

**WEST VIRGINIA DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
DESIGN DIRECTIVE**

**DD-305**  
**WATERLINE AND SANITARY SEWER RELOCATIONS**  
*October 1, 2003*

Attached for your use is the Division's policy on Waterline and Sanitary Sewer Relocations. These procedures shall be used on all applicable projects.

Attachment

## WATERLINE AND SANITARY SEWER RELOCATIONS

### A. STUDY PHASE

1. The Designer shall study and establish a suitable system for "Equivalent Replacement in Kind," in conjunction with the affected utility to assure that their desires and objectives of the relocation will be met.
2. In cases where the affected utility desires "Betterment" or improvement to the system beyond the "Equivalent Replacement in Kind", (i.e, Pipe Size Increase, Special Material) the "Betterments" shall be requested in writing by the affected utility through the Engineering Division, and be subject to the review and approval of the Division of Highways (DOH) prior to incorporation into contract plans.
3. Upon DOH approval of the "Betterment" design, the Designer shall determine quantities of all items involved and prepare an estimate of cost for the "Equivalent Replacement in Kind" and the "Betterment," with costs separated to reflect individual construction contracts. Actual final design of the system selected shall not begin until written approvals of the affected utility and the DOH are received.

### B. DESIGN PHASE

1. Current DOH Specifications (Sections 670 and 675) and bid items are to be used for waterline and sanitary sewer relocations.
2. Designer shall prepare Special Provisions for those situations or conditions not covered under standard DOH Specifications, subject to utility and DOH review and approval. Specifications of individual utilities may be considered as a supplement or revision to the DOH Specifications on a project-by-project basis.

When it is considered necessary to specify a utility item by trade name, three or more suppliers of acceptable quality materials, followed by the statement "or equal," shall be specified to assure opportunity for competition among equivalent materials.

Should it be necessary to specify a proprietary brand, full justification for its use must be submitted to the DOH and approval obtained prior to specifying or noting such product on the plans.

3. Utility pipe lines under state highways will be designed in accordance with the current issue of the DOH Manual "Accommodation of Utilities on Highway Right of Way" with the exception that pipe trenches will be repaved in accordance with the current issue of the DOH Manual "Typical Sections and Related Details."

4. Waterline and/or sanitary sewer relocations shall be shown on separate stable base reproducibles for clarity and detail with the location also shown on the cross-sections. The simplified location of existing and relocated waterlines and/or sanitary sewers shall be shown on the roadway plans for coordination, with cross-reference to the detailed utility plans.
5. The existing system(s) shall be shown on the reverse side of the reproducibles as completely and clearly as feasible. Elevations shall be determined as accurately as possible by field location of valve boxes or other visible appurtenances, pipe detectors or test excavations when necessary. Verification by the utility shall be obtained, if possible, as to pipe size, class, lining and/or coating, maximum and minimum operating pressures and other unusual features necessary to design the "Equivalent Replacement in Kind." Service boxes, meters and meter boxes, type of service pipe (copper, galvanized steel, plastics) shall also be verified where possible.
6. Relocation plans not parallel to or adjacent to the roadway centerline may be stationed and tied thereto by paper location.
7. Standard bends (90, 45, 22½, and 11¼) shall be used for changes in direction in waterline and/or forced main sanitary sewer relocations.
8. Plans shall show profile of relocated waterlines and/or sanitary sewers with location of vertical bends/manholes identified by station.
9. Plans shall show vertical and horizontal clearances from structures or other controls which may be significant.
10. The proposed location and fitting required shall be shown at connections and changes in horizontal and vertical alignment.
11. Thrust blocks or other anchorage may be required at valves, fire hydrants, horizontal and vertical bends and connections to existing or relocated mains. Details of the required anchorage should be shown and calculations submitted. A typical anchorage detail sheet will be furnished by the DOH.
12. Thrust blocks shall be calculated using test pressure requirement as described in Item 13 below, with joints not backfilled. Earth resistance will be based upon the project boring information.
13. The minimum hydrostatic test pressure at which the relocated mains are to be tested shall be the normal operating pressure in the main plus fifty psi or plus fifty percent of the normal operating pressure, whichever is greater. This information will be shown on the plans.

14. A detail of connections should be shown if the connection is out of the ordinary. Care should be taken that adequate detail is provided when connecting to existing mains as outside dimensions, different types of pipe material and/or special fittings may be required.
14. When casing pipe is required, it shall be of sufficient size for placement of the specified carrier pipe. Minimum wall thicknesses for steel casing pipe are: 0.1875 inches for 8-inch to 20-inch diameter casing; 0.2500 inches for 24-inch to 30-inch casing; and 0.3125 inches for 36-inch to 52-inch diameter casing.
15. An estimate of quantities and a bill of material for non-bid items will be shown on the plans.
16. The DOH shall obtain approval of the Bureau for Public Health for all waterline and sanitary sewer relocations.