

- WATER NOTES:**
- IN AREAS OF WATERLINE CONSTRUCTION, GRADES SHALL BE WITHIN SIX (6) INCHES OF FINISHED SUBGRADE PRIOR TO THE COMMENCEMENT OF WORK.
 - CITY OF ROANOKE SHALL MAKE ALL CONNECTIONS TO EXISTING WATER MAINS.
 - WATER PIPE SHALL BE DUCTILE IRON WITH PUSH-ON JOINTS. DUCTILE IRON PIPE SHALL CONFORM TO AWWA C-151/ANSI 2.51 AND FITTINGS SHALL CONFORM TO AWWA C-110/ANSI 21.10. THE PIPE AND FITTINGS SHALL BE BITUMINOUS COATED AND CEMENT LINE IN ACCORDANCE WITH AWWA C-104/ANSI 21.40. THE PIPE THICKNESS SHALL CONFORM TO AWWA C-150/ANSI 21.50 AND SHALL BE CLASS 50, AS A MINIMUM, UNLESS SPECIFIED OR INDICATED OTHERWISE.
 - MINIMUM CLEAR COVER OVER ALL WATER PIPE SHALL BE THREE (3) FEET.
 - THE CONTRACTOR SHALL INSTALL ALL WATER SERVICE CONNECTIONS AND METER BOXES.

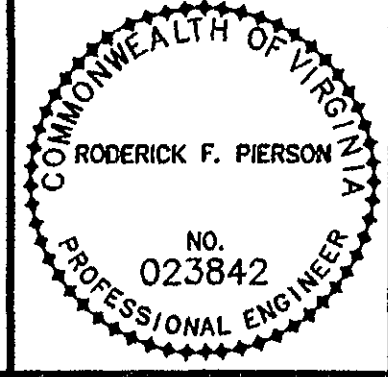
- SEWER NOTES:**
- PIPE AND FITTINGS SHALL BE POLYVINYL CHLORIDE (PVC) SDR 3 AND SHALL CONFORM TO ASTM D-3034. BEDDING SHALL BE CLASS "B" MINIMUM.
 - PIPE SHALL BE CONNECTED TO MANHOLES THROUGH PRECAST OPENINGS AND JOINED WITH EITHER A FLEXIBLE BOOT ADAPTER OR A PIPE SEAL GASKET.
 - RESIDENTIAL SERVICE CONNECTIONS SHALL BE MADE WITH A FOUR (4) INCH PIPE THROUGH A WYE OR TEE-WYE BRANCH FITTING AND SHALL BE INSTALLED ON A MINIMUM GRADE OF ONE-QUARTER (1/4) INCH PER ONE (1) FOOT FROM THE SEWER PIPE OR MANHOLE TO THE PROPERTY OR EASEMENT LINE WHERE A CLEANOUT SHALL BE PLACED AND THE SERVICE LATERAL PLUGGED/CAPPED UNTIL EXTENSION.
 - FUTURE SERVICE CONNECTIONS SHALL BE FIELD MARKED BY A TREATED, SOLID WOODEN (2"x4") MARKER THREE (3) FEET LONG SET VERTICALLY PLUMB WITH THE END OF THE CAPPED EXTENSION. THE TOPS OF THE MARKERS SHALL BE PAINTED YELLOW AND SET FLUSH WITH THE FINISH GRADE. THE LOCATION AND INVERT DEPTH OF THE SERVICE CONNECTION SHALL BE SHOWN ON THE AS-BUILT PLANS.

- DRAINAGE NOTES:**
- THE CONTRACTOR SHALL MAKE PROVISIONS AT ALL TIMES TO ALLOW NATURAL DRAINAGE TO FLOW THROUGH THE WORK AREA WITH MINIMUM DAMAGE TO THE NEW CONSTRUCTION AND/OR THE EXISTING DOWNSTREAM STORM DRAINAGE SYSTEM.
 - STORM DRAIN PIPE AND FITTINGS SHALL BE REINFORCED CONCRETE PIPE (R.C.P.) CLASS III (AS A MINIMUM), UNLESS SPECIFIED OTHERWISE, AND CONFORMING TO ASTM C-76 AND VDOT SECTION 240. ALL STORM DRAIN PIPES SHALL HAVE A MINIMUM 15 INCH DIAMETER.
 - PROVIDE 1% MINIMUM SLOPE TOWARDS OUTLETS FOR DETENTION POND BOTTOMS.
- GENERAL UTILITY NOTES:**
- THE CONTRACTOR SHALL VERIFY THE LOCATION AND ELEVATION OF ALL UNDERGROUND UTILITIES SHOWN ON THE PLANS OF CONSTRUCTION PRIOR TO STARTING WORK. THE ENGINEER SHALL BE CONTACTED IMMEDIATELY IF:
ANY LOCATION OR ELEVATION IS DIFFERENT FROM THAT SHOWN ON THE PLANS.
IF THERE APPEARS TO BE ANY CONFLICT.
UPON DISCOVERY OF ANY UTILITY NOT SHOWN ON THE PLANS.
TO MISS UTILITIES, CALL "MISS UTILITY" OF VIRGINIA (TOLL FREE 1-800-552-7001) 48 HOURS BEFORE YOU DIG. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE CAUSED TO ANY UTILITY, PUBLIC OR PRIVATE, AS A RESULT OF THIS WORK.
 - MAKE CONNECTIONS BETWEEN PIPES OF DIFFERENT SIZE OR MATERIALS WITH STANDARD FITTINGS MANUFACTURED FOR THE PURPOSE.
 - LAY WATER MAINS AT LEAST TEN FEET HORIZONTALLY FROM A SEWER OR SEWER MANHOLE. MEASURE THE DISTANCE EDGE-TO-EDGE WHEN LOCAL CONDITIONS PREVENT A HORIZONTAL SEPARATION OF TEN FEET, THE WATER MAIN MAY BE LAID CLOSER TO A SEWER OR SEWER MANHOLE PROVIDED THAT:
A. THE BOTTOM (INVERT) OF THE WATER MAIN SHALL BE AT LEAST EIGHTEEN INCHES ABOVE THE TOP (CROWN) OF THE SEWER.
B. WHERE THIS VERTICAL SEPARATION CANNOT BE OBTAINED, THE SEWER SHALL BE CONSTRUCTED OF AWWA APPROVED WATER PIPE, PRESSURE TESTED IN PLACE WITHOUT LEAKAGE PRIOR TO BACKFILLING.
C. THE SEWER MANHOLE SHALL BE OF WATERTIGHT CONSTRUCTION AND TESTED IN PLACE.
WATER LINES CROSSING SEWER SHALL BE LAID TO PROVIDE A SEPARATION OF AT LEAST 18 INCHES BETWEEN THE BOTTOM OF THE WATER LINE AND THE TOP OF THE SEWER WHENEVER POSSIBLE.
WHEN LOCAL CONDITIONS PREVENT THE REQUIRED VERTICAL SEPARATION, THE FOLLOWING CONSTRUCTION SHALL BE USED:
A. SEWERS PASSING OVER OR UNDER WATER MAINS SHALL BE OF CONSTRUCTED OF AWWA APPROVED WATER PIPE, PRESSURE TESTED IN PLACE WITHOUT LEAKAGE PRIOR TO BACKFILLING.
B. WATER LINES PASSING UNDER SEWERS SHALL, IN ADDITION, BE PROTECTED BY PROVIDING:
I. A VERTICAL SEPARATION OF AT LEAST 18 INCHES BETWEEN THE BOTTOM OF THE SEWER AND TOP OF THE WATER LINE,
II. ADEQUATE STRUCTURAL SUPPORT FOR THE SEWERS TO PREVENT EXCESSIVE DEFLECTION OF THE JOINTS AND THE SETTLING ON AND BREAKING OF THE WATERLINE,
III. THAT THE LENGTH OF THE WATER LINE BE CENTERED AT THE POINT OF THE CROSSING SO THAT JOINTS SHALL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE SEWER.
NO WATER PIPES SHALL PASS THROUGH OR COME IN CONTACT WITH ANY PART OF SEWER MANHOLE.
 - SUPPLY AND INSTALL ALL MATERIALS AND METHODS FOR WATERLINES, SANITARY SEWERS AND STORM DRAINAGE IN ACCORDANCE WITH THE SPECIFICATIONS AND REQUIREMENTS OF THE CITY OF ROANOKE AND THE VIRGINIA DEPARTMENT OF TRANSPORTATION "ROAD AND BRIDGE STANDARDS AND SPECIFICATIONS", LATEST EDITION.
 - OBTAIN ALL REQUIRED PERMITS AND NOTIFY APPROPRIATE OFFICIALS 48 HOURS PRIOR TO COMMENCEMENT OF WORK. OBTAIN INFORMATION FROM CITY OF ROANOKE CONCERNING PERMITS AND CONNECTIONS TO EXISTING LINES.
 - ALL WORK SHALL BE SUBJECT TO INSPECTION BY CITY OF ROANOKE. NOTIFY APPROPRIATE OFFICIALS PRIOR TO COMMENCEMENT OF WORK.
 - SITE SHALL BE TO SUBGRADE PRIOR TO INSTALLATION OF UTILITIES. ALL UTILITIES SHALL BE IN PLACE PRIOR TO PLACEMENT OF PAVEMENT BASE MATERIAL.
 - USE SELECT MATERIAL FREE FROM FROST, LARGE CLODS, STONES, AND DEBRIS FOR BACKFILL FROM THE BOTTOM OF THE TRENCH TO TWELVE (12) INCHES ABOVE THE PIPE.
 - MINIMIZE ANY DISTURBANCE TO EXISTING WATER SERVICE, SEWER LINES OR ANY OTHER UTILITY DURING CONSTRUCTION AND PROVIDE QUALITY WORKMANSHIP.
 - MAKE ALL PIPE JOINTS IN ACCORDANCE WITH THE MANUFACTURE'S INSTRUCTIONS AND CITY OF ROANOKE'S SPECIFICATIONS. MAKE JOINTS BETWEEN DIFFERENT PIPE MATERIALS WITH STANDARD FITTINGS MANUFACTURED FOR THE PURPOSE.
 - SEWER AND WATER TAPS SHALL BE LOCATED BY THE CONTRACTOR AND MADE BY CITY OF ROANOKE AT THE DEVELOPERS EXPENSE.
 - LOCATED AND UNCOVER VALVE VAULTS AND MANHOLES AFTER PAVING AND ADJUST TO FINAL GRADE, IF NECESSARY.

Roderick F. Pierson, P.E., L.L.S.
P.O. Box 311
1332 Roanoke Road, 220 North
Daleville, VA 24083

REV	DATE	DESCRIPTION	BY	APP

SEWER DETAILS & GENERAL UTILITY NOTES READ MOUNTAIN NORTH CITY OF ROANOKE



SCALE: NONE
COMM. NO. R9989
DATE: 06/2000
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