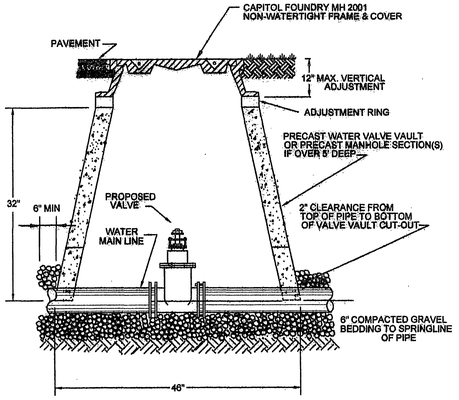
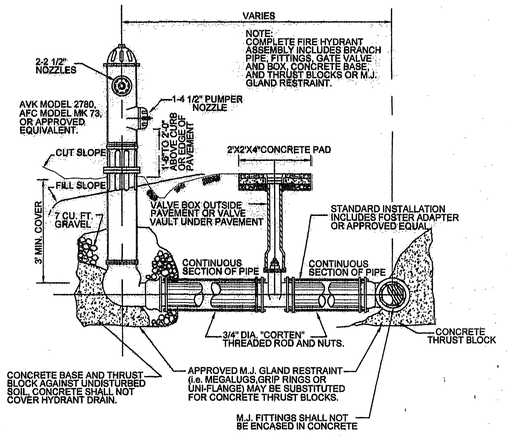


WATER LINE VALVE

INSTALLATION

NOT TO SCALE

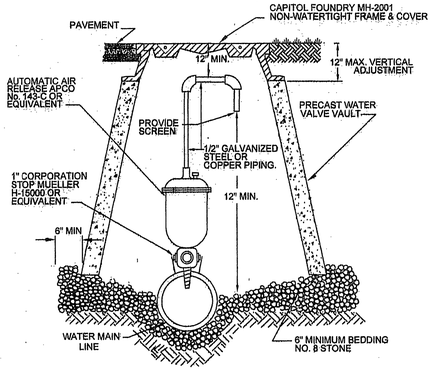
NOTES:
1. MAIN BODY OF HYDRANT MUST BE PAINTED SILVER WITH RED REFLECTIVE CAPS AND BONNET.
2. FIRE HYDRANT SHALL BE INSTALLED 2' MIN. AND 4' MAX. FROM BACK OF CURB OR 6' MIN. AND 12' MAX. WHEN CURB IS NOT PRESENT. FIRE HYDRANT TO BE INSTALLED WITHIN RIGHT-OF-WAY OR EASEMENT LINE.
3. AREA AROUND HYDRANT AT A RADIUS OF 4' TO BE LEVEL AND 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.



FIRE HYDRANT

ASSEMBLY

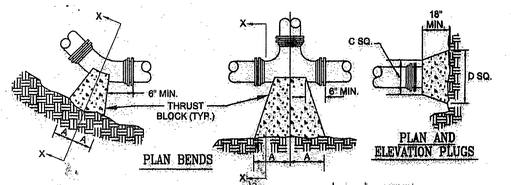
NOT TO SCALE



AUTOMATIC AIR

RELEASE ASSEMBLY

NOT TO SCALE



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.

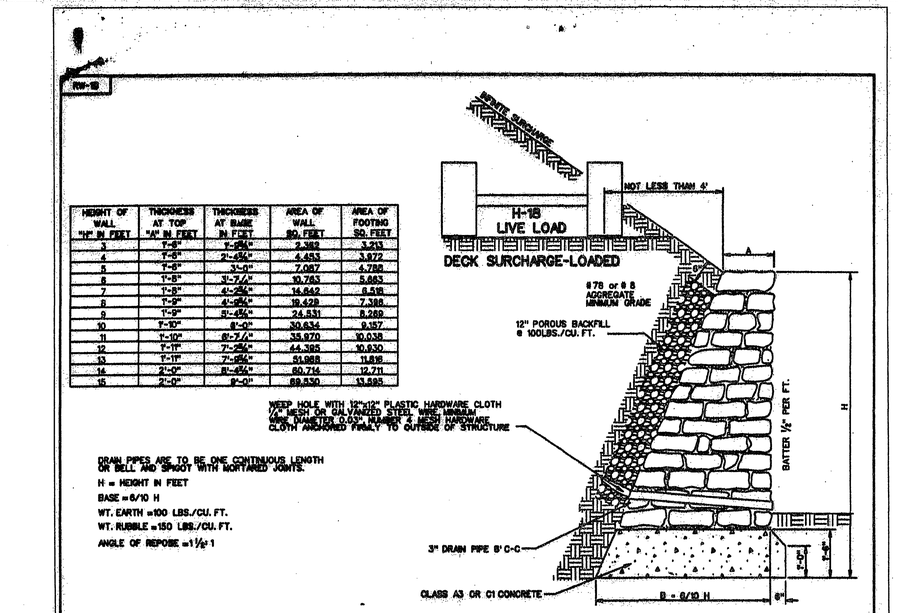
PRESSURE = 200 psi
BEARING = 2000 psf
FACTOR OF SAFETY = 1.5

PIPE SIZE	90° BEND 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"	5"	8"	6"	6"	6"	6"	11"	9"	10"	6"
6"	18"	12"	6"	10"	8"	8"	8"	8"	11"	10"	12"	18"
8"	16"	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"	6"	12"	14"	16"	16"	30"
16"	28"	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"

THRUST BLOCK

CONSTRUCTION

NOT TO SCALE



HEIGHT OF WALL "H" IN FEET	THICKNESS AT TOP "A" IN FEET	THICKNESS AT BASE IN FEET	AREA OF WALL SQ. FEET	AREA OF FOOTING SQ. FEET
3	1'-8"	1'-9½"	2.362	3.213
4	1'-8"	2'-2½"	4.451	3.972
5	1'-8"	3'-0"	7.087	4.788
6	1'-8"	3'-7½"	10.763	5.663
7	1'-8"	4'-2½"	14.642	6.518
8	1'-9"	4'-9½"	19.429	7.386
9	1'-9"	5'-4½"	24.631	8.269
10	1'-10"	6'-0"	30.634	9.157
11	1'-10"	6'-7½"	35.970	10.038
12	1'-11"	7'-2½"	44.385	10.930
13	1'-11"	7'-9½"	51.988	11.816
14	2'-0"	8'-4½"	60.714	12.711
15	2'-0"	9'-0"	69.330	13.595

DRAIN PIPES ARE TO BE ONE CONTINUOUS LENGTH OR BELL AND SPIGOT WITH MORTARED JOINTS.

H = HEIGHT IN FEET

BASE = 6/10 H

WT. EARTH = 100 LBS./CU. FT.

WT. RUBBLE = 150 LBS./CU. FT.

ANGLE OF REPOSE = 1½ : 1

NOTE:

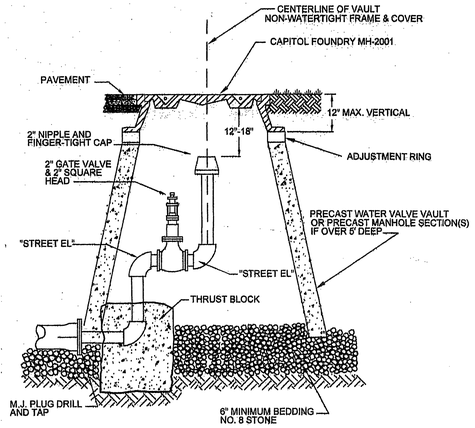
IF COMPRESSION AT TOE EXCEEDS SAFE BEARING CAPACITY OF SOIL, A SPECIAL FOOTING IS TO BE USED.

DEPTH OF WALL IN GROUND SHALL BE DETERMINED BY CONDITIONS. SHALL BE NOT LESS THAN 1'-0".

MORTAR RUBBLE RETAINING WALL
INFINITE SURCHARGE AND DECK SURCHARGE - LOADED

SPECIFICATION REFERENCE: 509

VIRGINIA DEPARTMENT OF TRANSPORTATION

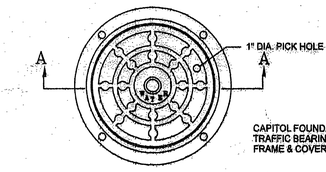


1. FIRE HYDRANT ASSMEBLIES MAY BE USED AS PERMANENT END OF LINES.
2. DETAIL FOR UP TO 8" MAINS, LARGER LINES SEE SEC. 101.10 FOR MIN. FLUSHING VALVE REQUIREMENTS.
3. THE END OF A PIPELINE SHALL NOT TERMINATE IN A PAVED AREA OR UNDER A CONCRETE VALLEY GUTTER.

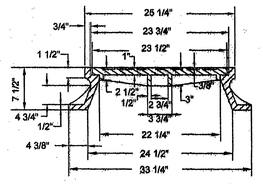
PERMANENT END

OF LINE

NOT TO SCALE



PLAN



MANHOLE FRAME

AND COVER

NOT TO SCALE

LUMSDEN ASSOCIATES, P.C.
ENGINEERS-SURVEYORS-PLANNERS
ROANOKE, VIRGINIA
4564 BRAMBLETON AVENUE
P.O. BOX 20569
ROANOKE, VIRGINIA 24018
PHONE: (540) 774-4411
FAX: (540) 772-4445
E-MAIL: MAIL@LUMSDENPC.COM

COMMONWEALTH OF VIRGINIA
2-28-06
B. LEE HENDERSON JR.
REG. 17581
PROFESSIONAL ENGINEER

WATER AND WALL DETAILS

WEST VILLAGE
PHASE II
PREPARED FOR
WEST VILLAGE, L.L.C.
CAVE SPRING MAGISTERIAL DISTRICT
ROANOKE COUNTY, VIRGINIA

REVISIONS

NO.	DATE	DESCRIPTION
1		
2		
3		
4		
5		

DATE: February 27, 2006
SCALE: NO SCALE
COMMISSION NO: 2004-230
SHEET 9 OF 12