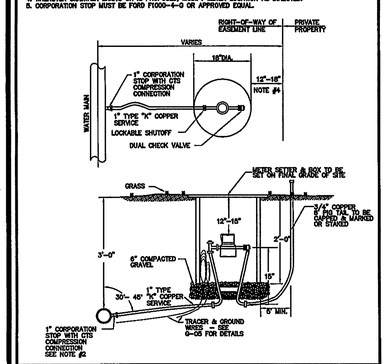
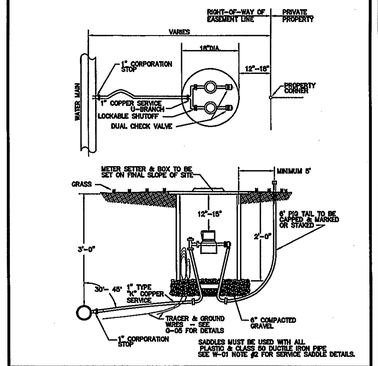
1. SETTER TO BE A.Y. McDONALD #20-215 WD0033 , FORD VBH972-15W-1133 OR APPROVED EQUAL.
2. SADDLES MUST BE USED WITH ALL PLASTIC & CLASS 52 DUCTILE IRON PIPE. SERVICE SADDLES SHALL BE USED IN ACCORDANCE WITH SECTION 3663 OF THE WATER STANDARDS. SERVICE SADDLES FOR PLASTIC PIPE SHALL BE HYDROSEAL 147 OR 241(DIA. SIZE), VS-200 OR FORD METER FS202 OR FS203. FOR DUCTILE IRON PIPE USE 147 OR 241(DIA. SIZE), VS-200 OR FORD METER FS202.
3. METER BOXES MUST BE CARSON/MID-STATES PLASTICS, INC. PLASTIC BOX WITH FORD ASC-7 (ELECTRONIC READ LID) OR A. Y. McDONALD MODEL 74B350-TO CAST IRON BASE & COVER OR APPROVED EQUAL. ELECTRONIC READ LID OF METER BOXES SHALL BE APPROVED BY THE AUTHORITY. TRAFFIC BEARING BOX SHALL BE CARSON/MID STATES PLASTICS 1033 OR EQUIVALENT AND LID SHALL BE FORD METER BOX C33H 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

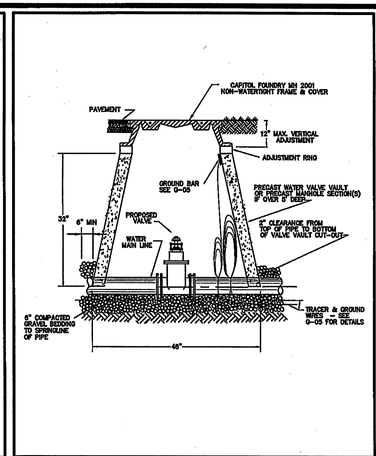
REVISION	DATE		
07/01/04		TYPE "A" SINGLE RESIDENTIAL WATER SERVICE (LINE PRESSURE UNDER 80 PSI)	W-01
03/01/06			

1. SETTER TO BE A.Y. McDONALD #20-215 WD0033 , FORD VBH972-15W-1133 OR APPROVED EQUAL.
2. METER BOX MUST BE CARSON/MID-STATES PLASTICS, INC. PLASTIC BOX WITH FORD ASC-7 (ELECTRONIC READ LID) OR A. Y. McDONALD MODEL 74B350-TO CAST IRON BASE & COVER OR APPROVED EQUAL.
3. CORPORATION STOP MUST BE FORD F1000-4-G OR APPROVED EQUAL.



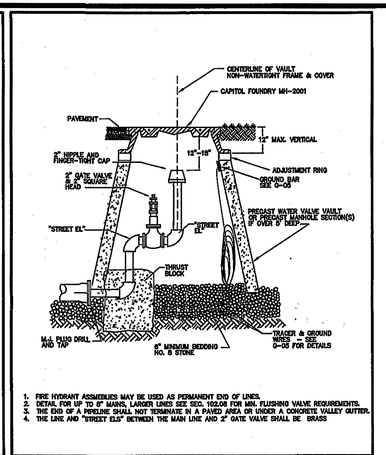
WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS

REVISION	DATE		
07/01/04		DOUBLE RESIDENTIAL WATER SERVICE	W-04
03/01/06			



WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS

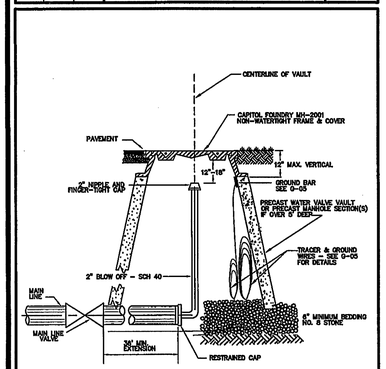
REVISION	DATE		
07/01/04		WATER LINE VALVE INSTALLATION	W-06
03/01/06			



1. FIRE HYDRANT ASSEMBLIES MAY BE USED AS PERMANENT END OF LINES.
2. DETAIL FOR UP TO 8" MAINS. LARGER LINES SEE SEC. 102.06 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 THE MAIN LINE AND 2" GATE VALVE SHALL BE BRASS

WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS

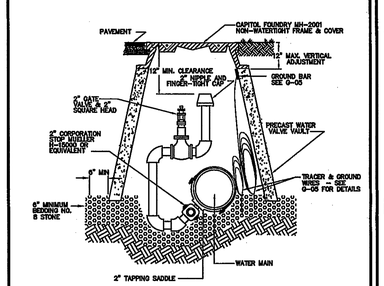
REVISION	DATE		
07/01/04		PERMANENT END OF LINE	W-09
03/01/06			



WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS

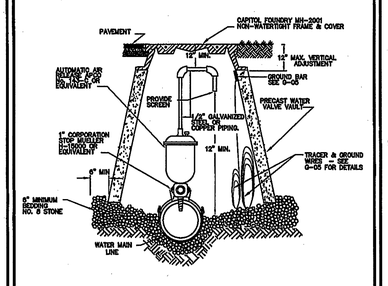
REVISION	DATE		
07/01/04		BLOW-OFF ASSEMBLY FOR MAIN LINE TEMPORARY TERMINATION	W-10
03/01/06			

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



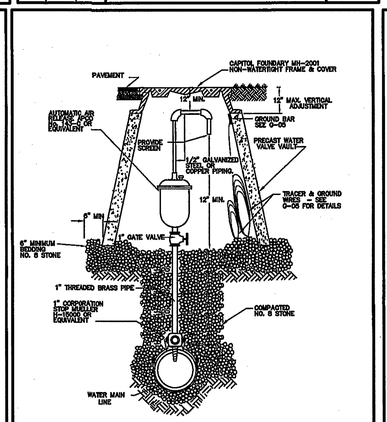
WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS

REVISION	DATE		
07/01/04		IN-LINE BLOW-OFF ASSEMBLY	W-11
03/01/06			



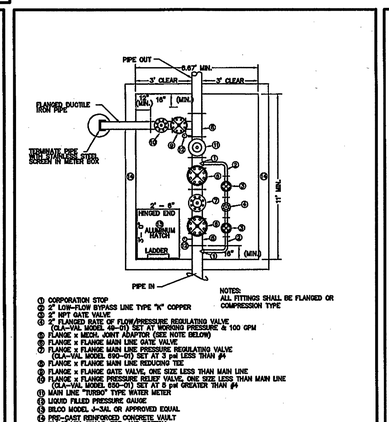
WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS

REVISION	DATE		
07/01/04		AUTOMATIC AIR RELEASE ASSEMBLY	W-12
03/01/06			



WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS

REVISION	DATE		
07/01/04		AUTOMATIC AIR RELEASE ASSEMBLY FOR DEEP WATER LINES	W-13
03/01/06			



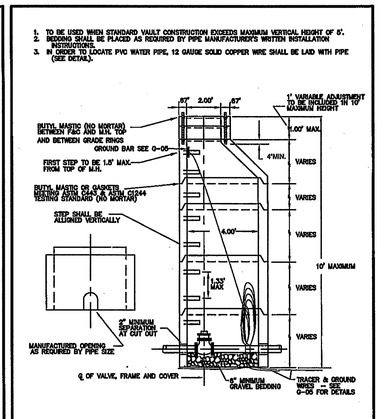
① CORPORATION STOP
② 2" LOW-FLOW BYPASS LINE TYPE "K" COPPER
③ 2" NPT GATE VALVE
④ 2" FLANGED RATE OF FLOW/PRESSURE REGULATING VALVE (DJA-VAL MODEL 49-01) SET AT WORKING PRESSURE & 100 GPM
⑤ FLANGE x MECH. JOINT ADAPTOR (SEE NOTE BELOW)
⑥ FLANGE x FLANGE MAIN LINE GATE VALVE
⑦ FLANGE x FLANGE MAIN LINE PRESSURE REGULATING VALVE (DJA-VAL MODEL 690-01) SET AT 3 psi LESS THAN ⑭
⑧ FLANGE x FLANGE MAIN LINE REDUCING TEE
⑨ FLANGE x FLANGE GATE VALVE, ONE SIZE LESS THAN MAIN LINE
⑩ FLANGE x FLANGE PRESSURE RELIEF VALVE, ONE SIZE LESS THAN MAIN LINE (DJA-VAL MODEL 690-01) SET AT 5 psi GREATER THAN ⑭
⑪ MAIN LINE "TURBO" TYPE WATER METER
⑫ LIQUID FILLED PRESSURE GAUGE
⑬ BILCO MODEL J-3AL OR APPROVED EQUAL
⑭ PRE-CAST REINFORCED CONCRETE VAULT W/ 8" MIN. WALLS, TOP, AND BOTTOM

NOTES:
ALL FITTINGS SHALL BE FLANGED OR COMPRESSION TYPE

WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS

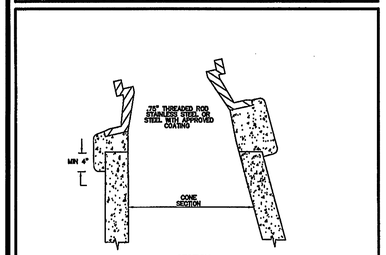
REVISION	DATE		
07/01/04		MAIN LINE PRESSURE REDUCING VALVE ASSEMBLY	W-14
03/01/06			

1. TO BE USED WHEN STANDARD VAULT CONSTRUCTION EXCEEDS MAXIMUM VERTICAL HEIGHT OF 5'.
2. BEDDING SHALL BE PLACED AS REQUIRED BY PIPE MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS.
3. IN ORDER TO LOCATE PVC WATER PIPE, 12 GAUGE SOLID COPPER WIRE SHALL BE LAID WITH PIPE (SEE DETAIL).



WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS

REVISION	DATE		
07/01/04		ALTERNATE VALVE VAULT (MANHOLE)	W-15
03/01/06			

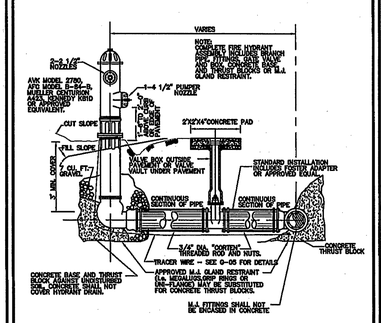


NOTE:
1. USE MODERATELY STIFF MIX OF NON-SHRINK CEMENT, SAND, AND 3/4" AND 1/2" AGGREGATE GRAVEL WITH 3/4" AGGREGATE PREDOMINANT.
2. MIX MUST BE WORKED INTO ALL CORNERS AND UNDER BOTTOM OF FRAME AND 1/2" AT OR ABOVE TOP OF FRAME.
3. MAY USE 4 BRICK OR CONCRETE BLOCKS TO BE USED FOR ADJUSTMENT.
4. DO NOT BACKFILL AROUND FRAME AND COVER, FOR 48 HOURS (IF NOT ENOUGH TIME, THE USE OF HIGHEST STRENGTH CONCRETE MIXES MIGHT BE ENTERTAINED).
5. RESTRICT TRAFFIC LOAD FOR MIN. 24 HOURS.

WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS

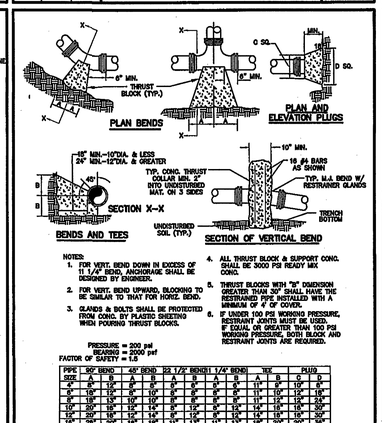
REVISION	DATE		
07/01/04		INSTALLATION DETAIL FOR ALL FRAMES AND COVERS	W-16
03/01/06			

NOTES:
1. PUBLIC HYDRANTS SHALL BE PAINTED SILVER WITH AN OIL-BASED PAINT AND PRIVATE HYDRANTS SHALL BE PAINTED RED WITH OIL-BASED PAINT.
2. FIRE HYDRANT SHALL BE INSTALLED 3' OR 4'-6" MIN. 4' MAX. FROM BACK OF CURB OR 5' MIN. AND 12' MAX. WHEN CURB IS NOT PRESENT. FIRE HYDRANT TO BE INSTALLED WITHIN 1'-0"-WAY OR EASEMENT LINE.
3. AREA AROUND HYDRANT AT A RADIUS OF 3' TO BE LEVEL AND UNOBSTRUCTED.
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		
07/01/04		MANHOLE FRAME AND COVER	W-17
03/01/06			



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 20" SHALL HAVE THE RESTRAINED PIPE INSTALLED WITH A MINIMUM OF 4' OF COVER.
6. IF UNDER 100 PSI WORKING PRESSURE, RESTRAINT JOINTS MUST BE USED. IF EQUAL OR GREATER THAN 100 PSI WORKING PRESSURE, BOTH BLOCK AND RESTRAINT JOINTS ARE REQUIRED.

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

PIPE SIZE	90° BEND A	90° BEND B	45° BEND A	45° BEND B	22 1/2° BEND A	22 1/2° BEND B	11 1/4° BEND A	11 1/4° BEND B	TEE A	TEE B	PLUG C	PLUG D
4"	8"	12"	6"	8"	5"	8"	5"	8"	8"	11"	10"	8"
6"	18"	12"	8"	10"	8"	8"	6"	8"	11"	15"	12"	18"
8"	18"	13"	10"	10"	8"	8"	6"	8"	11"	15"	12"	24"
10"	20"	18"	12"	14"	9"	12"	6"	12"	14"	18"	18"	30"
12"	20"	18"	12"	14"	9"	12"	6"	12"	14"	18"	18"	30"
16"	28"	20"	18"	18"	11"	13"	11"	13"	18"	20"	20"	36"
24"	42"	42"	22"	30"	14"	22"	14"	22"	22"	30"	30"	42"
30"	185"	42"	100"	42"	63"	42"	40"	30"	185"	42"	185"	42"

WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS

REVISION	DATE		
07/01/04		THRUST BLOCK CONSTRUCTION	W-19
03/01/06			

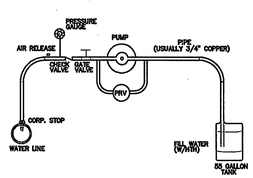
FACTOR OF SAFETY = 1.5

PIPE SIZE	PIPE MATL.	90° BEND	45° BEND	22 1/2° BEND	11 1/4° BEND	VALVE	TEE	REDUCER	VENT. 45°	VENT. 22 1/2°	VENT. 11 1/4°
6"	D.I.	28'	12'	6'	3'	38'	34'	20'	23'	11'	5'
8"	D.I.	37'	16'	7'	4'	51'	47'	21'	30'	15'	7'
10"	D.I.	46'	19'	9'	4'	61'	57'	23'	37'	18'	9'
12"	D.I.	52'	22'	11'	5'	72'	66'	38'	43'	21'	10'
8"	PVC	30'	12'	6'	3'	58'	35'	29'	35'	17'	8'
8"	PVC	40'	16'	8'	4'	74'	56'	31'	46'	22'	11'
10"	PVC	47'	20'	9'	5'	89'	62'	30'	56'	27'	13'
12"	PVC	56'	23'	11'	6'	106'	68'	58'	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.
3. IF UNDER 100 PSI WORKING PRESSURE, RESTRAINT JOINT(S) ARE TO BE USED. IF EQUAL TO OR OVER 100 PSI WORKING PRESSURE, BOTH THRUST BLOCK AND RESTRAINT JOINTS SHALL BE USED.

WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS

REVISION	DATE		
07/01/04		THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTHS	W-20
03/06/06			



TYPICAL WATER PRESSURE TEST RIG

WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS

REVISION	DATE		
07/01/04		TYPICAL WATER PRESSURE TEST RIG	W-21
03/01/06			

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WVWA Details (1 of 2)

Delaney Court
Waterline Extension
Western Virginia Water Authority

COMMONWEALTH OF VIRGINIA
RICHARD C. MURPHY
Lic. No. 041898
10/31/08
PROFESSIONAL ENGINEER

REVISED: 10/28/08

DESIGNED/CALC.: WVWA
CHECKED: RCM, WVWA
DRAWN: RWA
SCALE: N/A
DATE: 09/29/08

JOB NO. 2032.0

SHEET 9 OF 12

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