



# IRRIGATION SPECIALTY CONTRACTORS GENERAL TRADE KNOWLEDGE EXAMINATION CONTENT INFORMATION

December 2012

The General Trade Knowledge portion of the examination will be administered on the morning of the second day of the examination. It will consist of 80 equally weighted questions.

The examination will have questions relating to the following content areas and necessary knowledge for each area includes:

- reading and interpreting plans and specifications
- reading and interpreting codes
- basic mathematics (addition, subtraction, multiplication, division, calculations of area and volume, fractions, decimals, percentages, calculating the sides of triangles, square roots, powers of numbers, and solving simple algebraic equations for unknown variables)

You should be prepared to respond to examination questions on any of the content areas listed. Questions asked and content areas tested on previous examinations should not be assumed to be the only possible questions to be asked or content areas to be tested on this examination.

The percentage of questions shown for each content area may vary by as much as plus or minus three (3) percent. Please refer to the **Candidate Information Brochure** and the **Reference List** for additional information.

## **Content Area A** **25%** **Pre-Construction**

### **1. Site Analysis**

- a. Plants
- b. Soil
  - knowledge of infiltration rates
  - knowledge of texture
- c. Water Source
  - knowledge of potable (e.g., reading meters)
  - knowledge of reclaim water
  - knowledge of surface
  - knowledge of ground/well
  - knowledge of alternative sources (e.g., rainwater, condensate, storm, grey)
- d. Existing System Components

## **2. Develop/Review Plans & Specifications**

- a. Plan Reading
  - knowledge of elevations
  - knowledge of contours
  - knowledge of irrigation symbols
  - knowledge of scale
- b. Product Application
  - knowledge of emission device selection (e.g., nozzles, sprinklers, emitters)
    - MPR (Matched Precipitation Rates)
    - calculating precipitation rates
    - efficiency
    - reading nozzle charts
  - knowledge of valve sizing and zone flow
  - knowledge of wire
    - sizing
    - connectors
    - wire types
    - conduit
    - depth
- c. Hydraulics
  - knowledge of piping size
  - knowledge of pump sizing & selection
  - knowledge of static pressure
  - knowledge of dynamic pressure (working pressure)
    - friction loss
    - velocity
    - water hammer, surge
  - knowledge of looped mains
- d. Specifications
- e. Verify Code Compliance

## **3. Perform Material Take Off of Irrigation Job**

## **4. Prepare Submittals**

## **5. Obtain Permits (e.g., right-of-way, location requirements)**

## **Content Area B** **37.50%** **Construction**

### **1. Prepare for Installation**

- a. Review Scope of Work
- b. Understand Plans & Specifications
- c. System Lay-out

- d. Locating Site Utilities (e.g., Sunshine One Call)

## 2. Install Product

- a. Point of Connection
- b. Pipe & Fittings
  - knowledge of trenching or pulling
  - knowledge of locating pipe next to other utilities
  - knowledge of other utilities
  - knowledge of thrust blocking
  - knowledge of bedding, backfill & compaction
  - knowledge of pipe connections (e.g., solvent welding, threaded, gasketed mechanical joints)
  - knowledge of sleeving
  - knowledge of handling product
- c. Wiring & Electrical
  - knowledge of electrical concepts
    - grounding
    - conventional vs. 2-wire systems
  - knowledge of wire connections
  - knowledge of pulling wire
- d. Sprinkler Heads and Assemblies
  - knowledge of arc adjustment
  - knowledge of pulling wire
- e. Low Volume Components
  - knowledge of filtration
  - knowledge of pressure regulation
  - knowledge of limitations
  - knowledge of securing
  - knowledge of emitters (e.g., drip, micro-spray, bubblers)
- f. Valves
  - knowledge of sizing valves
  - knowledge of connecting valves
  - knowledge of valve boxes
- g. Controller & Related Components
  - knowledge of rain shut-off device
  - knowledge of sensors (e.g., soil moisture, ET sensor, weather stations, freeze, flow, salinity, pH)
  - knowledge of flow meter
  - knowledge of decoders
- h. Pumps
  - knowledge of pump size
  - knowledge of pump types (e.g., submersible, jet, centrifugal, turbine, booster)
  - knowledge of pump controls
    - pressure systems
    - clock start

- system protection devices (e.g., low water cut off, no flow cut off, pressure relief valves)
- i. Filtration (e.g., screen, disc, media, sand separator)
- j. Chemical Injection Systems

## 3. Create Record Drawing

### Content Area C

12.50%

#### Maintenance & Repair

##### 1. Perform Maintenance

- a. Visual Inspections
- b. Rain Delay Operation
- c. Raise, Level and Adjust Heads
- d. Check Filters
- e. Identify Water Source Issues
- f. Check Controller Operation and Scheduling

##### 2. Troubleshoot and Diagnose System

- a. Pipe Failures
- b. Low Pressure
- c. Valve Failures
- d. Electrical Problems (e.g., controller failures)
- e. Misapplication of Pumping
- f. Identifying Inadequate Installation Practices

##### 3. Perform Repair

##### 4. Upgrade System to Meet Current Codes

##### 5. Educate Customers

- a. Routine Maintenance
- b. Water Efficiency and Best Management Practices

### Content Area D

12.50%

#### Scheduling & Water Conservation

##### 1. Understand Soil-Plant-Water Relationships

##### 2. Conduct Irrigation Assessment/Audit

##### 3. Analyze Site Conditions for water

##### Conservation Potential

##### 4. Calculate Watering Schedules

**Content Area E**  
**Rules, Laws & Codes**

**12.50%**

**1. Job Safety**

knowledge of OSHA

knowledge of Florida Trench Safety Act

**2. Electrical Safety**

**3. Florida Building Code, Plumbing**

knowledge of backflow

**4. Department of Environmental Protection**

**5. Water Use/Restrictions**