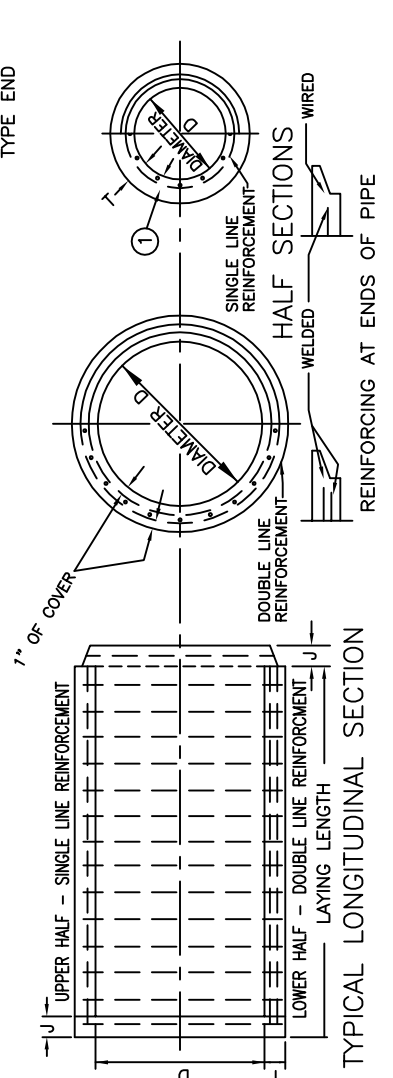


INTERNAL DIAMETER OF PIPE, INCHES	GROSS SECTION WATER AREA	WEIGHT PER LIN. FT. OF PIPE	MINIMUM WALL THICKNESS	JOINT LENGTH OF NOMINAL-A	CLASS I				CLASS II		CLASS III		CLASS IV		CLASS V						
					D1				D-LOAD TO PRODUCE A 0.01 INCH CRACK		D-LOAD TO PRODUCE ULTIMATE LOAD		D-LOAD TO PRODUCE ULTIMATE LOAD		D-LOAD TO PRODUCE ULTIMATE LOAD		D-LOAD TO PRODUCE ULTIMATE LOAD				
					INCHES				1000	1500	2000	3000	4000	5000	6000	7500	1000	1500	2000	3000	4000
D	T	J	D1	D2	D3	D4	CONCRETE 4000 psi. MINIMUM REINFORCEMENT SQUARE INCHES PER LINEAR FOOT OF PIPE BARREL	CONCRETE 4000 psi. INNER CAGE OUTER CAGE	CONCRETE 4000 psi. INNER CAGE OUTER CAGE	CONCRETE 4000 psi. INNER CAGE OUTER CAGE	CONCRETE 4000 psi. INNER CAGE OUTER CAGE	CONCRETE 4000 psi. INNER CAGE OUTER CAGE	CONCRETE 4000 psi. INNER CAGE OUTER CAGE	CONCRETE 4000 psi. INNER CAGE OUTER CAGE	CONCRETE 4000 psi. INNER CAGE OUTER CAGE	CONCRETE 4000 psi. INNER CAGE OUTER CAGE	CONCRETE 4000 psi. INNER CAGE OUTER CAGE	CONCRETE 4000 psi. INNER CAGE OUTER CAGE	CONCRETE 4000 psi. INNER CAGE OUTER CAGE	CONCRETE 4000 psi. INNER CAGE OUTER CAGE	
12	0.79	92	2	1 3/4	3/16	13 1/4	13 5/8	13 7/8	14 1/4	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.10
15	1.23	127	2 1/4	2	"	16 1/2	16 7/8	17 1/4	17 5/8	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.14
18	1.77	168	2 1/2	2 1/4	"	19 5/8	20	20 3/8	20 3/4	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.19
21	2.40	214	2 3/4	2 1/2	"	22 7/8	23 1/4	23 3/4	24 1/8	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.24
24	3.14	265	3	2 3/4	"	26	26 3/8	27	27 3/8	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.07	0.24
27	3.98	322	3 1/4	3	"	29 1/4	29 5/8	30 1/4	30 5/8	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.13	0.38
30	4.91	384	3 1/2	3 1/4	"	32 3/8	32 3/4	33 1/2	33 7/8	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.14	0.31
33	5.94	452	3 3/4	3 1/2	1 1/4	35 1/2	36	36 3/4	37 1/4	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.35
36	7.07	524	4	3 3/4	"	38 3/4	39 1/4	40	40 1/2	0.12	0.09	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.12	0.38
42	9.52	685	4 1/2	4	"	45 1/8	45 5/8	46 1/2	47	0.15	0.12	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.15	0.45
48	12.57	867	5	4 1/4	"	51 1/2	52	53	53 1/2	0.18	0.14	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.18	0.55
54	15.90	1070	5 1/2	4 1/2	"	57 7/8	58 3/8	59 3/8	59 7/8	0.22	0.16	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.22	0.55
60	19.63	1296	6	5	"	64 1/4	64 3/4	66	66 1/2	0.21	0.16	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.21	0.55
66	23.76	1542	6 1/2	5 1/2	"	70 3/8	71 1/8	72 1/2	73	0.25	0.19	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.55
72	28.27	1810	7	6	"	77	77 1/2	79	79 1/2	0.29	0.22	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.29	0.60
78	33.18	2098	7 1/2	6 1/2	"	83 3/8	83 7/8	85 5/8	86 7/8	0.32	0.24	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.32	0.60
84	38.48	2410	8	7	"	89 3/4	90 1/4	92 1/8	92 3/8	0.37	0.28	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.37	0.60
90	42.18	2740	8 1/2	7	"	95 3/4	96 1/4	98 1/8	98 5/8	0.41	0.31	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.60
96	50.27	2950	9	7	"	102 1/8	102 5/8	104 1/2	105	0.46	0.35	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.46	0.60
102	56.75	3075	9 1/2	7 1/2	"	109	109 1/2	111 1/2	112	0.54	0.41	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.54	0.60
108	63.62	3870	10	7 1/2	"	115 1/2	116	118	118 1/2	0.61	0.46	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.61	0.60

TOLERANCES IN DIMENSIONS:

- D: ± 1.5% FOR 12" TO 24", ±1% OR 3/8" WHICHEVER IS GREATER FOR 27" TO 108"D
- D1, D2, D3 & D4: ±3/16" FOR 12" TO 30"D, ±1/4" FOR 33" TO 108"D
- T: NOT LESS THAN THE DESIGN T BY MORE THAN 5% OR 3/16" WHICHEVER IS GREATER.
- J: ALL SIZES ±1/4"

LAYING LENGTH: SHALL NOT UNDERRUN BY MORE THAN 1/2"



NOTES:
 STANDARD PLATE 3006. GASKET JOINT R.C. PIPE MAY BE FURNISHED IN LIEU OF 3000 PIPE. THE GASKET REQUIRED FOR 3006 PIPE WILL NOT BE REQUIRED; HOWEVER, THE APPROPRIATE PROVISIONS OF THE SPECIFICATIONS RELATING TO FILLING THE JOINT SPACE WITH AN APPROVED SEALER OR FULL CIRCUMFERENTIAL WRAP OF GEOTEXTILE MATERIAL SHALL APPLY.

SEE SHEET 2 OF 4 FOR REINFORCEMENT INFORMATION AND GENERAL NOTES.

35 TO 50% T EXCEPT WHEN WALL THICKNESS IS LESS THAN 2-1/2" THEN 3/4" OF COVER.

APPROVED Dec. 18, 1984
R.H. Sullivan
 Assistant Division Director
 Technical Services

STATE OF MINNESOTA
 DEPARTMENT OF TRANSPORTATION
REINFORCED CONCRETE PIPE
 DIMENSIONS

SPECIFICATION REFERENCE	2501	STANDARD PLATE NO.	3000K
	2502		
	2503		
		Sheet 1 of 3	

REINFORCEMENT:

Reinforcing steel shall conform to the requirements AASHTO M170

If the splices are not welded, circumferential reinforcement shall be lapped not less than 20 diameters for deformed bars and deformed cold-worked wire, and 40 diameters for plain bars and cold-drawn wire. In addition, where lapped cages of welded-wire fabric are used without welding, the lap shall contain a longitudinal wire. All circular and longitudinal reinforcement shall be assembled and securely fastened cage fashion so as to maintain reinforcement in exact shape and correct position within the form.

Reinforcement will be considered as meeting the design requirements if the area, computed on the basis of nominal area of the wire or bars used, equals or exceeds the above requirement. Actual area of the reinforcing used may vary from the nominal area according to permissible variations of the standard specifications for the reinforcing.

The cover over the circumferential steel shall be as shown on this plate but in no case shall the cover be less than 1/2 in. as measured to the inside wall surface or the outside wall surface, except in the tongue and groove. Reinforcing steel may be omitted from either the tongue or groove of 12" thru 33" D plain round pipe only.

The spacing center to center of adjacent rings of circumferential reinforcement in a cage shall not exceed 4 in. (100mm) for pipe up to and including pipe having a 4 in. (100mm) wall thickness nor exceed the wall thickness for larger pipe, and shall in no case exceed 6 in. (152mm). The continuity of the circumferential reinforcing steel shall not be destroyed during the manufacture of the pipe.

GENERAL NOTES:

The strength test requirements in pounds per lineal foot of pipe under the three edge bearing method shall be computed by multiplying the internal diameter of the pipe in feet by the D-loads to produce the 0.01 inch crack and the ultimate load as specified above.

Not more than two lift holes will be permitted in each section of pipe. Tapered plugs shall be furnished for closing lift holes.

T and Y sections shall conform to the pertinent requirements of Std. Plate 4008 for pipe riser sections with a single line of reinforcing, and to Std. Plate 4009 for pipe riser sections with two lines of reinforcing.

LAYING LENGTH:

The nominal laying length of all pipe shall not be less than 6 feet, except that not more than two 4 ft. lengths of pipe will be permitted in a line of pipe to make the required total length. For all diameters of pipe one section of any odd length greater than 4 feet will be permitted in each line or reach of pipe to make the required total length. Pipe sections shorter than the nominal laying length shall be installed near the middle of the line or as directed by the Engineer.

BASIS FOR DESIGN: AASHTO M170

<p>APPROVED <u>Dec. 18, 1984</u></p> <p>R.H. Sullivan</p> <p>Assistant Division Director Technical Services</p>	<p>STATE OF MINNESOTA DEPARTMENT OF TRANSPORTATION</p> <p>REINFORCED CONCRETE PIPE</p> <p>REINFORCEMENT INFORMATION AND GENERAL NOTES</p>	<p>SPECIFICATION REFERENCE</p> <p>2501 2502 2503</p>	<p>STANDARD PLATE NO.</p> <p>3000K</p> <p>Sheet 2 of 3</p>
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INTERNAL DIAM. OF PIPE, INCHES	APPROX. WT. OF PIPE PER LIN. FT.	WALL THICKNESS	Class II		Class III		Class III-1		Class IV		Class IV-1		Class V	
			D—Load to produce a 0.01 inch crack											
			1000		1350		1700		2000		2500		3000	
			D—Load to produce Ultimate Load											
			1500		2000		2500		3000		3375		3750	
			Conc. 4000 psi		Conc. 4000 psi		Conc. 4000 psi		Conc. 4000 psi		Conc. 4000 psi		Conc. 6000 psi	
			Minimum reinforcement square inches per linear foot of pipe barrel											
D		D	Inner Cage	Outer Cage	Inner Cage	Outer Cage	Inner Cage	Outer Cage	Inner Cage	Outer Cage	Inner Cage	Outer Cage	Inner Cage	Outer Cage
12	140	2-3/4												0.08*
15	180	3												0.08*
18	230	3-1/4												0.10*
21	280	3-1/2									0.07	0.07		0.10*
24	340	3-3/4							0.07	0.07	0.09	0.07		0.12 0.09
27	410	4							0.08	0.07	0.11	0.09		0.14 0.11
30	480	4-1/4					0.07	0.07	0.09	0.07	0.14	0.11		0.18 0.14
33	510	4-1/2					0.08	0.07	0.11	0.08	0.17	0.13		0.23 0.17
36	630	4-3/4	0.07	0.07	0.08	0.07	0.11	0.08	0.14	0.10	0.21	0.16		0.27 0.20
42	810	5-1/4	0.10	0.08	0.12	0.08	0.16	0.12	0.20	0.15	0.28	0.21		0.36 0.27
48	1010	5-3/4	0.14	0.11	0.16	0.12	0.21	0.16	0.26	0.20	0.37	0.28		0.47 0.35
54	1230	6-1/4	0.17	0.13	0.21	0.16	0.28	0.21	0.34	0.26	0.46	0.35		0.58 0.43
											Conc. 5000 psi			
60	1470	6-3/4	0.22	0.17	0.25	0.19	0.33	0.25	0.41	0.31	0.56	0.42		0.70 0.53
66	1740	7-1/4	0.25	0.19	0.31	0.23	0.41	0.31	0.51	0.39	0.68	0.51		0.84 0.63
									Conc. 5000 psi					
72	2010	7-3/4	0.30	0.23	0.36	0.27	0.50	0.38	0.61	0.46	0.80	0.60		0.99 0.74
							Conc. 5000 psi							
78	2330	8-1/4	0.35	0.26	0.42	0.32	0.59	0.45	0.71	0.53				
84	2640	8-3/4	0.41	0.31	0.50	0.38	0.70	0.53	0.85	0.63				
					Conc. 5000 psi									
90	3000	9-1/4	0.48	0.36	0.59	0.45	0.82	0.62						
96	3370	9-3/4	0.55	0.41	0.70	0.53	0.96	0.72						
			Conc. 5000 psi											
102	3760	10-1/4	0.62	0.47	0.83	0.62								
108	4170	10-3/4	0.70	0.53	0.99	0.74								

*Single Line Reinforcement

See Std. Plate 3000 (1 of 2) for additional requirements.

APPROVED Dec. 18, 1984

R.H. Sullivan

Assistant Division Director
Technical Services

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE PIPE—WALL C

SPECIFICATION
REFERENCE

2501
2503

STANDARD
PLATE
NO.

3000K

Sheet 3 of 3