CITY
OF
LIVERMORE

STANDARD DETAILS

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WATER - W

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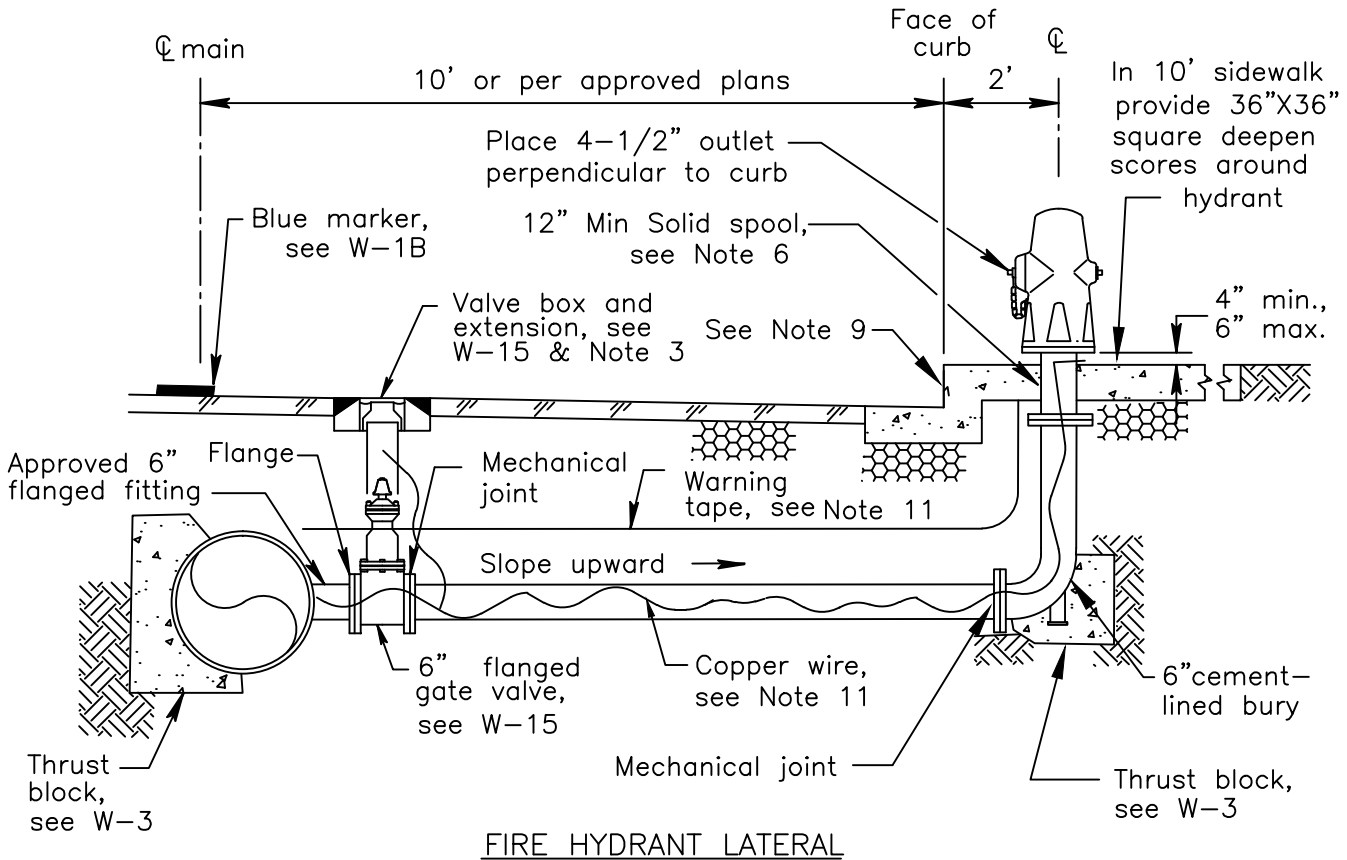
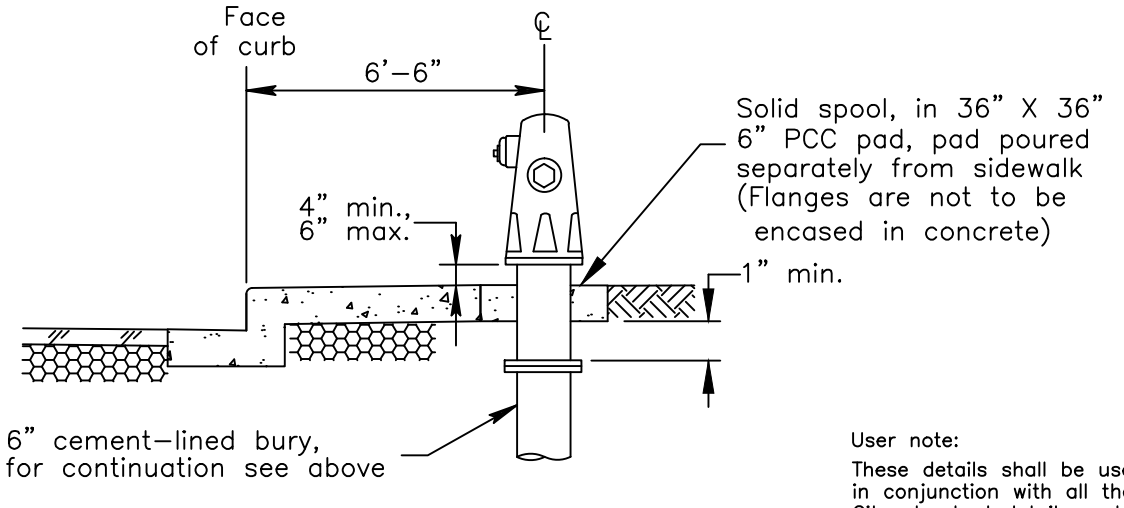


FIRE HYDRANT LATERAL

with 10' sidewalk or no sidewalk



FIRE HYDRANT LATERAL

with 5' sidewalk

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

W01A.DWG

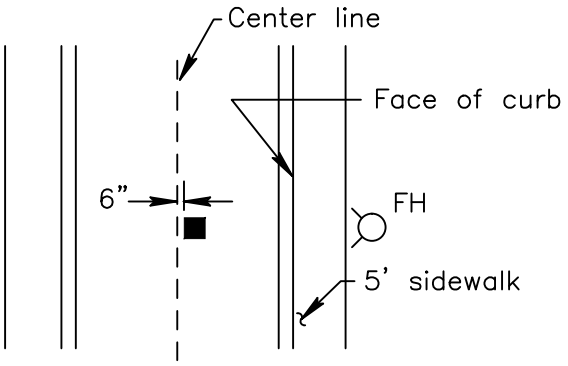
FOR CITY OF LIVERMORE
WATER SERVICE AREA

FIRE HYDRANT AND LATERAL

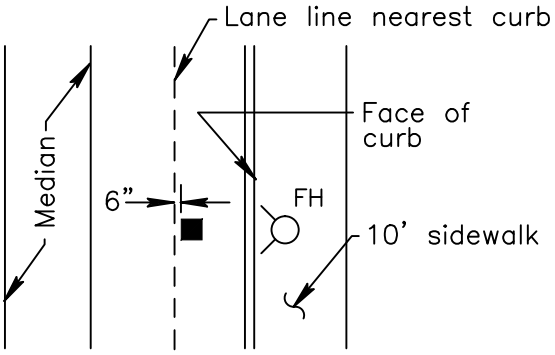
CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–1A

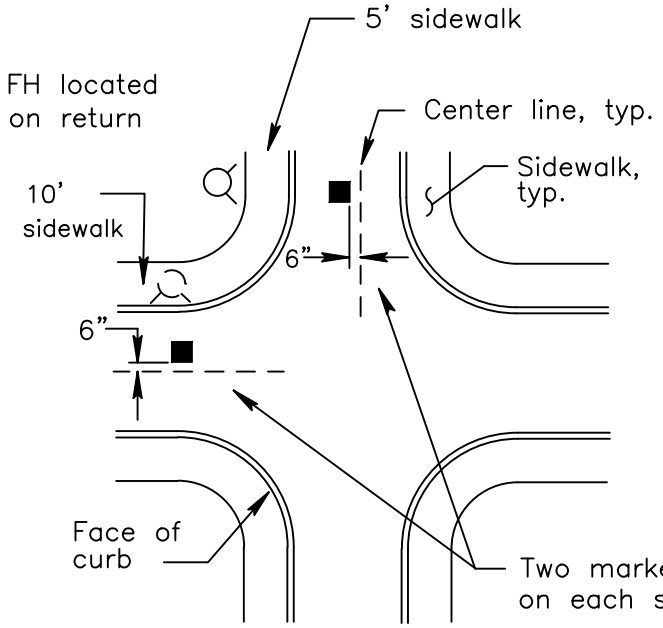
City Engineer

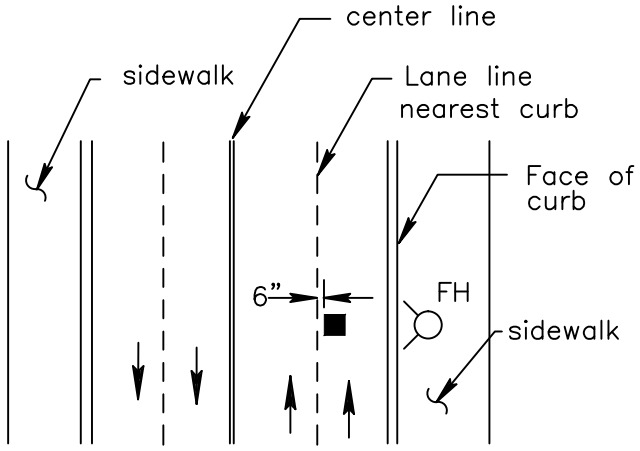


FH MARKER LOCATION



FH MARKER LOCATION
with median





FH MARKER LOCATION
without median

FH MARKER LOCATION
at intersection

■ Two-way blue reflective pavement marker, typ.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

W01B.DWG

FIRE HYDRANT MARKER

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-1B

City Engineer

Notes:

1. Deviations to the installation and location of fire hydrants are subject to Fire Department approval.
2. Where sidewalk is not provided, cast pipe in 36" sq. x 6" concrete pad.
3. Gate valve lids to be painted per the City Standard Specifications.
4. Blue reflective pavement markers are required. Marker and installation of marker per Section 85–1.05 and 85–1.06 of Caltrans Standard Specifications. Use Rapid Set Adhesive only per Caltrans Standard Specifications Section 95–2.04.
5. See W–15 for valve installation, and W–12 for guard post installation.
6. Hydrant flange bolts above grade to be break–off type with hollow bolt end installed facing up. All other hydrant flange bolts to be 12" min solid spool.
7. Locate as follows: Min. 6" from face of curb or back of sidewalk to closest point on fire hydrant, and:

   For 5' sidewalk = 6'–6" from face of curb.
   For 10' sidewalk, = 1'–6" from face of curb.
   separated sidewalk,
   or no sidewalk

   Residential = Minimum 5' from driveways.
   Minimum 3' from any obstruction.

   Commercial/ Industrial = Minimum 10' from driveways.
   Minimum 3' from any obstruction.

   Intersections = At end of return.

   For offset to street trees see L–3.
8. Stamp or chip 3" high valve type "GV" and distance of valve from face of curb, in Roman numerals, in face of curb over fire hydrant lateral. Paint the Roman numerals per the City Standard Specifications.
9. Warning signs are required for all Fire Hydrant installations on Recycled Water Systems. Contact the City Water Resources Division for specific size, materials, wording, and location.
10. Fire hydrant lateral shall have warning tape and copper wire installed along it's entire length and extended up through the concrete pad, see W–1A.
11. Fire hydrant and lateral in the California Water Company service area are to be constructed per Cal Water's latest standard detail.

User note:

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Date:	By:	Rev:

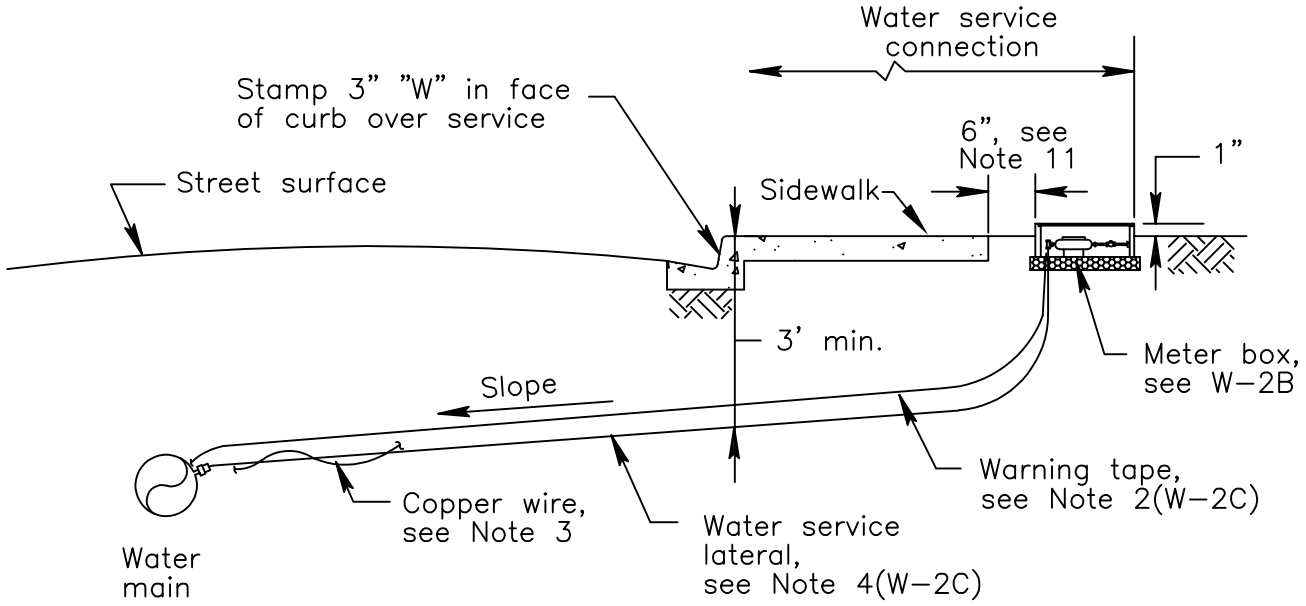
W01C.DWG

FIRE HYDRANT AND LATERAL NOTES

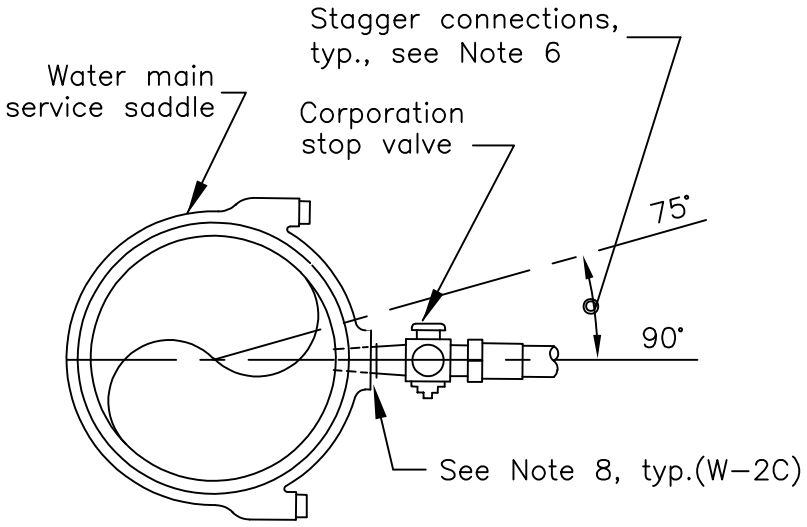
CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY/HI	Date: Sept–22	No.
Ckd: Spec. Committee	Scale: None	W–1C

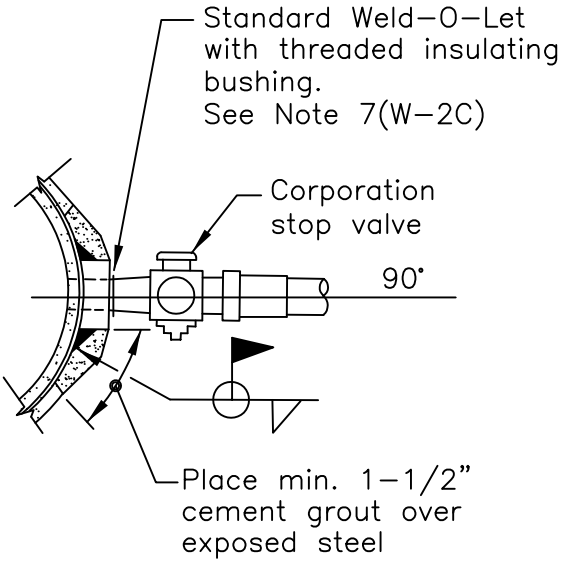
City Engineer



SERVICE CONNECTION



TYPICAL WATER MAIN CONNECTION



ALTERNATE WATER MAIN CONNECTION FOR STEEL PIPE

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

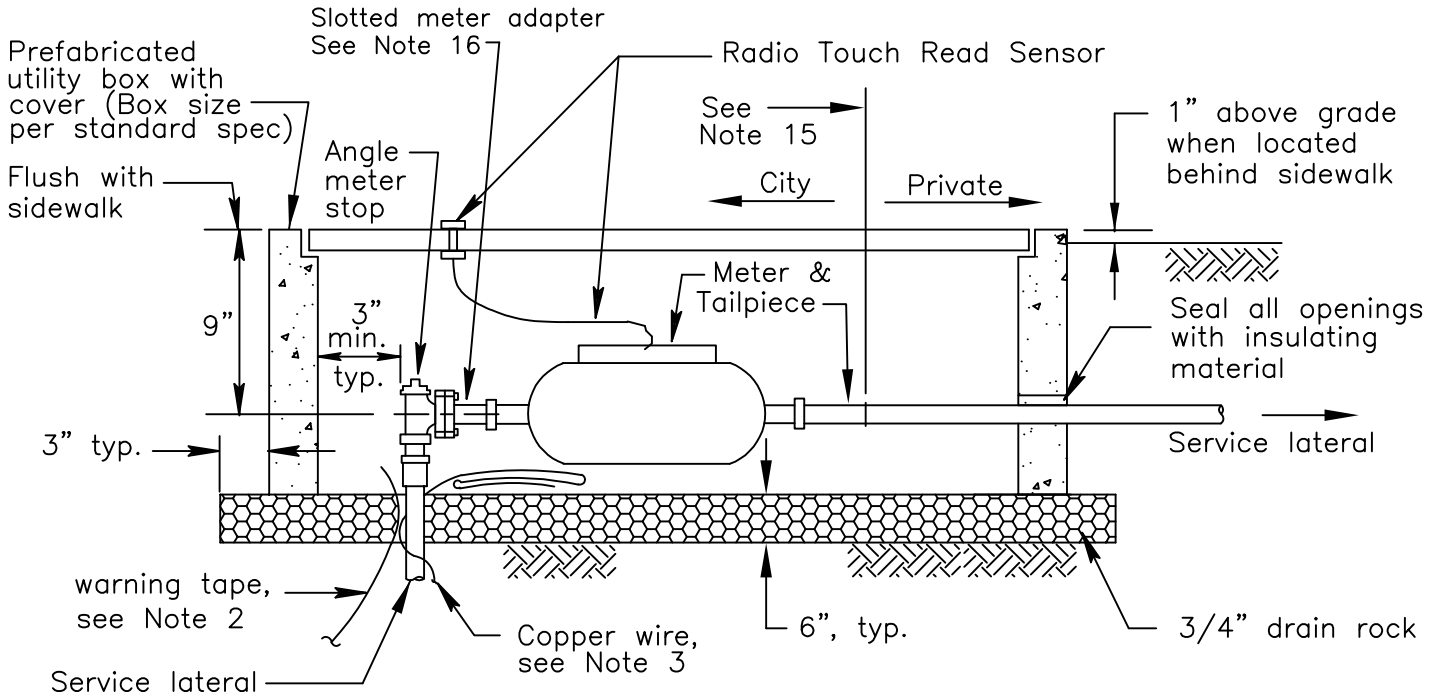
W02A.DWG

WATER SERVICE CONNECTION 1", 1-1/2", and 2"

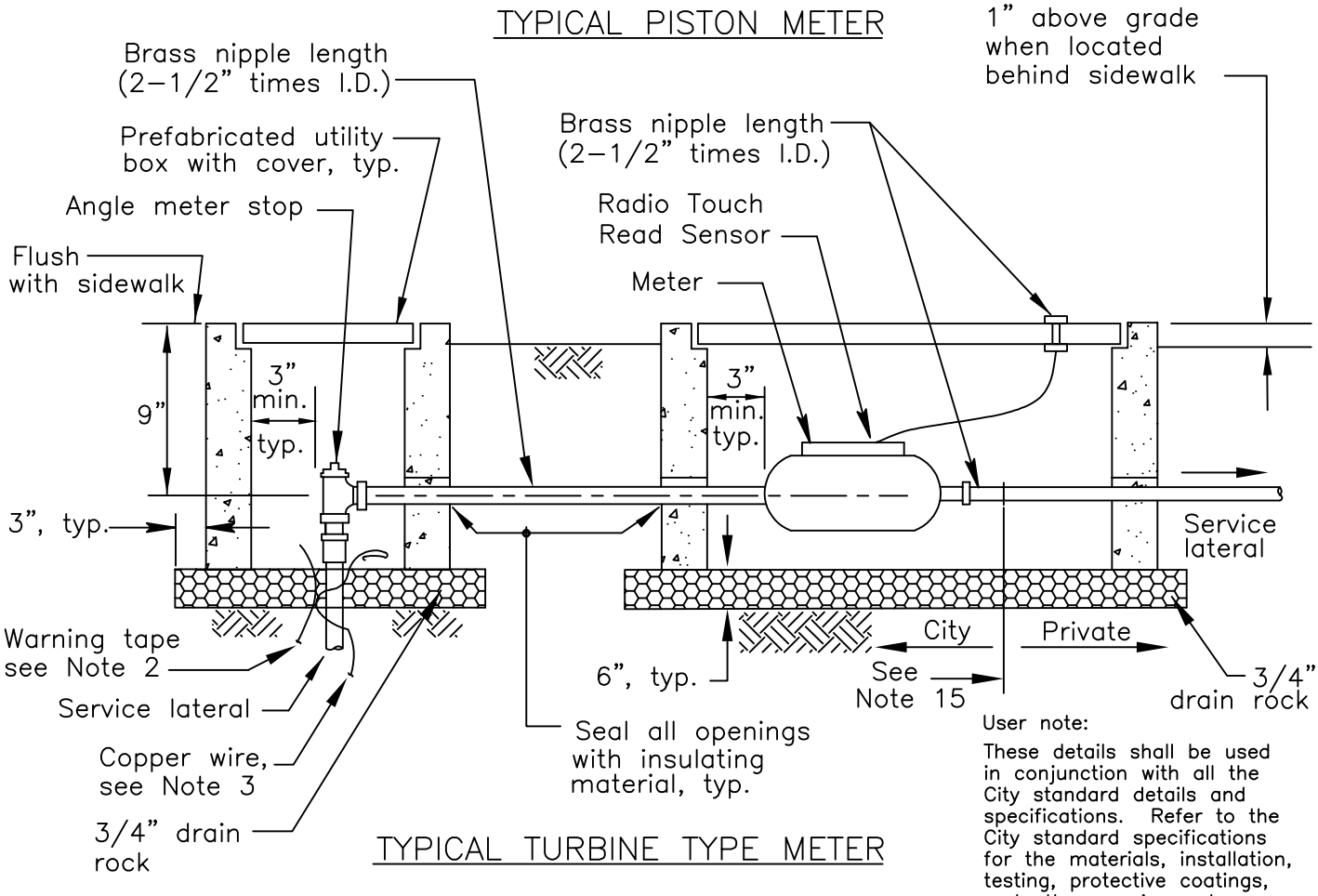
CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M-W-HI	Date: Apr-23	No.
Ckd: Spec. Committee	Scale: None	W-2A

City Engineer



TYPICAL PISTON METER



TYPICAL TURBINE TYPE METER

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

WATER SERVICE CONNECTION 1", 1–1/2", and 2"

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY/HI	Date: Apr–23	No.
Ckd: Spec. Committee	Scale: None	W–2B

City Engineer

W02B.DWG

Notes:

1. A check valve is required after the meter if service is a "Dedicated Fire Service". See W–10A
2. Provide warning tape. Place 1'–0" above service lateral between water main and curb. Lower to directly above service lateral from curb to meter.
3. Provide AWG Number 10 USE–2 insulated copper wire between meter and water main. Wrap insulated copper wire around service lateral and splice into main line copper wire. Provide 18" slack in utility box.
4. All service laterals to be polyethylene tubing, installed joint free. Industrial/commercial service laterals to be 2" CTS polyethylene.
5. Service connections shall be on service side of pipe and spaced at least 2' from fittings or end of pipe; and a minimum of 2' apart along water main.
6. Service connections shall be staggered 15 degrees from location of adjacent connection, and shall be at 75 and 90 degrees from vertical.
7. After completing water main connection, all coatings shall be repaired. All ferrous surfaces shall be coated.
8. From corporation stop valve through meter installation, all hardware to be brass or bronze (including nuts and bolts)+(lead free).
9. Split "T" services are not allowed.
10. All meters are to be purchased from the City, and installed by the city. All fittings or appurtenances not supplied with the meter are to be supplied by the contractor.
11. Location of meter box:
    - 6" from back of 5' monolithic sidewalks
    - 6" from back of curb without sidewalk or in 10' sidewalk
    - 6" from front of 5' separated sidewalk.
12. Service lateral shall be perpendicular to main, and run in a straight line without bends. Service laterals must not cross.
13. For turbine meter 3" and larger see W–11.
14. Meters for irrigation systems 1 1/2" and larger must be a turbine meter.
15. The City's maintenance jurisdiction is up to the tail piece.
16. Use a slotted meter adapter for meter sizes 1" and smaller when service laterals are 1–1/2" or 2".
17. For water service connections in City's Pressure Zone (east of Vasco Road and north of Highway I–580), pressure reducing valves shall be installed. For areas south of Highway I–580, west of Vasco Road, and Zone 1 area, contact the Building and Water Resources Divisions for information.
18. A reduce pressure back flow device is required on all commercial services.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

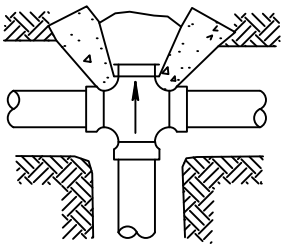
W02C.DWG

WATER SERVICE CONNECTION 1", 1–1/2", and 2" NOTES

CITY OF LIVERMORE
STANDARD DETAIL

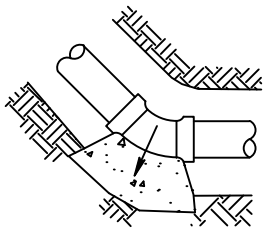
Dwn: FY/HI	Date: Sept–22	No.
Ckd: Spec. Committee	Scale: None	W–2C

City Engineer



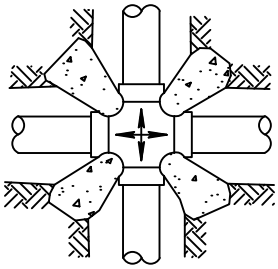
75 % of "Tee" thrust

BLIND CROSS



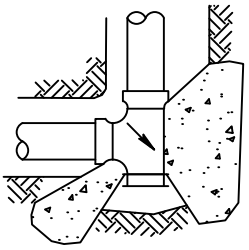
100% "Elbow" thrust

HORIZONTAL BEND



75 % of "Tee" thrust

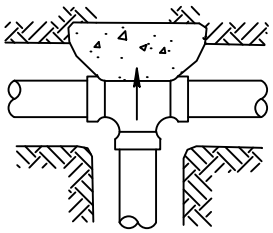
CROSS



100% of "Tee" thrust

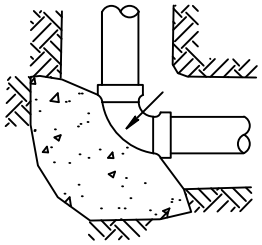
75% of "Tee" thrust

BLIND TEE



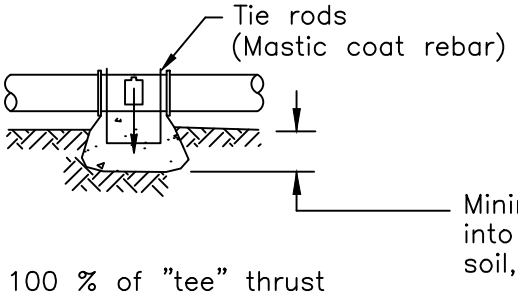
100% of "Tee" thrust

TEE



100% of "Elbow" thrust

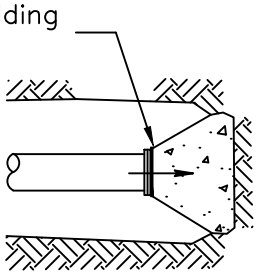
90° ELL



100 % of "tee" thrust

IN – LINE

VERTICAL VIEW



100 % of "Tee" thrust

DEAD – END

PLAN VIEW

User note:

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Date:	By:	Rev:

THRUST/ANCHOR BLOCK

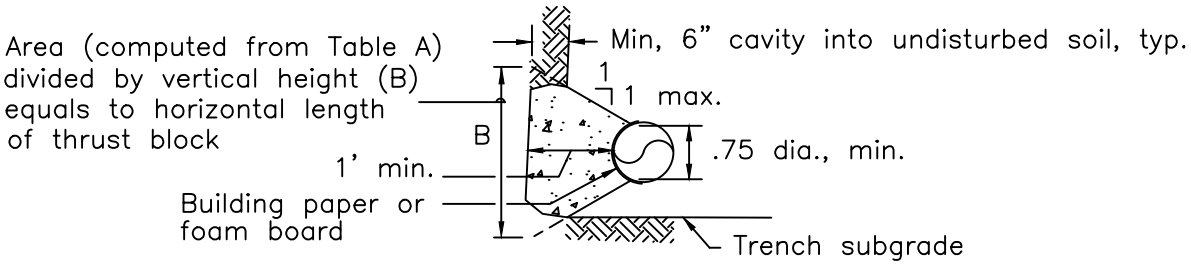
CITY OF LIVERMORE

STANDARD DETAIL

Dwn: FY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–3A

City Engineer

W03A.DWG



TYPICAL THRUST BLOCK SECTION–VERTICAL VIEW

TABLE A – THRUST BLOCKS FOR FITTINGS

THRUST PER PSI OF WATER PRESSURE AT VARIOUS FITTINGS (T)					
PIPE SIZE	DEAD END, TEE, OR CROSS	90° ELBOW	45° ELBOW	22–1/2° ELBOW	11–1/4° ELBOW
4	19	27	15	7	4
6	39	55	30	15	8
8	67	94	51	26	13
10	109	154	84	43	21
12	155	218	119	61	32
14	210	296	161	82	41
16	272	383	209	106	53
18	351	494	269	137	68
20	434	611	333	169	85
24	623	878	478	244	122

The bearing area required for a thrust block shall be determined form the following formula:

$$A = \frac{P \times T}{S}$$

Where A= Area of bearing required for thrust block (sq. ft.).
P= Internal Pressure (PSI). 200 PSI minimum, see Note 1.
T= Thrust (lb. per PSI of water pressure) form Table A above.
S= Allowable bearing pressure of Soil (PSF). See Note 2.
PSF= Pound per square foot
PSI= Pound per square inch

Example:

Given : An 8–inch 90° elbow with internal pressure (P)= 200 PSI, Allowable bearing pressure of Soil (S)= 1500 PSF.

From Table : Thrust (T)= 94 lb. per PSI of water pressure.

Required bearing area for thrust block (A) $= \frac{94 \times 200}{1500} =$ 12.5 sq. ft.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

W03B.DWG

THRUST/ANCHOR BLOCK

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M–W/KY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–3B

City Engineer

Notes:

1. In using the tables, use the maximum internal pressure anticipated (i.e. hydrostatic test pressure, possible surge pressure, due to pump shut–off, etc.). Minimum 200 PSI
2. See soils report for bearing strength of soil. In the absence of soils report obtain soil bearing strength from the ENGINEER. (Note: 1500 PSF is used only as an example in these calculations.)
3. Thrust blocks are not required on PVC pipe with solvent welded joints.
4. Thrust blocks for horizontal loads are not required if (0.0139 x dia. of pipe in inches)^2 x allowable soil bearing pressure (PSF) is larger than the thrust calculated in the tables.
5. Install thrust blocks at all pipe size changes, and at all fittings.
6. Figure (100%) in thrust block diagrams indicates percent of total calculated thrust load to be applied for each bearing area. Thrust loads to be calculated per Table A and example on W–3B.
7. Arrows (——►) indicate thrust direction.
8. Concrete is to be placed against undisturbed soil, in minimum 6" cavity.
9. Limit thrust/anchor block contact to "fittings" only, except on Horizontal Curves. Building paper or foam board material shall be used to prevent contact between concrete and "fittings".

User note:

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Date:	By:	Rev:

W03C.DWG

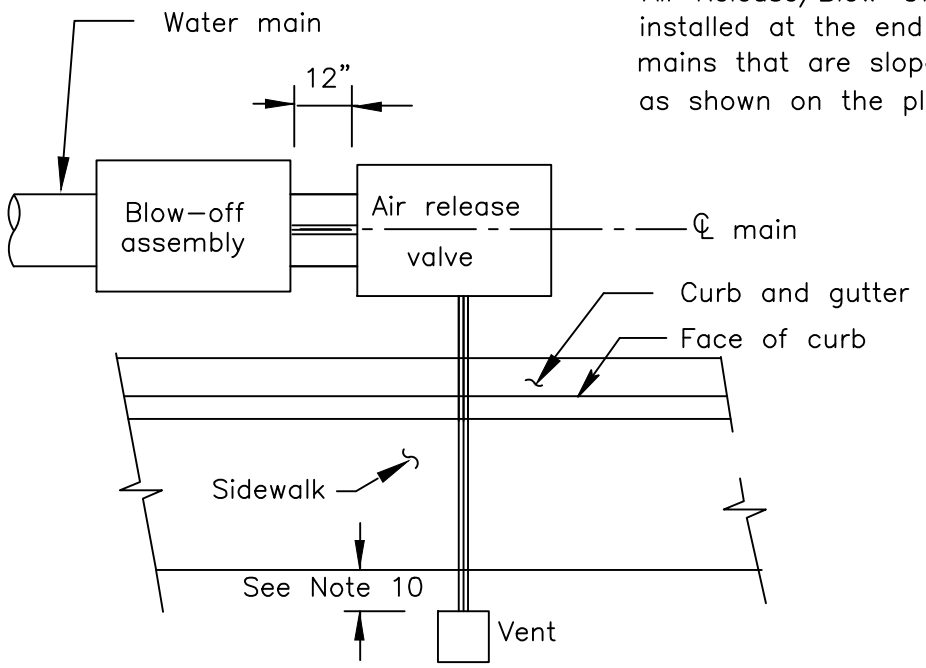
THRUST/ANCHOR BLOCK NOTES

CITY OF LIVERMORE
STANDARD DETAIL

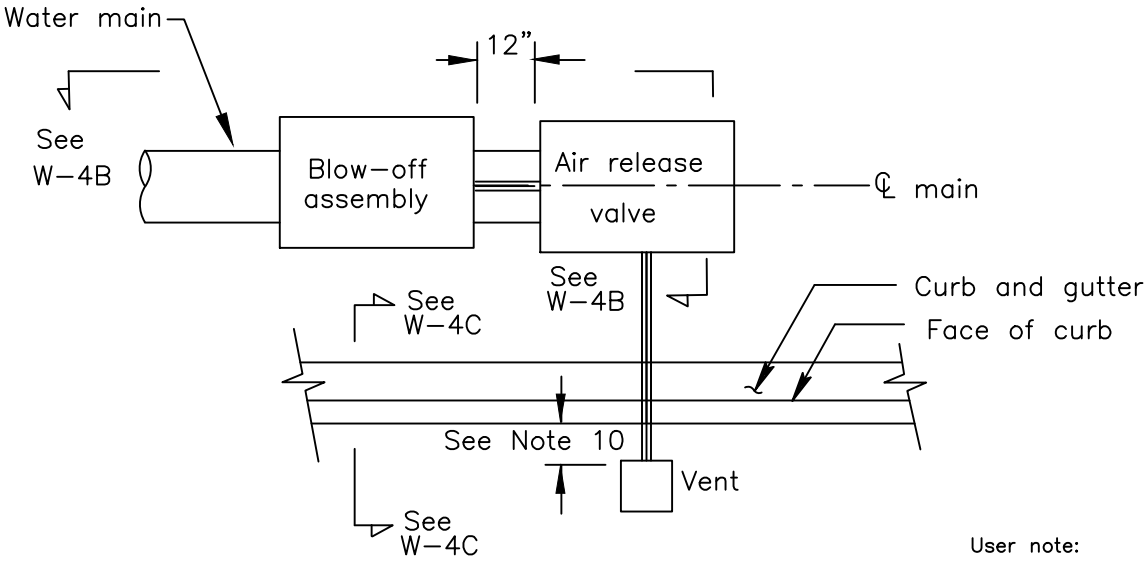
Dwn: M–W	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–3C

City Engineer

Air Release/Blow-Off assembly to be installed at the end of "Dead-end" water mains that are sloped upward, and as shown on the plans.



PLAN WITH SIDEWALK



PLAN WITHOUT SIDEWALK

User note:

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Date:	By:	Rev:

W04A.DWG

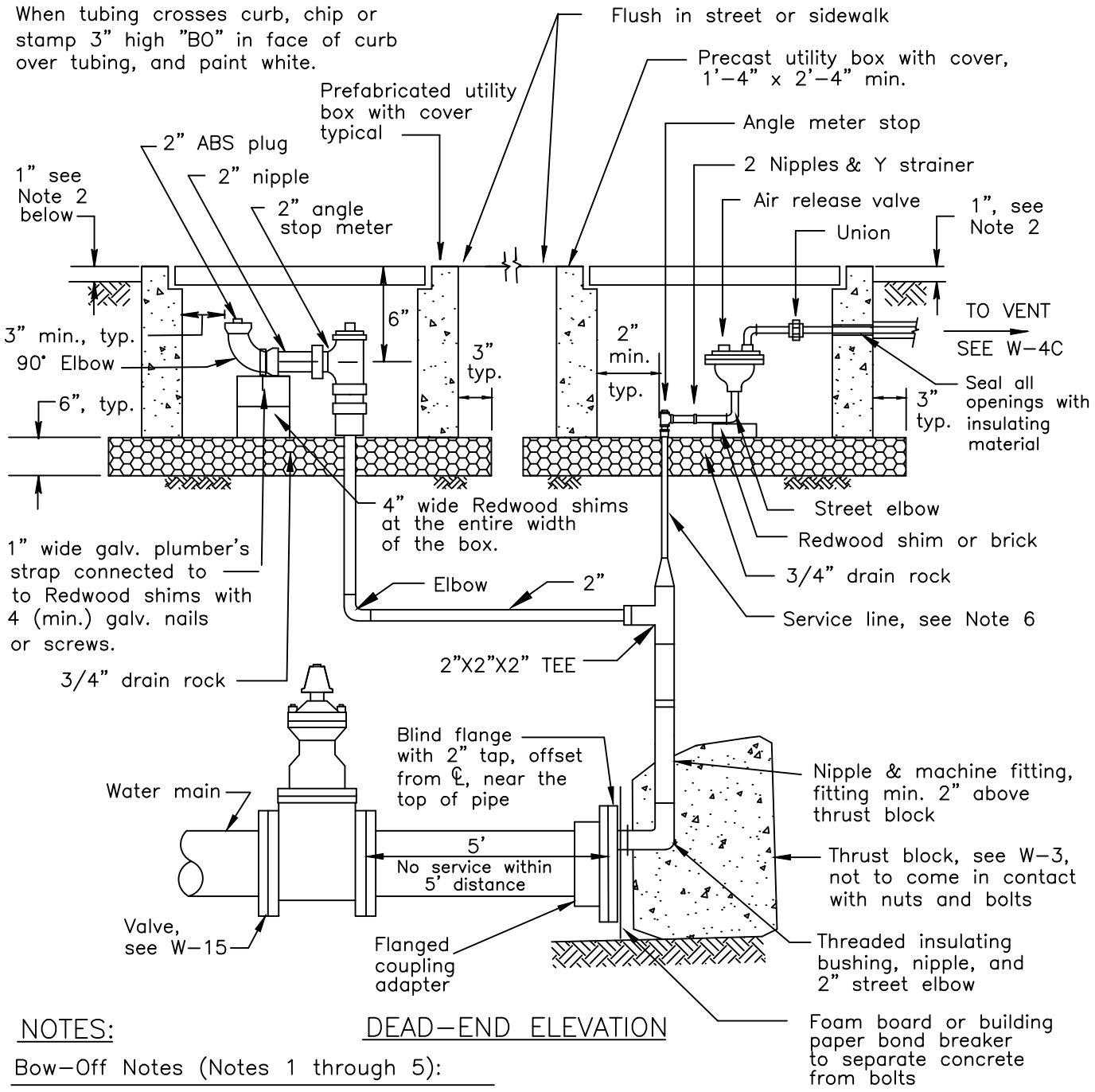
AIR RELEASE/BLOW-OFF

(FOR CUL-DE-SAC AND DEAD END STREET)

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: KY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-4A

City Engineer



DEAD–END ELEVATION

NOTES:

Bow–Off Notes (Notes 1 through 5):

1. Contractor shall not operate City valves. 24 hour notice required for City to operate valves.
2. Locate utility box 1" above grade in unimproved areas.
3. All material to be brass or bronze, except 2" ABS plug.
4. See W–5B for "In–Line" Blow–off.
5. For mains larger than 12" Blow–off assembly must be designed for adequate flow rate and approved by the ENGINEER.

User note:

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Date:	By:	Rev:

AIR RELEASE/BLOW–OFF

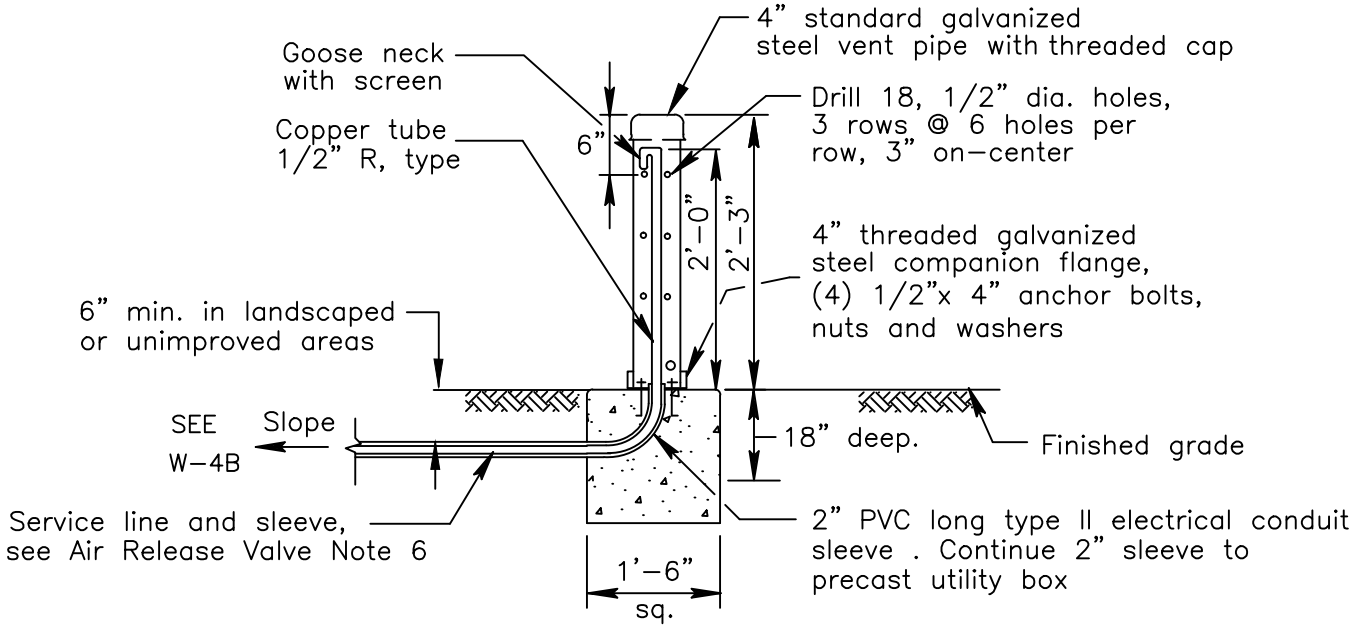
(FOR CUL–DE–SAC AND DEAD END STREETS)

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–4B

City Engineer

W04B.DWG



VENT ELEVATION

NOTES CONTINUED:

Air Release Valve Notes (Notes 6 through 15):

6. All service lines shall have warning tape and copper wire installed along its entire length. See W-2.
7. Provide bolt down cover on utility box.
8. All line and hardware sizes depend on size of air release valve.
9. All metal to be brass or bronze from the main thru the PVC street elbow above the air release valve. Line shall be copper tubing from the PVC street elbow to the top of the vent pipe.
10. 6" behind back of sidewalk or 12" behind back of curb without sidewalk.
11. Stamp "AV" with 3" letters in face of curb over tubing and paint white.
12. Paint vent pipe per the City Standard Specifications.
13. PVC street elbow above valve shall have a compression by mechanical iron pipe adapter.
14. Air release valves shall be 1" for pipelines less than or equal to 12" and 2" for pipelines greater than 12".
15. Orifice size for 1" and 2" air release valves shall be determined as follows:

Valve size	Max. operating pressure	Orifice size
1"	150 psi	1/4"
1"	200 psi	3/16"
2"	150 psi	5/16"
2"	200 psi	1/4"

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

AIR RELEASE/BLOW-OFF

(FOR CUL-DE-SAC AND DEAD END STREETS)

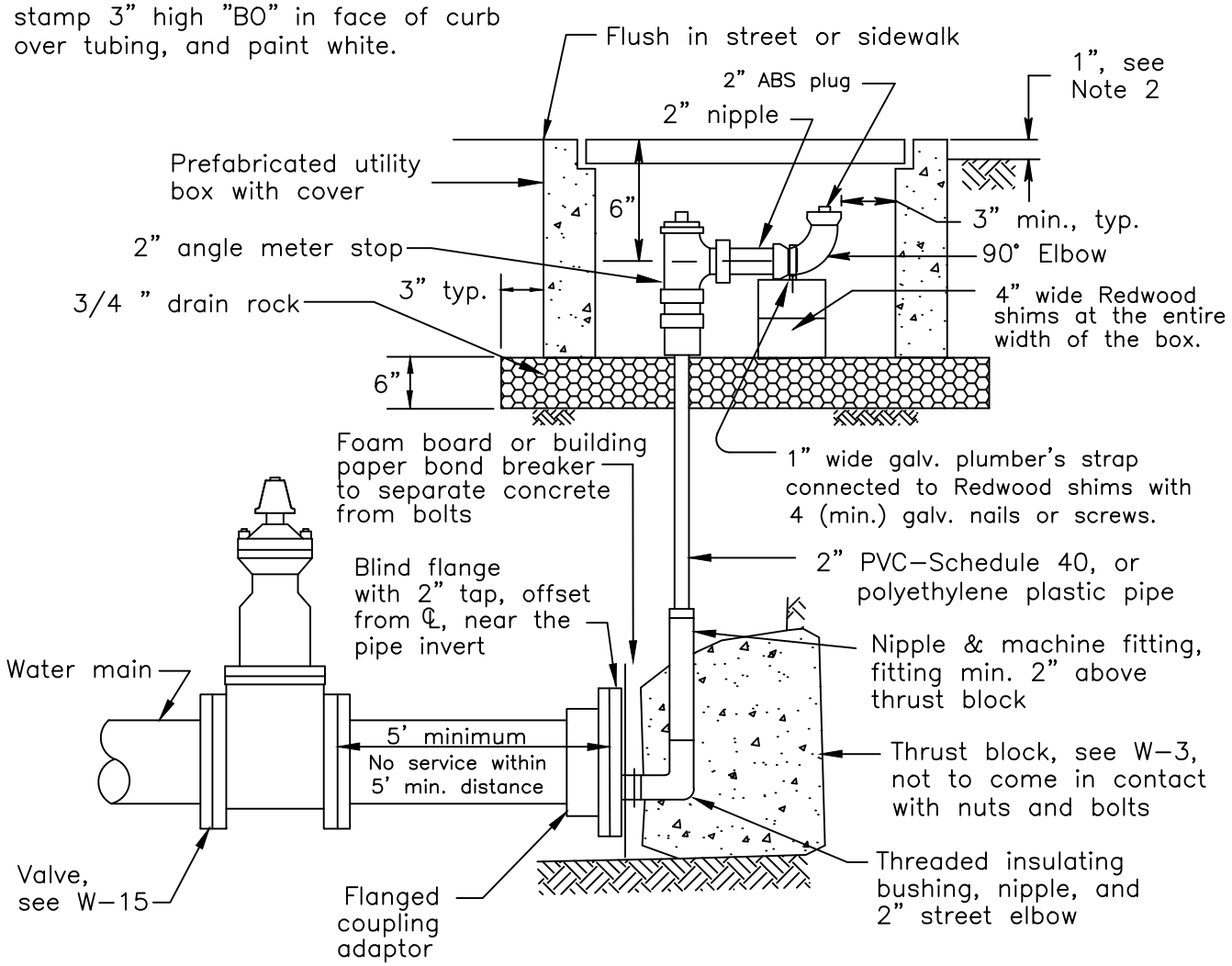
CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-4C

City Engineer

W04C.DWG

When tubing crosses curb, chip or stamp 3" high "BO" in face of curb over tubing, and paint white.



DEAD–END ELEVATION

Notes:

1. Contractor shall not operate City valves. 48 hour notice required for City to operate valves.
2. Locate utility box 1" above grade in unimproved areas.
3. All parts to be brass or bronze, except 2" ABS plug.
4. See W–5B for "In–Line" Blow–off.
5. For mains larger than 12" see W–5C.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

DEAD END BLOW–OFF

(FOR CUL–DE–SAC AND DEAD END STREETS)

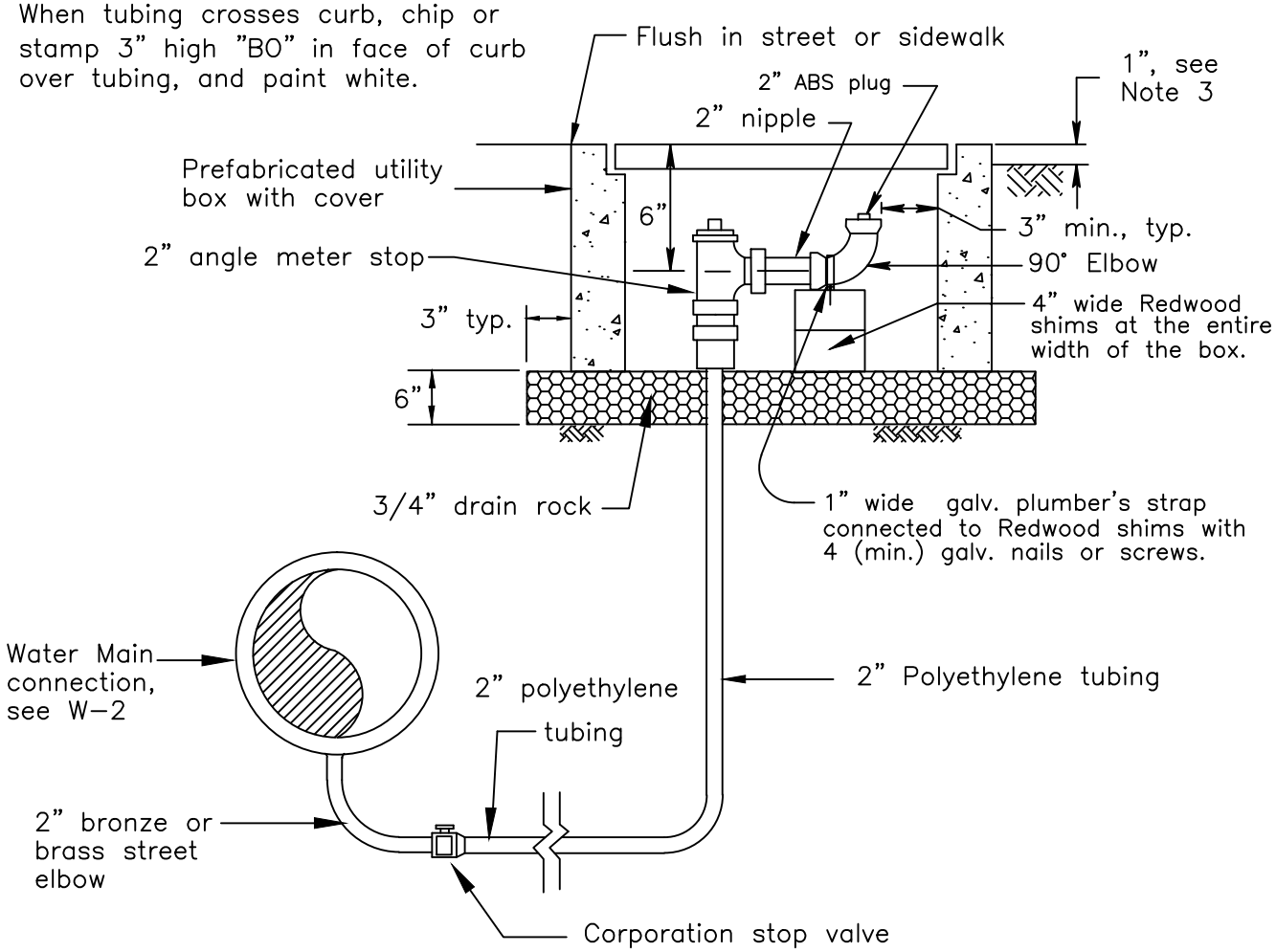
CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–5A

City Engineer

W05A.DWG

When tubing crosses curb, chip or stamp 3" high "BO" in face of curb over tubing, and paint white.



IN-LINE SECTION

(For 8" to 12" dia. pipe only.
For larger pipes see Note 1.)

Notes:

1. For pipe larger than 12" see W-5C.
2. On "In-Line" blow-off installations all polyethylene tubing shall have warning tape and copper wire installed along its entire length. See W-2.
3. Locate utility box 1" above grade in unimproved areas.
4. All metal to be brass or bronze, except 2" ABS plug.
5. See W-5A for CUL-DE-SAC and dead end streets blow-off.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

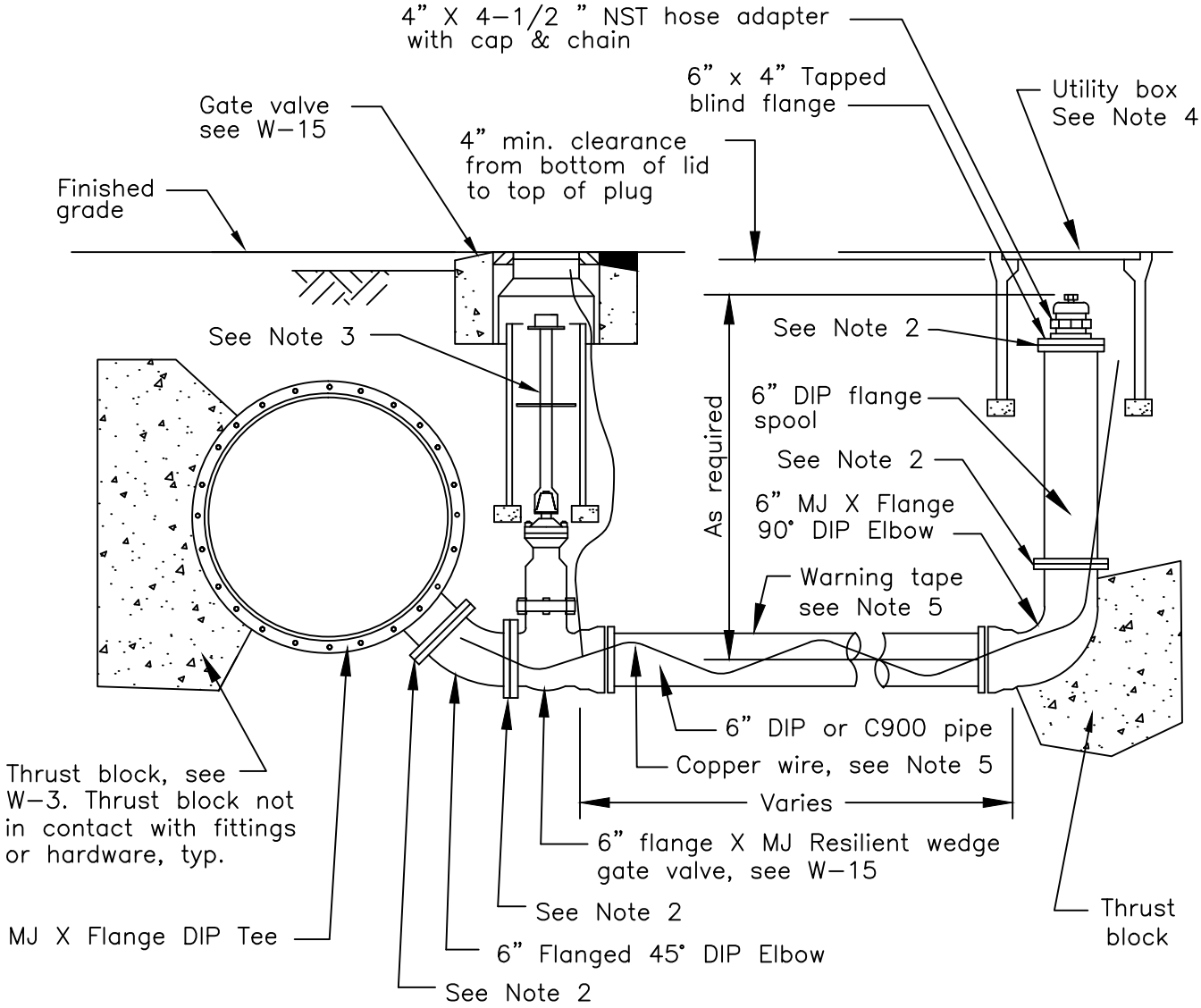
IN-LINE BLOW-OFF

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-5B

City Engineer

W05B.DWG



MJ = MECHANICAL JOINT

VERTICAL ELEVATION

Notes:

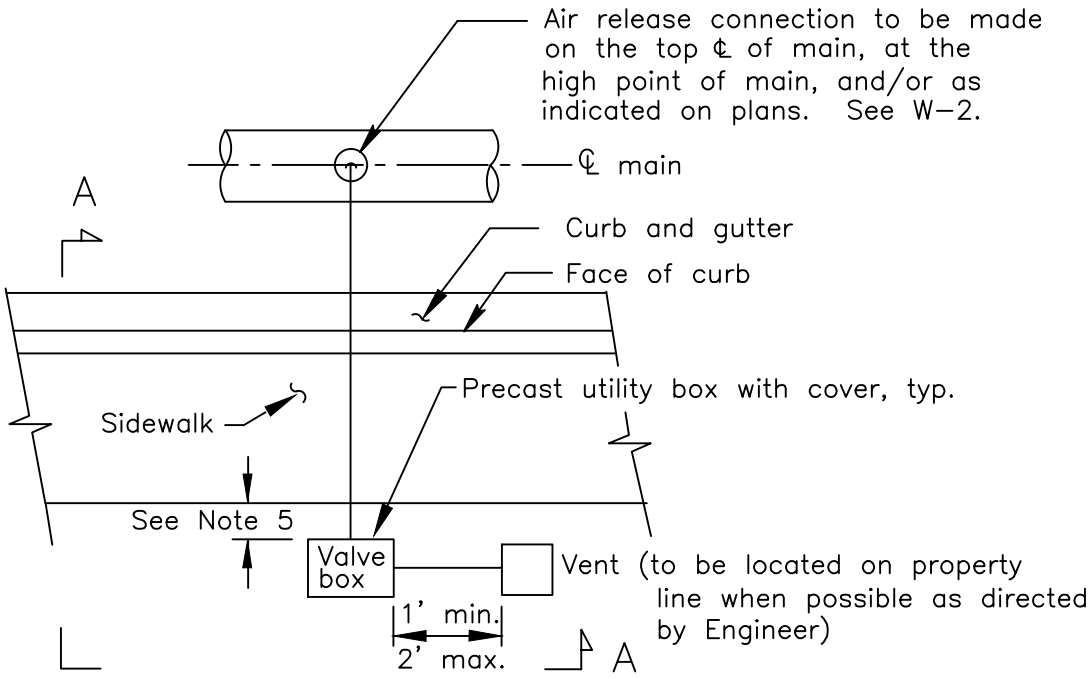
1. Use building paper or foam board to prevent direct contact of concrete with pipe fittings, flanges, or nuts and bolts. See W-3.
2. 6" 316 stainless steel bolt & gasket set.
3. Provide valve stem extension where depth to operator exceeds 8 feet.
4. Locate utility box for hose adapter 6" behind back of sidewalk or 12" behind back of curb without sidewalk. 1" above grade in landscaped or unimproved areas.
5. Low Point Blow-off line shall have warning tape and copper wire installed along it's entire length as shown, see W-2.

User note:

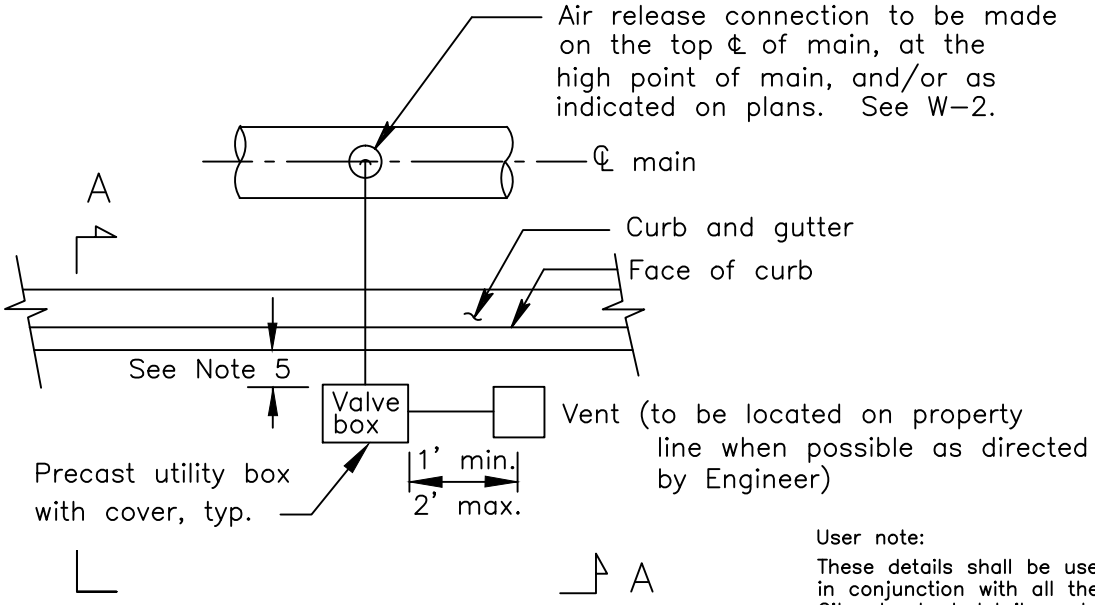
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

			LOW POINT BLOW-OFF (FOR PIPES LARGER THAN 12")	CITY OF LIVERMORE STANDARD DETAIL
				Dwn: FY / Date: May-13 / No.
				Ckd: Spec. Committee / Scale: None / W-5C
Date:	By:	Rev:		City Engineer

W5c.DWG



PLAN WITH SIDEWALK



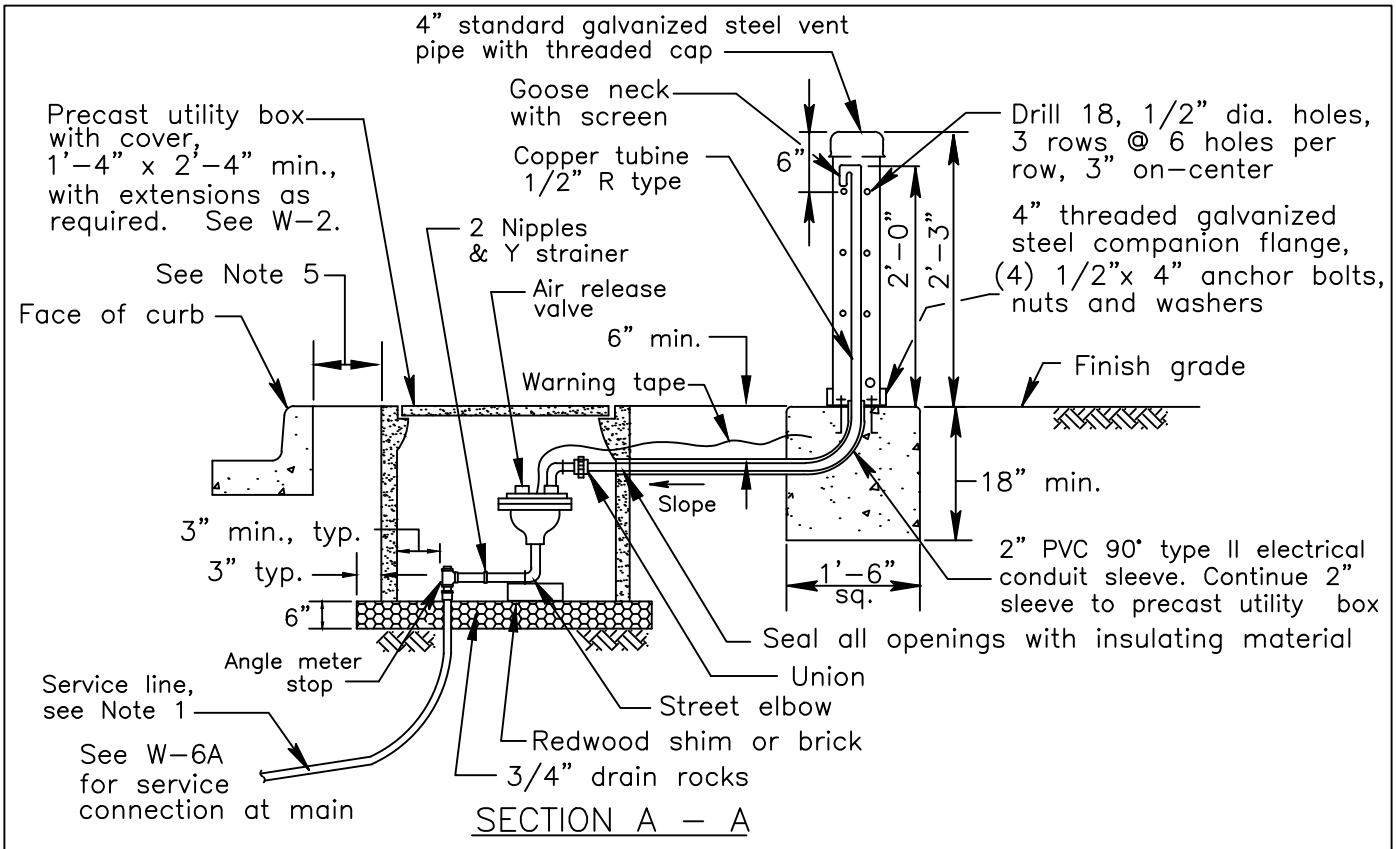
PLAN WITHOUT SIDEWALK

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

			AIR RELEASE VALVE	CITY OF LIVERMORE STANDARD DETAIL
				Dwn: FY / Date: May–13 / No.
				Ckd: Spec. Committee / Scale: None / W–6A
Date:	By:	Rev:		City Engineer

W06A.DWG



Notes:

1. All service lines shall have warning tape and copper wire installed along its entire length. See W-2.
2. Provide bolt down cover on utility box.
3. All line and hardware sizes depend on size of air release valve.
4. All metal to be brass or bronze from the main thru the PVC street elbow above the air release valve. Line shall be copper tubing from the PVC street elbow to the top of the vent pipe.
5. 6" behind back of sidewalk or 12" behind back of curb without sidewalk. (See W-6A for vent location.)
6. Stamp "AV" with 3" letters in face of curb over tubing and paint white.
7. Paint vent pipe per the City Standard Specifications.
8. PVC street elbow above valve shall have a compression by mechanical iron pipe adapter.
9. Air release valves shall be 1" for pipelines less than or equal to 12" and 2" for pipelines greater than 12".
10. Orifice size for 1" and 2" air release valves shall be determined as follows:

Valve size	Max. operating pressure	Orifice size
1"	150 psi	1/4"
1"	200 psi	3/16"
2"	150 psi	5/16"
2"	200 psi	1/4"

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

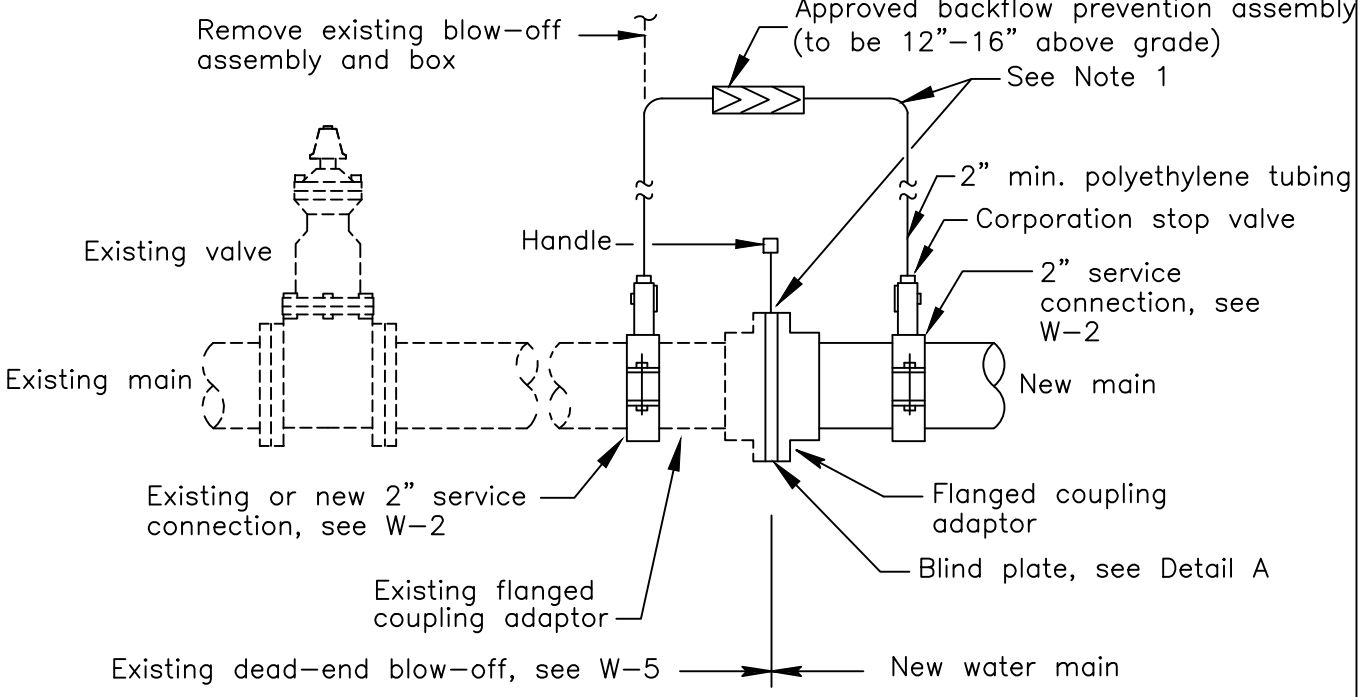
W06B.DWG

AIR RELEASE VALVE

CITY OF LIVERMORE
STANDARD DETAIL

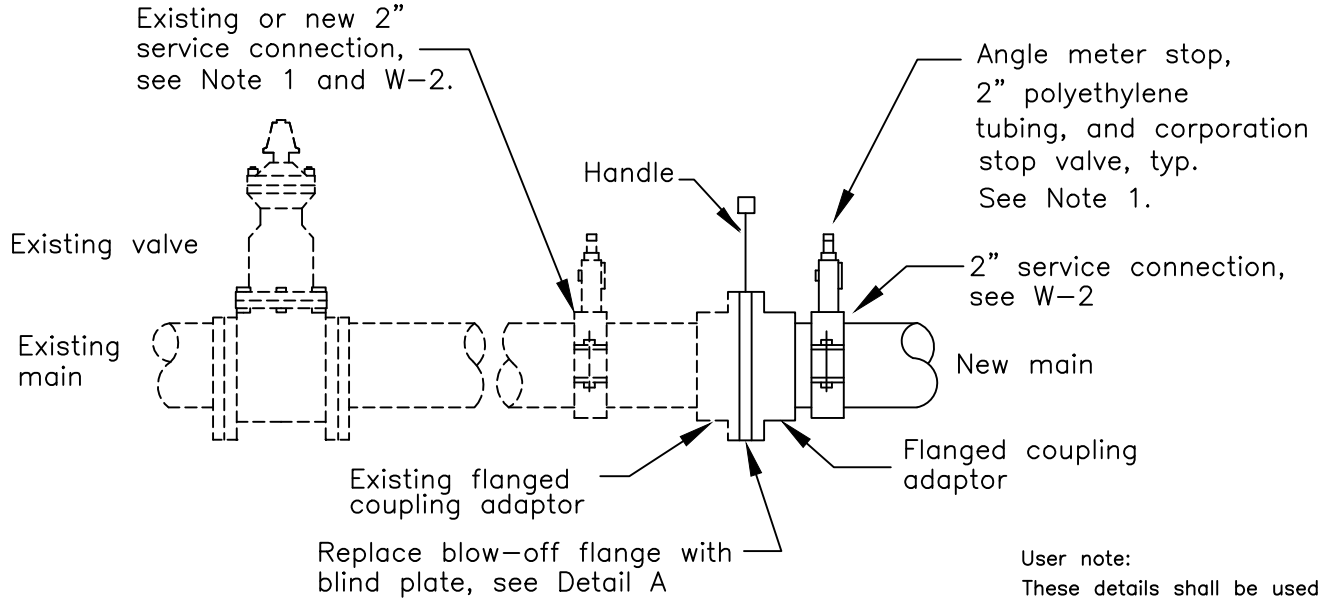
Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-6B

City Engineer



ELEVATION

Temporary Jumper Connection with Bypass – Primary Location



ELEVATION

Temporary Connection with-out Bypass – Secondary Location

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

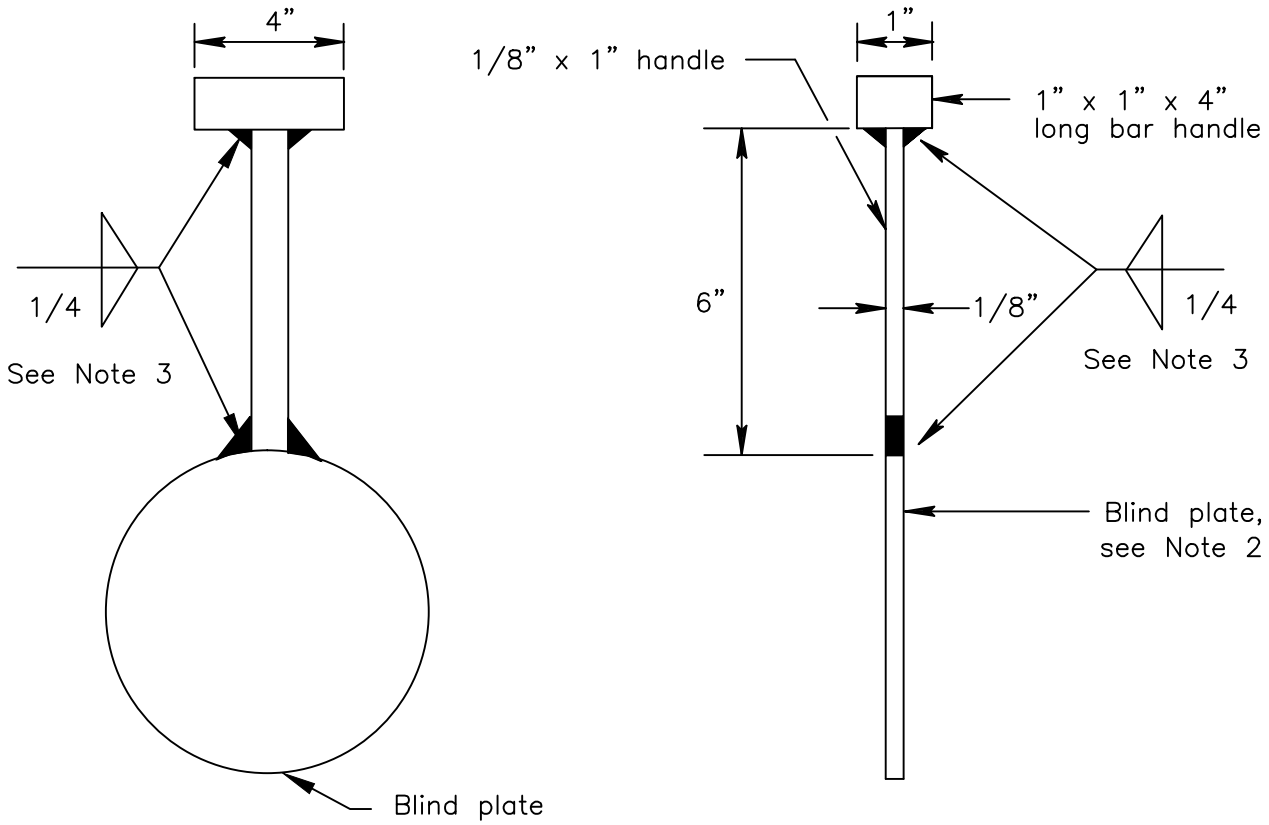
WATER MAIN TEMPORARY JUMPER CONNECTIONS

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-7A

City Engineer

W07A.DWG



DETAIL A

TEMPORARY BLIND PLATE AND HANDLE

Notes:

1. After acceptance of the new water system: 1) Remove temporary connection assemblies up through corporation stop valves, and replace with plugs of similar material as service connection: 2) Remove blind plate.
2. Blind plate with gaskets (2). Temporary blind plate blank shall be minimum 1/8" thick and shall be 1/4" smaller in diameter than the inside edge of the bolt holes.
3. Blind plate and handle can be one piece or welded.
4. Prior to connection, backflow assembly shall be certified by a City approved tester.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

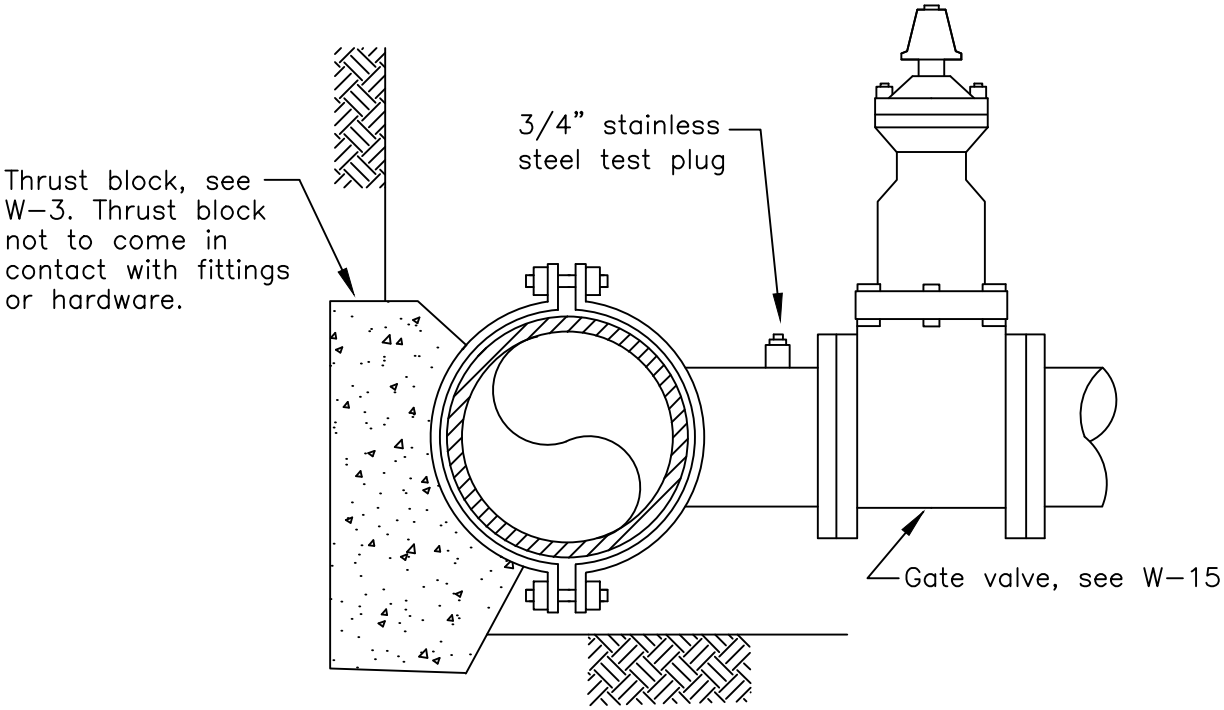
WATER MAIN TEMPORARY JUMPER CONNECTIONS

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M–W	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–7B

City Engineer

W07B.DWG



ELEVATION

Notes:

1. For mains larger than 12", field verify existing o.d. pipe dimension for the ENGINEER'S approval before ordering tapping sleeve.
2. Tapping sleeve shall be minimum 3' from joints, connections or fittings.
3. Maximum size tap allowed, without approval of the ENGINEER, shall be main line pipe inside diameter minus 2". Tee fittings are required for 'size' to 'size' connections.
4. All tapping valves to be resilient seat type gate valves with EPDM rubber.
5. Grind 3" valve type "GV", and distance of valve from face of curb (in Roman numerals) in face of curb. Paint white, except for 1) potable fire hydrant or dedicated fire service which shall be painted red, or 2) reclaimed system valves which shall be painted purple.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

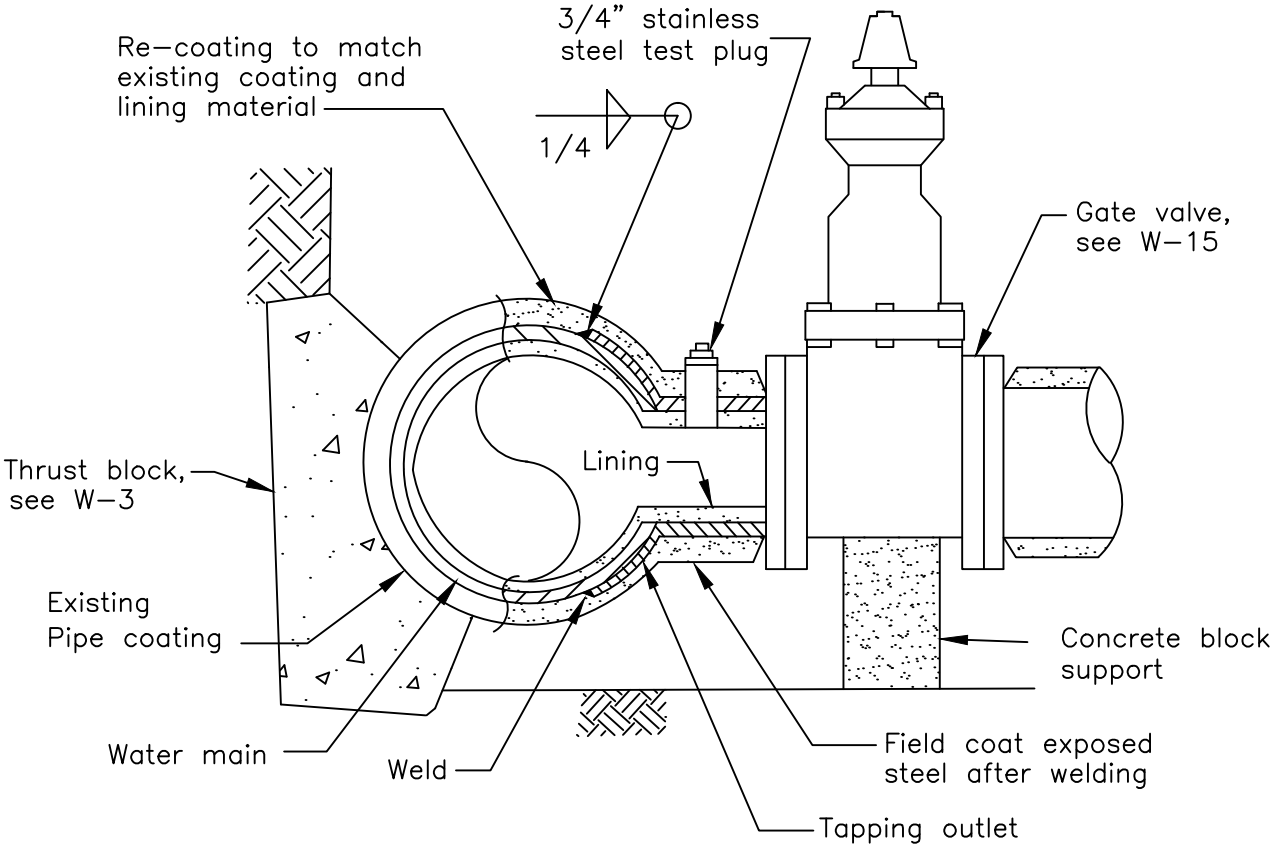
TAPPING SLEEVE AND VALVE, 4" SERVICE AND LARGER (ACP, PVC & DIP)

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–8

City Engineer

W08.DWG



ELEVATION

Notes:

1. For mains larger than 12", verify existing pipe outside dimension with City's Water Resources Division before ordering tapping sleeve.
2. Tapping outlet shall be minimum 3' from joints, connections or fittings.
3. Maximum size tap allowed, without approval of the ENGINEER, shall be main line pipe inside diameter minus 2". Tee fittings are required for 'size' to 'size' connections.
4. All tapping valves to be resilient seat type gate valves.
5. Grind 3" valve type "GV", and distance of valve from face of curb (in Roman numerals) in face of curb. Paint white, exept for 1) potable fire hydrant or dedicated fire service which shall be painted red, or 2) reclaimed system valves which shall be painted purple.
6. All welding per the American Welding Society (AWS) DI.1.
7. For spiral wrapped pipe, tack weld spirals before cutting pipe.
8. On "non–cathodically" protected systems, install anode before re–coating. Submit anode installation design to the ENGINEER for approval.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

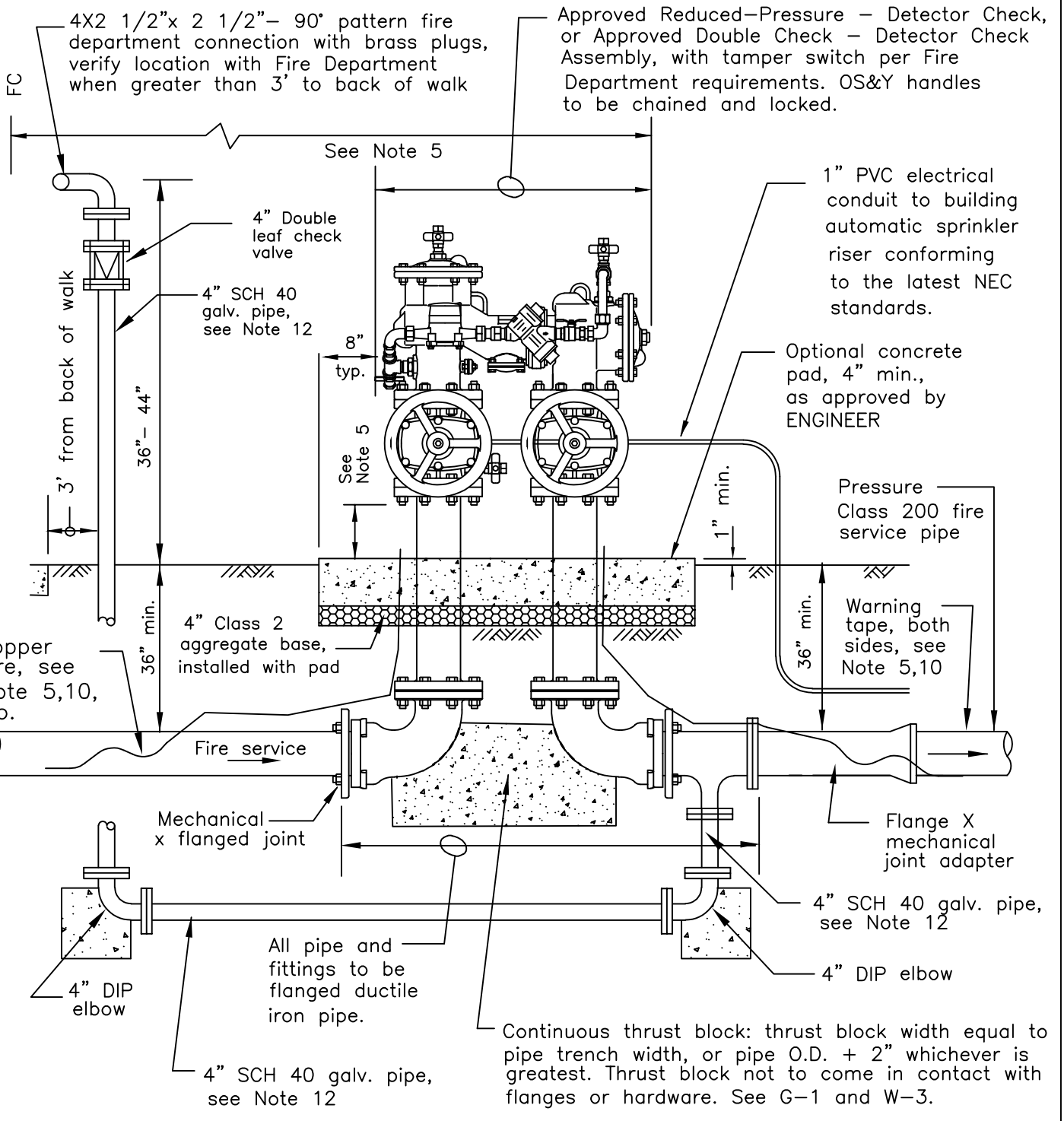
W09.DWG

TAPPING OUTLET & VALVE, 4" SERVICE AND LARGER (MLCSP)

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–9

City Engineer



* SEE NOTES ON SHEETS W–10B & W–10C
* For screening requirements see Note 5.
* For on–site installation see Note 7.
* Size & location of fire department connection to be approved by the Fire Department.
* See Note 13 for connection to the City's reclaimed water system.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

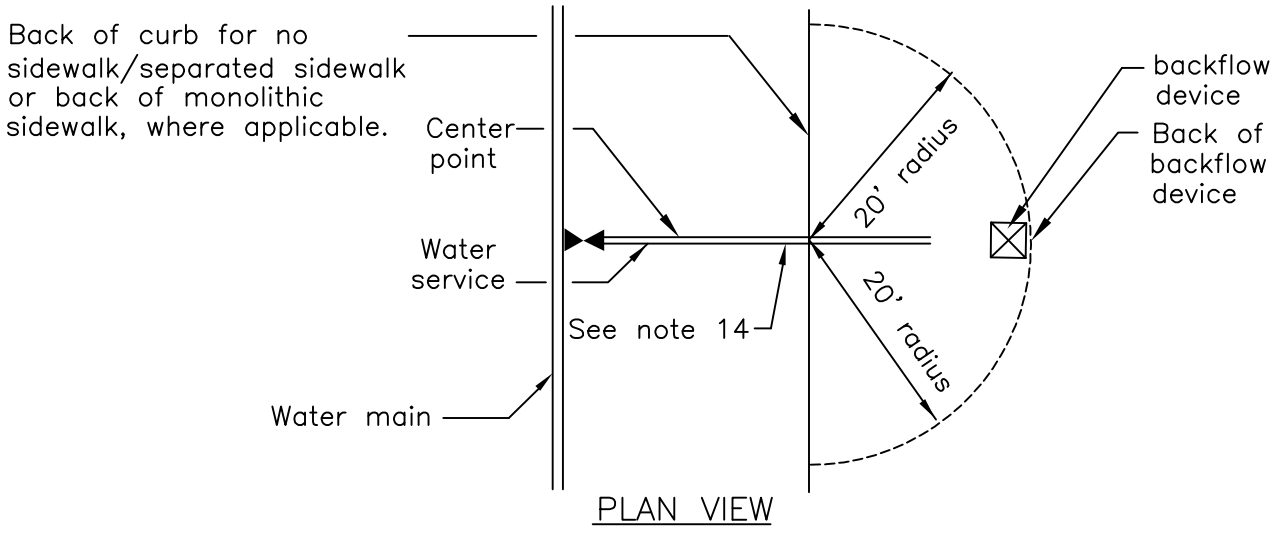
INDUSTRIAL/COMMERCIAL FIRE SERVICE (CLASS 1 THROUGH 6)

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: KY/HI	Date: Sept–22	No.
Ckd: Spec. Committee	Scale: None	W–10A

City Engineer

W10A.DWG



PLAN VIEW

LOCATION OF BACKFLOW PREVENTER

Notes:

1. Pipe size shall be determined by fire flow requirements.
2. Double Check–Detector Check assemblies shall be fully factory assembled.
3. Size and location of fire service, Double Check–Detector Check and Detector Check assemblies shall be approved by the ENGINEER AND FIRE MARSHALL.
4. By–pass trim shall be wrapped with insulation.
5. All aboveground industrial and commercial fire service devices shall be installed in accordance with City of Livermore City Council Resolution No. 93–116, Standard Conditions of Approval for Industrial and Commercial Development, Ordinance No. 1486 and the following:

   Location and placement:
   - locate backflow device as shown in the detail above.
   - install as near the minimum of 12" but not to exceed a maximum of 24" above 1) the street curb elevation, and 2) the grade elevation measured directly below the device;
   - place "DO NOT CONNECT" warning tape over the lateral from the main to the device;
   - devices shall be accessible for servicing.

   Screening requirements:
   - screen from view, except for the fire department connection which is to remain visible, by installing a combination of landscaped berms and/or masonry walls blending with the overall landscaping theme which forms a 100% opaque screen to the normal field of public street traffic; maintain 36" minimum clearance from plants and shrubs.
   - installation subject to design review approval.
   - Paint to match surroundings.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

W10B.DWG

INDUSTRIAL/COMMERCIAL FIRE SERVICE NOTES

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M/W/HI	Date: Sept–22	No.
Ckd: Spec. Committee	Scale: None	W–10B

City Engineer

Notes continued :

6. For Class 1 through 6 Fire Service, meter to be purchased from City and installed by City. Meter and by–pass line shall be insulated.
7. For all classes, on the "on–site" service side, the location and requirements for the Fire Department Connection are subject to Fire Department requirements and approval. All on site piping shall be installed in accordance with the City standard specifications.
8. For assemblies installed with concrete pad, additional protective wrap or coating shall be placed around pipe passing through the concrete.
9. For sites with high degrees of hazard, as determined by the Water Resources Division, the Double Check–Detector Check assembly shall be replaced with an approved Reduced Pressure assembly as directed by the Water Resources Division.
10. Service lateral shall have warning tape and copper wire installed along it's entire length up to the backflow prevention device.
11. Access to fire department connections to remain accessible and fire lane to be posted per City and Fire Department standards.
12. All underground SCH 40 galv. pipe shall be wrapped with 10 mil. protective tape or polyethylene encasement. Above ground pipe shall be wrapped with 10 mil. protective tape.
13. Recycled water:
    - See the latest City of Livermore "Guidelines for the use of Recycled Water" for installation and additional information.
    - Pressure Class 200 pipe shall be used when connecting to the City's recycled water system.
14. The City's maintenance jurisdiction is up to the property line.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

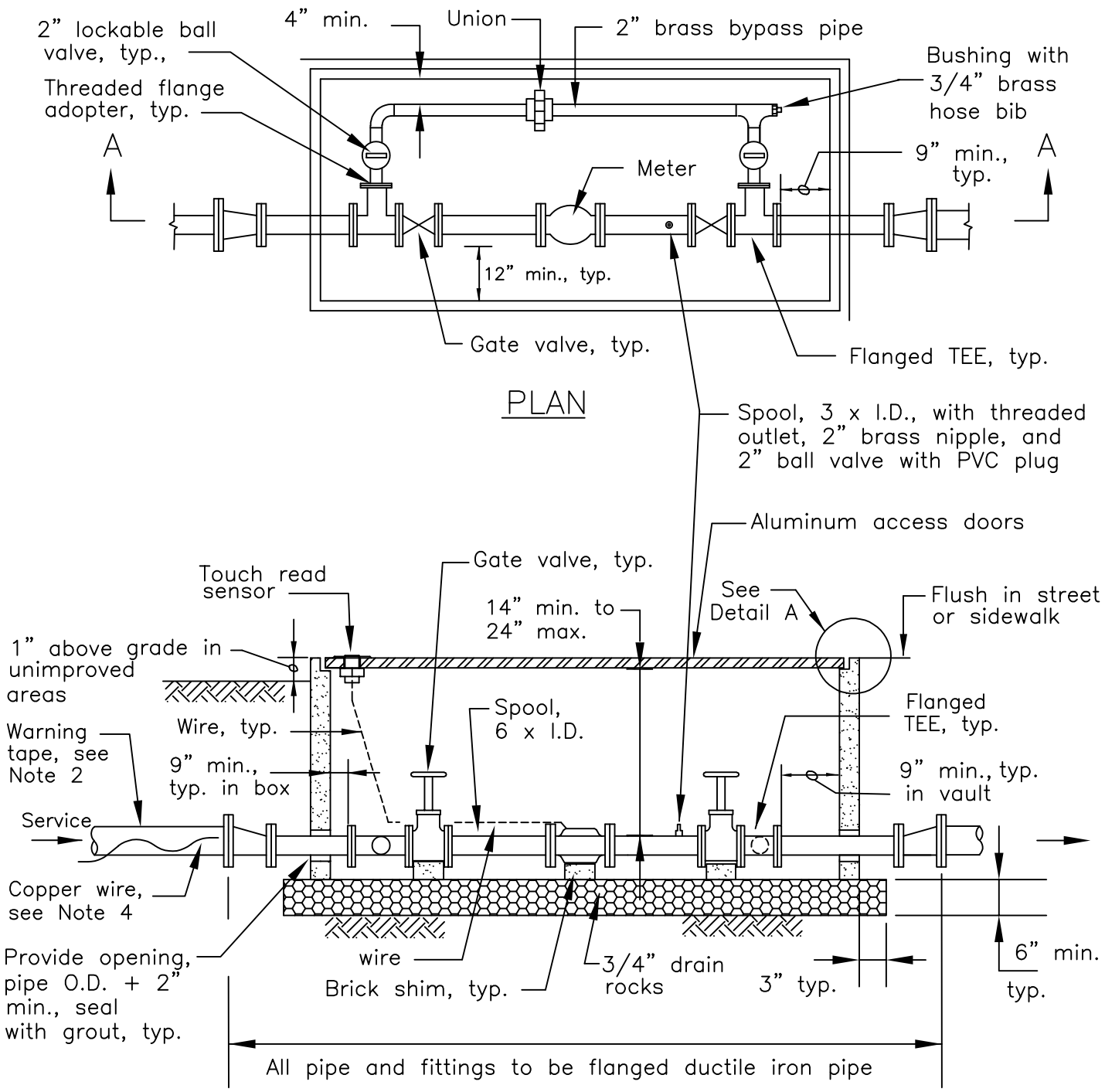
W10C.DWG

INDUSTRIAL/COMMERCIAL FIRE SERVICE NOTES

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: W/KY/HI	Date: Apr–23	No.
Ckd: Spec. Committee	Scale: None	W–10C

City Engineer



Notes:

1. Meters larger than 3" to be installed in vault with access doors per spec. 055000 2.3A and a permanent bypass line.
2. Service lateral shall have warning tape and copper wire installed along its entire length, see W–2.
3. If necessary, raise W line at meter to be a min. 14" to 24" max. from access doors.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

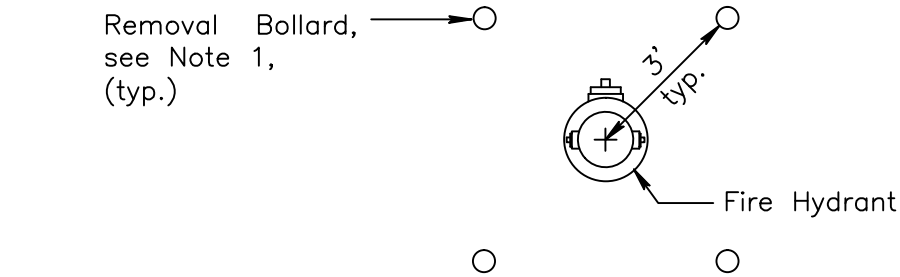
W11.DWG

TURBINE TYPE METER 3" AND LARGER

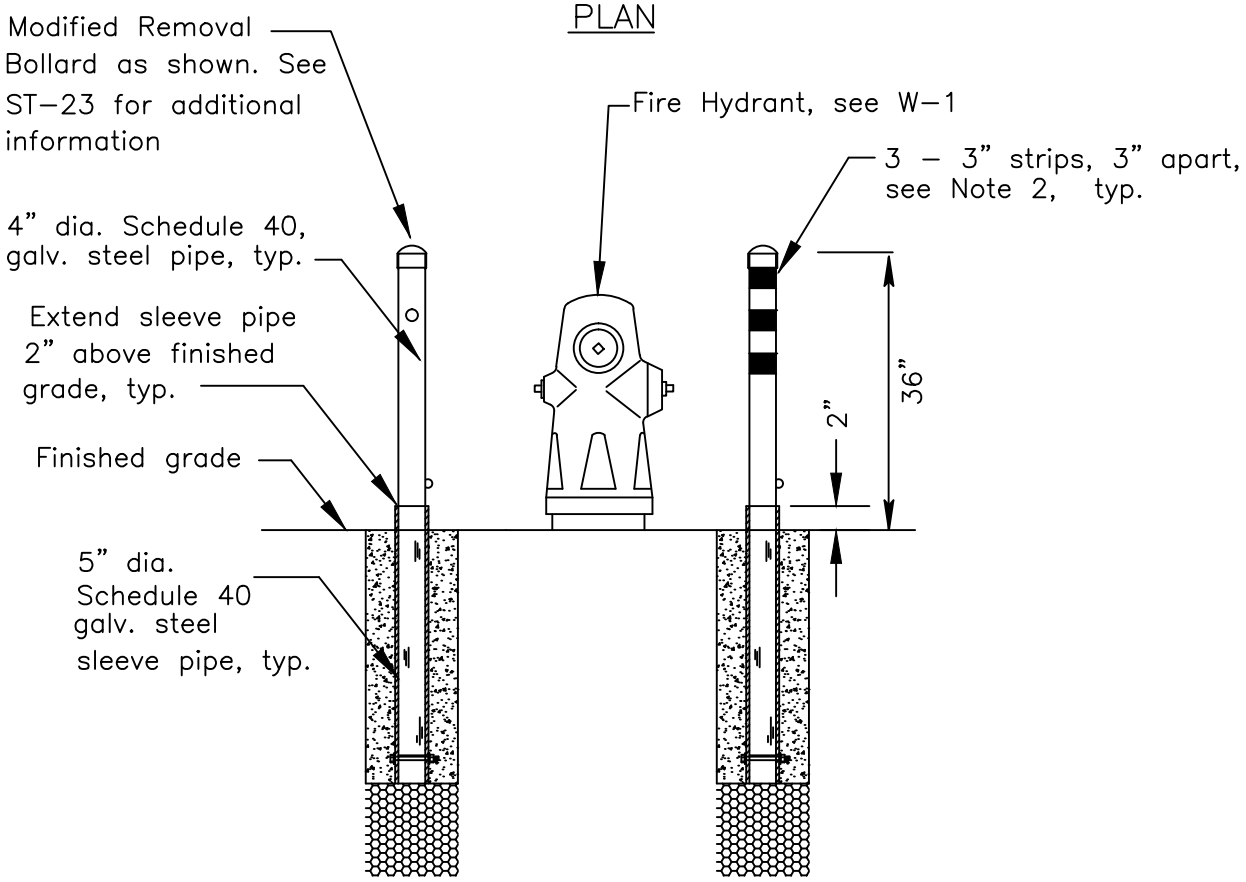
CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M–W/KY/HI	Date: Apr–23	No.
Ckd: Spec. Committee	Scale: None	W–11

City Engineer



PLAN



ELEVATION

Notes:

1. Fire Hydrant outlets NOT to be blocked by bollards.
2. Paint bollards per the City Standard Specifications, place 3 – 3" strips of 45° grey/white reflective barricade tape at top of bollard.
3. Bollard shall be installed as required by the ENGINEER
4. See ST–23 for additional information on the Removable Bollards.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

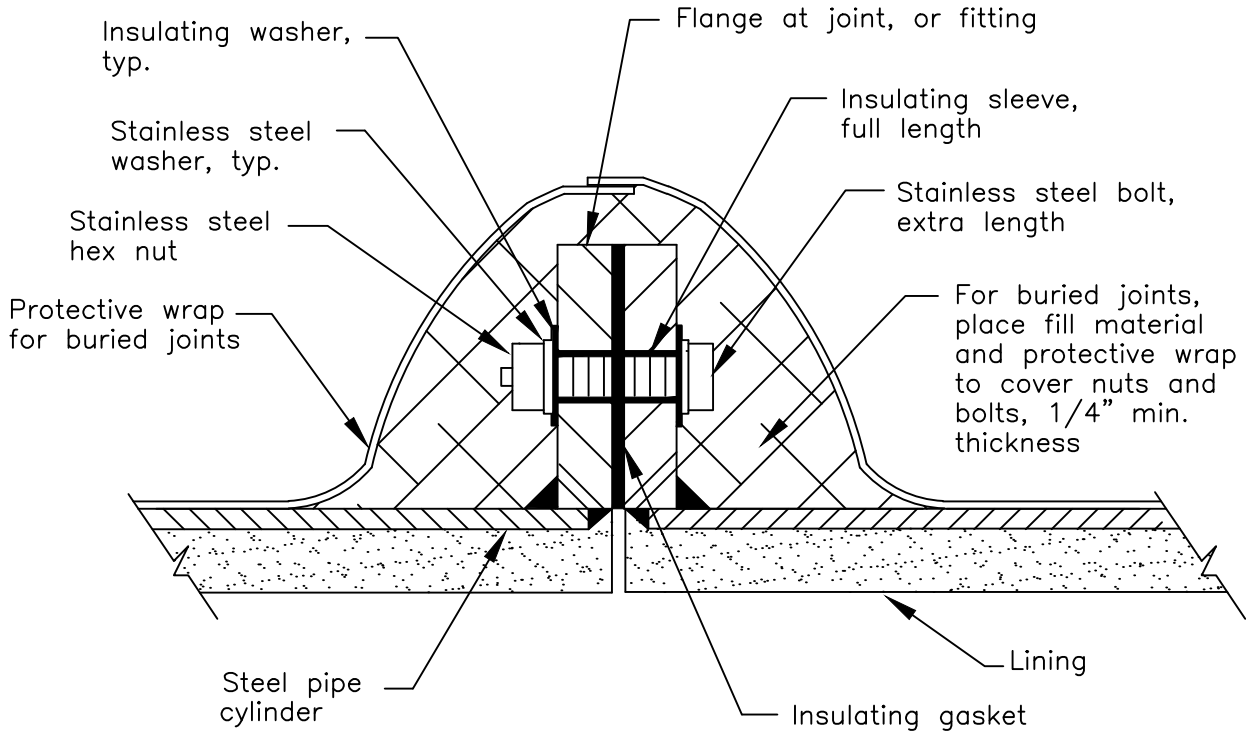
FIRE HYDRANT GUARD BOLLARD

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M–W/KY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–12

City Engineer

W12.DWG



INSULATING FLANGE

Notes:

1. Filler and wrappings may be deleted for above–grade insulating joints.
2. Insulating gasket shall be appropriate for "water" service and shall be the same pressure rating as the flange.
3. For exposed joints, coat flanges (except machined flange face) same as pipe. Do not coat bolts or washers.
4. "Fill" material shall be as recommended by the manufacturer.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

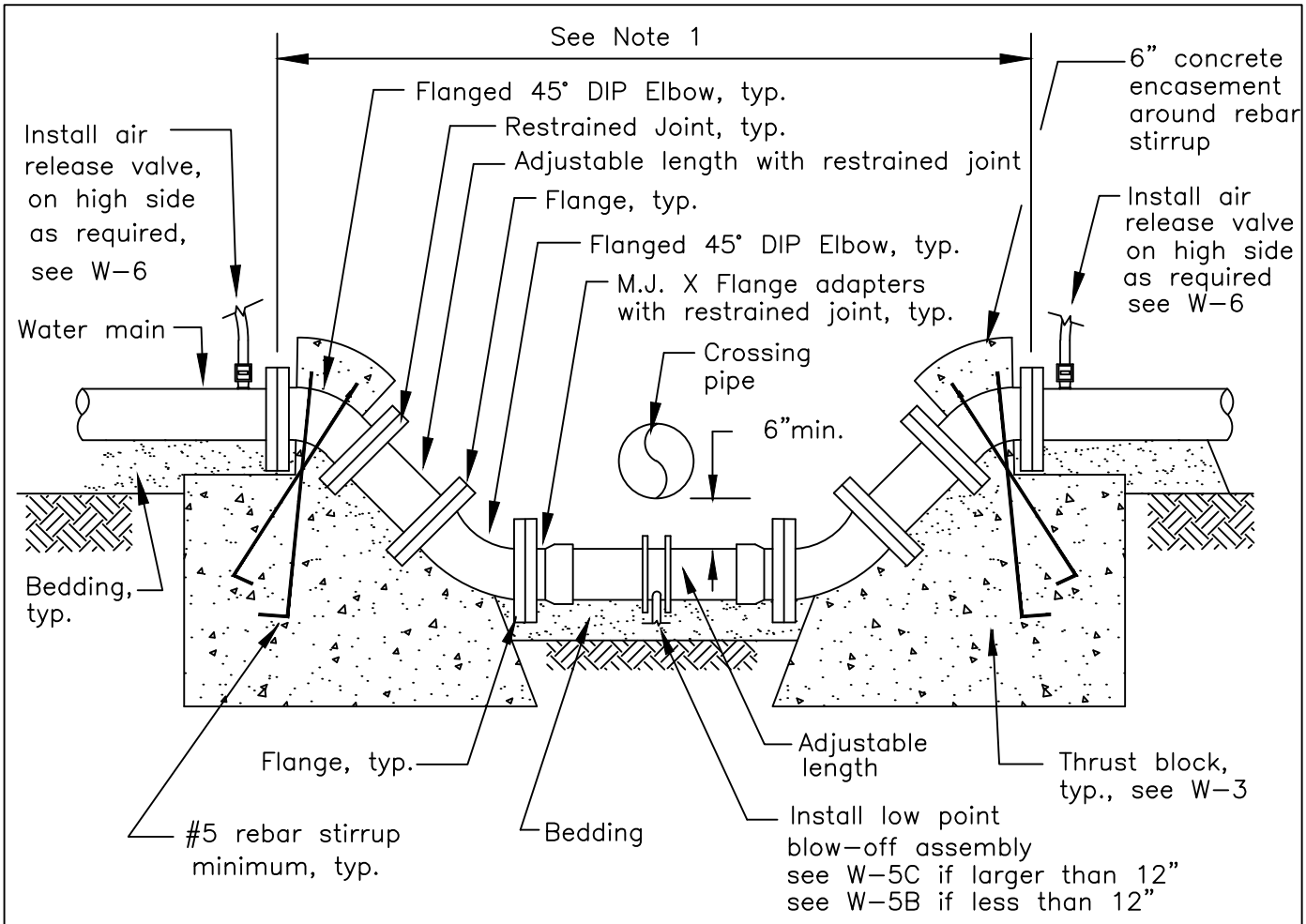
INSULATING FLANGE

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M–W	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–13

City Engineer

W13.DWG



M.J. = MECHANICAL JOINT

VERTICAL ELEVATION

Notes:

1. On ACP, PVC, and DIP pipe all material shall be flanged ductile iron pipe. On steel pipe all material shall be flanged steel.
2. Use building paper or foam board to prevent direct contact of concrete with pipe fittings, flanges, or nuts and bolts. See W–3.
3. Water line "off–set" is allowed only when all three of the following conditions are met:
   a. Crossing pipe is a gravity line,
   b. "off–set" line invert is more than 6' below finish grade, and
   c. only when approved by ENGINEER.
4. Install "Low Point Blow–off" at low point of offset. See W–5C.
5. For New Water line offset under an existing sanitary sewer pipe, the New Water line must comply with this detail and G–2.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

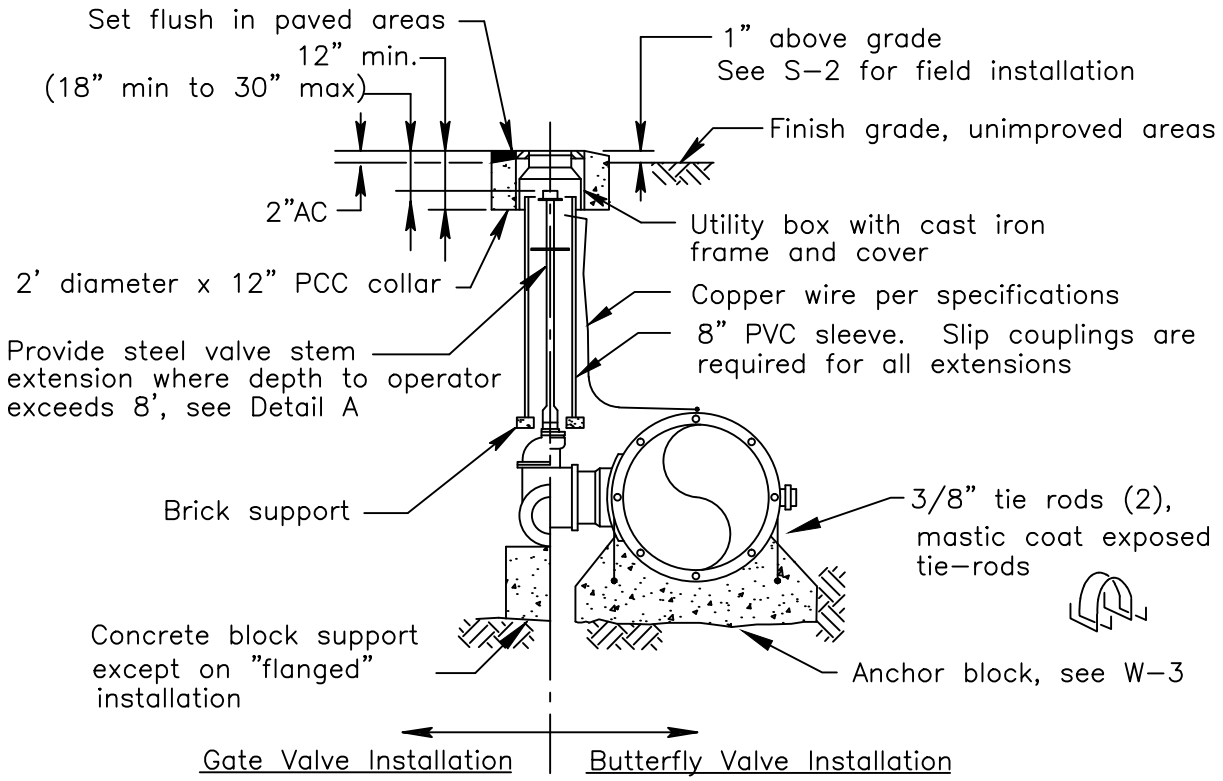
WATER LINE OFFSET

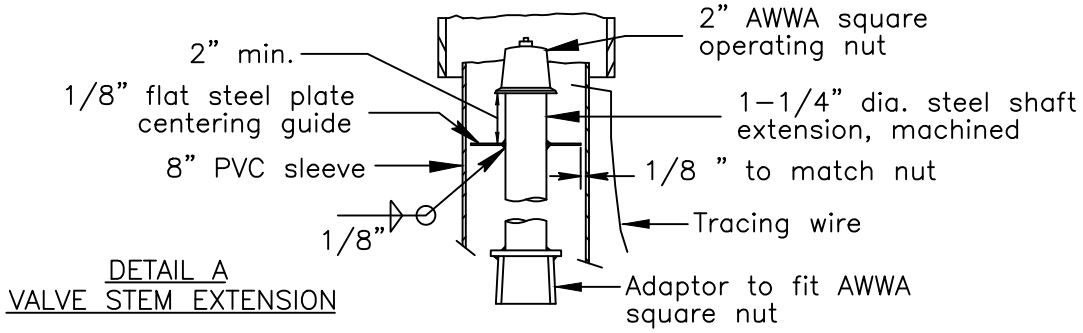
CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–14

City Engineer

W14.DWG





DETAIL A
VALVE STEM EXTENSION

Notes:

1. Anchor block is not required with flanged butterfly valve.
2. Install butterfly valve with operating nut on curb side of main.
3. Grind 3" valve type "BV", "GV", and distance of valve from face of curb (in Roman numerals) in face of curb. Paint red for fire hydrant and dedicated fire service, paint purple for reclaimed water, paint white for all others. If valve is on a dedicated fire service grind 3" "W" on top of curb over lateral, paint white for potable systems and purple for reclaimed systems.
4. Main line valve cover to be painted Handicap blue. On recycled water system, paint valve cover purple per the City Standard Specifications.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

W15.DWG

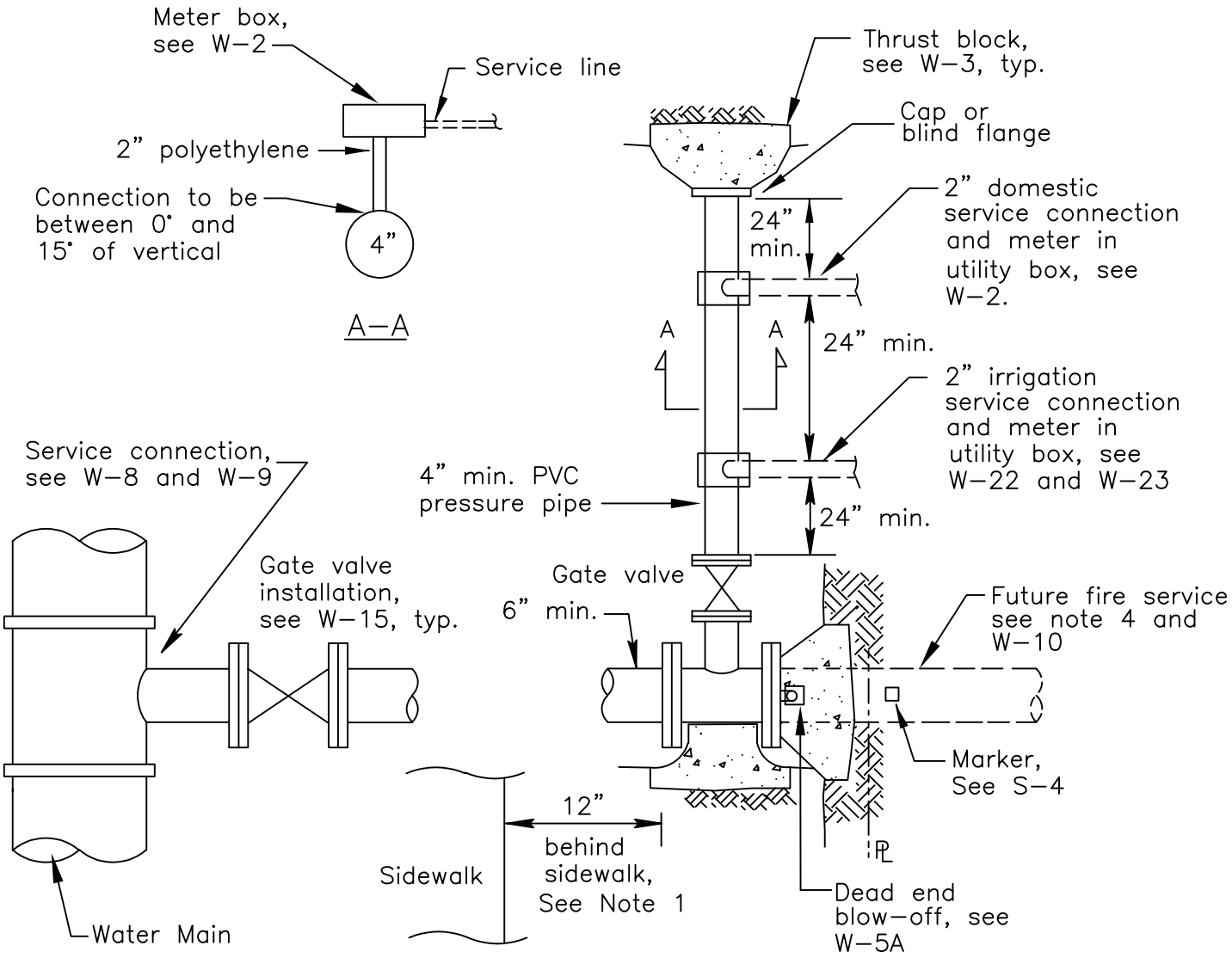
BURIED VALVE

14" AND LARGER BUTTERFLY VALVE
12" AND SMALLER GATE VALVE

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–15

City Engineer



Notes:

1. Grind 3" high "W" on top of curb over service and paint white. Grind 3" high valve type (i.e. "BV", "GV", etc.) and distance of valve to face of curb (in Roman numerals) in face of curb and paint white.
2. All pipes shall have blue warning tape and copper wire, see W-2.
3. For Commercial/Industrial Joint Domestic/Fire Service installation with MULTIPLE on-site domestic or irrigation service lines, install as shown above, for installation with only ONE on-site domestic or irrigation service line, connect to Fire service line in accordance with W-2.
4. The City's Maintenance jurisdiction is up to the property line.
5. Can install saddle on fire service, if only one service(no tee, no gate)

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

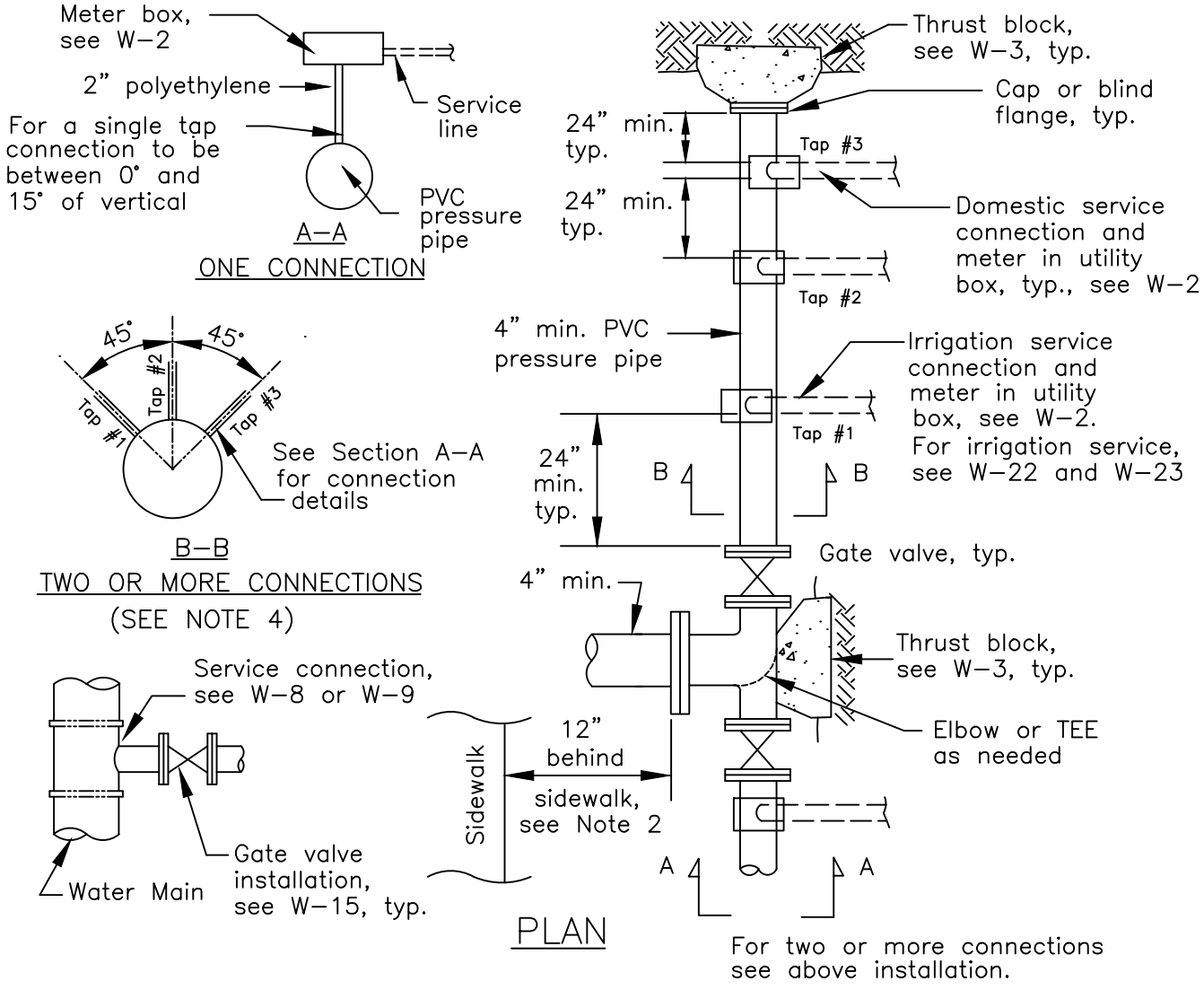
COMMERCIAL/INDUSTRIAL JOINT DOMESTIC/ FIRE SERVICE

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M/W/HI	Date: Sept-22	No.
Ckd: Spec. Committee	Scale: None	W-16

City Engineer

W16.DWG



Notes:

1. Manifold water meter installation is for domestic service only.
2. Grind 3" high "W" on top of curb over service and paint white. Grind 3" high valve type (i.e. "BV" "GV", etc.) and distance of valve to face of curb (in Roman numerals) in face of curb and paint white.
3. All pipes shall have blue warning tape and copper wire, see W-2.
4. For two or more taps on one length of PVC pipe, the taps should be staggered and no closer than 24" apart, measured longitudinally.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

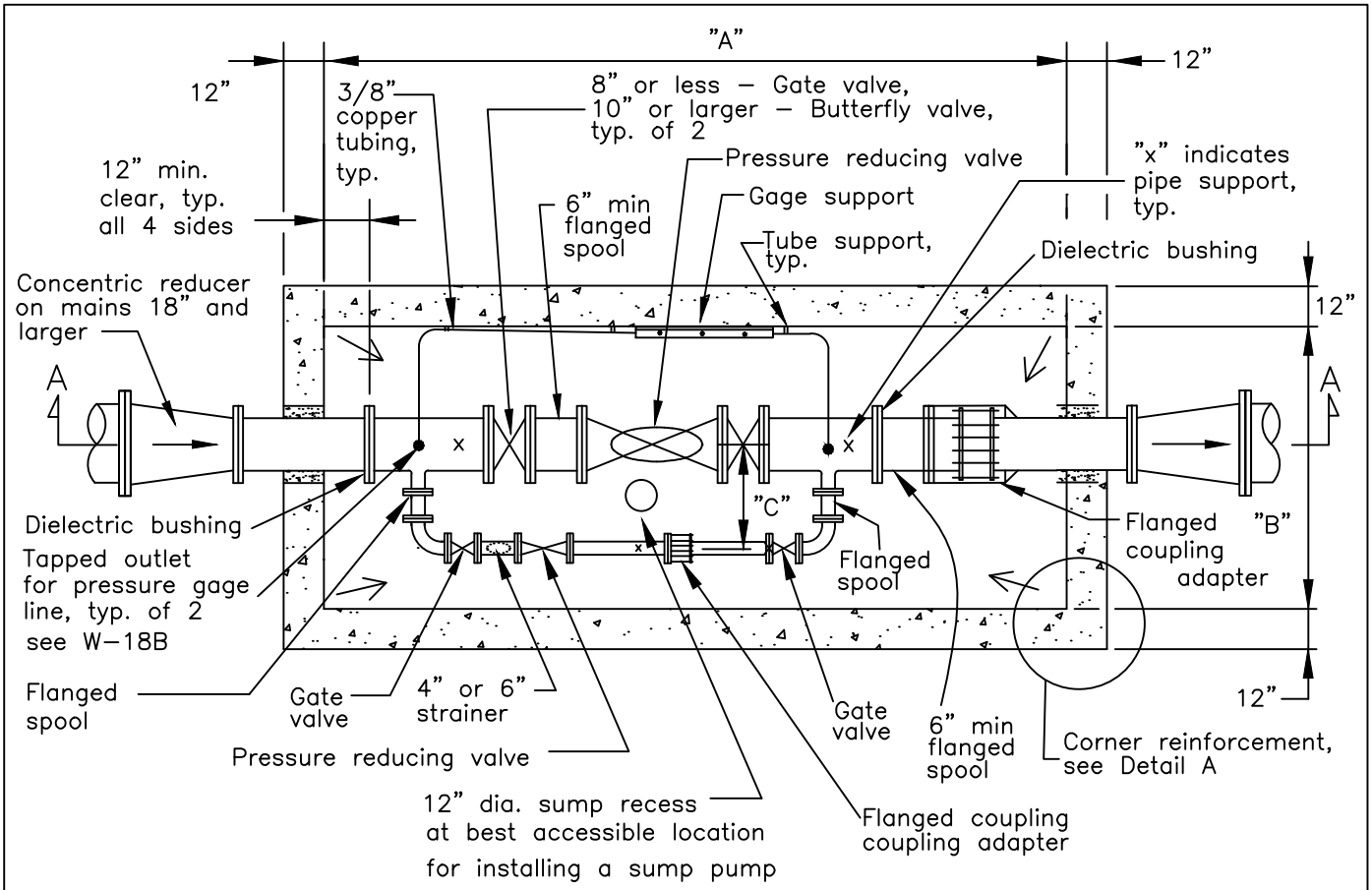
W17.DWG

MANIFOLD WATER METER INSTALLATION

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-17

City Engineer



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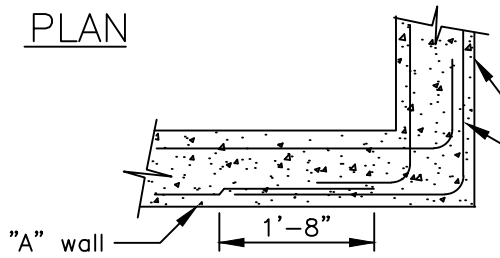


DETAIL A

Corner Reinforcement Overlap

Vault Size					
Main Size	Vault Piping	"A" min.	"B" min.	"C" min.	Bypass Piping and valve size
18"	16"	16'–0"	7'–0"	2'–1"	6"
16"	16"	16'–0"	7'–0"	2'–1"	6"
14"	14"	14'–0"	7'–0"	2'–1"	6"
12"	12"	12'–0"	6'–0"	2'–1"	see Note 5
10"	10"	12'–0"	4'–6"	1'–6"	4"
8"	8"	10'–6"	4'–6"	1'–6"	4"
6"	6"	10'–6"	4'–6"	1'–6"	4"

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

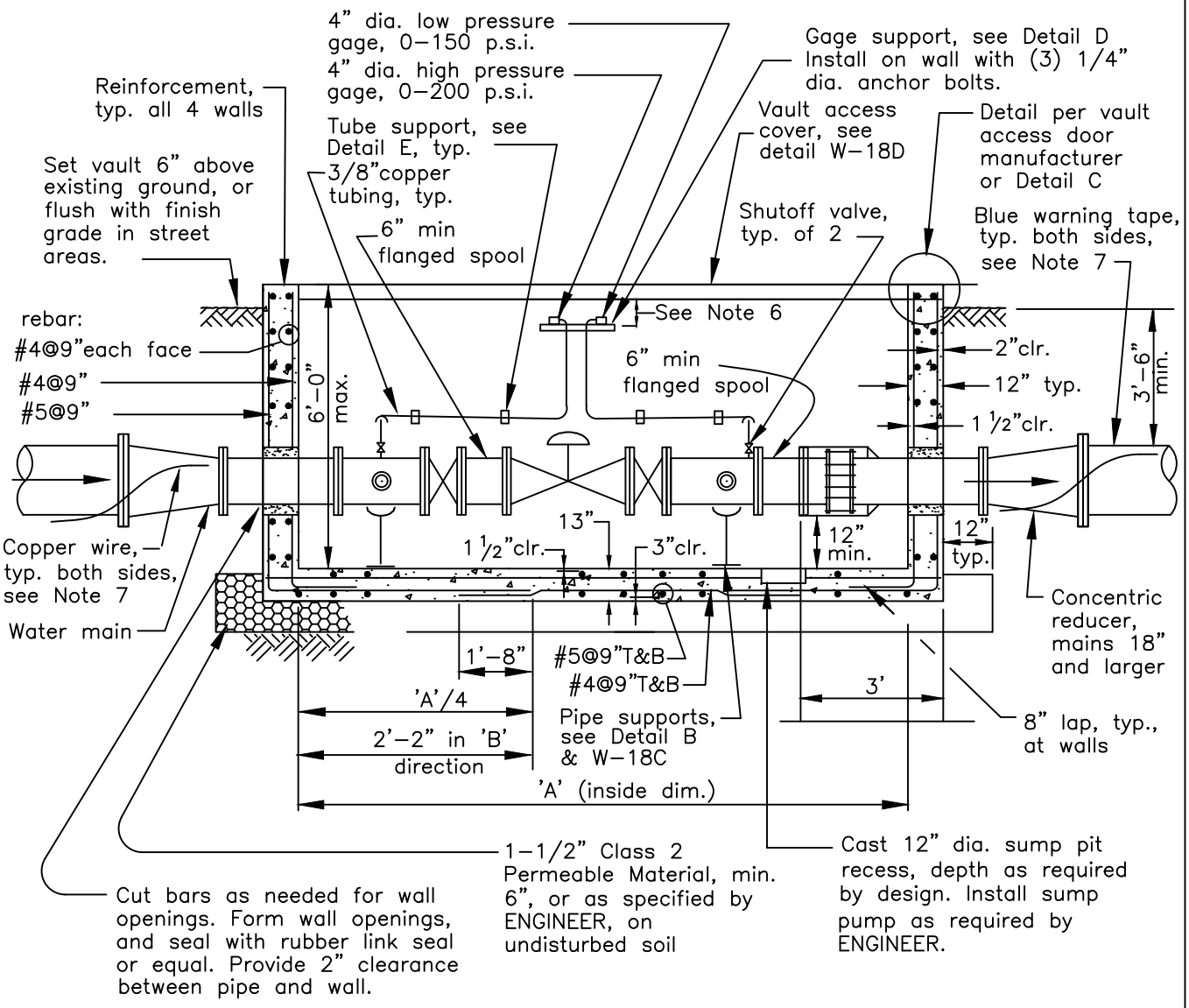
W18A.DWG

PRESSURE REDUCING STATION

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–18A

City Engineer



SECTION A–A

ASSUMED DESIGN CRITERIA, SEE NOTE 3:

Lateral soil pressure: 75 pcf (equivalent fluid)
Traffic surcharge: 150 psf (uniform)
No ground water
H–20 traffic loading on top of vault
allowable soil bearing: 1000 psf
f'c=3000 psi min.
Grade 40 or 60 Reinforcement
Seismic: zone 4,
increase in soil pressure: 24H (plf)
applied at 0.6H

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

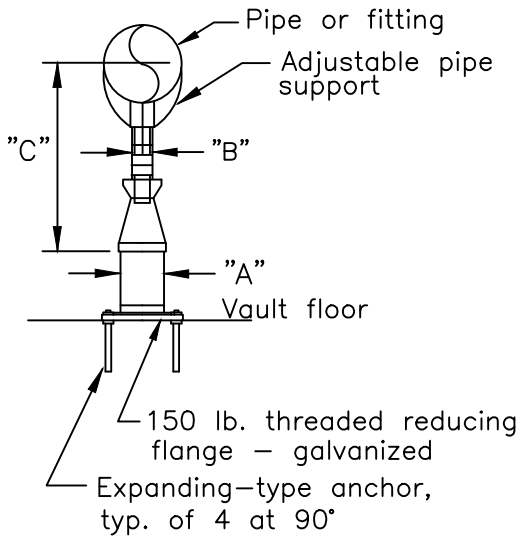
PRESSURE REDUCING STATION

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–18B

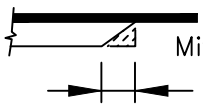
City Engineer

W18B.DWG



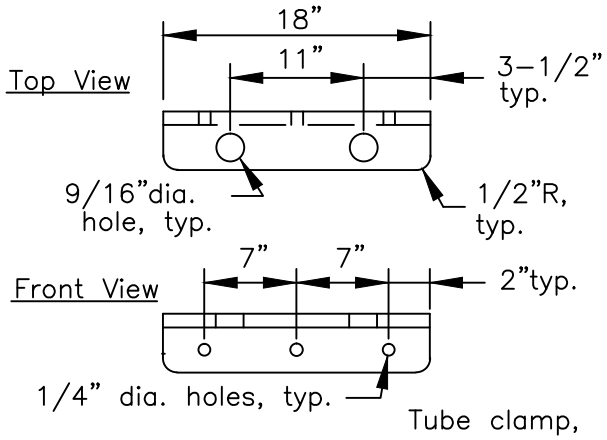
ADJUSTABLE PIPE SUPPORT APPROXIMATE DIMENSIONS IN INCHES				
PIPE SIZE	"A"	"B"	"C" MIN.	"C" MAX.
4	3	2–1/2	10–1/4	14
6	3	2–1/2	11–5/8	15–1/4
8	3	2–1/2	13–5/8	16–1/2
10	3	2–1/2	14–5/8	18–1/4
12	3	2–1/2	15–5/8	19–3/4
14	4	3	18–7/8	20–3/4
16	4	3	19–7/8	22–1/4
18	6	3–1/2	21–1/4	24

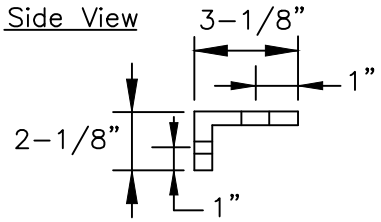
ADJUSTABLE PIPE SUPPORT
DETAIL B



For steel checker plate cover

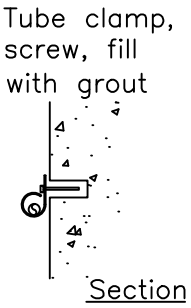
DETAIL C





1/8" aluminum plate
Gage support

DETAIL D



Tube support

DETAIL E

Notes:

1. Pipe fittings, valves, tees and cocks for pressure gauges to be brass, bronze, or copper.
2. Slope floor of vault to drain to sump pit, min, 1% and max. 2%.
3. Mains larger than 18" and specific site conditions that do not meet "ASSUMED DESIGN CRITERIA" per W–18A require custom designed box and assembly as approved by ENGINEER
4. For Pressure Reducing Stations installed in non–street areas, install 4 guard posts, one at each corner, 12" clear from outside edge of vault wall, and as directed by ENGINEER. Installation of guard posts per W–12.
5. Min. 4", or 6" as determined by ENGINEER and Water Resources Division.
6. Mounting height of gauges shall be as specified by the Water Resources Division.
7. Water main shall have warning tape and copper wire installed along it's entire length up to the vault, see W–2
8. For pressure reducing stations, installed in steel main areas, a bonding jumper will be installed around the station for cathodic protection.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

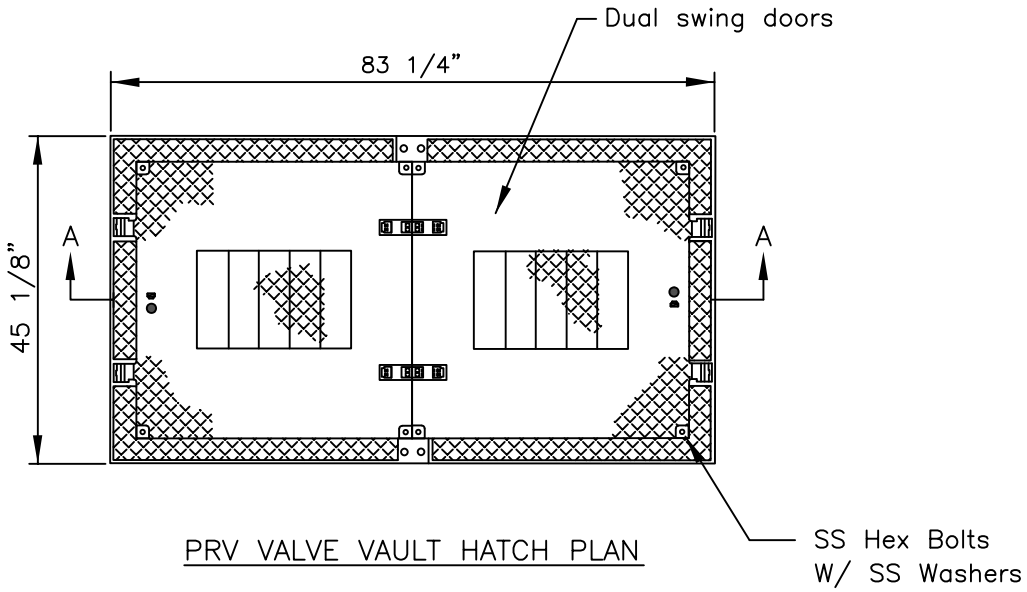
W18C.DWG

PRESSURE REDUCING STATION

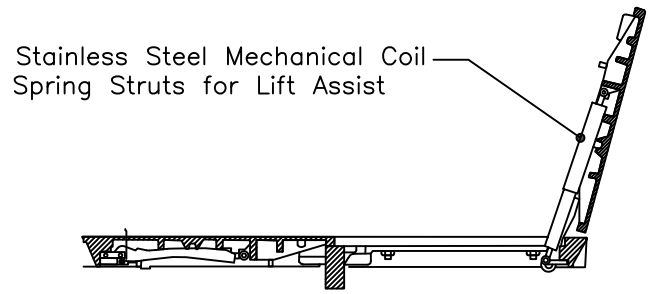
CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M–W	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–18C

City Engineer



PRV VALVE VAULT HATCH PLAN



SECTION A–A

NOTES:

1. Hatch shall be mode ej 8197Z2PT 8217APT Assembly or equal
2. Dual Swing Doors
3. SS Hex Bolts W/ SS Washers
4. MPIC® Multi–Tool Pickbar
5. Stainless Steel Mechanical Coil Spring Struts for Lift Assist
6. Design Load Heavy Duty
7. Design Features: Materials – Hatch Cover (Ductile Iron), Hatch Frame (Ductile Iron).

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date	By	Rev.

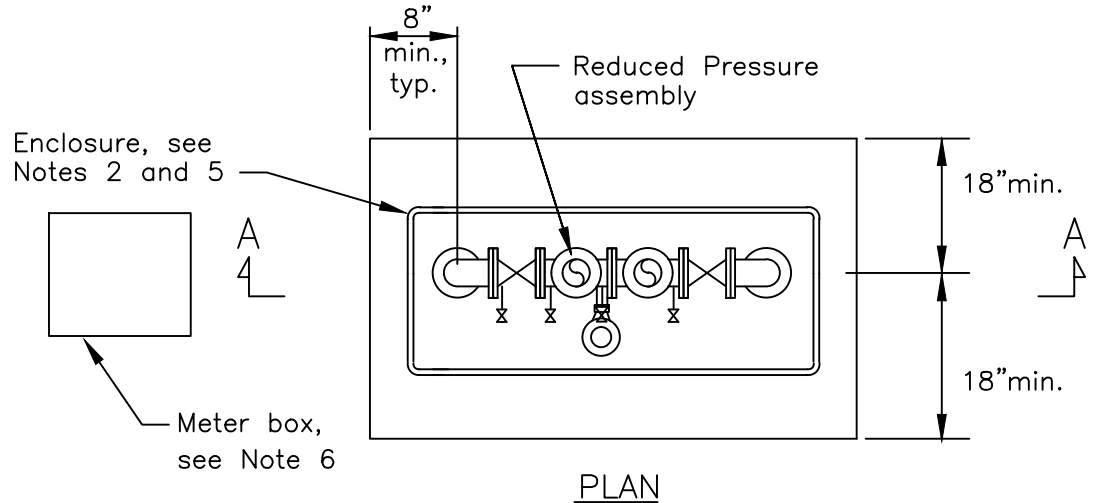
PRV VALVE VAULT HATCH

CITY OF LIVERMORE
STANDARD DETAIL

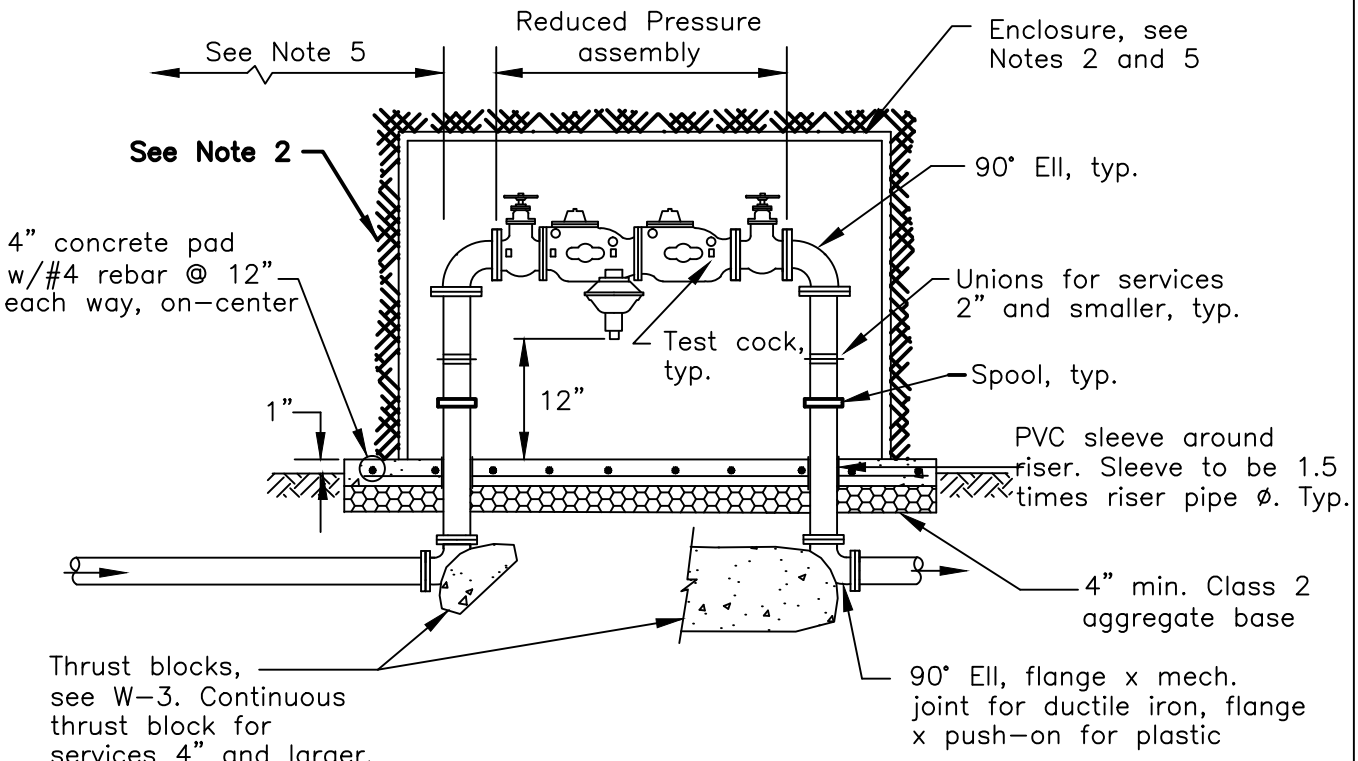
Dwn: HI	Date: Nov–22	NO.
Ckd: Spec. Committee	Scale: NONE	W-18D

City Engineer

W18d-r.dwg



PLAN



SECTION A-A

For screening requirements see Note 5.

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

			REDUCED PRESSURE BACKFLOW PREVENTER	CITY OF LIVERMORE STANDARD DETAIL
				Dwn: FY / Date: May-13 / No.
				Ckd: Spec. Committee / Scale: None / W-22A
Date:	By:	Rev:		City Engineer

W22A.DWG

Notes:

1. Reduced Pressure Backflow assemblies shall be fully factory assembled.
2. City owned Insulated enclosure (or an enclosure with an insulating blanket) is required for backflow preventers of 2" size and smaller. (Refer to Spec section 331213)
3. Concrete pad shall be sized to accommodate the insulated enclosure. Where an enclosure is not required, provide the minimum dimensions and clearances shown. Concrete pad may be deleted on private service installations.
4. Piping materials:
   - 2" and smaller: Brass, bronze or copper
     Threaded insulating bushing is required on installations with dissimilar materials.
   - Larger than 2": Flanged Ductile iron

   All pipe materials shall have protective wrap or coating around pipe passing through 4" concrete pad.
5. All aboveground irrigation service devices shall be installed as follows:
   Location and placement:
   - locate within 5' of water meter;
   - install at 12" above grade measured directly below the device;
   - place "DO NOT CONNECT" warning tape over the lateral from the meter to the device;
   - devices shall be accessible for servicing.

   In accordance with City of Livermore City Council Resolution No. 93–116, Standard Conditions of Approval for Industrial and Commercial Development, screening requirements shall be as follows:
   - screen from public street by installing a combination of landscaping, berms, and/or masonry walls;
   - installation subject to design review approval.
6. See W–2 for meter and service connection. Location subject to the approval of CITY ENGINEER.
7. Service lateral for Reduced Pressure Backflow Preventer assembly on a fire service line shall have blue warning tape and copper wire installed along it's entire length up to meter, see W–2.

User note: These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

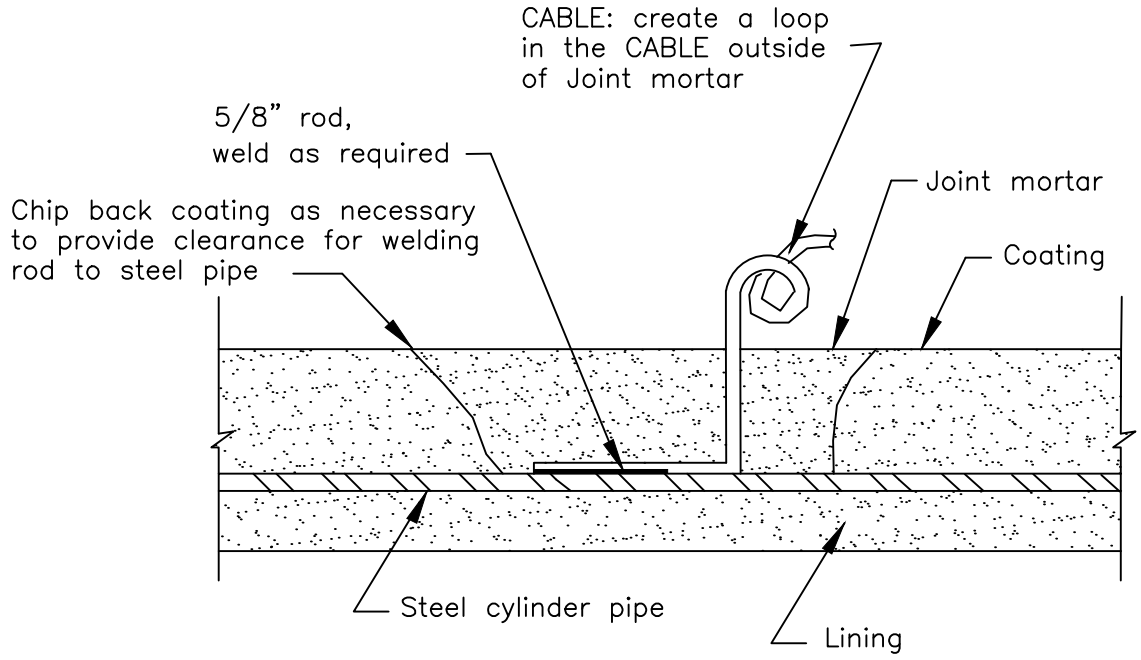
REDUCED PRESSURE BACKFLOW PREVENTER NOTES

CITY OF LIVERMORE
STANDARD DETAIL

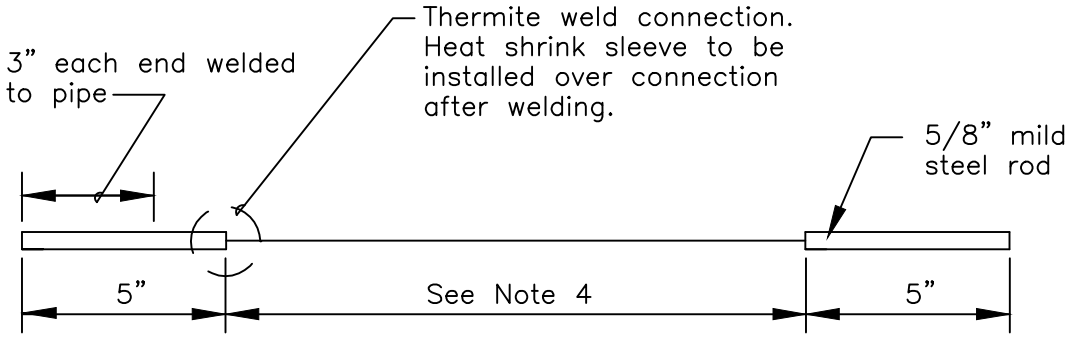
Dwn: FY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–22B

City Engineer

W22B.DWG



BONDING JUMPER CONNECTION DETAIL



CABLE DETAIL

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

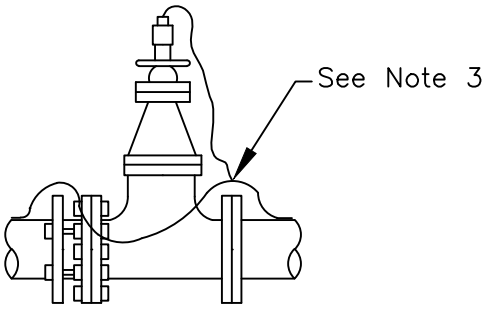
W23A.DWG

BONDING JUMPER

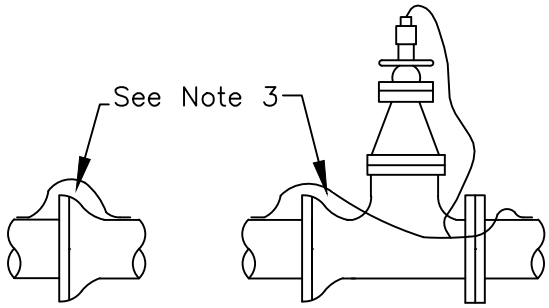
CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–23A

City Engineer



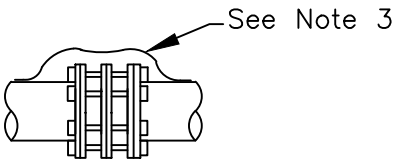
FLANGED ADAPTER



JOINT

JOINT/FITTING

BELL AND SPIGOT



FLEXIBLE COUPLING

INSTALLATION DETAILS

Notes:

1. Bonding jumpers shall be installed, as shown, across all flexible couplings, flanged adapters and hub–end valves and fittings installed in electrically continuous pipelines.
2. Bonding jumper is NOT to be installed across insulating joints or insulating couplings.
3. Bonding jumpers to be installed with a cable length of 10" at joints. On all other connections length of cable shall be "body length" of fitting(s) plus 8" additional cable for slack.
4. LOOP CABLE sizes shall be:
   #0000 on 30" and larger pipes,
   #0 on 14" thru 27" pipes, and
   #1 on 12" and smaller pipes.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

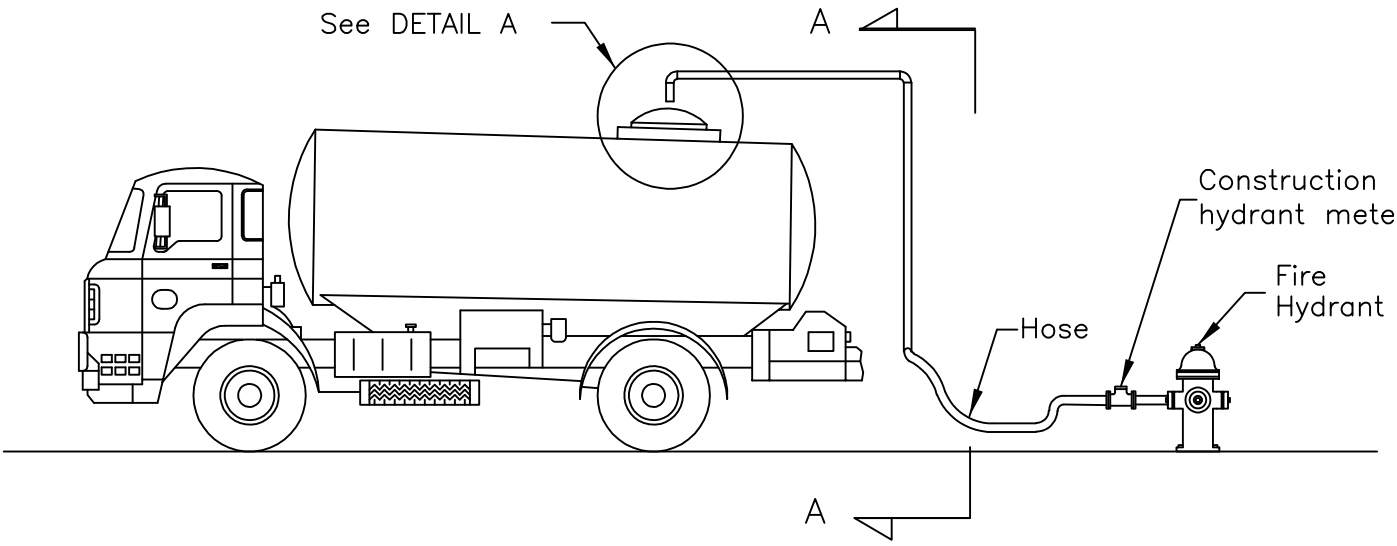
W23B.DWG

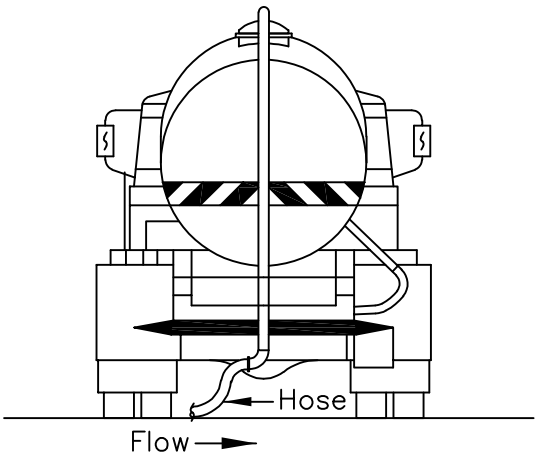
BONDING JUMPER

CITY OF LIVERMORE
STANDARD DETAIL

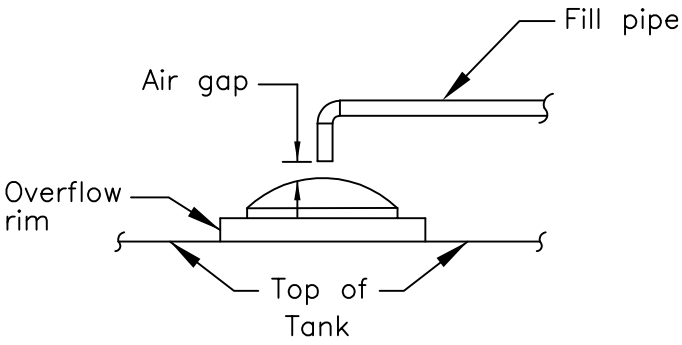
Dwn: FY	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–23B

City Engineer





SECTION A–A



AIR GAP SEPARATION
DETAIL A

Notes:

1. All piping up to air gap must be mounted permanently to the exterior of the tank, and clearly visible.
2. Air gap must be at least 2 times the fill pipe diameter from the overflow rim but in no case less than a 1 inch minimum gap, see Detail A.
3. No internally mounted air gap piping is permitted.
4. Elevated storage tank must have backflow preventer and air gap per Detail A and certified backflow preventer.
5. Contractor must obtain recycled water placard from WRD.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

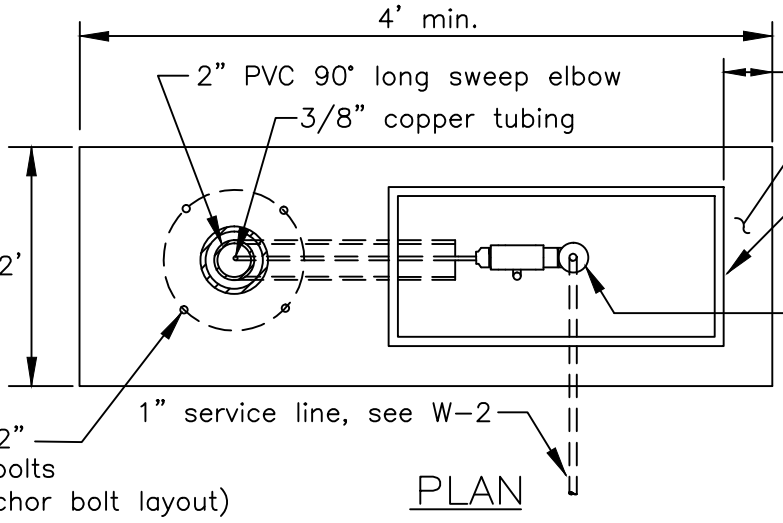
WATER TANK
TRUCK HOOK–UP
ELEVATED STORAGE TANK

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY/HI	Date: Sept–22	No.
Ckd: Spec. Committee	Scale: None	W–24

City Engineer

W24.DWG



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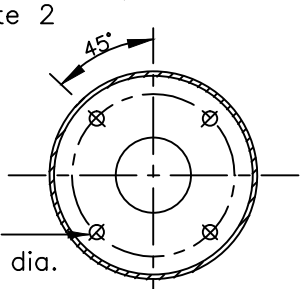
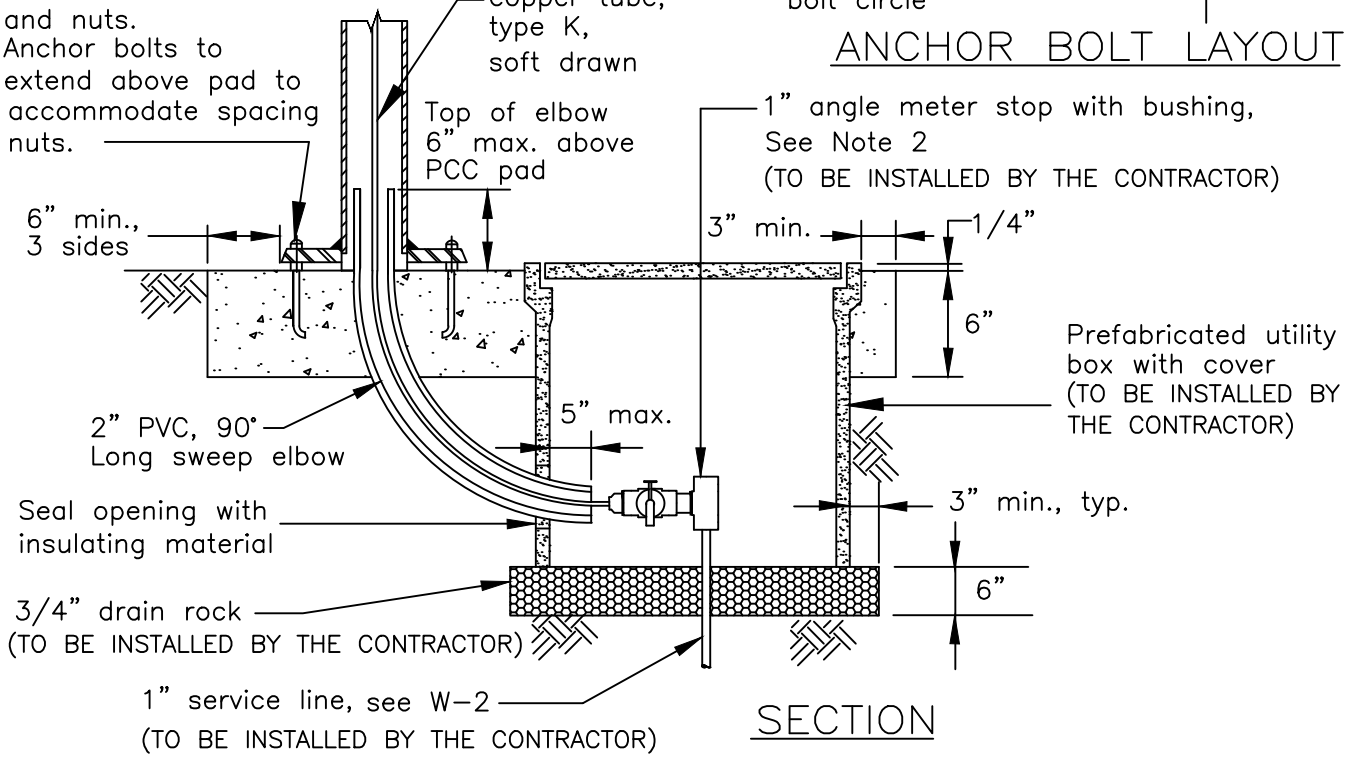


ANCHOR BOLT LAYOUT



SECTION

Notes:

1. Locate Sampling Stations within City Right-of-Way or Public Utility Easement, behind sidewalk or behind curb with no sidewalk. All locations to be approved by the ENGINEER.
2. Point the angle meter stop toward the Water Sampling Station as directed by the ENGINEER.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

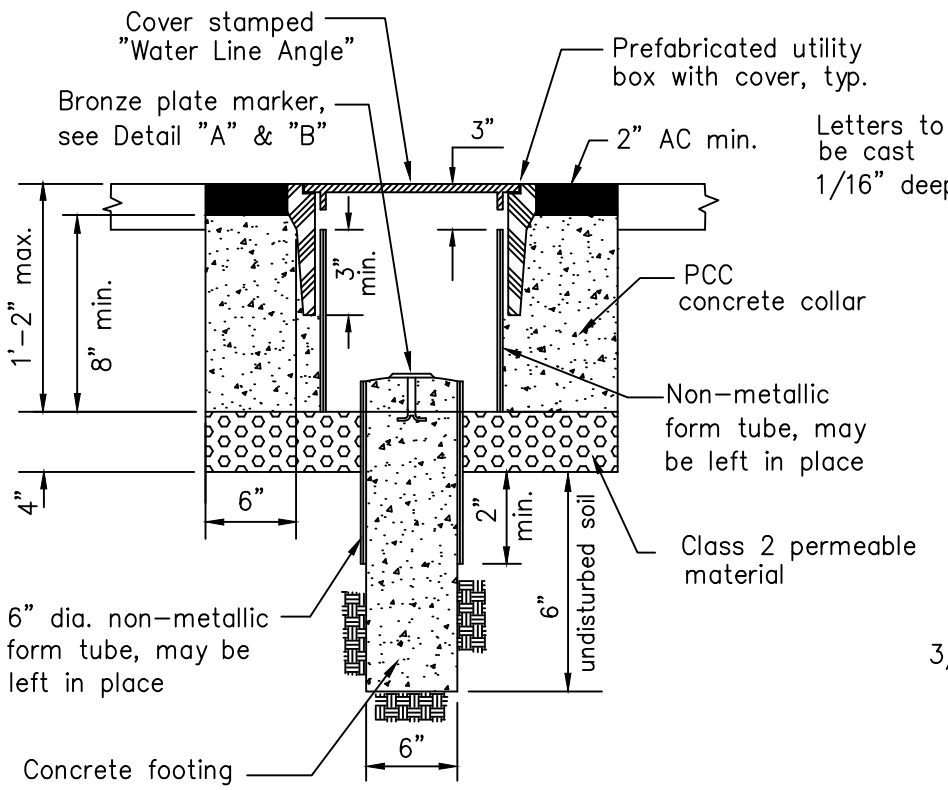
WATER QUALITY SAMPLING STATION

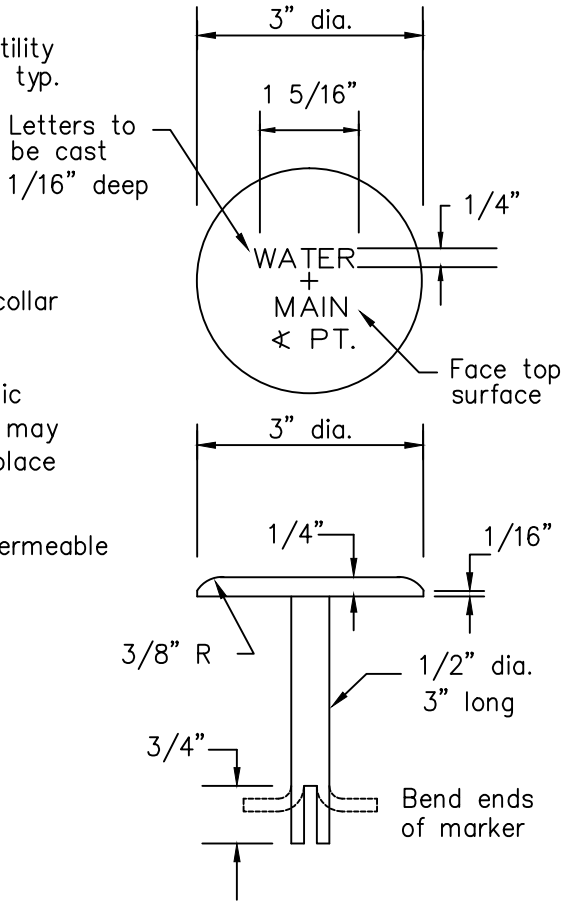
CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-25

City Engineer

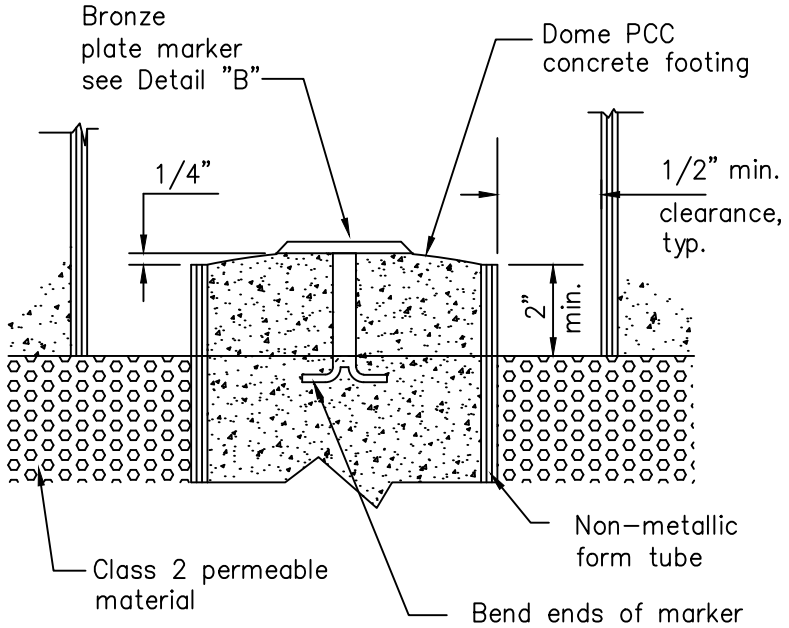
W25.DWG





BRONZE PLATE MARKER

DETAIL "B"



DETAIL "A"

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date	By	Rev.

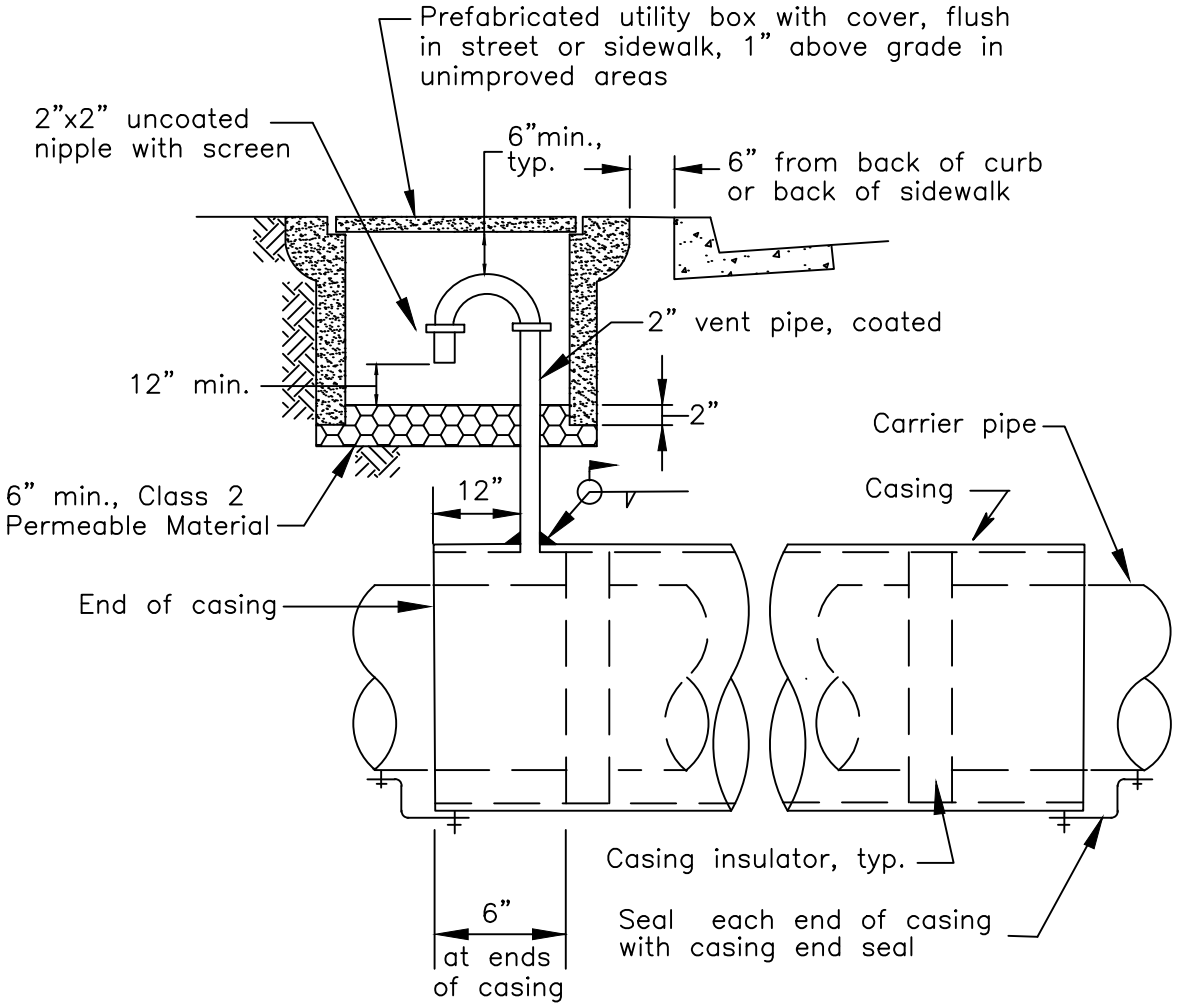
W26.DWG

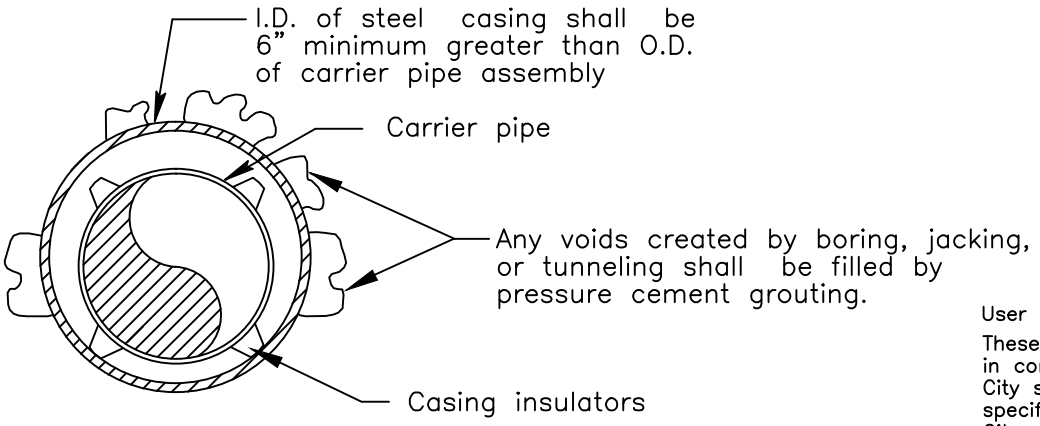
WATER LINE ANGLE MARKER

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: FY	Date: May-13	NO.
Ckd: Spec. Committee	Scale: NONE	W-26

City Engineer





SECTION

User note:

These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

STEEL CASING FOR MAINS

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M–W	Date: May–13	No.
Ckd: Spec. Committee	Scale: None	W–27A

City Engineer

G05A.DWG

Plate thickness of casing pipe				
Diameter	To 12"	15" to 27"	30" to 54"	60" to 72"
Minimum thickness	1/4"	3/8"	1/2"	5/8"

Casing shall be smooth steel pipe

Notes:

1. Carrier pipe must have restrained joints, and carrier pipe shall be tested before ends are sealed.

2. A minimum of 2 casing insulators shall be securely attached to carrier pipe. Install according to manufacturers recommendations.

3. Provide couplings in carrier pipe within 1' of each end of casing.

4. Vent pipe shall be 2" steel pipe with long radius bend, coated, and a 2" x 2" uncoated nipple with screen. Weld vent pipe to casing pipe.

5. On non-cathodically protected systems install anode(s) on casing pipe. Submit anode design for approval by the ENGINEER.

6. On cathodically protected systems insure electrical continuity on the casing pipe and the carrier pipe. Install electrolysis test station on casing pipe. Submit test station design for approval by the ENGINEER.

User note:
These details shall be used in conjunction with all the City standard details and specifications. Refer to the City standard specifications for the materials, installation, testing, protective coatings, and other requirements.

Date:	By:	Rev:

G05B.DWG

STEEL CASING FOR MAINS NOTES

CITY OF LIVERMORE
STANDARD DETAIL

Dwn: M-W	Date: May-13	No.
Ckd: Spec. Committee	Scale: None	W-27B

City Engineer