

Organizing Blacktop Maintenance Operations

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ASPHALTIC MATERIALS

In this paper no attempt is made to recommend any particular types of materials. This is a decision that must be made at the local level based on what is readily available at the lowest cost.

Basically, the various asphalt products used contain petroleum asphalt (AP) mixed with a spreading agent or heat to make it workable. When the heat or thinner has dispersed, the petroleum asphalt remains to act as the glue for stabilizing the material being placed. There are advantages and disadvantages of most of the products that will be offered and one's decisions as to what to use will have to be based on experience or on-the-job technical knowledge.

AGGREGATES

Aggregates for mixing should be graded in accordance with depth of lay and should be procured from the nearest and cleanest source if satisfactory results can be obtained. Many counties in Indiana can take advantage of pit run material which is locally available. Some general rules in choosing the size of aggregate and amount of bitumen to use are as follows:

1. The thickness of pavement lay should be not less than $1\frac{1}{2}$ times nor more than three times the size of the largest stone in the aggregate.
2. The bitumen content should be from four percent to eight percent, depending on the size of aggregate. The more fine aggregates in the mix the more asphalt will be required to properly coat all the particles.
3. To get a dense mix the aggregates should be graded so that the cavities between the largest size aggregate is filled with decreasing sizes of material until the sand is just enough to fill the final smallest cavities.

The most critical problem faced by the counties is the lack of money to provide all of the bituminous pavements that the public

wants. Because of this county officials are continually battling to spend money where the most traffic and the most people will benefit. This fact also causes a tendency to spread the money and pavements too thin which is frequently false economy.

FOUR PAVEMENTS FOR INDIANA COUNTIES

Briefly discussed below are four pavement types which are generally used by most of the Indiana counties.

High Type, Paver-Layed Pavement Costing \$20,000 or More Per Mile

Planning for this type work should start far in advance of the actual operation; adequate shoulders, ditches and right-of-way should be provided if the correct benefits are derived from the investment. It is frequently possible to build this type over three or four years so that the annual expenditure is low and the end product is a high type roadway. In stage construction, it is feasible to procure right-of-way, construct shoulders and ditches, and strengthen the base the first year; lay a base course of large aggregate and low bitumen content the second year; and pave with a dense-graded surface the third year after correcting the base weaknesses.

Blade Mix Surfaces

This type is extremely economical where the local pit run material is satisfactory for good pavement. Normally the base is checked for thickness and shaped to provide the proper contour for the finished road. Material is tail-gated in sufficient quantities to give the desired finished-pavement thickness. A part of the bitumen, normally 50 percent, is applied and the aggregate and bitumen is thoroughly mixed by repeatedly turning it over with a grader. The partially mixed material is then smoothed to a distributor width and again shot and mixed thoroughly by repeated manipulation ending in a uniformly colored material in a windrow down the center of the road. This is split as accurately as possible to the center of the two lanes and then layed out by a traveling paver or by a grader and rolled. A competent grader operator is necessary if this method is used. This type of operation should cost from \$3,000 to \$8,000 per mile depending on cost of local materials.

Chip and Seal

This method of applying the bituminous material and placing fine aggregate on it is used extensively because a little money goes a long

way. Repeated operations will eventually provide a suitable surface on low-traffic volume roads however the final cost of a suitable pavement is generally much higher than blade mixing. Maintenance of this type surface is generally costly and time consuming.

Squeegee Sealing

On existing bituminous surfaces the tendency to crack and oxidize causes a special type of maintenance which is extremely important and relatively inexpensive. In recent years the Indiana State Highway Commission has determined that considerable benefit can be derived by coating these surfaces with a diluted bitumen and then working the liquid into the cracks or crevices by use of a flexible squeegee. This operation which normally costs about \$300 per mile will extend the use of deteriorated pavement two to five years and will stop most of the spring break up. In one of our highway subdistricts where all of the roads were squeegeed we used less than ten tons of patching material during the spring breakup. Previous to this work several hundred tons had been used each year. Cracks should be cleaned by air, bitumen placed in them until they overflow, and then squeegeed by a hard squeegee. Where the entire surface is treated the surface is shot with the diluted bitumen and the excess is squeegeed off the pavement by hand or a rubber squeegee blade on a grader. Sand is used to blot the surface in each case.

PATCHING

A proper patch with the proper material should become a permanent part of the pavement if properly executed. Throwing material in a hole and rolling with truck tires will not produce a permanent patch. If patches are to stay the hole should be deepened, cleaned, primed and the edges should be squared so that the new material will not shove. Proper compaction is a necessity. It is difficult to get proper attention from the laborers on this operation, but after they see the results on the proper type of work they will realize the advantage of not repeating the work because it was done right the first time.

CONCLUSION

Mr. Mellinger and I cover all of the 92 counties for the State Highway and if you encounter trouble or if we can assist you in starting this type of work please feel free to call us at the State Office Building.