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Saved: 5/17/2018 12:03:51 PM Plotted: 11/8/2018 4:22:53 PM Current User: Squires, Alan LastSavedBy: 5548

1. DUCTILE IRON WATER AND SEWER LINES CROSSING STREAMS MUST BE CONCRETE ENCASED UNLESS OTHERWISE SPECIFIED BY PARTICIPATING UTILITY.		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 SUBJECT 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.		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 SUBJECT 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.		1. MATERIALS AND FABRICATION IN ACCORDANCE WITH ASTM C478-09. 2. WHEN USED AS SAMPLING MANHOLE FLOW SHALL PASS STRAIGHT THROUGH, I.E., 180°. 3. STEPS SHALL BE VERTICALLY ALIGNED. FIRST STEP SHALL BE WITHIN 12" OF COVER, BOTTOM STEP SHALL BE WITHIN 24" OF BOTTOM OF MANHOLE. 4. FRAME AND COVER SHALL BE PROPERLY ALIGNED WITH THE 2 FOOT OPENING OF THE MANHOLE STRUCTURE AND BOLTED IN PLACE. 5. FLAT TOP MANHOLES MAY ONLY BE SUBSTITUTED WITH THE PERMISSION OF THE PARTICIPATING UTILITY. 6. FLEXIBLE JOINT MANHOLE CONNECTION SHALL BE AS MANUFACTURED BY PRES-SEAL GASKET CORPORATION OR EQUAL. 7. GROUT ANNUAL SPACE BETWEEN PIPE AND PRECAST MANHOLE ON INSIDE OF MANHOLE. 8. WHEN REPLACING AN EXISTING MANHOLE OR INSTALLING A NEW PRECAST MANHOLE ON AN EXISTING SEWER, A MINIMUM OF SIX FEET (6') OF EXISTING PIPE SHALL BE REMOVED AND REPLACED WITH NEW MATERIAL ON INLET AND OUTLET OF MANHOLE. 9. MANHOLES WHERE THE INVERT IS LOWER THAN THE NORMAL GROUNDWATER ELEVATION (I.E., ALONG CREEKS, RIVERS, LOW-LYING AREAS, ETC.) SHALL HAVE A FULL EXTERIOR COATING AND JOINT WRAP APPLIED IN ADDITION TO JOINT SEALANT. SEE NOTES 10 & 11. 10. IF REQUIRED EXTERIOR VERTICAL WALL SURFACES SHALL BE FACTORY COATED IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATION. COATING SHALL BE HIGH BUILD COAL TAR EPOXY MEETING ASTM D1227. COATING SHALL BE APPLIED IN TWO COATS TO A MINIMUM TOTAL THICKNESS OF 16 MILS. 11. IF REQUIRED ALL MANHOLES SHALL UTILIZE AN EXTERNAL FRAME AND JOINT SEAL AT ALL JOINTS AND AT THE FRAME/CHIMNEY INTERFACE. SEAL SHALL BE MADE OF EPDM RUBBER IN ACCORDANCE WITH ASTM D412 OR POLYOLEFIN BACKED EXTERIOR JOINT WRAP IN ACCORDANCE WITH ASTM E-1745, C-877, AND C-990. EDM SEAL SHALL HAVE A MINIMUM THICKNESS OF 60 MILS. POLYOLEFIN BACKED EXTERIOR JOINT WRAP SHALL HAVE A BACKING BAND ELEMENT WITH MINIMUM THICKNESS OF 4 MILS. AND BUTYL ROLLER ADHESIVE WITH MINIMUM THICKNESS OF 60 MILS. SEAL SHALL AGGRESSIVELY BOND TO CONCRETE AND METAL STRUCTURES. 12. FOR PIPE LARGER THAN 15 INCHES IN DIAMETER, THE MINIMUM INSIDE DIAMETER OF THE MANHOLE SHALL BE IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS BASED ON PIPE SIZE AND ANGLE BETWEEN INLET AND OUTLET PIPING. 13. 6" MINIMUM DIAMETER MANHOLE SHALL BE REQUIRED WHEN DEPTHS EXCEED 15' UNLESS OTHERWISE APPROVED BY PARTICIPATING UTILITY. ADJUSTMENT RINGS IF NECESSARY (1'-0" MAX ADJUSTMENT) SEE FRAME & COVER DETAILS BUTYL MASTIC JOINT SEALER OR GASKETS MEETING ASTM C443 AND ASTM C1244 TESTING STANDARD (NO MORTAR) MINIMUM SLOPE FOR SERVICE CONNECTION 4" Ø=1/4" PER 1'-0" 6" Ø=1/8" PER 1'-0" PRECAST HOLE WITH FLEXIBLE BOOT & STAINLESS STEEL BAND SERVICE CONNECTION SLOPE BENCH 1/4" PER 1'-0" MANHOLE WITH PRECAST INVERT 3/4" Ø SS THREADED ROD (IF ADJUSTMENT RINGS ARE REQUIRED) ECCENTRIC CONE HEIGHT VARIES RISER SECTIONS HEIGHT VARIES BASE HEIGHT VARIES 6" Min. STONE BASE (6" MIN. DEPTH) #57 OR EQUIVALENT	
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL		WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL		WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL		WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL	
CONCRETE ENCASED PIPE		BEDDING AND BACKFILL OUTSIDE OF PAVED AREAS		BEDDING AND BACKFILL UNDER PAVEMENT AND IN RIGHT-OF-WAY		4' STANDARD MANHOLE FOR PIPE 15" OR SMALLER (FOR DEPTHS UP TO 15 FEET)	
G-9		G-11		G-12		S-1	
1. MATERIALS AND FABRICATION IN ACCORDANCE WITH ASTM C478-09. 2. STEPS SHALL BE VERTICALLY ALIGNED. FIRST STEP SHALL BE WITHIN 12" OF COVER, BOTTOM STEP SHALL BE WITHIN 24" OF BOTTOM OF MANHOLE. 3. THE FRAME AND COVER SHALL BE PROPERLY ALIGNED WITH THE 2 FOOT OPENING OF THE MANHOLE STRUCTURE AND BOLTED IN PLACE. 4. RELINER BY DURAN INSIDE DROP BOWLS AND PIPE BRACKETS WILL BE ALLOWED. 5. GROUT ANNUAL SPACE BETWEEN PIPE AND PRECAST MANHOLE ON INSIDE OF MANHOLE. 6. STEPS SHALL BE A MINIMUM OF 90 DEGREES FROM DROP & ALIGNED VERTICALLY. 7. INSIDE DROP ONLY ALLOWED WHEN DEPTH EXCEEDS 12' AND APPROVED BY PARTICIPATING UTILITY. 8. 6" MINIMUM DIAMETER MANHOLE REQUIRED FOR TWO OR MORE INSIDE DROP CONNECTIONS (MAIN LINE OR LATERAL). 9. SEE FRAME AND COVER DETAIL. 10. SEE DETAIL S-01 FOR EXTERIOR COATING AND JOINT SEAL REQUIREMENTS.		1. WATERTIGHT MANHOLE FRAME MODEL #1045Z BY EAST JORDAN IRON WORKS, INC. OR EQUIVALENT. 2. HDPE ADJUSTMENT RINGS SHALL MEET H-20 LOAD RATING, AND SHALL BE INTERLOCKING OR UTILIZE BUTYL MASTIC JOINT SEALANT BETWEEN EACH RING TO FORM A WATERTIGHT JOINT. 3. CONCRETE ADJUSTMENT RINGS SHALL MEET H-20 LOAD RATING AND UTILIZE BUTYL MASTIC JOINT SEALANT BETWEEN EACH RING AND FRAME AN COVER TO FORM A WATERTIGHT JOINT. 4. FRAME HEIGHT SHALL BE 7" FOR BURIED LOCATIONS AND 4" FOR EXPOSED LOCATIONS.		2" LETTERS (RECESSED FLUSH) NON-SLIP TEXTURE STOP LUGS FOR CAM 1040ACLS GS EAST JORDAN IRON WORKS MANHOLE #4 ASTM 148 12-2002 BOTTOM VIEW OF COVER FOR PARTICIPATING UTILITIES OTHER THAN THE WVWA, GENERIC NON-LOGO MANHOLE COVERS LABELED "SEWER" SHALL BE SUBSTITUTED 1/4" DIA. NEOPRENE GASKET 1. BOLT-DOWN MANHOLE COVER MODEL #1040ACLS GS BY EAST JORDAN IRON WORKS, INC OR EQUIVALENT. 2. HEX HEAD BOLTS (6-SIDED) SHALL BE USED. 3. BOLT-DOWN MANHOLE COVERS SHALL BE USED WHEN SHOWN ON PLANS OR AS DIRECTED BY THE PARTICIPATING UTILITY.		1. TRAFFIC BEARING BOX REQUIRED IN TRAFFIC AREAS. 2. SEWER LATERAL AND CLEANOUT PIPING SHALL BE ASTM D3034 SDR 26. SEWER LATERAL FITTINGS SHALL BE OF SAME SDR RATING AS THE SEWER MAIN. SCHEDULE 40 SOLVENT WELD PIPE AND FITTINGS MAY BE USED FOR THE SEWER LATERAL AND CLEANOUT ASSEMBLY WITH APPROVAL FROM THE PARTICIPATING UTILITY. 3. ALL PIPE SHALL BE OF SIZE SHOWN. 4. NO BENDS ARE ALLOWED IN THE LATERAL FROM THE MAIN TO THE CLEAN-OUT STACK WYE, (EXCEPT AS NOTED.) 5. ALL MAIN LINE TAPS ON ACTIVE MAIN SHALL BE PERFORMED BY PARTICIPATING UTILITY. 6. PIPING ON PRIVATE SIDE OF CLEANOUT TO BE INSTALLED PER GOVERNING JURISDICTION REQUIREMENTS. 7. MINIMUM COVER FOR ALL SEWER LATERALS SHALL BE THREE (3) FEET. 8. PROPERTY OWNER RESPONSIBLE FOR INSTALLING CLEANOUT ON PROPERTY LINE WHEN MAINTENANCE OCCURS, IN ACCORDANCE WITH THIS DETAIL. 9. LOWEST SERVED FINISHED FLOOR ELEVATION SHALL BE A MINIMUM OF THREE FEET (3') ABOVE THE TOP OF THE MAIN AT THE POINT WHERE THE SERVICE LATERAL CONNECTS TO THE MAIN. 10. WHEN CONNECTING TO EXISTING LATERAL USE FERNOCO FLEXIBLE COUPLING.	
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL		WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL		WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL		WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL	
INSIDE DROP MANHOLE		WATERTIGHT MANHOLE FRAME		WATERTIGHT MANHOLE COVER		DOUBLE LATERAL COMBINED 6" BY TWO 4" LATERALS	
S-3		S-4		S-5		S-7	

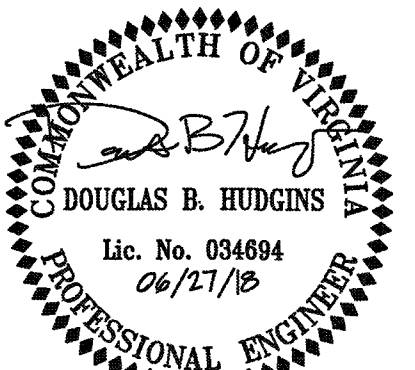
NOTE: THESE WESTERN VIRGINIA REGIONAL DESIGN AND CONSTRUCTION STANDARDS AND DETAILS GOVERN THE WORK ON THIS PROJECT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THAT ALL HIS WORK IS DONE IN ACCORDANCE WITH ALL STANDARDS INCLUDING ANY DETAILS PUBLISHED BY THE AUTHORITY THAT ARE NOT SHOWN.

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WESTERN VIRGINIA  
WATER AUTHORITY



DOUGLAS B. HUDGENS  
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06/27/16  
PROFESSIONAL ENGINEER

IT IS A VIOLATION OF LAW FOR ANY PERSON, UNLESS THEY ARE ACTING UNDER THE DIRECTION OF A LICENSED PROFESSIONAL ENGINEER, ARCHITECT, LANDSCAPE ARCHITECT OR LAND SURVEYOR, TO ALTER OR REUSE ANY PART OF AN ITEM BEARING THE SEAL OF A LICENSED PROFESSIONAL, BE IT ALTERED, THE ALTERATION BEING THE PROPERTY OF THE ORIGINAL HOLDER. ANY PERSON WHO VIOLATES THIS NOTICE SHALL BE FOLLOWED BY THEIR BOARD, THE DATE OF SUCH ALTERATION, AND A SPECIFIC DESCRIPTION OF THE ALTERATION.

WESTERN VIRGINIA  
WATER AUTHORITY  
PETERS CREEK ROAD  
SANITARY SEWER  
REPLACEMENT

No.	Submital / Revision	App'd.	By	Date
1	ADDENDUM 2	DBH	06/27/18	
2	CONSTRUCTION ISSUE	DBH	10/30/18	

CIVIL DETAILS

Designed By:	Drawn By:	Checked By:
SCF	RAS	DBH
Issue Date:	Project No:	Scale:
03-01-18	31237	AS NOTED

Drawing No.:  
**C-501**