

Highway Department. These are cooperative projects between the Highway Research Board and the respective highway departments.

Mr. A. U. Theuer, formerly with the National Bureau of Standards and now Research Engineer for the Highway Research Board discusses the programs for these field studies in his paper which is included in this Bulletin.

The Committee has held one general meeting this year and several of the members have been able to visit the field projects in Virginia and Alabama and provide assistance

in the work.

The Committee believes it would be extremely desirable if a series of such experiments could be conducted on a large scale among the states making use of granular stabilization. Such tests should be correlated and should cover as wide a range of soil types as possible. Accordingly, the Committee is planning for other field projects for the coming season. It is believed the results of these studies will provide data upon which a more rational approach to the design of stabilized roads may be made.

FIELD STUDIES TO DETERMINE THE VALUE OF CALCIUM CHLORIDE FOR COMPACTION OF SOILS

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The favorable results attained in the laboratory with the use of calcium chloride as an integral admixture in sand-clay base materials, has led the Soil Calcium Chloride Roads Stabilization Committee, to extend the scope of its work to full scale field investigations.

During the past summer the Committee initiated two cooperative projects and formulated plans for several more next year. Due to delays in getting the actual work underway, however, construction on only one of two projects has been completed. This is located in near-by Virginia. The second project, located in Alabama was started last month and is now in progress.

As stated by the Committee, the purpose of these field investigations is to study construction methods, durability, and performance, as well as those primary factors, density, moisture, compactive effort and strength. Each project following construction is to remain under observation for a minimum period of one year. Time

will also be spent in a comparative study of methods for determining strength relationships.

I will give a very brief review of the Virginia project, and a few data just by way of indicating what is being undertaken.

Several possible locations for starting the first investigation were made available by the Virginia Department of Highways last August. From these, a 3½-mile reconstruction project located in the Coastal region was selected. The reconstruction called for a 10-inch stabilized sand-clay base and a two coat asphalt wearing surface. Material for the base was secured from a nearby pit and was placed in two 5-inch courses.

For purpose of the experiment, a 3000-foot section, subdivided into 1000-foot lengths was selected. For the first section a 2½-pound per sq. yd. treatment was used. The second or control section was untreated. The third section was given a 5 lb. per sq. yd. treatment.

The base material as received from the pit was a quite uniform sand-clay coming under the PRA classification as an A-2 material. It had a liquid limit of 21.8, a PI of 4.7, and a Standard Proctor Density of 128 lb. per sq. ft. at an optimum moisture of 9.2 percent.

The experimental sections were first brought up to approximate grade and profile. The designated amount of calcium chloride was then spread uniformly over the two treated sections. It was thoroughly mixed with the top 5 inches, compacted depth, by means of a scarifier and a Seaman Pulvi-Mixer. Water to bring the material up to near optimum was added in the course of the mixing operation. The untreated section was constructed in identically the same way as the other two, except that no chloride was added in the mixing operation.

Compaction followed mixing. Immediately after compaction the road was thrown open to traffic. Eighteen days after construction the asphalt wearing surface was placed. Maintenance during this intervening period consisted of a light blading and the addition of water to the untreated section for laying dust.

It was intended to make a series of density measurements at intervals during the process of compaction. With the equipment available, this did not prove practical. (However, measurements, to establish a relation between compactive effort and density, are being made on the Alabama project now in progress.) Compaction was accomplished by means of a self-powered sheepsfoot roller and a rubber-tired power tractor. When the first density measurements were made they were found to be approximately 100 percent standard Proctor density. No additional compaction was attempted. Just as an indication of relative densities of three sections immediately after compaction, the following values may be given:

For the 2½-lb. treatment	130 lb. per cu. ft.
For the 5-lb. treatment	125½ lb. per cu. ft.
For the untreated section	128 lb. per cu. ft.
	same as standard Proctor density.

Density measurements were made at 1, 5, 7 and 15 days, following construction and are now being made every 30 days.

Other measurements made before surface treatment, included pH-values of the base materials, calcium chloride contents of roadway samples, surface roughness and strength measurements.

For determining strengths, the Burggraf Shear Apparatus was adopted. This apparatus is described in detail in the 1938 Proceedings of the Highway Research Board. The apparatus consists of a calibrated jack and plunger with attached pressure gauge. A strength measurement is made by placing the jack in a carefully prepared hole dug in the roadway, and applying a horizontal thrust through a parabolic plate bearing against a vertical surface. Measurements with this apparatus are being made at different depths down to and including the subgrade.

Again, merely as an indication of relative shear strengths obtained to date the following values were found:

at 4-days after compaction:

for 2½-lb. treatment	31.5 psi. at 4.7% moisture
for 5-lb. treatment	17.7 psi. at 5.3% "
for untreated	18.1 psi. at 4.6% "

at 11-days after compaction these values were:

for 2½-lb. treatment	31.6 psi. at 4.8% moisture
for 5-lb. treatment	15.8 psi. at 6.7% "
for untreated	11.6 psi. at 6.4% "

These values are all for the top 5-inch layer.

Since the tests and test data are still incomplete, nothing in the way of conclusions can be presented at this time.