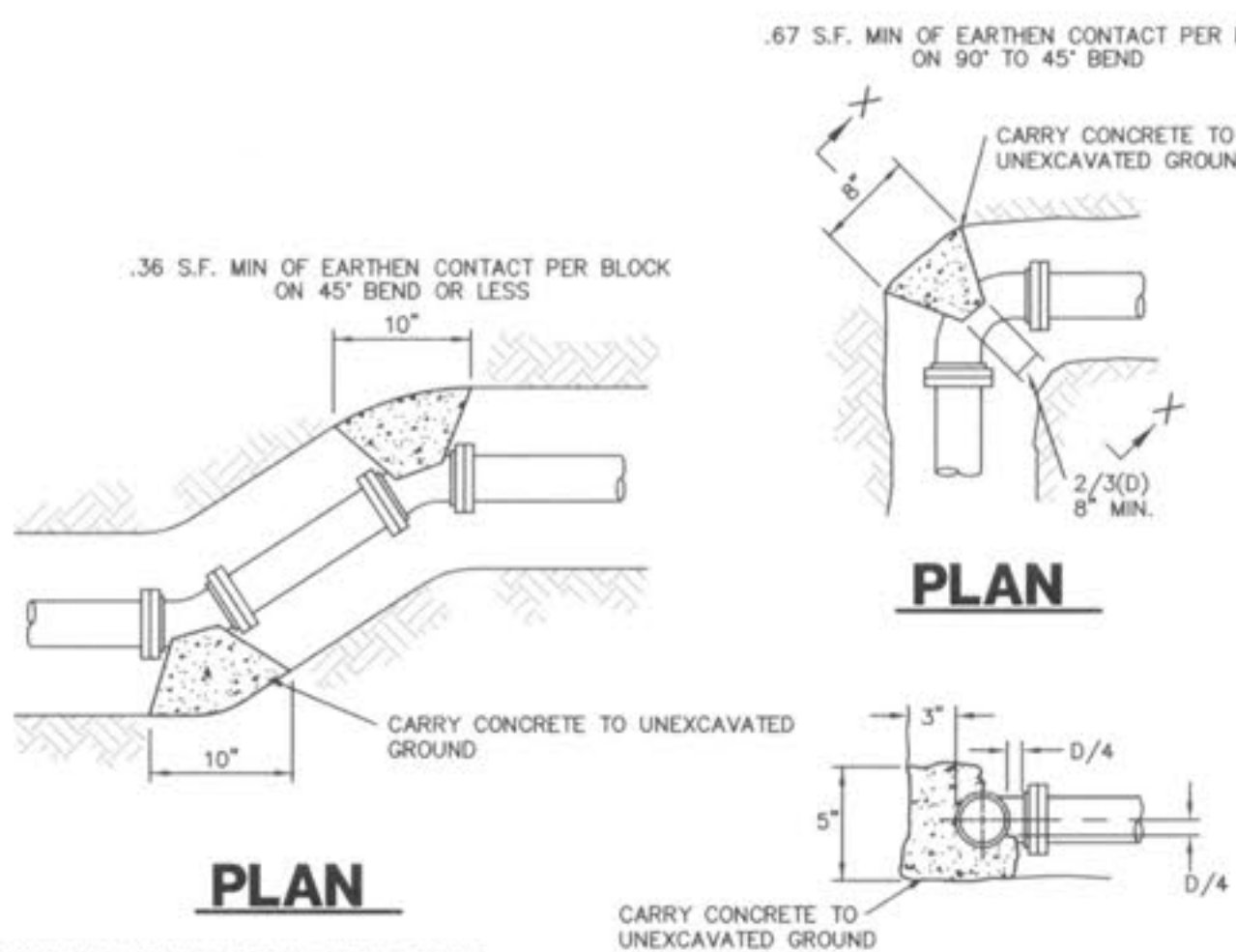


A = CONTACT BEARING AREA OF BLOCK WITH EARTH IN SQUARE FEET

PIPE DIA. IN.	PLUG	45° WYE	TEE CONNECTION	UP TO 22.5°	UP TO 45°	UP TO 90°
	A (SQ. FT.)	A (SQ. FT.)	A (SQ. FT.)	A (SQ. FT.)	A (SQ. FT.)	A (SQ. FT.)
4" STD	0.5	1.4	2.6	1.8	2.2	2.0
6"	1.5	3.0	6.0	4.0	4.5	4.5
8"	2.5	5.0	9.5	6.5	9.5	8.0
10"	4.1	8.0	13.0	9.5	12.5	12.5
12"	5.5	11.5	19.0	13.5	16.0	18.0
16"	9.0	18.0	33.0	23.0	27.0	32.0
20"	14.0	28.0	51.0	36.0	42.0	50.5

NOTES:

- BEARING AREAS ARE BASED ON UNDISTURBED SOIL WITH A BEARING CAPACITY OF 1,000 POUNDS PER SQUARE FOOT. FOR A LESSER SOIL BEARING CAPACITY THESE AREAS SHALL BE INCREASED ACCORDINGLY.
- ALL CONCRETE THRUST BLOCKS SHALL BE 3000 P.S.I. CONCRETE.
- THRUST BLOCKS SHALL BE POURED AGAINST UNDISTURBED EARTH.
- NO JOINT SHALL BE COVERED WITH CONCRETE.
- JOINTS THAT LOCATED AGAINST THRUST BLOCKS ARE TO BE WRAPPED IN A CLOTH MATERIAL.
- APPROVED MECHANICAL JOINT RESTRAINTS ARE REQUIRED AT ALL VERTICAL BENDS AND MAY BE USED IN LIEU OF THRUST BLOCKS AT HORIZONTAL BENDS AT THE OPTION OF THE ENGINEER, AT NO ADDITIONAL COST TO THE OWNER.



PLAN

SECTION X-X

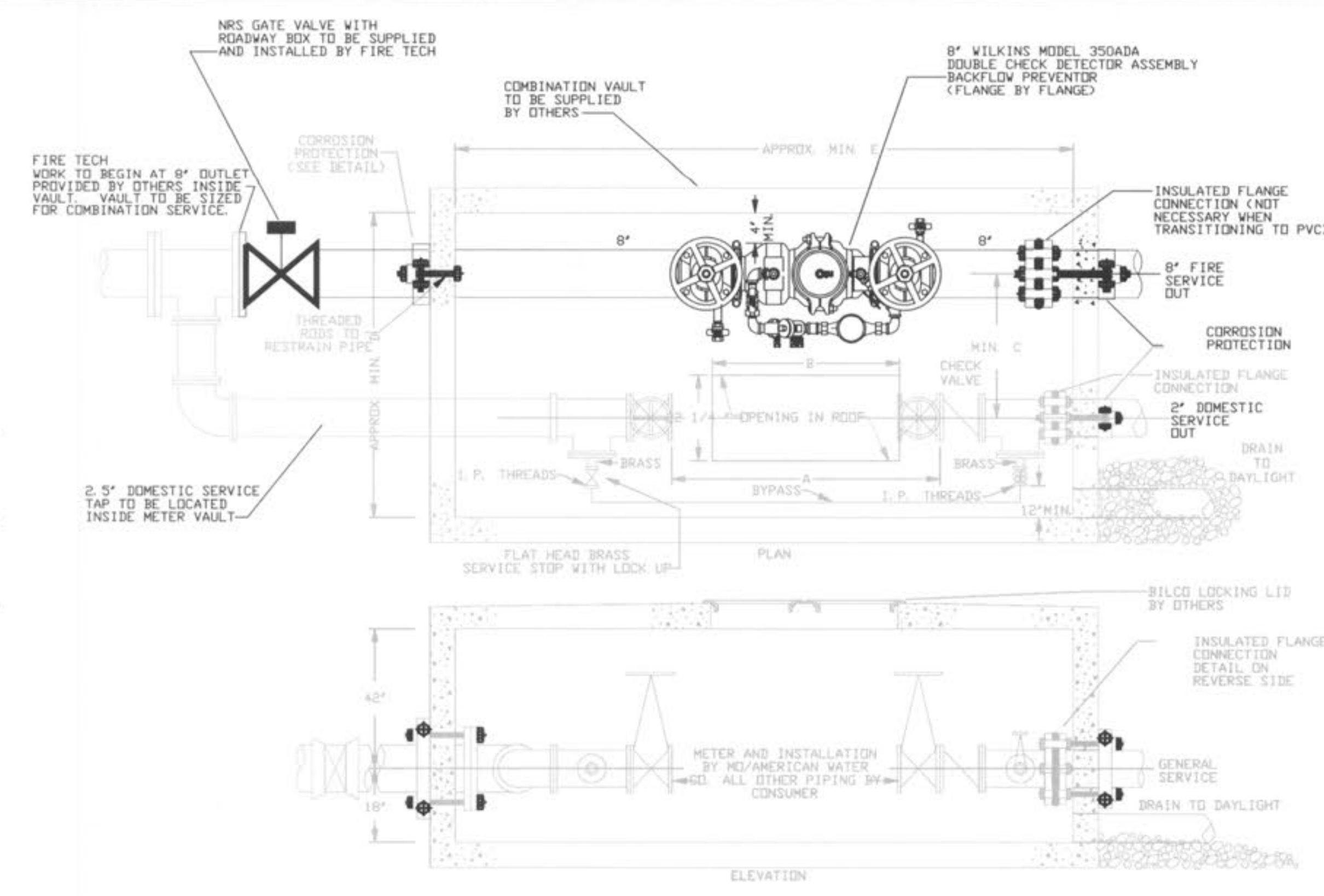
EQUATION USED FOR T-BLOCK CALCULATIONS
 $T = 2(PA \sin \theta/2) \times f.o.s. of 1.5$
 ASSUMED PRESSURE OF 150 PSI AND
 AND SOIL BEARING CAPACITY OF 1500 PSF

THRUST BLOCK DETAIL

SCALE: 1"=1'

WATER LINE NOTES

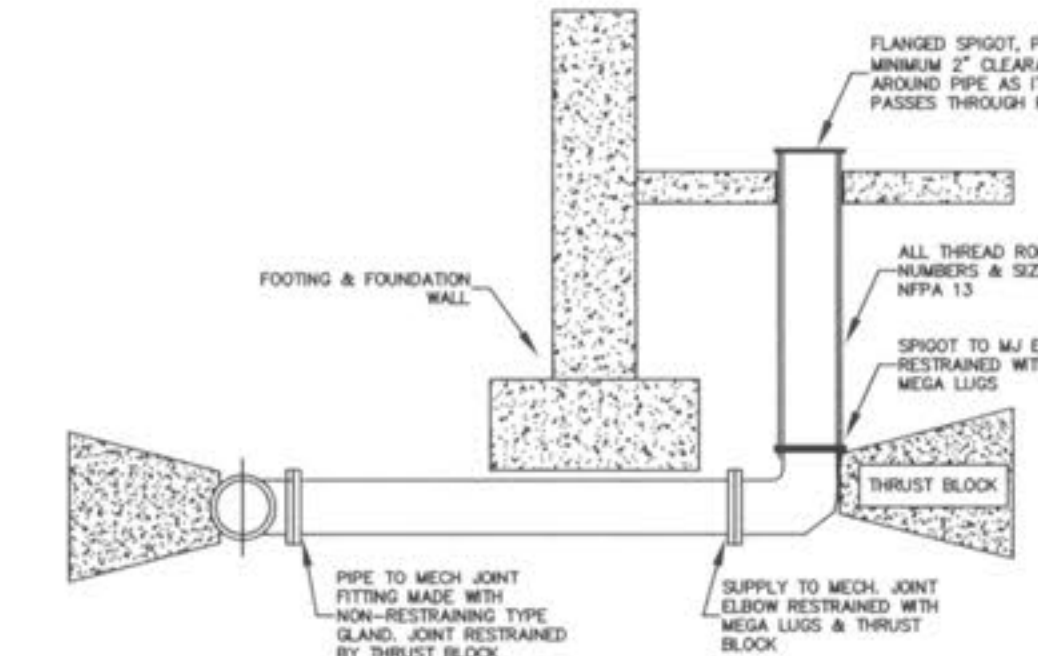
- ALL MATERIALS AND METHODS OF CONSTRUCTION FOR WATER MAINS TO MEET REQUIREMENTS OF THE CITY OF FALLON OR MISSOURI-AMERICAN WATER COMPANY DEPENDING UPON WHO IS SELECTED TO SERVE THE DEVELOPMENT.
- WATER MAINS SHALL BE POLYVINYL CHLORIDE (PVC) C900 PIPE CONFORMING TO A.S.T.M. SPECIFICATIONS D2241. THE PIPE SHALL BE PRESSURE RATED FOR A HYDROSTATIC WORKING PRESSURE OF 200 PSI AT 73.4 DEGREES F AND SHALL MEET ALL APPLICABLE REQUIREMENTS AS SET FORTH UNDER COMMERCIAL STANDARD (CS) 256-63
- DUCTILE IRON PIPE MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH ALL THE REQUIREMENTS OF U.S.A. STANDARD A2151 (A.W.W.A. C-151-65). THE PIPE SHALL BE FURNISHED WITH MECHANICAL, PUSH ON, OR FLANGE JOINTS AS REQUIRED. THE INTERIOR SURFACE OF PIPE SHALL BE COATED WITH A CEMENT-MORTAR LINING IN ACCORDANCE WITH U.S.A. STANDARD A 21.4 (A.W.W.A. C. 104). AFTER DRYING, THE CEMENT LINING SHALL BE SEAL COATED WITH SIMILAR A.W.W.A. APPROVED BITUMINOUS VARNISH. ALL FITTINGS AND BENDS SHALL BE CONSTRUCTED OF CAST OR DUCTILE IRON.
- WATER MAIN TRACER TAPE TO BE INSTALLED WITH ALL WATER MAIN AND SHALL CONSIST OF THREE INCH WIDE TAPE MADE OF BONDED LAYER PLASTIC WITH A METALLIC FOIL CORE. TAPE SHALL BE "TERRA TAPE D" AS MANUFACTURED BY THE GRIFFOLYN COMPANY OF HOUSTON, TEXAS, OR APPROVED EQUAL.
- WATER MAIN LOCATOR SHALL BE INSTALLED WITH ALL WATER MAIN, FITTINGS, AND VALVE INSTALLATION AND SHALL CONSIST OF A STANDARD ELECTRIC SERVICE WIRE, A SINGLE NO. 12 U.L. APPROVED COPPER WIRE OF THE SOLID OR STRAND TYPE WITH INSULATION FOR 600 VOLTS.
- ALL VALVES FOR EXTERIOR USE SHALL BE BURIED GATE VALVES WITH A VALVE BOX AND TWO INCH SQUARE NUT ATTACHMENT FOR MANUAL OPERATION WITH STANDARD VALVE WRENCH. GATE VALVE SHALL BE IRON BODIED WITH BRASS OR BRONZE MOUNTED DOUBLE DISC GATE. GATE VALVES SHALL BE OF THE NON-RISING STEM TYPE, OPENED BY TURNING COUNTER-CLOCKWISE. THE VALVE STEM SHALL HAVE DOUBLE "O" RING SEALS AND TERMINATE AT TOP WITH TWO INCH SQUARE NUT. GATE VALVE CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE LATEST GOVERNING SPECIFICATIONS OF THE A.S.T.M. AND A.W.W.A. ALL GATE VALVES FOR USE SHALL BE "MUELLER" OR APPROVED EQUAL.
- VALVE BOXES FOR USE SHALL BE THE SCREW-TYPE, EXTENSION SLEEVE KIND, OR P.V.C. PIPE. ALL BOXES SHALL BE FITTED WITH A RECESSED COVER HAVING THE WORD "WATER" CAST IN THE TOP.
- FIRE HYDRANTS SHALL BE MUELLER "SUPER CENTURION 250" MODEL A-423. HYDRANTS SHALL BE TRAFFIC MODEL TYPE WITH A WORKING PRESSURE OF 150 PSI IN FULL COMPLIANCE WITH A.W.W.A. STANDARD SPECIFICATIONS C-502 OF THE LATEST REVISION. HYDRANTS TO BE THREE-WAY WITH TWO HOSE CONNECTIONS AND ONE PUMPER CONNECTION AND SHALL HAVE 5 1/4" VALVE OPENINGS. HYDRANTS TO BE YELLOW IN COLOR.
- CONCRETE FOR THRUST BLOCKING AT BENDS, TEES, VALVES, HYDRANTS, ETC., SHALL BE 3,500 PSI COMPRESSIVE STRENGTH AT 28 DAYS.
- BEFORE WATER MAINS SHALL BE ACCEPTED AND PUT INTO SERVICE THEY SHALL BE TESTED FOR TWO HOURS ON EACH SEGMENT BETWEEN END POINTS AT A TEST PRESSURE OF AT LEAST 50% IN EXCESS OF NORMAL OPERATING PRESSURE, NOT TO EXCEED 200 PSI. WATER MAINS SHALL BE STERILIZED AND FLUSHED IN ACCORDANCE WITH THE CITY OF FALLON OR MISSOURI-AMERICAN WATER COMPANY DEPENDING UPON WHO IS SELECTED TO SERVE THE DEVELOPMENT.
- ALL WATER LINES AND SERVICE LINES SHALL HAVE A MINIMUM OF 42" OF COVERAGE.
- VERTICAL CLEARANCE BETWEEN SEWERS AND WATER MAINS SHALL BE A MINIMUM OF 2'-0".
- EACH FIRE HYDRANT SHALL HAVE A 6 INCH BARREL AND SHALL BE OF THE BREAKAWAY DESIGN, FROST FREE WITH CHAIN, LEFT HAND OPEN DESIGN AND HAVE NATIONAL STANDARD THREADS.
- THERE SHALL BE NO OBSTRUCTION, I.E., PLANTINGS, BUSHES, TREES, SIGNS, LIGHT STANDARDS, MAILBOXES, ETC. WITHIN SIX (6) FEET OF ANY FIRE HYDRANT, AND/OR FIRE DEPARTMENT CONNECTION TO AN AUTOMATIC SPRINKLER SYSTEM.



NOTES

GENERAL SERVICE	BYPASS				10"								FIRE SERVICE			
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P
SIZE	MIN	IN	IN	IN	IN	IN	IN	IN	IN	IN	IN	IN	IN	IN	IN	IN
1/2"	1	30E	1/4	35	72	102	35	72	90	30	66	84	27	60	84	
2"	1	30E	1/4	35	72	102	35	72	90	30	66	84	27	60	84	
3"	1 1/2	544	1/2	35	84	136	35	78	136	30	72	150	27	78	150	
4"	1 1/2	544	1/2	35	84	136	35	84	162	30	78	156	27	78	156	
6"	2	604	1/2	36	84	174	36	84	174	31	78	174				
8"	2	664	1/2	37	84	186	37	84	186							

- VAULT WALLS TO BE OF CONCRETE OR PRECAST CONCRETE.
- VAULT ROOF TO BE OF REINFORCED CONCRETE WITH OPENING CENTERED OVER GENERAL SERVICE METER.
- LIDS AND FRAMES OF OPENING TO BE SET IN PLACE, NOT IN CONCRETE.
- VALVES ON EACH SIDE OF GENERAL METER FOR 1 1/2" OR 2" SERVICE TO HAVE SCREW ENDS, I.P. THREADS; FOR 3" AND ABOVE, VALVES MUST HAVE FLANGED ENDS & BE IN ALIGNMENT. ALL VALVES MUST BE ADEQUATELY SECURED TO WITHSTAND WATER THRUST WITH METER REMOVED.
- MINIMUM CLEARANCE OF 2" TO BE PROVIDED BETWEEN GENERAL METER AND DETECTOR CHECK BYPASS METER.
- DRAINAGE FACILITIES MUST BE PROVIDED, OR BOX OTHERWISE KEPT FREE OF WATER, NO FRENCH DRAINS ALLOWED.
- SERVICE TO BE RUN AT RIGHT ANGLES FROM METER BOX TO STREET.
- METAL LADDER TO BE PROVIDED IF CUSTOMER SERVICE SUPERVISOR ALLOWS BOX DEPTH TO EXCEED 6 FEET.
- D. I. CLASS 52 PIPE MINIMUM - EXTENDED MIN. 6' FROM OUTLET SIDE OF METER PIT.
- TYPE "K" OR "L" COPPER DN DOMESTIC - EXTENDED MIN. 6' FROM OUTLET SIDE OF METER PIT.
- ANY DEVIATION FROM PIPE DEPTH SHOWN MUST BE APPROVED BY DISTRICT SUPERVISOR PRIOR TO CONSTRUCTION.
- METER BOX CONTROL VALVE TO BE LOCATED AS NEAR TO METER BOX AS PRACTICAL.
- BOX TO BE SET WITH TOP OF BOX AT FINISHED GRADE WITH NO EXTENSION ALLOWED.
- TAPS WILL NOT BE MADE BEFORE METER PIT AND PIPING ARE COMPLETE AND PROPERTY LINE VALVE INSTALLED, UNLESS APPROVED BY CUSTOMER SERVICE SUPERVISOR.



TYPICAL SERVICE ENTRANCE SECTION

NOT TO SCALE

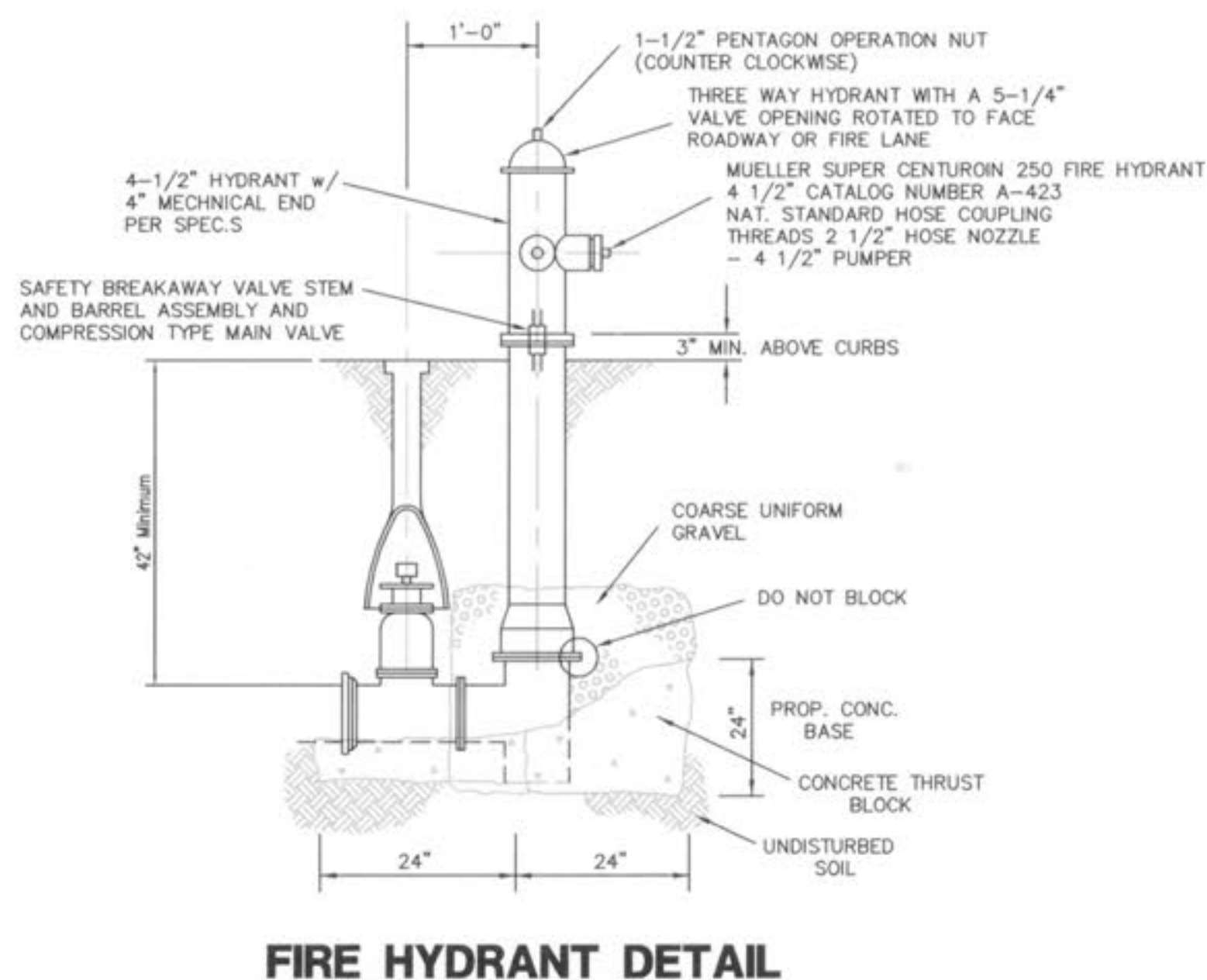
- 5 2010-11-03 FOR PERMIT
- 4 2010-07-21 REVISED PER CITY & PWSD COMMENTS
- 3 2010-06-30 REVISED PER CITY COMMENTS
- 2 2010-16-09 PROGRESS PRINTING #2
- 1 2010-05-24 REVISED PER SEWER DISTRICT COMMENTS

COTTEVILLE FIRE PROTECTION DISTRICT NOTES

- The fire department connection will be located within 150'-ft. of a fire hydrant. See Fire Sprinkler Site Plan by others.
- See site plan for water main sizes.
- The minimum fire flow from the fire hydrants shall be in accordance with Section B105 of the 2003 International Fire Code.
- Each fire hydrant shall have not less than two 2 1/2 inch outlets and one 4 1/2 inch outlet, a 5 1/4 inch valve, a 6 inch barrel and shall be of the breakaway design, frost free with chain, left hand open design and have National Standard Threads.
- Each fire hydrant shall be provided with a control valve in the hydrant connection such that the hydrant can be removed from service without shutting off water supply to other fire hydrants.
- The fire hydrants will be set to the final grade, not less than 18-in. from center of a hose nozzle outlet to finish grade and must face the street or access road.
- There shall be no obstruction, I.e., plantings, bushes, trees, signs, light standards, mailboxes, etc. within six (6) feet of any fire hydrant, and/or fire department connection to an automatic sprinkler system.
- The hydrants on the system side of the detector check/meter vault will be private and painted red (Porter 4119 or equal).
- A control valve shall be provided at the connection from the private fire service main to the building. Valves shall be either Post Indicator Valve (Section 3-3 of NFPA 24) Valves in Pits (Section 3-4), or a listed non-indicating valve with approved roadway box, along with this valve a T-wrench shall be provided in a clearly identified and readily accessible location of the premises.
- A permit will be required through Cottleville Fire Protection District for the installation of private service mains.
- Underground Piping for private service mains shall be listed for fire protection service and shall comply with AWWA Standards.
- Identification signs shall be provided at each valve to indicate its function and what it controls.
- All tees, plugs, bends and hydrant branches shall be restrained against movement in accordance with Section 8-6 of NFPA 24.
- The flushing and testing of the underground piping, etc. shall comply with Chapter 9 of NFPA 24 and shall be witnessed by a representative from Cottleville Fire Protection District.

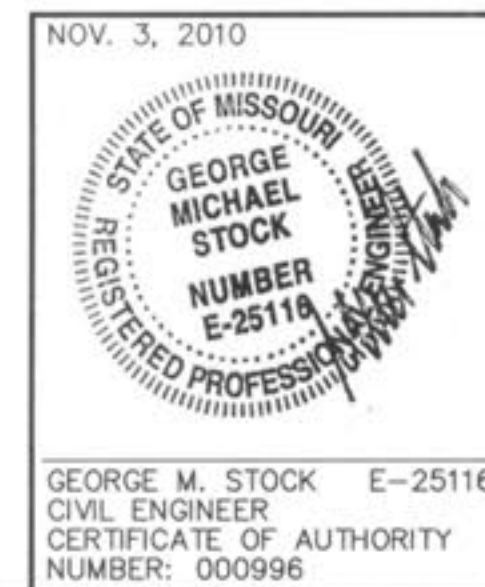
MISSOURI AMERICAN WATER LINE NOTES

- THE SERVICE CONNECTION WILL REQUIRE THE PLUMBER TO PURCHASE A TAP AT LEAST TWO WEEKS PRIOR TO WHEN HE NEEDS IT. AS A GENERAL RULE, MISSOURI AMERICAN WATER CO. MAKES THE TAPS IN THE ORDER IN WHICH THEY ARE RECEIVED, AND CANNOT GUARANTEE TWO WEEKS DURING A BUSY TIME OF THE YEAR. ONCE THE TAP IS PURCHASED THE PLUMBER HAS TO SCHEDULE IT WITH THE DISTRICT SUPERVISOR. THE PLUMBER HAS TO HAVE ALL REQUIRED INFORMATION, PLUS MISSOURI AMERICAN WATER REQUIRES TWO SETS OF A SITE PLANS SHOWING THE PROPOSED LAYOUT AND VALVING. ALONG WITH THIS MISSOURI AMERICAN WATER CO. CAN INSURE THAT THEY ARE ABLE TO PROVIDE THE REQUIRED FLOW. THE ONLY FEE IS THE ACTUAL COST OF THE TAP ITSELF. THE TAPPING FEE IS DIFFERENT FOR EVERY COMBINATION OF PIPE SIZE AND TAP SIZE AND IS BASED ON PREVIOUS YEAR'S ACTUAL COSTS.
- THE FOOTING OF THE BUILDING MUST BE IN BEFORE MISSOURI AMERICAN WATER CO. WILL MAKE A TAP. MISSOURI AMERICAN WATER DOES NOT MAKE TAPS FOR VACANT LOTS OR PREVIOUS TO SUBSTANTIAL BUILDING CONSTRUCTION.
- A MINIMUM CLASS 52 DUCTILE IRON PIPE, CONFORMING TO APPLICABLE AWWA STANDARDS, IS REQUIRED ON ANY SERVICE LINE THAT IS 4" OR GREATER IN SIZE BEFORE A METER. COPPER PIPING IS REQUIRED FOR SMALLER SERVICES FROM THE MAIN THROUGH THE METER BOX. FOR SERVICES SMALLER THAN 4" IN SIZE, FLEXIBLE TYPE "K" COPPER IS REQUIRED THROUGH THE STOP BOX. AFTER THE STOP BOX, FLEXIBLE OR RIGID TYPE "K" OR "L" COPPER IS REQUIRED TO FOUR FEET BEYOND THE METER BOX. FOR LARGER SERVICES, DUCTILE IRON PIPE SHOULD RUN FROM THE MAIN TO A POINT AT LEAST SIX FEET BEYOND THE METER BOX. FROM THE BUILDING FOUNDATION, COPPER OR DUCTILE IRON PIPE MUST EXTEND A MINIMUM OF TEN FEET OUTSIDE THE BUILDING WALL. ONCE A FIRE LINE IS PAST A DETECTOR CHECK METER IT IS CONSIDERED TO BE METERED AND ANY MATERIALS CAN BE USED THAT COMPLY WITH THE LOCAL PLUMBING CODES (C-900 PVC IS THE MINIMUM). A "MASTER SERVICE" WOULD NOT METERED.
- THE JOINTS ON COPPER SERVICE LINES (EXCLUDING JOINTS ON PRE-PURCHASED "METER SETTERS") SHALL BE EITHER FLARED, COMPRESSION, OR SILVER SOLDERED.
- EXISTING SERVICES WILL HAVE TO BE DESTROYED AT THE MAIN UNLESS THEY ARE BEING REUSED. PERMISSION TO REUSE A SERVICE (EITHER PERMANENTLY OR TEMPORARILY) MUST COME FROM THE DISTRICT SUPERVISOR. EXCAVATIONS IN THE PUBLIC RIGHT-OF-WAY WILL REQUIRE AN EXCAVATION PERMIT.
- MISSOURI AMERICAN WATER DOES NOT OWN, OPERATE, OR MAINTAIN SERVICE LINES. AS A GENERAL RULE, MISSOURI AMERICAN WATER DOES NOT RUN A WATER MAIN EXTENSION ON A PROJECT WHICH CAN BE SERVED BY A SERVICE LINE.
- MISSOURI AMERICAN WATER CO. REQUIRES A DETECTOR CHECK VALVE ON ALL FIRE PROTECTION LINES FOR SPRINKLER SYSTEMS. THEY ALSO REQUIRE A DETECTOR CHECK VALVE ON FIRE HYDRANTS, WITH THE POSSIBLE EXCEPTION OF HYDRANTS THAT ARE IMMEDIATELY ADJACENT TO AND VISIBLE FROM PUBLIC STREETS. MISSOURI AMERICAN WATER ALSO REQUIRES VALVES ON BOTH FIRE AND DOMESTIC LINES AFTER THEY SPLIT FROM A COMBINED SERVICE. THIS A TYPICAL SPLIT SERVICE WOULD HAVE VALVES ON BOTH FIRE AND DOMESTIC LINES AFTER A TEE. OF COURSE THIS WOULD ALSO REQUIRE A VALVE ON A LINE GOING TO A FIRE HYDRANT THAT CAME OFF OF A "MASTER WATER SERVICE".



FIRE HYDRANT DETAIL

(n.t.s.)



NOV. 3, 2010
 GEORGE M. STOCK E-25116
 CIVIL ENGINEER
 CERTIFICATE OF AUTHORITY
 NUMBER: 000996

WATER DETAILS
CENTENE DATA CENTER

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