

Idea Exchange

Former sign trailer now holds barricades

Sign trailers no longer considered safe on roadsides have been recycled by Iowa County. With a little welding, they now store and transport those giant Type III barricades used for closing roads.



"It's so handy," says Patrol Superintendent Mark James.

"Before, we had the barricades leaning against the side of the building. Now they're all on the trailer. When we need them we can just hook up the hitch to a truck and go."

Two stories in *Crossroads* gave him the idea, he says. The first, in Spring 2000, reported that sign trailers then used by counties on state roads, would no longer meet crash test safety requirements in work zones. The second, in Summer

2000, described an emergency trailer to hold Type III barricades and base supports developed by a county in South Dakota.

"We had the old sign trailers parked out in a quarry," James says. "We used the axles and frame, and welded 2x2 inch tube to hold the signs. They slide right in." Not only is it convenient and quick to get barricades to a site, they don't get banged up from loading and unloading, or from leaning against a wall when not in use. The cost was minimal since the county welder did the work using stock materials.

Most of the Iowa County Highway shops now have a trailer. Nearby townships have also borrowed a trailer when they have a road closing emergency.

For more information contact Iowa County Patrol Superintendent Mark James at 608/935-3381.

Notched wedge joints better, safer

Longitudinal joints on asphalt pavement tend to crack and ravel, making them the pavement's weakest element.

The reason is variable density at the centerline joint during paving. In conventionally paved vertical edge joints the "hot" lane, paved second, is more densely compacted than the edge of the previously paved "cold" lane.

Creating a notched, compacted wedge joint along the centerline reduces longitudinal joint cracking so significantly that most Wisconsin paving contractors now use it routinely. Based on a 10-year study completed in 2003, WisDOT has adopted this joint as a supplemental specification and will make it standard this year.

This joint also is safer for traffic. Instead of a vertical step-off between the paved and unpaved lanes, there is a tapered transition between them.

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Iowa makes a better salt shed door

The heavy wooden door would barely open on the Iowa DOT's salt shed in Cedar Rapids, even with two men pulling on it. Meanwhile, the garage's salt dome had no door at all.

First the Iowa DOT folks in Cedar Rapids bought a canvas door for the dome that could be raised and lowered, folding up like a roman blind. Steel rollers on the side of the canvas moved on metal tracks along the door frame.

But the door wasn't quite right. It wouldn't fold all the way to the top, so trucks couldn't fit through the opening.

By then Greg Callanan and Dale Sexton, equipment operators at the facility, had had enough. They replaced the dome door's metal tracks with wooden ones and the steel rollers with pipes running horizontally through the canvas, sliding up and down inside the wooden tracks. Now the door rises easily all the way above the door frame, well out of trucks' way.

The men then decided to replace the shed door, too. They designed a similar door—roman blind style with wooden



tracks. They used materials from the shop: truck tarps, fence top rail, cable, hardware, and a winch. The second door cost about a quarter what the commercial one for the dome had cost.

Now, opening and closing both doors is a snap. They glide smoothly all the way to the top and are much lighter.

For more information about replacing your salt shed door, contact Dale Sexton, 319/364-8189.



Lightweight canvas door folds up to let trucks in.

Using parts from the shop cut door cost 75%.

Do you have an idea that could help other streets or highway agencies? Tell us about it. See page 7 for contact information.

Crossroads

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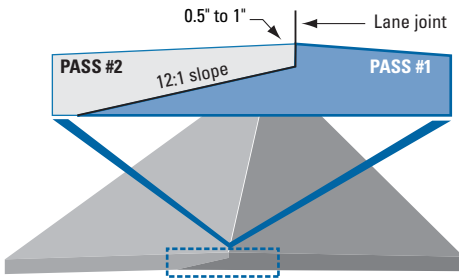
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Notched wedge joints *from page 2*

"It's pretty easy to do and pretty straight forward," says Scot Schwandt, Director of Engineering for the Wis. Asphalt Pavement Association. It does require adding a wedge-compacting roller to the paver. Worker experience also improves the success of the joint.

According to the WisDOT report, wedge joints using the Michigan method and two different steel compaction rollers, achieved over 92% of maximum density in the upper layer and had only 21% and 33% longitudinal joint cracking after 10 years. Conventional joints, using the standard butt-type joint, achieved 91% density at construction, but 10 years later they had 86% longitudinal cracking.



The key elements to a successful wedge joint are creating a 1/2" to 1" notch at the inner edge of the wedge, with a 12:1 taper ratio, and compacting the wedge with a steel roller. A tack coat on the wedge before the second lane is placed produces good adhesion.

Pavers used two methods to compact the successful wedges in the test: a tag-along steel roller and a steel wheel side roller. The tag-along roller produced a somewhat better performing joint at the end of 10 years, but workers reported the steel wheel side roller was much easier to use and its joints consistently ranked in the top three when evaluated at 2, 3, 4, 5, and 10 years.

Other joint methods tested—rolling with hauling truck tires and with rubber side roller wheel, no rolling, cut joints, and using a Bomag edge constraint device—all produced significantly poorer performance after 10 years.

See Resources to get wedge joint specs or copies of the report, **Evaluation of Techniques for Asphaltic Pavement Longitudinal Joint Construction** (Report No. WI-08-03) published by WisDOT's Technology Advancement Unit—available in print and online.

Resources

Printed publications

The following publications are available free from the T.I.C. while supplies last.

Invasive Species Packet Help crews learn to recognize four invasive plants commonly spread on roadsides: wild parsnip, spotted knapweed, leafy spurge and Canada thistle. Includes poster, color identification cards, and plant pamphlets with control strategies.

Evaluation of Techniques for Asphaltic Pavement Longitudinal Joint Construction WisDOT, No. WI-08-03 (*final report*), Nov. 2003. Evaluation of 8 longitudinal joint construction techniques. Density results and 10-year performance evaluation show that the wedge joints perform best. Also, download at <http://www.dot.wisconsin.gov/library/research/reports/pavements.htm>

Signing for Local Roads TIC/WTB No. 7, 2003, 12 pp. Helps local officials understand national and state signing standards. Addresses responsibility, principles, placement, and types of signs.

Pavement Markings TIC/WTB No. 9, 2004, 12 pp. Expanded and updated bulletin introduces basics of pavement markings including materials, general principles, and considerations for various marking types.

Roadway Safety and Guardrail TIC/WTB No. 12, 6 pp. Describes general roadside safety and discusses proper guardrail use.

Digital resources

For easier use, click on Web addresses in Crossroads online: <http://tic.engr.wisc.edu>.

Department of Administration Easy access to state purchasing resources, technical advice, data, and financial assistance. www.WisconsinPartnership.wi.gov

Full Road Closure for Work Zone Operations—A Cross-Cutting Study (August 2003, FHWA-OP-04-009). Summarizes how departments of transportation have used a full closure approach for road rehabilitation/reconstruction projects. Available at <http://ops.fhwa.dot.gov/wz/resources/publications/FullClosure/CrossCutting/its.htm>

Invasive Plant Species, WisDOT, Hwy. Ops., Transportation Synthesis Report, 9 pp., June 2003. Strategies and best practices to control invasive plant species along highway rights of way, with focus on six species of concern in Wisconsin: www.dot.wisconsin.gov/library/research/reports/tsr.htm

Reducing Injuries and Fatalities in Targeted Emphasis Areas. From NCHRP Project 17-18(3), Report 500. A series of guides addressing the 22 key areas that affect highway safety identified in the 1998 AASHTO

Strategic Highway Safety Plan. Each has a general description of the problem, the strategies/countermeasures to address the problem, and a model implementation process. These guides are available at: <http://safety.transportation.org/guides.aspx>. Guides that may be particularly useful are: *Collisions with Trees in Hazardous Locations*, VOL. 3; *Head-On Collisions*, VOL. 4; *Unsignalized Intersection Collisions*, VOL. 5; *Run-Off-Road Collisions*, VOL. 6.

WisDOT Specifications for the Wedge Joint are at <http://www.dot.wisconsin.gov/business/engrsrv/construction-library.htm>. CADDs details for the specs are available at www.dot.state.wi.us/business/engrsrv/roadway-design-files.htm MicroStation files -->Detail cells (ms det.exe).

Videotapes

Videotapes are an efficient and effective way to train staff. Recent additions are listed here. Videos are loaned free through county UW-Extension offices. The *2004 T.I.C. Video Lending Library Catalog* will be sent to agencies in July. Additional copies are available on request from the T.I.C. or online at <http://tic.engr.wisc.edu>

Plant Site Safety, Iowa State University, 1997, 11 min. #18630. Shows typical hazards at concrete, asphalt and crushing plants. Advice intended for plant workers, crane or truck operators. Good for new employees or as a refresher.

Drainage Pipe Installation, PA DOT, 18 min. #18667. The basics of proper culvert installation; planning steps; details and examples of excavating, removing, placing, and backfilling culverts; and the benefits of good compaction. Intended for field crews.

Safe Tree and Brush Removal, IL DOT, 2003, 19 min. #18668. Good training video. Begins with information on why to remove trees and brush. Shows details on daily maintenance, sharpening and tips for safe operation of chain saws and brush chippers. Also illustrates safe skills for tree cutting, stump removal and tree trimming.

Safe Mowing Procedures, IL DOT, 2003, 17 min. #18669. When and where to mow according to Illinois DOT policy. Has good details on daily equipment inspections and safe mowing operations.

On Again, Off Again: A Guide to Mounting and Dismounting Heavy Equipment Association of County Commissioners of Oklahoma, 2003, 18 min. #18670. A good review of basic safety rules. Includes steps for safe mounting of equipment. A few ideas presented with humor. Useful for all equipment operators.