Section 1 – New Construction Projects (Design and Construction)

A. GENERAL

a. All publically dedicated streets, roadways, collectors, or arterials, under the jurisdiction of the City of Tallahassee ("CITY") and within the city limits, which are to be constructed or improved using a flexible pavement shall conform to the requirements herein.
b. The Florida Department of Transportation's ("FDOT"), *Flexible Pavement Design Manual (Document No. 625-010-002-g)* is included in this Standard by reference.
c. The FDOT Standard Specifications for Road and Bridge Construction, latest edition is included in this Standard by reference.
d. FDOT Design Standard Indexes are included in this Standard by reference.

B. DEFINITIONS

a. Friction Course
    i. The friction course is the top layer of asphalt pavement and shall be FC-9.5 and meet the requirements of the FDOT SPECIFICATIONS.
    ii. Friction course asphalt shall only be used at the direction of the City Engineer ("ENGINEER").
b. Structural Asphalt
    i. Structural asphalt shall consist of either SP-9.5 or SP-12.5 and meet the requirements of the FDOT SPECIFICATIONS.
    ii. All structural courses shall be either Traffic Level B or Traffic Level C.
    iii. The minimum lift thickness for SP-9.5 shall be 1 inch.
    iv. The minimum lift thickness for SP-12.5 shall be 1.5 inches.
c. Base Course
    i. The base course shall consist of crushed limerock (LBR 100) or alternative materials approved by the ENGINEER, and meet the requirements of the FDOT SPECIFICATIONS.
d. Subgrade
    i. The subgrade course shall consist of 12 inches of Type B stabilized materials (LBR 40) and meet the requirements of the FDOT SPECIFICATIONS.

C. DESIGN METHODOLOGY AND VARIABLES

a. The design methodology for determining flexible pavement thickness on CITY projects shall follow the AASHTO design guidelines as shown and modified by the FDOT *Flexible Pavement Design Manual.*
b. A design period of 20 years shall be used for all CITY projects.
c. Values for design variables to be used on CITY projects:
    i. AADT Annual Growth Rate = 3%
    ii. % Trucks (T24)
        1. Local Streets = 2%
        2. Minor Collectors = 3%
        3. Major Collectors = 4%
        4. Minor Arterials = 4%
        5. Major Arterials = 5%
    iii. Equivalency Factors (E18) = 0.89
    iv. Resilient Modulus (MR psi) = 8,000 psi – 10,000 psi (or as determined by laboratory testing as detailed in the FDOT *Flexible Pavement Design Manual)*

v. % Reliability (%R)
   1. Local Streets = 80
   2. Minor/Major Collectors = 85
   3. Minor/Major Arterials = 90

vi. Alternative values for the design variables listed above shall only be used with approval from the ENGINEER.

d. Design constants and variables not specifically defined in this Standard shall use the values in the FDOT *Flexible Pavement Design Manual.*

D. STANDARD TYPICAL SECTIONS

a. Standard typical sections with minimum layer thickness are defined for local streets, minor and major collectors, and minor and major arterials.

b. The standard typical sections shown in Table D-1 may be used on CITY projects and as directed by the ENGINEER.

c. The standard typical sections shown in Table D-1 are not applicable to roundabouts or other special cases as defined by the ENGINEER.
   i. For flexible pavement design for roundabouts refer to Section F of this Standard.
   ii. For other special cases as directed by the ENGINEER refer to Section E of this Standard.

d. Table D-1 – Standard Typical Sections:

Table D-1 Standard Typical Sections	Local Streets	Minor Collectors	Major Collectors	Minor Arterials	Major Arterials
Max. Design AADT	2500	6500	14,500	19,500	25,000
Max. Design ESAL	250,000	800,000	2.5M	3M	4.5M
Min. Design Structural No.	2.4	2.99	3.61	3.88	4.13
Min. Subgrade Thickness – Type B Stabilization	12”	12”	12”	12”	12”
Min. Base Thickness – Limerock Base[1]	6”	6”	8”	8”	8”
Min. Asphalt Thickness – (Structural + Friction[2])	2”	2.5”	3”	3.5”	4”

Note 1: Minimum base thickness may change if an approved alternative material is used.
Note 2: Refer to Section (B)(a)(ii) for use of friction course in pavement thickness calculations.

E. ALTERNATIVE THICKNESS DESIGN

a. An alternative flexible pavement design may be submitted for approval by the ENGINEER for use on CITY projects.

b. Alternative flexible pavement designs submitted for review by ENGINEER shall meet all of the applicable requirements of this Standard and the FDOT *Flexible Pavement Design Manual.*

c. A traffic study may be required for a design submitted in accordance with this Article.

d. The designs shall be prepared by a registered Professional Engineer in the State of Florida.

F. ROUNDABOUT PAVEMENT DESIGN

a. A flexible pavement design shall be submitted for approval by the ENGINEER for all CITY roundabout projects.

b. A traffic study may be required for a design submitted in accordance with this Article.

c. All CITY design variables listed in Section C apply to roundabouts with the exception of % Reliability (%R).
    i. A value of 95 shall be used for all roundabouts on all roadway classes for CITY projects.
d. The designs shall be prepared by a registered Professional Engineer in the State of Florida.

G. CONSTRUCTION OF NEW FLEXIBLE PAVEMENTS

a. Construction of new projects shall be in accordance with any project specific plans, specifications, special provisions, etc.
b. Type B stabilization shall be constructed in accordance with FDOT Standard Specification Section 160 unless otherwise superseded by a CITY standard and/or specification.
c. Limerock base or approved equal shall be constructed in accordance with FDOT Standard Specification Section 285 unless otherwise superseded by a CITY standard and/or specification.
d. Asphalt pavement shall be constructed in accordance with FDOT Standard Specification Section 330 and 334 unless otherwise superseded by a CITY standard and/or specification.

Section 2 – Rehabilitation Projects (Design and Construction)

A. GENERAL

a. All publically dedicated streets, roadways, collectors, or arterials, under the jurisdiction of the CITY and within the city limits, which are to be rehabilitated using a flexible pavement, shall conform to the requirements herein.
b. A rehabilitation project is defined for the purposes of this Standard as one in which the existing sub-grade and/or base remains and only the asphalt pavement is rehabilitated.

B. EXISTING SUB-GRADE / BASE

a. Due to variation in the roadway sub-grade and/or base, it may be necessary to obtain information about the existing roadway typical section. Obtain information about the condition of the existing sub-grade and/or base either by non-destructive testing methods outlined in Section 6.3.1 of the FDOT *Flexible Pavement Design Manual or* through pavement cores.
b. Use information obtained by either method to determine the project specific Resilient Modulus (Mr).

C. EVALUATION OF THE EXISTING ROADWAY

a. Obtain the current roadway inspection survey and Overall Condition Index (OCI) for the project from the ENGINEER. This information coupled with the specific roadway distresses obtained from the survey need to be reviewed prior to determining the rehabilitation methodology.
b. Any data collected from field visits needs to be considered in evaluation of the rehabilitation methodology.
c. Any historical maintenance, construction, or other information should be reviewed prior to making any rehabilitation recommendations.
d. Physical roadway characteristic, such as the presence of curb and gutter, roadway overbuild, cross slope, etc. need to be considered in selecting a rehabilitation methodology.

D. DETERMINATION OF THE REQUIRED STRUCTURAL NUMBER (SNr)

a. Use Chapter 6 of the DOT *Flexible Pavement Design Manual* for all rehabilitation structural number calculations.

E. SELECTION OF THE REHABILIATION TECHNIQUE

a. The type of roadway rehabilitation needs to be determined based on the result of the evaluation of the existing roadway (Section C) and the required rehabilitation structural number obtained in Section D.

b. Rehabilitation may include either an asphalt overlay with no milling of the existing pavement or an asphalt overlay after milling of the existing asphalt pavement. The thickness of any milling and/or asphalt overlay will vary depending on the project specific conditions. Suggested minimum thickness for asphalt overlays for standard roadway functional classes have been provided in Table I-1.

c. The rehabilitation methodology for all projects shall be approved by the ENGINEER.

F. SPECIAL CONSIDERATIONS FOR ALL REHABILIATION PROJECTS

a. At the completion of the project, roadway cross slopes, with the exception of intersections and super-elevated locations, shall not be less than 2.0% nor be greater than 4.0% unless otherwise approved by the ENGINEER.

b. Any areas of the sub-grade and/or base that are not firm and unyielding at the completion of the milling shall be undercut a minimum of 18 inches below the top of the sub-grade and/or base and backfilled as directed by the ENGINEER.

c. Side road transitions shall extend a minimum of 50 feet beyond the end of the curb return.

d. Transitions at alleys, turnouts, and/or driveways shall be constructed as directed by the ENGINEER.

G. SPECIAL CONSIDERATIONS FOR ROADWAYS WITH CURB AND GUTTER

a. All roadway overbuild (depth of pavement above the lip of the curb) shall be removed as part of the rehabilitation project.

b. Milling depths shall be measured from the lip of the curb and not the existing asphalt pavement. Example: a 2.5 inch milling depth is required on a roadway with a 2 inch overbuild as measured above the lip of the curb, therefore the total milling depth is 4.5 inches.

c. Roadway overbuilds constructed as part of the rehabilitation project shall not exceed 1.0 inches above the lip of the curb unless approved by the ENGINEER.

H. SPECIAL CONSIDERATIONS FOR ROADWAYS WITHOUT CURB AND GUTTER

a. All drop-offs at the edge of pavement created as a result of the overlay need to be corrected as directed by the ENGINEER.

I. STANDARD TYPICAL SECTIONS

a. Standard typical sections for the minimum asphalt thickness for two cases are provided below; (1) roadways with an existing base course and (2) roadways without a base course.

b. The standard typical sections shown in Table I-1 shall be used on CITY projects and as directed by the ENGINEER.

c. Table I-1 – Standard Typical Sections:

Table I-1 Standard Typical Sections	Local Streets	Minor Collectors	Major Collectors	Minor Arterials	Major Arterials
Min. Asphalt Thickness (w/ Base Layer)	2”	2.5”	3”	3.5”	4”
Min. Asphalt Thickness (w/o Base Layer)	3”	3.5”	4”	Note 1	Note 1

Note 1: As directed by the ENGINEER.

J. CONSTRUCTION OF REHABILITATION PROJECTS

a. Construction of rehabilitation projects shall be in accordance with any project specific plans, specifications, special provisions, etc.
b. All milling of existing asphalt pavement shall be in accordance with FDOT Standard Specification Section 327 unless otherwise superseded by a CITY standard and/or specification.
c. The asphalt pavement shall be constructed in accordance with FDOT Standard Specification Section 330 and 334 unless otherwise superseded by a CITY standard and/or specification.

Section 3 – Repair of Utility Cuts and Trenches

A. GENERAL

a. All publicly dedicated streets, roadways, collectors, or arterials, under the jurisdiction of the CITY and within the city limits, which are patched as a result of a repair, utility cut, or utility trench shall conform to the requirements herein.
b. A utility cut is defined as an isolated repair or a group of repairs in close proximity. A utility trench cut is defined as a repair that extends more than 50 feet parallel to the direction of the roadway.
c. Where not specifically covered herein, the work will otherwise comply with the requirements of the FDOT Standard Specifications and/or Design Standards.
d. Longitudinal saw-cut lines shall coincide with either a centerline joint, edge line joint, or mid-lane point. Longitudinal saw-cut lines shall not be permitted in the wheel path.

B. BACKFILL

a. The excavation shall be protected at all times from surface run-off.
b. Place select backfill (as defined by the FDOT Design Standards) in horizontal uniform layers compatible with the compaction equipment used. Bring each layer up uniformly and thoroughly compact using pneumatic or other approved mechanical compaction methods.
c. The select backfill shall be compacted in 6 inch layers unless otherwise approved by the Engineer.
d. Compaction of select backfill shall be at optimum moisture content and continue until its in-situ, dry density is not less than 100 percent of the its maximum laboratory dry density. Maximum laboratory density shall be determined in accordance with AASHTO T-99 Method of Test.

e. The top 12 inches of select backfill shall be designated as stabilized sub-grade. This shall be the 12 inches immediately below the bottom of the existing base or proposed base (thickness as required by Table D-1) for roadways without a base course. The minimum LBR value shall be 40 and this layer shall be compacted in accordance with Section 160 of the FDOT Standard Specifications.

C. BASE COURSE

a. The base course shall be constructed with new material of equal or better quality than that which was removed.
b. The base course shall be constructed using limerock that meets the requirements of the FDOT Standard Specifications Section 285 unless otherwise directed by the ENGINEER.
c. For roadways without a base course, the thickness of the base layer constructed shall meet the requirements of Table D-1 (see Section 1(D)(d) Table D – Standard Typical Sections) unless otherwise directed by the Engineer.
d. For roadways with an existing base course, the thickness of the base layer constructed shall meet the requirements of Table D-1 (see Section 1(D)(d) Table D – Standard Typical Sections) unless otherwise directed by the Engineer.

D. ASPHALT PAVEMENT

a. The asphalt pavement used to patch utility cuts and/or utility trench cuts shall meet the requirements of this Standard as well the requirements of Section 330 and 334 of the FDOT Standard Specifications.
b. The thickness of the asphalt used to patch utility cuts and/or utility trench cuts shall meet the requirements of Table D-1 unless otherwise directed by the ENGINEER.

E. MILLING AND RESURFACING OF UTILITY CUTS OR UTILITY TRENCH CUTS

a. Milling and resurfacing will be required for utility cuts and/or utility trench cuts that meet any of the following requirements:
    i. If the total patch area is greater than 400 SF, either measured for a single patch or a group of patches in close proximity.
    ii. If the length of a utility trench cut extends more than 50 feet longitudinally.
    iii. If the utility cut or utility trench cut extends beyond the centerline or lane line.
    iv. If the roadway has been resurfaced, constructed, or reconstructed within 5 years.
b. Milling and resurfacing shall begin 25 feet prior to and extend 25 beyond the utility cut and/or utility trench cut.
c. Milling and resurfacing shall be the entire width of the lane unless the utility cut and/or utility trench cut satisfies E(a)(iii) then the milling will be either the entire width of the roadway (edge of pavement to edge of pavement) or the full width of both lanes affected by the utility cut and/or utility trench cut.
d. Milling depth shall be 1.5 inches below the lip of the curb and the resurfacing shall match the existing pavement and cross slope.
e. Transitions at alleys, turnouts, and/or driveways shall be as directed by the ENGINEER.
f. Milling and resurfacing at intersections shall be as directed by the ENGINEER.
g. Milling and resurfacing shall be performed at a minimum of 30 days after the initial repair of the utility cut and/or utility trench cut.