



DESIGN & CONSTRUCTION GUIDELINES

DIVISION 32 EXTERIOR IMPROVEMENTS

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SECTION 32 01 90.33 TREE PRESERVATION AND REPLACEMENT REQUIREMENT**1.1 General:**

Healthy trees shall be preserved as much as possible during design and construction phases. If the tree is less than 8-inch in diameter, transplant the tree to avoid removal. Consult USF Landscape Architect (USF-LA) for designated location.

1.2 USF Tree Protection Requirement:**A. Develop a tree protection plan:**

1. Answer the questions to decide if the tree is savable or not: Is the tree a desirable species? Is the tree healthy? Will it provide shade where desired? Remaining life expectancy? If the tree is left growing in a small space, will it survive? Will it be the desirable size when it reaches maturity? Will it have enough growing space to develop a full canopy and root zone?
2. Study how the tree is going to be affected during the construction.

B. Protection During Construction:

3. Avoid any possible compaction activity within dripline.
 - a. Prohibit placement of any heavy objects inside dripline.
 - b. Prohibit any vehicular/machinery traffic inside dripline.
 - c. Prohibit any placement or accumulation of material toxic to trees: including but not limited to lime rock, concrete waste, cement truck wash and paint wash.
4. Provide rigid Barricade at the dripline.
5. Provide high visibility screening (E.G.: Mesh barrier/safety fencing. Fluorescent yellow - green color is preferred).
6. If the tree is in low spot, install silt fence around to minimal silt buildup.
7. Avoid prolonged direct exposure to engine exhaust (prolonged stationary heavy equipment or vehicles, stationary diesel generator, etc.)
8. Plan crane activities out of tree canopy areas.
9. If trees are wounded during construction. Clean the wound area to be have a smooth edge. Remove the loose bark. Inform USF Landscape Architect the damage ASAP.
10. Trenching:
 - a. Consult USF Landscape Architect for any trenching approval.
 - b. For any trenching that cannot be avoided within dripline, root pruning at least 2 weeks before construction starts was required. Hire an International Society of Arboriculture (ISA) certified arborist.
 - c. Provide temporary drip irrigation during feeder root development (i.e. after root pruning was finished).
 - d. Weed all groundcover and grasses within the dripline to reduce competition. Cover with 2 - 4 inches of mulch.
 - e. Minimize exposure of roots to air; Stage work to backfill the exposed roots at the earliest.
11. Tree Trimming:
 - a. Consult USF Landscape Architect for any trimming approval.
 - b. Hire an International Society of Arboriculture (ISA) certified arborist for trimming work.
 - c. All trimming shall comply with Best Tree Care Practices: ANSI A300
 - d. Cut even and clean just beyond the branch collar of the branch to be trimmed.
 - e. Trim to create a natural look, reduce volume of moss.

1.3 USF Tree Transplanting Requirement:**A. Before Transplanting:**

1. Hire an International Society of Arboriculture (ISA) certified arborist.
2. Trim the tree per arborist's direction.
3. Initial root pruning to develop feeder roots. State root pruning in 1/4 segments of the root ball phased in 2-week increments to minimize shock and promote feeder root development. Fertilize and water at each root pruning. Plan for 8 weeks to root prune and develop feeder roots prior to transplanting.

4. Hydrate tree with a water wand the day before the move. Jet the tree with 50-100 gallons of water.
5. Refer to the table below for the minimal root ball size to be preserved for transplanting.

Small Trees (Ball & Burlap)

Tree caliper	Minimal root ball diameter	Minimal root ball weight
2-2.5 inch caliper	32 inch	800 lb
3-3.5 inch caliper	40 - 44 inch	1200 lb

Spaded Trees

Tree caliper	Minimal root ball diameter	Minimal root ball weight
2-2.5 inch caliper	32 inch	800 lb
3-3.5 inch caliper	40 - 44 inch	1200 lb

6. Hydrate and dig the receiving hole(s) and remove the dirt. Use the same tree spade to dig the receiving hole as is used to harvest the tree. This is to ensure the holes are nearly the same size.
 7. Dig, tie, shape and root prune the tree before transport. Install in new location under the supervising of the arborist. Root ball shall be slightly higher than the surrounding ground.
- B. After Transplanting:
1. Drench the tree with water for 3-7 days to dissolve any air gaps between the receiving hole and root ball to eliminate all the air gaps.
 2. Because transplanting causes loss of 80-95% of feeder roots, give the tree the best chance to rebound from transplant shock by promptly doing the following:
 - a. Roto-till a “donut” area from margin of root ball to the extremis of the tree canopy to a depth of at least 8 inches.
 - b. Distribute at least 20 – 40 pounds of biochar over both tree root ball and the donut area you have rototilled.
 - c. Stabilize the tree with earth screws and rope and garden hose.
 - d. Apply 5-10 gallons of root stimulator or composted seaweed (freshwater macro algae) to the donut area.
 - e. Give the tree its best chance to rebound quickly with plenty of loose aerated, mulched, moist soil around the root ball for enhance new roots growth.
 - f. Mulch the donut area with organic mulch such as wood chips, or bark mulch. Do not use stones. The mulch should not exceed 8 inches.
 3. Water the tree for at least three years weekly. With climate change frequent spring and fall watering has become essential.
 4. Misting the canopy of deciduous trees on hot summer days is very desirable.
 5. Remove the tree stabilizers in the fall when leaves are off the new tree.
 6. No fertilize for the first year.

1.4 USF Tree Replacement Requirement:

- A. Any trees removed from a site that are 6 – 24 inches in diameter will be replaced with equivalent total diameter of trees, 4 – 6 inches diameter, staked and irrigated. Palms are not considered as suitable tree replacement.
 1. Example: Removal of 3 (three) trees 12 inches in diameter each would require replacement of 36 inches. Could be with 9 (nine) trees that are 4 inches in diameter or 6 (six) trees that are 6 inches in diameter.
- B. Trees over 24 inches in diameter will be replaced with 1.5 (one point five) times the diameter, 4 – 6 inches in diameter, staked and irrigated.
 1. Example: Removal of a 28 inches diameter tree would require replacement of 42 inches.
 2. Example: Could be 11 (eleven) trees that are 4 inches in diameter or 7 (seven) trees that are 6 inches.
- C. Replacement trees to be Florida Grade #1 or Florida Fancy Live Oak with a center leader, unless approved otherwise by USF Landscape Architect.
- D. Location can be on site or elsewhere on campus where needed and consistent with the latest

Campus Master Plan.

- E. Consult with USF Landscape Architect to locate trees or bank for future consideration.

END OF SECTION 32 01 90.33

SECTION 32 16 00 PAVEMENTS**1.1 WALKS AND RAMPS**

- A. Walks and ramps are normally to be constructed of concrete pavement. Walks, restricted to pedestrian use only, may be a minimum of 10 feet wide for high use and 6 feet wide for low use and a minimum of 4 inches thick. Sidewalks 8 feet or greater must meet the specifications in [Section 32 16 00 Paragraph 1.1.B, Walks and Ramps](#), or as approved by the Owner. Fibermesh reinforcement shall not be used as a substitute for welded wire fabric. Concrete shall be of Class C, air entrained, and shall achieve a minimum compressive strength of 3,000 psi in 28 days. Reference is made to [Section 31 05 00, Paragraph 1.1, Site Grading](#).
- B. In addition to pedestrian use, where walks are likely to be subjected to bicycle, cart or service vehicle use, the walks shall be a minimum of 10 feet wide and 6 inches thick. Welded wire fabric shall be included. Fibermesh reinforcement shall not be used as a substitute for welded wire fabric. Concrete used shall be the same as that for pedestrian use, except that the minimum compressive strength shall be 4,000 psi in twenty-eight (28) days. The Architect/Engineer (A/E) is to also stipulate in the specifications that all concrete walks are to be kept protected and covered from the effects of rain and vandalism until set hard. Any damage is subject to being replaced at the contractor's expense.
- C. Use of fly ash in concrete require USF-FM approval. A/E to coordinate the USF-FM review with the USF Sustainability Manager when fly ash is considered as admixtures in reinforced concrete work in pursuit of Leadership in Energy and Environmental Design (LEED) credit.
- D. Where walks are to be featured as part of the building entry or patio areas, paver units such as brick masonry or interlocking pavers can be considered in lieu of concrete. The A/E is to get specific approval for use of this architectural alternative material. If used, the specifications and drawings are to include specific directives and details for the proper preparation and placement of the bedding material and paver.
- E. Finishes and Joints: All concrete walks are to receive a medium-heavy broom finish. Joints are to be spaced at equal distance intervals equal to the width of the walk such that square segments are formed. Joints that are considered to be contraction joints can be sawed or tooled. Expansion joints shall be tooled, separated with 1/2 inch asphalt impregnated fiberboard, sealed at the top with an elastomeric sealant, and spaced at the joint interval closest to 50 feet spacing. Joints are to be accurately depicted on the drawings. Where replacement work or new work joins old, make connection at the next full joint in the existing walk. Where walk or ramp surfaces are highlighted for traffic-warning purposes, use "traffic yellow" silicone acrylic concrete stain, as manufactured by H&C Concrete; do not use paint.

1.2 VEHICLE USE AREAS

- A. Design: Roadways, parking lots and service drives are to be designed in accordance with the applicable guidelines and standards:
1. Florida Department of Transportation (FDOT) Manual of Uniform Minimum Standards for Design, Construction and Maintenance of Streets and Highways.
 2. Federal Highway Administration, Manual on Uniform Traffic Control Devices (MUTCD).
 3. American Association of State Highway and Transportation Officials (AASHTO) Guidelines.
 4. FDOT Standard Specifications for Road and Bridge Construction, latest edition.
 5. FDOT Roadway and Traffic Design Standards (Standard Indexes)
- B. Materials.
1. General: Except for loading docks, ramps, and aprons which are to be constructed of concrete as outlined in [Section 32 16 00, Paragraph 1.1, Walks and Ramps](#), roads, parking, and service drives are to be constructed of bituminous flexible pavement.
 2. Subgrade: Subgrade stabilization is to be provided for all flexible pavement areas. Stabilize subgrades in accordance with FDOT methods A or B. Depth shall be 8 inches minimum in parking lots and 12 inches minimum under roads and service drives. The Limerock-Bearing Ratio (LBR) is to be at least 40.
 3. Base Materials: In high, well drained soils not influenced by the water table, bases are to be constructed of either crushed concrete, soil cement or lime rock from an FDOT

approved quarry. In other damp soil areas or regions subject to high fluctuations in the water table, the base material shall be either crushed concrete or soil cement. The bearing value (LBR) shall be 100 except for soil cement which shall be designed to have a compressive strength of 300 psi minimum for parking areas and 500 psi minimum for roads and service drives. Base thickness shall be 6 inches minimum in parking areas and 8 inches for roads and service drives.

4. Structural Course: Specify SP-12.5 Structural Course per FDOT Standard Specifications for Road and Bridge Construction, latest edition in roads and service drives where uniform placement can be provided by machine. Compacted thickness shall be 1-1/2 inches minimum for parking areas and 2 inches minimum for roads and service drives.
5. Friction Course: Specify Type SP-9.5 Friction Course asphaltic concrete in roads compacted thickness shall be 1 inch minimum.
6. Curbs and Gutters: All asphaltic paving is to be contained by a curbing system. Unless matching existing, specify Type E for medians, Type F for low side pavement edges, and Type D where drainage is away from the curb. Where it is preferable to not have a curb back, border the edge of flexible pavements with a flush ribbon curb, or where drainage needs routing use drop or shoulder gutter curb.

1.3 CONSTRUCTION

- A. Methods: Construction processes for roads and parking lots are to be in strict conformity with FDOT Standard Specifications for Road and Bridge Construction, latest edition. Any deviations will only be considered in advance on a specific case-by-case basis.
- B. Quality Control: An independent testing laboratory is to be employed to perform quality control testing to ensure that the roadways and parking lot materials and material placement are in compliance with the plans and specifications. The A/E is to procure this testing service as provided for under [Sections 31 60 00, Foundation and 32 16 00, Pavements](#).

1.4 PARKING LANDSCAPED ISLANDS

- A. A minimal 10' landscape buffer shall be provided at the perimeter of the parking lot. Trees and planting shall be planted with irrigation in the landscape buffer. Tree amount and spacing shall be determined by tree type. Consult USF Landscape Architect and [Section 32 90 00, Landscaping](#) for tree types.
 1. Landscape islands shall be provided at both ends of a parking aisle. Landscaped island shall be provided at no more than 15 parking spaces intervals. Landscape island shall be at minimum, parking space in size.
 2. One tree along with other planting materials or sod shall be planted in the island. Consult USF Landscape Architect and [Section 32 90 00, Landscaping](#) for tree types; irrigation shall be provided in accordance with [Section 32 80 00, Irrigation](#).

END OF SECTION 32 16 00

SECTION 32 80 00 IRRIGATION SYSTEM**PART 1 – GENERAL****1.1 General Provisions**

- A. General - SYSTEM WILL BE ON RAW WATER.
- B. DESCRIPTION OF WORK:
 - 1. Extent of underground irrigation system is shown on drawings.

1.2 QUALITY ASSURANCE:

- A. Manufacturer Qualification: Provide underground irrigation system as a complete unit produced by acceptable manufacturer, including heads, valves, controls, and accessories.

1.3 WARRANTY AND GUARANTEE:

- A. The Contractor shall furnish a certificate of warranty registration and written guarantee of work and materials and a one-year period from the date of final acceptance of the Site Irrigation System by the Owner or his representative.

1.4 SUBMITTAL:

- A. Product Data: Submit manufacturer's technical data and installation instructions for underground sprinkler system. Include catalogue cuts of controller, valves, sprinkler heads, and valve boxes.
- B. Record Drawing: After completion of piping installation, the irrigation contractor shall furnish the Owner's representative a record drawing showing all sprinkler heads, valves, and the zone numbers with GPM, manual drains and pipelines to reasonable scale, and provide a minimum of two dimensions taken from fixed, obvious objects to each automatic and manual control valve will be presented to the Owner's representative at the time of walk-through for acceptance and testing for proper operation.
- C. Instruction sheets and parts lists covering all operating equipment will be bound into a folder as an Operations and Maintenance Manual, and furnished to the Owner or his representative in two (2) copies.
- D. The valve boxes will have a number on each valve to match the number, which is in the controller which should also match the record drawing.

PART 2 – PRODUCTS**2.1 ACCEPTABLE MANUFACTURERS:**

- A. Manufacturer: Subject to compliance with requirements, provide products with one of the following:
 - 1. Rain Bird Sprinkler Manufacturing Company for controllers, rain sensors, control valves, spray heads, bubblers, and drip lines and fittings.
 - 2. Hunter Industries for turf rotors, and battery nodes for control valve.
 - 3. Carson or Rain Bird for irrigation valve and electrical joint boxes.

2.2 MATERIAL

- A. Pressure Pipe: All irrigation pipes are to be schedule 40.
- B. Swing Joint: K-Flex pipe and street elbows.
- C. Pipe Fittings: (American Society for Testing and Materials) ASTM D 2466 socket fittings with ASTM D 2564 solvent cement.
- D. Valves: Manufacturer's standard, of type and size indicated, and as follows:
 - 1. Automatic Circuit Valves: Glove valves operated by low-power solenoid, normally closed, manual flow adjustment.
 - 2. Mechanical isolation Valves: Gate valve and ball valve.
- E. 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: with screw-type flow adjustment and stainless steel retraction spring. 1800 series plastic nozzles shall be used.
 - 2. Hunter PGP-04 Ultra Rotors in large turf areas.
 - 3. Pop-Up Rotary Spray: Gear drive.

4. Bubblers: 1400 series bubblers with flow rate applicable to species and caliper of tree, point source flooding emitter, on flexible pipe.
5. Dripline: 0.9 GPH, 12 in. spacing.
- F. Valve Box: 7-inches Round boxes, 10-inches Round Vb Green boxes, 12 H x 21 L x 15 W inches Rect Vb Green Boxes.
- G. Controllers to be Rain Bird ESP-LXME with IQ System Cartridge.
- H. Electrical Piping: Schedule 20 purple pipe of reclaimed water pipe. Junction boxes for all electrical connections.
- I. Electrical wire: 18/12 irrigation wire with a separate 14 AWG ground wire. Wire connectors to be weatherproof wire connectors when two or more wires connect.
- J. Rain Bird wireless rain sensors are required.

PART 3 – EXECUTION

3.1 SYSTEM DESIGN:

- A. Design Pressures: As indicated on drawings, at connection to raw water system and/or in irrigation legend.
- B. Location of Heads: Design location is approximate. Make minor adjustments as necessary to avoid plantings and other obstructions.
- C. Minimum Water Coverage: Layout as necessary to obtain full head to head coverage. Do not decrease number of heads indicated unless otherwise acceptable to Owner.

3.2 TRENCHING AND BACKFILLING

- A. General: Excavate straight and true with bottom uniformly sloped to low points.
- B. Underground Utilities: All underground utilities are to be located and marked before trenching.
- C. Minimum Cover: Provide 18 inches minimum cover over top of main and 12 inches cover over the lateral piping.
- D. Backfill: Backfill with clean material from excavation. Remove organic material as well as rocks and debris larger than 1 inch diameter. Place acceptable backfill material in 6 inches lifts, compacting each lift.
- E. At Walkways: Jack piping under paving material as necessary.

3.3 INSTALLATION

- A. General: Unless otherwise indicated, comply with requirements of Florida Building Code.
- B. Connection to Main: point of connection needs to be approved by Owner. Mechanical isolation valve at point of connection to main.
- C. Valves: Install in valve box, arranged for each adjustment and removal. A mechanical isolation valve must be in front of each automatic valve. Ball valve is for up to 2-inch pipe. Gate valve is for pipe over 2-inch.
- D. Wiring: Maintain a color coded wire, white for ground wire. Install at least two extra wires for future use.
- E. Connections: Use recommended weatherproof type wire connections.
- F. Piping: Lay pipe on solid subbase, uniformly sloped without humps or depressions.
 1. Install PVC pipe in dry weather when temperature is above 40 degrees F (4 degrees C) in strict accordance with manufacturer's instructions using purple primer on all pipes and fittings.
 2. Allow joints to cure at least 24 hours at temperature above 40 degrees F (4 degrees C) before testing, unless otherwise recommended by the manufacturer.
- G. Sprinkler Heads: Flush circuit lines with full head of water and install after hydrostatic test is completed.
 1. Heads for turf shall be installed at grade unless approved by Owner.
 2. Locate all heads to maintain a minimum distance of 4 inches from walls and 4 inches from other boundaries, unless otherwise indicated.
 3. Heads for planting area shall be installed at the grade that when system functions, no coverage is blocked by planting. Otherwise use riser.
 4. Heads on risers: exposed risers to be painted black.
 5. Bubblers and drip shall be on its own zone separate from sprays or rotors.
 6. Drip line shall be installed that at least one emitter per plant and the emitter is no more than

3 inches outside of root ball edge. No shared emitter between plants. Drip line shall be installed with U-bend stakes at every 10 feet and the location when direction changes.

3.5 TESTING

- A. General: Notify owner or his representative in writing when testing will be conducted. Conduct tests in their presence.
- B. Hydrostatic Test: Test water piping and valves before backfilling trenches to a hydrostatic pressure of not less than 150 psi. Piping may be tested in sections to expedite work. Remove and repair piping, connections, valves that do not pass hydrostatic testing. Test pressure must be held for a minimum of 2 hours.
- C. Operational Testing: Perform operational testing after backfill and sod is in place, and sprinkler heads are adjusted to their final position.
 - 1. Demonstrate to Owner or his representative that system meets coverage requirements and automatic control function properly. Provide drawing to assist in demonstration.
 - 2. Head to head coverage requirements are based on operation of one circuit at a time and the GPM of the valve system to maintain recommended 5 feet/second. Maintain head to head coverage.
- D. Upon completion of grading, sodding, and rolling of sod areas, carefully adjust lawn sprinkler heads so they will be flush with or not more than 1/2 inch above finish grade.

3.6 WARRANTY

- A. All Materials and labor shall carry a one-year warranty.

END OF SECTION 32 80 00

SECTION 32 90 00 LANDSCAPING**1.1 GENERAL PROVISIONS**

A. Work Included:

1. LANDSCAPING

- a. Describe work to be done usually stated to include all labor, materials, services, equipment, and facilities required to complete work indicated on the Drawings and written Specifications, including maintenance and guarantee. Generally show work items in list form.
- b. Pre-Construction Meeting: Owner, contractor and subcontractor shall have a meeting on site before any construction starts.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Drawings such as demolition and preservation, site plan, site utilities, grading, irrigation, and general provisions of the Contract, including General and Supplemental Conditions and [Division 1 General requirements](#), apply to this section.

1.3 SUBMITTALS

A. Submit applicable information such as:

1. Fertilizer labels and application rates.
2. Herbicide labels and application rates.
3. Soil amendment labels.
4. Top Soil
5. Potting mix labels
6. Mulch materials.
7. Verification of all plant materials sources. Preferred sources of sod and plants are within 150-mile radius of project site.
8. All other decorative materials, such as gravels.

1.4 COORDINATION

- A. Coordinate all landscaping work with Owner.
- B. Landscape installer is required to coordinate landscaping with other applicable contractors, such as irrigation contractor.

1.5 SUBSTITUTIONS

- A. No substitution unless approved by Owner.

1.6 QUALIFICATIONS

- A. All landscape work shall be undertaken by a licensed and experienced landscape contractor.
- B. The landscape contractor shall provide a minimum of three references to Owner that indicate the installer's abilities and a minimum of three (3) years of experience in the installation and successful completion of commercial landscapes. The Owner shall have permission to contact the references listed on the submitted documents to verify the claims stated therein. If the installer is not qualified, as determined by the Owner's review and verification of the supplied documents, the Owner shall have the right to terminate the Contract.

1.7 INSPECTIONS OF TREES AND PLANT MATERIAL

- A. All trees need to be tagged by Owner or Owner's representative. The Landscape contractor shall inform the Owner at least three weeks before proposed date to nursery or growing site. Require and establish procedure for the accomplishment of approval of pre-tagged or pre-selected material at nursery or growing site.
- B. All planting need to be approved by Owner or Owner's representative before planted. Inform Owner or Owner's representative at least a day before to set up the on-site inspection schedule.

1.8 TOPSOIL

- A. If existing soil is compacted and/or contains more than 10 percentage of foreign objects,

- remove existing soil and provide new top soil for planting.
- B. Flower pots/containers shall be filled with Miracle-Gro potting mix for any new planting.

1.9 GRADES AND STANDARDS OF PLANT MATERIAL

- A. All plant materials are subject to rules and regulations of "Florida Grades and Standards for Nursery Plants" as published by the Division of Plant Industry, Florida Department of Agriculture and Consumer Services.
- B. All plant materials shall be Florida No.1 or better as graded by most current version of "Florida Grades and Standards for Nursery Plants".
- C. Plant materials shall be free of insects and diseases.
- D. Sod shall be well matted with enough roots. Weeds or other grasses shall be no more than 15% in the sod material. Sod shall be sufficiently thick to secure a dense stand of live grass. Sod shall be live fresh and uninjured at the time of planting.

1.10 WARRANTY

- A. All planting materials shall carry a one-year warranty.

1.11 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery all planting materials on the same day of scheduled planting. Storage them under the shade and provide enough water to minimize stress.
- B. All planting materials shall be handled in a manner to prevent breaking or other damage. Care shall be given to keep native soils on planting material' roots as much as possible.
- C. Trees:
 - 1. Trees shall be protected from excessive vibration, avoiding being thrown or bounced off mobile equipment to the ground. Trees shall not be dragged, lifted, or pulled by the trunk or foliage parts in a manner that will loosen the roots in the ball. To avoid damage when setting the tree in the hole, lift the tree with straps or rope around the root ball, not the trunk. For trees grown in large container, carefully cut the container, and peel the container off the root ball.
- D. Palms:
 - 1. Palm leaves shall be tied together to prevent leaf damage and to facilitate handling. Palms with slender trunks should have splints attached to the trunks and leaf bundles to prevent the palms from snapping during handling. Use of splints is also recommended for palm species with large, heavy crowns, but soft wood, such as Phoenix canariensis.
 - 2. Palms shall be lifted only by means of nylon slings wrapped around the trunk. Never attach chain, cables, or ropes directly to palm trunks; such practices can result in injury and possibly fatal diseases.
 - 3. Palms should be planted as soon as possible into their final site. However, if palms must be held for some time before they can be planted, they should be "healed-in" in an upright position with the leaf bundles untied until they can be moved to their permanent site. For shorter time periods, simply storing the palms upright and keeping the rootballs moist may be adequate.

1.12 TRANSPORTATION

- A. Cover all planting materials to prevent water loss during the transportation. The cover shall be tightly secured so air moves over the cover and does not penetrate under it. Trees shall be securely tied to truck so they will not roll around.
- B. During transport on truck or trailer, palms should be well supported along their entire length. Unsupported crowns may crack or damage the bud, resulting in reduced survival rates.

1.13 SITE CONDITIONS

- A. Remove all unsuitable soil, such as rubble fill, which would be detrimental to plant growth, would prevent proper drainage conditions, or would cause obstructions to roots.
- B. Coordination of site grades: Plantings coordinated with the schedule for finish grading and sodding operations.
- C. No vehicular access on any new sodding area. Limit vehicular access on any existing lawns. If any damage to existing or new lawns by landscape options, repair the lawn to the condition

acceptable by Owner.

1.14 SOIL AMENDMENTS

- A. Any soil amendments shall be approved by Owner before application.

1.15 HERBICIDES, INSECTICIDES, FUNGICIDES AND OTHER PESTICIDES

- A. Herbicides, Insecticides, fungicides, and other pesticides shall contain no chemicals or ingredients harmful to landscape plants. Before any application, contact Owner for approval.

1.16 MULCH

- A. Enviro-Mulch is to be used in plant beds (except for groundcover beds).
- B. Enviro-mulch can be purchased through Bay Mulch. Phone Number: 352-588-5200.
- C. For Groundcover beds, Mini Pine Bark Nuggets (Fine Pine Mulch) is required. The individual mulch size shall not be more than quarter inch.

1.17 SOD

- A. Argentine Bahia, Emerald Zoysia, St. Augustinegrass are the three varieties used on campus. Sod type shall be the one specified by the project. Confirm with Owner areas to be irrigated versus non-irrigated and select sod species accordingly.

1.18 PLANT MATERIALS

- A. All material shall be true to named genus, species, and variety as established by the American Joint Committee on Horticultural Nomenclature publication "Standard Plant Names" as per the recommendations and requirements of American National Standards Institute (ANSI) Z60.1, "American Standard for Nursery Stock".
- B. Plant species shall be same as specified on drawings. No substitute is allowed unless approved by Owner.

1.19 SITE PREPARATION

- A. Prior to beginning any construction or excavation, all utilities must be located and field marked. Call Florida Sunshine allowing minimum and maximum notification times as required.
- B. Contact Owner for layout approval before any excavation or planting.
- C. Take every precaution to prevent utility disturbance. In the event that existing utilities or trace wires are disturbed by construction activities, proper repair them to like or better condition than before damage occurred.

1.20 PREPARATION OF PLANTING SOIL BACKFILL

- A. Carefully stripe the topsoil before any excavation. Before mixing, clean topsoil of roots, plants, sods, stones, and other extraneous materials harmful to plant growth. Store topsoil on site with protection to be free from debris.
- B. Any unsuitable soil materials as mentioned above and in Section 32 90 00, Paragraph 1.13, Site Conditions shall be disposed out of Owner's property legally.

1.21 SOIL PREPARATION

- A. Prepare soil so after planting, the finish grade is matching existing, or as specified by drawings.

1.22 EXCAVATION FOR TREES AND SHRUBS

- A. Tree planting pits: Dig the planting pit at least three times widest dimension of the root ball. Dig the pit to the depth so that the top of the tree root ball shall be 2-4 inches above surrounding finished grade. The root ball shall rest on undisturbed soil or recompacted soil.
- B. Shrub planting pits: at least as wide as the plant container. Dig the pit to the depth so that the top of the shrub root ball shall be 1-2 inches above surrounding finished grade.

1.23 PLANTING TREES, PALMS AND SHRUBS

- A. Plants shall be planted in accordance to the landscape plan and details as well as adhering to current recognized horticultural practice. In addition to the planting details, the following practice shall be taken. Circling root shall be cut.

1. Planted trees shall exhibit no circling root condition or evidence of untreated root bound.
2. Prune trees only as directed by owner or owner's representative. All pruning shall be done in accordance with ANSI A300. Pruning shall be done with sharp instruments. No flush cuts are allowed.
3. Remove any synthetic materials from root ball. String, rope, synthetic burlap, plastic, strapping, and other materials that will not decompose in the soil shall be removed at planting. Mixing those materials in the backfill soil is prohibited.
4. When backfilling, avoid any air pocket as much as possible. Never step firmly on the backfill. Water thoroughly immediately to remove any large air pocket.

1.24 PLANTING GROUND COVER

- A. Spacing: Triangular unless shown otherwise on drawings. Equally spaced.
- B. Water thoroughly immediately after planting.

1.25 SODDING

- A. Preparation of ground: Remove existing contents, prepare the bed so that after sodding, the finished grade meeting the existing grade or as specified in the drawings.
- B. Placement and Watering: All sod shall be laid back and rolled to existing sod grades.
 1. Water thoroughly right after sodding.
 2. Water for minimum of 60 days or final acceptance whichever is first.
 3. Contractor's responsibility to maintain the sod until the final acceptance.

1.26 MULCHING

- A. Mulching shall be in accordance to the landscape plan and details.
 1. Mulch ring for individual trees shall be 4 inches in depth. Mulch ring shall be out of root ball edge. No more than 1 inch in depth of mulch shall cover the root ball.
 2. Shrub beds mulching requires minimum 3 inches in depth. Elevation of mulch shall be 1 inch lower than the adjacent walks, curbs and other improvements.
 3. Ground cover beds mulching requires a 1-2 inches in depth. Elevation of mulch shall be 1 inch lower than the adjacent walks, curbs and other improvements.

1.27 LANDSCAPE MAINTENANCE

- A. It is the contractor's responsibility to maintain the landscape until the date of final acceptance.

1.28 INSPECTION AND ACCEPTANCE

- A. Final Acceptance: Please inform Owner at least one week ahead of the anticipated finishing date to schedule the final walk through. During the walk through, Owner will inspect the condition and give any punch list for Contractor to correct. Contractor will correct the punch list items within three weeks after the walk through date unless agreed by Owner. The walk through date will be the final acceptance date.

1.29 PROJECT WARRANTY

- A. One year warrant for all plant materials and labor. Before the one year period ends, Contractor shall contact the Owner to schedule another walk through. Contractor shall replace the plants that not survived in the one year period at Contractor's own expense.

1.30 PROJECT CLEAN UP ADJUSTMENT AND RESTORATION

- A. Maintenance and care of all existing plant material inside construction area is the responsibility of the Contractor. Existing plant material not properly maintained will need to be replaced with like materials at Contractor's expense.
- B. All existing plant materials outside of the construction fence, but impacted by the project, shall require replacement or repair to like or better condition than before damage occurred, at Contractor's expense.

END OF SECTION 32 90 00