

Superpave is an acronym for Superior Performing Asphalt Pavements. Although the name may imply that SuperPave is a type of asphalt concrete used only on heavily loaded roads, it is just a new mix design procedure like the Marshall method currently in use. The two major components of Superpave are asphalt binder (asphalt cement) specification and asphalt concrete mix design.

Asphalt binder specification

The Superpave asphalt binder selection procedure allows engineers to specify the properties for desired level of performance (i.e. the higher the loads, the higher quality of asphalt binder used). The new designation - Performance Grading (PG) - contains two temperatures: the high and low pavement temperatures expected in the field. The high number relates to rutting resistance, and the low number relates to low temperature cracking. For example, PG64-22 indicates the high temperature expected on the pavement is 64 degrees Celsius and the low temperature expected is -22 degrees Celsius. These numbers may also be adjusted according to loading level and how high the material is within the pavement structure.

Asphalt Concrete Mix design

The most dramatic change in the mixture design is the use of a gyratory compactor that kneads the mix instead of the Marshall drop hammer. The kneading action is more similar to field compaction, and provides better performance prediction from laboratory results. The aggregate structure of SuperPave asphalt concrete is also different, and consequently the mixes have different density and asphalt binder content than current mixes.

Pay Items and Calculation of Quantities

The names of the new mixes have also changed. The first letter of the mix type indicates the type of mix (Surface, Intermediate or Base), the numbers indicate the nominal aggregate size in millimeters, and the letter at the end indicates the level of traffic loading (measured in ESALs) to be used in the mix design process. As an example, an S9.5A is a Surface Mix, with a nominal maximum aggregate size of 9.5 mm and a design loading of less than 0.3 million ESALs that will use PG64-22 Asphalt Binder.

Mix Name	Mix Type	ESAL Range (Millions)	Binder PG Grade
S9.5A	Surface Course	Less than 0.3	64-22
S9.5B	Surface Course	Less than 3	64-22
S9.5C	Surface Course	3 to 10	64-22
S12.5B	Surface Course	Less than 3	64-22
S12.5C	Surface Course	3 to 10	64-22
S12.5D	Surface Course	10 to 30	70-22
S12.5E	Surface Course	Over 30	76-22
I19.0B	Intermediate Course	Less than 3	64-22
I19.0C	Intermediate Course	3 to 10	64-22
I19.0D	Intermediate Course	10 to 30	64-22
I19.0E	Intermediate Course	Over 30	70-22
B25.0	Base Course	All Ranges	64-22
B37.5	Base Course	All Ranges	64-22

Notes: Under these specifications, the term "asphalt binder" replaces the term "asphalt cement". In order to eliminate dual use of the word "binder", the course above the Base Mix and below the Surface Mix has been changed to "Intermediate Mix" rather than "Binder Mix".

There are only two pay items for Asphalt Binder: PG64-22/PG70-22 and PG76-22. This means that only the S12.5E will require a separate pay item for Asphalt Binder.

Calculation of Quantities and Pavement Schedule

The % Asphalt Binder to be used for calculation of quantities is as follows:

Mix Type	% Asphalt
S9.5X	6.5
S12.5X	5.5
I19.0X	4.7
B25.0	4.3
B37.5	4.3

The density used for calculation of quantities is as follows:

Mix Type	Density Lbs/SY/in	Density Kb/m ² /mm
S9.5X	112	2.40
S12.5X	112	2.40
I19.0X	114	2.45
B25.0	114	2.45
B37.5	114	2.45

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 B25.0 at an average rate of ...
- Prop. Approx. X.X" Asphalt Concrete Base Course, Type B37.5 at an average rate of ...

Note: When calculating the rate for any depth of asphalt in metric units, round to the nearest Kg.

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 Surface Course, Type S12.5E 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 Intermediate Course, Type I19.0E Ton
- Asphalt Concrete Base Course, Type B25.0 Ton
- Asphalt Concrete Base Course, Type B37.5 Ton
- Asphalt Binder for Plant mix, Grade PG 64-22 and PG 70-22 Ton
- Asphalt Binder for Plant mix, Grade PG 76-22 Ton

Maximum and Minimum lift thickness:

Mix Type	Metric		English	
	Minimum	Maximum	Minimum	Maximum
S9.5X	25	40	1.0	1.5
S12.5X	35	60	1.5	2.25
I19.0X	55	110	2.25	4.0
B25.0	75	140	3.0	5.5
B37.5	115	150	4.5	6.0

ARCHIVED
FOR REFERENCE ONLY