CITY OF EVERETT
REQUEST FOR OPM SERVICES NO. ENG-25-66
ADDENDUM NO. 1

Date Issued: October 16, 2025
Project: ENG-25-66 Bohler Woodland Park Renovation

NOTICE TO ALL BIDDERS

This Addendum is issued to amend the Invitation for Bid for **ENG-25-66 Bohler Woodland Park Renovation**

Addition to Specification Package:

Division 31 Earthwork has been updated to include the following section:

32 28 00 Irrigation Specification

This Addendum modifies and becomes part of the original bid documents for IFB #25-66.

All other terms and conditions of the Invitation for Bid #25-66 remain unchanged. Proposers must acknowledge receipt of this Addendum with their submission.

Kiara M. Freeman
Chief Procurement Officer
City of Everett

SECTION 328400

IRRIGATION

PART 1 - GENERAL

1.1 SUMMARY

A. Provide all materials, labor, installation equipment, and technical service to complete automatic landscape irrigation system, as well as the testing and warranty of the system as defined in this Specification and Construction Drawings.

B. Items of work specifically included are:
1. Procurement of all applicable licenses, permits, and fees.
2. Coordination of all utilities.
3. Verification of site conditions.
4. Maintenance during guarantee period.

1.2 QUALIFICATIONS

A. Qualified irrigation system installers must have a minimum experience of five (5) years with work and products specified herein, including:
1. Two-Wire Controller and Valve Installation
2. Weather-Based Smart Controllers
3. Domestic Water Plumbing Systems

B. Submit three (3) references for similar work performed in the last five (5) calendar years, including:
1. Contact name
2. Company Name
3. Contact Phone Number
4. Project Name and Location
5. Brief Project Description

1.3 WORK DESCRIPTION

A. Irrigation System shall be a new, two-wire irrigation system with its own controller and water supply. Sprinkler head placement and throw radius shall be better than head-to-head coverage.

B. Provide new backflow preventers, irrigation master valve and flow sensor in vandal-proof enclosure for irrigation water supply.

C. Provide drain and blow-out port for winterization.

D. Provide and train Owner on remote irrigation management through Internet based platform through cellular internet service to be coordinated with site contractor.

1.4 UTILITIES

A. Water Service Point of Connection
   1. Approximate point of connection from existing main within site is located on Drawings.
      a. Equipment requirements within vandal-proof enclosure (see Irrigation Product Below):
         1) Shed (provided by owner)
         2) Irrigation Backflow Preventer
            a) Size: 1-Inch
            b) Construction: Bronze with Quarter Turn Ball Valve, Bronze Strainer,
            c) Ratings: 175 psi Maximum
            d) Manufacturer/Model: Watts Model 002M2-QT
         3) 1-Inch Brass Master Valve (see Irrigation Product Below)
         4) 1-Inch Brass Flow Sensor (see Irrigation Product Below)
      b. Flow and pressure requirements:
         1) Flow: Maximum 12 gallons per minute
         2) Pressure: 60 pounds per square inch (downstream of all plumbing)

B. Electrical Power Source to New Outdoor Controller
   1. New electrical circuits to be provided by Electrical Contractor (Refer to Division 26 Electrical).
      a. Power Requirements for Irrigation Controller within Pedestal
         1) 120-Volt, 1-Phase, 60-Hz, 20-Amp Breaker
         2) Irrigation Controller has internal transformer for 24VAC valve two-wire
      b. Conduits
         1) Provide minimum Schedule 80 PVC conduits through Irrigation Controller pedestal concrete pad with long elbow sweeps and under all hardscape through sleeves.

C. Internet for Outdoor Controller
   1. Provide Cellular Service through Irrigation Controller manufacturer for remote, internet-based access through any web-enabled device.

D. Pipe Sleeves
   1. Pipe sleeves to be provided by Earthwork Contractor beneath all hardscape, as indicated on Construction Drawings.
      a. Pipe sleeve requirements
         1) Two (2) parallel 4-inch Schedule 40 PVC
         2) Extend 18 inches beyond edge of hardscape
         3) Minimum cover: 24 inches

1.5 RELATED REQUIREMENTS

A. Coordinate with other project trades and refer to overall project Construction Document Specifications and Drawings, including, but not limited to:
   1. General Requirements
   2. Existing Conditions
   3. Concrete
   4. Plumbing
   5. Electrical
   6. Communications
   7. Earthwork
   8. Exterior Improvements
   9. Utilities

10. Construction Drawings:
    a. IR-1 – Irrigation Plan
    b. Review all other Project Construction Documents for coordination.

1.6 APPLICABLE STANDARDS AND CODES

A. At a minimum, comply with the following standards and codes:
1. American Society for Testing and Materials (ASTM)
2. National Standard Plumbing Code (NSPC)
3. National Electric Code (NEC)
4. National Sanitary Foundation (NSF)
5. Underwriters Laboratories, Inc. (UL)
6. Occupational Safety and Health Administration (OSHA)

B. Comply with applicable laws, standards, and regulations of the local governing authority. All local laws more stringent than those referenced above shall take precedent.

1.7 SUBMITTALS

A. Submit the following under provisions of specified Submittal Procedures:
1. Literature: Manufacturer's product data sheets, specifications and installation instructions for materials listed in this Specification (Part 2 – Products).
    a. Product submittals shall be concise (no extraneous pages or sections) and clearly marked to show submitted product model, type, size, etc.
    b. Substitute Product Submittal:
        1) Provide specified product submittals for “an approved equal” to Owner’s Representative for approval.
        2) Alternate products are acceptable when products of equal or better quality and performance are submitted and approved by the Owner’s Representative.
        3) Substitute Product Submittals constitute representation that:
            a) Substitute products have been thoroughly investigated and have been determined to be equal or superior in all respects to that specified.
            b) Substitute products shall provide the same warranties as specified products.
            c) Substitute products are compatible with interfacing items.
            d) Assume responsibility of and guarantee system performance as a result of product substitution, including making all subsequent changes to meet design specifications.
    c. Work shall not commence until all products specified are submitted and approved in a written notification by Owner’s Representative.
    d. All product installed shall be new, without defects, and of quality and performance as specified.
2. Schedule: Submit Schedule of all products to be furnished hereunder, indicating manufacturer, size, and model.
    a. Ensure that all of the types/styles of products and installation equipment specified herein can be furnished by the manufacturer submitted.
    b. Provide all spare irrigation parts as noted (see Spare Irrigation Parts)

c. Prior to submitting schedule, confirm current site conditions are as provided in the Construction Drawings.

1.8 DELIVERY, STORAGE AND HANDLING

A. Do not deliver materials to the site, until all specified submittals have been submitted to, and approved by, the Owner's Representative.

B. Coordinate with Owner's Representative for temporary storage and staging areas.

C. Protect materials from damage from construction traffic, weather, corrosion, and other causes while stored on-site. Minimize on-site storage as possible.

D. Store and handle all products and materials in compliance with manufacturer instructions and recommendations.

1.9 GUARANTEE AND REPLACEMENT

A. Guarantee entire irrigation system, parts and labor, for one (1) year from official written date of acceptance by Owner's Representative. Provide written warranty showing date of completion and period of warranty prior to request for final payment.

B. System malfunctions occurring during the guarantee period due to defective materials, poor workmanship, or improper adjustment shall be corrected to satisfaction of Owner's Representative at no additional cost to the Owner.
1. Repair all defects within 10 days of notification from Owner or Owner's Representative.
2. Repair defects with approved products.

C. First-year spring system start-up and winterization shall be included in system guarantee.

D. Manufacturer warranties shall be provided for all products and materials where such warranties are offered in published product data. Copies of manufacturer warranties are to be included in the Operations and Maintenance Manual (See Operation and Maintenance).

PART 2 – PRODUCTS

2.1 AUTOMATIC IRRIGATION CONTROLLER

A. Controller
1. Size: 54-Station Maximum
2. Construction: Electronic with 120-Volt Input and 24-28 Volt Output; Wall-Mounted Stainless-Steel Enclosure.
3. Standards: UL-Listed
4. Features: Manual and Automatic Control, Water Budgeting, Cycle-Soak, Sensor Input Terminals, Internal Transformer, Flow Monitoring Capability, Lightning Protection, Remote Control via Internet, Conventional Wire with Two-Wire Capability.
5. Manufacturer/Model: Rain Bird, ESP-LXD, Baseline BaseStation 1000, Hunter ACC2 Decoder, or Approved Equal.

B. External Devices (Matching Manufacturer and Compatible with Controller)

1. Wired Rain Sensor (free of Overhead Obstruction), with Enclosure Mounted to Shed
2. 1-Inch Brass Flow Sensor with Decoder (Inside Backflow Enclosure)
   a. Provide Isolation Valves and Unions on Each Side for Winterization
   b. Flow Range = 4 – 80 gpm
3. Lightning Surge Suppression

C. Outdoor Controller Grounding
1. Size
   a. Wire: 6AWG
   b. Rod: 5/8-Inch Diameter x 8-Foot Long
   c. Plate: 4-Inch x 96-Inch x 1/16-Inch Thick
2. Construction
   a. Wire: Bare Copper
   b. Rod: Copper
   c. Plate: Copper with Loresco PowerSet Ground Enhancement Material Above and Below
3. Ratings: UL-Listed
   a. Features: Cadweld Connectors from Wire to Rod, Plate Manufacturer provided Plate Connections, PVC or ADS Drain Pipe and Grate Cover over Rod Plate with Metal Detection

2.2 WIRE

A. Conventional Wire (From Decoders to Electric Zone Valves)
1. Size: 14AWG Minimum
2. Construction: Single Strand Solid Copper Conductor with PVC Insulation
3. Ratings: UL-Listed, NEC (Class II Circuit), Direct Burial UF/TWU, up to 600-Volt Potential
4. Standards: ASTM B-3, ASTM B-8
5. Markings: Manufacturer, Rating, Size, and Type
6. Manufacturer/Model: Paige Electric Model P7001D; Service Wire Company UF14, UF12; Regency Wire & Cable 14AWG, 12AWG; or Approved Equal.

B. Wire Splices
1. Type: Direct Burial Wire Splice Kit (All Components Intact)
2. Construction: Lockable Plastic Tube, Pre-Filled with Insulation Gel
3. Ratings: UL-Listed, NEC, Direct Burial and Submersion, up to 600-Volt Potential
4. Manufacturer/Model: 3M DBY-6; Rain Bird DB Series; or Approved Equal.

C. Wire Conduit
1. Size: 1-Inch Minimum
2. Construction: PVC, Solvent Weld
3. Ratings: Schedule 80
4. Fittings: Long Sweep Elbows
5. Manufacturer: Cresline; Certainteed, JM Eagle; or Approved Equal.

2.3 PIPE AND FITTINGS

A. Irrigation Mainline and Lateral
1. Size: 1-Inch Mainline, Lateral Sizes as Noted on Plans
2. Construction: Polyvinyl Chloride (PVC), Solvent Weld
3. Ratings: Schedule 40 PVC

4. Markings: Manufacturer, Nominal Size, Class or Schedule, Pressure, Extrusion Date, Pipe Insertion Mark.
5. Manufacturer: Cresline; Certainteed; JM Eagle; or Approved Equal.
6. Fittings
   a. For Valves Toe Nipples: Schedule 80 PVC
   b. Other Fittings: Schedule 40 PVC
7. Markings: NSF Designation, Size, Class or Schedule
8. Manufacturer: Lasco; Spears; Dura; or Approved Equal
9. Solvent
   a. Type: NSF Type I or Type II PVC
   b. Standards: ASTM D-2564
   c. Manufacturer: IPS Weld-On 711; Oatey HD Cement; Rectorseal Gold; or Approved Equal
10. Primer
    a. Type: NSF for PVC
    b. Standards: ASTM F-656
    c. Manufacturer: IPS Weld-On P-68; Oatey Clear Primer; Rectorseal Jim PR-2; or Approved Equal

2.4 ELECTRIC ZONE VALVES

A. Sprinkler Zone Valve
1. Size: 1-Inch
2. Construction: Plastic Globe Valve with Reinforced Nylon or Fiberglass Body
3. Ratings: 200 psi
4. Features: Manual Bleed Screw, Flow Control, Pressure Regulation, and Filter/Scrubber
5. Manufacturer/Model: Hunter ICV-FS; Rain Bird PESB; or Approved Equal

B. Master Valve (installed in Backflow Enclosure)
1. Size: 1-Inch
2. Construction: Brass Globe Valve
3. Ratings: 220 psi
4. Features: Manual Bleed Screw, Flow Control, Pressure Regulation, and Filter
5. Manufacturer/Model: Hunter IBV-FS; or Approved Equal

2.5 ISOLATION VALVES

A. Small Mainline Isolation Valve
1. Size: 1-Inch and Smaller
2. Construction: Bronze, Gate Valve
3. Ratings: 200 psi
4. Features: Steel Cross Handle, Non-Rising Stem
5. Manufacturer/Model: Nibco T-113K; Apollo 102T-K; or Approved Equal

2.6 QUICK COUPLING VALVES

A. Small Mainline Quick Coupling Valve
1. Size: 1-Inch, Normally Closed
2. Construction: Brass, Spring-Loaded Valve Seat, Key Engaged
3. Ratings: 125 psi

4. Features: 1-Inch NPT Inlet, ACME Key, Locking Vinyl Cover, Anti-Rotation Stabilization Wings
   a. Swing Joint Assembly
      1) Size: 1-Inch
      2) Construction: PVC, with O-Ring Seals and Brass Threaded Outlet
      3) Manufacturer: Hunter HSJ-1 with SnapLok; or Approved Equal
5. Manufacturer/Model: Hunter HQ-44RC-AW; or Approved Equal.

2.7 VALVE BOXES

A. General
1. Size:
   a. 12-Inch Standard Valve Box
      1) Single 1-Inch Electric Zone Valve
      2) Double 1-Inch or 1½-Inch Electric Zone Valves
   b. 6-Inch Round
      1) Wire Splice
      2) Decoder Cable Fuse Device
      3) Decoder Grounding Rod
   c. 10-Inch Round
      1) Single 1-Inch or 1½-Inch Electric Zone Valve
      2) Isolation Valve
      3) Quick Coupling Valve
2. Construction: Resin
3. Ratings: Tensile Strength 3,000-5,000 psi
4. Color: Green or Black (per Owner's Representative)
5. Features: Lockable, Bolt-Down Covers, Brick Supported
6. Manufacturer/Model: Carson, Model Specification Grade NDS Pro; Rain Bird VB; or Approved Equal

2.8 ROTARY SPRINKLERS

A. Body
1. Size: 6-Inch Pop-Up
2. Construction: Plastic, Ratcheting Riser, Removable Nozzle, Internal Check Valve
3. Ratings: Pressure Regulated to 40 psi
4. Manufacturer/Model: Hunter PROS-06-PRS40-CV; Rain Bird 1806-SAM-PRS-P45, or Approved Equal

B. Nozzles
1. 12' – 30' Radius (see Contract Drawings)
2. Features: Full and Part-Circle Fixed-Arc and Strip Patterns
3. Manufacturer/Model: Hunter MP Rotator, Toro Precision Rotating, or Approved Equal

2.9 DRIP IRRIGATION

A. Integral Emitter Drip Tubing

1. Type
   a. Planter Beds
      1) Tubing: 17mm Diameter
      2) Emitters: 12-Inch Spacing, 0.6 gal/hour
      3) Row Spacing: 18 Inches

   b. Blank Tubing
      1) Tubing: 17mm Diameter
      2) Emitters: none

2. Construction: Polyethylene (PE) with Embedded Pressure Compensating Emitters
3. Ratings: Minimum Bending Radius = 7-inches
4. Fittings: 17mm PVC Barbed Fittings with Stainless Steel Clamps, Corrosion Tubing Stakes to Secure Drip Tubing to Ground
5. Features: Check Valve
6. Manufacturer/Model: Netafim TLCV9-12 and TLCV0; or Approved Equal

B. Manual Flushing Valve
1. Size: 1-Gallon Flush
2. Construction: Plastic
3. Fittings: 17mm PVC Barbed Fittings with Stainless Steel Clamps, Corrosion Tubing Stakes to Secure Drip Tubing to Ground
4. Features: Check Valve
5. Manufacturer/Model: Netafim or Approved Equal

C. Manual Flushing Valve
1. Size: 1-Gallon Flush
   a. Construction: Plastic
   b. Fittings: 17mm PVC Barbed Fittings

2. Manufacturer/Model: Netafim or Approved Equal

2.10 EARTH MATERIALS

A. Stone (in Valve Boxes)
1. Type: ¾-Inch (minimum) Crushed Stone

B. Clean Sand
1. Gradation: (passing by weight)
   a. No. 4 Sieve= 80% Minimum
   b. No. 200 Sieve = 5% Maximum

C. Concrete
1. Ratings: 3,000 psi 28-day Compressive Strength
2. Standards: ASTM C-33, ASTM C-94, ASTM-C150

2.11 EARTH MATERIALS

A. Stone (in Valve Boxes)
1. Type: ¾-Inch (minimum) Crushed Stone

B. Clean Sand
1. Gradation: (passing by weight)
a. No. 4 Sieve= 80% Minimum
b. No. 200 Sieve = 5% Maximum

C. Concrete
2. Ratings: 3,000 psi 28-day Compressive Strength
3. Standards: ASTM C-33, ASTM C-94, ASTM-C150

2.12 BACKFLOW PREVENTER

A. Size: 1-inch

B. Construction: Bronze with Quarter Turn Ball Valve with Strainer

C. Ratings: 175 psi Maximum

D. Manufacturer: Watts, Model 009M2-QT-S, or approved equal

2.13 COPPER PIPE

A. Size: 2-inch Maximum

B. Construction: Type K Copper

C. Standards: ASTM B-88

D. Fittings: Wrought Copper, Silver Solder Joint (per ASTM B-828), Non-Corrosive Flux

2.14 ANGLED BALL METER VALVES

A. Size: 1-inch

B. Construction: Brass (85-5-5-5), Factory Installed Handles

C. Fittings: Elliptical Meter Flange (for 1-Inch Valves)

D. Manufacturer: Mueller, or Approved Equal

2.15 SPARE PARTS

A. Wrenches, Keys, and Tools for Servicing and Adjusting Sprinkler Heads (2)

B. Quick Coupler Valve Keys (1)

C. Gate Valve (1 of each size on Drawings)

D. Electric Zone Valve (1 of each size on Drawings)

E. Sprinkler Heads and Nozzles (3 of Each)

F. Assorted Valves and Fittings

PART 3 – EXECUTION

3.1 GENERAL

A. Competent superintendents and assistants shall be on-site at all times during product delivery, installation, testing, and system adjustments.
   1. Field communication by Owner or Owner's Representative to superintendent shall be binding.

B. System features shall be laid out as indicated on Drawings, making minor adjustments for variations in planting arrangements or field conditions. Major changes shall be reviewed with Owner's Representative before acceptance.
   1. Irrigation lines shown on Construction Drawings are diagrammatic only. Location of irrigation equipment is contingent upon and subject to integration with all other underground utilities, tree roots, and hardscape design elements.

3.2 EXAMINATION

A. Review and verify project conditions are as indicated on Construction Drawings prior to starting work, including but not limited to:
   1. Utilities provided by Others
   2. Site grades and dimensions
   3. Athletic Field, landscaping and features
   4. Structures
   5. Pipe sleeves

B. Report any irregularities of site conditions to the Owner's Representative prior to beginning work.

C. Beginning of installation connotes acceptance of existing project conditions.

3.3 PROJECT COORDINATION

A. Coordinate with Owner's Representative to expeditiously install system.

B. Provide written notifications (electronic is acceptable) to Owner's Representative prior to work commencement, weekly for progress report, for any proposed changes to system design, and upon installation completion.

C. All questions of design intent, proposed design changes, field notifications, and product substitution after installation commences shall be in writing to Owner's Representative as a Request for Information (RFI).

D. Utility Coordination:
   1. Maintain 6-inch minimum clearance between irrigation lines and any utility line. Do not install sprinkler lines directly above another utility of any kind.
   2. Exercise care when excavating, trenching and working near existing utilities.

3.4 SITE PROTECTION

A. Protect landscaping, paving, structures, walls, footings, etc. from damage caused during work. Damage to work of another trade shall be reported at once.

B. Replace or repair any damage with same product or material, to the satisfaction of Owner's Representative at no additional cost to the Owner per Guarantee.

C. Route pipe as necessary to prevent damage to tree roots. Where trenching must occur near trees, provide proper root pruning and sealing methods to all roots 1-inch and larger.

3.5 EXCAVATION, TRENCHING, AND BACKFILLING

A. Notify and request approval from Owner's Representative if pipe pulling is the intended installation method. Pipe pulling is an accepted installation practice only under the following conditions:
   1. Maximum pipe size 2 inches, and
   2. Suitable soils (i.e. naturally rounded loamy soils without sharp rocks), and
   3. Specified pipe burial depth can be maintained.

B. Pipe Trench:
   1. Excavate trenches straight and true, minimizing site disturbance as possible.
   2. Final trench bottom shall be undisturbed soil and shall be free of rocks and debris larger than 1 inch or with sharp edges. If trench base is unsuitable for laying pipe, over excavate 2 inches below pipe invert, and place Clean Sand or Stone.

C. Clean Backfill:
   1. Material: Clean Sand (See Earth Materials)
      a. Clean backfill must be free of foreign material, debris, frozen material and rocks larger than 1-inch.
   2. Carefully place clean backfill a minimum depth of 10-inches over pipe and wire, tamp in place.
   3. Carefully place material around pipe and wire, tamp in place.

D. Trench Backfill:
   1. Material: Re-use excavated material
      a. Clean backfill must be free of foreign material, debris, frozen material, and rocks larger than 1-inch.
   2. Place and compact in maximum 6-inch lifts to dry density equal to undisturbed soil. Compaction by truck or equipment tires is prohibited.
   3. Avoid backfilling in hot weather.
   4. Match adjacent subsurface grades without hills or depressions. Repair settling (as required by Guarantee).
   5. If final planting soils, mulch, or sod were removed or disturbed during trenching, replace to match Project Specifications and regrade as necessary.
      a. Use sod cutter where applicable, or reseed disturbed areas to acceptance of Owner.

3.6 PIPE INSTALLATION

A. PVC Pipe Installation:
1. Cut plastic pipe with handsaw or pipe cutter, removing all burrs at cut ends. All pipe cuts shall be square and true. Bevel cut end as required to conform to manufacturer instructions.
2. Make all solvent-weld joints as per manufacturer's instructions and avoid applying excess primer or solvent. Do not wipe off excess solvent from each connection.
   a. Allow welded joints minimum 5 minutes set-up/curing time before moving or handling.
      1) Above 80ºF: Allow connections to set 24 hours
      2) Below 80ºF: Follow manufacturer instructions
      3) Below 40ºF: Prohibited
3. Maximum deflection per joint shall not exceed manufacturer limits.
4. Maintain 1-inch minimum between lines which cross at angels of 45 to 90 degrees

B. Pipe and wire shall run in same trench as mainline, at the elevation of the pipe invert (See Wire Installation).

C. Pipe Cover (unpaved surfaces):
1. PVC Mainline = 22 inches
2. PVC Lateral = 16 inches

D. Pipe Protection:
1. Prevent foreign material from entering pipe during installation.
2. Open ends of pipe shall be closed by watertight plug or seal when not in use.
3. Securely store pipe when not scheduled for installation.
4. Pipe shall not be installed when water is in trench, during rainstorms, or when temperature is below 40 ºF.
   a. No additional pipe may be installed or backfilled if water enters trench during pipe installation. Remove all water from trench before resuming installation.
   b. Pipe installed at temperatures below 40 ºF shall be removed and replaced at no cost to owner.
5. Trenched PVC pipe shall be snaked to accommodate for expansion and contraction due to changes in temperature.

3.7 PIPE SLEEVE INSTALLATION

A. Coordinate with Owner's Representative for provided pipe sleeves and locations installed by Earthwork Contractor.

B. New Pipe Sleeves:
1. Pipe Sleeve Cover: Minimum 24 inches
2. Install pipe sleeves where irrigation pipe runs under hardscape (see Construction Drawings).
3. Extend pipe sleeves minimum 18 inches beyond edges of hardscapes.
4. Prior to installation of pipe, pipe sleeve ends shall be field marked with vertical wood stakes extending above grade to allow field location during irrigation system installation.

C. Cutting through or jacking under new pavement shall be strictly prohibited. Failure to provide sleeves shall require notification to Owner's Representative for resolution.

3.8 ELECTRICAL CONDUIT INSTALLATION

A. Outdoor Electrical conduit shall be installed:
   1. Under and through all hardscape areas
   2. For all above ground wiring

B. Electrical conduit shall extend 18 inches beyond edges of hardscape.

3.9 ELECTRIC ZONE VALVE INSTALLATION

A. Install electric zone valves on level crushed stone base generally where shown on Construction Drawings. Do not pour stone around valves that are already installed.

B. Install all Schedule 80 PVC threaded nipples with Teflon tape, isolation valves, and/or union couplings in and out of electric zone valves as shown on details on Construction Drawings.

C. Set valves plumb with adjusting handle and all bolts, screws, and wiring accessible through valve box opening.

D. Install at sufficient depth to provide between 4-6 inches of cover from top of valve to finish grade.

E. Install specified valve box over all electric zone valves. Ensure lid is flush with final proposed grade (coordinate with Site Contractor).

F. Adjust zone valve operation after installation using flow control device on valve.

3.10 ISOLATION VALVE INSTALLATION

A. Install isolation valves per detail where indicated on Construction Drawings.

B. Install all isolation valves on level crushed stone base for operation ease with appropriate valve wrench. Do not pour stone around valves that are already installed.

C. Install specified valve box over all isolation valves. Ensure lid is flush with final proposed grade (coordinate with Site Contractor).

D. Check and tighten valve bonnet packing before valve box and backfill installation.

3.11 QUICK COUPLING VALVE INSTALLATION

A. Install quick coupling valves where indicated on Construction Drawings; generally, at ends of mainline branches and immediately downstream of well.

B. Mount mainline quick coupling valves on 1-inch diameter, 12-inch long brass swing joint assemblies and stabilizers.

C. Where mainline pressure exceeds 60 psi, install pressure regulating valves to 40 psi off quick coupling valve service tee.

3.12 WIRE INSTALLATION

A. Install wiring per local codes for less than 30-Volt service.

B. Install valve two-wire in trench alongside mainline at invert elevation. Backfill carefully to avoid any damage to wire insulation on conductors.
   1. In areas of unsuitable material, use clean sand in bottom of trench before placing wire (see Excavation, Trenching, and Backfilling)
   2. Minimum cover: 12-inches

C. Maintain sufficient slack for expansion, contraction and servicing. Do not install wiring tightly.
   1. Provide and install additional 8 to 12 inches slack for conventional wire from decoder to valve.
   2. Provide 30 inches slack between decoders for two-wire.
   3. Provide sufficient length of wire in valve boxes to allow valve solenoid, splice, decoder wire, and all connections to be brought above grade for servicing.
   4. Coil slack for neatness in valve box.

D. Install Decoder Cable Fuse Device as shown on Contract Drawings.

E. Provide waterproof splices at all in-ground wire connections using approved splice kits. All splices shall be made in valve boxes and recorded on Record Drawings.

F. Provide complete wiring diagram showing wire routing for connections between controller and valves as specified in Record Documents.

G. Securely store wire when not scheduled for installation.

3.13 GROUND INSTALLATION

A. Controller Grounding
   1. Wire 6AWG Bare Copper Wire to Grounding Rod and Plate as shown on drawings.
   2. Grounding Rod
      a. Coordinate with Site Contractor to ensure no obstructions below grade at grounding rod site (Call 811 / DIG-SAFE if necessary)
      b. Prepare valve box for grounding rod installation 8 feet from all valve boxes and electrical equipment. Drive 8-foot grounding rod into earth with 6 inches minimum below valve box lid.
      c. Make Cadweld connection between bare copper wire from lightning arrestor splice to grounding rod lug.

3.14 SPRINKLER INSTALLATION

A. Sprinklers shall not exceed maximum spacing as indicated on Construction Drawings.

B. Install sprinklers flush with grade on PVC swing joints as specified.

C. Flush system before installing internals, flush caps, and nozzles (see Testing and Adjustments)

D. Adjust all sprinklers after installation using flow control device on valve. Do not exceed radius reduction recommendations from manufacturer.

3.15 VALVE BOX INSTALLATION

A. Furnish and install valve boxes as per valve schedule above for each valve, splice, or sensor.

B. Install valve boxes on minimum 4-inches crushed stone base. Pouring stone into valve box after installation is not acceptable.

C. Finish elevation of all boxes shall be at grade, unless otherwise noted in Drawings.

D. Provide level brick supports beneath valve boxes.
1. For square/rectangular boxes, provide four (4) supports - one at each corner.
2. For round boxes, provide three (3) supports equally spaced.

3.16 AUTOMATIC IRRIGATION CONTROLLER INSTALLATION

A. Controller
1. Controller located inside Stainless Steel Enclosure.
2. Wire valves and external sensors into controller through conduits and set proper programming.
   a. Program "Cycle-Soak" feature for all zones with sloped or poorly draining soils.
3. Use Irrigation Plans provided for Recommended Quantity and Assignment
4. Using licensed electrical, wire controller to 120-Volt, 20-Amp electrical supply provided by Electrical Contractor.
5. Provide keys to Owner after final walkthrough.

B. Rain Sensors
1. Install sensors within Sensor Guard welded to irrigation controller enclosure. Wire sensor through Sensor Guard, through enclosure, and into Controller.
2. Exposed sensor wire shall be installed within ½-inch galvanized conduit, where applicable.
3. Rain Sensor shall have direct overhead exposure to atmospheric conditions and not in contact with overhead irrigation.

C. Grounding
1. Provide outdoor grounding for irrigation controller with grounding rod and grounding plate. Refer to Ground Installation and Construction Drawings details for installation steps.

3.17 TESTING AND ADJUSTMENTS

A. Include all testing and adjustments in submitted bid price.

B. System Flushing:
1. Open electric zone valves and flush out irrigation system under full head of water before installing sprinkler internals, flush caps, and nozzles.
2. Flush entire irrigation system after complete installation.
3. Clogged nozzles shall be remedied after completion of irrigation system.

C. Testing:
1. Test all pipe and valves for leaks at operating pressure. Repair all leaks and retest until leaks are remedied.
2. Perform coverage test with Owner's Representative present. Operate electric zone valves for five (5) minutes minimum during coverage test. Readjust sprinkler nozzles and head locations (as necessary) to attain proper coverage. Replace any equipment that does not meet specified standards.

3. After testing, clean all equipment of debris during installation.

D. Adjust sprinkler heads and valve boxes as necessary for mowing and landscaping.

E. Throughout guarantee period, adjust sprinklers and ensure coverage due to settlement and landscaping operations.

3.18 RECORD DOCUMENTS

A. Record (As-Built) Drawings
1. Maintain and update Record Drawings with red-line markings as project progresses, including locations of:
   a. Sprinklers and descriptions (nozzle, pop-up height, and type)
   b. Valve Boxes and descriptions (valve type, zone numbers, splice, etc.)
   c. All equipment installed with distinct symbols
   d. Pipe routing and tees
   e. Wire routing and splices
2. Locations of installed equipment (valve, controller, sensors) shall be referenced by two permanent locations (swing ties) or GPS.
3. Make all notes legible as work progresses, any new equipment added shall use distinct symbols denoting location.
4. Document any changes from original Construction Drawings.
5. Prints of original Construction Drawings may be obtained from the Owner's Representative at cost (0% markup).
6. Record Drawings shall be used as basis of payment for work completed. Provide copies of red-lined set to Owner's Representative along with payment request.

B. Record Documents
1. Record Documents shall be on-site at all times. Maintain record of the following as the project progresses:
   a. Materials Approved and approval date
   b. Pressure Test results, testing personnel and testing date.
   c. Materials delivered, Accepted, and Installed by whom and date.
   d. Field Communications and Requests for Information (RFI)

C. Prior to final punchlist, provide complete electronic and hard copy files of Record Drawings and Documents to Owner's Representative as part of project completion. All information must be complete and shall be added to submitted documents prior to acceptance.

3.19 OPERATION AND MAINTENANCE

A. General
1. Bid price shall include up to four (4) hours of irrigation system overview and instruction with Owner and/or Owner's Representative.

B. Operation and Maintenance Manual
1. Provide three (3) hard cover binders titled "Operation and Maintenance for Woodland Park Irrigation System" prior to application for acceptance and final payment.
2. Operation and Maintenance Manual shall include, but not be limited to:

a. Title Page and Table of Contents
b. One-Paragraph Written Description of Irrigation System
c. Manufacturers' Data and Cut Sheets of Equipment, including:
    1) Copies of all approved submittals
    2) Wire resistance readings to each electric valve at completion (for future troubleshooting)
    3) Recommended operating settings
    4) Recommended maintenance schedule
    5) Name, address, and telephone number of installer (for repairs, spring startup, and winterization during 1-year guarantee period)
    6) Irrigation program for periods without rain and recommended settings including, zone run time, days per week, cycle-soak, and rain sensor suspension.
    7) Web Based Application Server settings, login, and troubleshooting
d. Winterization and Spring Startup Instructions (after 1-year guarantee period)
e. Guarantee Data
f. Pockets with Folded Plans of:
    1) Original Design Drawing
    2) Final Record Drawing
    3) Controller Valve and Wiring System Diagram Drawing
    4) Stop-and-Waste Valve Locations

3.20 SITE CLEANUP

A. Remove all unused materials and equipment from project site safely and efficiently. Dispose of all unused materials legally - including construction debris and trash.

B. Adjust ground, compact, and re-plant around irrigation sprinkler heads and trenches as necessary for proper angle and elevation.

C. Fill all depressions, erosion rills, tire tracks, etc. with proper planting soil mix to ensure site drainage.

3.21 FINAL OWNER ACCEPTANCE

A. Final Owner Acceptance of Irrigation System is predicated on:
1. Complete system installation, adjustment, testing, and instructional overview.
2. Submission of Operation and Maintenance Manuals to Owner's Representative.
3. Proper Programming and Internet Connection of Automatic Irrigation Controller
4. Completed and approved all punchlist items.

B. Owner and/or Owner's Representative shall provide written notice (hard copy and/or electronic) for Final Acceptance. Date of Final Acceptance notice shall serve as start of 1-year Guarantee period as described above.

PRODUCT DATA SHEET 1 - END OF SECTION