ADDENDUM NO. 2

TANGER PARK

COLG20-TANPARK-1

FOR THE

CITY OF LOCUST GROVE, GEORGIA

March 9, 2020

BELOW ARE ITEMS THAT CREATE AN AMENDMENT TO THE CONTRACT DOCUMENTS FOR THE PROJECT LISTED ABOVE:

ITEM NO. 1:

The attached technical specification "02810 – Landscape Irrigation Specifications" is to be included into the "Contract Documents and Technical Specifications" and utilized as a basis of design for the bidding process.

END ADDENDUM NO. 2

SECTION 02810

LANDSCAPE IRRIGATION SPECIFICATIONS

PART I - GENERAL

1.1 DESCRIPTION OF WORK

A. General.

1. The extent/project limits of base landscape irrigation is represented on the drawing.
2. Unless otherwise specified, the specifications are intended to include everything obviously requisite and necessary for the proper installation and completion of the work, whether or not each necessary item is mentioned herein.

1.2 QUALITY ASSURANCE

A. Manufacturing Qualifications.

1. Provide the landscape irrigation system as a complete unit produced by the approved manufacturers specified for all portions of the work, including heads, valves, piping circuits, controllers & water management system and accessories. Materials shall be purchased from an authorized service distributor of the specified products in the locale of the project.

B. Installer Qualifications.

1. Acceptable Irrigation Contractor per General Conditions of Specifications.
2. Irrigation-trained employee shall be responsible for the complete proper installation and operation of the system, and shall be on site for a minimum ½ the time of every day that work is preformed by the irrigation contractor.
3. The Irrigation Contractor shall submit a list of three (3) project references that have been installed within the last two (2) years that are a minimum or equal to this project to qualify.

C. Testing.

1. Pressure testing/verification shall be the responsibility of the irrigation contractor.

D. Requirements of Regulatory Agencies.

1. System shall comply with the requirements of state and local codes and ordinances.
2. Electrical devices shall carry Underwriters' Laboratory labels.

1.3 BASIS OF DESIGN

A. Manufacturer.

1. For the purpose of the specification only the basis of design is written around "The Toro Company" 811 Lyndale Ave. S., Bloomington, MN 55420–1196.

B. Alternate manufacturers.

1. Contractor may request an alternate manufacturer for irrigation components by submitting equivalent products for review and approval by the Engineer.

1.3 REFERENCES

A. ASTM D2241 - Polyvinyl chloride plastic pipe.

B. ASTM D2564 - Solvent cement for polyvinyl chloride plastic pipe and fittings.

1.4 SUBMITTALS

A. Irrigation Design.
   1. Submit a plan on 24”x36” or larger (at a scale of 1”= 20’, 30’ or 40’) showing layout /locations of sprinkler heads, valves, main, laterals, backflow preventer, isolation valves, flow sensors, rain sensors, pipe sizing, controller pedestals and pump (if necessary).

B. As-Builts.
   1. Submit as-built drawings after Substantial Completion.
      As-Built drawings shall be in digital form and in accordance with GIS survey on State plane coordinates.

C. Manufacturer’s Data.
   1. Submit two copies of manufacturer’s specification and instructions for specified materials and products.

1.5 GUARANTEE

A. The Contractor shall furnish a written warranty to the effect that all materials and work furnished under this section is warranted for at least one year, shall be free from defects and faulty workmanship and that any defective material or work shall be promptly repaired or replaced without additional cost to the Owner.

1.6 PROJECT/SITE CONDITIONS

A. Protection.
   1. Protect curbs, walls, utilities, sidewalks, trees and other existing features from damage.

1.7 SEQUENCING/SCHEDULING

A. Irrigation system shall be installed and made operable (in lawn areas) when finished grades have been established, but before seed and sod operations commence. Lateral lines, spray heads and drip-lines in planting beds should follow finished grading and planting. In all affected areas, the ground should be restored to its original grade as existed just before installation began.

1.8 OPERATION AND MAINTENANCE

A. Provide instructions covering full operation, care and maintenance of system and controls. Also provide manufacturers’ parts catalogs and CD of water management system.

B. Provide schedule showing length of time each valve is to be open (for May, July and September) to serve as a guide for the Owner in establishing an appropriate ‘water-window’.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Backflow Preventer.

1. Febco, Wilkins, Watts or Conbraco backflow preventers, as are appropriate and required by local code, with appropriate weatherproof enclosure if necessary.

B. Automatic Controller.

1. Toro TDC Series controller, or approved equal. The controller shall have the ability to communicate and control up to a total of 200 field decoders. The controller shall operate DC latching solenoids and be able to activate 20 decoders, and 40 individual valves simultaneously. The controller shall include 10 independent programs, six start times per program, day of week, odd/even or interval scheduling. The controller shall have non-volatile memory and self-diagnostics to identify decoder communication and open circuits. The controller shall include programmable master valve and pump start by station, rain delay up to 31 days and a water window calculator. The controller shall be able to run all decoders on #14 AWG cable up to 15,000 in any direction from the controller. The two-wire field controllers shall include a pump start, pressure sensor and rain sensor connection. The controller shall be able to use a VHF frequency hand-held. The controller shall be available in wall-mount or pedestal mount cabinets. The controller shall be upgradeable to a central control system and include a 5 year manufacture's warranty.

C. Controller-to-Decoder-to-Valve Communications.

1. Communication between controller and the decoders & valves shall be accomplished by a twisted pair of #14 AWG decoder cables for direct burial within a red HDPE. The communication cable shall be manufactured by Paige Electric model #P7350D, or equal. Decoders (either 1, 2 or 4 station configuration with ability to operate one or two solenoids per station) come pre-addressed with a five-digit address, and are not programmable. The decoders send a DC signal to DC-latching solenoids (up to 400 feet away) through #14 wire DTS cables (model #P7351D). All splices shall be made in accordance with National Electrical Code® Articles 300.5 (Underground Installations) and 110.14 (Electrical Connections) using 3M DBY-6 or DBR-6 connectors, which are UL listed under "UL 486D-Direct Burial", for wet or damp locations, 600 volts. Lightning Arrestors shall be installed no more than 1000' apart on the #14 AWG decoder cable and grounded to 20 ohms or less. The decoders shall include surge protection to a level of 20kv or 20,000 volts.

D. Control Valves.

1. Automatic valves: The automatic control valves shall be Toro plastic valves operated by DC-latching solenoids, normally closed, with manual flow adjustment.
   a. Standard for non-pressure regulated valves: Toro valves #P220-26-96 (1.5") for zones between 32-55 gpm; #P220-26-94 (1") for zones between 5-32 gpm; and Irritrol #700-1 (for drip or zones between 0-4 gpm). All valves require DC-latching solenoids.

b. Standard for pressure-regulating valves: Toro #P220-27-96 (1.5") and #P220-27-94 (1") with EZR-100 PR modules, or Irritrol #100P-1.5 (1.5") and #100P-1 (1") with OMR-100 (Omni-Reg-100) PR modules or Irritrol #700-1 (for drip or zones between 0-4 gpm) with OMR-30 (Omni-Reg-30) PR modules. These shall be used on all spray-head and drip zones, and wherever the operating pressure of rotors would exceed 60 psi. All valves require DC-latching solenoids..

E. Valve Enclosure.

1. Control valves, decoders and quick-coupling valves shall be enclosed in a fiberglass meter box such as Carson, Armour, or approved equal. Valve boxes are to be filled with a minimum of 6" of washed gravel below pipe level to ensure adequate drainage.

F. Pipe.

1. Main line piping shall be Class 200 polyvinyl chloride (PVC) solvent-weld pipe as manufactured by Cresline, or other approved equal. Pipe shall carry the N.S.F. seal of approval and meet the following specifications: ASTM D-2241, SDR 21 or latest revisions. Laterals shall be Class 160 PVC, SDR 26, solvent-weld pipe except 1" pipe, which shall be Class 200 PVC, SDR 21.

G. Sleeves.

1. Sleeves shall be twice the nominal size of the pipe to be carried within, unless noted differently. Sleeves for control wire only shall be 2" diameter, placed alongside (or above) each sleeve for the mainline.
2. Sleeves are to be installed under walks, paving and where indicated on drawings, install Schedule 40 PVC (ASTM D-1785) for sleeves 4" diameter and smaller. Sleeves 6" and larger shall be Class 200 PVC. Tape ends of sleeves and mark sleeve locations with above grade stakes with appropriate annotation, i.e.. "irrigation sleeves". Stakes shall be protected. Do not backfill over sleeve locations behind back of curbs or along walk edges, until work has been completed.

H. Pipe Fittings.

1. PVC fittings shall be solvent weld Schedule 40 standard weight. Attachment shall be made with both a primer and solvent cement, as approved by the manufacturer.

I. Sprinkler Heads.

1. Spray Heads
   a. The spray heads shall be Toro's 570Z-XF Series, with Matched Precipitation Rate (MPR) nozzles and Toro's pressure-compensating insert disc, as indicated on the drawings. The head shall feature a 4" pop-up (except groundcover and flower-bed areas where 12" high-pops shall be used, with bottom inlets), and shall have the X-Flow shutout device installed in the riser to prevent excessive water loss in case a nozzle is removed intentionally, or by accident. The body of the sprinkler shall be constructed of heavy duty Cycolac, and the head shall have a working

pressure of 25 - 70 p.s.i., with optimum pressure at the base of the head being 30 p.s.i.

b. The spray head nozzles shall be Toro PSN nozzles with no more than 1" per hour precipitation rate. They shall come in standard arc settings and not be adjustable other than radius reduction.

2. Flood Bubblers
   a. The flood-bubbler nozzles shall be Toro #FB-25-PC (preeure-compensating) on 2" 570Z bodies. There shall be three bubblers per tree, in a triangular layout, each one initially located 12" from the trunk. Bodies shall be connected to laterals by 'FunnyPipe', for ease of repositioning at later dates as trees grow.

J. Sprinkler Risers.
   1. Sprinkler heads are to be connected to the laterals by Irritrol's 'Blue Stripe SwingPipe' or flexible cut-off risers.

K. Drip Irrigation.
   1. Continuously self-flushing, pressure-compensating dripline by Toro. Toro's DL-2000 (the dripline) shall consist of nominal sized one-half inch low density, linear polyethylene tubing housing internal pressure compensating, continuously self-flushing, integral drip emitters. The tubing shall be black in color, with red stripes. The emitters shall provide 'RootGuard' protection using the pre-emergent Treflan, which is non-toxic and guards against root intrusion by diverting root growth away from the emitter outlet. The Treflan should be impregnated during the manufacturing process. The emitters should have the ability to independently regulate discharge rates, with an output pressure of between 15-40 psi, at a constant flow. The emitter discharge rate shall be 1.02 gallons per hour, utilizing a combination turbulent flow/reduced pressure cell mechanism and a diaphragm to maintain uniform discharge rates. The emitters shall continuously clean themselves while in operation. The dripline shall have the emitters spaced 18" apart. For each drip-zone, use the following drip-zone valve kit: Toro #DZK-700-LF.
   2. Accessories
      a. The disc-filters, flush-valves and air-relief valve shall all be manufactured specifically for use with drip-irrigation applications.

L. Pressure Pump.
   1. If necessary, a centrifugal booster pump shall be provided to increase the water pressure from the existing levels to an approximate range of 70-75 psi at the pump discharge, which is after the meter and backflow preventer. If the system will operate below 100 gpm, the pump shall be manufactured by Sta-Rite (Berkeley) or by RedJacket (ITT Industries) and shall contain a 3600 RPM Franklin motor. Unit shall be mounted on 4" thick concrete pad and enclosed by a HotBox "PG" series cover, if outside. Install Irritrol's pump-start relay: model #SR-1 between controller and booster pump. If the system will operate at 100 gpm or above, a prefabricated pump-station from Watertronics or Flowtronex shall be configured, with a VFD (variable-frequency drive) unit.

M. Wireless Rain Sensor.
   1. The sensor shall be Toro's wireless rain-sensor (Model #TWRS). The wireless sensor shall be mounted on a south/southwest facing surface (at least 10 feet above ground) within 500 feet of the controller. The receiver shall be adjacent to (and connected to) the field unit.

N. Manufacturer/Supplier.
   1. The materials chosen for the design of the sprinkler system have been specifically referred to by manufacturer, enabling the Owner to establish the level of quality and performance required by the system design. After award of contract and prior to beginning work, the contractor shall submit for approval three copies of the complete list of materials to be installed. *No deviations from the specifications will be allowed.*
   2. Acceptable manufacturers: The Toro Company
      Irritrol Systems
   3. Alternate manufacturers.
      A. Contractor may request an alternate manufacturer for irrigation components by submitting equivalent products for review and approval by the Engineer.

PART 3 - EXECUTION

3.1 WATER SUPPLY

A. Supply shall be from a line determined by construction manager. The connection to this line, for irrigation purposes, and providing the necessary backflow prevention devices are the responsibility of the irrigation contractor.

3.2 SYSTEM DESIGN

A. Layout work as closely as possible to the site improvement plan. The drawings may be generally diagrammatic to the extent that all components are not necessarily shown as they will exist on site.

B. The Contractor shall be responsible for full and complete coverage of irrigated areas as to spacing and precipitation rates being matched and shall make any necessary adjustments to the system at no additional charge to the Owner. Head spacing should be based on the water pressure being 70-75 p.s.i. before pressure losses occur through the meter, backflow, mainline, control valves and laterals. Head spacing shall be as noted in Part 2 (above). Contractor shall verify pressure and determine whether or not a booster pump will be necessary to provide at least 50 psi at the base of the rotor sprinklers, or 30 psi at the base of the spray heads. The water source will need to accommodate a flow of approximately 165 gpm. This flow may be comprised of several combinations of zone sizes. No zones shall exceed 55 gpm, which shall be regulated by 1.5" control valves. Two zones with identical operating characteristics may be combined on the same 'station', each with 28 gpm or less, and each being regulated by a 1" control valve.

C. Revisions to the irrigation system must be submitted to the Engineer in written form for approval.

3.3 TRENCHING, BACKFILLING AND COMPACTING

A. Pulling, Excavating and Trenching.
   1. Trenching, backfilling and compacting shall be as per Sitework Specifications - Trenching and Backfilling for utilities.
   2. If trenching, trenches shall be made wide enough to allow a minimum of 6 inches between parallel pipe lines. If pulling, the same lateral distance shall be observed.

B. Minimum Cover.
   1. An absolute minimum of 12 inches cover shall be held over laterals and control wires. Mains shall be 18" (16" minimum) below finished grade.

C. Backfill.
   1 Backfilling and backfill material shall be as per Sitework Specifications. Backfilling shall be done in 6" layers and compacted after each layer, to prevent excessive settling.
   2. Backfilling of trenches containing plastic pipe shall be done when pipe is cool to avoid excessive contraction in cold weather. Such backfilling can be done in early morning hours or the pipe may be water cooled prior to backfilling procedures.
   3. Where pipe is pulled into the ground, slit-domes shall be compacted to original grade after pulling.

D. Pavements, Walks, Etc.
   1. Communication wire must be placed in sleeving under pavement, walks, etc.
   2. Sleeving required shall be furnished by this Contractor, unless directed otherwise.

3.4 INSTALLATION

A. General.
   1. Unless otherwise indicated, comply with requirements of the Local Plumbing Code.
   2. Install piping, valves, controls and sprinklers in accordance with manufacturer's written instructions. Mainline and lateral pipes shall be sized to maintain flow rates of 5 ft./second or slower. Generally, pipe sizing shall conform to the following guidelines:
      a.) 0-16 gpm = 1" (minimum size shall be 1")
      b.) 17-35 gpm = 1.5"
      c.) 36-55 gpm = 2"
      d.) 56-80 gpm = 2.5"
      e.) 80-120 gpm= 3" (gasketed and thrustblocked)
      f.) 120-200 gpm= 4" (gasketed and thrustblocked)

B. Automatic Controllers.
   1. Use 'Installation Worksheet' to note station numbers and locations. Group like-zones in consecutive ranges together (turf, shrubs, groundcover) for ease of programming. Provide one hand-held remote control unit with the system, to communicate with the satellite field units.

C. Communications Circuitry.

1. Communication circuitry shall be run, wherever possible, along with the mainline pipe.
2. A minimum of 12 inches of wire shall be left at each decoder (or valve) to provide slack.

D. Piping.
1. Pipe may be assembled and welded on the surface.
2. Plastic pipe and fittings shall be solvent welded using solvents and methods as recommended by manufacturer of the pipe, except where screwed connections are required. Pipe and fittings shall be thoroughly cleaned of dirt, dust and moisture before applying solvent with a non-synthetic bristle brush.
3. When pipe is pulled into the ground, all PVC pipe shall be solvent welded at least 4 hours before pulling.
4. Make all connections between plastic pipe and metal valves or steel pipe with threaded fittings using plastic male adapters.
5. Use dielectric fittings at connection where pipes of dissimilar metal are joined.
6. Lay pipe on solid subbase, uniformly sloped without humps or depressions.
7. Trenches (or pulls) shall be snaked, or the pipe snaked, within the trench to allow for expansion and contraction of pipe.

E. Sprinkler Heads
1. Install heads at proper grade level as per manufacturer's recommendation.
2. Use only Teflon tape for sealing heads and riser assemblies when required.

F. Closing of Pipes and Flushing Lines.
1. Cap or plug 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 the installation.
2. Thoroughly flush out water lines and before installing heads, valves, and other hydrants.
3. Test in accordance with industry standards and pipe ratings.
4. Upon completion of the testing, the Contractor shall complete assembly and adjust sprinkler heads for proper distribution.

G. Grounding
1. Install grounding per controller specifications. Connect a surge unit (Toro #DEC-SG-LINE) to 4"x 36" ground plate and communication line within 500 feet of groups of decoders. Connect a surge unit (Toro #DEC-SG-OUTPUT) between decoder and solenoid, when/if distance is greater than 25 feet apart.
2. An earth ground should be attained for proper ground protection at each 'field satellite' unit and at the location of the 'central' (11-30 ohms acceptable in most cases), using 6 AWG(8mm) solid bare copper wire connected to copper clad 5/8" x 8' ground rod by 5/8" clamp or cad-weld.

3.5 TESTING

A. Operational Testing.
1. Perform operational testing after backfill is completed and sprinkler heads are adjusted to final position.

2. Demonstrate to the Owner that system meets coverage requirements and that automatic controls function properly.
3. Coverage requirements are based on operation of one circuit at a time, unless noted.

3.6 TRAINING

A. Personnel Training.
   1. Contractor shall be responsible for the training of as many personnel as the Owner shall deem necessary.
   2. Contractor shall be responsible for one closing and one opening of the system during the appropriate times of the year as part of the training of the Owner's personnel.
   3. Contractor training shall include general trouble-shooting and operation of the system with reference to head, valve, and controller operation.

3.7 SPARE PARTS

A. Submit spare parts as pertains to warranted materials, described by manufacturers' warranties.
B. Provide:
   1. Two extra sprinkler heads of each size and type.
   2. Two keys & hose swivels for quick coupling valves.
   3. Owners/operational manuals available on controller, heads, valves and pump.

3.8 CLEAN UP

A. Remove debris, resulting from work of this Section, from the site.

3.9 ADJUSTMENT

A. After completion of grading, seeding or sodding, if applicable, contractor shall return to the jobsite to perform any final adjustments to the system which might be deemed necessary.
B. Maintenance shall include, in addition to initial start-up, one winterization and one Spring start-up. Re-set heads up to two times if necessary, as directed.

END OF SECTION