Florida Department of TRANSPORTATION

Overview of Florida Asphalt Pavements

2019 Southeastern States Pavement Conference

Mary Jane Hayden, P.E.
Pavement Design Engineer

Overview

- Florida Facts
- Pavement Design History
- Factors Contributing to Durability
- Example

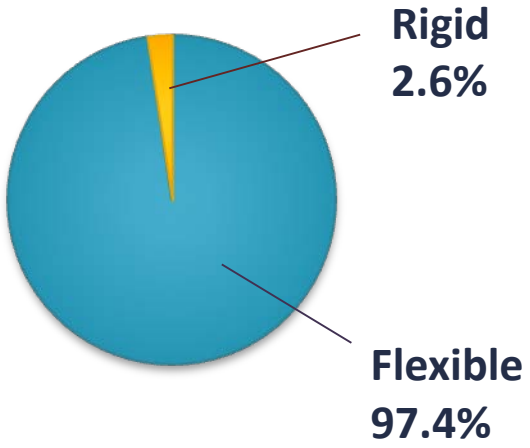
Florida

- Nickname: Sunshine State
- Capital: Tallahassee
- Counties: 67
- 2018 Population: 21,299,325
  - 3rd most populous state
  - > 100 people move here every day
  - 20% of population is over 65 years old
- 14 million registered vehicles
- Known For: Sunshine, Heat, Oranges, Hurricanes, Space Shuttles, Beaches, Theme Parks, Race Cars
- 127 million visitors in 2018

Florida's State Roads

Total Lane Miles: 44,500
(Flexible and Rigid Combined)

- As of 2019:
  - Arterials – 33,700 lane miles
  - Interstate – 8,500 lane miles
  - Turnpike – 2,300 lane miles
- Of those miles:
  - Rigid – 1,200 lane miles
  - Flexible – 43,300 lane miles



FDOT Pavement Design Background

- **1960's** – Hubbard-Field mix design
- **1970** – Marshall mix design

- **1980's** – FDOT Milling & Resurfacing Program Introduced
- **1990's** – Superpave mix design

Benefits Resulting from Superpave

- Improved Specifications
  - Stronger, more rut resistant mixes
    - Better Aggregate
    - Less Sand
    - Better Binders
  - Mixture Consistency
    - 9.5 mm
    - 12.5 mm
    - 19.0 mm

Friction Courses

- Highway Safety Act of 1966
  - 1967, FHWA required high skid resistance
- FDOT developed several wearing courses, finalized in 1975
- Meanwhile… FHWA published new guidelines in 1974 for Open Graded Friction Course

Friction Courses

- 1979: FC-2 Open Graded Friction Course

- 1998, FDOT began development of FC-5
  - Based on GDOT's D-Modified OGFC
- 2000, FDOT Specs for FC-5 were finalized & implemented

Other Factors

- Demand for Quality:
  - Contractor Quality Control (CQC) Specs
  - Construction Training and Qualification Program (CTQP)
- Warranty Specifications
- Pavement Management
  - Florida Statute
  - Pavement Condition Survey
- Florida's Geology and Climate

Pavement Condition Survey (PCS)

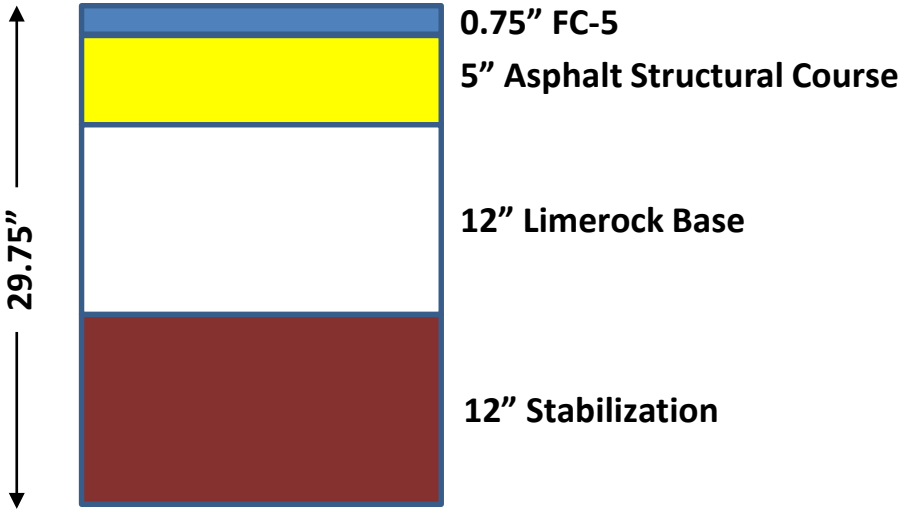
- PCS data has been collected since 1976.
- The PCS rates pavements using three indices:

CRACK **RUT** **RIDE**

- The rating scale for the PCS is from 0 (worst) to 10 (best).
- A rating under 6.5 in most cases is considered deficient.
- Since 2006 FDOT has surpassed the 80 % performance standard per Florida Statute.
- Averages: OGFC ~ 15 years; DGFC ~ 20 years

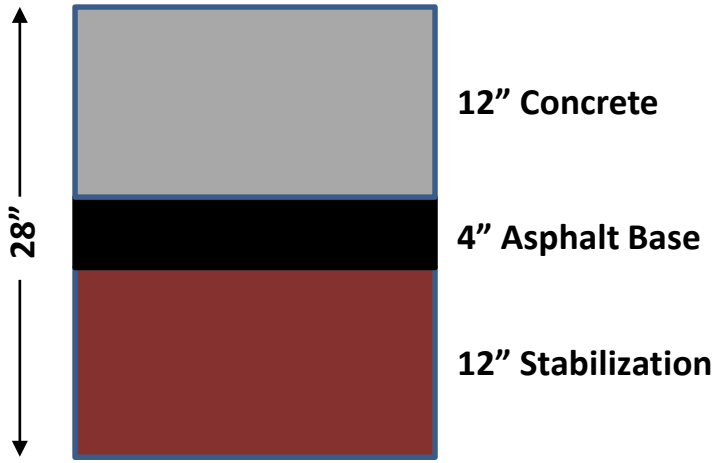
Example: High Volume Pavement Design

Asphalt



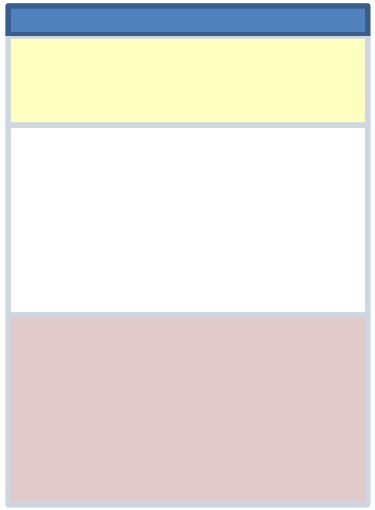
12,000 psi subgrade

Concrete



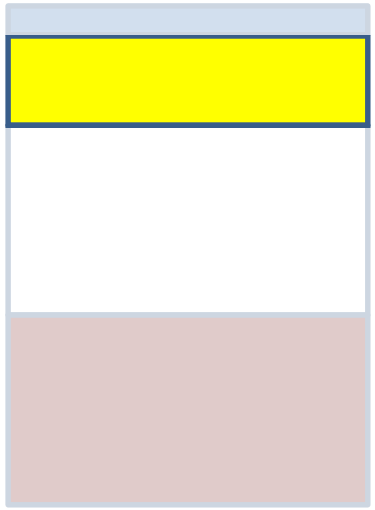
Friction Courses

- Dense Graded
  - FC-9.5
  - FC-12.5
- Open Graded
  - FC-5



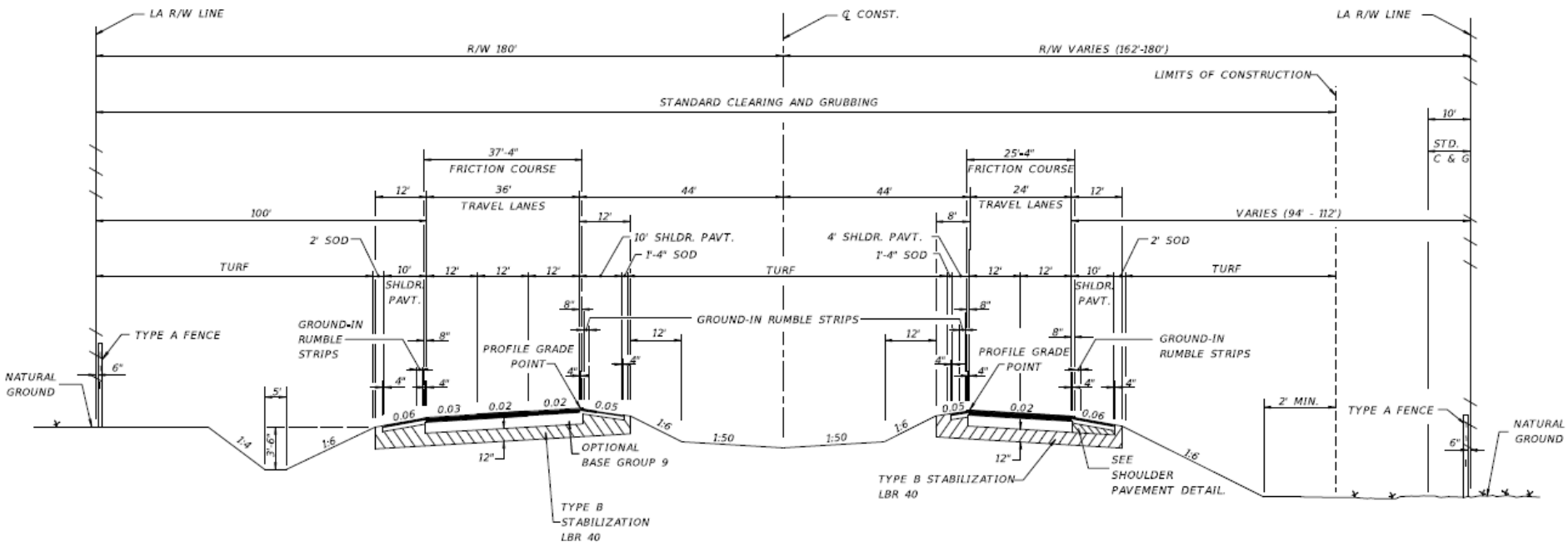
Structural Courses

- Layer Thicknesses
  - SP-9.5: 1” – 1½”
  - SP-12.5: 1½” – 2 ½”
  - SP-19.0: 2” – 4”
- Restricted Uses:
  - SP-9.5:
    - 2 layers max. & only used in top 2 structural layers
    - Not for ESAL > 10 million
  - SP-19.0:
    - Not beneath FC-5



Base Courses

GENERAL USE OPTIONAL BASE GROUPS AND STRUCTURAL NUMBERS (inches)



TYPICAL SECTION
I-10 (SR 8)
STA. 567+25.67 TO STA. 1056+84.35

TRAFFIC DATA

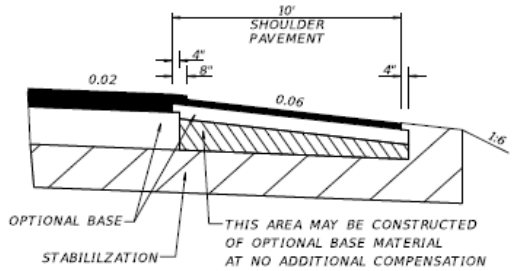
CURRENT YEAR = 2018 AADT = 22300
ESTIMATED OPENING YEAR = 2020 AADT = 23300
ESTIMATED DESIGN YEAR = 2040 AADT = 51500
K = 9 % D = 56 % T = 10 % (24 HOUR)
DESIGN HOUR T = 5 %
DESIGN SPEED = 70 MPH

TRAVEL LANES

OPTIONAL BASE GROUP 9 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (4") AND
FRICTION COURSE FC-5 (¾") (PG 76-22)

SHOULDER PAVEMENT

OPTIONAL BASE GROUP 1 WITH
TYPE SP STRUCTURAL COURSE (TRAFFIC D) (1 ½")



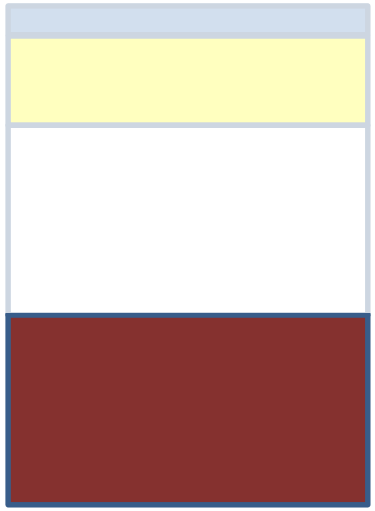
SHOULDER PAVEMENT DETAIL

Exhibit 306-1
4-Lane Limited Access Facility
Date: 1/1/18

15	2.60-2.70	715							9"	7"

Stabilization

- Materials:
  - Limerock, Shell Rock, Cemented Coquina, Shell Base



SECTION 914
STABILIZATION MATERIALS

914-1 General.

This Section governs materials to be used in subgrade stabilization. Meet the following requirements:

Plasticity Index (AASHTO T90)	Maximum 10
Liquid Limit (AASHTO T89)	Maximum 40
Passing a 3-1/2 inch screen (AASHTO T27)	Minimum 97%
LBR	No Requirement

Summary

- Florida Facts
- Pavement Design History
- Factors Contributing to Durability
- Example

Thank you!

Mary Jane Hayden, P.E.
Pavement Design Engineer
MaryJane.Hayden@dot.state.fl.us