



**SPECIAL PROVISIONS
FOR
IRRIGATION SYSTEM**

**Des Moines County
EDP-0977(653)--7Y-29**

**Effective Date
June 15, 2021**

THE STANDARD SPECIFICATIONS, SERIES 2015, ARE AMENDED BY THE FOLLOWING MODIFICATIONS AND ADDITIONS. THESE ARE SPECIAL PROVISIONS AND THEY SHALL PREVAIL OVER THOSE PUBLISHED IN THE STANDARD SPECIFICATIONS.

155071.01 DESCRIPTION.

A. Summary.

Section includes complete irrigation system for sand-based lawn. See plans for extent of areas to be irrigated.

B. Performance Requirements.

1. Irrigation zone control shall be automatic operation with controller and automatic control valves.
2. Delegated Design: Design full head-to-head coverage irrigation system for turf lawn areas, including comprehensive engineering analysis by a qualified licensed professional.

C. Action Submittals.

1. Delegated-Design Submittal: Provide an irrigation plan and associated details for the irrigation system, including analysis data, signed and sealed by the qualified licensed professional responsible for their preparation. Include a materials list which identifies all products that comprise the system. Include locations of all heads, valves, and quick couplers. Coordinate the system's point of connection and controller location with Owner prior to plan production.
2. Zoning Chart: Show each irrigation zone and its control valve.

D. Closeout Submittals.

1. Operation and Maintenance Data: For sprinklers, controllers and automatic control valves to include in operation and maintenance manuals. Include warranty information.

2. Record Documents: Locate by written dimension any variation in routing of mainline piping, remote control valves and quick coupling valves. Submit two completed blackline drawings prior to final acceptance.

E. Quality Assurance.

Installer Qualifications: An irrigation installer with a minimum 5 years continuous experience installing systems of this size and complexity.

F. Delivery, Storage, and Handling.

1. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
2. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

G. Project Conditions.

Interruption of Existing Water Service: Do not interrupt water service to facilities occupied by Contracting Authority or others unless permitted under the following conditions and then only after arranging to provide temporary water service according to requirements indicated:

1. Notify Engineer no fewer than 7 days in advance of proposed interruption of water service.
2. Do not proceed with interruption of water service without Engineer's written permission.

H. Warranty.

1. Extend to the Contracting Authority warranties and guarantees provided by the manufacturer of all equipment used.
2. Fully warrant system for a minimum of 1 year after final acceptance.

155071.02 MATERIALS.

A. Pipes, Tubes, and Fittings.

1. PVC Pipe: ASTM D 1785, PVC 1120 compound, Schedules 40 and 80.
 - a. PVC Socket Fittings: ASTM D 2466, Schedules 40 and 80.
 - b. PVC Threaded Fittings: ASTM D 2464, Schedule 80.
 - c. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket ends.
2. PVC Pipe, Pressure Rated: ASTM D 2241, PVC 1120 compound, SDR 21.
 - a. PVC Socket Fittings: ASTM D 2467, Schedule 80.
 - b. PVC Socket Unions: Construction similar to MSS SP-107, except both headpiece and tailpiece shall be PVC with socket or threaded ends.

B. Piping Joining Materials.

All PVC fittings shall be compatible with the PVC pipe furnished. Use only solvent recommended by the manufacturer of the PVC pipe and fittings.

C. Sprinklers.

1. General Requirements: Designed for uniform coverage over entire spray area indicated at available water pressure.

2. Plastic, Pop-up Spray Sprinklers.

a. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- Champion Irrigation Products.
- Hunter Industries Incorporated.
- K-RAIN Manufacturing Corporation.
- Nelson, L. R. Corporation.
- Orbit Irrigation Products, Inc.
- Rain Bird Corporation.
- Toro Company (The).

b. Description.

- Body Material: ABS.
- Nozzle: Brass.
- Retraction Spring: Stainless steel.
- Internal Parts: Corrosion resistant.
- Spray Pattern: Adjustable.

D. Quick Couplers.

1. Description: Factory-fabricated, bronze or brass, two-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.
2. Provide one quick coupler per individual irrigated lawn panel separated by walks as indicated in plans.

E. Controllers.

1. Locate irrigation controls at Port Building. Coordinate location and equipment placement with building mechanical systems and per Engineer's direction.
2. **Description.**
 - a. Controller Enclosure:
 - 1) Body Material: Stainless steel sheet metal.
 - 2) Mounting: wall.
 - 3) Lockable
 - b. Timing Device: Adjustable, 24 hour, 14 day clock, with automatic operations to skip operation any day in timer period, to operate every other day, or to operate two or more times daily.
 - 1) Manual or Semiautomatic Operation: Allows this mode without disturbing preset automatic operation.
 - 2) Nickel-Cadmium Battery and Trickle Charger: Automatically powers timing device during power outages.
 - 3) Surge Protection: Metal-oxide-varistor type on each station and primary power.
 - c. Moisture Sensor: Adjustable from 1 to 7 days, to shut off water flow during rain.

155071.03 CONSTRUCTION.**A. Earthwork.**

1. Excavating, trenching, and backfilling are specified in Standard Specifications
2. Install warning tape directly above pressure piping, 12 inches below finished grades, except 6 inches below subgrade under pavement and slabs.

B. Piping Installation.

1. Install piping at minimum uniform slope of 0.5% down toward drain valves.
2. Install piping free of sags and bends.
3. Install groups of pipes parallel to each other, spaced to permit valve servicing.
4. Install fittings for changes in direction and branch connections.
5. Lay piping on solid subbase, uniformly sloped without humps or depressions.
6. Install PVC piping in dry weather when temperature is above 40°F. Allow joints to cure at least 24 hours at temperatures above 40°F before testing.
7. Install piping in sleeves under parking lots, roadways, sidewalks and other pavement areas.

C. Joint Construction.

1. Remove dirt and debris from inside and outside of pipe and fittings before assembly.
2. PVC Piping Solvent-Cemented Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - a. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.
 - b. PVC Pressure Piping: Join schedule number, ASTM D 1785, PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.
 - c. PVC Nonpressure Piping: Join according to ASTM D 2855.

D. Sprinkler Installation.

1. Install sprinklers after hydrostatic test is completed.
2. Install sprinklers at manufacturer's recommended heights.
3. Locate part-circle sprinklers to maintain a minimum distance of 4 inches from walls and 2 inches from other boundaries.

E. Automatic Irrigation-Control System Installation.

1. Equipment Mounting: Install interior controllers on wall.
2. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.
3. Install anchor bolts to elevations required for proper attachment to supported equipment.
4. Install control cable in same trench as irrigation piping and at least 2 inches below or beside piping. Provide conductors of size not smaller than recommended by controller manufacturer. Install cable in separate sleeve under paved areas.

F. Connections.

1. Comply with all applicable codes governing connections to the public water supply.

2. Install piping adjacent to equipment, valves, and devices to allow service and maintenance.
3. Connect wiring between controllers and automatic control valves.

G. Identification.

1. Identify System Components.
 - a. Equipment Nameplates and Signs: Install engraved plastic-laminate equipment nameplates and signs on each automatic controller.
 - b. Text: In addition to identifying unit, distinguish between multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations.
2. Warning Tapes: Arrange for installation of continuous, underground, detectable warning tapes over underground piping during backfilling of trenches.

H. Field Quality Control.

1. Perform tests and inspections. Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.
2. Submit inspection reports.
3. Tests and Inspections:
 - a. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
 - b. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.
 - c. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
4. Any irrigation product will be considered defective if it does not pass tests and inspections.

I. Startup Service.

Complete installation and startup checks according to manufacturer's written instructions.

1. Verify that controllers are installed and connected.
2. Verify that electrical wiring installation complies with manufacturer's recommendations.

J. Adjusting.

1. Adjust settings of controllers. Adjust automatic control valves to provide flow rate at rated operating pressure required for each sprinkler circuit.
2. Adjust sprinklers and devices, except those intended to be mounted aboveground, so they will be flush with, or not more than 1/2 inch above, finish grade.

K. Cleaning.

Flush dirt and debris from piping before installing sprinklers and other devices.

L. Demonstration.

Train Contracting Authority's maintenance personnel to adjust, operate, and maintain automatic control valves and controllers.

155071.04 METHOD OF MEASUREMENT.

The Irrigation System is a lump sum bid item.

155071.05 BASIS OF PAYMENT.

Payment for Irrigation System shall be full compensation for designing, furnishing, and installing complete operational irrigation system including all incidental items and testing.