORNER OF THE BASKET BY LOOPING AND TWISTING, CONTINUE LACING THROUGHOUT WITH DOUBLE LOOPS AT APPROXIMATELY 5" INTERVALS. EACH UNIT SHALL CONSIST OF LININGS SUPPLIED IN WIDTHS OF 6'-0" AS SHOWN AND LENGTHS IN MULTIPLES OF 3'-0". EACH UNIT SHALL BE SUBDIVIDED INTO COMPARTMENTS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

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

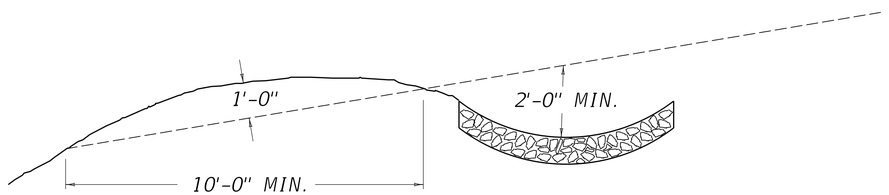
(5) T= MATTRESS THICKNESS, D= DEPTH TO PROTECT. SEE PLAN NOTES FOR THESE VALUES.



CHANNEL LINING
ISOMETRIC VIEW



ROADWAY EXCAVATION (1)



TYPICAL INTERCEPTOR DITCH

REVISION DATE: 12/01/2015
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SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

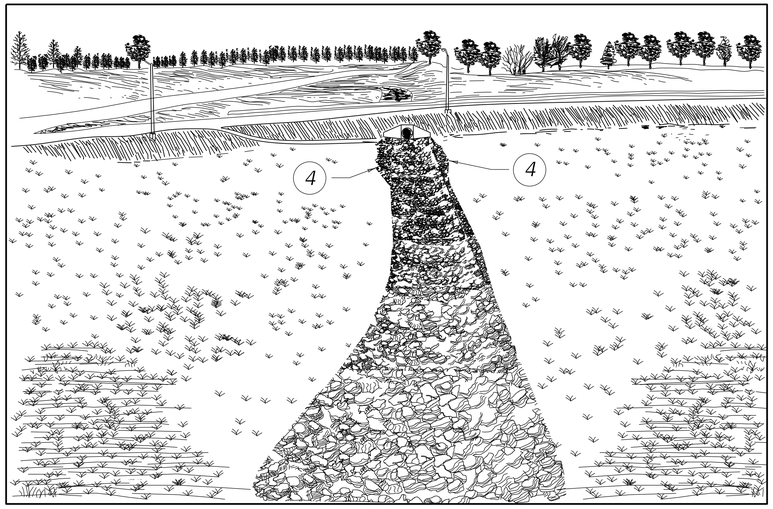
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

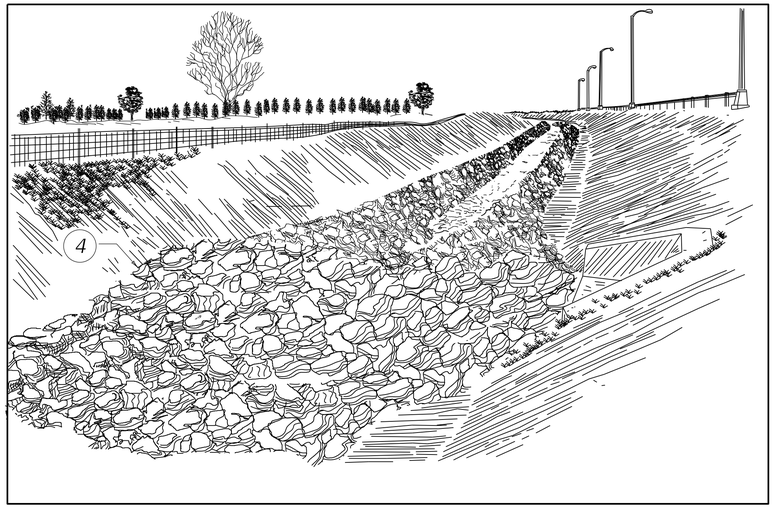
TEAM KENTUCKY TRANSPORTATION CABINET

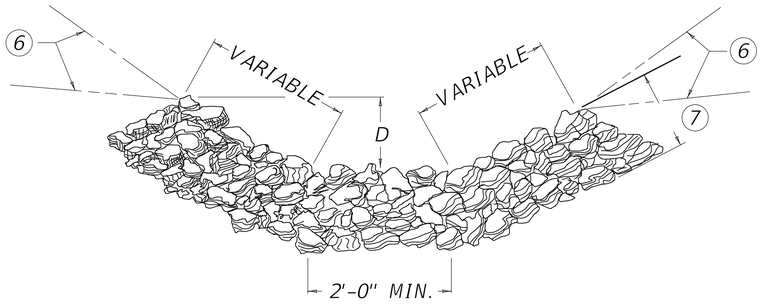
DITCHING

CHANNEL LINING CLASS 1A (MATTRESS UNITS)

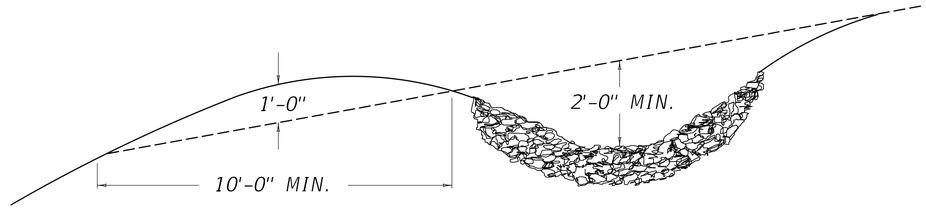
STANDARD DRAWING NUMBER
RDD-030-08







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)

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DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

DITCHING

CHANNEL LINING CLASS II AND III

STANDARD DRAWING NUMBER
RDD-040-05

12" PIPE - 24" PIPE

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" x ½" CSPHS (1)	16 GA.					
	2⅔" x ½" CSPLS (1)	16 GA.					
	2⅔" x ½" CAPHS	16 GA.					
	PVC	SMOOTH WALL (SOLID WALL)					
	HDPE						FF
	RCP (11)						
18	2⅔" x ½" CSPHS (1)	16 GA.					
	2⅔" x ½" CSPLS (1)	16 GA.					
	2⅔" x ½" CAPHS	16 GA.					
	SRS (1)	16 GA.					
	SRA	16 GA.					
	PVC	RIBBED (PROFILE WALL)					
	HDPE						FF
	RCP (11)						

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" x ½" CSPHS (1)	16 GA.												
	2⅔" x ½" CSPLS (1)	16 GA.					10 GA.							
	2⅔" x ½" CAPHS	16 GA.												
	SRS (1)	16 GA.												
	SRA	16 GA.				14 GA.								
	PVC	RIBBED (PROFILE WALL)												
	HDPE					FF								
	RCP (11)													
24 (6)	2⅔" x ½" CSPHS (1)	16 GA.											14 GA.	
	2⅔" x ½" CSPLS (1)	16 GA.					10 GA.							
	2⅔" x ½" 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)													

~ 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

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

REVISION DATE: 12/01/2015
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SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015

APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

PIPES

CULVERT AND STORM SEWER PIPE TYPES AND COVER HEIGHTS

STANDARD DRAWING NUMBER
RDI-001-10

27" PIPE - 42" PIPE

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" x ½" CSPHS (1)	16 GA.								14 GA.			12 GA.	
	2⅔" x ½" CSPLS (1)	16 GA.				12 GA.								
	2⅔" x ½" 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" x ½" CSPHS (1)	14 GA.									12 GA.		10 GA.	
	2⅔" x ½" CSPLS (1)	14 GA.			12 GA.		10 GA.							
	2⅔" x ½" 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" x ½" CSPHS (1)	14 GA.								12 GA.			10 GA.	
	2⅔" x ½" CSPLS (1)	14 GA.				12 GA.			10 GA.					
	2⅔" x ½" 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 ~

(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.

(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.

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

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SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

48" PIPE - 54" PIPE

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	$2\frac{2}{3}$" x $\frac{1}{2}$" CSPHS (1)	14 GA.							12 GA.			10 GA.													
	$2\frac{2}{3}$" x $\frac{1}{2}$" CSPLS (1)		14 GA.							12 GA.															
	$2\frac{2}{3}$" x $\frac{1}{2}$" 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)	$2\frac{2}{3}$" x $\frac{1}{2}$" CSPHS (1)			14 GA.				12 GA.				10 GA.													
	$2\frac{2}{3}$" x $\frac{1}{2}$" CSPLS (1)		14 GA.				12 GA.																		
	3"x1" CSPHS (1)			14 GA.					12 GA.																
	3"x1" CSPLS (1)		14 GA.			12 GA.		10 GA.					8 GA.												
	5"x1" CSPHS (1)			14 GA.				12 GA.																	
	$2\frac{2}{3}$" x $\frac{1}{2}$" 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)																								

~ 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.

USE WITH CUR. STD. DWGS.
RDI-001 RDI-021 RDI-026
RDI-035

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

REVISION DATE: 12/01/2015
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SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

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DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

PIPES

CULVERT AND STORM SEWER PIPE TYPES AND COVER HEIGHTS

STANDARD DRAWING NUMBER
RDI-003-05

60" PIPE - 66" PIPE

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	$2\frac{2}{3}$" x $\frac{1}{2}$" CSPHS (1)	12 GA.							10 GA.																
	$2\frac{2}{3}$" x $\frac{1}{2}$" 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.				
	$2\frac{2}{3}$" x $\frac{1}{2}$" CAPHS	10 GA.						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.																							
	SRA	10 GA.																							
	RCP (9)																								
66	$2\frac{2}{3}$" 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.																							
	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.

USE WITH CUR. STD. DWGS.
RDI-001 RDI-021 RDI-026 RDI-035

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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED William S. Haddad 12-01-2015
DIVISION DIRECTOR DATE

APPROVED [signature] 12-01-2015
STATE HIGHWAY ENGINEER DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY

PIPES

CULVERT AND STORM SEWER PIPE TYPES AND COVER HEIGHTS

STANDARD DRAWING NUMBER
RDI-004-04

72" PIPE - 78" PIPE

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 2/3" x 1/2" CSPHS (1)	10 GA.																					
	2 2/3" x 1/2" CSPLS (1)	10 GA.																					
	3"x1" CSPHS (1)	14 GA.					12 GA.																
	3"x1" CSPLS (1)	14 GA.			12 GA.				10 GA.														
	5"x1" CSPHS (1)	14 GA.				12 GA.																	
	6"x2" CSPLSSB (1)	10 GA.						8 GA.			7 GA.		5 GA.		3 GA.								
	2 2/3" x 1/2" CAPHS	8 GA.																					
	3"x1" CAPHS	14 GA.				12 GA.	10 GA.																
	9"x2 1/2" CAPLSSB	10 GA.						8 GA.		7 GA.	5 GA.	3 GA.											
	SRS (1)	12 GA.																					
	RCP (9)																						
78	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"x2 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.

USE WITH CUR. STD. DWGS.
RDI-001 RDI-021 RDI-026 RDI-035

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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED William S. Slaton 12-01-2015
DIVISION DIRECTOR DATE

APPROVED [signature] 12-01-2015
STATE HIGHWAY ENGINEER DATE

DRAINAGE

OpenRoads Designer v23.00.01.11 USER: matthew.sipes FILE NAME: C:\KYTC_STANDARDS\ORGANIZATION-CIVIL\KYTC_STANDARDS_OC_KYTC\DGNLIB\SHEET SEEDS\KYTC STANDARDS BORDER SEED.DGNLIB

84" PIPE - 96" PIPE

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
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.			1 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.			1 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.			1 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.

USE WITH CUR. STD. DWGS. RDI-001 RDI-021 RDI-026 RDI-035

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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015

APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

PIPES

CULVERT AND STORM SEWER PIPE TYPES AND COVER HEIGHTS

STANDARD DRAWING NUMBER
RDI-006-04

102" PIPE - 114" PIPE

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
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.

USE WITH CUR. STD. DWGS.
RDI-001 RDI-021 RDI-026 RDI-035

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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

PIPES

CULVERT AND STORM SEWER PIPE TYPES AND COVER HEIGHTS

STANDARD DRAWING NUMBER
RDI-007-04

120" PIPE

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.

USE WITH CUR. STD. DWGS.
RDI-001 RDI-021 RDI-026
RDI-035

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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

PIPES

CULVERT AND STORM SEWER PIPE TYPES AND COVER HEIGHTS

STANDARD DRAWING NUMBER
RDI-008-04

NON-CIRCULAR - 15" PIPE - 60" PIPE

EQUI. PIPE DIA. (IN)	PIPE TYPE	NON-CIRCULAR PIPE COVER HEIGHTS IN FEET					
		2 - 5	6	7	8	9	10
15	2 2/3" x 1/2" CSPA (1)	16 GA.					
	2 2/3" x 1/2" CAPA	16 GA.					
18	2 2/3" x 1/2" CSPA (1)	16 GA.					
	2 2/3" x 1/2" CAPA	16 GA.					
	SRSA (1)	16 GA.					
	SRAA	16 GA.					
	RCHEP (12)						
21	2 2/3" x 1/2" CSPA (1)	16 GA.					
	2 2/3" x 1/2" CAPA	16 GA.					
	SRSA (1)	16 GA.					
	SRAA	16 GA.					
24	2 2/3" x 1/2" CSPA (1)	16 GA.					
	2 2/3" x 1/2" 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)	2 2/3" x 1/2" CSPA (1)	16 GA.					
	2 2/3" x 1/2" CAPA	14 GA.					
	SRSA (1)	16 GA.					
	SRAA	14 GA.					
	RCHEP (12)						
36	2 2/3" x 1/2" CSPA (1)	14 GA.					
	2 2/3" x 1/2" CAPA	12 GA.					
	SRSA (1)	14 GA.					
	SRAA	12 GA.					
	RCHEP (12)						
42	2 2/3" x 1/2" CSPA (1)	14 GA.					
	2 2/3" x 1/2" 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	2 2/3" x 1/2" CSPA (1)	12 GA.					
	2 2/3" x 1/2" CAPA	10 GA.					
	SRSA (1)	14 GA.					
	SRAA	12 GA.					
	RCHEP (12)						
54	2 2/3" x 1/2" CSPA (1)	12 GA.					
	(3) CSPA (1)	14 GA.					
	2 2/3" x 1/2" CAPA	10 GA.					
	3"x1" CAPA	14 GA.					
	SRSA (1)	14 GA.					
	SRAA	12 GA.					
	RCHEP (12)						
60	2 2/3" x 1/2" CSPA (1)	10 GA.					
	(3) CSPA (1)	14 GA.					
	2 2/3" x 1/2" 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.

USE WITH CUR. STD. DWGS.
RDI-016 RDI-021 RDI-026 RDI-035

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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED William S. Ballard 12-01-2015
DIVISION DIRECTOR DATE

APPROVED [signature] 12-01-2015
STATE HIGHWAY ENGINEER DATE

DRAINAGE

NON-CIRCULAR - 66" PIPE - 120" PIPE

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.

USE WITH CUR. STD. DWGS.
RDI-011 RDI-016 RDI-021
RDI-026 RDI-035

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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015

APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY. TRANSPORTATION CABINET

PIPES

CULVERT AND STORM SEWER PIPE TYPES AND COVER HEIGHTS

STANDARD DRAWING NUMBER
RDI-012-03

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" X ½" CSPA: CORRUGATED STEEL PIPE ARCH
3"x1" OR 5"x1" CSPA: CORRUGATED STEEL PIPE ARCH
6"x2" CSPA: CORRUGATED STEEL PIPE ARCH
2⅔ " X ½" CAPA: CORRUGATED ALUMINUM ALLOY PIPE ARCH
3"x1" CAPA: CORRUGATED ALUMINUM ALLOY PIPE ARCH
9" X 2½" CAPAASB: CORRUGATED ALUMINUM ALLOY PIPE ARCH WITH ALUMINUM OR STEEL BOLTS
RCHEP: REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE

~ NOTES ~

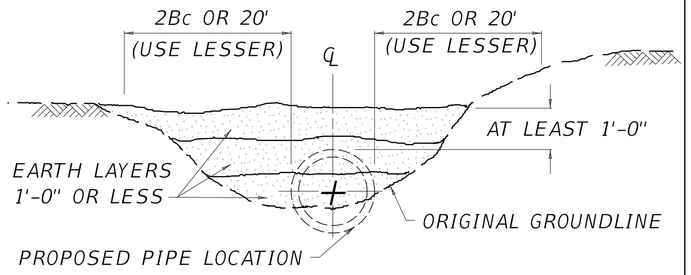
① 3"x1" OR 5"x1"

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

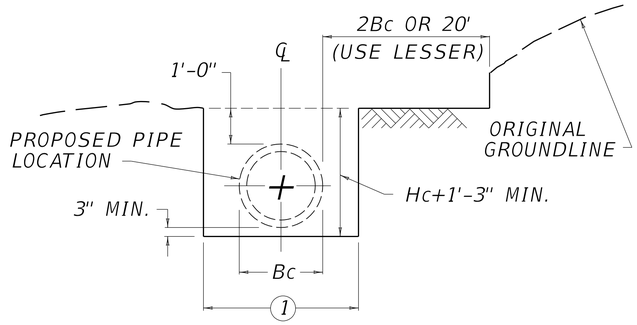
STEP 1



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



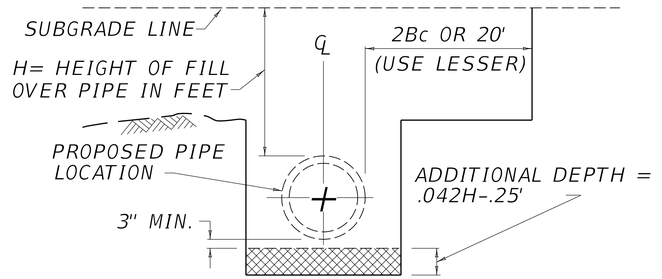
a. EXCAVATE TO WITHIN 1'-0" ABOVE TOP OF PROPOSED PIPE A WIDTH OF 2Bc OR 20' (USE LESSER) ON EACH SIDE OF PIPE.

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

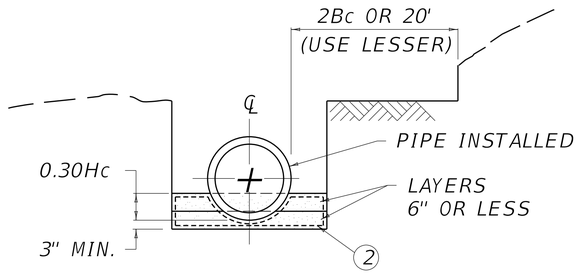


a. IF ROCK FOUNDATION IS NOT ENCOUNTERED, GO DIRECTLY TO "STEP 4".

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



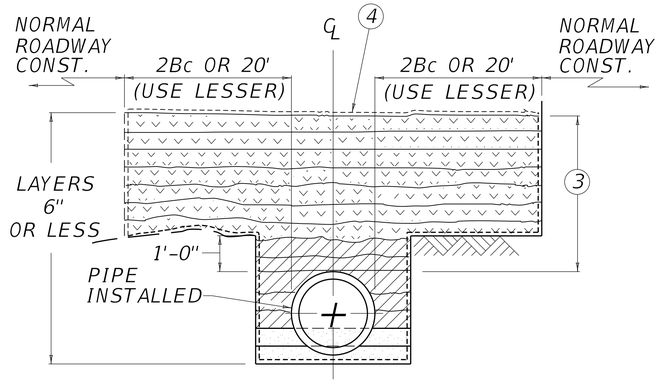
a. COMPACT BEDDING IN TRENCH IN LAYERS OF 6" OR LESS TO WIDTH AND ELEVATION SHOWN. ▨

b. EXCAVATE A GROOVE IN THE COMPACTED BEDDING TO CONFORM TO THE OUTSIDE OF THE PIPE. AFTER EXCAVATION OF THE GROOVE, APPROXIMATELY 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 IF COVER HEIGHT PERMITS.

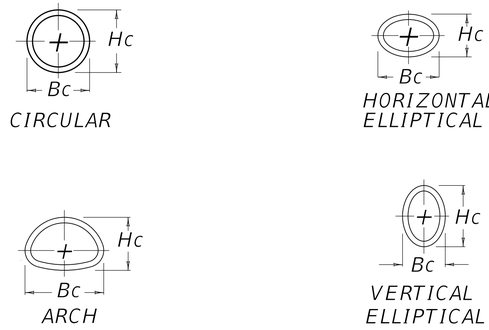
a. COMPACT REQUIRED BACKFILL MATERIAL IN LAYERS OF 6" OR LESS TO 1'-0" ABOVE TOP OF PIPE. ▨

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 ~



USE WITH CUR. STD. DWG.
RDI-025

FOR TRENCH CONDITIONS

REVISION DATE: 02/26/2020
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 02-26-2020 DATE

APPROVED — STATE HIGHWAY ENGINEER — 02-26-2020 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

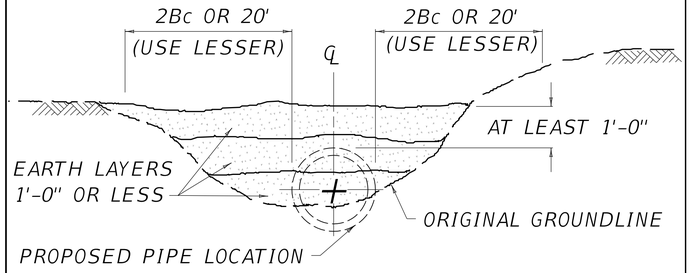
PIPE BEDDING

PIPE BEDDING FOR CULVERTS, ENTRANCE AND STORM SEWER PIPE

STANDARD DRAWING NUMBER
RDI-020-10

FOR TRENCH CONDITIONS

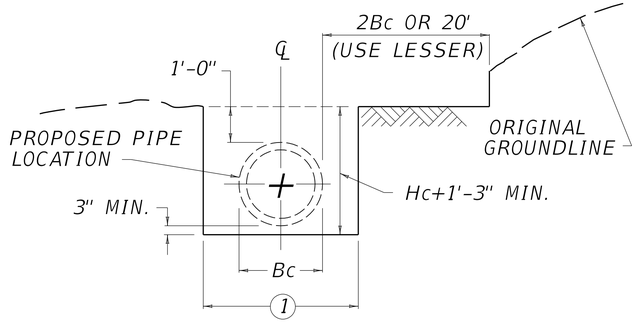
STEP 1



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



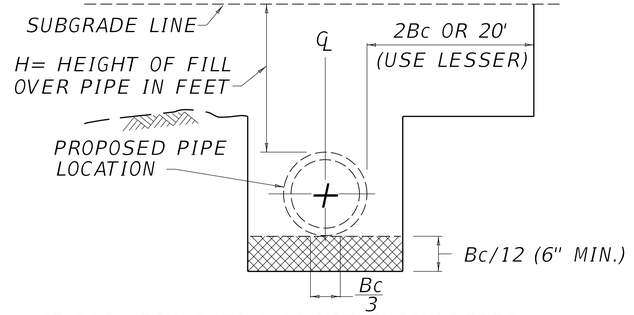
a. EXCAVATE TO WITHIN 1'-0" ABOVE TOP OF PROPOSED PIPE A WIDTH OF 2Bc OR 20' (USE LESSER) ON EACH SIDE OF PIPE.

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

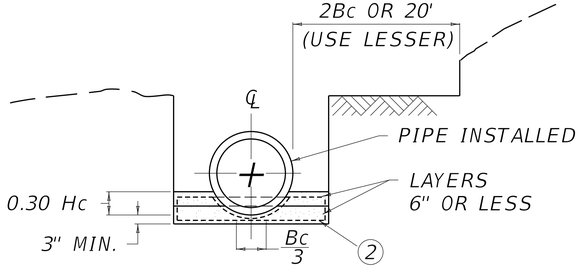


a. IF ROCK FOUNDATION IS NOT ENCOUNTERED, GO DIRECTLY TO "STEP 4".

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



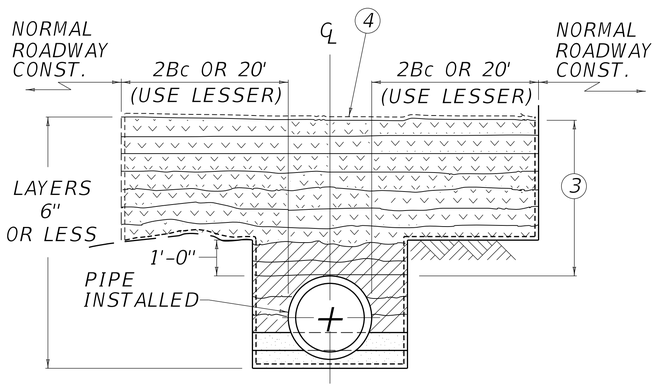
a. UNCOMPACTED 4" BEDDING IN SUBTRENCH. FOR TYPE 1 INSTALLATION COMPACT BEDDING IN LAYERS 6" OR LESS TO AN ELEVATION 0.30 Hc. ▨
LEAVE CENTER THIRD OF OUTSIDE PIPE DIA. (Bc/3) BEDDING UNCOMPACTED.

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. ▨

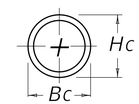
b. COMPACT REQUIRED BACKFILL MATERIAL TO ELEV. (3) ABOVE TOP OF PIPE IN LAYERS OF 6" OR LESS. ▨

c. PROCEED WITH NORMAL ROADWAY CONSTRUCTION.

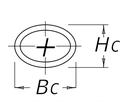
(4) WRAP BEDDING MATERIAL IN GEOTEXTILE FABRIC WHEN THE STANDARD SPECIFICATIONS SPECIFIES.

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



CIRCULAR



HORIZONTAL
ELLIPTICAL

~ PIPE SHAPES ~

~ 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.

USE WITH CUR. STD. DWG.
RDI-026

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

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APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

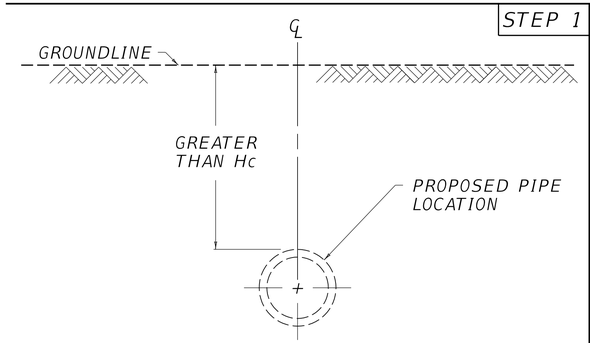
PIPES

PIPE BEDDING FOR CULVERTS, ENTRANCE, AND STORM SEWER REINFORCED CONC. PIPE

STANDARD DRAWING NUMBER
RDI-021-01

OpenRoads Designer v23.00.01.11
USER: matthew.sipes
FILE NAME: C:\KYTC_STANDARDS\ORGANIZATION-CIVIL\KYTC_STANDARDS_OC_KYTC\DGNLIB\SHEET SEEDS\KYTC STANDARDS BORDER SEED.DGNLIB

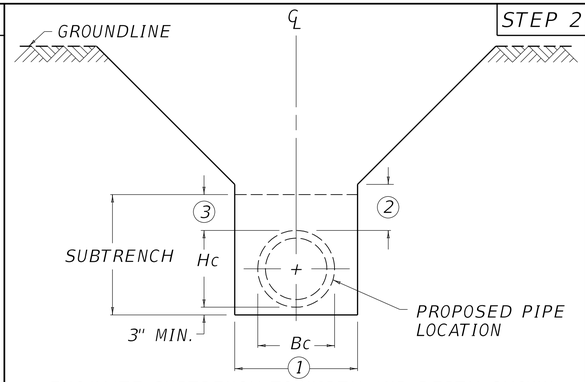
STEP 1



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.

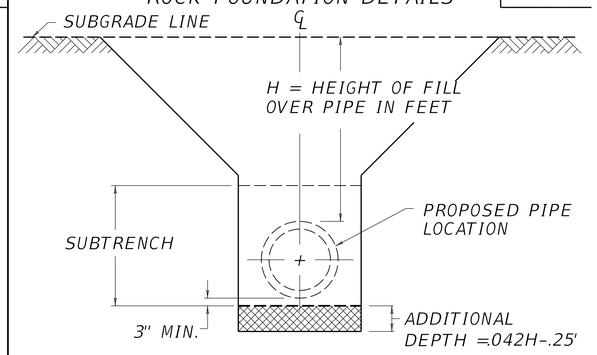
(1) Bc + 24" FOR PIPE 36" DIA. OR LESS.
Bc + 48" FOR PIPE GREATER THAN 36" DIA.

(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.

ROCK FOUNDATION DETAILS

STEP 3

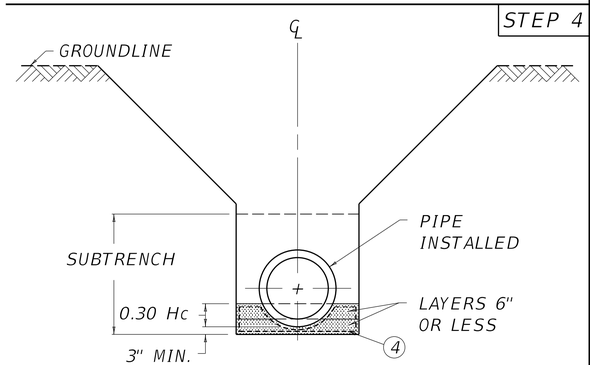


a. IF ROCK FOUNDATION IS NOT ENCOUNTERED, GO DIRECTLY TO "STEP 4".

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



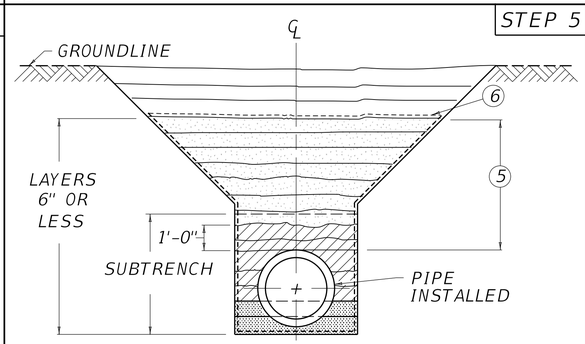
a. COMPACT BEDDING IN SUBTRENCH IN LAYERS OF 6" OR LESS TO WIDTH AND ELEVATION SHOWN. ▨

b. EXCAVATE A GROOVE IN THE COMPACTED BEDDING TO CONFORM TO THE OUTSIDE OF THE PIPE. AFTER EXCAVATION OF THE GROOVE, APPROXIMATELY 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 IF COVER HEIGHT PERMITS.

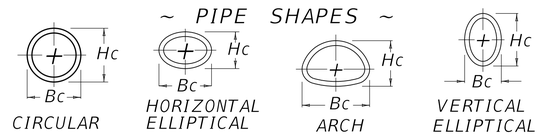
a. COMPACT REQUIRED BACKFILL MATERIAL IN LAYERS OF 6" OR LESS TO 1'-0" ABOVE TOP OF PIPE. ▨

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

REVISION DATE: 02/26/2020
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 02-26-2020 — DATE

APPROVED — STATE HIGHWAY ENGINEER — 02-26-2020 — DATE

DRAINAGE

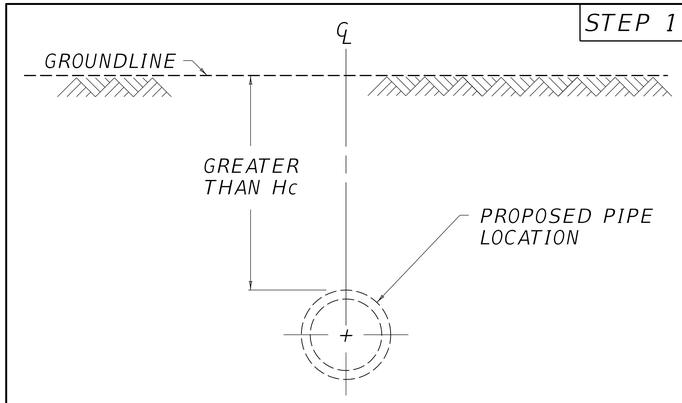
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

PIPE BEDDING

PIPE BEDDING TRENCH CONDITION

STANDARD DRAWING NUMBER
RDI-025-06

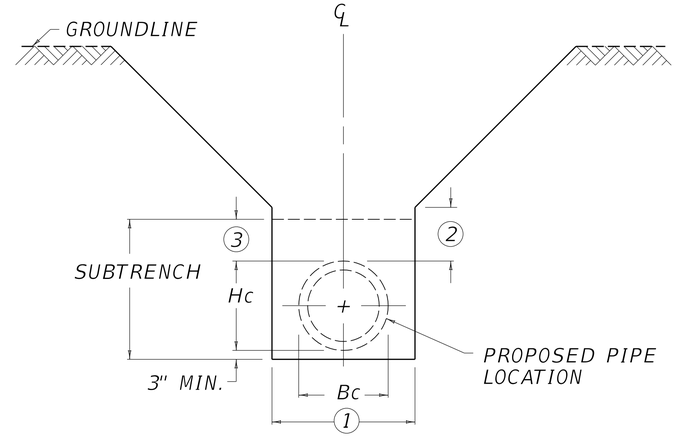
STEP 1



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.

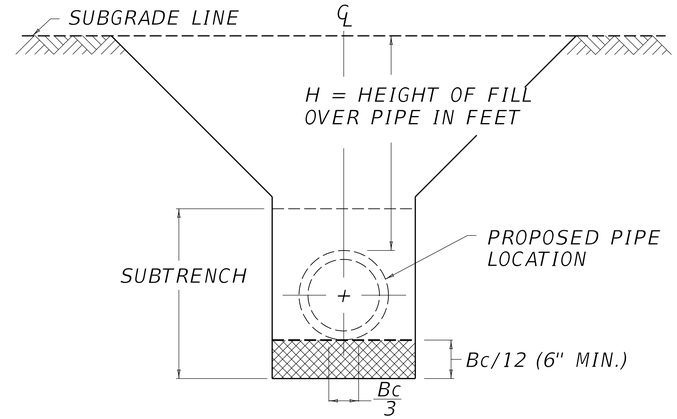
(1) Bc + 24" FOR PIPE 36" DIA. OR LESS.
Bc + 48" FOR PIPE GREATER THAN 36" DIA.

(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.

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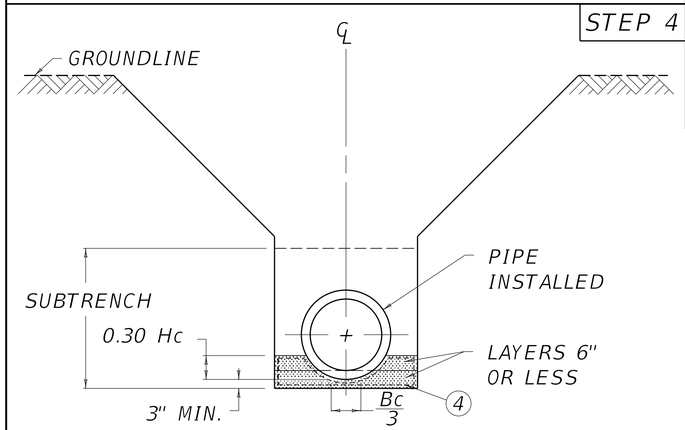
SUBMITTED Williams F. Hall 12-01-2015 DATE
DIVISION DIRECTOR

APPROVED 12-01-2015 DATE
STATE HIGHWAY ENGINEER

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. ▨

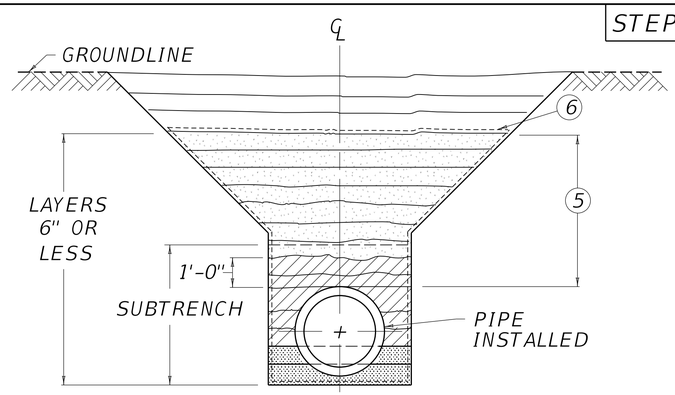
LEAVE CENTER THIRD OF OUTSIDE PIPE DIA. (Bc/3) BEDDING UNCOMPACTED.

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.

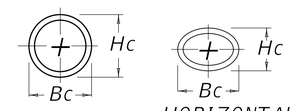
MAX. COVER HEIGHT		
CLASS	TYPE 1	TYPE 4
III	25'	9'
IV	38'	15'
V	57'	23'

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 ~

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

PIPES

PIPE BEDDING TRENCH CONDITION REINFORCED CONC. PIPE

STANDARD DRAWING NUMBER
RDI-026-01

CULVERT PIPE

PIPE MATERIAL	pH RANGE ③					
	(ACID) L (< 5)		M (5 - 9) ④		(BASE) H (> 9)	
	COATING	PAVING	COATING	PAVING	COATING	PAVING
ALUMINUM-COATED TYPE 2 STEEL	-	-	HB	I	-	-
ALUMINUM ALLOY	B	I	HB	I	B	I
REINFORCED CONCRETE	-	EP	-	-	-	EP
PLASTIC	-	-	-	-	-	-

STORM SEWER AND ENTRANCE PIPE

PIPE MATERIAL	pH RANGE					
	(ACID) L (< 5)		M (5 - 9)		(BASE) H (> 9)	
	COATING	PAVING	COATING	PAVING	COATING	PAVING
ALUMINUM-COATED TYPE 2 STEEL	B	-	AZ	-	B	-
ALUMINUM ALLOY	AL	-	AL	-	AL	-
STEEL GALVANIZED	P	-	P	-	P	-
REINFORCED CONCRETE	-	-	-	-	-	-
PLASTIC	-	-	-	-	-	-

HB - HALF ASPHALT COATED
B - FULLY ASPHALT COATED
P - POLYMERIC COATED (PRECOATED GALVANIZED)
EP - EXTRA PROTECTION
I - PAVED INVERT

~ NOTES ~

1. EXCEPTIONS FOR STORM SEWERS:
   a. ANNULAR CORRUGATED PIPE > 24" DIA. 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. 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 *EXPECTATIONS FOR CULVERT PIPE:*
   a. ALUMINUM COATED TYPE 2 STEEL IS ONLY PERMITTED IN pH RANGES OF 5 TO 9.

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APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

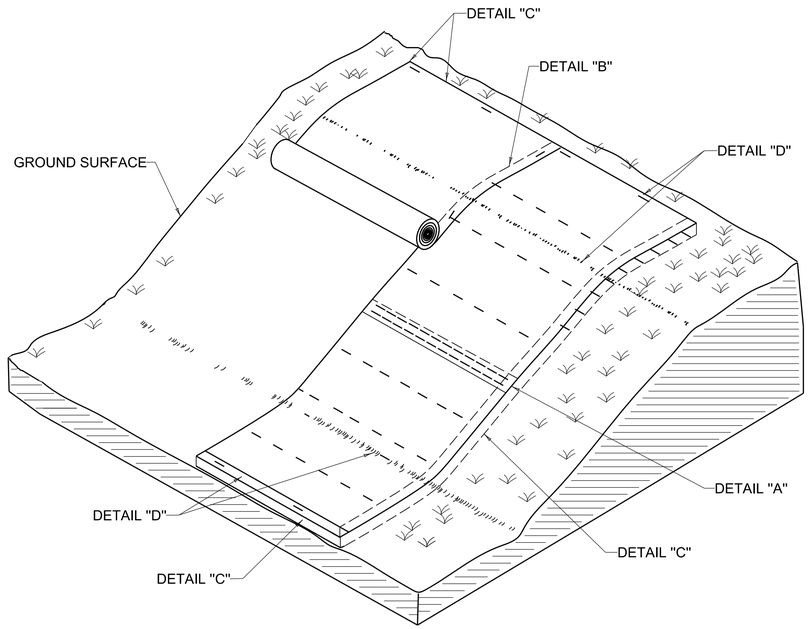
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

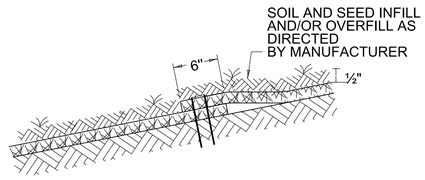
COATINGS, LINING, AND PAVING

FOR NON-STRUCTURAL PLATE PIPE

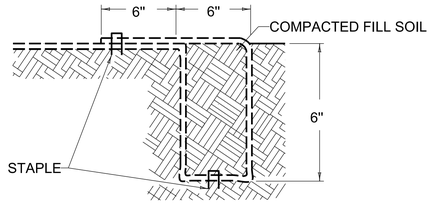
STANDARD DRAWING NUMBER
RDI-035-03



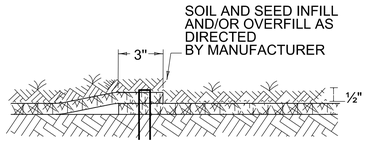
TURF MAT
SLOPE INSTALLATION



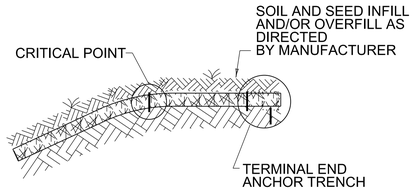
TRANSVERSE OVERLAP
DETAIL "A"

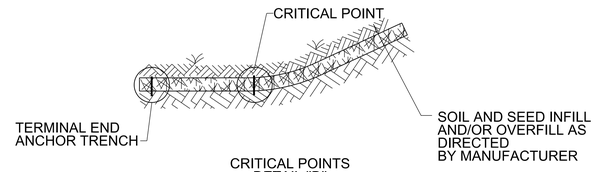


ANCHOR TRENCH
DETAIL "C"



LONGITUDINAL OVERLAP
DETAIL "B"





CRITICAL POINTS
DETAIL "D"

~NOTES~

1. *CONSTRUCT A 6" X 6" ANCHOR TRENCH AT THE BEGINNING OF THE SLOPE. LINE THE ANCHOR TRENCH WITH TURF REINFORCING MAT LEAVING 12" EXTENDING PAST THE ANCHOR TRENCH. FASTEN THE MAT MATERIAL INTO THE ANCHOR TRENCH ON 12" CENTERS BACKFILL THE TRENCH WITH TOPSOIL AND COMPACT. COVER THE AREA WITH THE REMAINING 12" OF THE MAT'S TERMINAL END LEAVING 6" TO OVERLAP THE TURF REINFORCING MAT. SECURE THE 6" OVERLAP WITH STAPLES ON 12" CENTERS.*

2. *UNROLL THE MAT DOWN THE SLOPE AND PLACE IN DIRECT CONTACT WITH THE SOIL SURFACE. INSURE THAT THE SOIL SURFACE IS GRADED SMOOTHLY AND DOES NOT CONTAIN IRREGULARITIES.*

3. *SECURELY FASTEN THE MAT 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 MATS ACCORDING TO THE LONGITUDINAL AND TRANSVERSE OVERLAP DETAILS. STAPLE LONGITUDINAL OVERLAPS WITH 2 ROWS OF STAPLES STAGGERED AT 4". STAPLE TRANSVERSE OVERLAPS WITH 1 ROW OF STAPLES SPACED AT 12".*

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 MAT IS IN DIRECT CONTACT WITH THE SOIL SURFACE WITH NO PROJECTIONS OR PROTRUSIONS.*

7. *INFILL AND OVERFILL THE MAT WITH A MINIMUM OF ½" TOPSOIL. APPLY SEEDING AND PROTETION AS DIRECTED BY THE MANUFACTURER. USE SEED MIX TYPE 1 AS DEFINED IN SECTION 212.03.03. 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.*

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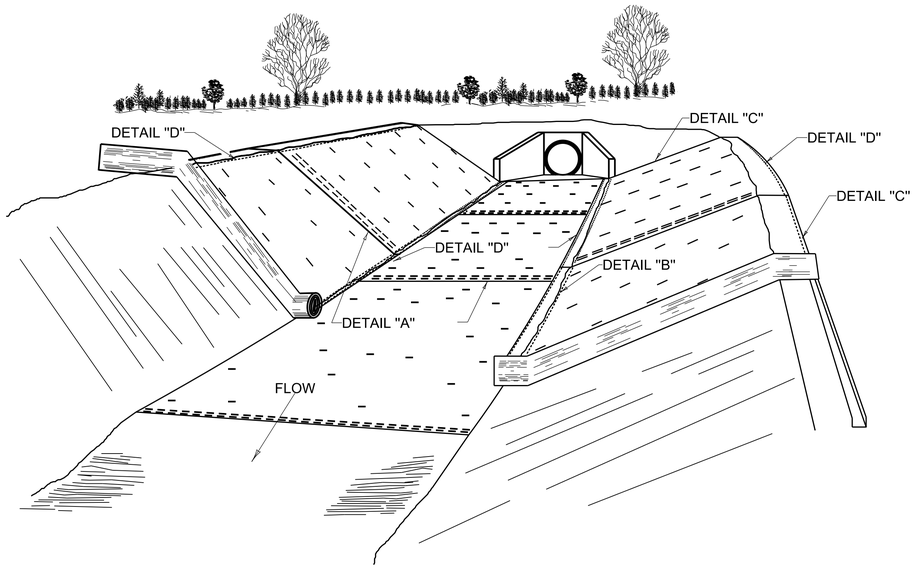
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

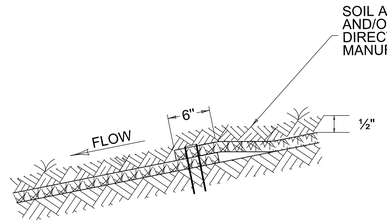
TURF MAT

TURF MAT SLOPE INSTALLATION

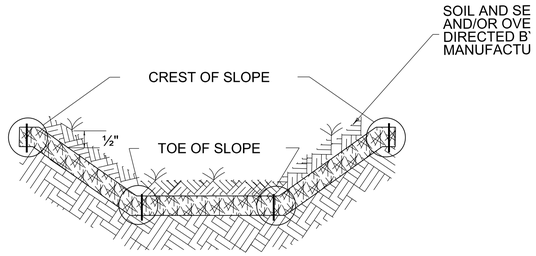
STANDARD DRAWING NUMBER
RDI-040-02



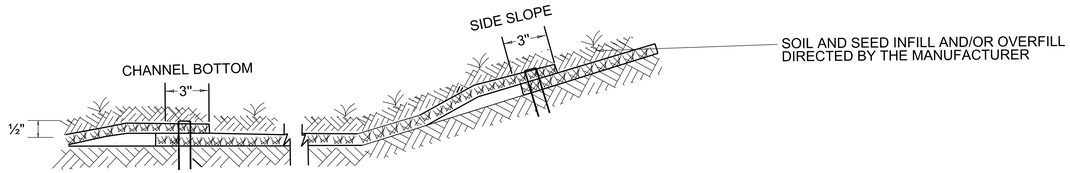
TURF MAT
CHANNEL INSTALLATION



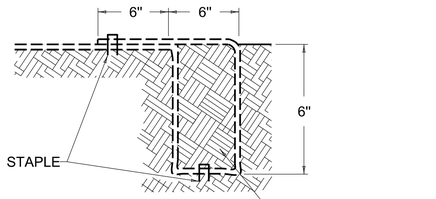
TRANSVERSE OVERLAP
DETAIL "A"



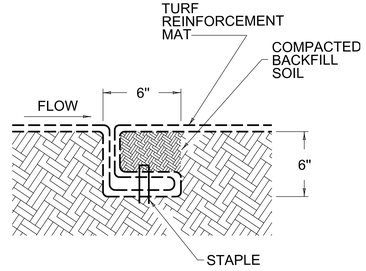
CRITICAL POINTS
DETAIL "D"



LONGITUDINAL OVERLAP
DETAIL "B"



ANCHOR TRENCH
DETAIL "C"



CHANNEL CHECK SLOT (3)

~ NOTES ~

1. *CONSTRUCT A 6" X 6" ANCHOR TRENCH AT THE UPSTREAM END OF THE CHANNEL. LINE THE ANCHOR TRENCH WITH TURF REINFORCIG MAT LEAVING 12" EXTENDING PAST THE ANCHOR TRENCH. FASTEN THE MAT MATERIAL INTO THE ANCHOR TRENCH ON 12" CENTERS BACKFILL THE TRENCH WITH TOPSOIL AND COMPACT. COVER THE AREA WITH THE REMAINING 12" OF THE MAT'S TERMINAL END LEAVING 6" TO OVERLAP THE TURF REINFORCING MAT. SECURE THE 6" OVERLAP WITH STAPLES ON 12" CENTERS.*

2. *UNROLL THE MAT PARALLEL TO THE PRIMARY DIRECTION OF WATER FLOW AND PLACE IN DIRECT CONTACT WITH THE SOIL SURFACE. INSURE THAT THE SOIL SURFACE GRADED SMOOTHLY AND DOES NOT CONTAIN IRREGULARITIES.*

(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 MAT AND THEN PULL BACK OVER. FASTEN WITH STAPLES ON 12" CENTERS. FILL THE CHECK SLOT WITH TOPSOIL, COMPACT, AND CONTINUE UNROLLING MAT DOWN THE CHANNEL.*

4. *CONTINUE UNROLLING THE MAT DOWNSTREAM OVER THE COMPACTED SLOT TO THE NEXT CHECK SLOT OR TERMINAL ANCHOR TRENCH. IF MORE THAN ONE SECTION OF MAT, AS SHOWN IN THE TRANSVERSE OVERLAP DETAIL, IS USED OVERLAP UPSTREAM MATS OVER TOP OF THE DOWNSTREAM MAT 6" AND SECURE. IF MATS ARE PLACED PARALLEL TO EACH OTHER ALONG THE CHANNEL, PLACE CHANNEL SECTIONS FIRST, THEN OVERLAP SIDE SLOPE SECTIONS 3" OVER THE CHANNEL SECTIONS AS SHOWN IN THE LONGITUDINAL OVERLAP DETAIL, AND SECURE WITH STAPLES ON 12" CENTERS. PROCEED UP THE SIDE SLOPES IN THE SAME MANNER UNTIL THE TOP OF CHANNEL IS REACHED.*

5. *SECURE MATS 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. *INFILL AND OVERFILL THE MAT WITH A MINIMUM OF ½" TOPSOIL. APPLY SEEDING AND PROTECTION AS DIRECTED BY THE MANUFACTURER. USE SEED MIX TYPE 1 AS DEFINED IN SECTION 212.03.03. 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

REVISION DATE: 08/11/2025
REVISION NUMBER:0

SUBMITTED — DIVISION DIRECTOR — DATE 08-11-2025
APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

TURF MAT

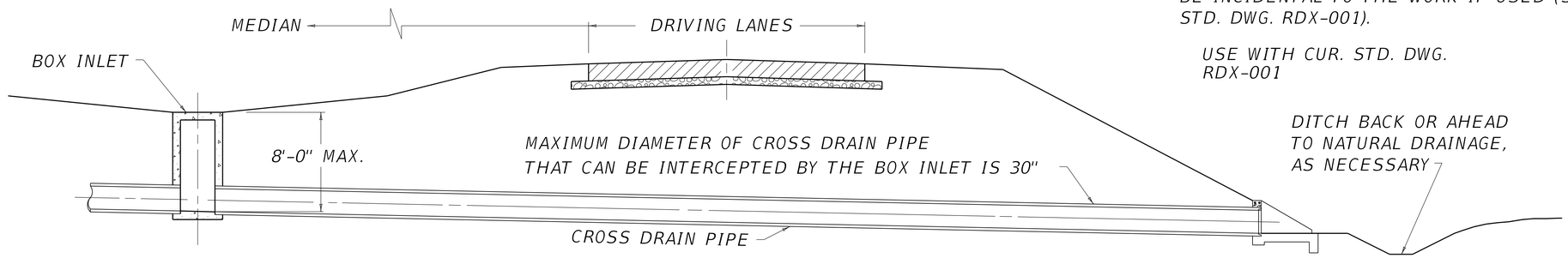
TURF MAT CHANNEL INSTALLATION

STANDARD DRAWING NUMBER
RDI-041-02

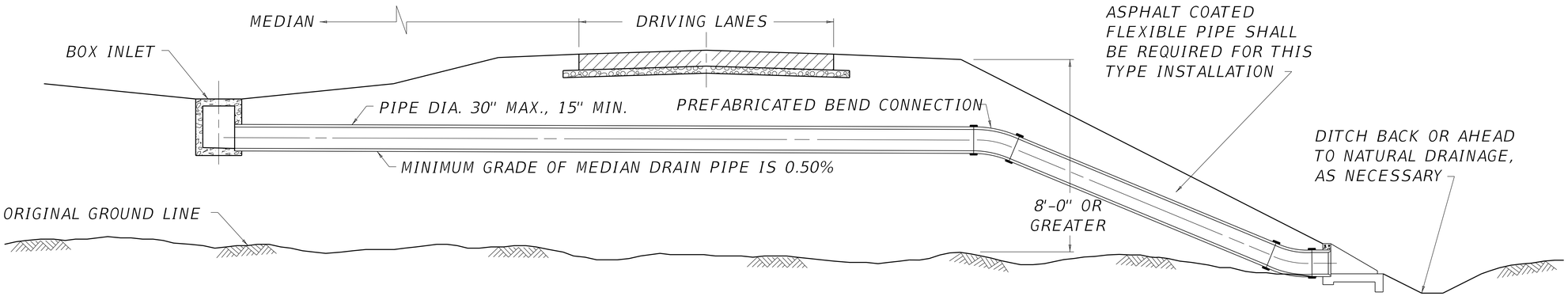
~ NOTES ~

(1) JUNCTION BOX IS PERMITTED, HOWEVER, IT SHALL BE INCIDENTAL TO THE WORK IF USED (SEE CUR. STD. DWG. RDX-001).

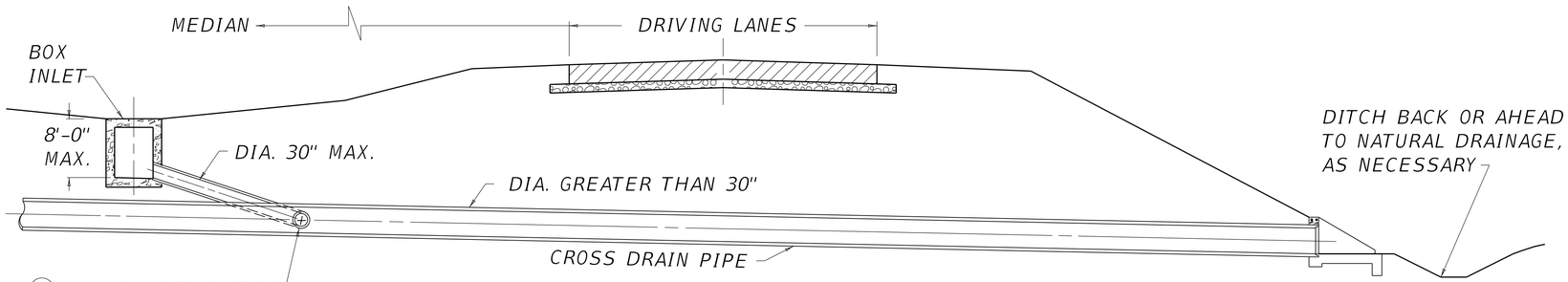
USE WITH CUR. STD. DWG. RDX-001



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

REVISION DATE: 12/01/2015
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DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

PIPES

TYPICAL MEDIANS DRAIN INSTALLATIONS

STANDARD DRAWING NUMBER
RDI-045-02

BOX SIZES	① TABLE 1 MAXIMUM FILL HEIGHT (FEET)												② TABLE 2 MAXIMUM FILL HEIGHT (FEET)												③ TABLE 3 MAXIMUM FILL HEIGHT (FEET)														BOX SIZES	BOX SIZES	TABLE 1 ④ LESS THAN 2' FILL	TABLE 2 ⑤ LESS THAN 2' FILL
	2	3	4	5	6	8	10	12	14	16	18	20	2	3	4	5	6	8	10	12	14	16	18	20	0	2	3	4	5	6	8	10	12	14	16	18	20	22				
3 X 2																																							3 X 2	3 X 2		
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4 X 2																																							4 X 2	4 X 2		
4 X 3																																							4 X 3	4 X 3		
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12 X 12																																							12 X 12	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.

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SUBMITTED William S. Haddad 12-01-2015
DIVISION DIRECTOR DATE

APPROVED [signature] 12-01-2015
STATE HIGHWAY ENGINEER DATE

DRAINAGE

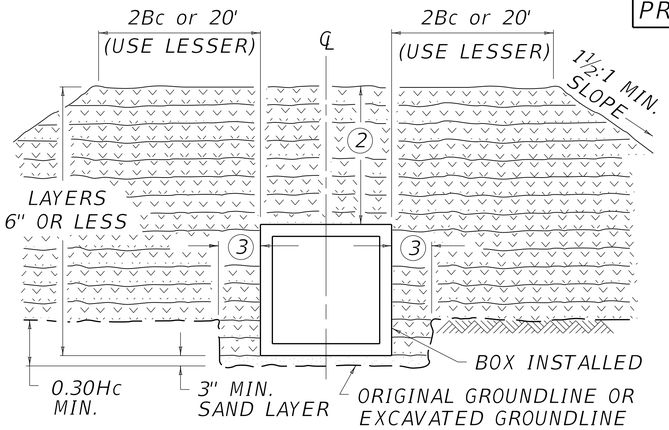
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

PIPES

FILL HEIGHTS FOR PRECAST REINF. CONC. BOX CULVERTS

STANDARD DRAWING NUMBER
RDI-100-05

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.

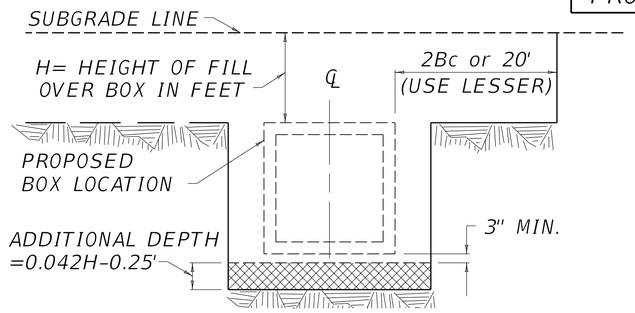
b. UNIFORMLY COMPACT SAND IN TRENCH WITH APPROXIMATELY 3" OF SAND BELOW BOTTOM OF BOX. LEVEL COMPACTED SAND WITH A TEMPLATE TO INSURE UNIFORM SUPPORT THROUGHOUT ENTIRE WIDTH AND LENGTH.

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

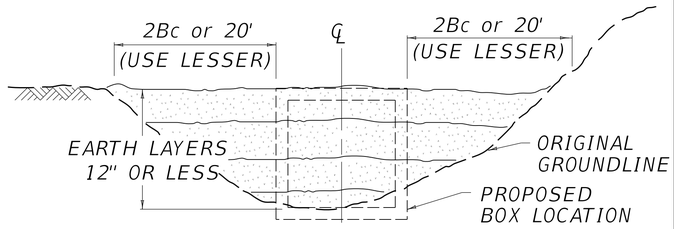


a. IF ROCK FOUNDATION IS NOT ENCOUNTERED, GO DIRECTLY TO STEP 4.

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.

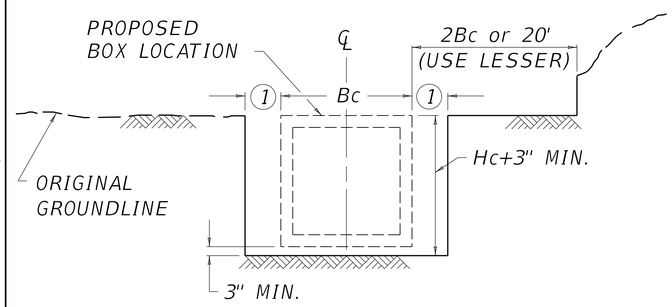
STEP 1 ZERO PROJECTION



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

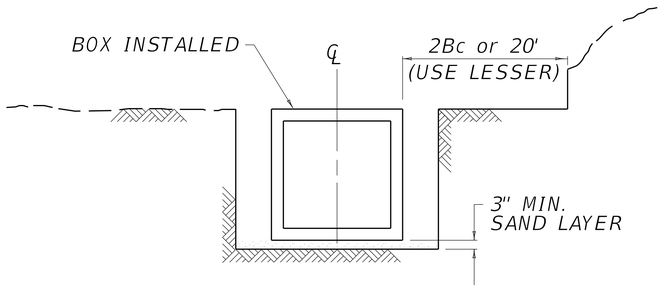


a. EXCAVATE TO TOP OF PROPOSED BOX A WIDTH OF 2Bc OR 20' (USE LESSER) ON EACH SIDE OF BOX.

b. EXCAVATE TRENCH TO WIDTH AND DEPTH SHOWN.

(1) AT LEAST 12", BUT NOT MORE THAN 15".

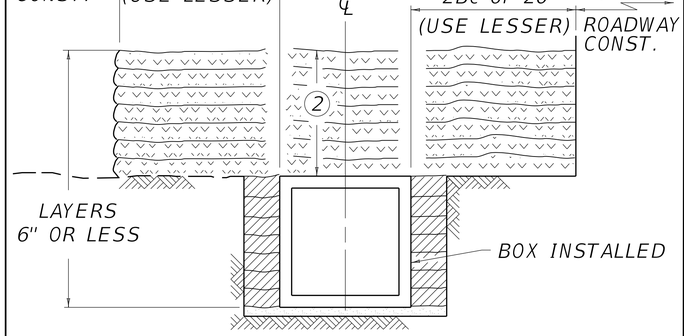
STEP 3 ZERO PROJECTION



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 4 ZERO PROJECTION



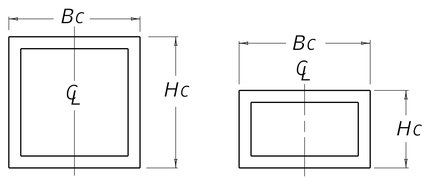
a. COMPACT SELECTED FINE SOIL, NATURAL SAND, OR NO. 10 COARSE AGGREGATE IN LAYERS OF 6" OR LESS TO TOP OF THE BOX. THEN COMPACT SELECTED FINE SOIL TO ELEVATION (2) ABOVE TOP OF BOX. MEET DENSITY REQUIREMENTS FOR ADJACENT EMBANKMENT.

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

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SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

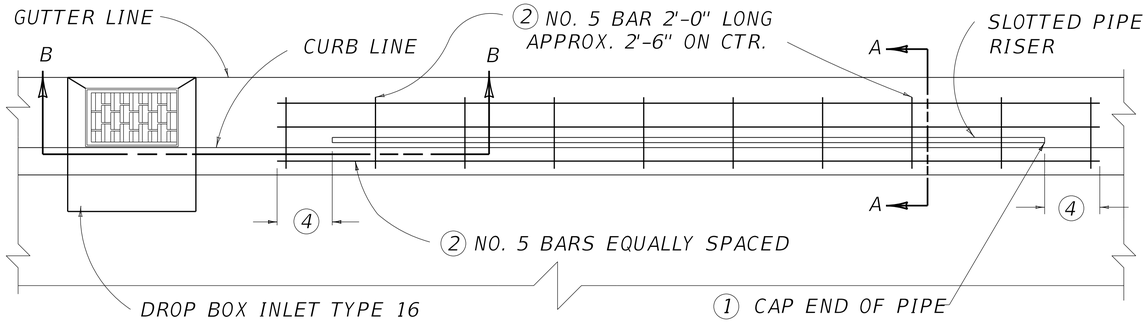
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

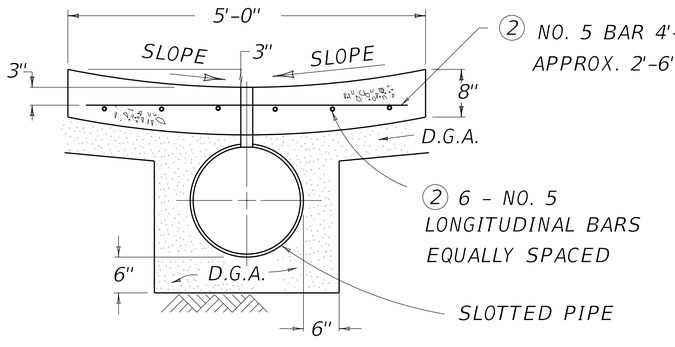
PIPES

BEDDING FOR PRECAST BOX CULVERTS, SEWERS, STORM DRAINS, AND THEIR COMBINATIONS

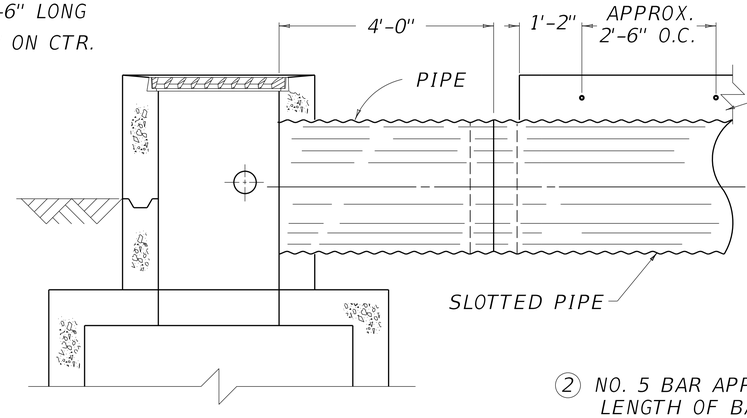
STANDARD DRAWING NUMBER
RDI-120-04



PLAN VIEW



VALLEY GUTTER SECTION ③



SECTION B-B

~ 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.

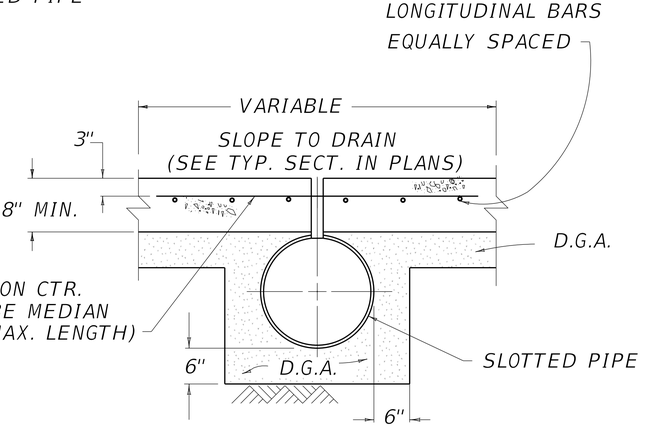
② ALL REINFORCING STEEL SHALL BE INCLUDED IN THE CONTRACT UNIT PRICE PER LINEAR FOOT OF SLOTTED DRAIN PIPE. ALL REINFORCING STEEL SHALL BE EPOXY COATED IN ACCORDANCE WITH THE DEPARTMENTS STANDARD SPECIFICATIONS.

③ USE DROP BOX INLET TYPE 10 WITH VALLEY GUTTER (LIMITED TO 24" METAL PIPE SIZE).

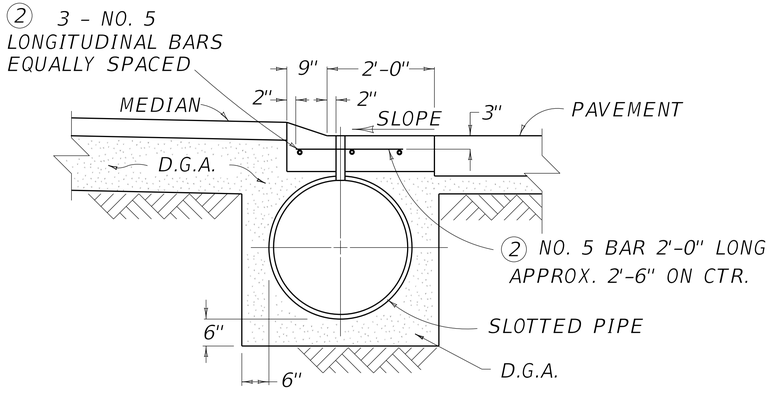
④ EXTEND LONGITUDINAL BAR APPROXIMATELY 1'-6" PAST END OF SLOTTED DRAIN PIPE.

5. MINIMUM THROAT DEPTH FOR SLOTTED DRAIN PIPE SHALL BE 10".

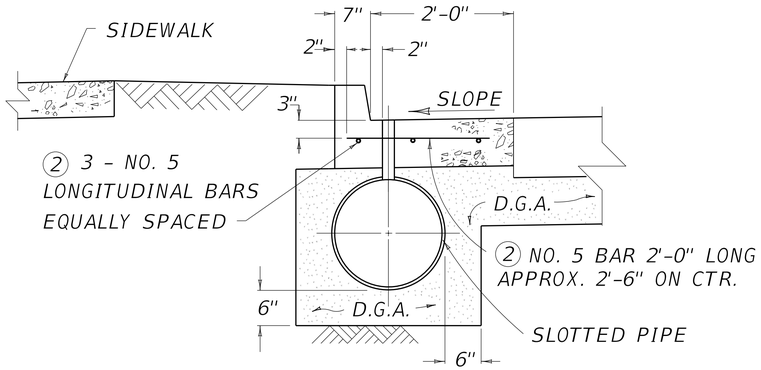
USE WITH CUR. STD. DWGS.:
RDB-014 RDB-030 RDB-031 RDB-032
RDB-033 RDB-034 RDB-035



FLUSH MEDIAN SECTION



SECTION A-A
LIP CURB SECTION



STD. CURB SECTION

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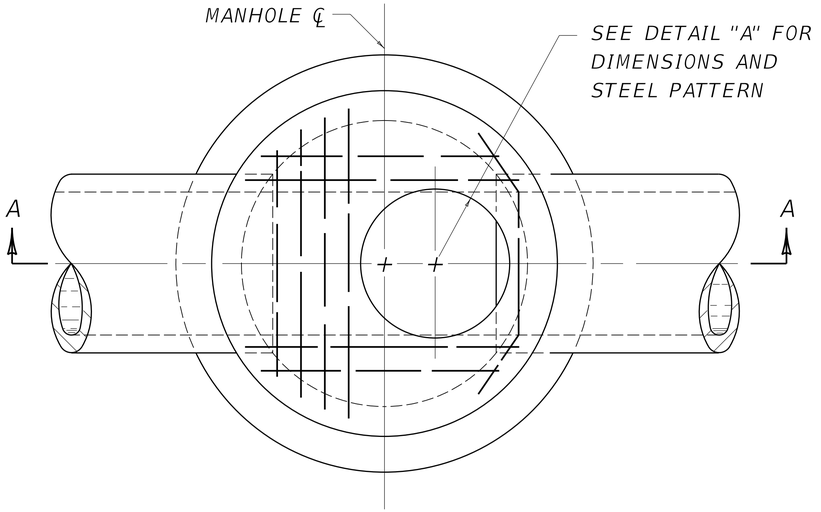
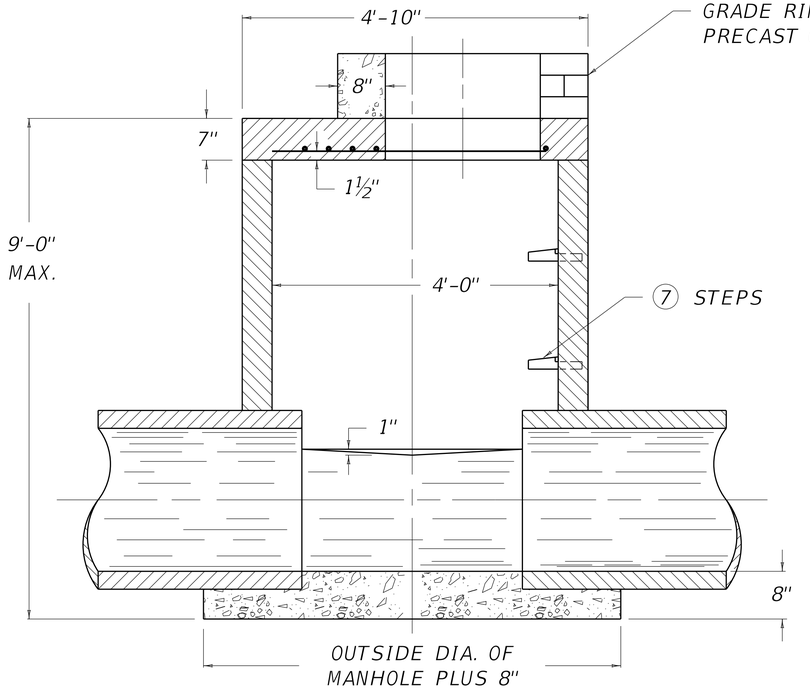
DRAINAGE



PLAN VIEW



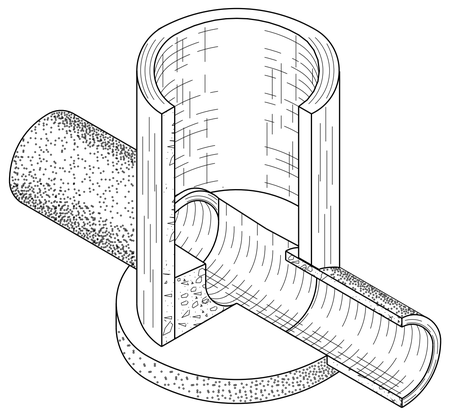
SECTION A-A

~ NOTES ~

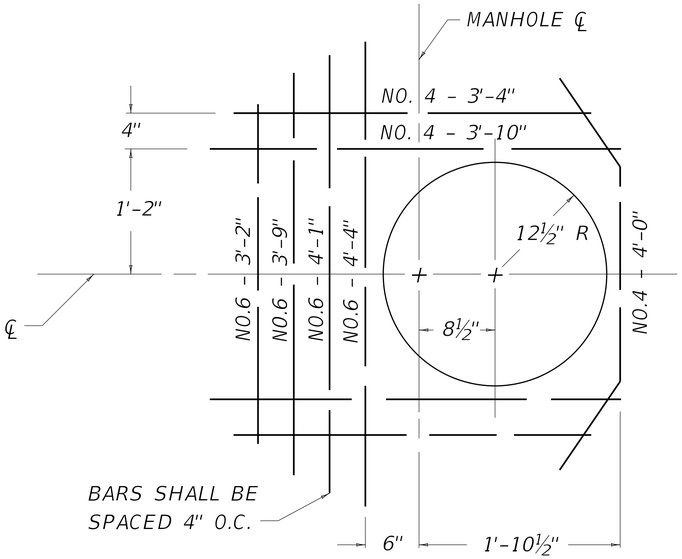
BID ITEM AND UNIT TO BID
MANHOLE TYPE A EACH

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.

USE WITH CUR. STD. DWGS.
RDM-055 RDM-100 RDM-105



ISOMETRIC OF BASE



DETAIL "A"
DIMENSIONS AND
STEEL PATTERN

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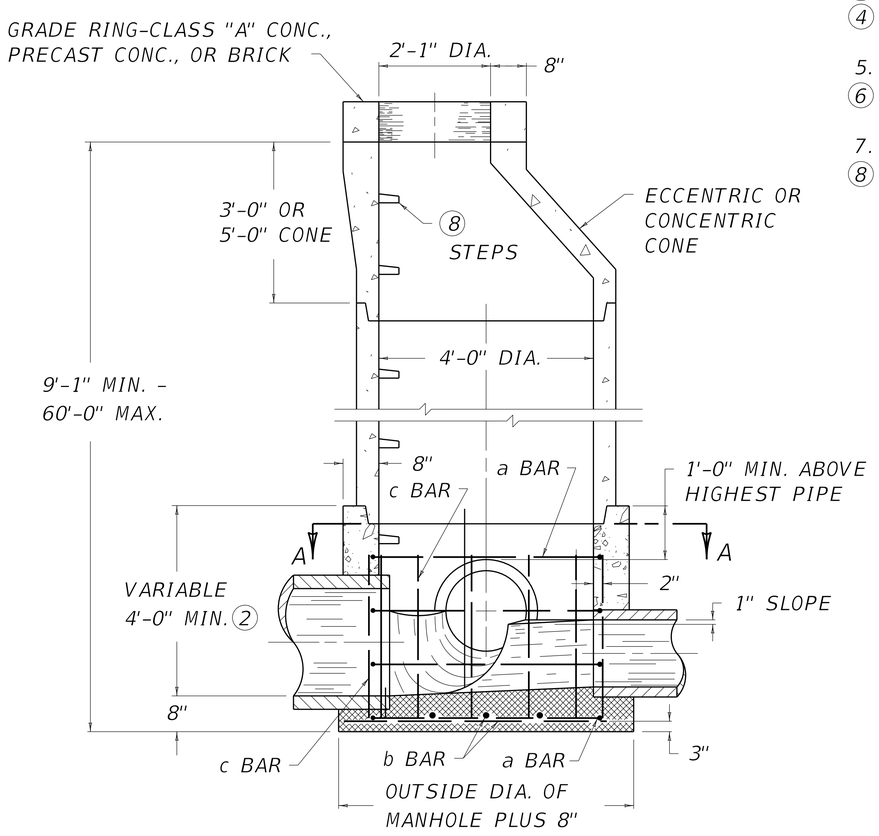
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

MANHOLE

TYPE A

STANDARD DRAWING NUMBER
RDM-001-07



SECTIONAL ELEVATION

~ NOTES ~

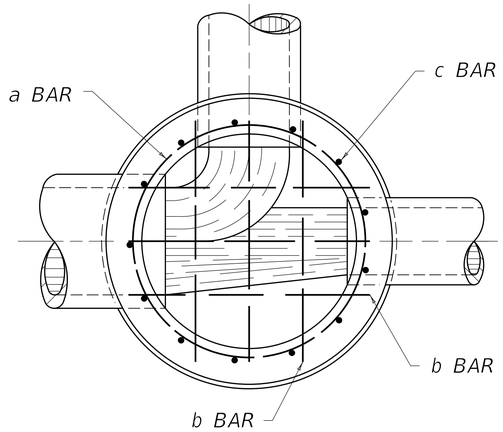
BID ITEM AND UNIT TO BID
MANHOLE TYPE B EACH

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.

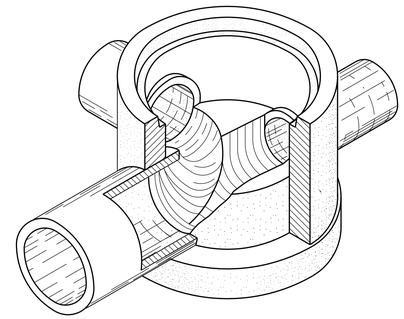
USE WITH CUR. STD. DWGS.
RDM-055 RDM-100 RDM-105

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.



SECTION A-A



ISOMETRIC OF BASE

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

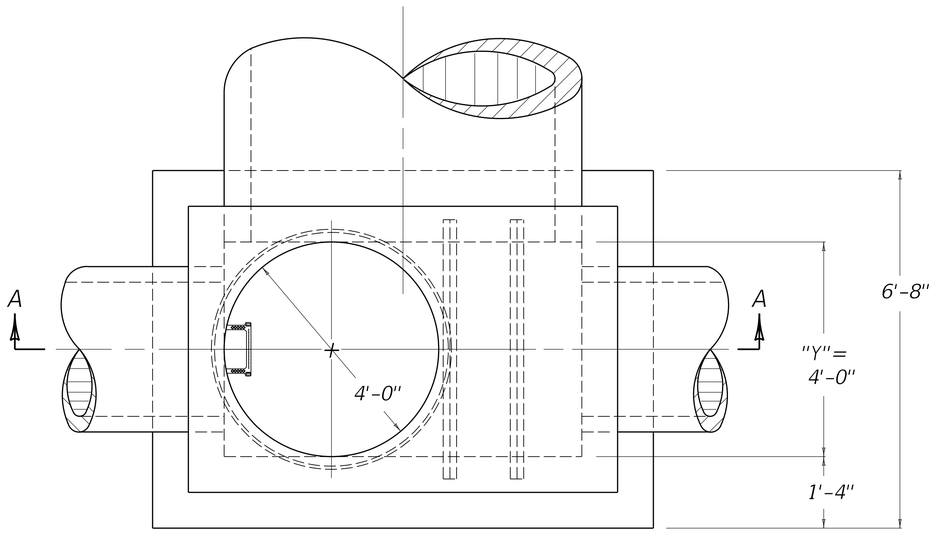
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

MANHOLE

TYPE B

STANDARD DRAWING NUMBER
RDM-005-06

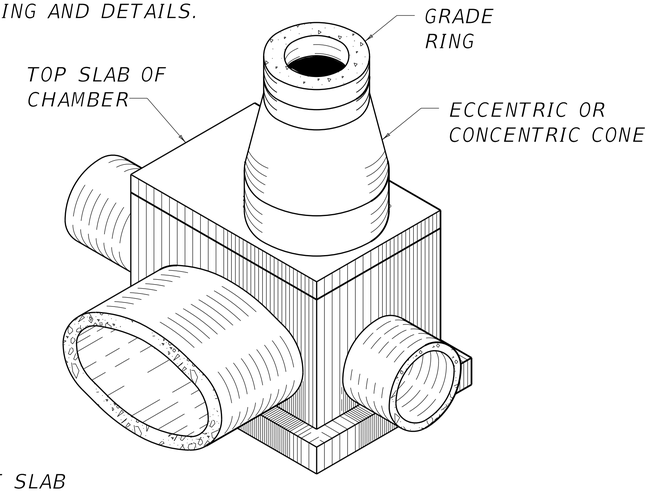


PLAN VIEW

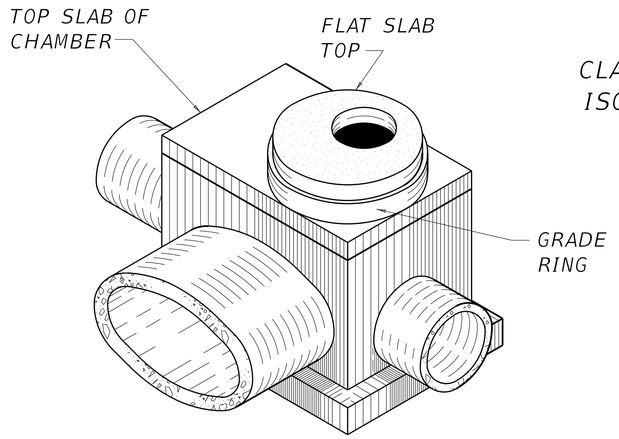
BID ITEM AND UNIT TO BID
MANHOLE TYPE C EACH

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.

USE WITH CUR. STD. DWGS.
RDM-011 RDM-012 RDM-013
RDM-055 RDM-100 RDM-105

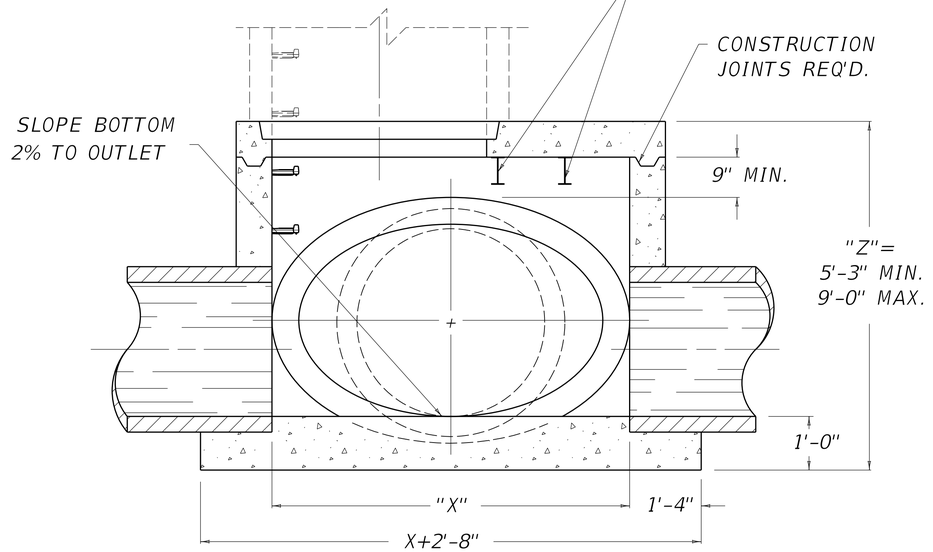


CLASS "A" TOWER
ISOMETRIC VIEW



CLASS "B" TOWER
ISOMETRIC VIEW

(TWO) GALV. W 6 x 9.0 REQUIRED WHEN X IS OVER 7'-0"
(ONE) GALV. W 6 x 9.0 REQUIRED WHEN X IS OVER 4'-0"
(EXTEND TO WITHIN 3" OF OUTSIDE FACE)



SECTION A-A

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

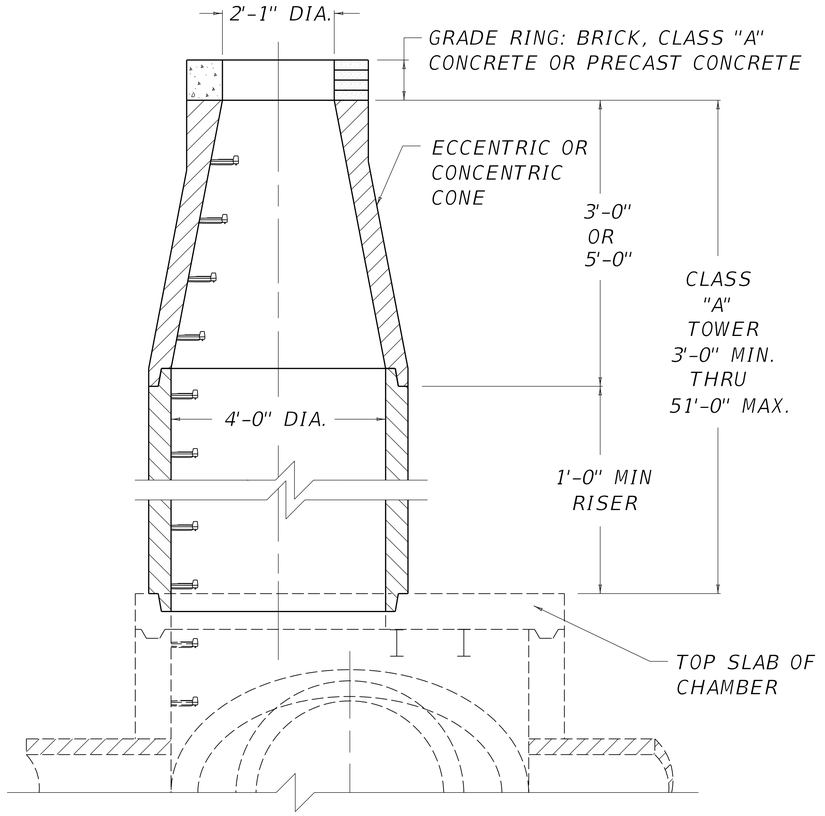
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

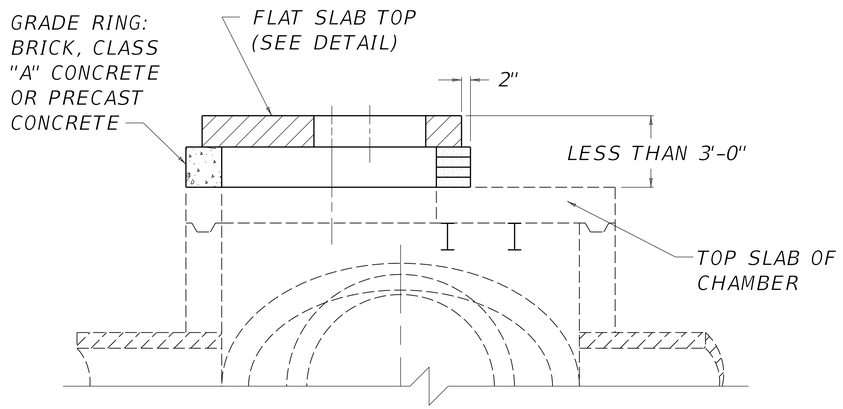
MANHOLE

TYPE C (CHAMBER LAYOUT)

STANDARD DRAWING NUMBER
RDM-010-06

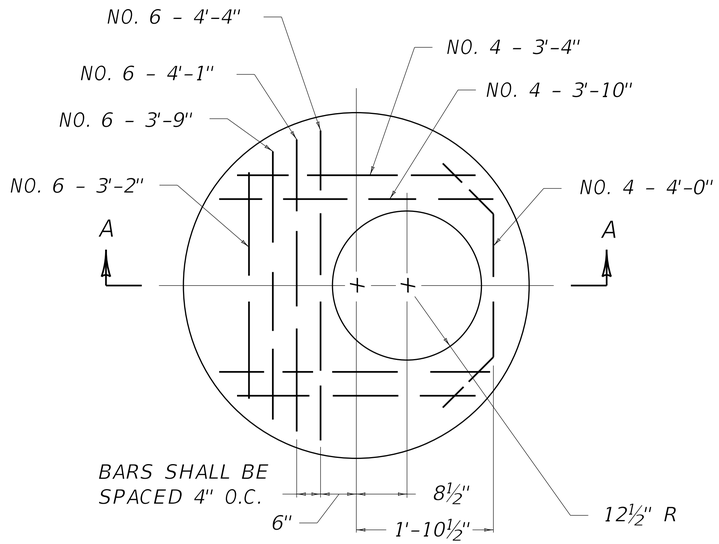


CLASS "A" TOWER DETAIL

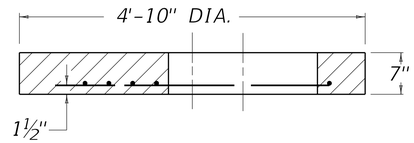


CLASS "B" TOWER DETAIL

USE WITH CUR. STD. DWGS.
RDM-010 RDM-012 RDM-013



PLAN VIEW
FLAT SLAB TOP DETAIL



SECTION A-A
FLAT SLAB TOP DETAIL

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

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APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

MANHOLE

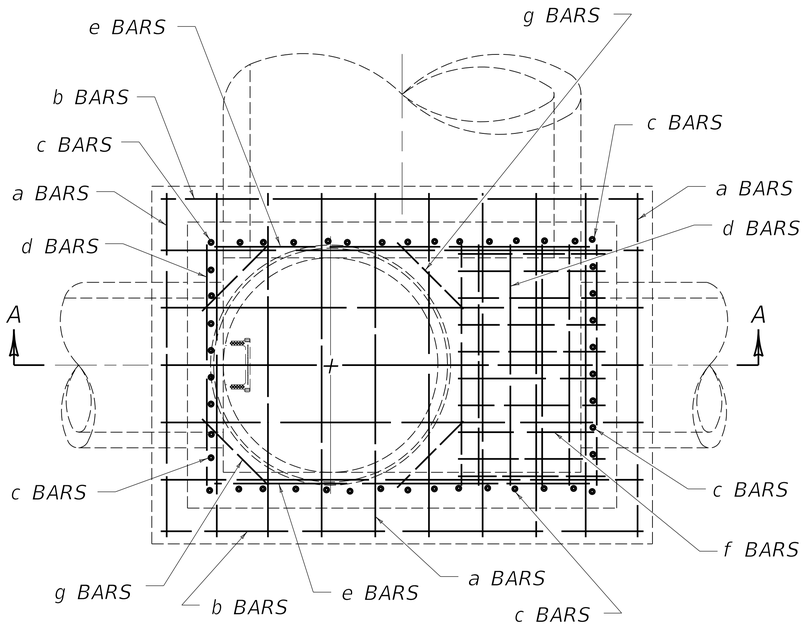
TYPE C (TOWER APPLICATIONS)

STANDARD DRAWING NUMBER
RDM-011-05

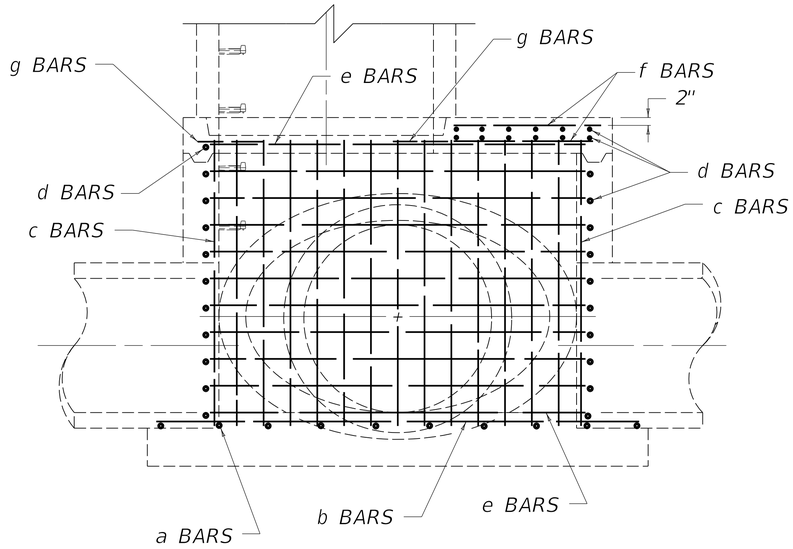
~ NOTES ~

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



PLAN VIEW



SECTION A-A

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

MANHOLE

TYPE C (STEEL PATTERN)

STANDARD DRAWING NUMBER
RDM-012-03

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"		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"	X	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".

USE WITH CUR. STD. DWGS.
RDM-010 RDM-011 RDM-012

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

REVISION DATE: 12/01/2015
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SUBMITTED William S. Ballard 12-01-2015
DIVISION DIRECTOR DATE

APPROVED [signature] 12-01-2015
STATE HIGHWAY ENGINEER DATE

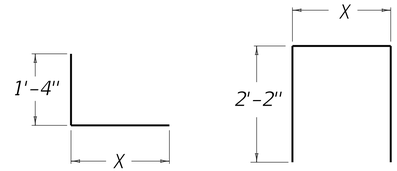
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

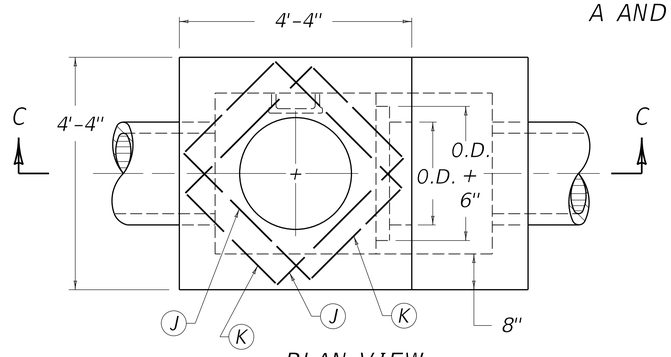
MANHOLE

TYPE C (TABLE OF QUANTITIES)

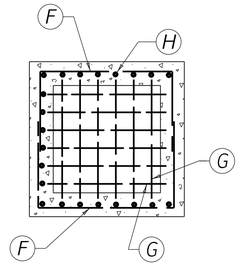
STANDARD DRAWING NUMBER
RDM-013-04



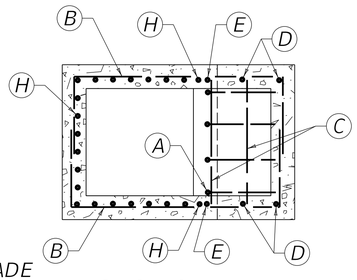
A AND M BARS B AND F BARS



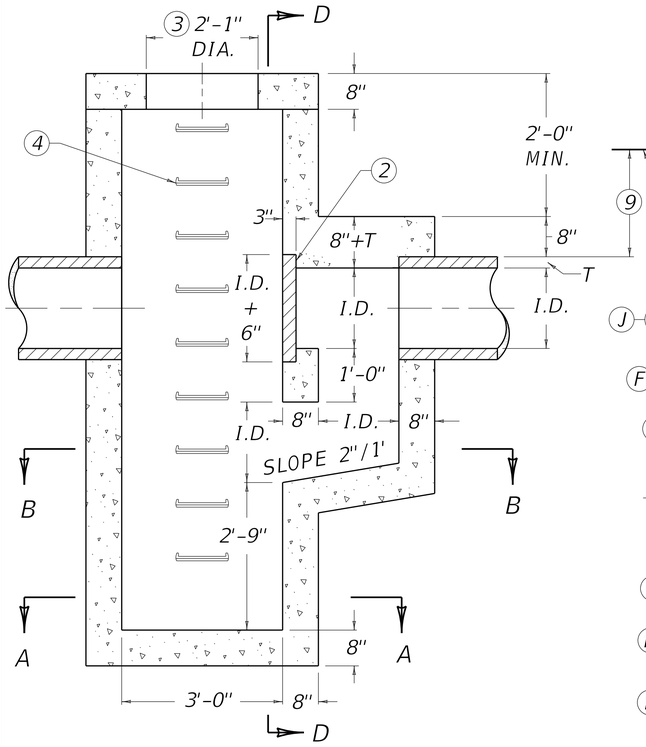
PLAN VIEW



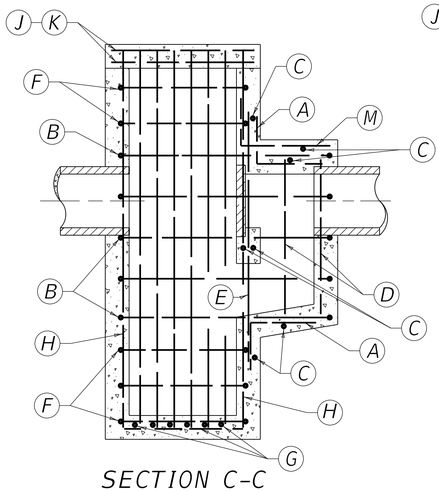
SECTION A-A



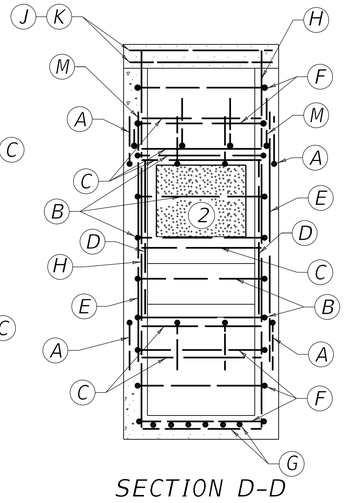
SECTION B-B



SECTION C-C



SECTION C-C



SECTION D-D

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.
A	8	2'-11"	1'-7"	8	3'-2"	1'-10"	8	3'-5"	2'-1"	8	3'-8"	2'-4"
B	10	9'-6"	5'-3"	10	9'-9"	5'-6"	12	10'-0"	5'-9"	12	10'-4"	6'-0"
C	7	3'-4"	-	7	3'-4"	-	7	3'-4"	-	9	3'-4"	-
D	4	3'-11"	-	4	4'-4"	-	4	4'-10"	-	6	5'-4"	-
E	2	6'-6"	-	2	7'-0"	-	2	7'-6"	-	2	8'-0"	-
F	10	7'-7"	3'-4"	10	7'-7"	3'-4"	10	7'-7"	3'-4"	10	7'-7"	3'-4"
G	12	3'-4"	-	12	3'-4"	-	12	3'-4"	-	12	3'-4"	-
H	22	9'-1"	-	22	9'-8"	-	22	10'-2"	-	22	10'-8"	-
J	8	3'-4"	-	8	3'-4"	-	8	3'-4"	-	8	3'-4"	-
K	8	2'-4"	-	8	2'-4"	-	8	2'-4"	-	8	2'-4"	-
M	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)			

~ 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.
4. SEE CUR. STD. DWG. RDM-055 FOR STEP TYPE, SPACING AND DETAIL.
5. G & H 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 H BAR SHALL BE INCREASED INCH FOR INCH WHEN BOX EXCEEDS MINIMUM HEIGHT. ADD TWO F 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

REVISION DATE: 12/01/2015
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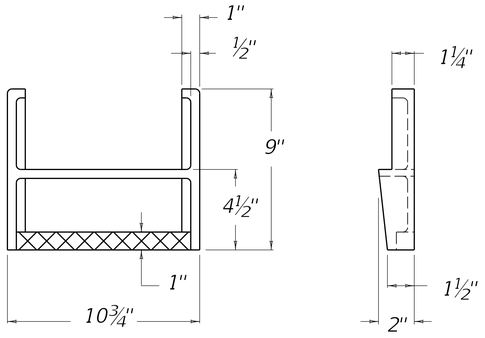
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

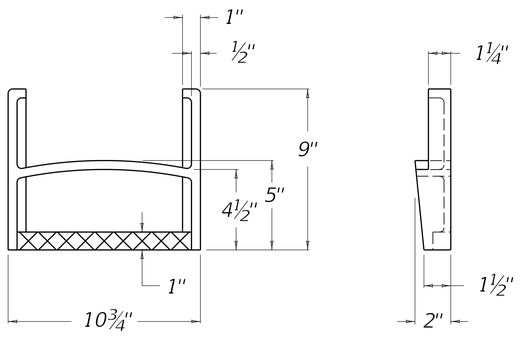
MANHOLE

TRAPPED MANHOLE

STANDARD DRAWING NUMBER
RDM-050-07



STEP TYPE NO. 1

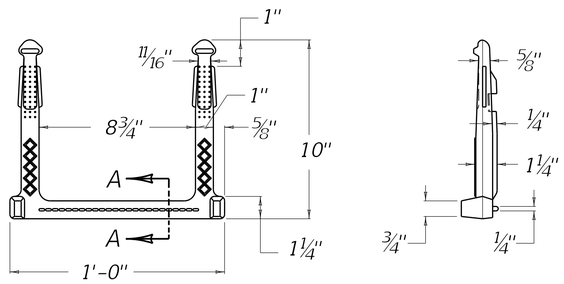


STEP TYPE NO. 2

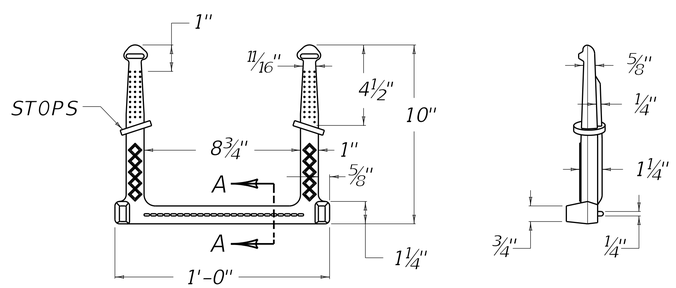
~ NOTES ~

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.

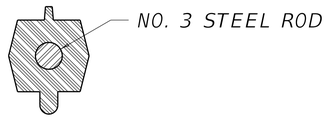
USE WITH CUR. STD. DWGS.
RDM-001 RDM-005 RDM-010 RDM-050



STEP TYPE NO. 3



STEP TYPE NO. 4



SECTION A-A

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

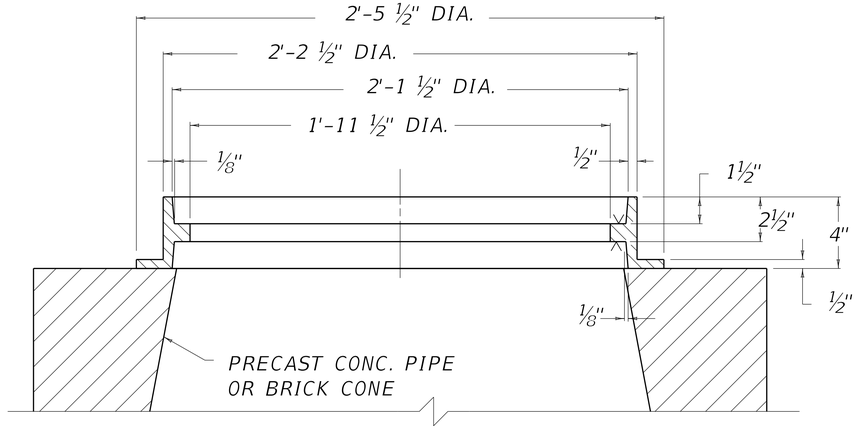
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

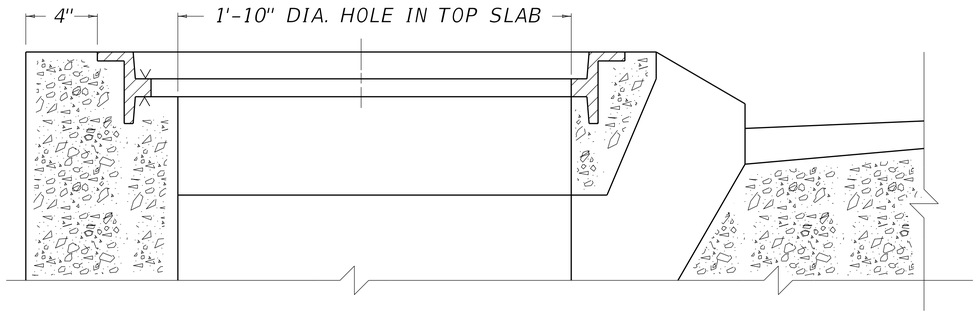
MANHOLE

STEPS

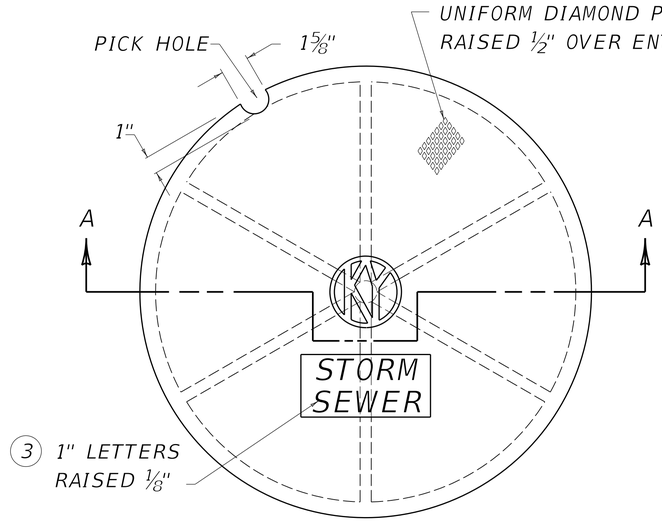
STANDARD DRAWING NUMBER
RDM-055-00



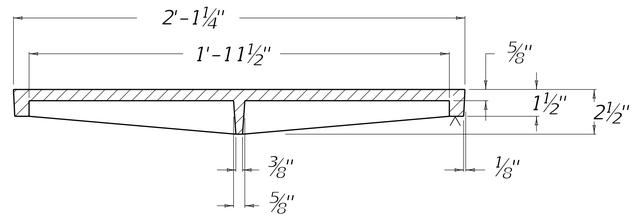
SECTION OF FRAME
WHEN USED WITH MANHOLES



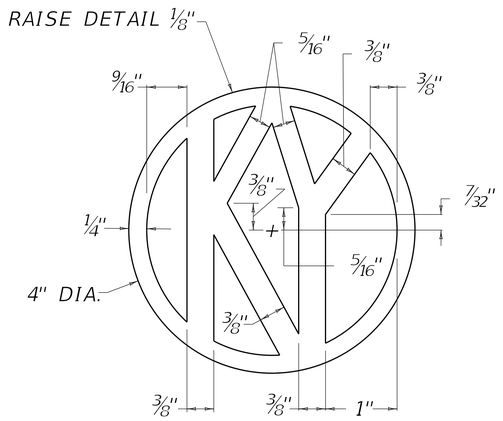
SECTION OF FRAME WHEN
USED WITH CURB BOX INLET



PLAN VIEW



SECTION A-A



DETAIL OF "KY"

APPROX. WEIGHT	
FRAME	90 LBS.
LID	116 LBS.

~ 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.

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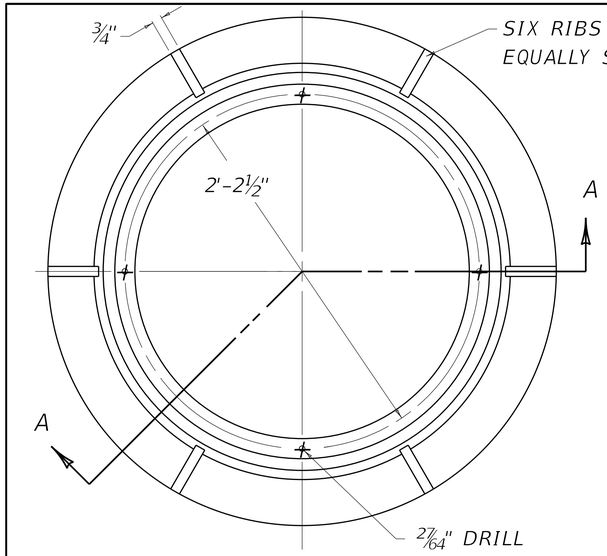
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

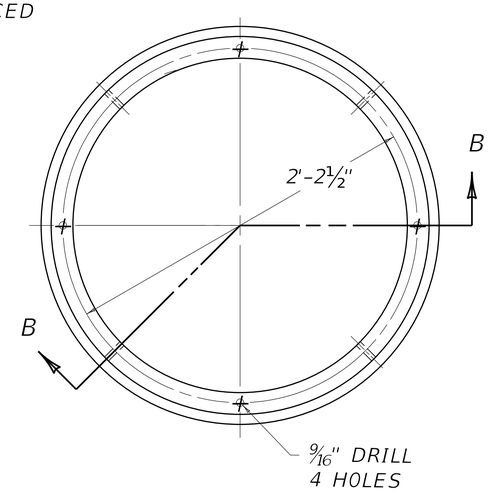
MANHOLE

FRAME AND LID TYPE 1

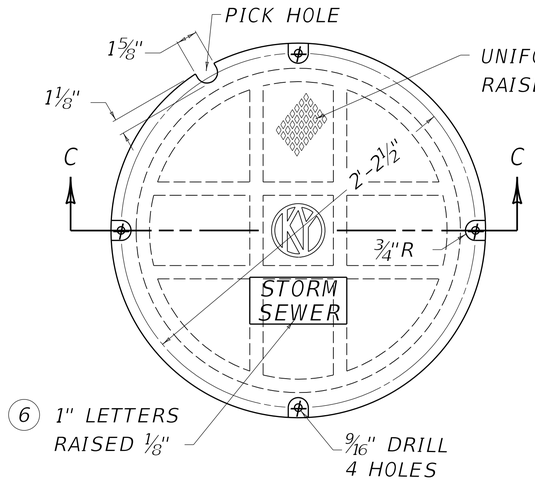
STANDARD DRAWING NUMBER
RDM-100-03



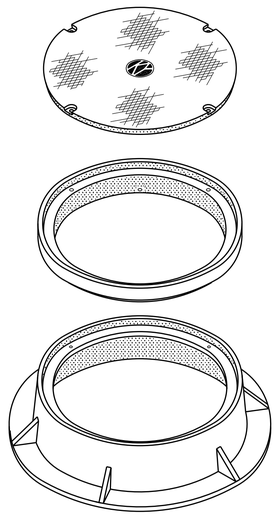
PLAN VIEW



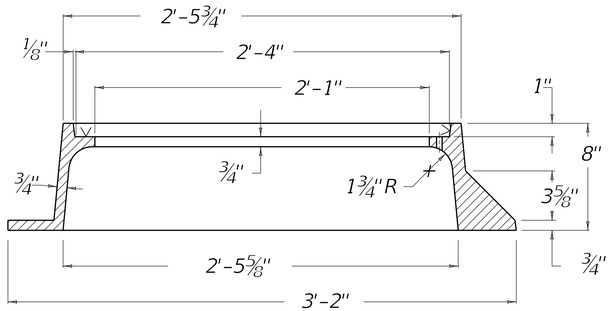
PLAN VIEW



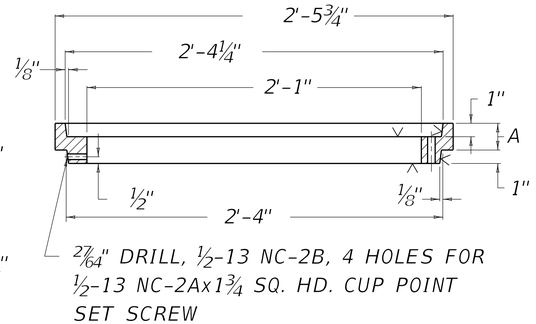
PLAN VIEW



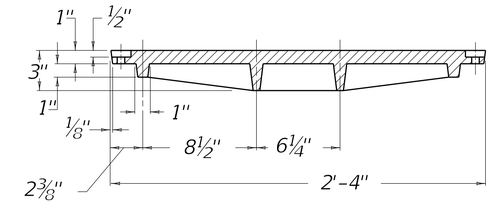
ISOMETRIC
EXPLODED VIEW



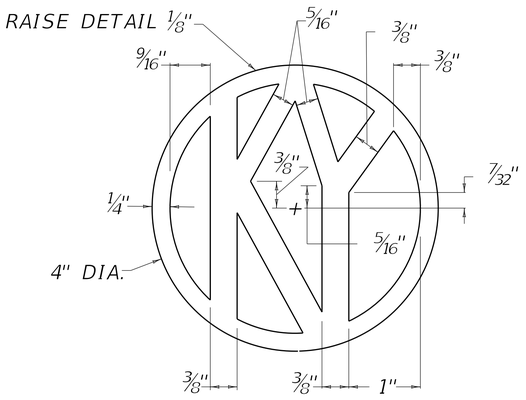
FRAME
SECTION A-A



ADJUSTING RING
SECTION B-B



LID
SECTION C-C



DETAIL OF "KY" SYMBOL

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 " ∨ " 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.

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED William S. Haddad 12-01-2015
DIVISION DIRECTOR DATE

APPROVED [signature] 12-01-2015
STATE HIGHWAY ENGINEER DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

MANHOLE

FRAME AND LID TYPE 2

STANDARD DRAWING NUMBER
RDM-105-03

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

REVISION DATE: 12/01/2015
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SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

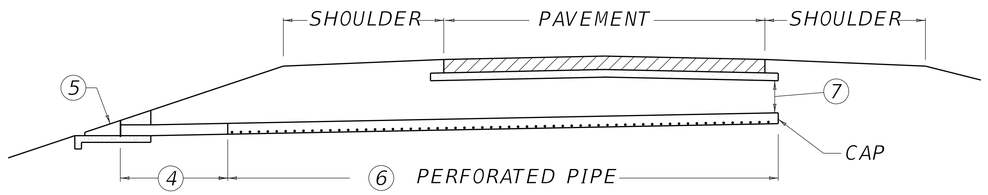
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

PERFORATED PIPE

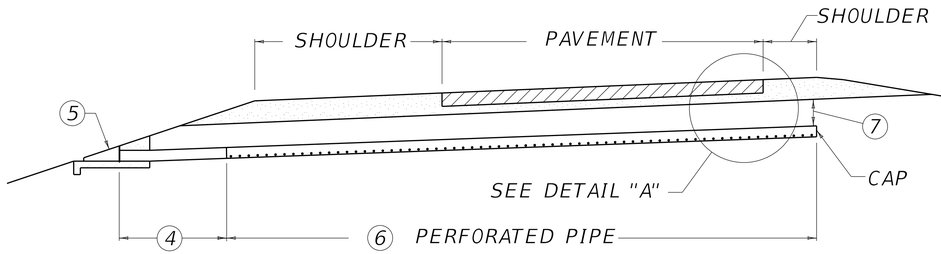
TYPES AND COVER HEIGHTS

STANDARD DRAWING NUMBER
RDP-001-06

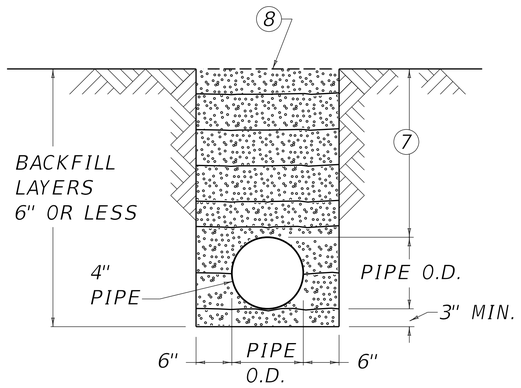
TYPICAL SUBGRADE DRAINAGE LOCATIONS



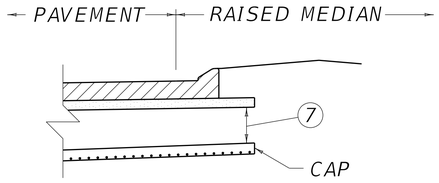
TANGENT SECTION - TWO LANE



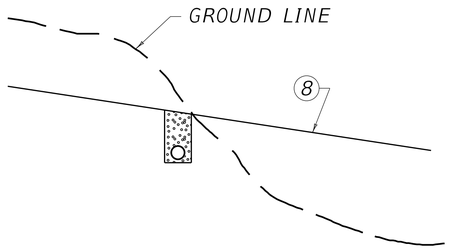
TANGENT SECTION - MULTI LANE



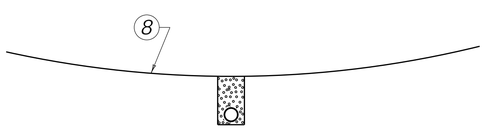
TRENCH DETAIL



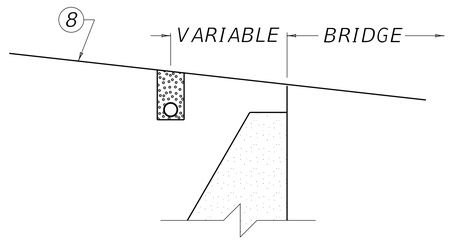
RAISED MEDIAN
DETAIL "A"



CUT TO FILL



SAG VERTICAL CURVES



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

REVISION DATE: 12/01/2015
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SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

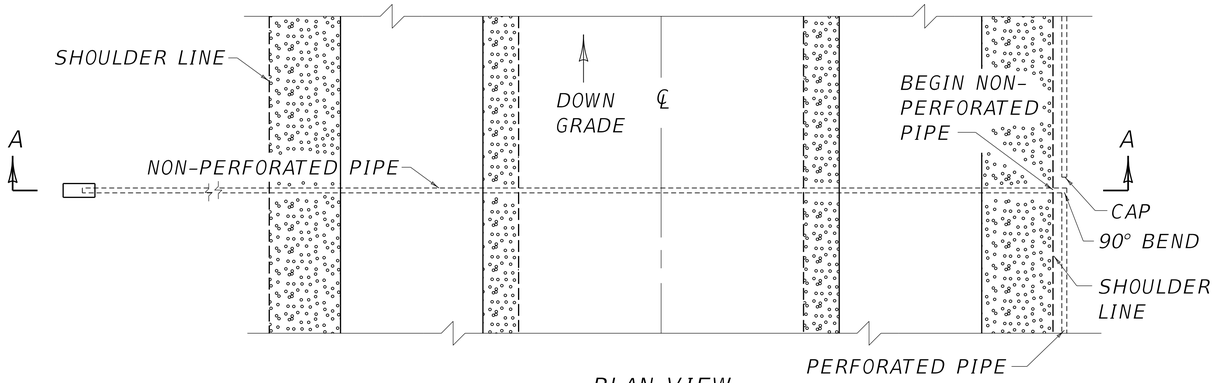
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

PERFORATED PIPE

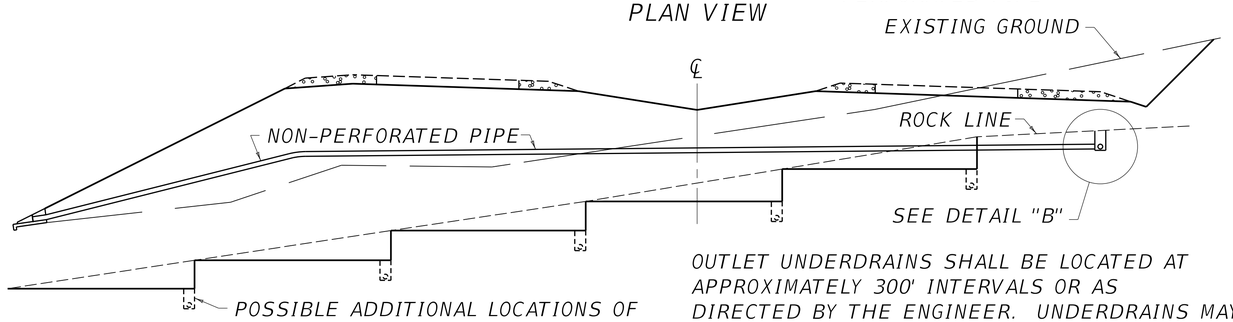
SUBGRADE DRAINAGE ON TWO-LANE (CLASS 2) AND MULTI-LANE ROADS

STANDARD DRAWING NUMBER
RDP-005-05

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

~ NOTES ~

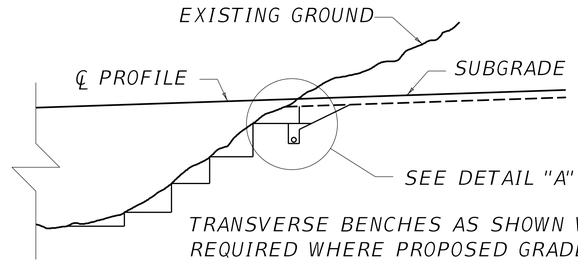
BID ITEMS AND UNIT TO BID	
ROADWAY EXCAVATION	CUYD
PERFORATED PIPE- △ IN	LF
NON-PERFORATED PIPE- △ IN	LF

△ = PIPE DIA. IN INCHES

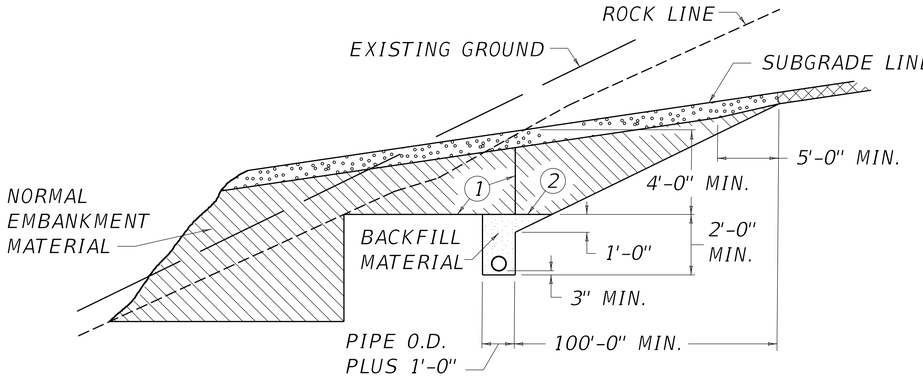
1. LIMITS OF FIRST BENCH.
2. UPPER LIMITS OF STRUCTURE EXCAVATION.
3. ALL PERFORATED PIPE SHALL COMPLY WITH THE STANDARD SPECIFICATIONS.
4. ALL NON-PERFORATED PIPE SHALL BE THE SAME TYPE AS THE PERFORATED PIPE, EXCEPT WITHOUT PERFORATIONS.
5. THE EXCAVATION NECESSARY TO FORM THE BENCHES SHALL BE PAID 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

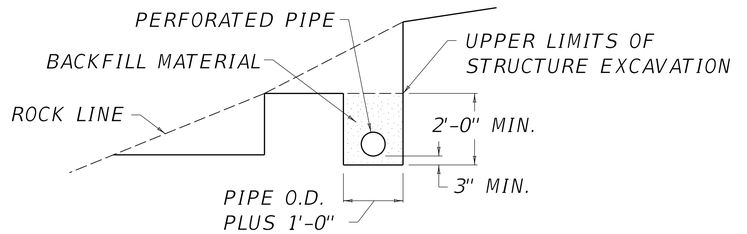
DETAIL FOR TRANSVERSE UNDERDRAIN CUT TO FILL CONDITION



TRANSVERSE BENCHES AS SHOWN WILL BE REQUIRED WHERE PROPOSED GRADE INTERSECTS THE EXISTING GROUND.



DETAIL "A"



DETAIL "B"

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

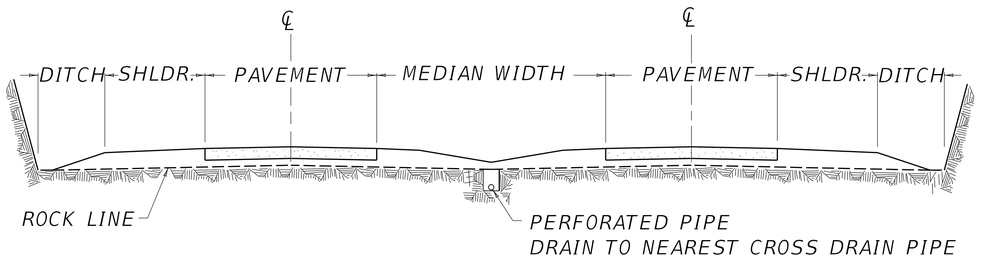
PERFORATED PIPE

UNDERDRAINS (LONGITUDINAL AND TRANSVERSE)

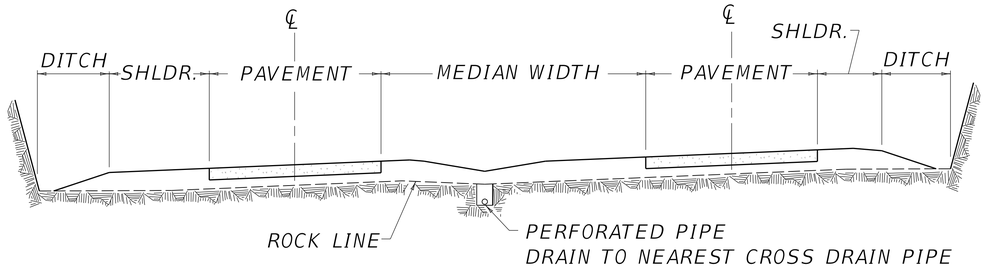
STANDARD DRAWING NUMBER
RDP-006-04

SECTIONS IN SOLID ROCK CUTS

DEPRESSED MEDIAN 36 FEET AND OVER

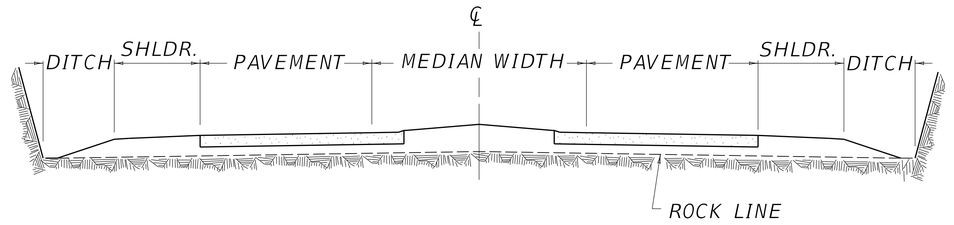


NORMAL SECTION

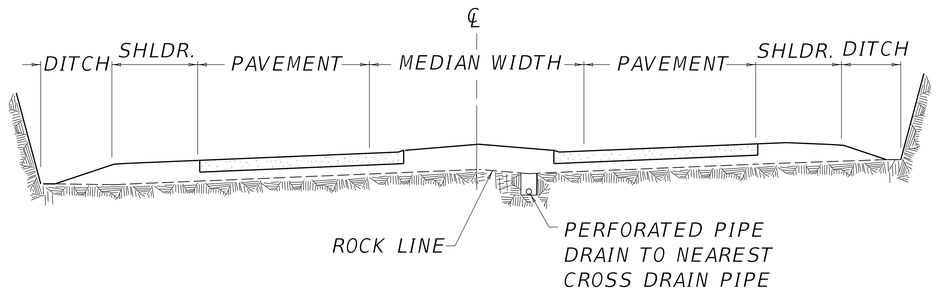


SUPERELEVATED SECTION

RAISED MEDIAN UNDER 36 FEET

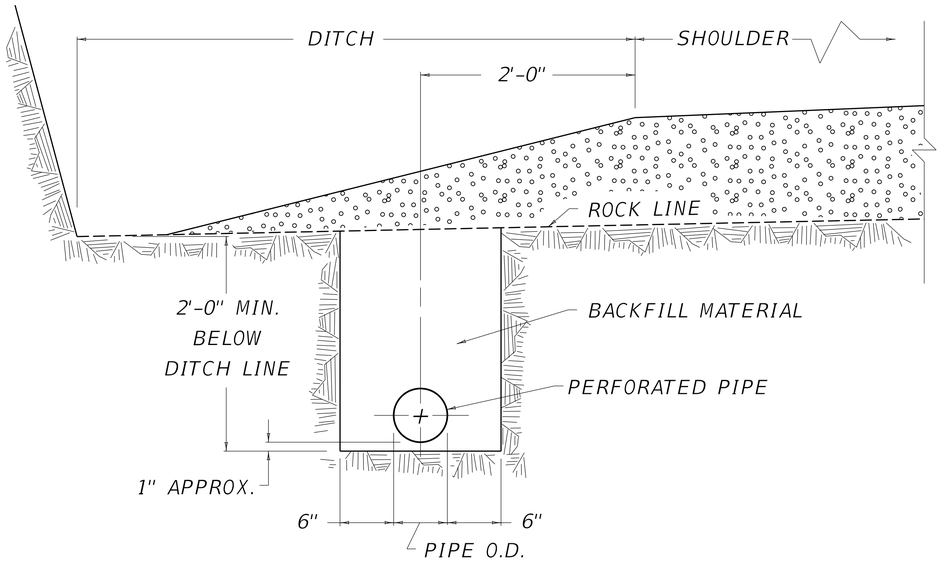


NORMAL SECTION

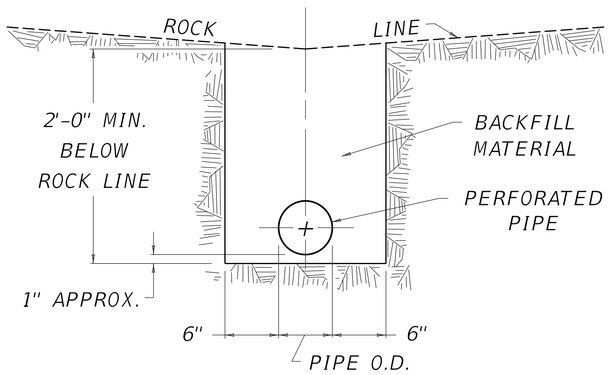


SUPERELEVATED SECTION

SUPERELEVATED SECTION



PERFORATED PIPE AT DITCH-SHOULDER LOCATION



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

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DRAINAGE

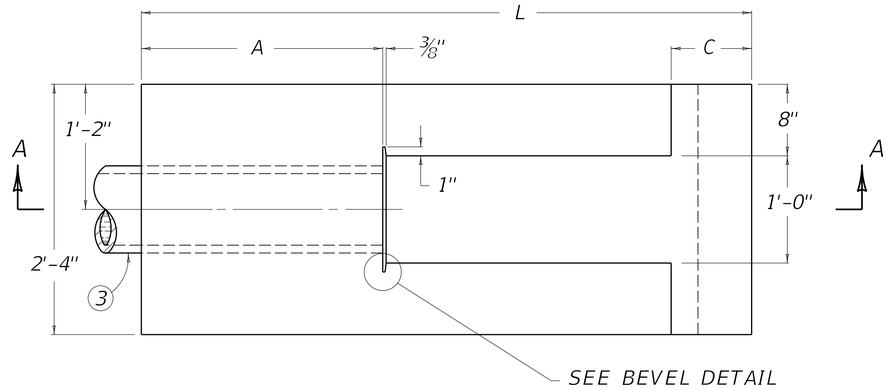
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY Transportation Cabinet

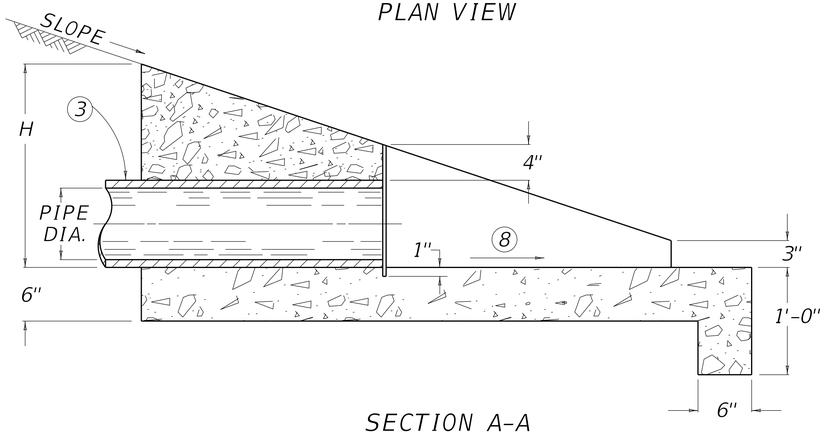
PERFORATED PIPE

SOLID ROCK DETAIL

STANDARD DRAWING NUMBER
RDP-007-04



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.

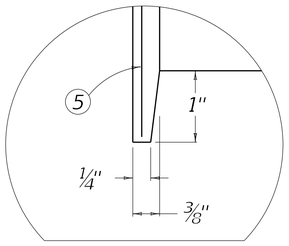
6. THE SLOT IS TO BE CONSTRUCTED SO THAT THE MESH CAN BE REMOVED FOR CLEANOUT PURPOSES.

(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)

USE WITH CUR. STD. DWG.
RDP-005



(7) BEVEL DETAIL

PICTORIAL VIEW

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

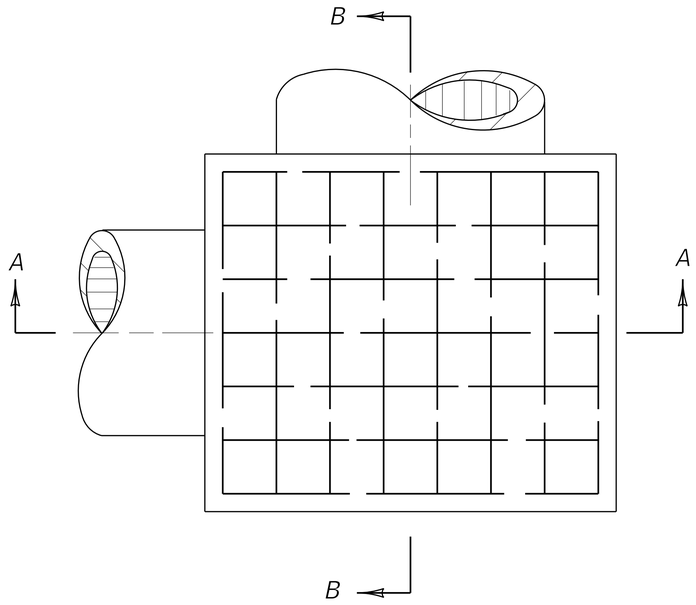
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

PERFORATED PIPE HEADWALLS

STANDARD DRAWING NUMBER
RDP-010-09



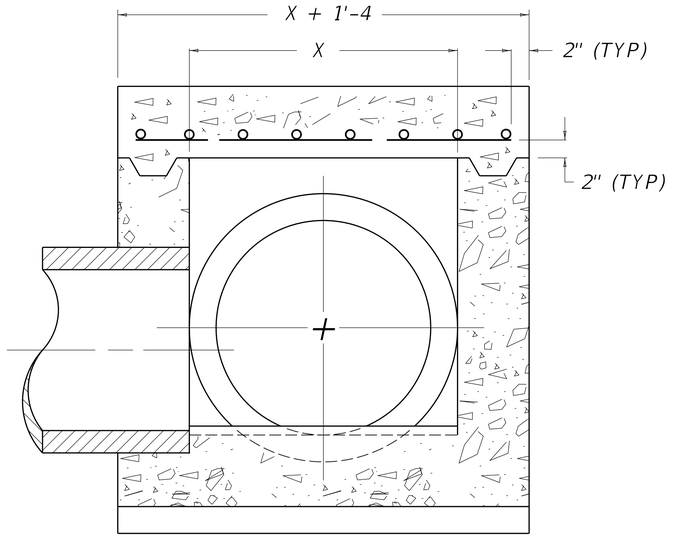
PLAN VIEW

~ NOTES ~

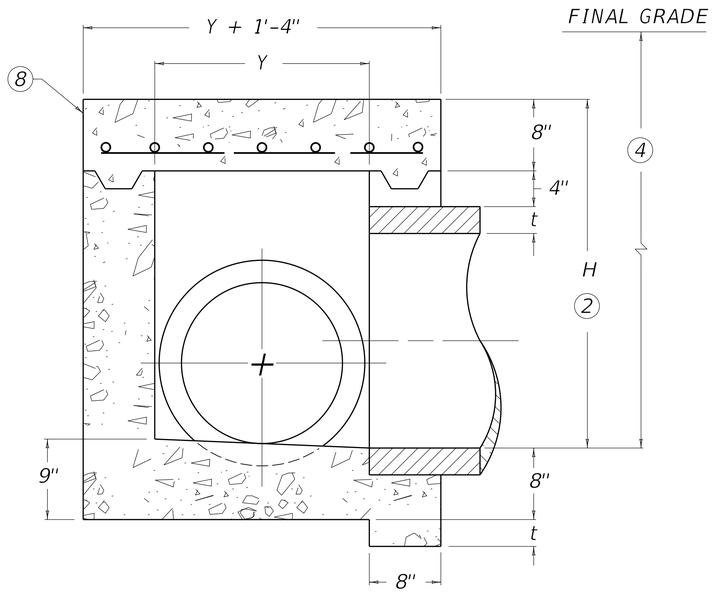
BID ITEM AND UNIT TO BID
JUNCTION BOX EACH

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 + t + 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.

USE WITH CUR. STD. DWG.
RDX-002



SECTION A-A



SECTION B-B

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

MISCELLANEOUS

JUNCTION BOX

STANDARD DRAWING NUMBER
RDX-001-06

DIMENSIONS AND ESTIMATE OF QUANTITIES

INLET SIZE			PIPE	(1)	CONCRETE		REINF. STEEL
NO.	X	Y	MAX. DIA.	H	CU. YDS.	(2) Q	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"	2'-6"	21"	3'-0"	1.35		32
5					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

INLET SIZE			PIPE	(1)	CONCRETE		REINF. STEEL
NO.	X	Y	MAX. DIA.	H	CU. YDS.	(2) Q	LBS.
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
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

~ NOTES ~

(1) BASED ON "H" AS EQUAL TO D+t+1'-0".

(2) "Q" = CU. YDS. OF CONCRETE PER FOOT INCREASE OR DECREASE WHEN "H" VARIES FROM D+t+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

REFERENCE CHART

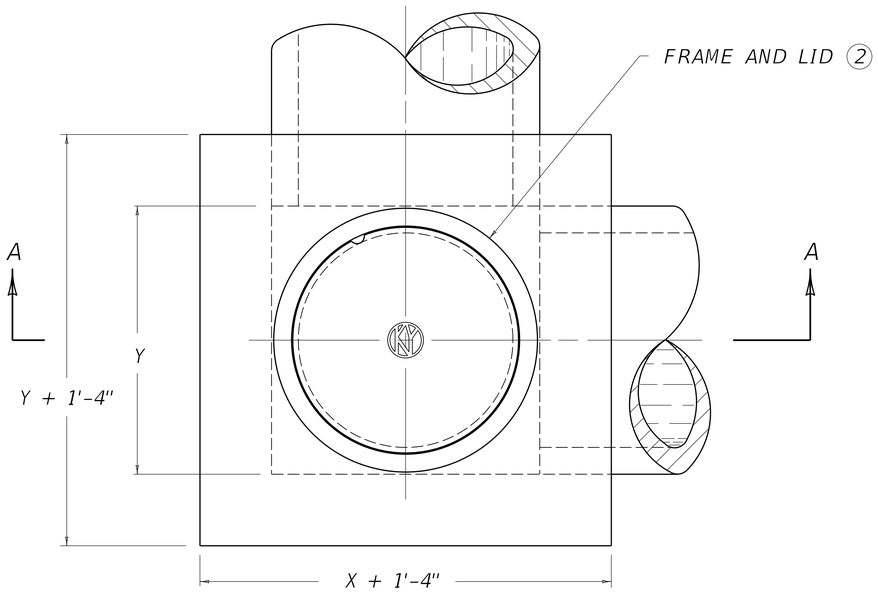
DIA. OF PIPE	JUNCTION BOX		CONCRETE TO DEDUCT FOR EACH PIPE
	PIPE ON "X" SIDE OF BOX	PIPE ON "Y" SIDE OF BOX	CU. YDS.
0	2'-0"	2'-0"	---
12"			0.1
15"-18"			
21"-24"	2'-6"	2'-6"	
27"	3'-0"	3'-0"	0.2
30"-33"	3'-6"	3'-6"	
36"	4'-0"	4'-0"	0.3
42"	4'-6"	4'-6"	0.4
48"	5'-0"	5'-0"	0.5
54"	5'-6"	5'-6"	0.6
60"	6'-0"	6'-0"	0.7
66"	7'-0"	7'-0"	0.8
72"	7'-6"	7'-6"	1.0

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

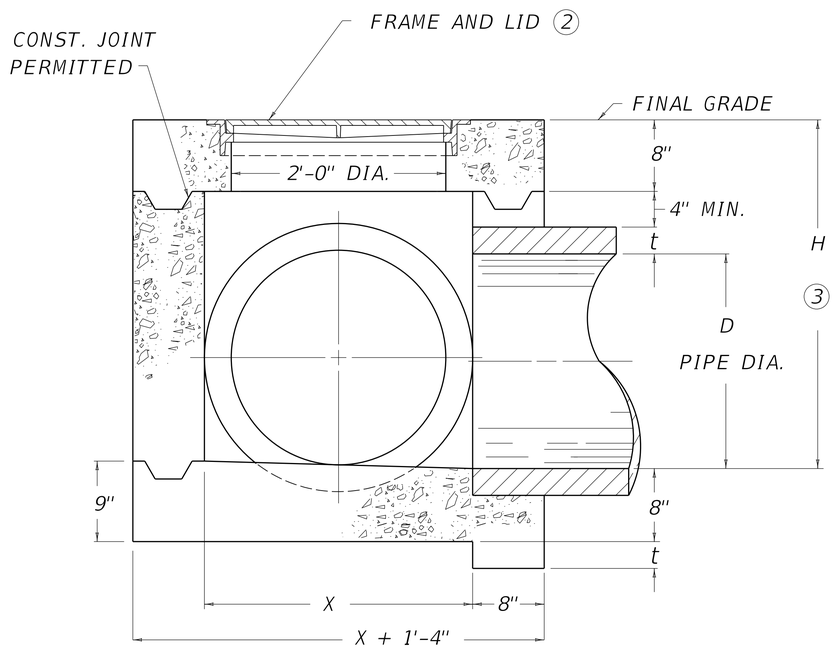
SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE



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 + t + 1'-0".

(5) "Q" = CUBIC YARDS OF CONCRETE PER FOOT INCREASE OR DECREASE WHEN "H" VARIES FROM D + t + 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.

USE WITH CUR. STD. DWGS.
RDM-100 RDM-105

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"	

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

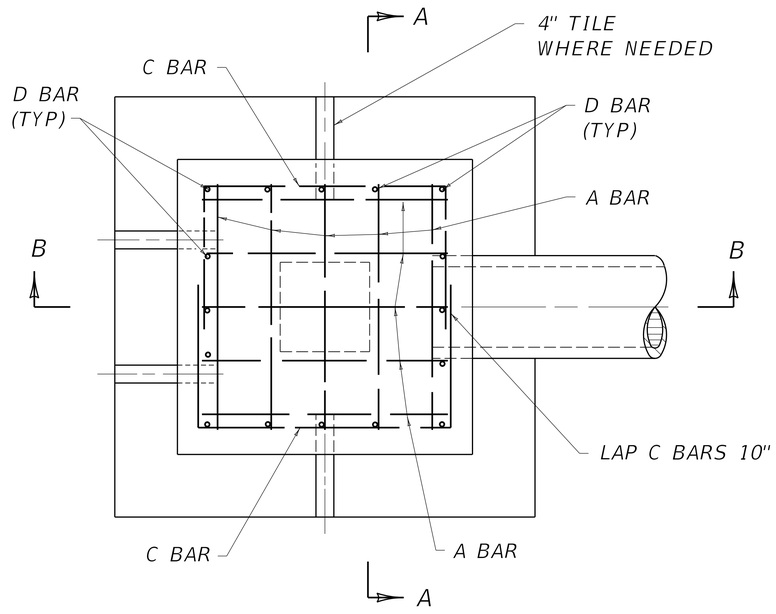
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

MISCELLANEOUS

JUNCTION BOX TYPE B

STANDARD DRAWING NUMBER
RDX-005-03



PLAN VIEW

~ NOTES ~

BID ITEM AND UNIT TO BID
SPRING BOX INLET TYPE A EACH

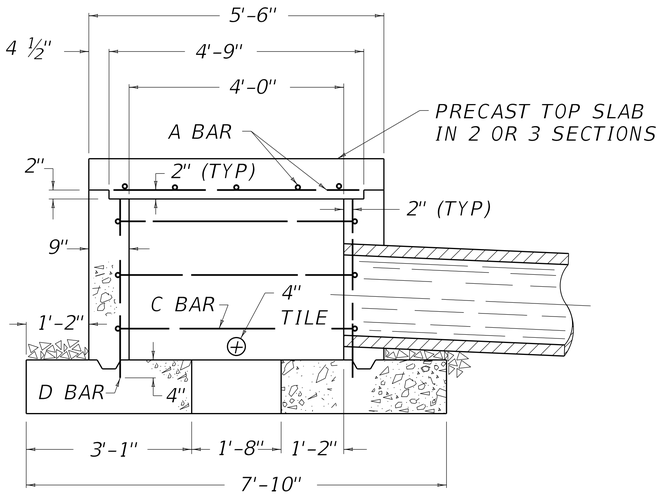
1. LOCATION OF OPENING MAY BE DETERMINED IN THE FIELD FOR A SIDE OR BOTTOM SPRING INLET.
2. SPRING INLET TYPE "A" SHALL BE USED WHEN FILL OVER TOP IS 10' OR MORE.

STEEL REINFORCEMENT

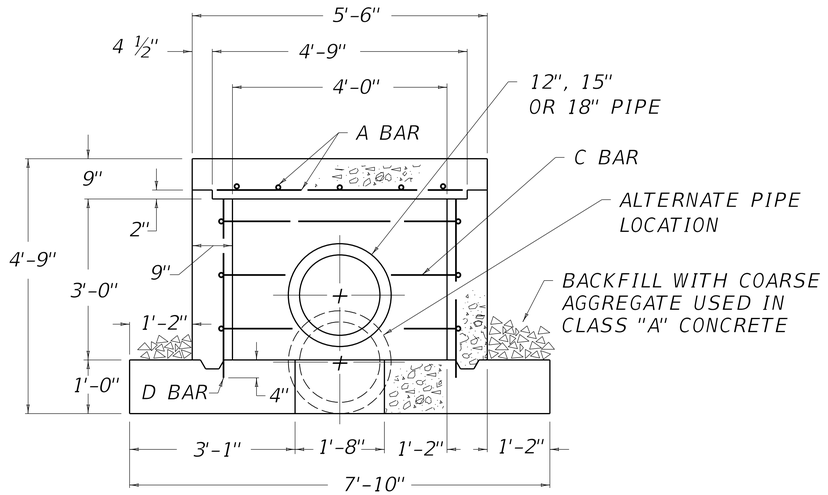
NO. 4 STEEL BARS			TOTAL LBS.
BAR	QTY.	LIN. FT.	
A	10	4'-7"	105
C	6	9'-9"	
D	16	3'-4"	

CLASS "A" CONCRETE

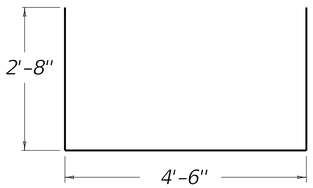
PIPE DIA.	CU. YDS. CONCRETE
12"	4.61
15"	4.59
18"	4.58



SECTION B-B



SECTION A-A



C BAR DETAIL

REVISION DATE:12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

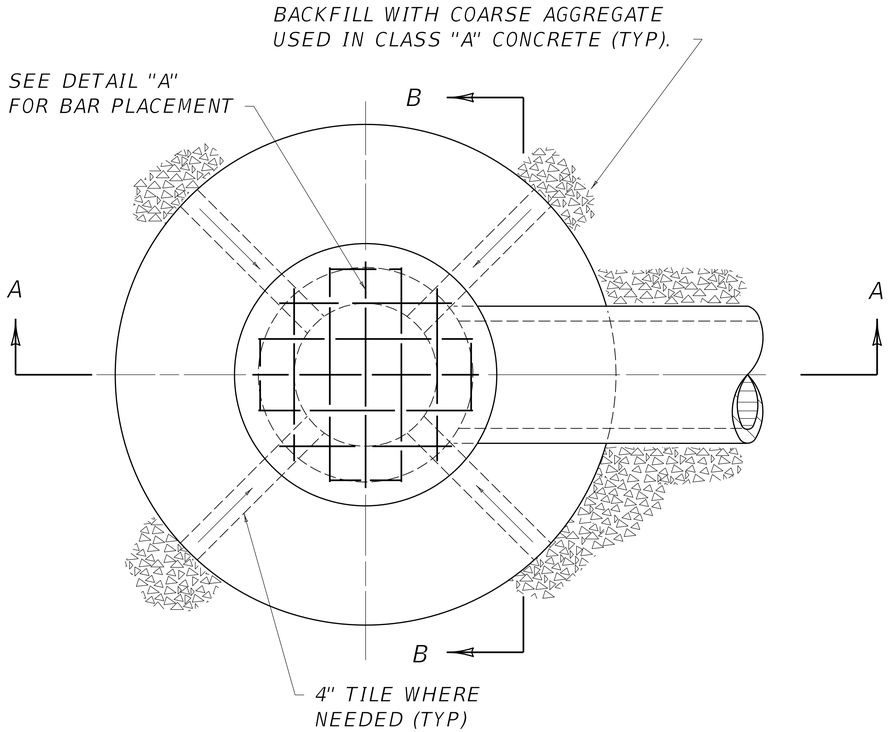
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

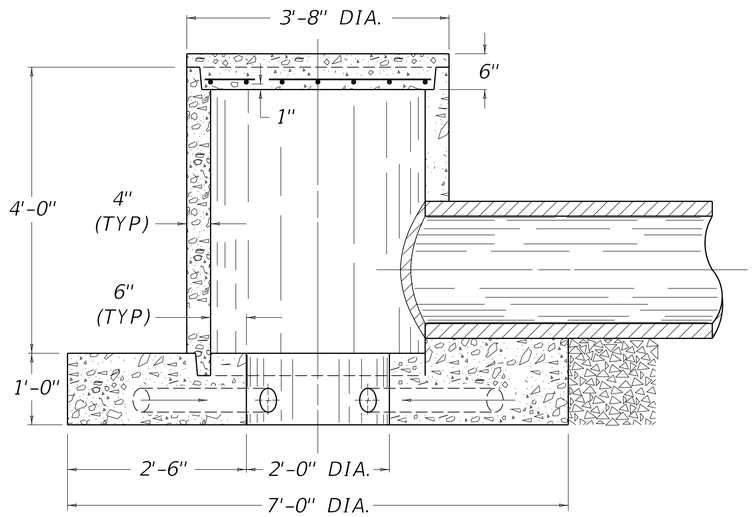
MISCELLANEOUS

SPRING BOX INLET TYPE A

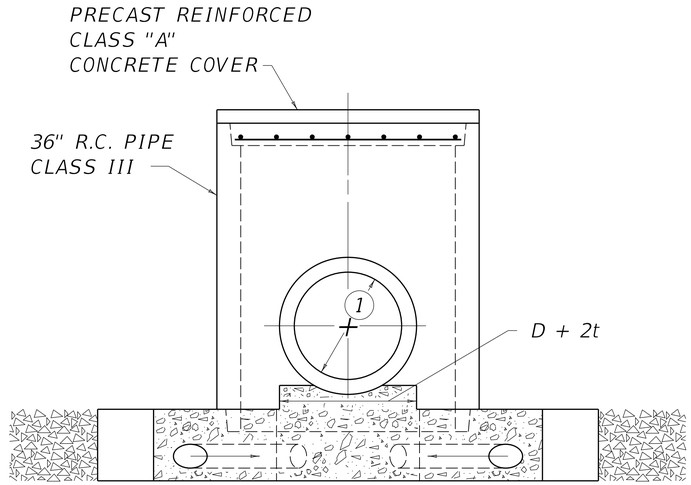
STANDARD DRAWING NUMBER
RDX-010-05



PLAN VIEW



SECTION A-A



SECTION B-B

~ NOTES ~

BID ITEM AND UNIT TO BID
SPRING BOX INLET TYPE B EACH

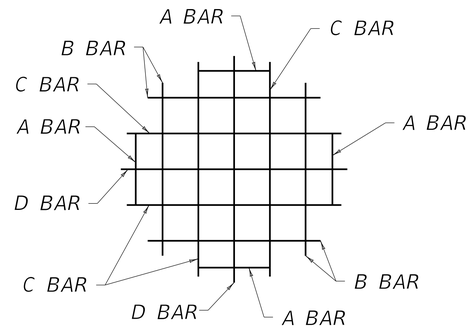
1. 12", 15", OR 18" DIAMETER PIPE OUTLET (SEE PIPE SECTIONS FOR SIZE AND TYPE). MORTAR AROUND PIPE TO PREVENT SEEPAGE.
2. SPRING BOX INLET TYPE "B" MAY BE USED WHEN FILL OVER TOP IS LESS THAN 10'-0".
3. STEEL REINFORCEMENT PLACED 6" ON CENTERS.
4. "t" IS CONCRETE PIPE WALL THICKNESS OR METAL PIPE CORRUGATION 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"

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED William S. Ballard 12-01-2015
DIVISION DIRECTOR DATE

APPROVED [signature] 12-01-2015
STATE HIGHWAY ENGINEER DATE

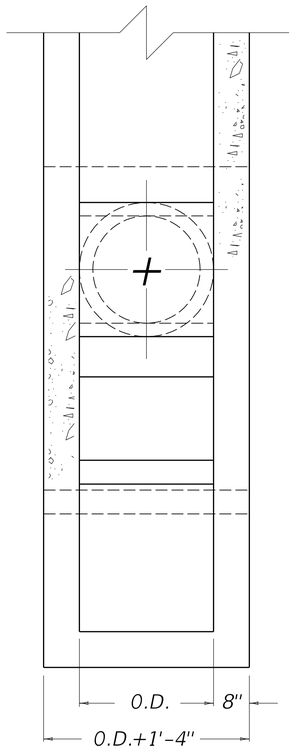
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

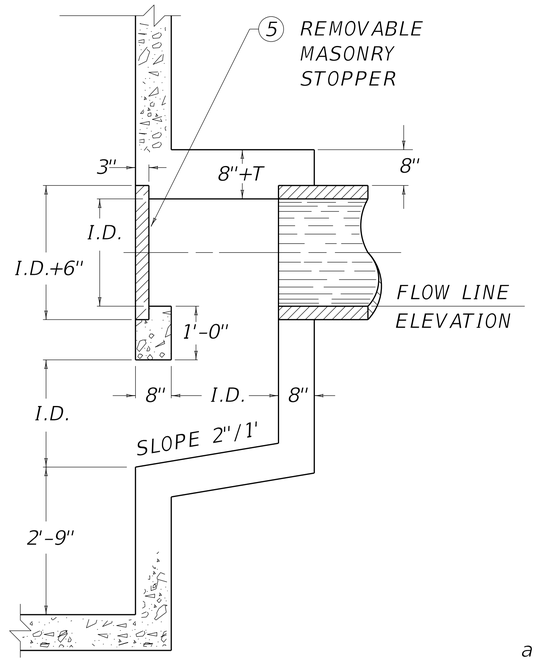
MISCELLANEOUS

SPRING BOX INLET TYPE B

STANDARD DRAWING NUMBER
RDX-011-05

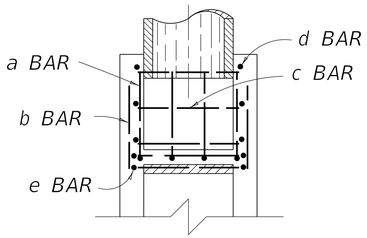


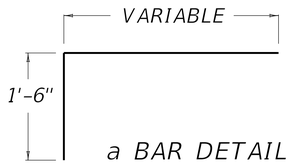
FRONT ELEVATION



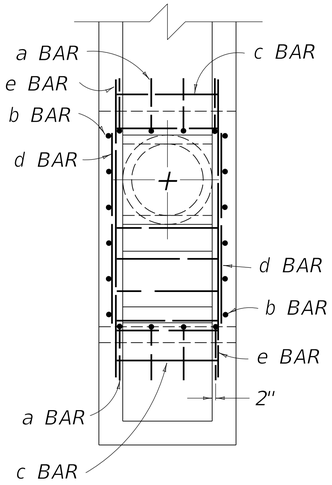
RIGHT SECTIONAL ELEVATION

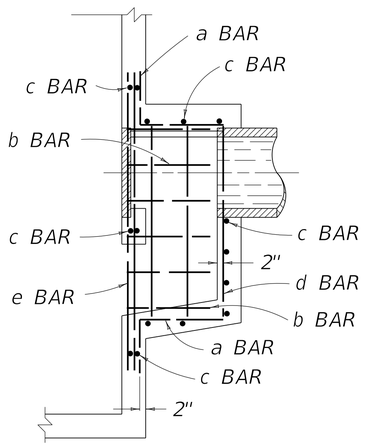
PIPE SIZE	NO. 5 REINFORCEMENT BARS QUANTITY – LENGTH AND WEIGHT										LBS.	CLASS A CONC.
	a		b		c		d		e			
	QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH	QTY.	LENGTH		CU.YDS.
12"	6	2'-10"	8	1'-4"	11	1'-8"	4	3'-4"	4	6'-4"	88	0.52
15"	6	3'-1"	10	1'-7"	12	2'-0"	4	3'-10"	4	6'-10"	105	0.69
18"	8	3'-4"	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



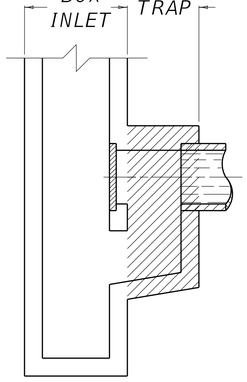


a BAR DETAIL





STEEL PATTERN



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.

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

DRAINAGE

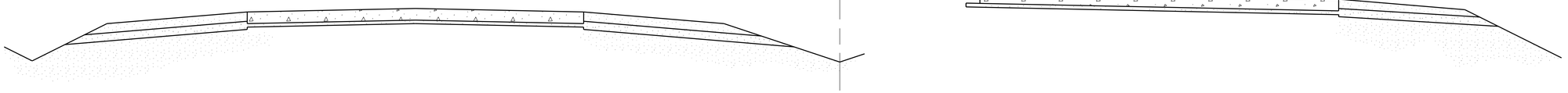
TYPICAL LATERAL SHOULDER DRAINS

FOUR LANE DIVIDED

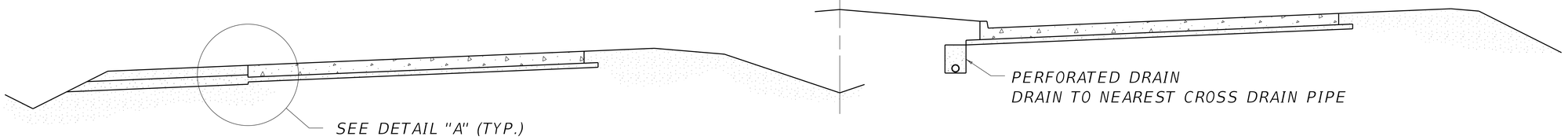
DEPRESSED MEDIAN

℄

RAISED MEDIAN

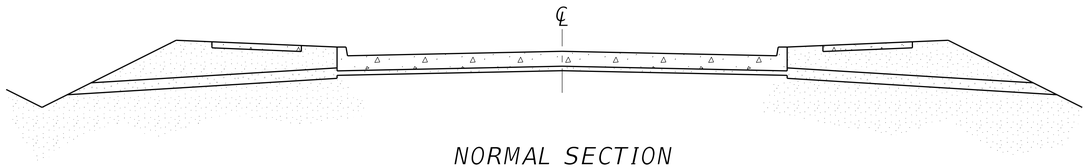


NORMAL SECTION

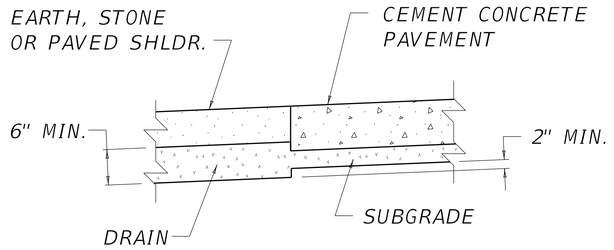


SUPERELEVATED SECTION

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.

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

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"

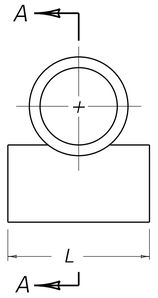
END ANCHOR FOR PIPE OUTLET (CLASS "A" CONCRETE)

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

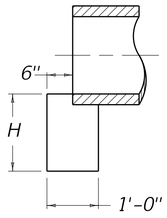
~ NOTES ~

BID ITEM AND UNIT TO BID
CONCRETE-CLASS "A" CUYD

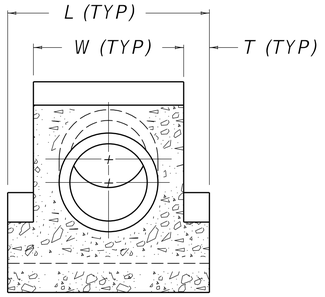
1. CIRCULAR PIPE INCLUDES SLIGHTLY ELLIPTICAL CONCRETE PIPE WITH CIRCULAR REINFORCEMENT.
2. THE VOLUME DISPLACED BY BARREL OF PIPE HAS BEEN COMPUTED USING INSIDE DIMENSION OF PIPE.
3. THE UNIT PRICE BID PER CU. YD. FOR CLASS "A" CONCRETE SHALL INCLUDE ALL FORMS, MATERIAL, LABOR, ETC. INCIDENTAL TO CONSTRUCTION.
4. FOR GRADE BREAKS IN PIPE, USE AVERAGE GRADE TO CALCULATE VOLUMES.



END ELEVATION

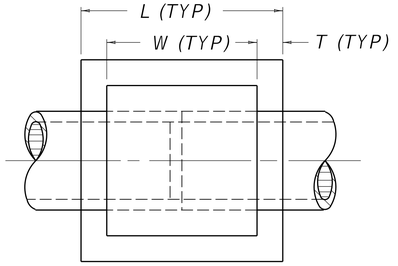


SECTION A-A

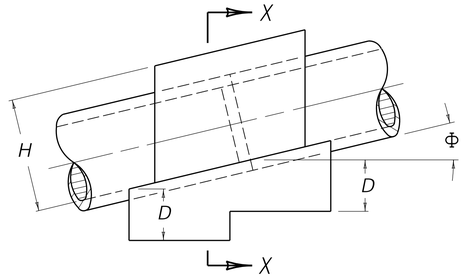


SECTION X-X

END ANCHOR FOR PIPE OUTLET



PLAN VIEW



ELEVATION VIEW

INTERMEDIATE ANCHOR

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

DRAINAGE

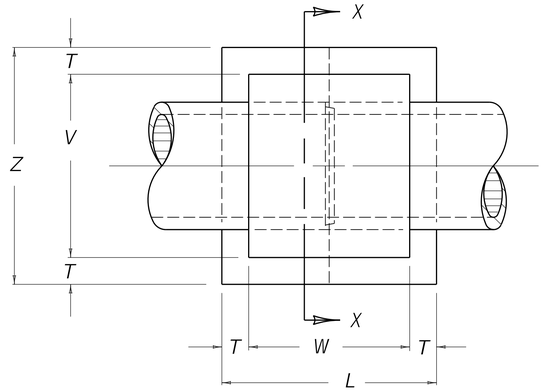
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY Transportation Cabinet

MISCELLANEOUS

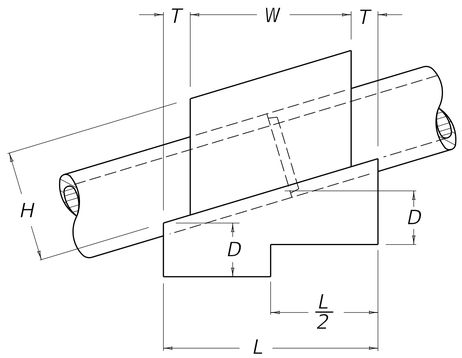
INTERMEDIATE AND END ANCHORS FOR CIRCULAR PIPE

STANDARD DRAWING NUMBER
RDX-060-04

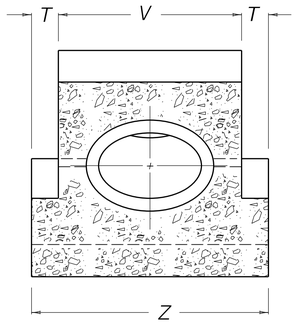
~INTERMEDIATE ANCHOR~



PLAN VIEW

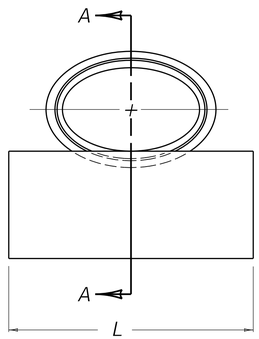


ELEVATION

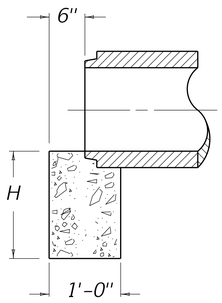


SECTION X-X

~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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED William S. Ballard 12-01-2015
DIVISION DIRECTOR DATE

APPROVED [signature] 12-01-2015
STATE HIGHWAY ENGINEER DATE

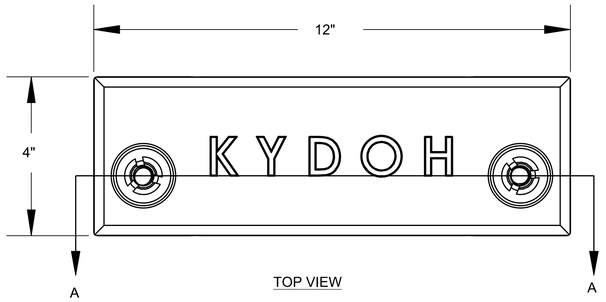
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

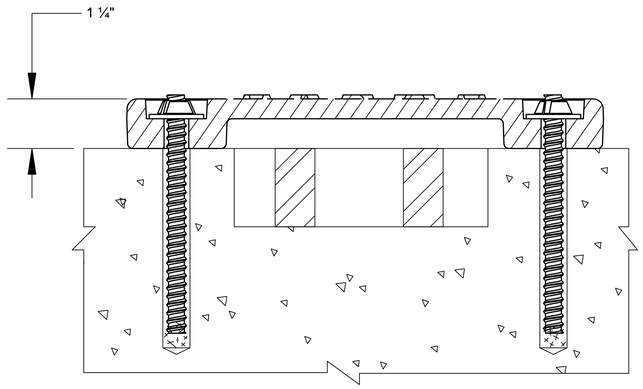
MISCELLANEOUS

INTERMEDIATE AND END ANCHORS FOR NON-CIRCULAR PIPES

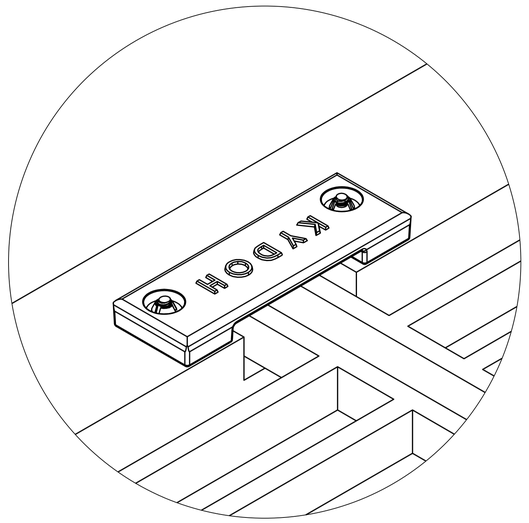
STANDARD DRAWING NUMBER
RDX-065-04



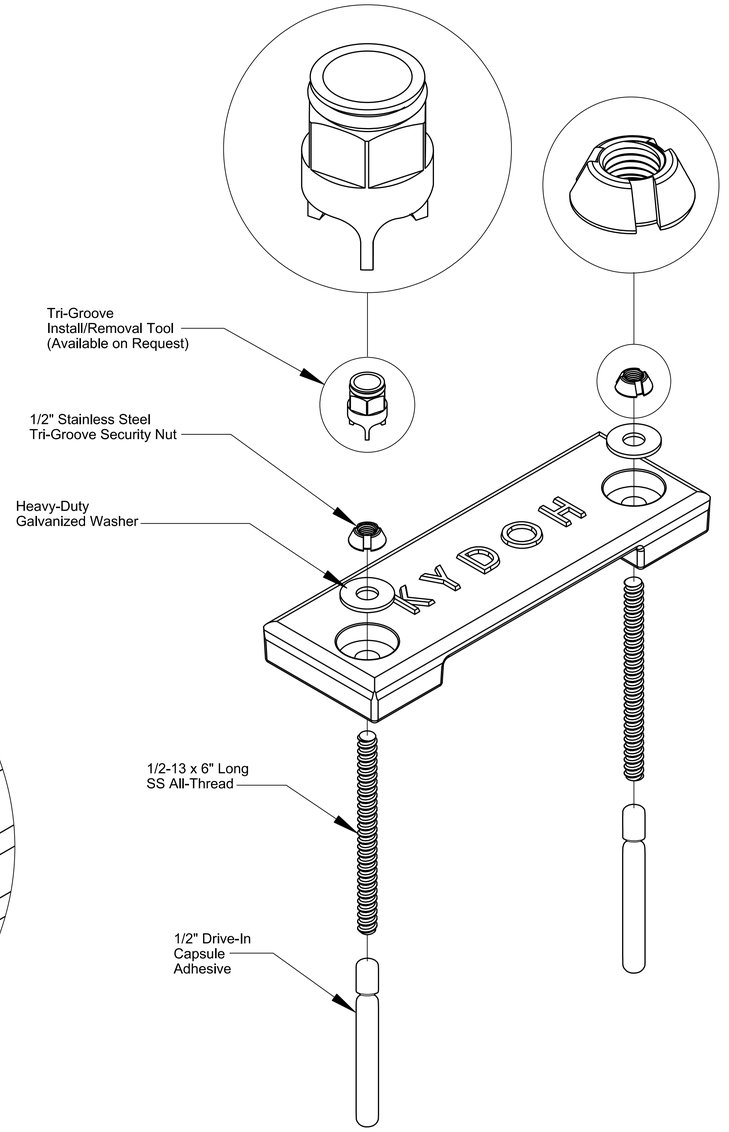
TOP VIEW



SECTION A-A



MOUNTED



BID ITEMS AND UNITS TO BID

24585EC SECURITY PLATE ASSEMBLY EACH

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED DIVISION DIRECTOR 08-11-2025 DATE

APPROVED STATE HIGHWAY ENGINEER 08-11-2025 DATE

DRAINAGE

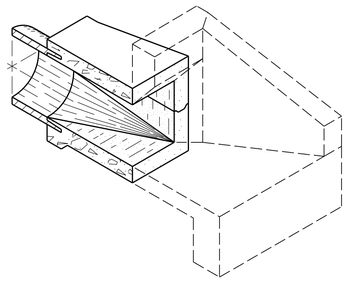
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

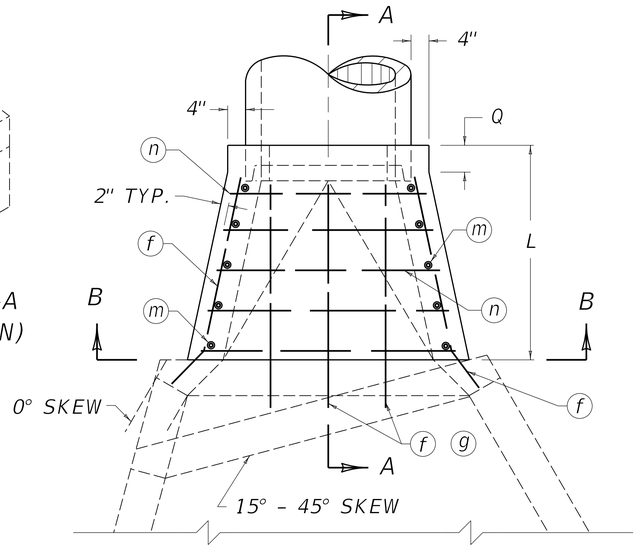
SECURITY PLATE

SECURITY PLATE ASSEMBLY

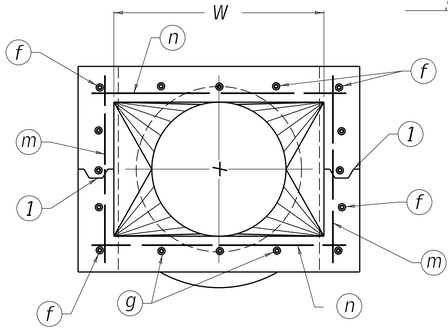
STANDARD DRAWING NUMBER
RDX-070



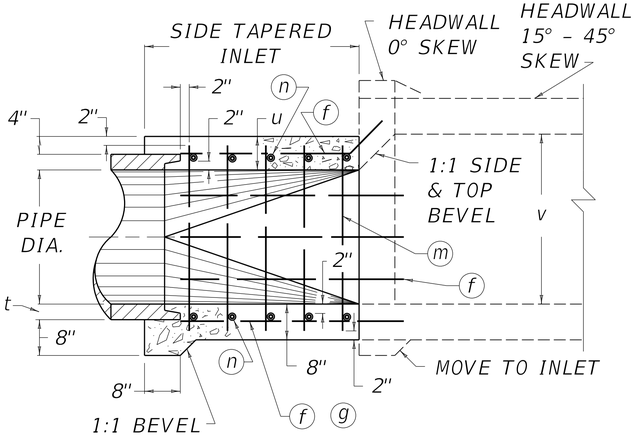
ISOMETRIC OF SECTION A-A
(0° SKEW HEADWALL SHOWN)



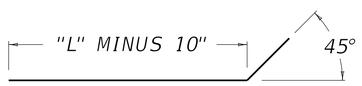
PLAN VIEW



SECTION B-B



SECTION A-A



f BAR DETAIL

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"	

~ NOTES ~

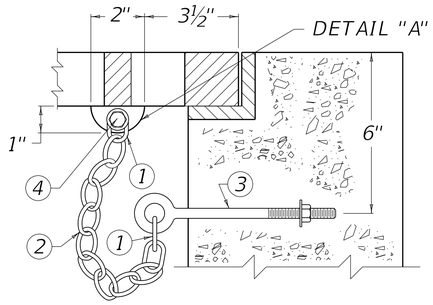
1. CONSTRUCTION JOINT PERMITTED.
2. THIS INLET SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CURRENT STANDARD SPECIFICATIONS.
3. SHOULD INLET DIMENSIONS CONFLICT WITH THOSE OF THE HEADWALL, THE INLET SHALL GOVERN.
4. INLET QUANTITIES SHALL BE COMBINED WITH HEADWALL QUANTITIES. NOTES SHALL APPEAR ON THE 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.

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

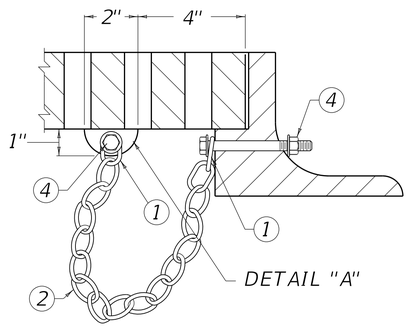
SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

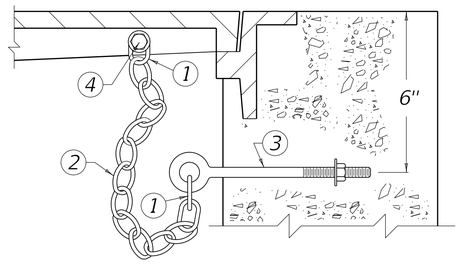
DRAINAGE



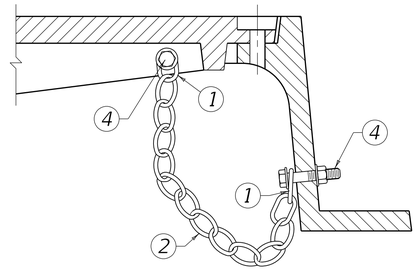
GRATE CONNECTED TO WALL



GRATE CONNECTED TO FRAME



LID CONNECTED TO WALL

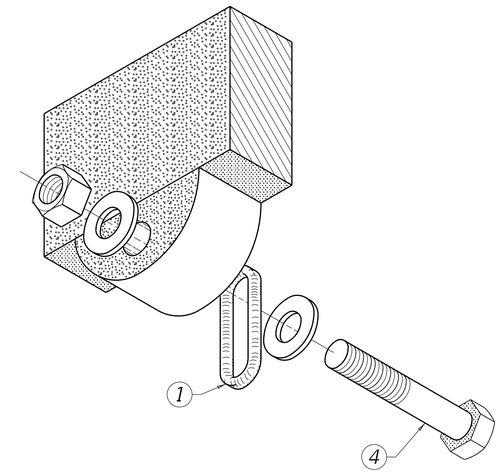


LID CONNECTED TO FRAME

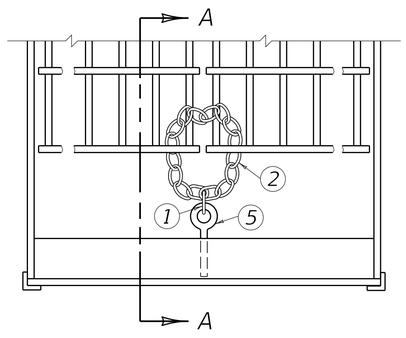
TYPICAL ILLUSTRATIONS FOR CASTINGS

~ NOTES ~

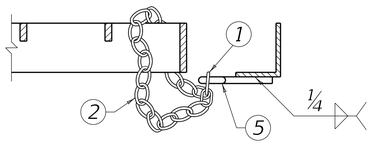
1. CHAIN SHACKLE, OR COLD SHUT OF AN APPROVED TYPE.
2. 3/16" PROOF COIL CHAIN OF SUFFICIENT LENGTH TO ALLOW REMOVAL AND DISPLACEMENT OF GRATE OR LID.
3. 3/8" x 6" EYE BOLT, NUT, AND WASHER.
4. 3/8" HEX HEAD CAP SCREW (GRADE 2), NUT AND WASHERS. LENGTH DETERMINED BY THICKNESS OF FRAME OR GRATE. 7/16" 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.



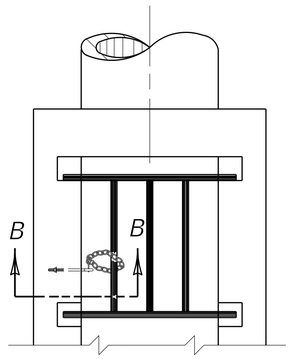
DETAIL Ⓐ
LUG ON CENTER CROSS MEMBER
AND BOLT ASSEMBLY
(AXONOMETRIC VIEW)



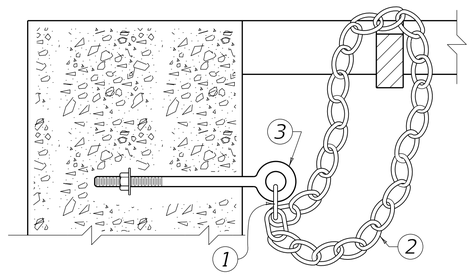
PLAN VIEW



SECTION A-A
GRATE CONNECTED TO FRAME



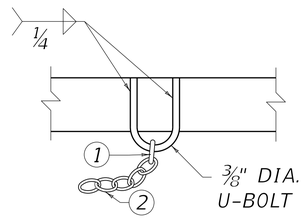
PLAN VIEW



SECTION B-B

GRATE CONNECTED TO WALL

TYPICAL ILLUSTRATIONS FOR STRUCTURAL STEEL UNITS



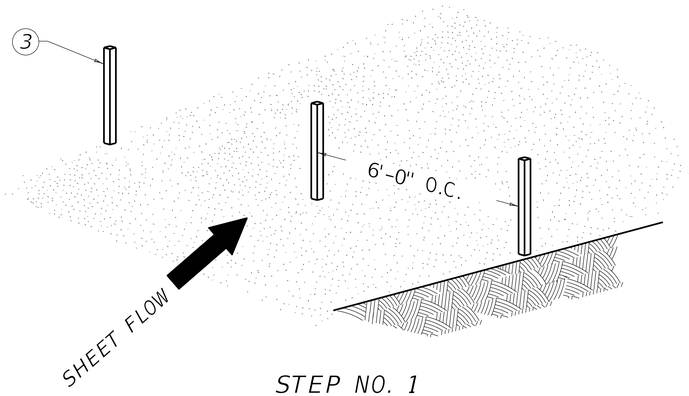
ALTERNATE FOR
STRUCTURAL STEEL
MEMBERS

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

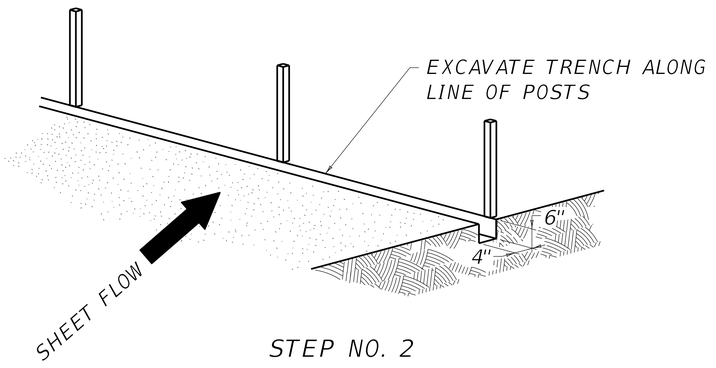
SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE



STEP NO. 1



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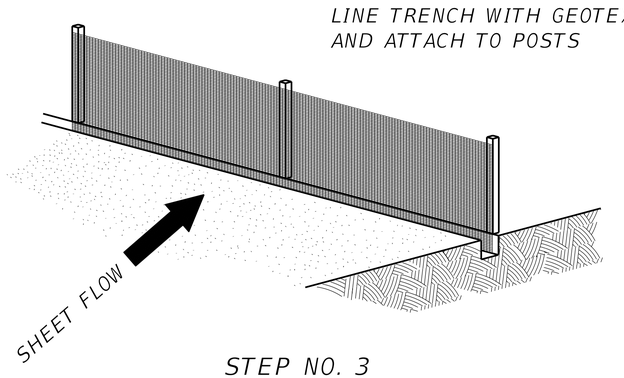

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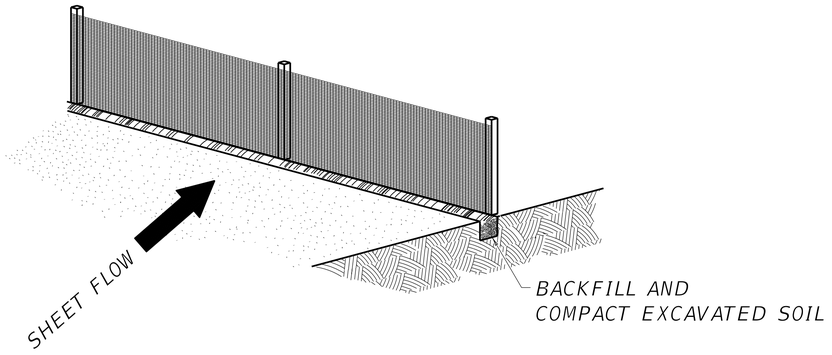

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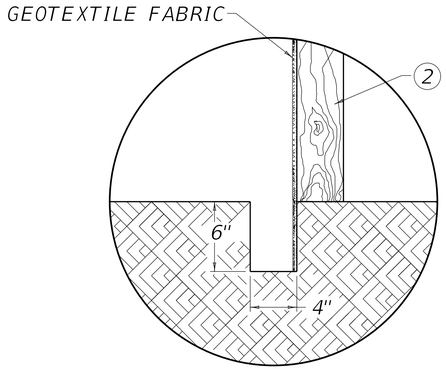

SECTIONAL DETAIL

~ 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.

REVISION DATE: 12/01/2015
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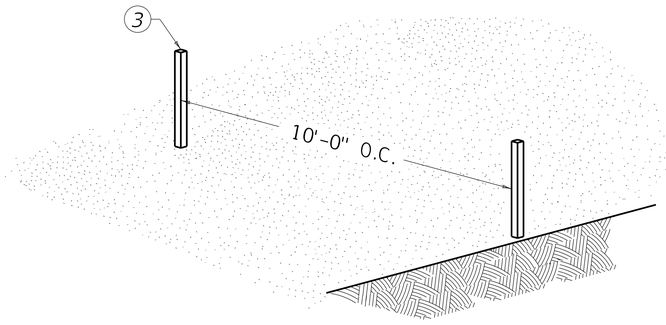
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

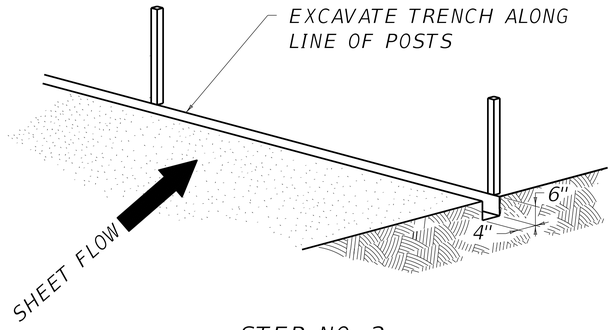
MISCELLANEOUS

TEMPORARY SILT FENCE

STANDARD DRAWING NUMBER
RDX-210-03



STEP NO. 1



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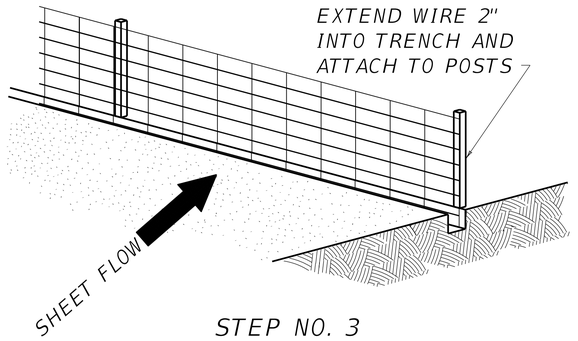

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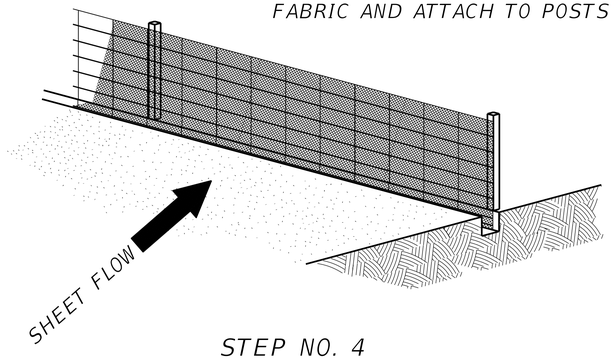

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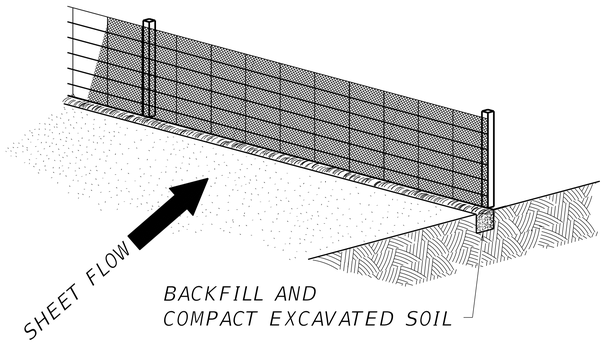

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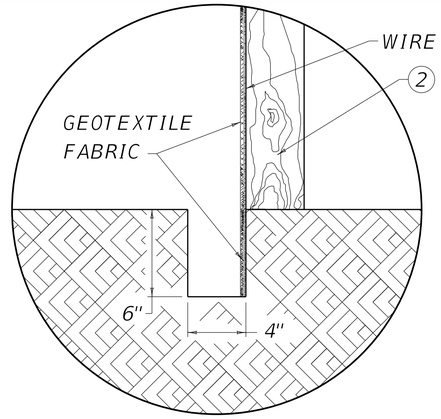


SECTIONAL DETAIL

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

~ 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.

DRAINAGE

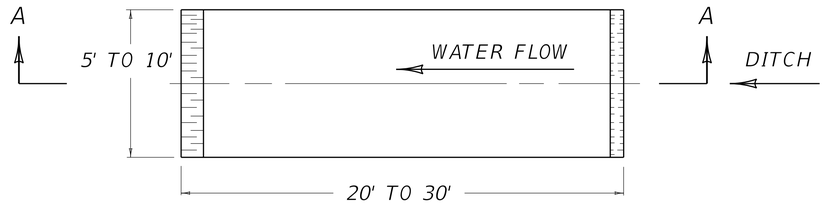
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

MISCELLANEOUS

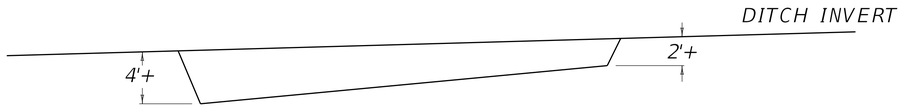
TEMPORARY SILT FENCE WITH WOVEN WIRE FENCE FABRIC

STANDARD DRAWING NUMBER
RDX-215-01

ALTERNATE NO. 1

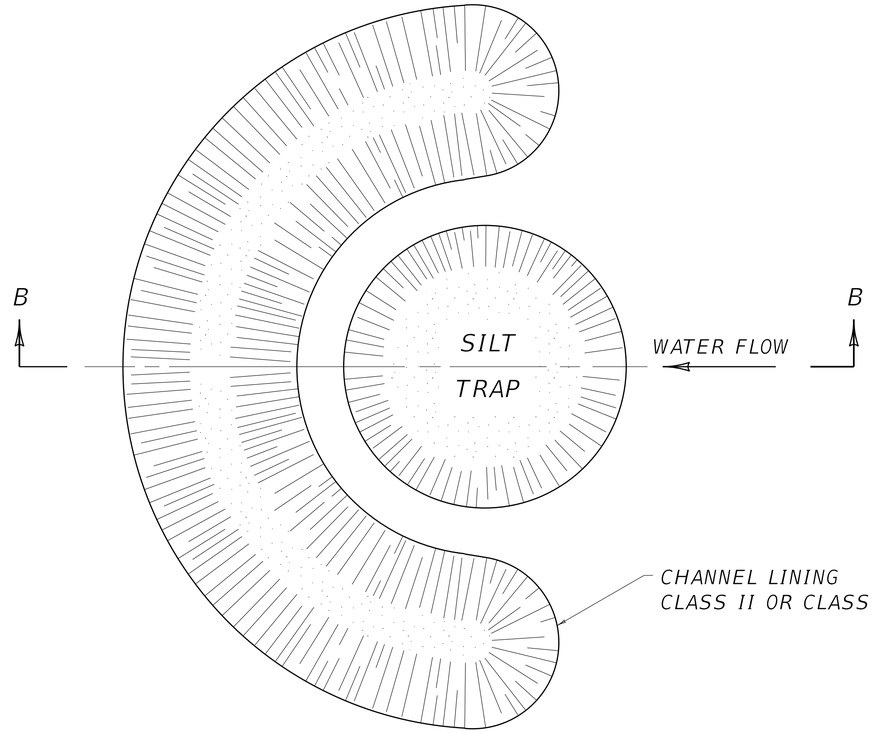


PLAN VIEW

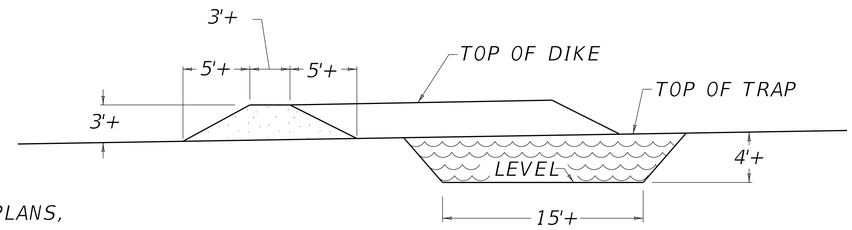


SECTION A-A

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.

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

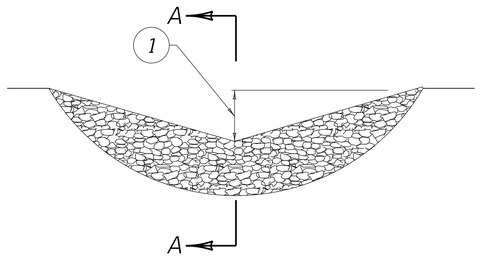
DRAINAGE

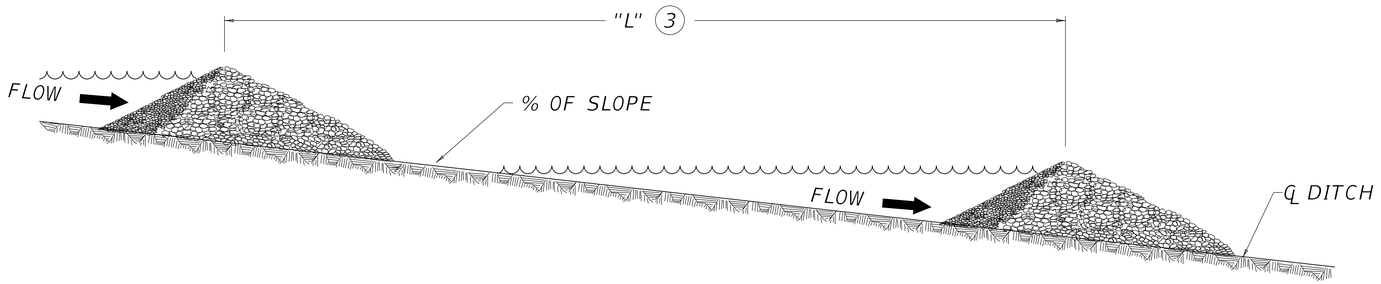
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

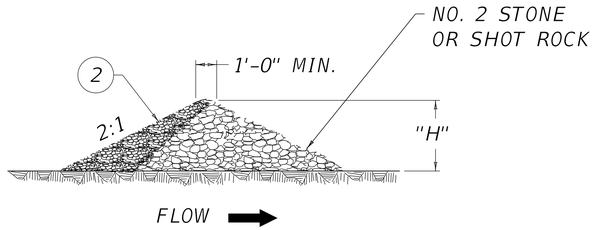
MISCELLANEOUS

SILT TRAP TYPE A

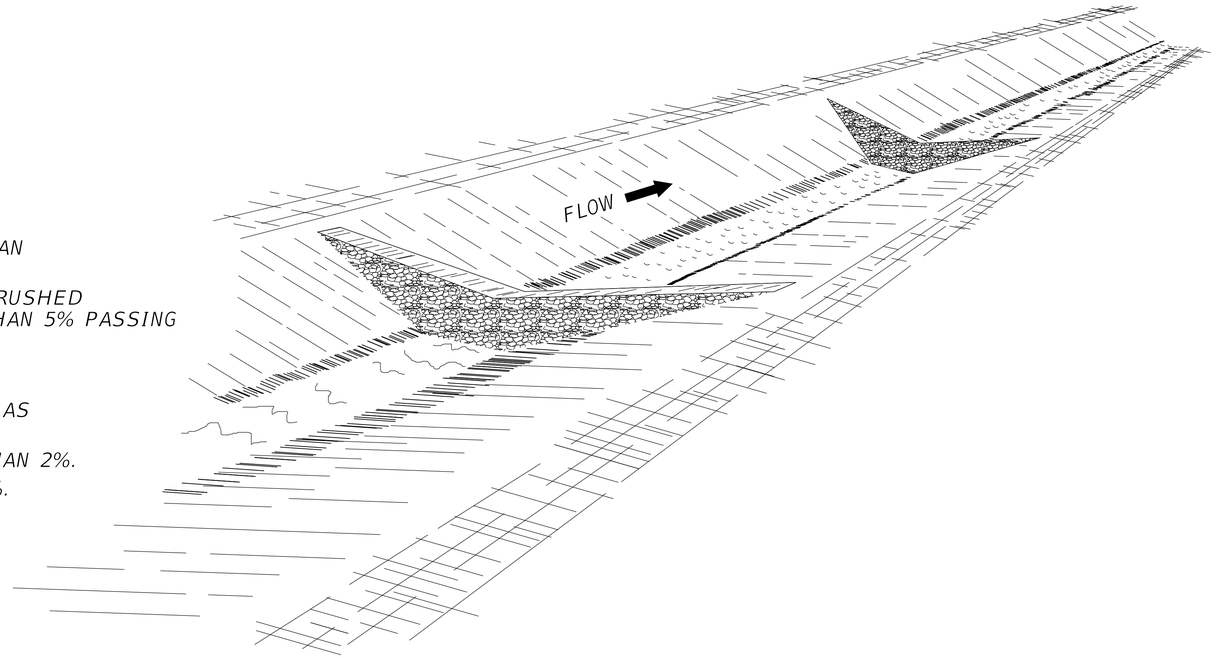
STANDARD DRAWING NUMBER
RDX-220-05







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) $L = \frac{H}{\text{SLOPE OF DITCH}}$

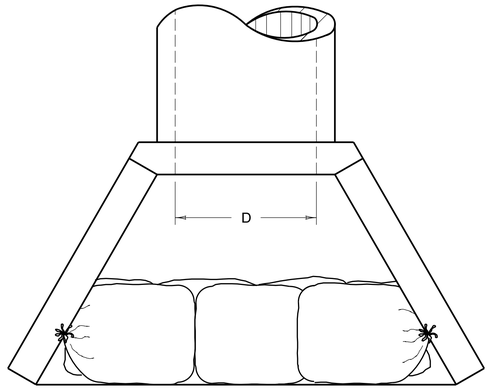
4. SPACE SILT TRAPS AT LOCATIONS AS SHOWN ON THE PLANS OR AS DIRECTED BY THE ENGINEER.
5. SILT TRAP TYPE B SHALL BE USED ON ALL SLOPES GREATER THAN 2%.
6. SILT TRAP TYPE B MAY BE USED ON ALL SLOPES LESS THAN 2%.

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

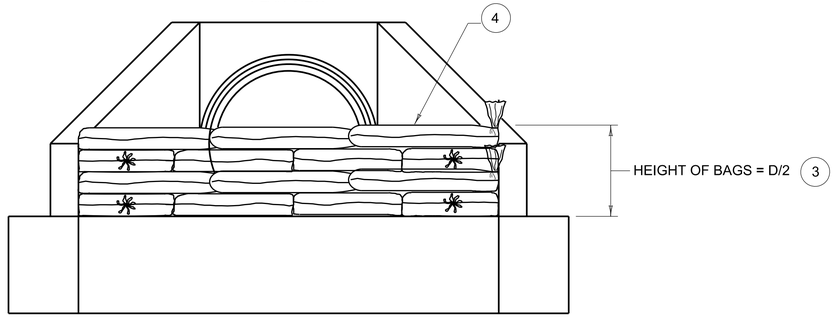
SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

DRAINAGE

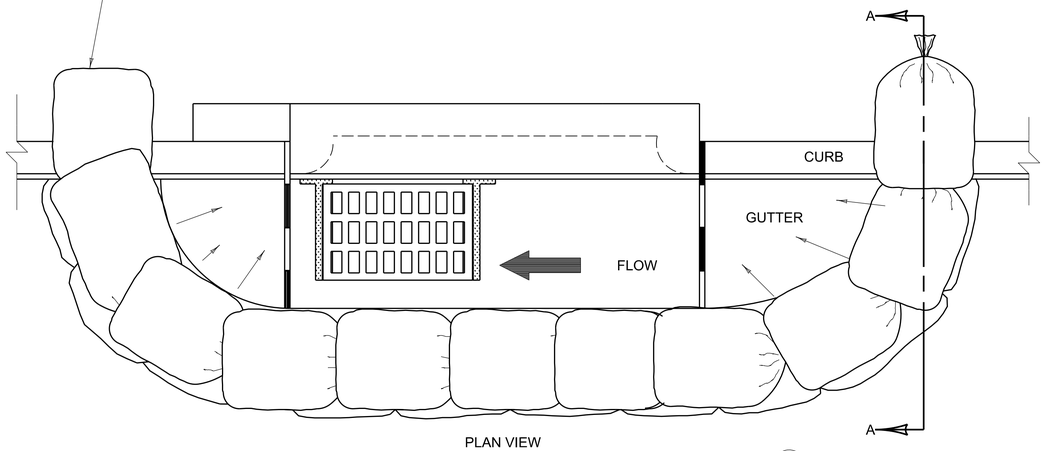


PLAN VIEW

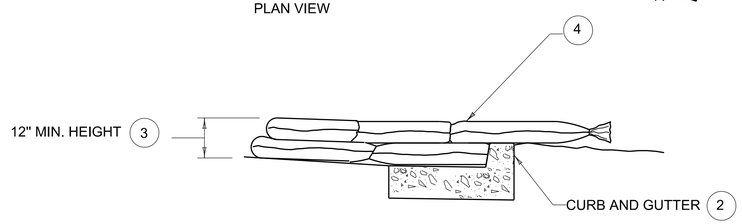


FRONT ELEVATION

INSTALL ADDITIONAL STONE BAGS OR SILT FENCE AROUND INLET IF PERMANENT STABILIZATION OF DISTURBED AREA BEHIND CURB IS NOT COMPLETE.



PLAN VIEW



SECTION A~A

~ NOTES ~

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.*

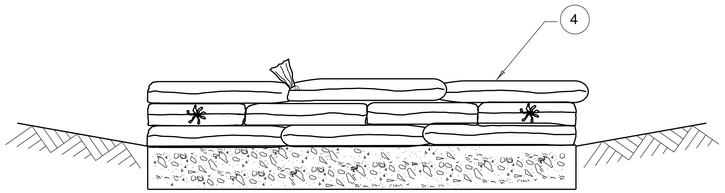
5. *CONSTRUCT 18" X 30" BAGS OF NON-WOVEN CLASS 1 OR 2 GEOTEXTILE FABRIC CONFORMING TO SECTION 843 OF THE STANDARD SPECIFICATIONS. DOUBLE STITCH BAG SEAMS WITH 1 LB. POLYESTER THREAD. ATTACH ONE (1) TIE STRING TO EACH BAG. BAG OPENING SHALL BE ON 18" SIDE.*

6. *FILL BAGS WITH NO. 57 STONE BETWEEN ½ TO I FULL (50 LB TO 60 LB).*

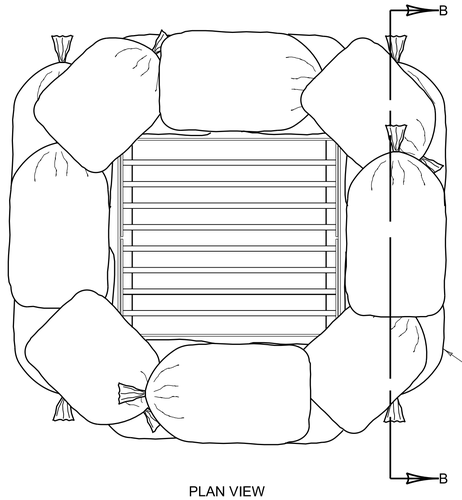
7. *SILT TRAP TYPE C SHALL NOT BE USED IN BLUE LINE STREAMS.*

BID ITEMS AND UNIT TO BID:

SILT TRAP TYPE C	*EACH*
CLEAN SILT TRAP TYPE C	*EACH*



SECTION B~B



SURROUND INLET WITH TWO COURSES OF BAGS (MINIMUM).

PLAN VIEW

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 08-11-2025 DATE

APPROVED — STATE HIGHWAY ENGINEER — 08-11-2025 DATE

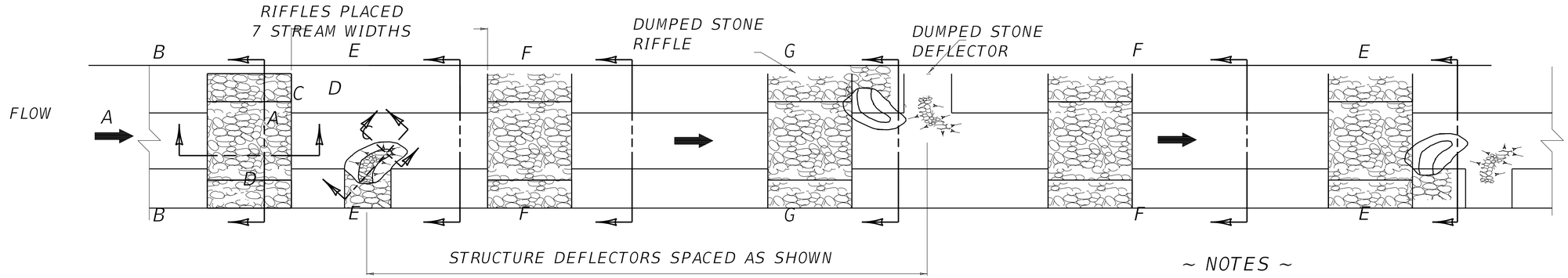
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

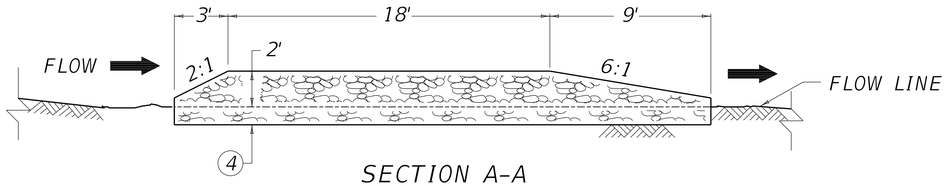
SILT TRAP

SILT TRAP TYPE C

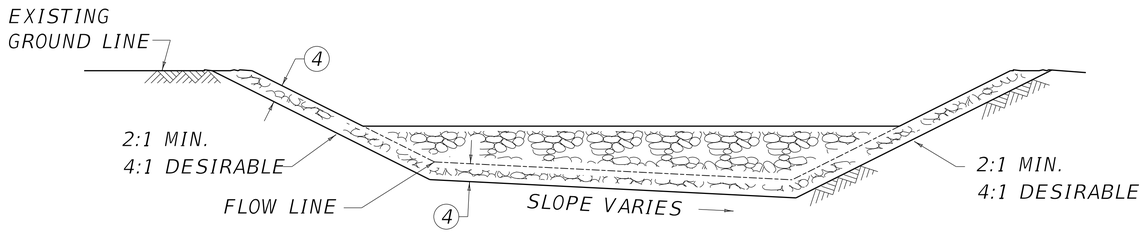
STANDARD DRAWING NUMBER
RDX-230-02



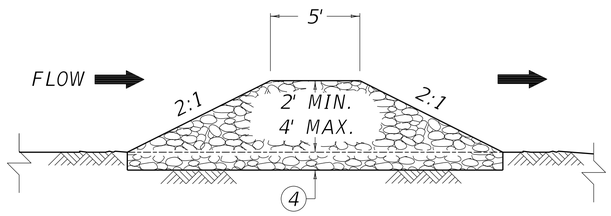
PLAN VIEW



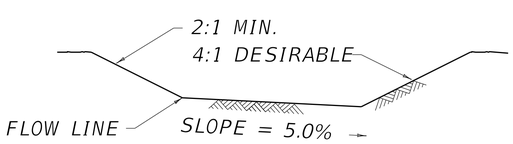
SECTION A-A



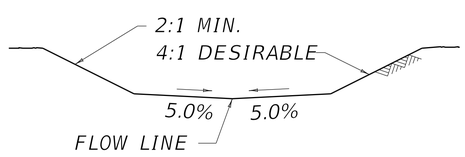
SECTION B-B



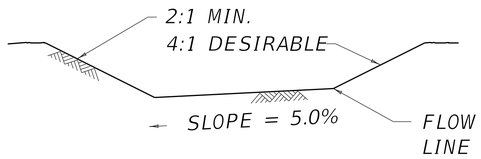
SECTION C-C



SECTION E-E



SECTION F-F



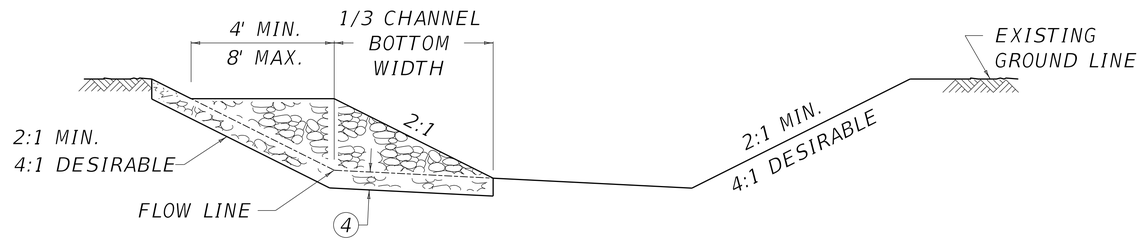
SECTION G-G

~ 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 D-D

DRAWING NOT TO SCALE

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

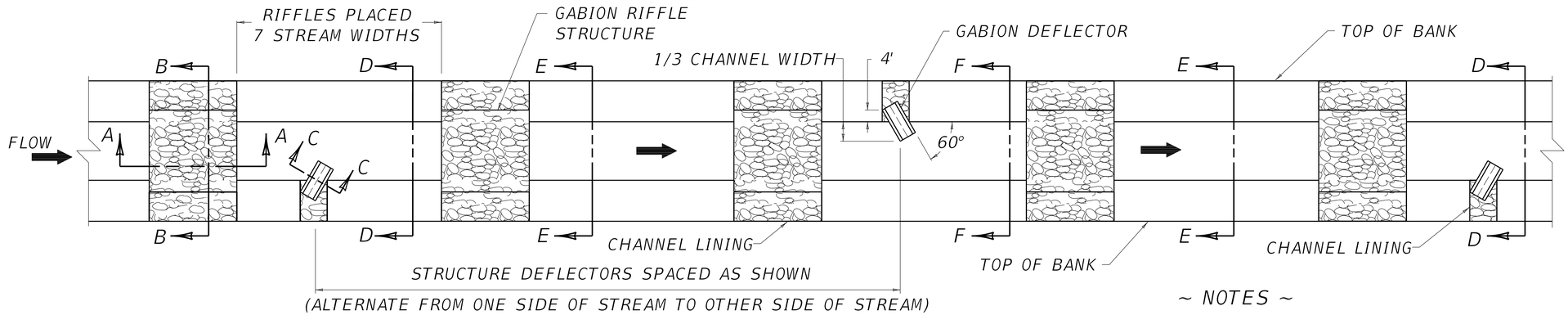
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

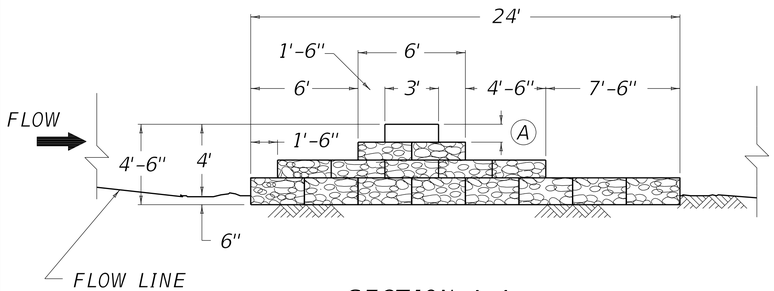
MISCELLANEOUS

CHANNEL HABITAT IMPROVEMENT STRUCTURES (DUMPED STONE)

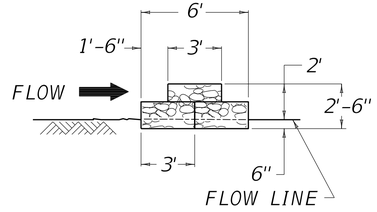
STANDARD DRAWING NUMBER
RDX-240-04



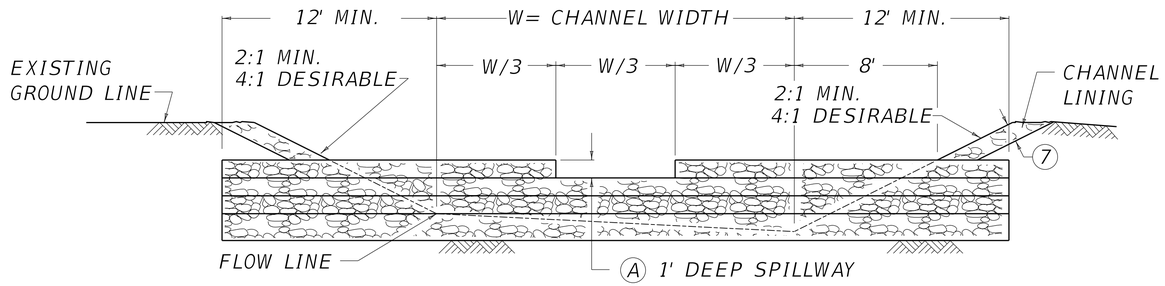
PLAN VIEW



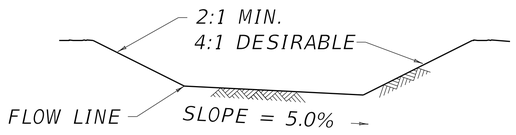
SECTION A-A



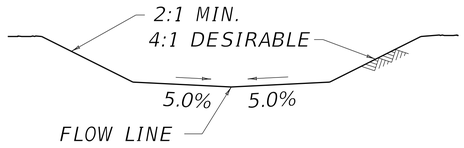
SECTION C-C



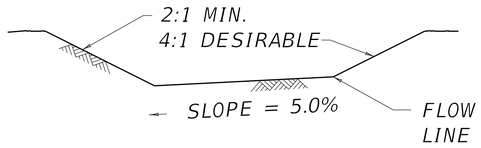
SECTION B-B



SECTION D-D



SECTION E-E



SECTION F-F

~ 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.

DRAWING NOT TO SCALE

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

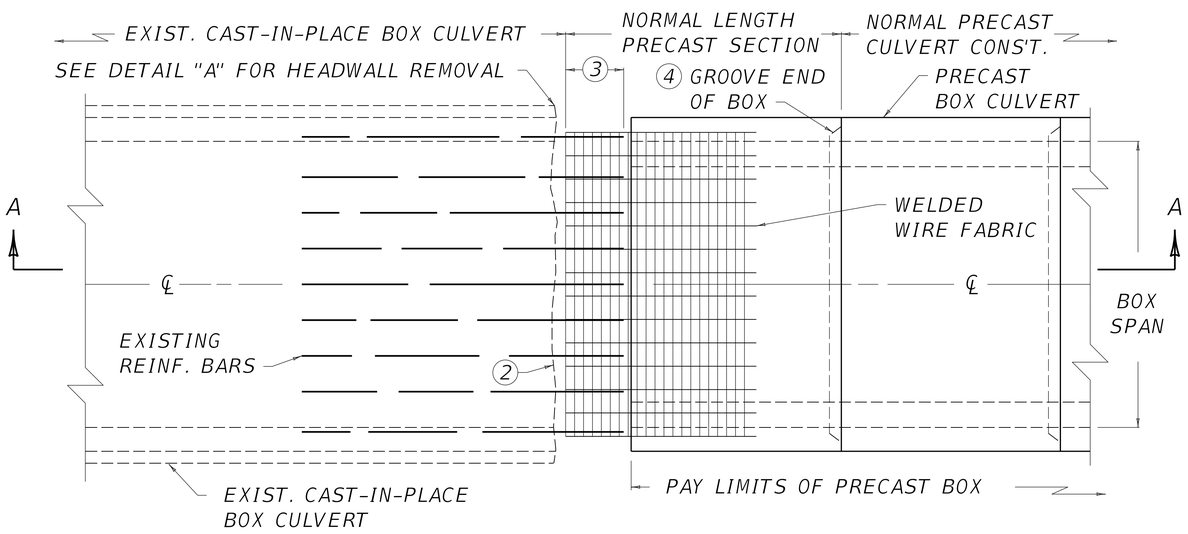
DRAINAGE

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

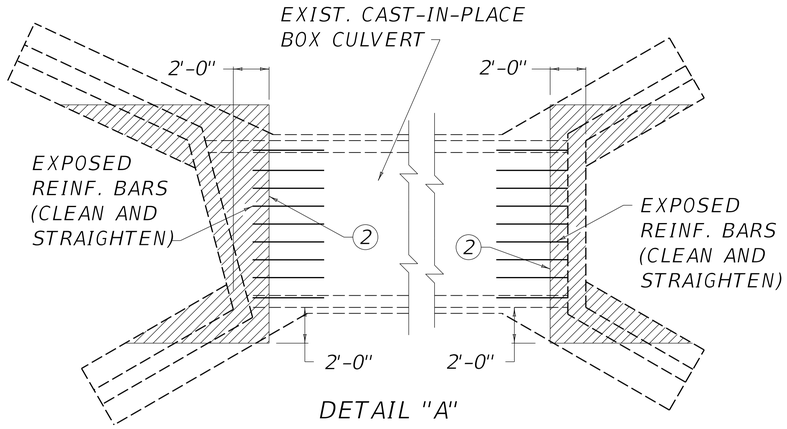
MISCELLANEOUS

CHANNEL HABITAT IMPROVEMENT STRUCTURES (GABIONS)

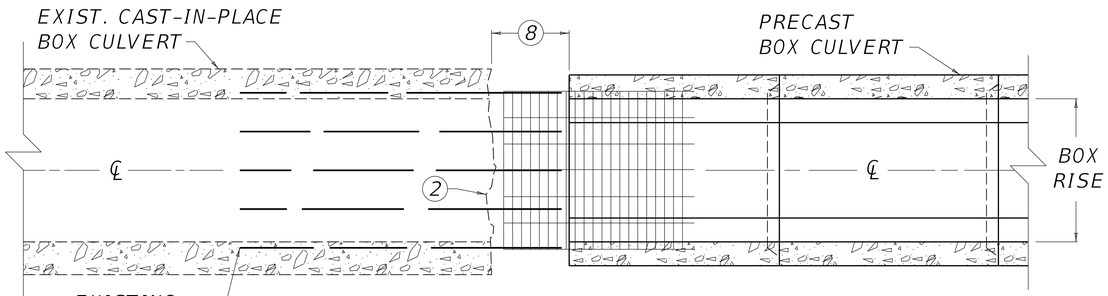
STANDARD DRAWING NUMBER
RDX-245-04



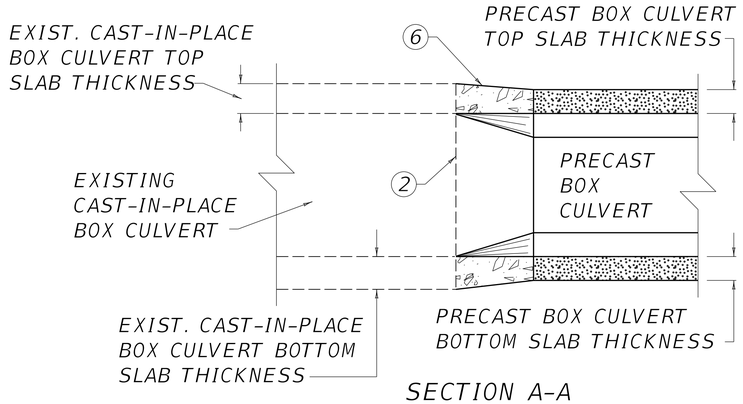
PLAN VIEW



DETAIL "A"



SECTION A-A
(SHOWING STEEL LAP)

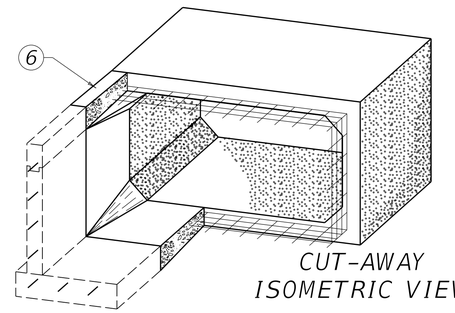


SECTION A-A
(SHOWING CAST-IN-PLACE SECTION)

~ 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.



CUT-AWAY
ISOMETRIC VIEW

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

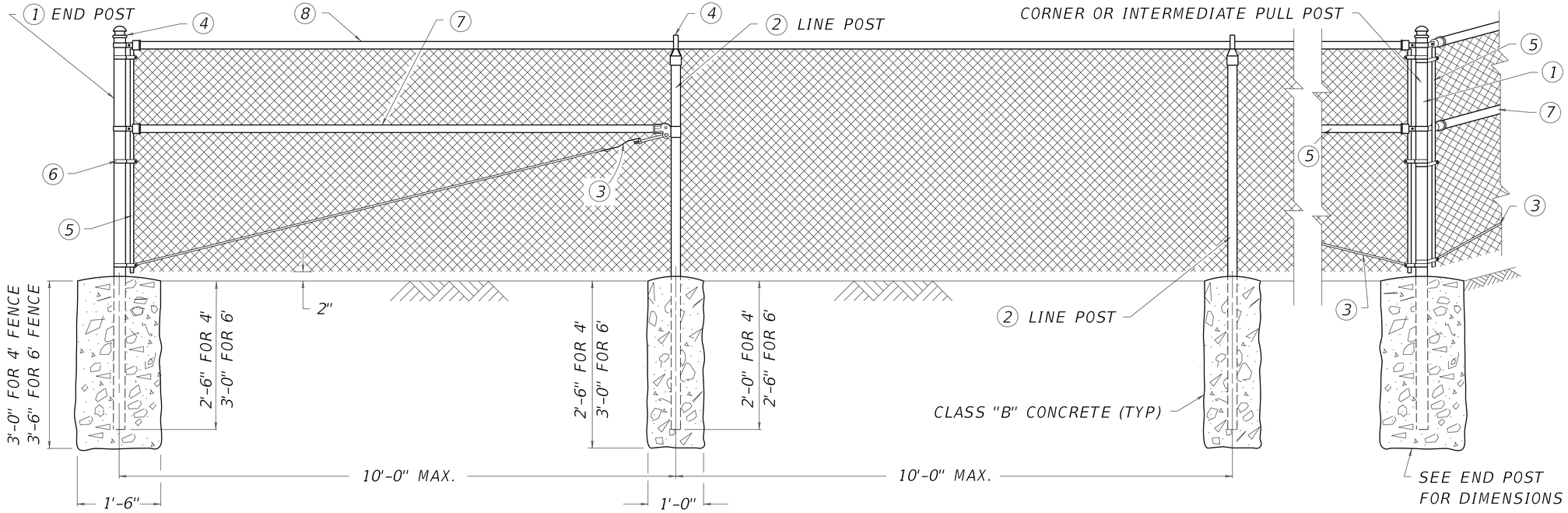
DRAINAGE

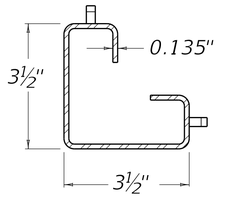
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

MISCELLANEOUS

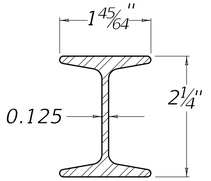
PRECAST BOX CULVERT EXTENSION

STANDARD DRAWING NUMBER
RDX-300-04

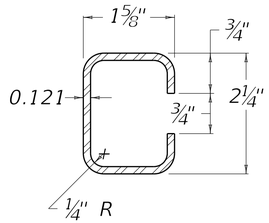




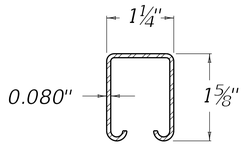
ROLL FORMED
TERMINAL POST &
CORNER POST



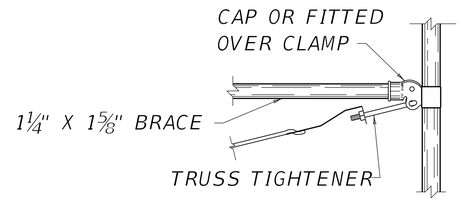
HOT ROLLED
LINE POST
H - COLUMN



LINE POST
HEAVY "C" ROLL FORMED



HOT ROLLED
TOP & BRACE
RAIL



BRACE AND TRUSS
CONNECTOR

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)	

~ 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

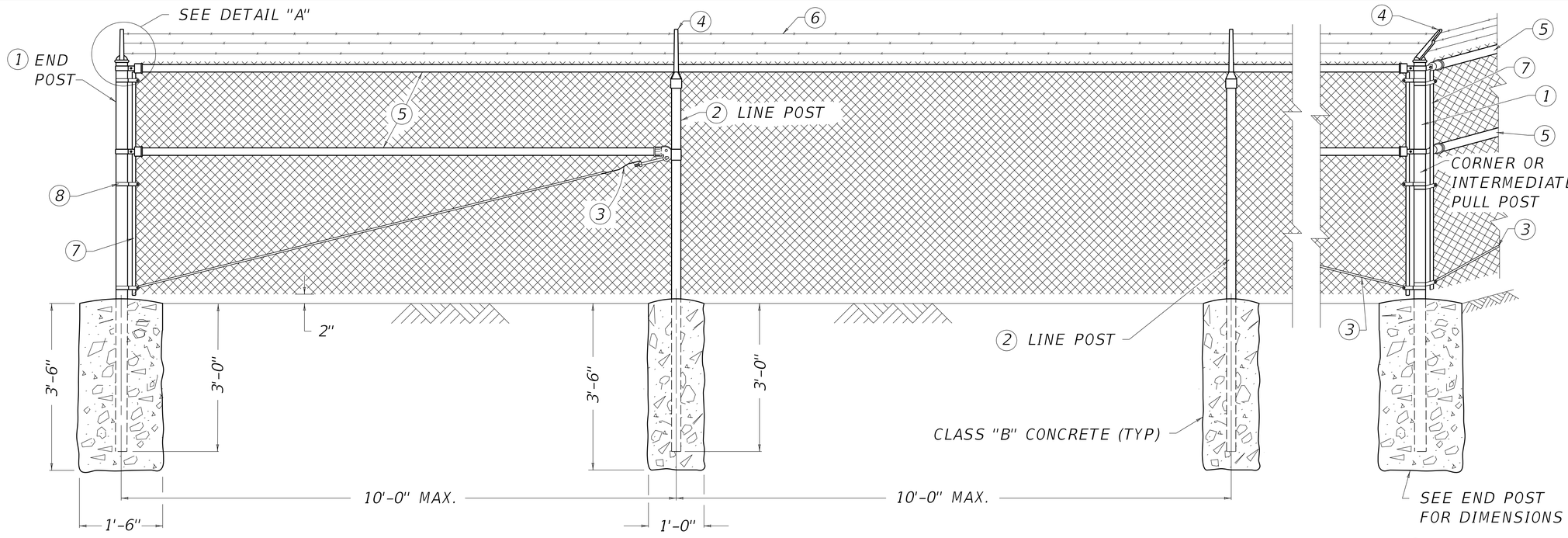
CHAIN LINK FENCE	LF
CONCRETE-CLASS B	CUYD

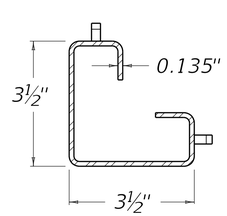
REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

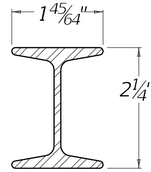
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

FENCES & GATES

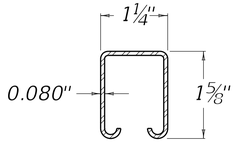




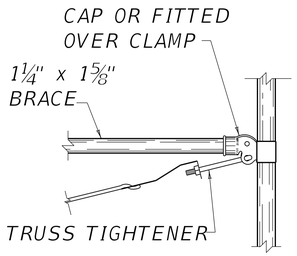
ROLL FORMED TERMINAL POST & CORNER POST



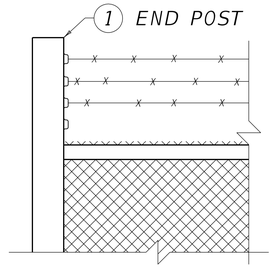
HOT ROLLED LINE POST H - COLUMN



ROLL FORMED TOP & BRACE RAIL



BRACE AND TRUSS CONNECTOR



DETAIL "A" ROLL FORMED

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

~ NOTES ~

9. ALL POSTS SHALL BE SET IN CONCRETE TO THE DIMENSIONS SHOWN ON THIS DRAWING.
10. A 1¼" NPS OR A 1¼" x 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

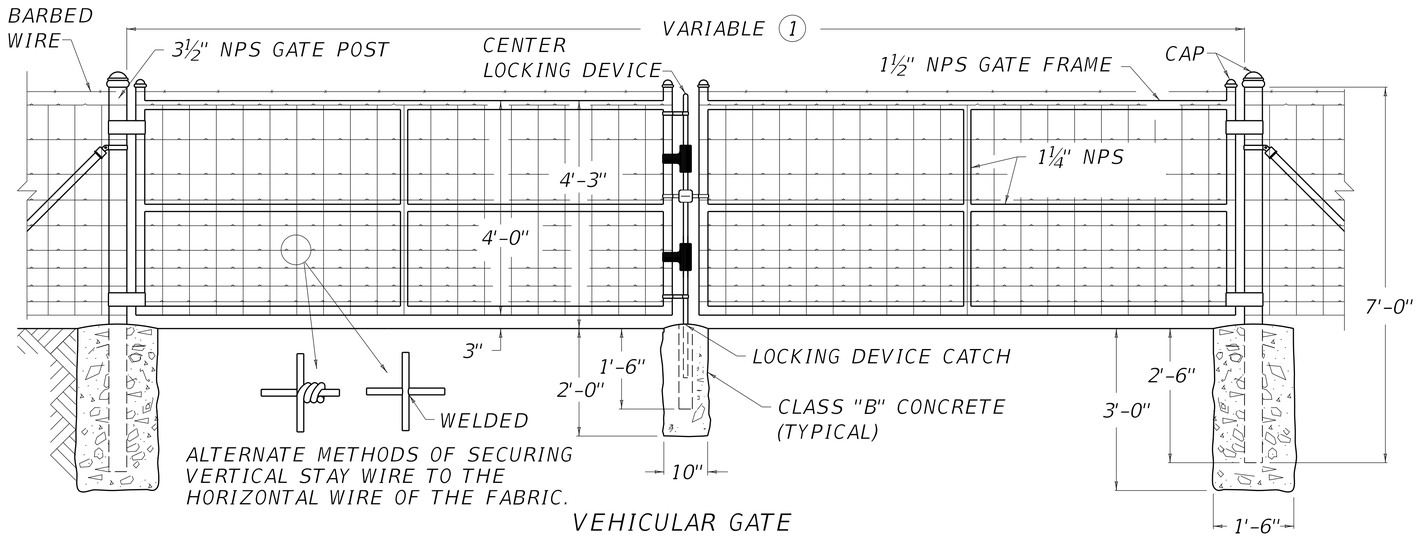
CHAIN LINK FENCE	LF
CONCRETE-CLASS B	CUYD

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

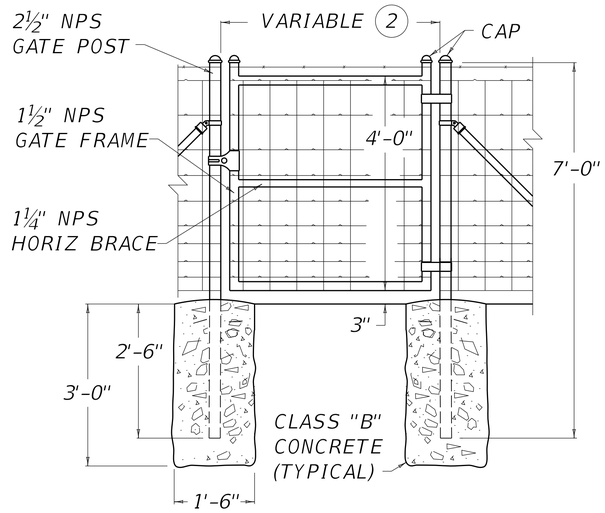
SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

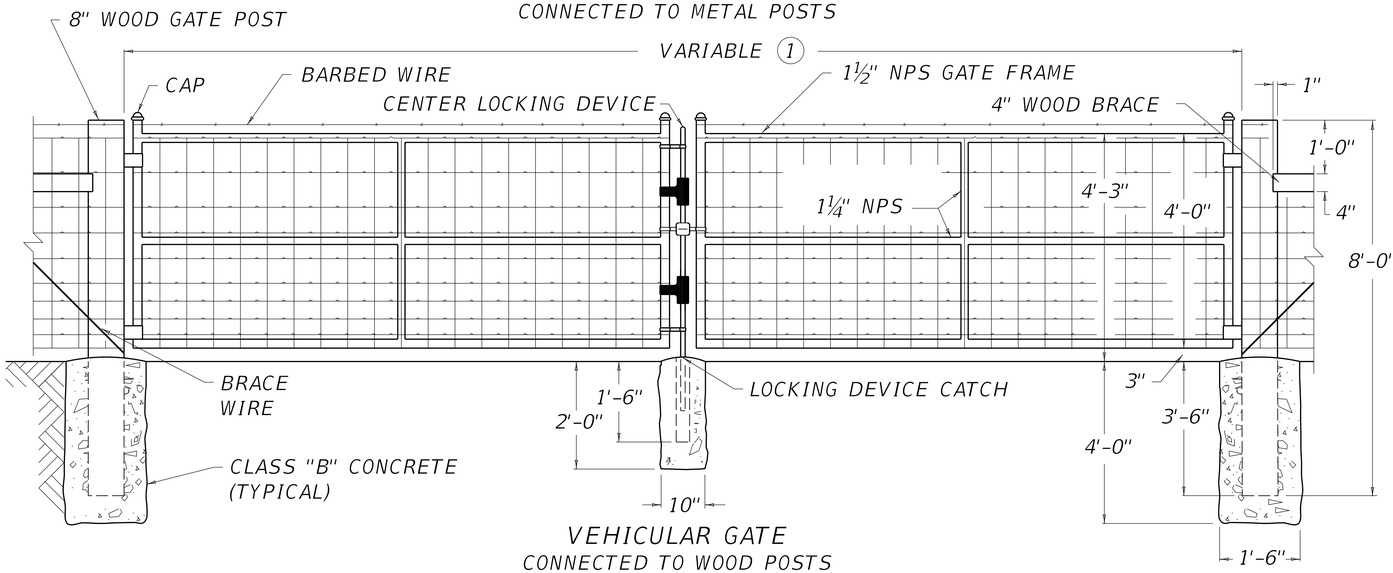
FENCES & GATES



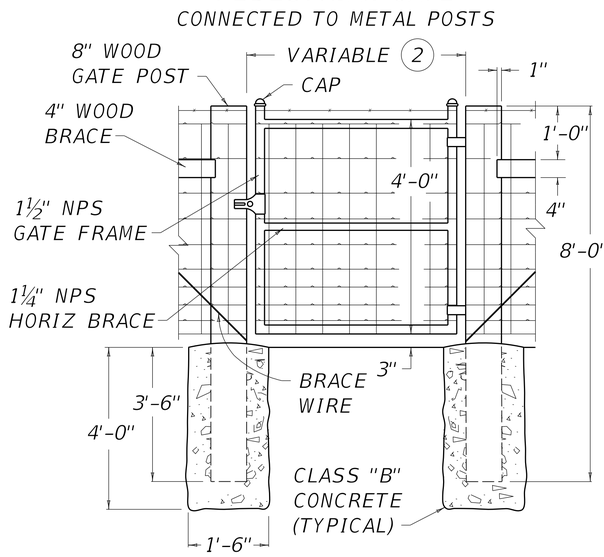
VEHICULAR GATE
CONNECTED TO METAL POSTS



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.

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

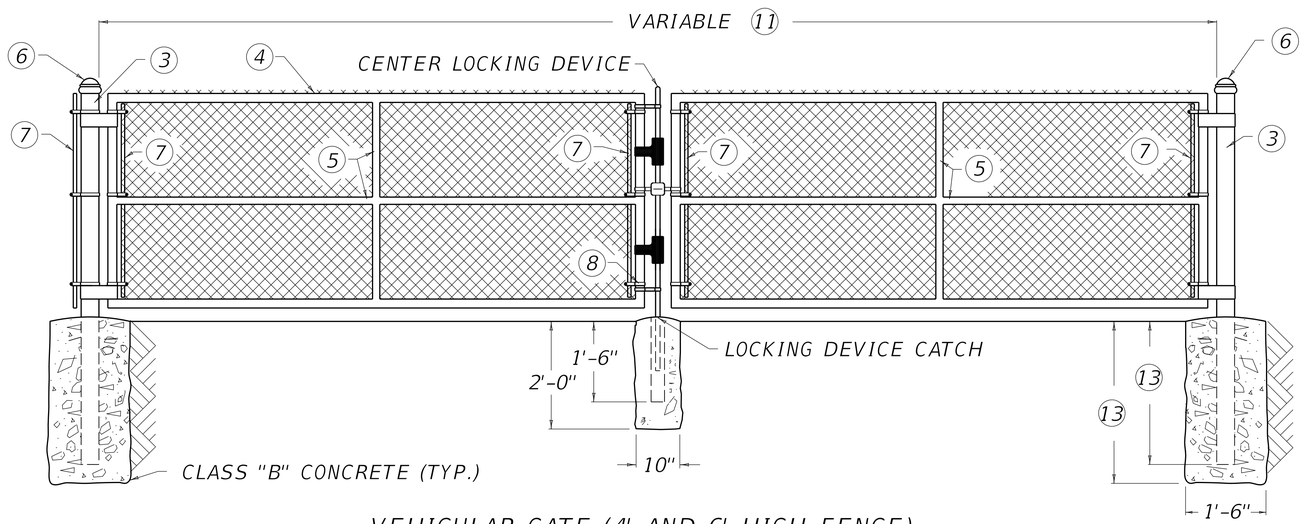
FENCES & GATES

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

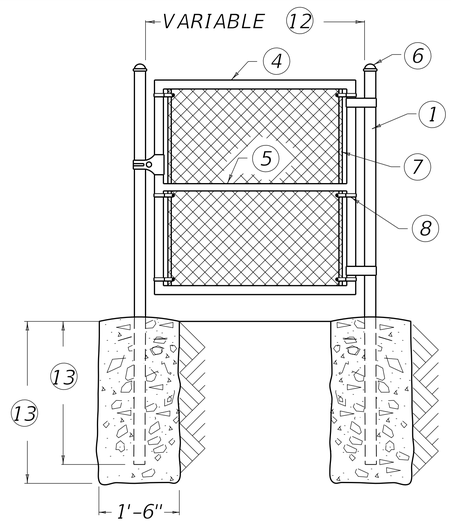
GATES

WOVEN WIRE GATES

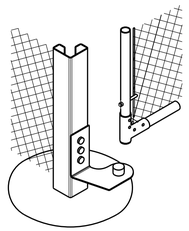
STANDARD DRAWING NUMBER
RFG-001-07



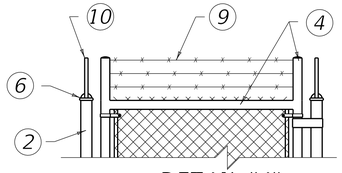
VEHICULAR GATE (4' AND 6' HIGH FENCE)



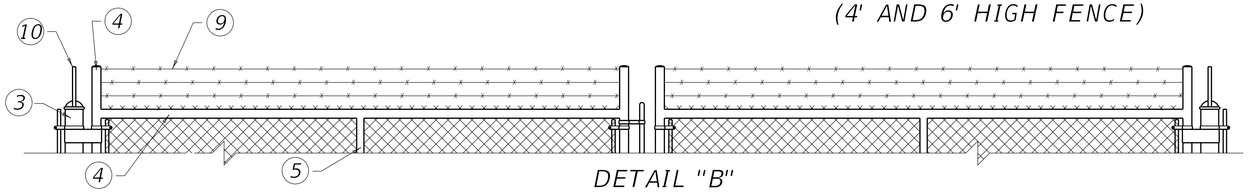
PEDESTRIAN GATE
(4' AND 6' HIGH FENCE)



ROLL FORMED
HINGE DETAIL



DETAIL "A"
(8' TO 12' HIGH FENCE)



DETAIL "B"
(8' TO 12' HIGH FENCE)

LEGEND / (ALTERNATES)

	TUBULAR	ROLL FORMED
(1)	END POST 2½" NPS	3½" X 3½"
(2)	END POST 2½" NPS	3½" X 3½"
(3)	GATE POST 3½' NPS	NO ALTERNATE
(4)	GATE FRAME 1½" NPS	NO ALTERNATE
(5)	1¼" 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

~ 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

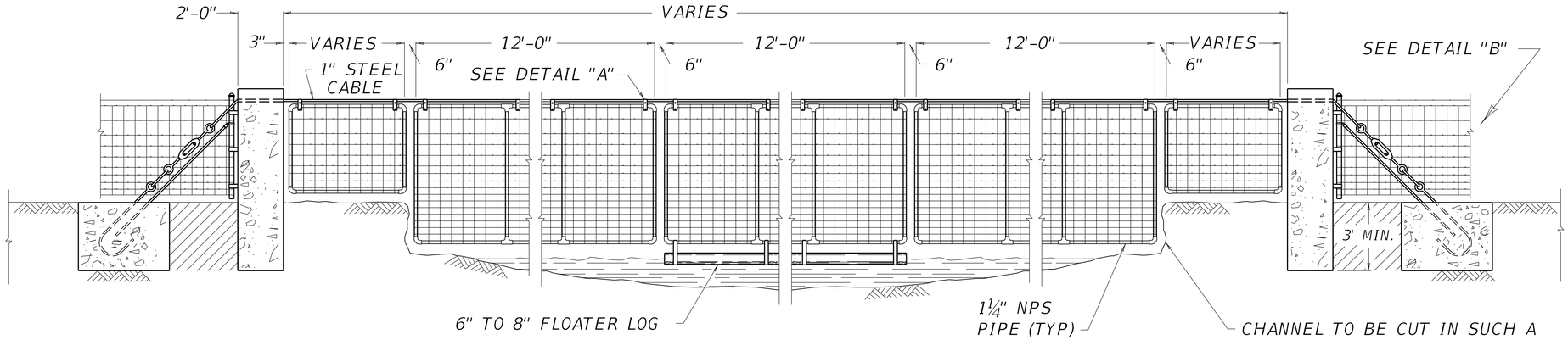
SINGLE VEHICULAR CHAIN LINK GATE	EACH
OR	
DOUBLE VEHICULAR CHAIN LINK GATE	EACH
OR	
PEDESTRIAN CHAIN LINK GATE	EACH
CONCRETE-CLASS B	CUYD

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

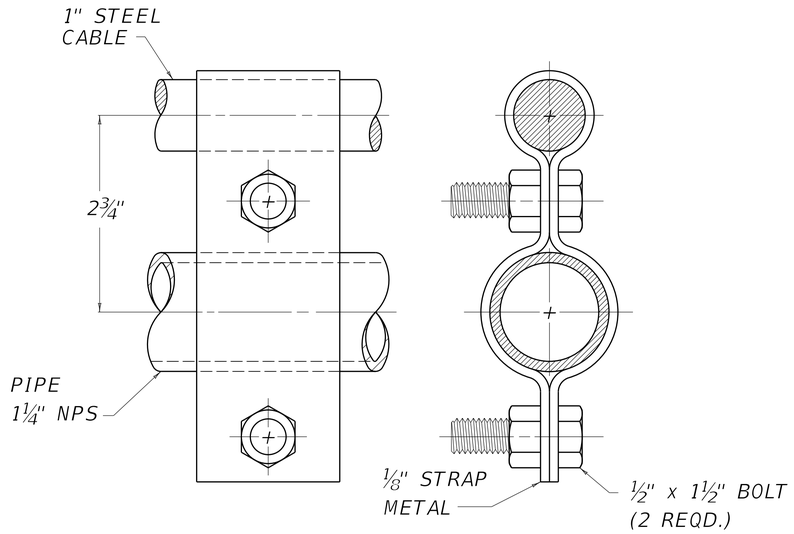
SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015

APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

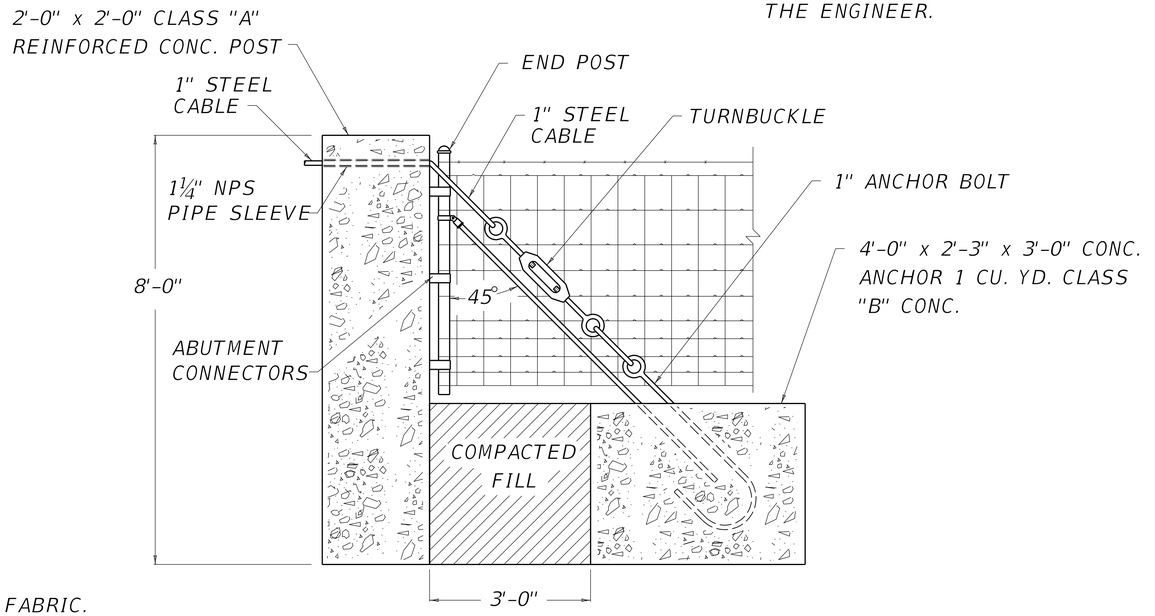
FENCES & GATES



TYPICAL WATER GATE



DETAIL "A"



DETAIL "B"

~ 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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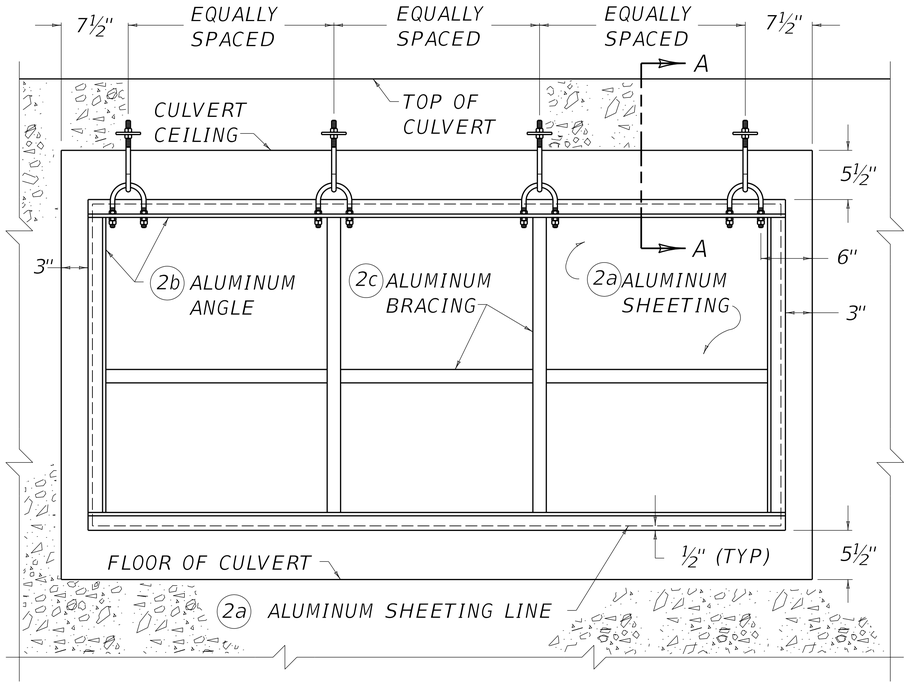
FENCES & GATES

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

GATES

WATER GATE TYPE 1

STANDARD DRAWING NUMBER
RFG-010-05

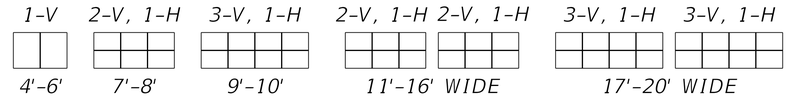


TYPICAL WATER GATE INSTALLATION

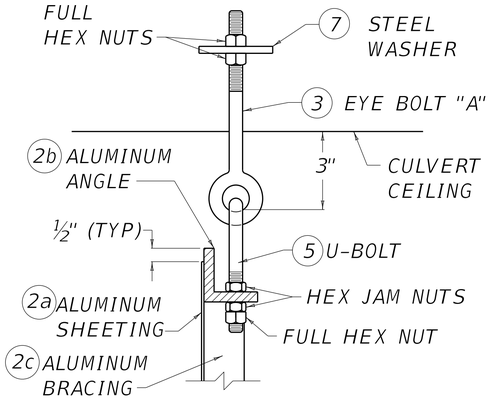
~ NOTES ~

BID ITEM AND UNIT TO BID
WATER GATE TYPE 3 — EACH

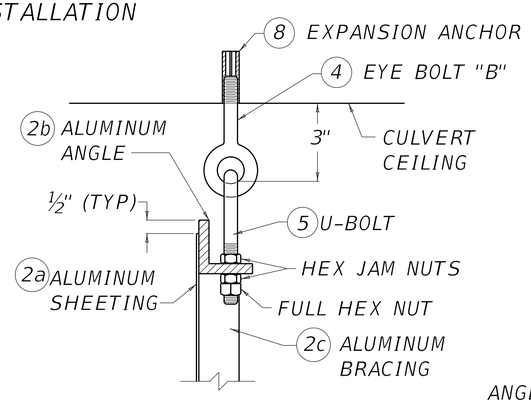
1. THE CONTRACT UNIT PRICE SHALL INCLUDE LABOR, MATERIALS, INSTALLATION, AND ALL NECESSARY INCIDENTALS TO COMPLETRE THE INSTALLATION. TWO OR MORE SECTIONS PER CULVERT OPENING EQUALS ONE WATER GATE TYPE 3.
2. COMMERCIAL GRADE ALUMINUM
   - (2a) SHEETING – 0.090" THICK, MILL FINISH.
   - (2b) ANGLES – 2" x 2" x ⅜" @ 1.60 LBS./LIN. FT.
   - (2c) BRACING – 1½" x 1½" X ⅛" SQUARE TUBING @ 0.826 LB./LIN. FT.
3. EYEBOLT "A" – GALVANIZED, WELDLESS, ½" DIA., 6" SHANK, 1" EYE I.D., 3" THREAD.
4. EYEBOLT "B" – GALVANIZED, WELDLESS, ½" DIA., 2½" SHANK, 1" EYE I.D., 1" THREAD.
5. U-BOLTS – CADMIUM PLATED STEEL, 3" BETWEEN LEGS, 4½" INSIDE LENGTH, 5" OUTSIDE LENGTH, 2" THREAD, ½" DIA.
6. HEX FULL NUTS AND JAM NUTS – ½" DIA., 13 THREADS/IN., FINISHED, DOUBLE CHAMFERED.
7. STEEL WASHER – ⅝" I.D., 2¾" O.D.
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.



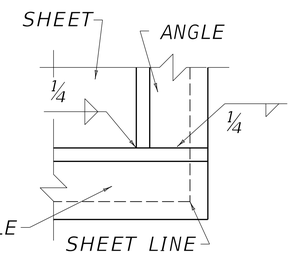
MINIMUM HOR. AND VER. BRACING SYSTEMS FOR VARIOUS WIDTH CULVERT OPENINGS. ONE (1) ADDITIONAL HOR. BRACE REQUIRED FOR CULVERT OVER 10' IN HEIGHT.



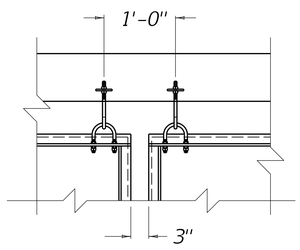
SECTION A-A
NEW CONSTRUCTION
HANGER SYSTEM



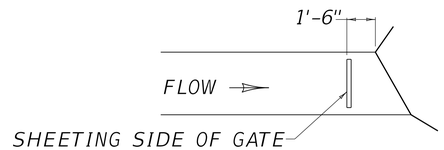
SECTION A-A
EXISTING CONSTRUCTION
HANGER SYSTEM



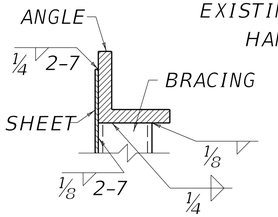
CORNER JOINT WELDS



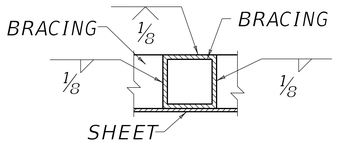
DETAIL "A"
(2 OR MORE SECTIONS)



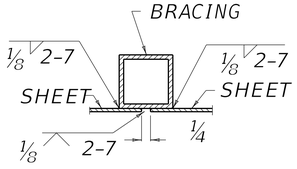
WATER GATE LOCATION
IN SKEWED CULVERTS



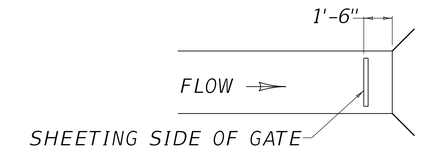
BRACING, ANGLE
AND SHEET WELDS



BRACING AND
BRACING WELDS



BRACING AND SHEET
SEAM WELDS



WATER GATE LOCATION
IN CULVERTS AT 90°

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APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

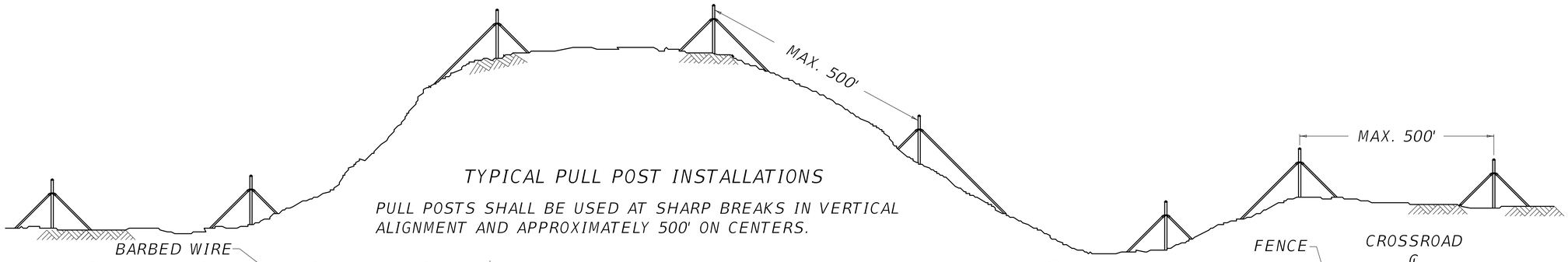
FENCES & GATES

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

GATES

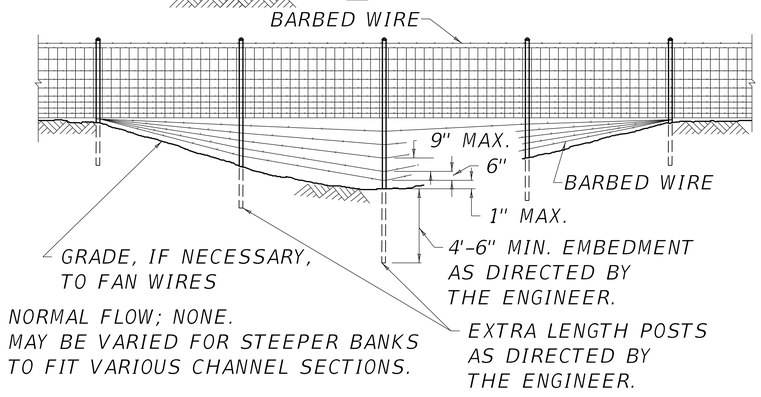
WATER GATE TYPE 3

STANDARD DRAWING NUMBER
RFG-011-06

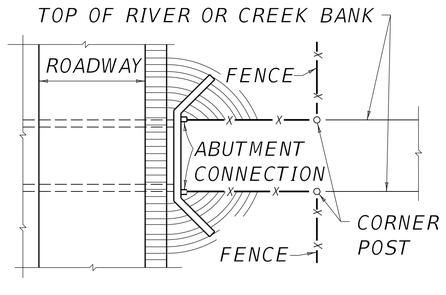


TYPICAL PULL POST INSTALLATIONS

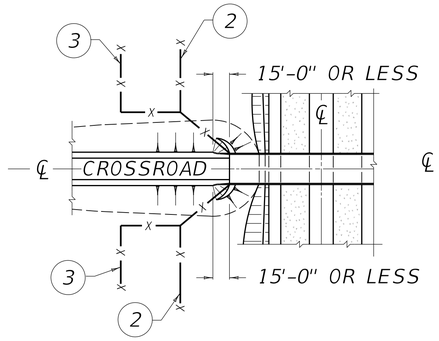
PULL POSTS SHALL BE USED AT SHARP BREAKS IN VERTICAL ALIGNMENT AND APPROXIMATELY 500' ON CENTERS.



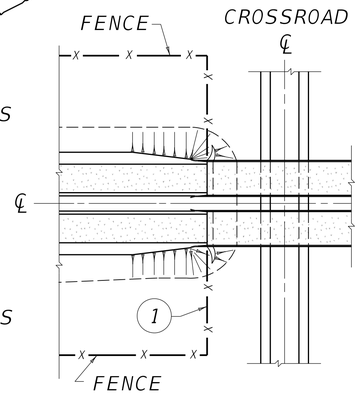
TYPE A CROSSING



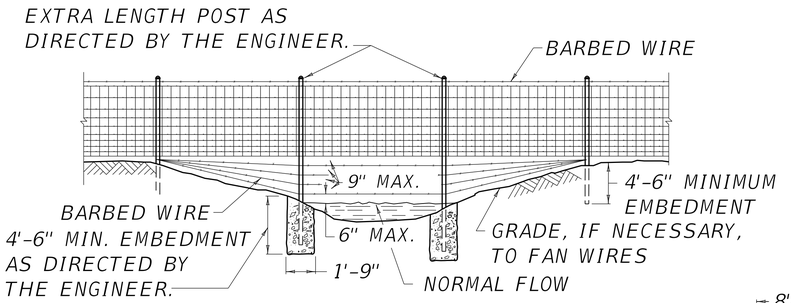
TYPICAL FENCE INSTALLATION FOR BOX CULVERT USED AS CATTLE CROSSING



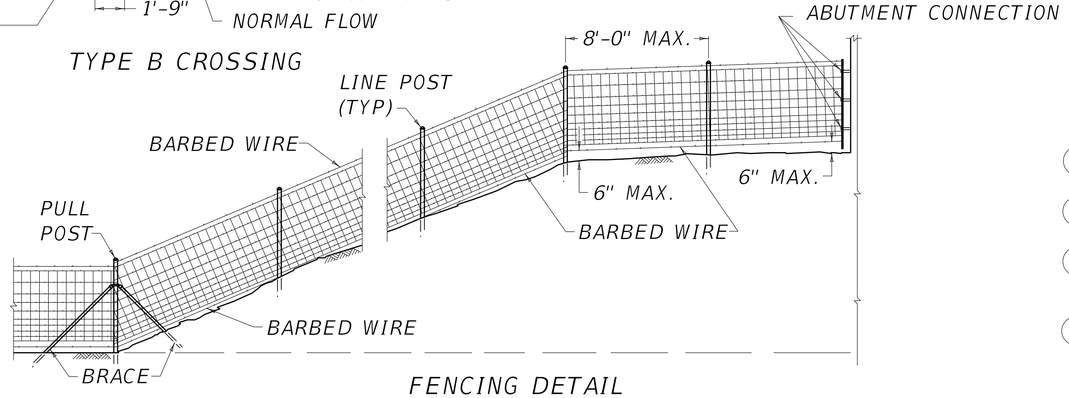
HIGHWAY UNDER CROSSROAD



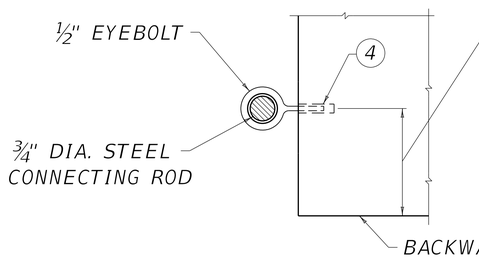
HIGHWAY OVER CROSSROAD



TYPE B CROSSING



FENCING DETAIL



ABUTMENT CONNECTION

~ 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"x2" SELF-DRILL ANCHOR AND EYEBOLT ASSEMBLY.
5. ALL MATERIAL FOR ABUTMENT CONNECTION SHALL BE GALVANIZED.

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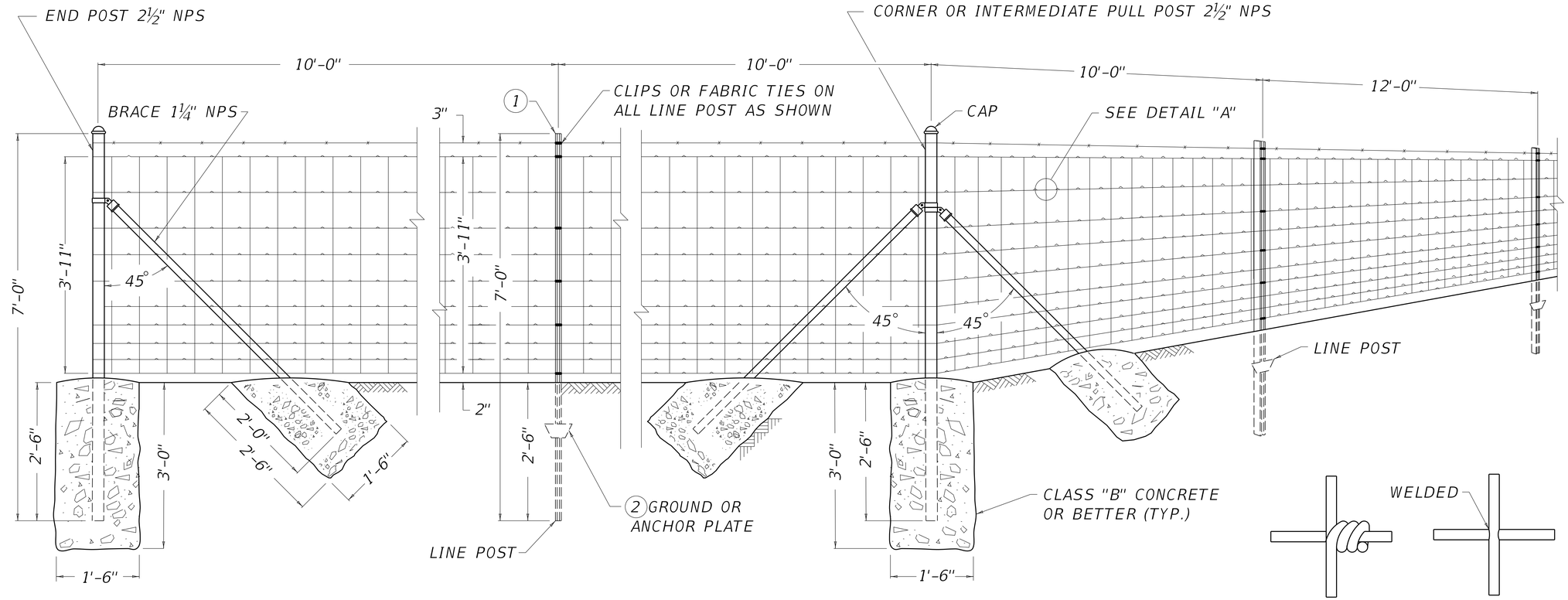
FENCES & GATES

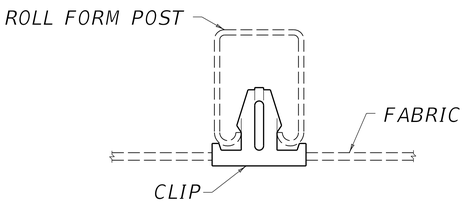
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

FENCING | DETAILS | STANDARD DRAWING NUMBER RFW-001-06

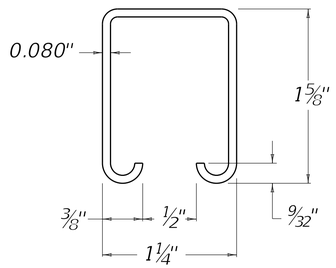


ALTERNATE METHODS OF SECURING VERTICAL STAY WIRE TO THE HORIZONTAL WIRE OF THE FABRIC.

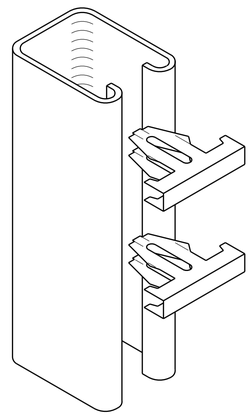
DETAIL "A"



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

~ NOTES ~

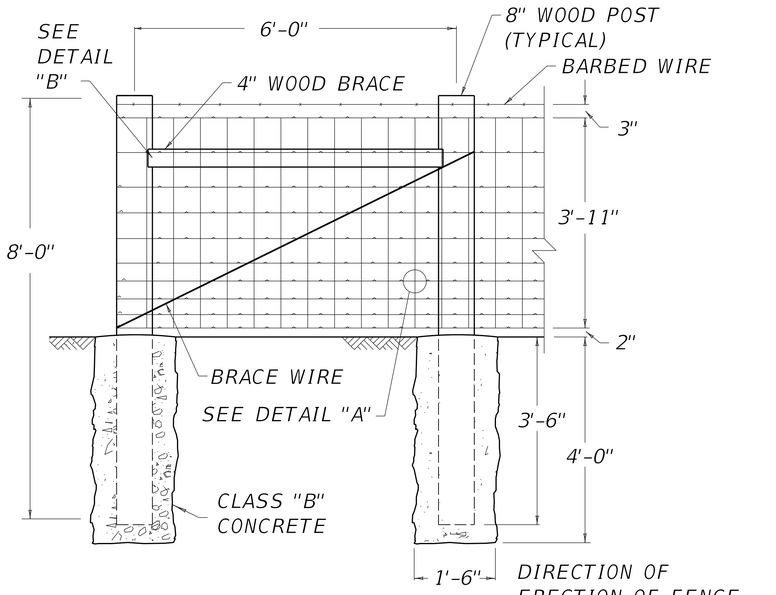
BID ITEMS AND UNIT TO BID
FENCE-WOVEN WIRE TYPE 1 LF
CONCRETE-CLASS B CUYD

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.

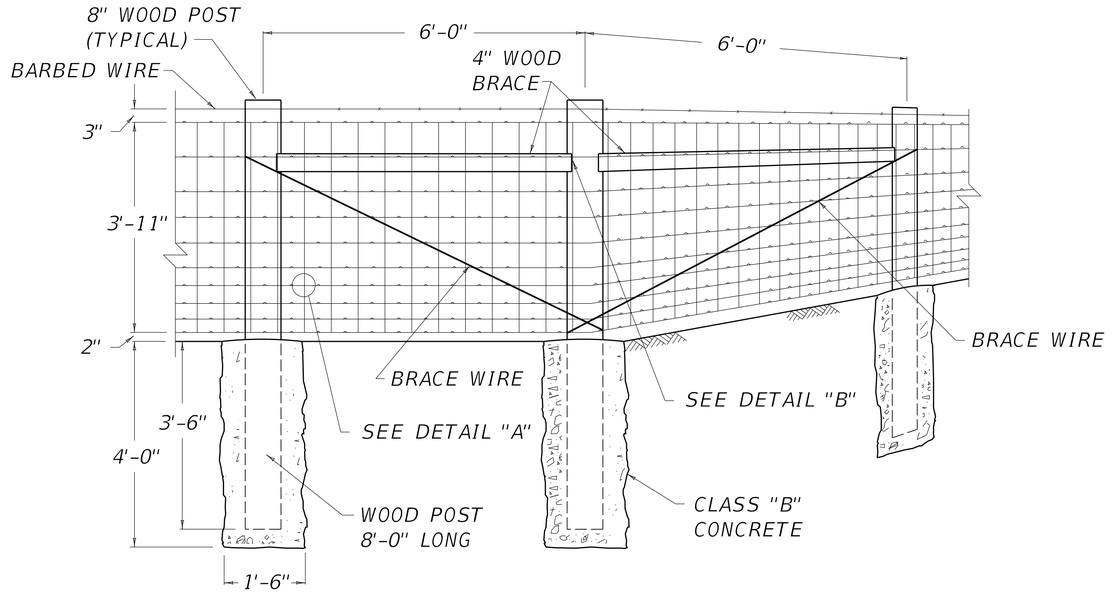
REVISION DATE:12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

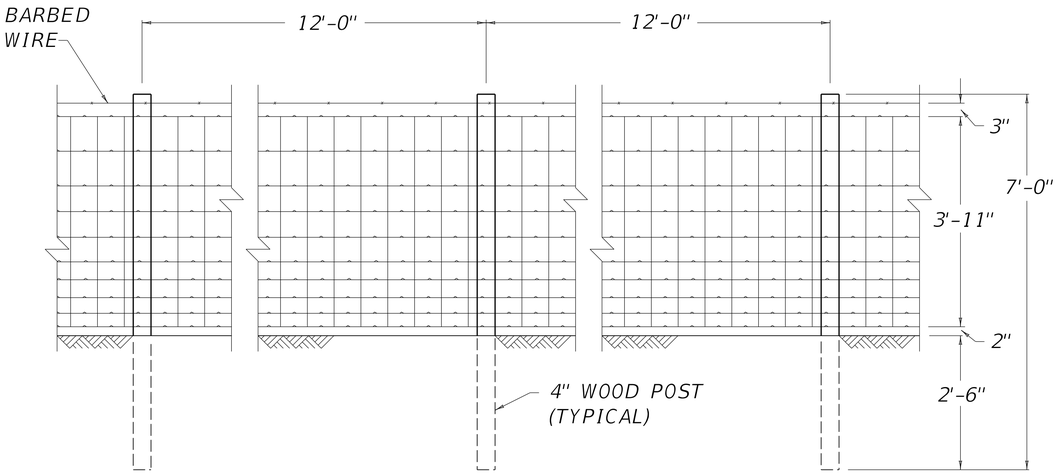
FENCES & GATES



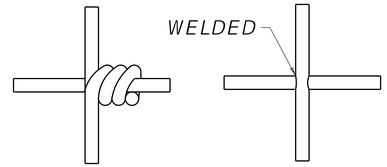
PULL OR END POST ASSEMBLY



CORNER POST ASSEMBLY

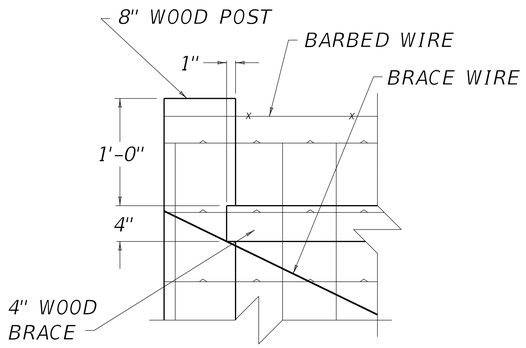


LINE POST



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.

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FENCES & GATES

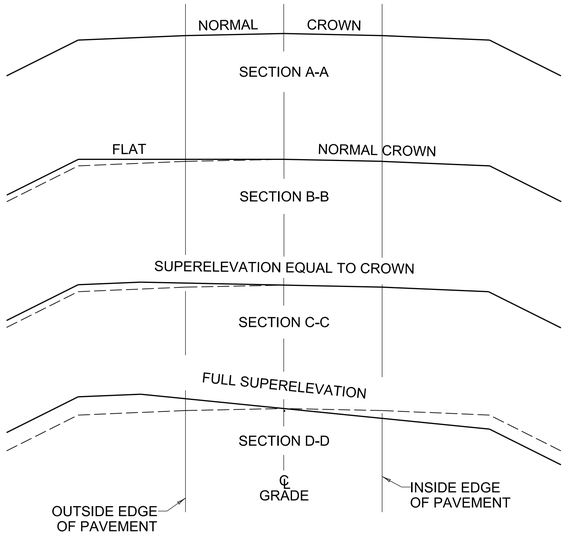
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

FENCES

WOVEN WIRE FENCE TYPE 2

STANDARD DRAWING NUMBER
RFW-006-07

~ SECTIONS ~

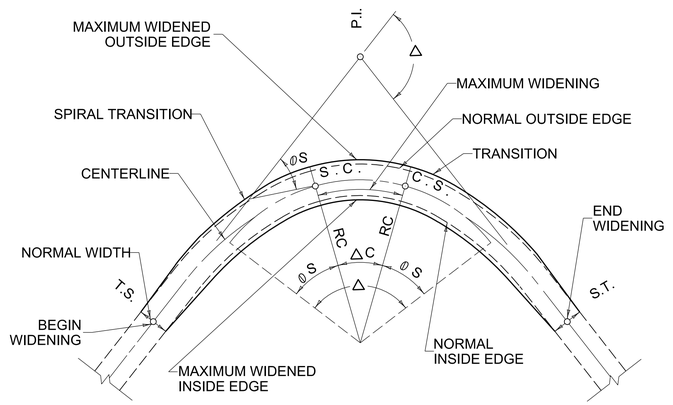


SUPERELEVATION TRANSITION FOR CURVES
SINGLE LANE PAVEMENT

CURVE WIDENING FOR SPIRAL TRANSITION CURVES

(WIDENING DIVIDED EQUALLY ON EACH SIDE)

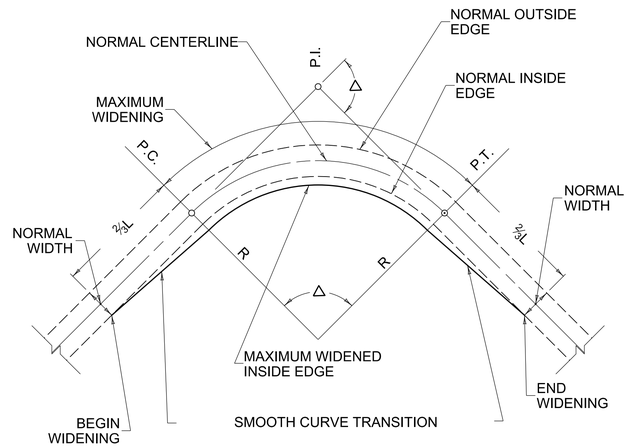
NOTE: IF DIRECTED, SPIRAL TRANSITION CURVES SHALL BE WIDENED ON INSIDE ONLY.



NOTE: MINIMUM WIDENING = 2'-0" (6)

CURVE WIDENING FOR SIMPLE CURVES

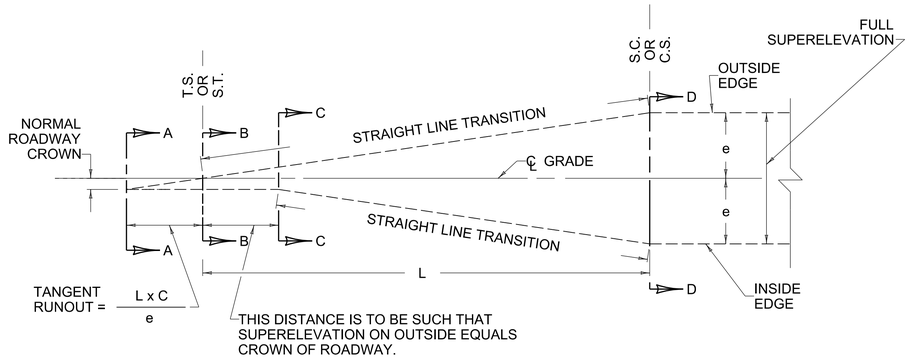
(WIDENED ON INSIDE ONLY)



SMOOTH CURVE TRANSITION

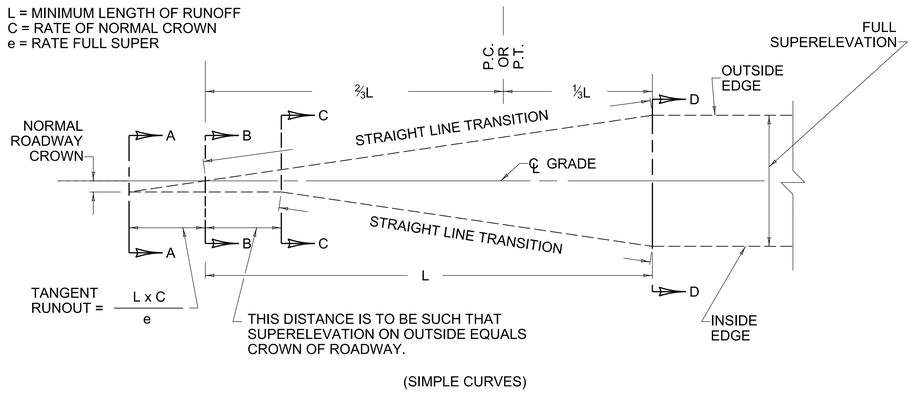
NOTE: MINIMUM WIDENING = 2'-0"

L = MINIMUM LENGTH OF RUNOFF.



(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.*

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			

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GENERAL

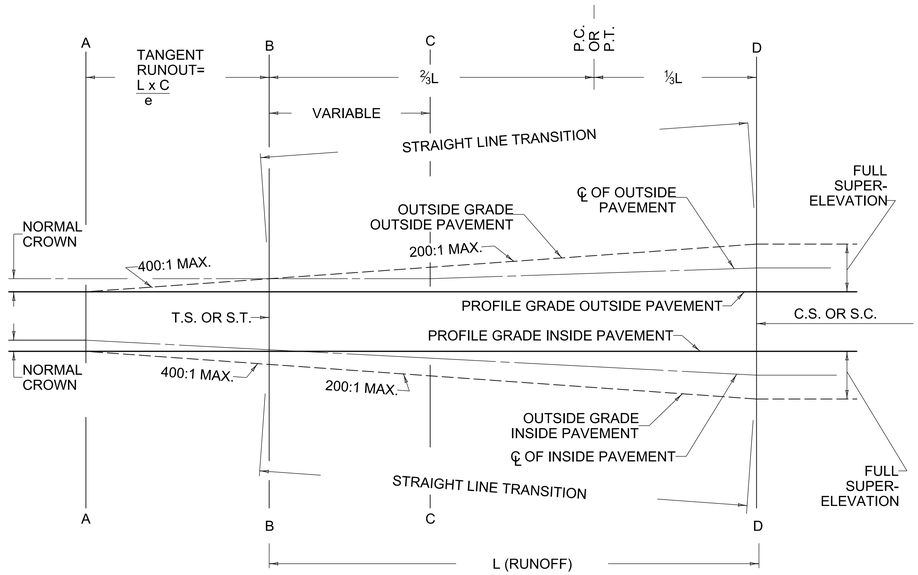
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

SUPERELEVATION

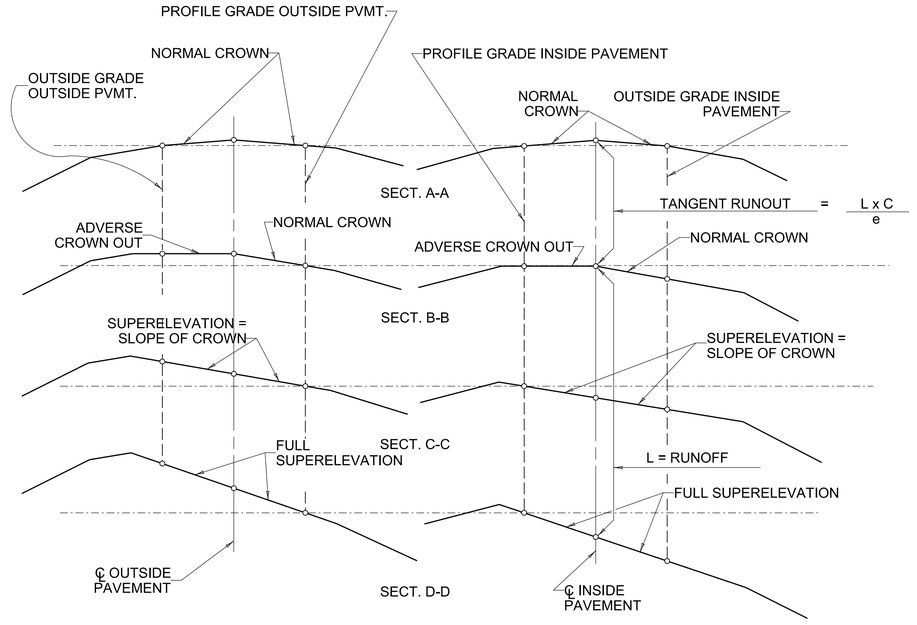
CURVE WIDENING AND SUPERELEVATION TRANSITIONS

STANDARD DRAWING NUMBER
RGS-001-07

DEPRESSED MEDIAN

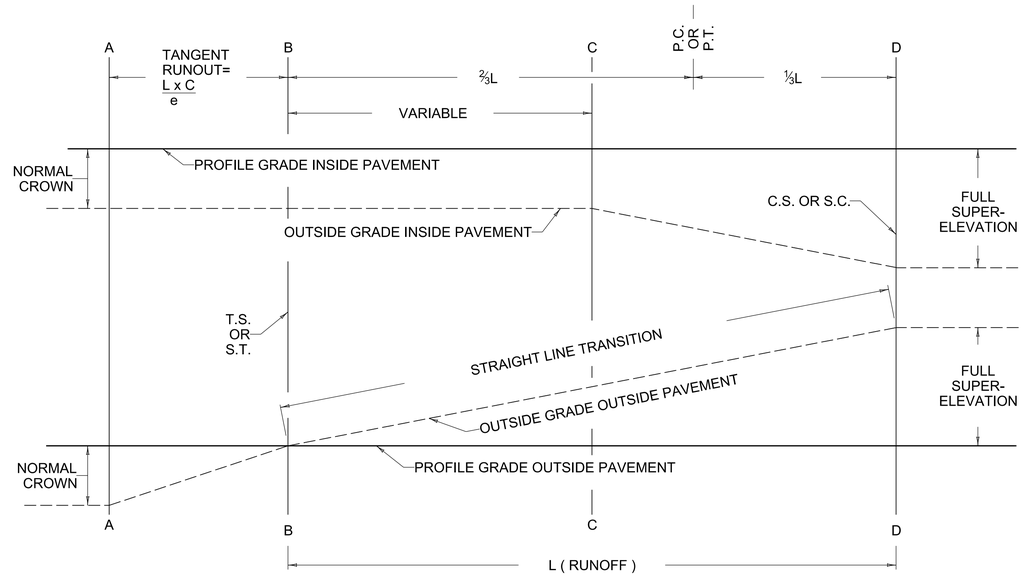


PROFILE OF PAVEMENT EDGES

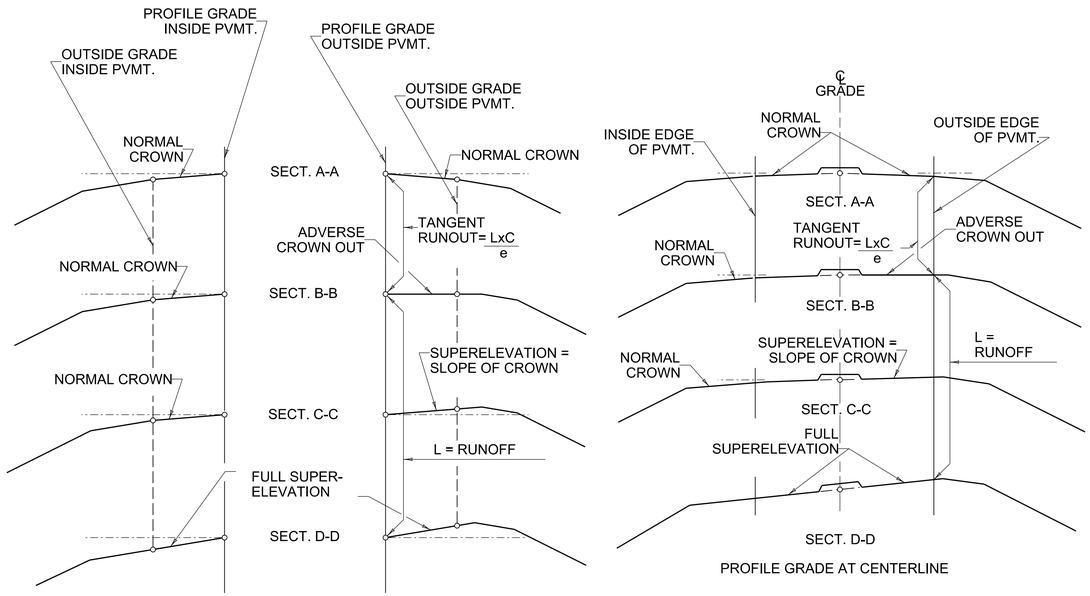


PROFILE GRADE AT MEDIAN EDGE

RAISED MEDIAN



PROFILE OF PAVEMENT EDGES



PROFILE GRADE AT MEDIAN EDGE

PROFILE GRADE AT CENTERLINE

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GENERAL

~ 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.

USE WITH CUR. STD. DWG.
RGX-001

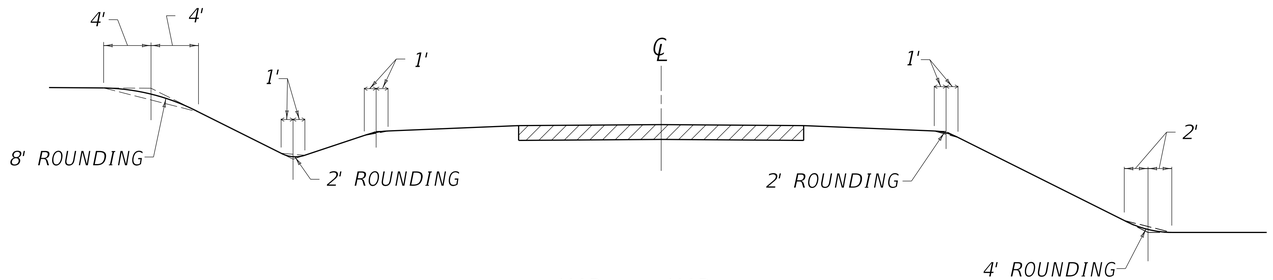
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY. TRANSPORTATION CABINET

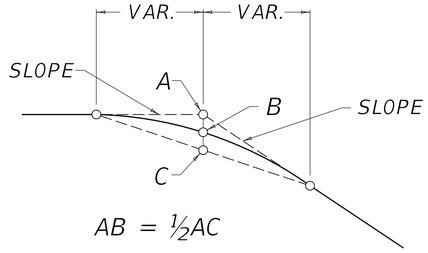
SUPERELEVATION

SUPERELEVATION FOR MULTILANE PAVEMENT

STANDARD DRAWING NUMBER
RGS-002-06

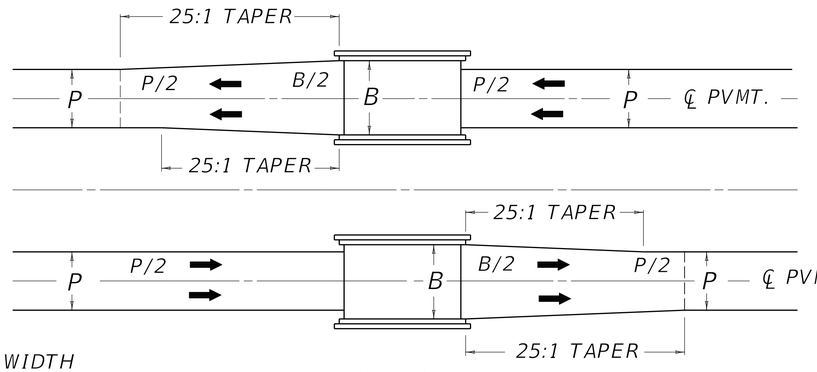
TYPICAL SECTION SHOWING ROUNDING OF SLOPES





DETAIL FOR ROUNDING OF SLOPES

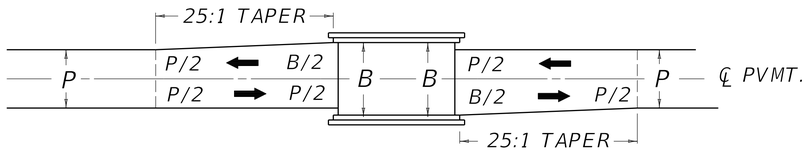
BRIDGE APPROACH FOR USE IN CONJUNCTION WITH ASPHALT CONCRETE PAVEMENT



P = NORMAL PAVEMENT WIDTH

B = BRIDGE ROADWAY

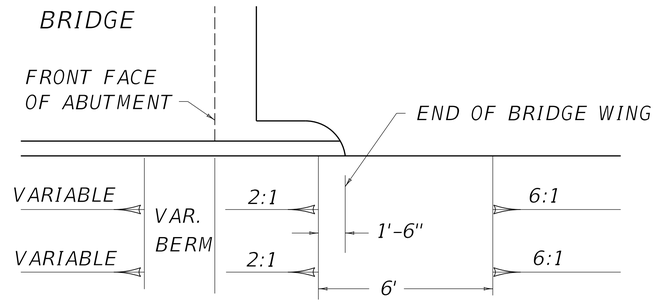
TWIN BRIDGES



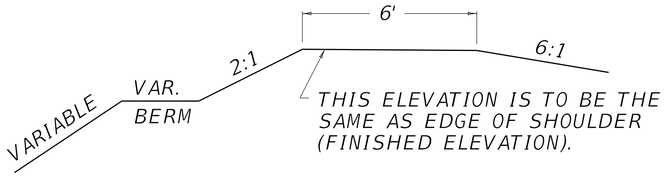
NORMAL PAVEMENT SHALL BE TRANSITIONED TO MEET BRIDGE ROADWAY AS INDICATED ABOVE.

SINGLE BRIDGE

EARTH DIKE IN DEPRESSED MEDIAN AT THE END OF TWIN BRIDGES



PLAN VIEW

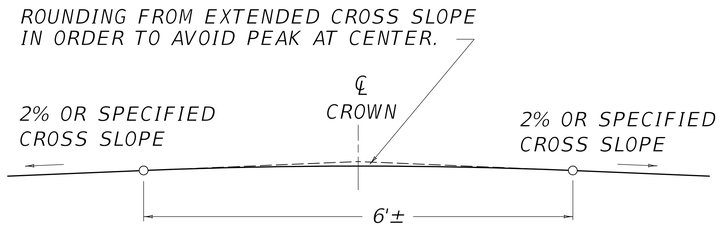


TO BE CONSTRUCTED ON GRADE AND DRAIN CONTRACT.

PROFILE OF EARTH DIKE

PAVEMENT AND SHOULDER CROWN ROUNDED

ROUNDING FROM EXTENDED CROSS SLOPE IN ORDER TO AVOID PEAK AT CENTER.



IN A HORIZONTAL CURVE, ROUNDING SHOULD BE USED AT HINGE POINT BETWEEN SUPERABLE AND NON-SUPERABLE SHOULDERS.

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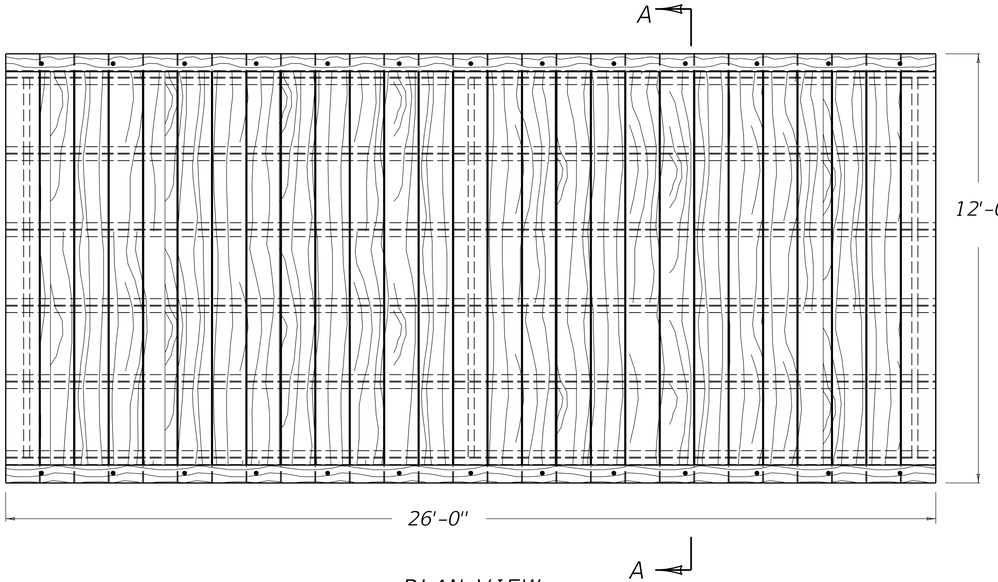
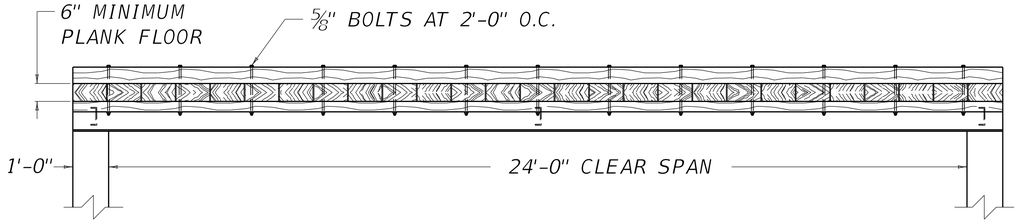
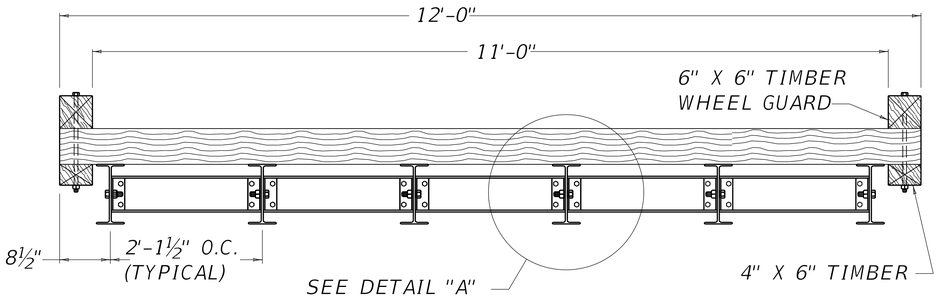
GENERAL



PLAN VIEW



ELEVATION VIEW

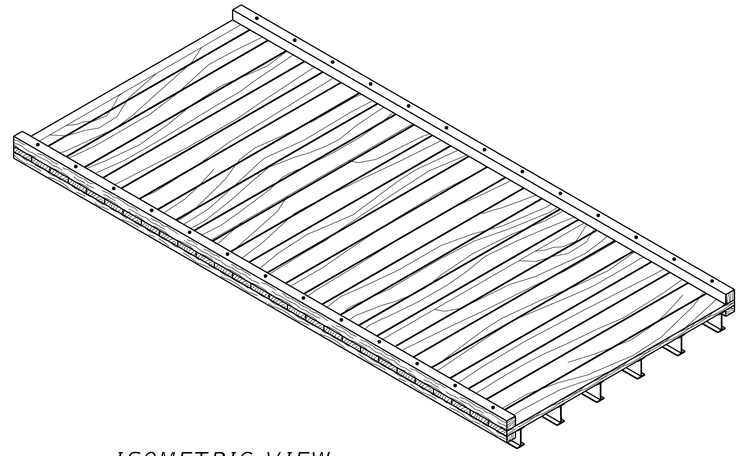


SECTION A-A

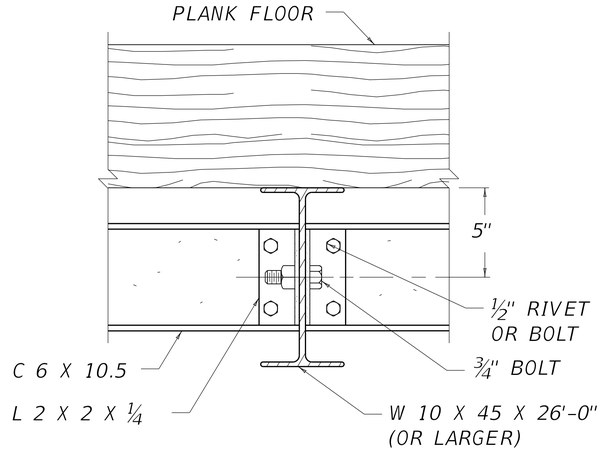
~ NOTES ~

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.



ISOMETRIC VIEW



DETAIL "A"

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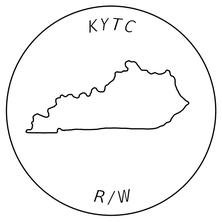
GENERAL

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

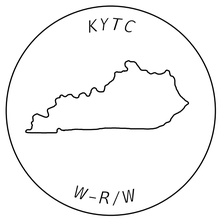
MISCELLANEOUS

TEMPORARY BRIDGE OR PAVEMENT CROSSOVER

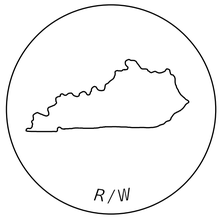
STANDARD DRAWING NUMBER
RGX-003-03



R/W MONUMENT
TYPE 1 OR 1A

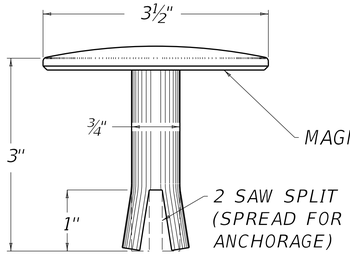


WITNESS R/W
MONUMENT
TYPE 2

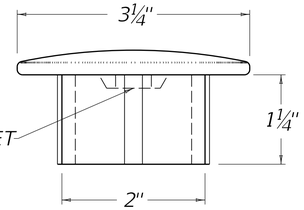


R/W MONUMENT
TYPE 3 OR 3A

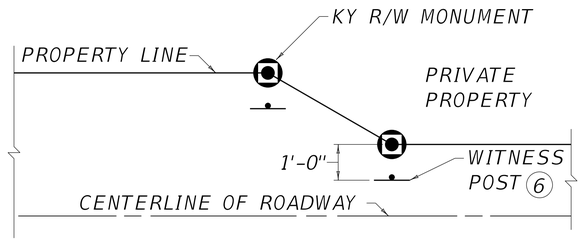
WITNESS R/W
MONUMENT
TYPE 4



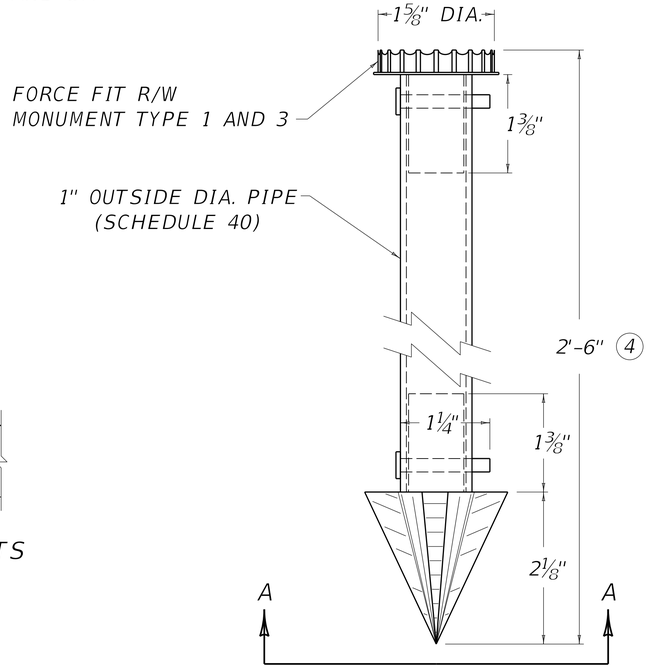
ELEVATION VIEW
R/W MONUMENT
TYPE 1A AND 3A



ELEVATION VIEW
R/W MONUMENT
TYPE 1 AND 3

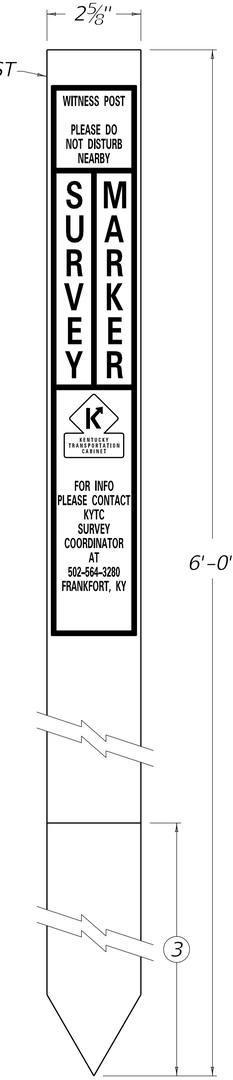


LAYOUT OF RURAL RIGHT-OF-WAY MONUMENTS

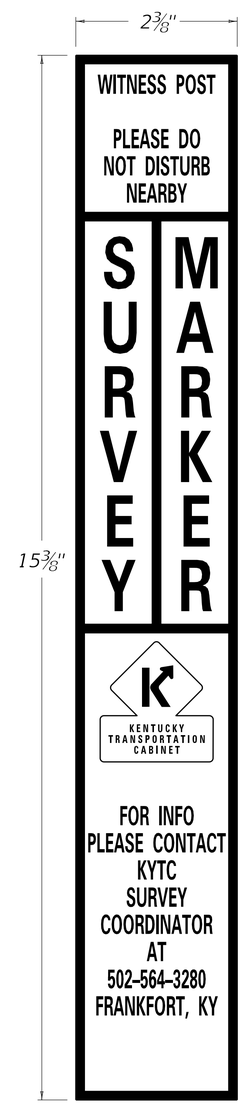


ELEVATION VIEW
R/W MONUMENT
TYPE 1 AND 3

ORANGE
FIBERGLASS
WITNESS POST



ELEVATION WITNESS POST



WITNESS POST DECAL

~ 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

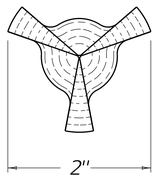
1. MANUFACTURE RIGHT-OF-WAY MONUMENTS FROM ALUMINUM ALLOY.
2. TYPE 1A AND 3A MONUMENTS SHALL BE MOUNTED FLUSH IN EXISTING PAVEMENT, DRAINAGE BOXES, ETC. DRILL A 1 1/16" DIAMETER HOLE AND EPOXY (COMMERCIAL GRADE) INTO EXISTING CONCRETE.

(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.



SECTION A-A

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

GENERAL

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

MISCELLANEOUS

RIGHT-OF-WAY MONUMENTS

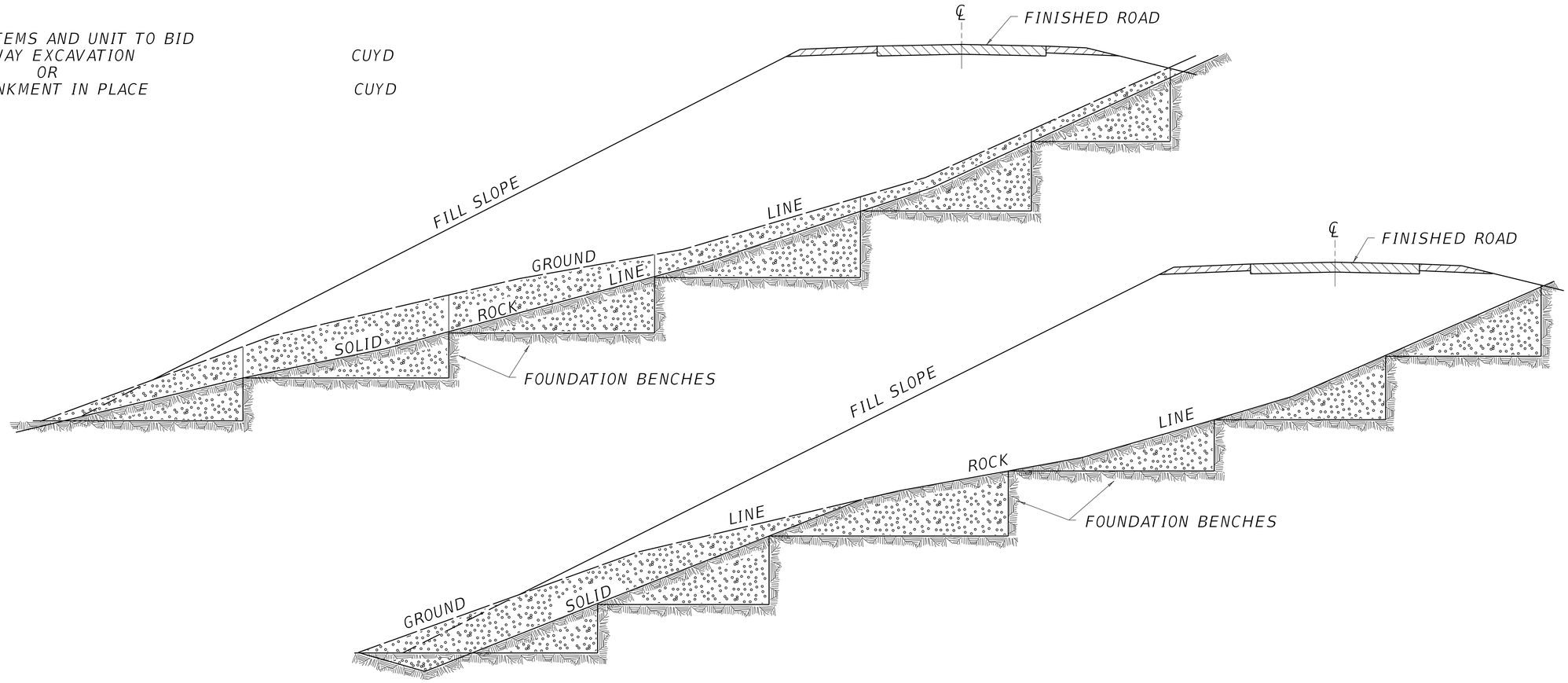
STANDARD DRAWING NUMBER
RGX-005-06

~ 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



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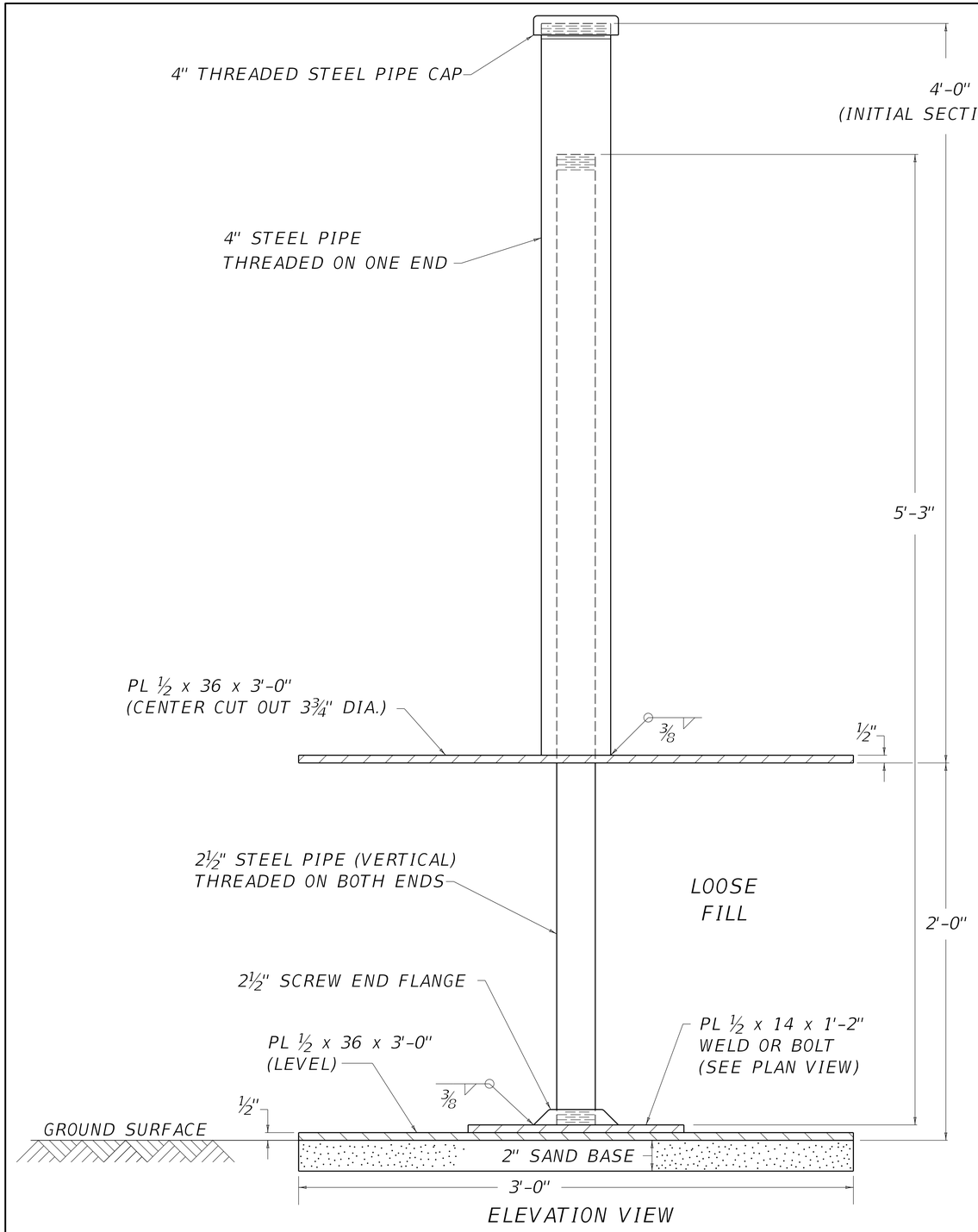
GENERAL

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

MISCELLANEOUS

TYPICAL EMBANKMENT FOUNDATION BENCHES

STANDARD DRAWING NUMBER
RGX-010-04

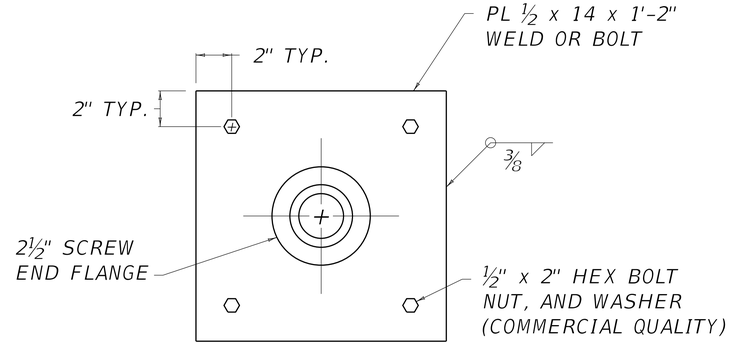


ELEVATION VIEW

~ 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-2½ IN	LF
STEEL PIPE-4 IN	LF



PLAN VIEW

REVISION DATE: 12/01/2015
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APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

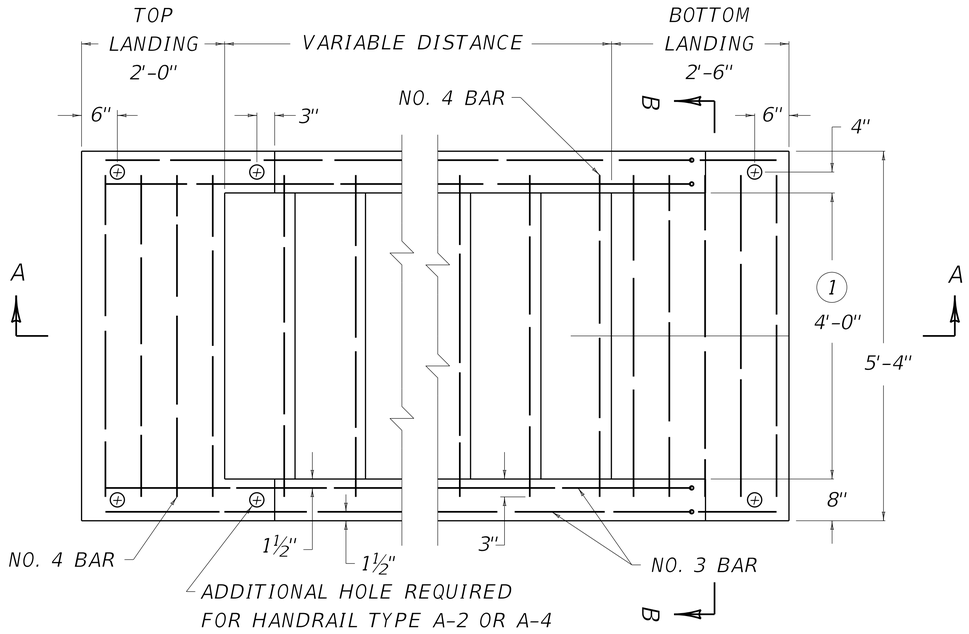
GENERAL

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

MISCELLANEOUS

SETTLEMENT PLATFORM

STANDARD DRAWING NUMBER
RGX-015-03



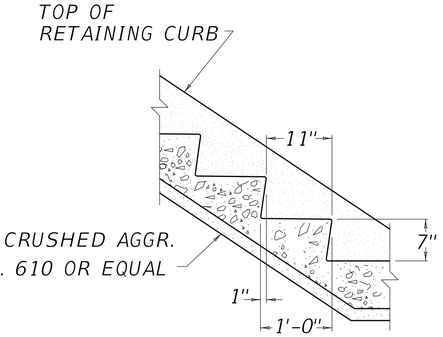
PLAN VIEW

~ NOTES ~

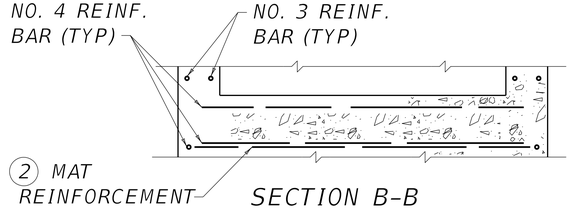
BID ITEM AND UNIT TO BID
CONCRETE-CLASS A FOR STEPS CUYD

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 ¼" R.
5. HANDRAIL SHALL BE REQUIRED WITH THREE OR MORE STEPS.
6. REINFORCING STEEL SHALL BE PLACED SO NOT TO INTERFERE WITH HANDRAIL POSTS.

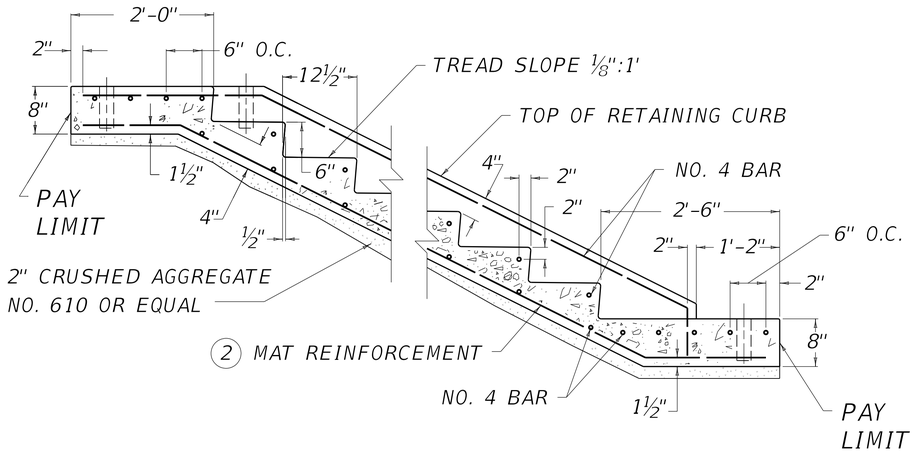
USE WITH CUR. STD. DWG.
RGX-030



STEP DETAIL FOR 1 ½ : 1 SLOPE



SECTION B-B



SECTION A-A 2:1 SLOPE

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
1½:1	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

REVISION DATE: 12/01/2015
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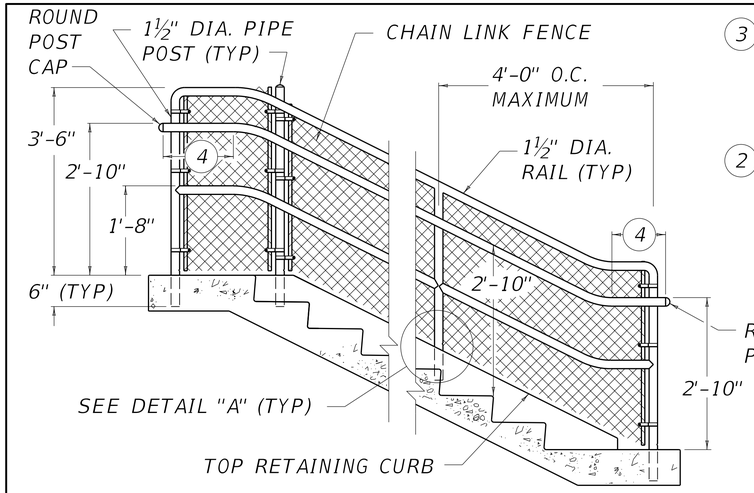
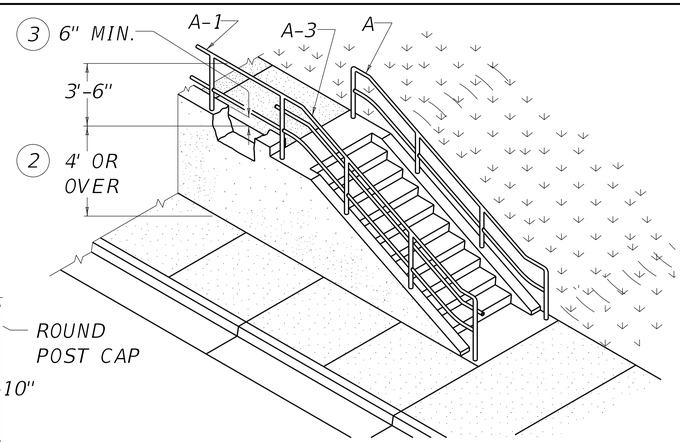
SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

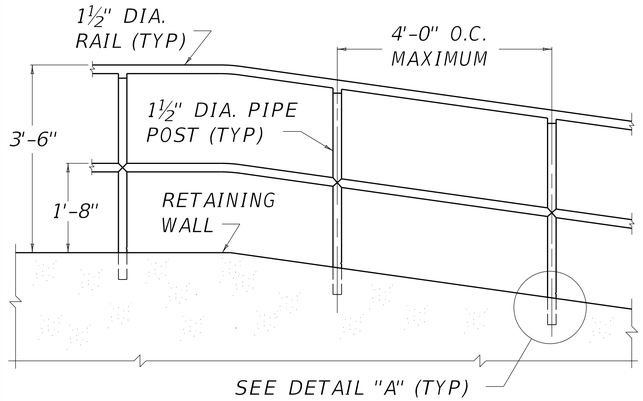
GENERAL



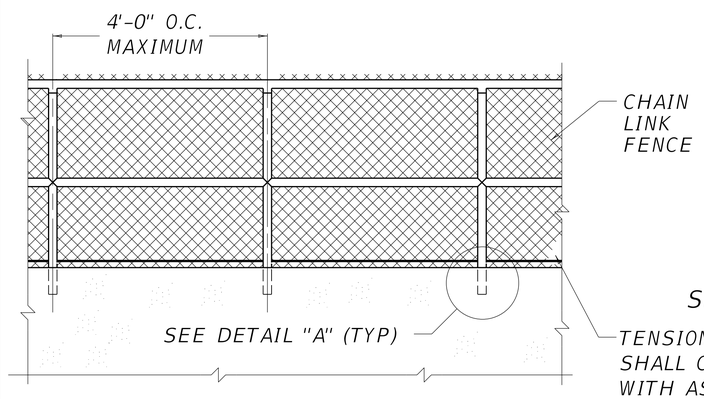
ELEVATION OF HANDRAIL TYPE A-4



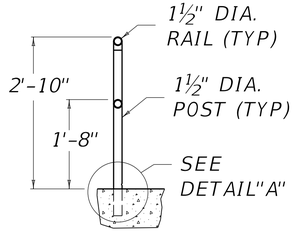
ISOMETRIC OF HANDRAIL TYPE A, A-1 AND A-2



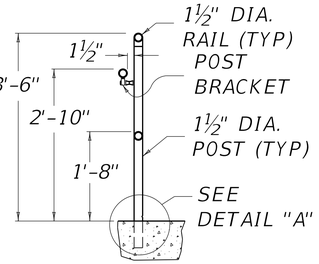
ELEVATION OF HANDRAIL TYPE A-1



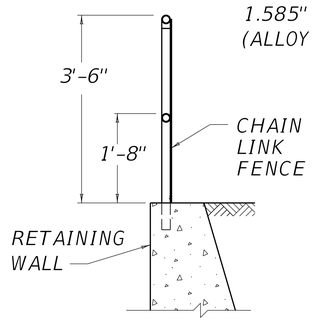
ELEVATION OF HANDRAIL TYPE A-2



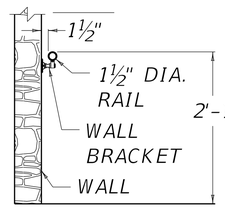
SECTION OF HANDRAIL TYPE A



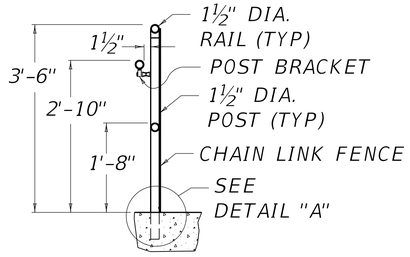
SECTION OF HANDRAIL TYPE A-3



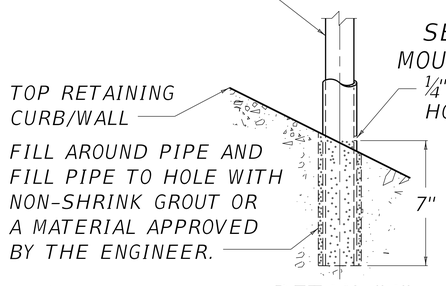
SECTION OF HANDRAIL TYPE A-2



SECT. FOR WALL MOUNTED HANDRAIL



SECT. OF HANDRAIL TYPE A-4



DETAIL "A"

~ 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 1½" 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 1½" 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. USE WITH CUR. STD. DWG. RFC-001

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

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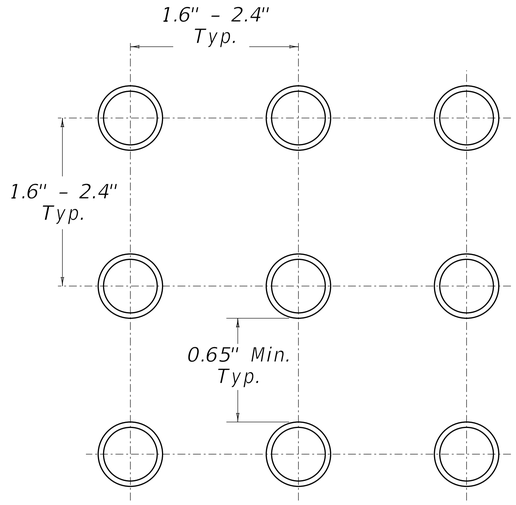
GENERAL

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

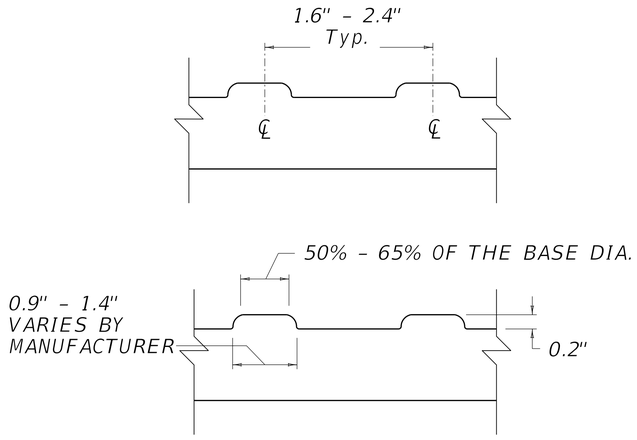
MISCELLANEOUS

HANDRAIL TYPE A, A-1, A-2, A-3, A-4

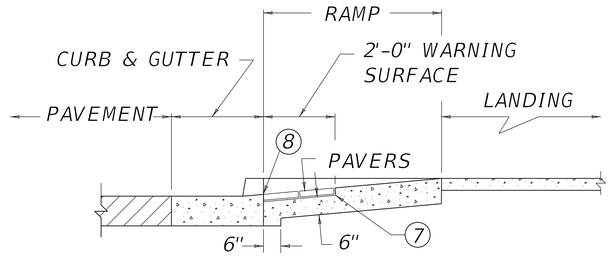
STANDARD DRAWING NUMBER
RGX-030-07



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

REVISION DATE: 12/01/2015
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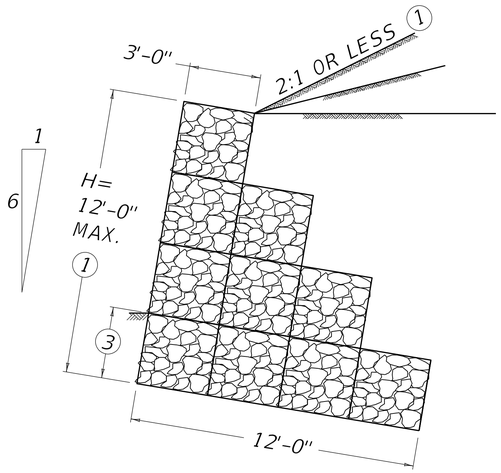
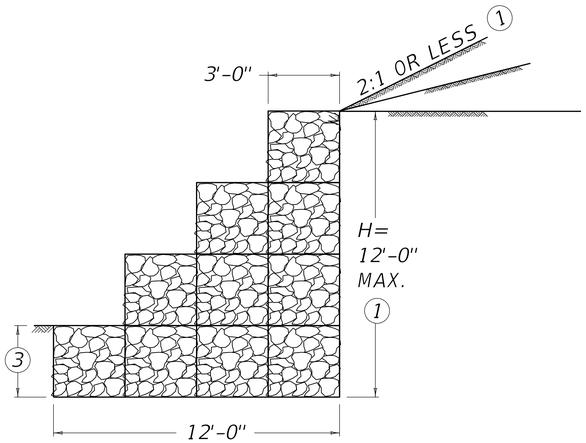
GENERAL



FRONT FACE 6:1 BATTER



FRONT FACE STEPPED

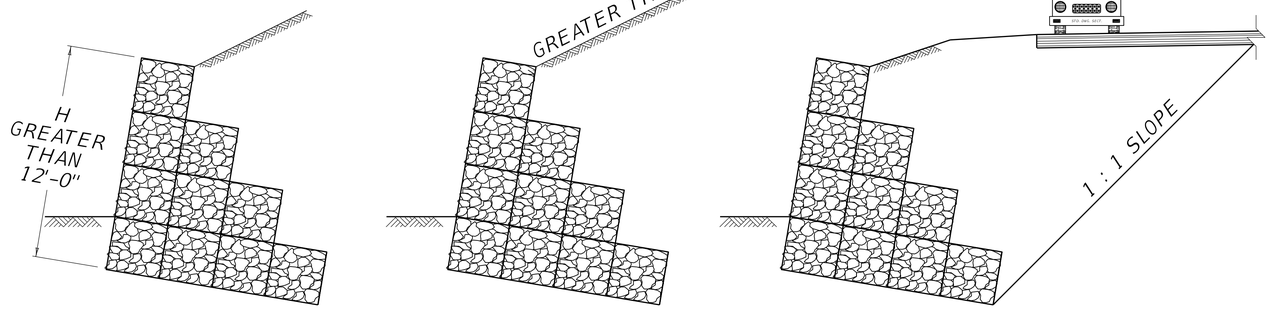
~ NOTES ~

BID ITEMS AND UNIT TO BID

RETAINING WALL-GABION	CUYD
STRUCTURE EXCAVATION	CUYD

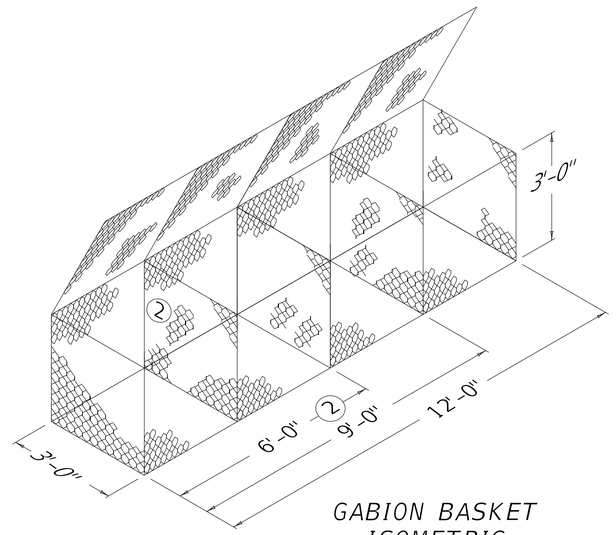
SEE THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION.

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.



A B C

SPECIAL DESIGNS REQUIRED 4



GABION BASKET
ISOMETRIC
VIEW

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015

APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

GENERAL

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

MISCELLANEOUS

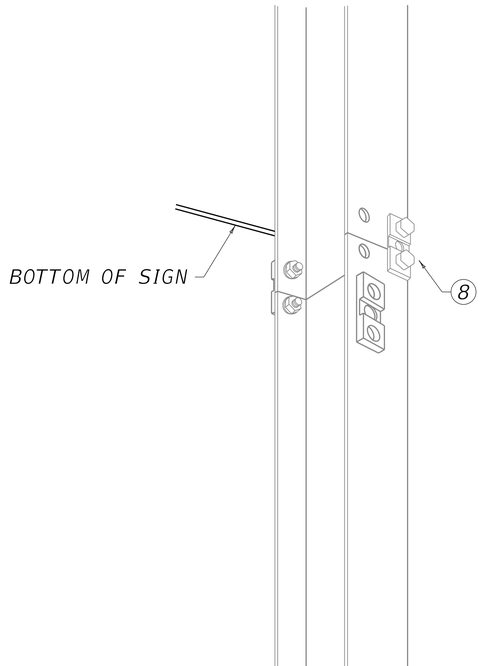
GABION RETAINING WALLS

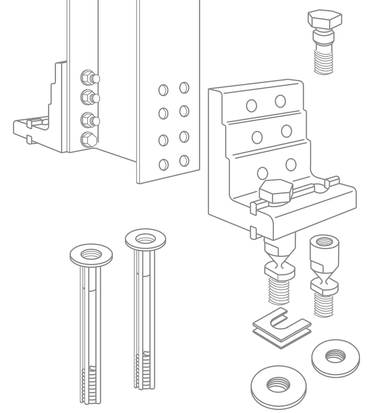
STANDARD DRAWING NUMBER
RGX-050-02

~ 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-061FOR FOOTING DETAILS.

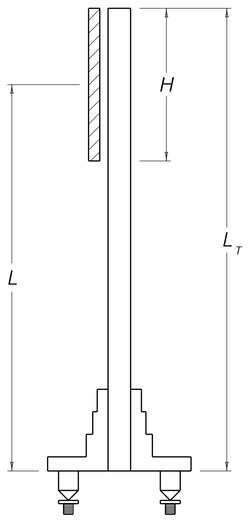
USE WITH CUR. STD. DWG.
RGX-061





~ PICTORIAL VIEW ~

$L = L_T - H/2$



~ 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"

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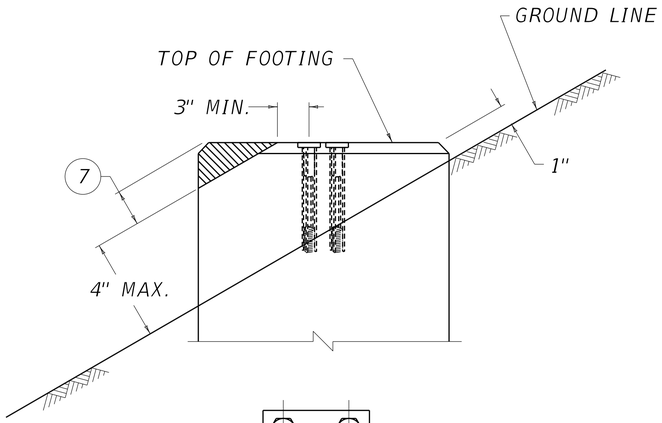
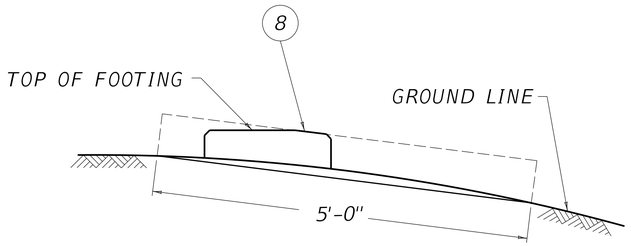
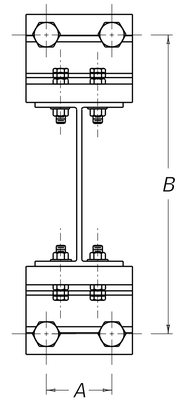
GENERAL



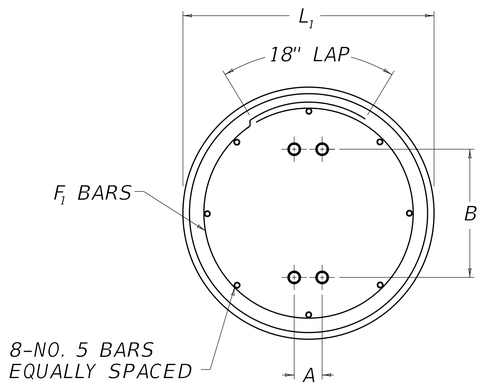


FOOTING SELECTION TABLE

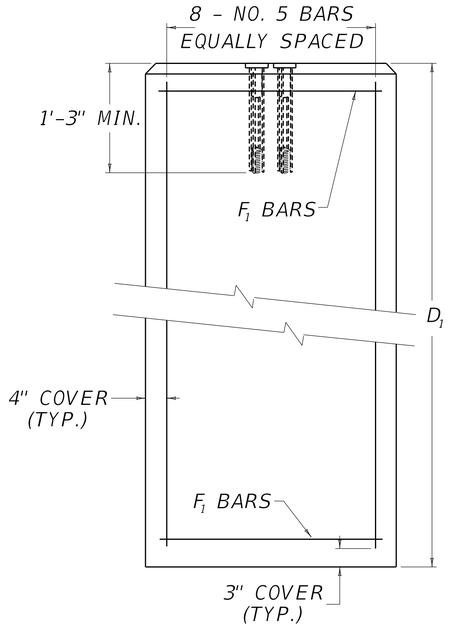
POST SIZE	L_1 DIA.	D_1 DEPTH	STEEL F_1 BARS		REINF.	CONC.
			QTY	SIZE	LBS.	CU. YDS.
W6	2'-0"	5'-0"	5	#4	57	0.58
W8	2'-6"	7'-0"	7	#4	88	1.27
W10	3'-0"	8'-0"	8	#4	110	2.09
W12	3'-0"	8'-0"	8	#4	110	2.09
W14	3'-0"	9'-0"	9	#4	124	2.36
W16	3'-6"	9'-0"	9	#4	133	3.21
W18	3'-6"	9'-0"	9	#4	133	3.21
W21	4'-0"	9'-0"	9	#4	143	4.19



PLAN VIEW



TOP VIEW

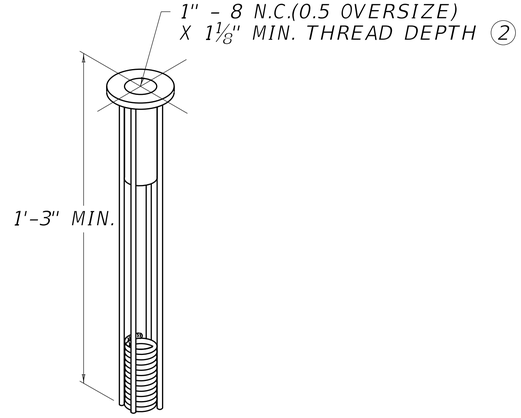


SIDE VIEW

~ 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.

USE WITH CUR. STD. DWG.
RGX-060



ANCHOR PICTORIAL VIEW

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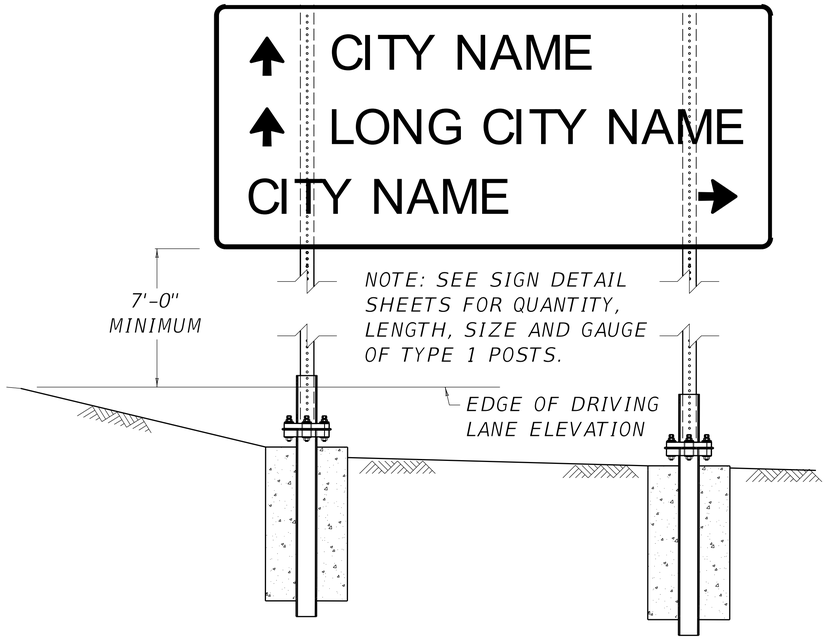
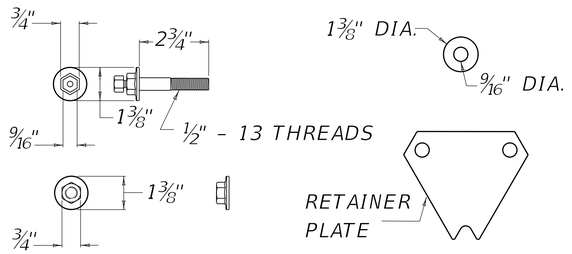
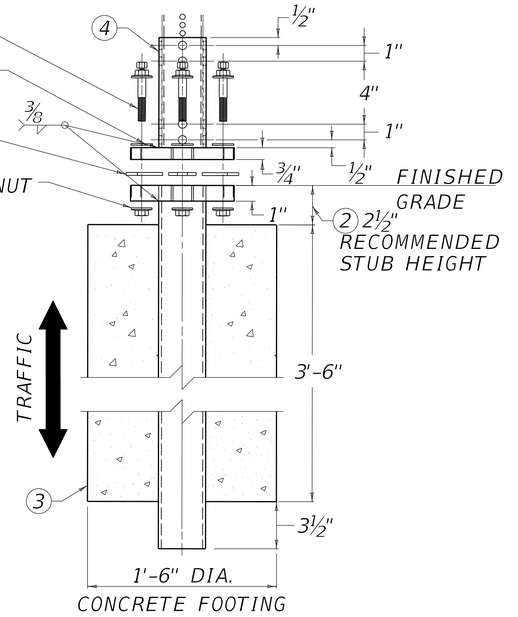
GENERAL



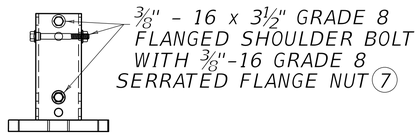
TYPICAL SHEETING SIGN BREAKAWAY SUPPORT INSTALLATION



RETAINER PLATE HARDWARE



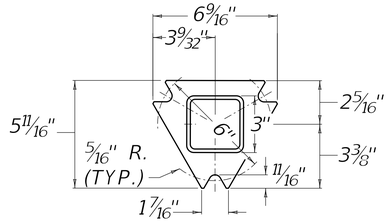
TYPE "D" SUPPORT
OMNI-DIRECTIONAL BREAK-A-WAY
FOR TYPE 1 POSTS



MATERIALS: TUBE RECEIVER - 3" x 3" x 7 GA. ASTM A500 OR A536 DOUBLE IRON CASTING
ASTM A500 GRADE B TUBE PLATE - ASTM A572 GRADE 50

TOP POST RECEIVER / FOR 2½"
SQUARE POST

2¼" x 12 GA. MAYBE INSERTED INTO
2½" X 12 GA. FOR ADDITIONAL WINDLOAD



BOTTOM BASE CONCRETE STUB
MATERIALS: TUBE - 3"X 3" X 7 GA. ASTM A500
GRADE B TUBE PLATE - ASTM A572 GRADE 50

~ NOTES ~

1. FOLLOW MANUFACTURERS INSTALLATION INSTRUCTIONS.
2. DEPTH OF IMBEDMENT TO LEAVE 2½" FROM THE GRADE TO THE TOP OF THE BASE.
3. ALLOW CONCRETE TO CURE AT LEAST 5 DAYS BEFORE ERECTING SIGN.
4. PLACE TOP POST RECIEVER SO THAT THE SIGN POST IS IN THE CORRECT POSITION FOR SIGN VISIBILITY, ON TO THE BASE AND WASHER SHIMS OR RETAINER PLATE.
5. TORQUE BOLTS AS PER MANUFACTURERS INSTRUCTIONS.
6. INSERT SIGN SUPPORT INTO THE TUBULAR PORTION OF THE TOP POST RECIEVER AND SECURE WITH 3 EACH ⅜"- 16 x 3½" 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.
7. 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.

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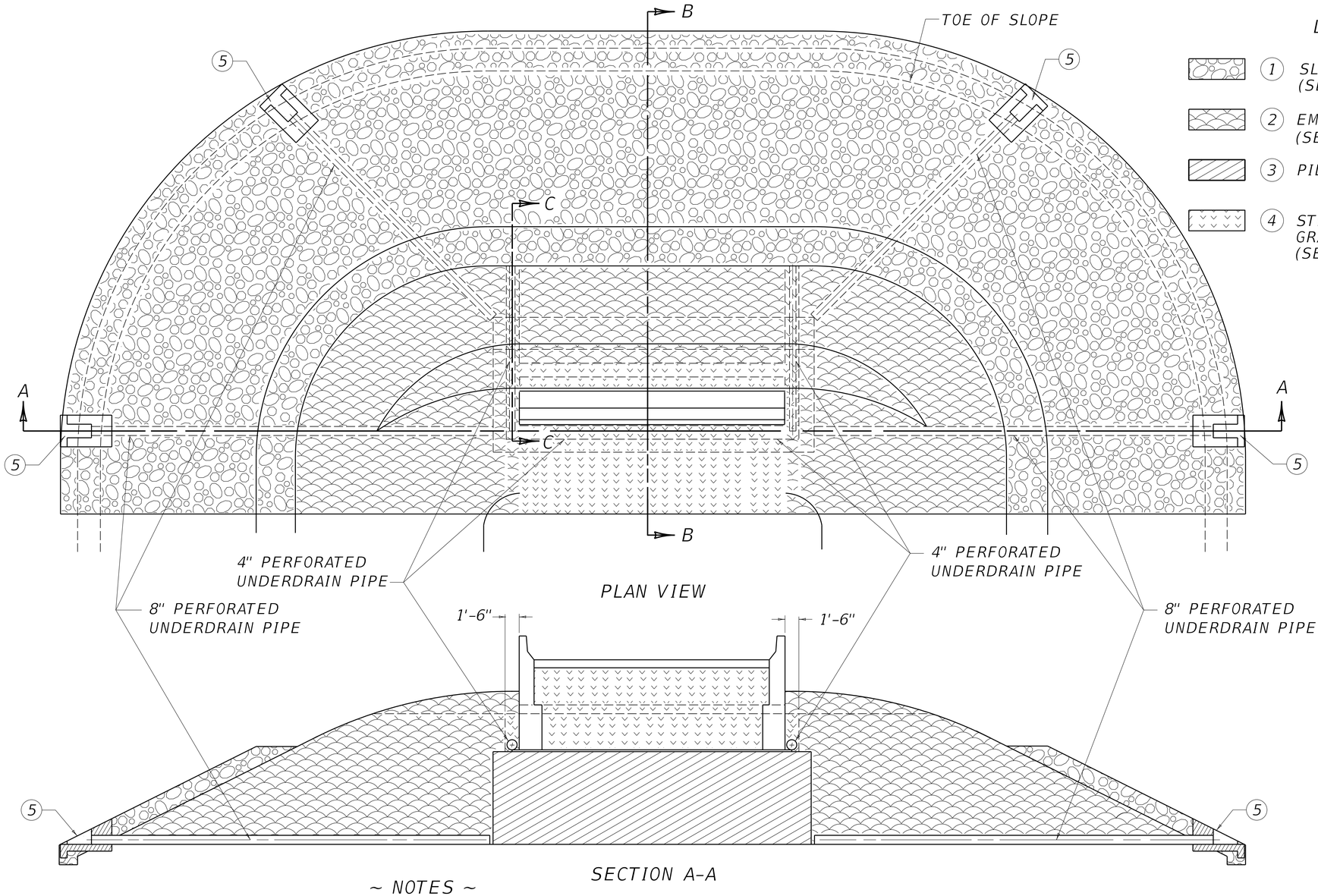
GENERAL



LEGEND

1. SLOPE PROTECTION (SEE BRIDGE PLANS)
2. EMBANKMENT (SEE ROADWAY PLANS)
3. PILE CORE
4. STRUCTURE GRANULAR BACKFILL (SEE BRIDGE PLANS)

~ NOTES ~

THE PURPOSE OF THIS DRAWING AND CUR. 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 PLANS.
2. GRANULAR OR ROCK EMBANKMENT REQUIRED WHEN AND AS NOTED ON THE PLANS.
3. PILE CORE IN ACCORDANCE WITH SPECIAL PROVISION NO. 69.
4. STRUCTURE GRANULAR BACKFILL REQUIRED AT ALL TIMES.
5. FOR HEADWALL CONSTRUCTION SEE CUR. STD. DWG RDP-010 (SEE ROADWAY PLANS)

USE WITH CUR. STD. DWG.
RDP-010 RGX-105

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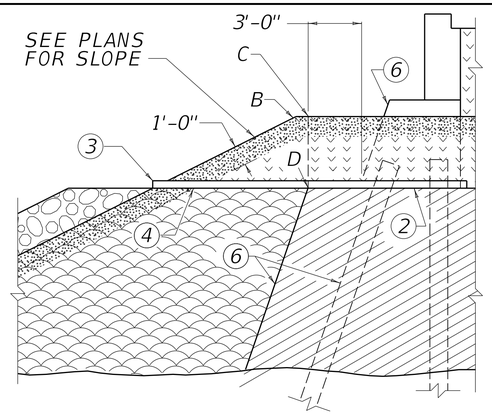
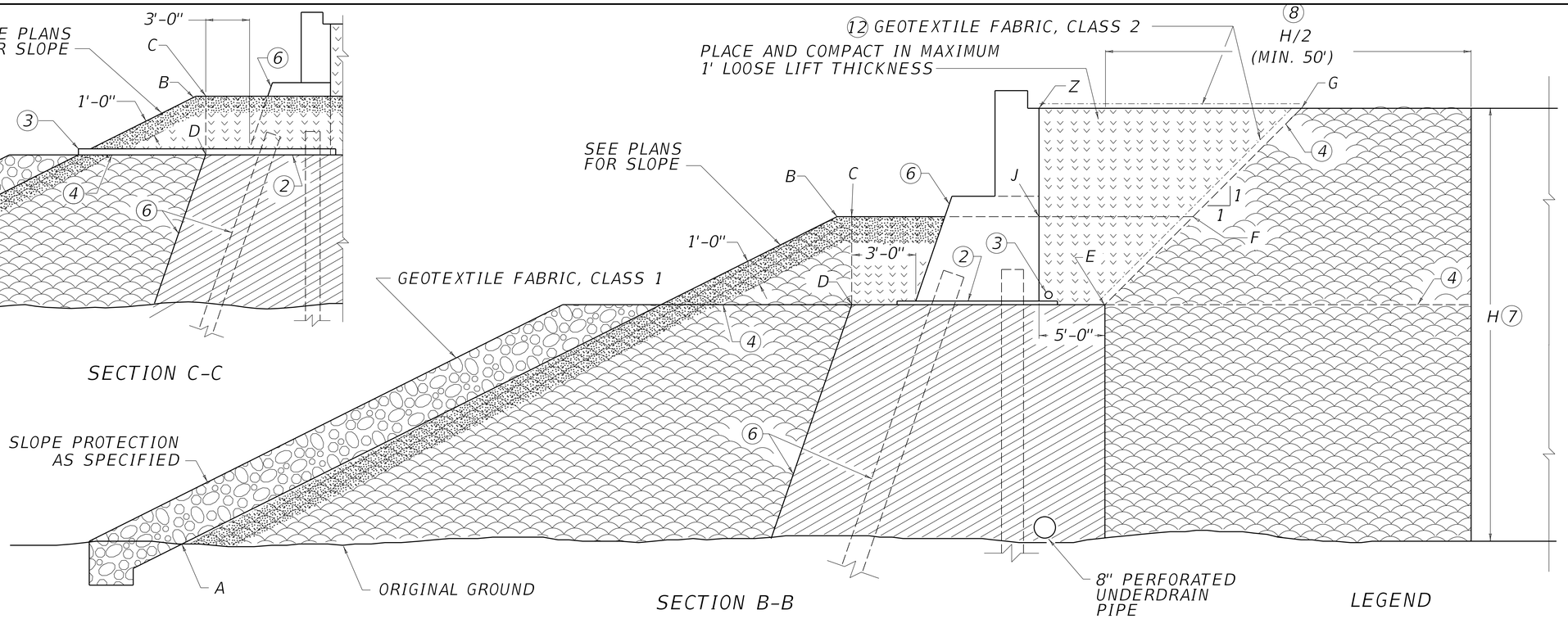
GENERAL

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

GENERAL	TREATMENT OF EMBANKMENTS AT END-BENTS	STANDARD DRAWING NUMBER RGX-100-07



SECTION C-C



SECTION B-B

BID ITEMS AND UNIT TO BID

GRANULAR EMBANKMENT	CUYD
STRUCTURE GRANULAR BACKFILL	CUYD

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 WITH COMPACTED STRUCTURE GRANULAR BACKFILL.

(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 IN ACCORDANCE WITH SPECIAL PROVISION NO. 69.

~ NOTES ~

(1) CONSTRUCTION SEQUENCE "B" IS A PERMITTED ALTERNATE ONLY WHEN GRANULAR OR ROCK EMBANKMENT IS UTILIZED.

(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 ALTERNATES FOR TEMPORARY SLOPE (CONSTRUCTION SEQUENCE "B").

5. SHADED PORTIONS AND REPRESENT LIMITS OF NON-ERODIBLE GRANULAR EMBANKMENT IN ACCORDANCE WITH SPECIAL PROVISION NO. 69.

(6) SLOPES ARE EQUAL.

(7) "H" = EMBANKMENT HEIGHT MEASURED FROM SUBGRADE ELEVATION AT POINT (Z) TO THE LOWEST ELEVATION AT THE TOE OF THE SLOPE.

(8) LIMITS OF EMBANKMENT CONSTRUCTION (H/2 OR 50' MIN.) REQUIRING 2' MAXIMUM LIFT THICKNESS FOR GRANULAR OR ROCK EMBANKMENTS.

9. SEE CURRENT SPECIAL PROVISION NO. 69 FOR CONSTRUCTION AND MATERIAL REQUIREMENTS, METHOD OF MEASUREMENT 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, CLASS 2 PRIOR TO PLACING STRUCTURE GRANULAR BACKFILL AND AGGREGATE BASE COURSE.

LEGEND

- SLOPE PROTECTION (SEE BRIDGE PLANS)
- PILE CORE
- STRUCTURE GRANULAR BACKFILL
- EMBANKMENT

USE WITH CUR. STD. DWG. RGX-100

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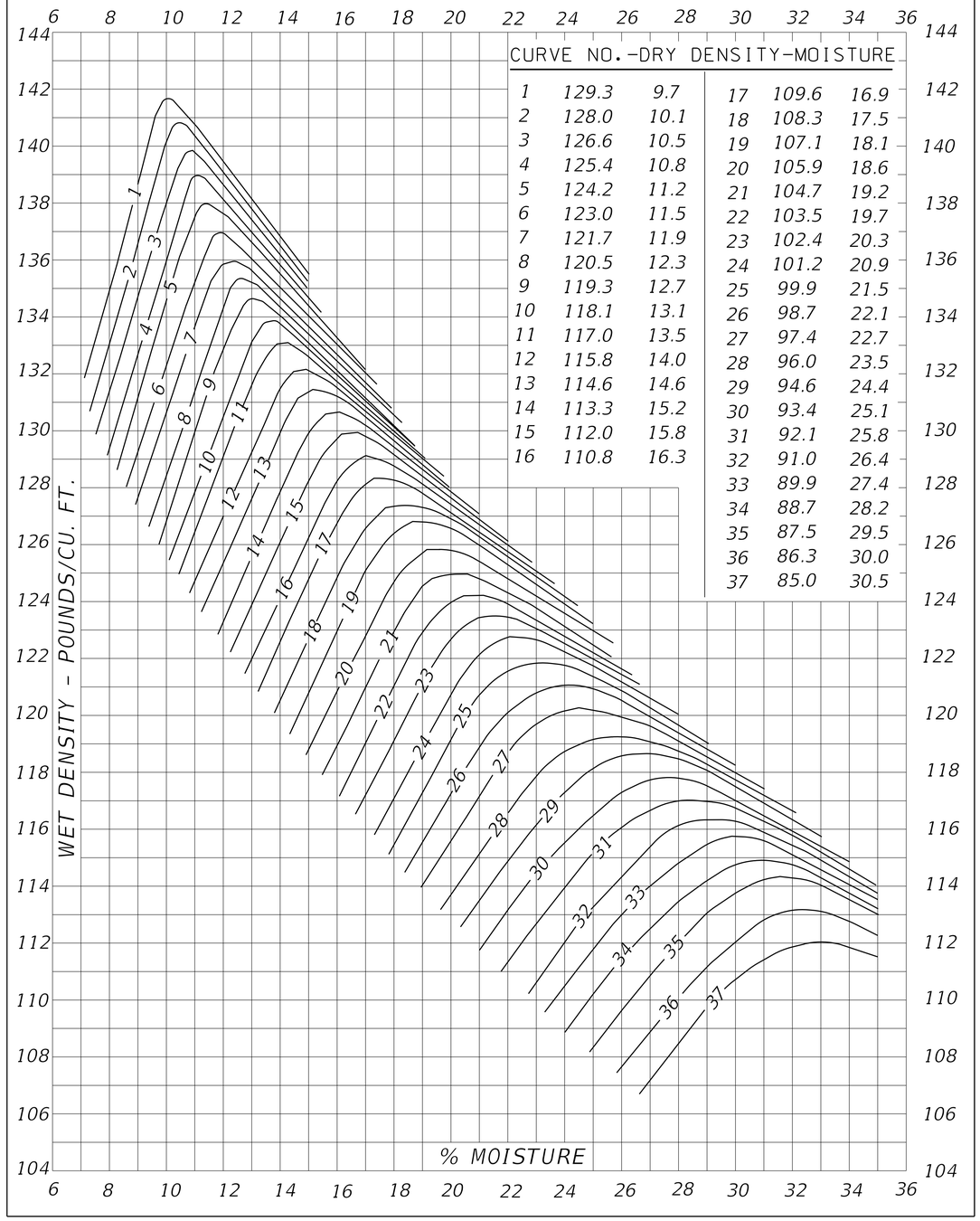
GENERAL

MOISTURE DENSITY FAMILY OF CURVES



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

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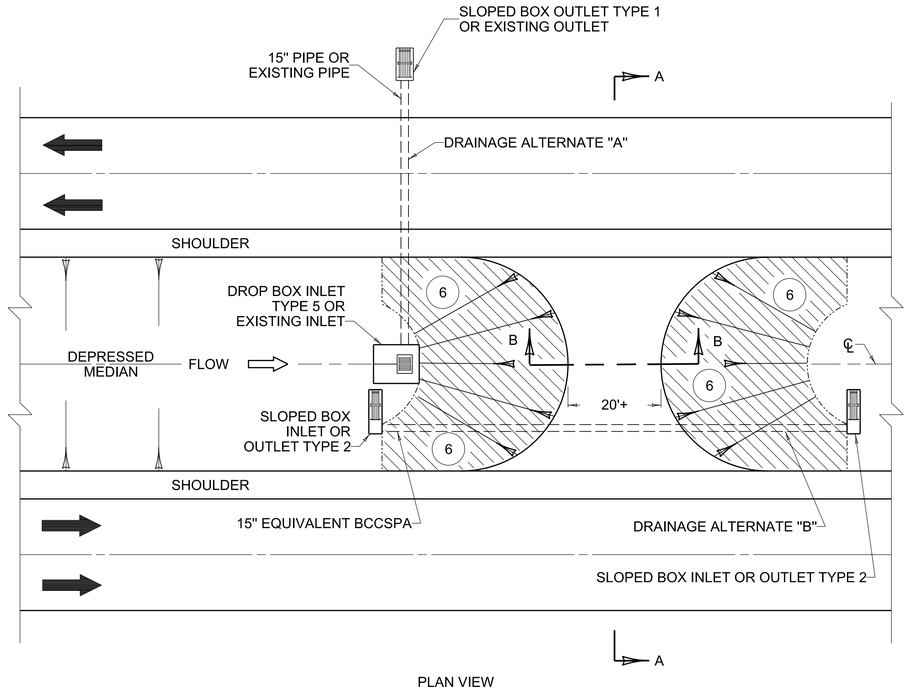
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY. TRANSPORTATION CABINET

MISCELLANEOUS

ONE POINT PROCTER FAMILY OF CURVES

STANDARD DRAWING NUMBER
RGX-200-01



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%*

THIS DRAWING TO BE USED ONLY FOR FULL CONTROL OF ACCESS PROJECTS WITH DEPRESSED MEDIANS.

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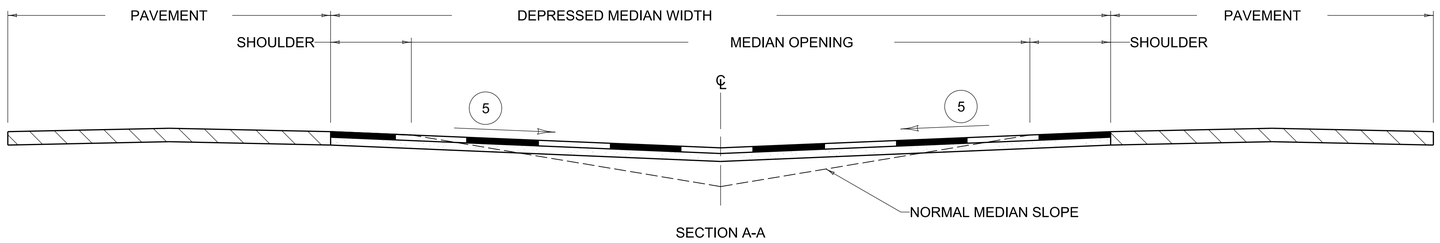
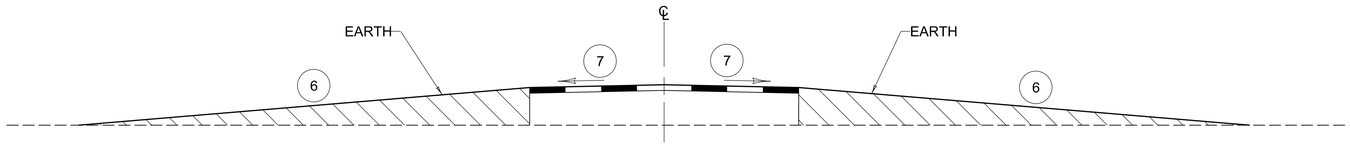


SECTION A-A



SECTION B-B

PAVEMENT

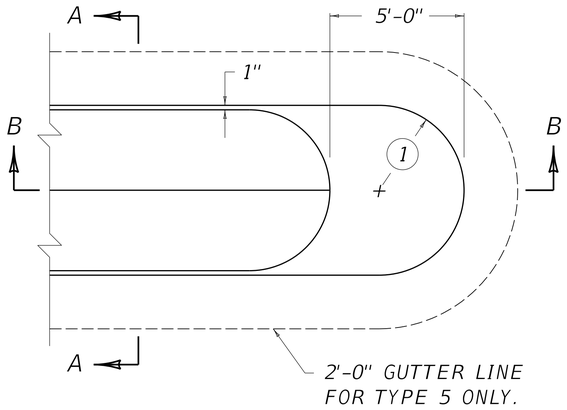
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

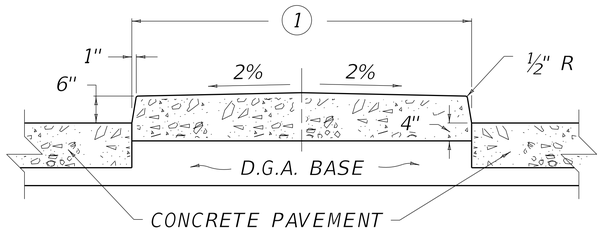
MEDIAN

PERMANENT U-TURN MEDIAN OPENING

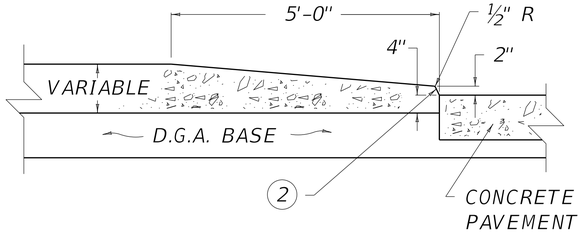
STANDARD DRAWING NUMBER
RPM-001-04



PLAN VIEW
BARRIER MEDIAN

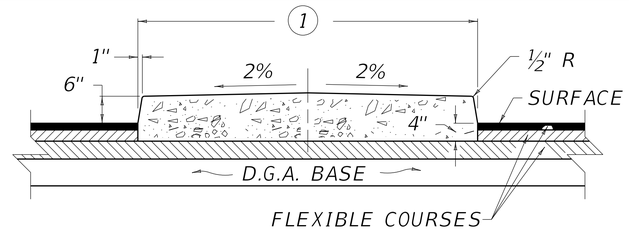


SECTION A-A

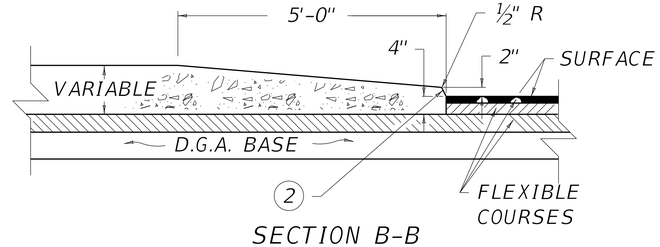


SECTION B-B

BARRIER MEDIAN
WITH RIGID PAVEMENT (TYPE 1)

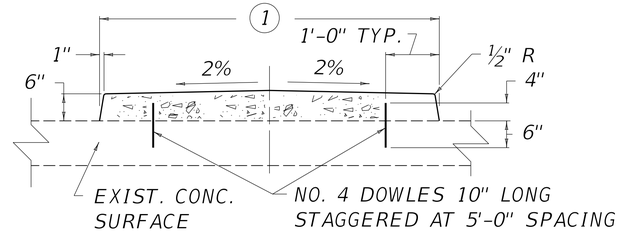


SECTION A-A

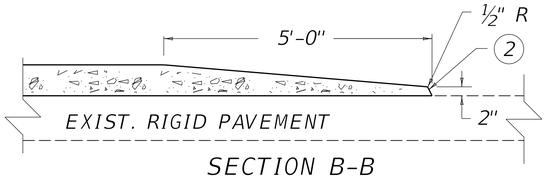


SECTION B-B

BARRIER MEDIAN
WITH FLEXIBLE PAVEMENT (TYPE 2)

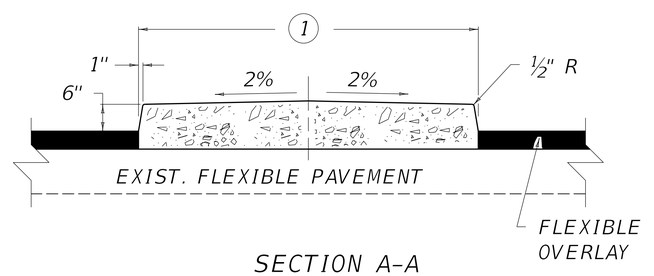


SECTION A-A

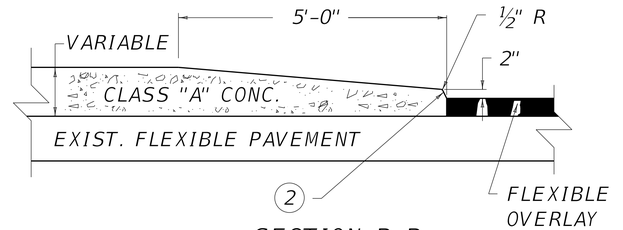


SECTION B-B

BARRIER MEDIAN
ON EXISTING RIGID PAVEMENT (TYPE 3)

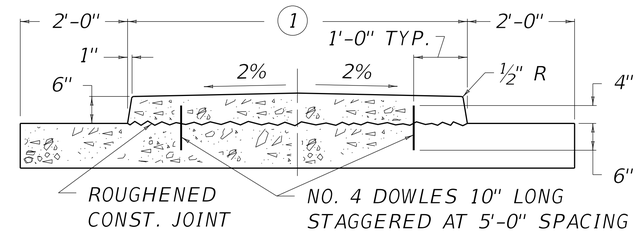


SECTION A-A

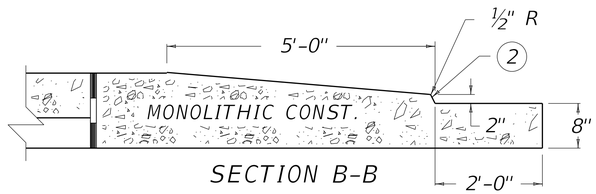


SECTION B-B

BARRIER MEDIAN
ON EXISTING FLEXIBLE PAVEMENT (TYPE 4)



SECTION A-A



SECTION B-B

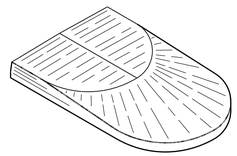
BARRIER MEDIAN
WITH FLEXIBLE PAVEMENT (TYPE 5)

~ 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)

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

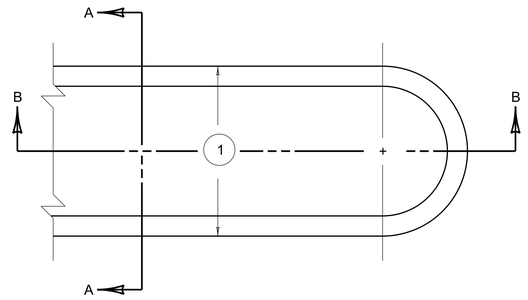
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

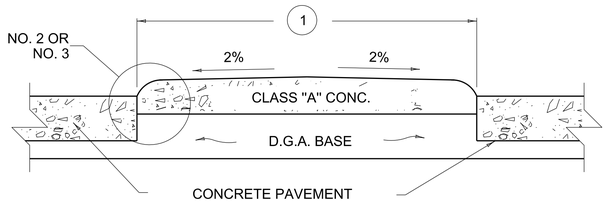
BARRIERS

STANDARD BARRIER MEDIAN

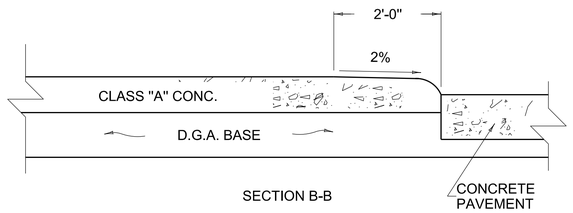
STANDARD DRAWING NUMBER
RPM-010-06



PLAN VIEW
MOUNTABLE MEDIAN



SECTION A-A



SECTION B-B

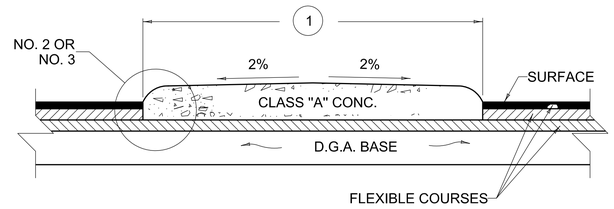
MOUNTABLE MEDIAN
WITH RIGID PAVEMENT
(TYPE 1 & TYPE 1A)

~ NOTES ~

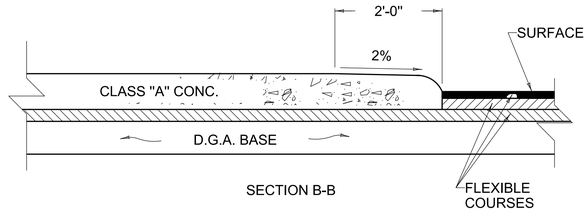
(1) *SEE PLANS FOR CONSTANT OR VARIABLE WIDTH DIMENSIONS.*

(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)

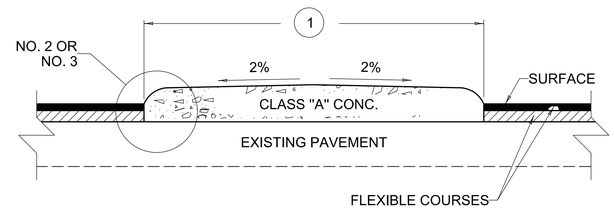


SECTION A-A

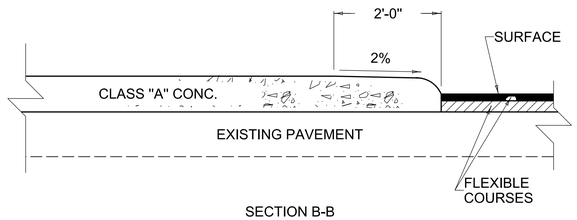


SECTION B-B

MOUNTABLE MEDIAN
WITH FLEXIBLE PAVEMENT
(TYPE 2 & TYPE 2A)

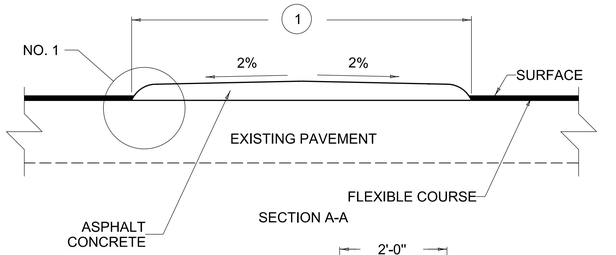


SECTION A-A

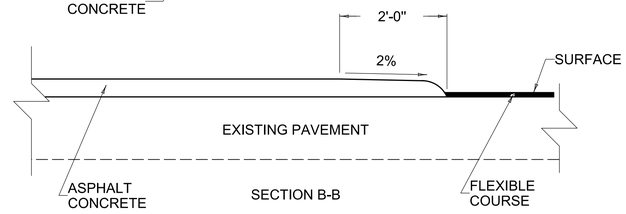


SECTION B-B

MOUNTABLE MEDIAN
ON EXISTING PAVEMENT
(TYPE 3 & TYPE 3A)

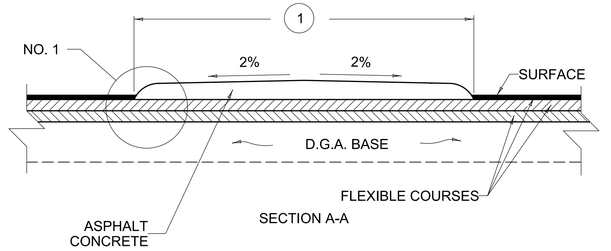


SECTION A-A

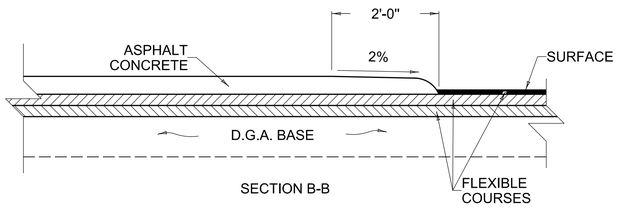


SECTION B-B

MOUNTABLE MEDIAN
ON EXISTING PAVEMENT
(TYPE 4)

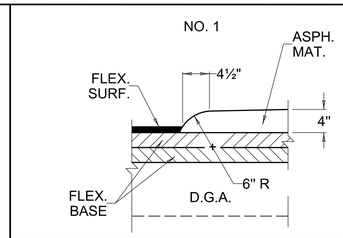


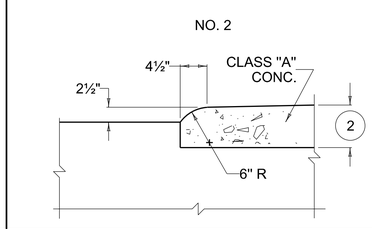
SECTION A-A

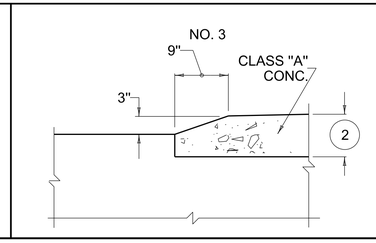


SECTION B-B

MOUNTABLE MEDIAN
WITH FLEXIBLE PAVEMENT
(TYPE 5)







REVISION DATE: 12/01/2015
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APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

PAVEMENT

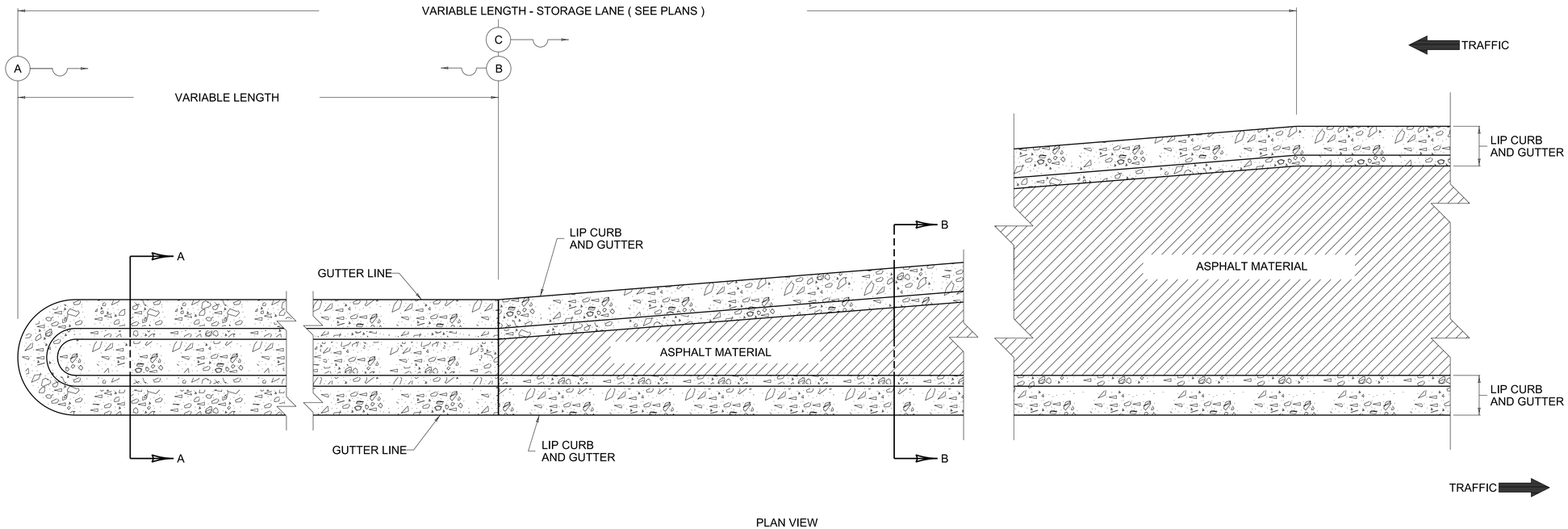
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

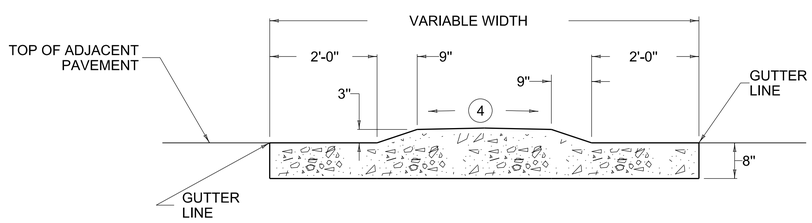
MEDIAN

MOUNTABLE MEDIAN

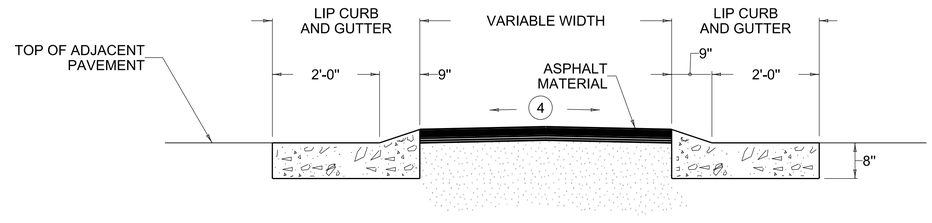
STANDARD DRAWING NUMBER
RPM-011-06



PLAN VIEW



SECTION A-A



SECTION B-B

~ NOTES ~

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 REQUIREMENTS 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.*

BID ITEMS AND UNIT TO BID

MOUNTABLE MEDIAN TYPE 6A	*SQYD*
LIP CURB AND GUTTER	*LF*

USE WITH CUR. STD. DWG.
RPM-100

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED *DIVISION DIRECTOR* 12-01-2015 *DATE*

APPROVED *STATE HIGHWAY ENGINEER* 12-01-2015 *DATE*

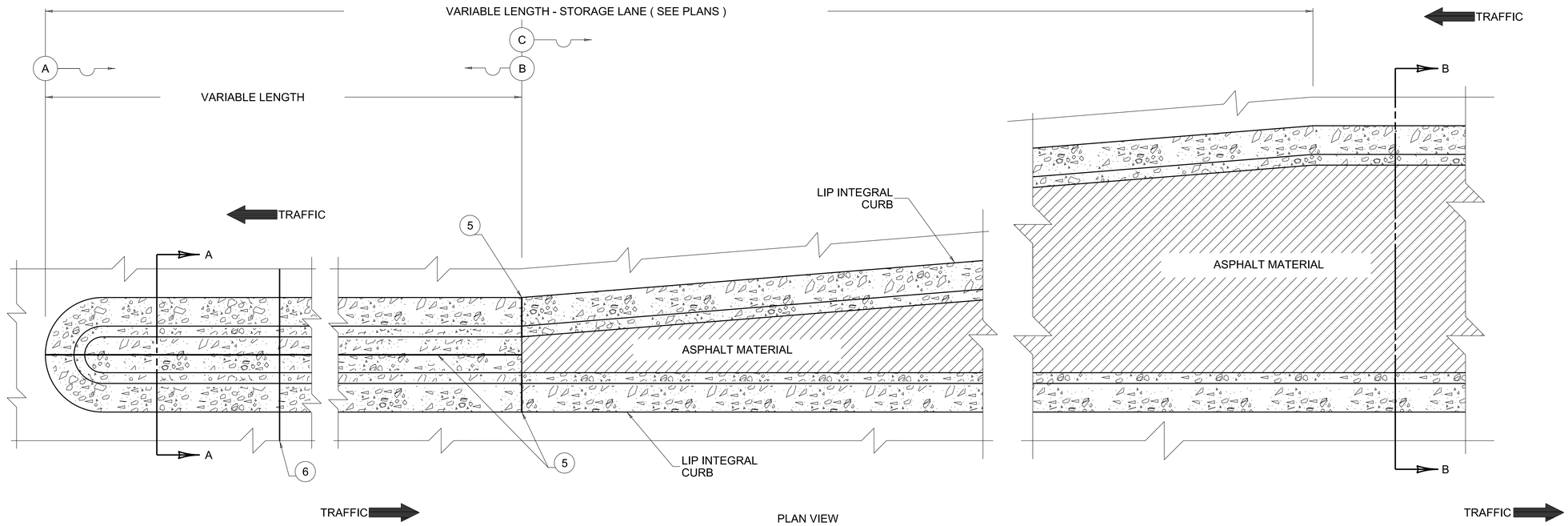
PAVEMENT

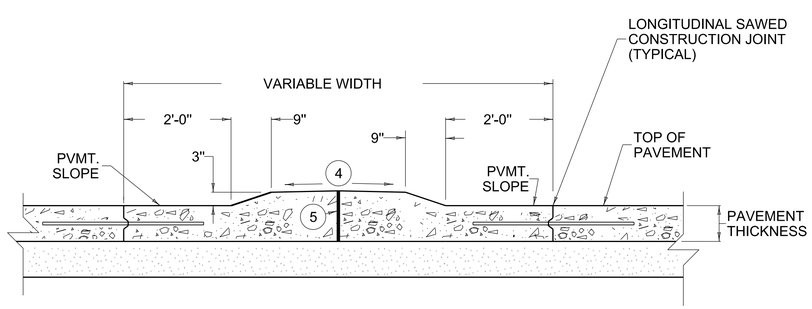
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

MEDIANS

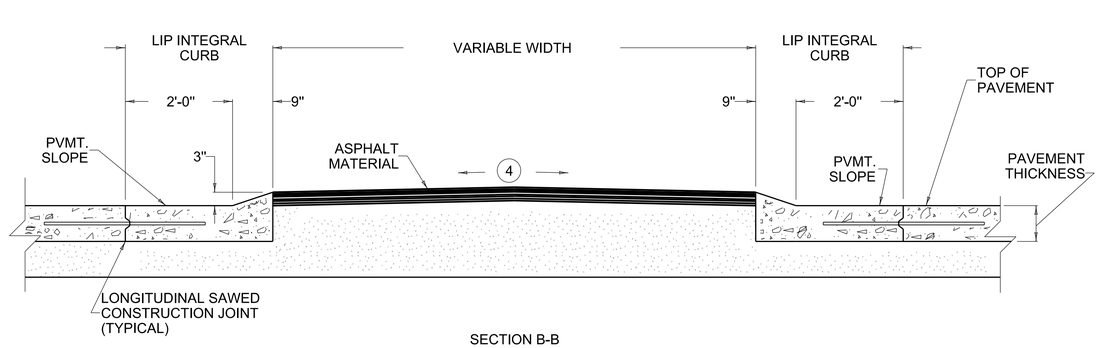
MOUNTABLE MEDIAN TYPE 6A

STANDARD DRAWING NUMBER
RPM-012-04





SECTION A-A



SECTION B-B

~ NOTES ~

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.*

BID ITEMS AND UNIT TO BID

MOUNTABLE MEDIAN TYPE 7A	*SQYD*
LIP INTEGRAL CURB	*LF*

INTENDED USE:
WITH RIGID PAVEMENT

USE WITH CUR. STD. DWG.
RPM-100

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015
APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

PAVEMENT

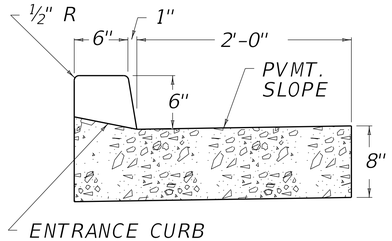
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY. TRANSPORTATION CABINET

MEDIANS

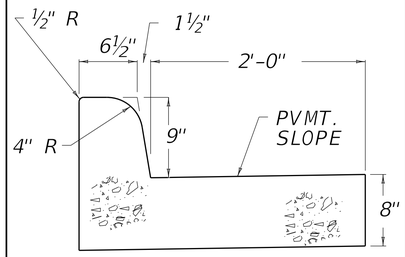
MOUNTABLE MEDIAN TYPE 7A

STANDARD DRAWING NUMBER
RPM-015-04

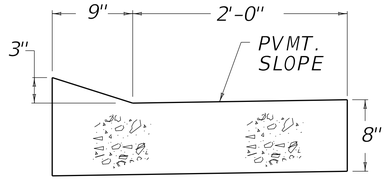
STANDARD CURB & GUTTER



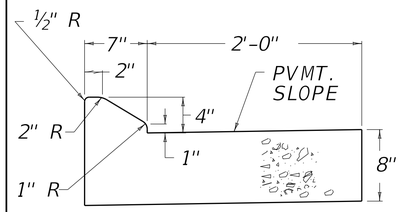
BARRIER CURB & GUTTER



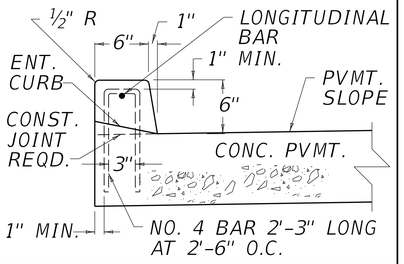
LIP CURB & GUTTER



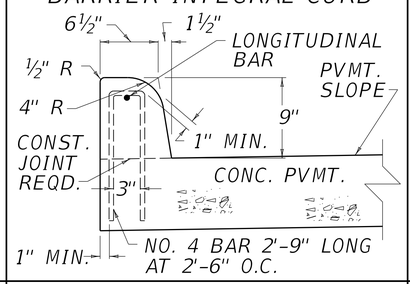
ISLAND CURB & GUTTER



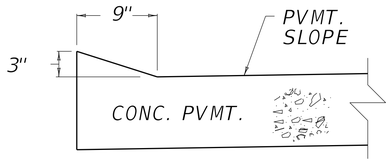
① STANDARD INTEGRAL CURB



BARRIER INTEGRAL CURB

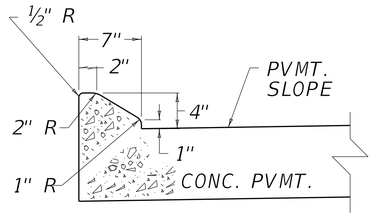


LIP INTEGRAL CURB



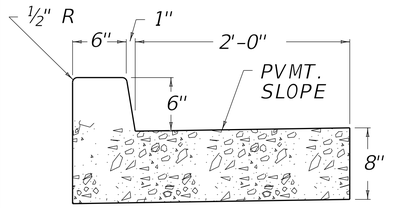
CONST. JOINT NOT PERMITTED

ISLAND INTEGRAL CURB

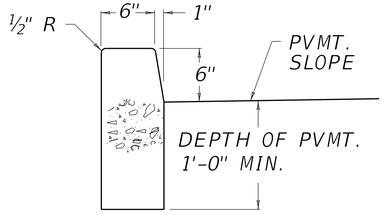


CONST. JOINT NOT PERMITTED

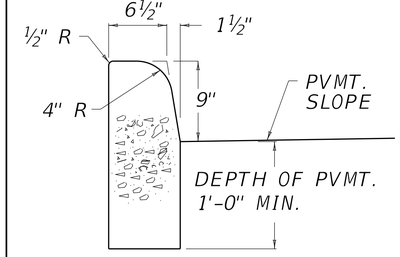
STANDARD HEADER CURB & GUTTER



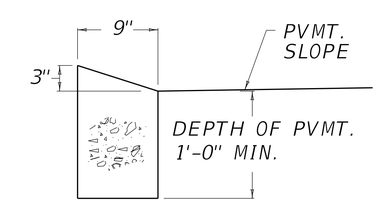
STANDARD HEADER CURB TYPE 1 EXISTING PAVEMENT



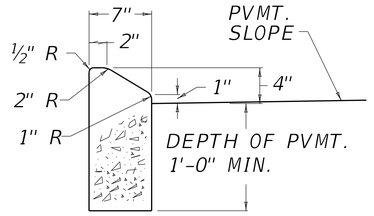
BARRIER HEADER CURB



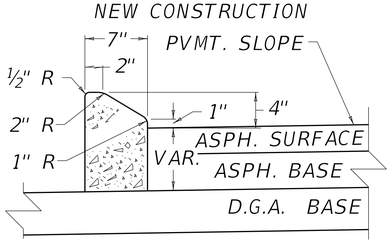
LIP HEADER CURB



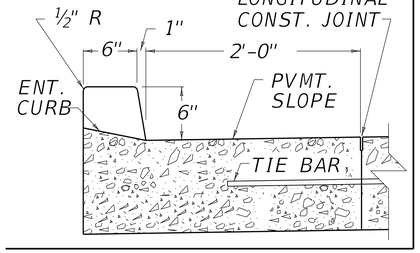
ISLAND HEADER CURB TYPE 1 EXISTING PAVEMENT



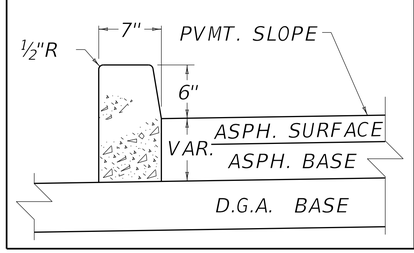
ISLAND HEADER CURB TYPE 2 NEW CONSTRUCTION



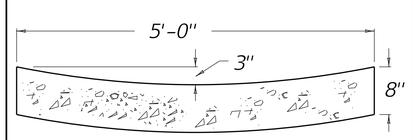
② STANDARD INTEGRAL CURB



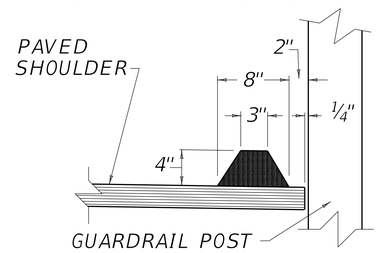
STANDARD HEADER CURB TYPE 2 NEW CONSTRUCTION



VALLEY GUTTER



ASPHALT WEDGE CURB



~ NOTES ~

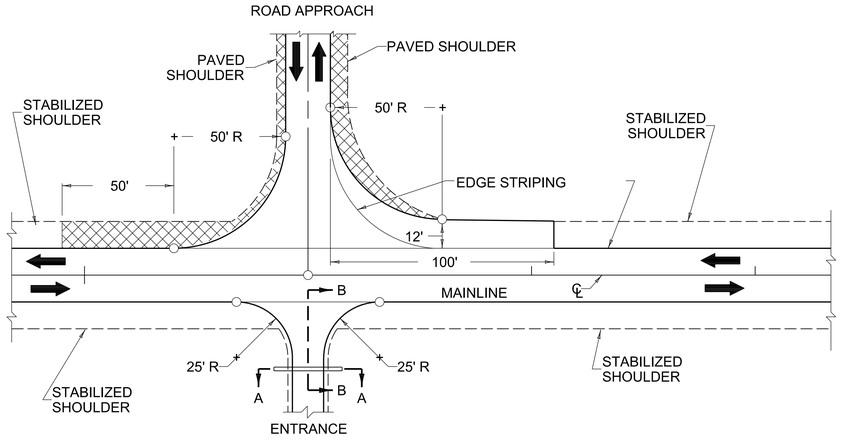
1. ALL INTEGRAL CURBS SHOWING REINFORCING STEEL SHALL BE CAST SEPARATELY FROM THE PAVEMENT AND THE REINFORCEMENT SHALL CONSIST SOLELY OF NO. 4 BARS AS DETAILED ON THIS DRAWING. ON CONSTRUCTION CARE SHOULD BE TAKEN SO THAT NO REINFORCEMENT BARS ARE CLOSER THAN 3" TO THE CENTER OF THE SAWED TRANSVERSE 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.

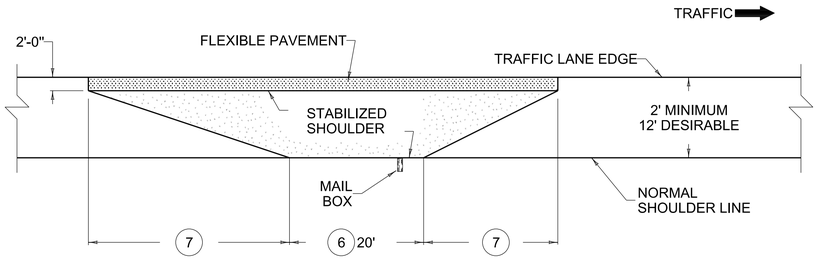
BID ITEM AND UNIT TO BID
(CURB TYPE) LF

REVISION DATE: 02/26/2020
REVISION NUMBER: 0

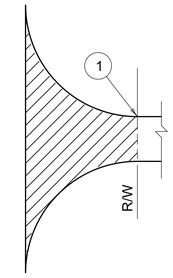
SUBMITTED — DIVISION DIRECTOR — DATE 02-26-2020
APPROVED — STATE HIGHWAY ENGINEER — DATE 02-26-2020

PAVEMENT



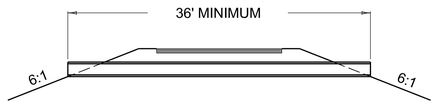


MAIL BOX TURNOUT

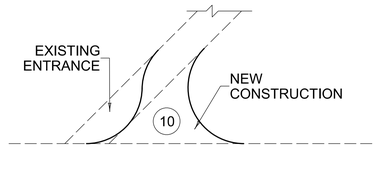


(1) PAVE TO R/W LINE OR END OF RADIUS, WHICHEVER IS FURTHER FROM THE EDGE OF TRAFFIC LANE.

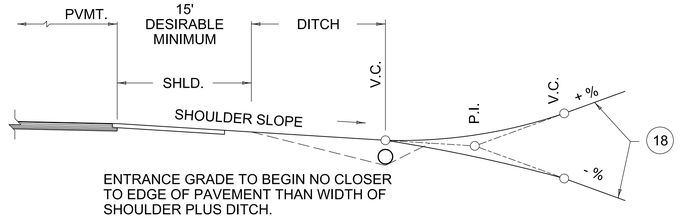
ROAD AND STREET APPROACHES



SECTION A-A

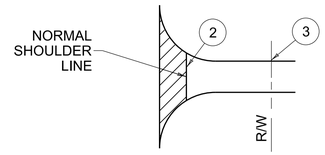


PLAN VIEW



ENTRANCE GRADE TO BEGIN NO CLOSER TO EDGE OF PAVEMENT THAN WIDTH OF SHOULDER PLUS DITCH.

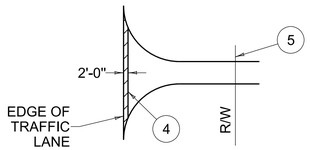
SECTION B-B



(2) PAVED TO SHOULDER LINE

(3) SURFACE TO R/W LINE OR TOUCHDOWN WITH TRAFFIC BOUND BASE.

ENTRANCE (RESIDENTIAL AND COMMERCIAL)



(4) PAVE AS SHOWN WITH FLEXIBLE PAVEMENT.

(5) SURFACE TO R/W LINE WITH TRAFFIC BOUND BASE.

ENTRANCE (FARM FIELD)

~ 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%.*

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SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

PAVEMENT

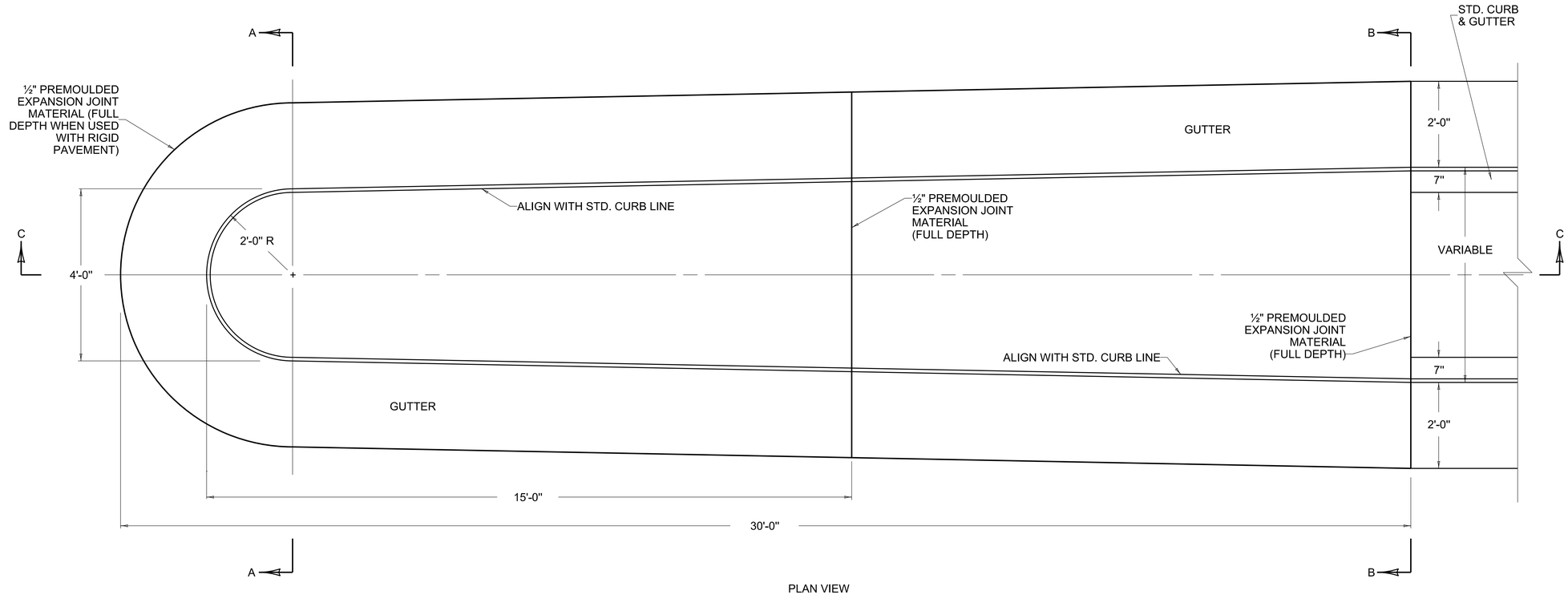
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

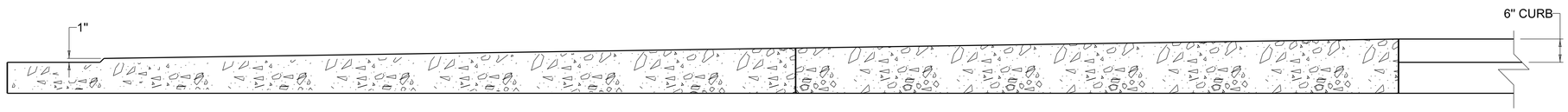
ENTRANCES

APPROACHES, ENTRANCES AND MAIL BOX TURNOUT

STANDARD DRAWING NUMBER
RPM-110-07



PLAN VIEW



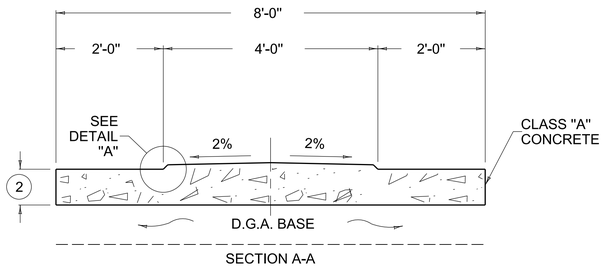
SECTION C-C

~ NOTES ~

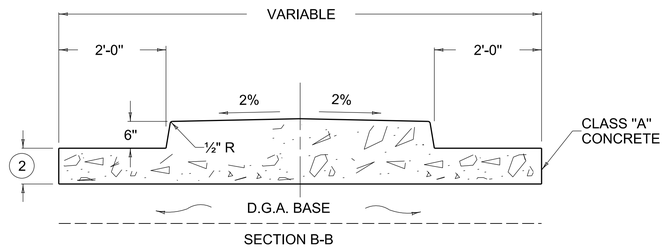
1. *THE CONTRACT UNIT PRICE BID EACH FOR CONCRETE TERMINAL SECTION TYPE 1 SHALL INCLUDE ALL MATERIALS, LABOR, TOOLS, AND OTHER INCIDENTALS NECESSARY TO COMPLETE THE WORK IN PLACE, AND SHALL RECEIVE A WOOD FLOAT FINISH.*

(2) *8" WHEN USED WITH FLEXIBLE PAVEMENT AND PAVEMENT THICKNESS WITH RIGID PAVEMENT.*

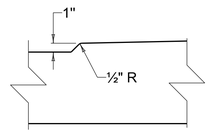
BID ITEM AND UNIT TO BID
CONCRETE TERMINAL SECTION TYPE 1 *EACH*



SECTION A-A



SECTION B-B



DETAIL "A"

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APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

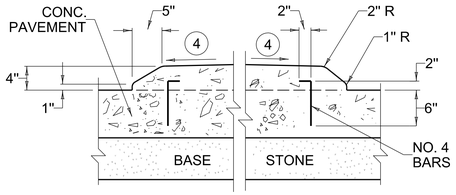
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

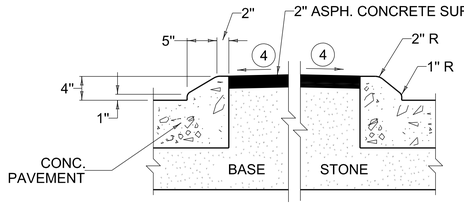
TERMINALS

CONCRETE TERMINAL SECTION TYPE 1

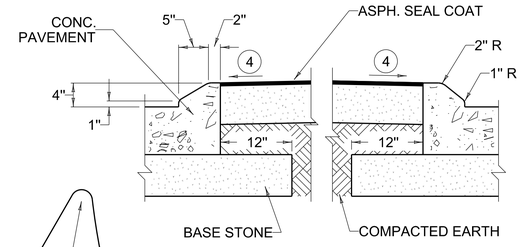
STANDARD DRAWING NUMBER
RPM-115-05



SECTION 1-1



SECTION 2-2

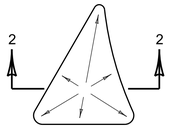


SECTION 3-3

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

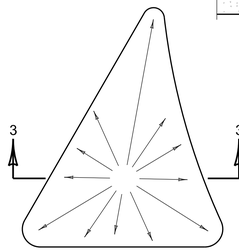
SMALL (UP TO 150 SQ. FT.)
CONCRETE ISLAND



AREA IN ISLAND FILLED WITH BASE STONE AND CAPPED WITH 2" ASPHALT CONCRETE SURFACE.

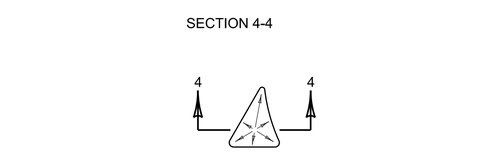
INTERMEDIATE (150 TO 1000 SQ. FT.)
ISLAND INTEGRAL CURB

~ RIGID PAVEMENT ~



AREA IN ISLAND FILLED WITH COMPACTED EARTH, 7" BASE STONE AND ASPHALT SEAL COAT.

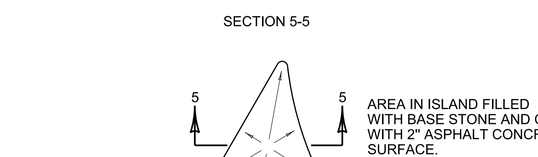
LARGE (1000 SQ. FT. AND ABOVE)
ISLAND INTEGRAL CURB



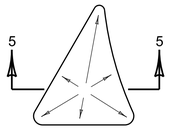
SECTION 4-4

BASE - FULL DEPTH BASE STONE

SMALL (UP TO 150 SQ. FT.)
CONCRETE ISLAND



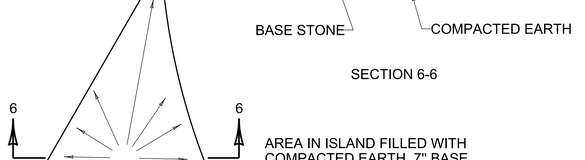
SECTION 5-5



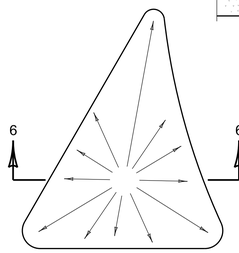
AREA IN ISLAND FILLED WITH BASE STONE AND CAPPED WITH 2" ASPHALT CONCRETE SURFACE.

INTERMEDIATE (150 TO 1000 SQ. FT.)
CONCRETE ISLAND HEADER CURB

~ FLEXIBLE PAVEMENT ~



SECTION 6-6



AREA IN ISLAND FILLED WITH COMPACTED EARTH, 7" BASE STONE AND ASPHALT SEAL COAT.

LARGE (1000 SQ. FT. AND ABOVE)
CONCRETE ISLAND HEADER CURB

~ *NOTES* ~

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.*

BID ITEM AND UNIT TO BID
CONCRETE ISLAND — *SQYD*

USE WITH CUR. STD. DWG. RPM-100

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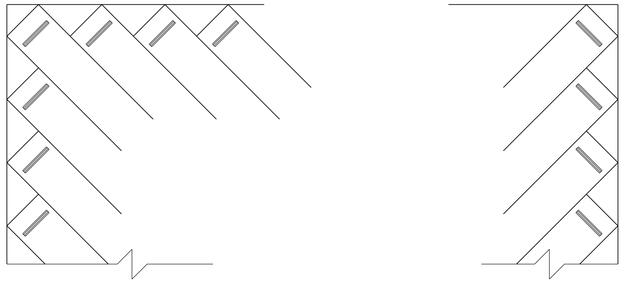
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

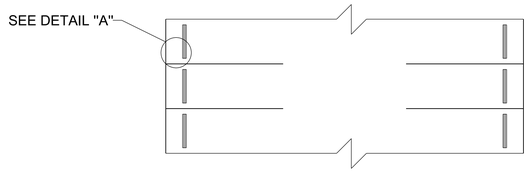
ISLANDS

CONCRETE ISLAND CURB CONSTRUCTION DETAILS
(RIGID & FLEXIBLE PAVEMENT)

STANDARD DRAWING NUMBER
RPM-120-07



ANGLED PARKING



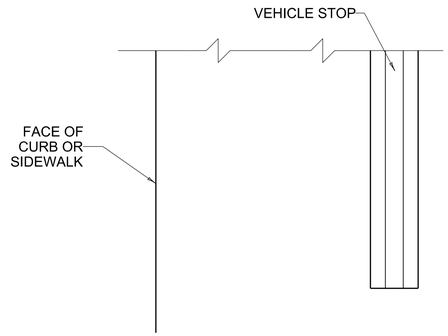
PERPENDICULAR PARKING

TYPICAL VEHICLE STOP
INSTALLATION

~ NOTES ~

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.*

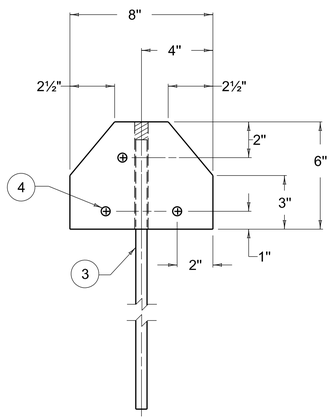
BID ITEM AND UNIT TO BID	
PRECAST VEHICLE STOP	*LF*



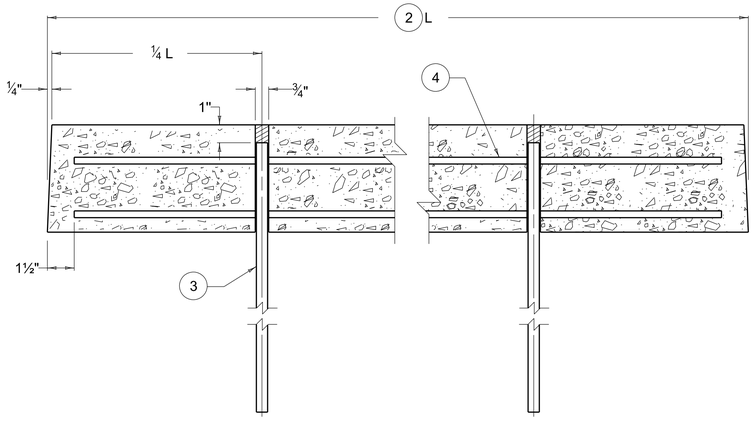
PLAN VIEW

END ELEVATION

DETAIL "A"



END VIEW



SECTIONAL ELEVATION VIEW

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PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

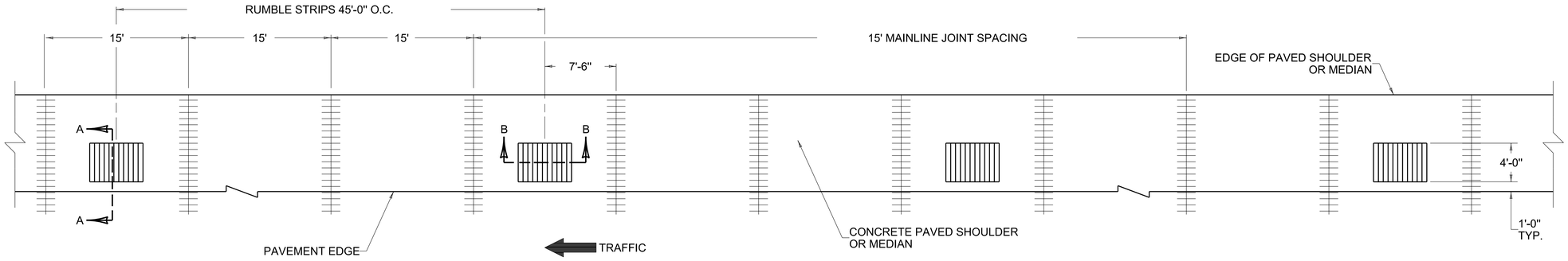
TEAM KENTUCKY TRANSPORTATION CABINET

PARKING

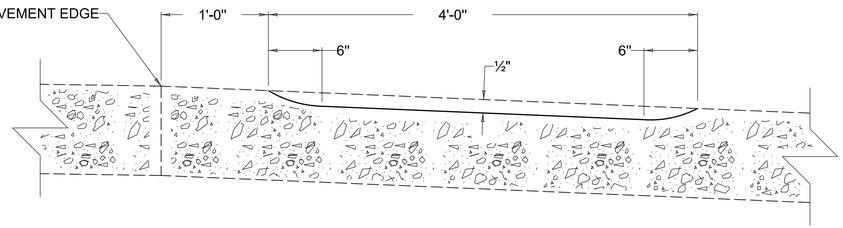
PRECAST VEHICLE STOP

STANDARD DRAWING NUMBER
RPM-130-04

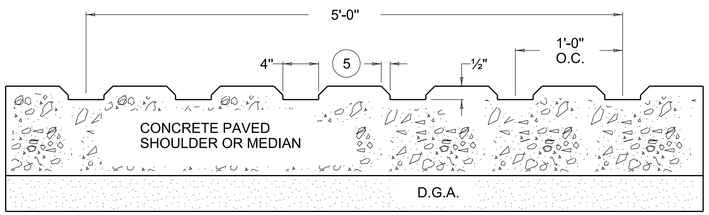
JOINTED PLAIN CONCRETE PAVED SHOULDER OR MEDIAN (DOWELLED) WITH JOINTED PLAIN CONCRETE MAINLINE PAVEMENT



PLAN VIEW



SECTION A-A



SECTION B-B

~ NOTES ~

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) *¼" BEVEL*

BID ITEM AND UNIT TO BID	
RUMBLE STRIPS TYPE 3	*LF*

REVISION DATE: 12/01/2015
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PAVEMENT

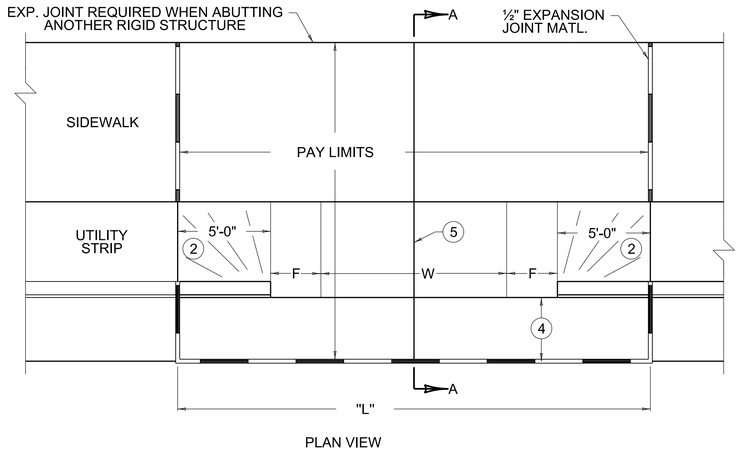
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

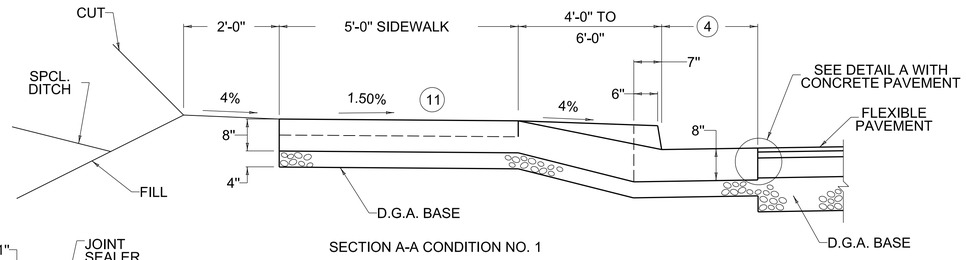
RUMBLE STRIPS

RUMBLE STRIPS TYPE 3

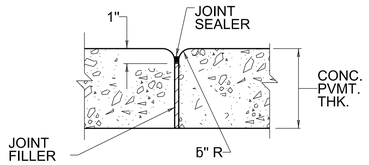
STANDARD DRAWING NUMBER
RPM-145-04



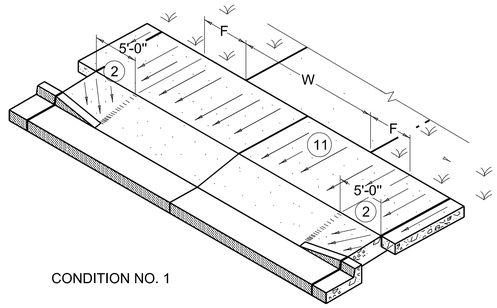
PLAN VIEW



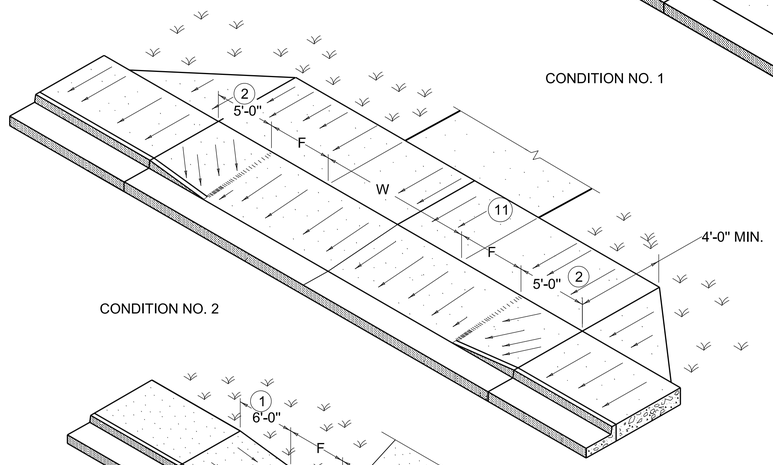
SECTION A-A CONDITION NO. 1



DETAIL A



CONDITION NO. 1



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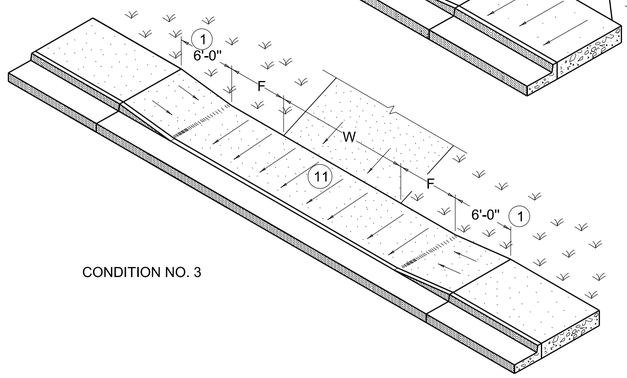

CONDITION NO. 3

~ NOTES ~

(1) *RUNNING SLOPE SHALL BE 12:1 (8.3%) MAXIMUM.*

(2) *SLOPE SHALL BE 10:1 (10%) MAXIMUM, MEASURED PARALLEL TO THE ADJACENT CURB LINE.*

3. *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.*

(4) *1'-0" OR 2'-0" WITH CONCRETE PAVEMENT, 2'-0" WITH FLEXIBLE PAVEMENT*

(5) *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.*

6. *CLASS "A" CONCRETE OR JOINTED PLAIN CONCRETE PAVEMENT SHALL BE USED IN THE ENTRANCE PAVEMENT.*

7. *THE ENTRANCE PAVEMENT SHALL RECEIVE A BROOM FINISH AND SHALL BE CURED THE SAME AS THE MAINLINE PAVEMENT AND/OR SIDEWALK.*

8. *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.*

9. *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.*

10. *PROVIDED THAT ADA GUIDELINES SHOWN IN NOTES (11) AND 12 ARE FOLLOWED, THE ENGINEER MAY MODIFY THE DESIGN TO BETTER FIT EXISTING CONDITIONS.*

(11) *2.00% CROSS SLOPE MAXIMUM, 1.50% DESIRABLE, ON SIDEWALK.*

12. *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'.*

13. *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

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APPROVED — STATE HIGHWAY ENGINEER — DATE 08-11-2025

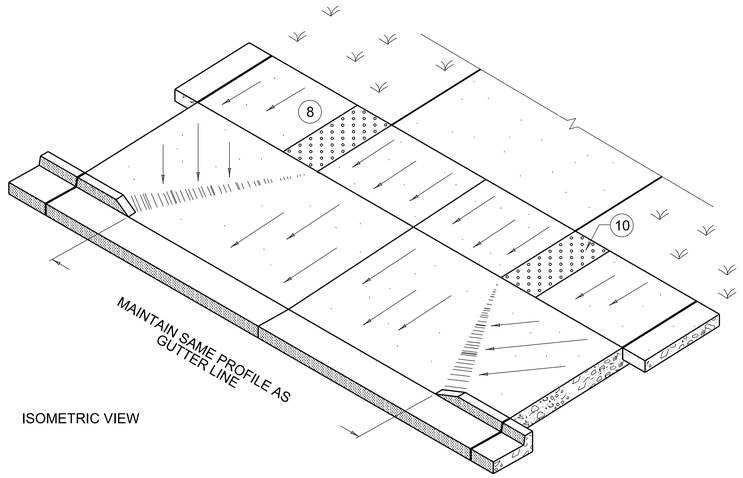
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

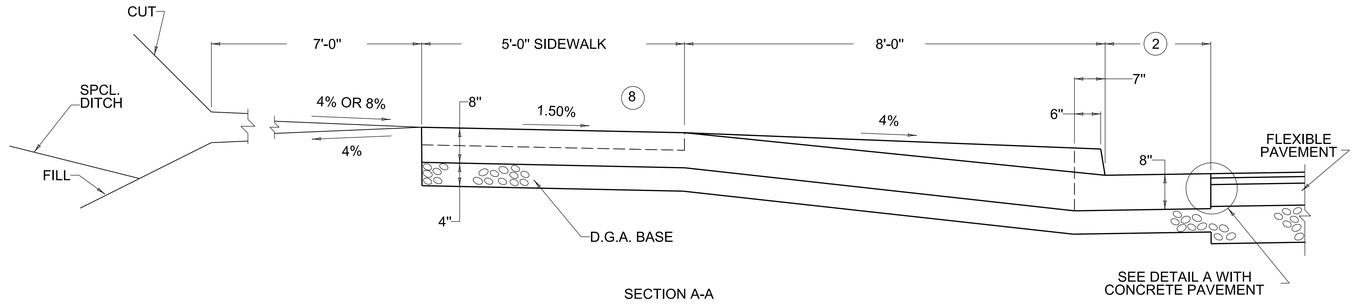
CONCRETE ENTRANCE

CONCRETE ENTRANCE PAVEMENT AND SIDEWALK

STANDARD DRAWING NUMBER
RPM-150-09



ISOMETRIC VIEW



SECTION A-A

~ NOTES ~

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, 2" 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. *PROVIDING THAT ADA GUIDELINES SHOWN IN NOTE (8) AND 9 ARE FOLLOWED, THE ENGINEER MAY MODIFY THE DESIGN TO BETTER FIT EXISTING CONDITIONS.*

(8) *2.00% CROSS SLOPE MAXIMUM, 1.50% DESIRABLE, ON SIDEWALK.*

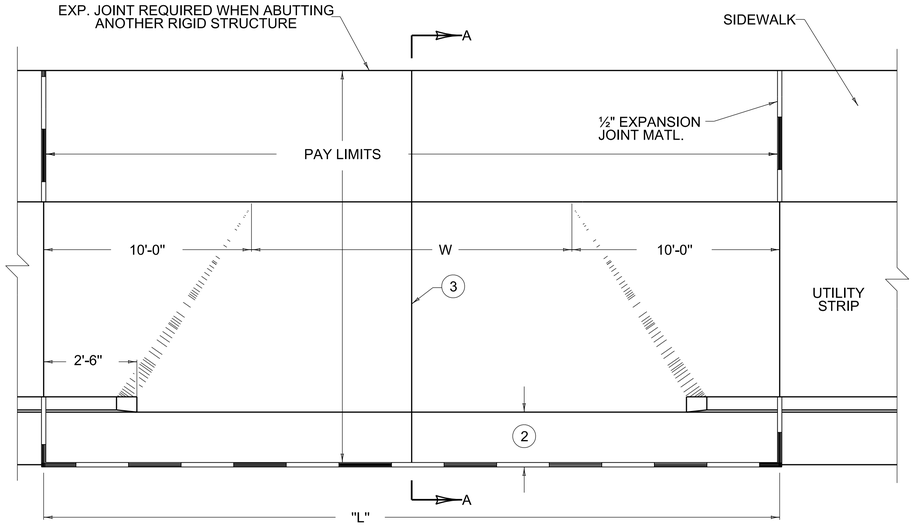
9. *WHERE THE SIDEWALK IS CONTAINED WITHIN A HIGHWAY RIGHT-OF-WAY, THE GRADE SHALL NOT EXCEED THE GRADE ESTABLISHED FOR THE ADJACENT STREET.*

(10) *COMMERCIAL DRIVEWAYS WITH TRAFFIC CONTROL DEVICES REQUIRE ADA SIDEWALK TREATMENTS WITH DETECTABLE WARNINGS.*

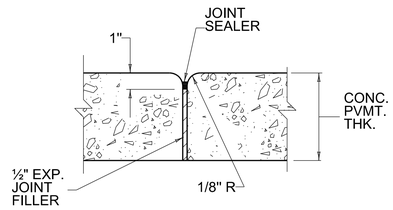
BID ITEMS AND UNIT TO BID

CEM CONC ENT PAVEMENT-8 IN	*SQYD*
DGA BASE	*TON*
DETECTABLE WARNINGS	*SQFT*

USE WITH CUR. STD. DWG. RGX-040



PLAN VIEW



DETAIL A

REVISION DATE: 08/11/2025
REVISION NUMBER: 0

SUBMITTED 08-11-2025 DATE
DIVISION DIRECTOR

APPROVED 08-11-2025 DATE
STATE HIGHWAY ENGINEER

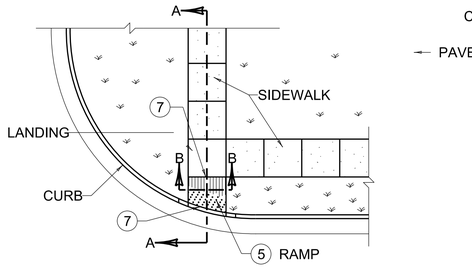
PAVEMENT

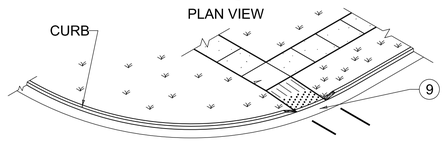
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

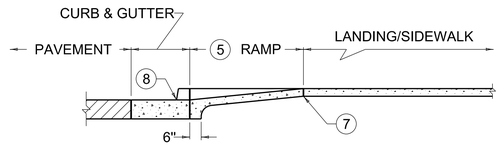
CONCRETE ENTRANCE

CONCRETE ENTRANCE PAVEMENT AND SIDEWALK

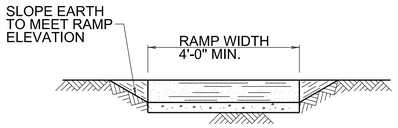
STANDARD DRAWING NUMBER
RPM-152-09





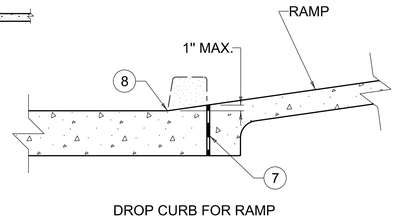


SECTION A-A

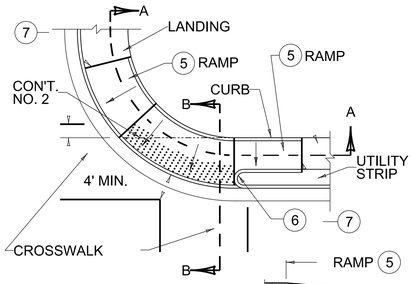


SECTION B-B

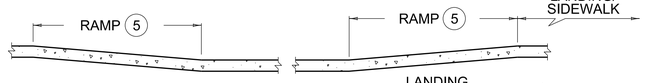
RAMP TYPE 1



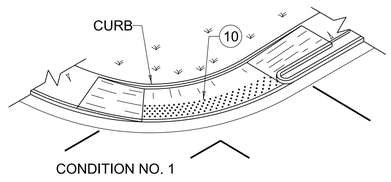
DROP CURB FOR RAMP



PLAN VIEW



SECTION A-A



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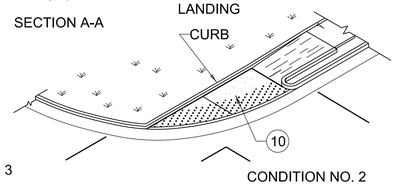
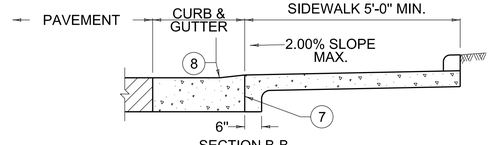
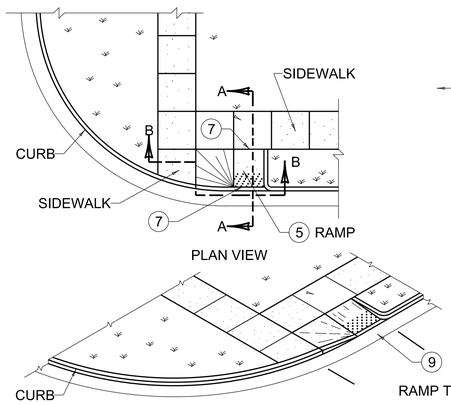


CONDITION NO. 2

RAMP TYPE 3

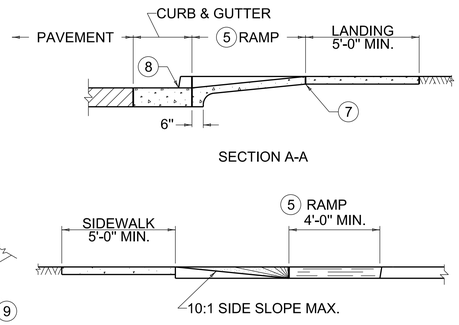


SECTION B-B



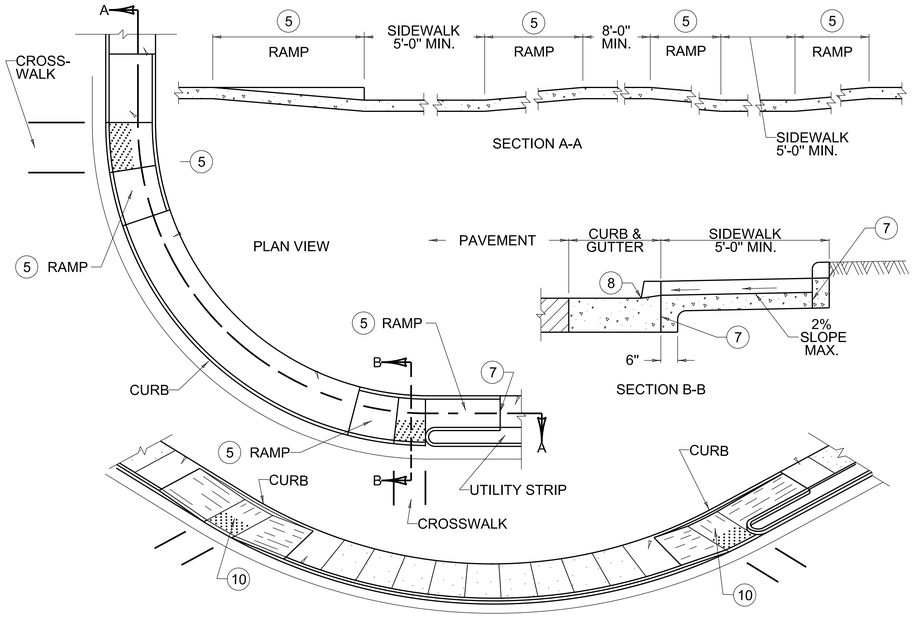
PLAN VIEW

RAMP TYPE 2



SECTION A-A

SECTION B-B



SECTION A-A

SECTION B-B

RAMP TYPE 4

~ NOTES ~

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 2.00%. 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. 2.00% GRADE OR CROSS SLOPE) AT APPROXIMATE STREET ELEVATION. A 4' SQUARE LEVEL LANDING IS THE REQUIRED MINIMUM.*

BID ITEMS AND UNIT TO BID

SIDEWALK-4 IN CONCRETE	*SQYD*
DETECTABLE WARNINGS	*SQFT*

USE WITH CUR. STD. DWG. RGX-040

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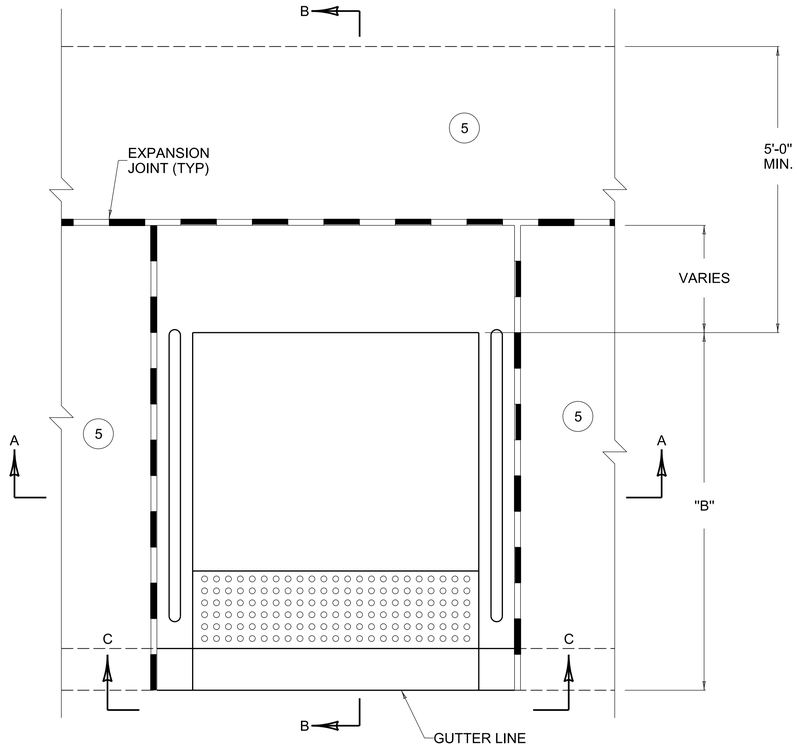
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

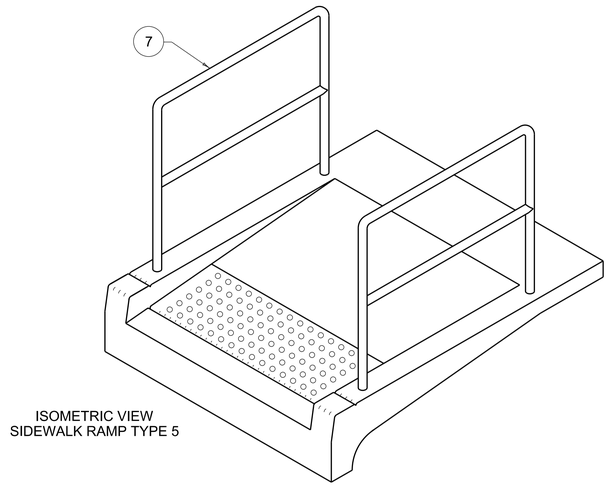
SIDEWALK RAMPS

SIDEWALK RAMPS

STANDARD DRAWING NUMBER
RPM-170-10



PLAN VIEW
SIDEWALK RAMP TYPE 5



ISOMETRIC VIEW
SIDEWALK RAMP TYPE 5

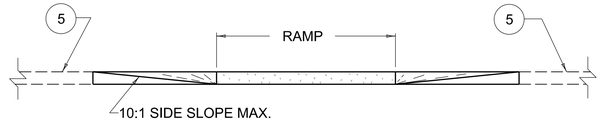
~ NOTES ~

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.*

BID ITEMS AND UNIT TO BID

SIDEWALK-4 IN CONCRETE	*SQYD*
DETECTABLE WARNINGS	*SQFT*
HANDRAIL-TYPE A-1	*LF*

USE WITH CURRENT STD. DWG
RGX-030, RGX-040

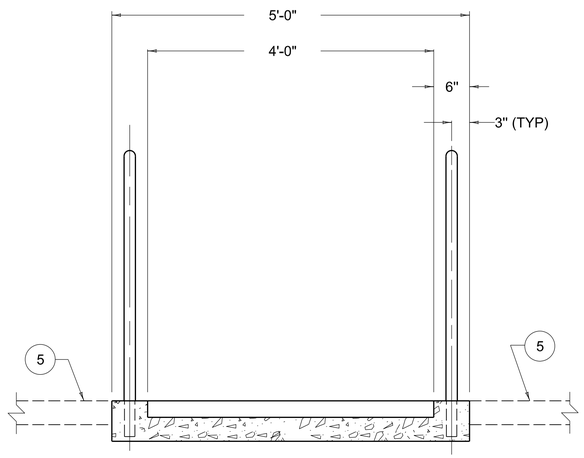


SECTION C-C⑧
(ALTERNATE TO HANDRAIL TYPE B)

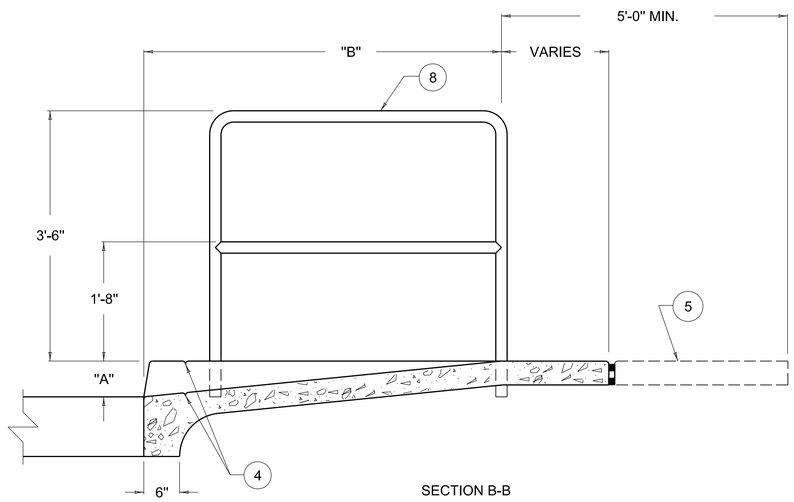
REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

PAVEMENT



SECTION A-A



SECTION B-B

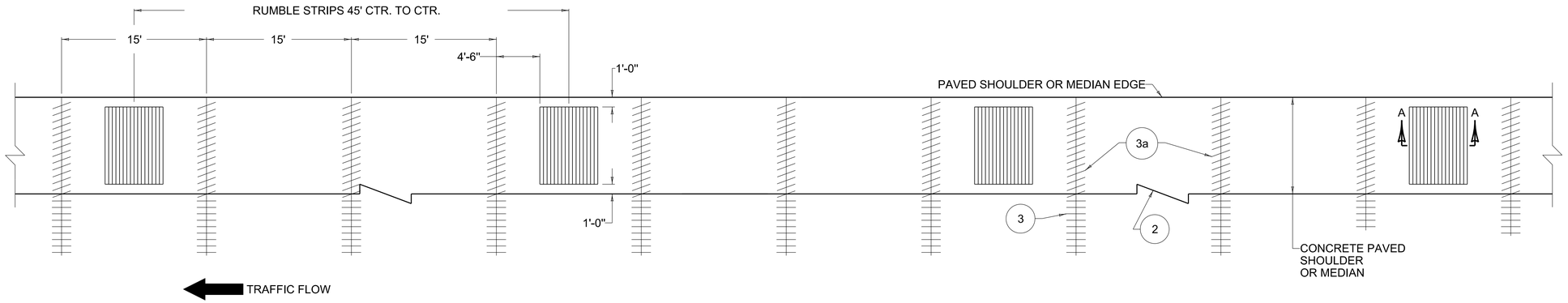
RAMP HEIGHT "A"	⑥ RAMP LENGTH "B"
≤ 3"	2'-0"
> 3" ≤ 6"	5'-0"

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

SIDEWALKS

SIDEWALK RAMP WITH HANDRAIL

STANDARD DRAWING NUMBER
RPM-172-07

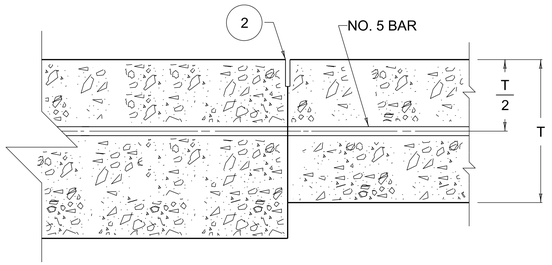


⑥ JOINTED PLAIN CONCRETE PAVED SHOULDER OR MEDIAN (UNDOWELLED) WITH JOINTED PLAIN CONCRETE MAINLINE PAVEMENT

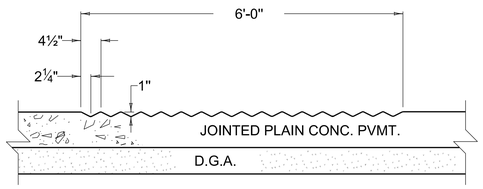
~ NOTES ~

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.*

USE WITH CUR. STD. DWGS.
RPM-145, RPS-010



JOINT DETAIL



SECTION A-A

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

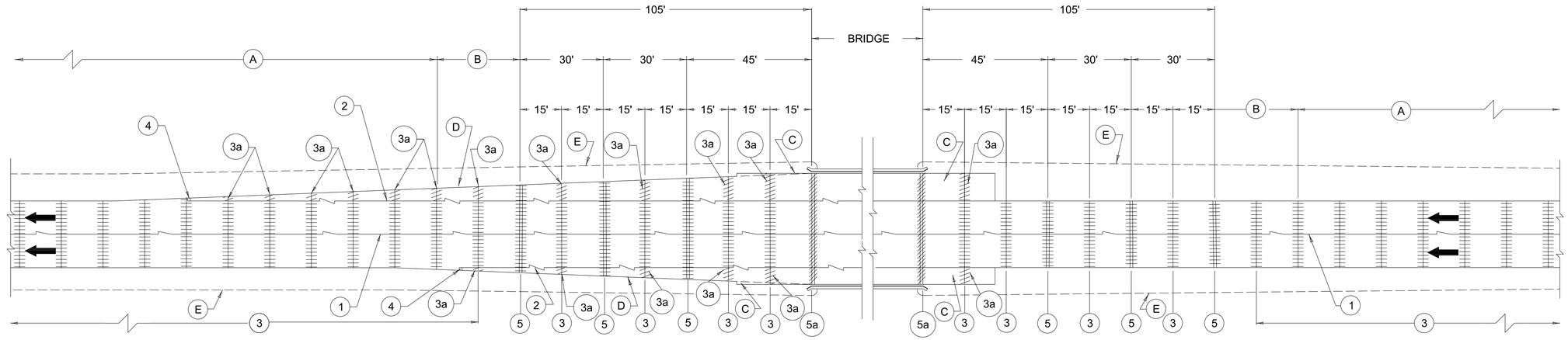
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

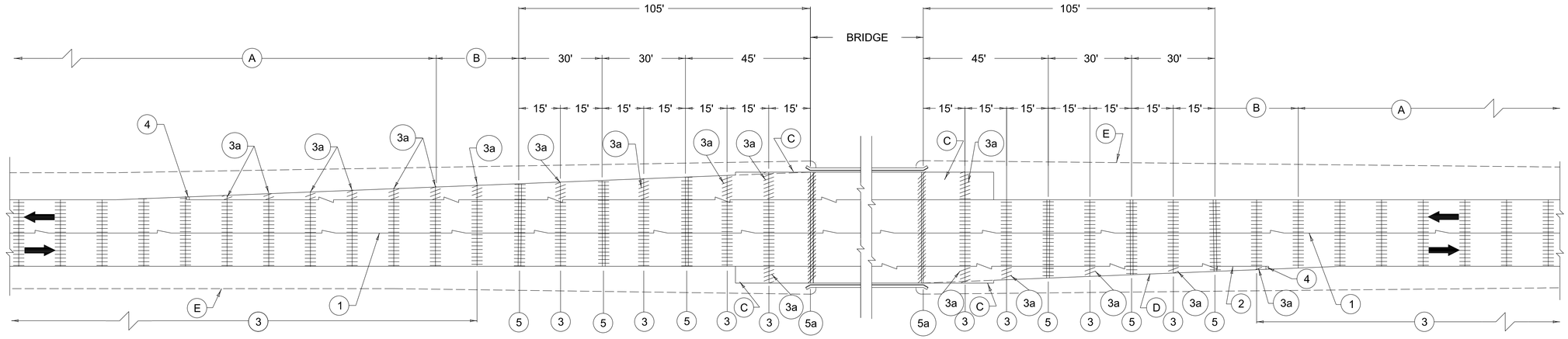
JOINTED PLAIN CONCRETE PAVEMENT

JOINTED PLAIN CONCRETE PAVEMENT FOR SHOULDERS & MEDIANS

STANDARD DRAWING NUMBER
RPN-001-07



SINGLE BRIDGE OR TWIN BRIDGES WITH ONE DIRECTION TRAFFIC



SINGLE BRIDGE WITH TWO DIRECTION TRAFFIC

~ NOTES ~

(A) NORMAL SPACING OF TRANSVERSE CONTRACTION JOINTS ARE 15'-0" ON CENTER TAKEN ALONG ℄ OF PAVEMENT.

(B) 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".

(C) THIS SLAB REQUIRED ONLY WHEN NEEDED FOR BRIDGE END DRAINAGE.

(D) PAVEMENT TRANSITION 25':1', NOT PERMITTED WHEN CONSTRUCTED IN CONJUNCTION WITH P.C.C. SHOULDERS.

(E) 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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015

APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

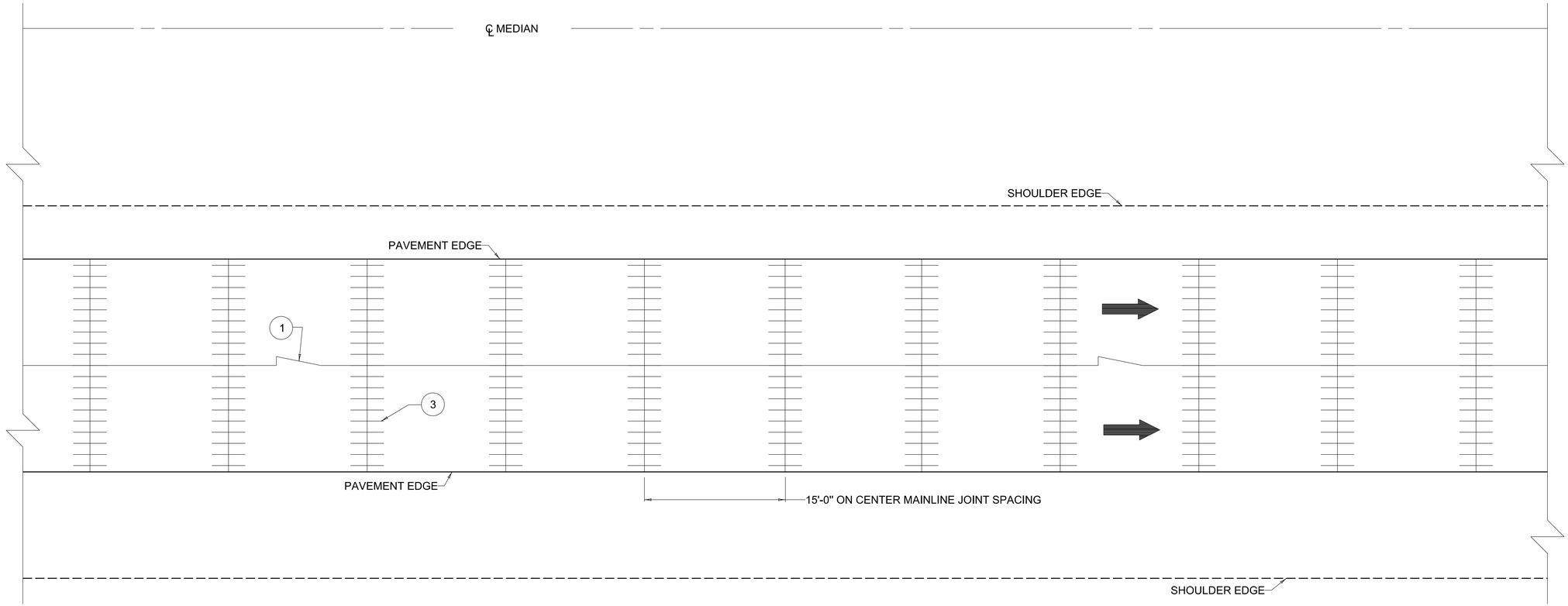
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY

JOINTED PLAIN CONCRETE PAVEMENT

PAVEMENT TRANSITIONS & JOINT DETAILS FOR JOINTED PLAIN CONCRETE PAVEMENT AT BRIDGE ENDS

STANDARD DRAWING NUMBER
RPN-010-07



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

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

PAVEMENT

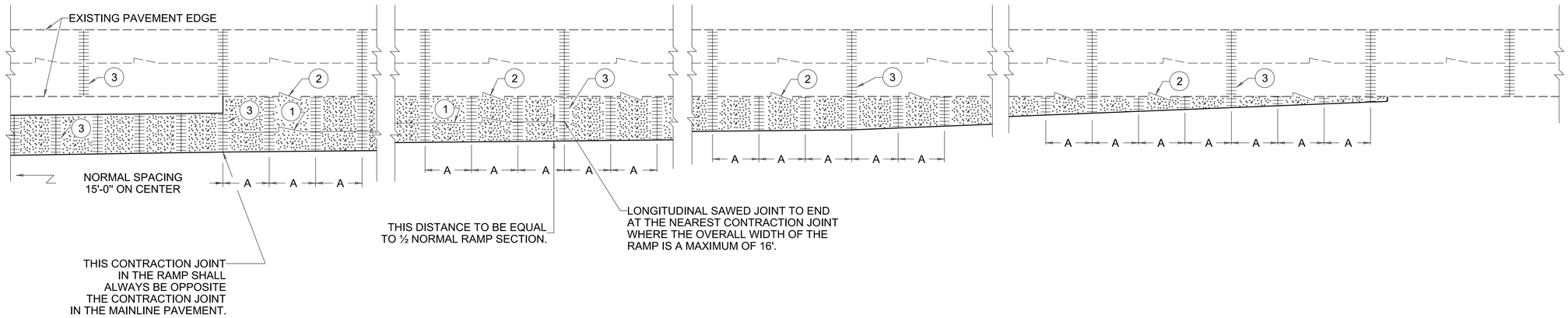
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

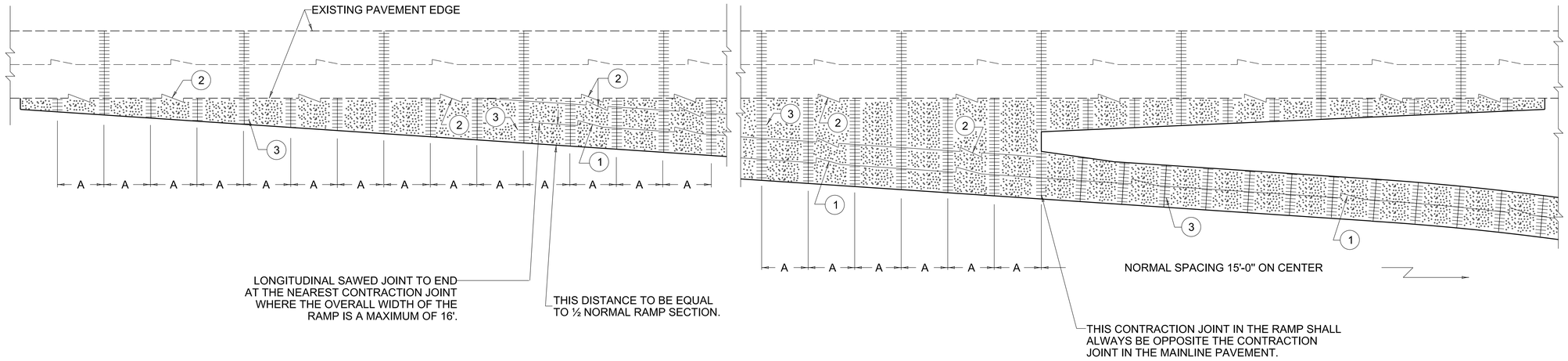
JOINTED PLAIN CONCRETE PAVEMENT

JOINTED PLAIN CONCRETE PAVEMENT

STANDARD DRAWING NUMBER
RPN-015-05



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

REVISION DATE: 12/01/2015
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SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

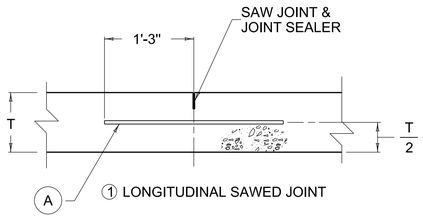
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY Transportation Cabinet

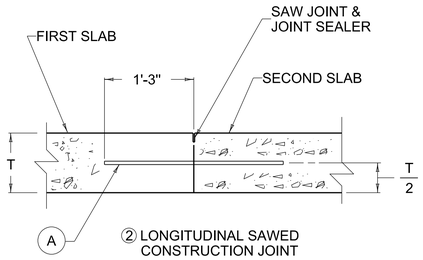
JOINTED PLAIN CONCRETE PAVEMENT

CONCRETE PAVEMENT JOINTS TYPES & SPACING

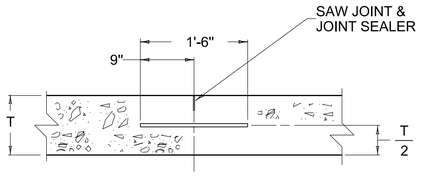
STANDARD DRAWING NUMBER
RPN-020-04



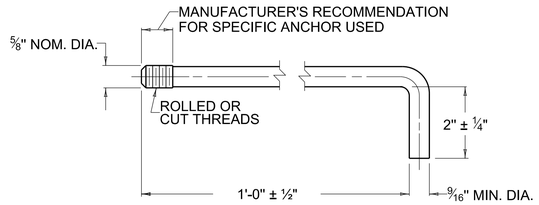
① LONGITUDINAL SAWED JOINT



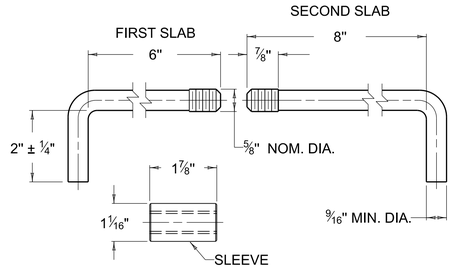
② LONGITUDINAL SAWED
CONSTRUCTION JOINT



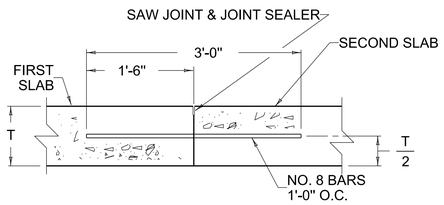
③ TRANSVERSE SAWED
CONTRACTION JOINT



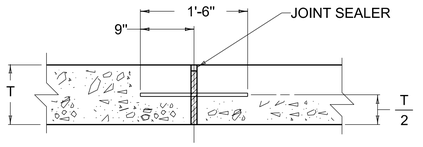
Ⓑ HOOK BOLT FOR USE WITH
EXPANSION ANCHOR
(SEE STANDARD SPECIFICATIONS
FOR BASIS OF PAYMENT)



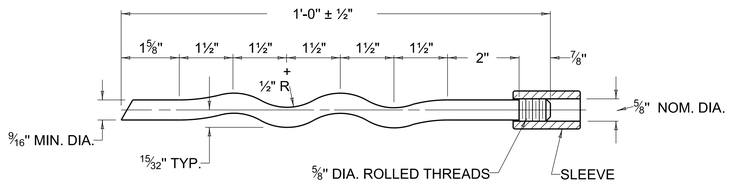
ALTERNATE 1
HOOK BOLTS FOR
CONSTRUCTION JOINTS



④ TRANSVERSE SAWED
CONSTRUCTION JOINT



⑤ TRANSVERSE EXPANSION JOINT



ALTERNATE 2 (FIRST SLAB)
DEFORMED ANCHOR BOLT
(TO BE USED WITH 8" HOOK BOLT)

⅝" PLASTIC INSERT

~ 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.*

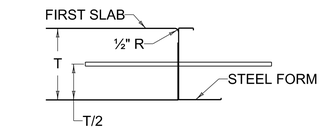
Ⓐ *NO. 5 DEFORMED TIE BAR 2'-6" LONG PLACED 1'-8" ON CENTER AND PLACED 1'-8" MINIMUM FROM ANY TRANSVERSE JOINT.*

Ⓑ *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.*

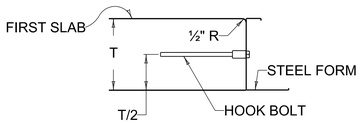
USE WITH CUR. STD. DWGS.
RPN-001 RPN-010 RPN-015
RPN-020 RPS-030 RPS-031
RPS-032 RPS-033 RPS-034
RPS-035 RPS-036 RPS-037
RPS-038 RPS-039 RPX-010
RPX-015 RPX-020

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 *½" TRANSVERSE EXPANSION JOINT (WITHOUT LOAD TRANSFER ASSEMBLY)*



TYPE A



TYPE B

METHODS OF FORMING CONSTRUCTION
JOINTS WHEN FORMS ARE USED

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

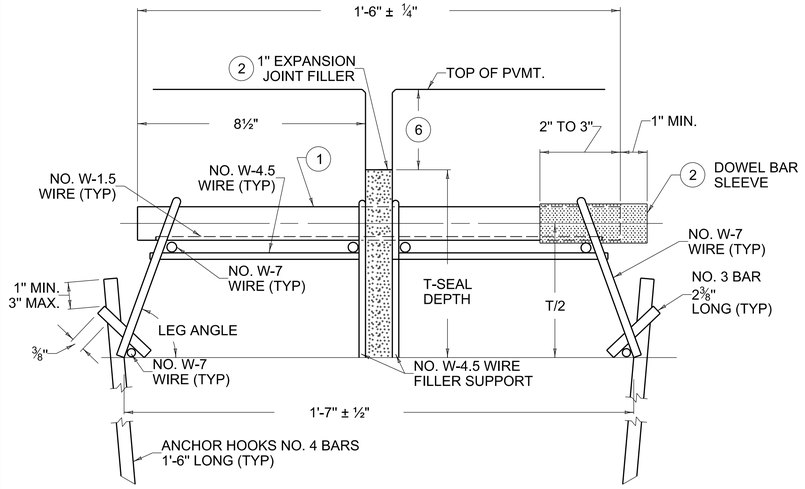
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

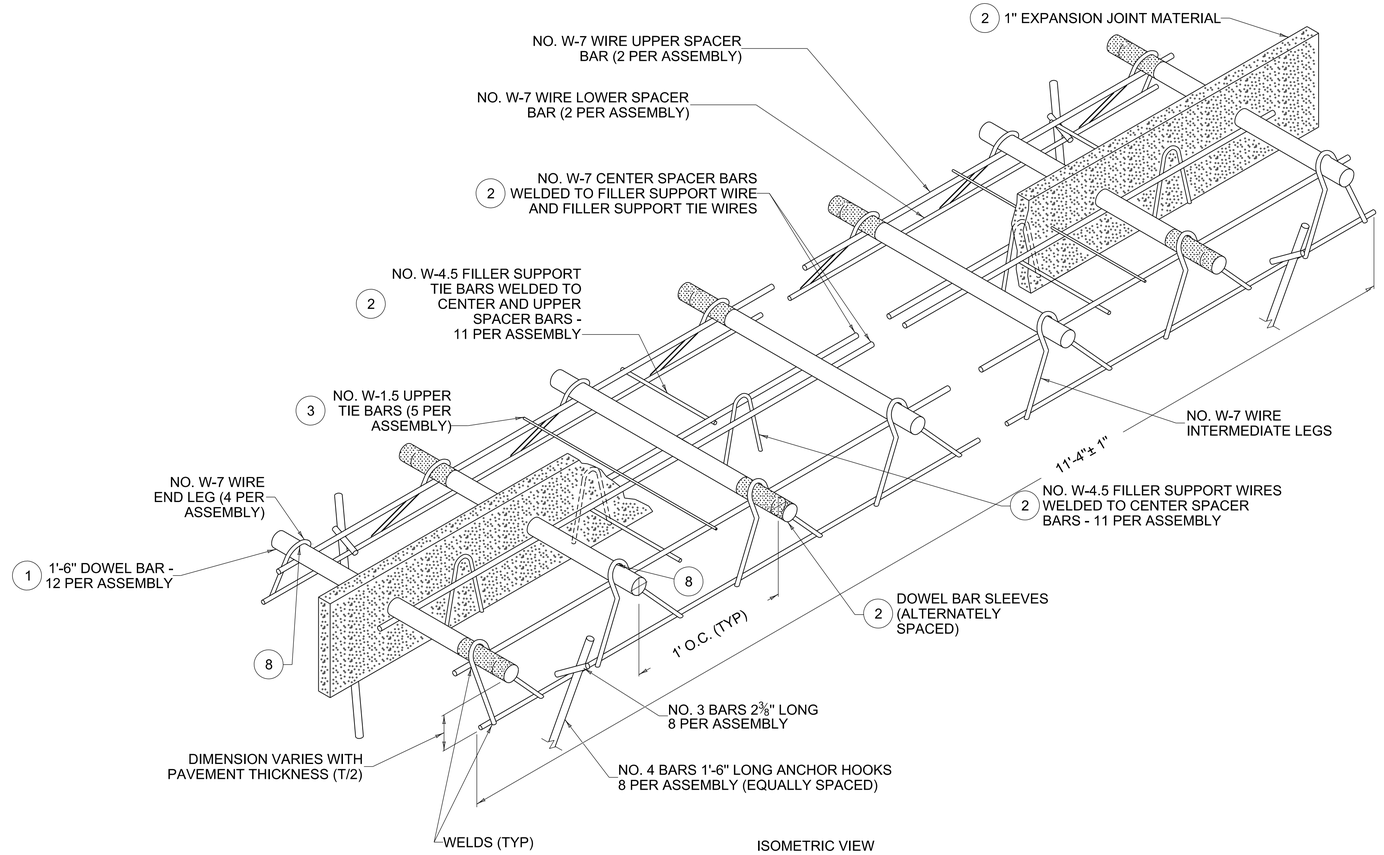
CONCRETE PAVEMENT JOINTS

CONCRETE PAVEMENT JOINT DETAILS

STANDARD DRAWING NUMBER
RPS-010-11



END ELEVATION



ISOMETRIC VIEW

~ NOTES ~

① *DOWEL BAR SIZES*

PAVEMENT THICKNESS						
8"	9"	10"	11"	12"	13"	14"
BAR DIAMETER						
1¼"			1½"		1¾"	
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 INITIAL 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 *4½" MIN. AND 10½" 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.*

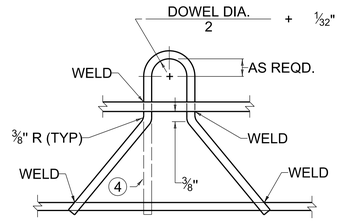
9. *DOWEL ENDS SHALL NOT VARY MORE THAN ¼" FROM A STRAIGHT LINE.*

10. *DOWELS SHALL BE PARALLEL WITH BASE, WITH A TOLERANCE OF ¼".*

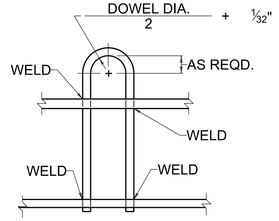
11. *EPOXY SHALL BE CLEANED OFF TO BARE METAL BEFORE WELDING DOWEL TO WIRE.*

12. *"U" LEG OR "A" LEG ARE ACCEPTABLE ALTERNATES PROVIDING MATCHED LEGS ARE SUPPLIED.*

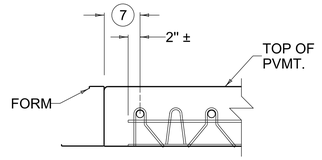
USE WITH CUR. STD. DWGS.
RPX-015 RPX-020



INTERMEDIATE OPTIONAL "A" LEG DETAIL



INTERMEDIATE OPTIONAL "U" LEG DETAIL



EDGE CLEARANCE DETAIL

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

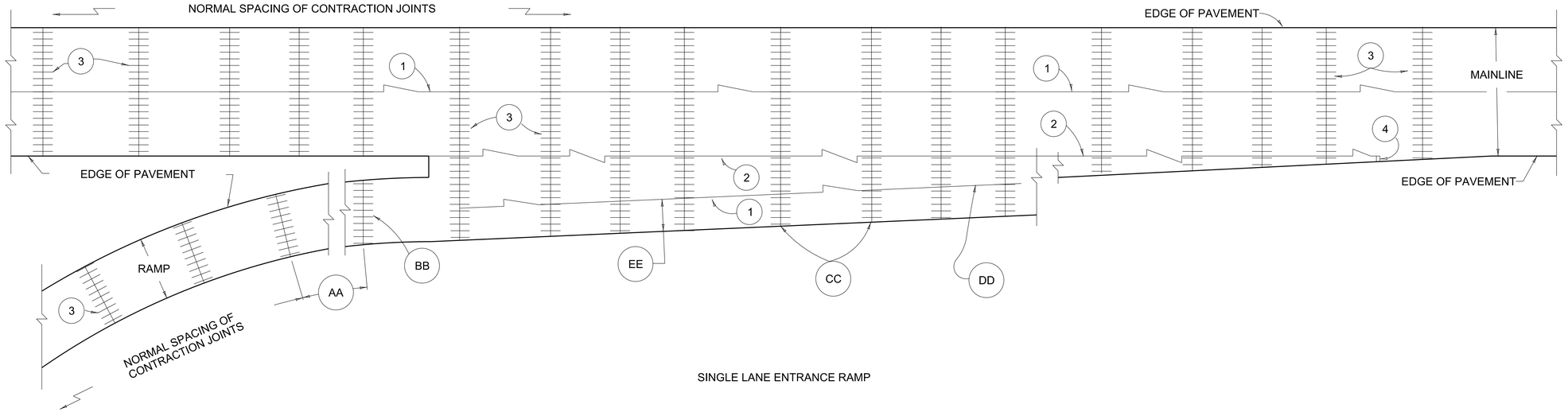
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

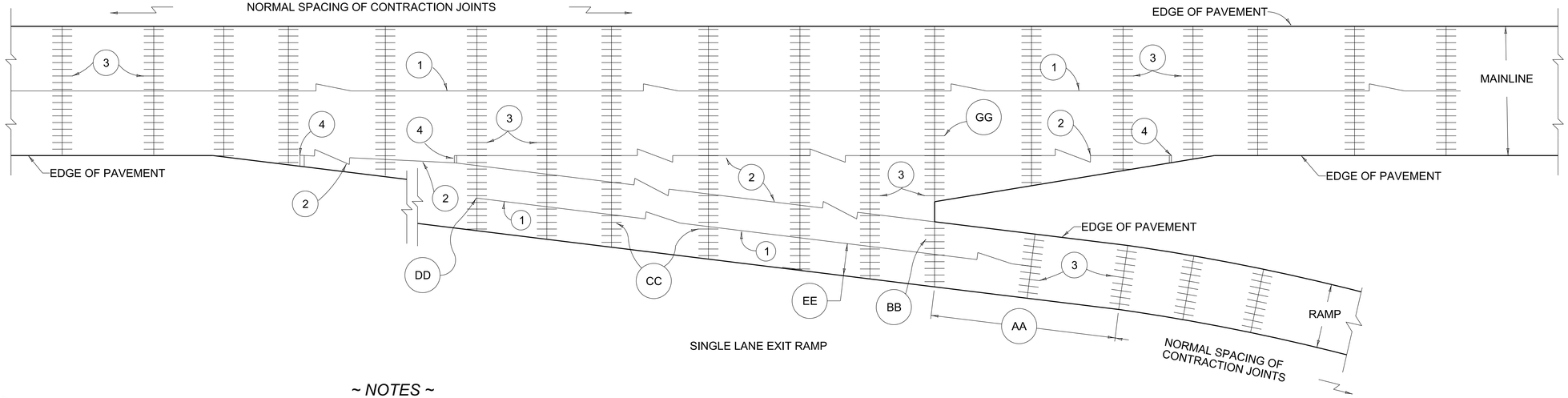
CONCRETE PAVEMENT JOINTS

EXPANSION AND CONTRACTION JOINT LOAD TRANSFER ASSEMBLIES

STANDARD DRAWING NUMBER
RPS-020-14



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 PRECEDING 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

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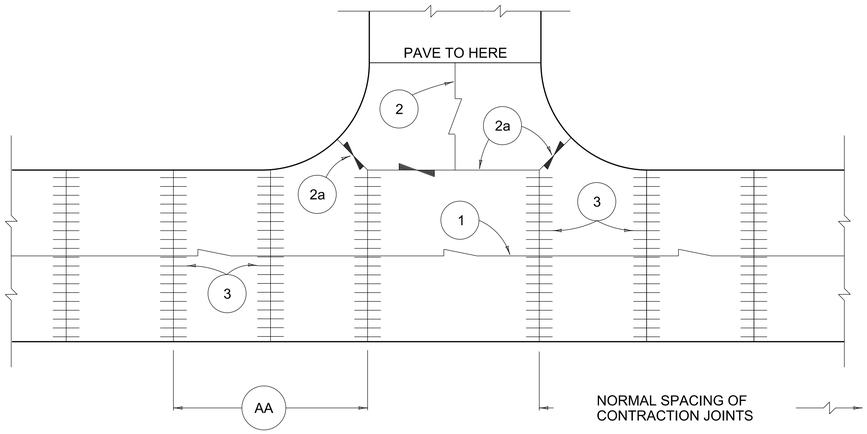
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

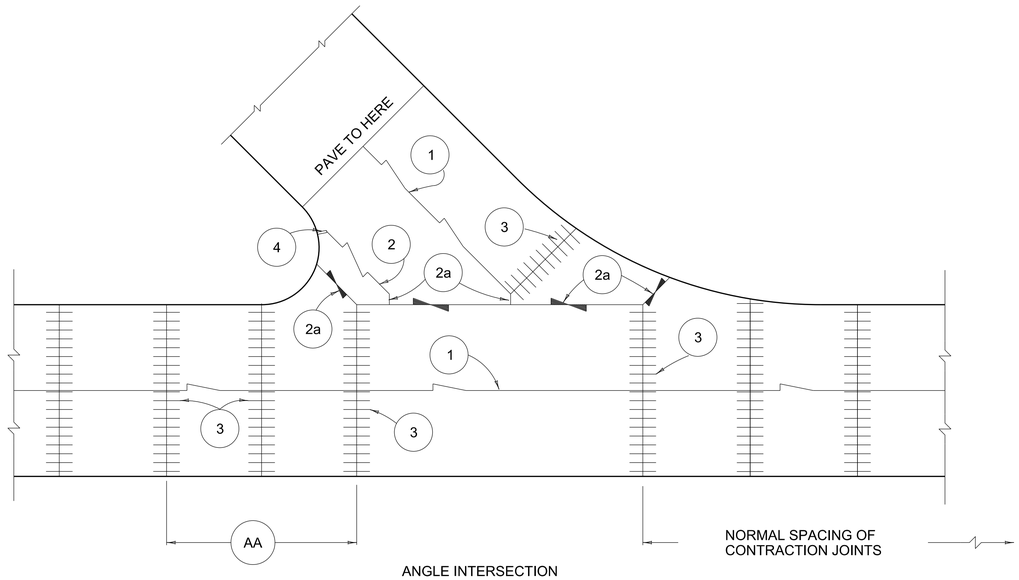
CONCRETE PAVEMENT JOINTS

CONCRETE PAVEMENT JOINTS TYPES AND SPACING

STANDARD DRAWING NUMBER
RPS-030-06



SINGLE INTERSECTIONS



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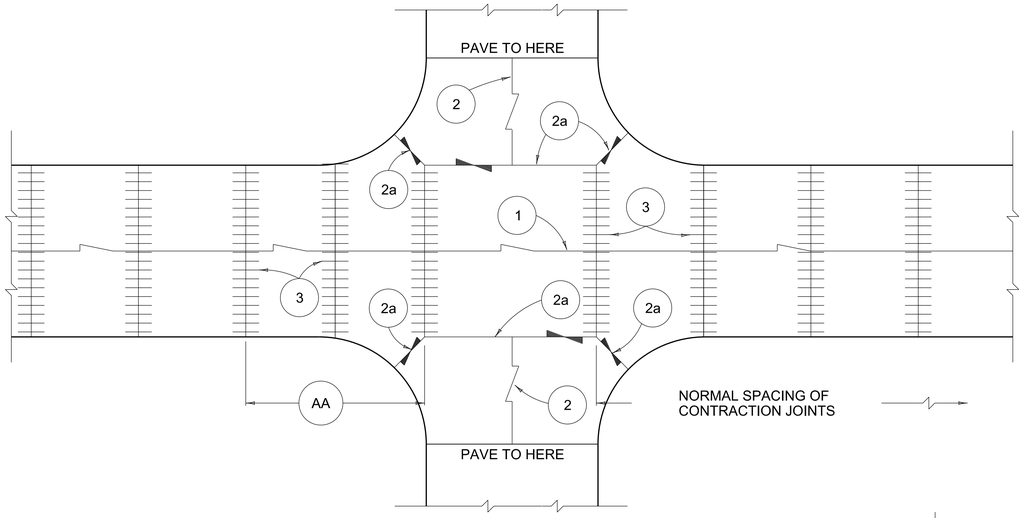

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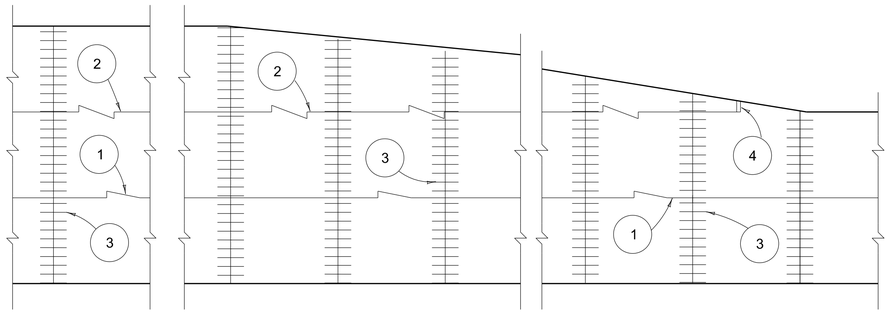
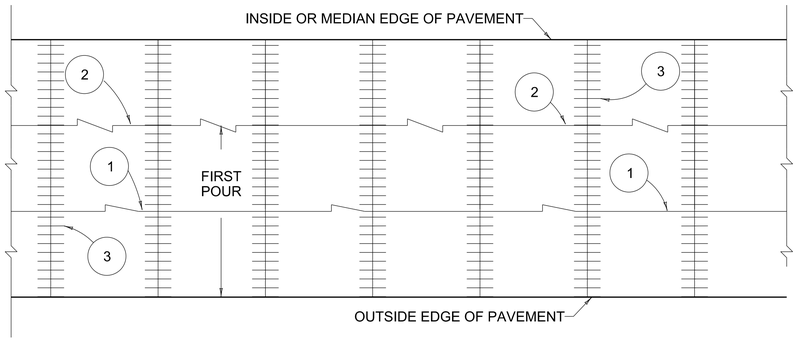


DECELERATING LANE



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

REVISION DATE: 12/01/2015
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PAVEMENT

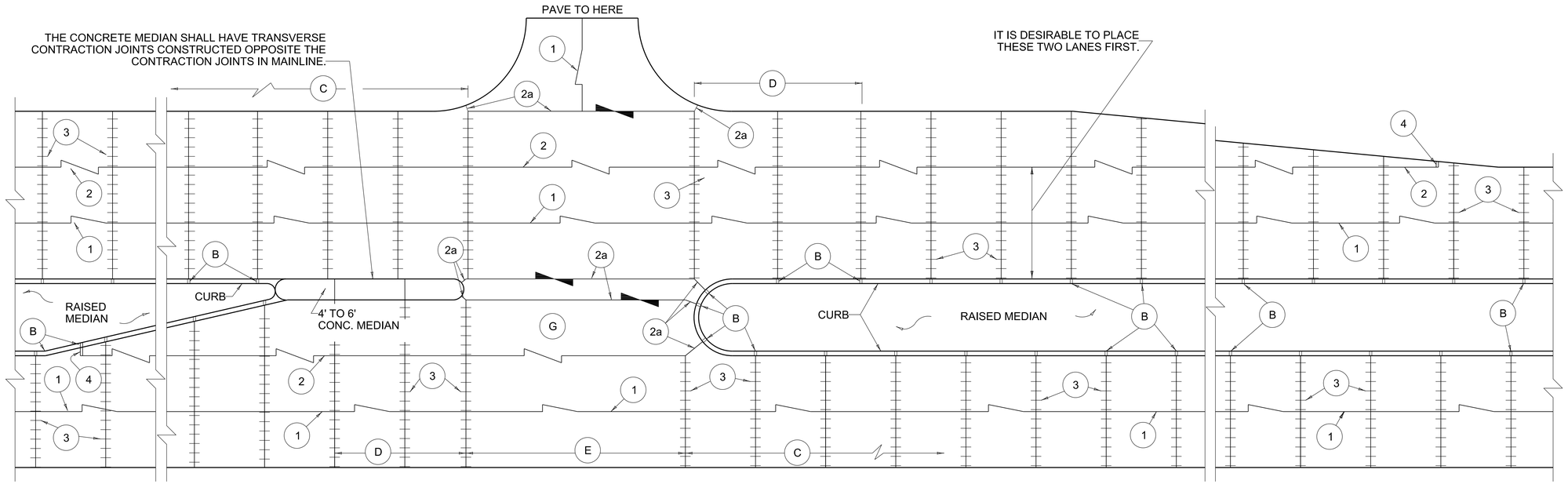
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

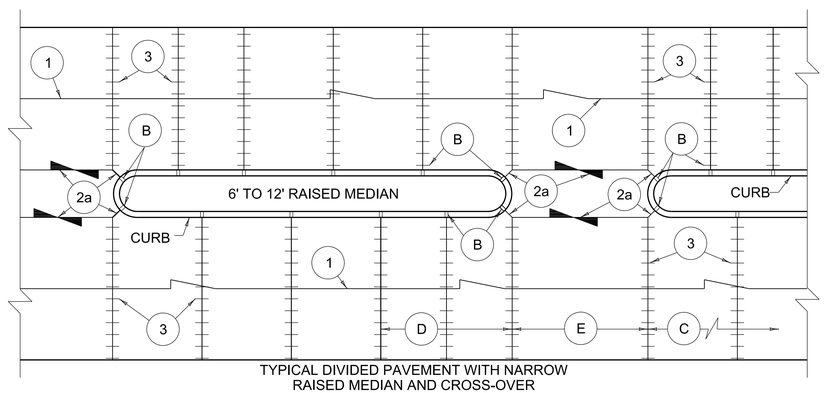
CONCRETE PAVEMENT JOINTS

CONCRETE PAVEMENT JOINTS TYPES AND SPACING

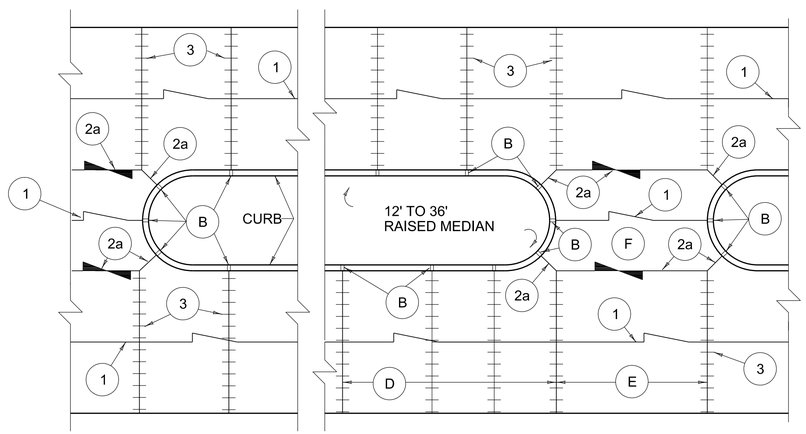
STANDARD DRAWING NUMBER
RPS-031-06



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 ~

Ⓑ *½" EXPANSION JOINT FILLER.*

Ⓒ *NORMAL SPACING OF CONTRACTION JOINTS 15'-0" ON CENTER.*

Ⓓ *THIS DISTANCE TO BE EQUALLY DIVIDED WHEN GREATER THAN 20' AND LESS THAN 40'.*

Ⓔ *NO CONTRACTION JOINT REQUIRED WHEN DISTANCE LESS THAN NORMAL SPACING OF JOINTS. EQUALLY DIVIDED WHEN DISTANCE IS GREATER THAN 20' AND LESS THAN 40'.*

Ⓕ *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.*

Ⓖ *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 ½" PREMOLDED EXPANSION JOINT FILLER, CUT TO THE REQUIRED SECTION.*

USE WITH CUR. STD. DWG.
RPS-010

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PAVEMENT

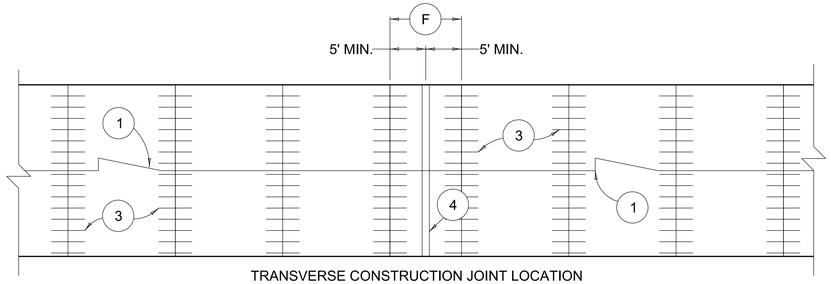
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

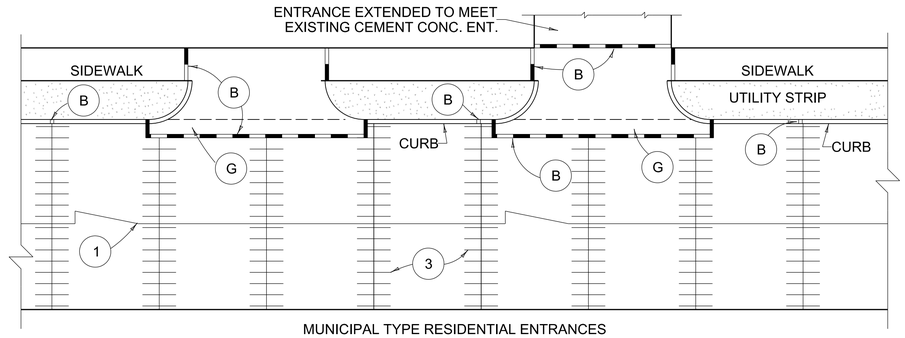
CONCRETE PAVEMENT JOINTS

CONCRETE PAVEMENT JOINTS TYPES AND SPACING

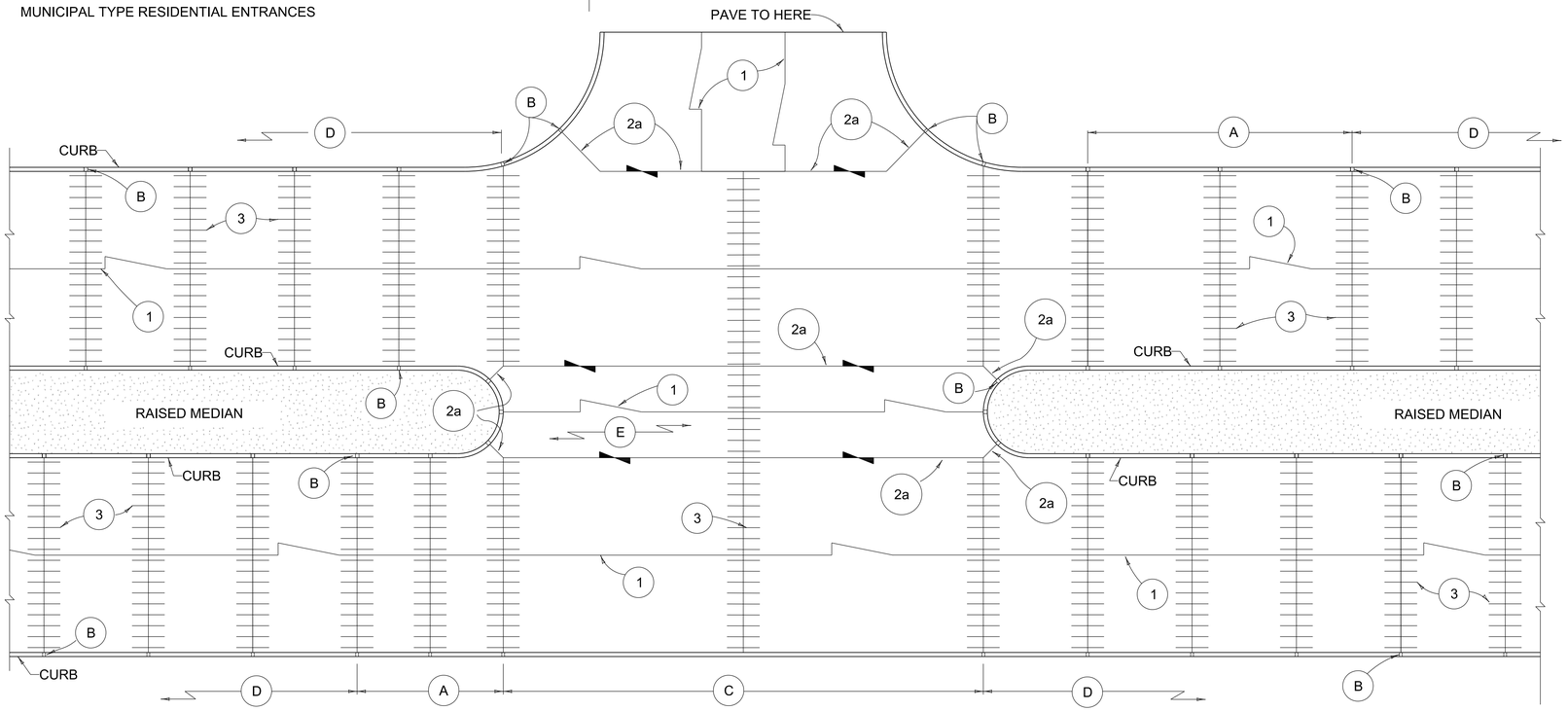
STANDARD DRAWING NUMBER
RPS-032-06



TRANSVERSE CONSTRUCTION JOINT LOCATION



MUNICIPAL TYPE RESIDENTIAL ENTRANCES



TYPICAL DIVIDED LANE WITH CROSSOVER AND CURB

~ 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.*

(A) *THIS DISTANCE TO BE EQUALLY DIVIDED WHEN GREATER THAN 20' AND LESS THAN 40'.*

(B) *½" EXPANSION JOINT FILLER.*

(C) *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.*

(D) *NORMAL SPACING OF CONTRACTION JOINTS.*

(E) *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.*

(F) *NORMAL SPACING OF TRANSVERSE CONTRACTION JOINTS.*

(G) *SEE CUR. STD. DWG. RPM-150 OR RPM-152, AS APPLICABLE FOR MORE DETAIL.*

USE WITH CUR. STD. DWG.
RPM-150 RPM-152 RPS-010

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PAVEMENT

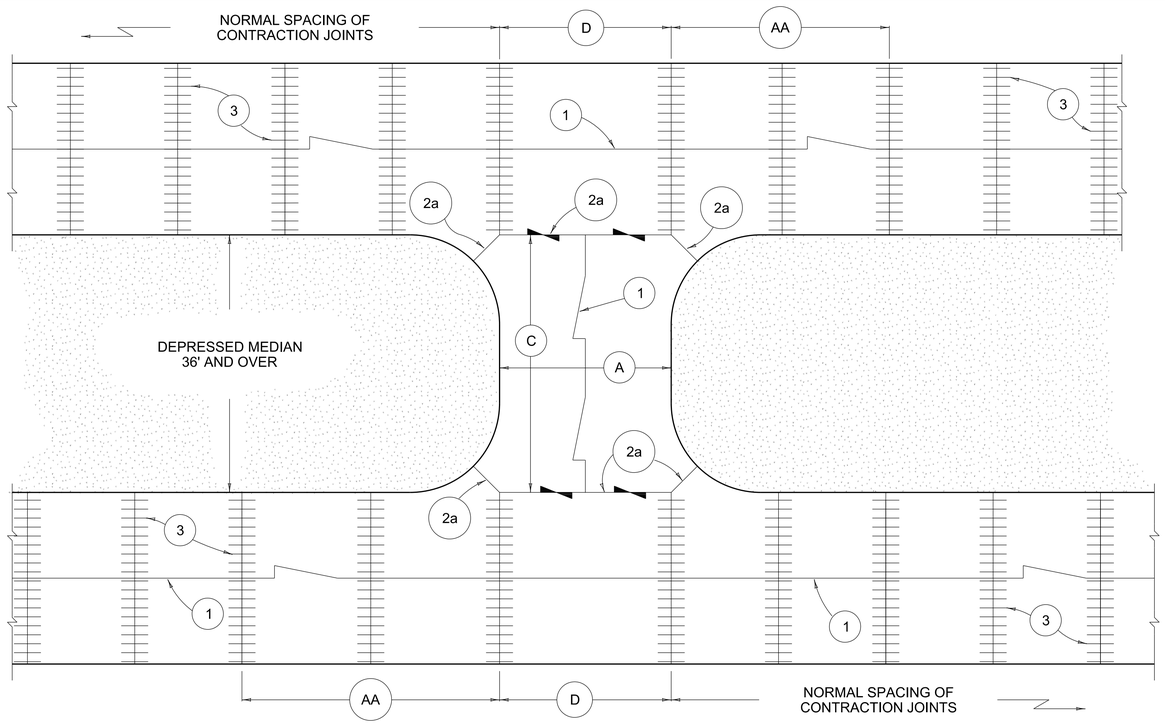
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

CONCRETE PAVEMENT JOINTS

CONCRETE PAVEMENT JOINTS TYPES AND SPACING

STANDARD DRAWING NUMBER
RPS-033-07



TYPICAL DIVIDED PAVEMENT WITH DEPRESSED MEDIAN AND CROSSOVER

~ NOTES ~

(A) *EQUALLY DIVIDE AND CONSTRUCT LONGITUDINAL SAWED JOINT WHEN DISTANCE BECOMES GREATER THAN 16'.*

(B) *½" 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'.*

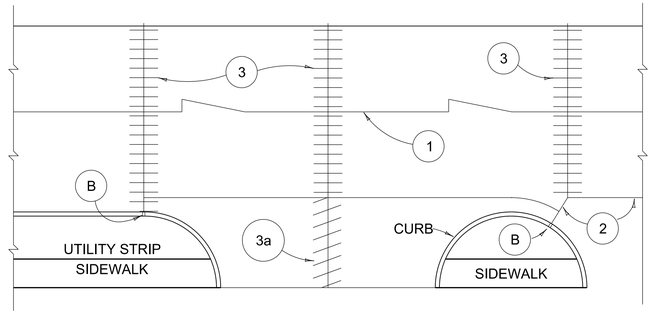
E. *ALL INTEGRAL CURBS CONSTRUCTED WITH CONCRETE BASE OR PAVEMENT SHALL HAVE JOINTS COINCIDING WITH THE TRANSVERSE JOINTS AND OTHER JOINTS SHOWN ON THIS STANDARD DRAWING.*

F. *THE JOINTS SHALL BE FILLED WITH ½" PREMOLDED EXPANSION JOINT FILLER, CUT TO THE REQUIRED SECTION.*

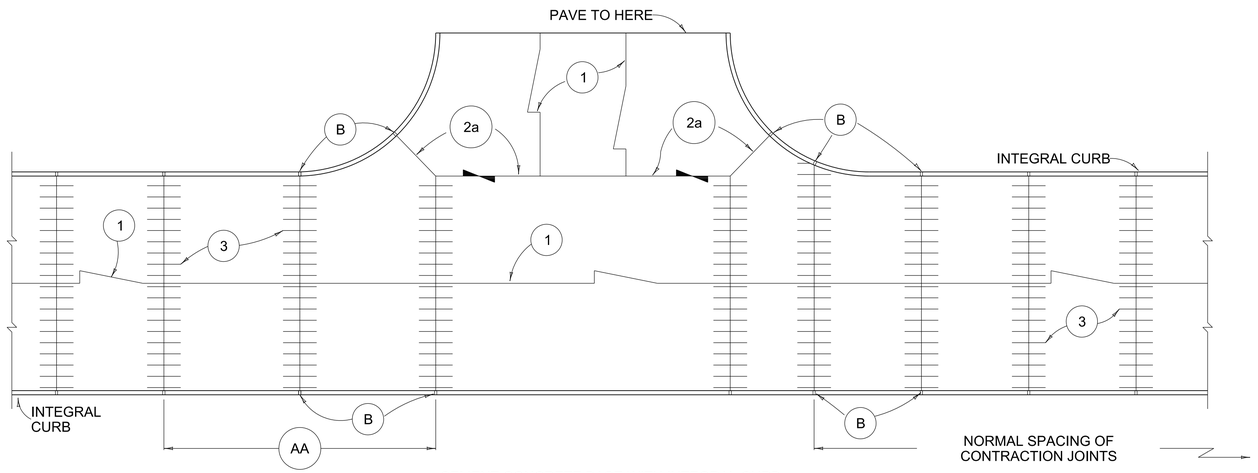
G. *SEE CUR. STD. DWG. RPS-010 FOR JOINT SYMBOLS AND DETAILS.*

(AA) *THIS DISTANCE TO BE EQUALLY DIVIDED WHEN GREATER THAN 20' AND LESS THAN 40'.*

USE WITH CUR. STD. DWG. RPS-010



COMMERCIAL ENTRANCE



CEMENT CONCRETE BASE WITH INTEGRAL CURB

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SUBMITTED — DIVISION DIRECTOR — DATE 12-01-2015

APPROVED — STATE HIGHWAY ENGINEER — DATE 12-01-2015

PAVEMENT

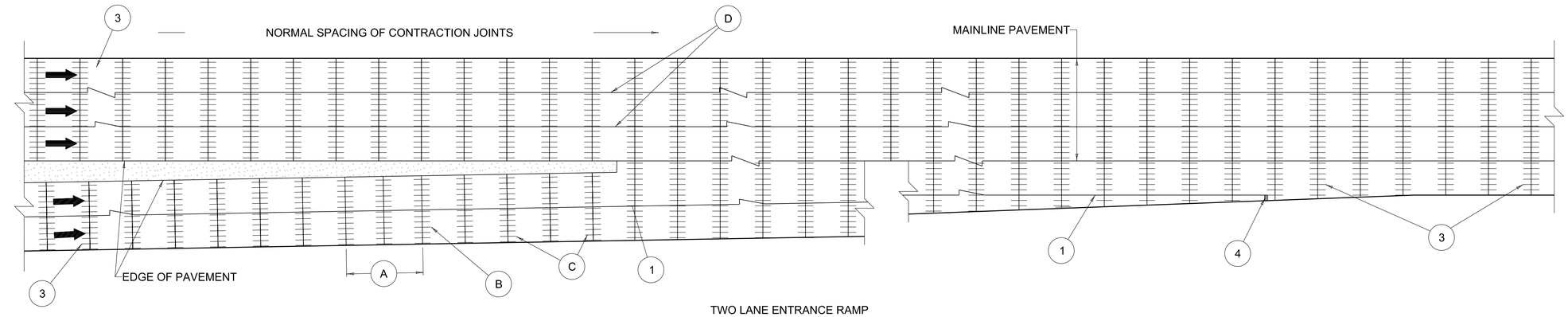
COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY. Transportation Cabinet

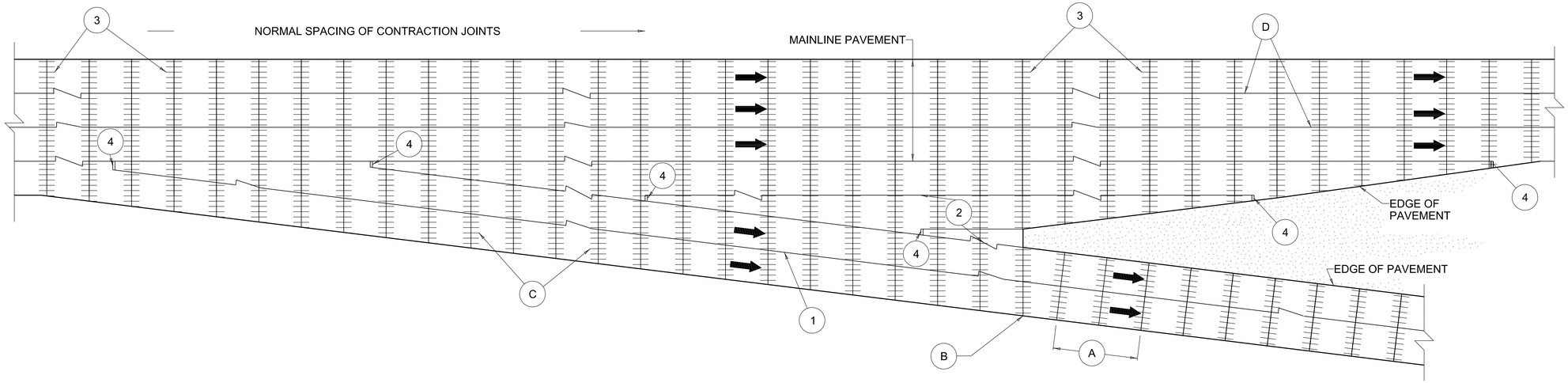
CONCRETE PAVEMENT JOINTS

CONCRETE PAVEMENT JOINTS TYPES AND SPACING

STANDARD DRAWING NUMBER
RPS-034-07



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

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PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY TRANSPORTATION CABINET

CONCRETE PAVEMENT JOINTS

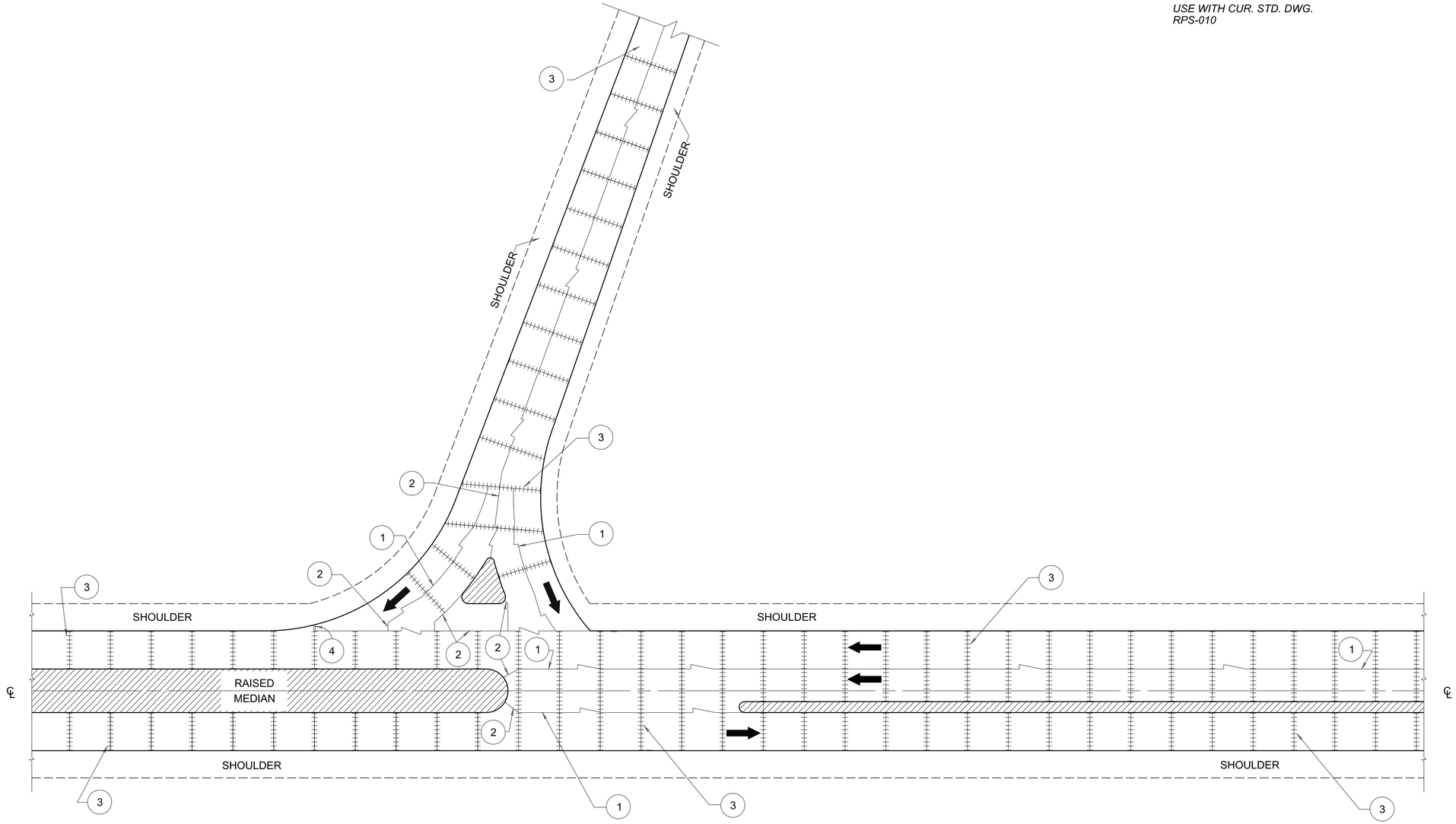
CONCRETE PAVEMENT JOINTS TYPES AND SPACING

STANDARD DRAWING NUMBER
RPS-035-06

~ 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.*

USE WITH CUR. STD. DWG.
RPS-010



INTERCHANGE RAMP DETAIL
ENTRANCE TO MINOR TWO LANE ROAD

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

CONCRETE PAVEMENT JOINTS

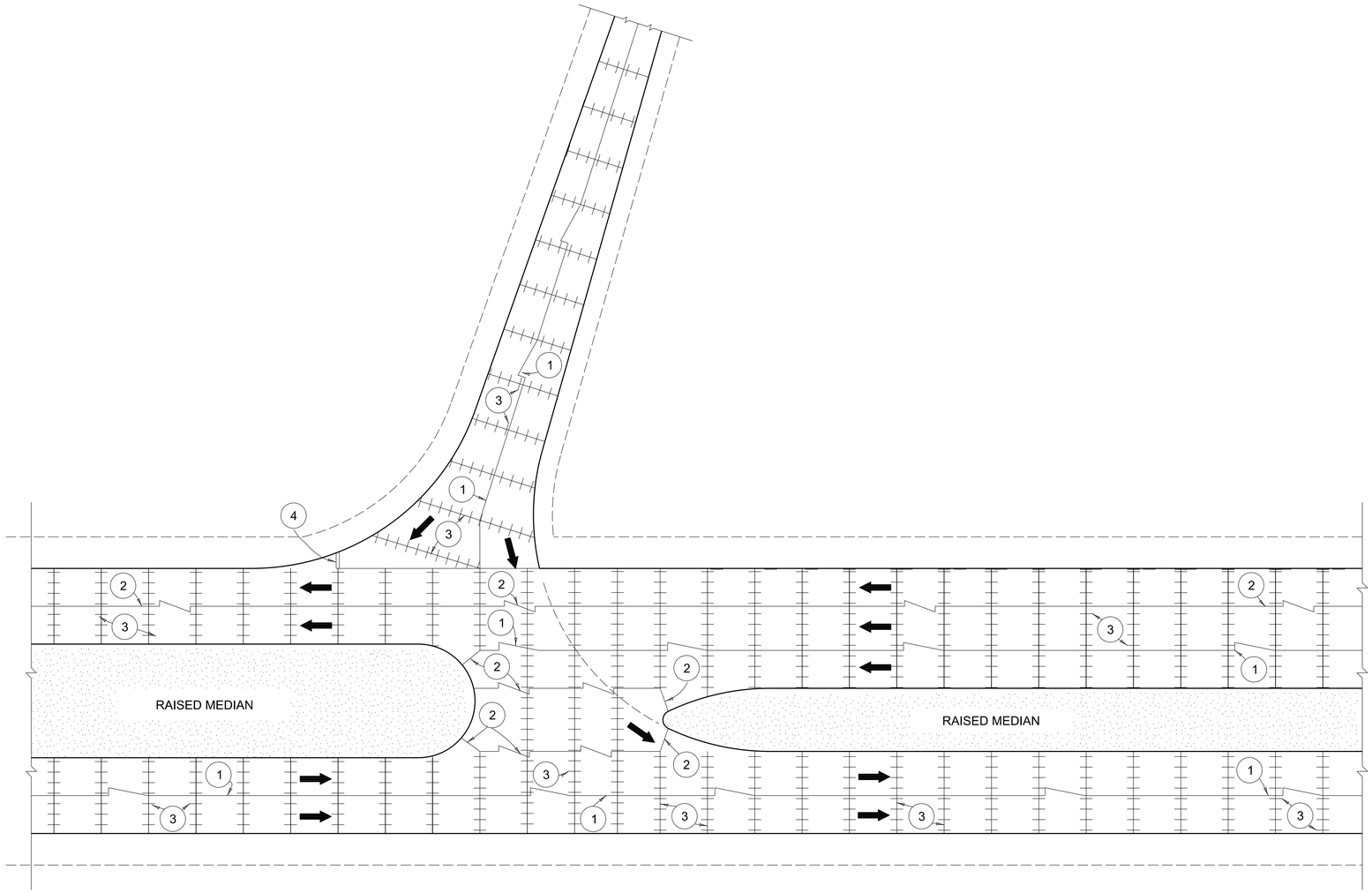
CONCRETE PAVEMENT JOINTS TYPES AND SPACING

STANDARD DRAWING NUMBER
RPS-036-06

~ 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'.*

USE WITH CUR. STD. DWG.
RPS-010



INTERCHANGE RAMP DETAIL
ENTRANCE TO MINOR FOUR LANE ROAD

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

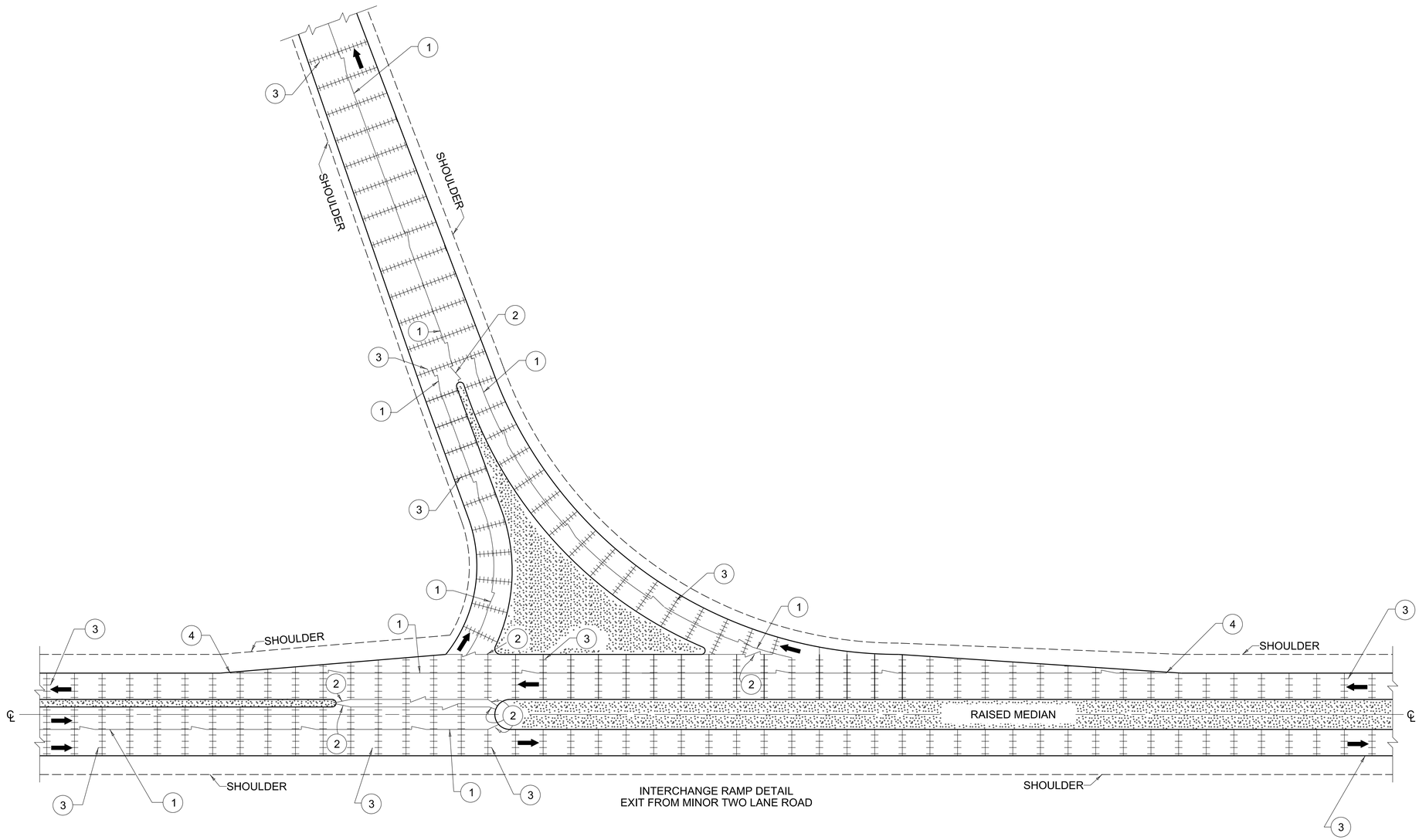
APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

PAVEMENT

~ 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.*

USE WITH CUR. STD. DWG.
RPS-010



INTERCHANGE RAMP DETAIL
EXIT FROM MINOR TWO LANE ROAD

REVISION DATE: 12/01/2015
REVISION NUMBER: 0

SUBMITTED — DIVISION DIRECTOR — 12-01-2015 DATE

APPROVED — STATE HIGHWAY ENGINEER — 12-01-2015 DATE

PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS

TEAM KENTUCKY
TRANSPORTATION CABINET

CONCRETE PAVEMENT JOINTS

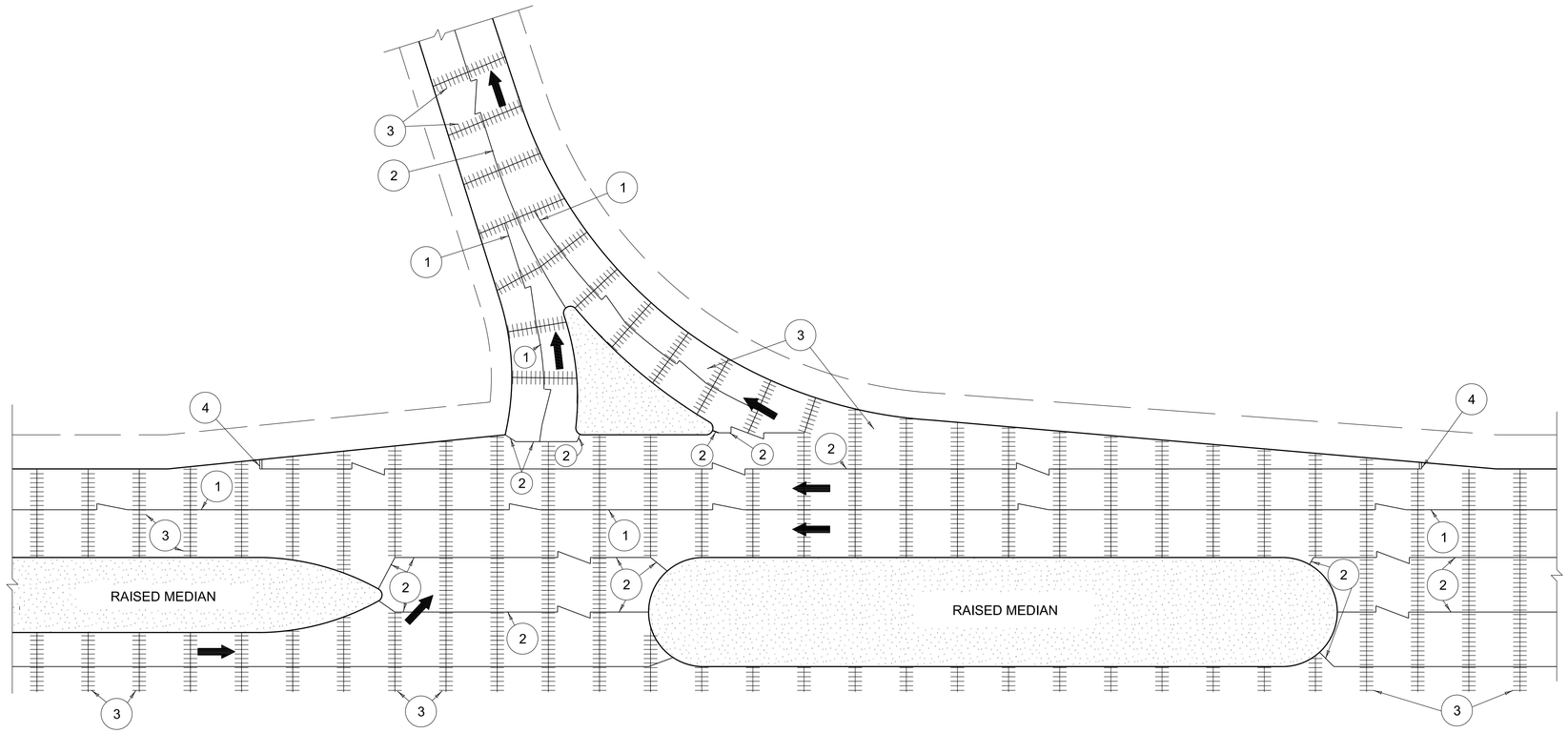
CONCRETE PAVEMENT JOINTS TYPES AND SPACING

STANDARD DRAWING NUMBER
RPS-038-06

~ 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.*

USE WITH CUR. STD. DWG.
RPS-010



INTERCHANGE RAMP DETAIL
EXIT FROM MINOR FOUR LANE ROAD

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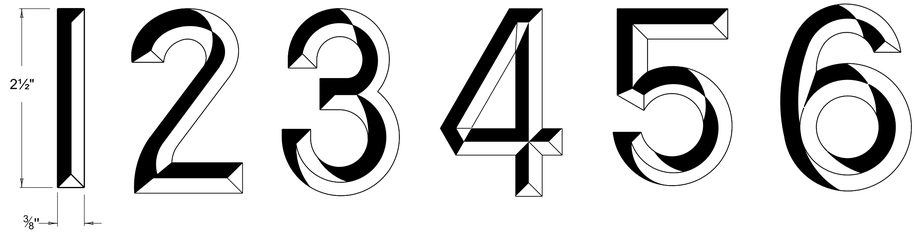
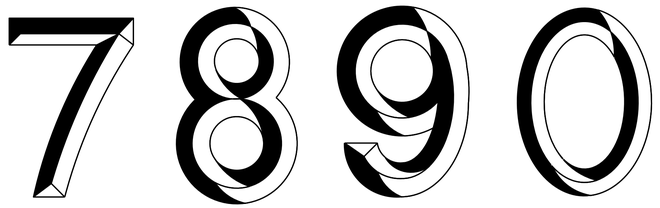
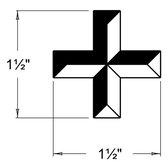
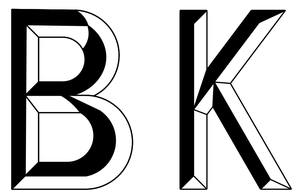
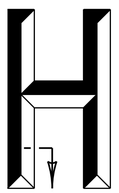
PAVEMENT

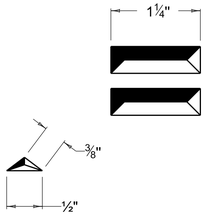


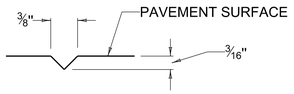




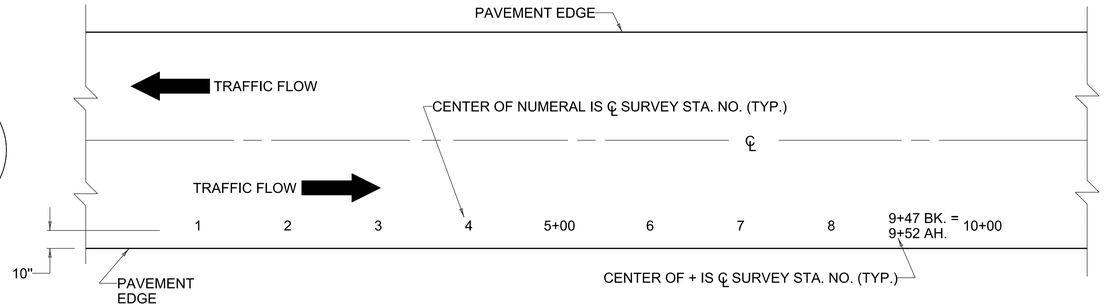




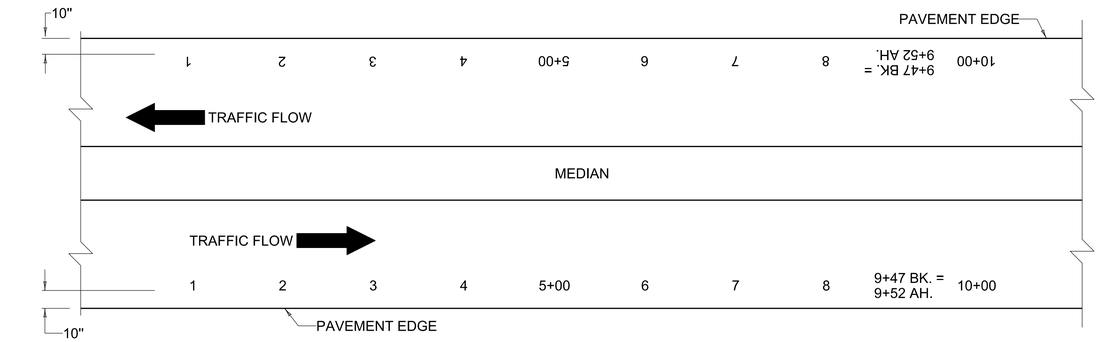




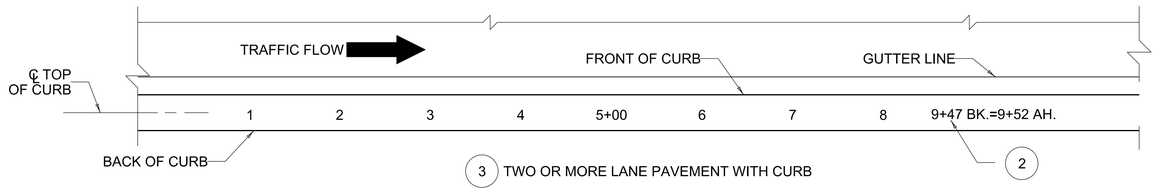
SECTION A-A



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.*

(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.

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.*

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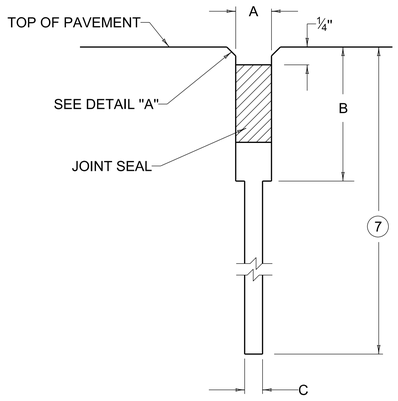
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

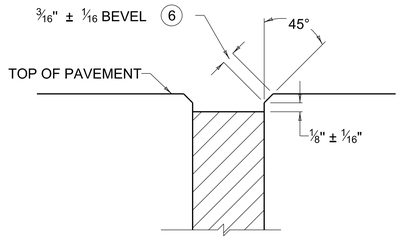
STATION MARKINGS

STATION MARKINGS CONCRETE PAVEMENT

STANDARD DRAWING NUMBER
RPX-001-04



JOINT SHAPE FOR
TRANSVERSE SAWED CONTRACTION JOINT



DETAIL "A"

JOINT SPACING	DIMENSIONS			SEAL WIDTH UNCOMPRESSED
	A	B	C	
15'-0"	⅜"	2"	⅛" TO ⅜"	11/16"
25'-0"	½"	2"	⅛" TO ½"	1"
50'-0"	⅝"	2"	⅛" TO ⅝"	1¼"

~ 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 ½".*
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*

USE WITH CUR. STD. DWGS. RPS-010 RPS-020

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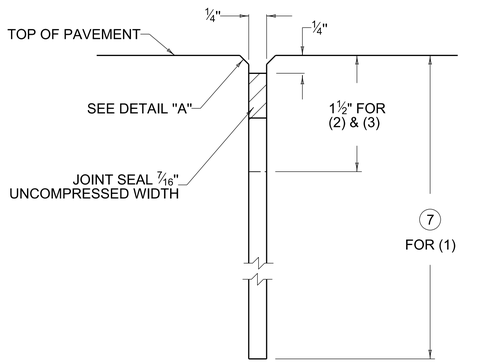
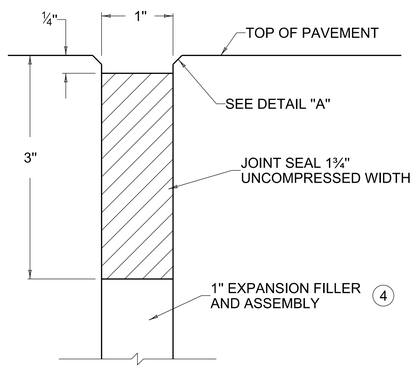


JOINT SHAPE FOR
(1) LONGITUDINAL SAWED JOINT (TIED)
(2) LONGITUDINAL SAWED CONSTRUCTION JOINT (TIED) (5)
(3) TRANSVERSE SAWED CONSTRUCTION JOINT (TIED)



JOINT SHAPE FOR
TRANSVERSE EXPANSION JOINT

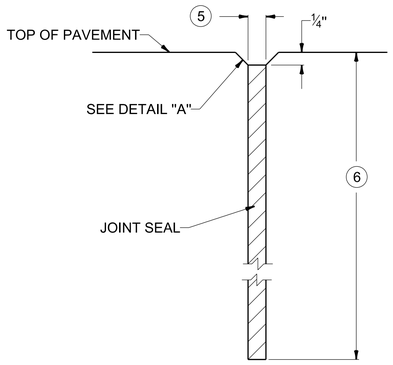
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

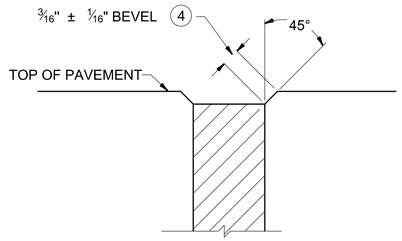
JOINTS

PREFORMED COMPRESSION JOINT SEAL FOR CONCRETE PAVEMENT

STANDARD DRAWING NUMBER
RPX-010-05



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. *⅛" MIN. - ¼" MAX.*
6. *JOINT DEPTH IS T/3 OR 4", WHICHEVER IS LESS. T = PAVEMENT THICKNESS*

USE WITH CUR. STD. DWGS.
RPS-010 RPS-020

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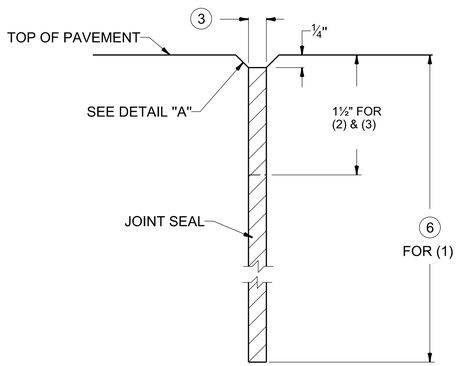
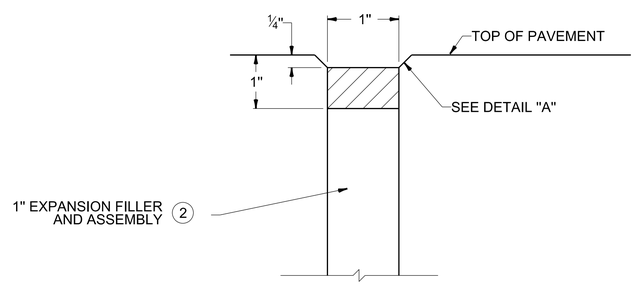


(1) LONGITUDINAL SAWED JOINT (TIED)
(2) LONGITUDINAL SAWED CONSTRUCTION JOINT (TIED)
(3) TRANSVERSE SAWED CONSTRUCTION JOINT (TIED)



JOINT SHAPE FOR
TRANSVERSE EXPANSION JOINT

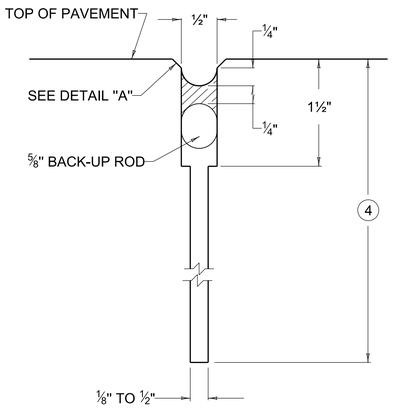
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

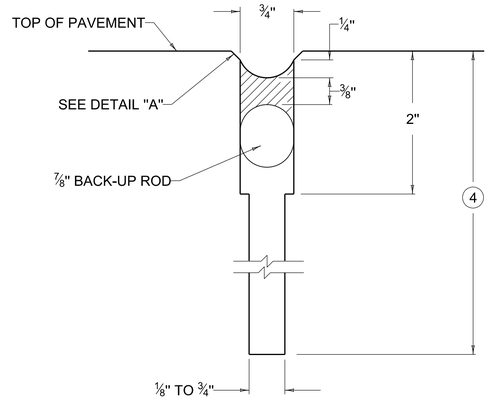
JOINTS

HOT-POURED ELASTIC JOINT SEALS FOR CONCRETE PAVEMENT

STANDARD DRAWING NUMBER
RPX-015-04



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 ~

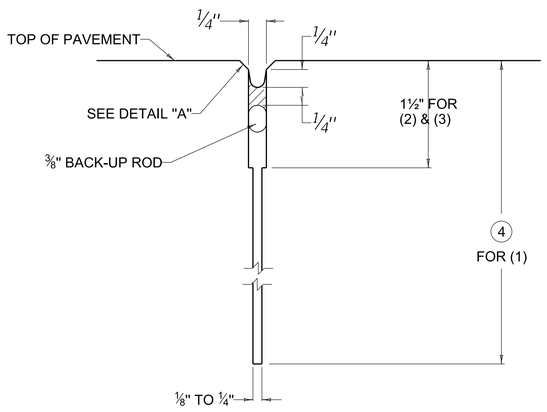
1. *PAYMENT FOR WORK SHALL BE INCIDENTAL TO THE UNIT PRICE PER SQ. YD. OF PAVEMENT.*

(2) *THE REMAINING JOINT SHALL BE IN ACCORDANCE WITH CUR. STD. DWGS. RPS-020 AND RPS-010*

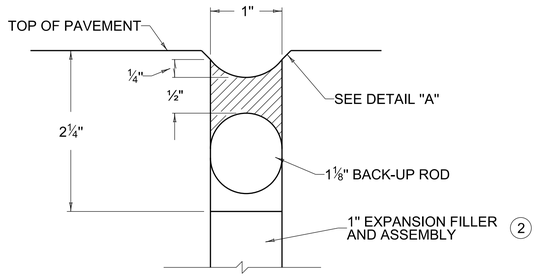
(3) *THESE EDGES SHALL BE BEVELED USING A CUTTING OR GRINDING DEVICE.*
JOINT TOLERANCES:
SAW CUT DEPTH -0" TO + ½"
SAW CUT WIDTH -0" TO + 1/16"
SEAL BEAD THICKNESS -0" TO + ⅛"

(4) *JOINT DEPTH IS T/3 OR 4", WHICHEVER IS LESS. T = PAVEMENT THICKNESS.*

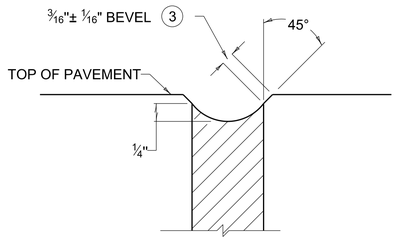
USE WITH CUR. STD. DWGS.
RPS-010 RPS-020



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"

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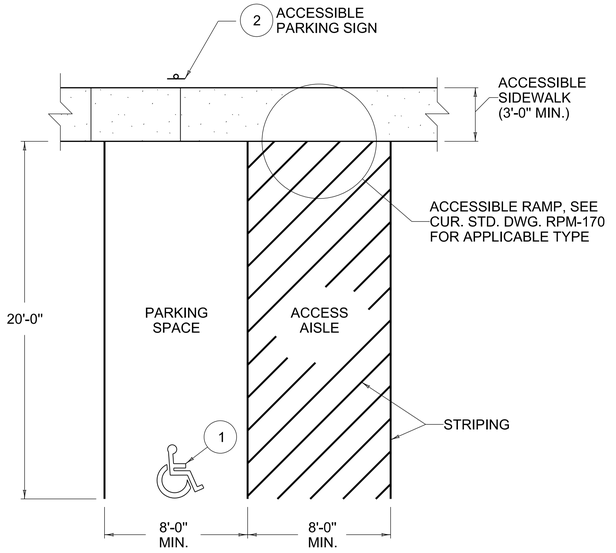
PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

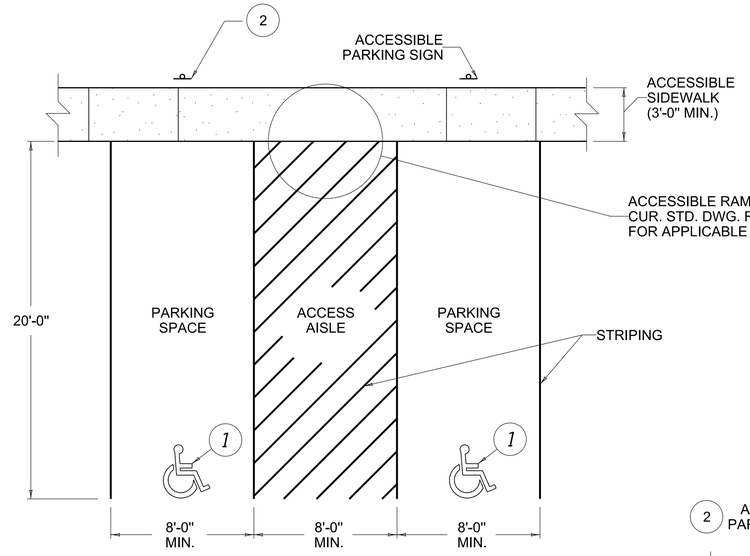
SEALS

SILICONE RUBBER SEALS FOR CONCRETE PAVEMENT

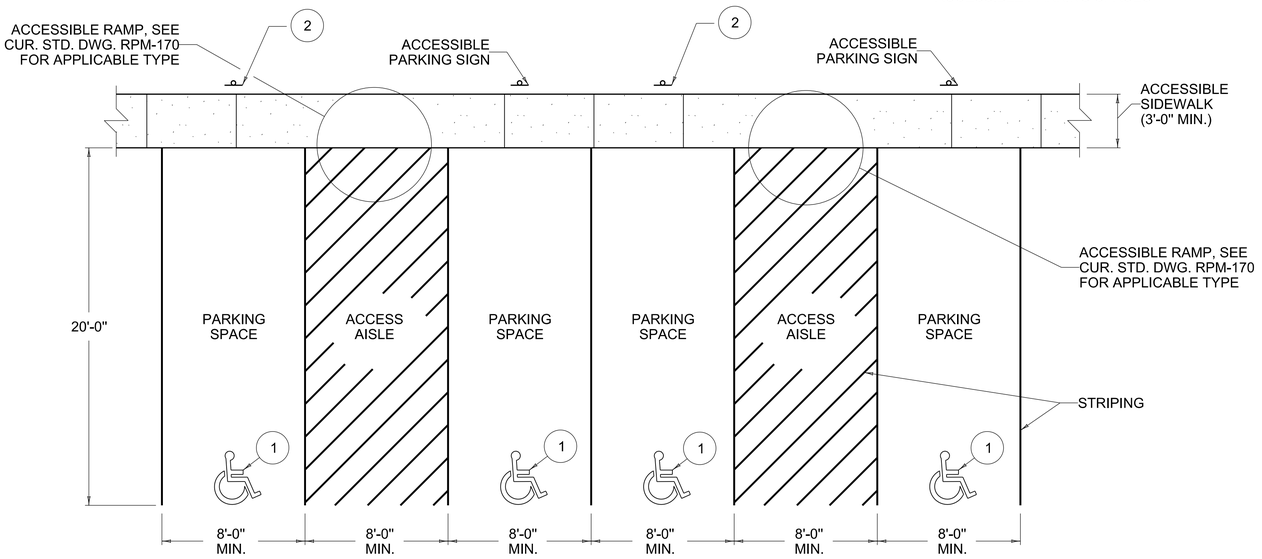
STANDARD DRAWING NUMBER
RPX-020-06



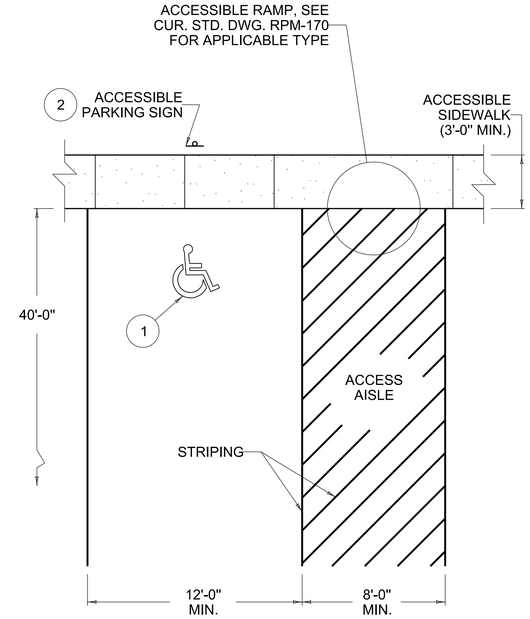
PLAN VIEW OF ONE ACCESSIBLE PARKING SPACE



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

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PAVEMENT

COMMONWEALTH OF KENTUCKY
DEPARTMENT OF HIGHWAYS
TEAM KENTUCKY TRANSPORTATION CABINET

PARKING SPACES

ACCESSIBLE PARKING SPACE DETAILS

STANDARD DRAWING NUMBER
RPX-100-03