

## Testing new pavement overlay

ALMOST 7,000 miles of Iowa's portland cement concrete (PCC) pavements have been resurfaced with asphalt and need to be resurfaced again. Jim Cable, associate professor of civil engineering at ISU, along with ISU's Center for Portland Cement Concrete Paving Technology, is evaluating a resurfacing technique that uses a thin layer of PCC instead of asphalt and is less expensive than traditional PCC overlays.

An unbonded PCC overlay has been constructed on a 9.55-mile stretch of Highway 13 north of Manchester. The new surface layer is much thinner than traditional PCC overlays, which can be nearly as thick as new pavement.

Like bonded overlays, in which all pavement layers absorb and distribute vehicle weight to the subgrade, this unbonded surface layer distributes vehicle weight through the PCC overlay and existing asphalt and PCC layers to the subgrade.

### Variables being tested

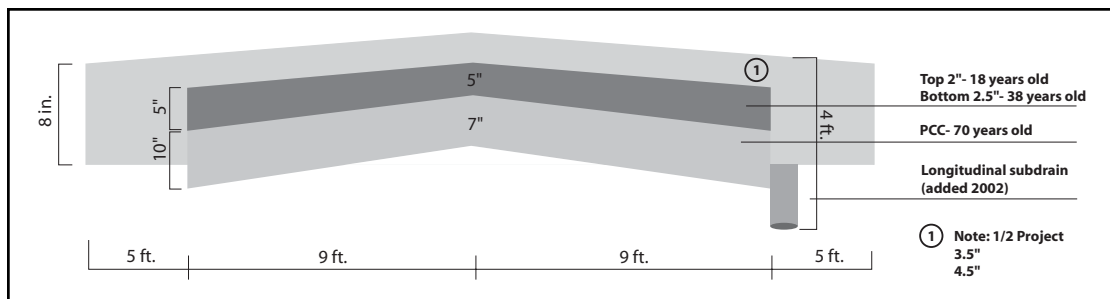
**Overlay thickness.** Part of the overlay is 3-1/2 inches thick; the rest is 4-1/2 inches thick.



Asphalt pavement before PCC was laid



PCC overlay with longitudinal joints cut into the pavement



The concrete overlay simultaneously overlays and widens the original pavement.

**Joint layout.** Joints were cut to divide the pavement into various sizes. Performance data will be collected from 100 test areas during the next five years.

**Joint construction methods.** Researchers are testing several new PCC jointing techniques and technologies, including not sealing transverse or longitudinal sawed joints and cutting longitudinal joints while the pavement was still wet (see picture).

**Installation method.** The thin PCC overlay is 28 feet wide—10 feet wider than the original pavement. The overlay was constructed with a new method that, in one pass, overlaid existing pavement and added five feet of PCC on each side (see figure). This method allowed engineers to open the pavement to traffic less than 30 hours after resurfacing.

**Overlay lifespan.** Highway 13 was overlaid with PCC in 1931 and then with asphalt in 1963 and 1983. Researchers expect the new thin PCC overlay to last until 2021.

### For more information

For information about this project, contact James K. Cable, 515-294-2862, jkcable@iastate.edu. •

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