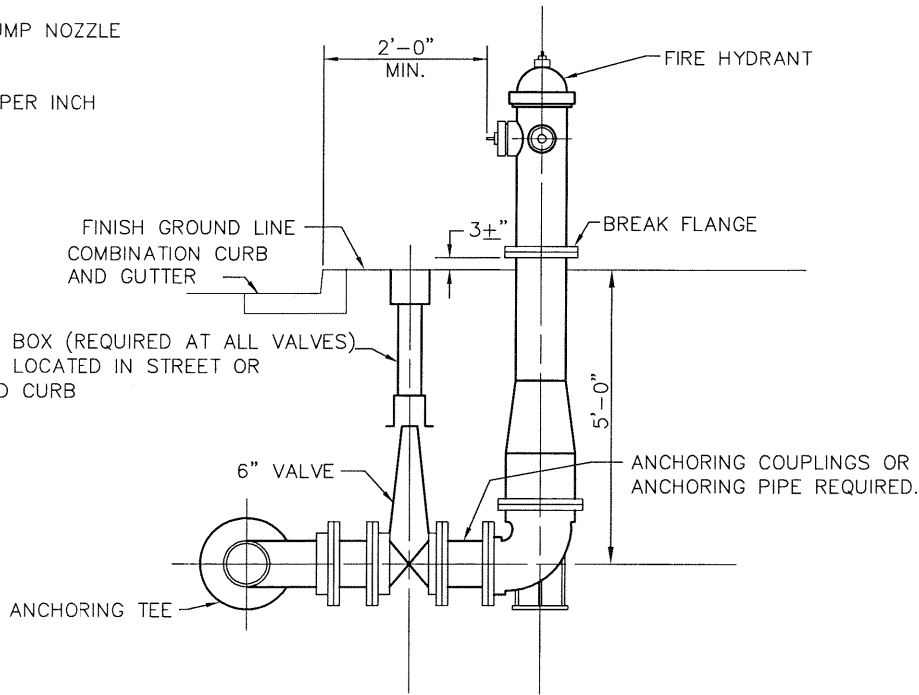


800 - WATER DISTRIBUTION

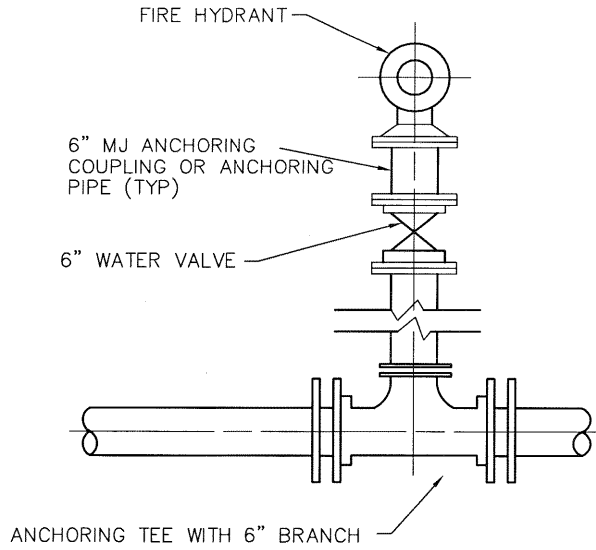
HYDRANT PUMP NOZZLE
4" I.D.
5" O.D.
4 THREADS PER INCH



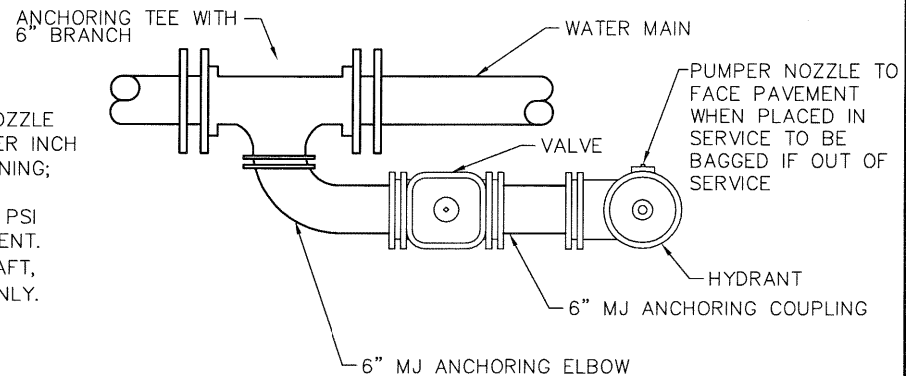
SECTION VIEW

NOTES

- A. FIRE HYDRANTS – MUELLER CENTURION No. A-423; MECHANICAL JOINT; TWO 2-1/2 INCH HOSE NOZZLE WITH NATIONAL STANDARD THREAD CONNECTIONS; ONE 4 INCH I.D AND 5 INCH O.D., 4 THREADS PER INCH PUMPER NOZZLE NATIONAL STANDARD THREADS; CONFORMING TO AWWA; CCW TO OPEN; NON-DRAINING; BREAK FLANGES 3 INCH ABOVE GRADE.
- B. GATE VALVES SHALL BE AWWA C-515, RESILIENT WEDGE, NONRISING STEM, MECHANICAL JOINT, 150 PSI WORKING PRESSURE, CCW TO OPEN WITH ARROW INDICATING OPEN DIRECTION, MUELLER OR EQUIVALENT.
- C. VALVE BOXES SHALL BE 3-PIECE, ADJUSTABLE 36 INCH TO 48 INCH, 5-1/4 INCH ADJUSTABLE SHAFT, 6 INCH DIAMETER NOMINAL, ADJUSTABLE SCREW TYPE, COVER MARKED "WATER", DOMESTIC MADE ONLY.
- D. ALL FITTINGS TO BE MEGALUG RESTRAINED AND THRUST BLOCKED.
- E. ALL FITTINGS TO BE AWWA C-153 DUCTILE IRON, COMPACT.
- F. ALL VALVES AND HYDRANTS SHALL OPEN LEFT BY TURNING IN A COUNTER CLOCKWISE DIRECTION.
- G. CONTRACTOR TO FACE HYDRANT AS REQUIRED BY THE CITY.
- H. WATER MAIN SHALL BE DUCTILE IRON PIPE CLASS 52 CEMENT LINED, AWWA C-151, WITH MECHANICAL JOINTS.
- I. THE LAYING OF PIPE ON EXISTING DIRT WITH THE BELLS CUT OUT SHALL NOT BE PERMITTED.
- J. THE OPEN ENDS OF ALL PIPES AND SPECIAL CASTINGS SHALL BE PLUGGED OR OTHERWISE CLOSED WITH A WATERTIGHT PLUG TO THE APPROVAL OF THE CITY BEFORE LEAVING THE WORK FOR THE NIGHT.
- K. THE FIRE DEPARTMENT SHALL COMPLETE A FUNCTION/FLOW TEST PRIOR TO BEING PLACED INTO SERVICE.
- L. ALL FIRE HYDRANTS MUST BE THRUST BLOCKED.



BASIC TEE DETAIL PLAN



**SPECIAL MECHANICAL JOINT
HYDRANT TEE DETAIL PLAN**

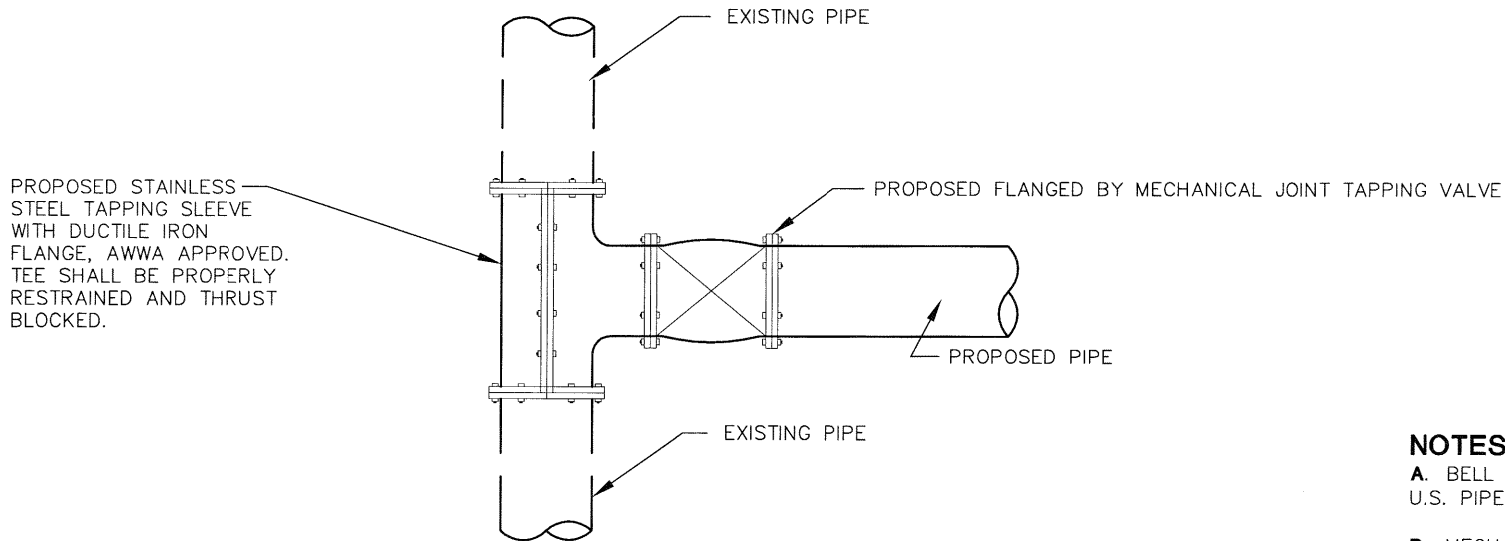
CITY OF
PIQUA

CHOICE
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FIRE HYDRANT

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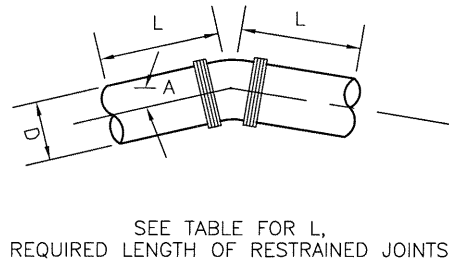
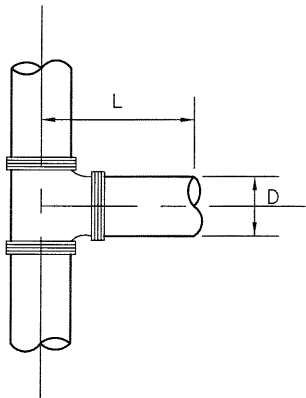
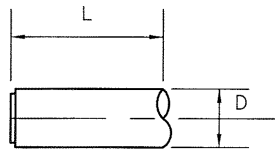
ALL JOINTS TO BE RESTRAINED.



TAPPING SLEEVE AND VALVE DETAIL

NOTES

- A. BELL JOINT RESTRAINTS – USE FIELD LOCK BY U.S. PIPE OR APPROVED EQUIVALENT.
- B. MECHANICAL JOINT RESTRAINTS – EBAA IRON MEGALUG RETAINER GLAND OR EQUIVALENT.
- C. CONTRACTOR TO USE RESTRAINED JOINTS AND THRUST BLOCKING.



		REQUIRED LENGTH OF RESTRAINED JOINTS IN FEET							
		D—DIAMETER OF PIPE							
		4"	6"	8"	10"	12"	16"	20"	24"
A ~ DEGREE OF DEFLECTION	11 1/4'	*	*	*	*	*	2	3	3
	22 1/2'	*	2	3	3	4	5	6	6
	45°	3	4	5	6	8	10	12	13
	90°	18	25	33	40	47	60	72	85
	TEE	18	25	33	40	47	60	72	85
	END	18	25	33	40	47	60	72	85

DESIGN PARAMETERS

LAYING CONDITIONS – TYPE 5
 SOIL DESIGNATION – SILT
 DEPTH OF COVER – 4'-6"
 DESIGN PRESSURE – 80 PSI
 SAFETY FACTOR – 1.50
 BARE PIPE
 THIS CHART AND PARAMETERS
 WILL BE UTILIZED UNLESS
 APPROVED BY THE UTILITY
 DIRECTOR.

REQUIRED LENGTH OF RESTRAINED JOINTS FOR WATER MAINS

* REQUIRED RESTRAINED JOINT AT FITTING.

CITY OF PIQUA

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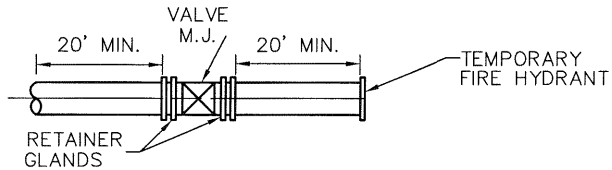
RESTRAINING JOINTS AND TAPPING SLEEVE FOR WATER MAINS

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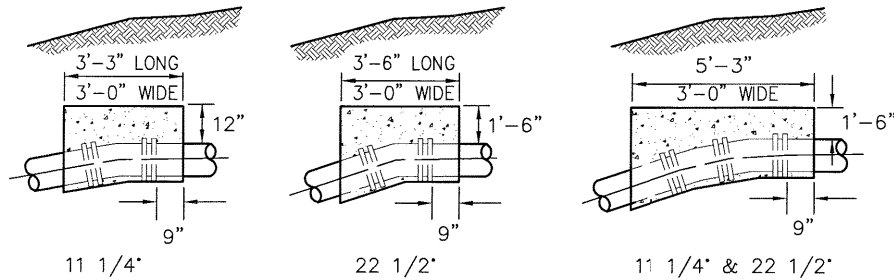
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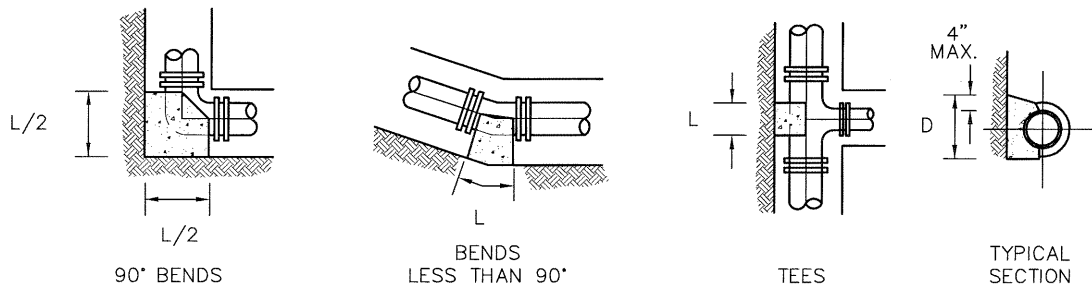
DETAIL - END OF WATER LINE



CONCRETE BLOCKING FOR VERTICAL BENDS

SIZE OF PIPE	BENDS							
	DEGREE OF BEND							
	11 1/4°		22 1/2°		45°		90°	
	L	D	L	D	L	D	L	D
3", 4", 6"	8"	6"	10"	6"	20"	6"	36"	6"
8"	9"	8"	14"	8"	24"	9"	50"	8"
12"	14"	12"	22"	12"	30"	16"	60"	15"
16"	18"	16"	24"	18"	33"	36"	70"	22"

RUN	TEES							
	BRANCH							
	3", 4", 6"		8"		12"		16"	
	L	D	L	D	L	D	L	D
3", 4", 6"	16"	6"						
8"	14"	8"	18"	12"				
12"	9"	12"	18"	12"	24"	18"		
16"	8"	16"	14"	16"	28"	16"	30"	26"



CONCRETE BLOCKING FOR HORIZONTAL BENDS

NOTES

- A. CARE SHALL BE TAKEN TO KEEP CONCRETE AWAY FROM MECHANICAL JOINTS BY PLACING VISQUEEN OR OTHER APPROVED MATERIAL OVER PIPE BEFORE PLACING OF CONCRETE. BOLTS SHALL NOT BE ENCASED IN CONCRETE.
- B. CONCRETE FOR BLOCKING VALVES AND FITTINGS SHALL CONFORM TO SECTION ODOT 499 CLASS C.
- C. CONTRACTOR SHALL USE THE THRUST BLOCKS AS SHOWN.

CITY OF PIQUA

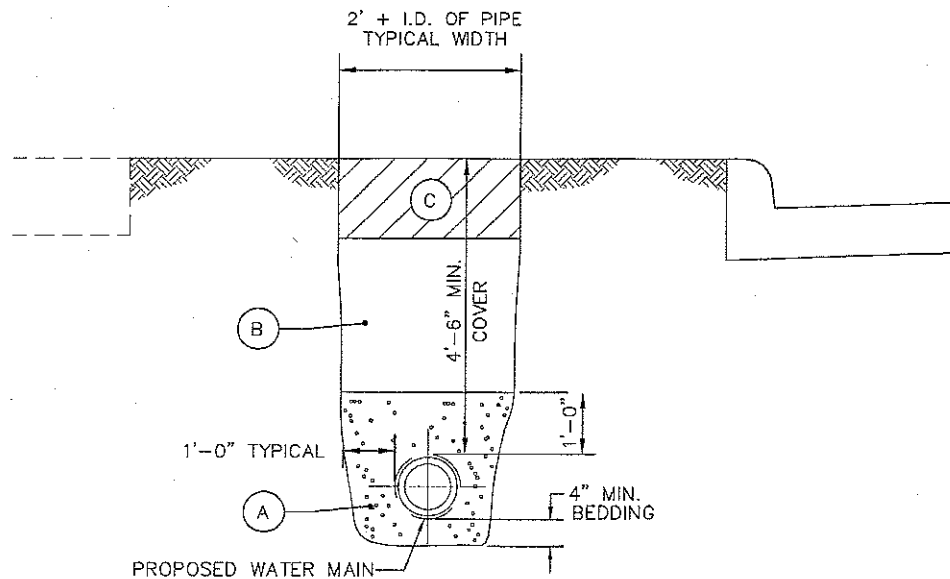
CHOICE ONE ENGINEERING

CONCRETE BLOCKING FOR WATER MAINS

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WATER MAIN TRENCH DETAIL

WATER MAIN CROSSING SEPARATION

WHENEVER A SANITARY SEWER AND WATER LINE MUST CROSS, THE SEWER SHALL BE LAID AT SUCH AN ELEVATION THAT THE CROWN OF THE SEWER IS AT LEAST 18 INCHES BELOW THE BOTTOM OF THE WATER LINE. IF IT IS ABSOLUTELY IMPOSSIBLE TO MAINTAIN THE 18-INCH VERTICAL SEPARATION, THE SANITARY SEWER SHALL BE CONSTRUCTED WITH WATER LINE TYPE MATERIALS WHICH WILL WITHSTAND A 50 PSI PRESSURE TEST. THESE REQUIREMENTS WILL EXTEND FOR A DISTANCE OF 10 FEET, MEASURED PERPENDICULAR, ON BOTH SIDES OF THE WATER LINE.

AT CROSSINGS, THE WATER MAIN SHALL HAVE A MINIMUM VERTICAL DISTANCE OF 18 INCHES FROM STORM AND SANITARY SEWERS. ALSO ONE FULL LENGTH OF WATER MAIN SHALL BE LOCATED SO THE JOINTS ARE AS FAR FROM THE STORM SANITARY SEWERS AS POSSIBLE.

TRENCH DETAIL NOTES

- A.** GRANULAR BEDDING SHALL BE CRUSHED STONE OR GRAVEL, ODOT 603 TYPE 3 (#57 OR #67), OR OTHER APPROVED EQUIVALENT.
 - B.** ALL TRENCHES OUTSIDE THE RIGHT-OF-WAY FROM PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREAS OR WALKS CAN BE COMPACTED WITH EXISTING NATIVE MATERIAL IN 12 INCH MAXIMUM LIFTS OR AS APPROVED BY THE CITY. NO MATERIAL SHALL BE USED FOR BACK FILLING THAT CONTAINS STONE, ROCKS, ETC., GREATER THAN 4 INCH DIAMETER.
 - C.** OFF-PAVEMENT AREAS SHALL BE PROVIDED WITH A MINIMUM OF 6 INCHES OF TOPSOIL OVER THE COMPACTED MATERIAL AND THEN SEEDED AND MULCHED PER ODOT ITEM 659.
 - D.** THE OPEN ENDS OF ALL PIPES SHALL BE PLUGGED TO THE APPROVAL OF THE CITY BEFORE LEAVING THE WORK FOR THE NIGHT.
- ALL TRENCHES INSIDE THE RIGHT-OF-WAY FROM PROPOSED OR EXISTING PAVEMENT, CURB, DRIVEWAYS, ALLEYS, STONE AREAS OR WALKS SHALL BE COMPACTED WITH GRANULAR BACKFILL MATERIAL ODOT 603 TYPE 1 IN 6 INCH MAXIMUM LIFTS.
- A DENSITY TEST ON GRANULAR BACKFILL OF 98% OF ASTM D698 STANDARD PROCTOR CURVE MAY BE REQUIRED TO BE PERFORMED BY A COMMERCIAL TESTING LAB SATISFACTORY TO THE CITY.

WATER MAIN TRENCH DETAIL

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MATERIAL SPECIFICATIONS

- A. WATER MAIN SHALL BE AWWA C-151 DUCTILE IRON PIPE CLASS 52 FOR 4 INCH TO 16 INCH AND CLASS 54 FOR 20 INCH AND GREATER, WITH SLIP-ON JOINTS AND RUBBER GASKETS.
- B. BELL JOINT RESTRAINTS – USE FIELD LOCK BY U.S. PIPE OR APPROVED EQUIVALENT.
- C. MECHANICAL JOINT RESTRAINTS – EBAA IRON MEGALUG RETAINER GLAND OR EQUIVALENT.
- D. FIRE HYDRANTS – MUELLER CENTURION No. A-423; MECHANICAL JOINT; TWO 2-1/2 INCH HOSE NOZZLES, WITH NATIONAL STANDARD THREAD CONNECTIONS; ONE 4 INCH I.D AND 5 INCH O.D., 4 THREADS PER INCH PUMPER NOZZLE NATIONAL STANDARD THREADS; CONFORMING TO AWWA; CCW TO OPEN; NON DRAINING; BREAK FLANGES 3 INCHES ABOVE GRADE.
- E. GATE VALVES (THRU 10 INCHES) – AWWA C-515, RESILIENT WEDGE, NON-RISING STEM, MECHANICAL JOINT, 150 PSI WORKING PRESSURE, CCW TO OPEN, OPEN LEFT WITH ARROW INDICATING OPEN DIRECTION.
- F. VALVE BOXES – 3-PIECE CAST IRON 6 INCH DIAMETER NOMINAL, ADJUSTABLE SCREW TYPE, COVER MARKED "WATER", DOMESTIC MADE ONLY.
- G. SERVICE LINE – TYPE "K" COPPER TUBE WITH COMPRESSION OR FLARED TYPE FITTINGS.
- H. CURB STOP – BRASS CONFORMING TO AWWA C-800, 300 PSI RATED. (FORD, MUELLER, CUMBRIDGE OR MCDONALD)
- I. CURB BOXES – 2-1/2 INCH SCREW TYPE, BUFFALO STYLE CAST IRON LID WITH PENTAGON HEAD PLUG EM2-45-67, ONLY IN APPROVED SITUATIONS. METER PITS ONLY IN NEW CONSTRUCTION.
- J. ALL SERVICE CONNECTIONS REQUIRE A METER AND OUTSIDE METER PIT (FOR NEW CONSTRUCTION).
- K. VALVE SIZING
 - 6 INCH TO AND INCLUDING 10 INCH TO BE A GATE VALVE OPENING LEFT
 - 12 INCHES AND LARGER-TO BE A BUTTERFLY VALVE OPENING LEFT
- L. LEAD FREE MATERIAL IS PREFERRED WHENEVER POSSIBLE.

HYDROSTATIC TEST

- A. AFTER THE PIPE HAS BEEN LAID AND BACKFILLED, ALL NEWLY LAID PIPE OR VALVED SECTION, SHALL BE SUBJECT TO HYDROSTATIC PRESSURE AND LEAKAGE TEST. ALL WATER MAINS MUST BE HYDROSTATICALLY TESTED (AWWA C-600). THE TESTS MUST BE PERFORMED BY THE CONTRACTOR IN THE PRESENCE OF A REPRESENTATIVE OF THE CITY OF PIQUA. THE LEAKAGE TEST PRESSURE SHALL BE NOT LESS THAN 200 PSI FOR MAINS AND 150 PSI FOR COPPER SERVICES. THE DURATION OF THE LEAKAGE TEST SHALL NOT BE LESS THAN 2 HOURS. HYDROSTATIC PRESSURE SHALL BE APPLIED BY MEANS OF A PUMP TAKING WATER FROM AN AUXILIARY SUPPLY. ALL PIPING MUST BE PROPERLY FILLED AND FLUSHED TO DISPEL ALL AIR BEFORE THE TEST IS MADE USING POTABLE WATER.
- B. LEAKAGE IS DEFINED AS THE QUANTITY OF WATER TO BE SUPPLIED INTO THE NEWLY LAID PIPE, OR ANY VALVED SECTION THEREOF, NECESSARY TO MAINTAIN THE SPECIFIED LEAKAGE TEST PRESSURE AFTER THE PIPE HAS BEEN FILLED WITH WATER AND THE AIR EXPELLED.
- C. DURING THE HYDROSTATIC TEST, A THOROUGH EXAMINATION OF ALL PIPING, FITTINGS, VALVES, HYDRANTS, ETC. SHALL BE PERFORMED. LEAKING JOINTS SHALL BE TIGHTENED AND THE TEST SHALL BE REPEATED UNTIL SATISFACTORY RESULTS ARE OBTAINED. CRACKED OR OTHERWISE DEFECTIVE MATERIAL SHALL BE REMOVED AND REPLACED AND THE TEST SHALL BE REPEATED UNTIL SATISFACTORY RESULTS ARE OBTAINED.

DISINFECTION

- A. AFTER SATISFACTORY HYDROSTATIC TESTING, THE COMPLETED WATER WORK SHALL BE DISINFECTED IN ACCORDANCE WITH AWWA C-651 BY THE CONTRACTOR, WITH THE CITY OF PIQUA OVERSEEING, BY MEANS OF LIQUID SODIUM HYPOCHLORIDE INJECTION. AFTER INJECTION TEST SHOULD INDICATE 50 PARTS PER MILLION (PPM) OR HIGHER OF CHLORINE. THE RESIDUAL AFTER 24 HOURS MUST BE 25 PPM OR HIGHER.
- B. CHLORINATION TAPS SHALL BE WITHIN 18 INCHES FROM END OF PIPE OR VALVE.
- C. MAINTAIN PIPES FREE OF DIRT AND FOREIGN MATTER DURING CONSTRUCTION BY DEWATERING TRENCH AND SEALING OPEN PIPE BARRELS. THIS IS ALSO A REQUIREMENT IF REPAIRS OCCUR.
- D. FLUSH CHLORINE SOLUTION TO WASTE INTO SANITARY SEWER, IF APOPROVED BY SANITARY SEWER DEPARTMENT, AT A CONTROLLED RATE, NOT TO EXCEED 25 GPM. IF SANITARY SEWER IS NOT AVAILABLE, CONTRACTOR TO DECHLORINATE WATER WITH APPROVED AWWA METHOD APPROVED BY THE CITY.
- E. WATER SAMPLES – PERFORM BACTERIOLOGICAL TEST PER AWWA C-651. THIS TEST WILL BE PERFORMED BY PER CITY SCHEDULED PERMITS. AT LEAST ONE SET OF SAMPLES SHALL BE COLLECTED FROM EVERY 1,200 FEET OF NEW WATER MAIN, PLUS ONE SET FROM THE END OF THE LINE AND AT LEAST ONE SET FROM EACH BRANCH. TWO CONSECUTIVELY NEGATIVE RESULTS WILL CONSTITUTE A PASSABLE TEST. THE CONTRACTOR SHALL FURNISH ALL REQUIRED TESTING APPENDAGES OR EXCAVATION NEEDED BY THE CITY.
- F. ADDITIONAL TESTING SHALL BE AT CONTRACTORS EXPENSE AND CANNOT CREATE OVERTIME COST UNLESS CONTRACTOR IS WILLING TO PAY FOR IT.

AVG. TEST PRESSURE (PSI) BAR

ALLOWABLE LEAKAGE PER 1000 FT. (305M) OF PIPELINE (GPH+)

	NOMINAL PIPE DIAMETER- INCHES									
	6	8	10	12	14	16	18	20	24	30
250(17)	0.71	0.95	1.19	1.42	1.66	1.90	2.14	2.37	2.85	3.56
225(16)	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25	2.70	3.38
200(14)	0.64	0.85	1.06	1.28	1.48	1.70	1.91	2.12	2.55	3.19
175(12)	0.59	0.80	0.99	1.19	1.39	1.59	1.79	1.98	2.38	2.98
150(10)	0.55	0.74	0.92	1.10	1.29	1.47	1.66	1.84	2.21	2.76
120(9)	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68	2.01	2.52

CITY OF PIQUA

CHOICE ONE ENGINEERING

WATER MAIN MATERIAL AND TESTING

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NOTES

- A. NO WORK SHALL BE APPROVED OR ACCEPTED BY THE CITY UNLESS 2 WORKING DAYS NOTICE OF COMMENCING WORK IS GIVEN TO THE CITY.
- B. ALL TEMPORARY PAVEMENT AND SIDEWALK SHALL BE MAINTAINED BY THE CONTRACTOR OR THE DEVELOPER AT HIS OWN EXPENSE IN A SUITABLE AND SAFE CONDITION FOR TRAFFIC UNTIL PERMANENT REPLACEMENT IS MADE OR THE PROJECT IS FINALLY ACCEPTED BY THE CITY, UNLESS OTHERWISE APPROVED.
- C. THE MINIMUM LENGTH OF PIPE NIPPLES SHALL BE 18" UNLESS OTHERWISE APPROVED BY THE CITY.
- D. ALL CUSTOMERS SHALL MEET BACKFLOW PREVENTION REQUIREMENTS AS PER CITY OF PIQUA STANDARDS.
- E. ALL WATERLINE CONSTRUCTION INCLUDING EXTENSIONS ON PRIVATE PROPERTY SHALL FOLLOW THE CITY STANDARDS, ODOT ITEM 638, AND AWWA STANDARDS WHICHEVER IS MORE RESTRICTIVE AS DETERMINED BY THE CITY.
- F. OPERATION OF CITY FIRE HYDRANTS, VALVES, METERS, SERVICES, STOPS, AND ALL OTHER MECHANICAL INFRASTRUCTURE ITEMS IS STRICTLY PROHIBITED.
- G. ALL WATER MAINS SHALL HAVE A MINIMUM DEPTH OF 4-1/2 FEET AND A MAXIMUM DEPTH OF 6 FEET FROM TOP OF PIPE TO SURFACE, UNLESS REQUIRED BY DESIGN.

PIPE

A. ALL PIPE FITTINGS SHALL BE DUCTILE IRON.

B.

WATER MAIN MINIMUM SIZE UNLESS OTHERWISE APPROVED	
RESIDENTIAL	8"
COMMERCIAL	10"
INDUSTRIAL	12"
6" MAY BE CONSIDERED FOR LOOPING PURPOSES IN RESIDENTIAL AREAS	

C. DEADENDS ARE NOT PERMITTED AND MUST BE LOOPED UNLESS THEY ARE DEEMED UNPRACTICAL BY THE CITY ENGINEERING DEPARTMENT AFTER A REVIEW OF A WATER MAIN DESIGN. WHEN APPROVED, THEY SHALL BE TERMINATED WITH A FIRE HYDRANT AT THE END.

EXCAVATION AND PIPE LAYING

A. THE OPEN ENDS OF ALL PIPES SHALL BE CLOSED WITH A WATERTIGHT PLUG TO THE APPROVAL OF THE CITY BEFORE LEAVING THE WORK FOR THE NIGHT AND AT OTHER TIMES OF INTERRUPTION OF THE WORK.

STORAGE AND HANDLING OF MATERIALS

A. PIPE FITTINGS, VALVES, FIRE HYDRANTS AND OTHER MATERIALS MUST BE PROPERLY STORED ON THE JOB SITE. PROPER TOOLS FOR THE SAFE AND CONVENIENT HANDLING AND PLACING OF PIPE AND FITTINGS SHALL BE USED. CARE SHALL BE TAKEN TO PREVENT DAMAGE TO THE COATINGS OF THE PIPE AND FITTINGS, AND ANY DAMAGE SHALL BE REMEDIED AS DIRECTED. NO DAMAGED OR DEFECTIVE PIPE OR FITTINGS SHALL BE USED..

B. PIPES AND FITTINGS SHALL BE THOROUGHLY CLEANED BEFORE THEY ARE USED, AND SHALL BE KEPT CLEAN UNTIL WORK IS COMPLETED BY USING WATER TIGHT PLUGS ON OPEN ENDS OF PIPES IN THE GROUND.

FITTINGS, VALVES AND HYDRANTS

A. FITTINGS OR SPECIALS IN SIZES 12 INCH THROUGH 48 INCH SHALL CONFORM TO ALL REQUIREMENTS OF AWWA C-153. FITTINGS AND SPECIALS 12 INCHES AND SMALLER SHALL BE CLASS 250. LARGER FITTINGS AND SPECIALS SHALL BE CLASS 150. FITTINGS AND SPECIALS SHALL HAVE MECHANICAL JOINTS AND SHALL BE DUCTILE IRON. CLUSTER VALVES WHENEVER POSSIBLE UNLESS APPROVED BY THE CITY.

B.

MAXIMUM SPACING UNLESS OTHERWISE APPROVED	HYDRANTS	VALVES
SINGLE & TWO FAMILY RESIDENTIAL	300'	900'
INDUSTRIAL, COMMERCIAL & MULTI-FAMILY	300'	500'

C. ALL TEES AND CROSSES SHALL BE VALVED IN EACH DIRECTION UNLESS OTHERWISE APPROVED.

D. NO VALVE SHALL BE OPERATED BY PERSONNEL OTHER THAN A REPRESENTATIVE EMPLOYED BY THE CITY.

E. ALL FITTINGS MUST BE DOMESTIC MADE ONLY.

UTILITY STAKING

A. OFFSETS EVERY 25 FEET ON CURVES. OFFSETS EVERY 100 FEET ON STRAIGHT SECTIONS. FLOW LINE OF WATER MAIN (CUT) MARKED EVERY 100 FEET AND OFFSETS SHALL BE CLEARLY MARKED AND EVERY HYDRANT WITH TOP OF CURB ELEVATION.

CITY OF
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MISCELLANEOUS WATER NOTES

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APPROVED:
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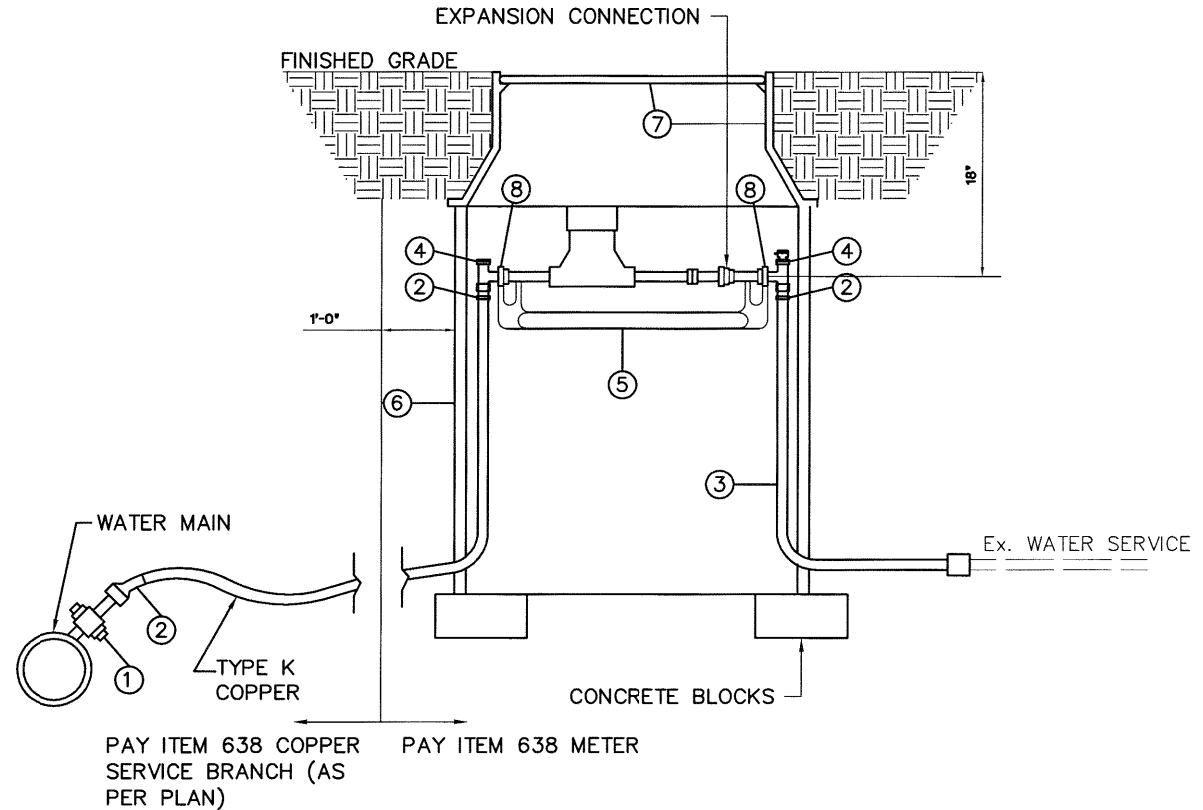
WATER PIT NOTES FOR 3/4" AND 1" SERVICES

1. CORPORATION STOP-FORD METER BOX F-600.
2. TUBE NUT-FORD METER BOX COMPANY.
3. COPPER TUBE-TYPE "K".
4. YOKE ANGLE VALVE-FORD METER BOX COMPANY.
5. YOKE-FORD METER BOX COMPANY, 500 SERIES.
6. METER BOX-SONOCO PRODUCTS, DUROPIPE (BOX MUST BE 18"x36" FOR 5/8"x3/4" OR 3/4" METER AND 24"x36" FOR 1" ORDUAL METERS)
7. METER BOX COVER, 11-1/2" MIN. LID OPENING, FORD, TYPE "A-T, WITH SINGLE 2" PRECAST HOLE PLUGGED WITH A CAST IRON, FORD, TP STYLE PLUG AND SECURED WITH A COTTER PIN".
8. LOCKING NUT-FORD METER BOX COMPANY.
9. IF METER IS REMOVED FROM THE PREMISES; THEN THE OWNER MUST PAY FOR A NEW METER AND A METER SET FEE.
10. WATER SERVICE SHALL BE A MINIMUM OF 18" ABOVE THE CROWN OF THE SANITARY SEWER MAIN WHERE THE WATER SERVICE CROSSES THE SEWER MAIN. WATER SERVICE MAY BE LAID ON BENCH IN THE SEWER LATERAL TRENCH IF CROWN IS AT LEAST 18" BELOW THE INVERT OF THE WATER SERVICE. AND THE MINIMUM DISTANCE BETWEEN THE WATER SERVICE AND THE SEWER LATERAL IS 5'-0".
11. ALL EXISTING WATER MAIN AND SERVICES TO REMAIN ACTIVE UNTIL NEW MAIN HAS BEEN PLACED INTO SERVICE.
12. CURB OR METERS SHALL BE SET IN THE CURB LAWN OR BEHIND BOX, AS SHOWN IN PLANS.
13. ANGLE CARTRIDGE STYLE DUAL CHECK VALVE ASSE 1024 METER YOKE INLET BY FLARE COPPER OUTLET - FORD METER BOX HHCA92 OR APPROVED EQUAL. (CUSTOMER SIDE ONLY) SEE *.

* OHIO PLUMBING CODE: SEC. 607.3.2, "BACKFLOW PREVENTION DEVICE OR CHECK VALVE" SPECIFIES THAT "WHERE A BACKFLOW PREVENTION DEVICE, CHECK VALVE, OR OTHER DEVICE IS INSTALLED ON A WATER SUPPLY SYSTEM UTILIZING STORAGE WATER HEATING EQUIPMENT SUCH THAT THERMAL EXPANSION CAUSES AN INCREASE IN PRESSURE, A DEVICE FOR CONTROLLING PRESSURE SHALL BE INSTALLED."

NOTES

- A. LID LOCKING BOLT MUST HAVE A STANDARD 27/32" PENTAGON HEAD.
- B. SUBSTITUTION OF MATERIALS LISTED MAY BE MADE ONLY IF APPROVED BY THE MUNICIPAL WATER SYSTEM.
- C. LEAD FREE MATERIAL ARE PREFERRED WHENEVER POSSIBLE. NO PLASTIC OR SOLDERED JOINTS IN METER PIT.
- D. LEAD FREE MATERIAL ARE PREFERRED WHENEVER POSSIBLE. NO PLASTIC OR SOLDERED JOINTS IN METER PIT.
- E. ALL BRASS FITTINGS TO BE FORD, MUELLER, A.Y. MCDONALD, OR CAMBRIDGE.
- F. FLARE OR COMPRESSION MAY BE USED.
- G. DO NOT CROSS COPPER TUBING IN METER PIT.



METER PIT DETAIL FOR 3/4" AND 1"



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3/4" AND 1" METER PIT INSTALLATION

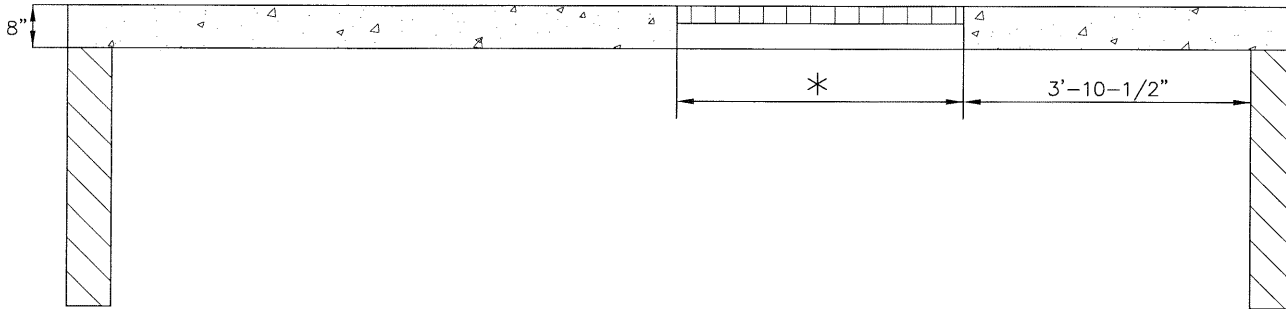
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APPROVED:
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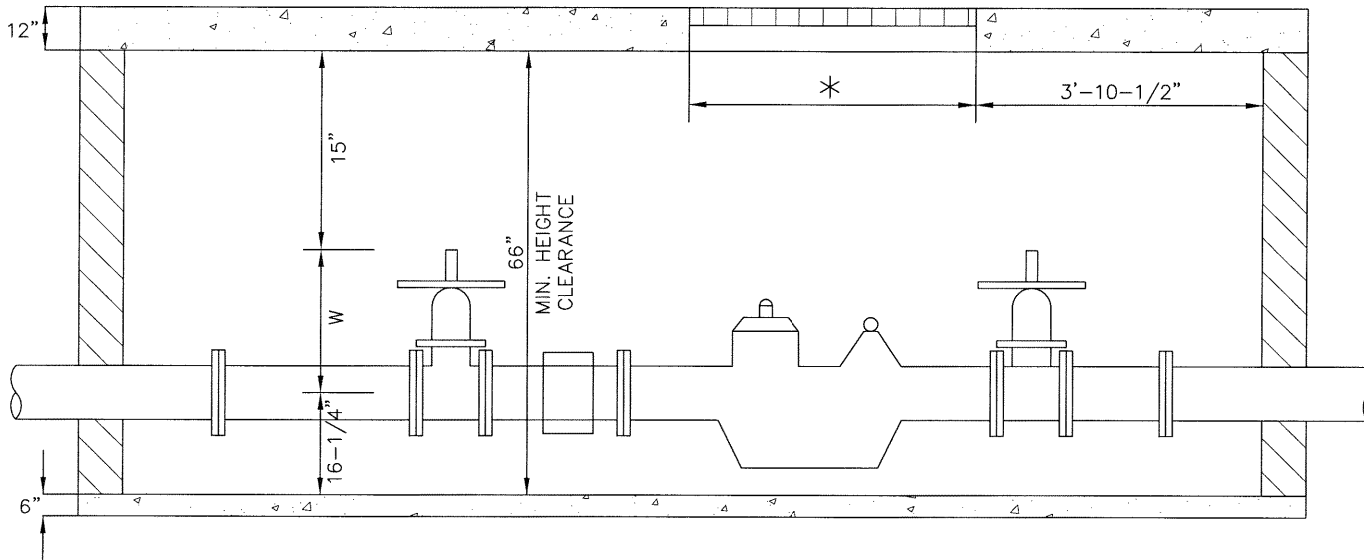
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SLAB FOR NON-TRAFFIC AREA



SLAB FOR TRAFFIC AREA



NOTES

- A. CENTERLINE OF METER TO BE NO MORE THAN 36" FROM THE FLOOR.
- B. METER MUST BE MOUNTED HORIZONTALLY INSIDE VAULT.
- C. USE STAINLESS STEEL OR BRASS NUTS AND BOLTS.
- D. METER BYPASS ASSEMBLY AND METER SETTING TO BE CONSTRUCTED OF DUCTILE.
- E. ALL PIPING TO BE THOROUGHLY SUPPORTED.
- F. THE CITY IS RESPONSIBLE FOR MAINTENANCE OF DOMESTIC INSIDE THE VAULT.
- G. PROVIDE APPROVED BACKFLOW PREVENTER REGISTERED WITH THE CITY.
- H. BYPASS VALVE SHALL BE LOCKABLE.
- I. IF VAULT IS PERMITTED TO BE INSTALLED OUTSIDE OF THE RIGHT-OF-WAY BY THE CITY OF PIQUA WATER DEPARTMENT, THEN A GATE VALVE WILL NEED TO BE INSTALLED IN THE RIGHT-OF-WAY.

CITY OF
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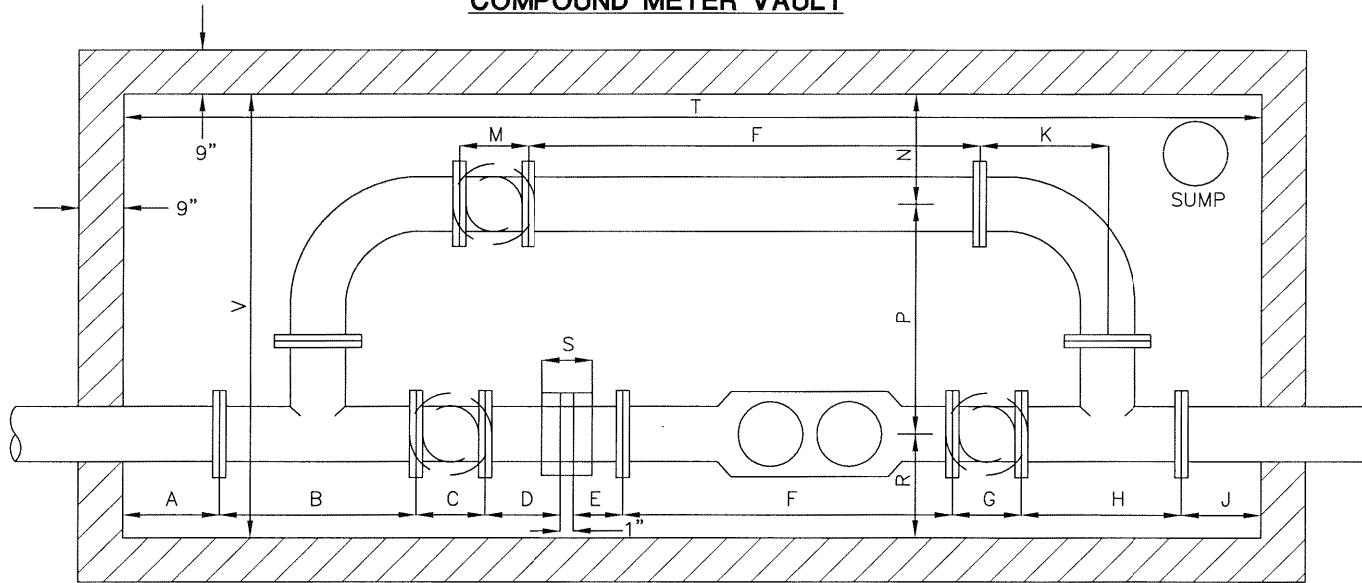
CHOICE
ONE
ENGINEERING

**4" AND LARGER COMPOUND
METER WITH BYPASS**

REVISIONS:

DATE
APPROVED:
AUG. 2008
PAGE No.
800-9

COMPOUND METER VAULT



METER SIZE	A	B	C	D	E	F	G	H	J	K	L	M	N	P	R	S	T	V	W	* MIN.
2"	7"	11"	8"	11"	9"	24"	8"	11"	7"	5-1/2"	53"	8"	15"	11-1/8"	17"	6"	9"	3-7"	13"	24x24
4"	7"	13"	9"	11"	9"	29"	9"	13"	7"	6-1/2"	59"	9"	16"	13-1/8"	18"	6"	9-9"	3-11"	16-1/4"	24x24
6"	7"	16"	10-1/2"	11"	9"	36-1/2"	10-1/2"	16"	7"	8"	68"	10-1/2"	17"	16-1/8"	19"	6-1/8"	10-5"	4-4"	20-5/8"	30x30
8"	7"	18"	11-1/2"	11"	9"	--	11-1/2"	18"	7"	9"	--	11-1/2"	19"	18-1/8"	21"	6-1/8"	11-9"	4-10"	24"	36x36
10"	7"	22"	13"	11"	9"	--	13"	22"	7"	11"	--	13"	20"	22-1/8"	22"	6-1/8"	13-1"	5-4"	27-1/8"	42x42
12"																				

CITY OF PIQUA

CHOICE ONE ENGINEERING

2" AND LARGER COMPOUND METER WITH BYPASS

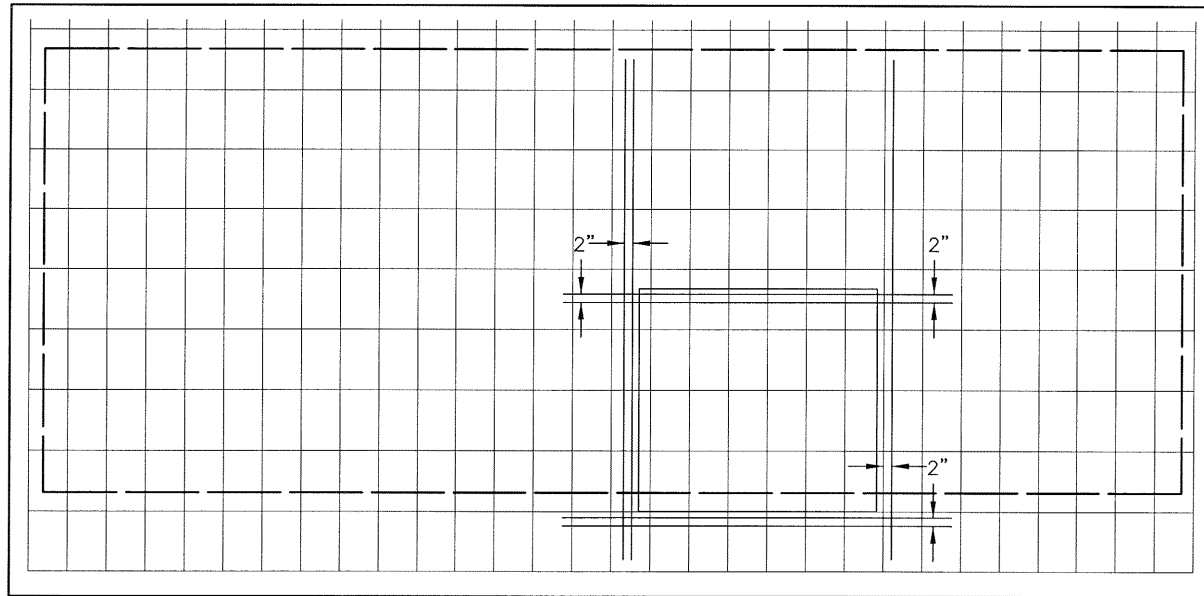
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AUG. 2008

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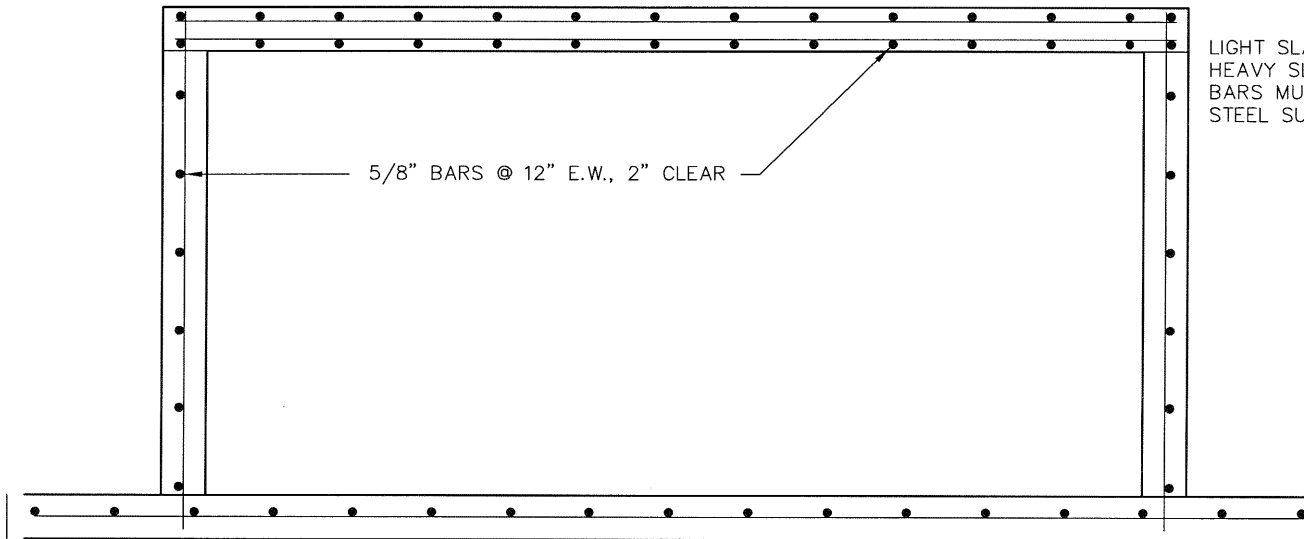
800-10

COVER SLAB



5/8" BARS @ 12" E.W., 2" CLEAR

CROSS SECTION



5/8" BARS @ 12" E.W., 2" CLEAR

LIGHT SLAB REQUIRES SINGLE STEEL MAT
 HEAVY SLAB REQUIRES DOUBLE STEEL MAT
 BARS MUST BE WIRE TIED AT EACH LAP
 STEEL SUPPORT CHARIS ONLY, MAY BE USED

CITY OF
 PIQUA

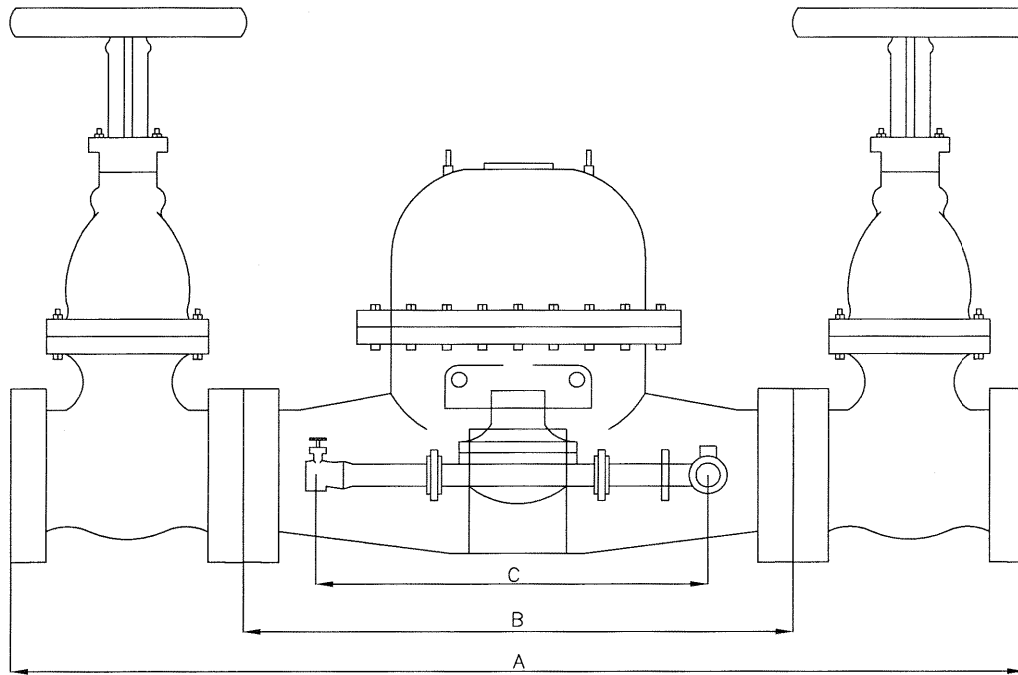
CHOICE
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REINFORCING STEEL PLAN FOR ALL VAULTS

REVISIONS:

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 APPROVED:
 AUG. 2008
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800-11



SIZE	A	B	HERSEY C	GRINNELL C	*MANHOLE SIZE	VAULT-SINGLE-VALVE			DOUBLE VALUE
						*L	*W	*H	*ADD TO L
4"	34-1/2"	16-1/2"	12-1/2"	7-9/16"	8"	60"	48"	66"	36"
6"	43-1/2"	22-1/2"	17"	11"	9"	60"	48"	66"	48"
8"	49-1/2"	26-1/2"	21"	13-3/4"	10-1/2"	72"	60"	66"	54"
10"	62"	36"	28"	--	11-1/2"	84"	66"	66"	66"
10"x12"	64"	36"	28"	--	13"	96"	66"	66"	66"

CITY OF
PIQUA

CHOICE
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ENGINEERING

DC VALVE DRAWING AND SPECIFICATIONS

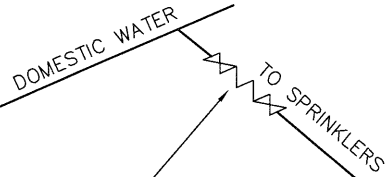
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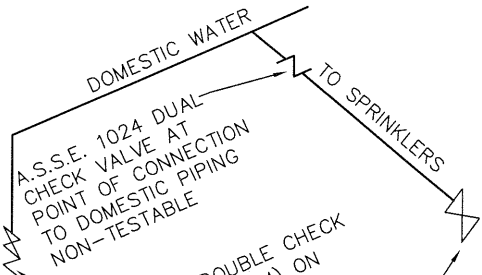
800-12

EXISTING DOMESTIC WATER WITH NO BACKFLOW DEVICE REQUIRED



- A. TESTABLE DOUBLE CHECK VALVE (ASSE 1015) AT POINT OF CONNECTION TO DOMESTIC PIPING
- B. LOCKABLE VALVES "SUPERVISED" PER OHIO BASIC BUILDING CODE 10:20
- C. PAST THE SPRINKLER HEADS AT THE END OF THE LINE A HOSE BIB SHALL BE INSTALLED FOR TESTING PURPOSES.

HOSE BIB AT END OF SPRINKLER LINES



A.S.S.E. 1024 DUAL CHECK VALVE AT POINT OF CONNECTION TO DOMESTIC PIPING NON-TESTABLE

EXISTING DOUBLE CHECK VALVE (MINIMUM) ON DOMESTIC SERVICE

HOSE BIB AT END OF SPRINKLER LINES

NOTE:

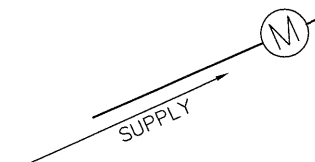
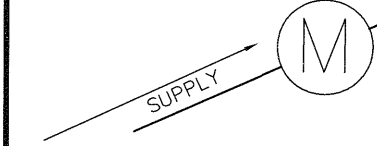
- A. ADDITION OF BACKFLOW DEVICE ONTO EXISTING FIRE SUPPRESSION SYSTEM WILL AFFECT ORIGINAL FLOW CALCULATION



- A. TESTABLE DOUBLE CHECK VALVE (ASSE 1015) AT POINT OF CONNECTION TO DOMESTIC PIPING
- B. LOCKABLE VALVES "SUPERVISED" PER OHIO BASIC BUILDING CODE 10:20

HOSE BIB AT END OF SPRINKLER LINES

EXISTING DOMESTIC BACKFLOW



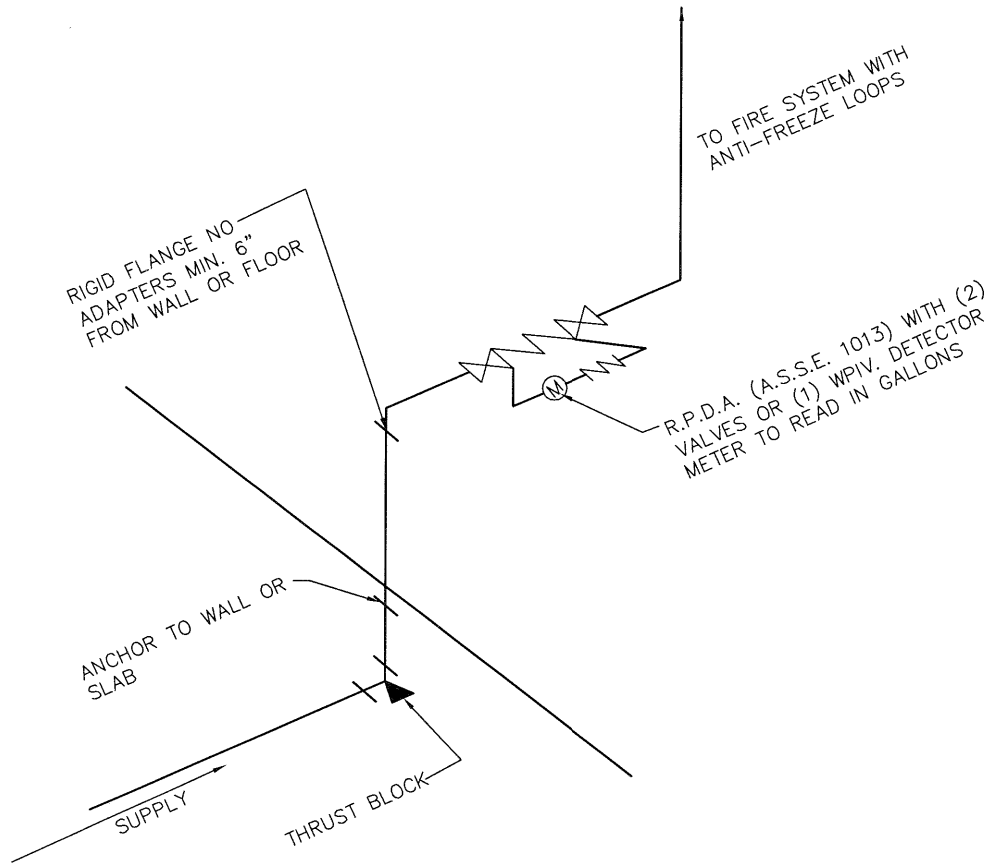
CITY OF PIQUA

CHOICE ONE ENGINEERING

LIMITED AREA SPRINKLER SYSTEM DETAIL

REVISIONS:

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NOTE

- A. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE DELIVERED FOR INSTALLATION COMPLETELY ASSEMBLED BY THE ORIGINAL MANUFACTURER WITH ALL COMPONENTS AS APPROVED.
- B. ADDITION OF BACKFLOW DEVICE ONTO EXISTING FIRE SUPPRESSION SYSTEMS WILL AFFECT ORIGINAL FLOW CALCULATIONS.
- C. CLASS 53 DUCTILE IRON TO VALVE. ALL JOINTS RESTRAINED.
- D. BACKFLOW REGULATIONS SHALL BE PER EPA'S CURRENT REGULATIONS.

CITY OF PIQUA

CHOICE ONE ENGINEERING

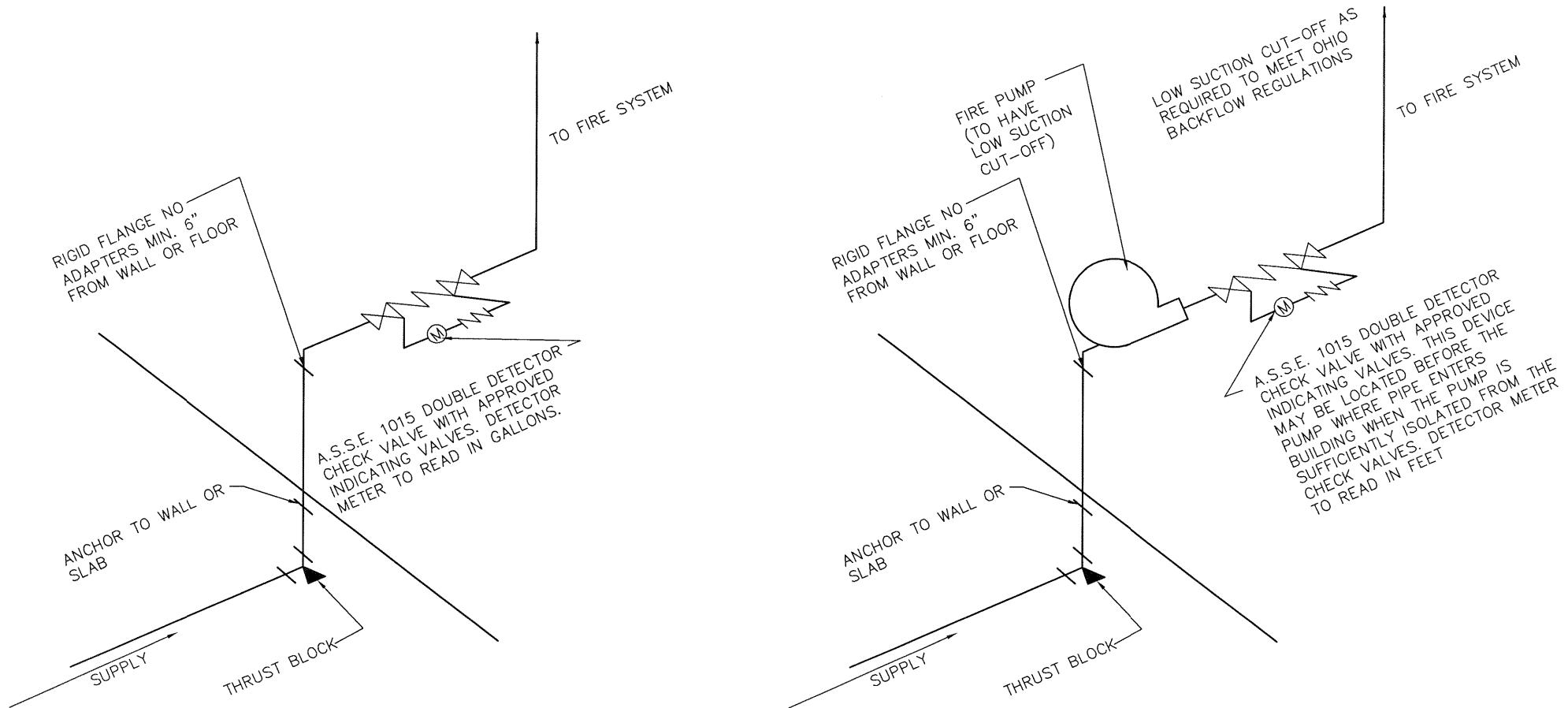
REDUCED PRESSURE DETECTOR ASSEMBLY

REVISIONS:

DATE APPROVED:
AUG. 2008

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NOTE:

- A. ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE DELIVERED FOR INSTALLATION COMPLETELY ASSEMBLED BY THE ORIGINAL MANUFACTURER WITH ALL COMPONENTS AS APPROVED.
- B. CLASS 53 DUCTILE IRON TO VALVE. ALL JOINTS RESTRAINED.
- C. BACKFLOW REGULATIONS SHALL BE PER EPA'S CURRENT REGULATIONS.

CITY OF
PIQUA

CHOICE
ONE
ENGINEERING

DOUBLE DETECTOR CHECK VALVE ASSEMBLY DETAIL

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800-15

NOTES

- A. SEE "STANDARDS FOR TAPS, SERVICES AND METERS" FOR TYPICAL NOTES.
- B. BACKFLOW PREVENTION DEVICE REQUIRED TO MEET CURRENT EPA REGULATIONS.
- C. PROVIDE APPROVED DRAIN FOR IRRIGATION SYSTEM.
- D. ALTERNATE DESIGNS MUST BE SUBMITTED FOR APPROVAL.
- E. THE CURB BOX MUST BE BROUGHT UP TO FINISH GRADE.
- F. NO OUTLETS ARE ALLOWED BETWEEN METER AND THE BACKFLOW PREVENTER OR HOSE BIBB VACUUM BREAKER WITH THE EXCEPTION OF ONE SCREW PLUG-IN TAP FOR WINTERIZING/DRAINAGE PURPOSES.
- G. THE UNDERGROUND WATER SERVICE SHALL BE K-COPPER UP TO THE BACKFLOW PREVENTER OR HOSE BIBB VACUUM BREAKER.
- H. THE INSTALLATION SHALL BE INSPECTED BY THE CITY.

**INSTRUCTIONS FOR
THE INSTALLATION OF IRRIGATION METERS
AND
BACKFLOW PREVENTERS FOR IRRIGATION**

- A. MAKE DRAWING OF THE PROPOSED IRRIGATION SYSTEM. THIS DRAWING MUST BE APPROVED BY CITY.
- B. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE CITY "STANDARDS FOR TAPS, SERVICES AND METERS".
- C. GET THE NECESSARY PERMITS.
 - 1) TAPPING FEE
- D. THE CONTRACTOR MUST BE REGISTERED WITH THE MIAMI COUNTY HEALTH DEPARTMENT.
 - 1) THE CONTRACTOR MUST OBTAIN A PERMIT TO INSTALL AND PAY ALL APPLICABLE FEES TO THE COUNTY HEALTH DEPARTMENT PRIOR TO INSTALLATION.
 - 2) A PLUMBER WITH AN OHIO LICENSE/BACKFLOW CERTIFICATION MUST BE OBTAINED TO INSTALL AND TEST THE BACKFLOW DEVICES.
- E. AFTER THE BACKFLOW PREVENTERS HAVE BEEN INSTALLED, PLEASE FILL OUT THE FORMS COMPLETELY WITH THE OWNER/ LEASE HOLDER'S NAME, ADDRESS (WHERE THE BACKFLOW PREVENTER WAS INSTALLED), LOCATION OF THE BACKFLOW PREVENTER, SIZE, MAKE, MODEL, TEST RESULTS BY A LICENSED PLUMBER, ANNUAL TEST RESULTS THERE AFTER, AND SERIAL NUMBER OF THE BACKFLOW PREVENTER. PLEASE RETURN THE COMPLETED FORMS TO THE CITY AND MIAMI COUNTY HEALTH DEPARTMENT.
- F. CONTACT THE CITY WATER DEPARTMENT AFTER THE WORK HAS BEEN COMPLETED. BACKFLOW PREVENTERS HAVE TO BE INSPECTED BY THE CITY.
- G. SEPARATE VALVES, ONE BEFORE AND AFTER, MUST BE PLACED NEAR THE BACKFLOW PREVENTER WHENEVER THE EXISTING BACKFLOW IS REMOVED.

CITY OF PIQUA

CHOICE ONE ENGINEERING

STANDARD INSTALLATION FOR IRRIGATION METERS AND BACKFLOW PREVENTER

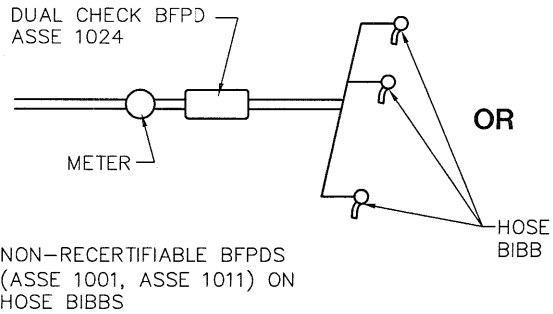
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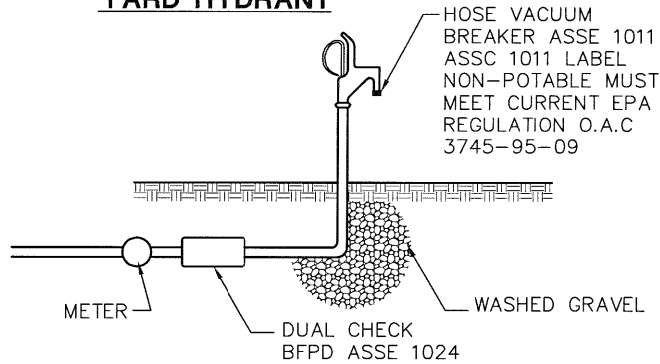
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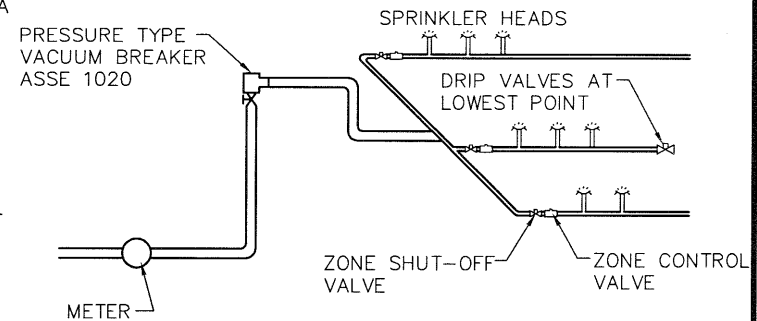
HOSE BIBB



YARD HYDRANT



SPRINKLER SYSTEM



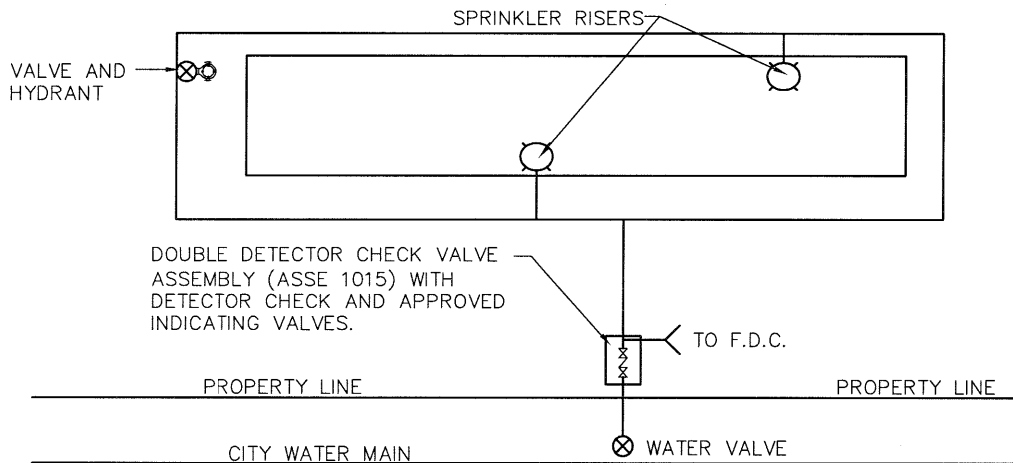
CONDITIONS

- A. SHUT-OFF VALVES ARE ALLOWED DOWNSTREAM OF THE BFPD.
- B. THE PRESSURE TYPE VACUUM BREAKER MUST BE A MINIMUM OF 12 INCHES ABOVE THE HIGHEST SPRINKLER HEAD.

NOTES

- A. SEE "STANDARDS FOR TAPS, SERVICES AND METERS" FOR TYPICAL NOTES.
- B. BACKFLOW PREVENTION DEVICE REQUIRED TO MEET CURRENT EPA REGULATIONS.
- C. PROVIDE APPROVED DRAIN FOR IRRIGATION SYSTEM.
- D. ALTERNATE DESIGNS MUST BE SUBMITTED FOR APPROVAL.
- E. THE CURB BOX MUST BE BROUGHT UP TO FINISH GRADE.
- F. NO OUTLETS ARE ALLOWED BETWEEN METER AND THE BACKFLOW PREVENTER OR HOSE BIBB VACUUM BREAKER WITH THE EXCEPTION OF ONE SCREW PLUG-IN TAP FOR WINTERIZING/DRAINAGE PURPOSES.
- G. THE UNDERGROUND WATER SERVICE SHALL BE K-COPPER UP TO THE BACKFLOW PREVENTER OR HOSE BIBB VACUUM BREAKER.
- H. THE INSTALLATION SHALL BE INSPECTED BY THE CITY.

YARD MAIN SYSTEM ARRANGEMENT



REQUIREMENTS FOR YARD HYDRANTS (O.A.C 3745-95-09)

- A. YARD HYDRANTS WITH WEEP HOLES ARE PROHIBITED
- B. SANITARY YARD HYDRANTS THAT DO NOT HAVE WEEP HOLES, SUCH AS THOSE THAT MEET THE REQUIREMENTS OF THE "AMERICAN SOCIETY OF SANITARY ENGINEERS (ASSE) STANDARD 1057", PERFORMANCE REQUIREMENTS FOR FREEZE RESISTANT YARD HYDRANTS WITH BACKFLOW PROTECTION (2001), ARE NOT PROHIBITED PROVIDED:
 - 1) THE DEVICE IS ACCEPTABLE TO THE PUBLIC WATER SYSTEM TO WHICH IT WILL BE CONNECTED
 - 2) ALL OF THE BACKFLOW AND CROSS-CONNECTION REQUIREMENTS OF THIS CHAPTER OF THE ADMINISTRATIVE CODE ARE MET.

CITY OF PIQUA

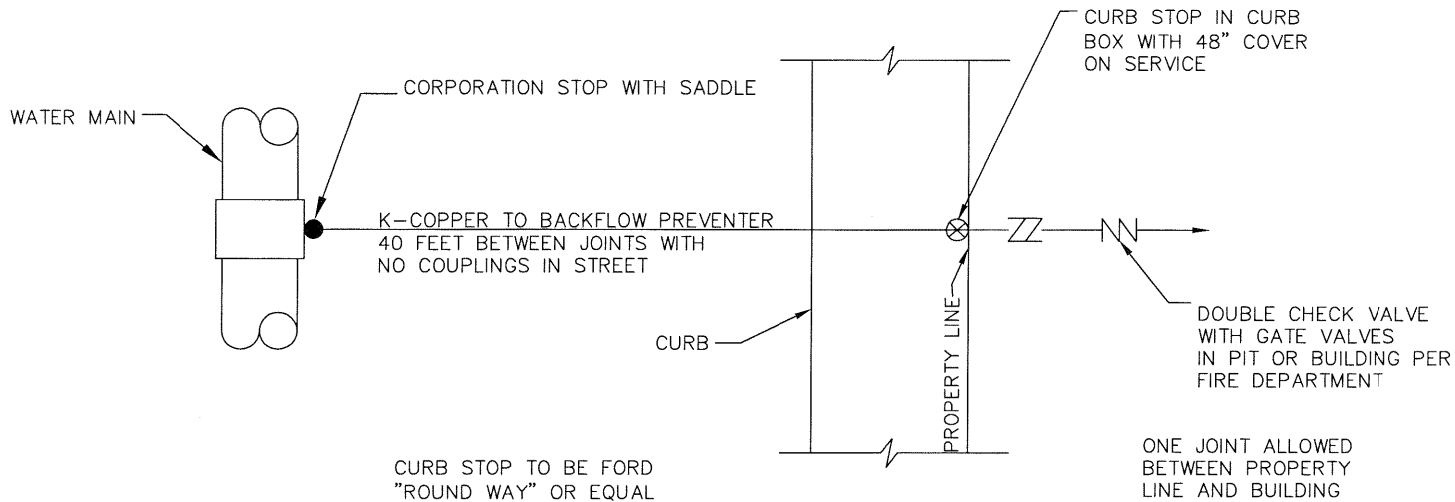
CHOICE ONE ENGINEERING

IRRIGATION DETAILS

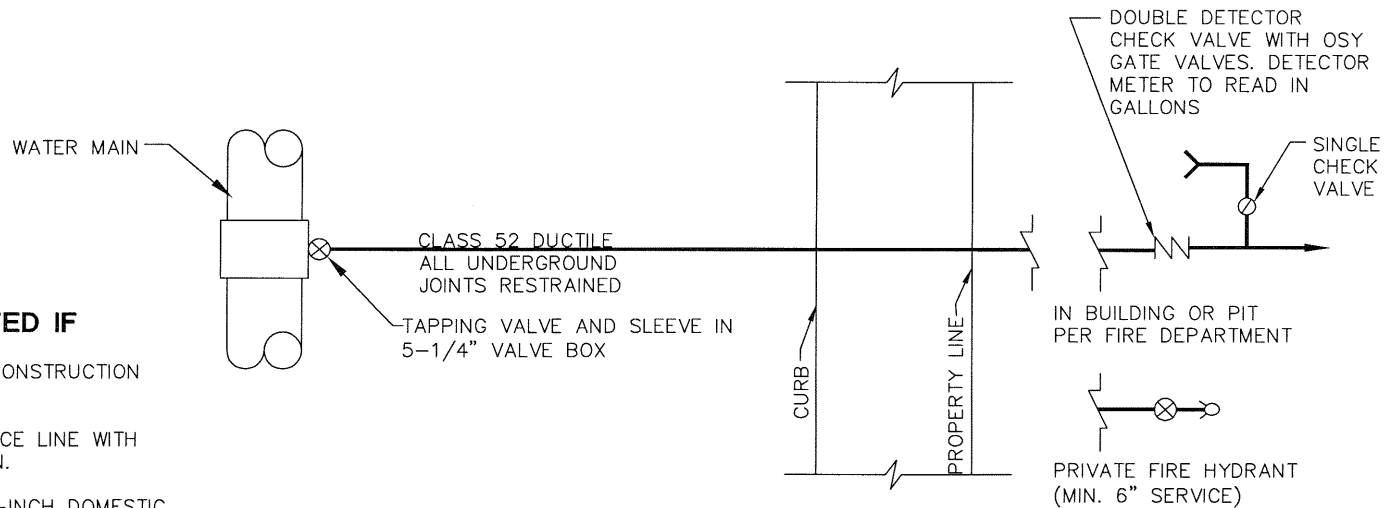
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2" FIRE LINE SERVICE
(METER REQUIRED)



4" AND LARGER FIRE LINE SERVICE
(METER REQUIRED)

WALL/POST INDICATOR VALVES SHALL BE ADDED ON PREMISES AT FIRE DEPARTMENT REQUEST

SERVICE TEES ARE PERMITTED IF

- A. SHOWN ON AN APPROVED SET OF CONSTRUCTION DRAWINGS.
- B. 4 INCH MINIMUM BRANCH AND SERVICE LINE WITH GATE VALVE WITHIN 3 FEET OF MAIN.
- C. 6 INCH FIRE LINE MAY HAVE A ONE-INCH DOMESTIC TAP AND 8 INCH FIRE LINE MAY HAVE A 2 INCHES DOMESTIC TAP. ALL DOMESTIC TAPS MUST BE INSTALLED BEFORE THE FIRE SPRINKLER RISER.

CITY OF
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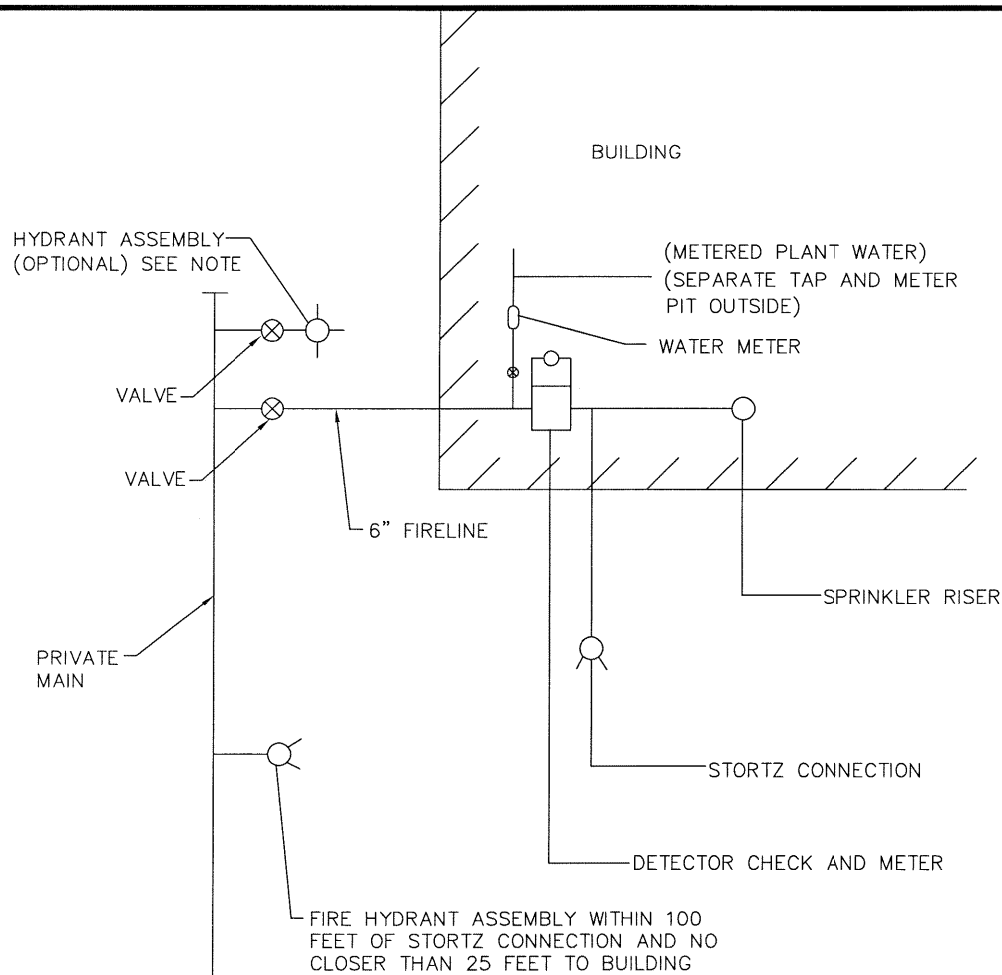
**2" FIRE LINE AND
4" AND LARGER FIRE LINE**

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APPROVED:
AUG. 2008

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REVIEW AND FEES

A. SEVEN SETS OF SITE PLANS SHALL BE SUBMITTED TO THE CITY BUILDING INSPECTOR TO BE REVIEWED BY THE BUILDING INSPECTOR, FIRE DEPT. OFFICIAL, WWTP, ELECTRIC DISTRIBUTION, WATER DEPARTMENT, CITY ENGINEER AND THE PLANNING COORDINATOR.

TESTING

A. THE CITY FIRE DEPARTMENT PERSONNEL WILL CONDUCT SELECTIVE FIRE HYDRANT TESTING FOR RESIDUAL PRESSURE. THE TESTING IS DONE ANNUALLY OR WHENEVER NEEDED. PROCEDURES OF THE HYDRANT FLOW TEST ARE FOLLOWED FROM THE FOURTH EDITION OF THE IFSTA MANUAL "WATER SUPPLIES FOR FIRE PROTECTION". TESTING PROCEDURES ARE ON FILE AT THE MAIN FIRE STATION. ALSO SEE PAGE 800-5.

GENERAL NOTES

- A. FIRE LINE AND HYDRANT INSTALLATION, TESTING AND MATERIALS SHALL BE THE SAME SPECIFICATIONS AS STATED IN THE CONSTRUCTION STANDARDS AND DRAWINGS. THESE CONSTRUCTION STANDARDS AND DRAWINGS SHALL ALSO BE FOLLOWED FOR WATERLINE EXTENSIONS ON PRIVATE PROPERTY THAT WILL PROVIDE FIRE LINE OR DOMESTIC WATER SERVICE.
- B. CITY OF PIQUA FIRE LINE REVIEW FORMS SHALL BE COMPLETED WITH TWO SETS OF PLANS FURNISHED TO THE CITY BUILDING INSPECTOR.
- C. CITY OF CERTIFIED I.S.O TEST SHALL NOT BE CERTIFIED TO THE STATE OF OHIO UNTIL THE FOLLOWING ITEMS HAVE BEEN COMPLETED.
 - 1.) ONE SET OF DRAWINGS FURNISHED TO THE CITY ENGINEERING DEPT. AND
 - 2.) FIRE LINE INSTALLATION FORM SHALL BE COMPLETE
- D. NO ADDITIONAL BOOSTER PUMPS SHALL BE INSTALLED FOR THE DOMESTIC LINE.

ALL MAINTENANCE SHOULD COMPLY WITH THE MOST CURRENT OHIO FIRE CODE AND NFPA 25.

E. FIRE LINE MAINTENANCE SHALL BE PERFORMED BY A CERTIFIED FIRE LINE CONTRACTOR THROUGH THE OFFICE OF THE STATE FIRE MARSHALL.

F. TESTING OF FIRE LINES SHALL BE PERFORMED BY A STATE-APPROVED FIRE LINE INSTALLER.

E. A CERTIFIED FIRE LINE CONTRACTOR LICENSED THROUGH THE OFFICE OF THE STATE FIRE MARSHALL SHALL PERFORM THE WORK.

SPRINKLER NOTES

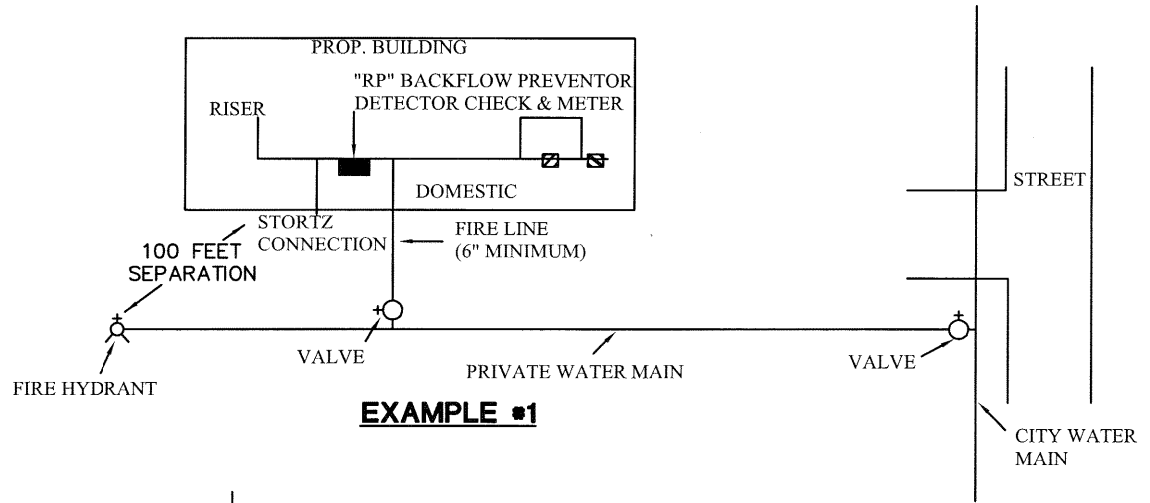
- A. SUBMIT TO: MIAMI COUNTY BUILDING DEPARTMENT.
- B. HYDRAULIC CALCULATIONS FROM THE SPRINKLER SYSTEM DESIGNER SHALL BE SUBMITTED TO THE FIRE DEPT. WITH THE SITE PLAN FOR REVIEW.
- C. INSTALLATION OF A FLOW SENSOR MONITOR WILL BE REQUIRED TO REPORT TO AN APPROVED MONITORING SYSTEM. (I.E. POLICE, PRIVATE STATION, ETC.)
- D. THERE SHALL BE AN EXISTING OR NEW HYDRANT INSTALLED WITHIN 100 FEET OF THE SIAMESE CONNECTION AND NO CLOSER THAN 25 FEET OF A BUILDING. EXCEPTIONS MUST BE SUBMITTED TO THE CITY FIRE PROTECTION OFFICIALS.
- E. A 6 INCH FIRE LINE MAY HAVE A ONE-INCH MAXIMUM DOMESTIC TAP AND AN 8 INCH FIRE LINE MAY HAVE A 2 INCH MAXIMUM DOMESTIC TAP. ALL DOMESTIC TAPS MUST BE INSTALLED BEFORE THE FIRE SPRINKLER RISER.

NOTES

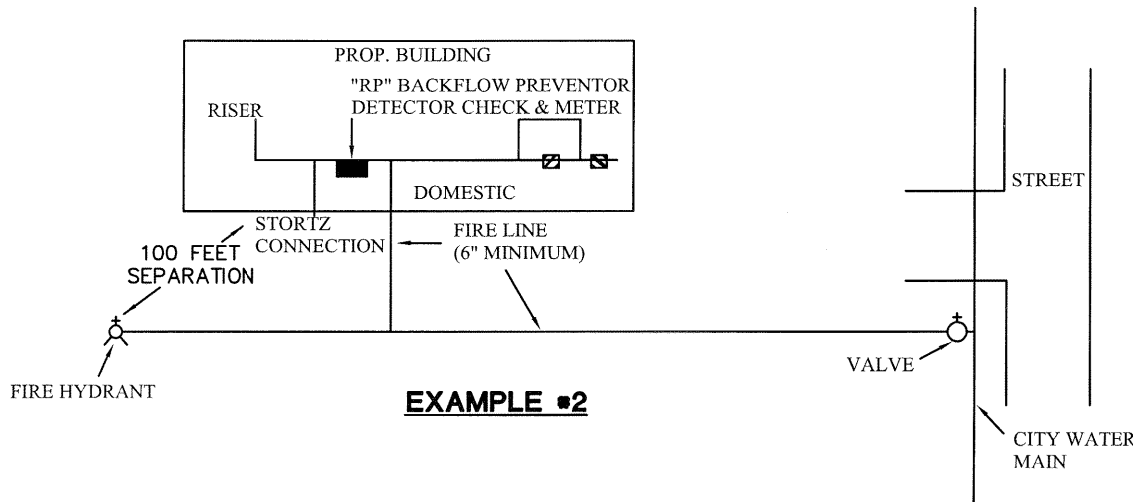
- A. THE FIRE LINE SHALL BE DEFINED AS "THE LINE FROM THE RISER INSIDE THE BUILDING TO THE FIRST VALVE ON THE SYSTEM."
- B. MINIMUM FIRE LINE SIZE SHALL BE 6 INCHES.
- C. A 1 INCH DOMESTIC TAP CAN BE MADE ON A 6 INCH FIRE LINE AND A 2 INCH DOMESTIC TAP ON AN 8 INCH FIRE LINE. TAP MUST BE MADE PRIOR TO BACKFLOW PREVENTOR.
- D. A FIRE HYDRANT SHALL BE INSTALLED WITHIN 100 FEET OF THE STORTZ CONNECTION.
- E. FIRE LINE CHARGES SHALL BE BASED ON SIZE OF RISER.
- F. CONTRACTOR SHALL INSTALL A REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTOR ON FIRE LINE PRIOR TO RISER.
- G. LIMITED AREA SPRINKLERS SHALL BE CONNECTED BEFORE METER.
- H. DOMESTIC SERVICE SHALL INCLUDE BACKFLOW PREVENTOR PRIOR TO METER. WATER METER SHALL HAVE BYPASS AND STRAINER.
- I. ALL MATERIAL AND CONSTRUCTION METHODS SHALL CONFORM TO CITY STANDARDS.
- J. PRIVATE WATER MAIN SHALL REMAIN PRIVATE UNLESS ACCEPTED BY THE CITY AND AN EASEMENT IS GRANTED.
- K. ALL FIRE LINES SHALL BE TESTED AT 200 PSI. SEE HYDROSTATIC TEST ON PAGE 800-5 FOR ADDITIONAL REQUIREMENTS. FIRE DEPARTMENT OR CITY OF PIQUA WATER DEPARTMENT TO WITNESS TEST.

TESTING PROCEDURES FOR EXAMPLE #1

- A. FIRE LINE SHALL BE INSTALLED, INSPECTED AND CERTIFIED BY A STATE LICENSED FIRE LINE INSTALLER.
- B. PRIVATE WATER MAIN CAN BE INSTALLED BY THE GENERAL CONTRACTOR AND MUST BE INSPECTED BY THE CITY. CONTRACTOR SHALL PRESSURE TEST MAIN AND OBSERVED BY THE CITY. CITY SHALL PERFORM DISINFECTION AND BACTERIA TEST ON BOTH THE FIRE LINE AND PRIVATE WATER MAIN AFTER PRESSURE TEST HAVE BEEN PERFORMED AND APPROVED.



EXAMPLE #1



EXAMPLE #2

TESTING PROCEDURES FOR EXAMPLE #2

- A. ENTIRE WATER LINE SHALL BE CONSIDERED THE FIRE LINE PER THE DEFINITIONS.
- B. THE ENTIRE FIRE LINE SHALL BE INSTALLED, INSPECTED AND CERTIFIED BY A STATE LICENSED FIRE LINE INSTALLER.
- C. SEE PAGE 800-5.

CITY OF PIQUA

CHOICE ONE ENGINEERING

FIRE LINE DETAIL AND NOTES

REVISIONS:

DATE APPROVED:
AUG. 2008

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