



Colorado Springs Utilities
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WATER MAIN CONSTRUCTION PLAN CHECKLIST

Complete this checklist for all water mains 4" and submit with initial construction plans to Utilities Development Services construction [review portal](#).

- A. Cover Sheet General Requirements
- B. Plan
- C. Profile

PROJECT NAME:

IMPORTANT NOTES, read carefully:

- Additional design requirements not included in this checklist can be found in the Water Line Extension and Service Standards.
[Water Line Extension and Service Standards \("Water LESS"\)](#)
- Call-outs are required. Keynote legends may be lightly used if approved by reviewer.
- Combine entire project set (W, S, USP) into one digital file and also combine checklists into their own digital file.
- Plan set digital files, after combining, must be below 18MB. For review and inspection efficiency, **DOWNSIZE ALL** plan set files keeping each individual page less than 1MB.
- Final UDCF file is required to be resubmitted to GIS Mapping Services before UDS plan reviewer signature. For coordinate system requirements per Colorado Springs Utilities Standards, utilize CO State Plane Coordinate system, Central Zone, North American Datum of 1983 (NAD 83/86), using the National Geodetic Vertical Datum of 1929 (NGVD 1929). Upload UDCF to the [resubmittal portal](#). Title digital file with your project's title from plan cover sheet.

A. Cover Sheet General Requirements - By completing this checklist you are required to have a water mainline plan set with its own coversheet. Exceptions must be approved by Utilities Development Services staff.

A N/A

- 1) Use 24" X 36" format.
- 2) Show north arrow and scale. Choose scale (approximately 1" = 50') to properly show details.
- 3) Include site map.
- 4) Include vicinity map.
- 5) Include title of project.
- 6) Provide addresses and lot numbers for all lots/buildings.
- 7) If multi-family, label as townhomes, apartments, duplexes or condominiums.
- 8) Show typical street cross section(s) showing all existing and proposed utilities with required separations. See Water LESS A3 Detail Drawings.
- 9) Add Owner/Developer signature block to cover sheet only. See Water LESS 3.6.B.
- 10) Include signature block on cover sheet for professional engineer registered in the state of Colorado.
- 11) Add CSU Signature block for Water Plan Approval. See Water LESS 3.6.A.
- 12) If plan includes fire hydrants or fire service lines, add CSFD Signature Block to cover sheet only. Add fire service line integrity test block if applicable. Fire service lines 4" must be shown on water mainline plans. See Water LESS 3.6.D.
- 13) Add standard Water Plan Notes, including Water Project Specific Notes. See Water LESS 3.6.G.
- 14) Include Fire Flow information if applicable (Building Data and Fire Flow). See Water LESS 3.6.C.
- 15) Utilize Plan Information Block detailed in Water LESS 3.6.F
 - a. FIMs map number (<https://www.csu.org/Pages/GISMapping.aspx>)
 - b. Tax Schedule number
 - c. Water pressure zone
 - d. Max static pressure (see Fire Flow Report and calculate the max static pressure)
 - e. Utility Design CAD file number
 - f. UAP file number or plat reception number
 - g. Development Plan number and date of approval
 - h. Notice of Private Water System reception number

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- 16) If proposing a private system, provide a copy of the Notice of Private Water System. See Water LESS 3.2.B.
- 17) Provide an Agreement and Bill of Sale signed by the Owner/Developer prior to approval of the construction plans. Note: Bill of Sale is required for fire lines 4" when connecting to existing public water mains.

B. Plan

Annotation:

- 1) Text call-outs are required, no symbol legends allowed.
- 2) Show and label all existing utilities including gas and electric.
 - a. Include diameter and material for water, wastewater and storm sewer. Indicate as public or private.
 - b. Label Colorado Springs Utilities Project Number for existing water and wastewater mains to which connections are proposed.
 - c. Label all existing valves and fire hydrants. If public, include numbers.
 - d. View information at <https://www.csu.org/Pages/GISMapping.aspx>. If you still need help contact Infrastructure Records at (719) 668-4426 for "as-builts" and FIMS maps, and City Engineering at (719) 385-5402 for existing storm sewer plans.
- 3) Label existing and proposed rights of way and/or easements with reception number and widths.
- 4) Label street names (note if private).
- 5) Label subdivision boundaries and adjacent filings.
- 6) Label phase lines.
- 7) Label match lines with stations and corresponding sheet numbers.
- 8) Label all existing and proposed pavement, curb and gutter, sidewalks and medians.
- 9) Label all existing or proposed surface improvements, including but not limited to signs, retaining walls, fences, water quality features, etc.
- 10) Label all proposed water mains with diameter and material. Note: all pipe segments must have lengths provided. Label all mains as public or private.
- 11) Label secondary valves and include CRA in construction note.
- 12) Label all horizontal and vertical bends and size.
- 13) Show anode size, test station, and location. CSU provides corrosion design on all proposed DIP/steel mains.
- 14) Label size of all reducers.
- 15) Label curve data including PC's and PT's with stations and label radius.
- 16) Show stations for all fittings.
- 17) Show stations for all crossings.
- 18) Show stations for all commercial service connections.
- 19) Label all CTRB's and CRA's (provide size in cubic yards).
- 20) MJ restraints are always required and CTRB's are required when necessary at all fittings. See Water LESS 2.6.G.

General:

- 21) Isolation valves must be installed a minimum of one every 600'. See Water LESS 2.6.G.8.
- 22) No connections allowed between connection to public system and secondary valves.
- 23) A maximum of 50 single family dwelling units allowed on a dead end main. System must be looped if more than 50 services on a single feed water line. Water Less 2.6.E.4
- 24) As determined by CSU, permanent and temporary dead end mains require a water quality device. See Water LESS Detail Drawing A2-3.
- 25) Ensure easements are adequate. See Water LESS 2.6.F.

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- 26) Outage modeling required for shut down of water mains 16" diameter. See Water LESS 2.6.D.2.
- 27) Mains 30" require DIP or steel. See Water LESS 2.6.C.
- 28) 30" minimum spacer pipe between fittings. See Water LESS Detail Drawing A4-5.
- 29) For joint deflection criteria, see Water LESS Detail Drawing A4-1.
- 30) A maximum of 4 degrees deflection at a fitting, 2 degrees in and 2 degrees out .
- 31) Water lines should be located on the north or east side of the street.
- 32) Provide calculation sheets for all CRA's and CTRB's for water mains >16", label volume and dimensions.

Abandonment:

- 33) Label pipe either to be abandoned in-place or to be removed per CSU standards. Also label length.
(Demo sheet may be required.) Note, existing pipes within proposed building footprint must be removed.

Stub-outs:

- 34) Stub-outs must be designed per Water LESS Detail Drawing A2-3

Separations:

- 35) Label horizontal distance from proposed water line to other utilities and verify that it meets required separation. See Water LESS 2.6.G.3.
- 36) If horizontal separation is not met, use secondary containment options detailed in Water LESS 2.6.G.2.
- 37) Label all utility vertical crossings. Indicate pipe elevations at crossings and maintain separations per Water LESS 2.6.G.4.
- 38) If vertical separation is not met, use secondary containment options detailed in Water LESS 2.6.H.2.
- 39) Refer to Water LESS Detail Drawings A7-1 through A7-4 for crossings underneath other utilities and structures.
- 40) Verify that the water main is located in roadways, in drive aisles of any parking areas, and at a minimum 15 feet from the edge of the easement, tree, structure or building.

Restraints:

- 41) For PVC and DIP pipe sloped at 10%, install MJ restrained pipe and add CRA's at top and bottom of slope. See Water LESS Detail Drawing A4-6.

Casing Pipes:

A N/A

- 42) Steel casing pipes need to be approximately 1.5 to 2 times the diameter of the proposed water line (as determined by the Design Engineer). See Water LESS Detail Drawing A7-2, A7-3 and A7-4.
- 43) Ensure no taps or tees are proposed at casing pipe locations or within lowerings.
- 44) Show casing pipe if water main is under another utility greater than 30" in diameter.
See Water LESS Detail Drawings A7-2 and A7-3.
- 45) Station begin/end points.

Pressure Regulator Stations/Air & Vacuum Valve Stations:

- 46) If crossing pressure zones, a pressure regulator station is required.
- 47) Show detail for all pressure regulator stations on construction drawings.
See Water LESS Detail Drawings A6-3 & A6-4.
- 48) Show detail for all air vacuum valve stations and vent locations on construction drawings
See Water LESS Detail Drawing A6-10.
- 49) Profile all pressure regulator stations. See Water LESS Detail Drawings A6-3 & A6-4.
- 50) Profile all air & vacuum valve stations. Show vents on plan view.
See Water LESS Detail Drawing A6-10.

Fire Hydrants:

- 51) Hydrant design notes shall include: station and offset, node label, flange elevation, bury depth and fire flow (GPM). Verify flange elevation max of 4" above final grade. All hydrant information must be included in single call-out.

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Fire Hydrants continued:

- 52) No horizontal or vertical bends allowed on hydrant laterals, except for offsets as shown on Water LESS Detail Drawing A5-3.
- 53) No taps allowed on hydrant laterals.
- 54) Show bollards if required. See Water LESS Detail Drawing A5-4.
- 55) All hydrant laterals must be restrained. See Water LESS Detail Drawing A5-3.
- 56) Show and label FDC (hydrant required within 100' of FDC).
- 57) Maximum 2' behind curb and/or sidewalk.
- 58) Reference easement criteria for hydrants. See Water LESS 2.6.F.

Roundabouts/Medians:

- 59) Verify water mains installed in a roundabout or median are in a casing pipe.
See Water LESS Detail Drawings A7-10 & A7-11.
- 60) Show service taps located 15' outside of roundabout or median. See Water LESS 2.6.H.6.

C. Profile

Note: The following items are to be used in conjunction with the above Water Plan checklist when designing Plan and Profiles.

- 1) Choose scale to properly show details. Minimum 1" = 50' horizontal; 1" = 5' vertical.
- 2) Profiles required for mains >12" and fire lines ≥4".
- 3) Profiles required when slopes >10%, if in geological hazard area, if water main lowering present, and when the water main is outside of ROW or paved areas.
- 4) Show profile grid stations and elevations.
- 5) Stations on profile and plan view must match.
- 6) Label existing and proposed grades.
- 7) Label length, diameter, material, and slope of all pipe segments.
- 8) Label all proposed horizontal and vertical bends with elevations.
- 9) Label all valves (note: butterfly valves required on mains >16").
- 10) Show profile grid elevations.
- 11) Plan and profile views must be on the same sheet if possible.

Signatures of engineering firm:

Plan drawn by:

Date:

Plan reviewed by:

Date: