

MnROAD Concrete Pavement Research – Recent Observations

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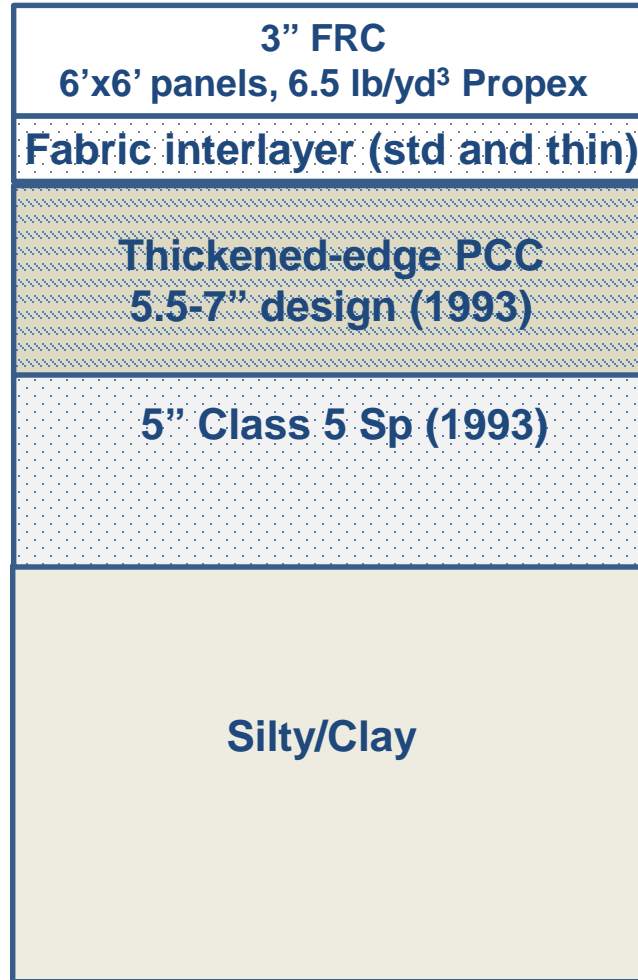


Ultrathin Unbonded Concrete Overlay



- Cells 140 and 240
- Constructed in June 2013
- 3" thick, 6' x 6' panels, structural fiber-reinforced concrete
- Nonwoven geotextile fabric
 - Standard thickness (wt.) and ½ thickness (wt.)

MnROAD Cells 140 & 240



Cell 240 Performance (Standard wt. fabric)

- Approximately 9000 passes of 80k MnROAD truck \approx 33,000 ESALS
- 1 polar vortex winter
- 1 “monsoon” June \approx 14” rain



- ***One transverse reflective crack over old utility trench***
- ***Audible movement of panels on cooler days***

Cell 140 Performance (Thinner wt. fabric)



2 (total) reflective cracks over underlying skewed, undoweled & faulted PCC joints

Cell 140 Performance (Thinner wt. fabric)



Question: Will structural fibers hold these cracks together?

Rehabilitation of Thin Concrete Pavements

- Cell 32: 5" thick concrete section constructed in 2000
 - LVR traffic = 80k 5-axle truck
 - 10'L x 12'W panels, undoweled joints
 - Undrained gravel base, gravel shoulders
- After 12 years of traffic, developed significant joint faulting (average=9mm, 3/8")
- Multiple slabs with corner and longitudinal cracks



Cell 32, 5" thick, after 12 years



October 2013 Repairs



October 2013 Repairs



October 2013 Repairs

Cell 32 Performance (4,000 passes \approx 15,000 ESALs)



Plate dowels “popping through” leave side of repair joints

Cell 32 Performance (7,700 passes \approx 29,000 ESALs)



Plate dowels “popping through” longitudinal side of repair joints

Cell 32 Performance (7,700 passes \approx 29,000 ESALs)



Cracking in retrofit dowel slots (both dowel types)

MnROAD Pavement Patching – Full depth

9.5" Cell 12 – Oct 2013 installation

- PNA CoVex, $\frac{3}{4}$ " thick plates
- Fiber-reinforced ready mix PCC



MnROAD Pavement Patching – Full depth

9.5" Cell 12 – June 2014 installation

- CRT Long Life™ dowels, 1" and 1.5" diameter FRP clad steel



Questions????