Cold In Place recycling with Intelligent Compaction

Cold In-Place Recycling (CIR) is an on-grade method of pavement rehabilitation that consists of milling the existing asphalt concrete pavement to a depth between 2 to 4 inches; mixing the cold milled material with emulsified recycling agent and other additives as needed; spreading and compacting the recycled mixture; and overlaying the recycled surface with a new layer of hot mix asphalt (HMA). Foamed asphalt can be used as a recycling agent instead of asphalt emulsion, but fine aggregates may need to be added to the recycled mixture.

Compaction of CIR is achieved with combination of vibratory/ static steel and, pneumatic rubber tired roller. The maximum field density of the CIR is achieved following rolling pattern established at the test strip. Using Intelligent Compaction, the roller operator can monitor the number of passes that is required to achieve the density.

Pre-mapping

CIR is best suited for moderate to low volume roadways that are structurally sufficient. One of the shortcomings of CIR rehabilitation strategy is the reliance on very limited field investigation during project design. It is not uncommon to encounter inadequate structural section support during recycling process. On CIR projects, Caltrans specification requires that Intelligent Compaction is used to map the stiffness of the underlying material of the existing pavement in order to establish the baseline stiffness of the materials and to identify areas of weak support. The stiffness of the material is depicted by Intelligent Compaction Measurement Value (ICMV). ICMV is a roller dependent value that is calculated based on the displacement measured by the accelerometer. Upon identification of the weak location, the resident engineer may ask the contractor to core the pavement and subsequently repair the pavement.
Mode of operation: Automatic

Bearing capacity sink

Amplitude = Max
Amplitude = Min

Distance [m]