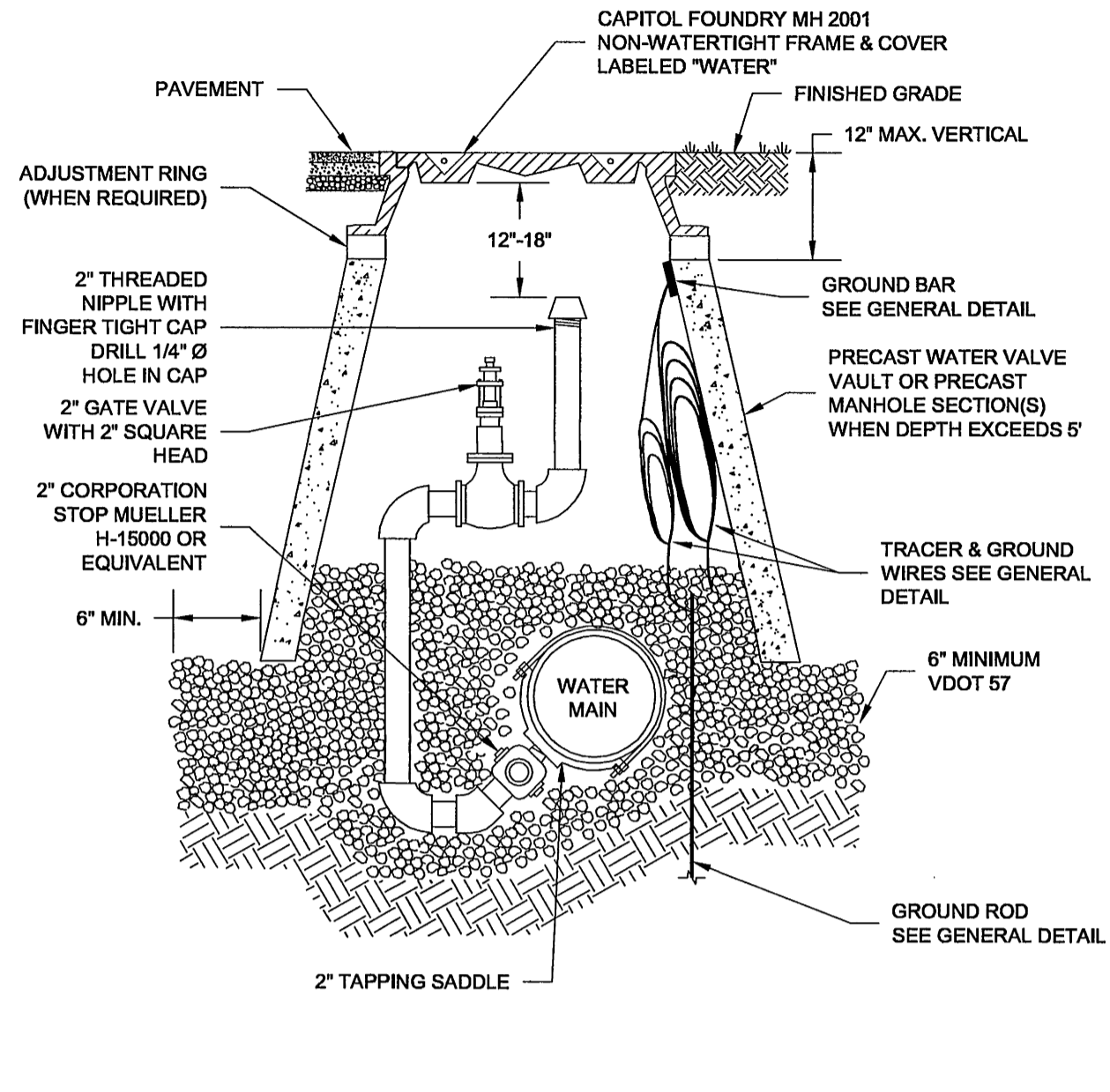## W-12 — IN-LINE BLOW-OFF ASSEMBLY

1. FIRE HYDRANTS MAY BE USED AT LOW POINTS IN PLACE OF BLOW-OFFS.
2. LINE AND "STREET ELL" BETWEEN CORPORATION STOP AND 2" GATE VALVE SHALL BE LEAD FREE BRASS.
3. THE POINT OF CONNECTION TO THE WATER MAIN SHALL BE LOCATED NEAR THE BOTTOM OF THE MAIN (AS SHOWN) TO FACILITATE REMOVAL OF ACCUMULATED SEDIMENT.
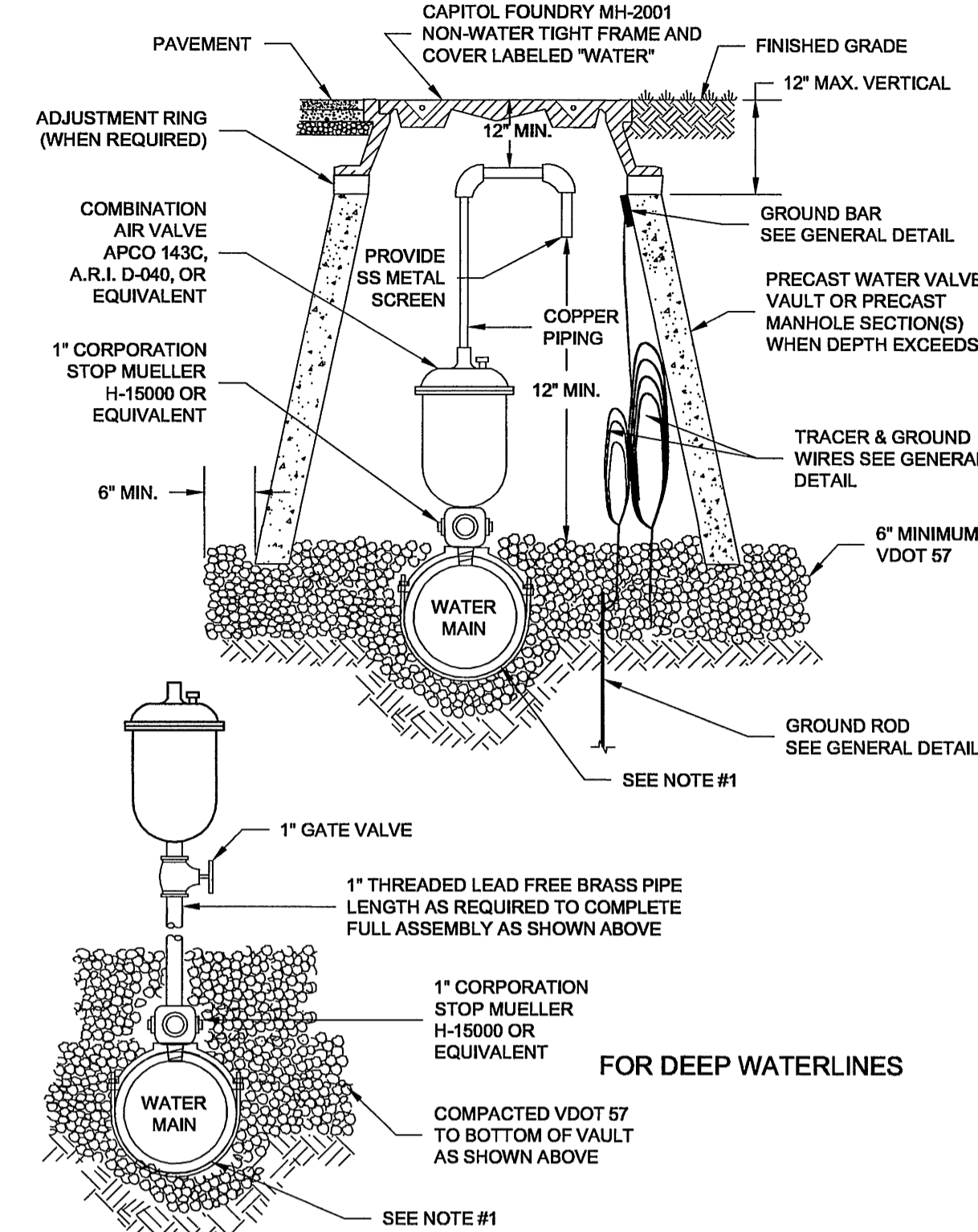4. SADDLES FOR PLASTIC PIPE SHALL BE PER RESIDENTIAL WATER SERVICE DETAIL.

Labels: CAPITOL FOUNDRY MH 2001 NON-WATERTIGHT FRAME & COVER LABELED "WATER"; PAVEMENT; ADJUSTMENT RING (WHEN REQUIRED); FINISHED GRADE; 12" MAX. VERTICAL; 12"-18"; 2" THREADED NIPPLE WITH FINGER TIGHT CAP, DRILL 1/4" Ø HOLE IN CAP; GROUND BAR SEE GENERAL DETAIL; 2" GATE VALVE WITH 2" SQUARE HEAD; PRECAST WATER VALVE VAULT OR PRECAST MANHOLE SECTION(S) WHEN DEPTH EXCEEDS 5'; 2" CORPORATION STOP MUELLER H-15000 OR EQUIVALENT; TRACER & GROUND WIRES SEE GENERAL DETAIL; 6" MIN.; 6" MINIMUM VDOT 57; WATER MAIN; GROUND ROD SEE GENERAL DETAIL; 2" TAPPING SADDLE

W-13 — COMBINATION AIR VALVE ASSEMBLY

1. SEE RESIDENTIAL WATER SERVICE DETAIL FOR SADDLE REQUIREMENTS.
2. LARGER COMBINATION VALVE MAY BE REQUIRED DEPENDING ON APPLICATION.

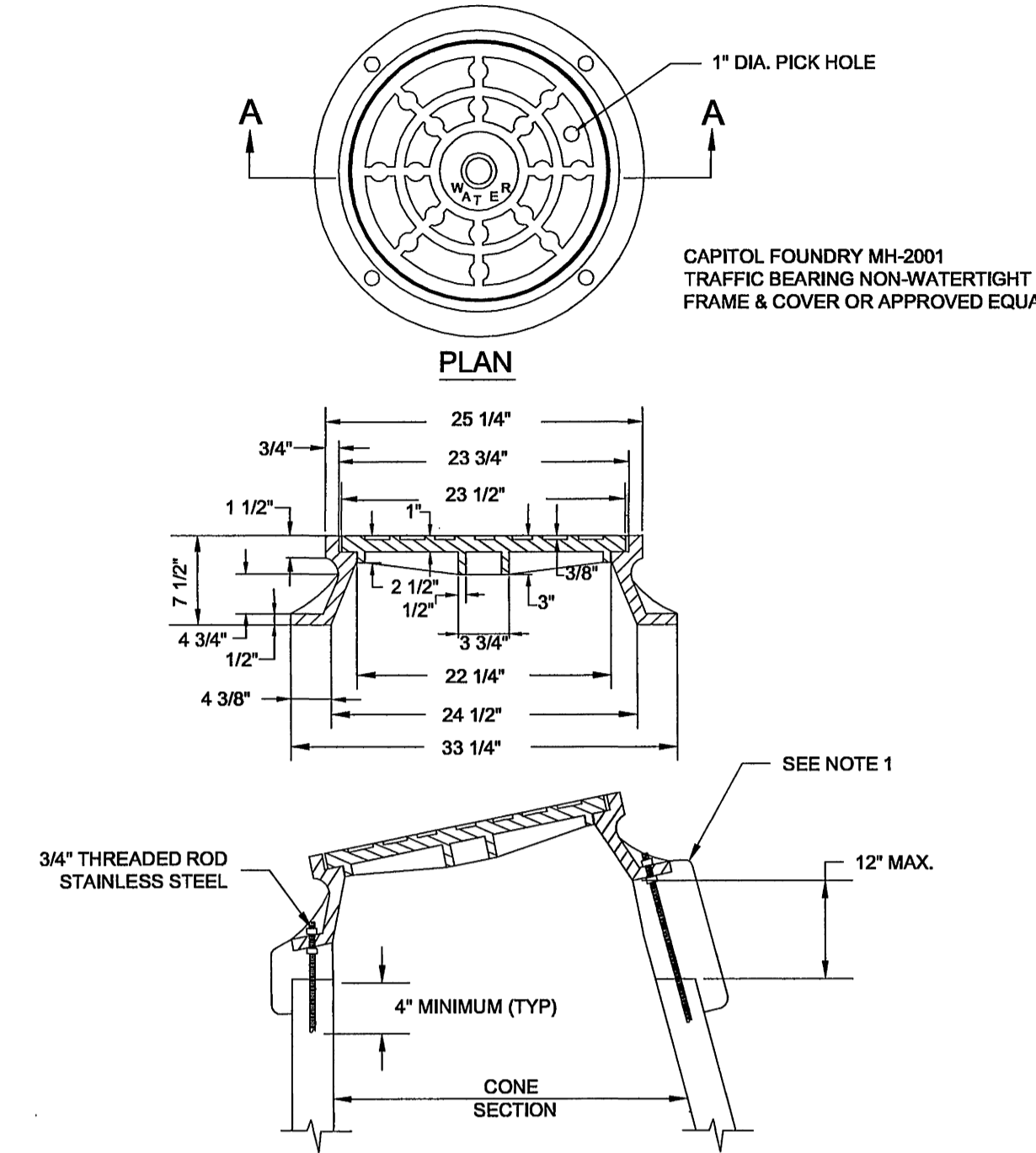Labels: PAVEMENT; CAPITOL FOUNDRY MH-2001 NON-WATER TIGHT FRAME AND COVER LABELED "WATER"; FINISHED GRADE; 12" MAX. VERTICAL; 12" MIN.; ADJUSTMENT RING (WHEN REQUIRED); COMBINATION AIR VALVE APCO 143C, A.R.I. D-040, OR EQUIVALENT; PROVIDE SS METAL SCREEN; GROUND BAR SEE GENERAL DETAIL; 1" CORPORATION STOP MUELLER H-15000 OR EQUIVALENT; COPPER PIPING; 12" MIN.; PRECAST WATER VALVE VAULT OR PRECAST MANHOLE SECTION(S) WHEN DEPTH EXCEEDS 5'; 6" MIN.; TRACER & GROUND WIRES SEE GENERAL DETAIL; WATER MAIN; GROUND ROD SEE GENERAL DETAIL; SEE NOTE #1; 1" GATE VALVE; 1" THREADED LEAD FREE BRASS PIPE LENGTH AS REQUIRED TO COMPLETE FULL ASSEMBLY AS SHOWN ABOVE; 1" CORPORATION STOP MUELLER H-15000 OR EQUIVALENT; **FOR DEEP WATERLINES**; COMPACTED VDOT 57 TO BOTTOM OF VAULT AS SHOWN ABOVE; SEE NOTE #1; WATER MAIN

W-16 — VAULT FRAME AND COVER

1. USE MODERATELY STIFF MIX OF NON SHRINK GROUT, SAND, AND 1/2" AND LESS DIAMETER GRAVEL WITH 28 DAYS, STRENGTH AT MINIMUM 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. DO NOT BACKFILL AROUND FRAME AND COVER, FOR 48 HOURS AFTER CONCRETE IS PLACED. THE USE OF HIGH EARLY STRENGTH CEMENT WOULD REDUCE TIME TO (24 HRS.)
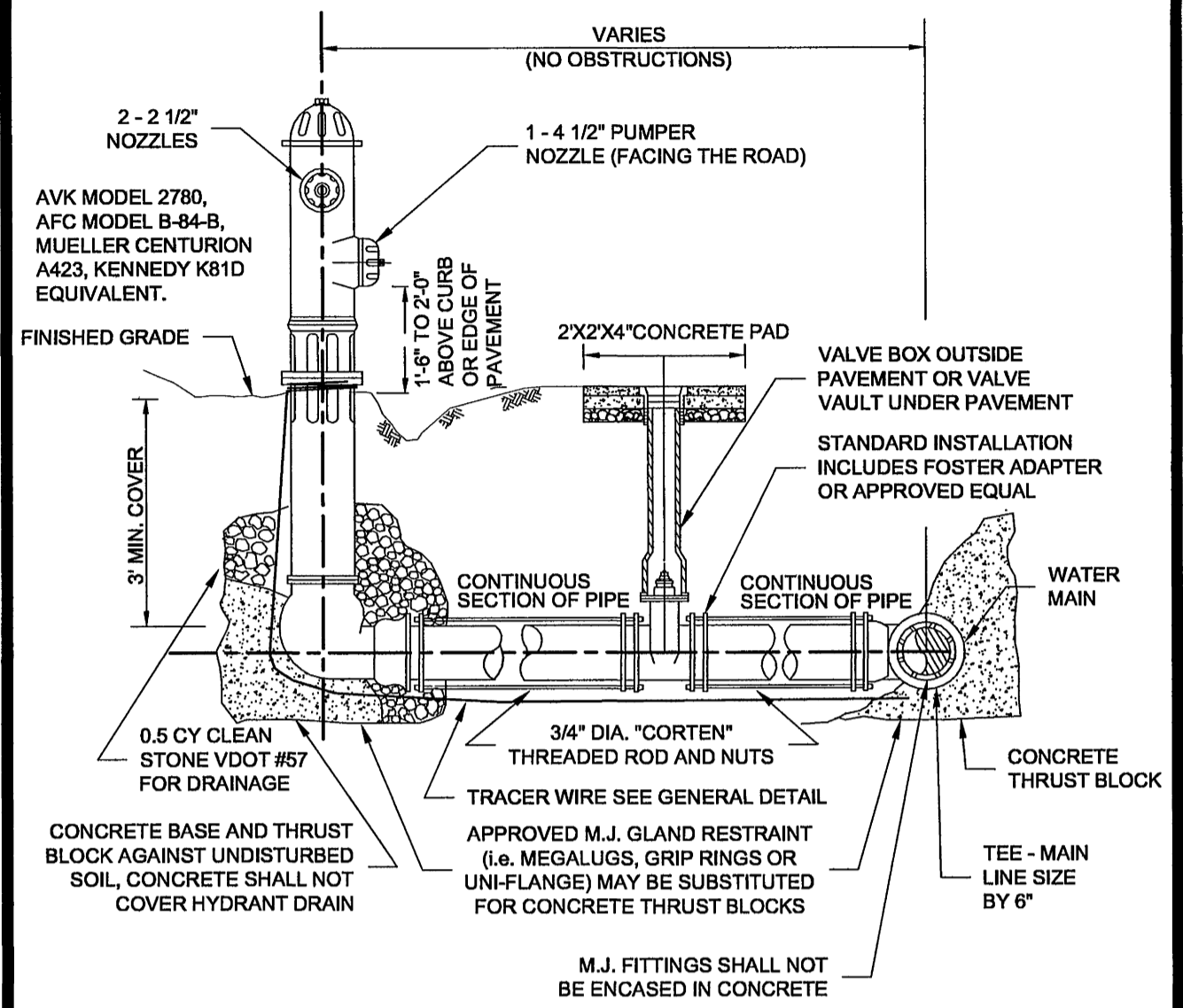4. RESTRICT TRAFFIC LOAD FOR A MINIMUM OF 24 HOURS.

Labels: A—A SECTION; 1" DIA. PICK HOLE; CAPITOL FOUNDRY MH-2001 TRAFFIC BEARING NON-WATERTIGHT FRAME & COVER OR APPROVED EQUAL; PLAN; 25 1/4"; 23 3/4"; 23 1/2"; 1 1/2"; 22 1/4"; 24 1/2"; 33 1/4"; 7 1/2"; 4 3/4"; 4 3/8"; 2 1/2"; 3 3/4"; 3"; 3/8"; 3/4" THREADED ROD STAINLESS STEEL; 12" MAX.; 4" MINIMUM (TYP); CONE SECTION; SEE NOTE 1

W-17 — FIRE HYDRANT ASSEMBLY

1. PUBLIC HYDRANTS SHALL BE PAINTED SILVER WITH AN OIL-BASED PAINT AND PRIVATE HYDRANTS SHALL BE PAINTED WHITE WITH AN OIL-BASED PAINT.
2. FIRE HYDRANT SHALL BE INSTALLED 2' MIN. AND 4' MAX. FROM BACK OF CURB OR 6' MIN. AND 12' MAX. FROM EDGE OF PAVEMENT 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 OR OUT OF SERVICE RINGS SHALL BE PLACED OVER ALL NEWLY INSTALLED FIRE HYDRANTS.
5. HIGH PRESSURE (OVER 120 PSI) REQUIRES THE USE OF ALL 3 RESTRAINTS.
6. IF DURING CONSTRUCTION THE SEASONAL WATER LEVEL IS NOTED TO BE ABOVE THE DRAIN OUTLETS OF THE PROPOSED HYDRANT. THE PARTICIPATING UTILITY WILL BE NOTIFIED IMMEDIATELY SO THAT THE HYDRANT CAN BE RELOCATED TO A SUITABLE LOCATION, OR THE DRAIN HOLE PLUGGED.
7. TWO WRAPS OF TRACER WIRE SHALL BE WRAPPED AROUND BASE OF HYDRANT.
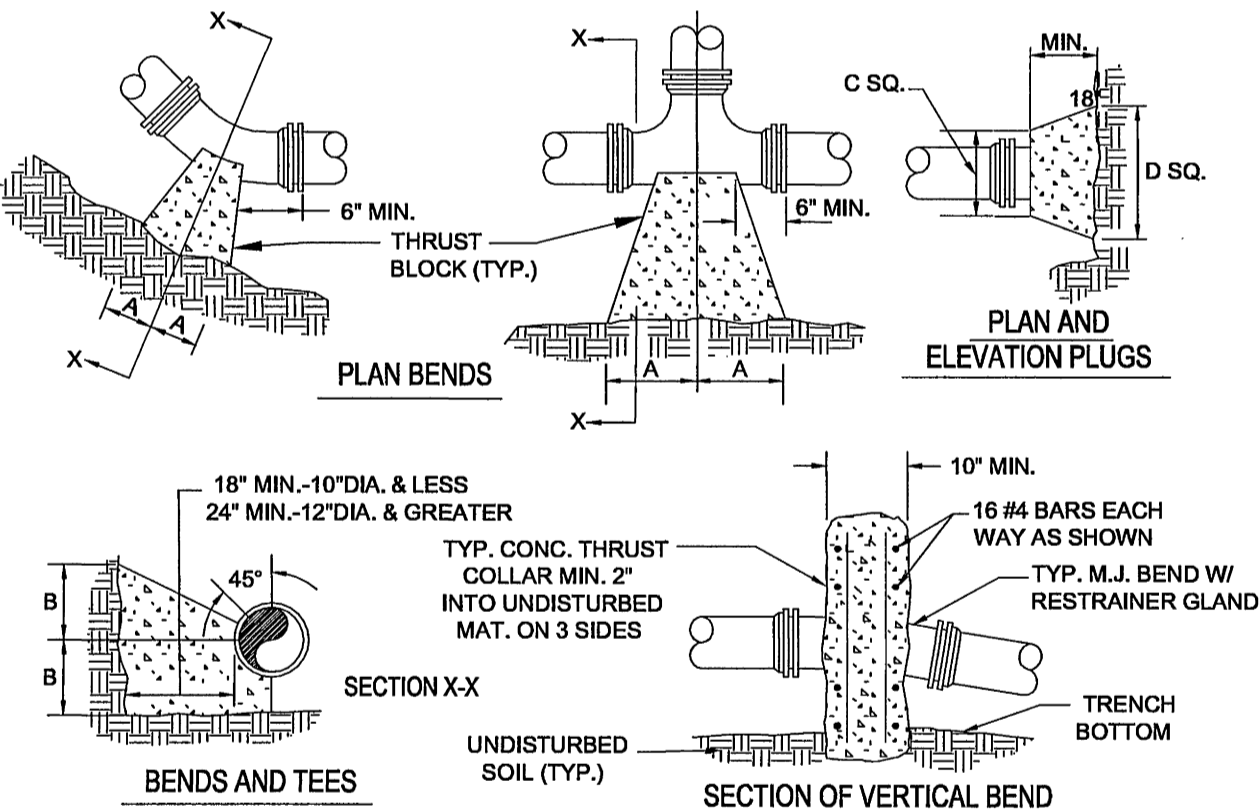8. APPROVED MODELS - AVK MODEL 2780, AFC MODEL B-84-B-5, MUELLER CENTURION A423, KENNEDY K81D EQUIVALENT.

Labels: VARIES (NO OBSTRUCTIONS); 2 - 2 1/2" NOZZLES; 1 - 4 1/2" PUMPER NOZZLE (FACING THE ROAD); AVK MODEL 2780, AFC MODEL B-84-B, MUELLER CENTURION A423, KENNEDY K81D EQUIVALENT; FINISHED GRADE; 3' MIN. COVER; 2X2'X4"CONCRETE PAD; VALVE BOX OUTSIDE PAVEMENT OR VALVE VAULT UNDER PAVEMENT; STANDARD INSTALLATION INCLUDES FOSTER ADAPTER OR APPROVED EQUAL; WATER MAIN; 3/4" DIA. "CORTEN" THREADED ROD AND NUTS; TRACER WIRE SEE GENERAL DETAIL; CONCRETE THRUST BLOCK; 0.5 CY CLEAN STONE VDOT #57 FOR DRAINAGE; APPROVED M.J. GLAND RESTRAINT (i.e. MEGALUGS, GRIP RINGS OR UNI-FLANGE) MAY BE SUBSTITUTED FOR CONCRETE THRUST BLOCKS; TEE - MAIN LINE SIZE BY 6"; CONCRETE BASE AND THRUST BLOCK AGAINST UNDISTURBED SOIL, CONCRETE SHALL NOT COVER HYDRANT DRAIN; M.J. FITTINGS SHALL NOT BE ENCASED IN CONCRETE

W-18 — THRUST BLOCK REQUIREMENTS

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. WITH 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.
6. IF UNDER 100 PSI WORKING PRESSURE, RESTRAINED JOINTS MUST BE USED. IF EQUAL OR GREATER THAN 100 PSI BOTH BLOCK AND RESTRAINED JOINTS ARE REQUIRED.

PRESSURE = 200psi
BEARING = 2000psf
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"	8"	8"	6"	6"	6"	6"	11"	9"	10"	6"
6"	18"	12"	8"	10"	8"	8"	6"	8"	11"	10"	12"	10"
8"	18"	13"	10"	10"	8"	8"	8"	8"	11"	12"	12"	24"
10"	20"	16"	12"	14"	8"	12"	8"	12"	14"	14"	16"	30"
12"	22"	20"	16"	12"	12"	12"	8"	12"	12"	16"	16"	30"
16"	26"	20"	16"	18"	11"	13"	11"	13"	18"	20"	20"	36"
24"	82"	42"	62"	30"	44"	22"	22"	42"	82"	42"	82"	42"
30"	185"	42"	100"	42"	52"	42"	40"	30"	185"	42"	185"	42"

Labels: THRUST BLOCK (TYP.); PLAN BENDS; PLAN AND ELEVATION PLUGS; 18" MIN. -10"DIA. & LESS, 24" MIN. -12"DIA. & GREATER; TYP. CONC. THRUST COLLAR MIN. 2" INTO UNDISTURBED MAT. ON 3 SIDES; TYP. M.J. BEND W/ RESTRAINER GLANDS; 16 #4 BARS EACH WAY AS SHOWN; 10" MIN.; 45°; SECTION X-X; UNDISTURBED SOIL (TYP.); SECTION OF VERTICAL BEND; TRENCH BOTTOM

W-19 — THRUST RESTRAINT OF PIPE JOINTS DESIGN LENGTHS

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'	50'	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.
3. IF UNDER 100 PSI WORKING PRESSURE, RESTRAINED JOINT(S) ARE TO BE USED. IF EQUAL TO OR OVER 100 PSI WORKING PRESSURE, BOTH THRUST BLOCK AND RESTRAINED JOINTS SHALL BE USED.

W-22 — DUCTILE IRON PIPE DEFLECTION ALLOWANCE TABLES

INSTALLATION OF DUCTILE IRON WATER MAINS TABLE 3 AWWA C600-05 — Maximum Joint Deflection Full Length of Pipe - Push on Type Joint

Nominal Pipe Size (inches)	Deflection Angle - θ (degree)	Maximum Offset - S" Joint Length 18-Feet	Maximum Offset - S" Joint Length 20-Feet	Radius of Curve - R" Joint Length 18-Feet	Radius of Curve - R" Joint Length 20-Feet
3	5°	19	21	205	230
4	5°	19	21	205	230
6	5°	19	21	205	230
8	5°	19	21	205	230
10	5°	19	21	205	230
12	5°	19	21	205	230
14	3°	11	12	340	380
16	3°	11	12	340	380
18	3°	11	12	340	380
20	3°	11	12	340	380
24	3°	11	12	340	380
30	3°	11	12	340	380

* SEE FIGURE 4.
For 14-inch and larger push-on joints, maximum deflection angle may be larger than shown above. Consult the manufacturer.

INSTALLATION OF DUCTILE IRON WATER MAINS TABLE 4 AWWA C600-05 — Maximum Joint Deflection Full Length of Pipe - Mechanical Joint Pipe

Nominal Pipe Size (inches)	Deflection Angle - θ (degree)	Maximum Offset - S" Joint Length 18-Feet	Maximum Offset - S" Joint Length 20-Feet	Radius of Curve - R" Joint Length 18-Feet	Radius of Curve - R" Joint Length 20-Feet
3	8°-18'	31	35	125	140
4	8°-18'	31	35	125	140
6	7°-07'	27	30	145	160
8	5°-21'	20	22	195	220
10	5°-21'	20	22	195	220
12	5°-21'	20	22	195	220
14	3°-35'	13.5	15	285	320
16	3°-35'	13.5	15	285	320
18	3°-00'	11	12	340	380
20	3°-00'	11	12	340	380
24	2°-23'	9	10	450	500

* SEE FIGURE 4.

FIGURE 4
θ = DEFLECTION ANGLE
S = JOINT DEFLECTION OFFSET
L = LAYING LENGTH
R = RADIUS OF CURVE
R = L/(2tan θ/2)

SAMPLE TAP INSTALLATION

Labels: ENCLOSED SAMPLE TAP UNIT SIMILAR TO GIL EH101 WATER SAMPLING STATION; CUT-OFF VALVE IN METER BOX; EXISTING OR PROPOSED FINISHED GRADE; 36" MIN.; 45°; WATER MAIN; CORP STOP; TAP DIRECT OR USE TAPPED SLEEVE; SERVICE LINE PER SPEC.; BRICKS AND MORTAR AS REQUIRED; 1 CU. FT. ASTM D448 NO. 68 STONE; 5 FEET MIN.; 36" MIN.; 4"

DATE : 07 JUN 13
DESIGNED : CSF
DRAWN : SEC
CHECKED : MGG
QA/QC : CSF
REV. # COMMENTS DATE

FRANKLIN COUNTY / WESTERN VIRGINIA WATER AUTHORITY
BURNT CHIMNEY WATER EXTENSION
FRANKLIN COUNTY, VIRGINIA

WVWA STANDARD DETAILS 3

DOCUMENT NO. 30337—002
SHEET 42 OF 44

ALL DETAILS: WESTERN VIRGINIA REGIONAL - CONSTRUCTION DETAIL — 01/01/12