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MACHINE LAID TRAVEL PLANT EMULSION MIXES

Application and Uses

by

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In the sale and application of our products and services we must set as a goal the production of a pavement that is durable, economical, skid resistant and environmentally acceptable. Toward these goals I want to report to you the contribution that can be made and is being made by machine laid travel plant mixes in our area of the mid-west. Because of the time limitations, I will not be able to discuss here the use of central plant emulsion mixes or central plant cold stockpile mixes. We will, however, cover (1) coarse open graded travel plant mixes and (2) dense graded mix seals or "slurry seal."

Coarse, open grade emulsion mixes mixed and laid with the older Moto-Paver or the new Mix Paver have three main uses in our area:

- 1) Improvement of rural roads and secondary highways by stage construction.
- 2) Correction of extremely "fat" or flushed" pavements, such as overly rich chip seals.
- 3) Construction of a rich "drain seal" to seal and improve the surface of severely distressed and aged pavements.

For thirteen years, Arthur H. Haddad, County Engineer, Miami County, Troy, Ohio, has used a progressive program of stage construction to improve their network of some 450 miles of rural collector and arterial roads. In 1961 much of the mileage was in serious trouble by today's standards. Dust, inadequate base, substandard drainage and unsafe widths were the problem. Roads were patrolled and salt added for stabilization and dust control. The costs of repair, patching, repetitive passes and wasted materials were weighed against the 2:1 strength ratio of a coarse emulsion mix over conventional base construction, the truly flexible nature of the coarse emulsion mix, and the added advantage of

a durable dust free surface. The economics were attractive and the program has proceeded with variations as follows:

Stage 1) Widening, ditching and establishment of base grades utilizing available materials, followed by 200 pounds per square yard of 1" maximum moto-paver emulsion mix. At times trench widening to depths as great as 10" was necessary. This initial application was followed by a conventional emulsion chip seal.

Stage 2) In 2 to 3 years, repair serious base failures and apply 200 pound per square yard 3/4" maximum moto-paver emulsion mix followed by chip seal or slurry seal. Emphasis here is placed on profile correction and strengthening the structure.

Stage 3) In 4 to 5 years apply 80 to 90 pound 3/8" emulsion moto-paver mix and seal with 15 to 18 pound slurry seal.

Stage 4) In 4 to 5 years apply slurry seal or hot mix as required.

To date, the accomplishments have been admirable. All mileage has received at least the first stage and there is no more dust and the base structures are adequate for the loads encountered. One hundred fifty miles have been totally completed and another 200 miles of primaries have been paved. In some cases hot mix did not fare well on the flexible base, but the emulsion mix was much better. Many of the roads that have been slurry sealed are sound enough that the final hot mix stage is not necessary. The economical and engineering flexibility of machine laid emulsion mixes is well demonstrated by the Miami County experience.

The second use of emulsion in machine mixed and laid travel plants is dense graded MIX SEALS or SLURRY SEAL. Slurry Seal is probably the most complex of all materials used in the paving arts. To the contractor, a central plant mix is a single component system and mix-paving is a relatively simple two-component system. But, Slurry Mix Seals compound the contractor's problem by the one site use of four and sometimes five components all proportioned, mixed, and laid simultaneously. Despite the complexity, modern mix seals are probably the most versatile of all paving materials.

To illustrate the versatility of mix seals, consider a typical intersate shoulder seal where slurry mix can in one pass:

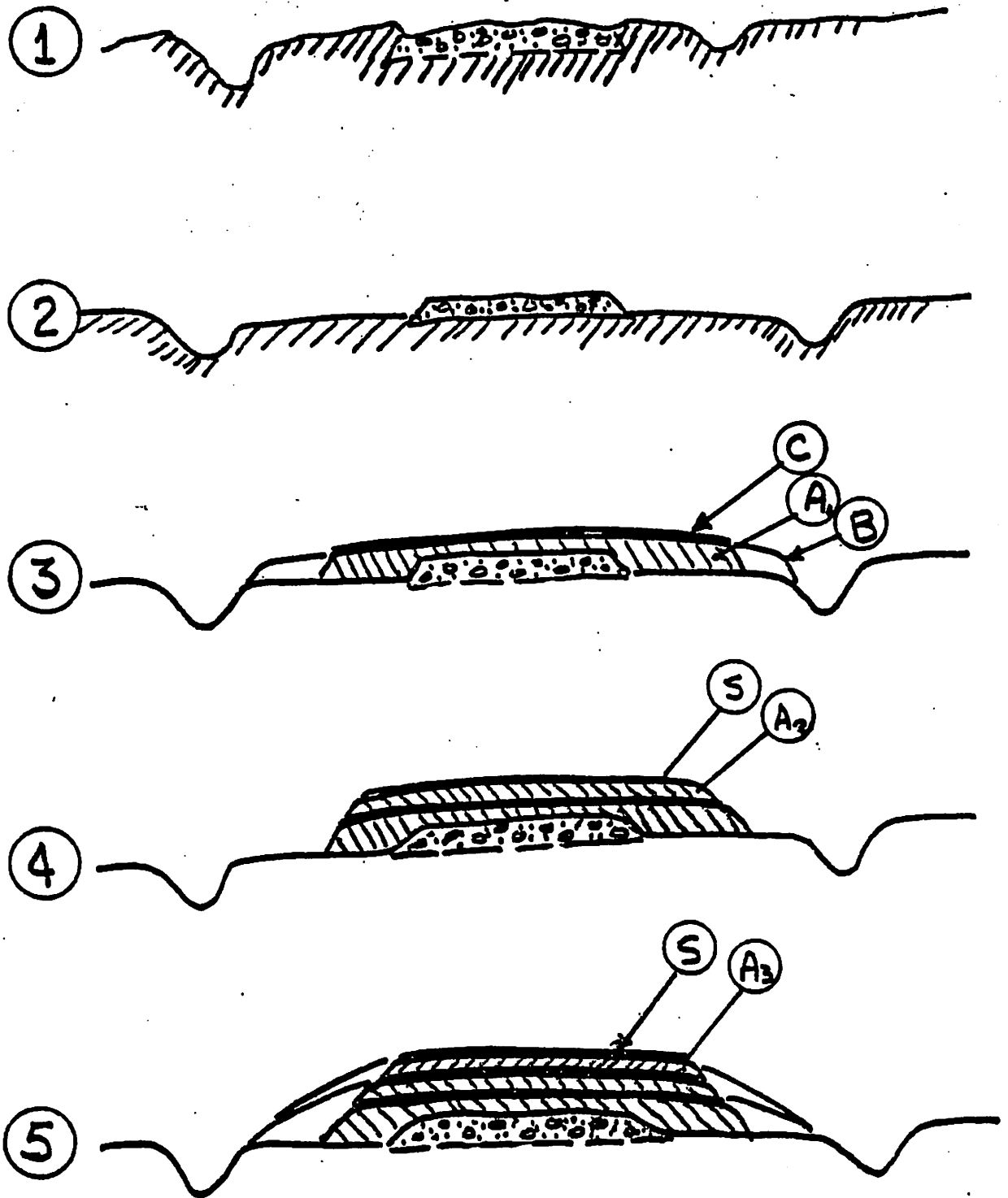
- 1) Fill the interface crack
- 2) Provide a modest wedge
- 3) Fill stress cracks and other minor surface voids
- 4) Provide a weather-tight seal
- 5) Give excellent skid resistance
- 6) Provide color delineation
- 7) Deposit the mix according to the demands of the surface

Because of Slurry Mix Seal's ability to deposit relatively thin layers of product, the use of special and even exotic materials becomes economically attractive. Examples are the use of extremely durable and skid resistant aggregates that might be imported, use of color, use of rubber, latexes or other desirable polymers.

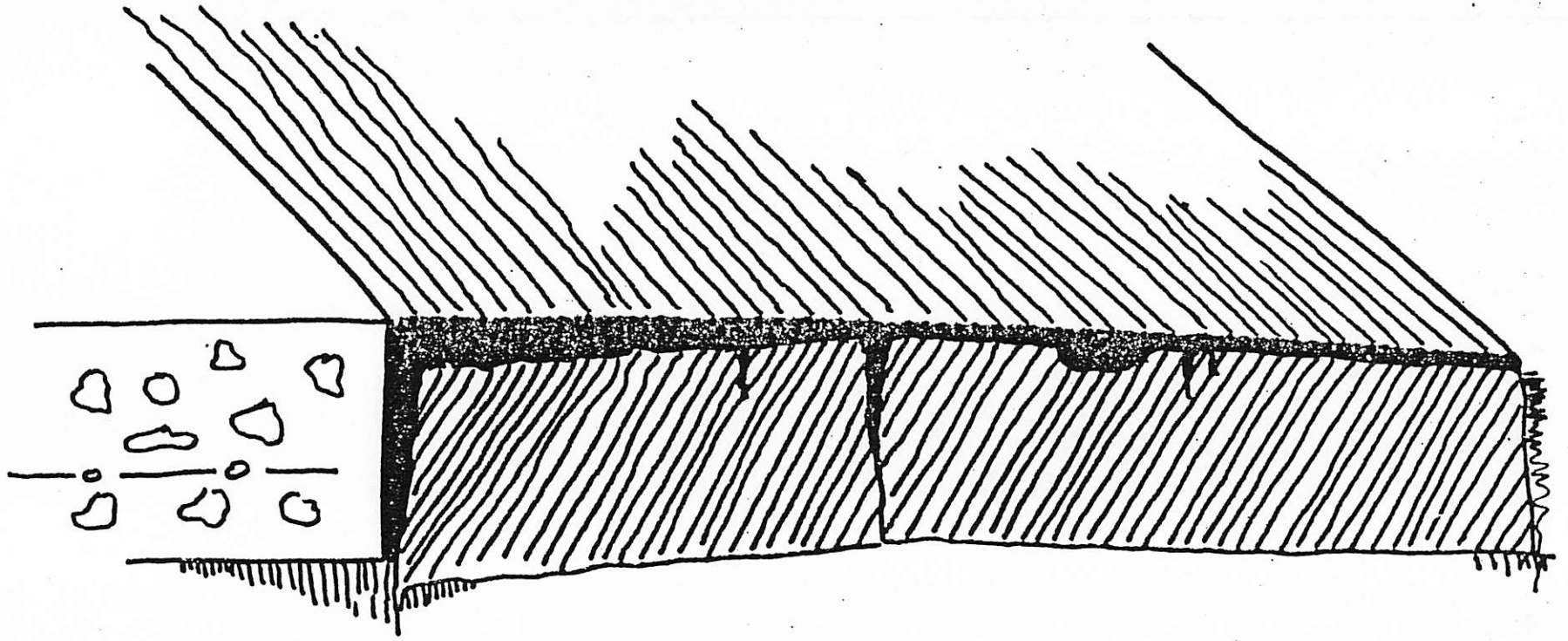
I want to emphasize here that quality work is not possible in either Mix Paving or Mix Sealing without thorough laboratory testing of all materials, a mix design established, and adequate field controls instituted. Perhaps the most neglected field operation by contractors is thorough cleaning and preparation

of the surface to be treated. This is especially true in the case of thin mix seals.

The following slide series will serve to illustrate the variety and versatility that can be found in the use of Slurry Mix Seals:



MIAMI COUNTY, OHIO STAGE CONSTRUCTION WITH
COARSE AGGREGATE EMULSION MIX & SLURRY



VERSATILE SLURRY SEAL CAN IN ONE PASS:

- ① FILL INTERFACE CRACK
- ② PROVIDE A MODEST WEDGE
- ③ FILL STRESS CRACK & OTHER MINOR SURFACE VOIDS
- ④ PROVIDE A WEATHER TIGHT SEAL
- ⑤ GIVE EXCELLENT SKID RESISTANCE
- ⑥ PROVIDE COLOR DELINEATION
- ⑦ DEPOSIT MATERIAL ACCORDING TO THE DEMANDS OF THE SURFACE