DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

INTRADEPARTMENTAL CORRESPONDENCE

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MEMORANDUM

TO: EACH DISTRICT ADMINISTRATOR

EACH ASSISTANT DISTRICT ADMINISTRATOR

MS. SIMONE ARDOIN, P.E.
ROAD DESIGN ADMINISTRATOR

MR. ED WEDGE, P.E.
DOTD DEPUTY ENGINEER ADMINISTRATOR

MR. MASOOD RASOULIAN, P.E.
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MR. RANDAL SANDERS, P.E.
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MR. JEFF LAMBERT, P.E.
PAVEMENT AND GEOTECHNICAL ENGINEER ADMINISTRATOR

FROM: MS. JANICE WILLIAMS, P.E.
DOTD CHIEF ENGINEER

DATE: OCTOBER 16, 2015

SUBJECT: ASPHALT PAVEMENT DESIGN POLICY

This memorandum sets forth current policy and design criteria for Asphalt Pavements in accordance with Part V of the 2006 Louisiana Standard Specifications for Road and Bridges, as amended. This memorandum supersedes the current design policy memorandum, dated September 3, 2010. This policy covers the special provision for Section 501 (Thin Asphaltic Concrete 05-15) and 502 (Superpave Asphaltic Concrete Mixtures 01-11). Exceptions to these requirements will require prior approval of the DOTD Chief Engineer.

JW/CA/ld

Attachment

10/16/15
RECOMMENDED FOR APPROVAL — DATE

RECOMMENDED FOR APPROVAL — DATE

27 OCT 15
RECOMMENDED FOR APPROVAL — DATE

10-29-15
APPROVED — DATE

ASPHALT DESIGN MEMO

1.0 ASPHALT CONCRETE PAVEMENT

1.1 Pavement Design

Submit the proposed typical section(s) and/or design to the Pavement Engineer Manager, along with any additional pavement design information available such as traffic data from Transportation Planning, the subgrade soil survey, and Dynamic Cone Penetration (DCP) results. Mixture selection depends on the pavement thickness, structural design, condition of the existing road, current ADT, and required grade adjustments.

Table 1 - Surface Types and Uses

Section	Surface Type (Est. Life)	Description
501	Thin Asphalt Concrete Applications (10-15 yrs.)	A thin lift, also called a finish course, is ¾" minimum and less than 1 ½" thickness and may be placed on new or existing roadways, which are structurally sound and have no base failures. This item improves friction properties, provides slight improvement for smoothness, seals, and evens out surface defects such as cracking and rutting. Does not correct grade or cross-slope.
502	Asphalt Concrete Mixtures (12-17 yrs.)	To be placed 1 ½" or greater. Asphalt mixtures are appropriate for a wide variety of applications. Provides structure, improves smoothness, seals, evens out surface defects such as cracking and rutting, and provides friction properties.
	Stone Matrix Asphalt (SMA) (15 -20 yrs.)	A wearing course which provides excellent rut resistance and structural support. The higher asphalt cement content ensures durability, crack resistance and resistance to oxidation. Improved friction properties and surface smoothness are expected. It is not conducive to short runs or items that include hand work.
507	Asphalt Surface Treatment (AST) or "chip seal" (5-7 yrs.)	Should be placed on a roadway which is structurally sound, with minimal cracking, rutting and raveling. This material will seal the smaller cracks and improve skid resistance at lowest initial cost. This does not correct grade or cross-slope and will not improve smoothness of the road.
NS-500	Microsurfacing (8-12 yrs.)	A mixture of polymer modified asphalt emulsion, mineral aggregate, mineral filler, water, and other additives, properly proportioned, mixed and spread on a paved surface. It can be used on roadways to correct wheel path rutting and provide friction properties. Use on roads with good existing base. May be used to correct rutting up to 1". Does not correct grade or cross-slope.

1.2.1 Section 501(Thin Asphalt Concrete Applications)

When a thin (less than 1 ½") lift of asphalt concrete is desired, select Section 501 Thin Asphalt Concrete Applications. The pavement minimum design thickness is ¾". The design engineer must consider the existing grade and cross slope when selecting the average thickness design for asphalt pavement applications.

To estimate quantities use 105 lbs/sq. yd. /in. for OGFC and 115 lbs/sq. yd. /in. for dense mix and coarse mix applications.

The Standard Specifications describe the following thin lift mixture types available as limited by the current ADT listed on plans:

Table 2 – Thin Lift < 1 ½"

Thin Lift Application[1]	
Dense Mix	≤ 3500 ADT
Coarse Mix [2]	>3500 ADT or to improve surface friction, (typically lower cost than OGFC)
OGFC[2]	> 3500 ADT and required when thin lift is used on interstate highway system. Improves surface friction and reduces overspray and noise. (typically placed 1" thick for interstates and ¾" for all other roadways)

[1]Tack coat to be paid as a separate item per 501 specifications

[2]OGFC and coarse Mix may be specified for any ADT to improve friction properties.

1.2.2 Section 502 (Asphalt Concrete Mixtures)

For Section 502, the design load level is determined by 20 year equivalent single axle loads (ESALs). Estimate quantities for ton measurement based upon 110 lbs /sq. yd. / in. The total quantity of asphalt mix (Mainline Mixture and Minor Mixture) shall be included.

For projects with borderline ESALs, greater than 15% truck traffic, or posted speed less than 45mph with frequent stops (urban areas), the designer may propose an increase in design load level or the use of SMA wearing course.

1.2.2.1 Mainline Mix

Per specifications, mainline asphalt mixtures include wearing, binder and/or base for travel lanes, ramps > 300', interstate acceleration/deceleration lanes, and turn lanes.

Consider adding a milling item or a leveling quantity when IRI is greater than 170 inches/mile or rutting is greater than 1" as measured in most recent PMS survey.

Table 3 – Mix Levels, ADT and Lift Thickness

	Wearing					Binder		Base
Level	1	1F[1]	2	2F[1]	SMA[2]	1	2	1
20 Yr. ESALs	≤ 3 Million	≤ 3 Million	> 3 Million	> 3 Million	> 3 Million	≤ 3 Million	> 3 Million	N/A
Current ADT	< 7000	> 7000	<7000	7000-35000	> 35000	N/A	N/A	N/A
Constructed Lift Thickness inches	1 ½", 2"					2", 2 ½", 3"		2 ½"+

[1] May specify level 1 or 2 respectively when Coarse mix or OGFC is the final surface.
[2] Required for interstates unless OGFC is the final surface. May specify level 2 when OGFC is the final surface. May specify 2F for short runs or segmented construction.

1.2.2.2 – Section 502 Minor Mixes

Per specifications, Minor mixes include mixtures used for bike path, crossover, curbs, diversion roads, driveways, guardrail widening, islands, joint repair, leveling, medians, parking lanes, parking lots, patching, shoulders, turnouts, widening, miscellaneous handwork, and any other mixture that is not mainline. For minor asphalt mixes, determine the level according to the following table:

Table 4 – Minor Mix Design level Guide

Location	Minimum Design Level
Minor Asphalt Concrete (Base, Binder, and Wearing)	Asphalt Concrete (Do not specify a level)
Shoulder	
Leveling and Slope Correction[1]	
Bike paths, Parking Lanes and Parking Lots	A
Curb	A
Diversion Roads[2]	A
Joint Repair	A
Crossover, Driveways, Guard Rail Widening, Medians, Island, Turnouts[3]	A
Patching	Asphalt Concrete (Do not specify a level)
Widening[4]	

[1] Thickness used for leveling and slope correction shall be from ½" to 2". Use mainline mix types when leveling exceeds 2".
[2] For temporary diversion roads that have ADT>35000, specify as Asphalt Concrete (Level 1F) when the diversion is expected to be in place for at least one year or if over 1 mile long. Otherwise, specify Asphalt Concrete (Level A)
[3] *For turnouts on state routes, do not use minor mix, use appropriate mainline mix.*
[4] If greater than 4' wide use typical roadway section.

1.2.3 Section 507 Asphalt Surface Treatment (AST)

When using asphalt surface treatment, also known as chip seal, select the type and number of applications in accordance with Section 507 and the following table:

Table 5 - Asphalt Surface Treatment

ADT	3000-7000	100-2999	Shoulder	Less Than 100 ADT, other uses	Crack Mitigation Interlayer
Surface Treatment Type	A	B[1]	C	D	E
No. of Application Allowed	1 or 2	1 or 2	1	1, 2 or 3	2

[1] Single Application Type C may be selected for ADT 0-1500 when roads and shoulders are being treated.

The quantities of liquid asphalt material and aggregate incorporated in the completed and accepted asphalt surface treatment will be measured separately. The quantity of aggregate is based on aggregate size. The emulsion and aggregate application rates for estimation and construction are listed in Table 507-1. Note that the aggregate size and the emulsion rate decreases with each application.