



Fig. 2. Widened and rebuilt at \$55 per mile.

gravel was well mixed and the road has the appearance of new material (Fig. 2).

COST DATA

We found the cost on this 12 miles of road to be as follows:

Two operators, 25 days each at \$4.00 per day	\$200.00
Gas for tractor, 500 gals. at 9 cents (20 gals. per day)	45.00
Oil for tractor, 26 gals. at 56 cents	14.56
Hauling rock with truck, 8 days at \$10 per day	80.00
Dragging berm, 2 days with truck	20.00
Raking rocks, single hands at \$3.00 per day	300.00
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Total cost	\$659.56
Cost per mile	\$54.98

After thus reconditioning this road, we found it to be practically as good as a new road and, inasmuch as the cost was only \$54.98 per mile, we unhesitatingly recommend the reconstruction of such roads as an economical measure.

ROAD MARKERS

By H. A. Firestone, Elkhart County Highway Superintendent

There is much good to be derived from marking our county highways with standard markers such as curve, slow, and stop signs. Elkhart County, like all other counties, has a great many dangerous curves and narrow bridges on her improved highways, all of which we have marked with U. S. standard markers, the same types of signs as those in use by the Indiana State Highway Commission. I urge every county to mark as

many of its dangerous curves and narrow bridges each year as its finances will permit. The standard color and style of marking is, in my opinion, the most advisable and less apt to be confusing to the many motorists traveling our highways.

The following set of designs and color schemes produce a uniformity of significance in the signs themselves, and make familiarity with them easy to acquire on the part of the most casual driver.

The *octagonal* sign is used to indicate STOP where for any reason such action is necessary.

The *diamond*-shaped signs, commonly called SLOW signs, are used to indicate any condition inherent in the road itself requiring slow speed and caution on the part of the driver.

The *circular* sign is used as an advance warning at railroad grade crossings only.

The *square*-shaped signs, commonly called CAUTION signs, are used to indicate any condition requiring caution that is not inherent in the road itself, but which is due to contiguous or adjacent conditions which often are also intermittent.

The *rectangular*-shaped signs of various dimensions are used to carry directions, information, and restrictions of use or benefit to the driver.

All signs of a precautionary character, including the circular railroad sign, the octagonal stop sign, the diamond slow sign, and the square caution sign have black designs on a yellow background. All direction, information, and restriction signs are black on a white background.

LOCATION OF MARKERS

The standard markers are to be erected for the purpose of directing traffic over a specific route and should be so located as to be conspicuously visible day and night. They should be set facing and on the right hand side of approaching traffic, and care should be taken to avoid placing them on the inside of curves, in sags, and behind objects which obstruct the view. They should be so located that they will be seen at all times with the minimum of effort by passing drivers. The type of post used for support can be either iron or wood.

Under ordinary conditions the center of the marker should be placed approximately $3\frac{1}{2}$ feet above the crown of the pavement or traveled roadway. On ascending or descending grades, the height may be varied so that the rays from headlights may properly illuminate the marker. Curve signs should be erected approximately 300 feet in advance of the curve, depending somewhat on the general conditions of the road.

Two signs for different purposes should not be placed close together. For instance, if there should be a narrow bridge at one end of a curve, the narrow bridge sign and the curve sign should be placed, if at all possible, at least 100 feet apart.

The stop sign, in my opinion, is perhaps the most abused sign that we have in the county; therefore, it should not be set back from the point of danger in an effort to save a sign. Place it at a point where the cause of danger is visible; then the driver can see and understand the reason he has been brought to a stop.

Too much protection and caution cannot be used at railroad grade crossings. Railroad signs should be erected 350 feet from the crossing under ordinary conditions or 450 feet where the speed of traffic is not slowed down by some road condition. The highway superintendent can determine the proper distance fairly well by a careful inspection of the conditions of the road and crossing involved. Frequently railroad crossings are so situated as to involve sharp curvature and a combination of signs may be used, such as a slow sign, or if you think best, a stop sign.

Slow signs should be used only where, for safety, careful driving at a reduced speed is necessary. The use of slow signs with other signs will not give satisfactory results except in unusual cases. As I stated before, it may be used as a pre-warning for a stop sign or to call special attention to railroad signs in especially hazardous conditions. In special cases, it may be used in addition to cross road or side road signs as it serves as a warning only.

No doubt all highway superintendents have received a copy of the manual on signs from the Indiana State Prison concerning the purchase of their markers. This manual gives the specifications of standard federal signs and markers and can be secured by writing Warden Daly.

While highways are under construction, it is advisable to mark and arrow all detours whenever and wherever possible, for such marking has a far-reaching effect on our motorists. When only standard signs and markers are used, the motorist is less confused and the signs are obeyed more readily.

The marking of dangerous curves, turns, and narrow bridges and the careful placing of stop signs at busy corners and the marking of detours certainly makes traveling much easier and safer and pleasanter for strangers, of whom we have a great many more on our county highways than we realize. A road that is well marked leaves a far more favorable impression on the motorist than the road that is poorly marked.

BITUMINOUS MULCH SURFACES

By Robie Hiron, Delaware County Highway Superintendent

Of the 92 counties in the State of Indiana, most depend on agricultural pursuits and small trading town areas, where it is necessary for the farming interests to come to town daily or weekly for their supplies. There has been a constant de-