<table>
<thead>
<tr>
<th>STD#</th>
<th>Title</th>
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<tbody>
<tr>
<td>850</td>
<td>Typical System Restraint Lengths</td>
<td>September 2017</td>
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<td>Harness Installation for Flange Fittings</td>
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<td>857</td>
<td>Fire Hydrant and Lateral</td>
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<td>858</td>
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<td>859</td>
<td>Temporary Blow Off and/or Metered Connection for Mains Under Construction</td>
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<td>Permanent Blow Off</td>
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<td>September 2017</td>
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<tr>
<td>863A</td>
<td>1&quot; High Density Polyethylene Water Service Lateral for 5/8&quot; x 3/4&quot; or 1&quot; Meter</td>
<td>September 2017</td>
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<tr>
<td>863B</td>
<td>1&quot; Copper Water Service Lateral for 5/8&quot; x 3/4&quot; or 1&quot; Meter</td>
<td>September 2017</td>
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<tr>
<td>863C</td>
<td>1-1/2&quot; High Density Polyethylene Water Service Lateral for 1&quot; Meter</td>
<td>September 2017</td>
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<tr>
<td>863D</td>
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<td>864</td>
<td>1-1/2&quot; High Density Polyethylene Dual Water Service Lateral</td>
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<td>866</td>
<td>4&quot; Water Service Lateral for 3&quot; Meter</td>
<td>September 2017</td>
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<td>867</td>
<td>4&quot; Water Service Lateral for 4&quot; Meter</td>
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<tr>
<td>868</td>
<td>6&quot; Water Service Lateral for 6&quot; Meter</td>
<td>September 2017</td>
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<tr>
<td>869</td>
<td>Combination Water Service Stub</td>
<td>September 2017</td>
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<td>874</td>
<td>Above Ground Double Check Valve Backflow Device</td>
<td>September 2017</td>
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<td>875</td>
<td>Below Ground Double Check Valve Backflow Device</td>
<td>September 2017</td>
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<tr>
<td>875F</td>
<td>Below Ground Inline Dual Check Valve Backflow Device</td>
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<tr>
<td>876</td>
<td>Reduced Pressure Backflow Device</td>
<td>September 2017</td>
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<td>No.</td>
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<td>Date</td>
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<tr>
<td>877</td>
<td>Gate Valve</td>
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<tr>
<td>878</td>
<td>Butterfly Valve and Tapping Valve</td>
<td>September 2017</td>
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<td>879</td>
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<td>September 2017</td>
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<td>880</td>
<td>Double Check Detector Fire Line Backflow Assembly</td>
<td>September 2017</td>
</tr>
<tr>
<td>881</td>
<td>Pressure Reducing Valve Assembly</td>
<td>September 2017</td>
</tr>
<tr>
<td>882</td>
<td>Surge Anticipator Valve and Pressure Relief Valve</td>
<td>September 2017</td>
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<tr>
<td>883</td>
<td>Combination Air and Vacuum/ Air Release Valve</td>
<td>September 2017</td>
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<tr>
<td>884</td>
<td>Water Meter for Private Non-Residential Systems</td>
<td>September 2017</td>
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<tr>
<td>885</td>
<td>Water Meter for Private Process and Evaporative Water Lines</td>
<td>September 2017</td>
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<td>886</td>
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<td>September 2017</td>
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<tr>
<td>887</td>
<td>4” Ductile Iron Multi-Service Manifold</td>
<td>September 2017</td>
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<tr>
<td>888</td>
<td>Above Ground Single Check Detector Assembly</td>
<td>September 2017</td>
</tr>
<tr>
<td>889</td>
<td>Water Service Anode</td>
<td>September 2017</td>
</tr>
</tbody>
</table>
RESTRAINED LENGTHS PROVIDED BY DESIGN ENGINEER SUPERSEDE THIS STANDARD

DEAD END & EACH SIDE OF A VALVE

VERTICAL BENDS

NOTES:

1. All joints within length "L" shall be restrained.
2. All tees shall have a concrete thrust block per Standard 854.
3. All four "branches" on a cross shall be restrained per the TEE branch length as shown.
4. Lengths shown assumes all pipes are installed at City Standard minimum depths. For Vertical bends, low side length provided is for a 1' drop.
5. Assumes safety factor of 1.5 and test pressure of 150 psi.
6. Assumes bedding and backfill is per Standard 215.
7. Restraint shown is for new piping, when connecting to existing piping utilize the appropriate City Standards for proper system restraint.
8. All joint restraints shall be per the Engineer's List of Approved Items or a City accepted submittal.
9. Where main is 12" or larger and area water pressure is 90 psi or greater, concrete thrust blocking per applicable City Standards, and restrained joints shall be installed.

CITY OF SANTA ROSA
TYPICAL SYSTEM RESTRAINT LENGTHS

SCALE: NULL DATE: Sept. 2017
OWN: DK APPROVED FILE NO.
CHK: RS STD.-850
Flange adapter

Underground socket pipe clamp

Pipe bedding

3" Clear

3'-0" Min

R=4" Min

Bearing area against undisturbed ground

(See table below)

6" Min

A

Flange x
Mechanical Joint
Gate Valve

Mechanical Joint plug
tapped for blow-off.

Concrete thrust block
(See table below)

Concrete shall extend at least
to the undisturbed earth at
both sides of trench.

---

**NOTE:**

1. Where possible, design a "Restained Joint System" per City Standards and Specifications in place of, or in addition to harness & tie rods.

2. All joints shown shall be restrained.

---

**MINIMUM DIMENSIONS**

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>TIE RODS</th>
<th>HARNESS BLOCK*</th>
<th>A BLOCK**</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>5/8&quot;</td>
<td>4 Sq. Ft. 2&quot;</td>
<td>4 Sq. Ft.</td>
</tr>
<tr>
<td>8&quot;</td>
<td>3/4&quot;</td>
<td>7 Sq. Ft. 3&quot;</td>
<td>7 Sq. Ft.</td>
</tr>
<tr>
<td>12&quot;</td>
<td>1-1/8&quot;</td>
<td>15 Sq. Ft. 3&quot;</td>
<td>15 Sq. Ft.</td>
</tr>
<tr>
<td>OVER 12&quot;</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* Bearing area below grade of pipe against undisturbed ground.

** Bearing area against undisturbed ground.
Tie rod to harness block – (See table below)

HARNESS FOR VALVE WITH PLUG

Concrete shall extend at least to the undisturbed earth at both sides of trench

Plugs for mains 12" and larger shall be held with angle iron as shown. Plugs with dilly lugs may be used on 6" & 8" mains

MINIMUM DIMENSIONS

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>TIE RODS</th>
<th>ANGLE IRON</th>
<th>* HARNESS BLOCK</th>
<th>A</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>5/8&quot;</td>
<td>3&quot;x3&quot;x1/4&quot;</td>
<td>4 Sq. Ft.</td>
<td>2'</td>
</tr>
<tr>
<td>8&quot;</td>
<td>3/4&quot;</td>
<td>3 1/2&quot;x3&quot;x1/4&quot;</td>
<td>7 Sq. Ft.</td>
<td>3'</td>
</tr>
<tr>
<td>12&quot;</td>
<td>1 1/8&quot;</td>
<td>4&quot;x3&quot;x1/2&quot;</td>
<td>15 Sq. Ft.</td>
<td>3'</td>
</tr>
</tbody>
</table>

OVER 12" BY THE DESIGN ENGINEER

* Bearing area below grade of pipe against undisturbed ground

NOTE:
Where possible, design a "Restrained Joint System" per City Standards & Specifications in place of, or in addition to harness & tie rods.
NOTES:

1. Where new and/or existing conditions allow, design a "Restained Joint System" per City Standards and Specifications in lieu of, or in addition to anchor blocks as shown.

2. Concrete anchor blocks shall be installed by the Contractor to withstand a thrust produced by the test pressure plus 50 p.s.i. Minimum dimensions for anchor bolts and clamps are listed on Table 1.

3. For pipes greater than 12" in diameter, bolts and clamps shall be properly sized by the Design Engineer, with calculations submitted to the City's Engineer.

4. Use mechanical restrained joints at all fittings.
NOTES:

1. Where new and/or existing conditions allow, design a "Restrained Joint System" in lieu of or in addition to concrete thrust blocks as shown.

2. Concrete blocking shall be poured to extend from bells of fittings to undisturbed soil, and the entire bearing area must be against undisturbed soil. Bolts and nuts shall be protected and kept clear of concrete.

3. In using Table 1, assume 2000 P.S.F. bearing capacity unless otherwise shown on the plans. The Design Engineer shall specify thrust blocking requirements for all other soil bearing conditions.

4. Safe bearing load of soil for horizontal thrust shall not be exceeded.

5. See Water Distribution Construction Specification for fitting type requirements.

6. Install mechanical joint plug or blind flange on leg(s) of tee or cross installed for future use.

7. For pipes greater than 12" in., concrete thrust blocks shall be properly sized by the Design Engineer, with calculations submitted to the City's Engineer.

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>MIN. REQ'D BEARING AREA IN SQ. FT. PER 100 P.S.I. TEST PRESSURE</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>MIN.</td>
</tr>
<tr>
<td>6&quot;</td>
<td>1000</td>
</tr>
<tr>
<td>8&quot;</td>
<td>1000</td>
</tr>
<tr>
<td>12&quot;</td>
<td>1000</td>
</tr>
</tbody>
</table>

* MULTIPLY NO. IN TABLE BY TEST PRESSURE & DIVIDE BY 100

CITY OF SANTA ROSA
CONCRETE THRUST BLOCKS for HORIZONTAL BENDS

SCALE: NONE    DATE: Sept. 2017
DRAW: GC    APPROVED
CHECK: RS    STD: 854
NOTES:

1. Residential fire hydrants shall have one 2-1/2" & one 4-1/2" outlet, and Commercial fire hydrants have one 2-1/2" & two 4-1/2" outlets.

2. Apply two coats of white paint to fire hydrant per Engineer’s Approved List, and in accordance with AWWA C503. Any damaged paint surfaces shall be corrected by touch up prior to acceptance.

3. Restrained joints are required for all new construction, from tee or saddle to hydrant bury. Thrust blocks are only required where existing services are being modified and restrained joints alone are not adequate.

4. Flanged riser spools may be installed below check valve to obtain proper grade. Spools used for this purposes shall not have break-off grooves.

5. If proposed hydrant lateral length is greater than 50 feet, contact Water Engineering.

6. Blue reflective raised pavement markers shall be placed 6 inches from the street centerline stripe, or at the approximate centerline of the street where there is no centerline stripe, on the side nearest the fire hydrant. When located near the corner of an intersection, this applies to both streets.

7. Private fire hydrants shall be constructed per NFPA Standards and as approved by Santa Rosa Fire.
NOTES:

1. Where no sidewalk exists, or where hydrant is installed in planter strip, a 4" thick 4’ x 4’ concrete pad shall be installed.

2. Hydrants to be a minimum of 10 feet from driveway approach in commercial or multi-family developments and a minimum of 5 feet from driveway approach in one or two family developments.
Bolts connecting low profile hydrant to break-off riser shall be set above finished grade with the nuts facing up.

Set mid point of break-off riser flush with top of pad ± 1".

Concrete sidewalk\Pad
(See Note 1 below)

Concrete block to be poured from 2" above bottom flange to 2" below top flange and shall extend to undisturbed ground as shown.

Hydrant check valve with break-off riser per Engineer’s Approved List

Bury shall be set plumb and stable prior to installation of check valve. Recheck hydrant for plumb prior to pouring concrete block around check valve.

**SECTION “A–A”**

![Diagram of hydrant system with annotations]

**PLAN VIEW**

Low Profile Fire Hydrant and lateral. (See Above)

Low pressure

Isolation valve

Standard Fire hydrant and lateral per Std. 857

High pressure

Water main

Water main

**NOTES**

1. Where no sidewalk exists, or where hydrant is installed in planter strip, a 4" thick 4’ x 4’ concrete pad shall be installed around the base of the hydrant.

2. Restrained joints are required for all new construction, from tee or saddle to hydrant bury. Thrust blocks are only required where existing services are being modified and restrained joints alone are not adequate.

3. Flanged riser spools may be installed below check valve to obtain proper grade. Spools used for this purposes shall not have break-off grooves.

4. Apply two coats of white paint to fire hydrant per Engineer’s Approved List, and in accordance with AWWA C503. Any damaged paint surfaces shall be corrected by touch up prior to acceptance.

5. Install min. of 10' from commercial or multi-family driveways and 5' from one or two family driveways.
8" to 10" for permanent connection by Contractor under Inspection by authorized City personnel

Temporary meter & double check valve installed by City Forces at the Contractor's expense.

Temporary connection between check valve assembly and blowoff to be made by the Contractor where temporary metered connection is required.

Install plug if metered connection is not required.

2" brass angle ball valve (F.I.P. x meter flange)

Existing main and blow-off assembly

(See Note 9)

(See Note 7)

Finished Grade

Pipe and fittings to be threaded galvanized iron.

New main (See Note 1)

Temporary wood blocking sufficient to hold test pressure.

NOTES:

1. End of new main to be on same line and grade as existing where feasible.
2. Wood blocking to be used for thrust produced by test pressure plus 50 P.S.I.
3. Safe bearing load of soil for horizontal thrust shall not be exceeded.
4. See Std. 861 for blowoff size chart. ("Blowoff" = pipe and fittings, up to and including valve.)
5. The Contractor shall make the final tie-in under the inspection of a City Utilities Dept. representative. Inspection fees must be paid prior to scheduling tie-in.
6. Should the blowoff on the existing main be located out of the traveled way as indicated on Std. 861, the temporary blowoff piping shall be extended out of the traveled way and the risers, meter, and check valve will be installed out of the traveled way.
7. Clearance to be 12" min. above finished grade or 6" above the inundation level, whichever is higher.
8. This installation is not acceptable when combustible material is stored on site or construction above grade begins. (See Standard 860 when fire flow is required.)
9. If blow off is 3", install 3" x 2" reducer.
NOTES:

1. This assembly shall be installed when combustible materials will be stored or constructed on-site prior to acceptance of the on-site water main by the City. Fire flow & access must be satisfactory to the City Fire Department.

2. The Contractor shall furnish the 6" meter and double check valve. The meter shall have a current certification by an approved testing facility upon arrival, and the double check valve shall be tested and certified on-site by a Certified Tester off the City’s Approved List of Testers. Written proof of a passing certification shall be provided to the City prior to activating the system. The Contractor is responsible for any fees and charges incurred.

3. Tie-in shall be made by the Contractor under inspection by authorized City personnel. Inspection fees must be paid prior to scheduling tie-in.

4. Meters to be gallon units only.

5. Clearance to be 12" min. above finished grade or 6" above the inundation level, whichever is higher.

6. Fire lines shall be flushed per City Standard Specifications and adequate fire flow provided prior to combustible materials being delivered to the site or construction beginning.
**APPROVED BOX & COVER**
(See Engineer's Approved List)

Tracer wire #12 copper W/2"-3" pigtail

Threaded galvanized pipe and pipe wrapped with 3M tape

Precast concrete meter box set flush with surface of ground.

2" or 3" Square head plastic plug—finger tight

2" or 3" Brass ball valve (See Engineer’s Approved List)

Set valve operator toward the long side of the box. Set valve grade above bottom of box and a min. 2" below lid.

Redwood support

Plug tapped on center for iron pipe size thread. (See Note 1)

**NOTES**

1. For 6" & 8" mains, M.J. plugs or caps with dilly lugs or starr bolts and 2" center tap may be used in lieu of angle iron. Install angle iron off-center to accommodate center tap.

2. Blow-off shall not be installed within the traveled way. If main ends within street area, blow-off to be extended to area outside of traveled way and installed as shown above.

3. Where possible, design a "Restrained Joint System" per City Standards and Specifications in lieu of, or in addition to harness and tie rods.

**PLAN**

Concrete shall extend at least to the undisturbed earth at both sides of trench.

**MINIMUM DIMENSIONS**

<table>
<thead>
<tr>
<th>PIPE SIZE</th>
<th>TIE RODS</th>
<th>ANGLE IRON</th>
<th>BEARING AREA</th>
<th>A</th>
<th>SIZE B.O.</th>
</tr>
</thead>
<tbody>
<tr>
<td>6&quot;</td>
<td>5/8</td>
<td>3&quot;x3&quot;x1/4&quot;</td>
<td>4 Sq. Ft.</td>
<td>2&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>8&quot;</td>
<td>3/4</td>
<td>3 1/2x3&quot;x1/4&quot;*</td>
<td>7 Sq. Ft.</td>
<td>3&quot;</td>
<td>2&quot;</td>
</tr>
<tr>
<td>12&quot;</td>
<td>1-1/8&quot;</td>
<td>4&quot;x3&quot;x1/2&quot;</td>
<td>15 Sq. Ft.</td>
<td>3&quot;</td>
<td>3&quot;</td>
</tr>
<tr>
<td>OVER 12&quot;</td>
<td>BY THE DESIGN ENGINEER</td>
<td></td>
<td></td>
<td></td>
<td>3&quot;</td>
</tr>
</tbody>
</table>

* (see note 1)

**CITY OF SANTA ROSA**

**PERMANENT BLOW-OFF**

Scale: 1" = 1'-0"

Drawn: WH RR

Approved: 9/27/2017

File No.: 861
NOTES

1. Restrained joints are required for all new construction from tee or saddle to 90' bend. Thrust blocks are only required where existing services are being modified and restrained joints are not used.

2. Elbow and riser pipe to be the same size as the main.
METER BOXES AND COVERS

(See Engineer's approved list)

Install Stainless Steel insert stiffeners at corstop and curbstop, Use McDonald 6133T or approved equal.

30° Min. Cover

3/4" ball valve corporation (See Engineer’s approved list)

Water main

Service saddle per Engineer's Approval List

City Forces to remove spacer pipe and install 5/8" x 3/4" or 1" meter when installation is for new development.

Meter box shall not have "mouse holes" or removed "maid-auteinns." Installations where mouse holes, broken out sections or cracks have been grouted will be rejected. 4" thick bedding of 3/4" drain rock.

Building service line to be Sch80 PVC, Type "K" hard or soft temper copper, or threaded brass. (See Note 6 & 8)

Spacer pipe, "no washers" (see table below)

Angle meter ball valve (See Table below) Set min. of 2" from box - each end.

Install tracer wire per City Construction Specifications. Connect to mainline tracer wire where possible, if mainline wire is not accessible wrap service wire 1 time around corporation stop and then by along lateral alignment without wrapping around tubing. Extend and coil 2' of wire in meter box.

NOTES

1. Unless otherwise specified plumb 1" service lateral for a 5/8" x 3/4" meter when use is for residential, or a 1" meter when use is for commercial. Where plans show a service lateral to be installed without specifying a City Standard, the Contractor shall request direction from the Engineer.

2. Bedding material shall be compacted to a minimum 90% relative compaction prior to tubing installation.

3. For new development, after testing the service lateral the Contractor shall install a Sch.80 PVC spacer with N.I.P. threads on both ends. The spacer shall have 1/2" # holes drilled through the pipe @ 2" C.C.

4. Meter box shall be set flush with surrounding surfaces.

5. Prior to setting water meter for new development projects the Water department requires the service address to be clearly marked on the top side lip of meter box with a permanent felt marker.

6. If connecting to a backflow device see specific backflow standard for piping requirements between meter and device. If existing line to be connected to is galvanized, use a dielectric fitting.

7. Water services and meter boxes shall be located away from driveways where possible, installations in driveways, or anywhere vehicular traffic may occur, must be approved by the Director of Santa Rosa Water. If so approved, the box & lid shall have at a minimum an AASHO H20 rating. All meter box and lid installations shall be per manufacturer’s recommendations, and shall comply with all applicable City Standards.

8. When not extending to a building, or connecting to a backflow device or an existing lateral, the Contractor shall extend the service lateral to a minimum of 12” behind future sidewalk or to back of P.U.E. and cap waterline. There shall be no bends or fittings under sidewalk and/or concrete planter strip. If the permanent service meter is requested prior to completion of the property side plumbing, at least 10 linear feet of service lateral shall be installed at a location safe from traffic and construction activities, and extended vertically to a minimum 24" above grade with a 3/4" hose bib on the end.

9. If 1" installation setup calls for 5/8" x 3/4" meter, Contractor to supply approved 1" x 3/4" meter adapters.

10. Where multiple boxes are set side-by-side see spacing requirements on Standard 887.

METER SETTING ASSEMBLY PARTS LIST

<table>
<thead>
<tr>
<th>METER SIZE</th>
<th>VALVES</th>
<th>SPACER BAR (SEE NOTE 3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot; x 3/4&quot;</td>
<td>1&quot; service x 3/4&quot; meter angle ball valve per Engineer's approved list</td>
<td>1&quot; x 7&quot;-3/4&quot; Sch. 80 PVC Pipe</td>
</tr>
<tr>
<td>1&quot;</td>
<td>1&quot; service x 1&quot; meter angle ball valve per Engineer's approved list</td>
<td>1-1/4&quot; x 11&quot; Sch. 80 PVC Pipe</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIZE OF METER</th>
<th>DIMENSION A</th>
<th>DIMENSION B</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot; x 3/4&quot;</td>
<td>9&quot;-11&quot;</td>
<td>14&quot;-15&quot;</td>
</tr>
<tr>
<td>1&quot;</td>
<td>9&quot;-11&quot;</td>
<td>14&quot;-15&quot;</td>
</tr>
</tbody>
</table>

CITY OF SANTA ROSA

1" HIGH DENSITY Polyethylene
WATER SERVICE LATERAL FOR
5/8" x 3/4" or 1" METERS

SCALE: NONE DATE: Sept. 2017
DRAW G.C. D.K. APPROVED FILE NO.
GROL. RS STD.863-A
METER BOXES AND COVERS

(See Engineer’s approved list)

1" blue poly coated type "K" soft temper copper water service tubing Continuous from corporation stop to angle meter ball valve. (no splices allowed)

1" Ball valve corporation stop per Engineer’s approved list

Water main

Service saddle per Engineer’s Approve List

City Forces to remove spacer pipe and install 3/8" x 3/4" or 1" meter when installation is for new development.

- Meter box shall not have "mouse holes" or removed "knock-outs". Installations where mouse holes, broken out sections or cracks have been grouted will be rejected.
- 4" thick bedding of 3/4" drain rock. (no contact with service tubing)

Building service line to be Sch 80 PVC Type “K” hard or soft temper copper, or threaded brass. (See Note 8 & 10)

Spacer pipe, "no washers" (see table below)

Set min. of 2" from box - each end.

<table>
<thead>
<tr>
<th>SIZE OF METER</th>
<th>DIMENSION A</th>
<th>DIMENSION B</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot; x 3/4&quot;</td>
<td>9&quot; - 11&quot;</td>
<td>14&quot; - 15&quot;</td>
</tr>
<tr>
<td>1&quot;</td>
<td>9&quot; - 11&quot;</td>
<td>14&quot; - 15&quot;</td>
</tr>
</tbody>
</table>

NOTES

1. This standard shall only be used where copper tubing is already specified for use, or when specifically called for on the plans or other contract documents. Where no specific standard is called out, install 1" service laterals per City Standard 883-A.

2. Bedding material shall be compacted to a minimum 90% relative compaction prior to tubing installation.

3. Unless otherwise specified, plum." service lateral for a 5/8" x 3/4" meter when use is for residential, or a 1" meter when use is for commercial.

4. Where copper tubing and this standard is specifically called for, 1" tubing shall be installed for both residential and commercial uses. If copper tubing is called for without a specific City Standard specified, the Contractor shall request direction from the Engineer prior to ordering material.

5. For new development, after testing the service lateral the Contractor shall install a Sch.80 PVC spacer with N.I.P. threads on both ends. The spacer shall have 1/2" & holes drilled through the pipe @ 2" O.C.

6. Meter box shall be set flush with surrounding surfaces.

7. Prior to setting water meter on new development projects the Water Department requires the service address to be clearly marked on the topside lip of meter box with a permanent felt marker.

8. If connecting to a backflow device see specific backflow standard for piping requirements between meter and device. If existing line to be connected to is galvanized, use a dielectric fitting.

9. Water services and meter boxes shall be located away from driveways where possible. Installations in driveways, or anywhere vehicular traffic may occur, must be approved by the Director of Water Service. If so approved, the box & lid shall have a AASHTO H20 rating. All meter box and lid installations shall be per manufacturer’s recommendations, and shall comply with all applicable City Standards.

10. When not extending to a building or connecting to a backflow or an existing lateral, the Contractor shall extend the service lateral to a minimum of 12" behind future sidewalk or to back of P.U.E. and cap watertight. There shall be no bends or fittings under sidewalk and/or concrete planter strip. If the permanent service meter is requested prior to completion of the property side plumbing, at least 10 linear feet of service lateral shall be installed at a location safe from traffic and construction activities, and extended vertically to a minimum 24" above grade with a 3/4" hose bib on the end.

11. If 1" installation setup calls for 5/8" x 3/4" meter, Contractor to supply approved 1" x 3/4" meter adapters.

12. Where multiple boxes are set side-by-side see spacing requirements on Standard 887.

METER SETTING ASSEMBLY PARTS LIST

<table>
<thead>
<tr>
<th>METER SIZE</th>
<th>VALVES</th>
<th>SPACER PIPE (SEE NOTE 5)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5/8&quot; x 3/4&quot;</td>
<td>1&quot; service x 3/4&quot; meter angle ball per Eng’s approved list</td>
<td>1/8&quot; x 7-3/4&quot; Sch. 80 PVC Pipe</td>
</tr>
<tr>
<td>1&quot;</td>
<td>1&quot; service x 1&quot; meter angle ball per Eng’s approved list</td>
<td>1-1/4&quot; x 11&quot; Sch. 90 PVC Pipe</td>
</tr>
</tbody>
</table>
NOTES

1. Service lateral bedding material to be compacted to minimum 90% relative compaction prior to installation of Polyethylene service tubing.

2. Unless otherwise specified on the plans, plumb 1-1/2" service for a 1" meter installation.

3. Meter box must be set flush with surrounding surfaces. Service address shall be clearly marked on top of meter box lip with a permanent felt marker prior to requesting meter set.

4. Water services and meter boxes shall be located away from driveways where possible. Installations in driveways, or anywhere vehicular traffic may occur, must be approved by the Director of Santa Rosa Water. If so approved, the box & lid shall have a MASHTO H20 rating. All meter box and lid installations shall be per manufacturer’s recommendations, and shall comply with all applicable City Standards.

5. Building Service line material shall be type "K" hard temper copper or threaded brass for at least the first 10 linear feet, 12" behind proposed sidewalk or to the back of P.U.E., whichever is farther. When not extending the service line to a building or connecting to a backflow device or an existing lateral, the Contractor shall cap the end watertight. There shall be no bends or fittings under curb, gutter, concrete planter strip or sidewalk unless first approved by the Director of Santa Rosa Water. If the permanent service meter is requested prior to completion of the property side plumbing, the service line shall be at least 10 linear feet in length and installed at a location safe from traffic and construction activities, and extended vertically to a minimum 24" above grade with a 3/4" hose bib on the end.

6. If connecting to a backflow device see specific backflow standard for piping requirements between meter and device. If existing line to be connected to is galvanized, use a dielectric fitting.

7. For new development, after testing the service lateral, the Contractor shall install a Sch.80 PVC spacer with NIP threads on both ends. The spacer shall have 1/2" holes drilled through the pipe @ 2" O.C.

8. If installation calls for 5/8" x 3/4" meter, Contractor to supply approved 1" x 3/4" meter adapters.

9. Where multiple boxes are set side-by-side see spacing requirements on Standard 887.

CITY OF SANTA ROSA

1-1/2" HIGH DENSITY POLYETHYLENE WATER SERVICE LATERAL for 1" METERS

SCALE: NONE DATE: Sept. 2017

DRAWN BY: APPROVED BY: FILE NO.
DNR/DS: CHK/RS: STD.863-C
METER BOXES AND COVERS
(See Engineer's approved list)

Meter box shall not have "mouse holes" or removed " knock-outs. Installations where mouse holes, broken out sections or cracks have been grouted will be rejected.

Service saddle and Ball Valve
Corporation Stop per Engineers' Approved List

1-1/2" Comp. x 1" M.I.P. Brass Reducer Coupling. (typ. of 2)

1-1/2" blue polyethylene coated type "K" hard temper copper tubing

1-1/2" comp. x comp. 90° brass elbow

1-1/2" type "K" hard temper copper

CITY OF SANTA ROSA
1-1/2" COPPER WATER SERVICE LATERAL FOR 1" METER

NOTES:
1. Unless otherwise specified on the plans, plumb 1-1/2" service for a 1" meter installation.
2. Service joints shall be minimized. Where joints are required due to service length and/or change of alignment, brass compression fittings shall be used.
3. For new development, after testing the service lateral, the Contractor shall install a Sch.80 PVC spacer with N.I.P. threads on both ends. The spacer shall have 1/2" holes drilled through the pipe @ 2" O.C.
4. Prior to setting water meter for new development projects the Water Department requires the service address to be clearly marked on the top side lip of meter box with a permanent felt marker.
5. Water services and meter boxes shall be located away from driveways where possible. Installations in driveways, or anywhere vehicular traffic may occur, must be approved by the Director of Santa Rosa Water. If so approved, the box & lid shall have a AASHTO H20 rating. All meter box and lid installations shall be per manufacturer's recommendations, and shall comply with all applicable City Standards.
6. Building Service line material shall be type "K" hard temper copper or threaded brass for at least the first 10 linear feet, 12" behind proposed sidewalk or to the back of P.U.E., whichever is farther. When not extending the service line to a building or connecting to a backflow device or an existing lateral, the Contractor shall cap the end watertight. There shall be no bends or fittings under curb, gutter, concrete planter strip or sidewalk unless first approved by the Director of Santa Rosa Water. If the permanent service meter is requested prior to completion of the property side plumbing, the service line shall be at least 10 linear feet in length and installed at a location safe from traffic and construction activities, and extended vertically to a minimum 24" above grade with a 3/4" hose bib on the end.
7. If connecting to a backflow device see specific backflow standard for piping requirements between meter and device. If existing line to be connected to is galvanized, use a dielectric fitting.
8. This standard shall only be used where 1-1/2" copper tubing is specifically called for. Where an 1-1/2" lateral is called for without specifying a City Standard, the Contractor shall seek direction from the Engineer.
9. If installation calls for 5/8" x 3/4" meter, Contractor to supply approved 1" x 3/4" meter adapters.
**SINGLE METER BOX INSTALLATION FOR DUAL 3/4" MANIFOLD**

**NOTES:**

1. If plans or site conditions call for copper installation, install lateral per Standard 863-B unless otherwise directed by the Engineer.
2. When not extending to a building or connecting to a backflow device or an existing lateral, the Contractor shall extend the service laterals to a minimum of 12" behind future sidewalk or to back of R.U.E. and cap watertight. There shall be no bends or fittings under sidewalk and/or concrete planter strip. If the permanent service meter is requested prior to completion of the property side plumbing, at least 10 linear feet of service lateral shall be installed at a location safe from traffic and construction activities, and extended vertically to a minimum 24" above grade with a 3/4" hose bib on the end.
3. Bedding material shall be compacted to a minimum 90% relative compaction prior to tubing installation.
4. For new development, after testing the service lateral the Contractor shall install a Sch. 80 PVC spacer with N.I.P. threads on both ends. The spacer shall have 1/2" # holes drilled through the pipe @ 2" O.C.
5. Meter box "knock-outs" shall not be removed for installation. Grouting of removed knock-outs, broken out sections or cracks will be rejected. Box shall be set at grade with surrounding surfaces.
6. Install solid lid with probe holes per City Standards and Specifications. If directed to install lid with inset read lid, box and read lid shall be centered over meters so both registers are easily visible.
7. If connecting to a backflow device see specific backflow standard for piping requirements between meter and device. If existing line to be connected to is galvanized, use a dielectric fitting.
8. Water services and meter boxes shall be located away from driveways where possible. Installations in driveways, or anywhere vehicular traffic may occur, must be approved by the Director of Santa Rosa Water. If so approved, the box & lid shall have a AASHTO H20 rating. All meter box and lid installations shall be per manufacturer's recommendations, and shall comply with all applicable City Standards.

**CITY OF SANTA ROSA**

1-1/2" HIGH DENSITY POLYETHYLENE DUAL WATER SERVICE LATERAL

**SCALE:** NONE **DATE:** Sept. 2017

**DMN: CC DJK** APPROVED **FILE NO.**

**CHK: RS** **STD.**-864
NOTES:

1. For new development, after testing building service line, Contractor to install galvanized spacer pipe with 2" flanges threaded on both ends. Drill 1/2" holes @ 2" O.C. through spacer pipe. Spacer assembly length is to outside of flanges. Do not install meter gaskets. City forces will remove spacer and install meter.

2. Meter box shall be set flush with surrounding surfaces. Service address shall be clearly marked on top of meter box lip with a permanent marker prior to requesting meter set.

3. Install tracer wire per City Construction Specifications. Connect to mainline tracer wire where possible. If mainline wire is not accessible start by wrapping service wire 1 time around area between saddle and corporation stop, and lay along lateral alignment without wrapping around tubing. Extend and coil 2' of wire in meter box.

4. Water services and meter boxes shall be located away from driveways where possible. Installations in driveways, or anywhere vehicular traffic may occur, must be approved by the Director of Santa Rosa Water. If so approved, the box & lid shall have a AASHTO H20 rating. All meter box and lid installations shall be per manufacturer's recommendations, and shall comply with all applicable City Standards.

5. Building Service line material shall be type "K" hard tempered copper or threaded brass for at least the first 10 linear feet, 12' behind proposed sidewalk or to the back of P.U.E., whichever is farther. When not extending the service line to a building or connecting to an existing lateral, the Contractor shall cap the end watertight. There shall be no bends or fittings under curb, gutter, concrete planter strip or sidewalk unless first approved by the Director of Santa Rosa Water. If the permanent service meter is requested prior to completion of the property side plumbing, the service line shall be at least 10 linear feet in length and installed at a location safe from traffic and construction activities, and extended vertically to a minimum 24" above grade with a 3/4" hose bib on the end.

6. If connecting to a backflow device use Type "K" hard tempered copper or threaded brass between the meter and backflow device. If existing line to be connected is galvanized, use dielectric fitting.

7. In general the service shall only have lateral joints where more than one length of tubing is necessary, or where bends are required for alignment changes.
NOTES:
1. This standard shall only be used where 2" copper tubing is already specified for use, or when specifically called for on the plans or other contract documents. Where no specific standard is called out Contractor to request direction from Engineer.

2. For new development, after testing building service line, Contractor to install galvanized spacer pipe with 2" flanges threaded on both ends. Drill 1/2" holes @ 2" O.C. through spacer pipe. Spacer assembly length is to outside of flanges. Do not install meter gaskets. City forces will remove spacer and install meter.

3. In general the service shall only have lateral joints where more than one length of tubing is necessary, or where bends are required for alignment changes.

4. Meter box shall be set flush with surrounding surfaces.

5. Prior to setting the water meter, the Water Department requires the service address to be clearly marked on the top side of meter box with a permanent felt marker.

6. Water services and meter boxes shall be located away from driveways where possible. Installations in driveways, or anywhere vehicular traffic may occur, must be approved by the Director of Santa Rosa Water. If so approved, the box & lid shall have a NASH identify #20 rating. All meter box and lid installations shall be per manufacturer's recommendations, and shall conform to all applicable City Standards.

7. Building Service line material shall be type "K" hard temper copper or threaded brass for at least the first 10 linear feet, 12" behind proposed sidewalk or to the back of P.U.E., whichever is farther. When not extending the service line to a building or connecting to an existing lateral, the Contractor shall cap the end water tight. There shall be no bends or fittings under curb, gutter, concrete planter strip, or sidewalk unless first approved by the Director of Santa Rosa Water. If the permanent service meter is requested prior to completion of the property side plumbing, the service line shall be at least 10 linear feet in length and installed at a location safe from traffic and construction activities, and extended vertically to a minimum 24" above grade with a 3/4" hose bib on the end.

8. If connecting to a backflow device use Type "K" hard tempered copper or threaded brass between the meter and backflow device. If existing line to be connected is galvanized, use dielectric fitting.
Valve box and riser
(See City Std. 877)

Tapping sleeve or tee

Concrete thrust block
required on all
installations
(See Std. 854)

Water main

PVC or Ductile iron pipe

Redwood blocking
as required

Concrete pier block

No gap between tier box

36" min.

17-5/8"

10" box extension
(See Engineer’s approved list)

Valve box and riser
(See City Std. 877)

Valve to be installed
only when backflow
prevented is not
required.

Depress line to meet
Building Dept.
requirements.

Redwood blocking
as required

Concrete pier block

4" bedding of 3/4" drain rock

Separation distances from 4" lateral to non-potable pipelines
shall be the same as if it were a water main.

<table>
<thead>
<tr>
<th>NO.</th>
<th>ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4&quot; Flange x MJ 90</td>
</tr>
<tr>
<td>2</td>
<td>4&quot; Flange x P.E. spool—length as required</td>
</tr>
<tr>
<td>3</td>
<td>4&quot; x 3&quot; Threaded Companion flange</td>
</tr>
<tr>
<td>4</td>
<td>3&quot; Brass close nipple</td>
</tr>
<tr>
<td>5</td>
<td>3&quot; Threaded Companion flange</td>
</tr>
<tr>
<td>6</td>
<td>3&quot; Galvanized Steel Pipe (See note 1)</td>
</tr>
<tr>
<td>7</td>
<td>3&quot; Steel flange</td>
</tr>
<tr>
<td>8</td>
<td>3&quot; Megaflex, or approved equivalent</td>
</tr>
<tr>
<td>9</td>
<td>3&quot; Flange x P.E. D.I.P. — length as req’d</td>
</tr>
<tr>
<td>10</td>
<td>AWWA C509/515 resilient wedge gate valve</td>
</tr>
<tr>
<td>11</td>
<td>3&quot; Meter by City Forces</td>
</tr>
</tbody>
</table>

APPROVED METER BOXES, EXTENSIONS AND COVERS
(See Engineer’s approved list)

APPROVED TAPPING SLEEVES
(See Engineer’s approved list)

NOTES:
1. Install solid wall galvanized steel spacer, with meter gaskets, for
testing. After testing drill 1/2" holes @ 2" O.C. through pipe. City
Forces to remove spacer bar & install 3" water meter. Do not
install meter gaskets.
2. Boxes located in traffic loading areas shall be AASHTO H20 rated. If
a box with a steel cover is approved for installation by the Water
Department they shall be installed so the steel cover is flush with
the surrounding finished surfaces. All box and lid installations shall
be per manufacturer’s recommendations, and shall comply with all
applicable City Standards.
3. Prior to meter set, address shall be clearly marked on top of
meter box with permanent marker.
4. Pipe openings in box/tier shall be neatly cut, do not break out or
use hammer. All annular spaces between box/tier and piping shall
be neatly grouted with an approved high strength non-shrink grout.
5. Restrained joints are required on all new piping from gate valve to
90° ell. Thrust blocks are only required where existing services
are being modified and restrained joints are not practical.
NOTES:

1. Install solid wall galvanized steel spacer, with meter gaskets, for testing. After testing drill 1/2" holes @ 2" O.C. through pipe. City Forces to remove spacer bar & install 4" water meter.

2. Boxes located in traffic loading areas shall be AASHTO H20 rated. If a box with a steel cover is approved for installation by the Water Department they shall be installed so the steel cover is flush with the surrounding finished surfaces. All box and lid installations shall be per manufacturer’s recommendations, and shall comply with all applicable City Standards.

3. Prior to meter set, address shall be clearly marked on top of meter box with permanent marker.

4. Pipe openings in box/tier shall be neatly cut, do not break out or use hammer. All annular spaces between box/tier and piping shall be neatly grouted with an approved high strength non-shrink grout.

5. Restrained joints are required on all new piping from gate valve to 90° all. Thrust blocks are only required where existing services are being modified and restrained joints are not practical.

<table>
<thead>
<tr>
<th>NO.</th>
<th>ITEM</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4&quot; Flange x MJ 90</td>
</tr>
<tr>
<td>2</td>
<td>4&quot; Flange x P.E. spool—length as required</td>
</tr>
<tr>
<td>3</td>
<td>4&quot; Galvanized Steel Pipe (See note 1)</td>
</tr>
<tr>
<td>4</td>
<td>4&quot; Steel Flange</td>
</tr>
<tr>
<td>5</td>
<td>4&quot; Megaflange or approved equivalent</td>
</tr>
<tr>
<td>6</td>
<td>4&quot; AMWA C509/515 resilient wedge gate valve</td>
</tr>
<tr>
<td>7</td>
<td>Meter by City Forces</td>
</tr>
</tbody>
</table>

APPROVED METER BOXES, EXTENSIONS AND COVERS

(See Engineer’s approved list)

APPROVED TAPPING SLEEVES

(See Engineer’s approved list)
NOTES:

1. Install solid wall galvanized steel spacer, with meter gaskets, for testing. After testing drill 1/2" holes @ 2" O.C. through pipe. City Forces to remove spacer bar & install 3" water meter.

2. Boxes located in traffic loading areas shall be AASHTO H20 rated. If a box with a steel cover is approved for installation by the Water Department they shall be installed so the steel cover is flush with the surrounding finished surfaces. All box and lid installations shall be per manufacturer's recommendations, and shall comply with all applicable City Standards.

3. Prior to meter set, address shall be clearly marked on top of meter box with permanent marker.

4. Pipe openings in box/tier shall be neatly cut, do not break out or use hammer. All annular spaces between box/tier and piping shall be neatly grouted with an approved high strength non-shrink grout.

5. Restrained joints are required on all new piping from gate valve to 90' ell. Thrust blocks are only required where existing services are being modified and restrained joints are not practical.

<table>
<thead>
<tr>
<th>NO.</th>
<th>ITEM</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>6&quot; D.I. 90° - Flange x M.J.</td>
</tr>
<tr>
<td>2</td>
<td>6&quot; D.I. Flange x P.E. spool - length as required</td>
</tr>
<tr>
<td>3</td>
<td>6&quot; Steel Flange</td>
</tr>
<tr>
<td>4</td>
<td>6&quot; Galvanized Steel Pipe (See note 1)</td>
</tr>
<tr>
<td>5</td>
<td>6&quot; Megaflange, or approved equivalent</td>
</tr>
<tr>
<td>6</td>
<td>6&quot; AWWA C509/515 resilient wedge gate valve</td>
</tr>
<tr>
<td>7</td>
<td>6&quot; Turbine meter by City Forces</td>
</tr>
</tbody>
</table>

APPROVED METER BOXES, EXTENSIONS AND COVERS
(See Engineer's approved list)

APPROVED TAPPING SLEEVES
(See Engineer's approved list)

Separation distances from 6" lateral to non-potable pipelines shall be the same as if it were a water main.
NOTES:

1. This standard applies to commercial and multi-residential developments where domestic, irrigation, or fire protection requirements are not established at the time of application.

2. Water Department approval must be obtained prior to installation.

3. Where a hydrant is required, install an 8" x 8" cross or 12" x 6" cross as appropriate. Where a hydrant is not required, install manifold connection per the appropriate service lateral Standard.

4. Orientation of fire hydrant outlets will be determined in the field by the Water Department.

5. Restrained joints are required on all new construction.
NOTES:
1. This standard applies to commercial and multi-residential developments where domestic, irrigation, or fire protection requirements are established at the time of application.
2. When referring to this standard, specify meter and detector check sizes and appropriate standard plans.
3. When field conditions preclude the installation of meters at or near the curb line, submit detailed plans of the proposed installation for Water Department approval. All meter installations must be within public right-of-way.
4. Where a hydrant is required, install 6" x 6" or 12" x 6" cross as appropriate. Where a hydrant is not required, install manifold connection per the appropriate service lateral standard.
5. Orientation of fire hydrant outlets shall be determined in the field by the Water Department.
6. Restained joints are required on all new construction.
NOTES

1. Water mains shall be located parallel to street centerlines unless conflicts with other underground facilities cannot be avoided.

2. Non-standard alignments must be approved by the Director of Santa Rosa Water prior to installation. Mainline valves, except hydrant valves and tapping valves, shall be on face of curb extended where feasible.

3. Install mains with constant alignment whenever possible, minimums from nearest outside edge of pipe are; 3' to lip of gutter; 4' to centerline of monuments; and 5' to outside edge of structures such as manholes.
TYPICAL END SEAL DETAIL

NOTES
1. Installations shall be per applicable manufacturer's recommendations and installation instructions.

TYPICAL PIPE AND SPACER INSTALLATION

NOTES
1. Install minimum three spacers per length of pipe.
2. Where conductor casing is existing R.C.P., stainless steel banded unfinished 2x4 redwood skids, made from con-heart grade lumber, may be installed, with the approval from the Water Department, in lieu of casing spacers. Redwood skids shall be a minimum of 4' long, notched to accommodate bands, with the leading edges beveled. There shall be a minimum of two bottom skids, side by side, and one top skid. Ends of skids shall be no more than 30" from pipe joints.

Specific installations may require filling of the annular space with dry blown sand.

Minimum size conductor casing for all approved pipe types

<table>
<thead>
<tr>
<th>Pipe Size</th>
<th>6&quot;</th>
<th>8&quot;</th>
<th>12&quot;</th>
<th>14&quot;</th>
<th>16&quot;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Casing Size (Inside φ)</td>
<td>16&quot;</td>
<td>18&quot;</td>
<td>24&quot;</td>
<td>24&quot;</td>
<td>30&quot;</td>
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<tr>
<td>Casing Wall Thickness</td>
<td>.375&quot;</td>
<td>.375&quot;</td>
<td>.375&quot;</td>
<td>.375&quot;</td>
<td>.500&quot;</td>
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</tbody>
</table>

SECTION "A-A"

CITY OF SANTA ROSA
WATER MAIN ENCASEMENT AND END SEAL
Installations of 2\textsuperscript{1/2} in. or less shall have type "K" hard temper copper or threaded brass piping and brass compression and/or threaded valves and fittings per applicable City standard. Installations of 3\textsuperscript{1/2} in. and greater shall have AWWA C509 gate valves and ductile iron piping with mechanical joint fittings below grade, and flanged fittings above. PVC pipe is not acceptable. Type "K" soft temper copper and compression fittings may be used below grade only from property side shut off to 90° elbow when tubing is 1\textsuperscript{1/2} in. or smaller.

NOTES:

1. This standard shall be used for all commercial installations requiring a double check valve type backflow preventer.
2. Approved double check valve assemblies shall be from the "List Of Approved Backflow Prevention Devices" (Latest Revision) by the University of Southern California Foundation For Cross-Connection Control & Hydraulic Research.
3. Double check valve assemblies are required on all services where, in the opinion of the Water Department, a potential intermediate hazard exists. Devices to be installed on all services to properties with wells.
4. If above ground installation is not feasible a request may be made to the Water Department for an installation per City Standard 875.
5. Double check valve assemblies shall typically be installed inline with the water meter and just behind the sidewalk. Where no sidewalk exists or installation at this location is not practical, double check valve assemblies shall be installed as close as possible to the water meter in a location that is safe from traveled ways. Any conflicts shall be brought to the attention of the Engineer and final location shall be determined by the Water Department.

6. The piping from the meter to the double check valve assembly and the double check valve assembly itself must be the same size as the meter unless otherwise approved by the Water Department.
7. Double check valve shall be equipped with shut off valves installed and tested as part of approved device assembly.
8. M.I.P. x F.I.P. 90° elbows (street ells) are not allowed for use on this installation.
9. Provide brass caps or plugs for all test cocks.
10. Minimum 12" long threaded brass nipple for 2\textsuperscript{1/2} in. and smaller, and 24" long ductile iron pipe for 3\textsuperscript{1/2} in. and greater.
11. Any enclosure, cover or screening for the backflow assembly must first be approved by the Water Department prior to installation.
12. For Residential Fire Line Requirements, if applicable, see details on City Standard 875.
13. Where multiple devices are installed side by side there shall be a minimum of 12" between devices. Where enclosures are installed over devices, devices shall be centered within, and there shall be a minimum of 4" between enclosures.
NOTES:

1. Upon written approval by the Water Department Director, this standard applies where there is a proposed residential connection to City water and there also may be an auxiliary water supply onsite, or where, in the opinion of the Water Department, a potential intermediate hazard may exist.

2. Upon written approval by the Fire Department, this standard applies where a residential fire sprinkler system is proposed. When approved, fire line to be installed in accordance with NFPA 13D.

3. Approved double check valve assemblies shall be from the "List Of Approved Backflow Prevention Devices" (Latest Revision) by the University of Southern California Foundation For Cross-Connection Control & Hydraulic Research.

4. Double check valve assemblies shall typically be installed inline with the water meter and just behind existing or proposed sidewalk. Where no sidewalk exists or installation at this location is not practical, assemblies shall be installed as close as possible to the water meter. Any conflicts shall be brought to the attention of the Engineer and final location shall be determined by the Water Department.

5. For 2" and smaller use brass compression and/or threaded fittings and threaded nipples. For 3" and larger use ductile iron fittings with mechanical joint connections below ground and flanged in the box.

6. Piping between property side shut off and backflow device shall be type "K" soft or hard temper copper for 1" and smaller, type "K" hard temper copper for 1-1/2" and 2", and ductile iron for 3" and larger. PVC will not be allowed. For all installations this piping shall be the same size as the meter unless otherwise approved by Water Department Engineering.

7. The device shall be centered in the box with a minimum of 2" clear between upper 90° elbows and box. The top of the highest point of the device shall be between 6" and 4" below the lid. Box shall not have "mouse holes" or removed "knock-outs", installations where mouse holes, broken out sections or cracks have been grouted will be rejected.

8. M.I.P. x F.I.P. 90° elbows (street elbows) are not allowed for use on this installation.

9. Provide brass caps or plugs for all test cocks.

10. Minimum 12" long threaded brass nipple for 2" and smaller, and 24" long ductile iron pipe for 3" and greater.

11. Compression fittings are not allowed on piping inside box.

Typical Residential Fire Line Connection Details

This installation allows the connection of the fire line to the domestic supply line near the residence.
NOTES:
1. In circumstances where existing piping meets fire suppression needs, new piping is not required.
2. This City standard applies to residential connections where residential fire sprinkler systems are installed. Where residential fire sprinkler systems are fully looped without dead ends, designed to circulate water with the domestic systems and approved by Santa Rosa Fire, no backflow device is required at occupancy. Backflow protection is still required for water to be provided to property during construction.
3. Inline dual check valves shall be installed adjacent to and on the property side of the sidewalk where applicable. Where no sidewalk exists, the inline dual check valve shall be installed as close as possible to the water meter location. Any conflicts shall be resolved by the City Water Department.
4. Inline dual check valves shall meet ASSE 1024 standards and shall be equipped with an upstream union and F.I.P. connections on both ends. Although a 1" inline dual check valve is required as a minimum size, the City may require the installation of a larger device for specific installations. No 3/4" valves with 1" connections will be accepted. All proposed valves and installation material shall be submitted to the Water Department for review. Device shall be installed so the serial number faces up at the 12 o'clock position.
5. Piping shall be same size as the water meter. New piping, if required, shall be type "L" or "K" hard temper copper and/or threaded brass. Where existing piping is PVC, it shall be replaced as specified and in compliance with California Plumbing Code and all applicable City Standards. New PVC tubing and/or fittings are not allowed.
6. New piping shall be "same size as inline dual check valve" type "L" or "K" hard temper copper and/or threaded brass. Connection to piping, as specified in note 5 above, shall take place behind and outside of the water meter box unless the surface above this location is concrete. Where concrete planter strip and/or sidewalk is present, the connection shall take place on the horizontal portion of the service line inside the meter box. Connections at any other location must be approved by the Water Department and every effort shall take place to avoid joints below concrete surfaces. Where the meter and inline dual check valve is the same size and all piping must be replaced, this connection is not required. Compression fittings may only be used on piping to be buried and/or to connect property side tubing to back of downstream union. New PVC tubing and/or fittings are not allowed. New installation shall be in compliance with California Plumbing Code and all applicable City Standards.
7. All new piping shall be lead free per existing City Standards.
8. Allowable connection types are; sweat, compression, threaded, propress and glued, per applicable pipe material.
9. The assembly, including union when required, shall be centered in the box.
10. Materials and installation of new piping shall be in compliance with California Plumbing Code.
11. Where new piping must start from inside of meter box, or whenever a new water meter box is installed, piping shall be lowered to pass under the box as shown. New water meter boxes shall not have manufactured "mouse holes", or their walls breached in any manner for piping installation.
12. When the existing service line, regardless of material, is shallow and breaches the wall of the water meter box but the box is not being replaced, the existing service line may be allowed to remain up to the connection point of the new backflow device. Please note that there could be specific conditions that may still require the replacement of the existing service line.
13. If damage occurs to a water meter box during construction the box shall be replaced. If an existing water meter box is damaged, the box shall be replaced and new piping shall be installed per note 11.

Fire Line Connection Details

This alternate installation allows the connection of the fire line to the domestic supply line with an inline dual check valve near the water meter. The check valve must be readily accessible.
NOTE:
1. Reduced pressure type backflow assembly shall be required as determined by Santa Rosa Water.
2. Approved backflow assemblies shall be from the “List Of Approved Backflow Prevention Devices” (Latest Revision) by the University of Southern California Foundation For Cross-Connection Control & Hydraulic Research.
3. Reduced pressure type backflow assemblies are required on all services where, in the opinion of the Water Department, a potential intermediate hazard exists. Device to be installed on all services to properties with wells.
4. Reduced pressure backflow assemblies shall typically be installed inline with the water meter and just behind the sidewalk. Where no sidewalk exists or installation at this location is not practical, double check valve assemblies shall be installed as close as possible to the water meter in a location that is safe from traveled ways. Any conflicts shall be brought to the attention of the Engineer and final location shall be determined by the Water Department.
5. The piping from the meter to the device, and the device itself shall be the same size as the meter unless otherwise approved by the Water Department.
6. Valves 2” & less shall be brass ball valves, and valves 3” & greater shall be resilient seat gate valves. When shut off valves on approved backflow assemblies are installed on their vertical risers, the bottom of the valves shall be a minimum of 4” above finished grade.
7. M.I.P. x F.I.P. 90” elbows (street ells) are not allowed for use on this installation.
8. Provide brass caps or plugs for all test cocks.
9. Minimum 12” long threaded brass nipple for 2” and smaller, and 24” long ductile iron pipe for 3” & greater.
10. Any enclosure, cover or screening for the backflow assembly must first be approved by the Water Department prior to installation.
11. Where multiple devices are installed side by side they shall have a minimum separation of 12”.
12. Where multiple devices are installed side by side there shall be a minimum of 12” between devices. Where enclosures are installed over devices, devices shall be centered within, and there shall be a minimum of 4” between enclosures.
VALVE STEM RISER FABRICATION NOTES

1. All welds to riser shaft shall be fillet welds all around as specified below.
2. All steel required for riser fabrication shall be structural steel per ASTM A36.

VALVE STEM RISER PARTS LIST

1. Valve operating nut or 1-7/8"x1-7/8"x2" high solid steel welded to top plate.
2. 3/16" thk x 7-1/2" dia. free spinning guide plate, with 3-3/8" dia. hole in center.
3. Two 3/16"x1-1/2"x1-1/2"x1-1/2"x5/8"L steel angle weld to two sides of riser shaft.
4. 2-1/2" x 3/16" square steel tubing length as required edge to weld to top plate.
5. 3" x 3" x 1/4" steel top plate. Riser shaft after guide plate is in place.

NOTES

1. Valves 2" and larger shall be resilient wedge gate valves per City Specification 132-1.05 unless otherwise approved by the Director of Santa Rosa Water.
2. All external valve bolts and nuts shall be stainless steel grade 304 or better.
3. Where valve is installed so that the top of the operating nut is 36" or less below finished grade, the valve stem riser is not required. Where valve stem riser is required the operating nut of the riser shall be 18" to 24" below grade. Risers of 12" in length or shorter shall not be used.
4. Where top of operating nut of valve will be 6" or less below finished grade, horizontal gate valve shall be installed unless otherwise approved.
5. For installation of tapping valve, or butterfly valve as approved by the Director of Santa Rosa Water, installation shall be per City Standard 878.
BUTTERFLY VALVE

To be used only upon approval from the Director of Santa Rosa Water

TAPPING SLEEVE & VALVE

TAPPING SLEEVES

(See Engineer's Approved List for Std. 866/867)

NOTES:
1. All external bolts and nuts on valve shall be stainless steel grade 304 or better.
2. Taps shall be scheduled through and made by Santa Rosa Water personnel only.

CITY OF SANTA ROSA

BUTTERFLY VALVE AND TAPPING VALVE
# BY-PASS PARTS LIST

<table>
<thead>
<tr>
<th>NO.</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>1.</td>
<td>3/4&quot; BRASS MALE HOSE BIB</td>
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</tr>
<tr>
<td>2.</td>
<td>3/4&quot; BRASS TEE – FIP x FIP x FIP</td>
<td>3</td>
</tr>
<tr>
<td>3.</td>
<td>3/4&quot; BRASS MTR SPUD – LENGTH AS NEEDED</td>
<td>2</td>
</tr>
<tr>
<td>4.</td>
<td>3/4&quot; BRASS MIP INLET X FIP OUTLET STRAIGHT CHK. VALVE</td>
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</tr>
<tr>
<td>5.</td>
<td>3/4&quot; BRASS MIP X COMP. COUPLING</td>
<td>1</td>
</tr>
<tr>
<td>6.</td>
<td>3/4&quot; TYPE &quot;K&quot; SOFT TEMPER COPPER AS NEEDED</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>3/4&quot; BRASS COMP. X MIP 90° ELL</td>
<td>4</td>
</tr>
<tr>
<td>8.</td>
<td>3/4&quot; BRASS FIP X FIP STRAIGHT BALL VALVE</td>
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</tr>
<tr>
<td>9.</td>
<td>3/4&quot; BRASS HEX HEAD CLOSE NIPPLE</td>
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<tr>
<td>10.</td>
<td>3/4&quot; BRASS COMP. X FIP 90° ELL</td>
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<td>12.</td>
<td>DEVICE PENETRATION # X 3/4&quot; BRASS BUSHING</td>
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* All material shall comply with California Health and Safety Code Section 116875

### NOTES

1. Single check detector installation per Standard 879 requires prior authorization by the Director of Santa Rosa Water. Authorization shall only be provided when, in the opinion of the Engineer, above ground installation, per Standard 888 is not possible due to site constraints.

2. The post indicator and valve shall be installed as approved by the Fire Department. The installation shall be provided with electronic supervision monitoring when required by the Fire Department. Any adjustments to this standard must be first approved, in writing, by both the Fire and Water Departments.

3. Refer to vault size chart for proper size. Should a property side O.S. & Y. valve be required inside the vault the vault length shall increase by an additional 12" for 4" & 6" installations, and 18" for 8" and 12" installations. The Contractor shall notify the Engineer if additional clearances appear to be warranted. See the engineer's approved list for approved vaults and covers. Pipe penetrations in vault shall be offset to allow 12" clearance from edge of device to edge of vault wall on side opposite of bypass.

4. All fire line services, to the post indicator valve, shall be tested by the Public Works Inspector per City of Santa Rosa Water Distribution Specifications. All onsite fire line appurtenances, including, the post indicator valve and hydrants, shall be inspected and tested by the City of Santa Rosa Fire Department per City Fire Code.

5. Where, in the opinion of the Water Department, there's potential for a higher level of hazard to exist on any fire service, the service shall be installed per City Standard 880.

6. The fire department connection (FDC) shall be installed and located as required by the Fire Department.

7. Post indicator valves shall be locked with a breakaway lock. The post indicator valve status indicator shall not be less than 36" above finished grade.

8. Valve shall be tied down with Fire Department approved rods and concrete blocking. See table on STD-851 for rod and block sizes. 4" valves shall sized the same as a 6".

---

### VAULT (inside) DIMENSIONS

<table>
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<tr>
<th>S.D.C. SIZE</th>
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</tr>
<tr>
<td>10&quot;</td>
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<td>7'</td>
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### CITY OF SANTA ROSA

SINGLE CHECK DETECTOR ASSEMBLY IN VAULT

Page 2 of 3

SCALE: NONE  DATE: Sept. 2017

OWN: CHECKED: APPROVED

STD: 879
NOTES

1. By-pass meter shall be plumbed to center under reading lid. Read lid may be replaced with Automatic Meter Reading probe mount at the direction of the Water Department.

2. Vault cover shall have extruded aluminum channel frame with bend down anchor tabs around perimeter. Hinges shall be heavy forged Type 316 stainless steel. Cover shall have a type 316 stainless steel "slam-lock" type latch with fixed interior handle and a removable exterior handle and mechanism to automatically lock doors in the open position. Latch release shall be protected by a flush removable screw plug.

3. Vault cover shall be AASHTO H20 compliant, and have a "non-skid" surface.

CITY OF SANTA ROSA
SINGLE CHECK DETECTOR ASSEMBLY IN VAULT
Page 3 of 3

SCALE: NONE DATE: Sept. 2017
FILE NO. STD-879
NOTES:

1. This Standard is required for:
   a.) all connections serving commercial fire sprinkler systems.
   b.) any fire line connections to properties with auxiliary water supplies.
   c.) sites with multiple fire line connections to the City water system.

2. Approved double check detector backflow assemblies shall be shown on "List of approved backflow devices" of latest revision, by the University of Southern California Foundation for Cross Connection Control & Hydraulic Research.

3. All test valves shall be fitted with 1/4" female test cocks.

4. Double check detector assembly shall be located as close as possible to the sidewalk or public right-of-way.

5. Any cover or screening for this assembly must have both the Fire and Water Department's approval prior to installation.

6. Shut-off valves shall be resilient wedge type O.S. & Y. valves. Valves are to be chained and padlocked by device owner in the open position.

7. Must have specific approval of the Fire Dept. prior to installation.

8. The installation shall be provided with electronic supervision monitoring when required by the Fire Department.

9. Double check detector shall be the same size as the fire line except when a 12" fire line is required, then a 10" double detector check backflow assembly is required.

10. Restrained joints are required for all new construction from gate valve to 90° elbow. Thrust blocks are only required where existing service is being modified and restrained joints are not used. Thrust block behind tee or tapping sleeve is required on all installations.

11. For filling and disinfection when service has been tapped or cut-in on existing main, add 2" piping as needed so "fill line" is a minimum of 6" above all other piping. Install brass plug after disinfection and testing.

12. Regardless of detector device orientation, bypass meter shall be installed to set horizontally at a location easily accessed and read. See City Standard 885.

13. Contractor shall provide protection from corrosion in accordance with Fire Department requirements.
NOTES:

1. Make 3/4" top top - install risers as shown.
2. Precast vault and spring assisted aluminum double leaf H20 rated cover with non-skid surface.
3. Low flow by-pass (port numbers 7-13) shall be installed unless otherwise approved by the Water Department and shall be sized as required (4" min.). If low flow P.R.V. is not required, center line P.R.V. in vault and change port number 7 to a blind flange.
4. Install fire hydrant and low profile hydrant only when required by the Water Department.
5. 12" x 12" x 12" sump with galvanized grate cover. Install 3/4" drain in corner of sump.
6. Gate valves shall be resilient wedge type. Where cover from top of operating nut to finish grade is 6" or less, install horizontal gate valve. Installation of any other valve type must be approved by the Director of Santa Rosa Water.
7. Pressure reducing valve shall be fusion bonded epoxy lined and coated. (See the engineer's approved list)
8. Restrained joints are required for all new construction from mainline gate valve to vault. Thrust blocks are only required where existing services are being modified and restrained joints are not used.

CITY OF SANTA ROSA
PRESSURE REDUCING VALVE ASSEMBLY

SCALE: NONE
DATE: Sept. 2017
DRAWN: RS
DRAWN BY: [Signature]
APPROVED: [Signature]
FILE NO. STD.- 881
NOTES

1. Service lateral pipe and fittings on inlet side of valve shall be 4" or some size as surge anticipator valve, whichever is greater. 3" and larger pipe material shall be PC-350 ductile iron unless otherwise shown on the plans. Where a smaller than 4" surge anticipator valve is approved for installation, install 4" "as required" reducer on the inlet side of the valve.

2. The Project Engineer shall submit a proposed design to the Engineer and all other appropriate Agencies for approval of discharge water drainage.

3. Material for discharge side of valve shall be the same size as the valve, and material smaller than 3" shall be submitted for approval.

4. Discharge riser shall be fabricated from standard welded steel pipe, with a weld on flange. Welding of pipe shall conform to AWWA Standard C206. The riser assembly shall be Fusion Bonded Epoxy lined and coated per AWWA Standard C213.

5. Contact the Water Department for specific telemetry requirements which must be met.

6. Restrained joints are required for all new construction from gate valve to upper 90° bend. Thrust blocks are only required where existing services are being modified and restrained joints are not used.

<table>
<thead>
<tr>
<th>PARTS LIST</th>
</tr>
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<tbody>
<tr>
<td><strong>NO.</strong></td>
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<td>5</td>
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</tbody>
</table>
NOTES

1. Air Release Valves shall have 1" threaded inlets unless otherwise shown on plans.

2. See engineer's approved list for all parts.
NOTES

1. Contractor to install schedule 80 PVC spacer pipe—without holes.

2. All meter boxes, vaults and pits shall be bedded on 3" minimum thick, 3/4" drain rock, AB–2, or other clean material with typical sand equivalent of 20 minimum uncontaminated by native soil, against compacted or undisturbed base. The gravel bed shall extend to a 4" minimum beyond all sides of the meter box. Box shall set flush with the top of curb, sidewalk or ground, whichever is applicable.

3. 1" PVC electrical conduit with pull cable may be required where a remote-read meter is to be installed. Only long-radius ells may be used. Conduit installation to be inspected by the Water Department.

4. Location of meter requires prior approval by Water Department.

5. Meters larger than 1" requires prior approval by Water Department.

6. Traffic loading box and lid to be installed in all driveways or locations where vehicular traffic may occur, and where specified on plans. Box shall be installed so that the steel cover is set flush with finished surface.
**METER SETTING ASSEMBLY PARTS LIST**

<table>
<thead>
<tr>
<th>METER SIZE</th>
<th>RESETTER</th>
<th>SPACER PIPE</th>
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<tr>
<td>5/8&quot; x 3/4&quot;</td>
<td>(See Engineer's approved list)</td>
<td>1&quot; x 7-3/4&quot; LG. SCHL. 80 PVC PIPE</td>
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<tr>
<td>1&quot;</td>
<td>(See Engineer's approved list)</td>
<td>1-1/4&quot; x 11&quot; LG. SCHL. 80 PVC PIPE</td>
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</table>

**HORIZONTAL INSTALLATION**

**NOTES:**

1. Spacer pipe—without holes to be installed between ball valves. City Forces to remove spacer pipe, install water meter and connect wiring.

2. Receptacle to be located on the outside wall of building. Receptacle to be mounted a minimum of 3 feet and a maximum of 4 feet above finished grade. The location of the receptacle will be determined by the Water Department.

3. Water meter must be mounted in a horizontal position. Water meter to be mounted a minimum of 3 feet and a maximum of 5 feet above finished floor. The location of the water meter will be determined by the Water Department.

4. Connecting wire to be installed in 1/2" diameter PVC conduit. Meter, conduit and wire may not be installed in areas with explosive atmospheres.

5. The Water Department will maintain the water meter only. All plumbing and wiring is the responsibility of the property owner.

**EXISTING WATER LINE**

- Straight ball valves with handles
- Unions as needed

**VERTICAL INSTALLATION**

FOR STANDARDS 879 & 880

RESETTER REQUIRED
NOTES:

1. If more than one length of 3/8" stainless steel tubing is required, stainless steel compression couplings shall be used.

2. All 3/8" tubing shall be wrapped in 10 mil tape.

3. Where planter strip exists, install min. 24" behind F/C — Where sidewalk is contiguous, install 12" behind sidewalk.

APPROVED SERVICE SADDLES:
(See Engineer's Approved List; STD-863A)
BOXES & COVERS
per applicable City Standards

Water service tubing shall be poly coated copper conforming to the sizes as required and applicable City Standards and Specifications. Install backflow devices as required.

12"-16"

4" ductile iron manifold

MJ 90°
(typ. of 2)

Face of curb

4" ductile iron lateral

Separation distances from 4" lateral to non-potable pipelines shall be the same as if it were a water main.

4" FL x MJ Gate valve
(See Std. 877 and 878)

City Water

Main

Tapping Sleeve or Tee

PLAN VIEW

90° MJ. X flanged ell with 4" reducing flange with brass bushing & brass M.I.P. x compression corporation stop.

(See note 3)

4" D.I. manifold to be installed with 24" minimum, 30" maximum cover.

SECTION "A-A"

CITY OF SANTA ROSA
4" DUCTILE IRON
MULTI-SERVICE
MANIFOLD

NOTES:
1. This Standard may be adapted, as approved by the Water Department, for connection to a combination water service per Std. 870.
2. Service saddle and corporation stop per applicable City Standard for individual service sizes.
3. Restrained joints are required for all new construction from gate valve to end of 4" manifold. Thrust blocks are only required where existing services are being modified and restrained joints are not used.
NOTES:

1. Above ground single check detector valve assemblies may only be used on fire lines serving private fire hydrants. Where sprinklers are served, use double check detector per STD. 880. Where above ground installation is not possible due to site constraints, in the opinion of the Engineer, a below ground single check detector per STD. 879 may be allowed.

2. See Engineer's Approved list for approved detector check devices.

3. Shut off valves shall be resilient wedge type O.S. & Y. valves, and shall be chained and padlocked in the open position by owner.

4. All test valves shall be fitted with 1/4" female test cocks.

5. Detector check assembly shall be located as close as possible to back of sidewalk or public right-of-way.

6. Any cover or screening for this device must have both the Fire and Water Department's approval prior to installation.

7. Detector check shall be the same size as the fire line except a 10" detector check assembly is permitted when a 12" fire line is required.

8. The installation shall be provided with electronic supervision monitoring when required by the Fire Department.

9. Restrained joints are required for all new construction from gate valve to 90° elbow. Thrust blocks are only required where existing service is being modified and restrained joints are not used. Thrust block behind tee or tapping sleeve is required on all installations.

10. Must have specific approval of the Fire Dept. prior to installation.

11. For filling and disinfection when service has been tapped or cut-in on existing main, add 2" piping as needed so "fill line" is a minimum of 6" above all other piping. Install brass plug after disinfection and testing.

12. Regardless of detector device orientation, bypass meter shall be installed to set horizontally at a location easily accessed and read. See City Standard 885.

13. Contractor shall provide protection from corrosion in accordance with Fire Department requirements.
NOTES:

1. **Do not** install anode on poly coated copper unless otherwise specified elsewhere in contract documents, or directed by the Water Department.

2. If anode does not have supplied hose clamp connector, wrap bare wire end four times around pipe and solder to service as shown.

3. Magnesium anode shall be driven completely into native soil at 45° angle. Maximize distance between copper service and anode.

4. Contractor shall confirm clearance between proposed anode location and other utilities in close proximity prior to driving anode.