Resolution No. 2015-03-01

RESOLUTION
OF THE
BOARD OF DIRECTORS
OF THE
CASCADE METROPOLITAN DISTRICT NO. 1

ADOPTING THE COLORADO SPRINGS UTILITIES WATER LINE EXTENSION & SERVICE STANDARDS (WATER LESS) – 2014 AND ADOPTING OTHER DISTRICT RULES AND REGULATIONS

WHEREAS, the Cascade Metropolitan District No. 1 (the "District") is a quasi-municipal corporation and political subdivision of the State of Colorado; and

WHEREAS, pursuant to § 32-1-1001(1)(h), C.R.S., the District's Board of Directors (the "Board") is empowered to have the management, control and supervision of all of the business and affairs of the District and all construction, installation, operation and maintenance of the District's improvements; and

WHEREAS, pursuant to § 32-1-1001(1)(m), C.R.S., the Board is permitted to adopt, amend and enforce rules and regulations not in conflict with the constitution and laws of the State of Colorado for carrying on the business, objects and affairs of the Board and of the District; and

WHEREAS, the District receives raw water from the Colorado Springs Utilities, an enterprise of the City of Colorado Springs, Colorado ("CSU"); and

WHEREAS, pursuant to a Settlement Agreement among CSU, the City of Colorado Springs, Colorado, RMG Properties, LLC, the District and other private parties, dated March 2015, the District desires CSU to ultimately take over the ownership, operation and maintenance of the District's water system, provided that the District meets the criteria established in the Settlement Agreement; and

WHEREAS, in order to ensure that water improvements constructed as of the date of this Resolution and in the future are constructed in accordance with CSU standards and specifications, the Board desires to adopt the standards and specifications utilized by CSU and referred to as the Water Line Extension & Service Standards ("Water LESS"), which Water LESS standards are attached hereto and incorporated herein as **Exhibit A**; and

WHEREAS, the Board recognizes that, until the point at which CSU accepts the District's water system for ownership, operation and maintenance, those references in the Water LESS standards which reference CSU as the entity with jurisdiction for oversight, inspection, construction, etc., will be the District and will not be the responsibility of CSU; and

WHEREAS, the Board desires to adopt the Water LESS standards as set forth herein; and

WHEREAS, in addition to the adoption of the Water LESS standards, the Board hereby desires to adopt additional Rules and Regulations for the District as set forth herein.

NOW, THEREFORE, BE IT RESOLVED BY THE BOARD AS FOLLOWS:

1. ADOPTION OF WATER LESS STANDARDS. The Board hereby adopts the Water Line Extension & Service Standards (Water LESS) standards promulgated by CSU, as set forth in **Exhibit A**, attached hereto and incorporated herein by this reference, and as may be amended from time to time. Until such time as CSU accepts the District's water system for ownership, operation and maintenance, all references in the Water LESS standards to Colorado Springs Utilities shall be replaced with the "Cascade Metropolitan District No. 1" or "the District" and the District shall have all of the rights, obligations, responsibilities and authorities established thereunder as those set forth for Colorado Springs Utilities. The Board shall have the right to waive any inconsistencies set forth in the Water LESS standards or make any changes thereto in its sole and absolute discretion.

2. RULES AND REGULATIONS. The Board hereby adopts the Rules and Regulations set forth in **Exhibit B**, attached hereto and incorporated herein by this reference.

3. EFFECTIVE DATE. The provisions of this Resolution shall take effect as of the date of this Resolution.

4. SEVERABILITY. If any term or provision of this Resolution or if any rule or regulation is found to be invalid or unenforceable by a court of competent jurisdiction or by operation of any applicable law, such invalid or unenforceable term or provision shall not affect the validity of the remainder of the Resolution or rules and regulations, as a whole, but shall be severed, leaving the remaining terms or provisions in full force and effect. In addition, in lieu of such void or unenforceable provision, there shall automatically be added a provision similar in terms to such illegal, invalid or unenforceable provision so that the resulting reformed provision is legal, valid and enforceable.

[Remainder of Page Intentionally Left Blank].

ADOPTED this 24th day of March 2015.

CASCADE METROPOLITAN DISTRICT NO. 1

Officer of the District

ATTEST:

APPROVED AS TO FORM:

WHITE BEAR ANKELE TANAKA & WALDRON
Attorneys at Law

General Counsel to the District

Signature Page to Resolution Adopting the Colorado Springs Utilities Water Line Extension & Service Standards (Water LESS) –2014 and Adopting Other District Rules and Regulations

EXHIBIT A

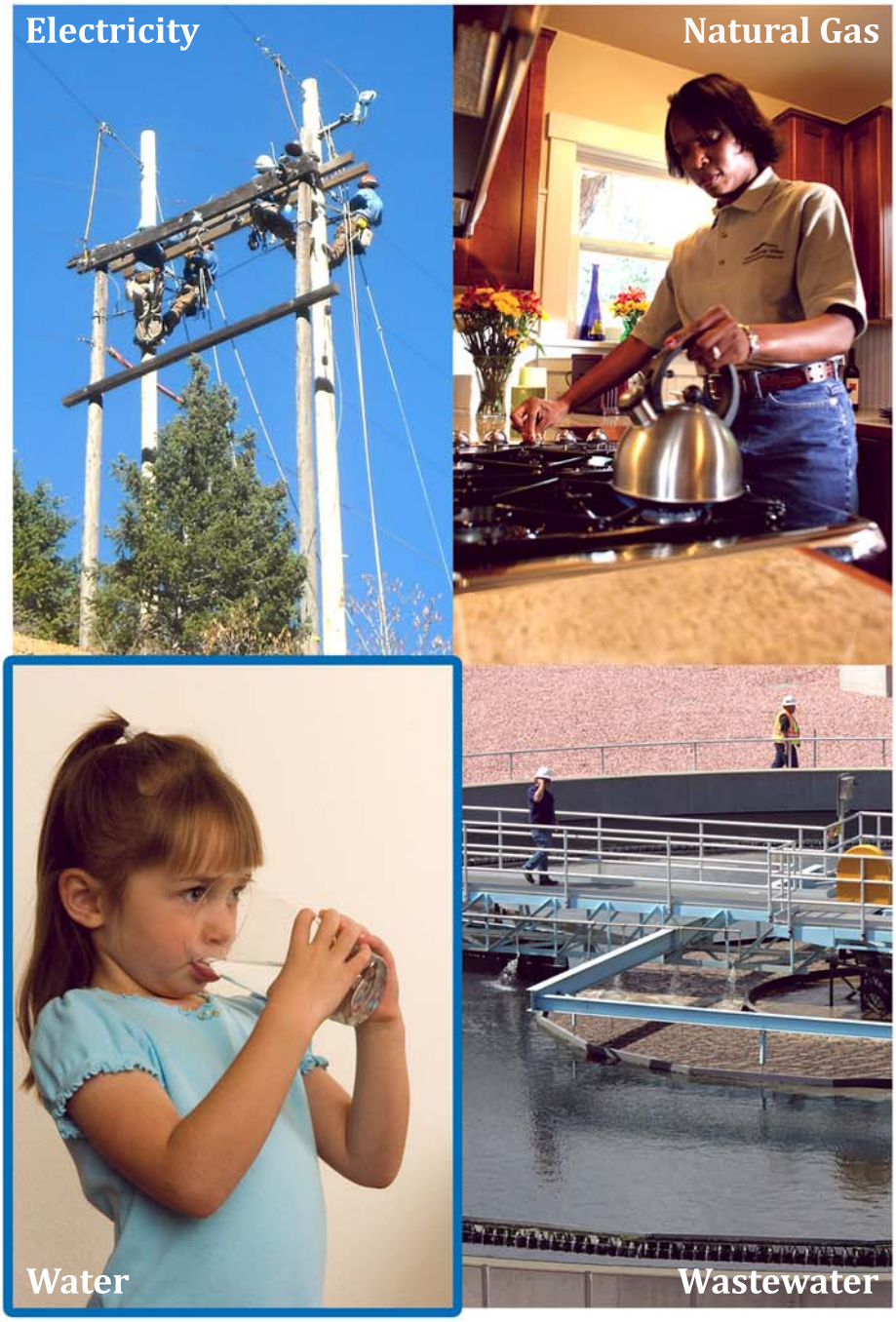
Colorado Springs Utilities Water Line Extension & Service Line Standards (Water LESS) – 2014

Colorado Springs Utilities
It's how we're all connected

2014 Edition

Water

Line Extension & Service Standards

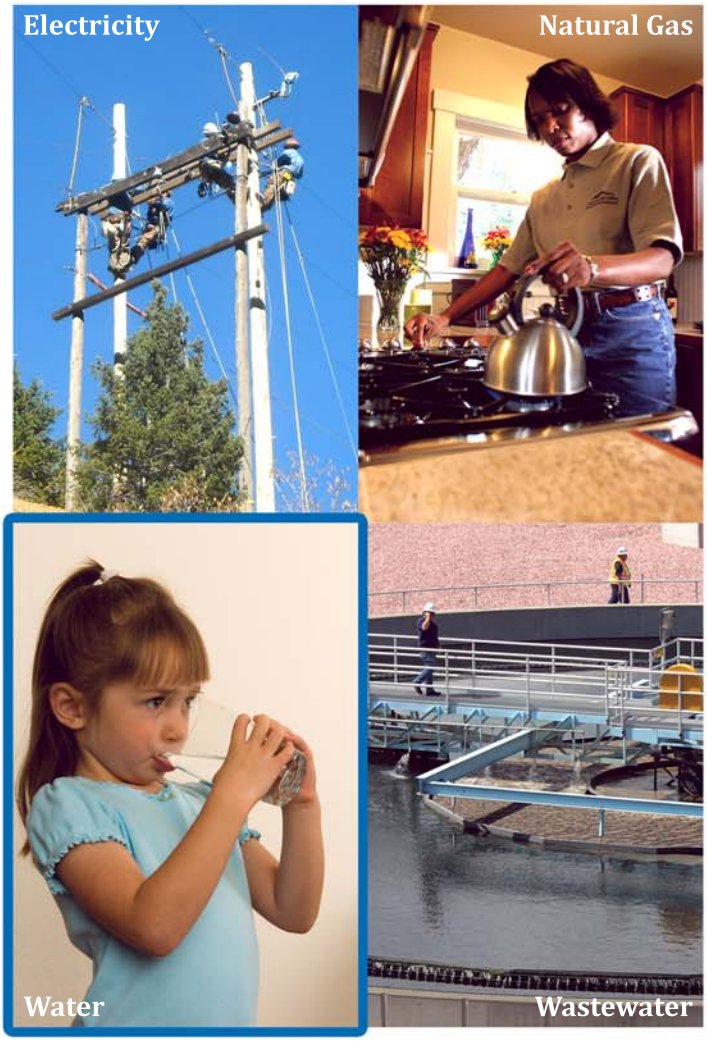


Colorado Springs Utilities
It's how we're all connected

2014 Edition

Water

Line Extension & Service Standards



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Pursuant to Colorado Springs City Code Section 12-1-109, on March 31, 2014 the Colorado Springs Utilities provided public notice of its intent to amend the Water Line Extension and Service Standards. No substantial comments to these Standards and no request for a hearing were received. Therefore, Colorado Springs Utilities does hereby amend the Water Line Extension and Service Standards as Colorado Springs Utilities policy to become effective on May 1, 2014.

Gary Bostrom, Chief Water Services Officer

May 1, 2014
Date Approved

COLORADO SPRINGS UTILITIES
WATER LINE EXTENSION AND SERVICE STANDARDS

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Revision Table

Colorado Springs Utilities has undertaken a major revision of the 2010 Water Line Extension and Service Standards. Our main goals in this effort have been the following:

1. To ensure that the Water Line Extension and Service Standards address the concerns of all impacted stakeholders
2. To organize the content in a manner that flows consistent with the design and construction process
3. To eliminate redundancies
4. To eliminate discrepancies
5. To review existing engineering assumptions and calculations and revise or amend the criteria as necessary
6. To understand the source and applicability of each standard

Major items that have been revised since the 2010 Water Line Extension and Service Standards include:

- A revised Authority Section 1.2.
- A new Enforcement Section 1.4.
- Addition of new definitions in Section 1.12.
- Addition of references in Section 1.15.
- A new material selection Section 2.6B.
- A new water looping and water quality Section 2.6E.
- A new section to instruct on the requirements and processing of easements Section 2.6F.
- New valve placement Section 2.6G.8.
- Addition of Section 2.6G.9 to provide more engineering justification behind the design of concrete reverse anchors and concrete thrust reaction blocks
- New Section 2.6I is a clarification of cathodic protection design standards along with new bolt protection requirements.
- Chapter 3 has been added to organize and clarify submittal requirements.
- Chapter 4 has been revised to include pictures and more organized content.
- Chapter 5 has been reorganized to better mimic the chronology of construction.
- Chapter 6 has been added to clarify requirements for HDPE and Trenchless Technology.
- Chapter 7 is a new chapter on Pump Stations.
- Chapter 8 has been included to address nonpotable water criteria.
- Appendix A has been reorganized to follow the test content and the Detail Drawings have been added to and modified per the above revisions.
- The entire document has been hyperlinked for ease of use online when cross referencing sections.

The document has gone through a thorough review process with both internal and external stakeholders. We would like to thank the following Colorado Springs Utilities staff for their dedication and time to this effort:

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Donene Dillow
Dustin Darling
Gabe Caunt
Gary Rust
James Sibert
Jason Hylton
Jay Hardison
Jeff Bray
Jessica Wilson
Jim Espinosa
Jim Swindler
Joe Abila
Joe Busemeyer
Joe Tafoya
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Keta Donegan
Kevin Lusk
Kim Mueller
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Mark Cerda
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Matt Williams
Melissa Wetzig
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Mike Neppl
Mike Pitts
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Neal Ehrenfelt
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Rich Dressel
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Rich Walker
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Ron Sanchez
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Vicki Card
Ward Scott
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Kirk Olds

We would like to offer a special thanks to those who served on the Standards Review Committee and those members from the development community who provided a high level of document review:

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Russ Snow

Finally, great thanks to Diane Block, Ginette Olszewski, and John Russell for formatting, hyperlinking and editing.

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CHAPTER 1
General Information

CHAPTER 1

General Information

1.1 General

The purpose of Chapter 1 is to provide an understanding of the organization and applicability of the *Colorado Springs Utilities Water Line Extension and Service Standards (Water LESS)* and how they should be utilized. By adopting and promulgating these *Water LESS*, Colorado Springs Utilities seeks to ensure safe and efficient design, construction and operation of the Water System. Refer to the appropriate set of *Line Extension and Service Standards Documents* according to Utility Service: Water, Wastewater, Gas or Electric.

The criteria are written to ensure uniformity of design concepts, methodologies, procedures, construction materials, types of equipment and quality of work products. Sound judgment shall be exercised in all applications to create safe, suitable, high-quality, energy efficient and cost efficient facilities. Any deviations from these criteria shall be approved by Colorado Springs Utilities.

1.2 Authority

These *Water LESS* are promulgated by the Colorado Springs Utilities Executive Director (CEO) and approved by the Chief Water Services Officer in accordance with *City Code 12.1.109*. The interpretation, enforcement, and revision of these *Water LESS* are hereby delegated to the Chief Water Services Officer, or their designated agent.

A. Interpretative Authority

The Chief Water Services Officer of Colorado Springs Utilities, acting either directly or through properly authorized agents, shall have the authority to interpret these *Water LESS*. In case of a dispute, the Chief Water Services Officer shall have final authority to interpret these *Water LESS*.

B. Inspection Authority

Colorado Springs Utilities shall assign an Inspector and/or Project Manager (Inspector) as the designated agent of the Chief Water Services Officer during Construction of the proposed Water System to ensure these *Water LESS* and all contractual Specifications are met. The Inspector shall maintain overall authority over Construction. The Inspector is responsible for reviewing the Approved Construction Plans, the applicable *Water LESS* criteria, all Contract Documents and any other approved plans and/or reports necessary for the Construction of the proposed Water System. The Inspector shall coordinate with the appropriate Colorado Springs Utilities Staff and the Design Engineer to resolve significant conflicts between the Approved Construction Plans, these Water LESS, Contract Documents and any other approved plans and/or reports with due consideration given to the professional duties and responsibilities of the Design Engineer. The Inspector may require on-site changes and corrections be made to the Approved Construction Plans during any phase of Construction to ensure these *Water LESS*, *City Code*, Contract Documents and any other approved plans and/or reports are followed to ensure Construction of a safe and efficient Water System. The Inspector shall use the Approved Construction Plans as follows:

- Addenda and modifications including, but not limited to, field changes and revisions to the Approved Construction Plans take precedence over the original Approved Construction Plans.
- In the Approved Construction Plans, calculated dimensions shall take precedence over scaled dimensions and noted material over graphic indication.

C. Conflicts Between Approved Construction Plans and these *Water LESS*
When a conflict occurs between the Approved Construction Plans and these *Water LESS*, the Chief Water Services Officer or its designees, shall decide which stipulation will provide the best installation and their decision shall be final.

1.3 Applicability

These *Water LESS* are Colorado Springs Utilities' service standards and regulations relevant to the design, installation, construction, maintenance, repair or replacement of the Water System and Water Service Lines, provision of water service to the public, and assurance of potable and palatable quality of water for the following:

- Private and Public Potable and Nonpotable Water System components including pump stations and Transmission and Distribution Water Mains up to and including 24 inches in diameter and
- Potable and Nonpotable Water Service Lines.

These Water LESS do not cover the design and construction of Raw Water collection, storage, transmission and treatment unless otherwise noted. Portions of these *Water LESS* are applicable and relevant to steel transmission lines and will be enforced as such. However, Colorado Springs Utilities recognizes that these *Water LESS* are not comprehensive for steel transmission line design, installation, construction, maintenance, repair, and replacement. Applicability and enforcement of these *Water LESS* for steel transmission mains will be conducted on a case by case basis. Determination of applicability and subsequent enforcement requirements will be made by the Chief Water Services Officer or its designees.

1.4 Enforcement

Colorado Springs Utilities may enforce these *Water LESS* in accordance with *City Code § 1.1.201*.

No building permits shall be issued for building Sites within any plat until all required utility systems have been installed in accord with all Specifications of Colorado Springs Utilities or, alternatively, until acceptable agreements guaranteeing the completion of all required utility systems and other requirements, as specified by Colorado Springs Utilities, have been placed on file with Colorado Springs Utilities. *City Code § 7.7.1102*.

Colorado Springs Utilities is authorized to take appropriate action, up to and including discontinuation of service, against any reclaimed water User who does not meet the requirements of these standards, *Regulation No. 84*, CDPHE, or the User's *NOA*. *City Code § 12.4.1109*

1.5 Effective Date of Standards

These *Water LESS* shall be in effect upon approval by the Chief Water Services Officer and shall supersede all previously approved *Water Line Extension & Service Standards*.

1.6 Organization of these *Water LESS*

These *Water LESS* have been organized to mirror the chronology of a Water Main Extension projects from planning to Construction.

1.7 Errors and Omissions

When there are discrepancies within these *Water LESS* the applicant shall defer to the more restrictive requirement unless otherwise approved by Colorado Springs Utilities.

Criteria not covered herein will be evaluated on a case by case basis with the review and approval by Colorado Springs Utilities.

1.8 Revisions, Amendments or Additions

These *Water LESS* may be revised, amended or added to by Colorado Springs Utilities. Such revisions, amendments and additions shall be binding and in full force and effect when published.

Colorado Springs Utilities may promulgate bulletins as addenda to the *Water LESS*. These bulletins shall be posted on Colorado Springs Utilities website at www.csu.org for review and comment for no less than 15 days prior to enforcement.

1.9 Requested Changes to Standards

Anyone wishing to submit a new product, method of installation, or design criteria for inclusion in these *Water LESS*, or to report an error within the *Water LESS*, may do so by contacting the Engineering Support Department, Leon Young Service Center, 1521 Hancock Expressway, MC 1821, Colorado Springs, CO. 80903, with the necessary support information as required by Colorado Springs Utilities.

1.10 Viewing These Standards Online

The *Water LESS*, forms, and drawings are available as Adobe®PDF files on the Colorado Springs Utilities web site at www.csu.org. AutoCAD drawings are available for Detail Drawings, notes and signature blocks and can be downloaded through links within the *Water LESS* Adobe®PDF file.

References to Detail Drawings and other sections of the *Water LESS* can be navigated with hyperlinks embedded within the text of the Adobe®PDF file.

1.11 Referenced Standards, Codes, Permits, Plans, Agreements and Specifications

Where all or part of a Federal, State, City, ASTM, ANSI, AWWA, etc., standard Specification is incorporated by reference in these *Water LESS*, the referenced standard shall be the latest edition and revision unless otherwise indicated by a specific revision date. Referenced documents will be italicized in the text.

1.12 Definitions

Definitions used in these *Water LESS*, or in the Detail Drawings, are shown as capitalized and shall have the meanings herein ascribed:

Agronomic Rate: The rate of application of water and associated nutrients to plants necessary to satisfy the plant's nutrition and watering requirements.

Air Gap: The unobstructed vertical distance of free atmosphere between a discharge point and the prevailing grade or flood level of a receptacle. An Air Gap must be at least twice the diameter of the effective discharge opening and in no case less than 1 inch.

Approved Backflow Prevention Assembly: A testable Backflow prevention assembly accepted and approved by Colorado Springs Utilities to control a Cross Connection based on the Degree of Hazard. The Backflow Prevention Assembly must be approved by the Foundation for Cross-Connection Control and Hydraulic Research of the University of Southern California.

Approved Construction Plans: Plans that are signed and approved by Colorado Springs Utilities for installation within the Colorado Springs Utilities Water System. Includes Water, Wastewater and Utility Service Plans prepared by the Design Engineer.

Approved Manufacturer/Material: Manufacturers and materials that are approved for use within the Colorado Springs Utilities Water System: (All "or equal" materials shall be approved by Colorado Springs Utilities in advance of Construction). "Equal" means, of the same quality, material or product that meets or exceeds the approved material/product in the standards.

Asbestos: Any material that contains more than one percent Asbestos and is friable or is releasing Asbestos fibers into the air above current action levels established by the United States Occupational Safety and Health Administration.

Authority Having Jurisdiction: An organization, office or individual responsible for enforcing the requirements of a code or standard, or for approving equipment, materials, an installation, or a procedure.

Backflow: The undesirable, reverse flow of water or other liquids, fluids, mixtures, gases, or any other substance that does not meet the current Colorado Primary Drinking Water Regulations.

Best Management Practices: Any program, technology, process, operating method, measure, or device that controls, prevents, removes, or reduces pollution and these methods that have been determined to be the most effective, practical means of preventing or reducing pollution or contamination from non-point sources.

Certified Backflow Prevention Assembly Tester: A person who has received training in the testing, operation, and maintenance of Approved Backflow Prevention Assemblies. This person must be certified in accordance with the Colorado Primary Drinking Water Regulations. *City Code § 12.4.1202.*

Certified Cross-Connection Control Technician: A person who has responsibility for the testing, operation and maintenance of Approved Backflow Prevention Assemblies and is certified in accordance with the provision of *Article 12 of the Colorado Primary Drinking Water Regulations.*

Check Meter (Nonpotable or Potable): A water meter (not owned or installed by Colorado Springs Utilities and not connected to Colorado Springs Utilities system) that is used to measure water consumption for reimbursement of the Colorado Springs Utilities-invoiced charges to the Master-Metered Customer by a downstream entity through an appropriate allocation procedure in accord with *URR Section 10*.

Chief Water Services Officer: Executive level at-will position reporting directly to the Executive Director. The Chief Water Services Office is responsible for all water and wastewater operations for Colorado Springs Utilities.

City: The City of Colorado Springs, County of El Paso, State of Colorado.

Cohesionless Soils: Soils that do not exhibit the qualities of Cohesive Soils. Soils having an AASHTO soil classification of A-1, A-2, or A-3. (*City of Colorado Springs Standard Specifications*)

Cohesive Soils: Soils in which the absorbed water and particle attraction work together to produce a body which holds together and deforms plastically at varying water contents. Soils having an AASHTO soil classification of A-4, A-5, A-6, or A-7. (*City of Colorado Springs Standard Specifications*)

Colorado Primary Drinking Water Regulations: Any regulations promulgated by the State of Colorado or any agency thereof to assure the safety of public drinking water supplies, and to enable the State of Colorado to assume responsibility for enforcing the standards established by the *Federal Safe Drinking Water Act* (*Public Law 93-523*), as amended. *City Code § 12.4.1202*.

Colorado Springs Utilities: Utilities of the City of Colorado Springs created and operated as an enterprise pursuant to *article VI* of the *City Charter*. *City Code § 12.1.101*.

Commercial User: Any person whose use of the utility supply system is in connection with the operation of a business, trade or occupation, whether or not for profit. The persons shall include, but shall not be limited to, clubs, fraternities, sororities, lodges, hotels, apartment and rooming houses, tourist camps and cottages, multi-family dwellings where more than one dwelling unit is served through one meter, all common areas of multi-family dwellings when separately metered, schools, governmental buildings and churches. *City Code § 12.1.101*

Community Garden: A single Premises gardened collectively by a group of natural people to produce edible produce, for non-commercial purposes, and operated by a nonprofit entity registered with the State of Colorado. *City Code § 12.4.1303*

Competent Person: Means one who is capable of identifying existing and predictable hazards in the surroundings, or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has the authorization to take prompt corrective measures to eliminate them.

Concept Plan: An accurate graphic representation drawn to scale of the proposed development of a particular Site which indicates in a conceptual form the proposed and surrounding land uses. *City Code § 7.2.201*

Consecutive System: A Public Water System that receives some or all of its finished water from one or more wholesale systems. Delivery may be through a direct connection or through the distribution system of one or more Consecutive Systems.

Construction: The entire completed construction or the various separately identifiable parts thereof required to be provided. Construction includes and is the result of performing or providing all labor, services, and documentation necessary to produce such construction, and furnishing, installing, and incorporating all materials and equipment into construction.

Construction Manager: An individual, or group of individuals, from Colorado Springs Utilities, or hired by Colorado Springs Utilities, to provide quality control and quality assurance of Construction.

Construction Plan: A drawing or set of drawings that includes but is not limited to: (a) Water Plan - showing horizontal alignment or plan and profile of the proposed Water Main(s), or (b) Wastewater Plan showing horizontal alignment or plan and profile of the proposed Wastewater Main(s), or (c) Utility Service Plan.

Containment or Containment Assembly: The installation of an Approved Backflow Prevention Assembly on a service line, at the User's expense, within the User's Potable Water System, immediately following the meter where the Water Service is metered, and in all cases, before the first branch line leading off the service line.

Contaminant: A foreign substance that if permitted to enter the User's Potable Water System, will degrade the water quality so as to constitute an immediate and severe health hazard leading to poisoning, acute illness, or the spread of disease.

Contaminant Source: Any source or system from which a Contaminant may originate, including but not limited to an Auxiliary Water Supply.

Contract Documents: Construction drawings and Specifications that detail the work to be completed by the Contractor during Construction.

Contractor: In the context of these standards, a person or persons, co-partnership or corporation employed by an Owner/Developer for the purpose of installing or conducting repairs or replacements to the Water System, Water Service Lines, or interior plumbing. This includes all subcontractors, builders, excavators, and or master plumbers.

Corporation Stop or Tapping Valve: Corporation Stop or Tapping Valve is the point of connection of a Water Service Line to Colorado Springs Utilities' Water Distribution Main.

Cross Connection: Any actual or potential connection or structural arrangement between the User's Potable Water System and a source of a Contaminant, Hazardous Pollutant or Pollutant. By-pass arrangements, jumper connections, removable sections, swivel or change-over devices, and other temporary or permanent devices through which or because of which Backflow may occur are considered to be Cross Connections.

Cross Connection Controlled: The proper installation and maintenance of an Approved Backflow Prevention Assembly. The assembly shall continuously provide Backflow prevention.

Curb Stop: The Curb Stop is the shutoff valve at a point on the Water Service Line to the premises being served; typically located at, near, or on the property or easement line. The Curb Stop is the demarcation of ownership between the property owner and Colorado Springs Utilities.

Customer: The person or authorized agent of the person designated on the records of Colorado Springs Utilities as the person responsible for payment of charges incurred for the use of the utility supply system of the City at the premises being served. *City Code § 12.1.101*

Customer Drilled and Maintained Wells: Wells located on private property, which are constructed, installed, operated and maintained at the Customer's expense.

Customer Owned Stand Alone Raw Water System: A system supplied only by raw water and is completely independent and not connected now or at any time in the future to any part of the Colorado Springs Utilities' Nonpotable Water System. Determination of a stand-alone Nonpotable raw water system shall be made by Colorado Springs Utilities.

Daisy Chains: Refers to a private water system connecting to another private water system that is receiving water service from a Colorado Springs Utilities public water main.

Dead End Main or Single Feed Main, (herein after called Dead End Main): A water Distribution Main with only one connection to the Water Distribution System. If this one connection were not available, then the Water Service Lines connected to the Dead End Main could not be supplied with water. A Water Distribution Main extended from and connecting back to a Dead End Main is not considered a Looped Main and does not meet the looping requirements described herein. Additionally, if a Water Distribution Main has only two connections to the Water Distribution System and one of the two connections is through a PRV to a lower pressure zone, then such water main does not meet the looping requirements and is also considered a Dead End Main. Includes Temporary Dead End Mains.

Degree of Hazard: A hazard assessment conducted by the Executive Director to identify and classify a Cross Connection based on the perceived probability and impact in the event of Backflow. The Executive Director shall have sole discretion to classify Cross Connections in to one of the following hazard levels:

- High Hazard: A determination by the Executive Director that a reasonable potential exists for the Backflow of a Contaminant.
- Low Hazard: A determination by the Executive Director that a reasonable potential exists for the Backflow of a Hazardous Pollutant.
- Non-Hazardous Nuisance: A determination by the Executive Director that a reasonable potential exists for the Backflow of a Pollutant

Design Engineer: The Registered Professional Engineer or Engineering Firm that creates, for submittal to Colorado Springs Utilities, a Development Preliminary Utility Plan, Master Plan, Concept Plan, Development Plan, Construction Drawings and/or Service Plans for approval. Includes the Engineer of Record.

Detail Drawings: Construction and design details in drawing format located in Appendix A.

Detector Assembly: A general term to collectively refer to any approved, Double Check Detector Backflow Prevention Assembly, Double Check Detector Backflow Prevention Assembly – Type II, Reduced Pressure Principle Detector Backflow Prevention Assembly or Reduced Pressure Principle Detector Backflow Prevention Assembly – Type II.

Development Plan: An accurate detailed, scaled, graphic representation of a proposed development which shows the specific land uses, Site design, and land dedication requirements for the property. It provides information including, but not limited to, building locations and building footprints, parking areas and designs, ingress/egress, access

and utility easements. The development plan includes, but is not limited to, a detailed Site plan, a preliminary or final landscape plan, building elevation drawings, a preliminary utility/facilities plan, a preliminary grading plan or a phasing plan, as appropriate. The development plan shall contain the information required in the development plan application provided by the Department. *City Code § 7.2.201*

Double Check Backflow Prevention Assembly or DC: An Approved Backflow Prevention Assembly composed of two independently acting check valves, including two tightly closing, resilient seated shut off valves attached at each end of the assembly and four properly located, tightly closing, resilient seated test cocks. *(University of Southern California (FCCHR),* 2012 Second Printing)

Double Check Detector Backflow Prevention Assembly: A specially designed assembly composed of a line sized, approved double check assembly with a bypass containing a special meter and an approved double check assembly. *(University of Southern California (FCCHR),* 2012 Second Printing)

Double Check Detector Backflow Prevention Assembly- Type II: A specially designed assembly composed of a line sized, approved double check assembly with a bypass around the second check valve containing a special meter and an approved check valve. *(University of Southern California (FCCHR),* 2012 Second Printing)

Downstream Entity: An entity that is not a Colorado Springs Utilities Customer but is located/connected downstream (in the direction of water flow) of the Colorado Springs Utilities Master-Metered Customer.

Earthwork: Earthwork shall include all clearing, grubbing, grading, excavation, fill, backfill, excess excavation, bedding material, borrow material, and surface restoration as may be required.

Easement: A right, privilege or liberty which one has in land owned by another; a right to limited use of another's land for some special and definite purpose within a specified boundary. It is not ownership of the land, but it includes the right to enter upon the land for the purpose(s) for which it was granted.

Engineer of Record: The registered licensed professional engineer who develops the overall design criteria for the project elements, components, and systems and performs the analysis and is responsible for the preparation of the construction engineering documents.

Essential Facilities: Hospitals, long term care facilities, schools, universities, hotels, and major manufacturing facilities, or other facilities deemed essential by Colorado Springs Utilities.

Excavator: One holding a license and permit under this part, and those departments of the City doing excavations under this part, or an agent, employee or contractor working for, or under, one holding a license and/or permit. (*City Code § 3.3.201).*

Executive Director (CEO): The Executive Director of Colorado Springs Utilities or their designees, if any. The Executive Director shall have the duties and responsibilities of the Chief Executive Officer (CEO). The Executive Director is Colorado Springs Utilities Director appointed by City Council pursuant to *City Charter § 6-10. City Code § 1.1.106*

Fertigation System: Any system attached to a water-connected appurtenance and through which any fertilizers, soil amendments, pesticides, herbicides, fungicides or any other water-soluble products are dispensed.

Fire Department Connection or FDC: A connection through which the fire department can pump supplemental water into the sprinkler system, standpipe, or other system furnishing water for fire extinguishment to supplement existing water supplies.

Fire Department Underground Flush Test: A test of a piping system using high velocity flows to remove debris from the piping system prior to it being placed in service.

Fire Hydrant Lateral: The extension pipe from the fire hydrant to the valve at the point of connection to the Water System.

Fire Main: A Water Distribution Main dedicated to serving fire protection systems and possibly hydrants which may be looped around a building or complex.

Fire Protection System: Any system used for firefighting purposes and comprised of underground and overhead piping designed in accordance with fire protection engineering standards. A Fire Protection System is categorized into four classifications:

- **Class 1** – Direct connection to the Water Supply System; no pumps, tanks, or reservoirs; no connections to auxiliary water supplies; no antifreeze or other additives of any kind; all sprinkler drains discharge to atmosphere dry wells, or other safe outlets.
- **Class 2** – Same as Class 1 system, with the exception of a booster pump installed in the Water Service Line or in the User's Potable Water System.
- **Class 3** – Direct connection to the Water Supply System and the fire sprinkler system contains storage tanks of any kind, or is supplemented from a covered, auxiliary water source.
- **Class 4** – Direct connection to the Water Supply System and the fire sprinkler system is interconnected with uncovered, auxiliary water supplies, or systems containing antifreeze or chemical additives of any kind.

Fire Service Line: The water line and its appurtenances extending from the base of the system riser up to and including the connection to the Water Main for the exclusive purpose of supplying water to Fire Protection Systems.

Fire Suppression System: A type of Fire Protection System which generally includes sprinklers or some type of fire extinguishing apparatus.

Flushing: The discharge of water to an approved outfall location.

Full Build Out: Occupancy of all buildings planned within the proposed development.

Groundwater: Subsurface waters in a zone of saturation which are or can be brought to the surface of the ground or to surface waters through wells, springs, seeps or other discharge areas.

Hazardous Environmental Condition: The onsite presence of Asbestos, PCBs, petroleum, hazardous waste, or radioactive material in such quantities or circumstances that

may present a substantial danger to persons or property exposed thereto in connection with the work.

Hazardous Pollutant: A foreign substance that if permitted to enter the User's Potable Water System, will degrade the water quality so as to constitute a health hazard through repeated and chronic exposure.

Hazardous Waste: The term hazardous waste shall have the meaning provided in latest version of the *Solid Waste Disposal Act (42 USC Section 6903).*

Irrigation Lateral: That portion of the Nonpotable Water System which transmits Nonpotable
Water from the Irrigation Main Line to the irrigation heads.

Irrigation Main: That portion of the Nonpotable Water System which transmits Nonpotable Water from the Nonpotable Service Line to the Irrigation Lateral Line.

Isolation Valve: A valve installed in the Water System that can be used for operation or maintenance of the Water Distribution System operated in either an open or closed position.

Laws and Regulations: Any and all applicable laws, rules, regulations, ordinances, codes, and orders of any and all governmental bodies, agencies, authorities, and courts having jurisdiction.

Looped Main: A Water Distribution Main with at least two separate connections to the existing Distribution System that are within the same designated water pressure zone. In order to be designated as a Looped Main, the connections to the Distribution System shall be designed such that if one of the connections is not available due to repairs or maintenance, then the other connection can supply water from the Distribution System to the Water Service Lines and Fire Lines served by the Looped Main.

Management Plan: A cross-connection-control plan which may include, but shall not be limited to, information on Backflow Prevention Methods, testing frequencies if applicable, installation requirements and locations, and a hazard assessment).

Master Meter: A meter that measures consumption of water through a service line to more than one Premise. *URR Section 1*

Master Plan: A plan for the development of a portion of the City which contains a generalized transportation system, proposed land use, and shows the relationship of the area included in the plan to surrounding property. *City Code § 7.2.201*

Master Plumber: As defined in and licensed pursuant to *title 12, article 58, Colorado Revised Statutes,* as the same may be now or hereafter amended, and registered with the Regional Building Department pursuant to *Section RBC205.1* of the *Building Code*. *City Code § 12.4.201*

Meter Pit: Underground housing for ¾ and 1 inch water meters.

Mixed Use: A Premise that includes both nonresidential occupancy and Multi-Family Residential dwellings within one Structure. *URR Section 1*

Multi-Family Residential Premises: A common wall premises for the purpose of multi-family residential dwelling. This may be described as a condominium, townhouse, duplex, stacked housing or other name form for multi-family housing, permanent or transient. This also includes service to buildings appurtenant to a residence including garage, cottages and other minor buildings where a Colorado Springs Utilities' water meter is being utilized on a single platted lot and each dwelling unit in a Mobile Home Park.

Multipurpose System: A professionally engineered, *NFPA 13D* compliant, water piping system installed in a residential dwelling where the domestic water system and a fire protection system are fully integrated, sharing a single, common piping system, in which each line serving a fire sprinkler terminates at either: a fixture that is used regularly for domestic purposes, or a common manifold used to supply multiple fixtures used regularly for domestic purposes.

Necessary Demand: The Finished Water turnover within a defined amount of time needed to meet Water Quality requirements.

Notice of Authorization(NOA): A notice issued by the CDPHE/WQCD to treaters and Users of reclaimed water containing terms, limitations, and conditions as deemed necessary by the CDPHE/WQCD, to ensure compliance with *Regulation No. 84*, CDPHE.

Owner/Developer: Any person, association, corporation, entity or government agency desiring Water Service for Premises under their control, often a sub-divider, developer, an owner or their representative.

Point of Compliance (POC) is typically located after the point of discharge (or dechlorination) and prior to entering or converging with State waters.

Pollutant: A foreign substance which, if permitted to enter the User's Potable Water System, does not create an actual hazard to the public health, but which does degrade the water quality so as to adversely and unreasonably impair the quality or usefulness of the water for domestic purposes.

Post Indicator Valve: An Isolation Valve installed on a Fire Service Line which visually indicates the open or closed position of the valve.

Preliminary Utility Plan: A document submitted with a Development Plan, Concept Plan, or Master Plan which shows among other things, all existing and proposed utility lines as well as existing and proposed easements.

Premises: A lot, parcel of land, building or establishment; the physical location where service is provided. *URR Section 1*

Project: The total design and/or Construction to be performed, may be the whole, or a part as may be indicated in a statement of work or on the Construction Plans.

Raw Water Transmission Main: A Raw Water Transmission Main transports water from a surface storage Structure (e.g., raw water, a well, a lake, a pond, or a ditch) to a water treatment facility. The water contained in these mains is considered as Nonpotable Water as it is in its raw state prior to treatment and distribution to the potable drinking water system. Typically these Raw Water Transmission Mains are large in size and carry high flows of water.

Reclaimed Water Control Regulation: A Colorado regulation promulgated pursuant to the *Colorado Water Quality Control Act* that establishes requirements, prohibitions, standards, and concentration limits on the use of reclaimed water to protect public health and the environment while encouraging its use. Codified at *5CCR 1002-84*, also known as *Regulation No. 84*, CDPHE.

Record Drawing (As-built): Construction drawings revised to show significant changes made during the construction process, usually based on marked-up prints, drawings, and other data furnished by the Contractor and/or the Colorado Springs Utilities Inspector.

Recovery Agreement: An Agreement between the Owner/Developer and Colorado Springs Utilities for the collection of a pro rata share of the eligible cost of facilities and interest as provided within the Colorado Springs *Utilities Rules and Regulations* from the property owner(s) or developer of such unserved or undeveloped lands and for the refund of such cost as provided in the Recovery Agreement.

Reduced Pressure Principle Backflow Prevention Assembly or RP: An Approved Backflow Prevention Assembly composed of two independently acting check valves, and a hydraulically operated, mechanically independent pressure relief valve located between the two check valves and below the first check valve. The assembly shall include two tightly closing, resilient seated shut off valves attached at each end of the assembly and four properly located, tightly closing, resilient seated test cocks. *(University of Southern California (FCCHR),* 2012 Second Printing)

Reduced Pressure Principle Detector Backflow Prevention Assembly: A specially designed assembly composed of a line sized, approved reduced pressure principle assembly with a bypass containing a special meter and an approved reduced pressure principle assembly. *(University of Southern California (FCCHR),* 2012 Second Printing)

Reduced Pressure Principle Detector Backflow Prevention Assembly- Type II: A specially designed assembly composed of a line sized, approved reduced pressure principle assembly with a bypass around the second check valve containing a special meter and an approved check valve. *(University of Southern California (FCCHR),* 2012 Second Printing)

Resident-Controlled Landscape Irrigation: Irrigation of grass, trees and other vegetation located on the property of a single family or other residential occupancy where the occupant is the User and is responsible for the maintenance and/or operation of the irrigation system.

Residential User: Any person whose use of the utility supply system is exclusively for domestic purposes in a private home or individual dwelling unit where not more than one dwelling unit is served through one meter. Each person of full legal age who resides at the premises shall be deemed to have received benefit of utility services supplied and shall be liable to Colorado Springs Utilities for payment, whether or not service is listed in that person's name. *City Code § 12.1.101*

Right-of-Way (ROW): A strip of land occupied or intended to be occupied by a street, crosswalk, railroad, electric transmission line, oil or gas pipeline, water main, sanitary or storm sewer main, telephone line, shade trees or other similar uses. Rights of way are not easements; however, easements can be in rights of way. *City Code § 7.2.201*

Samples: Physical examples of materials, equipment, or workmanship that are representative of some portion of the work and which establish the standards by which such portion of the work will be judged.

Secondary Valve: A Secondary Valve is the valve at a point on the Private Water Main; located at, near, or on the property or easement line, is owned and maintained by the Private Water System owner(s) and demarcates the change in ownership from public to private.

Service Entry Point: A single, horizontal or vertical penetration of a wall, foundation, or slab floor of a Structure by a Water Service Line or a Fire Service Line.

Shop Drawings: All drawings, diagrams, illustrations, schedules, and other data or information which are specifically prepared and submitted by the Contractor to illustrate some portion of the work.

Site: Lands or areas indicated in the Construction Plans as being furnished by Owner/Developer upon which the work is to be performed, including rights-of-way and easements for access thereto, and such other lands furnished by Owner/Developer which are designated for the use of contractor.

Specifications: Documents consisting of written technical descriptions of materials, equipment, systems, standards, and workmanship as applied to the work and certain administrative details applicable thereto.

State Engineer. The executive officer in charge of supervising the work of all division engineers and may direct their supervision of their employees. The State Engineer has executive responsibility and authority with respect to items as identified in *Colorado Revised Statutes 37-80-102*.

Structure: A construction that bears weight such that when undermined could collapse causing financial damage to itself or other property including but not limited to vaults, walls, foundations, buildings, transformers, and encasements.

Subcontractor: An individual or entity having a direct contract with the Contractor or with any other Subcontractor for the performance of a part of the work at the Site.

Supplier: A manufacturer, fabricator, supplier, distributor, or vendor having a direct contract with the Contractor or with any Subcontractor to furnish materials or equipment to be incorporated in the work by the Contractor or any Subcontractor.

Tap Connection: The Corporation Stop (3/4, 1, 1-1/2, and 2 inch) or the valve (4 inches and greater) connected directly to the Colorado Springs Utilities Water Distribution Main.

Tapping Valve or Corporation Stop: Corporation Stop or Tapping Valve is the point of connection of a Water Service Line to Colorado Springs Utilities' Water Distribution Main.

Temporary Dead End Mains: Water Distribution Mains that are approved by Colorado Springs Utilities with input from the Colorado Springs Fire Department on a case by case basis for an interim period to allow for development phasing until a second connection can be completed.

Temporary Loop: A Water Distribution Main or Water Service Line designed to allow water to flow through the Water Distribution System or Dead End Main in order to maintain Water Quality Requirements in the Water Distribution System for an interim period.

Traditional Neighborhood Development (TND): A development intended to provide a pedestrian-oriented residential neighborhood development pattern with diverse housing types integrated with neighborhood schools, parks, civic spaces and commercial uses. Each development will identify its own development standards.

Treater: An entity that treats and provides reclaimed water to a User for approved uses. In the City of Colorado Springs, the Treater is Colorado Springs Utilities. The Treater and the User may be the same entity.

Trenchless Technology (Trenchless): A type of subsurface construction work that requires few trenches or no continuous trenches. It can be defined as a "family" of methods, materials, and equipment capable of being used for the installation of new, replacement, or rehabilitation of existing underground infrastructure with minimal disruption to surface traffic, business, and other activities

Underground Facilities: All underground pipelines, conduits, ducts, cables, wires, manholes, vaults, tanks, tunnels, or other such facilities or attachments, and any encasements containing such facilities, including those that convey electricity, gases, steam, liquid petroleum products, telephone or other communications, cable television, water, wastewater, storm water, other liquids or chemicals, or traffic or other control systems.

Underground Hydrostatic Test: Required by the Fire Department on Fire Protection Systems, which is a test of a closed piping system and its attached appurtenances consisting of subjecting the piping to an increased internal pressure for a specified duration to verify system integrity and leak rates. This is done on both underground (leaks permitted) and above ground (no leaks permitted) piping.

User: Any person who uses, takes water from or is connected to the water supply system of the City. *City Code § 12.4.201*

User Plan to Comply: The information and documentation a reclaimed water User is required to submit to the Treater that describes procedures and activities enabling the reclaimed water User to comply with the conditions for use of reclaimed water included in *Section 84.9* of *Regulation No. 84*, CDPHE.

User's Nonpotable Water System: The Nonpotable Water System piping, meter pit and appurtenances that extends from the connection at the Nonpotable Distribution Main to a Customer's point of use, as approved by Colorado Springs Utilities. A Nonpotable Water System that typically begins at the connection of Colorado Springs Utilities' meter to the Customer's main or service line and includes all Customer owned facilities downstream of the meter. Non-typical points for determination of where publicly owned Nonpotable systems begin and end are subject to the sole determination of Colorado Springs Utilities.

User's Potable Water System: Any potable water supply located on the User's premises whether supplied by the Utilities' potable Water Supply System or an Auxiliary Water Supply.

Utility Service: The provision of regulated electric, natural gas, water or wastewater service by Colorado Springs Utilities to Users or Customers. *City Code § 12.1.101*

Utility Service Plan: See Construction Plan definition

Vault: An underground Structure large enough to accommodate equipment including but not limited to meters, pressure regulating valves (PRVs), meter bypasses, all valves and piping or other underground infrastructure.

Wastewater Main: That portion of the wastewater system which conveys wastewater from a User to the treatment facility.

Water Plan: See Construction Plan definition.

Wastewater System: Any devices, facilities, structures, equipment or works owned by the City or used by Utilities for the purpose of the transmission, storage, treatment, recycling and reclamation of industrial and domestic wastes, or necessary to recycle or reuse water at the most economical cost over the estimated life of the system, including intercepting sewers, outfall sewers, collection lines, pumping, power and other equipment, and their appurtenances and excluding service lines; extensions, improvements, additions, alterations or any remodeling thereof; elements essential to provide a reliable recycled supply such as standby treatment units and clear well facilities; and any works, including the land and sites that may be acquired, that will be an integral part of the treatment process or is used for ultimate disposal of residues resulting from the treatment. It does not include the stormwater drainage system, a separate Municipal operation which is not part of [Colorado Springs] Utilities. *(City Code 12.1.101)*

Water Quality Control Division: A division of the Colorado Department of Public Health and Environment, headquartered in Denver, Colorado.

Water System Definitions:

These terms may be combined to form a single definition with respect to ownership, quality and asset.

Quality

- **Nonpotable Water:** Water that is not treated to potable drinking water standards and is not suitable, nor intended, for human consumption (drinking, washing, or culinary purposes), but is produced and delivered to Users for irrigation and approved commercial and industrial uses. Nonpotable water includes treated wastewater (reclaimed water) and raw (untreated) ground water and surface water. *City Code § 12.4.1103*
- **Potable Water (Finished Water):** Water that is intended for distribution and consumption without further treatment, except as necessary to maintain water quality in the distribution system (e.g., booster disinfection, addition of corrosion control chemicals).
- **Raw Water:** Surface water and Groundwater in its natural state, prior to any treatment.

- **Reclaimed Water:** Wastewater that has received secondary treatment by a domestic wastewater treatment works and such additional treatment as to enable the wastewater to meet reclaimed water standards for approved uses. *City Code § 12.4.1103*

Ownership

- **Private:** Utility infrastructure located outside of public rights-of-way and/or easements that is owned, operated and maintained by an individual, property owner(s), corporation, homeowners association or partnership.
- **Public:** Utility infrastructure which resides in a public rights-of-way or dedicated easement that is owned, operated, and maintained by Colorado Springs Utilities. This definition does not include public systems not owned and operated by Colorado Springs Utilities such as Consecutive Systems.

Asset

- **Water Distribution Main (Water Main):** That portion of the water supply system, which transmits and distributes water from treatment or storage facilities to Users, excluding portions of service lines as provided in *City Code § 12.4.201*.
- **Water Distribution System:** Water Distribution Mains, together with all necessary valves, fire hydrants, taps, meters, service pipes, appurtenances and associated materials, property and equipment distributing water to the service line.
- **Water Main Extension:** Extensions to the existing Colorado Springs Utilities' Water Distribution System.
- **Water Service Line:** The water line extending from the property, building, establishment or grounds up to and including the connection to the Water Main. *City Code § 12.4.201*
- **Water System:** Any and all devices, facilities, structures, equipment or works owned by the City or used by Colorado Springs Utilities for the purpose of the collection, storage, transmission, treatment, regulation or distribution of potable and Nonpotable water, including distribution mains, pumping facilities, metering facilities, pressure regulations facilities and their appurtenances and excluding service lines; any and all standby or contingency equipment, facilities or material which may be necessary to provide reliable water service; any and all devices, facilities, structures, equipment or works owned by the City or used by Utilities for the purpose of the transmission, storage, treatment or distribution of potable and nonpotable water, including treatment plants, pumping facilities, reservoirs, transmission lines and their appurtenances; any and all land or sites owned by the City or used by Utilities, for the purpose of providing potable or nonpotable water to Users including streams or other waters which contribute to the water supply of the City and any area in or along the waters or within five (5) miles upgrade of any point from which water is taken by the City, and any and all watershed areas; and any and all extensions, improvements, additions, alterations or remodeling thereof. *City Code 12.1.101*
- **Water Transmission Main.** That portion of the water supply system which transports untreated water to water treatment facilities. *City Code § 12.4.201*

Water Service: The provision of regulated water by Colorado Springs Utilities to Users or Customers.

Water Quality: The chemical, biological, and physical integrity of the water within the Water System.

Water Quality Devices: Include Colorado Springs Utilities approved post hydrants, and automatic flushing systems. The purpose of the Water Quality Device is to promote the circulation of water and the maintenance of chlorine levels in the Water Distribution System including Dead End Mains. Fire hydrants may be used as Water Quality Devices.

Water Quality Requirements: The maximum allowable concentration of chemical, biological, and physical constituents within Colorado Springs Utilities Water System as established by Federal and State regulation and Colorado Springs Utilities.

Water Stub Outs: Any extension of a Water Distribution Main necessary for the future expansion of the Water Distribution System with no service connections or taps. Water Stub-Outs are typically extended beyond the curb and gutter and pavement limits of a road to minimize roadway disturbance for future system extensions.

Wholesale System: A public water system that treats source water as necessary to produce finished water and then delivers some or all of that finished water to another public water system. Delivery may be through a direct connection or through the system of one or more Consecutive Systems.

1.13 Abbreviations

All references to documents or standards shall be the latest edition unless otherwise stated:

Associations:

AASHTO – American Association of State Highway and Transportation Officials
ACI – American Concrete Institute
AISC – American Institute of Steel Construction Inc.
ANSI – American National Standard Institute
API – American Petroleum Institute
ASA – American Standards Association
ASLA – American Society of Landscape Architects
ASCE – American Society of Civil Engineers
ASSE – American Society of Safety Engineers
ASTM – American Society for Testing and Materials
AWWA – American Water Works Association
CDPHE – Colorado Department of Public Health and Environment
CDPS – Colorado Department of Public Safety
CSFD-Colorado Springs Fire Department
EPA – Environmental Protection Agency
FM – Factory Mutual
HI – Hydraulic Institute
IEEE – Institute of Electrical and Electronics Engineers
IPC – International Plumbing Code
ISO – International Organization for Standardization
MSS- Manufacturers Standardization Society of the Valve and Fittings Industry
NEMA – National Electric Manufacturers Association
NEC – National Electric Code
NFPA – National Fire Prevention Agency
NSF – National Sanitation Foundation
OSHA – Occupational Safety and Health Administration
PPI-Plastic Pipe Institute
PPRBD – (RBD) Pikes Peak Regional Building Department

TMS – The Masonry Society
UL – Underwriter's Laboratory
WQCD - Water Quality Control Division of the CDPHE

Colorado Springs Utilities Abbreviations:
CCTV – Close Circuit Television
CSFD – Colorado Springs Fire Department
EVS – Environmental Services Department of Colorado Springs Utilities
FIMS – Facilities Information Management System
LESS – Line Extension and Service Standards
LYSC – Leon Young Service Center – 1521 Hancock Expressway
QBD – Quality By Design
RSS – Regulatory Services Section of the EVS
URR-Utilities Rules and Regulations

Water Abbreviations:
ARV- Air Release and Vacuum Relief Valve
BHP – Brake Horsepower
BMP's – Best Management Practice's
CDPS – Colorado Discharge Permit System
CI-Cast Iron Pipe
CIOD- Cast Iron Outside Diameter Size
CIP – Cast Iron Pipe
CRA- Concrete Reverse Anchor
DC- Double Check Backflow Prevention Assembly
DIP – Ductile Iron Pipe
DIPS-Ductile Iron Pipe Size
DC-Double Check Back Flow Prevention Valve
DR-Dimension Ratio
GPM – Gallons per Minute
HDD- Horizontal Directional Drilling
HDPE - High Density Polyethylene Pipe
HP – Horsepower
HTH - High Test Hypochlorite
ID- Inside Diameter
MJ-Mechanical Joint
NICC – National Industrial Color Code
NGVD '29 – National Geodetic Vertical Datum
NOA – Notice of Authorization
NPSH – Net Positive Suction Head
NPSHa – Net Positive Suction Head Available
NPSHr – Net Positive Suction Head Required
OD-Outside Diameter
POC – Point of Compliance
PPM– Parts Per Million
PRV – Pressure Reducing Valve
PSI – Pounds per Square Inch
PVC – Polyvinyl Chloride – Plastic Pipe
ROW - Right-of-Way
RP- Reduced Pressure Principle Backflow Prevention Assembly
SU-Standard Units

SWMP – Storm Water Management Plan
TCR - Total Chlorine Residual
TSS - Total Suspended Solids
VFD – Variable Frequency Drive

Other Abbreviations

ACM – Asbestos Containing Materials
MUTCD-Manual on Uniform Traffic Control Devices
CFR – Code of Federal Regulations
dBA – A-Weighted Decibels
PCIS – Process Control and Instrumentation Systems
RTD – Resistance Temperature Detector
SCADA – Supervisory Control and Data Acquisition
UAP– Utilities Addressing Plan
UDCF– Utilities Design CAD File

1.14 Phone Numbers and Contact Information

PLANNING

Utility Development Services: **.....719-668-8259**
Master planning, utility plan review, service information

DESIGN

Utility Data Management**: 719-668-3524**
Land base (FIMS) maps, plat maps, UAP files, UDCF files, Record Drawing files (option 3)

Fire Flow**: 719-668-8259**
Design Underground Utility Line Locations**: **811
Utility Notification Center of Colorado (UNCC) ..... or 800-922-1987

CONSTRUCTION

Inspection:
Supervising Inspector-Main (South water and wastewater) 719-668-4658
Supervising Inspector (North water and wastewater).....719-668-4396
Scheduling Service Line Inspections 719-668-3524

Utility Notification Center of Colorado (UNCC)**:.....**811
Underground utility line locations - call 2 business days before digging ..... or 800-922-1987

SERVICE INSTALLATION

Customer Contract Administration Office (Permits**) 668-8111**

OTHER TELEPHONE NUMBERS

Colorado Springs Utilities Customer Service & Repair **.....719-448-4800**
Colorado Department of Public Health and Environment.....303-692-3500

- Cross-Connection & Backflow Prevention

El Paso County Regional Building Department (Building Permits):.....719-327-2880
El Paso County Public Health.....719-578-3199
National Institute for Occupational Safety and Health 800-356-4674
OSHA Information Line 202-219-8151

Repairs: Cable & utility line/street light
Colorado Springs Utilities Street Light Malfunction.....719-448-4800
Comcast (Cable Repair).....800-934-6489
Century Link Customer Service Repair 800-573-1311
Traffic Signals.....719-385-6721

1.15 References

Colorado Springs Utilities has utilized all or part of the following regulations, codes and requirements as references for these *Water LESS*:

A. American Concrete Institute, *ACI 318 Appendix D – Anchorage to Concrete*
B. American Concrete Institute, *ACI 350.4R - Design Considerations for Environmental Engineering Concrete Structures*
C. American Concrete Institute, *ACI 351.3R - Foundations for Dynamic Equipment*
D. American Petroleum Institute, *API 610 – Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries*
E. American Water Works Association, *AWWA Manual M11 - Steel Water Pipe a Guide to Design and Installation*
F. American Water Works Association, *AWWA Manual M14 - Recommended Practice for Backflow Prevention and Cross-Connection Control, 1990 and 2004 Editions*
G. American Water Works Association, *AWWA Manual M17 - Fire Hydrants Manual*
H. American Water Works Association, *AWWA Manual M20 - Water Chlorination/ Chloramination Practices and Principles*
I. American Water Works Association, *AWWA Manual M23 - PVC Pipe Design and Installation*
J. American Water Works Association, *AWWA Manual M24 - Dual Water Systems*
K. American Water Works Association, *AWWA Manual M41 - Ductile –Iron Pipe and Fittings Manual of Water Supply Practices*
L. American Water Works Association, *AWWA Manual M51 - Air-Release, Air/Vacuum, & Combination Air Valve*
M. American Water Works Association, *AWWA Manual M55 - PE Pipe-Design and Installation*
N. American Society of Civil Engineers, *ASCE 7 - Minimum Design Loads for Buildings*
O. City of Colorado Springs, *City Code*
P. City of Colorado Springs, *Drainage Criteria Manual Volume I and II*
Q. City of Colorado Springs, *Fire Department Access Information Packet*
R. City of Colorado Springs, *Mixed Use Development Design Manual*
S. City of Colorado Springs, *Procedure Manual for the Acquisition and Disposition of Real Property Interests*
T. City of Colorado Springs, *Small Lot Planned Unit Developments*
U. City of Colorado Springs, *Standard Specifications and Traffic Manuals*
V. City of Colorado Springs, *Traditional Neighborhood Development Design Manual*
W. Colorado Springs Utilities, *Electric Line Extension and Service Standards*
X. Colorado Springs Utilities, *Gas Line Extension and Service Standards*
Y. Colorado Springs Utilities, *Guide to Development and Building*
Z. Colorado Springs Utilities, *Physical Security Hardware Specifications*
AA. Colorado Springs Utilities, *Water System Operations – Safe Design Guidelines*
BB. Colorado Springs Utilities, *Site Design Guidelines*
CC. Colorado Springs Utilities, *Standard Requirements for Instrumentation, Control, and Electrical (SRICE) for Pumping Stations*
DD. Colorado Springs Utilities, *Utilities' Rules and Regulations*
EE. Colorado Springs Utilities, *Utility Easement Acquisition Instructions*
FF. Colorado Springs Utilities, *Wastewater Line Extension and Service Standards*
GG. Colorado Department of Labor and Employment, Division of Oil and Public Safety, *Storage Tank Regulations*

HH. Colorado Department of Public Health and Environment, Air Quality Control Commission, *Regulation Number 8 - Control of Hazardous Air Pollutants*,

II. Colorado Department of Public Health and Environment, Air Quality Control Commission, *Regulation Number 19 - The Control of Lead Hazards*

JJ. Colorado Department of Public Health and Environment, Water Quality Control Commission, *Design Criteria for Potable Water Systems*

KK. Colorado Department of Public Health and Environment, Water Quality Control Commission, *Primary Drinking Water Regulations*

LL. Colorado Department of Public Health and Environment, Water Quality Control Commission, *Regulation Number 61 - Colorado Discharge Permit System Regulations*

MM. Colorado Department of Public Health and Environment, Water Quality Control Commission, *Regulation Number 84 - Colorado Reclaimed Water Control Regulation*

NN. Colorado Department of Public Health and Environment, Hazardous Materials and Waste Management Division, *Part 1 – Regulations Pertaining to Solid Waste Sites and Facilities*

OO. Ductile Iron Pipe Research Association, *Installation Guide for Ductile Iron Pipe*

PP. Hydraulic Institute, *ANSI/HI 9.6.4 - Rotodynamic Pumps for Vibration Measurement and Allowable Values*

QQ. Hydraulic Institute, *ANSI/HI 9.8 - Rotodynamic Pumps for Pump Intake Design*

RR. Hydraulic Institute, *ANSI/HI 14.6 - Rotodynamic Pumps for Hydraulic Performance Acceptance Tests*

SS. Illuminating Engineering Society, *The Lighting Handbook*

TT. Institute of Electrical and Electronics Engineers, *IEEE 112- Standard Test Procedure for Polyphase Induction Motors and Generators*

UU. International Code Council, *International Building Code*

VV. International Code Council, *International Energy Conservation Code*

WW. International Code Council, *International Fire Code*

XX. International Code Council, *International Plumbing Code*

YY. International Code Council, *International Residential Code (approved version by the City of Colorado Springs and Pikes Peak Regional Building Department)*

ZZ. International Organization for Standards, *ISO 1940 - Balance Quality Requirements for Rotors in a Constant (Rigid) State*

AAA. International Organization for Standards, *ISO 10816 - Evaluation of Machine Vibration by Measurements on Non-Rotating Parts*

BBB. National Fire Protection Association, *National Electric Code*

CCC. National Sanitation Foundation, NSF/ANSI *Standards 60 - Drinking Water Treatment Chemicals*

DDD. National Sanitation Foundation, NSF/ANSI *Standards 61 - Drinking Water System Components*

EEE. Occupational Safety and Health Administration, *OSHA-29 CFR 1910.1001-Asbestos in General Industry Standard*

FFF. Occupational Safety and Health Administration, *OSHA-29 CFR 1926.1101-Asbestos Standard for the Construction Industry*

GGG. Plastic Pipe Institute, *Handbook of Polyethylene Pipe*

HHH. Pikes Peak Regional Building Department, *Pikes Peak Regional Building Code*

III. UniBell PVC Pipe Association, *Tapping Guide for PVC Pressure Pipe*

JJJ. University of Southern California, Foundation for Cross-Connection Control and Hydraulic Research, *Manual of Cross-Connection Control, Ninth and Tenth Editions*,

KKK. U.S. Environmental Protection Agency, *Asbestos Worker Protection (40 CFR Part 763, Subpart G)*
LLL. U.S. Environmental Protection Agency, *Clean Air Act*
MMM. U.S. Environmental Protection Agency, *Clean Water Act*
NNN. U.S. Environmental Protection Agency, *Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)*
OOO. U.S. Environmental Protection Agency, *Cross-Connection Control Manual*
PPP. U.S. Environmental Protection Agency, *Endangered Species Act*
QQQ. U.S. Environmental Protection Agency, *National Emission Standard for Asbestos (40 CFR Part 61, Subpart M)*
RRR. U.S. Environmental Protection Agency, *Oil Pollution Prevention Regulations (40 CFR Part 112)*
SSS. U.S. Environmental Protection Agency, *Reduction of Lead in Drinking Water Act*
TTT. U.S. Environmental Protection Agency, *Safe Drinking Water Act*
UUU. U.S. Fish and Wildlife Service, *Migratory Bird Treaty Act*

Documents referenced by number throughout these *Water LESS* include ANSI, AWWA, ASTM, PPI, and NFPA Standards.

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Development and Design of Water Systems

CHAPTER 2

Development and Design of Water Systems

2.1 General

The purpose of Chapter 2 of these *Water LESS* is to set forth the criteria for designing any proposed Private or Public Water System. The criteria are written to ensure that only proven high quality materials are installed in accordance with industry best practices. Determination of the best materials and construction methods are based upon lowest life cycle costs. Sizing and layout of the system are parts of the total consideration of design, operation and maintenance of the Water System that yields optimum quality service.

2.2 Responsibilities

A. Design Overview

Distribution mains to supply and distribute water to and throughout areas or additions shall be extended by the Owner or Developer of the Premises to be served by the lines from the existing distribution main to the point or points of the property line of the Premises farthest from the existing distribution main. The extension requirement may be waived by the Executive Director in the event that the Executive Director determines that extension to the farthest point from the existing distribution main is not necessary for the efficient expansion of the water supply system. In any event, distribution mains shall be extended by the Owner or Developer of the Premises to be served by the mains to a point which permits the shortest possible service line between the distribution main and the property line of the Premises served thereby. (*City Code §12.4.413*)

Colorado Springs Utilities' determination of extension points for the Water Distribution System shall be final.

Colorado Springs Utilities does not guarantee Water to the development area. Allocation of Water to serve a new development area will depend upon the supply available at the time of application. The Colorado Springs Utilities' policy is first come first-served at the time of application for service.

B. Design Responsibility

All Public and Private Water Main Extensions to serve properties within the Colorado Springs Utilities' service territory shall be the expense of the Owner/Developer. The Owner/Developer will be responsible for hiring a land development team which shall include a Design Engineer who will design and prepare Preliminary Utility Plans, Design Reports, and Construction Plans for the proposed Water System. Colorado Springs Utilities will review the Design Engineer's plans and reports to ensure that they meet the requirements of these *Water LESS*. New developments must have a Development Plan approved by the City of Colorado Springs or the appropriate jurisdiction/authority prior to Colorado Springs Utilities' approval of the Water Construction Plans. Following approval of the Water Construction Plans, the Owner/Developer will be responsible for hiring a qualified Contractor to install the approved Water System and appurtenances, with inspection by Colorado Springs Utilities.

1. Pressure Zones

There are multiple pressure zones in the Water Distribution System. The Owner/Developer shall be responsible for the design and cost of any pressure reducing, relief, or control valve, pump station, or tank necessary to provide adequate pressure to the proposed development. See Section 2.7I for more information.

C. Cost Responsibility

1. Cost Recovery

An Owner/Developer installing a Water System Extension shall pay all design, material and installation costs for the required extension(s) necessary to serve the premise(s). In accordance with *Utilities Rules and Regulations*, the Owner/Developer can apply for a Recovery Agreement, for a 20 year term, providing that non-participating property owners benefitting from the extension pay a pro-rata share of all eligible extension costs before they are allowed to connect to the subject Water Main for service. Requests for cost recovery must be received no later than 365 days after the issuance of final acceptance for the Water System Extension by Colorado Springs Utilities. Details on Recovery Agreements can be found in *Section 43* of Colorado Springs *Utilities Rules and Regulations*. Information and forms for Recovery Agreements are available at www.csu.org .

The cost, or fair market value, of the Easements within the developer's property that are granted to Colorado Springs Utilities for such Easements that are required for utility services are not recoverable.

2. Water Main Reimbursement

The Owner/Developer may be eligible for a material reimbursement for oversized materials required by Colorado Springs Utilities for the following installations:

- Water Mains and appurtenances that are greater than 12 inches in diameter which were oversized beyond fire-flow requirements necessary to serve the proposed development specifically to serve other developments, or
- Water Mains greater than 12 inches in diameter through un-served land or adjacent territories.

If the proposed development meets one or more of these conditions, please reference *Utilities Rules and Regulations* or contact Utilities Development Services to determine if the proposed development might be eligible for a reimbursement. Details on reimbursements can be found in *Section 43* of Colorado Springs *Utilities Rules and Regulations*. Forms and checklists for reimbursements are available at www.csu.org and in Section 2.8.

3. Pressure Regulating Valve Costs and Reimbursement:

a) All required piping, regulators, fittings, valves, and all other appurtenances within the confines of a station/Vault shall be furnished and installed by the Owner/Developer. Upon the completion and acceptance of the station/Vault, the Owner/Developer may submit a written request to Colorado Springs Utilities for reimbursement of materials. All requests for reimbursement must include a copy of the original invoice for the material and the reimbursement form found in Section 2.8. Facilities required for the sole purpose of an individual subdivision or Project may not be eligible for reimbursement at Colorado Springs Utilities' discretion.

b) All required concrete pits, reinforcing steel, manhole assemblies, and total installation shall be provided and installed by the Owner/Developer in accordance with Detail Drawings A6-1 through A6-9.

c) Colorado Springs Utilities shall supply and install remote monitoring systems.

4. Cost Responsibilities for Pump Stations

See Section 7.2

5. Cost Responsibility of Storage Facilities

In the event that Water Distribution storage facilities are required (hydro-pneumatic and above-ground storage), Colorado Springs Utilities will be responsible for the costs of land, design and construction. (*Section 42.D Utilities Rules and Regulations*)

D. Agreement and Bill of Sale and Warranty

The Owner/Developer shall enter into an *Agreement and Bill of Sale* for all Water Main Extensions that the Owner/Developer intends to convey to Colorado Springs Utilities as a Public Water System. The *Agreement and Bill of Sale* form shall be provided to the Owner/Developer by Colorado Springs Utilities. The Owner/Developer shall complete this form and return it to Colorado Springs Utilities for approval. An example of an *Agreement and Bill of Sale* can be found in Section 2.8.

The *Agreement and Bill of Sale* shall include a warranty for the Water Main Extension being conveyed to Colorado Springs Utilities for the satisfactory repair or replacement where required, or the cost thereof, of all work, material, services and equipment which becomes defective as a result of faulty materials, faulty installation, improper location of the facilities or improper handling of material and equipment installed by the Contractor. Such warranty shall be for a period of 24 months from the date of preliminary acceptance of the installation and completion of all work performed; however, Colorado Springs Utilities shall reserve the right to extend the warranty period as set forth in the *Agreement and Bill of Sale*. During the warranty period Colorado Springs Utilities will operate the system and may serve Customers with the facilities. The date of final acceptance shall be the approval date as recorded on the *Agreement and Bill of Sale* form, which identifies the end of the warranty period. After final acceptance by Colorado Springs Utilities, a copy of the fully executed Agreement and Bill of Sale will be sent to the Owner/Developer.

2.3 Public or Private Water System

This section outlines the types of Public and Private Water Systems allowable for connection to the Colorado Springs Utilities Water System. The *Federal Safe Drinking Water Act, Colorado Primary Drinking Water Regulation* and City of Colorado Springs *City Code* require all connections to the Colorado Springs Utilities Water System meet one of the allowable configurations listed in Section 2.3C- Table 2A below. Federal Water Systems on a Consecutive or Master Metered system are excluded.

A. Public Water Systems

Public Water Systems are that portion of the Colorado Springs Utilities Water System which transmits and distributes water from treatment or storage facilities to Users and is owned, operated and maintained by Colorado Springs Utilities.

B. Private Water Systems

Private Water Systems are that portion of the Water System which transmits and distributes water from one or more connections to the Colorado Springs Utilities Public Water System to Users and is owned, operated and maintained by an entity other than Colorado Springs Utilities.

When a Private Water System is connected to the Colorado Springs Utilities Public Water System, it is not allowed to have another Private Water System connected to it (i.e. no Daisy Chains). See Section 2.3C-Table 2A below for allowable connections.

C. Table: Public or Private System Options

Colorado Springs Utilities Water System Connection Configurations		(a) Single-Family Residential (Townhomes, Multiple Lot Subdivisions)	(b) Multi-Family Residential[1] (does not include apartments)	(c) All Non-Residential – Multiple Platted Lots	(d) All Non-Residential and apartments – One Platted Lot and One Building Receiving Water Service	(e) All Non-Residential and apartments – One Platted Lot and Multiple Buildings Receiving Individual Water Service
	Public Water System in Public Right-of-Way	ALLOWED	ALLOWED	ALLOWED	ALLOWED (but not typical)	ALLOWED
	Public Water System in an Easement on Private Property	ALLOWED See Detail Drawing A1-1	ALLOWED See Detail Drawing A1-2	ALLOWED See Detail Drawing A1-4	NOT ALLOWED	ALLOWED See Detail Drawing A1-6
	Private Water System on Private Property Connected to Public Water Main	NOT ALLOWED	NOT ALLOWED	NOT ALLOWED	ALLOWED[2] See Detail Drawing A1-5	ALLOWED See Detail Drawing A1-6
	Private Water System behind a Master Metered System Connected to Public Water System see Section 2.4[3]	NOT ALLOWED	ALLOWED See Detail Drawing A1-3	ALLOWED See Detail Drawing A1-4	ALLOWED See Detail Drawing A1-5	ALLOWED ***** See Detail Drawing A1-7

[1] Multi-family residential (including condominiums, duplexes, and triplexes) and apartments will be considered as non-residential for billing purposes if they are master metered.

[2] Water infrastructure feeding 1 building on a single platted lot is considered a Water Service Line. Water Service Lines shall be owned and maintained by property owner receiving service.

[3] Master meter systems are not recommended due owner maintenance responsibilities and fire flow, Backflow prevention, and meter requirements.

Additional Details for Table 2A:

- Single Family Residential and townhome subdivisions are required to have Public Water Mains either in a Right-of-Way ("ROW") or acceptable Easement. Private Water Mains or Master Metered systems are not allowed.
- Multi-family Residential Premises on individual or multiple lots are allowed the installation of Public Water Mains in a ROW or acceptable Easement, or the option of a Private Water Main behind a Master Metered system. Private Water Mains without the use of Master Meter are not allowed.
- Non-Residential Multiple Lots are allowed to have a Public Water Main in a ROW or acceptable Easement; or a Private Water Main behind a Master Meter. Private Water Mains without the use of a Master Meter are not allowed to serve multiple lots. Proposed Private Water Mains shall not be connected to an existing Private Water Main under separate ownership (i.e. No "Daisy Chains").
- Non-Residential and apartments – One Platted Lot with One Building – It is not typical to have a public Right-of-Way on a single platted lot with one building receiving water service but it is allowed. Public Water Systems within an Easement on private property are not allowed. A Private Water System on private property is allowed but the Water System is considered a Water Service Line and does not require a Notice of Private Water System. A Private Water System is allowed behind a Master Metered system.
- Non-Residential and apartments– One Platted Lot with Multiple Buildings with individual meters is allowed to have a public looped Water Main in a ROW or acceptable Easement; Private Water Main, or a Master Metered system.

D. Operation and Maintenance Considerations for Private Water Systems

This section is to inform new and current owners of a Private Water System of the expectations, responsibilities and requirements of owning and maintaining the Water System to provide safe drinking water and fire protection to their Users.

1. Private System Ownership

Private Water System ownership includes all Water Mains, fire hydrants, fittings, and appurtenances located on the Premises being served up to and including any Secondary Valve at the connection to Colorado Springs Utilities Water Main. The Secondary Valve shall be located on or near the property, Easement or ROW line closest to the distribution main. Colorado Springs Utilities retains the irrevocable right to operate the owner's Secondary Valve.

In the case where a Secondary Valve does not exist on an existing Private Water System then ownership shall begin at the property, Easement or ROW line and a Secondary Valve shall be installed by the Private Water System owner(s).

The Owner/Developer shall record a Notice of Private Water System for each individual parcel or platted lot served by the Private Water System and shall show the Reception Number (or Book and Page) on the proposed Water Construction Plan(s). The form for this notice of Private Water System can be found in Section 3.6.

If a Private Water System is already in existence and the owner(s) want to inquire about the possibility of converting the system to a Public Water System, contact Colorado Springs Utilities Development Services for information and direction.

2. Private Water System Responsibilities

Installation, operation, maintenance, repair, and replacement of Private Water Systems, shall be conducted in accordance with these *Water LESS*, and *AWWA Water Chlorination/ Chloramination Practices and Principles Manual M20* as further described below. The owner(s) shall keep all Private Water Mains, private fire hydrants, Water Service Lines, and appurtenances on the owner's Premises in proper working order and in good repair so as to minimize line breaks and leaks, prevent waste of water and ensure Water Quality. The owner shall only use approved materials to conduct repair or replacement of any Private Water Mains, fire hydrants, Water Service Lines, and appurtenances. The owner shall contact Colorado Springs Utilities to inspect any installation, repair or replacement. See Chapter 4.2 for a complete listing of approved materials. In the event of a risk to public health, Colorado Springs Utilities will make emergency repairs and assess billable charges to the owner.

a) Multiple Premises connected to a Private Water System

Where more than one Premise is connected to a Private Water System, the owners of the respective Premises shall be jointly and severally responsible for the operation, maintenance, repair and replacement of the Private Water Mains, private fire hydrants and appurtenances.

b) Multiple Owners of a Private Water System

If a Private Water System is owned by one or more persons or entities (other than the owners of the Premises), then those persons or entities owning the Private Water System shall be responsible for the operation, maintenance, repair and replacement of the Private Water System.

3. Private Fire Hydrants

The owner is responsible for the installation, operation, repair, maintenance, flow and pressure testing of private fire hydrants which shall be conducted in accordance with Colorado Springs Fire Department (CSFD) standards and practices as described in the *City Code §Section 8.4 Part 1 - Fire Prevention Code, AWWA Fire Hydrants Manual M17, NFPA 24* and manufacturers' recommendations. CSFD and Colorado Springs Utilities shall have the unrestricted right to use private fire hydrants in an emergency and to sample, inspect, pressure test, and conduct flow analysis as required. This will also apply to other appurtenances such as Water Quality Devices (above or below ground, temporary or permanent).

2.4 Alternate Water Systems - Consecutive and Master Metered Systems

Colorado Springs Utilities may provide Water to other systems in which Colorado Springs Utilities will become the Wholesale provider of Water to a new or existing Water System not owned by Colorado Springs Utilities. In the event that one of the following Master Metered or Consecutive Systems is requested, the system must comply with the *Federal Safe Drinking Water Act* and the *Colorado Primary Drinking Water Regulations*. Colorado Springs Utilities will evaluate Master Metered systems and Consecutive Systems on a case by case basis. These Master Metered systems and Consecutive Systems are rarely exercised alternatives and require agreements between Colorado Springs Utilities and the Master Meter or Consecutive System owner. Please contact Colorado Springs Utilities for more information.

A. Master Metered System

A Master Metered System will have 1 or more meters, depending on system looping requirements. Everything downstream of the Master Meter shall be owned and operated as a Private Water System. Colorado Springs Utilities will bill 1 owner or Customer of record for all water provided to a Master Meter System. Residential rates for water service are not available for Master Meter Systems regardless of the end use of the water, in accord with Colorado Springs Utilities tariffs. Connection to the Colorado Springs Utilities Water Distribution System may require, but is not limited to, a meter Vault, above-grade reduced pressure Backflow preventer, testing station and Secondary Valve. See Detail Drawing B1-16.

B. Consecutive System

Consecutive Systems are Water Systems not owned by Colorado Springs Utilities that are subject to the monitoring and reporting provisions of the *Colorado Primary Drinking Water Regulations*. The Colorado Department of Public Health and Environment (CDPHE) shall determine if a Water System is a Consecutive System based on their regulations. Consecutive System owners will be responsible for contacting the CDPHE to determine Consecutive System requirements. Colorado Springs Utilities will provide water to these systems through a specified connection from the Public Water System. This specified connection may require but is not limited to a meter Vault, a double check Backflow preventer and Vault, testing station and Secondary Valve. The quality of the water in the Consecutive System is the responsibility of the Consecutive System owner. Ownership between the two systems (Water System not owned by Colorado Springs Utilities and Water System owned by Colorado Springs Utilities) is typically delineated by a Secondary Valve, located between the meter Vault and the Backflow preventer Vault. The cost of establishing the connection and any required maintenance shall be the responsibility of the Consecutive System owner. The connection point design shall be completed along with the Water Construction Plans specified in these *Water LESS*, additionally, the Design Engineer must show the hydraulic grade line at the point of ownership delineation (the Secondary Valve in most cases).

In all instances, the delineation point of all Consecutive System requirements will be determined by a contractual agreement between Colorado Springs Utilities and the Consecutive System owner. All Vaults and appurtenances at this connection shall be installed outside of rights of way and roadway surfaces, in an Easement dedicated to the City of Colorado Springs on behalf of its enterprise Colorado Springs Utilities. For more details on these Easements, see Section 2.6F. Plans shall be submitted to Utilities Development Services for review.

Consecutive Systems are uncommon in Colorado Springs Utilities service area. As a result, *City Code § 12.4.302* may be pertinent in these instances.

2.5 Planning

Colorado Springs Utilities has compiled a *Guide to Development and Building* (*Guide*) available at www.csu.org**.** The purpose of the *Guide* is to assist Developers and Design Engineers in understanding the entire land development process including planning and construction of the Water System and the process for obtaining Utility Service.

A. Hydraulic Analysis Requirements/Water Main Sizing.

A *Hydraulic Grade Line (HGL) Request Form* is required with any Development Plan submittal which proposes the installation of a new Water Main. Colorado

Springs Utilities recommends that an *HGL Request Form* be submitted with any Annexation, Master Plan, or Concept Plan. The *HGL Request Form* shall be submitted to Colorado Springs Utilities by email at waterplanning@csu.org. The form is available at www.csu.org.

The *HGL Request Form* shall contain Site acreage with proposed demands based on land use, the maximum fire flow anticipated, a Site plan showing proposed connection points, and a preliminary alignment of pertinent Water Mains. Colorado Springs Utilities will respond with an *HGL Response Form* outlining the project requirements and will advise if a *Hydraulic Analysis Report (HAR)* is required. The *HAR*, if required, shall be completed by the Owner/Developer and submitted to Colorado Springs Utilities for review and approval prior to the Development Plan approval. The *HAR* shall establish Water Main sizes and pressure zone infrastructure requirements (PRVs, pumps, tanks, etc.). For additional *HAR* requirements refer to the *Hydraulic Analysis Report and Fire flow Modeling Requirements* at www.csu.org.

Colorado Springs Utilities has the final authority related to the sizing of Water Mains for projected future needs including the location of Water Mains and placement of required appurtenances. All Water Mains shall be sized large enough to provide for domestic, irrigation, and fire protection flows to the area requiring service. Water Main sizes may be increased in adherence to the recommendations of the *International Fire Code* to provide adequate fire flows. Water Distribution Main minimum sizing shall be per Section 2.6E. 10 inch Water Distribution Mains are not allowed.

The Owner/Developer may request that Colorado Springs Utilities complete the required modeling for the Site. Fees may apply for Colorado Springs Utilities to complete the *HAR* which will be assessed based on the latest *Utilities Rules and Regulations*.

B. Preliminary Utility Plan

A Preliminary Utility Plan shall be prepared for land planning applications within the Colorado Springs Utilities Service Territory that have an impact on existing or future expansions of Colorado Springs Utilities Water System. Preliminary Utility Plans shall be included as part of the Development Plan submittal and may be required with the Master or Concept Plan submittal depending on the complexity of the development. At the Development Plan Stage, the Preliminary Utility Plan shall address at a minimum:

- the location and separation of proposed and existing utility infrastructure, Structures, and obstructions,
- the identification of Private and Public Water Mains,
- access to existing and proposed utility infrastructure,
- the size and location of existing and proposed Public and Private utility Easements,
- Water System Extensions for future development,
- Water Quality Requirements,
- the location of any PRV's, tanks, pump stations, sub stations and pressure boundaries,
- Water Main sizes, and
- other items deemed necessary by Colorado Springs Utilities.

For additional Preliminary Utility Plan requirements refer to the *Preliminary Utility Plan Checklist* at www.csu.org.

2.6 Water Main Design

A. Water Mains General

All Water Main Extensions shall be designed in accordance with these *Water LESS*, and as approved by Colorado Springs Utilities. Plan submittal requirements for Water Main design can be found in Chapter 3.1.

B. Water Main Material and Pressure Class

The following materials are approved for use within Colorado Springs Utilities Water System:

- Steel,
- Ductile Iron Pipe (DIP)
- Polyvinyl Chloride (PVC)
- and High Density Polyethylene Pipe (HDPE)

All pipe material utilized in the Water Distribution System is to be Ductile Iron Pipe Sized (DIPS). Any other proposed material must be evaluated and accepted by Colorado Springs Utilities prior to use. See Chapter 4.1 for additional information on pipe pressure ratings, uses, applications and other approved materials for use in Public and Private Water Systems.

Water Main materials and thicknesses shall be designed for internal pressure using the occasional surge conditions and safety factors as dictated in the table below. Reoccurring surge should be evaluated in areas where the operation of pumps and or valves causes frequent surges in the Water System. Materials and thickness shall also be designed for trench loads including earth loads and any anticipated live loads. Additional factors that should be considered when choosing materials include the presence of Contaminants, geotechnical concerns, corrosivity of the soil, and any other conditions which may affect material selection.

The following chart shall be used for determining the appropriate pipe material based on the design Working Pressure and Occasional Surge Pressure for the proposed Water System (allowable pressure calculations in the table below were made in accordance with *AWWA C900, C905*, and *C150*).:

C. Table: Water Main Material and Pressure Class

Pipe Material	Nominal Size	DR	Max Design Working Pressure	Required Pressure Class
	inches		psi	psi
PVC C900	4-12*	14	170	305
PVC C905	16-24	18	170	235
HDPE PE4710	8-24	9	200	250
DIP	4- 24*	NA	250	350

* 4 and 6 inch Water Service Lines shall be designed as a Water Main.

Pipelines larger than 24 inches shall be constructed of DIP or Steel pipe. Calculations for the thickness of DIP or steel pipelines larger than 24 inches shall be provided to Colorado Springs Utilities for review.

When steel is utilized in the Water System it shall be designed by a qualified Design Engineer in accordance with *AWWA M-11Steel Pipe Guide for Design and Installation*.

1. HDPE

If HDPE is proposed, see Chapter 6.1 for additional design requirements. Where pressure may exceed 200 psi, use of HDPE will be reviewed on a case by case basis.

D. Connection Requirements

Connections to the existing Water Distribution System for a Public or Private Water System extension must be approved by Colorado Springs Utilities. Connection to an existing Colorado Springs Utilities Public Water Main must be completed by Colorado Springs Utilities or their designated representative. Unauthorized connections to Colorado Springs Utilities' Water System are a violation of the *City Code* and may be subject to fines, time and material charges and prosecution. (*City Code § 12.1.113 and § 12.4.604*) See Section 5.12A of these *Water LESS* for additional construction connection requirements.

1. Valves

Connections 4 inches and larger require a tee and valves be installed per Section 2.6G.8.

Where a connection requires the shutdown of an existing Water Main, Colorado Springs Utilities will identify the valves that need to be operated to isolate the Water Main. Utilities Development Services shall contact Inspections (North 668-4396, South 668-4658) after the initial Water Construction Plan review to schedule the identification and inspection of the valves required for the shutdown. Valves required for the Project should be brought up to grade, cleaned and inspected by Colorado Springs Utilities prior to scheduling the shutdown.

2. Outage Modeling

An outage model will be prepared by Colorado Springs Utilities for connections to existing Water Mains 16 inches or larger. In some situations, smaller sized

2. Outage Modeling

An outage model will be prepared by Colorado Springs Utilities for connections to existing Water Mains 16 inches or larger. In some situations, smaller sized mains may need outage modeling as determined by Colorado Springs Utilities. Colorado Springs Utilities may establish conditions for new connections based on modeling existing system reliability, redundancy, and criticality. These conditions shall be shown on the Water Construction Plans.

E. Looping Requirements

In general, Potable Water Distribution Main Extensions shall be looped such that Water Service Lines and Fire Service Lines supplied from these Water Main Extensions are supplied from at least two separate connections within the same pressure zone. As determined by Colorado Springs Utilities, additional off-site Water Main Extensions may be required to be designed and installed by the Owner/Developer in order to achieve the required Water Distribution System looping requirements for a proposed development.

Looping requirements are based on the following elements and are also subject to other factors without limitation:

- fire flow
- Water Quality Requirements
- Service Interruption Criteria
- land use
- development phasing

1. Permanent Dead-End Main Criteria

Permanent Dead End Mains shall be at least 8 inches in diameter (12 inches in diameter for HDPE). Permanent Dead End Mains shall be evaluated on a case-by-case basis, and will be allowed if:

- CSFD fire protection requirements are met at all times,
- Water Quality Requirements can be met at all times without flushing at Full Build Out,
- Service Interruption Criteria, as determined by Colorado Springs Utilities, are met, and
- Any additional conditions that may apply, as determined by Colorado Springs Utilities.

6 inch diameter Permanent Dead End Mains will be allowed if:

- the above criteria is met,
- the Water Distribution Main is 250 feet or less in length, and
- no more than 10 single family dwelling units are connected to the 6 inch diameter Dead End Main.

As determined by Colorado Springs Utilities, Permanent Dead End Mains shall be equipped with an approved Water Quality Device. Water Quality Devices shall be located:

- on property lines within a permanent Easement,
- outside of driveways,
- a minimum of 5 feet from vertical Structures and,

- per the horizontal and vertical separation as described in Section G.2 of these *Water LESS.*

Bollards may be required to ensure the Water Quality Device is protected from vehicular movements.

2. Temporary Dead End Main Criteria

Temporary Dead End Mains shall be evaluated on a case by case basis and will be allowed if they meet fire protection requirements, Water Quality Requirements, and Service Interruption Criteria at all times. A maximum of 50 single family dwelling units will be allowed on a Temporary Dead End Main.

As determined by Colorado Springs Utilities, Temporary Dead End Mains shall be equipped with an approved Water Quality Device. The Water Quality Device may be located as described above or within the Owner/Developer's property or a temporary construction Easement.

Temporary Dead End Mains may be fitted with a Temporary Loop to meet Water Quality Requirements. Temporary Loops shall be sized to provide flows which will maintain Water Quality Requirements in the Water Main being looped. Temporary Loops including all appurtenances shall be owned and maintained by the Owner/Developer. Colorado Springs Utilities may elect to own and maintain the Temporary Loop after the warranty period. A Development Agreement may be required to address the ownership and maintenance and duration of Temporary Loops. The Owner/Developer shall be responsible for obtaining all Easements necessary for the Temporary Loop. Temporary Loops may be removed or abandoned when the Temporary Dead End Main is extended and becomes a Looped Main. Temporary Loops shall not be tapped for water service.

The Owner/Developer shall be responsible for meeting Water Quality Requirements on all Dead End Mains until the Water Distribution Main becomes a component of a Looped Main or until the Necessary Demand requirements are met, as determined by Colorado Springs Utilities per Section 2.6E.4.

3. Water Stub-Out Criteria

Water Stub-Outs are an extension of Water Main necessary for the future expansion of the Water System with no service connections. Water Stub-Outs are typically extended past curb and gutter and pavement limits to minimize roadway disturbance for future system extensions.

All Water Stub-Outs shall be fitted with a temporary blow off valve assembly at the end of the main. (See Detail Drawing A2-3)

Water Stub-Outs shall be fitted with a Water Quality Device with an isolation valve located before and after the Water Quality Device (See Detail Drawing A2-3) to allow for future chlorination under the following conditions:

- the Water Stub Out is 16 inches in diameter or greater,
- the Water Stub Out is 12 inches in diameter and greater than 200 feet in length,

- the Water Stub Out is 8 inches in diameter and greater than 400 feet in length, or
- Flushing of the Water Stub Out for future connections is not feasible.

Water taps on the Water Stub-Outs shall not be allowed between the Water Quality Device and/or isolation valve and the temporary blow off valve assembly until the main is extended and accepted by Colorado Springs Utilities.

Water Stub-Outs shall be isolated at the branch valve or at the valve after the Water Quality Device. The Owner/Developer shall install a lock out tag out valve box insert to ensure the valve is not operated before Water Quality Requirements are met.

4. Service Interruption Criteria

Colorado Springs Utilities seeks to achieve a reliable and redundant Water Distribution System to minimize interruptions of service. Service Interruption Criteria is the measure of the type and maximum number of Customers considered reasonable to experience an outage during operation and maintenance of the Water Distribution System. Service Interruption Criteria is driven by land use, which dictates water use characteristics of a proposed development. Water use characteristics include, but are not limited to, average and peak daily water use, time of peak water usage, and business and community impacts of water outages. Colorado Springs Utilities will evaluate each proposed development to determine the Service Interruption Criteria as described below.

Current land uses in the City of Colorado Springs may be generally classified in the following categories:

- Residential (single family, townhomes)
- Commercial- Office
- Commercial- Retail
- Multi-Family (condominiums, duplexes, triplexes, apartments)
- Industrial
- Parks and Open Space
- Public/Institutional
- Mixed Use

If fire flow requirements and Water Quality Requirements, as specified above, are met, then the following general guidelines will apply in evaluating onsite and offsite Water Distribution Main looping requirements based on Service Interruption Criteria:

- Dead End Mains with greater than 50 single-family dwelling units will not be allowed, and must be looped.
- Commercial-office, commercial-retail, multi-family, industrial, mixed use and public/institutional land use designations will be evaluated on a case by case basis to determine Service Interruption Criteria.
- Dead End Mains will not be allowed for Essential Facilities.
- If information is not available on the type of land use for the proposed development, then conservative assumptions of water use and Service Interruption Criteria may apply.

Parks and open space areas will be evaluated to determine the risk of a water outage in meeting domestic service, fire, Water Quality, irrigation and other requirements.

5. Water Quality Plans

In the event that the Dead End Main meets fire flow and Service Interruption Criteria, but will not meet Water Quality Requirements before Full Build Out or before the Dead End Main is converted to a Looped Main, then the Owner/Developer is required to provide Colorado Springs Utilities with a written *Water Quality Plan*. Colorado Springs Utilities will determine if Water Quality Requirements are not being met and will advise the Owner/Developer of the requirement for a *Water Quality Plan* in the *HGL Response Form*, see Section 2.5A.

Colorado Springs Utilities will establish the Necessary Demand to meet Water Quality Requirements for proposed Dead End Mains. The *Water Quality Plan* must describe how the Water Distribution Main will be managed to meet Water Quality Requirements. Acceptable methods for meeting Water Quality Requirements include but are not limited to:

- constructing a Permanent Loop,
- constructing a Temporary Loop (pumping may be required),
- irrigation watering to meet the Necessary Demand,
- construction watering to meet the Necessary Demand,
- project phasing to minimize the length of proposed Dead End Mains,
- isolation of the proposed Water Distribution System not in use,
- bleeding through of PRVs to force water through the proposed Water Distribution System from a higher pressure zone to a lower pressure zone,
- timing of construction to minimize lack of demand on the proposed Water Distribution Mains,
- management of the existing Water Distribution System where valves are closed to force water through the proposed Water Distribution System, and
- temporary manual flushing.

The Owner/Developer shall be responsible for any permitting necessary to meet Water Quality Requirements. Costs of meeting Water Quality Requirements as described in the *Water Quality Plan* will be the responsibility of the Owner/Developer. Cost will vary and may include Water Quality Devices, labor and equipment and flush water. Costs may continue beyond the initial two year construction warranty period of Water Main Extensions. A separate development agreement may be required to address cost requirements and time. Costs shall continue to be paid by the Owner/Developer or subsequent Owner(s) until the Necessary Demand, as defined in the *Water Quality Plan*, is established. Costs of flush water for oversized mains will be paid by both the Owner/Developer and Colorado Springs Utilities. Cost of the flush water paid by Colorado Springs Utilities will be based on the increase in the volume of flush water over what is needed to serve the proposed development based on Colorado Springs Utilities established demands according to land use. The *Water Quality Plan* must be reviewed and approved by Colorado Springs Utilities prior to final Water Construction Plan approval. These requirements apply to both Public and Private

Water Distribution Mains. To obtain information on preparing a *Water Quality Plan* go to www.csu.org.

6. Temporary Loop Criteria

Temporary loops shall be sized based on hydraulic modeling that identifies minimal required water flow through the temporary loop in order to maintain Water Quality Requirements. Pumping may be required to force the necessary water volume through the Temporary Loop. Pumping facilities shall be evaluated on a case by case basis.

Temporary Loops 2 inch and less shall be designed as Water Service Lines per Section 2.7. Connection to the Dead End Main and the existing Looped Main shall be accomplished with a water tap per Detail Drawing B1-1 and a Curb Stop located directly after the tap.

Temporary Loops 4 inch and greater shall be designed as Water Mains per Section 2.6. Connection to any Dead End Main and the existing Looped Main shall be accomplished with a tap and gate valve per Detail Drawing B1-2. Requirements for additional valves along the Temporary Loop will be evaluated on a case by case basis with consideration to future maintenance.

The Owner/Developer will be responsible for owning and maintaining the Temporary Loop and obtaining all necessary Easements for Construction.

7. Looped Fire Mains

Fire Mains shall be looped, as determined by the CSFD and Colorado Springs Utilities, when necessary to meet the required fire flow or other provisions of the current adopted version of the *International Fire Code* by the City of Colorado Springs. Looped Fire Mains shall be a minimum of 8 inches in diameter and shall be connected to the existing Water Main with two tees and valves per Section 2.6G.8. Additional isolation valves within the loop may be required to ensure fire protection reliability.

8. Dead End Fire Mains

Unless approved by the fire code official, dead-end fire service mains shall not be used when there is not a reliable secondary or redundant means of water supply within 500 feet of a Structure along an approved route. (*City Code§ 8.4.105 Section 903.3.5.3*) See Detail Drawing A2-2.

F. Utility Cross Sections and Easement Requirements

The preferred location for a Public Water Main is within a public Right-of-Way (i.e. public street). See Detail Drawings A3-1 through A3-10 for utility locations within a public street. It is also acceptable to install Public Water Mains on private property within a utility Easement dedicated to the City of Colorado Springs on behalf of its enterprise Colorado Springs Utilities. Alternatively, Public Water Mains can be installed within tracts allowing for the installation of Public utility infrastructure.

Utility Easements are dedicated either by plat, via a dedication statement on the property plat, or by a separate instrument in which the owner executes a *Permanent Easement Agreement* independent of the platting of the property. If dedicating an Easement by separate instrument, the Owner/Developer should begin by downloading

the proper forms from the Colorado Springs Utilities website www.csu.org**.** The forms available on the website are kept current and can be used to ensure the Easement language will be suitable to Colorado Springs Utilities resulting in efficient processing of the Easement.

The exhibits for the Easements shall be prepared by a Professional Land Surveyor licensed to practice in the State of Colorado. Additionally there is a page entitled "Joinder and Consent of Holder of Deed of Trust" which must be signed by the holder(s) of any and all deeds of trust on the property. Colorado Springs Utilities will sign the *Permanent Easement Agreement* to indicate acceptance of the Easement and will be responsible for recording the Easement document. A copy of the recorded Easement will be returned to the Owner/Developer for their records allowing the engineer to place the Easement reception number on the Water Construction Plans.

The Easement document contains language that prohibits construction of Structures within the Easement. The Easement is non-exclusive allowing other utilities, such as telecommunication and storm sewer lines, to be installed within the Easement subject to written approval by Colorado Springs Utilities.

In all cases the Water Main shall have a minimum of 15 feet between the centerline of the water line and the edge of the Easement resulting in a minimum Easement width of 30 feet for a single 8 inch or 12 inch Water Main. A minimum distance of 20 feet is required from the centerline of a 16 inch to 24 inch Water Main, resulting in a minimum Easement width of 40 feet for a single Water Main in this size range. Easement width requirements for water lines larger than 24 inches will be addressed on a case-by-case basis. In each case the Easement is preferred to be centered over the water line.

In areas where additional utilities are to be included in the Easement, the Easement width shall then be increased to accommodate separation distances as described in Section 2.6G.3.

In areas where the water line exceeds 10% grade, the Easement width must be increased to 50 feet with the Easement centered over the water line unless otherwise specified by Colorado Springs Utilities.

The following table establishes the standard Easement widths for the combination of utilities represented by the cell in the matrix:

1. Table: Minimum Easement/Corridor Width (feet) Requirements for Utility Combinations

	No Gas or Electric Lines		Gas and/or Electric Distribution or Joint Trench		Gas Main ≥150 psig	
No Water, Storm, or Wastewater	N/A		20		20	
Water Main ≤ 12 inch diameter	30		40		35	
Wastewater Main ≤ 15 feet deep	30		40		40	
Wastewater Main 15-20 feet deep	40		45		45	
Water Main ≤ 12 inch diameter with Wastewater Main ≤ 15 feet deep	50		50		50	
Water Main ≤ 12 inch diameter with Wastewater Main 15-20 feet deep	60		60		60	
	Utility Ease-ment	**Total Corri-dor[1]**	**Utility Ease-ment**	**Total Corri-dor[1]**	**Utility Ease-ment**	**Total Corri-dor[1]**
Storm Sewer with Water Main ≤ 12 inch diameter	30	40	40	45	35	45
Storm Sewer with Wastewater Main ≤ 15 feet deep	30	50	40	50	40	50
Storm Sewer with Wastewater Main 15-20 feet deep	40	60	50	60	50	60
Storm Sewer with Water Main ≤ 12 inch diameter and Wastewater Main ≤ 15 feet deep	50	55	50	55	50	60
Storm Sewer with Water Main ≤ 12 inch diameter and Wastewater Main 15-20 feet deep	60	60	60	60	60	65

[1] The Total Corridor is the encumbered width by Easements to Colorado Springs Utilities and the City of Colorado Springs for Storm Sewer. Two Easements will be required in corridors where storm sewer is located with another utility. The Easements are public utility Easements for Colorado Springs Utilities, and a public drainage Easement for the City of Colorado Springs.

The table above is intended to provide minimum easement widths for typical utility installations and combinations. Case by case easement width determinations will be made based on soil type, depth, size, Site conditions, and construction methods for the following utilities:

- Water Mains greater than 12 inches in diameter (Easement width no less than 40 feet)
- Wastewater Mains greater than 20 feet deep
- Electric transmission and 600A sub-transmission lines
- High pressure natural gas lines
- Storm Sewers 60 inches and larger
- Multiple utility infrastructure of the same designation (water with water, wastewater with wastewater, etc.)

Easement widths depicted above are intended for utility infrastructure located on private property outside of Public Rights of Way. Where utility infrastructure is located with a Public Right-of-Way refer to Detail Drawings A3-1 through A3-10. Utility locations and Easements in Traditional Neighborhoods, Small Lot Planned

Unit Developments, Townhomes and Mixed Use Developments will be evaluated on a case by case basis. Guidance on utility locations and Easements in these developments can be found in:

- *Traditional Neighborhood Development Design Manual*, April 22, 2005
- *Small Lot Planned Unit Developments*, April 22, 2005, and
- *Mixed Use Development Design Manual*, September 23, 2003
  as published by the City of Colorado Springs.
- Guidance for utility locations for townhomes is included/shown in Detail Drawings A3-12 thru A3-14.

All public fire hydrants will be located within street rights-of-way or utility Easements. If the proposed location of a fire or flushing hydrant is less than 5 feet from or is beyond the edge of the right-of-way or utility Easement line, then additional Easement must be dedicated that is 30 feet wide and extends a minimum of 5 feet beyond the hydrant location.

A complete integrated Water System may also require a pressure regulating valve (PRV) and associated Vault placed at the point where two pressure zones are connected. These shall be installed outside of the paved street and may require additional Easement. The size and location of the PRV Vault as well as the size and orientation of the necessary Easement will be determined on a case-by-case basis. See Detail Drawing A6-9.

G. Water Main Horizontal Design Criteria

The following are the criteria needed for the layout of a Public or Private Water Main System. Water Plan and Profile or Utility Service Plan Checklists are located at **www.csu.org**.

1. Pipe Alignment

Normal practice is to lay the Water Main on the north or east side of the street, based on the approved street cross sections. The minimum distance between the Water Main and the edge of pavement should be as noted on the approved utility street cross sections.

The horizontal distance between the Water Main and any Structure or building shall be a minimum of 15 feet. Private and Public Water Mains shall be located in roadways, or in the drive aisles of any parking areas, or at a minimum of 15 feet from the edge of any Easement. Street cross section guidelines are shown on Detail Drawings A3-1 through A3-10.

2. Separation Criteria

Water Mains shall be separated from utility facilities and shall meet the minimum separation requirements as depicted in the clearance matrix below. If compliance with these requirements is not feasible, the Owner/Developer shall design and construct the stormwater, Nonpotable, Wastewater Main, or Water Main so as to protect the Water Main by means of secondary containment. The following methods of installation shall be considered secondary containment by Colorado Springs Utilities:

- The Water Main or the wastewater, storm sewer, or Nonpotable Water Main shall be installed in a casing pipe or

- The Water Main or the wastewater, storm sewer, or Nonpotable Water Main shall be encased in flow fill, per the specifications in Section 4.4S, throughout the embedment zone or
- The Water Main shall be bored and/or constructed of HDPE or welded steel and there are no mechanical fittings for the length of pipe that does not meet minimum separation criteria.

If these required separations, or those set forth in the clearance Matrix cannot be met, they will be addressed on a case by case basis. Use the below clearance Matrix along with the utility street cross sections in Detail Drawings A3-1 through A3-10.

3. Clearance Matrix for Typical Parallel Colorado Springs Underground Utilities:

All separations shown are the clear horizontal distance between two objects measured outside edge to outside edge (All dimensions are in feet)

Colorado Springs Utilities (Underground):	Potable Water	Non-potable Water	Waste-water	Storm Sewer	Gas main	Gas mains1 50 psig or higher	Electric Primary up to 34.5kV	Electric Second-ary (0-480 Volt)
Potable Water	**X**	**10**	**10**	**10**	**6**	**10**	**10***	**3**
Nonpotable Water	**10**	**X**	**10**	**10**	**6**	**10**	**10***	**3**
Wastewater	**10**	**10**	**X**	**10**	**6**	**10**	**10***	**3**
Storm Sewer	**10**	**10**	**10**	**X**	**6**	**10**	**10***	**3**
Gas main	**6**	**6**	**6**	**6**	**X**	**6**	**6**	**3**
Gas mains 150 psig or higher	**10**	**10**	**10**	**10**	**6**	**X**	**10***	**10***
Electric Primary up to 34.5kV	**10***	**10***	**10***	**10***	**6**	**10***	**X**	**0**
Electric Secondary (0-480 Volt)	**3**	**3**	**3**	**3**	**3**	**10***	**0**	**X**

4. Clearance Matrix for Typical Crossings of Colorado Springs Underground Utilities:

All separations shown are the clear vertical distance between two objects measured outside edge to outside edge (All dimensions are in feet)

Colorado Springs Utilities (Underground):	Potable Water	Non-potable Water	Waste-water	Storm Sewer	Gas main	Gas mains 150 psig or higher	Electric Primary up to 34.5kV	Electric Second ary (0-480 Volt)
Potable Water	**X**	**1.5****	**1.5****	**1.5****	**1**	**5***	**1**	**1**
Nonpotable Water	**1.5****	**X**	**1.5****	**1.5****	**1**	**5***	**1**	**1**
Wastewater	**1.5****	**1.5****	**X**	**1.5****	**1**	**5***	**1**	**1**
Storm Sewer	**1.5****	**1.5****	**1.5****	**X**	**1**	**5***	**1**	**1**
Gas main	**1**	**1**	**1**	**1**	**X**		**1**	**1**
Gas mains 150 psig or higher	**5***	**5***	**5***	**5***		**X**	**5***	**5***
Electric Primary up to 34.5kV	**1**	**1**	**1**	**1**	**1**	**5***	**X**	**0**
Electric Secondary (0-480 Volt)	**1**	**1**	**1**	**1**	**1**	**5***	**0**	**X**

*Note: Reduced clearances to these lines must be approved by Gas & Electric Field Engineering.

**Note: These utilities may require a sleeve when crossing under another utility.

Note: Water Service Lines shall meet horizontal and vertical clearances as defined in Sections 2.7D.3 and 2.7E.2 respectively.

5. Access Roads

Some appurtenances (Vaults, valves, manholes) may need an access road if the appurtenance is not located in a dedicated street area. This access road will be used for maintenance.

The maximum grade allowed on the access road is 10%, with a maximum cross-slope of 2%. Grades for cul-de-sacs and turnarounds shall not exceed 6% (per CSFD *Access Information Packet*). An access drive shall be constructed within a 30 foot wide Easement with a 16 foot wide all weather surface such as asphalt paving, concrete paving or an adequate gravel base, and shall be designed to carry HS-20 loading and compacted to the City of Colorado Springs, Engineering Standards. A vehicle turnaround area is required at the end the access road when the back-up distance for any maintenance vehicle exceeds 100 feet in length. See Detail Drawing A3-11 for additional information.

6. Abandonment of Water Mains

When the proposed Water System includes the abandonment of an existing Public or Private Water Main, the Water Main may be abandoned in place and left in the ground, on a case by case basis as approved by Colorado Springs Utilities and shown on the Water Construction Plans. All abandoned metal Water Mains shall be drained, filled with sand, grout, or approved flow fill and sealed by grouting and plugging or capping the exposed ends of the pipe. PVC or HDPE pipe shall be drained, sealed by grouting and plugging or capping the exposed ends of the pipe and does not need to be filled. Where the Water Main to be abandoned is located under an existing or proposed Structure, the Water Main shall be removed or drained, filled with sand, grout, or approved flow fill and sealed by grouting and plugging or capping the exposed ends of the pipe. See Section 5.10 these *Water LESS*.

All above grade appurtenances (i.e. fire hydrants, valve boxes) need to be removed when they are part of a Water Main abandonment. Any type of pit or Vault Structure will need to have all appurtenances removed, the vault removed or the bottom crushed and the Structure filled with compacted dirt or sand.

Abandoned in place mains and appurtenances shall be documented on the Water Construction Plans and in the Colorado Springs Utilities infrastructure mapping system by the Colorado Springs Utilities Inspector.

7. Removal of Unused Stub Outs

If it is determined that a previously placed stub out or tee installed by an Owner/Developer for a future connection is no longer usable or not intended to be used in the future, then the tee, valve and pipe of the stub out shall be removed by the Owner/Developer and/or Contractor, and shall be replaced with a solid piece of pipe in the remaining Water Main.

8. Line Valve Design Criteria

When installing valves within the Water Distribution System, the following objectives shall be met:

- Minimize outages for both commercial and residential Customers.
- Minimize interruptions to the fire safety system as determined by Colorado Springs Utilities and CSFD.
- Minimize construction and maintenance costs.
- Provide the ability to fill/release air, chlorinate, flush, and drain mains.
- Add only necessary valves and combine multiple purposes wherever possible.

All crosses installed on a Water Main require 4 line valves, 1 in each direction. All tees for Water Main connections installed on Water Distribution Mains require 3 line valves, 1 in each direction with the exception of fire hydrants. Service connections 4 inches and greater, with exception of Fire Service Lines, require the cut-in installation of a tee with 3 line valves. The number of required valves; however, may be impacted by the adjacent existing and proposed valves and other connections between the tee and the valve. The number of valves may also be impacted by the proposed land use of each Structure, square footage of Structures, the frontage of each lot, and the resultant effectiveness of each valve added.

An existing Water Main in service may be wet tapped in lieu of a tee when Colorado Springs Utilities determines that valves on the existing Water Main are not necessary. Wet taps shall be a minimum of one size smaller than the Water Main being tapped.

Additional valves may be required adjacent to fire hydrants and on fire hydrant tees, to minimize disruptions during repair or maintenance of the Water System. See Detail Drawing A4-5. Where grade exceeds 5%, 2 line valves are required with one at the high point hydrant and one at the low point hydrant for flushing and chlorination purposes.

Line valves are required a minimum of every 600 feet in the Water Distribution System to ensure reliability of water to Customers. On Transmission Water Mains with no water service connections, line valve placement will be evaluated on a case by case basis. Where necessary, Colorado Springs Utilities may require the installation of additional line valves in order to meet the above listed objectives. In commercial building complexes, additional valves may be required to isolate buildings to minimize service disruptions during repair or maintenance of the Water System.

The Inspector may require the installation of additional valves not shown on the plans, when determined necessary in the field, with the coordination of the Owner/Developer and/or Design Engineer.

Valves shall be designed in such a manner that the valve stems and valve boxes are accessible and valve stems operable. All valves must be opened RIGHT for Potable Water and opened LEFT for the Nonpotable Water System. All adjacent existing valves are to be identified and labeled on the Water Construction Plans.

9. Concrete Thrust Reaction Blocks, Concrete Reverse Anchors and Mechanical Joint Restraints

Concrete thrust reaction blocks (CTRB), concrete reverse anchors (CRA), and/or restrained pipe length with the use of Mechanical Joint (MJ) restraints are required on all appurtenances 4 inches in diameter and larger which necessitate reaction support due to unbalanced thrust forces. Uses of these would be required, but are not limited to, the following applications:

- CTRBs shall be constructed at all tees and taps 4-inch and larger opposite the branch. See Detail Drawing A4-5.
- CRAs shall be constructed at all temporary Dead End Mains 4-inch and larger. See Detail Drawing A2-4 through A2-8.
- CTRBs or restrained pipe lengths shall be constructed at all horizontal bends. See Detail Drawing A4-6.
- A CRA is required to be set on one side of a line valve (on the upstream side of the valve, if known) when the valve is stand alone and does not have another appurtenance to tie back to per these *Water LESS*. See Detail Drawing A4-5.
- Vertical bends shall be restrained using CRAs or restrained joints per Detail Drawing A4-6.
- Slopes greater than or equal to 10% shall be restrained throughout the slope with bell restraints and with a CRA at both the top and bottom of the slope. See Detail Drawing A4-6.
- CTRBs shall be constructed at the end of Fire Hydrant Laterals and Fire Service Line risers 4 inches and greater. See Detail Drawing A5-3.
- A CRA shall be required for the fire hydrant valve when a fire hydrant is installed at the end of a Dead End Main.
- Restrained joints shall be used where Fire Hydrant Laterals exceed one joint length. See Detail Drawing A4-4.
- Restrained joint DIP or HDPE is required in areas of geologic hazard, areas of erosion or unstable slopes (i.e. floodplain areas, stream or creek beds, and potentially hillside overlay areas.) If the Project lies within a Geologic Hazard Overlay Zone, a copy of the Project Geologic Hazard Report or Geologic Hazard Exemption Letter shall be submitted to Colorado Springs Utilities with the initial review set of the Construction Plans. Based on the Site conditions, Colorado Springs Utilities will determine if MJ pipe or HDPE is required.
- For additional restraints required for HDPE Water Mains see Section 6.3B.

Concrete thrust reaction blocks, concrete reverse anchors, and restrained pipe lengths shall be shown on the Water Construction Plans, with bearing surface area and volume of concrete called out for the concrete thrust reaction blocks and concrete reverse anchors.

Standard size and dimensions of concrete thrust reaction blocks and concrete reverse anchors for appurtenances 4 inch through 16 inch in size are shown on Detail Drawing A4-2, A4-7, and A4-8. However, the Design Engineer may be required to size these concrete thrust reaction blocks and concrete reverse anchors based on Site conditions. Thrust blocks and reverse anchors for appurtenances 24 inch and larger in diameter shall be sized by the Design Engineer. Calculation data for thrust blocks and reverse anchors sized by the Design Engineer shall be

submitted with the Water Construction Plans for approval. Sizing methodology and equations used shall conform to *AWWA M23 – PVC Pipe – Design and Installation* and *AWWA M41 – Ductile-Iron Pipe and Fittings*.

10. Fire Hydrant Criteria

All public fire hydrants will be located within street rights-of-way or within utility Easements. See Section 2.6F for additional Easements for fire hydrants that may extend outside of rights-of-way and utility Easements. The number and location of fire hydrants in a given area is determined by the Design Engineer based on theoretical fire flows modeled by Colorado Springs Utilities. Reference the Fire Flow Report Process in Section 3.3. Fire hydrant number and location shall be approved by the CSFD and Colorado Springs Utilities. A valve is required for a standalone private fire hydrant that is served off a Public Water Main at the connection point to the Public Water System, and a Secondary Valve is to be installed at the property line. The extension pipe from the fire hydrant to the valve at the point of connection to Water System is considered the Fire Hydrant Lateral. See Detail Drawing A5-3. Normal practice is to install fire hydrants near the corners of street intersections, see Detail Drawing A5-2. If hydrants are proposed at locations other than street intersections, they shall be located in relation to lines which are established by extending a perpendicular line from the property corner to the centerline of the Water Main, See Detail Drawing A5-1. Fire Hydrant Laterals shall be set at right angles to street mains. The hydrant shall be set at the end of the lateral line and shall face the main distribution water line and valve.

For Permanent Dead End Mains in residential areas, more than 250 feet in length the Water Main shall have a minimum diameter of 8 inches and have a minimum of 2 fire hydrants (per CSFD). One hydrant shall be located at the entrance to the cul-de-sac, tapped off the looped Water Distribution Main and the other hydrant must be located at the end of the cul-de-sac. If additional hydrants are required due to spacing requirements, then these additional hydrants shall be installed between the 2 required hydrants as directed by CSFD and approved by Colorado Springs Utilities. See Section 2.6E for additional dead end requirements. When a fire hydrant is installed at the termination point of a Main Extension, a concrete reverse anchor shall be required for the fire hydrant valve and the fire hydrant shall be secured to the valve. For fire hydrant placement and requirements in non-residential areas refer to CSFD.

Hydrants shall not be designed with horizontal bends, vertical bends or offsets without the approval of Colorado Springs Utilities. If the Design Engineer requires bends or offsets to adjust a hydrant to a desired horizontal or vertical position, and the change in positioning is 100 feet or more horizontal and or 10 feet or more vertical, then an additional fire flow modeling approval by Colorado Springs Utilities is required. In addition, concrete reverse anchors, MJ restraints, concrete thrust reaction blocks or a combination of these may be required. A riser no higher than 2 feet will be acceptable and it will be the Contractor's responsibility to set the safety flange at the proper elevation. The maximum allowed depth of a fire hydrant from shoe to flange is 8-1/2 feet. See Detail Drawing A5-3 for additional hydrant placement information.

Fire Hydrant Laterals shall be connected to the main by a 6 inch branch tee with PVC or DIP lateral line. A 6 inch gate valve shall be installed on each Fire Hydrant Lateral. For PVC or DIP Fire Hydrant Laterals greater than 20 feet in length, the pipe joint(s) are to be restrained with a restraining clamp or coupling or the appropriate use of a reverse anchor.

If HDPE Fire Hydrant Laterals are being installed see Section 6.3C.

Bollards shall be required where fire hydrants are not protected from vehicular movements by curb and gutter or some other means. See Detail Drawing A5-4.

Under no circumstances shall any connection be made on a Fire Hydrant Lateral.

11. Bends and Deflection

Bends utilized in the Water Distribution System on DIP or PVC pipelines shall be ductile iron material. Standard bends are 11-1/4°, 22-1/2° or 45°. For HDPE pipe bends see Section 6.3D. Note: 90° bends are not allowed in the Water Distribution System.

When it is necessary to deflect pipe from a straight line, in either a horizontal or vertical plane, the amount of joint deflection should not exceed the listed maximum deflections shown in Detail Drawing A4-1. Bends shall be used whenever individual deflections exceed those specified by Colorado Springs Utilities. Some manufacturers allow deflection on each side of a bend fitting if needed, however the use of a bend fitting in the pipe alignment is to alleviate the need for deflection. Please check manufacturer recommendation for fitting deflections, which should not be exceeded.

All deflecting joints or bends shall be specified on the designed curve. Short lengths of pipe shall be used as necessary to accomplish the curvature without exceeding individual deflections specified by Colorado Springs Utilities. PVC pipe high deflection couplings may be utilized as an option for deflection. For HDPE pipe bends refer to Section 6.3D of these *Water LESS*

12. Blow off Assemblies on Dead Ends (Temporary and Permanent).

All temporary dead ends on new mains shall be closed with ductile iron plugs or caps and shall be fitted with a Water Quality Device; such dead ends shall be equipped with suitable concrete anchors and blow-off facilities as required. There shall be no Water Service Line taps between the last main line valve on the Dead End Main and the Temporary Blow Off Assembly. See Detail Drawings A2-4 through A2-8. The use of temporary Dead End Mains shall conform to the criteria described in Section 2.6E.

A permanent Dead End Main is required to have a Water Quality Device constructed at the end of the main. The use of permanent Dead End Mains shall conform to the criteria described in Section 2.6E. The Design Engineer shall indicate any appurtenances on the Construction Plans and must consult with Colorado Springs Utilities as to type of Water Quality Device to be utilized.

13. Pressure Regulation and Water System Control

Regulating installations are required to control pressure, provide pressure or air relief, separate pump and gravity zones, or to monitor pressures and flows

throughout the Water Distribution System. The need for regulating installations will be determined by Colorado Springs Utilities, based on existing and proposed pressure zones, pumped areas, tank locations, and required operation and monitoring of the existing Water Distribution System.

Regulating installations shall be categorized as follows:

- Pressure Regulating Station, see Detail Drawings A6-3 through A6-9
- Pressure Relief Station, see Detail Drawing A6-2
- Check Valve Station, see Detail Drawing A6-1
- Flow Meter Installation see Detail Drawing A6-11
- Altitude Valve, Pressure Sustaining Valves
- Control Valve Station

All regulating installations shall be designed and installed by the Owner/Developer per these *Water LESS*. Regulating installations shall be constructed within a Vault located behind the curb unless otherwise noted.

Vault design for regulating installations greater than 12 inches in diameter shall be specified by the Design Engineer.

The Design Engineer shall coordinate with Colorado Springs Utilities Water System Operations on the location of remote monitoring systems.

14. Air and Vacuum Relief Valves

Air and vacuum relief valves shall be required for Water Mains 16 inches and larger and may be required for Distribution Mains less than 16 inches at the discretion of Colorado Springs Utilities. Air and vacuum relief valves shall be designed in accordance with *AWWA M51, AWWA M11*, and the manufacturer's recommendations. Locations shall be specified by the Design Engineer and shown on the Construction Plans. For details regarding Air and Vacuum Relief Valve Stations, see Detail Drawing A6-10.

Air and vacuum relief valves are typically not required on Water Distribution Mains as Water Service Lines and fire hydrants provide acceptable means of air relief. Fire hydrants should be located to provide for a means of air relief and drainage when charging the main.

15. Pumping Facilities

Pumping facilities may be allowed on mains supplying water from the Colorado Springs Utilities Water Distribution System only where specifically authorized by Colorado Springs Utilities. Colorado Springs Utilities prohibits the installation of pumping facilities where, in its opinion, such installations would cause injury to the operation, or future operation, of the Colorado Springs Utilities system. All proposed pumping facilities shall be considered as a special feature and will be dealt with on an individual case basis. This may include pressure testing of the total installation when determined necessary by Colorado Springs Utilities. For more information regarding pump station criteria see Chapter 7.1.

16. Storage Facilities

Water storage reservoirs are required throughout the Water Distribution System to maintain adequate supply during peak demand periods. Storage reservoirs may

also be required adjacent to and on the suction side of pumping facilities. The size, location and type of storage reservoirs shall be determined by Colorado Springs Utilities.

All proposed storage facilities will be evaluated on an individual case basis

H. Vertical Design

The criteria needed for the vertical layout of Public or Private Water Main System plans follows in this section. In addition, it will be helpful to have the *Water Plan and Profile or Utility Service Plan Checklists* which are located at www.csu.org.

1. Depth of Bury

All Water Mains shall be installed to the depth shown on the Water Construction Plans. The depth of fill over the pipe measured from the proposed finish grade over the pipeline to the top of the pipe shall be a minimum depth of 5 feet and a maximum of 6 feet unless otherwise specified. Due to a deeper frost depth that exists in the Green Mountain Falls area, the depth of fill over the pipe measured from the proposed finish grade to the top of the pipe shall be a minimum of 7 feet for DIP pipe and 9 feet for PVC/HDPE pipe. If difficulties arise when crossing an obstruction in the field or where specifically approved by Colorado Springs Utilities or its Inspector, deviations from the above minimum and maximum depths of cover may be permitted.

2. Utility Crossings

When crossing another utility, minimum vertical separation is required to be maintained, refer to Section 2.6G Separation Criteria. When crossing a storm sewer or Wastewater Main, it is preferred to lay the Water Main above the storm sewer or Wastewater Main. However, a water lowering may be required to meet depth and vertical Separation Criteria, refer to Detail Drawing A7-1. Where the Water Main crosses under another utility greater than 30 inches in diameter, the Water Main shall be installed in a casing pipe, see Detail Drawing A7-2.

Where the Water Main crosses other utility infrastructure and the required separation cannot be met, the Design Engineer shall design and construct the crossing to protect the Water Main from other utility infrastructure. Where the Water Main crosses a wastewater, storm sewer, or a Nonpotable Water Main or Service Line and the Water Main is the lower utility or where the minimum separation cannot be met, the water or other utility shall have secondary containment. If the Water Main is greater than 5 feet below the wastewater, storm sewer, or a Nonpotable Water Main secondary containment is not required. The following methods of installation shall be considered secondary containment by Colorado Springs Utilities:

- The Water Main or the wastewater, storm sewer, or Nonpotable Water Main shall be installed in a casing pipe extending no less than 9 feet on either side of the centerline of the crossing. See Detail Drawing A7-3, or
- The Water Main or the wastewater, storm sewer, or Nonpotable Water Main shall be constructed without mechanical joints for 9 feet on either side of the crossing, or
- The Water Main or the wastewater, storm sewer, or Nonpotable Water Main shall be encased in flow fill, per the specification in Section 4.4S, for 9 feet

on either side of the crossing, with limits extending to 6 inches below and above the pipe.

- The Water Main is constructed of HDPE or welded steel and there are no mechanical fittings within 9 feet on either side of the crossing.

Wherever minimum separation cannot be met, flow fill, per the specification in Section 4.4S, shall be used to achieve acceptable compaction between the upper and lower utility, see Detail Drawing A7-6.

If the Water Main crosses another utility, and a geotechnical analysis or field conditions indicate potential settlement that may cause a point load on the Water Main, a safety hazard exists that would compromise maintenance of the Water Main, or adequate separation cannot be attained to prevent a potential point load on the Water Main, then bridging of the Water Main or other utility may be required at the discretion of Colorado Springs Utilities. See Detail Drawings A7-5 and A7-6.

3. Crossing Drainageways

When the Water Main crosses under a drainage channel, the casing pipe for the Water Main shall be encased in concrete, per Detail Drawings A7-7 and A7-8. Caissons may be required based on drainageway flow line instability and shall be designed by a structural engineer. The Design Engineer shall be required to demonstrate that the appropriate clearances are adequate for existing and future conditions based on scour analyses and planning in Drainage Basin Planning Studies, Master Plans, and design plans that have been approved by the City of Colorado Springs.

Aerial crossings are not recommended and will be reviewed on a case by case basis. Supports for the Water Main in an aerial crossing shall be design by a structural engineer. The bottom of the aerial Structure shall be located above the 100 year floodplain plus freeboard. Freeboard shall be defined by the following equation:

$$H=1.0+0.025*V*D$$

where:
H=freeboard in feet
V=average channel velocity in fps
D=depth of flow in feet

4. Crossing Bridges

Design of Water Mains attached to bridges shall be done by a Design Engineer with experience in bridge design. The details of the design will be reviewed and approved by Colorado Springs Utilities on a case by case basis. The following are minimum design considerations:

- provision for thrust restraints at the points of transition from a buried pipe to an exposed pipe,
- restrained joints at changes in alignment and at fittings, as necessary,
- horizontal and vertical stability of the pipe under the bridge,
- provisions for increased loading on the bridge created by a full main and its supports,

- access to the main for maintenance,
- provisions for corrosion control,
- the freeze potential of the Water Main,
- expansion joints shall be designed as needed, and
- freeboard shall be maintained from the 100 year floodway.

5. Crossing Major Roadways, Railways, and Rights of Way

Installation of mains across rights-of-way or Easements of the City of Colorado Springs, El Paso County, Colorado Department of Transportation, Fountain Mutual Irrigation Company or other entities, such as major roadways, railroads, irrigation channels etc., may require casing pipes for the installation of the main as determined by Colorado Springs Utilities and the Authority Having Jurisdiction. The type of casing material and its properties will be specified by the Authority Having Jurisdiction with the approval of Colorado Springs Utilities. Refer to Detail Drawings A7-3 and A7-4 for design and construction of the casing.

All design plans (showing the area of construction, including the railroad or highway mile marker location) and calculations submitted to another agency shall also be submitted to Colorado Springs Utilities for approval.

6. Crossing Roundabouts and Medians

Where the existing or proposed Water Main crosses roundabouts or medians, the following design criteria apply:

- The Water Main shall be located outside of the roundabout or median or shall be installed in a casing pipe through the roundabout or median see Detail Drawings A7-10 and A7-11, and Detail Drawings A7-3 and A7-4. It will be the responsibility of the Owner/Developer to relocate or encase any existing Water Main.
- Valves, tees, Vaults, service taps, and crosses, shall be located outside of the roundabout or median see Detail Drawing A7-10 and A7-11. It will be the responsibility of the Owner/Developer to relocate any existing Water fittings outside a roundabout or median.
- Service Taps shall be located a minimum distance of 15 feet outside the roundabout or median. It will be the responsibility of the Owner/Developer to relocate any Service Taps outside a roundabout and medians.

Colorado Springs Utilities will evaluate Construction Plans on a case by case basis where the Water Main crosses a traffic calming device such as a chicane, stamped concrete, speed bump etc.

7. Crossing Above-Ground Structures

Where the Water Main crosses an above ground Structure, the Design Engineer shall design the crossing to protect the Water Main and the Structure.

There may be instances where trenchless technology can be employed to limit the disturbance of aboveground Structures. Refer to Section 6.8 for Trenchless Technology design requirements.

8. Crossing Raw Water Transmission Mains

When crossing a Colorado Springs Utilities Raw Water Transmission Main with another utility, the criteria in this section must be met or exceeded to ensure the safety, clearance requirements, long term access, and maintainability for each proposed utility system and the existing Main. Contact Colorado Springs Utilities to discuss alternatives and develop an acceptable solution. This section must be applied in conjunction with these *Water LESS*.

a) Design

Any proposed crossing of a Raw Water Transmission Main shall have a detailed profile Construction Plan to be approved by Colorado Springs Utilities.

b) Horizontal Layout - Parallel Facilities

Proposed utility infrastructure should not be located within Colorado Springs Utilities Raw Water Transmission Main Easements. Any proposed encroachment, crossing or grade change within the Easement must be approved in writing by Colorado Springs Utilities. The maximum allowable parallel running distance for another utility built within the Raw Water Transmission Main Easement is 25 feet, and the paralleling utility shall vacate the Easement.

Colorado Springs Utilities will review the separation between a Raw Water Transmission Main and the proposed utility considering future maintenance and replacement of the Raw Water Transmission Main and the construction and future maintenance of the proposed utility. Separation criteria is extended with regards to Raw Water Transmission Mains and are not typical of the limits of the Clearance Matrix for Typical Parallel Colorado Springs Utilities facilities in Section 2.6G of this *Water LESS*, due to the extents of the larger Raw Water Transmission Main Easements.

c) Vertical Design and Separation

Crossing separations shall be 24 inches or greater above or below the pipeline for electric or gas distribution lines and telephone or fiber communication lines, while a 5 foot separation or greater is required for electric and gas transmission lines crossing a Raw Water Transmission Main. This separation criteria is extended and critical with regards to Raw Water Transmission Mains and are not typical of the limits of the Clearance Matrix for Typical Crossings of the Colorado Springs Underground Utilities in Section 2.6G of this *Water LESS*.

Water Transmission Mains are typically buried with 5 feet of cover. Actual depth varies based on installation location and grade changes that occurred over time after the Colorado Springs Utilities installation was completed. Due to the size and nature of high-pressure, high-flow Raw Water Transmission mains, crossing under any Raw Water Transmission Main is strongly discouraged. If crossing under a Raw Water Transmission Main is proposed, contact Colorado Springs Utilities as soon as possible to discuss the proposed design and construction methods. Under no circumstances shall a Water Transmission Main be undermined such that its support soil is removed without other approved support mechanisms in place.

d) Location of Water Transmission Mains & existing utility infrastructure

The Design Engineer shall obtain existing infrastructure records of all Colorado Springs Utilities' facilities from the Infrastructure Records Department as well as

records from other utility entities in the area of the proposed construction prior to design.

Utility locates must be obtained before any excavation, potholing, or sub-surface work occurs. Call the Utility Notification Center of Colorado (Colorado 811) at "8-1-1" to request locates at least three days prior to excavation. Potholing is required for visual verification of the location and depth of the Raw Water Transmission Main. For questions regarding locates for Colorado Springs Utilities' infrastructure, contact the Colorado Springs Utilities Locating Office at 719-668-7205.

e) Construction Plan Submittal Guidelines

Detailed plans must be submitted to Colorado Springs Utilities for review 30 days prior to construction.

Items to be included on the plans are listed below. For additional information see the section on Construction Plan Submittal Guidelines.

- All pertinent information to clearly understand the nature and location of all proposed crossings,
- vicinity map,
- specific Site information (township/range description, subdivision map where applicable, mile marker or other Site data),
- plans and profiles (or equivalent indicating proposed horizontal and vertical separations),
- description of proposed facility including construction material type, and
- construction methods to be utilized.

The review criteria will include, but is not limited to, the nature of the proposed utility, depth of bury, unique safety hazards, soil conditions, existing pipe bedding, construction methods and Easements.

(1) Inspection

Unless waived in writing by Colorado Springs Utilities, no work shall be done unless an Inspector is on Site to observe the activities. Colorado Springs Utilities reserves the right to inspect the installation of all crossings of its facilities. The Colorado Springs Utilities' Inspector has the final approval on all clearances and other crossings, safety requirements as field conditions warrant or requirements as stated in the *Water LESS*. Contact Colorado Springs Utilities 2 working days prior to commencing construction to schedule a Colorado Springs Utilities' Inspector for the project. (North 668-4396, South 668-4658)

(2) Safety Precautions

When excavating in close proximity to the existing Raw Water Transmission Main, the Contractor shall exercise extreme caution to ensure the safety of both the construction crew and the general public.

I. Cathodic Protection Design Criteria

All metallic Water Mains, fittings, hydrants, valves, and appurtenances shall be cathodically protected by a coating and either galvanic anodes or an impressed current system.

1. Coatings and Wraps

The following coatings and wraps are allowed for use in the Water System; thickness of coating may vary and shall be specified based on the manufacturer's recommendations:

- Concrete encasement
- Bituminous enamels
- Polyethylene tubing
- Tape coating
- Epoxy coating
- Polyolefin
- Petroleum Wax Tape
- Polyurethane coating

A bonded coating may be required for critical Water Transmission Mains, 16 inches in diameter or larger, when installed in a corrosive environment.

2. Protection of Bolts

All mild steel bolts shall be protected by zinc end caps, wax tape, or zinc and epoxy coated bolts.

3. Bonding Joints

Electrically discontinuous ductile iron pipe joints may require bonding as determined by Colorado Springs Utilities.

4. Insulating Joints

Insulating joints shall be shown on the Water Construction Plans and may be required for the following:

- where dissimilar metals come in contact,
- where new metallic pipe is connected to old metallic pipe and testing shows a significant pipe to soil potential difference between the two pipes,
- at pump stations and PRV's or anywhere an electric connection is made,
- to prevent transmission of stray current and
- at locations determined by the Design Engineer or Colorado Springs Utilities as deemed necessary for protective electrical isolation .

5. Galvanic Anodes on Metallic Water Mains

Anode location and size shall be shown on the Water Construction Plans. Colorado Springs Utilities shall design the cathodic protection system based on field conditions. The Owner/Developer shall be responsible for materials and construction.

Design for anode placement on ductile iron pipe will be based on a holiday area of 5%, a current density of 2 mA/sq ft, and high potential magnesium anodes. Other factors that may impact design include, but are not limited to: the proximity of other cathodic protection systems, induced AC current, pH, moisture content, ground water influence, the presence of chlorides, sulfides, bacteria, redox potential, and chemical activity. If these factors are found to exist in the field, changes to the anode design may be required by Colorado Springs Utilities.

Soil resistivity will be evaluated based on the following categories:

Soil Resistivity (ohm-cm)	Corrosivity Rating
>20,000	Essentially non-corrosive
10,000 to 20,000	Mildly Corrosive
5,000 to 10,000	Moderately Corrosive
3,000 to 5,000	Corrosive
1,000 to 3,000	Highly Corrosive
<1,000	Extremely corrosive

In highly corrosive and extremely corrosive environments HDPE or PVC may be required. Additionally, anodes may be required at the lower bends of water lowering fittings to maximize current distribution on the pipe.

6. Impressed Current

Metallic pipelines for water tanks, pump stations, and water treatment facilities that have large current requirements may require the installation of an impressed current system. These systems shall be designed by a qualified Design Engineer.

7. Test Stations

Test Stations shall be shown on the Water Construction Plans and will be required for the following:

- at insulating joints,
- at casing pipes,
- at crossings with other metallic utility infrastructure,
- every 1000 feet, and
- at locations determined by the Design Engineer or Colorado Springs Utilities.

8. Galvanic Anodes with PVC Pipe and HDPE Installations

All metallic fittings and appurtenances (valves, hydrants, bends, crosses, tees, etc.) shall be installed with one high potential magnesium anode bonded to the metal. Where fittings are electrically continuous at tees and crosses, a minimum of one anode may be installed to protect all the fittings. Anode sizes shall be a minimum of 9 lbs for individual fittings and 17 lbs for hydrants, temporary blow off valve assemblies, bridging supports, and bonded fittings, based on the average soil resistivity in Colorado Springs and a design life of 25 years for the anode.

9. Cathodic Protection of Casing Pipe

Casing pipe shall be cathodically protected with an approved coating and 1 17 lb high potential magnesium anode. Casings used for boring pipe projects do not need to be cathodically protected but may need to be a greater thickness steel to accommodate potential corrosion.

2.7 Water Service Line Design Criteria

A. General Requirements

All Water Service Lines and Fire Service Lines shall be designed and constructed by the Owner/Developer in accordance with all applicable requirements set forth in these *Water LESS* and *City Code*.

The owner shall provide a separate and independent domestic service line, and an individual meter shall be provided from mains for each and every structurally independent residential, commercial, or industrial building, whether or not they

are on a single platted lot under common ownership, unless the Utilities, in the reasonable exercise of its discretion, may determine that other means are more suitable in the operation of its system. (*City Code § 12.4.407*)

Water Service Lines that need to extend across a property other than the one being served shall be located within an Easement granted by the owner of the property being crossed. Water Service Lines crossing public property need an agreement with the governmental agency with jurisdiction over the public property being crossed.

B. Ownership and Maintenance

Responsibility for the maintenance and replacement of the service line and appurtenances thereto, in public rights of way, generally between the connection to the distribution main and the property line or the Curb Stop if the Curb Stop is on or near the property line, shall be borne by Utilities. Responsibility for the maintenance and replacement of the service line and appurtenances thereto, from the property line or Curb Stop if the Curb Stop is on or near the property line, shall be borne by the owner of the Premises. The owner shall keep the service line and all pipes and fixtures on the owner's Premises in good repair so as to prevent waste of water. Where more than one premise is connected to a single service line, the owners of the respective Premises shall be jointly and severally responsible for maintenance and repair of the service line which is the owner's responsibility. Maintenance and replacement of the service line within private rights of way or private Easements is the responsibility of the owner. (*City Code § 12.4.410*)

C. Water Taps and Service Line, Sizing and Material

Water Service Line taps and sizes include ¾ inch, 1 inch, 1-1/2 inch, and 2 inch. Water Service Lines 3 inches in diameter are not allowed in the Colorado Springs Utilities Service area. For HDPE Water tap and Service Line sizes, see Section 6.5A. Water and Fire Service Lines 4 inches and above shall meet the Water Main design requirements as described in Section 2.6 and this section as indicated. Water Service Line connections may be accomplished by a direct or saddle tap; see Detail Drawing B1-1.

Water Service Line taps are not allowed in the following conditions:

- on any transmission Water Mains,
- on mains 16 inches and greater,
- where the main pressure is less than 60 psi,
- within a Water Main lowering,
- within 36 inches of another Water tap on the same side of the pipe or 18 inches on opposite sides of the pipe,
- within 24 inches from both the back of the bell and the spigot insertion line and from any MJ fitting,
- on Fire Hydrant Laterals,
- on Fire Service Lines,
- under traffic calming devices, and
- within 10 feet on either side of a utility crossing.

Fire Service Line taps are not permitted from a Nonpotable main.

Water Service Line Material Main to Curb Stop	Tap and Water Service Line Size Main to Curb Stop	Water Service Line Material Curb Stop to Meter	Water Service Line Size Curb Stop to Meter	Meter Size
HDPE	1”	HDPE	1”, 1 ½”	¾” , 1”
HDPE	1”	Type K Copper	¾”, 1”	¾”, 1”
HDPE	1 ½”	HDPE	1” ,1 ½”	¾”, 1”, 1 ½”
HDPE	1 ½”	HDPE	2”	1”, 1 ½”
HDPE	1 ½”	Type K Copper	1”,	¾”, 1”, 1 ½”
HDPE	1 ½”	Type K Copper	1 ½”	1”, 1 ½”
HDPE	2”	HDPE	1 ½”,2”	1”, 1 ½”, 2”
HDPE	2”	Type K Copper	1”	1”, 1 ½”
HDPE	2”	Type K Copper	1 ½”,2”	1”, 1 ½”, 2”
Type K Copper	¾”	Type K Copper	¾” ,1”	¾”, 1”
Type K Copper	¾”	HDPE	1”, 1 ½”	¾”, 1”
Type K Copper	1”	Type K Copper	¾” , 1”, 1 ½”	¾”, 1”, 1 ½”
Type K Copper	1”	HDPE	1”,1 ½”,	¾”, 1”, 1 ½”
Type K Copper	1”	HDPE	2”	1”, 1 ½”
Type K Copper	1 ½”	Type K Copper	1”, 1 ½”, 2”	1”, 1 ½”, 2”
Type K Copper	1 ½”	HDPE	1 ½”, 2”	1”, 1 ½”, 2”
Type K Copper	2”	Type K Copper	1 ½”,2”	1 ½”, 2”, 3”
Type K Copper	2”	HDPE	2”	1 ½”, 2”, 3”

Water Service Lines (3/4 inch-2 inches) shall be Type K Copper CTS or HDPE DR 9, see Approved Materials Section 4.5. If HDPE is utilized see Section 6.5 for design requirements.

The maximum size of a type K copper Water Service Line and tap can be one size greater or smaller than the size of the meter as depicted in the Table below. HDPE will typically need to be upsized one size from type K copper sizing to accommodate the reduction in internal diameter.

The Water Service Line shall be the same size from the Corporation Stop to the Curb Stop or Secondary Valve. Then if necessary, the size of the Water Service Line may be increased or reduced from the Curb Stop or Secondary Valve to the meter by one size. The Water Service Line shall be one material from the Corporation Stop to the Curb Stop/Secondary Valve and one material from the Curb Stop/Secondary Valve to the meter and/or Containment Backflow Prevention Assembly if applicable.

1. Sizing of Residential Potable Water Service Lines and Fire Service Lines

Typical residential Water service can be accomplished with a ¾ inch type K copper Water Service Line or a 1 inch CTS HDPE DR-9 Water Service Line (see Section 6.5), however it is the responsibility of the Owner/Developer to determine the required Water Service Line size based on residential Water demand, elevation changes, and friction losses. Where Water Service Line lengths are greater than 180 feet from the Water Main to the building, the Owner/Developer shall submit friction loss calculations to Colorado Springs Utilities demonstrating that acceptable pressure can be maintained in the residence per the latest adopted *International Plumbing Code* (*IPC*). The following table may be used as a guide to size the Water Service Line:

2. Residential Water Service Line Sizing Chart Table

3/4" Water Meter Size
Maximum flow – 20GPM
80% capacity – 16GPM

Static Pressure at Water Main/ Point of Connection (psi)	<20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
130	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A
120	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	A	B
110	A	A	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B
100	A	A	A	A	A	A	A	A	A	A	A	B	B	B	B	B	B
90	A	A	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B
80	A	A	A	A	A	A	B	B	B	B	B	B	B	B	B	B	B
70	A	A	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B
<60	A	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B	B

Linear feet of type "K" copper service from the Water Main to the primary meter location

1" Water Meter Size
Maximum flow– 50GPM
80% capacity – 40GPM

Static Pressure at Water Main/ point of Connection (psi)	<20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180
130	B	B	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C
120	B	B	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C
110	B	B	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C
100	B	B	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C
90	B	B	B	B	B	C	C	C	C	C	C	C	C	C	C	C	C
80	B	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
70	B	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
<60	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C

Linear feet of type "K" copper service from the Water Main to the primary meter location

Legend

A= ¾ inch copper/ 1" HDPE Water Service Line, B=1 inch copper/ 1 ½ inch HDPE Water Service Line, C=1 ½ inch copper/ 2 inch HDPE Water Service Line

Notes:

- Calculations assume 10 feet of elevation gain between the tap and the meter. The Design Engineer shall verify elevation differences and adjust the minimum Water Service Line size as necessary.
- Water Service Line size shown in the table is based on a minimum pressure of 35 psi on the outlet side of the meter. The Design Engineer shall verify pressure requirements within the Structure per the *International Plumbing Code* (*IPC*) and adjust the minimum Water Service Line size as necessary.

If a residential Fire Protection System is required by the CSFD then the combined Potable Water Service Line and Fire Service Line shall be sized to accommodate fire flow from the tap to the Fire Protection System branch and shall be a minimum 1 inch copper or 1 ½ inch HDPE. Combined Potable Water and Fire Service Line installations for residential buildings must have plans pre-approved by the CSFD. The residential Fire Protection System must be designed in conformance with the current version of *NFPA*

13, 13D and 13R, and approved UL Fire Protection Equipment (*City Code § 8.4.105 Section 903.3.5.1.2*). The Water meter may be located after the Fire Protection System branch and should be sized based on the domestic service demands. If the Fire Protection System presents a degree of hazard as specified in *City Code § 12.4.12*, a Containment Backflow Prevention Assembly is required on the incoming Water Service Line and prior to the first branch line of the Water Service Line. See Detail Drawing B2-2.

3. Sizing of Commercial Water Service Lines and Fire Service Lines

Sizing of Commercial Water Service Lines and Fire Service Lines should be done by a Design Engineer. Commercial Water Service Lines and Fire Service Lines shall be sized based on the flow requirements of the proposed use, friction losses, and internal Water pressure requirements per the *International Plumbing Code*. Calculations shall be based on pressure in the Water Main at maximum day demand. Fire Service Lines shall meet all requirements as established by the CSFD.

D. Water Service Line Horizontal Design Criteria

1. Residential Water Service Line Horizontal Design Criteria

When designing residential Water and wastewater service lines, be aware that in most development areas, the electric and gas service lines will generally enter the property within 5 feet of either side lot line of the property, See Detail Drawing B2-1 and B2-2. In hillside development areas or in developments with terrain changes, the placement of the electric and gas service lines may change and separation criteria in Section 2.6G must be followed. Water and Wastewater Service Lines shall be a minimum of 15 feet from the side property line to allow for separation from the gas and electric service lines. The Service Line trench must enter the lot as near 90 degrees to the street as is practical and not at an extreme angle, See Detail Drawing B2-1 and B2-2. It is the Owner/Developers' responsibility to determine the location of the Water Service Lines and to show placement on the Water Construction Plans.

2. Commercial Water Service Line Horizontal Design

Commercial Fire Service Lines shall be tapped separately from the domestic Water Service Line**.** No provision or omission in these *Water LESS* shall be interpreted to allow a Commercial User to combine water service for both domestic use and a Fire Protection System from a single wet tap on a Colorado Springs Utilities Water Distribution Main, nor shall the two systems be cross-connected in any manner. See Detail Drawing B2-5.

Commercial Fire Service Lines must be connected to a looped Water System main. See also Detail Drawing B2-5 for fire and domestic Water Service Line configurations for a commercial building.

All hospitals shall have two Water Service Lines installed in such a manner as to minimize the potential for an interruption of the supply of Water in the event of a Water Main or Service Line failure (per 2009 *IPC 609.2*). The Water Service Lines shall be separated by an isolation valve and should be tapped from two separate Water Mains.

Horizontal separation between the Water Service Line and other utility mains shall meet the requirements as stated in Section 2.6G Separation Criteria. For Water Service Lines 2 inch and less the minimum separation distance between the Water Service Line and gas or electric service lines shall be a minimum of 3 feet outside edge to outside edge.

The Water meter should be located within 5 feet of an outside wall. Exposed Water plumbing shall be minimized inside the building prior to the Water meter and/or Containment Backflow Prevention Assembly.

Water Service Lines shall be located a minimum of 15 feet from any Structure.

For multifamily configurations see Detail Drawing B2-4.

3. Separation Design Alternatives

Horizontal and vertical separation between the Water Service Line and other utility mains shall meet the requirements as stated in Section 2.6G.

Where the Water Service Line is 2 inch and less, the Water Service Line and the wastewater service line shall be separated by a minimum of 5 feet of undisturbed or compacted earth, except for the following: (*IPC Section 603.2*)

- The Water Service Line may be placed on a solid shelf excavated at one side of the common trench, at least 12 inches apart, vertically and horizontally from the wastewater service line outside diameter to outside diameter. (*IPC Section 603.2*) The Water Service Line shall be above the highest point of the wastewater service line. See Detail Drawing B2-6.
- The Water Service Line may be placed in the same trench as the wastewater service line if the wastewater service line is constructed of Schedule 40 PVC and is located a minimum of 12 inches from the Water Service Line outside diameter to outside diameter. See Detail Drawing B2-6.

The number of joints in the Water Service Lines and wastewater service lines shall be kept to a minimum, and the materials and joints of building drain and wastewater service lines shall be installed in such a manner, and shall possess the necessary strength and durability, to prevent escape of solids, liquids and gases there from, under all known adverse conditions such as corrosion, strains due to temperature changes, settlement, vibrations and superimposed loads.

4. Curb Stop and Stop Box

All Water and Fire Service Lines (including those 4 inches and greater) shall have a Curb Stop or Secondary Valve and stop box installed on or near the property line nearest to the Water tap and shall have no permanent Structures or landscaping within a 5-foot radius. Secondary Valves for Water Service Lines 4 inches and larger shall be restrained. For Residential Users the Curb Stop and stop box shall not reside in driveways, sidewalks, or other concrete surfaces. For Commercial Users stop boxes that are in a drivable surface must have a traffic rated valve box. CurbStops shall be located minimum of 9 feet from any building foundation to allow for operation and maintenance. See Detail Drawings B2-1, B2-2, B2-3 and B2-5.

Additional valves on Fire Service Lines after the Curb Stop or Secondary Valve are not permitted per the CSFD. If additional valves are necessary, they shall be Post Indicator Valves and approved by CSFD.

Curb stops or Secondary Valves on Private Water Systems shall be located to facilitate operation and maintenance of Water Service Lines.

E. Water Service Line Vertical Design Criteria

1. Depth of Bury

All Water Service Lines and Curb Stops shall be a minimum depth of 6 feet and a maximum depth of 7 feet. Due to deeper frost depths that exist in the Green Mountain Falls area, the depth shall be a minimum of 8 feet for DIP pipe and 10 feet for PVC/HDPE pipe.

2. Crossings

Vertical separation between Water Service Lines and other utility infrastructure shall meet the requirements as stated in Section 2.6G. Water Service Lines must be sleeved when crossing under another utility where the utility is 30 inches or greater in size or where there is less than 18 inches of vertical clearance between the utility and the Water Service Line. Where the Water Service Line is 2 inch and less, the sleeve material shall be schedule 40 PVC pipe (or other material as approved by Colorado Springs Utilities) when the minimum clearance cannot be met. There must be a minimum of 6 inches separation between the utility and the sleeve, Reference Detail Drawing B1-14.

F. Abandonment or Removal of Existing Corporation Stops

Where an existing Corporation Stop (tap) is not expected to be reconnected or reused or is relocated with a new Corporation Stop of equal or larger size, then the Owner/Developer shall be responsible for removal of the old Water Service Line and the tap and Water Main line pipe repair. All abandonments or removals shall be inspected by Colorado Springs Utilities.

If the tap being removed at the main is 1 inch in size or less and is directly tapped into the main, then the tap once turned off, and the Water Service Line disconnected from it, may be abandoned in place.

At the direction of the Inspector, when a saddle tap has been used, the tap and saddle must be removed from the main. Where the existing main is 8 inch or less it may be repaired with a Stainless Steel Repair Clamp. Water Mains under warranty and Water Mains 12 inches and greater require the tap be cut out from that section of main and replaced with a solid sleeve coupling and new pipe piece prior to the new tap and Water Service Line being placed. Placement of the new tap should be a minimum of 2 feet from the replacement section. Taps 4 inch and larger shall be removed and replaced with a new section of pipe using solid sleeve couplings.

If Colorado Springs Utilities is required to remove the Water Service Line and tap, Colorado Springs Utilities will invoice the owner for all removal costs and main line repairs on a time and materials basis.

G. Demolition or Remodel of Property

If for any reason a building is to be demolished or remodeled on a property that is currently receiving water service, a *Request for Removal of Utilities for Demolition or Construction* found in Section 2.8 (also available at www.csu.org) must be approved by Colorado Springs Utilities for disconnection of Colorado Springs Utilities' Services prior to application for a *Regional Building Demolition Permit.* If the water service is not going to be reused in accordance with *City Code*, the Water Service Line and tap shall be removed and inspected in accordance with Section 2.7F at the time of disconnection. If the Water Service Line is to be reused, the Contractor shall disconnect and temporarily plug the Water Service Line a minimum of 15 feet outside the limits of demolition to minimize potential damage to or contamination of the Water Service Line. The *Request for Removal of Utilities for Demolition or Construction* form will identify the date, not to exceed 2 years, when the Water Service Line will be in regular use. All demolitions shall be inspected by Colorado Springs Utilities.

H. Special Considerations for Groundwater Services

All Standards shall apply to Groundwater services with the addition of the following:

- a meter calibration tee must be included in the line immediately downstream of the meter. The tee is to be situated between the meter and the downstream valve,
- any additional control equipment, such as pumping assemblies and control, installed in the pit/Vault will be installed in such a way as to not interfere with the installation, removal and maintenance of the meter,
- all plumbing from the well head to the point of use is the responsibility of the property owner,
- Meter Pits shall be installed as close to the well as possible. Colorado Springs Utilities must approve all Meter Pit locations, and
- Meter loops and appurtenances may be required when Augmentation Service is provided by Colorado Springs Utilities.

I. Pressure Reducing Valve

1. General Requirements

A water pressure reducing valve rated for 250 psi shall be installed in all Water Service Lines with the exception of Fire Service Lines and Fire Protection Systems.

2. Ownership and Maintenance

The water pressure reducing valve shall be provided, installed, owned, and maintained by the Owner/Developer.

3. Sizing

The size of the pressure reducing valve shall be equal to or one size greater than the size of the water meter. Where a meter is not present, the pressure reducing valve shall be equal in size to the Water Service Line.

4. Installation

The pressure reducing valve shall be located after the first shut off valve and before the meter. On 1-1/2 inch through 12 inch meter installations, a ¼ inch or

3/8 inch device may be installed to allow for a pressure gauge before and after the pressure regulator to monitor incoming (main line) and internal pressure. The test cocks on the Containment Backflow Prevention Assembly shall not be modified to accept a pressure gauge. Under no circumstances shall the pressure exceed 80 psi at the inlet side of the meter. Installation of a Y strainer on the Water Service Line, following the first shut off valve and prior to the pressure reducing valve is recommended.

Pressure reducing valves located within a Meter Pit shall be located before the Water meter using a tandem coppersetter.

J. Water Meters

1. General Requirements

All water supplied by Colorado Springs Utilities must be metered with the exception of Fire Service Lines and Fire Protection Systems. All water meters require an address for billing purposes. Typical water meter sizes include ¾ inch, 1 inch, 1-1/2 inch, 2 inch, 4 inch, and 6 inch. Meter sizes greater than 6 inch shall be evaluated on a case by case basis.

2. Operation and Maintenance

All water meters shall be furnished and installed by Utilities at the expense of Utilities and Utilities shall retain ownership of the meters. Utilities shall perform all necessary maintenance and/or repair of meters, including replacement of meters; provided, however, that the property owner shall be responsible for protecting the meter against freezing and damage. (*City Code § 12.4.703*). Meter Pits and appurtenances shall be owned and maintained by the property owner.

3. Residential Water Meters

a) Residential Water Meter Sizing

Residential water meters shall be sized based on anticipated water usage. It is the responsibility of the Owner/Developer or the builder to determine the water meter size. Typical residential water meter sizes are ¾ inch and 1 inch.

b) Residential Water Meter Installation

Water meters installed inside a Structure shall be located in the basement or other lowest level of the building, not to include any crawl space or designated storage area**.** The location of the meter shall not require stooping or crawling to gain access to inspect or replace the meter. Water meter locations shall be such that the water meter is unobstructed on one side, i.e., easily accessible for reading or servicing. Water meter loops shall be constructed per Detail Drawing B1-4. If clearances cannot be met a vertical meter shall be installed per Detail Drawing B1-4.

Water meters (3/4 inch and 1 inch) installed outside a Structure shall be located in a Meter Pit on the property line just after the Curb Stop. The Meter Pit shall be a minimum 24 inches in diameter. Meter Pits shall be located outside of driveways and sidewalks and shall be accessible. No permanent Structures or landscaping which obstructs access, or where roots may cause damage to the pit, shall reside within a 5 foot radius of Meter Pits. See Detail Drawing B2-1 and B2-2.

4. Commercial Water Meters

a) Commercial Water Meter Sizing

Commercial water meters shall be sized based on anticipated water usage for the proposed use. The Owner/Developer shall utilize the Commercial Water Meter Sizing Form to determine the required water meter size. This form is available at **www.csu.org.** This form shall be submitted with the request for service contract and will be used by Colorado Springs Utilities to verify proposed meter size and type.

b) Commercial Water Meter Installation

Commercial water meters are typically located within the commercial unit in a utility or a mechanical room. Plans for inside water meter installations (to include support) for 1-1/2 inch and larger water meter shall be submitted to Colorado Springs Utilities for approval with the Commercial Water Meter Sizing Form. Water meter installations shall be constructed per Detail Drawing B1-11.

Commercial Water meters may be located outside, ¾ inch and 1 inch meters shall be located within a Meter Pit and 1 ½ inch and larger meters shall be located within a meter Vault. The Meter Pit or Vault should be located outside of a drivable surface. All Vaults shall be accessible via an H-20 rated drivable surface. No permanent Structures or landscaping which obstructs access or whose roots may cause damage to the Vault shall reside within a 5 foot radius of Meter Pits or Vaults. If it is not possible to locate the Meter Pit or Vault outside a drivable surface, then the Meter Pit or Vault shall be H-20 traffic load rated. Meter Pits or Vaults shall be designed per Detail Drawings B3-1thru B3-5.

Recommended upstream and downstream distances for fittings in a meter Vault from a proposed large meter installation for compound and Class 1 and 2 turbine meters are as follows:

Type of Fitting	Distance Upstream (Pipe Diameters)	Distance Downstream (Pipe Diameters)
Tees and Crosses	10	5
Elbows and Reducers	10	5
Tees and Crosses with Strainers or strengtheners	5	5
Elbows and Reducers with Strainers or Strengtheners	5	5
Gate Valve	1-3	1-3
Butterfly Valve	5	5
Plug Valve	5	5
Check Valve	*	5
Pressure Regulator	*	5
Test tee and plug	*	3
Saddle	*	3
Angle Strainer	5	3
Basket Strainer	5	3

* Check with manufacturer's recommendations for proposed meter, and

AWWA M6 – Water Meters. Distances may vary with type of meter i.e. Turbo, Compound or Mag. meter

5. Meter Bypass

Colorado Springs Utilities may require a meter bypass for Essential Facilities to ensure continuous service during meter maintenance. The pressure reducing valve and Containment Backflow Prevention Assembly shall not be bypassed. See Detail Drawing B1-10.

K. Commercial Water Meters for Consumptive Use

A Commercial User who qualifies for the Consumptive Use Adjustment (CUA) Program may receive a reduction in their wastewater charges for water that is not discharged into the Colorado Springs Utilities' wastewater System. The CUA program and applications are described in Colorado Springs Utilities' wastewater tariff.

The following configurations can be utilized for Water Service Lines that qualify for the CUA program:

- The Water Service Line for the CUA process may be tapped and metered separately from the domestic Water Service Line. The Water Service Line shall meet all of the requirements set forth in these Standards and shall have a water meter and a Containment RP, see Detail Drawing B1-22.
- The supply line to an approved CUA process may branch off the domestic Water Service Line from the discharge side of the Containment Reduced Pressure Principle Backflow Prevention Assembly (RP). A submeter and an additional RP are required on all branch lines serving an approved CUA process. Reference Detail Drawing B1-22.
- Pursuant to *City Code*, a branch line between the meter and the Containment Backflow Prevention Assembly is prohibited.

L. Backflow Prevention

It is the User's responsibility to consult with a qualified professional to evaluate the impact the Containment Backflow Prevention Assembly may have, and to ensure proper supply and relief of system pressures within plumbing or piping systems on the User's Premises.

1. Residential General Requirements

Residential Users are typically not required to install a Containment Backflow Prevention Assembly in each Water Service Line but may be required to do so if a Degree of Hazard is identified by Colorado Springs Utilities. The following conditions are a Degree of Hazard and require installation of a Containment Backflow Prevention Assembly in each Water Service Line and Fire Service Line:

- Wherever a Fertigation System is installed, a Containment RP shall be required.
- Wherever a Class 3 or Class 4 Fire Protection System is installed, a Containment RP shall be required.
- Wherever a Class 1 or Class 2 Fire Protection System is constructed from materials that are not approved for the conveyance of Potable Water, a Containment DC shall be required.

2. Commercial General Requirements

When installation of a Backflow prevention assembly is required under *City Code*, the following standards shall apply:

Whenever Colorado Springs Utilities determines a High Degree of Hazard exists at a premise, the Commercial User shall install a Containment RP in each Water Service Line. The following conditions are a High Degree of Hazard:

- Aircraft and missile manufacturing;
- Automotive plants including, but not limited to plants which manufacture or service motorcycles, automobiles, trucks, recreational vehicles, construction/agricultural equipment;
- Beverage bottling plants including, but not limited to, dairies, soft drink bottlers, and breweries;
- Canneries, reduction plants, slaughter houses or packing houses;
- Car washes;
- Chemical, biological and radiological laboratories including but not limited to, high schools, trade schools, colleges, universities and research institutions;
- Hospitals, clinics, medical buildings, autopsy facilities, morgues, mortuaries, veterinary facilities, dental clinics and other medical facilities;
- Metal or plastic manufacturing, fabrication, cleaning, plating or processing facilities;
- Plants manufacturing paper/paper products;
- Plants manufacturing, refining, compounding, or processing fertilizer, film, herbicides, natural or synthetic rubber, pesticides, petroleum or petroleum products, pharmaceuticals, radiological materials or any chemical which would be a Contaminant to the water supply system;
- Commercial facilities that use herbicides, pesticides, fertilizers or any chemical which would be considered a Contaminant;
- Plants processing, blending or refining animal, vegetable or mineral oils;
- Commercial laundries and dye works;
- Sewage, storm water and industrial waste treatment plants and pumping stations;
- Waterfront facilities including piers, docks, marinas, and shipyards;
- Industrial facilities which recycle water;
- Restricted or classified facilities or other facilities closed to access;
- Auxiliary water systems, including but not limited to alternative water sources, well systems, or non-potable water service;
- Irrigation systems with or without facilities for injection of pesticides, herbicides or other chemicals or with provision for creating back pressure;
- Connections to Springs Utilities' water supply system for construction purposes or filling any portable tank for transporting water, including potable water dispensing stations; and
- Facilities which have pumped or pressurized cooling or heating systems including any boiler systems.

Fire Sprinkler System, Class 1 and Class 2**:** The Commercial User at any premise where a fire service line is connected to the water supply system. shall install a double check valve Backflow prevention assembly.

Fire Sprinkler System, Class 3 and Class 4**:** A Commercial User at any premise where a fire service line is connected to the water supply system, shall install a reduced pressure principle Backflow prevention assembly

3. Ownership and Maintenance

The User shall be responsible for the cost, installation, testing, maintenance, repair and replacement of any Containment Backflow Prevention Assembly installed at their premises. The User shall be responsible to have each Containment Backflow Prevention Assembly tested and maintained as necessary upon installation and at least annually thereafter, by a Certified Backflow Prevention Assembly Tester.

Any Backflow prevention assembly required by these *Water LESS* that does not meet all requirements specified herein shall be repaired or replaced at the User's expense. Any repair or replacement shall be made with an Approved Backflow Prevention Assembly within ten days of discovery.

4. Sizing

If commercially available, the Containment Backflow Prevention Assembly shall be equal in size to the Water Service Line. When an equivalent size is not commercially available, the User shall install the next largest commercially available size.

5. Location

Installation of two Containment Assemblies in parallel, manifold type configurations, and bypass lines around a Containment Backflow Prevention Assembly are prohibited, including use of a Detector Assembly.

a) Orientation of the Containment Backflow Prevention Assembly

In all cases, the Containment Backflow Prevention Assembly shall be installed in accordance with its listing by the University of Southern California (USC). (In general, an RP is not approved when installed in a vertical orientation. Orientation for the DC varies by model and size.)

b) Inside Water Meter Installations

The Containment Backflow Prevention Assembly shall be installed immediately following the meter and in all cases prior to the first branch line leading off the Water Service Line. A minimum distance of 6 inches and no more than 18 inches shall be maintained between the water meter outlet valve and the Containment Backflow Prevention Assembly inlet valve. The section of pipe between the water meter and Containment Backflow Prevention Assembly shall be a single, continuous piece in which no appurtenances, outlets, tee fittings or any means to drain, withdraw or flush water is installed. The Containment Backflow Prevention Assembly shall be installed a minimum of 18 inches above grade and in a location that prevents submersion and exposure to any chemical or corrosive vapor. Reference Detail Drawings B1-18, B1-19 and B1-20 for clearance requirements.

c) Fire Protection Systems

The Containment Backflow Prevention Assembly shall be installed immediately after the Fire Service Line enters a Premises and in all cases before the first branch line leading off the Fire Service Line. All FDCs shall connect to the Fire

Service Line after the outlet valve of the Containment Backflow Prevention Assembly.

d) Residential Combination Service Protection:
When a Residential User installs a Fire Protection System that is served by a branch off the domestic Water Service Line and a Containment Backflow Prevention Assembly is required for the Fire Protection System, the Containment Backflow Prevention Assembly shall be installed prior to the first branch line leading off the Water Service Line, regardless of the meter location. Reference Detail Drawing B2-2 for clearance requirements.

6. Drainage Requirements for Inside Installations:
A drain connected to the wastewater system shall be installed within 10 feet of a Containment Backflow Prevention Assembly. The drain shall be sized to accommodate discharge from the Containment Backflow Prevention Assembly during routine maintenance. If a Containment RP is required, then the drain shall be sized to accommodate the maximum calculated discharge for the RP given the pressure for the domestic Water Service Line. When drain connected to the wastewater system is not installed, a drain to daylight that prevents contamination of any State waters shall be installed. When a drain to daylight is installed, the User shall be responsible for any and all discharge from the drain and compliance with all regulations, codes and standards which govern that discharge.

7. Outside Water Meter Installations:
The Containment Backflow Prevention Assembly shall be installed a minimum of 18 inches above the prevailing grade and no more than 5 feet from the outside edge of the Meter Pit. Installation of a Containment Backflow Prevention Assembly in a vault or pit is prohibited. The piping between the water meter and Containment Backflow Prevention Assembly shall contain no appurtenances, outlets, tee fittings or any means to drain, withdraw or flush water. Please reference Detail Drawing B1-16 for clearance requirements.

8. Enclosure and Protection Requirements:
For Water Service Lines where year round use is required, the Containment Backflow Prevention Assembly shall be installed inside a heated building or inside an enclosure certified to comply with all material and design specifications of a Type 1, heated enclosure as published by The American Society of Sanitary Engineering in ASSE Standard 1060, “Performance Requirements for Outdoor Enclosures for Backflow Prevention Assemblies.”

Where use of the Water is seasonal, the Containment Backflow Prevention Assembly shall be mounted inside a secure enclosure unless other means to prevent theft and tampering are approved. Where a Containment RP is required and it is installed in an enclosure, the enclosure shall be fitted with proper means to accommodate the maximum calculated discharge for the RP given the pressure for the Water Service Line.

9. Removal of a Containment Backflow Prevention Assembly
Other than replacement in kind, at no time shall a Water Service Line be open and exposed to the ambient environment except on the discharge side of an Approved Containment Backflow Prevention Assembly or when approved in writing as part

of a Management Plan. The Containment Backflow Prevention Assembly shall not be removed unless water service is disconnected first and then the Containment Backflow Prevention Assembly may only be removed after the User has complied with all other applicable provision of these service standards. Water Service may be disconnected by calling the Colorado Springs Utilities Customer Service Center at (719) 448-4800.

Special Circumstances:

a) Seasonal Removal for Lawn Irrigation Systems

A Containment RP installed in a Water Service Line used exclusively for lawn irrigation may be temporarily removed during winter months and for a period not to exceed 9 months. In instances where removal of the Backflow prevention assembly is desired, flanges shall be installed on both pipe stubs and the Containment RP. During removal period, water service shall be disconnected at the Curb Stop and both pipe stubs shall be capped with a bolted blind flange. Prior to irrigating, the same Containment Backflow Prevention Assembly that was removed for the winter months shall be reinstalled and tested. Please reference Detail Drawing B1-17.

b) Permanent Removal for Abated Degree of Hazard

If all Cross Connections on a premise that is currently receiving water service are permanently abated, a User may apply for a Containment Backflow Prevention Assembly Waiver. The Containment Backflow Prevention Assembly shall not be removed until and unless such time as Colorado Springs Utilities issues a Containment Backflow Prevention Assembly Waiver after completing a Hazard Assessment and the User has complied with all applicable provisions of these Service Standards.

Water service shall not be restored to any premises that Colorado Springs Utilities classifies with any Degree of Hazard until a Containment Backflow Prevention Assembly has been reinstalled or, if no Containment Backflow Prevention Assembly is installed, until such time as the User establishes an Approved Management Plan or Colorado Springs Utilities issues a Containment Backflow Prevention Assembly Waiver after completing a Hazard Assessment.

It is the User's responsibility to schedule the Hazard Assessment with Colorado Springs Utilities. To schedule a Hazard Assessment, please contact the Backflow Prevention Program at (719) 448-4800.

2.8 Forms

A. Cost Recovery

Requirements for Recovery Agreement Application

Recovery Agreements can be initiated by either the developer or Colorado Springs Utilities to recover a portion of applicable costs incurred when installing required water and wastewater infrastructure. The costs of installing the mains will be divided equally between any and all adjacent properties which will incur a benefit from the installation of the infrastructure and are not part of the developer's project area. The developer installing the mains will pay the full installation costs and may submit a recovery agreement application. Application for Recovery Agreement will be reviewed upon completion of the installation and Preliminary Acceptance of the Bill of Sale, as outlined in CSU's Line Extension & Service Standards, Section 2.2.C. Application must be submitted no later than 365 days past Final Acceptance of the Warranty/Bill of Sale for the project.

The application, appropriate fee and required documentation as outlined on the application may be mailed to Customer Contract Administration at the location below:

Colorado Springs Utilities- Customer Contract Administration
2880 International Circle, Suite 210
Attn: Chris Quinn - Mail Code 1376
Colorado Springs, CO 80947-1376

Required Documentation for Recovery Agreement

Project Information: Approved Plans, Bill of Sale document, Owner/Developer Name, Project Name and Number, Facility Type and Location.

NOTE: Owner/Applicant continuity exists throughout project lifecycle.
(Plan owner, Bill of Sale, Recovery Agreement Applicant)
If conflict exists with these documents, assignment agreements will be requested to ensure continuity of the appropriate entity(ies).

Cost Information: Invoicing/Proof of payment for directly related construction costs to include, but not limited to:
Contractor(s), Design/Engineering, Construction Management/Oversight, Permit fees, Easement acquisition, Legal/Attorney fees.

Proof of payment types:
Executed construction contract invoicing, vendor invoicing, support services invoicing, permit fee receipts, and confirmation of payment(s).

Application Fee: Two application fee levels dependent on the total Recovery Service Area:

Area up to 50 Acres:	$1,473.00
Area 50 Acres or greater:	$2,942.00

V 1.2 10-21-13

Colorado Springs Utilities
It's how we're all connected

Water/Wastewater Recovery Agreement Application

Date Requested: ____/____/_____

Applicant Information:

Requested by: _____

Contact Name: _____

Address: _____

_____

Contact phone: (_____)_____ Email: _____

Responsible Party Information:

- Construction Plan Owner : _____
- Warranty / Bill of Sale: _____
- Date of Preliminary Acceptance ____/____/_____

NOTES: Preliminary Acceptance MUST be granted prior to application for Recovery Agreement.
If more than one entity exists above, assignment agreements may be required prior to Agreement Approval.

CSU Project Number: _____ Extension Utility: Water Wastewater

Preliminary Acceptance Date: ____/____/_____ Facility Type: Public Private

Project Plan Title: _____

Subdivision name/area served: _____

Support Documentation:

Ensure Proof of Payment for costs directly related to the utility extension ONLY, including but not limited to:

Direct Construction Costs (Labor/Materials)	Construction Management
Engineering Costs	Permitting Fees
Easement Acquisition Costs (Legal, etc)	Surface Degradation/Restoration Fees

Fee: Application fees are based on potential service area for the facility(ies) as determined by CSU.

Estimated Recovery Service Area **up to** 50 Acres: **$1,473.00**

Estimated Recovery Service Area **over** 50 Acres: **$2,942.00**

Applicant Signature:_____ Date: ____/____/_____

This application for initiating a cost recovery agreement is subject to all the requirements of Colorado Springs Utilities Tariffs and Water/Wastewater Line Extension & Service Standards. Signature by Customer on this application does not guarantee acceptance by Colorado Springs Utilities to initiate the requested Cost Recovery Agreement. Colorado Springs Utilities may require additional information and/or time to determine Cost Recovery eligibility and setup fee amount.

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B. Agreement and Bill of Sale

This is a sample form for reference only, modification may occur on a periodic basis. This form is not intended to be used as the final document

Colorado Springs Utilities
AGREEMENT AND BILL OF SALE
for Water and/or Wastewater facilities

WHEREAS, the Undersigned has constructed private water facilities and/or wastewater facilities and appurtenances described below ("Facilities") and desires to connect the same to the public water system and/or wastewater system ("Public System") of Colorado Springs Utilities ("Springs Utilities"), an enterprise of the City of Colorado Springs, a home-rule city and Colorado municipal corporation ("City");

NOW, THEREFORE, in consideration of the promises, mutual covenants and agreements contained herein, Springs Utilities' permission to connect the Facilities to the Public System, and other good and valuable consideration, the receipt of which is hereby acknowledged, the Undersigned does hereby sell, transfer and assign to the City, on behalf of Springs Utilities, all of the Undersigned's right, title and interest in the Facilities described below, free and clear of all claims, including, but not limited to, claims of lien for labor or materials, and subject to the rights and obligations set forth herein, to wit:

Title of Plan:
Project #

Description of Facilities:

WARRANTY

For a minimum period of 24 months from the Springs Utilities' Preliminary Acceptance Date as shown below (hereafter referred to as "Warranty Period"), the Undersigned warrants: (a) that the Facilities shall be free from all defects and faults in materials or workmanship; (b) that the Facilities have been properly located and constructed in accordance with the City Code of the City of Colorado Springs, all applicable provisions of Springs Utilities' Water and/or Wastewater Line Extension and Service Standards in effect at the time the construction plans for the Facilities were approved by Springs Utilities, and any other applicable specifications required by Springs Utilities; and (c) that the Facilities are installed within a street, right-of-way, easement previously dedicated to and accepted by the City, and recorded in the Records of El Paso County, Colorado. For the Warranty Period, or any extension of the Warranty Period as provided herein ending upon Springs Utilities' final acceptance shown below, the Undersigned agrees that, at its sole cost and responsibility, any such defects or mis-locations of the Facilities must be immediately remedied to Springs Utilities' approval; and that the Undersigned shall schedule such remedies in order to minimize any related service interruptions. The Undersigned agrees that Springs Utilities shall have the right to perform work on the Facilities during the Warranty Period (or any extension of the Warranty Period) in order to protect the Public System or the Facilities, or to minimize any related service interruptions. In the event Springs Utilities performs any such work on the Facilities, the Undersigned shall reimburse Springs Utilities (for its costs to repair, replace or move the Facilities) within 30 days from the date of Springs Utilities' invoice for such costs. For such Warranty Period, the Undersigned further provides the following warranties and representations, both express and implied, regarding the Facilities: (1) Warranty of Merchantability; (2) Fitness For a Particular Purpose; (3) Trade and Usage; (4) Any other warranty provided for by law, and (5) that the condition, safety, suitability, and utility of the Facilities are adequate for their intended purpose.

INDEMNIFICATION

The Undersigned hereby releases Springs Utilities and shall fully protect, defend, discharge, indemnify and hold harmless the City of Colorado Springs, Springs Utilities, Colorado Springs City Council, Utilities Board, and their officers, directors, employees, agents and representatives from and against any and all liability for damages, injuries to the person or property of the Undersigned or any third party, causes of action, demands, or actions of whatsoever kind or nature, including but not limited to, all claims and demands for unpaid labor or material relating to the construction of said Facilities; and further, from and against any other claims, costs and fees (including but not limited to all fees and charges of engineers, architects, attorneys, and other professionals and all court or other dispute resolution costs), losses, damages, causes of action, or liability of any nature arising from, in connection with, or related in any way to the Facilities and to any extent arising from or due to the Undersigned's action(s) or failure(s) to act. The Undersigned's indemnification as stipulated herein shall be in effect for the duration of the Warranty Period or any other warranty for the Facilities, or five years from the Preliminary Acceptance Date, whichever occurs later.

EXTENSION OF WARRANTY

The Undersigned acknowledges and agrees that the correction of any deficient condition of the Facilities including, but not limited to, defects in material or workmanship, or improper horizontal or vertical location of the Facilities, shall be the sole responsibility of the Undersigned during the Warranty Period and shall cause the Warranty Period and all warranty and correction provisions of this Agreement and Bill of Sale to be extended to twelve months from the date such correction is completed by the Undersigned and approved by Springs Utilities, or the end of the original Warranty Period as established by Springs Utilities' Preliminary Acceptance Date herein, whichever occurs later.

COLORADO SPRINGS UTILITIES PRELIMINARY ACCEPTANCE

The above described Facilities have been inspected for adherence to required material and installation standards, and appear to be in compliance with current City Codes and Springs Utilities' Water and/or Wastewater Line Extension and Service Standards in effect at the time the construction plans for the Facilities were approved by Springs Utilities, and all other applicable specifications. Inspection and preliminary acceptance by Springs Utilities shall not waive any of the Undersigned's representations, warranties, or obligations hereunder. Additionally, such inspection and preliminary acceptance shall not constitute a representation by Springs Utilities that the Facilities are properly located and that all potential or real defects have been discovered. A follow-up inspection shall be made on or before 24 months from the Preliminary Acceptance Date, or from any extension of the Warranty Period to determine final acceptability of the Facilities. Correction of any deficient conditions, including but not limited to, defects in materials or workmanship and improper horizontal or vertical location of the Facilities, shall be the sole responsibility of the Undersigned until the expiration of the Warranty Period, including any extension of the Warranty Period.

IN WITNESS WHEREOF, the Undersigned hereto has executed this Agreement and Bill of Sale which shall be effective as of the Preliminary Acceptance Date below.

Corp: _____

(Attach Statement of Authority, unless not applicable)

By: _____

Print name:_____

Title: _____

Contact Phone #:_____

Address: _____ (Street)

_____(City, State, Zip)

STATE OF)
) SS.
COUNTY OF)

The foregoing instrument was acknowledged before me this __ day of _____, 20__,

by: _____ as _____(title) of _____(organization).

Witness my hand and official seal.

My Commission Expires: _____

_____

(SEAL) Notary Public

……

This Agreement and Bill of Sale is agreed and accepted this _____ day of _____, 20__ ("Preliminary Acceptance Date").

Approved: _____Title: _____

Print name: _____

……

COLORADO SPRINGS UTILITIES FINAL ACCEPTANCE

Final Acceptance is effective this _____ day of _____, 20__.

Approved: _____Title: _____

Print name: _____

Approved as to form by the City Attorney's Office-Utilities Division, 10-31-2013

C. Requirements for Reimbursement Request

Requirements for Reimbursement Request

If Colorado Springs Utilities requires a property owner or developer to construct a pipeline larger than that which is needed to serve the proposed development and larger than 12 inches in diameter, or requires the installation of a pressure reducing valve ("PRV"), the Owner/Developer may submit a written request requesting reimbursement or a Recovery Agreement for the qualified portion of such materials. For over-sized pipelines the eligible amount is the difference between 12-inch material, or the size needed to serve the proposed development, and the size actually installed. For PRV's the eligible amount is 100% of the PRV materials. The pipe and vault are the Owner/Developer's responsibility. The written request must be received within 180 days after Final Acceptance in order to ensure consideration. Note: Only the Owner/Developer is reimbursable by Colorado Springs Utilities.

Summary of required documents for reimbursement request

☐ Request for Reimbursement Form

☐ Itemized material list with quantities, sizes and cost for both equivalent 12-inch material and the material actually installed.

☐ Copies of invoices or other documents necessary to confirm prices for the applicable material

☐ Completed W-9 Form (If one has not been previously submitted to Colorado Springs Utilities)

☐ Indemnification Agreement regarding payments to suppliers and contractors signed by the Owner/Developer

Summary of the reimbursement process

The data submitted by the Owner/Developer is compared to the Inspector's records and verified by the "as-built" drawings. A summary is prepared by Colorado Springs Utilities using "as-built" quantities for the reimbursable oversize material and Colorado Springs Utilities' system average cost. The Owner/Developer's cost is compared to Colorado Springs Utilities cost to verify the reasonableness of the requested amount. A 5% handling fee is included along with any additional sales taxes that have been paid.
Colorado Springs Utilities then determines, in its sole discretion, whether the Owner/Developer will receive reimbursement or initiate a Recovery Agreement.
If it is decided to reimburse the Owner/Developer, a request for the approved amount of the reimbursement is forwarded to Colorado Springs Utilities accounting department. A check is then issued to the Owner/Developer listed on the Request for Reimbursement Form.
If it is decided to initiate a Recovery Agreement, a Recovery Agreement will be prepared by Colorado Springs Utilities and sent to the Owner/Developer for execution.
Colorado Springs Utilities is required

D. Request for Reimbursement Form

Request for Reimbursement

Date: _____

Name of Applicant: _____

Phone Number:_____

Project No.:_____

Project Title: _____

Type of reimbursement requested:

- ☐ Oversize pipeline material
- ☐ PRV material inside of a vault

If this request is approved, payment will be made to the Owner/Developer as noted below, and mailed to the following address:

Owner/Developer: _____

Address: _____

_____

_____

E. Indemnification Agreement Form

Indemnification Agreement

In consideration of Colorado Springs Utilities' reimbursement to the undersigned as part of the cost of construction of certain water system facilities described below, the undersigned agrees to indemnify and hold harmless the Colorado Springs Utilities from any and all claims and demands for unpaid labor or material relating to the construction of said facilities. In the event that any legal or equitable action is brought to enforce said claims or demands or to place a mechanic's lien upon the facilities, the undersigned agrees to bear the cost of defense of such claims and demands and to forthwith cause said lien, if any, to be discharged as to the facilities and any affected City property in accordance with the provisions of C.R.S. '73, 38-22-131 and 132.

Project No.: _____
Project description:
_____
_____
_____
_____

Dated the _____ day of _____, 20____

Name: _____
By: _____

F. Request for Removal of Utilities for Demolition or Construction

COLORADO SPRINGS UTILITIES
CUSTOMER CONTRACT ADMINISTRATION
2880 International Cir, Suite 210 • Colorado Springs, CO 80947
Phone (719) 668-8111 Fax (719) 668-8130

Date: _____

REQUEST FOR REMOVAL OF UTILITIES - DEMOLITION OR CONSTRUCTION

Property Address*: _____
**a single application may be submitted for bus shelters, traffic signals or multiple properties of one owner with a separate attachment of additional addresses*

Property Use: Residential ☐ Commercial ☐

Property Owner: _____ Phone: _____

Contractor: _____ Phone: _____

Notify Upon Completion of Utilities Removal: Owner ☐ Contractor ☐

Requested Services for Removal:
- ☐ Electric
- ☐ Transformer
- ☐ Gas
- ☐ Water
- ☐ Wastewater

Notes: _____

The Owner/Agent understands and agrees as follows:

Owner/Agent requests that Colorado Springs Utilities' (Utilities) electric, natural gas, water and/or wastewater services servicing the property be disconnected prior to proposed demolition or construction.

_____ **(the undersigned)** hereby warrants that he/she is the ☐ **Owner** or ☐ **Duly Authorized Agent** of the Owner (either is referred to herein as "Owner/Agent") of the above described property and hereby authorizes Utilities to remove all requested electric, natural gas, water, and/or wastewater services to the above described property and to execute such work as may be necessary to insure the integrity of Utilities' systems and the safety of all concerned. Owner/Agent agrees at his/her expense to meet all Utilities' requirements, including but not limited to those standards and authorized procedures for removal of said utilities. Such standards may be obtained at www.csu.org/business/development services/utility specifications.
(The utility removals are typically completed in 5-10 business days, however, emergency service requirements may affect scheduling.)

ELECTRIC

Commercial Electric Service: After Utilities has disconnected service from Utilities' side of the transformer, the Owner/Agent will have a licensed Electrician remove the Commercial Electric service wires from the secondary bushings at the transformer. This must be performed before any construction or demolition activities to protect the secondary bushings from damage.
Residential Electric Service: Utilities will remove the Residential Electric service wires from the transformer.

NATURAL GAS

Utilities will disconnect and cap the Natural Gas service line at or as close as possible to the property line.

WATER ***(Please check one)***

☐ **Service line to be reused:** If the water service line will be reconnected, Utilities will shut off of the water service line at the curb stop (at or near the property line). Any service reconnection must be in compliance with Utilities' Line Extension and Service Standards.

☐ **Service line not to be reused:** If the water service line is not to be reconnected or reused, then the water service line and tap shall be removed by Owner/Agent back to the water main in accordance with Colorado Springs Utilities' Line Extension & Service Standards for Water. If Utilities is required to remove the service line and tap, Utilities will invoice the Owner for all removal costs and main line repairs on a time and materials basis; and Owner/Agent will pay any such invoice within thirty (30) days of receipt.

WASTEWATER ***(Please check one)***

☐ **Service line to be reused:** If the wastewater service line will be reconnected, Owner/Agent will have a Licensed Excavator remove and cap (water tight) the wastewater service line servicing the property seven (7) feet inside of the property line. A Utilities' Service Line Inspector will inspect the capping of the wastewater service line. Inspection fees will be paid by the Owner/Agent to Utilities in accordance with Colorado Springs Utilities' Tariff. Any service reconnection must be in compliance with Utilities' Line Extension and Service Standards and may require CCTV inspection to confirm the integrity of the service line.

☐ **Service line not to be reused:** If the wastewater service line is not reconnected or reused, then the wastewater service line and tap shall be removed by Owner/Agent back to the wastewater main. If Utilities is required to remove the service line and tap, Utilities will invoice the Owner/Agent for all removal costs and wastewater main line capping on a time and materials basis; and Owner/Agent will pay any such invoice within thirty (30) days of receipt.

GENERAL PROVISIONS

The term "reconnection" as used in this Request for Removal of Utilities applies only when no alterations to the existing service connection points are required either by Owner/Agent or by current Utilities' Line Extension and Service Standards. If for any reason it should become necessary to reinstall or reconnect any of the utility services that have been disconnected pursuant to this Request for Removal of Utilities or

if such services later appear to have been wrongfully removed or discontinued at the Owner/Agent's request, the Owner/Agent agrees to indemnify and hold harmless Colorado Springs Utilities from any and all claims arising from the removal or discontinuance of said services and to promptly reimburse Colorado Springs Utilities for any and all costs or expenses incurred to reinstall or reconnect such services and any other applicable fees. Colorado Springs Utilities shall not be liable for delays in performing its obligations to the extent the delay is caused by an unforeseeable condition beyond its reasonable control without fault or negligence including strikes, riots, wars, floods, fires, explosions, acts of nature, or labor disturbances. This Request for Removal of Utilities is subject to the applicable provisions of the City Charter, City Code, ordinances, rules and regulations of the City of Colorado Springs as amended as well as applicable provisions of Colorado Springs Utilities' Tariff, as now in effect or hereafter amended. The laws of the State of Colorado will govern this Request for Removal and any interpretation or construction thereof. Owner/agent acknowledges that Colorado Springs Utilities is afforded protections of the Colorado Governmental Immunity Act, C.R.S. §24-10-101, *et seq*.

Additional Fees: Owner/Agent understands that there may be additional fees to reconnect utility service to the above described property and will pay any fees required.

Owner/Agent Signature_____ Address _____

State of Colorado)
County of El Paso)

Subscribed and sworn before me this _____ day of _____ 20_____, By _____
(Printed name of owner/agent)

_____ My commission expires: _____
Notary Public

Application may be submitted electronically, by mail or in person.

(For Colorado Springs Utilities Completion)

Premise ID: _____ Bill ID: _____ Fees: _____
Paid ☐ Billed ☐

Additional Information: _____

_____

_____

☐ Electric Service : _____ Date: _____

☐ Natural Gas Service : _____ Date: _____

☐ Water Service : _____ Date: _____
Place of removal: □ Curb stop □Water main

☐ Wastewater Service : _____ Date: _____
Place of removal: □ Capped 7 ft. inside Property Line □Wastewater main

Completed and Customer Contacted: _____ Date: _____

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CHAPTER 3
Submittal Requirements

CHAPTER 3

Submittal Requirements

3.1 General

Plans for construction, repair or retrofitting of Water Mains and Water Service Lines shall be prepared and submitted to Colorado Springs Utilities at Utilities Development Services' office at the Leon Young Service Center, 1521 S. Hancock Expressway, Colorado Springs, CO 80903, or they may be submitted electronically via the website at www.csu.org. All plans submitted shall be in compliance with the guidelines set forth in this Chapter.

Plans for construction include Water Plans and Utility Service Plans. Water Plans are prepared for Water Main extensions and Utility Service Plans are prepared for the Service Lines that connect the Water Main to the Premises. The initial plan submittal shall include the appropriate checklist which shall be signed by the Design Engineer and their applicable staff. The checklists may be obtained from the website at www.csu.org. Contact Utilities Development Services if you have questions or need assistance.

All Water Construction Plans shall be prepared under the supervision of a professional engineer registered in the State of Colorado and each sheet of the final Construction Plans signed and stamped by the same professional engineer. Utility Service Plans do not need to be signed and stamped by a registered professional engineer unless it includes a service line that is 4 inches or larger. The cover sheet of all final Construction Plans shall also be approved and signed by the Owner/Developer, the Colorado Springs Fire Department, and other required signatories prior to approval by Colorado Springs Utilities unless specific signature blocks are required on additional sheets.

No work shall commence on any extensions or services until the plans for construction are approved by Colorado Springs Utilities and copies of the Approved Construction Plans are delivered by the Owner/Developer to the Colorado Springs Utilities Inspections office also located at the Leon Young Service Center.

Construction shall begin within 1 year of the plan approval date or the approval will expire and the plans shall be submitted for re-approval, and must conform to the *Water LESS* in effect at the time of re-submittal. Note that any *Fire Flow Reports* also expire after 1 year and must be updated prior to re-approval.

3.2 Construction Plan Preparation

A. Quality Guidelines

This section sets forth items for the Design Engineer to consider in preparation of Water Plans and Utility Service Plans to ensure an acceptable quality of the submittal.

- The plans should be based on actual field surveys referenced to land corners or other official survey control points and accurate to 1/10 of 1 foot so that the facilities can be accurately staked for installation and can be readily located after installation for maintenance, tapping and control. All elevations shall be referenced to the NGVD '29 datum.

- The plans should be of suitable scale to show all necessary information on a 24 inches X 36 inches size sheet. The preferred scale for all drawings is 1 inch=50 feet horizontal and 1inch =5 feet vertical. Other scales may be used when necessary to adequately show specific details of mains, connections and other facilities.
- The plans should show sufficient adjacent area to provide the relationship of proposed facilities to existing facilities.
- The plans should show necessary details. Detail Drawings, signature blocks, and Plan Notes from these *Water LESS* are available online in AutoCAD downloadable format. Specific Detail Drawings include water line lowerings, pressure regulator stations and water meter schematics. These details can be used for construction clarification and include elevations, distances and construction notes. They may be placed on the drawings or referenced at the applicable locations.
- The plans should be neat, orderly and legible. Information not needed to clarify the design should not be shown on the plans.

B. Required Information

The following information is required to be included on all Construction Plans. Additional detail is listed on the applicable checklist, which shall be utilized to ensure that the submittal contains sufficient information to minimize review times.

- The name of the project, applicable Water Plan Notes or Utility Service Plan Notes and applicable signature blocks, which can be found in Section 3.6. The CSFD Acceptance signature block shall be included, even if no fire hydrants or Fire Service Lines are proposed. The Utility Grade Review signature block shall be included whenever a Water Main is to be installed in a proposed or future city street.
- Vicinity map, Site map, north arrow and scale
- The Colorado Springs Utilities project no. for the Water Main being connected to
- FIMS map number, water pressure zone, maximum static water pressure for the project, the Development Plan number assigned by City Land Use Review (e.g. CPC DP-XXXXX) with its approval date, the applicable plat name with its recordation information, and the Utility Addressing Plan (UAP) number, if applicable. To obtain a UAP number, see Section 3.5. A Plan Information Block is provided in Section 3.6Ffor use by the Design Engineer. It can be edited to meet project-specific needs.
- Property lines, lot numbers and addresses
- Location and dimensions of dedicated streets, alleys, rights-of-way and easements
- The proposed alignment, size and material of the Water Mains to include the location of all appurtenances such as, valves, fire hydrants (including flange elevation), bends, fittings, and high-deflection couplings
- The results of the *Fire Flow Report* to include building data if applicable and the flows and pressures at maximum day demand at each fire hydrant. See Section 3.6C.
- All existing and proposed pavement, curb and gutter, sidewalks and medians
- All existing and proposed utilities, including stormwater mains, to include size, type, and horizontal and vertical location, and the separation of such utilities. Show stationing for all utility crossings in both the plan and profile sections of the

drawings. Colorado Springs Utilities reserves the right to request a pothole of the crossing in the absence of data that reasonably verifies the proposed separation.

- All existing and proposed utility easements with the recordation information
- All existing or proposed surface improvements, including, but not limited to, signs, retaining walls, fences, vaults, catch basins and traffic islands
- PC and PT stations and radius for all curvilinear pipes
- The stations of all valves, fittings and sleeves, whether or not profiles are included
- For submittals with more than 5 sheets, include a "Key Map". The Key Map should show the proposed street layout and proposed street names for the subdivision with the current sheet highlighted.
- If applicable, lay out such that plan and profiles do not overlap or duplicate on continuing sheets. A "MATCH LINE" with a "STA. X+XX.XX" should be placed at the match-line location on both sheets.
- If applicable, include phase lines
- If a Private Water Main is being proposed, ensure that the "private facilities proposed" box is checked in the Owner/Developer signature block. In addition, the Owner/Developer shall execute and record a Notice of Private Water System identifying each platted lot served by the extension and show the reception number on the Water Plan.

C. Profile Guidelines

All Water Mains 12 inches and larger in diameter shall have both plan and profiles submitted as part of the Water Plan set. At the discretion of the Design Engineer, the profile of Water Mains less than 12-inches is optional, unless any of the following conditions exist, in which case a profile is required regardless of the size of the Water Main:

- Slopes greater than 10 percent – where the Water Main is laid with a slope of this magnitude, the Design Engineer will evaluate and establish a design that ensures the system will operate effectively for its life without joint separation or other damage.
- Project Geological Hazards Study denotes Site problems – where a project's Geological Hazards Study identifies unstable Site conditions, the Water Mains may be required to be profiled. The Design Engineer shall design the system to clearly address Site conditions. A copy of the geologic hazards report and/or grading plan shall be submitted with the Construction Plan at the request of Colorado Springs Utilities.
- Lowering of Water Main – profile all Water Main lowerings and half lowerings, including those using high deflection couplings.
- Water Main outside of Right-of-Way – plan and profiles are required for Water Mains that will be located outside public right-of-way or outside paved areas. The plan and profile shall show existing and proposed ground conditions and existing or proposed surface improvements. For short distances (50 feet or less) where the Water Main travels between two paved areas (e.g. parking lots) and there are no grade changes, a profile is not required.
- Dedicated Fire Service Lines – 4 inch and larger Fire Service Lines need to be profiled from the Water Main to the building. The profile must include all bends, both horizontal and vertical.

3.3 Fire Flow Report Process

Prior to approval of a Water Plan by Colorado Springs Utilities, the Design Engineer shall submit a completed *Request a Fire Flow Report* form to waterplanning@csu.org. A description of the process and the form can be found online at www.csu.org. The submittal shall also include a PDF of the current Water Plans and a UDCF as described in Section 3.5 of this chapter. Colorado Springs Utilities will perform the necessary calculations, generate a Fire Flow Report, and provide a copy to the Design Engineer.

The Fire Flow Report provided to the Design Engineer shall be used to complete the necessary information on the Water Plan. If additional copies of the report are required as part of the plan approval process with Regional Building or Colorado Springs Fire Department, the Design Engineer shall provide copies of the report. The Fire Flow Report is good for one year from the date of issue. Colorado Springs Utilities will complete a total of 2 fire flow reports for the same address or project within a 1-year period. More than 2 requests for Fire Flow Reports for the same address or project within the 1-year period will result in the charges outlined in *Utilities Rules and Regulations*.

The Design Engineer can submit the Fire Flow Request at any time during the project. Colorado Springs Utilities reserves the right to reject any Fire Flow Request if adequate information is not supplied with the request.

3.4 FIMS Maps

FIMS maps may be utilized to identify the general location of water, gas, electric, and wastewater pipes and appurtenances. These maps are for information only and are not to be used for design purposes. Maps may be obtained from Colorado Springs Utilities through its website at www.csu.org.

A service area map can be obtained from the Colorado Springs Utilities website at www.csu.org. Specific questions regarding utility service should be directed to Utilities Development Services.

3.5 Utilities Addressing Plan and Utilities Design CAD File

There are two types of support documents universal to all service extensions: the Utilities Addressing Plan (UAP) and the Utilities Design CAD File (UDCF). Depending upon the nature and timing of the project, a UAP and/or a UDCF may need to be submitted as part of the flow of information to Colorado Springs Utilities in support of the design or review of the proposed utility infrastructure. The following sections describe each item in detail.

A. Utilities Addressing Plan

Colorado Springs Utilities/Land Base Services (LBS) uses the UAP to obtain addressing from the Enumerator's office of the Regional Building Department (RBD) for the lots in the project. LBS will create lot geometry and address pointers for the lots. The FIMS address data is then synchronized with the Colorado Springs Utilities' Customer systems database.

1. Conditions Requiring a Utilities Addressing Plan

A UAP is required anytime an application for extension of electric, gas, Water or Wastewater Mains and/or service lines to a parcel of land is made and any of the following conditions apply:

- the parcel has not been platted,
- the parcel does not have assigned addressing in place as of the date of the request,
- the parcel has an existing recorded plat in place, but the parcel geometry will be modified as part of a land development process and has not yet been re-platted,
- an approved UAP exists, but changes have been made (or are proposed) to the geometry of the development which alters the lot or street configuration of the development, or
- the proposed development activity will in any way change approved addressing on the parcel.

2. Utilities Addressing Plan Submittal

The UAP can be submitted either in hardcopy or electronic format. Hardcopy submittals must be delivered to 1521 Hancock Expressway, Attention: Land Base Services, MC 1812, Colorado Springs, CO. 80903. The Utilities Addressing Plan must be submitted at least 7 business days prior to a request for service. Requests for service may be submitted concurrently with the Utilities Addressing Plan, but will not be acted upon until after the Utilities Addressing Plan has been processed.

The Utility Addressing Plan Checklist and Submittal Form can be found in Section 3.6. A subdivision plat prepared as per the City of Colorado Springs specifications will suffice as a UAP submittal. Although a preliminary version of the plat is acceptable for the UAP, fictitious, incomplete or erroneous plat geometry is not. LBS needs complete dimensioning information on the UAP to calculate coordinate geometry on the boundary, the rights of way and the lots/tracts. LBS will refer errors back to the submitter for correction before completing the UAP.

A revised Utilities Addressing Plan must be submitted whenever dimensions or addresses are revised. To expedite processing Digital UAP submittals are preferred using the website www.csu.org. A receipt will be emailed to the User once a submittal is made online. The receipt will include the Utilities Addressing Plan Identification Number which is required for any request for service. Upon successful completion of LBS processing, a second email notification will be sent and all addressing will be available for service requests.

A digital submission consists of an AutoCAD drawing (.dwg) file with a layout for each sheet containing all necessary model and paper space elements. All dimensional data shall use AutoCAD Drawing Units of:

- Length: Decimal (Precision: 0.00)
- Angle: Surveyor's Units (Precision: N 0d00'00" E)
- Insertion Scale: Unitless

For information or assistance in performing online UAP submittal, contact LBS.

B. Utilities Design CAD File

The Utilities Design CAD File (UDCF) is an AutoCAD drawing (.dwg) file that contains specific point, line and text features related to the design and analysis of new utility lines in proposed land developments and public works projects.

1. Conditions Requiring a Utilities Design CAD File

A UDCF shall be submitted on all projects which meet the following criteria:

- single-family residential projects requiring new Right-of-Way or street design
- mobile home parks, multifamily residential developments, commercial or industrial projects
- public works projects requiring utility design or relocation

2. Purpose of the Utilities Design CAD File

The UDCF will be used by:

- the water system planners to do pressure zone modeling and fire flow reporting,
- the gas and electric system designers as a background environment to support their system extension design, and
- LBS, at its discretion, to update base mapping.

The Customer/submitter is responsible for ensuring the project data supplied to Colorado Springs Utilities is current through all of the project design phases. If Colorado Springs Utilities does not have the most up to date version of project data, the construction schedule could be negatively impacted. The Customer/submitter consents to Colorado Springs Utilities' use of the electronic data being used to update FIMS base mapping. Colorado Springs Utilities acknowledges the Customer/submitter has no responsibility for the accuracy or completeness of the data in the "as-built" stage of the project.

3. Utilities Design CAD File Submittal

A UDCF must be submitted to Colorado Springs Utilities prior to or concurrent with any application for water or wastewater plan review or service extension design is initiated. The file can be submitted via the Internet (see www.csu.org) or directly to LBS 1521 Hancock Expressway, Attention: Land Base Services, Mail Code 1812, Colorado Springs, CO. 80903) complete with the submittal form (see Section 3.6L).

The digital file submittal must contain the appropriate data to perform CAD based system design and analysis on new service system extensions (see Utility Design CAD File Recommended Feature Data in Section 3.6M). Residential projects contain most of the features on the Water Construction Plan. Commercial, multifamily and industrial projects include the features from the Utility Service Plan.

The submitted.dwg file must contain all applicable feature elements listed in Section 3.6M. Feature elements must be in model space. No XREF data links are allowed. XREF files need tobe bound to a single file. Multiple zipped files will not be accepted.

The features shall be placed on separate layers. The processing of the file, as well as gas and electric design work based on that file, can be expedited if the layer organization delineated in Utility Design CAD File Recommended Feature Data in Section 3.6M is followed; however, this is not a requirement. Residential subdivision projects shall include pertinent elements checked under the "Residential" column. All other development types (commercial, multifamily

residential, industrial and mobile home parks, public works and state highway) shall require that the CAD file include pertinent feature types checked under the column titled “All Others”. On residential projects, the UDCF will contain the same feature data as the water service plan and on commercial and multifamily projects the UDCF will contain the same feature data as the Site plan or the Site/utility plan.

LBS will contact the submitting agent to resolve any issues. Ultimately, the Customer is responsible for the content of the file. Missing or inaccurate data may affect the timing of design or construction schedules. The Customer will be responsible for submitting an amended file should any of the project’s feature details change after the time of the initial submittal but prior to completion of the use of the data by water, gas, and electric designers. The online application was designed to make iterative resubmission of data more convenient for the Colorado Springs Utilities Customers.

When a CAD file is not generated by the Design Engineer a hard copy plan shall be submitted showing the same level of detail as described above. Additional time will be required to process hard copy plans as system designers will have to spend time manually digitizing key features to complete their work.