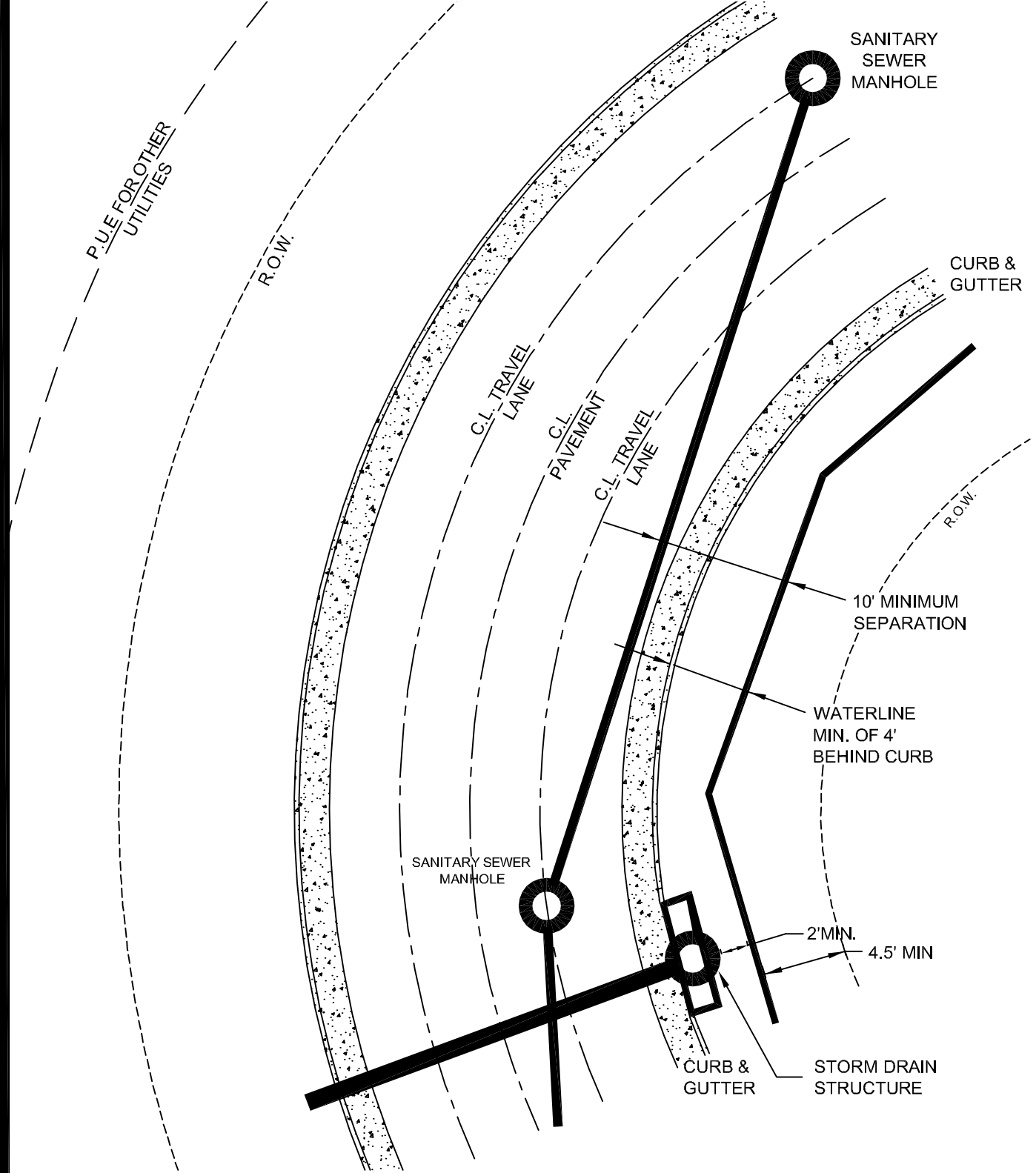


1. A WORK AREA WITH A MINIMUM CLEAR SPACE OF TEN FEET BEHIND THE BACK OF CURB SHALL BE PROVIDED FOR ALL WATER AND SEWER MAINS. A DEDICATED WATER OR SEWER EASEMENT MUST BE PROVIDED IF THERE IS LESS THAN TEN FEET BEHIND THE BACK OF CURB AND THE LIMITS OF RIGHT-OF-WAY.



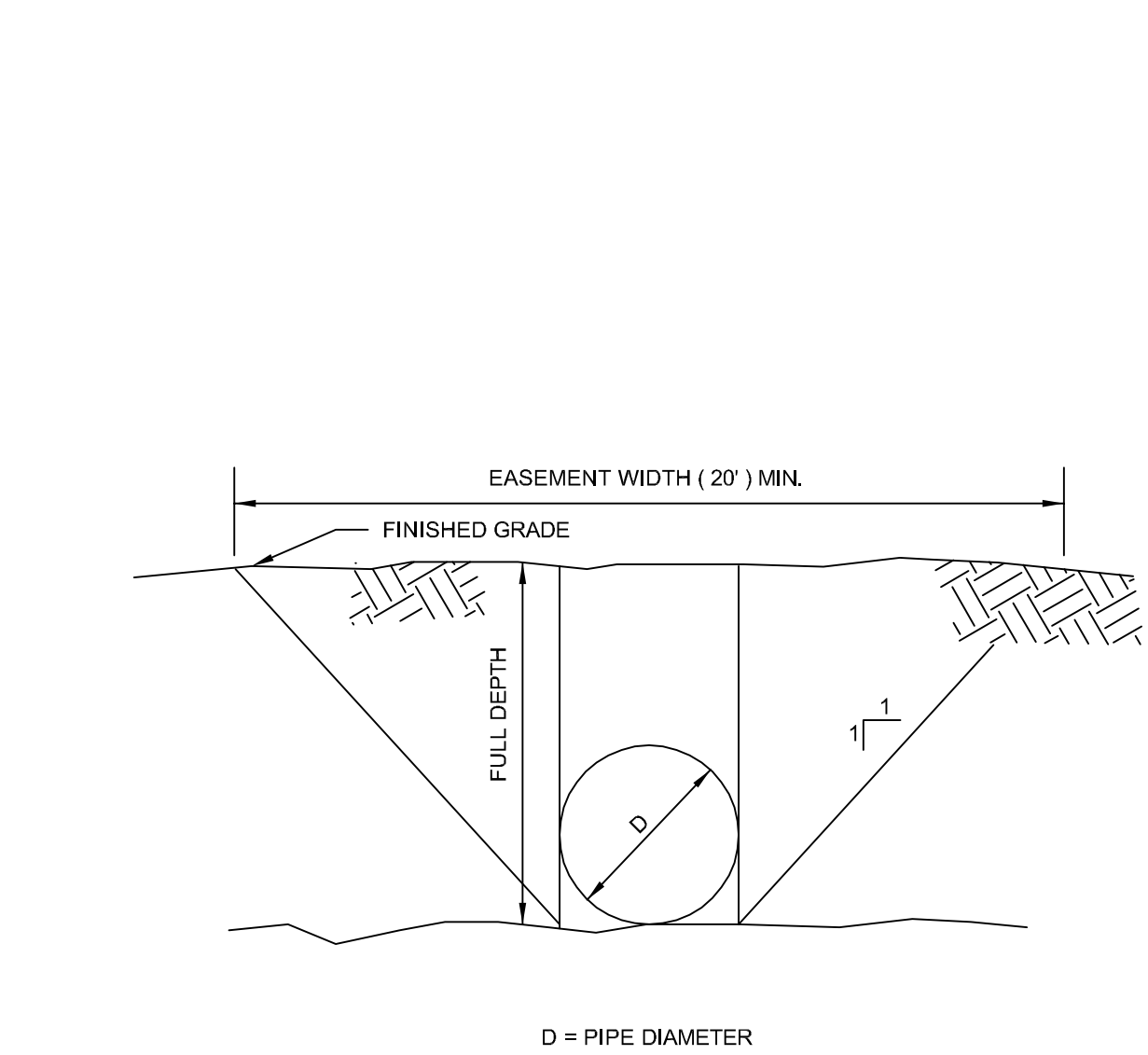
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

PUBLIC WATER AND SANITARY SEWER
STANDARD CONFIGURATION IN PUBLIC ROADS

G-1

01/01/12

1. PUBLIC EASEMENT WIDTH SHALL BE DETERMINED BASED ON 1:1 SIDE SLOPE EXTENDING FROM THE FINISHED GRADE TO OUTSIDE EDGE OF PIPE (NOMINAL PIPE DIAMETER) ROUNDED UP TO THE NEAREST 1' INCREMENT, OR 20' MINIMUM, WHICHEVER IS GREATER.
2. THIS EASEMENT SHALL EXTEND ALONG THE ENTIRE LENGTH OF THE SUBJECT PIPE AT LEAST ONE HALF THE DISTANCE OF EASEMENT PAST CENTER OF LAST MANHOLE OR WATER APPURTENANCE.



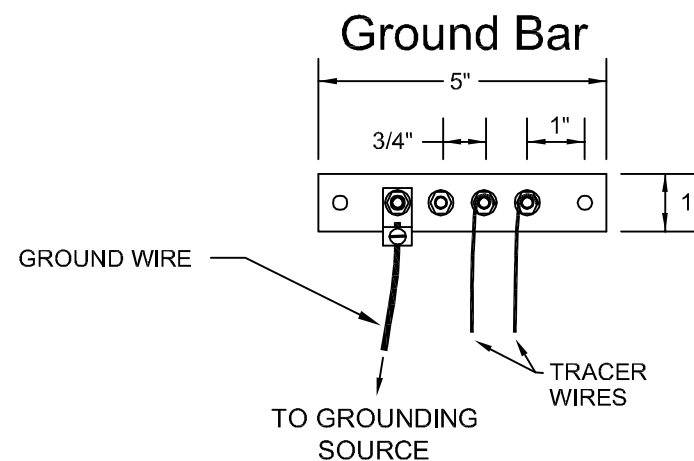
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

SANITARY SEWER AND
WATER LINE EASEMENTS

G-3

01/01/12

1. TRACER WIRES SHALL BE INSTALLED USING MANHOLES, VALVE BOXES OR VAULTS, WATER METERS AND FIRE HYDRANTS AS ACCESS POINTS.
2. FOR WATER OR SEWER INSTALLED BY OPEN TRENCHING, TRACER WIRE SHALL BE COPPERHEAD INDUSTRIES COPPER CLAD STEEL DIRECT BURY #14 AWG SOLID (.0641" DIAMETER), STEEL CORE SOFT DRAWN HIGH STRENGTH TRACER WIRE, 250# AVERAGE TENSILE BREAK LOAD, 30 MIL HIGH MOLECULAR WEIGHT-HIGH DENSITY (GREEN OR BLUE) POLYETHYLENE JACKET COMPLYING WITH ASTM-D-1248, 30 VOLT RATING. A HEAVIER GAUGE MAY BE REQUIRED FOR DEPTHS EXCEEDING SIX FEET.
3. FOR WATER OR SEWER INSTALLED BY HORIZONTAL DIRECTIONAL DRILLING METHOD, TRACER WIRE SHALL BE COPPERHEAD INDUSTRIES COPPER CLAD STEEL DIRECT BURY #12 AWG SOLID (.0808" DIAMETER), STEEL CORE HARD DRAWN EXTRA HIGH STRENGTH HORIZONTAL DIRECTIONAL DRILL TRACER WIRE, 1150# AVERAGE TENSILE BREAK LOAD, 45 MIL HIGH MOLECULAR WEIGHT-HIGH DENSITY (GREEN OR BLUE) POLYETHYLENE JACKET COMPLYING WITH ASTM-D-1248, 30 VOLT RATING.
4. SPLICES SHALL BE MADE USING COPPERHEAD INDUSTRIES SNAKE BITE SPLICE KIT PART #SCX-01, OF THE APPROPRIATE COLOR, 3M DIRECT BURY SPLICE KIT (DBY), OR EQUIVALENT.
5. TRACER WIRE SHALL BE LONG ENOUGH TO EXTEND A DISTANCE OF FIVE (5) FEET BEYOND THE STRUCTURE.
6. AS-BUILTS SHALL SHOW TRACER WIRE(S) LOCATION AND ACCESS POINT(S).
7. 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.
8. WHERE LINES ARE GREATER THAN SIX (6) FEET IN DEPTH, WIRE SHALL BE BROUGHT TO THE SURFACE EVERY ONE-HUNDRED (100) FEET AND PLACED IN A WATER METER BOX OR APPROVED JUNCTION BOX.
9. THE TRACER WILL BE TESTED BY THE PARTICIPATING UTILITY AS PART OF THE PROJECT'S FINAL ACCEPTANCE.
10. THE GROUND WIRE SHALL BE #6 GAUGE COPPER WIRE AND SHALL BE OF ADEQUATE LENGTH TO EXTEND A MINIMUM OF FIVE (5) FEET BEYOND THE TOP OF STRUCTURE. THE END OF GROUND WIRE SHALL CONNECT TO THE GROUND BAR USING A BURNDY K&B MECHANICAL CABLE LUG.
11. A GROUND ROD SHALL BE INSTALLED AT EACH LOCATION WHERE GROUND WIRE SURFACES AND CONNECTS TO GROUND BAR. GROUND ROD SHALL BE COPPER COATED, MINIMUM DIAMETER OF .58", AND SHALL BE BURIED A MINIMUM OF FOUR (4) FEET INTO THE GROUND.
12. THE GROUND BAR SHALL BE STAINLESS STEEL AND SHALL BE ATTACHED USING SS 1/4" X 1 1/4" SS HEX TAPCON. THE FOLLOWING SHALL BE INSTALLED IN 4 (FOUR) CENTER HOLES: 10-32 SS NUTS, #10 SS WASHERS AND 10-32 X 3/4 SS PHILLIPS. THE FOURTH HOLE SHALL HAVE A BURNDY CONNECTOR K&B FOR THE #6 GAUGE GROUND WIRE. THE ASSEMBLY CAN BE ACQUIRED AT MAGIC CITY SUPPLY - CLAMP RFC-11. THE ENDS OF THE TRACER WIRES SHALL BE PLACED IN THE GROUND BAR AS SHOWN.
13. TWO WRAPS OF TRACER WIRE SHALL BE WRAPPED SNUGLY AROUND BASE OF HYDRANT. WIRE SHALL NOT BE LEFT IN A WAY THAT WOULD INTERFERE WITH MOWING AROUND HYDRANT.



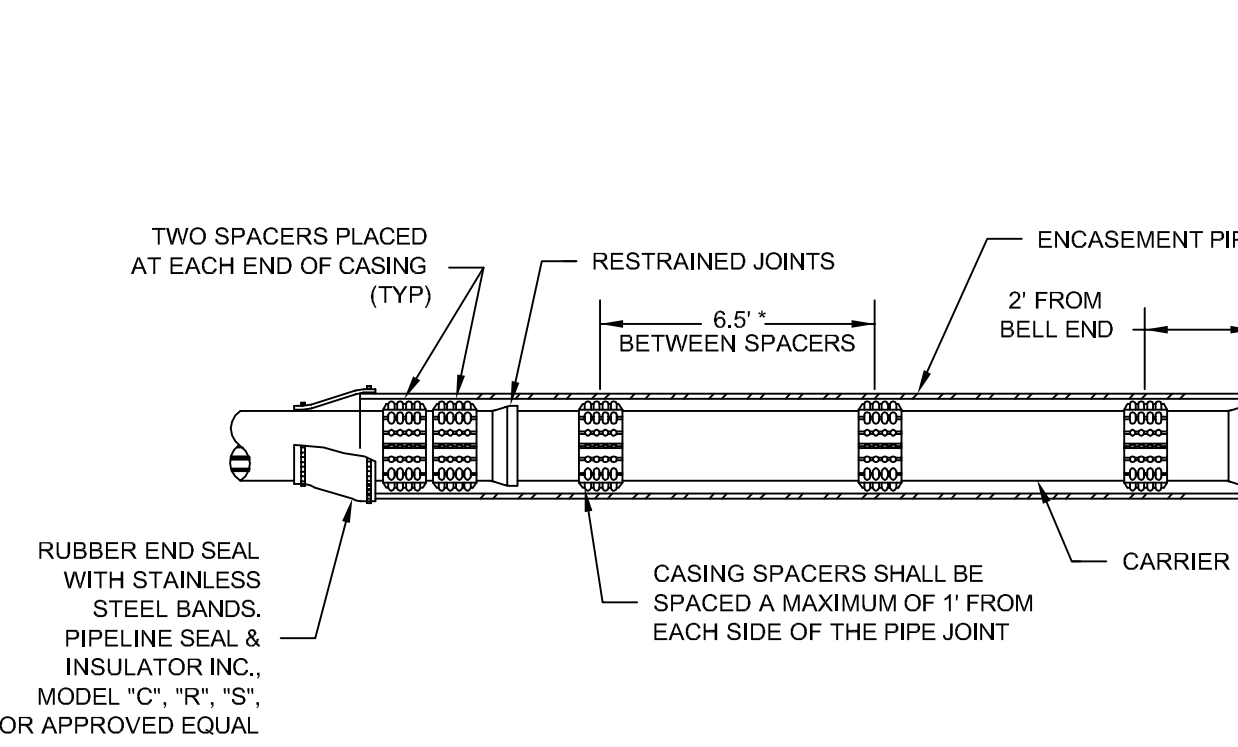
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

TRACER WIRE
FOR NON-METALLIC
PRESSURE PIPE

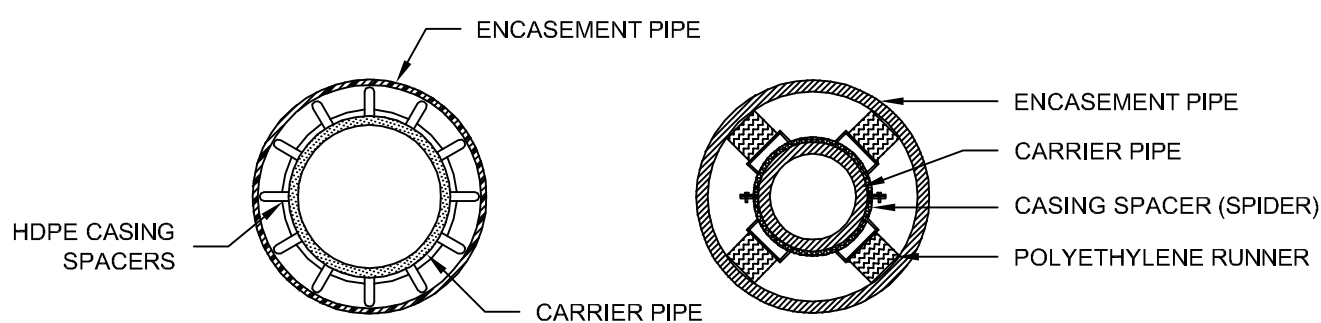
G-4

01/01/12

1. A 1" DRAIN WILL BE REQUIRED ON THE LOWER END OF THE ENCASUREMENT PIPE.
2. SPACERS SHALL BE RACI HDPE SPIDER OR EQUIVALENT.
3. SPACERS SHALL BE SPACED 6 1/2" ON SEWER PIPE.
4. CARRIER PIPE SHALL BE DUCTILE OR HDPE IN ACCORDANCE WITH REGIONAL STANDARDS.
5. ENCASUREMENT PIPE TO BE STEEL IN ACCORDANCE WITH VDOT STANDARD DETAIL EP-1, OR HDPE AS SPECIFIED IN THE STANDARDS IF APPROVED BY THE PARTICIPATING UTILITY.
6. CONCRETE ENCASUREMENT PIPE WILL NOT BE ALLOWED.
7. DIAMETER OF ENCASUREMENT PIPE TO BE DETERMINED BY PARTICIPATING UTILITY.



* ADDITIONAL SPACING ALLOWED AS RECOMMENDED BY PIPE MANUFACTURER.



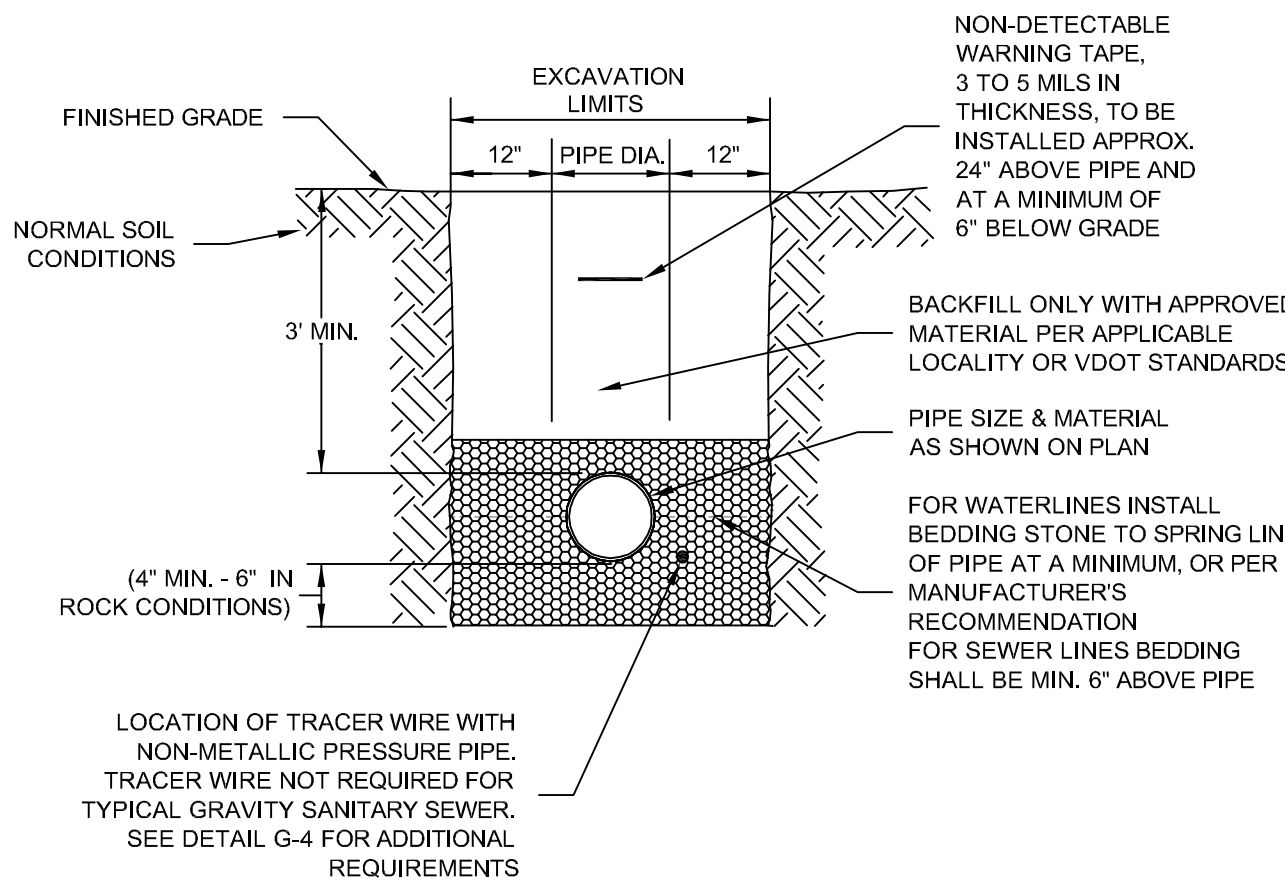
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

PIPE SUPPORT
IN ENCASUREMENT PIPE

G-6

01/01/12

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 #58 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.



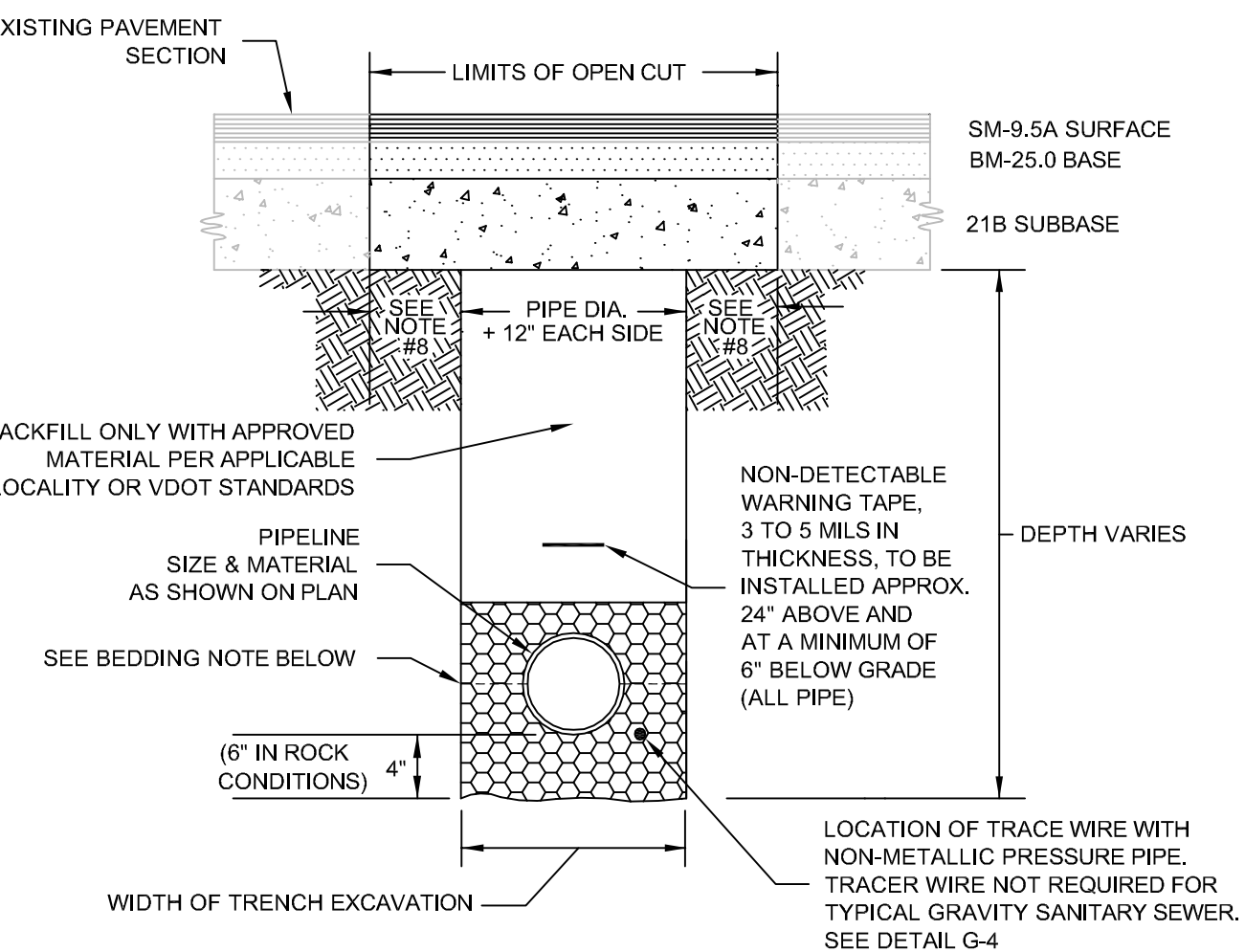
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

BEDDING AND BACKFILL
OUTSIDE OF PAVED AREAS

G-11

01/01/12

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 #58 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 6" 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, 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. BENCHOUT ON EACH SIDE OF PAVEMENT: CITY OF ROANOKE = 12" VDOT RIGHT-OF-WAY = 6".
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.



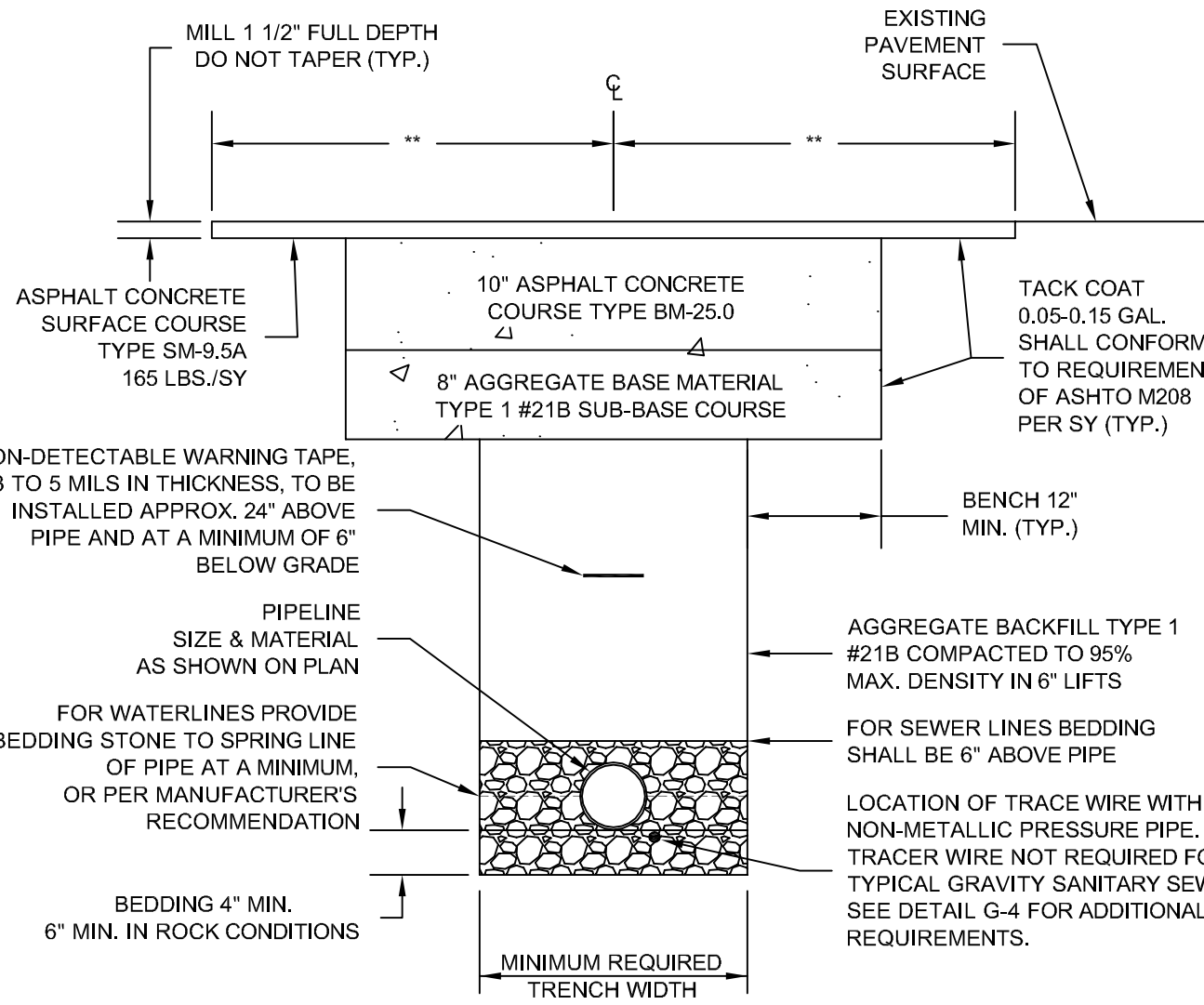
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

BEDDING AND BACKFILL
UNDER PAVEMENT AND IN RIGHT-OF-WAY

G-12

01/01/12

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 #58 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 DESIGNER.
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.



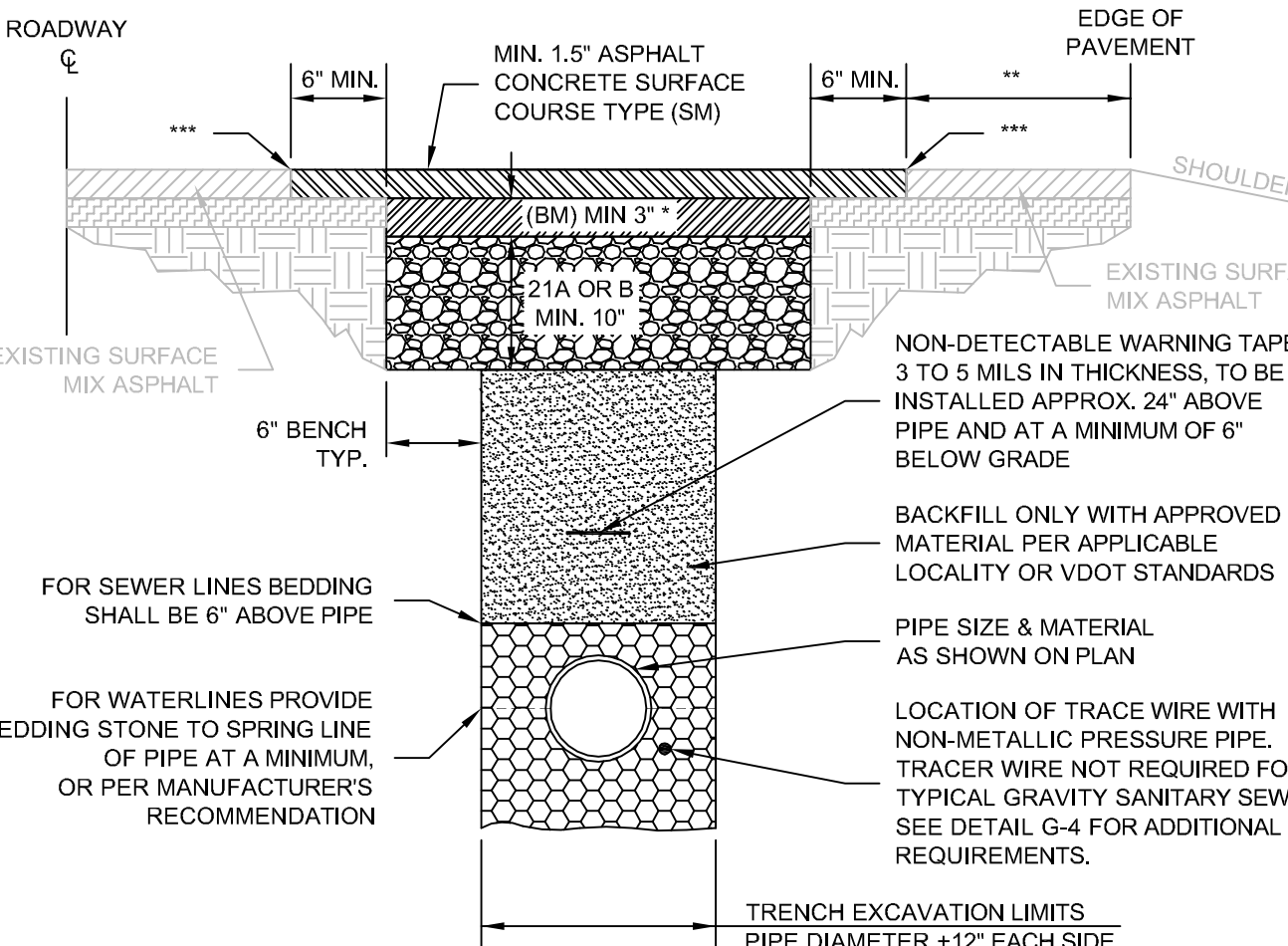
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

VDOT LAND USE PERMIT
OPEN CUT PAVEMENT RESTORATION

G-13

01/01/12

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 #58 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 6" 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. BENCHOUT ON EACH SIDE OF PAVEMENT: CITY OF ROANOKE EQUALS 12" VDOT RIGHT-OF-WAY EQUALS 6".
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.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL

PAVEMENT RESTORATION
FOR LONGITUDINAL TRENCHING
PARALLEL TO THE VDOT ROADWAY CENTERLINE

G-14

01/01/12



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COMMENTS
1ST REVIEW
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06 JUL 12
04 SEP 13

SOUTH PEAK DEVELOPMENT
PHASE I WATER SYSTEM IMPROVEMENTS

WWVA GENERAL STANDARD DETAILS

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