provement of existing highways by widening, grading, side-ditching, and, in some cases, graveling and black topping. Whenever a road is set up for this work, the surveyor sends out a crew to locate the corner stones and set the right-of-way stakes on both sides of the road at intervals of 100 feet. In this way the reconditioned road is correctly located and is built on straight lines between corner stones, or curves if the road is not on section lines. Curves are run in with a transit, and the W.P.A. labor has no trouble following the correct line of the improvement.

The W.P.A. furnishes all the labor on the work and the highway department furnishes all necessary trucks and power machinery, together with operators, pipe culverts, cement, sand, gravel, bituminous materials, and stakes for staking out the work. Some reinforced concrete culverts and bridges are being built under the same procedure.

The county engineer while traveling about the county observes road intersections where weeds, brush, or field corn have obscured the view from each of the intersecting roads, presenting a serious traffic hazard. This condition is immediately reported to the highway supervisor, and stop signs are installed on the least traveled road, or the obstructions are removed.

Recently a man called me on the telephone at night and reported that there was a sunken place in the road at a point where the road men recently had put in a new cross-drain. Rains had caused the back fill to settle and form a depression across the road. I secured all the information necessary, informed him that I would see that it was repaired as soon as possible, and immediately called the highway supervisor. The necessary repairs were made the next morning.

These are a few of the ways in which the county surveyor and engineer can co-operate with the county highway supervisor.

BASE STABILIZATION IN BOONE COUNTY
Leaton Day,
Boone County Road Supervisor

Base stabilization has been widely discussed by road men during the past few years. Different materials are used with different methods of application, but I shall discuss only the methods used in Boone County.

A test should be taken to determine the depth and type of material in the old road to be stabilized. In Boone County we find there is sufficient clay in the base for this type of construction. If there is not enough material to insure a com-
pacted base of five to six inches, more new material should be added. We use gravel from our maintenance-stock piles. This material is fine and has a sufficient amount of clay for compaction. The old base is scarified to the required depth and thoroughly pulverized and mixed. All large aggregate is thrown out by men with forks during the mixing process. The mixed material is then leveled off and tar (T M 2) is applied at approximately 150° to 165° F. and at the rate of one-third of a gallon per square yard. A heavy maintainer is used, while the tar is being applied, to aid in mixing. A spring-tooth harrow will do this work very well. Then the material is bladed back and forth until it is thoroughly mixed. A power grader and maintainer is used in the mixing operation.

Water may have to be added in hot, dry weather. Just enough water should be added to make the mixture damp; six to eight per cent moisture is sufficient.

After the mixing is completed, the material is windrowed and leveled off in thin layers and thoroughly rolled. This process is continued until the road is properly shaped and compacted. If the surface becomes dry and dusty, a light application of water is made.

When the base has been thoroughly rolled, a tack coat of tar (T M 2) is applied at the rate of .2 per gallon per square yard and covered with five to ten pounds of sand, or No. 12 stone, per square yard. The road is then left open to traffic for a day or so before the seal coat is applied.

The surface should be swept clean of all loose sand or stone and be perfectly clean before sealing. A heavy tar (T H) is applied at approximately 200° F. at the rate of .3 gallon per square yard and covered with fifteen to sixteen pounds of No. 12 limestone or gravel. A long broom drag is used to spread the chips and insure a smooth surface before and during the process of rolling.

We have used 1.2 gallons of T M 2 per square yard in the base mixture and tack coat, and .3 gallon per square yard of heavy T H in the seal. This totals 1.5 gallons per square yard for the complete job. The road was closed to traffic only when the tack and seal coats were being applied. Fourteen miles of this type of road were constructed in Boone County in 1940, and three miles in 1939, all being in excellent condition at this time.

SURFACE STABILIZATION IN DEKALB COUNTY

Wayne T. Van Auken,
Dekalb County Surveyor and Road Supervisor

The most important problem facing county engineers today is the formulation of a balanced program which will include