

## **Abstract**

This study investigated the effect of temperature and moisture ingress on the crack healing ability of long term aged AC-13 asphalt mortar and mixtures. Base bitumen emulsion (BBE) and two maltene based cationic emulsions were applied on the cracks of fractured semi-circular samples of the asphalt mortar and mixtures to promote healing. Test results indicated that wet cracks of long term aged asphalt concrete could be healed using healing agents (HAs). Moisture infiltration before drying of the HAs was found to be detrimental to crack healing but initial moisture state of the crack was less influential to the ultimate healing for selected HAs. Increase in temperature increased the extent of crack healing in dry asphalt materials while moisture at 25 °C–45 °C had a minimal effect on crack healing. Water ingress had a nominal effect on the multiple fracture-rehealing performance. Generally, carefully selected HAs applied at higher pavement temperatures have the potential to heal and reheat wet cracks of asphalt pavements provided that sufficient time is allowed for the HAs to dry.