SECTION 94 - SURFACE DRESSING

2204. Surface dressing makes an existing surface waterproof and skid-proof. and protects it from abrasion. It will never improve the riding quality of an uneven surface, and it should not be applied to a disintegrated surface.

2205. Existing roads should be treated as soon as possible; surface dressing may double the traffic capacity of water bound roads.

2206. Surface dressing can be applied on:-

(a) All kinds of bituminous construction
(b) Water bound macadam.
(c) Compacted soil, either natural or stabilized.

Binders

2207. General. -Hot binder are recommended. Emulsion can be used (see Para 497), but surfaces dressed with got binder are fit to take traffic much sooner than those treated with emulsion. Rate of application is very important (see Figure 22.1)

2208. Hot binder. -When using hot binder, the general principle is that the greater the anticipated intensity of traffic and the hotter the air temperature, the higher should be the binder viscosity, but if the containers have to be opened on site the upper limit of viscosity, may be restricted by the difficulty of pouring. Recommended grades and spraying temperatures are given in Tables 22.1 and 22.2 and rates of application in Table 22.3.

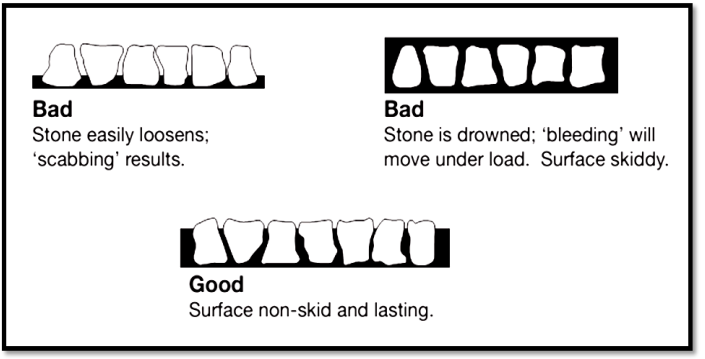

Figure 22-1:Quantity of Binder in Surface Dressing.

2209. Emulsion. - The cold binder method of surface dressing can be used on damp surfaces, but work is liable to be adversely affected by frost or by rain directly after application. Labile (quick breaking) emulsion should be used. Rates of application are given in Table 22.4.

2210. Applications are

a. Hand Application. Hand application of binders is best carried out with spray lances. The skill and experience of the operator play a considerable part in the quality of the finished product. The lance should be rotated in an even circular motion at a constant speed and height above the surface: it should not be swung from side to side as this results in alternate fat and lean streaks. Other methods of hand application, eg pouring can and brush, may be used but these tend to give uneven distribution.

b. Mechanical Application. The majority of binder distribution is carried out with mechanical distributors. Properly used and maintained, mechanical binder distributors are capable of accurate high-quality work. Distributors vary in type and capacity but generally the binder is fed to a spray bar by a pump which feeds at a constant pressure ensuring a constant rate of flow through the spray nozzles. Points to be observed in the mechanical application of binders are given in Military Engineering Volume V, Part 1, Road Design and Construction. In particular, the standard of distribution of the binder must be checked to ensure a correct rate of spread.

Chippings

2211. Chippings should be clean roughly cubical in shape and hard but not brittle. A chipping that can be crushed b y a boot heel is unsuitable. Recommended sizes are given in Table 22.5.Applications of chippings are:

a. **Hand Application**. An even application is essential. When application is by hand shovel, the direction of spread should be along and not across the sprayed section. To even out the spread of chippings, a light brushing with a broom-drag may be beneficial. When hand spreading, it is usually better to apply more stone than is actually required and to sweep off the excess after initial adhesion has taken place. Excess material should be collected and re-used.

b. **Mechanical Application**. Mechanical application may be carried out by equipment varying from a chipping attachment fitted to the rear of a tipper to a towed or self-propelled unit. The width covered by such spreaders should be adjustable and be capable of covering the full width sprayed by the binder distributor in a single pass. Mechanical application of chippings is described in Military Engineering Volume V, Part 1, Road Design and Construction.

Procedure

2212. Surface dressing procedure is summarized in Table 22.6.

2213. Coating agent. -There is no way of improving adhesion between hot binder and a damp surface, but coating agents improve adhesion between hot binder and damp chippings. They are applied before spreading, preferably to the stone, alternatively by spraying the binder film. Thebest-known coating agents are:

a. CPB (cetyl pyridinium bromide).-Use 4 per cent by weight of creosote oil containing 10 per cent CPB i.e., a net addition of 0.4 per cent CPB.

b. Aphelia T.-Mix 8 parts of coating agent to 92 parts of light creosote by weight. The quantity of solution used depends upon the type, size and cleanness of the stone chippings, and varies between 0.5 and 2.0 gals per ton.

2214. **Spraying**. Practical points to remember are:

a. Tanker sprayers:

(1) Check the alignment of nozzles and ensure that they procedure even cones of concentration all along the spray-bar.
(2) Cones should overlap so that all points on the surface receive binder from the same number of nozzle, except at the ends of the spray-bar.
(3) When making parallel runs, the outer nozzles should overlap the equivalent are of the adjacent strip.
(4) The vehicle must move at the correct, even speed. The driver should have an assistant to watch the spray.

b. **Hand spraying**. The lance should be swung in a series of fairly wide, overlapping, circular arcs, not from side to side.

c. If boilers and sprayers are not available, bitumen may be heated in open drums, poured from cans or improvised containers and brushed over the surtace.

2215. **Spreading chippings**. Practical points to remember are:

a. Surface drainage may be improved by leaving the outer edges of the road unchipped, so as to form channels.

b. **Mechanical spreaders**. These may be either separate equipments or attachments to a normal vehicles. They give quicker and more even distribution than hand spreading. In either case the driver needs help in maintaining correct speed and rate of distribution.

c. **Hand spreading**. This is done with shovels, usning a sweeping motion. Apply more stone than is required. After initial adhesion of the binder sweep off and collect excess material for re-use.