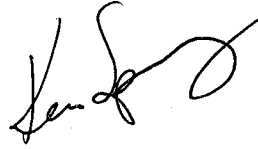


DESIGN MEMORANDUM NO. 9-05

TO: Chief District Engineers
Design Engineers
Active Consultants

FROM: Ken Sperry, Acting Director
Division of Highway Design



DATE: May 12, 2005

SUBJECT: Revisions to Fill Height Requirements for
Reinforced Concrete Pipe (RCP)
and Supplemental Specifications

Attached please find new drawings outlining revised installation procedures and new fill height requirements for Reinforced Concrete Pipe and revisions to be made in the next edition of Kentucky Standard Specifications for Road and Bridge Construction for Section 701. The drawings are available electronically at:

<http://www.kytc.state.ky.us/design/standard2003/sepia>

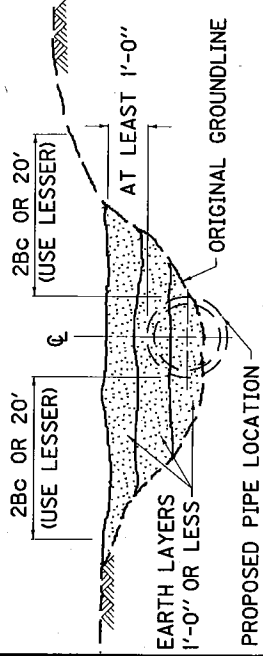
The fill height chart for both flexible and rigid pipe was revised in 1996. Since the implementation of the current charts, improved techniques for computer modeling (finite element analysis) have been developed to analyze the behavior of pipe in the trench and embankment conditions. The Standard Installations Direct Design (SIDDD) procedure was adopted by AASHTO in 1998. Using the SIDDD approach, the current fill height chart for RCP was reevaluated and the revised drawings are the result of that effort.

Implementation and use of the Revisions to Fill Height Requirements for Reinforced Concrete Pipe (RCP) in conjunction with the supplemental specification changes for Section 701 will begin with the August 2005 letting.

KRS:JAD

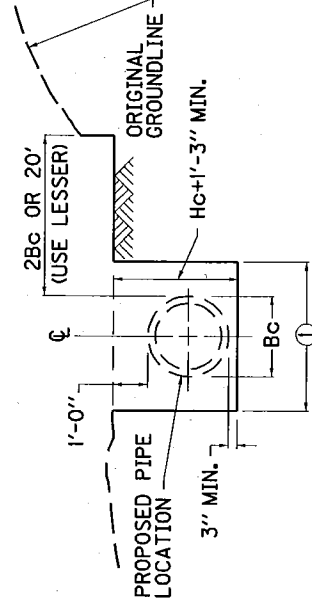
Attachments

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 1'-0" OR LESS TO ELEVATION AND WIDTH SHOWN. MEET DENSITY REQUIREMENTS FOR PROPOSED EMBANKMENT.

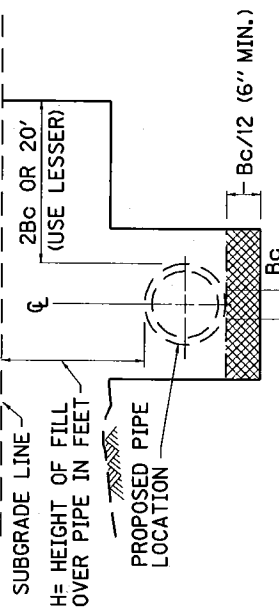
STEP 2



- 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.

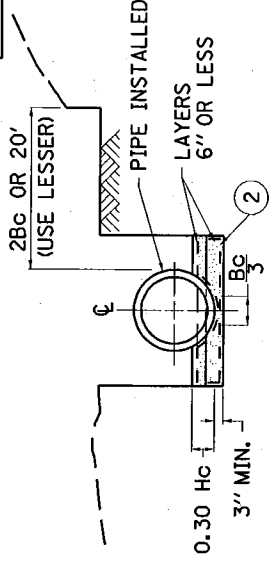
STEP 3

ROCK FOUNDATION DETAILS



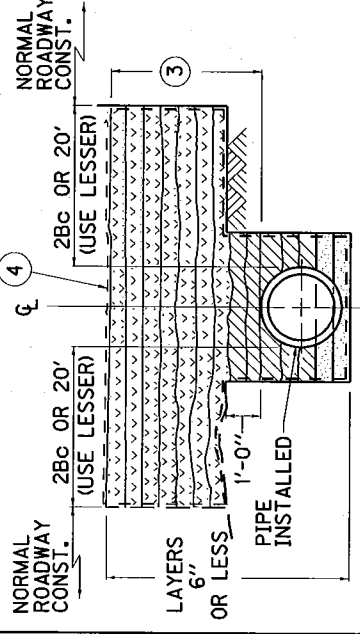
- a. IF ROCK FOUNDATION IS NOT ENCOUNTERED, GO DIRECTLY TO "STEP 4".
- b. IF ROCK FOUNDATION IS ENCOUNTERED, EXCAVATE TRENCH DEPTH USING FORMULA GIVEN. THIS DEPTH SHALL BE A MIN. OF 6" AND SHALL NOT EXCEED 24".
- c. BACKFILL WITH COMPACTED BEDDING MATERIAL IN LAYERS 6" OR LESS LEAVING $Bc/3$ UNCOMPACTED 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. COMPACT ANY LOOSE BEDDING DISTURBED DURING INSTALLATION.
- ② WRAP BEDDING MATERIAL IN GEOTEXTILE FABRIC WHEN THE STANDARD SPECIFICATIONS SPECIFIES.

STEP 5

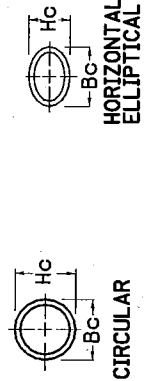


- a. COMPACT REQUIRED BACKFILL MATERIAL IN LAYERS 6" OR LESS TO 1'-0" ABOVE TOP OF PIPE.
 - b. COMPACT REQUIRED BACKFILL MATERIAL TO ELEV. ABOVE TOP OF PIPE IN LAYERS OF 6" OR LESS.
 - c. PROCEED WITH NORMAL ROADWAY CONSTRUCTION.
- ③ 4'-0" REQUIRED FOR CONSTRUCTION LOADING.
- ④ WRAP BEDDING MATERIAL IN GEOTEXTILE FABRIC WHEN THE STANDARD SPECIFICATIONS SPECIFIES.

MAX. COVER HEIGHT	CLASS	PIPE DIA.
III	25'	9'
IV	38'	15'
V	57'	23'

2' OF COVER OR LESS	CLASS	PIPE DIA.
III	12"-15"-18"	
IV	21"-24"	
V	27" & LARGER	

PIPE SHAPES

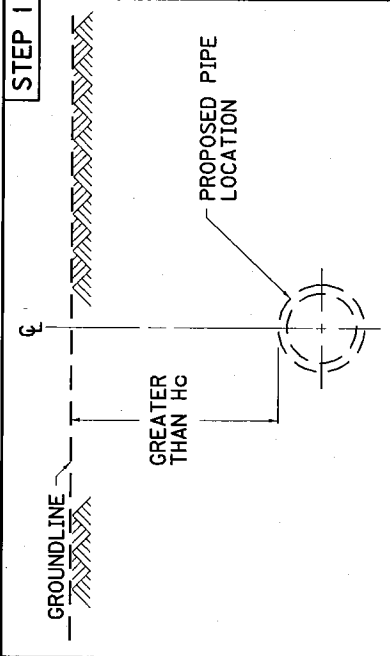


NOTE:
 10' MAXIMUM COVER HEIGHT FOR HORIZONTAL ELLIPTICAL CLASS III PIPE.
 COVER HEIGHTS EXCEEDING THOSE SHOWN IN TABLES REQUIRE SPECIAL DESIGNS.
 FOR TYPE 4 INSTALLATION PLACE EMBANKMENT MATERIAL ACCORDING TO SECTION 701.03.06A OF THE CURRENT SPEC. BOOK.
 FOR TYPE I INSTALLATION, WHEN THE TOP OF PIPE IS NOT WITHIN ONE PIPE DIAMETER OF THE SUBGRADE, INSTALL ACCORDING TO SECTION 701.03.06A OF THE CURRENT SPEC. BOOK.

SEE SHEET 2 OF 2 FOR TRENCH CONDITIONS

KENTUCKY
 DEPARTMENT OF HIGHWAYS
 PIPE BEDDING FOR CULVERTS,
 ENTRANCE, AND STORM SEWER
 REINFORCED CONC. PIPE

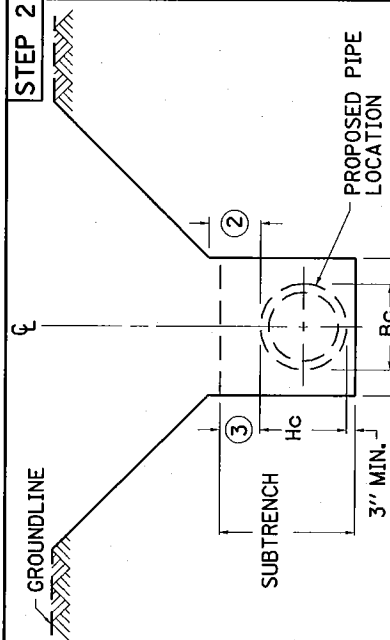
SUBMITTED: DATE: 5-12-05



- a. TRENCH CONDITION IS WHEN GROUNDLINE ELEVATION IS GREATER THAN H_c ABOVE TOP OF PROPOSED PIPE.

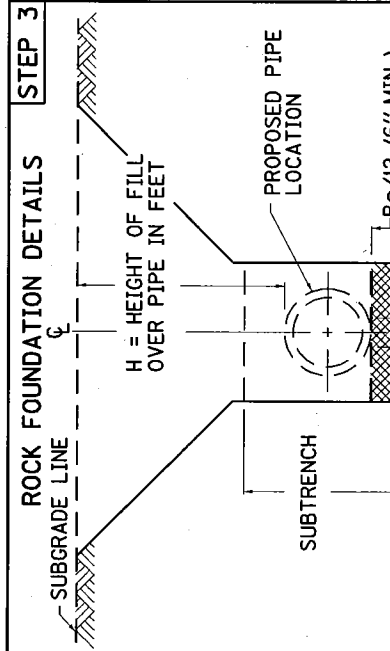
NOTE:

GROUNDLINE MAY BE (a) EXISTING OR ORIGINAL (b) EXCAVATED SURFACE OR (c) EMBANKMENT SURFACE.

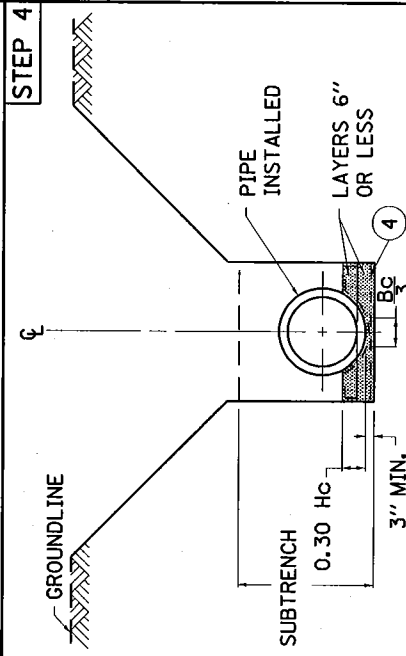


- a. EXCAVATE SUBTRENCH TO WIDTH AND DEPTH SHOWN.
 b. TRENCH WALLS MAY BE CONSTRUCTED VERTICAL. FOR ILLUSTRATION PURPOSES THE DETAIL DEPICTS A SLOPING WALL TRENCH, WHICHEVER METHOD IS USED, THE TRENCH WALLS SHALL REMAIN SYMMETRICAL ABOUT THE CENTERLINE OF THE PIPE.

- ① $BC + 24"$ FOR PIPE 36" DIA. OR LESS.
 ② $BC + 48"$ FOR PIPE GREATER THAN 36" DIA.
 ③ SLOPING OF TRENCH WALLS MAY BEGIN AT ANY ELEVATION GREATER THAN 1'-0" ABOVE TOP OF PIPE. THE SUBTRENCH SHALL ALWAYS BE REQUIRED. 1'-0" MINIMUM TO H_c MAXIMUM.



- 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 6" OR LESS LEAVING $Bc/3$ UNCOMPACTED IN THE FINAL LAYER.

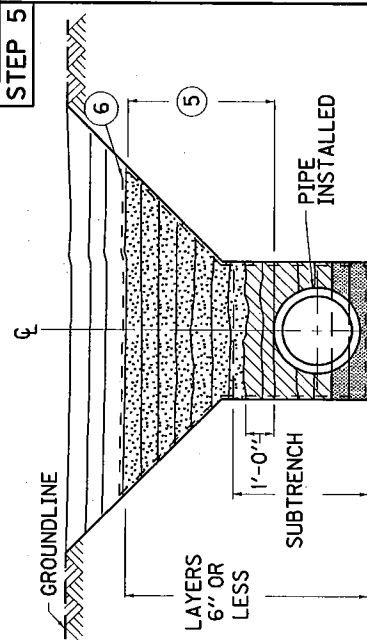


- a. UNCOMPACTED 4" BEDDING IN SUBTRENCH. FOR TYPE I INSTALLATION COMPACT BEDDING IN LAYERS 6" OR LESS TO AN ELEVATION 0.30 H_c . LEAVE CENTER THIRD OF OUTSIDE PIPE DIA. ($Bc/3$) BEDDING UNCOMPACTED.

- 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.



- ⑤ 4'-0" REQUIRED FOR CONSTRUCTION LOADING.

- a. COMPACT REQUIRED BACKFILL MATERIAL IN LAYERS 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 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 I	TYPE 4
III	V	25'	9'
IV	IV	38'	15'
V	III	57'	23'

2' OF COVER OR LESS	PIPE DIA.
V	12"-15"-18"
IV	21"-24"
III	27" & LARGER

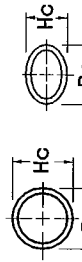
NOTE:
 10' MAXIMUM COVER HEIGHT FOR HORIZONTAL ELLIPTICAL CLASS III PIPE.

COVER HEIGHTS EXCEEDING THOSE SHOWN IN TABLES REQUIRE SPECIAL DESIGNS.

FOR TYPE 4 INSTALLATION PLACE EMBANKMENT MATERIAL ACCORDING TO SECTION 701.03.06A OF CURRENT SPEC. BOOK.

FOR TYPE I INSTALLATION, WHEN THE TOP OF PIPE IS NOT WITHIN ONE PIPE DIAMETER OF THE SUBGRADE, INSTALL

ACCORDING TO SECTION 701.03.06A OF THE CURRENT SPEC. BOOK.



CIRCULAR

HORIZONTAL ELLIPTICAL

PIPE SHAPES

KENTUCKY
 DEPARTMENT OF HIGHWAYS

PIPE BEDDING
 TRENCH CONDITION
 REINFORCED CONC. PIPE

SUBMITTED
 DATE 5-12-05

PIPE DIA. (IN)	PIPE TYPE	CIRCULAR PIPE COVER HEIGHTS IN FEET							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								
12 & 15	2 2/3" x 1/2" CSPHS (1)				16 GA.				21	2 2/3" x 1/2" CSPHS (1)				16 GA.							16 GA.			
	2 2/3" x 1/2" CSPLS (1)				16 GA.					2 2/3" x 1/2" CSPLS (1)				16 GA.							16 GA.			
	2 2/3" x 1/2" CAPHS				16 GA.					2 2/3" x 1/2" CAPHS				16 GA.							16 GA.			
	PVC (1)				SMOOTH WALL (SOLID WALL)					SRA (1)				16 GA.							16 GA.			
	HDPE (1)							FF		PVC (1)				RIBBED (PROFILE WALL)							14 GA.			
18	RCP (2)								HDPE (1)				FF							FF				
	2 2/3" x 1/2" CSPHS (1)				16 GA.				RCP (2)										16 GA.					
	2 2/3" x 1/2" CSPLS (1)				16 GA.				2 2/3" x 1/2" CSPHS (1)				16 GA.							16 GA.				
	2 2/3" x 1/2" CAPHS				16 GA.				2 2/3" x 1/2" CSPLS (1)				16 GA.							16 GA.				
	SRA (1)				16 GA.				SRA (1)				16 GA.							16 GA.				
24	SRA (1)				16 GA.				2 2/3" x 1/2" CSPHS (1)				16 GA.							16 GA.				
	PVC (1)				RIBBED (PROFILE WALL)				2 2/3" x 1/2" CSPLS (1)				16 GA.							16 GA.				
	HDPE (1)								2 2/3" x 1/2" CAPHS				16 GA.							16 GA.				
	RCP (2)								SRA (1)				16 GA.							16 GA.				
										SRA (1)				16 GA.							16 GA.			
24									PVC (1)				RIBBED (PROFILE WALL)							14 GA.				
									HDPE (1)				FF							12 GA.				
									RCP (2)										10 GA.					

NOTES

- 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.
- WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES.
- CSP, CAP, SRS AND SRA ARE SHOWN IN GAGE.
- 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.
- 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.
- 24" DIA. PIPE IS MINIMUM SIZE FOR COVER HEIGHTS FROM 30 FEET TO 65 FEET.
- MINIMUM COVER HEIGHT FOR ENTRANCE PIPE SHALL BE 0.5 FEET.
- GAGE OF ENTRANCE PIPE FOR COVER HEIGHTS LESS THAN 2 FEET SHALL MEET THE FOLLOWING REQUIREMENTS:
 - GAGE OF CSP SHALL BE THAT SHOWN FOR HEIGHTS OF 30 FEET.
 - GAGE OF CAP SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLE.
- ALL CIRCULAR STRUCTURAL PLATE SHALL BE 5% VERTICALLY ELONGATED.
- SEE CURRENT STANDARD DRAWING RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.
- PVC AND HDPE PIPE ARE NOT PERMITTED ON THE NATIONAL HIGHWAY SYSTEM OR FOR STORM SEWER INSTALLATIONS.
- 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.


LEGEND

- CSPHS: CORRUGATED STEEL PIPE WITH HELICAL LOCK SEAM OR HELICAL WELDED SEAM (HELICAL CORR.)
- CSPLS: CORRUGATED STEEL PIPE WITH LONGITUDINAL RIVETED OR SPOT WELDED SEAM (ANNULAR CORR.)
- CAPHS: CORRUGATED ALUMINUM ALLOY PIPE WITH HELICAL LOCK SEAM (HELICAL CORR.)
- HDPE: HIGH DENSITY POLYETHYLENE PIPE
- PVC: POLYVINYL CHLORIDE
- SRS: SPIRAL RIB STEEL
- SRA: SPIRAL RIB ALUMINUM
- RCP: CIRCULAR REINFORCED CONCRETE PIPE
- FF: FLOWABLE FILL REQUIRED

12" PIPE - 24" PIPE

KENTUCKY
 DEPARTMENT OF HIGHWAYS

CULVERT, ENTRANCE & STORM SEWER PIPE TYPES & COVER HEIGHTS

SUBMITTED:  5-12-05
 DATE


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
27 & 30	2 1/2" x 1/2" CSPHS (1)	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.
	2 1/2" x 1/2" CSPLS (1)	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.
	2 3/4" x 1/2" CAPHS	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.
	SRS (1)	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.
	SRA	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.
	PVC	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.	16 GA.
	HDPE	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)
	RCP	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
36	2 1/2" x 1/2" CSPHS (1)	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.
	2 1/2" x 1/2" CSPLS (1)	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.
	2 3/4" x 1/2" CAPHS	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.
	SRS (1)	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.
	SRA	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.
	PVC	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)
	HDPE	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF	FF
	RCP													
42	2 1/2" x 1/2" CSPHS (1)	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.
	2 1/2" x 1/2" CSPLS (1)	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.
	2 3/4" x 1/2" CAPHS	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.
	SRS (1)	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.
	SRA	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.
	PVC	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)	RIBBED (PROFILE WALL)
	HDPE													
	RCP													

NOTES

- 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.
- WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES.
- SEE CURRENT STANDARD DRAWING RDI-001 FOR EXPLANATION OF COVER HEIGHTS LESS THAN 2 FEET.
- CSP, CAP, SRS AND SRA ARE SHOWN IN GAGE.
- 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.
- MINIMUM COVER HEIGHT FOR ENTRANCE PIPE SHALL BE 0.5 FEET.
- ALL CIRCULAR STRUCTURAL PLATE SHALL BE 5% VERTICALLY ELONGATED.
- ENTRANCE PIPE GREATER THAN 30" DIA. SHALL BE CULVERT PIPE.
- SEE CURRENT STANDARD DRAWING RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.
- PVC AND HDPE PIPE ARE NOT PERMITTED ON THE NATIONAL HIGHWAY SYSTEM OR FOR STORM SEWER INSTALLATIONS.

27" PIPE - 42" PIPE

KENTUCKY
DEPARTMENT OF HIGHWAYS
CULVERT, ENTRANCE &
STORM SEWER PIPE TYPES
& COVER HEIGHTS

SUBMITTED:  HIGHWAY DESIGN
5-12-05
DATE

- LEGEND**
- CSPHS: CORRUGATED STEEL PIPE WITH HELICAL LOCK SEAM OR HELICAL WELDED SEAM (HELICAL CORR.)
 - CSPLS: CORRUGATED STEEL PIPE WITH LONGITUDINAL RIVETED OR SPOT WELDED SEAM (ANNULAR CORR.)
 - CAPHS: CORRUGATED ALUMINUM ALLOY PIPE WITH HELICAL LOCK SEAM (HELICAL CORR.)
 - HDPE: HIGH DENSITY POLYETHYLENE PIPE
 - PVC: POLYVINYL CHLORIDE
 - SRS: SPIRAL RIB STEEL
 - SRA: SPIRAL RIB ALUMINUM
 - RCP: CIRCULAR REINFORCED CONCRETE PIPE
 - FF: FLOWABLE FILL REQUIRED

NOTES CONTINUED

(1) 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.

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 1/2" x 1/2" CSPHS (1)	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.	14 GA.
	2 1/2" x 1/2" CSPLS (1)	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.
	2 1/2" x 1/2" CAPHS	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.
	SRS (1)	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.
	SRA	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.
	PVC	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.	12 GA.
54	3" x 1" CSPHS (1)	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.
	3" x 1" CSPLS (1)	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.
	3" x 1" CAPHS	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.
	SRS (1)	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.	4 GA.
	SRA	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.	6 GA.
	RCP (10)	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.
⑦																									


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

- 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 CURRENT STANDARD DRAWING 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 CURRENT STANDARD DRAWING RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.
- ⑨ PVC AND HDPE PIPE ARE NOT PERMITTED ON THE NATIONAL HIGHWAY SYSTEM OR FOR STORM SEWER INSTALLATIONS.
- 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.

48" PIPE - 54" PIPE

KENTUCKY
DEPARTMENT OF HIGHWAYS
CULVERT &
STORM SEWER PIPE TYPES
& COVER HEIGHTS

SUBMITTED:  T. J. HANCOCK, HIGHWAY DESIGN
5-12-05
DATE

CIRCULAR PIPE COVER HEIGHTS IN FEET (4)

PIPE DIA. (IN)	PIPE TYPE	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	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110
60	2 3/4" x 1/2" CSPHS (1)	12 GA.																					
	2 3/4" x 1/2" CSPLS (1)	12 GA.																					
	3" x 1" CSPHS (1)	14 GA.																					
	3" x 1" CSPLS (1)	14 GA.																					
	5" x 1" CSPHS (1)	10 GA.																					
	5" x 1" CSPLS (1)	10 GA.																					
	6" x 2" CSPSSB (1)	10 GA.																					
	2 3/4" x 1/2" CAPHS	10 GA.																					
	3" x 1" CAPHS	10 GA.																					
	9" x 2 1/2" CAPLSSB	10 GA.																					
SRS (1)	12 GA.																						
SRA	10 GA.																						
RCP (9)	10 GA.																						
66	2 3/4" x 1/2" CSPHS (1)	10 GA.																					
	2 3/4" x 1/2" CSPLS (1)	10 GA.																					
	3" x 1" CSPHS (1)	14 GA.																					
	3" x 1" CSPLS (1)	14 GA.																					
	5" x 1" CSPHS (1)	14 GA.																					
	5" x 1" CSPLS (1)	14 GA.																					
	6" x 2" CSPSSB (1)	10 GA.																					
	2 3/4" x 1/2" CAPHS	10 GA.																					
	3" x 1" CAPHS	10 GA.																					
	9" x 2 1/2" CAPLSSB	10 GA.																					
SRS (1)	12 GA.																						
SRA	10 GA.																						
RCP (9)	10 GA.																						

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.)
- CSPSSB: 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

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" CSPSSB ARE SHOWN FOR ZINC COATED (GALVANIZED).
4. SEE CURRENT STANDARD 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 CURRENT STANDARD DRAWING RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.
9. SEE DETAIL SHEET "PIPE BEDDING FOR CULVERTS, ENTRANCE, AND STORM SEWER REINFORCED CONC. PIPE" FOR RCP COVER HEIGHT AND BEDDING REQUIREMENTS.

KENTUCKY
DEPARTMENT OF HIGHWAYS

**CULVERT &
STORM SEWER PIPE TYPES
& COVER HEIGHTS**

SUBMITTED:  J. H. HANCOCK HIGHWAY DESIGN
5-12-05 DATE

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	65-70	70-75	75-80	80-85	85-90	90-95	95-100	100-105	105-110
72	2 7/8" x 1/2" CSPHS (1)	10 GA.																					
	2 7/8" x 1/2" CSPLS (1)	10 GA.																					
	3" x 1" CSPHS (1)	14 GA.																					
	3" x 1" CSPLS (1)	14 GA.																					
	5" x 1" CSPHS (1)	14 GA.																					
	5" x 1" CSPLS (1)	14 GA.																					
	6" x 2" CSPHS (1)	10 GA.																					
	6" x 2" CSPLS (1)	10 GA.																					
	2 7/8" x 1/2" CAPHS	8 GA.																					
	3" x 1" CAPHS	8 GA.																					
78	9" x 2 1/2" CAPLSSB	12 GA.																					
	SRS (1)	12 GA.																					
	RCP (9)	12 GA.																					
	3" x 1" CSPHS (1)	12 GA.																					
	3" x 1" CSPLS (1)	12 GA.																					
	5" x 1" CSPHS (1)	12 GA.																					
	5" x 1" CSPLS (1)	12 GA.																					
	6" x 2" CSPHS (1)	10 GA.																					
	6" x 2" CSPLS (1)	10 GA.																					
	3" x 1" CAPHS	10 GA.																					
9" x 2 1/2" CAPLSSB	12 GA.																						
SRS (1)	12 GA.																						
RCP (9)	12 GA.																						

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.)
- CSPSSB: 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
- RCP: CIRCULAR REINFORCED CONCRETE PIPE

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 CURRENT STANDARD 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 CURRENT STANDARD DRAWING RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.
9. SEE DETAIL SHEET "PIPE BEDDING FOR CULVERTS, ENTRANCE, AND STORM SEWER REINFORCED CONC. PIPE" FOR RCP COVER HEIGHT AND BEDDING REQUIREMENTS.

72" PIPE - 78" PIPE

SHEET 5 OF 8

KENTUCKY
DEPARTMENT OF HIGHWAYS
CULVERT &
STORM SEWER PIPE TYPES
& COVER HEIGHTS

5-12-05
DATE

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	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.	12 GA.	12 GA.	12 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	
	3"x1" CSPLS (1)	12 GA.	12 GA.	12 GA.	12 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	
	5"x1" CSPHS (1)	10 GA.	10 GA.	10 GA.	10 GA.	8 GA.	8 GA.	7 GA.	7 GA.	7 GA.	7 GA.	5 GA.	5 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	
	6"x2" CSPSSB (1)	12 GA.	12 GA.	12 GA.	10 GA.	10 GA.	10 GA.	10 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.
	3"x1" CAPHS	10 GA.	10 GA.	10 GA.	10 GA.	8 GA.	8 GA.	7 GA.	7 GA.	5 GA.	5 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	
90	9"x2 1/2" CAPLSSB	10 GA.	10 GA.	10 GA.	10 GA.	8 GA.	8 GA.	7 GA.	7 GA.	5 GA.	5 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	
	RCP (9)	10 GA.	10 GA.	10 GA.	10 GA.	8 GA.	8 GA.	7 GA.	7 GA.	5 GA.	5 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	
	3"x1" CSPHS (1)	12 GA.	12 GA.	12 GA.	12 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	
	3"x1" CSPLS (1)	12 GA.	12 GA.	12 GA.	12 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	
	5"x1" CSPHS (1)	10 GA.	10 GA.	10 GA.	10 GA.	8 GA.	8 GA.	7 GA.	7 GA.	5 GA.	5 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	
96	6"x2" CSPSSB (1)	12 GA.	12 GA.	12 GA.	12 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	
	3"x1" CAPHS	10 GA.	10 GA.	10 GA.	10 GA.	8 GA.	8 GA.	7 GA.	7 GA.	5 GA.	5 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	
	9"x2 1/2" CAPLSSB	10 GA.	10 GA.	10 GA.	10 GA.	8 GA.	8 GA.	7 GA.	7 GA.	5 GA.	5 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	
	RCP (9)	10 GA.	10 GA.	10 GA.	10 GA.	8 GA.	8 GA.	7 GA.	7 GA.	5 GA.	5 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	
	3"x1" CSPHS (1)	12 GA.	12 GA.	12 GA.	12 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	

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.)
 CSPSSB: CORRUGATED STEEL PIPE WITH LONGITUDINAL SEAMS WITH STEEL BOLTS (ANNULAR CORR.)
 CAPHS: HELICAL LOCK SEAM 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

KENTUCKY
 DEPARTMENT OF HIGHWAYS
STORM SEWER PIPE TYPES & COVER HEIGHTS

SUBMITTED: *[Signature]*
 DATE: 5-12-05

SHEET 6 OF 8
 84" PIPE - 96" PIPE

NOTES

- 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.
- WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES. CONTRARY TO NOTE 2, GAGES FOR 6"x2" CSPSSB ARE SHOWN FOR ZINC COATED (GALVANIZED).
- SEE CURRENT STANDARD DRAWING RDI-001 FOR EXPLANATION OF COVER HEIGHTS LESS THAN 2 FEET.
- CSP, CAP, SRS AND SRA ARE SHOWN IN GAGE.
- 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.
- ALL CIRCULAR STRUCTURAL PLATE SHALL BE 5% VERTICALLY ELONGATED.
- SEE CURRENT STANDARD DRAWING RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.
- 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.

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.	12 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.
	3"x1" CSPLS (1)	12 GA.	12 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.
	5"x1" CSPHS (1)	12 GA.	12 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.
	6"x2" CSPSSB (1)	10 GA.	10 GA.	10 GA.	8 GA.	8 GA.	7 GA.	7 GA.	5 GA.	5 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.
	3"x1" CAPHS (1)	10 GA.	10 GA.	10 GA.	10 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.
108	9"x2 1/2" CAPLSSB (1)	10 GA.	10 GA.	10 GA.	8 GA.	7 GA.	5 GA.	5 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.
	RCP (9)																								
	3"x1" CSPHS (1)	12 GA.	12 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.
	3"x1" CSPLS (1)	12 GA.	12 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.
	5"x1" CSPHS (1)	12 GA.	12 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.
114	6"x2" CSPSSB (1)	10 GA.	10 GA.	10 GA.	8 GA.	8 GA.	7 GA.	7 GA.	5 GA.	5 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.
	3"x1" CAPHS (1)	10 GA.	10 GA.	10 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.	8 GA.
	9"x2 1/2" CAPLSSB (1)	10 GA.	10 GA.	10 GA.	8 GA.	7 GA.	7 GA.	5 GA.	5 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.	3 GA.
	RCP (9)																								
	3"x1" CSPHS (1)	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.	10 GA.

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.)

CSPSSB: 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

SHEET 7 of 8
102" PIPE - 114" PIPE

KENTUCKY
DEPARTMENT OF HIGHWAYS

**CULVERT &
STORM SEWER PIPE TYPES
& COVER HEIGHTS**



SUBMITTED: _____
DATE: 5-12-05

NOTES

- 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.
- WHEN CORRUGATED STEEL PIPE IS ZINC COATED (GALVANIZED) THE GAGE SHALL BE ONE GAGE HEAVIER THAN SHOWN IN THE TABLES.
- CONTRARY TO NOTE 2, GAGES FOR 6"x2" CSPSSB ARE SHOWN FOR ZINC COATED (GALVANIZED).
- SEE CURRENT STANDARD DRAWING RDI-001 FOR EXPLANATION OF COVER HEIGHTS LESS THAN 2 FEET.
- CSP, CAP, SRS AND SRA ARE SHOWN IN GAGE.
- 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.
- ALL CIRCULAR STRUCTURAL PLATE SHALL BE 5% VERTICALLY ELONGATED.
- SEE CURRENT STANDARD DRAWING RDI-035 FOR COATINGS, LININGS AND PAYINGS FOR NON-STRUCTURAL PIPE.
- 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.

PIPE DIA. (IN)	PIPE TYPE	CIRCULAR PIPE COVER HEIGHTS IN FEET ④																				
		2-5	10-10	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
120	3"x1" CSPHS ①	10 GA.																				
	3"x1" CSPLS ①	10 GA.																				
	5"x1" CSPLS ①	10 GA.																				
	6"x2" CSPSSB ①	10 GA.	8 GA.	8 GA.	7 GA.	5 GA.	3 GA.	1 GA.														
120	3"x1" CAPHS	8 GA.																				
	9"x2 1/2" CAPLSSB	10 GA.	8 GA.	7 GA.	5 GA.	3 GA.	1 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 CONTRARY TO NOTE 2, GAGES FOR 6"x2" CSPLSSB ARE SHOWN FOR ZINC COATED (GALVANIZED).
- ④ SEE CURRENT STANDARD 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 5/8" VERTICALLY ELONGATED.
- ⑧ SEE CURRENT STANDARD DRAWING RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.
- ⑨ SEE DETAIL SHEET "PIPE BEDDING FOR CULVERTS, ENTRANCE, AND STORM SEWER REINFORCED CONC. PIPE" 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.)
- CSPSSB: 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

SHEET 8 OF 8
120" PIPE

KENTUCKY DEPARTMENT OF HIGHWAYS
CULVERT & STORM SEWER PIPE TYPES & COVER HEIGHTS
<small>SUBMITTED:</small>  <small>DESIGNED BY:</small> Highway Design <small>DATE:</small> 5-12-05

EQUI. PIPE DIA. (IN)	PIPE TYPE	NON-CIRCULAR PIPE COVER HEIGHTS IN FEET										EQUI. PIPE DIA. (IN)	PIPE TYPE	NON-CIRCULAR PIPE COVER HEIGHTS IN FEET										EQUI. PIPE DIA. (IN)	PIPE TYPE	NON-CIRCULAR PIPE COVER HEIGHTS IN FEET									
		2	3	4	5	6	7	8	9	10	2			3	4	5	6	7	8	9	10	2	3			4	5	6	7	8	9	10			
15	2 7/8" x 1/2" CSPA (1) 2 7/8" x 1/2" CAPA	16 GA. 16 GA.										30	SRSA (1) SRAA RCHEP (2)	16 GA. 16 GA. 14 GA.										48	SRSA (1) SRAA RCHEP (2)	12 GA. 10 GA. 14 GA. 12 GA.									
21	2 7/8" x 1/2" CSPA (1) 2 7/8" x 1/2" CAPA SRSA (1) SRAA	16 GA. 16 GA. 16 GA. 16 GA.										54	SRSA (1) SRAA RCHEP (2)	10 GA. 14 GA. 14 GA. 12 GA.																					
																								24	2 7/8" x 1/2" CSPA (1) 2 7/8" x 1/2" CAPA SRSA (1) SRAA RCHEP (2)	16 GA. 14 GA. 16 GA. 14 GA.									

LEGEND

CSPA: CORRUGATED STEEL PIPE ARCH (ANNULAR CORR.)
 CAPA: CORRUGATED ALUMINUM ALLOY PIPE ARCH (ANNULAR CORR.)
 SRSA: SPIRAL RIB STEEL ARCH
 SRAA: SPIRAL RIB ALUMINUM ARCH
 RCHEP: REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE

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"x1" OR 5"x1"
 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 CURRENT STANDARD DRAWING RDI-016 FOR NON-CIRCULAR PIPE ALTERNATES.
 11. SEE CURRENT STANDARD DRAWING RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.

⑫ 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 RCHEP COVER HEIGHT AND BEDDING REQUIREMENTS."

15" PIPE - 60" PIPE
NON-CIRCULAR

KENTUCKY
DEPARTMENT OF HIGHWAYS
CULVERT, ENTRANCE &
STORM SEWER PIPE TYPES
& COVER HEIGHTS

5-12-05
DATE

SHEET 1 OF 2

EQUI. PIPE DIA. (IN)	PIPE TYPE	NON-CIRCULAR PIPE COVER HEIGHTS IN FEET (4)										EQUI. PIPE DIA. (IN)	PIPE TYPE	NON-CIRCULAR PIPE COVER HEIGHTS IN FEET (4)																
		2	3	4	5	6	7	8	9	10	2			3	4	5	6	7	8	9	10									
66	(3) CSPA (1)	14 GA.								84	(3) CSPA (1)	12 GA.								102	(3) CSPA (1)	12 GA.								
	6"x2" CSPA (1)	12 GA.										(3) CSPA (1)										12 GA.								
	3"x1" CAPA	14 GA.																				(3) CSPA (1)								12 GA.
	RCHEP (11)	12 GA.																												(3) CSPA (1)
72	(3) CSPA (1)	14 GA.	90	(3) CSPA (1)	12 GA.								108	(3) CSPA (1)	10 GA.															
	6"x2" CSPA (1)	12 GA.			(3) CSPA (1)										12 GA.															
	3"x1" CAPA	12 GA.													(3) CSPA (1)								12 GA.							
	RCHEP (11)	12 GA.																					(3) CSPA (1)	12 GA.						
78	(3) CSPA (1)	12 GA.	96	(3) CSPA (1)		12 GA.								114		(3) CSPA (1)	10 GA.													
	6"x2" CSPA (1)	12 GA.			(3) CSPA (1)	12 GA.																								
	3"x1" CAPA	12 GA.				(3) CSPA (1)									12 GA.															
	RCHEP (11)	12 GA.													(3) CSPA (1)		12 GA.													
	(3) CSPA (1)	12 GA.	120	(3) CSPA (1)			12 GA.									120	(3) CSPA (1)	12 GA.												
	6"x2" CSPA (1)	12 GA.			(3) CSPA (1)		12 GA.																							
	3"x1" CAPA	12 GA.				(3) CSPA (1)	12 GA.																							
	RCHEP (11)	12 GA.					(3) CSPA (1)								12 GA.															

- 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
- 66" PIPE - 120" PIPE
 NON-CIRCULAR
- SEE CURRENT STANDARD DRAWING RDI-011 FOR EXPLANATION OF COVER HEIGHTS LESS THAN 2 FEET.
- CSPA AND CAPA ARE SHOWN IN GAGE.
- MAXIMUM COVER HEIGHT FROM TOP OF PIPE TO SUBGRADE ELEVATION SHALL GOVERN GAGE OF PIPE TO BE USED FOR ENTIRE LENGTH OF PIPE INSTALLATION.
- MAXIMUM COVER HEIGHT FOR NON-CIRCULAR PIPE IS 10 FEET. NON-CIRCULAR PIPE SHALL ONLY BE USED WHERE COVER LIMITATIONS EXIST.
- NON-CIRCULAR CMP HAVING AN EQUIVALENT ROUND DIAMETER GREATER THAN 84" SHALL BE SUPPLIED AS STRUCTURAL PLATE.
- SEE CURRENT STANDARD DRAWING RDI-016 FOR NON-CIRCULAR PIPE ALTERNATES.
- SEE CURRENT STANDARD DRAWING RDI-035 FOR COATINGS, LININGS AND PAVINGS FOR NON-STRUCTURAL PIPE.

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 RCHEP COVER HEIGHT AND BEDDING REQUIREMENTS."

KENTUCKY
 DEPARTMENT OF HIGHWAYS
 CULVERT &
 STORM SEWER PIPE TYPES
 & COVER HEIGHTS

5-12-05
 DATE

EQUIVALENT CIRCULAR PIPE DIAMETER	2 2/3" x 1/2" CSPA & CAPA		① CSPA AND 3" x 1" CAPA		6" x 2" CSPA		9" x 2 1/2" CAPAASB		RCHEP	
	SPAN (INCH)	RISE (INCH)	SPAN (INCH)	RISE (INCH)	SPAN (INCH)	RISE (INCH)	SPAN (INCH)	RISE (INCH)	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							68	43
60"	71	47							76	48
66"									83	53
72"									91	58
78"									98	63
84"									106	68
90"									113	72
96"									121	77
102"									128	82
108"									136	87
114"									143	92
120"									151	97

CHART KEY

- 2 2/3" x 1/2" CSPA: CORRUGATED STEEL PIPE ARCH
- 3" x 1" OR 5" x 1" CSPA: CORRUGATED STEEL PIPE ARCH
- 6" x 2" CSPA: CORRUGATED STEEL PIPE ARCH
- 2 2/3" x 1/2" CAPA: CORRUGATED ALUMINUM ALLOY PIPE ARCH
- 3" x 1" CAPA: CORRUGATED ALUMINUM ALLOY PIPE ARCH
- 9" x 2 1/2" CAPAASB: CORRUGATED ALUMINUM ALLOY PIPE ARCH WITH ALUMINUM OR STEEL BOLTS
- RCHEP: REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE

NOTES

- ① 3" x 1" OR 5" x 1"

KENTUCKY DEPARTMENT OF HIGHWAYS
NON-CIRCULAR PIPE ALTERNATES
SUBMITTED: 5-12-05 <small>KENTUCKY HIGHWAY DESIGN DATE</small>

**Supplemental Specifications to The Standard Specifications
for Road and Bridge Construction, 2004 Edition**

SUBSECTION: 701.02.05 Backfill Materials. PART: A) Granular Backfill. NUMBER: 1) REVISION: Remove "A2" from the list of acceptable materials.
SUBSECTION: 701.03.03 Pipe Bedding. REVISION: Replace with the following: 701.03.03 Pipe Bedding. A) Reinforced Concrete Pipe. Construct bedding according to the Standard Drawings and this section. 1) Type 1 Installation. When working on a rock foundation, place bedding to a depth of 6 inches or equal to $B_c/12$, the pipe diameter in inches divided by 12, whichever is greater. For all other foundations, place a minimum of 4 inches of bedding. Shape the bedding to conform to the invert shape throughout the entire width and length of the proposed structure. Compact the bedding, but leave the center third of the pipe diameter ($B_c/3$) uncompacted. Place and compact additional bedding material in lifts 6 inches or less to an elevation of 0.30 the culvert diameter. 2) Type 4 Installation. When working on a rock foundation, place bedding to a depth of 6 inches or equal to $B_c/12$, the pipe diameter in inches divided by 12, whichever is greater. For all other foundations, place a minimum of 4 inches of bedding. B) Corrugated Metal, Thermoplastic, and Structural Plate Pipe. Place and compact bedding to provide 4 inches of bedding below the outside invert of the pipe after shaping. Shape the bedding to conform to the invert shape throughout the entire width and length of the proposed structure. Place and compact additional bedding material in lifts 6 inches or less to an elevation of 0.30 the culvert diameter.
SUBSECTION: 701.03.06 Initial Backfill. PART: A) Reinforced Concrete REVISION: Replace with the following: A) Reinforced Concrete Pipe. 1) Type 1 Installation. When the top of the pipe is not within one pipe diameter of the subgrade, backfill with granular backfill, additional bedding material, or flowable fill from the top of the bedding to an elevation equal to $1/2$ the pipe diameter, and either granular backfill, flowable fill, or embankment material in 6-inch lifts to an elevation of one-foot above the pipe. 2) Type 4 Installation. Backfill from the top of the bedding with granular backfill, flowable fill, or embankment material in 6-inch lifts to an elevation of one-foot above the pipe. The Department will allow Type 4 installations for median drains and pipe installations located 35 feet or more from the edge of shoulder, back of curb, or any paved surface.