



# 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-8-6.2 A BEND FOR:

**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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## Thrust Block Area Calculations

## 6-INCH PIPE

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

2. Min. Working Pressure (PSI) = 200

### THRUST FROM NFPA 24 TABLE A-8-6.2 A BEND FOR:

**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' WIDE X 1.5' HIGH THRUST BLOCK**



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## Thrust Block Area Calculations

## 8-INCH PIPE

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

2. Min. Working Pressure (PSI) = 200

### THRUST FROM NFPA 24 TABLE A-8-6.2 A BEND FOR:

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**



# CHULA VISTA FIRE DEPARTMENT

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## Thrust Block Area Calculations

## 10-INCH PIPE

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

2. Min. Working Pressure (PSI) = 200

### THRUST FROM NFPA 24 TABLE A-8-6.2 A BEND FOR:

**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**



# CHULA VISTA FIRE DEPARTMENT

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## Thrust Block Area Calculations

## 12-INCH PIPE

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

2. Min. Working Pressure (PSI) = 200

### THRUST FROM NFPA 24 TABLE A-8-6.2 A BEND FOR:

**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 6' WIDE X 7' 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**