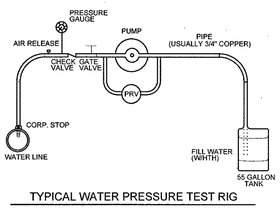
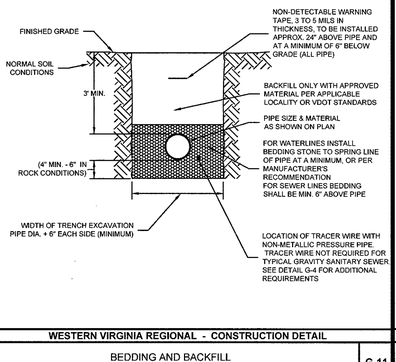


TYPICAL WATER PRESSURE TEST RIG

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

TYPICAL WATER PRESSURE TEST RIG — W-20 — 01/01/14

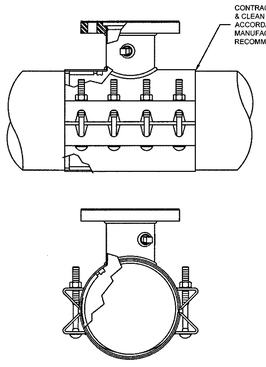
1. BEDDING, HAUNCHING AND INITIAL BACKFILL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THIS DETAIL AND MANUFACTURER'S RECOMMENDATION.
2. ALL PVC PIPE SHALL BE BEDDED IN COMPACTED VDOT #57 OR #68 STONE, OR CRUSHER RUN.
3. IN AREAS SUBJECTED TO VEHICULAR TRAFFIC, BEDDING STONE AND FILL SHALL BE PLACED IN 6" LIFTS FROM BOTTOM OF TRENCH TO 1' ABOVE THE PIPE AND THE REMAINING SHALL BE PLACED IN 10" LIFTS AND SHALL BE COMPACTED TO AT LEAST 90% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D 698.
4. BEDDING REQUIREMENTS FOR DUCTILE IRON WATER LINE ARE DEPENDENT ON MANUFACTURER'S BEDDING CRITERIA.
5. ALL EXCAVATIONS SHALL COMPLY WITH OSHA TECHNICAL MANUAL, CHAPTER 2, TITLED "EXCAVATIONS: HAZARD RECOGNITION IN TRENCHING AND SHORING."
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.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

BEDDING AND BACKFILL OUTSIDE OF PAVED AREAS — G-11 — 08/01/15

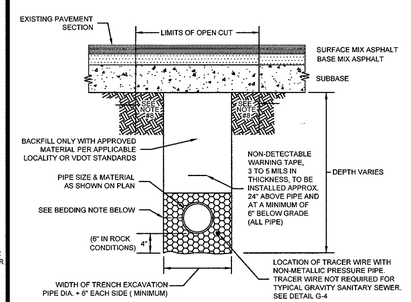
1. TAPPING SLEEVE SHALL BE POWERSEAL MODEL 3490 TYPE 304 STAINLESS STEEL WITH CARBON STEEL FLANGE, ROMAC'S MODEL SST III, FORD MODEL FTSS WITH CARBON STEEL FLANGE OR APPROVED EQUIVALENT. SLEEVE SHALL BE RATED AT 100 PSI OVER WORKING PRESSURE AND MUST HAVE A TEST PLUG.
2. TAPPING VALVE SHALL BE AVK RESILIENT SEATED GATE VALVE SERIES 25 MJFL, MUELLER T-2360 RESILIENT WEDGE TAPPING VALVE WITH MJFL, OR AFC SERIES 2500 RESILIENT WEDGE TAPPING VALVE WITH MJFL. VALVE SHALL BE RATED AT 250 PSI.
3. TAPPING SLEEVE AND VALVE SHALL BE FULL PORT TO ACCEPT FULL SIZE SHELL CUTTER.
4. STEEL FLANGE SHALL MEET AWWA C207.
5. SIZE-ON-SIZE TAPPING NOT ALLOWED UNLESS APPROVED BY PARTICIPATING UTILITY.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

TAPPING SLEEVE AND VALVE — W-21 — 01/01/14

1. BEDDING, HAUNCHING AND INITIAL BACKFILL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THIS DETAIL AND MANUFACTURER'S RECOMMENDATION.
2. ALL PVC PIPE SHALL BE BEDDED IN COMPACTED VDOT #57 OR #68 STONE.
3. IN VDOT ROW, THE CONTRACTOR SHALL REPLACE THE PAVEMENT AS REQUIRED AND SPECIFIED BY VDOT. IN ROANOKE CITY, CONTRACTOR SHALL REPLACE PAVEMENT AS REQUIRED BY CITY OF ROANOKE RIGHT OF WAY EXCAVATION AND RESTORATION STANDARDS, LATEST EDITION.
4. ALL CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE AS SPECIFIED BY VDOT OR APPLICABLE LOCALITY.
5. PRIOR TO CONSTRUCTION, CONTRACTOR IS RESPONSIBLE FOR SECURING ALL REQUIRED PERMITS FROM VDOT AND/OR APPLICABLE LOCALITY.
6. IN AREAS SUBJECTED TO VEHICULAR TRAFFIC, BEDDING STONE AND FILL SHALL BE PLACED IN 6" LIFTS AND SHALL BE COMPACTED TO AT LEAST 95% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D 698.
7. ALL SEWER LINE PIPE SHALL BE BEDDED IN COMPACTED GRANULAR MATERIAL. BEDDING REQUIREMENTS FOR DUCTILE SEWER LINE ARE DEPENDENT ON MANUFACTURER'S BEDDING CRITERIA.
8. BENCH CUT ON EACH SIDE OF PAVEMENT SHALL BE IN ACCORDANCE WITH VDOT OR APPLICABLE LOCALITY'S SPECIFICATIONS.
9. ALL EXCAVATIONS SHALL COMPLY WITH OSHA TECHNICAL MANUAL, CHAPTER 2, TITLED "EXCAVATIONS: HAZARD RECOGNITION IN TRENCHING AND SHORING."
10. 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.



BEDDING: FOR WATERLINES, INSTALL BEDDING STONE TO SPRING LINE OF PIPE AT A MINIMUM, OR PER MANUFACTURER'S RECOMMENDATION. FOR SEWER LINES, BEDDING SHALL BE MINIMUM 6" ABOVE PIPE.

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

BEDDING AND BACKFILL UNDER PAVEMENT AND IN RIGHT-OF-WAY — G-12 — 08/01/15

INSTALLATION OF DUCTILE IRON WATER MAINS
TABLE 3 AWWA C600-05
Maximum Joint Deflection Full Length of Pipe - Push on Type Joint

Nominal Pipe Size (inches)	Deflection Angle - θ (degree)	Maximum Offset - S* (Inches) Joint Length 18-Feet	Maximum Offset - S* (Inches) Joint Length 20-Feet	Approximate Radius of Curve - R* Produced by Succession of Joints Joint Length 18-Feet	Approximate Radius of Curve - R* Produced by Succession of Joints Joint Length 20-Feet
3	5°	19	21	205	230
4	5°	19	21	205	230
6	5°	19	21	205	230
8	5°	19	21	205	230
10	5°	19	21	205	230
12	5°	19	21	205	230
14	3°	11	12	340	380
16	3°	11	12	340	380
18	3°	11	12	340	380
20	3°	11	12	340	380
24	3°	11	12	340	380
30	3°	11	12	340	380

* SEE FIGURE 4.
For 14-inch and larger push-on joints, maximum deflection angle may be larger than shown above. Consult the manufacturer.

INSTALLATION OF DUCTILE IRON WATER MAINS
TABLE 4 AWWA C600-05
Maximum Joint Deflection Full Length of Pipe - Mechanical Joint Pipe

Nominal Pipe Size (inches)	Deflection Angle - θ (degree)	Maximum Offset - S* (Inches) Joint Length 18-Feet	Maximum Offset - S* (Inches) Joint Length 20-Feet	Approximate Radius of Curve - R* Produced by Succession of Joints Joint Length 18-Feet	Approximate Radius of Curve - R* Produced by Succession of Joints Joint Length 20-Feet
3	8°-18°	31	35	125	140
4	8°-18°	31	35	125	140
6	7°-07°	27	30	145	160
8	5°-21°	20	22	195	220
10	5°-21°	20	22	195	220
12	5°-21°	20	22	195	220
14	3°-35°	13.5	15	285	320
16	3°-35°	13.5	15	285	320
18	3°-00°	11	12	340	380
20	3°-00°	11	12	340	380
24	2°-23°	9	10	450	500

* SEE FIGURE 4.

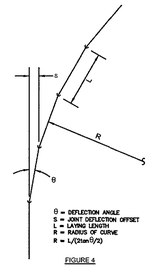
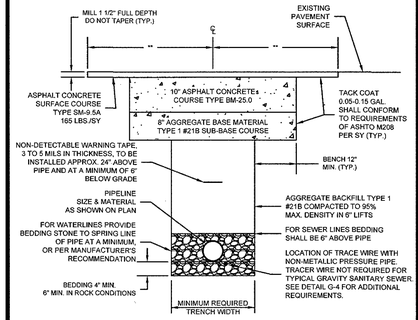


FIGURE 4

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

DUCTILE IRON PIPE DEFLECTION ALLOWANCE TABLES — W-22 — 01/01/14

1. ALL PAVEMENT MARKINGS DAMAGED OR DESTROYED BY TRENCH EXCAVATION ACTIVITY SHALL BE REPLACED BY THE PERMITEE PER VDOT SPECIFICATIONS.
2. ALL PVC PIPE SHALL BE BEDDED IN COMPACTED VDOT #57 OR #68 STONE.
3. THIS DETAIL FOR HIGHWAYS WITH EXISTING ASPHALT CONCRETE PAVEMENT SECTIONS.
4. THE EXTENT OF PAVEMENT RESTORATION FOR ALL OTHER PAVEMENT CUTS SHALL BE DETERMINED BY THE DISTRICT ADMINISTRATOR'S DESIGNEE.
5. ** WIDTH OF TRAVEL LANE MINIMUM FULL PAVEMENT WIDTH FOR OPEN CUT TRENCHING ALONG ROAD CENTERLINE OR 25' (MINIMUM) FOR PERPENDICULAR CROSSINGS.
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.



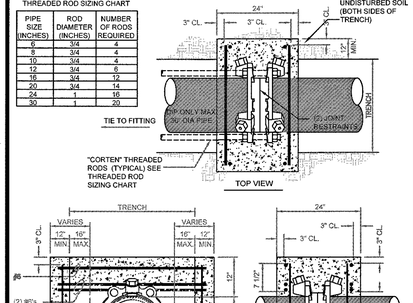
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

VDOT LAND USE PERMIT OPEN CUT PAVEMENT RESTORATION — G-13 — 01/01/14

1. CONCRETE SHALL BE 3000 P.S.I. READY MIX CONCRETE.
2. REINFORCING BARS SHALL BE DEFORMED, AND TIED TOGETHER.
3. TRENCH BOTTOM WIDTH IN VICINITY OF THRUST COLLAR INSTALLATION SHALL BE THE MINIMUM WIDTH.
4. BACKFILL AND COMPACT IN 6" LAYERS.
5. PLACE THRUST COLLAR ON ONE FULL JOINT OF PIPE.
6. LAST JOINT OF PIPE WITH THRUST COLLAR TO BE MECHANICAL JOINT PIPE.
7. PLACE RESTRAINED JOINT THRUST RING 4' FROM FITTING END OF PIPE.
8. FORMS SHALL BE USED WHEN PLACING CONCRETE TO PREVENT CONCRETE FROM INFILTRATING JOINTS.
9. ALLOW MINIMUM OF 3 DAYS FOR CONCRETE TO OBTAIN STRENGTH BEFORE WATERLINE BECOMES ACTIVE.
10. JOINT RESTRAINTS SHALL BE INSTALLED LIP TO LIP AND WRAPPED WITH POLYETHYLENE TO PREVENT CONCRETE INTRUSION INTO WEDGE POCKET.

THREADED ROD SIZING CHART

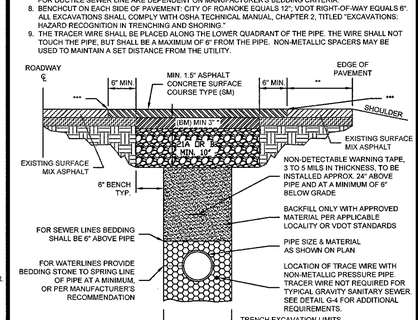
PIPE SIZE (INCHES)	ROD DIAMETER (INCHES)	NUMBER OF RODS REQUIRED
6	3/4	4
8	3/4	4
10	3/4	4
12	3/4	6
16	3/4	12
20	3/4	14
24	1	16
30	1	20



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

THRUST COLLAR DETAIL — W-23 — 01/01/14

1. BEDDING, HAUNCHING AND INITIAL BACKFILL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THIS DETAIL AND MANUFACTURER'S RECOMMENDATION.
2. ALL PVC PIPE SHALL BE BEDDED IN COMPACTED VDOT #57 OR #68 STONE.
3. IN VDOT ROW, THE CONTRACTOR SHALL REPLACE THE OPEN CUT WITH A MINIMUM TOP COURSE OF 1.5" (MINIMUM) VDOT SM-9.5A, BASE COURSE OF 3" VDOT BM-25.0, AND SUBBASE OF 10" VDOT 21B, OR AS REQUIRED BY VDOT. IN ROANOKE CITY, CONTRACTOR SHALL REPLACE PAVEMENT AS REQUIRED BY CITY OF ROANOKE RIGHT OF WAY EXCAVATION AND RESTORATION STANDARDS.
4. ALL CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE AS SPECIFIED BY VDOT OR APPLICABLE LOCALITY.
5. PRIOR TO CONSTRUCTION, CONTRACTOR IS RESPONSIBLE FOR SECURING ALL REQUIRED PERMITS FROM VDOT AND/OR APPLICABLE LOCALITY.
6. IN AREAS SUBJECTED TO VEHICULAR TRAFFIC, BEDDING STONE AND FILL SHALL BE PLACED IN 6" LIFTS AND SHALL BE COMPACTED TO AT LEAST 95% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D 698.
7. ALL SEWER LINE PIPE SHALL BE BEDDED IN COMPACTED GRANULAR MATERIAL. BEDDING REQUIREMENTS FOR DUCTILE SEWER LINE ARE DEPENDENT ON MANUFACTURER'S BEDDING CRITERIA.
8. BENCHCUT ON EACH SIDE OF PAVEMENT: CITY OF ROANOKE EQUALS 12"; VDOT RIGHT-OF-WAY EQUALS 6". ALL EXCAVATIONS SHALL COMPLY WITH OSHA TECHNICAL MANUAL, CHAPTER 2, TITLED "EXCAVATIONS: HAZARD RECOGNITION IN TRENCHING AND SHORING."
9. 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.

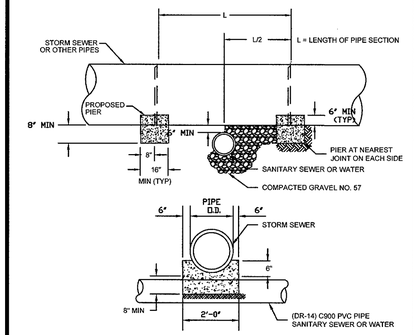


PAVING NOTES:
* THE BASE ASPHALT MIX SHALL BE EQUAL TO THE EXISTING PAVEMENT THICKNESS OR 3 INCHES, WHICHEVER IS GREATER.
** IF THE REMAINING DISTANCE TO THE EXISTING EDGE OF PAVEMENT IS LESS THAN 2 FEET, THE REMOVAL AND REPLACEMENT OF NEW SURFACE MIX ASPHALT SHALL EXTEND TO THE ORIGINAL EDGE OF PAVEMENT.
*** EXISTING PAVEMENT SURFACE MIX TO BE SAWCUT AND TACK COATED FOR A CLEAN CONTINUOUS JOINT.

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

PAVEMENT RESTORATION FOR LONGITUDINAL TRENCHING PARALLEL TO THE VDOT ROADWAY CENTERLINE — G-14 — 01/01/14

1. PIER REQUIRED WHEN STORM DRAIN OR OTHER PIPES CROSSES OVER THE OTHER UTILITY WITH A VERTICAL CLEARANCE OF LESS THAN 18".
2. PIER TO BE BUILT ON UNDISTURBED EARTH.
3. CONCRETE TO BE READY MIX, CLASS A3.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

CONCRETE PIER — G-8 — 01/01/14

WESTERN VIRGINIA WATER AUTHORITY
ENGINEERING SERVICES
601 S JEFFERSON ST, SUITE 300
ROANOKE, VA 24011
540-853-5700

COMMONWEALTH OF VIRGINIA
W. C. Bulloss
WILLIAM C. BULLOSS
Lic. No. 053694
07/01/2019
PROFESSIONAL ENGINEER

CHRISTIAN AVE & TRINKLE AVE WATERLINE REPLACEMENT

DETAILS

Rev	Description	Date	By

Designed:
Drawn: AJC
Checked: NSS, IAS
Approved: WCB
Date: JUNE 2019
Project: WCIP-323

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Sheet 9 of 10