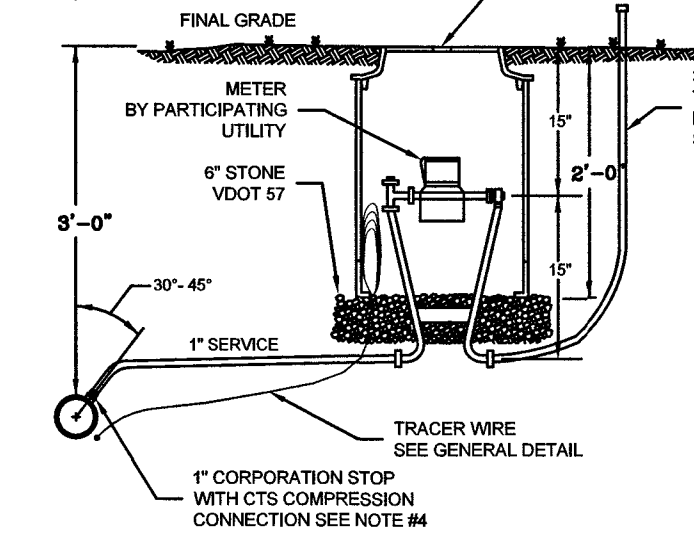
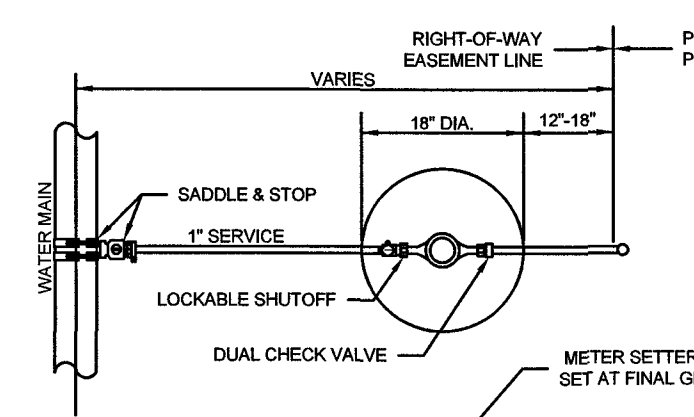


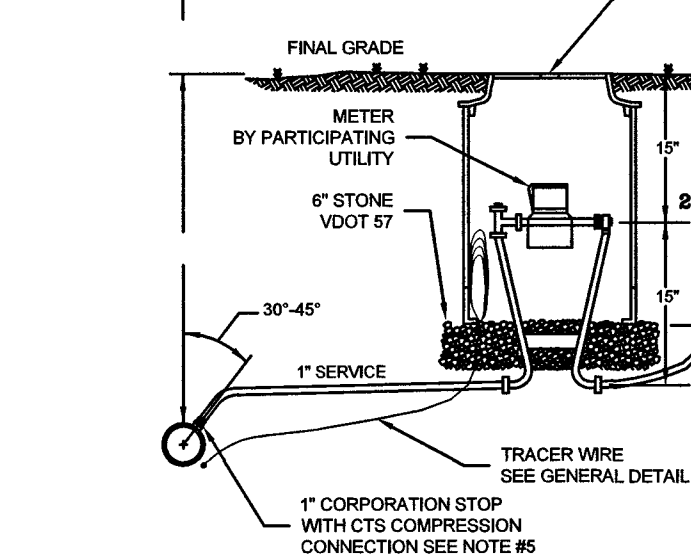
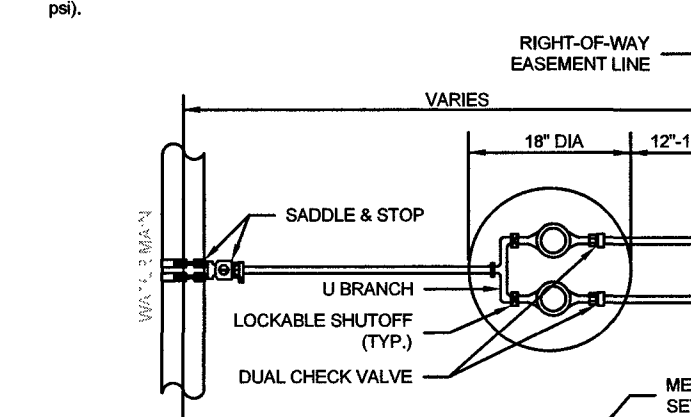
1. SETTER TO BE A.Y. McDONALD 720-215 MDD33, FORD VEH72-15W-11-33 OR APPROVED EQUAL.
2. SADDLES MUST BE USED WITH ALL PLASTIC & DUCTILE IRON PIPE. SERVICE SADDLES SHALL BE USED IN ACCORDANCE WITH WATER DISTRIBUTION PIPING SPECIFICATION. SERVICE SADDLES FOR PLASTIC PIPE SHALL BE POWERSEAL 3417, OR 3412AS, ROMAC 202S, OR 306, OR FORD METER F202 OR F303. FOR DUCTILE IRON PIPE USE THE ABOVE OR POWERSEAL 3413, ROMAC 202 OR FORD METER F202.
3. METER BOX SHALL BE CARSON/MI-STATES PLASTICS, INC. PLASTIC BOX WITH FORD A32-T (ELECTRONIC READ ID), AND CORRUGATED HOPE BOX WITH FORD A32-T (ELECTRONIC READ ID), OR A.Y. McDONALD MODEL 74M24ZT CAST IRON BASE & COVER OR APPROVED EQUAL. METER BOX SHALL NOT BE PLACED IN AREAS SUBJECT TO VEHICULAR TRAFFIC. IF TRAFFIC BEARING BOX IS REQUIRED, DESIGN ENGINEER SHALL CONSULT WITH PARTICIPATING UTILITY TO DETERMINE SITE SPECIFIC REQUIREMENTS.
4. CORPORATION STOP SHALL BE FORD FB1000-4-GAL, MUELLER B-2508 OR APPROVED EQUAL.
5. SERVICE SHALL BE 90° TYPE COPPER, OR COPPER TUBE SIZE POLYETHYLENE (PE) 4710, SODR-9 (200 #).
6. WHENEVER SIDEWALK EXISTS OR IS PROPOSED, MODIFY METER LOCATION AS DIRECTED.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

SINGLE RESIDENTIAL
WATER SERVICE - (NEW DEVELOPMENT)
(LINE PRESSURE UNDER 120 PSI)

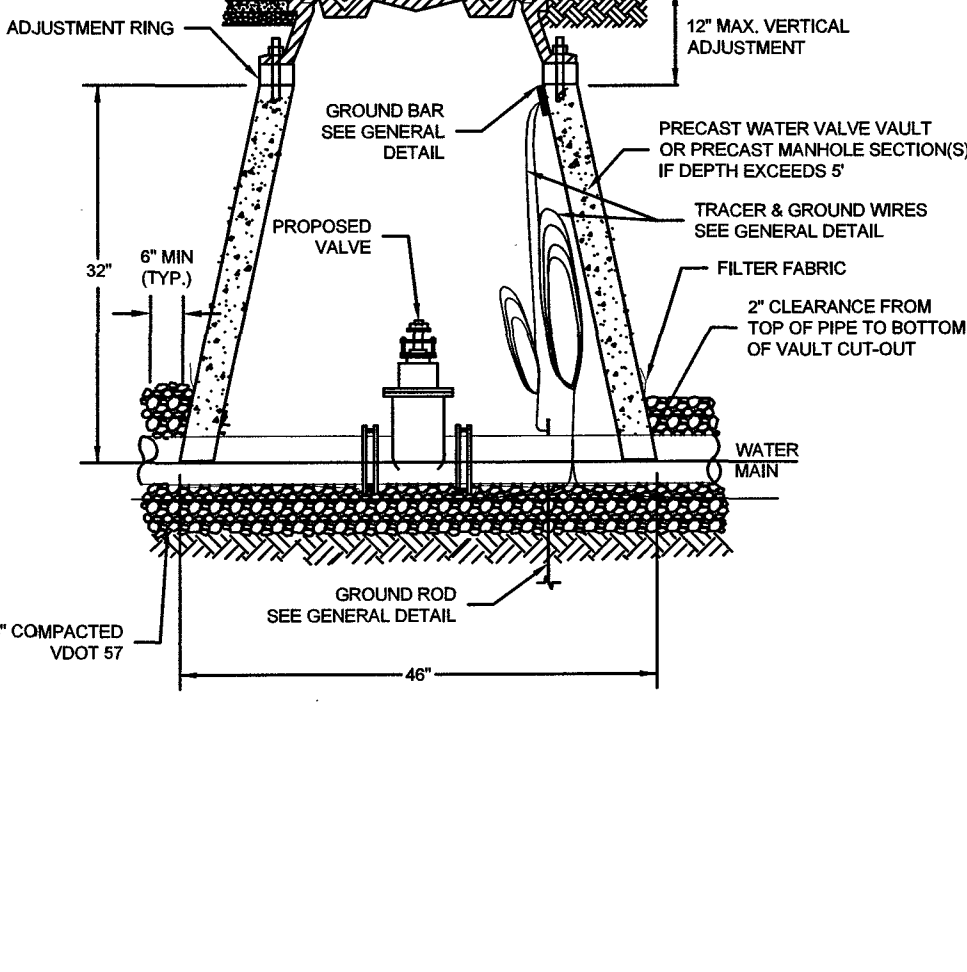
1. SETTER TO BE A.Y. McDONALD 720-215 MDD33, FORD VEH72-15W-11-33 OR APPROVED EQUAL.
2. SADDLES MUST BE USED WITH ALL PLASTIC & DUCTILE IRON PIPE. SERVICE SADDLES SHALL BE USED IN ACCORDANCE WITH WATER DISTRIBUTION PIPING SPECIFICATION. SERVICE SADDLES FOR PLASTIC PIPE SHALL BE POWERSEAL 3417, OR 3412AS, ROMAC 202S, OR 306, OR FORD METER F202 OR F303. FOR DUCTILE IRON PIPE USE THE ABOVE OR POWERSEAL 3413, ROMAC 202 OR FORD METER F202.
3. METER BOX SHALL BE CARSON/MI-STATES PLASTICS, INC. PLASTIC BOX WITH FORD A32-T (ELECTRONIC READ ID), AND CORRUGATED HOPE BOX WITH FORD A32-T (ELECTRONIC READ ID), OR A.Y. McDONALD MODEL 74M24ZT CAST IRON BASE & COVER OR APPROVED EQUAL. USE OF TRAFFIC BEARING BOX SHALL BE APPROVED BY THE AUTHORITY. METER BOX SHALL NOT BE PLACED IN AREAS SUBJECT TO VEHICULAR TRAFFIC. IF TRAFFIC BEARING BOX IS REQUIRED, DESIGN ENGINEER SHALL CONSULT WITH PARTICIPATING UTILITY TO DETERMINE SITE SPECIFIC REQUIREMENTS.
4. WHENEVER SIDEWALK EXISTS OR IS PROPOSED, MODIFY METER LOCATION AS DIRECTED.
5. CORPORATION STOP SHALL BE FORD FB1000-4-GAL, MUELLER B-2508 OR APPROVED EQUAL.
6. SERVICE SHALL BE 90° TYPE COPPER, OR COPPER TUBE SIZE POLYETHYLENE (PE) 4710, SODR-9 (200 #).



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

DOUBLE RESIDENTIAL
WATER SERVICE
(LINE PRESSURE UNDER 120 PSI)

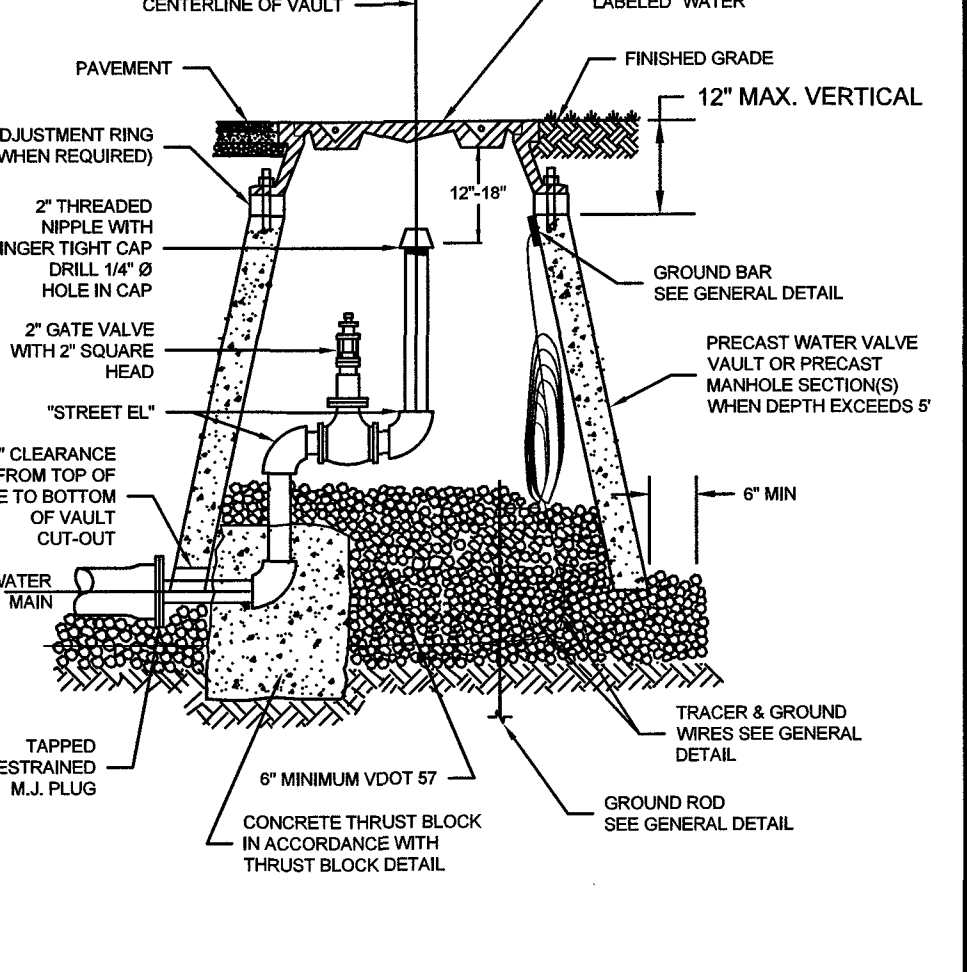
1. FILTER FABRIC TO BE INSTALLED BETWEEN BOTTOM OF PIPE AND STONE BEDDING. FABRIC TO EXTEND VERTICALLY A MINIMUM OF 6" FROM BOTTOM OF VAULT (FULL CIRCUMFERENCE).



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

WATER LINE VALVE
& VAULT

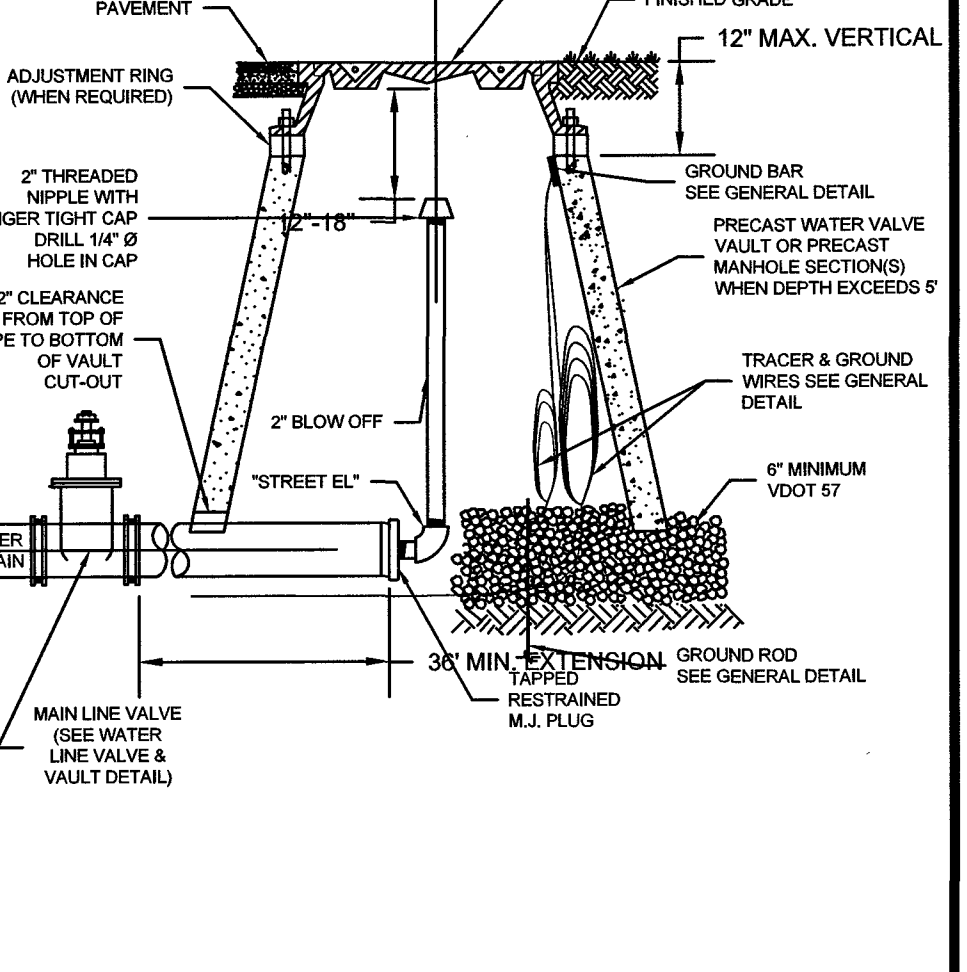
1. WHEN APPROVED BY PARTICIPATING UTILITY, FIRE HYDRANT ASSEMBLIES MAY BE USED AS PERMANENT END OF LINES.
2. DETAIL FOR UP TO 8" MAINS, LARGER LINES SEE WATER SYSTEM DESIGN STANDARDS FOR MIN. FLUSHING VALVE REQUIREMENTS.
3. THE END OF A PIPELINE SHALL NOT TERMINATE IN A PAVED AREA OR UNDER A CONCRETE CURB & GUTTER.
4. THE PIPING AND "STREET EL" SHALL BE LEAD FREE BRASS OR DUCTILE IRON.
5. RESTRAINED JOINTS SHALL BE INSTALLED BEFORE M.J. PLUG FOR DISTANCE SHOWN IN THE "MINIMUM THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTHS" DETAIL FOR VALVE/PLUG AND CORRESPONDING PLUG DETAIL.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

PERMANENT END
OF LINE BLOW-OFF ASSEMBLY

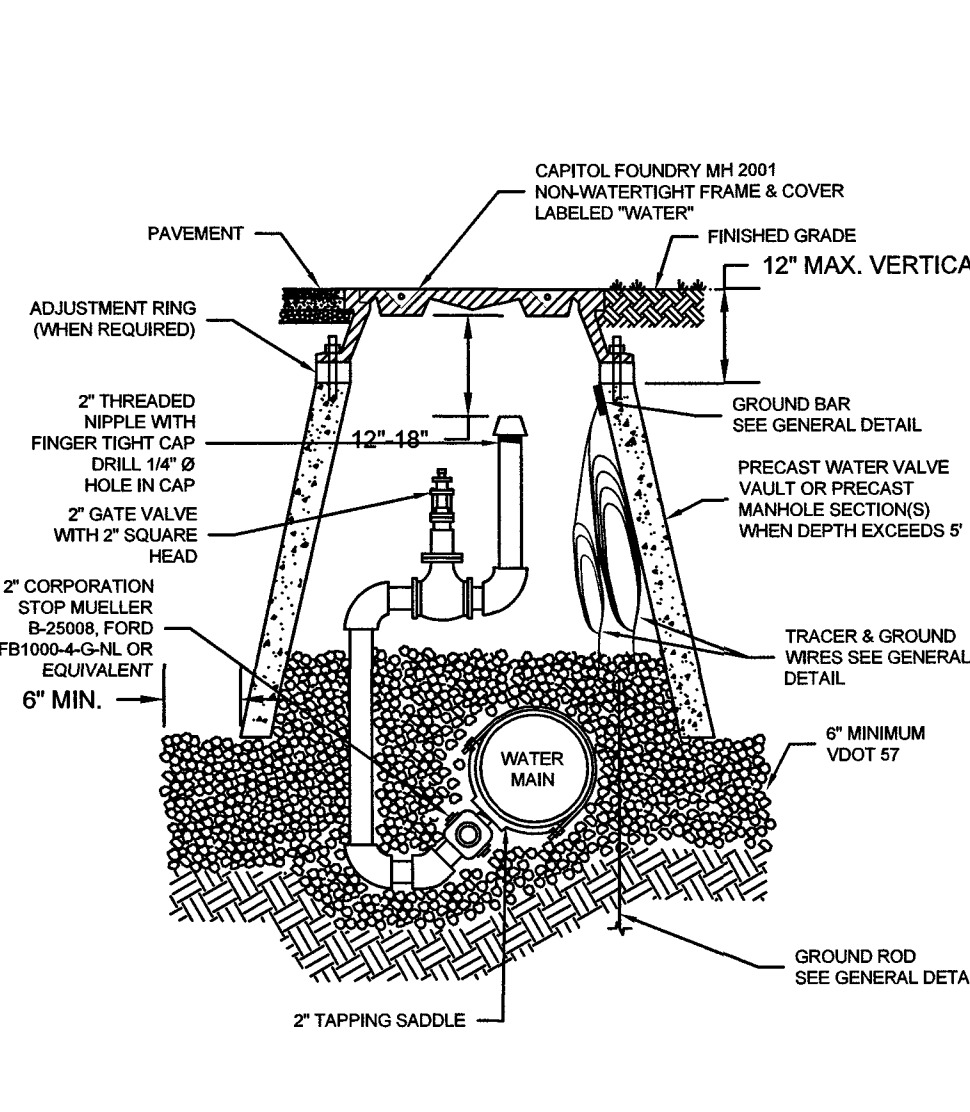
1. THE 2" PIPING AND "STREET EL" SHALL BE LEAD FREE BRASS OR DUCTILE IRON.
2. PIPE JOINTS SHALL BE RESTRAINED BEFORE GATE VALVE IN ACCORDANCE WITH DISTANCE SHOWN IN THE "MINIMUM THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTHS" DETAIL FOR VALVE/PLUG AND CORRESPONDING PLUG DETAIL.
3. PIPE JOINTS BETWEEN GATE VALVE AND BLOWOFF SHALL ALSO BE RESTRAINED.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

TEMPORARY END OF LINE
BLOW-OFF ASSEMBLY

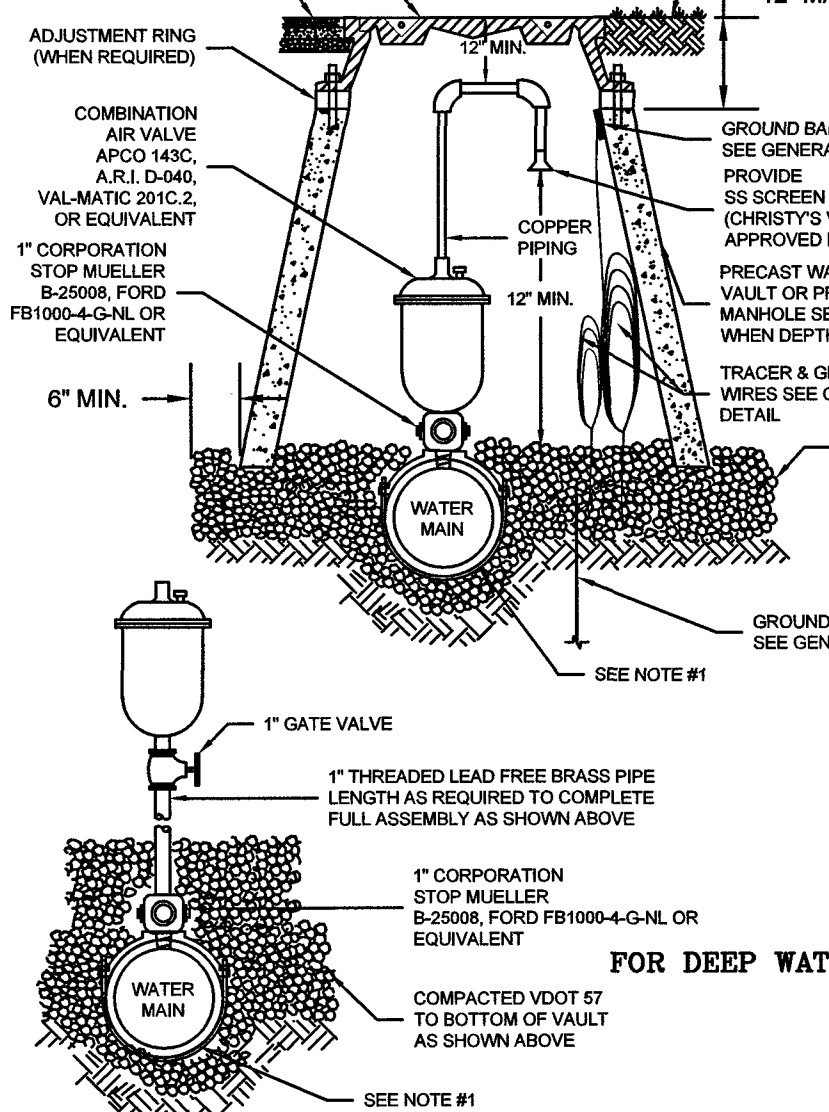
1. FIRE HYDRANTS MAY BE USED AT LOW POINTS IN PLACE OF BLOW-OFFS.
2. THE PIPING AND "STREET EL" BETWEEN CORPORATION STOP AND 2" GATE VALVE SHALL BE LEAD FREE BRASS OR DUCTILE IRON PIPE.
3. THE POINT OF CONNECTION TO THE WATER MAIN SHALL BE LOCATED NEAR THE BOTTOM OF THE MAIN AS SHOWN TO FACILITATE REMOVAL OF ACCUMULATED SEDIMENT.
4. SADDLES FOR PLASTIC PIPE SHALL BE PER RESIDENTIAL WATER SERVICE DETAIL.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

IN-LINE
BLOW-OFF ASSEMBLY

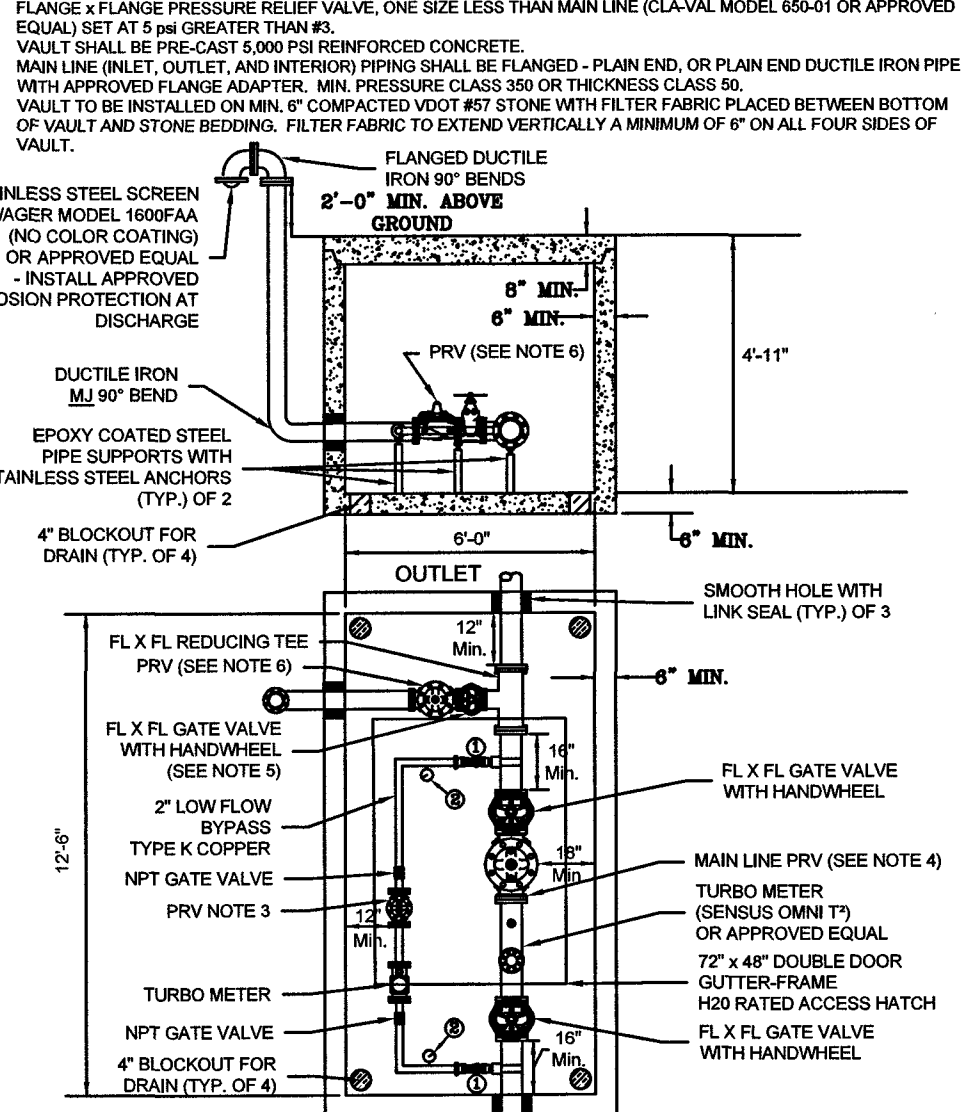
1. SEE RESIDENTIAL WATER SERVICE DETAIL FOR SADDLE REQUIREMENTS.
2. LARGER COMBINATION VALVE MAY BE REQUIRED DEPENDING ON APPLICATION.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

COMBINATION AIR VALVE ASSEMBLY

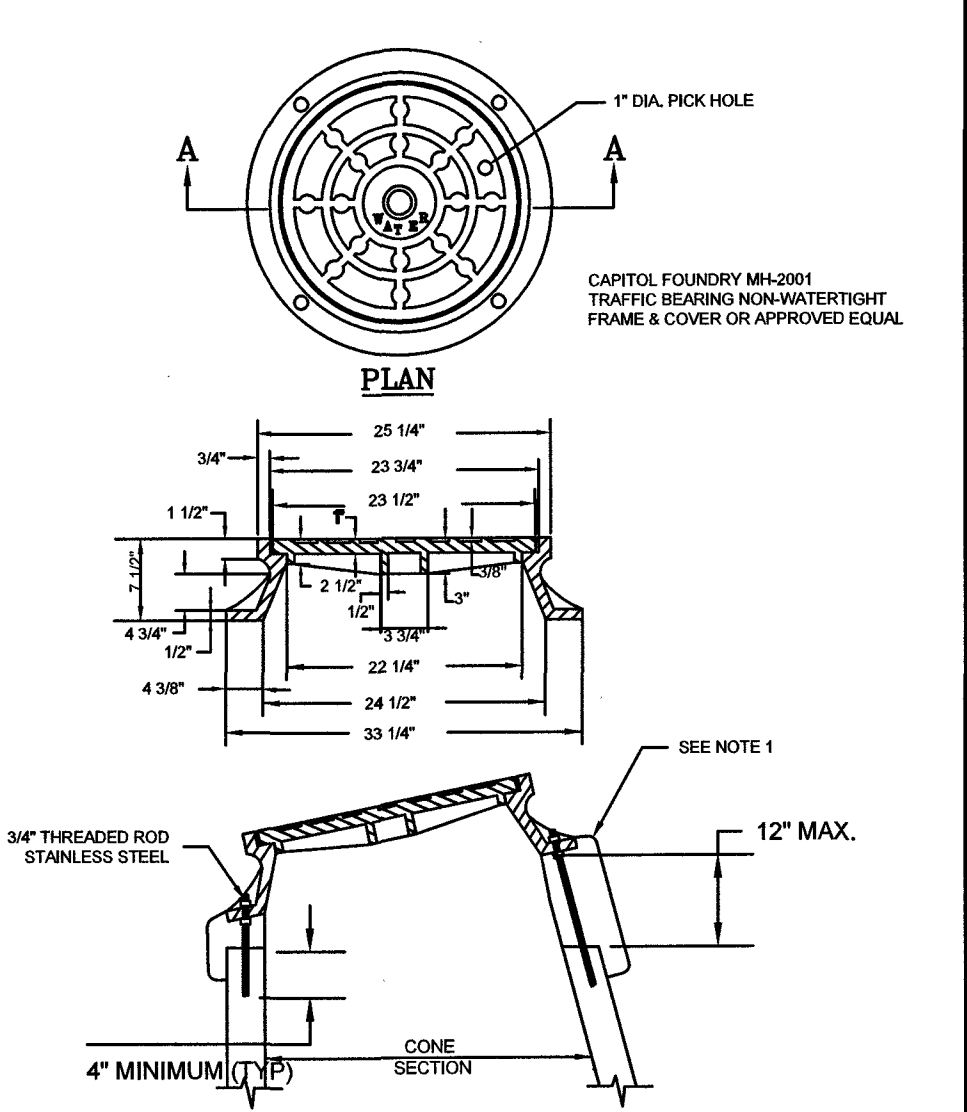
1. CORPORATION STOP MUELLER B-2508, FORD FB1000-4-GAL OR EQUIVALENT.
2. LIQUID FILLED PRESSURE GAUGE.
3. 2" FLANGED PRESSURE REGULATING VALVE (CLAVAL MODEL 90-01 OR APPROVED EQUAL) SET AT WORKING PRESSURE.
4. FLANGE X FLANGE MAIN LINE PRESSURE REGULATING VALVE (CLAVAL MODEL 90-01 OR APPROVED EQUAL) SET AT 5 PSI LESS THAN 8". (CLAVAL 90-01 OR APPROVED EQUAL MAY BE ALLOWED IN SOME INSTALLATIONS, CONFORM WITH PARTICIPATING UTILITY.)
5. FLANGE X FLANGE GATE VALVE, WITH HAND WHEEL, ONE SIZE LESS THAN MAIN LINE.
6. FLANGE X FLANGE PRESSURE RELIEF VALVE, ONE SIZE LESS THAN MAIN LINE (CLAVAL MODEL 90-01 OR APPROVED EQUAL) SET AT 5 PSI GREATER THAN 8".
7. VAULT SHALL BE PRE-CAST 5000 PSI REINFORCED CONCRETE.
8. MAIN LINE INLET, OUTLET, AND INTERIOR PIPING SHALL BE FLANGED - PLAN END, OR PLAN END DUCTILE IRON PIPE WITH APPROVED FLANGE ADAPTER, MIN. PRESSURE CLASS 350 OR THICKNESS CLASS 50.
9. VAULT TO BE INSTALLED ON MIN. 6" COMPACTED VDOT #7 STONE WITH FILTER FABRIC PLACED BETWEEN BOTTOM OF VAULT & STONE BEDDING. FILTER FABRIC TO EXTEND VERTICALLY A MINIMUM OF 6" ON ALL FOUR SIDES OF VAULT.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

MAIN LINE - PRESSURE REDUCING VALVE ASSEMBLY

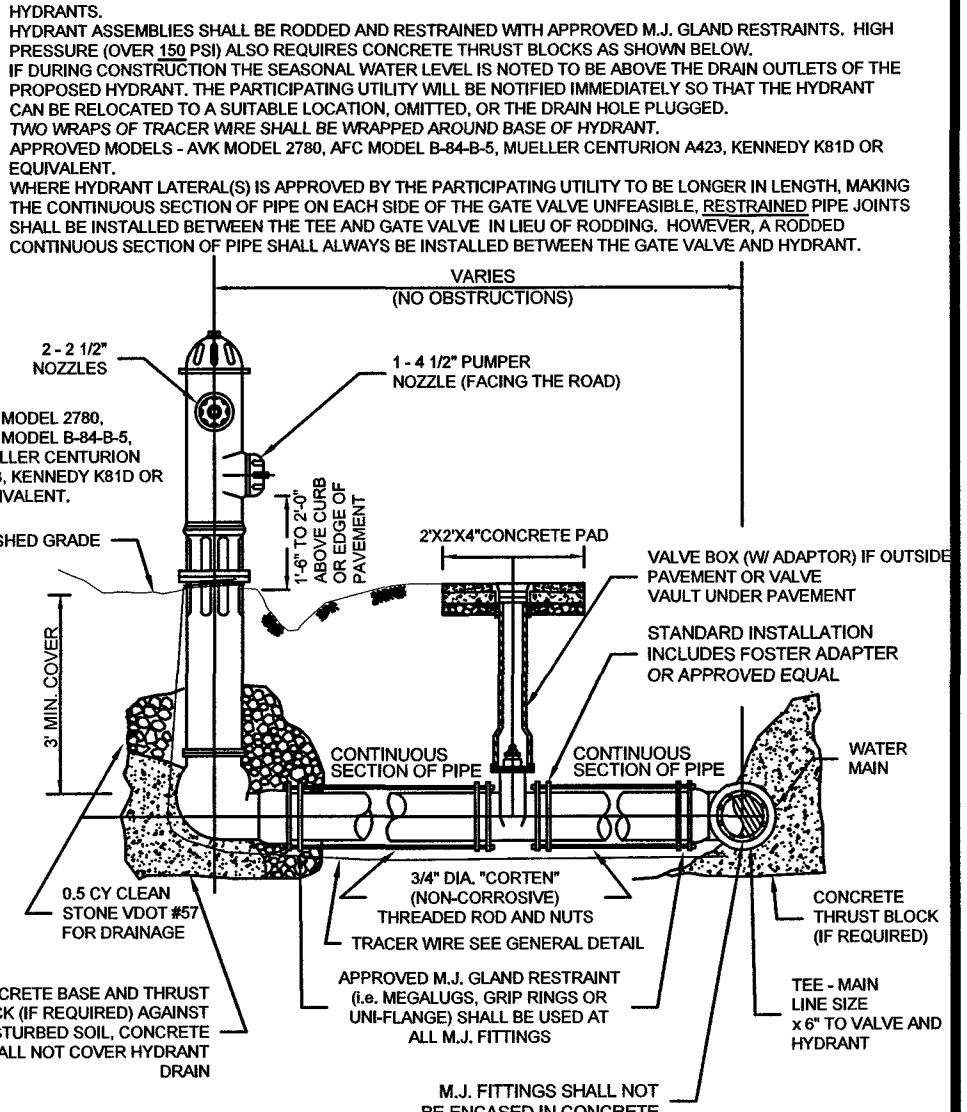
1. USE MODERATELY STIFF MIX OF NON SHRINK GROUT, SAND, AND 1/2" LESS DIAMETER GRAVEL WITH 28 DAYS STRENGTH AT MINIMUM 3,000 P.S.I.
2. MIX TO BE FORCED INTO ALL GROOVES AND UNDER FLANGE OF FRAME AND LEFT AT OR ABOVE TOP OF FLANGE.
3. DO NOT BACKFILL AROUND FRAME AND COVER, FOR 48 HOURS AFTER CONCRETE IS PLACED, THE USE OF HIGH EARLY STRENGTH CEMENT WOULD REDUCE TIME TO (24 HRS.).
4. RESTRAINED TRAFFIC LOAD FOR A MINIMUM OF 24 HOURS.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

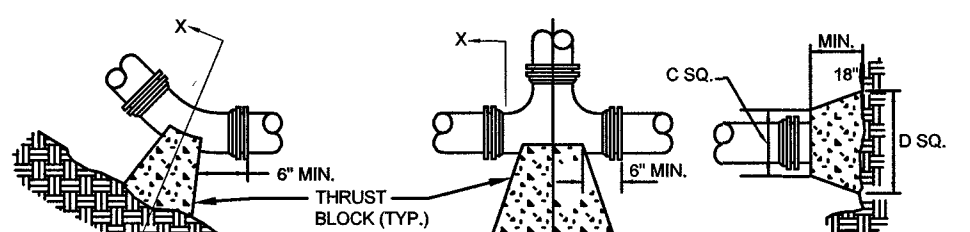
VAULT FRAME
AND COVER

1. PUBLIC HYDRANTS SHALL BE PAINTED SILVER WITH AN OL-BASED PAINT. PRIVATE HYDRANTS SHALL ALSO BE PAINTED SILVER WITH AN OL-BASED PAINT UNLESS OTHERWISE SPECIFIED BY THE JURISDICTIONAL FIRE MARSHAL.
2. FIRE HYDRANT SHALL BE INSTALLED 2' MIN. AND 4' MAX. FROM BACK OF CURB OR 6' MIN. AND 12' MAX. FROM EDGE OF PAVEMENT WHEN CURB IS NOT PRESENT. FIRE HYDRANT TO BE INSTALLED WITHIN RIGHT-OF-WAY OR EASEMENT LINE.
3. AREA AROUND HYDRANT AT A RADIUS OF 4' TO BE LEVEL AND UNOBSERVED.
4. WATERPROOF BAGS OR OUT OF SERVICE RINGS SHALL BE PLACED OVER ALL NEARLY INSTALLED FIRE HYDRANTS.
5. HYDRANT ASSEMBLIES SHALL BE ROOFED AND RESTRAINED WITH APPROVED M.J. GLAND RESTRAINTS. HIGH PRESSURE (OVER 150 PSI) ALSO REQUIRES CONCRETE THRUST BLOCKS AS SHOWN BELOW.
6. IF DURING CONSTRUCTION THE SEAWALL WATER LEVEL IS NOTED TO BE ABOVE THE DRAIN OUTLETS OF THE PROPOSED HYDRANT, THE PARTICIPATING UTILITY WILL BE NOTIFIED IMMEDIATELY SO THAT THE HYDRANT CAN BE RELOCATED TO A SUITABLE LOCATION, OMITTED, OR THE DRAIN HOLE PLUGGED.
7. TWO WIRMS OF TRACER WIRE SHALL BE WRAPPED AROUND BASE OF HYDRANT.
8. APPROVED MODELS - A.W.K. MODEL 2780, A.F.C. MODEL B-848-S, MUELLER CENTURION A423, KENNEDY KH10 OR EQUIVALENT.
9. WHERE HYDRANT LATERALS IS APPROVED BY THE PARTICIPATING UTILITY TO BE LONGER IN LENGTH MAKING THE CONTINUOUS SECTION OF PIPE ON EACH SIDE OF THE GATE VALVE UNDESIRABLE, RESTRAINED PIPE JOINTS SHALL BE INSTALLED BETWEEN THE TEE AND GATE VALVE IN LIEU OF ROOFING. HOWEVER, A ROOFED CONTINUOUS SECTION OF PIPE SHALL ALWAYS BE INSTALLED BETWEEN THE GATE VALVE AND HYDRANT.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

FIRE HYDRANT
ASSEMBLY



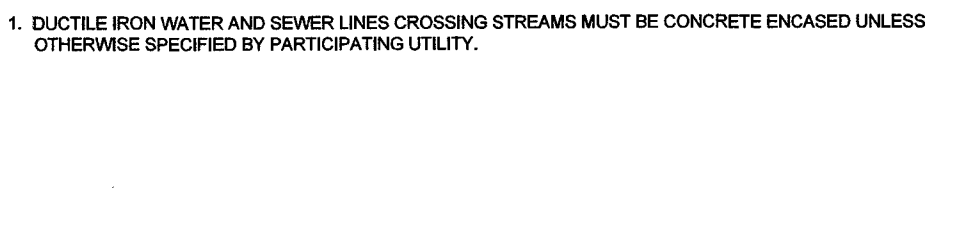
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

THRUST BLOCK
REQUIREMENTS



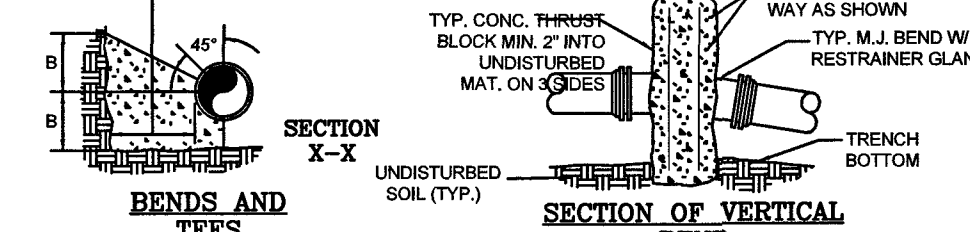
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

MINIMUM THRUST
RESTRAINT OF PIPE JOINTS
DESIGN LENGTHS



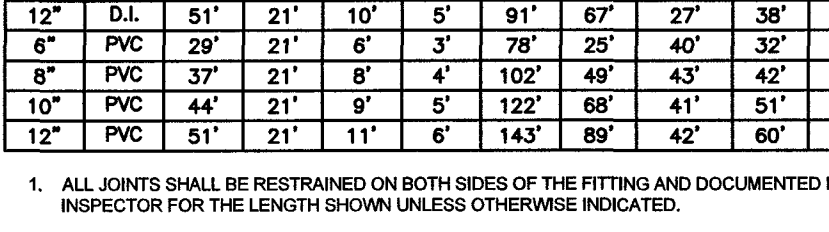
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

CONCRETE ENCASED PIPE



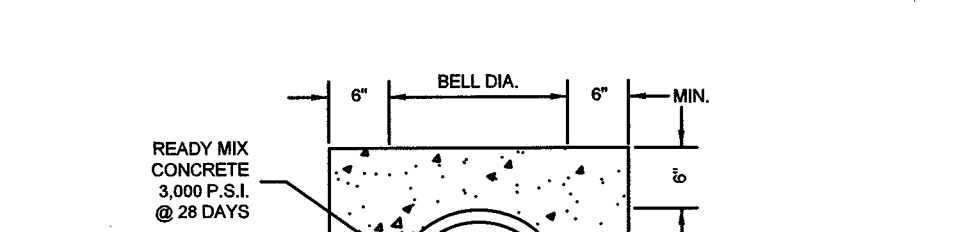
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

PLAN BENDS



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

PLAN AND ELEVATION
PLUGS



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

SECTION OF VERTICAL
BEND

- NOTES
1. FOR VERT. BEND DOWN IN EXCESS OF 11 1/4" BEND ANCHORAGE SHALL BE DESIGNED BY ENGINEER.
 2. FOR VERT. BEND UPWARD, BLOCKING TO BE SIMILAR TO THAT FOR HORIZ. BEND.
 3. GLANDS & BOLTS SHALL BE PROTECTED FROM CONC. WITH PLASTIC SHEETING WHEN POURING THRUST BLOCKS.
 4. ALL THRUST BLOCK & SUPPORT CONCRETE SHALL BE 3000 PSI READY MIX CONCRETE.
 5. THRUST BLOCKS WITH 18" DIMENSION GREATER THAN 10" SHALL HAVE THE RESTRAINED PIPE INSTALLED WITH A MINIMUM OF 4" OF COVER.
 6. REFER TO MINIMUM THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTHS DETAIL FOR WHEN THRUST BLOCKS ARE REQUIRED TO BE USED.
 7. WHEN THRUST BLOCK IS REQUIRED BUT NOT FEASIBLE TO CONSTRUCT, THRUST COLLAR SHALL BE USED. SEE "THRUST COLLAR" DETAIL.

PRESSURE = 200psi
BEARING = 2000psi
FACTOR OF SAFETY = 1.5

PIPE SIZE	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	TEE	PLUG
4"	8"	8"	8"	8"	8"	8"
6"	12"	12"	12"	12"	12"	12"
8"	16"	16"	16"	16"	16"	16"
10"	20"	20"	20"	20"	20"	20"
12"	24"	24"	24"	24"	24"	24"
14"	28"	28"	28"	28"	28"	28"
16"	32"	32"	32"	32"	32"	32"
18"	36"	36"	36"	36"	36"	36"
20"	40"	40"	40"	40"	40"	40"
22"	44"	44"	44"	44"	44"	44"
24"	48"	48"	48"	48"	48"	48"
26"	52"	52"	52"	52"	52"	52"
28"	56"	56"	56"	56"	56"	56"
30"	60"	60"	60"	60"	60"	60"

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

THRUST BLOCK
REQUIREMENTS

FACTOR OF SAFETY = 1.5

PIPE SIZE	PIPE MAT'L	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	TEE (NOTE 4)	REDUCER (NOTE 4)	45° VERT.	22 1/2° VERT.	11 1/4° VERT.
6"	D.I.	28'	21'	6'	3'	50'	26'	26'	21'	10'
8"	D.I.	36'	21'	8'	4'	65'	41'	27'	27'	13'
10"	D.I.	43'	21'	9'	5'	77'	53'	28'	32'	16'
12"	D.I.	51'	21'	10'	6'	91'	67'	33'	38'	18'
6"	PVC	29'	21'	6'	3'	78'	25'	40'	32'	16'
8"	PVC	37'	21'	8'	4'	102'	49'	43'	42'	21'
10"	PVC	44'	21'	9'	5'	122'	66'	41'	51'	25'
12"	PVC	51'	21'	11'	6'	143'	89'	42'	60'	29'

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

MINIMUM THRUST
RESTRAINT OF PIPE JOINTS
DESIGN LENGTHS

1. ALL JOINTS SHALL BE RESTRAINED ON BOTH SIDES OF THE FITTING AND DOCUMENTED BY THE INSPECTOR FOR THE LENGTH SHOWN UNLESS OTHERWISE INDICATED.
2. RESTRAINED LENGTH SHOWN REFERS TO ANY DESIGNED OR POTENTIAL LINE STOP, INCLUDING ALL GATE VALVES.
3. RESTRAINED LENGTH SHOWN REFERS TO THE BRANCH LINE ONLY. THE CONTINUOUS PIPE LENGTH OF THE MAIN RUN SHALL BE A MINIMUM OF 15' ON EACH SIDE OF THE TEE.
4. RESTRAINED LENGTH SHOWN IS BASED ON REDUCING PIPE DIAMETER TO ONE SIZE SMALLER THAN PIPE LISTED (ANY OTHER DIAMETER REDUCTION WILL REQUIRE ADDITIONAL CALCULATIONS BEFORE INSTALLATION). RESTRAINED LENGTH SHOWN IS UPSTREAM ON THE LARGE SIDE OF THE REDUCER.
5. 12" AND SMALLER DIAMETER: IF UNDER 150 PSI WORKING PRESSURE, RESTRAINED JOINT(S) ARE TO BE USED. IF EQUAL TO OR OVER 150 PSI WORKING PRESSURE, BOTH THRUST BLOCK(S) AND RESTRAINED JOINT(S) SHALL BE USED.
6. 12" AND SMALLER DIAMETER: IF UNDER 150 PSI WORKING PRESSURE, RESTRAINED JOINT(S) ARE TO BE USED. IF EQUAL TO OR OVER 150 PSI WORKING PRESSURE, BOTH THRUST BLOCK(S) AND RESTRAINED JOINT(S) SHALL BE USED (UNLESS OTHERWISE APPROVED BY THE PARTICIPATING UTILITY).
7. FOR RESTRAINED JOINT PIPING REQUIREMENTS AT FITTING R.J. PVC AND R.J. DI MAY BE USED INTERCHANGEABLY WITH APPROVAL FROM PARTICIPATING UTILITY. CONTRACTOR MUST PLAN ACCORDINGLY FOR THE DIFFERENCE IN PVC AND DI BELL AND SPIGOT DIMENSIONS.

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

CONCRETE ENCASED PIPE