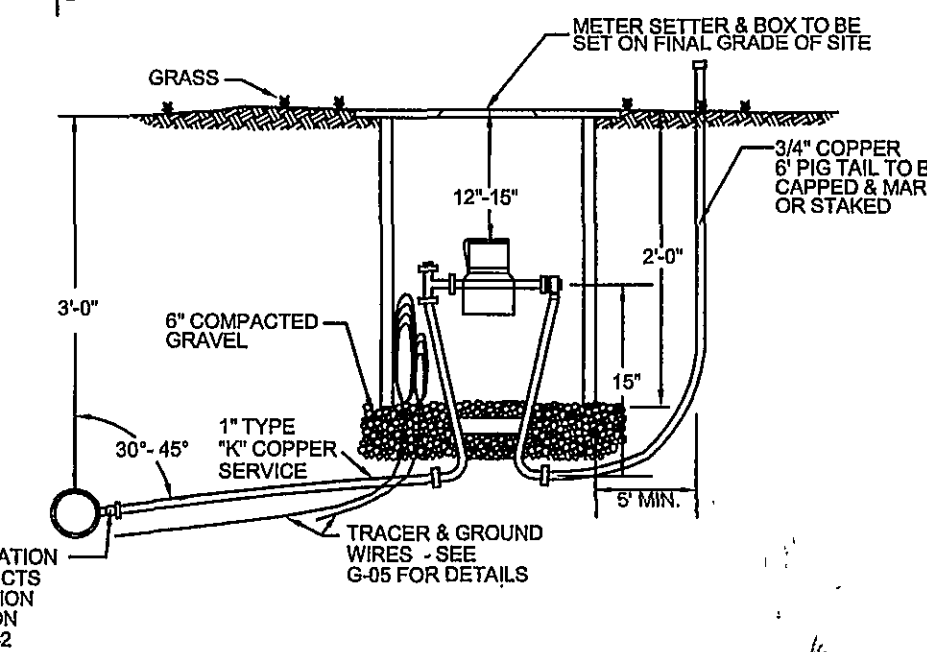
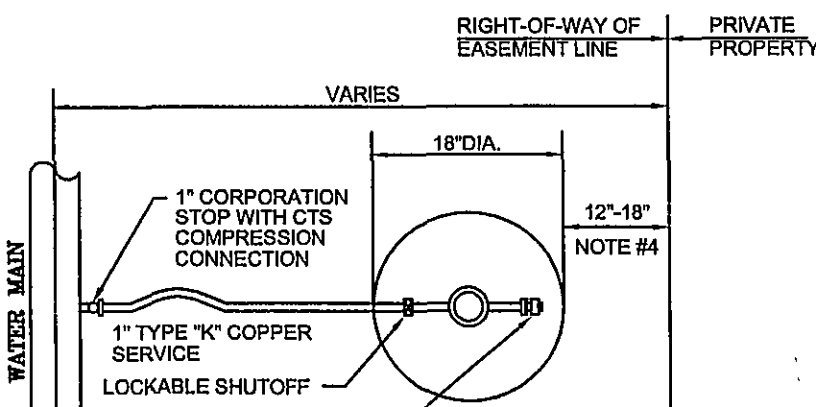


1. SETTER TO BE A.Y. McDONALD #20-215 WDD033, FORD VEH72-15W-1133 OR APPROVED EQUAL.
2. SADDLES MUST BE USED WITH ALL PLASTIC & CLASS 50 DUCTILE IRON PIPE. SERVICE SADDLES SHALL BE USED IN ACCORDANCE WITH SECTION 2805 OF THE WATER STANDARDS. SERVICE SADDLES FOR PLASTIC PIPE SHALL BE: POWERSEAL 341T, OR 3412AS, ROMAC 202S, OR 300, OR FORD METER F3002 OR F3003. FOR DUCTILE IRON PIPE USE THE ABOVE OR POWERSEAL 341S, ROMAC 202 OR FORD METER F3002 OR F3003.
3. METER BOX MUST 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 & COVER OR APPROVED EQUAL. USE OF TRAFFIC BEARING BOX SHALL BE APPROVED BY THE AUTHORITY. TRAFFIC BEARING BOX SHALL BE CARSON/MID-STATES PLASTICS 1420 OR EQUIVALENT AND LID SHALL BE FORD METER BOX C301 OR EQUIVALENT.
4. WHENEVER SIDEWALK EXISTS OR IS PROPOSED, MODIFY METER LOCATION AS DIRECTED.
5. CORPORATION STOP MUST BE FORD F1000-4-G OR APPROVED EQUAL.

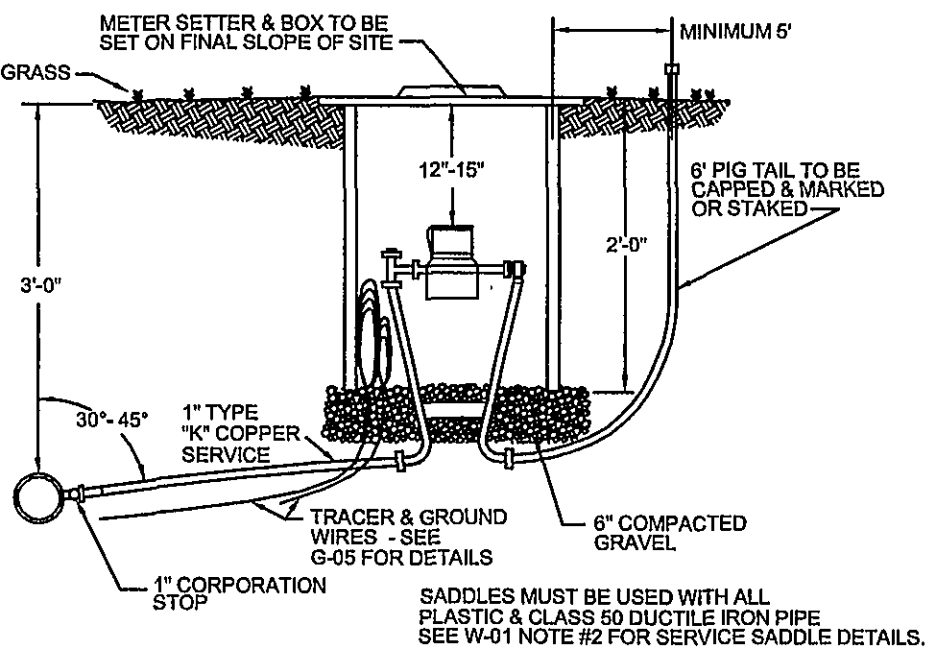
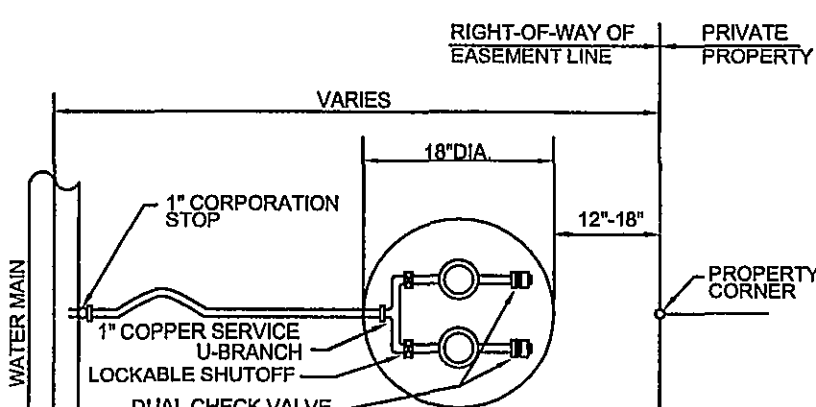


WESTERN VIRGINIA WATER AUTHORITY - CONSTRUCTION STANDARDS

REVISION DATE	DESCRIPTION	W-01
07/01/04		
03/01/06		

SINGLE RESIDENTIAL WATER SERVICE (LINE PRESSURE UNDER 80 PSI)

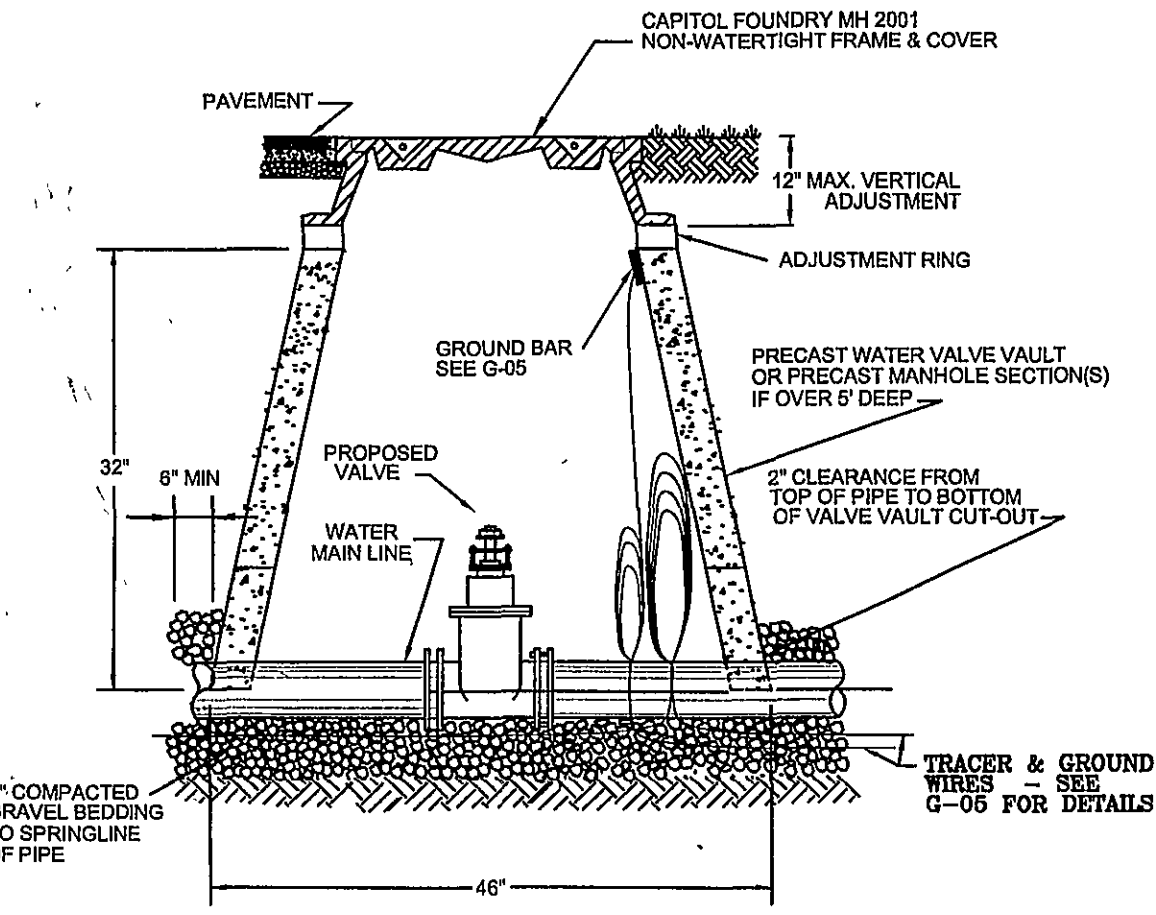
1. SETTER TO BE A.Y. McDONALD #20-215 WDD033, FORD VEH72-15W-1133 OR APPROVED EQUAL.
2. METER BOX MUST BE CARSON/MID-STATES PLASTICS, INC. PLASTIC BOX WITH FORD A32-T (ELECTRONIC READ LID) OR A.Y. McDONALD MODEL 74M32C-TC CAST IRON BASE & COVER OR APPROVED EQUAL.
3. CORPORATION STOP MUST BE FORD F1000-4-G OR APPROVED EQUAL.



WESTERN VIRGINIA WATER AUTHORITY - CONSTRUCTION STANDARDS

REVISION DATE	DESCRIPTION	W-04
07/01/04		
03/01/06		

DOUBLE RESIDENTIAL WATER SERVICE

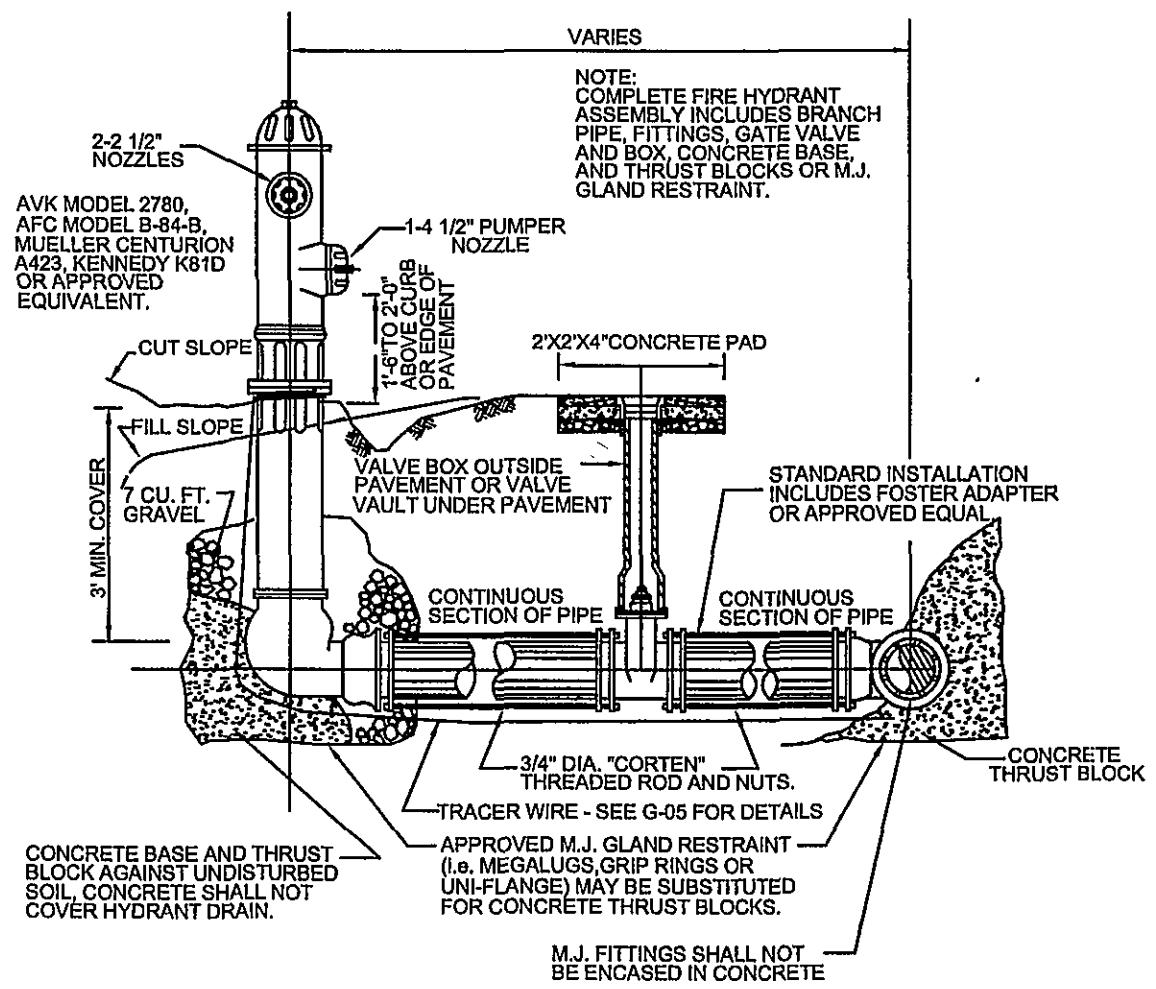


WESTERN VIRGINIA WATER AUTHORITY - CONSTRUCTION STANDARDS

REVISION DATE	DESCRIPTION	W-08
07/01/04		
03/01/06		

WATER LINE VALVE INSTALLATION

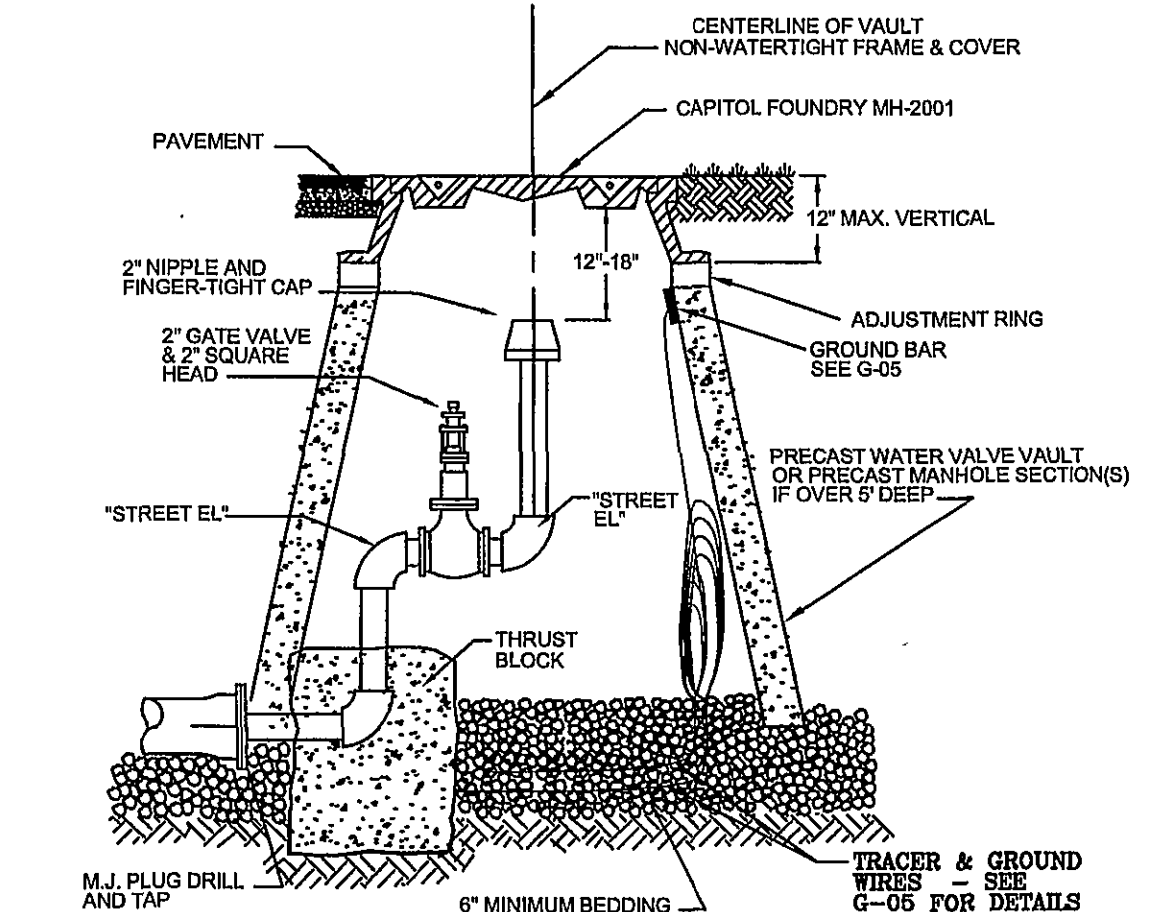
- NOTES:
1. PUBLIC HYDRANTS SHALL BE PAINTED SILVER WITH AN OIL-BASED PAINT AND PRIVATE HYDRANTS SHALL BE PAINTED WHITE WITH AN OIL-BASED PAINT.
 2. FIRE HYDRANT SHALL BE INSTALLED 2' MIN. AND 4' MAX. FROM BACK OF CURB OR 8' MIN. AND 12' MAX. WHEN CURB IS NOT PRESENT. FIRE HYDRANT TO BE INSTALLED WITHIN RIGHT-OF-WAY OR EASEMENT LINE.
 3. AREA AROUND HYDRANT AT A RADIUS OF 4' TO BE LEVEL AND UNCONSTRICTED.
 4. WATERPROOF BAGS SHALL BE PLACED OVER ALL NEWLY INSTALLED FIRE HYDRANTS.
 5. HIGH PRESSURE (OVER 120 PSI) REQUIRES THE USE ALL 3 RESTRAINTS.



WESTERN VIRGINIA WATER AUTHORITY - CONSTRUCTION STANDARDS

REVISION DATE	DESCRIPTION	W-18
07/01/04		
03/01/06		

FIRE HYDRANT ASSEMBLY

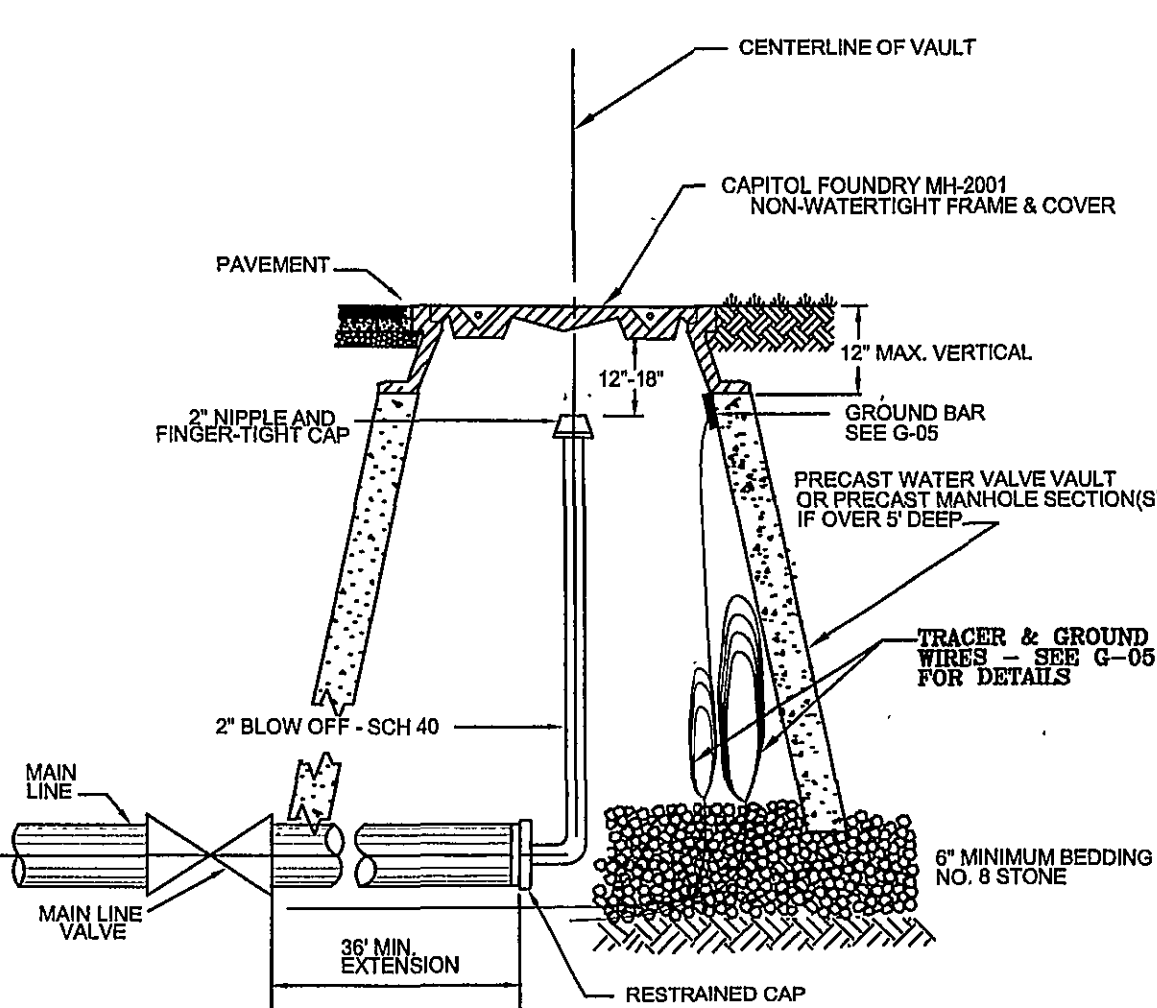


1. FIRE HYDRANT ASSEMBLIES MAY BE USED AS PERMANENT END OF LINES.
2. DETAIL FOR UP TO 8" MAINS, LARGER LINES SEE SEC. 102.08 FOR MIN. FLUSHING VALVE REQUIREMENTS.
3. THE END OF A PIPELINE SHALL NOT TERMINATE IN A PAVED AREA OR UNDER A CONCRETE VALLEY GUTTER.
4. THE LINE AND "STREET ELS" BETWEEN CORPORATION STOP AND 2" GATE VALVE SHALL BE BRASS.

WESTERN VIRGINIA WATER AUTHORITY - CONSTRUCTION STANDARDS

REVISION DATE	DESCRIPTION	W-09
07/01/04		
03/01/06		

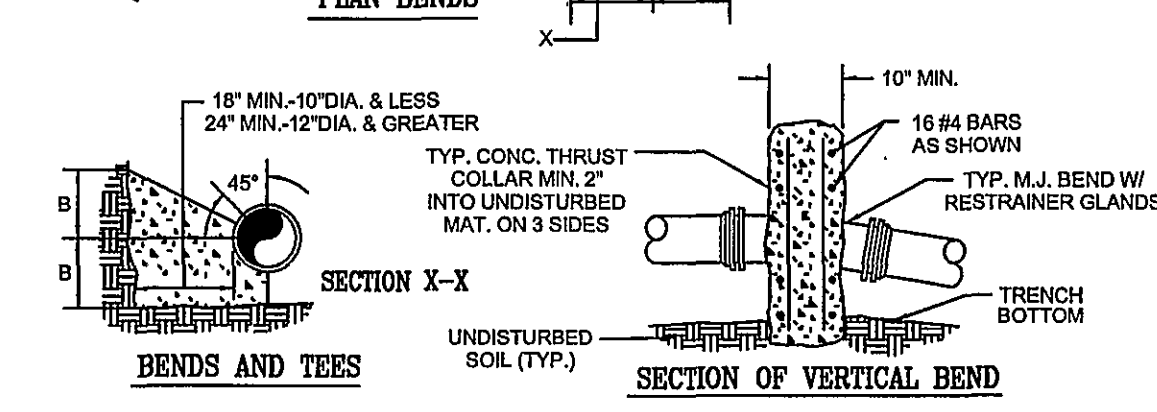
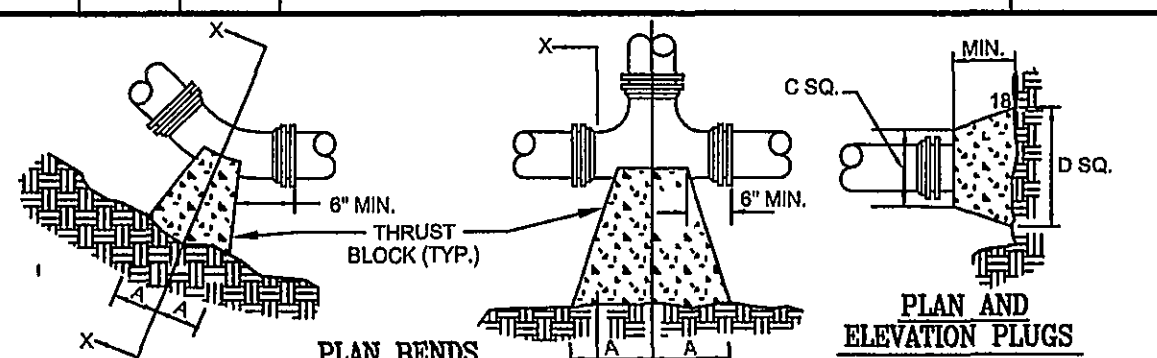
PERMANENT END OF LINE



WESTERN VIRGINIA WATER AUTHORITY - CONSTRUCTION STANDARDS

REVISION DATE	DESCRIPTION	W-10
07/01/04		
03/01/06		

BLOW-OFF ASSEMBLY FOR MAIN LINE TEMPORARY TERMINATION



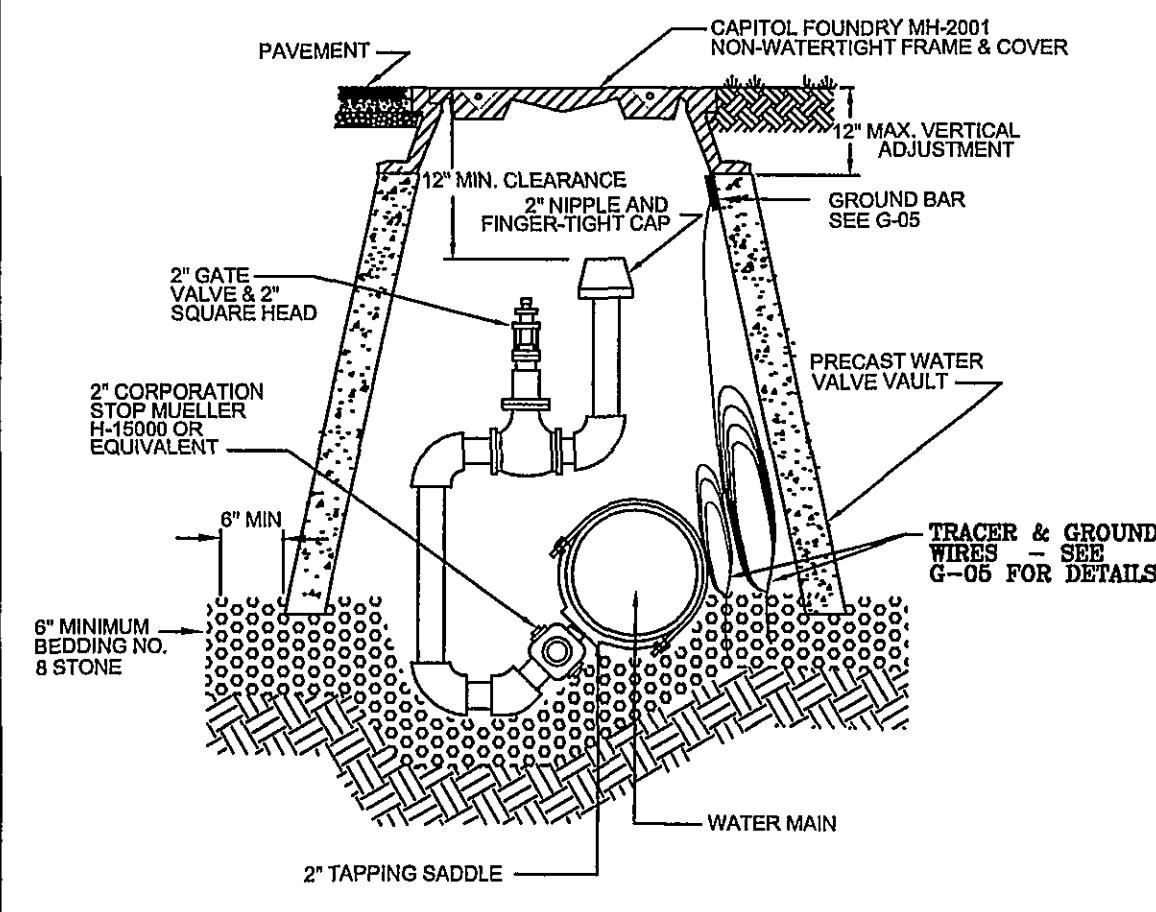
- NOTES:
1. FOR VERT. BEND DOWN IN EXCESS OF 11 1/4" BEND, ANCHORAGE SHALL BE DESIGNED BY ENGINEER.
 2. FOR VERT. BEND UPWARD, BLOCKING TO BE SIMILAR TO THAT FOR HORIZ. BEND.
 3. GLANDS & BOLTS SHALL BE PROTECTED FROM CONC. BY PLASTIC SHEETING WHEN POURING THUS BLENDS.
 4. ALL THRUST BLOCK & SUPPORT CONC. SHALL BE 3000 PSI READY MIX CONC.
 5. THRUST BLOCKS WITH "B" DIMENSION GREATER THAN 30" SHALL HAVE THE RESTRAINT JOINTS MUST BE USED.
 6. IF UNDER 100 PSI WORKING PRESSURE, RESTRAINT JOINTS MAY BE USED. IF EQUAL OR GREATER THAN 100 PSI WORKING PRESSURE, BOTH BLOCK AND RESTRAINT JOINTS ARE REQUIRED.

PIPE SIZE	30" BEND	45" BEND	22 1/2" BEND	11 1/4" BEND	TEE	PLUG
4"	8"	8"	8"	8"	8"	8"
6"	12"	12"	12"	12"	12"	12"
8"	16"	16"	16"	16"	16"	16"
10"	20"	20"	20"	20"	20"	20"
12"	24"	24"	24"	24"	24"	24"
14"	28"	28"	28"	28"	28"	28"
16"	32"	32"	32"	32"	32"	32"
18"	36"	36"	36"	36"	36"	36"
20"	40"	40"	40"	40"	40"	40"
22"	44"	44"	44"	44"	44"	44"
24"	48"	48"	48"	48"	48"	48"
26"	52"	52"	52"	52"	52"	52"
28"	56"	56"	56"	56"	56"	56"
30"	60"	60"	60"	60"	60"	60"

WESTERN VIRGINIA WATER AUTHORITY - CONSTRUCTION STANDARDS

REVISION DATE	DESCRIPTION	W-19
07/01/04		
03/01/06		

THRUST BLOCK CONSTRUCTION

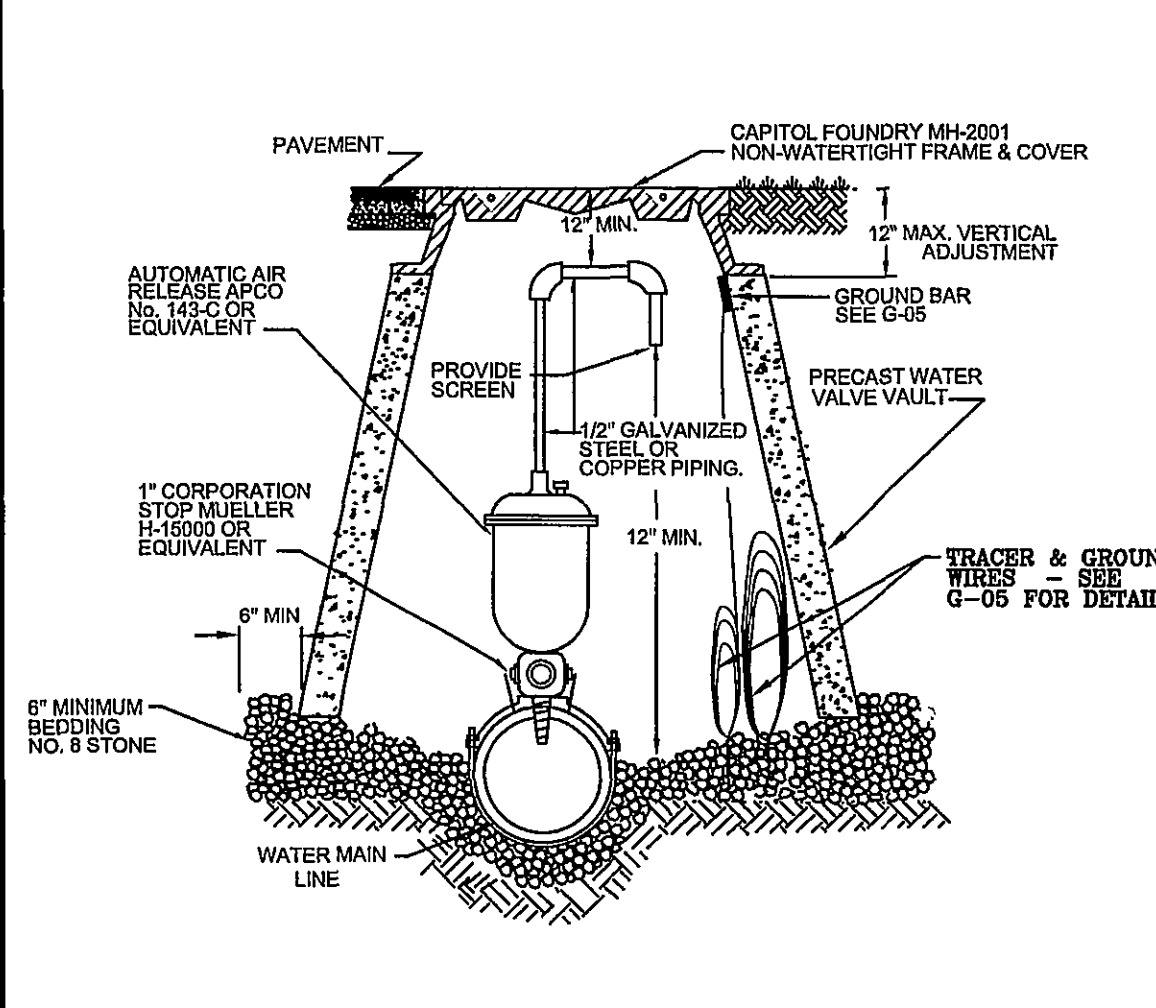


1. FIRE HYDRANTS MAY BE USED AT LOWPOINTS IN PLACE OF BLOW-OFFS WHERE IT IS DEMONSTRATED THAT A MINIMUM FLUSHING VELOCITY OF 4 FT/S IS PROVIDED.
2. LINE AND "STREET ELS" BETWEEN CORPORATION STOP AND 2" GATE VALVE SHALL BE BRASS.

WESTERN VIRGINIA WATER AUTHORITY - CONSTRUCTION STANDARDS

REVISION DATE	DESCRIPTION	W-11
07/01/04		
03/01/06		

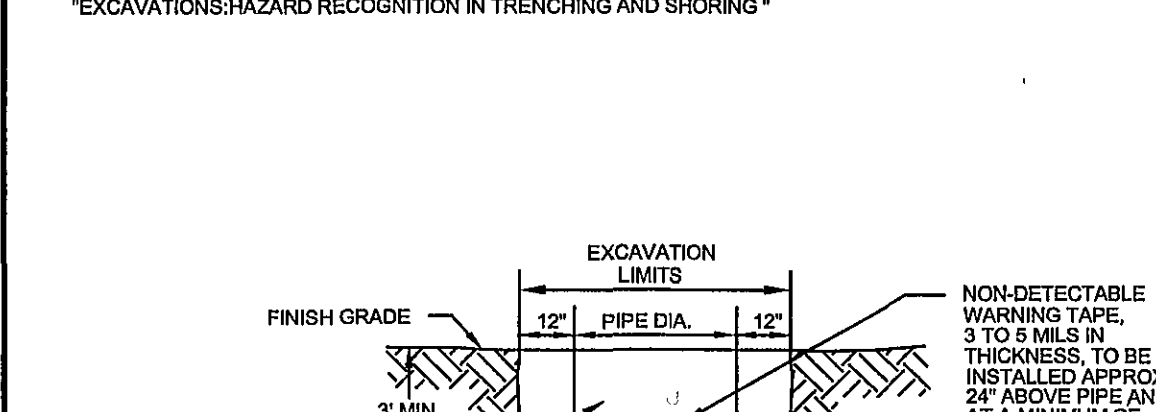
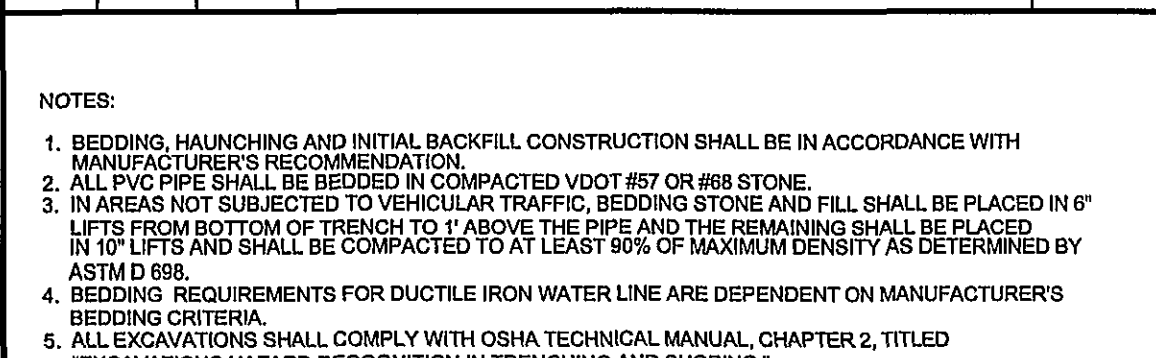
IN-LINE BLOW-OFF ASSEMBLY



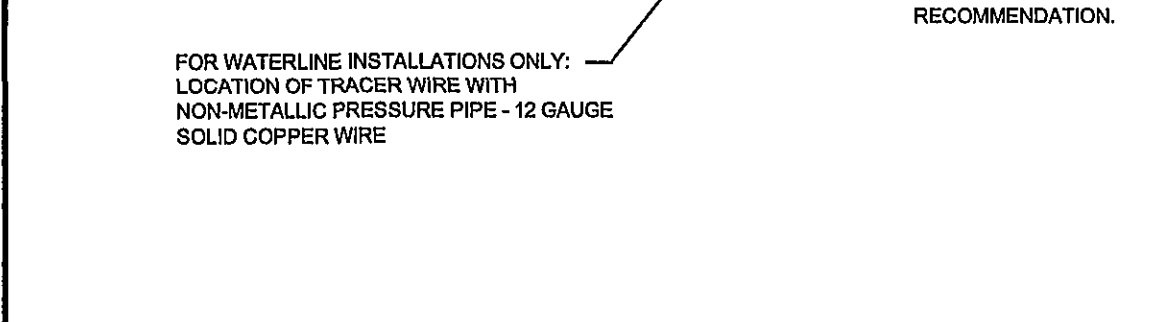
WESTERN VIRGINIA WATER AUTHORITY - CONSTRUCTION STANDARDS

REVISION DATE	DESCRIPTION	W-12
07/01/04		
03/01/06		

AUTOMATIC AIR RELEASE ASSEMBLY



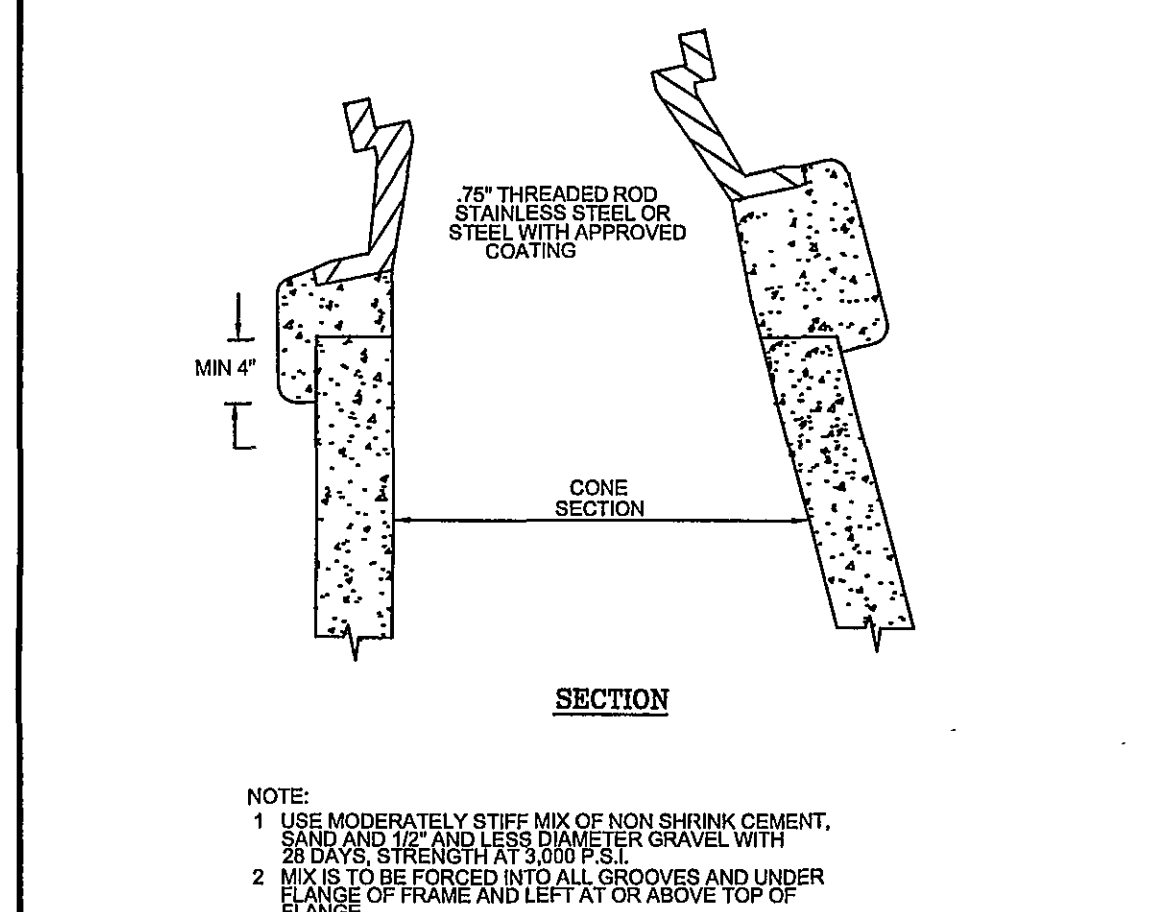
- NOTES:
1. BEDDING, HAUNCHING AND INITIAL BACKFILL CONSTRUCTION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION.
 2. ALL PVC PIPE SHALL BE BEDDED IN COMPACTED VDOT #57 OR #68 STONE.
 3. IN ROANOKE COUNTY, THE CONTRACTOR SHALL REPLACE THE OPEN CUT WITH A MINIMUM TOP COURSE OF 1" (5" MINIMUM) VDOT #A-9.5A, BASE COURSE OF 6" VDOT #A-25K, AND SUBBASE OF 10" VDOT #1. OR AS REQUIRED BY VDOT. IN ROANOKE CITY, CONTRACTOR SHALL REPLACE PAVEMENT AS REQUIRED BY CITY OF ROANOKE RIGHT OF WAY EXCAVATION AND RESTORATION STANDARDS.
 4. ALL EXCAVATIONS SHALL COMPLY WITH OSHA TECHNICAL MANUAL, CHAPTER 2, TITLED "EXCAVATIONS-HAZARD RECOGNITION IN TRENCHING AND SHORING."



WESTERN VIRGINIA WATER AUTHORITY - CONSTRUCTION STANDARDS

REVISION DATE	DESCRIPTION	S-30 & W-24
07/01/04		
03/01/06		

BEDDING AND BACKFILL OUTSIDE OF PAVED AREAS

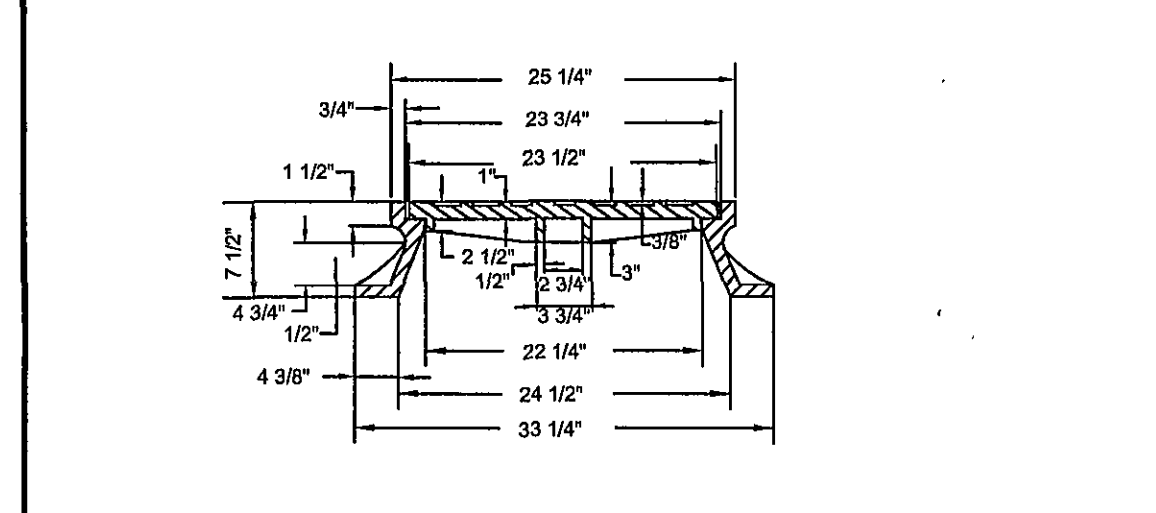
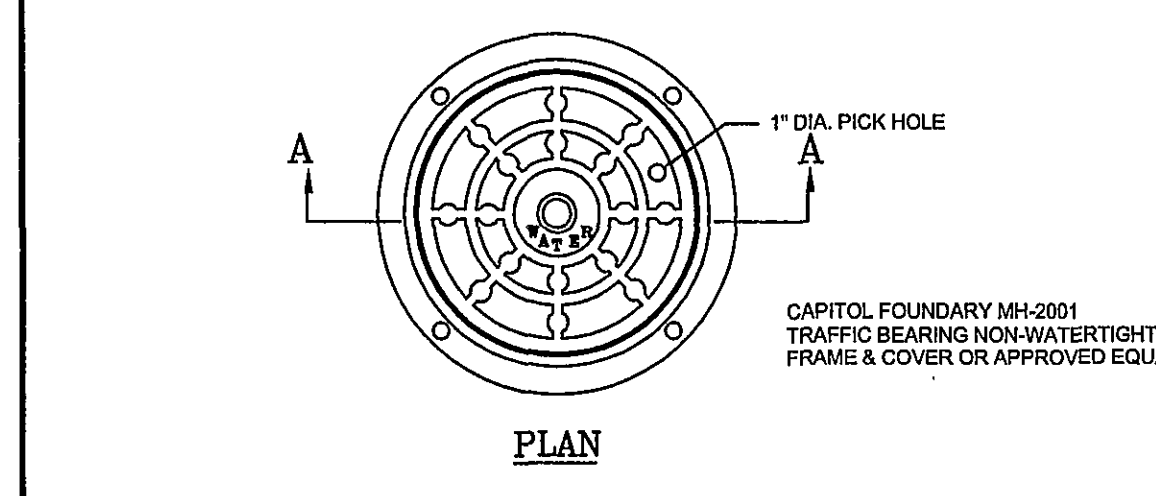


- NOTE:
1. USE MODERATELY STIFF MIX OF NON-SHRINK CEMENT, SAND AND 1/2" LESS DIAMETER GRAVEL WITH 30 DASH 10 STRENGTH 1:3:3 MIX.
 2. MIX IS TO BE FORCED INTO ALL GROOVES AND UNDER FLANGE.
 3. MAX. OF 4 BRICK OR CONCRETE BLOCKS TO BE USED FOR GRADE CONTROL.
 4. DO NOT BACKFILL AROUND FRAME AND COVER, FOR 48 HOURS AFTER CON. IS PLACED, THE USE OF HIGHLY COMPACTED BACKFILL WOULD REDUCE TIME TO (24HRS).
 5. RESTRICT TRAFFIC LOAD FOR MIN. 24 HOURS.

WESTERN VIRGINIA WATER AUTHORITY - CONSTRUCTION STANDARDS

REVISION DATE	DESCRIPTION	W-16
07/01/04		
03/01/06		

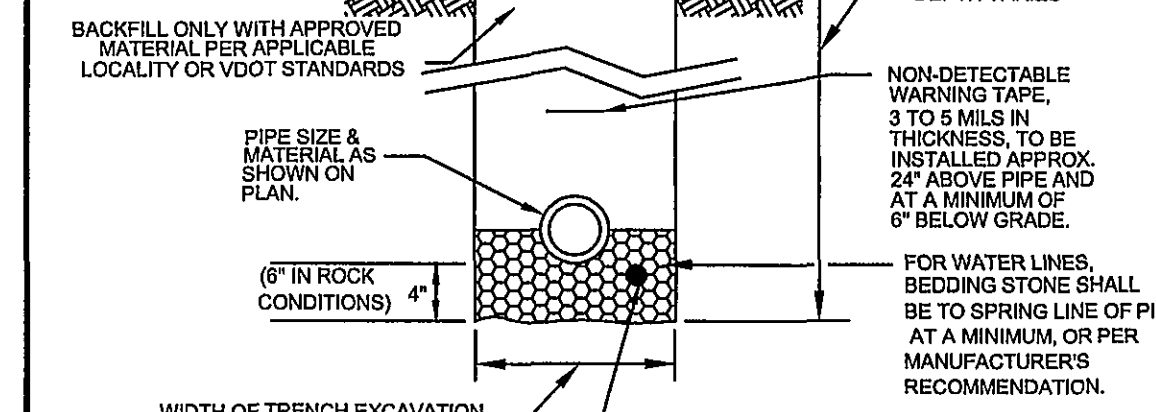
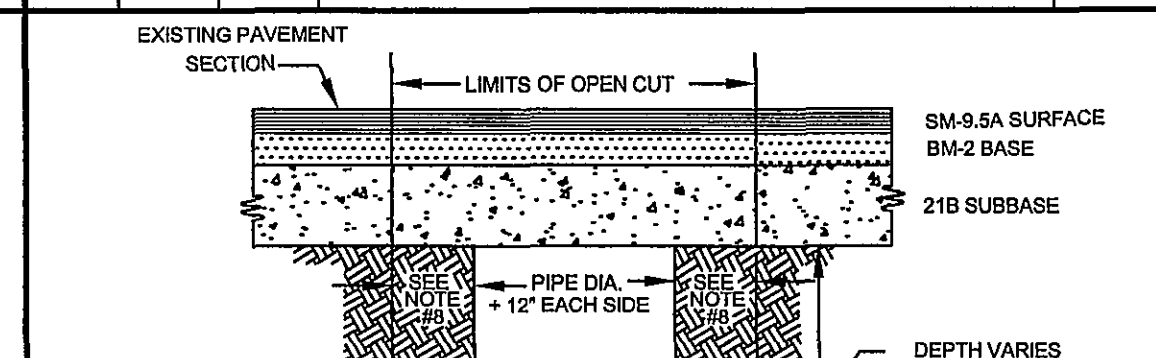
INSTALLATION DETAIL FOR ALL FRAMES AND COVERS



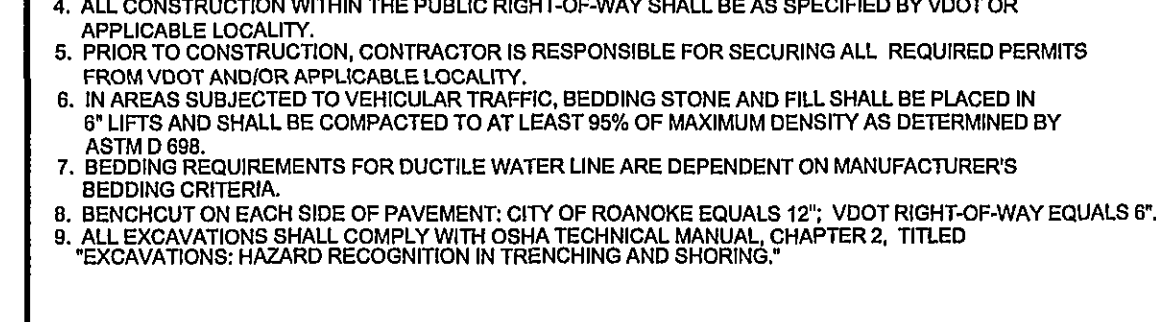
WESTERN VIRGINIA WATER AUTHORITY - CONSTRUCTION STANDARDS

REVISION DATE	DESCRIPTION	W-17
07/01/04		
03/01/06		

MANHOLE FRAME AND COVER



- NOTES:
1. BEDDING, HAUNCHING AND INITIAL BACKFILL CONSTRUCTION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION.
 2. ALL PVC PIPE SHALL BE BEDDED IN COMPACTED VDOT #57 OR #68 STONE.
 3. IN ROANOKE COUNTY, THE CONTRACTOR SHALL REPLACE THE OPEN CUT WITH A MINIMUM TOP COURSE OF 1" (5" MINIMUM) VDOT #A-9.5A, BASE COURSE OF 6" VDOT #A-25K, AND SUBBASE OF 10" VDOT #1. OR AS REQUIRED BY VDOT. IN ROANOKE CITY, CONTRACTOR SHALL REPLACE PAVEMENT AS REQUIRED BY CITY OF ROANOKE RIGHT OF WAY EXCAVATION AND RESTORATION STANDARDS.
 4. ALL EXCAVATIONS SHALL COMPLY WITH OSHA TECHNICAL MANUAL, CHAPTER 2, TITLED "EXCAVATIONS-HAZARD RECOGNITION IN TRENCHING AND SHORING."



WESTERN VIRGINIA WATER AUTHORITY - CONSTRUCTION STANDARDS

REVISION DATE	DESCRIPTION	S-31 & W-25
07/01/04		
03/01/06		

BEDDING AND BACKFILL UNDER PAVEMENT AND RIGHT-OF-WAY



1208 Corporate Circle
Roanoke, Virginia 24018
Phone: 540/772-9580
FAX: 540/772-8050

501 Branchway Road
Richmond, Virginia 23236
Phone: 804/794-0571
FAX: 804/794-2635

880 Technology Park Drive
Suite 200
Glen Allen, Virginia 23059
Phone: 804/653-0132
FAX: 804/653-0133

448 Peppers Ferry Road, NW
Chattahoochee, Virginia 24075
Phone: 540/248-3220
FAX: 540/248-3221

1657 Commerce Road
Suite 201
Verona, Virginia 24482
Phone: 540/248-3220
FAX: 540/248-3221

MAPLE RIDGE

W.V.W.A STD. DETAILS
ROANOKE CITY, VIRGINIA

DRAWN BY: JVJ

DESIGNED BY: JVJ

CHECKED BY: SMH

DATE: 09/29/2006

REVISIONS:

- 1st - 02/26/2007, per City Review
- 2nd - 04/20/2007, per City Review
- 3rd - 05/15/2007, per City Review
- 4th - 08/28/2007, Owner Revisions
- 5th - 09/20/2007, per City Review

SHEET NO.

C-15

JOB NO.
R0400131.03