32 84 00 - Planting Irrigation

Irrigation Controller:
Campus Standard: Calsense CS3000 Ethernet and Radio Controlled. Evapotranspiration (ET)-based controller. Controller shall have non-volatile memory to retain program in memory during temporary power failures. Provide diagram of numbered valves and respective irrigated areas for inside panel of each controller.

Wall Mount Enclosure:
The wall-mounted gray box shall be a completely assembled unit, pre-mounted with the designated controller. The box shall be constructed of weather- and vandal-resistant stainless steel. The wall mount unit shall come complete with transient and lightning protection board and factory-labeled terminals. The transient protection board shall be pre-mounted in the wall mount unit and shall support field replaceable modules which include terminal strips for the connection of irrigation field wires, 2-Wire cable, and weather monitoring devices such as an ET gage, Tipping Rain Bucket, and Wind gage. The wall mount unit shall feature a security-tight locking mechanism, louvered vents, with splash guards, and bee/wasp screens.

All wall mount units shall come with a 10-year limited warranty and shall be fully UL-approved. Double-Wide, Top Entry Enclosure Assemblies:

Calsense Controller Assembly: SSE-D-R, vandal and weather resistant, made entirely of 304 grade stainless steel with the top being 12 gauge and the body being 14 gauge. The pre-assembled vandal resistant enclosure factory pre-assembled and supplied by controller manufacturer shall come complete with 24 VAC lightning and surge protection and all terminals shall be factory labeled. The pre-assembled enclosure shall come provided with an On/Off switch to isolate the controller along with a GFI receptacle. Specific radio antenna(s) shall be pre-mounted and connected on enclosure. The enclosure shall include 2-7/8”, 1-1/2” thick, 6-pin cylinder, die-cast steel padlock with unique shackles design. The assembly shall carry a full U/L listing. The 38 inch height enclosure with flip top should allow for side by side placement of two controllers. All necessary wiring between the two controllers in order to share central communications and/or flow and weather data shall be pre-wired by the manufacturer for easy installation. The main housing shall be louvered upper and lower body to allow cross flow ventilation. A stainless steel backboard shall be provided for the purpose of mounting electronic and various other types of equipment. The stainless steel backboard shall be mounted on four stainless steel bolts that will allow for easy removal of the backboard. The factory pre-assembled enclosures shall carry a ten year limited warranty.

Top Entry Single Enclosure:
Calsense Controller Assembly: SSE-R, vandal and weather resistant, made entirely of 304 grade stainless steel with the top being 12 gauge and the body being 14 gauge. The pre-assembled vandal resistant enclosure factory pre-assembled and supplied by controller manufacturer shall come complete with 24 VAC lightning and surge protection and all terminals shall be factory labeled. The pre-assembled enclosure shall come provided with an On/Off switch to isolate the controller along with a GFI
Specific radio antenna(s) shall be pre-mounted and connected on enclosure. The enclosure shall include 2-7/8”, 1-1/2” thick, 6-pin cylinder, die-cast steel padlock with unique shackles design. The assembly shall carry a full U/L listing. The 38 inch height enclosure with flip top should allow for one controller. The main housing shall be louvered upper and lower body to allow cross flow ventilation. A stainless steel backboard shall be provided for the purpose of mounting electronic and various other types of equipment. The stainless steel backboard shall be mounted on four stainless steel bolts that will allow for easy removal of the backboard. The factory pre-assembled enclosures shall carry a ten year limited warranty.

**Controller Grounding:**
Grounding shall consist of one 5/8-inch x 8-foot copper rod installed per irrigation controller and where multiple controllers are not connected to the same ground rod.

The top of each rod shall be installed inside a 10-inch round valve box, with the rod installed as close as practical to the controller. If a pedestal enclosure is used, the ground rod may be installed through the pedestal base. Under no circumstances shall the rods be shortened. A #6 AWG solid copper wire shall be used to connect from the ground lug of the transient protection board to the copper rod. Brass clamps specifically designed to secure the copper wire to the grounding rod shall be used. There shall be no kinks or sharp bends in the wire. Each wire may be wrapped around the rod and brazed in place as an alternative to clamping. Braze the wire to the rod for at least one circumference of the rod.

**Recommended: Control System**

**Low Voltage System:** Expressly for control of automatic control valves for underground sprinkler systems.

**Transformer:** To convert building service voltage to control voltage of 24 volts.

**Circuit Control:** The controller shall automatically calculate cycle and soak scheduling to water each station for a fixed cycle time and allow the water to soak in between cycles, maximizing infiltration and minimizing runoff.

**Timing Device:** The controller shall have the ability to accommodate multiple types of irrigation schedules including irrigating even days, odd days, prescribed days of the week, and interval scheduling ranging from every other day up to every four weeks.

**Wiring:** Solid copper with UL approval for direct burial in ground. Provide one spare control wire along entire wire routing for each controller for each unused station at controller. Loop 36 inches excess wire into each single valve box and into one valve box in each group of valves.

**CS 3000, pedestal mounted controller call out:** CS3-2W-S/CS3-EN/CS-2W-2ST/CS-2W-POC/FM XX
Provide CAT-5 or 6 cable in conduit from the nearest router to the controller maximum run 328’ including bends and twists.

Two wire plan notes:
Specify number # of decoders needed. Two station decoders. POC decoder included in call out above.
Decoder part number: CS-2W-2ST

Two wire cable: Specify Paige cable P-7354-D in conduit. Maximum run 7,000 feet. 1.25 “Conduit recommended.

Grounding requirements:
- Every 300-400 feet with one 5/8-inch x 8-foot copper grounding rod per irrigation controller and decoder.
- #6 AWG solid copper wire from the copper rod to the field common (white wires in the black harness) of the controller / decoder.

Flow Sensor: The flow sensor used shall be supplied by the same manufacturer as the irrigation controller. The flow sensor shall be wired back to the irrigation controller using two #14 AWG wires, one red, and one black in 1” PVC conduit to connect to the irrigation controller. The maximum wire run between flow meter and controller shall be 2000 ft. The flow meter shall send low voltage digital pulses back to the controller and therefore all electrical connections must be waterproof and be resistant to any moisture entry. It is intended that all wire runs between the controller and flow meter shall be direct pulls and have no splices. If wire splices are unavoidable, they must be installed in a valve box with Spears DS-100 connectors with Spears sealant or 3M Scotch lock No. 3570 connector sealing pack used.

**Piping and Fittings**

Campus Preferences:
Mainline Pipe and Fittings - PVC Plastic Pipe (3 inches and larger): Rigid unplasticized polyvinyl chloride (PVC) 1120, Type 1, Grade 1, NSF-approved pipe, complying with ASTM D 2241. For mainline to control valve connections, use Schedule 80 PVC threaded both ends.

Mainline Pipe and Fittings - PVC Plastic Pipe (smaller than 3 inches): Rigid unplasticized polyvinyl chloride (PVC) 1120, Type 1, Grade 1, NSF-approved pipe, color – white, complying with ASTM D 1785. For mainline to control valve connections, use Schedule 80 PVC threaded both ends.

Lateral Pipe and Fittings (Downstream of Control Valves): Rigid unplasticized polyvinyl chloride (PVC) 1120, Type 1, Grade 1, NSF-approved, color-white, complying with ASTM D 1785. For pipe and fittings, Schedule 40 solvent weld pipe, and Schedule 40, Type 1, PVC Solvent weld fitting conforming to ASTM D 2466 and ASTM D 1784.

Galvanized Steel Pipe and Fittings: Pipe standard weight, seamless or welded, galvanized conforming to ASTM A 53. Fittings galvanized malleable-iron, threaded fittings conforming to ANSI B 16.3.
Copper Pipe and Fittings: Pipe Type L seamless copper water tube, drawn temper, conforming to ASTM B 88. Fittings wrought copper or cast brass, recessed solder joint type fittings conforming to ANSI B 16.22.

Sleeving: Rigid unplasticized polyvinyl chloride (PBC) 1120, Type 1, Grade 1, NSF-approved pipe, extruded from material conforming to ASTM D 1784, color-white. Schedule 40 solvent weld pipe.

Campus Preference

- Isolation Valves (Larger than 3-inches): Comply with Section 33 11 00 – Water Utility Distribution Piping.
  - Locking Cover Keys: Rain Bird Model #2049l. Furnish two cover keys per project. Website: [http://www.rainbird.com/landscape/products/valves/lockingcoverkey.htm](http://www.rainbird.com/landscape/products/valves/lockingcoverkey.htm)
  - Valve Keys: Rain Bird Model 33DK. ¾-inch (20/27). Key threads into top of quick-coupling valve to provide water access. Furnish two valve keys per quick coupling valve. Website: [http://www.rainbird.com/landscape/products/valves/valvekeys.htm](http://www.rainbird.com/landscape/products/valves/valvekeys.htm)
- Flex Riser - KBI model FR or approved equal (6” length).
- Triple-Swing Assemblies - Rainbird SA series, KBI TSA-TT series, or approved equal. 12” length for 4” and 6” pop-up sprinklers, and 18” length for 12” pop-up sprinklers. Match sprinkler inlet size.
• Sprinkler Heads - Pop-up height: 4” minimum height for turf sprinklers; 12” minimum height for shrub sprinklers.

Campus Alternate
Two-Wire Path and Decoders:
The 2-Wire option shall provide support for up to one-hundred and twenty-eight (128), 2-Wire stations connected to a single controller and shall provide support for up to 6 points of connection (POC’s). The 2-Wire cable shall either be Paige P7354D or Regency’s Hunter® Decoder cable with a maximum length of 7,000 ft. A ground rod, 5/8 inch x 8-ft solid copper shall be required every 300-feet along the 2-Wire path as well as a single ground rod at the end of the cable run.

The station decoder shall be a 2-station decoder and shall be able to operate up to 2-solenoids using unique colored wires for each. A single controller shall be able to operate up to 70, 2-station decoders and it shall be intended that all wire runs between valves and 2-Wire decoders shall be direct pulls and have no splices except at the decoder location. All electrical connections must be waterproof and moisture-resistant and shall be done with 3M™ Scotchcast™ 3570G Connector Sealing Packs. The 2-Wire decoders shall use #14 AWG direct burial wire to connect to remote control valves and the maximum wire run between the decoder and the valve shall be 100-feet.

The POC decoder shall operate a single master valve and flow meter (model FM). A single controller shall be able to operate up to six POC decoders with a maximum of 12-POC’s in a chain, controllers using FLOWSENSE™ technology. The maximum wire run between the POC decoder and flow meter shall be 20-feet while the maximum wire run between the decoder and the master valve shall be 100-feet.