

Field Experiments with Bituminous Surface Treatments

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SYNOPSIS*

A performance survey of a bituminous surface treatment test road seven years old has recently been made. The test road, ten miles long, is in northern Indiana on the State Highway System, and consists of fifty-one experimental sections using three types of bituminous materials and aggregate from two sources. Other variables include the amount and method of application of bituminous material and size of aggregate. The results obtained during construction and through the first year of service have been reported previously in the *Engineering Bulletin of Purdue University* by T. E. Shelburne entitled "Bituminous Surface Treatment."

The performance survey after seven years of service was quite broad in scope and detailed in nature. Visual ratings were made of each section by two different methods. In one method, the various sections were given an over-all rating by a number of observers; in the other, the same observers estimated the percentage area of failure of each of four types. Surface texture measurements were made of each section in at least two locations by means of a profilometer. Four specimens were removed from the road and tested for stability on a minitrack machine. Two surface samples were taken at representative areas in each section, one in the wheel-track area and one between wheel tracks. These samples were analyzed in the laboratory for bitumen content and grading of the bitumen-free aggregates. Surface area values were calculated from the grading results.

The test road has shown rather remarkable performance and longevity of life. This is attributed chiefly to generally good soil conditions,

* Reprints of the complete paper, appearing in the *Highway Research Board Proceedings*, 1946, may be secured from the Joint Highway Research Project, Purdue University. Since it has been printed elsewhere, we are omitting it here in the interest of economy.

elevation of the road surface, adequate base, low traffic density, and, especially, careful workmanship during construction. However, even with very careful workmanship during construction and experienced personnel, the bitumen content, surface area of the aggregate, and performance of road-mix bituminous surface treatment may be expected to vary quite markedly. Successful performance is dependent more on uniformity of the mixture and grading of the aggregate than on type of bituminous material or source of the stone. The better-graded aggregates produce the better results under proper conditions, but since they are more difficult to mix with uniformity by road-mix methods, the use of plant-mix methods is indicated as being advisable.