



Irrigation Performance Audit Guidelines & Forms

Background:

Per Greeley Municipal Code, Section 24-801(b)(5) and 24-804(h)(5) a letter of substantial completion of the landscape plan and an irrigation performance audit must be completed prior to issuance of Certification of Occupancy or other City approvals. Release of bonding or surety (if applicable) shall be withheld until approval is given.

The contractor in charge of the irrigation system installation must contract to have an irrigation performance audit completed by a licensed professional independent of the installation contractor. Acceptable auditors are Greeley's Water Conservation Program personnel, a CLIA, or QWEL.

1. System Evaluation

- ☐ Activate all zones individually and complete a visual inspection of each zone to identify any defects or deficiencies in the system. Indicate all problems on the Zone Evaluation Form.

2. Pressure Test

- ☐ Conduct pressure tests using the appropriate pressure testing device on one head per zone.
 - All newly installed sprinkler bodies shall operate at the manufacturer's specific optimum performance pressure range.
 - All pop-up bodies retrofitted with rotary nozzles shall operate at no less than 20 PSI and no more than 45 PSI.

3. Catch Can Procedures

- ☐ Measure wind velocity. If over 5 mph, wind is felt on the face and the catch can test must be rescheduled.
- ☐ Use a minimum of 24 catch cans per zone.
 - All catch devices must be uniform in size and shape. Larger collectors give better, repeatable results.
- ☐ Place the catch cans along the edge of the zones 12 to 24 inches in from the edge.
- ☐ Minimum catchment devices are spaced:
 - For pop-up heads: near a head (within 2 feet) and half-way between the heads.
 - For rotors spaced less than 40 feet on center: near a head (within 3 feet) and every one-third of the distance between the heads.
 - Rotors spaced greater than 40 feet on center: near a head (within 3 feet) and every one-fourth of the distance between the heads.
- ☐ Unusual or irregularly shaped areas, catchment devices are placed:
 - For rotors: a uniform grid of catch devices, 10 to 20 feet on center spacing
 - For pop-up heads: uniform grid of catch devices, 5 to 8 feet on center spacing
- ☐ Test run times must be consistent and appropriate for the sprinkler type and arc. Run time

must be at least 10 minutes for rotors and rotary nozzle pop-ups

- ☐ When the test area covers multiple zones, adjust the test run times for each zone to be 10 minutes each in order to achieve a matched precipitation rate across the test area.
- ☐ Using information from one station or zone and applying to another may be used when there are several sprinkler zones that are identical, i.e. the same sprinkler head, nozzle, spacing and operating pressure.
 - The auditor may elect to perform catch device tests on 25% of the sprinkler overhead zones (provided it meets the required minimum of 2 zones per overhead sprinkler type) to get an average value that could be applied to identical sprinkler zones.
- ☐ Use only zones with rotors, retrofitted spray heads, or multi-jet rotary nozzles for the catch can tests, not subsurface systems, microspray, bubbler, or drip zones.

4. Calculations

- ☐ **Precipitation Rate** using milliliter readings

$$PR_{net} = [V_{avg} \times 3.66] (T_R \times A_{CD}) = \underline{\hspace{2cm}} \text{ inches/hour}$$

- ☐ **Precipitation Rate** using inch (decimal) readings

$$PR_{net} = [V_{avg} \times 60 \text{ min}] (T_R \times A_{CD}) = \underline{\hspace{2cm}} \text{ inches/hour}$$

Where:

PR_{net} = Precipitation Rate (inches per hour)

V_{avg} = Average catchment volume (milliliters or inches)

T_R = Test run time (minutes)

A_{CD} = Area of catch can throat area (square inches)

$$\text{Distribution Uniformity using low-quarter (DU}_{LQ}) = \frac{\text{Average Catch of Lower Quarter}}{\text{Average Catch Overall}} \times 100\%$$

- ☐ Additional resources are found at www.irrigation.org

5. Results & Follow-Up

- ☐ Minimum acceptable distribution uniformity shall be 70% for rotor and rotary nozzle pop-ups for a Certification of Occupancy to be issued for the site. If the audit shows the system doesn't meet these standards, the contractor must correct the problems and have a new audit performed.
- ☐ The auditor must provide the following entirety of this guideline and forms documents to the contractor/owner and Greeley's Water Conservation personnel.
- ☐ Submit forms to Etrackit
- ☐ An irrigation performance audit must be completed prior to issuance of Certification of Occupancy or other City approvals. Release of bonding or surety (if applicable) shall be withheld until approval is given.
- ☐ Greeley's Water Conservation staff may perform periodic inspections for quality assurance. Submittal of inaccurate audit data may result in watering violations that can incur additional fines.



Irrigation Performance Audit Guidelines & Forms

Date:	Time:
Site Name:	Site Address:
Auditor's Name:	Auditor's Certification:
Auditor's Phone:	Auditor's Email:
Company:	Site's Contact Name:
Site's Contact Phone:	Site's Contact Email:
# Zones - Total:	# Controllers:
# Zones – Traditional Turf:	Controller(s) Make:
# Zones – Preferred Turf:	Controller(s) Model:
# Zones – Shrubs/Perennials:	# Rain Sensors:
# Zones Tested: *Must test no less than 25% of overhead irrigation zones to include a minimum of 2 zones per overhead sprinkler type	Additional Controller Accessories:



Irrigation Performance Audit Guidelines & Forms

Controller _____

Observed Problems	Zone #														
Valve or Solenoid Malfunction															
Failed to Activate from Controller															
Low Pressure															
High Pressure															
Incorrect Arc															
Incorrect Radius															
Tilted Heads															
Spray Deflected/ Obstructed															
Sunken Head															
Plugged Equipment															
Low Head Drainage															
Leaking Heads/Valves															
Leaking Pipes/Valve															
Missing Heads															
Runoff															
Mixed Head Types															
Combined/ Mixed Zones															
Lack of Head-to-Head Coverage															
Broken Head or Nozzle															

Additional Comments:

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Irrigation Performance Audit Guidelines & Forms

Zone#

Can #1 _____	Can #9 _____	Can #17 _____	Can #25 _____	Can #33 _____
Can #2 _____	Can #10 _____	Can #18 _____	Can #26 _____	Can #34 _____
Can #3 _____	Can #11 _____	Can #19 _____	Can #27 _____	Can #35 _____
Can #4 _____	Can #12 _____	Can #20 _____	Can #28 _____	Can #36 _____
Can #5 _____	Can #13 _____	Can #21 _____	Can #29 _____	Can #37 _____
Can #6 _____	Can #14 _____	Can #22 _____	Can #30 _____	Can #38 _____
Can #7 _____	Can #15 _____	Can #23 _____	Can #31 _____	Can #39 _____
Can #8 _____	Can #16 _____	Can #24 _____	Can #32 _____	Can #40 _____

Run Time _____ Total Catch _____ mL or inch

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Summary of Results

Pass Distribution Uniformity: 70%

Controller#	Zone #	Applies to Zone(s) #	Head Type	Operating Pressure (one sprinkler tested per zone)	Precipitation Rate (inches/hour)	Distribution Uniformity (percent)	Pass or Fail
North Lawn Example	A1	A1,A2, A3	Rotary	40 psi	0.35inches/hr.	65%	Fail (example)

I certify that I performed this sprinkler performance audit according to Greeley's Irrigation Performance Audit Guidelines and these results are accurate.

Printed name of Auditor

Signature of Auditor

Date



Smart Controller Data Input Chart

Complete the required performance audit, and if the zones meet the minimum acceptable distribution uniformities per Section 6.14.C.2 of the Landscape and Irrigation Criteria, fill the smart controller data input chart with site observations. This chart shall be included within the irrigation control panel.

Smart Controller Data Input Chart Example

Zone ID	Sprinkler Type	Precipitation Rate (in./hr.)	Plant Type	Soil Type	Micro-climate	Slope
A1	Rotor	0.5	Cool Traditional Turf	Sand	Sunny	Medium
A2	Rotor	0.5	Preferred Turf	Sand	Sunny	None
A4	Rotary	0.7	Perennials	Sandy Loam	Partial	None
A5	Drip	1.1	Shrubs	Sandy Loam	Shade	Steep
A6	Microspray	1.6	Annuals	Sandy Loam	Partial	Mild

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