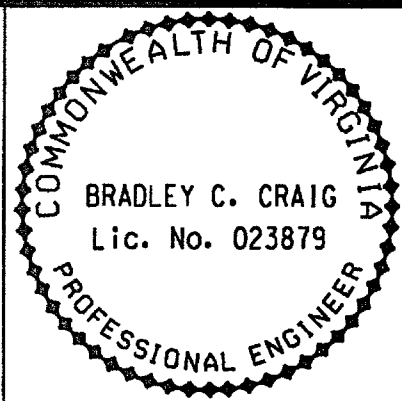


MATERIAL NOTES



Bradley C Craig
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MATTEN & CRAIG, INC
Roanoke, Virginia
(UTILITY ENGINEER)

REVISED	STATE	FEDERAL AID	STATE		SHEET NO.
		PROJECT	ROUTE	PROJECT	
	VA.			U000-128-VI2, C-503	23(12)

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

SUGGESTED SEQUENCE OF
CONSTRUCTION - WATER & SEWER

- CONTRACTOR SHALL CAREFULLY COORDINATE ALL WATER/SEWER UTILITY RELOCATIONS WITH THE ROADWAY SEQUENCE OF CONSTRUCTION FOR THIS PROJECT. REFER TO ROADWAY PLANS FOR THIS SEQUENCING.
- IT IS THE INTENT OF THESE PLANS FOR THE UTILITY WORK TO BE CONSTRUCTED UNDER THE DETOURS (SOUTHERN AND NORTHERN) DESCRIBED IN THE ROADWAY PLANS. UTILITY CONTRACTOR SHALL MAINTAIN LOCAL TRAFFIC WITHIN THESE DETOURED AREAS DURING UTILITY CONSTRUCTION USING ADDITIONAL FLAGGING, ETC.
- CONSTRUCTION OF ALL WATER/SEWER FACILITIES SHALL BE ACCOMPLISHED PRIOR TO THE ROADWAY CUTS/FILLS AND STORM DRAINAGE CONSTRUCTION THAT CREATE CONFLICTS WITH THE RESPECTIVE UTILITIES.

Materials :

Water

Pipe : 6", 8", 12" U.S. Pipe DIP, Class 350
Service Line: 1" Endot HDPE SDR-9
Valves : American Flow Control
Resilient seat Gate valves
6" - CCW on, 21 Turns
8" - CCW on, 27 Turns
12" - CCW on, 39 Turns

Sewer

Pipe : 8", 10", ~~12"~~, 24" U.S. Pipe DIP
Protecto 401 Epoxy-coated Class 52
8" North American PVC SDR-35 (For Betterment/Add'l Work)
Laterals : 4" North American PVC SDR-26
MH Structures: C P & P Pre-cast concrete
F & C : U.S. Foundry (standard watertight)

- DUCTILE IRON PIPE SHALL CONFORM WITH AWWA C 151/ANSI 21.51 AND FITTINGS SHALL CONFORM WITH ANSI/AWWA C110 OR C153 (COMPACT FITTINGS). THE PIPE AND FITTINGS SHALL BE ASPHALT COATED AND CEMENT LINED IN ACCORDANCE WITH AWWA C104/ANSI 21.40. THE PIPE THICKNESS SHALL CONFORM WITH AWWA C150/ANSI 21.50 AND SHALL BE CLASS 350, AS A MINIMUM, THROUGH THE 12" SIZE. FITTINGS FOR WATER PIPE SHALL BE MECHANICAL OR PUSH-ON JOINT. FITTINGS SHALL BE EITHER DUCTILE IRON OR GRAY IRON. FOR THE LARGER DIAMETER PIPE, PIPE PRESSURE CLASS SHALL BE 250. DUCTILE IRON PIPE SHALL BE MANUFACTURED BY:
 - AMERICAN CAST IRON PIPE COMPANY
 - U.S. PIPE AND FOUNDRY COMPANY
 - MCWANE CAST IRON PIPE COMPANY

A. DUCTILE IRON PIPE AND FITTINGS FOR BURIED SERVICE SHALL BE EITHER MECHANICAL OR BELL AND SPIGOT TYPE JOINTS AS SPECIFIED OR INDICATED. JOINTS SHALL BE MADE WITH A SINGLE WATERTIGHT RUBBER GASKET MANUFACTURED IN ACCORDANCE WITH AWWA C111/ANSI 21.11. THE JOINTS SHALL BE MADE IN STRICT ACCORDANCE WITH THE RECOMMENDATIONS OF THE PIPE MANUFACTURER.

B. DEFLECTION: ALLOWABLE DEFLECTION SHALL BE 80% OF THE MAXIMUM DEFLECTION ALLOWED BY AWWA C600 TABLE 3 AND 4. 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 C10, 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. RESTRAINED JOINTS:
 - MECHANICALLY RESTRAINED JOINTS SHALL BE A FOLLOWER GLAND TYPE, SUITABLE FOR A 250 PSI WORKING PRESSURE AND A 500 PSI WATER HAMMER (SURGE) PRESSURE. GLANDS SHALL BE A SINGLE PIECE, EXCEPT WHERE REQUIRED TO BE SPLIT FOR APPLICATION ON EXISTING PIPE. MATERIAL SHALL BE DUCTILE IRON. JOINT SHALL BE DESIGNED TO RESTRAIN STANDARD MECHANICAL JOINTS. THE RATED PRESSURE SHALL INCLUDE A 2:1 SAFETY FACTOR. ACCEPTABLE MECHANICAL RESTRAINT DEVICES ARE "MEGA-LUG" BY EBAA IRON, "UNI-FLANGE" BY FORD, "GRIP RING" BY ROMAC INDUSTRIES OR EQUAL.
 - DUCTILE IRON PUSH-ON JOINT PIPE MAY BE RESTRAINED USING "FIELD LOK" GASKETS BY U.S. PIPE OR THE "FAST GRIP" BY AMERICAN DUCTILE IRON PIPE COMPANY.
 - RESTRAINED JOINT PIPE SHALL BE DUCTILE IRON. THE JOINT SHALL BE CAPABLE OF HANDLING A WORKING PRESSURE OF 350 PSI FOR SIZES 4" THROUGH 24", 250 PSI FOR SIZES 30" THROUGH 48" AND 200 PSI FOR SIZES 54" THROUGH 64". ACCEPTABLE RESTRAINED JOINT PIPE INCLUDES THE "TR FLEX" PIPE BY U.S. PIPE, "SNAP-LOK" PIPE BY GRIFFIN PIPE, AND "FLEX RING" BY AMERICAN DUCTILE IRON PIPE COMPANY OR EQUAL.
 - MUELLER COMPANY'S "AQUAGRIP" SYSTEM MAY BE USED TO RESTRAIN VALVES OR HYDRANTS THAT ARE MANUFACTURED BY MUELLER COMPANY.
 - RESTRAINED JOINTS SHALL BE USED FOR ALL FITTINGS, VALVES AND TRANSITIONS.
 - MINIMUM RESTRAINED LENGTHS SHALL BE AS SPECIFIED ON SHEET 23(17).

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 STAINLESS STEEL, MEETING AWWA C207, WITH A MINIMUM PRESSURE RATING OF 250 PSI. SLEEVES SHALL HAVE MECHANICAL JOINT ENDS SUITABLE FOR USE WITH APPROVED RESTRAINING RETAINER GLANDS. 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. SIZE ON SIZE TAPS SHALL NOT BE ALLOWED.

G. BEDDING AND BACKFILL SHALL BE IN ACCORDANCE WITH VDOT STANDARD UB-1, TYPE 1.
- GATE VALVES AND BLOWOFF GATE VALVES SHALL BE COMPRESSION RESILIENT SEATED VALVES CONFORMING TO AWWA C509 OR C515. THE VALVE SHALL BE DESIGNED SO THAT NO SLIDING OR SHEAR ON THE RESILIENT SEATING SURFACE IS PRESENT WHEN COMPRESSED TO A DROP TIGHT SHUT OFF. VALVE SHALL SEAL EQUALLY WELL IN EITHER DIRECTION. VALVE SHALL PROVIDE FULLY OPEN WATERWAY. VALVE SHALL HAVE O-RING SEALING AND A FUSION BONDED EPOXY COATING INSIDE AND OUT. VALVE SHALL BE PERMANENTLY LUBRICATED. VALVE SHALL HAVE A MANGANESE BRONZE STEM AND NUT WITH ANTI-THRUST WASHERS. OPERATING NUT SHALL BE 2 INCH SQUARE. THE VALVES SHALL BE:
 - AFC-2500 BY AMERICAN FLOW CONTROL
 - FIG. 8571 BY KENNEDY VALVE
 - F-6100 BY CLOW CORPORATION
 - AVK
 - OR EQUAL

GATE VALVES SMALLER THAN 3 INCH SHALL BE BRONZE WITH ENDS TO SUIT PIPING AND SHALL BE 250 PSI WORKING PRESSURE. VALVES SHALL BE STOCKHAM FIGURE B103, B104, OR B109 OR EQUAL. EACH GATE VALVE SHALL BE PROVIDED WITH A MANHOLE IN ACCORDANCE WITH WYWA DETAIL W-9 SHOWN ON SHEET 23(17A). GATE VALVES SERVING FIRE HYDRANTS SHALL UTILIZE A VALVE BOX INSTEAD OF A MANHOLE.

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. VALVE BOXES SHALL ONLY BE USED ON FIRE HYDRANT VALVES.

- FIRE HYDRANTS SHALL CONFORM TO AWWA C502 (LATEST REVISION) AND SHALL BE DRY TOP, DRY BARREL, COMPRESSION TYPE WITH DOUBLE O-RING SEALS SUITABLE FOR 250 PSI WORKING PRESSURE. HYDRANTS SHALL BE DESIGNED FOR WATER MAINS HAVING THREE (3) FEET MINIMUM COVER; HOWEVER, EACH PROPOSED LOCATION SHALL BE COORDINATED BY THE CONTRACTOR AS TO THE EXACT SETTING DEPTH REQUIRED. HYDRANTS SHALL BE EQUIPPED WITH A 5/4" INCH VALVE OPENING, AND A 7 INCH MINIMUM INSIDE DIAMETER STANDPIPE. EACH HYDRANT SHALL HAVE A 6 INCH MECHANICAL JOINT SHOE, TWO (2) 2 1/2 INCH HOSE NOZZLES WITH NATIONAL STANDARD THREADS CONNECTION AND ONE (1) 4 1/2 INCH BUMPER NOZZLE WITH NATIONAL STANDARD THREADS CONNECTION. PRIOR TO ORDERING HYDRANTS, CONTRACTOR SHALL CONFIRM WITH LOCAL FIRE DEPARTMENT THAT NOZZLES, THREADS AND OPERATING NUT SUIT THEIR STANDARDS. EACH HYDRANT SHALL BE PROVIDED WITH ONE OPERATING WRENCH FOR ITS OPERATING STEM NUT. THE DIRECTION OF ROTATION SHALL BE COUNTERCLOCKWISE. THE OPERATING STEM NUT SHALL BE A FIVE-SIDED NUT WITH A FLAT TO POINT DIMENSION OF ONE AND ONE-HALF (1 1/2) INCHES. HYDRANTS SHALL BE COATED AND PAINTED IN ACCORDANCE WITH AWWA C502, WITH COLORS TO SUIT THE OWNER'S STANDARD. THE UPPER AND LOWER OPERATING STEMS SHALL BE JOINED BY A SAFETY COUPLING, LOCATED TO PREVENT DAMAGE TO HYDRANT VALVE WHEN UPPER STANDPIPE IS DAMAGED. FIRE HYDRANTS SHALL BE CONSTRUCTED IN ACCORDANCE TO WYWA DETAIL W-17 SHOWN ON SHEET 23(17B). THE FIRE HYDRANTS SHALL BE:
 - AFC MODEL B-84-B-5
 - MUELLER CENTURION A-423
 - AVK MODEL 2780
 - KENNEDY K81D OR APPROVED EQUAL
- 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:
 - FOR SERVICE LINES GREATER THAN OR EQUAL TO 1" DIAMETER AND EQUAL TO OR LESS THAN 3" DIAMETER CORPOARTION STOP WITH CTS COMPRESSION CONNECTION REQUIRED. SADDLE REQUIRED FOR CONNECTIONS TO ALL CLASS 50 DUCTILE IRON PIPE. APPROVED SADDLES INCLUDE POWERSEAL 3413, ROMAC 202; OR FORD METER F202.
- 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 23(17C). THE METER INSTALLATION TYPE ("A" OR "C"), SHALL BE DETERMINED BY THE PRESSURE AT THE METER LOCATION.

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 WDDD33, FORD TVBH72-15W 1133 OR APPROVED EQUAL. ALL SETTERS SHALL BE EQUIPPED WITH INTEGRAL LOCKABLE VALVE AND CHECK VALVE. CONTRACTOR SHALL REFER TO THE DETAILS ON SHEET 23(17C).
- 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.
- 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 401 EPOXY, OR APPROVED EQUAL. SANITARY LATERALS AND CLEANOUTS SHALL BE IN ACCORDANCE WITH DETAIL S-6 SHOWN ON SHEET 17(17A).
- SANITARY SEWER MANHOLES SHALL BE IN ACCORDANCE WITH WYWA DETAILS S-1, S-2, & S-3 SHOWN ON SHEETS 23(17) & 23(17A). MANHOLE FRAME & COVER SHALL BE IN ACCORDANCE WITH DETAILS S-4 & S-5 SHOWN ON SHEET 23(17A). FRAME AND COVER SHALL BE SET FLUSH WITH PROPOSED GRADE INCLUDING CROSS SLOPES OF PAVEMENTS. MANHOLES WITH AN INSIDE DROP CONNECTIONS SHALL BE FIVE FEET (5') IN DIAMETER.
- NOTE FOR BLOW OFF VALVE
- AIR RELEASE VALVES SHALL BE IN ACCORDANCE WITH DETAIL W-13 SHOWN ON SHEET 23(17A).
- NOTE FOR SAN. SERVICE LAT. CONNECTION AND SEWER CLEANOUTS
- UTILITY STONE BACKFILL UNDER PAVEMENT SHALL BE VDOT STANDARD 21B STONE.

PLAN NO.	PROJECT	FILE NO.	SHEET NO.
	U000-128-VI2		23(12)

As-Builts 4.2.18 K. Winslow / E.C. Pace