

## Michigan's Unbonded Concrete Overlays

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## UNBONDED CONCRETE OVERLAYS

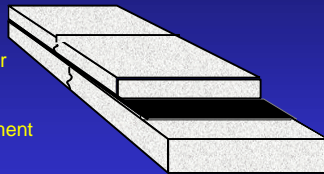
Bob Risser, P.E.  
Executive Director

## Unbonded? Separated Concrete Overlays

PCC Overlay

Separator Layer

Old PCC Pavement



## Unbonded Concrete Overlays

- Design
  - Little or no preparation
  - Interlayer/separator (hot mix) approx. 1in.
- Performance
  - No reflective cracking
  - Almost 20 yrs in Michigan

## Unbonded Overlays in Michigan

- **Highways**
  - I-96, Ionia County, 1984
    - M-66 to Sunfield Rd., 7.5 in.
  - US 23, Monroe County, 1984
    - Ida Center Rd. to M-50, 8 in.
  - US 10, Bay County, 1990
    - Bay City to Midland, 7 in.
  - I-96, Ionia County, 1991
    - Ionia Co. to Bauer Rd., 7.5 in.

## Unbonded Overlays in Michigan

- **Highways (cont.)**
  - I-94, Jackson County, 1995
    - Jackson Co. east 9.5 mi., 7.5 in.
  - US 131, Allegan County, 1998
    - Conrail RR to 114th Ave., 7.5 in.
  - US 23, Livingston County, 1999
    - Faucett Road to Genesee County Line, 8 in.
  - I-69, Branch County, 1999
    - I-94 to Eaton County Line, 7.5 in.

## **Unbonded Overlays in Michigan**

- **Highways (cont.)**
  - I-69, Eaton County, 2000
    - Eaton Co. Line to Island Hwy., 7.0 in.
  - US 131, Kent County, 2000-2001
    - M-46 north to Cannonsville Road., 7.0 in.

## **Unbonded Overlays in Michigan**

- **US 10, Bay County, 1990**
    - Bay City to Midland
- Length: 6.0 mi.  
 Contractor: Interstate Hwy. Const.  
 Thickness: 7 in.  
 Joint Spacing: 15' Random  
 Interlayer: 1 in. AC

## **U.S. 10 Concrete Overlay**

- **Westbound Concrete Overlay**
  - 12 miles Completed in 11 Weeks
  - 14 days Ahead of Schedule
  - Incentive: \$210,000 @ \$15,000 per day
- **Eastbound Rubblize & AC Overlay**
  - 5 1/2 Months Completion Time

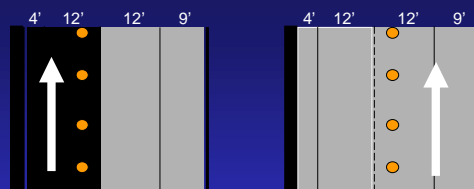
## **U.S. 10 Concrete Overlay**

- **Phase I**
  - Began September 4 (After Labor Day)
  - Completed October 18
- **Phase II**
  - Began October 22
  - Completed November 7

## **US 131 Concrete Overlay**

- 4.5 miles divided highway
- Concrete Overlay - All Lanes + Shoulders
- Completed in 44 days

## **Traffic Management**



**Stage I**

- Prepare Shoulders
- Place AC Interlayer
- Take Outside Lane & Shoulder
- Pave Concrete Overlay
- Open to Traffic

**Stage II**

- Take Inside Lane & Shoulder
- Pave Concrete Overlay
- Open to Traffic



## ***Fast and Affordable***

- **I-96, Ionia County, 1991**  
– Ionia Co. Line to Bauer Rd.

Length: 6.8 mi.  
Contractor: Ajax Paving  
Thickness: 7.5 in.

## **Interstate I-96**

- **Concrete Overlay - 7.5"**  
– Clinton County, 1991  
– Cost: \$1,034,000 per mile  
– Three months
- **Rubblize w/Asphalt Overlay - 6"**  
– Ingham County, 1992-93  
– Cost: \$1,437,500 per mile  
– Two Seasons

***39% Difference in Initial Cost***

## **1998 Bid Results**

- **I-96 Asphalt Overlay**  
– 14.06 kilometers  
– Original Concrete 36 Yrs Old  
– 8-10 Year Fix  
– \$14.52 Million - \$1.03 Million/km

**Overall Cost to Taxpayers**  
**\$103,000 per kilometer per year**

## **1998 Bid Results**

- **I-69 Rubblize/Asphalt Overlay**  
– 9.61 kilometers  
– Original Concrete 30 Yrs Old  
– 12 Year Fix  
– \$11.4 Million (w/o Bridges) -  
\$1.19 Million/km

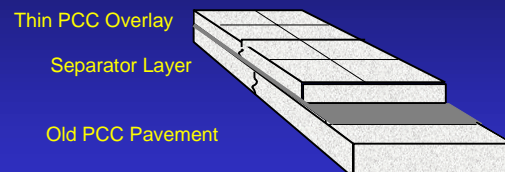
**Overall Cost to Taxpayers**  
**\$99,200 per kilometer per year**

## **1998 Bid Results**

- **US 131 Concrete Overlay**  
– 6.6 kilometers  
– Original Concrete 38 Years Old  
– 20 Year Fix  
– \$6.18 Million (w/o bridge) -  
\$0.94 Million/k

**Overall Cost to Taxpayers**  
**\$47,000 per kilometer per year**

## **Thin Unbonded Concrete Overlays in Michigan**



## Unbonded Concrete Overlays in Michigan

- Local Roads & Streets
  - Coolidge Highway, Royal Oak, 1983
    - 13 Mile to 14 Mile, 5 in.
  - Enterprise Drive, Allen Park, 1997
    - Oakwood to S. Dearborn, 6 in.

## Coolidge Road, 1983

- Concrete Overlay and Widening
- Original Concrete Built 1928 and 1929
- 8 inch plain concrete
- 20 foot wide two lane road

## Coolidge Road, 1983

- Numerous 3" and 5" asphalt overlays
- Widen from 20 to 25 feet
- 4,590 feet of 5-inch unbonded overlay
- Placed in September 1983

## Coolidge Road 13 Mile to 14 Mile Road



## Coolidge Road 13 Mile to 14 Mile Road



## Coolidge Road



## Enterprise Drive, Allen Park

- Original pavement built in 1950's
- 9-inch mesh reinforced
- 6-inch unbonded overlay
- 9-inch plain concrete widening
- Joint Spacing - 10 feet

## Enterprise Drive, Allen Park

- Access to Local Businesses Crucial
- 9-inch widening built first
- 7,200 square yard overlay built in one Saturday

## Enterprise Drive, Allen Park



## Enterprise Drive, Allen Park



## Enterprise Drive, Allen Park



## Enterprise Drive, Allen Park



Enterprise Drive, Allen Park



Enterprise Drive  
Oakwood to S. Dearborn, 6"



Enterprise Drive, Allen Park



Enterprise Drive, Allen Park



Enterprise Drive  
Oakwood to S. Dearborn, 6"



Enterprise Drive, Allen Park



## Outer Drive, Wayne County

- Outer Drive, Ford Rd. to Hines Drive, Wayne County
- 5 lane curbed pavement
- Original plain concrete built in 1928
- Last asphalt overlay lasted 7 years