



CROSS SECTION FOR
SPECIAL DESIGN PIPES

NOTES:

SEE SHEET 1 FOR INNER AND OUTER CAGE REINFORCEMENT.

$A_1 + A_2 =$ TOTAL INNER CAGE REINFORCEMENT.

$A_3 + A_4 =$ TOTAL OUTER CAGE REINFORCEMENT.

POINT OR INDENT LEGIBLE MARKS AT ONE END OF EACH SECTION ON THE INSIDE AND OUTSIDE OF OPPOSITE WALLS DESIGNATING THE CENTER OF STIRRUP REINFORCEMENT.

THE TOP OF THE PIPE SHALL BE APPROPRIATELY MARKED OR STENCILED BOTH ON THE INSIDE AND OUTSIDE SURFACES.

① THE CAGES MUST BE ASSEMBLED WITH THE OUTER MAT OVERLAPPING THE INNER MAT BY A DISTANCE EQUAL TO ONE PIPE WALL THICKNESS OR GREATER.

A_1 = REINFORCING OF FULL CIRCULAR INNER CAGE.

A_2 = REINFORCING OF INNER LAP SECTION, 90° MINIMUM ARC.

A_3 = REINFORCING OF FULL CIRCULAR OUTER CAGE.

A_4 = REINFORCING OF OUTER LAP SECTION, 90° MINIMUM ARC.

A_r = MINIMUM RADIAL REINFORCING REQUIRED IN SQUARE INCHES PER SQUARE FOOT OF PIPE OVER A MINIMUM 90° ARC AT TOP AND BOTTOM OF PIPE. HOOK DESIGN MUST BE APPROVED BY MATERIALS SECTION.

THE FULL CIRCULAR CAGES MUST HAVE AN AREA EQUAL TO AT LEAST 40% OF THE REQUIRED TOTAL AREA.

L = LENGTH OF 90° ARC MEASURED AT INNER CAGE.

N = MINIMUM NUMBER OF ROWS OF RADIAL REINFORCING AT TOP AND BOTTOM OF PIPE.

S = MAXIMUM CIRCUMFERENTIAL SPACING OF ROWS OR RADIAL REINFORCING AT OUTER CAGE.

INTERNAL DIA. OF PIPE	LENGTH OF 90° ARC	WALL THICKNESS	SHEAR STEEL					
			CLASS IV			CLASS V		
			N	S	A_r	N	S	A_r
D	L	T						
54"	44"	5-1/2"	—	—	—	12	4"	0.22
60"	49"	6"	—	—	—	10	6"	0.22
66"	54"	6-1/2"	—	—	—	10	6"	0.22
72"	59"	7"	—	—	—	11	6"	0.23
78"	63"	7-1/2"	12	6"	0.25	12	6"	0.25
84"	68"	8"	13	6"	0.28	13	6"	0.28
90"	73"	8-1/2"	13	6"	0.31	13	6"	0.31
96"	77"	9"	14	6"	0.34	14	6"	0.34
102"	82"	9-1/2"	15	6"	0.37	15	6"	0.37
108"	87"	10"	16	6"	0.40	16	6"	0.40

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R.H. Sullivan

Director

Materials, Research and Standards

STATE OF MINNESOTA
DEPARTMENT OF TRANSPORTATION

REINFORCED CONCRETE PIPE

REINFORCEMENT INFORMATION
SPECIAL DESIGN PIPES

SPECIFICATION
REFERENCE

2501
2502
2503

STANDARD
PLATE
NO.

3000L

4 OF 5