MEMBER BEST PRACTICES

TXAPA
Texas Asphalt Pavement Association

MINIMIZING THERMAL SEGREGATION IN HMAC

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Visible segregation is readily distinguishable and can quickly be addressed. However, temperature segregation is invisible to the naked eye and more difficult to ascertain the cause. Thermal segregation is usually not seen until the premature failure of the pavement due to fatigue cracking, raveling, and moisture damage.

Minimizing thermal segregation is an integral process in quality HMA placement. The use of hand-held thermal cameras or automated thermal imaging systems can identify potential problem areas during placement. Monitoring the overall mat temperature of the mix being placed and the uniformity of the temperature across the mat, is critical to achieving adequate density.

There are many methods, tools and various equipment that can be used during the paving process to help deter thermal segregation. Pavers, material transfer vehicles (MTVs), and haul truck trailers can help with temperature consistency. Selecting appropriate paving speeds that balance delivery, capacity and timing on the compaction process is imperative. If the paver runs empty or low, this can result in the leftover cold mix being placed in a concentrated mass. This often results in relatively extreme temperature differentials, which will usually result in isolated low mat densities. Most MTVs offer some sort of remixing capability that remixes the cool HMA crust formed during transport with the hot interior HMA to produce a more uniform mix entering the paver. This remixing can assist in eliminating temperature variances. Insulated truck trailers, waterproof tarps, use of a consistent number of trucks for mix delivery and shorter haul distances also help maintain uniform temperature of delivered mix.

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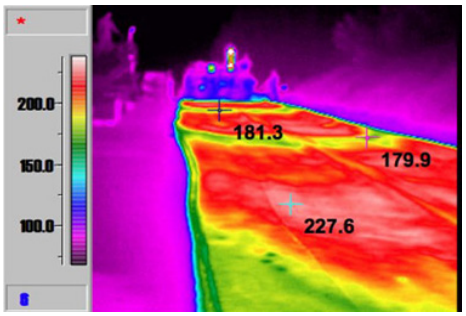
Thermal segregation is classified as moderate and severe. Moderate segregation is when the temperature differential is greater than 25°F, but not exceeding 50°F. Severe segregation is when the temperature differential is greater than 50°F. Thermal profiles are used to check the level and variability of the mixture temperature behind the paving machine. Profiles of mat temperature are recorded during field compaction to identify possible locations of cold spots as well as the rate of temperature loss. This helps ensure the mix being delivered and placed on the project has a uniform temperature and is a consistent, top quality material.

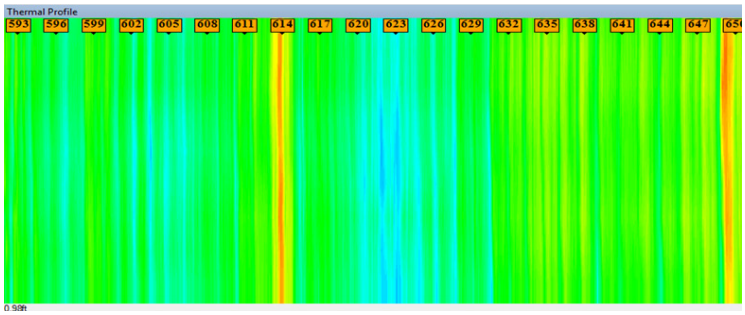
Thermal Camera

A handheld thermal camera records a still shot of the HMA mat temperature distribution directly behind the paving machine.



Thermal Imaging System

A paver mounted thermal imaging system is an innovative advancement in monitoring the uniformity of the mixture temperature behind the paver screed. It includes an infrared camera to capture temperatures of the complete width of paving as the paver moves thru the stations. A computer program generates automated test reports that include all temperatures and will identify locations where moderate or severe segregation exists.



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