



DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT

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TO: EACH DISTRICT ADMINISTRATOR
EACH ASSISTANT DISTRICT ADMINISTRATOR
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FROM: MR. CHRISTOPER P. KNOTTS, P.E.
DOTD CHIEF ENGINEER ADMINISTRATOR
DATE: 12/30/2020
SUBJECT: ASPHALT PAVEMENT DESIGN POLICY

This memorandum sets forth current policy and design criteria for Asphalt Pavements in accordance with Part V of the 2016 Louisiana Standard Specifications for Roads and Bridges, as amended. This memorandum supersedes the current design policy memorandum, dated October 16, 2015. Exceptions to these requirements will require prior approval of the DOTD Chief Engineer.

CK/LC/SC/ads
Attachment

RECOMMENDED FOR APPROVAL DATE
RECOMMENDED FOR APPROVAL DATE
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APPROVED DATE
1/4/2021

# ASPHALT DESIGN MEMO

## ASPHALT CONCRETE PAVEMENT

### Pavement Design

Submit the proposed typical section(s) and/or design to the Geotechnical Section, along with any additional pavement design information available such as traffic data, the subgrade soil survey, and Dynamic Cone Penetration (DCP) results. Mixture selection depends on the pavement thickness, structural design, condition, grade and cross-slope of the existing road, current/projected ADT, and required grade adjustments. Consider the lift thickness allowed in the specifications for the type of mix.

**Table 1 - Surface Types and Uses**

Section	Surface/Mix Type (Est. Life)	Current ADT	Description	
501 Thin Asphalt Concrete	Dense Mix (10-15 yrs.)	<3,500 ADT	Also called a finish course, and is specified as ¾" or 1" thick and may be placed on new or existing roadways, which are structurally sound and have no base failures. This item may improve friction properties, provides slight improvement for smoothness, seals, and evens out surface defects such as cracking and rutting. Cannot correct grade or cross-slope.	Should not be used on milled surfaces. May be used if the surface is Micro-Milled.
	Coarse Mix <sup>1</sup> (10-15 yrs.)	≥3,500 ADT		Should not be used on milled surfaces. May be used if the surface is Micro-Milled.
	OGFC <sup>1</sup> (8-10 yrs.)	≥ 3,500 ADT		Cannot be used on Milled Surfaces. May be used if the surface is Micro-Milled. Required when using 501 as the final surface on Interstate Highway System.
502 Asphalt Concrete	Asphalt Concrete Mixtures (12-17 yrs.)	All ADT	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 may improve friction properties.	
	Stone Matrix Asphalt (SMA) (15 -20 yrs.)	All ADT	A wearing course appropriate for applications requiring added rut resistance and structural support. The higher asphalt cement content ensures durability, crack resistance and resistance to oxidation. Improves friction properties and surface smoothness. It is not conducive to short runs, intersections, or items that include hand work. Required when using 502 as the final surface on Interstate Highway System.	
507 Asphalt Surface Treatment	Chip Seal (5-7 yrs.)	≤7,000 ADT	Should be placed on a roadway, which is structurally sound with minimal cracking, rutting and raveling. This material will seal the smaller cracks and improves friction properties at lowest initial cost. Cannot correct grade or cross-slope and will not improve smoothness of the road.	
	Rejuvenating Scrub Seal (5-7 yrs.)	≤7000 ADT	A rejuvenating asphalt emulsion scrubbed into the cracks and voids via mechanical brooms followed by a uniform application of aggregate improving friction properties, sealing cracks, and reducing the rate of oxidation.	
	Micro-surfacing (NS-500) (8-12 yrs.)	≤7000 ADT	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 may improve friction properties. Use on roads with good existing base. May be used with rutting up to 1". Cannot correct grade or cross-slope.	

<sup>1</sup>May be specified for any ADT to improve friction properties.

## Section 501 (Thin Asphalt Concrete Applications)

For Thin Lift Applications, use the following to estimate quantities:

Dense Mix	115 lbs. /sq. yd. /in.
Coarse Mix	115 lbs. /sq. yd. /in.
OGFC	95 lbs. /sq. yd. /in.

## Section 502 (Asphalt Concrete)

For Superpave, use the following to estimate quantities:

502 Asphalt	110 lbs. /sq. yd. /in.
SMA	110 lbs. /sq. yd. /in.

For Section 502, the design load level (Level 1, 2, or A) is determined by 20 year equivalent single axle loads (ESALs).

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.

## Mainline Mix

Per specifications, mainline asphalt mixtures include wearing, binder and/or base for travel lanes, ramps > 300', turnouts for state routes, interstate acceleration/deceleration lanes, turn lanes, and the two center lanes for airports.

**Table 2 – Mix Levels, ADT and Lift Thickness**

Level	Wearing					Binder		Base
	1	1F <sup>1</sup>	2	2F <sup>1</sup>	SMA <sup>2</sup>	1	2	1
20 Yr. ESALs	≤ 3 Million	≤ 3 Million	> 3 Million	> 3 Million	> 3 Million	≤ 3 Million	> 3 Million	N/A
Current ADT	≤ 7,000	> 7,000	≤ 7,000	7,000-35,000	> 35,000	N/A	N/A	N/A
Lift Thickness	1 ½", 2"					2" - 4"		≥ 2 ½"

<sup>1</sup>Friction coarses (1F or 2F) are not required when Coarse Mix or OGFC is the final surface.

<sup>2</sup>Required for interstates unless OGFC is the final surface. May specify level 2 when OGFC is the final surface. May specify level 2F for short runs or segmented construction.

## Minor Mixes

Per specifications, minor mixes include mixtures used for bike paths, crossovers, curbs, diversion roads, driveways, guardrail widening, islands, joint repair, leveling, medians, parking lanes, parking lots, patching, shoulders, turnouts for non-state routes, ramps ≤ 300', widening, miscellaneous handwork, and any other mixture that is not mainline. For minor asphalt mixes, determine the level according to the following table:

**Table 3 –Minor Mix Design Level Guide**

Location	Minimum Design Level
Bike Paths, Parking Lanes and Parking Lots	A
Curbs	A
Temporary Detour Roads <sup>1</sup>	A
Joint Repair	A
Crossovers, Driveways, Turnouts <sup>2</sup>	A
Guard Rail Widening, Medians, Islands	A
Minor Asphalt Concrete (Base, Binder, and Wearing)	Asphalt Concrete <sup>5</sup>
Shoulder	
Leveling and Slope Correction <sup>3</sup>	
Patching	Asphalt Concrete <sup>5</sup>
Widening <sup>4</sup>	

<sup>1</sup> For temporary detour roads that have ADT>35000, specify as Asphalt Concrete (Level 1F) when the detour is expected to be in place for at least one year or if over 1 mile long. Otherwise, specify Asphalt Concrete (Level A)

<sup>2</sup> For turnouts on state routes, do not use minor mix, use appropriate mainline mix.

<sup>3</sup> Thickness used for leveling and slope correction shall be from ½” to 2”. Use mainline mix types when leveling exceeds 2”.

<sup>4</sup> If greater than 4’ wide use typical roadway section.

<sup>5</sup> Do not specify level

### Section 507 Asphalt Surface Treatment (AST)

When using Asphalt Surface Treatments, such as Chip Seal, Rejuvenating Scrub Seal, or Micro-surfacing, select the type and number of applications in accordance with Section 507, the NS Specifications, and the following tables:

**Table 4 - Chip Seal**

ADT	3000-7000	100-2999	Shoulder	Less Than 100 ADT, other uses	Crack Mitigation Interlayer
Surface Treatment Type	A	B <sup>1</sup>	C	D	E
No. of Applications Allowed	1 or 2	1 or 2	1	1, 2 or 3	2

<sup>1</sup> Single application of Type C may be selected for ADT 0 – 1599 when treating roads and shoulders.

The quantity of aggregate is based on aggregate size. The emulsion and aggregate rates for estimation and construction are listed in Table 507-1 and 507-2. Note that the aggregate size and the emulsion rate decrease with each application.

**Table 5 – Rejuvenating Scrub Seal<sup>1</sup>**

ADT	3000-7000	100-2999	Shoulder	Less Than 100 ADT, other uses
Surface Treatment Type	A	B	C	D
No. of Applications Allowed	1	1	1	1

<sup>1</sup> NS Rejuvenating Scrub Seal (06-19)

**Table 6 – Micro-surfacing<sup>1</sup>**

RUTS AND IRREGULARITIES	< ½”	½” – 1”
Type of Application	Scratch Coat (Full Width)	Rut Filling Spreader Box (5’ – 6’ Width)
No. of Applications Allowed	1	1

<sup>1</sup> NS Micro-Surfacing Aggregate and Micro-Surfacing Asphalt (Polymer Modified Emulsion) (NS500) (06-17)

The quantities of liquid asphalt material and aggregate incorporated in the completed and accepted asphalt surface treatments will be measured separately.