

## **IRRIGATION TROUBLESHOOTING AND ASSESSMENT**

**Description:** Water conservation and irrigation efficiency have become an increased focus for the landscape industry. Irrigation troubleshooting reflects this focus. Well-maintained systems are more efficient over their life cycles. Troubleshooting and repair skills are, therefore, key. The students (maximum of one two-person team per school) will be required to have a working knowledge regarding:

1. Measuring or calculating key system parameters:
  - a. Static and dynamic pressures
  - b. System flows
  - c. Precipitation rate
  - d. Distribution uniformity
2. Proper operation and repair of irrigation components
  - a. remote control valves
  - b. sprinklers and rotors
  - c. drip/micro components
3. Electrical components within an irrigation system
  - a. controllers
  - b. transformers
  - c. solenoids
  - d. pump start relays
  - e. weather sensors (rain ET soil moisture etc.)
  - f. field wiring and splices
4. Working knowledge of basic diagnostic devices
  - a. volt-ohm meter
  - b. wire locator
  - c. fault finder
  - d. tone probe
5. Scheduling based on system and site data

### **Study resource materials are available at the following links:**

1. Preliminary exam questions will be drawn from these Irrigation Association Publications:  
<http://store.irrigation.org> (Search word: "trouble")
  - a. "Electricity for Landscape Irrigation Systems (Package)"
  - b. "Hydraulic Troubleshooting for Landscape Irrigation Systems"
  - c. "Trouble Shooting Irrigation Control Systems"
2. Additional Irrigation Resources:  
<https://store.ewingirrigation.com/education-nclc-resources>

**Pre-Event Qualifying Test:** There will be a proctor monitored online test held onsite at NCLC. The testing center will be open Tuesday, March 14 from 10 am – 8 pm and Wednesday, March 15 from 7 am – 7 pm. See the schedule for room assignments. Participants from the same school are to take the test individually but must come to the testing center at the same time. Results will be posted on Wednesday night at 9 pm.

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**Time:** The hands-on competition will consist of the top 20 two-member teams from the pre-event qualifying exam. Problems to solve will be both hydraulic and electrical in nature. Each team will troubleshoot, diagnose and modify an existing irrigation system. In addition, there will be scheduling problems relating to the modified system.

The time limit for the field portion will be 1 hour and 50 minutes.

**Limits:** No limit on the number of students for the pre-qualifying exam. The sponsor reserves the right to limit the number of students that will compete in the hands-on event based on exam scores, space constraints, and materials available. **Prequalifying exam scores will not be a part of the individual or team point totals.**

### JUDGING CRITERIA

**Each team can earn 200 points for the competition. Each individual, consequently, can earn up to 100 individual points for this event.**

(As noted above, preliminary exam no longer counts toward the event score and merely acts as a pre-qualifier.)

**Students are required to bring the following materials to the event:**

- Volt-ohm meter – Tested and working
- Batteries for meter
- Screw driver(s)
- Wiring pliers / strippers
- Calculator
- Two sharpened pencils with erasers or mechanical pencil with extra leads
- Eye protection
- Gloves

**Sponsor is required to supply the following materials for the event:**

- All equipment and materials necessary for the event (including gauges and adaptors) that are not assigned to the contestants
- Stopwatches
- Sufficient number of judges and event monitors
- Any other items deemed necessary for this event