Abstract
Top-Down cracks (TDC) are longitudinal or transverse cracks that initiate at the pavement surface and propagate downward and outward. In the past two decades, TDCs have turned into a worldwide phenomenon and drawn the attention of the research community. As this surface distress is different from the conventional fatigue crack that initiates from the bottom of asphalt concrete (AC) layer, many investigations have been carried out to study its characteristics and causes. Previous researchers concluded that TDC initiation is a result of the effect of the increased load- and thermal-included surface tensile stresses, and the decrease of the tensile strength due to segregation, construction-related temperature differentials (CRTD) and compaction. However, the validity of these conclusions is questioned since there is discontinuity in the timeline when TDC initiate. After reviewing the existing literature, one hypothesis of the root cause of the TDC initiation is compaction. Subsequently, other factors would contribute to the propagation of cracks downward.