

## REPORT ON A FIELD EXPERIMENT ON INTRODUCTION OF PLANES OF WEAKNESS IN CONCRETE SLABS

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The problem of regulating or controlling transverse cracks in reinforced and plain concrete roads has been discussed frequently but no control of the cracks has occurred to date. With this object in view, an experiment was tried on one of our State projects in order carefully to study results under normal working conditions

Project 107-B in Bertie County, North Carolina, was selected as typical for this experiment. This project was reinforced gravel concrete 7-6-7 cross-section 1 1½ 3 mix and 16 feet wide

Aggregate used was Signal Mountain cement Ariendel gravel and Petersburg sand. Reinforcing steel used was N C State Specifications No 3, placed 2½ inches from top of slab

The experiment covered 2,000 linear feet and the section selected was on more or less poor subgrade, being part gumbo clay and part loam not very well drained. Of the 2,000 feet, 836.6 feet were on a 4-degree curve and 1,163.4 feet on tangent. In this experiment the idea was to

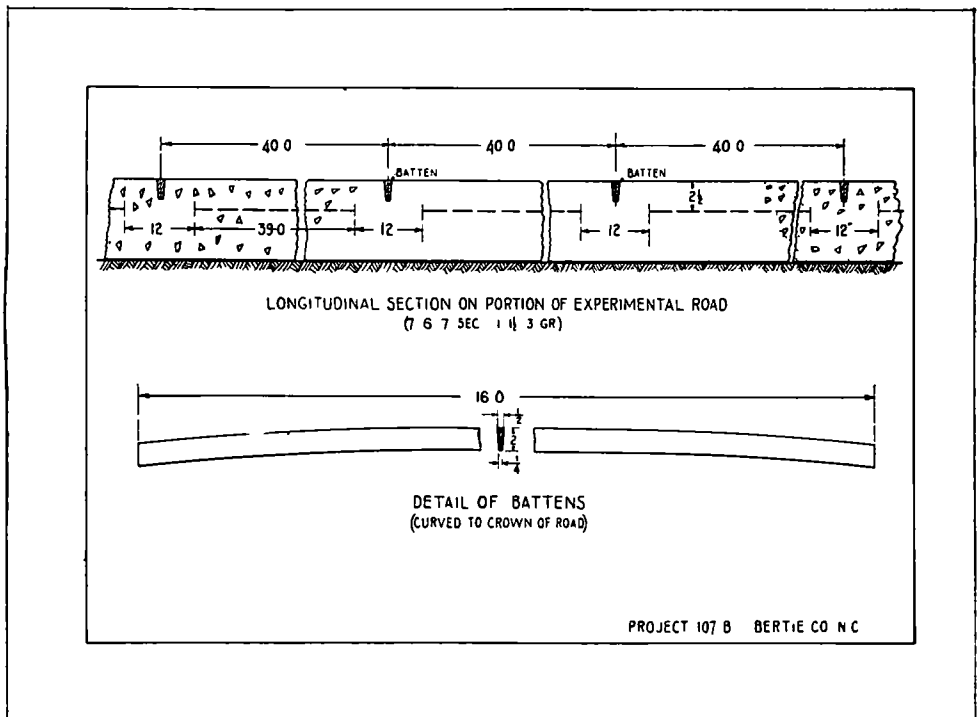


Figure 1—Method of introducing planes of weakness in a concrete slab

control or localize the cracks by introducing planes of weakness in the slab during construction. In carrying out the idea the method shown in Figure 1 was used. It was decided to introduce these planes of weakness at 40-foot intervals throughout the 2,000-foot section. This was done by omitting the steel in a strip 1 foot wide where the plane was to be built in across the slab and at right angles to center line. With this exception the construction proceeded and when the final belting was completed at the spot selected a wooden strip 2 inches deep, battered from  $\frac{1}{4}$  to  $\frac{1}{2}$  inch and cut to the crown of the road was pushed into the surface of the finished slab until it was flush with the surface and a trowel finish used to smooth at the strip. This strip was left in place until the concrete had taken its initial set. It was then removed leaving an incision in the slab 2 inches deep,  $\frac{1}{4}$  inch at bottom and  $\frac{1}{2}$  inch on the surface. Curing, which was by the ponding method, continued as usual. After the curing period these incisions were poued with a tar filler same as construction joints. This experimental section was poured March 23 and 24, 1925, and it was noted at the end of the curing period that at each plane of weakness the slab had cracked and the crack ran through to the subgrade.

Another inspection was made by the writer on October 22, 1925, which was a cold cloudy day, and at this time all the planes of weakness showed open cracks and in nearly every instance the crack continued 4 to 6 inches out into the shoulder dirt. No other cracks appeared in the 2,000 foot experiment section but were numerous both on tangents and curves on the remainder of the project which is 9 miles long.

As this road is now going into its first winter free of cracks other than at the planes of weakness, we feel that a little progress has been made in the right direction and it will be carefully inspected again in the spring for further results.

## REPORT ON THE RIO VISTA, CALIF., SUBGRADE TREATMENT EXPERIMENTS

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In November, 1921, experimental subgrade treatment was begun on the Rio Vista Lateral between Denverton and Rio Vista. The treatment consisted of loosening and pulverizing the soil to a depth of 6 and 12 inches, after which various adulterants were mixed with the pulverized soil.

Eleven 500-foot sections and one 380-foot section were treated as follows:

Section 1 Station 177+50 to 182+50, 1 to 10, cement mixture 12-inch depth