Leon County  
Board of County Commissioners  
301 South Monroe Street, Tallahassee, Florida 32301  
(850) 606-5302  www.leoncountyfl.gov

June 2, 2010

RE:  Bid Title: Construction of Leon County Public Library Eastside Branch  
     Bid No: BC-06-08-10-33  
     Opening Date: Tuesday, June 8, 2010 at 2:00 PM

**ADDENDUM #3**

Dear Vendor:

This letter serves as Addendum #3 for the above referenced project.

1. Attached is a questions and answers document for your consideration.

2. The attached Addendum #3, 43 pages, from the Architect shall be added to the bid documents as stated therein.

3. The electrical transformer for this project is 3-phase 277/480 Volts and the City only provides single phase electric service to projects without additional costs; therefore, contractors will need to include in their bid prices the requisite costs of a 3-phase power. In addition, the Letter of Agreement (LOA) expires in February 2011, and therefore the noted electrical transformer work will need to be completed on or before December 31, 2010, to permit close-out.

Acknowledgment of this addendum is required as part of your bid submittal. Failure to acknowledge this addendum may result in rejection of your bid.

Should you have any questions, feel free to call me at (850) 606-1600.

Sincerely,

Wendi Sellers
Contract Manager

An equal opportunity employer
Question 1. Beginning on 3 of 10, Water Resources Engineering, who is the “Developer” the documents are referring to?
Answer: As stated in the LOA, the word "Developer" refers to "Leon County".

Question 2. Referencing 8 of 10, Water Resources Engineering, who is responsible for furnishing and installing the following?

Line item 4a, the lift station
Line item 4b, 6” force main
Line item 4c, 2 sanitary manholes
Line item 4d, 8” pvc sanitary line

Answer: As stated in the LOA, the County is the party responsible for installing the Water Resources components (consisting of the lift station, force main, sanitary manholes, and pvc sanitary sewer line). It was noted at the Pre-Bid conference that the only component of the LOA that is applicable to the Eastside Branch Library project shall be the electrical distribution component (specifically to consist of the utility supply through new transformer), as detailed on pages 1-3 of the LOA.
Date: June 02, 2010
To: John Ward
   Construction Manager
   Leon County Facilities Management

From: Johnson Peterson Architects, Inc.
Copied: John Ward, Construction Manager Leon County Facilities Management
        Douglas Barkley & Barry Pujol, Barkley Engineering
        Homer Ooten, Ooten and Associates
        Roger Walsh, R. E. Walsh Engineering, Inc.
        Peter Okonkwo, Spectra Engineering

Addendum #3

Project Name: Leon County Library
Eastside Branch

Modifications to Project Manual:

Architectural:

APM1: Reference 08443, Part 2 Products, 2.01 A. – YKK is an acceptable manufacturer.

Mechanical:

MPM1: Reference 15900, Part 1 General, 1.6 A. – Trane is an acceptable manufacturer.

MPM2: Reference 15900, Part 1 General, 1.6 A. – Siemens Industry is an acceptable manufacturer.

MPM3: Reference 15671, Part 2 Products, 2.05 Lines 15, 16, 17, 18 & 19. – Delete lines.

MPM4: Reference 15878, Part 1 General, Manufactures. - Greenheck, EHPrice & Lindab are acceptable manufacturers.

MPM5: Reference 15860, Part 1 General, Manufactures. - Greenheck, EHPrice & Lindab are acceptable manufacturers.

MPM6: Reference 15820, Part 1 General, Manufactures. - Greenheck, EHPrice & Lindab are acceptable manufacturers.

MPM7: Reference 15840, Part 1 General, Manufactures. - Greenheck, EHPrice & Lindab are acceptable manufacturers.

MPM8: Reference Mechanical Specifications. - Greenheck, EHPrice & Lindab are acceptable manufacturers for exhaust fans and fittings.

Electrical:

EPM1: Reference 26 00 00, Part 1 General, Drawings, line 28. – Replace “bed” with “be”.

JOHNSON PETERSON Architects, Inc
930 THOMASVILLE RD, STE 1 TALLAHASSEE, FLORIDA 32303

FL #AAC001215
EPM2: Reference 26 05 19, Part 1 General, Color Coding, line 10. – Replace “grounded conductor” with “conductors.”

EPM3: Reference 26 27 26, Part 1 General, Occupancy Switches, line 27. – Replace “acrylic” with “high impact nylon.”

EPM4: Reference 26 27 26, Part 1 General, Clock Systems, line 23. – Add “Franklin” as an alternate manufacturer.

EPM5: Reference 26 00 00, Part 1 General, Scope of Work, line 28, 29 & 46. – The furnishing and installation of all electrical items shown on the drawings or herein specified, unless shown or specified otherwise including but not limited to those listed: 5 KW Photovoltaic Solar System. Additionally, Note 3 on Sheet E3.1 states; Install photovoltaic (PV) solar panels on the roof to supply 5 KW of generated power @ 208/120 volts, single phase. Basis of Design is Sunpower by One World Sustainable, Inc. IAW Specifications Section 26 31 00. Substitutions are considered if submitted for review to the Engineer at least 10 days prior to receipt of bids (IAW Spec 26 00 00-5, lines 6-22).

EPM5: Reference 26 31 00, Installer Qualifications, Shop Drawings and Product Data. – Installation Details will be provided by the installer.

Landscape:

LPM1: Reference 02900 Landscape Work. – 02900 Landscape Work Technical Specification has been added. See attachment.

LPM2: Reference 02810 Underground Irrigation System. – 02810 Underground Irrigation System Technical Specification has been added. See attachment.

Modification to Drawings:

Architectural:

Note: Architectural Sheet A5.3 is not yet updated. Drawings will be revised and resubmitted when a General Contractor is selected.

A1: Reference Architectural Sheet A5.3. – Opening 102A and 102B shall have rim exit devices.

A2: Reference Architectural Sheet A5.3. – Opening 104A and 105 shall have keyed lock with “Storeroom” function.

A3: Reference Architectural Sheet A5.3. – Opening 106A and 106B shall have keyed locks with “Corridor with Deadbolt” function, and have door closers, thresholds, and weatherstripping to match other exterior doors.

A4: Reference Architectural Sheet A5.3. – Opening 107A shall use Hardware Set #1 except for drip edge, cylinder, and threshold. Room shall not have a keyed lock.
A5: Reference Architectural Sheet A5.3. – Opening 107B shall have a closer and a keyed lock with “Corridor with Deadbolt” function.

A6: Reference Architectural Sheet A5.3. – Opening 107D shall have a keyed lock with “Storeroom” function. Right hand reverse leaf shall be active leaf with cylinder, and left hand reverse leaf shall be inactive with dummy handle.

A7: Reference Architectural Sheet A5.3. – Opening 108 shall have a keyed lock with “Storeroom” function. Right hand reverse leaf shall be active leaf with cylinder, and left hand reverse leaf shall be inactive with dummy handle.

A8: Reference Architectural Sheet A5.3. – Opening 109 shall have a keyed lock with “Office” function.

A9: Reference Architectural Sheet A5.3. – Opening 111A shall have a door closer and a card reader. For all doors with a card reader: the card reader controls the door’s locking mechanism, and the door shall have a manual override/backup. Card reader to be provided by owner. Contractor to coordinate electrician, door hardware supplier/installer, and card reader supplier/installer.

A10: Reference Architectural Sheet A5.3. – Opening 111B shall have a concealed vertical rod exit device. See note “A9” above for information on card readers.

A11: Reference Architectural Sheet A5.3. – Opening 112 shall have a door closer and a card reader - see note “A9.”

A12: Reference Architectural Sheet A5.3. – Opening 115 shall have a keyed lock with a “Storeroom” function.

A13: Reference Architectural Sheet A5.3. – Opening 118A shall have a closer, threshold, weatherstripping, and a card reader – see note “A9.”

A14: Reference Architectural Sheet A5.3. – Opening 118B shall have a card reader – see note “A9.”

A15: Reference Architectural Sheet A5.3. – Opening 119A shall have a keyed lock with a “Storeroom” function.

A16: Reference Architectural Sheet A5.3. – Opening 119B shall have a keyed lock with a “Storeroom” function.

A17: Reference Architectural Sheet A1.1. – Room 119A walls have been modified to show 6” metal stud walls.

Structural:
S1: Reference Structural Sheet S-1.1. – Column lines 3, 5, 9, 10, 11, 12, 13, 15 and 16 have been modified to show CP designations. See attachment.

S1: Reference Structural Sheet S-1.1, S-1.2, S-1.3, S-1.4, S-1.5 & S-1.6. – Drawing have been modified to shown the scale. See attachment.

Civil:


C2: Reference Civil Sheets C7.0-R. – The size of the concrete parking has been modified. See attachment.

Landscape:

L1: Reference Landscape Sheets L1.0, L1.1, L2.0 & L2.1. – Modifications have been made on these sheets. See revision clouds. See Attachment.

L2: Reference Landscape Sheets L1.2 & L1.3. – Landscape sheet have been added. See attachment.

Electrical:

E1: Reference Electrical Sheet E1.0. – Lighting Fixture Schedule; Fixture F. Replace Sheet “E1.1” with “E1.2.” Add “ELECTRICAL NOTES” above “APPLICABLE ELECTRICAL CODES AND SPECIFICATIONS.” See attachment.

E2: Reference Electrical Sheet E1.1. - Sheet E1.1, Electrical Site Plan, changed as follows: Add Scale: 1” = 50” – 0”. Add note at COT Underground Primary Power note to “Coordinate IAW Note 5 on Sheet E1.0.” Add Underground Conduits for Telephone and Cable TV, IAW Detail at C/D Board on Sheet E1.0. See attachment.

E3: Reference Electrical Sheet E2.0. - Add clarifications pertaining to the switchbank information and the Lighting Control System. See attachment.

E4: Reference Electrical Sheet E3.0. - In Electrical Room 119A, add a smoke detector above the Fire Alarm Control Panel. See attachment.

E5: Reference Electrical Sheet E3.3. - Switchbank 1: Change circuits for one switch. See attachment.

E6: Reference Electrical Sheet E2.0 & E2.1. - Clarification - The switch banks are actually control stations as part of the Intelligent Lighting Control (ILC) System shown on Sheet E2.1. All such controls fit into one 4-gang recessed box. Local contact for the ILC system specified is Jeff Crisp, 850-422-3600. Further, see Lighting Control Notes on Sheet E2.0.
**E7:** *Reference Electrical Sheet E1.1 & E2.0. – Clarification* - Circu uitng Home Run Directions are in "Circuiting Notes" on Sheet E2.0 and Note 4 on Sheet E1.1.

**E8:** *Reference Electrical Sheet E3.1. – Change 18 PV Solar Panels to 16 panels.* As a matter of information, 305 watt panels by Sunpower are available. Supplier contact person with OneWorld Sustainable, Inc. in Savannah, GA is Keith Freeman at 912-236-1322.

**E9:** *Reference Electrical Sheet E3.1. – Change “2 strings of 9 X 305w” to “2 strings of 8 X 305w”*

**E10:** *Reference Electrical Sheet E1.1. – Clarification* - C.O.T. Electrical Service is to be by overhead line to a power pole in the easement on the east side of Pedrick Road. C.O.T will provide a three-phase transformer for this service, since the service is justified by the three-phase chiller. This contractor will have to provide conduit up the power pole to a weather head and the transformer pad IAW C.O.T. specifications. The transformer and overhead service are to be set “in place” on or before December 22, 2010 in order to avoid interference with utility improvements along Pedrick Road.
SECTION 02900 - LANDSCAPE WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

1.2 SUMMARY

A. This Section includes provisions for the following items:

1. Protecting existing trees to remain.
2. New cabbage palm trees.
3. New trees.
4. New shrubs.
5. New ground cover.
7. Mulching.
8. Initial maintenance of landscape materials.

B. Related Sections: The following sections contain requirements that relate to this Section.

1. Protection of existing vegetation is specified in Division 2, Section 02110 - Site Clearing.
2. Excavation, filling, and rough grading required for establishing elevations shown on drawings is specified in Division 2, Section 02220 - Earthwork.
3. Sodding is specified in Division 2, Section 02485A – Sodding.
4. Automatic underground sprinkler system is specified in Division 2, Section 02810 - Underground Irrigation System.

1.3 QUALITY ASSURANCE

A. Subcontract landscape work to a single firm specializing in landscape work with not less than five (5) years of successful experience and knowledge of plant materials and techniques of the north region of Florida. The Contractor may be required to submit evidence of these qualifications. The Landscape Architect and the Owners Representative (OR) may reject Contractors who cannot show evidence of these qualifications.

B. Quality Control: Ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials. Comply with standards and specifications indicated in the following publications:

C. Do not make substitutions. If specified landscape material is not obtainable in Florida, submit proof of non-availability to the Landscape Architect and OR together with proposal for use of equivalent material. All deviations from the project documents must be in writing and written approval given.

D. Analysis and Standards: Package standard products with manufacturer’s certified analysis. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.

E. Topsoil: Application of topsoil will not be required for this project.

F. Trees, Shrubs and Other Plants: Provide shrubs, and other plants of quantity, size, genus, species, and variety shown and scheduled for landscape work. Plant quantities shown in the Plant Schedule are for the convenience of the Contractor. In the event of a discrepancy between the drawings and the Plant Schedule, the drawings shall prevail. Provide healthy, vigorous stock, grown in a recognized nursery in the north Florida/south Alabama/south Georgia region, in accordance with good horticultural practice and free of disease, insects, eggs, larvae, and defects such as knots, sun-scald, injuries, abrasions, or disfigurement.

G. Label at least one plant of each variety with a securely attached waterproof tag bearing legible designation of botanical and common name.

H. Where formal arrangements or consecutive order of trees or shrubs are shown, select stock for uniform height and spread, label with number to assure symmetry in planting.

I. Inspection: The Landscape Architect and OR may inspect plant materials either at place of growth or at site before planting, for compliance with requirements for genus, species, variety, size, and quality. The Landscape Architect and OR retains right to further inspect plant materials for size and condition of balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected plant materials immediately from project site.

J. Soil Testing: To qualify for acceptance to move into the planting phase, the Contractor must test the existing soils and fill material for pH, moisture retention, and percentage of organic material. This information will be given to the Landscape Architect and OR along with soil amendment product information and samples for final approval on soil amendment usage. Proceeding with any planting, grassing, or seeding without written approval will be considered a violation of the specifications and soil materials shall be removed from the site at the expense of the Contractor.

1.4 SUBMITTALS

A. Submit the following in accordance with Conditions of Contract and Division 1 Specification Sections.

1. Plant and Material Certifications:
   a. Certificates of inspection as required by governmental authorities.
   b. Manufacturers or vendor’s certified analysis for soil amendments and fertilizer materials.
   c. Label data substantiating that plant materials and other items comply with specified requirements. Refer to paragraph 1.3 QUALITY ASSURANCE.
   d. Mulch sample labeled to indicate producer, source species and source location. Provide one-quarter (1/4) cubic foot in sealed container.
2. Test Reports: Test existing and imported soil according to USDA Soil Survey Investigation Report No. 1. See PART 2 of this specification for information required.

3. Plant Installation Schedule: Proposed Plant Installation Schedule, indicating dates for each type of landscape work during normal seasons for such work in area of site. Correlate with specified maintenance periods to provide maintenance from date of substantial completion. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.

4. Maintenance Instructions: Three (3) sets of typewritten instructions, each in a binder, recommending procedures to be established by Owner for maintenance of landscape work for one full year. Submit prior to expiration of required maintenance period(s) or prior to Final Acceptance and submittal of Request for Final Payment, whichever comes first.

1.5 DELIVERY, STORAGE AND HANDLING

A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

B. Plant materials: Provide container grown plant materials, as specified in the drawings. Do not prune prior to delivery unless otherwise approved by the Landscape Architect or OR. Do not bend or bind-tie shrubs in such manner as to damage bark, break branches, or destroy natural shape. Provide protective covering during delivery. Do not drop plant materials during delivery.

C. Deliver plants after preparations for planting have been completed and plant immediately. If planting is delayed more than 6 hours after delivery, set plant materials in shade, protect from weather and mechanical damage, and keep roots moist by covering with mulch, burlap or other acceptable means of retaining moisture.

D. Do not remove container-grown stock from containers until planting time.

1.6 JOB CONDITIONS

A. Utilities: Determine location of underground utilities and perform work in a manner, which will avoid possible damage. Hand excavate as required. Maintain grade stakes set by others until parties concerned mutually agree upon removal.

B. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, contaminated soil, adverse drainage conditions, or obstructions, notify the Landscape Architect or the OR for approval to continue before planting.

1.7 SEQUENCING AND SCHEDULING:

A. Planting Time: Proceed with, and complete landscape work as rapidly as portions of site become available, working within seasonal limitations for each kind of landscape work required.

B. Install new plant materials only after underground irrigation system is substantially complete and operational.

C. Install plant materials during normal planting seasons for each type of plant material required.
D. Correlate planting with specified maintenance periods to provide maintenance from date of substantial completion.

E. Coordination with Lawns: Plant shrubs and ground covers after final grades are established and prior to planting of lawns, unless otherwise acceptable to the Landscape Architect or the OR. If planting of shrubs and ground covers occurs after lawn work, protect lawn areas and promptly repair damage to lawns resulting from planting operations.

1.8 SPECIAL PROJECT WARRANTY

A. Warranty lawns through specified lawn maintenance period, and until final acceptance.

B. Warranty plant materials, except lawns, for a period of ONE (1) YEAR after date of Final Completion, against defects including death and unsatisfactory growth, except for defects resulting from neglect by Owner, abuse or damage by others, or unusual phenomena or incidents which are beyond Contractor's control. Relocated trees and other relocated plant materials shall be included in this warranty.

C. Remove and replace plant materials found to be dead or in unhealthy condition as determined by the Landscape Architect and/or the OR during the warranty period. Replacement sizes shall be equal to or exceed the size of plant material as originally relocated or installed as new plant material. Make replacements during growth season following end of the warranty period. Replace plant materials that are in doubtful condition at end of the warranty period, unless, in opinion of the Landscape Architect and/or the OR, it is advisable to extend warranty period for a full growing season.

D. Another warranty inspection will be conducted at end of the extended warranty period, if any, to determine acceptance or rejection. Only one replacement (per tree, shrub or plant) will be required at end of the warranty period, except for losses or replacements due to failure to comply with specified requirements.

PART 2 – PRODUCTS

2.1 SOIL AMENDMENTS

A. Aluminum Sulfate: Commercial grade.

B. Biostimulants: Dry soluble yucca plant extract from *Yucca schidigera*, soluble sea kelp extract from *Ascophyllum nodosum*, and humic acid composed primarily of Leonardite humates.

C. Bonemeal: Commercial, raw, finely ground containing 4 percent nitrogen and 20 percent phosphoric acid.

D. Lime: Natural dolomitic limestone containing not less than 85 percent of total carbonates with a minimum of 30 percent magnesium carbonates, ground so that not less than 90 percent passes a 10-mesh sieve and not less than 50 percent passes a 100-mesh sieve.

E. Manure: Well-rotted, unleached stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials and containing no chemicals or ingredients harmful to plants.

F. Mycorrhizal Fungi Inoculum: Endomycorrhizal fungi (live spores of Vesicular-Arbuscular [VA]
fungi to include *Entrephospora columbiana*, *Glomus etunicatum*, *Glomus clarum* and *Glomus sp.* and ectomycorrhizal fungi (live spores of *Pisolithus tinctorius*) superstrains inoculant as manufactured by Plant Health Care, Inc. or approved equal.

G. Peat Humus: Finely divided domestic peat or solid waste compost, so completely decomposed and free of fibers that its biological identity is lost. Provide in granular form, free of hard lumps and with pH range suitable for intended use.

H. Superabsorbent Polymer: Cross linked polyacrylamide copolymer, particle size 1.0 mm to 1.5 mm, maximum 5%< 1.0mm, less than 5% soluble, absorption rate of 330-400 times in distilled water, fade resistance of hard crystals shall be firm to touch with no more than very slight softness. Polymer shall be non-toxic. Certificate of analysis must certify that the free acrylamide monomer level is less than 0.5%. Polymer shall be manufactured by Terrasorb or approved equal.

I. Super phosphate: Composed of finely ground phosphate rock as commonly used for agricultural purposes containing not less than 20 percent available phosphoric acid.

J. Mulch: Organic mulch free from deleterious materials, including seeds, and suitable for top dressing of trees, shrubs, and other plant materials, and consists of one of the following:

1. Pine straw
2. Ground or shredded pine bark
3. Wood chips

Cypress mulch will not be considered an acceptable mulch material unless acceptable certified evidence that mulch is a by-product of the lumber manufacturing process is submitted for approval by the Landscape Architect and the OR.

K. Commercial Fertilizer: Complete fertilizer of neutral character, with some elements derived from organic sources and containing following percentages of available plant nutrients:

1. For shrubs, provide slow-release fertilizer with not less than 20 percent total nitrogen, 10 percent available phosphoric acid and 5 percent soluble potash.
2. For groundcover plant beds, provide fertilizer with not less than 6 percent total nitrogen, 6 percent available phosphoric acid and 6 percent soluble potash. Wildflower planting areas will not receive fertilizer.
3. For lawns, provide fertilizer with percentage of nitrogen required to provide not less than 1 pound of actual nitrogen per 1,000 sq. ft. of lawn area and not less than 4 percent phosphoric acid and 2 percent potassium or a formulation recommended in writing by the local USDA Soil Conservation Service Agent or the local IFAS Horticultural or Soils Technician/Agent, whichever is greater. Provide nitrogen in a form that will be available to lawn during initial period of growth. At least 50 percent of nitrogen to be in organic form and contain no less than 3 percent water-insoluble nitrogen. For the purpose of bidding, assume 6 percent nitrogen, 6 percent phosphorus and 6 percent potash by weight.

2.2 PLANT MATERIALS

A. Quality: Provide plant materials of size, genus, species, and variety shown and scheduled for landscape work that comply with the standards for 'Florida No. 1' or better as specified in the Florida Department of Agriculture and Consumer Services publication titled "Grades and Standards for Nursery Plants" as published in 1998 or as amended. Label at least one of each plant species or variety with a securely attached waterproof tag bearing a legible designation of both the botanical and common name of the plant.
2.3 GRASS MATERIALS

A. Sod: Provide strongly rooted sod, not less than 2 years old, and contain no visible broadleaf weeds when viewed from a standing position and shall be visibly consistent with no obvious patches of foreign grasses. In no case may the total amount of foreign grasses or weeds exceed 2% of the total vegetative component of the sod. Machine cut to pad size. Provide only sod capable of vigorous growth and development when planted (viable, not dormant).

B. Provide sod of uniform pad sizes with maximum 5 percent deviation in either length or width. Broken pads or pads with uneven ends will not be acceptable. Sod pads incapable of supporting their own weight when suspended vertically with a firm grasp on upper 10 percent of pad will be rejected.

C. Provide sods composed principally of ‘Centipedegrass’ (Eremuchola ophiuroides).

2.4 GROUND COVER

A. Provide plants established and well rooted in removable containers or integral peat pots and with not less than minimum number and length of runners required by ANSI Z60.1-1990 for the pot size shown or listed.

2.5 MISCELLANEOUS LANDSCAPE MATERIALS

A. Anti-Desiccant: Emulsion type, film-forming agent designed to permit transpiration, but retard excessive loss of moisture from plants. Deliver in manufacturer's fully identified containers and mix in accordance with manufacturer's instructions.

B. Stakes: Provide steel stakes, plastic stabilizing disks and rubber supports as manufactured by Lawson Landscape Products, Martinsville, IN 46151, 800/833-5323, or approved equal.

C. Gravel Mulch: Cleaned water-worn river gravel or crushed stone, graded from 1-1/2 " maximum to 1/2" minimum.

PART 3 - EXECUTION

3.1 PREPARATION - GENERAL:

A. Lay out individual plant materials locations and areas for multiple plantings. Stake locations and outline areas and secure Landscape Architect and/or OR acceptance before start of planting work. Make minor adjustments as may be required.

B. NOTE: Spacing requirements also applies to minimum distance away from hard surfaces. See Plant Schedule(s) and detail drawings.

3.2 PREPARATION OF PLANTING SOIL

A. Before mixing, clean native soil of roots, plants, sods, stones clay lumps and other extraneous materials that may be harmful or toxic to plant growth.

B. Mix specified soil amendments and fertilizers with native soil and at rates specified. A soil test will have to be made in order to adjust the pH with lime or sulfur for lawn areas, groundcover beds and annual flowering plant beds. Delay mixing of fertilizer if planting will not follow
C. "Schedule of Planting Soil Mixture Requirements" is attached at end of this section.

D. For pit and trench type backfill, mix planting soils prior to backfilling, and stockpile at site.

E. For planting beds and lawns, mix planting soil either prior to planting or apply on surface of topsoil and mix thoroughly before planting. Wildflower beds shall not have plant bed soil mix incorporated.

F. Apply phosphoric acid fertilizer (other than that constituting a portion of complete fertilizers) directly to subgrade before applying planting soil and tilling.

3.3 PREPARATION FOR PLANTING LAWN

A. Loosen subgrade of lawn areas to a minimum depth of 8 inches. Remove stones measuring over 1-1/2 inches in any dimension. Remove sticks, roots, rubbish and other extraneous matter. Adjust subgrade elevation to meet lines, grades and elevations required after light rolling, natural settlement and sod placement. (Sod level to be below all adjacent hard surfaces to insure proper drainage.) Limit preparation to areas that will be planted promptly after preparation.

B. Place superphosphate at a rate for bidding purposes of 5 pounds per 1000 square foot. Place a complete fertilizer at a rate for bidding purposes of 16 pounds per 1000 square foot. Evenly distribute the superphosphate and the complete fertilizer over entire area and cross-disc into the soil to a depth of 4 – 6 inches.

C. Preparation of Unchanged Grades: Where lawns are to be planted in areas that have not been altered or disturbed by excavating, grading, or stripping operations, prepare soil for lawn planting as follows: Till to a depth of not less than 6 inches. Apply soil amendments and initial fertilizers as specified. Remove high areas and fill in depressions. Till soil to a homogenous mixture of fine texture, free of lumps, clods, stones, roots and other extraneous matter.

D. Prior to preparation of unchanged areas, remove existing vegetation and turf not noted to remain. Dispose of such material outside of Owner's property. Do not turn existing vegetation over into soil being prepared for lawns.

E. Allow for sod thickness in areas to be sodded.

F. Delay application of fertilizer if lawn planting will not follow within a few days.

G. "Schedule of Planting Soil Mixture Requirements" indicating required rate of fertilizer application, is attached at end of this section.

H. Fine grade lawn areas to smooth even surface with loose, uniformly fine texture. Roll, rake and drag lawn areas, remove ridges and fill depressions, as required to meet finish grades. Limit fine grading to areas which can be planted immediately after grading.

I. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.

J. Restore lawn areas to specified condition, if eroded or otherwise disturbed, after fine grading and prior to planting.
3.4 PREPARATION OF GROUNDCOVER PLANTING BEDS
   A. Dig beds not less than 8 inches deep and mix with specified soil amendments and fertilizers.
   B. Limit preparation of beds to areas which will be planted promptly or unless directed otherwise by the Landscape Architect and the OR.

3.5 EXCAVATION FOR TREES AND SHRUBS
   A. Excavate pits, beds, and trenches with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage. Loosen hard subsoil in bottom of excavation. Excavation of planting pits should be in a square fashion to prevent the chance of roots circling the planting pit and girdling.
   B. Allow for 3-inch thick setting layer of planting soil mixture.
   C. For container-grown stock, excavate as specified in the planting details on drawings, adjusted to size of container width and depth.
   D. Fill excavations for trees and shrubs with water and allow water to percolate out prior to planting.

3.6 PLANTING SHRUBS: Refer to the planting details to supplement the information below.
   A. Set container grown plant on layer of compacted planting soil mixture, plumb and locate in center of pit or trench with top of ball at same elevation as adjacent finished landscape grades. Remove containers by cutting containers on 2 sides, if necessary, with an approved container cutter. When set, place additional backfill around base and sides of ball and work each layer to settle backfill and eliminate voids and air pockets. When excavation is approximately 2/3-full, water thoroughly and after the water is drained, place 1 Agriform tablet or equal for every 1 gallon container plant, place 3 equally spaced tablets for 3 gallon material, and for any larger container use 1 tablet for each 1/2" of trunk plus 1 for the hole, equally spaced 3 minimum. (For multiple trunks the diameter measurements will be cumulative).
   B. The root ball of certain plants may be "butterflied" to ensure that roots will grow out into the soil. The butterfly method involves making two (2) vertical cuts from the bottom up 1/5 of the root ball dividing that lower section of the root ball into four (4) equal sections. The cuts are made in the center of the bottom of the ball and the root mass is spread or flattened.
   C. Depress planting pit to allow for mulching. Depressed dish to be the same diameter as planting pit. See details on drawings for width and height.
   D. Mulch pits, trenches, and planted areas. Provide not less than following thickness of mulch, and work into top of backfill and finish level with adjacent finish grades.
   E. Provide 3 inches thickness of mulch.
   F. Apply anti-desiccant, using power sprayer, to provide an adequate film over trunks, branches, stems, twigs and foliage.
   G. If trees are moved when in full-leaf, spray with anti-desiccant before moving and spray again 2 weeks after planting.
   H. Prune, thin out, and shape trees and shrubs in accordance with standard horticultural practice.
Prune trees to retain required height and spread. Unless otherwise directed by the Landscape Architect or OR, do not cut tree leaders, and remove only injured or dead branches from trees, if any. Prune shrubs to retain natural character, only if necessary. Do not prune to achieve a formal clipped hedge appearance.

I. Remove and replace excessively pruned or misformed stock resulting from improper pruning.

J. Guy and stake trees immediately after planting, as indicated on planting details.

3.7 SODDING NEW LAWNS

A. Lay sod within 24 hours from time of stripping. Do not plant dormant sod.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod strips; do not overlap. Stagger strips to offset joints in adjacent courses. Work from boards to avoid damage to subgrade or sod. Tamp or roll lightly to ensure contact with subgrade. Work top dressing (clean weed-free sifted soil or sand) into minor cracks between pieces of sod. Remove excess top dressing to avoid smothering adjacent grass. Top dressing may be required at no additional cost to the Owner if deemed necessary by the Landscape Architect.

C. Anchor sod on slopes greater than 1:5 with wood pegs to prevent slippage.

D. Lay sod on slopes equal to or greater than 1:3.

E. Lay sod in swale bottoms and side slopes.

G. Water sod thoroughly with a fine spray immediately after planting.

H. Water newly planted lawn areas and keep moist until new grass is established.

3.8 SEEDING NEW LAWN:

A. Seed the areas disturbed by construction and not otherwise noted to be sodded on the Drawings or herein.

B. Sow seeds at the rate of eight (8) pounds per one thousand (1000) square feet. Sow one-half the seed in one direction and the remainder at right angles to the first sowing. Cover seed with soil to an average depth of one-half inch using a spike-tooth harrow, cultipacker or other device. Apply mulch after seeding. Mulch shall be normally dry mulch. Dry mulch shall be straw or hay consisting of oat, rye and wheat straw, or of pangola, peanut, coastal Bermuda or Bahiagrass hay. Mulching shall be two (2) inches (loose thickness) uniformly applied over the seeded area. Secure mulch by crimping with a serrated disc, using twine or netting, or other Landscape Architect and/or OR approved method.

C. If hydroseeding is utilized mix the seed, fertilizer and mulch in water to produce a homogeneous slurry and then uniformly apply it under pressure.

D. Immediately after seeding, firm the entire area except for slopes in excess of 3:1 with a roller. If a cultipacker-type seeder or hydroseeding is used, rolling is optional.

E. Erosion Control Material: Install on slopes if grade is 3:1 or greater and not noted for sodding or planting with ground cover.

F. Protection: Protect seeded areas from traffic and other use by erecting barricades and placing
3.9 PLANTING GROUND COVERS:

A. Space plants as indicated on the Planting Schedule.

B. Dig holes large enough to allow for spreading of roots and backfill with planting soil. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water. Water thoroughly after planting, taking care not to cover crowns of plants with wet soils.

C. Mulch areas between plants placing mulch not less than 3 inches thick.

3.10 MAINTENANCE:

A. Begin maintenance immediately after planting.

B. Maintain trees, shrubs and other plants by pruning, cultivating and weeding as required for healthy growth. Restore planting saucers. Repair stake supports and reset trees, palms, and shrubs to proper grades or vertical position as required. Restore or replace damaged wrappings. Treat as necessary to keep trees and shrubs free of insects and disease. Maintain trees, shrubs and other plants until final acceptance, but in no case, less than sixty (60) days after Final Completion.

C. Maintain lawns by watering to provide an equivalent of 1-1/2" water per week minimum, fertilizing, weeding, mowing not less than every two weeks, trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth, acceptable lawn, free of eroded or bare areas. Maintain lawns for not less than the period stated below and longer as required to establish an acceptable lawn.

1. Seeded lawns, not less than sixty (60) days after Final Completion. If seeded in fall and not given full 60 days of maintenance, or if determined not acceptable at that time, continue maintenance through the following spring until acceptable lawn is established.

2. Sodded lawns, not less than thirty (30) days after Final Completion.

3.11 CLEAN UP AND PROTECTION:

A. During landscape work, keep pavements clean and work area in an orderly condition on a daily basis.

B. Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged landscape work as directed. Upon completion of the plantings, all excess soil, stones and debris that have not previously been cleared shall be removed.

3.12 INSPECTION AND ACCEPTANCE:

A. When landscape work is completed, including maintenance, the Contractor should notify the Landscape Architect or OR in writing. The Landscape Architect or OR will then make an inspection to determine acceptability.
B. Landscape work may be inspected for acceptance in portions as agreeable to the Landscape Architect and/or the OR provided each portion of work offered for inspection is complete, including maintenance.

C. When inspected landscape work does not comply with requirements, replace rejected work and continue specified maintenance until re-inspected by the Landscape Architect and/or the OR and found to be acceptable. Remove rejected plants and materials promptly from project site at no cost to the Owner.

3.13 SCHEDULE OF PLANTING SOIL MIXTURE REQUIREMENTS:

A. For groundcover and planting beds, provide not less than the following quantities of specified materials:
   1. One (1) part of loose peat humus or solid waste compost to two (2) parts of in-situ native soil by volume.
   2. Twenty (20) pounds of commercial time-released fertilizer (6-6-6) per 1000 square feet.

B. For backfill for trees and shrubs, provide specified materials in not less than the following quantities:
   1. One (1) three (3) ounce packet of prepared MycorTree Tree Saver Transplant mix as produced by Plant Health Care, Inc., Bradenton, FL 34282, 800-227-6728, or approved equal, per one inch caliper tree or one three gallon shrub or three one gallon shrubs.
   2. 1 part of loose peat humus or solid waste compost to 3 parts of in-situ native soil by volume – for shrubs only.
   3. Required Agriform tablets required in Commercial Fertilizer section. THIS ITEM SHALL BE TURNED OVER TO THE OWNER FOR INSTALLATION AT A LATER DATE.

C. For lawn areas, provide not less than the following quantities of specified materials:
   1. Five (5) pounds of colloidal phosphate (superphosphate) per 1000 sq. ft.
   2. Sixteen (16) pounds of commercial fertilizer per 1000 sq. ft.
   3. Quantity of lime or sulfur to provide a healthy medium for optimum grass growth.

END OF SECTION 02900
PART 1 - GENERAL

1.1 RELATED DOCUMENTS
A. Drawing and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK
A. The extent of new underground irrigation system, drip irrigation and temporary irrigation zones is shown on drawings, but generally involves permanent and temporary irrigation for two (2) distinct Vegetation Management Plan (VMP) zones. VMP Zone 1 generally consists of connecting the new two (2) inch main irrigation line to the new potable water supply source one (1) inch irrigation meter and backflow preventer assembly (both provided under the civil work) and providing and installing the following new irrigation equipment: one (1) new multi-zone controller; manual and automatic valves; a rain switch; quick-connect valves; pop-up spray sprinklers with fixed and adjustable spray nozzles; drip irrigation piping, emitters, and appurtenances; temporary irrigation equipment and temporary tree watering bags, to provide sufficient irrigation coverage for all new landscape materials.

Irrigation of VMP Zone 2 Reforestation plant materials will be temporary. The General Contractor shall be responsible for providing the method, materials, labor, transportation, tools and appurtenances for irrigating the new plant materials for a period of not less that six (6) months or less, should establishment of plant materials be demonstrable, such that the plants are thriving and does not display wilting when water is not provided over a seven (7) day period.

B. Refer to Division-16 sections for electrical service for controller(s).

1.3 PRECONSTRUCTION SITE REVIEW
A. The Contractor shall schedule an on-site pre-construction conference with the Landscape Architect and the Owner's Representative (OR) prior to beginning installation of the new irrigation system and equipment. The Contractor shall be responsible for coordinating his work with all other parties involved with the project in order to prevent unnecessary complication during the installation of this work.

1.4 QUALITY ASSURANCE
A. Manufacturer Qualifications: Provide irrigation system(s) as complete unit(s) produced by a single acceptable manufacturer for all equipment. Multiple manufacturer's products may be combined as a complete unit provided evidence of compatibility is submitted for review and approved by the Landscape Architect and the OR.

B. Contractor Qualifications: The system shall be installed and modified by an experienced firm, regularly engaged in irrigation installation. Contractor shall have a minimum of five (5) years of successful experience with installations. The Contractor can be asked to submit evidence of these qualifications. The Landscape Architect and the OR may reject contractors who cannot show evidence of these qualifications.
C. The Contractor shall employ only competent workmen for the execution of this work and all such work shall be performed under the direct supervision of an experienced superintendent.

1.5 SUBMITTALS

A. The Contractor shall be responsible for submitting the following:

B. Product Data: Submit manufacturer's technical data and installation instructions for all new irrigation system equipment, materials and components.

C. Permits: The Contractor shall bear the expense of and procure all permits, certificates and licenses required by law for the execution of the work. The Contractor shall comply with all Federal, State and local laws, ordinances or rules and regulations relating to the performance of the work.

D. Submit shop drawing(s) on reproducible media (vellum or mylar) and digital (PDF format in Arch D size) for pop-up spray, drip and temporary irrigation systems including plan layout and details illustrating location and type of sprinklers, valves, piping circuits, controller location, well, and appurtenances.

E. As-Built Drawings: During the course of the installation, the Contractor shall record all changes made to the irrigation system during installation. Changes shall be carefully drawn in red line on a print of the irrigation system drawing. Upon completion of the installation, the information marked this red line drawing shall be used to update the Shop Drawing. Upon completion of updating the drawing, it shall be given to the Landscape Architect for review and approval. The Landscape Architect shall deliver the approved drawing(s) to the OR for use as an As-Built irrigation drawing in both paper and digital formats. Contractor and Installer's name, address and telephone number and date of installation must be shown on drawing.

G. After the irrigation system is installed and approved, the OR and Leon County maintenance personnel shall be instructed in the complete operation and maintenance of the system by the Contractor. The Contractor shall furnish five (5) copies of an Irrigation System Management Manual prepared by the system installer. Each manual shall be in a labeled three-ring binder and contain one copy of the approved product data, approved Shop Drawings, approved As-Built Drawing(s), and complete operation and maintenance instructions for the irrigation system.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work include, but are not limited to, the following:

1. Ametek
2. Can-Tex Industries
3. Carson Industries, Inc.
4. Eslon Thermoplastics
5. Glen-Hilton Products, Inc.
6. Hunter Industries
7. Hydrodyne Products, Inc.
8. Irritrol Irrigation
2.2 MATERIALS

A. Pressure Pipe (between the meter/backflow preventer assembly, and manual and solenoid valves): Comply with following:

1. Rigid polyvinyl chloride (PVC) SDR pressure rated Schedule 40 plastic pipe; Type 1, compound per ASTM D-1785; NSF approved; plain end pipe per ASTM D-2241, bell end pipe per ASTM D-2672; marked per ASTM D-2241.


C. Non-Pressure Pipe (downstream from solenoid valve): Comply with following:

1. Rigid polyvinyl chloride (PVC) SDR pressure rated Class 160 plastic pipe; Type 1, Grade 1 compound per ASTM D-1784; NSF approved; plain end pipe per ASTM D-2241, bell end pipe per ASTM D-2672; marked per ASTM D-2241.

2. Polyethylene (PE) plastic pipe, virgin linear, low-density polyethylene resin with nominal sized internal diameter as required, rated to 50 p.s.i. operating pressure at 100 degrees Fahrenheit (F).

D. Pipe Fittings: Comply with following:

1. For PVC plastic pipe, Schedule 40, Type 1, Grade 1 per ASTM D-1784; NSF Approved, conforming to ASTM D-1784 for material and ASTM D-2466 for dimensions for socket and threaded fittings. ASTM D-2564 solvent cement.

2. For PE pipe and PVC/PE female compression on locking ring fittings and adapters with ASTM D 2564 solvent cement.

3. For PE pipe with locking ring to secure polyethylene base over an insert barbed fitting, do not use solvent cement.

4. For PE pipe, insert barbed fittings shall be constructed of molded, ultraviolet-resistant, black colored, plastic having a nominal inside dimension (ID) of .57” and an average thickness of .018”. Each fitting shall have a minimum of two ridges or barbs per outlet. All fittings shall be of one manufacturer and shall be available in one of the following end configurations:

   a. Barbed insert fittings.
   b. Male pipe threads (MPT) with barbed insert fittings.
   c. Female pipe threads (FPT) with barbed insert fittings.

5. For galvanized steel pipe, ANSI B16.3 galvanized malleable-iron screwed fittings.

E. Risers: Rigid polyvinyl chloride (PVC) Schedule 80 plastic pipe; Type 1, Grade 1 compound per ASTM D-1784; grey pigment color, NSF approved; nominal pipe threads, physical dimensions; tolerances and markings per ASTM D-1785.

F. Pipe Sleeves: All crossings under paved areas for irrigation water lines shall be Schedule 40
PVC pipe conforming to ASTM D 1785.

G. Flexible Pipe: Flexible pipe for sprinklers in lawn shall be flexible thick-walled PE pipe or approved equal.

H. Valves: Manufacturer's standard, type and size indicated, and as follows:

I. Manual Circuit and By-Pass Valves: Cast plastic ball valves with female threaded ends.

J. Check Valves:

1. Provide in-line or in-head sprinkler check valves for individual heads which could allow circuit drainage due to low-spot location.

K. Valve Box and Cover: Molded thermoplastic, 6-1/2" deep x 16" length x 10-1/4" inside dimensions or of size required to adequately enclose system components below grade, with evergreen color locking cover, marked "Control Valve", equal to Ametek Model No. VB-12 or approved equal.

L. Valve Pit and Cover: Molded thermoplastic 10" deep x 8" inside diameter with evergreen color cover, equal to Ametek Model No. VP-10 or approved equal.

M. Drainage Backfill: Cleaned gravel or crushed stone, graded from 1" diameter maximum to 1/4" diameter minimum.

N. Sprinkler Heads: Manufacturer’s standard unit designed to provide uniform coverage over entire area of spray shown on drawings at available water pressure, as follows:

1. Pop-Up Spray: Fixed and variable arc pattern nozzle, with and without screw-type flow adjustment and stainless steel retraction spring.

2. Pop-Up Rotary Spray: Gear drive, full circle and adjustable part circle type.

3. Shrub Adapter: Fixed and variable arc pattern nozzle, with and without screw-type flow adjustment.


5. Flood Bubbler: Fixed pattern nozzle, with screw-type flow adjustment.

O. Stainless Steel Clamps: Tubing clamps shall be constructed of 304 AISI stainless steel and shall be one “ear” type. This “ear” shall be capable of being pinched with a pinching tool to secure the tubing around barbed insert fitting. Interior clamp wall shall be smooth to prevent crimping or pinching of tubing. Wall thickness of clamps shall be 0.0236” with an overall band width of 1/4”. Properly secured clamps shall be capable of withstanding a maximum operating pressure of 441 psi.

P. Rain Sensor: Adjustable sensing device for rainfall events between 1/8” and 1” utilizing hygroscopic discs to activate a switch which interrupts circuit to solenoid valves via the common ground wire. Housing shall be constructed of ultraviolet stabilized engineering thermoplastic. Mounting bracket shall be aluminum two-piece, adjustable. Switch shall be U.L. listed, 10.1 amps, 1/4 H.P. at 125/250 VAC. Five (5) year warranty required.

Q. Drip Irrigation:

R. Tree Watering Bags:
PART 3 - EXECUTION

SYSTEM DESIGN

3.1 SYSTEM CAPACITY AND DESIGN PRESSURE

A. System shall provide a volume of suitable water at the pressure necessary to operate the irrigation zones, as produced by the existing and/or new well-source irrigation water supply system and at last head in largest circuit. New irrigation zones sizing may need to be adjusted due to a lack of information concerning the existing well’s capability.

B. Location of Spray Heads: Design location is approximate. Piping shown on plans is diagrammatically routed for clarity. Make approved minor adjustments as necessary to avoid plantings and other obstructions. Layout may be modified, if necessary to obtain coverage, to suit manufacturer’s standard heads. Do not decrease number of heads indicated unless reduction approved by the Landscape Architect and the OR.

C. Minimum Water Coverage:

1. Turf areas, 100%
2. Other planting areas, 85%

D. Contractor shall be responsible for verification at the site of all conditions and dimensions shown on the plans prior to commencement of work.

3.2 TRENCHING AND BACKFILLING

A. General: Excavate straight and true with bottom uniformly sloped to low points. Protect existing lawns and plantings where indicated. Remove and replant as necessary to complete installation. Replace damaged lawn areas and plants with new to match existing.

B. Trench Depth: Excavate trenches of sufficient depth to provide the minimum cover from finish grade, unless otherwise indicated.

C. Minimum Cover: Provide following minimum cover over top of installed piping:

1. PVC main line piping, 16”.
2. Lateral lines to sprinkler heads, 12”.
3. PVC pipe sleeves, 16”.
4. Emitter tubing, 4” minimum and 6” maximum.

D. Backfill: Backfill with clean material from excavation. Remove organic material as well as rocks and debris larger than 1” diameter. Place acceptable backfill material in 6” lifts, compact each lift. After placement of piping, connection to rigid PVC supply, initial system flushing and installation of the line, backfilling can begin. Fill remainder of trenches and/or in the case of over-excavation, place shovels of soil on piping to hold lines in place as indicated on the plans. Bring soil up top finish grade and remove any rocks larger than 1” during final grading and contouring. Compact backfill by hand to a minimum of 90% relative compaction. Maintain adequate soil moisture levels as needed to achieve the required compaction requirement.

E. Pavements: Schedule 40 PVC sleeves for PVC pipe shall be placed where indicated or where needed prior to new asphalt or concrete pavement placement. Coordinate with paving
contractor. Where existing or new pavements must be cut to install irrigation system, cut smoothly to straight line 6" wider than trench.

1. Excavate trench to required depth and width.
2. Remove cutout pavement and excavated material from site.
3. At walkways, jack piping under paving material, if possible.
4. Backfill with dry sand fill material, placing in 6-inch lifts. See Civil specifications for backfill and compaction requirements for soils under pavements.
5. Repair or replace pavement cuts with equivalent materials and finishes.

3.3 INSTALLATION

A. General: Unless otherwise indicated, comply with requirements of Uniform Plumbing Code and applicable local and state codes.

B. Connection of controllers to 120 Volt AC electrical supply and provision of necessary electrical equipment and equipment noted herein, is the responsibility of the Contractor per applicable Division 16 Sections.

C. Electric Solenoid-Operated Plastic Valve: Provide union on downstream side.

D. Piping: Lay pipe on solid sub-base, uniformly sloped without humps or depressions. Install PVC and PE pipe in dry weather when temperature is above 40 degrees Fahrenheit (4 degrees Centigrade) in strict accordance with manufacturer's instructions. Allow joints to cure at least 24 hours at temperature above 40 degrees Fahrenheit (4 degrees Centigrade) before testing, unless otherwise recommended by piping manufacturer.

E. Sprinkler Heads: Flush circuit lines with full head of water and install heads after hydrostatic test is completed.

1. Install lawn sprinklers at manufacturer's recommended heights or as specified on the drawings or herein.
2. Install shrubbery heads at heights indicated on the drawings or as required herein.
3. Locate part-circle heads to maintain a minimum distance of 4" from walls and 2" from other boundaries, or built objects, such as walks, curbs or drives unless otherwise indicated.
4. Install drip emitter tubing per manufacturer standards.

F. Barbed Fittings: Connect flexible tubing to barbed fittings by pushing on and over both barbs all the way until the tubing has seated against another piece of tubing or has butted against another portion of the barbed fitting. For water pressures in excess of the 45 psi maximum, use stainless steel clamps.

G. Pipe Clamping: When operating pressure exceeds 45 psi, stainless steel pipe clamps shall be used. Slip clamps over tubing before slipping tubing over insert of barbed fitting. Place clamp between the first and second ridge of the barbed fitting and crimp the “ear” of the clamp tightly. Crimp the “ear” twice to ensure proper seating.

3.4 TESTING

A. General: Notify Landscape Architect and OR in writing when testing will be conducted. Conduct tests in presence of the Landscape Architect and the OR.

B. Hydrostatic Test: Test all valves and water piping to a hydrostatic pressure of not less than 100 pounds per square inch before backfilling trenches. Piping may be tested in sections to
expedite work. Remove and repair piping, connections and valves that do not pass hydrostatic testing.

C. Controller Charts: Upon completion of “As-Built” drawings, prepare controller chart. Indicate in the chart each zone area of coverage and valve location. This chart shall be reduced to a size that will fit within the utility basket or a pocket within the pump enclosure, or shall be posted adjacent to the controller on the enclosure wall. The reduction shall be a black and white copy that is hermetically sealed between two 20-mil pieces of clear heat-sealed plastic.

D. Operational Testing: Perform operational testing after hydrostatic testing is completed, backfill is in place and sprinkler heads adjusted to final position.

E. Demonstrate to Landscape Architect and the OR that system meets coverage requirements and that automatic control (controllers and solenoid valves) functions properly. Coverage requirements are based on operation of one circuit at a time.

F. After completion of grading, planting, seeding or sodding, mulching and rolling of grass areas, carefully adjust lawn sprinkler heads so they will be flush with or not more than 1/2" above finish grade or elevation indicated.

3.5 WARRANTIES AND GUARANTEES

A. The new irrigation system components shall be guaranteed against defective materials for a period equal to the manufacturer’s warranties for materials, but warranty period for materials and defective workmanship shall be ONE (1) year from the date of Final Completion.

3.6 FINAL ACCEPTANCE

A. Prior to Final Acceptance of the irrigation system, the following documents shall be submitted and approved:

1. Final walk-through and correction of any Punch List items.
2. Completion of and acceptance of “As-Built” drawings.
3. Acceptance of zone charts and placement in the controller enclosure.
4. Turn over any required spare parts and maintenance or adjustment tools, keys, and other submittals as required or previously noted.
5. Permits.
6. Warranties and guarantees in written format.

END OF SECTION 02810