MICHIGAN

DEPARTMENT OF TRANSPORTATION

SPECIAL PROVISION

FOR

**UPGRADE AUTOMATED IRRIGATION SYSTEM**

JAK:VAL 1 of 4 APPR:CJD:DMG:01-02-25

**a. Description.** This work consists of removing, salvaging or disposal of existing double sprinklers and associated components at tree wells. Design, furnish and install new components to upgrade the existing automated irrigation system to function as specified herein and as shown on the plans. Furnish operation and maintenance manuals for the system and two winterizations of the upgraded system.

1. Hold a coordination meeting a minimum of 14 calendar days prior to commencement of the work with the city of Jonesville personnel and the Engineer in attendance.

2. Protect the existing system, utilities, trees and plants that are to remain following construction activities. Replace any existing trees and plants that are damaged as a result of the Contractor’s operations in kind and as approved by the Engineer. If damaged, furnish and replace new system parts and utilities at no cost to the contract. Furnish and replace the new plants or trees in proper cultivation season at no cost to the contract.

3. Protect existing hardscape, utilities and other site-related features during construction activities.

**b. Materials.** Furnish the following components:

1. Double sprinkler set (one set of two assemblies for each tree well), including two 75-millimeter shrub sprinkler bodies with typical 400 series stainless steel fixed performance nozzle. Ensure the nozzle is a low-trajectory type with a 90 degree coverage arc. Ensure each assembly is installed on opposite sides of the tree well.

2. Schedule 40 PVC riser for each assembly to match existing lateral piping size. Allow minimum 18 inches of linear footage for each assembly.

3. Schedule 40 PVC 90-degree elbow fitting to match existing lateral piping size.

4. Schedule 40 PVC sleeve for under walkway crossings, where applicable.

5. Hose connection assembly, including coupling valve with National Pipe Taper (NPT) to Garden Hose Thread (GHT) adaptor, brass coupling valve key comprised of a valve key and a single lug to be threaded into the top of adaptor, brass hose swivel 360-degree. Each assembly to be kept inside valve box or in another storage area readily accessible to city of Jonesville Department of Public Works for hose connection and irrigating manually. One assembly for each two trees (nine hose connection assemblies total).

6. Ensure wiring is 16-gauge wire or equal for connecting irrigation valves to irrigation controller. Ensure all components for the irrigation system are from the same supplier or as recommended by the system manufacturer. Furnish an irrigation system with components as shown on the plans. Electronically submit a complete list of all materials proposed for installation to the Engineer for approval at least 14 calendar days prior to starting the work for all equipment associated with the automated irrigation system. Select one of the following system suppliers for material purchase and technical support or Engineer approved equal:

SiteOne Landscape Supply

650 Stephenson Hwy

Troy MI 48083-1110

(248) 588-2100

Trost Irrigation

215 Brown Road

Orion Twp, MI 48359

(248) 391-2930

Office@trostirrigation.com

Marc Dutton Irrigation Inc.

4720 Hatchery Road

Waterford, MI 48329

(248) 674-4470

**c. Construction.** Furnish upgraded system water zone coverage as shown on the plans or as directed by the Engineer.

1. Coverage. Inspect the existing system and verify which items are operable and reusable in the upgraded system and which must be removed and disposed of. Furnish full and complete coverage of all upgraded areas and make any necessary adjustments. Verify that the existing, as well as the upgraded system is operable, and the existing components are salvageable, or to be disposed of. Ensure each new or salvaged sprinkler is adequately irrigating the intended area and fine tune spray patterns as necessary. Verify that all sprinklers and other components are adjusted properly to grade. Furnish a written request to the Engineer for approval for any revision to the upgraded or existing irrigation systems.

2. Excavation and Restoration. Perform all excavation as required for installation of the work included under this section, including shoring of earth to prevent cave-ins, if applicable. Restore all surfaces and existing underground installations damaged or cut as a result of the Contractor’s operations to the original condition and in accordance with the plans as approved by the Engineer.

3. Trenches. If applicable, construct trenches wide enough to allow a minimum of 6 inches between parallel pipelines. Where applicable, provide 12-inch minimum cover over lateral lines to the sprinkler head.

4. Polyvinyl Chloride (PVC) Pipe. Solvent weld all PVC pipes in the mainline utilizing solvents and methods as recommended by the manufacturer. Make all connections between PVC pipe and valves or copper pipe with threaded fittings using PVC male adapters.

5. Open Pipe. Block all pipe openings as soon as lines have been installed to prevent the entrance of materials that would obstruct the pipe. Leave in place until removal is necessary for completion of installation. Thoroughly flush out all water lines before installing heads, valves, and other hydrants.

6. Hydrostatic Tests. Request the presence of the Engineer at least 3 workdays in advance of testing. Conduct testing at no cost to the contract and performed in the presence of the Engineer. Place a small amount of backfill to center load the pipe, preventing arching or slipping under pressure. After PVC welded joints have cured at least 24 hours and with the risers capped, apply a continuous and static water pressure of 50 psi as follows: main lines and submains to be tested for 12 hours and lateral lines to be tested for 2 hours. Repair leaks resulting from tests and retest until acceptable.

7. Sleeves. Where applicable, ensure sleeves beneath walks are schedule 40 PVC or equal and are placed at a depth of 24 inches, unless otherwise specified in the details, on the plans or as directed by the Engineer.

8. Control Wires. Conduct the following work unless otherwise specified in the details, on the plans or as directed by the Engineer. If the existing wiring was damaged, proceed with the following: install control wires, sprinkler mains and laterals in common trenches wherever applicable. Install control wires at least 24 inches below finished grade lay to the side and below the main line. Furnish looped slack at valves and snake wires in trench to allow for contraction of wires. Tie wires in bundles at 5 foot intervals. Install all wire passing under existing or future paving in conduit extending at least 3 feet beyond the edge of paving. Install all wire not installed with mainline pipe inside schedule 40 PVC or equal electrical conduit.

9. Backfill and Compaction. Perform after the system is operating and required tests and inspections have been completed and are acceptable to the Engineer. Backfill and compact in accordance with subsection 401.03.D of the Standard Specifications for Construction.

10. Clean Up. Remove from the site all debris resulting from the construction operations and restore all areas to a well-groomed, clean established appearance by restoring turf areas, thoroughly cleaning paved areas, and conducting all other related clean-up and removal activities.

11. As-Built Plans. Furnish as-built plans in both DWG, or equal CAD-generated format, and PDF as required by the Engineer, illustrating all deviations from the contract made during the construction affecting the main line pipe, controller locations, remote control valves, quick-coupling valves, and all sprinkler heads. Indicate on the plans approved substitutions of size, material and manufacturer’s name and catalog number. Furnish the as-built plans to the Engineer prior to approval of final work.

12. Seasonal Shut-Down and Start-up. Include two seasonal shutdowns and start-ups as part of the cost for this work. Provide for the complete winterization following the second season after installation and start-up the following spring. Coordinate the winterizations and spring start-ups with the Engineer. Approval of winterization and final installation of the irrigation system will occur at the end of the first season of watering all landscape placed as shown on the plans. Complete both spring start-ups no later than the 15th day of May and include all repairs and adjustments to ensure uniform coverage and a functioning system. Final acceptance will occur after the final spring start up.

**d. Measurement and Payment.** The completed work, as described, will be measured as a lump sum and paid for at the contract price using the following pay item:

**Pay Item Pay Unit**

Upgrade Automated Irrigation System Lump Sum