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3	PhD Thesis Title	Studies on the Performance of Ultra Thin Cement Concrete Overlays on Flexible Pavements
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6	Date of Award of PhD degree	2014
7	<p><u>Brief synopsis</u></p> <p>Traditionally, Cement concrete has been perceived as a material for new pavement construction, in particular for roads with heavy axle loads. However, with respect to pavement rehabilitation, construction agencies many a times consider Bituminous overlays as the first option, regardless of the condition of the existing pavement structure. It is in this environment that Ultra Thin White Topping (UTW) and Thin White Topping (TWT) overlays are gaining popularity all over the world.</p> <p>Sub arterial and residential main streets with considerable high volume of traffic within cities have been strengthened periodically with Bituminous overlays. These streets exhibit well stabilized base due to the repeated wheel load applications, but the riding quality of these streets are not satisfactory due to the deterioration of the surface layer and hence it is required to rehabilitate these pavements. At present these pavement are being rehabilitated with a Bituminous layer almost every year which is increasing the maintenance cost and causing hindrance and delay to the traffic and the road user. To overcome this it is advisable to rehabilitate these pavement sections with such rehabilitating methods which will not require repeated maintenance and also provide the road user a better riding quality for a long duration of time, which in turn will reduce the overall life cycle cost.</p> <p>Ultra-Thin Whitetopping (UTW) is a pavement rehabilitation technique that involves the placement of a thin Portland Cement Concrete (PCC) overlay, 50 mm to 100 mm thick, over a distressed Bituminous pavement. The bond between the two layers promotes composite action of the pavement section and as a result has a direct impact on the performance of the UTW Pavement. This composite action allows for the reduced thickness in the UTW layer. Additionally, a short joint spacing is typically used, which reduces the UTW flexural and curling stresses.</p> <p>The study resulted in a modified UTW design methodology that takes into account the stiffness of all underlying pavement layers. Additionally, the study provides insight into the effects of pavement section, UTW mix design, mechanical loading and bond conditions on the performance of UTW.</p>	