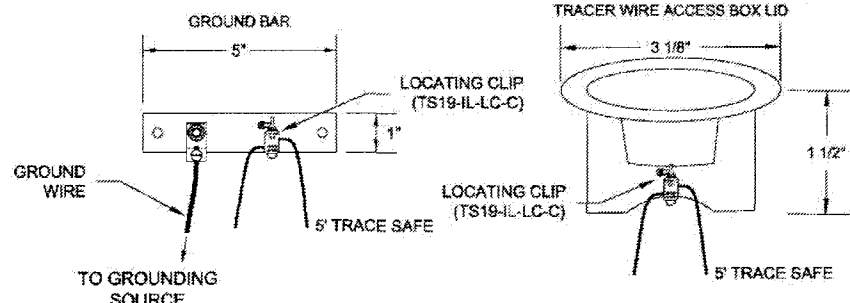


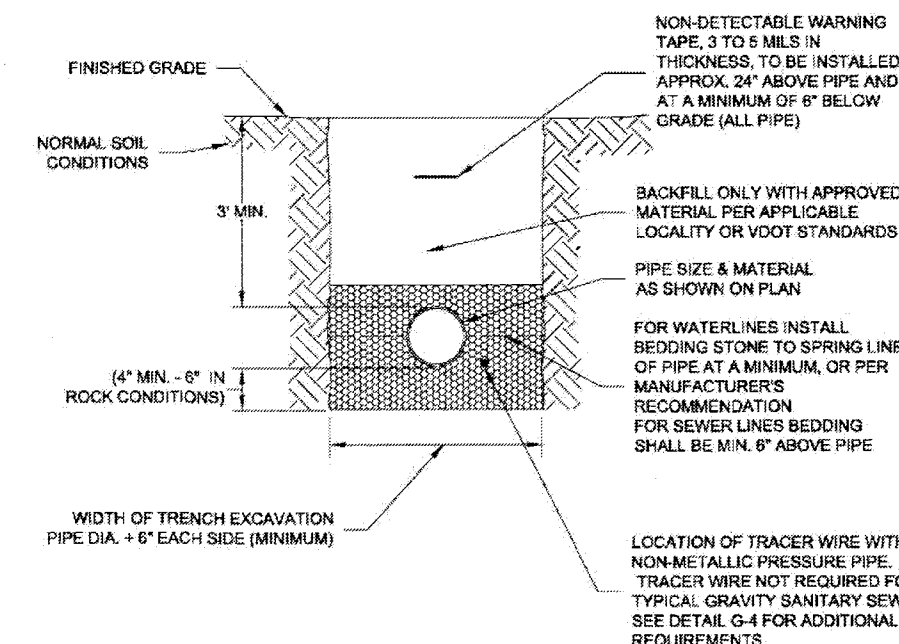
1. TRACER WIRE SHALL BE INSTALLED USING MANHOLES, TRACER WIRE ACCESS BOXES, VALVE BOXES OR VAULTS, WATER METER AND FIRE HYDRANTS AS ACCESS POINTS.
2. FOR WATER AND SEWER, TRACER WIRE SHALL BE INSTALLED BY OPEN TRENCHING, HORIZONTAL DIRECTIONAL DRILLING, OR PIPE BURSTING. TRACER WIRE SHALL BE REPTED TO TRACE SAFE WATER LOCATING TRACER WIRE OR APPROVED EQUIVALENT.
3. SPACERS SHALL ONLY BE MADE WITH GEL FILLED CONNECTORS DESIGNED FOR WIRE WITH A WOVEN POLYESTER FIBER CORE SUCH AS REPTED TRACER SAFE WATER LOCATING TRACER WIRE OR APPROVED EQUIVALENT. SPACERS SHALL BE MADE IN ACCORDANCE WITH THE MANUFACTURER'S INSTALLATION INSTRUCTIONS. CONTRACTOR WILL BE RESPONSIBLE FOR MAINTAINING CONTINUITY AT ALL SPICE LOCATIONS.
4. WHERE HOPE PIPE IS INSTALLED WITHOUT STEEL CASING PIPE, SUCH AS A DIRECTIONALLY DRILLED CROSSOVER, AND CONNECTS TO DUCTILE IRON PIPE OR CAST IRON, TRACER WIRE SHALL BE INSTALLED ALONG FULL LENGTH OF HOPE PIPE WITH AN ACCESS POINT INSTALLED AT EACH HOPE/DUCTILE IRON TRANSITION. TRACER WIRE SHALL BE CONNECTED TO THE ACCESS POINT IN ACCORDANCE WITH THE DETAIL. ANY TRANSITION FROM DUCTILE IRON MAIN TO NON-DUCTILE IRON MAIN SHALL HAVE AN ACCESS POINT TO BEGIN TRACER WIRE.
5. GROUND WIRE SHALL SHOW TRACER WIRE LOCATION AND ACCESS POINTS ALONG WITH RUT SPICE LOCATIONS.
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 7 FEET FROM THE PIPE. NON-METALLIC SPACERS MAY BE USED TO MAINTAIN A SET DISTANCE FROM THE UTILITY.
7. WIRE SHALL BE BROUGHT TO THE SURFACE EVERY FIVE-FOOT (50) FEET AND PLACED IN A WATER METER BOX OR A DRAINAGE WATER SOLUTIONS, INC. (ON APPROVED EQUIVALENT) CAST IRON TRACER WIRE ACCESS BOX.
8. THE TRACER WIRE SHALL BE TESTED BY THE PARTICIPATING UTILITY AS PART OF THE PROJECT'S FINAL ACCEPTANCE. CONTRACTOR WILL BE RESPONSIBLE FOR MAINTAINING CONTINUITY OF TRACER WIRE.
9. THE GROUND WIRE SHALL BE #16 AWG COPPER WIRE AND SHALL BE OF ADEQUATE LENGTH TO EXTEND A MINIMUM OF (5) FIVE FEET BEYOND THE 10' OF THE GROUND WIRE. THE END OF THE GROUND WIRE SHALL BE PLACED TO THE GROUND BAR OR LID TERMINAL USING A BURNDY K&M MECHANICAL TERMINAL LUG.
10. A GROUND ROD SHALL BE INSTALLED AT EACH LOCATION WHERE GROUND WIRE SURFACES AND CONNECTS TO GROUND BAR. GROUND ROD SHALL BE COPPER COATED WITH A MINIMUM DIAMETER OF 5/8" AND SHALL BE BURIED A MINIMUM OF FOUR (4) FEET INTO THE GROUND.
11. THE GROUND BAR SHALL BE STAINLESS STEEL AND SHALL BE ATTACHED USING 80 7" X 1/2" 88 HEX TAPCON. THE FOLLOWING SHALL BE INSTALLED IN 10" DIA. CENTER VOLTAGE, 1000 VOLTS, 50 HZ, 60 SECONDS AND 1000 43 SE PHILLIPS. THE FOURTH HOLE SHALL HAVE A BURNDY K&M MECHANICAL TERMINAL LUG FOR THE #16 AWG GROUND WIRE. THE ASSEMBLY CAN BE ACQUIRED AT K&M INDUSTRIAL SUPPLY, INC. (800) 424-6644, 15 AMP 195-1". THE SPACE OF THE TRACER WIRE SHALL BE PLACED IN THE GROUND BAR AS SHOWN BELOW.
12. IF USING TRACER WIRE ACCESS BOX AS ACCESS POINT, GROUND BAR WILL NOT BE REQUIRED. WIRE SHALL BE CONNECTED AS SHOWN BELOW. TRACER WIRE SHALL BE OF ADEQUATE LENGTH TO EXTEND FIVE (5) FEET ABOVE THE TOP OF ACCESS BOX.
13. TWO WIRING OF TRACER WIRE SHALL BE WAPPED BRACEDLY AROUND BASE OF HYDRANT. WIRE SHALL NOT BE LEFT IN A WAY THAT WOULD INTERFERE WITH MOVING AROUND HYDRANT.
14. WHEN USING A.D. OUTLET MARK, TRACER WIRE FOR SERVICES SHALL BE 12 AWG COPPER TRACER WIRE. TRACER WIRE SHALL HAVE BARE WIRE CONTACT TO DUCTILE MAIN.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL  
TRACER WIRE FOR NON-METALLIC PRESSURE PIPE  
08/06/18

G-4

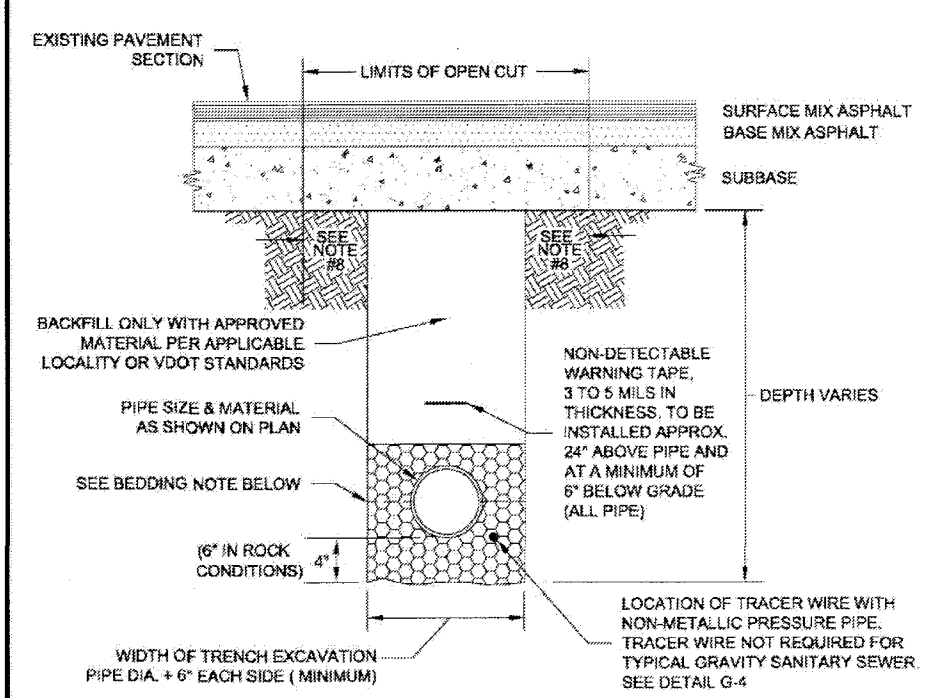
1. BEDDING, HAUNCHING AND INITIAL BACKFILL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THIS DETAIL AND MANUFACTURER'S RECOMMENDATION.
2. ALL PVC PIPE SHALL BE BEDDED IN COMPACTED VDOT #57 OR #88 STONE OR CRUSHER RUN.
3. IN AREAS SUBJECT TO VEHICLE OR TRAFFIC, BEDDING STONE AND FILL SHALL BE PLACED IN 6" 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 688.
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 8" FROM THE PIPE. NON-METALLIC SPACERS MAY BE USED TO MAINTAIN A SET DISTANCE FROM THE UTILITY.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL  
BEDDING AND BACKFILL OUTSIDE OF PAVED AREAS  
08/01/15

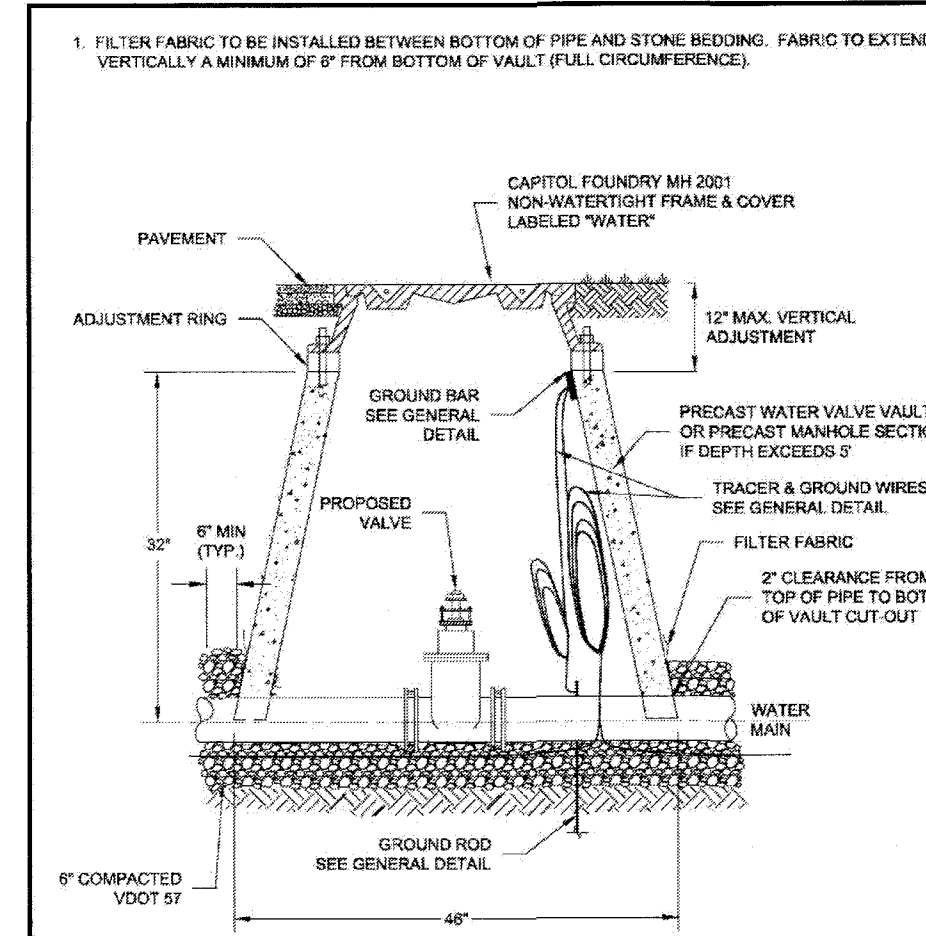
G-11

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 #88 STONE.
3. IN VDOT ROW, THE CONTRACTOR SHALL REPLACE THE PAVEMENT AS REQUIRED AND SPECIFIED BY VDOT. IN ROWSIDE 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 VEHICLE OR TRAFFIC, BEDDING STONE AND FILL SHALL BE PLACED IN 6" LIFTS AND SHALL BE COMPACTED TO AT LEAST 90% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D 688.
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. BEDDING OUT ON EACH SIDE OF PAVEMENT SHALL BE IN ACCORDANCE WITH VDOT OR APPLICABLE LOCALITY'S SPECIFICATIONS.
8. 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 8" FROM THE PIPE. NON-METALLIC SPACERS MAY BE USED TO MAINTAIN A SET DISTANCE FROM THE UTILITY.



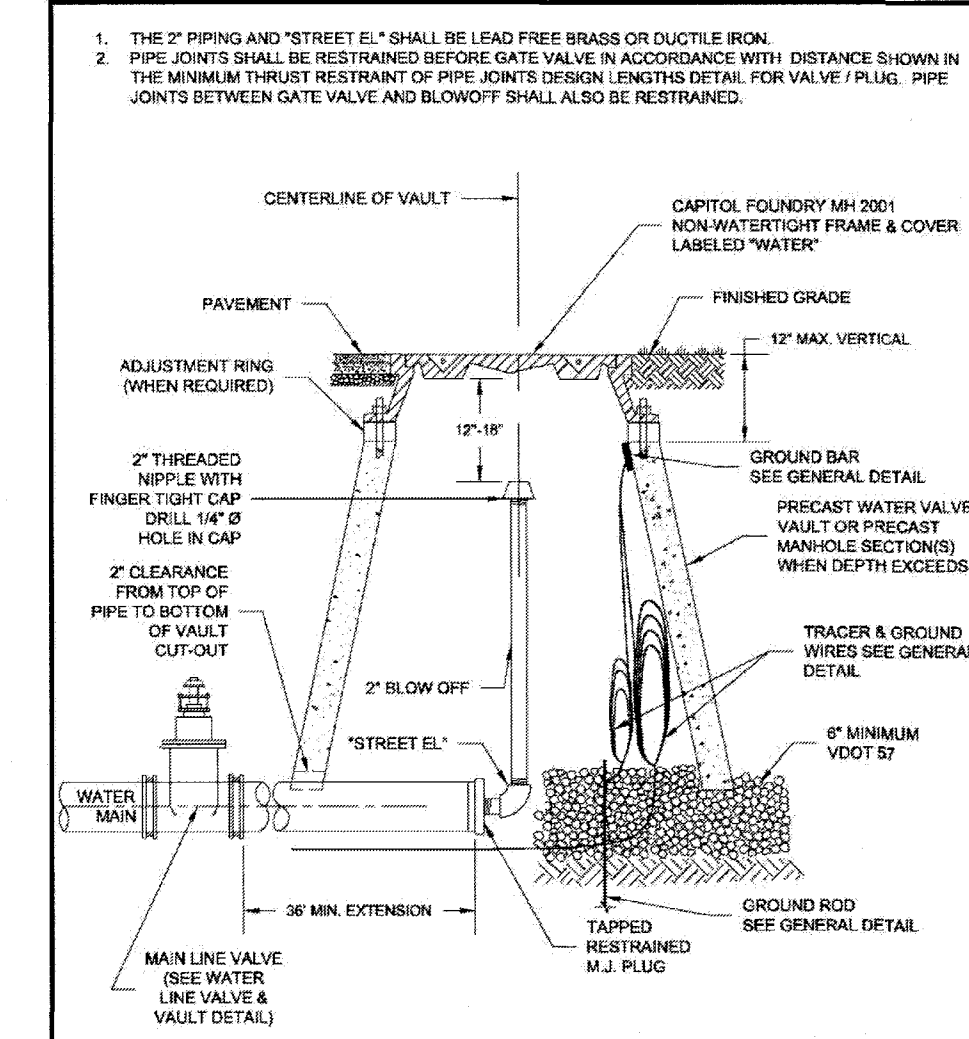
WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL  
BEDDING AND BACKFILL UNDER PAVEMENT AND IN RIGHT-OF-WAY  
08/01/15

G-12



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL  
WATER LINE VALVE & VAULT  
01/01/14

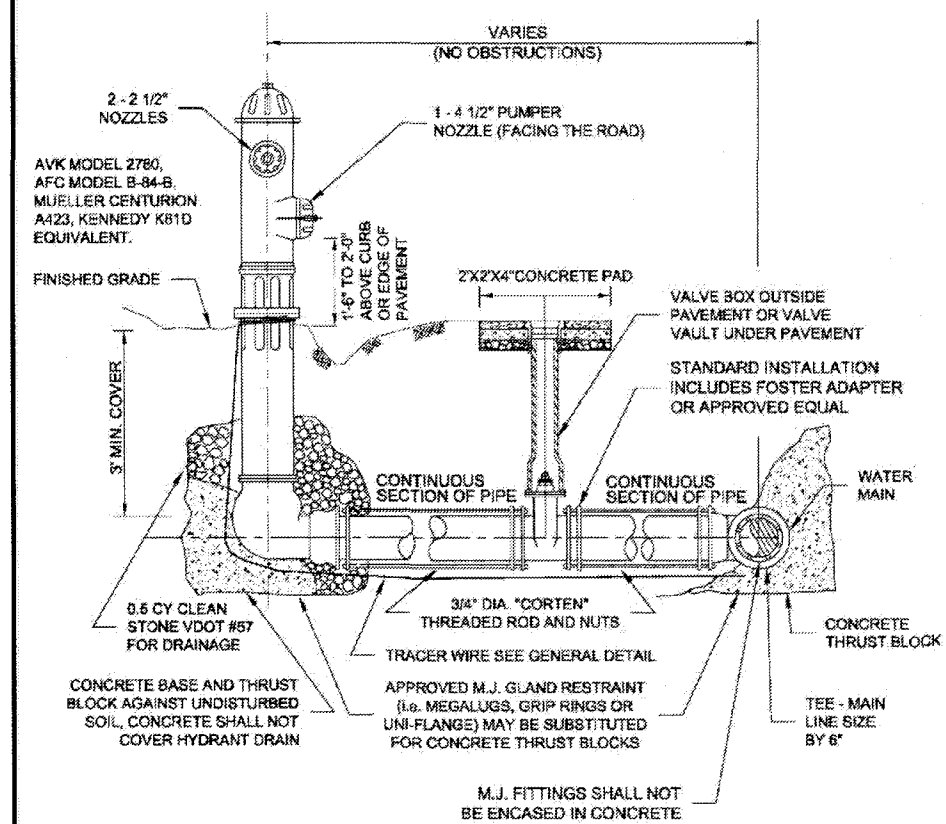
W-9



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL  
TEMPORARY END OF LINE BLOW-OFF ASSEMBLY  
01/01/14

W-11

1. PUBLIC HYDRANTS SHALL BE PAINTED SILVER WITH AN OIL-BASED PAINT. PRIVATE HYDRANTS SHALL ALSO BE PAINTED SILVER WITH AN OIL-BASED PAINT UNLESS OTHERWISE SPECIFIED BY THE JURISDICTIONAL FIRE MARSHALL.
2. FIRE HYDRANT SHALL BE INSTALLED 2 MIN. AND 6 MAX. FROM BACK OF CURB OR 6 MIN. AND 12 MAX. FROM EDGE OF PAVEMENT WHEN CURB IS NOT PRESENT. FIRE HYDRANT TO BE INSTALLED WITHIN RIGHT-OF-WAY OR EASEMENT LINE.
3. AREA AROUND HYDRANT AT A RADIUS OF 4' TO BE BELIEVED AND UNOBSTRUCTED.
4. WATERPROOF BASES AND OUT OF SERVICE RINGS SHALL BE PLACED OVER ALL NEWLY INSTALLED FIRE HYDRANTS.
5. HIGH PRESSURE (OVER 120 PSI) REQUIRES THE USE OF ALL 3 RESTRAINTS.
6. IF DURING CONSTRUCTION THE SEASONAL WATER TABLE IS OBSERVED TO BE ABOVE THE DRAIN OUTLETS OF THE PROPOSED HYDRANT, THE PARTICIPATING UTILITY WILL BE NOTIFIED IMMEDIATELY SO THAT THE HYDRANT CAN BE RELOCATED TO A SUITABLE LOCATION, DOWNED, OR THE DRAIN FILL RELOCATED.
7. TWO WIRES OF TRACER WIRE SHALL BE WAPPED AROUND BASE OF HYDRANT.
8. APPROVED MODELS - A&K MODEL 2780, AFC MODEL B-84-B, MUELLER CENTURION 402, KENNEDY #810 EQUIVALENT.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL  
FIRE HYDRANT ASSEMBLY  
01/01/14

W-17

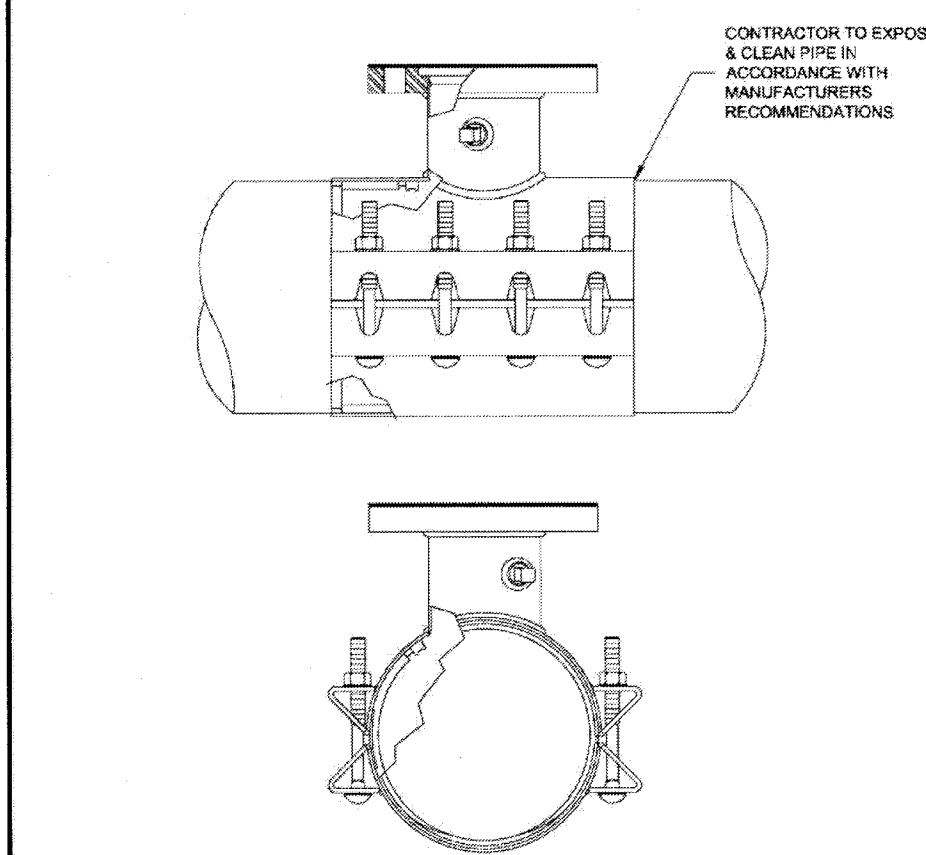
FACTOR OF SAFETY = 1.5												
PIPE SIZE	PIPE MAT'L	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	VALVE / FLUID (NOTE 2)	TEE / BRANCH (NOTE 3)	REDUCER (NOTE 4)	45° VERT.	22 1/2° VERT.	11 1/4° VERT.	
6"	D.I.	28	21	6	3	50	26	26	21	10	5	
8"	D.I.	38	21	6	4	60	41	27	27	13	7	
10"	D.I.	43	21	9	5	77	53	28	32	16	8	
12"	D.I.	51	21	10	5	91	67	27	38	16	9	
6"	PVC	29	21	6	3	78	29	40	32	18	8	
8"	PVC	37	21	8	4	102	49	43	42	21	10	
10"	PVC	44	21	9	5	122	59	41	51	25	12	
12"	PVC	51	21	11	6	143	68	42	60	29	15	

1. ALL JOINTS SHALL BE RESTRAINED ON BOTH SIDES OF THE FITTING AND DOCUMENTED BY THE INSPECTOR FOR THE LENGTH SHOWN UNLESS OTHERWISE INDICATED.
2. RESTRAINED LENGTH SHOWN REFERS TO ANY DESIGNED OR POTENTIAL LINE STOP, INCLUDING ALL GATE VALVES.
3. RESTRAINED LENGTH SHOWN REFERS TO THE BRANCH LINE ONLY. THE CONTINUOUS PIPE LENGTH OF THE MAIN RUN SHALL BE A MINIMUM OF 10' ON EACH SIDE OF THE TEE.
4. RESTRAINED LENGTH SHOWN IS BASED ON REDUCING PIPE DIAMETER TO ONE SIZE SMALLER THAN PIPE LISTED (ANY OTHER DIAMETER REDUCTION WILL REQUIRE ADDITIONAL CALCULATIONS BEFORE INSTALLATION). RESTRAINED LENGTH SHOWN IS UPSTREAM ON THE LARGE SIDE OF THE REDUCER.
5. 12" AND SMALLER DIAMETER: IF UNDER 150 PSI WORKING PRESSURE, RESTRAINED JOINT(S) ARE TO BE USED. IF EQUAL TO OR OVER 150 PSI WORKING PRESSURE, BOTH THRUST BLOCKS AND RESTRAINED JOINT(S) SHALL BE USED.
6. FOR RESTRAINED JOINT PIPING REQUIREMENTS AT FITTING R.J. PVC AND R.J. DP MAY BE USED INTERCHANGEABLY WITH APPROVAL FROM PARTICIPATING UTILITY. CONTRACTOR MUST PLAN ACCORDINGLY FOR THE DIFFERENCE IN PVC AND DP BELL AND SPIGOT DIMENSIONS.

WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL  
MINIMUM THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTHS  
02/01/15

W-19

1. TAPPING SLEEVE SHALL BE POWERLESS, MODEL 3480 TYPE 304 STAINLESS STEEL WITH CARBON STEEL FLANGE, ROMAN'S MODEL 857 IN FORD MODEL 1735 WITH CARBON STEEL FLANGE OR APPROVED EQUIVALENT. SLEEVE SHALL BE RATED AT 100 PSI OVER WORKING PRESSURE AND MUST HAVE A TEST PLUG.
2. TAPPING VALVE SHALL BE A&K RESILIENT SEATED GATE VALVE SERIES 25 MIF, MUELLER T-2300 RESILIENT WEDGE TAPPING VALVE WITH MIF, VALVE SHALL BE RATED AT 200 PSI.
3. TAPPING SLEEVE AND VALVE SHALL BE FULL PORT TO ACCEPT FULL SIZE SHELL CUTTER.
4. STEEL FLANGE SHALL MEET AWWA C207.
5. SIZE ON SIZE TAPPING NOT ALLOWED UNLESS APPROVED BY PARTICIPATING UTILITY.



WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL  
TAPPING SLEEVE AND VALVE  
01/01/14

W-21

City of Roanoke  
Planning, Building, & Development  
COMPREHENSIVE DEVELOPMENT PLAN  
**APPROVED**  
by Ken Richardson  
04/16/2019


## CONSTRUCTION DETAILS

## SELF-STORAGE CONVERSION

FOR  
PREPARED FOR  
PHOENIX PARTNERS, LLC  
SITUATED AT 3533 FRANKLIN ROAD, SW  
CITY OF ROANOKE, VIRGINIA

REVISIONS	DESCRIPTION	DATE
NO.		
1		
2		
3		
4		
5		

DATE: March 26, 2019  
SCALE: AS SHOWN  
COMMISSION NO: 18-148  
SHEET 9 OF 10

**Lumsden Associates, P.C.**  
ENGINEERS | SURVEYORS | PLANNERS  
  
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ROANOKE, VIRGINIA 24018

