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BITUMEN ABSORPTION BY SEALING AGGREGATE

1. Recent experience has shown that an adjustment must be made to the rate of application of the bitumen binder when a sealing aggregate having a high capacity for absorbing bitumen is used. This adjustment is necessary to correct for the amount of bitumen absorbed by the aggregate.
2. Those aggregates with a high absorptive capacity are usually derived from calcareous or other porous sedimentary rocks. Typical values for the absorption of bitumen by calcareous aggregates range from 0.8 to 2.2 per cent by dry weight of aggregate. Correction of the calculated binder application rate is necessary when using such materials. Igneous rocks and cherts generally have a low rate of absorption of bitumen (less than 0.3 percent by weight) and no allowance is necessary when these materials are used.
3. Aggregates suspected of having high absorptive characteristics should be sampled and forwarded to Pavements Engineering so that the percentage absorption can be established. Care must be taken to ensure that samples are fully representative of the aggregate to be used. Where the variability of the aggregate is such that a single sample cannot be representative, a number of samples should be submitted.
4. The correct spray rate (adjusted for bitumen absorption by the aggregate) can be determined as follows:

$$\text{Corrected spray rate} = A + (B \times C \times 7) \text{ litres/m}^2 \text{ at } 15^\circ\text{C} \text{ -EQN. (1)}$$

- Where
- | | | |
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| A | = | Application rate of bitumen (litres/square metre) calculated from A.L.D. etc. |
| B | = | Application rate of aggregate tonnes/square metre |
| | = | $\frac{\text{Loose bulk density of aggregate (tonnes/cubic metres)}}{\text{Spread rate of aggregate (square metre/cubic metre)}}$ |
| C | = | % Absorption by dry weight of aggregate (derived from laboratory test). |

5. That portion of the applied bitumen, which is designed to compensate for the amount absorbed by the aggregate, will be absorbed over a period of time. This period will vary in length but must be anticipated in selecting the initial application rate. The total rate as calculated by equation (1) is necessary only at the end of the period of absorption. Where equation (1) yields a rate of application of bitumen, which will result in an excess of bitumen at the road surface (a "fatty" seal) if applied in total initially, the rate must be reduced. The reduction should be such that no initial surface excess will occur. Where necessary the total rate can be achieved by surface enrichment at a later date.
6. This note is only concerned with absorption of bitumen by cover aggregate. The recommended application rate does not include any amount to compensate for absorption by a base material which has an unusually high absorption capacity due either to the mineralogical composition of the base material or due to the presence of surface voids. A separate estimate of this amount must be made and the application rate chosen on the basis of equation (1) modified accordingly to give the initial application rate to be used to compensate both for absorption by surface aggregate and base materials.