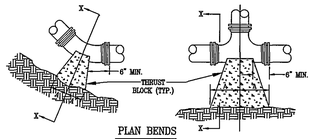
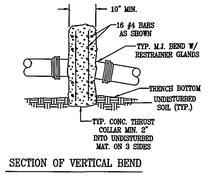
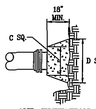


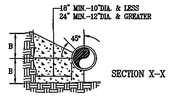
PLAN BENDS



SECTION OF VERTICAL BEND



PLAN AND ELEVATION PLUGS



BENDS AND TEES

NOTES:

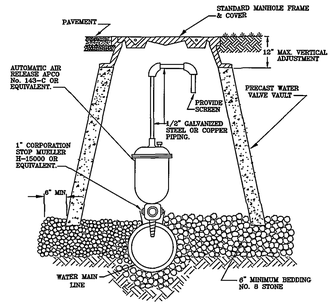
1. FOR VERT. BEND DOWN IN EXCESS OF 11 1/4° BEND, ANCHORAGE SHALL BE DESIGNED BY ENGINEER.
2. FOR VERT. BEND UPWARD, BLOCKING TO BE SIMILAR TO THAT FOR HORIZ. BEND.
3. GLANDS & BOLTS SHALL BE PROTECTED FROM CONC. BY PLASTIC SHEETING WHEN POURING THRUST BLOCKS.
4. ALL THRUST BLOCK & SUPPORT CONC. SHALL 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

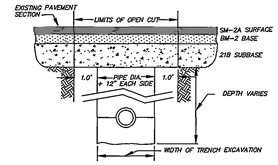
PIPE	90° BEND		45° BEND		22 1/2° BEND		11 1/4° BEND		TEE		PLUG	
SIZE	A	B	A	B	A	B	A	B	A	B	C	D
4"	8"	12"	8"	8"	6"	6"	6"	6"	11"	9"	10"	6"
6"	18"	12"	8"	10"	8"	8"	8"	8"	11"	10"	12"	18"
8"	18"	13"	10"	10"	8"	8"	8"	8"	11"	12"	12"	24"
10"	20"	16"	12"	14"	8"	12"	8"	12"	14"	16"	16"	30"
12"	20"	16"	12"	14"	8"	12"	8"	12"	14"	16"	16"	30"
16"	26"	20"	16"	18"	11"	13"	11"	13"	18"	20"	20"	36"
24"	82"	42"	63"	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

NO SCALE



AUTOMATIC AIR RELEASE ASSEMBLY



ALL CONSTRUCTION WITHIN THE PUBLIC RIGHT-OF-WAY SHALL BE AS SPECIFIED OR AS REQUIRED BY THE CITY.

ALL SAW-CUTS WITHIN THE RIGHT OF WAY SHALL BE NEAT, UNIFORM LINES PRIOR TO EXCAVATION. AFTER UTILITY INSTALLATION AND TRENCH BACKFILL, THE PAVEMENT EDGES SHALL BE RE-CUT IN STRAIGHT LINES TO 12" BEYOND ANY UNDERMINED AREA. THE SHAPE OF THE REPAIR SHALL BE RECTANGULAR.

BACKFILL FOR UTILITY TRENCHING IN THE RIGHT OF WAY SHALL BE VDOT 21A PLACED IN 8" LOOSE LIFTS COMPACTED TO 95% ASTM D698 @ ± 20% OPTIMUM MOISTURE CONTENT. AS AN ALTERNATIVE, VDOT SPECIFIED FLOWABLE FILL (300 PSI @ 28 DAYS) MAY BE USED.

ALL EXPOSED EDGES OF EXISTING BITUMINOUS SURFACE COURSE SHALL BE SATURATED WITH MATERIAL SUBMITTED TO THE INSPECTOR BEFORE THE BITUMINOUS MIXTURES ARE REPLACED. EDGES OF TRENCH SHALL BE RE-CUT AS DIRECTED ABOVE PRIOR TO PAVING.

THE CONTRACTOR SHALL REPLACE THE OPEN CUT WITH A MINIMUM TOP COURSE, 2" VDOT GM-2A, BASE COURSE, 3" VDOT GM-2, AND SUBBASE, 8" VDOT 21B. NO EXCAVATION UNDER THE EXISTING PAVEMENT WILL BE PERMITTED. SHEETING OR SHORING SHALL BE USED WHEN REQUIRED BY THE DEPTH OF THE TRENCH OR TYPE OF MATERIAL IN ACCORDANCE WITH VIRGINIA O.S.H.A. STANDARDS.

PAVEMENT REPLACEMENT
RIGHT OF WAY OPEN-CUT

VAULT & WATER STANDARDS FOR CONSTRUCTION

1. VAULTS, MANHOLE BASES, RISERS, TAPERS AND GRADE RINGS SHALL BE PRECAST REINFORCED CONCRETE MANUFACTURED IN ACCORDANCE WITH VIRGINIA DEPARTMENT OF TRANSPORTATION ROAD AND BRIDGE SPECIFICATIONS, SECTION 503.
2. MANHOLE BASE AND RISER SECTIONS CONSTRUCTION SHALL BE VERTICAL WITH MAXIMUM 1" IN 4' TILT.
3. A MAXIMUM OF 2 CONSTRUCTION GRADE RINGS OR MAXIMUM OF 1' OF GRADE RINGS AND FRAME AND COVER ADJUSTMENT ARE ALLOWABLE.
4. FINAL ADJUSTMENT OF FRAME AND COVER SHALL BE IN ACCORDANCE TO FRAME AND COVER ADJUSTMENT DETAIL USING NON SHRINK CONCRETE WITH MAXIMUM OF 4 BRICKS OR CONCRETE BLOCKS FOR GRADE CONTROL. FRAME AND COVER ARE TO BE SET AT FINISH GRADE OR 1/4" ABOVE FINISH GRADE IN PAVEMENT AND YARD AREAS AND MINIMUM 6" ABOVE FINISH GRADE IN OTHER AREAS. MANHOLE FRAMES AND COVERS ARE NOT TO BE SET IN DRAINAGE SWALE, VALLEY GUTTER, ETC.
5. JOINTS AND OPENINGS IN MANHOLE UNITS SHALL BE MADE WATERTIGHT BY USING BUTYL SEALANTS, "O" RING GASKETS OR MASTIC. THE CONCRETE SURFACE SHALL BE CLEANED PRIOR TO USE OF SEALANT.
6. FRAME AND COVERS
   A) DEWEY BROTHERS INC. SERIES 2000 OR 2001.
   B) APPROVED EQUAL.
7. ALL LIFT HOLES, OPENINGS AROUND PIPE, ETC. SHALL BE FILLED FROM INSIDE AND OUTSIDE TO THICKNESS OF STRUCTURE.
8. ALL UNITS USED IN MANHOLE AND VAULT CONSTRUCTION SHALL BE SECURELY CONNECTED BY INTERLOCKING BETWEEN UNITS, CONCRETE COLLARS OR OTHER APPROVED METHODS.
9. AREA AROUND METER BOX AT A RADIUS OF 4' TO BE ON FINISH GRADE AND UNOBSTRUCTED.

APPROVED MATERIALS

1. METER BOXES
   A) FORD IRONCRETE METER BOX WITH NO. 2 IRONCRETE TOP OR APPROVED EQUAL.
   B) SOUTHEASTERN DISTRIBUTOR MODEL MB-5 PLASTIC BOX WITH FORD OR CHARLOTTE MODEL C-32 CAST IRON BASE AND COVER (NOT APPROVED FOR ROADWAY AREA).
   C) APPROVED EQUAL.
2. METER SETTER (INCLUDING INLET RISER VALVE AND DOUBLE CHECK VALVE ON OUTLET).
   A) FORD VBHL 72-15-WD.
   B) APPROVED EQUAL.
3. METER SETTER EXTENDER OR RISER
   A) NOT ALLOWED UNLESS APPROVED BY THE UTILITY DIRECTOR.
4. CORPORATION STOP
   A) MUELLER MODEL H-1500
   B) FORD MODEL F-600
   C) APPROVED EQUAL.
5. U-BRANCH
   A) FORD MODEL U28-43
   B) MUELLER MODEL H 15362
   C) APPROVED EQUAL
6. SERVICE SADDLES (FOR PVC PIPE)
   A) FORD MODEL FS 202 AND FC 202 WITH STAINLESS STEEL BAND AND BOLTS.
   B) APPROVED EQUAL.

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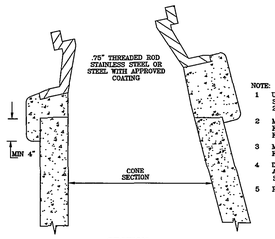
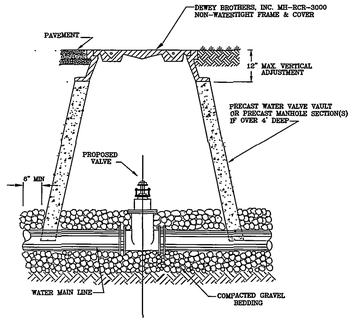


SECTION

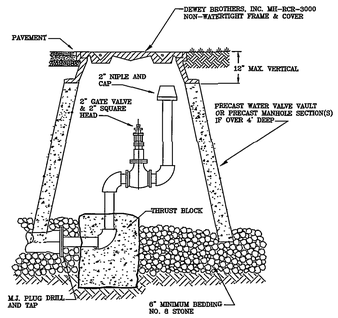
NOTE:

1. USE MODERATELY STIF MIX OF NON SHRINK CEMENT, SAND AND 1/2" AND LESS DIAMETER GRAVEL WITH 28 DAYS, STRENGTH AT 3,000 P.S.I.
2. MIX IS TO BE FORCED INTO ALL GROOVES AND UNDER FLANGE OF FRAME AND LEFT AT OR ABOVE TOP OF 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 HIGHEARLY STRENGTH CONCRETE WOULD REDUCE TIME TO (24HRS).
5. RESTRICT TRAFFIC LOAD FOR MIN. 24 HOURS.

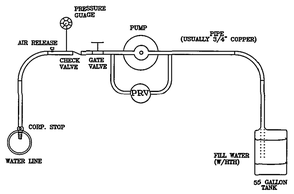
INSTALLATION DETAIL
FOR ALL FRAMES AND COVERS



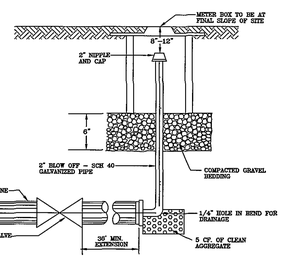
WATER LINE VALVE
INSTALLATION



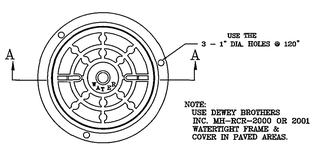
PERMANENT END OF LINE



TYPICAL WATER PRESSURE TEST RIG

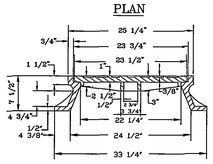


BLOW OFF ASSEMBLY FOR MAIN LINE
TEMPORARY TERMINATION



NOTE:
USE DEWEY BROTHERS INC. MH-RCR-2000 OR 2001 WATERTIGHT FRAME & COVER IN PAVED AREAS.

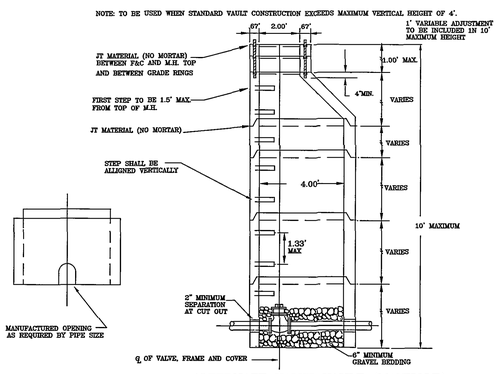
PLAN



SECTION A-A

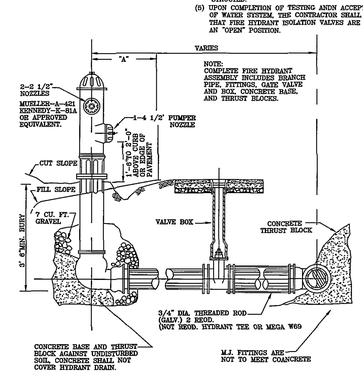
MANHOLE FRAME AND COVER
PAVED 2001EC
UNPAVED 2301(ABOVE)

NOTE: TO BE USED WHEN STANDARD VAULT CONSTRUCTION EXCEEDS MAXIMUM VERTICAL HEIGHT OF 4'.

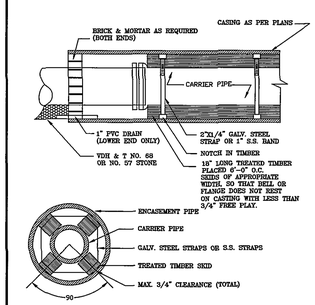


ALTERNATE VALVE VAULT (MANHOLE)

NOTES:
(1) MAIN BODY OF HYDRANT MUST BE SILVER AND HAVE RED CAPS AND BONNET.
(2) DISTANCE "A" WITH CURB AND GUTTER. 2' MIN., 4' MAX. FROM BACK OF CURB.
(3) DISTANCE "A" WITHOUT CURB AND GUTTER. 6' MIN., 12' MAX. FROM EDGE OF PAVEMENT.
(4) AREA AROUND HYDRANT AT A RADIUS OF 4' TO BE APPROXIMATELY LEVEL AND UNOBSTRUCTED.
(5) UPON COMPLETION OF TESTING AND ACCEPTANCE OF WATER SYSTEM, THE CONTRACTOR SHALL INSURE THAT FIRE HYDRANT ISOLATION VALVES ARE LEFT IN AN "OPEN" POSITION.



FIRE HYDRANT ASSEMBLY



FOR DUCTILE IRON PIPE, SOAP-BASED LUBRICANT MAY BE USED TO EASE SLIDING OF SKID. FOR PVC PIPE, FLAX SOAP OR DRILLING MUD SHOULD BE UTILIZED FOR LUBRICATION.

PIPE SUPPORT IN CASING PIPE

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CALDWELL WHITE ASSOCIATES
ENGINEERS / SURVEYORS / PLANNERS
4203 MELROSE AVENUE
P.O. BOX 6260
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PATRICK HENRY HIGH SCHOOL

PHASE I
School Site Project No. 124-39A
Literary Loan No. 11187

NUMBER	ISSUE	DATE
	ISSUED FOR CONSTRUCTION	04/02/04

Revisions

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COMMONWEALTH OF VIRGINIA
CORBIN L. WHITE
No. 23843
04/02/04
PROFESSIONAL ENGINEER

Sheet Information	
Date	04/02/04
Job Number	800200.000
Scale	As Shown
Drawn	C.L. White
Checked	
Approved	

Title

DETAILS-WATERLINE CONSTRUCTION

Sheet

C1-402

WWWA ID# 78HGUA