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THIS SHEET FOR UTILITY RELOCATION/ADJUSTMENT/BETTERMENT FOR WATER AND SEWER ONLY

MATERIALS NOTES

1. DUCTILE IRON WATER MAIN OR OFFSETS OF EXISTING MAINS SHALL CONFORM TO AWWA C151. CLASS OF PIPE SHALL BE PRESSURE CLASS 350 DIP THROUGH THE 600mm SIZE AND PRESSURE CLASS 250 DIP FROM 750mm SIZE TO 1200mm SIZE. FOR BURIAL DEPTHS EXCEEDING THOSE ALLOWED BY THE CLASS, PIPE AND FITTINGS OF SUFFICIENT WALL THICKNESS SHALL BE PROVIDED. DUCTILE IRON FITTINGS SHALL CONFORM WITH AWWA C110 OR AWWA C153. THE MINIMUM ACCEPTABLE PRESSURE RATING SHALL BE 250 PSI. IF COMPACT FITTINGS ARE USED THEN THE MINIMUM ACCEPTABLE PRESSURE RATING SHALL BE 350 PSI THROUGH THE 600mm SIZE, AND 250 PSI FROM 750mm SIZE AND ABOVE. "ONE BOLT" FITTINGS (MANUFACTURED BY ONE BOLT, INCORPORATED) MAY BE USED FOR DUCTILE IRON PIPE. THE "FOSTER ADAPTOR" MAY BE USED TO CONNECT BETWEEN MECHANICAL JOINT FITTINGS, VALVES, AND HYDRANT CONNECTIONS. DUCTILE IRON PIPE SHALL BE AS MANUFACTURED BY:

1. AMERICAN CAST IRON PIPE COMPANY

2. U.S. PIPE AND FOUNDRY COMPANY

3. GRIFFIN PIPE PRODUCTS

A. JOINTS: USE PUSH-ON OR MECHANICAL JOINTS CONFORMING WITH ALL APPLICABLE PROVISIONS OF AWWA C111, OR RESTRAINED JOINTS AS SPECIFIED BELOW. WHERE FLANGED JOINT PIPE OR FLANGED FITTINGS ARE REQUIRED FOR CONNECTIONS, VERIFY AND COORDINATE BOLT HOLE DRILLING WITH MANUFACTURER. USE ANSI CLASS 125 BOLT PATTERN. FLANGED JOINTS SHALL NOT BE USED FOR BURIED PIPE.

B. DEFLECTION: ALLOWABLE DEFLECTION SHALL BE 80% OF THE MAXIMUM DEFLECTION ALLOWED BY AWWA C600 TABLE 4 AND 5. MECHANICAL JOINTS WITH METAL TIE RODS WILL BE PROHIBITED IN AREAS WHERE PIPE IS DEFLECTED.

C. EXTERIOR COATING OF ALL DUCTILE IRON PIPE, JOINTS AND FITTINGS SHALL BE PROVIDED AS REQUIRED BY AWWA C110, C111, C115, C151 OR C153 AS APPLICABLE. ALL PIPES, JOINTS AND FITTINGS SHALL BE EXAMINED AFTER LAYING TO DETERMINE IF THE COATING HAS BEEN DAMAGED DURING INSTALLATION. ANY DAMAGED AREAS AND ALL JOINTS SHALL BE COATED WITH APPROXIMATELY 1 MIL. OF A BITUMINOUS COATING.

D. INTERIOR LINING FOR WATER MAINS SHALL BE CEMENT MORTAR LINED IN ACCORDANCE WITH AWWA C104, STANDARD THICKNESS INCLUDING ASPHALTIC SEAL.

E. PIPE RESTRAINING LENGTH SHALL BE IN ACCORDANCE WITH THE SCHEDULE ON SHEET 12(12). RESTRAINED PIPE SHALL MEET ONE OF THE FOLLOWING CRITERIA:

1. RESTRAINED JOINT PIPE.

ALL RESTRAINED JOINT PIPE AND FITTINGS SHALL BE RESTRAINED AGAINST THRUST BY USING ONE OF THE FOLLOWING POSITIVE RESTRAINT SYSTEMS:

1. TR-FLEX BY U.S. PIPE

2. FLEX-RING BY AMERICAN DUCTILE IRON PIPE

3. SNAP-LOK BY GRIFFIN PIPE PRODUCTS

2. MECHANICAL JOINT PIPE WITH RETAINER GLANDS:

ALL PIPE WHERE RETAINER GLANDS ARE INSTALLED SHALL HAVE A BRINELL HARDNESS NUMBER (BHN) OF 140-200 TO ALLOW PROPER ACTIVATION OF GLAND.

RETAINER GLAND SHALL BE U.L. LISTED AS MANUFACTURED BY: EBAA IRON INC., SERIES 100 "MEGALUG," FORD "UNI-FLANGE", ROMAC INDUSTRIES "GRIP RING", OR EQUAL.

3. DUCTILE IRON PIPE (PUSH-ON): "AQUA GRIP" SYSTEM BY MUELLER.

F. CONNECTIONS: UNLESS OTHERWISE NOTED, CONNECTIONS TO EXISTING MAINS SHALL BE MADE USING MJ SOLID SLEEVE FITTINGS. SLEEVES SHALL BE LONG PATTERN, SOLID TYPE MADE OF GRAY- IRON OR DUCTILE IRON WITH A MINIMUM PRESSURE RATING OF 250 PSI. SLEEVES SHALL HAVE MECHANICAL JOINT ENDS SUITABLE FOR USE WITH APPROVED RESTRAINING RETAINER GLANDS. SLEEVES SHALL BE MANUFACTURED BY THE DUCTILE IRON PIPE MANUFACTURER. THE CONTRACTOR IS REQUIRED TO VERIFY THE OUTSIDE DIAMETER OF THE EXISTING WATER AND SEWER MAINS AND COORDINATE REQUIRED MODIFICATIONS, IF ANY, TO THE SLEEVE AND GLAND (MACHINING AND OTHERWISE) WITH THE MANUFACTURER. CONTRACTOR SHALL HAVE ALL MATERIALS NEEDED TO MAKE CONNECTION ON SITE PRIOR TO COMMENCING WITH THE CONNECTION.

G. BEDDING AND BACKFILL SHALL BE IN ACCORDANCE WITH VDOT STANDARD UB-1, TYPE 1.

2. GATE VALVES AND MANHOLES FOR WATER MAINS FROM 75mm UP TO AND INCLUDING 500mm IN DIAMETER SHALL CONFORM TO AWWA C509 - LATEST REVISION. GATE VALVES SHALL BE RESILIENT SEATED, HAVING AN ENCAPSULATED DISC, RATED FOR 200 PSI WORKING PRESSURE FOR VALVES UP TO AND INCLUDING 300mm AND 150 PSI WORKING PRESSURE FOR THE VALVES LARGER THAN 300mm. VALVES SHALL BE EQUIPPED WITH O-RING SEALS, MECHANICAL JOINTS, IRON BODY, AND SUITABLE FOR BURIED SERVICE. GATE VALVES SHALL BE VERTICAL NUT-OPERATED, NON-RISE STEM TYPE. ALL GATE VALVES FOR WATER MAINS SHALL OPEN LEFT (COUNTER CLOCKWISE).

3. GATE VALVES AND BOXES SHALL UTILIZE THE SAME GATE VALVE SPECIFIED BY NOTE NO. 2, EXCEPT THE WATER VALVE BOXES SHALL BE IN ACCORDANCE WITH VDOT STANDARD VB-1 "TYPE A". VALVE BOX CASTINGS SHALL RECEIVE AN ASPHALTIC COATING. VALVE BOX SHALL BE THE SLIDING TYPE WITH A ROUND HEAD MARKED "WATER". VALVE BOX SHALL BE MUELLER NO. 10364, OR APPROVED EQUAL.

4. FIRE HYDRANTS SHALL BE DRY BARREL TYPE AND SHALL BE MANUFACTURED IN COMPLETE ACCORDANCE WITH AWWA C502 - LATEST REVISION. HYDRANTS SHALL HAVE FULL 360 DEGREE REVOLVING HEADS AND SHALL OPEN BY TURNING THE OPERATING NUT TO THE LEFT (COUNTER CLOCKWISE). HYDRANTS SHALL BE:

1. AFK MODEL MK 73

2. AVK MODEL 2780

HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH VDOT STANDARD FH-1 TYPE 1 RESTRAINT REQUIRED. HYDRANT HOSE CONNECTIONS, THREADS, AND OPERATING NUTS SHALL CONFORM TO THE WESTERN VIRGINIA WATER AUTHORITY STANDARDS. HYDRANTS SHALL BE PAINTED PER THE WESTERN VIRGINIA WATER AUTHORITY STANDARDS.

5. WATER SERVICE LINES SHALL BE TYPE "K" COPPER, AND SHALL BE INSTALLED IN ACCORDANCE WITH VDOT STANDARD WM-1 AND AWWA C800. CRIMP AND CLAMP EXISTING WATER SERVICE LINES ON ABANDONED WATER MAINS. CORPORATION STOPS SHALL BE BRONZE FITTINGS AND SHALL CONFORM TO AWWA C800.

A. TAPS FOR PROPOSED WATER MAINS SHALL INCLUDE:

1. LESS THAN 1/8" DIAMETER - CORPORATION STOP WITH NO SADDLE REQUIRED.

2. GREATER THAN OR EQUAL TO 1/8" DIAMETER OF WATER MAIN AND LESS THAN 50mm DIAMETER

6. WATER METERS SHALL BE MANUFACTURED BY BADGER AND SHALL BE IN ACCORDANCE WITH WESTERN VIRGINIA WATER AUTHORITY STANDARDS. THE INSTALLATION OF THE WATER SERVICE LINE, METER, METER BOX, AND YOKE SHALL BE LOCATED AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH VDOT STANDARD WM-1. WATER METER ASSEMBLY SHALL BE IN ACCORDANCE WITH DETAIL NO. W-03 OF THE WYWA STANDARDS AND SHALL CONTAIN A PRESSURE REDUCING VALVE (WATTS NO. 600, OR EQUAL).

7. SANITARY SEWER PIPE SHALL BE POLYVINYL CHLORIDE (PVC) PIPE. SANITARY SEWER MAINS 100mm - 400mm IN DIAMETER SHALL BE MADE OF SDR 35 PVC, MANUFACTURED IN ACCORDANCE WITH ASTM D3034. SANITARY SEWER MAINS 450mm - 750mm IN DIAMETER SHALL CONFORM TO ASTM F-679. OR ASTM F-794- CORPORATION STOP WITH SADDLE REQUIRED.

SANITARY SEWER SERVICE LATERALS SHALL BE MADE OF SDR 35 OR SCHEDULE 40 PVC. CONTRACTOR SHALL BE RESPONSIBLE FOR THE EXPLORATION TO LOCATE AND CONNECT TO EXISTING SANITARY SERVICE LATERALS. THIS COST SHALL BE CONSIDERED INCIDENTAL TO THE COST OF PROPOSED SANITARY SERVICE INSTALLATION.

8. SANITARY SEWER MANHOLES SHALL BE IN ACCORDANCE WITH VDOT STANDARD SMH-1. WATERTIGHT MANHOLE FRAME AND COVERS SHALL BE IN ACCORDANCE WITH VDOT STANDARD WF&C-1. FRAMES SHALL BE EAST JORDAN IRON WORKS, INC. MODEL 10452, AND COVERS SHALL BE MODEL #1040ACS, OR APPROVED EQUAL. MANHOLE COVERS SHALL HAVE THE WORDS "SANITARY SEWER" CAST INTO THE COVER FRAME AND COVER SHALL BE SET FLUSH WITH PROPOSED GRADE INCLUDING CROSS SLOPES OF PAVEMENT.

9. SEWER CLEANOUTS SHALL BE IN ACCORDANCE WITH VDOT STANDARD SCO-1, TYPE B.

10. ADJUST EXISTING SANITARY SEWER MANHOLE FRAME & COVER IN ACCORDANCE WITH SECTION 510 AND 520 OF THE ROAD AND BRIDGE SPECIFICATIONS. FRAME AND COVER SHALL BE SET FLUSH WITH THE PROPOSED GRADE INCLUDING CROSS SLOPES OF PAVEMENTS.

11. CONCRETE ENCASEMENT SHALL BE IN ACCORDANCE WITH VDOT STANDARD UB-1. THE COST FOR CONCRETE ENCASEMENT SHALL INCLUDE THE COFFERDAMS NECESSARY TO CONSTRUCT THE STREAM CROSSING, INCLUDING PROPER DISPOSAL OF THE COFFERDAM MATERIAL.

12. ADJUST EXISTING WATER MANHOLE FRAME & COVER IN ACCORDANCE WITH NOTE NO. 10.

13. AIR RELEASE VALVE AND MANHOLE SHALL BE CONSTRUCTED IN ACCORDANCE WITH VDOT STANDARD ARV-1.

14. WATER VAULT SHALL BE IN ACCORDANCE WITH PLAN DETAIL SHOWN ON SHEET 12(12).

WATER VAULT WILL BE MEASURED IN UNITS OF EACH AND WILL BE PAID FOR AT THE CONTRACT UNIT PRICE EACH PER EACH. THIS PRICE SHALL INCLUDE ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED FOR A COMPLETE, WORKING INSTALLATION. THIS WORK SHALL INCLUDE, BUT NOT LIMITED TO, THE PRECAST CONCRETE VAULT WITH STEPS, ACCESS HATCH, FLOOR DRAIN (INCLUDING PIPING & FRENCH DRAIN), INTERIOR PIPING PENETRATION SEALS, PIPE SUPPORTS, CONNECTIONS TO EXISTING PIPING, REMOVAL OF EXISTING VALVES FROM EXISTING VAULT AND PLACEMENT IN NEW VAULT, SHUTDOWNS OF WATER MAINS, EXCAVATIONS, STONE BEDDING AND BACKFILL.

CONTRACTOR SHALL CAREFULLY MEASURE EXISTING PIPING, METERS, AND VALVES TO ENSURE THAT THESE WILL ADEQUATELY FIT IN THE NEW VAULT PRIOR TO ORDERING MATERIALS FOR THIS WORK. CONTRACTOR SHALL DETAIL THIS WORK ON A SHOP DRAWING. ACCESS HATCH SHALL BE A SINGLE DOOR HATCH AS MANUFACTURED BY HALIDAY OR BILCO. INTERIOR PIPING SHALL BE FLANGED DUCTILE IRON PIPE. PRECAST VAULT SHALL BE CONSTRUCTED IN ACCORDANCE WITH VDOT SPECIFICATION SECTION 302.03(B).

DESIGN FEATURES RELATING TO CONSTRUCTION OR TO REGULATION AND CONTROL OF TRAFFIC MAY BE SUBJECT TO CHANGE AS DEEMED NECESSARY BY THE DEPARTMENT

REVISED	FWA REGION	STATE	FEDERAL AID PROJECT	ROUTE	STATE PROJECT	SHEET NO.
	3	VA		601	0601-080-233 C-501	12(2)

SUGGESTED SEQUENCE OF CONSTRUCTION

1. RELOCATE 300mm D.I. WATER MAIN ON SHEET 12(3) PRIOR TO CONSTRUCTION OF STORM DRAINAGE STRUCTURES THAT CONFLICT WITH EXISTING WATER MAIN AND ALSO PRIOR TO NEW BRIDGE CONSTRUCTION (NEAR STATION 12+80).

2. RELOCATE 300mm D.I. WATER MAIN FROM STATION 13+20 (NEAR BRIDGE) TO STATION 32+50 PRIOR TO ROADWAY CONSTRUCTION AFFECTING THE WATER MAIN.

3. RELOCATE THE 450mm SANITARY SEWER ON SHEET 12(5) PRIOR TO ROADWAY EARTHWORK AFFECTING THE UTILITY.

4. RELOCATE THE 300mm D.I. WATER MAIN ON SHEET 12(6) NEAR STATION 20+40 PRIOR TO CONSTRUCTION OF DROP INLET STRUCTURE 6-3.

5. RELOCATE THE 300mm D.I. WATER MAIN (30+85 LT. TO 35+75 LT.) PRIOR TO STORM DRAINAGE CONSTRUCTION AND ROADWAY CUTS AFFECTING THE WATER MAIN.

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PLAN NO. A

PROJECT 0601-080-233

FILE NO.

SHEET NO. 12(2)

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