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Roadway

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MEMO TO: Messrs. John Alford, PE and Bob Brown, PE

FROM: Mr. George C. Gibson, PE

DATE: November 23, 1999

SUBJECT: CHANGE IN SUPERPAVE SPECIFICATIONS – **Revision 2**

The NCDOT Superpave mix design special provisions are being updated effective in the January 2000 letting. The quantity calculations for the mixes will remain as they were previously; however, calculations for asphalt binder are affected by this change.

Highlights of the changes are as follows:

Asphalt mix load designations:

Previous loading levels "C" and "D" were combined into "C"
(i.e. any superpave mixes currently shown as "D" should be changed to "C")

Previous loading level "E" is now "D"
(i.e. any superpave mixes currently shown as "E" should be changed to "D")

Base mixes are now as follows:
B-25.0B, B-25.0C, and B-37.5 C

Asphalt binder pay items:

The three grades of asphalt binder used will be paid for separately:

PG 76-22 is used for S12.5D

PG 70-22 is used for **S9.5C, S12.5C** and I19.0D

PG 64-22 is used for all other mixes

Attached is a table listing values to be used in calculating pay quantities.

If you have any questions, please call me at 919-250-4094

Superpave is an acronym for Superior Performing Asphalt Pavements. Superpave is a new mix design method that allows designers to specify asphalt binder and mix requirements to match expected traffic levels. One change in the nomenclature that is important to note is that we now refer to "asphalt cement" (which is by definition an unmodified product) as "asphalt binder" (which may or may not contain modifiers, depending on the specified grade). Because of this change, the "binder layer" is now referred to as the "intermediate layer".

Performance Grading (PG) asphalt designations contain two numbers that indicate the high and low pavement temperatures expected in the field. (i.e. PG 64-22 indicates 64 ^{o}C high and -22 ^{o}C low temperatures). These numbers are modified according to loading level, traffic speed and depth of the layer within the pavement structure. PG 76-22 will contain polymer modifiers, but PG 64-22 and 70-22 typically will not.

The mix name designations are based on surface type, aggregate size and expected loading levels. The first letter designates surface (S), intermediate (I) or base (B) courses. The numbers indicate the nominal maximum aggregate size in millimeters (There is no intent to change this designation to english units). The last letter indicates the level of loading expected on the facility being designed. A higher letter indicates a higher level of loading.

Pay Items and Calculation of Quantities

The Pavement Schedule should read as follows:

Prop. Approx. X.X" Asphalt Concrete Surface Course, Type S9.5X at an average rate of ...
Prop. Approx. X.X" Asphalt Concrete Surface Course, Type S12.5X at an average rate of ...
Prop. Approx. X.X" Asphalt Concrete Intermediate Course, Type I19.0X at an average rate of ...
Prop. Approx. X.X" Asphalt Concrete Base Course, Type B25.0X at an average rate of ...
Prop. Approx. X.X" Asphalt Concrete Base Course, Type B37.5X at an average rate of ...

Pay Items are as follows:

Asphalt Concrete Surface Course, Type S9.5A ..... Ton
Asphalt Concrete Surface Course, Type S9.5B ..... Ton
Asphalt Concrete Surface Course, Type S9.5C ..... Ton

Asphalt Concrete Surface Course, Type S12.5B ..... Ton
Asphalt Concrete Surface Course, Type S12.5C ..... Ton
Asphalt Concrete Surface Course, Type S12.5D ..... Ton

Asphalt Concrete Intermediate Course, Type I19.0B ..... Ton
Asphalt Concrete Intermediate Course, Type I19.0C ..... Ton
Asphalt Concrete Intermediate Course, Type I19.0D ..... Ton

Asphalt Concrete Base Course, Type B25.0B ..... Ton
Asphalt Concrete Base Course, Type B25.0C ..... Ton
Asphalt Concrete Base Course, Type B37.5C ..... Ton

Asphalt Binder for Plant mix, Grade PG 64-22 ..... Ton
Asphalt Binder for Plant mix, Grade PG 70-22 ..... Ton
Asphalt Binder for Plant mix, Grade PG 76-22 ..... Ton

The % and type of Asphalt Binder and densities to be used for calculation of quantities are as follows:

Mix Type	Loading Range (Million ESALs)	% Asphalt Binder	Asphalt Binder Grade	Density Lbs/SY/in	Density Kb/m^2/mm
Surface					
S9.5A	Less than 0.3	6.5	PG 64-22	112	2.40
S9.5B	Less than 3	6.5	PG 64-22	112	2.40
S9.5C	3 to 10	6.5	**PG 70-22**	112	2.40
S12.5B	Less than 3	5.5	PG 64-22	112	2.40
S12.5C	3 to 30	5.5	PG 70-22	112	2.40
S12.5D	Over 30	5.5	PG 76-22	112	2.40
Intermediate					
I19.0B	Less than 3	4.7	PG 64-22	114	2.45
I19.0C	3 to 30	4.7	PG 64-22	114	2.45
I19.0D	Over 30	4.7	PG 70-22	114	2.45
Base					
B25.0B	Less than 3	4.3	PG 64-22	114	2.45
B25.0C	3 or Greater	4.3	PG 64-22	114	2.45
B37.5B	Less than 3	4.3	PG 64-22	114	2.45
B37.5C	3 or Greater	4.3	PG 64-22	114	2.45

The maximum and minimum lift thickness, and normal total layer thickness are as follows:

Mix Type	Metric			English		
	Minimum lift	**Maximum lift**	**Normal total layer**	**Minimum lift**	**Maximum lift**	**Normal total layer**
S9.5X	25	40	50/60	1.0	1.5	2/2.5
S12.5X	35	60	70	1.5	2.25	3
I19.0X	55	110	80	2.25	4.0	3
B25.0X	75	140	-	3.0	5.5	-
B37.5C	115	150	-	4.5	6.0	-

cc:

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