

April 10, 2019  
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SPECIFICATIONS PACKAGE  
Project Number: RFB 2019-05  
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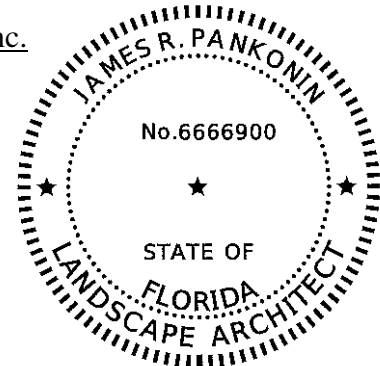
US 41/SR 45 LANDSCAPE INSTALLATION & ESTABLISHMENT

DISTRICT ONE  
LEE COUNTY

The January 2019 Edition of the Florida Department of Transportation Standard Specifications is revised as follows:

This item has been digitally signed and sealed by James Pankonin, P.L.A. on the date adjacent to the seal. Printed copies of this document are not considered signed and sealed and the signature must be verified on any electronic copies.

Date: April 10, 2019  
State of Florida,  
Landscape Architect, License No.: 6666900  
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Page(s): 1-21



*THE ABOVE NAMED LANDSCAPE ARCHITECT  
SHALL BE RESPONSIBLE FOR THE SHEETS 1-21 IN  
ACCORDANCE WITH RULE 61G10-11.011, F.A.C.*

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# **SPECIAL PROVISIONS**

## **CONSTRUCTION EQUIPMENT - GENERAL REQUIREMENTS.**

**(REV 1-28-15) (1-19)**

SUBARTICLE 100-1 is expanded by the following:

Clearly and legibly identify the owner of all equipment on the Department's right-of-way.

## **MOBILIZATION.**

**(REV 7-29-13) (1-19)**

SUBARTICLE 101-2.1 is deleted and the following substituted:

**101-2.1 When a Separate Item is Included in the Proposal:** When the proposal includes a separate item of payment for this work, the work and incidental costs specified as being covered under this Section will be paid for at the contract unit price for the item of Mobilization.

Payment will be made under the items specified in the Bid Price Proposal.

SUBARTICLE 101-2.2 is deleted and the following is substituted:

**101-2.2 Partial Payments:** When the proposal includes a separate pay item for Mobilization - Lump Sum, partial payment will be prorated based on the percentage of contract amount earned for work completed and accepted by the Department.

## **MAINTENANCE OF TRAFFIC.**

**(REV 8-30-17) (1-19)**

SUBARTICLE 102-5.4 is deleted and the following substituted:

**102-5.4 Crossings and Intersections:** Provide and maintain adequate accommodations for intersecting and crossing traffic. Do not block or unduly restrict any median opening, road or street crossing the project unless approved by the Engineer. Maintain all existing actuated or traffic responsive mode signal operations for main and side street movements for the duration of the work. Restore any loss of detection within 12 hours. Use only detection technology listed on the Department's Approved Products List (APL) and approved by the Engineer to restore detection capabilities. Before beginning any construction, submit to the Engineer the names and phone numbers of persons that can be contacted when signal operation malfunctions.

ARTICLE 102-7 is expanded by the following:

Provide off-duty law enforcement officer when required or as directed by the Engineer.

SUBARTICLE 102-11.1 is deleted and the following substituted:

**102-11.1 General:** Devices installed/used on the project on any calendar day or portion thereof, within the Contract Time, including time extensions which may be granted, will be paid for at lump sum price per day or per location

ARTICLE 102-12 is deleted.

ARTICLE 102-13.23 is deleted and the following substituted:

**102-13.23 Maintenance of Traffic Lump Sum:** Price and payment will be full compensation for all work and costs specified under Section 102.

When the proposal does not include a separate item for Maintenance of Traffic, all work and incidental costs specified as being covered under this Section will be included for payment under the several scheduled items of the overall Contract and no separate payment will be made therefore.

**102-13.24 Payment Items:** Payment will be made under the items shown in the Bid Price Proposal.

## **CLEARING AND GRUBBING.**

**(REV 8-30-17) (1-19)**

ARTICLE 110-2 is expanded by the following new subarticle:

**110-2.6 Clearing and Grubbing Locations:** Clear and grub within the areas shown in the Work Document or the Plans.

Remove portions of fence when necessary to gain access within fenced areas. Restore fence immediately following completion of the work described in the work document. Cost of restoring the fence will be included in the cost of clearing and grubbing.

Report to the Engineer, before beginning work, all damaged fence, fence posts and other appurtenances such as sign posts and bases, delineators posts, guardrail or barrier walls, light poles, endwalls, pipes, drainage structures, poles, guys, landscape areas, etc. Damaged fence, fence post or other appurtenance found after beginning work will be deemed damaged and will be replaced at no cost to the Department.

ARTICLE 110-9 is expanded by the following new Subarticle:

**110-9.6 Stockpiling Debris:** Stockpile outside of the clear zone, or remove and dispose from the right-of-way, all material that was the result of the clearing and grubbing operation at the end of each day. Provide disposal areas approved by the Engineer, in accordance with the applicable requirements of the Federal, State, and Local Rules and Regulations.

SUBARTICLE 110-11.1 is deleted and the following substituted:

**110-11.1 Clearing and Grubbing:** When direct payment is provided in the Contract, the quantity to be paid for will be the lump sum quantity.

When areas of clearing and grubbing are designated to be paid for separately by the acre, the quantity to be paid for will be determined by measurement of the areas authorized by the Engineer to be cleared and grubbed and acceptably completed. Measurements of the above areas will be rounded to the nearest one thousandths (0.001) acre.

For areas of flexible pavement, the quantity to be paid for will be the number of square yards of flexible pavement removed. Measurements will be rounded up to the nearest yard.

# **SUPPLEMENTAL SPECIFICATIONS**

**580 LANDSCAPING.**  
**(REV 8-4-17) (1-19)**

The following new Section is added at the end of Section 571:

**SECTION 580**  
**LANDSCAPING**

**580-1 Description.**

Install and establish landscaping as indicated in the Contract Documents.

The allowable Contract Time is two separate phases called Installation Period and Establishment Period. The Installation Period precedes the Establishment Period and is the allowable Contract Time minus the two-year Establishment Period.

Regardless of the duration of the time used for the Installation Period, the duration of the Establishment Period will be two years.

**580-2 Materials.**

**580-2.1. Grade Standards and Conformity with Type and Species:** Provide plant materials purchased from Florida commercial nursery stock that comply with all required inspection, grading standards, and plant regulations in accordance with the latest edition of the Florida Department of Agriculture's "Grades and Standards for Nursery Plants."

Florida commercial nursery stock is defined as plants propagated or grown at a Florida commercial nursery or imported to a Florida commercial nursery, made available for sale to the public, and included as inventory for fee. Nursery stock purchased from outside Florida and shipped directly to the project site is not Florida commercial nursery stock. Prior to installation, provide nursery invoices or delivery tickets that include written certification that all nursery stock meets the requirements of this Section.

Unless otherwise specified, the minimum grade for plant material is Florida No. 1. Plant material must be the specified size and grade at the time of delivery to the site.

Use only plants that are true to type and species, free of fungal infection and disease, and ensure that the plants not specifically covered by Florida Department of Agriculture's "Grades and Standards for Nursery Plants" conform in type and species with the standards and designations in general acceptance by Florida nurseries. Submit a list of nurseries where plants are tagged, including contact information and location. The Engineer may visit the nursery sites to inspect representative samples and lock tag the example plant material.

A minimum of two plants of each species on each shipment must be shipped with tags stating the botanical nomenclature and common name of the plant. Should discrepancies arise between botanical nomenclature and common name, the botanical name will take precedence.

**580-2.2 Inspection and Transporting:** Move nursery stock in accordance with all Federal, State, and Local Rules and Regulations. For each shipment of nursery stock, provide the nursery's General Nursery Stock Inspection Certificate as required in Chapter 5B-2, F.A.C.

**580-2.3 Water:** Meet the requirements of Section 983.

**580-2.4 Mulch:** Use of cypress mulch is prohibited.

**580-2.5 Soil:** Remove all unsuitable soil and debris to root ball depth. Replace soil meeting the requirements of Section 987-2.4.



### **580-3 Worksite Landscape Supervisor.**

Provide a Worksite Landscape Supervisor to directly oversee all landscape installation and establishment. The Worksite Landscape Supervisor must be a Certified Landscape Technician or Certified Landscape Contractor in accordance with the Florida Nursery Growers and Landscape Association (FNGLA) located at the following URL address: <https://www.fn gla.org/certifications/index.aspx>, or a State of Florida Registered Landscape Architect. Provide verification at the pre-construction meeting.

### **580-4 Installation.**

**580-4.1 Installation Plan:** At the pre-construction meeting, provide an Installation Plan for review and comment. Specifically describe the methods, activities, materials, and schedule to achieve installation as described in this Section. Include a schedule for monthly inspections and reports described in 580-4.9. Begin installation after Installation Plan is accepted by Engineer.

**580-4.2 Delivery:** All materials must be available for inspection before installation.

**580-4.3 Layout:** The locations of plants as shown in the Contract Document are approximate. At no cost to the Department adjust final locations when directed by the Engineer to accommodate unforeseen field conditions or to comply with safety setbacks and requirements. Mark proposed mowing limits, planting beds and individual locations of trees and palms as shown in the Contract Documents for the Engineer's review, prior to excavation or planting.

Make no changes to the layout, or any variations of materials from the Contract Documents without the Engineer's approval.

**580-4.4 Soil Drainage:** Planting holes and beds must drain sufficiently. Notify the Engineer of drainage or percolation problems before plant installation.

**580-4.5 Planting:** Meet the requirements of the Contract Documents.

**580-4.6 Maintenance:** Throughout the installation period, at a minimum, maintain plant materials to the equivalent visible structural quality and healthy characteristics of Florida No. 1.

**580-4.7 Site Repair and Restoration:** Repair and restore existing areas disturbed by installation or maintenance activities. Where new turf is required to restore and repair disturbed areas, meet the requirements of Section 570.

**580-4.8 Disposal of Surplus Materials and Debris:** Remove from the jobsite any surplus material unless otherwise directed by the Engineer. Surplus is defined as material not needed after installation of landscaping per Contract Documents. Upon commencement of landscape installation, remove daily, all debris from the jobsite.

**580-4.9 Reporting:** Certify monthly on a form provided by the Department, "Landscape Monthly Inspection Form" that the plants have been installed and are being maintained in accordance with the Contract Documents.

**580-4.10 Establishment Plan:** Not less than 45 days before the scheduled completion of the installation, submit an Establishment Plan to the Engineer for review and comment. Installation will be considered complete only when the Establishment Plan has been accepted by the Engineer. Specifically describe the methods, activities, materials and schedule to achieve establishment of plant material and incidental landscaping as described in 580-5. Include a schedule for monthly inspections and reports described in 580-5.2. Acceptance of the Establishment Plan is not a release from responsibility of the establishment and maintenance as required in the Contract Documents.

**580-4.11 Installation Completion:** Notify the Engineer no less than seven calendar days in advance of completion. Upon completion of installation of plants and incidental landscaping, certify on a form provided by the Department, "Contractor Certification of Installation" that the

landscaping has been installed and is being maintained in accordance with the Contract Documents.

**580-5 Establishment.**

**580-5.1 Establishment Period:** The establishment period will begin upon acceptance by the Engineer of the Establishment Plan and the installation of all landscaping.

During the establishment period, at a minimum:

1. Maintain plant material quality, to sustain all structural and healthy characteristics per Contract Documents.
2. Maintain the soil moisture adjacent to root ball at field capacity. Field capacity will be determined from a 4-inch deep excavation where the soil must hold together and form a hand clump.
3. Maintain a 3-inch mulch cover.
4. Remove undesirable vegetation and Florida Exotic Plant Pest Council Category One invasive plant species. This includes from walls and within fences.
5. Prune to remove crossing, deflecting and circling roots, crossing, dead, damaged and co-dominant branching. An ISA certified arborist is to direct pruning operations. Follow ANSI A300 Part 1 and the Contract Documents.
6. Maintain plant beds as depicted in the Contract Documents.
7. Remove litter and debris.
8. Operate and maintain the irrigation system when installed as part of the Contract.
9. Remove staking and guying from established plants.
10. Continue mowing and litter pick up of the turf areas as shown in the Contract Documents.

**580-5.2 Inspection and Reporting Requirements:** During the establishment period, inspect and certify monthly on the Department's "Landscape Monthly Inspection Form" that the landscaping is being established per the Contract Documents.

In addition, at quarterly intervals, beginning within 90 days of the establishment period start date, provide a Registered Landscape Architect to perform inspections of the landscaping and document the findings in a signed and sealed report. At a minimum, include the following in the inspection report:

1. Date of inspection
2. Location of inspection
3. Condition of plants - identify by species, location, and number of plants that are no longer the specified minimum grade.
4. Condition of plant beds and adjoining areas including mulch, turf, edges of planting beds, weeds, and staking and guying.
5. Soil moisture level
6. Condition of mulch cover
7. Pruning requirements
8. Weed control
9. Accompanying photographs
10. Condition and operation of the irrigation system, if applicable
11. Contractor's response, action, and schedule
12. Other comments

Submit the monthly inspection form and the quarterly inspection report to the Engineer within seven calendar days after performing the inspection.

**580-6 Remedial Work.**

Perform all necessary remedial work at no cost to the Department. Use replacement plants of the same species and planting medium as the plant being replaced and as specified in the Contract Documents. Replacement size must match the size of the adjacent grown-in plant material of the same species and that may be larger than the initially installed size.

The establishment period for replacement plant material will be the remaining establishment period or 90 days after the date of replacement installation acceptance, whichever is greater.

Approval of remedial work does not relieve the Contractor from continuing responsibility under the provisions of this Section. At the end of the contract period when all contract requirements are met, the Engineer will release the Contractor from further remedial work.

**580-7 Failure to Perform.**

Upon receipt of the monthly inspection form, the quarterly inspection report, or after inspection by the Engineer, a daily deduction of 0.0333% of the Contract amount will be assessed and forfeited if full compliance with 580-5 is not achieved. The daily deduction will continue until full compliance is achieved to the Engineer's satisfaction.

**580-8 Method of Measurement.**

The quantity to be paid will be the lump sum quantity for landscape installation and establishment.

**580-9 Basis of Payment.**

Price and payment will be full compensation for all work and materials specified in this Section. Seventy-six percent of the total contract amount will be paid during the installation period for work completed and accepted. Up to twenty-four percent of the total contract amount will be paid in accordance with 580-7 during the establishment period.

**580-9.1 Payment during the Installation Period:** Within 21 calendar days after contract award or at the pre-construction meeting, whichever is earlier, prepare and submit a schedule of values to the Engineer for approval prior to invoicing. The schedule of values will be the basis for determining monthly payments.

Prepare a monthly progress invoice for work completed during the installation period and submit the progress invoice to the Engineer. The Engineer will pay for any item of work only when the progress invoice is approved. The invoice must consist of the following:

1. Contract Number, Financial Project Identification Number, Invoice Number, Invoice Date and the period that the invoice represents.
2. The basis for arriving at the amount of the progress invoice including approximate quantities of work completed, less payments previously made and less an amount previously forfeited.
3. Contract Summary showing the percentage of dollar value of completed work based on the present Contract amount and the percentage of days used based on the present Contract Days.

**580-9.2 Payment during the Establishment Period:** Upon acceptance of the Landscape Monthly Inspection Form from the Contractor as described in 580-5 and approval of the

Engineer, payment during the establishment period will be made in 24 equal monthly payments, less any deductions assessed in accordance with 580-7.

**580-9.3 Payment:** Payment will be made under:

999- 2

Lump Sum Contract, lump sum.

# **TECHNICAL SPECIAL PROVISIONS**

## **SECTION 590 IRRIGATION**

### **590-1 Description.**

The work specified in this Technical Special Provision consists of the furnishing and installation of an Irrigation System and related equipment with accessories necessary to function safely, properly and in accordance with the design set of plans. All costs associated with this Technical Special Provision shall be included in the lump sum price.

### **590-2 Quality Assurance.**

It is the intention of this specification to accomplish the work of installing an automatic irrigation system, which will operate in an efficient and satisfactory manner. The irrigation system shall be installed and made operational according to the workmanlike standards established for landscape installation and sprinkler irrigation operation as set forth by the most recent Best Management Practices (BMP) of the Irrigation Association.

Irrigation piping and related equipment are drawn diagrammatically. Although sizes and locations of plants and or irrigation equipment are drawn to scale wherever possible, it is not within the scope of the drawings to show all necessary offsets, obstructions, or site conditions. The Contractor shall be responsible to install the work in such a manner that it will be in conformance to site conditions, complete, and in good working order.

The specification can only indicate the intent of the work to be performed rather than a detailed description of the performance of the work. It shall be the responsibility of the Contractor to install said materials and equipment in such a manner that they shall operate efficiently and evenly and support optimum plant growth and health.

### **590-3 Submittals.**

Submit a complete list of all irrigation equipment to be used, manufacturer's brochures, maintenance manuals, warranties and operating instructions, within 15 days after the notice to proceed. This submission may be done digitally and all documents shall be submitted in one PDF document. The submittals shall be packaged and presented in an organized manner. Provide a table of contents of all submitted items. Submit product information for irrigation equipment including:

1. Dripline and Fittings
2. Drip Zone Valve Kit
3. Flush Valve
4. Air Relief Valve
5. Drip Emitters
6. Lateral Line Piping and Fittings
7. Main Line Piping and Fittings
8. Communication Cable

Clearly identify on each submitted sheet by underlining or highlighting (on each copy) the specific product being submitted for approval. Failure to clearly identify the specific product being submitted will result in a rejection for the entire submittal. No substitutions of material or

procedures shall be made concerning these documents without the written consent of an accepted equivalent.

Equipment or materials installed or furnished without prior approval may be rejected by the Engineer and the Contractor shall be required to remove such materials from the site at their own expense.

#### **590-4 Delivery, Storage, and Handling.**

All materials and equipment shall be stored properly and protected as required by the Contractor. The Contractor shall be entirely responsible for damages or loss by weather or other cause to work under the contract. Materials shall be furnished in ample quantities and at such times as to ensure uninterrupted progress of the work. Store in accordance with the manufacturers' recommendations.

#### **590-5 As Built Record Set of Drawings.**

Immediately upon the installation of any buried pipe or equipment, the Contractor shall indicate on the progress record drawings the locations of said pipe or equipment. The progress record drawings shall be made available at any time for review by the Engineer.

Before final acceptance of work, the Contractor shall provide an as built record set of drawings showing the irrigation system work as built. The drawings shall be transmitted to the Owner's Representative in paper format and as a pdf file of each document on compact disk or flash drive. The drawings shall include all information shown on the original contract document and revised to reflect all changes in the work. The drawings shall include the following additional information

1. All valves shall be numbered by station and corresponding numbers shall be shown on the as built record set of drawings.
2. All main line pipe or irrigation equipment including sleeves, valves, controllers, irrigation wire runs which deviate from the mainline location, backflow preventers, remote control valves, grounding rods, shut-off valves, rain sensors, wire splice locations, and quick coupling valves shall be located by two (2) measured dimensions, to the nearest one-half foot. Dimensions shall be given from permanent objects such as buildings, sidewalks, curbs, walls, structures and driveways. All changes in direction and depth of main line pipe shall be noted exactly as installed. Dimensions for pipes shall be shown at no greater than a 50 ft. maximum interval.
3. As built record set of drawings shall be signed and dated by the Contractor attesting to and certifying the accuracy of the as built record set of drawings. As built record set of drawings shall have "As Built Record Set of Drawings", company name, address, phone number and the name of the person who created the drawing and the contact name (if different).

#### **590-6 Products.**

**590-6.1 Reclaimed Water Designation:** Where irrigation systems use reclaimed water, all products including valve boxes, lateral and main line pipe, etc. where applicable and/or required by local code shall have the reclaimed water purple color designation.

**590-6.2 Piping Material:** Individual types of pipe and fittings supplied are to be of compatible manufacturer unless otherwise approved. Pipe sizes shown are nominal inside diameter unless otherwise noted. All pipe shall be free of blisters, internal striations, cracks, or any other defects or imperfections. The pipe shall be continuously and permanently marked with the following information: manufacturer's name or trade mark, size, class and type of pipe pressure rating, quality control identifications, date of extrusion, and National Sanitation Foundation (NSF) rating.

Pressure main line for piping upstream of remote control valves and quick coupling valves:

1. Pipe smaller than 2-inch diameter shall be plastic pipe for use with solvent weld or threaded fittings. Shall be manufactured rigid virgin polyvinyl chloride (PVC) 1220, Type 1, Grade 2 conforming to ASTM D 1785, designated as Schedule 40.
2. Pipe 2 - 3-inch diameter shall be manufactured rigid virgin polyvinyl chloride (PVC), Type 1, Grade 2 conforming to ASTM D 1785, designated as bell gasket Class 315.
3. Pipe larger than 3-inch diameter shall be manufactured rigid virgin polyvinyl chloride (PVC), Type 1, Grade 2 conforming to ASTM D 1785, designated as bell gasket Class 200 PVC.

Non-pressure lateral line for piping downstream of remote control valves: plastic pipe for use with solvent weld or threaded fittings. Shall be manufactured rigid virgin polyvinyl chloride PVC 1220 (type 1, grade 2) conforming to ASTM d 1785, designated as Class 200, 3/4" minimum size.

**590-6.3 Fittings and Connections:** Polyvinyl chloride pipe fittings and connections: Type II, Grade 1, Schedule 40, high impact molded fittings, manufactured from virgin compounds as specified for piping tapered socket or molded thread type, suitable for either solvent weld or screwed connections. Machine threaded fittings and plastic saddle and flange fittings are not acceptable. Furnish fittings permanently marked with following information: nominal pipe size, type and schedule of material, and National Sanitation Foundation (NSF) seal of approval. PVC fittings shall conform to ASTM D2464 and D2466.

**590-6.4 Solvent Cements and Thread Lubricant:** Solvent cements shall comply with ASTM D2564. Socket joints shall be made per recommended procedures for joining PVC plastic pipe and fittings with PVC solvent cement and primer by the pipe and fitting manufacturer and procedures outlined in the appendix of ASTM D2564. Thread lubricant shall be Teflon ribbon-type, or approved equal, suitable for threaded installations as per manufacturer's recommendations.

**590-6.5 Control Wires:** The electrical control wire shall be direct burial type UF, no. 14 AWG, solid, single conductor, copper wire UL approved or larger, if required to operate system as designed. For 2-Wire controllers all irrigation wire for the controller, flow sensor, master valve, hydrometer, remote control valves and moisture sensors shall be per the controller



manufacturer's specifications and recommendations.

Color code wires to each valve. Common wire shall be white. If multiple controllers are being utilized, and wire paths of different controllers cross each other, both common and control wires from each controller to be of different colors.

Control wire splices: Splices are when required shall be placed in splice boxes. Use waterproof direct burial wire connectors DBC-Y or equal for connection of solenoid wires to the Decoders. Wire connections shall be per the controller manufacturer's specifications and recommendations.

**590-6.6 Remote Control Valves:** As shown per plan. Remote control valves shall be electrically operated, single seat, normally closed configuration, equipped with flow control adjustment and capability for manual operation. Valves shall be actuated by a normally closed low wattage solenoid using 24 volts, 50/60 cycle solenoid power requirement. Solenoid shall be epoxy encased and have a captured plunger with a removable retainer for easy servicing and a leverage handle for easy turning. The valve pressure rating shall not be less than 150 psi. The valve body and bonnet shall be constructed of heavy-duty glass-filled UV resistant nylon and have stainless steel studs and flange nuts; diaphragm shall be of nylon reinforced nitrile rubber. The valve shall have an external manual open/close control (external bleed) to manually open and close the valve without electrically energizing the solenoid. The valve shall have a flow control stem for accurate manual regulation and/or shutoff of outlet flow. Provide for all internal parts to be removable from the top of the valve without disturbing the valve installation.

Remote control valves shall be wired to controller in same numerical sequence as indicated on drawings. Remote control valves shall be as indicated on the drawings.

**590-6.7 Valve Boxes:** Valve boxes to be polymer composite flush solid lid and flared wall valve box meeting the requirements of ANSI/SCTE-77 Tier 8, WUC 3.6, and ASTM C857 A-8. Lid to include standard stainless-steel fasteners, and have >0.6 Coefficient of Friction per ASTM 1028.

**590-6.8 Dripline:** As shown per plan. Dripline shall be pressure compensating with 0.9 GPH emitters at 12" on center laterals spaced 12" apart with emitters offset for triangular spacing.

#### **590-7 Execution.**

**590-7.1 Installation of Piping:** Install plastic pipe in a manner to provide for expansion and contraction as recommended by Manufacturer. Unless otherwise indicated on drawings, mainlines and laterals may be installed below ground as per the Trenching Detail. Polyethylene hose may be installed above ground. Above ground polyethylene hose shall be staked with sod staples spaced a maximum of four (4') feet apart. Drawings show arrangement of piping. Should local conditions necessitate rearrangement, obtain approval of the Department before proceeding with work. Cut plastic pipe square. Remove burrs at cut ends prior to installation so unobstructed flow will result.

Make solvent weld joints in the following manner - Clean mating pipe and fitting with

clean, dry cloth and apply one coat of P-70 primer to each. Apply uniform coat of 711 solvent to outside of pipe. Apply solvent to filling in similar manner. Re-apply a light coat of solvent to pipe and quickly insert into filling. Give pipe or filling a quarter turn to insure even distribution of solvent and make sure pipe is inserted to full depth of filling socket. Hold in position for 15 seconds minimum or long enough to secure joint. Wipe off solvent appearing on outer shoulder of filling. Do not use an excessive amount of solvent thereby causing an obstruction to form on inside of pipe. Allow joints to set at least 24 hours before applying pressure to PVC pipe. Tape threaded connections with Teflon tape.

**590-7.2 Trenching and Backfilling:** Over-excavate trenches two (2") inches and bring back to indicated depth by filling with fine rock-free, soil or sand. Cover pipe both top and sides with two (2") inches of material specified in paragraph above. In no case shall there be less than two (2") inches of rock-free soil or sand surrounding buried pipe. Do not cover pressure main, sprinkler pipe, or fittings until the Department has inspected and approved system. During construction and the establishment period, fill and repair depressions and replace plantings and/or grassing due to settlement of irrigation trenches.

**590-7.3 Thrust Blocks:** All main line pipes shall have thrust blocks installed at tees, bends, or end of pipelines. Care should be taken to keep all concrete off of the fittings and from joints of pipe. Control, power and live wires must be kept free of concrete and placed outside of thrust.

**590-7.4 Installation of Control Valves and Controller(s):** Install controller and valves in accordance with Manufacturer's recommendations. Install valves in valve boxes. Locate valve box tops at finish grade. Valve boxes shall have snap top lids. Install remote control valves in valve boxes positioned so all parts of the valve can be reached for service. Set cover of valve box at finish grade.

**590-7.5 Installation of Dripline:** Prior to installation of poly tubing and dripline, open control valves and use full head of water to flush out system lateral piping.

**590-7.6 Installation of Decoder System Grounding:** Controller: Earth grounding shall be connected via a factory supplied copper ground lug inside the controller, for connection to earth ground hardware via 6 AWG copper wire ground wire shall be extended underground, at right angles to any communications wiring, to approved direct burial earth grounding hardware at least 6 ft. from the controller location. Earth ground shall have an impedance of 10 Ohms or less. Grounding hardware shall consist of 5/8" x 10' length copper clad steel ground rod, 4" width x 36" length x 0.0625" thick copper plate and ground-enhancement material if required to meet the 10 Ohms or less resistance requirement.

Decoders: Surge suppression devices designed for use with the decoder system shall be installed at a minimum of every 1000 feet along the two-wire path or every 12 decoder modules, whichever is first. A surge suppression module must be installed at the end of each two-wire path. All surge suppression device installations shall be made in appropriately sized valve boxes. At each decoder splice, approximately 5 feet of wire slack shall be provided, looped inside each valve box, to prevent strain on the connection over time.

Earth ground hardware shall not be located in the same valve box as the surge suppression devices. Ground connections from decoder ground lead to grounding hardware shall be made by joining the 12 AWG decoder ground wire with a 10 AWG solid copper lead utilizing a copper alloy split bolt connector. Ground hardware shall be routed at right angles to the two-wire path, a minimum of 8 feet away from the two-wire path, and connected to a 5/8" x 10' length copper-clad steel ground rod or copper plate of 4" width x 36" length x 0.0625" thick. Nominal resistance of this earth ground connection shall be approximately 10 Ohms or less. Ground-enhancement materials may be required to achieve this.

**590-7.7 System Operation:** Maintain the irrigation system in safe and operational condition during construction and throughout the establishment period. Monitor and adjust system to supply proper coverage to areas intended to receive water.

**590-8 Field Quality Control.**

**590-8.1 Pressure Testing:** All pressure lines shall be tested prior to backfilling joint areas. Test pressure lines at minimum sustained pressure of 100 psi for 4 hours. Maximum loss shall be 0.8 gallons/inch pipe diameter/1000 feet. Testing shall be witnessed by the Engineer. Notify the Engineer a minimum of 48 hours prior to test. Do not backfill lines until approved by the Engineer.

**590-8.2 Operational Testing:** Upon completion of the entire system, test each zone to visually check for uniform distribution. Distribution shall be checked within any one area and over the entire zone. Test the entire system to demonstrate the complete and successful operation of all equipment. Testing shall be witnessed by the Engineer. Notify the Engineer a minimum of 48 hours prior to test.

**590-9 Adjustment and Cleaning.**

Adjust watering time of valves to provide proper amounts of water to all plants.

**590-10 Method of Measurement.**

The Contract unit price per assembly for Irrigation System, furnished and installed, will include all equipment specified in the Contract Documents, and all labor, equipment, water and electrical service charges and usage fees, and miscellaneous materials necessary for a complete and acceptable installation/removal.

**590-11 Basis of Payment.**

Price and payment will be full compensation for all work and materials specified in this Section. Seventy-six percent of the total contract amount will be paid during the installation period for work completed and accepted. Up to twenty-four percent of the total contract amount will be paid during the establishment period.

**590-11.1 Payment during the Installation Period:** Within 21 calendar days after contract award or at the pre-construction meeting, whichever is earlier, prepare and submit a schedule of values to the Engineer for approval prior to invoicing. The schedule of values will be the basis for determining monthly payments.

Monthly, prepare a progress invoice for work completed during the installation period and submit the progress invoice to the Engineer. The Engineer will pay for any item of work only when each form is submitted in accordance with 580-4, and the progress invoice is approved. The invoice must consist of the following:

1. Contract Number, Financial Project Identification Number, Invoice Number, Invoice Date and the period that the invoice represents.
2. The basis for arriving at the amount of the progress invoice including approximate quantities of work completed, less payments previously made and less an amount previously forfeited.
3. Contract Summary showing the percentage of dollar value of completed work based on the present Contract amount and the percentage of days used based on the present Contract Days.

**590-11.2 Payment during the Establishment Period:** Upon acceptance of the monthly Landscape Inspection Report from the Contractor as described in 580-5 and approval of the Engineer, payment during the establishment period will be made in 24 equal monthly payments, less any deductions assessed in accordance with 580-7.

**590-11.3 Payment:** Payment will be made under:

999- 2                      Lump Sum Contract, lump sum.

**THIS COMPLETES  
THIS  
SPECIFICATIONS  
PACKAGE**