

PART 2

DESIGN STANDARDS

The District has developed design standards which apply to typical water service and water main pipeline installations. They are not intended to be all inclusive but are items that should be covered when designing typical 4", 6", 8" or 12" distribution water mains and services. This information is also found in the District's Developer's Manual.

a. THRUST RESTRAINT

Where and as shown on the approved drawings or as directed by the District retaining glands, eye bolts and lacing rods shall be installed, in accord with the "Water Main and Service Details" shown for thrust restraint. The length of piping that must be restrained shall be noted on the drawings.

When using the mechanical joint retainer gland method retaining glands shall be installed as directed in lieu of the standard mechanical joint gland. The "T" bolts shall be tightened with a ratchet or torque wrench to between 75 and 90-foot pounds. Only then shall the set screws be tightened 180 degrees apart to a maximum of 70 foot-pounds. Once all set screws have been tightened a final check with the torque wrench shall be made to ascertain that all set screws have 70 foot-pounds. The joint is then complete. Torque settings shall be done with the pipe laid in the trench in place.

When restraining push on joints, either mechanical joint glands and lacing rods or retaining glands shall be used. Lacing rods, nuts and bolts shall be coated in the field with an approved coating to protect them from corrosion.

b. GATE VALVES

- 1) Gate valves are normally installed at street lines of intersecting streets. Upon District review, additional valves may be required to facilitate future main extensions.
- 2) Gate valve sizes for 4", 6", 8" and 12" pipe shall be full pipe size and resilient seated or double disc type, as shown in Part 4 of this manual. Gate valve operation shall be to District standards - Open Left or Open Right.

c. **HYDRANTS**

- 1) Hydrants shall have a 6" branch pipe with a 6" gate valve controlling each hydrant. Gate valve operation shall be to District standards - Open Left or Open Right.
- 2) The appropriate town approving authority shall be contacted for locations of hydrants to be installed.
- 3) Hydrants shall be installed on the side of the street closest to the water main, in the area directly behind the curb or pavement line, normally, 2 feet from face of curb to center line of hydrant except in Bloomfield, Farmington and Glastonbury where they shall be 3 feet from the face of the curb.
- 4) Hydrants, although located where assigned by proper municipal authorities, shall not be located on the radius of intersecting curb lines. Most District towns now require a maximum spacing of 500 feet between hydrants and they are normally placed at a side property line.
- 5) All hydrant installations are to be restrained from the branch to the hydrant with approved methods, i.e., rods, retainer glands or hydrant anchoring tee, or a combination of these.
- 6) All hydrants, prior to their acceptance and placing in service, shall: have concrete collars installed around the barrel, below grade as indicated on the hydrant detail; be painted according to District color scheme (barrel-red; cap-yellow or green); and have cap chains in place.
- 7) All hydrants shall open counterclockwise and shall have two 2-1/2" nozzles and one 4-1/2" nozzle.
- 8) Hydrants are not to be placed at the end of the main in cul-de-sac, but rather at or before the P.C. of the cul-de-sac.

d. **AIR VALVES**

- 1) Air valves shall be installed at the high point of the water main, if the grade change is over 4' and no hydrant is available near the high point.
- 2) Each case should be reviewed for the required need, since the air valves consist of a box and fittings that must be maintained. Their use is only very occasional, i.e., filling the main originally and then on any shut down. Hydrants or end blow-offs can most often be used if they occur at the high point.

e. **CHLORINATION**

- 1) Use if a 3/4" x 1" corporation cock as a sterilization test sample connection at the end of the main is a one-time occurrence and after its use it can be converted to a permanent air valve or abandoned; whichever is dictated by the specific installation.
- 2) Chlorination tables, where used, shall be glued to the top of the pipe with Permatex No. 2c adhesive. See page Table 1 for number of tablets required per pipe size.
- 3) Chlorination inlet valves and chlorination blow-offs are to be used on 16" and larger mains that will require liquid chlorination instead of tablets. Injection of hypochlorite will be performed by the District on water mains up to the water service corporation.

f. **BLOW-OFFS**

- 1) All blow-offs installed to the road surface are to be 4" ductile or cast iron pipe with the proper reducer.
- 2) All components of the blow-off assembly, including the gate valve, reducer, and 90° bend are to be restrained together with approved methods.
- 4) All blow-offs shall be separated from the gate valve by one full length of pipe or a minimum distance of 15 feet whenever possible. In certain cases there may be exceptions based on the practicality of the installation and physical constraints such as green belts in cul-de-sacs, driveways and conflicting utilities, therefore this separating distance may be reduced to 10 feet with approval of the District.

g. **MAIN PIPE**

- 1) In general, all new water mains shall be a minimum of 8" in diameter. Water mains that will supply hydrants must be at least 8" in diameter.
- 2) Installation of 4" main into a permanent cul-de-sac in a single family residential area shall be acceptable following the last hydrant with no more than 500' of 4" main or no more than 15 homes on this extension . Hydrants must be installed on the 8" section of pipe before the reducer.

- 3) Normally the water main shall be installed on the north or west side of the street. Laying line will normally be 5' off the curb line in the roadway except in West Hartford where line will be 6' off the curb line. Line assignment for the proposed main shall be coordinated with Town officials especially in cases where storm drains and catch basins are proposed.
- 4) Water mains should not be installed less than six feet (6') from the street line.
- 5) Water mains shall be installed with minimum clearances of sanitary sewers of ten feet (10') horizontally and eighteen inches (18") vertically.
- 6) All mechanical joint fittings shall be installed using approved retainer glands instead of the normal mechanical joint follower glands.
- 7) Use of thrust blocks for thrust restraint will generally not be permitted. Use of thrust blocks must be approved by the District on a case by case basis.
- 8) Thrust restraint shall be calculated as required for each project.
- 9) All water mains shall have a minimum cover of 4-1/2' (54").
- 10) All ductile iron pipe shall be Class 54 cement lined ductile iron and conform to the latest ANSI/AWWA Specification C151/A21.51 Ductile Iron Pipe Centrifugally Cast In Metal Molds Or Sand-lined Molds, For Water Or Other Liquids.
- 11) All ductile iron fittings shall conform to the latest ANSI/AWWA Specification C110/A21.10 Gray-Iron and Ductile-Iron Fittings.
- 12) Although rights-of-ways should be avoided, the standard minimum width of right-of-ways for distribution mains shall be twenty feet (20').
- 13) Wye branch and cross fittings shall not be used in the District's distribution system. All branches shall be tees.

h. TAPPING GATE VALVES

When a 4", 6", 8" or 12" tapping gate valve is used for the installation of a new main, a street line gate valve shall also be installed. The street line gate valve shall serve as the operating valve. Gate boxes shall be installed over both gate valves. Taps shall be one size smaller than the main being tapped.