

SECTION 33 10 50

CRITERIA FOR SEPARTION OF WATER MAINS AND NON-POTABLE PIPELINES

1.0 GENERAL

When buried water mains are in close proximity to non-potable pipelines, the water mains are vulnerable to contamination that can pose a risk of waterborne disease outbreaks. For example, sewers (sanitary sewer gravity and force mains) frequently leak and saturate the surrounding soil with sewage due to structural failure, improperly constructed joints, and/or subsidence or upheaval of the soil encasing the sewer. If a nearby water main is depressurized and no pressure or negative pressure occurs, that situation is a public health hazard that is compounded if an existing sewer is broken during the installation or repair of the water main. Further, failure of a water main in close proximity to other pipelines may disturb their bedding and cause them to fail. In the event of an earthquake or other disaster, simultaneous failure of all pipelines could occur.

The most effective protection against this type of drinking water contamination is adequate construction and separation of water mains and non-potable pipelines. Section 64572 Waterworks Standards (Title 22, California Code of Regulations) provide separation criteria for new construction. However, when these criteria cannot be met, the risk of contamination can be reduced by increasing the structural integrity of pipe materials and joints, and ensuring minimum separation requirements are met. Therefore, the following guidance details construction criteria for the installation of water mains and non-potable pipelines to minimize the risk of contamination of drinking water.

2.0 DEFINITIONS

- **WATER MAIN** – Any pipeline, except for user service lines, within the water distribution system.
- **SANITARY SEWER MAIN** – A gravity sewer conveying untreated municipal wastewater.
- **SEWER FORCE MAIN** – A pressurized sewer conveying untreated municipal wastewater.
- **SEWER LATERAL** – A sewer line connecting the building drain and the sanitary sewer main.
- **CONTINUOUS SLEEVE** – A protective tube of high-density-polyethylene (HDPE) pipe with heat fusion joints or other metallic casing without joints into which a pipe is inserted.
- **RATED WORKING PRESSURE** – A pipe classification system based on internal working pressure of the fluid in the pipe, type of pipe material, and the thickness of the pipe wall.

3.0 APPLICABILITY

- A. The alternative construction criteria presented in this document also apply to sewer laterals that cross above a water main, but not to the sewer laterals that cross below a water main.
- B. In no case, should water mains and non-potable pipelines conveying sewage or other liquids be installed in the same trench.

4.0 CALIFORNIA CODE OF REGULATIONS- BASIC REQUIREMENTS

- A. New water mains and raw water supply lines shall not be installed in the same trench as, and shall be at least ten feet (10') horizontally from, and one foot (1') vertically above any parallel pipeline conveying:
 - 1. Sanitary Sewage
 - 2. Hazardous fluids such as fuels, industrial wastes etc.
- B. New water mains and raw water supply lines shall be installed at least four feet (4') horizontally from, and one foot (1') vertically above any parallel pipeline conveying:
 - 1. Storm Drainage
 - 2. Recycle Water.
- C. If crossing a pipeline conveying any of the non-potable fluids listed in paragraphs A and B above, a new water main shall be constructed perpendicular to and at least one foot (1') above that pipeline. No connection joints shall be made in the water main within eight feet (8') measured from the outside wall of the non-potable fluid pipeline.
- D. New water mains shall not be installed within one-hundred feet (100') of any sanitary landfill, wastewater disposal pond, or hazardous waste disposal site, or within twenty-five feet (25') of any cesspool, septic tank, sewage leach field, or groundwater recharge project site.
- E. The minimum clear distances between the water pipe bell or flange and other utility pipes, ducts, and/or structures shall be as follows for water pipe four inches (4") diameter and larger:
 - 1. Thirty inches (30") for adjacent or parallel utilities.
 - 2. Sixty inches (60") for adjacent or parallel high pressure, high voltage, or other high-risk utilities.
 - 3. Twelve inches (12") vertical clearance for perpendicular or crossing utilities.

5.0 ALTERNATIVE CONSTRUCTION CRITERIA

When new water mains and new sanitary sewer mains are being installed in existing developed areas, local conditions (e.g. available space, limited slope, existing structures) may create a situation in which there is no alternative but to install water mains, sanitary sewer mains at a distance less than the Basic Requirements specified above. In such cases, the City may approve alternative construction criteria.

Any application that proposes to use the alternative construction criteria shall demonstrate to the City how it will institute additional mitigation measures to ensure that the proposed alternative would not result in an increased risk to public health.

Appropriate alternative construction criteria for four (4) different cases in which the basic requirements for water main and sanitary sewer separation cannot be met are shown in the following Figures 1 through 4.

- Figure 1 - New Sewer Main parallel to Existing Water Main.
- Figure 2 - New Sewer Main crossing Existing Water Main.
- Figure 3 - New Water Main parallel to Existing Sewer Main.
- Figure 4 - New Water Main crossing Existing Sewer Main.

NOTE: Dimensions shown in the above figures are from the outside wall of the water main to the outside wall of other pipeline, manhole, or sleeve.

Alternative Construction Criteria

PARALLEL CONSTRUCTION FOR NEW
SEWER MAIN AND EXISTING WATER MAIN

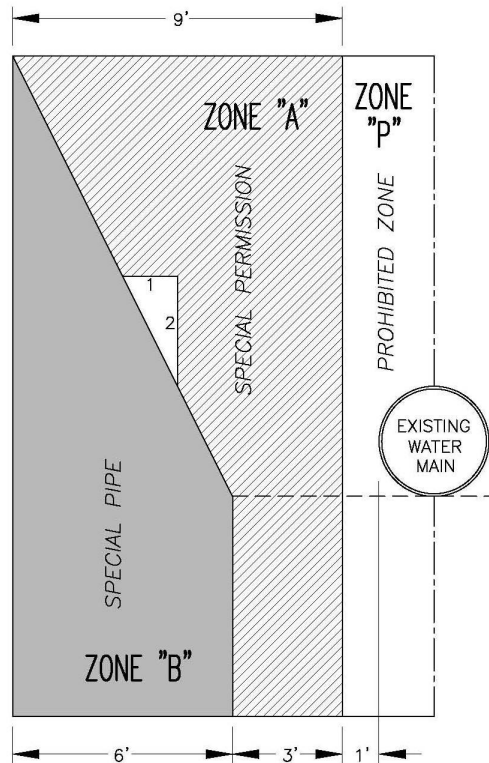


FIGURE 1

NOTES:

1. ZONES IDENTICAL ON EITHER SIDE OF EXISTING PIPE
2. ZONE "P" IS A PROHIBITED AREA. SECTION 64630 (e) CALIFORNIA CODE OF REGULATIONS, TITLE 22

Zone **Alternative Construction Criteria**

- P** Construction within Zone "P" is prohibited.
- A** The new parallel sewer main shall not be permitted in Zone "A" without prior written approval from the City.
- B** The new parallel sewer main within Zone "B" shall be constructed of one of the following:
1. A continuous section of HDPE pipe with no joints.
 2. HDPE pipe with electro-fusion joints (per AWWA C906-99).
 3. PVC sewer pipe with rubber ring joints (per ASTM D3034) contained within a continuous outer sleeve or encased in 2-sack cement slurry.

Alternative Construction Criteria

CROSSING CONSTRUCTION FOR NEW
SEWER MAIN AND EXISTING WATER MAIN

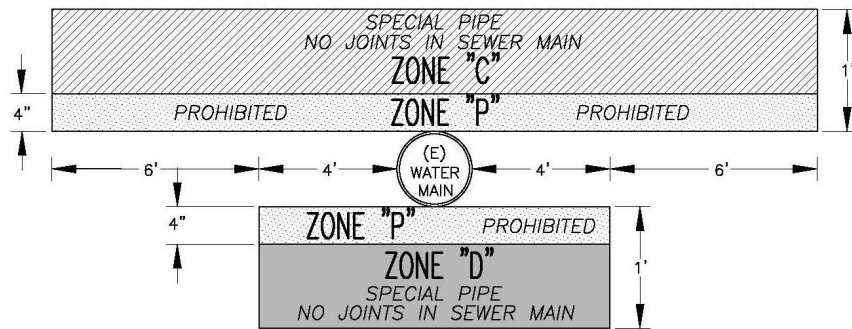


FIGURE 2

NOTES:

1. ZONES IDENTICAL ON EITHER SIDE OF EXISTING PIPE
2. ZONE "P" IS A PROHIBITED AREA. SECTION 64630 (e) CALIFORNIA CODE OF REGULATIONS, TITLE 22

Zone **Alternative Construction Criteria**

The existing water main shall be constructed of one of the following within four feet (4') feet from either side of the new sewer main:

1. A continuous section of ductile ion pipe with no joints.
2. Ductile ion pipe with "MEGALUG" mechanical joints
3. Any other pipe material contained within a continuous outer sleeve or encased in 2-sack cement slurry.

C New sewer main crossing above the existing water main in Zone "C" should be constructed of a continuous section of HDPE pipe (per AWWA C906-99) with no joints within ten feet (10') of the water main:

P Prohibited.

D New sewer main crossing below the existing water main in Zone "D" should be constructed of a continuous pipe of HDPE pipe (per AWWA C906-99) with no joints within four feet (4') of the water main:

Alternative Construction Criteria

PARALLEL CONSTRUCTION FOR NEW
WATER MAIN AND EXISTING SEWER MAIN

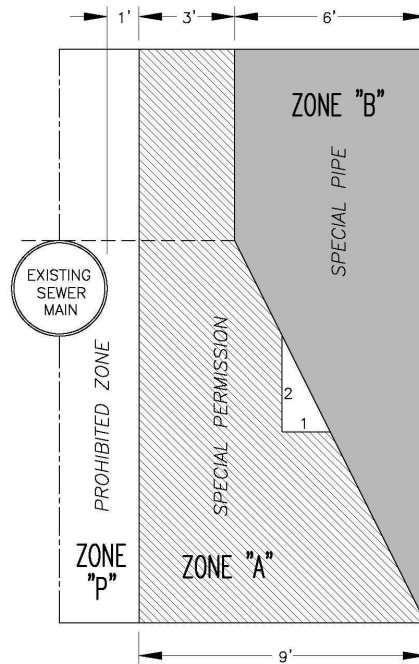


FIGURE 3

NOTES:

1. ZONES IDENTICAL ON EITHER SIDE OF EXISTING PIPE
2. ZONE "P" IS A PROHIBITED AREA. SECTION 64630 (e) CALIFORNIA CODE OF REGULATIONS, TITLE 22

Zone **Alternative Construction Criteria**

The existing sewer main should be constructed of one of the following:

1. A continuous section of HDPE pipe with no joints.
2. HDPE pipe with butt-fused or electro-fusion joints (per AWWA C906-99).
3. Any other pipe material contained within a continuous outer sleeve or encased in 2-sack cement slurry.

P Prohibited.

A New parallel water main shall not be permitted in Zone "A" without prior written approval from the City

B New parallel water main within Zone "B" shall be constructed of one of the following:

1. A continuous pipe of ductile iron pipe with hot dip bituminous coating and no joints.
2. Ductile iron pipe with hot dip bituminous coating and "MEGALUG" mechanical joints.

Alternative Construction Criteria

**CROSSING CONSTRUCTION FOR NEW
WATER MAIN AND EXISTING SEWER MAIN**

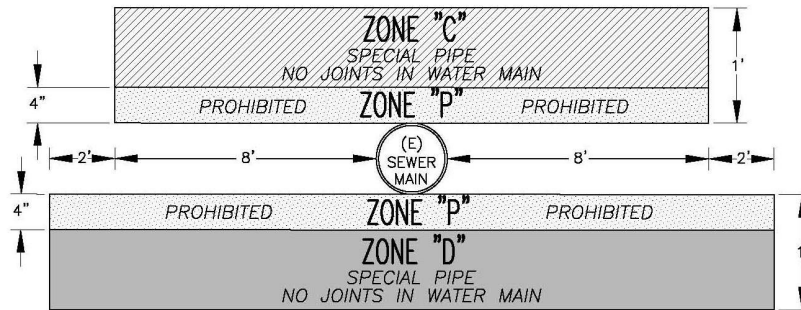


FIGURE 4

NOTES:

1. ZONES IDENTICAL ON EITHER SIDE OF EXISTING PIPE
2. ZONE "P" IS A PROHIBITED AREA. SECTION 64630 (e) CALIFORNIA CODE OF REGULATIONS, TITLE 22

Zone Alternative Construction Criteria

The existing sewer main should be constructed of one of the following within four feet (4') from either side of the new water main:

1. A continuous pipe of HDPE or ductile iron pipe with no joints.
2. HDPE pipe with electro-fusion joints (per AWWA C906-99).
3. Any other pipe material contained within a continuous outer sleeve or encased in 2-sack cement slurry.

C New water main crossing above the existing sewer main in Zone "C" should be constructed of a continuous pipe of ductile iron pipe with hot dip bituminous coating and no joints within eight feet (8') of the sewer main:

P Prohibited.

D New water main crossing below the existing sewer main in Zone "D" should be constructed of one of the following within ten feet (10') of the sewer main:

1. A continuous pipe of ductile iron pipe with hot dip bituminous coating and no joints.
2. Ductile iron pipe with hot dip bituminous coating and "MEGALUG" mechanical joints.

6.0 SEWER FORCE MAINS AND WATER MAINS

1. Sewer force mains shall not be installed within ten feet (10') horizontally of a water main.
2. When a sewer force main must cross a water main, the crossing should be as close as practical to the perpendicular. The sewer force main should be at least one foot (1') below the water main.
3. When a new sewer force main crosses under an existing water main, and a one foot (1') vertical separation cannot be provided, all portions of the sewer force main within eight feet (8') measured from the outside wall of the water main should be enclosed within a continuous outer sleeve or encased in 2-sack cement slurry. In these cases, a minimum vertical separation distance of 4 inches (4") shall be maintained between the bottom edge of the water main and the top of the continuous sleeve.
4. When a new water main crosses over an existing sewer force main, the water main shall be constructed of pipe materials with a minimum rated working pressure of 200 psig or the equivalent.

7.0 STORM DRAINS AND WATER MAINS

The basic separation criteria for water mains and storm drain are a four feet (4') horizontal separation where lines are running parallel and one foot (1') vertical separation water line above storm drains where the lines cross each other.

8.0 MISCELLANEOUS GUIDANCE

- More stringent requirements may be necessary if conditions such as high groundwater exist, HDPE or similar pipe may be required to provide flexibility to move without potential joint leaks.
- Sanitary sewer mains should not be installed within 25 feet horizontally of a low head (5 psig or less pressure) water main.
- New water mains and sanitary sewer mains should be pressure tested in accordance with manufacturer's specifications.
- When installing new water mains, sewers, or other pipelines, measures should be taken to prevent or minimize disturbance of existing pipes. Disturbance of the base materials supporting the existing pipes could eventually result in pipeline failure.
- Special consideration should be given to the selection of pipe materials if corrosive conditions are likely to exist. These conditions may be due to soil type and/or the nature of the fluid conveyed in the pipe, such as a septic sewage producing corrosive hydrogen sulfide.

-END OF SECTION-