

3.2 INSTALLATION OF PLASTIC PIPE:

- Plastic pipe shall be installed in a manner that permits expansion and contraction as recommended by the manufacturer.
- Plastic pipe shall be installed with a sand or bedding or backbox with the assistance of a square in removed view or in a manner so as to ensure a square cut. Bends at cut ends shall be removed proper to installation so that a smooth undisturbed flow will be achieved.
- Plastic pipe shall be installed with a sand or bedding or backbox with the assistance of a square recommended for the pipe and fittings shall be installed as outlined and instructed by the manufacturer. The Contractor shall assume full responsibility for the correct installation.
- The joints shall be allowed to set at least twenty-four (24) hours before pressure is applied to the system or PVC pipes.

3.3 CONTROLLER AND ELECTRICAL CONNECTIONS:

- All electrical connections shall conform to the National Electrical Code, latest edition.
- Control wires installed beneath walks, drives, or other permanent surfaces shall be placed in sleeves.
- Control wires shall be applied only at valve boxes.
- Leave twenty-four (24) inch loop of wire at each valve for expansion/contraction and servicing.
- Control wires and valves shall be from the same company e.g. Rain Bird, Toro or approved equal.
- 120 VAC electrical power supply to the controller location shall be supplied by others.

3.4 FLUSHING AND TESTING:

- After all new sprinkler piping and risers are in place and connected for a given section and all necessary devices have been connected and prior to the installation of sprinkler heads all piping shall be flushed and tested under normal water pressure for a period of twelve (12) hours. If leaks occur, repair and repeat the test. Give Landscape Architect forty-eight hours notice.
- Testing of the system shall be performed after completion of the entire installation and any necessary repairs shall be made at the Contractor's expense to put the system in good working order before final payment by the Owner. Equipment will be done by the Contractor upon completion of installation to provide optimum performance. Minor adjustments during the guarantee period will be made by the Owner.
- After completion of the system, the Contractor shall maintain the system. The Contractor's personnel in the operation and maintenance of the system.

4.0 ACCEPTANCE AND GUARANTEE

4.1 SUBSTANTIAL COMPLETION:

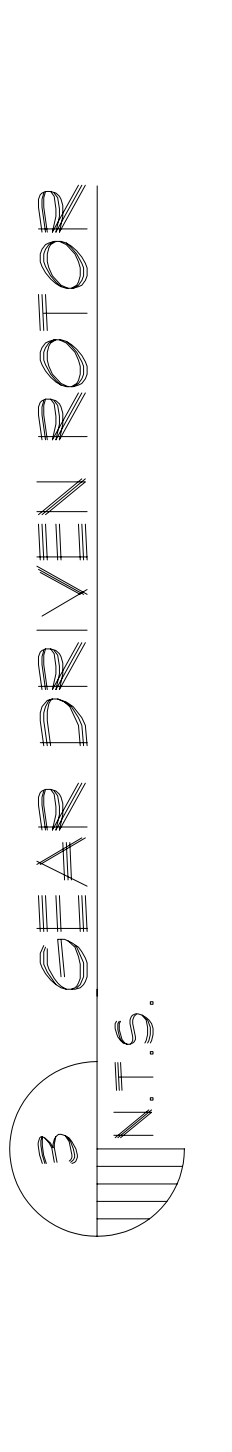
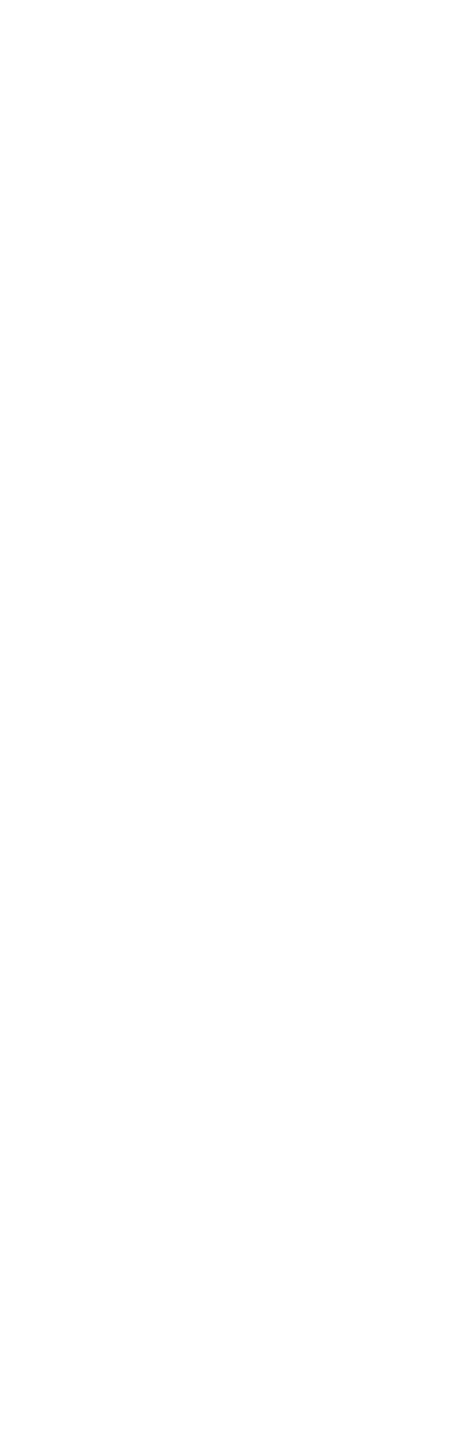
- Submit request for inspection for Substantial Completion to the Landscape Architect at least ten (10) business days prior to anticipated date of inspection and testing (refer to Paragraph 5.3 TESTING, here).
- Submit Record Drawings and Maintenance Manual to the Landscape Architect with the request for inspection.
- Review the work jointly with the Owner and Landscape Architect for Substantial Completion.
- Upon completion of repairs and replacements found necessary at the time of review, the work and Landscape Architect will confirm the date of Substantial Completion of the guarantee.
- The date of Substantial Completion will constitute the beginning date of the One-Year Guarantee.

4.2 GUARANTEE

- Guarantee all work, products, equipment, and materials for one(1) year, beginning at Date of Substantial Completion.
- During the period of the Guarantee, replace immediately with no additional cost any work, products, equipment, and materials that are found to be defective or failing to maintain complete coverage, make good any other damage, loss, destruction or failure. Repairs and replacements shall be done promptly and at no additional cost to the Owner. Repair, damage to grade, plants, and other work or property as necessitated due to the work shall be done at the Contractor's expense.
- If the replacement is not acceptable during or at the end of the Guarantee Period, the Owner may elect either subsequent replacement or credit. Replacement products shall be approved by the Owner and the Contractor shall be responsible for the cost of replacement. Guarantee applies to all devices with the exception of those due to Acts of God, vandalism, or Owner neglect, as determined by the Landscape Architect.

4.3 FINAL INSPECTION AND ACCEPTANCE:

- At end of Guarantee Period and upon request for inspection, jointly review all guaranteed work and materials for acceptance.
- Sign and date Final Acceptance Certificate. Upon request for Final Acceptance by the Landscape Architect at least two weeks prior to anticipated date of inspection. Include list of work provisionally accepted and list of work to be replaced during Guarantee Period.
- Final Acceptance Certificate shall be signed by the Owner and the Landscape Architect will confirm the date of Final Acceptance of the work.



E. All valves, elbows and underground piping under concrete surfaces shall be field installed using PVC Class 200 (or higher) pressure-rated trench pipe of the type specified on the drawings. The pipe shall be homogeneous throughout and free from visible cracks, holes, and foreign materials, blisters, wrinkles and dents. F. All valves, elbows and underground piping shall be installed with a sand or bedding or backbox with the assistance of a square in removed view or in a manner so as to ensure a square cut. Bends at cut ends shall be removed proper to installation so that a smooth undisturbed flow will be achieved. G. Plastic pipe shall be installed with a sand or bedding or backbox with the assistance of a square recommended for the pipe and fittings shall be installed as outlined and instructed by the manufacturer. The Contractor shall assume full responsibility for the correct installation.

2.2 SLEEVES:

- All sleeves shall be Schedule 40 PVC or stronger. All sleeves are required at every connection.
- All sleeves shall be installed under proposed pavement areas prior to subgrade and base construction. Sleeves shall be installed with a minimum horizontal separation of 18" and a maximum of twenty-four (24) inch clearance below bottom of curb.
- The location of all sleeves shown on the plans is schematic. The contractor shall make any adjustments necessary to accommodate existing vegetation, utilities, or other existing conditions.
- If additional coverages are designated as being bare locations the bare must be ample size to accommodate the size sleeve specified.

2.3 CONTROL SYSTEM:

- The automatic controllers shall be made by the same manufacturer as valves.
- Install Rain Check or Mini-Click type shut off device to override the control timer in the event of rain.
- 120-volt power will be supplied by others.

2.4 CONTROL WIRE:

- Control wire shall be type UFIL approved for direct burial and shall be gauge 14 or larger for the control wire and gauge 12 or larger for common wire.
- Joining of underground wires shall be made with watertight connectors in valve boxes. No splicing shall be permitted.
- All wire connections in valve boxes.

2.5 IRRIGATION VALVES:

- Zone Control Valves:
 - Operation accomplished by means of an integrally mounted heavy-duty 24 volt AC solenoid complying with National Electrical Code, Class II Circuit, solenoid coil protected with a minimum of 1/2" of concrete.
 - Completely waterproof, suitable for direct underground burial. Provide a flow stem adjustment in each valve.

2.6 VALVE BOXES:

- All valves shall be installed in thermoplastic valve access boxes of the size required to permit control, and quick-coupler types.
- Manufacturer, Amana, or approved equal.
- All valve boxes shall be installed on at least a two (2) cubic foot gravel base to provide foundation and drainage.
- All valve box elevations shall be 1/2" below finished grade.

2.7 THIRST BLOCKS:

- Place one cubic ft. of concrete for each inch of pipe diameter for thirst block. Thirst block shall not allow vertical or horizontal movement of pipe in any direction unless otherwise noted on design. Thirst blocking shall be provided on all piping three (3) inch diameter and larger.

2.8 SURGE PROTECTION: Contractor to provide electrical surge protection for the system controller.

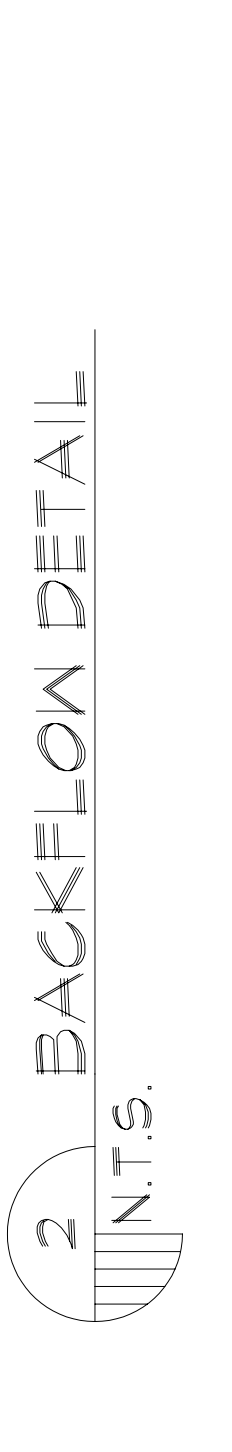
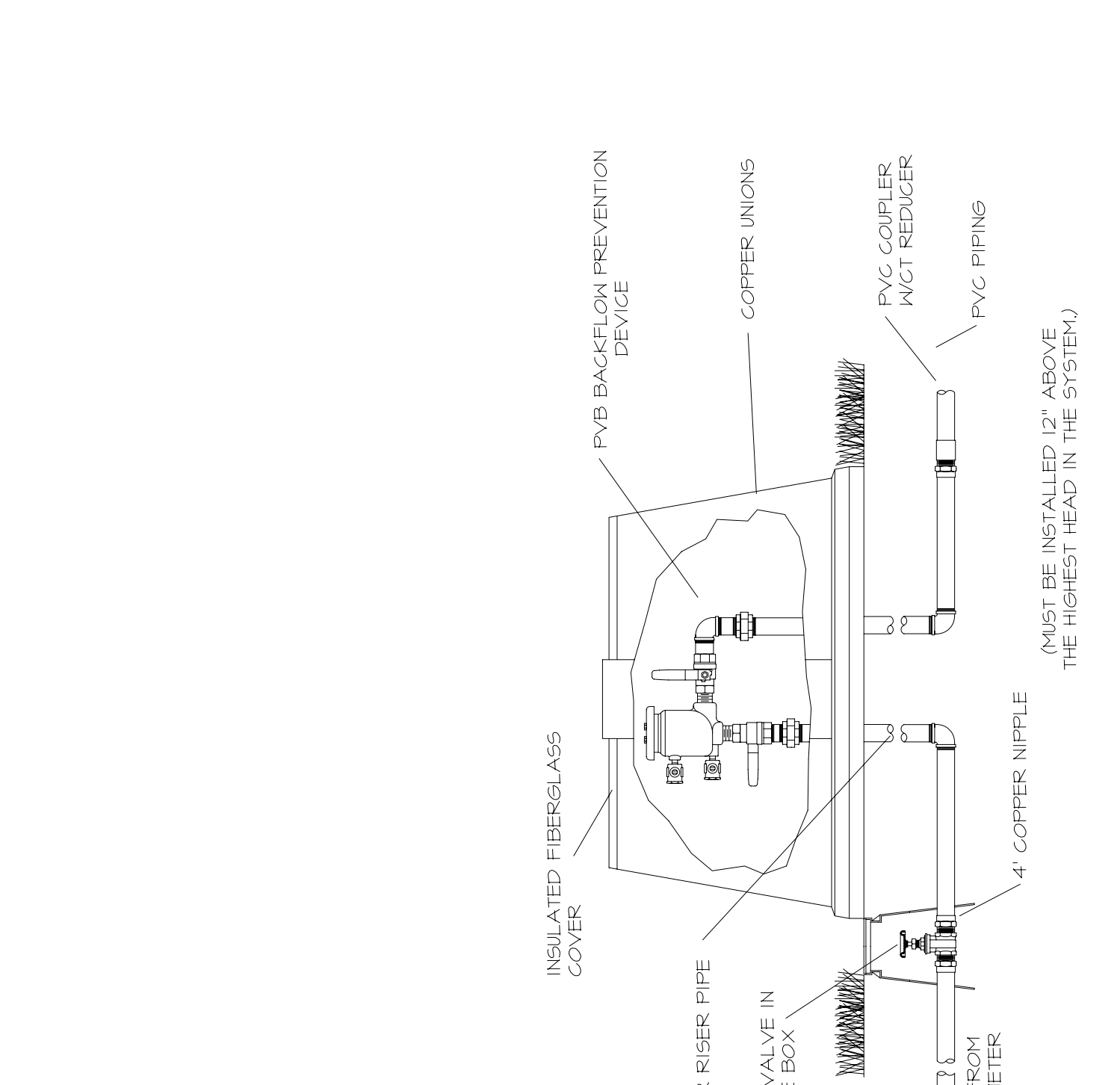
2.9 BACKFLOW PREVENTION: As determined by Municipality/Local regulations.

2.10 PRESSURE REGULATOR: As determined by Contractor.

3.0 EXECUTION

3.1 EXCAVATION AND BACKFILL:

- Trenches for pipe, sprinkler lines shall be excavated to sufficient depth and width to permit proper handling and installation by any other method the Contractor may desire if approved by the Owner, pipe manufacturer, and Designer. The backfill shall be compacted to a minimum of 95% relative compaction. The backfill shall be free of rocks, roots, and other debris. The trenching depth shall be two (2) inches below normal trenching depth to allow for this bedding. The fill dirt or sand shall be used in filling (4) inches above the pipe. The remainder of the backfill shall be topsoil, free of rocks, stumps, or trash. Any open trenches or partially backfilled trenches left overnight or left unattended shall be backfilled to prevent erosion.
- The Contractor shall backfill in six (6) inch compacted lifts as needed to bring the soil to its original density.



SECTION 02B00 - LANDSCAPE IRRIGATION

1.0 GENERAL

1.1 DESCRIPTION OF WORK:

- Install all labor, materials, equipment and services necessary for the complete installation of a landscape irrigation system to provide 100% coverage of the landscape areas identified on the plans as specified. The work includes, but is not limited to:
 - Trenching, backfill and compaction for irrigation lines.
 - Backflow prevention water tap, water meter pressure regulator drain valves and location gate valves piping and sleeves under paving and sidewalks, repair of paving, main and lateral lines, electrical valves and fittings.
 - Test all systems and make adjustments.
 - Submit Record Drawings.
 - One-year Guarantee Period.

1.2 QUALITY CONTROL:

- Installer Qualifications: Firms experienced in the successful installation of a minimum of 100,000 square feet of landscape irrigation systems are eligible to bid. Firms with a minimum of 10 years experience in the installation of landscape irrigation systems are preferred. Firm shall have sufficient manpower, equipment and financial resources to complete the work of the Section.
- Materials: All materials shall be of the highest quality available. The right to reject any and all materials and workmanship which they deem to be not in accordance with the Specifications. Rejected materials and work shall be removed from site immediately and replaced with that of the specified quality.
- Applicable Standards:
 - ASTM
 - D2241-Poly (Vinyl Chloride) (PVC) Plastic Pipe, SDR-PR, Class 200 and 180.
 - D2242-Poly (Vinyl Chloride) (PVC) Plastic Pipe, SDR-PR, Class 200 and 180.
 - D2464-Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Socket type, Schedule 40.
 - D2466-Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Socket type, Schedule 40.
 - D2564-Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
- Applicable Codes:
 - Most current edition of Uniform Plumbing Code.
 - Applicable Building Code, and ordinances.
 - National Electrical Code.
 - Should Specifications requirements differ from local requirements, consider Contract requirements.

E. Permits and Fees:

- Obtain all necessary permits and fees to any agency having jurisdiction over the work.
- Arrange inspections required by local ordinances during the course of construction.
- Upon completion of the work, furnish satisfactory evidence to show that all work has been installed in accordance with the ordinances and code requirements.

F. 1. Perform testing and inspections required by specifications and by regulating authorities.

- Give 24 hours notice that such tests are to be conducted.

1.3 SUBMITTALS:

- Product Data: Include pressure rating, rated capacity, settings, and electrical data of selected equipment.
 - Valves, include aboveground and underground, general-duty, manual and automatic control, and quick-coupler types.
 - Sprinklers.
 - Specialties, include emitters, drip tubes, and other devices.
 - Controllers, include wiring diagrams.
- Prepare and submit a reproducible Record Drawing showing the complete layout of the main line pipe, controller, location, valve locations, and all sprinkler head manufacturer's name and catalog number and name.

1.5 SITE INSPECTION

- Become familiar with all site conditions.
- Locate all existing utilities prior to start of construction.
- Make necessary adjustments in the layout as may be required, (1) to connect to existing work, (2) to correct for any errors in the layout, (3) to correct for any errors in existing work. Such adjustments shall be made with no increase in cost to the Owner.

1.6 PROTECTION OF EXISTING CONDITIONS:

- Take necessary precautions to protect site conditions to remain.
- Should damage be incurred, repair the work to its original condition at no additional cost to the Owner.

2.0 PRODUCTS

2.1 PIPE AND FITTINGS:

- Pipe sizes shall conform to those shown on the drawings. No substitutions of smaller pipe sizes shall be permitted. All pipe shall be of the highest quality available. Pipe damaged or rejected because of defects shall be removed at the site at the bid or sold rejection.

- All fittings (3") these inch and larger, will be equipped with gaskets.
- All fittings for pipes three inches or larger will be equipped with gaskets.
- All piping downstream of electric valves sizes (3) inches and smaller, shall be rigid, unpressurized PVC 200 (PS) working pressure extruded from virgin polyethylene material free from visible cracks, holes, foreign materials, blisters, wrinkles and permanently marked with the manufacturer's name, material size, and schedule type. Pipe must bear the NPS seal.

6PM FOR RAINBIRD MFR NOZZLES

NOZZLE	6PM	NOZZLE	6PM	NOZZLE	6PM
15F	4	12F	3	10F	2
15TQ	5	12TQ	2.25	10TQ	1.5
15H	2	12H	1.5	10H	1
15G	1	12G	0.75	10G	0.5
15S	1	12S	0.75	10S	0.5

6PM FOR RAINBIRD MFR NOZZLES

NOZZLE	6PM	NOZZLE	6PM
1555T	1.5	BUBBLER	1
1555T	0.75		

