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COLD IN-PLACE RECYCLING FOR FLEXIBLE PAVEMENTS

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3.1 INTRODUCTION

Cold in-Place Recycling (CIPR) is defined as a pavement rehabilitation technique in which the existing pavement materials are reused in-place, along with the addition of virgin aggregates, if required. The materials are mixed in-place without the application of heat. Stabilizing agents such as cement, lime, bitumen emulsion or foamed bitumen are added and mixed with the materials to provide additional strength to the pavement. CIPR is one of the most preferred structural rehabilitation techniques to be used by highway authorities. Among the advantages of CIPR are low cost, low energy consumption and eco-friendly. CIPR is a rehabilitation technique that reuses existing pavement materials in-situ without involving heat. CIPR can be used to address most pavement distresses such as rutting, cracking, surface irregularities and base problems. The process can be carried out with a single machine or an equipment train consisting of different machines. CIPR is an alternative method to the more traditional methods of structural overlay or reconstruction, whereby existing pavement distresses are addressed and additional strength required for future traffic increase is provided for, by using a stabilizing agent to increase the load carrying properties of the recycled pavement base.

CIPR can be performed in two ways: in partial-depth recycling, 50-100 mm of the asphalt layer is used to produce a base course. In full depth recycling, also known as full depth reclamation, both asphalt and portions of unbound aggregate layers are crushed, mixed with binder, and placed as a stabilized base course. However, the Asphalt Recycling and Reclaiming Association (ARRA) defines cold in-place recycling as partial depth recycling of the existing pavement while the full depth recycling is defined as full depth reclamation (ARRA, 2001). This article attempts to provide a brief introduction to the CIPR process, equipment for the process, selection criteria for the suitable pavement candidate, mix design, construction process, quality control and finally, the advantages and disadvantages of this method. The construction process to be explained is confined to the single pass equipment train. This article focuses on full depth reclamation rather than partial depth recycling.

3.2 ADVANTAGES AND DISADVANTAGES OF CIPR

The following are the advantages and disadvantages of CIPR:

Advantages

- i. Conservation of energy and materials (aggregates, asphalt and transport fuel).
- ii. No milling waste disposal.
- iii. Pavement geometrics are preserved or restored.
- iv. Most pavement distresses such as cracks, rutting and potholes can be corrected.
- v. Structural improvements can be made without significantly affecting the geometry.
- vi. Existing base problems can be corrected.
- vii. The process is relatively cheap compared to conventional methods such as reconstruction.