



## Asphalt Testing Solutions & Engineering, LLC

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1. If HIMA is used in the base, and it has a wearing course on top, can I model in a mechanistic method the section as a single HIMA section to compute the longest fatigue life?

**Gary Fitts:** I would model it as a single layer and use fatigue data specific to the base mixture for traditional (bottom-up) fatigue cracking. Here's a link to publications on the NCAT website where you can find the basis for assuming mechanical properties of mixtures: <http://eng.auburn.edu/research/centers/ncat/files/technical-reports/rep13-03.pdf>

2. How has HiMA been used in combination with high RAP mixtures? What has the performance been? Any examples?

**Gary Fitts:** Here is a link to a report developed by ATS for Kraton that evaluated a rejuvenator and High Polymer binder used together in a mixture with 40% RAP: <https://www.asphalttesting.info/case-study-testing-kraton-polymers/> As you can see, High Polymer allowed the binder content to be increased to enhance cracking resistance without compromising rutting resistance.

The "Green Group" NCAT experiment included a test section using 35% RAP with highly modified asphalt binder described here <http://eng.auburn.edu/research/centers/ncat/files/technical-reports/rep16-04.pdf> and here: <http://eng.auburn.edu/research/centers/ncat/files/technical-reports/rep17-04.pdf>. Something to consider is that most state DOT binder specs for highly modified asphalt binders result in formulations that use softer base binders than traditional modified binders. Since cracking typically occurs at moderate or low temperatures, this provides similar benefit as using a softer binder grade, except that the material is NOT softer at high service temperatures. The high polymer content of the binder means that mixtures can be designed to be "richer" without being susceptible to rutting, and thus can allow a significant percentage of RAP without causing a brittle mix.

3. I am from Virginia and have some experience with the impermeable asphalt bridge membranes in VA. You referenced the NJ bridge overlays using HIMA. Do you know if they equate to each other in bridge applications?

**Gary Fitts:** I can't say for certain, but I believe that they are similar. VDOT has used PG76E-28 (HP) mostly for SMA and dense-graded mixes used for heavy-duty highway surfaces, but that doesn't preclude its use to resurface bridges.