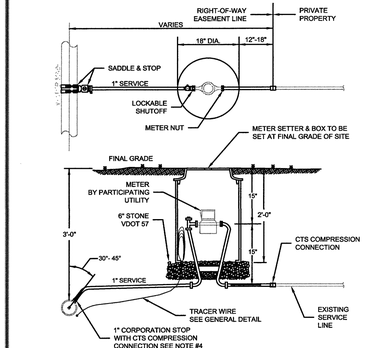
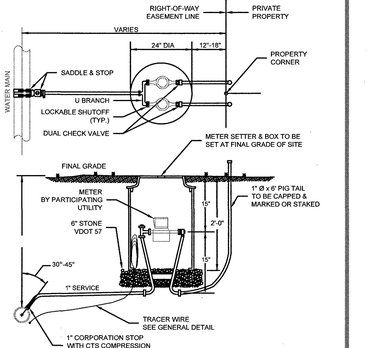
1. SETTER TO BE ® A.Y. McDONALD 720-215WXDD33, FORD VB72-15W-11-33 OR APPROVED EQUAL.
2. SADDLES MUST BE USED WITH ALL PLASTIC DUCTILE IRON PIPE. SERVICE SADDLES SHALL BE USED IN ACCORDANCE WITH WATER DISTRIBUTION PIPING SPECIFICATION. SERVICE SADDLES FOR PLASTIC PIPE SHALL BE: POWERSEAL 3417, OR 3412AS, ROMAC 202S, OR 306, OR FORD METER FS202 OR FS303. FOR DUCTILE IRON PIPE USE THE ABOVE OR POWERSEAL 3413, ROMAC 202 OR FORD METER FJ202.
3. METER BOX SHALL BE CARSONMID-STATES PLASTICS, INC. PLASTIC BOX WITH FORD "A" DOMESTIC SERIES FRAME OR BINGHAM & TAYLOR 180-18 AWEH FRAME WITH A NICOR DOMESTIC 12.25 CX LID WITH SENSUS RECESS, ADS CORRUGATED HDPE BOX WITH FORD "A" DOMESTIC SERIES FRAME OR BINGHAM & TAYLOR 180-18 AWEH FRAME WITH A NICOR DOMESTIC 12.25 CX LID WITH SENSUS RECESS 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.WHENEVER SIDEWALK EXISTS OR IS PROPOSED, MODIFY METER LOCATION AS DIRECTED.
4. CORPORATION STOP SHALL BE FORD FB1000-4-G-NL, MUELLER B-25008 OR APPROVED EQUAL.
5. SERVICE SHALL BE "K" TYPE COPPER, OR COPPER TUBE SIZE POLYETHYLENE (PE) 4710, SDR-9 (200 psi).



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

SINGLE RESIDENTIAL WATER SERVICE (REPLACEMENT OF EXISTING SERVICE) — 05/05/17 — W-2

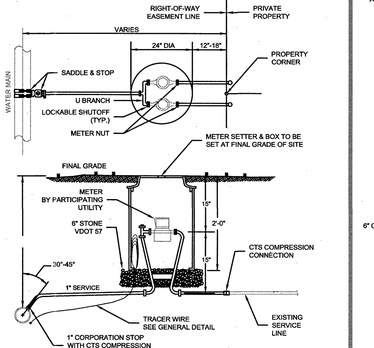
1. SETTER TO BE ® A.Y. McDONALD 720-215 WDD033, FORD VB6H72-15W-11-33 OR APPROVED EQUAL.
2. SADDLES MUST BE USED WITH ALL PLASTIC DUCTILE IRON PIPE. SERVICE SADDLES SHALL BE USED IN ACCORDANCE WITH WATER DISTRIBUTION PIPING SPECIFICATION. SERVICE SADDLES FOR PLASTIC PIPE SHALL BE POWERSEAL 3417, OR 3412AS, ROMAC 202S, OR 306, OR FORD METER FS202 OR FS303. FOR DUCTILE IRON PIPE USE THE ABOVE OR POWERSEAL 3413, ROMAC 202 OR FORD METER FJ202.
3. METER BOX SHALL BE CARSONMID-STATES PLASTICS, INC. PLASTIC BOX WITH FORD "A" DOMESTIC SERIES FRAME OR BINGHAM & TAYLOR 180-18 AWEH FRAME WITH A NICOR DOMESTIC 12.25 CX LID WITH SENSUS RECESS, ADS CORRUGATED HDPE BOX WITH FORD "A" DOMESTIC SERIES FRAME OR BINGHAM & TAYLOR 180-18 AWEH FRAME WITH A NICOR DOMESTIC 12.25 CX LID WITH SENSUS RECESS 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.WHENEVER SIDEWALK EXISTS OR IS PROPOSED, MODIFY METER LOCATION AS DIRECTED.
4. CORPORATION STOP SHALL BE FORD FB1000-4-G-NL, MUELLER B-25008 OR APPROVED EQUAL.
5. SERVICE SHALL BE "K" TYPE COPPER, OR COPPER TUBE SIZE POLYETHYLENE (PE) 4710, SDR-9 (200 psi).



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

DOUBLE RESIDENTIAL WATER SERVICE (LINE PRESSURE UNDER 120 PSI) — 05/05/17 — W-4

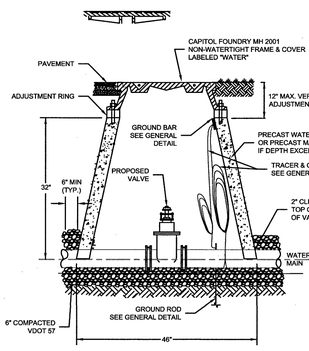
1. SETTER TO BE ® A.Y. McDONALD 720-215 WDD033, FORD VB6H72-15W-11-33 OR APPROVED EQUAL.
2. SADDLES MUST BE USED WITH ALL PLASTIC DUCTILE IRON PIPE. SERVICE SADDLES SHALL BE USED IN ACCORDANCE WITH WATER DISTRIBUTION PIPING SPECIFICATION. SERVICE SADDLES FOR PLASTIC PIPE SHALL BE POWERSEAL 3417, OR 3412AS, ROMAC 202S, OR 306, OR FORD METER FS202 OR FS303. FOR DUCTILE IRON PIPE USE THE ABOVE OR POWERSEAL 3413, ROMAC 202 OR FORD METER FJ202.
3. METER BOX SHALL BE CARSONMID-STATES PLASTICS, INC. PLASTIC BOX WITH FORD "A" DOMESTIC SERIES FRAME OR BINGHAM & TAYLOR 180-18 AWEH FRAME WITH A NICOR DOMESTIC 12.25 CX LID WITH SENSUS RECESS 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.WHENEVER SIDEWALK EXISTS OR IS PROPOSED, MODIFY METER LOCATION AS DIRECTED.
4. CORPORATION STOP SHALL BE FORD FB1000-4-G-NL, MUELLER B-25008 OR APPROVED EQUAL.
5. SERVICE SHALL BE "K" TYPE COPPER, OR COPPER TUBE SIZE POLYETHYLENE (PE) 4710, SDR-9 (200 psi).



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

DOUBLE RESIDENTIAL WATER SERVICE (REPLACEMENT OF EXISTING SERVICE) — 05/05/17 — W-4E

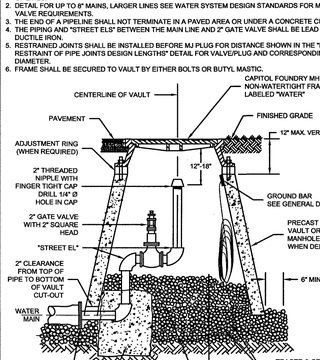
1. FRAME SHALL BE SECURED TO VAULT BY EITHER BOLTS OR BUTYL MASTIC.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

WATER LINE VALVE & VAULT — 01/01/14 — W-9

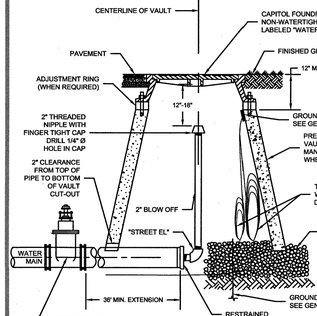
1. WHEN APPROVED BY PARTICIPATING UTILITY, FIRE HYDRANT ASSEMBLIES MAY BE USED AS PERMANENT END OF LINES.
2. DETAIL FOR UP TO 8" MAINS, LARGER LINES SEE WATER SYSTEM DESIGN STANDARDS FOR MIN. FLUSHING VALVE REQUIREMENTS.
3. THE END OF A PIPELINE SHALL NOT TERMINATE IN A PAVED AREA OR UNDER A CONCRETE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



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

PERMANENT END OF LINE BLOW-OFF ASSEMBLY — 02*10/15 — W-10

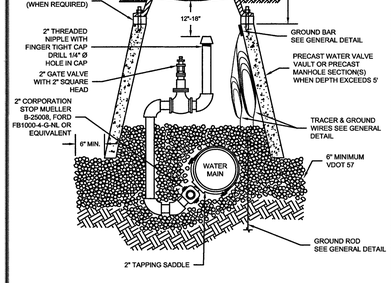
1. THE 2" PIPING AND "STREET EL" SHALL BE LEAD FREE BRASS OR DUCTILE IRON.
2. PIPE JOINTS SHALL BE RESTRAINED BEFORE GATE VALVE IN ACCORDANCE WITH DISTANCE SHOWN IN THE "MINIMUM THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTHS" DETAIL FOR VALVE / PLUG. PIPE JOINTS BETWEEN GATE VALVE AND BLOWOFF SHALL ALSO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



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

TEMPORARY END OF LINE BLOW-OFF ASSEMBLY — 01/01/14 — W-11

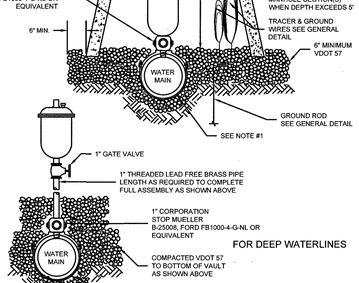
1. FIRE HYDRANTS MAY BE USED AT LOW POINTS IN PLACE OF BLOW-OFFS.
2. THE PIPING AND "STREET ELS" BETWEEN CORPORATION STOP AND 2" GATE VALVE SHALL BE LEAD FREE BRASS OR DUCTILE IRON PIPE.
3. THE POINT OF CONNECTION TO THE WATER MAIN SHALL BE LOCATED NEAR THE BOTTOM OF THE MAIN (AS SHOWN) TO FACILITATE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



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

IN-LINE BLOW-OFF ASSEMBLY — 02/10/15 — W-12

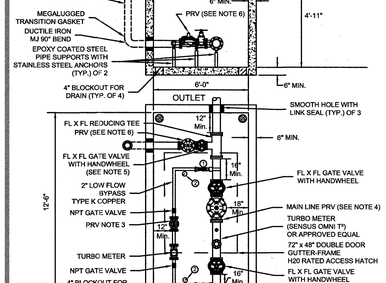
1. SEE RESIDENTIAL WATER SERVICE DETAIL FOR SADDLE REQUIREMENTS.
2. LARGER COMBINATION VALVE MAY BE REQUIRED DEPENDING ON APPLICATION.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

COMBINATION AIR VALVE ASSEMBLY — 02/10/15 — W-13

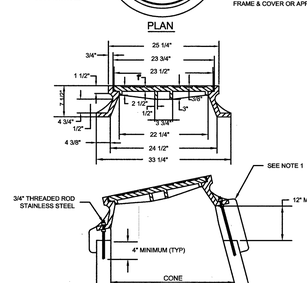
1. 2" CORPORATION STOP, MUELLER B-25008, FORD FB1000-4-G-NL OR EQUIVALENT.
2. LIQUID FILLED PRESSURE GAUGE.
3. 2" FLANGED PRESSURE REGULATING VALVE (CLA-VAL MODEL 90-01 OR APPROVED EQUAL) SET AT WORKING PRESSURE.
4. FLANGE x FLANGE MAIN LINE PRESSURE REGULATING VALVE (CLA-VAL MODEL 90-01 OR APPROVED EQUAL) SET AT 5 psi LESS THAN #3. (CLA-VAL 690-01 OR APPROVED EQUAL) MAY BE ALLOWED IN SOME INSTALLATIONS, CONFIRM 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 (CLA-VAL MODEL 650-01 OR APPROVED EQUAL) SET AT 5 psi GREATER THAN #3.
7. VAULT SHALL BE PRE-CAST 5,000 PSI REINFORCED CONCRETE.
8. MAIN LINE (INLET, OUTLET, AND INTERIOR) PIPING SHALL BE FLANGED - PLAIN END, OR PLAIN 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 #57 STONE.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

MAIN LINE - PRESSURE REDUCING VALVE ASSEMBLY — 1/28/16 — W-14

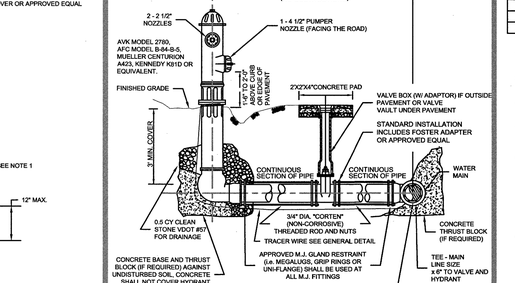
1. USE MODERATELY STIFF MIX OF NON SHRINK GROUT, SAND, AND 1/2" AND LESS DIAMETER GRAVEL WITH 28 DAYS, STRENGTH AT MINIMUM 3,000 PSI.
2. MIX IS TO BE FORCED INTO ALL GROOVES AND UNDER FLANGE OF FRAME AND LEFT AT OR ABOVE TOP OF FLANGE.
3. DO NOT BACKFILL AROUND FRAME AND COVER, FOR 48 HOURS AFTER CONCRETE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



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

VAULT FRAME AND COVER — 01/01/14 — W-16

1. PUBLIC HYDRANTS SHALL BE PAINTED SILVER WITH AN OIL-BASED PAINT. PRIVATE HYDRANTS SHALL ALSO BE PAINTED SILVER WITH AN OIL-BASED PAINT UNLESS OTHERWISE SPECIFIED BY THE JURISDICTIONAL FIRE MARSHALL.
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 UNOBSTRUCTED.
4. WATERPROOF BAGS SHALL BE PUT OUT OF SERVICE RINGS SHALL BE PLACED OVER ALL NEWLY INSTALLED FIRE HYDRANTS.
5. HYDRANT ASSEMBLIES SHALL BE RODDED 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 SEASONAL 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 WRAPS OF TRACER WIRE SHALL BE WRAPPED AROUND BASE OF HYDRANT.
8. APPROVED MODELS - AVK MODEL 2780, AFC MODEL B-84-B-S, MUELLER CENTURION A423, KENNEDY K81D OR EQUIVALENT.
9. WHERE HYDRANT LATERAL(S) IS APPROVED BY THE PARTICIPATING UTILITY TO BE LONGER IN LENGTH, MAKING THE CONTINUOUS SECTION OF PIPE ON EACH SIDE OF THE GATE VALVE UNFEASIBLE, RESTRAINED PIPE JOINTS SHALL BE INSTALLED BETWEEN THE TEE AND GATE VALVE IN LIEU OF RODDING. HOWEVER, A RODDED CONTINUOUS SECTION OF PIPE SHALL ALWAYS BE INSTALLED BETWEEN THE GATE VALVE AND HYDRANT.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

FIRE HYDRANT ASSEMBLY — 02/10/15 — W-17

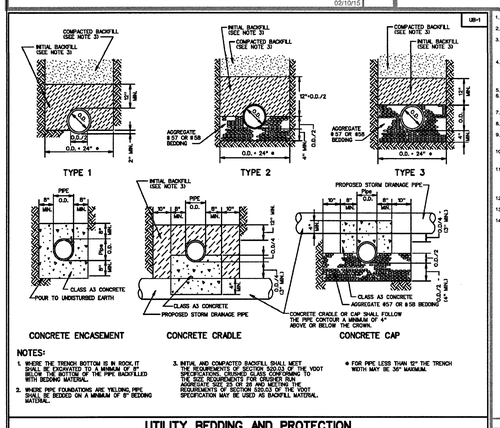
PIPE SIZE	PIPE MAT'L	90° BEND	45° BEND	22 ½° BEND	11 ¼° BEND	VALVE / PLUG END/TEE	TEE END/90° BEND	REDUCER ONLY/TEE 45°	45° VERT.	22 ½° VERT.	11 ¼° VERT.
						FACTOR OF SAFETY = 1.5					
6"	D.I.	28'	21'	6'	3'	50'	26'	26'	21'	10'	5'
8"	D.I.	36'	21'	8'	4'	65'	41'	27'	27'	13'	7'
10"	D.I.	43'	21'	9'	5'	77'	53'	26'	32'	16'	8'
12"	D.I.	51'	21'	10'	5'	91'	67'	27'	38'	18'	9'
6"	PVC	29'	21'	6'	3'	78'	25'	40'	32'	16'	8'
8"	PVC	37'	21'	8'	4'	102'	49'	43'	42'	21'	10'
10"	PVC	44'	21'	9'	5'	122'	68'	41'	51'	25'	12'
12"	PVC	51'	21'	11'	6'	143'	89'	42'	60'	29'	15'

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 10' 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.

   LARGER THAN 12" DIAMETER: IF UNDER 100 PSI WORKING PRESSURE, RESTRAINED JOINT(S) ARE TO BE USED. IF EQUAL TO OR OVER 100 PSI WORKING PRESSURE, BOTH THRUST BLOCK(S) AND RESTRAINED JOINT(S) SHALL BE USED (UNLESS OTHERWISE APPROVED BY THE PARTICIPATING UTILITY).
6. FOR RESTRAINED JOINT PIPING REQUIREMENTS AT FITTING R.J. PVC AND R.J. DIP MAY BE USED INTERCHANGEABLY WITH APPROVAL FROM PARTICIPATING UTILITY. CONTRACTOR MUST PLAN ACCORDINGLY FOR THE DIFFERENCE IN PVC AND DIP BELL AND SPIGOT DIMENSIONS.

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

MINIMUM THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTHS — 07/10/15 — W-19



NOTES:

1. WHERE THE TRENCH BOTTOM IS IN ROCK, IT SHALL BE EXCAVATED TO A MINIMUM OF 6" BELOW THE BOTTOM OF THE PIPE BACKFILLED WITH BEDDING MATERIAL.
2. WHERE PIPE FOUNDATIONS ARE YIELDING PIPE SHALL BE BEDDED ON A MINIMUM OF 6" BEDDING MATERIAL.
3. BATH AND CONPACTED BACKFILL SHALL MEET THE REQUIREMENTS OF SECTION 303.03 OF THE VDOT SPECIFICATIONS. CRUSHED GLASS CONFORMING TO THE SIZE REQUIREMENTS FOR CRUSHER RUN AGGREGATE SIZE 21A OR 21B OF THE VDOT SPECIFICATIONS MAY BE USED AS BACKFILL MATERIAL.
4. ★ FOR PIPE LESS THAN 15" THE TRENCH WIDTH MAY BE 24" MAXIMUM.

UTILITY BEDDING AND PROTECTION
WATER AND SANITARY SEWER FACILITIES
VIRGINIA DEPARTMENT OF TRANSPORTATION
REV 8/07 — 1401.01

1. TRACER WIRES SHALL BE INSTALLED USING MANHOLES, TRACER WIRE ACCESS BOXES, VALVE BOXES OR VAULTS, WATER METERS AND FIRE HYDRANTS AS ACCESS POINTS.
2. FOR WATER AND SEWER INSTALLED BY OPEN TRENCHING, HORIZONTAL DIRECTIONAL DRILLING, OR PIPE BURSTING, TRACER WIRE SHALL BE PLACED ALONG THE TOP OF THE PIPE FOR THE ENTIRE LENGTH OF THE LAST IRON TRACER WIRE ACCESS BOX.
3. SPLICES SHALL ONLY BE MADE WITH GEL FILLED CONNECTORS DESIGNED FOR WIRE WITH A NYLON POLYESTER FIBER CORE SUCH AS KEPTCO TRACE-SAFE WATER BLOCKING CONNECTORS OR APPROVED EQUAL. SPLICES SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING CONTINUITY AT ALL SPLICE LOCATIONS.
4. TRACER WIRE SHALL BE INSTALLED WITHOUT STEEL CASING PIPE, SUCH AS A DIRECTIONALLY DRILLED CROSSINGS, AND CONNECTED TO DUCTILE IRON PIPE ON EACH END, TRACER WIRE SHALL BE INSTALLED ALONG FULL LENGTH OF NON-IRON PIPE WITH AN ACCESS POINT INSTALLED AT EACH HDPE/DUCTILE IRON TRANSITION. TRACER WIRE SHALL BE CONNECTED TO THE ACCESS POINT IN ACCORDANCE WITH THIS DETAIL. ANY TRANSITION FROM DUCTILE IRON MAIN TO NON-DUCTILE IRON MAIN SHALL HAVE AN ACCESS POINT TO BEGIN TRACER WIRE.
5. TRACER WIRE SHALL BE INSTALLED IN SAME LOCATION AND ACCESS POINT(S), ALONG WITH BUTT SPLICE LOCATIONS.
6. THE TRACER WIRE SHALL BE PLACED ALONG THE LOWER QUADRANT OF THE PIPE. THE WIRE SHALL NOT TOUCH THE PIPE, BUT SHALL BE A MAXIMUM OF 6" FROM THE PIPE. NON-METALLIC SPACERS MAY BE USED TO MAINTAIN A SET DISTANCE FROM THE UTILITY.
7. WIRE SHALL BE BROUGHT TO THE SURFACE EVERY **FIVE-HUNDRED (500) FEET** AND PLACED IN A WATER METER BOX OR A TRACER WIRE ACCESS BOX. THE WIRE SHALL BE PLACED ALONG THE LAST IRON TRACER WIRE ACCESS BOX.
8. THE TRACER WILL BE TESTED BY THE PARTICIPATING UTILITY AS PART OF THE PROJECT'S FINAL ACCEPTANCE. CONTRACTOR WILL BE RESPONSIBLE FOR ENSURING ALL CONTINUITY OF TRACER WIRE.
9. THE GROUND WIRE SHALL BE #8 AWG COPPER WIRE AND SHALL BE OF ADEQUATE LENGTH TO EXTEND A MINIMUM OF (5) FIVE FEET BEYOND THE TOP OF THE STRUCTURE. THE END OF THE G