WATER INSTALLATION SPECIFICATIONS FOR NEW CONSTRUCTION & SUBDIVISIONS

PROCEDURE FOR WATER LINE DESIGN AND APPROVAL

Subdividers or Developers will need to supply two sets of preliminary plans for the development to Cleveland County Water. Cleveland County Water will review the plans to ensure accuracy with the applicable Local, State and Federal standards and provide comments/notes through their review. Cleveland County Water will keep one set of plans and return the other set with changes/corrections/notations made to the Developer. The Developer will then be required at the Developers expense to have a Professional Engineer licensed in the State of North Carolina to prepare and seal the official plans. Four (4) sets of sealed engineering plans, specifications, and applications shall be submitted to Cleveland County Water. Cleveland County Water will execute the required State regulatory applications and forward them to the Division of Health Services in Raleigh. The plans will need to include an addressed envelope with postage. The engineer will need to consult with Cleveland County Water as to the preparation of specifications.

LINE EXTENSIONS ON NCDOT MAINTAINED ROADS

On NCDOT maintained roads where Cleveland County Water has no water lines close to the proposed development project or subdivision, the Developer may be required to extend the lines to the development at their own expense. The Developer will be required to run lines that are large enough to serve the development. The Developer is also responsible for obtaining any encroachments that are needed.

DEVELOPER'S RESPONSIBILITY

The Developer or their Contractor shall be required to provide in writing a warranty against defects for all water lines, valves and appurtenances installed for a period of one (1) year from the date of completion of construction. The Developer is also financially responsible for obtaining any private easements to be issued in the name of Cleveland County Water where sufficient public right-of-way does not exist for any improvements required or not completed within a publicly dedicated right of way. The minimum easement width provided shall be twenty (20) feet in width.

SPECIAL NOTE

No meter boxes and/or taps shall be set until all other utilities have been installed such as power, natural gas, telephone, fiber optic, cable television, etc. Cleveland County Water reserves the right to change or alter the plans and materials of construction based on differing site conditions during construction.

ENGINEER'S NOTES

1. **Water lines shall be laid to require a minimum of thirty (30) inches of cover from top of water lines to the finished ground elevation and a maximum depth of four (4) feet.**

2. **Water lines shall be installed a minimum of three (3) feet from the edge of the pavement and no further than five (5) feet except where conflicts may arise and must be approved by Cleveland County Water.**

3. **Special care should be taken at cul-de-sacs to keep water lines an equal and uniform distance from the edge of pavement and within the existing right-of-way. Water mains shall be designed to wrap around the cul-de-sac to serve each lot or parcel. All lines installed around cul-de-sacs shall be installed with the proper mechanical joint bends except where allowable bending permits. Refer to UNI-BELL or AWWA standards.**

4. **All road bores or waterlines that will be paved over in the future shall be encased in steel casing carrier pipe two (2) times the diameter of the pipe size being installed for the public water line. Steel casing pipe shall be welded at the seams to form a water-tight seal. (See NCDOT standards). All carrier pipes shall be restrained joint ductile iron pipe (DIP) Class 350 or better. NO PVC TO DIP BELLS SHALL BE ALLOWED. Contractor shall use ductile iron long pattern (LP) sleeve for the transition between PVC and DIP. Cleveland County Water will not be responsible for any asphalt or concrete repairs resulting from water line being paved over.**

5. **All water lines being installed shall be equal to or better than C900/DR18 polyvinyl chloride (PVC) or Class 350 ductile iron pipe (DIP). The minimum size diameter allowed shall be no less than four (4) inch diameter pipe.**

6. **Tracing wire shall be no smaller than 14 awg SOLID copper wire and coated. Tracing wire shall be installed with all material types of water lines.**

7. **Fire hydrants shall be spaced no more than 1000 feet apart and the minimum fire flow shall be no less than 500 gpm at 20 psi residual. All hydrants or stub-out lines 6" or larger shall be constructed using hydrant tees.**

8. **For design standards of water mains in relation to sanitary sewer mains refer to NC DEQ 15A NCAC 18C .0906. See also Division of Water Quality *Minimum Design Criteria for the permitting of Gravity Sewers.***

9. **All creek crossings shall be constructed with mechanical joint ductile iron pipe with proper restraints, rodding, and dead-man blocking used. Construction shall provide for two valves located on each side of the creek for isolation. Blow-offs shall be no larger than six (6) inches in diameter with flap valve on end. Construction shall also provide a test box for pressure gauge between isolation valves.**

INSTALLATION SPECIFICATIONS

1. **All work shall be installed in strict accordance with the Engineer's designed and approved plans. Work to be performed by contractor shall consist of furnishing and installing all water mains and appurtenances in accordance with the contract plans and specifications.**

2. **Prior to commencing work, the contractor will provide two (2) working days' notice to Cleveland County Water, NCDOT, and all other appropriate utility companies. The contractor shall also be required to contact and provide their own utility locate calls via the NC One Call System (811).**

3. **Trench excavation in rock shall be a minimum of two (2) feet wider than the outside diameter of the pipe being installed. Excavation shall be six (6) inches below the invert of the pipe and shall be laid on select backfill with clean soil or sand.**

4. **Backfill along sides of pipe and immediately over pipe shall be done by hand. Backfill material around pipe shall be free of rock and other debris. Trench backfill under existing or proposed paving and road shoulders shall be compacted to a density of 95 percent of maximum dry density.**

5. **Road bores shall conform to NCDOT specifications.**

6. **All pipe shall be thoroughly cleaned of all foreign debris before being placed in the trench. Pipe shall be placed on firm, smooth foundation to prevent subsequent settlement.**

7. **Hydrants shall be set plumb as indicated on the plans with the pumper connection eighteen (18) inches above the ground. The back of the hydrant shall be set firmly against the undisturbed side of trench for a firm backing with poured in place concrete or equal/better restraint to prevent movement or shifting that could cause the hydrant to come loose from the main. Clean stone or gravel shall be placed around the base of each hydrant above the supporting foundation up to a height of twelve (12) inches and to a width of ten (10) inches all the way around hydrant. Hydrants shall be opened and flushed prior to pressure testing of the lines.**

8. **All valve boxes shall be set level with the ground and have a concrete collar placed around it. Valve box shall be five and one quarter (5 ¼) inch cast iron with WATER stamped on lid. The valve box shall also be of the screw type nature to allow for future adjustment in height.**

9. **All water mains shall be flushed and disinfected prior to being put in service. Flushing shall be accomplished with a minimum velocity of 2.5 feet per second to thoroughly clean the main. The chlorine solution for disinfecting the main shall**

be no less than 50 milligrams per liter (50ppm). When flushing the main the amount of water flushed should equal twice the volume of the new line. The chlorine solution shall remain in the new line for a period of 24 hours before being flushed and sampled.

10. **All valves, bends, reducers, tees and hydrants shall be attached to the pipe with the proper size restraint fittings.**

11. **All concrete thrust or reaction blocking shall be poured with 3000 psi concrete with all fittings being wrapped in 10-millimeter Polyethylene before pouring.**

12. **No meters shall be installed in the meter boxes. Meter installation will be the responsibility of Cleveland County Water. Meters will be installed when proper applications have been filled out and required deposits have been paid.**

13. **New mains shall be pressure tested at 200 psi and shall maintain 200 psi for a minimum period of two (2) hours.**

GENERAL MATERIAL SPECIFICATIONS

1. **Pipe - Shall be C900/DR18 PVC or Class 350 DIP or better in maximum lengths of 18-20' and shall be no smaller than 4" in diameter. Pipe must have NSF/PW seal stamped on it.**

2. **Valves - AWWA Standard specifications, valves shall open left, non-rising stem, 200 psi working pressure with iron body, resilient seat gate valve with 2" square nut. Allowable brand names include Mueller, M&H, American Darling or Kennedy.**

3. **Fire Hydrants - AWWA Dry-Barrel Type Fire Hydrant, traffic rated. Specifications shall include either 4 ½" or 5 ¼" valve opening, 1 ½" PENT. operating nut, two – 2 ½" openings, and one 4 ½" opening bronze to bronze seat. Hydrants shall be open left and 3' 6" bury.**

4. **Fittings - Ductile Iron Mechanical Joint.**

5. **All adapters shall be ductile iron male iron pipe threads (MIPT).**

6. **All threaded pipe (nipples etc.) shall be 2" brass or larger.**

7. **Valve boxes shall be 5 ¼" cast iron screw type with WATER stamped in lid.**

8. **Meter boxes shall be plastic and 18" deep and lid shall be solid cast iron, 15 pounds minimum.**

9. **Meter setter shall be AY McDonald WDTD 33 with ASSE approved Dual Check Valve with compression by dual-purpose ends.**

10. **Service lines shall be Type K Copper tubing ASTM B-88 on all meters.**

11. **Corporation Stops shall be AY McDonald or Mueller.**

12. **Service Saddles shall be AY McDonald.**

13. **Tapping Sleeves shall be Stainless Steel with a full rubber back. (Romac or Smith/Blair)**

14. **All valves shall have 2" square nut.**

15. **Gland Pack accessories shall be Grip Ring Type made by Romac or Mega-Lug.**