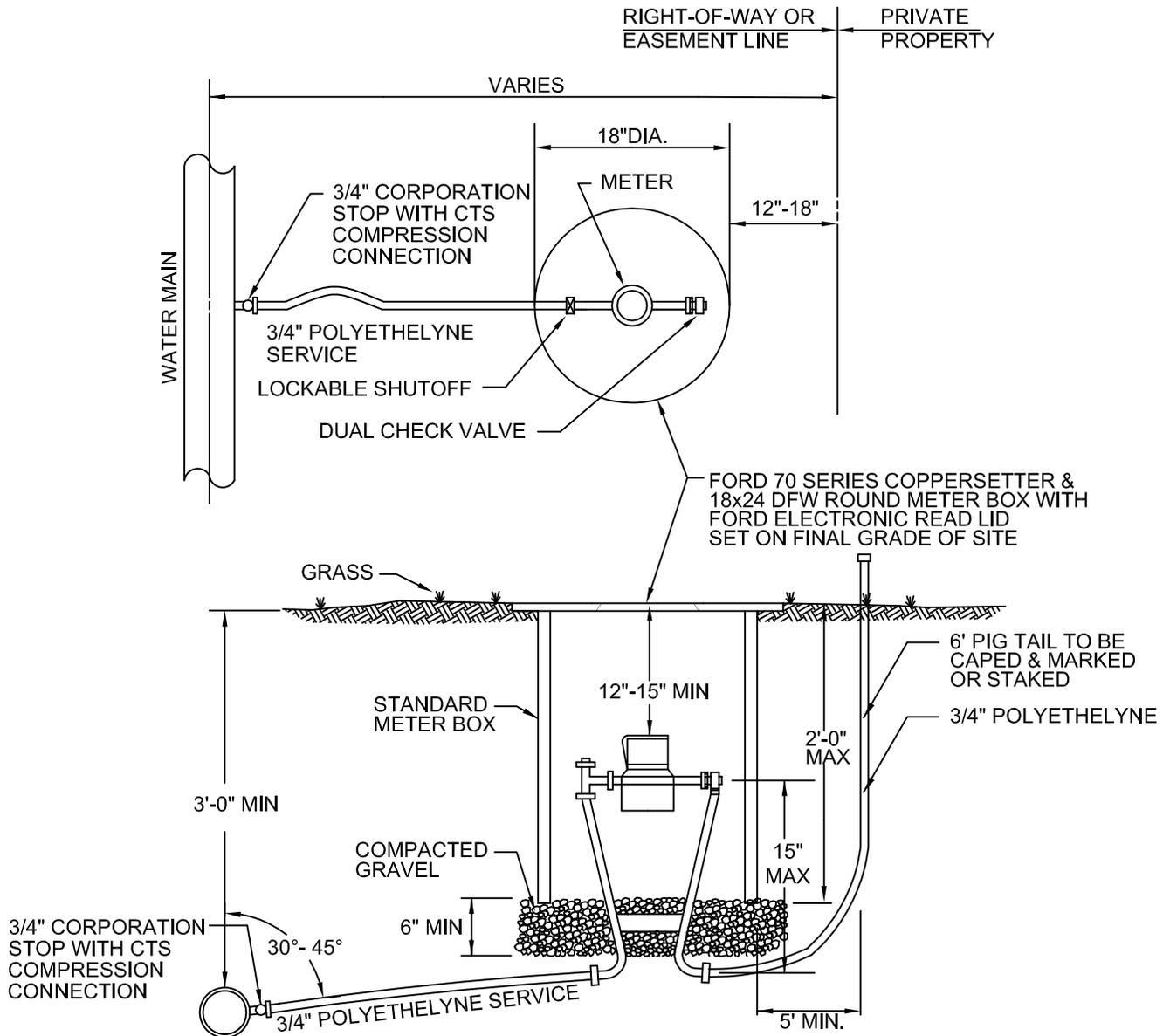


LIST OF WATER DETAIL DRAWINGS

BC #	TITLE
W-01	Single Residential Water Service
W-02	Single Residential Water Service with PRV
W-03	Double Residential Water Service
W-04	Double Residential Water Service with PRV
W-05	Standard Valve Box Installation
W-06	Valve Box Installation Trench Adapter
W-07	Permanent End of Line Blow-Off Assembly
W-08	Temporary End of Line Blow-Off Assembly (For Future Extension)
W-09	In-Line Blow-Off Assembly
W-10	Automatic Air/Vacuum Release Assembly
W-11	Automatic Air/Vacuum Release Assembly for Deep Water Lines
W-12	Fire Hydrant Assembly American Darling B-84-B
W-13	Thrust Block Construction
W-14	Thrust Restraint of Pipe Joints Design Lengths
W-15	Pipe Support in Casing Pipe
W-16	Leak Detection & Location Access Points for C909 PVCO Pipe
W-17	Commercial Water Service - ≤ 2 " Meter

NOTES:

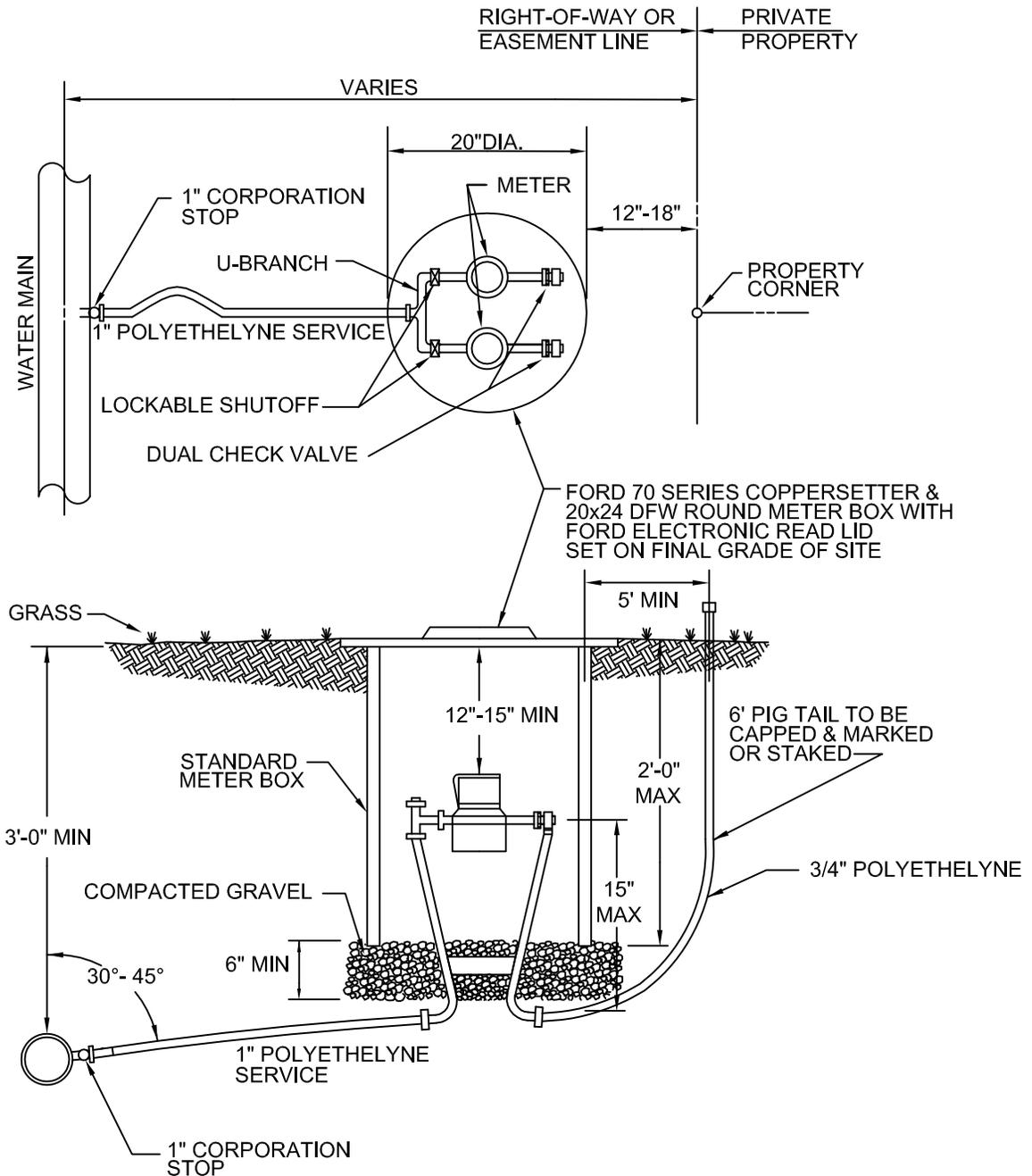
1. FORD METER SETTERS MUST BE USED BY CONTRACTOR.
2. METERS MUST NOT BE INSTALLED IN BOTTOM OF ROADSIDE DITCH.
3. METERS WILL BE PROVIDED AND INSTALLED BY BOTETOURT COUNTY UTILITY DEPARTMENT FOR ALL WATER SYSTEMS OWNED AND MAINTAINED BY BOTETOURT COUNTY.
4. METERS SHALL BE SENSUS SR11 WATER METERS.
5. SADDLES MUST BE USED WITH ALL PLASTIC & CLASS 50 DUCTILE IRON PIPE.
6. ALL POLYETHELYNE SERVICE LINES SHALL BE RATED FOR MINIMUM 200 PSI.



	BOTETOURT COUNTY PUBLIC FACILITIES & PROGRAMS	CONSTRUCTION STANDARDS	DATE: MARCH 2005	BC # W-01
	30 WEST BACK STREET, NUMBER 4 FINCASTLE, VA 24090 Ph: 540-473-8316 Fx: 540-473-8360	SINGLE RESIDENTIAL WATER SERVICE	REVISIONS	

NOTES:

1. FORD METER SETTERS MUST BE USED BY CONTRACTOR.
2. METERS MUST NOT BE INSTALLED IN BOTTOM OF ROADSIDE DITCH.
3. METERS WILL BE PROVIDED AND INSTALLED BY BOTETOURT COUNTY UTILITY DEPARTMENT FOR ALL WATER SYSTEMS OWNED AND MAINTAINED BY BOTETOURT COUNTY.
4. METERS SHALL BE SENSUS SR11 WATER METERS.
5. SADDLES MUST BE USED WITH ALL PLASTIC & CLASS 50 DUCTILE IRON PIPE.
6. ALL POLYETHELYNE SERVICE LINES SHALL BE RATED FOR MINIMUM 200 PSI.



BOTETOURT COUNTY
PUBLIC FACILITIES & PROGRAMS

30 WEST BACK STREET, NUMBER 4
FINCASTLE, VA 24090
Ph: 540-473-8316
Fx: 540-473-8360

CONSTRUCTION STANDARDS

**RESIDENTIAL /
SMALL COMMERCIAL
DOUBLE WATER SERVICE**

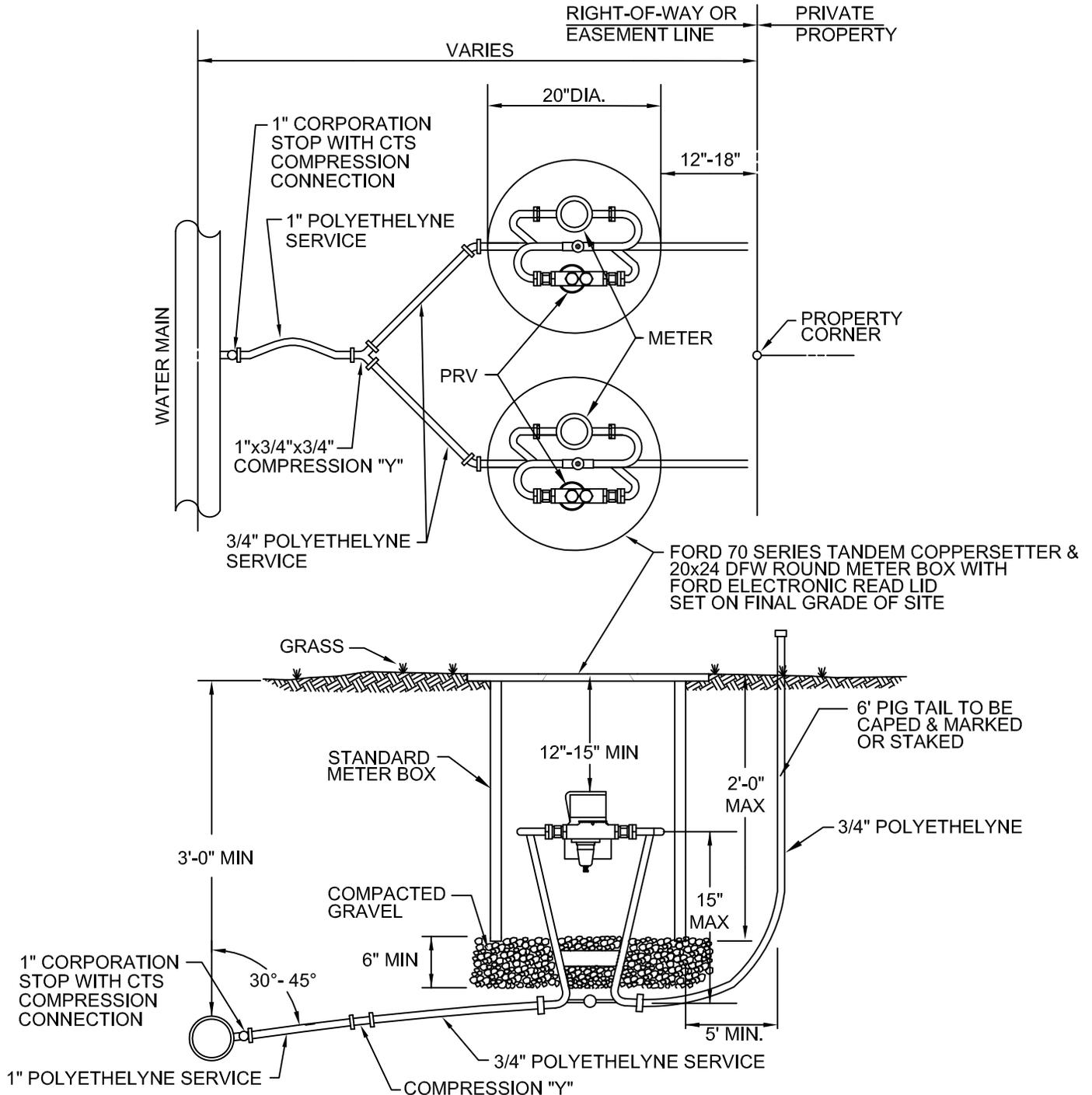
DATE:
MARCH 2005

REVISIONS

BC #
W-03

NOTES:

1. FORD METER SETTERS MUST BE USED BY CONTRACTOR.
2. METERS MUST NOT BE INSTALLED IN BOTTOM OF ROADSIDE DITCH.
3. METERS WILL BE PROVIDED AND INSTALLED BY BOTETOURT COUNTY UTILITY DEPARTMENT FOR ALL WATER SYSTEMS OWNED AND MAINTAINED BY BOTETOURT COUNTY.
4. METERS SHALL BE SENSUS SR11 WATER METERS.
5. SADDLES MUST BE USED WITH ALL PLASTIC & CLASS 50 DUCTILE IRON PIPE.
6. ALL POLYETHYLENE SERVICE LINES SHALL BE RATED FOR MINIMUM 200 PSI.



BOTETOURT COUNTY
PUBLIC FACILITIES & PROGRAMS

30 WEST BACK STREET, NUMBER 4
FINCASTLE, VA 24090
Ph: 540-473-8316
Fx: 540-473-8360

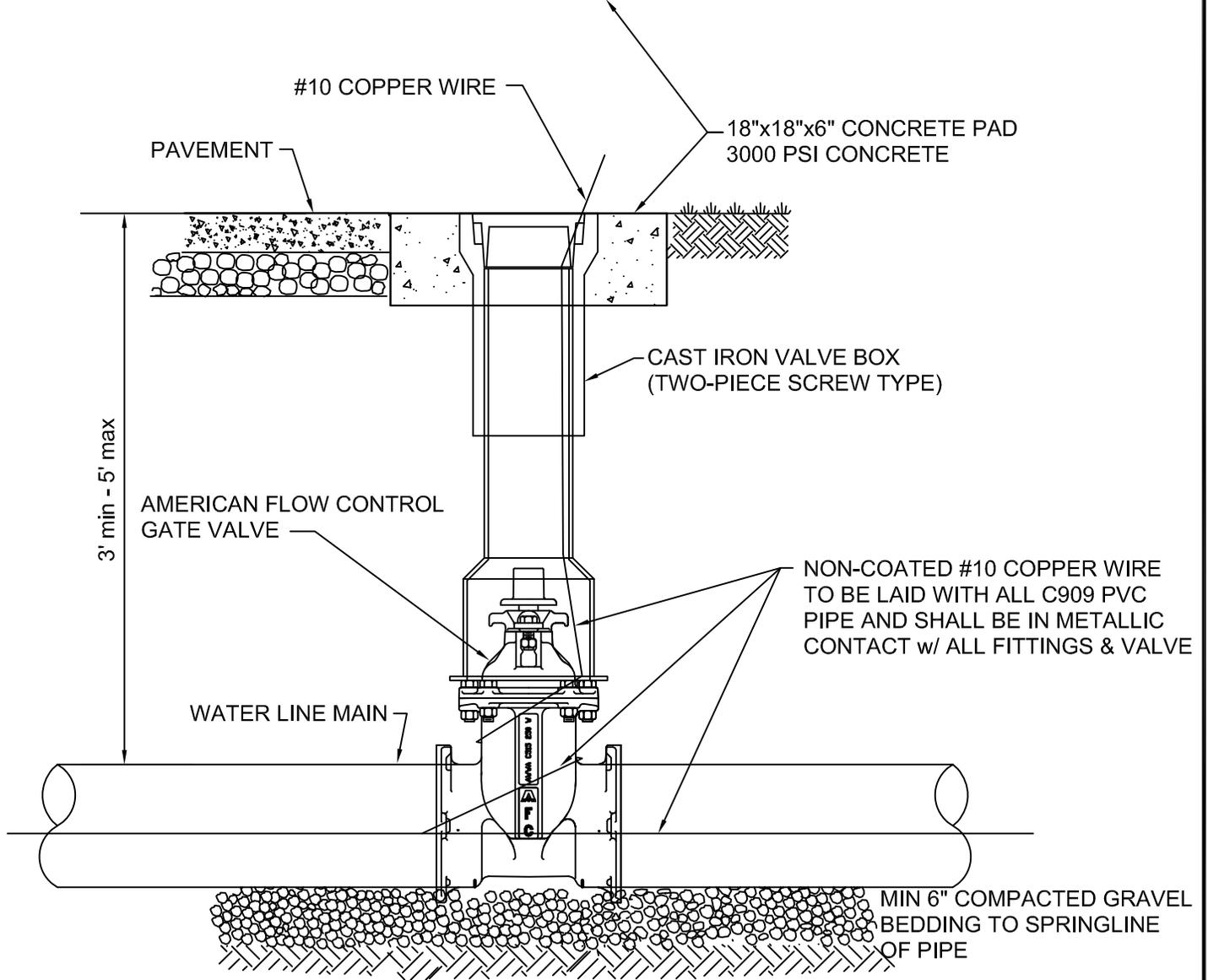
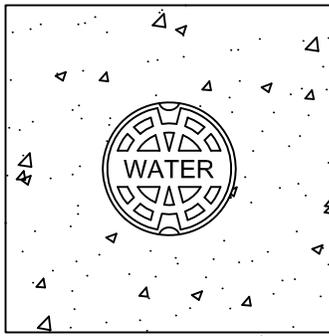
CONSTRUCTION STANDARDS

**DOUBLE RESIDENTIAL
WATER SERVICE
WITH PRV**

DATE:
MARCH 2005

REVISIONS

BC #
W-04



BOTETOURT COUNTY
PUBLIC FACILITIES & PROGRAMS

30 WEST BACK STREET, NUMBER 4
FINCASTLE, VA 24090
Ph: 540-473-8316
Fx: 540-473-8360

CONSTRUCTION STANDARDS

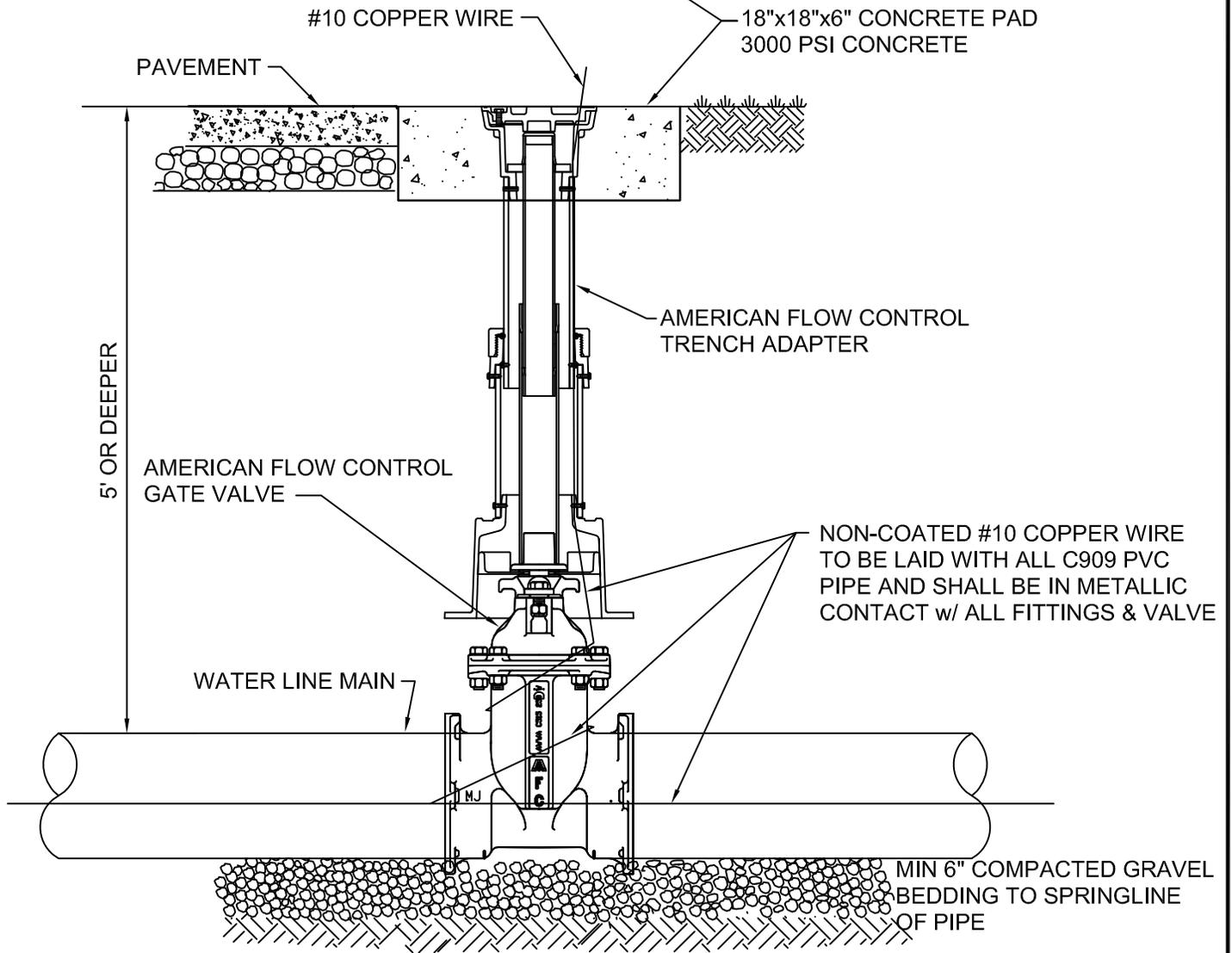
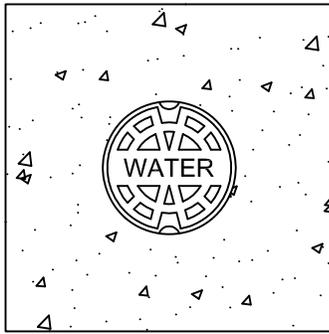
**STANDARD VALVE
BOX INSTALLATION**

DATE:
MARCH 2005

REVISIONS

BC #

W-05



BOTETOURT COUNTY
PUBLIC FACILITIES & PROGRAMS

30 WEST BACK STREET, NUMBER 4
FINCASTLE, VA 24090
Ph: 540-473-8316
Fx: 540-473-8360

CONSTRUCTION STANDARDS

**VALVE BOX INSTALLATION
TRENCH ADAPTER**

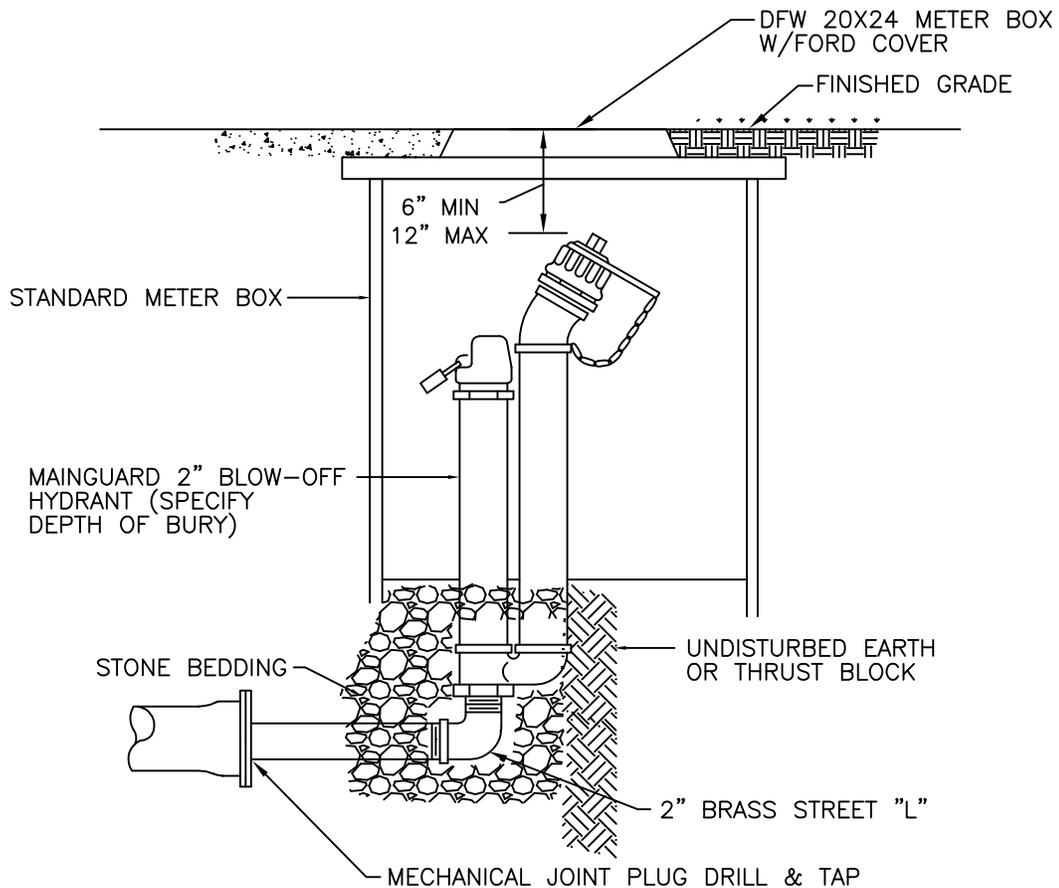
DATE:
MARCH 2005

REVISIONS

BC #

W-06

MAINGUARD NO. 78 BLOW-OFF HYDRANT



Blow-Off Hydrants shall be non-freezing, self draining type, with an overall length of 30". Set underground in a DFW 20x24 meter box, these hydrants will be furnished with a 2" FIP inlet, a non-turning operating rod, and shall open counter-clockwise. All of the working parts shall be of bronze-to-bronze design, and be servicable from above grade with no digging. The outlet shall also be bronze and be 2-1/2" NST. Hydrants shall be lockable to prevent unauthorized use as manufactured by Kupferle Foundry Co., St. Louis, MO, or approved equal.

(Specify overall length 6" shorter than normal depth of bury. Minimum opening in meter box shall be 10".)

BLOW-OFF HYDRANT DRAINS THAT ARE NOT PLUGGED SHALL BE DRAINED TO THE GROUND SURFACE OR TO DRY WELLS PROVIDED EXCLUSIVELY FOR THIS PURPOSE. IF DURING , CONSTRUCTION THE SEASONAL WATER TABLE IS NOTED TO BE ABOVE THE DRAIN OUTLETS OF THE PROPOSED HYDRANT, THE COUNTY ENGINEER SHALL BE NOTIFIED IMMEDIATELY SO THAT THE HYDRANT CAN BE RELOCATED TO A SUITABLE LOCATION OR DELETED.



BOTETOURT COUNTY
PUBLIC FACILITIES & PROGRAMS

30 WEST BACK STREET, NUMBER 4
FINCASTLE, VA 24090
Ph: 540-473-8316
Fx: 540-473-8360

CONSTRUCTION STANDARDS

PERMANENT END OF LINE BLOW-OFF ASSEMBLY

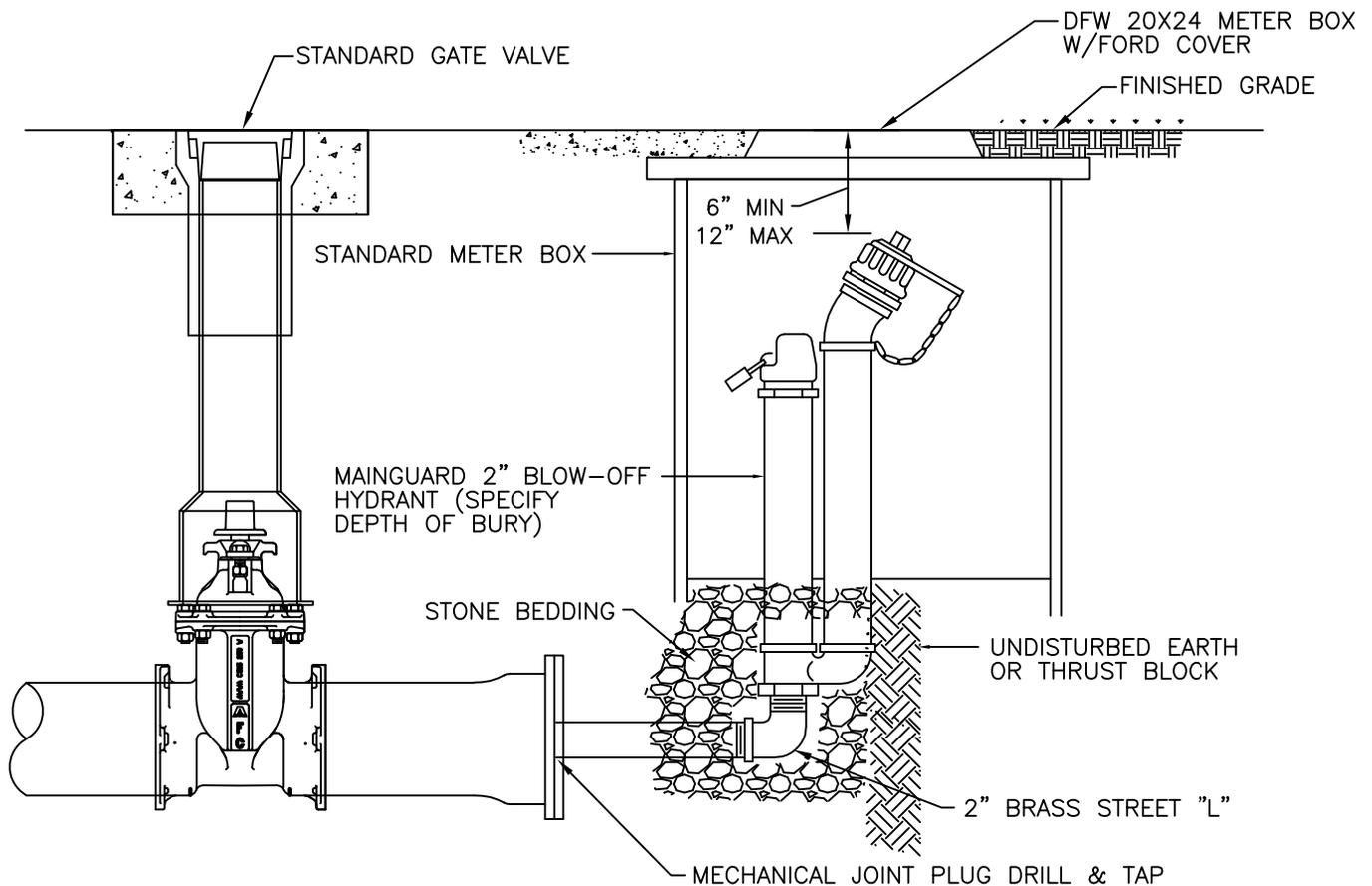
DATE:
MARCH 2005

REVISIONS

BC #

W-07

MAINGUARD NO. 78 BLOW-OFF HYDRANT



Blow-Off Hydrants shall be non-freezing, self draining type, with an overall length of 30". Set underground in a DFW 18x24 meter box, these hydrants will be furnished with a 2" FIP inlet, a non-turning operating rod, and shall open counter-clockwise. All of the working parts shall be of bronze-to-bronze design, and be servicable from above grade with no digging. The outlet shall also be bronze and be 2-1/2" NST. Hydrants shall be lockable to prevent unauthorized use as manufactured by Kupferle Foundry Co., St. Louis, MO, or approved equal.

(Specify overall length 6" shorter than normal depth of bury. Minimum opening in meter box shall be 10".)

BLOW-OFF HYDRANT DRAINS THAT ARE NOT PLUGGED SHALL BE DRAINED TO THE GROUND SURFACE OR TO DRY WELLS PROVIDED EXCLUSIVELY FOR THIS PURPOSE. IF DURING , CONSTRUCTION THE SEASONAL WATER TABLE IS NOTED TO BE ABOVE THE DRAIN OUTLETS OF THE PROPOSED HYDRANT, THE COUNTY ENGINEER SHALL BE NOTIFIED IMMEDIATELY SO THAT THE HYDRANT CAN BE RELOCATED TO A SUITABLE LOCATION OR DELETED.



BOTETOURT COUNTY
PUBLIC FACILITIES & PROGRAMS

30 WEST BACK STREET, NUMBER 4
FINCASTLE, VA 24090
Ph: 540-473-8316
Fx: 540-473-8360

CONSTRUCTION STANDARDS

**TEMPORARY END OF LINE
BLOW-OFF ASSEMBLY
(FOR FUTURE EXTENSION)**

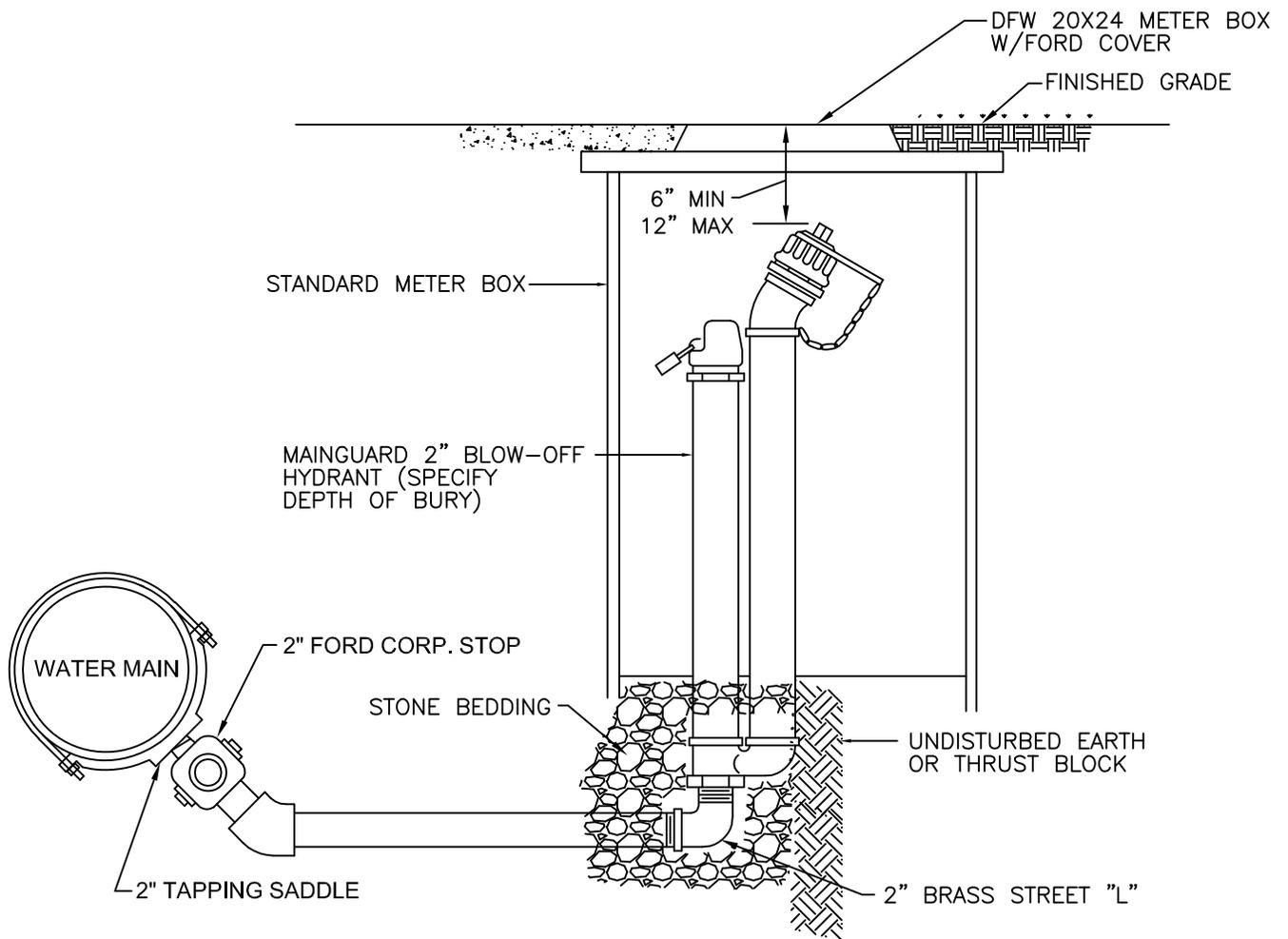
DATE:
MARCH 2005

REVISIONS

BC #

W-08

MAINGUARD NO. 78 BLOW-OFF HYDRANT



Blow-Off Hydrants shall be non-freezing, self draining type, with an overall length of 30". Set underground in a DFW 18x24 meter box, these hydrants will be furnished with a 2" FIP inlet, a non-turning operating rod, and shall open counter-clockwise. All of the working parts shall be of bronze-to-bronze design, and be servicable from above grade with no digging. The outlet shall also be bronze and be 2-1/2" NST. Hydrants shall be lockable to prevent unauthorized use as manufactured by Kupferle Foundry Co., St. Louis, MO, or approved equal.

(Specify overall length 6" shorter than normal depth of bury. Minimum opening in meter box shall be 10".)

BLOW-OFF HYDRANT DRAINS THAT ARE NOT PLUGGED SHALL BE DRAINED TO THE GROUND SURFACE OR TO DRY WELLS PROVIDED EXCLUSIVELY FOR THIS PURPOSE. IF DURING , CONSTRUCTION THE SEASONAL WATER TABLE IS NOTED TO BE ABOVE THE DRAIN OUTLETS OF THE PROPOSED HYDRANT, THE COUNTY ENGINEER SHALL BE NOTIFIED IMMEDIATELY SO THAT THE HYDRANT CAN BE RELOCATED TO A SUITABLE LOCATION OR DELETED.



BOTETOURT COUNTY
PUBLIC FACILITIES & PROGRAMS

30 WEST BACK STREET, NUMBER 4
FINCASTLE, VA 24090
Ph: 540-473-8316
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CONSTRUCTION STANDARDS

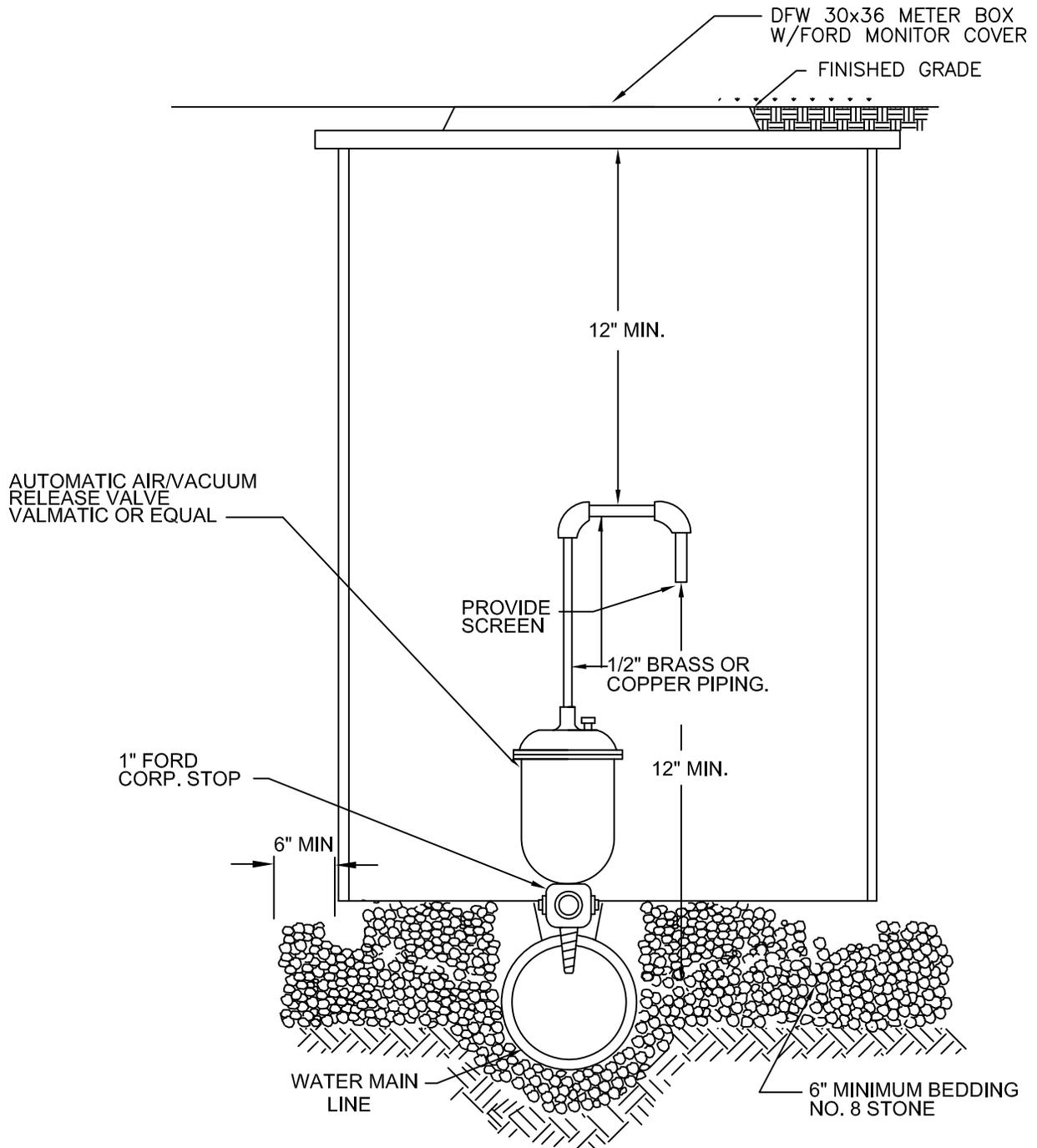
IN-LINE BLOW-OFF ASSEMBLY

DATE:
MARCH 2005

REVISIONS

BC #

W-09



BOTETOURT COUNTY
PUBLIC FACILITIES & PROGRAMS

30 WEST BACK STREET, NUMBER 4
FINCASTLE, VA 24090
Ph: 540-473-8316
Fx: 540-473-8360

CONSTRUCTION STANDARDS

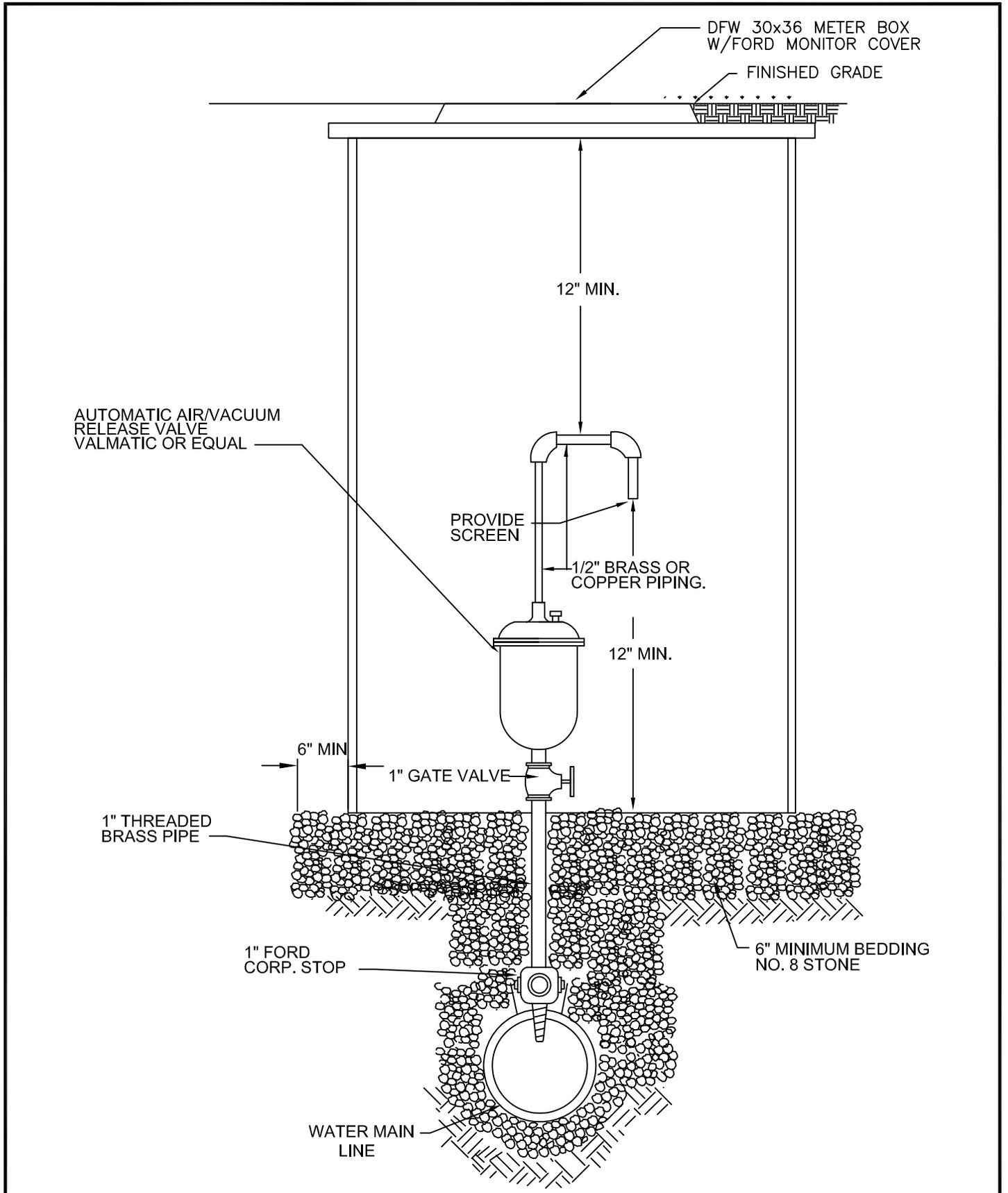
**AUTOMATIC AIR/VACUUM
RELEASE ASSEMBLY**

DATE:
MARCH 2005

REVISIONS

BC #

W-10



BOTETOURT COUNTY
PUBLIC FACILITIES & PROGRAMS

30 WEST BACK STREET, NUMBER 4
FINCASTLE, VA 24090
Ph: 540-473-8316
Fx: 540-473-8360

CONSTRUCTION STANDARDS

**AUTOMATIC AIR/VACUUM
RELEASE ASSEMBLY
FOR DEEP WATER LINES**

DATE:
MARCH 2005

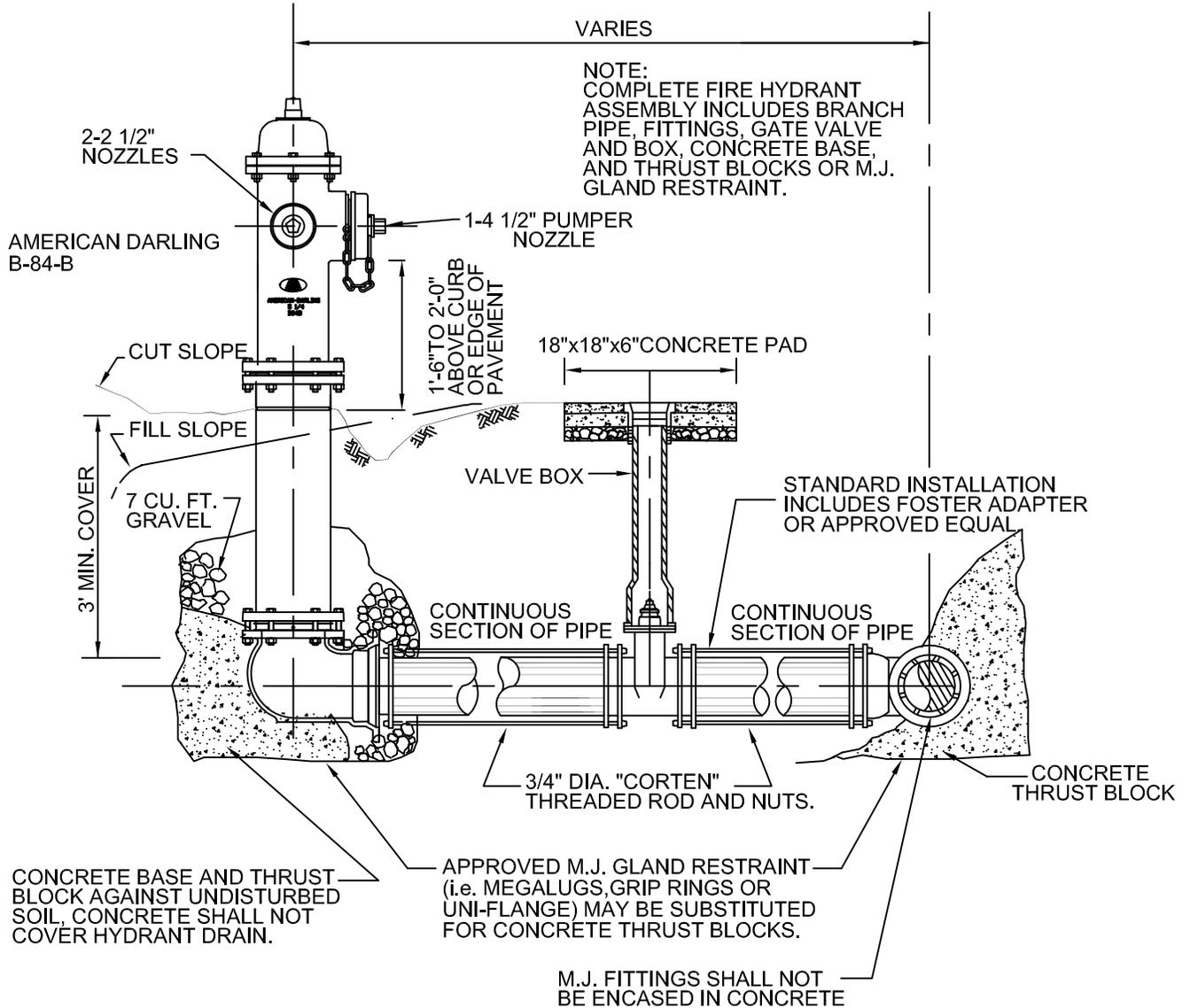
REVISIONS

BC #

W-11

NOTES:

1. FIRE HYDRANT SHALL BE INSTALLED 2' MIN. AND 4' MAX. FROM BACK OF CURB OR 6' MIN. AND 12' MAX. FROM EDGE OF PAVEMENT BUT NOT IN THE DITCHLINE. FIRE HYDRANT TO BE INSTALLED WITHIN RIGHT-OF-WAY OR EASEMENT LINE.
2. AREA AROUND HYDRANT AT A RADIUS OF 4' TO BE LEVEL AND UNOBSTRUCTED.
3. HIGH PRESSURE (OVER 120 PSI) REQUIRES THE USE ALL 3 RESTRAINTS.
4. FIRE HYDRANT DRAINS THAT ARE NOT PLUGGED SHALL BE DRAINED TO THE GROUND SURFACE OR TO DRY WELLS PROVIDED EXCLUSIVELY FOR THIS PURPOSE. IF DURING , CONSTRUCTION THE SEASONAL WATER TABLE IS NOTED TO BE ABOVE THE DRAIN OUTLETS OF THE PROPOSED HYDRANT, THE COUNTY ENGINEER SHALL BE NOTIFIED IMMEDIATELY SO THAT THE FIRE HYDRANT CAN BE RELOCATED TO A SUITABLE LOCATION OR DELETED.



BOTETOURT COUNTY
PUBLIC FACILITIES & PROGRAMS

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CONSTRUCTION STANDARDS

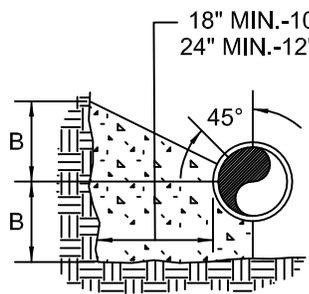
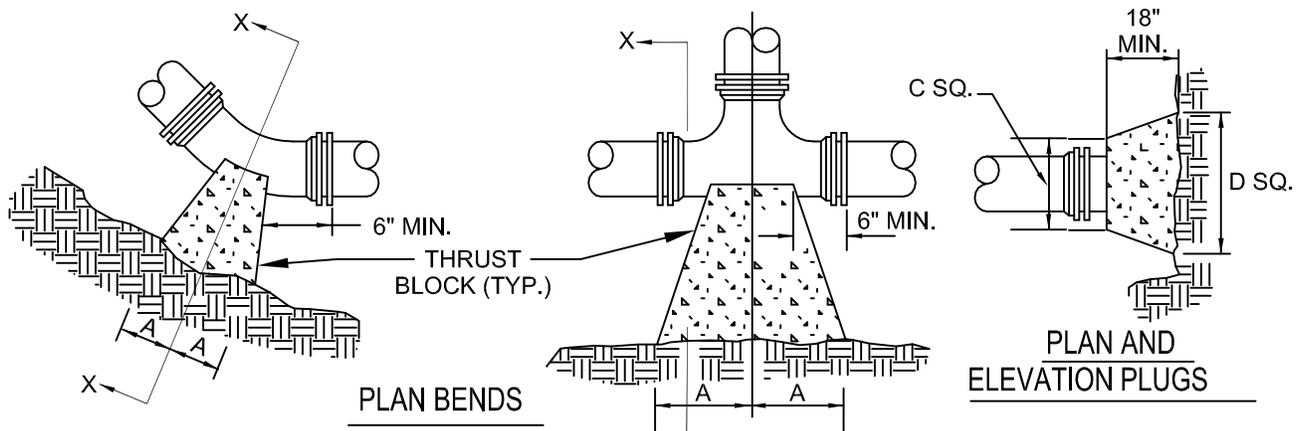
FIRE HYDRANT ASSEMBLY
AMERICAN DARLING
B-84-B

DATE:
MARCH 2005

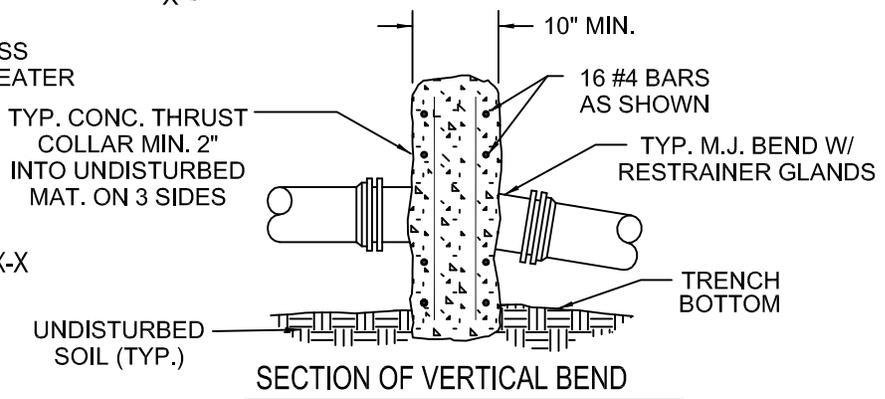
REVISIONS

BC #

W-12



BENDS AND TEES



SECTION OF VERTICAL BEND

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 THRUST BLOCKS.

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 RESTRAINED PIPE INSTALLED WITH A MINIMUM OF 4' OF COVER.

PRESSURE = 200 psi
 BEARING = 2000 psf
 FACTOR OF SAFETY = 1.5

PIPE SIZE	90° BEND		45° BEND		22 1/2° BEND		11 1/4° BEND		TEE		PLUG	
	A	B	A	B	A	B	A	B	A	B	C	D
4"	8"	12"	8"	8"	6"	6"	6"	6"	11"	9"	10"	6"
6"	18"	12"	8"	10"	8"	8"	8"	8"	11"	10"	12"	18"
8"	18"	13"	10"	10"	8"	8"	8"	8"	11"	12"	12"	24"
10"	20"	16"	12"	14"	8"	12"	8"	12"	14"	16"	16"	30"
12"	20"	16"	12"	14"	8"	12"	8"	12"	14"	16"	16"	30"
16"	26"	20"	16"	18"	11"	13"	11"	13"	18"	20"	20"	36"
24"	82"	42"	62"	30"	44"	22"	22"	16"	82"	42"	82"	42"
30"	185"	42"	100"	42"	52"	42"	40"	30"	185"	42"	185"	42"



BOTETOURT COUNTY
 PUBLIC FACILITIES & PROGRAMS
 30 WEST BACK STREET, NUMBER 4
 FINCASTLE, VA 24090
 Ph: 540-473-8316
 Fx: 540-473-8360

CONSTRUCTION STANDARDS
THRUST BLOCK CONSTRUCTION

DATE: MARCH 2005
REVISIONS

BC #
W-13

FACTOR OF SAFETY = 1.5

PIPE SIZE	PIPE MAT'L	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	VALVE /PLUG	TEE BRANCH	REDUCER (NOTE 2)	VERT. 45°	VERT. 22 1/2°	VERT. 11 1/4°
6"	D.I.	28'	12'	6'	3'	38'	34'	20'	23'	11'	5'
8"	D.I.	37'	15'	7'	4'	51'	47'	21'	30'	15'	7'
10"	D.I.	45'	19'	9'	4'	61'	57'	20'	37'	18'	9'
12"	D.I.	53'	22'	11'	5'	73'	69'	38'	43'	21'	10'
6"	PVC	30'	12'	6'	3'	56'	38'	29'	35'	17'	8'
8"	PVC	40'	16'	8'	4'	74'	56'	31'	46'	22'	11'
10"	PVC	47'	20'	9'	5'	89'	82'	30'	56'	27'	13'
12"	PVC	56'	23'	11'	6'	106'	88'	56'	66'	32'	16'

1. ALL JOINTS SHALL BE RESTRAINED ON BOTH SIDES OF THE FITTING FOR THE LENGTH SHOWN UNLESS OTHERWISE INDICATED.
2. REDUCER IS ONE SIZE SMALLER THAN PIPE LISTED. RESTRAINED LENGTH IS UPSTREAM ON THE LARGE SIDE OF THE REDUCER.



BOTETOURT COUNTY
PUBLIC FACILITIES & PROGRAMS

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CONSTRUCTION STANDARDS

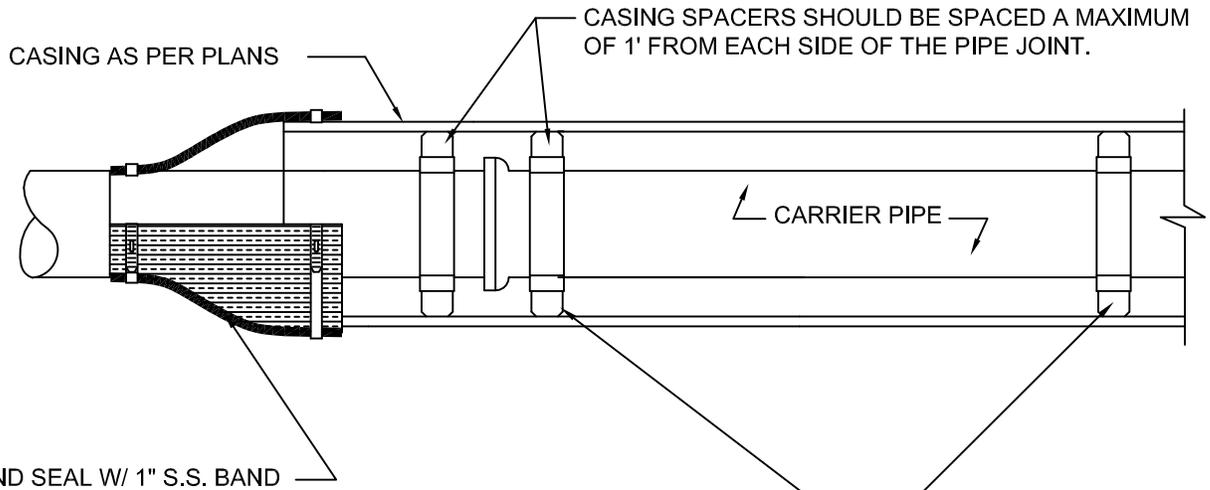
**THRUST RESTRAINT
OF PIPE JOINTS
DESIGN LENGTHS**

DATE:
MARCH 2005

REVISIONS

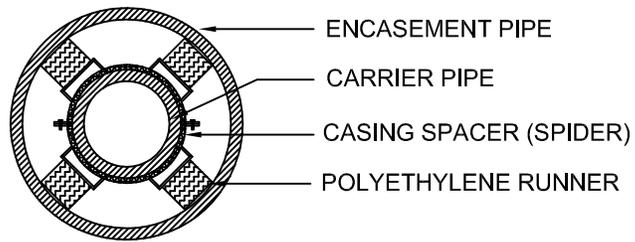
BC #

W-14



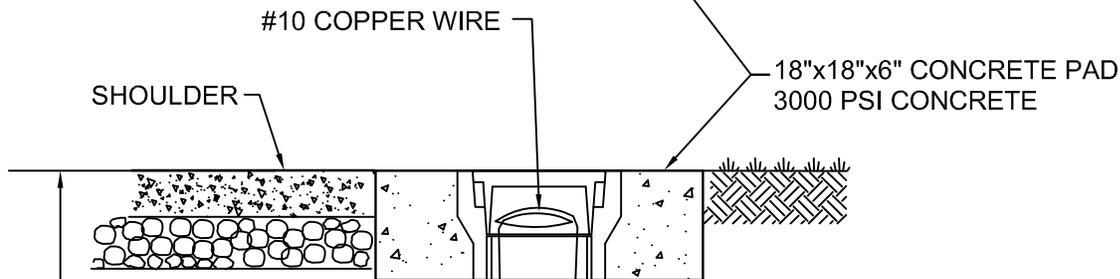
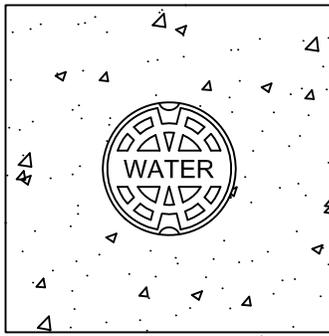
CASING SPACERS SHOULD BE SPACED A MAXIMUM OF 1' FROM EACH SIDE OF THE PIPE JOINT.

CASING SPACERS SHOULD BE SPACED A MAXIMUM OF 12' BETWEEN CASING SPACERS OR AS RECOMMENDED BY MANUFACTURER.
 MAXIMUM TOTAL FREE PLAY BETWEEN OUTSIDE OF SPACERS AND INSIDE OF CASING PIPE SHALL BE 1 INCH.



NOTES:

1. A 1" DRAIN WILL BE REQUIRED ON THE LOWER END OF THE CASING IF THE CASING ENDS ARE SEALED WITH MORTER AND BRICK.
2. CASING PIPE LENGTH SHALL BE FROM R/W TO R/W OR AS SHOWN ON APPROVED PLANS, WHICHEVER IS GREATER.



3' min - 5' max

CAST IRON VALVE BOX
(TWO-PIECE SCREW TYPE)

NON-COATED #10 COPPER WIRE
TO BE LAID WITH ALL C909 PVC
PIPE AND SHALL BE IN METALLIC
CONTACT w/ ALL FITTINGS & VALVE

WATER LINE MAIN

MIN 6" COMPACTED GRAVEL
BEDDING TO SPRINGLINE
OF PIPE



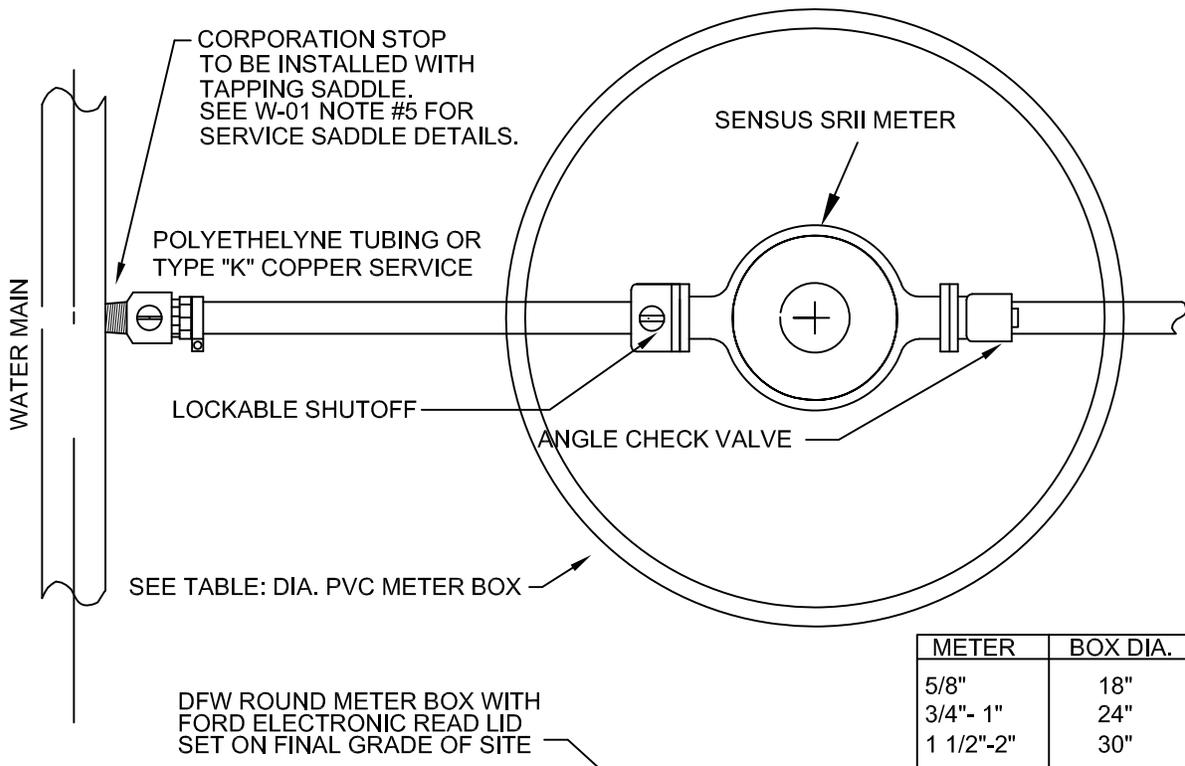
BOTETOURT COUNTY
PUBLIC FACILITIES & PROGRAMS
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FINCASTLE, VA 24090
Ph: 540-473-8316
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CONSTRUCTION STANDARDS

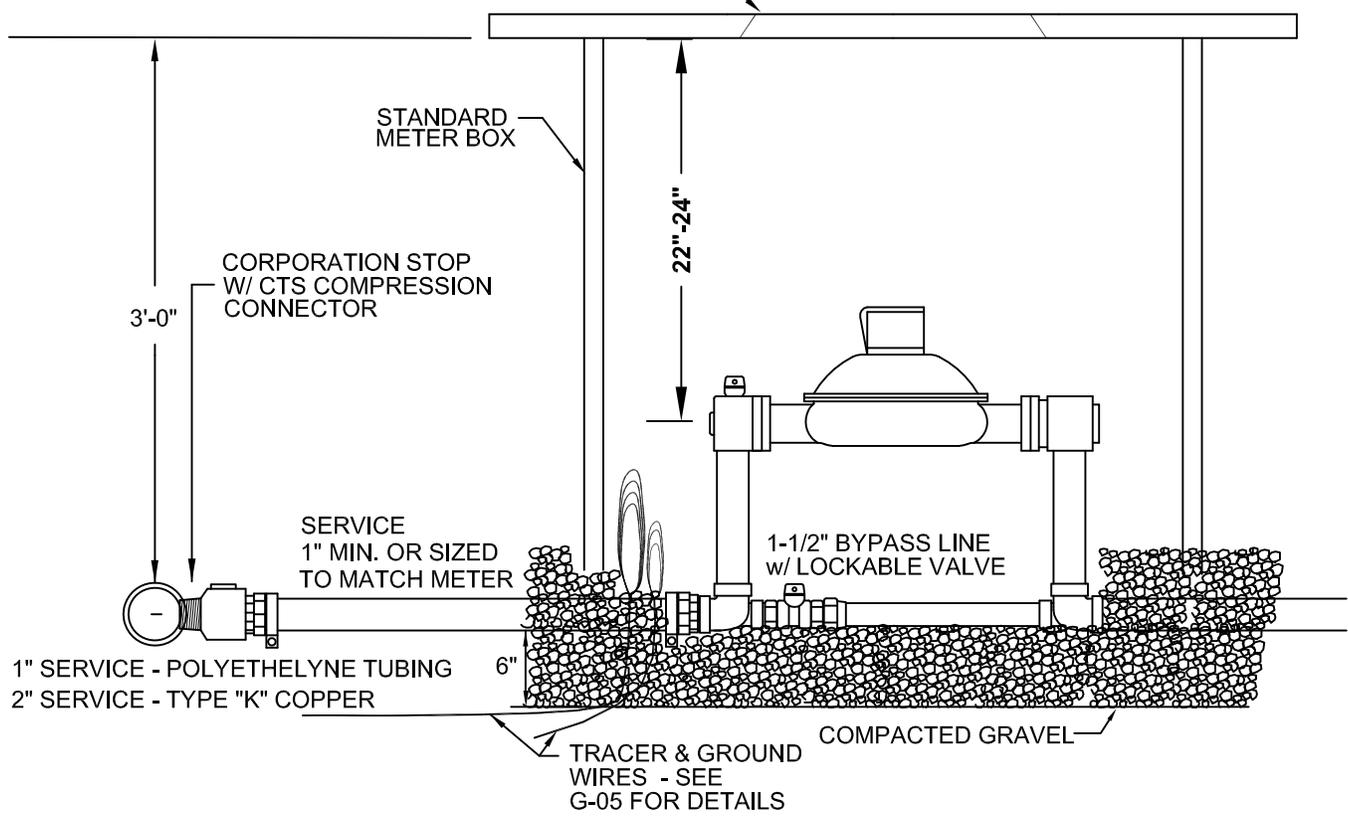
**LEAK DETECTION &
LOCATION ACCESS POINTS
FOR C909 PVC PIPE**

DATE:	MAY 2006
REVISIONS	

BC #
W-16



METER	BOX DIA.
5/8"	18"
3/4"- 1"	24"
1 1/2"-2"	30"



BOTETOURT COUNTY
 PUBLIC FACILITIES & PROGRAMS
 30 WEST BACK STREET, NUMBER 4
 FINCASTLE, VA 24090
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CONSTRUCTION STANDARDS

**COMMERCIAL
 WATER SERVICE
 ≤ 2" METER**

DATE: JULY 2008
REVISIONS

**BC #
 W-17**