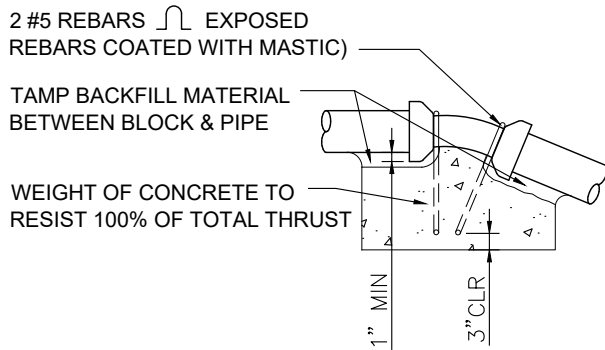


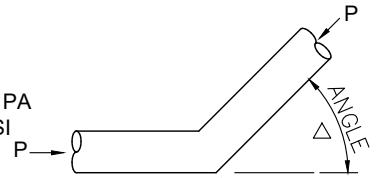
FOR OTHER ANGLES NOT SHOWN, CALCULATE AS REQUIRED.



**NOTES:**

- THRUST BLOCK CONC VOLUMES REQUIRED FOR UPWARD THRUST SHALL BE CALCULATED BY DESIGN ENGINEER.

FOR BENDS:  $R = 2PA \sin \Delta / 2$   
 FOR TEES AND DEAD ENDS:  $R = PA$   
 WHERE: P = TEST PRESSURE, PSI  
 A = PIPE AREA, SQ INCHES



USE THE FORMULA BELOW TO CALCULATE BEARING AREA OF THRUST BLOCKS FOR VERTICAL BENDS WITH DOWNWARD THRUST AND HORIZONTAL BENDS.

AREA THRUST BLOCK (SQ FT) =  $R/S \times D$

IN WHICH:

- R = (FROM FORMULA ABOVE, IN LBS)
- S = ALLOWABLE SOIL PASSIVE PRESSURE IN LB/FT<sup>3</sup>
- D = DISTANCE IN FEET FROM GRADE DOWN TO CENTERLINE OF FITTING FOR HORIZONTAL BENDS; FOR VERTICAL BENDS USE D = 1'-0" FOR CALCULATION REGARDLESS OF DEPTH.

**VERTICAL BEND WITH UPWARD THRUST**

**HORIZONTAL BEND OR VERTICAL BENDS WITH DOWNWARD THRUST**

**NOTES**

- THESE DETAILS SHALL APPLY TO ALL BURIED PRESSURE PIPING WITHOUT WELDED, SOLVENT WELDED, FLANGED, OR RIGID GROOVED END (VICTAULIC) COUPLINGS, AND ALSO ON ALL PIPING WHICH CONTAIN SLEEVE TYPE COUPLINGS OR FLANGE COUPLING ADAPTERS WHICH ARE NOT RESTRAINED AND IN AREAS OF NON-RESTRAINT WALL PENETRATIONS. WHEN REQUIRED, THRUST BLOCKING SHALL BE PROVIDED AT ALL BENDS, TEES, WYES AND DEAD ENDS AS NECESSARY.
- ARROWS (→) INDICATE THRUST DIRECTION.
- CONCRETE FOR THRUST BLOCKS TO BE 6 SACK, 3/4" AGG MAX 3000 PSI.
- CAST CONCRETE THRUST BLOCK AGAINST UNDISTURBED EARTH.
- FIGURE (100%) AT THRUST BLOCK INDICATES PERCENT OF TOTAL THRUST TO BE APPLIED FOR BEARING AREA.
- FITTINGS TO RECEIVE POLYETHYLENE WRAPPING SHALL BE WRAPPED PRIOR TO POURING THRUST BLOCK.
- THRUST BLOCKS FOR VERTICAL BENDS HAVING DOWNWARD RESULTANT THRUSTS SHALL BE THE SAME AS FOR HORIZONTAL BENDS.
- BEARING AREA OF THRUST BLOCK SHALL NOT BE LESS THAN 1.0 SQ. FT.
- USE THE MAXIMUM INTERNAL PRESSURE ANTICIPATED (i.e. HYDROSTATIC TEST PRESSURE).
- ALLOWABLE SOIL PASSIVE PRESSURE (LB/FT<sup>3</sup>) SHALL BE PROVIDED BY GEOTECHNICAL ENGINEER.



**FAIRFIELD-SUISUN SEWER DISTRICT**

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**PUMP STATION AND COLLECTION SYSTEM DESIGN STANDARDS**

**THRUST BLOCK DETAIL**

(DETAIL INTENDED FOR USE BY DESIGN ENGINEER, NOT CONTRACTOR)

DETAIL NO.

**2**

DATE  
 9/21