



**Colorado Outdoor Environments, Inc.**

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**IRRIGATION SYSTEM SPECIFICATIONS  
GLENWOOD SPRINGS – ROUNDABOUT @ I-70**

**PART 1 - GENERAL**

**1.1 SUMMARY**

- A. Provide irrigation installation where shown on the Drawings, and as specified herein, complete in place, tested and approved. It is the responsibility of the installation contractor to verify plans and quantities for correctness. Notify COE of any differences between the plans and site conditions immediately for review.

**1.3 WARRANTY**

- A. System to be under warranty for one year, after final acceptance of project. Items included in the warranty include but are not limited to double coverage, dry spots, proper functioning of control boxes, control clock, all irrigation heads, emitters, all valves and quick couplers and remaining components for proper operation.

**1.4 QUALITY ASSURANCE**

- A. Subcontract irrigation work to a single firm specializing in irrigation installations for quality and warranties.
- B. Use adequate numbers of skilled workmen thoroughly trained and experienced in the necessary crafts and completely familiar with the specified requirements and methods needed for proper performance of the work of this Section.

**1.5 DELIVERY, STORAGE, AND HANDLING**

- A. Ensure no parts or components are damaged during delivery. Store materials in a location out of the way of current construction and vehicular traffic. Materials shall be stored in a way to guarantee that the products do not deteriorate or become damaged.

**PART 2 – PRODUCTS**

**2.0 SUBSTITUTIONS**

- A. Substitutions for equivalent materials will be reviewed when submitted in writing to the following entities.

**IRRIGATION SYSTEM SPECIFICATIONS**

- a. Colorado Outdoor Environments – Peer Erickson – peer@coeaspen.com
  - b. Landscape Architect – Shannon Murphy - shannon@shannonmurphy.net
  - c. City of Glenwood Springs Parks Department – Nate Mohrmann - nate.mohrmann@cogs.us
- B. After review by the above parties Colorado Outdoor Environments will reply in writing weather the substitution is approved or not approved.

## 2.1 PIPE

- A. Mainline pipe: Use schedule 40 polyvinyl chloride, marked 1120-1220, and bearing the seal of the National Sanitation Foundation.
- B. Laterals: Use 80# Poly pipe.
- C. Fittings: Use schedule 40 polyvinyl chloride, type I-II, bearing the seal of the National Sanitation Foundation, and complying with ASTM D2466.
- D. For joining: 1. Use a solvent complying with ASTM D2466 and recommended by the manufacturer of the approved pipe. Glue and Primer must be approved by the City of Glenwood Springs Parks Department and installed in a controlled environment. 2. For poly. pipe use Otiker pinch clamps. Gear clams are not acceptable.
- E. Plastic Pipe Identification: Continuously and permanently mark with manufacturer's name, pipe size, schedule number, type of material, and code number.

## 2.4 REMOTE CONTROL VALVES

- A. Automatic valves for sprinkler heads shall be Rain Bird PEB-100 as drawn.
- B. Automatic valves for drip zones shall be Rain Bird XCZ-100-PRB-COM.
- C. All valves shall be installed in standard valve boxes with 2-3" gravel in the bottom.

## 2.5 SPRINKLER HEADS

- A. Heads for Turf areas shall be 6" pop-ups.
- B. Heads in Planting areas shall be 12" pop-ups.

## 2.6 DRIP SYSTEM

- A. Drip system for planting beds shall use Rain Bird XFD-09-12 on-surface pressure compensating landscape dripline space 12" apart per plan per manufacturer specifications.
- B. Drip system for trees/shrubs shall be ¾" dripline.
- C. Dripline shall circle tree or shrub the same diameter as the root ball and then continue to the next tree or shrub. Space emitters equally around the tree/shrub.
- D. Installer shall use 2 GPH Xeri-Bug Emitters for trees and shrubs.
  - a. 5-gallon shrubs 1
  - b. 10-gallon shrubs 3
  - c. 15-gallon shrubs 4
  - d. 1"-2" caliper trees 3
  - e. 2"-3" caliper trees 4
  - f. 3" caliper or more. 5+

## IRRIGATION SYSTEM SPECIFICATIONS

- g. 6' or less evergreen 3
  - h. 6'-10" evergreen 4
  - i. 10'-15' evergreen 5
  - j. 15' or above evergreen 6+
- E. 4 drip valves have been centrally placed to cover all trees and shrubs. Installer shall design layout of dripline from valves to all trees/shrubs. Bury dripline between trees and shrubs a minimum of 6" between top of pipe and finished grade. Bring dripline to surface at each tree/shrub. Stake dripline to ground and cover with mulch as directed by Landscape Architect so pipe is not visible.
- F. Layout shall be approved by Landscape Architect and COE before final installation.

## 2.7 IRRIGATION TAPS

- A. A 2" tap has been provided at the location noted on the plans.

## 2.8 AUTOMATIC IRRIGATION CLOCK

- A. Use RME Eagle Controller – 2 Wire as indicated on plans.
- B. Provide hard wire hookup for clock with 110-volt power source.
- C. A Rain/Freeze sensor shall be installed near the clock and away from any obstructions that would limit the devices effectiveness.
- D. Lightning/Surge Protector is required per the clock manufacturers specifications.

## 2.9 ISOLATION VALVES

- A. Provide Lasco TUBV-SV True Union Ball Valve with 12" Standard Valve Box as drawn equal to size of pipe.

## 2.10 SLEEVES

- A. Sleeves were installed by CDOT. Verify all locations match plans and depths are 18" below final grade. Notify COE of any differences between the plans and site conditions immediately for review.
- B. All sleeves to be 2 times the diameter of the pipe to be sleeved. If multiple pipes are going through the sleeve the sleeve diameter shall be 2X the total diameters of the pipes using the sleeve.
- C. All main line sleeves shall have an additional 4" sleeve for control wires.
- D. Minimum pipe sleeve size is 4".

## 2.11 WATER METER

- A. A Water Meter as selected by the City of Glenwood Springs Parks Department shall be installed directly after Tap.
- B. Contractor shall install water meter per the manufacturer installation requirements and the City of Glenwood Springs Parks Department.

## 2.12 VALVE BOXES

- A. Valves, water meters, filters, etc. shall be installed in either Standard or Jumbo valve boxes.

# IRRIGATION SYSTEM SPECIFICATIONS

- B. 6" Round valve boxes shall not be used.
- C. 10" Round valve boxes shall only be used for quick couplers.

## 2.13 BACKFLOW PREVENTER

- A. Install a Febco 825YA 1-1/2" backflow preventer as shown on the plans
- B. Install a GuardShack GS-1 Lift-Off Backflow Cover (Forest Green) as specified by the manufacture.

## 2.14 OTHER MATERIALS

- A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Irrigation Designer (Colorado Outdoor Environments, Inc.).

## PART 3 - EXECUTION

### 3.1 DESIGN EXECUTION:

- A. The irrigation system shall employ the following specifications:
  1. Source of Water: Tap, per the City of Glenwood Springs, is estimated to provide 50+ GPM and 125+ PSI. COE designed using 45 PSI at 4-26+/- GPM. PSI and GPM to be verified in the field once construction allows. Notify COE if PSI and GPM are not as stated above.
  2. Meet local code requirements.
  3. Mainline to be installed 18" below finished grade, and laterals 12" below grade. Schedule 40 PVC for mainlines.
  4. Laterals 80# Poly. pipe.
  5. The irrigation clock shall be located as shown on the plans.
  6. Valve box/s locations to be approved by the Landscape & Irrigation Designer.
  7. All trees and shrubs should be drip irrigated.
  8. The lawn areas shall be irrigated with Rain Bird 1800 Pop-Up heads as shown on the plans.
  9. Areas within close proximity to the building shall be irrigated with small radius pop-up heads ensuring double coverage and NOT rotors.
  10. Double coverage should be provided.
  11. Overspray should be minimized so not to occur on paved areas or building structures. Adjustment of heads will be required to achieve this.
  12. Available water pressure is to be confirmed in the field.
  13. Electrical connection shall be verified in the field.
  14. Locate all sleeving required under hardscape areas.

### 3.2 INSPECTION:

- A. Submit and review design plans with Irrigation Designer, Colorado Outdoor Environments, Inc. and the City of Glenwood Spring Parks Department before beginning work.

## IRRIGATION SYSTEM SPECIFICATIONS

### 3.3 SURFACE CONDITIONS

- A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

### 3.4 FIELD MEASUREMENTS

- A. Make necessary measurements in the field to ensure correct design parameters and to ensure precise fit of items in accordance with the approved design. It is the responsibility of the installation contractor to verify plans and quantities for correctness.

### 3.5 TRENCHING AND BACKFILLING

- A. Trench, backfill, and compact to 95% compaction.
- B. Pipes shall be bedded with clean topsoil with rocks of equal to or less than ¾" for a minimum of 4" of cover over the pipe. Once proper bedding cover and compaction is established backfill of native soil is acceptable as long as no rocks over 4" are put into the trench.

### 3.6 INSTALLATION OF PIPING

- A. General:
  - 1. Lay out the piping system in accordance with arrangement shown on the approved Design Drawings.
  - 2. If piping is shown on the Design Drawings to be under paved areas but running parallel and adjacent to planted areas, the intention is to install the piping in the planted areas.
  - 3. If piping is shown on the Design Drawings to be under paved areas but running perpendicular to the paved area, provide sleeving as outlined in this section.
  - 4. If piping is shown on the design drawings running parallel with other irrigation pipe, they can be placed in a single trench provided the pipe is separated by no less than 6".
- B. Piping depth: Install piping with at least the following depth:
  - 1. Mainlines: 18" below finished grade or 5X the pipe diameter, whichever is greater.
  - 2. Laterals: 12" below finished grade or 5X the pipe diameter, whichever is greater.
  - 3. PVC Sleeves beneath paved areas: 18" below finished grade and extend 12" past paved area edges. Provide a 90-degree elbow on each sleeve end and add additional length of same pipe size to extend above finished grade by 12" until sleeve is used. Cap pipes using PVC caps.
- C. Inspection of materials:
  - 1. Carefully inspect pipe and fittings before installation, removing all dirt, scale, and burrs; and reaming as required.
  - 2. Install pipe with markings side facing up for visual inspection.
- D. Plastic pipe:
  - 1. Exercise care in handling, loading, unloading, and storing plastic pipe and fittings:
    - a. Store under cover until ready to install.
    - b. Transport only on a vehicle with a bed long enough to allow the pipe to lay flat to avoid undue bending and concentrated external load.

## IRRIGATION SYSTEM SPECIFICATIONS

2. Repair dented and damaged pipe by cutting out and discarding the dented or damaged section and rejoining with a coupling.
3. In jointing, use only the specified glue and primer and make joints in accordance with the manufacturer's recommendations as approved by the Irrigation Designer.
  - a. Give solvent welds at least 15 minutes set-up time before moving or handling, and 24 hours curing time before filling with water.
  - b. For sealing threads, Teflon tape is NOT acceptable. Rectorseal or Weldon pipe thread paste that does not harden is acceptable.
4. Centerload plastic pipe with a small amount of backfill to prevent arching and whipping under pressure.
5. For plastic-to-steel connections:
  - a. Work the steel connections first;
  - b. Use a non-hardening pipe dope on threaded plastic-to-steel connections.
  - c. Use only a light wrench pressure.

E. Control Wires:

1. Control wires shall be routed with the main line and attached every 24" increments with plastic wire ties or duct tape.
2. If splicing of wiring is necessary permanent wire splices shall be located in a valve box at least 10 inches round or larger.
3. Wiring shall be 14 gauge or larger.
4. Recommended 2-Wire is 12/2 Maxi Cable.
5. An Extra Wire 2-Wire run shall be installed along entire wiring route.

### 3.7 INSTALLATION OF EQUIPMENT

A. Control Valves:

1. Install automatic valves where indicated on the approved Design Drawings and in accordance with the manufacturer's recommendations as approved by the Irrigation Designer.

B. Turf sprinkler heads:

1. Install where indicated on the approved Design Drawings and in accordance with the manufacturer's recommendations as approved by the Irrigation Designer.
2. Set heads 1/2" above grade except along walks and driveways where finished grade is established. Set heads flush with surface of pavement at time of installation, and next to pavement.
3. Installation of irrigation head locations are critical to minimize overspray onto hard surfaces. Head layout shall be reviewed and approved by the City of Glenwood Springs Parks Department and Colorado Outdoor Environments before installation begins.

C. Plant Material spray heads:

1. Install where indicated on the approved Design Drawings and in accordance with the manufacturer's recommendations as approved by the Irrigation Designer.
2. Set tops of heads 1/2" above finished grade.
3. Set heads along curbs in parking areas flush with top surface of curb.
4. Installation of irrigation head locations are critical to minimize overspray onto hard surfaces. Head layout shall be reviewed and approved before installation begins by the City of Glenwood Springs Parks Department and Colorado Outdoor Environments.

### IRRIGATION SYSTEM SPECIFICATIONS

### 3.8 TESTING AND INSPECTING

- A. Do not allow or cause any of the work of this Section to be covered up or enclosed until it has been inspected, tested, and approved by the Irrigation Designer.
- B. Before backfilling the main line, and with control valves in place but before lateral pipes are connected, completely flush and test the main line.
  - 1. Repair leaks.
  - 2. Flush out each section of lateral pipe before sprinkler heads are attached.
- C. Testing:
  - 1. Make necessary provision for thoroughly bleeding the line of air and debris.
  - 2. Before testing, fill the line with water for a period of at least 24 hours.
  - 3. After valves have been installed, test live water lines for leaks at the required pressure for a period of two hours, with couplings exposed and with pipe sections centerloaded.
  - 4. Provide required testing equipment and personnel.
  - 5. Repair leaks, and retest until acceptance by the Irrigation Designer.
- D. Final inspection:
  - 1. Clean, adjust, and balance all systems. Verify that:
    - a. Remote control valves are properly balanced;
    - b. Heads are properly adjusted for radius and arc of coverage;
    - c. The installed system is workable, clean, and efficient.

### 3.9 INSTRUCTIONS

- A. Attach a typewritten legend inside each controller door, stating the areas covered by each remote-control valve. Also include a map of the zone areas and major components.
- B. After the system has been completed, inspected, and approved, instruct the City of Glenwood Springs Parks Department in the operation and maintenance of the system.
- C. Provide an As-Built of the irrigation system. The plan needs to be reproducible in black and white. Provide a copy to the client, Maintenance Company, general contractor and irrigation designer. The irrigation as-built should include the following information, which may be written on a separate form:
  - 1. Source of water.
  - 2. Dynamic Pressure: \_\_\_\_ PSI at 25 GPM.
  - 3. Zones and their locations.
  - 4. Types of heads on each zone.
  - 5. Water usage for each zone.
  - 6. Clock type, location and schedule.
  - 7. Pump type, location and size if applicable.
  - 8. Booster pump type, location and size if applicable.
  - 9. Storage tank type, location and size if applicable.
  - 10. Backflow preventer type, location and size if applicable.
  - 11. Where the main line exits the building, if applicable.
  - 12. Irrigation contractor name, address, phone number, and person knowledgeable about installation and use.
  - 13. Irrigation designer information: Colorado Outdoor Environments, Inc., Contact: Peer Erickson, PO Box 513, Carbondale, CO 81623, (970) 618-7005.
  - 14. General Contractor contact information including superintendent familiar with system.

## IRRIGATION SYSTEM SPECIFICATIONS

#### 4.0 TRAFFIC & SITE CONTROL

- A. It is the responsibility of the installation contractor to receive and pay for a CDOT Right of Way Permit and to pay for all traffic control. The traffic control plan is to be reviewed and approved by the City of Glenwood Springs before work begins to minimize traffic delays and ensure pedestrian access to the site and surrounding area.
- B. Installation contractor shall keep the site neat, orderly, clean and free of debris during the entire installation process.

END OF SECTION

IRRIGATION SYSTEM SPECIFICATIONS