

# **MESA CORTINA WATER AND** **SANITATION DISTRICT**

## **WATER** **CONSTRUCTION STANDARDS**

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## **General Statement**

This regulation is adopted pursuant to Article VIII of the Rules and Regulations for Mesa Cortina Water and Sanitation District (District).

Additions to the District's water distribution system may only be installed between May 1<sup>st</sup> and October 31<sup>st</sup>.

This document is not intended to be a complete list of every requirement for construction in the District, but is designed as a guide to the requirements for materials to be used, and for the installation of water lines (main and service), water meters and pressure reducing valves.

This document in no way releases the owner, builder, contractor, or their agents from the responsibility to be familiar with the provisions of the water Rules and Regulations or other referenced documents and/or to meet the requirements of those documents.

**It is hereby declared that the rules and regulations contained here are necessary to insure and protect the health, safety, prosperity, security, and general welfare of the residents of the District.**

Any area not specifically addressed will be determined by the District Administrator or District Manager or the authorized agent inspecting the project identified.

At the time of application for any class of project, the owner or developer will be required to submit the following to the District Administrator for approval:

- 1) Copy of a site plan showing proposed route of water service and sewer service.
- 2) Copy of mechanical drawings showing building service connection(s).
- 3) Copy of a floor plan showing proposed location of water meter assembly.

Any addition to the distribution system, mechanical change to the water supply of any existing structure, or modification of site use shall be inspected by the District Administrator or District Manager or authorized agent to ensure compliance with the following standards.

Inspections will require any water installation to meet the highest standard applicable to preserve the integrity of Mesa Cortina Water and Sanitation District's water supply.

**Inspections require a 48 hour notice to the District Manager for proper scheduling.**

**Follow-up inspections also require 48 hour notice.**

INSPECTIONS ARE MADE BETWEEN THE HOURS OF 8:00 AM TO 4:00 PM M-F, HOLIDAYS EXCEPTED

**970-668-4776**

## **WATER MAIN EXTENSIONS**

*All installations must be approved by the District and constructed as shown on the approved plan.*

Additions to the District's distribution system shall typically follow standards set forth by the American Water Works Association, except when more stringent requirements are set forth in these standards. Updates and revisions to the American Water Works Association standards may not necessarily be shown in this document, but will apply as such updates and revisions are adopted by such Association.

**AWWA C500 series, C600 series, and C111 are the compliance standard adopted by the District for the installation of water mains.**

## **WATER MAIN INSTALLATION**

- Ductile Iron Pipe (DIP) class CL-52, push on joint, cement lined is the accepted material for water mains and large (2" and greater) service lines. DIP service lines shall conform to service line standards. All pipe joints must be copper strapped or cad-welded to maintain conductivity. Where cad welding is the method chosen heavy gauge single strand wire (minimum 6 gauge) shall be used.
- Minimum depth of bury shall be 8 ½' to the top of the pipe from finished grade. Minimum depth of bury shall be met notwithstanding the depth of existing mains.
- Water mains shall be located a minimum of 10' horizontally from existing or proposed sewer mains. Whenever a sewer main or sewer service line crosses above or crosses within 18" below the water main, the sewer line shall be made impervious to a minimum distance of 10' to both sides of the water main either through SDR26 or AWWA C-900 spec pipe.

- All trenches shall conform to and be consistent with OSHA regulations. The District Administrator or District Manager or authorized agent observing unsafe conditions will not enter the trench for inspection.
- Water mains and their appurtenances must be properly bedded. Bedding material requirements call for 3/4" clean gravel as the maximum size material accepted, 3/8" clean gravel or similar is preferred. Bedding material must be crushed and cleaned stone to be accepted. There shall be a minimum 6" layer of bedding below the pipe and a minimum 12" layer of bedding above the pipe.
- Wet taps shall be performed in locations where new mains are connected to the District's water distribution system. Wet taps are the responsibility of the owner or developer.
- Service taps shall be separated by at least 18" and be placed no closer than 24" to the end of a pipe section. Tapping saddles are required for all service line taps. An abandoned service line must be terminated at the corporation stop.
- Valves shall be resilient seat NRS gate valves, and shall open left. (Mueller resilient wedge and Waterous F-2500 valves only.) Isolation valves shall be located at all tees and spaced no more than 800' apart on a straight run.
- Valve boxes shall be set plumb and true and centered over the valve operating nut. Valve box installations shall be supported to prevent settling. Valve stem extensions are required on all valve installations. Valve stem extensions will be sized so that the top of the valve stem extension is within 12" of the valve box lid. Valve boxes located in asphalt or concrete will have an additional 2 1/2" paving grade ring installed to allow for future grade adjustments. Valve boxes located in asphalt or concrete will be installed so that the top of the valve box lid is 1/2" – 3/4" below grade. Valve boxes located in a non-paved right of way will be installed so that the top of the valve box lid is 6" below finish grade.
- Fire Hydrants shall be a dry barrel, Waterous Pacer model. Fire hydrants shall be painted red. A "mountain spec" fire hydrant is the only type fire hydrant accepted in the District. (Mountain spec = 42" from finish grade to center of streamer connection.) Mountain spec fire hydrants shall not be fabricated on site with additional barrel and stem extension kits. Fire hydrants shall have only one breakaway traffic flange set 3" above grade. Fire hydrants shall be set over 1/3 cubic yard of crushed stone to allow for barrel drainage through the weep holes. Fire hydrant installations shall conform to AWWA standard C502 and have as a minimum a 6" fire hydrant lateral line.

- Thrust blocks/restraints. Appurtenances must be properly braced by appropriately sized concrete thrust blocks. When using concrete for restraint, all nut and bolt assemblies shall be protected with a high density plastic (visqueen) wrap. Joint restraint shall be provided with threaded rod and nut assemblies and/or mega-lugs.
- Disinfection. Tabular calcium hypochlorite attached to the inside of the pipe with food grade adhesive is the required method of disinfection for new water mains.
- Inspection. Water mains, water service lines and water service appurtenances tied into and served by the District must be inspected during installation. Any ductile iron pipe entering a building to be utilized as a service line shall also adhere to subsequent service line installation requirements.

## **WATER MAIN TESTING**

All procedures shall be carried out with the District Administrator, District Manager or authorized agent present.

- Main will be filled slowly with water to dissolve tabular chlorine.
- Main will then remain static for 48 hours.
- Representative sampling for chlorine residual will then be drawn. (minimum 25 mg/L per AWWA C651).
- Main must be thoroughly flushed at maximum velocity from a fire hydrant to remove any and all potential debris left from the installation process.
- A minimum 2 hour hydrostatic pressure test in accordance with American Water Works Standards SEC. 4 of C600. Hydrostatic pressure in the line shall not be less than 150 PSI for the test. The Contractor will supply a metered pump with lockoff mechanism and a working pressure gauge (min. 250 psi).
- After the final line flush, the line must remain static for a minimum of 24 hours prior to a sample being drawn to check for bacteria. This will be collected by the District Manager or representative. The results will be communicated to the contractor ASAP, after the initial 24 hour test is complete.
- The main will be inspected to determine electrical conductivity.

When the approved plans have been completed:

- An engineer licensed by the State of Colorado must stamp and validate the as-built drawings before consideration for final acceptance by the District.
- From the date of formal acceptance, all work shall be warranted completely for a minimum of two years.

## **WATER SERVICE LINE MATERIAL REQUIREMENTS**

All residential water service lines installed in the District shall meet as minimum standard the following requirements:

- **Water service materials** shall be new, undamaged material of the highest quality meeting standards approved by the American Water Works Association (ref. C-800).
- **Water service lines** shall be appropriately sized Type K copper, meeting AWWA 75-CR, or Cross-Linked Polyethylene (PEX) pressure tubing made from material having a standard PEX material designation code of PEX 1306, or higher, according to ASTM\* F876 and intended for use as underground potable water service lines.
- **Direct water taps** for service lines are not allowed. Tapping saddles are required for all water service taps. Tapping saddles may be ductile iron or bronze, must be double strap, CC thread, and have an O-ring gasket seal.
- **Corporation stops** - shall be ball corps (no inverted key) of brass or bronze in the same size as the copper service line. They shall be AWWA standard inlet thread, compression type outlet (Ford Quick-Joint or Mueller C-110 only). No flared fittings are allowed.
- **Curb stop** - shall be a cast bronze body ball valve design with resilient seals, standard T-head operator and 90 degree rotation, with compression type outlets (Ford Quick-Joint or Mueller C-110 only). No stop and waste valves are allowed. No flared fittings are allowed. All curb stops will be treated as system valves and accessed through a curb box. Curb stops are to be located 5' inside property line.
- **Curb box** - shall be an arch pattern box with 1 inch diameter upper section and 2-hole Erie pattern lid, or equivalent for up to 1 inch size service line, 1 1/2" service lines require an enlarged base. All boxes require an 80" extension with an extended shut off rod and must be properly supported to prevent settling on the valve. Curb boxes must be set at final grade. In the

event a curb box is located in a driveway, a “monument box” shall be permanently installed to protect the box lid from damage. The monument box shall be installed with an additional 2 ½’ of paving grade rings installed on top to allow for future grade adjustments. The top of the valve box ring must be 1/2” – 3/4” below finish grade.

- **Coupling** - Where absolutely necessary due to the length of the service line run, service line couplings shall be AWWA/ANSI approved brass or cast bronze body with compression type outlets (Ford Quick-Joint or Mueller C-110 only). No couplings are permitted within 15’ of any building structure or foundation. The service line must be pressurized and the couplings inspected prior to any backfill.
- **Size reductions** shall be made with a compression piggyback, or by using compression by I.P.T. adapter on the inlet and outlet and a brass or bronze bell reducer to change size.
- **Multiple branch connections** to a single service line will only be allowed in a previously accepted stub-out, and shall be made with a connector such as a Mueller 110 compression style, MacDonald 3700 series branch connector or equivalent.

## **WATER SERVICE LINE INSTALLATION REQUIREMENTS**

Prior to acceptance by the District:

**Inspection of a service line by District Administrator, District Manager or authorized agent is MANDATORY.**

**Inspections** are made between the hours of 8:00 a.m. and 4:00 p.m. Monday through Friday, holidays excepted. Inspections must be scheduled in advance, with a minimum 48 hour notice. Follow-up inspections shall also require 48 hour notice. **970-668-4776**

**No inspections will be performed on any excavation that the inspector feels is unsafe to enter.**

In any situation where there is disagreement concerning safety of an excavation, an OSHA Representative will be summoned to make a determination on the existing conditions.



All connections, bedding, insulation, and backfill lifts must be approved before a service line is accepted.

- **The water service line shall be buried to a minimum depth of 8.5’.** This measurement is from the top of pipe, notwithstanding depth of the main or service line connection. No service line will be accepted without meeting this condition. Water service lines shall not encroach within 15 ‘ of a property line without a dedicated easement agreement involving the associated property owners, unless absolutely necessary as determined by the District Administrator, District Manager or authorized agent. It is the owners responsibility to identify property lines. The District recommends avoiding water lines installed under or across driveways. Water lines shall not be laid over consolidated rock outcroppings unless over-excavated a minimum of 12 inches (to 9.5’), and properly bedded. In areas where blasting is required, over-excavation to minimum of 12” greater than the final grade is required with removal of the blasted material and replacement with granular bedding material.
- **The water service line shall be protected** from ground water contamination while being installed and shall be flushed full discharge upon complete installation to ensure that any obstructions in the pipe are removed before approval will be issued.
- **Service lines** exceeding 1 1/2” in diameter are considered to be mains for testing purposes and must be disinfected in accordance with AWWA C-600 prior to acceptance by the District. See Line Testing section.
- **Corporation stops** shall be located in the top 1/3 of the main and the service line connection made thereto shall be installed in such a manner so that an expansion loop (goose neck) is established to prevent damage to the main.
- **Service lines** shall be inspected to insure that there are no leaks at all connections either visually at static pressure or through an air pressure test at 80 psi. Connections to previously approved stub-outs will be pressure tested back to the approved valve.
- **Frost protection** is required. Frost protection material shall be as a minimum, 2” Dow Board insulation or its equivalent. Sections shall be a minimum, 24” wide, centered over the pipe, with a 6” overlap between sections. The frost protection material shall be installed 6” above top of pipe on level bedding material, with an additional 6” of bedding material on top of the frost protection material.
- **All water service lines** installed in the District shall be bedded with clean granular bedding material to a minimum 6” above the top of the freeze protection board, 6” between the bottom of the freeze protection board and

the top of the pipe, 6" below the bottom of the pipe and 24" inside the building foundation wall. Any rock greater than 6" in diameter that is imbedded in the trench bottom shall be removed and the resulting void filled with the specified bedding material.

- **Granular bedding material** shall be 3/4" minus cleaned rock, 3/8" minus cleaned rock, or other material previously agreed to and authorized in writing by the District Administrator, District Manager or his authorized representative. Except that any area showing signs of ground water infiltration shall have 3/4" washed rock or a fill as specified by a licensed soils geologist or professional engineer of the State of Colorado.
- **Trenches** constructed in the District shall conform to Occupational Safety and Health Standards in the protection of workers and the public. There shall be a designated competent person on site at the time that any water installation is to be inspected. If necessary, the excavation work shall be protected with an OSHA approved trench box or other shoring system. Trenches shall be dug so that the pipe and appurtenances can be laid to the alignment and depth required and have continuous support when placed. The trench shall be dewatered prior to and at all times that work is being done in the trench.
- **Spoil material** unsuitable for backfill shall be disposed of off site.
- **Backfill**, including pipe bedding, shall be installed properly and hand tamped under the haunches of the pipe, followed by suitable native material or other materials as specified, installed in maximum 12 inch lifts and mechanically tamped. Native backfill material shall not be placed by dozing or dumping over the sides of the trench, but shall be installed by forming a gentle slope proceeding upgrade in the trench. Frozen backfill material is not acceptable. Backfill lifts not exceeding 12 inches, and compacted to 95% standard proctor, are required in any proposed or existing road right-of-way, or driveway.
- **Sewer line crossings** – Water service lines shall be located a minimum of 10' horizontally from existing or proposed sewer lines. In the event that a sewer main or sewer service line crosses above or crosses within 18" below the water service line, the sewer line shall be made impervious to a minimum distance of 10' to both sides of the water service line either through SDR-26 or AWWA C-900 spec pipe.
- **Water service lines shall not be installed** in the same trench with gas pipes, electrical conduits, sewer pipes or other utilities except with written approval of the District. In instances where sewer pipes in a joint trench are approved, the sewer pipe shall be SDR26 or C900 pipe.

- **No soldered connections** shall be allowed underground or before the meter assembly.
- **It is the responsibility of owner/developer**, or their designated representative, to have all valves accessible and operable prior to inspection by the Water Department.

## **WATER METERS**

Any person who desires to build in the District or who does any work which requires a building permit, shall, if they have not previously done so, install a water meter and associated equipment before a Certificate of Occupancy will be issued.

**Connections, (tees, wyes, bleeders, spigots), are not allowed prior to the water meter.**

The associated equipment required is a pressure reducing valve, meter yoke, and service valves on each end of the equipment run. Since this equipment must be ordered in advance, anyone desiring to build in the District should contact the District's Manager so that a determination can be made as to the type and quantity of equipment necessary.

- The District Administrator, District Manager or authorized agent will approve the meter location prior to installation and will have access for inspecting, servicing, and reading the meter.
- All meter installations shall be inspected by the District Administrator, District Manager or authorized agent prior to acceptance. The building owner will provide an accessible, lighted, heated location for the water meter ahead of any water usage. Water meters must be installed in a location that protects the device from freezing.
- Meters – Supplied by District.
- Meter Installation - There shall be a compression valve as the first fitting on the service line immediately upstream of the meter installation. These valves shall be ball valves meeting A.S.T.M. B62-76 standards. The water meter shall be installed with a yoke in such a manner that there is no mechanical strain on the meter and the piping will not restrict meter removal. The meter will only be installed in the horizontal position. Electrical continuity will be maintained across the entire water meter assembly with a minimum 6 gauge bonding wire secured at each end of the water meter assembly with water pipe grounding clamps.

- Bypass Piping - Bypass piping around a water meter will not be allowed.
- For all new construction, curb stops must be operable and accessible prior to the arrival of the inspector.
- The District Administrator, District Manager or authorized agent shall have the right to periodically inspect and/or test each water meter.

Inspections and follow-up inspections are scheduled through the District Manager. 48 hour notice is required, inspections are performed M-F, 8:00 a.m. - 4:00 p.m. holidays excepted. **970-668-4776**

## **Cross Connection Control**

The degree of hazard for backflow prevention will be determined by the District as part of the District's Cross Connection Control Program. The authority to implement and maintain this program on cross connection control is contained in the following legislative actions:

- Colorado Revised Statutes (CRS) 1973, as amended, Sections 25-2-207, 25-1-108 and Section 251-114
- Colorado Primary Drinking Water Regulations (CPDWR) Article 12
- Cross-Connection Control Manual 5<sup>th</sup> edition, Colorado Department of Public Health and Environment

Reference manuals adopted for guidelines on cross connection control:

- Cross-Connection Control Manual, Colorado Department of Public Health and Environment, latest edition
- Definitions of terms used in this regulation are those contained in Cross-Connection Control Manual, Colorado Department of Public Health and Environment, latest edition

## **Repairs**

**District Administrator, District Manager or authorized agent will inspect all repairs prior to backfill.**

Repairs to the District's water distribution system must comply with all existing new construction standards.

Details of any proposed system repair must be approved by the District.

It shall be the intent of the District to preserve the integrity of all existing pipe and appurtenances when repairs are necessary.

Isolation of pressurized services and mains within the distribution system shall be the sole responsibility of District.

**Repairs must, as a minimum, uphold the highest standards applicable to materials and installation procedures to ensure a quality finished product.**