TYP. BARS FOR 4:1 STEEL PIPE ROUND INLET OR SIDE TAPERED INLET

PIPE	SKEW	BARS F		BARS FB		BARS FC		BARS WXL		BARS WXS		SERIES BARS WYL (2 REQ'D)					SERIES BARS WYS (2 REQ'D)					2 BARS WZL	2 BARS WZS	SERIES BARS WL (1 REQ'D)					SERIES BARS WS (1 REQ'D)					SERIES BARS WLA (1 REQ'D)					SERIES BARS WSA (1 REQ'D)				
		T.L.	N.R.	T.L.	N.R.	T.L.	N.R.	T.L.	N.R.	T.L.	N.R.	A	B	C	X	T.L.	A	B	C	X	T.L.			A	B	C	X	T.L.	A	B	C	X	T.L.	A	B	C	X	T.L.	A	B	C	X	T.L.
15"	45°	6'5"	4	3'3"	4	2'5"	11	6'6"	4	3'4"	4	3'2"	3'2"	0"	1	3'2"	1'9"	1'9"	0"	1	1'9"	8'2"	5'0"	2'4"	1'7"	1½"	7	18'5"	2'4"	1'7"	3"	4	10'6"	2'4"	1'7"	1½"	7	13'9"	2'4"	1'7"	3"	4	7'10"
	60°	4'8"	4	3'3"	4	2'5"	9	4'9"	4	3'3"	4	2'4"	2'4"	0"	1	2'4"	1'9"	1'9"	0"	1	1'9"	6'5"	5'0"	2'4"	1'7"	2¼"	5	13'2"	2'4"	1'7"	3"	4	10'6"	2'4"	1'7"	2¼"	5	9'10"	2'4"	1'7"	3"	4	7'10"
	75°	4'6"	4	3'5"	4	2'5"	9	4'7"	4	3'6"	4	2'4"	2'4"	0"	1	2'4"	2'0"	2'0"	0"	1	2'0"	6'3"	5'3"	2'4"	1'7"	2¼"	5	13'2"	2'4"	1'7"	3"	4	10'6"	2'4"	1'7"	2¼"	5	9'10"	2'4"	1'7"	3"	4	7'10"
	90°	4'0"	4	4'0"	4	2'5"	10	4'0"	4	4'0"	4	2'0"	2'0"	0"	1	2'0"	2'0"	2'0"	0"	1	2'0"	5'8"	5'8"	2'4"	1'7"	2¼"	5	13'2"	2'4"	1'7"	2¼"	5	13'2"	2'4"	1'7"	2¼"	5	9'10"	2'4"	1'7"	2¼"	5	9'10"
18"	45°	8'5"	4	4'3"	4	2'5"	14	8'6"	4	4'4"	4	4'3"	4'3"	0"	1	4'3"	2'2"	2'2"	0"	1	2'2"	10'2"	6'0"	2'7"	1'7"	1½"	9	24'9"	2'7"	1'7"	3"	5	13'9"	2'7"	1'7"	1½"	9	18'9"	2'7"	1'7"	3"	5	10'5"
	60°	6'1"	4	4'3"	4	2'5"	12	6'2"	4	4'4"	4	3'1"	3'1"	0"	1	3'1"	2'2"	2'2"	0"	1	2'2"	7'10"	6'0"	2'7"	1'7"	2"	7	19'3"	2'7"	1'7"	3"	5	13'9"	2'7"	1'7"	2"	7	14'7"	2'7"	1'7"	3"	5	10'5"
	75°	5'11"	4	4'6"	4	2'5"	12	6'0"	4	4'7"	4	3'0"	3'0"	0"	1	3'0"	2'3"	2'3"	0"	1	2'3"	7'8"	6'3"	2'7"	1'7"	2"	7	19'3"	2'7"	1'7"	3"	5	13'9"	2'7"	1'7"	2"	7	14'7"	2'7"	1'7"	3"	5	10'5"
	90°	5'3"	4	5'3"	4	2'5"	12	5'3"	4	5'3"	4	2'8"	2'8"	0"	1	2'8"	2'8"	2'8"	0"	1	2'8"	4'6"	8'11"	2'7"	1'7"	2½"	6	16'6"	2'7"	1'7"	2½"	6	16'6"	2'7"	1'7"	2½"	6	12'6"	2'7"	1'7"	2½"	6	12'6"
24"	45°	8'5"	4	4'3"	4	2'5"	14	8'6"	6	4'4"	6	5'3"	5'3"	0"	1	5'3"	3'3"	3'3"	0"	1	3'3"	10'2"	6'0"	3'2"	2'2"	1½"	9	30'0"	3'2"	2'2"	3"	5	16'8"	3'2"	2'2"	1½"	9	24'0"	3'2"	2'2"	3"	5	13'4"
	60°	6'1"	4	4'3"	4	2'5"	12	6'2"	6	4'4"	6	4'1'	4'1'	0"	1	4'1'	3'3"	3'3"	0"	1	3'3"	7'10"	6'0"	3'2"	2'2"	2"	7	23'4"	3'2"	2'2"	3"	5	16'8"	3'2"	2'2"	2"	7	18'8"	3'2"	2'2"	3"	5	13'4"
	75°	6'0"	4	4'3"	4	2'5"	12	6'0"	6	4'7"	6	3'11"	3'11"	0"	1	3'11"	3'3"	3'3"	0"	1	3'3"	7'8"	6'0"	3'2"	2'2"	2"	7	23'4"	3'2"	2'2"	3"	5	16'8"	3'2"	2'2"	2"	7	18'8"	3'2"	2'2"	3"	5	13'4"
	90°	5'3"	4	4'3"	4	2'5"	12	5'3"	6	5'3"	6	3'7"	3'7"	0"	1	3'7"	3'3"	3'3"	0"	1	3'3"	6'11"	6'11"	3'2"	2'2"	2½"	6	20'0"	3'2"	2'2"	2½"	6	20'0"	3'2"	2'2"	2½"	6	16'0"	3'2"	2'2"	2½"	6	16'0"
30"	45°	13'2"	4	6'9"	4	2'5"	22	12'5"	6	6'3"	6	9'0"	9'0"	0"	1	9'0"	5'0"	5'0"	0"	1	5'0"	13'10"	7'8"	2'2"	3'8"	1½"	13	46'7"	2'2"	3'8"	3"	7	25'1"	2'2"	3'8"	1½"	13	37'11"	2'2"	3'8"	3"	7	20'5"
	60°	9'8"	4	6'9"	4	2'5"	18	9'0"	6	6'3"	6	6'9"	6'9"	0"	1	6'9"	5'0"	5'0"	0"	1	5'0"	10'0"	7'5"	2'2"	3'8"	2¼"	9	32'3"	2'2"	3'8"	3"	7	25'1"	2'2"	3'8"	2¼"	9	26'3"	2'2"	3'8"	3"	7	20'5"
	75°	9'4"	4	7'2"	4	2'5"	18	8'9"	6	6'9"	6	6'9"	6'9"	0"	1	6'9"	5'2"	5'2"	0"	1	5'2"	9'10"	7'5"	2'2"	3'8"	2¼"	9	32'3"	2'2"	3'8"	3"	7	25'1"	2'2"	3'8"	2¼"	9	26'3"	2'2"	3'8"	3"	7	20'5"
	90°	8'2"	4	8'2"	4	2'5"	18	7'9"	6	7'9"	6	6'0"	6'0"	0"	1	6'0"	6'0"	6'0"	0"	1	6'0"	8'9"	8'9"	2'2"	3'8"	2½"	8	28'8"	2'2"	3'8"	2½"	8	28'8"	2'2"	3'8"	2½"	8	23'4"	2'2"	3'8"	2½"	8	23'4"
36"	45°	13'2"	4	6'9"	4	2'5"	21	12'5"	6	6'3"	6	9'0"	9'0"	0"	1	9'0"	5'0"	5'0"	0"	1	5'0"	13'10"	7'8"	2'8"	4'2"	1½"	13	53'1"	2'8"	4'2"	3"	7	28'7"	2'8"	4'2"	1½"	13	44'5"	2'8"	4'2"	3"	7	23'11"
	60°	9'8"	4	6'9"	4	2'5"	18	8'11"	6	6'3"	6	7'3"	7'3"	0"	1	7'3"	5'0"	5'0"	0"	1	5'0"	10'2"	7'8"	2'8"	4'2"	2¼"	9	36'9"	2'8"	4'2"	3"	7	28'7"	2'8"	4'2"	2¼"	9	30'9"	2'8"	4'2"	3"	7	23'11"
	75°	9'4"	4	7'2"	4	2'5"	18	8'9"	6	6'8"	6	7'6"	7'6"	0"	1	7'6"	5'5"	5'5"	0"	1	5'5"	10'3"	8'1"	2'8"	4'2"	2¼"	9	36'9"	2'8"	4'2"	3"	7	28'7"	2'8"	4'2"	2¼"	9	30'9"	2'8"	4'2"	3"	7	23'11"
	90°	8'2"	4	8'2"	4	2'5"	18	7'9"	6	7'9"	6	6'9"	6'9"	0"	1	6'9"	6'9"	6'9"	0"	1	6'9"	12'11"	12'11"	2'8"	4'2"	2½"	8	32'8"	2'8"	4'2"	2½"	8	32'8"	2'8"	4'2"	2½"	8	27'4"	2'8"	4'2"	2½"	8	27'4"
42"	45°	17'2"	4	8'9"	4	2'5"	28	16'5"	6	8'3"	6	13'0"	13'0"	0"	1	13'0"	7'0"	7'0"	0"	1	7'0"	18'0"	10'0"	2'8"	4'8"	1½"	17	73'8"	2'8"	4'8"	3"	9	39'0"	2'8"	4'8"	1½"	17	62'4"	2'8"	4'8"	1½"	9	33'0"
	60°	12'6"	4	8'9"	4	2'5"	23	11'9"	6	8'3"	6	9'11"	9'11"	0"	1	9'11"	7'0"	7'0"	0"	1	7'0"	13'2"	9'8"	2'8"	4'8"	2¼"	12	52'0"	2'8"	4'8"	3"	9	39'0"	2'8"	4'8"	2¼"	12	44'0"	2'8"	4'8"	3"	9	33'0"
	75°	12'2"	4	9'4"	4	2'5"	23	11'7"	6	8'10"	6	9'11"	9'11"	0"	1	9'11"	7'3"	7'3"	0"	1	7'3"	13'0"	10'3"	2'8"	4'8"	2¼"	12	52'0"	2'8"	4'8"	3"	9	39'0"	2'8"	4'8"	2¼"	12	44'0"	2'8"	4'8"	3"	9	33'0"
	90°	10'8"	4	10'8"	4	2'5"	24	10'3"	6	10'3"	6	8'10"	8'10"	0"	1	8'10"	8'10"	8'10"	0"	1	8'10"	11'11"	11'11"	2'8"	4'8"	2½"	11	47'8"	2'8"	4'8"	2½"	11	47'8"	2'8"	4'8"	2½"	11	40'4"	2'8"	4'8"	2½"	11	40'4"
48"	45°	21'2"	4	10'9"	4	2'8"	33	20'5"	6	10'4"	6	12'3"	4'8"	7'7"	2	16'11"	6'3"	3'0"	3'3"	2	9'3"	21'10"	11'10"	2'8"	5'2"	1½"	21	96'3"	2'8"	5'2"	3"	11	50'5"	2'8"	5'2"	1½"	21	82'3"	2'8"	5'2"	3"	11	43'1"
	60°	15'4"	4	10'9"	4	2'8"	28	14'7"	6	10'4"	6	3'8"	3'9"	4'11"	2	12'5"	6'3"	3'0"	3'3"	2	9'3"	16'0"	11'10"	2'8"	5'2"	2¼"	15	68'9"	2'8"	5'2"	3"	11	50'5"	2'8"	5'2"	2¼"	15	58'9"	2'8"	5'2"	3"	11	43'1"
	75°	15'0"	4	11'6"	4	2'8"	29	14'5"	6	11'0"	6	8'8"	3'11"	4'9"	2	12'7"	6'6"	3'1"	3'5"	2	9'7"	15'10"	12'5"	2'8"	5'2"	2¼"	15	68'9"	2'8"	5'2"	3"	11	50'5"	2'8"	5'2"	2¼"	15	58'9"	2'8"	5'2"	3"	11	43'1"
	90°	13'2"	4	13'2"	4	2'8"	28	12'9"	6	12'9"	6	7'7"	3'5"	4'2"	2	11'0"	7'7"	3'5"	4'2"	2	11'0"	14'6"	14'6"	2'8"	5'2"	2½"	13	59'7"	2'8"	5'2"	2½"	13	59'7"	2'8"	5'2"	2½"	13	50'11"	2'8"	5'2"	2½"	13	50'11"
54"	45°	25'2"	4	12'10"	4	2'8"	40	24'5"	6	12'4"	6	16'3"	9'0"	7'3"	2	25'3"	8'2"	5'0"	3'2"	2	13'2"	26'1"	14'0"	2'8"	5'8"	1½"	25	120'10"	2'8"	5'8"	3"	13	62'10"	2'8"	5'8"	1½"	25	104'2"	2'8"	5'8"	3"	13	54'2"
	60°	18'2"	4	12'9"	4	2'8"	32	17'5"	6	12'4"	6	11'6"	6'8"	4'10"	2	18'2"	8'2"	5'0"	3'2"	2	13'2"	19'1"	14'0"	2'8"	5'8"	2¼"	18	87'0"	2'8"	5'8"	3"	13	62'10"	2'8"	5'8"	2¼"	18	75'0"	2'8"	5'8"	3"	13	54'2"
	75°	17'10"	4	13'7"	4	2'8"	33	17'3"	6	13'2"	6	11'5"	6'8"	4'9"	2	18'1"	8'9"	5'3"	3'6"	2	14'0"	18'11"	14'10"	2'8"	5'8"	2¼"	18	87'0"	2'8"	5'8"	3"	14	67'8"	2'8"	5'8"	2¼"	18	75'0"	2'8"	5'8"	3"	14	58'4"
	90°	15'8"	4	15'8"	4	2'8"	33	15'3"	6	15'3"	6	10'1"	6'0"	4'1"	2	16'1"	10'1"	6'0"	4'1"	2	16'1"	16'11"	16'11"	2'8"	5'8"	2½"	16	77'4"	2'8"	5'8"	2½"	16	77'4"	2'8"	5'8"	2½"	16	66'8"	2'8"	5'8"	2½"	16	66'8"
60"	45°	29'2"	4	14'10"	4	2'8"	46	28'5"	6	14'4"	6	20'3"	4'11"	7'8"	3	37'9"	10'2"	3'0"	3'7"	3	19'7"	30'1"	16'0"	2'8"	6'2"	1½"	29	147'5"	2'8"	6'2"	3"	15	76'3"	2'8"	6'2"	1½"	29	128'1"	2'8"	6'2"	3"	15	66'3"
	60°	21'0"	4	14'9"	4	2'8"	37	20'3"	6	14'4"	6	14'7"	3'11"	5'4"	3	27'9"	10'2"	3'0"	3'7"	3	19'9"	21'11"	16'3"	2'8"	6'2"	2¼"	21	106'9"	2'8"	6'2"	3"	15	76'3"	2'8"	6'2"	2¼"	21	92'9"	2'8"	6'2"	3"	15	66'3"
	75°	20'8"	4	15'9"	4	2'8"	38	20'1"	6	15'4"	6	14'3"	3'9"	5'3"	3	27'0"	11'0"	3'0"	4'0"	3	21'0"	21'9"	17'0"	2'8"	6'2"	2¼"	21	106'9"	2'8"	6'2"	2¾"	16	81'4"	2'8"	6'2"	2¼"	21	92'9"	2'8"	6'2"	2¾"	16	70'8"
	90°	18'2"	4	18'2"	4	2'8"	38	17'9"	6	17'9"	6	12'8"	3'4"	4'8"	3	24'0"	12'8"	3'4"	4'8"	3	24'0"	19'5"	19'5"	2'8"	6'2"	2½"	18	91'6"	2'8"	6'2"	2½"	18	91'6"	2'8"	6'2"	2½"	18	79'6"	2'8"	6'2"	2½"	18	79'6"
66"	45°	33'1"	4	16'11"	4	3'2"	50	32'5"	6	16'5"	6	24'3"	9'0"	7'7½"	3	49'11"	12'5"	5'1"	3'8"	3	26'3"	34'1"	18'1"	2'8"	6'8"	1¼"	44	265'10"	2'8"	6'8"	2¾"	22	133'0"	2'8"	6'8"	1½"	33	154'0"	2'8"	6'8"	3"	17	79'4"
	60°	23'7"	4	16'10"	4	3'2"	41	23'1"	6	16'4"	6	17'5"	5'9"	5'10"	3	34'9"	12'5"	5'1"	3'8"	3	26'3"	24'9"	18'0"	2'8"	6'8"	2"	31	187'4"	2'8"	6'8"	2¾"	22	133'0"	2'8"	6'8"	2"	24	112'0"	2'8"	6'8"	3"	17	79'4"
	75°	23'5"	4	17'11"	4	3'2"	42	23'0"	6	17'5"	6	17'5"	5'9"	5'10"	3	34'9"	13'2"	5'4"	3'11"	3	27'9"	24'7"	19'1"	2'8"	6'8"	2"	31	187'4"	2'8"	6'8"	2⅝"	23	139'0"	2'8"	6'8"	2"	24	112'0"	2'8"	6'8"	3"	18	84'0"
	90°	20'9"	4	20'9"	4	3'2"	42	20'3"	6	20'3"	6	15'4"	5'2"	5'1"	3	30'9"	15'4"	5'2"	5'1"	3	30'9"	21'11"	21'11"	2'8"	6'8"	2¼"	27	163'2"	2'8"	6'8"	2¼"	27	163'2"	2'8"	6'8"	2½"	21	98'0"	2'8"	6'8"	2½"	21	98'0"
72"	45°	37'3"	5	19'3"	5	3'11"	56	36'5"	6	18'5"	6	28'6"	5'0"	7'10"	4	67'0"	14'6"	3'0"	3'10"	4	35'0"	38'1"	20'1"	2'8"	7'2"	1⅛"	49	273'9"	2'8"	7'2"	2¼"	25	159'7"	2'8"	7'2"	1½"	37	181'11"	2'8"	7'2"	3"	19	93'5"
	60°	27'3"	5	19'2"	5	3'11"	46	25'11"	6	18'4"	6	20'3"	4'0"	5'5"	4	48'6"	14'4"	3'0"	3'9¼"	4	34'8"	27'7"	20'0"	2'8"	7'2"	1½"	35	195'5"	2'8"	7'2"	2¼"	25	159'7"	2'8"	7'2"	2⅛"	26	127'10"	2'8"	7'2"	3"	19	93'5"
	75°	24'7"	5	20'5"	5	3'11"	44	25'9"	6	19'7"	6	20'2"	3'10"	5'5¼"	4	48'0"	15'4"	3'2"	4'0½"	4	37'0"	27'5"	21'3"	2'8"	7'2"	1¾"	32	195'5"	2'8"	7'2"	2⅛"	27	150'9"	2'8"	7'2"	2⅜"	24	118'0"	2'8"	7'2"	2¾"	20	98'4"
	90°	23'7"	5	23'7"	5	3'11"	46	22'9"	6	22'9"	6	17'10"	3'6"	4'9¼"	4	42'8"	17'10"	3'6"	4'9¼"	4	42'8"	24'5"	24'5"	2'8"	7'2"	1¾"	31	173'1"	2'8"	7'2"	1¾"	31	173'1"	2'8"	7'2"	2½"	23	113'1"	2'8"	7'2"	2½"	23	113'1"
78"	45°	41'3"	5	21'3"	5	4'2"	62	40'5"	6	20'5"	6	32'6"	9'0"	7'10"	4	83'0"	16'6"	5'0"	3'10"	4	43'0"	42'1"	22'1"	2'8"	7'8"	1⅛"	54	315'0"	2'8"	7'8"	2¼"	27	157'6"	2'8"	7'8"	1½"	41	211'10"	2'8"	7'8"	3"	21	108'6"
	60°	29'7"	5	21'2"	5	4'2"	50	28'9"	6	20'4"	6	23'0"	6'6"	5'6"	4	59'0"	16'6"	5'0"	3'10"	4	43'0"	30'5"	22'0"	2'8"	7'8"	1½"	39	227'6"	2'8"	7'8"	2¼"	28	163'4"	2'8"	7'8"	2⅛"	29	149'10"	2'8"	7'8"	3"	21	108'6"
	75°	29'5"	5	22'7"	5	4'2"	51	28'7"	6	21'9"	6	23'0"	6'6"	5'6"	4	59'0"	17'6"	5'4"	4'0½"	4	45'8"	30'3"	23'5"	2'8"	7'8"	1½"	39	227'6"	2'8"	7'8"	2¼"	29	169'2"	2'8"	7'8"	2⅛"	29	149'10"	2'8"	7'8"	2⅞"	22	113'8"
	90°	26'1"	5	26'1"	5	4'2"	52	25'3"	6	25'3"	6	20'4"	6'0"	4'9¼"	4	52'8"	20'4"	6'0"	4'9¼"	4	52'8"	26'11"	26'11"	2'8"	7'8"	1¾"	34	198'4"	2'8"	7'8"	1¾"	34	198'4"	2'8"	7'8"	2½"	26	134'4"	2'8"	7'8"	2½"	26	134'4"

PIPE	SKEW	2 BARS WZL	2 BARS WZS	SERIES BARS WSA (1 REQ'D)					SERIES BARS FA (1 REQ'D)					BARS FD		4 BARS W	2 BARS T	SERIES BARS FA (1 REQ'D)					BARS FD		4 BARS W	2 BARS "TA"		
				A	B	C	X	T.L.	A	B	C	X	T.L.	T.L.	N.R.			A	B	C	X	T.L.	T.L.	N.R.		A	B	T.L.
15"	45°			2'4"	1'7"	3"	4	10'6"	6'9"	4'3"	10"	4	22'0"	3'9"	4	5'9"	8'1"	7'5"	4'11"	10"	4	24'8"	3'9"	5	6'6"	2'4½"	1'9"	8'1"
	60°			2'4"	1'7"	3"	4	10'6"	6'8"	4'2"	10"	4	21'8"	3'9"	4	5'9"	8'1"	7'4"	4'10"	10"	4	24'4"	3'9"	5	6'6"	2'4½"	1'9"	8'1"
	75°			2'4"	1'7"	3"	4	10'6"	6'7"	4'1"	10"	4	21'4"	3'9"	4	5'9"	8'1"	7'3"	4'9"	10"	4	24'0"	3'9"	5	6'6"	2'4½"	1'9"	8'1"
	90°			2'4"	1'7"	2¼"	5	9'10"	6'6"	4'0"	10"	4	21'0"	3'9"	4	5'9"	8'1"	7'2"	4'8"	10"	4	23'8"	3'9"	5	6'6"	2'4½"	1'9"	8'1"
18"	45°			2'7"	1'7"	1½"	9	18'9"	7'0"	4'6"	10"	4	23'0"	3'9"	4	4'6"	8'11"	7'9"	5'3"	10"	4	26'0"	3'9"	5	6'9"	2'9"	2'0"	9'1"
	60°			2'7"	1'7"	3"	5	10'5"	6'11"	4'5"	10"	4	22'8"	3'9"	4	4'6"	8'11"	7'8"	5'2"	10"	4	25'8"	3'9"	5	6'9"	2'9"	1'9"	9'1"
	75°			2'7"	1'7"	3"	5	10'5"	6'10"	4'4"	10"	4	22'4"	3'9"	4	4'6"	8'11"	7'7"	5'1"	10"	4	25'4"	3'9"	4	6'9"	2'9"	2'0"	9'1"
	90°			2'7"	1'7"	2¼"	6	12'6"	6'9"	4'3"	10"	4	22'0"	3'9"	4	4'6"	8'11"	7'6"	5'0"	10"	4	25'0"	3'9"	4	6'9"	2'9"	1'9"	9'1"
24"	45°			3'2"	2'2"	3"	5	13'4"	7'6"	4'6"	1'0"	4	24'0"	3'9"	4	6'6"	8'11"	8'6"	5'6"	1'0"	4	28'0"	3'9"	5	7'6"	3'6"	2'6"	11'1"
	60°			3'2"	2'2"	2"	7	18'8"	7'6"	4'6"	1'0"	4	24'0"	3'9"	4	6'6"	8'11"	8'6"	5'6"	1'0"	4	28'0"	3'9"	5	7'6"	3'6"	2'6"	11'1"
	75°			3'2"	2'2"	3"	5	13'4"	7'6"	4'6"	1'0"	4	24'0"	3'9"	4	6'6"	8'11"	8'6"	5'6"	1'0"	4	28'0"	3'9"	5	7'6"	3'6"	2'6"	11'1"
	90°			3'2"	2'2"	2½"	6	16'0"	7'6"	4'6"	1'0"	4	24'0"	3'9"	4	6'6"	8'11"	8'6"	5'6"	1'0"	4	28'0"	3'9"	5	7'6"	3'6"	2'6"	11'1"
30"	45°			2'2"	3'8"	3"	7	20'5"	7'10"	5'4"	10"	4	26'4"	3'9"	6	7'0"	10'5"	9'1"	6'7"	10"	4	31'4"	3'9"	6	8'3"	4'3"	3'0"	13'1"
	60°			2'2"	3'8"	2¼"	9	26'3"	7'11"	5'5"	10"	4	26'8"	3'9"	6	7'0"	10'5"	9'2"	6'8"	10"	4	31'8"	3'9"	6	8'3"	4'3"	3'0"	13'1"
	75°			2'2"	3'8"	2¼"	9	26'3"	7'6"	5'2"	10"	4	25'4"	3'9"	6	6'10"	10'5"	8'9"	6'5"	10"	4	30'4"	3'9"	6	8'3"	4'3"	3'0"	13'1"
	90°			2'2"	3'8"	2½"	8	23'4"	7'7"	5'1"	10"	4	25'4"	3'9"	6	6'10"	10'5"	8'10"	6'4"	10"	4	30'4"	3'9"	6	8'3"	4'3"	3'0"	13'1"
36"	45°			2'8"	4'2"	3"	7	23'11"	8'4"	5'10"	10"	4	28'4"	3'9"	6	7'6"	12'0"	9'10"	7'4"	10"	4	34'4"	3'9"	7	9'0"	5'0"	3'6"	15'1"
	60°			2'8"	4'2"	2¼"	9	30'9"	8'5"	5'11"	10"	4	28'8"	3'9"	6	7'6"	12'0"	9'11"	7'5"	10"	4	34'8"	3'9"	7	9'0"	5'0"	3'6"	15'1"
	75°			2'8"	4'2"	2¼"	9	30'9"	8'2"	5'8"	10"	4	27'8"	3'9"	6	7'4"	12'0"	9'8"	7'2"	10"	4	33'8"	3'9"	7	9'0"	5'0"	3'6"	15'1"
	90°			2'8"	4'2"	2½"	8	27'4"	8'1"	5'7"	10"	4	27'4"	3'9"	6	7'4"	12'0"	9'7"	7'1"	10"	4	33'4"	3'9"	7	9'0"	5'0"	3'6"	15'1"
42"	45°			2'8"	4'8"	1½"	17	62'4"	8'10"	6'4"	10"	4	30'4"	3'9"	6	8'0"	13'7"	10'7"	8'1"	10"	4	37'4"	3'9"	8	9'9"	5'9"	4'0"	17'1"
	60°			2'8"	4'8"	2¼"	12	44'0"	8'11"	6'5"	10"	4	30'8"	3'9"	6	8'0"	13'7"	10'8"	8'2"	10"	4	37'8"	3'9"	8	9'9"	5'9"	4'0"	17'1"
	75°			2'8"	4'8"	2¼"	12	44'0"	8'8"	6'2"	10"	4	29'8"	3'9"	6	7'11"	13'7"	10'5"	7'11"	10"	4	36'8"	3'9"	8	9'9"	5'9"	4'0"	17'1"
	90°			2'8"	4'8"	2½"	11	40'4"	8'7"	6'1"	10"	4	29'4"	3'9"	7	7'10"	13'7"	10'4"	7'10"	10"	4	36'4"	3'9"	8	9'9"	5'9"	4'0"	17'1"
48"	45°			2'8"	5'2"	1½"	21	82'3"	9'4"	6'10"	10"	4	32'4"	4'0"	7	8'6"	15'3"	11'4"	8'10"	10"	4	40'4"	4'0"	9	10'6"	6'6"	4'6"	19'1"
	60°			2'8"	5'2"	2¼"	15	58'9"	9'5"	6'11"	10"	4	32'8"	4'0"	7	8'6"	15'3"	11'5"	8'11"	10"	4	40'8"	4'0"	9	10'6"	6'6"	4'6"	19'1"
	75°			2'8"	5'2"	2¼"	15	58'9"	9'2"	6'8"	10"	4	31'3"	4'0"	6	8'4"	15'3"	11'2"	8'8"	10"	4	39'8"	4'0"	9	10'6"	6'6"	4'6"	19'1"
	90°			2'8"	5'2"	2½"	13	50'11"	9'1"	6'7"	10"	4	31'4"	4'0"	8	8'4"	15'3"	11'1"	8'7"	10"	4	39'4"	4'0"	9	10'6"	6'6"	4'6"	19'1"
54"	45°			2'8"