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A. ROMAC, FORD, OR MUELLER SERVICE SADDLE WITH C.C. THREAD TO BE USED ON ALL MAINS 4" DIA. AND LARGER. ALL NEW TAPS ON EXISTING WATER MAINS SHALL BE DONE BY THE CITY OF EVERETT UTILITIES DEPARTMENT AT THE DEVELOPERS OR CONTRACTORS EXPENSE.

B. CORPORATION STOP:
3/4" OR 1" - FORD FB600, OR CITY APPROVED EQUAL.

C. FORD SERIES LAO-2-33S NL FOR 3/4" OR LAO2-44S-NL FOR 1" BEND FITTING (1/8 OR 1/4) FOR FLARE x FLARE COPPER. PHYSICAL BENDS IN POLYETHYLENE PIPE ARE NOT ALLOWED. USE APPROPRIATE 1/4 OR 1/8 BENDS PER NOTE B ABOVE.

D. USE MUELLER H-15073 N INSTA-TITE FITTING OR CITY APPROVED EQUAL FOR IPS-PE PLASTIC PIPE X FEMALE COPPER FLARE THREAD.

E. RESIDENTIAL SERVICE:
1. PROVIDE 3/4" OR 1" POLYETHYLENE TUBING MEETING THE FOLLOWING REQUIREMENTS:
   a. AWWA C901.
   b. ASTM D2239, SDR 7, FOR ID IRON PIPE SIZE (IPS).
   c. ASTM 3350 - PE3608 OR PE4710.
2. PROVIDE A #10 AWG, SINGLE STRAND COPPER WIRE WITH BLUE TYPE UF OR USE COATING SUITABLE FOR DIRECT BURY.
   a. WRAP WIRE AROUND TUBING, ONE WRAP PER FT, ITS ENTIRE LENGTH.
   b. SECURE ONE END AROUND THE SADDLE BOLT BETWEEN TWO NUTS AND EXPOSE A MINIMUM OF 18" OF THE OTHER END IN THE METER BOX.

F. NON-RESIDENTIAL SERVICE:
1. PROVIDE 3/4" OR 1" TYPE K COPPER TUBING MEETING ASTM B88, ANSI/NSF 61 & APPLICABLE IAPMO STANDARDS.

G. USE 1/4 OR 1/8 BEND BRASS ST BEND WITH MUELLER H-15426 N INSTA-TITE FITTING OR CITY APPROVED EQUAL FOR IPS-PE PLASTIC PIPE X MALE IRON PIPE THREAD.

H. 3/4" METER SETTER SHALL BE "A.Y. MCDONALD" 62-212WWDD33-15 OR APPROVED EQUAL.
1" METER SETTER SHALL BE "A.Y. MCDONALD" 62-415WWDD44-15 OR CITY APPROVED EQUAL.

I. METERS SHALL BE SUPPLIED AND INSTALLED BY CITY UTILITIES DEPARTMENT AT THE DEVELOPERS OR CONTRACTOR EXPENSE.

J. PROVIDE METER BOX BODY MANUFACTURED BY "RAVEN PRODUCTS, FOR A 3/4" USE MODEL RMB-11-18-12, FOR A 1" USE MODEL RMB-15-27-12", MOUSEHOLES CUT, WITH AASTHO H-20 RATED DI FLUSH SOLID COVER LID OR EQUAL.

K. PLACE SAWDUST IN METER BOX AROUND PIPE TO TOP OF METER TO PREVENT FREEZING.
2" METERED WATER SERVICE

NOTES

A. ROMAC, FORD OR MUELLER DOUBLE STRAP SERVICE SADDLE WITH I.P. THREAD TO BE USED ON ALL MAINS 4" DIA
AND LARGER. ALL NEW TAPS ON EXISTING WATER MAINS SHALL BE DONE BY THE CITY OF EVERETT UTILITIES
DEPARTMENT AT THE DEVELOPERS OR CONTRACTORS EXPENSE.

B. 2" BRASS NIPPLE.

C. HEAVY DUTY 2" GATE VALVE WITH RESILIENT SEAT AND 2" OPERATING NUT. GATE VALVES SHALL BE "WATEROUS"
SERIES 2500 OR CITY APPROVED EQUAL.

D. MUELLER H-15451N OR H-15428N OR APPROVED EQUAL. USE APPROPRIATE STAINLESS STEEL INSERT STIFFENER
WITH POLYETHYLENE TUBING. PHYSICAL BENDS IN POLY PIPE ARE NOT ALLOWED, USE BRASS ELBOWS.

E. RESIDENTIAL SERVICE
   1. PROVIDE 2" POLYETHYLENE TUBING MEETING THE FOLLOWING REQUIREMENTS:
      a. AWWA C901.
      b. ASTM D2737, SIDR 9 (pe3608/4710).
      c. ASTM 3350 - PE3608 OR PE4710.
   2. PROVIDE A #10 AWG, SINGLE STRAND COPPER WIRE WITH BLUE TYPE UF OR USE COATING SUITABLE FOR
      DIRECT BURY.
      a. WRAP WIRE AROUND TUBING, ONE WRAP PER FT. ITS ENTIRE LENGTH.
      b. SECURE ONE END AROUND THE SADDLE BOLT BETWEEN TWO NUTS AND EXPOSE A MINIMUM OF 18"
      OF THE OTHER END IN THE METER BOX.

F. NON-RESIDENTIAL SERVICE
   1. PROVIDE 2" TYPE K COPPER TUBING MEETING ASTM B88, ANSI/NSF 61 & APPLICABLE IAPMO STANDARDS.

G. BRASS ELBOWS & NIPPLES AS NEEDED.

H. METER SETTERS SHALL BE "FORD" 70 SERIES COPPER SETTER VBH77-12B-11-77 WITH HORIZONTAL INLET AND
OUTLET OR APPROVED EQUAL.

I. METER SHALL BE SUPPLIED AND INSTALLED BY CITY UTILITIES DEPARTMENT AT THE DEVELOPERS OR CONTRACTORS
EXPENSE.

J. PROVIDE METER BOX BODY MANUFACTURED BY "RAVEN PRODUCTS, MODEL RMB-17-30-12", MOUSEHOLES CUT,
WITH AASTHO H-20 RATED DUCTILE IRON FLUSH SOLID COVER LID OR EQUAL.

K. PLACE SAWDUST IN METER BOX AROUND PIPE TO TOP OF METER TO PREVENT FREEZING.

L. ADJUSTABLE VALVE BOX AND EXTENSION SEE STD 505.
PARTS:
A. DUCTILE IRON PIPE

B. TEE (MJ W/MEGA LUGS x FL)

C. FLANGE COUPLING ADAPTOR (FLxMI)

D. METER ASSEMBLY SEE NOTE 2

E. GATE VALVE (FLxMI W/MEGA LUG) WITH ADJUSTABLE VALVE BOX AND EXTENSION SEE STANDARD DRAWING 505

F. 90° ELL (MI W/MEGA LUGS)

G. UTILITY VAULT CO LID 332P WITH TRAFFIC LOADED LOCKING STEEL COVERS OR CITY APPROVED EQUAL. PROVIDE NON-SLIP COVER IF VAULT IS LOCATED IN PEDESTRIAN WALKWAY.

H. UTILITY VAULT CO PRECAST VAULT OR CITY APPROVED EQUAL.

I. 2" FLOOR DRAIN. SLOPE TO DAYLIGHT OR TO STORM DRAINAGE SYSTEM.

J. NON-SHRINK GROUT

K. 1" CORPORTION AND SERVICE SADDLE IN ACCORDANCE WITH COE STD DWG 502C PARTS A & B.

L. 1" DRAIN LINE.

M. 1" 90° BEND.

NOTES
1. CONTRACTOR SHALL INSTALL VAULT, BYPASS, AND STRAIGHT PIPE THRU VAULT. CITY UTILITIES DEPARTMENT SHALL PROVIDE AND INSTALL ALL FITTINGS AND APPURTANCES WITHIN THE VAULT INCLUDING METER, AND VALVES AT THE DEVELOPERS OR CONTRACTORS EXPENSE.

2. CITY OF EVERETT WILL SUPPLY AND INSTALL METER AND ACCESSORIES REQUIRED TO COMPLETE CONNECTION.

3. PIPING AND METERS SHALL BE SUPPORTED BY STEEL STANDS. THE NUMBER OF AND PLACEMENT OF SUPPORT STANDS TO BE DETERMINED BY CITY OF EVERETT UTILITIES DEPARTMENT ACCORDING TO SIZE OF PIPE AND METER.

4. VAULTS SHALL NOT BE INSTALLED IN AREAS WITH VEHICULAR TRAFFIC UNLESS APPROVED BY THE CITY.

5. GATE VALVES SHALL BE “WATEROUS” SERIES 2500 OR CITY APPROVED EQUAL.
NOTES
1. CONTRACTOR SHALL INSTALL VAULT, BYPASS, AND STRAIGHT PIPE THRU VAULT. CITY UTILITIES DEPARTMENT SHALL PROVIDE AND INSTALL ALL FITTINGS AND APPURtenances WITHIN THE VAULT INCLUDING METER, VALVES AND SPOOLS AT THE DEVELOPERS OR CONTRACTORS EXPENSE.

2. CITY OF EVERETT WILL SUPPLY AND INSTALL METER AND NOTES "L", IF NEEDED, & "P".

3. PIPING AND VALVES SHALL BE SUPPORTED BY STEEL STANDS. THE NUMBER OF AND PLACEMENT OF SUPPORT STANDS TO BE DETERMINED BY CITY OF EVERETT UTILITIES DEPARTMENT ACCORDING TO SIZE OF PIPE AND METER.

4. VALVES SHALL HAVE A MINIMUM CLEARANCE OF 3" BETWEEN OPERATING NUT AND TOP OF VAULT.

5. VAULTS SHALL NOT BE INSTALLED IN AREAS WITH VEHICULAR TRAFFIC.

6. GATE VALVES SHALL BE "WATEROUS" SERIES 2500 OR CITY APPROVED EQUAL.

7. INSTALLATION OF COMPOUND METERS LARGER THAN 8" SHALL BE APPROVED BY THE CITY ON AN INDIVIDUAL BASIS.

PARTS
A. DUCTILE IRON PIPE.
B. TEE (MJ W/MEGA LUGS x FL).
C. FLANGE COUPLING ADAPTOR (FlxMj).
D. SPOOL (FlxFl).
E. GATE VALVE CL 125 (FlxFl) W/2" OPERATING NUT & ADJUSTABLE VALVE BOX WITH EXTENSIONS. SEE STD 505.
F. METER ASSEMBLY SEE NOTE 2.
G. GATE VALVE (FlxMj W/MEGA LUG) WITH ADJUSTABLE VALVE BOX AND EXTENSION SEE STD 505.
H. 90° ELL (MJ W/MEGA LUGS).
I. UTILITY VAULT CO LID 322P WITH TRAFFIC LOADED LOCKING STEEL COVERS OR CITY APPROVED EQUAL. PROVIDE NON-SLIP COVER IF VAULT IS LOCATED IN PEDESTRIAN WALKWAY.
J. UTILITY VAULT CO PRECAST VAULT OR CITY APPROVED EQUAL.
K. NON-SHRINK GROUT.
L. FLANGE x FLANGE SPOOL WITH TWO 2" TEST OUTLETS & BRASS PLUGS. LENGTH OF SPOOL TO BE 3 TIMES THE DIAMETER OF THE PIPE TO THE TEST PLUGS PLUS 5".
M. 1" CORPORATION AND SERVICE SADDLE IN ACCORDANCE WITH CITY STANDARD DRAWING 502, PARTS A & B.
N. 1" DRAIN LINE.
O. 1" 90° BEND W/ 1" BALL VALVE
P. STRAINER.
1. Valve operating nut extensions are required when the valve nut is more than three (3) feet below finished grade. Extensions are to be a minimum of one (1) foot long. Only one extension will be allowed per valve.

2. All valve operating nut extensions are to be made of steel, sized as noted, and painted with two (2) coats of metal paint.

3. Valve boxes in paved areas shall be cast iron, two piece units, East Jordan 8555 16" Top, 24" bottom and East Jordan 6800 Heavy Duty Lid w/ "WATER" on lid. In grass, non-paved or non-traffic areas use of plastic valve boxes, with cast iron lid as manufactured by Handley Industries are acceptable.

4. Use of plastic valve box extensions, as manufactured by Handley Industries are acceptable.
A. HYDRANTS AND ALL MATERIALS SHALL CONFORM TO AWWA STANDARDS AND SHALL BE OF STANDARD MANUFACTURE (MUeller SUPER CENTURION #250, WATEROUS PACER #WB67, OR CITY APPROVED EQUAL).

B. 5-1/4" VALVE MINIMUM.

C. 1-1/4" OPERATING NUT AND CAP NUT FOR 2-1/2" PORTS.

D. NATIONAL STANDARD THREAD ON 2-1/2" PORTS.

E. 5" STORZ FITTING WITH NATIONAL STANDARD THREAD ON THE 4-1/2" PORT.

F. IF HYDRANT RISES THROUGH CONCRETE, USE EXPANSION STRIP AROUND HYDRANT BARREL, PER STD PLAN 509. IN ADDITION, INSTALLATION OF THE HYDRANT ON PRIVATE PROPERTY SHALL EQUAL OR EXCEED THE STANDARDS FOR INSTALLATION OF PUBLIC FIRE HYDRANTS IN THE CITY OF EVERETT.

G. PROVIDE FOR VEHICULAR TRAFFIC PROTECTION WHEN NECESSARY PER STANDARD DRAWING 508.

H. STEAMER PORT TO BE FACING STREET OR ROADWAY FOR FIRE ENGINE ACCESS.

I. BREAK-OFF FLANGE TO BE 2"-4" ABOVE GROUND LEVEL.

J. INSTALL CONCRETE PAD AROUND HYDRANT IN UNPAVED, SOD AND ASPHALT AREAS PER STANDARD DRAWING 508.

K. HYDRANT CONNECTION PIPE TO BE DUCTILE IRON CLASS 52. ANY INTERMEDIATE JOINTS TO BE MJ WITH RETAINER GLANDS, OR FIELD LOCK GASKETS.

L. FIRE HYDRANTS SHALL BE PAINTED WITH TWO COATS OF HIGH GLOSS CATERPILLAR YELLOW, LUXLITE #6100-516 OR "RUST-OLEUM" #7448 OR APPROVED EQUAL. THE PORT CAPS WILL BE PAINTED BLACK.

M. PROVIDE FOR A MINIMUM OF 3' CLEAR ZONE AROUND HYDRANT.
1. CONCRETE SHALL BE CLASS 3000.

2. INSTALL 1/2" x 4" EXPANSION STRIP AROUND HYDRANT.

3. GUARD POSTS SHALL BE 6' LONG, 9" IN DIAMETER PRECAST CONCRETE OR 6' LONG, 6" DIAM SCH 40, CONCRETE FILLED CLASS 52 STEEL PIPE, PAINTED WITH TWO COATS OF KELLY-MOORE LUXLITE Q.D. ALKYD GLOSS ENAMEL #6100-516 CAT YELLOW OR CITY APPROVED EQUAL.

4. TOP OF GUARD POST SHALL BE LEVEL WITH TOP OF PUMPER PORT.

5. VALVE MARKER POST SHALL BE 42" PORTABLE TRAFFIC DELINEATOR POST W/TWO REFLECTOR STRIPS. THEY SHALL BE FURNISHED NEW AND UNUSED AND BURIED 24" DEEP, TO LEAVE 18" EXPOSED AS A MARKER POST THE LETTER "V" AND THE DISTANCE TO THE VALVE SHALL BE STENCILLED ON THE POST WITH 2" HIGH NUMERALS, WITH BLACK ENAMEL PAINT.

6. VALVE MARKER POSTS SHALL BE INSTALLED FOR ALL VALVES LOCATED IN UNIMPROVED OR UNPAVED AREAS. VALVE MARKER POSTS SHALL BE SET AS DIRECTED BY THE PUBLIC WORKS INSPECTOR IN A SAFE AND REASONABLY CONSPICUOUS LOCATION.

7. VALVE MARKER POSTS ARE NOT REQUIRED FOR AUXILIARY HYDRANT VALVES.
A. GIL INDUSTRIES SLIMLINE HYDRANT.  
SEE gilindustries.com/slimline.htm

B. 2" GIL INDUSTRIES ISO 9001 CERTIFIED BRONZE BODY BALL VALVE W/ CHROME PLATED BALL AND AUTOMATIC WEEP.

C. 2" BRASS NIPPLE

D. PROVIDE METER BOX BODY MANUFACTURED BY "RAVEN PRODUCTS, MODEL RMD-17-30-12", FLUSH SOLID COVER LID.

E. 2.5" NATIONAL STANDARD THREAD BRASS BUSHING WITH CAP AND CHAIN.

F. OPERATING LOCKWING. LOCK TO BE SUPPLIED BY CITY OF EVERETT UTILITIES DEPARTMENT.

G. VALVE BOX AND EXTENSION PER STANDARD DRAWING 505

H. HEAVY DUTY 2" GATE VALVE WITH RESILIENT SEAT. GATE VALVES SHALL BE "WATEROUS" SERIES 2500 OR CITY APPROVED EQUAL
NOTES

1. AIR-VAC UNIT AND BOX TO BE INSTALLED IN NON-TRAFFIC AREA.

2. USE MUELLER DOUBLE STRAP SERVICE CLAMP OR APPROVED EQUAL ON ALL MAINS LESS THAN 8" IN DIAMETER.

3. ALL PIPE FITTINGS BETWEEN MAIN AND UNION, AFTER AIR/VACUUM RELIEF VALVE, SHALL BE BRASS.

4. INSTALLATIONS FOR OTHER SIZE AIR/VACUUM RELIEF VALVES SHALL BE INDIVIDUALLY DESIGNED AND WILL REQUIRE APPROVAL BY THE CITY UTILITIES DEPARTMENT.

5. PAINT METER BOX LID AND RISER ASSEMBLY (2) COATS SAFETY YELLOW, OIL BASE ENAMEL- HAND BRUSH APPLIED. STENCIL RISER ASSEMBLY WITH "AV" AND SIZE OF AIR/VAC ASSEMBLY ON SIDE FACING ROADWAY IN 2" BLACK LETTERS.

6. AIR/VAC RELEASE VALVE ASSEMBLY SHALL BE INSTALLED AT HIGH POINT ON LINE. IF HIGH POINT FALLS IN LOCATION WHERE ASSEMBLY CANNOT BE INSTALLED, PROVIDE ADDITIONAL DEPTH TO CREATE NEW HIGH POINT.

7. CONCRETE VAULT PENETRATIONS SHALL BE CORE DRILLED AND GROUTED.

PARTS

A. CL 52 DUCTILE IRON PIPE WITH ROMAC, FORD OR MUELLER SERVICE SADDLE.

B. 1" FORD F600 SERIES CORPORATION STOP.

C. 1" TYPE "K" COPPER TUBING.

D. 1" FORD 602-44 ANGLE COUPLING.

E. 1" FORD B21-444 CURB STOP.

F. 1" BRASS NIPPLE.

G. 6" PVC PIPE.

H. 1" BRASS UNION.

I. 1" BRASS 90° ELL.

J. 1" COMBINATION AIR AND VACUUM RELIEF VALVE APCO 143-C, VALMATIC 201C OR EQUAL.

K. 2"X1" GALV REDUCER.

L. 2" GALV PIPE.

M. 2" STREET ELL (HORIZ).

N. 2" GALV 90° ELL (VERT).

O. 2" GALV RETURN BEND.

P. GALV BEEHIVE STRAINER GREENBURG P-24-08, FOR 2" PIPE.

Q. PROVIDE METER BOX BODY MANUFACTURED BY "RAVEN PRODUCTS, MODEL RMD-15-27-12", FLUSH SOLID COVER LID.

R. BACKFILL WITH SAWDUST TO BONNET.
SERVICE CONNECTION PLAN

A. 2" WATER MAIN SHALL BE POLYETHYLENE PER STANDARD DETAIL 502B. CONNECTION TO MAIN TO BE MADE PER STANDARD DETAIL 502B.

B. 2" BRASS MALE IRON PIPE THREAD X COMPRESSION FITTING WITH STAINLESS STEEL INSERT STIFFENER. COUPLING SHALL BE "FORD" C84-77 NL OR CITY APPROVED EQUAL.

C. 2" BRASS TEE (FIP).

D. BRASS HEX BUSHING 2" X SERVICE SIZE.

E. CORPORATION STOP SHALL BE FORD FB700 OR CITY APPROVED EQUAL.

F. METERED WATER SERVICE PER STANDARD 502A OR 502C.

G. #10 COPPER TRACE WIRE WRAPPED ALONG ENTIRE LENGTH (ONE WRAP PER FOOT) WITH ONE END WRAPPED AROUND THE SADDLE BOLT AND SECURED BETWEEN 2 NUTS, ON MAIN CONNECTION. THE OTHER END WILL BE EXPOSED IN THE METER BOX. A SCOTCH CAST ELECTRICAL SPLICE KIT TO BE USED TO SPLICE ALL WIRES WHERE REQUIRED. SCOTCH CAST ELECTRICAL SPLICE KITS SHALL BE 3M INSULATION DISPLACEMENT CONNECTORS OR CITY APPROVED EQUAL.

NOTES

- CONNECTION TO MAIN
- #10 COPPER TRACE WIRE WRAPPED ONCE AROUND SADDLE BOLT SECURED BETWEEN 2 NUTS
- 2" HEAVY DUTY GATE VALVE MUELLER # A2380-8 WITH 2" DRIVE BLOCK
- SERVICE CLAMP MUELLER BOUBLE STRAP OR APPROVED EQUAL
- WATER LINE
- 2" OD POLYETHYLENE (PE) PER AWWA C901, SDR9 (COPPER TUBE SIZE)
- #10 WIRE CHASER
- 2" HEAVY DUTY BRASS NIPPLE BRASS THREAD X COMPRESSION FITTING WITH STAINLESS STEEL INSERT STIFFENER. COUPLING SHALL BE "FORD" C84-77 NL OR CITY APPROVED EQUAL.
NOTES

1. STAINLESS STEEL TAPPING SLEEVES SHALL HAVE FULL CIRCLE SEAL.

2. ALL TEES AND VALVES TO BE WATER TESTED BEFORE TAP.

3. SIZE ON SIZE TAPS ALLOWED ONLY WITH MJ TAPPING TEES. ALL OTHER TAPS SHALL BE AT LEAST 2" SMALLER THAN THE EXISTING MAIN.

**Utility Vault C.C.**

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<tr>
<th>Size</th>
<th>Model</th>
<th>Cover</th>
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<tr>
<td>10&quot;</td>
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<td>5106-TL3-332P</td>
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**Parts**

1. Post Indicator Valve (PIV) painted red with tamper to fire alarm panel and with stenciled address (white, 2" high text).
2. Ductile iron pipe (sized as required) Class 52.
3. Schedule 40 galvanized steel wrapped w/6 Mil Plastic.
4. Class 52 DI tee fl x fl.
5. Swing check valve w/ball drip assembly.
6. Fire department connection (FDC), brass. Provide Knox locking caps. Exposed galvanized steel pipe to be painted red. Stencil address (white, 2" high text) on painted pipe.
7. All pipe through vault wall shall be core drilled and have a "link seal" (or approved equal).
8. OS & Y valves with tamper switch to alarm panel or chain and padlock.
9. 1-galv. ladder with pull-up ladder extension to be bolted to vault floor and to vault wall, mounted such that ladder is directly above the edge of access opening for ease of access.
10. UL-FM listed softseated wa state approved double check detector valve assembly including 2-o.s.&y resilient seated gate valves, test cocks, 3/4" brass or copper bypass with inline valves, 5/8" x 3/4" Neptune meter w/e-coder R9001, cu ft w/stub antenna & a 3/4" double check valve assembly.
11. State approved double check detector assembly.
12. RFCA (restrained flange coupling adapter).
13. Cutable padlock with key in Knox box.

**Notes**

1. Tee and gate valve required on main.
2. Single detector checks are not approved backflow prevention devices.
3. Assembly requires certification upon installation and re-certification annually by owner.
4. All test cocks must have brass plugs.
5. Round Manhole lids are not to be used.
6. Inside depth is to be kept at a minimum as per dimension in sketches above and/or as approved by City of Everett Utilities Department.
7. Meter shall be installed such that it can be read with access hatch open and without entering the vault.
8. All dimensions are minimum clearance.
9. All backflow devices will be installed in a vault outside the building unless otherwise approved by Utilities Superintendent.
10. Fire service piping from main to building shall be restrained.
11. Provisions for drainage of the vault shall be in the following order of precedence:
   A) Vault drain to daylight
   B) Vault drain to storm drain system (If practical)
   C) If no possible means of gravity drain, then install sump pump
12. Swing check valve on FDC line must be located in a vault. If outside of DCDA, vault must be in minimum 4’x4’ vault.
13. PIV location must be downstream of DCDA and upstream of FDC.
14. New FDC must be located within 75’ of a fire hydrant (or 100’ for an existing building being retrofit for sprinklers). New fire hydrant installation may be needed to meet code requirement.
1. TEE AND GATE VALVE REQUIRED ON MAIN.

2. SINGLE DETECTOR CHECKS ARE NOT APPROVED BACKFLOW PREVENTION DEVICES.

3. ASSEMBLY REQUIRES CERTIFICATION UPON INSTALLATION AND RECERTIFICATION ANNUALLY BY OWNER.

4. ALL TEST COCKS MUST HAVE BRASS PLUGS.

5. MAXIMUM HEIGHT OF ASSEMBLY IS FIVE FEET UNLESS AN OSHA APPROVED PLATFORM IS PROVIDED.

6. INSIDE DEPTH IS TO BE KEPT AT A MINIMUM AS PER DIMENSION IN SKETCHES ABOVE AND/OR AS APPROVED BY CITY OF EVERETT UTILITIES DEPARTMENT.

7. ALL DIMENSIONS ARE MINIMUM CLEARANCE REQUIREMENTS.

A. UL-FM LISTED SOFTSEATED WA STATE APPROVED DOUBLE CHECK VALVE ASSEMBLY INCLUDING:
   2-0.S. & Y RESILIENT SEATED GATE VALVES, AND TEST COCKS.

B. UNI-FLANGE WITH SET SCREWS OR MJ x FL ADAPTER WITH MEGALUG.

C. PRECAST CONCRETE VAULT WITH STEEL ACCESS HATCH (AS MANUFACTURED BY UTILITY VAULT CO OR AN APPROVED EQUAL). PROVIDE OSHA APPROVED HOT DIPPED GALVANIZED STEEL LADDER. INSTALL LADDER IN SUCH A WAY AS TO PROVIDE VAULT ACCESS THAT DOES NOT INTERFERE WITH INSTALLED EQUIPMENT OR MAINTENANCE THEREOF. PROVIDE NON-SLIP SURFACE ON ACCESS HATCH IF VAULT LOCATED IN PEDESTRIAN WALKWAY.

D. DUCTILE IRON PIPE (SIZED AS REQUIRED) CLASS 52.

E. WATER TIGHT GROUT SHALL BE USED IN ALL VAULT PENETRATIONS.

F. 2 - GALVANIZED ADJUSTABLE PIPE SUPPORTS FOR 2 1/2" DIA. AND LARGER PIPE.

G. MINIMUM 6" COARSE AGGREGATE, AASHTO GRADING NO. 4 PER WSDOT 9-03.1(4)(C).

H. 6" FLOOR OPENING FOR DRAIN.

I. 3" MIN CLEARANCE FROM UNDERSIDE OF VAULT LID TO STEM OF O.S. & Y WHEN FULLY OPEN.
1. TEE AND GATE VALVE REQUIRED ON MAIN.

2. ALL TEST COCKS MUST HAVE BRASS PLUGS.

3. MAXIMUM HEIGHT OF ASSEMBLY IS FIVE FEET UNLESS AN OSHA APPROVED PLATFORM IS PROVIDED.

4. MINIMUM INSIDE VAULT HEIGHT IS 78", OR AS APPROVED BY THE CITY UTILITIES DEPARTMENT.

5. METER SHALL BE INSTALLED SUCH THAT IT CAN BE READ WITHOUT ENTERING VAULT WITH ACCESS HATCH OPEN AND WITHOUT ENTERING THE VAULT.

6. ALL DIMENSIONS ARE MINIMUM CLEARANCE REQUIREMENTS.

7. ASSEMBLY REQUIRES CERTIFICATION UPON INSTALLATION AND RECERTIFICATION ANNUALLY BY OWNER.

A. UL-FM LISTED SOFTSEATED WA STATE APPROVED REDUCED PRESSURE DETECTOR ASSEMBLY INCLUDING: 2-O.S.& Y RESILIENT SEATED GATE VALVES, TEST COCKS, 3/4" BRASS OR COPPER BYPASS WITH IN LINE VALVES, 5/8" METER (METER TO READ IN CUBIC FEET), AND A 3/4" REDUCED PRESSURE BACKFLOW ASSEMBLY.

B. UNI-FLANGE WITH SET SCREWS OR MJ x FL ADAPTOR WITH MEGALUG OR GALVANIZED SHACKLE TO MAIN WITH 2-3/4" RODS, OR MJ RETAINER GLANDS.

C. HOT BOX OR APPROVED EQUAL. DEVICE CAN BE INSIDE BUILDING WITH PROPER DRAIN IN FLOOR AND WITH PRIOR APPROVAL.

D. DUCTILE IRON PIPE (SIZED AS REQUIRED) CLASS 52.

E. WATER TIGHT GROUT SHALL BE USED IN ALL VAULT PENEtrATIONS.

F. 2 - GALVANIZED ADJUSTABLE PIPE SUPPORTS FOR 2 1/2" DIA AND LARGER PIPE.

G. GRAVEL FOUNDATION AS REQUIRED.

H. DRAIN SHALL BE INSTALLED WITH APPROVED AIR GAP (SEE STANDARD DRAWING 519) AND BE ABLE TO BE BORE SIGHTED TO DAYLIGHT WHICH MUST BE ABOVE 100 YEAR FLOOD LEVEL. DRAIN WILL BE SIZED SO AS TO PROVIDE FREE GRAVITY DRAINAGE OF MAX DISCHARGE OF RELIEF VALVE PORT.

I. 3" MIN CLEARANCE FROM UNDERSIDE OF VAULT LID TO STEM OF OS&Y WHEN FULLY OPEN.
1. TEE AND GATE VALVE REQUIRED ON MAIN.

2. ALL TEST COCKS MUST HAVE BRASS PLUGS.

3. MAXIMUM HEIGHT OF ASSEMBLY IS FIVE FEET UNLESS AN OSHA APPROVED PLATFORM IS PROVIDED.

4. MINIMUM INSIDE VAULT HEIGHT IS 78", OR AS APPROVED BY THE CITY UTILITIES DEPARTMENT.

5. MAXIMUM HEIGHT OF ASSEMBLY FROM FLOOR IS FIVE FEET UNLESS AN OSHA APPROVED PLATFORM IS PROVIDED.

6. ALL DIMENSIONS ARE MINIMUM CLEARANCE REQUIREMENTS.

7. ASSEMBLY REQUIRES CERTIFICATION UPON INSTALLATION AND RECERTIFICATION ANNUALLY BY OWNER.

A. UL-FM LISTED SOFTSEATED WA STATE APPROVED REDUCED PRESSURE BACKFLOW ASSEMBLY INCLUDING: 2-0.5" & Y RESILIENT SEATED GATE VALVES, AND TEST COCKS.

B. UNI-FLANGE WITH SET SCREWS OR MJ x FL ADAPTOR WITH MEGALUG OR GALVANIZED SHACKLE TO MAIN WITH 2-3/4" RODS, OR MJ RETAINER GLANDS.

C. PRECAST CONCRETE ENCLOSURE WITH STEEL ACCESS HATCH (AS MANUFACTURED BY UTILITY VAULT CO OR AN APPROVED EQUAL). ABOVE GROUND INSTALLATIONS WILL: BE PROVIDED WITH 6'-6"x36" STEEL DOOR FOR ACCESS, THE EXTERIOR WILL BE PAINTED WITH AN APPROVED PAINT, PROVIDED WITH SUFFICIENT INSULATION TO PREVENT FREEZING AND SITE WILL BE PROVIDED WITH A 6' HIGH SECURITY FENCE WITH PEDESTRIAN AND VEHICLE GATES. SEMI-BURIED INSTALLATIONS WILL: BE PROVIDED WITH OSHA APPROVED LADDER. INSTALLED IN SUCH A WAY AS TO NOT INTERFERE WITH INSTALLED EQUIPMENT MAINTENANCE. PROVIDE NON-SLIP SURFACE ON ACCESS HATCH IF VAULT LOCATED IN PEDESTRIAN WALKWAY.

D. DUCTILE IRON PIPE (SIZED AS REQUIRED) CLASS 52.

E. WATER TIGHT GROUT SHALL BE USED IN ALL VAULT PENETRATIONS.

F. 2 - GALVANIZED ADJUSTABLE PIPE SUPPORTS FOR 2 1/2" DIA AND LARGER PIPE.

G. GRAVEL FOUNDATION AS REQUIRED.

H. DRAIN SHALL BE INSTALLED WITH APPROVED AIR GAP (SEE STD 519) AND BE ABLE TO BE BORE SIGHTED TO DAYLIGHT WHICH MUST BE ABOVE 100 YEAR FLOOD LEVEL. DRAIN WILL BE SIZED SO AS TO PROVIDE FREE GRAVITY DRAINAGE OF MAX DISCHARGE OF RELIEF VALVE PORT.

I. 3" MIN CLEARANCE FROM UNDERSIDE OF VAULT LID TO STEM OF OS&Y WHEN FULLY OPEN.
1. ALL INSTALLED AIR GAPS MUST BE WA DOH APPROVED.
2. THE HEIGHT OF THE AIR GAP MUST MEET THE CRITERIA IN TABLE A UNLESS OTHERWISE NOTED.
3. THE CITY UTILITIES DEPARTMENT MAY REQUIRE THE AIR GAP TO BE INCREASED IF INSTALLED WITHIN A BUILDING WHERE THE AIR PRESSURE IS ARTIFICIALLY MAINTAINED OR INCREASED.
4. AIR GAPS LESS THAN 1 INCH SHALL BE APPROVED ONLY AS A PART OF A LISTED DEVICE THAT HAS BEEN TESTED UNDER BACKSPHONAGE CONDITIONS WITHIN A VACUUM OF A MINIMUM OF 25 INCHES OF MERCURY.
5. TUBULAR SCREENS MAY BE ATTACHED OR THE SUPPLY LINE OUTLET MAY BE CUT AT A 45° ANGLE.
6. HOSES AND BYPASSES ARE NOT ALLOWED.
7. THE INSPECTION OF AIR GAPS SHALL BE INCLUDED IN THE YEARLY TESTING PROGRAM FOR BACKFLOW DEVICES.

### TABLE A

<table>
<thead>
<tr>
<th>D</th>
<th>AIR GAP (INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 0.5 INCH</td>
<td>1</td>
</tr>
<tr>
<td>&lt; 0.75 INCH</td>
<td>1.5</td>
</tr>
<tr>
<td>≥ 1 INCH</td>
<td>2 X D</td>
</tr>
</tbody>
</table>

**NOTES**
1. All test cocks must have brass plugs.
2. Test cocks must face up or sideways whichever is more accessible.
3. Provide non-slip surface on access hatch if vault is located in pedestrian walkway.

Parts
A. WA State approved double check valve assembly.
B. In non-traffic areas use:
   Precast concrete vault (Utility Vault Co 233-1A, or approved equal) or plastic valve box (Utility Vault Co 1324-12L or approved equal)
C. In traffic areas:
   A traffic loaded box must be used and location approved by the City of Everett prior to installation.
D. If a daylight drain cannot be provided there must be a 4" min layer of free draining gravel at the bottom of box.
E. Angles may be in or out of box so long as sufficient room is allowed at each end for valve operator and DCVA repair or maintenance.
A. DUCTILE IRON PIPE.
B. SPOOL (FLxFL), IF NEEDED.
C. NON-SHRINK GROUT.
D. FLANGE COUPLING ADAPTOR (FLxMJ) WITH MEGA LUG OR GALVANIZED SHACKLE TO MAIN WITH 2-3/4" RODS OR MJ RETAINER GLANDS.
E. TEE (FL).
F. GV SHALL BE WATEROUS 2500 OR APPROVED EQUAL.
G. PRV (FLxFL).
H. 90° ELL (ALL MJ WITH MEGA LUGS).
I. GV (FLxFL) SHALL BE WATEROUS 2500 OR APPROVED EQUAL.
J. PRV (FLxFL).
K. UTILITY VAULT CO LID WITH TRAFFIC LOADED LOCKING STEEL COVERS OR
L. UTILITY VAULT CO PRECAST VAULT OR APPROVED EQUAL.
M. 2" GRAVITY SUMP DRAIN EXTEND TO DAY-LIGHT OR TO STORM DRAINAGE SYSTEM.
N. 1/4" GAUGE TAPS WITH 1/4" BALL VALVES FOR ISOLATION.

NOTES
1. MINIMUM VAULT INSIDE HEIGHT SHALL BE 78", OR AS APPROVED BY THE CITY UTILITIES DEPARTMENT.
2. MINIMUM CLEARANCE BETWEEN PRV VALVES AND FLOOR SHALL BE 12".
3. PROVIDE LIQUID FILLED 2 1/2" PRESSURE GAUGES AMETEK SERIES 550L OR CITY APPROVED EQUAL.
4. ALL EQUIPMENT MUST BE RATED FOR SOURCE PRESSURE.
5. PIPING AND VALVES SHALL BE SUPPORTED BY Poured-IN-PeACE CONCRETE OR STEEL STANDS. NUMBER of AND PLACEcMENT Of STANDS to BE DETERMINED by CITY UTILITIES DEPARTMENT ACCORDING to VALVE SIZE.
6. BRAND, SIZE, MINIMUM CLEARANCES, TYPE Of PRV and ACCESSORIES to BE DETERMINED by CITY Of EVerETT UTILITIES DEPARTMENT.
7. PROVIDE NON-SLIP SURFACE on ACCESS HATCH IF VAULT IS LOCATED IN PEDESTRIAN WALKWAY.
1. Tee and gate valve required on main.

2. Single detector checks are not approved backflow prevention devices.

3. Assembly requires certification upon installation, and recertification annually by owner.

4. All test cocks must have brass plugs.

5. Maximum height of assembly from floor is five feet unless an OSHA approved platform is provided.

6. All dimensions are minimum clearance requirements.

7. Fire department pumper connection must be downstream of assembly.

8. The OSY valve cannot be used as a post indicator valve. (These are only part of the backflow assy.)

A. UL-FM listed soft seated WA state approved double check detector valve assembly which must be installed in the same orientation for which it was approved. Assembly to include: test cocks, 3/4" brass or copper bypass with in-line valves and a 5/8" remote meter. Meter to read in cubic feet, and be remoted to an external wall of building meter box.

B. Uni-flange with set screws or MJ x FL adapter with megalug restraint for both upstream and downstream of assembly.

C. Ductile iron pipe (sized as required) Class 52.

D. Two galvanized adjustable pipe supports for 2 1/2" dia and larger pipe.

E. A sufficiently sized floor drain or wall footing drain must be provided in the same room. Drain to slope to daylight or connect to storm drain system.

F. External door with key is required. Either a lockset in the door hardware or a key vault (i.e. Supra S.S.) with a 1 5/8" diameter x 1 1/8" length mortise cylinder. Mortise cylinder must accept the city standard “best” locking system. The width and height of the door(s) must exceed the width and height of the assembly. Clearance both inside and outside room must be sufficient to remove assembly intact. The assembly must be fully accessible (2ft min horizontal clearance to all walls and or equipment) for testing and repairs.

G. Flushing capabilities must be provided with a 2" flushing line downstream of assembly to outside or sufficiently sized internal drain.

H. Where assembly is to be located above external ground level, all bends required to lower inlet pipe to provide required external ground cover shall be flange fittings or be fitted with horizontal and vertical thrust restraints.

I. The room should be insulated with R-19 insulation or greater and heated to above freezing. Only construction materials that can withstand occasional submergence will be allowed.

NOTES

TYPICAL WHEN FIRE ROOM IS LESS THAN 70’ FROM MAIN
IBC DEFINED MULTIFAMILY OR COMMERCIAL STRUCTURES THAT ARE REQUIRED TO HAVE A FIRE SPRINKLER SYSTEM MUST HAVE A SEPARATE FIRE SERVICE. THE SIZE OF FIRE SPRINKLER SERVICE AND METER SHALL BE CALCULATED BY A CIVIL ENGINEER OR FIRE SPRINKLER DESIGNER WHO IS SOLELY RESPONSIBLE FOR THIS CALCULATION. FIRE SERVICES LARGER THAN 2" MUST CONFORM TO STANDARD DRAWINGS 515 AND 523. THE FIRE SERVICE SIDE OF THE SYSTEM MUST HAVE A WA STATE APPROVED BACKFLOW PREVENTION DEVICE.

SYSTEMS INSTALLED WITH THIS CONFIGURATION SHALL BE IN ACCORDANCE WITH NFPA 13R OR NFPA 13.

PROVIDE CUT-SHEET FOR DEVICE SHOWING MAKE AND MODEL WITH PERMIT SUBMITTAL.

IRC DEFINED SINGLE FAMILY, DUPLEX OR TOWNHOUSE STRUCTURES THAT ARE REQUIRED TO OR OPT TO HAVE A FIRE SPRINKLER SYSTEM MAY USE A SINGLE DOMESTIC WATER METER PER STANDARD DRAWING 501 OR 502. THE SIZE OF THE SERVICE METER SHALL BE CALCULATED BY THE CIVIL ENGINEER OR FIRE SPRINKLER DESIGNER, WHO IS SOLELY RESPONSIBLE FOR THESE CALCULATIONS. THE FIRE SERVICE SIDE OF THE SYSTEM MUST HAVE A WA STATE APPROVED BACKFLOW PREVENTION DEVICE, OR BE INSTALLED PER THE MULTIPURPOSE PIPING DIAGRAM. SYSTEMS INSTALLED IN THIS CONFIGURATION SHALL BE IN ACCORDANCE WITH NFPA 13D.

1 OR 2 UNITS

MULTIPURPOSE PIPING SYSTEM DIAGRAM FOR 1 OR 2 UNITS

1/2" MIN LINE (TYP)  
BATHROOM TOILET (TYP)  
(NO CONNECTION TO WASHING MACHINES ALLOWED IN FIRE SYSTEM)

10' MAX  
DEAD END

FLOW SWITCH TO OUTSIDE BELL ALARM

PRESSURE GAUGE

1/2" BALL VALVE  
SYSTEM DRAIN  
(TO OUTSIDE)

SINGLE CHECK VALVE  
(WEIGHTED)

1" OR LARGER DOMESTIC WATER SERVICE METER  
PER STANDARD DRAWING 501 OR 502

THIS IS A SCHEMATIC DIAGRAM OF THE MINIMUM REQUIREMENTS FOR A MULTIPURPOSE PIPING SYSTEM, PER NFPA 13D. ALL APPLICABLE CODES ARE TO BE FOLLOWED IN THE DESIGN AND INSTALLATION OF THE RESIDENTIAL PLUMBING. CONTACT THE CITY OF EVERETT FIRE MARSHAL'S OFFICE AT (425) 257-8124 OR (425) 257-8120 TO DISCUSS SPECIFIC PROJECTS.

REQUIRED:

- SINGLE CHECK VALVE. (PROVIDE CUT-SHEET OF CHECK VALVE WITH SUBMITTAL. CHECK VALVE SHALL BE WEIGHTED, NOT SPRING.)
- FLOW SWITCH TO OUTSIDE ALARM BELL. (PROVIDE CUT-SHEET OF CHECK VALVE WITH SUBMITTAL)
- 1/2" BALL VALVE SYSTEM DRAIN (TO OUTSIDE).
- PRESSURE GAUGE.
- 1/2" MIN LINES TO MINIMUM 2 TOILETS, AT LEAST ONE TOILET PER FLOOR, FOR EFFECTIVE FLOW THROUGH SYSTEM.

MULTIPURPOSE PIPING SYSTEM DIAGRAM FOR 3 UNITS OR MORE

IBC DEFINED MULTIFAMILY OR COMMERCIAL STRUCTURES THAT ARE REQUIRED TO HAVE A FIRE SPRINKLER SYSTEM MUST HAVE A SEPARATE FIRE SERVICE. THE SIZE OF FIRE SPRINKLER SERVICE AND METER SHALL BE CALCULATED BY A CIVIL ENGINEER OR FIRE SPRINKLER DESIGNER WHO IS SOLELY RESPONSIBLE FOR THIS CALCULATION. FIRE SERVICES LARGER THAN 2" MUST CONFORM TO STANDARD DRAWINGS 515 AND 523. THE FIRE SERVICE SIDE OF THE SYSTEM MUST HAVE A WA STATE APPROVED BACKFLOW PREVENTION DEVICE. SYSTEMS INSTALLED WITH THIS CONFIGURATION SHALL BE IN ACCORDANCE WITH NFPA 13R OR NFPA 13.

PROVIDE CUT-SHEET FOR DEVICE SHOWING MAKE AND MODEL WITH PERMIT SUBMITTAL.

3 UNITS OR MORE

MULTIPURPOSE PIPING SYSTEM DIAGRAM FOR 3 UNITS OR MORE
PARTS

A. METER/SAMPLING ASSEMBLY WILL BE INSTALLED BY CITY UTILITIES DEPARTMENT.

B. PLUG METER SETTER ON SERVICE SIDE WITH 3/4" BRASS PLUG.

INSTALL PARTS AND FITTINGS PER STANDARD DRAWING 501 UNLESS OTHERWISE NOTED.
REQUIRED FLOW & OPENINGS TO FLUSH PIPELINES *

<table>
<thead>
<tr>
<th>PIPE DIAMETER</th>
<th>FLOW REQUIRED TO PRODUCE 2.5 FT/S (APPROX.) VELOCITY IN MAIN</th>
<th>NUMBER OF TAPS ON PIPE **</th>
<th>NUMBER OF 2 1/2&quot; HYDRANT OUTLETS USING 2 1/2&quot; DIA SUPPLY HOSE</th>
<th>*** MAXIMUM LENGTH OF SUPPLY HOSE</th>
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<tbody>
<tr>
<td>IN</td>
<td>GPM</td>
<td>1</td>
<td>1 1/2</td>
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<tr>
<td>12</td>
<td>900</td>
<td>-</td>
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</table>

* WITH A 40-PSI PRESSURE IN THE MAIN AND THE HYDRANT FLOWING TO ATMOSPHERE, A 2-1/2 IN. (64MM) HYDRANT OUTLET WILL DISCHARGE APPROXIMATELY 1000 GPM; AND A 4-1/2 HYDRANT OUTLET WILL DISCHARGE APPROXIMATELY 2500 GPM.

** NUMBER OF TAPS ON PIPE BASED ON DISCHARGE THROUGH 5 FT OF GALVANIZED IRON (GI) PIPE WITH ONE 90° ELBOW.

*** ALTERNATE HOSE DIAMETERS AND LENGTHS MAY BE USED IF CALCULATIONS SUPPORTING THEIR USE ARE PREVIOUSLY APPROVED BY THE CITY UTILITIES DEPARTMENT.