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SHEET TITLE
**WESTERN VIRGINIA WATER AUTHORITY**
**DETAIL SHEET**

SHEET NO.

| DRAWN BY: | CHECK BY: |
|---|---|
| DLC | MDM |
| DATE | ISSUE |
| 03/21/07 | 01/20/10 |

MME PROJECT NUMBER
**2006-125**

| REVISION |
|---|
| 1 - PER COUNTY COMMENTS |
| 2 - 10/30/07 - PER VDOT AND PER COUNTY COMMENTS |
| 3 - 11/06/07 - PER COUNTY COMMENTS |
| 4 - 12/14/07 - PER VDOT COMMENTS |
| 5 - 11/20/09 - ADDED PHASE 1 AND PHASE 2 LINES TO PLAN |
| 6 - |
| |
| |
| |

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APPROVED

# SITE DEVELOPMENT PLAN FOR THE TOWNES AT HIDDEN VALLEY WINDSOR HILLS DISTRICT, ROANOKE COUNTY, VIRGINIA

COMMONWEALTH OF VIRGINIA
MICHAEL D. MOORE II
Lic. No. 042247
PROFESSIONAL ENGINEER
01/20/10

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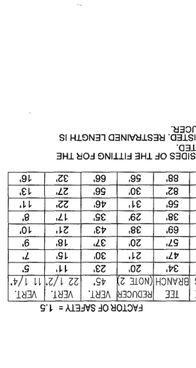
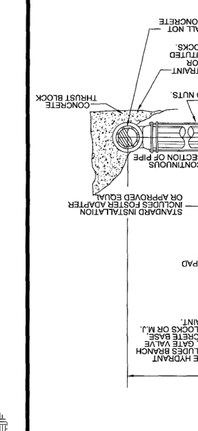
WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS — W–17 — MANHOLE FRAME AND COVER — REVISION DATE 02/05/08

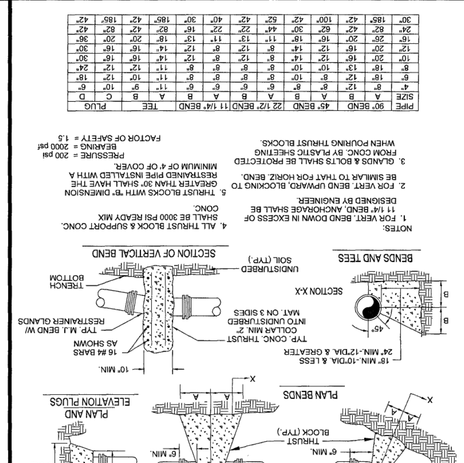



1. PIPE VELOCITIES MAY BE USED TO LOWER POINTS AT FLOW RATES LESS THAN DEMONSTRATED THAT A MINIMUM FLUSHING VELOCITY OF 4 FT/S IS PROVIDED.

WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS — W–18 — FIRE HYDRANT ASSEMBLY — REVISION DATE 02/05/08




WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS — W–19 — THRUST BLOCK CONSTRUCTION — REVISION DATE 02/05/08


NOTES:
1. FOR VERT. BEND DOWN & EXCESS OF 11 1/4" BEND, MECHANICAL RESTRAINT SHALL BE DESIGNED BY ENGINEER.
2. FOR HORZ. BEND UPWARD, BLOCKING TO BE SIMILAR TO THAT FOR HORIZ. BEND.
3. GLANDS & BOLTS SHALL BE PROTECTED FROM CONC. PLACEMENT BY SUITABLE MEANS.
4. ALL THRUST BLOCK & SUPPORT CONC. SHALL BE 3000 PSI READY MIX CONC.
5. THRUST BLOCKS WITH "P" DIMENSION RESTRAINED PIPE NOT CALCULATED WITH A MINIMUM OF 6' OF COVER.
6. THRUST BLOCKING SHALL NOT BE CONSIDERED TO BE EFFECTIVE UNTIL CONCRETE HAS CURED FOR 48 HOURS.
BENDS AND TEES
SECTION OF VERTICAL BEND
SECTION X-X
TYP. CONC. THRUST BLOCK
18" MIN. TOTAL & LESS 24" MIN. 1/2 DIA. OF PIPE
UNDISTURBED SOIL (TYP.)
TRENCH BOTTOM
PLAN BENDS
THRUST BLOCK (TYP.)
6" MIN.
PLAN AND ELEVATION PLUGS
D SQ.
C SQ.
MIN.
1/2"
PIPE SIZE | 90° BEND A | 45° BEND B | 22 1/2° BEND C | 11 1/4° BEND D | TEE A | TEE B | PLUG C
4" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0"
6" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0"
8" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0"
10" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0"
12" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0"
16" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0"
20" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0"
24" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0"
30" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0"
36" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0"
42" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0"

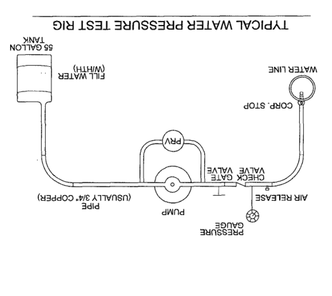
WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS — W–20 — THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTHS — REVISION DATE 02/05/08

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

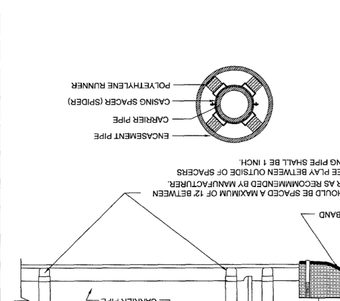
| | 12" | 16" | 20" | 24" | 30" | 36" | 42" | 48" |
|---|---|---|---|---|---|---|---|---|
| 12" | PVC | 66' | 22' | 11' | 6' | 10'6" | 6' | 6' |
| 10" | PVC | 47' | 20' | 9' | 5' | 8'9" | 6'2" | 5'3" |
| 8" | PVC | 60' | 15' | 8' | 4' | 7'4" | 5'6" | 4'8" |
| 6" | PVC | 30' | 12' | 6' | 3' | 5'6" | 3'8" | 3'2" |
| 12" | DI | 65' | 22' | 11' | 5' | 7'5" | 6'9" | 5'8" |
| 10" | DI | 65' | 15' | 9' | 4' | 6'1" | 5'7" | 4'8" |
| 6" | DI | 37' | 15' | 7' | 4' | 6'1" | 4'7" | 3'9" |
| SIZE | MATL | BEND | BEND | BEND | 7-1/2 | BRANCH | HOR. | 22 | 45 | 22 1/2° | 11 1/4° |
| PIPE | PIPE | 90° | 45° | 22 1/2° | 11 1/4° | VALVE | TEE | REDUCER | VERT. | VERT. | VERT. |
| 12" | DI | 6' | 3' | 3' | 1'-6" | 2'-0" | 2'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" |
| 10" | DI | 5' | 2'-6" | 2'-6" | 1'-6" | 2'-0" | 2'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" |
| 8" | DI | 4' | 2'-0" | 2'-0" | 1'-0" | 2'-0" | 2'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" |
| 6" | DI | 3' | 1'-6" | 1'-6" | 1'-0" | 2'-0" | 2'-0" | 1'-0" | 1'-0" | 1'-0" | 1'-0" |

FACTOR OF SAFETY = 1.5

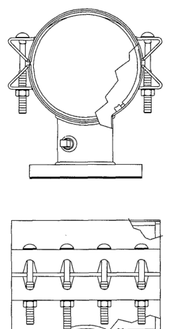
WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS — W–21 — TYPICAL WATER PRESSURE TEST RIG — REVISION DATE 02/05/08




WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS — W–22 — PIPE SUPPORT IN CASING PIPE — REVISION DATE 02/05/08




WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS — W–23 — TAPPING SLEEVE AND VALVE — REVISION DATE 02/05/08

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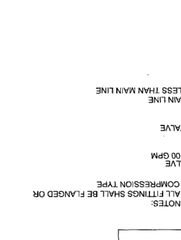
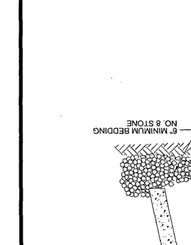
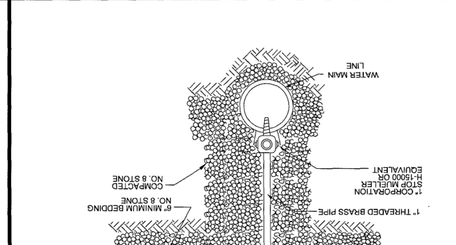
WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS — W–11 — IN-LINE BLOW-OFF ASSEMBLY — REVISION DATE 02/05/08



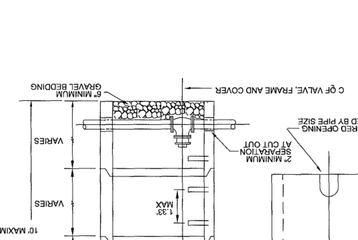

WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS — W–12 — AUTOMATIC AIR RELEASE ASSEMBLY — REVISION DATE 02/05/08



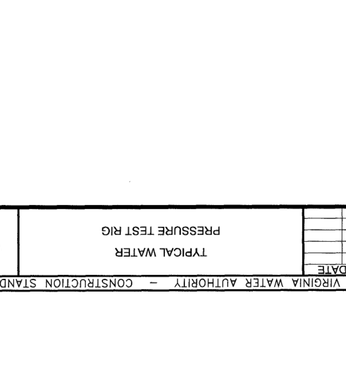

WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS — W–13 — AUTOMATIC AIR RELEASE ASSEMBLY FOR DEEP WATER LINES — REVISION DATE 02/05/08




WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS — W–14 — MAIN LINE PRESSURE REDUCING VALVE ASSEMBLY — REVISION DATE 02/05/08




WESTERN VIRGINIA WATER AUTHORITY – CONSTRUCTION STANDARDS — W–15 — ALTERNATE VALVE VAULT (MANHOLE) — REVISION DATE 02/05/08


NOTES:
1. USE MODIFIED 4' DIA MANHOLE WITH ECCENTRIC CONE FOR VALVES 16" AND LARGER.
2. ALL CONCRETE TO BE 3000 PSI.
3. MAXIMUM OF 4 GRADE RINGS ALLOWED.
4. CONCRETE SURFACE TO BE SMOOTH AND FREE OF HONEYCOMB.
5. MINIMUM 8" THICK CONCRETE BASE REQUIRED.
6. MANHOLE STEPS REQUIRED.
7. MANHOLE TO BE PRECAST CONCRETE.
8. RESTRAINT TRAPPING LOAD FOR MIN. 24 HOURS.
SECTION
CONE SECTION
MIN 6"
24" DIA. MANHOLE WITH STEEL CS STEPS AT 12" O.C. STAGGERED
CAST IRON I.D. LABELED "SEWER"
STANDARD WATER METER BOX
SERIES 1 RADIUS
1" BALL CHECK
1" BRASS BALL VALVE
2"x1" BRASS NIPPLE
1" COPPER TUBE
1" THREADED PACK JOINT
4" CONCRETE
HOME FORGE MARK
CHISEL OR MARK ON CURB IF NO PLANS
CURB
1" MINIMUM CLEARANCE
CONCRETE
CONCRETE
CONCRET