Concrete Pavements in Virginia
Route 58 Open House
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Overview

- Background
- Types of Concrete Pavements in Virginia
- How Route 58 Was Constructed?
- What Caused Distresses on Route 58?
- Virginia Experience with Bonded Concrete Overlay
- Current Dem for Unbonded Concrete Overlay
- Current CRCP Construction Features
- Lessons learned

Background

History

Types

Concrete Pavement Construction In Virginia Since 1913

Concrete Pavement Types in Virginia

- Jointed Plain, JPCP (15 - 20 ft Joint spacing, doweled or undoweled)
- Jointed Reinforced, JRCP (25 – 61.5 ft Joint Spacing, mostly doweled)
- Continuously Reinforced, CRCP(No working joints, no dowels)

What is CRCP?

Concrete pavement in which longitudinal reinforcing steel is continuous throughout the pavement length

Transverse Reinforcement

Functions as:

- **Tie bars across longitudinal joints**
- **Keeps potential longitudinal cracks held tight**
- **Supports longitudinal steel in place**

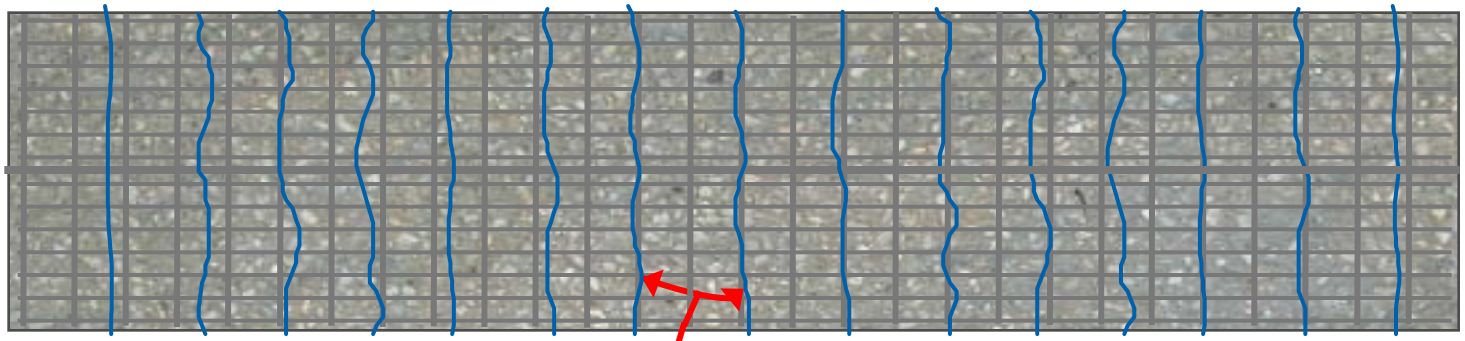
CRCP Features

- Crack widths are controlled by continuous steel reinforcement
- Joint-related distresses are eliminated with absence of transverse contraction joints
- Provides smooth ride, long service-life
- Has become an optional pavement type for heavy traffic loads, high volume cases, with a low life cycle cost

CRCP Behavior - Crack Spacing

- Cracks begin to develop in the transverse direction
- Held tight by longitudinal reinforcing steel
- Cracks spacing 3.5-6ft (Crack width < 0.040 in.)

Aerial View



Side View

How Route 58 was constructed ?

Tying the longitudinal Steel in advance

Feeding the longitudinal Steel into the Tubes

Close up showing the Tubes

Delivering Concrete and Steel Depth check

Positioning the Longitudinal Steel

Positioning the Longitudinal Steel

Tube Feeding of Longitudinal Steel in CRCP

CRCP Paving I-64 in 1971

Placement of Tie-bars

Another System for Tube Feeding

Finished CRCP

What Distress May Result from the Tube Feeding System

- High Steel (spalling, rusting of steel due to inadequate cover)
- Low Steel (wider crack width, concrete acts as plain slab)
- Inconsistent spacing (erratic cracking)

Longitudinal Crack Due to High Steel

Close up High Steel On Route 58

Two Longitudinal Cracks and Punch out

High Steel as a Result of Tube Feeding System

High Steel Measurement

Drop Off at the Retrofitted Edgedarin Leading to Water Entry

CRCP in Good Condition On Route 58

Virginia Experience with Bonded Thin Concrete Overlay

- Route 13, Northampton County
- 8 inches JPCP (20 joint spacing, undoweled) original construction 1965
- 6 inches Select material as subbase
- 3.5 inches bonded concrete overlay (1990)

- I 295, Henrico County
- 8 inches CRCP, constructed 1979
- 6 inches CTA subbase
- 2 inches Bonded concrete overlay (1995)

Virginia Experience with Bonded Thin Concrete Overlay

I 85, Dinwiddie County

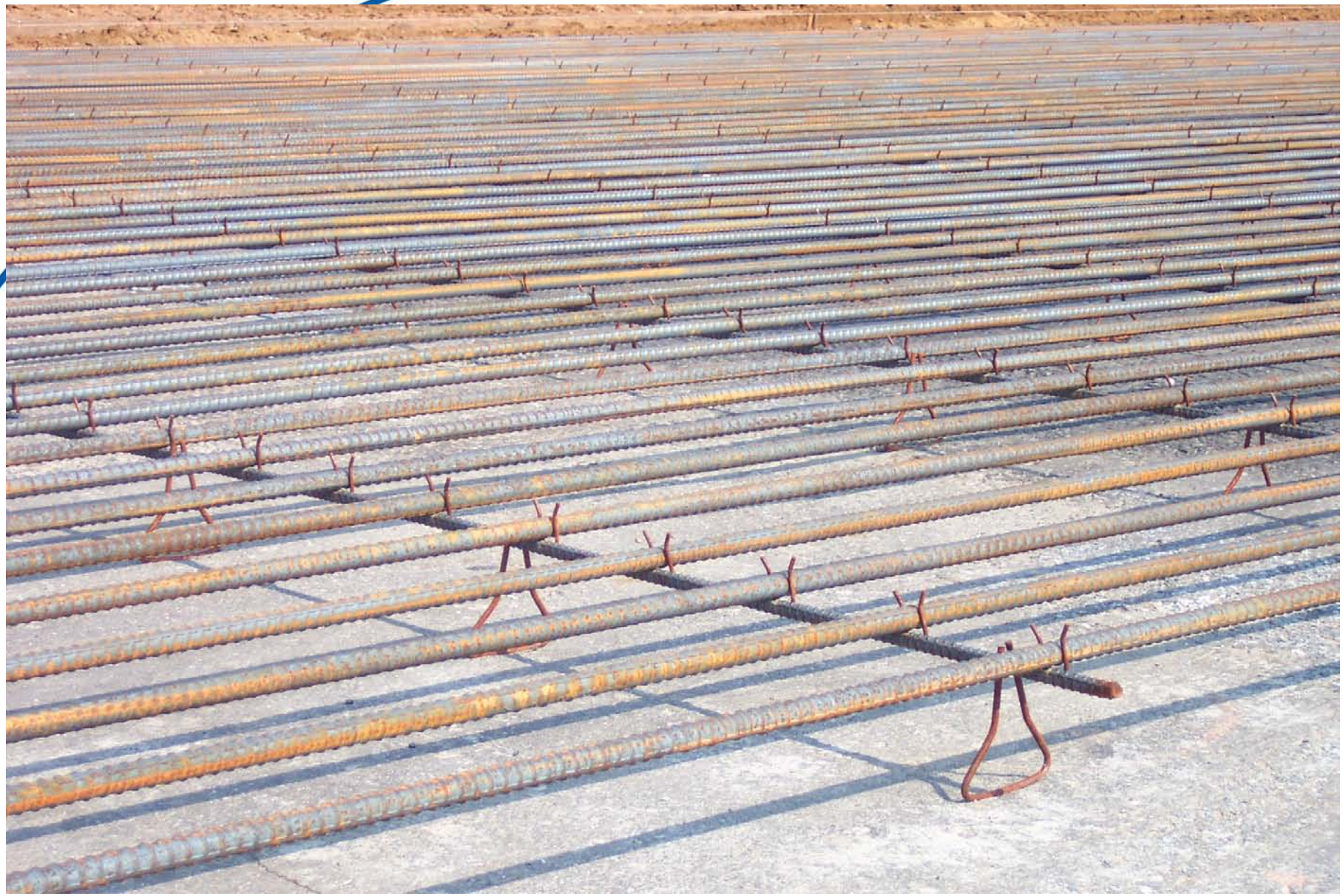
- 8 inches CRCP, constructed 1960's
- 6 inches CTA subbase
- 4 inches bonded concrete overlay (1995)
- Route 58, Southampton County
- 8 inches CRCP, constructed 1986-1988
- 6 inches CTA subbase
- 4 inches bonded Concrete overlay (2012)

Virginia Demo with Unbonded Concrete Overlay

- Today (2012)
- Route 58, Southampton County (first unbonded project in Virginia)
- Existing 8 inches CRCP , constructed 1986-1988
- 6 inches CTA subbase
- 7 inches unbonded jointed plain (6’x6’ panel), undoweled, concrete overlay
- One inches asphalt separation layer

Current CRCP Construction Features

- No Tube feeding is allowed
- Longitudinal steel on transverse steel and chairs
- Emphasis on consolidation
- Wider travel lane (14 ft)
- Use of OGDL
- Use edgedarins



Finishing CRCP

Open Graded Drainage Layer Balance Between Stability and Drainability

Working Edgedrain Outlet

Close up of Finished CRCP

Madison Heights By-pass

Madison Heights By-Pass

CRCP in Madison Heights, Virginia

I-64 Battlefield Blvd. CRCP Project

Lessons Learned

- Familiarization with the unique CRCP aspects
- Refer to Project specifications, special provisions, Pavement Manual, standard drawings
- Most important: Steel placement & concrete consolidation
- Pay attention to construction joints & end anchorage details
- Recognition of effects of changes in ambient conditions

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