# Laboratory Investigation of Stabilization of Soils Using Cutback Asphalt

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ABRIDGMENT

•VARIOUS FACTORS affect the properties and behavior of soils stabilized with cutback asphalts. Empirical rules are often used to design soil-asphalt mixtures.

Laboratory investigations were carried out on three soil samples, and the properties and behavior of soils stabilized with cutback asphalts were determined in terms of Iowa bearing value (IBV), water absorption, water content and swelling after soaking. The samples were also subjected to wetting and drying cycles.

MC-2 was best suited to stabilize the soil samples under the prevaling climatic conditions in India. The behavior of soils varied considerably with varying curing and soaking periods, which depend on the soil type. Every soil-water-cutback mix has a particular aeration period which gives maximum stability and minimum water absorption.

The mixing water content has considerable effect on the properties of the stabilized soil. A particular mixing water content could be selected corresponding to the maximum stability or maximum dry density or minimum water absorption. There is an optimum percentage of cutback which would give maximum stability. If the mixing water content is changed even slightly, there is a great loss in the stability of the mix. Hence, for every soil the optimum percentage of cutback and mixing water should be chosen if maximum stability after soaking is desired. This optimum percentage of water content for maximum stability is seldom equal to the optimum water content corresponding to the maximum dry density or the optimum moisture content calculated by some of the empirical rules.

Some of the secondary additives improved the stability of the soils stabilized with cutback asphalt.

TABLE 1

SOIL STABILITY

| Soil Type | IBV of Untreated Soil (lb) | IBV of Stabilized Soil (lb) | Opt. Percentage MC-2 | Opt. Mixing Water Content (%) |
|---|---|---|---|---|
| A | 114 | 460 | 4.0 | 9.5 |
| B | 167 | 810 | 5.0 | 7.0 |
| C | 40 | 650 | 4.5 | 10.0 |

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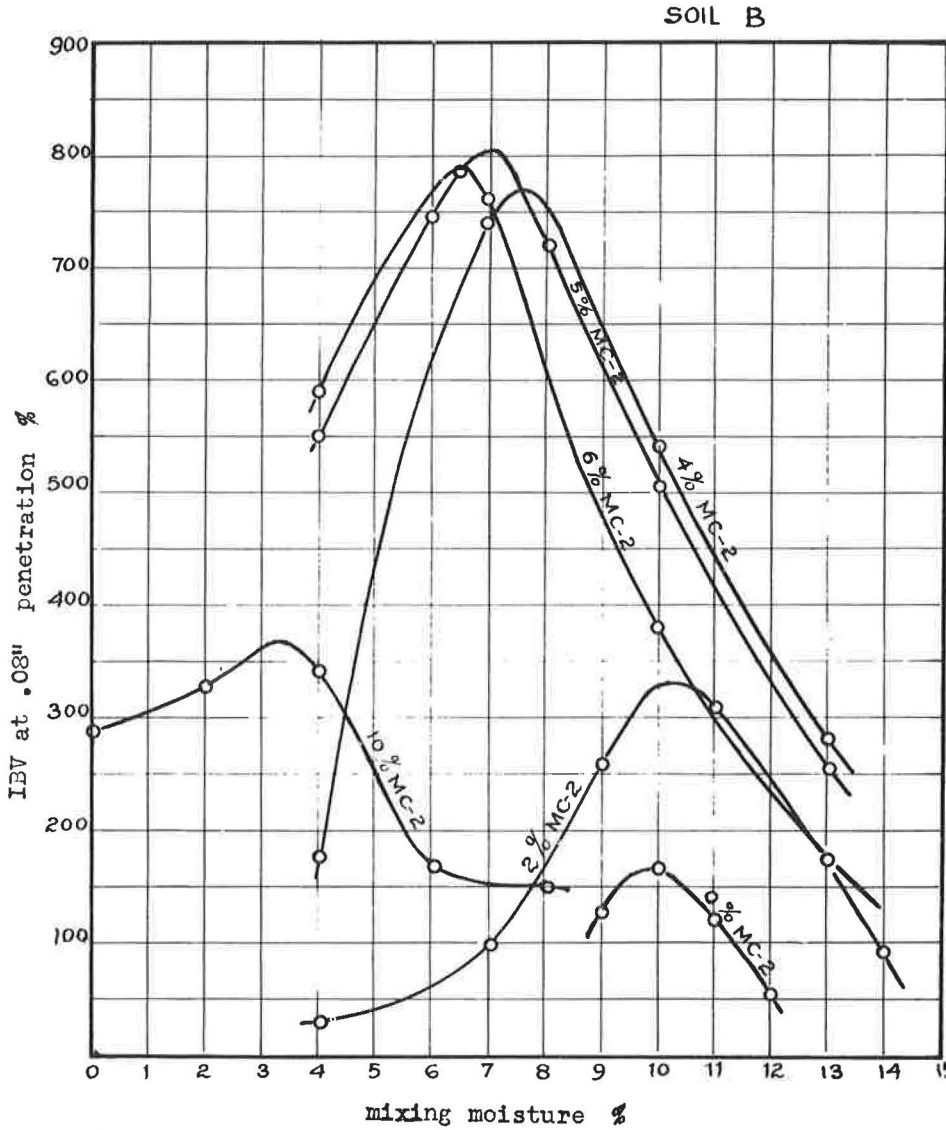


Figure 1. IBV vs mixing moisture content for soil B with different percentages of MC-2.

Figure 1 shows the variation in the IBV for varying percentages of bitumen and water contents for one of the soils. By selecting the optimum percentages of bitumen and mixing water, as suggested in the investigation, the stability of the soils increased considerably, as indicated in Table 1.