

SECTION 32.04.00 - PLANTING/IRRIGATION

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
 - A Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specifications sections apply to this Section.
- 1.2 SUMMARY
 - A This Section includes the design and installation of the valves, piping, sprinklers, accessories, controls, and wiring for lawn and landscape irrigation systems.
- 1.3 DEFINITIONS
 - A Pipe sizes used in this Section are nominal pipe size (NPS) in inches. Tube sizes are standard size in inches. Equivalent NPS or metric sizes are indicated in parentheses (mm) in parentheses.
 - B Supply Piping: Piping from water source to controller or irrigation system pressure piping. Piping to make meter pressure or water supply. Piping in this category is not included in this Section.
 - C Pressure Piping: Piping downstream from supply piping to and including control valves. Piping to make irrigation system pressure. Piping in this category includes pressure regulators, meter meters, and backflow preventers, when used.
 - D Control Piping: Piping downstream from control valves to irrigation system sprinklers. Piping to make pressure (low flow pressure ratings) during flow.
 - E Control Valve: Manual or automatic electrically operated valve for control water flow to irrigation system zone.
- 1.4 SYSTEM PERFORMANCE REQUIREMENTS
 - A Design of Sprinklers and Devices: System shall be designed so that all areas shall receive low to high coverage. **Turf areas shall be covered separately from shrubs areas.** Actual plantings and clearances shall conform to applicable standards.
 - B Minimum Water Coverage: Not less than the following on all prepared soil, trees and shrubs indicated to be irrigated:
 - 1 Turf Areas: 70 percent.
 - 2 Shrubs: 80 percent.

1.5 SUBMITTALS

- A General: Submit the following according to the Conditions of the Contract.
- B Proposed design drawings showing irrigation system, including pipe layouts and locations types, sizes, capacities, and flow characteristics of irrigation system components. Include water meters, backflow preventers, valves, piping, sprinklers and device accessories, controls, and wiring.
- C Product data including pressure ratings, rated capacity, settings and clearance data of selected models for the following:
 - 1 Pressure regulators.
 - 2 Valves, including general-duty underground manual and automatic control, and quick-coupler types, and valve boxes.
 - 3 Sprinklers, including rotators, drip emitters, and devices.
 - 4 Controls, including controller wiring diagrams.
 - 5 Wiring.
- D Maintenance data for fixtures in "Operating and Maintenance Manual" provided in Division 1 Section "Project Criteria" for the following:
 - 1 Pressure regulators.
 - 2 Automatic control valves.
 - 3 Sprinklers.
 - 4 Controllers.

1.6 QUALITY ASSURANCE

- A Complete work requirements of utility supplying water for prevention of backflow and back-siphonage.
- B Complete with requirements of authority with jurisdiction for irrigation systems.
- C Designer Qualifications: Engage an experienced Designer who has completed irrigation systems similar in material, design, and extent to that indicated for Project that have resulted in continuous work with a record of successful on-site performance.
- D Installer Qualifications: Engage an experienced installer who has completed irrigation systems similar in material, design, and extent to that indicated for Project that have resulted in continuous work with a record of successful on-site performance.
- E Listing/Approval Stamp, Label, or Other Marking: On equipment, specialties and accessories make-to-specific standards.
- F Listing and Labeling: Equipment, specialties, and accessories that are listed and labeled.
 - 1 The Terms "Listed" and "Labeled": As defined in "National Electrical Code," Article 100.
 - 2 Listing and Labeling Agency Qualification: A "Nationally Recognized Testing Laboratory" (NRTL), as defined in OSHA Regulation 1910.7.

1.7 PROJECT COORDINATION

- A The Contractor shall be responsible for verifying the exact location of all underground utilities prior to excavation.
- B Sequencing and Scheduling:
 - A Coordinate irrigation system work with landscape work specified in Division 32.
- C Erection Materials:
 - A Utilize extra materials to ensure. Furnish extra materials including products installed. Package them with protective covering for storage and label clearly identifying contents.
 - 1 A minimum of two keys with correct adapters shall be given to the Owner.

PART 2 - PRODUCTS

- 2.1 PIPING AND TUBING FITTINGS
 - A PVC Pipe and Fittings:
 - 1 Pipe material shall be virgin high-strength Polyvinyl Chloride (PVC) pipe having a minimum working pressure rating of at least 200. All PVC pipe shall be continuously and permanently marked with manufacturer's name, material size, and schedule. Pipe shall conform to US Department of Commerce Commercial Standard (CNSC) or at least revisions. Material shall conform to all requirements of Commercial Standard (CNSC) or at least revisions.
 - 2 All fittings to be used on specified PVC pipe shall be Schedule 40 PVC, Type 1, and must be of domestic manufacture. All fittings shall be identified as to pressure rating or schedule.
 - 3 Fittings for ball-valve type pipe shall be of the same manufacture as the pipe and shall be either nonpressure PVC or cast-iron/bronze with brass inserts for tapped outlets. (Tap end coupling)
 - 4 Slants and Elbows shall be approved.
 - 5 All pipe sizes 1/2" to 1" shall be galvanized polyvinyl chloride, Schedule 80 threaded pipe fittings on meter shall be PVC Schedule 80 threaded elbows.
- 2.2 JOINING MATERIALS

2.3 CONTROL VALVES

- A Irrigation Valves:
 - 1 Irrigation valves shall be installed valves with 24 volt solenoid. Valves shall be globe type operated by low-voltage solenoid assembly sized, manual flow adjustment.
- B Control Valve Boxes: Polyethylene (PE), acrylonitrile-butadiene styrene (ABS), fiberglass polymer concrete, or precast concrete box and cover. Size as required for application.
 - 1 Drainage Backfill: Cleaned gravel or crushed stone, graded from 3 inches to 5/8 inch maximum in 2:1 to 1:1 ratio.
- C Sprinklers:
 - 1 Flush Surface: Fixed pattern, with screw-type flow adjustment.
 - 2 Rotary: Fixed pattern, with screw-type flow adjustment.
 - 3 Pop-Up, Spray: Fixed pattern, with screw-type flow adjustment and tensioned rod retraction spring.
 - 4 Pop-Up, Rotary Spray: Claw drive, full-circle and adjustable part-circle type.

2.4 AUTOMATIC CONTROL SYSTEM

- A Description: Low-voltage controller system, made for control of irrigation system automatic control valves. Controller operator on 120 volts a.c. building power system, provides 24 volts a.c. power to control valves, and includes stations for the number of zones valves indicated, plus two future stations.
- B Outdoor Control Enclosure: Manufacturer's standard waterproof metal enclosure with locking cover and 2 mounting keys. Framework construction complies with NFPA 70 and NEC/MS 280, Type 4, and includes provision for grounding.

PART 3 - EXECUTION

- 3.1 INSPECTION OF WORK IN PROGRESS
 - A The Landscaping Architect shall make frequent observations of the Contractor's work while such work is in progress. The Landscaping Architect shall bring to the attention of the Contractor any work which does not meet the specifications of the contract and the Contractor shall correct such work as he/she is to be observed.
 - B Staking of SPRINKLER LOCATIONS:
 - 1 Making of sprinkler locations shall be done by the Contractor. Location shall be according to approved plans with field modifications to adjust to local conditions and actual plant locations.
 - C EXCAVATION:
 - 1 The Contractor shall notify 911 or call 811 or call 48 hours prior to beginning trenching. The Contractor shall expose manholes, cables and all underground utilities and structures. The Landscaping Architect shall advise the Contractor of any underground utilities or structures of which he is aware, however, it is the Contractor's responsibility to locate and to protect all utilities. Any damage to utilities shall be corrected and paid for by the Contractor.
 - 2 All excavations shall be backfilled and include all materials encountered except materials which cannot be recovered by normal mechanical excavation means. Such excavations shall be brought to the attention of the Landscaping Architect and an adjustment in price shall be agreed upon before excavation of those areas proceeds. Such price adjustments and agreement shall include responsibility for disposal of the excavated materials removed from the trench and the hauling of additional backfill materials.
 - 3 The minimum depth of cover for piping 6" and larger shall be 18". The minimum depth of cover for piping less than 6" shall be 12".
 - 4 Install paving face of signs and benches.
 - 5 Lay-out groups of pipes parallel to each other, spaced to permit valve servicing.
 - D Trenching of existing asphalt shall be minimized. Contractor shall notify the property owner (if not the same as the general contractor) of all proposed trenching and shall be installed at the Contractor's expense under the pavement. If trenching is required, it shall be the responsibility of the contractor to provide backfill, restore the trench and backfill with 5% soil and back to original thickness and elevation.
 - E The contractor shall ensure responsible care of any existing landscape, including all underground utilities and structures. The contractor shall be notified located 48 hours prior to beginning trenching. The landscape architect shall advise the contractor of any underground utilities or structures of which he is aware, however, it is the contractor's responsibility to locate and protect all utilities. Any damage to utilities shall be corrected and paid for by the contractor.
- 3.2 BACKFILLING:
 - A Backfill materials shall be hydraulic, large stones, and other removable substances which would damage pipes or cause unusual settling problems. Backfilling will be done in 6" lifts and tamped down. All trench backfill will be done in 6" lifts and tamped down to prevent excessive settling.

3.3 INSTALLATION OF SYSTEM MAIN

- A Installation of the system main shall be in accordance with the manufacturer's instructions and shall proceed from the point of connection of supply for the zone pumping station, reservoir, water meter, or existing line. Install 12" below finished grade or 6" below first line, whichever is greater.
 - 1 The main and laterals shall be flushed and pressure tested for 24 hours prior to making any final connections.

3.4 INSTALLATION OF LATERAL LINES

- A Lateral lines may be installed by standard trenching techniques or by "pulling in" pipe. If the "pull in" method is used, the pipe shall be a tapered type and equipped with a turf miller device to prevent tearing of the turf. The pipe or stake which precedes the pipe and is used to form the opening for the pipe, shall be not less than 1" larger in diameter than the outside diameter of the pipe. Staking and finishing holes shall not exceed a 2 foot square opening with the soil removed from such holes to be preserved and reseeded.
- B Lateral pipes and fittings shall be installed in accordance with the manufacturer's recommendations, including the making-in of the PVC pipe to prevent excessive stress when connecting to solid hardware.
- C All lateral lines shall be thoroughly flushed prior to the installation of any automatic valves or sprinkler heads.

3.5 SPRINKLER HEADS

- A All sprinklers shall be installed on pop-up risers or as shown on the drawings. The sprinkler head shall be installed so that the top is 1/4" above the finished grade level. If finished grade has not been established, the sprinkler will be installed a minimum of 4" above existing level and marked with a stake to prevent damage by equipment.
- B Backfill around the stem nut and sprinkler shall be free of large rocks, roots, or foreign debris. Matched proportions will be required on all full and part circle sprinklers operating on the same zone.
- C Manual stationary (key) sprinklers on those schedule 80 PVC 3/4" and 1 1/4" PPT to make up the stem below existing joint.
- D Manual pop-up sprinklers with an 18" minimum length 1/2" polyethylene tubing. Tubing is withdrawn 60 psi burst test and shall have a wall thickness of 0.15". Fittings for tubing shall be comparable and made by the same manufacturer.

3.6 CONTROL LINES

- A All control lines shall be installed in a neat and orderly fashion and may be installed either in the main and lateral openings or in their own separate trench. The lines shall be trench depth and depth every 18". Control line excavations shall be as approved in a preceding section of these specifications.
- B All wires shall be finished to minimum 1.500' radii and capped only at valve or tee locations.
- C The joining of all control lines will be by the use of a wire race covered by Soonde Lok per manufacturer's instructions provided by manufacturer.
- D Control tubing and wire runs shall be installed with enough slack under occasional expansion loops to permit excessive stress due to seasonal contractions.

3.7 CONTROL EQUIPMENT

- A All automatic valves and controllers shall be installed following the recommendations of the manufacturer and approved. The location of all controllers shall be approved by the Owner's representative before the actual installation of such controllers.

3.8 CHECK CHECKING VALVES

- A All quick-coupling valves shall be installed on galvanized pipe triple using joints.

3.9 VALVE BOXES, MOUNTS, ETC.

- A All valve boxes, or any other miscellaneous meter or access box shall be installed on the top of soil structure as detailed on drawings.

3.10 TESTING AND ACCEPTANCE OF SYSTEM

- A Testing System:
 - 1 Upon completion of the irrigation system and after sufficient time has elapsed for the soil to settle, the entire system shall be tested for proper operation. All air will be purged from the system and all components will be checked for proper operation by the Contractor.
 - 2 Following and Adjustment: The Contractor shall balance and adjust the pressure and flow of the sprinkler system so the overall operation of the system is most efficient. This includes adjustment of the controllers, adjustment to pressure regulators, pressure relief valves, part-circle sprinkler heads, and individual station adjustments on the controllers.
- B Operational Testing:

3.11 PERFORM OPERATIONAL TESTING

- A Perform operational testing after hydrostatic testing backfill is in place and sprinkler heads are adjusted to final position. Demonstrate to the Owner's representative that the completed system meets coverage requirements and that automatic controls function properly.
- B Final Checks at Finish:
 - 1 After completion of existing, planting and finishing and attention with establishment of the final grade, carefully adjust all irrigation operation so it will be flush with or not more than 1/4" above grade.
- C Record of Completion:
 - 1 When the Contractor is satisfied the system is operating properly, and all work and cleanup is completed, there shall issue the notice of completion to the Landscaping Architect. The notice of completion shall include the request for final inspection on which date and time given.
- D Final Inspection with Landscaping Architect:
 - 1 The Landscaping Architect will respond to the notice of completion by the Contractor's representative at an agreed upon time for the final inspection. Any instructions for the final inspection shall be provided by the Landscaping Architect and a written copy of the instructions shall given to the Contractor.
- E Final Plant Acceptance:
 - 1 Acceptance of the system is based on the final inspection by the Landscaping Architect of a completed system that meets all applicable specifications and all applicable codes.
 - 2 The Contractor's responsibility of training maintenance personnel to properly operate and maintain the system, shall not be included in this contract. If required, the Contractor shall provide the training and provide parts for the training, but not specification about. The Contractor shall be notified by the Owner of the training. The Contractor shall be notified by the Owner of the training.

3.12 GUARANTEES

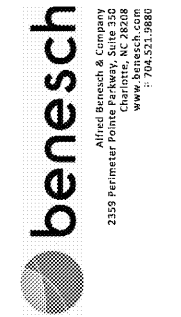
- A The work included under this contract shall be guaranteed by the Contractor against all defects and malfunctions due to faulty workmanship or defective materials for a period of one year from the date of final acceptance by the Owner. Upon being informed by the Owner of any defects or malfunctions, the Contractor shall correct all necessary repairs and/or replacements in a reasonable expedient manner at no additional cost to the Owner.
- B Emergency Repairs, when necessary may be made by the Owner without relieving the Contractor of his guarantee obligations.
- C If the Contractor shall be obligated to repair any settling of backfilled trenches which may occur during the guarantee period. The Contractor is obligated to restore any and all damage to existing or improvements due to trench settling or repair within the year period.
- D If the Contractor does not respond to the Owner's request for repair work within 5 days, the Owner may proceed with such necessary repairs and charge the Contractor for all expenses incurred by the repair work.

3.13 THE LANDSCAPE ARCHITECT SHALL MAKE FREQUENT OBSERVATIONS

- A The Landscaping Architect shall make frequent observations of the Contractor's work while such work is in progress. The Landscaping Architect shall bring to the attention of the Contractor any work which does not meet the specifications of the contract and the Contractor shall correct such work as he/she is to be observed.
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Seals



Corp. NC License: F-1320

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Order Plans

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