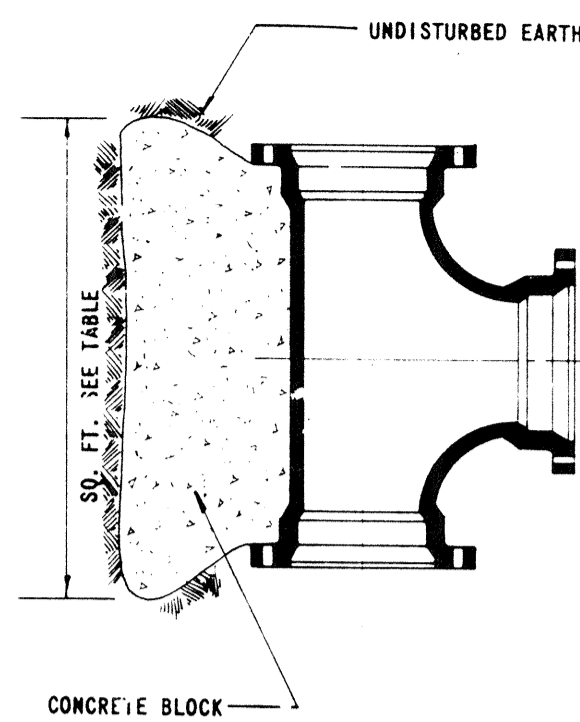


PIPE SIZE	ANCHOR SIZE ¹	TIE BAR DIA.
2"	2' x 2' x 2'	0.25"
3"	2.6' x 2.6' x 2.6'	0.25"
4"	3.1' x 3.1' x 3.1'	0.25"
6"	4' x 4' x 4'	0.375"
8"	4.8' x 4.8' x 4.8'	0.50"
10"	5.6' x 5.6' x 5.6'	0.50"
12"	6.3' x 6.3' x 6.3'	0.625"

NOTES: 1. ANCHOR BLOCKS SIZES DIFFERENT THAN THOSE SHOWN MUST BE APPROVED BY THE ENGINEER.
2. SEE THRUST BLOCK GENERAL NOTES FOR MORE INFORMATION.

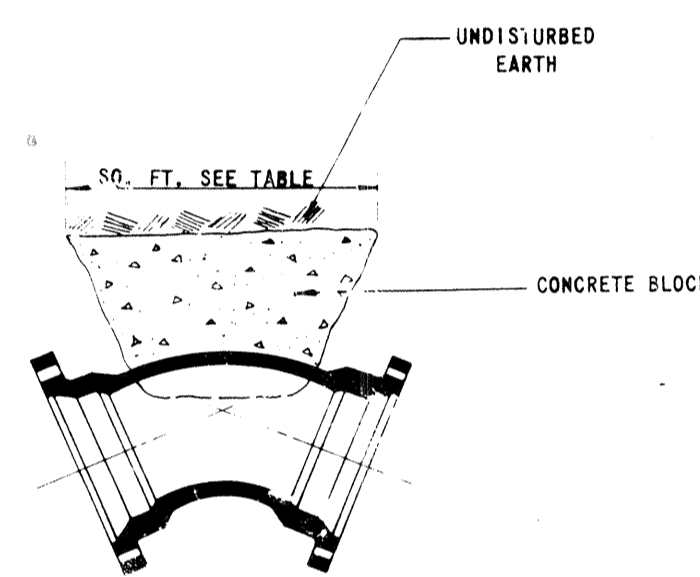
ANCHOR BLOCK 45°/22 1/2° BEND VERTICAL
N.T.S.



PIPE SIZE	TEE
2"	0.8
3"	1.8
4"	3.1
6"	7.1
8"	12.6
10"	19.6
12"	28.3
14"	38.5
16"	50.3

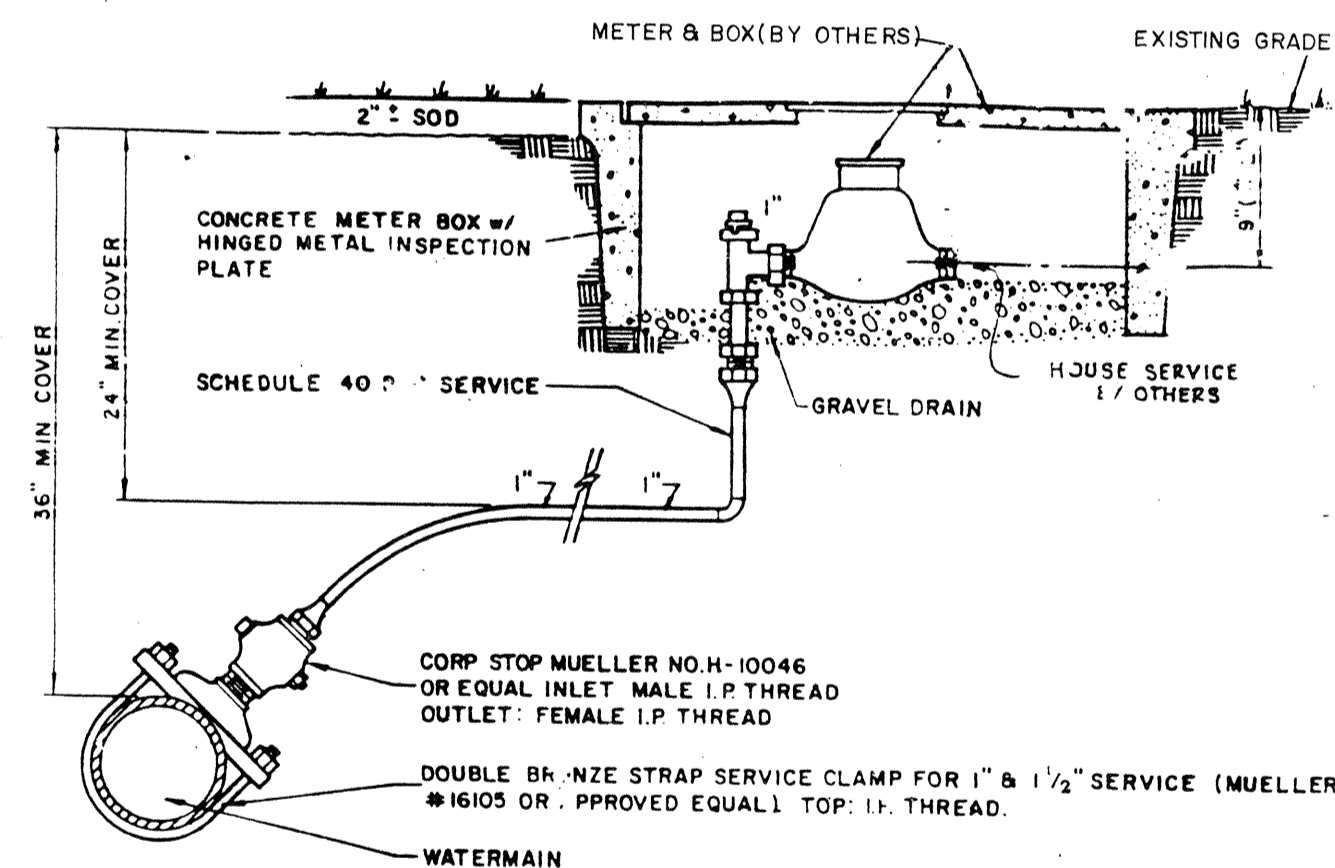
NOTE: SEE THRUST BLOCK GENERAL NOTES THIS SHEET.

THRUST BLOCK TEE
N.T.S.

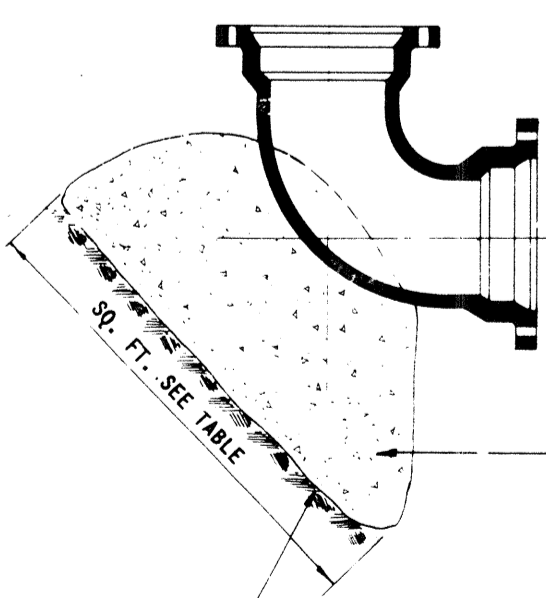


PIPE SIZE	45	22 1/2	11 1/4
2"	0.6	0.3	0.2
3"	1.4	0.7	0.4
4"	2.4	1.2	0.6
6"	5.4	2.8	1.4
8"	9.6	4.9	2.5
10"	15.0	7.7	3.9
12"	21.6	11.0	5.5
14"	29.4	15.0	7.5

THRUST BLOCK 45°/22 1/2°/11 1/4° BEND
N.T.S.

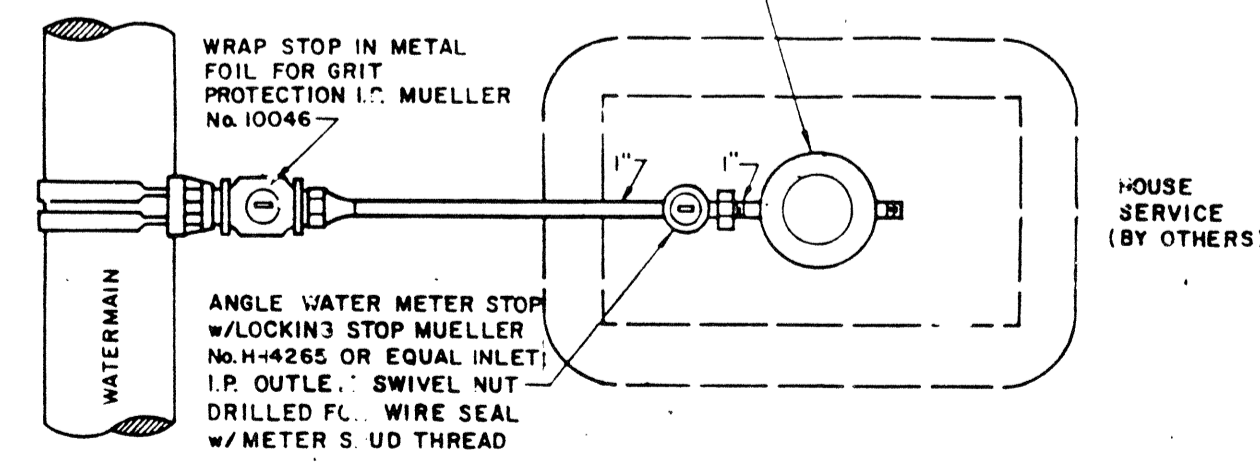


PROFILE



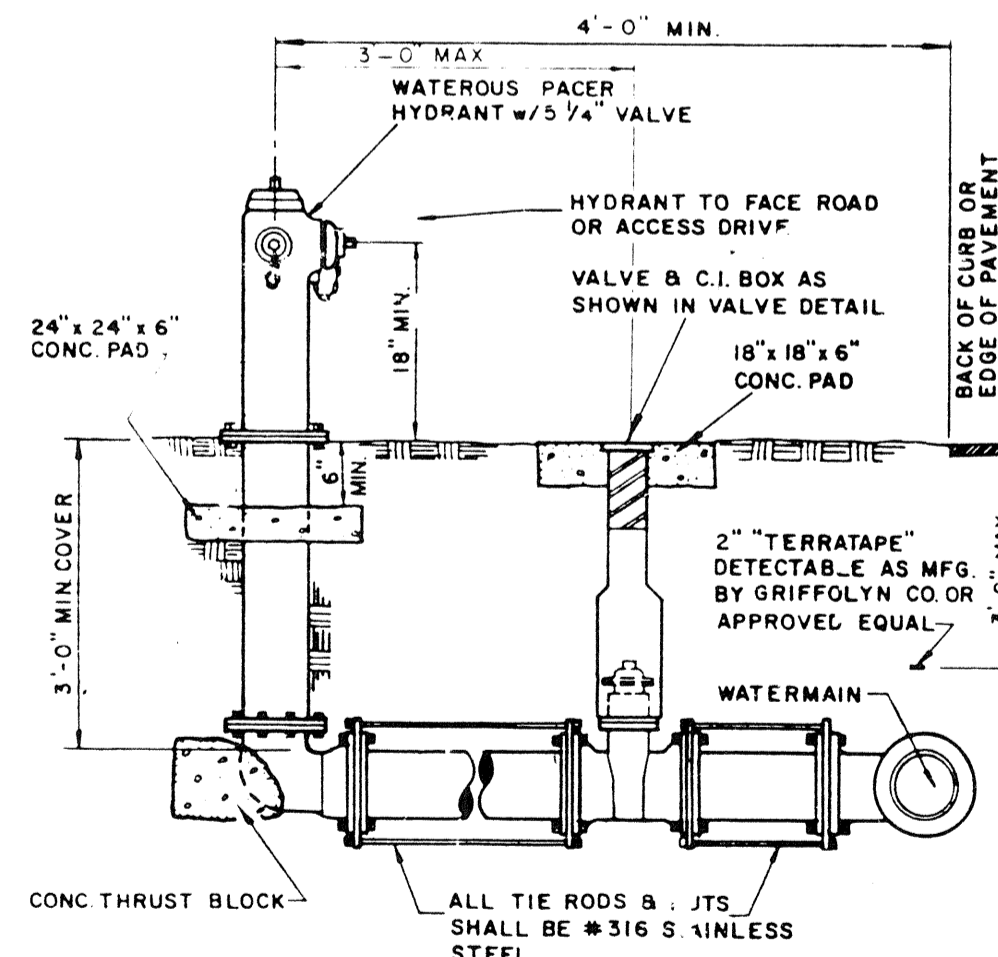
PIPE SIZE	90°
2"	1.1
3"	2.5
4"	4.4
6"	10.0
8"	17.8
10"	27.8
12"	40.0
14"	54.8

THRUST BLOCK 90° BEND
N.T.S.

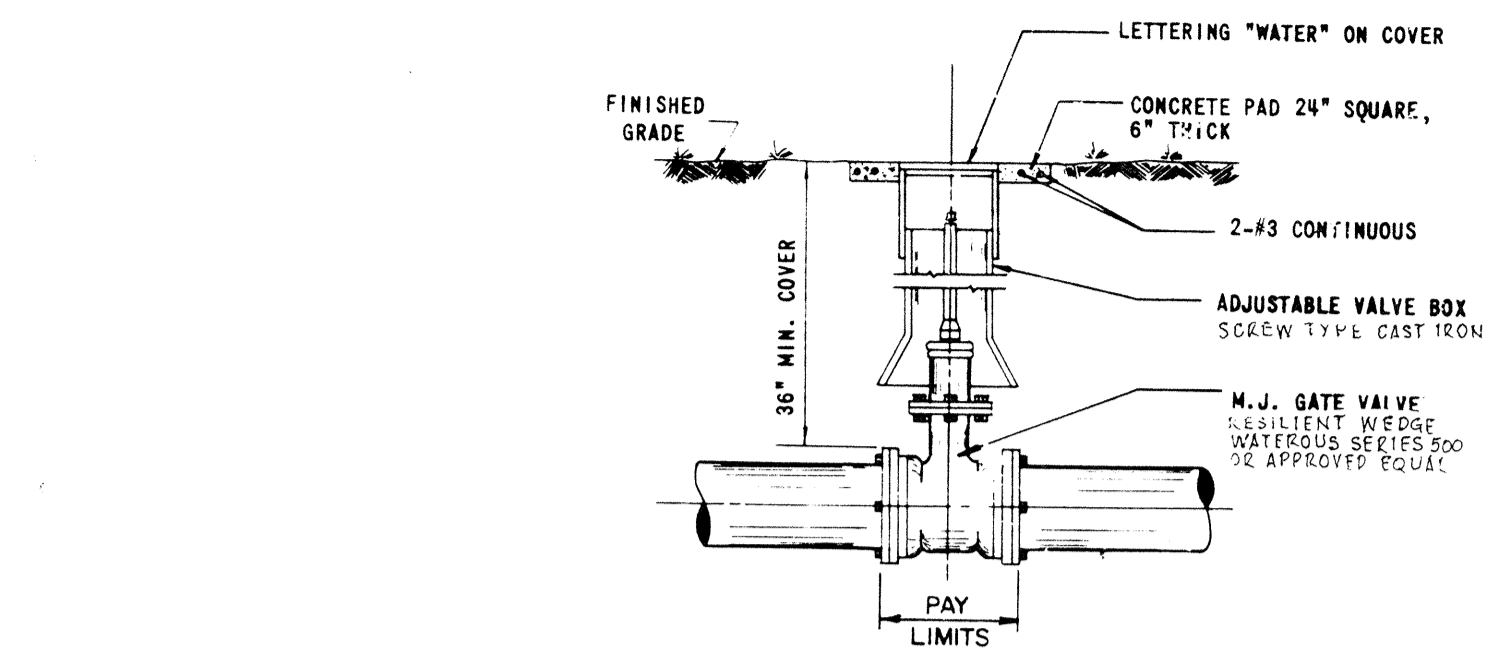


PLAN

TYPICAL METERED SERVICE



TYPICAL FIRE HYDRANT DETAIL
NO SCALE



TYPICAL GATE VALVE & ASSEMBLY DETAIL
N.T.S.

CONSTRUCTION NOTES

- THE FOLLOWING NOTES ARE INTENDED AS A SUPPLEMENT TO THE PROJECT SPECIFICATIONS
- THE CONTRACTOR SHALL INVESTIGATE AND VERIFY OR HAVE VERIFIED THE LOCATION OF UTILITIES BEFORE STARTING WORK. HE SHALL BE LIABLE FOR ANY EXPENSE RESULTING FROM DAMAGE TO SAME. ANY CONFLICTS WITH EXISTING UTILITIES WILL BE BROUGHT TO THE ATTENTION OF THE ENGINEER AS SOON AS POSSIBLE IN ORDER THAT HE MAY VERIFY THE ELEVATION AND LOCATION OF EXISTING CONDITIONS AND TAKE APPROPRIATE ACTION AS REQUIRED.
 - IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO NOTIFY THE CITY UTILITY COMPANIES AND THE ENGINEER 48 HOURS PRIOR TO ANY WORK AT SITE. WATER MAINS REQUIRING WATER SERVICE TO BE SHUT OFF WILL BE MADE DURING DAY OR NIGHT HOURS AS REQUIRED BY LONGBOAT KEY WATER DEPARTMENT.
 - THE WATER MAIN SHALL BE CONSTRUCTED TO THE ELEVATIONS AND DEPTHS AS INDICATED ON THE DRAWINGS, WITHIN 0.25 FT. AND IN GENERAL SHALL HAVE A MINIMUM OF 3 FEET OF COVER BELOW PROPOSED GRADE OR NATURAL GRADE. MINIMUM COVER SHALL BE 4 FT. NECESSARY, WILL BE BORNE BY THE CONTRACTOR.
 - ALL DISTURBED AREAS IN EXISTING LAWNS SHALL BE REPLACED WITH SOD EQUAL TO OR BETTER THAN EXISTING AND OF THE SAME TYPE. SLOPES AND BOTTOM AND OTHER SLOPES SHALL BE SODDED TO ELIMINATE EROSION. RESTORATION DUE TO EROSION OCCURRING PRIOR TO GRASS ROOTING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL WATER AS NECESSARY ALL SODDED AND GRASSED AREAS UNTIL GRASS ROOTS. SEE THE CONTRACT DOCUMENTS FOR ADDITIONAL REQUIREMENTS.
 - ALL PVC WATER MAINS WILL BE WATER BLUE IN COLOR. MYLAR DETECTABLE COLOR TAPE (BLUE) WITH WORDS "CAUTION-BURIED WATER LINE BELOW" WILL BE APPLIED TO ALL WATER MAINS. THE COST FOR COLOR TAPE WILL BE INCLUDED IN THE WATER MAIN PRICES CONTAINED IN THE BID SCHEDULE.
 - FIELD DEFLECTION OF WATER MAINS FROM A STRAIGHT LINE OR GRADE SHALL NOT EXCEED 75 PERCENT OF THE MANUFACTURER'S RECOMMENDED JOINT DEFLECTION. VALVE AND BOX DETAILS
- ALL PROPOSED VALVE BOXES AND METER BOXES SHALL BE ADJUSTED TO FINISHED GRADES AS ESTABLISHED IN THE FIELD. CONCRETE VALVE BOX PADS SHALL BE CONSTRUCTED AS SHOWN ON THE DETAILS. ALL COSTS INVOLVED IN THE APPROPRIATE LINE ITEMS CONTAINED IN THE BID SCHEDULE. NO ADDITIONAL COMPENSATION WILL BE MADE BY THE OWNER.

SERVICE DETAILS

- FOR SERVICE INSTALLATION ON WATER MAINS, A DOUBLE STRAP BRONZE SERVICE SADDLE SHALL BE USED.
- SERVICE CONNECTION TAPS SHALL NOT BE CLOSER THAN 2 FEET APART OR CLOSER THAN 2 FEET TO ANY WATER MAIN CONNECTIONS IN MULTIPLE GROUPS. TAPS SHALL NOT BE MADE IN THE SAME LONGITUDINAL LINE OF THE WATER MAIN, BUT SHALL BE STAGGERED.
- PRESSURE TESTING OF MAINS SHALL INCLUDE ALL SERVICES. NO PLUGS WILL BE USED IN CURB STOPS DURING PRESSURE TESTING.
- 2 INCH OR SMALLER DIAMETER SERVICES SHALL INCLUDE THE SERVICE SADDLE. THE CONNECTION SHALL BE MADE TO THE SERVICE SADDLE. CURB STOP, MYLAR DETECTABLE TAPE AND METER BOX OF THE PROPER SIZE FOR THE METER INTENDED.

FIRE HYDRANT DETAILS

- FIRE HYDRANTS SHALL BE CONSTRUCTED WITH THE "GROUND LINE" SET TO FINISHED GRADES AS ESTABLISHED IN THE FIELD. THE HYDRANT SHALL BE SET TO FINISHED DEPTH OF EACH HYDRANT SETTING AND ORDER THE BARREL SECTION ACCORDINGLY. EXTENSIONS BELOW FINISHED GRADE SHALL BE MADE TO THE HYDRANT ASSEMBLY ALL AT NO ADDITIONAL COST TO THE OWNER. FIRE HYDRANTS SHALL BE PLACED AS SHOWN ON THE DRAWINGS. ALL HYDRANTS SHALL BE WATEROUS PACER (NO EXCEPTIONS).

MAIN FLUSHING

- BLOW-OFFS SHALL BE PROVIDED AND SHALL BE SIZED TO MAINTAIN A CLEANSING VELOCITY DURING FLUSHING OPERATIONS.

METER VAULT DETAILS

- MASTER METERED SERVICES SHALL INCLUDE THE PIPE FROM TEE AT MAIN TO END OF SERVICE, PIPING IN VAULT, AROUND VAULT, VALVES, CHECK VALVES, METER PIT AND INCLUDING ALL APPURTENANCES SHOWN ON THE DRAWINGS REQUIRED TO COMPLY WITH THE WORK FOR THE VARIOUS SIZES AND LOCATIONS AS SHOWN ON THE DRAWINGS.

TRENCH DETAILS

- WHERE WATER MAINS CROSS SEWERS, THEY SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL DISTANCE OF 18 INCHES BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SEWER UNLESS OTHERWISE SHOWN. THIS SHALL BE THE CASE WHERE THE WATER MAIN IS EITHER ABOVE OR BELOW THE SEWER. WHERE THE WATER MAIN IS PARALLEL TO EXISTING OR PROPOSED SEWERS, THE WATER MAINS SHALL BE PARALLEL TO EXISTING OR PROPOSED SEWERS. THE DISTANCE SHALL BE MEASURED EDGE TO EDGE.
- USE OF SHEETING, TRENCH BOX OR OTHER APPROVED METHOD OF SHORING SHALL BE USED IN SITUATIONS WHERE DAMAGE TO ADJACENT UTILITIES, DRAINAGE, ROAD SIDE EMBANKMENT, PAVEMENT OR WERE UNSUITABLE MATERIALS CREATE AN UNSAFE CONDITION. CONSTRUCTION SHALL BE IN PLACE SHALL BE INCLUDED IN THE RESPECTIVE PRICE FOR WATER MAIN INSTALLED.
- MAXIMUM TRENCH WIDTHS SHALL BE OUTSIDE DIAMETER OF PIPE PLUS TWENTY-FOUR INCHES (24").

THRUST BLOCKS, ANCHOR BLOCKS AND JOINT RESTRAINING

- THE CONTRACTOR SHALL PROVIDE ALL THRUST BLOCKING AND JOINT RESTRAINING AS REQUIRED BY THE CONTRACT DOCUMENTS AND THE CONTRACT DOCUMENTS FOR ADDITIONAL INFORMATION.
- AREAS AND DIMENSIONS OF THRUST BLOCKS WILL BE AS SHOWN IN THE DETAILS UNLESS DIRECTED BY THE ENGINEER ACCORDING TO ACTUAL FIELD CONDITIONS, UNLESS DIRECTED BY THE ENGINEER ACCORDING TO ACTUAL FIELD CONDITIONS.
- DESIGN CRITERIA: 150 P.S.I. TEST PRESSURE TIMES 1.87 SAFETY FACTOR (250 P.S.I.) FOR WATER HAMMER WITH ASSUMED SOIL BEARING CAPACITY OF 1000 LBS. PER SQUARE FOOT.
- COMPLETELY COAT TIE-RODS OR OTHER UNCOATED STEEL AFTER INSTALLATION. THE COATING SHALL BE A COAL TAR OR ASPHALT BASE BITUMINOUS RESIN WITH A MINIMUM OF 3 MILS DPT, IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- WRAP ALL PIPE AND FITTINGS IN 8 MIL POLYETHYLENE PRIOR TO PLACING CONCRETE.
- ALL CONCRETE BLOCKING SHALL BE 2500 P.S.I. AT 28 DAYS MINIMUM.
- BLOCKING REQUIREMENTS FOR PLUG OR DEAD END SHALL BE THE SAME AS "TEE" BLOCKING REQUIREMENTS.
- BLOCK FOR TEE SHALL BE CONSTRUCTED IN SIZE FOR THE BRANCH DIAMETER.

AS-BUILTS

- THE CONTRACTOR SHALL LOCATE ALL CROSSES, TEES, WYES, BENDS, VALVES, CURB STOPS, HYDRANTS, STUB-OUTS, BLOW-OFFS, AIR RELEASE VALVES, ETC. BY USING THE "AS-BUILT" METHOD. ALL "AS-BUILT" FEATURES SHALL BE LOCATED AND IDENTIFIED BY THE CONTRACTOR AND PRESENTED TO THE ENGINEER AT THE TIME OF EACH PAY REQUEST. FOR PERMANENT RECORDING, SEWER SERVICES SHALL BE LIKE MANNER.
- THE CONTRACTOR SHALL FURNISH "AS-BUILT" TOP OF PIPE ELEVATIONS OF ALL WATER MAINS AT MAXIMUM INTERVALS OF ONE HUNDRED FEET (100'). ALL FITTINGS AND VALVES AND ALL CHANGES IN GRADE IN ACCORDANCE WITH THE UTILITY DEPT. REQUIREMENTS.

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