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SECTION 14
PAVING - GENERAL REQUIREMENTS

14.1 PERMITS

Permits for construction, modification or maintenance of roadways, sidewalks, drainage or related facilities shall be granted only after the following requirements have been met:

14.1.1 Paving and drainage plans must have been reviewed and be deemed complete by the Public Works Department prior to approval.

14.1.2 All required permits have been obtained from the St. John's River Water Management District, Florida Department of Environmental Protection, Florida Department of Transportation, U. S. Environmental Protection Agency, U.S. Corps of Engineers and any/all other agencies having permitting jurisdiction over the proposed work. Approval or acceptance by the City of Groveland of the proposed facilities does not imply acceptance of any other agency.

14.1.3 Other applicable provisions of this document.

14.2 FEES

14.2.1 Fees will be charged in accordance with the City of Groveland fee schedule currently in effect.

14.2.2 No security shall be required for driveway connections to paved roadways

14.3 PLANS AND SPECIFICATIONS

14.3.1 All plans shall be submitted on white prints with blue or black lines. In addition to the proposed project they shall show all existing facilities as well as all other planned facilities in sufficient detail to permit assessment of the compatibility of the proposed work and the existing systems.

14.3.2 Plans must be submitted on 24" x 36" sheets, except that for small projects plans may be submitted on legal size paper, provided that scale requirements are met and only one sheet is required.

14.3.3 Any general area layout shall be prepared at a scale of 300 feet or less to the inch. Detailed plans shall be prepared at a scale of 20 feet or less to the inch. (40 feet or less for subdivisions). Design drawings for arterial and collector roads shall include both plans and profiles. Design drawings for local roads need not include roadway profiles. When profiles are drawn, they shall be to the same horizontal scale as the plan.

14.3.4 The names and boundaries of all abutting subdivisions shall be shown, giving the plat book and page number of the recordation.

14.3.5 Areas not platted shall be shown as acreage, and the Section, Township and Range shall be noted.

- 14.3.6 Dimensions of right-of-ways widths shall be indicated.
- 14.3.7 All plans shall show suitable legends.
- 14.3.8 New pavement shall be indicated by notes and/or light shading.
- 14.3.9 Cross-sections and/or typical sections of proposed road and drainage construction, shall show dimensions, materials and purposes of all existing (to remain) facilities as well as all proposed facilities within the right-of-way.
- 14.3.10 The public roadways proposed in the plans shall be designed in accordance with the "Manual of Uniform Minimum Standards for Design, Construction and Maintenance for Streets and Highways, State of Florida," unless otherwise approved by the Public Works Director.

14.4 CONFLICT MANHOLES

All conflict manholes must have approval of the appropriate State or County reviewing agencies before being permitted by the Public Works Department, and must be constructed as shown in the Construction Details. This shall apply to field changes as well as conflict structures proposed in the design of the project in question.

14.5 HOT BITUMINOUS MIXTURES

14.5.1 Weather Limitations

14.5.1.1 Limitations of Laying Operations: General: The mixture shall be spread only when the surface upon which it is to be laid has been previously prepared, is intact, firm and properly cured, and is dry. Unless otherwise approved by the Public Works Department, no mixture shall be spread that cannot be finished and compacted during daylight hours.

14.5.1.2 Temperature: The mixture shall be spread only when the air temperature (the temperature in the shade away from artificial heat) is above 40 degrees F and is not dropping.

14.5.1.3 Wind: The mixture shall not be spread when the wind is blowing to such an extent that proper and adequate compaction cannot be maintained or when sand, dust, etc. are being deposited on the surface being paved, to the extent that the bond between layers will be diminished.

14.5.2 Preparation of Asphalt Cement: The asphalt cement shall be heated in advance of the mixing operations, to within a range of 270 degrees F to 350 degrees F. Heating within these limits shall be constant and wide fluctuations of temperature during the day's production will not be permitted.

14.5.3 Preparation of Aggregates

14.5.3.1 Stockpiles: Each aggregate component shall be placed in an individual stockpile, which shall be separated from the adjacent stockpiles, either

by space or by a system of bulkheads. The intermingling of different materials in stockpiles shall be prevented at all times.

14.5.3.2 Prevention of segregation: In the event that the method used for stockpiling coarse aggregate results in segregation of the aggregate, stockpiles shall be built up in layers not higher than four feet, with each layer completely in place before the next is started. Stockpiles shall not be formed by depositing material in one place or by forming cones.

14.5.3.3 Blending of Aggregates: Blending or proportioning from railroad cars will not be permitted. All aggregates shall be stockpiled prior to blending or placing in the cold hoppers. All aggregates to be blended or proportioned shall be placed in separate bins at the hopper and proportioned by means of securely positioned calibrated gates or other approved devices.

14.5.3.4 Mineral Filler: If mineral filler is required in the mix it shall be fed or weighed-in separately from the other aggregates.

14.5.4 Preparation of Mixtures

14.5.4.1 Aggregates: The dried aggregates and mineral filler (if required), prepared in the manner previously described, and combined in batches to meet the job mix formula by weighing each separate bin size, shall be conveyed to the empty mixer.

14.5.4.2 Bitumen: The hot asphalt cement, accurately measured, shall be introduced into the mixer simultaneously with, or after, the hot aggregates. Mixing shall continue until the mixture is thoroughly uniform, with all particles fully coated.

14.5.4.3 Mixing Time: The mixing time shall begin when the measuring devices for both the asphalt and the aggregates indicate that all the material is in the mixer, and shall continue until the material begins to leave the mixing unit. The mixing time will vary in relation to the nature of the aggregates and the capacity of the mixer, but shall in no case be less than 35 seconds.

14.5.4.4 Continuous Mixing: The dried aggregate and mineral filler (if required), prepared as specified and proportioned to meet the job mix formula by volumetric measurements, shall be introduced into the mixer in synchronization with the accurate feeding of the hot asphalt cement. The rate of flow of material to the pugmill shall be such that the maintained depth of the mix will not exceed the tips of the paddles when in the upright position. Mixing shall be sufficient to produce a thoroughly and uniformly coated mixture.

14.5.4.5 Drum Mixing: The aggregates and mineral filler (if required), prepared or specified and proportioned to meet the job mix formula, shall be introduced into the drum mixer with the accurate feeding of asphalt cement. The rate of flow of material to the drum shall be such that the

manufacturer's mixing capacity shall not be exceeded. Mixing shall be sufficient to produce a thoroughly and uniformly coated mixture.

14.5.4.6 Mixing Temperature: The ingredients of the mix shall be heated and combined in such a manner as to produce a mixture which shall be at a temperature, when discharged from the pugmill or hot storage (surge) bin, within 25 degrees F of the design temperature, and within the temperature limits specified in Section 5.2.

14.5.4.7 Contractor's Responsibility for Mixture Requirements: The responsibility for producing a homogeneous mixture, free from excess moisture and with no segregated materials, and meeting all requirements of the specifications for the mixture, including compliance with the design limits, shall lie entirely with the Contractor. These requirements shall also apply to all mixes used from a hot storage or surge bin, both before and after storage. No mix shall be stored overnight.

14.5.5 Transportation of the Mixture: The mixture shall be transported in tight vehicles previously cleaned of all foreign material and each load shall be covered. The inside surface of the truck bodies shall be thinly coated with soapy water or an approved emulsion containing not over 5% oil, but no excess of either shall be used. Kerosene, gasoline or similar products shall not be used. After the truck bodies are coated and before any mixture is placed therein, they shall be raised so that all excess liquids will be drained out.

14.5.6 Coating Materials

14.5.6.1 Prime Coat: The material used for prime coat shall be cut-back asphalt, Asphalt Grade RC-70 or RC-250, meeting the requirements of AASHTO M81-751, Emulsified Asphalt Grades SS-1 or CSS-1, SS-1H or CSS-1H, diluted in equal proportion with water and meeting the requirements of AASHTO M140-70, or other types and grades of bituminous material which may be called for in approved plans. The Contractor may select any of the specified bituminous materials for use, unless the approved plans indicate use of a specific material. Types and grades of bituminous material other than those specified above may be allowed if it can be shown that the alternate material will properly perform the function of prime coat material.

14.5.6.2 Tack Coat: The material used for tack coat shall be undiluted Emulsified Asphalt Grades RS-1 or RS-2, unless some other specific material is called for by the approved plans. RS-1 and RS-2 shall be heated to a temperature range of between 140 degrees F and 180 degrees F. RS-1 may be modified by the addition of up to 3% naphtha during the winter months to improve handling of the material.

14.5.6.3 Tack Coat Required: A tack coat, as specified in 5.6.2, will be required on the following surfaces:

- a. Between hot bituminous base courses and surface courses.
- b. On primed bases which have become excessively dirty and cannot be cleaned.
- c. In areas where the prime coat has cured to the extent that it has lost bonding effect.
- d. On old pavements to be patched or leveled.

14.5.6.4 Tack Coat Optional: A tack coat will be required on the following surfaces only when so directed by the Engineer of Record:

- a. Freshly primed bases.
- b. Surface treatment.
- c. Other surfaces shown on the approved plans.

14.5.7 Preparation of Application Surfaces

14.5.7.1 Cleaning: Prior to the laying of the mixture, the surface of the base of pavement to be covered shall be cleaned of all loose and deleterious material by the use of power brooms, supplemented by hand brooming as necessary.

14.5.7.2 Patching and Leveling Courses: Where a surface course is constructed on an existing pavement or old base which is irregular, and wherever so indicated in the approved plans, the existing surface shall be brought to proper grade and cross section by the application of patching or leveling courses.

14.5.7.3 Application Over Surface Treatment: Where a surface course is to be placed over a newly constructed surface treatment, all loose material shall be swept from the paving area and disposed of by the Contractor.

14.5.7.4 Coating Surfaces of Contacting Structures: All structures which will be in actual contact with the asphalt mixture, with the exception of the vertical faces of existing pavements and curbs or curb and gutter, shall be provided with a uniform coating of asphalt cement to provide a closely bonded, watertight joint.

14.5.8 Placing Mixture

14.5.8.1 Requirements Applicable to All Types:

- a. Alignment of Edges: All asphaltic concrete mixtures (including leveling courses), other than adjacent to curb and gutter or other true edges, shall be laid by the string line method, to assure obtaining an accurate, uniform alignment of the pavement edge.
- b. Temperature of Spreading: The temperature of the mixture at the time of spreading shall be within 25 degrees F of the temperature set by the Engineer of Record, which temperature shall be between 270 degrees F and 350 degrees F, unless otherwise directed.

- c. Rain and Surface Conditions: Any mixture caught in transit by sudden rain may be laid only at the Contractor's risk. Should such mixture prove unsatisfactory, it shall be removed and replaced with satisfactory mixture at the Contractor's expense. In no case shall the mixture be laid while rain is falling or when there is water on the surface to be covered.
- d. Number of Crews Required: For each paving machine being operated, the Contractor will be required to use a separate crew, each crew operating as a full unit.
- e. Checking Depth of Layer: The depth of each layer shall be checked at frequent intervals, not to exceed 25 feet. Any deviation from the required thickness, in excess of the allowable tolerance, shall be immediately corrected.
- f. Hand spreading: In limited areas where the use of the spreader is impossible or impracticable, the mixture may be spread and finished by hand.
- g. Straight-edging and Back-patching: straight-edging and back-patching shall be done after initial compaction has been obtained and while the material is still hot.

14.5.8.2 Requirements Applicable Only to Surface Courses

- a. Spreading and Finishing: Upon arrival, the mixture shall be dumped into the approved mechanical spreader and immediately spread and struck-off to the full width required, and to such loose depth for each course that, when the work is completed, the required weight of mixture per square yard, or the specified thickness, will be obtained. An excess amount of mixture shall be carried ahead of the screed at all times. Hand raking shall be done behind the machine as required.
- b. Thickness of Layers: Where a surface course is to be constructed to a thickness greater than two inches, it shall be constructed in approximately equal layers and no layer shall be more than two inches in thickness when compacted. Each layer shall be thoroughly compacted and shall conform to the requirements of these specifications before an additional layer is placed.
- c. Laying Width: If necessary due to traffic requirements, the mixture shall be laid in strips in such manner as to provide for the passage of traffic. Where the road is closed to traffic, the mixture may be laid to the full width, by machines traveling in echelon.
- d. Correcting Defects: Before any rolling is started the surface shall be checked, any irregularities adjusted, and all drippings, fat sandy accumulations from the screed, and fat spots from any source shall be removed and replaced with satisfactory material. No skin

patching shall be done. When a depression is to be corrected while the mixture is hot, the surface shall be well scarified before the addition of fresh mixture.

14.5.8.3 Requirements Applicable Only to Leveling Courses

- a. Patching Depressions: Before any leveling course is spread, all depressions in the existing surface more than one inch deep shall be filled by spot patching with leveling course mixture and then thoroughly compacted.
- b. Work Adjacent to Bridge Ends: On resurfacing projects where the roadway joins an existing bridge and where necessary to insure that a bump will not be created by the overlay, before any surfacing is placed adjacent to the bridge, a portion of the existing pavement shall be bladed off, in order that a smooth transition between the new surfacing and the bridge end may be effected.
- c. Spreading Leveling Courses: The leveling shall be placed by the use of a paving machine, in good condition and appropriate for the project to be undertaken. Other types of leveling devices may be used, subject to prior approval by the Engineer of Record, with the concurrence of the Public Works Department.
- d. Rate of Application: When the total amount of leveling course material to be applied exceeds 50 pounds per square yard, it shall be applied in separate courses, with the average spread not to exceed 50 lbs. per square yard. When Type S-III Asphaltic Concrete is used for leveling, the average spread for each leveling course shall not be less than 50 pounds per square, nor more than 75 pounds per square yard. Unless otherwise indicated the quantity shown in the plans for leveling represents an average for the entire job. The rate of application of leveling may be increased or decreased, as necessary, at locations designated by the Engineer of Record. Where widening construction is specified in connection with leveling, the Engineer of Record may require that approximately fifty percent of the leveling be placed prior to the widening operation.
- e. Placing Leveling Over Existing Concrete Pavement: For leveling course to be applied over broken existing concrete pavement (with or without old asphaltic surface), the first course of the leveling shall be placed as soon after the cracking and reseating of the concrete as is practicable, but not later than two days after the cracking operations on any section. The remainder of the surfacing shall follow in the normal sequence of operations.
- f. Removal of Excess Joint Material: Where leveling is placed over concrete pavement or concrete deck-slab bridges, all excess joint filler at the cracks and joints shall be removed flush with the existing concrete prior to placing the leveling course.

14.5.9 Compacting Mixture

14.5.9.1 Provisions Applicable to All Types:

- a. Equipment and Sequence: For each paving or leveling train in operation, the Contractor shall furnish a separate set of rollers, with their operators. The rolling shall be done in the following sequence, with the equipment as shown, unless otherwise permitted by the Engineer of Record, with the concurrence of the Public Works Department.
 - (1) Seal rolling, using tandem steel rollers weighing 5 to 12 tons, and following as close behind the spreaders as is possible without pick-up, undue displacement or blistering of the material.
 - (2) Rolling with self propelled pneumatic-tired rollers, following as close behind the seal rolling as the mix will permit. The roller shall cover every portion of the surface with at least five passes.
 - (3) Final rolling with the 5 to 12 ton tandem steel rollers, to be done after the seal rolling and pneumatic-tired rolling have been completed, but before the pavement temperature has dropped below 175 degrees F.
- b. Compaction at Crossovers, Intersection, etc: When a separate paving machine is being used to pave the crossovers, the compaction of the crossovers may be done by one 5 to 10 ton tandem steel roller. If crossovers, intersections and acceleration and deceleration lanes are placed with the main run of paving, a traffic roller shall also be used in the compaction of these areas.

14.5.9.2 Rolling Procedures

The initial rolling shall be longitudinal. When the lane being placed is adjacent to a previously placed lane, the center joint shall be pinched or rolled, prior to the rolling of the rest of the lane.

After the rolling or pinching of the center joint, the rolling shall continue across the mat by overlapping each previous roller path by at least one-half the width of the roller wheel. The motion of the roller shall be slow enough to avoid displacement of the mixture, and any displacement shall be corrected at once by the use of rakes, and the addition of fresh mixture if required. Final rolling shall be continued until all roller marks are eliminated.

- a. Speed of Rolling: Rolling with the self-propelled, pneumatic-tired rollers shall proceed at a speed of 6 to 10 miles per hour, and the area covered by each roller shall not be more than 4,000 square yards per

hour, except that for Type S Asphaltic Concrete, this maximum rate of coverage shall be 3,000 square yards per hour.

- b. Number of Pneumatic tired Rollers Required: A sufficient number of self-propelled pneumatic-tired rollers shall be used to assure that the rolling of the surface for the required number of passes will not delay any other phase of the laying operation nor result in excessive cooling of the mixture before the rolling is complete. In the event that the rolling falls behind, the laying operation shall be discontinued until the rolling operations are sufficiently caught up.
- c. Compaction of Areas Inaccessible to Rollers: Areas which are inaccessible to a roller (such as areas adjacent to curbs, headers, gutters, bridges, manholes, etc.,) shall be compacted by the use of hand tamps or other satisfactory means.
- d. Rolling Patching and Leveling Courses: Self-propelled pneumatic-tired rollers shall be used for the rolling of all patching and leveling courses.
- e. Correcting Defects: The rollers shall not be allowed to deposit gasoline, oil or grease onto the pavement, and any areas damaged by such deposits shall be removed and replaced as directed by the Engineer of Record. While rolling is in progress, the surface shall be tested continuously and all discrepancies corrected to comply with the surface requirements. All drippings, fat or lean areas and defective construction of any description shall be removed and replaced. Depressions which develop before the completion of the rolling, shall be remedied by loosening the mixture and adding new mixture to bring the depressions to a true surface. Should any depression remain after the final compaction has been obtained, the full depth of the mixture shall be removed and replaced with sufficient new mixture to form a true and even surface. All high spots, high joints and honeycomb shall be corrected as directed by the Engineer of Record. Any mixture remaining unbonded after rolling shall be removed and replaced. Any mixture which becomes loose or broken, mixed or coated with dirt or in any way defective, prior to laying the wearing course, shall be removed and replaced with fresh mixture, which shall be immediately compacted to conform with the surrounding area. Areas of defective surface may be repaired by the use of indirect heat. No method of repair involving open-flame heaters shall be used.
- f. Provisions Applicable to Shoulder Pavement Only: Shoulder pavements wider than three feet shall be compacted by the use of equipment of the type required for other asphaltic concrete pavements. Compaction of asphaltic concrete three feet or less in width, shall be done by the use of tandem steel rollers not exceeding 12 tons in weight. Other compaction in such restricted widths shall be by the use of any type of rubber-tired equipment the Contractor may elect to use, approved by the Engineer of Record, with the concurrence of the Public Works Department.

14.5.9.3 Density Required for Asphaltic Concrete Pavement: After final compaction, the density shall be at least 96% of the laboratory compacted density of the paving mixture for that day's production.

14.5.10 Joints

14.5.10.1 Transverse Joints: Placing of the mixture shall be as continuous as possible and the roller shall not pass over the unprotected end of the freshly laid mixture except when the laying operation is to be discontinued long enough to permit the mixture to become chilled. When the laying operation is thus interrupted, a transverse joint shall be constructed by cutting back on the previous run to expose the full depth of the mat.

14.5.10.2 Longitudinal Joints: Where only a portion of the width of pavement is to be laid and opened to traffic, longitudinal joints shall be formed by rolling the exposed edge of the strip first laid. When the adjacent strip is constructed, the Engineer of Record may require the edge of the mixture in place to be trimmed back to expose an unsealed or granular vertical surface. Where the strip first laid is closed to traffic, the edge shall not be sealed but shall be left vertical and the adjacent strip placed against it without trimming.

14.5.10.3 General: When fresh mixture is laid against the exposed edges of joints (trimmed or formed as provided above), it shall be placed in close contact with the exposed edge so that an even, well-compacted joint will be produced after rolling.

14.5.11 Surface Requirements

14.5.11.1 Checking with Rolling Straightedge: The final surface course of all pavements will be required to be checked by the rolling straightedge, in accordance with the following provisions. As soon as the rolling has been completed and the surface has hardened sufficiently to be walked on, the entire surface shall be checked with a rolling straightedge, set to indicate any surface irregularities in excess of 3/16 inch. The rolling straightedge shall have an effective length of 15 feet and its design shall meet the approval of the Engineer of Record. The rolling straightedge and labor for its operation shall be supplied by the Contractor. The straightedge shall be applied in lines parallel to the centerline, at least twice for each pass of the spreader. Straight-edging shall be extended across all joints. Any irregularities in excess of 3/16 inch shall be corrected by removing and replacing the defective sections or by overlaying with surface material, as directed by the Engineer of Record. Straight-edging of paved shoulders will not be required unless so directed by the Engineer of Record.

14.5.11.2 Manual Straightedge: A 15-foot manual straightedge shall be furnished by the Contractor and shall be available at all times on the work. The Contractor shall designate an employee whose duty it is to handle the straightedge in checking the compacted surfaces under the direction of the

Engineer of Record, or if requested by a representative of the Public Works Department.

14.5.11.3 Permissible Variations from True Surface: The finished surface shall not vary more than 3/16 inch from the straightedge applied parallel to the centerline of the pavement. Any surface irregularities exceeding such limits shall be corrected in accordance with the requirements.

14.5.11.4 Texture of Finished Surface: The finished surface shall be of uniform texture and compaction. The surface shall have no pulled, torn or loosened portions, and shall be free of sand streaks, sand spots or ripples. These requirements shall also apply to any areas where it is necessary to apply hand work.

14.5.11.5 Any areas in which the surface does not meet the above requirements for texture, sand streaks, ripples, pulled or loosened portions, or for uniformity of compaction; or does not meet the straight-edging requirements, shall be corrected at the Contractor's expense. Such corrections may be made either by replacing the surface course (to full depth) or by overlaying with the type of asphaltic concrete mixture being placed. Within the longitudinal limits where such defective areas occur, such corrections shall be made for the full width of the roadway and for longitudinal distances in both directions beyond such defective areas in accordance with the following:

- (a) If the correction is made by replacing of the full thickness, it shall extend to at least 50 feet each side of the defective area.
- (b) If the Contractor elects to effect the correction by overlaying, the overlay shall consist of at least 100 pounds of mixture per square yard, at the defective section and shall taper uniformly down from the full thickness of such weight, to zero thickness, feathered, at the end of a minimum length of 50 feet each side of the defective area.
- (c) The transverse thickness at any section shall be such as to provide the design cross section.

14.5.12 Protection of Finished surface: Sections of newly compacted asphaltic concrete which are to be covered by additional courses shall be kept clean until the successive course is laid.

Upon completion of the finished pavement, no dumping of any material directly on the pavement will be permitted. When shoulders are constructed after completion of the final surface, blade graders operating adjacent to the pavement during shoulder construction shall have a two inch by eight inch (or larger) board (or other attachment providing essentially the same results) attached to their blades in such manner that it extends below the blade edge, in order to protect the pavement surface from damage by the grader blade. Vehicular traffic shall not be permitted on any pavement which has not set sufficiently to prevent rutting or other distortion.

14.5.13 Other Requirements: All requirements outlined above may be supplemented by, substituted for or modified by the Florida Department of Transportation "Standard Specifications for Road and Bridge Construction," latest edition, at the discretion of the Engineer of Record, with the concurrence of the Public Works Director.
