



Guide to Cold Mix Surfacing -- By George V. Wiebe

A good cold mix surface is simple, but can be challenging, especially mixing in place. Supervision and help is available upon request.

1. Cold Mix Asphalt Oil & Gravel

- 1.1 These two components must be compatible to ensure a successful end product. In past years, the industry has tried different asphalt oils, MC, SC, Heavy Crude, etc., and hoped for the best. We have found better results when we analyze the gravel and blend the oil accordingly.
- 1.2 Each gravel pit is different and the crushing is different. In some cases where the clay, silt and/or moisture levels are too high, this gravel is simply not suitable for cold mix. No wonder there has been a high rate of failure.
- 1.3 Depending on the fines and size of gravel the blend ratio is 5 to 5.5%. i.e., a 1,000 tonne of gravel requires 50,000 to 55,000 litres of asphalt oil. A higher % of fines requires .1 to .3% more MC Modified. If the mix is too dry (not enough oil), the road surface will look dark brown and will not compact properly, if it is too rich, the road will bleed and rut.

2. Mixing in Place

- 2.1 In a perfect world, we would have a definite base, know exactly how many tonne of gravel we have put on this base an even windrow and then we know exactly how much oil we need to put into that gravel. We try our best to achieve the above-mentioned circumstances.
- 2.2 Once the gravel and the right amount of oil are on the road, the mix begins. We have found the best way to mix the oil and gravel is to establish a windrow, bringing this windrow over to one side of the road and then to the other side. Note: when you



roll the windrow all the way over it ensures there is no dry gravel in the bottom of the centre of windrow.

- 2.3 Don't bring the windrow over too far; we don't want to have to pick it up from the shoulders.
- 2.4 Flatten the windrow out, pick it up again and follow these procedures until the product is mixed. It is easy to read the mix when flattened out. Try not to pick up any base material during mixing so our percentages remain the same and to avoid contamination, especially with clay.
- 2.5 Every piece of clay is a pot hole in the days to come, keep your eye out for clay contamination in the windrow and remove it. Clay does not mix with oil.
- 2.6 You will know the product is mixed when there are no color differences throughout the windrow. The windrow will be black.
- 2.7 The last few passes the graders make should be just off the base enough to be leaving behind a little cold mix. This is to ensure that they are not bringing any dry product into the windrow from the base.

3. Spreading and Compaction

- 3.1 These two definitely go hand in hand. The graders should have new blades when laying out the product. When you begin laying out the product, you establish the edge of the asphalt surface. If possible, a foot to a foot and a half from the edge of the road.
- 3.2 The graders that are laying out the product should lay it out between a half and three quarters of an inch per pass if possible. This ensures even depth on the base and helps a great deal with compaction.
- 3.3 You want to build a definite 2 to 3 inch lift on the edge of the asphalt when complete.
- 3.4 If you feather the product out too thin the edge of the asphalt will break up with the first vehicle that drives on it.



3.5 Note: If you keep back from the shoulder you are accomplishing two things:

3.5.1 The asphalt surface is on good compacted base, not the soft shoulder.

3.5.2 Also, the traffic will stay back from the edge of the asphalt.

3.6 Grader operators please take your time. A few hours more to do it just right will give the surface many more years of life.

3.7 The packers should be smooth drum only, working steady with water. We find that Wobblies just don't work in this kind of application.

3.8 Any contaminants, grass, moisture, or clay sticks to the wheels and makes a mess of the road.

3.9 The packers follow the graders the whole time the road is being laid out.

3.10 This creates even compaction and breaks up any larger stones for better fracture and less potholes.

3.11 On the first pass when establishing the edge, the packers should not be using the vibratory option. After the second lift on the edge is laid out, the packers can begin to use their vibration option.

3.12 Continue packing until there are no signs of compaction.

3.13 ****Important**** note to the packer operators. You can over vibrate the cold mix pavement during compaction. Once it has stopped compacting, if you notice any small cracking, stop vibrating the surface and get off the road. The packers are the last pieces of equipment on the road.

When MC Modified is blended properly with acceptable gravel, and when the above-mentioned procedures are followed correctly, it will produce a proper cold mix surface and it is not unusual for the roads to last 5 to 10 years before reworking.