rail and end posts was a good quality of outside white lead and oil paint. After the surface was cleaned, one coat of asphalt was applied. The rail and end posts were given two coats of white. This gave us a very satisfactory job.

In addition to getting these bridges cleaned and painted, we found out things about them that might ordinarily have been overlooked. Some parts, after the scale and rust were removed, disclosed weakened members. In fact, some parts were eaten through and needed repairs badly.

Since the closing of the CWA project, we have limited our painting to bridges on which repairs are being made. If a wood floor is being replaced, the working crew cleans and paints the joists, floor beams, lower chords, batter posts and shoes, if a truss bridge, and the I beams, if it happens to be a beam bridge. We have also changed our paint, and are now using a rust inhibitive red paint which has given us good results. This paint contains 55% pigment and 45% vehicle of the following ingredients:

<table>
<thead>
<tr>
<th>Pigment</th>
<th>Vehicle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iron Oxide</td>
<td>Drying and penetrating</td>
</tr>
<tr>
<td>Lead oxide</td>
<td>oils</td>
</tr>
<tr>
<td>Zinc chromate</td>
<td>Dryer</td>
</tr>
<tr>
<td>Mag. silicate</td>
<td>Penetrating mineral</td>
</tr>
<tr>
<td>Silicon dioxide</td>
<td>thinner</td>
</tr>
</tbody>
</table>

For rails and end posts, we now use an aluminum paint composed of 21.4% aluminum paste and 78.6% vehicle which is covered by federal specifications, T-T-V81.

We have found that it is not necessary to have expensive equipment to get a good job of bridge painting on smaller bridges on the county highways. Care must be exercised in cleaning and seeing that no surface is overlooked, however inaccessible it may seem. Tools and brushes can be improvised that will go into almost any corner and do the job.

It is of the utmost importance that the foremen on the job be particular about getting a first-class job, rather than pride himself on the amount of work that he can turn out, although the latter qualification is also desirable.

**SCREENING AND CRUSHING PLANTS**

R. N. Horton

Jefferson County Surveyor and Road Supervisor, Madison

The equipment we use in Jefferson County in screening and crushing material for surfacing county roads consists of single-unit, portable stone crushers of approximately 100 to 125 cu. yd. capacity per eight-hour day. This output depends upon the size of material crushed and the condition of the stone when crushed. As you know, wet stone, or stone with earth in
it, slows up production. The crusher is equipped with an elevator and sectional screen. The screen is set on top of a loading bin and tilted toward the crusher, so that all stone too large to go through the screen may be returned to be recrushed.

The loading bin is divided into two or more compartments, depending on the number of sizes wanted. We are crushing at present only two sizes of stone—1 1/2-inch for bottom course on earth roads, which we cover lightly with earth to bind it (if not bound in some manner, it will work to the top in maintaining); then we add a light coat of 3/8-inch stone with the dust left in. It is very important that small-sized stone be used on our county roads if we are to maintain a smooth surface.

On old roads that have a good base, we use only stone passing the 3/8-inch screen with the dust left in, and spread this with dump trucks, just heavy enough to give us a smooth surface after dragging.

If we want all small stone, we remove the 1 1/2-inch section of screen and put in the smaller size, thereby returning all the larger stone to the crusher. The return is much better than trying to reduce the crusher opening too small, as it tends to eliminate so much dust. If it is necessary to remove the dust, this can be done by inserting a section of dust screen and dividing the bin accordingly, or making a chute to run the dust out on the ground.

Any available power can be used, but it is important for best results to run the crusher at the proper speed as recommended by the manufacturer.

The cost of quarried material will run approximately $1.00 to $1.10 per cubic yard in the bin, including depreciation, drilling, and blasting, and also the stripping of the quarry if the overburden is not too great. Stone from creek beds can be crushed for less, if convenient to get out. We have a lot of this in the eastern part of our county.

There are many advantages in using stone of a small maximum size on our county roads. It will maintain better and compact better; it is not as hard on tires and rides smoother, which pleases the people who use the roads. In the long run, I firmly believe it is cheaper, because the cars and trucks do not throw small-sized stone off the road as readily as the larger sizes. To convince yourself of this, just follow a fast moving car or truck over the roads and notice which sized stone is moved farthest by the tires. You can take a truckload of small-sized stone, set the tailgate chains properly, spread it on the road one inch thick or less, and it looks good and maintains well. But take the same sized load of large stone or gravel, spread it the same distance, and it won't completely cover the road and it won't compact properly. Where coarse stone already exists on our roads, we gradually work it off to the sides where traffic will hammer it into the shoulder, and thus help widen the road.