SECTION 32 11 16
STABILIZED SUBGRADE

1. GENERAL

1.1 Stabilization of the roadway subgrade shall be in accordance with Section 160 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition.

2. REQUIREMENTS

2.1 The work specified in this section consists of the preparation of the firm and unyielding subgrade having the required bearing value specified in the Contract Drawings and Specifications. It is intended that the desired bearing value be obtained regardless of the quality of the existing soil or materials available on the site.

2.2 All roadway subgrade construction in excess of 400 feet in length shall be tested for L.B.R. value.

END OF SECTION 32 11 16

SECTION 32 11 23
AGGREGATE BASE COURSE

1.0 GENERAL

1.1 The work specified in this section consists of the construction of a base course composed of limerock or crushed stone. It shall be constructed on a prepared subgrade in accordance with Florida Department of Transportation Standard Specifications for Road and Bridge Construction, Latest Edition, Section 911, and in conformity with the lines, grades, notes and typical sections shown in the plans.

2.0 EQUIPMENT AND MATERIALS

The aggregate base material shall meet the requirements of Section 911, Florida Department of transportation Standard Specifications, Latest Edition. The base material shall be spread by mechanical rock spreaders equipped with a device which strikes off the aggregate uniformly to laying thickness.

3.0 TRANSPORTING AGGREGATE BASE

The aggregate shall be transported to the point where it is to be used, over rock previously placed where practical and dumped on the end of the preceding spread. Hauling over the subgrade will be permitted when in the engineer's opinion, the hauling will not damage the base.

4.0 SPREADING AGGREGATE

4.1 Method of Spreading

The aggregate shall be spread uniformly, with equipment as previously specified in this section. All segregated areas of fine or coarse rock shall be removed and replaced with properly graded rock.

4.2 Number of Courses

When the specified compacted thickness of the base is greater than six inches, the base shall be constructed in two courses. The thickness of the first course shall be half the total compacted thickness of the finished base or thick enough to be the weight of construction equipment without disturbing the subgrade.

4.3 Aggregate Base for Shoulder Pavements

Aggregate base for shoulder construction shall be placed before the final course of pavement for the traveled roadway. Any aggregate placed on the surface course of the traveled roadway shall be immediately swept off. The placing of aggregate for shoulder construction shall not damage or scar the surface course of the adjacent roadway for any reason.

5.0 COMPACTING AND FINISHING BASE

5.1 Single-Course Base

For single course base, after spreading is complete the entire surface shall be scarified and shaped so as to produce the required grade and cross section after compaction.

5.2 Double-Course Base

For double-course base, the first course shall be cleaned of foreign materials, and bladed to a cross section approximately parallel to the finished base. Prior to placement of the second course the first course shall be compacted as required by the plans and density tests demonstrating compliance with compaction requirements shall be provided to the engineer. After spreading of aggregate for the second course, the surface shall be finished and shaped so as to produce the required grade and cross section after compaction. The second course shall be free of foreign material.

5.3 Moisture Content

When the material does not have the proper moisture content to ensure the required density, wetting or drying will be required. When water is added, it shall be uniformly mixed-in by disking to the full depth of the course which is being compacted. Wetting or drying operations shall involve manipulation, as a unit, of the entire width and depth of the course which is being compacted.

5.4 Density Requirements

5.4.1 Compaction

As soon as proper moisture conditions are attained, the aggregate shall be compacted to 100% of maximum density as determined by AASHTO T180. Aggregate base for shoulder areas shall be compacted to 98% density. Aggregate for the travel way shall achieve a minimum LBR of 100. Aggregate for shoulder base shall achieve an LBR of 33.

5.4.2 Testing

A minimum of 3 density tests shall be performed on each day's final compaction operation on each course and density tests shall be performed more frequently if deemed necessary by the engineer. During final compaction operators, if blading is needed to obtain the true cross section and true grade, the compacting operators for affected areas shall be completed prior to density testing on the finished base.

5.5 CORRECTION OF DEFECTS.

5.5.1 Contamination of base material:

If, at any time, the subgrade becomes mixed with the aggregate base, the contractor shall, without compensation, remove the mixture, reshape and compact the subgrade, and replace the removed aggregate which shall be reshaped and compacted according to the specifications above.

5.5.2 Cracks and Checks

If cracks or checks appear in the base, either before or after priming, which, in the Engineer's opinion, would damage or impair the structural efficiency of the base, the contractor shall remove the cracks or checks by re-scarifying, reshaping, adding base material where necessary and recompacting.

5.5.3 Compaction of Widening Strips

Where base construction cannot be accomplished with the use of standard compaction equipment, compaction shall be accomplished by use of vibratory compactors, trench rollers or other special equipment which achieves the density requirements.

6.0 TESTING SURFACE

The finished surface of the base course shall be checked with a templet cut to the required crown and with a 15 foot straight edge laid parallel to the centerline of the road. All irregularities greater than 1/4 inch shall be corrected by scarifying and removing or adding aggregate as required, after which the entire area shall be recompacted as specified before. Tests shall not be taken in small holes caused by small pieces of aggregate having been pulled out by the grader.

7.0 PRIMING AND MAINTAINING

The prime coat shall be applied only when the base meets the specified density requirements and the moisture content in the top half of the base does not exceed 90% of the optimum moisture of the base material. At the time of prime coat application. The base shall be firm, unyielding, and in compliance with the specifications so as to achieve the desired grade and cross slope.

The contractor shall assure that the true crown and template are maintained with no rutting or distortions and that the base meets all specification at the time of surface course application.

8.0 THICKNESS REQUIREMENTS

8.1 Measurements

Thickness of the base shall be measured at intervals of not more than 200 feet. Measurements shall be taken at various points on the cross section through holes 3 inches in diameter minimum.

8.2 Correction Areas

Where the compacted base is deficient by more than ½ inches from the thickness called for in the plans, the contractor shall scarify, place additional material 100 feet in each direction, and recompact to the required, thickness, slope, and density as specified.

END OF SECTION 32 11 23

SECTION 32 12 13
PRIME and TACK COATS for BASE COURSES

1. GENERAL

1.1 The application of prime and tack coats shall be in accordance with Section 300 of the Florida Department of Transportation Specifications for Road and Bridge Construction, latest edition.

2. DESCRIPTION

2.1 The work specified in this section consists of the application of bituminous prime coats on previously prepared bases and the application of bituminous tack coats on previously prepared asphalt bases, on existing pavement surfaces and between lifts of an asphaltic base course. All such work shall be accomplished in accordance with these Specifications and in conformity with the lines, dimensions and notes shown in the plans.

3. TACK COATS REQUIRED

3.1 Tack coats will be required on the following surfaces:

3.1.1 Between successive surface courses

3.1.2 Between successive leveling courses

3.1.3 Between the leveling and surface courses

3.1.4 On old pavements to be patched, leveled, or resurfaced.

END OF SECTION 32 12 13

SECTION 32 12 16
ASPHALTIC CONCRETE PAVING

Part 1 GENERAL

1.1 REFERENCES
A. Florida Department of Transportation Standard Specifications Section 330, Latest Edition

1.2 SUBMITTALS
A. Certificates
   (1) Submit certificates of compliance from the supplier for bituminous materials for prime coat, paint binder, bituminous concrete, and seal coat.
   (2) Submit weigh master’s certificates or certified delivery tickets for each truckload of bituminous material delivered to the project site.
   (3) Upon completion of the weed control treatment, and as a condition for final acceptance, furnish a written certificate stating the brand name of the sterilant and the manufacturer, and that the sterilant used had at least the minimum required concentration, and that the rate and method of application complied in every respect with the conditions and standards contained herein.
B. Mix Designs
   (1) Submit mix designs for asphaltic concrete prepared by a materials laboratory under the direct supervision of a Registered Engineer, or a standard mix design proven in actual performance.

1.3 QUALITY ASSURANCE
A. Perform work in accordance with Florida Department of Transportation Standard Specifications Section 330, Latest Edition
B. Obtain materials from same source throughout.

1.4 SITE CONDITIONS
A. Apply asphaltic primer, asphaltic binder, and tack coat only when the ambient temperature is above 50 degrees F and when the temperature has not been below 35 degrees F for 12 hours immediately before application.
B. Do not apply asphaltic materials when the base surface is wet or contains an excess of moisture, which would prevent uniform distribution and the required penetration.
C. Construct asphaltic concrete surface course only when the ambient temperature is above 40 degrees F, when the underlining base is dry and when it is not raining.
D. Existing Conditions Protect concrete walks, curbs and bases, and other improvements adjacent to the operations. Repair damage caused by employees or equipment. Cover building and other surfaces with paper or other protection, where required.
E. Grade Control Establish and maintain required lines and elevations. Joints shall be located at lane lines where possible.
F. Before placing the mixture, clean the surface of the base or underlying pavement of all loose and deleterious material by the use of power brooms or blowers, supplemented by hand brooming where necessary

Part 2 EXECUTION

2.1 INSPECTION

A. Verify compacted sub-grade is dry and ready to support paving and imposed loads. Verify that sub-grade is compacted to 95% of maximum density.
B. Verify gradients and elevations of base are correct.
C. Beginning of installation means acceptance of substrate.
D. Verify gradients and elevations of crushed aggregate bases are correct.
E. Verify aggregate base course is unyielding to heavy loads.
F. Asphalt Mix temperature to be measured by the inspector to ensure placing temperature is not less than required by governing authority.

2.2 PLACEMENT OF ASPHALTIC CONCRETE FINISHED PAVING

A. Remove all loose materials from compacted base.
B. Apply tack coat at the rate of 0.05 to 0.10 gallon per square yard to all existing pavement, curbs, gutters, manholes and the like immediately before asphalt concrete is placed.
C. Adjust frames and covers, if so required, to meet final grades.
D. Spreading Concrete Materials:
    (1) Spread material with a self-propelled mechanical spreading and finishing machine designed specifically for that purpose.
    (2) Spread asphalt concrete to thickness required to achieve the compacted thickness shown on drawings.
    (3) Asphalt mix to remain in delivery truck until such time that equipment for the spreading is ready.
    (4) Where thickness of asphalt concrete paving will be 3 inches or less, spread in one layer.
    (5) Where thickness of asphalt concrete paving will be more than 3 inches, spread in two layers. Surface course shall be a minimum of 1 1/2 inch thick.
E. Rolling:
    (1) After material has been spread to proper depth, roll with a self-propelled compacting roller
    (2) Roll in at least two directions until no roller marks are visible.
    (3) Compact mixture with hot hand tampers or vibrating plate compactors in areas inaccessible to rollers.
    (4) Finished paving smoothness tolerance

END OF SECTION 32 12 16

SECTION 32 13 01
SIDEWALKS and DRIVEWAYS

1. GENERAL

1.1 Except as may otherwise be specified on the plans or herein, construction of concrete sidewalks and driveways shall be in accordance with Section 522 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, current edition, the FDOT Roadway and Traffic Design Standards, latest edition and the notes and details shown in the Contract Drawings.

2. REQUIREMENTS

2.1 The work specified in this section consists of the construction of concrete sidewalk and driveways in accordance with these specifications, and in conformity with the lines, grades and dimensions and notes shown in the plans.

2.2 Sidewalks - Unless otherwise noted in the Contract Drawings, all concrete sidewalk shall be four (4) inches thick.

2.2.1 Unless otherwise shown on the Contract Drawings, foundations for concrete sidewalk shall be graded so the top of the sidewalk is a minimum six (6) inches above grade. Fill material shall be added (as needed) to slope from the top of sidewalk to existing grade. Where the plans call for the removal and/or replacement of sidewalk, the sidewalk grades shall match the previous existing grade, except as may be directed by the Engineer to do otherwise. In no cases shall there be a drop-off in excess of 1" along the edge of sidewalk measured from the top of the sidewalk to the top of sod.

2.2.2 Joints shall be in accordance with Index 310 of the FDOT Roadway and Traffic Design Standards, January 2000 Edition.

2.2.3 Shape and compact the foundation materials to a firm, even surface, true to grade and cross-slope. Compact areas that have been excavated more than 6 inches below the bottom of the concrete, to a minimum of 95% of AASHTO T99 density. The area to be compacted includes the area directly under and 1 foot beyond each side of the sidewalk or driveway, when right-of-way allows.

2.2.4 The Contractor shall make provisions to protect curing concrete including, but not limited to, the covering of concrete with burlap or visqueen and the placement of temporary fencing.

2.2.5 Imprint concrete as detailed in the Plans, otherwise provide a broom finish. Ensure that the surface variations are not more than 1/4 inch under a 10-foot straightedge or more than 1/8 inch on a 5 foot transverse section. Finish the outer edges of the concrete with an edging tool having a radius of 1/2 inch.

2.3 Driveways - Unless otherwise noted on the Contract Drawings, all concrete driveways shall be six (6) inches thick,

2.3.1 Layout and construction of driveway turnouts shall be in accordance with Index 515 of the FDOT Roadway and Traffic Design Standards, January 2000 Edition.

2.3.2 Foundations for concrete driveways shall be graded to meet the adjacent property at the right-of-way line or the proposed grades shown on the contract drawings.

END OF SECTION 32 13 01

SECTION 32 13 13
CEMENT CONCRETE PAVEMENT

1. GENERAL

1.1 All cement concrete pavement shall be in accordance with Section 350 and Section 346 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition, the FDOT Roadway and Traffic Design Standards, current edition, and the notes and details shown on the Contract Drawings.

1.2 Construct Portland cement concrete pavement in one course, on a prepared subgrade. Use either the fixed-form or the slip-form method of construction. When reinforced cement concrete pavement is specified or required, use concrete reinforced with steel bars or welded wire reinforcement, in accordance with details shown in the Plans.

1.3 If any uncontrolled cracks appear during the life of the Contract, remove, and replace the cracked concrete at no expense to the Owner. Investigate and implement immediate effective solutions to eliminate further cracks, in consultation with, and subject to the approval of the Engineer.

1.4 Contractor shall provide the following:

1.4.1 Submit all concrete mix designs to the Engineer for approval prior to commencing any concrete placements.

1.4.2 Follow the requirements of the FDOT Standard Operation Procedures for Quality Control of Concrete.

1.4.3 Notify the Engineer forty-eight (48) hours prior to the placement of concrete.

1.4.4 Provide structural concrete from an FDOT approved source.

2. DESCRIPTION

2.1 The work included under this section consists of furnishing all materials, forms, transportation, and equipment, and performing all necessary labor to do all the plain and reinforced concrete work shown on the Contract Drawings, or incidental to the proper execution of the work.

3. STRENGTH REQUIREMENT

3.1 Unless otherwise specified on the Contract Drawings or herein, all concrete shall have a 28-day minimum compressive strength requirement of 3,000 pounds per square inch.

4. SUBGRADE PREPARATION

4.1 Keep construction of the subgrade completed for a distance of at least 500 feet ahead of the paving operation. Maintain the finished subgrade in a smooth, compact condition, and restore any areas which are disturbed prior to placing the concrete. Do not place concrete on a frozen subgrade.

4.2 Ensure that the subgrade is within two percent of the optimum moisture content while placing the concrete. Uniformly apply water ahead of the paving operations, as directed by the Engineer.

4.3 Do not allow vehicles to travel on the prepared subgrade between the subgrade trimming machine and the paving operations unless specifically authorized.

4.4 Accurately trim the subgrade to the required elevation. Trim high areas to proper elevation. Fill low areas with suitable material, compacted to the specified density, or with concrete placed integrally with the pavement.

5. PLACING CONCRETE

5.1 Distribute the concrete on the subgrade to such depth that, when it is consolidated and finished, the slab thickness required by the Plans will be obtained at all points. The surface will at no point be below the grade specified for the finished surface. Place the concrete on the subgrade in a manner which will require as little rehandling as possible.

5.2 Place concrete as near to expansion and contraction joint assemblies as possible without disturbing them. Ensure that workers do not walk in the freshly placed concrete with their boots or shoes coated with earth or other deleterious substances.

5.3 Place concrete on the subgrade by an approved spreading device. Do not place concrete from the discharge bucket or hopper onto an assembly without centering the bucket or hopper directly over the assembly

5.4 A spreader is not required in areas where the width of slab varies, intersections, and small or isolated areas where it would be impractical to use a spreader. Perform the necessary hand spreading with shovels (not with rakes or hoes).

5.5 Immediately after placing the concrete, strike-off, consolidate, and finish it to produce a finished pavement in accordance with the Specifications. Perform the sequence of operations as follows: strike-off; vibratory consolidation; screeding; floating; removal of laitance; straight edging; and final surface finish. Except as specified, perform strike-off, consolidation, screeding, and floating by the machine method.

5.6 As soon as possible after screeding while the concrete is plastic, correct all flaws such as cavities, blemishes, marks, or scratches that will not be removed by planing.

5.7 Provide a concrete surface true to grade, cross slope, and superelevation, and free of irregularities. If the Engineer permits adding water to assist the finishing operations, apply water as a fog spray by means of approved spray equipment.

END OF SECTION 32 13 13

SECTION 32 16 13
CURB AND GUTTER

1. GENERAL

1.1 Construction of concrete curb and gutter and traffic separator shall be in accordance with Section 520 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, current edition and the FDOT Roadway and Traffic Design Standards, latest edition.

1.2 Concrete shall meet the requirements of Section 347 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, current edition

2. DESCRIPTION

2.1 The work specified in this section consists of portland cement concrete curb. Curb will include concrete curb and gutter, concrete traffic separator, valley gutter, special concrete gutter, curb for sidewalk curb ramps and driveways, and any other types of concrete curb not specified in other Sections. The various items shall be constructed in accordance with these specifications and in conformity with the lines, grades, dimensions, and notes shown in the plans.

2.2 Place the concrete in the forms, and tamp and spade it to prevent honeycombing, and until the top of the structure can be floated smooth and the edges rounded to the radius shown in the Plans.

2.3 Construct expansion joints at all inlets, at all radius points, and at other locations as directed by the Engineer. Locate them at intervals of 500 feet between other expansion joints or ends of a run. Ensure that the joints are 1/2 inch in width.

2.4 Test the gutter section of curb and gutter with a 10 foot straightedge laid parallel to the centerline of the roadway and while the concrete is still plastic. Perform straight edging along the edge of the gutter adjacent to the pavement or along other lines on the gutter cross-section, as directed by the Engineer. Immediately correct irregularities in excess of 1/4 inch.

2.5 After the concrete has set sufficiently, but not later than three days after pouring, refill the spaces in front and back of the curb to the required elevation with suitable material. Place and thoroughly compact the material in layers not thicker than 6 inches.

END OF SECTION 32 16 13

SECTION 32 17 23
THERMOPLASTIC TRAFFIC STRIPES AND MARKINGS

1. GENERAL

1.1 The work under this Section consists of placing traffic stripes and markings in accordance with Section 711 of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, 2004 Edition with Supplemental Specifications and Department of Transportation Roadway and Traffic Design Standards, January 2004 Edition.

1.2 Thermoplastic compound shall be extended or sprayed on to the pavement surface in a molten state by mechanical means with surface application of glass spheres and shall produce after cooling, an adherent pavement marking of specified thickness and width capable of resisting deformation.

1.3 The thermoplastic compound shall be white, black, or yellow as specified in the plans.

2.0 MATERIALS

2.1 The material shall meet the requirements of AASHTO M249-79. The glass spheres premixed in the compound shall be as specified in AASHTO M 249-79. Spheres for surface application shall meet the requirements of AASHTO M 247, type 1, 80% rounds minimum. The compound shall be lead free.

2.2 The finished stripe shall not be slippery when wet. The compound shall not lift from the pavement in freezing weather. The compound shall not deteriorate by contact with sodium chloride, calcium chloride, or oil drippings from traffic. After application and proper drying time the stripe shall show no appreciable deformation or discoloration under traffic and under road temperatures up to 140 degrees Fahrenheit.

3.0 EQUIPMENT

3.1 The thermoplastic shall be placed utilizing an extrusion device. The application equipment shall be so constructed as to insure continuous uniformity in the dimensions of the stripe. The applicator shall provide a means for cleanly cutting off square stripe ends and shall provide a method of applying skip lines. The equipment will be so constructed as to provide for varying widths to produce varying width of traffic markings.

3.2 Glass spheres applied to the surface of the stripe shall be applied by an automatic head dispenser attached to the striping machine in such a manner that the beads are dispensed almost instantaneously on the completed line. The glass sphere dispenser cut-off shall be synchronized with the automatic cut-off of the thermoplastic material.

3.3 Applicators shall be mobile and maneuverable to the extent that straight lines can be followed and normal curves can e made in a true arc. The hand applicator equipment shall be insulated and shall have sufficient capacity to hold 150 pounds of molten material and shall be sufficiently maneuverable to install crosswalks, lane, edge, and center lines; arrows and legends. The truck mounted unit for lane, edge and center lines shall consist of a mobile self-contained unit carrying its own material capable of operating at a minimum speed of five miles per hour while installing striping.

4.0 THICKNESS

All pavement edge lines, gore, island and diagonal strip markings shall have a minimum thickness of 0.060 inches at the edges and a maximum thickness of 0.120 inches at the center. A minimum average film thickness of 0.090 inches shall be maintained. For longitudinal lines, thickness tests shall be taken every 1/3 mile. For other thermo markings, thickness tests shall be taken at the discretion of the Engineer.

5.0 GLASS SPHERES

Glass spheres shall be applied at the rate of one pound of spheres for each ten square feet of compound. Reflective glass spheres shall be applied to all white and yellow traffic stripes or markings. The glass sphere top coating shall not incur more than 9 - 10 percent loss during the first 30 days of traffic exposure. The sharp silica sand shall meet the following graduation requirements:

U.S. Sieve Number	Percent Passing
20	100
50	0-10

6.0 CERTIFICATION OF TESTS

The producer of the compound shall furnish to the department three (3) copies of certified test reports showing results that conform to the requirements of Section 711, current edition, F.D.O.T. Standard Specifications for Road and Bridge Construction. The producer shall certify that the material meets the requirements of Section 711. However, acceptance of the material is dependent upon test results of samples.

END OF SECTION 32 17 23

SECTION 32 31 13
CHAIN LINK FENCING and GATES

PART 1 GENERAL

1.1 RELATED DOCUMENTS

A. The provisions of the General Conditions, Supplementary Conditions, Drawings, Specifications, and the Sections included under Division 1, General Requirements and References are included as a part of this Section as though bound herein.

1.2 SECTION INCLUDES

A. Provide labor, materials, services, and equipment necessary to furnish and install work as indicated and as specified herein, which includes, but is not limited to:
B. Provide complete chain link fencing for exterior locations as follows.
   1. 4'-0" high separation fence
   2. 8'-0" high fence typical perimeter fencing and separation fences
   3. Other heights as indicated for specific locations.
   4. Baseball backstop
   5. Provide fences and gates around the retention ponds, athletic facilities, lift station, gas tanks, irrigation well, power transformer, gas meters, and DX ground mounted condensers. Fence height to be 6 feet, unless indicated otherwise. Provide clearance to work on items as indicated by the Architect and provide 3‘-0” wide gate or size as indicated on the drawings at each enclosure.
   6. At elementary schools, provide DOT grate cover of pipes 8” in diameter or greater and accessible to the students and within fences around wet and dry retention/detention ponds, swales or depressed areas with open access to drainage pipes over 8” in diameter.
   7. The JEA water meter and backflow assembly shall be located outside the site perimeter fence. The school facilities backflow preventers shall be installed on this school side of the perimeter fence within 10 feet of the meter and enclosed with a 6 foot high fence with a 3 foot wide gate. Verify with the Architect.

1.3 REFERENCES

A. ASTM A392 – Standard Specification for Zinc-Coated Steel Chain Link Fence Fabric
B. ASTM F567 – Standard Practice for Installation of Chain Link Fence
C. ASTM F668 – Standard Specification for Poly Vinyl Chloride (PVC) and Other Organic Polymer-Coated Steel Chain-Link Fence Fabric
D. CLFMA – Standard Guide for Metallic-coated Steel Chain Link Fence & Fabric
E. CLFMA – Chain Link Fence Wind Load Guide for the Selection of Line Post and Line Post Spacing

1.4 SUBMITTALS

A. Shop drawings shall indicate details of fabrication, installation, size, layout, equipment enclosure layout, post/foundation details, hardware anchorage, and component schedule.
   1. Show locations of different fence fabrics.
B. Provide manufacturer's product descriptive data on fabric, posts, accessories, fittings, and hardware.

C. Manufacturer Installation Instructions: Indicate installation requirements and post foundation anchor bolt templates.
D. Product Data: Submit manufacturer's product data, installation instructions and general recommendations for each specified sheet material and fabricated product. Unless otherwise indicated, submit the following for each type of product provided under work of this Section:
    1. Recycled Content:
        a. Indicate recycled content; indicate percentage of pre-consumer and post-consumer recycled content per unit of product.
        b. Indicate relative dollar value of recycled content product to total dollar value of product included in project.
        c. If recycled content product is part of an assembly, indicate the percentage of recycled content product in the assembly by weight.
        d. If recycled content product is part of an assembly, indicate relative dollar value of recycled content product to total dollar value of assembly.
    2. Local/Regional Materials: *(Provide materials extracted/harvested and manufactured within a 500 mile radius from the project site).*
        a. Sourcing Location(s): Indicate location of extraction, harvesting, and recovery; indicate distance between extraction, harvesting, and recovery and the project site.
        b. Manufacturing Location(s): Indicate location of manufacturing facility; indicate distance between manufacturing facility and the project site.
        c. Product Value: Indicate dollar value of product containing local/regional materials; include materials cost only.
        d. Product Component(s): Where product components are sourced or manufactured in separate locations, provide location information for each component. Indicate the percentage by weight of each component per unit of product

1.5 QUALITY ASSURANCE

A. Perform work in accordance with the manufacturer’s instructions.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with a minimum of 5-years experience.

PART 2 PRODUCTS

2.1 MATERIALS

A. Galvanized steel fabric: 9-ga. steel wire, 2" diamond mesh interwoven wire, top salvage knuckle end closed, bottom salvage knuckle end closed, full-height unless otherwise noted.
B. Vinyl-coated fabric: 9-ga. steel wire, 2" diamond mesh interwoven wire, top salvage knuckle end closed, bottom salvage-knuckle end closed, full-height unless otherwise noted, color: black.
C. Top and Brace Rail: 1-5/8” O.D. schedule 40 galvanized steel pipe, plain end, with outside sleeve-type couplings at least 7" long, one coupling in every five shall have a spring for expansion and contraction of rail.
    1. Finish shall match supported fence fabric.
    2. Note that all listed diameters are nominal outside diameters per standard steel pipe schedules.
D. Corner and Terminal (End) Posts: 3" (min.) O.D. schedule 40 galvanized steel pipes.
    1. Finish shall match supported fence fabric.

E. Line Posts shall be 2-1/2” O.D. schedule 40 galvanized steel pipes, end, corner, and pull posts.
   1. Equip posts with ¼" x ¾" tension bar 11-ga by 1" wide tension bands and ⅜" dia. carriage bolts and nuts, bands at 14" o.c.
   2. Equip posts with pressed steel top of manufacturer's design; finish shall match supported fence fabric.

F. Gate Posts: 4" (min.) O.D. schedule 40 galvanized steel pipe 6" O.D. for gates with leaves 12'-0" or wider.
   1. Note: Design gateposts for proper resistance to forces encountered by normal use.
   2. Finish of gates shall match adjacent fence fabric.

G. Gates:
   1. 1-5/8” O.D. galvanized steel pipe frames with pressed steel corner ells, riveted with 4 rivets per corner.
   2. Shall be 1-5/8” OD galvanized steel pipe and internal bracing with ⅜" adjustable steel truss rods.
   3. Heavy-duty type “Bull Dog” hinges as manufactured by Hoover Fence Company or approved equal, constructed to allow gate to swing 90° to 180°.
      a. Provide minimum 3 per leaf.
      b. Cast iron hinges are not acceptable.
   4. Use pressed steel padlocking device, center rest, and semi-automatic catch to secure drive gate in open position.
      a. Cast iron hardware is not acceptable.
   5. Pedestrian gates not located along a means of egress shall be equipped with locking hardware that will allow use of padlocks to secure the gate.
      a. Manufacture locking hardware from pressed steel, not cast iron.
   6. Pedestrian gates that are located along a means of egress shall be equipped with panic hardware that allows immediate egress from the school site.
      a. Manufacture all locking hardware from pressed steel or equivalent materials.
      b. Cast iron hardware is not acceptable.
   7. All gates with a leaf over 6'-0" wide shall be provided with steel wheels and steel track and 18" wide concrete track bed.
   8. Sliding gates shall be commercial sliding cantilever heavy duty gate as manufactured by Hoover Fence Company or approved equal.

H. Caps: Vinyl or galvanized steel, depending on location, sized to post diameter, set screw retainer.

I. Accessories: Same finish as framing and fabric.

J. Steel:
   1. Recycled Content: Provide post-consumer recycled and pre-consumer recycled content.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that preparations in fence locations are complete, without irregularities that would interfere with fence installation, correct unsatisfactory conditions before starting work.

3.2 INSTALLATION

A. Field Measurements: Verify layout information for fences and gates shown on Drawings in relation to the property survey and existing structures. Verify dimensions by field measurements.
B. Measure and lay out complete fence line, parallel to surface of ground.
   1. Locate line posts 10' o.c. maximum spacing.
   2. Locate corner posts where fence changes directions more than 10°.
C. Provide minimum posthole diameter 3 times outside post diameter.
   1. Set posts minimum of 24" into concrete base, plumb to ¼" in 10'; fill hole with concrete to 2" above grade.
   2. Crown the surface of concrete to slope away from posts.
D. Fence Fabrics:
   1. Stretch fabric tight between terminal posts or at intervals of 100' maximum.
      a. Do not stretch fabric until concrete foundation has cured 28 days min.
   2. Position the bottom of the fabric approximately 2" above ground level at each post.
   3. Cut or splice fabric to form one continuous piece between terminal posts.
   4. Attach fabric to terminal post using tension bars and tension bands at 14" o.c.
   5. Attach fabric to line posts using wire ties or clips, spacing not to exceed 15" o.c.
   6. Attach top edge of fabric to top rails using wire ties or clips, spacing not to exceed 24" o.c.
   7. Attach bottom edge of fabric to bottom rails using wire ties or clips, spacing not to exceed 24" o.c.
   8. Place fabric on outside of posts and rails.
   9. Install fabric so its bottom edge is two inches above finished grade (+/- ½ inch).
E. Gates:
   1. Use swing gates.
   2. When used in emergency egress situations, limit-swinging gate leaves to 4'-0" wide.
   3. Provide 2" ground clearance for gate leaves 5'-0" or less and 4" for over 5'-0" wide.
   4. Set gate posts at least 1'-8" back from face of curbs.
   5. Install gates plumb and level ¼" in 10'.
   6. Adjust hardware to provide smooth operation.
F. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods.
   1. Install brace rail one bay from end and gateposts.
G. Brace tops of all posts installed adjacent to buildings and/or columns with steel brackets substantially secured to building wall and/or columns.
H. Fasten fabric to top rail, posts, braces, and bottom tension wire with tie wire, maximum 15" o.c.
I. Attach fabric to end, corner, and gateposts with tension bars and tension bar clips.
J. Install bottom tension wire stretched taut between terminal posts.
K. Do not attach the hinged side of gate to building walls; provide gateposts.
L. Install gate with fabric to match fence.
   1. Install three hinges per leaf, latch, catches, and drop bolt.
M. Provide concrete center drop to footing depth and drop rod retainers at center of double gate openings.
   1. Do not install drop rod retainers (cane bolts) on gates that that are part of emergency egress routes – provide alternate approved hardware.

3.3 ADJUST AND CLEAN

A. Adjust brace rails and tension rods for rigid installation.
B. Tighten hardware, fasteners, and accessories.

C. Remove excess and waste materials from project site.
D. Adjust gates to alignment, operate freely, and latch properly.

END OF SECTION

SECTION 32 93 00
LANDSCAPE DEVELOPMENT

PART 1 GENERAL

1.1 Scope. This section includes all planting of shrubs, trees, ground covers, and other supplementary work and all other landscaping work shown on the drawings and specified herein, complete.

1.2 Applicable Documents. The following publications, specifications, and standards of the issues listed in this paragraph (including the amendments and addenda designated), but referred to hereinafter by basic designation only, form a part of this specification to the extent required by the references thereto.

1.3 Publication of Reference. Publications as herein listed shall be held in basic reference:

- 1.3.1 Grades and Standard for Nursery Plants, Parts I and II, State Department of Agriculture and/or State Plant Board of Florida, Seagle Building, Gainesville, Florida.
- 1.3.2 State of Florida Fertilizer Law, Office of the Secretary of State, Tallahassee, Florida.
- 1.3.3 American Standard for Nursery Stock (ANSI Z60.1-), American Association of Nurserymen.
- 1.3.4 Tree Care Operations (ANSI Z133.1-)
- 1.3.5 Guideline Specifications to Sodding, America Sod Producers Association (ASPA).

1.4 Substitutions of Plant Material. If a plant is found to be unavailable, submit proof of non-availability and a proposal for use of equivalent material. When authorized, adjustment of contract amount will be made. No substitutions will otherwise be authorized.

To prove non-availability, the Contractor must provide at least eight (8) letters from growers or dealers form the States of Florida and Georgia explaining the non-availability of the plant material.

1.5 On-site Conditions and Adjustments. The location of plants, as shown on the plans, is approximate. Planting shall be adjusted to fit actual as-built conditions on the site and any changes in locations caused thereby shall be made without additional cost to the Owner, Engineer, and/or Landscape Architect.

The Contractor shall immediately notify the Engineer and/or Landscape Architect when conditions detrimental to plant growth are encountered, such as rubble fill, limerock, or obstructions; and when field conditions are different than portrayed on the plans prior to planting. The Engineer and/or Landscape Architect may adjust the layout or location of specified plant materials to avoid these areas without additional costs.

1.6 Delivery of Plant Materials. Deliver plants after preparations for planting have been completed and plant immediately. If planting is delayed more than six (6) hours after delivery, set plants in shade, protect from weather and mechanical damage and keep roots moist. Keep container grown stock in containers until planting time. Pick up plants by ball or container, not by stems or trunks when moving or setting.

1.7 Handling and Protection of Plant Material. No plant shall be bound with rope or wire at any time so as to damage the bark, break branches, or destroy its natural shape. During shipment protect all plants with tarpaulin or other suitable cover, against excessive drying from sun and wind. All plants shown in Plant Schedule shall be Container Grown Plants and shall have sufficient roots to hold earth together after removal from containers without being root bound.

1.8 Deliver, Storage, and Handling of Sod. Deliver sod on pallets. Protect exposed roots from dehydration. Do not deliver more sod than can be laid within 24 hours.

1.9 Test Reports and Labels. Submit as requested by the Engineer and/or Landscape Architect any tags, labels, certificates for plant material, fertilizer, peat, or other material required elsewhere in this Specification. Provide analysis of existing and imported topsoil for all landscaped areas (sod included) as specified in Paragraphs 2.3 and 2.4. Test reports and labels of governmental or private laboratory inspections or certifications shall also be submitted for final approval.

Except as may otherwise be specified on the plans or herein, all inspection, testing, and approval shall be performed according to the General, Special and Technical Conditions of the Specifications. In no event, however, shall any fewer requirements be acceptable than hereinafter stated.

1.10 Verification of Submittals and Materials. All landscape materials shall be shipped with the certificates of inspection as required by governmental authorities and the nursery identification tag. Failure to have the proper certificates and approved inspection tags will be grounds for rejection of the plant material. If the Engineer and/or Landscape Architect has reason to believe that some of the plant material are not of the specified grade or size, he will request a regrading inspection by the Department of Agriculture and Consumer Services for a final determination, if required.

1.11 Coordination of Plantings. Coordinated all landscape work with the Engineer and/or Landscape Architect and other contractors. Plant trees and shrubs after final grades are established and prior to planting of lawns, unless otherwise acceptable to the Owners Representative.

1.12 Coordination of Sodding. Coordinate with installation of underground sprinkler system piping and watering heads.

1.13 Fine Grading. Provide fine grading necessary to establish finish grade in all landscape areas. Fine grading shall include only minor grading to correct random or infrequent grade irregularities of 3" or less.

PART 2 SUBMITTALS

2.1 Soil Testing for Sod. Analyze the topsoil to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value. Testing for topsoil shall be in accordance with Section 162 of the FDOT Standard Specifications for Road and Bridge Construction, 2000 Edition.

2.2 Planting Soil Mixture. The Contractor shall provide a sample and soil analysis report from the University of Florida Extension (IFAS) Soil Testing laboratory or approved testing laboratory for the proposed planting soil mix. Provide soil samples in accordance with recommendations of the Laboratory. Soil pH should range between 5.0 and 8.0.

2.3 Inspection Certificates, Manufacturer's Data. Submit copies of certificates of inspection required by governmental authorities. Submit manufacturers or vendors certified analysis, application, and installation instructions for materials noted below. Submit other data substantiating that materials comply with specified requirements and as detailed within these specifications.

2.4.1 Fertilizer

2.4.2 pH Adjuster used

2.4.3 Certification from each nursery providing container stock trees and shrubs that the material has been growing in the container specified for a minimum of six (6) months.

2.4.4 Sod growers' certification indicating grass species and conformance to ASPA "nursery grown" grade, location of field where sod was cut, and date cut.

2.4.5 Copy of the latest Nursery, Stockdealer and Special Inspection Report as prepared by the Department of Agriculture and Consumer Services for all nurseries from which plant material is derived.

PART 3 MATERIALS

3.1 General Requirements. Provide state inspected, nursery-grown plants, unless otherwise specified. Conform to the plant schedule, "Florida Department of Agriculture Grades and Standards for Nursery Plants", local landscape ordinance, and, where applicable, to ANSI Z60.1. All materials delineated and specified hereunder and represented on the drawings are subject to the acceptance of the Engineer and/or Landscape Architect. All materials shall be subject to inspection and any or all items failing to meet the required standards herein stipulated or detailed on the plans will be rejected.

3.2 Topsoil. Topsoil shall be 4" thick for sodden areas and 6" thick for mulched areas. Topsoil shall be in accordance with Section 162 of the FDOT Standard Specifications for Road and Bridge Construction, 2000 Edition. Topsoil shall be indigenous to the area and shall be naturally fertile of a loamy-sand or sand-loam agricultural nature and capable of sustaining plant growth. It shall be free of admixtures except as specified herein or on the drawings. It shall be free of sticks, stones, bottles and other superfluous plant matter and materials. It shall be delivered in a normally moist, unmuddy, unwet condition.

3.3 Peat/Humus. Peat or Humus shall be of a suitable type and shall consist of reed peat or sedge peat, but not peat moss. It shall be free of sticks, stones, weeds, roots and other undesirable debris and shall be derived from a source which indigenously produces peat of this nature. It shall be delivered containing between 35 and 50 percent moisture. It shall be dark brown to black in color, granulated, free of lumps and shall have been conditioned in a storage pile for at least six (6) months after it was excavated from the peat pit.

3.4 Fertilizer. Commercial fertilizer shall be a complete mixture and shall comply with the laws of the manufacturer regulating the sale and manufacturer of fertilizer in the State of Florida. Use a 12-8-8, 50% organic with microelement fertilizer. It shall contain the following percentages of plant nutrients by weight:

3.4.1 Nitrogen – Twelve Percent (12%) – One quarter of nitrogen shall be in the form of nitrate nitrogen, one-quarter in the form of ammoniac nitrogen, and one-half in the form of urea-formaldehyde for agricultural uses;

3.4.2 Phosphoric Acid – Eight Percent (8%) – The source of phosphoric acid may be superphosphate, bone meal, or tankage; and

3.4.3 Potash – Eight Percent (8%) – Potash shall be derived from sulfate of potash.

3.5 Manure. Well rotted, horse or cattle manure free of stones, sticks and soil; containing a maximum 25 percent by volume of straw, sawdust, or other bedding materials. If commercially processed cow manure is used, it must meet the minimum requirements of the Florida Fertilizer Law pertaining to the sale of fertilizer materials.

3.6 pH Adjusters. If the Engineer and/or Landscape Architect determines that the soil pH needs to be adjusted to ensure the survivability of plant material the Contractor shall use the following:

3.6.1 Lime. Commercial grade, ground or hydrated limestone containing not less than 50% of total oxides.

3.6.2 Aluminum Sulfate. Commercial grade.

3.7 Planting Soil Mix. Backfill shall be prepared as a uniform mixture of one-forth (Paragraph 3.3) peat, one-forth (Paragraph 3.5) cow manure, and one-half topsoil (Paragraph 3.2). To this mixture shall be added and uniformly mixed 1-1/2 pounds of commercial fertilizer as herein specified, per cubic yard and backfill prepared. The chemical reaction of this mixture shall be adjusted to pH 5.0 to 8.0 by either adding wettable flowers of sulphur to raise the acidity level or by adding dolomitic agricultural limestone to lower the acidity level. This preparation shall be used around and under all plant materials, except sod and seed and mulch.

3.8 General Plant Materials Requirements. All plant materials shall be nurseries grown Florida No. 1 stock. All materials shall be healthy, vigorous, free of diseases and insects, pruned for best shape without appearance of "de-horning", and without symptoms of nutritional deficiency. Furnish plants grown under climatic conditions similar to those in the locality of the project. All plants must be true of variety, cultivar, and/or species. Plants must measure according to sizing requirements detailed on the drawings. Plants must be naturally bushy, dense, in good foliage, well branched, and of good appearance. The nursery/nurseries from which they are derived shall be under regulatory inspection by the Florida State Department of Agriculture and/or the Florida State Board or an equivalent agency, if derived from outside the State of Florida. Plants entering from outside the State of Florida must bear the entry certificate of the State Department of Agriculture of the State of Florida.

All plants materials will be subject to approval of the Engineer and/or Landscape Architect for quality, size and color. Plants lacking compactness or proper proportions, plants which are weak or thin, and plants injured by close planting in nursery rows will not be accepted. Plant materials which have been cut back from larger grades to meet certain specified requirements.

3.9 Container Plants. All plants provided shall be container-grown plants with sufficient roots to hold the container soil together after removal from the container. Rootbound plants and plants with inadequate root systems are not acceptable. Trees and shrubs shown as container grown in the Plant Schedule shall have been grown in their pots, cans, tubs, or boxes for a period of at least 6 months. Grow bags are not acceptable. The Contractor shall provide, upon delivery, a certification from the grower that the plants have been growing in the containers for a period not less than six (6) months.

Plants, which have been repotted from smaller containers to meet container, size specifications or grown in the container for a period less than 6 months are not acceptable. Container material is subject to approval and tagging by the Engineer and/or Landscape Architect prior to shipping to project site.

3.10 Surface Mulch for Plants and Beds. Mulch shall be Mini Pine Bark, Grade A, minimum three (3) inches think and be in a non-decomposed state; not more than one (1) season old, or pine straw, minimum three (3) inches thick and free of sticks and debris. See plans for location and type of mulch.

3.11 Wrapping Material. Four-inch wide bituminous impregnated tape, corrugated or crepe paper, specifically manufactured for tree wrapping and having qualities to resist insect infestation. Twine for tying shall be a lightly tarred medium or course sisal yarn.

3.12 Wire. Guying wire for staking trees shall be 12 gauge annealed galvanized steel.

3.13 Hose Chafing Guards. Chafing guards for guy wires shall be new or used two-ply reinforced rubber or plastic hose.

3.14 Wound Dressing/Pruning Plant. Tree wound dressing shall be black asphalt base antiseptic paint as manufactured for such purposes.

3.15 Herbicides, Insecticides. Chemical sprays, dusts, or gaseous compounds used on or around plant materials, including but not limited to trees, shall be approved for such uses by the Environmental Protection Agency and the Florida Department of Agriculture and Consumer Services. Such materials as may be used shall not constitute a hazard to human health or interfere with site working conditions and habitation.

3.16 Stakes. Stakes for staking trees shall be of a dimension as noted on the drawings. The lumber manufacturer with pressure-applied pentachlorophenol or an equal nonwashable wood preservative shall have treated such stakes; however, the preservative shall not be creosote.

3.17 General Sod Requirements. Sod shall be Argentine Bahia except in areas adjacent to existing St. Augustine sod. In these areas, replacement sod shall match existing St. Augustine sod for the full width of the property from the right-of-way (including additional areas disturbed) to the edge of pavement (or curb and gutter) or as determined by the Engineer and/or Landscape Architect. All sod shall be healthy, strongly rooted and not less than two (2) years old, free of weeds and undesirable native grasses in 16" x 24" pads, 1-1/2" thick. Sod shall conform to "Nursery Grown" grade as established by American Sod Producers Association (ASPA). Sod shall be considered free of weeds if less than 5 weeds are found per 100 square feet of area. Brown, dry, irregularly smooth, and/or unfresh sod will be rejected.

3.18 Sod Materials.

3.20.1 Sod: ASPA certified nursery grown; cultivated grass sod; type indicated in plant schedule on drawings below in schedule at end of Section; with strong fibrous root system, free of stones, burned or bare spots; containing no more than five weeds per 100 square feet.

3.20.2 Topsoil: As specified in Paragraph 3.2.

3.20.3 Fertilizer: F 0-241, Type I, Grade A; recommended for grass, with 50 percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, as indicated in analysis to the following proportions: Nitrogen – 12% percent, phosphoric acid-8%, soluble potash-8%. Fertilizer to be distributed at a rate of 500 pounds per acre.

3.20.4 Water: Clean, fresh, and free of substances or matter, which could inhibit vigorous growth of grass.

PART 4 PLANTING PROCEDURES

4.1 General. Prior to commencement of any work, the Landscape Contractor shall inspect the site, locate planting areas, placement of guying devices, locate electrical cables, conduits, and other underground and above utilities so that proper precautions and procedures may be followed during and throughout construction. The Contractor shall become familiar with other job trade activity which has an impact upon his work or upon which his work has any impact and shall arrange to carefully coordinate his work with other trades.

4.2 Layout. The location of plants and planting beds, as shown on these plans, are approximate. The locations and bed lines shall be staked on the project site by the Contractor and approved by the Engineer and/or Landscape Architect before any plant pits or beds are dug. The Engineer and/or Landscape Architect any adjust plant material locations to meet field conditions. Contractor shall make minor adjustments without additional cost to the Owner.

4.3 Finish Grades. The Landscape Contractor is responsible for all-fine grading and preparation for planting. Finish grades (top of soil) for all areas after settlement shall be one-half inch below the top of abutting curbs, walks, walls, and abutments. The finish grade of all plant beds prior to mulching shall be three inches below finish grade of sod, abutting curbs, walks, and walls. Three inches of mulch shall be added after planting.

4.4 Planting Season/Times. The planting of plant materials, sod and mulch may proceed at any time, period, or season agreed upon by the Contractor and the Engineer and/or Landscape Architect.

4.4.1 Excessive Temperatures. Do not install plant material when ambient temperatures may drop below 35 degrees Fahrenheit or above 90 degrees Fahrenheit.
4.4.2 Excessive Wins. Do not install plants when wind velocity exceeds 30 mph.

4.5 Plant Pits. The Contractor shall excavate plant pits, unless otherwise approved, according to the drawings. Remove all limerock material, unsuitable soil, trash and debris. Dispose of off the site.

4.6 Setting Plants. Each plant shall be established in a manner consistent with plant details. All plants shall be set plumb and straight. Plants shall be established to a depth, which is not greater than that at which they grew when in the nursery container or field. The excavation void around each plant shall be backfilled with ½ the planting mixture as specified in "Part 3.0 Materials" and ½ pit soil. All backfill shall be tamped and worked firmly under and around the root ball to fill all voids.

4.7 Soil Preparation for Ground Cover Beds. Spread three (3) inches of peat uniformly over entire ground cover area; spread 50 percent organic fertilizer at a rate of 40 pounds per 1,000 square feet uniformly over the ground cover area; rotor mix to a depth of eight inches; fine grade to remove all trash, rocks and debris to a depth of twelve inches; regrade to finished grade before mulching; apply an approved pre-emergence herbicide; mulch planting beds before setting plants; thoroughly water and firm the plants into the ground cover mixture; any mulch that may have received soil on it during the plating of the ground cover shall be removed and the area remulched.

4.8 Staking. All trees are to be staked unless otherwise instructed by Engineer and/or Landscape Architect. Refer to staking details o the drawings. Wire shall be encased in hose to prevent direct contact with the bark of the tree and shall be placed around the tunk of the tree in a single loop. Wires shall be tightened and kept taut by twisting strands together, or with turnbuckles. Stakes shall be driven into the ground a minimum depth of 30 inches and backfilled firmly.

4.9 Mulching. All plant beds and plant saucers shall be uniformly covered with a three-inch layer of mulch. Mulch hedges full width of the hedge bed. Contain mulch within landscape borders. Adjust plants after mulching so mulch does not cover or bury any above root foliage.

4.10 Wrapping. All trees are to be wrapped. Wet the trunks of trees thoroughly with insecticide. Wrap trees by overlapping 1-1/12 inches, wrap from the base of the tree to the lowest main branches of the tree. Tie the wrapping at the top, bottom and at tow feet intervals along the trunk of the trees has been inspected and approved.

4.11 Preparation for Sod Areas. Limit preparation to areas, which will be planted in the immediate future. Where sod is to be planted, prepare soil for sod planting as follows: Till to a depth of not less than 4 inches and add 3 yards of peat/humus per 1,000 square feet, as specified in "Paragraph 3.3, Peat/Humus". 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. Prior to preparation, remove existing grass, vegetation, and turf. Dispose of such material outside of Owner's property; do not turn over into soil being prepared for sod. Grade areas to a smooth, even surface with a loose, uniformly fine texture. Roll, rake and remove ridges and fill depressions, as required to meet finish grades. Limit fine grading to areas which can be planted within the immediate future. Moisten prepared areas before planting. If soil is very dry, water thoroughly and allow surface to dry off before planting of sod. Do not create a muddy soil condition. Restore prepared areas to specified condition, if eroded or otherwise disturbed after fine grading and prior to planting.

4.12 Examination before Sodding. Verify that prepared soil base is ready to receive the work of this section.

4.13 Soil Preparation for Sod. Where sod is to be planted, prepared soil for these areas as follows: Loosen in-place topsoil to a minimum depth of four inches (4"). Remove stones over 1" diameter, stick, roots, and other extraneous matter. Limit preparation to areas, which will be planted promptly. Add three yards of peat per 1,000 square feet and add pH adjustment materials as recommended by soil test, mix thoroughly into top four inches (4") of soil. Fine grade areas to smooth, even surface with loose, uniformly fine texture. Roll, rake and drag areas, remove ridges and fill depressions with topsoil as required to meet finish grades. In areas to be sodden, allow for sod thickness (see Paragraph 4.3). Moisten prepared lawn areas 24 hours before planting, if dry.

4.14 Placing Topsoil for Sodding. Spread topsoil to a minimum depth of four (4) inches over area to be sodden in accordance with Section 162 of the FDOT Standard Specifications for Road and Bridge Construction, 2000 Edition. Place topsoil during dry weather and on dry unfrozen subgrade. Remove vegetable matter and foreign non-organic material from topsoil while spreading. Grade topsoil to eliminate rough, low or soft areas, and to ensure positive drainage.

4.15 Fertilizing for Sod. Apply after smooth raking of topsoil and prior to installation of sod. Fertilizer shall be applied in accordance with manufacturer's instructions at a rate of one pound per 1,000 square feet. Application should occur no more than 48 hours before laying sod. Mix fertilizer thoroughly into upper two inches of topsoil. Lightly water to aid the dissipation of fertilizer.

4.16 Sod Installation. Lay sod within 36 hours of stripping at farm. Lay sod in straight, parallel rows to form a solid mass with tightly fitted joints, without overlap. No gaps greater than ¼" will be allowed between sod pieces. Work topsoil material into minor cracks. Stagger strips to offset joints. On 1:3 slopes or greater, lay sod with long dimension of pads parallel to contours. The Contractor shall stake the sod as needed in the opinion of the Engineer and/or Landscape Architect at no additional cost to the Owner. Drive sod stakes flush with top of sod. Roll entire sodden area (on areas with 4:1 slope or flatter) with a 200-pound roller. Water sods immediately after rolling; thereafter water sufficiently to keep soil moist to a depth of 4" until established. Prior to rolling sod spread a 1" layer of debris and weed free sand to sod surface. Roll freshly laid sod using a lightweight turf roller. Provide a true and even surface without any displacement of the sod or deformation. Where sodding on slopes, stagger the setting of the sod pieces to avoid a continuous seam along the line of flow. Tamp the outer pieces of sod to produce a featheredge effect. Peg sod at locations where the sod may slide. Drive pegs through sod blocks into firm earth, at intervals approved by the Engineer. Remove any sod as directed by the Engineer.

4.17 Protection of Plant Material. Protect vehicular and pedestrian traffic, landscape work, existing vegetation and above and below ground utilities from damage due to landscape operations. Post signs or barriers as required. Maintain protection until final acceptance. Repair or replace damage as directed.

4.18 Final Clean up. Upon final completion of work and before inspection and acceptance, all aspects of the project site shall be thoroughly and completely cleaned of debris, stains, materials, defacements, and temporary facilities. Likewise, any repairs, which are the obligation of this Contractor, shall be completed.

4.19 Liability of Contractor. The Contractor shall be liable for any and all damages to property, which result from his performance. He shall, without extra cost, restore to original condition any areas and/or construction damaged, defaced, disturbed, or destroyed by him or his workmen.

PART 5 INITIAL INSPECTION AND ACCEPTANCE

5.1 Initial Inspection and Acceptance. The Engineer and/or Landscape Architect shall make inspection within ten (10) days of written notification from the Contractor that installation is complete. The Contractor shall replace all rejected work and material found not to meet specifications as delineated herein within 15 days of notification. Remove rejected plants and materials promptly from project site.

PART 6 MAINTENANCE AND GAURANTEE

6.1 Maintenance of Plant Material. Maintain all plant materials until Final Acceptance. Maintenance shall include all required watering, cultivation, weeding, mowing, pruning, wound dressing, immediate replacement of dead and unacceptable material, straightening plants which lean or sag, adjustments of plants which are planted too low, and any other procedure consistent with good horticultural practice necessary to insure normal, vigorous, and healthy growth of all planting under this Contract.

6.1.1 Watering. After initial watering, water plants as needed to prevent wilting, but at least three times weekly, if no rain, for the first 30 days. Water thereafter as required for healthy growth. The Contractor will be responsible for watering all trees, shrubs, ground covers and sod by water truck, or other acceptable temporary means, until such time as the irrigation system becomes functional or the Final Acceptance which ever comes first. In the event that no automatic irrigation system is planned all plant material will be watered according to the following 90-day plant establishment schedule:

- Palm Trees - 20 gal per application
- Large Trees - 30 gal per application
- Small Trees - 20 gal per application
- Shrubs - 10 gal per application
- Small Shrubs- 5 gal per application

First 4 weeks – 3 waterings/week for the first month or 12 waterings
Second 4 weeks – 2 waterings/week for the second month or 8 waterings
Third 5 weeks – 1 watering/week or 5 waterings for the third month plus 1 week

6.1.2 General Maintenance. The Landscape Contractor shall reset settled plants to proper grade and position, remove and replace unhealthy or dead material, tighten or repair guys and stakes, spray to keep plants free of insects and disease, and prune as necessary, as well as keep mulch areas neat and attractive until the Final Acceptance. Weeding of mulched beds shall also be performed every 30 days with a minimum of four weedings until the Final Acceptance.

6.1.3 Mulch. At the end of the maintenance period, re-mulch any areas with less than 3 inches of mulch and remove stakes and guys from trees.

6.2 Maintenance of Sod. Maintain sod for a minimum period of 45 days after Substantial Completion and until Final Acceptance. Immediately resod bare spots. Reset settled or eroded sod areas to proper grade. Fill open joints with topsoil. Keep sod free of insects and disease.

6.2.1 Watering. Water sod sufficiently to maintain moist soil to a depth of 4 inches until Final Acceptance. The Contractor will be responsible for watering all sodden areas by water truck, or other acceptable temporary means, until such time as the irrigation system becomes functional or the Final Acceptance which ever comes first.

6.2.2 Mowing. Mow sodden areas when sod is firmly rooted and tip growth exceeds 3".

6.2.3 Fertilization. Fertilize sod 4 weeks after planting with 16-4-8 at a rate of 6 lbs. per 1,000 SF.

6.3 Guarantee. All plant materials and trees installed by the Contractor shall be guaranteed for 365 days from the date of final inspection and acceptance. The Contractor shall not be obliged to replace, repair, or restore any portion of the work which is damaged, defaced, disturbed, and/or destroyed by others after final acceptance. The Contractor shall replace at no additional cost to the Owner, all guarantee period. Replacement of such material shall occur within ten (10) days from Owner's written notification to the Contractor. The guarantee period for replaced plant materials shall commence on the date of acceptance of the replace item or items of plant material.

PART 7 WARRANTY INSPECTION AND ACCEPTANCE

7.1 Final Inspection. At the end of the maintenance period, the Engineer and/or Landscape Architect shall conduct a final inspection within ten (10) days of written notification from the Contractor that the maintenance period has been completed. The Contractor shall replace any material not in healthy condition or which fails to meet specifications.

7.2 Replacements. The specified plant warranty, including the maintenance, inspection and acceptance provisions, shall apply to replacement plants. The extended warranty period shall begin from the date the Owner's Representative has accepted the installation of minimum specified maintenance period and until Final Acceptance, with each additional replacement in turn being maintained and warranted for the minimum specified maintenance period. Replacements shall comply with specified requirements for new plants.

END OF SECTION 32 93 00