



Water & Wastewater Construction Plan Checklist

Complete the following checklist for all water and wastewater mains and submit with construction plan submittals.

- A. General Requirements
- B. Water Plan
- C. Wastewater Plan
- D. Separations
- E. Profile

PROJECT INFORMATION

Date:	
Project Name:	

NOTE: Additional design requirements not included in the following checklist can be found in Appendix C & D of Eagle River Water & Sanitation Rules & Regulations (ERWSD).

Check (X) if completed; or (N/A) if not applicable

A. General Requirements

1. Format:

	Use 24" x 36" format.
	Include an updated date on each submittal

2. Site Information:

	Show north arrow on all applicable sheets.
	Show the scale for all plan views (conform to a scale of 1" = 20').
	Include a vicinity map.
	Include title of the project.
	Provide addresses and lot numbers for all lots/buildings.
	Label multi-family structures as townhomes, apartments, duplexes, or condominiums.

3. Signatures:

	Include the Owner/Developer signature block on the cover sheet.
	Include stamped signature block on each sheet signed by a professional engineer registered in Colorado.
	Include Fire Department signature block on the cover sheet if the plan includes fire hydrants or fire service lines.

4. Plan Notes:

	Add standard Water Plan Notes, including water project specific notes.
	Add standard Wastewater Plan Notes, including wastewater project specific notes.

5. Fire Flow Information:

	Include fire flow data (building data and fire flow calculations).
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6. Existing Utilities:

	Show and label all existing utilities (water, wastewater, gas, communications, electric, storm sewer).
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	Label diameter and material for existing water, wastewater, and storm sewer pipes.
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	Label existing water and wastewater as public or private.
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7. Easements:

	Label existing and proposed rights of way and/or easements with reception numbers and widths.
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	For easements on outside properties, provide written consent and proof of approval for a temporary construction easement.
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	Show easements for all public water and wastewater infrastructure.
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	All hydrants must have 10-foot easements around them.
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	Minimum 20-foot easements around water mains.
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	Minimum 20-foot easements around wastewater mains.
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	Check all sheets for encroachments into existing or proposed easements.
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	Easement encroachment applications must be initiated before construction plan approval.
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8. Additional Labels:

	Label street names (note if private).
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	Label subdivision boundaries and adjacent filings with parcel numbers.
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	Label and show all existing or proposed surface improvements, including buildings, signs, retaining walls, fences, water quality features, etc.
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	Label all existing and proposed pavement, curb and gutter, sidewalks, and medians.
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	Label all existing valves and fire hydrants with district numbering (contact ERWSD for information).
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	Label match lines with stations and corresponding sheet numbers.
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	Label phase lines if the project is split into multiple phases.
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9. Geotechnical Report:

	Submit a report with the information on the corrosivity of native soils.
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	Corrosive Soils: If mitigation is required, show anode size, test station, and location.
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	Submit a report with the information on groundwater levels.
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10. Abandonments:

	Label pipes as abandoned in-place or removed. Include a label denoting the length.
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11. Details:

	Include all applicable ERWSD details.
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12. Stub-Outs:

	Stub-outs must be designed per Appendix C.
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13. Structure Distance:

	Verify that water or wastewater mains are a minimum of 10 feet away from any structure.
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14. Tracer Wire:

	Provide Tracer Wire Plan.
15. Ownership:	
	Distinguish proposed infrastructure as public or private
B. Water Plan	
1. Size:	
	Minimum 8"
2. Depth of Bury:	
	Minimum: 7 feet
	Maximum: 9.5 feet
3. Materials:	
	Ductile Iron Pipe
	Steel Pipe (for high pressure applications)
	HDPE Pipe (for corrosive soil applications)
4. Labeling (Curb Stops, Thrust Blocks, Deflections with degree or angle):	
	Station
	Elevation
	Type
5. Fire Hydrant Labels:	
	Station
	Offset
	Breakable Flange Elevation
	Depth of Bury
	Type
6. Fire Hydrant Laterals:	
	No horizontal or vertical bends allowed on hydrant laterals.
	No taps allowed on hydrant laterals between the guard valve and hydrant.
	Show bollards if required.
	All hydrant laterals shall be restrained.
	Hydrant laterals must be less than 50 feet in length.
	Ensure guard valves are 5+ feet from hydrant
	Verify hydrant flange elevations are above finished grade.
7. Service Lines:	
	Must have an application and be size shall be verified by ERWSD based on water demand.
8. Line Valves:	
	Line valves must be installed at a minimum of once every 1,000 feet.
	Line valves must be on every leg of a tee
9. Restraints:	
	Provide thrust restraint calculations or sizes at all fittings and show thrust block.

	Mechanical joint restraints must be used in conjunction with thrust blocks at all bends and fittings
	All fill conditions require mechanical or internal joint restraints
	Joint restraints shall be used on all change of direction fittings
	For DIP pipe sloped at $\geq 20\%$, install anchor blocks, joint restraints, and cutoff collars. Refer to Standard Detail C-10 in Appendix C.
10. Irrigation Plan	
	Irrigation connection is shown
	Meter Pit is shown (if applicable)
	Irrigation plan is shown
11. Additional:	
	Verify dead-end water mains have a water quality device.
	Ensure there is a minimum of an 18-inch spacer pipe between fittings.
	High points of water mains require air vacuum valves per Appendix C.
	Cathodic protection and insulation are required between the connection of dissimilar materials.
	Ensure no taps or fittings are proposed at casing pipe locations.
C. Wastewater Plan Review	
1. Size:	
	Minimum 8"
2. Depth of Bury:	
	Minimum: 4.5 feet
	Maximum: 14 feet
	Between 10–14.5 feet: SDR 26.
	No connections with bury depths less than 3 feet.
3. Materials:	
	8" to 15": PVC SDR 35 or SDR 26
	18" to 27": SDR 26
	Bury depths greater than 10 feet require SDR 26
	Alternative options: Yelomine, C-909, or DIP
4. Labeling (Stream Crossings, Deflections with degree or angle):	
	Station
	Elevation
5. Labeling (Manholes):	
	District Numbering
	Station
	Rim elevation
	Invert elevations
	Drop connections
6. Labeling (Service Lines):	
	Size

	Material
	Cleanouts
	Station on main
7. General:	
	Restrained joints are required on mains with slopes greater than 20%.
	Verify minimum and maximum slopes (see Appendix D).
8. Manholes:	
	Located at the end of every wastewater main.
	Located a maximum of 400 feet apart on wastewater mains.
	Located at all changes in size, grade, material, horizontal or vertical alignment.
	Located at all intersections.
	Minimum 0.2' drop between inverts required.
	Bar screen manholes required for slopes greater than 10%.
	For mains over 18" in diameter, access openings must be 36 inches.
	Consistent materials between manholes are required
9. Manhole Lids:	
	Must be outside of vehicle wheel paths.
	Must be outside of areas where surface water can accumulate (drainage paths, ditches, floodplains, low spots, holes, etc.).
	Minimum 3 feet clearance from the rim to any surface obstruction (walls, structures).
	Clearances must be level
10. Drop Manholes:	
	Internal drops are not permitted.
	External drops shall be approved on a case-by-case basis (located where a main enters the manhole 24" or more above the invert).
11. Maintenance Access:	
	Vehicular access required for all mains.
	Access benches must be at least 12 feet wide with a centerline grade of no more than 10% and a cross slope of no more than 6%.
	Turnarounds required at dead-end mains.
12. High Ground Water Installations:	
	Consider Groundwater barriers (Standard Detail D-07).
	Consider C-900 or Yelomine pressure-rated piping.
	Design to prevent flotation of the main.
	Consider High groundwater manholes (Standard Detail D-07).
13. Bypass Pumping Plan:	
	A bypass pumping plan shall be included. (if applicable)
14. Fats Oils and Grease Plan:	
	Mitigation shown on plans (interceptor or other if applicable)

15. Services/ Stub outs:

Minimum size: 4".

Factory Wye required.

D. Separations**1. Horizontal Separation:**

A 10-foot separation between potable and non-potable pipes when running parallel is required.

Label horizontal distance from proposed water lines to other utilities and verify separation compliance.

2. Secondary Containment:

If horizontal separation is not met, use secondary containment options from Appendix D.

3. Vertical Separation:

Label all utility vertical crossings. Indicate pipe elevations at crossings and maintain minimum 18" separations.

4. Vertical Separation (if not met):

If vertical separation is not met, use secondary containment options as per Appendix D.

5. Insulation:

Required when cold air sources (storm sewer or ground surface) are within 7 feet of water pipes

Required when cold air sources (storm sewer or ground surface) are within 4.5 feet of wastewater pipes

1" of insulation per foot of cover less than 4.5 feet for wastewater pipes

1" of insulation per foot of cover less than 7 feet for water pipes

E. Profiles

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

1. General:

Show the horizontal and vertical scale

Depths of bury called out

Separations between utilities called out

Other utilities shown

Insulation shown

Secondary containment shown

Label existing and proposed grades

2. Labeling (Pipes):

Length

Diameter

Material

Class

Slope

3. Labeling (Type, Size and Station):

	Horizontal bends
	Vertical bends
	Reducers
	Valves
	Fittings
	Curb Stops
	Thrust blocks
	Elbows
	Deflections
	Service Lines
	Label all proposed mains as Public or Private.
Add any project related comments below:	

SIGNATURES OF ENGINEERING FIRM:

Plan drawn by signature:

Plan drawn by (print name):

Plan reviewed by signature:

Plan reviewed by (print name):

ERWSD Standard Plan Notes

1. All materials, workmanship, and construction shall meet or exceed the standards and specifications set forth in the Eagle River Water and Sanitation District Rules and Regulations. Where there is conflict between these plans and the Rules and Regulations or any applicable standards, the more stringent standard shall apply. All work shall be inspected and approved by the ERWSD Inspector.
2. The contractor shall schedule a mandatory pre-construction meeting at the construction site a minimum of three (3) business days after the plans have been submitted. Participants shall include but are not limited to the Applicant, contractor, excavator, engineer, and the district representative. Construction may begin once the meeting has concluded, and the ERWSD Inspector has signed off.
3. The contractor shall have one (1) signed copy of the approved plans, one (1) copy of the appropriate criteria and specifications, and a copy of any permits and extension agreements needed for the job onsite at all times.
4. The contractor shall provide a complete bill of materials for all proposed water and wastewater infrastructure.
5. The contractor shall be responsible for all aspects of safety including, but not limited to, excavation, trenching, shoring, traffic control, and security.
6. If during the construction process conditions are encountered which could indicate a situation that is not identified in the plans or specifications, the contractor shall contact the ERWSD Inspector immediately.
7. The contractor shall submit traffic control plans as approved by the appropriate governing agency.
8. The contractor is responsible for providing all labor and materials necessary for the completion of the intended improvements shown on the drawings or as designated to be provided, installed, or constructed unless specifically noted otherwise.
9. The contractor shall be responsible for recording as-built information on a set of record drawings kept on the construction site and available to the ERWSD Inspector at all times. All as-built information shall be field surveyed under the direct care and supervision of a licensed Professional Land Surveyor.
10. The contractor shall obtain locates prior to any excavation.
11. The contractor is responsible for any damage to any utility facilities as a result of their actions. The contractor shall make the required repairs immediately to the satisfaction of the affected utility.
12. Eagle River Water and Sanitation District does not guarantee the accuracy of the locations of existing pipelines, manholes, hydrants, valves and service lines. If field conditions are found to be different than shown on the plans, the contractor shall notify the inspector and design engineer immediately.
13. All trenching and backfill shall be in accordance with Appendix E of the ERWSD Rules and Regulations.

ERWSD Water Main Plan Notes

1. All water main construction is subject to the most recently adopted ERWSD Rules and Regulations.
2. Water mains shall be a minimum of 8 inches in diameter, with the exception of fire hydrant laterals.
3. Water mains shall be installed with a minimum of 7 feet of cover and a maximum of 9.5 feet of cover to the top of pipe.
4. Pipe deflections shall not exceed pipe manufacturers maximum allowable deflection or values in ERWSD Rules and Regulations Appendix C- 2.6.9 Table C-1.
5. Ductile iron pipe water mains shall be encased in PE Wrap per ERWSD Rules and regulations Article C-3.2.9
6. Water mains shall have tracer wire installed meeting ERWSD requirements per ERWSD Rules and Regulations Appendix E-1.12
7. Water mains shall have water specific marking tape installed 24 inches above the water main.
8. Water mains shall be bedded per ERWSD Rules and Regulations Appendix E, Detail E-01.
9. Water mains parallel to non-potable water shall be installed a minimum of 10 feet away horizontally.
10. Water mains shall be tested in accordance with ERWSD Rules and Regulations Article 9.3.3.

ERWSD Water Service Line Plan Notes

1. All water service line construction is subject to the most recently adopted ERWSD Rules and Regulations.
2. Each individually metered unit shall have its own independent water service line.
3. Residential water service lines should be 1 inch, 1.5 inches, or 2 inches, designed not to exceed a velocity of 10 ft/sec, and approved by the District Plan Review Engineer.
4. Water service lines shall be constructed along the shortest and straightest route possible.
5. Water service line taps shall be a minimum of 18 inches apart.
6. Prior to a new tap, any and all existing water service line stub outs shall be abandoned per ERWSD Rules and Regulations Appendix B-2.11.
7. Water service lines that are 1 inch through 2 inch shall be copper or polyethylene and all water service lines 4 inches or greater shall be ductile iron. All materials must meet the requirements in ERWSD Rules and Regulations Appendix -B 2.1
8. Water service line curb stops shall be located within 1 foot of the property line, edge of ROW or edge of easement (whichever is closest to the water main).
9. Water service lines shall be installed with a minimum cover of 7 feet and a maximum cover of 9.5 feet to the top of the pipe.
10. Water service lines must be installed with tracer wire per ERWSD Rules and Regulations Appendix E-1.12.
11. Water service lines parallel to non-potable water shall be installed a minimum of 10 feet away horizontally.
12. Refer to ERWSD Rules and Regulations Appendix B section 2.3 for requirements at all crossings with non-potable water.

ERWSD Wastewater Main Plan Notes

1. All wastewater main construction is subject to the most recently adopted ERWSD Rules and Regulations.
2. Wastewater mains shall be a minimum of 8 inches in diameter.
3. Wastewater mains shall be installed with a minimum cover of 4.5 feet and a maximum cover of 14 feet to the top of the pipe.
4. Wastewater mains shall have tracer wire installed per ERWSD Rules and Regulations Appendix E1.12.
5. Wastewater mains shall be bedded per ERWSD Rules and Regulations Appendix E, Detail E-01.
6. Wastewater mains shall be installed a minimum of 10 feet horizontally away from potable water.
7. Wastewater mains must be tested in accordance with ERWSD Rules and Regulations Article 9.3.3.

ERWSD Wastewater Service Line Plan Notes

1. All wastewater service line construction is subject to the most recently adopted ERWSD Rules and Regulations.
2. Each individually metered unit shall have its own independent wastewater service line.
3. Wastewater service lines shall be constructed along the shortest and straightest route possible.
4. Wastewater service lines shall have a clean out within 3 feet of the structure, every 100 feet, and at every change of direction greater than 45 degrees. Clean outs shall be placed outside the ROW whenever possible.
5. Wastewater service line connections shall be a minimum of 18 inches apart, shall be no closer than 10 feet outside of a manhole and shall be made with a wye.
6. Wastewater service lines shall be PVC and meet the requirements in ERWSD Rules and Regulations Appendix B 3.1.
7. Wastewater service lines shall be installed with a minimum cover of 4.5 feet and a maximum cover of 13 feet to the top of the pipe.
8. Wastewater service lines shall be installed with tracer wire per ERWSD Rules and Regulations Appendix E 1.12.
9. Wastewater service lines parallel to potable water shall be installed a minimum of 10 feet away horizontally.
10. Refer to ERWSD Rules and Regulations Appendix B section 2.3 for requirements at crossings with potable water.

As-Built Requirements

See ERWSD Rules and Regulations Section 9.4

Name of person submitting:

Date on submitted drawings:

Overall

Right of Ways

All right of ways shown (including adjacent right of ways)
Labeled with Eagle County recording information

Easements

Labeled with Eagle County recording information

Property Boundaries

Labeled with Eagle County recording information

Abandoned Water and/or Wastewater System Infrastructure

Greyed out

Labeled as “abandoned in place” or “abandoned and removed”

Date of abandonment

Pipe material

Details shall be included where abandoned mains or services are within a
20-foot radius of any water system valves

Different Drawings (Water, Sewer, Easements)

Water

Sewer

Easements

Water Infrastructure

Water Mains

- Diameter
- Length
- Material
- Insulation (if applicable)
- Private or Public

Water Services

- Tap location (X,Y,Z state planes coordinates)
- Diameter
- Length
- Material
- Insulation (if applicable)

Fittings

- Type
- Diameter
- Material
- XYZ state planes coordinate

Thrust Blocks

- Size

Fire Hydrants

- Type
- Flange elevation
- Lateral invert elevation
- Extensions (if applicable)
- Ownership status (private or public)
- X,Y state planes coordinate

Valves (including curb stops)

- Size
- Type
- X,Y,Z state planes coordinate

Water Infrastructure Cont.

Vaults and Other Appurtenances

Vault information

Type

Lid X,Y,Z state planes coordinate

Extent of below-grade structure

Existing Water Mains and Existing Water Services

Shown and labeled as “existing”

Crossings

Storm crossings

Other utility crossings

Details (include all appurtenant details)

Wastewater Infrastructure

Sewer Mains

- Diameter
- Length
- Material
- Slope
- Secondary containment (if applicable)
- Insulation (if applicable)
- Ownership status (private or public)

Sewer Services

- Tap location (X,Y,Z state planes coordinate)
- Diameter
- Material
- Length
- Insulation (if applicable)
- Stub out at distal end (X,Y,Z state planes coordinate)
- Cleanouts X,Y state planes coordinate

Manholes

- Diameter
- Type
- Rim elevation
- Invert elevations
- Lid location (X,Y state planes coordinate)

Crossings

- Storm crossings (location)
- Other utility crossings (location)
- Details (include appurtenant details)

FOG Infrastructure

Grease Interceptor

Size

X,Y state planes coordinates

Inspection Pit

X,Y state planes coordinates

Rim elevation

Invert elevations

Service Line

Diameter

Length

Material

Cleanouts