

### DIMENSIONS OF CONCRETE BLOCKING FOR VERTICAL BENDS WITH AN UPWARD THRUST

PIPE SIZES	6" AND 8"			10" AND 12"			14" AND 16"			18" AND 20"			24"		
	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'
DEGREE BEND OR DEFLECTION	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'
LENGTH	3'	4'	6'	4.5'	6.0'	8.0'	6'	8'	11'	7'	9'	13'	7'	10'	14'
WIDTH	3'	3'	3'	3'	3'	4'	3.5'	3.5'	5'	4'	5'	5.5'	5'	6'	7'
DEPTH	2'	3'	4'	3'	4.5'	5'	3.5'	5'	5'	4'	5'	6'	5'	6'	7'
SQ. IN. REBAR	0.15	0.28	0.57	0.33	0.66	1.30	0.60	1.18	2.31	0.92	1.84	3.61	1.36	2.7	5.2
MASS CONCRETE CU. YD.	0.66	1.33	2.66	1.5	3.0	5.9	2.7	5.2	10.2	4.1	8.3	15.8	6.7	13.3	25.7

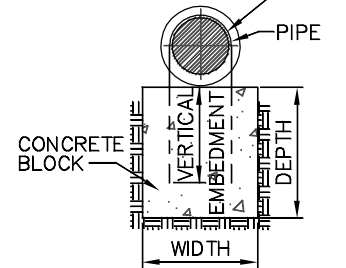
  

PIPE SIZES	30"			36"			42"			48"			54"		
	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'
DEGREE BEND OR DEFLECTION	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'	11 1/4'	22 1/2'	45'
LENGTH	8'	10'	15'	9'	12'	17.5'	10'	15'	19'	13'	17'	21.5'	15'	18'	24'
WIDTH	6'	8'	8.5'	7'	8.5'	10'	8'	8.5'	12'	8'	9.5'	13'	8'	10'	14'
DEPTH	6'	7'	8.5'	6.5'	8'	9'	7'	8.5'	9.5'	7'	9'	10'	8'	10'	11'
SQ. IN. REBAR	2.13	4.14	8.1	3.06	5.96	11.7	4.16	8.1	16.0	5.44	10.6	21.0	6.9	13.4	26.3
MASS CONCRETE CU. YD.	10.5	20.4	40.0	15.1	29.4	57.8	20.6	40	79	26.9	52.3	103.7	34.1	66.2	130

### REINFORCING

BAR NO.	CROSS SECTION IN <sup>2</sup> PER BAR	VERTICAL IMBEDMENT
5	0.31	15 IN.
6	0.44	19 IN.
7	0.60	26 IN.
8	0.79	35 IN.
9	1.00	44 IN.
10	1.27	56 IN.
11	1.56	68 IN.

EACH "U" SHAPED BAR SHALL BE CONSIDERED AS ONE BAR FOR COMPUTING CROSS SECTIONAL AREAS.



### SECTION

VERTICAL THRUST UPWARD

### MINIMUM SQUARE FEET OF BEARING SURFACE REQUIRED FOR HORIZONTAL THRUST BLOCKING AND VERTICAL THRUST DOWNWARD

PIPE SIZES	6" AND 8"				10" AND 12"				14" AND 16"				18" AND 20"			
	DEGREE BEND OR DEFLECTION				DEGREE BEND OR DEFLECTION				DEGREE BEND OR DEFLECTION				DEGREE BEND OR DEFLECTION			
	11 1/4'	22 1/2'	45'	90'	11 1/4'	22 1/2'	45'	90'	11 1/4'	22 1/2'	45'	90'	11 1/4'	22 1/2'	45'	90'
SAND 1 TON/SQ. FT.	1.50	3.00	6.00	12.00	3.00	6.00	12.00	24.50	5.50	11.00	21.50	43.00	8.50	16.50	33.00	66.00
SOFT CLAY 1 TON/SQ. FT.	1.00	1.50	3.00	6.00	1.50	3.00	6.00	12.00	2.50	5.50	11.00	21.50	4.00	8.50	16.50	33.00
SAND & GRAVEL 2 TON/SQ. FT.	1.00	1.00	2.00	4.00	1.00	2.00	4.00	8.00	2.00	3.50	7.00	14.00	3.00	5.50	11.00	22.00
CLAY 3 TON/SQ. FT.	1.00	1.00	1.00	2.50	1.00	1.00	2.50	5.00	1.00	2.00	4.50	8.50	1.50	3.50	6.50	13.00
SOFT ROCK 5 TON/SQ. FT.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.50	3.50
ROCK 20 TON/SQ. FT.	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	2.00	1.00	1.00	1.50	3.50

PIPE SIZES	24"				30"				36"				42"			
	DEGREE BEND OR DEFLECTION				DEGREE BEND OR DEFLECTION				DEGREE BEND OR DEFLECTION				DEGREE BEND OR DEFLECTION			
	11 1/4'	22 1/2'	45'	90'	11 1/4'	22 1/2'	45'	90'	11 1/4'	22 1/2'	45'	90'	11 1/4'	22 1/2'	45'	90'
SAND 1 TON/SQ. FT.	13.6	27	52	97	21.3	41.4	81	150	30.6	59.6	117	220	41.6	81	160	294
SOFT CLAY 1 TON/SQ. FT.	6.8	13.5	26	48.5	10.6	20.7	40.5	75	15.3	29.8	58.5	110.0	20.8	40.5	80	147
SAND & GRAVEL 2 TON/SQ. FT.	4.5	9	17.3	32.3	7.1	13.8	27.0	50	10.2	19.9	39	73.3	13.8	27	53.3	98
CLAY 3 TON/SQ. FT.	2.7	5.4	10.4	19.4	4.2	8.3	16.2	30	6.1	11.9	23.4	44	8.3	16.2	32	58.8
SOFT ROCK 5 TON/SQ. FT.	.68	1.3	2.6	4.8	1.06	2.07	4.05	7.5	1.5	2.9	5.8	11	2.08	4.05	8	14.7
ROCK 20 TON/SQ. FT.	.68	1.3	2.6	4.8	1.06	2.07	4.05	7.5	1.5	2.9	5.8	11	2.08	4.05	8	14.7

PIPE SIZES	48"				54"				60"			
	DEGREE BEND OR DEFLECTION				DEGREE BEND OR DEFLECTION				DEGREE BEND OR DEFLECTION			
	11 1/4'	22 1/2'	45'	90'	11 1/4'	22 1/2'	45'	90'	11 1/4'	22 1/2'	45'	90'
SAND 1 TON/SQ. FT.	54.4	106	210	384	69	134	263	486	85	165.5	324.6	600
SOFT CLAY 1 TON/SQ. FT.	27.2	53	105	192	34.5	67	131.5	243	42.5	82.7	162.3	300
SAND & GRAVEL 2 TON/SQ. FT.	18.1	35.3	70	128	23	44.6	87.6	162	28.3	55.1	108.2	200
CLAY 3 TON/SQ. FT.	10.9	21.2	42	76.8	13.8	26.8	52.6	97.2	17	33.1	64.9	120
SOFT ROCK 5 TON/SQ. FT.	2.7	5.3	10.5	19.2	3.4	6.7	13.1	24.3	4.2	8.2	16.2	30
ROCK 20 TON/SQ. FT.	2.7	5.3	10.5	19.2	3.4	6.7	13.1	24.3	4.2	8.2	16.2	30

THRUST BLOCKING  
DIMENSION AND BEARING  
SURFACE TABLES

## SPRING - BENNER - WALKER JOINT AUTHORITY

DATE  
4/05  
SCALE  
NTS  
PROJECT  
SHEET  
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