

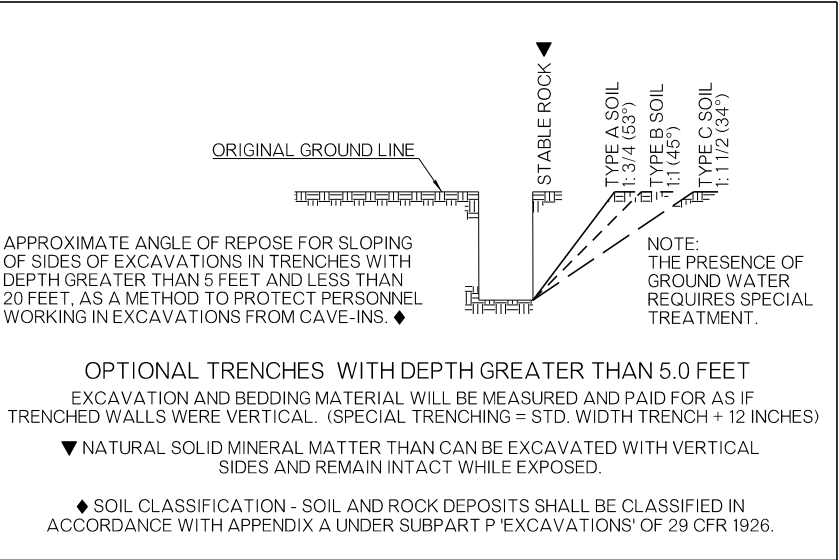
REINFORCED CONCRETE ARCH PIPE				
EQUIV. DIA.	CLASS A-III		MINIMUM COVER	MAXIMUM COVER
	SPAN	RISE		
INCHES	INCHES		INCHES	FEET
18	22	13	12	10
24	28	18	12	10
30	36	22	12	10
36	43	26	12	10
42	51	31	12	10
48	58	36	12	10
54	65	40	12	10
60	73	45	12	10
66			12	10
72	88	54	12	10
78			12	10
84	102	62	12	10
90	115	72	12	10
96	122	77	12	10

REINF. CONC. HORIZONTAL ELLIPTICAL PIPE				
EQUIV. DIA.	CLASS HE-III		MINIMUM COVER	MAXIMUM COVER
	RISE	SPAN		
INCHES	INCHES		INCHES	FEET
18	14	23	12	10
24	19	30	12	10
30	24	38	12	10
36	29	45	12	10
42	34	53	12	10
48	38	60	12	10
54	43	68	12	10
60	48	76	12	10
66	53	83	12	10
72	58	91	12	10
78	63	98	12	10
84	68	106	12	10

CONCRETE ROUND PIPE CULVERT									
PIPE DIAMETER	FILL HEIGHT AND PIPE CLASS TABLE								
	MINIMUM COVER INCHES	EMBANKMENT				TRENCH			
		CLASS II	CLASS III	CLASS IV	CLASS V	CLASS II	CLASS III	CLASS IV	CLASS V
INCHES		MAXIMUM FILL HEIGHT ABOVE TOP OF PIPE IN FEET							
12	12	10	14	20	30	18	50	●	●
18	12	10	14	20	30	20	50	●	●
24	12	10	14	20	30	12	20	40	●
30	12	10	14	20	30	12	20	50	●
36	12	10	14	20	30	10	14	30	50
42	12	10	14	20	30	10	16	30	50
48	12	10	14	20	30	10	16	30	50
54	12	10	14	20	30	10	16	30	50
60	12	12	16	20	30	10	14	25	50
66	12	12	16	20	30	10	14	25	50
72	12	12	16	20	35	10	14	25	50
78	12	12	16	20	35	10	16	25	50
84	12	12	16	20	35	10	16	25	50
90	12	12	16	20	35	12	16	25	50
96	12	12	16	20	35	12	16	25	50
108	12	12	16	20	35	12	16	25	50

● SPECIAL DESIGN PIPE. DESIGN METHOD TO CONFORM TO CURRENT AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS.

CONCRETE PIPE FABRICATION SPECIFICATIONS			PIPE DESCRIPTIONS
SHAPE OF CONCRETE PIPE	AASHTO	ASTM	
CONCRETE ROUND PIPE	M 170	C 76	SIZE IS DENOTED AS SPAN x RISE, BOTH IN INCHES
CONCRETE ARCH PIPE	M 206	C 506	
CONCRETE HORIZONTAL ELLIPTICAL PIPE	M 207	C 507	SPAN, THE LONGEST DIMENSION, IS ORIENTED
			HORIZONTALLY WHILE THE RISE IS ORIENTED
			VERTICALLY. DENOTED AS RISE x SPAN, BOTH IN
			INCHES



- ▣ SPECIFY DIAMETER OF PIPE.
- ▣ SPECIFY CLASS OF PIPE.
- ▣ SPECIFY SPAN AND RISE OF ARCH PIPE.
- ▣ SPECIFY RISE AND SPAN OF ELLIPTICAL PIPE.
- ▲ SPECIFY DIAMETER OF STEEL CASING.
- SPECIFY DIAMETER OF CLASS V CONC. PIPE.

GENERAL NOTES

- ALL CONSTRUCTION AND MATERIALS REQUIREMENTS SHALL BE IN ACCORDANCE WITH THE 2019 ODOT STANDARD SPECIFICATIONS.
- TRENCH EXCAVATION AND BEDDING MATERIAL WILL NOT BE REQUIRED FOR PIPE INSTALLATIONS OF SIDE DRAINS UNLESS OTHERWISE NOTED ON THE PLANS.
- NORMAL BACKFILLING OPERATIONS SHALL FOLLOW BEDDING PIPE INSTALLATION AS CLOSELY AS PRACTICAL. IN NO CASE SHALL A PIPE INSTALLATION SUBJECT TO SUDDEN FLOW DEVELOPMENT BE LEFT WITHOUT SUFFICIENT BACKFILL TO RESTRAIN THE CONDUIT AND PREVENT JOINT SEPARATION AND/OR PIPING SCOUR. PHYSICALLY RESTRAINING THE CONDUIT MAY BE USED TO AUGMENT OR REPLACE THIS IMMEDIATE BACKFILL REQUIREMENT.
- ANY EXCESS EXCAVATION NOT USED FOR BACKFILL WILL BECOME THE PROPERTY OF, AND DISPOSED OF BY THE CONTRACTOR IN A MANNER APPROVED BY THE ENGINEER.
- STANDARD BEDDING QUANTITIES FOR ROUND PIPE ARE BASED ON AASHTO SPECIFICATION M-170 DESIGNATED CLASS III (WALL B) REINFORCED CONCRETE PIPE.
- 3 INCHES OF BEDDING MATERIAL BELOW PIPE CONDUIT IS REQUIRED FOR A PROPER FOUNDATION. IF THE FOUNDATION IS ROCKY, THEN 6 INCHES OF BEDDING MATERIAL IS REQUIRED.
- MULTIPLE PIPE CULVERTS SHALL BE INSTALLED WITH A MINIMUM CLEARANCE BETWEEN PIPES OF ½ D OR 12 INCHES, WHICHEVER IS GREATER, BUT NOT TO EXCEED 36 INCHES.
- CLASS I AND II REINFORCED CONCRETE PIPE SHALL ONLY BE USED FOR SEWERS IN TRENCHES OUTSIDE ROADBED AND STREET LIMITS.
- FOR COMPUTING TRENCH EXCAVATION AND STANDARD BEDDING QUANTITIES, THE LENGTH OF THE CULVERT SHALL INCLUDE THE END SECTION AND END TREATMENT LENGTHS. COST OF TRENCH EXCAVATION AND BEDDING SHALL BE PAID FOR SEPARATELY FOR CROSS DRAINS ONLY. FOR SIDE DRAINS, THE COST OF BOTH ITEMS SHALL BE INCLUDED IN COST OF CULVERT.
- WHEN EITHER GROUND WATER OR SURFACE RUN-OFF IS ENCOUNTERED, THE CONTRACTOR SHALL FURNISH, INSTALL, MAINTAIN, AND OPERATE ALL NECESSARY PUMPS, MATERIALS AND EQUIPMENT TO KEEP EXCAVATION REASONABLY FREE FROM WATER UNTIL THE LAYING AND JOINTING OF THE PIPE, POURING OF CONCRETE AND PLACING OF BEDDING MATERIAL HAS BEEN COMPLETED, INSPECTED AND APPROVED AND ALL DANGER OF FLOTATION AND OTHER DAMAGE IS REMOVED.
- TYPICAL CLASS OF REINFORCED CONCRETE ARCH PIPE SHALL BE CLASS A-III. AND TYPICAL REINFORCED CONCRETE HORIZONTAL ELLIPTICAL PIPE SHALL BE CLASS HE-III. STANDARD BEDDING MATERIAL QUANTITIES ARE BASED ON THESE PIPE CLASSES.
- PROPER INSTALLATION PRACTICE MUST BE ADHERED TO AS SHOWN ON ROADWAY STANDARD PBB-1.
- IN THE EVENT LOADS IN EXCESS OF HL-93 ARE TO BE OPERATED OVER OR ADJACENT TO THE PIPE INSTALLATION DURING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE AND MAINTAIN A MINIMUM OF 3 FEET OF COVER OVER THE PIPE AT WHEEL OR TRUCK PATHS.
- HAUNCH AREA, AND BEDDING LAYER UNDER PIPE SHALL BE CLASS B OR CLASS C BEDDING. BACKFILL FROM SPRINGLINE TO TOP OF GROUND SHALL BE NATIVE SOIL, SEE ROADWAY STANDARD PBB-1.
- CLASS V CONCRETE PIPE SHALL BE USED IN PIPE JACKING OPERATIONS, TYPICALLY WITHOUT THE CASING. COST OF ALL MATERIALS AND LABOR ASSOCIATED WITH JACKING OPERATIONS WITHOUT CASING SHALL BE PAID FOR AS 613(W) JACKED CONDUIT, IN UNITS OF LINEAR FEET. TYPICALLY, THE POTABLE WATER AND SANITARY SEWER PIPES ARE CASED. CASING SHALL BE PAID FOR AS 613(U) BORE AND JACK STEEL CASING. WATER AND SANITARY SEWER PIPES ARE PAID FOR SEPARATELY WITH UNITS OF LINEAR FEET.

BASIS OF PAYMENT		
ITEM NO.	ITEM	UNIT
613 (A)	▣ R.C. PIPE CLASS ▣	LF
613 (A)	▣ R.C. PIPE ARCH CLASS A-111	LF
613 (A)	▣ R.C. PIPE ELL. CLASS HE-111	LF
613 (R)	STANDARD BEDDING MATERIAL, CLASS A	CY
613 (S)	STANDARD BEDDING MATERIAL, CLASS B	CY
613 (T)	STANDARD BEDDING MATERIAL, CLASS C	CY
613 (U)	BORE AND JACK ▲ STEEL CASING	LF
613 (V)	TRENCH EXCAVATION	CY
613 (W)	● JACKED CONDUIT	LF

APPROVED BY
ROADWAY ENGINEER:  DATE: 12/20/2024

ROADWAY DESIGN DIVISION STANDARD

CONCRETE CULVERT INSTALLATION
(2 OF 2 SHEETS)



2019 SPECIFICATIONS

CCI-2

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R-58