

## Module 3-4

### ***Cold Milling***

## Objectives

Application and uses of cold milling

Describe equipment and construction procedures

Differentiate between diamond grinding and cold milling

## Cold Milling Equipment



## Introduction

Cold milling has evolved over the last 20 years such that its use has changed or modified many of the older processes for HMA removal, leveling and overlay preparation

## Definitions

Cold milling - removal of pavement surface using drum-mounted carbide steel cutting bits

## Milling Drum - Triple Warp Head



## **Purpose and Application**

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Cold milling has been used primarily on HMA, but there is some emerging use on PCC. Its use can range from full lane width removal to small areas of partial depth removal

## **Purpose and Application**

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### **Major uses for cold milling:**

- Removal of rutting
- Restoration of curb line
- Restoration of cross slope
- Restoration of surface friction
- Mass removal of HMA
- Roughened surface for improved bond between layers

## **Mass Removal**

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## **Edge Milling to Maintain Curb Line**

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## **Rut Removal**

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## **Limitations and Effectiveness**

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Surface texture produced by milling is a function of:

- Carbide bit spacing
- Depth of cut
- Rotational speed of head
- Speed of travel

### Potential Operation Problems

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### Design Considerations

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- Resulting surface profile
- Skid resistance
- Pavement removal and surface profiling

### Construction Considerations

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#### Pavement to be resurfaced

- Standard head with normal carbide bits
- Standard line and grade requirements

#### Pavement surface to be turned over to traffic

- Special heads with more carbide bits
- Smoothness and grade requirements in line with HMA wearing course

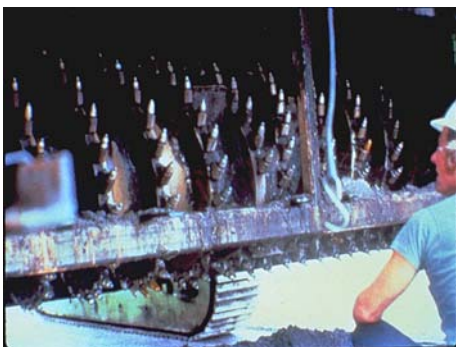
### Poor Milled Surface

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### Typical Milling Drum

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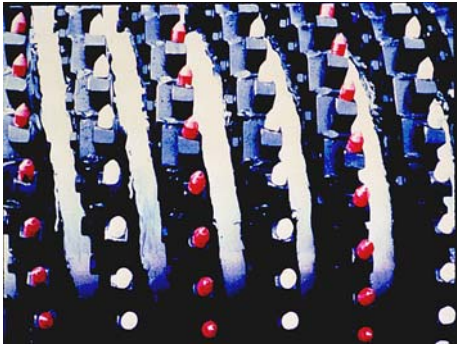


### Special Multiple Tooth Attachments

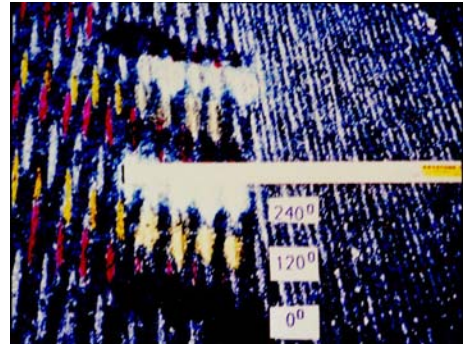
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### Special Multiple "Warp" Drum



### Single Warp Vs. Triple Warp Drums



### Milling Wheelpaths in Sweden



### Paving Wheelpaths in Sweden



### Paving Wheelpaths in Sweden



### Finished Wheelpaths in Sweden



## **Summary**

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**This section covered the basic aspects of cold milling which is used as a specific rehabilitation treatment, or as preparation for an HMA overlay**

**Included were discussions on milling equipment, design, and construction procedures**