**SP-157151**
**(New)**

**SPECIAL PROVISIONS**
**FOR**
**PLANTING IRRIGATION**

**Dallas County**
**ICAAP-SWAP-8177(626)--SH-25**

**Effective Date**
**December 15, 2020**

**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.**

## 157151.01 GENERAL

### 1.01 SECTION INCLUDES

All labor, materials, equipment and supervision required to furnish and install a complete quick coupler valve irrigation system to allow for the irrigation of plantings.

### 1.02 REFERENCES: ASTM INTERNATIONAL, LATEST EDITION

A. The publications listed below form a part of this specification to the extent referenced. The publications are referenced in the text by the basic designation only.

B. Federal Specifications (Fed. Spec.): RR-F-621E Frames, Covers, Gratings, Steps, Sump And Catch Basin, Manhole

C. American National Standard Institute (ANSI):

1. B40.1-91Gauges-Pressure Indicating Dial Type Elastic Element

D. American Society for Testing and Materials (ASTM):

1. B61-93 Steam or Valve Bronze Castings
2. B62-93 Composition Bronze or Ounce Metal Castings
3. D1785-91Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedule 40, 80, and 120
4. D2241-89Poly(Vinyl Chloride) (PVC) Pressure Rated Pipe (SDR Series)
5. D2287-81Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds
6. D2464-91Threaded Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80

7. D2466-90 Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40
8. D3035 Standard Specification for Polyethylene Plastics Pipe and Fittings Materials
9. F714 Standard Specification for Polyethylene (PE)4170 Plastic Pipe (SDR-PR) Based on Outside Diameter
10. D2564-94 Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Pipe And Fittings
11. D2855-90 Making Solvent Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings
12. F477-90 Elastomeric Seals (Gaskets) for Joining Plastic Pipe
13. B209-96 Aluminum and Aluminum-Alloy Sheet and Plate

E. American Water Works Association (AWWA):

1. C110-93 Ductile-Iron and Gray-Iron Fittings, 3-Inch Through 48-Inch for Water and Other Liquids
2. C111-90 Rubber Gasket Joints for Ductile-Iron and Gray-Iron Pressure Pipe Fittings.
3. C115-94 Flanged and Ductile Iron and Gray Iron Pipe with Threaded Flanges
4. C151-93 Ductile-Iron Pipe, Centrifugally Cast in Metal Molds or Sand Lined Molds, for Water or Other Liquids
5. C153-94 Ductile-Iron Compact Fittings, 3 Inch Through 12-Inch for Water and Other Liquids.
6. C500-93 Gate Valves for Water and Sewerage Systems
7. C504-87 Rubber Sealed Butterfly Valves
8. C600-93 Installation for Ductile-Iron water Mains and Their Appurtenances
9. C901-02 Polyethylene (PE) Pressure Pipe and Tubing, ½ In. Through 3 In., for Water Service

F. American Society of Irrigation Consultants (ASIC)

G. Irrigation Association:

1. Irrigation System Installation and Maintenance, 2nd Edition
2. Irrigation Contractor Workbook, 2nd Edition

H. Manufacturers Standardization Society (MSS):

1. SP70-90Cast Iron gate Valves, Flanged and Thread Ends

I. National Electrical Manufacturers Association (NEMA):

1. 250-85 Enclosures for Electrical Equipment (1000 Volts Maximum); Revision 1, May 1986

J. National Electric Code: (latest edition)

K. Uniform Plumbing Code: (latest edition)

## 1.03 DESCRIPTION OF WORK

A. The following irrigation system when fully completed shall provide quick couple valves throughout all noted turf and landscaped/planter areas. It is the intent of the diagrammatic irrigation plan to install all products within the Contracting Authority's property limits and within turf and/or landscaped areas. Contractor to utilize new mechanical point of connection (POC) equipment, as located by Engineer and performed by Licensed Plumber.

B. Provide all permitting, labor, materials, equipment and supervision required to construct the irrigation system complete including but not limited to:

1. Irrigation meter and a reduced pressure zone device (backflow preventer) shall be located inside the hotbox enclosure.

2. Valves, quick coupler and isolation;

3. Piping.

C. Quick coupler irrigation system shall be installed as a complete system. All equipment whether mentioned or not shall be provided for the proper operation of quick coupler irrigation system. Operation shall be as per manufacturer recommendations and to the satisfaction of the Engineer. It may be produced by manufacturers as specified.

D. Provide and install as required, the following – see plans:

1. City POC, winterization drain/blow down, water service, valves, fittings and piping – as per local codes by Licensed Plumber.

## 1.04 SUBMITTALS

Manufacturers' Data: Submit manufacturers' cutsheets and specifications with item being supplied highlighted for all equipment in the project work. Include all materials and products that are part of the irrigation system including, but not limited to: pipe, fittings, valves and mainline components. Quantities of materials need not be included.

## 1.05 QUALITY ASSURANCE

A. Irrigation Contractor Qualifications: Irrigation Contractor must be Certified Irrigation Contractor (CIC) and must demonstrate experience with the installation of at least six irrigation systems of similar size within the last 3 years.

B. Irrigation Contractor must be licensed and/or certified in the State of Iowa – as applicable.

C. Approved Equipment Manufacturer(s): Manufacturer(s) regularly and presently manufactures the item submitted as one of their current and supported principal products.

## 1.06 DELIVERY, STORAGE, AND HANDLING

A. Materials shall be delivered to the site in accordance with manufacturer's recommendations for shipment and protection of materials.

B. Handling of materials as recommended by manufacturer.

C. Storage of all materials in locations designated and approved by Engineer.

## 1.07 PROJECT/SITE CONDITIONS

A. The Contractor shall take precautions to insure that equipment and vehicles do not disturb or damage existing site grading, walks, curbs, pavements, utilities, plants, and other existing items and elements on public and private property.

B. Verify locations and depths of all underground utilities prior to commencing excavation.

C. Repair and/or return to original condition any damage caused by Contractor's negligence at no cost to the Contracting Authority.

D. Existing Utilities:

1. Provide connection to new city main – see plan.

2. Locate existing underground utilities in areas of work. If utilities are to remain in place, provide adequate means of support and protection during this work.

3. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, consult utility owner immediately for directions. Cooperate with Contracting Authority and utility companies in keeping respective services and facilities in full operation. Repair damaged utilities to satisfaction of utility owner, at no additional cost to the Contracting Authority.

4. Do not interrupt existing utilities serving facilities occupied and used by Contracting Authority or others during occupied hours, except when permitted in writing by Contracting Authority and then only after acceptable temporary utility services have been provided.

5. Provide minimum of 48 hour notice to Contracting Authority and Engineer and receive written notice to proceed before interrupting any utility.

6. Demolish and completely remove from site existing underground utilities indicated to be removed after complete deactivation. Coordinate with utility companies for shut-off of services if lines are active.

E. Protection of Persons and Property:

1. Barricade open excavations occurring as part of this work and post warning lights.

2. Operate warning lights as recommended by authorities having jurisdiction.

3. Protect structures, utilities, sidewalks, pavements, curbs, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by this work.

**1.08 CODES, INSPECTIONS AND PERMITS**

A. The entire installation shall fully comply with all local and state laws and ordinances, and with all the established codes applicable thereto.

B. The Contractor shall take out <u>all</u> required permits, arrange for all necessary inspections and shall pay any fees and expenses in conjunction with the same as a part of the work under this section.

**157151.02 MATERIALS**

**2.01 GENERAL**

A. All quick coupler valves and isolation valves shall be as specified herein and on plan. Said equipment and other products are called out on the plans and or listed in the specifications below.

B. All equipment to be from one manufacturer and/or as specified and must be purchased by the local authorized serviced regional distributor. See Submittal section for details.

**2.02 SUBSTITUTIONS**

A. Unless noted otherwise, use specified equipment. Engineer must approve equipment prior to construction. The Contactor through written request prior to purchase or installation may request substitutions to the approved equals listed herein. Changes and associated design costs to accommodate alternative equipment are Contractor's responsibility.

B. Pipe sizes referenced in the contract documents are minimum sizes, and may be increased at Contractor's option.

**2.03 SLEEVING**

A. Provide sleeves beneath all hardscape for irrigation pipe and all wiring. Provide separate sleeves beneath hardscape for wiring.

B. Use rigid, unplasticized polyvinyl chloride (PVC) 1120, 1220 National Sanitation Foundation (NSF) approved pipe, extruded from material meeting the requirements of Cell Classification 12454-A or 12454-B, ASTM Standard D1784, with an integral belled end.

C. Use C905, DR-18 rated at 235 psi confirming to dimensional and tolerances established by ASTM Standard D2241 for mainline pipe sleeves larger than 12 inch.

D. Use Class 200, SDR-21, rated at 200 psi, conforming to dimensions and tolerances established by ASTM Standard D2241 or AWWA C905, DR-25 rated at 165 psi conforming to AWWA Standard C905, or use C-900 PVC pipe, rated at 200 psi.

E. Sleeve sizes are to be as shown on the drawings or twice the nominal diameter of pipe if not shown. The wiring bundle area may not exceed more than 40% of the sleeve cross sectional area, per NEC recommendations.

F. Restrained Casing Spacers:

1. Use restrained casing spacers on gasketed pipe contained in a sleeve. Provide restrained casing spacers for gasketed joints that occur within sleeve and as necessary along pipe length.

2. Sleeve Size: As shown in the Casing Spacer Installation Detail.

3. Use casing spacers manufactured from high strength ductile iron, per ASTM A536, Grade 65-45-12. Use restraining rods manufactured from high strength low alloy material meeting the requirements of ASTM A242 and ANSI/AWWA C111/A21.11. Use runners manufactured from ultra-high molecular weight polymer with a tensile impact of 600 to 1200 foot-pounds per inch) and a coefficient of friction of 0.14 to 0.17 per ASTM D-1894.

**2.04 PVC PIPE AND FITTINGS**

A. Sizes 1 inch diameter and larger

B. Virgin, high impact, poly-vinyl chloride (PVC) pipe, Schedule 1120-1220. Mainline piping: Class 200, having a minimum of 200 psi working pressure rating. Laterial piping: Class 200, having a minimum of 200 psi working pressure rating.

C. Continuously and permanently marked with manufacturer's name, material, size and schedule or type.

D. Pipe: Conform to CS 207-60 or latest revision.

E. Material: Conform to CS 256-63 or latest revision.

F. Jointing Material: Solvent cement to conform to ASTM D2564; primer to conform to ASTM F656 or latest revision.

**2.05 PVC PIPE FITTINGS**

A. Sch. 40 PVC solvent weld or belled fittings; saddles prohibited.

B. Conform to ASTM D1784, ASTM D2466 or latest revision.

**2.06 METER & BACKFLOW PREVENTER** Coordinate location with Contracting Authority.

A. No connections are allowed between the meter and backflow preventer.

B. Manufacturer's standard, to suit quick coupler system and located over drain capable of accommodating any discharge event.

C. Location of meter and backflow preventer shall be in the hotbox.

**2.07 QUICK COUPLING VALVES** - see plans and details

A. Located in intervals along all mainline pipe with swing joints and stabilizers. Verify all final locations with Engineer.

B. Install quick coupling valve in circular valve box labeled QCV approved by Engineer for each location.

C. Provide matching quick coupler keys. One key for each three coupling valves. Keys to be given to Contracting Authority with close-out instructions and manuals.

**2.08 ISOLATION VALVES**

A. See plan for actual location and verify final locations with the Engineer. Valves and boxes not to impede with root balls or protection zones.

B. Size valve to match line size.

C. Install isolation valves in 12 inch standard valve box according to the plans labeled Isolation Valve.

**2.09 VALVE BOX FOR QUICK COUPLER VALVES AND ISOLATION VALVES** – see plan and details

A. Single Valve Setup: 12 inch standard box labeled EV (Electric Valve).

B. Multi-Valve Setup: Jumbo box. Use manufacturer's recommended extension kits if required labeled EV.

C. Quick Coupling Valves: 10 inch circular box labeled QCV (Quick Coupler Valve).

**2.10 SWING JOINTS**

LASCO 360 degree Swing Joint Assembly as manufactured by Philips Industries or approved equal.

**2.11 THRUST BLOCK** – See plan and details

A. Pour concrete thrust blocks at all change of directions both mains and laterals to ensure against pipe separation. Note: Irrigation Contractor will be liable for any movement of pipe causing fitting/piping failure.

B. As shown on construction details.

## 157151.03 CONSTRUCTION

### 3.01 SYSTEM DESIGN

Locate quick coupler valves as per manufacturer's recommendations: Make minor adjustments as necessary to avoid plantings and other obstructions and to provide proper location relative to grades and finished plant beds, taking care in working around and not disrupting any and all plant material at no additional cost to the Contracting Authority. Irrigation system layout is diagrammatic. Exact locations of piping, valves, and other components shall be established by the Contractor in the field at time of installation and on the approved shop drawings. Engineer to approve such locations.

### 3.02 TIMING

Coordinate time schedule with all trades.

### 3.03 INSTALLATION

A. Excavating and backfilling:

1. Excavation shall include all materials encountered, except materials that cannot be excavated by normal mechanical means.

    a. Rock excavation: Submit a unit cost per foot of trench for rock excavation. Include in price additional backfill materials required to replace excavated rock.

2. Excavate trenches of sufficient depth and width to permit proper handling and installation of pipe and fittings – as applicable.

3. If the pulling method is used, the pipe "plow" shall be a vibratory type. Starting and finishing holes for pipe pulling shall not exceed a 1 foot 0 inch by 3 foot 0 inch opening.

4. Excavate to depths required to provide 2 inch depth of earth fill or sand bedding for piping when rock or other unsuitable bearing material is encountered.

5. Fill to match adjacent grade elevations with approved earth fill material. Place and compact fill in layers not greater than 8 inch depth.

    a. Provide approved earth fill or sand to a point 4" above the top of pipe.

    b. Overfill with approved excavated or borrow fill materials free of lumps or rocks larger than 3 inches in any dimension. Level, compact and water settle. Should settlement occur, refill and re-sod as required.

6. Minimum cover of 18 inches based on finished grade; laterals with a minimum cover of 12 inches based on finished grades.

7. Excavate trenches and install piping and fill during the same working day. Do not leave open trenches or partially filled trenches open overnight.

B. Plastic Pipe:

1. Install plastic pipe in accordance with manufacturer's installation instructions. Provide for thermal expansion and contraction.

2. Saw cut plastic pipe. Use a square-in-sawing vice to ensure a square cut. Remove burrs and shavings at cut ends prior to installation.

3. Make plastic to plastic joints with solvent welded joints or slip seal joints. Use only solvent recommended by the pipe manufacturer. Install plastic pipe fittings in accordance with pipe manufacturer's instructions with restraints. Contractor shall make arrangements with pipe manufacturer for all necessary field assistance.

4. Make plastic to metal joints with toe nipples, no male adapters.

5. Make solvent weld joints in accordance with manufacturer's recommendations.

6. Allow joints to set at least 24 hours before pulling or pressure is applied to the system.

7. Maintain pipe interiors free of dirt and debris. Close open ends of pipe by acceptable methods when pipe installation is not in progress and over all non-working hours.

C. Valves, fittings, and accessories:

1. Install fittings, valves, swing joints and accessories in accordance with manufacturer's instructions, except as otherwise indicated.

a. Provide concrete thrust blocks or joint restraints where required at fittings valves and all change of directions. No exceptions.

2. Set QCV's perpendicular to finish grades, except as otherwise indicated.

3. Obtain Engineer's review and acceptance of height for proposed valves prior to installation.

4. Install quick-coupling (1 inch) valves in 10 inch valve box on 360 degree swing joint assembly as per manufacturer's recommendation with stabilizer - see detail.

5. Install fittings and accessories as shown or required to complete the system.

6. Install in-ground control valves in a valve access box as indicated.

7. Install valve access boxes on a suitable base of gravel to provide a level foundation at proper grade to provide drainage of the access box.

8. Seal threaded connections on pressure side of control valves as per manufacturer's recommendations.

D. Sleeves: Coordinate with Contractor and all trades.

E. Flushing, testing, and adjustment:

1. Perform system testing upon completion of each section. Make necessary repairs and re-test repaired sections as required.

**3.04 AS-BUILT DRAWING**

A. Furnish accurate reproducible and electronic “As-Built” drawings of all components. State the size, manufacturer, model number, part number, size, and exact location of each and every item furnished and installed. Final payment can be withheld until “as-built” has been provided and approved by Engineer.

B. Contractor will furnish Contracting Authority with two bound copies of instruction sheets and parts lists covering all operating equipment.

**3.05 DISPOSAL OF WASTE MATERIAL**

A. Stockpile, haul from site, and legally dispose of waste materials, including unsuitable excavated materials, rock, trash, and debris.

B. Maintain disposal route clear, clean and free of debris.

C. Repair any damage resulting from irrigation system installation.

**3.06 ACCEPTANCE**

A. Test and demonstrate to the Engineer the satisfactory operation of the system free of leaks.

B. Instruct the Contracting Authority in the operation of the system.

C. Upon acceptance, the Contracting Authority will assume operation of the system.

**3.07 SPECIAL INSTRUCTIONS**

A. Coordinate and cooperate with all subcontractors, during the installation of this system.

B. It is the intent of the Contracting Authority to use moderate to heavy motorized lawn mowers to maintain the turf on this project. All QCV’s shall safely sustain these loads without failure.

**157151.04 METHOD OF MEASUREMENT.**

Measurement for this item shall be made on a lump sum basis of furnished and installed system for irrigating of plants.

**157151.05 BASIS OF PAYMENT.**

Payment is for full compensation for all labor, equipment, and materials necessary for furnishing and installation of system for irrigating of plants.