

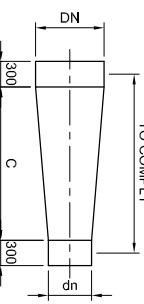
$$L1 = L + (\frac{\theta}{2}) \tan \frac{\theta}{4}$$

$$L2 = L - (\frac{\theta}{2}) \tan \frac{\theta}{4}$$

UP TO 30° BEND

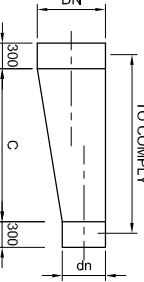
M.S. BENDS (NOMINAL DIA.)	OUTER DIA. (mm)	R (mm)	L (mm)
100	121.9	200	200
150	177.3	275	300
200	232.2	300	300
250	286.0	375	375
300	345.4	450	450
350	399.3	600	600
400	453.1	750	750
450	507.0	900	900
500	560.9	1050	1050
600	667.0	1200	1200
700	754.0	1350	1350
800	804.0	1500	1500
954	954.0	1700	1700
1050	1054.0	1800	1800
1150	1107.0	1900	1900
1200	1219.0	2000	2000
1400	1472.0	2100	2100
1800	1876.0	2200	2200
2050	2138.0	-	-
2200	2290.0	-	-

ENDS SUITABLE FOR WELDED COLLAR JOINTS OR FLANGE END TO COMPLY

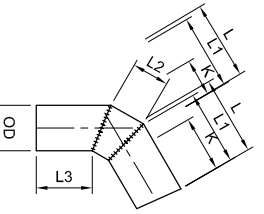


**CONCENTRIC TAPER**  
\*PLATE THICKNESS FOR SECTION C SHALL BE THE SAME AS DN PLATE THICKNESS

ENDS SUITABLE FOR WELDED COLLAR JOINTS OR FLANGE END TO COMPLY



\*PLATE THICKNESS FOR SECTION C SHALL BE THE SAME AS DN PLATE THICKNESS



$$K = L - R \tan \frac{\theta}{4}$$

$$L1 = K + (R + \frac{\theta}{2}) \tan \frac{\theta}{4}$$

$$L2 = (2R + \theta) \tan \frac{\theta}{4}$$

$$L3 = K + (R - \frac{\theta}{2}) \tan \frac{\theta}{4}$$

$$L4 = (2R - \theta) \tan \frac{\theta}{4}$$

OVER 30° TO 60° BEND

M.S. BENDS (NOMINAL DIA.)	OUTER DIA. (mm)	R (mm)	L (mm)
100	121.9	200	200
150	177.3	275	300
200	232.2	300	350
250	286.0	375	450
300	345.4	450	550
350	399.3	600	600
400	453.1	750	600
450	507.0	900	600
525	560.9	1050	650
600	667.0	1200	750
700	754.0	1350	850
800	804.0	1500	850
954	954.0	1700	850
1050	1054.0	1800	1100
1150	1107.0	1800	1200
1200	1219.0	1800	1200
1400	1472.0	2100	1300
1800	1876.0	2700	1500
2050	2138.0	3000	1600
2200	2290.0	3000	1700

OVER 60° TO 90° BEND

M.S. BENDS (NOMINAL DIA.)	OUTER DIA. (mm)	R (mm)	L (mm)
100	121.9	200	250
150	177.3	275	300
200	232.2	300	400
250	286.0	375	500
300	345.4	450	600
350	399.3	600	600
400	453.1	750	600
450	507.0	900	600
525	560.9	1050	650
600	667.0	1200	750
700	754.0	1350	850
800	804.0	1500	850
954	954.0	1700	850
1000	1054.0	1800	1100
1050	1107.0	1800	1100
1150	1219.0	1800	1200
1200	1270.0	1800	1200
1400	1472.0	2100	1300
1800	1876.0	2700	1500
2050	2138.0	3000	1600
2200	2290.0	3000	1700

M.S. BENDS (NOMINAL DIA.)	OUTER DIA. (mm)	R (mm)	L (mm)
100	121.9	200	350
150	177.3	275	350
200	232.2	300	400
250	286.0	375	500
300	345.4	450	500
350	399.3	600	700
400	453.1	750	800
450	507.0	900	850
500	560.9	1050	900
600	667.0	1200	1000
700	754.0	1350	1100
800	804.0	1500	1100
954	954.0	1700	1100
1050	1054.0	1800	1500
1100	1107.0	1800	1500
1200	1219.0	1800	1700
1200	1270.0	1800	1700
1400	1472.0	2100	1900
1800	1876.0	2700	2200
2050	2138.0	3000	2200
2200	2290.0	3000	2600

NOMINAL DIAMETER	FINISHED INTERNAL DIAMETER	OUTSIDE DIAMETER (mm)	THICKNESS OF STEEL PLATE (mm)	THICKNESS OF CONCRETE LINING (mm)
50	50.0	69.2	3.6	6.0
75	75.0	94.2	3.6	6.0
100	93.7	121.9	4.1	10.0
150	149.1	177.3	4.1	10.0
200	204.0	232.2	4.1	10.0
250	257.8	286.0	4.1	10.0
300	313.8	345.4	5.8	10.0
350	361.7	399.3	5.8	13.0
375*	388.4	428.0	5.8	13.0
400	415.5	453.1	5.8	13.0
450	469.4	507.0	5.8	13.0
525*	522.7	560.3	5.8	13.0
600	628.0	667.0	6.5	13.0
700	701.2	754.0	7.4	19.0
750	751.2	804.0	7.4	19.0
900	900	954	8.0	19.0
1000	1000	1054.0	8.0	19.0
1050	1050	1107.0	9.5	19.0
1150	1150	1219.0	9.5	23.0
1200	1200	1270.0	10	23.0
1300	1300	1372.0	11	25.0
1400	1400	1472.0	11	25.0
1800	1800	1876.0	13	25.0
2000	2000	2088.0	14	30.0
2050	2050	2138.0	14	30.0
2100	2100	2189.0	14.5	30.0
2200	2200	2290.0	15	40.0

\* OUTSIDE DIAMETER OF PIPE SIZE 375mm DIA. AND 525mm DIA. ARE BASED ON A.D. PIPE CLASS C

DESCRIPTION	OUTER DIA. (mm)	OUTER DIA. (DN)	LENGTH OF TAPER (C) mm
2200 x 2100mm	2290.0	2189.0	600
2200 x 2000mm	2290.0	2088.0	1200
2050 x 2000mm	2138.0	2088.0	600
2050 x 1800mm	2138.0	1876.0	1500
1400 x 1200mm	1472.0	1270.0	1200
1150 x 1000mm	1219.0	1054.0	900
1050 x 1000mm	1107.0	1054.0	600
750 x 700mm	751.2	701.2	600
750 x 450mm	304.0	507.0	600
600 x 525mm	667.0	560.3	450
600 x 450mm	667.0	507.0	900
450 x 375mm	507.0	428.0	450
450 x 150mm	507.0	177.3	1800
400 x 375mm	453.1	428.0	300
250 x 200mm	286.0	232.2	1500
250 x 150mm	286.0	177.3	600
200 x 150mm	232.2	177.3	300

TABLE FOR MILD STEEL TAPER

- NOTES:-
1. ALL DIMENSIONS ARE IN MILLIMETRE UNLESS OTHERWISE STATED.
  2. THICKNESS OF TAPER AND BENDS SEE SCHEDULE OF STEEL PIPES/ FITTINGS THICKNESS.
  3. FID REFERS TO FINISHED INTERNAL DIAMETER AFTER LINING.
  4. MS PIPE SPECIAL ARE DESIGN IN ACCORDANCE TO BS EN 534 : 1990
  5. ALL FLANGE ARE DESIGN TO PN 16 PRESSURE.



SURJAHANAWA PERKOHIDAYATAN AIR NEGARA  
Araa Borneo & Araa Selu  
Jalan Tanjong 6,  
Sungai Besi, Bkt 3510  
Selangor Darul Ehsan, Malaysia

PREPARED BY :

MINCONSULT SDN. BHD.  
No. 6, JALAN 514/223,  
48100 PETALING AJAY,  
SELANGOR DARUL EHSAN, MALAYSIA  
TEL: 03-75512722 / 79547373  
FAX: 03-75512725

DRAWING TITLE :

DETAILS OF MILD STEEL PIPES,  
BENDS AND TAPERS

DRAWING NO.:

SPANWS/STD/F/015