

MATERIALS NOTES

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

REVISED	FWMA REGION	STATE	FEDERAL AID		STATE		SHEET NO.
			PROJECT	ROUTE	PROJECT		
VA.	3			11	0011-080-108, C-501		21(2)

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 12" 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 12" SIZE. 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
4. McWANE PIPE

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 AND ANSISPECIFICATION A21.4, STANDARD THICKNESS INCLUDING ASPHALTIC SEAL LININGS EQUAL TO "ENAMELINE" WITH TAR COATING IN THE EXTERIOR EXTERIOR WILL BE CONSIDERED AS A SATISFACTORY LINING FOR WATER PIPE.

E. PIPE RESTRAINING LENGTH SHALL BE IN ACCORDANCE WITH THE SCHEDULE ON SHEET 10(8). RESTRAINED PIPE SHALL MEET THE FOLLOWING CRITERIA:

1. 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 1100 "MEGALUG," FORD "UNI-FLANGE", ROMAC INDUSTRIES "GRIP RING", OR APPROVED EQUAL.

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 BOXES FOR WATER MAINS FROM 3" UP TO AND INCLUDING 20" IN DIAMETER SHALL CONFORM TO AWWA C515 - LATEST REVISION. GATE VALVES SHALL BE RESILIENT SEATED, HAVING AN ENCAPSULATED DISC, RATED FOR 250 PSI WORKING PRESSURE FOR ALL VALVES. ON VALVES LARGER THAN 14", BUTTERFLY VALVES CONFORMING TO AWWA C504 MAY BE USED. VALVES SHALL BE EQUIPPED WITH O-RING SEALS, MECHANICAL JOINTS, IRON BODY, AND SUITABLE FOR BURIED SERVICE. GATE VALVES SHALL BE VERTICAL WRENCH NUT-OPERATED, NON-RISING STEM TYPE GATE VALVES SHALL BE:

1. AMERICAN FLOW CONTROL SERIES 500 AND 2500
2. DRESSER "M & H" MODEL 3067/68
3. MUELLER COMPANY MODEL A-2360

ALL GATE VALVES FOR WATER MAINS SHALL OPEN LEFT (COUNTER CLOCKWISE).

ALL MAIN LINE WATER VALVES SHALL BE CONTAINED WITHIN A WATER VALVE MANHOLE. VALVE MANHOLE SHALL CONSIST OF PRECAST MANHOLE CONE SECTIONS WITH WATER MANHOLE COVERS.

WATER VALVE BOXES SHALL BE IN ACCORDANCE WITH VDOT STANDARD VB-1 "TYPE A." VALVE BOX INSTALLATION/ADJUSTMENT SHALL BE IN ACCORDANCE WITH VDOT STANDARD VB-1, "TYPE A." VALVE BOX CASTINGS SHALL RECEIVE AN ASPHALTIC COATING. VALVE BOXES SHALL BE MUELLER COMPANY 10364, OR APPROVED EQUAL. WATER VALVE BOXES SHALL ONLY BE USED ON FIRE HYDRANT VALVES.

3. BUTTERFLY VALVES SHALL HAVE A MINIMUM WORKING PRESSURE OF 250 PSIG CONFORMING TO AWWA STANDARD C504, CLASS 250B, LATEST REVISION. VALVES SHALL BE OF ONE PIECE, POSITIVE DRIVE TYPE WITH MECHANICAL JOINT ENDS, RUBBER VALVE SEATS, AN IRON BODY, AND PERMANENT LUBRICATION. THERE SHALL BE MOUNTED ON EACH BUTTERFLY VALVE A SIDE MOUNTED MANUAL OPERATOR WITH TOTALLY ENCLOSED, PERMANENTLY LUBRICATED GEARING CONSTRUCTED SUCH THAT A MAXIMUM TORQUE OF 80 FT. - LB. IS REQUIRED ON THE OPERATOR TO DEVELOP THE SEATING AND UNSEATING TORQUES OF THE VALVE. THE VALVES SHALL OPEN LEFT (COUNTER-CLOCKWISE) BY A 2" SQUARE OPERATING NUT. BUTTERFLY VALVES SHALL BE GROUNDHOG BY PRATT, AMERICAN-BFV BY VAL-MATIC, LINESEAL III BY MUELLER, OR 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 HAVE A MAIN VALVE OPENING OF NOT LESS THAN 4 1/2" IN DIAMETER. HYDRANTS SHALL BE:

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1. AFC MODEL B-84-B
  2. MUELLER CENTURION A-423
  3. AVK MODEL 2780
  4. KENNEDY K81D
- OR APPROVED EQUAL.

HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH VDOT STANDARD FH-1 TYPE 1 RESTRAINT REQUIRED. HYDRANT NOZZLES, THREADS, AND OPERATING NUTS SHALL CONFORM TO LOCAL FIRE DEPARTMENT STANDARDS. HYDRANTS SHALL HAVE ONE 4 1/2" PUMPER NOZZLE AND TWO 2 1/2" HOSE NOZZLES. HYDRANTS SHALL BE PAINTED ACCORDING TO OWNERS COLOR SCHEME AND SPECIFICATIONS. HYDRANT ASSEMBLY SHALL BE RESTRAINED FROM CONNECTION TO DISTRIBUTION MAIN TO HYDRANT. APPROVED RESTRAINT METHODS INCLUDE THREADED "CORTEN" RODDING BETWEEN HYDRANT, HYDRANT VALVE AND CONNECTION TO WATER DISTRIBUTION MAIN WITH CONCRETE RESTRAINT ("MEGA-LUG", "GRIP RING", OR "UNI-FLANGE") MAY BE USED IN LIEU OF CONCRETE THRUST BLOCKING. INFACCT CORPORATION'S "FOSTER ADAPTOR" MAY BE USED TO CONNECT BETWEEN MECHANICAL JOINT VALVES, FITTINGS AND HYDRANT CONNECTIONS.

5. WATER SERVICE LINES SHALL BE TYPE "K" COPPER WITH MINIMUM 1" DIAMETER, AND SHALL BE INSTALLED IN ACCORDANCE WITH VDOT STANDARD WM-1 AND AWWA C800. CORPORATION STOPS SHALL BE BRONZE FITTINGS AND SHALL CONFORM TO AWWA C800. CORPORATION STOP SHALL BE FORD F1000-4-G OR APPROVED EQUAL.

A. TAPS FOR PROPOSED WATER MAINS SHALL INCLUDE:

1. FOR SERVICE LINES GREATER THAN OR EQUAL TO 1" DIAMETER AND EQUAL TO OR LESS THAN 3" DIAMETER - CORPORATION STOP WITH CTS COMPRESSION CONNECTION REQUIRED. SADDLE REQUIRED FOR CONNECTIONS TO ALL CLASS 50 DUCTILE IRON PIPE. APPROVED SADDLES INCLUDE POWERSEAL 3413, 3417, OR 3412AS; ROMAC 202, 202S, OR 306; OR FORD METER F202, FS202, OR FS303.

6. WATER METERS WILL BE INSTALLED BY WESTERN VIRGINIA WATER AUTHORITY. THE INSTALLATION OF THE WATER SERVICE LINE, BOX AND SETTER SHALL BE LOCATED AS SHOWN ON THE PLANS AND IN ACCORDANCE WITH THE DETAILS ON SHEET 21(19A). THE METER INSTALLATION TYPE ("A" OR "C"), SHALL BE DETERMINED BY THE PRESSURE AT THE METER LOCATION. REFER TO THE HYDRAULIC GRADE ELEVATIONS INDICATED BY THE GENERAL NOTE \*27 ON SHEET 21(1A).

ON WATER SERVICES WHERE WATER MAIN PRESSURE IS GREATER THAN 120 PSI, METER BOX TO BE CARSON/MID-STATES PLASTICS, INC PLASTIC BOX WITH FORD A32-T ELECTRONIC READ LID OR A.Y. McDONALD MODEL 74M32C-TC CAST IRON BASE AND COVER OR APPROVED EQUAL. METER BOX ASSEMBLY TO BE STANDARD DOUBLE METER SETTER AND BOX. A 3/4" PRESSURE REDUCING VALVE WITH PRESSURE RELIEF VALVE TO BE INSTALLED. DOUBLE SETTER TO BE A.Y. McDONALD \*50-215 WDD33, FORD TVBHH92-15W 1133 OR APPROVED EQUAL. ALL SETTERS SHALL BE EQUIPPED WITH INTEGRAL LOCKABLE VALVE AND CHECK VALVE. CONTRACTOR SHALL REFER TO THE DETAILS ON SHEET 21(19A).

7. 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.

8. DUCTILE IRON SANITARY SEWER PIPE, SANITARY SEWER LATERAL CONNECTIONS AND FITTINGS SHALL BE IN ACCORDANCE WITH MATERIAL NOTE NO. 1 FOR DUCTILE IRON WATER MAIN EXCEPT THAT THICKNESS CLASS 51 PIPE SHALL BE THE MINIMUM STRENGTH USED IN ALL SEWER APPLICATIONS. ALL DUCTILE IRON PIPE AND FITTINGS SHALL BE LINED WITH PROTECTO 401EPOXY, OR APPROVED EQUAL.

9. SANITARY SEWER MANHOLES SHALL BE IN ACCORDANCE WITH VDOT STANDARD SMH-1. MANHOLE FRAME & COVER SHALL BE IN ACCORDANCE WITH VDOT STANDARD F&C-1. FRAME AND COVER SHALL BE SET FLUSH WITH PROPOSED GRADE INCLUDING CROSS SLOPES OF PAVEMENTS. WATERTIGHT MANHOLE FRAME & COVER SHALL BE IN ACCORDANCE WITH VDOT STANDARD WF&C-1.

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

11. CONCRETE ENCASEMENT SHALL BE IN ACCORDANCE WITH VDOT STANDARD UB-1.

12. AIR RELEASE VALVE SHALL BE MODEL NO. 145-C BY APCO, OR APPROVED EQUAL BY CRISPIN OR VAL-MATIC. VALVE SHALL BE PLACED IN PRECAST CONCRETE MANHOLE IN ACCORDANCE WITH WYWA STANDARDS.

13. PRESSURE REDUCING VALVE VAULT SHALL BE IN ACCORDANCE WITH PLAN DETAIL SHOWN ON SHEET 21(19). VAULT WILL BE MEASURED AND PAID FOR AT THE LUMP SUM PRICE. THIS PRICE SHALL INCLUDE ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED FOR A COMPLETE, WORKING INSTALLATION. THIS WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, THE PRECAST CONCRETE VAULT WITH STEPS, ACCESS HATCH, FLOOR DRAIN (INCLUDING PIPING & FRENCH DRAIN IF SHOWN), INTERIOR PIPING, PENETRATION SEALS, PIPE SUPPORTS, CONNECTIONS TO PIPING (INCLUDING REDUCERS), PRESSURE REDUCING VALVES, BYPASSES, GATE VALVES, BENDS, FITTINGS, SHUTDOWNS OF WATER MAINS, EXCAVATIONS, STONE BEDDING, AND BACKFILL. WORK SHALL ALSO INCLUDE INITIAL SETTING AND ADJUSTMENT OF VALVES AND COORDINATION WITH WYWA FOR OPERATION.

14. METER VAULTS SHALL BE IN ACCORDANCE WITH PLAN DETAILS ON SHEET 21(19). VAULTS SHALL BE MEASURED AND PAID FOR AT THE UNIT PRICE BID FOR EACH. THIS PRICE SHALL INCLUDE ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED FOR A COMPLETE, WORKING INSTALLATION. THIS WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, THE PRECAST CONCRETE VAULT WITH STEPS, ACCESS HATCH, FLOOR DRAIN (INCLUDING PIPING AND FRENCH DRAIN), INTERIOR PIPING, PENETRATION SEALS, PIPE SUPPORTS, CONNECTIONS TO PIPING (INCLUDING REDUCERS), DOUBLE DETECTOR CHECK VALVE, GATE VALVES WITH HAND WHEELS, BENDS, FITTINGS, SHUTDOWNS OF WATER MAIN, EXCAVATIONS, STONE BEDDING AND BACK FILL. DOMESTIC METER SHALL BE FURNISHED BY WYWA.

15. BULK METER VAULTS SHALL BE IN ACCORDANCE WITH PLAN DETAILS ON SHEET 21(19). VAULT SHALL BE MEASURED AND PAID FOR AT THE UNIT PRICE BID FOR EACH. THIS PRICE SHALL INCLUDE, ALL MATERIALS, EQUIPMENT AND LABOR REQUIRED FOR A COMPLETE, WORKING INSTALLATION. THIS WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, THE PRECAST CONCRETE VAULT WITH STEPS, ACCESS HATCH, INTERIOR PIPING, PENETRATION SEALS, PIPE SUPPORTS, CONNECTIONS TO EXISTING PIPING, ELECTROMAGNETIC FLOWMETER, INTERNAL WIRING AND CONDUIT, PANEL BOX AND FRAME FOR METER BASE AND DISCONNECT (BY OTHERS), CONDUIT FROM THE VAULT TO POWER POLE (STUBBED UP POLE), COORDINATION WITH THE POWER COMPANY, EXCAVATIONS, STONE BEDDING AND BACKFILL.

16. RELOCATE EXISTING METER VAULT SHALL BE IN ACCORDANCE WITH PLAN DETAILS ON ON SHEET 21(19A) THIS ITEM SHALL INCLUDE ALL MATERIALS, EQUIPMENT, AND LABOR REQUIRED FOR A COMPLETE WORKING INSTALLATION. THIS WORK SHALL INCLUDE, BUT NOT BE LIMITED TO, THE PRECAST CONCRETE VAULT WITH STEPS, ACCESS HATCH, FLOORDRAIN (IF SHOWN), PENETRATION SEALS, INTERIOR PIPING, PIPE SUPPORTS, VALVES, BYPASS LINES AROUND THE VAULT, SHUTDOWNS OF EXISTING WATER MAIN, COORDINATION WITH WYWA AND CUSTOMER, RELOCATION OF EXISTING METER INTO NEW VAULT, EXCAVATIONS, STONE BEDDING, AND BACKFILL.

17. TAPPING SLEEVES SHALL BE MANUFACTURED FROM GRAY IRON, MEETING OR EXCEEDING ASTM A126 GRADE B, OR DUCTILE IRON, MEETING ASTM A536 GRADE 65-45-12. AS AN ALTERNATIVE, TAPPING SLEEVES CAN BE ALL STAINLESS STEEL (18-8 TYPE 304) STYLE FAST AS MANUFACTURED BY FORD METER BOX CO. OR EQUAL. TAPPING SLEEVES SHALL HAVE MECHANICAL JOINT ENDS AND FLANGED OUTLETS CONFORMING TO CLASS 125, ANSIB16.1. OUTSIDE COATING OF IRON SLEEVES SHALL BE ASPHALTIC COATING. TAPPING VALVES SHALL MEET THE REQUIREMENTS OF ANSI/AWWA C515. TAPPING SLEEVES AND TAPPING VALVES SHALL BE SUPPLIED BY THE SAME MANUFACTURER. TAPPING SLEEVES SHALL BE MUELLER H-615, AD84MJ TAPPING SLEEVE BY AMERICAN, OR FIG. 920 OR 921 BY KENNEDY. TAPPING VALVES SHALL BE MUELLER T-2360, AMERICAN SERIES 2500, OR FIG 8950 BY KENNEDY.

18. SANITARY SEWER PIPE SHALL BE SDR 35 PVC PIPE CONFORMING TO ASTM D3034-77, OR SHALL BE DUCTILE IRON PIPE IN ACCORDANCE WITH MATERIAL NOTE NO. 8.

19. SANITARY SEWER LATERALS SHALL BE CONSTRUCTED OF SDR-35 PVC PIPE CONFORMING TO ATSM D3034-77, OR DUCTILE IRON CONFORMING TO MATERIAL NOTE 8.

20. SANITARY FORCE MAIN SHALL BE SDR-21 PVC PIPE, AWWA C-900 DR-18 PVC PIPE, OR HIGH-DENSITY POLYETHYLENE (HDPE) DR-11-PIPE.

21. NOT USED

22. SANITARY SEWER PRESSURE LATERAL SHALL BE IN ACCORDANCE WITH THE DETAIL ON SHEET 21(19A).