



CHULA VISTA FIRE DEPARTMENT

FIRE PREVENTION DIVISION

Thrust Block Area Calculations

4-INCH PIPE

1. Min. Soil Bearing Capacity (PSF) = 1500

2. Min. Working Pressure (PSI) = 200

THRUST FROM NFPA 24 TABLE A.10.6.1(a):

DEAD END =	1,810	LB	@ 100 PSI			
FOR 200 PSI =	200 / 100	*	1,810	=	3,620	LB
Ab =	T/Sb	=	3,620 / 1,500	=	2.41	S.F.
Ab*S.F. =	2.41	X	1.5	=	3.62	S.F.
						USE 2' WIDE X 2' HIGH THRUST BLOCK
90° BEND =	2,559	LB	@ 100 PSI			
FOR 200 PSI =	200 / 100	*	2,559	=	5,118	LB
Ab =	T/Sb	=	5,118 / 1,500	=	3.41	S.F.
Ab*S.F. =	3.41	X	1.5	=	5.12	S.F.
						USE 2.5' WIDE X 2.5' HIGH THRUST BLOCK
45° BEND =	1,385	LB	@ 100 PSI			
FOR 200 PSI =	200 / 100	*	1,385	=	2,770	LB
Ab =	T/Sb	=	2,770 / 1,500	=	1.85	S.F.
Ab*S.F. =	1.85	X	1.5	=	2.77	S.F.
						USE 2' WIDE X 1.5' HIGH THRUST BLOCK
22 1/2° BEND =	706	LB	@ 100 PSI			
FOR 200 PSI =	200 / 100	*	706	=	1,412	LB
Ab =	T/Sb	=	1,412 / 1,500	=	0.94	S.F.
Ab*S.F. =	0.94	X	1.5	=	1.41	S.F.
						USE 1.5' WIDE X 1' HIGH THRUST BLOCK
11 1/4° BEND =	355	LB	@ 100 PSI			
FOR 200 PSI =	200 / 100	*	355	=	710	LB
Ab =	T/Sb	=	710 / 1,500	=	0.47	S.F.
Ab*S.F. =	0.47	X	1.5	=	0.71	S.F.
						USE 1' WIDE X 1' HIGH THRUST BLOCK





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6-INCH PIPE

1. Min. Soil Bearing Capacity (PSF) = 1500

2. Min. Working Pressure (PSI) = 200

THRUST FROM NFPA 24 TABLE A.10.6.1(a):

DEAD END = 3,739 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 3,739 = 7,478 LB
 Ab = T/Sb = 7,478 / 1,500 = 4.99 S.F.
 Ab*S.F. = 4.99 X 1.5 = 7.48 S.F. **USE 3' WIDE X 2.5' HIGH THRUST BLOCK**

90° BEND = 5,288 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 5,288 = 10,576 LB
 Ab = T/Sb = 10,576 / 1,500 = 7.05 S.F.
 Ab*S.F. = 7.05 X 1.5 = 10.58 S.F. **USE 4' WIDE X 3' HIGH THRUST BLOCK**

45° BEND = 2,862 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 2,862 = 5,724 LB
 Ab = T/Sb = 5,724 / 1,500 = 3.82 S.F.
 Ab*S.F. = 3.82 X 1.5 = 5.72 S.F. **USE 2.5' WIDE X 2.5' HIGH THRUST BLOCK**

22 1/2° BEND = 1,459 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 1,459 = 2,918 LB
 Ab = T/Sb = 2,918 / 1,500 = 1.95 S.F.
 Ab*S.F. = 1.95 X 1.5 = 2.92 S.F. **USE 2' WIDE X 1.5' HIGH THRUST BLOCK**

11 1/4° BEND = 733 LB @ 100 PSI
 FOR 150 PSI = 200 / 100 * 733 = 1,466 LB
 Ab = T/Sb = 1,466 / 1,500 = 0.98 S.F.
 Ab*S.F. = 0.98 X 1.5 = 1.47 S.F. **USE 1.5' WIDE X 1' HIGH THRUST BLOCK**





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8-INCH PIPE

1. Min. Soil Bearing Capacity (PSF) = 1500

2. Min. Working Pressure (PSI) = 200

THRUST FROM NFPA 24 TABLE A.10.6.1(a):

DEAD END = 6,433 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 6,433 = 12,866 LB
 Ab = T/Sb = 12,866 / 1,500 = 8.58 S.F.
 Ab*S.F. = 8.58 X 1.5 = 12.87 S.F. **USE 4' WIDE X 3.5' HIGH THRUST BLOCK**

90° BEND = 9,097 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 9,097 = 18,194 LB
 Ab = T/Sb = 18,194 / 1,500 = 12.13 S.F.
 Ab*S.F. = 12.13 X 1.5 = 18.19 S.F. **USE 5' WIDE X 4' HIGH THRUST BLOCK**

45° BEND = 4,923 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 4,923 = 9,846 LB
 Ab = T/Sb = 9,846 / 1,500 = 6.56 S.F.
 Ab*S.F. = 6.56 X 1.5 = 9.85 S.F. **USE 3.5' WIDE X 3' HIGH THRUST BLOCK**

22 1/2° BEND = 2,510 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 2,510 = 5,020 LB
 Ab = T/Sb = 5,020 / 1,500 = 3.35 S.F.
 Ab*S.F. = 3.35 X 1.5 = 5.02 S.F. **USE 3' WIDE X 2' HIGH THRUST BLOCK**

11 1/4° BEND = 1,261 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 1,261 = 2,522 LB
 Ab = T/Sb = 2,522 / 1,500 = 1.68 S.F.
 Ab*S.F. = 1.68 X 1.5 = 2.52 S.F. **USE 2' WIDE X 1.5' HIGH THRUST BLOCK**





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10-INCH PIPE

1. Min. Soil Bearing Capacity (PSF) = 1500

2. Min. Working Pressure (PSI) = 200

THRUST FROM NFPA 24 TABLE A.10.6.1(a):

DEAD END = 9,677 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 9,677 = 19,354 LB
 Ab = T/Sb = 19,354 / 1,500 = 12.90 S.F.
 Ab*S.F. = 12.90 X 1.5 = 19.35 S.F. **USE 5' WIDE X 4' HIGH THRUST BLOCK**

90° BEND = 13,685 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 13,685 = 27,370 LB
 Ab = T/Sb = 27,370 / 1,500 = 18.25 S.F.
 Ab*S.F. = 18.25 X 1.5 = 27.37 S.F. **USE 5.5' WIDE X 5' HIGH THRUST BLOCK**

45° BEND = 7,406 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 7,406 = 14,812 LB
 Ab = T/Sb = 14,812 / 1,500 = 9.87 S.F.
 Ab*S.F. = 9.87 X 1.5 = 14.81 S.F. **USE 4' WIDE X 4' HIGH THRUST BLOCK**

22 1/2° BEND = 3,776 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 3,776 = 7,552 LB
 Ab = T/Sb = 7,552 / 1,500 = 5.03 S.F.
 Ab*S.F. = 5.03 X 1.5 = 7.55 S.F. **USE 3' WIDE X 3' HIGH THRUST BLOCK**

11 1/4° BEND = 1,897 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 1,897 = 3,794 LB
 Ab = T/Sb = 3,794 / 1,500 = 2.53 S.F.
 Ab*S.F. = 2.53 X 1.5 = 3.79 S.F. **USE 2' WIDE X 2' HIGH THRUST BLOCK**





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12-INCH PIPE

1. Min. Soil Bearing Capacity (PSF) = 1500

2. Min. Working Pressure (PSI) = 200

THRUST FROM NFPA 24 TABLE A.10.6.1(a):

DEAD END = 13,685 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 13,685 = 27,370 LB
 Ab = T/Sb = 27,370 / 1,500 = 18.25 S.F.
 Ab*S.F. = 18.25 X 1.5 = 27.37 S.F. **USE 6' WIDE X 5' HIGH THRUST BLOCK**

90° BEND = 19,353 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 19,353 = 38,706 LB
 Ab = T/Sb = 38,706 / 1,500 = 25.80 S.F.
 Ab*S.F. = 25.80 X 1.5 = 38.71 S.F. **USE 7' WIDE X 6' HIGH THRUST BLOCK**

45° BEND = 10,474 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 10,474 = 20,948 LB
 Ab = T/Sb = 20,948 / 1,500 = 13.97 S.F.
 Ab*S.F. = 13.97 X 1.5 = 20.95 S.F. **USE 5' WIDE X 4.5' HIGH THRUST BLOCK**

22 1/2° BEND = 5,340 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 5,340 = 10,680 LB
 Ab = T/Sb = 10,680 / 1,500 = 7.12 S.F.
 Ab*S.F. = 7.12 X 1.5 = 10.68 S.F. **USE 4' WIDE X 3' HIGH THRUST BLOCK**

11 1/4° BEND = 2,683 LB @ 100 PSI
 FOR 200 PSI = 200 / 100 * 2,683 = 5,366 LB
 Ab = T/Sb = 5,366 / 1,500 = 3.58 S.F.
 Ab*S.F. = 3.58 X 1.5 = 5.37 S.F. **USE 2.5' WIDE X 2.5' HIGH THRUST BLOCK**

